



Brossett
Architect

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Project Manual

December 20, 2025

**Lake Charles Public Works New Facility
Phase 2
4200 Broad Street
Lake Charles, LA 70615
Project No. DR002**

City of Lake Charles
326 Pujo Street
Lake Charles, LA, 70601

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Brossett Architect

The following specification sections have been prepared by Brossett Architect LLC by or under the direct supervision of David Brossett, AIA
Specification sections:

Section 011000	Summary
Section 012000	Price and Payment Procedures
Section 013000	Administrative Requirements
Section 014216	Definitions & Standards
Section 014219	References
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Section 096516	Resilient Sheet Flooring
Section 099100	Painting
Section 099600	High Performance Coating
Section 099657	Floor Moisture Vapor Retarder
Section 101400	Signage
Section 102113	Toilet Compartments
Section 102600	Wall and Door Protection
Section 104413	Fire Extinguisher Cabinets
Section 104416	Fire Extinguishers
Section 105143	Storage Lockers
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Section 313116	Termite Control
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ADVERTISEMENT FOR BIDS

Public notice is hereby given that sealed bids are to be received at www.bidexpress.com or by mail or hand delivered in the office of Clerk of Council of the City of Lake Charles, located on the 4th Floor of City Hall at 326 Pujo Street, 4th Floor, Lake Charles, Louisiana, 70601 until two forty five p.m. (2:45 p.m.) central standard time on the **17th day of February 2026**, and will be publicly opened and read aloud in the City Council Chambers on the 1st Floor of City Hall at 326 Pujo Street, Lake Charles, Louisiana 70601 at three p.m. (3:00 p.m) central standard time. For the following Project:

City of Lake Charles, Louisiana
Lake Charles Public Works New Facility Phase 2
DR002

All bids must be submitted on the proper bid form or electronic bid form. The Contractor shall display his Contractor's license number prominently on the outside of the envelope on paper bids. Bids received after the above specified time for opening shall not be considered and shall be returned unopened to the sender.

Contract Documents, including drawings and technical specifications in digital form, may be examined at the office of the Architect, Brossett Architect, LLC at 414 Pujo Street, Lake Charles, LA, phone: **(337) 439-8400**. Digital copies may be obtained at the office of the Architect, upon payment of **\$0.00** for each set of documents. An electronic original set of construction documents is available upon request to the Architect, at no cost. Plans and specifications will be available until twenty-four (24) hours before the bid opening. In accordance with LA R.S. 38:2212, deposits on the first set of documents furnished to bonafide prime bidders will be fully refunded upon return of the documents, in good condition, no later than ten (10) days after receipt of bids. For additional sets of documents, furnished to the bidder, the deposit less the actual cost of reproduction will be refunded upon return of the documents, in good condition, no later than ten (10) days after receipt of bids.

All bids shall be accompanied by a certified check, cashier's check, or bid bond payable to the City of Lake Charles, the amount of which shall be five percent (5%) of the base bid and all alternates. If a bid bond is used, it shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- Rating in the latest printing of the A.M. Best's Key Rating Guide to write individual bonds up to ten percent of policyholders' surplus as shown in the A.M. Best's Key Rating Guide, or by an insurance company in good standing licensed to write bid bonds which is either domiciled in Louisiana or owned by Louisiana residents. The bid bond shall be issued by a company licensed to do business in Louisiana and who is under contract with the surety company or bond issuer as a licensed agent in this state and residing in this state. The certified check, cashier's check or bid bond shall be given as a guarantee that the bidder shall execute the contract, should it be awarded to him, in conformity with the contract documents within fifteen (15) days of the Notice of Award.

No Bidder may withdraw his bid within forty-five (45) days after the actual date of the opening thereof; except as prescribed in LA R.S. 38:2215 A. Bids and Bid Bonds shall be submitted only on the forms provided with the specifications.

The successful bidder shall be required to furnish a Performance and Payment Bond in an amount equal to 100% of the Contract amount, shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list (Circular 570) or approved bonding

companies which is published annually in the Federal Register. The public shall incur no obligation to the Contractor until the contract between the City and the Contractor is fully executed.

Contractors or contracting firms doing work which is classed as "Hazardous Materials" or any sub classification, shall be properly licensed when the work to be performed is \$1.00 or more. Contractors or contracting firms submitting bids for work besides Hazardous Materials, shall be properly licensed for any work in the amount of \$50,000.00 or more. All such bidders shall certify that they are licensed Contractors under Chapter 24 of Title 37 of the Louisiana Revised Statutes.

As a requirement under LA R.S. 37:2163, this project is classified by the Architect. The Contractor shall reference Section 00200 – Instructions to Bidders Part 3.6.1 for the required licensure classification.

Bids will be evaluated by the City of Lake Charles based on the lowest responsible bid submitted which is also in compliance with the specifications. The City of Lake Charles reserves the right to reject any and all bids in accordance with the provisions of LA R.S. 38.2211, et seq. Bids in the amounts specified above which have not bid in accordance with the requirements, shall be rejected and shall not be read. Additional information relative to licensing may be obtained from the Louisiana State Licensing Board for Contractors, Baton Rouge, Louisiana.

Attention is called to the fact that the Contractor must ensure that employees and applicants for employment are not discriminated against because of race, creed, color, or national origin. The City of Lake Charles fully complies with Title VI of the Civil Rights Act of 1964, Americans with Disabilities Act, and related statutes, executive orders, and regulations in all programs and activities. The City operates without regard to race, color, national origin, income, gender, age, and disability. Any person who believes him/herself or any specific class of persons, to be subjected to discrimination prohibited by Title VI/Americans with Disabilities Act may by him/herself or by representative file a written complaint with the City of Lake Charles. The City's Title VI Coordinator/ADA Coordinator may be reached by phone at (337) 491-1440, the Mayor's Action Line at (337) 491-1346, or contact the appropriate Department Head.

A pre-bid conference will be held at the office of Brossett Architect, LLC, 414 Pujo Street, Lake Charles, LA , phone: 337-439-8400 on January 21, 2026 at 9:00 a.m. Attendance at this conference is **NON-MANDATORY**. Bidders are advised that they will be required to state on the bid form that they have personally inspected and are familiar with the project site.

PUBLISH DATES:
January 9, 2026
January 16, 2026
January 23, 2026

CITY OF LAKE CHARLES, LOUISIANA

By: s/ Marshall J. Simien Jr.,
Marshall J. Simien Jr., Mayor

ATTEST:
s/Renee P. Deville
CLERK OF THE COUNCIL

SECTION 00200

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS

- 1.1 Terms used in these Instructions to Bidders which are defined in the Standard General Conditions of the Construction Contract have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to Owner, as distinct from a "Sub-bidder", who submits a Bid to the Bidder. The term "Successful Bidder" means the lowest, qualified, responsible, and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) proposes to make an award. The term "Bidding Documents" includes the Advertisement for Bids, Instructions to Bidders, the Bid Form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids) and the Drawings.

2. COPIES OF BIDDING DOCUMENTS

- 2.1 Complete sets of Bidding Documents in the number and for the sum stated in the Advertisement for Bids may be obtained as stated in the Advertisement for Bids.
- 2.2 Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Architect assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents by Bidders and their Sub-bidders.
- 2.3 Owner and Architect in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.
- 2.4 No Bidding Documents will be issued later than twenty-four (24) hours of the date set for receiving bids, as provided by Louisiana Revised Statutes.

3. QUALIFICATIONS OF BIDDERS

- 3.1 It is the intention of the Owner to award this contract to a Bidder competent to perform and complete the Work in a satisfactory manner and who proposed to employ Subcontractors, if any, competent to perform their portion of the Work in a satisfactory manner. Accordingly the apparent responsible low bidder shall fully complete and submit the Subcontractor List (Section 00435), provided herein, within ten (10) calendar days after the bid opening. Failure to submit this form within the specified time frame will result in the bidder being declared as non-responsive, in accordance with LA R.S. 38.2212(B)(3)(a).
- 3.2 The Owner shall consider the Bidder qualifications, Subcontractors, and suppliers in evaluating the Bidder's bid and shall have the right to reject any Bidder for any reason set forth in LA R.S. 38:2211, et seq.
- 3.3 Should the Owner request additional information about the Bidder and proposed Subcontractors, following the submission of the Subcontractor List (Section 00435), the Bidder shall submit within seven (7) days of Owner's request the specific additional information requested by the Owner to define in greater detail the Bidder's bid proposal for Owner's evaluation. Such information shall have the same legal significance as if submitted with the original bid and, if the bid is accepted, shall become legally binding on the Successful Bidder.
- 3.4 The following reasons may be considered as being sufficient for the disqualification of a Bidder

and the rejection of his Bid proposal or proposals; however, this list is not all inclusive:

- 3.4.1 More than one Bid received for the same work from an individual, firm or partnership, a corporation, or association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one Bid for the same work will cause the rejection of all such Bids in which the Bidder is interested.
- 3.4.2 If there are reasonable grounds for believing that collusion exists among the Bidders, the Bids of participants in such collusion will not be considered. Participants in such collusion will receive no recognition as Bidders for any future work until any such participant shall have been reinstated as a qualified Bidder.
- 3.4.3 Default of any contract in force with the Owner at the time of Bid opening.
- 3.4.4 If the Bidder has withdrawn his bid from consideration after the bids were opened at a previous bid opening under this same project.
- 3.5 Should a prospective Bidder or low Bidder be rejected on the grounds that such a bidder is not a "responsible bidder" the following procedures shall be followed in accordance with LA R.S. 38:2212(X)(1):
 - 3.5.1 Give written notice of the proposed action to such bidder and include in the written notice all reasons for the proposed action.
 - 3.5.2 Give the bidder who is proposed to be disqualified the opportunity to be heard at an informal hearing at which such bidder is afforded the opportunity to refute the reasons for the proposed action.
 - 3.5.2.1 The informal hearing shall be conducted prior to the award of the public work.
 - 3.5.2.2 The informal hearing shall be a condition precedent to any action by the bidder adverse to the public entity, its representatives, employees, and designers.
 - 3.5.2.3 The informal hearing shall be conducted by the public entity not later than five (5) business days after the date of the notice of disqualification of such bidder. The public entity shall issue a ruling in writing and deliver it to the affected bidder not later than five (5) business days after the date of the informal hearing.
 - 3.5.2.4 No award of the contract for the public work shall be made by the public entity prior to the expiration of at least five working days following the date of issuance of the decision by the hearing official.
- 3.6 Bidders on projects in the amount of fifty thousand dollars (\$50,000) or more shall be required to have a Louisiana Contractor's license and classification applicable to the work in compliance with Louisiana State Licensing Board for Contractors and in compliance with Louisiana Revised Statutes.
 - 3.6.1 The work covered by these bid documents has been classified by the Architect in accordance with LA R.S. 37:2156.1 and LA R.S. 37:2156.2 as: **Building Construction**.
 - 3.6.2 Following an initial contact to the Architect, any person may object to the above stated classification(s) by sending a certified letter to both the State of Louisiana Licensing Board of Contractors and to the Architect. The objection shall be received by State of Louisiana Licensing Board of Contractors and the Architect within ten (10) working days prior to the date on which bids are to be opened. The objection shall

explicitly state the reasons for the objection. The objection shall be submitted to a committee for determination. The Chairman of the Licensing Board shall appoint the committee, which shall consist of board members. The Committee shall have the power to approve the project classification or add an additional classification by vote of a majority of the members of the committee. The matter shall be resolved and the board shall notify the Architect within five (5) working days prior to the date on which bids are to be opened, unless all parties agree that a delay will not cause harm to others.

4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

- 4.1 It is the responsibility of each Bidder, before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with local conditions that may in any manner affect cost, progress, performance or furnishing of the Work, (c) consider federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress, performance or furnishing of the Work; (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Architect of all conflicts, errors or discrepancies in the Contract Documents requiring correction, clarification, or interpretation.
- 4.2 Information and data reflected in the Contract Documents with respect to underground facilities at or contiguous to the site are based upon information and data furnished to Owner and Architect by Owners of such underground facilities or others, and Owner does not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary Conditions.
- 4.3 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, underground facilities and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in the General Conditions.
- 4.4 Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies, and obtain any additional information and data which pertain to the physical conditions (surface, subsurface and underground facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance, or furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.
- 4.5 On request in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the site to its former condition upon completion of such explorations.
- 4.6 The lands upon which the Work is to be performed, right-of-ways and servitudes for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by Owner unless otherwise provided in the Contract Documents.
- 4.7 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences, or procedures of construction as may be

indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions of performance and furnishing of the Work.

5. INTERPRETATIONS AND ADDENDA

- 5.1 All questions about the meaning or intent of the Contract Documents are to be directed to the Architect. Interpretations or clarifications considered necessary by Architect in response to such questions will be issued by Addenda mailed, faxed, or emailed to all parties recorded by Architect as having received the Bidding Documents. Questions received less than seven (7) working days prior to the date for opening of Bids may not be answered. Only answers to questions by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 5.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner.
- 5.3 No addenda will be issued within seventy-two (72) hours of the advertised time for the opening of bids, excluding Saturdays, Sundays and any other legal holidays; without resulting in the extending the bid period for at least seven (7) but not more than twenty-one (21) working days, without the requirement of re-advertising as provided by LA R.S. 38:2212(O)(2)(b).

6. BID SECURITY

- 6.1 Each Bid must be accompanied by Bid security made payable to Owner in an amount of five percent (5%) of the Bidder's maximum Bid price and in the form of a certified or cashier's check or a Bid Bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions and Paragraph 6.3 below.
- 6.2 The Bid Security of the apparent Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required Payment and Performance Bonds, whereupon the Bid Security will be returned. If the apparent Successful Bidder fails to execute and deliver the Agreement and furnish the required Bond, Affidavits and Insurance Certificate within fifteen (15) calendar days of the Notice of Award, Owner may annul the Notice of Award, and the Bid Security of that Bidder will be forfeited. The Bid Security of any Bidder whom the Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the forty-sixth (46th) day after the Bid opening, whereupon Bid Security of such Bidders will be returned. The Owner and the Bidder may mutually agree to extend the forty-five (45) day period for holding the Bids and the Bid Security, as provided by Louisiana Revised Statutes. Bid Security of other Bidders will be returned approximately seven (7) days after the Bid opening.
- 6.3 In accordance with LA R.S. 38:2218.C, all Bid Guaranty Bonds shall be written by a surety or insurance agency currently on the U.S. Department of Treasury Financial Management Service list of approved companies, or by a Louisiana domiciled insurance company with at least an A-rating in the latest printing of the A.M. Best's Key Rating Guide or by an insurance company in good standing licensed to write bonds either domiciled in Louisiana or owned by Louisiana residents.

7. CONTRACT TIME

- 7.1 The dates by which, the WORK is to be Substantially Completed, and also completed and ready for final payment (the Contract Time) are set forth in Article 3.1 of the Agreement, Section 00500.

- 7.2 This contract time shall be on a **calendar day or working day** basis as set forth in Article 3.1 of the Agreement, Section 00500. In the case of a calendar day contract, the calendar days shall consist of the consecutive number of calendar days stated in the Agreement, Section 00500, including all Saturdays, Sundays, and Holidays.
- 7.3 In accordance with LA R.S. 38:2215(C) the Owner shall issue the Notice to Proceed no later than thirty (30) days following the date of execution of the contract by both parties, whichever date is later. However, the public Owner and the Contractor, upon mutual written consent of both parties, may agree to extend the deadline to issue the notice to proceed.
- 7.4 The WORK shall begin no later than ten (10) calendar days after the date to begin work as stipulated in the Notice to Proceed. Failure to start construction within the ten (10) day grace period and/or conduct the work in such a manner or with sufficient materials, equipment, and labor necessary to insure completion within the Contract time may be first cause for default of the Contract.

8. LIQUIDATED DAMAGES

- 8.1 In the event the Contractor fails to satisfactorily complete the entire work intended and provided for under this contract within the time as provided, liquidated damages shall be assessed against the Contractor by the Owner by deducting damages as follows:

Original Contract Amount (Dollars)		Daily Charge (Dollars)	
For More Than	To and Including	Calendar Day	Working Day
\$0	\$25,000	\$80	\$195
\$25,000	\$50,000	\$210	\$345
\$50,000	\$100,000	\$240	\$400
\$100,000	\$500,000	\$270	\$510
\$500,000	\$1,000,000	\$330	\$595
\$1,000,000	\$2,000,000	\$400	\$695
\$2,000,000	\$5,000,000	\$480	\$825
\$5,000,000	\$10,000,000	\$600	\$975
\$10,000,000	-----	\$630	\$1,115

9. SUBSTITUTE MATERIALS OR PRODUCTS – PRIOR APPROVALS

- 9.1 In unusual cases where a closed specification has been justified for prior acceptance by the Owner in conformance with LA R.S. 38:2291 and LA R.S. 38:2295. A and B, the naming of that product in the Drawings and Specifications will be followed by wording indicating that no substitution is permitted.
- 9.2 Otherwise, where the Drawings and Specifications identify a product by a single specific brand, make, manufacturer, or definite specification it is to establish the required quality standard for the product regarding style, type, character, materials of construction, function, accessories, dimensions, appearance and durability. Products which are determined to be equivalent by the

Architect will be acceptable. Products which are specified by a specific brand, make or manufacturer's name may also be specified by its applicable model or catalog number or other product designation.

- 9.3 If the Bidder desires to obtain approval of materials or equipment from other alternative suppliers or manufacturers to those identified in the Specifications or noted on the Drawings, a written request for a substitution shall be submitted to the Architect at least seven (7) working days prior to the Bid date as specified in LA R.S. 38:2295(C). Each such request shall include the name of the material or equipment for which it is to be substituted and complete description of the proposed substitute including drawings, cuts, performance and test data and other information necessary for an evaluation.
- 9.4 A statement setting forth any changes in other materials, equipment, or Work that incorporation of the substitute would require shall be included. Any proposed substitution shall include the cost of any necessary changes in the Project to substitute the proposed equipment, material or product for a complete installation. Basis of design of this Project is based upon the specified suppliers or manufacturers. Certain materials or equipment may meet the specification requirements with changes and/or modifications to their standard equipment and may include redesign of structures, hydraulics, processes, instrumentation and controls, electrical system and mechanical systems. In such a case, a substituted supplier or manufacturer will be accepted if such offered product is at least equivalent to the product specified, and the cost of any redesign is covered as specified. Should the Contractor propose furnishing substitute materials or equipment, the Contractor shall comply with the following:
- a. The Contractor shall reimburse the Architect through the Owner for any associated Architectural costs for redesign and/or construction drawings production generated by any dimensional, mechanical, electrical, instrumentation, civil/site work, architectural, and structural changes and/or requirements for Manufacturer/Supplier. The bid for such Substitute Manufacturer/Supplier shall also include any proof of the merit of the proposed substitute is upon the Bidder.
 - b. Reimbursement for Architecting redesign shall be based on the Architect's published hourly rates effective at the time of review or redesign plus any direct non-labor expenses such as travel, per diem, or reproduction services. Work necessary to furnish and install the equipment, including reimbursement described above and other modifications to the Work necessary to make the several parts fit together and perform as specified shall be at no additional cost to the Owner.
- 9.5 The Architect's decision of approval or disapproval of a proposed substitution shall be final. If Architect approves any proposed substitution, such approval will be set forth in an Addendum issued to all prospective Bidders, within three (3) days, exclusive of holidays and weekends, after the potential Bidder's submission of a substitute material. Bidders shall not rely upon approvals made in any other manner. If a substitute offered by the Contractor is not found by the Architect to be equal to the material specified, the Contractor shall furnish and install the material specified.
- 9.6 After the receipt of Bids, the Contract, if awarded, will be on the basis of material and product described in the Drawings or specified in the Specifications without consideration of possible substitute of "or equal" items except as specified in 9.3 above.

10. SUBCONTRACTORS

- 10.1 All Subcontractors being assigned a portion of the Work in the amount of fifty-thousand dollars (\$50,000) or more must possess a current Louisiana Contractor's license of the proper classification, as provided by Louisiana Revised Statutes. Furthermore, any Subcontractor who enters into a subcontract in the which the Subcontractor is to provide labor only, and the Contractor is to provide the materials, that Subcontractor must possess a current Louisiana Contractor's license of the proper classification if the combined cost of the Subcontractor's labor and the materials provided by the Contractor is \$50,000 or more, even if the Subcontractor's labor cost is less than \$50,000 pursuant to LA R.S. 37:2150.1(3).
- 10.2 In accordance with Ordinance No. 12743 of the City of Lake Charles, Louisiana, the Bidder shall identify ALL Subcontractors which he proposes to employ on the Contract by NAME, ADDRESS, TELEPHONE, and SCOPE OF WORK. This information shall be provided in the Subcontractor List (Section 00435) which shall be submitted by the apparent low bidder within ten (10) days following the bid opening. If no Subcontractors are to be used on this project, the Bidder shall state this. The Contractor will be required to use all Subcontractors he identifies as listed on this form.
- 10.3 Should the Owner request additional information about the Bidder and proposed Subcontractors, following the submission of the Subcontractor List (Section 00435), the Bidder shall submit within seven (7) days of Owner's request the specific additional information requested by the Owner to define in greater detail the Bidder's bid proposal for Owner's evaluation. Such information shall have the same legal significance as if submitted with the original bid and, if the bid is accepted, shall become legally binding on the Successful Bidder.
- 10.4 If Owner or Architect after due investigation has reasonable objection to any proposed Subcontractor, supplier, other person or organization, either may, before giving the Notice of Award, request the apparent Successful Bidder to submit an acceptable substitute without an increase in Contract Price or Contract Time. If the apparent Successful Bidder declines to make any such substitution, Owner may award the contract to the next lowest responsible and responsive Bidder that proposes to use acceptable Subcontractors, Suppliers, and other persons and organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, Supplier, other person, or organization listed and to whom Owner or Architect does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Architect subject to revocation of such acceptance after the "effective date of the Agreement" as provided in Paragraph 6.06 of the General Conditions.
- 10.5 No Contractor shall be required to employ any Subcontractor, Supplier, other person, or organization against whom he has reasonable objection.
- 10.6 Unless otherwise approved by the City Council, the total amount of subcontract work shall not exceed forty-nine percent (49%) of the Work.

11. BID FORM

- 11.1 The Bid Form (Section 00300) is included with the Bidding Documents; additional copies may be obtained from the Architect.
- 11.2 Bid Form shall be completed in ink or by typewriter. All blanks on the Bid Form must be completed.
- 11.3 Bids by corporations must be executed in the corporate name by a corporate officer

accompanied by evidence of authority to sign in accordance with the Resolution form (Section 00485). The corporate address and state of incorporation must be shown where indicated on the bid form.

- 11.4 Bids by partnerships must be executed in the partnership name and signed by a partner whose title must appear where indicated on the bid form, and the official address of the partnership must be shown below the signature.
- 11.5 All names must either be clearly written and legible or be typed or printed where indicated on the Bid Form.
- 11.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which shall be filled in where indicated on the Bid Form).
- 11.7 The address and telephone number for communications regarding the Bid must be shown where indicated on the bid form.

12. SUBMISSION OF BIDS

- 12.1 Paper bids shall be submitted on forms provided by the Owner at or before the time and at the place indicated in the Advertisement for Bids in accordance with LA R.S 38:2212(B)(6)(a). Both paper and electronic bids shall be subject to all requirements of the Contract Documents including the drawings, specifications, addenda, and these Instructions to Bidders. All bids must be regular in every respect and no interlineations, exclusions, or special conditions shall be made or included on the Bid Form by the Bidder.
- 12.2 If a bid is a paper bid, the bid, including the Bid Form, the Bid Security, and evidence of authority to sign the bid (if required) shall be enclosed in an opaque envelope. The envelope shall be sealed and clearly labeled with the name of the project, project number, name of bidder, bidder license number (where required), and the date and time of bid opening. All envelopes containing a Bid in the amount of fifty-thousand dollars (\$50,000) or more shall bear the BIDDER'S Louisiana Contractor's license number, as provided by Louisiana Revised Statutes. Any bid that does not require the Contractor to be licensed shall state the exemption on the bid envelope. If the Bid is submitted through the mail, the sealed envelope containing the bid shall be enclosed in a separate envelope addressed as specified in the Bid Form and sent by registered or certified mail with a return receipt requested. If the bid is submitted by hand the deliverer shall request a written receipt.
- 12.3 Electronic bids shall conform to the same requirements of a paper bid described, herein, and shall be encrypted prior to sending using the City's key. The encryption level will ensure security. The City's on-line provider shall follow the standards for the receipt of electronic bids adopted by the office of the Governor, Division of Administration, and the Office of Information Technology as provided for in LAC 4:XV.701.
- 12.4 Any Bids received after the bid submission deadline will not be accepted under any circumstances. Any uncertainty regarding the time a Bid is received will be resolved against the Bidder. The Owner may consider as irregular any Bid on which there is an alteration of or departure from the electronic bid form or the paper bid hereto attached and at its option may reject the same.

13. MODIFICATION AND WITHDRAWAL OF BIDS

- 13.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the deadline for submitting Bids. A request for withdrawal or a modification must be in writing and signed by a person duly authorized to do so; and, in case signed by a deputy or subordinate, the principal's proper written authority to such deputy or subordinate must accompany the request for withdrawal or modifications. Withdrawal of a Bid will not prejudice the rights of a Bidder to submit a new Bid prior to the Bid Date and Time. After expiration of the period for receiving Bids, no Bid may be withdrawn or modified.
- 13.2 If, within forty-eight (48) hours of the Bid opening, exclusive of Saturdays, Sundays and legal holidays, any Bidder who files a duly signed, and sworn written notice with Owner to the satisfaction of Owner that there was a patently obvious mechanical, clerical or mathematical error in its Bid, that Bidder may withdraw its Bid and the Bid Security will be returned as provided by LA R.S. 38:2214 [C]. Thereafter, the Bidder will be disqualified from future bidding and will not be permitted to provide any subcontract work on the Contract, for which the withdrawn bid was submitted, as provided by LA R.S. 38:2214 [D].

14. OPENING OF BIDS

- 14.1 Bids will be opened and (unless obviously nonresponsive) read aloud publicly. An abstract of the amounts of the base Bids and major alternates (if any) will be made available to Bidders after the opening of Bids.
- 14.2 For projects requiring licensing, any bid which does not show on the paper bid envelope or the electronic bid form, the Contractor's Louisiana Contractor's license number and contain the Contractor's license certification on the Bid Form, or any bid which does not state the exemption on the bid envelope or electronic bid form if the bid does not require the Contractor to hold a Louisiana Contractor's license shall be automatically rejected and returned to the bidder marked "Rejected," and shall not be read aloud.

15. BIDS TO REMAIN OPEN

- 15.1 As provided by LA R.S. 38:2215A., all Bids shall remain open for forty-five (45) calendar days after the day of the Bid opening, however as provided under LA R.S. 38:2215.D, these provisions are not applicable for projects requiring the sale of bonds or financed in whole or in part by federal or other funds which will not be readily available at the time bids are received.
- 15.1 Extensions of time when Bids shall remain open beyond the forty-five (45) calendar day period specified in LA R.S. 38:2215A may be made only by mutual agreement between the Owner and the lowest responsible bidder by one or more thirty (30) calendar day extensions.

16. NON-COLLUSION AFFIDAVIT

- 16.1 In accordance with the LA R.S. 38:2224, the apparent responsible low bidder shall execute and submit the Non-Collusion Affidavit (Section 00440) provided herein, within ten (10) calendar days after the bid opening, declaring that he has not entered into a collusive agreement with any other corporation, firm, nor person in preparation of his bid. Failure to submit this affidavit within the specified time frame will result in the bidder being declared as non-responsive.

17. FELONY CONVICTION/E-VERIFY AFFIDAVIT

- 17.1 In accordance with LA R.S. 38:2227 and LA R.S. 38:2212.10(C), the apparent responsible low bidder shall execute and submit the Felony Conviction and Employee Verification Affidavit (Section 00420) provided herein, within ten (10) calendar days after the bid opening, attesting that he has satisfied the requirements contained within said affidavit. Failure to submit this affidavit within the specified time frame will result in the bidder being declared as non-responsive.

18. AFFIDAVIT OF COMPLIANCE WITH CLEAN AIR ACT AND WATER POLLUTION ACT

- 18.1 The apparent responsible low bidder shall execute and submit the Affidavit of Compliance with Clean Air Act and Water Pollution Act (Section 00425) provided herein, within ten (10) calendar days after the bid opening, attesting that he has satisfied the requirements contained within said affidavit. Failure to submit this affidavit within the specified time frame will result in the bidder being declared as non-responsive.

19. AWARD OF CONTRACT

- 19.1 For reasons of just cause, as provided by LA 38:2214 B, the Owner reserves the right to reject any and all Bids, to waive any informalities allowable by statute, and to disregard all nonconforming, nonresponsive, unbalanced or conditional Bids. Bids which are unsigned or are not accompanied by the required bid security shall be irrevocably rejected. When one or more bids are rejected, the reason therefore shall be given. Bids may be considered irregular and subject to rejection if they show serious omission, unauthorized alteration of form, unauthorized alternate bids, incomplete or unbalanced unit prices, or irregularities of any kind. Also, Owner reserves the right to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.
- 19.2 In evaluating bids, Owner will consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data as may be requested in the Bid Form or prior to the Notice of Award.
- 19.3 Owner will also consider the qualifications and experience of Subcontractors, suppliers, and other persons and organizations proposed for those portions of the Work whose identity must be submitted as provided in Article 3 of these Instructions to Bidders.
- 19.4 Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.
- 19.5 If the contract is to be awarded, it will be awarded to the lowest responsible, responsive Bidder. Alternates, if accepted, shall be accepted in the order in which they are listed in the bid form. Determination of the low bidder shall be on the basis of the sum of the base bid and any alternates accepted. However, the Owner shall reserve the right to accept alternates in any order which does not affect determination of the low bidder.

- 19.6 If this contract should involve financial assistance with funds from other agencies, the Owner shall refer to the regulations of that agency concerning the determination of the Bidder to be awarded this contract.

20. CONTRACT SECURITY

- 20.1 Article 11.7 of the General Conditions sets forth Owner's requirements as to Performance and Payment Bonds. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by the required Performance and Payment Bonds.
- 20.2 In addition to the requirements in Article 11.7, in order to be acceptable to the Owner, a surety company issuing Bid Guaranty Bonds, or 100% Performance/Payment Bonds, called for in these Specifications, shall meet and comply with the following minimum standards:
- 20.2.1 Surety must be admitted to do business in the State of Louisiana and shall comply with the provisions of LA R.S. 38:2241. The Surety Company shall be listed by the U.S. Department of Treasury Financial Management Service (Circular 570 as amended) with an A-rating as provided under LA R.S. 38:2219.
- 20.2.2 Surety shall have been in business and have a record of successful continuous operations for at least five (5) years.
- 20.2.3 Attorneys-in-fact who sign bid bonds or performance/payment bonds must file with such bond a certified copy of their power of attorney to sign such bond.
- 20.2.4 Agents of surety companies must list their name, address and telephone number on all bonds.
- 20.2.5 Surety shall have at least the following minimum ratings:
- | <u>CONTRACT AMOUNT</u> | <u>BEST'S RATINGS</u> |
|----------------------------|-----------------------|
| up to \$2,500,000 | Class IV A- or better |
| \$2,500,000 to \$5,000,000 | Class V A- or better |
| Above \$5,000,000 | Class V A- or better |
- 20.2.6 The life of the bonds shall extend twelve (12) months beyond the date of final acceptance for warranty purposes and shall contain a waiver of alteration to the terms of the Contract, extensions of time and/or forbearance on the part of the Owner.

21. SIGNING OF AGREEMENT

- 21.1 When the Owner issues the Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement, as well as, all other Contract Documents attached. No more than fifteen (15) calendar days thereafter, the Contractor shall sign and deliver the required number of counterparts of the Agreement, additional Contract Documents, and the required Performance and Payment Bonds with insurance certificates to Owner.
- 21.2 Having satisfied all conditions of the award as set elsewhere in these documents, the successful bidder shall, within the period specified above, furnish bonds in the penal sum not less than the amount of the contract as awarded, as security for the faithful performance of the contract and for payment of all persons performing labor and furnishing materials in connection with this contract. Such bonds shall be in the form of the City of Lake Charles Performance and Payment Bonds and shall bear the same date as, or a date subsequent to that of the Agreement. The

bonds shall be written by the Surety of Insurance Company satisfying all of the minimum standards set forth in Article 20 of The Instructions to Bidders.

- 21.3 The failure of the successful bidder to execute such agreement, additional contract documents, and to supply the required bonds within fifteen (15) calendar days after the Notice of Award is issued, or within such extended period as the Owner may grant, based on reasons determined sufficient by the Owner, shall constitute a default, and the Owner may either award the Contract to the next lowest bidder or re-advertise for bids, and may charge against the bidder the difference between the amount of the bid and the amount for which a contract for the work is subsequently executed, irrespective of whether the amount thus due exceeds the amount of the bid bond. If a more favorable bid is received by re-advertising, the defaulting bidder shall have no claim against the owner for a refund.
- 21.4 Within fifteen (15) calendar days thereafter, Owner shall deliver one (1) fully signed counterpart of the Agreement, as well as, all other Contract Documents to Contractor.

22. RETAINAGE

- 22.1 Retainage of 10% of the value of WORK completed and materials stored on-site shall be deducted from the Contractor's Application for Payment for contract prices up to \$500,000.00.
- 22.2 Retainage of 5% of the value of WORK completed and materials stored on-site shall be deducted from the Contractor's Application for Payment for contract prices of \$500,000 or more.

23. RELATED WORK UNDER SEPARATE CONTRACTS

- 23.1 The Bidder's attention may be directed to the fact that the Work to be done under this contract may be only part of a Project consisting of improvements under several different contracts, that contracts may be let for the other portions of the Project, and that the success of the Project may be dependent upon the completion of the Work under this contract and the work to be done by others.

24. TAXES

- 24.1 In accordance with applicable rules adopted and promulgated by the Louisiana Department of Revenue, the Owner will designate the Contractor and all Subcontractors as its agents for the purchase and lease of materials, supplies or equipment for this Project as per LA R.S. 47:301 (8)(c). The Contractor and all Subcontractors shall accept the agency designation. The designation and acceptance thereof shall be made on the form prescribed by the Louisiana State Department of Revenue which form shall be part of the contract between the Owner, and the Contractor. A copy of this form is included in Section 00445.
- 24.2 The agency relationship between the Owner and the Contractor and all Subcontractors shall relieve the Contractor and Subcontractors (1) from paying any state or local sales taxes or state or local use taxes on materials, supplies or equipment which is affixed to and/or made a part of the real estate of the project or work or which is permanently incorporated into the project or work and, (2) from paying any state or local use taxes on any materials, supplies or equipment which is leased and used exclusively for the project or work. Accordingly, in preparing their bids and computing costs, the Contractor and Subcontractors shall not consider sales and/or use taxes which would otherwise be due.
- 24.3 The Contractor and Subcontractor shall furnish a copy of such certificate to all vendors or

suppliers of any of the materials, supplies or equipment described above.

- 24.4 The Contractor and Subcontractors shall make all purchases and leases on behalf of and as the agent of the Owner.
- 24.5 The Contractor shall be responsible for reviewing the pertinent State Statutes involving the sales and use taxes and complying with all requirements. Rules and regulations of the Louisiana Department of Revenue shall prevail over any conflicting provisions or specifications of the Contract.

25. REQUIRED DISCLOSURE

- 25.1 At its sole discretion the Owner may reject any Bidder the Owner finds to lack, or whose present or former executive employees, officers, directors, stockholders, partners, or Owners are found by the Owner to lack, honesty, integrity, or moral responsibility. The discretion of the Owner may be exercised based on the disclosure required herein. By submitting a Bid, Bidder recognizes and accepts that the Owner may reject the Bid based upon the exercise of its sole discretion, and Bidder waives any claim it might have for damages or other relief resulting from the rejection of its bid based on these grounds.
- 25.2 In accordance with LA R.S. 38:2212(B)(3)(a) within ten (10) days of its bid submission the Bidder shall disclose all material facts pertaining to any felony conviction or any pending felony charges in the last three (3) years in Louisiana or any other state or the United States against (i) Bidder, (ii) any business entity related to or affiliated with Bidder, or (iii) any present or former executive employee, officer, director, stockholder, partner, or Owner of Bidder or of any such related or affiliated entity. This disclosure shall not apply to any person or entity which is only a stockholder, which person or entity owns twenty percent (20%) or less of the outstanding shares of the Bidder whose stock is publicly owned and traded.
- 25.3 The apparent, responsible low bidder is required by the State of Louisiana Public Bid Law to furnish the following information or documentation within ten (10) calendar days after the date bids are opened; Felony Conviction and E-Verification Affidavit (Section 00420) the Non-Collusion Affidavit (Section 00440). If the apparent low bidder does not submit the proper information or documentation as required by the bidding documents within the ten (10) calendar day period, such bidder shall be declared non-responsive, and the public entity shall award the bid to the next lowest bidder, and afford the next lowest bidder not less than ten days from the date the apparent low bidder is declared non-responsive, to submit the proper information and documentation as required by the bidding documents, and may continue such process until the public entity either determines the low bidder or rejects all bids.

26. PROTESTS

- 26.1 Owner is responsible for resolution of protests of contract award, claims, disputes, alleged patent infringements, alleged license fees, and other related procurement matters in accordance with sound business judgment and good administrative practice. The following procedures shall be used for this purpose:
- 26.1.1 Any party with a direct financial interest adversely affected by Owner's procurement decision shall file a protest under this Article or be barred further relief.

- 26.1.2 A protest must (a) be in writing (oral protests shall not be permitted); (b) adequately state the basis of the protest and the relief requested; and (c) be received by Owner within seven (7) calendar days from the date the basis of the protest was, or should have been, known.
- 26.1.3 Owner shall take action on protests within forty-five (45) calendar days of the receipt thereof. Owner may defer the protested procurement upon receipt of a procedurally adequate protest, provided that, in any event, award of a contract or subcontract or procurement of a sub-item may be permitted, at the Owner's sole discretion, where it will not materially affect resolution of the protest.
- 26.1.4 A protest shall be limited to (a) issues arising from the procurement provisions of the Contract and (b) state or local law. No protest may be filed with respect to basic project design.
- 26.1.5 The Owner's Attorney will establish procedures for resolution of protests. The Owner will rely for resolution of the protest, on decisions issued under Louisiana law, as well as decisions issued by other states, Federal courts, the U.S. Comptroller General, or other Federal agencies with extensive procurement expertise if Louisiana law is not clearly established.

27. OSHA REQUIREMENTS

- 27.1 Successful bidder shall comply with all applicable OSHA requirements.

28. CONSTRUCTION UTILITIES

- 28.1 Electric power required by the Bidder shall be secured by the Bidder and through his own arrangement with a Utility Company, or by other means.
- 28.2 Any water needed by the Bidder during construction will be shall be secured by him through his own arrangements. All water withdrawn from City of Lake Charles fire hydrants shall be metered. The Contractor shall obtain the water meter from the City of Lake Charles Water Division. The Contractor shall be responsible for all deposits, meter, and consumption charges. There will be no direct payment for this water usage, water deposit, or fee.
- 28.3 All sanitary facilities required during construction shall be provided by the Bidder and made satisfactory to the Architect and Public Health Authorities.

29. QUANTITIES OF ESTIMATE

- 29.1 Wherever the estimated quantities of work to be done and materials to be furnished on a unit price basis under this contract are shown in any of the documents, including the bid form, and the right is expressly reserved, except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract, and such increase or diminution shall in no way vitiate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.
- 29.2 Bidders must satisfy themselves of the accuracy of the estimated quantities in the bid schedule by examination of the site and review of the drawings and specifications including addenda. After bids have been submitted, the bidder shall not assert that there was a misunderstanding

concerning the quantities of work or of the nature of the work to be done.

30. STATE PREFERENCE

30.1 Preference shall be given in accordance with the prevailing Statutes under Title 38, as follows:

30.1.1 Preference is hereby given to materials, supplies, and provisions, produced, manufactured or grown in Louisiana, quality being equal to articles offered by competitors outside of the State.

30.1.2 In the letting of contracts for public work by any entity, except contracts financed in whole or in part by contributors or loans from any agency of the United States government, preference shall be given to Louisiana resident Contractors over non-resident Contractors, in accordance with LA RS 38:2211 et seq.

30.1.3 Additionally, public works contracts shall comply with the City of Lake Charles Ordinance No. 7911 whereby no less than eighty percent (80%) of non-management persons employed and fulfilling public works contracts with the City of Lake Charles shall be residents of the State of Louisiana. Except for Public Works contracts that require specialized equipment or knowledge, including, but not limited to, pipe bursting and cured-in-place (CIPP) lining of underground stormwater or sewerage lines.

31. PRE-EMPLOYMENT DRUG SCREENING

31.1 The City of Lake Charles has passed Ordinance No. 12943 amending the Code of Ordinances requiring language regarding pre-employment drug screen tests to be added to all City of Lake Charles' advertisement for bids on building and construction projects.

31.1.1 By submittal of this bid proposal, Contractor hereby certifies that has in place and employs a pre-employment drug screen test for each employee of the Contractor and administers periodic, random drug screen testing for each such employee and agrees that it will not enter into any Subcontractor agreement, whether verbal or written, unless said Subcontractor has in place and employs pre-employment drug screen testing and periodic, random drug screen testing. All such pre-employment drug screen testing and random testing shall meet or exceed the standards of drug screen testing as promulgated by the Associated General Contractors of Louisiana.

32. TITLE VI OF THE CIVIL RIGHTS ACT OF 1964

32.1 Title VI Notice

32.1.1 The City of Lake Charles fully complies with Title VI of the Civil Rights Act of 1964, Americans with Disabilities Act, and related statutes, executive orders, and regulations in all programs and activities. The City operates without regard to race, color, national origin, income, gender, age, and disability. Any person who believes him/herself or any specific class of persons, to be subjected to discrimination prohibited by Title VI/Americans with Disabilities Act may by him/herself or by representative file a written complaint with the City of Lake Charles. The City's Title VI Coordinator/ADA Coordinator may be reached by phone at (337) 491-1440, the Mayor's Action Line at (337) 491-1346, contacting the appropriate Department Head, or see the City of Lake Charles' website at www.cityoflakecharles.com. A complaint must be filed no later than 180 days after the date of the alleged discrimination has occurred.

- 32.1.2 City of Lake Charles meetings are conducted in accessible locations and materials can be provided in accessible formats. If you would like accessibility or language accommodation, please contact the Title VI Coordinator at (337) 491-1440 (phone) or (337) 491-1437 (fax) or the Mayor's Action Line at (337) 491-1346.

33. CITY OF LAKE CHARLES SMALL BUSINESS OPPORTUNITY PROGRAM (SBOP)

- 33.1 The City has gone on record to encourage general Contractors to provide opportunities for small businesses owned and operated by socially or economically disadvantaged persons to become involved as Subcontractors. To that end, the City requires all general Contractors to make good faith efforts to award at least 25 percent of the funds to be spent on their subcontracted work, in all City funded projects that are subject to the Louisiana public bid laws, to small businesses owned and operated by socially or economically disadvantaged persons as defined in Section 2-28(h) in the City of Lake Charles Code of Ordinances.
- 33.2 Those Contractors who actually have accomplished the goal of awarding 25 percent as set forth in section 2 above shall be entitled to a discount on the payment of the building permit fee associated with the project in an amount of ten percent with a maximum of \$2,000.00.
- 33.3 Small Business Opportunity Program Reporting Requirements
- 33.3.1 In accordance with Section 2-33 of the City of Lake Charles Code of Ordinances, the apparent low Prime Bidder is required to submit a completed City of Lake Charles SBOP Good Faith Compliance Form (Section 00430) within ten (10) days following the bid opening. Nothing herein shall be deemed to require that the General Contractor accept the bid of any Subcontractor.

NOTE: This form is in addition to the Subcontractors List (Section 00435) which is also to be submitted within 10 days of the bid opening.

34. GUIDANCE CONCERNING GOOD FAITH EFFORTS

- 34.1 Prime Bidders must have exerted efforts that were of an intense, aggressive, and sincere nature that goes far beyond any simple paperwork exercise to demonstrate a good faith effort in achieving the project goal. The most recent list of Disadvantaged Small Business Enterprises (DSBE) can be found under the Business tab at www.cityoflakecharles.com. Prime Bidders will take necessary affirmative effort steps to assure that Disadvantaged Small Business Enterprises are used when possible. Affirmative effort steps shall include:
- 34.1.1 Placing certified Disadvantaged Small Business Enterprises on solicitation lists;
- 34.1.2 Assuring that Disadvantaged Small Business Enterprises are solicited whenever they are potential sources;
- 34.1.3 Dividing the work, when economically feasible, into smaller tasks or quantities to permit maximum participation by Disadvantaged Small Business Enterprises;
- 34.1.4 Establishing delivery schedules, where the requirement permits, which encourages participation by Disadvantaged Small Business Enterprises;
- 34.1.5 Using the services and assistance of the Small Business Administration, and the Minority Business Development Agency of the Department of Commerce;
- 34.1.6 Requiring the prime Contractor, if subcontracts are to be let, to take the affirmative

effort steps listed in this section;

- 34.1.7 Attending any pre-bid meetings at which DSBE's could be informed of contracting and subcontracting opportunities;
- 34.1.8 Advertising in general circulation, trade association, and disadvantaged focused media concerning the subcontracting opportunities;
- 34.1.9 Providing written notice to all certified DSBE's who have capabilities pertinent to the work of the contract that their interest in the contract is being solicited. This notice shall be in sufficient time to allow the DSBE's to respond to the written solicitation;
- 34.1.10 Following up initial solicitations of interest by contacting DSBE's to determine with certainty if the DSBE's are interested;
- 34.1.11 Providing interested DSBE's with adequate information about the plans, specifications, and requirements of the contract;
- 34.1.12 Negotiating in good faith with interested DSBE's. The evidence of such negotiations should include the names, addresses, and telephone numbers of DSBE's that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and a statement as to why additional agreements could not be reached for DSBE's to perform the work;
- 34.1.13 Not rejecting DSBE's as unqualified without sound reasons based on thorough investigation of their capabilities;
- 34.1.14 Making efforts to assist interested DSBE's in obtaining bonding, lines of credit, or insuring as required by the recipient or Contractor;
- 34.1.15 Making efforts to assist interested DSBE's in obtaining necessary equipment, supplies, materials, or other related services; and
- 34.1.16 Effectively using the services of available community organizations; disadvantaged Contractors' groups; local, state, and federal Disadvantaged Small Business Enterprise assistance offices; and other organizations as allowed on a case by case basis to provide assistance in the recruitment and placement of DSBE's.

END OF SECTION

SECTION 00300
LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: City of Lake Charles
Office of the Clerk of Council, City Hall, 4th Floor
326 Pujo St.
Lake Charles, LA 70601
(BIDEXPRESS.COM TO SEND AN ELECTRONIC BID)

BID FOR: City of Lake Charles, Louisiana
Lake Charles Pubic Works
New Facility Phase 2
Capital Project Number DR002

The undersigned bidder hereby declares and represents that she/he; a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by:

Brossett Architect, LLC
(Owner to provide name of entity preparing bidding documents.)

and dated: December 20, 2025

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following **ADDENDA:** (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging) _____

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated "Base Bid" * but not alternates) the sum of:

_____ Dollars (\$ _____)

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.

Alternate No. 1 (Owner to provide description of alternate and state whether add or deduct) for the lump sum of:

_____ N/A _____ Dollars (\$ _____ N/A _____)

Alternate No. 2 (Owner to provide description of alternate and state whether add or deduct) for the lump sum of:

_____ N/A _____ Dollars (\$ _____ N/A _____)

Alternate No. 3 (Owner to provide description of alternate and state whether add or deduct) for the lump sum of:

_____ N/A _____ Dollars (\$ _____ N/A _____)

NAME OF BIDDER: _____

ADDRESS OF BIDDER: _____

LOUISIANA CONTRACTOR'S LICENSE NUMBER: _____

NAME OF AUTHORIZED SIGNATORY OF BIDDER: _____

TITLE OF AUTHORIZED SIGNATORY OF BIDDER: _____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER **: _____

DATE: _____

THE FOLLOWING ITEMS ARE TO BE INCLUDED WITH THE SUBMISSION OF THIS LOUISIANA UNIFORM PUBLIC WORK BID FORM

* The Unit Price Form shall be used if the contract includes unit prices. Otherwise it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.

** **A CORPORATE RESOLUTION OR WRITTEN EVIDENCE** of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5).

BID SECURITY in the form of a bid bond, certified check or cashier's check as prescribed by LA RS 38:2218(A) is attached to and made a part of this bid.

SECTION 00410

BID BOND

(For a paper bid, one original required of all Bidders with Power of Attorney attached. For an electronic bid, an electronic bid bond will still be accepted if received prior to the bid opening)

KNOW ALL MEN BY THESE PRESENTS, that we, _____ as PRINCIPAL, and _____ as Surety, are hereby held and firmly bound unto the CITY OF LAKE CHARLES, LOUISIANA, as OWNER in the penal sum of DOLLARS (\$ _____) for the payment of which sum well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed this _____ day of _____, 20_____.

The Condition of the above obligation is such that whereas the PRINCIPAL has submitted to the CITY OF LAKE CHARLES, LOUISIANA, a Bid, attached hereto and hereby made a part thereof, to enter into a contract in writing, for the construction of the following project:

Lake Charles Public Works New Facility Phase 2

NOW THEREFORE,

- a. If said Bid shall be rejected, or
- b. If said Bid shall be accepted and the PRINCIPAL shall execute and deliver a contract in the Form of Agreement attachment hereto (properly completed in accordance with said Bid) and shall furnish a Bond for faithful performance of said contract, and for the payment of all persons performing labor and furnishing materials in connection therewith, and shall in all other respects perform the Agreement created by the acceptance of said Bid, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its Bond shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such Bid; and said Surety does hereby waive notice of any such extensions.

IN WITNESS WHEREOF, the PRINCIPAL and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

PRINCIPAL (BIDDER)	SURETY
ADDRESS: _____ _____	ADDRESS: _____ _____
BY: _____ AUTHORIZED OFFICER-OWNER-PARTNER	BY: _____ AGENT OR ATTORNEY-IN-FACT (SEAL)
TITLE: _____	TITLE: _____
SIGNATURE: _____	SIGNATURE: _____
WITNESS _____	WITNESS _____

IMPORTANT: Bid Guaranty Bonds: In accordance with LA R.S. 38:2218.C, all Bid Guaranty Bonds shall be written by a surety or insurance agency currently on the U.S. Department of Treasury Financial Management Service list of approved companies, with at least an A-rating in the latest printing of the A.M. Best's Key Rating Guide or by an insurance company in good standing licensed to write bonds either domiciled in Louisiana or owned by Louisiana residents.

SECTION 00420

FELONY CONVICTION AND EMPLOYEE VERIFICATION AFFIDAVIT

This document must be executed and furnished by the **lowest responsive bidder** no later than ten (10) calendar days after the Bid Opening. Failure to submit within the specified timeframe will result in the bidder being declared as non-responsive.

Name of Project: Lake Charles Public Works New Facility Phase 1

By signing this document in accordance with LA R.S. 38:2227, the appearer, as a bidder on the above project, does hereby attest that:

- A. No sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of , or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes:

(a) Public bribery (LA R.S. 14:118)	(c) Extortion (LA R.S. 14:66)
(b) Corrupt influencing (LAR.S. 14:120)	(d) Money laundering (LA R.S. 14:23)

- B. Within the past five years from the project bid date, no sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes, during the solicitation or execution of a contract or bid awarded pursuant to the provisions of Chapter 10 of Title 38 of the Louisiana Revised Statutes:

(a) Theft (LA R.S. 14:67)	(f) Bank fraud (LA R.S. 14:71.1)
(b) Identity Theft (LA R.S. 14:67.16)	(g) Forgery (LA R.S. 14:72)
(c) Theft of a business record (LA R.S. 14:67.20)	(h) Contractors; misapplication of payments (LA R.S. 14:202)
(d) False accounting (LA R.S. 14:70)	(i) Malfeasance in office (LA R.S. 14:134)
(e) Issuing worthless checks (LA R.S. 14:71)	

By signing this document in accordance with LA R.S. 38:2212.10, the appearer, as a bidder on the above project, does hereby attest that:

- A. The private employer is registered and participates in a status verification system (E-Verify) to verify that all employees in the State of Louisiana are legal citizens of the United States or are legal aliens.

- B. The private employer shall continue, during the term of the contract, to utilize a status verification system to verify the legal status of all new employees in the state of Louisiana.
- C. The private employer shall require all Subcontractors to submit to the employer a sworn affidavit verifying compliance with Paragraphs (A) and (B) of this Subsection.

If evidence is submitted substantiating that a false attestation has been made and the project must be readvertised or the contract cancelled, the awarded entity making false attestation shall be responsible to the public entity for the cost of rebidding, additional costs due to increased cost of bids and any and all delay costs due to the rebid or cancellation of the contract.

NAME OF BIDDER

NAME OF AUTHORIZED SIGNATORY OF BIDDER

DATE

TITLE OF AUTHORIZED SIGNATORY OF BIDDER

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER

Subscribed and sworn to before me

WITNESSES

This ____ day of _____, 20 ____

(NOTARY PUBLIC)

My commission expires _____

SEAL

END OF SECTION

SECTION 00425

AFFIDAVIT OF COMPLIANCE WITH CLEAN AIR ACT AND WATER POLLUTION ACT

This document must be executed and furnished by the **lowest responsive Bidder** no later than ten (10) calendar days after the Bid Opening. Failure to submit within the specified timeframe will result in the Bidder being declared as non-responsive.

STATE OF LOUISIANA

PARISH OF CALCASIEU

BE IT KNOWN _____ being first
duly

(Name of Authorized Representative of Bidder)

sworn, deposes and says that:

(1) He is the _____, of _____,
(Title) (Firm Name)

the Bidder, that has submitted the accompanying Bid for the Construction of the

Lake Charles Public Works New Facility Phase 2,
(Project Name)

, a public project of the City of Lake Charles, Louisiana;

- (2) He certifies that he will comply with all of the requirements of Section 114 of the Clean Air Act, as amended (42 U.S.C. 1857 et. seq.) and Section 308 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1318), relating to inspection, monitoring, entry, reports, and information, as well as all requirements, regulations, and/or guidelines issued under the above Sections;
- (3) He further certifies that he nor any of his non-exempt subcontractors will not use any facility in the performance of any non-exempt Contract which is listed on the List of Violating Facilities issued by the Environmental Protection Agency;
- (4) He further agrees that prompt notice will be given to the Agency or Agencies involved in this Contract of any notification received from the Director, Office of Federal Activities, Environmental Protection Agency, indicating that any facility utilized or to be utilized for this Contract is under consideration to be listed on the Environmental Protection Agency List of Violating Facilities; and
- (5) He further agrees to include or cause to be included the criteria and requirements of paragraphs 2 through 4 of this Section in every non-exempt subcontract and

further that he will take such action as the proper Agency may direct as a means of enforcing such provisions.

WITNESSES:

BIDDER:

BY: _____

TITLE: _____

Subscribed and sworn to before me

This ____ day of _____, 20 ____

(NOTARY PUBLIC)

My commission expires _____

SEAL

END OF SECTION

SECTION 00430

CITY OF LAKE CHARLES SMALL BUSINESS OPPORTUNITY PROGRAM (SBOP) GOOD FAITH COMPLIANCE FORM

This form is to be submitted by the lowest responsive Bidder within 10 days of bid opening. All Good Faith Effort forms **MUST BE COMPLETE AND IN COMPLIANCE** by the 10th day **IN ORDER FOR THE BID TO BE CONSIDERED RESPONSIVE**. Bid Opening Day counts as Day 1.

Project No: DR002

Project Title: Lake Charles Public Works New Facility Phase 2

The total amount of subcontracted work for this project is valued at approximately \$ _____
which is approximately _____% of the total project.

BIDDER (FIRM): _____

Contact Person: _____ Telephone: _____

Address: _____ City: _____

State _____ Zip _____ E-Mail: _____

By: _____, _____ / _____ / _____
(Signature) (Title) (Date)

The City of Lake Charles has gone on record to encourage general Contractors to provide opportunities for disadvantaged small business enterprises (DSBE) to become involved as Subcontractors as specifically stated in City Ordinance Section 2-33. Accordingly, this form is required of the lowest responsive Bidder to document his or her specific plan to provide such opportunities.

The City requires all general Contractors to make good faith efforts to award at least 25% of their subcontracted work in all City funded projects to DSBE.

If the lowest responsive Bidder does not plan to provide DSBE opportunities on this project, please explain why.

If the lowest responsive Bidder plans to provide DSBE opportunities on this project, please list on the following page(s).

1. The lowest responsive Bidder plans to engage the following DSBE firm as a Subcontractor

Name of DSBE Firm: _____

DSBE Firm Owner or Contact: _____

Telephone: _____ **Fax:** _____ **E-Mail:** _____

SCOPE OF WORK: Describe the work to be performed by the DSBE firm.

The estimated dollar value of the scope of work is \$_____ which is approximately _____% of the amount to be spent on subcontracted work for this project.

DSBE AFFIRMATION

The above-named DSBE affirms that it can perform the scope of work required in a thorough and competent manner to the satisfaction of the lowest responsive Bidder and as per the specifications for the estimated dollar value as stated above.

By: _____, _____, ____/____/____
(Signature) (Title) (Date)

2. The lowest responsive Bidder plans to engage the following DSBE firm as a Subcontractor

Name of DSBE Firm: _____

DSBE Firm Owner or Contact: _____

Telephone: _____ **Fax:** _____ **E-Mail:** _____

SCOPE OF WORK: Describe the work to be performed by the DSBE firm.

The estimated dollar value of the scope of work is \$_____ which is approximately _____% of the amount to be spent on subcontracted work for this project.

DSBE AFFIRMATION

The above-named DSBE affirms that it can perform the scope of work required in a thorough and competent manner to the satisfaction of the lowest responsive Bidder and as per the specifications for the estimated dollar value as stated above.

By: _____, _____, ____/____/____
(Signature) (Title) (Date)

If more space is needed, please make more copies of this page.

The City of Lake Charles considers the actions listed below evidence of the good faith efforts to award at least 25% of their subcontracted work to DSBE. **Please mark appropriate boxes.**

YES	NO	EVIDENCE OF GOOD FAITH EFFORTS
		PRE-BID MEETING(S): The bidder attended the pre-bid meeting if held.
		SMALL CONTRACT(S): The bidder selected specific portions of the work to be performed by DSBE firms in order to increase the likelihood of meeting the SBOP goals (including breaking down contracts into smaller units to facilitate DSBE participation).
		SBOP LIST(S): The bidder utilized the City's Small Business and Disadvantaged Small Business Enterprise List or lists of certified DSBE firms found at www.cityoflakecharles.com .
		FOLLOW-UP: The bidder followed-up initial indications of interest by DSBE firms by contacting those DSBE firms to determine with certainty if they remained interested in bidding.
		ADVERTISEMENT: The bidder advertised in general circulation, public journals, and/or trade association publications concerning subcontracting opportunities, and allowed DSBE firms reasonable time to respond.
		GOOD FAITH NEGOTIATIONS: The bidder negotiated in good faith with interested DSBE firms and did not reject DSBE firms as unqualified without sound business reasons based on a thorough investigation of their capabilities.
		INFORMATION: The bidder provided interested DSBE firms with adequate information about the plans, specifications, and requirements of the subcontract.
		WRITTEN NOTICE(S): The bidder took the necessary steps to provide written notice in a manner reasonably calculated to inform DSBE firms of subcontracting opportunities and allowed sufficient time for them to participate effectively.
		COMMUNITY RESOURCES: The bidder used the services of the City's SBOP office, available community organizations, small and/or disadvantaged business assistance offices and other organizations that provide assistance in the recruitment and placement of DSBE firms.
		CONTRACT RECORDS: The bidder has maintained the following records for each DSBE firm that has made bid on the subcontracting opportunity: 1. Name, address, and telephone number; 2. A description of information provided by the bidder or Subcontractor; and 3. A statement of whether an agreement was reached, and if not, why not, including any reasons for concluding that the DSBE was unqualified to perform the job.

Please list the DSBE contacts made and the results of said contact.

Name of DSBE Firm: _____

DSBE Firm Owner or Contact: _____

Telephone: _____

E-Mail: _____

Type of work solicited for this project:

Results of Bidder's contact with the DSBE firm:

SBOP Office Use Only:

Name of DSBE Firm: _____

DSBE Firm Owner or Contact: _____

Telephone: _____ **E-Mail:** _____

Type of work solicited for this project:

Results of Bidder's contact with the DSBE firm:

SBOP Office Use Only:

Name of DSBE Firm: _____

DSBE Firm Owner or Contact: _____

Telephone: _____ **E-Mail:** _____

Type of work solicited for this project:

Results of Bidder's contact with the DSBE firm:

SBOP Office Use Only:

Name of DSBE Firm: _____

DSBE Firm Owner or Contact: _____

Telephone: _____ **E-Mail:** _____

Type of work solicited for this project:

Results of Bidder's contact with the DSBE firm:

SBOP Office Use Only:

If more space is needed, please make more copies of this page.

CITY OF LAKE CHARLES, LA

SMALL BUSINESS OPPORTUNITY AND DISADVANTAGED SMALL BUSINESS ENTERPRISES

DISADVANTAGED BUSINESS ENTERPRISES -La. Dept. of Transportation Unified Certification Program

Coordinator, DBE/SBOP/DSBE/ LaKeisha Richard 337 491-1461

Coordinator, DBE/SBDB/DBSBE/Lakeisha Richard 337 491-1461																
TYPE OF BUSINESS	Date	VENDOR NAME	ADDRESS	CITY	ST	ZIP	PHONE #	FAX #	DBA/ADVANTAGE SMALL BUSINESS (SDB)	SMALL BUSINESS ENTERPRISE (SBDB)	UCP CERTIFIED (DBE)	NAICS code	Code 2	Code 3	Code 4	Code 5
																9/1/2024
PROF. CONSULTING/ENV. MGMT./DISASTER																
		A. COLLINS CONSULTING	1712 15TH STREET	LAKE CHARLES	LA	70601	225-252-8301	NA	X	X		541611	541618			
		ANCCW GROUP, LLC	P. O. BOX 13021	LAKE CHARLES	LA	70612	337-707-0197	NA		X						
		DARIUS CLAYTON ENTERPRISE LLC	1309 CLOVER DR	LAKE CHARLES	LA	70607	337-529-2324	NA	X	X		611430				
		CONDALL CONSULTING GROUP LLC	1215 PRYTANIA STREET, STE. 475	NEW ORLEANS	LA	70130	504-592-4000	504-592-4001	X	X	Y	541620	541990	541618	541370	562910
		DIVERSIFIED MATERIALS & CONSULTING, LLC	2122 HOUSTON RIVER ROAD	WESTLAKE	LA	70669	337-564-3966	337-564-3967		X						
		DOUBLE / ENVIRONMENTAL SERVICES, LLC	P.O. BOX 322	WALKER	LA	70785	225-603-7561	225-666-7705		X		541620				
		GREENING NASH AND ASSOCIATES LLC	4800 WOODSTOCK WAY DR.	GREENWELL	LA	70739	225-806-8707	NA	X	X		624230	925110	922190	926110	923130
		KINGDOM INDUSTRIES, LLC	2305 BENEDICTO LANE	PORT ALLEN	LA	70767	225-301-2567	NA	X	X		286220	541618			
		LANDMARK CONSULTING, LLC	525 ST. CHARLES AVENUE, SU# 330	NEW ORLEANS	LA	70130	504-524-8880	504-524-8884	X	X	Y	569110	541300	541611	541690	541618
		M.A.C. ENTERPRISE CONSULTING AGENCY	111 DOVE CIRCLE	LAFAYETTE	LA	70508	832-627-2787	NA	X	X		541611	541612	541612		
		MEAUX CONSULTING	821 ASHLEY AVE	LAKE CHARLES	LA	70611	337-780-6624	NA	X	X		541614	541690	561499		
		RENEW INDUSTRIAL SERVICES	2700 OLIVER RD	WESTLAKE	LA	70669	337-707-1333	NA	X	X						
		SEVPRO JEFFRIES GLOBAL INC	8484 WILSHIRE BLVD. #605	BEVERLY HILLS	CA	90211	888-255-3488	NA		X						
		SOUTHLAND ENVIRONMENTAL, LLC	510 CLARENCE ST	LAKE CHARLES	LA	70601	337-436-3248	337-436-3641		X		541614	541690			
		TAJ FIRE CONSULTANTS	1428 TASCA STREET	LAKE CHARLES	LA	70615	337-302-7313	NA	X	X		524291				
		T & M DYNAMIC ENTERPRISES LLC	P. O. BOX 5293	LAKE CHARLES	LA	70606	337-351-7842	337-358-2004	X	X	Y	286220	562910	238320	238910	
		QUATERNARY RESOURCE INVESTIGATIONS, LLC	13588 FLORIDA BLVD.	BATON ROUGE	LA	70809	225-292-1400	225-292-1404	X	X		541620	541113	541910		
		VIVID IMAGE CONSULTING	1620 ENTERPRISE BLVD	LAKE CHARLES	LA	70601	337-912-7463	NA	X	X		541613	611430			
		WCI CONSULTANTS, LLC	16415 CREPE MYRTLE DRIVE	BATON ROUGE	LA	70817	225-921-0777	NA	X	X	Y	541611	541618	611430		
CONTRACTOR, COMMERCIAL																
		BULLWIN INDUSTRIAL SERVICE	6558 HWY 90 EAST	LAKE CHARLES	LA	70615	337-602-6362	NA		X		811310				
		BUTLER'S	2304 ASTER STREET	LAKE CHARLES	LA	70601	337-912-9826	NA	X	X		286220	236210	236118		
		CREB STONE OF SWLA, LLC	815 SMITH ROAD	LAKE CHARLES	LA	70611	337-802-4329	NA	X	X		238390	238340	236118		
		FINAL FINISH CONCRETE, INC	2927 LAFAYETTE RD.	LAKE CHARLES	LA	70605	337-406-7904	NA	X	X		238110	23571			
		J. OLIVER CONSTRUCTION, INC	P.O. BOX 6454	LAKE CHARLES	LA	70606	337-429-5397	337-428-5398	X	X		236118	236220	236210		
		J.T. CUSTOM BUILDERS LLC	2002 ELMS ST.	LAKE CHARLES	LA	70601	281-660-2626	NA		X		236220				
		L & F CONSTRUCTION	2916 TODD JUDE ROAD	LAKE CHARLES	LA	70607	337-513-3277	NA		X		236220	236210			
		LAKE CHARLES CONSTRUCTION LLC	7834 LAKE STREET	LAKE CHARLES	LA	70605	337-990-5015	337-564-0228	X	X		236220	236210			
		MILIDIA CONSTRUCTION LLC	1283 JOE MILLER ROAD	LAKE CHARLES	LA	70611	337-794-2142	337-885-1882	X	X		286220	236210			
		MPB CONSTRUCTION LLC	160 BUDDY COOPER ROAD	SINGER	LA	70660	337-786-2373	337-786-4143	X	X		286220	236210			
		QUALIFIED CONSTRUCTION AND ROOFING	1004 CHERYHILL ST.	LAKE CHARLES	LA	70607	337-214-9337	NA	X	X		236220				
		VISION INDUSTRIAL SERVICES LLC	1424 SWISCO ROAD	SUIPHUR	LA	70665	337-625-5757	337-626-1627		X		236220	236210			
CONTRACTOR, DEMOLITION																
		1st CHOICE LAWN & DEBRIS	950 MAIN ST. #19135	LAKE CHARLES	LA	70616	337-240-9333	866-896-7759		X		561730	562119	238910		
		CLOPHUS TRACTOR & LAWN	3443 HIGHWAY 90	WESTLAKE	LA	70669	337-302-4759	337-558-7319	X	X		238910	238190			
		COMLEY WORKS, LLC	7340 JEFF DAVIS RD	IOWA	LA	70647	337-611-4867	NA	X	X		238910	562119	44220		
		COMMIERS LANDDEVELOPING	627 16TH STREET	LAKE CHARLES	LA	70601	337-912-2776	NA	X	X		238190	238910			
		CSI SERVICES, LLC	1585 HWY 1179	PLAUCHEVILLE	LA	71362	318-305-4265	NA		X		238190	238130	562998		
		CW LAWN CARE dba CW REMODELING	609 COLLETTA ST	LAKE CHARLES	LA	70615	337-802-1165	NA	X	X		561730	236220	238910		
		FREDRICK LEWIS DEMOLITION & ETC.	2528 KIRKMAN STREET	LAKE CHARLES	LA	70601	337-215-0953	NA	X	X		238910	561730	562119		
		GULF COAST & VEGETATION SERVICE LLC	630 W. PRIEN LAKE RD STE B #274	LAKE CHARLES	LA	70601	210-429-2786	NA	X	X		238910	236115	236116	236220	236210
		HARMON'S CONSTRUCTION LLC	1248 OPELOUSAS STREET	LAKE CHARLES	LA	70601	337-436-3489	337-436-1960	X	X	Y	238190	238910	238990	238110	
		KING'S ELITE DEMOLITION, LLC	3214 REDWAY STREET	LAKE CHARLES	LA	70605	337-707-8220	NA	X	X		238910	236220	237310		
		LAKE CITY TRUCKING	P.O. BOX 16545	LAKE CHARLES	LA	70616	337-494-6900	337-436-4606	X	X	Y	238190	238910			
		STERLING'S LIMESTONE WORKS, LLC	1501 1ST ST.	LAKE CHARLES	LA	70601	337-540-1996	NA	X	X		238910	424910	212319		
		ue. complete. care@yahoo.com	2331 BROAD ST.	LAKE CHARLES	LA	70601	337-249-2233	NA	X	X		238910	236220			
CONTRACTOR, ELECTRICAL																
		ANYTIME ELECTRIC LLC	5543 OPELOUSAS STREET	LAKE CHARLES	LA	70615	337-602-6127	504-539-3723		X		238210				
		BALTHAZAR ENTERPRISES INC. dba BALTHAZAR ELECTRICS	3623 D'HEMECOURT ST.	NEW ORLEANS	LA	70119	504-891-5504	504-891-5580	X	X	Y	423610	423620	423690	421610	235310
		belectrics@balthazarinc.com														

CITY OF LAKE CHARLES, LA

SMALL BUSINESS OPPORTUNITY AND DISADVANTAGED SMALL BUSINESS ENTERPRISES

DISADVANTAGED BUSINESS ENTERPRISES -La. Dept. of Transportation Unified Certification Program

Coordinator, DBE/SBOP/DSBE/ LaKeisha Richard 337 491-1461

Coordinator, DBE/SBOP/DSBE/Lakeisha Richard 337 491-1461																DATE
TYPE OF BUSINESS	Date	VENDOR NAME	ADDRESS	CITY	ST	ZIP	PHONE #	FAX #	DISADVANTAGE (DSB)	SMALL BUSINESS ENTERPRISE (SBOP)	UOP CERTIFIED (DBE)	NAICS code	Code 2	Code 3	Code 4	Code 5
josephjack236@yahoo.com		JACK'S GENEERAL CONTRACTING	2260 NIKAL DR.	LAKE CHARLES	LA	70605	337-513-2874	NA	X	X		286118	286220	561730		
jalonvic28@yahoo.com		JAY'S ALL ABOUT MAINTENANCE	3009 GENERAL PERSHING DR	LAKE CHARLES	LA	70615	337-540-5357	NA		X		286118	286220	561730		
		JK PROPERTIES OF SWLA, LLC	4402 RUE ELYSEE	LAKE CHARLES	LA	70605	337-764-9410	NA		X		286220	286210			
jferro@gmail.com		JLE CONTRACTOR	3201 ENTERPRISE BLVD. APT. A	LAKE CHARLES	LA	70601	337-438-7113	NA	X	X		288320	288110	238140		
jfradney@yahoo.com		JOHN F. GRADNEY GENERAL CONTRACTOR	1354 LAVERGNE E. STE. G	LAKE CHARLES	LA	70611	337-802-6143	NA		X	Y	286220	286210	236168	C74	
melanie@leilandnllc.com		KEILAND CONSTRUCTION	600 BAYOU PINES E. STATE	LAKE CHARLES	LA	70601	337-436-6846	337-134-0704	X	X	Y	286220	286210	236168	237310	238110
kelandcocontractingllc@yahoo.com		KEL & COE CONTRACTING, LLC	4963 CHAPELWOOD DRIVE	IOWA	LA	70647	225-986-9869	NA	X	X		288210	288220	236220		
grachelle@kinnerbuilds.com		KINDER ROOFING & CONSTRUCTION	509 IKES RD.	KINDER	LA	70648	337-764-3220	NA		X		288160	288320	238170		
		KING'S ELITE DEMOLITION, LLC	3214 REDWAY STREET	LAKE CHARLES	LA	70605	337-707-8220	NA	X	X		288910	286220	237310		
		KINGDOM INDUSTRIES, LLC	2105 BENEDETTO LANE	PORT ALLEN	LA	70767	225-301-2567	NA	X	X		286220	286210			
		KT CONSTRUCTION	319 GOODWIN STREET	WELSH	LA	70591	337-734-4481	337-734-4471		X		286220	286210			
		LAKE AREA PAINTING LLC	1424 SWISCO ROAD	SULPHUR	LA	70663	337-605-5757			X		286220	286210	237310		
		LAKE CHARLES CONSTRUCTION LLC	7834 LAKE STREET	LAKE CHARLES	LA	70605	337-990-5015	337-564-0228	X	X		286220	286210			
lakearea.customs@yahoo.com		LAKE AREA CUSTOMS	1309 GERSTNER MEMORIAL DR	LAKE CHARLES	LA	70601	337-425-2523	NA		X	Y	286220	286210			
gary@lakecitytrucking.com		LAKE CITY TRUCKING	P.O. BOX 16545	LAKE CHARLES	LA	70616	337-494-6900	337-436-4606	X	X		286118	286115			
		LEGACY HOME & BUSINESS IMPROVEMENTS, LLC	1922 BANK STREET	LAKE CHARLES	LA	70601	337-707-5603	NA		X	Y	23	2361	2362		
accounts@living-solutions-construction.com	Sep 24	LIVING SOLUTIONS CONSTRUCTION, LLC	P.O. BOX 1764	ZACHARY	LA	70791	225-372-4111			X		238330	286118	561720	236220	
		MULTI ALLIANCE MANAGEMENT GROUP LLC	6969 TITAN AVENUE	BATON ROUGE	LA	70806	225-448-2711	225-448-2711	X	X		288330	286118	561720	236220	
		NOLA STELLE FABRICATION & ERECTION, LLC	6641 WESTBANK EXPWY, STE. B	MARRERO	LA	70072	504-264-7499	504-264-7077	X	X		286220	286210	236118		
		PAT WILLIAMS CONSTRUCTION LLC	1321 HODGES STREET	LAKE CHARLES	LA	70601	337-433-4300	337-238-4967		X		286220	286210			
dstout1185@yahoo.com		PBS SOLUTIONS GENERALCONSTRUCTION	5091 WEAVER RD. UNIT B	LAKE CHARLES	LA	70605	337-513-8640	NA	X	X		286220	286118	624229		
travis.manceaux@percdevelopment.com		PERC DEVELOPMENT, LLC	413 7TH STREET	LAKE CHARLES	LA	70601	337-602-3958	NA		X		263220	286118	236117		
ljernigan@plconsultantsllc.com		PL CONSULTANTS	21658 CHOKECHERRY AVENUE	PORTER	TX	77365	832-212-1620	NA	X	X		286220	288910	562119		
procon.hlw@gmail.com		PROCON PROFESSIONAL CONTRACTOR	P. O. BOX 16690	LAKE CHARLES	LA	70616	337-263-0409	NA	X	X		237310	288110	238990		
		RAZOR CONSTRUCTION, LLC	5848 BENNIE LANE B	LAKE CHARLES	LA	70605	337-564-4113	337-419-1663		X		238130	288320	238110		
		RHINO RENOVATORS, LLC	1027 ENTERPRISE BLVD.	LAKE CHARLES	LA	70601	337-483-9434	337-439-5088		X		286220	286210			
		RICKY BELLON LLC	916 ENTERPRISE BLVD.	LAKE CHARLES	LA	70601	337-433-4373	337-433-4374		X		286220	286210			
		ROBERT GOTTE'S HANDYMAN SERVICES	107 S. FRANKLIN STREET	LAKE CHARLES	LA	70601	337-224-1508	NA	X	X		286220	288910	562119		
romelenterprisesinc@gmail.com		ROMEL ENTERPRISES INC	400 LYMAN AVENUE	RAYNE	LA	70578	337-581-9065	337-334-2799	X	X		92658	96239			
		SETH PRIOLA CONSTRUCTION LLC	1300 ROSTEET STREET	LAKE CHARLES	LA	70601	337-855-9186	337-855-7949		X		286220	286210			
stephan.igardi@er-sconstruct.net		SHANNON SMITH CONSTRUCTION, INC.	1200 E. MCNEESE ST., STE. A	LAKE CHARLES	LA	70607	337-474-5157	337-474-8428		X		286220	286210	236200		
		SIMON CONSTRUCTION	7521 ASTER STREET	LAKE CHARLES	LA	70601	337-892-8577	337-602-1765	X	X		286220	286210			
		STEVENS GENERAL CONTRACTOR	929 WEST NORTHERN AVENUE	CROWLEY	LA	70526	337-263-2783	NA		X		288210	286210	236118		
		TERENCE PETE, LLC	1010 WILBERT D. ROCHELLE AVENUE	JENNINGS	LA	70546	434-755-5290	NA	X	X		286118	286115	236117		
		TING INDUSTRIAL INC	201 ST. CHARLES AVE STE. 114-202	NEW ORLEANS	LA	70170	504-881-1188	NA	X	X		561210	561320	236220		
		WRANGELER CONSTRUCTION CO	2700 MCNEESE FARM RD,BLDG B	LAKE CHARLES	LA	70605	337-625-9959	337-625-8908	X	X		286220	286210	238210		
support@4d4greenorth.shop		ZAID DEVELOPMENT LLC	1621 JOHN BELLER	MOSS BLUFF	LA	70611	337-540-8613	NA	X	X		286118	288910			
		Z-A HANDYMAN SERVICES	717 KINGSLEY STREET	LAKE CHARLES	LA	70605	337-660-5171	NA		X		286220	286210			

CITY OF LAKE CHARLES, LA

SMALL BUSINESS OPPORTUNITY AND DISADVANTAGED SMALL BUSINESS ENTERPRISES

DISADVANTAGED BUSINESS ENTERPRISES -La. Dept. of Transportation Unified Certification Program

Coordinator, DBE/SBOP/DSBE/ Lakeisha Richard 337 491-1461

TYPE OF BUSINESS	Date	VENDOR NAME	ADDRESS	CITY	ST	ZIP	PHONE #	FAX #	DISADVANTAGED SMALL BUSINESS (DSB)	SMALL BUSINESS ENTERPRISE (SBOP)	UCP CERTIFIED (DBE)	NAICS code	Code 2	Code 3	Code 4	Code 5
herman@wing7logistics.com		WING 7 ADVANCED TRUCKING, LEASING & LOGISTICS, LLC	4310 RYAN ST. STE 107	LAKE CHARLES	LA	70605	337-602-8223	337-602-8225	X	X	Y	488510	488999	492110	484110	484220
ENGINEERING, GEOTECHNICAL		BETA GROUP ENGINEERING & CONSTRUCTION SERVICES	1428-1/2 CLAIR AVENUE	GRETNVA	LA	70053	504-227-2273	504-227-2274	X	X	Y	541330				
gibson@betagroupgc.com																
HVAC/HEAT/ A/C / REFRIGERATION		AIR CONDUIT	1300 2ND STREET	LAKE CHARLES	LA	70601	337-436-7551	337-436-7644	X	X		238220				
bobby@airconduit.net																
la.arms@armscousa.com		BRADLEY J. ARMS dba ARMSCO	2300 PASADENA FWY. 225. STE. 103	PASADENA	TX	77506	713-472-4200	844-263-1903	X	X		238220	423730	221330		
colleair@lakecharles@gmail.com		COLE AIR, INC	PO BOX 12593	LAKE CHARLES	LA	70612	337-855-6628	337-855-9797		X						
		INDEPENDENT UNIVERSAL SERVICES	1423 S. GREENFIELD CIRCLE	LAKE CHARLES	LA	70605	337-274-5113	NA		X						
		LOUISIANA CONTROLS INC.	2332 CHATAWIA AVENUE	BATON ROUGE	LA	70815	225-924-4990	225-928-2504		X		238220				
corp@solarsupply.us		SOLAR SUPPLY, INC	1212 12TH STREET	LAKE CHARLES	LA	70601	337-310-1000	337-310-1005		X		423730				
nutstarr1980@gmail.com		WASHINGTON & SON'S HVAC	1714 BELDEN STREET	LAKE CHARLES	LA	70601	337-912-2164	NA		X		238220	423730			
JANITORIAL (Environmental)		FOUNDATION SHIELD SERVICES	P. O. BOX 385	SULPHUR	LA	70664	337-563-9181	NA		X		561720				
gregorykcarlin@yahoo.com		MONUMENTAL LIFE	5831 S. 40 CT	IOWA	LA	70647	337-304-9494	NA		X		541720	561790			
chris.w.breiaus@gmail.com		SHERMAN & ASSOCIATES	202 RUE PACANNIER #1	CARENCRO	LA	70520	337-886-7889	NA	X	X	Y	561720	562910	425120		
janice_sherman@bellsouth.net																
JANITORIAL, RESIDENTIAL / COMMERCIAL		ABOVE & BEYOND CLEANING SOLUTION SERVICE	1316 WENDELL STREET	LAKE CHARLES	LA	70601	337-274-8974	NA	X	X		561720				
albertafrank12@yahoo.com		ALBERTA'S CLEANING SERVICE	1711 PEAR STREET	LAKE CHARLES	LA	70601	337-802-7942	NA	X	X		561720				
		A THRU Z JANITORIAL SERVICE & SUPPLY INC	9473 LA HWY 941	GONZALES	LA	70737	225-675-3014	225-675-6056	X	X		561720	453998	423850		
		B&P MANAGEMENT & SUPPORT SERVICES, LLC	2505 KIRKMAN STREET	LAKE CHARLES	LA	70605	706-533-3348	NA	X	X		561720	811192			
alfredbel71@yahoo.com		BELL'S JANITORIAL LLC	1433 NORTH 35TH STREET	BATON ROUGE	LA	70802	225-288-0107	NA	X	X						
statorabuckner@gmail.com		BUCKNER'S COMMERCIAL & RESIDENTIAL CLEANING	1126 N. ELTON COURT	LAKE CHARLES	LA	70607	337-842-0525	NA	X	X		561720				
		C COMPANY OF LOUISIANA, LLC, THE	2101 23RD STREET	LAKE CHARLES	LA	70601	337-474-3229	NA	X	X		561720				
		CAULIN CHEMICAL & JANITORIAL SUPPLY, INC.	1511 W. VINE STREET	OPELOUSAS	LA	70570	337-948-8217	337-948-1700		X		423850				
staagmiller@classycleaning.biz		Classy Cleaning by Stacy, LLC	1812 Kirkman Street	LAKE CHARLES	LA	70601	337-602-6240			X		561720				
		CLEAN IT TO THE "T", LLC	1515 W. MCNEESE ST. #110	LAKE CHARLES	LA	70605	337-707-2903	NA	X	X		561720				
cool3407@yahoo.com	Sep-24	COOL CLEANING SERVICES, LLC	1612 WOODLAND DRIVE	LAKE CHARLES	LA	70605	917-680-6973	NA		X		561720				
louyondcleaning@gmail.com		COUTON CLEANING, LLC	322 NOMA LANE	WESTLAKE	LA	70669	337-254-2302	NA	X	X		561720	561740	238390		
		EASY STREET ENTERPRISES, LLC	5659 CHUCK DRIVE	LAKE CHARLES	LA	70605	337-377-8492	337-478-4066	X	X		561720				
		ELAINE'S HOME REPAIR/CLEANING LLC	P.O. BOX 5457	LAKE CHARLES	LA	70606	337-540-9117	NA	X	X		236118	236220	561720		
		GASPARD'S CLEANING SERVICES	903 14TH STREET	LAKE CHARLES	LA	70601	337-292-2023	NA	X	X		561740	561720			
dewayneelli402@gmail.com		GLOBE TROTTER JANITORIAL SERVICE, LLC	2230 6TH STREET	LAKE CHARLES	LA	70601	337-842-5728	NA	X	X		561720				
		GREEN'S ENTERPRISES OF LAKE CHARLES, LLC	809 NORTH LAKE STREET	LAKE CHARLES	LA	70601	337-529-2057	NA	X	X		561720				
info@cleaningbydesignla.com		KEITH'S JANITORIAL SERVICES	650 BOSTON STREET	LAKE CHARLES	LA	70601	337-489-1604	NA	X	X		561720				
		KRISTEN'S CLEANING BY DESIGN	1400 RYAN ST.	LAKE CHARLES	LA	70601	337-442-0062	NA	X	X		561720				
		LAKE CITY BEVERAGE dba LAKE CITY SUPPLY	502 7TH STREET	LAKE CHARLES	LA	70601	337-439-8308	337-439-4365		X		423850	424690	424130		
lewissvcs@aol.com		LENDEN J. LEWIS, JR. dba LEWIS SERVICES, INC	510 SAUL, STE A	SCOTT	LA	70583	337-232-0675	337-269-0047	X	X	Y	561720	561730			
melgaremedios@gmail.com		MA REMEDIOS MELGAR SOTELO	3619 TEXAS ST APT. 32C	LAKE CHARLES	LA	70607	346-314-7758	NA	X	X		561720	561740	561730		
		MULTI ALLIANCE MANAGEMENT GROUP LLC	6989 TITIAN AVENUE	BATON ROUGE	LA	70806	225-448-2711	225-448-2711	X	X		283330	236118	561720	236220	
billpelletier67@gmail.com		PELTER'S JANITORIAL SERVICE	2431 OAK PARK BLVD	LAKE CHARLES	LA	70601	337-377-4894	NA	X	X		561720				
presidentallcleaning@gmail.com	Sep-24	PRESIDENTIAL CLEANING	4732 S. JACE MATTHEW LANE	IOWA	LA	70647	337-7647710	N/A	X	X		561720				
rctcleaning@yahoo.com		RC CLEANING SERVICES, LLC	7201 BURGUNDY DRIVE	LAKE CHARLES	LA	70601	337-302-7230	NA	X	X		561740	561720	841410	561790	
robertstop2bottom@gmail.com		ROBERT'S TOP 2 BOTTOM CLEANING SVCS, LLC	P O BOX 964	SULPHUR	LA	70664	337-249-5933	NA	X	X		561720	561740			
		ROYAL CUSTODIAN CARE	2030 3RD STREET	LAKE CHARLES	LA	70601	409-233-9173	NA	X	X		561720	561790			
		SHINE BRITE, LTD	2270 HOPE COURT	LAKE CHARLES	LA	70615	337-499-6623	NA	X	X		561720	841410	541410		
		SMILEY'S CLEANING SERVICE	1725 13TH STREET	LAKE CHARLES	LA	70601	337-853-7351	NA	X	X		561720				
luke@southernjanicorp.com		SOUTHERN JANICORP, LLC	1800 KIRKMAN STREET	LAKE CHARLES	LA	70601	337-436-3000	337-436-0099		X		561720	561740	561790		
yelia_lambert@yahoo.com		SPARKLIN SISTERS CLEANING SERVICES	2918 CYPRESS STREET	LAKE CHARLES	LA	70601	337-292-0636	337-274-1731		X		561720				

SECTION 00435

SUBCONTRACTOR LIST

(Required from Apparent Low Bidder within 10 Days of Receipt of Bids)

Capital Project No.: **DR002** _____

In accordance with Ordinance No. 12743 of the City of Lake Charles, Louisiana, the following is a list of Subcontractors proposed to be used on above listed Project or Capital Project No., including the category or scope of work, which each Subcontractor will be performing. **Any disadvantaged small business enterprise (DSBE) should be identified as such next to their name.** *If no Subcontractors are to be used on this project, the bidder shall so indicate by insertion of the phrase **"No Subcontractors will be used on this project"** written or typed across this submittal.*

The Contractor will be required to use all Subcontractors listed on this form in the identified scope of work. Listing Subcontractors with a duplicate category or scope of work will not be permitted.

The obligation to submit the names of Subcontractors on the Subcontractor's Submittal form is not applicable for subcontracts amounting to less than Five Thousand Dollars (\$5,000.00), or less than one percent (1%) of the total amount bid.

SUB'S NAME, ADDRESS AND TELEPHONE

CATEGORY OR SCOPE OF WORK

1) _____

2) _____

3) _____

4) _____

Signed: _____

Title: _____

SECTION 00440

NON-COLLUSION AFFIDAVIT

This document must be executed and furnished by the **lowest responsive Bidder** no later than ten (10) calendar days after the Bid Opening. Failure to submit within the specified timeframe will result in the Bidder being declared as non-responsive.

STATE OF LOUISIANA

PARISH OF CALCASIEU

BE IT KNOWN _____ being first duly
(Name of Authorized Representative of Bidder)

sworn, deposes and says that:

- (1) He is the _____, of _____,
(Title) (Firm Name)

the Bidder, that has submitted the accompanying Bid for the Construction of the

Lake Charles Public Works New Facility Phase 2,
(Project Name)

, a public project of the City of Lake Charles, Louisiana;

- (2) He is fully informed respecting the preparation and contents of the Bid and of all pertinent circumstances respecting the Bid;
- (3) The Bid is genuine and is not a collusive or sham Bid;
- (4) Neither the said Bidder nor any of its officers, partners, Owners, agents, representatives, employees or parties in interest, including this affiant, have in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Bidder, firm, or person to submit a collusive or sham Bid in connection with the Contract or Work for which the attached Bid has been submitted; or to refrain from bidding in connection with such Work; or have in any manner, directly or indirectly, sought by agreement, collusion, communication or conference with any Bidder, firm, or person to fix the price or prices in the Bid or the Bid of any other Bidder; or to fix any overhead, profit, or cost elements of the Bid price or the Bid price of any other Bidder; or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against the Owner, or any person interested in the proposed Work;
- (5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or

any other of its agents, representatives, Owners, employees, or parties in interest, including this affidavit;

- (6) That he has employed no one person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he is to receive payment, other than persons regularly employed by him whose services in connection with the construction of the public building or project or in securing the public contract were in the regular course of their duties for him; and that no part of the contract price to be received by him as paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by him whose services in connection with the construction of the public building or project were in the regular course of their duties for him;

APPEARER FURTHER DECLARES that they will, in all respects, comply with the public contract laws of the State of Louisiana, including Title 38 of the Louisiana Statutes, and particularly Section 2224, as amended, of such Title 38 of the Louisiana Revised Statutes.

WITNESSES:

BIDDER:

BY: _____

TITLE: _____

Subscribed and sworn to before me

This ____ day of _____, 20 ____

(NOTARY PUBLIC)

My commission expires _____

SEAL

END OF SECTION



**Designation of Construction Contractor
as Agent of a Governmental Entity
Sales Tax Exemption Certificate**

City of Lake Charles (LA) _____, an agency of the United States government, or an agency, board, commission, or instrumentality of the State of Louisiana or its political subdivisions, including parishes, municipalities and school boards, does hereby designate the following contractor as its agent for the purpose of making sales tax exempt purchases on behalf of the governmental body:

Name of Contractor		
Address		
City	State	ZIP

This designation of agency shall be effective for purchases of component construction materials, taxable services and leases and rentals of tangible personal property for the following named construction project:

Construction Project	Contract Number

This designation and acceptance of agency is effective for the period

Beginning Date (mm/dd/yyyy)	End Date (mm/dd/yyyy)

Purchases for the named project during this period by the designated contractor shall be considered as the legal equivalent of purchases directly by the governmental body. Any materials purchased by this agent shall immediately, upon the vendor’s delivery to the agent, become the property of this government entity. This government entity, as principal, assumes direct liability to the vendor for the payment of any property, services, leases, or rentals made by this designated agent. This agreement does not void or supersede the obligations of any party created under any construction contract related to this project, including specifically any contractual obligation of the construction contractor to submit payment to the vendors of materials or services for the project.

This contractor-agent is not authorized to delegate this purchasing agency to others; separate designations of agency by this governmental entity are required for each contractor or sub-contractor who is to purchase on behalf of this governmental entity. The undersigned hereby certify that this designation is the entirety of the agency designation agreement between them. In order for a purchase for an eligible governmental entity through a designated agent to be eligible for sales tax exemption, the designation of agency must be made, accepted, and disclosed to the vendor before or at the time of the purchase transaction.

Designation of Agency			Acceptance of Agency		
Signature of Authorized Designator		Date (mm/dd/yyyy)	Signature of Contractor or Subcontractor Authorized Acceptor		Date (mm/dd/yyyy)
Name of Authorized Designator Emily K. McDaniel, Director of Finance			Name of Contractor's or Subcontractor's Acceptor		
Name of Governmental Entity City of Lake Charles			Name of Contractor		
Address 326 Pujo Street, 6th Floor			Address		
City Lake Charles	State LA	ZIP 70601	City	State	ZIP

This designation of agency form, when properly executed by both the contractor and the governmental entity, shall serve as evidence of the sales tax exempt status that has been conferred onto the contractor. No other exemption certificate form is necessary to claim exemption from sales taxes. The agency agreement evidenced by this sales tax exemption certificate must be implemented at the time of contract execution with the governmental entity. The contract between the governmental entity and his agent must contain provisions to authenticate the conferment of agency.

SECTION 00450

CITY OF LAKE CHARLES NOTICE OF AWARD

Project: Lake Charles Public Works New Facility Phase 2	
Owner: City of Lake Charles, LA	Owner's Contract No.: DR002
Architect: Brossett Architect LLC	Architect's Project No.: 24009BA
Bidder:	
Bidder's Address:	

You are notified that your Bid dated _____ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for _____

[Indicate total Work, alternates, or sections of Work awarded.]

The Contract Price of your Contract is _____ Dollars (\$_____).

PDF or Hard copies of the proposed Contract Documents (except Technical Specifications and Drawings) accompany this Notice of Award.

Three (3) sets of the Drawings and Specifications will be delivered separately or otherwise made available to you with, or prior to, your Notice to Proceed.

You must comply with the following conditions precedent within fifteen (15) working days of the date you receive this Notice of Award.

1. Deliver to the Architect seven (7) fully executed counterparts of ALL Contract Documents signed in ink.
2. Executed the Agreement and the Surety Bonds as specified in Article 19 of the Instructions to Bidders and Article 11 of the General Conditions.
3. Other conditions precedent:
Insurance Certificate per the General Conditions and Other Required Documents per Specifications Including but May Not be Limited to the following:
 - Section 00485 Corporate Resolution (When Applicable)
 - Section 00500 Agreement (DO NOT DATE)
 - Section 00610 Contractor's Performance Bond (DO NOT DATE)
 - Section 00615 Contractor's Payment Bond (DO NOT DATE)
 - Provide Certifications of Insurance as specified (Article 11 of the General Conditions)

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within fifteen (15) calendar days after you comply with the above conditions, the Owner will return to you one fully executed counterpart of the Contract Documents.

City of Lake Charles, Louisiana

Owner

By:

Authorized Signature

Title

Date

SECTION 00485

CORPORATE RESOLUTION

Excerpt from minutes of meeting of the board of directors of _____
_____, incorporated.

At the meeting of directors of _____,
Incorporated, duly noticed and held on _____, 20____,
A quorum being there present, on motion duly made and seconded. It was:

Resolved that _____, be and is hereby appointed, constituted and designated as agent and attorney-in-fact of the corporation with full power and authority to act on behalf of this corporation in all negotiations, bidding, concerns and transactions with The City of Lake Charles or any of its agencies, departments, employees or agents, including but not limited to the execution of all bids, papers, documents, affidavits, bonds, sureties, contracts and acts and to receive and receipt therefor all purchase orders and notices issued pursuant to the provisions of any such bid or contract, this corporation hereby ratifying, approving, confirming and accepting each and every such act performed by said agent and attorney-in-fact.

I hereby certify the foregoing to be a true and correct copy of an excerpt of the minutes of the above dated meeting of the board of directors of said corporation, and the same has not be revoked or rescinded.

SECRETARY-TREASURER

DATE

END OF SECTION

SECTION 00500
AGREEMENT BETWEEN OWNER AND CONTRACTOR

THIS AGREEMENT is by and between the CITY OF LAKE CHARLES, LOUISIANA hereinafter called the OWNER, and _____, hereinafter called the CONTRACTOR.

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents for the Lake Charles Public Works New Facility Phase 2 and DR002. The Work includes, but is not limited to:

New multiple buildings, and structures, new paving, new landscaping, and other work as noted on drawings for a complete and fully functioning facility

ARTICLE 2. ARCHITECT

2.1 The Project has been designed by Brossett Architect LLC who is hereinafter called ARCHITECT and who will assume all duties and responsibilities and have the rights and authority assigned to ARCHITECT in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

2.2 The Architect's Contact Information is as follows:
David Brossett, AIA
414 Pujo Street
Lake Charles, LA

ARTICLE 3. CONTRACT TIME

3.1 Time is of the Essence

A. All time limit Milestones, if any, Substantial Completion, and completion and readiness for final payments as stated in the Contract Documents are of the essence of the Contract.

3.2 Days to Achieve Substantial Completion and Final Acceptance

A. The CONTRACTOR shall be substantially complete with the Work by April 15, 2027 after the date when the Contract Time commences to run as provided in Article 8 of the General Conditions of the Construction Contract (Section 00700), complete and ready for final acceptance in accordance with Section 9.10 of the General Conditions within 45 calendar days after the date work is substantially complete.

3.3 Liquidated Damages

- A. OWNER and CONTRACTOR recognize that the OWNER will suffer direct financial loss if Work is not completed within the Contract times specified in Paragraph 3.2 above plus any extensions thereof allowed in accordance with Article 7 of the General Conditions, and therefore, time is of the essence. They also recognize the delays, expense, and difficulties involved in proving in a legal proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, CONTRACTOR and Surety agree to forfeit and pay OWNER as liquidated damages for delay (but not as a penalty) the amount of \$XXX for each calendar day that expires after the Contract Time specified in Paragraph 3.2 for substantial completion until the Work is substantially complete; and \$XXX for each calendar day that expires after the time specified in Paragraph 3.2 for final completion and ready for final acceptance until the Work is completed. These amounts represent a reasonable estimate of OWNER's expenses for extended delays and for inspection, architectural services, and administrative costs associated with such delay. This provision shall be effective between the parties ipso facto and without demand or putting in default, it being specifically agreed that the CONTRACTOR by his mere failure to complete the work on or before the date specified shall be deemed in default.

ARTICLE 4. CONTRACT PRICE

CONTRACT PRICE: The amount to be paid to the CONTRACTOR by the OWNER for completion of all work hereunder is:

_____ Dollars (\$_____)

and all extra work in connection therewith, in accordance with the plans and specifications made part of this this Contract Document.

ARTICLE 5. PAYMENT PROCEDURES

5.1 Submittal and Processing of Payments

- A. CONTRACTOR shall submit Applications for Payment in accordance with Article 9 of the General Conditions. Applications for Payment will be processed by ARCHITECT as provided in the General Conditions.

5.2 Progress Payments and Retainage

- A. OWNER shall make progress payments which exceed \$5,000 on account of the Contract price on the basis of CONTRACTOR's Applications for Payment, as recommended by ARCHITECT, on or about the thirtieth (30th) day following receipt by the OWNER. Applications for Payments less than \$5,000 shall be accumulated until the next payment period or until final payment.
- B. Progress payments will be based upon estimated quantities of completed contract unit price items or upon estimated percentages of completion of the schedule of lump sum values of labor and materials incorporated into the Work on the last day of each month or other mutually agreed regular monthly date ending the progress payment period.
- C. Prior to final completion and acceptance of all Work covered by the Contract Documents, progress payments will be made in an amount equal to the percentage indicated below but,

in each case, less the aggregate of payments previously made and less such amounts as ARCHITECT may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Article 15 of the General Conditions. Retainage indicated below does not include withholdings for known incomplete work. Such withholdings are not included in calculating the retainage but are additional monies withheld:

1. For Contract Prices of \$500,000 or less, 90% of Work completed and/or cost of materials and equipment not incorporated in the Work (with the balance of 10% being retainage).
 2. For Contract Prices in excess of \$500,000, 95% of Work completed and/or cost of materials and equipment not incorporated in the Work (with the balance of 5% being retainage).
- D. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to the applicable percent based on the preceding Paragraph 6.02.C of the Work completed, less such amounts as ARCHITECT shall determine in accordance with Paragraph 9.8 of the General Conditions and less the value of ARCHITECT's estimate of the Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion. When substantial completion is granted by the OWNER, the Certificate of Substantial Completion is then filed with the Recorder of Mortgages of the City of Lake Charles. This begins the lien period which shall not be less than forty-five (45) days as prescribed for Public Works by Louisiana Revised Statutes 38:2242.

5.3 Final Acceptance and Final Payment

- A. Upon the final completion of all Work, the CONTRACTOR may request a final inspection and may make a final Application for Payment as provided by Article 9.10 of the General Conditions, upon the OWNER's certificate of final acceptance.
- B. At the expiration of the lien period it is the CONTRACTOR's responsibility to obtain a certificate from the Recorder of Mortgages of the City of Lake Charles that the Contract is clear of any liens or privileges, and said certificate shall be presented to the OWNER for final payment and release of retainage, less any such sums as may be lawfully withheld under the Contract.

ARTICLE 6. CONTRACTOR'S REPRESENTATIONS

6.1 In order to induce OWNER to enter into this Agreement, CONTRACTOR makes the following representations:

- A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
- B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

- D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in as containing reliable "technical data."
- E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.
- F. Based on the information and observations referred to in Paragraph 6.1.D above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Architect written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by ARCHITECT is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work

ARTICLE 7. CONTRACT DOCUMENTS

- 7.1 The following Contract Documents, which comprise the entire Agreement between OWNER and CONTRACTOR, are all hereby made a part of that Agreement to the same extent as if incorporated herein in full:
 - A. This Agreement (Pages 00500-1 to 00500-9, inclusive).
 - B. Contractor's Performance Bond (Pages 00610-1 to 00610-2, inclusive).
 - C. Contractor's Payment Bond (Pages 00615-1 to 00615-3, inclusive) and Insurance Certificates.
 - D. Addenda (Nos. 1 through 3, inclusive).

- E. Specifications and Drawings, as listed in the table of contents of the Project Manual and bearing the general title, "**Lake Charles Public Works New Facility Phase 2**".
- F. General Conditions (pages 00700-1 through 00700-65, inclusive).
- G. Exhibits to this Agreement (enumerated as follows)
 - 1. Legal Notice to Bidders (Pages 00010-1 to 00010-2, inclusive).
 - 2. CONTRACTOR's Bid Form (Pages 00300- 1 to 00300- 1, inclusive).
 - 3. Felony Conviction / E-Verify Affidavit (00420)
 - 4. Questionnaire (00430)
 - 5. Non-Collusion Affidavit (00440)
 - 6. Authority to Execute Contract (00485)
 - 7. FEMA Exhibits A-D
 - 8. City of Lake Charles Small Business Opportunity Program Responsiveness Form for Prime Contractor (00630)
- H. The following may be delivered or issued on or after the Effective Date of the Agreement:
 - 1. Notice to Proceed (00640)
 - 2. Change Orders (00650)
 - 3. Work Change Directives (00660)
 - 4. Field Orders (00670)

7.2 There are no Contract Documents other than those listed above in this Article 7. The Contract may only be amended, modified or supplemented as provided in Article 7 of the General Conditions.

ARTICLE 8. MISCELLANEOUS

8.1 Terms

- A. Terms used in this Agreement will have the meanings stated in the General Conditions.

8.2 Assignment of Contract

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents. Notwithstanding the foregoing, the OWNER may assign this contract to the State of Louisiana or any political subdivision, municipality, special district or authority thereof without CONTRACTOR's consent and without recourse.

8.3 Successors and Assigns

- A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

8.4 Severability

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

8.5 Contractor's Certifications

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.5:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.6 Remedies for Dispute Resolution

- A. In the event of dispute arising between the parties, both parties shall have all rights granted by the general laws of The State of Louisiana. It is hereby further agreed upon and understood by the parties hereto that any and all disputes that may arise in litigation shall be litigated in the 14th Judicial District Court for the Parish of Calcasieu or United States District Court Western District of Louisiana if jurisdiction is proper.

8.7 Relationship between the parties

- A. The Contractor is engaged by the Owner for the purposes set forth in this agreement. The relationship between the Contractor and the Owner shall be, and only be, that of an independent contractor and the owner shall not be construed to be an employee, agent, partner of, or in joint venture with, the Owner.

8.8 Acknowledgement of Exclusion from Worker’s Compensation Coverage

- A. The owner and the Contractor expressly agree that the Contractor is an independent contractor as identified in R.S 23:1021(7) and, as such, expressly agree that the Owner shall not be liable to the Contractor or to anyone employed by the Contractor for any benefits or coverage as provided by the Worker’s Compensation Law of the State of Louisiana.

8.9 Acknowledgement of Exclusion from Unemployment Compensation Coverage

- A. The Owner and the Contractor expressly declare and acknowledge that the Contractor is an independent contractor, as such, is being engaged by the Owner under this agreement as noted and defined in R.S. 23:1472(12)(E) and, therefore, it is expressly declared and understood between the parties hereto, that for the purposes of unemployment compensation only:
 1. The Contractor has been and will be free from any control or direction by the Owner over the performance of the services covered by this agreement;
 2. The services to be rendered by the Contractor are outside the normal course and scope of the Owner’s usual business; and
 3. The Contractor is customarily engaged in an independent established trade, occupation, profession, or business.
- B. Consequently, neither the Contractor nor anyone employed or contracted by the Contractor shall be considered an employee of the Owner for the purpose of unemployment

compensation coverage.

8.10 Employment of Owner Personnel

- A. The Contractor certifies that it has not employed and will not employ any person to engage in the performance of this agreement who is, presently, or at the time of such employment, and employee of the Owner.

8.11 Legal Compliance

- A. The Owner and Contractor shall comply with all federal, state, and local laws and regulations, including, specifically, the Louisiana Code of Governmental Ethics (R.S. 42:1101, *et seq.*) in carrying out the provisions of this agreement.

8.12 Covenants against Contingency Fees

- A. The Contractor warrants that it has not employed or retained any entity or person, other than bona fide employees working solely for the Contractor, to solicit or secure this agreement, and that it has not paid or agreed to pay any entity or person, other than a bona fide employee working solely for the Contractor any fee, commission, percentage, brokerage fee, gift, or any other consideration, contingent upon or resulting from the award or making of this agreement. For breach or violation of this warranty, the Owner shall have the right to annul this agreement without liability or, in the Owner's discretion, to deduct from the contract price or consideration, or otherwise recover the full amount of such fee, commission, percentage, brokerage fee, gift, or contingent fee.

8.13 Non-Discrimination Clause

- A. The Contractor agrees to abide by the requirements of the following as applicable: Title VI and VII of the Civil Rights Act of 1964, as amended by the Equal Opportunity Act of 1972, Federal Executive Order 11246, the Federal Rehabilitation Act of 1973, as amended, the Vietnam Era Veteran's Readjustment Assistance Act of 1974, Title IX of the Education Amendments of 1972, as amended, the Age Act of 1975, as amended, and Contractor agrees to abide by the requirements of the American Disabilities Act of 1990, as amended. Contractor agrees not to discriminate in its employment practices, and will render services under this contract without regard to race, color, religion, sex, sexual orientation, national origin, veteran status, political affiliation, or disabilities. The Contractor acknowledges and agrees that any act of unlawful discrimination committed by the Contractor, or any other failure to comply with these statutory obligations when applicable shall be grounds for termination of this agreement.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement effective as of the date first written above. All portions of the Contract Documents have been signed or have been identified by OWNER and CONTRACTOR on their behalf.

This Agreement will be effective on _____, _____ (which is the Effective Date of the Agreement).

OWNER:

CONTRACTOR

By: Honorable Mayor Marshall J. Simien, Jr.
Title: Mayor of the City of Lake Charles
[CORPORATE SEAL]
Attest: _____
Title: _____

By: _____
Title: _____
[CORPORATE SEAL]
Attest: _____
Title: _____

Address for giving notices:

P.O. Box 900
Lake Charles, Louisiana 70602-0900

(If OWNER is a corporation, attach evidence of authority to sign. If OWNER is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

Designated Representative:

Name: Honorable Mayor Marshall J. Simien, Jr.
Title: Mayor of the City of Lake Charles
Address: P.O. Box 900
Lake Charles, LA 70602-0900
Phone: (337) 491-1201

Address for giving notices:

License No.: _____
(Where applicable)

Agent for Service or process: _____

(If CONTRACTOR is a corporation or a partnership, attach evidence of authority to sign.)

Designated Representative:

Name: _____
Title: _____
Address: _____

Phone: _____

END OF SECTION

SECTION 00501

Exhibit A

FEDERAL COMPLIANCE PROVISIONS FOR CONSTRUCTION CONTRACTS

Owner (City of Lake Charles) intends to pursue reimbursement of eligible Project costs from the Federal Emergency Management Agency (FEMA), therefore this project is subject to compliance by Contractor with all applicable federal contract clauses, including but not limited to the following:

1. Remedies

The parties agree that the Owner reserves all rights and privileges under applicable laws and regulations with respect to this contract in the event of a breach of contract, including but not limited to the right to institute legal proceedings in a court of competent jurisdiction seeking monetary damages, court costs and litigation expenses, as applicable.

2. Termination for Cause

Refer to Section 00700 Standard General Conditions Section 14.2.

Note: If Section 00700 is not included in the Contract Documents, then the paragraph below shall be considered part of the contract:

The City of Lake Charles reserves the right to terminate this contract for cause or convenience pursuant to the rules and regulations and special conditions which are incorporated herein by reference in their entirety.

3. Termination for Convenience

Refer to Section 00700 Standard General Conditions Section 14.4.

Note: If Section 00700 is not included in the Contract Documents, then the paragraph below shall be considered part of the contract:

The City of Lake Charles reserves the right to terminate this contract for cause or convenience pursuant to the rules and regulations and special conditions which are incorporated herein by reference in their entirety.

4. Equal Employment Opportunity

Refer to Section 00501 Agreement between Owner and Contractor, Exhibit B

5. Contracting with Small and Minority Firms, Women’s Business Enterprises, and Labor Surplus Area Firms

1. Any party to this contract, when expending and Federal funds received under this Agreement, must take all necessary affirmative steps to assure that minority businesses, women’s business enterprises, and labor surplus area firms are used when possible. These steps are required for the hiring of any subcontractors under this contract.
2. Affirmative steps must include:
 - a. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
 - b. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
 - c. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
 - d. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and
 - e. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

Refer to Section 00430 City of Lake Charles SBOP Good Faith Compliance.

6. Anti-Kickback Clause

Compliance with the Copeland “Anti-Kickback” Act.

Contractor. The contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. Part 3 as may be applicable, which are incorporated by reference into this contract.

Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as FEMA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.

Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.

7. Contract Work Hours and Safety Standard Act

Compliance with the Contract Work Hours and Safety Standards Act.

(1) *Overtime requirements.* No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) *Violation; liability for unpaid wages; liquidated damages.* In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages.

Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) *Withholding for unpaid wages and liquidated damages.* The City of Lake Charles shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) *Subcontracts.* The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

8. Civil Rights

Refer to Section 00200, Title 33

9. Section 504 of the Rehabilitation Act Of 1973, As Amended

The Contractor agrees that no otherwise qualified individual with disabilities shall, solely by reason of his disability, be denied the benefits, or be subjected to discrimination including discrimination in employment, any program or activity that receives the benefits from the federal financial assistance.

10. Age Discrimination Act Of 1975

The Contractor shall comply with the provisions of the Age Discrimination Act of 1975. No person in the United States shall, on the basis of age, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under, any program or activity receiving federal financial assistance.

11. Compliance with Air and Water Acts

(applicable to contracts and subcontracts exceeding \$100,000)

Refer to Section 00501 Agreement Between Owner and Contractor, Exhibit C

The Contractor and all subcontractors shall comply with the requirements of the Clean Air Act, as amended, 42 USC 7401 et seq., the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq. Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA)

12. Energy Efficiency

The Contractor hereby recognizes the mandatory standards and policies relating to energy efficiency which are contained in the State energy conservation plan issued in compliance with the Energy Policy and Conservation Act (P.L. 94-163).

13. Flood Disaster Protection

This contract is subject to the requirements of the Flood Disaster Protection Act of 1973 (P.L. 93-234). Nothing included as a part of this contract is approved for acquisition or construction purposes as defined under Section 3(a) of said

Act, for use in an area identified by the Secretary of HUD as having special flood hazards which is located in a community not then in compliance with the requirements for participation in the National Flood Insurance Program pursuant to Section 201(d) of said Act; and the use of any assistance provided under this contract for such acquisition for construction in such identified areas in communities then participating in the National Flood Insurance Program

shall be subject to the mandatory purchase of flood insurance requirements or Section 102(a) of said Act.

Any contract or agreement for the sale, lease, or other transfer of land acquired, cleared or improved with assistance provided under this Contract shall contain, if such land is located in an area identified by the Secretary as having special flood hazards and in which the sale of flood insurance has been made available under the National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4001 et seq., provisions obligating the transferee and its successors or assigns to obtain and maintain, during the ownership of such land, such flood insurance as required with respect to financial assistance for acquisition or construction purposes under Section 102(a) of Flood Disaster Protection Act of 1973.

14. Debarment, Suspension, and Ineligibility

The Contractor represents and warrants that it and its subcontractors are not debarred, suspended, or placed in ineligibility status under the provisions of 2 CFR 180 that implement Executive Order 12549, *Debarment and Suspension* (3 CFR Part 1986 Comp., p. 189) and Executive Order 12689, *Debarment and Suspension* (3 CFR Part 1989 Comp., p. 235).

- 1) This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such the contractor is required to verify that none of the contractor, its principals (defined at 2 C.F.R. § 180.995), or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).
- 2) Contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.
- 3) This certification is a material representation of fact relied upon by Owner. If it is later determined that Contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to Owner, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
- 4) The bidder or proposer agrees to comply with the requirements of 2 C.F.R. Part 180, subpart C and 2 C.F.R. Part 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

15. Byrd Anti-Lobbying amendment

Refer to Section 00500 Agreement Between Owner and Contractor, Exhibit D

Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352 (as amended)

Contractors who apply or bid for an award of more than \$100,000 shall file the required certification. Each tier certifies to the tier above that it will not and has not used federally

appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-federal funds that takes place in connection with obtaining any federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the federal awarding agency.

16. Procurement of Recovered Materials

In accordance with the requirements of Section 6002 include procuring only items designated in guideless of the EPA at 40 C.F.R. Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired by the preceding fiscal year exceeding \$10,000; procuring solid waste management service in a manner that maxims energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

- 1) In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the products cannot be acquired in accordance with the following:
 - i) Competitively within a timeframe providing for compliance with the contract performance schedule;
 - ii) Meeting contract performance requirements; or
 - iii) At a reasonable price.
- 2) Information about this requirement is available at EPA's Comprehensive Procurement Guidelines website, <http://www.epa.gov/cpg>.
- 3) The list of EPA-designated items is available at <http://www.epa.gov/cpg/products.html>
- 4) The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

17. Changes

The Owner may, from time to time, request changes in the scope of the services of the Contractor to be performed hereunder. Such changes, including any increase or decrease in the amount of the Contractor's compensation which are mutually agreed upon by and between the Owner and the Contractor, shall be incorporated in written and executed amendments to this Contract.

18. Access to Records

The Contractor agrees to provide the City of Lake Charles, any pass-through entities that may be participate in this project, the FEMA Administrator, the Comptroller General of the

United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

The Contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

19. DHS Seal, Logo, And Flags

The Contractor shall not use the DHS seal(s), logos, crests, or reproductions of flags or likeness of DHS agency officials without specific FEMA pre-approval.

20. Compliance with The Office of Management And Budget

The parties agree to comply with the regulations, policies, guidelines, and requirements of the Office of Management and Budget, "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards", 2 CFR Part 200, as they relate to the use of Federal funds under this contract.

21. Compliance with Federal Law, Regulations, and Executive Orders

This is an acknowledgement that FEMA financial assistance will be used to fund all or a portion of the contract. The contractor will comply with all applicable Federal law, regulations, executive orders, FEMA policies, procedures, and directives.

22. No Obligation by Federal Government

The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, contractor, or any other party pertaining to any matter resulting from the contract.

23. Program Fraud and False or Fraudulent Statements or Related Acts

The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract.

24. Program Fraud and False or Fraudulent Statements or Related Acts

The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract.

25. Prohibition On Contracting For Covered Telecommunications Equipment Or Services (Required for Declarations and Awards after Nov 12 2020)

2 C.F.R. § 200.216, as implemented by FEMA Policy 405-143-1, prohibits the Contractor from using equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. A full excerpt from 2 C.F.R is below.

(a) *Definitions.* As used in this clause, the terms backhaul; covered foreign country; covered telecommunications equipment or services; interconnection arrangements; roaming; substantial or essential component; and telecommunications equipment or services have the meaning as defined in FEMA Policy 405-143-1, Prohibitions on Expending FEMA Award Funds for Covered Telecommunications Equipment or Services (Interim), as used in this clause—

(b) *Prohibitions.*

(1) Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of an executive agency on or after Aug.13, 2020, from obligating or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons.

(2) Unless an exception in paragraph (c) of this clause applies, the contractor and its subcontractors may not use grant, cooperative agreement, loan, or loan guarantee funds from the Federal Emergency Management Agency to:

(i) Procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;

(ii) Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;

(iii) Enter into, extend, or renew contracts with entities that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system; or

(iv) Provide, as part of its performance of this contract, subcontract, or other contractual instrument, any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.

(c) Exceptions.

(1) This clause does not prohibit contractors from providing—

- (i) A service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or
- (ii) Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

(2) By necessary implication and regulation, the prohibitions also do not apply to:

- (i) Covered telecommunications equipment or services that:
 - i. *Are not used* as a substantial or essential component of any system; *and*
 - ii. *Are not used* as critical technology of any system.
- (ii) Other telecommunications equipment or services that are not considered covered telecommunications equipment or services.

(d) Reporting requirement.

(1) In the event the contractor identifies covered telecommunications equipment or services used as a substantial or essential component of any system, or as critical technology as part of any system, during contract performance, or the contractor is notified of such by a subcontractor at any tier or by any other source, the contractor shall report the information in paragraph (d)(2) of this clause to the recipient or subrecipient, unless elsewhere in this contract are established procedures for reporting the information.

(2) The Contractor shall report the following information pursuant to paragraph (d)(1) of this clause:

- (i) Within one business day from the date of such identification or notification: The contract number; the order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.
- (ii) Within 10 business days of submitting the information in paragraph (d)(2)(i) of this clause: Any further available information about mitigation actions undertaken or recommended. In addition, the contractor shall describe the efforts it undertook to prevent use or submission of covered telecommunications equipment or services, and any additional efforts that will be incorporated to prevent future use or submission of covered telecommunications equipment or

services.

(e) *Subcontracts*. The Contractor shall insert the substance of this clause, including this paragraph (e), in all subcontracts and other contractual instruments.

26. Domestic Preferences for Procurements (Required for Declarations and Awards after Nov 12, 2020)

As appropriate, and to the extent consistent with law, the contractor should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States. This includes, but is not limited to iron, aluminum, steel, cement, and other manufactured products.

For purposes of this clause:

Produced in the United States means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

Manufactured products mean items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

27. Davis-Bacon Act (Not Required On FEMA PA Grants)

(The Davis-Bacon Act only applies to the emergency Management Preparedness Grant Program, Homeland Security Grant Program, Nonprofit Security Grant Program, Tribal Homeland Security Grant Program, Port Security Grant Program, and Transit Security Grant Program for all awarded construction contracts with a value greater than \$2,000.00. It **does not apply to other FEMA grant and cooperative agreement programs, including the Public Assistance Program.**)

28. Affirmative Socioeconomic Steps: (Required for Declarations and Awards after Nov 12, 2020)

If subcontracts are to be let, the prime contractor is required to take all necessary steps identified in 2 C.F.R. § 200.321(b)(1)-(5) to ensure that small and minority businesses, women's business enterprises, and labor surplus area firms are used when possible.

29. Copyright and Data Rights:

The Contractor grants to the City of Lake Charles, a paid-up, royalty-free, nonexclusive, irrevocable, worldwide license in data first produced in the performance of this contract to reproduce, publish, or otherwise use, including prepare derivative works, distribute copies to

the public, and perform publicly and display publicly such data. For data required by the contract but not first produced in the performance of this contract, the Contractor will identify such data and grant to the City of Lake Charles, or acquires on its behalf a license of the same scope as for data first produced in the performance of this contract. Data, as used herein, shall include any work subject to copyright under 17 U.S.C. § 102, for example, any written reports or literary works, software and/or source code, music, choreography, pictures or images, graphics, sculptures, videos, motion pictures or other audiovisual works, sound and/or video recordings, and architectural works. Upon or before the completion of this contract, the Contractor will deliver to the City of Lake Charles, data first produced in the performance of this contract and data required by the contract but not first produced in the performance of this contract in formats acceptable by the City of Lake Charles.

30. Rights to inventions made under a contract or agreement

Funding Agreements: The regulation at 37 C.F.R. § 401.2(a) defines *funding agreement* as “any contract, grant, or cooperative agreement entered into between any federal agency, other than the Tennessee Valley Authority, and any contractor for the performance of experimental, developmental, or research work funded in whole or in part by the federal government. This term also includes any assignment, substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under a funding agreement as defined in the first sentence of this paragraph.

END OF SECTION

EXHIBIT B

CIVIL RIGHTS COMPLIANCE PROVISIONS

1. EQUAL EMPLOYMENT OPPORTUNITY (Equal Opportunity Clause)

(Applicable to Contracts and Subcontracts above \$10,000)

During the performance of this contract, the contractor agrees as follows:

- (1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- (2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- (3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- (4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for

further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided*, that if the applicant so participating is a state or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

2. **CERTIFICATION OF NONSEGREGATED FACILITIES**

(Applicable to Contracts and Subcontracts over \$10,000)

By the submission of this bid, the bidder, offeror, applicant or sub-Contractor certifies that he/she does not maintain or provide for his/her establishments, and that he/she does not permit employees to perform their services at any location, under his/her control, where segregated facilities are maintained. He/she certifies further that he/she will not maintain or provide for employees any segregated facilities at any of his/her establishments, and he/she will not permit employees to perform their services at any location under his/her control where segregated facilities are maintained. The bidder, offeror, applicant or sub-Contractor agrees that a breach of this certification is a violation of the equal opportunity clause of this contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation and housing facilities provided for employees which are segregated by explicit directive or are, in fact, segregated on the basis of race, color, religion, or national origin because of habit, local custom, or any other reason.

He/she further agrees that (except where he/she has obtained for specific time periods) he/she will obtain identical certification from proposed sub-Contractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the equal opportunity clause; that he/she will retain such certifications in his/her files; and that he/she will forward the following notice to such proposed sub-Contractors (except where proposed sub-Contractors have submitted identical certifications for specific time periods).

Signature of Contractor's Authorized Official

EXHIBIT C

ENVIRONMENTAL COMPLIANCE PROVISIONS

Compliance with Clean Air Act

1. The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.
2. The Contractor agrees to report each violation to the City and understands and agrees that the City will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.
3. The Contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FEMA.

Federal Water Pollution Control Act

1. The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.
2. The Contractor agrees to report each violation to the City and understands and agrees that the City will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.
3. The Contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FEMA.

Signature of Contractor's Authorized Official

EXHIBIT D

BYRD ANTI-LOBBYING CERTIFICATION

Certification for Contracts, Grants, Loans, and Cooperative Agreements per Appendix A to Part 18, 44 C.F.R Part 18.

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions .
3. The undersigned shall require that the language of this certification be included in the award documents for all sub awards at all tiers (including subcontracts, sub grants, and contracts under grants, loans, and cooperative agreements) and that all sub recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

Signature of Contractor's Authorized Official

Name and Title of Contractor's Authorized Official

Date

SECTION 00610

CONTRACTOR'S PERFORMANCE BOND

KNOW ALL PERSONS BY THIS INSTRUMENT, that we _____
as Principal, hereinafter referred to as CONTRACTOR, and the
_____, Surety Company, authorized to do
business in the State of Louisiana, as Surety, are held and firmly bound unto the City of Lake Charles,
Louisiana, hereinafter referred to as the OWNER, organized and existing under the laws of the State of
Louisiana in the penal sum of _____ DOLLARS
(\$ _____), in lawful money of the United States, for the payment of which well and
truly be made, the said principal and the said surety do hereby bind ourselves, our heirs, administrators,
and assigns, jointly and severally, by these present as follows:

THE CONDITION OF THIS OBLIGATION is such that whereas, the CONTRACTOR by an instrument in writing
attached hereto and entered into on the _____ day of _____, 20____ has agreed
with said OWNER to construct: _____

NOW, THEREFORE, if said CONTRACTOR shall well, truly and faithfully perform its duties, all the
undertakings, covenants, terms, conditions, and agreements of said contract during the original term
thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the
SURETY and during the one(1) year guaranty period and the CONTRACTOR shall satisfy all claims and
demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all
costs and damages which may suffer by reason of failure to do so, and shall reimburse and repay the
OWNER all outlay and expense which the OWNER may incur in making good any default, then this
obligation shall be void, otherwise to remain in full force and effect,

PROVIDED, FURTHER, That the said SURETY for value received hereby stipulates and agrees that no
change, extension of time, alterations, or addition to the terms of that contract, or the WORK to be
performed thereunder, or the SPECIFICATIONS, accompanying the same, shall in anyway affect its
obligation on this BOND, and it does hereby waive notice of any change, extension of time, alteration or
addition to the terms of the CONTRACTOR, or to the WORK, or to the SPECIFICATIONS.

PROVIDED, FURTHER, that it is expressly agreed that the BOND shall be deemed automatically and
immediately, without formal and separate amendments hereto, upon amendment to the Contract not
increasing the contract price more than twenty (20) percent, so as to bind the CONTRACTOR and the
SURETY to the full and faithful performance of the Contract as so amended. The term "Amendment",
wherever used in this BOND, and whether referring to this BOND, the Contract of the Loan Documents
shall include any alteration, addition, extension, or modification of character whatsoever:

The Date of this Performance Bond Shall be:

The _____ day of _____ 20____. (Not Earlier than Contract Date)

Surety and Contractor, intending to be legally bound hereby, subject to the terms of printed hereon, do each cause this Performance Bond to be duly executed on behalf by its authorized officer, agent, or representative.

ATTESTS: As to Principal

PRINCIPAL (SEAL)

(WITNESS)

(ADDRESS)

(WITNESS)

By _____

ATTESTS: As to Surety

SURETY (SEAL)

(WITNESS)

(ADDRESS)

(WITNESS)

By _____
ATTORNEY-IN-FACT

NOTE: Date of Bond shall not be prior to date of Contract.
If CONTRACTOR is a partnership, all partners should execute BOND.

END OF SECTION

SECTION 00615

CONTRACTOR'S PAYMENT BOND

KNOW ALL PERSONS BY THIS INSTRUMENT, that we _____
as Principal, hereinafter referred to as CONTRACTOR, and the
_____, SURETY Company, authorized to do
business in the State of Louisiana, as SURETY, are held and firmly bound unto the City of Lake Charles,
Louisiana, hereinafter referred to as the OWNER, organized and existing under the laws of the State of
Louisiana and unto all persons, firms, and corporations who or which may furnish labor, or who furnishes
materials to perform as described under the contract to their successors and assigns in the total aggregate
penal sum _____ DOLLARS
(\$ _____), in lawful money of the United States, for the payment of which well and
truly be made, the said principal and the said SURETY do hereby bind ourselves, our heirs, administrators,
and assigns, jointly and severally, by these present as follows:

THE CONDITION OF THIS OBLIGATION is such that whereas, the CONTRACTOR by an instrument in writing
attached hereto and entered into on the _____ day of _____, 20____ has agreed
with said OWNER to construct: _____

NOW, THEREFORE, if said CONTRACTOR shall promptly make payment to all persons, firms, and
corporations furnishing materials for or performing labor in the prosecution of the work provided for in
such contract and any authorized extensions or modification thereof, including all amounts due for
materials, lubricants, oil, gasoline, repairs on machinery, equipment, and tools, consumed or used in
connection with the construction of such work, and for all labor cost incurred in such work including that
by a SUBCONTRACTOR, and to any mechanic or materialman lienholder whether it acquires its lien by
operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and
effect,

PROVIDED, FURTHER, That the said SURETY for value received hereby stipulates and agrees that no
change, extension of time, alterations, or addition to the terms of that contract, or the work to be
performed thereunder, or the Specifications, accompanying the same, shall in anyway affect its obligation
on this BOND, and it does hereby;

PROVIDE, FURTHER, that no suit or action shall be commenced hereunder by any claimant:

- a) Unless claimant, other than one having a direct contract with the CONTRACTOR, shall
have given written notice to any two of the following: The CONTRACTOR, the OWNER, or
the SURETY above named within ninety (90) days after such claimant did or performed
the last of the work or labor, or furnished the last of the materials for which said claim is

made; starting with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the CONTRACTOR, OWNER, or SURETY, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the states in which the aforesaid project is located, save that such service need not be made by a public officer.

- b) After the expiration of one (1) year following the date of which CONTRACTOR ceased work on said CONTRACT, it being understood, however, that if any limitation embodied in the BOND is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED, FURTHER, that it is expressly agreed that the BOND shall be deemed automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the Contract price more than twenty (20) percent, so as to bind the CONTRACTOR and the SURETY to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, the Contract of the Loan Documents shall include any alteration, addition, extension, or modification of character whatsoever:

In faith whereof, we have subscribed this obligation at _____ .

WITNESS OUR HANDS AND SEALS, this _____ day of _____ 20____.

ATTESTS: As to Principal

PRINCIPAL (SEAL)

(WITNESS)

(ADDRESS)

(WITNESS)

By _____

ATTESTS: As to Surety

SURETY (SEAL)

(WITNESS)

(ADDRESS)

(WITNESS)

By _____
ATTORNEY-IN-FACT

NOTE: Date of Bond shall not be prior to date of Contract.
If CONTRACTOR is a partnership, all partners should execute BOND.

END OF SECTION

SECTION 00640

CITY OF LAKE CHARLES NOTICE TO PROCEED

Project: Lake Charles Public Works New Facility Phase 2

Owner: City of Lake Charles, LA

Owner's Contract No.: DR002

Architect: Brossett Architect, LLC

Architect's Project No.: 24009BA

Contractor:

Contractor's Address:

You are notified that the Contract Times under the above Contract will commence to run on _____. On or before that date, you are to start performing your obligations under the Contract Documents. Work on the project shall begin no later than ten (10) calendar days after the date stipulated in this Notice to Proceed. In accordance with Article 3 of the Agreement, the date of substantial completion is _____, _____, and the date of readiness for final payment is _____, _____.

Before you may start any Work at the Site, Paragraph 11.1.2 of the General Conditions provides that you and OWNER must each deliver to the other (with copies to Architect and other identified additional insureds and loss payees) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Also, before you may start any Work at the Site, you must:

CITY OF LAKE CHARLES, LOUISIANA
OWNER

AUTHORIZED SIGNATURE

TITLE

DATE

SECTION 00650
CHANGE ORDER

Owner:	City of Lake Charles, LA	Change Order No.:	<u>1</u>
Project Name:	Lake Charles Public Works New Facility Phase 2	City Project No.	DR002
Contractor:		Contract Date:	
Architect:	Brossett Architect, LLC	Notice to Proceed Date	

The contract is changed as follows:

Original Contract Value:	\$	1,000.00
Change Order Request :	\$	-
Percent Increase:	0.000%	
Cumulative Cost of Previous Change Orders	\$	-
Cumulative Cost of Change Orders to Date:	\$	-
Percent Increase (Cumulative):	0.000%	
Contract Value including all Changed Orders to date:	\$	1,000.00
 Original Substantial Completion Date		0-Jan-00
days per original contract:		100
previous Change Orders increase contract days by:		0
this Change Order increases contract days by:		0
Substantial Completion Date with all approved Change Orders:		0-Jan-00

RECOMMENDED:

ACCEPTED:

Architect (Firm Name)

Contractor (Firm Name)

Address

Address

City, State & Zip

City, State & Zip

By (Type/Print)

By (Type/Print)

By (Authorized Signature)

By (Authorized Signature)

Date

Date

CITY OF LAKE CHARLES

P.O. BOX 900

LAKE CHARLES, LA 70602

APPROVED BY: City of Lake Charles
OWNER

CITY OF LAKE CHARLES FINANCE DIRECTOR

By (Authorized Signature)

By (Signature)

Herman Stevens
By (Type/Print)

Emily K. McDaniel
By (Type/Print)

Date

Date

CHANGE ORDER

Owner:	City of Lake Charles, LA	Change Order No.:	<u>1</u>
Project Name:	Lake Charles Public Works New Facility Phase 2	City Project No.	<u>DR002</u>
Contractor:	0	Contract Date:	<u>1/0/00</u>
Architect:	Brossett Architect, LLC	Notice to Proceed Date	<u>1/0/00</u>

This document shall become an amendment to the contract, and all provisions of the contract will apply thereto.

You are hereby directed to make and comply with the following changes in the Contract Documents:

Contract completion time is increased by: 0 CALENDAR DAYS

Item No.	DESCRIPTION and EXPLANATION of Change(s): (Quantities, Units, Unit Prices, Change in Completion Schedule, Etc.)	Change in Project Funds

Description

For the lump sum amount of \$100.00
Add 1 @ \$100.00/lump sum \$ -

Explanation

Attachments (list documents supporting change):

TOTAL Amount Added This Change Order \$ -

SECTION 00660

FIELD ORDER

FIELD ORDER NO: _____

Date of Issuance: _____ Effective Date: _____

Project: Lake Charles Public Works New Facility Phase 2

Owner: City of Lake Charles	Owner's Contract No.: DR002
Architect's Firm: Brossett Architect, LLC	Architect's Project No:24009BA
Contractor:	Date of Contract:

Attention:

You are hereby directed to promptly execute this Field Order issued in accordance with General Conditions Paragraph 4.2.10.11 , for minor changes in the Work without changes in Contract Price or Contract Times. If you consider that a change in Contract Price or Contract Times is required, please notify the Architect immediately and before proceeding with this Work.

Reference: _____
(Specification Section(s)) (Drawing(s) / Detail(s))

Description:

Attachments:

	Architect:

Receipt Acknowledged by Contractor:	Date:

SECTION 00670

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: Lake Charles Public Works New Facility Phase 2	
Owner: City of Lake Charles, Louisiana	Owner's Contract No.: DR002
Architect's Firm: Brossett Architect, LLC	Architect's Project No.: 24009BA
Contractor:	Date of Contract:

This [tentative] [definitive] Certificate of Substantial Completion applies to:

☐ All Work under the Contract Documents: ☐ The following specified portions of the Work:

Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, CONTRACTOR, and Architect, and found to be substantially complete. The Date of Substantial Completion of the Project or portion thereof designated above is hereby declared and is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

A [tentative] [revised tentative] [definitive] list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the CONTRACTOR to complete all Work in accordance with the Contract Documents.

The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as provided in the Contract Documents except as amended as follows:

☐ Amended Responsibilities ☐ Not Amended

Owner's Amended Responsibilities:

Contractor's Amended Responsibilities:

The following documents are attached to and made part of this Certificate:

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of CONTRACTOR's obligation to complete the Work in accordance with the Contract Documents.

Recommended by Architect	Date
Accepted by Contractor	Date
Accepted by Owner	Date

END OF SECTION



AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

CoLC contract
Lake Charles

THE OWNER:

(Name, legal status and address)

City of Lake Charles
329 Pujo Street
Lake Charles, LA 70601

THE ARCHITECT:

(Name, legal status and address)

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ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. The Contract Documents shall include the bidding documents as listed in the instructions to bidders and any modifications made thereto by addenda.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or

unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These

obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

(Paragraph deleted)

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further

warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains unmarked burial or archaeological sites, burial artifacts, or wetlands, which are not indicated in the Contract Documents, the Contractor shall follow all procedures mandated by State and Federal law, including but not limited to La.R.S. 8:671 et seq., La.R.S. 49:214.1 et seq., and Sections 401 & 404 of the Federal Clean Water Act.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection. Allowances shall be in accordance with La.R.S. 38:2212K.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not be unreasonably withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. For Projects with a Contract Sum greater than \$1,000,000, the Contractor shall include with the schedule, for the Owner's and Architect's information, a network analysis to identify those tasks which are on the critical path, i.e. where any delay in the completion of these tasks will lengthen the Project timescale, unless action is taken. A revised schedule shall be submitted with each Application and Certificate for Payment. No payment will be made until this schedule is received.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect. If the Work is not on schedule, as determined by the Architect, and the Contractor fails to take action to bring the Work on schedule, then the Contractor shall be deemed in default under this Contract and the progress of the Work shall be deemed unsatisfactory. Such default may be considered grounds for termination by the Owner for cause in accordance with Section 14.2.

§ 3.10.4 Submittal by the Contractor of a schedule or other documentation showing a completion date for its Work prior to the completion date stated in the contract shall not impose any obligation or responsibility on the Owner or Architect for the earlier completion date.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities

for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings,

Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall release, protect, defend, indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees and court costs, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The term Architect, when used in the Contract Documents, shall mean the prime designer (architect, engineer or landscape architect), or its authorized representative, lawfully licensed to practice architecture, engineering or landscape architecture in the State of Louisiana, identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until final payment is due, and with the Owner's concurrence, from time to time during the one year period for correction of Work described in Section 12.2. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed to endeavor to guard the Owner against defects and deficiencies in the Work,, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives. There will be no restriction on the Owner having a representative. The duties and responsibilities of the PR are limited to those of Architect in Architect's agreement with the Owner and in the construction Contract Documents, and are further limited and described as follows:

- .1 Architect shall furnish a Project Representative ("PR"), assistants and other field staff to assist Architect in observing progress and quality of the work of Contractor. Though more extensive on-site observations of the Work in progress and field checks of materials and equipment by the PR and assistants, Architect shall endeavor to provide further protection for Owner against defects and deficiencies in the work of Contractor. However, Architect shall not, during such visits or as a result of such observations of Contractor's work in progress, supervise, direct, or have control over Contractor's work nor shall Architect have authority over or responsibility for the means, methods, techniques, sequences or procedures selected by Contractor, for safety precautions and programs incident to the work of Contractor, for any failure of Contractor to comply with laws, rules,

regulations, ordinances, codes or orders applicable to Contractor's performing and furnishing the work, or responsibility of construction for Contractor's failure to furnish and perform the Work in accordance with the Contract Documents.

- .2 APR is Architect's agent at the Site, will act as directed by and under the supervision of Architect, and will confer with Architect regarding PR's actions. PR's dealings in matters pertaining to the on-site Work shall in general be with Architect and Contractor, keeping Owner advised as necessary. PR's dealing with Subcontractors shall only be through or with the full knowledge and approval of Contractor. PR shall generally communicate with Owner with the knowledge of and under the direction of Architect.
- .3 Schedules: Review the progress schedule, schedule of Shop Drawing submittals and schedule of values prepared by Contractor and consult with Architect concerning acceptability.
- .4 Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.
- .5 Liaison:
 1. Serve as Architect's liaison with Contractor, working principally through Contractor's superintendent and assist in understanding the intent of Contract Documents; and assist Architect in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-site operations.
- .6 Shop Drawings and Samples:
 1. Record date of receipt of Shop Drawings and Samples.
 2. Receive Samples, which are furnished at the site by Contractor, and notify Architect of availability of Samples for examination.
 3. Advise Architect and Contractor of the commencement of any Work requiring a Shop Drawing or Sample if the submittal has not been approved by Architect.
- .7 Review of Work, Rejection of Defective Work, Inspections and Tests:
 1. Conduct on-site observations of the Work in progress to assist Architect in determining if the Work is in general proceeding in accordance with the Contract Documents.
 2. Report to Architect whenever PR believes that any Work will not produce a completed Project that conforms generally to the Contract Documents or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Architect of Work that PR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
 3. Verify that tests, equipment, and system start-ups operating and maintenance training are conducted in the presence of appropriate personnel, and that Contractor maintains adequate records thereof; and observe, record and report to Architect appropriate details relative to the test procedures and start-ups.
 4. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to Architect.
- .8 Interpretation of Contract Documents: Report to Architect when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor Clarifications and interpretations as issued by Architect.
- .9 Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report with PR's recommendations to Architect. Transmit to Contractor in writing decisions as issued by Architect.
- .10 Records:

1. Maintain at the job Site orderly files for correspondence, reports of job conferences, Shop Drawings and Samples, reproductions of original Contract Documents including all Work Change Directives, Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Contract, Architect's clarifications and interpretations of the Contract Documents, progress reports, Shop Drawing submittals received from and delivered to Contractor and other Project related documents.
2. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the job site, weather conditions, data relative to questions of Work Change Directives, Change Orders or changed conditions, list of job Site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Architect.
3. Record names, addresses and telephone numbers of all Contractors, Subcontractors and major suppliers of materials and equipment.

.11 Reports:

1. Furnish to Architect periodic reports as required of progress of the Work and of Contractor's compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.
2. Consult with Architect in advance of scheduled major tests, inspections or start of important phases of the Work.
3. Draft proposed Change Orders and Work Change Directives, obtaining backup material from Contractor and recommend to Architect Change Orders, Work Change Directives, and Field Orders.
4. Report immediately to Architect and Owner the occurrence of any accident.

.12 Payment Requests: Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Architect, noting particularly the relationship of the payment requested to the schedule of values, Work completed and materials and equipment delivered at the Site but not incorporated in the Work.

.13 Certificates, Maintenance and Operation Manuals: During the course of the Work, verify that certificates, maintenance and operation manuals and other data required to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to Architect for review and forwarding to Owner prior to final payment for the Work.

.14 Completion:

1. Before Architect issues a Certificate of Substantial Completion, submit to Contractor a list of observed items requiring completion or correction.
2. Observe whether Contractor has had performed inspections required by laws, rules, regulations, ordinances, codes, or orders applicable to the Work, including but not limited to those to be performed by public agencies having jurisdiction over the Work.
3. Conduct a final inspection in the company of Architect, Owner and Contractor and prepare a final list of items to be completed or corrected.
4. Observe whether all items on final list have been completed or corrected and make recommendations to Architect concerning acceptance and issuance of the Notice of Acceptability of the Work.

.15 Limitations on authority of PR.

1. Shall not authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items), unless authorized by Architect.
2. Shall not exceed limitations of Architect's authority as set forth in the Agreement or the Contract Documents.
3. Shall not undertake any of the responsibilities of Contractor, Subcontractor, Suppliers, or Contractor's superintendent.

4. Shall not advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the Contract Documents.
5. Shall not advise on, issue directions regarding or assume control over safety precautions and programs in connection with the Work.
6. Shall not accept Shop Drawing or Sample submittals from anyone other than Contractor.
7. Shall not authorize Owner to occupy the Project in whole or in part.
8. Shall not participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by Architect.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretation required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretation until 15 days after written request is made for them.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which response required of the Architect shall be furnished in compliance with this Section 4.2.14, then delay shall not be recognized on account of failure by the Architect to furnish such interpretation until 15 days after written request is made for them. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, shall furnish at the pre-construction conference, to the Owner and the Architect, in writing, the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. No Contractor payments shall be made until this information is received.

§ 5.2.2 The Contractor shall be solely responsible for selection and performance of all Subcontractors. The Contractor shall not be entitled to claims for additional Contract Time and/or an increase in the Contract Sum due to a problem with performance or non-performance of a Subcontractor.

§ 5.2.3 The Contractor shall notify the Owner when a Subcontractor is to be changed and substituted with another Subcontractor.

(Paragraph deleted)

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

(Paragraphs deleted)

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.1.4 As part of the pre-construction conference submittals, the Contractor is to submit the following prior to the commencement of Work:

- .1** Fixed job site overhead cost itemized with documentation to support daily rates.
- .2** Bond premium rate with supporting information from the Contractor's carrier.
- .3** Labor burden by trade for both Subcontractors and the Contractor.
- .4** Internal rate charges for all significant Contractor-owned equipment.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written order to the Contractor signed by the Owner and the Architect, issued after the execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum or the Contract Time.

§ 7.2.2 "Cost of the Work" for the purpose of Change Orders shall be costs required to be incurred in performance of the Work and paid by the Contractor and Subcontractors which shall consist of:

1. Wages paid direct labor personnel, delineating a labor burden markup for applicable payroll taxes, worker's compensation insurance, unemployment compensation, and social security taxes.
2. Cost of all materials and supplies, including the identification of each item and its cost.
3. Identify each necessary piece of machinery and equipment and its individual cost.
4. Other documented direct costs. Credit will not be required for overhead and profit.

§ 7.2.3 "Overhead and Profit"

The Contractor and Subcontractor shall be due job-site and home office fixed overhead and profits on the Cost of the Work, but shall not exceed a total of 25% of the direct cost of any portion of Work:

The credit to the Owner resulting from a change in the Work shall be the sum of those items above, except credit will

not be required for overhead and profit. Where a change results in both credits to the Owner and extras to the Contractor for related items, overhead and profit will only be computed on the net extra cost to the Contractor.

§ 7.2.4 The cost to the Owner resulting from a change in the Work shall be the sum of: "Cost of the Work" (as defined at Section 7.2.2) and "Overhead and Profit" (as defined at Section 7.2.3), and shall be computed as follows:

- .1** When all of the Work is general Contract Work; 15% markup on the Cost of the Work.
- .2** When the Work is all Subcontract Work; 15% markup on the Cost of the Work for Subcontractor's Overhead and Profit, plus 10% markup on the Cost of the Work, not including the Subcontractor's Overhead and Profit markup, for the Contractor's Overhead and Profit.
- .3** When the Work is a combination of general Contract Work and Subcontract Work; that portion of the direct cost that is general Contract Work shall be computed per Section 7.2.4.1 and that portion of the direct cost that is Subcontractor work shall be computed per Section 7.2.4.2. Bond premiums may be included, but after markup is added to the Cost of the Work.
- .4** Subcontractor cost shall consist of the items in Section 7.2.2 above plus Overhead and Profit as defined in Section 7.2.3.

§ 7.2.5 Before a Change Order is prepared, the Contractor shall provide and deliver to the Architect the following information concerning the Cost of the Work, not subject to waiver, within a reasonable time after being notified to prepare said Change Order:

- .1** A detailed itemized list of labor, material and equipment costs for the Contractor's Work including quantities and unit costs for each item of labor, material and equipment.
- .2** An itemized list of labor, material and equipment costs for each Subcontractor's and/or Sub-Subcontractor's Work including quantities and unit costs for each item of labor, material, and equipment.

§ 7.2.6 After a Change Order has been approved, no future requests for extensions of time or additional cost shall be considered for that Change Order.

§ 7.2.7 The Contractor will be due extended fixed job-site overhead for time delays only when complete stoppage of Work occurs causing a Contract completion extension, and the Contractor is unable to mitigate financial damages through replacement Work. Such stoppage must be due to acts or omissions solely attributable to the Owner. In all cases the Contractor is to notify the designer in writing as required by this contract. Reasonable proof may be required by the Architect that alternate Work could not be performed. Reasonable proof may be required by the Architect that the stoppage affected the completion date.

§ 7.2.8 Cost of the Work, whether Contract cost or Subcontract Cost, shall not apply to the following:

- .1** Salaries or other compensation of the Contractor's personnel at the Contractor's principal office and branch offices.
- .2** Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the Work.
- .3** Overhead and general expenses of any kind or the cost of any item not specifically and expressly included above in Cost of the Work.
- .4** Cost of supervision not specifically required by the Change Order.

§ 7.2.9 When applicable as provided by the Contract, the cost to Owner for Change Orders shall be determined by quantities and unit prices. The quantity of any item shall be as submitted by the Contractor and approved by the Architect. Unit prices shall cover the cost of material, labor, equipment, Overhead and Profit.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly but not to exceed a specified amount.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total costs of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the

Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.1.5 The Contract Time shall not be changed by the submission of a schedule that shows an early completion date unless specifically authorized by Change Order.

§ 8.2 Progress and Completion

§ 8.2.1 Time is of the essence and completion of the Work must be within the time for completion stated in the Agreement, subject to such extensions as may be granted under Section 8.3. The Contractor agrees to commence Work not later than fourteen (14) days after the transmittal date of Written Notice to Proceed from the Owner and to substantially complete the Project within the time stated in the Contract. The Owner will suffer financial loss if the Project is not substantially complete in the time set forth in the Contract Documents. The Contractor and the Contractor's Surety shall be liable for and shall pay to the Owner the sum stated in the Contract Documents as fixed, agreed and liquidated damages for each consecutive calendar day (Saturdays, Sundays, and holidays included of delay until the Work is substantially complete. The Owner shall be entitled to the sum stated in the Contract Documents. Such liquidated damages shall be withheld by the Owner from the amounts due the Contractor for progress payments.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending litigation; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may recommend, subject to the Owner's approval of Change Order. If the Claim is not made within the limits of Article 15, all right for future Claims for that month are waived.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

At the pre-construction conference, the Contractor shall submit to the Owner and the Architect a schedule of values prepared as follows:

§ 9.2.1 The attached Schedule of Values Format shall be used. If applicable, the Cost of Work for each section listed under each division, shall be given. The cost for each section shall include labor, materials, Overhead and Profit.

§ 9.2.2 The total of all items shall equal the total Contract Sum. This schedule, when approved by the Architect, shall be used only as a basis for the Contractor's Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 Monthly, the Contractor shall submit to the Architect an Application & Certificate for Payment on the AIA Document G702-1992, accompanied by AIA Document G703-1992, and supported by any additional data substantiating the Contractor's right to payment as the Owner or the Architect may require. Application for Payment shall be submitted on or about the first of each month for the value of labor and materials incorporated into the Work and of materials, suitably stored, at the site as of the twenty-fifth day of the preceding month, less normal retainage as follows, per LaR.S.38:2248:

§ 9.3.1.1 Projects with Contract price up to \$500,000.00 - 10% of the Contract price.

§ 9.3.1.2 Projects with Contract price of \$500,000.00, or more - 5% of the Contract price.

§ 9.3.1.3 No payment will be made until the revised schedule required by Section 3.10.1 is received. The normal retainage shall not be due the Contractor until after Substantial Completion and expiration of the forty-five day lien period and submission to the Architect of a clear lien certificate and invoice for retainage.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. Payments for materials or equipment stored on the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, including applicable insurance.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect.

However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

(Paragraph deleted)

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment within twenty (20) days except for Projects funded fully or in part by a Federal reimbursement program. For such Projects the Owner will make payment in a timely manner consistent with reimbursement.

§ 9.6.2 The Contractor shall pay each Subcontractor after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner. La.R.S. 9:2784 (A) and (C) requires a Contractor or Subcontractor to make payment due to each Subcontractor and supplier within fourteen (14) consecutive days of the receipt of payment from the Owner. If not paid within such 14-day period, a penalty in the amount of 1/2 of 1% of the amount due, per day, shall be paid by the Contractor or Subcontractor to the applicable Subcontractor and/or supplier, up to a maximum of 15% of the outstanding balance due, from the expiration date until paid. The Contractor or Subcontractor, whichever is applicable, is solely responsible for payment of such penalty.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law. Pursuant to La. R.S. 38:2242 et seq., when the Owner receives any claim of nonpayment arising out of the Contract, the Owner shall deduct 125% of such claim from the Contract Sum. The Contractor, or any interested party, may deposit security, in accordance with La. R.S. 38:2242.2, guaranteeing payment of the claim with the recorder of mortgages of the parish where the Work has been done. When the Owner receives original proof of such guarantee from the recorder of mortgages, the claim deduction will be added back to the Contract Sum.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall release, protect, defend, hold harmless and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

Reserved

(Paragraphs deleted)

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The Architect shall determine if the Project has reached the stage of Substantial Completion in accordance with this Subparagraph.

§ 9.8.2 When the Contractor considers that the Work is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work is substantially complete. A prerequisite to the work being accepted as substantially complete is the Owner's receipt of the executed roofing Contractor's and roofing manufacturer's guarantees, where roofing Work is part of the Contract. Prior to inspection by the Architect, the Contractor shall notify the Architect that the Project is ready for inspection by the State Fire Marshal's office. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use, the Contractor shall, before acceptance of the Work as substantially complete, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Architect determines that the Project is substantially complete, he shall prepare a "punch list" of exceptions and the dollar value related thereto. The monetary value assigned to this list will be the sum of the cost estimate for each particular item of Work the Architect develops based on the mobilization, labor, material and equipment costs of correcting the item and shall be retained from the monies owed the Contractor, above and beyond

the standard lien retainage. The cost of these items shall be prepared in the same format as the schedule of values. At the end of the forty-five (45) day lien period, payment shall be approved for all punch list items completed up to that time. After that payment, none of the remaining funds shall be due the Contractor until all punch list items are completed and are accepted by the Architect. If the dollar value of the punch list exceeds the amount of funds, less the retainage amount, in the remaining balance of the Contract, then the Project shall not be accepted as substantially complete. If funds remaining are less than that required to complete the Work, the Contractor shall pay the difference.

§ 9.8.5 When the "punch list" is complete the Architect shall prepare a Recommendation of Acceptance" incorporating the punch list and submit it to the Owner. Upon approval of the Recommendation of Acceptance, the Owner may issue a Notice of Acceptance of Building Contract which shall establish the Date of Substantial Completion. The Contractor will record the Notice of Acceptance with the Clerk of Court in the Parish in which the Work has been performed. If the Notice of Acceptance has not been recorded seven (7) days after issuance, the Owner may record the acceptance at the Contractor's expense.

§ 9.8.6 Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work unless otherwise agreed to in writing by the Owner and Contractor. Unless otherwise agreed to in writing by Owner and Contractor, security, maintenance, heat, utilities, damage to the Work not covered by the punch list and insurance shall become the Owner's responsibility on the Date of Substantial Completion.

§ 9.8.7 If all punch list items have not been completed by the end of the forty-five (45) day lien period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within forty-five (45) days after notification, the Surety has not completed the punch list, through no fault of the Architect or Owner, the Owner may, at its option, contract to have the balance of the Work completed and pay for such Work with the unpaid funds remaining in the Contract Sum. Finding the Contractor in default shall constitute a reason for disqualification of the Contractor from bidding on future contracts. If the Surety fails to complete the punch list within the stipulated time period, the Owner may not accept bonds submitted, in the future, by the Surety.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 Partial Occupancy is the stage in the progress of the Work when a designated portion of the Work is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the designated portion of the Work for its intended use. The Owner may occupy or use any substantially completed portion of the Work so designated by separate agreement with the Contractor and authorized by public authorities having jurisdiction over the Work. Such occupancy or use may commence provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers the designated portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Subparagraph 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. If the Architect does not find the Work acceptable under the Contract Documents, the Architect shall make one additional inspection. If the Work is still not acceptable, the Architect, and each of the Architect's principal consultants, shall be paid \$150.00/hour for their time at the project site, for each additional inspection, to be withheld from the unpaid funds remaining in the Contract Sum. The payment shall be made by the Owner and deducted from the construction contract funds. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the

final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1** liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2** failure of the Work to comply with the requirements of the Contract Documents;
- .3** terms of special warranties required by the Contract Documents; or
- .4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

§ 9.10.6 In response to Federal Arbitration regulations: if such compliance has not been effected within 90 days of the date of acceptance, the Contract shall be terminated and no further opportunity will be granted the Contractor and no further payments will be made on this Contract.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1** employees on the Work and other persons who may be affected thereby;
- .2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and

- .3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on the health and safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB) or lead, encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. The Contract Time shall be extended appropriately.

§ 10.3.3 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.4 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.5 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

(Paragraph deleted)

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall notify the Owner and Architect immediately of the emergency, simultaneously acting at its discretion to prevent damage, injury, or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency Work shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 All policies and certificates of insurance of the Contractor (and any Subcontractor(s)) shall contain the following clauses:

§ 11.1.1.1 The insurer will have no right of recovery or subrogation against the Owner, it being the intention of the parties that the insurance policies so affected shall protect both parties and the primary coverage for any and all losses covered by the below described insurance.

§ 11.1.1.2 The Owner shall be named as an additional insured as regards negligence by the Contractor (or applicable Subcontractor) (ISO Forms CG 1010, current form approved for use in Louisiana).

§ 11.1.1.3 The insurance companies issuing the policy or policies shall have no recourse against the Owner for payment of any premiums or for assessments under any form of policy.

§ 11.1.1.4 Any and all deductibles in the below described insurance policies shall be assumed by and be at the sole risk of the Contractor or Subcontractor.

§ 11.1.2 INSURANCE:

The Contractor (and any Subcontractor(s)), prior to commencing Work, shall provide to the Owner, at its own expense, proof of the following insurance coverages required by the Contract with insurance companies authorized in the State of Louisiana. Insurance is to be placed with insurers with an A.M. Best rating of no less than A-:VI. This rating requirement will be waived for the workers' compensation coverage.

Thirty days prior notice of cancellation shall be given to the Owner by registered mail, return receipt requested, on all of the required coverage provided to the Owner. All notices will name the Contractor (or Subcontractor, as applicable) and identify the Contract number.

Insurance coverage specified in the GENERAL CONDITIONS (AIA Document A 201, 2017 Edition) to be provided by the Contractor, and any other insurance described below shall be furnished with the following minimum limits:

§ 11.1.2.1 Workers' Compensation - Statutory - in compliance with the Workers' Compensation Law of the State where the Work is performed. Employer's liability insurance with a \$1,000,000 per occurrence limit when Work is to be over water and involves maritime exposures.

§ 11.1.2.2 Commercial General Liability Insurance with a combined single limit per occurrence for bodily injury and property damage. This insurance shall include coverage for bodily injury and property damage, and indicate on the Certificate of Insurance which of the seven (7) coverages required below are not included in the policy, if any:

- 1 Premises - Operations;5 Personal Injury;
- 2 Broad Form Contractual Liability;6 Broad Form Property Damage;
- 3 Products and Completed Operations;7 Explosion, Collapse, and Underground (XCU) Coverage
- 4 Use of Contractors & Subcontractors;

Note: On the Certificate of Insurance, under the description of operations, the following wording is required: THE AGGREGATE LOSS LIMIT APPLIES TO EACH PROJECT, or a copy of ISO form CG2503 (Current form approved for use in Louisiana) shall be submitted.

COMBINED SINGLE LIMIT (CSL) - AMOUNT OF INSURANCE REQUIRED

Type of Construction	Projects Under \$100,000	Projects \$100,001 - \$1,000,000	Projects Over \$1,000,000
New Buildings:			
-Each Occurrence/ Minimum Limit	\$500,000	\$1,000,000	\$3,000,000
-Aggregate (Applicable to this Contract ONLY)	\$500,000	\$1,000,000	\$3,000,000
Renovations:			
-Each Occurrence/ Minimum Limit	\$500,000*** (Depends On Building Value)	\$1,000,000*** (Depends On Building Value)	\$3,000,000*** (Depends On Building Value)
-Aggregate (Applicable to this Contract ONLY)	\$500,000*** (Depends On Building Value)	\$1,000,000*** (Depends On Building Value)	\$3,000,000*** (Depends On Building Value)

****While the minimum combined single limit of \$500,000 is required for all renovations, the value of a building shall be multiplied by 10% and insurance requirements will be increased at \$1,000,000 intervals and rounded to the nearest \$1,000,000. Example: Renovation on \$33,000,000 building would require \$3,000,000 minimum combined single limit of coverage. Maximum limit required is \$5,000,000.00 regardless of building value.*

§ 11.1.2.3 Business Automobile Liability Insurance with a combined single limit of \$1,000,000 per occurrence for bodily injury and property damage, unless otherwise indicated. This insurance shall include for bodily injury and property damage the following coverages:

- .1** Owned automobiles;
- .2** Hired automobiles;
- .3** Non-owned automobiles.

§ 11.1.2.4 An Umbrella Policy may be used to meet minimum requirements.

§ 11.1.3 All property losses shall be made payable to and adjusted with the Owner.

§ 11.1.4 All policies of insurance shall be approved by the contracting Owner prior to the inception of any Work.

§ 11.1.5 Other insurance required is as follows:

§ 11.1.5.1 Owner's Protective Liability Insurance shall be furnished by the Contractor and name the Owner as the Insured.

Projects Under	Projects \$100,001-	Projects Over

Init.

\$100,000	\$1,000,000	\$1,000,000	
CSL - Each Occurrence	\$500,000	\$1,000,000	\$3,000,000

§ 11.1.5.2 Asbestos Abatement Liability
(required when asbestos abatement is included in the Work)

The Contractor or Subcontractor who will be doing the asbestos abatement as outlined in this Contract shall obtain and maintain such liability coverage for the asbestos abatement hazard and exposure with minimum limits of \$1,000,000 per occurrence for the duration of the Project. The policy shall name the Owner as an additional insured for the Project. The policy shall be written on an "occurrence" form without a sunset clause. Claims-made coverage is unacceptable. The insurance company shall have an A.M. Best rating of at least A-:VI or better.

§ 11.1.6 If, at any time, any of the said policies shall be or become unsatisfactory to the Owner, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Owner, the Contractor/Subcontractor shall promptly obtain a new policy, submit the same to the Owner for approval and submit a certificate thereof as hereinabove provided.

Upon failure of the Contractor/Subcontractor to furnish, deliver and maintain such insurance as above provided, this contract, at the election of the Owner, may be forthwith declared suspended, discontinued or terminated. Failure of the Contractor/Subcontractor to take out and/or to maintain or the taking out and/or maintenance of any required insurance, shall not relieve the Contractor/Subcontractor from any liability under the contract, nor shall the insurance requirements be construed to conflict with the obligations of the Contractor/Subcontractor concerning indemnification. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time.

§ 11.1.7 RISKS AND INDEMNIFICATIONS ASSUMED BY THE CONTRACTOR Neither the acceptance of the completed Work nor payment therefore shall release the Contractor/Subcontractor from its obligations from the insurance requirements or indemnification obligations hereunder.

§ 11.1.7.1 Additional insurance may be required on an individual basis for extra hazardous contracts and specific service agreements.

If such additional insurance is required for a specific contract, that requirement will be described in the "Special Conditions" of the contract specifications.

§ 11.1.7.2 If any of the property and casualty insurance requirements are not complied with at their renewal dates, payments to the Contractor/Subcontractor will be withheld until those requirements have been met, or at the option of the Owner, the Owner may pay the renewal premium and withhold such payments from any monies due the Contractor/Subcontractor.

§ 11.1.7.3 All property losses shall be made payable to and adjusted with the Owner.

§ 11.1.7.4 All policies and certificates of insurance shall be approved by the contracting agency prior to the inception of any Work.

§ 11.1.7.5 If at any time any of the foregoing policies shall be or become unsatisfactory to the Owner, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Owner, the Contractor/Subcontractor shall, upon notice to that effect from the Owner, promptly obtain a new policy, submit the same to the Owner for approval and submit a certificate thereof as hereinabove provided. Upon failure of the Contractor/Subcontractor to furnish, deliver and maintain such insurance as above provided, this Contract, at the election of the Owner, may be forthwith declared suspended, discontinued or terminated. Failure of the Contractor/Subcontractor to take out and/or maintain or the taking out and/or maintenance of any required insurance, shall not relieve the Contractor/Subcontractor from any liability under the Contract, nor shall the insurance requirements be construed to conflict with or otherwise limit the obligations of the Contractor/Subcontractor concerning indemnification. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time.

§ 11.1.8 SUBCONTRACTORS

Contractor shall include all Subcontractors as insureds under its policies or shall furnish separate certificates from each Subcontractor. All coverages for Subcontractors shall be subject to all of the requirements stated herein.

§ 11.1.9 CERTIFICATE OF INSURANCE

Contractor shall furnish the Owner with certificates of insurance affecting coverage required by this clause. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates of insurance must also contain the following in the "Description of Operations" section:

- .1** If the Contractor is a general contractor, then so state.
- .2** If the Contractor is a specialty contractor, then so state and provide the list of specialties for which the Contractor is insured.

The certificates are to be received and approved by the Owner before work commences. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time.

§ 11.1.10 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. Owner's insurance policies, if any, operate separately and independently from policies required to be provided by the Contractor, and Contractor cannot rely upon Owner's insurance policies for any of Contractor's obligations to the Owner, Architect, or third parties.

(Paragraphs deleted)

§ 11.3 Insurance Requirements for Subcontractors

Contractor shall procure and maintain for the duration of the Contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by the Contractor, his agents, representatives, employees or Subcontractors. The cost of such insurance shall be included in the Contractor's bid.

§ 11.3.1 MINIMUM SCOPE OF INSURANCE

Coverage shall be at least as broad as:

§ 11.3.1.1 Insurance Services Office Commercial General Liability coverage ("occurrence") form CG 0001. (Current form approved for use in Louisiana.) "Claims Made" form is unacceptable. The "occurrence form" shall not have a "sunset clause".

§ 11.3.1.2 Insurance Services Office form number CA 0001 (Current form approved for use in Louisiana.) covering Automobile Liability. The policy shall provide coverage for owned, hired, and non-owned coverage. If an automobile is to be utilized in the execution of this Contract, and the vendor/contractor does not own a vehicle, then proof of hired and non-owned coverage is sufficient.

§ 11.3.1.3 Workers' Compensation insurance as required by the Labor Code of the State of Louisiana, including Employers Liability insurance.

§ 11.3.2 MINIMUM LIMITS OF INSURANCE

Contractor shall maintain limits no less than:

(Paragraphs deleted)

§ 11.3.2.1 Commercial General Liability: \$500,000 combined single limit per occurrence for bodily injury, personal injury and property damage (or higher limits depending on size of contract.)

(Paragraph deleted)

§ 11.3.2.2 Automobile Liability: \$500,000 combined single limit per accident, for bodily injury and property damage (or higher limits depending on size of contract).

§ 11.3.2.3 Workers Compensation and Employers Liability: Workers' Compensation limits as required by the Labor Code of the State of Louisiana and Employers Liability coverage. Employers liability limit is to be \$1,000,000 when Work is to be over water and involves maritime exposure.

§ 11.3.3 DEDUCTIBLES AND SELF-INSURED RETENTIONS

Any deductibles or self-insured retentions must be declared to and approved by the Owner. At the option of the Owner, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Owner, its officers, officials, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

§ 11.3.4 OTHER INSURANCE PROVISIONS

The insurance policies to be carried by the Contractor hereunder are to contain, or be endorsed to contain, the following provisions:

§ 11.3.4.1 General Liability and Automobile Liability Coverages

- .1** The Owner, its officers, officials, employees, and volunteers are to be added as "additional insureds" as respects liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor, premises owned, occupied or used by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Owner, its officers, officials, employees or volunteers.
It is understood that the business auto policy under "Who is an Insured" automatically provides liability coverage in favor of the Owner.
- .2** Any failure to comply with reporting provisions of the policy shall not affect coverage provided to the Owner, its officers, officials, employees, or volunteers.
- .3** The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

§ 11.3.4.2 Workers' Compensation and Employers' Liability Coverage The insurer shall agree to waive all rights of subrogation against the Owner, its officers, officials, employees and volunteers for losses arising from Work performed by the Contractor for the Owner.

§ 11.3.4.3 All Coverages

Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to the Owner.

§ 11.3.5 ACCEPTABILITY OF INSURERS

Insurance is to be placed with insurers with an A.M. Best's rating of no less than A-:VI. This rating requirement will be waived for the workers' compensation coverage.

§ 11.3.6 VERIFICATION OF COVERAGE

Contractor shall furnish the Owner with certificates of insurance effecting coverage required. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates of insurance must also contain the following in the "Description of Operations" section:

If the Contractor is a general contractor, then so state.

If the Contractor is a specialty contractor, then so state and provide the list of specialties for which the contractor is insured.

The certificates are to be received and approved by the Owner before Work commences. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time.

§ 11.4 Property Insurance

§ 11.4.1 The general contractor shall purchase and maintain property insurance upon the entire Work included in the Contract for an amount equal to the greater of the full-completed value or the amount of the construction contract including any amendments thereto. The general Contractor's policy shall provide "ALL RISK" Builder's Risk insurance (extended to include the perils of wind, collapse, vandalism/malicious mischief, and theft, including theft of materials whether or not attached to any structure.) The "All Risk" Builder's Risk Insurance must also cover architects' and engineers' fees that may be necessary to provide plans and specifications and supervision of Work for the repair and/or replacement of property damage caused by a covered peril not to exceed 10% of the cost of those repair and/or replacements.

A specialty contractor shall purchase and maintain property insurance upon the system to be installed for an amount equal to the greater of the full-completed value or the amount of the contract including any amendments thereto. The specialty contractor may provide an installation floater with the same coverage as the "ALL RISK" Builder's Risk insurance policy.

The policy must include the interest of the Owner, Contractor and Subcontractors as their interest may appear. The Contractor has the right to purchase coverage or self-insure any exposures not required by the bid specifications, but shall be held liable for all losses, deductibles, self-insurance for coverages not required.

Policies insuring Projects involving additions, alterations or repairs to existing buildings or structures must include an endorsement providing the following:

In the event of a disagreement regarding a loss covered by this policy which may also be covered by the Owner or any commercial property insurance policy purchased by the Owner, this company agrees to follow the following procedure to establish coverage and/or the amount of loss:

Any party to a loss may make written demand for an appraisal of the matter in disagreement. Within 20 days of receipt of written demand, this company and either ORM or its commercial insurance company shall each select a competent and impartial appraiser and notify the other of the appraiser selected. The two appraisers will select a competent and impartial umpire. The appraisers will then identify the policy or policies under which the loss is insured and, if necessary, state separately the value of the property and the amount of the loss that must be borne by each policy. If the two appraisers fail to agree, they shall submit their differences to the umpire. A written decision by any two shall determine the policy or policies and the amount of the loss. Each insurance company (or ORM) agree that the decision of the appraisers and the umpire if involved, will be binding and final and that neither party will resort to litigation. Each of the two parties shall pay its chosen appraiser and bear the cost of the umpire equally.

§ 11.5 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.6 Adjustment and Settlement of Insured Loss

§ 11.6.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.6.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.6.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the

Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

§ 11.7 Performance and Payment Bond

§ 11.7.1 RECORDATION OF CONTRACT AND BOND [La.R.S. 38:2241A(2)]

"The Owner shall record within thirty (30) days the Contract Between Owner and Contractor and Performance and Payment Bond with the Clerk of Court in the Parish in which the work is to be performed."

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

If the Contractor fails to correct Work identified as defective and covered by warranties, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. Finding the Contractor in default shall constitute a reason for disqualification of the Contractor from bidding on future state contracts.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

(Paragraph deleted)

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.3.3 The nearest Judicial Court to the Owner's office of governance shall have sole jurisdiction and venue in any action brought under this Contract.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. The Contractor shall make arrangements for such tests, inspections and approvals with the testing laboratory provided by the Owner, and the Owner shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

(Paragraphs deleted)

§ 13.4.7 The Contractor shall make arrangements for all materials testing, inspections, and approvals with the third party testing laboratory as provided in Section 13.4.1 and the Owner shall bear all related costs of all required cost of tests, inspections, and approvals required by the contract documents.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1** Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2** An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3** Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents; or
- .5 failure to complete the punch list within the lien period as provided in 9.8.7.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished. Termination by the Owner shall not suspend assessment of liquidated damages against the Surety.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.2.5 If an agreed sum of liquidated damages has been established, termination by the Owner under this Article will not relieve the Contractor and/or Surety of its obligations under the liquidated damages provisions and the Contractor and/or Surety shall be liable to the Owner for per diem liquidated damages.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of

subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

A "Reservation of Rights" and similar stipulations shall not be recognized under this Contract as having any effect. A party must make a claim as defined herein within the time limits provided.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, the Contractor shall document that weather conditions had an adverse effect on the scheduled construction. An increase in the Contract Time due to weather shall not be cause for an increase in the Contract Sum.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1** damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2** damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect shall always serve as the Initial Decision Maker. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to litigation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties.

§ 15.2.6 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

(Paragraph deleted)

§ 15.2.7 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

(Paragraphs deleted)

ARTICLE 16 PROJECT REPRESENTATIVE

§ 16.1 If the Owner determines that a Project Representative is to be assigned to the Project, the duties, responsibilities, and limitations of authority of the assigned Representative are as noted in Exhibit A attached hereto.



Additions and Deletions Report for AIA® Document A201® – 2017

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CoLC contract
Lake Charles

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City of Lake Charles329 Pujo Street
Lake Charles, LA 70601

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The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. ~~Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.~~ The Contract Documents shall include the bidding documents as listed in the instructions to bidders and any modifications made thereto by addenda.

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~~§ 15.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.~~ publication.

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§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive. The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.4.3 ~~The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.~~

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§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains ~~or recognizes the existence of burial markers, archaeological sites or wetlands~~ unmarked burial or archaeological sites, burial artifacts, or wetlands, which are not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15: follow all procedures mandated by State and Federal law, including but not limited to La.R.S. 8:671 et seq., La.R.S. 49:214.1 et seq., and Sections 401 & 404 of the Federal Clean Water Act.

...

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection. Allowances shall be in accordance with La.R.S. 38:2212K.

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§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

...

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not be ~~unreasonably be~~ withheld or delayed.

...

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. For Projects with a Contract Sum greater than \$1,000,000, the Contractor shall include with the schedule, for the Owner's and Architect's information, a

network analysis to identify those tasks which are on the critical path, i.e. where any delay in the completion of these tasks will lengthen the Project timescale, unless action is taken. A revised schedule shall be submitted with each Application and Certificate for Payment. No payment will be made until this schedule is received.

...

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect. If the Work is not on schedule, as determined by the Architect, and the Contractor fails to take action to bring the Work on schedule, then the Contractor shall be deemed in default under this Contract and the progress of the Work shall be deemed unsatisfactory. Such default may be considered grounds for termination by the Owner for cause in accordance with Section 14.2.

§ 3.10.4 Submittal by the Contractor of a schedule or other documentation showing a completion date for its Work prior to the completion date stated in the contract shall not impose any obligation or responsibility on the Owner or Architect for the earlier completion date.

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§ 3.18.1 To the fullest extent permitted by law, the Contractor shall release, protect, defend, indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, fees and court costs, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

...

§ 4.1.1 ~~The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.~~ Architect, when used in the Contract Documents, shall mean the prime designer (architect, engineer or landscape architect), or its authorized representative, lawfully licensed to practice architecture, engineering or landscape architecture in the State of Louisiana, identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number.

...

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until ~~the date the Architect issues the final Certificate for Payment.~~ The final payment is due, and with the Owner's concurrence, from time to time during the one year period for correction of Work described in Section 12.2. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, ~~completed, to endeavor to guard the Owner against defects and deficiencies in the Work,~~ and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

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§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the

duties, responsibilities and limitations of authority of the Project representatives. There will be no restriction on the Owner having a representative. The duties and responsibilities of the PR are limited to those of Architect in Architect's agreement with the Owner and in the construction Contract Documents, and are further limited and described as follows:

- .1 Architect shall furnish a Project Representative ("PR"), assistants and other field staff to assist Architect in observing progress and quality of the work of Contractor. Though more extensive on-site observations of the Work in progress and field checks of materials and equipment by the PR and assistants, Architect shall endeavor to provide further protection for Owner against defects and deficiencies in the work of Contractor. However, Architect shall not, during such visits or as a result of such observations of Contractor's work in progress, supervise, direct, or have control over Contractor's work nor shall Architect have authority over or responsibility for the means, methods, techniques, sequences or procedures selected by Contractor, for safety precautions and programs incident to the work of Contractor, for any failure of Contractor to comply with laws, rules, regulations, ordinances, codes or orders applicable to Contractor's performing and furnishing the work, or responsibility of construction for Contractor's failure to furnish and perform the Work in accordance with the Contract Documents.
- .2 APR is Architect's agent at the Site, will act as directed by and under the supervision of Architect, and will confer with Architect regarding PR's actions. PR's dealings in matters pertaining to the on-site Work shall in general be with Architect and Contractor, keeping Owner advised as necessary. PR's dealing with Subcontractors shall only be through or with the full knowledge and approval of Contractor. PR shall generally communicate with Owner with the knowledge of and under the direction of Architect.
- .3 Schedules: Review the progress schedule, schedule of Shop Drawing submittals and schedule of values prepared by Contractor and consult with Architect concerning acceptability.
- .4 Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.
- .5 Liaison:
 1. Serve as Architect's liaison with Contractor, working principally through Contractor's superintendent and assist in understanding the intent of Contract Documents; and assist Architect in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-site operations.
- .6 Shop Drawings and Samples:
 1. Record date of receipt of Shop Drawings and Samples.
 2. Receive Samples, which are furnished at the site by Contractor, and notify Architect of availability of Samples for examination.
 3. Advise Architect and Contractor of the commencement of any Work requiring a Shop Drawing or Sample if the submittal has not been approved by Architect.
- .7 Review of Work, Rejection of Defective Work, Inspections and Tests:
 1. Conduct on-site observations of the Work in progress to assist Architect in determining if the Work is in general proceeding in accordance with the Contract Documents.
 2. Report to Architect whenever PR believes that any Work will not produce a completed Project that conforms generally to the Contract Documents or will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Architect of Work that PR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
 3. Verify that tests, equipment, and system start-ups operating and maintenance training are conducted in the presence of appropriate personnel, and that Contractor maintains adequate records thereof; and observe, record and report to Architect appropriate details relative to the test procedures

and start-ups.

4. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to Architect.

.8 Interpretation of Contract Documents: Report to Architect when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor Clarifications and interpretations as issued by Architect.

.9 Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report with PR's recommendations to Architect. Transmit to Contractor in writing decisions as issued by Architect.

.10 Records:

1. Maintain at the job Site orderly files for correspondence, reports of job conferences, Shop Drawings and Samples, reproductions of original Contract Documents including all Work Change Directives, Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Contract, Architect's clarifications and interpretations of the Contract Documents, progress reports, Shop Drawing submittals received from and delivered to Contractor and other Project related documents.

2. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the job site, weather conditions, data relative to questions of Work Change Directives, Change Orders or changed conditions, list of job Site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Architect.

3. Record names, addresses and telephone numbers of all Contractors, Subcontractors and major suppliers of materials and equipment.

.11 Reports:

1. Furnish to Architect periodic reports as required of progress of the Work and of Contractor's compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.

2. Consult with Architect in advance of scheduled major tests, inspections or start of important phases of the Work.

3. Draft proposed Change Orders and Work Change Directives, obtaining backup material from Contractor and recommend to Architect Change Orders, Work Change Directives, and Field Orders.

4. Report immediately to Architect and Owner the occurrence of any accident.

.12 Payment Requests: Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Architect, noting particularly the relationship of the payment requested to the schedule of values, Work completed and materials and equipment delivered at the Site but not incorporated in the Work.

.13 Certificates, Maintenance and Operation Manuals: During the course of the Work, verify that certificates, maintenance and operation manuals and other data required to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to Architect for review and forwarding to Owner prior to final payment for the Work.

.14 Completion:

1. Before Architect issues a Certificate of Substantial Completion, submit to Contractor a list of observed items requiring completion or correction.

2. Observe whether Contractor has had performed inspections required by laws, rules, regulations, ordinances, codes, or orders applicable to the Work, including but not limited to those to be performed by public agencies having jurisdiction over the Work.

3. Conduct a final inspection in the company of Architect, Owner and Contractor and prepare a final list of items to be completed or corrected.

4. Observe whether all items on final list have been completed or corrected and make recommendations to Architect concerning acceptance and issuance of the Notice of Acceptability of the Work.

.15 Limitations on authority of PR.

1. Shall not authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items), unless authorized by Architect.
2. Shall not exceed limitations of Architect's authority as set forth in the Agreement or the Contract Documents.
3. Shall not undertake any of the responsibilities of Contractor, Subcontractor, Suppliers, or Contractor's superintendent.
4. Shall not advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the Contract Documents.
5. Shall not advise on, issue directions regarding or assume control over safety precautions and programs in connection with the Work.
6. Shall not accept Shop Drawing or Sample submittals from anyone other than Contractor.
7. Shall not authorize Owner to occupy the Project in whole or in part.
8. Shall not participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by Architect.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretation required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretation until 15 days after written request is made for them.

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§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which response required of the Architect shall be furnished in compliance with this Section 4.2.14, then delay shall not be recognized on account of failure by the Architect to furnish such interpretation until 15 days after written request is made for them. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

...

§ 5.2.1 ~~Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including shall furnish at the pre-construction conference, to the Owner and the Architect, in writing, the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.~~ design) proposed for each of the principal portions of the Work. No Contractor payments shall be made until this information is received.

§ 5.2.2 ~~The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.~~ be solely responsible for selection and performance of all Subcontractors. The Contractor shall not be entitled to claims for additional Contract Time and/or an increase in the Contract Sum due to a problem with performance or non-performance of a Subcontractor.

§ 5.2.3 ~~If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but~~

~~rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required. The Contractor shall notify the Owner when a Subcontractor is to be changed and substituted with another Subcontractor.~~

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

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§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1** — assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2** — assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

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§ 7.1.4 As part of the pre-construction conference submittals, the Contractor is to submit the following prior to the commencement of Work:

- .1** Fixed job site overhead cost itemized with documentation to support daily rates.
- .2** Bond premium rate with supporting information from the Contractor's carrier.
- .3** Labor burden by trade for both Subcontractors and the Contractor.
- .4** Internal rate charges for all significant Contractor-owned equipment.

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following: order to the Contractor signed by the Owner and the Architect, issued after the execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum or the Contract Time.

§ 7.2.2 "Cost of the Work" for the purpose of Change Orders shall be costs required to be incurred in performance of the Work and paid by the Contractor and Subcontractors which shall consist of:

- 1.** Wages paid direct labor personnel, delineating a labor burden markup for applicable payroll taxes, worker's compensation insurance, unemployment compensation, and social security taxes.
- 2.** Cost of all materials and supplies, including the identification of each item and its cost.
- 3.** Identify each necessary piece of machinery and equipment and its individual cost.
- 4.** Other documented direct costs. Credit will not be required for overhead and profit.

§ 7.2.3 "Overhead and Profit"

1 The change in the Work; The Contractor and Subcontractor shall be due job-site and home office fixed overhead and profits on the Cost of the Work, but shall not exceed a total of 25% of the direct cost of any portion of Work:

The credit to the Owner resulting from a change in the Work shall be the sum of those items above, except credit will not be required for overhead and profit. Where a change results in both credits to the Owner and extras to the Contractor for related items, overhead and profit will only be computed on the net extra cost to the Contractor.

§ 7.2.4 The cost to the Owner resulting from a change in the Work shall be the sum of: "Cost of the Work" (as defined at Section 7.2.2) and "Overhead and Profit" (as defined at Section 7.2.3), and shall be computed as follows:

- 1** When all of the Work is general Contract Work; 15% markup on the Cost of the Work.
- 2** The amount of the adjustment, if any, in the Contract Sum; and When the Work is all Subcontract Work; 15% markup on the Cost of the Work for Subcontractor's Overhead and Profit, plus 10% markup on the Cost of the Work, not including the Subcontractor's Overhead and Profit markup, for the Contractor's Overhead and Profit.
- 3** When the Work is a combination of general Contract Work and Subcontract Work; that portion of the direct cost that is general Contract Work shall be computed per Section 7.2.4.1 and that portion of the direct cost that is Subcontractor work shall be computed per Section 7.2.4.2. Bond premiums may be included, but after markup is added to the Cost of the Work.
- 4** Subcontractor cost shall consist of the items in Section 7.2.2 above plus Overhead and Profit as defined in Section 7.2.3.

§ 7.2.5 Before a Change Order is prepared, the Contractor shall provide and deliver to the Architect the following information concerning the Cost of the Work, not subject to waiver, within a reasonable time after being notified to prepare said Change Order:

- 1** A detailed itemized list of labor, material and equipment costs for the Contractor's Work including quantities and unit costs for each item of labor, material and equipment.
- 2** An itemized list of labor, material and equipment costs for each Subcontractor's and/or Sub-Subcontractor's Work including quantities and unit costs for each item of labor, material, and equipment.

§ 7.2.6 After a Change Order has been approved, no future requests for extensions of time or additional cost shall be considered for that Change Order.

§ 7.2.7 The Contractor will be due extended fixed job-site overhead for time delays only when complete stoppage of Work occurs causing a Contract completion extension, and the Contractor is unable to mitigate financial damages through replacement Work. Such stoppage must be due to acts or omissions solely attributable to the Owner. In all cases the Contractor is to notify the designer in writing as required by this contract. Reasonable proof may be required by the Architect that alternate Work could not be performed. Reasonable proof may be required by the Architect that the stoppage affected the completion date.

§ 7.2.8 Cost of the Work, whether Contract cost or Subcontract Cost, shall not apply to the following:

- 1** Salaries or other compensation of the Contractor's personnel at the Contractor's principal office and branch offices.
- 2** Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the Work.
- 3** The extent of the adjustment, if any, in the Contract Time. Overhead and general expenses of any kind or the cost of any item not specifically and expressly included above in Cost of the Work.
- 4** Cost of supervision not specifically required by the Change Order.

§ 7.2.9 When applicable as provided by the Contract, the cost to Owner for Change Orders shall be determined by quantities and unit prices. The quantity of any item shall be as submitted by the Contractor and approved by the Architect. Unit prices shall cover the cost of material, labor, equipment, Overhead and Profit.

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§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted ~~accordingly~~ accordingly but not to exceed a specified amount.

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- .1 Costs of labor, including applicable payroll taxes, ~~fringe benefits required by agreement or custom,~~ workers' compensation insurance, and other employee costs approved by the Architect;

...

- .4 Costs of premiums for all bonds and insurance, ~~permit fees,~~ and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision ~~and field office personnel~~ directly attributable to the change.

...

§ 7.3.9 Pending final determination of the total ~~cost~~ costs of a Construction Change Directive to the Owner, ~~the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.~~ amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs.

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§ 8.1.5 The Contract Time shall not be changed by the submission of a schedule that shows an early completion date unless specifically authorized by Change Order.

§ 8.2.1 ~~Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.~~ is of the essence and completion of the Work must be within the time for completion stated in the Agreement, subject to such extensions as may be granted under Section 8.3. The Contractor agrees to commence Work not later than fourteen (14) days after the transmittal date of Written Notice to Proceed from the Owner and to substantially complete the Project within the time stated in the Contract. The Owner will suffer financial loss if the Project is not substantially complete in the time set forth in the Contract Documents. The Contractor and the Contractor's Surety shall be liable for and shall pay to the Owner the sum stated in the Contract Documents as fixed, agreed and liquidated damages for each consecutive calendar day (Saturdays, Sundays, and holidays included of delay until the Work is substantially complete. The Owner shall be entitled to the sum stated in the Contract Documents. Such liquidated damages shall be withheld by the Owner from the amounts due the Contractor for progress payments.

...

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending ~~mediation and binding dispute resolution, litigation~~ ; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may ~~determine~~ recommend, subject to the Owner's approval of Change Order. If the Claim is not made within the limits of Article 15, all right for future Claims for that month are waived.

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~~Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the~~

various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment. At the pre-construction conference, the Contractor shall submit to the Owner and the Architect a schedule of values prepared as follows:

§ 9.2.1 The attached Schedule of Values Format shall be used. If applicable, the Cost of Work for each section listed under each division, shall be given. The cost for each section shall include labor, materials, Overhead and Profit.

§ 9.2.2 The total of all items shall equal the total Contract Sum. This schedule, when approved by the Architect, shall be used only as a basis for the Contractor's Applications for Payment.

...

§ 9.3.1 ~~At least ten days before the date established for each progress payment, Monthly,~~ the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all Application & Certificate for Payment on the AIA Document G702-1992, accompanied by AIA Document G703-1992, and supported by any additional data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents. ~~as the Owner or the Architect may require.~~ Application for Payment shall be submitted on or about the first of each month for the value of labor and materials incorporated into the Work and of materials, suitably stored, at the site as of the twenty-fifth day of the preceding month, less normal retainage as follows, per LaR.S.38:2248:

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders. ~~Projects with Contract price up to \$500,000.00 - 10% of the Contract price.~~

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay. ~~Projects with Contract price of \$500,000.00, or more - 5% of the Contract price.~~

§ 9.3.1.3 No payment will be made until the revised schedule required by Section 3.10.1 is received. The normal retainage shall not be due the Contractor until after Substantial Completion and expiration of the forty-five day lien period and submission to the Architect of a clear lien certificate and invoice for retainage.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. ~~If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off.~~ Payments for materials or equipment stored on the site shall be conditioned upon compliance by the Contractor with submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site. ~~including applicable insurance.~~

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§ 9.5.3 ~~When the reasons for withholding certification are removed, certification will be made for amounts previously withheld. If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.~~

~~§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.~~

~~§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect within twenty (20) days except for Projects funded fully or in part by a Federal reimbursement program. For such Projects the Owner will make payment in a timely manner consistent with reimbursement.~~

~~§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days Subcontractor after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner. La.R.S. 9:2784 (A) and (C) requires a Contractor or Subcontractor to make payment due to each Subcontractor and supplier within fourteen (14) consecutive days of the receipt of payment from the Owner. If not paid within such 14-day period, a penalty in the amount of 1/2 of 1% of the amount due, per day, shall be paid by the Contractor or Subcontractor to the applicable Subcontractor and/or supplier, up to a maximum of 15% of the outstanding balance due, from the expiration date until paid. The Contractor or Subcontractor, whichever is applicable, is solely responsible for payment of such penalty.~~

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~~§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law. Pursuant to La. R.S. 38:2242 et seq., when the Owner receives any claim of nonpayment arising out of the Contract, the Owner shall deduct 125% of such claim from the Contract Sum. The Contractor, or any interested party, may deposit security, in accordance with La. R.S. 38:2242.2, guaranteeing payment of the claim with the recorder of mortgages of the parish where the Work has been done. When the Owner receives original proof of such guarantee from the recorder of mortgages, the claim deduction will be added back to the Contract Sum.~~

...

~~§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend, release, protect, defend, hold harmless and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.~~

Reserved

§ 9.7 Failure of Payment

~~If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.~~

~~§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work~~

for its intended use. The Architect shall determine if the Project has reached the stage of Substantial Completion in accordance with this Subparagraph.

§ 9.8.2 When the Contractor considers that the ~~Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete,~~ Work is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work ~~or designated portion thereof is substantially complete,~~ is substantially complete. A prerequisite to the work being accepted as substantially complete is the Owner's receipt of the executed roofing Contractor's and roofing manufacturer's guarantees, where roofing Work is part of the Contract. Prior to inspection by the Architect, the Contractor shall notify the Architect that the Project is ready for inspection by the State Fire Marshal's office. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work ~~or designated portion thereof~~ for its intended use, the Contractor shall, before ~~issuance of the Certificate of Substantial Completion,~~ acceptance of the Work as substantially complete, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the ~~Work or designated portion thereof is substantially complete,~~ the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. Architect determines that the Project is substantially complete, he shall prepare a "punch list" of exceptions and the dollar value related thereto. The monetary value assigned to this list will be the sum of the cost estimate for each particular item of Work the Architect develops based on the mobilization, labor, material and equipment costs of correcting the item and shall be retained from the monies owed the Contractor, above and beyond the standard lien retainage. The cost of these items shall be prepared in the same format as the schedule of values. At the end of the forty-five (45) day lien period, payment shall be approved for all punch list items completed up to that time. After that payment, none of the remaining funds shall be due the Contractor until all punch list items are completed and are accepted by the Architect. If the dollar value of the punch list exceeds the amount of funds, less the retainage amount, in the remaining balance of the Contract, then the Project shall not be accepted as substantially complete. If funds remaining are less than that required to complete the Work, the Contractor shall pay the difference.

§ 9.8.5 ~~The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents. When the "punch list" is complete the Architect shall prepare a Recommendation of Acceptance" incorporating the punch list and submit it to the Owner. Upon approval of the Recommendation of Acceptance, the Owner may issue a Notice of Acceptance of Building Contract which shall establish the Date of Substantial Completion. The Contractor will record the Notice of Acceptance with the Clerk of Court in the Parish in which the Work has been performed. If the Notice of Acceptance has not been recorded seven (7) days after issuance, the Owner may record the acceptance at the Contractor's expense.~~

§ 9.8.6 Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work unless otherwise agreed to in writing by the Owner and Contractor. Unless otherwise agreed to in writing by Owner and Contractor, security, maintenance, heat, utilities, damage to the Work not covered by the punch list and insurance shall become the Owner's responsibility on the Date of Substantial Completion.

§ 9.8.7 If all punch list items have not been completed by the end of the forty-five (45) day lien period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within forty-five (45) days after notification, the Surety has not completed the

punch list, through no fault of the Architect or Owner, the Owner may, at its option, contract to have the balance of the Work completed and pay for such Work with the unpaid funds remaining in the Contract Sum. Finding the Contractor in default shall constitute a reason for disqualification of the Contractor from bidding on future contracts. If the Surety fails to complete the punch list within the stipulated time period, the Owner may not accept bonds submitted, in the future, by the Surety.

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§ 9.9.1 Partial Occupancy is the stage in the progress of the Work when a designated portion of the Work is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the designated portion of the Work for its intended use. The Owner may occupy or use any ~~completed or partially completed portion of the Work at any stage when such portion is substantially completed~~ portion of the Work so designated by separate agreement with the Contractor, ~~provided such occupancy or use is consented to by the insurer~~ Contractor and authorized by public authorities having jurisdiction over the Project. ~~Such partial occupancy or use may commence whether or not the portion is substantially complete.~~ Work. Such occupancy or use may commence provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, ~~retainage~~, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers ~~a the designated~~ portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under ~~Section 9.8.2- Subparagraph 9.8.2.~~ Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. ~~The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.~~

...

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. If the Architect does not find the Work acceptable under the Contract Documents, the Architect shall make one additional inspection. If the Work is still not acceptable, the Architect, and each of the Architect's principal consultants, shall be paid \$150.00/hour for their time at the project site, for each additional inspection, to be withheld from the unpaid funds remaining in the Contract Sum. The payment shall be made by the Owner and deducted from the construction contract funds. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in ~~effect~~, effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

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§ 9.10.6 In response to Federal Arbitration regulations: if such compliance has not been effected within 90 days of the date of acceptance, the Contract shall be terminated and no further opportunity will be granted the Contractor and no further payments will be made on this Contract.

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§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on the health and safety of persons or property or their protection from damage, injury, or loss.

...

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), (PCB) or lead, encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. ~~Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up. The Contract Time shall be extended appropriately.~~

§ 10.3.3 ~~To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity. The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.~~

§ 10.3.4 ~~The Owner shall not be responsible under this Section 10.3 for~~ Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence. If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional notify the Owner and Architect immediately of the emergency, simultaneously acting at its discretion to prevent damage, injury, or loss. Any additional compensation or extension of time claimed by the Contractor on account of an emergency Work shall be determined as provided in Article 15 and Article 7.7.

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§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents. All policies and certificates of insurance of the Contractor (and any Subcontractor(s)) shall contain the following clauses:

§ 11.1.1.1 The insurer will have no right of recovery or subrogation against the Owner, it being the intention of the parties that the insurance policies so affected shall protect both parties and the primary coverage for any and all losses covered by the below described insurance.

§ 11.1.1.2 The Owner shall be named as an additional insured as regards negligence by the Contractor (or applicable Subcontractor) (ISO Forms CG 2010, current form approved for use in Louisiana).

§ 11.1.1.3 The insurance companies issuing the policy or policies shall have no recourse against the Owner for payment of any premiums or for assessments under any form of policy.

§ 11.1.1.4 Any and all deductibles in the below described insurance policies shall be assumed by and be at the sole risk of the Contractor or Subcontractor.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located. INSURANCE:

The Contractor (and any Subcontractor(s)), prior to commencing Work, shall provide to the Owner, at its own expense, proof of the following insurance coverages required by the Contract with insurance companies authorized in the State of Louisiana. Insurance is to be placed with insurers with an A.M. Best rating of no less than A-:VI. This rating requirement will be waived for the workers' compensation coverage.

Thirty days prior notice of cancellation shall be given to the Owner by registered mail, return receipt requested, on all of the required coverage provided to the Owner. All notices will name the Contractor (or Subcontractor, as applicable) and identify the Contract number.

Insurance coverage specified in the GENERAL CONDITIONS (AIA Document A 201, 2017 Edition) to be provided by the Contractor, and any other insurance described below shall be furnished with the following minimum limits:

§ 11.1.2.1 Workers' Compensation - Statutory - in compliance with the Workers' Compensation Law of the State where the Work is performed. Employer's liability insurance with a \$1,000,000 per occurrence limit when Work is to be over water and involves maritime exposures.

§ 11.1.2.2 Commercial General Liability Insurance with a combined single limit per occurrence for bodily injury and property damage. This insurance shall include coverage for bodily injury and property damage, and indicate on the Certificate of Insurance which of the seven (7) coverages required below are not included in the policy, if any:

1 Premises - Operations; 5 Personal Injury;

2 Broad Form Contractual Liability; 6 Broad Form Property Damage;

3 Products and Completed Operations; 7 Explosion, Collapse, and Underground (XCU) Coverage

4 Use of Contractors & Subcontractors;

Note: On the Certificate of Insurance, under the description of operations, the following wording is required: THE AGGREGATE LOSS LIMIT APPLIES TO EACH PROJECT, or a copy of ISO form CG2503 (Current form approved for use in Louisiana) shall be submitted.

COMBINED SINGLE LIMIT (CSL) - AMOUNT OF INSURANCE REQUIRED

Type of	Projects Under	Projects \$100,001 -	Projects Over
Construction	\$100,000	\$1,000,000	\$1,000,000
New Buildings:			
-Each Occurrence/ Minimum Limit	\$500,000	\$1,000,000	\$3,000,000
-Aggregate (Applicable to this Contract ONLY)	\$500,000	\$1,000,000	\$3,000,000
Renovations:			
-Each Occurrence/ Minimum Limit	\$500,000*** (Depends On Building Value)	\$1,000,000*** (Depends On Building Value)	\$3,000,000*** (Depends On Building Value)
-Aggregate (Applicable to this Contract ONLY)	\$500,000*** (Depends On Building Value)	\$1,000,000*** (Depends On Building Value)	\$3,000,000*** (Depends On Building Value)

****While the minimum combined single limit of \$500,000 is required for all renovations, the value of a building shall be multiplied by 10% and insurance requirements will be increased at \$1,000,000 intervals and rounded to the nearest \$1,000,000. Example: Renovation on \$33,000,000 building would require \$3,000,000 minimum combined single limit of coverage. Maximum limit required is \$5,000,000.00 regardless of building value.*

§ 11.1.2.3 Business Automobile Liability Insurance with a combined single limit of \$1,000,000 per occurrence for bodily injury and property damage, unless otherwise indicated. This insurance shall include for bodily injury and property damage the following coverages:

.1 Owned automobiles;

.2 Hired automobiles;

.3 Non-owned automobiles.

§ 11.1.2.4 An Umbrella Policy may be used to meet minimum requirements.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished. All property losses shall be made payable to and adjusted with the Owner.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide

notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage. All policies of insurance shall be approved by the contracting Owner prior to the inception of any Work.

§ 11.1.5 Other insurance required is as follows:

§ 11.1.5.1 Owner's Protective Liability Insurance shall be furnished by the Contractor and name the Owner as the Insured.

<u>Projects Under</u>	<u>Projects \$100,001-</u>	<u>Projects Over</u>	
<u>\$100,000</u>	<u>\$1,000,000</u>	<u>\$1,000,000</u>	
CSL - Each Occurrence	\$500,000	\$1,000,000	\$3,000,000

§ 11.1.5.2 Asbestos Abatement Liability
(required when asbestos abatement is included in the Work)

The Contractor or Subcontractor who will be doing the asbestos abatement as outlined in this Contract shall obtain and maintain such liability coverage for the asbestos abatement hazard and exposure with minimum limits of \$1,000,000 per occurrence for the duration of the Project. The policy shall name the Owner as an additional insured for the Project. The policy shall be written on an "occurrence" form without a sunset clause. Claims-made coverage is unacceptable. The insurance company shall have an A.M. Best rating of at least A-:VI or better.

§ 11.1.6 If, at any time, any of the said policies shall be or become unsatisfactory to the Owner, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Owner, the Contractor/Subcontractor shall promptly obtain a new policy, submit the same to the Owner for approval and submit a certificate thereof as hereinabove provided.

Upon failure of the Contractor/Subcontractor to furnish, deliver and maintain such insurance as above provided, this contract, at the election of the Owner, may be forthwith declared suspended, discontinued or terminated. Failure of the Contractor/Subcontractor to take out and/or to maintain or the taking out and/or maintenance of any required insurance, shall not relieve the Contractor/Subcontractor from any liability under the contract, nor shall the insurance requirements be construed to conflict with the obligations of the Contractor/Subcontractor concerning indemnification. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time.

§ 11.1.7 RISKS AND INDEMNIFICATIONS ASSUMED BY THE CONTRACTOR Neither the acceptance of the completed Work nor payment therefore shall release the Contractor/Subcontractor from its obligations from the insurance requirements or indemnification obligations hereunder.

§ 11.1.7.1 Additional insurance may be required on an individual basis for extra hazardous contracts and specific service agreements.

If such additional insurance is required for a specific contract, that requirement will be described in the "Special Conditions" of the contract specifications.

§ 11.1.7.2 If any of the property and casualty insurance requirements are not complied with at their renewal dates, payments to the Contractor/Subcontractor will be withheld until those requirements have been met, or at the option of the Owner, the Owner may pay the renewal premium and withhold such payments from any monies due the Contractor/Subcontractor.

§ 11.1.7.3 All property losses shall be made payable to and adjusted with the Owner.

§ 11.1.7.4 All policies and certificates of insurance shall be approved by the contracting agency prior to the inception of any Work.

§ 11.1.7.5 If at any time any of the foregoing policies shall be or become unsatisfactory to the Owner, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Owner, the Contractor/Subcontractor shall, upon notice to that effect from the Owner, promptly obtain a new policy, submit the same to the Owner for approval and submit a certificate thereof as hereinabove provided. Upon failure of the Contractor/Subcontractor to furnish, deliver and maintain such insurance as above provided, this Contract, at the election of the Owner, may be forthwith declared suspended, discontinued or terminated. Failure of the Contractor/Subcontractor to take out and/or maintain or the taking out and/or maintenance of any required insurance, shall not relieve the Contractor/Subcontractor from any liability under the Contract, nor shall the insurance requirements be construed to conflict with or otherwise limit the obligations of the Contractor/Subcontractor concerning indemnification. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time.

§ 11.1.8 SUBCONTRACTORS

Contractor shall include all Subcontractors as insureds under its policies or shall furnish separate certificates from each Subcontractor. All coverages for Subcontractors shall be subject to all of the requirements stated herein.

§ 11.1.9 CERTIFICATE OF INSURANCE

Contractor shall furnish the Owner with certificates of insurance affecting coverage required by this clause. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates of insurance must also contain the following in the "Description of Operations" section:

- .1 If the Contractor is a general contractor, then so state.
- .2 If the Contractor is a specialty contractor, then so state and provide the list of specialties for which the Contractor is insured.

The certificates are to be received and approved by the Owner before work commences. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time.

§ 11.1.10 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

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§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. Owner's insurance policies, if any, operate separately and independently from policies required to be provided by the Contractor, and Contractor cannot rely upon Owner's insurance policies for any of Contractor's obligations to the Owner, Architect, or third parties.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does

not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation Insurance Requirements for Subcontractors

Contractor shall procure and maintain for the duration of the Contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by the Contractor, his agents, representatives, employees or Subcontractors. The cost of such insurance shall be included in the Contractor's bid.

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property. MINIMUM SCOPE OF INSURANCE

Coverage shall be at least as broad as:

§ 11.3.1.1 Insurance Services Office Commercial General Liability coverage ("occurrence") form CG 0001. (Current form approved for use in Louisiana.) "Claims Made" form is unacceptable. The "occurrence form" shall not have a "sunset clause".

§ 11.3.1.2 Insurance Services Office form number CA 0001 (Current form approved for use in Louisiana.) covering Automobile Liability. The policy shall provide coverage for owned, hired, and non-owned coverage. If an automobile is to be utilized in the execution of this Contract, and the vendor/contractor does not own a vehicle, then proof of hired and non-owned coverage is sufficient.

§ 11.3.1.3 Workers' Compensation insurance as required by the Labor Code of the State of Louisiana, including Employers Liability insurance.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance. MINIMUM LIMITS OF INSURANCE

Contractor shall maintain limits no less than:

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.3.2.1 Commercial General Liability: \$500,000 combined single limit per occurrence for bodily injury, personal injury and property damage (or higher limits depending on size of contract.)

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

§ 11.3.2.2 Automobile Liability: \$500,000 combined single limit per accident, for bodily injury and property damage (or higher limits depending on size of contract).

§ 11.3.2.3 Workers Compensation and Employers Liability: Workers' Compensation limits as required by the Labor Code of the State of Louisiana and Employers Liability coverage. Employers liability limit is to be \$1,000,000 when Work is to be over water and involves maritime exposure.

§ 11.3.3 DEDUCTIBLES AND SELF-INSURED RETENTIONS

Any deductibles or self-insured retentions must be declared to and approved by the Owner. At the option of the Owner, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Owner, its officers, officials, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

§ 11.3.4 OTHER INSURANCE PROVISIONS

The insurance policies to be carried by the Contractor hereunder are to contain, or be endorsed to contain, the following provisions:

§ 11.3.4.1 General Liability and Automobile Liability Coverages

- .1 The Owner, its officers, officials, employees, and volunteers are to be added as "additional insureds" as respects liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor, premises owned, occupied or used by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Owner, its officers, officials, employees or volunteers.**
It is understood that the business auto policy under "Who is an Insured" automatically provides liability coverage in favor of the Owner.
- .2 Any failure to comply with reporting provisions of the policy shall not affect coverage provided to the Owner, its officers, officials, employees, or volunteers.**
- .3 The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.**

§ 11.3.4.2 Workers' Compensation and Employers' Liability Coverage The insurer shall agree to waive all rights of subrogation against the Owner, its officers, officials, employees and volunteers for losses arising from Work performed by the Contractor for the Owner.

§ 11.3.4.3 All Coverages

Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to the Owner.

§ 11.3.5 ACCEPTABILITY OF INSURERS

Insurance is to be placed with insurers with an A.M. Best's rating of no less than A-:VI. This rating requirement will be waived for the workers' compensation coverage.

§ 11.3.6 VERIFICATION OF COVERAGE

Contractor shall furnish the Owner with certificates of insurance effecting coverage required. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates of insurance must also contain the following in the "Description of Operations" section:

If the Contractor is a general contractor, then so state.

If the Contractor is a specialty contractor, then so state and provide the list of specialties for which the contractor is insured.

The certificates are to be received and approved by the Owner before Work commences. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time.

§ 11.4 Property Insurance

§ 11.4.1 The general contractor shall purchase and maintain property insurance upon the entire Work included in the Contract for an amount equal to the greater of the full-completed value or the amount of the construction contract including any amendments thereto. The general Contractor's policy shall provide "ALL RISK" Builder's Risk insurance (extended to include the perils of wind, collapse, vandalism/malicious mischief, and theft, including theft of materials whether or not attached to any structure.) The "All Risk" Builder's Risk Insurance must also cover architects' and engineers' fees that may be necessary to provide plans and specifications and supervision of Work for the repair and/or replacement of property damage caused by a covered peril not to exceed 10% of the cost of those repair and/or replacements.

A specialty contractor shall purchase and maintain property insurance upon the system to be installed for an amount equal to the greater of the full-completed value or the amount of the contract including any amendments thereto. The specialty contractor may provide an installation floater with the same coverage as the "ALL RISK" Builder's Risk insurance policy.

The policy must include the interest of the Owner, Contractor and Subcontractors as their interest may appear. The Contractor has the right to purchase coverage or self-insure any exposures not required by the bid specifications, but shall be held liable for all losses, deductibles, self-insurance for coverages not required.

Policies insuring Projects involving additions, alterations or repairs to existing buildings or structures must include an endorsement providing the following:

In the event of a disagreement regarding a loss covered by this policy which may also be covered by the Owner or any commercial property insurance policy purchased by the Owner, this company agrees to follow the following procedure to establish coverage and/or the amount of loss:

Any party to a loss may make written demand for an appraisal of the matter in disagreement. Within 20 days of receipt of written demand, this company and either ORM or its commercial insurance company shall each select a competent and impartial appraiser and notify the other of the appraiser selected. The two appraisers will select a competent and impartial umpire. The appraisers will then identify the policy or policies under which the loss is insured and, if necessary, state separately the value of the property and the amount of the loss that must be borne by each policy. If

the two appraisers fail to agree, they shall submit their differences to the umpire. A written decision by any two shall determine the policy or policies and the amount of the loss. Each insurance company (or ORM) agree that the decision of the appraisers and the umpire if involved, will be binding and final and that neither party will resort to litigation. Each of the two parties shall pay its chosen appraiser and bear the cost of the umpire equally.

§ 11.5 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.6 Adjustment and Settlement of Insured Loss

§ 11.6.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.6.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.6.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

§ 11.7 Performance and Payment Bond

§ 11.7.1 RECORDATION OF CONTRACT AND BOND [La.R.S. 38:2241A(2)]

"The Owner shall record within thirty (30) days the Contract Between Owner and Contractor and Performance and Payment Bond with the Clerk of Court in the Parish in which the work is to be performed."

PAGE 40

If the Contractor fails to correct Work identified as defective and covered by warranties, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. Finding the Contractor in default shall constitute a reason for disqualification of the Contractor from bidding on future state contracts.

PAGE 41

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4. located.

...

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither Neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

~~§ 13.2.2~~ The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

...

§ 13.3.3 The nearest Judicial Court to the Owner's office of governance shall have sole jurisdiction and venue in any action brought under this Contract.

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. ~~Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and inspections and approvals with the testing laboratory provided by the Owner, and the Owner shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.~~

PAGE 42

~~§ 13.5 Interest~~

~~Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~

§ 13.4.7 The Contractor shall make arrangements for all materials testing, inspections, and approvals with the third party testing laboratory as provided in Section 13.4.1 and the Owner shall bear all related costs of all required cost of tests, inspections, and approvals required by the contract documents.

...

- ~~.3~~ Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- ~~.4~~ The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2. Documents

...

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, ~~executed~~ and costs incurred by reason of such termination.

PAGE 43

- ~~.3~~ repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; ~~or authority~~
- ~~.4~~ otherwise is guilty of substantial breach of a provision of the Contract Documents; ~~Documents; or~~
- ~~.5~~ failure to complete the punch list within the lien period as provided in 9.8.7.

...

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished. Termination by the Owner shall not suspend assessment of liquidated damages against the Surety.

...

§ 14.2.5 If an agreed sum of liquidated damages has been established, termination by the Owner under this Article will not relieve the Contractor and/or Surety of its obligations under the liquidated damages provisions and the Contractor and/or Surety shall be liable to the Owner for per diem liquidated damages.

...

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

...

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of ~~Subcontracts;~~ subcontracts; and the termination fee, if any, set forth in the Agreement.

PAGE 44

A "Reservation of Rights" and similar stipulations shall not be recognized under this Contract as having any effect. A party must make a claim as defined herein within the time limits provided.

...

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in ~~Section 9.7~~ and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

...

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, ~~such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and the Contractor shall document that weather conditions had an adverse effect on the scheduled construction. An increase in the Contract Time due to weather shall not be cause for an increase in the Contract Sum.~~

PAGE 45

- 2** damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of ~~profit, except anticipated profit arising directly from the Work.~~ profit.

...

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect ~~will~~ shall always serve as the Initial Decision Maker, ~~unless otherwise indicated in the Agreement.~~ Maker. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to ~~mediation-litigation~~ of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

...

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution parties.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1. In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy. If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry

Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

ARTICLE 16 PROJECT REPRESENTATIVE

§ 16.1 If the Owner determines that a Project Representative is to be assigned to the Project, the duties, responsibilities, and limitations of authority of the assigned Representative are as noted in Exhibit A attached hereto.

~~**§ 15.4.4.3** The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.~~

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, _____, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 14:34:48 ET on 04/23/2024 under Order No. 2114517836 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2017, General Conditions of the Contract for Construction, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)

PROJECT SIGN:

The Contractor shall construct on the Project Site at locations to be designated by the Architect, one (1) signs of 4' x 8' minimum size as shown on the following attached sheet. These signs shall be supported by two 4"x4" timber posts or approved equal. Sign proofs or shop drawings shall be submitted to the architect for approval prior to fabrication.

These project signs shall be maintained in good condition throughout the construction period until completion of the Contract work. When directed, this sign shall be removed in its entirety.



CITY OF LAKE CHARLES

Project Name CP#

Brief Description if title unclear

Mayor
Nicholas E. Hunter

City Council

Ronnie Harvey	Luvertha August	Rodney Geyen	John leyoub
Stuart Weatherford	Craig Marks	Mark Eckard	

Consultant
X

Contractor
X

Department of Public Works & Engineering
337-491-1220



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVENUE
NEW ORLEANS LA 70118-3651

September 10, 2025

Regulatory Division
Western Evaluation Branch

SUBJECT: MVN-2023-00850-WFF

Ms. Stacy Dowden
City of Lake Charles
326 Pujo St.
Lake Charles, Louisiana 70601

Dear Ms. Dowden:

Receipt is acknowledged of your application dated October 9, 2024, requesting authority to clear, grade, excavate, and place fill for the development of a consolidated Lake Charles Department of Public Works Facility and appurtenant structures, located off 4136 Broad St., in Lake Charles, Louisiana, within Calcasieu Parish.

The subject work is permitted under authority of Department of the Army **Regional General Permit (RGP) 33**, provided that all the conditions of the permit are met. This approval to perform work is valid for 5 years from the date of this letter. This authorization does not eliminate the need to obtain a Coastal Use Permit from the Louisiana Department of Energy and Natural Resources or any other federal, state, or local approvals that may be required by law.

In addition to the attached standard RGP conditions, the following special conditions are made a supplemental part of this authorization:

1. Permittees that discover any previously unknown historic, cultural, or archeological remains and artifacts while accomplishing the permitted activity must immediately notify the U.S. Army Corps of Engineers New Orleans District Regulatory Division (CEMVN-RG), halt all construction activity at the location of discovery, and avoid construction activities within a fifty (50) foot buffer zone of the location of discovery until the required coordination has been completed. CEMVN-RG will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
2. If abandoned cemeteries, unmarked graves, or human remains are discovered during the permitted activity, the permittee will stop work immediately and comply with the Louisiana Unmarked Human Burial Sites Preservation Act (La. R.S. 8:671 et seq.). The permittee will notify local law enforcement, CEMVN-RG, and the Louisiana Division of Archaeology (LDOA), within the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, by telephone at 225-342-8170 to assess the nature and age of the human skeletal remains within twenty-four (24) hours of the discovery of

unmarked human remains and will accompany local law enforcement personnel during all field investigations. If the appropriate local law enforcement official determines that the remains are not a crime scene, and the remains are more than 50 years old, LDOA has jurisdiction over the remains. In no instance will human remains be removed from the discovery site until jurisdiction is established. In cases where the LDOA assumes jurisdiction and the remains are determined to be American Indian, LDOA will consult with Tribes, CEMVN-RG, and the permittee to determine the appropriate course of action.

3. Issuance of this permit confirms that the US Army Corps of Engineers, New Orleans District, Regulatory Branch (CEMVN) has been provided with written notification from Third Louisiana Resource, L.L.C. that the permittee has contracted for 1.4 acres of Coastal Prairie at Petit Bois Addendum One Bank. Third Louisiana Resource, L.L.C. has assumed responsibility for completing the mitigation in accordance with Petit Bois Addendum One Mitigation Banking Instrument and has recorded the allocation of the mitigation required by this permit in the Regulatory In-lieu Fee & Bank Information Tracking System (RIBITS).
4. All work shall be done in accordance with the approved plans and shall be confined to the permitted work area(s) represented within the attached drawings. If the authorized project requires additional work, modifications to the present plan, or deviations in the overall project scope and purpose, the permittee shall obtain an amendment and/or separate permit review and decision from this office, prior to commencement of those alterations.
5. The permittee shall properly install adequate erosion/siltation control measures around work areas that require land-based earthwork (i.e., excavation and/or deposition of fill materials, land contouring, machinery rutting, fill maneuvering and redistribution, etc.), to aid in preventing project related sediments, debris and other pollutants from entering adjacent wetlands or waters. Acceptable measures include but are not limited to the proper use and positioning of temporary silt fences, straw bales, fiber/coir logs, wooden barriers, seeding or sodding of exposed soils, or other approved EPA construction site storm-water runoff control and best management practices. Control techniques shall be installed prior to the commencement of earthwork activities and maintained until the project is complete and/or the subject areas are stabilized.
6. Many local governing bodies have instituted laws and/or ordinances in order to regulate dredge and/or fill activities in floodplains to assure maintenance of floodwater storage capacity and avoid disruption of drainage patterns that may affect surrounding properties. Your project involves dredging and/or placement of fill; therefore, you must contact the local municipal and/or parish governing body regarding potential impacts to floodplains and compliance of your activities with local floodplain ordinances, regulations or permits. Work activities and any associated drainage plans and/or drainage affects associated with the project shall comply with applicable laws and ordinances administered by governing bodies such as the (Parish Government, Police Jury, Local Drainage Authority, Flood Plain Administration), and/or other applicable agency requirements. Should it be determined that the project is or would create negative drainage issues for the area and/or unacceptable and unnatural inundation conditions on adjacent properties, the permittee will be required to remediate the situation as directed by the applicable governing body or bodies. Should there be any changes required in the project design by other governing bodies, the permittee

shall coordinate with this office to obtain a permit amendment and/or review and decision on the plans, prior to commencement of those alterations.

7. Roadway culverts, outfall structures, drainage plans and associated amenities shall comply with the local Parish Government and/or Drainage Authority requirements and shall be of sufficient size and set to an elevation which maintains natural pre-project flow conditions within the area but shall not be designed in a manner that would impact, unnaturally inundate, or promote the drainage of adjacent wetland areas. Culvert openings shall be maintained free of debris and/or obstructions to the greatest extent, as to allow for unrestricted flow of water and to maintain natural flow conditions to and from any adjacent wetland areas. Should it be determined by this office that the project or associated drainage plans are impacting adjacent wetland areas, the permittee will be required to remediate the situation through corrective methods, additional culverts, and/or adjustments to the existing drainage infrastructure or project plans, along with any necessary permit modification requirements

The opinion has been made on the basis of information provided by your letter. If it is later established that you furnished erroneous data, you may be directed to alter or modify your plans, to remove structures you have installed, and/or to restore the work area to pre-project conditions at your own expense. If it is established that you knowingly furnished erroneous data, you could also be subject to legal action.

The permittee is aware that this office may re-evaluate its decision on this permit at anytime the circumstances warrant.

The drawings submitted with your letter are attached hereto and made a part of the record. If you have any questions, please contact your project manager Fred Conerly with this office at (504) 862-2277 or frederick.j.conerly@usace.army.mil.

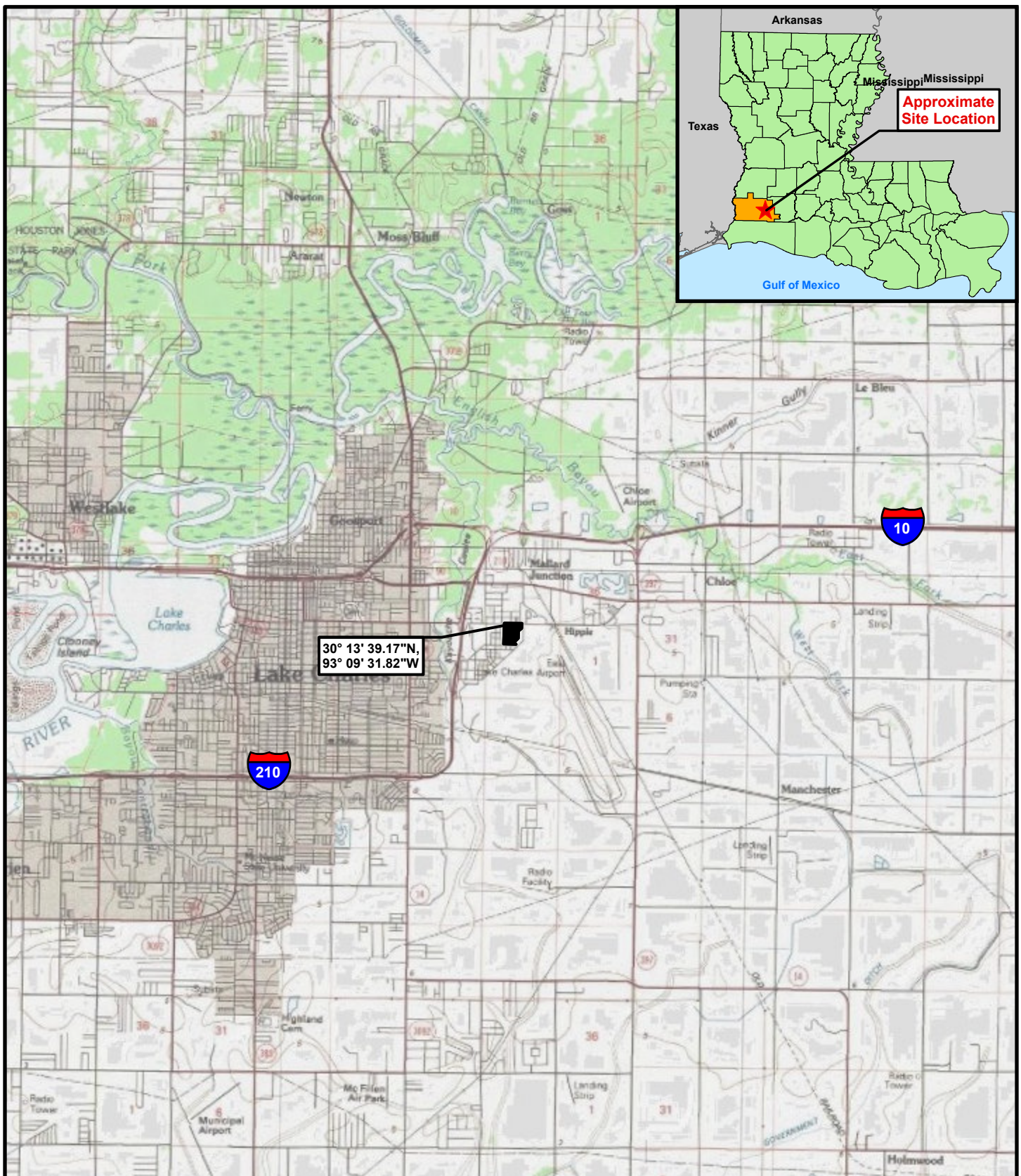
Sincerely,

**Darrell S.
Barbara**

Digitally signed by
Darrell S. Barbara
Date: 2025.09.10
12:11:51 -05'00'

For: Brad A. Guarisco
Acting Chief, Regulatory Division

Enclosures



30° 13' 39.17"N,
93° 09' 31.82"W



0 6,000 12,000 Feet

Figure 1: TopoVicinity Map

Chennault Airport

Legend:

Site Outline	Interstate
Parish Boundary	Stream/River
Waterbody	
City/Town	

Section: 2
Township: 10 South
Range: 08 West

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

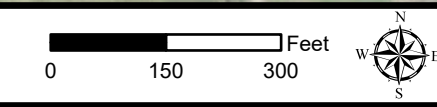
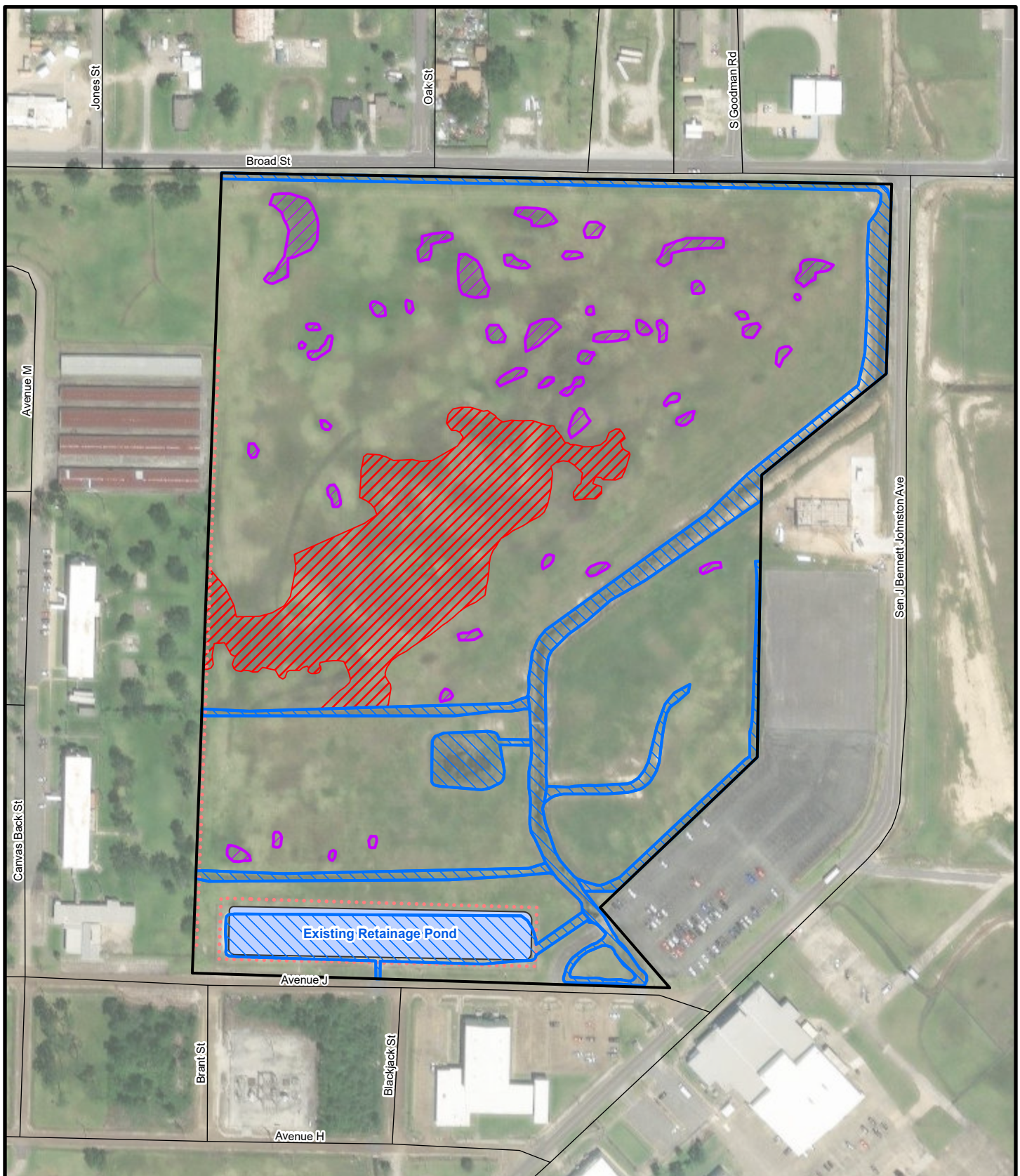


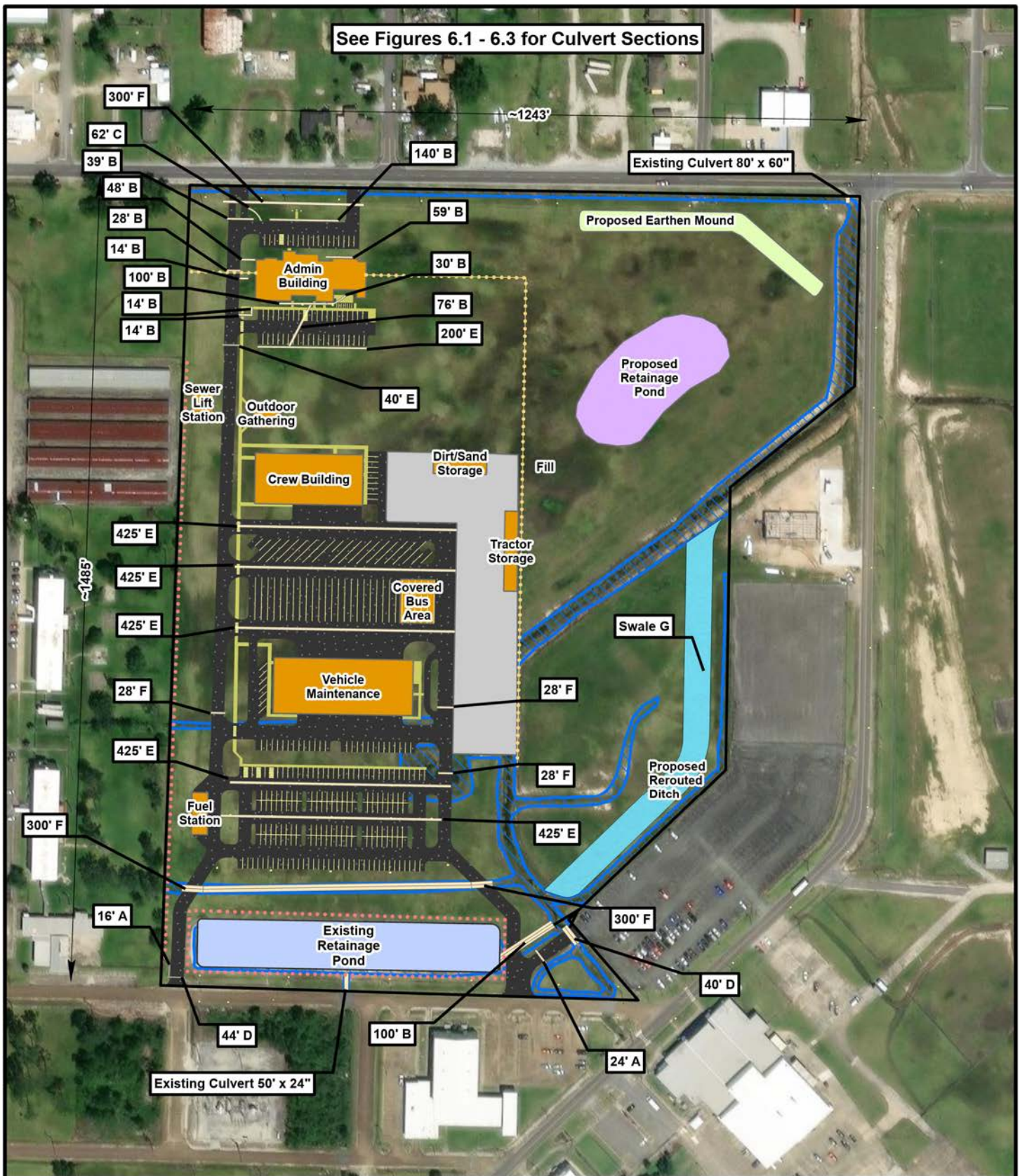
Figure 2: Existing Conditions

Chennault Airport

Legend:

- Site Outline
- Wetlands
- NonJurisdictional Wetlands
- Other Waters
- Existing Retainage Pond
- Existing Fence
- Roadways

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<http://elosenv.com/>

0 200 400 Feet

Figure 3.0: Plan View Culverts

Chennault Airport

Legend:

Site Outline	Gravel Parking	Other Waters
Asphalt	Proposed Rerouted Ditch	Existing Fence
Building	Earthen Mound	Proposed Fence
Sidewalk	New Retainage Pond	Roadways
Culvert		

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

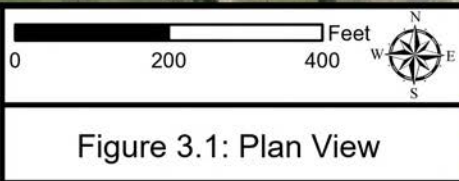
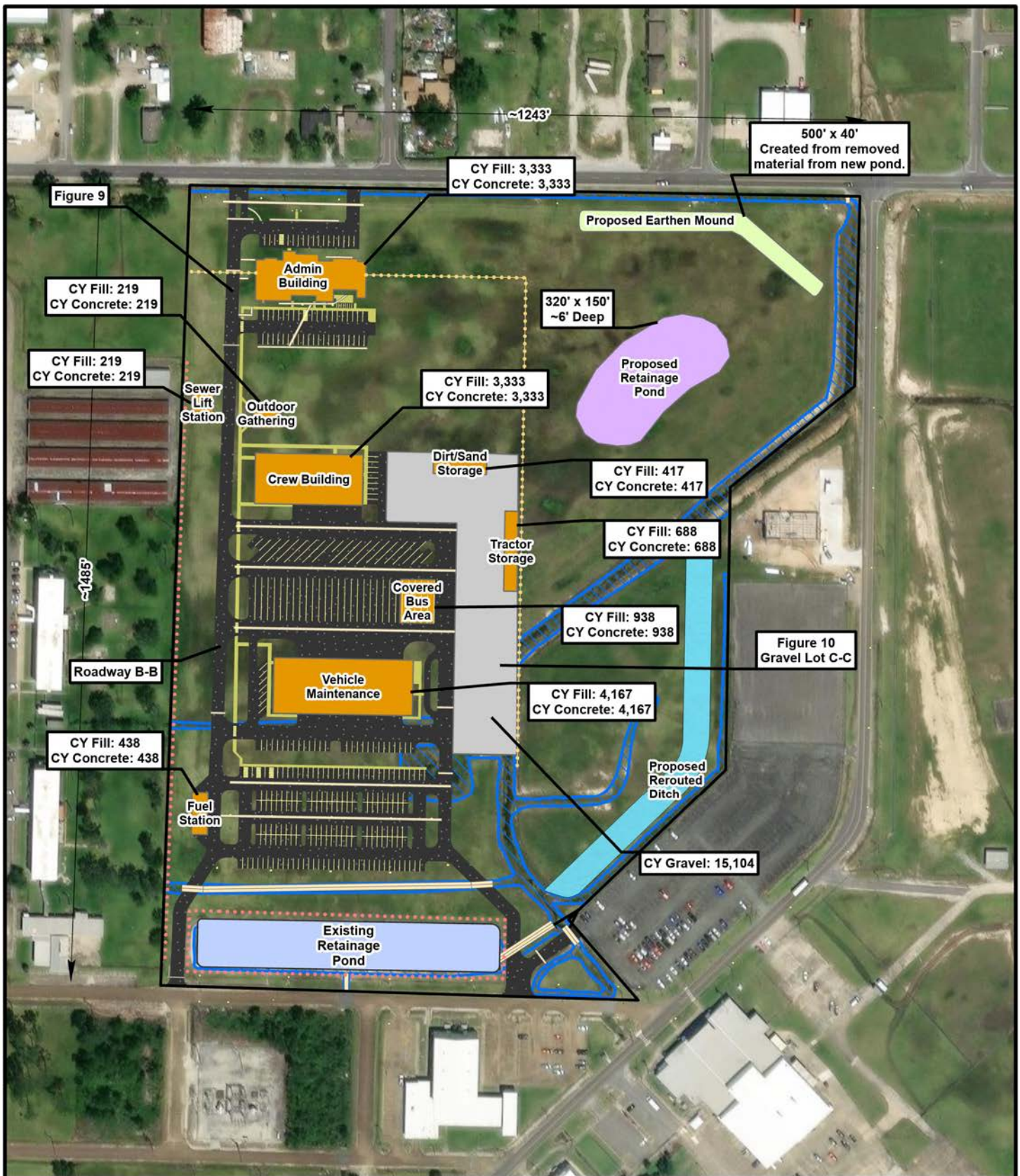
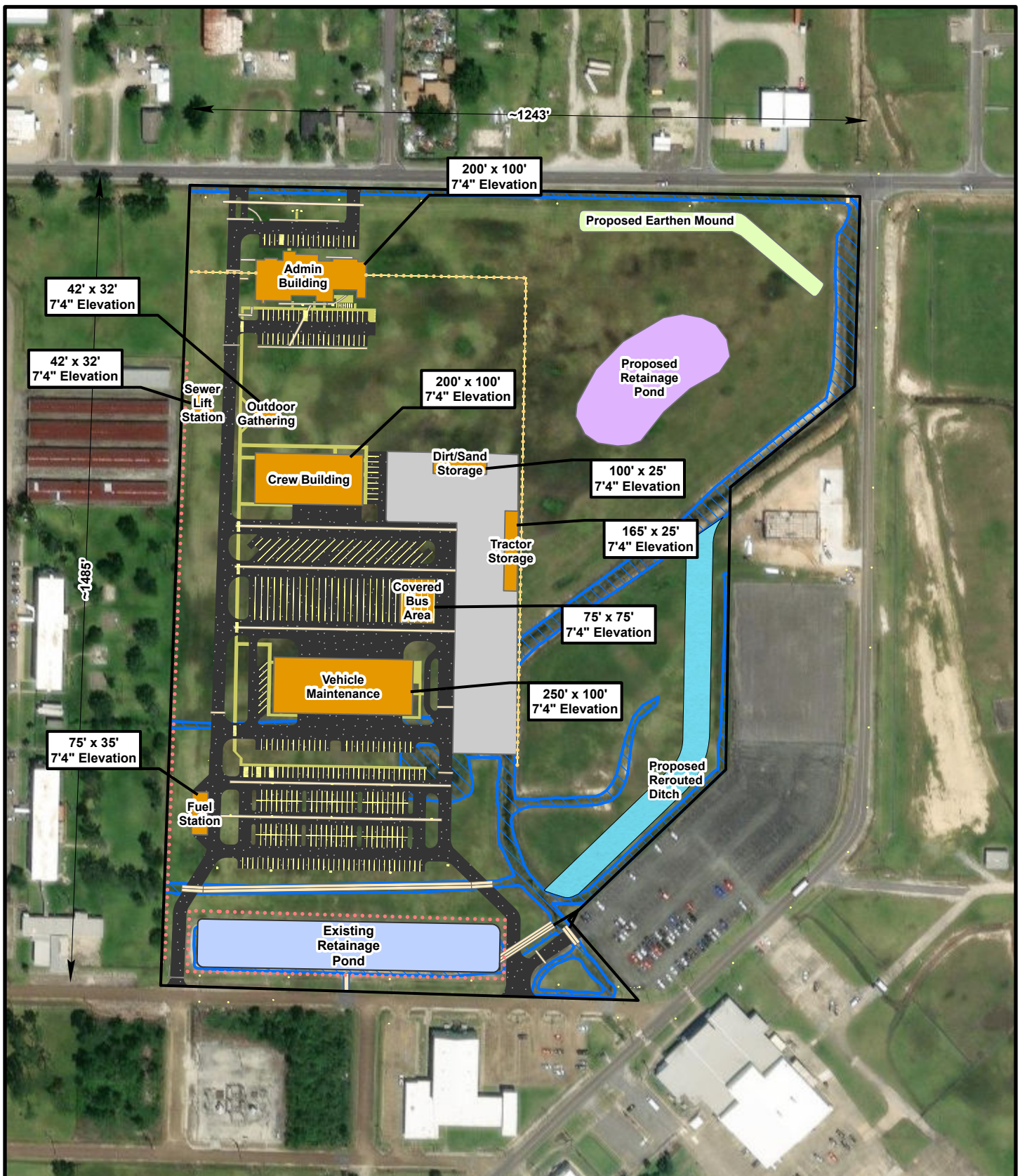


Figure 3.1: Plan View
Chennault Airport

Site Outline	Gravel Parking	Other Waters
Asphalt	Proposed Rerouted Ditch	Existing Fence
Building	Earthen Mound	Proposed Fence
Sidewalk	New Retainage Pond	Roadways
Culvert		

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<http://elosenv.com/>

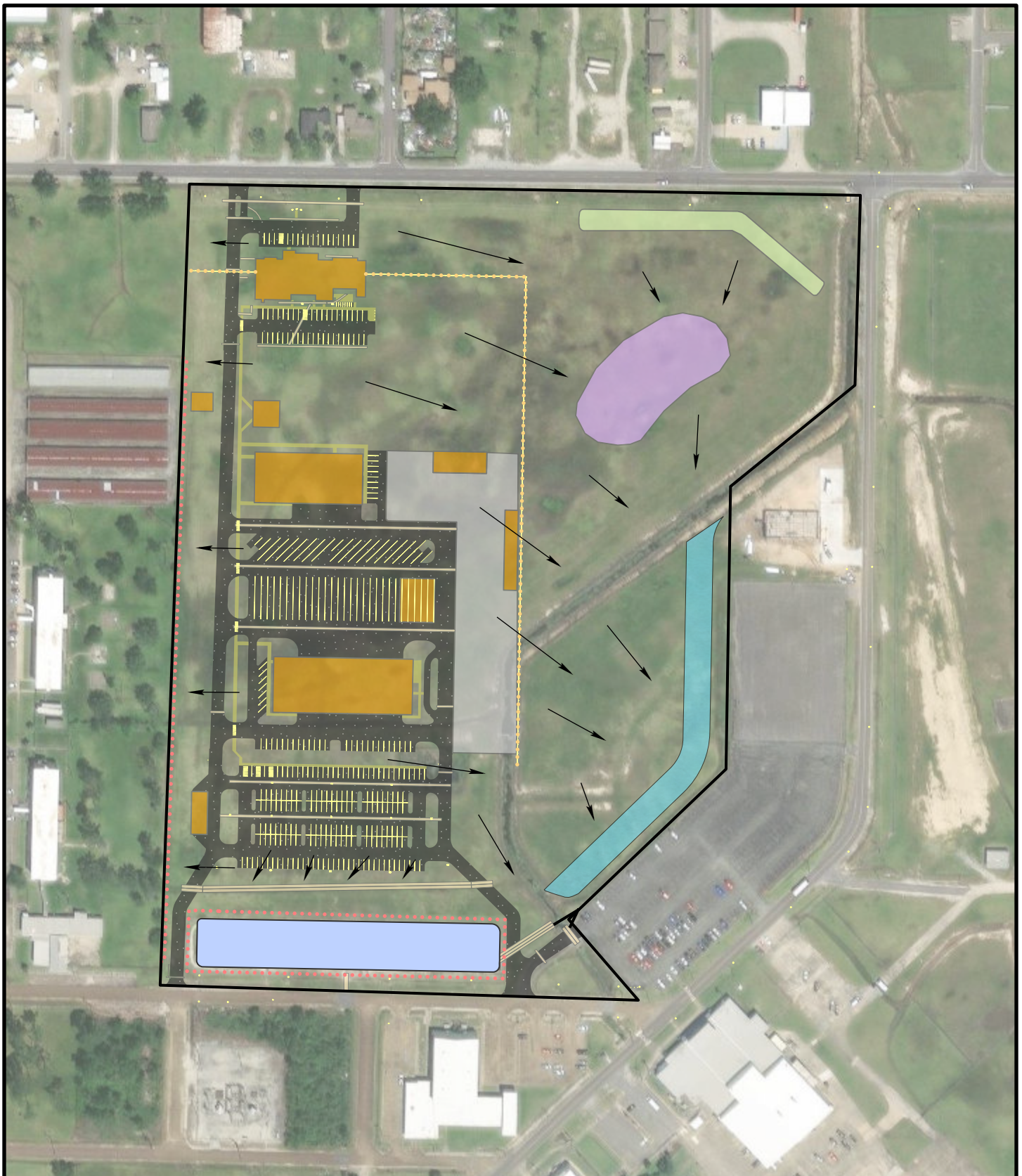
Figure 3.2: Plan View

Chennault Airport

Legend:

Site Outline	Gravel Parking	Other Waters
Asphalt	Proposed Rerouted Ditch	Existing Fence
Building	Earthen Mound	Proposed Fence
Sidewalk	New Retainage Pond	Roadways
Culvert		

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.





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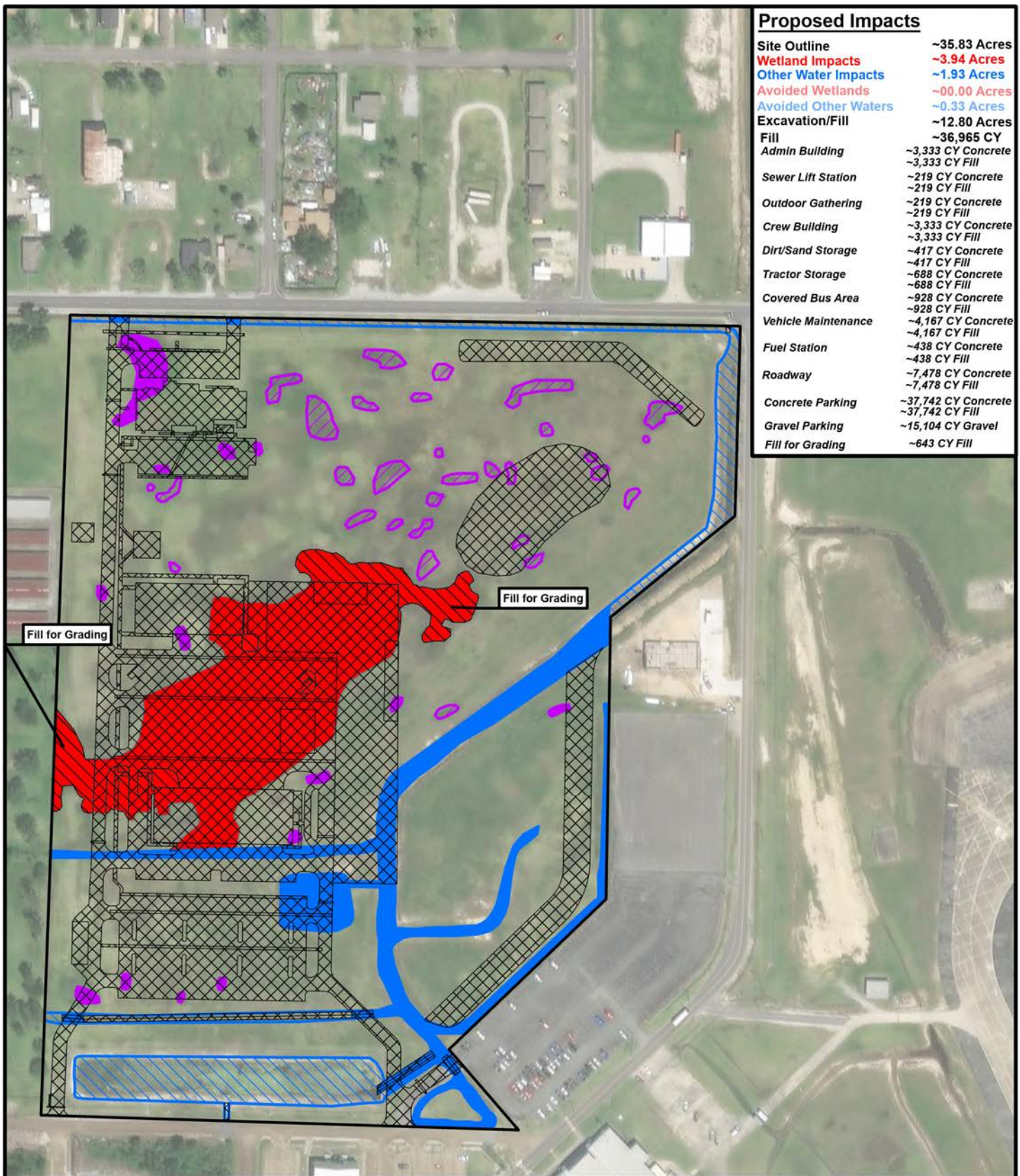
Figure 4.0: Drainage

Chennault Airport

Legend:

Site Outline	Gravel Parking	Drainage
Asphalt	Proposed Rerouted Ditch	Existing Fence
Building	Earthen Mound	Proposed Fence
Sidewalk	New Retention Pond	Roadways
Culvert		

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.





<http://elosenv.com/>

0 200 400 Feet



Legend:

Site Outline	Avoided NonJurisdictional Wetlands
Fill	Avoided Other Waters
Excavation	Proposed Other Water Impacts
Wetland Impacts	
NonJurisdictional Wetland Impacts	

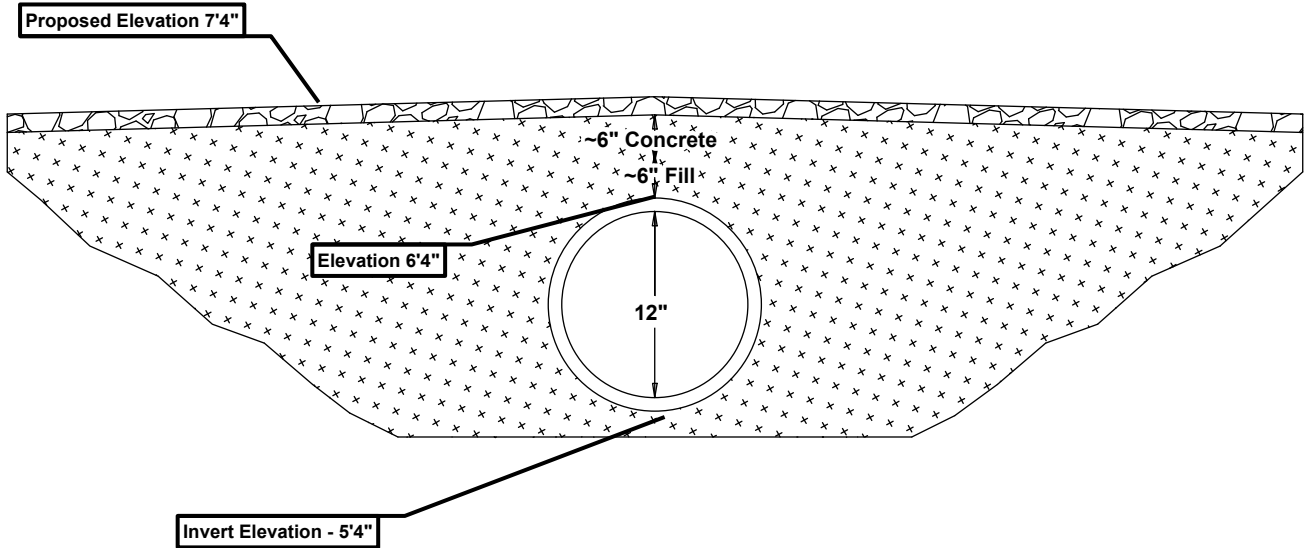
Figure 5: Proposed Impacts

Chennault Airport

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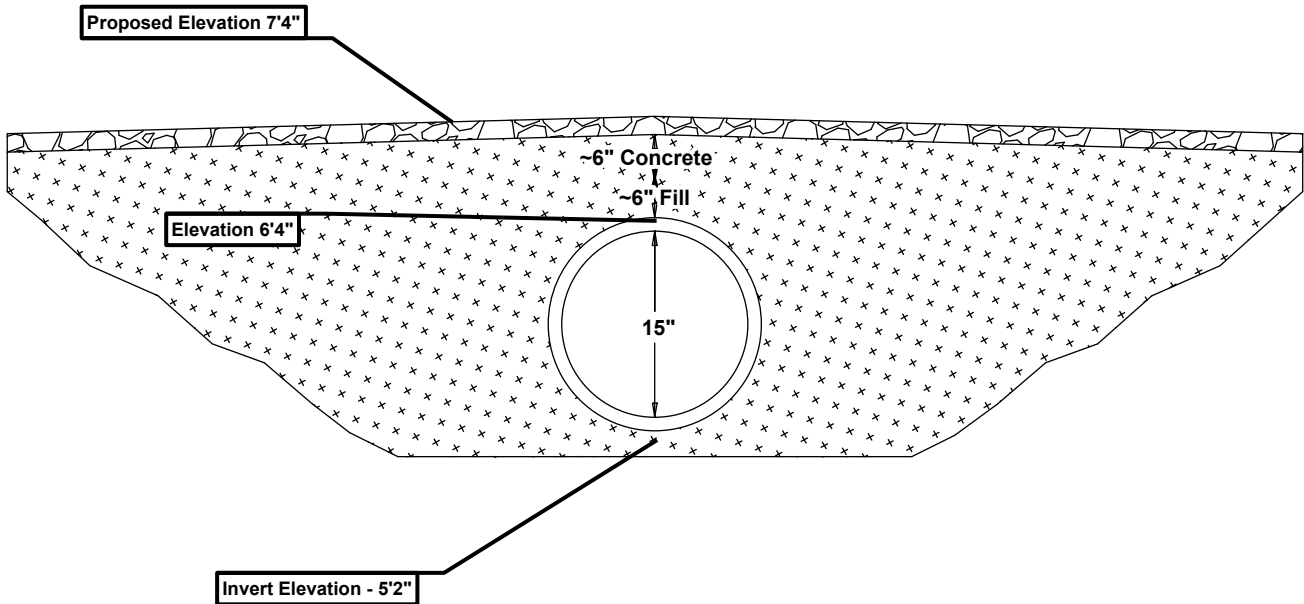
12" Culvert Diameter Section

A



15" Culvert Diameter Section

B



Scale = Not to Scale

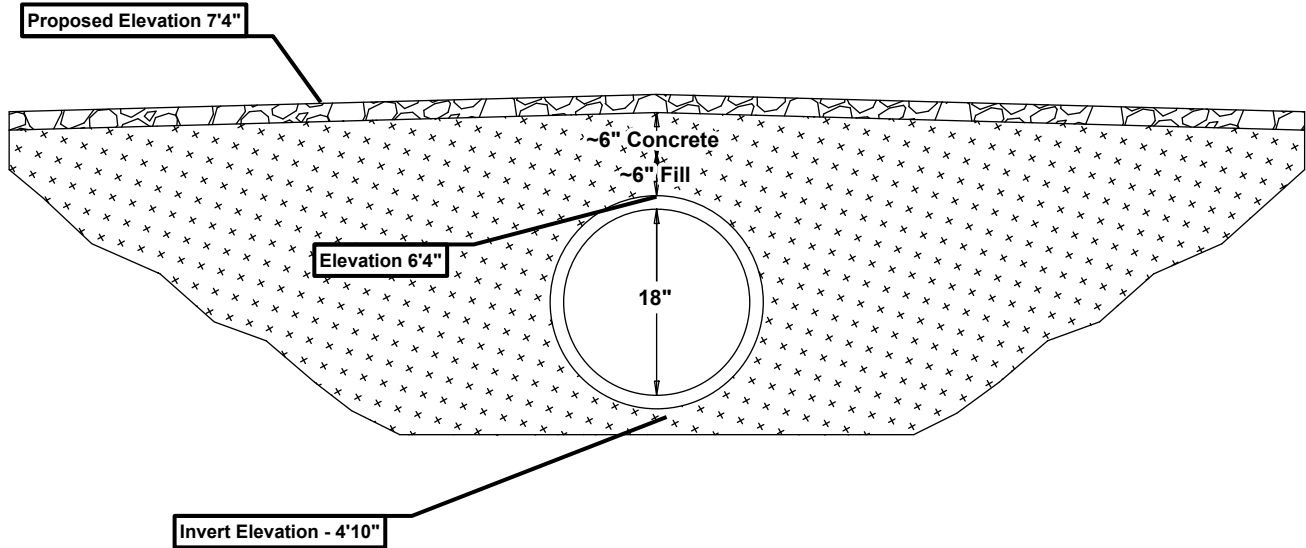
Figure 6.1: Typical Section

Chennault Airport

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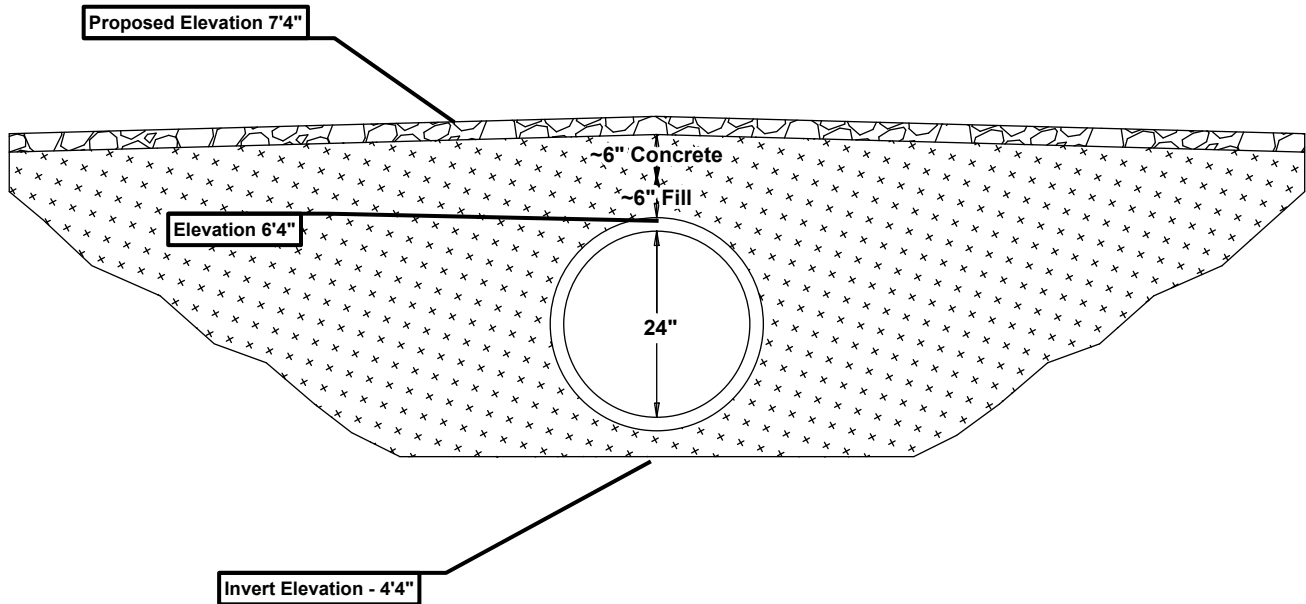
18" Culvert Diameter Section

C



24" Culvert Diameter Section

D



Scale = Not to Scale

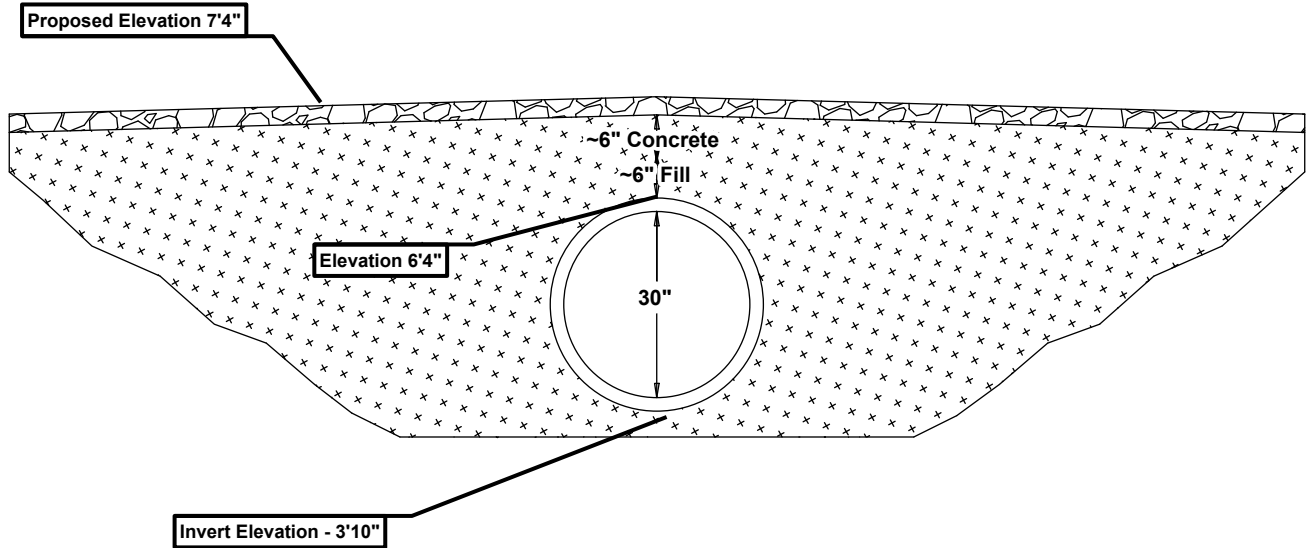
Figure 6.2: Typical Section

Chennault Airport

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

30" Culvert Diameter Section

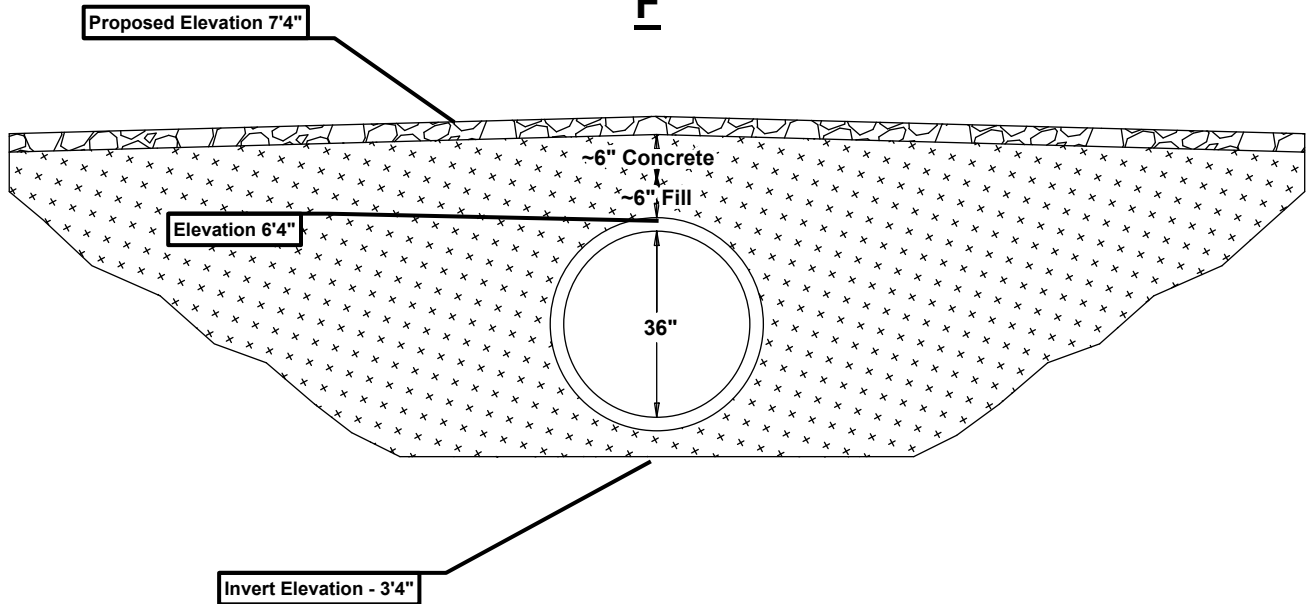
E



36" Culvert Diameter Section

Water Crossing

F



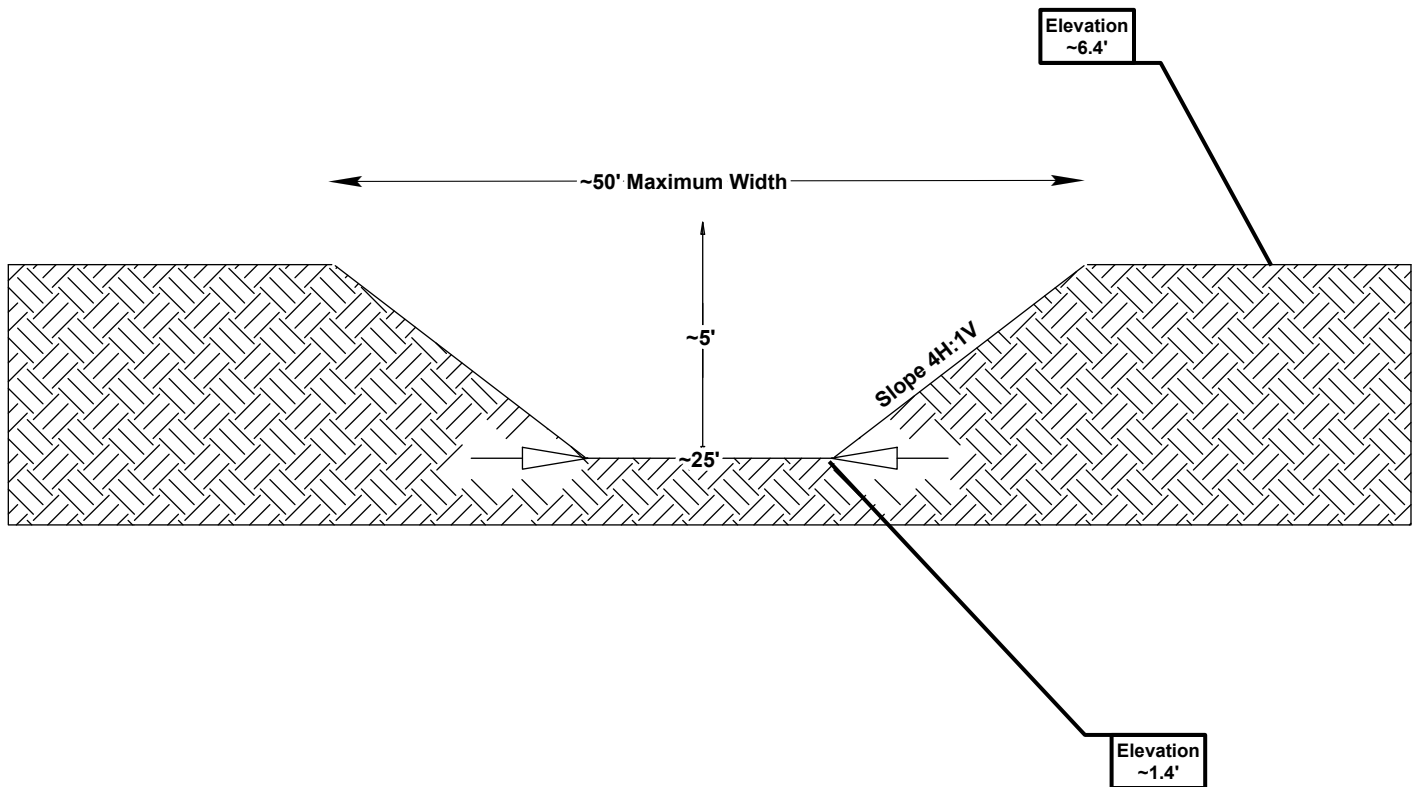
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Figure 6.3: Typical Section

Chennault Airport

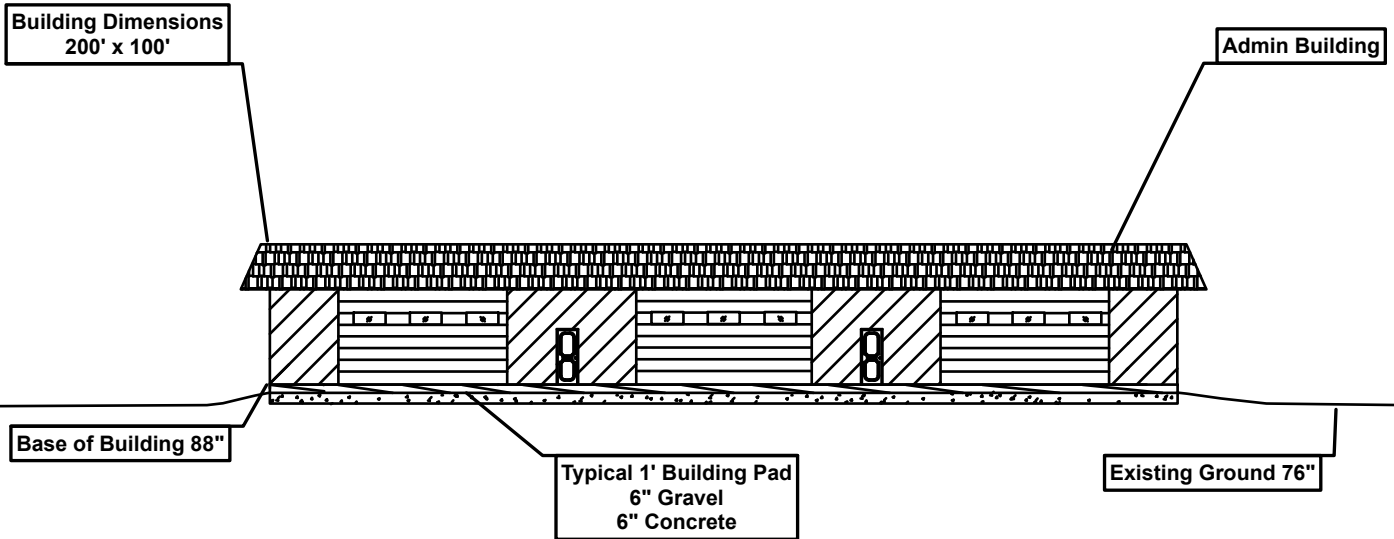
This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

Typical Drainage Swale G



	Scale = Not to Scale	This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.
	Figure 7: Typical Section	
	Chennault Airport	

Admin Building Typical Section



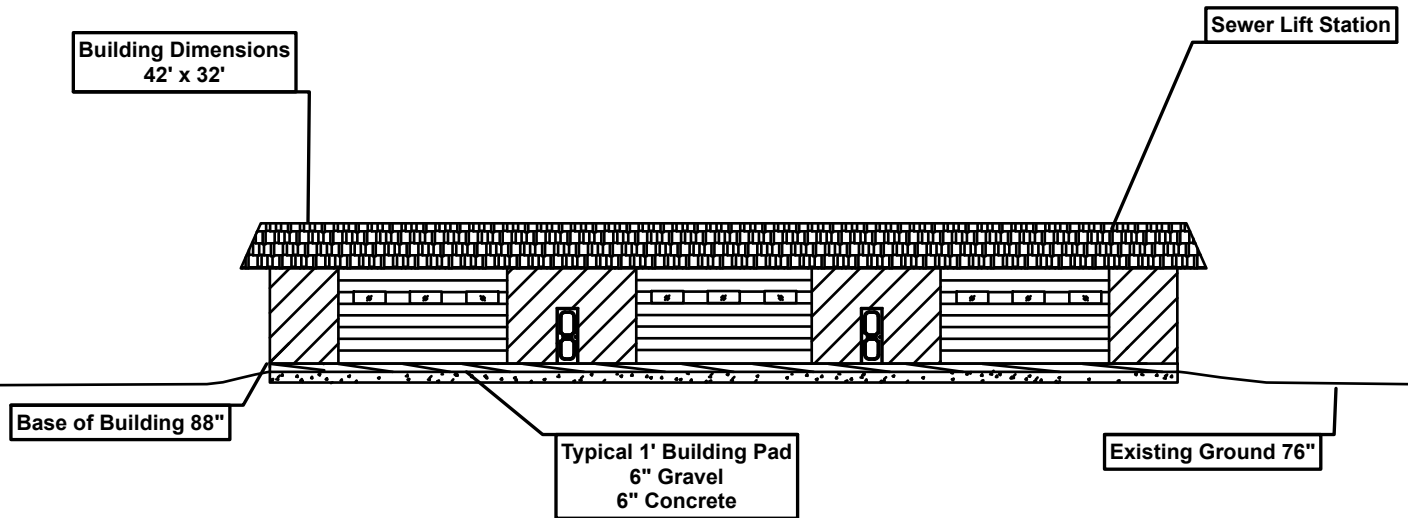
Scale = Not to Scale

Figure 8.1: Typical Section

Chennault Airport

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

Sewer Lift Station Typical Section



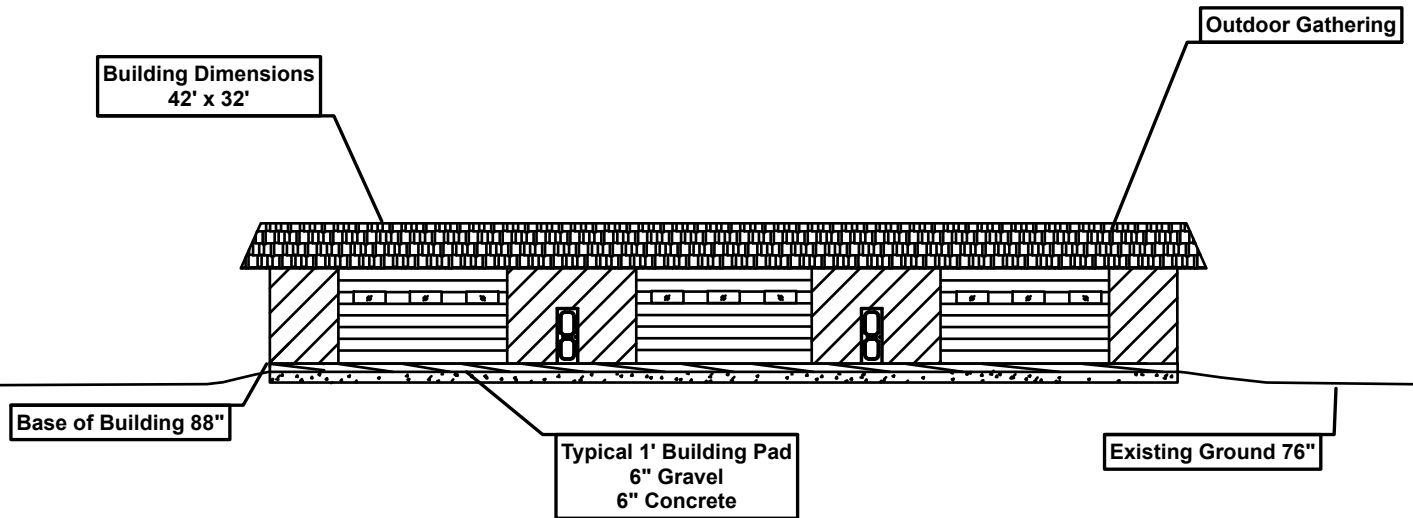
Scale = Not to Scale

Figure 8.2: Typical Section

Chennault Airport

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Outdoor Gathering Typical Section



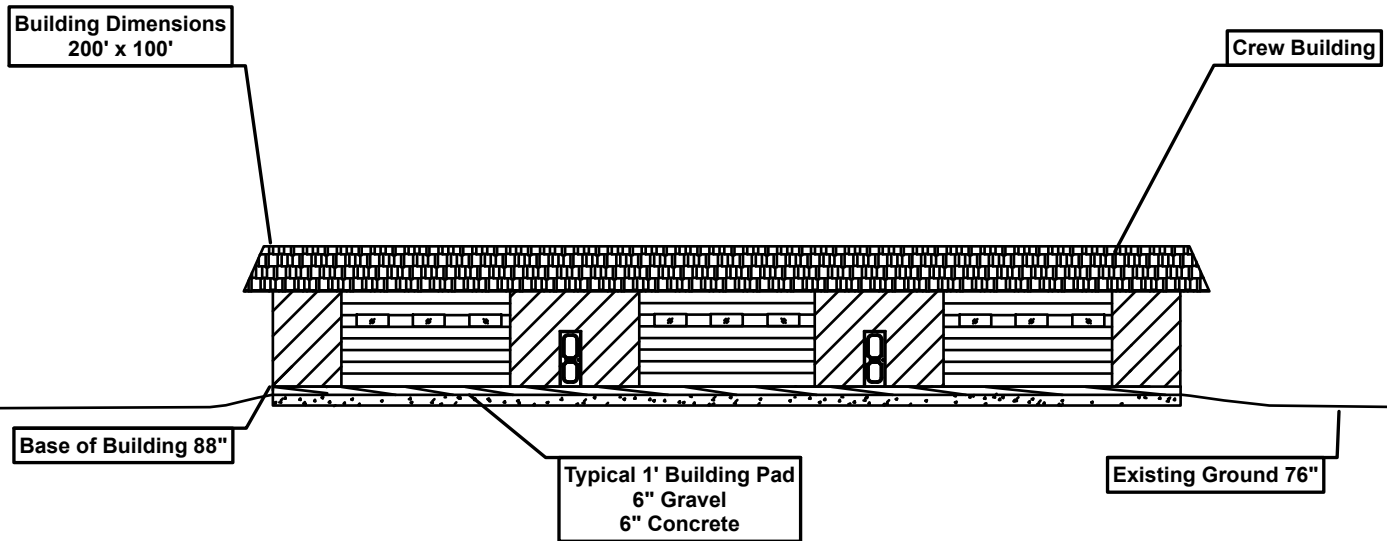
Scale = Not to Scale

Figure 8.3: Typical Section

Chennault Airport

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

Crew Building Typical Section



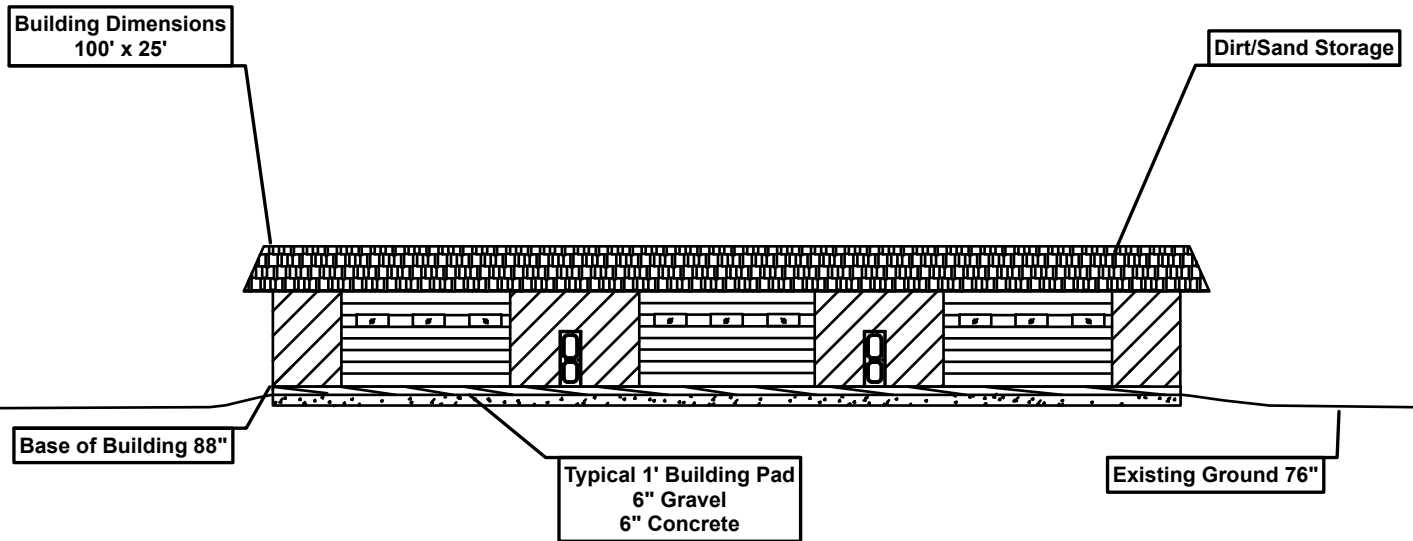
Scale = Not to Scale

Figure 8.4: Typical Section

Chennault Airport

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

Typical Dirt/Sand Storage Typical Section



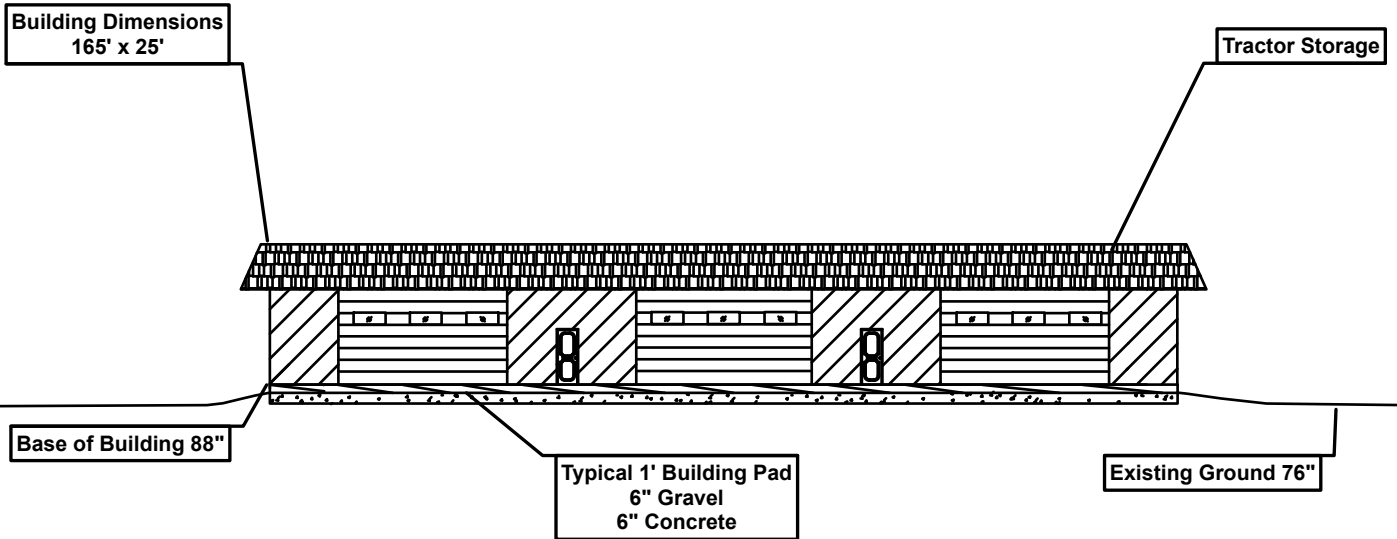
Scale = Not to Scale

Figure 8.5: Typical Section

Chennault Airport

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

Tractor Storage Typical Section



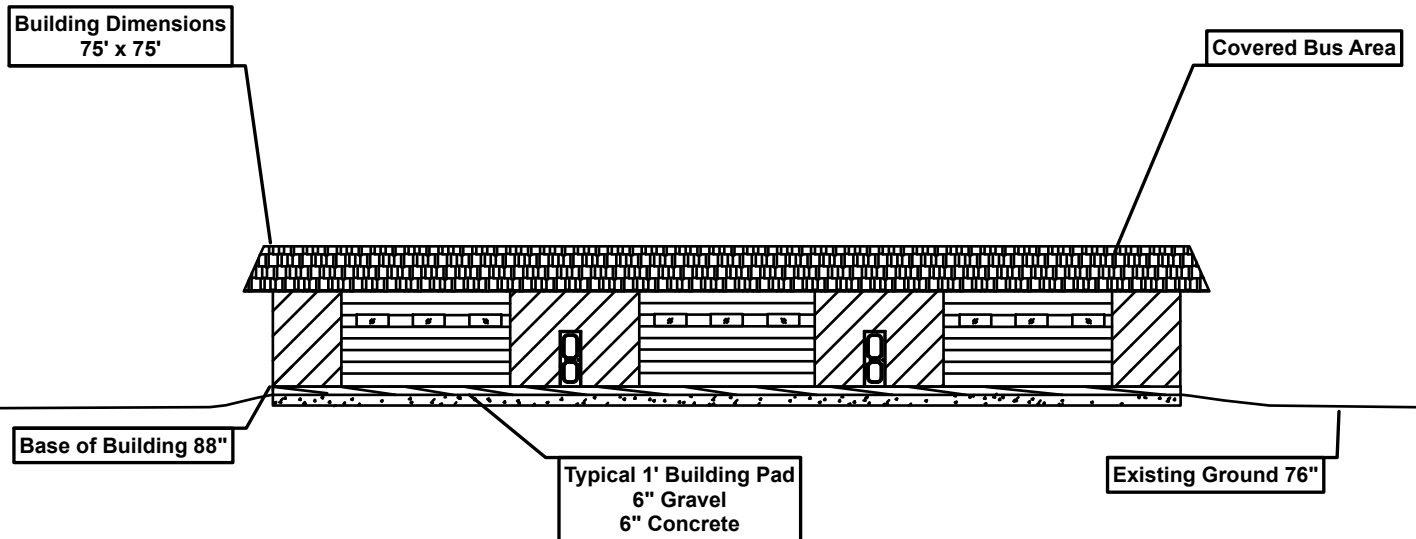
Scale = Not to Scale

Figure 8.6: Typical Section

Chennault Airport

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

Covered Bus Area Typical Section



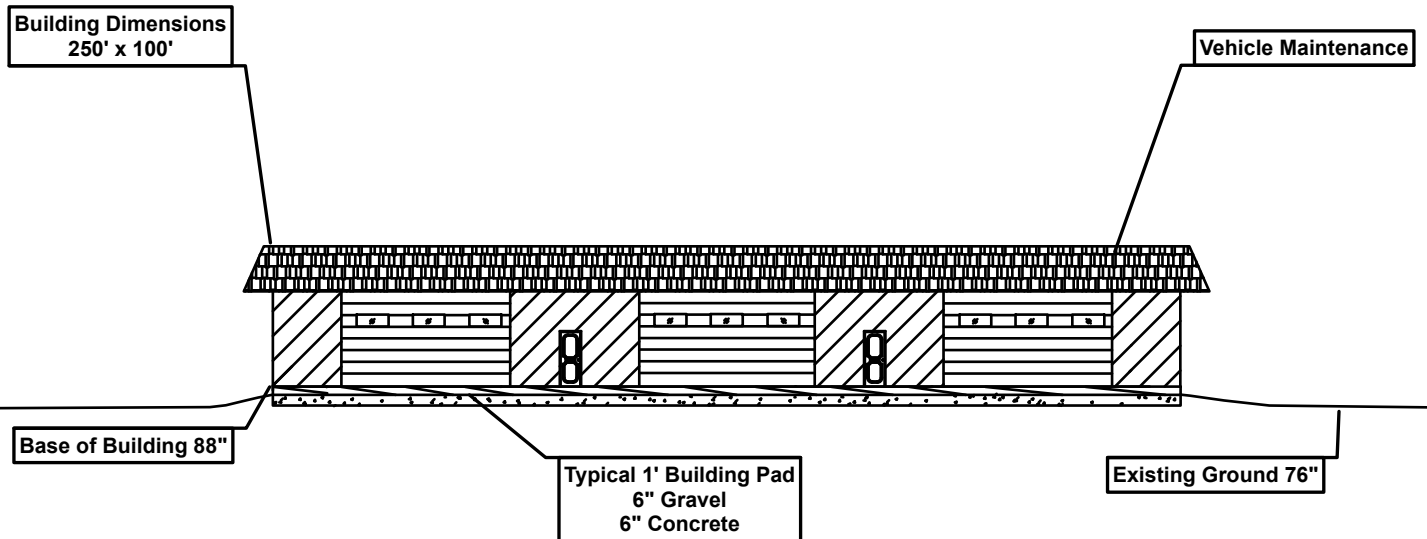
Scale = Not to Scale

Figure 8.7: Typical Section

Chennault Airport

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

Vehicle Maintenance Typical Section



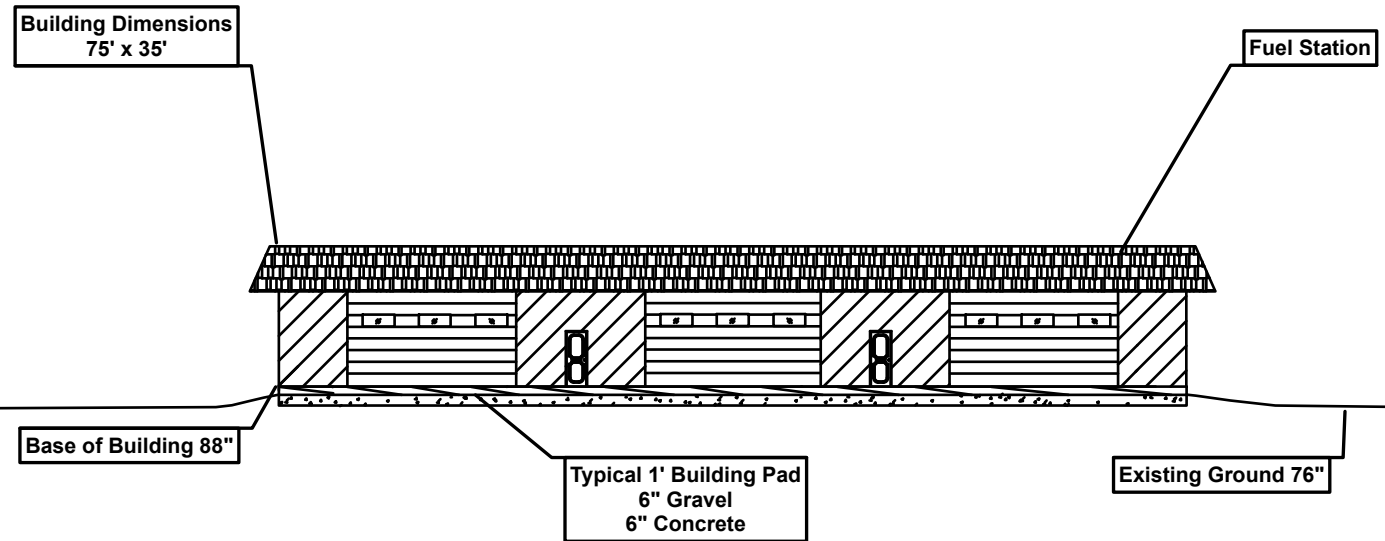
Scale = Not to Scale

Figure 8.8: Typical Section

Chennault Airport

This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

Fuel Station Typical Section



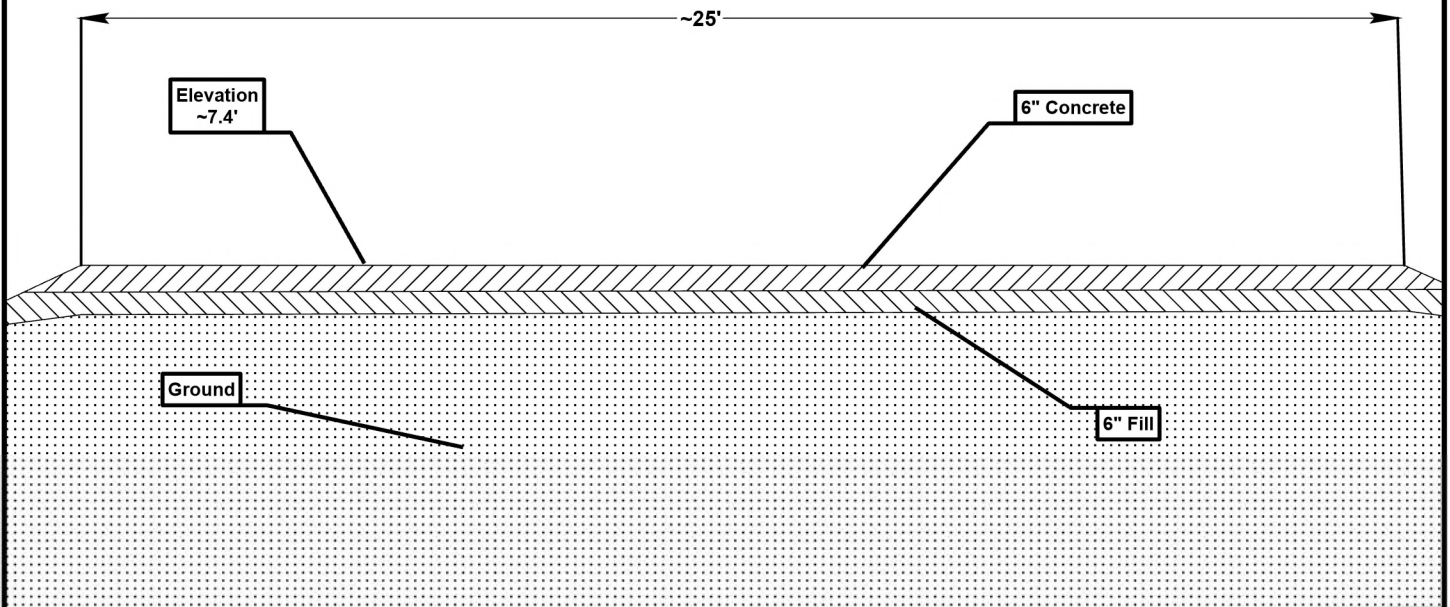
Scale = Not to Scale

Figure 8.9: Typical Section

Chennault Airport

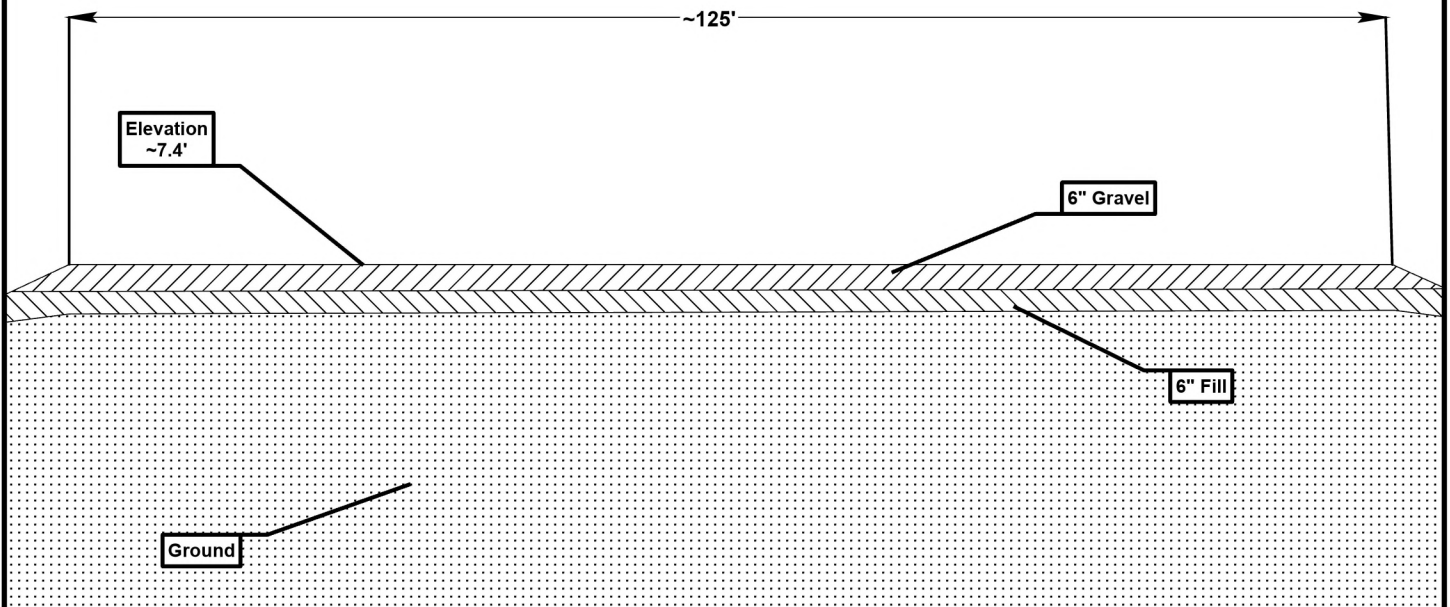
This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

Typical Roadway B-B



 http://elosenv.com/	Scale = Not to Scale	
	Figure 9: Typical Section	
	Chennault Airport	This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.

Typical Gravel Parking Lot C-C



 ELOS http://elosenv.com/	Scale = Not to Scale	This figure was prepared utilizing public and proprietary data. It should not be used to establish any legal boundaries or specific locations. ELOS Environmental, L.L.C., is not responsible for any usage of this figure contrary to its original, intended purpose.
	Figure 10: Typical Section	
	Chennault Airport	



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
7400 LEAKE AVE
NEW ORLEANS, LA 70118-3651

Regulatory Division

SUBJECT: CEMVN-RG (General Permit) GP-33

DEPARTMENT OF THE ARMY
GENERAL PERMIT

GENERAL PERMIT AUTHORIZING MINOR
CONSTRUCTION ACTIVITIES FOR COMMERCIAL, INDUSTRIAL, AND
INSTITUTIONAL PURPOSES
AND THE ASSOCIATED DISCHARGE OF FILL MATERIAL
INTO WATERS OF THE UNITED STATES

AUTHORIZATION NO.: MVN-2022-00383-MG (General Permit) GP-33

EFFECTIVE DATE: 1 April 2023

EXPIRATION DATE: 31 March 2028

Under authorization granted by applicable sections of Parts 320 through 332 of Title 33, Code of Federal Regulations, and delegated authority from the Commander, U.S. Army Corps of Engineers, the District Engineer at New Orleans has determined that it is in the public interest to issue a general permit to authorize minor construction activities for commercial, industrial, and institutional purposes and the associated discharge of fill material into waters of the United States occurring within the boundaries of the New Orleans District.

Specific legislation requiring Department of the Army permits for work of this nature:

a. Section 404 of the Clean Water Act (33 USC 1344).

The work and activities specifically intended for authorization under this general permit are the construction of commercial, industrial, and institutional facilities, and the associated drainage, roadway, sanitary, utility infrastructure, and typical amenities such as parking areas and landscaping.

Under this general permit, when the construction of commercial, industrial, and institutional facilities is being proposed for use by the applicant, the activity may not exceed an aggregate loss of **5 acres** of jurisdictional wetlands. Whenever any other nationwide or general permit is used in conjunction with this general permit, the total acreage of jurisdictional wetland loss combined cannot exceed the appropriate threshold. In addition, any activity performed in conjunction with the proposed development that degrades existing jurisdictional project site wetlands without actually incurring a loss of waters of the U.S., such as the removal of native vegetation for

aesthetic purposes, will be counted towards the threshold established for this general permit. Last, a determination will be made as to scope of the proposed activity's impact on jurisdiction of any adjacent wetlands on a case-by-case basis

Prior to written approval from the New Orleans District (CEMVN), each request for work covered by this general permit will be reviewed to determine impacts to the natural and human environment to determine if approval is not contrary to the public interest. A detailed justification of project need and project alternatives considered, including other potential off-site project locations and/or on-site project designs, supporting the applicant's view that the proposed activity represents the least environmentally damaging practicable alternative must be submitted with the application (see Section 3).

This general permit will authorize work in those areas which are located within the boundaries of the U.S. Army Engineer District, New Orleans, but outside the Louisiana Coastal Zone (LCZ), UNLESS the activity is within the LCZ but specifically or partially exempt from coastal use permitting as determined by the Louisiana Department of Natural Resources, Office of Coastal Management (OCM). The map attached to this permit shows the approximate boundaries of the District (attachment 1).

1. Inclusions: The following are examples of work that may be eligible under this permit:
 - a. Commercial facilities proposed for use by the applicant such as retail establishments, warehouses, office buildings, etc.
 - b. Industrial facilities proposed for use by the applicant such as manufacturing facilities, industrial storage and/or staging facilities, etc.
 - c. Institutional facilities proposed by the applicant such as schools, municipal centers, non-governmental buildings, etc.
2. Exclusions: The following work will not be eligible under this general permit. Applications for this work will be processed in accordance with 33 CFR Part 325.
 - a. Piecemeal development; the proposed activity must be a single and complete project. In addition, the use of this general permit will not be applicable to a "phased" development of a larger project.
 - b. Work subject to authorization under Section 10 of the Rivers and Harbors Act of 3 March 1899 (33 USC 403).
 - c. With the exception to activities required for compliance with GP-33 special conditions h. and i. on pages 6-7, work within the banks of natural drains. For the purposes of this general permit, natural drains are defined as any stream, slough, bayou, creek, etc. that has been formed by natural geomorphic

processes, including those systems which may have been altered by anthropogenic forces. Additionally, a 50-foot avoidance buffer zone shall be extended to all riparian wetlands and floodways, where applicable.

- d. Work within jurisdictional wetland areas that are prone to prolonged inundation (e.g., seasonally flooded bottomland hardwoods and cypress-tupelo swamp).
- e. This general permit will not authorize work within the following areas:

- (1) Work authorized under GP-33 may not be performed in areas where the activity is likely to result in a "disturbance" to bald eagles. If a bald eagle nest occurs within 660 feet of the proposed project area, then an evaluation must be performed to determine whether the project is likely to disturb nesting bald eagles. That evaluation can be conducted on-line at:

<http://www.fws.gov/southeast/birds/Eagle/tamain.html>

Applicants are advised to review the National Bald Eagle Management (NBEM) Guidelines for information and recommendations to minimize potential project impacts to bald eagles. A copy of the NBEM Guidelines is available at:

<https://www.fws.gov/northeast/EcologicalServices/pdf/NationalBaldEagleManagementGuidelines.pdf>

If you need further assistance, please contact the U.S. Fish and Wildlife Service's Office of Migratory Birds (404) 679-7070.

- (2) Within 1,000 feet of known bird nesting colonies or rookeries.
- (3) No activity that is likely to adversely affect federally listed threatened or endangered species, or a species proposed for such designation, or that is likely to destroy or adversely modify the critical habitat of such species, is authorized under this general permit.
- (4) Within 1,500 feet a levee or flood control facilities constructed or maintained with federal funds, or owned and operated by agencies of state or local governments without the written consent of the appropriate agency or governing body.
- (5) At or within one mile of a site listed or eligible to be listed on the National Register of Historic Places, within one-half mile of a known archaeological site, or within one-half mile of any known cultural resource site, without the written approval or waiver from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO) or the appropriate authority.

- (6) Work within 300 feet of a Louisiana designated Scenic River without written approval or waiver from the Louisiana Department of Wildlife and Fisheries. A list with description as well as access to mapping of Louisiana Scenic Rivers is available at <https://www.wlf.louisiana.gov/page/scenic-rivers-descriptions-and-map>. Questions regarding the LDWF Scenic Rivers program can be directed to LDWF staff for assistance if needed. Inquiries can be sent to staff via <https://www.wlf.louisiana.gov/page/scenic-rivers>.
 - (7) Work performed within an existing facility where the existing hard surface or aggregate road system, drainage infrastructure, utilities, etc., are in violation of Section 404 of the Clean Water Act (33 USC 1344).
3. Applications for approval for work to be performed under authority of this general permit must include the following (attachment 2):
 - a. Completed application form ENG 4345. Note: for those activities within the LCZ, the Joint Application form must be used, provided it includes OCM's exemption determination. If the proposed activity is not exempt, or is partially exempt by OCM, this GP may not be used, or is limited to the exempt portion of the project, respectively.
 - b. Vicinity Map – You may use an existing road map or U.S. Geological Survey topographical map. This map should include:
 - (1) Location of activity site (draw an arrow showing the exact location of the site on the map).
 - (2) Latitude, longitude, and section, township and range.
 - (3) Names, descriptions, and locations of landmarks.
 - (4) Name of and distance to nearest town, community or other identifying locations.
 - (5) Names or numbers of all roads in the vicinity of the site.
 - (6) North arrow.
 - c. The proposed facility layout (if in an existing facility then the location of the areas that have previously been developed), a delineation of wetlands/waters of the U.S., and property boundaries.
 - d. Plan view and cross section (samples attached) of the proposed work which include:

- (1) Principal dimensions of the activity
 - (2) Number of cubic yards and source of fill material
- e. A Needs and Alternatives Analysis.
- f. A proposed compensatory mitigation plan for unavoidable wetland impacts. On a case-by-case basis, appropriate and practicable compensatory mitigation will be required for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and/or minimization has been attained. Compensation for unavoidable impacts must be commensurate with the wetland loss. Mitigation requirements will be determined by CEMVN and be consistent with the Compensatory Mitigation Rule.
4. No work may be performed under this general permit unless and until:
- a. The New Orleans District has reviewed the application and has issued a written approval and the permittee has fulfilled all compensatory mitigation requirements (if applicable).
 - b. All required local, state and other federal permits, licenses, authorizations, and certifications are obtained. This includes, but is not limited to:
 - (1) A water quality certification or waiver from the Louisiana Department of Environmental Quality, Office of Environmental Services;
 - (2) A drainage impact analysis certified by a professional engineer and approved by the appropriate local authority, as required, and;
 - (3) A Parish or State-approved individual or central sewage treatment system, as appropriate for the activity proposed under this general permit.

All work authorized by this general permit must be performed in accordance with the applicable standard conditions of ENG Form 1721, Department of the Army Permit (attachment 3), and the following special conditions:

- a. The area extent of the clearing, grading, and/or otherwise filling will be limited to the minimum amount necessary to include the commercial, industrial, or institutional facility. A maximum of 5.0 acres of jurisdictional wetland impacts for the proposed facility will be allowed for clearing, grading, and/or otherwise filling of the lot. The remaining unpermitted jurisdictional wetlands on the property will remain in their natural state.

- b. All projects must comply with the Section 404(b)(1) Guidelines (49 CFR 230.10). Appropriate and practicable steps must be taken to minimize potential adverse effects of the discharge on the aquatic ecosystem. Whenever practicable, non-wetland disposal sites must be used.
- c. The permittee shall provide the project manager with this office a **Notification of Completion** within five days of project construction being finalized. Notification shall reference the subject MVN permit #, and may be submitted, preferably by email to the project manager, or alternatively by hard copy mail to: U.S. Army Corps of Engineers, New Orleans District, CEMVN-RG, 7400 Leake Ave., New Orleans, LA 70118-3651.
- d. Many local governing bodies have instituted laws and/or ordinances in order to regulate dredge and/or fill activities in floodplains to assure maintenance of floodwater storage capacity and avoid disruption of drainage patterns that may affect surrounding properties. Your project involves dredging and/or placement of fill; therefore, you must contact the local municipal and/or parish governing body regarding potential impacts to floodplains and compliance of your activities with local floodplain ordinances, regulations or permits.
- e. Work activities and any associated drainage plans and affects associated with the project shall comply with all applicable laws and ordinances administered by local governing bodies, and/or other applicable agency requirements (Parish Government, Police Jury, Drainage Authority, Levee District, etc.). If it is determined that the project is creating unacceptable and unnatural ponding, inundation or flooding conditions on adjacent properties, the permittee will be required to remediate the situation as directed by these governing bodies. Should there be any changes required in the project design, the permittee shall coordinate with this office to obtain a permit amendment and/or review and decision on the plans, prior to commencement of those alterations.
- f. The permittee is responsible for ensuring that all contractors and/or workers associated with project construction and implementation, are equally aware of the authorized plans, conditions, and/or restrictions associated with this approval.
- g. All work shall be done in accordance with the approved plans and shall be confined to the permitted work area(s) represented within the attached drawings. If the project requires modifications to the authorized plan, the permittee shall contact this office to obtain a permit amendment and/or review and decision on the plans, prior to commencement of those alterations.
- h. The permittee shall properly install adequate erosion/siltation control measures around construction areas that require land-based earthwork (i.e., excavation and/or deposition of fill materials, land contouring, machinery rutting, fill maneuvering and redistribution, etc.), to aid in preventing project related sediments, debris and other pollutants from entering adjacent wetlands or

waters. Acceptable measures include but are not limited to the proper use and positioning of temporary silt fences, straw bales, fiber/core logs, wooden barriers, seeding or sodding of exposed soils, or other approved EPA construction site storm-water runoff control and best management practices. Control techniques shall be installed prior to the commencement of earthwork activities and maintained until the project is complete and/or the subject areas are stabilized.

- i. This general permit does not authorize work that could adversely affect adjacent property, including adjacent jurisdictional wetlands or waters. Where roads or driveways are constructed across and/or through jurisdictional wetlands, waterways, sloughs, streams, ditches, laterals, etc., culverts must be installed and maintained to allow for a direct hydrologic surface connection in a typical year between the bisected wetlands or waters. Culverts must be set to the proper elevation and shall be of sufficient size and number relative to the road size and length so as to allow for unencumbered flow between the bisected wetlands or waters.
- j. Permittees must evaluate the effect that the proposed work would have on historic properties listed, or eligible for listing, in the National Register of Historic Places (NRHP) prior to initiation of work. Historic properties include prehistoric and historic archaeological sites, and areas or structures of cultural interest that occur in the permit area. If a known historic property would be encountered, the permittee shall notify CEMVN and shall not conduct any work in the permit area that would affect the property until the requirements of 33 CFR Part 325, Appendix C, and 36 CFR Part 800 have been satisfied. If a previously unknown historic property is encountered during work authorized by this general permit, the permittee shall immediately notify the CEMVN and avoid further impact to the site until the USACE has verified that the requirements of 33 CFR Part 325, Appendix C, and 36 CFR Part 800 have been satisfied.
- k. If abandoned cemeteries, unmarked graves, or human remains are discovered during the permitted activity, the permittee will stop work immediately and comply with the Louisiana Unmarked Human Burial Sites Preservation Act (La. R.S. 8:671 et seq.). The permittee will notify local law enforcement, the District Commander, and the Louisiana Division of Archaeology (LDOA), within the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, by telephone at 225-342-8170 to assess the nature and age of the human skeletal remains within twenty-four (24) hours of the discovery of unmarked human remains and will accompany local law enforcement personnel during all field investigations. If the appropriate local law enforcement official determines that the remains are not a crime scene, and the remains are more than 50 years old, LDOA has jurisdiction over the remains. In no instance will human remains be removed from the discovery site until jurisdiction is established. In cases where the LDOA assumes jurisdiction and the remains are determined to be American Indian, LDOA will consult with Tribes, the District Commander, and the permittee to determine the appropriate course of action.

- l. Permittees that discover any previously unknown historic, cultural, or archeological remains and artifacts while accomplishing the permitted activity must immediately notify the District Commander, halt all construction activity at the location of discovery, and avoid construction activities within a fifty (50) foot buffer zone of the location of discovery until the required coordination has been completed. The District Commander will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
- m. The District Commander retains discretionary authority to require applicants to obtain an individual permit when determined that the public interest will best be served by doing so.
- n. The District Commander may include additional conditions to this general permit at any time and as necessary to protect the public interest.
- o. This general permit may be suspended in whole or part and/or revoked if the District Commander determines such action is necessary to protect the public interest.
- p. Additional public notice will be given to advise the interested public of major revisions to the general permit or of its suspension or revocation.
- q. That all activities identified and authorized herein shall be consistent with the terms and conditions of this general permit; and that any activities not specifically identified and authorized herein shall constitute a violation of the terms and conditions of this general permit which may result in the modification, suspension, or revocation of the authorization granted to the permittee, in whole or in part, as set forth more specifically in General Condition t., and in the institution of such legal proceedings as the United States Government may consider appropriate, whether or not this general permit has been previously modified, suspended, or revoked in whole or in part.
- r. That all activities authorized herein shall be at all times consistent with applicable water quality standards and best management practices established pursuant to the Clean Water Act of 1972 (PL 92-500: 86 Stat. 816) and pursuant to applicable state and local laws.
- s. That the permittee agrees to make every reasonable effort to perform the work authorized herein in a manner so as to minimize any adverse impact on fish, wildlife, special aquatic sites, and natural environmental values.
- t. That the permittee shall permit the District Commander or his authorized representative(s) or designee(s) to make periodic inspections of the project

site(s) and disposal site(s), if different from the project site(s), at any time deemed necessary in order to assure that the activity being performed under authority of this general permit is in accordance with the terms and conditions prescribed herein.

- u. That the general permit does not convey any property rights, either in real estate or material, or any exclusive privileges; and that it does not authorize any injury to property or invasion of rights or any infringement of federal, state, or local laws or regulations nor does it obviate the requirement to obtain state or local approval required by law for the activity authorized herein.
- v. That any individual authorization granted under this general permit may be either modified, suspended, or revoked in whole or in part if the Secretary of the Army or his authorized representative determines that there has been a violation of any of the terms or conditions of this general permit or that such action would otherwise be in the public interest.
- w. That in issuing authorization under this general permit, the federal government will rely upon information and data supplied by the applicant. If subsequent to the issuance of an authorization such information and data prove to be false, incomplete, or inaccurate, the general permit authorization may be modified, suspended, or revoked, in whole or in part.
- x. That any modification, suspension or revocation of this general permit or any individual authorization granted under this general permit will not be the basis for any claim for damages against the United States.
- y. That this general permit cannot be used for piecemeal fill activities or other piecemeal work, nor is this general permit valid for any activity that is part of an overall project for which the Corps has determined that an individual permit is required.
- z. The permittee shall assure that all material used during construction shall be pollutant free in accordance with the EPA Guidelines for Discharge of Dredged or Fill Material, found in 40 CFR 230. The material may be obtained offsite or from site preparation. Offsite material shall not be obtained from wetlands or from other areas that may adversely affect adjacent wetlands. Any excess material shall be placed in an upland area and properly contained or stabilized to prevent entry into adjacent wetlands or other waters.
- aa. Individual approvals granted under this general permit allows 5 years from the date of approval letter to complete the project.

All references to "Permittee" in ENG Form 1721 shall, for purposes of this general permit, be understood to refer to the person, family, agency or group performing work authorized by this permit.

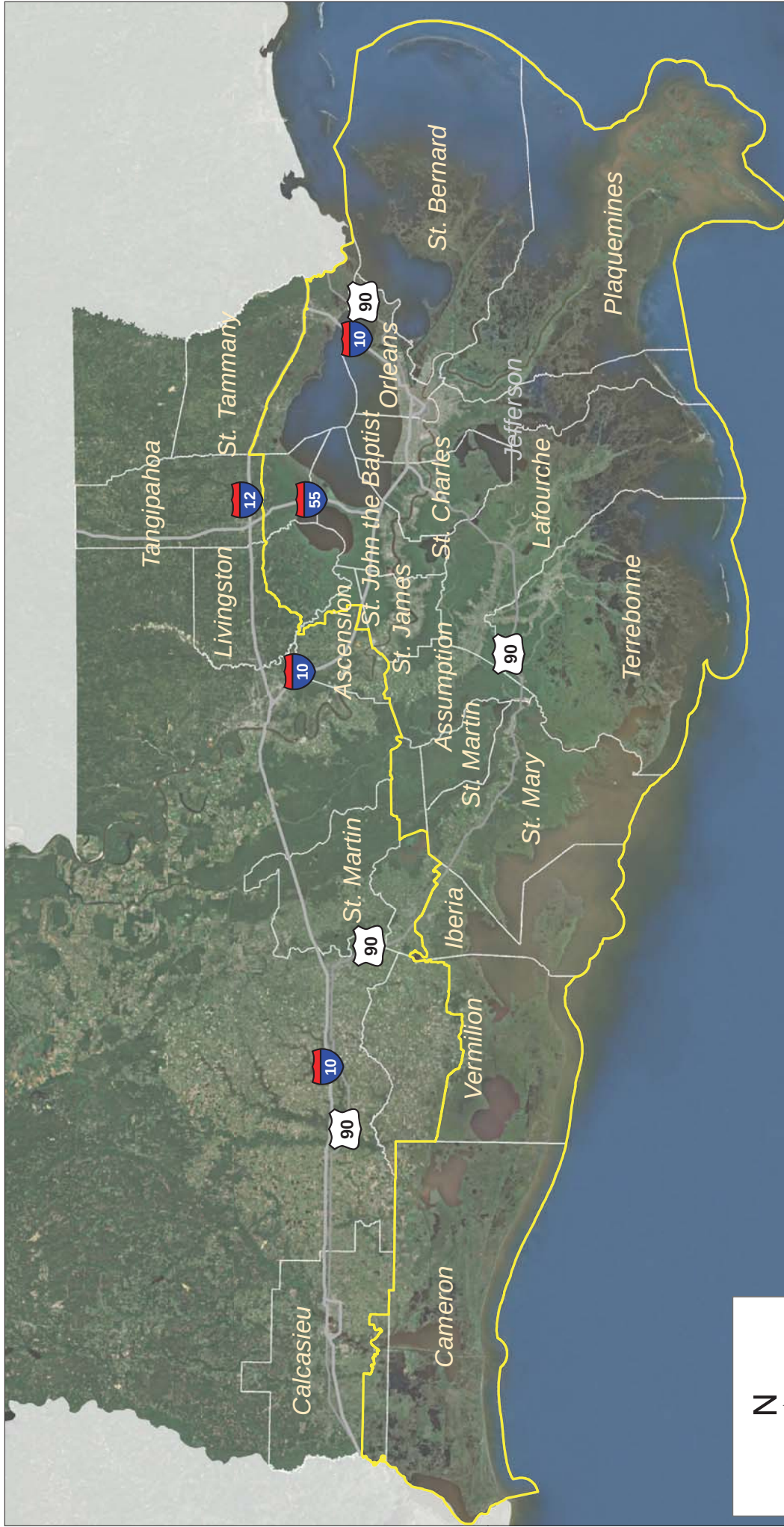
BY THE AUTHORITY OF THE SECRETARY OF THE ARMY:

Martin S. Mayer
Chief, Regulatory Division

Attachments

1. District Boundary Map and
Coastal Zone Boundary Map
2. Sample Application and Drawings
3. ENG FORM 1721





1 in = 19 miles



Revised Boundary

Source: Esri, i-Cubed, USDA, USGS, AEX, GeoEye, GeoMapping, AeroGrid, IGN, IGP, UPR-EGP and the GIS User Community



GENERAL PERMIT (GP-33) ATTACHMENT 2

U.S. Army Corps of Engineers (USACE) APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT 33 CFR 325. The proponent agency is CECW-CO-R.		Form Approved - OMB No. 0710-0003 Expires: 02-28-2022	
The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil . Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR APPLICATION TO THE ABOVE EMAIL.			
PRIVACY ACT STATEMENT			
Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: http://dpcl.dod.mil/Privacy/SORNSIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx			
(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)			
1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE
(ITEMS BELOW TO BE FILLED BY APPLICANT)			
5. APPLICANT'S NAME First - Middle - Last - Company - E-mail Address -		8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required) First - Middle - Last - Company - E-mail Address -	
6. APPLICANT'S ADDRESS: Address- City - State - Zip - Country -		9. AGENT'S ADDRESS: Address- City - State - Zip - Country -	
7. APPLICANT'S PHONE NOs. w/AREA CODE a. Residence b. Business c. Fax		10. AGENTS PHONE NOs. w/AREA CODE a. Residence b. Business c. Fax	
STATEMENT OF AUTHORIZATION			
11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.			
_____ SIGNATURE OF APPLICANT		_____ DATE	
NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY			
12. PROJECT NAME OR TITLE (see instructions)			
13. NAME OF WATERBODY, IF KNOWN (if applicable)		14. PROJECT STREET ADDRESS (if applicable) Address	
15. LOCATION OF PROJECT Latitude: °N Longitude: °W		City - State- Zip-	
16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions) State Tax Parcel ID Municipality Section - Township - Range -			

17. DIRECTIONS TO THE SITE

18. Nature of Activity (Description of project, include all features)

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type
Amount in Cubic Yards

Type
Amount in Cubic Yards

Type
Amount in Cubic Yards

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres
or
Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

24. Is Any Portion of the Work Already Complete? ☐ Yes ☐ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address-

City -

State -

Zip -

b. Address-

City -

State -

Zip -

c. Address-

City -

State -

Zip -

d. Address-

City -

State -

Zip -

e. Address-

City -

State -

Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT

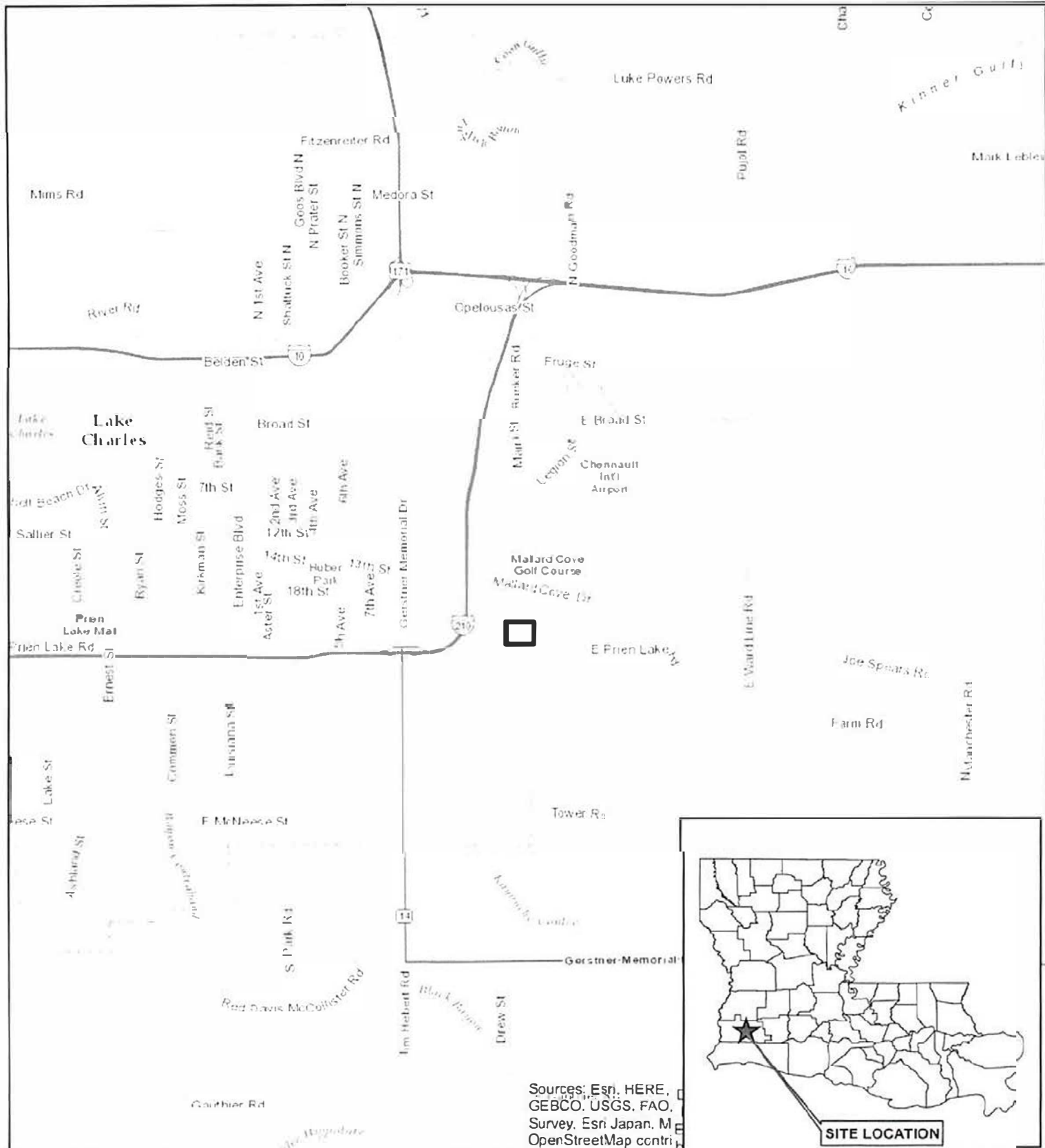
DATE

SIGNATURE OF AGENT

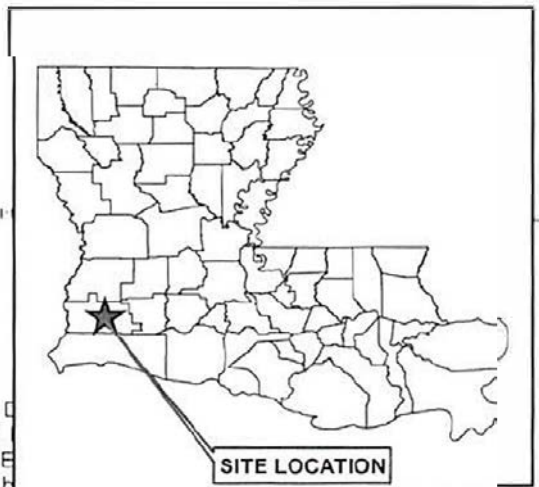
DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.



Sources: Esri, HERE, GEBCO, USGS, FAO, Survey, Esri Japan, M, OpenStreetMap contri



0 0.5 1 2 Miles

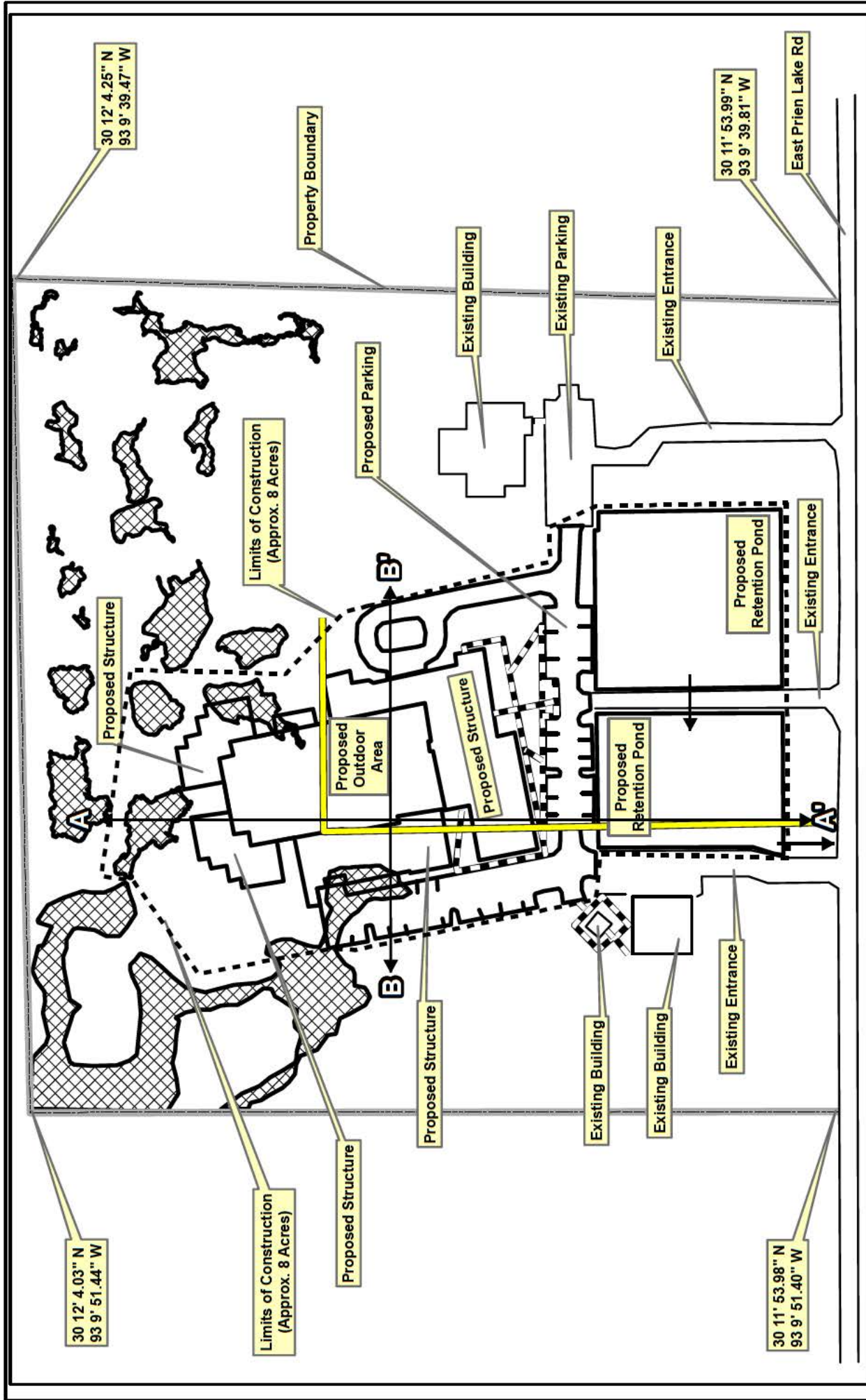
 SITE LOCATION



FIGURE 1 OF 4
SITE LOCATION MAP
 PERMIT APPLICATION

CALCASIEU PARISH, LOUISIANA

Drawn By: [REDACTED]	Date: [REDACTED]	Project # [REDACTED]
Checked By: [REDACTED]	Date: [REDACTED]	Revised: [REDACTED]



100% WETLANDS (TOTAL - 2.1 ACRES)
0.41 ACRES IMPACTED

→ POND DRAINAGE

--- WALKING PATH

— DRAIN DITCH (900 FT)

0 100 200 400 Feet

North Arrow

FIGURE 2 OF 4
SITE DIAGRAM
PERMIT APPLICATION

Calcasieu Parish, Louisiana

Drawn By: [Redacted] Date: 11/15/16

Checked By: [Redacted] Date: 04/18/17

Project # [Redacted]

Revised: [Redacted]

East Prien Lake Rd

30 11' 53.99" N
93 9' 39.81" W

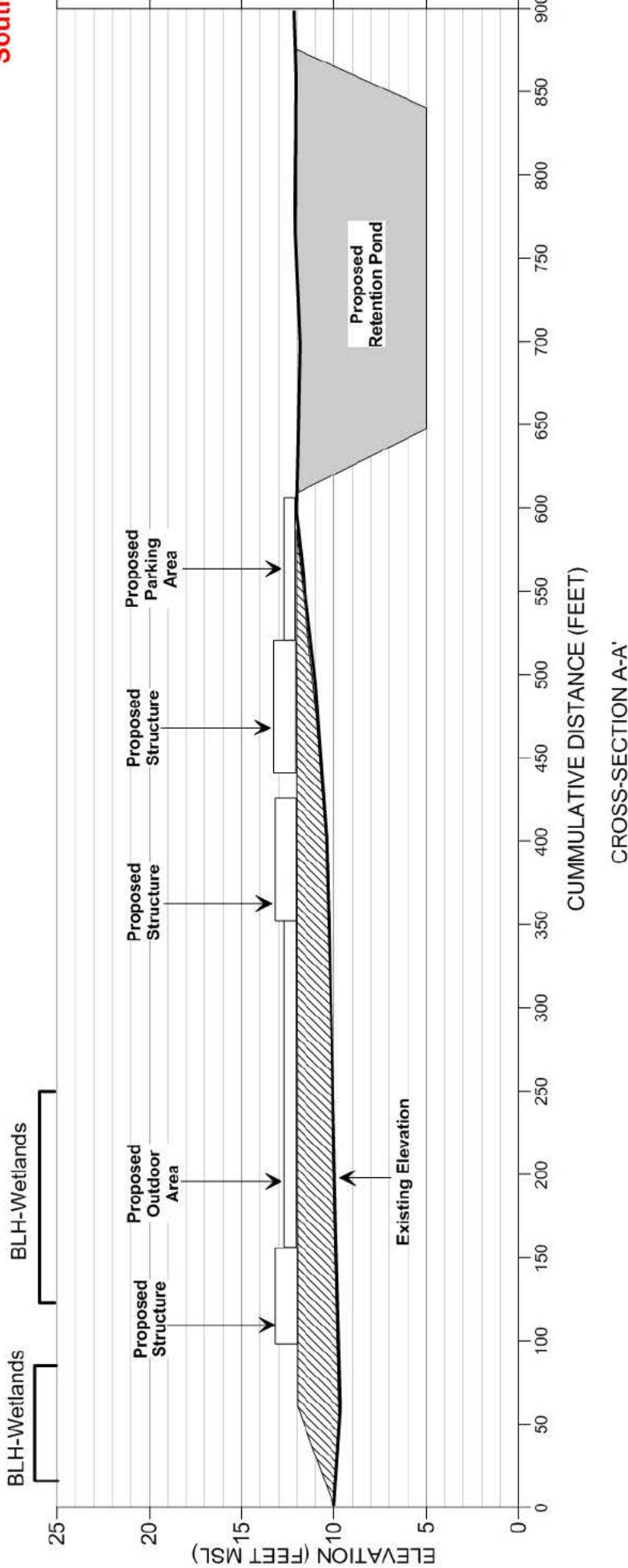
30 12' 4.25" N
93 9' 39.47" W

30 12' 4.03" N
93 9' 51.44" W

30 11' 53.98" N
93 9' 51.40" W

North

South

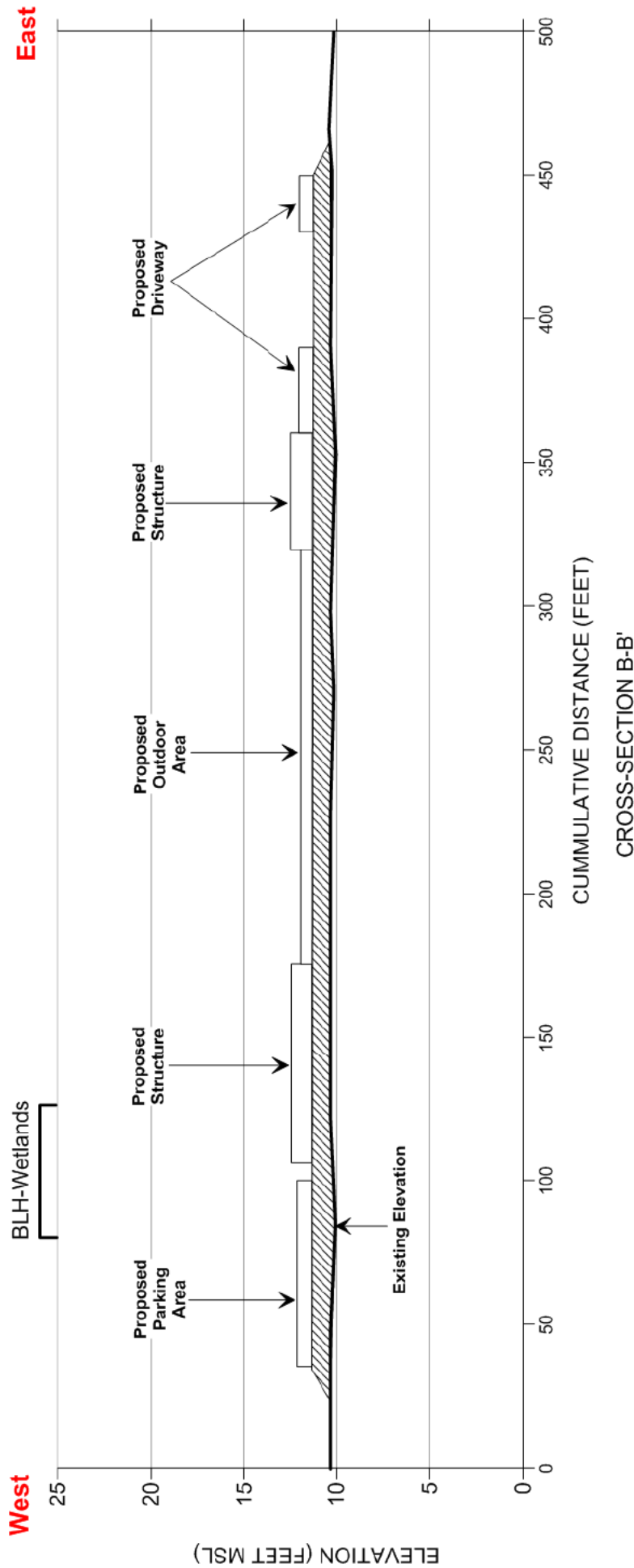


= Fill Areas

= Cut Areas

NOT TO SCALE
DIMENSIONS AS NOTED

Note: Approximately 23,700 yd³ of earthen material will be excavated.
Approximately 10,000 yd³ of earthen material will be placed on site. The remaining earthen will be utilized by the contractor for off site projects.
Approximately 4,200 yd³ of concrete will be placed on site for foundations, parking areas, and walking paths.



- = Fill Areas
- = Cut Areas

**NOT TO SCALE
DIMENSIONS AS NOTED**

Note: Approximately 23,700 yd³ of earthen material will be excavated.
 Approximately 10,000 yd³ of earthen material will be placed on site. The remaining earthen will be utilized by the contractor for off site projects.
 Approximately 4,200 yd³ of concrete will be placed on site for foundations, parking areas, and walking paths.

GENERAL PERMIT (GP-33) ATTACHMENT 3

DEPARTMENT OF THE ARMY PERMIT

Permittee _____

Permittee No. _____

Issuing Office _____

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

Project Location:

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on _____. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

☐ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

☐ Section 404 of the Clean Water Act (33 U.S.C. 1344).

☐ Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413)

2. Limits of the authorization.

- a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.
- b. This permit does not grant any property rights or exclusive privileges.
- c. This permit does not authorize any injury to the property or rights of others.
- d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

- a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.
- b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or behalf of the United States in the public interest.
- c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.
- d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE)

(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

(DISTRICT ENGINEER)

(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE)

(DATE)

SECTION 011000 SUMMARY

PART 1 - GENERAL

1.1 PROJECT INFORMATION

- A. Project: Lake Charles Public Works New Facility Phase 2, #DR002.
 - 1. Project Location: 4200 Broad Street, Lake Charles, LA 70615.
- B. Owner: City of Lake Charles, 326 Pujo Street, Lake Charles, LA.
- C. Architect: Brossett Architect, LLC, 414 Pujo Street, Lake Charles, LA.
- D. The Work consists of site work, new construction and improvements.
 - 1. The work includes general construction, finishes, plumbing, HVAC and electrical.
- E. Work by Owner: Install of cameras and access control end devices.
- F. Work Under Separate Contracts:
 - 1. Lake Charles Public Works New Facility Phase 1, by Russell J. Stutes Construction Company, LLC.
- G. Extra payment will not be authorized for relocation, removal, and/or temporary removal and reinstallation of any existing or newly installed construction (ducts, conduit, piping, wiring, fixtures, equipment, finishes, etc.) necessary to properly complete the Work, which could have been anticipated by careful examination of the project site, areas of work and the Contract Documents, including visual examination inside access panels, above suspended ceilings, inside millwork cabinets, etc. Such work shall be performed, without additional cost to the Owner.
- H. The Contract Documents are intended to produce a piece of work complete in every respect and the Contractor shall furnish all things necessary to complete the Work within the meaning and intent of said documents. It shall be the responsibility of the Contractor and his respective Subcontractors to provide and coordinate everything necessary to complete the Work as enumerated in these bid documents and provide all necessary plumbing, data and electrical connections, etc. required for complete and proper operation of all work provided whether noted or not.

1.2 TRANSMITTAL OF ELECTRONIC DRAWING FILES

- A. Electronic copies of drawing files may be transmitted to the contractor for convenience and use in the preparation of shop drawings.

- B. Contractor will be required to sign a contract for transmittal of the electronic files. A service fee of \$100 (One-Hundred Dollars) per sheet shall be remitted to Architect prior to delivery of the electronic files.

1.3 WORK RESTRICTIONS

- A. Contractor's Use of Premises: During construction, Contractor will have limited use of site. Contractor's use of premises is also limited by Owner's right to perform work or employ other contractors on portions of Project, and as follows:
 - 1. Owner will occupy premises during construction. Perform construction only during normal working hours 7 AM to 4 PM Monday thru Friday, (other than holidays), unless otherwise agreed to in advance by Owner. Clean up work areas and return to usable condition at the end of each work period.
 - 2. Partial Owner Occupancy: In accordance with the General Conditions, the Owner has the right to occupy completed portions of the Work prior to substantial completion of the total Work.
 - 3. Owner Occupancy: The Owner will occupy the site during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage.
 - 4. Limits: Limit site disturbance, including earthwork and clearing of vegetation, to 10 feet beyond building perimeter; 10 feet beyond surface walkways, patios, surface parking, and utilities less than 12 inches in diameter; 10 feet beyond primary roadway curbs and main utility branch trenches; and 10 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities, and playing fields) that require additional staging areas to limit compaction in the constructed area.
 - 5. Driveways, Walkways, and Entrances: Keep driveways, parking, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - 6. Contractor shall maintain all areas of this Project Construction Site in a clean and mowed state throughout the Construction Project. Project shall be mowed a minimum of once monthly and more often if required. No trash shall be allowed to accumulate on site outside of container for trash, including all discarded building materials. Project site shall be cleaned as needed and once a week at a minimum.
- B. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.
- C. In compliance with the CLEAN AIR ACT:
 - 1. The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq. and comply with FEMA circular Public Assistance Debris Monitoring Guide.
 - 2. The contractor agrees to report each violation to the City of Lake Charles and understands and agrees that the City will, in turn, report each violation as required

to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

3. The contractor agrees to dispose of all excess materials in a permitted landfill. Debris disposal tickets to be submitted weekly.

1.4 EXAMINATION OF SITE

- A. By executing the Contract, the Contractor represents that he has
 4. Visited the site and performed due diligence and examination of all areas of the work.
 5. Made due allowances for any and all difficulties and contingencies that may be encountered.
 6. Thoroughly compared Bid Documents with work in place;
 7. Visited the area of work and informed himself of existing conditions, and;
 8. Notified the Architect of ambiguities, inconsistencies and errors discovered within the Bid Documents, the existing conditions and any other project conditions. The Architect shall be the sole decision maker regarding inconsistencies and interpretations within the Bid Documents.
- B. In accordance with the General Conditions, each Subcontractor shall similarly represent that he has fulfilled the same responsibilities to the Contractor.
- C. Failure to visit the site and perform attendant responsibilities listed above shall not relieve the Contractor or any Subcontractor from their obligations, and no extra payment will be authorized for work related to conditions which can be identified and determined by examination of the site and the Contract Documents.

1.5 SPECIAL PROVISIONS

- A. Retainage per RS 38:2248 shall be 10% for projects < \$500,000 actual construction cost & 5% projects ≥ \$500,000 actual construction cost.
- B. No interest charges shall be added to cost from the Contractor for any payments due.
- C. Insurance Requirements to be per Insurance requirements included in the Project Manual.
- D. This project to be tax exempt and shall comply with all requirements of the Designation of Agency
- E. Attach a corporate resolution or other written evidence of the authority of the person signing the Bid to the actual bid submitted as. Per La R.S. 38:2212.
- F. Where AIA-A201 3.18 language conflicts with the contractual language, the contractual language shall govern.
- G. Completed, signed and executed contracts shall be returned with bonds and COI attached to the Architect within 2 weeks after submission to the Contractor. Contracts will be summarily executed and filed by the Owner.

- H. Notice to Proceed shall be issued by the Architect within 2 weeks of filing of the Contract unless otherwise agreed to by all parties.
- I. Project completion date is fixed at April 15, 2027.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012000 - PRICE AND PAYMENT PROCEDURES

PART 1- GENERAL

1.1 ALTERNATES

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate the alternate into the Work. No other adjustments will be made to the Contract Sum.
- B. Notification: Immediately following award of contract, prepare and distribute to each party involved, notification of the status of each alternate. Indicate whether alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to alternates, if any.
- C. Schedule: A "Schedule of Alternates" is included at the end of this section. Specification sections referenced in the Schedule contain requirements for materials and methods necessary to achieve the work described under each alternate.
- D. As part of each alternate include miscellaneous devices, appurtenances and similar items incidental to or required for a complete installation whether or not mentioned as part of the alternate.
- E. Coordination: Coordinate related work and modify or adjust adjacent work as required to ensure that work affected by each accepted alternate is complete and fully integrated into the project.

1.2 SUBSTITUTION PROCEDURES

- A. Substitutions include changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor award of the Contract.
 - 1. Substitution requests after award if the contract will not be approved. Follow requirements of Instructions to Bidders Article 3 for all substitution requests prior to bidding.
 - 2. Do not submit unapproved substitutions on Shop Drawings or other submittals.

1.3 CONTRACT MODIFICATION PROCEDURES

- A. Architect will issue supplemental instructions in writing authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.6 CHANGE ORDER PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work.
 - 1. Proposal Requests are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Unless otherwise indicated in the proposal request, within seven (7) calendar days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost necessary to execute the proposed change. Include an itemized list of Work to be performed and labor and material unit costs. Where requested, furnish data to substantiate costs and quantities. Indicate applicable taxes, delivery charges, equipment rental and amounts of trade discounts.
 - 3. Include a statement indicating the effect the proposed change in the Work will have on the Contract time and schedule.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
 - 1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract time.
 - 2. Include an itemized list of work to be performed and labor and material unit costs. Where requested, furnish data to substantiate costs and quantities. Indicate applicable taxes, delivery charges, equipment rental and amounts of trade discounts.
 - 3. All requests for additional days due to inclement weather shall be submitted monthly. Requests shall include backup documentation and hard copies shall be submitted within 5 calendar days of end of month to be considered as a request for a change. No weather delay days will be approved other than unused or conditions that exceed 300% of typical anticipated days for inclement weather per month.
- C. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor for all changes to the Contract Sum or the Contract Time.
- D. Architect may issue a Construction Change Directive. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

- E. Submit change order proposals in the form and detail as requested by the Architect and these Contract Documents.
- F. Upon Owner's approval of a Change Order Proposal Request, the Architect will issue a Change Order for signatures of the Owner and Contractor on the change order form, as provided in the Conditions of the Contract.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Architect may issue a Construction Change Directive instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. The Construction Change Directive will contain a complete description of the change in the work and designate the method to be followed to determine change in the Contract Sum and/or Contract time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract and permit preparation of a Change Order.
 - 1. The Contractor should initiate no work included on a Change Order without written approval from the Owner.

1.8 SCHEDULE OF VALUES

- A. Prepare the schedule of values, as required by the General Conditions, in conjunction with the preparation of the progress schedule. Deliver in duplicate to the Architect within 14 days after the awarding of the Contract. Coordinate preparation of schedule of values and progress schedule. Correlate line items with other administrative schedules and the forms required for the work, including the progress schedule, payment request form, listing of subcontractors, schedule of allowances, schedule of alternates, listing of products and principal suppliers and fabricators, and the schedule of submittals. Provide breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of payment requests and progress reports. Break down principal subcontract amounts into several line items. Round off to the nearest whole dollar, but with the total equal to the Contract Sum. Submit on AIA Form G703, or form as approved by Architect.
 - 1. Material/Fabrication Values: For each unit of work where payment requests will be made on account of materials or equipment purchased, fabricated, or delivered, but not yet installed, show the "initial value" for payment request and "value added" for subsequent stage or stages of completion on that unit of work.
 - 2. Time Coordination: In coordination of initial submittals and other administrative "start-up" activities, submit the schedule of values to the Architect at the earliest feasible date, but in no case later than 14 days after the Notice to Proceed.
 - 3. Listing: Arrange schedule with columns to indicate the generic name of item, related specification sections, the subcontractor, the supplier, manufacturer, or

- fabricator, change orders (numbers) which have affected the value, the dollar value of the item, and the percentage of the Contract Sum to nearest one-hundredth percent and adjusted to total 100 percent.
4. Margins of Cost: Show line items of indirect costs, and margins on actual costs, only to the extent such items will be individually listed in payment requests. In general, each item in the schedule of values and in payment requests shall be established to be complete with its total expenses and proportionate share of the general overhead and profit margin. Except as otherwise indicated, those major cost items that are not directly the cost of actual work-in-place, such as distinct temporary facilities, may be either shown as line items in the schedule of values or may be distributed as general overhead expense, at Contractor's option.
 5. Schedule Updating: Update and resubmit schedule of values when change orders affect the listing and when the actual performance of the work involves necessary changes of substance to the values previously listed.

1.9 PAYMENT REQUESTS

- A. Except as otherwise indicated, the progress payment cycle is to be regular. Each application must be consistent with previous applications and payments. Certain applications for payment, such as the initial application, application at substantial completion, and final payment application involve additional requirements.
- B. Payment Application Forms: AIA Document G702 and Continuation Sheets; available from "Publications, a Division of The AIA Service Corporation", 1735 New York Ave. NW., Washington, DC, 20006.
- C. Application Preparation: Except as otherwise indicated, complete every entry provided for on the form, including notarization and execution by authorized persons. Incomplete applications will be returned by Architect without action. Entries must match current data of schedule of values and progress schedule and report. Listing must include amounts of change orders issued prior to last day of the "period of construction" covered by application. Attach updated Construction Schedule to each Application for Payment. Attach Contractor and Subcontractor/Supplier Partial Lien Waiver to each Application for Payment.
- D.
- E. Initial Payment Application: The principal administrative actions and submittals which must precede or coincide with submittal of Contractor's first payment application can be summarized as follows, but not necessarily by way of limitation:
 1. Listing of subcontractors and principal suppliers and fabricators.
 2. Schedule of values.
 3. Listing of Contractor's staff assignments and principal consultants.
 4. Copies of acquired building permits and similar authorizations and licenses from governing authorities for current performance of the work.
 5. Data needed to acquire Owner's insurance coverages.
- F. Application at Time of Substantial Completion: Following issuance of Architect's final "certificate of substantial completion," and also in part as applicable to prior certificates

on portions of completed work as designated, a "special" payment application may be prepared and submitted by Contractor. The principal administrative actions and submittals which must proceed or coincide with such special applications can be summarized as follows, but not necessarily by way of limitation:

1. Occupancy permits and similar approvals or certifications by governing authorities and franchised services, assuring Owner's full access and use of completed work.
2. Warranties, (guarantees), maintenance agreements and similar provisions of contract documents.
3. Test/adjust/balance records, maintenance instructions, meter readings, start-up performance reports, and similar change-over information germane to Owner's occupancy, use, operation and maintenance of completed work.
4. Advice to Owner on coordination of shifting insurance coverages, including proof of extended coverages as required.
5. Final progress photographs, where required.
6. Application for reduction (if any) of retainage and consent of surety.
7. Listing of Contractor's incomplete work, recognized as exceptions to Architect's certificate of substantial completion.

G. Final Payment Application: The administrative actions and submittals which must precede or coincide with submittal of Contractor's final payment application can be summarized as follows, but not necessarily by way of limitation:

1. Completion of project closeout requirements.
2. Completion of items specified for completion beyond time of substantial completion (regardless of whether special payment application was previously made).
3. Assurance, satisfactory to Owner, that unsettled claims will be settled and that work not actually completed and accepted will be completed without undue delay.
4. Transmittal of required project construction records to Owner.
5. Proof, satisfactory to Owner, that taxes, fees and similar obligations of Contractor have been paid.
6. Removal of temporary facilities, services, surplus materials, rubbish and similar elements.
7. Change over of door locks and other Contractor's access provisions to Owner's property.
8. Consent of surety for final payment.
9. Cancellation of contract and furnish a no lien certificate.

H. Application Transmittal: Submit two executed copies of each payment application. Transmit each copy with a transmittal form listing those attachments, and recording appropriate information related to application in a manner acceptable to Architect. Transmit to Architect by means ensuring receipt within 24 hours.

PART 2- PRODUCTS (Not Used)

PART 3- EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. No alternates at date of first advertisement for bids.

END OF SECTION 012000

Lake Charles Public Works New Facility Phase 2, #DR002
Lake Charles, LA

CONTRACTOR'S AFFIDAVIT AND PARTIAL WAIVER OF LIEN

BEFORE ME, the undersigned authority, on this day personally appeared _____, known to me to be a credible person and officer of _____ (hereunder called Contractor) and who, being duly sworn, upon his oath declares and acknowledges as follows:

1. I am the duly authorized agent for the said Contractor, which has authorized me to make this affidavit, to enter into the agreements and to grant the lien waivers herein set forth, on its behalf and as its acts and deeds, and all of the facts and recitations herein are true and correct.

2. Pursuant to an Agreement dated _____, between _____ (the CONTRACTOR) and **City of Lake Charles** (the Owner), which contract is recorded with the Clerk of Court for the Parish of Calcasieu as _____, the Contractor has supplied materials and performed labor in connection with the Agreement for construction of Project _____.

3. The Contractor is now requesting payment in the amount of \$_____, Payment Application Number _____ for all materials supplied and labor performed to the date of the period identified in the payment application in connection with the construction of the Project, and pledges to release these funds to settle individual accounts which have been billed to Contractor for the applicable payment period minus any applicable retainage.

4. The Contractor has actual knowledge that all bills owed by the Contractor to others for materials supplied or labor performed in connection with the improvements associated with all previous payments issued by Owner to Contractor have been fully paid and satisfied by Contractor. The Contractor does further warrant that should any claim or lien be filed for material supplied or labor performed by virtue of the Contractor's participation in the construction of said Project and Agreement, the Contractor will immediately furnish a bond for release of each such lien and obtain settlement of any such liens. Should the Contractor be unable to obtain such release, the Contractor agrees to fully indemnify and hold harmless the Owner for any and all costs they may incur by reason of such liens.

On this ____ DAY OF _____, 20____, before me, a Notary Public in and for the (Parish,State), personally appeared _____, known to me to be the person whose name is subscribed to this instrument, and acknowledged that he/she executed the same for the purposes therein contained.

BY: _____
Subcontractor/Supplier

NOTARY PUBLIC

Notary printed/stamped name and identification number

Lake Charles Public Works New facility Phase 2, #DR002
Lake Charles, LA

SUBCONTRACTOR/SUPPLIER AFFIDAVIT AND PARTIAL WAIVER OF LIEN

BEFORE ME, the undersigned authority, on this day personally appeared _____, known to me to be a credible person and officer of _____(hereunder called Subcontractor/ Supplier) and who, being duly sworn, upon his oath declares and acknowledges as follows:

1. I am the duly authorized agent for the said Subcontractor/Supplier, which has authorized me to make this affidavit, to grant the lien waivers herein set forth, on its behalf and as its acts and deeds, and all of the facts and recitations herein are true and correct.
2. Pursuant to an agreement dated _____, between _____(the Contractor) and **City of Lake Charles** (the Owner) for the Project _____, the Subcontractor/Supplier has supplied materials and/or performed labor in connection with this contract.
3. As a Subcontractor/Supplier, the undersigned acknowledges the receipt of all payments from the Contractor through Contractor's Payment Application Number _____ except for applicable retainage and releases and waives any claim to any funds previously paid by Contractor which to date hereof total \$_____.
4. Subcontractor/Supplier further certifies that all bills owed by Subcontractor/Supplier to other for materials supplied or labor performed in connection with the improvements associated with previous payments have been fully paid and satisfied.

On this ____ DAY OF _____, 20____, before me, a Notary Public in and for the (Parish,State), personally appeared _____, known to me to be the person whose name is subscribed to this instrument, and acknowledged that he/she executed the same for the purposes therein contained.

BY: _____
Subcontractor/Supplier

NOTARY PUBLIC

Notary printed/stamped name and identification number

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 PROJECT MANAGEMENT AND COORDINATION

- A. Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work.
 - 1. Limitations on site usage as well as specific requirements that impact site utilization are indicated on the drawings and by other contract documents. In addition to these limitations and requirements administer allocation of available space equitably among entities needing both access and space so as to produce the best overall efficiency in performance of the total work of the project. Schedule deliveries so as to minimize space and time requirements for storage of materials and equipment on site.
- B. Minimum administrative and supervisory requirements necessary for coordination of work on the project include but are not necessarily limited to the following categories:
 - 1. Coordination and meetings.
 - 2. Administrative and supervisory personnel.
 - 3. Records or reports.
 - 4. Limitations for use of site.
 - 5. Special reports.
 - 6. General installation provisions.
 - 7. Cleaning and protection.
 - 8. Conservation and salvage.
- C. Coordinate both the timing and the listing of reports and other activities required by provisions of this section and other sections, so as to provide consistency and logical coordination between the reports. Maintain coordination and correlation between separate reports by updating at monthly or shorter time intervals. Make appropriate distribution of each report and updated report to all parties involved in the work including the Architect and Owner. In particular provide close coordination of the progress schedule, schedule of values, listing of subcontracts, schedule of submittals, progress reports, and payment requests.
- D. All requests for information involving a clarification to resolve questions and/or conflicts in the plans and specification shall be submitted on a Request for Information form. Any change to the project/contract as a result of this information will be addresses under a separate cover as required. All requests for information not submitted on the required form may or may not be responded to be the Architect and shall have no influence on the project scope or time frame. If a Request for Information form is not attached hereto, this form shall be obtained form the Architect prior to the first submittal for application for payment.

1. Requests for Information (RFIs): On discovery of the need for additional information or interpretation of the Contract Documents, contractor shall prepare and submit an RFI.
- E. Submit initial progress schedule in duplicate. After review by the Architect revise and resubmit as required. Submit revised schedule with each application for payment, reflecting changes since previous submittal. Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities. Show projected percentage of completion for each item of Work as of the time of each application for payment.
 1. Comply with Progress Schedule for submittals related to work progress. Coordinate submittal of related items. Show submittal dates required for shop drawings, product data, and product delivery dates.
- F. Schedule and conduct progress meetings at Project site at biweekly regular intervals. Notify Owner and Architect of meeting dates and times. Require attendance of each subcontractor or other entity concerned with current progress or involved in planning, coordination, or performance of future activities. Provide a two week look ahead **detailed, short-term plan** breaking down upcoming tasks (next 14 days) from the master schedule, focusing on daily activities, resource needs, and constraints for foremen/site managers to ensure smooth workflow, identify issues early, and coordinate teams to ensure everyone stays on track with the project's immediate goals at each meeting.
 1. In addition to specific coordination and pre-installation meetings for each element of work, and other regular project meetings held for other purposes, hold a general progress meeting each month with time coordinated with preparation of payment request. Require each entity then involved in planning, coordination or performance of work to be properly represented at each meeting. Review each entity's present and future needs including interface requirements, time, sequences, deliveries, access, site utilization, temporary facilities and services, hours of work, hazards and risks, housekeeping, change orders, and documentation of information for payment requests. Discuss whether each element of current work is ahead of schedule, on time, or behind schedule in relation with updated progress schedule. Determine how behind-schedule work will be expedited, and secure commitments from entities involved in doing so. Discuss whether schedule revisions are required to ensure that current work and subsequent work will be completed within Contract Time. Review everything of significance which could affect progress of the work.
 2. Architect will record minutes and distribute to everyone concerned, including Owner.

1.2 RECORDS/REPORTS

- A. Working from lines and levels established by the property survey, establish and maintain bench marks and markers to set lines and levels for the work at each story of construction and elsewhere as needed to properly locate each element of the project.

Calculate and measure required dimensions as shown within recognized tolerances. Drawings shall not be scaled to determine dimensions. Advise entities performing work, of marked lines and levels provided for their use.

- B. Submit special reports directly to the Owner within one day of an occurrence. Submit a copy of the report to the Architect and other entities that are affected by the occurrence.
- C. Reporting Unusual Events: When an event of an unusual and significant nature occurs at the site, prepare and submit a special report listing chain of events, persons participating, response by the Contractor's personnel, an evaluation of the results or effects and similar pertinent information. Advise the Owner in advance when such events are known or predictable.
- D. Reporting Accidents: Prepare and submit reports of significant accidents, at site and anywhere else work is in progress. Record and document data and actions. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. General: This section specifies procedural requirements for non-administrative submittals including shop drawings, product data, samples and other miscellaneous work-related submittals. Shop drawings, product data, samples and other work-related submittals are required to amplify, expand and coordinate the information contained in the Contract Documents.
 - 1. Refer to other Division-1 sections and other contract documents for specifications on administrative, non-work-related submittals. Such submittals include, but are not limited to the following items:
 - a. Permits.
 - b. Payment applications.
 - c. Performance and payment bonds.
 - d. Insurance certificates.
 - e. Inspection and test reports.
 - f. Schedule of values.
 - g. Progress reports.
 - h. Listing of subcontractors
- B. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 1. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 2. Submit one hard copy and one digital copy of each action submittal.
 - 3. Submit one hard copy and one digital copy of each informational submittal.

4. Architect will return submittals, without review, discard submittals received from sources other than Contractor.
- C. Shop drawings are technical drawings and data that have been specially prepared for this project, including but not limited to the following items:
1. Fabrication and installation drawings.
 2. Setting diagrams.
 3. Shopwork manufacturing instructions.
 4. Templates.
 5. Patterns.
 6. Coordination drawings (for use on-site).
 7. Schedules.
 8. Design mix formulas.
 9. Contractor's engineering calculations.
 10. Standard information prepared without specific reference to a project is not considered to be shop drawings.
- D. Product data includes standard printed information on manufactured products that has not been specially-prepared for this project, including but not limited to the following items:
1. Manufacturer's product specifications and installation instructions.
 2. Standard color charts.
 3. Catalog cuts.
 4. Roughing-in diagram and templates.
 5. Standard wiring diagrams.
 6. Printed performance curves.
 7. Operational range diagrams.
 8. Mill reports.
 9. Standard product operating and maintenance manuals.
- E. Samples are physical examples of work, including but not limited to the following items:
1. Partial sections of manufactured or fabricated work.
 2. Small cuts or containers of materials.
 3. Complete units of repetitively-used materials.
 4. Swatches showing color, texture and pattern.
 5. Color range sets.
 6. Units of work to be used for independent inspection and testing.
 7. Mock-ups are special forms of samples, which are too large or otherwise inconvenient for handling in the manner specified for transmittal of sample submittals.
- F. Miscellaneous submittals are work-related, non-administrative submittals that do not fit in the three previous categories, including, but not limited to the following:
1. Specially-prepared and standard printed warranties.
 2. Maintenance agreements.
 3. Workmanship bonds.

4. Testing and certification reports.
 5. Record drawings.
 6. Field measurement data.
 7. Operating and maintenance manuals.
 8. Keys and other security protection devices.
 9. Maintenance tools and spare parts.
 10. Overrun stock.
- G. Place a permanent label or title block on each submittal for identification. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings. Include the following information on the label:
1. Project name.
 2. Date.
 3. Name and address of Contractor.
 4. Name and address of subcontractor or supplier.
- H. Identify deviations from the Contract Documents on submittals.
- I. Contractor's Construction Schedule Submittal Procedure: Submit six (6) hard copies and one digital copy of schedule within fourteen (14) days after date established for Notice to Proceed.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. Product Data: Mark each copy to show applicable products and options. Include the following:
1. Manufacturer's written recommendations, product specifications, and installation instructions.
 2. Wiring diagrams showing factory-installed wiring.
 3. Printed performance curves and operational range diagrams.
 4. Testing by recognized testing agency.
 5. Compliance with specified standards and requirements.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data. Submit on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches. Include the following:
1. Dimensions and identification of products.
 2. Fabrication and installation drawings and roughing-in and setting diagrams.
 3. Wiring diagrams showing field-installed wiring.
 4. Notation of coordination requirements.
 5. Notation of dimensions established by field measurement.

- C. Samples: Submit Samples for review of kind, color, pattern, and texture and for a comparison of these characteristics between submittal and actual component as delivered and installed. Include name of manufacturer and product name on label.
 - 1. If variation is inherent in material or product, submit at least three Insert number sets of paired units that show variations.

2.2 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

2.3 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit one hard copy and one digital copy of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Chart Schedule: Submit a comprehensive, fully developed, horizontal chart-type schedule within fourteen (14) days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

PART 3 - EXECUTION

3.1 SUBMITTAL PROCEDURES

- A. Refer to the General Conditions for basic procedures for submittal handling:
- B. Coordinate the preparation and processing of submittals with the performance of the work. Coordinate each separate submittal with other submittals and related activities such as testing, purchasing, fabrication, delivery and similar activities that require sequential activity.
 - 1. Coordinate the submittal of different units of interrelated work so that one submittal will not be delayed by the Architect's need to review a related submittal. The Architect reserves the right to withhold action on any submittal requiring coordination with other submittals until related submittals are forthcoming.
- C. Prepare and transmit each submittal to the Architect sufficiently in advance of the scheduled performance of related work and other applicable activities. Transmit different kinds of submittals for the same unit of work so that processing will not be delayed by the Architect's need to review submittals concurrently for coordination.
 - 1. Allow sufficient time so that the installation will not be delayed as a result of the time required to properly process submittals, including time for resubmittal, if necessary.
 - 2. Advise the Architect on each submittal, as to whether processing time is critical to the progress of the work, and if the work would be expedited if processing time could be shortened.
 - a. Allow three weeks for the Architect's initial processing of each submittal. Allow a longer time period where processing must be delayed for coordination with subsequent submittals.
 - b. Allow three weeks for reprocessing each submittal.
 - c. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Architect sufficiently in advance of the work.
- D. Mark each submittal with a permanent label for identification. Provide the following information on the label for proper processing and recording of action taken.
 - 1. Project name.
 - 2. Date.
 - 3. Name, address and telephone number, including area code, of Architect.
 - 4. Name, address and telephone number, including area code, of Contractor.
 - 5. Name, address and telephone number, including area code, of Subcontractor.
 - 6. Name, address and telephone number, including area code, of supplier.
 - 7. Name of manufacturer.
 - 8. Similar definitive information as necessary.
 - 9. Provide a space on the label for the Contractor's review and approval markings.
- E. Package each submittal appropriately for transmittal and handling. Transmit each sub-

mittal from the Contractor to the Architect and to other destinations as indicated, by use of a transmittal form. Submittals received from sources other than the Contractor will not be acted upon.

1. Transmittal Form: Prepare a draft of a transmittal form and submit it to the Architect for acceptance. Provide on the form places for the following information:
 - a. Project name.
 - b. Date.
 - c. To.
 - d. From.
 - e. Submittal purpose and description.
 - f. Submittal and transmittal distribution record.
 - g. Signature of transmitter.
 - h. Contractor's certification stating that the information submitted complies with the requirements of the Contract Documents, with a place for the Contractor's signature.
2. Record relevant information and requests for data on the transmittal form. On the transmittal form, or on a separate sheet attached to the form, record deviations from the requirements of the Contract Documents, if any, and including minor variations and limitations.

3.2 SPECIFIC SUBMITTAL REQUIREMENTS

- A. Specific submittal requirements for individual units of work are specified in the applicable specification section. Except as otherwise indicated in the individual specification sections, comply with the requirements specified herein for each type of submittal.
 1. Where it is necessary to provide intermediate submittals between the initial and final submittals, provide and process intermediate submittals in the same manner as for initial submittals.
- B. Information required on shop drawings includes, dimensions, identification of specific products and materials which are included in the work, compliance with specified standards and notations of coordination requirements with other work. Provide special notation of dimensions that have been established by field measurement. Highlight, encircle or otherwise indicate deviations from the contract documents on the shop drawings.
 1. Provide coordination drawings where required for the integration of the work, including work first shown in detail on shop drawings or product data. Show sequencing and relationship of separate units of work which must interface in a restricted manner to fit in the space provided, or function as indicated. Coordination drawings are considered shop drawings and must be definitive in nature.
 2. Do not permit shop drawing copies without an appropriate final "Action" by the Architect to be used in connection with the work.
 3. Submit newly prepared information, drawn to accurate scale on sheets not less than 8-1/2" x 11"; except for actual pattern or template type drawings, the maximum

sheet size shall not exceed 24" x 36". Indicate the name of the firm that prepared each shop drawing and provide appropriate project identification in the title block. Provide a space not less than 20 sq. in. beside the title block for marking the record of the review process.

- a. Do not reproduce contract documents or copy standard printed information as the basis of shop drawings.
 4. Provide 2 prints plus 3 additional prints where they are required for maintenance manuals. 2 prints will be retained; the remainder will be returned. One of the prints returned is to be marked up and maintained by the Contractor as a "As Built Document".
- C. General information required specifically as product data includes manufacturer's standard printed recommendations for application and use, compliance with recognized standards of trade associations and testing agencies, and the application of their labels and seals (if any), special notation of dimensions which have been verified by way of field measurement, and special coordination requirements for interfacing the material, product or system with other work.
1. Collect required product data into a single submittal for each unit of work or system. Mark each copy to show which choices and options are applicable to the project. Where product data has been printed to include information on several similar products, some of which are not required for use on the project, or are not included in this submittal, mark the copies to show clearly that such information is not applicable.
 - a. Where product data must be specially prepared for required products, materials or systems, because standard printed data is not suitable for use, submit data as "shop drawings" and not as "product data".
 3. Product data submittal is required for information and record and to determine that the products, materials and systems comply with the provisions of the contract documents. Therefore, the initial submittal is also the final submittal, except where the Architect observes that there is non-compliance with the provisions of the contract documents and returns the submittal promptly to the Contractor marked with the appropriate "Action".
 - a. Provide a preliminary double-copy submittal where required, for selection of options by the Architect.
 - b. Except as otherwise indicated in individual sections of these specifications, submit one hard copy and one digital copy of each required product data submittal, plus additional copies where required for maintenance manuals. The Architect will retain two copies, and will return the other with "Action" and corrections or modifications as required.
 - c. Do not submit product data or allow its use on the project, until compliance with the requirements of the contract documents has been confirmed by the Contractor.
 - d. Furnish copies of product data to subcontractors, suppliers, fabricators,

- manufacturers, installers, governing authorities and others as required for proper performance of the work. Show distribution on transmittal forms.
- e. Do not proceed with installation of materials, products and systems until a copy of product data applicable to the installation is in the possession of the installer. Do not permit the use of unmarked copies of product data in connection with the performance of the work.
- D. Submit samples for the Architect's visual review of general generic kind, color, pattern, and texture, and for a final check of the coordination of these characteristics with other related elements of the work. Samples are also submitted for quality control comparison of these characteristics between the final sample submittal and the actual work as it is delivered and installed.
- 1. Refer to individual work sections of these specifications for additional sample requirements, which may be intended for examination or testing of additional characteristics. Compliance with other required characteristics is the exclusive responsibility of the Contractor; such compliance is not considered in the Architect's review and "Action" on sample submittals.
 - 2. Documentation required specifically for sample submittals includes a generic description of the sample, the sample source or the product name or manufacturer, compliance with governing regulations and recognized standards. In addition, indicate limitations in terms of availability, sizes, delivery time, and similar limiting characteristics.
 - 3. Where possible provide samples that are physically identical with the proposed material or product to be incorporated in the work; provide full scale, fully fabricated samples cured and finished in the manner specified. Where variations in color, pattern, or texture are inherent in the material or product represented by the sample, submit multiple units of the sample (not less than 3 units), which show the approximate limits of variations. Where samples are specified for the Architect's selection of color, texture or pattern, submit a full set of available choices for the material or product. Mount, display, or package samples in the manner specified to facilitate the review of indicated qualities. Prepare samples to match the Architect's sample where so indicated.
 - a. Refer to individual sections of these specifications for samples which, because of their relatively high cost or other special considerations, are intended to be returned to the Contractor for incorporation in the work. Such samples must be in an undamaged condition at the time of use. On the transmittal form to the Architect, indicate such special requests regarding the disposition of sample submittals.
 - 4. At the Contractor's option, and depending upon the nature of the anticipated response from the Architect, the initial submittal of samples may be either a preliminary submittal or a final submittal.
 - a. Preliminary submittal, of a single set of samples, is required where requirements indicate the Architect's selection of color, pattern, texture or similar characteristics from a manufacturer's range of standard choices is necessary. Preliminary submittals will be reviewed and returned with the Architect's "Ac-

- tion".
- b. Submit 2 sets of samples in the final submittal, one set will be returned.
- c. Maintain the final submittal sets of samples, as returned by the Architect, at the project site, available for quality control comparisons throughout the course of performing the work. In addition, final submittal sets may be used to obtain final acceptance of the work associated with each set. Prepare and distribute additional sets of samples to subcontractors, suppliers, fabricators, manufacturers, installers, governing authorities, and others as required for proper performance of the work. Show final distribution on transmittal forms.
- d. Mock-Ups and similar samples specified in individual work sections are special types of samples. Comply with sample submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

E. Miscellaneous Submittals

1. Classify each inspection and test report as being either "shop drawings" or "product data" depending on whether the report is specially prepared for the project, or a standard publication or workmanship control testing at the point of production. Process inspection and test reports accordingly.
2. Refer to section "Products and Substitutions" for specific general requirements on warranties, product bonds, workmanship bonds and maintenance agreements. In addition to copies desired for the Contractor's use, furnish 2 executed copies of such warranties, bonds or agreements. Provide 2 additional copies where required for maintenance manuals.
3. Where submittal of a copy of standards is indicated, and except where copies of standards are specified as an integral part of a "Product Data" submittal, submit a single copy of standards for the Architect's use. Where workmanship, whether at the project site or elsewhere is governed by a standard, furnish additional copies of the standard to fabricators, installers and others involved in the performance of the work.
4. Refer to section "Project Closeout" and to individual sections of these specifications for specific submittal requirements of project closeout information, materials, tools, and similar items.
 - a. Furnish set of original documents as maintained on the project site. Along with original marked-up As Built drawings provide 3 photographic copies of marked-up drawings, which, at the Contractor's option, may be reduced to not less than half size.
 - b. Operating and Maintenance Data: Furnish 3 bound copies of operating data and maintenance manuals.
 - c. Refer to individual sections of these specifications for required quantities of spare parts, extra and overrun stock, maintenance tools and devices, keys and similar physical units to be submitted.

- F. Provide additional distribution of submittals to subcontractors, suppliers, fabricators, installers, governing authorities, and others as necessary for the proper performance of the work. Include such additional copies of submittals in the transmittal to the Architect where the submittals are required to receive "Action" marking before final distribution. Record distributions on transmittal forms.

3.3 ARCHITECT'S ACTION

- A. Except for submittals for the record and similar purposes, where action on submittals is required, the Architect will review each submittal, note appropriate "Action", and where possible return within 3 weeks of receipt. Where the submittal must be held for coordination the Architect will so advise the Contractor without delay.
 - 1. The Architect will review each submittal and return a uniform, self explanatory action, appropriately marked and executed to indicate whether the submittal returned is for unrestricted use, approved as noted (or make corrections noted), must be revised and resubmitted (use not permitted) or without action (as explained in the transmittal form). Submittals indicated as "make corrections noted" will not be reviewed if resubmitted.

3.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule with Application for payment before each regularly scheduled progress meeting.
 - 1. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribute copies of approved schedule to Owner, Architect, subcontractors, testing and inspecting agencies, and parties identified by Contractor with a need-to-know schedule responsibility. When revisions are made, distribute updated schedules to the same parties.

3.5 GENERAL INSTALLATION PROVISIONS

- A. Pre-Installation Conferences: Hold a pre-installation meeting at the project site well before installation of each unit of work which requires coordination with other work. Installer and representatives of the manufacturers and fabricators who are involved in or affected by that unit of work, and with its coordination or integration with other work that has preceded or will follow shall attend this meeting. Advise the Architect of scheduled meeting dates.
 - 1. At each meeting review progress of other work and preparations for the particular work under consideration, including specific requirements for the following:
 - a. Contract documents.
 - b. Options.
 - c. Related change orders.
 - d. Purchases.
 - e. Deliveries.
 - f. Shop drawings, product data, and quality control samples.

- g. Possible conflicts and compatibility problems.
 - h. Time schedules.
 - i. Weather limitations.
 - j. Manufacturer's recommendations.
 - k. Compatibility of materials.
 - l. Acceptability of substrates.
 - m. Temporary facilities.
 - n. Space and access limitations.
 - o. Governing regulations.
 - p. Inspection and testing requirements.
 - q. Required performance results.
 - r. Recording requirements
2. Record significant discussions of each conference, and record agreements and disagreements, along with the final plan of action. Distribute the record of meeting promptly to everyone concerned, including the Owner and Architect.
 3. Do not proceed with the work if the pre-installation conference cannot be concluded successfully. Initiate whatever actions are necessary to resolve impediments to performance of the work, and reconvene pre-installation conference at earliest date feasible.
- B. Installer's Inspection of Conditions: Require the Installer of each major unit of work to inspect the substrate to receive work and conditions under which the work is to be performed. The Installer shall report all unsatisfactory conditions in writing to the Contractor. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.
 - C. Manufacturer's Instructions: Where installations include manufactured products, comply with the manufacturer's applicable instructions and recommendations for installation, to the extent that these instructions and recommendations are more explicit or more stringent than requirements indicated in the contract documents.
 - D. Inspect each item of materials or equipment immediately prior to installation. Reject damaged and defective items.
 - E. Provide attachment and connection devices and methods for securing work. Secure work true to line and level, and within recognized industry tolerances. Allow expansion and building movement. Provide uniform joint width in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable visual-effect choices to the Architect for final decision.
 - F. Recheck measurements and dimensions of the work, as an integral step of starting each installation.
 - G. Install each unit-of-work during weather conditions and project status which will ensure the best possible results in coordination with the entire work. Isolate each unit of work from incompatible work, as necessary to prevent deterioration.

- H. Coordinate enclosure of the work with required inspections and tests, so as to minimize the necessity of uncovering work for that purpose.
- I. Mounting Heights: Where mounting heights are not indicated, mount individual units of work at A.D.A.A.G. standard mounting heights for the particular applications indicated. Refer questionable mounting height choices to the Architect for final decision.

3.6 CLEANING AND PROTECTION

- A. During handling and installation of work at the project site, clean and protect work in progress and adjoining work on a basis of continuous maintenance. Apply protective covering on installed work where it is required to ensure freedom from damage or deterioration at time of substantial completion.
- B. Clean and perform maintenance on installed work as frequently as necessarily through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- C. Limiting Exposures of Work: To the extent possible through reasonable control and protection methods, the Contractor shall supervise performance of work in a manner and by means which will ensure that none of the work, whether completed or in progress, will be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Such exposures include, where applicable, but not by way of limitation the following:
 - 1. Excessive static or dynamic loading.
 - 2. Excessive internal or external pressures.
 - 3. Excessively high or low temperatures.
 - 4. Thermal shock.
 - 5. Excessively high or low humidity.
 - 6. Air contamination or pollution.
 - 7. Water or ice.
 - 8. Solvents.
 - 9. Chemicals.
 - 10. Light.
 - 11. Radiation.
 - 12. Puncture.
 - 13. Abrasion.
 - 14. Heavy traffic.
 - 15. Soiling.
 - 16. Bacteria.
 - 17. Insect infestation.
 - 18. Combustion.
 - 19. Electrical current.
 - 20. High speed operation, improper lubrication, unusual wear or other misuse.
 - 21. Incompatible interface.
 - 22. Destructive testing.
 - 23. Misalignment.

- 24. Excessive weathering.
- 25. Unprotected storage.
- 26. Improper shipping or handling.
- 27. Theft
- 28. Vandalism

3.7 CONSERVATION AND SALVAGE

- A. It is a requirement for supervision and administration of the work that construction operations be carried out with the maximum possible consideration given to conservation of energy, water and materials. In addition maximum consideration shall be given to salvaging materials and equipment involved in performance of the work but not incorporated therein. Refer to other sections for required disposition of salvage materials which are the Owner's property.

END OF SECTION 013000

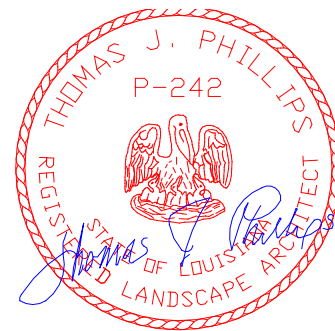
SECTION 01 40 00 – INCORPORATED 2016 LaDOTD STANDARD SPECIFICATIONS

GENERAL: The Technical Specifications governing the construction of the work are the 2016 edition of the Louisiana Standard Specification for Roads and Bridges as listed herein, together with any special Technical Specifications included in these contract documents, and as amended hereinafter. The sections of the 2016 edition of the Louisiana Standard Specification for Roads and Bridges as listed herein and as amended herein are incorporated by reference. References in the incorporated sections to the General Provisions of the Louisiana Standard Specification for Roads and Bridges, which are not specifically listed herein, are to be included except in the event of conflict with other provisions of these contract documents. References to the “City” will mean the “City of Lake Charles, La.”. Special Provisions and Supplemental Specifications related to the Louisiana Standard Specification for Roads and Bridges are attached hereto.

COORDINATION OF PLANS AND SPECIFICATIONS: These specifications, the supplemental specifications, the plans, general requirements and supplementary documents are essential parts of the contract. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, calculated dimensions will govern over scaled dimensions; plans will govern over standard plans, standard specifications or supplemental specifications; supplemental specifications will govern over standard specifications; and general requirements will govern over standard specifications, supplemental specifications, and plans.

SECTION 706 CONCRETE WALKS, DRIVES, AND INCIDENTAL PAVING: Section 706 is hereby incorporated into the specifications by reference.

SECTION 719, LANDSCAPING: Section 719 is hereby incorporated into the specifications by reference.



NOVEMBER 28, 2025

SECTION 014216 - DEFINITIONS AND STANDARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF REQUIREMENTS

- A. General: This section specifies procedural and administrative requirements for compliance with governing regulations and codes and standards imposed upon the Work. These requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.
 - 1. The term, "Regulations", is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.
- B. Governing Regulations: Refer to General and Supplementary Conditions for requirements related to compliance with governing regulations.

1.3 DEFINITIONS

- A. General Explanation: Certain terms used in contract documents are defined in this article. Definitions and explanations contained in this section are not necessarily either complete or exclusive, but are general for the Work to the extent that they are not stated more explicitly in another element of the contract documents.
- B. General Requirements: The provisions or requirements of other Division-1 sections apply to entire work of the Contract and, where so indicated, to other elements which are included in the project.
- C. Indicated: The term, "indicated", is a cross-reference to graphic representations, notes or schedules on the drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are used in lieu of "indicated", it is for the purpose of helping the reader locate the cross-reference, and no limitation of location is intended except as specifically noted.
- D. Directed, Requested, Etc.: Terms such as "directed", "requested", "authorized", "selected",

"approved", "required", "accepted", and "permitted" mean "directed by the Architect", "requested by the Architect", and similar phrases. However, no such implied meaning will be interpreted to extend the Architect's responsibility into the Contractor's area of construction supervision.

- E. Approve: Where used in conjunction with the Architect's response to submittals, requests, applications, inquiries, reports and claims by the Contractor, the term "approved" will be held to limitations of the Architect's/Engineer's responsibilities and duties as specified in General and Supplementary Conditions. In no case will the Architect's approval be interpreted as a release of the Contractor from responsibilities to fulfill requirements of contract documents or acceptance of the work unless otherwise provided by requirements of the contract documents.
- F. Project Site: The term, "project site", is defined as the space available to the Contractor for performance of the Work, either exclusively or in conjunction with others performing other work as part of the project. The extent of the project site is shown on the drawings, and may or may not be identical with the description of the land upon which the project is to be built.
- G. Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations".
- H. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations".
- I. Provide: The term "provide" or "new" means "to furnish and install, complete and ready for intended use".
- J. Installer: The "installer" is "the entity" (person or firm) engaged by the Contractor, its subcontractor or sub-subcontractor for performance of a particular unit of work at the project site, including installation, erection, application and similar required operations. It is a requirement that installers are experienced in the operations they are engaged to perform.
- K. Testing Laboratories: A "testing laboratory" is defined as an entity engaged to perform specific inspections or tests of the work, either at the project site or elsewhere, and to report, and (if required) interpret results of those inspections or tests.
- L. Stipulated Damages: Where the words "liquidated damages" may be found throughout the project manual, it shall be used interchangeably with "stipulated damages". It is to acknowledge that the Contractor's failure to achieve substantial completion of the work within the Contract Time provided by the Contract Documents will cause the Owner to incur substantial economic damages and losses of types and in amounts which are impossible to compute and ascertain with certainty as a basis for recovery by the Owner of actual damages, and that stipulated damages represent a fair, reasonable and appropriate estimate thereof. Accordingly, in lieu of actual damages for such delay, the Contractor agrees that stipulated damages may be assessed and recovered by the Owner as against Contractor and its Surety, in the event of delayed completion and without the

Owner being required to present any evidence of the amount or character of actual damages sustained by reason thereof; therefore Contractor shall be liable to the Owner for payment of stipulated damages for each day that Substantial Completion is delayed beyond the Contract Time as adjusted for time extensions provided by the Contract Documents. Such stipulated damages are intended to represent estimated actual damages and are not intended as a penalty, and Contractor shall pay them to Owner without limiting Owner's right to terminate this agreement for default as provided elsewhere herein.

- M. $\pm$: All dimensions noted with a plus/minus notation or symbol shall be a maximum 1/8" larger or 1/8" smaller than the dimension indicated.
- N. Digital copy: Where a digital copy is requested or allowed the digital submittal shall be a digital pdf version of the document submitted via email to the Project Architect and not require log-in or registration of any kind to receive the digital version.

1.4 INDUSTRY STANDARDS

- A. Applicability of Standards: Except where more explicit or stringent requirements are written into the contract documents, applicable construction industry standards have the same force and effect as if bound into or copied directly into the contract documents. Such industry standards are made a part of the contract documents by reference.
- B. Individual specification sections indicate which codes and standards the Contractor must keep available at the project site for reference.
 - 1. Referenced standards (standards referenced directly in the contract documents) take precedence over non-referenced standards that are recognized in the industry for applicability to the Work.
 - 2. Unreferenced Standards: Except as otherwise limited by the contract documents, standards not referenced but recognized in the construction industry as having direct applicability to the Work and will be enforced for the performance of the Work. The decision as to whether an industry code or standard is applicable, or as to which of several standards are applicable, is the sole responsibility of the Architect/ Engineer.
- C. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of contract documents.
 - 1. Updated Standards: At the request of the Architect, Contractor or governing authority, submit a change order proposal where an applicable industry code or standard has been revised and reissued after the date of the contract documents and before the performance of the work affected. The Architect will decide whether to issue the change order to proceed with the updated standard.
- D. Conflicting Requirements: Where compliance with two or more standards is specified, and where these standards establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the contract documents specifically indicate otherwise. Refer requirements that are different,

but apparently equal, and uncertainties as to which quality level is more stringent to the Architect for a decision before proceeding.

1. Minimum Quantities or Quality Levels: In every instance the quantity or quality level shown or specified is intended to be the minimum to be provided or performed. Unless otherwise indicated, the actual work may either comply exactly, within specified tolerances, with the minimum quantity or quality specified, or may exceed that minimum within reasonable limits. In complying with these requirements, the indicated numeric values are either minimum or maximum values, as noted, or as appropriate for the context of the requirements. Refer instances of uncertainty to the Architect for decision before proceeding.

- E. Copies of Standards: The contract documents require that each entity performing work be experienced in that part of the work being performed. Each entity is also required to be familiar with industry standards applicable to that part of the work. Copies of applicable standards are not bound with the contract documents.

1. Where copies of standards are needed for proper performance of the Work, the Contractor is required to obtain such copies directly from the publication source.
2. Although copies of standards needed for enforcement of the requirements may be required submittals, the Architect reserves the right to require the Contractor to submit additional copies as necessary for enforcement of requirements.

- F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The acronyms or abbreviations as referenced in contract documents are defined to mean the associated names. Both names and addresses are subject to change, and are believed to be, but are not assured to be, accurate and up-to-date as of date of contract documents.

- G. Federal Government Agencies: Names and titles of federal government standard or specification producing agencies are frequently abbreviated. The acronyms or abbreviations as referenced in the contract documents indicate the names of standard or specification producing agencies of the federal government. Names and addresses are subject to change but are believed to be, but are not assured to be, accurate and up-to-date as of the date of the contract documents.

1.5 GOVERNING REGULATIONS/AUTHORITIES

- A. General: The procedure followed by the Architect has been to contact governing authorities where necessary to obtain information needed for the purpose of preparing contract documents; recognizing that such information may or may not be of significance in relation to the Contractor's responsibilities for performing the Work. Contact governing authorities directly for necessary information and decisions having a bearing on performance of the Work.

1. Copies of Correspondence: During the preparation of the contract documents, the Architect may have maintained a file of correspondence with governing authorities.

This file is available at the Architect's office for reference by bidders/contractors. The Architect will provide, if requested, copies of such applicable correspondence at the cost of reproduction.

- B. Trade Union Jurisdictions: The Contractor shall maintain, and shall require prime subcontractors to maintain, complete current information on jurisdictional matters, regulations actions and pending actions, as applicable to the Work. Discuss new developments at appropriate project meetings at the earliest feasible dates. Record information of relevance along with the actions agreed upon. The manner in which contract documents have been organized and subdivided is not intended to be an indication of jurisdictional or trade union agreements. Assign and subcontract the work, and employ tradesmen and laborers, in a manner which will not unduly risk jurisdictional disputes of a kind which could result in conflicts, delays, claims and losses in the performance of the Work.
- C. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 014216

SECTION 014219 - REFERENCES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- B. Abbreviations and Acronyms: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ABAA	Air Barrier Association of America
ABMA	American Bearing Manufacturers Association
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHA	American Hardboard Association (Now part of CPA)

AHAM	Association of Home Appliance Manufacturers
AI	Asphalt Institute
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)
ALSC	American Lumber Standard Committee, Incorporated
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	Architectural Precast Association
APA	APA - The Engineered Wood Association
APA EWS	APA - The Engineered Wood Association; Engineered Wood Systems (See APA - The Engineered Wood Association)
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASCE	American Society of Civil Engineers
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International (American Society of Mechanical Engineers International)
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International

	(American Society for Testing and Materials International)
AWCI	Association of the Wall and Ceiling Industry
AWCMA	American Window Covering Manufacturers Association (Now WCMA)
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association (Formerly: American Wood Preservers' Association)
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BICSI	BICSI, Inc.
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
BISSC	Baking Industry Sanitation Standards Committee
BWF	Badminton World Federation (Formerly: IBF - International Badminton Federation)
CCC	Carpet Cushion Council
CDA	Copper Development Association
CEA	Canadian Electricity Association
CEA	Consumer Electronics Association
CFFA	Chemical Fabrics & Film Association, Inc.
CGA	Compressed Gas Association
CIMA	Cellulose Insulation Manufacturers Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute

CRRC	Cool Roof Rating Council
CPA	Composite Panel Association
CPPA	Corrugated Polyethylene Pipe Association
CRI	Carpet and Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CSA	CSA International (Formerly: IAS - International Approval Services)
CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
DHI	Door and Hardware Institute
EIA	Electronic Industries Alliance
EIMA	EIFS Industry Members Association
EJCDC	Engineers Joint Contract Documents Committee
EJMA	Expansion Joint Manufacturers Association, Inc.
ESD	ESD Association (Electrostatic Discharge Association)
ETL SEMCO	Intertek ETL SEMCO (Formerly: ITS - Intertek Testing Service NA)
FIBA	Federation Internationale de Basketball (The International Basketball Federation)
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)
FM Approvals	FM Approvals LLC

FM Global	FM Global (Formerly: FMG - FM Global)
FMRC	Factory Mutual Research (Now FM Global)
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.
FSA	Fluid Sealing Association
FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GRI	(Part of GSI)
GS	Green Seal
GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)
HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
IAS	International Approval Services (Now CSA International)
IBF	International Badminton Federation (Now BWF)
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America

IENT	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
ILI	Indiana Limestone Institute of America, Inc.
ISO	International Organization for Standardization Available from ANSI
ISSFA	International Solid Surface Fabricators Association
ITS	Intertek Testing Service NA (Now ETL SEMCO)
ITU	International Telecommunication Union
KCMA	Kitchen Cabinet Manufacturers Association
LMA	Laminating Materials Association (Now part of CPA)
LPI	Lightning Protection Institute
MBMA	Metal Building Manufacturers Association
MFMA	Maple Flooring Manufacturers Association, Inc.
MFMA	Metal Framing Manufacturers Association, Inc.
MH	Material Handling (Now MHIA)
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International (National Association of Corrosion Engineers International)
NADCA	National Air Duct Cleaners Association

NAGWS	National Association for Girls and Women in Sport
NAIMA	North American Insulation Manufacturers Association
NBGQA	National Building Granite Quarries Association, Inc.
NCAA	National Collegiate Athletic Association (The)
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute
NCTA	National Cable & Telecommunications Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NELMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFHS	National Federation of State High School Associations
NFPA	NFPA (National Fire Protection Association)
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association)
NOMMA	National Ornamental & Miscellaneous Metals Association
NRCA	National Roofing Contractors Association
ARMCA	National Ready Mixed Concrete Association
NSF	NSF International (National Sanitation Foundation International)

NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)
NTRMA	National Tile Roofing Manufacturers Association (Now TRI)
NWWDA	National Wood Window and Door Association (Now WDMA)
OPL	Omega Point Laboratories, Inc. (Now ITS)
PCI	Precast/Prestressed Concrete Institute
PDCA	Painting & Decorating Contractors of America
PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PLANET	Professional Landcare Network (Formerly: ACLA - Associated Landscape Contractors of America)
PTI	Post-Tensioning Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
SAE	SAE International
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers (See ASCE)
SGCC	Safety Glazing Certification Council
SIA	Security Industry Association
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)

SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SMPTE	Society of Motion Picture and Television Engineers
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)
SPIB	Southern Pine Inspection Bureau (The)
SPRI	Single Ply Roofing Industry
SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TCA	Tile Council of America, Inc. (Now TCNA)
TCNA	Tile Council of North America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TMS	The Masonry Society
TPI	Truss Plate Institute, Inc.
TPI	Turfgrass Producers International
TRI	Tile Roofing Institute
UL	Underwriters Laboratories Inc.
UNI	Uni-Bell PVC Pipe Association
USAV	USA Volleyball

USGBC	U.S. Green Building Council
USITT	United States Institute for Theatre Technology, Inc.
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)
WIC	Woodwork Institute of California (Now WI)
WMMPA	Wood Moulding & Millwork Producers Association
WSRCA	Western States Roofing Contractors Association
WWPA	Western Wood Products Association

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014219

SECTION 014500 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Testing and inspecting services shall be performed by independent testing agencies.
 - 2. Except as otherwise indicated, engage inspection and test service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which are recognized in the industry as specialized in the types of inspections and tests to be performed.
- B. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements, comply with the most stringent requirement. Refer uncertainties to Architect for a decision.
- C. Definitions: The requirements of this section relate primarily to customized fabrication and installation procedures, not to the production of standard products. Quality control services include inspections and tests and related actions including reports, performed by independent agencies and governing authorities, as well as directly by the Contractor. These services do not include Contract enforcement activities performed directly by the Architect.
 - 1. Specific quality control requirements for individual units of work are specified in the sections of these specifications that specify the individual element of the work. These requirements, including inspections and tests, cover both production of standard products, and fabrication of customized work. These requirements also cover quality control of the installation procedures.
 - 2. Inspections, tests and related actions specified in this section and elsewhere in the contract documents are not intended to limit the Contractor's own quality control procedures which facilitate overall compliance with requirements of the contract documents.
 - 3. Requirements for the Contractor to provide quality control services as required by the Architect, the Owner, governing authorities or other authorized entities are not limited by the provisions of this section.
- D. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum. The actual installation may exceed the minimum within reasonable limits. Indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision.

- E. Refer to Division-1 section on "Submittals" for the general requirements on submittals. Submit a certified written report of each inspection, test or similar service, directly to the Architect, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit a certified written report of each inspection, test or similar service through the Contractor, in duplicate. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
- F. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 6. Names of individuals making tests and inspections.
 7. Description of the Work and test and inspection method.
 8. Complete test or inspection data, test and inspection results, an interpretation of test results, and comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 9. Name and signature of laboratory inspector.
 10. Recommendations on retesting and reinspecting.
- G. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, notices, receipts for fee payments, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.
- H. Testing Agency Qualifications: An independent agency with the experience and capability to conduct testing and inspecting indicated; and where required by authorities having jurisdiction, that is acceptable to authorities.
- I. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- J. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Promptly notify Architect and Contractor of irregularities or deficiencies in the Work observed during performance of its services.
 2. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
 3. Do not perform any duties of Contractor.

- K. Associated Services: Cooperate with testing agencies and provide reasonable auxiliary services as requested. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Security and protection for samples and for testing and inspecting equipment.
- L. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- M. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction.
- N. Special Tests and Inspections: Owner will engage a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections.

1.2 RESPONSIBILITIES

- A. Contractor Responsibilities: Except where they are specifically indicated as being the Owner's responsibility, or where they are to be provided by another identified entity, inspections, tests, and similar quality control services are under the Contractor's responsibility; these services also include those specified to be performed by an independent agency and not directly by the Contractor. Costs for these services shall be included in the Contract Sum. The Contractor shall employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified.
1. The Owner will engage and pay for the services of an independent agency to perform inspections and tests that are specified as the Owner's responsibility.
- B. Retest Responsibility: Where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance of related work with the requirements of the contract documents, then retests are the responsibility of the Contractor, regardless of whether the original test was the Contractor's responsibility. Retesting of work revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original work.
- C. Responsibility for Associated Services: The Contractor is required to cooperate with the independent agencies performing required inspections, tests and similar services. Provide such auxiliary services as are reasonably requested. Notify the testing agency sufficiently in advance of operations to permit assignment of personnel. These auxiliary services include but are not necessarily limited to the following:
1. Providing access to the work.

2. Taking samples or assistance with taking samples.
 3. Delivery of samples to test laboratories.
 4. Security and protection of samples and test equipment at the project site.
- D. Coordination: The Contractor and each independent agency engaged to perform inspections, tests and similar services for the project shall coordinate the sequence of their activities so as to accommodate required services with a minimum of delay in the progress of the work. In addition the Contractor and each independent testing agency shall coordinate their work so as to avoid the necessity of removing and replacing work to accommodate inspections and tests. The Contractor is responsible for scheduling times for inspections, tests, taking of samples and similar activities.
- E. Manufacturer's Field Services: When specified in respective sections, require supplier and/or manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable and to make appropriate recommendations. Representative shall submit written report to Architect listing observations and recommendations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. Upon completion of inspection, testing, sample-taking and similar services performed on the work, repair damaged work and restore substrates and finishes to eliminate deficiencies, including deficiencies in the visual qualities of exposed finishes. Comply with the contract document requirements for "Cutting and Patching". Protect work exposed by or for quality control service activities, and protect repaired work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 014500

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. This section specifies administrative and procedural requirements for temporary services and facilities, including such items as temporary utility services, temporary construction and support facilities, and project security and protection.
- B. Use Charges: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated.
- C. Temporary utility services required for use at the project site include but are not limited to the following:
 - 1. Water service and distribution.
 - 2. Temporary electric power and light.
 - 3. Storm and sanitary sewer.
- D. Provide adequate utility capacity at each stage of construction. Prior to availability of temporary utilities at the site, provide trucked-in services for start-up of construction operations.
 - 1. Obtain and pay for temporary easements required to bring temporary utilities to the project site, where the Owner's permanent easement cannot be utilized for that purpose
- E. Erosion- and Sedimentation-Control Plan: Submit plan showing compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- F. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- G. Accessible Temporary Egress: Comply with applicable provisions in ICC/ANSI A117.1.
- H. Temporary construction and support facilities required for the project include but are not limited to the following:
 - 1. Temporary heat.
 - 2. Field offices.
 - 3. Temporary roads and paving.
 - 4. Sanitary facilities, including drinking water.
 - 5. Dewatering facilities and drains.
 - 6. Temporary enclosures.
 - 7. First aid station.

8. Project identification, bulletin boards and signs.
 9. Waste disposal services.
 10. Rodent and pest control.
 11. Construction aids and miscellaneous general services and facilities.
 12. Alternate temporary services and facilities, equivalent to those specified, may be used, subject to acceptance by the Architect.
- I. Security and protection facilities and services required for the project include but are not limited to the following:
1. Temporary fire protection.
 2. Barricades, warning signs, lights.
 3. Environmental protection
 4. Alternate security and protection methods or facilities, equivalent to those specified, may be used, subject to acceptance by the Architect.

1.2 QUALITY ASSURANCE

- A. Regulations: Comply with requirements of local laws and regulations governing construction and local industry standards, in the installation and maintenance of temporary services and facilities, including but not limited to the following:
1. Building Codes, including local requirements for permits, testing and inspection.
 2. Health and safety regulations.
 3. Utility company regulations and recommendations governing temporary utility services
 4. Police and Fire Department rules and recommendations.
 5. Police and Rescue Squad recommendations.
 6. Environmental protection regulations governing use of water and energy, and the control of dust, noise and other nuisances.
 7. In addition, comply with "Environmental Impact" commitments the Owner or previous Owners of the site may have made to secure approval to proceed with construction of the project.
- B. Standards: Comply with the requirements of NFPA Code 241, "Building Construction and Demolition Operations", the ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and the NECA National Joint Guideline NJG-6 "Temporary Job Utilities and Services".
1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", as prepared jointly by AGC and ASC for industry recommendations.
- C. Inspections: Inspect and test each service before placing temporary utilities in use. Arrange for required inspections and tests by governing authorities, and obtain required certifications and permits for use.

1.3 SUBMITTALS

- A. Reports and Permits: During progress of the work, submit copies of reports and permits required by governing authorities, or necessary for installation and efficient operation of temporary services and facilities.
 - 1. Submit copies of reports of tests, inspections, meter readings and similar procedures performed on temporary utilities before, during and after performance of the work. Submit copies of permits, easements and similar documentation necessary for the installation, use and operation of temporary utility services. Reports and permits required for the use of temporary utility services and their use include but are not limited to the following:
 - a. Temporary heat.
 - b. Ventilation.
 - c. Temporary electric power and light.

1.4 JOB CONDITIONS

- A. General: Provide each temporary service and facility ready for use at each location when the service or facility is first needed to avoid delay in performance of the work. Maintain, expand as required and modify temporary services and facilities as needed throughout the progress of the Work. Do not remove until services or facilities are no longer needed, or are replaced by the authorized use of completed permanent facilities.
 - 1. With the establishment of the job progress schedule, establish a schedule for the implementation and termination of service for each temporary utility. At the earliest feasible time, and when acceptable to the Owner and Architect, change over from the use of temporary utility service to the use of the permanent service, to enable removal of the temporary utility and to eliminate possible interference with completion of the work.
- B. Conditions of Use: Operate temporary services and facilities in a safe and efficient manner. Do not overload temporary services or facilities, and do not permit them to interfere with the progress of the work. Do not allow unsanitary conditions, public nuisances or hazardous conditions to develop or persist on the site.
 - 1. Temporary Utilities: Do not permit the freezing of pipes, flooding or the contamination of water sources.
 - 2. Temporary Construction and Support Facilities: Maintain temporary facilities in such a manner as to prevent discomfort to users. Take necessary fire prevention measures. Maintain temporary support facilities in a sanitary manner so as to avoid health problems and other deleterious effects.
 - 3. Security and Protection: Maintain site security and protection facilities in a safe, lawful and publicly acceptable manner. Take necessary measures to prevent erosion of the site.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. General: Provide new materials and equipment for temporary services and facilities; used materials and equipment that are undamaged and in serviceable condition may be used, if acceptable to the Architect. Provide only materials and equipment that are recognized as being suitable for the intended use, by compliance with appropriate standards.
- B. Temporary Utilities: Where the local utility company provides only a portion of the temporary utility, provide the remainder with matching, compatible materials and equipment. Comply with the utility company's recommendations
 - 1. Water Hoses: Where shut-off nozzles are used at the water hose discharge, provide heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system.
 - a. Where non-potable water is used, provide warning signs on the discharge end of each length of hose.
 - 2. Electrical Service: Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service, including those requirements included in Division-16 sections.
 - a. Voltage Differences: Provide identification warning signs at power outlets which are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets.
 - b. Electrical Power Cords: Use only grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Use single lengths or use waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas of work.
 - c. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage indicated or required for adequate illumination. Protect lamps with guard cages or tempered glass enclosures, where fixtures are exposed to breakage by construction operations. Provide exterior fixtures where fixtures are exposed to the weather or moisture.
- C. Chain-Link Temporary Fencing: Minimum 2-inch , 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts and top and bottom rails.

2.2 TEMPORARY FACILITIES

- A. Provide field offices, and other support facilities for construction operations. Store combustible materials apart from building.

1. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the fuel being consumed.
 2. Temporary Offices and Similar Construction: For temporary offices, fabrication shops, storage sheds and similar construction, provide either standard prefabricated or mobile units or the equivalent job-built construction. Provide insulated, weathertight units, heated or air-conditioned where indicated, lockable entrances, operable windows, roofing, foundations adequate for normal loading, including wind loads, serviceable finishes, and mechanical and electrical equipment necessary to achieve ambient conditions indicated.
 - a. Fire-Resistance: Provide fire-resistant construction for offices, shops, and sheds located within the construction work area, or within 50 feet of building lines. Provide UL labeled Class "A" fire treated lumber and plywood for framing, sheathing and siding, and UL Class "A" asphalt shingle or rollroofing. Provide gypsum board (drywall) interior walls.
- B. Self-Contained Toilet Units: Provide single occupant self-contained toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar non-absorbent material. Provide one per every 8 workers on site at a minimum.
- C. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with a flame-spread rating of 15 or less. For temporary enclosures where work is being or will be performed, provide translucent tarpaulins made of nylon reinforced laminated polyethylene to admit the maximum amount of daylight and reduce the need for temporary lighting.
- D. First Aid Supplies: Comply with governing regulations and recognized recommendations within the construction industry.
- E. Drinking Water: Provide potable water approved by local health authorities. Where well water must be used, comply with local health authorities recommendations for type and frequency of testing water for portability.
- F. Fire Extinguishers: Provide type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical or grease-oil-flammable liquid fires. In other locations provide type "ABC" dry chemical extinguishers, or a combination of several extinguishers of NFPA recommended types for the exposures in each case.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 13 at each return-air grille in system and remove at end of construction.

2.4 PROJECT SIGN

- A. Prepare one (1) project sign, 8'X8'X3/4" exterior grade B-B plywood. Install sign in location and with graphic content as directed by the Architect. Support sign on 4x4 treated wood or galv. steel posts imbedded 3'-0" deep in concrete. Do not permit installation of unauthorized signage. Lettering shall be vinyl letters ranging from 1 1/2" to 3 1/2". Engage an experienced sign painter to apply graphics. Sign shall be fully painted (all sides and edges) with primer and exterior enamel. Graphics shall be cut out vinyl characters for exterior use and applied to both sides as per layout. Verify layout with Architect.

PART 3 - EXECUTION

3.1 INSTALLATION GENERAL

- A. General: Use qualified tradesmen for installation of temporary services and facilities. Locate temporary services and facilities where they will serve the entire project adequately and result in minimum interference with the performance of the Work.
 1. Relocate, modify and extend services and facilities as required during the course of work so as to accommodate the entire work of the project

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. General: Install water service and distribution piping of sizes and pressures adequate for construction purposes during the construction period and until permanent service is in use, including but not limited to the following uses.
 1. Construction processes.
 2. Fire protection.
 3. Drinking water.
 4. Sanitary facilities.
 5. Cleaning.

6. Where the available supply of potable water is inadequate, provide non-potable water for purposes other than drinking and washing. Provide warning signs at each outlet of non-potable water.
 7. Obtain water service from the nearby water main of the local water authority, as permitted by the governing authority. Pay water service use charges, whether metered or otherwise, for all water used by entities authorized to be at or to perform work at the project site. Exercise control over usage in an effort to conserve water.
 8. Sterilization: Except piping of non-potable water, sterilize temporary water piping prior to use.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Sanitary Facilities: Use of Owner's existing toilet facilities will not be permitted.
- E. Heating and Cooling: Provide temporary heating and cooling required for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Temporary Electric Power Service: Provide a weatherproof, grounded temporary electric power service and distribution system of sufficient size, capacity, and power characteristics to accommodate performance of work during the construction period. Whenever an overhead floor or roof deck has been installed, install temporary lighting adequate to provide sufficient illumination for safe work and traffic conditions in every area of work.
1. Temporary Service: Install service and grounding in compliance with the National Electric Code (NFPA 70). Include necessary meters, transformers, overload protected disconnect and main distribution switch gear.
 - a. Install electric power service underground or overhead and comply with governing regulations.
 - b. Connect temporary service to the local electric power company main in the manner directed by company officials. Pay use charges whether metered or otherwise, for electricity used by all entities authorized to be at or to perform the work at the project site. Exercise control over power usage in an effort to conserve energy.
 - c. Provide overload-protected disconnect switch for each temporary circuit and each temporary lighting circuit, located at the power distribution center.
 - d. For power hand tools and task lighting, provide temporary 4-gang outlets at each floor level, spaced so that a 100 foot extension cord can reach each area of work. Provide a separate 110-120 Volt, 20 Amp circuit for each 4-gang outlet (4 outlets per circuit).

G. Temporary Lighting.

1. Provide local switching of temporary lighting, spaced to allow lighting to be turned off in patterns to conserve energy and retain light suitable for work-in-progress, access traffic, security check and project lock-up.
2. Provide not less than one 200-watt incandescent lamp per 1000 square feet of floor area, uniformly distributed, for general construction lighting, or equivalent illumination of a similar nature. In corridors and similar traffic areas provide one 100- watt incandescent lamp every 50 feet. In stairways and at ladder runs, Provide lamp minimum per story, located to illuminate each landing and flight.
3. Install and operate temporary lighting that will fulfill security and protection requirements, without the necessity of operating the entire temporary lighting system.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Install project identification and other signs in locations approved by Architect to inform the public and persons seeking entrance to Project.
- B. Provide a reasonably neat and uniform appearance in temporary construction and support facilities acceptable to the Architect and the Owner.
 1. Locate field offices, storage and fabrication sheds and other support facilities for easy access to the Work. Position offices so that windows give the best possible view of construction activities.
 2. Except as otherwise indicated, make the change-over from use of temporary services and facilities to use of permanent services and facilities at the earliest feasible date at each portion of the building, to minimize hazards and interferences with performance of the Work.
 3. Maintain field office storage and fabrication sheds, temporary sanitary facilities, waste collection and disposal systems, and project identification and temporary signs until near substantial completion. Immediately prior to substantial completion remove these facilities. Personnel remaining at the site beyond substantial completion will be permitted to use certain permanent facilities, under restricted use conditions acceptable to the Owner.
- C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.
- D. Field Offices: Provide temporary field offices of sufficient size to accommodate required office personnel at the project site, furnished and equipped as follows:
 1. Provide field offices with operable windows equipped with insect screen.
 2. Provide a light fixture capable of maintaining an average illumination of 20 foot candles at desk height.
- E. Temporary Roads and Paving

1. To the fullest extent possible, locate temporary roads and paving for storage areas and temporary parking, in the same locations as permanent facilities for similar uses. To incorporate temporary paving provisions, review significant modifications of permanent paving requirements with the Architect for acceptance of the proposed improvements.
 - a. Coordinate development of temporary roads and paved areas with grading and compaction of the subgrade, installation and stabilization of the subbase and installation of the base and finish courses of the permanent paving. Coordinate development in a manner that will minimize exposure of incomplete work to deterioration and the need to rework installations, that will provide adequate temporary roads and paving during the course of the work, and that will result in the completion of permanent roads and paved areas that will be new in appearance and without damage or deterioration at the time of the Owner's occupancy.
 - b. Delay installation of the final course of permanent paving in areas exposed to temporary use, until immediately before substantial completion. Coordinate with normal weather conditions to avoid unsatisfactory results.
 - c. Extend temporary paving in and around the site construction area as necessary to accommodate the following:
 - 1) Delivery and storage of materials.
 - 2) Fabrication operations.
 - 3) Use of equipment, including truck cranes.
 - 4) Mock-ups.
 - 5) Testing operations.
 - 6) Administration and supervision.
 - 7) Safety and protection activities.
 2. Provide temporary traffic control facilities at the junction of temporary roads with public roads, including warning signs for public traffic and "STOP" signs for the access road entrance onto public roads. Comply with requirements and recommendations of local traffic authorities.
 3. Paving: Construct and maintain temporary roads and paving to adequately support the indicated loading and to withstand exposure to traffic during the construction period.
 - a. Provide aggregate paving course of a well graded subbase material.
- F. For temporary drainage and dewatering facilities and operations not directly associated with performance of work included under individual work sections, comply with dewatering requirements of applicable sections. Where feasible, utilize the same facilities. Maintain the site, excavations and construction free of water.
1. Dispose of rainwater in a lawful manner which will not result in flooding the project or adjoining property, nor endanger either permanent work or temporary facilities.

2. Provide temporary drainage where the roofing or similar waterproof deck construction is completed prior to the connection and operation of the permanent drainage piping system, provide temporary drainage.
- G. Do not permit installation of unauthorized signs that are visible outside the site.
- H. Establish a system for daily collection and disposal of waste materials from construction areas and elsewhere on the site. Enforce requirements strictly. Do not hold collected materials at the site longer than 7 days during normal weather or 3 days when the daily temperature is expected to rise above 80 deg F (27 deg C). Handle waste materials that are hazardous, dangerous, or unsanitary separately from other inert waste by containerizing appropriately. Dispose of waste material in a lawful manner.
1. Burying or burning of waste materials on the site will not be permitted.
 2. Washing waste materials down sewers or into waterways will not be permitted.
 3. Provide rodent proof containers located on each floor level of construction work, to encourage depositing of garbage and similar wastes by construction personnel.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings or authorities having jurisdiction, whichever is more stringent.
- C. Furnish and install site enclosure temporary fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
- D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- E. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
- F. Install and maintain temporary fire-protection facilities. Comply with NFPA 241.
- G. Early in the construction process before deep foundation work has been completed, retain a recognized local exterminator or insect-and-pest control company to recommend practices that will minimize attraction and harboring of rodents, roaches and other pests. Employ this service to perform extermination and control procedures at regular intervals so that the project will be relatively free of pests and their residues at substantial completion. Perform control operations in a lawful manner using environmentally safe materials.

- H. Until fire protection needs may be fulfilled by permanent facilities, install and maintain temporary fire protection facilities of the types needed to adequately protect against reasonably predictable and controllable fire losses. Comply with the applicable recommendations of NFPA Standard 10 "Standard for Portable Fire Extinguishers". Locate fire extinguishers where they are most convenient and effective for their intended purpose, but provide not less than one extinguisher on each floor at or near each usable stairwell. Store combustible materials in containers in recognized fire-safe locations.
 - 1. Where temporary water outlets are available, provide hoses of sufficient length to reach construction areas. Hang hoses with a warning sign, to the effect that hoses are for fire protection purposes and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.
- I. Comply with recognized standards and code requirements for the erection of substantial, structurally adequate barricades where needed to prevent accidents and losses. Paint with appropriate colors, graphics and warning signs to inform personnel at the site and the public, of the hazard being protected against. Provide lighting where appropriate and needed, including flashing red lights where appropriate.
- J. Provide general protection facilities, operate temporary facilities, conduct construction activities, and enforce strict discipline for personnel on the site in ways and by methods that comply with environmental regulations, and that minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result from the performance of work at the site. Avoid the use of tools and equipment which produce harmful noise. Restrict the use of noise making tools and equipment to hours of use that will minimize noise complaints from persons or firms near the project site.

3.5 MOISTURE AND MOLD CONTROL

- A. Before installation of weather barriers, protect materials from water damage and keep porous and organic materials from coming into prolonged contact with concrete.
- B. After installation of weather barriers but before full enclosure and conditioning of building, protect as follows:
 - 1. Do not load or install drywall or porous materials into partially enclosed building.
 - 2. Discard water-damaged and wet material and material that begins to grow mold.
 - 3. Allow installed wet materials adequate time to dry before being enclosed.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Operate and maintain temporary services and facilities in good operating condition throughout the time of use and until removal is authorized. Protect from damage by freezing temperatures and similar elements.

1. Protection: Prevent water filled piping from freezing, by use of ground covers, insulation, by keeping drained or by temporary heating. Maintain distinct markers for underground lines. Protect from damage during excavation operations.
- C. Unless the Architect requests that it be maintained for a longer period of time, remove each temporary service and facility promptly when the need for it or a substantial portion of it has ended, or when it has been replaced by the authorized use of a permanent facility, or no later than substantial completion. Complete, or, if necessary, restore permanent work which may have been delayed because of interference with the temporary service or facility. Repair damaged work, clean exposed surfaces and replace work which cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary services and facilities are and remain the property of the Contractor. The Owner reserves the right to take possession of the project identification signs.
 2. Remove temporary roads and paving materials which are not intended for or acceptable for integration into permanent paving. Where the area shown is intended for landscape development, remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the landscape area. Remove materials contaminated with road oil, asphalt and other petro-chemical compounds, and other substances which might impair growth of plant materials or lawns. Repair or replace street paving, curbs and sidewalks at the temporary entrances, as required by the governing authority.
 3. At substantial completion, clean and renovate permanent services and facilities that have been used to provide temporary services and facilities during the construction period, including but not limited to the following:
 - a. Replace air filters and clean the inside of ductwork and housings.
 - b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
 - c. Replace lamps in the lighting system that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Definitions: Definitions used in this paragraph are not intended to negate the meaning of other terms used in the contract documents, including such terms as, "specialties", "systems", "structure", "finishes", "accessories", "furnishings", "special construction" and similar terms. Such terms are self-explanatory and have recognized meanings in the construction industry.
- B. "Products" are items purchased for incorporation in the Work, regardless of whether they were specifically purchased for the project or taken from the Contractor's previously purchased stock. The term "product" as used herein includes the terms "material", "equipment", "system" and other terms of similar intent.
 - 1. "Named Products" are products identified by use of the manufacturer's name for a product, including such items as a make or model designation, as recorded in published product literature, of the latest issue as of the date of the contract documents.
 - 2. "Materials" are products that must be substantially cut, shaped, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form units of work.
 - 3. "Equipment" is defined as a product with operational parts, regardless of whether motorized or manually operated, and in particular, a product that requires service connections such as wiring or piping.
- C. Comparable Product Requests:
 - 1. Submit request for consideration of each comparable product. Do not submit unapproved products on Shop Drawings or other submittals.
 - 2. Identify product to be replaced and show compliance with requirements for comparable product requests. Include a detailed comparison of significant qualities of proposed substitution with those of the Work specified.
 - 3. Architect will review the proposed product and notify Contractor of its acceptance or rejection.
 - 4. Consideration of comparable products will only be reviewed when submitted per Instructions to Bidders Section 9.
- D. Substitutions: The Contractor's requests for changes in the products, materials, equipment and methods of construction required by the contract documents are considered requests for "substitutions", and are subject to the requirements specified herein. The following are not considered as substitutions.

1. Revisions to the contract documents, where requested by the Owner or Architect are considered as "changes", not substitutions.
 2. Substitutions requested during the bidding period, which have been accepted by Addendum prior to the Contract Bid Date, are included in the contract documents and are not subject to the requirements for substitutions as herein specified.
 3. Specified Contractor options on products and construction methods included in the contract documents are choices available to the Contractor and are not subject to the requirements for substitutions as herein specified.
 4. Except as otherwise provided in the contract documents, the Contractor's determination of and compliance with governing regulations and orders as issues by governing authorities do not constitute "substitutions" and do not constitute a basis for change orders.
- E. Basis-of-Design Product Specification Submittal: Show compliance with requirements.
- F. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Deliver products to Project site in manufacturer's original sealed container or packaging, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 3. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 4. Store materials in a manner that will not endanger Project structure.
 5. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- G. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- H. Standards: Refer to Division-1 section "Definitions and Standards" for the applicability of industry standards to the products specified for the project, and for the acronyms used in the text of the specification sections.
- 1.2 QUALITY ASSURANCE
- A. Source Limitations: To the fullest extent possible, provide products of the same generic kind, from a single source, for each unit of work.
- B. Compatibility of Options: Compatibility of products is a basic requirement of product selection. When the Contractor is given the option of selecting between two or more products for use on the project, the product selected must be compatible with other products previously selected, even if the products previously selected were also

Contractor options. The complete compatibility between the various choices available to the Contractor is not assured by the various requirements of the Contract documents, but must be provided by the Contractor.

1.3 SUBMITTALS

- A. Submittal: Submit one hard copy and one digital copy of the product-listing schedule within 30 days after the date of commencement of the Work. Provide a written explanation for omissions of data, and for known variations from contract requirements.
- B. Architect's Action: The Architect will respond to the Contractor in writing within 2 weeks of receipt of the product-listing schedule. No response by the Architect within the 2-week time period constitutes an objection to the listed products or manufacturers, but does not constitute a waiver of the requirement that products comply with the requirements of the contract documents. The Architect's response will include the following:
 - 1. The Architect's listing of unacceptable product selections.
 - 2. A request for additional data necessary for the review and possible acceptance of the products and manufacturer's listed.
- C. Substitution Request Submittal:
 - 1. Requests for Substitutions: No request for substitutions will be considered.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. Provide products that comply with the Contract Documents, are undamaged, and are new at the time of installation.
 - 1. Provide products complete with accessories, trim, finish, and other devices and components needed for a complete installation and the intended use and effect.
 - 2. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Requirements for individual products are indicated in the contract documents; compliance with these requirements is in itself a contract requirement. These requirements may be specified in any one of several different specifying methods, or in any combination of these methods. These methods include the following:
 - 1. Proprietary.
 - 2. Descriptive.
 - 3. Performance.
 - 4. Compliance with reference Standards.
 - 5. Compliance with codes, compliance with graphic details, allowances, and similar provisions of the contract documents also have a bearing on the selection process

- C. Procedures for Selecting Products: The Contractor's options in selecting products are limited by requirements of the contract documents and governing regulations. They are not controlled by industry traditions or procedures experienced by the Contractor on previous construction projects. Required procedures include but are not limited to the following for the various indicated methods of specifying:
1. Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Advise the Architect before proceeding, when it is discovered that the named product is not a reasonable or a feasible solution.
 2. Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
 3. Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered. Advise the Architect before proceeding where none of the named products comply with specification requirements, or are feasible for use.
 4. Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 5. Where Specifications name a single product, or refer to a product indicated on Drawings, as the "basis-of-design," provide the named product. Comply with provisions for "comparable product requests" for consideration of an unnamed product by another manufacturer.
 6. Where products or manufacturers are specified by name, accompanied by the term "or-equal" or similar language, comply with the contract document provisions concerning "substitution" in the "Instructions to Bidders" to obtain approval from the Architect for the use of an unnamed product.
 7. Where the specifications name products or manufacturers that are available and may be incorporated in the Work, the Contractor may not, at his option, use any available product that complies with contract requirements.
 8. Where the specifications describe a product or assembly generically, in detail, listing the exact characteristics required, but without use of a brand or trade name, provide products or assemblies that provide the characteristics indicated and otherwise comply with contract requirements.
 9. Where the specifications require compliance with indicated performance requirements, provide products that comply with the specific performance requirements indicated, and that are recommended by the manufacturer for the application indicated. The manufacturer's recommendations may be contained in published product literature, or by the manufacturer's individual certification of performance. General overall performance of a product is implied where the product is specified for specific performances.
 10. Where the specifications require only compliance with an imposed standard, code or regulation, the Contractor has the option of selecting a product that complies with specification requirements, including the standards, codes and regulations.
- D. Where Specifications require "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. Visual Matching: Where matching an established sample is required, the final judgment of whether a product proposed by the Contractor matches the sample satisfactorily will be determined by the Architect. Where there is no product available within the specified product category that matches the sample satisfactorily and also complies with other specified requirements, comply with the provisions of the contract documents concerning "substitutions" and "change orders" for the selection of a matching product in another product category, or for non-compliance with specified requirements.
 2. Visual Selection: Except as otherwise indicated, where specified product requirements include the phrase "...as selected from the manufacturer's standard colors, patterns, textures..." or similar phrases, the Architect is subsequently responsible for selecting the color, pattern, and texture from the product line indicated.
 3. Allowances: Refer to individual sections of the specifications and "Allowance" provisions in Division-1 sections for an indication of product selections that are controlled by established allowances, and for the procedures required for processing such selections.
- E. Unless otherwise indicated, Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.
- F. Producer's Statement of Applicability: Where individual specification sections indicate products that require a "Statement of Applicability" from the manufacturer or other producer, submit a written-certified statement from the producer stating that the producer has reviewed the proposed application of the product on the project. This statement shall state that the producer agrees with or does not object to the Architect's specification and the Contractor's selection of the product for use in the Work. The statement shall also state that the proposed application of the product on the project is suitable and proper.

2.2 SUBSTITUTIONS

- A. Conditions: The Contractor's request for a substitution will be received and considered when extensive revisions to the contract documents are not required, when the proposed changes are in keeping with the general intent of the contract documents, when the requests are timely, fully documented and properly submitted, and when one or more of the following conditions is satisfied, all as judged by the Architect; otherwise the requests will be returned without action except to record non-compliance with these requirements.
1. The Architect will consider a request for substitution where the specified product or method cannot be provided within the Contract Time. However, the request will not be considered if the product or method cannot be provided as a result of the Contractor's failure to pursue the work promptly or to coordinate the various activities properly.

2. The Architect will consider a request for substitution where the specified product or method cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 3. The Architect will consider a request for a substitution where a substantial advantage is offered the Owner, in terms of cost, time, energy conservation, or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. These additional responsibilities may include such considerations as additional compensation to the Architect for redesign and evaluation services, the increased cost of other work by the Owner or separate contractors, and similar considerations.
 4. The Architect will consider a request for substitution when the specified product or method cannot be provided in a manner, which is compatible with other materials of the work, and where the Contractor certifies that the substitution will overcome the incompatibility.
 5. The Architect will consider a request for substitution when the specified product or method cannot be properly coordinated with other materials in the work, and where the Contractor certifies that the proposed substitution can be properly coordinated.
 6. The Architect will consider a request for substitution when the specified product or method cannot receive a warranty as required by the contract documents and where the contractor certifies that the proposed substitution receive the required warranty.
- B. Work-Related Submittals: The Contractor's submittal of and the Architect's acceptance of shop drawings, product data or samples which relate to work not complying with requirements of the contract documents, does not constitute an acceptable or valid request for a substitution, nor approval thereof.

2.3 GENERAL PRODUCT REQUIREMENTS

- A. General: Provide products that comply with the requirements of the contract documents and that are undamaged and, unless otherwise indicated, unused at the time of installation. Provide products that are complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
1. Standard Products: Where they are available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

PART 3- EXECUTION

3.1 INSTALLATION OF PRODUCTS

- A. General: Except as otherwise indicated in individual sections of these specifications, comply with the manufacturer's instructions and recommendations for installation of

the products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other work. Clean exposed surfaces and protect surfaces as necessary to ensure freedom from damage and deterioration at time of acceptance.

END OF SECTION 016000

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF REQUIREMENTS

- A. Definitions: Project closeout is the term used to describe certain collective project requirements, indicating completion of the Work that are to be fulfilled near the end of the Contract time in preparation for final acceptance and occupancy of the Work by the Owner, as well as final payment to the Contractor and the normal termination of the Contract.
- B. Specific requirements for individual units of work are included in the appropriate sections in Divisions 2 through 33.
- C. Time of closeout is directly related to "Substantial Completion"; therefore, the time of closeout may be either a single time period for the entire Work or a series of time periods for individual elements of the Work that have been certified as substantially complete at different dates. This time variation, if any, shall be applicable to the other provisions of this section.

1.3 CLOSEOUT SUBMITTALS

- A. As Built Drawings: Maintain a set of prints of the Contract Drawings as As Built Drawings. Mark to show actual installation where installation varies from that shown originally.
 - 1. Identify and date each record Drawing; include the designation "PROJECT AS BUILT DRAWING" in a prominent location.
 - 2. Do not use As Built documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to As Built documents for the Architect's reference during normal working hours.
 - 3. Maintain a set of blue or black line prints of contract drawings and shop drawings in a clean, undamaged condition. Mark-up the set of As Built documents to show the actual installation where the installed work varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing the actual "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at the corresponding location on the working drawings. Give particular attention to concealed work that would be difficult to measure and record at a later date.

4. Mark as built sets with red erasable pencil and, where feasible, use other colors to distinguish between variations in separate categories of work.
 5. Mark-up new information, which is known to be important to the Owner, but for some reason was not shown on either contract drawings or shop drawings.
 6. Note related change-order numbers where applicable.
 7. Organize as built drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
 8. Upon completion of mark-up, submit complete set of as built data to the Architect for the Owner's records.
- B. Operation and Maintenance Data: Submit three hard copies of manual and one digital copy. Organize data into three-ring binders with identification on front and spine of each binder, and envelopes for folded drawings. Organize operating and maintenance data into suitable sets of manageable size. Bind data into individual binders properly identified and indexed. Bind each set of data in a heavy-duty 2-inch, 3-ring vinyl-covered binder, with pocket folders for folded sheet information. Mark the appropriate identification on both front and spine of each binder. Include the following:
1. Manufacturer's operation and maintenance documentation.
 2. Maintenance and service schedules.
 3. Maintenance service contracts.
 4. Emergency instructions.
 5. Spare parts list.
 6. Wiring diagrams.
 7. Copies of warranties.
 8. Recommended "turn-around" cycles.
 9. Inspection procedures.
 10. Shop drawings and product data.

1.4 CLOSEOUT PROCEDURES

- A. Substantial Completion: Before requesting Substantial Completion inspection, complete the following:
1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 2. Advise Owner of pending insurance changeover requirements.
 3. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents. Submit roof warranty certificate.
 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, fire marshal inspections, operating certificates, and similar releases.
 5. Submit As Built Drawings, operation and maintenance manuals, property surveys, and similar final record information.
 6. Deliver tools, spare parts, extra materials, and similar items.
 7. Make final changeover of permanent locks and deliver keys to Owner.

8. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities and services from the project site, along with construction tools and facilities, mock- ups, and similar elements.
 9. Remove temporary facilities and controls.
 10. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 11. Complete final cleaning requirements, including touchup painting.
 12. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. In the progress payment request that coincides with, or is the first request following, the date substantial completion is claimed, show either 100% completion for the portion of the Work claimed as "substantially complete", and list incomplete items, the value of incomplete work, and reasons for the Work being incomplete.
1. Include supporting documentation for completion as indicated in these contract documents. Submit a statement showing an accounting of changes to the Contract Sum.
- C. Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will proceed with inspection or advise Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will advise Contractor of items that must be completed or corrected before certificate will be issued.
- D. Inspection Procedures: Upon receipt of the Contractor's request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled prerequisites.
- E. Following the initial inspection, the Architect will either prepare the certificate of substantial completion, or will advise the Contractor of work which must be performed before the certificate will be issued. The Architect will repeat the inspection when requested and when assured that the Work has been substantially completed.
1. Results of the completed inspection will form the initial "punch-list" for final acceptance.
- 1.5 PREREQUISITES TO FINAL ACCEPTANCE
- A. Complete the following before requesting the Architect's final inspection for certification of final acceptance, and final payment as required by the General Conditions. List known exceptions, if any, in the request.
1. Submit the final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
 3. Submit a certified copy of the Architect's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and has been endorsed and dated by the Architect.
 4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data either as of the date of substantial completion, or else when the Owner took possession of and responsibility for corresponding elements of the Work.
 5. Submit consent of surety.
 6. Submit a final liquidated damages settlement statement, acceptable to the Owner.
 7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 8. Submit a No-lien certificate.
- B. Reinspection Procedure: The Architect will reinspect the Work upon receipt of the Contractor's notice that the work, including punch-list items resulting from earlier inspections, has been completed, except for these items whose completion has been delayed because of circumstances that are acceptable to the Architect.
1. Submit a written request for final inspection for acceptance. On receipt of request, Architect will proceed with inspection or advise Contractor of unfulfilled requirements. Architect will prepare final Certificate for Payment after inspection or will advise Contractor of items that must be completed or corrected before certificate will be issued.
 2. Upon completion of reinspection, the Architect will either prepare a certificate of final acceptance, or will advise the Contractor of work that is incomplete or of obligations that have not been fulfilled, but are required for final acceptance.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance.
1. Verify compatibility with and suitability of substrates.
 2. Examine roughing-in for mechanical and electrical systems.
 3. Examine walls, floors, and roofs for suitable conditions.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

- C. Take field measurements as required to fit the Work properly. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication.
- D. Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- E. Surface and Substrate Preparation: comply with manufacturer's written recommendations for preparation of substrates to receive subsequent work.

3.2 CONSTRUCTION LAYOUT AND FIELD ENGINEERING

- A. Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks.
- B. Engage a land surveyor to lay out the Work using accepted surveying practices.
- C. Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project.
 - 1. At Substantial Completion, have the final flood elevation certificate prepared for each building and structure.

3.3 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated. Make vertical work plumb and make horizontal work level.
 - 1. Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections to form hairline joints.
 - 2. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 3. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations.
- C. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- D. Use products, cleaners, and installation materials that are not considered hazardous.
- E. Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place. Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed.

3.4 CUTTING AND PATCHING

- A. Provide temporary support of work to be cut. Do not cut structural members or operational elements without prior written approval of Architect.
- B. Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- C. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
 - 1. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - 2. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

3.5 FINAL CLEANING

- A. Clean Project site and work areas daily, including common areas. Dispose of materials lawfully.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
 - 3. Remove debris from concealed spaces before enclosing the space.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion:
 - 1. Remove labels that are not permanent.
 - 2. Clean transparent materials, including mirrors. Remove excess glazing compounds. Replace chipped or broken glass.
 - 3. Clean exposed exterior and interim hard-surfaced finishes to a dust-free condition, free of dust, stains, films and similar noticeable distracting substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces..
 - 4. Vacuum carpeted surfaces and wax resilient flooring.
 - 5. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication. Clean plumbing fixtures. Clean light fixtures, lamps, globes, and reflectors.
 - 6. Clean Project site, yard, and grounds, in areas disturbed by construction activities. Sweep paved areas; remove stains, spills, and foreign deposits. Rake grounds to a smooth, even-textured surface.
 - 7. Provide final cleaning of the Work at the time indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of

work to the condition expected from a normal, commercial building cleaning and maintenance program. Comply with the manufacturer's instructions for operations.

- C. Engage an experienced exterminator to make a final inspection of the project, and to rid the project of rodents, insects and other pests.
- D. Removal of Protection: Except as otherwise indicated or requested by the Architect, remove temporary protection devices and facilities which were installed during the course of the work to protect previously completed work during the remainder of the construction period.
- E. Compliance: Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at the site. Do not bury debris or excess materials on the Owner's property. Do not discharge paint of any kind, volatile or other harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
 - 1. Where extra materials of value remaining after completion of associated work have become the Owner's property, dispose of these materials to the Owner's best advantage as directed.

3.6 DEMONSTRATION AND TRAINING

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system. Include a detailed review of the following:
 - 1. Include instruction for basis of system design and operational requirements, review of documentation, emergency procedures, operations, adjustments, troubleshooting, maintenance, and repairs.
 - 2. As part of this instruction provide a detailed review of the following items:
 - a. Maintenance manuals
 - b. Record documents
 - c. Spare parts and materials
 - d. Tools
 - e. Lubricants
 - f. Fuels
 - g. Identification systems
 - h. Control sequences
 - i. Cleaning
 - j. Warranties bonds, maintenance agreements and similar, continuing commitments.
 - 3. As part of this instruction for operating equipment demonstrate the following procedures:

- a. Start-up
- b. Shut-down
- c. Emergency operations
- d. Noise and vibration adjustments
- e. Economy and efficiency adjustments
- f. Effective energy utilization

END OF SECTION 017000

SECTION 017329 - CUTTING AND PATCHING AND REPAIR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF REQUIREMENTS

- A. Definition: Whether noted on plans or not, "Cutting and patching and repair" includes cutting into existing construction to provide for the installation or performance of other work, repair or patching as required to conceal evidence of new work at existing conditions, and subsequent fitting and patching required to restore surfaces to their original condition. Also any repair work required to restore existing conditions to this original condition before any work of this project occurred and to provide final visual and aesthetic appearance acceptable to the Architect.
 - 1. Cutting and patching and repair is performed for coordination of the work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed, for installation of any new work, or for other similar purposes.
 - 2. Cutting and patching and repair performed during the manufacture of products, or during the initial fabrication, erection or installation processes is not considered under this definition. Drilling of holes to install fasteners and similar operations are also not considered to be cutting and patching and repair.
- B. Refer to other sections of these specifications for specific cutting and patching requirements and limitations applicable to individual units of work.
 - 1. Unless otherwise specified requirements of this sections apply to mechanical and electrical work. Refer to any and all specification sections for additional requirements and limitations on cutting and patching and repair of mechanical and electrical work.

1.3 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural work in a manner that would result in a reduction of load-carrying capacity or of load-deflection ratio.
- B. Before cutting and patching the following categories of work, obtain the Architect's approval to proceed with cutting and patching as described in the procedural proposal for cutting and patching.
 - 1. Structural steel.
 - 2. Miscellaneous structural metals, including lintels, equipment supports, stair systems and similar categories of work.

3. Structural concrete.
 4. Foundation construction.
 5. Timber and primary wood framing.
 6. Bearing and retaining walls.
 7. Structural decking.
 8. Exterior wall construction.
 9. Piping, ductwork, vessels and equipment.
- C. Operational and Safety Limitations: Do not cut and patch operational elements or safety related components in a manner that would result in a reduction of their capacity to perform in the manner intended, including energy performance, or that would result in increased maintenance, or decreased operational life or decreased safety.
- D. Before cutting and patching and repair the following elements of work, and similar work elements where directed, obtain the Architect's approval to proceed with cutting and patching as proposed in the proposal for cutting and patching and repair.
1. Primary operational systems and equipment.
 2. Water/moisture/vapor/air/smoke barriers, membranes and flashings.
 3. Noise and vibration control elements and systems.
 4. Control, communication, conveying, and electrical wiring systems.
- E. Visual Requirements: Do not cut and patch and repair areas or work exposed on the building's exterior or in its occupied spaces, in a manner that would, in the Architect's opinion, result in lessening the building's aesthetic qualities. Do not perform work without patching and repairing existing conditions in a manner that would result in substantial visual evidence of work. Remove and replace work judged by the Architect to be cut and patched in a visually unsatisfactory manner.

1.4 SUBMITTALS

- A. Procedural Proposal: Where prior approval of cutting and patching and repair is required, submit proposed procedures for this work well in advance of the time work will be performed and request approval to proceed. Include the following information, as applicable, in the submittal:
1. Describe nature of the work and how it is to be performed, indicating why cutting and patching cannot be avoided. Describe anticipated results of the work in terms of changes to existing work, including structural, operational, and visual changes as well as other significant elements.
 2. List products to be used and firms that will perform work.
 3. Give dates when work is expected to be performed.
 4. List utilities that will be disturbed or otherwise be affected by work, including those that will be relocated and those that will be out-of-service temporarily. Indicate how long utility service will be disrupted.
 5. Where cutting and patching and repair of structural work involves the addition of reinforcement, submit details and engineering calculations to show how that

- reinforcement is integrated with original structure to satisfy requirements.
6. Approval by the Architect to proceed with cutting and patching and repair work does not waive the Architect's right to later require complete removal and replacement of work found to be cut and patched and repaired in an unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Except as otherwise indicated, or as directed by the Architect, use materials for cutting and patching and repairing that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal-or-better performance characteristics.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Before cutting, examine the surfaces to be cut and patched and the conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.
- B. Before the start of cutting work, meet at the work site with all parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict between the various trades. Coordinate layout of the work and resolve potential conflicts before proceeding with the work.

3.2 PREPARATION

- A. Temporary Support: To prevent failure provide temporary support of work to be cut.
- B. Protection: Protect other work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations.
 1. Avoid interference with use of adjoining areas or interruptions of free passage to adjoining areas.
- C. Take precautions not to cut existing pipe, conduit, or duct serving the building but scheduled to be relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching and repair work. Except as otherwise indicated or as approved by the Architect, proceed with cutting and patching at the earliest feasible time and complete work without delay.

- B. Cutting: Cut the work using methods that are least likely to damage work to be retained or adjoining work. Where possible review proposed procedures with the original installer; comply with original installer's recommendations.
1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut through concrete and masonry using a cutting machine such as a carborundum saw or core drill to insure a neat hole. Cut holes and slots neatly to size required with minimum disturbance of adjacent work. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces. Temporarily cover openings when not in use.
 2. By-pass utility services such as pipe and conduit, before cutting, where such utility services are shown or required to be removed, relocated or abandoned. Cut-off conduit and pipe in walls or partitions to be removed. After by-pass and cutting, cap, valve or plug and seal tight remaining used portion of pipe and conduit to prevent entrance of moisture or other foreign matter. Remove all abandoned wire, conduit and piping back to origin.
- C. Patching: Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.
1. Where feasible, inspect and test patched areas to demonstrate integrity of work.
- D. Restore exposed finishes of patched areas and all areas of new work and where necessary extend finished restoration into retained adjoining work in a manner which will eliminate evidence of new work, patching and refinishing.
- E. Where removal of walls or partitions extends one finished area into another finished area, patch and repair floor and wall and ceiling surfaces in the new space to provide an even surface of uniform color and appearance. If necessary to achieve uniform color and appearance, remove existing floor and wall coverings and replace with new materials.
1. Where patch occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing patch, after patched area has received prime and base coat.
- F. Patch and repair existing ceilings as necessary to provide an even plan surface of uniform appearance.

3.4 CLEANING

- A. Thoroughly clean areas and spaces where work is performed or used as access to work. Remove completely point, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 017329

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Items indicated to be removed and salvaged remain Owner's property. Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.
- B. Comply with EPA regulations and hauling and disposal regulations of authorities having jurisdiction. Comply with ANSI A10.6 and NFPA 241.
- C. Predemolition Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces. Submit before Work begins.
- D. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- E. It is not expected that hazardous materials will be encountered in the Work. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Maintain services/systems indicated to remain and protect them against damage during selective demolition operations. Before proceeding with demolition, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of the building.
- B. Locate, identify, shut off, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
- C. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- D. Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to

remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

- E. Provide temporary weather protection to prevent water leakage and damage to structure and interior areas.
- F. Protect walls, ceilings, floors, and other existing finish work that are to remain. Erect and maintain dustproof partitions. Cover and protect furniture, furnishings, and equipment that have not been removed.
- G. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
- H. Promptly remove demolition waste materials from Project site and legally dispose of them. Do not burn demolished materials.
- I. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before demolition operations began.

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE



PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
 - 1. Footings.
 - 2. Foundation Walls
 - 3. Slabs-on-grade.
 - 4. Drilled Piers/Drilled Shafts
 - 5. Water Control Structures
- B. Related Sections include the following:
 - 1. Division 03 Section "Architectural Concrete" for general building applications of specially finished formed concrete.
 - 2. Division 31 Section "Earth Moving" for drainage fill under slabs-on-grade.
 - 3. Division 32 Section "Concrete Paving" for concrete pavement and walks.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

- A. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- B. Floor surface flatness and levelness measurements to determine compliance with

specified tolerances.

- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Field quality-control test and inspection reports.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- C. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code-Reinforcing Steel."
- D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
 - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- E. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 - 2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. "Formply" Plywood, metal, or other approved panel materials.
 - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
 - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - c. Structural 1, B-B or better; mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.
- G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

- H. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

- 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

- I. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

- 1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
 - 3. Furnish ties with integral water-barrier plates to walls indicated to receive damp-proofing or waterproofing.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed. (Only as indicated on drawings and/or approved in writing by Architect/Engineer.)
- C. Steel Bar Mats: ASTM A 184/A 184M, fabricated from [ASTM A 615/A 615M, Grade 60 (Grade 420) deformed bars, assembled with clips.
- D. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.

2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut bars true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
 - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
 - 3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.5 STEEL CASINGS (Drilled Shafts/Piers)

- A. Steel Pipe Casings: ASTM A 283/A 283M, Grade C, or ASTM A 36/A 36M, carbon-steel plate, with joints full-penetration welded according to AWS D1.1/D1.1M.

2.6 SLURRY (Drilled Shafts/Piers)

- A. Slurry: Pulverized bentonite, pulverized attapulgite, or polymers mixed with water to form stable colloidal suspension; complying with ACI 336.1 for density, viscosity, sand content, and pH.

2.7 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

- 1. Portland Cement: ASTM C 150, Type I, Type II, or ASTM C 595 Type 1L

- a. Fly Ash: ASTM C 618, Class C or F. Maximum 15% by weight.

- B. Normal-Weight Aggregates: ASTM C 33, uniformly graded as follows:

- 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
- 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement. Grading should follow requirements for fine aggregate per ASTM C33.

- C. Lightweight Aggregate: ASTM C 330, 3/4-inch (19-mm) nominal maximum aggregate size.

- D. Water: ASTM C 94/C 94M and potable.

2.8 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.

- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

- 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
- 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
- 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
- 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
- 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
- 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.9 WATERSTOPS

- A. Flexible Rubber Waterstops: CE CRD-C 513, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
 - 1. Available Manufacturers:
 - a. Greenstreak.
 - b. Progress Unlimited, Inc.
 - c. Williams Products, Inc.
 - d. Earth Shield
 - 2. Profile: Ribbed with center bulb
- B. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
 - 1. Available Manufacturers:
 - a. Bometals, Inc.
 - b. Greenstreak.
 - c. Meadows, W. R., Inc.
 - d. Murphy, Paul Plastics Co.
 - e. Progress Unlimited, Inc.
 - f. Tamms Industries, Inc.
 - g. Vinylex Corp.
 - h. Earth Shield
 - 2. Profile: Ribbed with center bulb.
- C. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).
 - 1. Available Products:
 - a. Colloid Environmental Technologies Company; Volclay Waterstop-RX.
 - b. Concrete Sealants Inc.; Conseal CS-231.
 - c. Greenstreak; Swellstop.
 - d. Henry Company, Sealants Division; Hydro-Flex.
 - e. JP Specialties, Inc.; Earthshield Type 20.
 - f. Progress Unlimited, Inc.; Superstop.
 - g. TCMiraDRI; Mirastop.
- D. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch (10 by 19 mm).

1. Available Products:

- a. Deneef Construction Chemicals; Swellseal.
- b. Greenstreak; Hydrotite.
- c. Mitsubishi International Corporation; Adeka Ultra Seal.
- d. Progress Unlimited, Inc.; Superstop.

2.10 VAPOR RETARDERS

- A. Plastic Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.

1. Available Products:

- a. Fortifiber Corporation; Moistop Ultra A.
- b. Raven Industries Inc.; Vapor Block.
- c. Reef Industries, Inc.; Griffolyn Type.
- d. Stego Industries. LLC, Stego Wrap.

- B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

- C. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a 3/8-inch sieve, 10 to 30 percent passing a No. 100 sieve, and at least 5 percent passing No. 200 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

2.11 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Available Products:

- a. Axim Concrete Technologies; Cimfilm.
- b. Burke by Edoco; BurkeFilm.
- c. ChemMasters; Spray-Film.
- d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Aquafilm.
- e. Dayton Superior Corporation; Sure Film.
- f. Euclid Chemical Company (The); Eucobar.
- g. Kaufman Products, Inc.; Vapor Aid.
- h. Lambert Corporation; Lambco Skin.
- i. L&M Construction Chemicals, Inc.; E-Con.

- j. MBT Protection and Repair, Div. of ChemRex; Confilm.
 - k. Meadows, W. R., Inc.; Sealtight Evapre.
 - l. Metalcrete Industries; Waterhold.
 - m. Nox-Crete Products Group, Kinsman Corporation; Monofilm.
 - n. Sika Corporation, Inc.; SikaFilm.
 - o. Symons Corporation, a Dayton Superior Company; Finishing Aid.
 - p. Unitex; Pro-Film.
 - q. US Mix Products Company; US Spec Monofilm ER.
 - r. Vexcon Chemicals, Inc. ; Certi-Vex EnvioAssist.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
1. Available Products:
- a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
 - b. Burke by Edoco; Aqua Resin Cure.
 - c. ChemMasters; Safe-Cure Clear.
 - d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company;
W.B. Resin Cure.
 - e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
 - f. Euclid Chemical Company (The); Kurez DR VOX.
 - g. Kaufman Products, Inc.; Thinfilm 420.
 - h. Lambert Corporation; Aqua Kure-Clear.
 - i. L&M Construction Chemicals, Inc.; L&M Cure R.
 - j. Meadows, W. R., Inc.; 1100 Clear.
 - k. Nox-Crete Products Group, Kinsman Corporation; Resin Cure E.
 - l. Symons Corporation, a Dayton Superior Company; Resi-Chem Clear Cure.
 - m. Tamms Industries, Inc.; Horncure WB 30.
 - n. Unitex; Hydro Cure 309.
 - o. US Mix Products Company; US Spec Maxcure Resin Clear.
 - p. Vexcon Chemicals, Inc. ; Certi-Vex Enviocure 100.
- F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.
1. Available Products:
- a. Anti-Hydro International, Inc.; AH Clear Cure WB.

- b. Burke by Edoco; Spartan Cote WB II.
- c. ChemMasters; Safe-Cure & Seal 20.
- d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company;Cure and Seal WB.
- e. Dayton Superior Corporation; Safe Cure and Seal (J-18).
- f. Euclid Chemical Company (The); Aqua Cure VOX.
- g. Kaufman Products, Inc.; Cure & Seal 309 Emulsion.
- h. Lambert Corporation; Glazecote Sealer-20.
- i. L&M Construction Chemicals, Inc.; Dress & Seal WB.
- j. Meadows, W. R., Inc.; Vocomp-20.
- k. Metalcrete Industries; Metcure.
- l. Nox-Crete Products Group, Kinsman Corporation; Cure & Seal 150E.
- m. Symons Corporation, a Dayton Superior Company; Cure & Seal 18 Percent E.
- n. Tamms Industries, Inc.; Clearseal WB 150.
- o. Unitex; Hydro Seal.
- p. US Mix Products Company; US Spec Hydrasheen 15 percent
- q. Vexcon Chemicals, Inc.; Starseal 309.

G. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315,Type 1, Class A.

1. Available Products:

- a. Burke by Edoco; Cureseal 1315.
- b. ChemMasters; Spray-Cure & Seal Plus.
- c. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company;Sealcure 1315.
- d. Dayton Superior Corporation; Day-Chem Cure and Seal (J-22UV).
- e. Euclid Chemical Company (The); Super Diamond Clear.
- f. Kaufman Products, Inc.; Sure Cure 25.
- g. Lambert Corporation; UV Super Seal.
- h. L&M Construction Chemicals, Inc. ; Lumiseal Plus.
- i. Meadows, W. R., Inc.; CS-309/30.
- j. Metalcrete Industries; Seal N Kure 0.
- k. Sonneborn, Div. of ChemRex; Kure-N-Seal 5.
- l. Tamms Industries, Inc.; LusterSeal 300.
- m. Unitex; Solvent Seal 1315.
- n. US Mix Products Company; US Spec CS-25
- o. Vexcon Chemicals, Inc. ; Certi-Vex AC 1315

H. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound:ASTM C 1315,Type 1, Class A.

1. Available Products:

- a. Burke by Edoco; Cureseal 1315 WB.
- b. ChemMasters; Polyseal WB.
- c. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company;Sealcure 1315 WB.

- d. Euclid Chemical Company (The); Super Diamond Clear VOX.
- e. Kaufman Products, Inc.; Sure Cure 25 Emulsion.
- f. Lambert Corporation; UV Safe Seal.
- g. L&M Construction Chemicals, Inc. ; Lumiseal WB Plus.
- h. Meadows, W. R., Inc.; Vocomp-30.
- i. Metalcrete Industries; Metcure 30.
- j. Symons Corporation, a Dayton Superior Company; Cure & Seal 31 Percent E.
- k. Tamms Industries, Inc.; LusterSeal WB 300.
- l. Unitex; Hydro Seal 25.
- m. US Mix Products Company; US Spec Radiance UV-25.
- n. Vexcon Chemicals, Inc.; Vexcon Starseal 1315.

2.12 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- C. Reglets: Fabricate reglets of not less than 0.0217-inch- (0.55-mm-) thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- D. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.13 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4000 psi (28 MPa) at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be

applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

2.14 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 1. Fly Ash: 15 percent.
 2. Combined Fly Ash and Pozzolan: 15 percent.
 3. Ground Granulated Blast-Furnace Slag: 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
 1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.15 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings, Drilled Shafts, Foundation Walls, and Slabs on Grade: Proportion normal-weight concrete mixture as follows:
 1. Minimum Compressive Strength: 3000 psi (20.7 MPa) at 28 days. Higher

strength as specified on drawings.

2. Maximum Water-Cementitious Materials Ratio: 0.50.
3. Slump Limit: 4 inches (100 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).
4. Air Content: 5-1/2 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch (38-mm) nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch (19-

2.16 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.17 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.
 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 PREPARATION (Drilled Shafts/Piers)

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, vibration, and other hazards created by drilled-pier operations.

3.2 EXCAVATION (Drilled Shafts/Piers)

- A. Unclassified Excavation: Excavate to bearing elevations regardless of character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions.
 - 1. Obstructions: Unclassified excavated materials may include removal of unanticipated boulders, concrete, masonry, or other subsurface obstructions. Payment for removing obstructions that cannot be removed by conventional augers fitted with soil or rock teeth, drilling buckets, or underreaming tools attached to drilling equipment of size, power, torque, and downthrust necessary for the Work will be according to Contract provisions for changes in the Work.
- B. Prevent surface water from entering excavated shafts. Conduct water to site drainage facilities.
- C. Excavate shafts for drilled piers to indicated elevations. Remove loose material from bottom of excavation.
 - 1. Excavate bottom of drilled piers to level plane within 1:12 tolerance.
 - 2. Remove water from excavated shafts before concreting.
 - 3. Excavate rock sockets of dimensions indicated.
- D. Notify and allow testing and inspecting agency to test and inspect bottom of excavation. If unsuitable bearing stratum is encountered, make adjustments to drilled piers as determined by Architect.
 - 1. Do not excavate shafts deeper than elevations indicated unless approved by Architect.
 - 2. Payment for additional authorized excavation will be according to Contract provisions for changes in the Work.
- E. Slurry Displacement Method: Stabilize excavation with slurry maintained a minimum of 60 inches above ground-water level and above unstable soil strata to prevent caving or sloughing of shaft. Maintain slurry properties before concreting.
 - 1. Excavate and complete concreting of drilled pier on same day if possible, or redrill, clean, and test slurry in excavation before concreting.
 - 2. Clean the bottom of each shaft before concreting.
- F. Temporary Casings: Install watertight steel casings of sufficient length and thickness to prevent water seepage into shaft; to withstand compressive, displacement, and withdrawal stresses; and to maintain stability of shaft walls.
 - 1. Remove temporary casings, maintained in plumb position, during concrete placement and before initial set of concrete, or leave temporary casings in place.
- G. Tolerances: Construct drilled piers to remain within ACI 336.1 tolerances.
 - 1. If location or out-of-plumb tolerances are exceeded, provide corrective construction. Submit design and construction proposals to Architect for review

before proceeding.

3.3 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 - 1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.4 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
 - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 - 3. Install dovetail anchor slots in concrete structures as indicated.

3.5 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
 - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
 - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.6 SHORES AND RESHORES

- A. Comply with ACI 318 (ACI 318M) and ACI 301 for design, installation, and removal of shoring and reshoring.
 - 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.
- B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively

loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

- C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.7 VAPOR RETARDERS

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.
- B. Bituminous Vapor Retarders: Place, protect, and repair vapor retarders according to manufacturer's written instructions.

3.8 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Weld reinforcing bars according to AWS D1.4, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
- F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.
- G. Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement.

3.9 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
 - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-third of concrete thickness as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
 - 2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
 - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.10 WATERSTOPS

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.
- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.11 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.
- H. Dry Method (Drilled Shafts/Piers): Place concrete to fall vertically down the center of drilled pier without striking sides of shaft or steel reinforcement.
1. Where concrete cannot be directed down shaft without striking reinforcement, place concrete with chutes, tremies, or pumps.
 2. Vibrate top 60 inches of concrete.
- I. Slurry Displacement Method (Drilled Shafts/Piers): Place concrete in slurry-filled shafts by tremie methods or pumping. Control placement operations to ensure that tremie or pump pipe is embedded no fewer than 60 inches into concrete and that flow of concrete is continuous from bottom to top of drilled pier.
- J. Coordinate withdrawal of temporary casings with concrete placement to maintain at

least a 60-inch head of concrete above bottom of casing.

1. Vibrate top 60 inches of concrete after withdrawal of temporary casing.
- K. Screed concrete at cutoff elevation level and apply scoured, rough finish. Where cutoff elevation is above the ground elevation, form top section above grade and extend shaft to required elevation.

3.12 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces exposed to public view.
- C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
 2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
 3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.13 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in 1 direction.
 - 1. Apply scratch finish to surfaces indicated and to receive concrete floor toppings to receive mortar setting beds for bonded cementitious floor finishes.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
 - 1. Apply float finish to surfaces indicated to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 1. Apply a trowel finish to surfaces indicated exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 - 2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
 - a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
 - b. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs- on-grade.
 - c. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
 - d. Specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.
 - 3. Finish and measure surface so gap at any point between concrete surface and an unlevelled, freestanding, 10-foot- (3.05-m-) long straightedge resting on 2 high

spots and placed anywhere on the surface does not exceed 3/16 inch (4.8 mm)

- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated. While concrete is still plastic, slightly scarify surface with a fine broom.
 - 1. Comply with flatness and levelness tolerances for trowel finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- G. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions and as follows:
 - 1. Uniformly spread 25 lb/100 sq. ft. (12 kg/10 sq. m) of dampened slip-resistive aggregate over surface in 1 or 2 applications. Tamp aggregate flush with surface, but do not force below surface.
 - 2. After broadcasting and tamping, apply float finish.
 - 3. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate.
- H. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces according to manufacturer's written instructions and as follows:
 - 1. Uniformly apply dry-shake floor hardener at a rate of 100 lb/100 sq. ft. (49 kg/10 sq. m) unless greater amount is recommended by manufacturer.
 - 2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.
 - 3. After final floating, apply a trowel finish. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

3.14 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel- finish concrete surfaces.

3.15 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot- weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

- a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
- 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
- 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.16 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.17 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension in solid concrete, but not less than

- 1 inch (25 mm) in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.18 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
 - 1. Steel reinforcement placement.
 - 2. Steel reinforcement welding.
 - 3. Headed bolts and studs.
 - 4. Verification of use of required design mixture.
 - 5. Concrete placement, including conveying and depositing.
 - 6. Curing procedures and maintenance of curing temperature.
 - 7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
 - 2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 - 4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
 - 6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's

- pour of each concrete mixture.
7. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
 8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
 - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
 11. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
 14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 15. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.
- D. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 48 hours of finishing.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS (Drilled Shafts/Piers)

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property (or on property as directed by Owner).

END OF SECTION 033000

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. See Division 05 Section "Metal Fabrications" for furnishing steel lintels and shelf angles for unit masonry.
- B. Submittals:
 - 1. Samples for concrete masonry units.
 - 2. Material Certificates: For each type of product indicated. Include statements of material properties indicating compliance with requirements.
- C. Comply with ACI 530.1/ASCE 6/TMS 602.
- D. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections required by authorities having jurisdiction.
 - 1. Inspections: Level 2 special inspections according to the IBC.
 - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.

PART 2 - PRODUCTS

2.1 MASONRY UNITS

- A. Concrete Masonry Units: ASTM C 90; Density Classification, Medium Weight.
 - 1. Integral Water Repellent: ACM Chemistries; RainBloc BASF Aktiengesellschaft; Rheopel Plusor Grace Construction Products, W. R. Grace & Co. - Conn.; Dry-Block.
 - 2. Special shapes for lintels, corners, jambs, sash, control joints, and other special conditions.

2.2 MORTAR AND GROUT

- A. Mortar: ASTM C 270, proportion specification.
 - 1. Use masonry cement mortar.
 - 2. Do not use calcium chloride in mortar.
 - 3. For masonry below grade or in contact with earth, use Type S.
 - 4. For reinforced masonry, use Type S.
 - 5. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions, and for other applications where another type is not indicated, use Type S.

6. Water-Repellent Additive: For mortar used with concrete masonry units made with integral water repellent, use product recommended by manufacturer of units.

- B. Grout: ASTM C 476 with a slump of 8 to 11 inches, 2000 psi.

2.3 REINFORCEMENT, TIES, AND ANCHORS

- A. Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).
- B. Joint Reinforcement: ASTM A 951.
 1. Coating: Hot-dip galvanized at both interior and exterior walls.
 2. Wire Size for Side Rods: 0.187-inch diameter.
 3. Wire Size for Cross Rods: 0.187-inch diameter.
 4. For single-wythe masonry, provide either ladder design or truss design.
 5. For multiwythe masonry, provide ladder design with three side rods.

2.4 EMBEDDED FLASHING MATERIALS

- A. Sheet Metal Flashing: Stainless steel, 0.0156 inch thick.
- B. Rubberized Asphalt Sheet Flashing: Pliable, adhesive rubberized-asphalt compound, bonded to a polyethylene film to produce an overall thickness of [0.030 inch (0.76 mm)] [0.040 inch (1.02 mm)]. Use only where flashing is fully concealed.

2.5 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded strips complying with ASTM D 1056, Grade 2A1.
- B. Preformed Control-Joint Gaskets: Designed to fit standard sash block and to maintain lateral stability in masonry wall; made from styrene-butadiene rubber or PVC.
- C. Weep Holes: Cellular-plastic extrusion, full height and width of head joint.
- D. Cavity Drainage Material: Free-draining polymer mesh, full depth of cavity with dovetail shaped notches that prevent mortar clogging.
- E. Proprietary Acidic Masonry Cleaner: Product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cut masonry units with saw. Install with cut surfaces and, where possible, cut edges concealed.
- B. Mix units for exposed unit masonry from several pallets or cubes as they are placed to produce uniform blend of colors and textures.
- C. Install CMU in stack bond.
- D. Stopping and Resuming Work: Rack back units; do not tooth.
- E. Fill all cores in hollow concrete masonry units with grout, including 24 inches under bearing plates, beams, lintels, posts, and similar items.
- F. Tool exposed joints slightly concave when thumbprint hard unless otherwise indicated.

3.2 LINTELS

- A. Install lintels at all openings.
- B. Minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.3 FLASHING AND WEEP HOLES

- A. Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated.
- B. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing before covering with mortar.
 - 1. Extend flashing 4 inches into masonry at each end and turn up 4 inches to form a pan.

3.4 CLEANING

- A. Clean masonry as work progresses. Remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly cured, clean exposed masonry.
 - 1. Wet wall surfaces with water before applying acidic cleaner, then remove cleaner promptly by rinsing thoroughly with clear water.
 - 2. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

END OF SECTION 042000

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and material certificates.
 - 1. Shop drawings: Show layout, spacing, size, thickness and type of cold-formed metal framing; fabrication; and fastening and anchorage details including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details and attachment to adjoining work. Layout for metal stud wall framing shall include building elevations and/or wall plans indicating applicable wall sections in shop drawings. Provide wall sections for all unique exterior wall framing conditions around perimeter of building, including applicable locations where sections have not been provided in contract drawings. Contact Architect prior to submittal of Shop Drawings if additional information is required. For exterior canopies supported by cold-formed framing, the detailing of canopy connections to the cold formed metal framing shall be clearly indicated on the shop drawings (general contractor shall coordinate loading and connections between canopy supplier and cold formed metal stud supplier).
- B. Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" for calculating structural characteristics of cold-formed metal framing.
- C. Comply with AISI "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - general provisions and Header Design".
- D. Comply with AWS D1.3, "Structural Welding Code - Sheet Steel" and AWI D1.1 "Structural welding code-Steel"
- E. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- F. PERFORMANCE REQUIREMENTS
 - 1. Design Loads: Dead loads: As indicated on drawings and as follows
 - a. Dead loads to be weights of materials and construction as per IBC 2021
 - b. Live Loads: as per IBC 2021
 - c. Roof Loads: as per IBC 2021
 - d. Wind Loads: as per IBC 2021 and ASCE 7-16. Risk category and exposure category as noted in project documents.
 - e. Seismic Loads: as per IBC 2021 and ASCE 7-16
 - 2. Deflection limits: Design framing systems to withstand design loads without deflections greater than:

- a. Interior load bearing and non-load bearing wall framing: horizontal deflection of $1/360$ of wall height under a horizontal load of 5/lbf/sg.ft.
 - b. Exterior wall framing: Horizontal deflection of $1/600$ of the wall height.
- 3. Design framing systems to provide for movement of framing members without damage or over-stressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120dF
- 4. Design framing systems to maintain clearances at openings to allow for construction tolerances and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward deflection movement of $1/4$ " max.
- G. Cold formed steel framing: Design to AISI "standard for Cold-Formed Steel Framing general provisions.
 - 1. Design exterior load and non-load bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
 - 2. Where metal stud, track, and other framing gauges are listed, indicated, or otherwise provided, nominal gauge framing materials as noted shall be provided and not equivalent thicknesses
 - 3. Design all exterior soffit ceiling framing to resist positive and negative wind pressures in accordance with ACSE 7-16. Soffit framing to have live load of 10psf minimum.
 - 4. Design cold formed framing to accommodate connection of curtainwall glass assemblies and window assemblies.
- H. Quality Assurance
 - 1. Engineering responsibility: Preparation of shop drawings, design calculations and other structural data to be by qualified professional engineer.
 - 2. Professional Engineer Qualifications: A professional structural engineer who is legally qualified to practice in jurisdiction where project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installation of cold-formed metal framing that are similar to those indicated for this project in material, design and extent.
 - 3.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Galvanized Steel Sheet: ASTM A 653/A 653M, G60 (Z180) zinc coated; Structural Steel (SS); Grade 50 (340), Class 1 or 2.
- B. Steel Studs: C-shaped, with flange width of not less than 1-5/8 inches, minimum uncoated steel thickness of 14 gauge, and of depths indicated.

- C. Steel Joists: C-shaped, with flange width of not less than 1-5/8 inches, minimum uncoated steel design thickness of 14 gauge, and of depths indicated.
- D. Steel Track: U-shaped, minimum uncoated metal thickness same as [studs] [or] [joists] used with track, with flange widths of 1-1/4 inches for studs and 1-5/8 inches for joists, of web depths indicated.

2.2 ACCESSORIES

- A. Accessories: Fabricate from the same material and finish used for framing members, of manufacturer's standard thickness and configuration, unless otherwise indicated.
- B. Mechanical Fasteners: Corrosion-resistant coated, self-drilling, self-threading steel drill screws.
- C. Insulation: ASTM C 665, Type I, unfaced mineral-fiber blankets.
- D. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035.

PART 3 - EXECUTION

3.1 FRAMING

- A. Install framing and accessories level, plumb, square, and true to line, and securely fastened, according to ASTM C 1007. Temporarily brace framing until entire integrated supporting structure has been completed and permanent connections are secured.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten framing members by welding or screw fastening.
 - 3. Install insulation in built-up exterior framing members.
 - 4. Fasten reinforcement plates over web penetrations larger than standard punched openings.
- B. Erection Tolerances: Install cold-formed metal framing with a maximum variation of 1/8 inch in 10 feet (1:960) and with individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
- C. Studs: Install continuous top and bottom tracks securely anchored at corners and ends. Squarely seat studs against webs of top and bottom tracks. Space studs as indicated, set plumb, align, and fasten both flanges of studs to top and bottom tracks.
 - 1. Install and fasten horizontal bridging in stud system, spaced in rows not more than 48 inches apart.
 - 2. Install steel-sheet diagonal bracing straps to both stud flanges, terminate at and fasten to reinforced top and bottom track and anchor to structure.

3. Install miscellaneous framing and connections to provide a complete and stable wall-framing system.
 4. Isolate non-load-bearing, curtain-wall framing from building structure using vertical slide clips or deflection track to prevent transfer of vertical loads while providing lateral support.
- D. Joists: Install and securely anchor perimeter joist track sized to match joists. Install joists bearing on supporting framing, brace and reinforce, and fasten to both flanges of joist track.
1. Install joist bridging at 48 inches o.c., and fasten bridging at each joist intersection.
 2. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners.

END OF SECTION 054000

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Shop Drawings showing details of fabrication and installation.

PART 2 - PRODUCTS

2.1 METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 240/A 240M or ASTM A 666, Type 304.
- C. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
- D. Rolled Steel Floor Plate: ASTM A 786/A 786M.
- E. Steel Tubing: ASTM A 500.
- F. Steel Pipe: ASTM A 53, standard weight (Schedule 40), black finish.
- G. Slotted Channel Framing: Cold-formed steel channels, 1-5/8 by 1-5/8 inches by 14 gauge thick, complying with MFMA-4.
- H. Cast Iron: ASTM A 48/A 48M or ASTM A 47/A 47M.

2.2 GROUT

- A. Nonshrink, Nonmetallic Grout: ASTM C 1107; recommended by manufacturer for exterior applications.

2.3 FABRICATION

- A. General: Shear and punch metals cleanly and accurately. Remove burrs and ease exposed edges. Form bent-metal corners to smallest radius possible without impairing work.
- B. Welding: Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. At

exposed connections, finish welds and surfaces smooth with contour of welded surface matching those adjacent.

- C. On units indicated to be cast into concrete or built into masonry, provide welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c.
- D. Fabricate steel pipe columns with 1/2-inch steel base plates and 1/4-inch steel top plates welded to pipe with continuous fillet weld same size as pipe wall thickness. Drill top plates for connection bolts and base plates for 5/8-inch anchor bolts.
- E. Fabricate loose lintels from steel angles and shapes. Size to provide bearing length at each side of openings equal to one-twelfth of clear span, but not less than 8 inches.
- F. Fabricate pipe bollards from Schedule 80 steel pipe.

2.4 STEEL AND IRON FINISHES

- A. Hot-dip galvanize steel fabrications at exterior and interior locations.
- B. Prepare uncoated ferrous metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning," and paint with a fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Perform cutting, drilling, and fitting required for installing miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack.
- B. Fit exposed connections accurately together to form hairline joints.
- C. Anchor bollards in concrete and fill solidly with concrete, mounding top surface as per drawings.

END OF SECTION 055000

SECTION 055200 - METAL RAILINGS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, and structural analysis data signed and sealed by a qualified professional engineer registered in the state where Project is located.

PART 2 - PRODUCTS

2.1 RAILING SYSTEMS

- A. Provide railings capable of withstanding a uniform load of 50 lbf/ ft. and a concentrated load of 200 lbf applied to handrails and top rails of guards in any direction. Uniform and concentrated loads need not be assumed to act concurrently.
- B. Provide railing infill capable of withstanding a concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft. . Infill load and other railing loads need not be assumed to act concurrently.

2.2 METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Pipe: ASTM A 53, Schedule 40.
- C. Steel Tubing: ASTM A 500 (cold formed) or ASTM A 513.
- D. Iron Castings: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.
- E. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.3 OTHER MATERIALS

- A. Nonshrink, Nonmetallic Grout: ASTM C 1107; recommended by manufacturer for exterior applications.

2.4 FABRICATION

- A. Assemble railing systems in shop to the greatest extent possible. Use connections that maintain structural value of joined pieces.
- B. Form changes in direction of railing members by bending.
- C. Fabricate railing systems and handrails for connecting members by welding.
- D. Provide manufacturer's standard wall brackets, flanges, miscellaneous fittings, and anchors to connect handrail and railing members to other construction.
- E. Provide wall returns at ends of wall-mounted handrails.

2.5 FINISHES

- A. Steel Railings: Hot-dip galvanized after fabrication, ASTM A 123; cleaned and shop primed after galvanizing, ready for paint.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fit exposed connections accurately together to form tight, hairline joints.
- B. Set railings accurately in location, alignment, and elevation and free of rack.
- C. Anchor posts in concrete by forming or core-drilling holes 5 inches deep and 3/4 inch greater than OD of post. Fill annular space between post and concrete with nonshrink, nonmetallic grout.
- D. Attach handrails to wall with wall brackets.

END OF SECTION 055200

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: ICC-ES evaluation reports for wood-preservative treated wood fire-retardant treated wood and metal framing anchors.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: Provide dressed lumber, S4S, marked with grade stamp of inspection agency.
- B. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

2.2 TREATED MATERIALS

- A. Preservative-Treated Materials: AWPAC2, except that lumber not in ground contact and not exposed to the weather may be treated according to AWPAC31 with inorganic boron (SBX)].
 - 1. Use treatment containing no arsenic or chromium.
 - 2. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
 - 3. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- B. Provide preservative-treated materials for items indicated on Drawings, and the following:
 - 1. Wood members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Concealed members in contact with masonry or concrete.
 - 3. Wood floor plates that are installed over concrete slabs-on-grade.
- C. Fire-Retardant-Treated Materials: Comply with performance requirements in AWPAC20.
 - 1. Use Exterior type for exterior locations and where indicated.
 - 2. Use Interior Type A, High Temperature (HT) for enclosed roof framing, framing in attic spaces, and where indicated.
 - 3. Use Interior Type A unless otherwise indicated.

4. Identify with appropriate classification marking of a testing and inspecting agency acceptable to authorities having jurisdiction.
- D. Provide fire-retardant treated materials for items indicated on Drawings.

2.3 LUMBER

A. Dimension Lumber:

1. Maximum Moisture Content: 15 percent.
2. Non-Load-Bearing Interior Partitions: Construction or No. 2 Mixed southern pine: SPIB.
3. Framing Other Than Non-Load-Bearing Interior Partitions: No. 2 Southern pine: SPIB.
4. Exposed Framing: Provide material hand-selected for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.
 - a. Species: As specified for framing other than non-load-bearing interior partitions.
 - b. Grade: Select Structural.

B. Timbers 5-Inch Nominal Size and Thicker: No. 1 Southern pine: SPIB.

1. Maximum Moisture Content: 20 percent.

C. Exposed Boards: Mixed southern pine, No. 1: SPIB with 15 percent maximum moisture content.

D. Concealed Boards: Mixed southern pine, No. 2: SPIB with 15 percent maximum moisture content.

E. Miscellaneous Lumber: Construction, or No. 2 grade with 15 percent maximum moisture content of any species. Provide for nailers, blocking, and similar members.

2.4 PLYWOOD BACKING PANELS

A. Telephone and Electrical Equipment Backing Panels: Plywood, Exterior, AC, fire-retardant treated, not less than 3/4-inch nominal thickness.

2.5 MISCELLANEOUS PRODUCTS

A. Fasteners: Size and type indicated. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners [with hot-dip zinc coating complying with ASTM A 153/A 153M.

1. Power-Driven Fasteners: CABO NER-272.
 2. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- B. Metal Framing Anchors: Structural capacity, type, and size indicated.
1. Use anchors made from hot-dip galvanized steel complying with ASTM A 653/A 653M, G60 (Z180) coating designation for interior locations where stainless steel is not indicated.
- C. Sill Sealer: Closed-cell neoprene foam, 1/4 inch thick.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Securely attach rough carpentry to substrates, complying with the following:
1. CABO NER-272 for power-driven fasteners.
 2. Published requirements of metal framing anchor manufacturer.
 3. Table 2304.9.1, "Fastening Schedule," in the IBC.

END OF SECTION 061000

SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data for solid-surfacing materials Shop Drawings and Samples showing the full range of colors, textures, and patterns available for each type of finish.
- B. Quality Standard: Architectural Woodwork Institute's "Architectural Woodwork Quality Standards.
- C. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is completed, and HVAC system is operating.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Hardboard: AHA A135.4.
- B. Medium-Density Fiberboard: ANSI A208.2, Grade 130, made with binder containing no urea formaldehyde.
- C. Particleboard: Not allowed this project.
- D. Softwood Plywood: DOC PS 1.
- E. Hardwood Plywood and Face Veneers: HPVA HP-1, made with adhesive containing no urea formaldehyde.
- F. Thermoset Decorative Panels: Comply with LMA SAT - 1.
- G. High-Pressure Decorative Laminate: NEMA LD 3.
 - 1. Products:
 - a. Formica
 - b. Nevamar
- H. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2.
 - 1. Products:
 - a. Corian by Dupont.

2.2 CABINET HARDWARE AND ACCESSORY MATERIALS

- A. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 100 degrees of opening, self-closing.
- B. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.
- C. Catches: Magnetic catches, BHMA A156.9, B03141.
- D. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.
- E. Drawer Slides: BHMA A156.9, B05091.
 - 1. Box Drawer Slides: Grade 1HD-100.
 - 2. File Drawer Slides: Grade 1HD-200.
- F. Drawer Locks: BHMA A156.11, E07041 (for every drawer).
- G. Grommets for Cable Passage through Countertops: 2-inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage at every knee space.
- H. Exposed Hardware Finishes: Comply with BHMA A156.18 for BHMA code number indicated.
 - 1. Finish: Satin Chrome: BHMA 626 or BHMA 652.
- I. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to 15 percent moisture content.

2.3 INTERIOR WOODWORK

- A. Complete fabrication to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- B. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.
- C. Wood Shelving for Opaque Finish: Custom grade.
 - 1. AWI Type of Cabinet Construction: Flush overlay.
 - 2. Wood Species and Cut for Exposed Surfaces: White birch, plain sawn or sliced.
 - 3. Grain Direction: Vertically for drawer fronts, doors, and fixed panels.
 - 4. Semiexposed Surfaces Other Than Drawer Bodies: Same species and cut indicated for exposed surfaces.
- D. Plastic-Laminate Cabinets: Custom grade.

1. AWI Type of Cabinet Construction: Flush overlay.
2. Laminate Cladding: Horizontal surfaces other than tops, HGS; vertical surfaces, HGS; Edges, HGS; semiexposed surfaces, thermoset decorative panels.
3. Drawer Sides and Backs: Solid hardwood.
4. Drawer Bottoms: Hardwood plywood.

E. Plastic-Laminate Countertops: Custom grade.

1. Laminate Grade: HGS for flat countertops.
2. Grain Direction: Parallel to cabinet fronts.
3. Edge Treatment: Same as laminate cladding on horizontal surfaces.

F. Solid-Surfacing Material: Premium grade.

1. Solid-Surfacing Material Thickness: 3/4 inch.
2. Fabricate tops in one piece.

2.4 SHOP FINISHING OF INTERIOR ARCHITECTURAL WOODWORK

A. Finishes: Same grades as items to be finished.

B. Finish architectural woodwork at the fabrication shop; defer only final touch up until after installation.

1. Apply one coat of sealer or primer to concealed surfaces of woodwork.
2. Apply a vinyl wash coat to woodwork made from closed-grain wood before staining and finishing.
3. Apply paste wood filler to open-grain woods and wipe off excess.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.

B. Install woodwork to comply with referenced quality standard for grade specified.

C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.

D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Fasten with countersunk concealed fasteners and blind nailing. Use fine finishing

nails[or finishing screws] for exposed nailing, countersunk and filled flush with
woodwork.

- F. Cabinets: Install so doors and drawers are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.
 - 1. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.
- G. Anchor countertops securely to base units. Seal space between backsplash and wall.

END OF SECTION 064023

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 INSULATION PRODUCTS

- A. Surface-Burning Characteristics: ASTM E 84, and as follows:
 - 1. Flame-Spread Index: 25 or less where exposed; otherwise, as indicated in Part 2 "Insulation Products" Article.
 - 2. Smoked-Developed Index: 450 or less.
- B. Mineral-Fiber-Blanket Insulation: ASTM C 665, Type I, unfaced with fibers manufactured from glass, with flame-spread index of 25 or less.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install insulation in areas and in thicknesses indicated or required to produce R-values indicated. Cut and fit tightly around obstructions and fill voids with insulation.
- B. Except for insulation that is friction fitted in stud cavities, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

END OF SECTION 072100

SECTION 074113 - METAL ROOF PANELS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Summary: Factory-formed metal roof and soffit panels, fasciae, and trim.
- B. Submittals: Product Data, Shop Drawings, and color Samples.
- C. Warranties: Provide manufacturer's standard written warranty, without monetary limitation, signed by manufacturer agreeing to promptly repair or replace metal roof panels that fail to remain weathertight within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 METAL ROOF PANELS

- A. Products:
 - 1. Insulated Metal Roof: METL-SPAN, insulated metal roof panels, CFR 36" wide, U=.044.
 - 2. Uninsulated Metal Roof: Berridge Manufacturing Company, Double-lock, Zee-lock panel.
- B. Wind-Uplift Resistance of Roof Assemblies: UL 580, Class 90.
- C. Energy Performance of Roof Panels: Initial solar reflectance not less than 0.70 and emissivity not less than 0.75 when tested according to CRRC-1.
- D. Roof Panel Type: Standing-seam metal insulated roof panels and concealed fastener standing seam metal roof panels
- E. Metallic-Coated Steel Roof Panels: Fabricated from galvanized structural-steel sheet, ASTM A 653/A 653M, G90 (Z275).
 - 1. Nominal Metal Thickness: 24 gauge.
 - 2. Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight with not less than 20 available colors for selection.
- F. Insulated Metal Roof Panels: Factory-assembled panels fabricated from two sheets of metal with insulation core foamed-in-place during fabrication with joints between panels designed to form weathertight seals.

1. Insulation Core: Modified isocyanurate or polyurethane foam using a non-CFC blowing agent, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively.
2. Facings: Fabricate panel with exterior and interior facings of same material and thickness, 24 gauge minimum.
3. Interior Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight.
4. Exterior Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight, with not less than 20 available colors for selection.

2.2 ACCESSORIES

- A. Provide components required for a complete roof panel assembly including trim, fasciae, clips, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- B. Flashing and Trim: Formed from 24 gauge thickness, zinc-coated (galvanized) steel sheet. Provide flashing and trim as required to seal against weather and to provide finished appearance. Finish flashing and trim with same finish system as adjacent metal roof panels.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install flashings to cover underlayment to comply with requirements specified in Division 07 Section "Sheet Metal Flashing and Trim."
- B. Rigidly fasten metal roof panels to structure at one and only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction. Predrill panels for fasteners.
 1. Insulated and Uninsulated Roof Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and galvanized-steel fasteners for surfaces exposed to the interior.
 2. Provide metal closures at rake edges, rake walls, and each side of ridge and hip caps.
 3. Flash and seal roof panels with weather closures at eaves, rakes, and perimeter of all openings.
 4. Install ridge and hip caps as roof panel work proceeds.
- C. Install gaskets, joint fillers, and sealants where required for weatherproof performance of roof panel assemblies. Provide types of gaskets, fillers, and sealants recommended by roof panel manufacturer.
- D. Separate dissimilar metals with a bituminous coating or self-adhering sheet underlayment.

- E. Coat back side of aluminum panels with bituminous coating where they will contact wood, ferrous metal, or cementitious construction.

END OF SECTION 074113

SECTION 074117 - METAL SOFFIT PANELS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Summary: Factory-formed metal soffit panels, fasciae, and trim.
- B. Submittals: Product Data, Shop Drawings, and color Samples.

PART 2 - PRODUCTS

2.1 METAL PANELS

- A. Panel Type: Flat, flush metal panels ribbed, non-vented.
- B. Metallic-Coated Steel Panels: Fabricated from galvanized structural-steel sheet, ASTM A 653/A 653M, G90 (Z275),
 - 1. Nominal Metal Thickness: 24 gauge
 - 2. Finish: Manufacturer's standard three-coat fluoropolymer system with color coat and clear coat containing not less than 70 percent PVDF resin by weight.

2.2 ACCESSORIES

- A. Provide components required for a complete assembly including trim, fasciae, clips, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
- B. Flashing and Trim: Formed from 24 ga. nominal thickness, zinc-coated (galvanized) steel sheet. Provide flashing and trim as required to seal against weather and to provide finished appearance. Finish flashing and trim with same finish system as adjacent metal roof panels.
- C. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install flashings to comply with requirements specified in Division 07 Section "Sheet Metal Flashing and Trim."

- B. Rigidly fasten metal panels to structure at one and only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction. Predrill panels for fasteners.

- 1. Provide metal closures at exposed ends.

- C. Install gaskets, joint fillers, and sealants where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants recommended by metal roof panel manufacturer.

- D. Separate dissimilar metals with a bituminous coating or self-adhering sheet underlayment.

END OF SECTION 074113

SECTION 074213 - METAL WALL PANELS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, and color Samples.
- B. Warranties: Provide manufacturer's standard written warranty, signed by manufacturer agreeing to promptly repair or replace metal wall panels that show evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 INSULATED METAL WALL PANELS

- A. Products:
 - 1. METL-SPAN, CF Panel, CF Striated (U-Value=.050).
- B. Wall Panel Type: Factory-formed and -assembled, foamed-insulation-core metal wall panels, with concealed fastener lap seam.
- C. Metallic-Coated Steel Wall Panels: Fabricated from galvanized structural-steel sheet, ASTM A 653/A 653M, G90 (Z275).
 - 1. Nominal Metal Thickness: 24 gauge.
 - 2. Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight; complying with AAMA 621.
 - 3. Concealed Finish: Manufacturer's standard white or light-colored acrylic or polyester backer finish.
- D. Flush-Profile Metal Liner Panels: Solid panels formed with vertical panel edges and [intermediate stiffening ribs symmetrically spaced between panel edges].
 - 1. Fabricated from galvanized structural-steel sheet, ASTM A 653/A 653M, G90 (Z275), 24 gauge nominal thickness.
 - 2. Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight.
- E. Insulated Metal Wall Panels: Factory-assembled, metal wall panels fabricated from two sheets of metal with insulation core foamed-in-place during fabrication with joints between panels designed to form weathertight seals.

1. Insulation Core: Modified isocyanurate or polyurethane foam using a non-CFC blowing agent, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively.
 2. Facings: Fabricate panel with exterior and interior facings of same material and thickness.
 3. Interior Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight.
 4. Exterior Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight and not less than 20 colors available for selection.
- F. Flashing and Trim: Formed from 24 gauge nominal thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet. Provide flashing and trim as required to seal against weather and to provide finished appearance. Finish flashing and trim with same finish system as adjacent metal wall panels.
- G. Provide components required for a complete wall panel assembly including trim, copings, fasciae, mullions, sills, corner units, clips, seam covers, flashings, louvers, sealants, gaskets, fillers, closure strips, and similar items.
- H. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Anchor panels securely in place, with provisions for thermal and structural movement. Field cutting exterior panels by torch is not permitted. Install panels with concealed fasteners unless otherwise indicated. Where exposed, use fasteners finished to match wall panels.
1. Wall Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and galvanized-steel fasteners for surfaces exposed to the interior.
- B. Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of wall panel assemblies. Provide types of gaskets, fillers, and sealants as indicated, or as recommended by panel manufacturer.
- C. Separate dissimilar metals and metal panels from contact with wood or cementitious materials, by painting each metal surface in area of contact with a bituminous coating or by other permanent separation.

END OF SECTION 074213

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, and Samples.
- B. Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- C. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

PART 2 - PRODUCTS

2.1 SHEET METAL

- A. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, with No. 2D finish; not less than 0.016 inch thick.
- B. Metallic-Coated Steel Sheet: Galvanized structural-steel sheet, ASTM A 653/A 653M, G90 (Z275) 24 gauge nominal thickness.
 - 1. Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight.
 - 2. Concealed Finish: Manufacturer's standard white or light-colored acrylic or polyester backer finish.

2.2 ACCESSORIES

- A. Fasteners: Annular-threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners.
 - 1. Exposed Fasteners: Heads matching color of sheet metal roofing using factory-applied coating.
 - 2. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 - 3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
 - 4. Fasteners for Metallic-Coated Steel Sheet: Hot-dip galvanized steel or Series 300 stainless steel.
- B. Butyl Sealant: ASTM C 1311, solvent-release butyl rubber sealant.

- C. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.3 FABRICATION

- A. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.
- B. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with SMACNA's "Architectural Sheet Metal Manual." Allow for thermal expansion; set true to line and level. Install Work with laps, joints, and seams permanently watertight and weatherproof; conceal fasteners where possible.
- B. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- C. Fabricate nonmoving seams in sheet metal with flat-lock seams. Rivet joints for additional strength.
- D. Aluminum Flashing and Trim: Coat back side of aluminum flashing and trim with bituminous coating where it will contact wood, ferrous metal, or cementitious construction.
- E. Separate dissimilar metals with a bituminous coating or polymer-modified, bituminous sheet underlayment.

END OF SECTION 076200

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, and color Samples.
- B. Warranties: Provide manufacturer's standard written warranty, signed by manufacturer agreeing to promptly repair or replace roof specialties that show evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Prepainted, Zinc-Coated Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation, structural quality, and coil coated prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight; complying with AAMA 621.
- B. Butyl Sealant: ASTM C 1311, solvent-release butyl rubber sealant.
- C. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.2 ROOF SPECIALTIES

- A. SPRI Wind Design Standard: Provide copings, roof-edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressures:
 - 1. Design Pressure: As calculated based on 140 mph wind speed.
- B. Copings: Manufactured coping system consisting of formed-metal coping cap, concealed anchorage; corner units, end cap units, and concealed splice plates.
 - 1. Prepainted, Zinc-Coated Steel: 24 gauge thick.
- C. Canted Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of compression-clamped metal fascia cover and a continuous formed galvanized-steel sheet cant, with extended vertical leg terminating in a drip-edge cleat.

1. Prepainted, Zinc-Coated Steel: 24 gauge thick over 22-gauge cleat.
- D. Gutters and Downspouts:
1. Gutters: Manufactured in uniform section lengths, with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch above front edge. Furnish expansion joints, and expansion-joint covers.
 - a. Gutter Style: Rectangular.
 - b. Prepainted, Zinc-Coated Steel: 24 gauge thick.
 - c. Gutter Supports: Gutter brackets Manufacturer's standard supports as selected by Architect with finish matching the gutters.
 2. Downspouts: Plain rectangular with mitered elbows. Furnish wall brackets of same material and finish as downspouts, with anchors.
 - a. Prepainted, Zinc-Coated Steel: 24 gauge thick.
- E. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches designed to snap into through-wall-flashing receiver and compress against base flashings with joints lapped.
1. Zinc-Coated Steel: Nominal 24 gauge thickness.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement.
- B. Coat back side of roof specialties with bituminous coating where they will contact wood, ferrous metal, or cementitious construction.
- C. Separate dissimilar metals with a bituminous coating or polymer-modified, bituminous sheet underlayment.
- D. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
- E. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless indicated.
 1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion joint caps and rivet in place.

- F. Fastener Sizes: Use fasteners of sizes that will penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- G. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.
- H. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.

END OF SECTION 077100

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and Installer certificates signed by Installer certifying that products have been installed in compliance with requirements.

PART 2 - PRODUCTS

2.1 PENETRATION FIRESTOPPING

- A. Provide penetration firestopping materials that are compatible with one another, substrates, and penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls and Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 - 1. F-Rating at Fire-Resistance-Rated Walls: Not less than that of construction penetrated.
 - 2. F-Rating at Horizontal Assemblies: At least 1 hour, but not less than that of construction penetrated.
 - 3. T-Rating at Horizontal Assemblies: At least 1 hour, but not less than the fire-resistance rating of construction penetrated except for penetrations within the cavity of a wall.
- C. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
 - 1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at 0.30-inch wg (74.7 Pa) at both ambient and elevated temperatures.
- D. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- E. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Include the following information on labels:
 - 1. The words "Warning - Penetration Firestopping - Do Not Disturb."
 - 2. Designation of applicable testing and inspecting agency.
 - 3. Manufacturer's name.
- C. Owner will engage a qualified testing agency to perform tests and inspections needed.

END OF SECTION 078413

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and color Samples.
- B. Environmental Limitations: Do not proceed with installation of joint sealants when ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (4.4 deg C).

PART 2 - PRODUCTS

2.1 JOINT SEALANTS

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under service and application conditions.
- B. Sealant for Use in Building Expansion Joints:
 - 1. Single-component, neutral-curing silicone sealant, ASTM C 920, Type S; Grade NS; Class 100/50; for Use NT.
- C. Sealant for General Exterior Use Where Another Type Is Not Specified.
 - 1. Single-component, nonsag urethane sealant, ASTM C 920, Type S; Grade NS; Class 25; and for Use NT.
- D. Sealant for Exterior Traffic-Bearing Joints, Where Slope Precludes Use of Pourable Sealant:
 - 1. Single-component, nonsag urethane sealant, ASTM C 920, Type S; Grade NS; Class 25; for Use T.
- E. Sealant for Exterior Traffic-Bearing Joints, Where Slope Allows Use of Pourable Sealant:
 - 1. Single-component, pourable urethane sealant, ASTM C 920, Type S; Grade P; Class 25; for Use T.
- F. Sealant for Use in Interior Joints in Ceramic Tile and Other Hard Surfaces in Kitchens and Toilet Rooms and Around Plumbing Fixtures:

1. Single-component, mildew-resistant silicone sealant, ASTM C 920, Type S; Grade NS; Class 25; for Use NT; formulated with fungicide.
- G. Sealant for Interior Use at Perimeters of Door and Window Frames:
1. Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

2.2 MISCELLANEOUS MATERIALS

- A. Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.
- D. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with ASTM C 1193.
- B. Install sealant backings to support sealants during application and to produce cross-sectional shapes and depths of installed sealants that allow optimum sealant movement capability.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and Shop Drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cold-Rolled Steel Sheets: ASTM A 1008/A 1008M, suitable for exposed applications.
- B. Hot-Rolled Steel Sheets: ASTM A 1011/A 1011M, free of scale, pitting, or surface defects.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, G60 (Z180) or A60 (ZF180).
- D. Frame Anchors: ASTM A 591/A 591M, 40Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, sheet steel complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

2.2 HOLLOW METAL DOORS AND FRAMES

- A. Fire-Rated Doors and Frames: Labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, based on testing at [as close to neutral pressure as possible according to UL 10B].
 - 1. At vertical exit enclosures and exit passageways, provide doors that have a temperature rise rating of 450 deg F (250 deg C).
- B. Smoke-Control Door Assemblies: Comply with NFPA 105 or UL 1784.
- C. Doors: Complying with ANSI 250.8 for level and model and ANSI A250.4 for physical-endurance level indicated, 1-3/4 inches thick unless otherwise indicated.
 - 1. Interior Doors: Level 2 and Physical Performance Level B (Heavy Duty) Model 2 (Seamless).

2. Exterior Doors: Level 3 and Physical Performance Level A (Extra Heavy Duty) Model 2 (Seamless), metallic-coated steel sheet faces.
 - a. Thermal-Rated (Insulated) Doors: Provide doors with thermal-resistance value (R-value) of not less than 6.0 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.
 3. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as door face sheets.
- D. Frames: ANSI A250.8; conceal fastenings unless otherwise indicated.
1. Steel Sheet Thickness for Interior Doors: 16 gauge.
 2. Steel Sheet Thickness for Exterior Doors: 14 gauge.
 3. Fabricate interior frames with mitered or coped and continuously welded corners.
 4. Fabricate exterior frames from metallic-coated steel sheet, with mitered or coped and continuously welded corners.
 5. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.
 6. Frame Anchors: Not less than 0.042 inch thick.
- E. Glazing Stops: Nonremovable stops on outside of exterior doors and on secure side of interior doors; screw-applied, removable, glazing stops on inside, fabricated from same material as door face sheet in which they are installed. Provide glazing stops rated for wind design pressures noted on drawings.
- F. Door Louvers: Sight proof per SDI 111C.
- G. Door Silencers: Three on strike jambs of single-door frames and two on heads of double-door frames. Provide at all interior doors.
- H. Grout Guards: Provide where mortar might obstruct hardware operation.
- I. Prepare doors and frames to receive mortised and concealed hardware according to ANSI A250.6 and ANSI A115 Series standards.
- J. Reinforce doors and frames to receive surface-applied hardware.
- K. Prime Finish: Manufacturer's standard, factory-applied coat of lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install hollow metal frames to comply with ANSI/SDI A250.11.
 1. Fire-Rated Frames: Install according to NFPA 80.

- B. Install doors to provide clearances between doors and frames as indicated in ANSI/SDI A250.11.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying rust-inhibitive primer. Use galvanizing repair paint for metallic coated surfaces.

END OF SECTION 081113

SECTION 083113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel Sheets: ASTM A 1008/A 1008M or ASTM A 591/A 591M.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, with A60 (ZF180) or G60 (Z180) coating.
- C. Stainless-Steel Sheets: ASTM A 666, Type 304, with No. 4 directional satin finish.

2.2 ACCESS DOORS AND PANELS

- A. Products:
 - 1. Best Access Doors, BA-TBC-TB1210 (for T-Bar ceilings)
 - 2. Best Access Doors, BA-F2-24-24 (for 5/8" drywall ceilings)
- B. Flush Access Doors and Trimless Frames: Metallic-coated aluminum units with drywall bead flange where needed.
- C. Locks: Flush to finished surface, screwdriver operated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install access doors and panels accurately in position. Adjust hardware and door and panels for proper operation.
- B. Provide additional blocking and framing as needed for proper installation.

END OF SECTION 083113

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and Shop Drawings.

PART 2 - PRODUCTS

2.1 OVERHEAD COILING DOORS

- A. Products:
 - 1. Overhead Corporation, 625 insulated door series, F265I slats.
- B. Structural Performance, Exterior Doors: Provide doors capable of withstanding 40 lbf/sq. ft. wind-loading pressure.
- C. Door Curtain Slats: Powder coated flat-profile, insulated slats in a minimum of 20 colors available for selections.
- D. Operation: Electrical with manual chain hoist backup.
- E. Obstruction Detection Device: Equip motorized door with external automatic photo electric safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.
- F. Tracks, Supports, and Hardware: Manufacturer's standard with windbar and other high wind accessories.
- G. Weatherseals: Provide replaceable weather stripping at bottom and at top of exterior doors.
- H. Operator Motor: RG, $\frac{3}{4}$ HP motor. Provide interior push button stations with open-close-stop options.
- I. Provide 24 gauge hood with intermediate supports and internal hood baffle weatherseal.

2.2 OVERHEAD COILING COUNTER SHUTTER

- A. Available Product:
 - 1. Overhead Door Corporation, 652 Series, manual push-up operation.

- B. Door Curtain Slats: Interlocking slats, Type FE-138, aluminum, with end locks to maintain curtain alignment and prevent lateral slat movement.
- C. Finish: Clear anodized finish.
- D. Tracks, Supports, Hardware: Provide aluminum bottom bar with vinyl astragals, extruded aluminum guides and steel brackets as required to support counter balance and hood.
- E. Provide aluminum hood with intermediate support brackets.
- F. Provide slide bolt locks with cylindrical key locks.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install door, track, and operating equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports.
- B. Accessibility: Install overhead coiling door switches and controls along accessible routes in compliance with regulatory requirements for accessibility.
- C. Test and adjust controls and safeties.

END OF SECTION 083323

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, and color Samples.
 - 1. For entrance doors, include hardware schedule.

PART 2 - PRODUCTS

2.1 ALUMINUM-FRAMED STOREFRONTS

- A. Products:
 - 1. Kawneer 1600, 7½".
 - 2. Kawneer 451T, 4½".
- B. Accessible Entrances: Comply with ICC/ANSI A117.1.
- C. Performance Requirements:
 - 1. Limit deflection of framing members normal to wall plane to 1/175 of clear span[for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
 - 2. Limit deflection of framing members parallel to glazing plane to L/360 of clear span or 1/8 inch, whichever is smaller.
 - 3. Structural Testing: Systems tested according to ASTM E 330 at 150 percent of inward and outward wind-load design pressures do not evidence material failures, structural distress, deflection failures, or permanent deformation of main framing members exceeding 0.2 percent of clear span.
 - 4. Air Infiltration: Limited to 0.06 cfm/sq. ft. of system surface area when tested according to ASTM E 283 at a static-air-pressure difference of 6.24 lbf/sq. ft.
 - 5. Water Penetration: Systems do not evidence water leakage when tested according to ASTM E 331 at minimum differential pressure of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.
 - 6. Thermal Conductance: Average U-factor of not more than 0.40 Btu/sq. ft. x h x deg F when tested according to AAMA 1503.
- D. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated; ASTM B 209 (ASTM B 209M) sheet; ASTM B 221 (ASTM B 221M) extrusions.

- E. Glazing: As specified in Division 08 Section "Glazing."
- F. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
- G. Doors: 1-3/4-inch- thick glazed doors with minimum 0.125-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods. Provide snap-on extruded-aluminum glazing stops, and preformed gaskets.
 - 1. Door Design: Wide stile; 5-inch nominal width.
 - 2. Accessible Doors: Smooth surfaced for width of door in area within 10 inches above floor or ground plane.
 - 3. Interior Doors: Provide ANSI/BHMA A156.16 silencers, three on strike jamb of single-door frames and two on head of double-door frames.
 - 4. Exterior Doors: Provide compression weather stripping at fixed stops. At other locations, provide sliding weather stripping retained in adjustable strip mortised into door edge.
 - 5. Hardware: As per hardware set.
- H. Fasteners and Accessories: Compatible with adjacent materials, corrosion resistant, nonstaining, and nonbleeding. Use concealed fasteners except for application of door hardware.
- I. Fabrication: Fabricate framing in profiles indicated for flush glazing (without projecting stops). Provide subframes and reinforcing of types indicated or, if not indicated, as required for a complete system. Factory assemble components to greatest extent possible. Disassemble components only as necessary for shipment and installation.
 - 1. Door Framing: Reinforce to support imposed loads. Factory assemble door and frame units and factory install hardware to greatest extent possible. Reinforce door and frame units for hardware indicated. Cut, drill, and tap for factory-installed hardware before finishing components.
- J. Aluminum Finish: Class I, color anodic finish; AA-M21C22A42/A44; complying with AAMA 611.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Isolate metal surfaces in contact with incompatible materials, including wood, by painting contact surfaces with bituminous coating or primer, or by applying sealant or tape recommended by manufacturer.
- B. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

- C. Set continuous sill members and flashing in full sealant bed as specified in Division 07 Section "Joint Sealants" to produce weathertight installation.
- D. Install framing components true in alignment with established lines and grades to the following tolerances:
 - 1. Variation from Plane: Limit to 1/8 inch in 12 feet; 1/4 inch over total length.
 - 2. Alignment: For surfaces abutting in line, limit offset to 1/16 inch. For surfaces meeting at corners, limit offset to 1/32 inch.
 - 3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch.
- E. Install doors without warp or rack. Adjust doors and hardware to provide tight fit at contact points and smooth operation.
- F. Provide reinforcing steel and edge connections as needed to meet wind design forces.

END OF SECTION 084113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Hardware schedule and keying schedule.
- B. Deliver keys to Owner.
- C. Fire-Resistance-Rated Assemblies: Provide products that comply with NFPA 80 and are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for applications indicated. On exit devices provide label indicating "Fire Exit Hardware."

PART 2 - PRODUCTS

2.1 HARDWARE

- A. Hinges:
 - 1. Brass/bronze hinges with stainless-steel pins for exterior.
 - 2. Nonremovable hinge pins for exterior and public interior exposure.
 - 3. Ball-bearing hinges for doors with closers and entry doors.
 - 4. 3 hinges for 1-3/4-inch- thick doors 90 inches or less in height; 4 hinges for doors more than 90 inches in height.
- B. Locksets and Latchsets:
 - 1. BHMA A156.2, Series 4000, Grade 1 for bored locks and latches.
 - 2. BHMA A156.3, Grade 1 for exit devices.
 - 3. BHMA A156.5, Grade 1 for auxiliary locks.
 - 4. BHMA A156.12, Series 5000, Grade 1 for interconnected locks and latches.
 - 5. Lever handles on locksets and latchsets.
 - 6. Provide trim on exit devices matching locksets.
- C. Key locks to Owner's existing master-key system.
 - 1. Cylinders with seven-pin tumblers and removable cores.
 - 2. Provide cylinders for overhead doors, storefront doors, and other locking doors that do not require other hardware.
 - 3. Provide construction keying.
 - 4. Provide key control system.
- D. Closers:

1. Mount closers on interior side (room side) of door opening. Provide regular-arm, parallel-arm, or top-jamb-mounted closers as necessary.
 2. Adjustable delayed opening (accessible to people with disabilities) feature on closers.
- E. Provide wall stops for all doors.
- F. Provide hardware finishes as follows:
1. Hinges: Matching finish of lockset/latchset or aluminum storefront door as applicable.
 2. Locksets, Latchsets, and Exit Devices: Satin chrome plated.
 3. Closers: Matching finish of lockset/latchset.
 4. Other Hardware: Matching finish of lockset/latchset.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mount hardware in locations recommended by the Door and Hardware Institute unless otherwise indicated.

3.2 HARDWARE SCHEDULE

- A. Hardware schedule sets as per drawings.

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and 12-inch- square Samples.
- B. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201.
- C. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated.
 - 1. GANA Publications: [GANA's "Laminated Glazing Reference Manual" and GANA's "Glazing Manual."
 - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- D. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- E. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I, Quality-Q3.
- B. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3.
- C. Tempered Glass: ASTM C 1048, Kind FT (fully tempered), Type II, Class 1 (clear), Quality-Q3.
- D. Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials.
- E. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.

2.2 MONOLITHIC-GLASS TYPES

A. Glass Type: Clear fully tempered float glass.

1. Thickness: ¼".
2. Provide safety glazing labeling.

2.3 LAMINATED-GLASS TYPES

A. Glass Type: Clear laminated glass with two plies of clear fully tempered float glass.

1. Thickness of Each Glass Ply: ¼" with .090 PVB inner layer.
2. Provide safety glazing labeling.

B. Glass Type: Tinted laminated glass with two plies of fully tempered float glass with outer ply Class 2 (tinted) and inner ply Class 1 (clear).

1. Thickness of Each Glass Ply: ¼" with .090 PVB inner layer.
2. Tint Color: Bronze.
3. Solar Heat Gain Coefficient: 0.25 maximum.
4. Provide safety glazing labeling.

2.4 INSULATING-GLASS TYPES

A. Glass Type: Low-E coated, laminated, tinted insulating glass.

1. Overall Unit Thickness: 1 5/8 inch, more or less.
2. Thickness of Each Glass Lite: ¼".
3. Outdoor Lite: Tinted fully tempered float glass.
4. Tint Color: Bronze.
5. Interspace Content: Air.
6. Indoor Lite: Clear laminated fully tempered float glass (2 layers ¼" with 0.10 PVB inner layer).
7. Winter Nighttime U-Factor: 0.40 maximum.
8. Summer Daytime U-Factor: 0.40 maximum.
9. Solar Heat Gain Coefficient: 0.25 maximum.
10. Provide safety glazing labeling.

2.5 GLAZING SEALANTS

A. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT.

B. Glazing Sealant Exterior Glass: Products that are approved by testing agencies for listed and labeled security glazing products with which they are used for this application.

1. Product: Kawneer SSG 4 sides.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are contained in GANA's "Glazing Manual."
- B. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- C. Remove nonpermanent labels, and clean surfaces immediately after installation.

END OF SECTION 088000

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to those tested in assemblies per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- B. STC-Rated Assemblies: Provide materials and construction identical to those tested in assemblies per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing and inspecting agency.

2.2 METAL FRAMING AND SUPPORTS

- A. Steel Framing Members, General: ASTM C 754.
 - 1. Steel Sheet Components: ASTM C 645. Thickness specified is minimum uncoated base-metal thickness.
 - 2. Protective Coating: ASTM A 653/A 653M, G40 (Z120), hot-dip galvanized coating.
- B. Suspended Ceiling and Soffit Framing:
 - 1. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch diameter, or double strand of 0.0475-inch- diameter wire.
 - 2. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, and 0.162-inch diameter.
 - 3. Carrying Channels: Cold-rolled steel, 0.0538 inch thick, 2-1/2 inches deep.
 - 4. Furring Channels: Steel studs, 0.0296 inch thick, in depth indicated and Steel, rigid hat-shaped channels; 7/8 inch deep, 0.0296 inch thick.
- C. Partition and Furr Down Framing:
 - 1. Studs and Runners: In depth indicated and 14 ga thick unless otherwise indicated.
 - 2. Flat Strap and Backing: 20 ga thick.
 - 3. Rigid Hat-Shaped Furring Channels: In depth indicated and 20 ga thick.
 - 4. Resilient Furring Channels: 1/2 inch deep, with single- or double-leg configuration.

5. Cold-Rolled Furring Channels: 0.0538 inch thick, 3/4 inch deep.
6. Z-Furring: In depth required by insulation, 1-1/4-inch face flange, 7/8-inch wall-attachment flange, and 0.0179 inch thick.
7. Horizontal bridging (16 ga) in stud walls spaced at rows not more than 48 inch apart.

2.3 ACCESSORIES

- A. General: Comply with referenced installation standards.
 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation and with United States Gypsum's "Gypsum Construction Handbook."
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Isolate steel framing from building structure, except at floor, to prevent transfer of loading imposed by structural movement.
 1. Where studs are installed directly against exterior walls, install foam-gasket isolation strip between studs and wall.
- D. Fire-Resistance-Rated Assemblies: Comply with requirements of listed assemblies.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to those tested in assemblies per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- B. STC-Rated Assemblies: Provide materials and construction identical to those tested in assemblies per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing and inspecting agency.

2.2 PANEL PRODUCTS

- A. Provide in maximum lengths available to minimize end-to-end butt joints.
- B. Interior Gypsum Board: ASTM C 36/C 36M or ASTM C 1396/C 1396M, in thickness indicated, with manufacturer's standard edges. Type XP and Sag-resistant type for ceiling surfaces.
- C. Glass-Mat, Water-Resistant Gypsum Backing Board: ASTM C 1178/C 1178M, of thickness indicated. Type X where required for fire-resistance-rated assemblies and where indicated.

- 1. Product: G-P Gypsum; Dens-Shield Tile Guard.

2.3 ACCESSORIES

- A. Trim Accessories: ASTM C 1047, formed from galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet. For exterior trim, use accessories formed from hot-dip galvanized-steel sheet, plastic, or rolled zinc.
 - 1. Provide cornerbead at outside corners unless otherwise indicated.
 - 2. Provide LC-bead (J-bead) at exposed panel edges.
 - 3. Provide control joints where indicated.

- B. Aluminum Accessories: Extruded-aluminum accessories indicated with Class II, clear anodic finish; AA-C12C22A31.
- C. Joint-Treatment Materials: ASTM C 475/C 475M.
 - 1. Joint Tape: Paper unless otherwise recommended by panel manufacturer.
 - 2. Joint Compounds: Setting-type taping compound and drying-type, ready-mixed, compounds for topping.
 - 3. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install gypsum board to comply with ASTM C 840.
 - 1. Isolate gypsum board assemblies from abutting structural and masonry work. Provide edge trim and acoustical sealant.
 - 2. Single-Layer Fastening Methods: Fasten gypsum panels to supports with screws.
 - 3. Multilayer Fastening Methods: Fasten base layers and face layer separately to supports with screws.
- B. Install water resistant backer units to comply with ANSI A108.11. Install at restrooms and showers.
- C. Fire-Resistance-Rated Assemblies: Comply with requirements of listed assemblies.
- D. Finishing Gypsum Board: ASTM C 840.
 - 1. At concealed areas, unless a higher level of finish is required for fire-resistance-rated assemblies, provide Level 2 finish: Embed tape at joints and first coat joint compound
 - 2. At substrates for tile, provide Level 2 finish: Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges.
 - 3. Unless otherwise indicated, provide Level 4 finish: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges.
- E. Glass-Mat, Water-Resistant Backing Panels: Finish according to manufacturer's written instructions.

END OF SECTION 092900

SECTION 093000 - TILING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data for each type of product indicated and Samples for tile and grout.
- B. Obtain tile of each type and color or finish from same production run for each contiguous area
- C. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- D. Definition: Tile includes ceramic surfacing units made from clay or other ceramic materials.
 - 1. Extent of tile work is indicated on drawings and schedules.
 - 2. Types of tile work in this section include the following:
 - 3. Unglazed ceramic tile.
 - 4. Glazed ceramic wall tile.

1.2 QUALITY ASSURANCE

- A. Source of Materials: Provide materials obtained from one source for each type and color of tile, grout, and setting materials.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information and installation instructions for materials required, except bulk materials.
- B. Shop Drawings: Submit shop drawings indicating tile patterns and locations and widths of control, contraction and expansion joints in tile surfaces.
- C. Samples for Initial Selection Purposes: Submit manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures and patterns available for each type of tile indicated. Include samples of grout and accessories involving color selection
- D. Samples for Verification Purposes: Submit the following:
 - 1. Samples for each type of tile and for each color and texture required, not less than 12" square.

2. Full size samples for each type of trim, accessory and for each color.

- E. Certified Test Reports: Submit certified test reports from a qualified independent testing laboratory evidencing compliance of tile and tile-setting products with requirements specified based on comprehensive testing of current products. Include in reports testing laboratory's interpretation of test results relative to specified requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage or contamination to materials by water, freezing, foreign matter or other causes.

1.5 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.
- C. Maintain temperatures at not less than 50 deg. F (10 deg. C) in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

PART 2 - PRODUCTS

2.1 CERAMIC TILE

- A. Ceramic tile that complies with Standard grade requirements in ANSI A137.1, "Specifications for Ceramic Tile."
1. Furnish tile complying with "Standard or Premium Grade" requirements unless otherwise indicated.
- B. Colors, Textures and Patterns: For tile, grout and other products requiring selection of colors, surface textures or other appearance characteristics, provide products indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standards.
1. Provide tile trim and accessories that match color and finish as selected by Architect from manufacturer's full offering of colors.
- C. Mounting: Where factory-mounted tile is required provide back-or edge-mounted tile assemblies as standard with manufacturer unless another mounting method is indicated.

- D. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies that this type of mounting is suitable for these kinds of use and has been successfully used on other projects.
- E. Tile Type: Factory-mounted unglazed impervious natural clay or porcelain cushion-edged ceramic mosaic tile.
1. Products:
 - a. Daltile Mosaic Colorbody Porcelain (Groups 1-4)
 2. Module Size: 2 by 2 inches.
 3. Surface: Smooth, without abrasive admixture.
 4. Finish: Mat, opaque.
 5. Color and Pattern: As selected by Architect.
 6. Grout Color: As selected by Architect.
 7. Trim Units: Coordinated with sizes and coursing of adjoining flat tile and matching characteristics of adjoining flat tile:
 - a. Base: Coved.
 - b. Base Cap for Thin-Set Mortar Installations: Surface bullnose.
 - c. Wainscot Cap for Thin-Set Mortar Installations: Surface bullnose.
 - d. External Corners for Thin-Set Mortar Installations: Surface bullnose.
 - e. Internal Corners: Cove.
 - f. Internal Corners: Field-buttet square corners. For coved base and cap, use angle pieces designed to fit with stretcher shapes.
- F. Tile Type: Glazed decorative floor/wall tile.
1. Products:
 - a. Daltile On Demand and Daltile Fabric Art.
 2. Module Size: 12 inches x 24 inches.
 3. Thickness: 5/16 inch and 3/8 inch.
 4. Face: Pattern of design indicated, with manufacturer's standard edges.
 5. Finish: Mat, opaque glaze.
 6. Color and Pattern: As selected by Architect.
 7. Grout Color: As selected by Architect.
 8. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
 - a. Base for Thin-Set Mortar Installations: Straight.
 - b. External Corners for Thin-Set Mortar Installations: Schluter trim.
 - c. Internal Corners: Field-buttet square corners. For base and cap use angle pieces designed to fit with stretcher shapes.

2.2 INSTALLATION MATERIALS

- A. Water Resistant Backer Units: ANSI A118.9 or ASTM C 1325, 5/8 inch thick.
- B. VOC Limit for Adhesives and Fluid-Applied Waterproofing Membranes: 65 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Waterproofing Membranes for Thin-Set Installations: ANSI A118.10, fabric-faced chlorinated polyethylene, PVC, or polyethylene sheet product.
 - 1. Products:
 - a. Schluter System, Kerdi Membrane.
- D. Setting and Grouting Materials: Comply with material standards in ANSI's "Specifications for the Installation of Ceramic Tile" that apply to materials and methods indicated.
 - 1. Thin-Set Mortar Type: Latex-portland cement.
 - 2. Grout Type: Water-cleanable epoxy unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
 - 1. For installations indicated below, follow procedures in ANSI's "Specifications for the Installation of Ceramic Tile" for providing 95 percent mortar coverage.
 - a. Tile floors in wet areas.
 - b. Tile floors composed of tiles 8 by 8 inches or larger.
 - c. Tile floors composed of rib-backed tiles.
- B. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- C. Lay tile in grid pattern unless otherwise indicated. Align joints where adjoining tiles on floor, base, walls, and trim are the same size.

- D. Prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.
- E. Install waterproofing to comply with ANSI A108.13.
- F. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.
- G. Interior Floor Tile Installation Method(s):
 - 1. Over Concrete Subfloors: TCA F115 (thin-set mortar, epoxy grout).
 - 2. Over Waterproof Membranes on Concrete Subfloors: TCA F122 (thin-set mortar).
- H. Interior Wall Tile Installation Method(s):
 - 1. Over Metal Studs or Furring: TCA W245 with thin-set mortar (thin-set mortar on glass-mat, water-resistant backer board).
 - 2. Shower Wall Installations, Metal Studs or Furring: TCA B419 with thin-set mortar (thin-set mortar on glass-mat, water-resistant backer board with waterproof membrane).

3.2 CLEANING AND PROTECTION

- A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
- B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work.
- C. Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage and wear.
- D. Prohibit foot and wheel traffic from using tiled floors for at least 7 days after grouting is completed.
- E. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION 093000

SECTION 095113 – SUSPENDED CEILING SYSTEMS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and material Samples.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to those tested in assemblies per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Seismic Standard: Provide acoustical panel ceilings designed and installed to withstand the effects of earthquake motions according to the following:
 - 1. CISCA's Recommendations for Acoustical Ceilings: Comply with CISCA's "Recommendations for Direct-Hung Acoustical Tile and Lay-in Panel Ceilings - Seismic Zones 0-2."
 - 2. CISCA's Guidelines for Systems Requiring Seismic Restraint: Comply with CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies - Seismic Zones 3 & 4."
 - 3. UBC Standard 25-2, "Metal Suspension Systems for Acoustical Tile and for Lay-in Panel Ceilings."
 - 4. <Insert requirement of authorities having jurisdiction.>

2.2 ACOUSTICAL PANELS

- A. Products:
 - 1. Armstrong Ultima High NRCC# 1940
- B. Classification: As follows, per ASTM E 1264:
 - 1. Type and Form: Type IV, Form 2.
 - 2. Pattern: E (lightly textured).
 - 3. Color: White.
 - 4. Light Reflectance (LR) Coefficient: Not less than 0.85.
 - 5. Noise Reduction Coefficient (NRC): Not less than 0.80.
 - 6. Ceiling Attenuation Class (CAC): Not less than 35.

- C. Surface-Burning Characteristics: ASTM E 1264, Class A materials, tested per ASTM E 84.
- D. Edge Detail: Square.
- E. Thickness: 7/8 inch.
- F. Modular Size: 24 by 24 inches.

2.3 CEILING SUSPENSION SYSTEM

- A. Wide-face, direct-hung system; ASTM C 635 heavy-duty structural classification.
 - 1. Products:
 - a. Armstrong Prelude XL 15/16.
 - 2. Color: White.
- B. Attachment Devices: Sized for 5 times the design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated.
- C. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire; ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 1. Size: Provide yield strength at least 3 times the hanger design load (ASTM C 635, Table 1, Direct Hung), but not less than 0.135-inch- (3.5-mm-) diameter wire.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Ceiling Suspension System Installation: Comply with ASTM C 636 and Cisca's "Ceiling Systems Handbook."
- B. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
- C. Arrange directionally patterned acoustical panels in a basket-weave pattern.

END OF SECTION 095113

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and Samples.
- B. Extra Materials: Deliver to Owner at least <Insert quantity> linear feet (linear m) of each type and color of resilient wall base installed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE

- A. Color and Pattern: As selected by Architect.
- B. ASTM F 1861, Type TP (rubber, thermoplastic).
- C. Group (Manufacturing Method): I (solid, homogeneous).
- D. Style: Cove (base with toe) or Straight (flat or toeless). Straight at carpet, cove at all other areas.
- E. Minimum Thickness: 0.125 inch.
- F. Height: 4 inches.
- G. Lengths: [Coils in manufacturer's standard lengths.
- H. Outside Corners: Job formed.
- I. Inside Corners: Job formed.
- J. Finish: Satin.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement- or blended hydraulic cement-based formulation provided or approved by flooring manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit products and substrate conditions.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Prepare concrete substrates according to ASTM F 710. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
- B. Adhesively install resilient wall base and accessories.
- C. Install wall base in maximum lengths possible. Apply to walls, columns, pilasters, casework, and other permanent fixtures in rooms or areas where base is required.

END OF SECTION 096513

SECTION 096516 - RESILIENT FLOORING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and Samples.
- B. Extra Materials: Deliver to Owner at least 50 linear feet, in form and in full width, for each type and color of resilient flooring installed.

PART 2 - PRODUCTS

2.1 LUXURY VINYL FLOOR COVERING (LVT)

- A. Products:
 - 1. Mannington, Spacia Collection Wood.
- B. Color and Pattern: As selected by Architect.
- C. Vinyl Floor Covering with Backing: ASTM F 1700, Type III, Grade B.
 - 1. Overall Thickness: 0.98
 - 2. Wear Material: 20 mil.
 - 3. Backing Class: Class A (fibrous).
- D. Fire-Test Response: Critical radiant flux classification of Class I, not less than 0.45 W/sq. cm per ASTM E 648.
- E. Wearing Surface: Embossed.
- F. Size: 7 ¼" x 48"

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement- or blended hydraulic cement-based formulation provided or approved by flooring manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit vinyl floor covering and substrate conditions indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Prepare concrete substrates according to ASTM F 710. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
- B. Provide floor moisture barrier as specified.
- C. Maintain uniformity of resilient flooring direction, and match edges for color shading at seams.

END OF SECTION 096516

SECTION 099100 - PAINTING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals:
 - 1. Product Data
 - 2. Samples.
- B. Mockups: Full-coat finish Sample of each type of coating, color, and substrate, applied where directed.
- C. Extra Materials: Deliver to Owner [1 gal. (3.8 L)] [1 quart (0.9 L)] <Insert quantity> of each color and type of finish coat paint used on Project, in containers, properly labeled and sealed.

PART 2 - PRODUCTS

2.1 PAINT

- A. Products:
 - 1. Sherwin Williams Pro Mar 200 Zero VOC
 - 2. Benjamin Moore Regal Select.
- B. Material Compatibility: Provide materials that are compatible with one another and with substrates.
 - 1. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. Use[interior] paints and coatings that comply with the following limits for VOC content:
 - 1. Flat Paints and Coatings: 0 g/L.
 - 2. Nonflat Paints, Coatings: 0 g/L.
 - 3. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 0.
 - 4. Floor Coatings: 0 g/L.
 - 5. Primers, Sealers, and Undercoaters: 0 g/L.
 - 6. Zinc-Rich Industrial Maintenance Primers: 0 g/L.
- D. Colors: As selected by Architect.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Comply with recommendations in MPI's "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove hardware, lighting fixtures, and similar items that are not to be painted. Mask items that cannot be removed. Reinstall items in each area after painting is complete.
- C. Clean and prepare surfaces in an area before beginning painting in that area. Schedule painting so cleaning operations will not damage newly painted surfaces.

3.2 APPLICATION

- A. Paint exposed surfaces, new and existing, unless otherwise indicated.
 - 1. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces.
 - 2. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint the back side of access panels.
 - 4. Color-code mechanical piping in accessible ceiling spaces.
 - 5. Do not paint prefinished items, items with an integral finish, operating parts, and labels unless otherwise indicated.
 - 6. Paint all exposed conduit and piping in vehicle maintenance building with corresponding colors.
- B. Apply paints according to manufacturer's written instructions.
 - 1. Use brushes only for exterior painting and where the use of other applicators is not practical.
 - 2. Use rollers for finish coat on interior walls and ceilings.
- C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
 - 1. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply stains and transparent finishes to produce surface films without color irregularity, cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other imperfections. Use multiple coats to produce a smooth surface film of even luster.

3.3 EXTERIOR PAINT APPLICATION SCHEDULE

- A. Concrete, Nontraffic Surfaces:
 - 1. Semigloss Latex: Two coats over alkali-resistant primer.
- B. Concrete Masonry Units:
 - 1. Semigloss Latex: Two coats over latex block filler.
- C. Steel:
 - 1. Semigloss, Quick-Dry Enamel: Two coats over rust-inhibitive primer.
- D. Galvanized Metal:
 - 1. Semigloss Latex: Two coats] over cementitious galvanized-metal primer.

3.4 INTERIOR PAINT APPLICATION SCHEDULE

- A. Concrete, Nontraffic Surfaces:
 - 1. Water based epoxy color floor coating: 3 coats, 2.0 mils each coat (low VOC, low odor, two-component, catalyzed waterborne, polyamide epoxy floor coating, gloss finish).
- B. Concrete Masonry Units:
 - 1. Semigloss Latex: Two coats over latex block filler.
- C. Steel:
 - 1. Semigloss Latex: Two coats over quick-drying alkyd primer.
- D. Galvanized Metal:
 - 1. Semigloss Latex: Two coats over cementitious galvanized-metal primer.
- E. Dressed Lumber: Including architectural woodwork.
 - 1. Semigloss Latex: Two coats over primer.
- F. Gypsum Board:
 - 1. Satin Latex: Two coats over primer/sealer.

END OF SECTION 099100

SECTION 099600 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals:
 - 1. Product Data.
 - 2. Samples.
- B. Mockups: Full-coat finish Sample of each type of coating, color, and substrate, applied where directed.
- C. Extra Materials: Deliver to Owner 1 gal. of each color and type of finish coat used on Project, in containers, properly labeled and sealed.

PART 2 - PRODUCTS

2.1 HIGH-PERFORMANCE COATINGS

- A. Products:
 - 1. Sherwin Williams, ResuFlor Shop Floor SB
- B. Material Compatibility: Provide materials that are compatible with one another and with substrates.
 - 1. For each coat in a system, provide products recommended in writing by manufacturers of topcoat for use in system and on substrate indicated.
- C. Colors: As selected by Architect.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Comply with recommendations in Manufacturer's Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove hardware, and similar items that are not to be coated. Mask items that cannot be removed. Reinstall items in each area after coating work is complete.

- C. Clean and prepare surfaces in an area before beginning coating work in that area. Schedule work so cleaning operations will not damage newly coated surfaces.
 - 1. Remove incompatible primers and reprime substrate with compatible primers as required to produce coating systems indicated.

3.2 APPLICATION

- A. Coat exposed surfaces.
 - 1. Coat surfaces under movable equipment and furniture same as similar exposed surfaces.
 - 2. Coat surfaces under permanently fixed equipment or furniture with prime coat only.
 - 3. Do not coat prefinished items, items with an integral finish, operating parts, and labels unless otherwise indicated.
- B. Apply high-performance coatings according to manufacturer's written instructions.
 - 1. Use brushes only where the use of other applicators is not practical.
- C. Apply high-performance coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
 - 1. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform finish, color, and appearance.

3.3 INTERIOR COATING APPLICATION SCHEDULE

- A. Concrete, Vehicle Maintenance Shop Areas:
 - 1. Resinous Floor System, 4 Coat System: primer coat, broadcast coat, grout coat, and top coat (1/16" total thickness) (with silica).

END OF SECTION 099600

SECTION 099657 – FLOOR MOISTURE VAPOR RETARDER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings, general provisions of the Contract, and other related construction documents such as Division 01, Division 03, and Division 09 specifications that apply to this Section

1.2 SUMMARY

- A. This Section included a ready-to-use, one-component, water-based, two-coat system formulated to suppress residual moisture in concrete with RH readings up to 98%.

- 1. One-Component Moisture Vapor Retarder

- B. Related Sections include the following:

- 1. Section 033000, Cast-In-Place Concrete.
 - 2. Division 09 Flooring Sections.

1.3 REFERENCES

- A. ASTM 109M, Compressive Strength Air-Cure Only.
- B. ASTM C348, Flexural Strength of Hydraulic-Cement Mortars.
- C. ASTM F2170, Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- D. ASTM E1745, Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- E. ASTM D4263, Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- F. ASTM F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- G. ASTM C1583, Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay materials by Direct Tension.
- H. ASTM D1308, Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used. Include manufacturer's Safety Data Sheets.
- B. Qualification Data: Submit installer qualifications for review by Architect.

1.5 QUALITY ASSURANCE

- A. Installation of the product must be completed by a factory trained applicator, using mixing equipment and tools approved by the manufacturer.
- B. Manufacturer Experience: Provide products of this section by companies which have successfully specialized in production of this type of work for not less than 3 years. Contact Manufacturer Representative prior to installation for substrate acceptance.

1.6 WARRANTY

- A. Certified applicator must file a pre-installation checklist with the manufacturer and Architect and receive written confirmation of the approval to proceed in order to obtain the Warranty. Provide a 10-year warranty.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in original packaging, labeled with product identification manufacturer, batch number and shelf life.
- B. Store products in a dry area with temperature maintained between 50° and 85° F and protect from direct sunlight.
- C. Handle products in accordance with manufacturer's printed recommendations.

1.8 PROJECT CONDITIONS

- A. Do not install material below 50° F surface and air temperatures. These temperatures must also be maintained during and for 48 hours after the installation of products included in this section. Install quickly if substrate is warm and follow warm weather instructions.

PART 2 - PRODUCTS

2.1 FLOOR MOISTURE VAPOR RETARDER

- A. Fast –Track, One-Component Moisture Vapor Retarder.

1. Acceptable Products:
 - a. Shonox MR18, Shonox of HPS North America.
2. Performance and Physical Properties: Meet or exceed the following values for material cured at 70°F ±3°F and 50% ±5% relative humidity:
 - a. Application: Manual
 - b. Material requirements on clean, absorbent concrete: Approx 425 sq. ft. per unit at 2 coats of 8 mils each. Approx. 100 sq. ft. per gal at 2 coats of 8 mil each.
 - c. 14 pH Solution (ASTM D1308): No effect.
 - d. VOC: 37.5 g/L
 - e. Walkable: Minimum of 2 hours.

2.2 WATER

- A. Water shall be clean, potable, and sufficiently cool (not warmer than 70°F).

PART 3 - EXECUTION

3.1 PREPARATION

- A. Concrete Subfloors: Prepare substrate in accordance with manufacturer's instructions.
 1. Prior to proceeding please refer to ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring. All concrete subfloors must be structurally sound and solid, surface dry and thoroughly clean and free of all dust, dirt, oil, grease, wax, asphalt, paint, patching compounds, curing and sealing compounds, form release and any contaminant that could act as a bond breaker. **Mechanically clean the floor down to ensure the surface is porous.** Over-water, frozen or otherwise weak concrete surfaces also must be cleaned down to sound, solid concrete by mechanical methods. Sanding equipment is not an effective method to remove contaminants from concrete. Acid etching, solvents, sweeping compounds and adhesive removes are not acceptable means of cleaning substrate.
 2. In order to obtain a solid bond, the concrete must be clean and absorbent.
 3. The concrete must have a minimum tensile strength of at least 150 psi for areas to receive normal foot traffic and 200 psi for areas of heavy commercial traffic when tested in accordance with ASTM C1583.
 4. Prior to beginning the installation, the relative humidity within the concrete must be measured (ASTM F2170). Results must be 98% RH or less. For RH results up to 98%, the installation area must be enclosed and acclimated and the ambient humidity must not exceed 60%.

5. The surface of the concrete must be completely dry at the time the product is installed. Verify concrete surface dryness by mat testing in conformance with ASTM D4263. This test must be conducted for at least 4 hours, which is the time required to set sufficiently.
6. To ensure that condensation does not form, it is extremely important to check the surface temperature of the concrete just prior to installation to verify this temperature is at least 5°F higher than the dew point for the given temperature and humidity in the space and rising.
7. All dormant control joints and dormant cracks greater than a hairline (1/32") must be pre-filled with a two-part, low viscosity, 100% solids, rigid crack and joint filler per manufacturer. Dormant cracks and dormant control joints must be filled in strict accordance with the installation instructions provided by the manufacturer. Once the dormant cracks and dormant control joints have been filled properly, broadcast sand to refusal, and allow these areas to cure thoroughly. Remove all excess sand prior to proceeding with the product installation.
8. All moving joints and moving cracks must be honored up through the product, the underlayment and the floor covering by installing a fully flexible sealing compound designed specifically for use in moving joints.

3.2 APPLICATION

- A. Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected. Install at all areas to receive LVT.
- B. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas from contact due to mixing and handling of materials.
- C. Mixing: Comply with manufacturer's printed instructions and the following.
 1. Thoroughly mix with a low speed drill and paint mixing paddle until the material is evenly distributed throughout the container. Do not add water or other additives.
- D. Application: Comply with manufacturer's printed instructions and the following.
 1. Immediately apply the freshly mixed product to the prepared concrete. For best results, pour in a serpentine pattern and roll at a 90° angle to the direction of the pour using a short-nap roller. The use of a professional style roller cage is highly recommended. Roll the material in a uniform direction, without interruption and at a thickness of 8 mils. To minimize the potential for pinhole formation, work into the surface with the roller to ensure maximum penetration. The product can also be worked into the surface with a paintbrush for hard-to-reach areas and corners. Once an area has been coated completely, allow this to dry to a tack-free film for a minimum of 30 minutes.

2. Once the first coat is dry, apply the second coat at right angles to the first and install without interruption and in a uniform direction at a thickness of 8 mils. Allow the second coat to dry completely (approximately 2 hours). Note: Do not allow more than 24 hours of dry time between coats. If the product was not worked into the surface sufficiently to prevent pinholes, you must apply another coat.
 - E. Re-test the substrate for moisture emissions prior to installing the floor covering.
- 3.3 DIRECT APPLICATION OF FINISH FLOORING
- A. Install finish floor directly over moisture vapor retarder. Follow mfr standard recommendations.
- 3.4 FIELD QUALITY CONTROL
- A. Where required, contact manufacturer for field sampling methods and procedures.
- 3.5 PROTECTION
- A. Avoid all general traffic over the surface until the product is completely dry (approximately 2 hours). If the underlayment will not be installed immediately, protect the surface from construction traffic, dirt and debris using Masonite or similar. Regarding the underlayment installation, prior to the installation of the finish flooring, the surface of the underlayment should be protected from abuse by other trades by the use of plywood, Masonite or other suitable protection course.

END OF SECTION 099657

SECTION 101400 - SIGNAGE

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, and Samples.
 - 1. Submit full-size rubbings for metal plaques.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Bronze Castings: ASTM B 584, Alloy UNS C83600 (No. 1 manganese bronze).
- B. Bronze Plate: ASTM B 36/B 36M, alloy UNS No. C28000 (muntz metal).
- C. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

2.2 SIGNS

- A. Plaques: Cast bronze, free from pits, scale, sand holes, and other defects. Provide manufacturer's standard satin polished finish on borders and raised copy (F8).
- B. Dimensional Characters: Cast-bronze cutout acrylic sheet characters as noted on drawings.
 - 1. Finish and Color: As selected from manufacturer's full range by Architect.
- C. Interior Panel Signs: Enamel-filled, reverse-engraved clear acrylic with square-cut edges and square corners.
 - 1. Finishes and Colors: As selected from manufacturer's full range.
 - 2. Tactile Characters: Characters and Grade 2 Braille raised 1/32 inch (0.8 mm) above surface with contrasting colors.
 - 3. Provide signs for all rooms mounted on the wall beside the room door and as noted on drawings.

- D. Exterior Framed Panel Signs: Extruded-aluminum with steel frames and matte-finished opaque acrylic characters chemically welded to faces of panels.
 - 1. Finishes and Colors: As selected from manufacturer's full range by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Locate signs where indicated or directed by Architect. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
- B. Interior Wall-Mounted Signs:
 - 1. Two-Face Tape: Mount signs to smooth, nonporous surfaces, other than vinyl.
 - 2. Mechanical Fasteners: Use nonremovable mechanical fasteners placed through predrilled holes at shop areas.
- C. Dimensional Characters: Mount characters at projection distance from wall surface indicated.
- D. Cast-Metal Plaques: Mount plaques with threaded studs on back of plaque set in quick-setting cement.

END OF SECTION 101400

SECTION 102113 - TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data, Shop Drawings, and Samples.
- B. Regulatory Requirements: Comply with ICC/ANSI A117.1 for toilet compartments designated as accessible.

PART 2 - PRODUCTS

2.1 TOILET COMPARTMENTS AND SCREENS

- A. Products:
 - 1. ASI, HDPE Class A, GAP Free Privacy System.

2.2 MATERIALS

- A. Stainless-Steel Sheet: ASTM A 666, Type 304, No. 3 directional polish.
- B. Solid-Plastic, Polymer Resin: High-density polyethylene with homogenous color, not less than 1 inch thick, with seamless construction and eased edges.
 - 1. Flame-Spread Index: 25 or less per ASTM E 84.
 - 2. Color: As selected by Architect.
- C. Pilaster Shoes and Sleeves (Caps): Solid plastic, polymer resin, not less than 3 inches high.
- D. Brackets: Continuous.
 - 1. Material: Chrome-plated, nonferrous, cast-zinc alloy (zamac).

2.3 FABRICATION

- A. Toilet Compartments: Overhead braced and floor anchored.
- B. Urinal Screens: Wall hung.

- C. Doors: Unless otherwise indicated, 24-inch-wide in-swinging doors for standard toilet compartments and 36-inch-wide out-swinging doors with a minimum 32-inch-wide clear opening for compartments indicated to be accessible to people with disabilities.
- D. Door Hardware: Clear-anodized aluminum or cast-zinc alloy (zamac). Provide units that comply with accessibility requirements of authorities having jurisdiction at compartments indicated to be accessible to people with disabilities.
 - 1. Hinges: Self-closing type, adjustable to hold door open at any angle up to 90 degrees.
 - 2. Latches and Keepers: Surface-mounted unit designed for emergency access and with combination rubber-faced door strike and keeper.
 - 3. Coat Hook: Combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories.
 - 4. Door Bumper: Rubber-tipped bumpers at out-swinging doors or entrance screen doors.
 - 5. Door Pull: Provide at out-swinging doors. Provide units on both sides of doors at compartments indicated to be accessible to people with disabilities.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install units rigid, straight, level, and plumb, with not more than 1/2 inch (13 mm) between pilasters and panels and not more than 1 inch (25 mm) between panels and walls. Provide brackets, pilaster shoes, bracing, and other components required for a complete installation. Use theft-resistant exposed fasteners finished to match hardware. Use sleeve nuts for through-bolt applications.
 - 1. Set hinges on in-swinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors and swing doors in entrance screens to return to fully closed position.

END OF SECTION 102113

SECTION 102600 - WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and material Samples.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Extruded Plastic: ASTM D 1784, Class 1, textured, PVC or acrylic-modified vinyl plastic.
 - 1. Impact Resistance: Minimum 25.4 ft-lbf/in. of notch when tested according to ASTM D 256, Test Method A.
 - 2. Flame-Spread Index: 25 or less per ASTM E 84.
 - 3. Smoke-Developed Index: 450 or less per ASTM E 84.
- B. Engineered PETG Sheet: ASTM D 6098, S-PC01, Class 1 or 2; with a minimum impact-resistance rating of 15 ft-lbf/in. of notch when tested according to ASTM D 256, Test Method A, 0.78 inch thick minimum.
- C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
- D. Adhesive: Recommended by manufacturer for use with material and substrate indicated.

2.2 WALL PROTECTION

- A. Wall Protection System: Surface mounted corner guard with continuous extruded-aluminum retainer and extruded-plastic cover.
 - 1. Products:
 - a. CS/Acrovyn, SM-20AN/SSM-25N/SM-20MN.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install components level, plumb, and true to line without distortions.

- B. Install at all interior gypsum board outside corners. Contractor to verify all locations.

END OF SECTION 102600

SECTION 104413 - FIRE EXTINGUISHER CABINETS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data.
- B. Fire-Rated, Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

PART 2 - PRODUCTS

2.1 FIRE-PROTECTION CABINETS

- A. Fire-Protection Cabinets: Enameled-steel, semirecessed cabinets for fire extinguisher.
 - 1. Products:
 - a. Larson's Manufacturing Company.
- B. Cabinet Construction: Nonrated.
 - 1. Fire-Rated Cabinets: Constructed with double walls fabricated from 0.048-inch-thick, steel sheet lined with fire-barrier material.
- C. Cabinet Material: Steel sheet.
 - 1. Trim Style: Rolled trim.
 - 2. Trim Material: Aluminum.
- D. Door Material: Aluminum.
 - 1. Door Style: Vertical duo.
 - 2. Door Glazing: Acrylic.
- E. Accessories: Identification lettering.
- F. Finishes:
 - 1. Manufacturer's standard baked-enamel paint for the following:
 - a. Interior of cabinet.
 - 2. Aluminum: Clear anodic.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install cabinets at 54 inches above finished floor to top of cabinet.
- B. Identification: Apply vinyl lettering at locations indicated.

END OF SECTION 104413

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 FIRE EXTINGUISHERS AND BRACKETS

- A. Portable Fire Extinguishers: NFPA 10, listed and labeled for the type, rating, and classification of extinguisher.
 - 1. Wet Chemical K-Type: UL-rated 2-A, 2.5-gal. nominal capacity, in stainless-steel container; with pressure-indicating gage.
 - 2. Multipurpose Dry-Chemical Type: UL-rated 2-A:10-B:C, 5-lb (2.3-kg)] [3-A:40-B:C, 5-lb nominal capacity, in enameled-steel container.
- B. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for fire extinguishers indicated, with plated or baked-enamel finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install mounting brackets in locations indicated.
- B. Install fire extinguishers in mounting brackets and cabinets where indicated.

END OF SECTION 104416

SECTION 105143 - STORAGE LOCKERS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. See Division 08 Section "Door Hardware" for lock cylinders for storage locker doors.
- B. Submittals: Product Data and Shop Drawings.
- C. Verify dimensions by field measurements before fabricating and indicate on Shop Drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel Wire: ASTM A 510 (ASTM A 510M).
- B. Steel Plates, Channels, Angles, and Bars: ASTM A 36/A 36M.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; G60 (Z180) zinc (galvanized).
- D. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.
- E. Shop Primer for Galvanized Steel: Water-based, galvanized-metal primer complying with MPI#134.

2.2 STORAGE LOCKERS

- A. Products:
 - 1. Salisbury, Extra Wide Standard Double Tier Lockers.
- B. Locker Unit Sizes:
 - 1. Width: 15".
 - 2. Depth: 15".
 - 3. Height: 36".
- C. Wall Panels: 1-1/4-by-1-1/4-by-1/8-inch steel angles on top, bottom, and back sides, and 3-by-1/8-inch steel flat bars on front side. Provide finished end panels, end bases, front bases.

1. Horizontal Panel Stiffeners: 1-1/4-by-1-1/4-by-1/8-inch steel angles or 3/4-by-1/4-inch steel flat bars.
- D. Backs: 0.0269-inch-thick, metallic-coated steel sheet.
- E. Tops: Fabricated from same framing as doors 0.028-inch-thick, metallic-coated steel sheet with sloped hood.
- F. Doors: 1-1/4-by-1-1/4-by-1/8-inch steel angles on four sides. Include lift up handle and recessed hasp with padlock security.
 1. Horizontal Stiffeners: 3/4-by-1/4-inch steel flat bars.
 2. Hinges: Full-surface type, 2-1/2-by-2-1/2-inch steel, welded to door and jamb framing.
- G. Fabrication: Fabricate initial storage locker with front and two sides. Fabricate additional storage lockers as add-on units, designed to share one side with initial storage locker. Provide bolts, hardware, and accessories as required for complete installation.
 1. Welding: Weld corner joints of framing and grind smooth, leaving no evidence of joint.
 2. Fabricate wall panel and door framing with slotted holes for connecting adjacent panels.
 3. Prehang doors in factory.
- H. Finishes: Powder-coated finish.
 1. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Anchor storage lockers to wall with 3/8-inch-diameter expansion anchors at 12 inches o.c. through panel framing. Shim panel framing as required to achieve level and plumb installation.
 1. Anchor wire mesh storage lockers to walls at 12 inches o.c. through back corner panel framing with fasteners appropriate to substrate.
 2. Attach adjacent wire mesh storage lockers to each other through side panel framing.
 3. Install doors complete with door hardware. Adjust to operate easily without binding.
- B. Touchup Painting: Clean field welds and abraded areas and touch up with same material used for shop painting.

- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas; repair galvanizing to comply with ASTM A 780.

END OF SECTION 105143



SECTION 107316 – FUEL STATION CANOPY

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Freestanding, pre-engineered metal canopies including concrete foundation, steel framing, metal roof, roof drains and leaders, fascia components, and metal ceiling and accessories.

- 1. Fuel station canopies.

1.2 RELATED SECTIONS

- A. Section 033000 - Cast-in-Place Concrete.
- B. Division 22 - Plumbing: Plumbing services and connections.
- C. Division 26 - Electrical: Electrical wiring and connections.

1.3 REFERENCES

- A. American Institute of Steel Construction, Inc. (AISC): AISC 360 - Specification for Structural Steel Buildings (copyrighted by AISC, ANSI approved).
- B. American Society of Civil Engineers (ASCE): ASCE 7 - Minimum Design Loads for Buildings and Other Structures (copyrighted by ASCE, ANSI approved).
- C. American Welding Society (AWS): AWS D1.1 - Structural Welding Code - Steel (copyrighted by AWS, ANSI approved).
- D. ASTM International (ASTM):
 - 1. ASTM A36/A36M - Standard Specification for Structural Steel.
 - 2. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - 3. ASTM A325/A325M - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - 4. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - 5. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality.
 - 6. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 7. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic Cement Grout (Non Shrink).
- E. National Association of Architectural Metal Manufacturers (NAAMM): NAAMM MFM - Metal Finishes Manual.
- F. National Fire Protection Association (NFPA): NFPA 70 - National Electrical Code (copyrighted by NFPA, ANSI approved) - hereinafter referred to as NEC.

1.4 DESIGN AND PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide pre-engineered canopies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated for the specific location where Canopy will be installed:
 - 1. Wind Load: As indicated on Drawings.
 - a. Minimum design wind load per ASCE 7-16, and the following minimum wind design criteria: Risk Category IV, Exposure Category B, Ultimate Wind Speed of 146 mph.
 - 2. Snow Load: As indicated on drawings.
 - a. Minimum design snow load per ASCE 7-16.
 - 3. Seismic Performance: Minimum design seismic criteria per ASCE 7-16.
- B. Thermal Movements: Pre-engineered canopies that allow for thermal movements resulting from the following maximum range change in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects.
 - 1. Engineering Calculations: Based on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 2. Temperature Change Range:
 - a. Ambient: 120 degrees F (67 degrees C).
 - b. Material Surfaces: 180 degrees F (100 degrees C).
- C. Delegated Design: Design and structural analysis data and calculations shall be signed and sealed by a Registered Professional Engineer, licensed in the State of Louisiana, responsible for their preparation, to certify conformance with project specific design loads and governing code requirements as described herein and as indicated on the drawings. Engineering calculations and data to define and include cladding and cladding attachment for all applicable zones (field, perimeter, corner, overhang, etc.).

1.5 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Canopy Supplier: Complete canopy drawings and calculations signed and sealed by a professional engineer licensed in state where canopy is to be installed.
- C. Samples:

1. For initial color selection and each specified finish in form of manufacturer's color charts showing full range of colors and finishes available, minimum 15 different colors.
 - a. Where finishes involve normal color variations, include samples showing full, range of variations expected.
 2. For verification purposes, prior to installation.
- D. Certificates: Product certificates signed by manufacturer certifying material compliance with specified performance characteristics and criteria, and physical requirements.
- E. Warranty: Documents specified herein.
- 1.6 QUALITY ASSURANCE
- A. Manufacturer Qualifications: Company specializing in engineering and manufacturing pre-engineered canopies with a minimum documented experience of twenty years and with a quality assurance program utilizing a quality inspection for each system.
- B. Welding:
1. Qualify procedures and personnel according to the following:
 - a. In accordance with AWS D1.1; with E70XX electrodes.
 - b. Structural Shop Welding: Done by certified welders.
 2. Steel Shop Connections: Welded and field connections are to be bolted, unless otherwise noted on the Drawings. Shop welds may be changed to field welds with approval of the project engineer.
 3. Slag: Clean from welds and inspect.
- C. Steel Finish: Painted with red oxide rust-inhibitive primer.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NEC, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- E. Source Limitations: Obtain pre-engineered metal canopy through one source from a single manufacturer who shall manufacture and install the canopy.
- F. Product Options:
1. Information on the Drawings and in the Specifications establishes requirements for system's aesthetic effects and performance characteristics.
 - a. Aesthetic Effects: Indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 1) Do not modify intended aesthetic effects, as judged solely by the Architect, except with the Architect's approval.
 - 2) If modifications are proposed, submit comprehensive explanatory data to the Architect for review.
 - b. Performance Characteristics: Indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and

in-service performance.

2. Drawings: Indicate size, profiles, and dimensional requirements of pre-engineered metal canopies and are based on the specific system indicated.

G. Coordination: Contract is responsible for the following items.

1. Conduct site meetings to verify project requirements, substrate conditions, utility connections, manufacturer's drawings and installation instructions.
 - a. Comply with Division 1 section on project meetings.
2. Prepare for and pour concrete footers for pre-engineered metal canopies.
 - a. Manufacturer will provide the following items.
 - 1) Recommended footing drawings as per IBC Section 1807.3.
 - 2) Prints and rebar details for concrete footings
 - 3) Anchor bolts to be embedded in concrete footer.
 - 4) Items must be delivered to project site in time for installation.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect components and accessories from corrosion, deformation, damage, and deterioration when stored at job site. Keep materials free from dirt and foreign matter.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Contractor is to verify location and elevation of footings relative to finished grade, columns, and other construction contiguous with pre-engineered metal canopies by field measurements before fabrication and indicate measurements on shop drawings.
 1. Established Dimensions: Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating metal canopies without field measurements. Contractor is responsible to coordinate footer locations and elevations with any interferences with or attachments to abutting structures.

1.9 WARRANTY

1. Furnish five-year manufacturer warranty for pre-engineered canopy systems and all components.

PART 2 PRODUCTS

2.1 PRE-ENGINEERED CANOPIES

- A. Furnish materials according to AISC 360-16, the State of Louisiana, and the City of Lake Charles, LA standards.

2.2 MATERIALS

- A. Structural Steel: Hot-dip-galvanized.
 1. Material and Work: Conform to the latest AISC 360.

2. Wide Flange I-Beam: Conform to ASTM A572/A572M GR.50, Fy equal to 50 ksi.
3. Other Rolled Sections: Conform to ASTM A36/A36M, Fy equal to 36 ksi.
4. Square and Rectangular Tubing: Conform to ASTM A500/A500M, Grade B, Fy equal to 46 ksi.
5. Plate steel shall conform to ASTM A36/A36M, Fy equal to 36 ksi.
6. Structural Steel Finish: Painted with rust inhibitive, red oxide primer; Manufacturer's standard.

B. Sheet Metal:

1. Decking: 3 x 16 inch (76 x 406 mm) by 20 gage smooth white, ASTM A653/A653M GR40, Fy equal to 40 ksi, galvanized steel with baked enamel finish.
2. Center and Tapered Gutter: 24 gage hot-dip galvanized steel baked enamel finish.
3. Perimeter Gutter: 20 gage hot-dip galvanized steel baked enamel finish.
4. Internal Downspout: PVC. 3 inch (76 mm) diameter.
5. External Downspouts: 3 x 4 inch (76 x 102 mm) by 24 gage hot-dip galvanized steel with baked enamel finish.
6. Manufacturer shall be capable of providing seamless gutter profiles up to 40 feet (12192 mm) in length.

2.3 PRE-ENGINEERED METAL CANOPIES

A. Manufacturer's canopy components consisting of the following.

1. Flexible frame with fixed base.
2. Steel Framing System: Stacked I Beam construction transferring the moment to the concrete footing without requiring a rigid connection between steel frame members.
3. Beam Arrangements: Allow for cantilever design which can bring columns from the perimeter of the structure to the inner protected zones between the drive lanes.
4. These mutually dependent components form a pre-engineered canopy, ready for construction on project site.
5. Design meeting site structural wind, snow and seismic requirements.

B. Canopy Fascia:

1. Aluminum Composite Panel (ACM): Fluorocarbon paint finish, masked on one side.
 - a. Warranted for 10 or 20 years depending on color and finish.
2. Laminated Foam Core Fascia: 2 inch (51 mm) expanded virgin polystyrene.
 - a. Panel Face: 24 gage hot-dip galvanized steel with a baked enamel finish.
 - b. Backing: 24 gage galvanized steel.
 - c. Finish Warranty: Against cracking, checking, peeling, or adhesion failure.
 - 1) Duration: 5, 10, 20 years depending on color selection.
3. Fascia: Various custom fascia meeting design requirements such as architectural shingle, EIFS, standing seam panels.

C. Canopy Finishes: Comply with NAAMM MFM for recommendations for applying and designating finishes.

1. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved

- samples.
 - 2. Noticeable variations in the same piece are not acceptable.
 - 3. Variations in appearance of other components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.
- D. Fabrication: Fabricate pre-engineered canopies completely in factory.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
- 1. Examine supporting foundations for compliance with manufacturer's requirements, including installation tolerances and other conditions affecting performance of supporting members.
 - 2. Check installed anchor bolts for accuracy. Verify that bearing surfaces are ready to receive the work.
 - 3. Verify the rough-in of required mechanical and electrical services prior to placement of the structure.
 - 4. If preparation is the responsibility of another installer, notify the Architect of unsatisfactory preparation before proceeding.
 - 5. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Erect framing according to AISC requirements.
- B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.
- C. Set pre-engineered metal canopy plumb and aligned. Level base plates true to plane with full bearing on concrete bases.
- D. Fasten pre-engineered metal canopy columns to anchor bolts and/or foundation bolts.
- E. Set column base plates with non-shrink grout to achieve full plate bearing.

- F. Do not field cut or alter structural members without approval of Architect/Engineer.
 - G. After erection, prime welds, abrasions, and surfaces not shop-primed. Repair galvanizing as required.
 - H. Provide Bolted Connections as Follows:
 - 1. Structural erection bolts shall conform to ASTM A325/A325M.
 - 2. A minimum diameter of 3/4 inch (19 mm) erection bolts shall be used for cross beam-to-column connections and a minimum of 5/8 inch (16 mm) diameter bolts for all other connections.
 - 3. Drilled holes in structural steel shall be deburred.
 - 4. Flat structural washers, minimum of one, shall be used on bolted connections.
 - 5. Bolts shall be tightened to snug tight per latest RCSC specifications, unless otherwise specified.
 - I. Provide Screws as Follows:
 - 1. Fastening shall be performed per installation prints provided by the manufacturer.
 - 2. Installation screws shall be furnished with electrode deposited cadmium coating unless otherwise noted.
 - 3. Self-drilling and self-tapping screws shall have a sufficient cut point and a 1/2 inch (13 mm) outside diameter dished metal-backed neoprene washer to be used in water sealing applications .
 - J. Provide pedestrian protection and warnings during construction which comply with local, Federal, and OSHA codes.
 - K. Prior to steel erection of any kind, the Contractor shall grade, backfill and otherwise prepare the job site to allow for rolling scaffold and ensure safe working conditions including the removal or relocation of overhead power lines.
 - L. Any grade or elevation situations which deviate from the approved manufacturer's plans shall be conveyed to the manufacturer prior to fabrication.
 - M. All anchor bolts and/or leveling plates shall be set within 1/4 inch (6 mm) tolerance on layout and grade level.
 - N. Temporary electrical power shall be provided.
 - O. Connect electrical power service to power distribution system according to requirements specified in Division 16 - Electrical.
 - P. Dumpster for trash and debris shall be provided by the Contractor.
- 3.4 ADJUSTING AND CLEANING
- A. After completing installation, inspect exposed finishes and repair damaged finishes.
- 3.5 PROTECTION
- A. Protect installed products until completion of project.

- B. Touch-up, repair, or replace damaged products before Substantial Completion.

END OF SECTION 107316

SECTION 113100 - APPLIANCES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data.
- B. Regulatory Requirements: Comply with provisions of the following product certifications:
 - 1. NFPA: Provide electrical appliances listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 2. UL and NEMA: Provide electrical components required as part of appliances that are listed and labeled by UL and that comply with applicable NEMA standards.
 - 3. NAECA: Provide appliances that comply with NAECA standards.
- C. Accessibility: All appliances are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines. Contractor to verify compliance with manufacturer
- D. Energy Ratings: Provide appliances that qualify for the EPA/DOE ENERGY STAR product labeling program.

PART 2 - PRODUCTS

2.1 APPLIANCES

- A. Electric Range: Freestanding range with 4 burners and self-cleaning oven with broiler unit.
 - 1. Products:
 - a. As noted on drawings.
 - 2. Color: Stainless steel.
- B. Microwave Oven: Undercabinet microwave oven drawer as noted on drawings.
- C. Refrigerator/Freezer: Freestanding, frost-free, French-door refrigerator with dual ice maker, gallon door bins, etc.
 - 1. Total Compartment Volume: 27.8 cu. ft.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Built-in Appliances: Securely anchor to supporting cabinetry or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed. Provide all required connection to ductwork, elec, data, plumbing etc as required for proper operation of appliance.
- B. Freestanding Appliances: Place in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment. Provide all required connection to ductwork, elec, data, plumbing etc as required for proper operation of appliance.
- C. Test each item of appliances to verify proper operation. Make necessary adjustments.
- D. Verify that accessories required have been furnished and installed.

END OF SECTION 113100

SECTION 122113 - HORIZONTAL LOUVER BLINDS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and Samples.
- B. Product Standard: Unless otherwise indicated, comply with WCMA A 100.1.

PART 2 - PRODUCTS

2.1 HORIZONTAL LOUVER BLINDS (MB)

- A. Provide blinds passing flame-resistance testing according to NFPA 701.
- B. Louver Slats: Aluminum, antistatic polyester coated.
- C. Slat Width: 1 inch and 8 gauge thick.
- D. Headrail: Formed steel or extruded aluminum; long edges returned or rolled; fully enclosing operating mechanisms on three sides and ends.
- E. Tilt Operation: Manual with wand.
- F. Valance: Two louver slats.
- G. Mounting: Wall/jamb.
- H. Colors, Textures, Patterns, and Gloss: As selected from manufacturer's full range by Architect.
- I. Fabrication: Comply with AWCMA Document 1029 unless otherwise indicated.
 - 1. Fabricate concealed components from noncorrodible or corrosion-resistant-coated materials.
 - 2. Provide lifting and tilting mechanisms with permanently lubricated moving parts.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install blinds level, plumb, and located not closer than ½ inch to interior face of glass.

1. Flush Mounted: Install blinds with louver edges flush with finish face of opening when slats are tilted open.
 2. Jamb Mounted: Install headrail flush with face of opening jamb and head.
- B. Adjust horizontal louver blinds to operate smoothly and easily throughout entire operational range.

END OF SECTION 122113

SECTION 125000 – FURNITURE

PART 1 - GENERAL

1.1 FURNITURE- SUBMITTALS

- A. Submittals are required of the awarded vendor, and are not required at time of bid.
- B. Product data for each type of furniture item and assembly accessory required. Submit written data on physical characteristics, durability, and flame resistance characteristics.
- C. Dimensioned shop drawings of each table specified.
- D. Material test reports from qualified independent testing laboratory indicating and interpreting test results relative to compliance of materials with requirements indicated.
- E. Product Certificates: Signed by the manufacturer certifying that materials furnished comply with specified requirements. Include supporting certified laboratory testing data indicating that material meets specified test requirements.
- F. Maintenance data for furniture for inclusion in the final Maintenance Manual.
- G. Refer to Fabric and materials specified and Finishes. Please notify Brossett Architect, LLC ASAP if a finish or material is discontinued. Provide suggested replaced finishes approved by the manufacturer.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain furniture types from one source from a single manufacturer.
- B. Physical Properties: Provide furniture that is identical to that tested for the following physical properties, according to test method indicated by UL, BIFMA, ANSI, or other testing and inspecting agency acceptable to authorities having jurisdiction.

1.4 WARRANTY

- A. Submit a written warranty, executed by Manufacturer/Dealer, agreeing to repair or replace furniture which fails in materials or workmanship within the specified standard warranty period. Warranty period is a minimum of 5 years from substantial completion.

PART 2 – PRODUCTS

2.1 FINISH DESIGNATIONS

- A. Refer to Selections Listed in the drawings.

2.2 BRAND NAME/BROCHURES

- A. Whenever manufacturer trade names, brand names, make or model numbers are specified, they are used only to denote the quality standard of the article desired, and set forth and convey to prospective vendors the general style, type, character, and quality of the article desired, and the words "or equal" shall be assumed to follow whether or not so stated.
- B. Vendors must submit any "Comparable Products" to be reviewed a minimum of 10 working days before bidding is due. **The PRODUCT MANUFACTURER'S SPECIFICATIONS AND ILLUSTRATED BROCHURE(S) SHALL BE FURNISHED WITH THE APPROVAL REQUEST. THE SPECIFICATIONS AND BROCHURE(S) SUBMITTED MUST BE IDENTICAL TO THE MAKE AND MODEL OF THE ITEM(S) REQUESTED TO BE BID.** In the event such specifications/brochure(s) are generic and cover more than the specific item(s) bid, all references to the item(s) being bid must be clearly marked so there is no question of the bidder's intent.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Delivery and installation for all furniture. Remove all boxes and packing materials and leave the area clean.

END OF SECTION 125000

SECTION 133419 - METAL BUILDING SYSTEMS (Buildings A, E, F, & H)



PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Pre-engineered, shop fabricated structural steel building frame; insulated (and non-insulated) metal wall and sloped roof system including gutters and downspouts; exterior doors and overhead doors. This specification applies to Buildings A (Covered Pavilion), E (Bus Canopy), F (Equipment Shed), and H (Sand and Dirt Pit). **All steel and fasteners shall be hot-dipped galvanized.**

1.2 REFERENCES

- A. American Institute of Steel Construction:
1. AISC 360-16 - Specification for Structural Steel Buildings.
 2. AISC S335 - Specification for Structural Steel Buildings Allowable Stress Design, and Plastic Design.
- B. ASTM International:
1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
 2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 3. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 4. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 5. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 6. ASTM A490 - Standard Specification for Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength.
 7. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 8. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
 9. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.
 10. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
 11. ASTM A992/A992M - Standard Specification for High-Strength Low-Alloy Structural Steel.
 12. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

13. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
14. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
15. ASTM C991 - Standard Specification for Flexible Glass Fiber Insulation for Pre-Engineered Metal Buildings.
16. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
17. ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
18. ASTM C1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
19. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
20. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.
21. ASTM E408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
22. ASTM E903 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
23. ASTM E1918 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
24. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.
25. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

C. American Welding Society:

1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
2. AWS D1.1 - Structural Welding Code - Steel.

D. Metal Building Manufacturers Association:

1. MBMA - Low Rise Building Systems Manual.

E. SSPC: The Society for Protective Coatings:

1. SSPC - Steel Structures Painting Manual.
2. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).

F. Underwriters Laboratories Inc.:

1. UL - Building Materials Directory.

G. U.S. Environmental Protection Agency:

1. ENERGY STAR - ENERGY STAR Voluntary Labeling Program.

1.3 SYSTEM DESCRIPTION

A. Building A (Outdoor Pavilion):

1. 50ft by 50ft prefabricated, pre-engineered metal framed primary building/canopy. Primary building consists of rigid frames spanning the 50-foot direction.
2. Primary Building Bay Spacing: 25 feet
3. Primary Framing: Rigid frame of rafter beams and columns, portal frames, and wind bracing. All framing to be hot-dipped galvanized after fabrication.
4. Columns: Straight (not tapered) legs.
5. Roof System: Preformed and prefinished standing seam metal roof panels of upslope profile, with sub-girt framing/anchorage assembly, and accessory components.
6. Building Color(s): As selected by Architect from any of the manufacturer's standard and premium colors, minimum of 15 options.
7. Maximum baseplate dimensions: 12"x22"

B. Building E (Bus Canopy):

1. 80ft (including roof overhangs) by 90ft prefabricated, pre-engineered metal framed primary building/canopy. Primary building consists of rigid frames spanning 70-feet with 5-foot overhangs on each end (80-foot direction).
2. Primary Building Bay Spacing: 29 feet
3. Primary Framing: Rigid frame of rafter beams and columns, portal frames, and wind bracing. All framing to be hot-dipped galvanized after fabrication.
4. Roof System: Preformed and prefinished standing seam metal roof panels of upslope profile, with sub-girt framing/anchorage assembly, and accessory components.
5. Building Color(s): As selected by Architect from any of the manufacturer's standard and premium colors, minimum of 15 options.
6. Maximum baseplate dimensions: 12"x22"

C. Building F (Covered Equipment Parking):

1. 25ft-6in by 161ft-6in prefabricated, pre-engineered metal framed primary building/canopy. Primary building consists of cantilevered rigid frames spanning the 25 foot - 6-inch direction.
2. Primary Building Bay Spacing: 20 feet
3. Primary Framing: Cantilevered rigid frame of rafter beams and columns, and wind bracing. All framing to be hot-dipped galvanized after fabrication.
4. Roof System: Preformed and prefinished standing seam metal roof panels of upslope profile, with sub-girt framing/anchorage assembly, and accessory components.
5. Building Color(s): As selected by Architect from any of the manufacturer's standard and premium colors, minimum of 15 options.
6. Maximum baseplate dimensions: 12"x22"

D. Building H (Sand/Dirt Pits):

1. 26ft-6in by 91ft prefabricated, pre-engineered metal framed primary building. Primary building consists of rigid frames spanning the 26-foot, 6-inch direction.
 2. Primary Building Bay Spacing: 18 feet (standard) & 18-feet, 60-inches at end bays.
 3. Primary Framing: Rigid frame of rafter beams and columns, portal frames, and wind bracing. All framing to be hot-dipped galvanized after fabrication.
 4. Roof System: Preformed and prefinished standing seam metal roof panels of upslope profile, with sub-girt framing/anchorage assembly, and accessory components.
 5. Building Color(s): As selected by Architect from any of the manufacturer's standard and premium colors, minimum of 15 options.
 6. Maximum baseplate dimensions: 14"x18"
- E. Secondary Framing (All): purlins, girts, eave struts, flange bracing, still supports, clips, and other items indicated on drawings.
- F. Wall System (All – where indicated): Preformed and prefinished metal panels of vertical profile, with sub-girt framing/anchorage assembly, insulation (where indicated), insulated panels (where indicated), liner sheets, and accessory components.
- G. Roof System (All): Preformed metal panels of upslope profile, with sub-girt framing/anchorage assembly, insulation (where indicated), and accessory components. Provide standing seam system where indicated. Provide insulated panels where indicated.
- H. Roof Slope (All): 1 on 12 roof slope for all sections

1.4 DESIGN REQUIREMENTS

- A. Building A (Outdoor Pavilion):
1. Thermal resistance of wall system: N/A
 2. Thermal resistance of roof system: N/A
 3. Design members to withstand dead loads, live loads, applicable seismic loads, wind loads, and other design loads calculated in accordance with IBC 2021, ASCE 7-16, and the following minimum wind design criteria: Risk Category I, Exposure Category B, Ultimate Wind Speed of 140 mph.
- B. Building E (Bus Canopy):
1. Thermal resistance of wall system: N/A
 2. Thermal resistance of roof system: N/A
 3. Design members to withstand dead loads, live loads, applicable seismic loads, wind loads, and other design loads calculated in accordance with IBC 2021, ASCE 7-16, and the following minimum wind design criteria: Risk Category I, Exposure Category B, Ultimate Wind Speed of 140 mph.
- C. Building F (Covered Equipment Parking):
1. Thermal resistance of wall system: N/A
 2. Thermal resistance of roof system: N/A

3. Design members to withstand dead loads, live loads, applicable seismic loads, wind loads, and other design loads calculated in accordance with IBC 2021, ASCE 7-16, and the following minimum wind design criteria: Risk Category I, Exposure Category B, Ultimate Wind Speed of 140 mph.
- D. Building H (Sand/Dirt Pits):
 1. Thermal resistance of wall system: N/A
 2. Thermal resistance of roof system: N/A
 3. Design members to withstand dead loads, live loads, applicable seismic loads, wind loads, and other design loads calculated in accordance with IBC 2021, ASCE 7-16, and the following minimum wind design criteria: Risk Category I, Exposure Category B, Ultimate Wind Speed of 140 mph.
 - E. All: Design members to support mechanical and electrical equipment and fire sprinkler system piping (as required). Minimum collateral load shall be 5 psf.
 - F. All: Maximum allowable deflection: As per IBC 2021, with no framing member exceeding 1/180 of span with imposed loads for exterior wall and roof system.
 - G. All: Maximum allowable lateral drift: As per IBC 2021, with no primary framing member exceeding l/400.
 - H. All: Metal panel assemblies shall withstand the effects of loads and stresses within limits and under conditions indicated according to ASTM E 1592.
 - I. All: Provide drainage to exterior for water entering or condensation occurring within wall or roof system.
 - J. All: Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of 0 to 120 degrees F.
 - K. All: Size and fabricate wall and roof systems free of distortion or defects detrimental to appearance or performance.
 - L. Delegated Design (All): Design and structural analysis data and calculations shall be signed and sealed by a Registered Professional Engineer, licensed in the State of Louisiana, responsible for their preparation, to certify conformance with project specific design loads and governing code requirements as described herein and as indicated on the drawings. Engineering calculations and data to define and include cladding and cladding attachment for all applicable zones (field, perimeter, corner, overhang, etc.).

1.5 PERFORMANCE REQUIREMENTS

- A. Conform to applicable IBC 2021 and City of Lake Charles, LA for submission of design calculations, reviewed Shop Drawings and erection drawings as required for acquiring permits.

- B. Cooperate with regulatory agency or authority and provide data as requested authority by having jurisdiction.
- C. Provide components of each type from one manufacturer compatible with adjacent materials.
- D. Vapor Retarder Permeance: Maximum 1 perm when tested according to ASTM E96/E96M.

1.6 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate assembly dimensions, locations of structural members, connections, attachments, openings, cambers, loads; wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, method of installation; framing anchor bolt settings, sizes, and locations from datum, and foundation loads; indicate welded connections with AWS A2.4 welding symbols; net weld lengths. Provide professional engineer (licensed in the State of Louisiana) seal and signature.
 - 2. Manufacturer's Instructions: Submit preparation requirements and anchor bolt placement.
 - 3. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.
- B. Product data sheets for each type of door and accessory (includes personnel and overhead doors).
 - 1. Construction details, material descriptions, dimensions of individual components, profile door sections, and finishes
 - 2. Rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with AISC S335, AISC 360-10 and MBMA Low Rise Building Systems Manual.
- B. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.
- C. Perform Work in accordance with the State of Louisiana and City of Lake Charles standard.

1.8 QUALIFICATIONS

- A. Manufacturer Qualifications: A qualified manufacturer.
 - 1. Company specializing in manufacturing products specified in this section with minimum three years documented experience.
 - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified Professional Engineer.
- B. Erector: Company specializing in performing Work of this section with minimum three years' experience and approved by manufacturer.
- C. Design structural components, develop shop drawings, under direct supervision of a Professional Engineer experienced in design of this Work and licensed in the State of Louisiana.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Protect foam-plastic insulation as follows:
 - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
- E. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.

1.10 WARRANTY

- A. Furnish five-year manufacturer warranty for pre-engineered building systems and all components.

PART 2 - PRODUCTS

2.1 PRE-ENGINEERED BUILDINGS

- A. Furnish materials according to AISC 360-16, the State of Louisiana and City of Lake Charles standards.

2.2 COMPONENTS - FRAMING

- A. Structural Steel Members: ASTM A36/A36M. A572/A572M, Grade 50.
- B. Plate or Bar Stock: Minimum ASTM A36 (Match structural members).
- C. Headed Anchor Bolts: ASTM F1554 Grade 36, galvanized.
- D. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M) or ASTM A490 (ASTM A490M) galvanized.
- E. Welding Materials: AWS D1.1; type as required for materials being welded.
- F. Primer: SSPC Paint 20, Red Oxide.
- G. Non-Shrink Structural Grout: ASTM C1107/C1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,000 psi in 48 hours and 7,000 psi in 28 days.

2.3 COMPONENTS - WALL AND ROOF SYSTEM

- A. Sheet Steel Stock: ASTM A792/A792M aluminum-zinc alloy Coating Designation AZ50.
- B. Joint Seal Gaskets: Manufacturer's standard.
- C. Fasteners: Manufacturer's standard type, high-performance organic coating, finish to match adjacent surfaces when exterior exposed.
- D. Insulation: Semi-rigid, batt, or roll glass fiber type, faced with reinforced white vinyl, friction fit.
- E. Bituminous Paint: Asphaltic type.
- F. Sealant: Manufacturer's standard type, non-staining, elastomeric, skinning.
- G. Trim, Closure Pieces, Caps, Flashings, Rain Water Diverter, Facias, Infills: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

2.4 COMPONENTS - METAL DOORS AND FRAMES

A. MATERIALS

1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
2. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
3. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 metallic coating.
4. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized.
 - a. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
5. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
6. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.
7. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
8. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

B. FABRICATION

1. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
2. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.

C. STEEL FINISHES

1. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
 - a. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.
2. Factory-Applied Paint Finish: Manufacturer's standard, complying with ANSI/SDI A250.3 for performance and acceptance criteria.

2.5 FABRICATION - FRAMING

- A. Fabricate members according to AISC requirements for plate, bar, tube, or rolled structural shapes.
- B. Anchor Bolts: Formed with straight shank, assembled with template for casting into concrete.
- C. Provide framing for exterior penetrations including (but not limited to) door, window, louver, and ventilator openings.

2.6 FABRICATION - WALL AND ROOF SYSTEMS

- A. Siding: Designed to comply with code requirements. Minimum 24-gauge metal thickness, profile indicated on drawings. For R-Panel, provide 1.5-inch-deep minimum ribs at 12" on center with lapped edges.
- B. Roofing: Designed to comply with code requirements. Minimum 24-gauge metal thickness, profile indicated on drawings. For R-Panel, 1.5-inch-deep minimum ribs at 12" on center with lapped edges.
- C. Girts/Purlins: Rolled formed structural shape to receive siding, roofing sheet.
- D. Internal and External Corners: Same material thickness and finish as adjacent material, profile brake formed to required angles.
- E. Expansion Joints: Same material and finish as adjacent material manufacturer's standard brake formed.
- F. Flashings, Closure Pieces, Fascia, Infills and Caps. Same material and finish as adjacent material, profile to suit system.
- G. Fasteners: To maintain load requirements and weather tight installation, same finish as cladding, non-corrosive finish.

2.7 FABRICATION - GUTTERS AND DOWNSPOUTS

- A. Fabricate of same material and finish as roofing metal.
- B. Form gutters and downspouts of profile and size as indicated to collect and remove water. Minimum gutter and downspout size to be 6" square. Fabricate with connection pieces.
- C. Form sections in maximum possible lengths. Hem exposed edges. Allow for expansion at joints.
- D. Fabricate support straps of same material and finish as roofing metal, color as selected.

2.8 FACTORY FINISHING

- A. Interior Framing Members: Clean, prepare, and prime to SSPC Manual requirements.
- B. Exterior Framing Members: Clean, prepare, and galvanize to ASTM A123.
- C. Galvanizing for Nuts, Bolts and Washers: ASTM A153/A153M.
- D. Interior Surfaces of Wall and Roof Components and Accessories: Pre-coated enamel on steel as selected from manufacturer's standard range.
- E. Exterior Surfaces of Wall and Roof Components and Accessories: Pre-coated enamel on steel as selected from manufacturer's standard range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position.

3.2 ERECTION

- A. Framing:
 - 1. Erect framing according to AISC requirements.
 - 2. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.
 - 3. Set column base plates with non-shrink grout to achieve full plate bearing.
 - 4. Do not field cut or alter structural members without approval of Architect/Engineer.
 - 5. After erection, prime welds, abrasions, and surfaces not shop-primed. Repair galvanizing as required.
- B. Wall and Roofing Systems:
 - 1. Install Work according to MBMA standards.
- C. Gutters and Downspouts:
 - 1. Install Work according to MBMA standards.
- D. Accessories:
 - 1. Install Work according to MBMA standards.

3.3 ERECTION TOLERANCES

- A. Framing Members: 1/4 inch from level; 1/8 inch from plumb.
- B. Siding and Roofing: 1/8 inch from indicated position.

END OF SECTION 133419

SECTION 133420 - METAL BUILDING SYSTEMS (Buildings B, C, & G)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Pre-engineered, shop fabricated structural steel building frame; insulated metal wall and sloped roof system including soffits, gutters and downspouts; exterior doors, overhead doors, windows, skylights, and louvers. This specification applies to Buildings B (Crew Building), Building C (Storage Building), and G (Vehicle Maintenance Building). Also included with Building G (Vehicle Maintenance Building) is an interior bridge crane.

1.2 REFERENCES

- A. American Institute of Steel Construction:

1. AISC 360-16 - Specification for Structural Steel Buildings.
2. AISC S335 - Specification for Structural Steel Buildings Allowable Stress Design, and Plastic Design.

- B. ASTM International:

1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
4. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
5. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
6. ASTM A490 - Standard Specification for Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength.
7. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
8. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
9. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.
10. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
11. ASTM A992/A992M - Standard Specification for High-Strength Low-Alloy Structural Steel.



12. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
13. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
14. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
15. ASTM C991 - Standard Specification for Flexible Glass Fiber Insulation for Pre-Engineered Metal Buildings.
16. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
17. ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
18. ASTM C1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
19. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
20. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.
21. ASTM E408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
22. ASTM E903 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
23. ASTM E1918 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
24. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.
25. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

C. American Welding Society:

1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
2. AWS D1.1 - Structural Welding Code - Steel.

D. Metal Building Manufacturers Association:

1. MBMA - Low Rise Building Systems Manual.

E. SSPC: The Society for Protective Coatings:

1. SSPC - Steel Structures Painting Manual.
2. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).

F. Underwriters Laboratories Inc.:

1. UL - Building Materials Directory.

G. U.S. Environmental Protection Agency:

1. ENERGY STAR - ENERGY STAR Voluntary Labeling Program.

1.3 SYSTEM DESCRIPTION

A. Building B (Crew Building):

1. 90ft by 200ft prefabricated, pre-engineered metal framed primary building with 5ft by 60ft-2inch roof overhang. Primary building consists of rigid frames spanning the 90-foot direction.
2. Primary Building Bay Spacing: 20 feet
3. Primary Framing: Rigid frame of rafter beams and columns, end wall columns, portal frames, and wind bracing.
4. Columns: Straight (not tapered) legs below 11'-0" above finished floor.
5. Wall System: Preformed and prefinished insulated metal wall panels of vertical profile, with sub-girt framing/anchorage assembly and accessory components.
6. Roof System: Preformed and prefinished insulated metal roof panels of upslope profile, with sub-girt framing/anchorage assembly and accessory components.
7. Roof Slope: 3 on 12 roof slope for all sections.
8. Building Color(s): As selected by Architect from any of the manufacturer's standard and premium colors, minimum of 15 options.
9. Maximum baseplate dimensions: 12"x22"

B. Building C (Storage Building):

1. 70ft by 80ft prefabricated, pre-engineered metal framed primary building. Primary building consists of rigid frames spanning the 70-foot direction.
2. Primary Building Bay Spacing: 20 feet
3. Primary Framing: Rigid frame of rafter beams and columns, end wall columns, portal frames, and wind bracing.
4. Wall System: Preformed and prefinished insulated metal wall panels of vertical profile, with sub-girt framing/anchorage assembly and accessory components.
5. Roof System: Preformed and prefinished insulated metal roof panels of upslope profile, with sub-girt framing/anchorage assembly and accessory components.
6. Roof Slope: 1 on 12 roof slop for all sections.
7. Building Color(s): As selected by Architect from any of the manufacturer's standard and premium colors, minimum of 15 options.

C. Building G (Vehicle Maintenance Building):

1. 100ft by 360ft prefabricated, pre-engineered metal framed primary building. Primary building consists of rigid frames and continuous beam frames spanning the 100-foot direction.
2. Primary Building Bay Spacing: 20 feet
3. Primary Framing: Rigid frame of rafter beams and columns, end wall columns, portal frames, wind bracing, and framing as required for overhead crane.
4. Bridge Crane: 10-ton bridge crane with electric hoist and travel.
5. Wall System: Preformed and prefinished insulated metal wall panels of vertical profile, with sub-girt framing/anchorage assembly and accessory components.

6. Roof System: Preformed and prefinished standing seam metal roof panels of upslope profile, with sub-girt framing/anchorage assembly, insulation, liner sheets, and accessory components.
 7. Roof Slope: 3 on 12 roof slope for all sections.
 8. Building Color(s): As selected by Architect from any of the manufacturer's standard and premium colors, minimum of 15 options.
 9. Maximum baseplate dimensions: 12"x18"
- D. Secondary Framing (All): purlins, girts, eave struts, flange bracing, still supports, clips, and other items indicated on drawings.

1.4 DESIGN REQUIREMENTS

- A. Building B (Crew):
1. Design members to withstand dead loads, live loads, applicable seismic loads, wind loads, and other design loads calculated in accordance with IBC 2021, ASCE 7-16, and the following minimum wind design criteria: Risk Category IV, Exposure Category B, Ultimate Wind Speed of 146 mph.
- B. Building C (Storage Building):
1. Design members to withstand dead loads, live loads, applicable seismic loads, wind loads, and other design loads calculated in accordance with IBC 2021, ASCE 7-16, and the following minimum wind design criteria: Risk Category I, Exposure Category B, Ultimate Wind Speed of 140 mph.
- C. Building G (Vehicle Maintenance):
1. Design members to withstand dead loads, live loads, applicable seismic loads, wind loads, and other design loads calculated in accordance with IBC 2021, ASCE 7-16, and the following minimum wind design criteria: Risk Category IV, Exposure Category B, Ultimate Wind Speed of 146 mph.
- D. All: Design members to support mechanical and electrical equipment and fire sprinkler system piping (as required). Minimum collateral load shall be 5 psf.
- E. All: Maximum allowable deflection: As per IBC 2021, with no framing member exceeding 1/180 of span with imposed loads for exterior wall and roof system.
- F. All: Maximum allowable lateral drift: As per IBC 2021, with no primary framing member exceeding 1/400.
- G. All: Metal panel assemblies shall withstand the effects of loads and stresses within limits and under conditions indicated according to ASTM E 1592.
- H. All: Provide drainage to exterior for water entering or condensation occurring within wall or roof system.
- I. All: Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of 0 to 120 degrees F.

- J. All: Size and fabricate wall and roof systems free of distortion or defects detrimental to appearance or performance.
- K. Delegated Design (All): Design and structural analysis data and calculations shall be signed and sealed by a Registered Professional Engineer, licensed in the State of Louisiana, responsible for their preparation, to certify conformance with project specific design loads and governing code requirements as described herein and as indicated on the drawings. Engineering calculations and data to define and include cladding and cladding attachment for all applicable zones (field, perimeter, corner, overhang, etc.).

1.5 PERFORMANCE REQUIREMENTS

- A. Conform to applicable IBC 2021 and City of Lake Charles, LA for submission of design calculations, reviewed Shop Drawings and erection drawings as required for acquiring permits.
- B. Cooperate with regulatory agency or authority and provide data as requested authority by having jurisdiction.
- C. Provide components of each type from one manufacturer compatible with adjacent materials.

1.6 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate assembly dimensions, locations of structural members, connections, attachments, openings, cambers, loads; wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, method of installation; framing anchor bolt settings, sizes, and locations from datum, and foundation loads; indicate welded connections with AWS A2.4 welding symbols; net weld lengths. Provide professional engineer (licensed in the State of Louisiana) seal and signature.
 - 2. Manufacturer's Instructions: Submit preparation requirements and anchor bolt placement.
 - 3. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.
- B. Product data sheets for each type of door and accessory (includes personnel and overhead doors).
 - 1. Construction details, material descriptions, dimensions of individual components, profile door sections, and finishes
 - 2. Rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with AISC S335, AISC 360-10 and MBMA Low Rise Building Systems Manual.
- B. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.
- C. Perform Work in accordance with the State of Louisiana and City of Lake Charles standard.

1.8 QUALIFICATIONS

- A. Manufacturer Qualifications: A qualified manufacturer.
 - 1. Company specializing in manufacturing products specified in this section with minimum three years documented experience.
 - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified Professional Engineer.
- B. Erector: Company specializing in performing Work of this section with minimum three years' experience and approved by manufacturer.
- C. Design structural components, develop shop drawings, under direct supervision of a Professional Engineer experienced in design of this Work and licensed in the State of Louisiana.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Protect foam-plastic insulation as follows:
 - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.

- E. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.

1.10 WARRANTY

- A. Furnish five-year manufacturer warranty for pre-engineered building systems and all components.

PART 2 - PRODUCTS

2.1 PRE-ENGINEERED BUILDINGS

- A. Furnish materials according to AISC 360-16, the State of Louisiana and City of Lake Charles standards.

2.2 COMPONENTS - FRAMING

- A. Structural Steel Members: ASTM A36/A36M. A572/A572M, Grade 50.
- B. Plate or Bar Stock: Minimum ASTM A36 (Match structural members).
- C. Headed Anchor Bolts: ASTM F1554 Grade 36, galvanized.
- D. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M) or ASTM A490 (ASTM A490M) galvanized.
- E. Welding Materials: AWS D1.1; type as required for materials being welded.
- F. Primer: SSPC Paint 20, Red Oxide.
- G. Non-Shrink Structural Grout: ASTM C1107/C1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,000 psi in 48 hours and 7,000 psi in 28 days.

2.3 COMPONENTS - WALL AND ROOF SYSTEM

- A. As specified on Architectural drawings.

2.4 COMPONENTS - METAL DOORS AND FRAMES

- A. MATERIALS
 - 1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

2. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
3. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 metallic coating.
4. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized.
 - a. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
5. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
6. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.
7. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
8. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- 9.

B. FABRICATION

1. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
2. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.

C. STEEL FINISHES

1. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
 - a. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.
2. Factory-Applied Paint Finish: Manufacturer's standard, complying with ANSI/SDI A250.3 for performance and acceptance criteria.

2.5 FABRICATION - FRAMING

- A. Fabricate members according to AISC requirements for plate, bar, tube, or rolled structural shapes.
- B. Anchor Bolts: Formed with straight shank, assembled with template for casting into concrete.

- C. Provide framing for exterior penetrations including (but not limited to) door, window, louver, and ventilator openings.

2.6 FABRICATION - WALL AND ROOF SYSTEMS

- A. Siding: Designed to comply with code requirements. Minimum 24-gauge metal thickness, profile indicated on drawings.
- B. Roofing: Designed to comply with code requirements. Minimum 24-gauge metal thickness, profile indicated on drawings.
- C. Girts/Purlins: Rolled formed structural shape to receive siding, roofing sheet.
- D. Internal and External Corners: Same material thickness and finish as adjacent material, profile brake formed to required angles.
- E. Expansion Joints: Same material and finish as adjacent material manufacturer's standard brake formed.
- F. Flashings, Closure Pieces, Fascia, Infills and Caps. Same material and finish as adjacent material, profile to suit system.
- G. Fasteners: To maintain load requirements and weather tight installation, same finish as cladding, non-corrosive finish.

2.7 FABRICATION - GUTTERS AND DOWNSPOUTS

- A. Fabricate of same material and finish as roofing metal.
- B. Form gutters and downspouts of profile and size as indicated to collect and remove water. Minimum gutter and downspout size to be 6" square. Fabricate with connection pieces.
- C. Form sections in maximum possible lengths. Hem exposed edges. Allow for expansion at joints.
- D. Fabricate support straps of same material and finish as roofing metal, color as selected.

2.8 FACTORY FINISHING

- A. Interior Framing Members: Clean, prepare, and prime to SSPC Manual requirements.
- B. Exterior Framing Members: Clean, prepare, and galvanize to ASTM A123.
- C. Galvanizing for Nuts, Bolts and Washers: ASTM A153/A153M.

- D. Interior Surfaces of Wall and Roof Components and Accessories: Pre-coated enamel on steel as selected from manufacturer's standard range.
- E. Exterior Surfaces of Wall and Roof Components and Accessories: Pre-coated enamel on steel as selected from manufacturer's standard range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position.

3.2 ERECTION

- A. Framing:
 - 1. Erect framing according to AISC requirements.
 - 2. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.
 - 3. Set column base plates with non-shrink grout to achieve full plate bearing.
 - 4. Do not field cut or alter structural members without approval of Architect/Engineer.
 - 5. After erection, prime welds, abrasions, and surfaces not shop-primed. Repair galvanizing as required.
- B. Wall and Roofing Systems:
 - 1. Install Work according to MBMA standards.
- C. Gutters and Downspouts:
 - 1. Install Work according to MBMA standards.
- D. Accessories:
 - 1. Install Work according to MBMA standards.

3.3 ERECTION TOLERANCES

- A. Framing Members: 1/4 inch from level; 1/8 inch from plumb.
- B. Siding and Roofing: 1/8 inch from indicated position.

END OF SECTION 133419

SECTION 21 00 00 – FIRE PROTECTION GENERAL PROVISIONS

PART 1 - GENERAL



1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions) and Division 00 and 01 as appropriate, apply to the Work specified in this Section.
- B. Refer to all Sections, as well as the Specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding all work.

1.2 SYSTEM DESCRIPTION

- A. Fire protection system shall be a system employing automatic sprinkler heads attached to a piping system containing water and connected to an adequate water supply so that water discharges immediately from the sprinklers opened by fire.
- B. The fire protection system shall be the following:
 - 1. Standard-Pressure Sprinkler Piping: Automatic Wet-Pipe sprinkler system piping designed to operate at a working pressure of 175-psig maximum.
- C. The fire protection system shall be monitored by a fire alarm system.

1.3 DEFINITIONS

- A. Working Plans as used in this Section means those documents (including drawings and calculations) prepared pursuant to the requirements contained in NFPA 13 for obtaining approval of the authority having jurisdiction (AHJ).
- B. Pipe sizes used in this Specification are Nominal Pipe Size (NPS).
- C. Refer to NFPA Standard 13 for additional definitions for fire protection systems.

1.4 SCOPE OF WORK

- A. Furnish all materials, labor, tools, equipment and working plans necessary to install and place into operation the complete fire protection portion of this Contract as called for on the accompanying drawings and as specified herein.
- B. Interlock the fire protection system with the fire alarm system monitoring. If there is no fire alarm being provided under work of Division 26 – Electrical, this contractor shall provide a fire alarm communicator panel in the vicinity of the sprinkler entry riser. Contractor shall interlock the supervised valves (Post indicator valve, OS&Y valves, tamper switch(es), flow switch(es), etc.) with the communicator panel. The contractor shall provide a phone line to the communicator panel. Contractor shall

provide one year of monitoring. Contractor shall coordinate turn-over of the monitoring service with the owner. Contractor shall provide a complete and operable system as per specifications.

- C. Prior to start of the working plans of the fire protection system, the contractor shall coordinate and complete the "Owner's Information Certificate" form required by the State Fire Marshal. The form can be found at the State Fire Marshal's website <http://sfm.dps.louisiana.gov>. The form shall identify special occupancies and commodity classifications and shall be given to the fire protection system designer before the start of design.
- D. Contractor shall refer to the Architectural and Structural drawings and install equipment, piping, etc. to meet building and space requirements. No equipment shall be bid on or submitted for approval if it will not fit in the space provided.
- E. It is the intention of these specifications that all fire protection systems shall be furnished complete with all necessary valves, controls, insulation, piping devices, equipment, etc. necessary to provide a satisfactory installation that is complete and in good working order.
- F. Contractor shall visit the site and acquaint himself thoroughly with all existing facilities and conditions which would affect his portion of the work. Failure to do so shall not relieve the Contractor from the responsibility of installing his work to meet the conditions.
- G. This Contractor shall protect the entire system and all parts thereof from injury throughout the project and up to acceptance of the work. Failure to do so shall be sufficient cause for the Architect to reject any piece of equipment.
- H. Contractor shall include in the bid all offsets required in order to avoid conflict with ductwork, lights, grilles, structure, water lines, cable trays, conduits, etc. Offsets shall be made above intersecting ducts or pipes in order to minimize trapping of water.
- I. Coordinate installation of piping with other trades to assure that the piping can fit in the space provided. In general, the sprinkler piping shall be run at maximum height above the finished floor or between joists in order to minimize conflict with other trades. Obtain latest plan of Architectural, Mechanical, Plumbing, Structural and Electrical before preparing finished drawings.
- J. Contractor shall obtain the latest flow data from the local utility water company and assure prior to bid that adequate water pressures and flow are available for the system intended to be provided.

1.5 DEMOLITION

- A. The contractor shall visit the site prior to bid to determine the extent of work required to complete the project.

- B. Contractor shall coordinate demolition with owner. All equipment shall be salvaged for owner. Locate equipment as directed by owner. All equipment and materials not salvaged by the owner shall be removed from the site and discarded at the contractor's expense in a lawful manner.
- C. Contractor shall coordinate all work with general contractor and phase work as required by project.
- D. All equipment piping, etc. required to be removed to accommodate the modifications shall be removed.
- E. Contractor shall maintain services to existing facilities which shall remain during and after construction is complete.
- F. Contractor shall coordinate any shutdown of services with the owner. It is intended that the building will remain occupied during construction. Contractor shall schedule shut down of services with the owner in order to prevent disruption of building occupancy.
- G. Contractor shall be responsible for draining down of existing systems to complete demolition. All work shall be scheduled with the owner. Contractor shall also be responsible for refilling system and removing all air in order to return the systems to proper operating conditions.

1.6 BIDDING REQUIREMENTS AND RESPONSIBILITIES

- A. Each bidder shall be licensed to perform sprinkler work in the State of Louisiana and shall be recognized by the Property Insurance Association of Louisiana as a reliable sprinkler contractor.
- B. Prime bidder is responsible for all work, of all trades and sub-contractors bidding this project. It is the prime bidder's responsibility, prior to submitting a bid to ensure that sub-contractors coordinate all aspects of the work between trades, sub-contractors, etc. to the fullest extent possible.
- C. Prime bidder shall ensure that all sub-contractors, suppliers, equipment vendors, etc., obtain all necessary and pertinent contract document information pertaining to their work prior to the submission of a bid. Contractor shall realize that different sub-contractors may furnish equipment, accessories, devices, etc. necessary for a complete and working installation require provisions of services by another sub-contractor or trade.
- D. Bidders of all or any portions of this section or division are required to review all contract documents including but not limited to Architectural drawings, Structural drawings, Mechanical drawings, Plumbing drawings, Electrical drawings, etc. to coordinate requirements and responsibilities with and through prime bidder.

- E. Bidders of all or any portions of this section or division, by furnishing a bid on a portion of the prime contract are indicating that they have received all contract documents and coordinated services provided under their portion of the work with the prime bidder; they are indicating that they have expressed any pertinent questions (which would result from a detailed, thorough review of the entire set of contract documents) to the prime bidder in accordance with Division 00 & 01 requirements, prior to bidding.
- F. All timely, pertinent, questions provided in writing prior to bids, in accordance with Division 00 & 01 requirements, will be clarified, defined, or otherwise explained in a written addendum and/or addendums prior to bids, in accordance in Division 00 & 01 requirements.
- G. It is not the intention of these contract documents to leave any issue relating to coordination between trades or sub-contractors vaguely defined. The intention is to define all issues, coordination matters, equipment requirements, sizes, routing, etc. to the satisfaction of the prime bidder, prior to receipt of bids.
- H. Bidders of all or any portions of this section or division, by virtue of the submission of a bid to the prime bidder, are indicating that they have reviewed the entire set of contract documents with due diligence and regard for the Owner's desire for a comprehensive and complete bid proposal; that they have expressed all concerns or questions requiring clarification on matters of coordination between trades and/or sub-contractors; that they have expressed any such concerns or questions in writing in accordance with Division 00 & 01 requirements.
- I. Prime bidders, by submission of a comprehensive bid on the project are indicating that the subcontractors selected in their bid have complied with all Division 00 & 01 requirements, that they have indicated in writing, prior to bidding, all questions or concerns requiring clarification and/or explanation and have documented any and all specific exclusions involving work that would generally be considered to be work of their trade.
- J. The prime bidder shall coordinate all work so that anything excluded by the bidder of all or any portions of this section or division, have been addressed prior to bids in one of the following manners:
 - 1. The work has been confirmed, by the prime bidder, to be work of another trade or subcontractor (whose proposal is also being accepted).
 - 2. Clarification of the matter has been made through the prime design professional via written addendum and is clearly and mutually understood by the prime bidder and the party raising the issue/question, or seeking clarification.
 - 3. The work has been accepted as the responsibility of the prime contractor directly.

1.7 MATERIAL AND EQUIPMENT

- A. The term "provide" when used in the Contract Documents includes all items necessary for the proper execution and completion of the Work.
- B. Specific reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgment of the Architect expressed in writing is equal to that specified.
- C. Coordinate and properly relate all Work of this Division to building structure and work of all other trades.
- D. Visit premises and become thoroughly familiar with existing conditions; verify all dimensions in field. Advise Architect of any discrepancies prior to Bid Date in accordance with Division 00.
- E. Do not rough-in for any item or equipment furnished by others or noted "Not in Contract" (NIC), without first receiving rough-in information from physically examining the existing equipment, receiving specific cut sheet information from the Owner's representative, other trades and/or Architect. Rough-in services for "NIC" equipment as required, as the work progresses.
- F. Provide storage and protection for all equipment and materials in accordance with requirements of Division 00 & 01. Replace any equipment and materials damaged by improper handling, storage, or protection, at no additional cost to Owner.
- G. Keep premises clean in accordance with requirements of Division 00 & 01.

1.8 EXTRA MATERIALS

- A. Sprinkler heads and cabinets: Provide spare sprinkler heads of each style included in the project. Furnish each style with its own special wrenches and in quantities as specified by NFPA 13. Minimum of six (6) spare heads required.
- B. Identify the storage cabinet and each spare sprinkler head with labels describing contents.

1.9 SUBSTITUTIONS

- A. Substitutions are only allowed by approval of the Architect prior to Bid Date as stipulated in Division 00 & 01.
- B. Design of systems is based on specific equipment. If the use of other manufacturer's equipment, even though approved by Architect, involves additional cost due to space requirements, foundation requirements, increased mechanical or

electrical services, the cost of such extra work shall be borne by Contractor. Even though a manufacturer's name appears in the Contract Documents as having acceptable equipment, their equipment with different model numbers shall be classified as being a substitute to the equipment originally designed for and named in the Contract Documents. Substitute equipment, materials, etc., will not be allowed to deviate from Contract Document requirements. Furnish all options specified or reasonably implied from the contract documents. Specifically identify any variance in regard to submittal versus specified performance on the cover sheet of each submittal.

1.10 POST-BID VALUE ENGINEERING (V/E):

- A. While it may be in the project Owner's interest to consider the first cost money saving that may be generated via alternatives and options generated via participation in Value Engineering, Division 21 contractor shall realize that substantive offers of Value Engineering (V/E), if accepted by the Owner, constitute a design-build agreement (offer and acceptance) with the owner, and drastically change the design concept of the project, as developed by the Professional of Record identified on the Contract Documents.
- B. Should contractor offer, and the owner accept value engineering options that alter aspects of the system design, equipment, performance and/or performance verification or monitoring of respective systems, Division 21 contractor shall provide duly licensed professional engineering consultants working on behalf of the Division 21 contractor (including sub-contractors and equipment vendors/manufacturers) to review, approve and take professional responsibility for performance and suitability of V/E hybrid systems, materials or operational changes related to respective V/E items. The Division 21 contractor's licensed professional engineering consultants and the Division 21 contractor assume any and all responsibility for the design and suitability in terms of performance, of hybrid systems installed, as Division 21 contractor's Professional of Record, absolving the original project Professional of Record (identified on the original Contract Documents, released for the original project Bid/Negotiation) from responsibility for the V/E hybrid systems portion of the work.
- C. Division 21 contractor, via the offer and acceptance of value engineering items on the project agrees to provide professional engineering design services and take full and complete responsibility for the hybrid design.
- D. Further, the Division 21 contractor's (V/E Items) professional of record (either employees, or independent consultants to the Division 21 contractor) through the offer and acceptance of V/E items, agree to indemnify and hold harmless the project owner, the owner's original A/E team (Professional of Record on behalf of the owner for the original Contract Documents) their heirs and assigns in regard to the V/E changes and their impact on the Division 21 systems altered, affected or modified, in whole or in part.

- E. The Professional of Record shown on the original Contract Documents in regard to the systems altered, adjusted, revised, modified or otherwise affected by the value engineering items implemented, shall be absolved of design responsibility as a result of implementation of V/E items, and their original use of Engineering Seals used for original Contract Documents, shall not apply.

1.11 DRAWINGS AND SPECIFICATIONS

- A. The specific intent of these Contract Documents is to provide the various systems, equipment, etc. to the Owner complete and in a thoroughly calibrated functional condition.
- B. The Drawings shall not be construed as shop drawings. In the event of a possible interference with piping or equipment of another trade, items requiring set grade and elevations shall have precedence over other items should any major interference develop, immediately notify the Architect.
- C. In laying out Work, refer to mechanical, electrical, structural, and architectural drawings at all times in order to avoid interference and undue delays in the progress of the Work.

1.12 CODES AND REGULATIONS

- A. Work shall be in full accord with the most stringent interpretation of the local AHJ, local ordinances, building codes, and other applicable national, local, and state regulations.
- B. Equipment shall conform to requirements and recommendations of the National bureau of Fire Underwriters and National Fire Protection Association (NFPA).
- C. Items provided under this Division shall comply with the American National Standards Institute (ANSI) "Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People," ANSI A 117.1
- D. In the possible event of conflict between codes or regulations and Contract Documents, the most stringent interpretation of either shall govern (provided if exceeds the requirements of other codes). In the event of an irreconcilable difference between codes or regulations notify the Architect/Engineer immediately.
- E. In addition to the codes heretofore mentioned, all work and equipment shall conform to the applicable portions of the following promulgated specifications, codes and/or regulations:
 - 1. NFPA 13
 - 2. NFPA 101
 - 3. National Electrical Code (NEC)
 - 4. International Building Code (2021 IBC)

- 5. Underwriters Laboratories (UL)
 - 6. LA State Fire Marshal Regulations
- F. All materials, equipment and accessories installed under this Contract shall conform to all rules, codes, etc. as recommended by National Associations governing the manufacturer, rating and testing of such materials, equipment and accessories. All materials shall be new and of the best quality and first class in every respect. Whenever directed by the Architect, the Contractor shall submit a sample for approval before proceeding.
- G. Where laws or local regulations provide that certain accessories such as gauges, thermometers, relief valves and parts be installed on equipment, it shall be understood that such equipment be furnished complete with the necessary accessories, whether or not called for in these Specifications.
- H. All unfired and fired pressure vessels shall be built in accordance with the A.S.M.E. Code and so stamped. Furnish shop certificates for each vessel. Contractor shall provide and pay for first operating certificate as per State Fire Marshal Regulations.

1.13 FEES, PERMITS, AND TAXES

- A. Obtain and pay for permits required for the Work of this Division. Pay fees in connection therewith, including necessary inspection fees.
- B. All permits, fees, certificates, etc. for the installation, inspections, plan review, service connections locations, and/or construction of the work which are required by any authority and/or agencies having jurisdiction, shall be obtained and paid for by the Contractor.
- C. The Contractor shall make all tests required by the Architect, Engineer or other governing authorities at no additional cost to the Owner.

1.14 REQUEST FOR APPEAL

- A. The Contractor shall be required to complete any appeal to the State of Louisiana Fire Marshal's Office required to address review comments associated with the fire protection system shop drawings. The Contractor shall be responsible for completing the appeal forms and submitting to the AHJ. The Contractor shall be responsible for the associated cost of the appeals associated with this project.

1.15 SUBMITTALS

- A. Product Data: Include each manufacturer's data sheet for each type sprinkler head, valve, pipe, piping specialty, fire protection specialty, specified.
- B. Plans and Diagrams: Working plans (drawings) shall be prepared by the contractor and found acceptable by all Authorities Having Jurisdiction before commencing fire protection installation.

- C. Contractor shall pay all applicable fees required, by all Authorities Having Jurisdiction, for the project thru completion of project.
- D. All drawings shall be made at minimum 1/8" scale and arranged same as contract drawings.
- E. Shop Drawings: Submit working drawings which have been prepared in accordance with the requirements contained herein and identified as "Working Drawings," including hydraulic calculations and manufacturers data sheets.
 - 1. Submit one (1) copy of the working drawings printed to scale, manufacturers' product data sheets, and hydraulic calculations to the Architect/Engineer for review.
 - 2. If the submittal is found acceptable the shop drawing review stamp will be applied to the shop drawing submittal. The submittal will then be scanned and a pdf copy will be transmitted to the contractor for electronic submittal to the State Fire Marshal's Office and all other Authorities Having Jurisdiction for review.
- F. Quality Control Submittals:
 - 1. Welders' qualification certificates.
 - 2. Test Reports and Certificates: Include "Contractor's Material & Test Certificate for Aboveground Piping" and "Contractor's Material & Test Certificate for Underground Piping" as described in NFPA 13.

1.16 QUALITY ASSURANCE

- A. Installer's Qualifications: Installation and alterations of fire protection piping, equipment, specialties, and accessories, and repair and servicing of equipment shall be performed only by a qualified installer. The term qualified means experienced in such work (experienced shall mean having a minimum of five (5) previous projects similar in size and scope to this project), familiar with all precautions required, and has complied with all the requirements of the Authority Having Jurisdiction. Upon request, submit evidence of such qualifications to the Engineer. Refer to Division-01 Section: "Definitions and Standards" for definitions for "Installers."

1.17 QUALIFICATIONS OF CONTRACTOR:

- A. The contractor shall be a qualified fire protection contractor, licensed by the State of Louisiana and directly engaged in the installation of automatic fire sprinkler systems and other fire protection equipment.
- B. Qualifications for Welding Processes and Operators: Comply with the requirements of AWS D10.9, Specifications for Qualifications of Welding Procedures and Welders for Piping and Tubing, Level AR-3."
- C. Regulatory Requirements: Comply with the requirements of the following codes

(Latest Edition):

1. NFPA 13 - Standard for the Installation of Sprinkler Systems.
2. UL and FM Compliance: Fire protection system materials and components shall be Underwriter's Laboratories listed and labeled, and Factory Mutual approved for the application anticipated.

1.18 MANUFACTURER'S DIRECTIONS

- A. Install and operate equipment and material in strict accord with manufacturer's installation and operating instructions. The manufacturer's instructions shall become part of the Contract Documents and shall supplement Drawings and Specifications.

1.19 GROUNDS AND CHASES

- A. This Contractor shall see that all required chases, grounds, holes and accessories necessary for the installation of his work are properly built in as the work progresses; otherwise, he shall bear the cost of providing them.

1.20 CUTTING AND PATCHING

- A. Initial cutting and patching shall be the responsibility of the General Contractor, with the various trades being responsible for laying out and marking any and all holes required for the reception of his work. No structural beams or joists shall be cut or thimble without first receiving the approval of the Architect. After initial surfacing has been done, any further cutting, patching and painting shall be done at this Contractor's expense.

1.21 PROTECTION OF EQUIPMENT AND MATERIALS

- A. During the project the Contractor shall safe guard and take the necessary precautions to protect the equipment and materials from damage. Failure on the part of the Contractor to comply with the above to the entire satisfaction of the Professional of Record shall be a sufficient cause for rejection of the damaged piece of equipment, material and/or assembly. In this case the Contractor shall be responsible for replacing the damaged piece of equipment, material and/or assembly to the satisfaction of the Professional of Record.

1.22 CLEANING AND ADJUSTING:

- A. Upon completion of his work, the Contractor shall clean and adjust all equipment, controls, valves, etc.; clean all piping, ductwork, etc.; and leave the entire installation in good working order.

1.23 LOCAL CONDITIONS

- A. The location and elevation of all utility services is based on available surveys and

utility maps and are believed to be reasonably accurate; however, these shall serve as a general guide only, and the Contractor shall visit the site and verify the location and elevation of all services to his satisfaction in order to determine the amount of work required for the execution of the Contract.

- B. In case major changes are required, this fact, together with the reasons therefore, shall be submitted to the Architect, in writing, not less than seven (7) days before the date of bidding. Failure to comply with this requirement will make the Contractor liable for any changes, additions and expenses necessary for the successful completion of the project.

1.24 MINOR DEVIATIONS

- A. Plans and detail sketches are submitted to limit, explain and define conditions, specified requirements, pipe sizes, etc. Structural or other conditions may require certain modifications from the manner of installation shown, and such deviations are permissible and shall be made as required. However, specified sizes and requirements necessary for satisfactory operation shall remain unchanged. It may be necessary to shift ducts or pipes, or to change the shape of ducts, and these changes shall be made as required. All such changes shall be referred to the Architect for approval before proceeding. Extra charges shall not be allowed for these changes.
- B. Only typical details are shown on the Plans. In cases where the Contractor is not certain about the installation of his work, he shall ask for details. Lack of details will not be an excuse for improper installation.
- C. In general, the drawings are diagrammatic and the Contractor shall install his work in a manner so that interferences between the various trades are avoided. In cases where interferences do occur, the Architect is to state which item was first installed.
- D. Contractor shall make note that the sprinkler head locations and piping layout are diagrammatic and the spaces shall have proper number of heads and proper pipe size in the contractor's bid.

1.25 PROJECT RECORD DOCUMENTS

- A. Keep Project Record Documents in accordance with requirements of Division 00 & 01.
- B. During construction period, keep accurate records of installations made under this Division, paying particular attention to major interior and exterior underground and concealed piping, ductwork, etc.
- C. The Contractor shall obtain at his cost, two sets of prints of the original bid documents by the Architect. One print set shall be kept on the site with all information as referenced below, and shall update same as the work progresses.

The other print set will be utilized to record all field changes to a permanent record copy for the Owner.

- D. If the Contractor elects to vary from the Contract Documents and secures prior approval from the Architect for any phase of the work, he shall record in a neat and readable manner, all such variances on the print set in red. The original print set shall be returned to the Architect for documentation.
- E. Provide electronic (PDF) copies of all documentation included in Final Report.
- F. All deviations from sizes, locations, and from all other features of the installations shown in the Contract Documents shall be recorded.
- G. In addition, it shall be possible using these drawings to correctly and easily locate, identify and establish sizes of all piping, directions and the like, as well as other features of the work which will be concealed underground and/or in the finished building.
- H. Locations of underground work shall be established by dimensions to columns, lines or walls, locating all turns, etc., and by properly referenced centerline or invert elevations and rates of fall.
- I. For work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases, this may be by dimension. In others, it may be sufficient to illustrate the work on the drawings in relation to the spaces in the building near which it was actually installed. The Architect's/Engineer's decision in this matter will be final.
- J. The following requirements apply to all "As-Built" drawings:
 - 1. They shall be maintained at the Contractor's expense.
 - 2. All such drawings shall be done carefully and neatly, and in a form approved by the Architect/Engineer.
 - 3. Additional drawings shall be provided as necessary for clarifications.
 - 4. These drawings shall be kept up-to-date during the entire course of the work and shall be available upon request for examination by the Architect/Engineer; and when necessary, to establish clearances for other parts of the work.
 - 5. "As-built" drawings shall be returned to the Architect upon completion of the work and are subject to approval of the Architect/Engineer.

1.26 USE OF ELECTRONIC (CAD) MEDIA

- A. Electronic media (cadfiles) can be made available to the Contractor by filling in the information on the next page, agreeing to the single use waiver and submitting to the Architect/Engineer.

NAME OF PROJECT : _____

1.27 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Provide the owner a copy of NFPA 25 "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems" to be kept on site.
- B. Provide the Owner with three (3) copies of printed instructions indicating various pieces of equipment by name and model number, complete with parts lists, maintenance and repair instructions and test and balance report.

1.28 GUARANTEE

- A. The Contractor shall guarantee all materials, equipment and workmanship for a period of one (1) year from the date of final acceptance of the project. This guarantee shall include furnishing of all labor and material necessary to make any repairs, adjustments or replacement of any equipment, parts, etc. necessary to restore the project to first class condition. This guarantee shall exclude only the changing or cleaning of filters. Warranties exceeding one (1) year are hereinafter specified with individual pieces of equipment.
- B. If the Contractor's office is in excess of a fifty (50) mile radius of the project, he shall appoint a local qualified contractor to perform any emergency repairs or adjustments required during the guarantee period. The name of the contractor appointed to provide emergency services shall be submitted to the Architect for his approval.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 21 00 00

SECTION 21 11 00 – SPRINKLER PIPING

PART 1 - GENERAL



1.1 SECTION INCLUDES

- A. Pipe, fittings, valves, covers, and connections for combination sprinkler and standpipe systems including exterior piping systems.

1.2 RELATED SECTIONS

- A. Division 21, Section 21 00 00- "Fire Protection General Provisions"
- B. Division 21, Section 21 13 19 - "Sprinkler Systems"

1.3 REFERENCES

- A. ASME Boiler and Pressure Vessel Code Section IX - Welding and Brazing Qualifications.
- B. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings, Class 250.
- C. ASME B16.3 - Malleable Iron Threaded Fittings, Class 300.
- D. ASME B16.4 - Cast Iron Threaded Fittings, Class 250.
- E. ASME B16.5 - Pipe Flanges and Flanged Fittings.
- F. ASME B16.9 - Factory-made Wrought Steel Buttwelding Fittings.
- G. ASME B16.11 - Forged Steel Fittings, Socket-welding and Threaded.
- H. ASME B16.25 - Buttwelding Ends.
- I. ASME B36.10 - Welded and Seamless Wrought Steel Pipe.
- J. ASTM A135 - Electric-Resistance-Welded Steel Pipe.
- K. ASTM A47 - Malleable Iron Castings.
- L. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-coated Welded and Seamless.
- M. ASTM A795 - Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use.
- N. AWWA C110 - Ductile Iron and Gray Iron Fittings.

- O. AWWA C151 - Ductile Iron Pipe, Centrifugally Cast.
- P. NFPA 13 - Installation of Sprinkler Systems.
- Q. NFPA 24 - Installation of Private Fire Service Mains and Their Appurtenances.
- R. UL - Fire Resistance Directory.
- S. UL 262 - Gate Valves for Fire-Protection Service.
- T. UL 312 - Check Valves for Fire-Protection Service.
- U. UL 405 - Fire Department Connections.

1.4 SUBMITTALS FOR REVIEW

- A. Section - "Submittal Procedures": Procedures for submittals.
- B. Product Data: Provide manufacturers catalogue information. Indicate valve data and ratings.
 - 1. Grooved joint couplings and fittings shall be referred to on drawings and product submittals, and be identified by the manufacturer's listed model or series designation.
- C. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
 - 1. Sprinklers shall be referred to on drawings, submittals and other documentation, by the sprinkler identification number or Series designation as specifically published in the appropriate agency listing or approval.

1.5 SUBMITTALS AT PROJECT CLOSEOUT

- A. Section - "Closeout Submittals": Record actual locations of components and tag numbering.
- B. Operation and Maintenance Data: Include installation instructions and spare parts lists.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1. All grooved couplings, fittings, valves, and specialties shall be the products of a single manufacturer. Grooving tools shall be of the same manufacturer as the grooved components.
 2. All castings used for couplings housings, fittings, or valve and specialty bodies shall be date stamped for quality assurance and traceability.
- B. Installer Qualifications: Company specializing in performing the work of this section and shall be licensed to perform sprinkler work in the State of Louisiana.

1.7 REGULATORY REQUIREMENTS

- A. Conform as a minimum to UL and FM.
- B. Sprinkler Systems: As a minimum, conform work to NFPA 13.
- C. Welding Materials and Procedures: Conform to ASME Code and AWS D10.9.
- D. Valves: Bear UL and/or FM label or marking. Provide manufacturer's name and pressure rating marked on valve body.
- E. Products Requiring Electrical Connection: Listed and classified as suitable for the purpose specified and indicated.

1.8 DELIVERY, STORAGE, AND PROTECTION

- A. Refer to Architectural Specification Section -"Temporary Facilities & Controls": Transport, handle, store, and protect products.
- B. Deliver and store valves in shipping containers, with labeling in place.
- C. Provide temporary protective coating on cast iron and steel valves.
- D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- E. Store all materials a minimum of 12" above grade when stored in exterior environment, 6" when stored on slab. Do not allow materials to contact ground. Provide end caps on all piping to prevent dirt or other construction debris from entering piping while stored.

1.9 EXTRA MATERIALS

- A. Provide two sets of valve stem packings for each size and type of valve installed.

PART 2 - PRODUCTS

2.1 BACKFLOW PREVENTOR ASSEMBLY

A. Backflow Preventors:

1. Provide Reduced Pressure Principal or Double Check Assembly as required by local governing authority and at a location approved by the Authority Having Jurisdiction.
2. Enclose backflow assembly in a heated enclosure.

B. Heated Valve Assembly Enclosure

1. Provide factory assembled, heated, backflow preventor assembly enclosure. Enclosure shall be constructed and approved to ASSE Standard 1060 as a "Class I Freeze Protection Enclosure".
 - a. Acceptable Manufacturers
 - i. Hot Box
 - ii. Safe - T - Cover
2. Provide insulated valve enclosure on all above ground exposed fire protection piping. Insulate fire protection piping which is NOT located in heated valve box assembly.
3. Insulation shall be polyisocyanurate foam sprayed in place with a minimum of 1-inch thickness average coverage.
 - a. Dimensional stability shall be less than 2% linear shrinkage.
 - b. Compressive strength shall be 20 psi or greater.
 - c. Flame spread rating shall not exceed 25.
4. Enclosure shall be of aluminum.
5. Structural components shall be of aluminum.
6. Multi-sectional enclosures shall be fitted together with overlapping "tongue & groove" joints.
7. The enclosure shall be securely attached to a concrete base with anchor brackets installed on the interior of the enclosure, through the flange base of the enclosure itself or through a stainless steel anchor hinge.
8. Access panels shall be provided to allow access for operations and inspections without the removal of the entire enclosure.
9. Heating equipment shall be furnished by the enclosure manufacturer to maintain a temperature of 40 deg F with an outside temperature of (-) 10 deg. F.
 - a. Factory assemble heater shall be ETL, UL, or CSA certified.
 - b. Heating equipment shall be installed above the level of the backflow equipment.
 - c. Electrical power source shall be GFI protected, with a minimum of 18" clearance from the receptacle base to the top of slab.

2.2 BURIED PIPING

A. Ductile Iron Pipe: AWWA C151.

1. Fittings: AWWA C110, standard thickness.
2. Joints: AWWA C111, rubber gasket.

3. Mechanical Couplings: Shaped composition sealing gasket, stainless steel bolts, nuts, and washers.
 4. Listed and internally lined with cement or epoxy coated.
- B. PVC Pipe (On exterior of building) - ASTM - D2241; AWWA - C-900, Class 150-DR-18.
1. Fittings - AWWA C110.
 2. Joints - ASTM F-477; AWWA C-111.
 3. Mechanical Couplings - Shaped composition sealing gasket, stainless steel bolts, nuts and washers.
- C. Refer to Architectural Specification - "Excavation, Filling and Grading" for further specific trenching and backfilling requirements.

2.3 ABOVE GROUND PIPING

- A. General: Refer to PART 3 - Article 3.2 "PIPE APPLICATIONS" or on individual plan sheets for identification and type of piping where the below materials are used.
1. All above ground fire protection piping located within non-heated enclosures shall be insulated.
- B. Steel Pipe (Galvanized steel pipe manufactured in Korea shall not be accepted): ASTM A53; ASTM A135; ASTM A795; Schedule 10 and 40, black and galvanized.
1. Steel Fittings: ASME B16.9, wrought steel, butt welded; ASME B16.25, butt weld ends; ASME B16.5, steel flanges and fittings; ASME B16.11, forged steel socket welded and threaded.
 2. Ductile Iron Fittings: ASME B16.1, flanges and flanged fittings; ASME B16.4, threaded fittings; or ASTM A536 Grade 65-45-12 grooved end fittings.
 - a. Grooved - In applicable sizes, fittings shall be short-pattern, with flow equal to standard pattern fittings. Basis of Design: Victaulic FireLock.
 3. Malleable Iron Fittings: ASME B16.3, threaded fittings
 4. Mechanical Roll Grooved Couplings (Cut grooves not acceptable): Two (2) ductile iron housing clamps to engage and lock, "C" shaped or center-leg elastomeric sealing gasket with pipe stop to ensure proper groove engagement, alignment, and pipe insertion depth, ASTM A449 compliant steel bolts, nuts, and washers; galvanized for galvanized pipe. Anvil and Victaulic:
 - a. Rigid: Victaulic Style 009-EZ and 107N
 - b. Flexible: Victaulic Style 177 Installation Ready and Style 77
 - c. Listed for dry or wet pipe use.
 - d. Grooves shall be rolled (cut grooves not allowed).
 - e. Couplings shall be Installation-Ready in applicable sizes, for direct stab installation without field disassembly.

5. Installation-Ready™ fittings for Schedule 40 grooved end steel piping in fire protection applications sizes NPS 1-¼ thru 2½ (DN 32 thru DN 65). Fittings shall consist of a ductile iron housing with Installation-Ready™ ends, prelubricated Grade “E” EPDM Type ‘A’ gasket, and ASTM A449 electroplated steel bolts and nuts. UL listed for a working pressure of 300 psi (2065 kPa) and FM approved for working pressure 365 psi (2517kPa).
6. In lieu of threaded steel piping systems, the Victaulic FireLock IGS System with “Installation-Ready™” fittings and couplings may be used for NPS 1 (DN 25) Schedule 40 carbon steel pipe in fire protection applications. System rated for a working pressure to 365 psi (2517 kPa).
 - a. Groove: IGS “Innovative Groove System” groove with shortened “A” dimension and tapered groove backside for ease of installation.
 - b. Grooving Tool: Victaulic RG2100, with IGS Confirmation Gauge.
 - c. Fittings: Ductile iron housing conforming to ASTM A-536, Grade 65-45-12. Orange enamel coated or galvanized.
 - d. Victaulic Style 101 (90-degree elbow), Style 102 (tee), and Style 108 (coupling) with Installation-Ready™ ends.
 - e. Style 108 single-bolt coupling provided with EPDM Type A pressure responsive gasket with Vic-Plus lubricant, and ASTM A449 compliant electroplated steel bolt and nut. CrMo alloy steel coupling linkage.

2.4 PIPE HANGERS AND SUPPORTS

- A. Conform to the General Requirements of NFPA 13 and the additional design and installation requirements as listed below:
 1. Provide hangers and vertical piping restraints within 12 inches on all sprinkler drops at end of branch where system pressure exceeds 100 psig in accordance with NFPA 13.
 2. Provide hangers within 12 inches of each turn of direction (horizontal elbow) in sprinkler piping.
 3. Powder- driven Studs are not acceptable.
 4. Prime coat all sprinkler pipe hangers where indicated in Part 3 - “Execution”
 5. Hangers for Pipe Sizes 1 through 6 Inch: Provide Carbon steel, adjustable swivel, split ring hangers.
 6. Multiple or Trapeze Hangers: Steel pipe or steel angles with welded spacers and hanger rods.
 7. Vertical Support: Steel riser clamps.
 8. Floor Support: Cast iron adjustable pipe saddles, lock nut, nipple, floor flange, and concrete pier or steel support.

2.5 FIRE PROTECTION GATE VALVES

- A. Up to and including 2 Inches:

1. Manufacturers:
 - a. Nibco Model T-104-O.
 - b. Kennedy Model KS-FW
2. Bronze body, bronze trim, rising stem, handwheel, solid wedge or disc, threaded ends.

B. Over 2 Inches:

1. Manufacturers:
 - a. Nibco Model F-697-0., F-609
 - b. Kennedy Model KS-FW
 - c. Victaulic Series 771
2. Iron body, bronze trim, rising stem, pre-grooved for mounting tamper switch, handwheel, OS&Y, solid bronze or cast iron wedge, flanged, or grooved ends. 250 psi pressure rated

2.6 BALL VALVES

A. Up to and including 2 Inches (Ball valves are not to be used over 2 inches):

1. Manufacturers:
 - a. NIBCO KG-505-W-8
 - b. Victaulic Series 728
2. Brass two piece body, chrome-plated brass, full port, chrome plated bronze, or stainless steel ball, teflon seats and stuffing box ring, weatherproof actuator housing with supervisory switches and handwheel or lever handle and balancing stops, threaded or grooved ends. 300 psi pressure rated.

2.7 AUTOMATIC AIR VENT VALVES

A. Automatic Air Vent:

1. Manufacturers:
 - a. Potter Model "PAV" with ball valve and Potter Model RBVS tamper switch
2. Manufacturers:
 - a. Engineered Corrosion Solutions Model "PAV-W" Automatic Air Vent with ball valve and Potter Model RBVS tamper switch

2.8 BUTTERFLY VALVES

A. Cast or Ductile Iron Body:

1. Manufacturers:
 - a. Kennedy Fig. G300 or 01G
 - b. Victaulic Series 705
2. Cast or ductile iron, chrome or electroless-nickel plated ductile iron or

aluminum bronze disc, pressure responsive resilient replaceable EPDM seat, stainless steel stem (offset from the disc centerline to provide complete 360-degree circumferential seating), wafer, lug, or grooved ends, extended neck, with weatherproof actuator housing and handwheel with gear drive and integral indicating device, and internal tamper switches rated 10 amp at 125 volt AC. 300 psi pressure rated.

2.9 CHECK VALVES

A. Up to and including 2 Inches:

1. Manufacturers:
 - a. Nibco Model KT403W
 - b. Victaulic Series 717
2. Bronze body and swing disc, rubber seat, threaded ends.
3. Ductile iron body with stainless steel spring for vertical or horizontal installation, grooved ends. 250 psi rated.

B. Over 2 Inches:

1. Manufacturers:
 - a. Nibco Model G917-W
 - b. Victaulic Series 717
2. Ductile iron body, bronze trim, spring-assisted swing check for vertical or horizontal installation with stainless steel or rubber / elastomer encapsulated disc, renewable disc and seat, grooved or flanged ends with automatic ball check. 250 psi pressure rated.

2.10 BACKFLOW PREVENTER VALVE ASSEMBLY

A. Manufacturer

1. Wilkins
 - a. Model 350 ASTDA with by-pass meter, bypass double check valve assembly OS&Y Valves and tamper switches
2. Apollo Valves
 - a. Model DCDALF 4A with by-pass meter, bypass double check valve assembly, OS&Y Valves and tamper switches

2.11 FIRE HYDRANTS

- A. The fire hydrants to be supplied under this contract shall conform to AWWA Standards C 50 - 73 or updated revisions thereof for improved type three-way hydrants, suitable for a working pressure of 150 pounds per square inch, and shall contain the following features:

- B. Two (2), 2 1/2" hose nozzles and one (1), 4 1/2" pumper nozzle.

- C. Compression type main valve. Valve opens against pressure and closes with pressure.
- D. Main valve and valve seat replaceable without digging up fire hydrant
- E. Bronze upper valve plate, bronze main valve seat, and non-corrodible double drain valves with treated leathers, rubber main valve.
- F. "O" ring seals between dry top and main body.
- G. All hydrants shall contain a breakaway feature at ground level consisting of breakaway bolts or flange and breakable coupling on the rod.
- H. The size of valve opening shall be 5 1/4".
- I. The inlet size shall be mechanical joint 6" and inlet.
- J. All hydrants shall have a National Standard 1 1/2" pentagon operating nut and shall open counterclockwise.
- K. The hose nozzle thread shall conform to National Standard Fire Hose Coupling Thread.
- L. The pumper nozzle thread shall conform to the National Standard Thread.
- M. The hydrant shall be lubricated according to manufacturer's recommendations when installed.
- N. The exterior of the hydrant shall be painted with enamel and shall be repainted after installation. Color shall be yellow #54-302 PPG or equal.
- O. Hydrant bury shall be three, four, five, and six feet.
- P. Hydrant extension sections shall be furnished by the same manufacturer as for the hydrant to which section is to be added.
- Q. One hydrant wrench shall be furnished with each ten (10) hydrants, of fraction thereof.
- R. All nozzle caps shall have extra long, heavy (no smaller than five gauge) link chains that will not kink. The chain loop at the cap end shall permit free turning of the caps.
- S. The hydrants to be supplied under this contract shall be Mueller "Centurion", Dresser "Reliant", American "B-84-B" and Kennedy "K-8 I-A Guardian".

PART 3 - EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends.
 - 1. Remove burrs.
 - 2. Bevel or groove plain end ferrous pipe.
 - 3. Remove scale and foreign material, from inside and outside, before assembly.
 - 4. Prepare piping connections to equipment with flanges or unions.
 - 5. Unions and flanges for servicing or disconnect are not required in installations using grooved mechanical joint couplings.

3.2 PIPE APPLICATIONS

- A. Underground Pipe: Listed, lined, ductile iron pipe and fittings, 250 lb working pressure. Refer to Architectural Specification - "Excavation, Filling and Grading" for further specific trenching and backfilling requirements.
 - 1. Depth of Bury:
 - a. Minimum 36 inches depth of bury from top of pipe to finished grade in accordance with NFPA 24.
 - i. Provide pipe tape markers and # 12 copper trace wire over entire length of pipe.
 - b. Minimum 42 inches depth of bury under driveways, slabs, parking lots, etc., in accordance with NFPA 24.
 - i. Provide pipe tape markers and # 12 copper trace wire over entire length of pipe.
- B. Underground Pipe: Listed C900 DR 18 PVC pipe and ductile iron fittings, 150 lb working pressure. Refer to Architectural Specification - "Excavation, Filling and Grading" for further specific trenching and backfilling requirements.
 - 1. Depth of Bury:
 - a. Minimum 36 inches depth of bury from top of pipe to finished grade in accordance with NFPA 24.
 - i. Provide pipe tape markers and # 12 copper trace wire over entire length of pipe.
 - b. Minimum 42 inches depth of bury under driveways, slabs, parking lots, etc., in accordance with NFPA 24.
 - i. Provide pipe tape markers and # 12 copper trace wire over entire length of pipe.
- C. Above Ground Pipe: Provide piping in accordance with the following schedule of systems:
 - 1. Sprinkler pipe (wet pipe - 1 1/4 inches & below): Schedule 40 steel pipe - screwed fittings or with rolled grooves and roll grooved fittings where the fittings are designed to prevent the pipe from rotating.
 - 2. Sprinkler pipe (wet pipe - 1 1/2 thru 5 inches): Schedule 40 steel pipe with

- rolled grooves and roll grooved fittings
- 3. Sprinkler pipe (wet pipe - 6 inches and larger): Schedule 10 steel pipe with rolled grooves and roll grooved fittings
- 4. Drain lines: Schedule 40 galvanized steel pipe - screwed or grooved fittings

*All exposed sprinkler pipe where indicated to be painted shall be properly prepared for painting.

3.3 INSTALLATION OF FIRE HYDRANTS:

- A. General: Install fire hydrants when called for in accordance with AWWA M17 "Installation, Operation, and Maintenance of Fire Hydrants".
- B. Hydrants shall be placed with pumper nozzles facing the street and shall be located as indicated on the contract drawings. Each hydrant shall be placed on a concrete base and shall be secured against dislocation, as indicated on the typical detail drawings. A minimum of seven (7) cubic feet of clean washed gravel shall be placed around each hydrant base. Backfill above gravel shall be thoroughly tamped.
- C. Hydrants of the required bury shall be used at each location, and each shall be buried to the point indicated on the barrel. Cutting or filling around the hydrant will be required as may be necessary to meet existing grades. Where necessary, and where required by the Engineer, hydrant extension sections shall be installed to adjust the hydrant to grade.
- D. Hydrants shall be placed plumb and with back side at the utility easement line, unless otherwise directed by the Engineer. Hydrants shall be properly lubricated and shall be in good working order before acceptance. Touch-up painting will be required prior to acceptance.
- E. Location: Install fire hydrants minimum of 40'-0" from building outside wall, or as indicated.
- F. Shutoff Valves: Install shutoff valve ahead of each hydrant.
- G. The fire hydrant bury shall be three and one-half feet (31/2) except where conditions are not favorable in which case the Contractor shall select the correct hydrant bury to fit the existing ground elevations subject to approval of the Engineer.

3.4 INSTALLATION

- A. Heated Backflow Prevention Device enclosure shall be assembled and mounted on concrete pad in accordance with the manufacturer's published installation instructions.

1. Enclosure shall be installed plumb, level, and square.
- B. Install piping in accordance with NFPA 13 for Sprinkler Systems, NFPA 14 for Standpipe and Hose systems, and NFPA 24 for service mains. Refer to Architectural Specification "Excavation, Filling and Grading" for further specific trenching and backfilling requirements.
- C. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- D. Install piping to conserve building space, to not interfere with use of space and other work.
- E. Group piping whenever practical at common elevations.
- F. Sleeve pipes passing through partitions, walls, and floors.
- G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- H. Pipe Hangers and Supports:
 1. Install in accordance with NFPA 13 and NFPA 14 except where specifically indicated in order to raise the minimum standards set by NFPA.
 2. Install hangers to provide minimum ½ inch space between finished covering and adjacent work.
 3. Place hangers within 12 inches of each horizontal elbow.
 4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 5. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
 6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 7. Prime coat exposed steel hangers and supports or provide factory primed hangers and supports. Refer to Section - "Painting". Hangers and supports located in areas not generally in view of the general public including crawl spaces, pipe shafts, and above suspended ceiling spaces are not considered exposed.
- I. Electrical Service to Fire Protection Systems:
 1. Except for high voltage electrical service to fire pumps, jockey pumps, and pump controllers, if electrical circuits or services are required for the operation of the fire protection system(s) at a location selected by sprinkler designer, the sprinkler contractor shall coordinate the location and placement of required electrical circuit(s) with the electrical sub-contractor. It is the responsibility of the sprinkler contractor to

coordinate the number, size, type, and location of electrical circuits in the field with other trades. The fire protection contractor shall be responsible for providing and/or paying for all costs associated with providing electrical service for his equipment prior to bidding.

J. Drains:

1. Where sanitary sewer drains, storm drains, hub drains, floor drains, etc., are required for the draining of fire protection systems at a location indicated or selected by the sprinkler designer, the sprinkler contractor shall coordinate the location and placement of required drains with the plumbing sub-contractor. It is the responsibility of the sprinkler contractor to coordinate the number, type, and location of drains in field with other trades. Contractor shall be responsible for covering all costs associated with providing for and/or paying for drainage piping for his equipment prior to bidding.

K. Slope piping and arrange systems to drain at low points.

1. Use eccentric reducers to maintain top of pipe level.

L. Do not penetrate building structural members unless indicated.

M. Provide sleeves when penetrating building footings, floors and walls. Seal pipe and sleeve penetrations to achieve fire resistance rating equivalent to fire separation required.

N. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

O. Die cut threaded joints with full cut standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only.

P. Grooved Joints: Install in accordance with the manufacturers latest published installation instructions. Pipe ends shall be clean and free from indentations, projections, and roll marks in the area from the pipe end to (and including) the groove. Gasket shall be verified as suitable for the intended service. Contractor shall remove and replace any improperly installed products. Grooved coupling manufacturer's factory trained field representative shall provide on-site training for contractor's field personnel in the proper use of grooving tools, application of groove, and installation of grooved piping products. Factory trained representative shall periodically visit the jobsite to ensure best practices in grooved product installation are being followed. Contractor shall remove and replace any improperly installed products.

- Q. Install valves with stems upright or horizontal, not inverted. Remove protective coatings after installation.
 - 1. Provide gate or butterfly valves for shut-off or isolating service.
 - 2. Provide drain valves at main shut-off valves, low points of piping and apparatus.

3.5 TRAINING & DEMONSTRATION

- A. Demonstration Services: Arrange and pay for a factory-authorized service representative to train Owner's maintenance personnel on the following:
 - 1. Procedures and schedules related to start-up and shut down, troubleshooting, servicing, preventative maintenance, and how to obtain replacement parts.
 - 2. Familiarization with contents of Operating and Maintenance Manuals specified in Architectural Specification - "Closeout Submittals" and Division 15, Section - "Basic Mechanical Materials & Methods."
 - 3. Provide Service Manuals for each sprinkler system specified.
- B. Provide three (3) hours of factory authorized training and demonstration.
 - 1. Refer to Section - "Mechanical General Provisions" for video taping requirements.
 - 2. Schedule training with a minimum of seven (7) days notice to Owner's Representative.

END OF SECTION 21 11 00

SECTION 21 13 19 - SPRINKLER SYSTEMS

PART 1 - GENERAL



1.1 REQUIRED PRE-BID FLOW TESTS

- A. Prior to submitting a bid, the Sprinkler Contractor shall perform a flow test utilizing the nearest municipal fire hydrant(s) at the Project site in order to substantiate the basis of the Contractor's design. The flow test shall be performed using gauges which have been calibrated within twelve (12) months of the flow test. The flow test shall be performed in accordance with the recommendations included in NFPA 291.
 - 1. The Contractor shall utilize a five (5) psig reduction/safety factor in the field flow test data (static & residual) and a ten (10) percent reduction/safety factor in the flow in GPM obtained during the flow test for the basis of design in order to calculate and/or perform a hydraulic analysis of the proposed system.
- B. All flow test data shall be performed by the Contractor at no cost to Owner.
 - 1. Contractor shall notify the Owner's Representative a minimum of seven (7) days prior to flow tests being performed.
 - 2. Owner's Representative shall witness all flow tests.
 - 3. Provide a report to Owner's Representative stating location, time and duration of test.

1.2 SECTION INCLUDES

- A. Wet-pipe and dry-pipe sprinkler systems. Note!: Unless specifically so noted on plan sheets, the utilization of glycol anti-freeze wet-pipe sprinkler systems for freeze protection is not allowed!
- B. Sprinkler system design, installation, and certification including site work and insurances.
- C. Fire department connections.

1.3 RELATED SECTIONS

- A. Division 21, Section 21 00 00 - "Fire Protection General Provisions"
- B. Division 21, Section 21 11 00 - "Sprinkler Piping"

1.4 REFERENCES

- A. NFPA 13 - Installation of Sprinkler Systems.

- B. FM - Factory Mutual Approval Guide.
- C. NFPA 70 - National Electrical Code.
- D. UL - Fire Resistance Directory.
- E. UL 199 - Automatic Sprinklers.
- F. Warnock Hersey - Certification Listings.

1.5 SYSTEM DESCRIPTION

- A. The sprinkler system is to provide coverage for the entire building.
 - 1. Note: It is not the intent of this specification to design or to construct the sprinkler system in accordance with the "minimum" design criteria allowed by the applicable codes. Where indicated, certain areas, specific equipment or methods may exceed the "minimum" criteria required by applicable codes. Refer to Section - "Mechanical General Provisions", Article 1.3 - "Compliance with National & Local Code Requirements."
 - 2. The contractor shall refer to both plans and specifications in order to accomplish the design intent.
- B. Provide a system designed in accordance with NFPA 13 for Light hazard, Ordinary hazard, Group 1, Ordinary hazard, Group 2, or other hazard classification as indicated on the various plan sheet.
- C. Interface the sprinkler system with the building Fire and Smoke Alarm Systems and Smoke Evacuation systems. Coordinate electrical power requirements or control interfaces with the various sub-contractors.
- D. Provide fire department connections where indicated. Coordinate thread patterns with the local fire department serving the site.

1.6 ELECTRICAL REQUIREMENTS

- A. Note: It is the intent of this section that prior to bidding, the fire protection contractor shall coordinate and either provide, or pay to provide, all of the minor electrical power and control services, circuits, wiring and conduit required for the fire protection equipment.
- B. It is not the intent of this section that the fire protection contractor provide or pay for the necessary electrical service to the emergency fire pump, jockey pump, controllers or associated wiring and conduit required to connect fire protection devices (such as limit switches, flow switches, tamper switches, etc.) to the fire alarm system. Other coordination issues and requirements between sub-contractors, however, remain.

1.7 PLUMBING REQUIREMENTS

- A. Sprinkler Drains: "Note" - Where sewer or storm drains are required for any component of the sprinkler system such as pre-action cabinets, standpipes, risers, etc., the sprinkler contractor shall provide such drains as required to prevent spillage of water onto or within the building. Contractor shall coordinate with other trades and pay for and/or provide at the point of discharge, all floor drains, hub drains, catch basins, etc., needed for the maintenance and draining of the sprinkler system.

1.8 SUBMITTALS FOR REVIEW

- A. Refer to Architectural Specification - "Submittal Procedures": for full submittal requirements.
- B. Product Data: Provide data on all system components including fire pumps (if applicable), pipes, sprinklers, valves, flow switches, pressure reducing devices, meters, and other specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections. Contractor shall submit a minimum of one (1) printed set of shop drawings, hydraulic calculations, and equipment cut sheets to the Architect/Engineer for review. Architect/Engineer will review the submittal, and if it is found to be acceptable for submittal to the State Fire Marshals office for review, the Architect/Engineer will stamp it with their shop drawing review stamp. This stamped submittal will be scanned and a "PDF" copy will be E-mailed to the contractor for electronic submittal to the State Fire Marshall for review. Contractor shall be responsible for all fees and costs as may be required for final acceptance of system(s) by all Authorities Having Jurisdiction.
 - 1. Sprinklers shall be referred to on drawings, submittals and other documentation, by the sprinkler identification number or Model/Series designations as specifically published in the appropriate agency listing or approval.
- C. Shop Drawings: Submittal to the State Fire Marshal shall occur after Contractor has obtained a "No Exception Taken", or "Appears to Comply" comment on the System Shop Drawings from the Architect/Engineer. No payment will be made to the contractor for any automatic sprinkler system work until submittal is forwarded to the AHJ for approval.
 - 1. Provide project name, project address, occupancy and owner on application. Drawings shall include "Preparer of Shop Drawings" indicated on each sheet.
 - 2. Drawing shall be legible and drawn to a scale suitable for proper definition and clarity. In no case shall the scale be less than 1/8" = 1'- 0". Indicate partitions or small enclosures in which no sprinklers are to be installed. Provide graphic representation of the scale used on all plans.
 - 3. Submittal shall include a master list of all materials and equipment which

- is to be utilized for the project. Include manufacturers model number, size, color, and quantity of each.
4. Provide the number of sprinklers on each riser per floor.
 5. Provide the total number of sprinklers on each dry pipe system, pre-action system, combined dry pipe pre-action system, or deluge system.
 6. Provide the approximate capacity in gallons of each dry pipe system.
 7. Provide the location and electrical characteristics of all air compressors, pre-action cabinets, and any and all other components which require electrical services.
 8. Provide type of fittings and joints and location of all welds and bends. The contractor shall specify on the drawing any sections to be shop welded and the type of fittings or formations to be used.
 9. Indicate piping provisions for flushing.
 10. Provide kind, type and location of alarm bells.
 11. Provide size, location, of hose outlets, hand hose, and related equipment if used. The hydraulic reference point shown on plans shall correspond with comparable reference points on the hydraulic calculation sheets.
 12. Provide full height cross section of building or schematic diagram.
 13. Provide the occupancy class or each area or room identified.
 14. All sprinklers shall be identified by make, type, orifice size, temperature rating, thermal sensitivity including if applicable, all existing heads affecting the submitted scope of work.
 15. For large storage areas, provide the storage height, method of storage, description of commodities, etc. If the project is a specialized storage design, provide a complete design statement denoting the methodology for arriving at the project area/densities.
 16. All piping shall be identified by size, type, inside diameter, and schedule.
 17. Submit layout of finished ceiling areas indicating sprinkler head locations and type, fully coordinated with ceiling installation. Provide ceiling information such as heights, architectural profiles, (vaults, coffers, furrings, etc.), construction assembly, (combustible ceiling or framing, significant combustibles in ceiling cavity, etc.).
 18. Provide sprinkler obstructions denoted (suspended light fixtures, duct work, fire alarm strobes, fire alarm horns, speakers, motion detectors, or other architectural items.)
 19. Show all HVAC openings and all ductwork over 48" in width/height.
 20. Indicate the method of maintaining the sprinkler system at or above 40 deg F. Describe all unheated applicable areas and explain the methodology of all sizes, types, locations, etc. of freeze protection devices.
 21. Graphically highlight each hydraulic area (perimeter dashed lines, etc.) title each area on the plans with matching title on each calculation sheet.
 22. Provide the locations and ratings of fire walls, unprotected vertical openings, and other assemblies affecting sprinkler design.
 23. Provide a site plan showing location and size of city mains at street, denoting dead end or circulating or denote private supply system.
 24. Provide the total area protected by each system on each floor.
 25. Provide and indicate the location, type, and listing of each pipe hanger.

26. Provide the underground pipe size, length, location, type, point of connection to city main, bury depth, thrust blocks, and all appurtenances (valve types, water meters, backflow preventors, valve pits, etc.) with appropriate back-up data sheets denoting manufacturer's fire protection equipment listing and friction/pressure loss for each device.
27. Provide all hydraulic nameplate information.
28. Hydraulic reference points shall coordinate between the drawings and calculations.
29. Provide the setting for pressure reducing devices denoted.
30. Submit hydraulic calculations, building sections, site plan indicating piping layout, detailed building piping layouts, hangers and supports locations, sprinklers, components and accessories. Indicate system controls.

D. Hydraulic Calculations:

1. Verify that the water supply, test location, date (must be 4 months current) of peak demand time (or calculated adjustment) and account for test elevations at calculations. Reduce the static and residual pressures by 5 psig and calculate on this basis.
2. Verify the hazard classification (light, ordinary, special occupancy, etc.).
3. Verify the design criteria (density/sq. ft. over the hydraulic design area).
4. Verify the location of the design area calculated (most hydraulically demanding not always the most physically remote).
5. Verify the physical dimensions of the area calculated (design area shall not extend beyond the designated area served by each sprinkler). Sufficient length parallel to the branch lines or cross mains, as required.
6. Verify the densities (sprinklers flowing at or above minimum required flow rate).
7. Verify the pipe sizes, lengths, equivalent lengths of fittings, and flow paths (account for all pressure losses).
8. Verify the hose demand and provide the total quantity of water and the pressure required for hose streams both inside and outside.
9. Confirm that the system demand is at or less than the available water supply (include demand versus supply graph).
10. Sprinkler Drains: "Note" - Where drains are required for any component of the sprinkler system such as pre-action cabinets, standpipes, etc. the sprinkler contractor shall provide such drains as required to prevent spillage of water onto or within the building. Contractor shall coordinate with other trades and pay for and/or provide floor drains, hub drains, catch basins, etc. needed for the maintenance and draining of the sprinkler system.
11. Samples: Submit two samples of each style of sprinkler head specified.

1.9 SUBMITTALS AT PROJECT CLOSEOUT

- A. Section - Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.

- B. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds code requirements.
- C. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.
- D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- E. Provide a copy of NFPA 25 - "Standard for Inspection, Testing, and Maintenance of Water Based Fire Protection Systems."

1.10 QUALITY ASSURANCE

- A. Perform Work in accordance with NFPA 13. Maintain one copy on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.
- D. Design system under direct supervision of a NICET III Certified Technician experienced in design of this work and licensed in the State of Louisiana. The Fire Protection contractor shall be licensed for fire protection work in the State of Louisiana.

1.11 REGULATORY REQUIREMENTS

- A. Conform to UL, FM.
- B. Perform Work in accordance with NFPA 13.
- C. Equipment and Components: Bear UL, FM, label or marking.
- D. Products Requiring Electrical Connection: Provide products that are listed and classified by Underwriters Laboratories Inc., or other testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.
- E. Fire Protection Contractor shall be licensed to perform fire protection systems design and installation in the State of Louisiana.

1.12 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section.

1. Provide seven (7) days advanced notice to Owner's Representative.

1.13 DELIVERY, STORAGE, AND PROTECTION

- A. Section - Product Requirements: Transport, handle, store, and protect products.
- B. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.14 EXTRA MATERIALS

- A. Provide extra sprinklers under provisions of NFPA 13.
- B. Provide suitable wrenches for each sprinkler type.
- C. Provide metal storage cabinet in location designated.

PART 2 - PRODUCTS

2.1 SPRINKLERS

- A. Sprinklers shall be glass bulb type, with hex shaped wrench boss integrally cast into the sprinkler body to reduce the risk of damage during installation.
 1. Wrenches shall be provided by the sprinkler manufacturer that directly engage the hex-shaped wrench boss integrally cast in the sprinkler body.
- B. Both threaded and grooved sprinklers are accepted.
 1. UL listed and FM approved rigid coupling to join sprinklers with IGS profile grooved ends to matching 1" IGS outlets; Coupling consists of two cast copper-alloy housing segments for connection of ½", ¾", and 1" sprinklers. Coupling includes an EPDM Type A gasket, with zinc-plated cap screws conforming to ASTM F835, and nylon insert locknut. Installation-ready, for direct push installation without field disassembly. Rated for a working pressure to 175 psi.
- C. Suspended/Finished Ceilings
 1. Manufacturers:
 - a. Victaulic Series FL-QR/C
 - b. Viking Microfast -Quick Response Concealed Sin No. VK 462
 - c. Reliable SIN RA3415
 2. Type: Concealed Quick Response pendant type with push on thread off cover plate.
 3. Finish: Color by Architect.
 4. Cover Plate Finish: Color by Architect.

5. Fusible Link: Glass bulb type temperature rated for specific area hazard.
6. Location: In center of modular ceiling tile

D. Exposed Area Type:

1. Manufacturers:
 - a. Victaulic Series FL-QR
 - b. Viking Microfast .Model M Sin No. VK 302
 - c. Reliable SIN RA 1414
2. Type: Standard coverage Quick Response Pendant type.
3. Finish: Brass.
4. Fusible Link: Glass bulb type temperature rated for specific area hazard.

E. Exposed Area Type:

1. Manufacturers:
 - a. Victaulic Series FL-QR
 - b. Viking Microfast .Model M Sin No. VK 300
 - c. Reliable SIN RA 1425
2. Type: Standard coverage Quick Response Upright type.
3. Finish: Brass.
4. Fusible Link: Glass bulb type temperature rated for specific area hazard.

F. Exposed Area Type:

1. Manufacturers:
 - a. Victaulic Series FL-SR
 - b. Viking.Model M Sin No. VK 102
 - c. Reliable SIN RA1314
2. Type: Standard coverage Standard Response Pendant type.
3. Finish: Brass.
4. Fusible Link: Glass bulb type temperature rated for specific area hazard.

G. Exposed Area Type:

1. Manufacturers:
 - a. Victaulic Series FL-SR
 - b. Viking.Model M Sin No. VK 100
 - c. Reliable SIN RA 1325
2. Type: Standard coverage Standard Response Upright type.
3. Finish: Brass.
4. Fusible Link: Glass bulb type temperature rated for specific area hazard.

2.2 PIPING SPECIALTIES

A. Wet Pipe Sprinkler Riser Check Alarm Valve:

1. Manufacturers

- a. Victaulic Series 751 Series or UMC Riser Check Assembly
 - b. Viking Easy Riser Swing Check Valve Model E-1, F-1
 - c. Reliable Model G
 - 2. Check type valve with divided seat ring, rubber faced clapper to automatically actuate electric alarm, with test and drain valve.
- B. Wet Pipe Sprinkler Zone Control Riser Valve Assembly:
 - 1. Manufacturers
 - a. Victaulic Zone Control Riser Module Series 747M or UMC Floor Universal Floor Control Assembly
 - b. Viking Easy Pac
 - c. Reliable Model "CR"
 - 2. The module shall consist of a butterfly control valve, test and drain valve combination with appropriate orifice, a UL Listed and FM approved Flow Switch, and a UL Listed and FM approved pressure relief valve
- C. Electric Alarm Bell:
 - 1. Manufacturers
 - a. Potter Electric Model MBA-6-24
 - b. System Sensor Model SSM 24-6
 - 2. Electrically operated red enameled gong.
- D. Fire Department Connections:
 - 1. Manufacturers:
 - a. Potter Roemer Model 5761
 - b. Guardian Model 6224
 - 2. Type: Free standing type with chrome plated finish.
 - 3. Outlets: Two (2)-way with thread size to suit fire department hardware; threaded dust cap and chain of matching material and finish.
 - 4. Drain: 3/4 inch automatic drip, outside.
 - 5. Label: "Auto. Sprinkler - Fire Department Connection".
 - 6. At the low point near each fire department connection, install a 90-degree elbow with drain connection to allow for localized system drainage. Basis of Design: Victaulic #10-DR.
- E. Supervisory Switches:
 - 1. Manufacturers
 - a. Potter Electric Model OSYSU-2, PCVS
 - b. System Sensor. Model OSY-2, PIBV2
- F. Flow Switches:
 - 1. Manufacturers
 - a. Potter Electric Model VSR-F

- b. System Sensor Model WFD Series
- G. Test and Drain Valve
 - 1. Manufacturers
 - a. Victaulic Series UTD (Universal Test and Drain)
 - b. AGF Model 1011A
 - c. Guardian Model 9210
 - d. Reliable Model "TD"
- H. Post Indicator Valve
 - 1. Manufacturers
 - a. Victaulic Series 772 valve with Series 774 upright post
 - b. Kennedy Style 2945-A
 - c. Nibco Model NIP-1AJ
- I. Flexible Sprinkler Hose Fitting for Fire Protection Service:
 - 1. Manufacturer: FlexHead Industries, Inc. and Victaulic Vic-Flex AH2/AH2CC
 - a. Substitutions: Allowed if substitute product meets regulatory requirements, performance criteria and material specifications listed below.
 - 2. Description:
 - a. Regulatory Requirements: Provide flexible stainless steel hose fittings that comply with the following requirements:
 - i. In accordance with General Requirements contained in specification.
 - ii. In accordance with NFPA 13.
 - 3. Performance Criteria: Comply with the following to suit project requirements:
 - a. FM 1637 Approval Standard for Flexible Sprinkler Hose with Treaded End Fittings
 - b. UL 2443 Standard for Flexible Sprinkler Hose with Fitting for Fire Protection Service.
 - c. ICC-ES AC-156 Acceptance Criteria for Seismic Qualification by Shake-Table Testing of Nonstructural Components and System
 - 4. Materials: Victaulic Vic-Flex Connection
 - a. Flexible Stainless Steel Sprinkler Drop System (with captured coupling style 108) may be used to locate sprinklers as required by final finished ceiling tiles and walls. The drop system shall consist of a braided type 304 stainless steel flexible tube, zinc plated steel Male threaded nipple or Victaulic Firelock IGS Groove Style 108 coupling for connection to branch-line piping, and a zinc plated steel reducer with a female thread for connection to a sprinkler head.

- b. The drop shall include a UL approved Series AH1 with 3" bend radius; AH2 or AH2-CC braided hose with a bend radius to 2" to allow for proper installation in confined spaces.
 - c. The hose shall be listed for [(4) bends at 31" length]
 - d. Union joints shall be provided for ease of installation.
 - e. The flexible drop shall attach to the ceiling grid using a one-piece open gate Series AB1 or AB2 bracket. The bracket shall allow installation before the ceiling tile is in place.
 - f. The braided drop system is UL listed for sprinkler services to 175 psi (1206 kPa) and FM Approved to 200 psi (1380 kPa)
- 5. Materials: FlexHead Superflex Commercial Sprinkler Connection
 - a. FlexHead Superflex flexible stainless steel hose assemblies:
 - i. Straight Hose Assembly Lengths (3 ft. length, Model #2036SF-50), (4 ft. length, Model #2048SF-50), (6 ft. length, Model #2072SF-50)
 - 1) ½ inch outlet
 - 2) 175 psi maximum rated pressure.
 - 3) Fully welded non-mechanical fittings, braided, leak-tested with minimum 1 inch true-bore internal corrugated hose diameter made of 100% 304 stainless steel including end fittings.
 - b. FlexHead Ceiling Bracket: Direct attachment type having integrated snap-on clip ends positively attached to the ceiling using tamper-resistant screws and removable attachment hub with set screw for attaching and adjusting flexible hose.
- 6. For Dry systems, In lieu of rigid connections to dry sprinkler heads, a Victaulic VicFlex™ dry sprinkler, Model VS1, may be used. The sprinkler shall provide a vertical or horizontal flexible connection with a bend radius to 2", and allow for up to 4 bends.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with NFPA 13
- B. Wrenches used to install the sprinkler heads shall be the wrench called for by the manufacturer of the sprinkler head. The use of any other wrench shall not be acceptable and contractor shall replace all heads which were improperly installed without the use of the correct sprinkler head wrench.
- C. Install equipment in accordance with manufacturers instructions.
- D. Install buried shut-off valves in valve box. Provide post indicator.
- E. Provide approved double detector check valve assembly at sprinkler system water source connection.

- F. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent siamese connections to allow full swing of fire department wrench handle.
- G. Locate outside alarm gong on building wall as indicated.
- H. Place pipe runs to minimize obstruction to other work.
- I. Do not install sprinkler heads that have been dropped, damaged, or show a visible loss of fluid. Never install sprinklers with cracked bulbs.
- J. Sprinkler bulb protector shall be removed by hand after installation. Do not use tools or any other device(s) that could damage the bulb in any way, to remove the protector.
- K. Place piping in concealed spaces above finished ceilings.
- L. Center sprinklers in two directions in ceiling tile and provide piping offsets as required, dependent upon spacing and coordination with ceiling elements.
- M. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
- N. Flush entire piping system of foreign matter.
- O. Install guards on sprinklers where indicated.
- P. Hydrostatically test entire system.
- Q. Require test be witnessed by Fire Marshal and Architect.

3.2 INTERFACE WITH OTHER PRODUCTS

- A. Ensure required devices are installed and connected as required to fire alarm system.

3.3 TRAINING & DEMONSTRATION

- A. Demonstration Services: Arrange and pay for a factory-authorized service representative to train Owner's maintenance personnel on the following:
 - 1. Procedures and schedules related to start-up and shut down, troubleshooting, servicing, preventative maintenance, and how to obtain replacement parts.
 - 2. Familiarization with contents of Operating and Maintenance Manuals specified in Division 1, Section- "Closeout Submittals" and Division 22, Section - "Basic Mechanical Requirements."

3. Provide Service Manuals for each sprinkler system specified.
- B. Provide three (3) hours of factory authorized training.
 1. Refer to Section - "Mechanical General Provisions" for video taping requirements.
 2. Provide seven (7) days advanced notice to Owner's Representative.

3.4 INSPECTIONS AND TESTS

- A. All fees, etc. for the installation, inspection, or construction of the work which are required by any authority and/or agencies having jurisdiction, shall be obtained and paid for by the contractor.
- B. All inspections, examination, and tests required shall be arranged and paid for by the contractor as necessary to obtain complete and final acceptance of the Fire Protection System. The contractor shall deliver certificates of all such inspections to the Architect/Engineer.
- C. Maintenance Instructions to the Owners: After installation of this system is completed and before it is accepted by the owner, the sprinkler contractor shall instruct the maintenance personnel on the care and maintenance of this system. Included in these instructions shall be the following:
 1. Two (2) original copies of NFPA 25 shall be furnished to the owner's maintenance personnel.
 2. Full sized copy of AS-BUILT sprinkler drawings, showing any modified locations of sprinkler heads/piping.
 3. Full sized print of Louisiana State Fire Marshal reviewed/stamped submittal including material data sheets, hydraulic calculations, and shop drawings.
 4. Normal conditions of the sprinkler system.
 5. Weekly test of alarm valve.
 6. Weekly test of waterflow indicator.
 7. Semi-Annual test of alarm valve and water flow indicator.
 8. Abnormal conditions and corrections.
 9. Maintenance.
- D. After the above instruction has been completed, this contractor shall notify the Architect/Engineer by letter of such. This letter should state the name(s) of the individuals receiving instructions.

3.5 INSPECTIONS

- A. For a period of one (1) year after acceptance, this contractor shall make two (2) inspections on the sprinkler system. One shall be six (6) months after acceptance and the other one (1) year after acceptance. This contractor shall furnish the owner with all inspection certificates after each inspection and

furnish the architect with two copies of the inspection certificate. After one year, the owner shall be responsible for arranging for inspections by a qualified sprinkler contractor.

END OF SECTION 21 13 19

SECTION 22 00 00 - PLUMBING GENERAL PROVISIONS



PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions) and Division 0 as appropriate, apply to the Work specified in this Section.
- B. Refer to all Sections, as well as the Specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding all work.

1.2 SCOPE OF WORK

- A. Furnish all labor and material necessary to provide and install the complete plumbing portion of this Contract as called for herein and on accompanying drawings. Parts of the plumbing division may be bid separately or in combination, at the Contractor's option; however, it shall be the responsibility of the General Contractor to assure himself that all items covered in the Plumbing Division have been included if he chooses to accept separate bids.
- B. It is the intent of this specification that all materials with temperatures below ambient conditions or conveying any fluid/gas at temperatures below 70 deg. F be insulated to completely eliminate the potential for condensation. Unless specified elsewhere in these specifications, for materials that do not require access, insulate with 2" thick 3/4# density fiberglass duct wrap insulation with foil face (seal all joints air and water tight). For materials requiring occasional access, use 2" thick closed cell rubberized insulation with re-sealable fabric joints (hook and loop type).
- C. Contractor shall refer to the Architectural and Structural drawings and install equipment, piping, etc. to meet building and space requirements. No equipment shall be bid on or submitted for approval if it will not fit in the space provided.
- D. It is the intention of these specifications that all plumbing systems shall be furnished complete with all necessary valves, controls, insulation, piping devices, equipment, etc. necessary to provide a satisfactory installation that is complete and in good working order.
- E. Contractor shall visit the site and acquaint himself thoroughly with all existing facilities and conditions which would affect his portion of the work. Failure to do so shall not relieve the Contractor from the responsibility of installing his work to meet the conditions.
- F. This Contractor shall protect the entire system and all parts thereof from injury throughout the project and up to acceptance of the work. Failure to do so shall be

sufficient cause for the Architect to reject any piece of equipment.

1.3 DEMOLITION

- A. The contractor shall visit the site prior to bid to determine the extent of work required to complete the project.
- B. Contractor shall coordinate demolition with owner. All equipment shall be salvaged for owner. Locate equipment as directed by owner. All equipment and materials not salvaged by the owner shall be removed from the site and discarded at the contractors expense.
- C. Contractor shall coordinate all work with general contractor and phase work as required by project.
- D. All equipment piping, etc. required to be removed to accommodate the modifications shall be removed.
- E. Contractor shall maintain services to existing facilities which shall remain during and after construction is complete.
- F. Contractor shall coordinate any shutdown of services with the owner. It is intended that the building will remain occupied during construction. Contractor shall schedule shut down of services with the owner in order to prevent disruption of building occupancy.
- G. Contractor shall be responsible for draining down of existing systems to complete demolition. All work shall be scheduled with the owner. Contractor shall also be responsible for refilling system and removing all air in order to return the systems to proper operating conditions.
- H. All shutdown of services shall be done at night during a time period approved by owner. The systems shall be required to be back up and running each morning unless otherwise approved by the owner.

1.4 GROUNDS AND CHASES

- A. This Contractor shall see that all required chases, grounds, holes and accessories necessary for the installation of his work are properly built in as the work progresses; otherwise, he shall bear the cost of providing them.

1.5 CUTTING AND PATCHING

- A. Initial cutting and patching shall be the responsibility of the General Contractor, with the Mechanical Contractor being responsible for laying out and marking any and all holes required for the reception of his work. No structural beams or joists shall be cut or thimble without first receiving the approval of the Architect. After initial surfacing has been done, any further cutting, patching and painting shall be done

at this Contractor's expense.

1.6 FILL AND CHARGES FOR EQUIPMENT

- A. Fill and charge with materials or chemicals all those devices or equipment as required to comply with the manufacturer's guarantee or as required for proper operation of the equipment.

1.7 BIDDING REQUIREMENTS AND RESPONSIBILITIES

- A. Prime bidder is responsible for all work , of all trades and sub-contractors bidding this project. It is the prime bidders responsibility, prior to submitting a bid to ensure that sub-contractors coordinate all aspects of the work between trades, sub-contractors, etc. to the fullest extent possible.
- B. Prime bidder shall ensure that all sub-contractors, suppliers, equipment vendors, etc., obtain all necessary and pertinent contract document information pertaining to their work prior to the submission of a bid. Contractor shall realize that different sub-contractors may furnish equipment, accessories, devices, etc. necessary for a complete and working installation, that require provision of services by another sub-contractor or trade.
- C. Bidders of all or any portions of this section or division are required to review all contract documents including but not limited to Architectural drawings, Structural drawings, Mechanical drawings, Plumbing drawings, Electrical drawings, etc. to coordinate requirements and responsibilities with and through prime bidder.
- D. Bidders of all or any portions of this section or division, by furnishing a bid on a portion of the prime contract are indicating that they have received all contract documents and coordinated services provided under their portion of the work with the prime bidder; they are indicating that they have expressed any pertinent questions (which would result from a detailed, thorough review of the entire set of contract documents) to the prime bidder in accordance with Division 0 & 01 requirements, prior to bidding.
- E. All timely, pertinent, questions provided in writing prior to bids, in accordance with Division 0 & 01 requirements, will be clarified, defined, or otherwise explained in a written addendum and/or addendums prior to bids, in accordance in Division 0 & 01 requirements.
- F. It is not the intention of these contract documents to leave any issue relating to coordination between trades or sub-contractors vaguely defined. The intention is to define all issues, coordination matters, equipment requirements, sizes, routing, etc. to the satisfaction of the prime bidder, prior to receipt of bids.
- G. Bidders of all or any portions of this section or division, by virtue of the submission of a bid to the prime bidder, are indicating that they have reviewed the entire set of contract documents with due diligence and regard for the Owner's desire for a

comprehensive and complete bid proposal; that they have expressed all concerns or questions requiring clarification on matters of coordination between trades and/or sub-contractors; that they have expressed any such concerns or questions in writing in accordance with Division 0 & 01 requirements.

- H. Prime bidders, by submission of a comprehensive bid on the project are indicating that the subcontractors selected in their bid have complied with all Division 0 & 01 requirements, that they have indicated in writing, prior to bidding, all questions or concerns requiring clarification and/or explanation and have documented any and all specific exclusions involving work that would generally be considered to be work of their trade. The prime bidder shall coordinate all work so that anything excluded by the bidder of all or any portions of this section or division, have been addressed prior to bids in one of the following manners:
1. The work has been confirmed, by the prime bidder, to be work of another trade or subcontractor (whose proposal is also being accepted).
 2. Clarification of the matter has been made through the prime design professional via written addendum and is clearly and mutually understood by the prime bidder and the party raising the issue/question, or seeking clarification.
 3. The work has been accepted as the responsibility of the prime contractor directly.

1.8 MATERIAL AND EQUIPMENT

- A. The term "provide" when used in the Contract Documents includes all items necessary for the proper execution and completion of the Work.
- B. Specific reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgement of the Architect expressed in writing is equal to that specified.
- C. Coordinate and properly relate all Work of this Division to building structure and work of all other trades.
- D. Visit premises and become thoroughly familiar with existing conditions; verify all dimensions in field. Advise Architect of any discrepancies prior to Bid Date in accordance with Division 0.
- E. Do not rough-in for any item or equipment furnished by others or noted "Not in Contract" (NIC), without first receiving rough-in information from physically examining the existing equipment, receiving specific cut sheet information from the Owner's representative, other trades and/or Architect. Rough-in services for "NIC" equipment as required, as the work progresses.
- F. Provide storage and protection for all equipment and materials in accordance with

- requirements of Division 0 & 01. Replace any equipment and materials damaged by improper handling, storage, or protection, at no additional cost to Owner.
- G. Keep premises clean in accordance with requirements of Division 0 & 01.

1.9 SUBSTITUTIONS

- A. Substitutions are only allowed by approval of the Architect prior to Bid Date as stipulated in Division 0 and/or Division 0 & 01.
- B. Design of systems is based on specific equipment. If the use of other manufacturer's equipment, even though approved by Architect, involves additional cost due to space requirements, foundation requirements, increased mechanical or electrical services, the cost of such extra work shall be borne by manufacturer of substituted equipment. Even though a manufacturer's name appears in the Contract Documents as having acceptable equipment, their equipment with different model numbers shall be classified as being a substitute to the equipment originally designed for and named in the Contract Documents. Substitute equipment, materials, etc., will not be allowed to deviate from Contract Document requirements. Furnish all options specified or reasonably implied from the contract documents. Specifically identify any variance in regard to submittal versus specified performance on the cover sheet of each submittal.

1.10 VALUE ENGINEERING (V/E):

- A. While it may be in the project Owner's interest to consider the first cost money saving that may be generated via alternatives and options generated via participation in Value Engineering, Division 22 contractor shall realize that substantive offers of Value Engineering (V/E), if accepted by the Owner, constitute a design-build agreement (offer and acceptance) with the owner, and drastically change the design concept of the project, as developed by the Professional of Record identified on the Contract Documents.
- B. Should contractor offer, and the owner accept value engineering options that alter aspects of the system design, equipment, performance and/or performance verification or monitoring of respective systems, Division 22 contractor shall provide duly licensed professional engineering consultants working on behalf of the Division 22 contractor (including sub-contractors and equipment vendors/manufacturers) to review, approve and take professional responsibility for performance and suitability of V/E hybrid systems, materials or operational changes related to respective V/E items. The Division 22 contractor's licensed professional engineering consultants and the Division 22 contractor assume any and all responsibility for the design and suitability in terms of performance, of hybrid systems installed, as Division 22 contractor's Professional of Record, absolving the original project Professional of Record (identified on the original Contract Documents, released for the original project Bid/Negotiation) from responsibility for the V/E hybrid systems portion of the work.
- C. Division 22 contractor, via the offer and acceptance of value engineering items on the project agrees to provide professional engineering design services and take full and

complete responsibility for the hybrid design. Further, the Division 22 contractor's (V/E Items) professional of record (either employees, or independent consultants to the Division 22 contractor) through the offer and acceptance of V/E items, agree to indemnify and hold harmless the project owner, the owner's original A/E team (Professional of Record on behalf of the owner for the original Contract Documents) their heirs and assigns in regard to the V/E changes and their impact on the Division 22 systems altered, affected or modified, in whole or in part. The Professional of Record shown on the original Contract Documents in regard to the systems altered, adjusted, revised, modified or otherwise affected by the value engineering items implemented, shall be absolved of design responsibility as a result of implementation of V/E items, and their original use of Engineering Seals used for original Contract Documents, shall not apply.

1.11 DRAWINGS AND SPECIFICATIONS

- A. The specific intent of these Contract Documents is to provide the various systems, equipment, etc. to the Owner complete and in a thoroughly calibrated functional condition.
- B. The Drawings shall not be construed as shop drawings. In the event of a possible interference with piping or equipment of another trade, items requiring set grade and elevations shall have precedence over other items. Should any major interference develop, immediately notify the Architect.
- C. In laying out Work, refer to mechanical, electrical, structural, and architectural drawings at all times in order to avoid interference and undue delays in the progress of the Work.

1.12 CODES AND REGULATIONS

- A. Work shall be in full accord with the most stringent interpretation of the State Sanitary Code, local ordinances, building codes, and other applicable national, local, and state regulations.
- B. Equipment shall conform to requirements and recommendations of the National bureau of Fire Underwriters and National Fire Protection Association (NFPA).
- C. Items provided under this Division shall comply with the American National Standards Institute (ANSI) "Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People," ANSI A 117.1
- D. In the possible event of conflict between codes or regulations and Contract Documents, the most stringent interpretation of either shall govern (provided it exceeds the requirements of other codes. In the event of an irreconcilable difference between codes or regulations notify the Architect/Engineer immediately.
- E. In addition to the codes heretofore mentioned, all mechanical work and equipment shall conform to the applicable portions of the following specifications, codes and/or regulations:

1. National Electrical Code (NEC)
 2. National Fire Protection Association (NFPA)
 3. American Society of Mechanical Engineers (ASME)
 4. American Gas Association(AGA)
 5. Underwriters Laboratories (UL)
- F. All materials, equipment and accessories installed under this Contract shall conform to all rules, codes, etc. as recommended by National Associations governing the manufacturer, rating and testing of such materials, equipment and accessories. All materials shall be new and of the best quality and first class in every respect. Whenever directed by the Architect, the Contractor shall submit a sample for approval before proceeding.
- G. Where laws or local regulations provide that certain accessories such as gauges, thermometers, relief valves and parts be installed on equipment, it shall be understood that such equipment be furnished complete with the necessary accessories, whether or not called for in these Specifications.
- H. All unfired and fired pressure vessels shall be built in accordance with the A.S.M.E. Code and so stamped. Furnish shop certificates for each vessel. Contractor shall provide and pay for first operating certificate as per State Fire Marshal Regulations.

1.13 FEES, PERMITS, AND TAXES

- A. Obtain and pay for permits required for the Work of this Division. Pay fees in connection therewith, including necessary inspection fees.
- B. Pay any and taxes levied for Work of this Division, including municipal and/or state sales tax where applicable.
- C. All permits, fees, certificates, etc. for the installation, inspections, plan review, service connections locations, and/or construction of the work which are required by any authority and/or agencies having jurisdiction, shall be obtained and paid for by the Contractor.
- D. The Contractor shall make all tests required by the Architect, Engineer or other governing authorities at no additional cost to the Owner.
- E. The Contractor shall notify the Architect and local governing authorities before any tests are made, and the tests are not to be drawn off a line covered or insulated until examined
- and approved by the authorities. In event defects are found, these shall be corrected and the work shall be retested.
- F. Prior to requesting final inspection by the Architect, the Contractor shall have a complete coordination and adjustment meeting of all of his sub-contractors directly

responsible for the operation of any portion of the system. At the time of this meeting, each and every sequence of operation shall be checked to assure proper operation. Notify the Architect in writing ten (10) days prior to this meeting, instructing him of the time, date and whom you are requesting to be present.

- G. This project shall not be accepted until the above provisions are met to the satisfaction of the Architect.

1.14 MANUFACTURER'S DIRECTIONS

- A. Install and operate equipment and material in strict accord with manufacturer's installation and operating instructions. The manufacturer's instructions shall become part of the Contract Documents and shall supplement Drawings and Specifications.

1.15 SUBMITTAL DATA

- A. Submit shop drawings, project data, and samples in accordance with requirements of Division 0/and or Division 0 & 01.
- B. Shop drawings shall consist of published ratings or capacity data, detailed construction drawings for fabricated items, wiring and control diagrams, performance curves, installation instructions, manufacturer's installation drawings, and other pertinent data. Submit drawings showing revisions to equipment layouts due to use of alternate or substitute equipment.
- C. Where approved manufacturers and suppliers of equipment, materials, etc. are unable to fully comply with Contract Document requirements, specifically call such deviations to attention of Architect on submittals. Type deviations on a separate sheet; underlined statements or notations on standard brochures, equipment fly sheets, etc. will not be accepted.
- D. Approval of submittals shall not relieve Contractor from furnishing required quantities and verifying dimensions. In addition, approval shall not waive original intent of Contract Documents.
- E. Failure to obtain written approval of equipment shall be considered sufficient grounds for rejection of said equipment regardless of the stage of completion of the project.

1.16 REVIEW OF MATERIALS:

- A. Whenever manufacturers or trade names are mentioned in these Plans or Specifications, the words "or approved equivalent" shall be assumed to follow whether or not so stated. Manufacturers or trade names are used to establish a standard of quality only, and should not be construed to infer a preference. Equivalent products which meet the Architect's approval will be accepted; however, these products must be submitted to the Architect a minimum of ten (10) days prior to the Bid Date.
- B. Submission shall include the manufacturer's name, model number, rating table and

construction features.

- C. Upon receipt and checking of this submittal, the Architect will issue an addendum listing items which are approved as equivalent to those specified. THE CONTRACTOR SHALL BASE HIS BID SOLELY ON THOSE ITEMS SPECIFIED OR INCLUDED IN THE "PRIOR APPROVAL ADDENDUM", AS NO OTHER ITEM WILL BE ACCEPTABLE.
- D. Prior approval of a particular piece of equipment does not mean automatic final acceptance and will not relieve the Contractor of the responsibility of assuring himself that this equipment is in complete accord with the Plans and Specifications and that it will fit into the space provided. Shop drawings must be submitted on all items of equipment for approval as hereinafter specified.
- E. Before proceeding with work and/or within thirty (30) days after the award of the General Contract for this work, the Mechanical Contractor shall furnish to the Architect complete shop and working drawings of such apparatus, equipment, controls, insulation, etc. to be provided in this project. These drawings shall give dimensions, weights, mounting data, performance curves and other pertinent information.
- F. The Architect's approval of shop drawings shall not relieve the Contractor from the responsibility of incorrectly figured dimensions or any other errors which may be contained in these drawings. Any omission from the shop drawings or specifications, even through approved by the Architect, shall not relieve the Contractor from furnishing and erecting same.
- G. Seven (7) sets of shop drawings shall be submitted to the Architect for approval. These submittals shall be supplied as part of this Contractor's contract. Any drawings not approved shall be resubmitted until they are approved. SUBMIT ALL SHOP DRAWINGS AT THE SAME TIME. NO SEPARATE ITEMS WILL BE ACCEPTED.
- H. Submit one (1) sepia with two (2) blueline prints of all mechanical room layouts showing locations of all equipment, piping, etc. to insure all will fit in space provided. Submit drawings at 1/4" scale.

1.17 PROJECT RECORD DOCUMENTS

- A. Keep Project Record Documents in accordance with requirements of Division 0 & 01.
- B. During construction period, keep accurate records of installations made under this Division, paying particular attention to major interior and exterior underground and concealed piping, ductwork, etc.
- C. The Contractor shall obtain at his cost, two sets of blueline prints of the original bid documents by the Architect. One set shall be kept on the site with all information as referenced below, and shall update same as the work progresses. The other set will be utilized to record all field changes to a permanent record copy for the Owner.
- D. If the Contractor elects to vary from the Contract Documents and secures prior

approval from the Architect for any phase of the work, he shall record in a neat and readable manner, ALL such variances on the blue-line print in red. The original blue-lines shall be returned to the Architect for documentation.

- E. All deviations from sizes, locations, and from all other features of the installations shown in the Contract Documents shall be recorded.
- F. In addition, it shall be possible using these drawings to correctly and easily locate, identify and establish sizes of all piping, directions and the like, as well as other features of the work which will be concealed underground and/or in the finished building.
- G. Locations of underground work shall be established by dimensions to columns, lines or walls, locating all turns, etc., and by properly referenced centerline or invert elevations and rates of fall.
- H. For work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases this may be by dimension. In others, it may be sufficient to illustrate the work on the drawings in relation to the spaces in the building near which it was actually installed. The Architect's/Engineer's decision in this matter will be final.
- I. The following requirements apply to all "As-Built" drawings:
 - 1. They shall be maintained at the Contractor's expense.
 - 2. All such drawings shall be done carefully and neatly, and in a form approved by the Architect/Engineer.
 - 3. Additional drawings shall be provided as necessary for clarifications.
 - 4. These drawings shall be kept up-to-date during the entire course of the work and shall be available upon request for examination by the Architect/Engineer; and when necessary, to establish clearances for other parts of the work.
 - 5. "As-built" drawings shall be returned to the Architect upon completion of the work and are subject to approval of the Architect/Engineer.

1.18 EXCAVATING AND BACKFILLING

- A. Provide excavating and backfilling necessary for Work of this Division. Comply with provisions of Division 2, Site Work, if applicable.
- B. Trenches shall be inspected by Code Authorities and/or Owner's Representative before and after piping is laid. Give Owner's Representative 24-hour notice for each inspection. If any trenches are filled without Owner's Representative inspection and as subsequently found to be deficient, the trenches shall be uncovered, inspected, and then re-filled, if requested by Owner's Representative.
- C. Provide minimum 18 inches of cover or in compliance with local published frost line data (if greater than 18 inches) to finish grades or paving at water piping.
- D. For piping, provide bell holes at trench bottom to assure uniform bearing. Accurately

grade trench bottoms by instrument before laying any pipe.

- E. Protect and maintain trenches in dry condition until piping has been inspected and approved. Immediately after approval, backfill trenches in tamped layers.
- F. Compact fill to satisfaction of Architect and/or Owner's Representative.

1.19 CUTTING AND PATCHING

- A. Comply with requirements of Division 0 and Division 0 & 01 regarding cutting and patching. Locate and timely install sleeves as required to minimize cutting and patching.
- B. Cutting, fitting, repairing, patching, and finishing of Work shall be done by craftsmen skilled in their respective trades. Where cutting is required, cut in such a manner as not to weaken structure, partitions, or floors. Holes required to be cut must be cut or drilled without breaking out around the holes. Where patching is necessary in finished areas of the building, the Architect will determine the extent of such patching and refinishing.
- C. Repairing Roadways and Walks: Coordinate all roadway work with authorities having jurisdiction. Cut and/or bore under roadways for connection of utilities as required. Coordinate work through General Contractor. Where this contractor cuts or breaks roadways or walks to lay the piping, he shall repair or replace these sections to match existing, unless specifically identified as the responsibility of others.

1.20 PAINTING

- A. Painting shall be provided by General Contractor's painting sub-contractor, unless specified otherwise. Leave exposed piping, materials, and equipment clean and free of rust, grease, dirt, etc. before and after painting.
- B. Factory finished equipment, fixtures, and materials which are marred, chipped, scratched, or otherwise unacceptable shall be repaired or replaced under this Division to Architect satisfaction, at no additions cost to Owner.
- C. Coordinate all painting requirements with prime bidder prior to bids.
- D. Paint all exposed piping inside and outside of building. Label all piping after painting as required. Utilize industry standard paint colors for respective system unless directed otherwise by Architect. Review proposed color scheme with Architect/Engineer prior to ordering materials.
- E. All piping shall be color coded per the following:
 - 1. Domestic Cold Water Piping Yellow
 - 2. Domestic Hot Water Piping Blue

1.21 CLEANING AND ADJUSTING:

- A. Upon completion of his work, the Contractor shall clean and adjust all equipment, controls, valves, etc.; clean all piping, ductwork, etc.; and leave the entire installation in good working order.

1.22 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Provide the Owner with three (3) copies of printed instructions indicating various pieces of equipment by name and model number, complete with parts lists, maintenance and repair instructions and test and balance report.

COPIES OF SHOP DRAWINGS WILL NOT BE ACCEPTABLE AS OPERATION AND MAINTENANCE INSTRUCTIONS.

- B. This information shall be bound in plastic hardbound notebooks with the job name, Architect and Engineer names permanently embossed on the cover. Rigid board dividers with labeled tabs shall be provided for different pieces of equipment. Submit manuals to the Architect for approval.
- C. In addition to the operation and maintenance brochure, the Contractor shall provide a separate brochure which shall include registered warranty certificates on all equipment, especially any pieces of equipment which carry warranties exceeding one (1) year.
- D. The operation and maintenance brochure shall be furnished with a detailed list of all equipment furnished to the project, including the serial number and all pertinent nameplate data such as voltage, amperage draw, recommended fuse size, rpm, etc. The Contractor shall include this data on each piece of equipment furnished under this contract.

1.23 GUARANTEE

- A. The Contractor shall guarantee all materials, equipment and workmanship for a period of one (1) year from the date of final acceptance of the project. This guarantee shall include furnishing of all labor and material necessary to make any repairs, adjustments or replacement of any equipment, parts, etc. necessary to restore the project to first class condition. This guarantee shall exclude only the changing or cleaning of filters. Warranties exceeding one (1) year are hereinafter specified with individual pieces of equipment.
- B. If the Contractor's office is in excess of a fifty (50) mile radius of the project, he shall appoint a local qualified contractor to perform any emergency repairs or adjustments required during the guarantee period. The name of the contractor appointed to provide emergency services shall be submitted to the Architect for his approval.

1.24 LOCAL CONDITIONS

- A. The location and elevation of all utility services is based on available surveys and utility

maps and are reasonably accurate; however, these shall serve as a general guide only, and the Contractor shall visit the site and verify the location and elevation of all services to his satisfaction in order to determine the amount of work required for the execution of the Contract.

- B. The Contractor shall contact the various utility companies, determine the extent of their requirements and he shall include in his bid all lawful fees and payments required by these companies for complete connection and services to the building, including meters, connection charges, street patching, extensions from meters to main, etc.
- C. In case major changes are required, this fact, together with the reasons therefor, shall be submitted to the Architect, in writing, not less than seven (7) days before the date of bidding. Failure to comply with this requirement will make the Contractor liable for any changes, additions and expenses necessary for the successful completion of the project.

1.25 MINOR DEVIATIONS

- A. Plans and detail sketches are submitted to limit, explain and define conditions, specified requirements, pipe sizes and manner of erecting work. Structural or other conditions may require certain modifications from the manner of installation shown, and such deviations are permissible and shall be made as required. However, specified sizes and requirements necessary for satisfactory operation shall remain unchanged. It may be necessary to shift ducts or pipes, or to change the shape of ducts, and these changes shall be made as required. All such changes shall be referred to the Architect for approval before proceeding. Extra charges shall not be allowed for these changes.
- B. The Contractor shall realize that the drawings could delve into every step, sequence or operation necessary for the completion of the project, without drawing on the Contractor's experience or ingenuity. However, only typical details are shown on the Plans. In cases where the Contractor is not certain about the method of installation of his work, he shall ask for details. Lack of details will not be an excuse for improper installation.
- C. In general, the drawings are diagrammatic and the Contractor shall install his work in a manner so that interferences between the various trades are avoided. In cases where interferences do occur, the Architect is to state which item was first installed.

1.26 VALVE TAGS

- A. Secure metal tags to all valves. Labeling on all valve tags shall include type of system the valve controls and the area of building, zone, or equipment number affected by valve operation. Tag shall be 2" minimum diameter brass, engraved with code number, service and size. A framed list of the valves, giving manufacturer's name, model number, type and location shall be mounted in the main basement equipment room.

1.27 LABELING MECHANICAL EQUIPMENT

- A. All equipment furnished under Division 0 & 01 of contract documents shall be labeled with permanent laminated plate secured to equipment. Units shall be labeled as indicated on plans and schedules.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 22 00 00

SECTION 22 05 00 - BASIC MATERIALS & METHODS



PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work in this section includes furnishing and installing all piping for project as hereinafter described.
- B. Related Work: All piping shall be coordinated with Plumbing, Air Conditioning and Ventilation section of these specifications.

PART 2 - PRODUCTS

2.1 PIPE

- A. All sanitary sewer waste and vent lines, 6" and under are to be constructed of schedule 40 PVC DWV plastic pipe and fittings as manufactured by Alabama Pipe Co., Tyler Pipe Co., Mead Pipe Co., or equal. Where space requirements do not allow the use of the above materials, government type DWV copper pipe and fittings shall be used. All pipe and fittings shall comply with Commercial Standards CS 188-59 and marked with manufacturer's identification and proper weight classification. Provide tracer wire for all plastic pipe below grade.
- B. All 8" sanitary sewer waste pipe shall be ANSI/ASTM D 2241, SDR 26, 12454-B PVC cell classification in accordance with ASTM D 1784; additives and fillers shall not exceed 10 parts (by weight) per hundred of PVC resin in the compound. Joints shall be push on type joint in accordance with ASTM D 3212; flexible elastomeric seals (gaskets) in accordance with ASTM F 477. Fittings shall be same material and cell classification as pipe. PVC pipe and fittings shall be green in color. Comply with City of Lake Charles Standard Specifications for Infrastructure Construction.
- C. Sewer force main piping shall be fused HDPE. (AWWA C906, DIPS, SDR11, 125 psi, PE3408, ASTM D3350). Provide adapters and fittings as required to connect to pumps and force main connection. Provide tracer wire for all plastic pipe below grade. HDPE sewer force main pipe shall have a green colored stripe along the entire exterior length of the pipe.
- D. All domestic cold water lines, domestic hot water lines, domestic hot water return lines, water heater relief lines, and A/C condensate drain lines shall be government ASTM B-88 type "L" hard copper tube of standard weight and thickness as made by Mueller, Chase, Anaconda, or equal except where indicated otherwise. Fittings are to be solder type wrought copper fittings. Use 95-5 solder on all piping above slab. For lines run underground, use Silfos 1000 deg. solder. Dielectric unions shall be used between copper and iron pipe.
- E. All domestic water lines below slab shall be type "K" soft copper with no joints. Provide color coded protecto-sleeve (Red Hot, Blue Cold) where pipes penetrate slab. Return line from font shall be type "K" hard copper pipe.

- F. Domestic cold water lines penetrating concrete slabs shall be wrapped with "Protect-O-Sleeve" vinyl flexible tube as manufactured by Robert H. Harris Co., or equivalent.
- G. Domestic cold water piping on site up to within 5'-0" of building may be Schedule 40 PVC plastic pressure pipe with solvent welded joints. At contractor's option, HDPE fused joint piping may be used on site but shall be upsized as necessary for equivalent pipe ID. (SDR11, 200 psi, PE4710, ASTM F714, J-M Manufacturing Company or equal.) Installation shall be in accordance with manufacturer's recommendations. Provide tracer wire for all plastic pipe below grade.

2.2 PIPE FITTINGS

- A. All pipe fittings shall be same as piping specified unless indicated otherwise.
- B. All screwed fittings and pipe shall have threads cut to standard pipe thread dimensions. Pipe shall be properly reamed after cutting of threads.
- C. Joint compound, Crane Thread lubricant or equal, shall be applied to male threads of the screwed pipe and fittings only.
- D. Approved expansion joints or flexible couplings shall be provided as necessary.
- E. Care shall be taken in making up pipe and fittings such that pipe does not extend into fitting sufficiently to reduce the waterway.
- F. Unions for use on above grade pipe larger than 2 inches shall be cast iron, screwed flanges, 125 pound flat face with 1/16" non-asbestos composition gasket.
- G. All risers 3" or larger shall have a flanged joint at each floor.
- H. Standard, one-piece reducing fittings of approved design shall be used wherever a change in size is made. Changes in pipe sizes shall not be made by means of reducing flanges.

2.3 VALVES AND UNIONS

- A. Furnish and install all valves, unions, stops, connections, etc. shown on plans and necessary to make a complete system in working order. Provide valves on inlet and outlet of all equipment and fixtures and on branch lines to fixtures or groups of fixtures.
- B. Valves and unions shall be as follows:

Copper Pipe	2" and Less	Over 2"
-----	-----	-----
Gate Valve	Crane 1320	Crane 461
Globe Valve	Crane 1310	Crane 359
Unions	Crane 633	Crane Std. Gal.
Check Valve	Crane 1303	Crane 373

Iron Pipe	2" and Less	Over 2"
Gate Valve	Crane 440	Crane 461
Globe Valve	Crane 7	Crane 359
Unions	Crane 633	
Check Valve	Crane 1303	Crane 373

- C. All valves, unions, etc. where pipe is chrome plated shall have similar finish. All exposed supplies to plumbing fixtures shall be chrome plated.

2.4 PIPE HANGER AND SUPPORTS

- A. This Contractor shall furnish and install all foundations and supports required for his equipment unless otherwise indicated on the drawings.
- B. This Contractor shall furnish and install all escutcheons, inserts, thimbles, hangers, etc. required for the proper support and installation of his equipment and piping. Cooperate with other trades in locating and placing these items.
- C. Provide sleeves for all pipes passing through walls, floors, beams, etc. Sleeves passing through structural members shall be of cast iron or Schedule 40 steel pipe. Sleeves passing through non-structural walls or floors shall be of 26 gauge galvanized iron. Joints between sleeves and pipes passing through floors shall be made watertight with plastic materials. Where pipes pass through waterproofing membrane, flashing sleeves shall be installed.
- D. Provide Grinnell # 108, Fee and Mason Fig. 57, Carpenter & Patterson # 34, Michigan # 450, or equal malleable iron split ring hangers with rod supports throughout. Strap hangers or wire will not be accepted. Maximum spacing of hangers for cast iron pipes shall be 5'; for other than soil, use 10'.
- E. Provide galvanized iron shields between hangers and pipe covering.
- F. Provide Grinnell, Fee and Mason, Crane, or equivalent heavy steel riser clamps on vertical risers at floors to support pipes.
- G. Provide chrome plated brass escutcheons wherever pipes pass through floors, walls or ceilings in exposed or finished areas.
- H. All piping projecting from chases shall be rigidly supported in the wall or chase. Loosely supported fixtures or accessories will not be accepted.

2.5 ACCESS PANELS

- A. Furnish and install access panels where valves, drains, dampers, etc. are concealed in walls, ceilings, or floors, or otherwise inaccessible. Panels shall be Milcor, or equivalent, sized as required and furnished with prime coat finish.

END OF SECTION 22 05 00

SECTION 22 07 00 - PLUMBING INSULATION



PART 1 - GENERAL

1.1 DESCRIPTION

- A. Pipe insulation installation shall not begin until all work has been tested and found to be tight.

PART 2 - MATERIALS

2.1 THERMAL INSULATION

- A. After all work has been tested and found to be tight, insulate as follows:
- B. Cover all domestic cold and hot water lines and hot water return lines above slab with 1" thick, high density fiberglass insulation with Universal Fire Retardant Jacket, Owens/Corning "25 ASJ/SSL", Knauf ASJ-SSL, or equal. All laps are to be sealed and stapled in place. Fittings are to be mitered segments of insulation held in place with white vapor barrier tape for concealed areas and Zeston 25/50 PVC, Knauf 25/50 rated PVC, pre-molded insulated fitting covers in exposed areas.
- C. Domestic cold and hot water lines (2'-1/2" and above) shall be insulated with 1-1/2" thick fiberglass with jacket.
- D. All storm drain piping (horizontal and vertical), fittings, and bottoms of roof drain bodies shall be insulated with 2.33" thick 3/4 # density fiberglass ductwrap insulation with aluminum foil vapor barrier. Insulation shall be sealed at all seams and joints.
- E. All water lines exposed in Vehicle Shops shall be covered with 0.030 PVC jacket with solvent welded seams and joints. Submit colors for review.
- F. All water lines on the outside of the building exposed to the weather shall be covered with 0.160 smooth aluminum jacket and elbows.
- G. Domestic cold and hot water lines run below slab within building shall be insulated with 3/4" thick closed cell tube insulation. Apply two (2) coats of mastic on insulation.
- H. Mastic shall be white vapor barrier type. All insulation shall be installed in strict accordance with manufacturer's recommendations.
- I. All valves, strainers, etc. shall be covered and the covering shall extend all the way up to the equipment.
- J. All pipe insulation where recommended by the manufacturer shall be banded with

aluminum bands, three to a section, and with one band on each side of each fitting, valve, etc.

- K. P-traps receiving HVAC condensate (exposed to weather or above ceilings) shall be insulated with 2" thick 3/4 # density fiberglass ductwrap insulation with aluminum foil vapor barrier. Insulation shall be sealed at all seams and joints.
- L. Insulate p-trap, tailpiece and water supplies on handicapped lavatories with white, Truebro Model 102 Handi Lav-Guard, Pro-Wrap A.D.A. lavatory insulation kit, or approved equivalent insulating system to meet A.D.A. Requirements. Provide accessories for offset tailpiece as required.
- M. Insulation through hangers and sleeves shall be continuous through pipe hangers and pipe sleeves. At hangers where the pipe is supported by insulation, provide a galvanized iron protection shield. Provide pipes 2-inch i.p.s. and larger in insulation inserts at points of hanger supports. The inserts shall be of calcium silicate, cellular glass, prestressed molded glass fiber of minimum 13-pound density, or other approval material of the same thickness as adjacent insulation and not less than 13-pound density. The inserts shall have sufficient compression strength to adequately support the pipe without compressing the inserts to a thickness less than the adjacent insulation. Inserts shall be 180 degrees and not less than the length of the protection shield. Vapor barrier facing of the insert shall be the same as the facing on the adjacent insulation. Where copper clad hangers are used on domestic copper pipe, insulation may cover pipe and hanger. Provide 18 gauge metal saddles between all hangers and insulation.

END OF SECTION 22 07 00

SECTION 22 11 00 - WATER SUPPLY

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide and install new domestic hot and cold water distribution system as indicated on drawings. Contractor shall pay all service and connection charges including meter cost.

PART 2 - PRODUCTS

2.1 WATER PIPING

- A. All water supply piping shall be of materials hereinbefore specified. Contractor shall make provisions for expansion and contraction of hot water lines by means of expansion bends or loops as required.
- B. All water lines shall be disinfected in accordance with local code authorities.
- C. Water lines run underground shall have a minimum cover of 30" from top of pipe to finished grade and hot water lines and cold water lines running parallel shall be run a minimum of 18" apart. Water lines shall be run a minimum of 18" each side of sanitary sewer piping.
- D. This Contractor shall make up a complete water supply system. Connect water lines to all fixtures and outlets requiring water and provide valved stubouts for continuation by other trades where so called for.
- E. At each fixture or group of fixtures, furnish and install a 12" high air chamber of same size as the branch feed line except at fixtures with quick closing valves such as dishwashers, etc., in which case provide "Shocktrol", Wade, Zurn, Josam or equal and properly sized for each unit.
- F. Contractor shall use "lead free" solder, pipe, and fittings for the installation of all piping. "Lead free" when used with respect to solder and flux shall refer to solder and flux containing not more than 0.2 per cent lead. When used with respect to pipes and fittings, "Lead Free" shall refer to pipes and fittings containing not more than 8.0 per cent lead. All installations of domestic water systems shall conform with the Safe Drinking Water Act of 1986.
- G. All water piping shall be disinfected in accordance with AWWA standards and local and state Plumbing Codes. All water piping where located below grade shall be placed a minimum of 24" below grade.

PART 3 - EXECUTION



3.1 TESTING

- A. All domestic water lines shall be tested under 200 psig hydrostatic pressure for a minimum of five (5) hours unless elsewhere specified.

END OF SECTION 22 11 00

SECTION 22 11 23 – NATURAL GAS PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipes, tubes, and fittings.
 - 2. Piping specialties.
 - 3. Piping and tubing joining materials.
 - 4. Manual gas shutoff valves.
 - 5. Pressure regulators.
 - 6. Dielectric fittings.

1.3 SCOPE OF WORK

- A. Prior to bid, contact the local utility company to determine the extent of their requirements and include all costs associated with the complete installation of the gas service line, gas meter assembly, gas meter and gas service regulator. Contractor shall be responsible for fees and permits required for the gas service.
- B. Contract shall include routing gas main from the local utility main to the building and throughout project as indicated on Drawings.
- C. Provide gas pressure regulator downstream of the meter assembly to provide adequate gas pressure to equipment furnished in project. Coordinate gas supply pressure and equipment supply pressure requirements with the utility company and equipment manufacturer.
- D. All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within the following references:
 - 1. International Fuel Gas Code.
 - 2. NFPA 54.

1.4 QUALITY ASSURANCE

- A. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- C. Gas Regulators shall be AGA rated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Handling Flammable Liquids: Remove and dispose of liquids from existing natural-gas piping according to requirements of authorities having jurisdiction.



- B. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.
- C. Store and handle pipes and tubes having factory-applied protective coatings to avoid damaging coating, and protect from direct sunlight.
- D. Protect stored PE pipes and valves from direct sunlight.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Natural-Gas Service: Do not interrupt natural-gas service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide purging and startup of natural-gas supply according to requirements indicated:
 - 1. Notify Architect, Owner and Engineer no fewer than seven days in advance of proposed interruption of natural-gas service.
 - 2. Do not proceed with interruption of natural-gas service without Architect's permission.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Minimum Operating-Pressure Ratings:
 - 1. Piping and Valves: 100 psig minimum unless otherwise indicated.
 - 2. Service Regulators: 100 psig minimum unless otherwise indicated.
 - 3. Minimum Operating Pressure of Service Meter: 5 psig.
- B. Natural-Gas System Pressure within Buildings: **More than 2 psig but not more than 5 psig**

2.2 PIPES, TUBES, AND FITTINGS

- A. See Part 3 – Piping Schedule articles to determine where pipes, tubes, fittings and joining materials are applied in various services.
- B. Steel Pipe: ASTM A53/A53M, black steel, Schedule 40, Type E or S, Grade B.
 - 1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
 - 2. Wrought-Steel Welding Fittings: ASTM A234/A234M for butt welding and socket welding.
 - 3. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.
 - 4. Forged-Steel Flanges and Flanged Fittings: ASME B16.5, minimum Class 150, including bolts, nuts, and gaskets of the following material group, end connections, and facings:
 - a. Material Group: 1.1.
 - b. End Connections: Threaded or butt welding to match pipe.
 - c. Lapped Face: Not permitted underground.
 - d. Gasket Materials: ASME B16.20, metallic, flat, asbestos free, aluminum O-rings, and spiral-wound metal gaskets.
 - e. Bolts and Nuts: ASME B18.2.1, carbon steel aboveground and stainless-steel underground.

5. Mechanical Couplings:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - i. Baker Hughes Company.
 - ii. Smith-Blair, Inc.
 - b. Stainless-steel flanges and tube with epoxy finish.
 - c. Buna-nitrile seals.
 - d. Stainless-steel bolts, washers, and nuts.
 - e. Coupling shall be capable of joining PE pipe to PE pipe, steel pipe to PE pipe, or steel pipe to steel pipe.
 - f. Steel body couplings installed underground on plastic pipe shall be factory equipped with anode.

C. PE Pipe: ASTM D2513, SDR 11.

1. PE Fittings: ASTM D2683, socket-fusion type or ASTM D3261, butt-fusion type with dimensions matching PE pipe.
2. PE Transition Fittings: Factory-fabricated fittings with PE pipe complying with ASTM D2513, SDR 11; and steel pipe complying with ASTM A53/A53M, black steel, Schedule 40, Type E or S, Grade B.
3. Anodeless Service-Line Risers: Factory fabricated and leak tested.
 - a. Underground Portion: PE pipe complying with ASTM D2513, SDR 11 inlet.
 - b. Casing: Steel pipe complying with ASTM A53/A53M, Schedule 40, black steel, Type E or S, Grade B, with corrosion-protective coating covering. Vent casing aboveground.
 - c. Aboveground Portion: PE transition fitting.
 - d. Outlet shall be threaded or flanged or suitable for welded connection.
 - e. Tracer wire connection.
 - f. Ultraviolet shield.
 - g. Stake supports with factory finish to match steel pipe casing or carrier pipe.
4. Plastic Mechanical Couplings, NPS 1-1/2 and Smaller: Capable of joining PE pipe to PE pipe.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - i. Lyall, R. W. & Company, Inc.
 - ii. Mueller Co.
 - iii. Perfection Corporation.
 - b. PE body with molded-in, stainless-steel support ring.
 - c. Buna-nitrile seals.
 - d. Acetal collets.
 - e. Electro-zinc-plated steel stiffener.
5. Plastic Mechanical Couplings, NPS 2 and Larger: Capable of joining PE pipe to PE pipe, steel pipe to PE pipe, or steel pipe to steel pipe.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - i. Lyall, R. W. & Company, Inc.
 - ii. Mueller Co.
 - iii. Perfection Corporation.
 - b. Fiber-reinforced plastic body.
 - c. PE body tube.
 - d. Buna-nitrile seals.
 - e. Acetal collets.
 - f. Stainless-steel bolts, nuts, and washers.

6. Steel Mechanical Couplings: Capable of joining plain-end PE pipe to PE pipe, steel pipe to PE pipe, or steel pipe to steel pipe.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - i. Baker Hughes Company.
 - ii. Smith-Blair, Inc.
 - b. Stainless-steel flanges and tube with epoxy finish.
 - c. Buna-nitrile seals.
 - d. Stainless-steel bolts, washers, and nuts.
 - e. Factory-installed anode for steel-body couplings installed underground.

2.3 PIPING SPECIALTIES

A. Appliance Flexible Connectors:

1. Indoor, Fixed-Appliance Flexible Connectors: Comply with ANSI Z21.24.
2. Indoor, Movable-Appliance Flexible Connectors: Comply with ANSI Z21.69.
3. Outdoor, Appliance Flexible Connectors: Comply with ANSI Z21.75.
4. Corrugated stainless-steel tubing with polymer coating.
5. Operating-Pressure Rating: 0.5 psig.
6. End Fittings: Zinc-coated steel.
7. Threaded Ends: Comply with ASME B1.20.1.
8. Maximum Length: 72 inches

B. Quick-Disconnect Devices: Comply with ANSI Z21.41.

1. Copper-alloy convenience outlet and matching plug connector.
2. Nitrile seals.
3. Hand operated with automatic shutoff when disconnected.
4. For indoor or outdoor applications.
5. Adjustable, retractable restraining cable.

C. Weatherproof Vent Cap: Cast- or malleable-iron increaser fitting with corrosion-resistant wire screen, with free area at least equal to cross-sectional area of connecting pipe and threaded-end connection.

2.4 JOINING MATERIALS

A. Joint Compound and Tape: Suitable for natural gas.

B. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.5 GAS VALVES

A. General Requirements for Metallic Valves, **(NPS 2 and Smaller)**: Comply with ASME B16.33.

1. CWP Rating: 125 psig.
2. Threaded Ends: Comply with ASME B1.20.1.
3. Dryseal Threads on Flare Ends: Comply with ASME B1.20.3.
4. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch and smaller.
5. Service Mark: Valves 1-1/4 inches to NPS 2 shall have initials "WOG" permanently marked on valve body.

- B. General Requirements for Metallic Valves, **(NPS 2-1/2 and Larger)**: Comply with ASME B16.38.
1. CWP Rating: 125 psig.
 2. Flanged Ends: Comply with ASME B16.5 for steel flanges.
 3. Service Mark: Initials "WOG" shall be permanently marked on valve body.
- C. Service / Main Line Valves: Cast-Iron, Lubricated Plug Valves: MSS SP-78.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A.Y. McDonald Mfg. Co.
 - b. Flowserve Corporation.
 - c. Homestead Valve.
 - d. Milliken Valve Company.
 - e. Mueller Co.
 - f. R & M Energy Systems; Robbins & Myers.
 - g. Nordstrom.
 - h. Resun.
 2. Body: Cast iron, complying with ASTM A126, Class B.
 3. Plug: Bronze or nickel-plated cast iron.
 4. Seat: Coated with thermoplastic.
 5. Stem Seal: Compatible with natural gas.
 6. Ends: Threaded or flanged as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 7. Operator: Square head or lug type with tamperproof feature where indicated.
 8. Pressure Class: 125 psig.
 9. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
 10. Service: Suitable for natural-gas service with "WOG" indicated on valve body.
- D. Equipment / Shut-off Valves: Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim: MSS SP-110.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Nibco.
 - b. Apollo Flow Controls; Conbraco Industries, Inc.
 - c. Milwaukee.
 - d. BrassCraft Manufacturing Co.; a Masco company.
 - e. Lyall, R. W. & Company, Inc.
 - f. Perfection Corporation.
 - g. A.Y. McDonald Mfg. Co
 2. Body: Bronze, complying with ASTM B584.
 3. Ball: Chrome-plated bronze.
 4. Stem: Bronze; blowout proof.
 5. Seats: Reinforced TFE; blowout proof.
 6. Packing: Threaded-body packnut design with adjustable-stem packing.
 7. Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
 8. CWP Rating: 600 psig.
 9. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
 10. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

E. Automatic Emergency Shut-off Valves.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ASCO Red Hat Series 8044
 - b. Honeywell.
2. Listing: UL listed and Factory Mutual (FM) Approved for natural gas service.
3. Valve shall be 2-way electrically tripped solenoid type, fail safe closed; manual reset; Type 1 solenoid enclosure; NBR seals and disc; stainless steel core tube and springs; copper coil.

2.6 PRESSURE REGULATORS

A. General Requirements:

1. Single stage and suitable for natural gas.
2. Steel jacket and corrosion-resistant components.
3. Elevation compensator.
4. End Connections: Threaded for regulators NPS 2 and smaller; flanged for regulators NPS 2-1/2 and larger.

B. Line Pressure Regulators: Comply with ANSI Z21.80.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Meter Company.
 - b. Dormont; a WATTS brand.
 - c. Fisher Control Valves & Instruments; a brand of Emerson Process Management.
 - d. Maxitrol Company.
2. Body and Diaphragm Case: Cast iron or die-cast aluminum.
3. Springs: Zinc-plated steel; interchangeable.
4. Diaphragm Plate: Zinc-plated steel.
5. Seat Disc: Nitrile rubber resistant to gas impurities, abrasion, and deformation at the valve port.
6. Orifice: Aluminum; interchangeable.
7. Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.
8. Single-port, self-contained regulator with orifice no larger than required at maximum pressure inlet, and no pressure sensing piping external to the regulator.
9. Pressure regulator shall maintain discharge pressure setting downstream, and not exceed 150 percent of design discharge pressure at shutoff.
10. Atmospheric Vent: Factory- or field-installed, stainless-steel screen in opening if not connected to vent piping.
11. Maximum Inlet Pressure: 2 psig.

C. Appliance Pressure Regulators: Comply with ANSI Z21.18.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dormont; a WATTS brand.
 - b. Eaton.
 - c. Harper Wyman Co.
 - d. Maxitrol Company.
 - e. SCP, Inc.
2. Body and Diaphragm Case: Die-cast aluminum.

3. Springs: Zinc-plated steel; interchangeable.
4. Diaphragm Plate: Zinc-plated steel.
5. Seat Disc: Nitrile rubber.
6. Seal Plug: Ultraviolet-stabilized, mineral-filled nylon.
7. Factory-Applied Finish: Minimum three-layer polyester and polyurethane paint finish.
8. Regulator may include vent limiting device, instead of vent connection, if approved by authorities having jurisdiction.
9. Maximum Inlet Pressure: 2 psig.

2.7 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
- B. Dielectric Unions (NPS 1/2 to NPS 2):
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A.Y. McDonald Mfg. Co.
 - b. HART Industrial Unions, LLC.
 - c. WATTS.
 - d. Wilkins.
 - e. Zurn Industries, LLC.
 2. Description:
 - a. Standard: ASSE 1079.
 - b. Pressure Rating: 125 psig minimum at 180 deg F.
 - c. End Connections: Solder-joint copper alloy and threaded ferrous.
- C. Dielectric Flanges (NPS 2-1/2 to NPS 4):
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Capitol Manufacturing Company.
 - b. Matco-Norca.
 - c. WATTS.
 - d. Wilkins.
 2. Description:
 - a. Standard: ASSE 1079.
 - b. Factory-fabricated, bolted, companion-flange assembly.
 - c. Pressure Rating: 125 psig minimum at 180 deg F.
 - d. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
- D. Dielectric-Flange Insulating Kits:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Central Plastics Company.
 - d. Pipeline Seal and Insulator, Inc.
 2. Description:
 - a. Nonconducting materials for field assembly of companion flanges.
 - b. Pressure Rating: 150 psig.

- c. Gasket: Neoprene or phenolic.
- d. Bolt Sleeves: Phenolic or polyethylene.
- e. Washers: Phenolic with steel backing washers.

2.8 LABELING AND IDENTIFYING

- A. Detectable Warning Tape: Acid- and alkali-resistant, PE film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored yellow.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for natural-gas piping system to verify actual locations of piping connections before equipment installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Close equipment shutoff valves before turning off natural gas to premises or piping section.
- B. Inspect natural-gas piping according to NFPA 54 to determine that natural-gas utilization devices are turned off in piping section affected.
- C. Comply with NFPA 54 requirements for prevention of accidental ignition.

3.3 OUTDOOR PIPING INSTALLATION

- A. Comply with NFPA 54 for installation and purging of natural-gas piping.
- B. Install underground, natural-gas piping buried at least 36 inches below finished grade.
 - 1. If natural-gas piping is installed less than 36 inches below finished grade, install it in containment conduit.
- C. Install underground, PE, natural-gas piping according to ASTM D2774.
- D. Steel Piping with Protective Coating:
 - 1. Apply joint cover kits to pipe after joining to cover, seal, and protect joints.
 - 2. Repair damage to PE coating on pipe as recommended in writing by protective coating manufacturer.
- E. Install fittings for changes in direction and branch connections.
- F. Install pressure gage upstream and downstream from each service regulator.

3.4 INDOOR PIPING INSTALLATION

- A. Comply with NFPA 54 for installation and purging of natural-gas piping.

- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
- D. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- G. Locate valves for easy access.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Verify final equipment locations for roughing-in.
- K. Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.
- L. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
 - 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.
- M. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.
- N. Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels unless indicated to be exposed to view.
- O. Concealed Location Installations: Except as specified below, install concealed natural-gas piping and piping installed under the building in containment conduit constructed of steel pipe with welded joints as described in Part 2. Install a vent pipe from containment conduit to outdoors and terminate with weatherproof vent cap.
 - 1. Above Accessible Ceilings: Natural-gas piping, fittings, valves, and regulators may be installed in accessible spaces without containment conduit.
 - 2. In Floors: Install natural-gas piping with welded or brazed joints and protective coating in cast-in-place concrete floors. Cover piping to be cast in concrete slabs with minimum of 1-1/2 inches of concrete. Piping may not be in physical contact with other metallic structures such as reinforcing rods or electrically neutral conductors. Do not embed piping in concrete slabs containing quick-set additives or cinder aggregate.

- 3. In Walls or Partitions: Protect tubing installed inside partitions or hollow walls from physical damage using steel striker barriers at rigid supports.
 - a. Exception: Tubing passing through partitions or walls does not require striker barriers.
- 4. Prohibited Locations:
 - a. Do not install natural-gas piping in or through circulating air ducts, clothes or trash chutes, chimneys or gas vents (flues), ventilating ducts, or dumbwaiter or elevator shafts.
 - b. Do not install natural-gas piping in solid walls or partitions.
- P. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
- Q. Connect branch piping from top or side of horizontal piping.
- R. Install unions in pipes NPS 2 and smaller, adjacent to each valve, at final connection to each piece of equipment. Unions are not required at flanged connections.
- S. Do not use natural-gas piping as grounding electrode.
- T. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.
- U. Install pressure gage upstream and downstream from each line regulator.
- V. Install sleeves for piping penetrations of walls, ceilings, and floors.
- W. Install sleeve seals for piping penetrations of concrete walls and slabs.
- X. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.5 VALVE INSTALLATION

- A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing connector.
- B. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.
- C. Install cooking appliance shunt trip valve per valve manufacturer's instructions and in coordination with the kitchen equipment vendor and installer.

3.6 PIPING JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints:
 - 1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
 - 2. Cut threads full and clean using sharp dies.
 - 3. Ream threaded pipe ends to remove burrs and restore full inside diameter of pipe.

4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
 5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- D. Welded Joints:
1. Construct joints according to AWS D10.12/D10.12M, using qualified processes and welding operators.
 2. Bevel plain ends of steel pipe.
 3. Patch factory-applied protective coating as recommended by manufacturer at field welds and where damage to coating occurs during construction.
- E. Flanged Joints: Install gasket material, size, type, and thickness appropriate for natural-gas service. Install gasket concentrically positioned.
- F. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D2657.
1. Plain-End Pipe and Fittings: Use butt fusion.
 2. Plain-End Pipe and Socket Fittings: Use socket fusion.

3.7 HANGER AND SUPPORT INSTALLATION

- A. Install hangers for steel piping, with maximum horizontal spacing and minimum rod diameters, to comply with MSS-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.
- B. Install hangers for corrugated stainless-steel tubing, with maximum horizontal spacing and minimum rod diameters, to comply with manufacturer's written instructions, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.
- C. Support horizontal piping within 12 inches of each fitting.
- D. Support vertical runs of steel piping to comply with MSS-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.
- E. Support vertical runs of corrugated stainless-steel tubing to comply with manufacturer's written instructions, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

3.8 CONNECTIONS

- A. Connect to utility's gas main after the gas meter and the gas regulator.
- B. Install natural-gas piping electrically continuous, and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.
- C. Install piping adjacent to appliances to allow service and maintenance of appliances.
- D. Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches of each gas-fired appliance and equipment. Install union between valve and appliances or equipment.

- E. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.

3.9 LABELING AND IDENTIFYING

- A. Install detectable warning tape directly above gas piping, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.10 PAINTING

- A. Paint exposed, Exterior metal piping, valves, service regulators, service meters and meter bars, earthquake valves, and piping specialties, except components, with factory-applied paint or protective coating.
 - 1. Alkyd System: MPI EXT 5.1D.
 - a. Prime Coat: Alkyd anticorrosive metal primer.
 - b. Intermediate Coat: Exterior alkyd enamel matching topcoat.
 - c. Topcoat: Exterior alkyd enamel (gloss).
Color (Service Gas Regulator and Upstream): Grey
 - d. Color (Downstream of Service Gas Regulator): Yellow.
- B. Paint exposed, Interior metal piping, fittings and piping specialties, except components, with factory-applied paint or protective coating.
 - 1. Latex Over Alkyd Primer System: MPI INT 5.1Q.
 - a. Prime Coat: Alkyd anticorrosive metal primer.
 - b. Intermediate Coat: Interior latex matching topcoat.
 - c. Topcoat: Interior latex (gloss).
 - d. Color: Yellow.
- C. Damage and Touchup: Repair marred and damaged factory-applied finishes with materials and by procedures to match original factory finish.

3.11 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Test, inspect, and purge natural gas according to NFPA 54 and authorities having jurisdiction.
- C. Natural-gas piping will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports and submit to the Architect and Engineer for review.

3.12 OUTDOOR PIPING SCHEDULE

- A. Underground natural-gas piping shall be the following.
 - 1. PE pipe and fittings joined by heat fusion, or mechanical couplings; service-line risers with tracer wire terminated in an accessible location.
- B. Aboveground natural-gas piping, **(NPS 2 and Smaller)** shall be the following:
 - 1. Steel pipe with malleable-iron fittings and threaded joints.
- C. Aboveground natural-gas piping, **(NPS 2-1/2 and Larger)** shall be the following:

1. Steel pipe with wrought-steel fittings and welded joints.

3.13 INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES LESS THAN 0.5 PSIG

- A. Aboveground, natural-gas piping (**NPS 2 and smaller**) shall be one of the following:

1. Steel pipe with malleable-iron fittings and threaded joints.
2. At Contractor's option, for branch piping (**NPS 1 or smaller**) Corrugated stainless-steel tubing with mechanical fittings having socket or threaded ends to match adjacent piping.
3. Exceptions:
 - a. All exposed piping located within areas utilized as a return air plenum shall have welded joints with Schedule 40 socket welded forged steel fittings conforming ASME B16.11.
 - b. All exposed piping serving laboratories from main natural gas riser to each emergency shut-off valve shall have welded joints with Schedule 40 socket welded forged steel fittings conforming to ASME B16.11.

- B. Aboveground natural-gas piping, (**NPS 2-1/2 and Larger**) shall be the following:

1. Steel pipe with wrought-steel fittings and welded joints.

3.14 INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES MORE THAN 5 PSIG

- A. Aboveground, Branch and Distribution Piping: Steel pipe with steel welding fittings and welded joints.

END OF SECTION 22 11 23

SECTION 22 11 24 - NATURAL GAS DISTRIBUTION



1.1 SERVICE:

- A. Contractor shall contact local utility company, determine the extent of their requirements and include in his price all costs required for the complete installation of gas service, meter and regulator.
- B. Contract shall include routing gas main from local utility main to the building and throughout project as indicated on Drawings.
- C. Contractor shall provide gas pressure regulator downstream of the meter to provide adequate gas pressure to equipment furnished in project. Coordinate gas supply pressure and equipment supply pressure requirements with utility co. and equipment manufacturers.

1.2 GENERAL:

- A. Gas piping shall be of materials as hereinbefore specified and installed in accordance with NFPA 54 and 2021 IFGC
- B. Provide valved outlet and rigid pipe connection at each piece of equipment requiring gas service.
- C. All gas piping shall be run exposed. All gas piping not exposed shall be encased with Schedule 40 steel sleeves with open ends. ALL PIPING THROUGH WALLS SHALL BE SLEEVED.
- D. Automatic gas valve supplying gas equipment below kitchen hood shall be furnished by the Hood Chemical Extinguisher System Contractor and installed by the Plumbing Contractor.
- E. Gas supports on the roof and penetrations through the roof shall be furnished and installed as detailed on the drawings.
- F. The Mechanical Contractor shall lay out location of supports and openings and coordinate same with all respective trades.
- G. Pipe shall be anchored to roof supports with Fee & Mason #366 galvanized pipe anchor. (STRAPS NOT ACCEPTABLE.)

1.3 TESTING:

- A. All low-pressure gas piping shall be tested with a 10" mercury column for thirty (30) minutes.
- B. After the test has been completed and approved by the City Inspector and Architect, the Contractor shall complete the attached form on next page entitled "GAS INSTALLATION CERTIFICATE OF INSPECTIONS AND TESTS", and forward same to Architect.

CERTIFICATION
GAS INSTALLATION
CERTIFICATE OF INSPECTIONS AND TESTS

FILE NO _____

DATE: _____

NAME OF OCCUPANCY _____

STREET ADDRESS _____

PARISH _____ TOWN _____

IS THERE A SHUTOFF COCK OR VALVE AT METER? _____ CONDITION _____

ACCESSIBLE? _____

LENGTH OF SHUT-IN TEST (TIME) _____

RESULT OF TEST IN DETAIL _____

MODE OF TESTING UNDERGROUND LINES _____

MODE OF TESTING GENERAL INSTALLATION _____

CONDITIONS FOUND _____

OWNER'S NAME _____

ADDRESS _____ PHONE _____

OCCUPANT'S NAME _____

ADDRESS _____ PHONE _____

NAME OF PERSON MAKING TEST _____

ADDRESS _____ PHONE _____

REMARKS _____

MAINTENANCE SUPERINTENDENT NAME _____

ADDRESS _____ PHONE _____

END OF SECTION 22 11 24

SECTION 22 13 00 - WASTE WATER DISPOSAL



PART 1 - GENERAL

1.1 DESCRIPTION

- A. Connect to sanitary sewage system as indicated on plans. Contractor shall verify all elevations and inverts prior to beginning construction. Contractor shall contact local utilities and pay all service and connection fees.
- B. The system of sewage and drainage below grade shall be in general PVC plastic as hereinbefore specified except where space requirements necessitate the use of Type "DWV" copper.
- C. All work shall be in strict conformity with all local codes. Piping shall be routed as shown on plans or in an acceptable manner to meet building conditions. Venting shall be as shown on plumbing riser diagrams.
- D. Connections between traps and cast iron pipes are to be made with heavy brass ferrules.
- E. Provide reducers, increasers, special flanges, and fittings where required between piping work and fixtures in order to connect and complete work and render it ready for use. Make any offsets required to avoid construction.
- F. All lines 3" and smaller shall be sloped 1/4" per foot and all lines 4" shall be sloped 1/8" per foot. Piping shall be laid so slope is continuous.
- G. All vents shall extend 10" above roof and terminate in an appropriate lead flashing collar. No vents shall penetrate roof within 48" of an exterior wall. Offset in ceiling as required. All back vents shall be taken off as near trap as possible.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Vents - Provide flashing collar as detailed. Coordinate with roofing contractor to maintain roof warranty.

PART 3 - EXECUTION

3.1 TESTING

- A. Test all plumbing sewer lines, vents, waste, etc. with a minimum of 10' water head, for 24 hours and in accordance with local code authority requirements. If the sanitary sewer test fails, the contractor shall remove test, repair defective pipe, joint or system and shall retest for 24 hours.

END OF SECTION 22 13 00

SECTION 22 42 00 - PLUMBING



PART 1 - GENERAL

1.1 DESCRIPTION

- A. Furnish all labor and materials as hereinbefore specified, indicated or reasonably implied for the complete installation of the following systems:
 - 1. Hot Water System
 - 2. Sanitary Drainage System
 - 3. Cold Water System

PART 2 - PRODUCTS

2.1 FLASHING

- A. Flash around all pipes passing through roof in connection with this contract with sheet lead, not less than 4 # to the square foot, built 6" into the waterproofing, running 10" up the pipe and turned over into the pipe cavity. Flashing around roof drains shall be not less than 4 # lead extending at least 12" from the drain rim into membrane waterproofing. Fasten flashing to drain clamp device making watertight durable joint.

2.2 ELECTRIC HOT WATER HEATERS

- A. Model Number - Furnish and install an electric hot water heater as scheduled and detailed on plans. Provide State Boiler Inspection at each water heater.
- B. Warranty - The tank shall have a three (3) year warranty to protect the owner against defects in material and workmanship, discolored water or tank perforation due to erosion and corrosion.

2.3 PLUMBING FIXTURES

- A. Plumbing Contractor shall furnish and install all plumbing fixtures shown on accompanying drawings. Refer to both plumbing and architectural drawings and provide all fixtures shown on either. Fixtures shall be complete with all necessary brass and accessories required for a complete installation including traps, escutcheons, angle supplies, basin cocks, etc. All fixtures shall be new and must be delivered to the building properly crated in perfect condition.
- B. All brass must be of the best quality, lightweight goods will not be accepted. All brass pipe shall be seamless brass tubing and nipples shall be extra heavy. All fittings and trim shall

be cast brass with cleanouts. All exposed piping shall be chromium plated. Provide cut-off valves at each fixture in both hot and cold water piping.

- C. For the purpose of establishing type and class of fixtures required, the following plate numbers have been taken from the Kohler catalog unless otherwise indicated. Fixtures as manufactured by Crane, or American Standard of equivalent quality and manufacturer will be accepted.
- D. Refer to plumbing fixtures. Plumbing fixture schedule on plans for plumbing fixtures.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All plumbing fixtures shall be installed as per local code authorities.
- B. All tests shall be in accordance with local code authorities.
- C. All supply piping (hot and cold) to all sinks, lavatories, water closets, water coolers, etc. shall be installed so that no more than 1/2" of copper tubing is exposed at the supply/cutoff valves.

END OF SECTION 22 42 00

SECTION 23 00 00 - HVAC GENERAL PROVISIONS



PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions, Division 0) and Division 01 as appropriate, apply to the Work specified in this Section.
- B. Refer to all Division as well as the Specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding mechanical work.

1.2 SCOPE OF WORK

- A. Furnish all labor and material necessary to provide and install the complete mechanical portion of this Contract, including plumbing, air conditioning, heating and ventilating systems as called for herein and on accompanying drawings. Parts of the mechanical division may be bid separately or in combination, at the Contractor's option; however, it shall be the responsibility of the General Contractor to assure himself that all items covered in the Mechanical Division have been included if he chooses to accept separate bids.
- B. It is the intent of this specification that all Division 22 materials with temperatures below ambient conditions or conveying any fluid/gas at temperatures below 70 deg. F be insulated to completely eliminate the potential for condensation. Unless specified elsewhere in these specifications, for materials that do not require access, insulate with 2-1/8" thick 3/4# density fiberglass duct wrap insulation with foil face (seal all joints air and water tight). For materials requiring occasional access, use 2" thick closed cell rubberized insulation with re-sealable fabric joints (hook and loop type).
- C. Contractor shall refer to the Architectural and Structural drawings and install equipment, piping, etc. to meet building and space requirements. No equipment shall be bid on or submitted for approval if it will not fit in the space provided.
- D. It is the intention of these specifications that all mechanical systems shall be furnished complete with all necessary valves, controls, insulation, piping devices, equipment, etc. necessary to provide a satisfactory installation that is complete and in good working order. The HVAC system shall ensure that under all circumstances, the building shall be kept at temperatures and indoor space relative humidities that when compared to outside temperatures and relative humidities protect building finishes installed under this contract and/or existing floor, wall and ceiling finishes within the building from damage due to excessive temperature or humidity. HVAC system shall ensure that building remain under a slight positive pressure and shall alarm in the event of a negative pressure condition. In addition Contractor shall provide training to Owner in

regard to the need for space temperature and humidity control whenever the outdoor dew point (wetbulb temperature) exceed 62.5 deg. F and freeze protection procedures whenever the outdoor temperature (drybulb temperature) drops below 32 deg. F. Contractor shall obtain written sign-off on the part of the Owner to the receipt of all training including the above and all required training referenced hereafter, throughout these specifications. Failure to obtain this sign-off shall be constructed as evidence that proper training was not given.

- E. Contractor shall visit the site and acquaint himself thoroughly with all existing facilities and conditions which would affect his portion of the work. Failure to do so shall not relieve the Contractor from the responsibility of installing his work to meet the conditions.
- F. This Contractor shall protect the entire system and all parts thereof from injury throughout the project and up to acceptance of the work. Failure to do so shall be sufficient cause for the Architect to reject any piece of equipment.

1.3 DEMOLITION

- A. The contractor shall visit the site prior to bid to determine the extent of work required to complete the project.
- B. Contractor shall coordinate demolition with owner. All equipment shall be salvaged for owner. Locate equipment as directed by owner. All equipment and materials not salvaged by the owner shall be removed from the site and discarded at the contractors expense.
- C. Contractor shall coordinate all work with general contractor and phase work as required by project.
- D. All equipment piping, etc. required to be removed to accommodate the modifications shall be removed.
- E. Contractor shall maintain services to existing facilities which shall remain during and after construction is complete.
- F. Contractor shall coordinate any shutdown of services with the owner. It is intended that the building will remain occupied during construction. Contractor shall schedule shut down of services with the owner in order to prevent disruption of building occupancy.
- G. Contractor shall be responsible for draining down of existing systems to complete demolition. All work shall be scheduled with the owner. Contractor shall also be responsible for refilling system and removing all air in order to return the systems to proper operating conditions.

- H. All shutdown of services shall be done at night during a time period approved by owner. The systems shall be required to be back up and running each morning unless otherwise approved by the owner.

1.4 GROUNDS AND CHASES

- A. This Contractor shall see that all required chases, grounds, holes and accessories necessary for the installation of his work are properly built in as the work progresses; otherwise, he shall bear the cost of providing them.

1.5 CUTTING AND PATCHING

- A. Initial cutting and patching shall be the responsibility of the General Contractor, with the Mechanical Contractor being responsible for laying out and marking any and all holes required for the reception of his work. No structural beams or joists shall be cut or thimble without first receiving the approval of the Architect. After initial surfacing has been done, any further cutting, patching and painting shall be done at this Contractor's expense.

1.6 FILL AND CHARGES FOR EQUIPMENT

- A. Fill and charge with materials or chemicals all those devices or equipment as required to comply with the manufacturer's guarantee or as required for proper operation of the equipment.

1.7 BIDDING REQUIREMENTS AND RESPONSIBILITIES

- A. Prime bidder is responsible for all work , of all trades and sub-contractors bidding this project. It is the prime bidders responsibility, prior to submitting a bid to ensure that sub-contractors coordinate all aspects of the work between trades, sub-contractors, etc. to the fullest extent possible.
- B. Prime bidder shall ensure that all sub-contractors, suppliers, equipment vendors, etc., obtain all necessary and pertinent contract document information pertaining to their work prior to the submission of a bid. Contractor shall realize that different sub-contractors may furnish equipment, accessories, devices, etc. necessary for a complete and working installation, that require provision of services by another sub-contractor or trade.
- C. Bidders of all or any portions of this section or division are required to review all contract documents including but not limited to Architectural drawings, Structural drawings, Mechanical drawings, Plumbing drawings, Electrical drawings, etc. to coordinate requirements and responsibilities with and through prime bidder.
- D. Bidders of all or any portions of this section or division, by furnishing a bid on a portion of the prime contract are indicating that they have received all contract documents and

coordinated services provided under their portion of the work with the prime bidder; they are indicating that they have expressed any pertinent questions (which would result from a detailed, thorough review of the entire set of contract documents) to the prime bidder in accordance with Division 0 & 01 requirements, prior to bidding.

- E. All timely, pertinent, questions provided in writing prior to bids, in accordance with Division 0 & 01 requirements, will be clarified, defined, or otherwise explained in a written addendum and/or addendums prior to bids, in accordance in Division 0 & 01 requirements.
- F. It is not the intention of these contract documents to leave any issue relating to coordination between trades or sub-contractors vaguely defined. The intention is to define all issues, coordination matters, equipment requirements, sizes, routing, etc. to the satisfaction of the prime bidder, prior to receipt of bids.
- G. Bidders of all or any portions of this section or division, by virtue of the submission of a bid to the prime bidder, are indicating that they have reviewed the entire set of contract documents with due diligence and regard for the Owner's desire for a comprehensive and complete bid proposal; that they have expressed all concerns or questions requiring clarification on matters of coordination between trades and/or sub-contractors; that they have expressed any such concerns or questions in writing in accordance with Division 0 & 01 requirements.
- H. Prime bidders, by submission of a comprehensive bid on the project are indicating that the subcontractors selected in their bid have complied with all Division 0 & 01 requirements, that they have indicated in writing, prior to bidding, all questions or concerns requiring clarification and/or explanation and have documented any and all specific exclusions involving work that would generally be considered to be work of their trade. The prime bidder shall coordinate all work so that anything excluded by the bidder of all or any portions of this section or division, have been addressed prior to bids in one of the following manners:
 - 1. The work has been confirmed, by the prime bidder, to be work of another trade or subcontractor (whose proposal is also being accepted).
 - 2. Clarification of the matter has been made through the prime design professional via written addendum and is clearly and mutually understood by the prime bidder and the party raising the issue/question, or seeking clarification.
 - 3. The work has been accepted as the responsibility of the prime contractor directly.

1.8 MATERIAL AND EQUIPMENT

- A. The term "provide" when used in the Contract Documents includes all items necessary for the proper execution and completion of the Work.

- B. Specific reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgement of the Architect expressed in writing is equal to that specified.
- C. Coordinate and properly relate all Work of this Division to building structure and work of all other trades.
- D. Visit premises and become thoroughly familiar with existing conditions; verify all dimensions in field. Advise Architect of any discrepancies prior to Bid Date in accordance with Division 0.
- E. Do not rough-in for any item or equipment furnished by others or noted "Not in Contract" (NIC), without first receiving rough-in information from physically examining the existing equipment, receiving specific cut sheet information from the Owner's representative, other trades and/or Architect. Rough-in services for "NIC" equipment as required, as the work progresses.
- F. Provide storage and protection for all equipment and materials in accordance with requirements of Division 0 and Division 0 & 01. Replace any equipment and materials damaged by improper handling, storage, or protection, at no additional cost to Owner.
- G. Keep premises clean in accordance with requirements of Division 0 and Division 01.

1.9 SUBSTITUTIONS

- A. Substitutions are only allowed by approval of the Architect prior to Bid Date as stipulated in Division 0 and/or Division 01.
- B. Design of systems is based on specific equipment. If the use of other manufacturer's equipment, even though approved by Architect, involves additional cost due to space requirements, foundation requirements, increased mechanical or electrical services, the cost of such extra work shall be borne by manufacturer of substituted equipment. Even though a manufacturer's name appears in the Contract Documents as having acceptable equipment, their equipment with different model numbers shall be classified as being a substitute to the equipment originally designed for and named in the Contract Documents. Substitute equipment, materials, etc., will not be allowed to deviate from Contract Document requirements. Furnish all options specified or reasonably implied from the contract documents. Specifically identify any variance in regard to submittal versus specified performance on the cover sheet of each submittal.

1.10 VALUE ENGINEERING (V/E):

- A. While it may be in the project Owner's interest to consider the first cost money saving that may be generated via alternatives and options generated via participation in Value Engineering, Division 15 contractor shall realize that substantive offers of Value Engineering (V/E), if accepted by the Owner, constitute a design-build agreement (offer and acceptance) with the owner, and drastically change the design concept of the project, as developed by the Professional of Record identified on the Contract Documents.
- B. Should contractor offer, and the owner accept value engineering options that alter aspects of the system design, equipment, performance and/or performance verification or monitoring of respective systems, Division 15 contractor shall provide duly licensed professional engineering consultants working on behalf of the Division 15 contractor (including sub-contractors and equipment vendors/manufacturers) to review, approve and take professional responsibility for performance and suitability of V/E hybrid systems, materials or operational changes related to respective V/E items. The Division 15 contractor's licensed professional engineering consultants and the Division 15 contractor assume any and all responsibility for the design and suitability in terms of performance, of hybrid systems installed, as Division 15 contractor's Professional of Record, absolving the original project Professional of Record (identified on the original Contract Documents, released for the original project Bid/Negotiation) from responsibility for the V/E hybrid systems portion of the work.
- C. Division 15 contractor, via the offer and acceptance of value engineering items on the project agrees to provide professional engineering design services and take full and complete responsibility for the hybrid design. Further, the Division 15 contractor's (V/E Items) professional of record (either employees, or independent consultants to the Division 15 contractor) through the offer and acceptance of V/E items, agree to indemnify and hold harmless the project owner, the owner's original A/E team (Professional of Record on behalf of the owner for the original Contract Documents) their heirs and assigns in regard to the V/E changes and their impact on the Division 15 systems altered, affected or modified, in whole or in part. The Professional of Record shown on the original Contract Documents in regard to the systems altered, adjusted, revised, modified or otherwise affected by the value engineering items implemented, shall be absolved of design responsibility as a result of implementation of V/E items, and their original use of Engineering Seals used for original Contract Documents, shall not apply.

1.11 DRAWINGS AND SPECIFICATIONS

- A. The specific intent of these Contract Documents is to provide the various systems, equipment, etc. to the Owner complete and in a thoroughly calibrated functional condition.
- B. The Drawings shall not be construed as shop drawings. In the event of a possible interference with piping or equipment of another trade, items requiring set grade and

elevations shall have precedence over other items Should any major interference develop, immediately notify the Architect.

- C. In laying out Work, refer to mechanical, electrical, structural, and architectural drawings at all times in order to avoid interference and undue delays in the progress of the Work.
- D. Furnish all plumbing fixtures (with required accessories) shown on either the plumbing drawings or the architectural drawings. Review Architectural casework elevations and identify fixtures indicated. Provide fixtures indicated. Rough-in for all fixtures as work progress. Verify prior to fixture shop drawing submittal.

1.12 CODES AND REGULATIONS

- A. Work shall be in full accord with the most stringent interpretation of the State Sanitary Code, local ordinances, building codes, and other applicable national, local, and state regulations.
- B. Equipment shall conform to requirements and recommendations of the National bureau of Fire Underwriters and National Fire Protection Association (NFPA).
- C. Items provided under this Division shall comply with the American National Standards Institute (ANSI) "Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People," ANSI A 117.1
- D. In the possible event of conflict between codes or regulations and Contract Documents, the most stringent interpretation of either shall govern (provided if exceeds the requirements of other codes. In the event of an irreconcilable difference between codes or regulations notify the Architect/Engineer immediately.
- E. In addition to the codes heretofore mentioned, all mechanical work and equipment shall conform to the applicable portions of the following specifications, codes and/or regulations:
 - 1. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
 - 2. National Electrical Code (NEC)
 - 3. National Fire Protection Association (NFPA)
 - 4. American Society of Mechanical Engineers (ASME)
 - 5. American Gas Association(AGA)
 - 6. Underwriters Laboratories (UL)
 - 7. International Building Code (IBC)
- F. All materials, equipment and accessories installed under this Contract shall conform to all rules, codes, etc. as recommended by National Associations governing the manufacturer, rating and testing of such materials, equipment and accessories. All materials shall be new and of the best quality and first class in every respect.

Whenever directed by the Architect, the Contractor shall submit a sample for approval before proceeding.

- G. Where laws or local regulations provide that certain accessories such as gauges, thermometers, relief valves and parts be installed on equipment, it shall be understood that such equipment be furnished complete with the necessary accessories, whether or not called for in these Specifications.
- H. All unfired and fired pressure vessels shall be built in accordance with the A.S.M.E. Code and so stamped. Furnish shop certificates for each vessel. Contractor shall provide and pay for first operating certificate as per State Fire Marshal Regulations.

1.13 FEES, PERMITS, AND TAXES

- A. Obtain and pay for permits required for the Work of this Division. Pay fees in connection therewith, including necessary inspection fees.
- B. Pay any and taxes levied for Work of this Division, including municipal and/or state sales tax where applicable.
- C. All permits, fees, certificates, etc. for the installation, inspections, plan review, service connections locations, and/or construction of the work which are required by any authority and/or agencies having jurisdiction, shall be obtained and paid for by the Contractor.
- D. The Contractor shall make all tests required by the Architect, Engineer or other governing authorities at no additional cost to the Owner.
- E. The Contractor shall notify the Architect and local governing authorities before any tests are made, and the tests are not to be drawn off a line covered or insulated until examined and approved by the authorities. In event defects are found, these shall be corrected and the work shall be retested.
- F. Prior to requesting final inspection by the Architect, the Contractor shall have a complete coordination and adjustment meeting of all of his sub-contractors directly responsible for the operation of any portion of the system. At the time of this meeting, each and every sequence of operation shall be checked to assure proper operation. Notify the Architect in writing ten (10) days prior to this meeting, instructing him of the time, date and whom you are requesting to be present.
- G. This project shall not be accepted until the above provisions are met to the satisfaction of the Architect.

1.14 MANUFACTURER'S DIRECTIONS

- A. Install and operate equipment and material in strict accord with manufacturer's installation and operating instructions. The manufacturer's instructions shall become part of the Contract Documents and shall supplement Drawings and Specifications.

1.15 SUBMITTAL DATA

- A. Submit shop drawings, project data, and samples in accordance with requirements of Division 0/and or Division 01.
- B. Shop drawings shall consist of published ratings or capacity data, detailed construction drawings for fabricated items, wiring and control diagrams, performance curves, installation instructions, manufacturer's installation drawings, and other pertinent data. Submit drawings showing revisions to equipment layouts due to use of alternate or substitute equipment.
- C. Where approved manufacturers and suppliers of equipment, materials, etc. are unable to fully comply with Contract Document requirements, specifically call such deviations to attention of Architect on submittals. Type deviations on a separate sheet; underlined statements or notations on standard brochures, equipment fly sheets, etc. will not be accepted.
- D. Approval of submittals shall not relieve Contractor from furnishing required quantities and verifying dimensions. In addition, approval shall not waive original intent of Contract Documents.
- E. Failure to obtain written approval of equipment shall be considered sufficient grounds for rejection of said equipment regardless of the stage of completion of the project.

1.16 REVIEW OF MATERIALS:

- A. Whenever manufacturers or trade names are mentioned in these Plans or Specifications, the words "or approved equivalent" shall be assumed to follow whether or not so stated. Manufacturers or trade names are used to establish a standard of quality only, and should not be construed to infer a preference. Equivalent products which meet the Architect's approval will be accepted; however, these products must be submitted to the Architect a minimum of ten (10) days prior to the Bid Date.
- B. Submission shall include the manufacturer's name, model number, rating table and construction features.
- C. Upon receipt and checking of this submittal, the Architect will issue an addendum listing items which are approved as equivalent to those specified. THE CONTRACTOR SHALL BASE HIS BID SOLELY ON THOSE ITEMS SPECIFIED OR INCLUDED IN THE "PRIOR APPROVAL ADDENDUM", AS NO OTHER ITEM WILL BE ACCEPTABLE.

- D. Prior approval of a particular piece of equipment does not mean automatic final acceptance and will not relieve the Contractor of the responsibility of assuring himself that this equipment is in complete accord with the Plans and Specifications and that it will fit into the space provided. Shop drawings must be submitted on all items of equipment for approval as hereinafter specified.
- E. Before proceeding with work and/or within thirty (30) days after the award of the General Contract for this work, the Mechanical Contractor shall furnish to the Architect complete shop and working drawings of such apparatus, equipment, controls, insulation, etc. to be provided in this project. These drawings shall give dimensions, weights, mounting data, performance curves and other pertinent information.
- F. The Architect's approval of shop drawings shall not relieve the Contractor from the responsibility of incorrectly figured dimensions or any other errors which may be contained in these drawings. Any omission from the shop drawings or specifications, even through approved by the Architect, shall not relieve the Contractor from furnishing and erecting same.
- G. Seven (7) sets of shop drawings shall be submitted to the Architect for approval. These submittals shall be supplied as part of this Contractor's contract. Any drawings not approved shall be resubmitted until they are approved. **SUBMIT ALL SHOP DRAWINGS AT THE SAME TIME. NO SEPARATE ITEMS WILL BE ACCEPTED.**
- H. Submit one (1) sepia with two (2) blueline prints of all mechanical room layouts showing locations of all equipment, piping, etc. to insure all will fit in space provided. Submit drawings at 1/4" scale.

1.17 PROJECT RECORD DOCUMENTS

- A. Keep Project Record Documents in accordance with requirements of Division 0 and/or Division 01.
- B. During construction period, keep accurate records of installations made under this Division, paying particular attention to major interior and exterior underground and concealed piping, ductwork, etc.
- C. The Contractor shall obtain at his cost, two sets of blueline prints of the original bid documents by the Architect. One set shall be kept on the site with all information as referenced below, and shall update same as the work progresses. The other set will be utilized to record all field changes to a permanent record copy for the Owner.
- D. If the Contractor elects to vary from the Contract Documents and secures prior approval from the Architect for any phase of the work, he shall record in a neat and readable manner, ALL such variances on the blueline print in red. The original bluelines shall be returned to the Architect for documentation.

- E. All deviations from sizes, locations, and from all other features of the installations shown in the Contract Documents shall be recorded.
- F. In addition, it shall be possible using these drawings to correctly and easily locate, identify and establish sizes of all piping, directions and the like, as well as other features of the work which will be concealed underground and/or in the finished building.
- G. Locations of underground work shall be established by dimensions to columns, lines or walls, locating all turns, etc., and by properly referenced centerline or invert elevations and rates of fall.
- H. For work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases this may be by dimension. In others, it may be sufficient to illustrate the work on the drawings in relation to the spaces in the building near which it was actually installed. The Architect's/Engineer's decision in this matter will be final.
- I. The following requirements apply to all "As-Built" drawings:
 - 1. They shall be maintained at the Contractor's expense.
 - 2. All such drawings shall be done carefully and neatly, and in a form approved by the Architect/Engineer.
 - 3. Additional drawings shall be provided as necessary for clarifications.
 - 4. These drawings shall be kept up-to-date during the entire course of the work and shall be available upon request for examination by the Architect/Engineer; and when necessary, to establish clearances for other parts of the work.
 - 5. "As-built" drawings shall be returned to the Architect upon completion of the work and are subject to approval of the Architect/Engineer.

1.18 EXCAVATING AND BACKFILLING

- A. Provide excavating and backfilling necessary for Work of this Division. Comply with provisions of Division 2, Site Work, if applicable.
- B. Trenches shall be inspected by Code Authorities and/or Owner's Representative before and after piping is laid. Give Owner's Representative 24-hour notice for each inspection. If any trenches are filled without Owner's Representative inspection and as subsequently found to be deficient, the trenches shall be uncovered, inspected, and then re-filled, if requested by Owner's Representative.
- C. Provide minimum 18 inches of cover or in compliance with local published frost line data (if greater than 18 inches) to finish grades or paving at water piping.
- D. For piping, provide bell holes at trench bottom to assure uniform bearing. Accurately grade trench bottoms by instrument before laying any pipe.

- E. Protect and maintain trenches in dry condition until piping has been inspected and approved. Immediately after approval, backfill trenches in tamped layers.
- F. Compact fill to satisfaction of Architect and/or Owner's Representative.

1.19 CUTTING AND PATCHING

- A. Comply with requirements of Division 0 and Division 01 regarding cutting and patching. Locate and timely install sleeves as required to minimize cutting and patching.
- B. Cutting, fitting, repairing, patching, and finishing of Work shall be done by craftsmen skilled in their respective trades. Where cutting is required, cut in such a manner as not to weaken structure, partitions, or floors. Holes required to be cut must be cut or drilled without breaking out around the holes. Where patching is necessary in finished areas of the building, the Architect will determine the extent of such patching and refinishing.
- C. Where return air plenums above ceilings are utilized, Division 22 Contractor shall ensure that return air openings are provided in walls run to deck, for proper return air flow back to the AHU. Cut walls as required to provide openings sized for maximum 1000 feet per minute air flow velocity through openings above ceiling. Provide a fire damper at openings of fire walls and a smoke damper at openings of smoke walls. Coordinate electric or pneumatic services to smoke dampers via automatic temperature control/EMS Contractor.
- D. Repairing Roadways and Walks: Coordinate all roadway work with authorities having jurisdiction. Cut and/or bore under roadways for connection of utilities as required. Coordinate work through General Contractor. Where this contractor cuts or breaks roadways or walks to lay the piping, he shall repair or replace these sections to match existing, unless specifically identified as the responsibility of others.

1.20 PAINTING

- A. Painting shall be provided by General Contractor's painting sub-contractor, unless specified otherwise. Leave exposed piping, materials, and equipment clean and free of rust, grease, dirt, etc. before and after painting.
- B. Factory finished equipment, fixtures, and materials which are marred, chipped, scratched, or otherwise unacceptable shall be repaired or replaced under this Division to Architect satisfaction, at no additions cost to Owner.
- C. Coordinate all painting requirements with prime bidder prior to bids.
- D. Paint all exposed piping inside and outside of building. Label all piping after painting as required. Utilize industry standard paint colors for respective system unless direct otherwise by Architect. Review proposed color scheme with Architect/Engineer prior to ordering materials.

1.21 CLEANING AND ADJUSTING:

- A. Upon completion of his work, the Contractor shall clean and adjust all equipment, controls, valves, etc.; clean all piping, ductwork, etc.; and leave the entire installation in good working order.

1.22 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Provide the Owner with three (3) copies of printed instructions indicating various pieces of equipment by name and model number, complete with parts lists, maintenance and repair instructions and test and balance report.
- B. COPIES OF SHOP DRAWINGS WILL NOT BE ACCEPTABLE AS OPERATION AND MAINTENANCE INSTRUCTIONS.
- C. This information shall be bound in plastic hardbound notebooks with the job name, Architect and Engineer names permanently embossed on the cover. Rigid board dividers with labeled tabs shall be provided for different pieces of equipment. Submit manuals to the Architect for approval.
- D. In addition to the operation and maintenance brochure, the Contractor shall provide a separate brochure which shall include registered warranty certificates on all equipment, especially any pieces of equipment which carry warranties exceeding one (1) year.
- E. The operation and maintenance brochure shall be furnished with a detailed list of all equipment furnished to the project, including the serial number and all pertinent nameplate data such as voltage, amperage draw, recommended fuse size, rpm, etc. The Contractor shall include this data on each piece of equipment furnished under this contract.

1.23 GUARANTEE

- A. The Contractor shall guarantee all materials, equipment and workmanship for a period of one (1) year from the date of final acceptance of the project. This guarantee shall include furnishing of all labor and material necessary to make any repairs, adjustments or replacement of any equipment, parts, etc. necessary to restore the project to first class condition. This guarantee shall exclude only the changing or cleaning of filters. Warranties exceeding one (1) year are hereinafter specified with individual pieces of equipment.
- B. If the Contractor's office is in excess of a fifty (50) mile radius of the project, he shall appoint a local qualified contractor to perform any emergency repairs or adjustments required during the guarantee period. The name of the contractor appointed to provide emergency services shall be submitted to the Architect for his approval.

1.24 LOCAL CONDITIONS

- A. The location and elevation of all utility services is based on available surveys and utility maps and are reasonably accurate; however, these shall serve as a general guide only, and the Contractor shall visit the site and verify the location and elevation of all services to his satisfaction in order to determine the amount of work required for the execution of the Contract.
- B. The Contractor shall contact the various utility companies, determine the extent of their requirements and he shall include in his bid all lawful fees and payments required by these companies for complete connection and services to the building, including meters, connection charges, street patching, extensions from meters to main, etc.
- C. In case major changes are required, this fact, together with the reasons therefor, shall be submitted to the Architect, in writing, not less than seven (7) days before the date of bidding. Failure to comply with this requirement will make the Contractor liable for any changes, additions and expenses necessary for the successful completion of the project.

1.25 MINOR DEVIATIONS

- A. Plans and detail sketches are submitted to limit, explain and define conditions, specified requirements, pipe sizes and manner of erecting work. Structural or other conditions may require certain modifications from the manner of installation shown, and such deviations are permissible and shall be made as required. However, specified sizes and requirements necessary for satisfactory operation shall remain unchanged. It may be necessary to shift ducts or pipes, or to change the shape of ducts, and these changes shall be made as required. All such changes shall be referred to the Architect for approval before proceeding. Extra charges shall not be allowed for these changes.
- B. The Contractor shall realize that the drawings could delve into every step, sequence or operation necessary for the completion of the project, without drawing on the Contractor's experience or ingenuity. However, only typical details are shown on the Plans. In cases where the Contractor is not certain about the method of installation of his work, he shall ask for details. Lack of details will not be an excuse for improper installation.
- C. In general, the drawings are diagrammatic and the Contractor shall install his work in a manner so that interferences between the various trades are avoided. In cases where interferences do occur, the Architect is to state which item was first installed.

1.26 VALVE TAGS

- A. Secure metal tags to all valves. Labeling on all valve tags shall include type of system the valve controls and the area of building, zone, or equipment number affected by

valve operation. Tag shall be 2" minimum diameter brass, engraved with code number, service and size. A framed list of the valves, giving manufacturer's name, model number, type and location shall be mounted in the main basement equipment room.

1.27 MACHINERY GUARDS

- A. This Contractor shall provide v-belt guards for each v-belt drive or other hazardous drive. The guard shall enclose the drive entirely and shall have a hole for taking a tachometer reading.

1.28 LABELING MECHANICAL EQUIPMENT

- A. All mechanical equipment (A/C units, air handlers, fan coil units, fan powered boxes, water heaters, etc.) furnished under Division 22 of contract documents shall be labeled with permanent laminated plate secured to equipment. Units shall be labeled as indicated on plans and schedules.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 23 00 00



PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work in this section includes furnishing and installing all piping for project as hereinafter described.
- B. Related Work: All piping shall be coordinated with Plumbing, Air Conditioning and Ventilation section of these specifications.

PART 2 - PRODUCTS

2.1 REFRIGERANT PIPE

- A. Refrigerant lines greater than 3/4" shall be ACR hard copper pipe and fittings.
- B. All exposed refrigerant lines, regardless of size, shall be ACR hard copper pipe and fittings.
- C. Concealed refrigerant lines 3/4" or less may be ACR soft copper.
- D. All brazing must be done with a nitrogen purge. The engineer at anytime may require removal of two fittings per system to verify that the nitrogen purge was done.

2.2 REFRIGERANT PIPE TESTING

- A. Refrigerant lines shall be tested under 600 psi nitrogen pressure for 48 hours using soap suds at joints to test for leaks. After that, the refrigerant lines shall be tested with 500 microns vacuum for 1 hour. Evacuate system and charge with refrigerant.

2.3 CONDENSATE DRAIN LINES

- A. Shall be Type L hard copper.

2.4 PIPE FITTINGS

- A. All pipe fittings shall be same as piping specified unless indicated otherwise.
- B. All screwed fittings and pipe shall have threads cut to standard pipe thread dimensions. Pipe shall be properly reamed after cutting of threads.
- C. Joint compound, Crane Thread lubricant or equal, shall be applied to male threads of the screwed pipe and fittings only.
- D. Approved expansion joints or flexible couplings shall be provided as necessary.
- E. Care shall be taken in making up pipe and fittings such that pipe does not extend into fitting sufficiently to reduce the waterway.
- F. Unions for use on above grade pipe larger than 2 inches shall be cast iron, screwed

flanges, 125 pound flat face with 1/16" non-asbestos composition gasket.

- G. All risers 3" or larger shall have a flanged joint at each floor.
- H. Standard, one-piece reducing fittings of approved design shall be used wherever a change in size is made. Changes in pipe sizes shall not be made by means of reducing flanges.

2.5 PIPE HANGER AND SUPPORTS

- A. This Contractor shall furnish and install all foundations and supports required for his equipment unless otherwise indicated on the drawings.
- B. This Contractor shall furnish and install all escutcheons, inserts, thimbles, hangers, etc. required for the proper support and installation of his equipment and piping. Cooperate with other trades in locating and placing these items.
- C. Provide sleeves for all pipes passing through walls, floors, beams, etc. Sleeves passing through structural members shall be of cast iron or Schedule 40 steel pipe. Sleeves passing through non-structural walls or floors shall be of 26 gauge galvanized iron. Joints between sleeves and pipes passing through floors shall be made watertight with plastic materials. Where pipes pass through waterproofing membrane, flashing sleeves shall be installed.
- D. Provide Grinnell # 108, Fee and Mason Fig. 57, Carpenter & Patterson # 34, Michigan # 450, or equal malleable iron split ring hangers with rod supports throughout. Strap hangers or wire will not be accepted. Maximum spacing of hangers for cast iron pipes shall be 5'; for other than soil, use 10'.
- E. Provide galvanized iron shields between hangers and pipe covering.
- F. Provide Grinnell, Fee and Mason, Crane, or equivalent heavy steel riser clamps on vertical risers at floors to support pipes.
- G. Provide chrome plated brass escutcheons wherever pipes pass through floors, walls or ceilings in exposed or finished areas.
- H. All piping projecting from chases shall be rigidly supported in the wall or chase. Loosely supported fixtures or accessories will not be accepted.

2.6 MOTORS, STARTERS, AND ELECTRICAL WORK

- A. The Mechanical Contractor shall furnish to the Electrical Contractor for installation, all the motor starters, start-stop switches and pilot lights for each piece of motor driven equipment unless shown otherwise.
- B. The Electrical Contractor shall install all motor starters, start-stop switches and pilot lights as furnished by the Mechanical Contractor. The Electrical Contractor shall also do all power wiring required for the installation of such mechanical equipment.

- C. The Mechanical Contractor shall furnish and install equipment interlocking, control wiring, etc., as hereinafter specified under Temperature Controls. All work shall be done in accordance with the National Electric Code requirements. The Mechanical Contractor shall be responsible for coordinating all work to provide a complete system in working order.
 - D. All electrical equipment shall have the U.L. Label and shall meet the standards of the National Electrical Code and NEMA.
 - E. All motors for the mechanical equipment shall be of the 40oC rise type and shall be furnished and installed by the Mechanical Contractor. All motors shall be wound for plus or minus 10% of the specified voltage. Motors ½ HP and smaller shall be 120 volt, single phase, 60 cycle. Motors above ½ HP shall be the voltages as indicated on the Drawings. All motors shall be PREMIUM EFFICIENCY type with a minimum motor efficiency of: 1, 1.5 and 2 HP-84%; 3 HP-85%; 5 HP-87%; 7.5 and 10 HP-89%; 15 HP-90%; 20 HP-91%; 25 and 30 HP-92%; 40 HP-93%. Contractor shall submit certification after project is complete indicating minimum motor efficiency requirement has been met. All motors shall be rated for inverter duty.
 - F. Mechanical contractor shall furnish magnetic type starters for all motors regardless of horse power and phase.
 - G. Exception: Manual starters can be furnished for fractional horsepower motors that are not controlled automatically or remotely. Refer to Section 15800 (Temperature Control) and mechanical drawings to determine if fractional horsepower motors are controlled automatically or remotely.
- 2.41 SINGLE PHASE AC FRACTIONAL HORSEPOWER MANUAL STARTERS - 1HP OR LESS FHP manual starters shall be Square D Class 2150 or Allen Bradley Bulletin 600.
- A. The manual starters shall consist of a manually operated toggle switch equipped with melting alloy type thermal overload relay. Thermal unit shall be of one-piece construction and interchangeable. Starter shall be inoperative if thermal unit is removed. Contacts shall be double break, silver alloy visible from both sides of starter.
 - B. All FHP MANUAL STARTERS shall be double-pole type with one thermal overload relay and general purpose enclosure and red pilot light.
- 2.42 SINGLE AND THREE PHASE AC MAGNETIC STARTERS - LINE VOLTAGE TYPE (ALL MOTORS BELOW 10 HP
- A. Motor starters shall be Square "D" Class 8536 or Allen Bradley Bulletin 509. Motor starters shall be across-the-line magnetic type rated in accordance with NEMA Standards, sizes and horsepower ratings. Starters shall be mounted in general purpose enclosures unless otherwise indicated on plans.
 - B. Across-the-line magnetic starters through NEMA Size seven shall be equipped with double break silver alloy contacts. Single break contacts

shall be supplied on Size eight. All contacts shall be replaceable without removing power wiring or removing starter from panel. The starter must have straight-through wiring.

- C. Coils shall be of molded construction through NEMA Size seven. Coils on size eight starters shall be form wound, taped, varnished and baked. All coils shall be replaceable from the front without removing the starter from the panel.
- D. Overload relays shall be thermally alloy type with a replaceable control circuit module. Thermal units shall be of one-piece construction and interchangeable. The starter shall be inoperative if the thermal unit is removed.
- E. NEMA Size 0 thru 7 starters shall be suitable for the addition of at least four external auxiliary contacts of any arrangement normally open or normally closed; Sizes 0-7 external auxiliary contacts shall be field convertible. Size 00 and Size 8 starters shall be suitable for the addition of up to three external auxiliary contacts of any arrangement normally open or normally closed. A minimum of two auxiliary contacts (one normally open and one normally closed) shall be provided.
- F. Single and Three-Phase Starter:
 - 1. All magnetic starters shall be equipped with a "HAND-OFF-AUTO" SELECTOR SWITCH, A RED RUN PILOT LIGHT, and a control circuit transformer with two fuses in primary circuit and one fuse in secondary. Control voltage shall be coordinated with other trades.
- G. Three Phase Starters:
 - 1. All three phase starters shall be equipped with an individual phase relay for protection against phase failures, phase voltage unbalance, and phase reversal. This relay shall have a response delay adjustable from ½ to 1 second and an adjustable unbalance voltage level of 5 to 30%.

2.43 REDUCED VOLTAGE AC MAGNETIC STARTERS - (ALL MOTORS 10 HP AND ABOVE)

- A. All starters for motors 10 HP and above shall be autotransformer type containing a starter and contactors with a vertically actuated magnet and armature assembly, and horizontally actuated contacts through NEMA Size 4, contacts, on NEMA Size 5 through NEMA size 7.
- B. The controller will be supplied for use on an electrical system as indicated on drawings.
- C. The Reduced Voltage Starter will be sized to control horsepower, as indicated on drawings.
- D. The Reduced Voltage Starter shall be Square "D" Class 8606 or Allen Bradley Bulletin 570 and shall have the following features: hand-off-automatic

selector switch, pilot light (red), control circuit transformer with two fuses in the primary circuit, and one fuse in the secondary circuit. Control voltage shall be coordinated with other trades.

- E. All three phase starters shall be equipped with an individual phase relay for protection against phase failures, phase voltage unbalance, and phase reversal. This relay shall have a response delay of approximately 3 seconds. After either the undervoltage or voltage unbalance limits are exceeded.

REFER TO DESCRIPTION OF MAGNETIC STARTERS FOR DETAILS REGARDING CONTACTORS AND STARTERS INTERNAL TO THIS DEVICE.

- F. Refer to electrical plans and provide combination starters and disconnects where required.
- G. All starters which are to be energized from remote "start-stop" stations shall be equipped with a step-down transformer to 120 volts.

2.7 ACCESS PANELS

- A. Furnish and install access panels where valves, drains, dampers, etc. are concealed in walls, ceilings, or floors, or otherwise inaccessible. Panels shall be Milcor, or equivalent, sized as required and furnished with prime coat finish.

END OF SECTION 23 05 00



PART 1 - GENERAL

1.1 TEST AND BALANCE:

- A. The balancing, testing, and adjusting of the air conditioning, heating, and ventilating systems shall be performed by an independent certified NEBB/AABC air balancing contractor. The contractor shall be responsible for inspecting, adjusting, balancing and logging the data on the performance of fans, air handling units, low pressure supply and exhaust ductwork, and the flows of air through all fans, coils, and heat exchangers.
- B. Results of the investigation shall be submitted in typed triplicate prior to final inspection of the project and shall include results of the following:
 - 1. Complete air balance including all A/C units, exhaust fans, ducts, etc. and other components in which flow occurs.
 - 2. A tabulation of all electrical data including starter type, size, heater rating, amperage and voltage rated and running.
 - 3. Complete air balance report on all air handling units, A/C units, fans and grilles connected to low pressure rectangular ductwork.
 - 4. Actual operating capacities of all equipment.
 - 5. Dry bulb temperature at site on day of test.
 - 6. Entering and leaving air temperatures (D.B. and W.B.) on heating and cooling cycle with outdoor air damper closed.
 - 7. Adjust and record pressure drop and temperature drop across all heat exchangers, coils, equipment, etc. giving, entering, and leaving conditions.
 - 8. Mark settings on all valves, splitters, and dampers.
 - 9. Test and adjust each diffuser, grille and register to within 10% of design and requirements.
 - 10. Test and adjust blower RPM to design requirements.
 - 11. In cooperation with control manufacturer's representative, setting adjustments of automatically operated dampers to operate as specified, indicated or noted. Contractor shall check all controls for proper calibrations and list all controls requiring adjustment by control installers.
 - 12. As a part of the work in this contract, air conditioning contractor shall make any changes in the pulleys, belts, and dampers required for correct balance. Contractor shall notify Architect no later than seven (7) days prior to bid if any items other than those called out on drawings are required for system balancing.
 - 13. As a part of the work of this contract, air conditioning contractor shall make any changes in the duct elements, fans, vibration isolators, etc. as required.

1.2 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced to in the text by the basic designation

only.

1. American National Standards Institute (ANSI)
2. American Society of Heating, Refrigeration, & Air Conditioning Engineers (ASHRAE)
3. Associated Air Balance Council (AABC)
4. National Environmental Balancing Bureau (NEBB)

1.3 DEFINITIONS

- A. Adjust: To regulate the specified fluid flow rate and air patterns at the terminal equipment, (e.g., reduce fan speeds, throttling, etc.).
- B. Balance: To proportion flows within the distribution system (submains, branches, and terminals) in accordance with specified design quantities.
- C. Procedure: Standardize approach and execution of sequence of work operations to yield reproducible results.
- D. Report Forms: Test data sheets arranged for collection of test data in logical order for submission and review. This data should also form the permanent record which shall be used as the basis for any future testing, adjusting, and balancing required.
- E. Test: To determine quantitative performance of equipment.

PART 2 - EXECUTION

2.1 INSTALLATION

- A. Air balance and testing shall not begin until system has been completed and is in full working order. Contractor shall put all heating, ventilating, and air conditioning systems and equipment into full operation and shall continue the operation of same during each working day of testing and balancing. The contractor shall submit within 15 days after receipt of the contract, 6 copies of submittal data for the testing and balancing of the air conditioning, heating and ventilating system. The air balance agency shall provide proof of having successfully completed at least 5 projects of similar size and scope and shall be a certified member of the Associated Air Balance Council.
- B. Test and balance shall include an extended warranty of 90 days after completion of test and balance work during which time the Engineer, at his discretion, may request a re-check or re-setting of any outlet, supply air fan or exhaust fan as listed in test report. The agency shall provide technicians to assist architect in making any tests he may require during this period of time.
- C. Air conditioning contractor shall award the test and balance contract to the approved agency upon receipt of his contract to proceed with air conditioning installation, to allow the air balance agency to schedule this work in cooperation

with other trades involved and comply with the completion date.

- D. Upon completion of the air conditioning system, air balance agency shall perform the following tests, compile the test data and submit five (5) copies of the complete test data to contractor for forwarding to the Engineer for evaluation and approval. The contractor agency shall comply with all standards as set forth by the Associated Air Balance Council.

2.2 TESTING PROCEDURES

- A. Perform the following tests and balance system in accordance with the following requirements.
1. Test and record all full motor load amperes.
 2. Make Pitot Tube traverse of main supply ducts and obtain design cfm at fans.
 3. Test and record system static pressures, suction and discharges.
 4. Test and adjust system for design recirculated air, cfm.
 5. Test and adjust system for design cfm outside air.
 6. Test and record entering air temperature (D.B. heating and cooling).
 7. Test and record leaving air temperature (D.B. heating and cooling).
 8. Test and record leaving air temperature (W.B. cooling).
 9. Test and record entering air temperature (W.B. cooling).
 10. Adjust all main supply and return air ducts to proper design cfm.
 11. Adjust all zones to proper cfm, supply and return.
 12. Test and adjust each diffuser, grille and register to within 10% of design and requirements.
 13. Each grille, diffuser, and register shall be identified as to location and area.
 14. Size, type and manufacturer of diffusers, grilles, registers, and all tested equipment shall be listed. Manufacturer's ratings on all equipment shall be used to make required calculations.
 15. Readings and tests of diffusers, grilles and registers shall include required FPM velocity and test resultant velocity, required CFM and test resultant CFM after adjustments.
 16. In cooperation with control manufacturer's representative, setting adjustments of automatically operated dampers to operate as specified, indicated or noted. Testing agency shall check all controls for proper calibrations and list all controls requiring adjustment by control installers.
 17. All diffusers, grilles and registers shall be adjusted to minimize drafts in all areas.
 18. As a part of the work in this contract, air conditioning contractor shall make any changes in the pulleys, belts, and dampers or the addition of dampers required for correct balance as recommended by Air Balance Agency at no additional cost to the owner.
 19. As a part of the work of this contract, air conditioning contractor shall make any changes in the duct elements, fans, vibration isolators, etc. as recommended by Air Balance Agency to comply with sound and vibration criteria below.

- B. The Contractor shall make a total of three (3) inspections within ninety (90) days after use of the system to insure satisfactory conditions are being maintained. During this period the Architect, at his discretion, may request a re-check or re-setting of any outlet, supply air fan or exhaust fan as listed in test report. Provide technicians to assist the Engineer in making any tests he may require during this period of time.
- C. All work shall be done in accordance with "National Standards for Field Measurement and Instrumentation", Total System Balance, Volume I, Number 81266 published by the Associated Air Balance Council.

END OF SECTION 23 05 93

SECTION 23 07 00 - HVAC INSULATION



PART 1 - GENERAL

1.1 DESCRIPTION

- A. Duct insulation installation shall not begin until all joints are sealed with mastic and all work has been tested and found to be tight.

PART 2 - MATERIALS

2.1 THERMAL INSULATION

- A. After all work has been tested and found to be tight, insulate as follows:
- B. Wrap all rigid supply ductwork, exhaust ductwork, return ductwork, and fresh air ductwork with flexible Fiberglass insulation with aluminum foil facing, as follows: 2-1/8" thick, 3/4 # density, R-6, sealing all joints w/ 2" wide vapor barrier tape. An additional band or tape shall be applied between the circumferential joints for a maximum two feet spacing of taped bands.
- C. Insulate all refrigerant suction lines, with 3/4" Armstrong "Armaflex" Insulation or equal. On all lines exposed to weather or exterior conditions, provide two coats of mastic caulking over entire assembly. Mastic shall be Virginia foam mastic or equal.
- D. Condensate drain lines shall be insulated with 3/4" Armstrong "Armaflex" Insulation or equal.
- E. Furnish and install over entire areas of walls of air handling rooms containing a/c units a 1" thick Manville Linacoustic or equal acoustical type duct insulation 3# density, applied over Slick-Klips 12" on center. Stick-Klips shall be applied to wall with Miracle Adhesive. Acoustical material shall be applied over Stick-Klips with duct liner adhesive tape EC-104 spotted between pins. Stick-Klips with factor applied adhesive will not be acceptable.
- F. HVAC flex-connections shall be wrapped on outside with 2-1/8" thick 3/4 # density fiberglass insulation with aluminum foil vapor barrier. Insulation shall be taped at all joints and installed per the manufacturer's recommendations.
- G. Reheat coils shall be wrapped on outside with 2-1/8" thick 3/4 # density fiberglass insulation with aluminum foil vapor barrier. Insulation shall be taped at all joints and installed per the manufacturer's recommendations.
- H. Duct mounted heaters shall be wrapped on outside with 2-1/8" thick 3/4 # density fiberglass insulation with aluminum foil barrier. Insulation shall be taped at all joints and installed per the manufacturer's recommendations.

END OF SECTION 23 07 00

SECTION 23 09 00 - TEMPERATURE CONTROLS



PART 1 - GENERAL

1.1 DESCRIPTION

- A. Furnish and install as hereinafter specified, a complete system of electronic temperature controls. This control system shall be as manufactured by Johnson Service Co. or approved equal. This system shall be installed and adjusted by mechanics regularly employed by the mechanical contractor. All equipment shall be of the manufacturer's first quality and shall be of full proportioning type.
- B. All temperature controls and instrumentation covered by this specification shall be manufactured, installed and supervised by the same manufacturer in order to consolidate the responsibility of this system to one manufacturer. The control system shall consist of all thermostats, central control panel and other necessary equipment to provide controls of the following:
- C. Split System Air Conditioning System
- D. Exhaust Fans

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All materials shall be new and delivered to the jobsite in the manufacturer's original shipping package. Used or otherwise second class material shall not be acceptable.

2.2 THERMOSTATS

- A. Provide Mitsubishi AE-200A control panel and simple MA thermostat controllers as shown on plans. Coordinate IP address with owner to connect to the building LAN.

2.3 TEMPERATURE CONTROL WIRING INTERLOCK

- A. The control sub-contractor shall make complete and coordinated interlock wiring and supervisory central system wiring diagrams. This sub-contractor shall obtain necessary diagrams from the successful manufacturer and shall completely coordinated the interlock diagram.
- B. Interlocks by control contractor shall be as follows:
 - 1. Interlock all firestats and smoke detectors with respective fans or air units.

2. Interlock electric heaters so that strip heaters shall only be able to be energized if fan operation is proven.
3. Interlock smoke detectors to de-energize the respective A/C units and exhaust fans when sensors detect a presence of products of combustion.
4. Interlock all control dampers with 2nd stage of cooling/heating cycles where multiple condensing unit serve a single air handling unit.
5. Interlock all 120V actuators for exhaust fans.
6. Interlock fresh air motorized dampers to shut when corresponding A/C Unit is "Off".
7. Provide interlocks and control wiring for motorized combination louver dampers with end switches, such that corresponding exhaust fan will not start until the dampers are fully open.

2.4 FIRESTAT:

- A. Provide manual reset firestat in return air to each air handling unit. Firestat shall stop associated fan on a rise in air temperature above 125°F.

2.5 FLOAT SWITCH:

- A. Provide float switch to emergency drain pan of each AHU. Switch shall be interlocked with AHU to de-energize the unit when the water level in the pan rises above a set level.

2.6 MOTORIZED DAMPERS:

- A. O.A. motorized dampers shall be interlocked with A/C units in respective mechanical rooms to open when any A/C unit is "on" and closed when all A/C units are "off". Provide all necessary relays, switches, transformers, etc. as required.
- B. Motorized dampers shall be furnished and set in place by contractor installing the ductwork.
- C. Damper actuators shall be 120/1/60 electric actuators specifically selected for damper manufacturer's requirements. Controls contractor shall furnish and install actuators. Coordinate all work with contractor installing dampers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The Mechanical Contractor shall coordinate with the Electrical Contractor and shall provide all motor starters, etc., required for the completion of the electrical work.
- B. All control wiring 24V or 120V shall be provided by the Mechanical Contractor. Coordinate with electrical contractor.

- C. All wiring required in the control systems, including electrical connections for the thermostats, firestats, smoke detectors, exhaust fans and all interlocking motor control wiring shall be furnished and installed by Mechanical Contractor.
- D. All wiring shall be in conduit and in accordance with the National Electrical Code (N.E.C.).
- E. All control wiring located outdoors shall be installed in rigid or intermediate metal conduit.
- F. All control wiring located indoors where an accessible ceiling is not available shall be installed in E.M.T. conduit.
- G. All control wiring located above accessible ceilings shall be N.E.C. approved cable. All control wiring located above accessible ceilings used as air plenums shall be N.E.C. approved "plenum cable".
- H. All conductors shall be copper. Conductors used for power circuits shall be #12 TW minimum. Conductors used for control circuits shall be #14 TW minimum. Conductors used for sensor circuits shall be #18 TW minimum.

END OF SECTION 23 09 00

STATE OF LOUISIANA

HERBERT R. ALEXANDER, III

LICENSE No. 30775

PROFESSIONAL ENGINEER

MECHANICAL ENGINEERING

11/26/25

A. Furnish and install all ducts for Air Conditioning, Heating and Ventilating System as shown on the plans and as may be required to provide complete system. Ductwork shall be complete with grilles, vanes, flashings, hangers, flexible connections, splitters, dampers, fresh air inlets, louvers, reinforcing angles, etc. All ductwork shall be concealed and insulated as hereinafter specified. All ductwork indicated on drawings shall be metal-to-metal outside dimensions.

G. All edges shall be straight and true, and all bends shall be made with vaned turns. Where long radius turns cannot be used, the Contractor shall use square turns and use air splitters spaced not more than 3" center to center, and of a length so air will be properly distributed over the ducts.

2.3 ROUND DUCTWORK

- A. Shall be constructed of 26 gauge galvanized sheet metal with screwed and taped joints or snap lock joints.
- B. At contractor's option, pre-insulated flexible ductwork (R-6) as manufactured by Thermaflex Model MKE, Flexmaster 8M or prior approved equal may be used to connect to ceiling diffusers (maximum 6'-0" length). Quietflex Series 80 and Thermaflex Model KM are not approved.
- C. Flexible duct shall be maximum 4' in length, properly installed tight and straight with hangers and no sagging or kinks. Provide hard round snap lock duct wrapped with insulation for all runs greater than 6' in length. Any flexible duct runs 6' or less shall only be used for straight runs. Any turns shall have hard round elbows at spin in fittings prior to running flexible duct.
- D. Insulated Acoustical Low Pressure Flexible Duct Specification:
 - 1. The duct shall be constructed of a CPE fabric supported by helical wound galvanized steel. UL181 Class I Air Duct. Fabric shall be mechanically locked to the steel helix without the use of adhesives or chemicals. The internal working pressure rating shall be at least 6" w.g. positive and 4" w.g. negative with a bursting pressure of at least 2½ time the working pressure. The duct shall be rated for a velocity of at least 4000 feet per minute. The duct must be suitable for continuous operation at a temperature range of -20° F to +250° F. Factory insulate the flexible duct with fiberglass insulation. The R value shall be at least 6.0 at a mean temperature of 75° F. (R-4.2 is not acceptable) Cover the insulation with a fire retardant metalized vapor barrier jacket reinforced with crosshatched scrim having a permeance of not greater than 0.05 perms when tested in accordance with ASTM E96, Procedure A. All flex connections to ceiling diffusers must be connected with an insulated square to round box.

2.4 DUCTWORK SEALANT

- A. All ductwork shall be air tight. All seams, both shop made and field installed, and shall be sealed with tape and glue. All transverse joints shall be sealed as well as spin collar takeoffs and rough duct connections. All duct connections and seams shall be sealed with a UL approved non-flammable tape and mastic system. Strict adherence to manufacturers installation instruction is required. The duct sealant shall be equal to Hardcast FTA20/DT5300, United McGill Unit-Sealer Tape and Glue or 3M Company Sealing System.

2.5 DUCT ACCESSORIES

- A. Dampers of the fusible link operated type shall be provided in all ductwork passing through the floor or firewalls. In all cases, the time rating of damper shall be equal to or greater than the time rating of the wall.

- B. Provide quadrant or adjustable splitters and mark shaft to give position of splitter damper in duct.
- C. Provide vanes behind every supply grille or diffuser. Splitters shall be provided where shown on Plans and where located in concealed, non-accessible space, provide Young Regulators to operate splitter. Vanes shall be Tuttle and Bailey "Ducturns", Barber Coleman Uniflo or equivalent. Shop fabricated vanes will be acceptable. All dampers shall be constructed of 14 gauge steel.

2.6 REGISTERS, GRILLES AND DIFFUSERS

- A. Square or rectangular ceiling supply outlets, unless noted otherwise, shall be Anemostat, Metalaire, Price, Titus or equal, as indicated in schedules. Color shall be white. Grilles shall be of aluminum construction with baked enamel finish. Where noted on plans, grilles with the fire dampers in ceiling shall be steel construction with fire rated blanket behind grille as required by grille type scheduled.
- B. All wall supply grilles shall be complete with horizontal and vertical adjustable deflectors and opposed blade volume control damper. Grilles shall be manufactured by Titus, Anemostat, Metalaire, Price or prior approved equivalent.
- C. Return air grilles shall be as manufactured by Anemostat, Metalaire, Titus, Price or equivalent, and shall be of the style called for on the Plans. Provide filters in filter back grilles.
- D. All supply outlets shall have a sponge rubber gasket.
- E. "Stamped" grilles and diffusers are not approved.
- F. Unless otherwise shown on Drawings, all grilles installed in walls and doors shall be furnished with prime coat finish suitable for painting by painting sub-contractor.

2.7 MOTORIZED DAMPERS

- A. Mechanical Contractor shall furnish and install motorized dampers at outdoor intakes as indicated on mechanical and architectural drawings. Damper shall be parallel blade motorized type equivalent to Ruskin CD36/PB, Arrow Series 1770, or equal. Motorized dampers shall be operated by 120/1/60 electric actuator as indicated on plans. Damper shall be complete with outboard support bearing, blade and jamb seals. Dampers shall be low - leakage type.

2.8 FILTERS

- A. Unless noted otherwise, AHU filter media shall be 1" thick and of the non-woven cotton fabric type. The filter media shall have an average efficiency of 25-30% on ASHRAE Test Standard 52-76. It shall have an average arrestance of 90-92% in accordance with that test standard. Media support grid shall be a welded wire grid with an effective open area not less than 96%. The welded wire grid shall be bonded to the filter media to eliminate the possibility air bypass. Filters shall be Farr 30/30 or A.A.F. AM 300.

- B. Provide one (1) set of filters for start-up and replace with new set after building is turned over to owner.
- C. Provide one (1) additional set of filters for every piece of equipment to owner for stock.

2.9 DUCT ACCESS PANELS

- A. Access panel shall be Flexmaster "Inspector Series" Model SDSM low leakage spin-in access door. Door shall be 1" insulated type and shall be 24 gauge steel with 24 gauge steel frame. A continuous 3/8" wide by 3/16" thick open cell adhesive neoprene gasket shall be installed in the door frame to provide a positive seal upon insertion and locking of door. The door shall be held secure with every spaced cast aluminum cam latches for even pressure against the gasket.

2.10 MANUAL DAMPERS

- A. Mechanical contractor shall furnish and install manual dampers at outdoor air intakes and in other rectangular ductwork as indicated on plans. Damper shall be complete with outboard support bearing, and manual locking quadrant lever for balancing, blade and jamb seals.
- B. Manual balancing dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules. Dampers shall consist of: a 16 ga galvanized steel hat channel frame with 5 in depth; triple V type blades fabricated from 16 ga galvanized steel; 0.5 india. plated steel axles; external (out of the airstream) blade-to-blade linkage. Damper manufacturer's printed application and performance data including pressure, velocity and temperature limitations shall be submitted for approval showing damper suitable for pressures to 4 in wg, velocities to 2,000 ft/min and temperatures to 180 F. Testing and ratings to be in accordance with AMCA Standard 500. Basis of design is Greenheck's Model MBD-15, Nailor 1022, Ruskin MBD-35.
- C. Manual balancing damper and motorized damper sizes shall be 6" in height. Transition 4" high fresh air ductwork to standard manual and motorized damper sizes.

2.11 SPIN COLLARS:

- A. All round low pressure connections to rectangular ducts shall be made with a factory fabricated spin collar fitting with damper and constructed of minimum 26 ga galvanized steel. The damper shall have a 2" raised handle with a high quality locking quadrant. A 3/8" continuous rod with "U" bolts connects the damper to the rod. Nylon end bearings are required where the rod penetrates the spin collar barrel. Provide Dace #SM-7 SPININ-W/SOLQ-CR, Flexmaster #FLD-B03, or prior approved equal. A sample must be submitted for engineer's approval prior to installation.

2.12 DUCT ACCESS PANELS

- A. Access panel shall be Flex Master "Inspector Series" Model SDSM low leakage spin-

in access door. Door shall be 1" insulated type and shall be 24 gauge steel with 24 gauge steel frame. A continuous 3/8" wide by 3/16" thick open cell adhesive neoprene gasket shall be installed in the door frame to provide a positive seal upon insertion and locking of door. The door shall be held secure with every spaced cast aluminum cam latches for even pressure against the gasket.

2.13 FIRE DAMPERS

- A. Furnish and install, at locations shown on Plans, fire dampers constructed and tested in accordance with UL Safety Standard 555. Each fire damper shall have fire protection label in accordance with established UL labeling procedures. Damper manufacturer's literature submitted for approval prior to installation shall include comprehensive performance data developed from testing in accordance with AMCA Standard 500, and shall illustrate pressure drops for all sizes of dampers required at all anticipated air flow rates. Fire dampers shall be equipped for vertical or horizontal installation as required by the location shown.
- B. Fire dampers shall be 100% free area and installed in wall openings utilizing steel sleeves, angles or other materials and practices required to provide an installation equivalent to that utilized by the manufacturer when dampers are tested by UL. Installation shall be in accordance with the damper manufacturer's instructions. Fire dampers shall be Ruskin Type DIBD, Style B, Air Balance or approved equivalent

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All installations shall comply with SMACNA standards, or ASHRAE standards whichever is more stringent for the type of installation being performed.
- B. Coordinate with other trades as required to assure proper and adequate provisions in the work of those trades for interface with the work of this section.
- C. NOTE: Prior to fabrication and installation of ductwork, contractor shall coordinate the location of all ducts and ductwork with structural shop drawings and shall make any and all deviations necessary to accommodate ductwork to structural conditions. Contractor shall verify all locations, routing, installation, and sizes with existing conditions on job site prior to fabricating or installing ductwork. Notify architect of any changes required for proper coordination between trades.

END OF SECTION 23 30 00

SECTION 23 38 13 – COMMERCIAL KITCHEN HOODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Commercial-kitchen hoods, Type I.

1.3 DEFINITIONS

- A. Listed Hood: A hood, factory fabricated and tested for compliance with UL 710 by a testing agency acceptable to authorities having jurisdiction.
- B. Standard Hood: A hood, usually field fabricated, that complies with design, construction, and performance criteria of applicable national and local codes.
- C. Type I Hood: A hood designed for grease exhaust applications.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Standard hoods.
 - 2. Filters/baffles.
 - 3. Fire-suppression systems.
 - 4. Luminaires.
- B. Shop Drawings: Signed and sealed by a qualified professional engineer.
 - 1. Show plan view, elevation view, sections, roughing-in dimensions, service requirements, duct connection sizes, and attachments to other work.
 - 2. Show cooking equipment plan and elevation to confirm minimum code-required overhang.
 - 3. Indicate performance, exhaust and makeup air airflow, and pressure loss at actual Project-site elevation.
 - 4. Show water-supply and drain piping connections.
 - 5. Show control cabinets.
 - 6. Show fire-protection cylinders, piping, actuation devices, and manual control devices.



7. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
8. Design Calculations: Calculate requirements for selecting seismic restraints.
9. Include diagrams for power, signal, and control wiring.
10. Duct Connections: Detail connections between ducts and hoods, including access doors and panels.
11. Piping Diagrams: Detail fire-suppression piping and components and differentiate between manufacturer-installed and field-installed piping. Include roughing-in requirements for drain connections. Show cooking equipment plan and elevation to illustrate fire-suppression nozzle locations.
 - a. Piping Diagram Scale: 1/4 inch = 1 foot.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 1. Coordination Drawing Scale: 1/4 inch = 1 foot.
 2. Suspended ceiling assembly components.
 3. Structural members to which equipment will be attached.
 4. Roof framing and support members for duct penetrations.
 5. Items penetrating finished ceiling including the following:
 - a. Luminaires.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Access panels.
 - f. Moldings on hoods and accessory equipment.
- B. Welding certificates.
- C. Seismic Qualification Data: Submit certification that commercial-kitchen hoods, accessories, and components will withstand seismic forces defined in Section 230548 "Vibration and Seismic Controls for HVAC." Include the following:
 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.

3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Field quality-control reports.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Grease Filters/Baffles: One complete set(s).

1.7 QUALITY ASSURANCE

- A. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D 1.1M, "Structural Welding Code - Steel," for hangers and supports; and AWS D9.1/D9.1M, "Sheet Metal Welding Code," for joint and seam welding.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 GENERAL HOOD FABRICATION REQUIREMENTS

- A. Welding: Use welding rod of same composition as metal being welded. Use methods that minimize distortion and develop strength and corrosion resistance of base metal. Make ductile welds free of mechanical imperfections such as gas holes, pits, or cracks.
1. Welded Butt Joints: Full-penetration welds for full-joint length. Make joints flat, continuous, and homogenous with sheet metal without relying on straps under seams, filling in with solder, or spot welding.
 2. Grind exposed welded joints flush with adjoining material and polish to match adjoining surfaces.
 3. Where fasteners are welded to underside of equipment, finish reverse side of weld smooth and flush.
 4. Coat concealed stainless-steel welded joints with metallic-based paint to prevent corrosion.

5. After zinc-coated steel is welded, clean welds and abraded areas and apply SSPC-Paint 20, high-zinc-dust-content, galvanizing repair paint to comply with ASTM A780/A780M.
- B. For metal butt joints, comply with SMACNA's "Kitchen Ventilation Systems & Food Service Equipment Guidelines."
- C. Where stainless steel is joined to a dissimilar metal, use stainless-steel welding material or fastening devices.
- D. Form metal with break bends that are not flaky, scaly, or cracked in appearance; where breaks mar uniform surface appearance of material, remove marks by grinding, polishing, and finishing.
- E. Sheared Metal Edges: Finish free of burrs, fins, and irregular projections.
- F. In food zones, as defined in NSF, fabricate surfaces free from exposed fasteners.
- G. Cap exposed fastener threads, including those inside cabinets, with stainless-steel lock washers and stainless-steel cap (acorn) nuts.
- H. Fabricate pipe slots on equipment with turned-up edges sized to accommodate service and utility lines and mechanical connections.
- I. Fabricate enclosures, including panels, housings, and skirts, to conceal service lines, operating components, and mechanical and electrical devices including those inside cabinets unless otherwise indicated.
- J. Fabricate seismic restraints according to SMACNA's "Kitchen Ventilation Systems & Food Service Equipment Guidelines," Appendix A, "Seismic Restraint Details."
- K. Fabricate equipment edges and backsplashes according to SMACNA's "Kitchen Ventilation Systems & Food Service Equipment Guidelines."

2.3 EXHAUST HOOD FABRICATION, TYPE I HOOD

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 1. Captive-Aire Systems.
- B. Weld all joints exposed to grease with continuous welds, and make filters/baffles or grease extractors and makeup air diffusers easily accessible for cleaning.
 1. Fabricate hoods according to NSF 2, "Food Equipment."
 2. Hoods shall be listed and labeled, according to UL 710, by a testing agency acceptable to authorities having jurisdiction.
 3. Hoods shall be designed, fabricated, and installed according to NFPA 96.

4. Include access panels as required for access to fire dampers and fusible links.
 5. Duct Collars: Minimum 0.0598-inch-thick steel at least 3 inches long, continuously welded to top of hood and at corners.
 6. Duct-Collar Fire Dampers: Collar and damper shall comply with UL 710 testing and listing required for the entire hood.
 - a. Collar: Minimum 0.0598-inch-thick stainless steel, at least 3 inches long, continuously welded to top of hood and at corners.
 - b. Blades: Minimum 0.1046-inch-thick stainless steel, counterbalanced to remain closed after actuation.
 - c. Blade Pivot and Spring: Stainless steel.
 - d. Fusible Link: Replaceable, 212 deg F rated.
 7. Makeup Air Fire Dampers: Labeled, according to UL 555, by a testing agency acceptable to authorities having jurisdiction.
 - a. Fire Rating: 1-1/2 hours.
 - b. Frame: SMACNA Type A, with blades in airstream; fabricated with roll-formed, galvanized steel; with mitered and interlocking corners.
 - c. Blades: Roll-formed, interlocking or folded, minimum 0.034-inch-thick, galvanized-steel sheet.
 - d. Horizontal Dampers: Include a blade lock and stainless-steel closure spring.
 - e. Fusible Link: Replaceable, 212 deg F rated.
- C. Hood Configuration: Exhaust and makeup air.
1. Makeup air shall be introduced through laminar-flow-type, perforated metal panels on front of hood canopy.
- D. Hood Style: Refer to plans for configuration.
- E. Filters/Baffles: Removable, aluminum. Fabricate stainless steel for filter frame and removable collection cup and pitched trough. Exposed surfaces shall be pitched to drain to collection cup. Filters/baffles shall be tested according to UL 1046, "Safety for Grease Filters for Exhaust Ducts," by an NRTL acceptable to authorities having jurisdiction.
- F. Removable Water-Wash Grease Extractor: Stainless steel, tested with hood according to UL 710.
- G. Luminaires: LED luminaires and lamps with lenses sealed vapor tight. Wiring shall be in conduit on hood exterior. Number and location of luminaires shall provide a minimum of 70 fc at 30 inches above finished floor.
1. Light switches shall be mounted on front panel of hood canopy.
 2. Luminaires: LED complying with UL 1598.

- H. Hood Controls: Hood-mounting control cabinet, factory wired to control groups of adjacent hoods, and fabricated of stainless steel.
1. Exhaust Fan: On-off switches shall start and stop the exhaust fan. Interlock exhaust fan with makeup air supply fan to operate simultaneously. Interlock exhaust fan with fire-suppression system to operate fan(s) during fire-suppression-agent release and to remain in operation until manually stopped. Include red pilot light to indicate fan operation.
 2. Exhaust Fan Interlock: Factory wire the exhaust fan starters in a single control cabinet for adjacent hoods to operate together.
 3. High-Temperature Control: Alarm shall sound and cooking equipment shall shut down before hood discharge temperature rises to actuation temperature of fire-suppression system.

2.4 FIRE-SUPPRESSION SYSTEM, WET CHEMICAL

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Ansul by Johnson Controls Company.
 2. Badger Fire Protection.
 3. Pyro-Chem; Tyco Fire Suppression & Building Products.
 4. United Technologies Corporation (UTC Climate, Controls & Security - Kidde).
- B. Description: Engineered distribution piping designed for automatic detection and release or manual release of fire-suppression agent by hood operator. Fire-suppression system shall be listed and labeled for complying with NFPA 17A, "Wet Chemical Extinguishing Systems," by a qualified testing agency acceptable to authorities having jurisdiction.
1. Steel Pipe, NPS 2 and Smaller: ASTM A53/A53M, Type S, Grade A, Schedule 40, plain ends.
 2. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300.
 3. Piping, fusible links and release mechanism, tank containing the suppression agent, and controls shall be factory installed. Controls shall be in stainless-steel control cabinet mounted on wall. Furnish manual pull station for wall mounting. Exposed piping shall be covered with chrome-plated aluminum tubing. Exposed fittings shall be chrome plated.
 4. Liquid Extinguishing Agent: Noncorrosive, low-pH liquid.
 5. Furnish electric-operated gas shutoff valve.
 6. Furnish electric-operated gas shutoff valve with clearly marked open and closed indicator for field installation.
 7. Fire-suppression system controls shall be integrated with controls for fans, lights, and fuel supply and located in a single cabinet for each group of hoods immediately adjacent.

8. Wiring shall have color-coded, numbered terminal blocks and grounding bar. Spare terminals for fire alarm, optional wiring to start fan with fire alarm, red pilot light to indicate fan operation, and control switches shall all be factory wired in control cabinet with relays or starters. Include spare terminals for fire alarm, and wiring to start fan with fire alarm.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Complete installation shall comply with all requirements of NFPA 96 and 2021 IMC.
- B. Coordinate equipment layout and installation with adjacent Work, including luminaires, HVAC equipment, plumbing, and fire-suppression system components.
- C. Complete field assembly of hoods where required.
 1. Make closed butt and contact joints that do not require filler.
 2. Grind field welds on stainless-steel equipment smooth, and polish to match adjacent finish. Comply with welding requirements in "General Hood Fabrication Requirements" Article.
- D. Install hoods and associated services with clearances and access for maintaining, cleaning, and servicing hoods, filters/baffles, grease extractor, and fire-suppression systems according to manufacturer's written instructions and requirements of authorities having jurisdiction.
- E. Make cutouts in hoods where required to run service lines and to make final connections, and seal openings according to UL 1978.
- F. Securely anchor and attach items and accessories to walls, floors, or bases with stainless-steel fasteners unless otherwise indicated.
- G. Install hoods to operate free from vibration.

- H. Install seismic restraints according to SMACNA's "Kitchen Ventilation Systems & Food Service Equipment Guidelines," Appendix A, "Seismic Restraint Details."
- I. Install trim strips and similar items requiring fasteners in a bed of sealant. Fasten with stainless-steel fasteners at 48 inches o.c. maximum.
- J. Install sealant in joints between equipment and abutting surfaces with continuous joint backing unless otherwise indicated. Provide airtight, watertight, vermin-proof, sanitary joints.
- K. Install lamps, with maximum recommended wattage, in equipment with integral lighting.
- L. Set initial temperatures and calibrate sensors.
- M. Set field-adjustable switches.

3.3 CONNECTIONS

- A. Where installing piping adjacent to hoods, allow space for service and maintenance.
- B. Connect ducts according to requirements in Section 233300 "Air Duct Accessories." Install flexible connectors on makeup air supply duct. Weld exhaust-duct connections with continuous liquidtight joint.
- C. Install fire-suppression piping for remote-mounted suppression systems according to NFPA 17A, "Wet Chemical Extinguishing Systems."

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Test each equipment item for proper operation. Repair or replace equipment that is defective, including units that operate below required capacity or that operate with excessive noise or vibration.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Test water, drain, gas, and liquid-carrying components for leaks. Repair or replace leaking components.

- 4. Perform hood performance tests required by authorities having jurisdiction.
 - 5. Perform fire-suppression system performance tests required by authorities having jurisdiction.
 - D. Commercial-kitchen hoods will be considered defective if they do not pass tests and inspections.
 - E. Prepare test and inspection reports.
- 3.5 DEMONSTRATION
- A. Train Owner's maintenance personnel to adjust, operate, and maintain commercial-kitchen hoods.

END OF SECTION 23 38 13

SECTION 23 80 00 - HVAC EQUIPMENT



PART 1 - GENERAL

1.1 DESCRIPTION

- A. The Air Conditioning System, in general, shall be for the entire building providing cooling and dehumidification in summer and heating in winter. A constant amount of fresh air shall be taken into the system and all air shall be filtered.

1.2 SCOPE OF WORK

- A. This section calls for furnishing all labor and materials necessary to provide and install the complete air conditioning, heating and ventilating system. It is the intention of these specifications that the mechanical system shall be furnished complete with all necessary valves, controls, insulation, piping, devices, equipment, etc. necessary to provide a satisfactory installation in working order.
- B. All ductwork and piping shall be concealed and insulated as hereinafter specified unless noted otherwise.
- C. Provide a temperature control system.

PART 2 - PRODUCTS

2.1 VENTILATING SYSTEM

- A. This contractor shall furnish and install all exhaust fans shown and scheduled on plans. Fans shall be of type indicated and shall be Acme, Cook, Greenheck, or approved equal. All belt driven fans shall have adjustable pitch sheaves and adjustable motor bases. Maximum tones shall be as scheduled.
- B. All fans shall bear AMCA certified ratings and seal. Fan performances shall be rated according to AMCA standards 210 and standard 300. For belt driven models BHP shall include belt drive losses.
- C. All exhaust fans shall be equipped with bird screen, wall collars and automatic back draft dampers unless noted otherwise.
- D. Fan motors shall be of the 40 degrees C ambient temperature rise type and shall be suitable for continuous duty operation.
- E. Fresh air intakes shall be of the same type and style as exhaust fans and of the size indicated on plans.
- F. Aluminum insect screens shall be provided with fresh air intakes.

2.2 AIR FILTERS

- A. Filters shall be as hereinafter specified filters shall be sized for capacity as

scheduled on drawings. Filters shall be field installed on filter rack as required by filter manufacturer and A/C unit manufacturer. Filter housing shall be equipped with access doors on each side of housing.

- B. Housing and doors shall be constructed of minimum 16 gauge galvanized steel.
- C. Independent access doors for filter servicing shall be provided on each side of the housing. Doors shall utilize perimeter gasketing of closed cell neoprene rubber. Latches shall be quick acting, spring loaded, and of noncorrosive materials. Hinges shall be plated.
- D. Pre-Filters for central station air handling units shall be AIRGUARD 2" thick pleated filters with a maximum pressure drop of .22 at 500 FPM initial velocity. Filter media shall be of the non-woven cotton fabric type. The filter media shall have an average efficiency of 25 - 30% on ASHRAE Test Standard 52-76. It shall have an average arrestance of 90-92% in accordance with that test standard. Media support grid shall be a welded wire grid with an effective open area of not less than 96%. The welded wire grid shall be bonded to the filter media to eliminate the possibility of air bypass.

2.3 HIGH EFFICIENCY CONDENSING UNITS (OUTDOOR SECTION)

- A. Furnish and install high efficiency air cooled air conditioning units where shown and with capacities scheduled on plans. Unit shall be completely factory assembled and tested and shall be the highest efficiency, highest quality unit produced by the equipment manufacturer.
- B. Condenser coil shall be of nonferrous construction with aluminum plated fins mechanically bonded to seamless aluminum or copper tubes.
- C. Condenser fan shall be propeller type, direct driven. Motor shall have inherent protection and be of the permanently lubricated type, resiliently mounted. Fans shall have safety guards and units shall be designed for operation at 30 deg. F. outdoor temperature, during the cooling cycle.
- D. Compressor shall be of serviceable hermetic or sealed hermetic design at Contractor's option with external spring isolators. Compressors shall have a 5-year warranty.
- E. All controls and equipment shall be factory wired and shall consist of high and low pressure stats, compressor and condenser fan overload devices, crankcase heater, internal pressure relief valve, filter dryer, pressure taps, outdoor temperature sensor, sweat type refrigerant couplings, liquid and suction line service valves, and rubber condenser mounting pads.
- F. Casing shall be fully weatherproof for outdoor installation and shall be bonderized steel with baked enamel finish. Panels shall be removable to provide access for servicing.
- G. Unit shall be as manufactured by Carrier, Trane, Lennox, or York.

2.4 HIGH EFFICIENCY AIR CONDITIONING UNIT (INDOOR SECTION)

- A. Furnish and install indoor vertical air conditioning units of size and type with return as scheduled on the drawings. Units shall be Carrier, Trane, Lennox, or York.
- B. Units shall be complete with fan, motor, drive, direct expansion valve type cooling coil, grease fittings, drain pan, etc. and shall have capacities as scheduled on plans. All units shall be factory insulated on the interior with not less than 3/4# density neoprene coated fiberglass cemented in place with waterproof adhesive and shall be designed to operate in a ventilated attic without sweating.
- C. Each unit shall be designed for continuous operation at the maximum rated static pressure. Fan capacities shall be rated with the fans in the units, and horsepower specified shall include all losses.
- D. Casings shall be suitable for operation at the pressures specified and constructed of bonderized steel.
- E. Cooling coils shall be of the copper or aluminum tube and non-ferrous fin type and shall be tested at 400 psi air pressure. Cooling coil face velocity shall not exceed that guaranteed by manufacturer for no moisture carry-over.
- F. Electric strip heaters shall be as hereinafter specified and shall be mounted inside unit housing. Coordinate electric service to heaters and blower with Electrical Contractor. Unit shall be internally wired and fused to accept electrical disconnect from only disconnecting means.
- G. Filter shall be 1" thick throw-away mounted in a/c unit.
- H. Unit shall have direct drive, multi-speed motor, sweat type refrigerant line couplings, filter access panel, re-oilable fan motor and voltage transformer for single point electrical connection.

2.5 ELECTRIC STRIP HEATERS

- A. Electric heaters shall consist of open coils made from Grade "A" resistance wire insulated by floating ceramic bushings and supported in an aluminum steel frame. Heaters shall be located inside units.
- B. All terminal studs, nuts, and washers shall be stainless steel, insulated with phenolic terminal bushings. Terminals shall be machine crimped to coils and heater shall be tested at 2000 volts before shipment. All voltages and phases shall be as scheduled.
- C. Heater shall be provided with built-in conductors.
- D. An automatic reset thermal cutoff shall be provided to break the heater load directly on over-temperature. In addition, provide manual reset thermal cutoff to break the heater load directly.

- E. Control circuit transformer shall be built into heater terminal box and sized to carry full contractor holding coil load.
- F. Heaters shall be listed by UL and shall be as manufactured by Industrial Engineering and Equipment Co., Chromalox, FPE, or equal and shall have capacities as indicated on plans.

2.6 DUCTLESS SPLIT SYSTEM

- A. System shall be a Mitsubishi Electric split system (or approved equal) with Variable Speed Inverter Compressor technology. The system shall consist of a horizontal discharge, single phase outdoor unit, a matched capacity indoor section that shall be equipped with a wired wall-mounted thermostat. Install per manufacturer's installation instructions.
- B. The units shall have a manufacturer's parts and defects warranty for a period five (5) year from date of installation. The compressor shall have a warranty of seven (7) years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

2.7 LABELING

- A. Contractor shall provide unit identification numbers at each indoor and outdoor A/C unit. Numbers shall be as detailed on plans. Identification shall have black background and white numbers and shall indicate respective A/C equipment.

2.8 EMERGENCY DRAIN PAN

- A. Provide an emergency drain pan for air units. The pan shall be constructed of 18 gauge galvanized steel, extending 6" beyond unit all around and turning up a minimum of 4" around the perimeter. A 1-1/4" x 1-1/4" x 1/8" galvanized angle iron frame shall be welded around the top of the pan. Entire pan should be painted with black asphalt rust preventative paint. Extend a Type "L" hard copper drain line (minimum 1") as indicated on the drawings. Provide connection at low point of pan and provide ball valve to drain pan.
- B. Emergency drain pans for all water heaters shall be 20 gauge galvanized sheet metal with sides of pan extending 4" above the bottom of the pan per detail.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All A/C installations shall comply with manufacturer's recommendations.

3.2 INSTALLATION OF EQUIPMENT

- A. Install all equipment where indicated on drawings, in accordance with equipment manufacturer's published installation instructions, and with recognized industry practices, to ensure equipment comply with other trades as necessary to insure the

equipment is installed and interfaced with other associated equipment to insure a complete installation and the equipment operates properly and serves its intended purposes.

- B. Provide access to equipment for servicing as for the published manufacturers installation drawing and instruction and as per accepted trade practices dictate.
- C. Install electrical devices furnished by the manufacturer but not specified to be factory mounted. Furnish copy of manufacturer's submittal and installation requirements of Division 16 section. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.
- D. Piping connections are to be according to Division 15. Provide piping, valves, accessories, gauges, supports, and flexible connector as indicated on drawings and equipment manufacturers submittals if applicable.
- E. All connections i.e., duct connections are to be per Division 15 and equipment manufacturer's submittals. Provide all necessary accessories to make connection complete as per acceptable trade practices.
- F. Provide positive equipment ground for all installed equipment as per equipment manufacturer's specifications.

3.3 FIELD QUALITY CONTROL

- A. Upon completion of installation of equipment start-up operate equipment to demonstrate capability and compliance with requirements. Field correct malfunctioning equipment and retest to demonstrate compliance.

3.4 INSPECTION

- A. Examine areas and conditions under which equipment is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the installer. Under no circumstance is any equipment to be installed and operated under normal conditions without all necessary controls and safety shut off devices installed and working properly.

END OF SECTION 23 80 00

SECTION 23 80 10 – 100% OUTSIDE AIR SYSTEMS



PART 1 – GENERAL

1.1. SYSTEM DESCRIPTION

The dedicated outside air system (DOAS) shall be a Mitsubishi Electric CITY MULTI VRF (Variable Refrigerant Flow Zoning) System. The DOAS shall be provided with the capability to reheat air using recovered energy from the primary cooling coil or provide a primary cooling coil only. The DOAS shall be of a split system type.

The DOAS reheat system shall consist of a 10 ton PURY modular outdoor unit, 6 port minimum BC (Branch Circuit) Controller, PEFY-AF1200CFMR indoor unit, and M-NET based controller. System shall be capable of automatically determining mode necessary to provide required air conditions with no interruption to system operation except for defrost operation. The system shall only consist of one indoor unit per outdoor unit.

The DOAS non-reheat system shall consist of 10 ton PUHY modular outdoor unit, PEFY-AF1200CFM indoor unit, and M-NET based controller. System shall be capable of automatically determining mode necessary to provide required air conditions with no interruption to system operation except for defrost operation. The system shall only consist of one indoor unit per outdoor unit.

1.2. QUALITY ASSURANCE

- A. The units shall be listed by Electrical Test Laboratories (ETL) and bear the ETL label.
- B. All wiring shall be in accordance with the National Electrical Code (N.E.C.).
- C. The units shall be manufactured in a facility registered to ISO 9001 and ISO14001 which is a set of standards applying to environmental protection set by the International Standard Organization (ISO).
- D. A full charge of R-410A for the condensing unit only shall be provided in the condensing unit.
- E. System shall be composed of components which meet or exceed the 2010 Federal minimum efficiency requirements and the proposed ASHRAE 90.1 efficiency requirements for VRF systems. Efficiency shall be published in accordance with the DOE alternative test procedure, which is based on the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Standards 340/360, 1230 and ISO Standard 13256-1.
- F. The installing contractor shall be fully trained to install and commission Mitsubishi systems.

G. DELIVERY, STORAGE AND HANDLING

- 1. Unit shall be stored and handled according to the manufacturer's recommendation.

PART 2 – WARRANTY

- 2.1. The units shall be covered by the manufacturer's limited warranty for a period of one (1) year from date of installation.

If the systems are:

- 1) designed by a certified CITY MULTI Diamond Designer,
- 2) installed by a contractor that has successfully completed the Mitsubishi Electric three day service course, AND
- 3) verified with a completed commissioning report submitted to and approved by the Mitsubishi Electric Service Department,

then the units shall be covered by an extended manufacturer's limited warranty for a period of five (5) years from date of installation.

In addition the compressor shall have a manufacturer's limited warranty for a period of seven (7) years from date of installation.

If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

This warranty shall not include labor.

- 2.2. Manufacturer shall have a minimum of thirty years of HVAC experience in the U.S. market.
- 2.3. All manufacturer technical and service manuals must be readily available for download by any local contractor should emergency service be required. Registering and sign-in requirements which may delay emergency service reference are not allowed.
- 2.4. The CITY MULTI VRF system shall be installed by a contractor with extensive CITY MULTI install and service training. The mandatory contractor service and install training should be performed by the manufacturer.

PART 3 – PRODUCTS

3.1. R2-SERIES OUTDOOR UNIT

A. General:

1. The reheat DOAS shall be used specifically with the R2-Series PURY outdoor unit using CITY MULTI VRF components. The PURY outdoor units shall be equipped with multiple circuit boards that interface to the M-NET controls system and shall

perform all functions necessary for operation. Each outdoor unit module shall be completely factory assembled, piped and wired and run tested at the factory.

2. Outdoor unit shall have a sound rating no higher than 60 dB(A). If an alternate manufacturer is selected, any additional material, cost, and labor to meet published sound levels shall be incurred by the contractor.
3. Both refrigerant lines from the outdoor unit to the BC (Branch Circuit) Controller (Single or Main) shall be insulated.
4. The outdoor unit shall have an accumulator with refrigerant level sensors and controls.
5. The outdoor unit shall have a high pressure safety switch, over-current protection, crankcase heater and DC bus protection.
6. The outdoor unit shall have the ability to operate with a maximum height difference of 164 feet. The greatest length is not to exceed 541 feet between outdoor unit and the indoor units without the need for line size changes or traps.
7. The outdoor unit shall be capable of operating in heating mode down to -4°F ambient temperature or cooling mode down to 23°F ambient temperature, without additional low ambient controls. If an alternate manufacturer is selected, any additional material, cost, and labor to meet low ambient operating condition and performance shall be incurred by the contractor.
8. The outdoor unit shall not cease operation in any mode based solely on outdoor ambient temperature.
9. The outdoor unit shall have a high efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained.
10. Unit must defrost all circuits simultaneously in order to resume full heating more quickly. Partial defrost which may extend "no or reduced heating" periods shall not be allowed.

B. Unit Cabinet:

1. The casing(s) shall be fabricated of galvanized steel, bonderized and finished. Units cabinets shall be able to withstand 960 hours per ASTM B117 criteria for seacoast protected models (–BS models)

C. Fan:

1. Each outdoor unit module shall be furnished with one or two direct drive, variable speed propeller type fan(s). The fan shall be factory set for operation under 0 in. WG external static pressure, but capable of normal operation under a maximum of 0.24 in. WG external static pressure via dipswitch.
2. All fan motors shall have inherent protection, have permanently lubricated bearings, and be completely variable speed.

3. All fan motors shall be mounted for quiet operation.
4. All fans shall be provided with a raised guard to prevent contact with moving parts.
5. The outdoor unit shall have vertical discharge airflow.

D. Refrigerant

1. R410A refrigerant shall be required for PURY-P-T/Y(S)KMU-A outdoor unit systems.

E. Coil:

1. The outdoor coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.
2. The coil fins shall have a factory applied corrosion resistant blue-fin finish.
3. The coil shall be protected with an integral metal guard.
4. Refrigerant flow from the outdoor unit shall be controlled by means of an inverter driven compressor.
5. The outdoor coil shall include 4 circuits with two position valves for each circuit, except for the last stage.

F. Compressor:

1. Each outdoor unit module shall be equipped with one inverter driven scroll hermetic compressor. Non inverter-driven compressors shall not be allowed.
2. A crankcase heater(s) shall be factory mounted on the compressor(s).
3. The outdoor unit compressor shall have an inverter to modulate capacity. The capacity shall be completely variable with a turndown of 18% of rated capacity.
4. The compressor will be equipped with an internal thermal overload.
5. The compressor shall be mounted to avoid the transmission of vibration.

G. Electrical:

1. The outdoor unit electrical power shall be 208/230 or 460 volts, 3-phase, 60 hertz.
2. The outdoor unit shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz), 207-253V (230V/60Hz) or 414-506V (460V/60Hz).
3. The outdoor unit shall be controlled by integral microprocessors.
4. The control circuit between the indoor units, BC Controller and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

3.2. BRANCH CIRCUIT (BC) CONTROLLERS FOR R2-SERIES SYSTEMS

A. General:

The BC (Branch Circuit) Controllers shall be specifically used with R410A R2-Series systems. These units shall be equipped with a circuit board that interfaces to the M-NET controls system and shall perform all functions necessary for operation. The unit shall have a galvanized steel finish. The BC Controller shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory. This unit shall be mounted indoors, with access and service clearance provided for each controller. The DOAS BC Controller shall be connected to only one indoor unit, the DOAS indoor unit.

B. BC Unit Cabinet:

1. The casing shall be fabricated of galvanized steel.
2. Each cabinet shall house a liquid-gas separator and multiple refrigeration control valves.
3. The unit shall house two tube-in-tube heat exchangers.

C. Refrigerant

1. R410A refrigerant shall be required.

D. Refrigerant valves:

1. The unit shall be furnished with multiple branch circuits which can individually accommodate up to 54,000 BTUH. Branches may be twinned to allow more than 54,000 BTUH.
2. Each branch shall have multiple two-position valves to control refrigerant flow.
3. Service shut-off valves shall be field-provided/installed for each branch.
4. Linear electronic expansion valves shall be used to control the variable refrigerant flow.

E. Integral Drain Pan:

1. An integral condensate pan and drain shall be provided.

F. Electrical:

1. The unit electrical power shall be 208/230 volts, 1 phase, 60 hertz.
2. The unit shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253V (230V/60Hz).
3. The BC Controller shall be controlled by integral microprocessors.

4. The control circuit between the indoor units and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

3.3. PEFY-AF1200CFMR (REHEAT OPTION), 100% OSA DUCTED INDOOR UNIT

A. General:

- i. The PEFY-AF1200CFMR (Reheat Option) unit shall be a ducted indoor fan coil that mounts where needed with a fixed rear return and a horizontal discharge supply, primary and reheat coil, and three modulating linear expansion devices. The PEFY-AF1200CFMR shall be used with the R2-Series outdoor unit and BC Controller to create a DOAS. The PEFY-AF1200CFMR shall support individual control using M-NET DDC controllers. The PEFY-AF1200CFMR model shall feature external static pressure settings up 0.96 in. WG, depending on voltage.

B. Indoor Unit.

- a. The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, primary cooling coil, reheat coil, temperature and humidity sensors, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

C. Unit Cabinet:

- a. The cabinet shall be ducted on both the supply and return
- b. The cabinet panel shall have provisions for a field installed filtered outside air intake.

D. Fan:

- a. The indoor unit fan shall be an assembly with two Sirocco fan(s) direct driven by a single motor.
- b. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
- c. The indoor unit shall have a ducted air outlet system and ducted return air system.

E. Filter:

- a. Outside air shall be filtered by a field-supplied filter. Unit shall have sufficient external static pressure to operate with a MERV-13 filter installed.

F. Coil:

- a. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing.
- b. The tubing shall have inner grooves for high efficiency heat exchange.
- c. All tube joints shall be brazed with phos-copper or silver alloy.
- d. The coils shall be pressure tested at the factory.
- e. A condensate pan and drain shall be provided under the coil.
- f. A condensate lift mechanism shall be factory installed capable of providing up to 21-11/16" of lift.
- g. All refrigerant lines to the PEFY indoor units shall be insulated.

G. Electrical:

- a. The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.
- b. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz).

H. Controls:

- I. This unit shall use controls provided by Mitsubishi Electric to perform functions necessary to operate the system. Please refer to Part 5 of this guide specification for details on controllers and other control options.

3.4. PEFY-AF1200CFM (NON REHEAT OPTION), 100% OSA DUCTED INDOOR UNIT

A. General:

The PEFY-AF1200CFM (Non Reheat Option) unit shall be a ducted indoor fan coil that mounts where needed with a fixed rear return and a horizontal discharge supply, primary coil, and two modulating linear expansion devices. The PEFY-AF1200CFM shall be used with the Y-Series outdoor unit to create a DOAS. The PEFY-AF1200CFM shall support individual control using M-NET DDC controllers. The PEFY-AF1200CFM models shall feature external static pressure settings up 1.04 in. WG, depending on voltage.

B. Indoor Unit.

The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, cooling/heating coil, temperature and humidity sensors, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

C. Unit Cabinet:

1. The cabinet shall be ducted on both the supply and return
2. The cabinet panel shall have provisions for a field installed filtered outside air intake.

D. Fan:

- H. The indoor unit fan shall be an assembly with two Sirocco fan(s) direct driven by a single motor.
- I. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
- J. The indoor unit shall have a ducted air outlet system and ducted return air system.

E. Filter:

1. Outside air shall be filtered by a field-supplied filter. Unit shall have sufficient external static pressure to operate with a MERV-13 filter installed.

F. Coil:

1. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing.
2. The tubing shall have inner grooves for high efficiency heat exchange.
3. All tube joints shall be brazed with phos-copper or silver alloy.
4. The coils shall be pressure tested at the factory.
5. A condensate pan and drain shall be provided under the coil.
6. A condensate lift mechanism shall be factory installed capable of providing up to 21-11/16" of lift.
7. All refrigerant lines to the PEFY indoor units shall be insulated.

G. Electrical:

1. The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.
2. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz).

H. Controls:

1. This unit shall use controls provided by Mitsubishi Electric to perform functions necessary to operate the system. Please refer to Part 5 of this guide specification for details on controllers and other control options.

PART 4-OPERATION

4.1. Dedicated Outside Air System with Reheat Capability (PEFY-AF1200CFMR)

A. General:

The DOAS reheat system shall be rated at 87° F DB/80° F WB in cooling for both the outdoor unit and indoor unit entering air conditions. Heating rating point shall be 32° F DB/28° F WB for the outdoor unit and 32° F DB indoor unit entering air conditions.

B. System operation parameters:

1. The system shall operate with intake air temperature ranging from -4° F WB up to 95° F WB.
 1. The unit shall be capable of intake of unmixed or untreated -4° F WB air directly to the primary coil.
 2. The unit shall be capable of providing active coil operation in cooling mode down to 50° F WB.
2. In a cooling condition, the system shall be capable of providing supply air for downstream use within the following specifications at rated conditions

Operation Type	Minimum Leaving Air Condition		Maximum Leaving Air Condition	
	Degrees F, Dry Bulb	Degrees F, Wet Bulb	Degrees F, Dry Bulb	Degrees F, Wet Bulb
Cooling Only, No Reheat	50	50	60	60
Cooling Mode with Reheat	63	51.5 (45% RH)	83	67.5 (45% RH)
1. Cooling Only, No reheat uses only primary cooling coil. Leaving air temperature can be chosen between 50 and 60 deg F in one degree increments. 2. Cooling mode with reheat uses both primary cooling coil and reheat coil. Leaving air temperature from reheat coil can be chosen between 63 and 83 deg F in one degree F dry bulb increments along a line of 45% constant relative humidity.				

3. In heating mode, the system shall be capable of providing 78° F DB supply air at rated conditions.

END OF SECTION 23 80 10

SECTION 23 80 20 – VARIABLE REFRIGERANT FLOW SYSTEMS

PART 1 -GENERAL



1.1 SYSTEM DESCRIPTION R2-SERIES (SIMULTANEOUS HEAT/COOL)

- A. Per the equipment schedule, the variable capacity, heat pump heat recovery air conditioning system basis of design is Mitsubishi Electric CITY MULTI VRF (Refrigerant Flow) zoning system(s).
- B. Acceptable alternative manufacturers, assuming compliance with these equipment specifications, are Daikin. Contractor bidding an alternate manufacturer does so with full knowledge that that manufactures product may not be acceptable or approved and that contractor is responsible for all specified items and intents of this document without further compensation.
- C. Simultaneous heating/cooling (heat recovery) systems shall consist of an outdoor unit, BC (Branch Circuit) Controller (or comparable branch devices), multiple indoor units, and an integral DDC (Direct Digital Controls) system. Each indoor unit or group of indoor units shall be capable of operating in any mode independently of other indoor units or groups. System shall be capable of changing mode (cooling to heating, heating to cooling) with no interruption to system operation. To ensure owner comfort, each indoor unit or group of indoor units shall be independently controlled and capable of changing mode automatically when zone temperature strays 1.8 degrees F from set point for ten minutes.
- D. No additional branch circuit controllers (or comparable branch devices) than shown on the drawings/schedule may be connected to any one outdoor unit. Contractors proposing alternate systems requiring more branch devices than those included as the basis of design are responsible for additional piping & electrical costs and are required to identify additional costs & installation time required of other trades with their bid.

1.2 SYSTEM DESCRIPTION Y-SERIES (HEAT/COOL MODEL)

- A. Per the equipment schedule, the variable capacity, heat pump air conditioning system basis of design is Mitsubishi Electric CITY MULTI VRF (Variable Refrigerant Flow) zoning system(s).
- B. Acceptable alternative manufacturers, assuming compliance with these equipment specifications, are Daikin, Panasonic, and Hitachi. Contractor bidding an alternate manufacturer does so with full knowledge that that manufactures product may not be acceptable or approved and that contractor is responsible for all specified items and intents of this document without further compensation.

1.3 QUALITY ASSURANCE

- A. The units shall be listed by Electrical Testing Laboratories (ETL) and bear the ETL label.
- B. All wiring shall be in accordance with the National Electrical Code (N.E.C.).
- C. The units shall be manufactured in a facility registered to ISO 9001 and ISO14001 which is a set of standards applying to environmental protection set by the International Standard Organization (ISO).
- D. All units must meet or exceed the 2010 Federal minimum efficiency requirements and the ASHRAE 90.1 efficiency requirements for VRF systems. Efficiency shall be published in accordance with the Air- Conditioning, Heating, and Refrigeration Institute (AHRI) Standard 1230.
- E. System start-up supervision shall be a required service to be completed by the manufacturer or a duly authorized, competent representative that has been factory trained in system configuration and operation. The representative shall provide proof of manufacturer certification indicating successful completion within no more than two (2) years prior to system installation. This certification shall be included as part of the equipment and/or controls submittals.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Unit shall be stored and handled according to the manufacturer's recommendation.

PART 2 – WARRANTY

- 2.1 The CITY MULTI units shall be covered by the manufacturer's limited warranty for a period of one (1) year parts and seven (7) year compressor to the original owner from date of installation.
- 2.2 Manufacturer shall have a minimum of fifteen (15) years continuous experience providing VRF systems in the U.S. market.
- 2.3 All manufacturer technical and service manuals must be readily available for download by any local contractor should emergency service be required. Registering and sign-in requirements which may delay emergency service reference are not allowed.
- 2.4 The CITY MULTI VRF system shall be installed by a contractor with extensive CITY MULTI install and service training. The mandatory contractor service and install training should be performed by the manufacturer.

PART 3 - OUTDOOR UNITS

- 3.1 R2-SERIES STANDARD EFFICIENCY (HEAT RECOVERY), AIR COOLED OUTDOOR UNITS
 - A. General:

1. The outdoor unit modules shall be air-cooled, direct expansion (DX), multi- zone units used specifically with VRF components described in this section and Part 5 (Controls). The outdoor unit modules shall be equipped with a single compressor which is inverter-driven and multiple circuit boards—all of which must be manufactured by the branded VRF manufacturer. Each outdoor unit module shall be completely factory assembled, piped and wired and run tested at the factory.
2. Outdoor unit systems may be comprised of multiple modules with differing capacity if a brand other than basis of design is proposed. All units requiring a factory supplied twinning kits shall be piped together in the field, without the need for equalizing line(s). If an alternate manufacturer is selected, any additional material, cost, and labor to install additional lines shall be incurred by the contractor. Contractor responsible for ensuring alternative brand compatibility in terms of availability, physical dimensions, weight, electrical requirements, etc.
3. Outdoor unit shall have a sound rating no higher than 66.5 dB(A) individually or 69.5 dB(A) twinned. Units shall have a sound rating no higher than 52 dB(A) individually or 55 dB(A) twinned while in night mode operation. Units shall have 5 levels sound adjustment via dip switch selectable fan speed settings. If an alternate manufacturer is selected, any additional material, cost, and labor to meet published sound levels shall be incurred by the contractor.
4. Refrigerant lines from the outdoor unit to the indoor units shall be insulated in accordance with the installation manual.
5. The outdoor unit shall have the capability of installing the main refrigerant piping through the bottom of the unit.
6. The outdoor unit shall have an accumulator with refrigerant level sensors and controls. Units shall actively control liquid level in the accumulator via Linear Expansion Valves (LEV) from the heat exchanger.
7. The outdoor unit shall have a high pressure safety switch, over-current protection, crankcase heater and DC bus protection.
8. VRF system shall meet performance requirements per schedule and be within piping limitations & acceptable ambient temperature ranges as described in respective manufacturers' published product catalogs. Non- published product capabilities or performance data are not acceptable.
9. The outdoor unit shall be capable of operating in heating mode down to -18°F ambient temperatures or cooling mode down to 23°F ambient temperatures, without additional low ambient controls. If an alternate manufacturer is selected, any additional material, cost, and labor to meet low ambient operating condition and performance shall be incurred by the contractor.
10. The outdoor unit shall have a high efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained. Oil return sequences must be enabled only during extended periods of reduced refrigerant flow to ensure no disruption to correct refrigerant flow to individual zones during peak loads. Systems which might engage oil return sequence based on hours of operation risk oil

return during inopportune periods are not allowed. Systems which rely on sensors (which may fail) to engage oil return sequence are not allowed.

11. Unit must defrost all circuits simultaneously in order to resume full heating more quickly during extreme low ambient temperatures (below 23F). Partial defrost, also known as hot gas defrost which allows reduced heating output during defrost, is permissible only when ambient temperature is above 23F.
12. While in hot gas defrost the system shall slow the indoor unit fan speed down to maintain a high discharge air temperature. Systems that keep fans running in same state shall not be allowed as they provide an uncomfortable draft to the indoor zone due to lower discharge air temperatures.
13. In reverse defrost all refrigerant shall be bypassed in the main branch controller and shall not be sent out to the indoor units, systems that flow refrigerant through indoor units during reverse defrost shall not be allowed.

B. Unit Cabinet:

1. The casing(s) shall be fabricated of galvanized steel, bonderized and finished.
2. The outdoor unit shall be tested in compliance with ISO9277 such that no unusual rust shall develop after 960 hours of salt spray testing.
3. Panels on the outdoor unit shall be scratch free at system startup. If a scratch occurs the salt spray protection is compromised and the panel should be replaced immediately.

C. Fan:

1. Each outdoor unit module shall be furnished with direct drive, variable speed propeller type fan(s) only. Fans shall be factory set for operation at 0 in. WG.
external static pressure, but capable of normal operation with a maximum of 0.32 in. WG. external static pressure via dipswitch.
2. All fan motors shall have inherent protection, have permanently lubricated bearings, and be completely variable speed.
3. All fans shall be provided with a raised guard to prevent contact with moving parts.

D. Refrigerant and Refrigerant Piping:

1. R410A refrigerant shall be required for systems.
2. Polyolester (POE) oil—widely available and used in conventional domestic systems—shall be required. Prior to bidding, manufacturers using alternate oil types shall submit material safety data sheets (MSDS) and comparison of hygroscopic properties for alternate oil with list of local suppliers stocking alternate oil for approval at least two weeks prior to bidding.
3. Refrigerant piping shall be phosphorus deoxidized copper (copper and

copper alloy seamless pipes) of sufficient radial thickness as defined by the VRF equipment manufacturer and installed in accordance with manufacturer recommendations.

4. All refrigerant piping must be insulated with 3/4" closed cell, CFC-free foam insulation with flame-Spread Index of less than 25 and a smoke-development Index of less than 50 as tested by ASTM E 84 and CAN / ULC S-102. R value of insulation must be at least 3.
5. Refrigerant line sizing shall be in accordance with manufacturer specifications. Future changes to indoor unit styles or sizes must be possible without resizing/replacing refrigerant piping to any other branch devices or indoor units.

E. Coil:

1. Outdoor Coil shall be constructed to provide equal airflow to all coil face surface are by means of a 4-sided coil.
2. Outdoor Coil shall be elevated at least 12" from the base on the unit to protect coil from freezing and snow build up in cold climates. Manufacturer's in which their coil extends to within a few inches from the bottom of their cabinet frame shall provide an additional 12" of height to their stand or support structure to provide equal protection from elements as Mitsubishi Electric basis of design. Any additional support costs, equipment fencing, and tie downs required to meet this additional height shall be responsibility of Mechanical Contractor to provide.
3. The outdoor coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.
4. The coil fins shall have a factory applied corrosion resistant blue-fin finish. Uncoated aluminum coils/fins are not allowed.
5. The coil shall be protected with an integral metal guard.
6. Refrigerant flow from the outdoor unit shall be controlled by means of an inverter driven compressor.
7. Unit shall have prewired plugs for optional panel heaters when operating below ambient conditions of 1F to prevent any residual ice buildup from defrost.

- F. Condenser coil shall have active hot gas circuit direct from compressor discharge on lowest coil face area to shed defrost condensate away from coil and protect from Ice formation after returning to standard heat pump operation. While in Heat Pump operation this lower section of the Outdoor Evaporator coil shall continually run hot gas from the compressor discharge to protect the coil from ice buildup and coil rupture. Manufacturers who do not have an active hot gas circuit in the lower section of the Outdoor coil to protect coil from freezing shall not be allowed in markets where the outdoor unit will see temperatures below freezing.

G. Compressor:

1. Each outdoor unit module shall be equipped with only inverter driven scroll hermetic compressors. Non inverter-driven compressors, which

may cause inrush current (demand charges) and require larger generators for temporary power shall not be allowed.

2. Each compressor shall be equipped with a multi-port discharge mechanism to eliminate over compression at part load. Manufacturer's that rely on a single compressor discharge port and provide no means of eliminating over compression and energy waste at part load shall not be allowed.
3. Crankcase heat shall be provided via induction-type heater utilizing eddy currents from motor windings. Energy-wasting "belly-band" type crankcase heaters are not allowed. Manufacturer's that utilize belly-band crankcase heaters will be considered as alternate only.
4. Compressor shall have an inverter to modulate capacity. The capacity for each compressor shall be variable with a minimum turndown not greater than 15%.
5. The compressor shall be equipped with an internal thermal overload.
6. Field-installed oil equalization lines between modules are not allowed. Prior to bidding, manufacturers requiring equalization must submit oil line sizing calculations specific to each system and module placement for this project.
7. Manufacturers that utilize a compressor sump oil sensor to equalize compressor oil volume within a single module shall not be allowed unless they actively shut down the system to protect from compressor failure.

H. Controls:

1. The unit shall be an integral part of the system & control network described in Part 5 (Controls) and react to heating/cooling demand as communicated from connected indoor units over the control circuit. Required field- installed control voltage transformers and/or signal boosters shall be provided by the manufacturer.
2. Each outdoor unit module shall have the capability of 4 levels of demand control based on external input.

I. Electrical:

1. The outdoor unit electrical power shall be 208/230 volts, 3-phase, 60 hertz or 460 volts, 3-phase, 60 hertz per equipment schedule.
2. The outdoor unit shall be controlled by integral microprocessors.
3. The control circuit between the indoor units, BC Controller and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

3.2 BRANCH CIRCUIT (BC) CONTROLLERS AS REQUIRED FOR SIMULTANEOUS HEAT/COOL SYSTEMS

A. General

1. BC (Branch Circuit) Controllers (or comparable branch devices) shall include multiple branches to allow simultaneous heating and cooling by

allowing either hot gas refrigerant to flow to indoor unit(s) for heating or subcooled liquid refrigerant to flow to indoor unit(s) for cooling. Refrigerant used for cooling must always be subcooled for optimal indoor unit LEV performance; alternate branch devices which do not include controlled refrigerant subcooling risk bubbles in liquid supplied to indoor unit LEVs and are not allowed.

2. BC Controllers (or comparable branch devices) shall be equipped with a circuit board that interfaces to the controls system and shall perform all functions necessary for operation. The unit shall have a galvanized steel finish and be completely factory assembled, piped and wired. Each unit shall be run tested at the factory. This unit shall be mounted indoors, with access and service clearance provided for each controller. BC Controllers (or comparable branch devices) shall be suitable for use in plenums in accordance with UL1995 ed 4.

B. BC Unit Cabinet:

1. The casing shall be fabricated of galvanized steel.
2. Each cabinet shall house a liquid-gas separator and multiple refrigeration control valves.
3. The unit shall house two tube-in-tube heat exchangers.

C. Refrigerant Piping (specifications in addition to those for outdoor unit):

1. All refrigerant pipe connections shall be brazed.
2. Future changes to indoor unit quantities or sizes served by BC Controller or comparable branch device must be possible with no piping changes except between the branch device and indoor unit(s) changing. Systems which might require future piping changes between branch device and outdoor unit—if changes to indoor unit quantities or sizes are made—are not considered equal and are not allowed.

D. Refrigerant valves:

1. Service shut-off valves shall be field-provided/installed for each branch to allow service to any indoor unit without field interruption to overall system operation.

E. Condensate Management:

1. BC Controller (or comparable branch device) must have integral resin drain pan or insulate refrigeration components with removable insulation that allows easy access for future service needs. Cabinets filled with solid foam insulation do not allow for future service and are not allowed.

F. Electrical:

1. The unit electrical power shall be 208/230 volts, 1 phase, 60 Hertz. The unit shall be capable of satisfactory operation within voltage limits of

187-228 (208V/60Hz) or 207-253 (230/60Hz).

2. The BC Controller shall be controlled by integral microprocessors
3. The control circuit between the indoor units and outdoor units shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total.

3.3 Y-SERIES STANDARD EFFICIENCY (HEAT PUMP), AIR-COOLED OUTDOOR UNITS

A. General:

1. The outdoor unit modules shall be air-cooled, direct expansion (DX), multi- zone units used specifically with VRF components described in this section and Part 5 (Controls). The outdoor unit modules shall be equipped with a single compressor which is inverter-driven and multiple circuit boards—all of which must be manufactured by the branded VRF manufacturer. Each outdoor unit module shall be completely factory assembled, piped and wired and run tested at the factory.
2. Outdoor unit systems may be comprised of multiple modules with differing capacity if a brand other than basis of design is proposed. All units requiring a factory supplied twinning kits shall be piped together in the field, without the need for equalizing line(s). If an alternate manufacturer is selected, any additional material, cost, and labor to install additional lines shall be incurred by the contractor. Contractor responsible for ensuring alternative brand compatibility in terms of availability, physical dimensions, weight, electrical requirements, etc.
3. Outdoor unit shall have a sound rating no higher than 65 dB(A) individually or 70 dB(A) twinned. Units shall have a sound rating no higher than 52 dB(A) individually or 54.5 dB(A) twinned while in night mode operation. Units shall have 5 levels sound adjustment via dip switch selectable fan speed settings. If an alternate manufacturer is selected, any additional material, cost, and labor to meet published sound levels shall be incurred by the contractor.
4. Refrigerant lines from the outdoor unit to the indoor units shall be insulated in accordance with the installation manual.
5. The outdoor unit shall have the capability of installing the main refrigerant piping through the bottom of the unit.
6. The outdoor unit shall have an accumulator with refrigerant level sensors and controls. Units shall actively control liquid level in the accumulator via Linear Expansion Valves (LEV) from the heat exchanger.
7. The outdoor unit shall have a high pressure safety switch, over-current protection, crankcase heater and DC bus protection.
8. VRF system shall meet performance requirements per schedule and be within piping limitations & acceptable ambient temperature ranges as described in respective manufacturers' published product catalogs. Non- published product capabilities or performance data are not acceptable.
9. The outdoor unit shall be capable of guaranteed operation in heating

mode down to -18°F ambient temperatures and cooling mode up to 126°F without additional restrictions on line length & vertical separation beyond those published in respective product catalogs. Models with capacity data for required temperature range published as “for reference only” are not considered capable of guaranteed operation and are not acceptable. If an alternate manufacturer is selected, any additional material, cost, and labor to meet ambient operating range and performance shall be incurred by the contractor.

10. The outdoor unit shall have a high efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained. Oil return sequences must be enabled only during extended periods of reduced refrigerant flow to ensure no disruption to correct refrigerant flow to individual zones during peak loads. Systems which might engage oil return sequence based on hours of operation risk oil return during inopportune periods are not allowed. Systems which rely on sensors (which may fail) to engage oil return sequence are not allowed.
11. Unit must defrost all circuits simultaneously in order to resume full heating more quickly during extreme low ambient temperatures (below 23F). Partial defrost, also known as hot gas defrost which allows reduced heating output during defrost, is permissible only when ambient temperature is above 23F.
12. While in hot gas defrost the system shall slow the indoor unit fan speed down to maintain a high discharge air temperature, systems that keep fan running in same state shall not be allowed as they provide an uncomfortable draft to the indoor zone due to lower discharge air temperatures.

B. Unit Cabinet:

1. The casing(s) shall be fabricated of galvanized steel, bonderized and finished.
2. The outdoor unit shall be tested in compliance with ISO9277 such that no unusual rust shall develop after 960 hours of salt spray testing.
3. Panels on the outdoor unit shall be scratch free at system startup. If a scratch occurs the salt spray protection is compromised and the panel should be replaced immediately.

C. Fan:

1. Each outdoor unit module shall be furnished with direct drive, variable speed propeller type fan(s) only. Fans shall be factory set for operation at 0 in. WG external static pressure, but capable of normal operation with a maximum of 0.32 in. WG external static pressure via dipswitch.
2. All fan motors shall have inherent protection, have permanently lubricated bearings, and be completely variable speed.
3. All fans shall be provided with a raised guard to prevent contact with moving parts.

D. Refrigerant and Refrigerant Piping

1. R410A refrigerant shall be required for systems.
2. Polyolester (POE) oil—widely available and used in conventional domestic systems—shall be required. Prior to bidding, manufacturers using alternate oil types shall submit material safety data sheets (MSDS) and comparison of hygroscopic properties for alternate oil with list of local suppliers stocking alternate oil for approval at least two weeks prior to bidding.
3. Refrigerant piping shall be phosphorus deoxidized copper (copper and copper alloy seamless pipes) of sufficient radial thickness as defined by the VRF equipment manufacturer and installed in accordance with manufacturer recommendations.
4. All refrigerant piping must be insulated with ½" closed cell, CFC-free foam insulation with flame-Spread Index of less than 25 and a smoke-development Index of less than 50 as tested by ASTM E 84 and CAN / ULC S-102. R value of insulation must be at least 3.
5. Refrigerant line sizing shall be in accordance with manufacturer specifications.

E. Coil:

1. Outdoor Coil shall be constructed to provide equal airflow to all coil face surface are by means of a 4-sided coil.
2. Outdoor Coil shall be elevated at least 12" from the base on the unit to protect coil from freezing and snow build up in cold climates. Manufacturer's in which their coil extends to within a few inches from the bottom of their cabinet frame shall provide an additional 12" of height to their stand or support structure to provide equal protection from elements as Mitsubishi Electric basis of design. Any additional support costs, equipment fencing, and tie downs required to meet this additional height shall be responsibility of Mechanical Contractor to provide.
3. The outdoor heat exchanger shall be of zinc coated aluminum construction with turbulating flat tube construction. The coil fins shall have a factory applied corrosion resistant finish. Uncoated aluminum coils/fins are not allowed.
4. The coil shall be protected with an integral metal guard.
5. Refrigerant flow from the outdoor unit shall be controlled by means of an inverter driven compressor.
6. Unit shall have prewired plugs for optional panel heaters when operating below ambient conditions of 1F to prevent any residual ice buildup from defrost.
7. Condenser coil shall have active hot gas circuit direct from compressor discharge on lowest coil face area to shed defrost condensate away from coil and protect from Ice formation after returning to standard heat pump operation. While in Heat Pump operation this lower section of the Outdoor Evaporator coil shall continually run hot gas from the compressor discharge to protect the coil from ice buildup and coil rupture. Manufacturers who do not have an active hot gas circuit in the lower section of the Outdoor coil to protect coil from freezing shall not be allowed to bid on project in markets where the outdoor unit will see temperatures below freezing.

F. Compressor:

1. Each outdoor unit module shall be equipped with only inverter driven scroll hermetic compressors. Non inverter-driven compressors, which may cause inrush current (demand charges) and require larger generators for temporary power shall not be allowed.
2. Each compressor shall be equipped with a multi-port discharge mechanism to eliminate over compression at part load. Manufacturer's that rely on a single compressor discharge port and provide no means of eliminating over compression and energy waste at part load shall not be allowed.
3. Crankcase heat shall be provided via induction-type heater utilizing eddy currents from motor windings. Energy-wasting "belly-band" type crankcase heaters are not allowed. Manufacturers that utilize belly-band crankcase heaters will be considered as alternate only.
4. Compressor shall have an inverter to modulate capacity. The capacity for each compressor shall be variable with a minimum turndown not greater than 15%.
5. The compressor shall be equipped with an internal thermal overload.
6. Field-installed oil equalization lines between modules are not allowed. Prior to bidding, manufacturers requiring equalization must submit oil line sizing calculations specific to each system and module placement for this project.
7. Manufacturers that utilize a compressor sump oil sensor to equalize compressor oil volume within a single module shall not be allowed unless they actively shut down the system to protect from compressor failure.

G. Controls:

1. The unit shall be an integral part of the system & control network described in Part 5 (Controls) and react to heating/cooling demand as communicated from connected indoor e control circuit. Required field-installed control voltage transformers and/or signal boosters shall be provided by the manufacturer.
2. The outdoor unit shall have the capability of 4 levels of demand control for each refrigerant system based on external input.

H. Electrical:

1. The outdoor unit electrical power shall be 208/230 volts, 3-phase, 60 hertz or 460 volts, 3-phase, 60 hertz per equipment schedule.
2. The outdoor unit shall be controlled by integral microprocessors.
3. The control circuit between the indoor units and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

PART 4 - INDOOR UNITS

4.1 4-WAY CEILING-RECESSED CASSETTE WITH GRILLE INDOOR UNIT

A. General:

1. The ceiling-recessed indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function, a test run switch, and the ability to adjust airflow patterns for different ceiling heights. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory. The unit shall be suitable for use in plenums in accordance with UL1995 ed 4.

B. Unit Cabinet:

1. The cabinet panel shall have provisions for a field installed filtered outside air intake.
2. Branch ducting shall be allowed from cabinet.
3. Four-way grille shall be fixed to bottom of cabinet allowing two, three or four-way blow.
4. The grille vane angles shall be individually adjustable from a wired remote controller to customize the airflow pattern for the conditioned space

C. Fan:

1. The indoor fan shall be an assembly with a statically and dynamically balanced turbo fan direct driven by a single motor with permanently lubricated bearings.
2. The indoor unit shall include an AUTO fan setting capable of maximizing energy efficiency by adjusting the fan speed based on the difference between controller set-point and space temperature. The indoor fan shall be capable of five (5) speed settings, Low, Mid1, Mid2, High and Auto.
3. The indoor unit shall have an adjustable air outlet system offering 4-way airflow, 3-way airflow, or 2-way airflow.
4. The indoor unit fan logic must include multiple setting that can be changed to provide optimum airflow based on ceiling height and number of outlets used.
5. The indoor unit vanes shall have 5 fixed positions and a swing feature that shall be capable of automatically swinging the vanes up and down for uniform air distribution.
6. The vanes shall have an Auto-Wave selectable option in the heating mode that shall randomly cycle the vanes up and down to evenly heat the space.
7. Grille shall include a factory-installed "i-see" sensor, or equal, to work in conjunction with indoor unit control sequence to prevent unnecessary cooling or heating in unoccupied areas of the zone without decreasing comfort levels. Sensor must detect occupancy (not simply motion) and location of occupants by measuring size & temperature of objects within a 39' detecting diameter (based on 8.8ft mounting height) with 1,856 or

more measuring points.

D. Filter:

1. Return air shall be filtered by means of a long-life washable filter

E. Coil:

1. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phosphor copper or silver alloy.
2. The coils shall be pressure tested at the factory.
3. The unit shall be provided with an integral condensate lift mechanism that will be able to raise drain water 33 inches above the condensate pan.

F. Electrical:

1. The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.
2. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz).

G. Controls:

1. Indoor unit shall compensate for the higher temperature sensed by the return air sensor compared to the temperature at level of the occupant when in HEAT mode. Disabling of compensation shall be possible for individual units to accommodate instances when compensation is not required.
2. Control board shall include contacts for control of external heat source. External heat may be energized as second stage with 1.8°F – 9.0°F adjustable deadband from set point.
3. Indoor unit shall include no less than four (4) digital inputs capable of being used for customizable control strategies.
4. Indoor unit shall include no less than three (3) digital outputs capable of being used for customizable control strategies.
5. A factory-installed drain pan sensor shall provide protection against drain pan overflow by sensing a high condensate level in the drain pan. Should this occur the control shuts down the indoor unit before an overflow can occur. A thermistor error code will be produced should the sensor activate indicating a fault which must be resolved before the unit re-starts.

4.2 4-WAY CEILING-RECESSED CASSETTE WITH GRILLE FOR 2X2 GRID INDOOR UNIT

A. General:

1. The indoor unit shall be a four-way cassette style indoor unit that recesses into the ceiling with a ceiling grille. The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function and a test run switch. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory. The unit shall be suitable for use in plenums in accordance with UL1995 ed 4.

B. Unit Cabinet:

1. The cabinet shall be a compact 22-7/16" wide x 22-7/16" deep so it will fit within a standard 24" square suspended ceiling grid.
2. The cabinet panel shall have provisions for a field installed filtered outside air intake.
3. Four-way grille shall be fixed to bottom of cabinet allowing two, three or four-way blow.

C. Fan:

1. The indoor fan shall be an assembly with a turbo fan direct driven by a single motor.
2. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
3. The indoor unit shall include an AUTO fan setting capable of maximizing energy efficiency by adjusting the fan speed based on the difference between controller set-point and space temperature. The indoor fan shall be capable of five (4) speed settings, Low, Mid, High and Auto.
4. The indoor unit shall have an adjustable air outlet system offering 4-way airflow, 3-way airflow, or 2-way airflow.
5. The indoor unit vanes shall have 5 fixed positions and a swing feature that shall be capable of automatically swinging the vanes up and down for uniform air distribution.
6. Grille shall include a factory-installed "i-see" sensor, or equal, to work in conjunction with indoor unit control sequence to prevent unnecessary cooling or heating in unoccupied areas of the zone without decreasing comfort levels. Sensor must detect occupancy (not simply motion) and location of occupants by measuring size & temperature of objects within a 39' detecting diameter (based on 8.8ft mounting height) with 1,856 or more measuring points.

D. Filter:

1. Return air shall be filtered by means of a long-life washable filter.

E. Coil:

1. The indoor coil shall be of nonferrous construction with smooth plate fins

on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phosphor-copper or silver alloy.

2. The coils shall be pressure tested at the factory.
3. The unit shall be provided with an integral condensate lift mechanism that will be able to raise drain water 19-3/4" inches above the condensate pan.

F. Electrical:

1. The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.
2. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz).

G. Controls:

1. Indoor unit shall compensate for the higher temperature sensed by the return air sensor compared to the temperature at level of the occupant when in HEAT mode. Disabling of compensation shall be possible for individual units to accommodate instances when compensation is not required.
2. Control board shall include contacts for control of external heat source. External heat may be energized as second stage with 1.8°F – 9.0°F adjustable deadband from set point.
3. Indoor unit shall include no less than four (4) digital inputs capable of being used for customizable control strategies.
4. Indoor unit shall include no less than three (3) digital outputs capable of being used for customizable control strategies.
5. A factory-installed drain pan sensor shall provide protection against drain pan overflow by sensing a high condensate level in the drain pan. Should this occur, the control shuts down the indoor unit before an overflow can occur. A thermistor error code will be produced should the sensor activate indicating a fault which must be resolved before the unit re-starts.

4.3 MEDIUM STATIC CEILING-CONCEALED DUCTED INDOOR UNIT

A. General:

1. The ceiling-concealed ducted indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory. The unit shall be suitable for use in plenums in accordance with UL1995 ed 4.

B. Unit Cabinet:

1. The unit shall be ceiling-concealed, ducted—with a 2-position, field adjustable return and a fixed horizontal discharge supply.
 2. The cabinet panel shall have provisions for a field installed filtered outside air intake.
- C. Fan:
1. Indoor unit shall feature multiple external static pressure settings ranging from 0.14 to 0.60 in. WG.
 2. The indoor unit fan shall be an assembly with statically and dynamically balanced Sirocco fan(s) direct driven by a single motor with permanently lubricated bearings.
 3. The indoor fan shall consist of three (3) speeds, High, Mid, and Low plus the Auto-Fan function.
- D. Filter:
1. Return air shall be filtered by means of a standard factory installed return air filter.
 2. Optional return filter box (rear or bottom placement) with high-efficiency filter as noted on equipment schedule.
- E. Coil:
1. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phosphor-copper or silver alloy.
 2. The coils shall be pressure tested at the factory.
 3. Coil shall be provided with a sloped drain pan. Units without sloped drain pans which must be installed cockeyed to ensure proper drainage are not allowed.
 4. The unit shall be provided with an integral condensate lift mechanism able to raise drain water 27 inches above the condensate pan.
- F. Electrical:
1. The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.
 2. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz).
- G. Controls:
1. Indoor unit shall compensate for the higher temperature sensed by the return air sensor compared to the temperature at level of the occupant when in HEAT mode. Disabling of compensation shall be possible for individual units to accommodate instances when compensation is not required.
 2. Control board shall include contacts for control of external heat source. External heat may be energized as second stage with 1.8°F – 9.0°F

- adjustable deadband from set point.
- 3. Indoor unit shall include no less than four (4) digital inputs capable of being used for customizable control strategies.
- 4. Indoor unit shall include no less than three (3) digital outputs capable of being used for customizable control strategies.

PART 5 – CONTROLS

5.1 OVERVIEW

- A. The control system shall consist of a low voltage communication network and a web-based interface. The controls system shall gather data and generate web pages accessible through a conventional web browser on each PC connected to the network. Operators shall be able to perform all normal operator functions through the web browser interface.
- B. Furnish energy conservation features such as optimal start, request-based logic, and demand level adjustment of overall system capacity as specified in the sequence.
- C. System shall be capable of email generation for remote alarm annunciation.

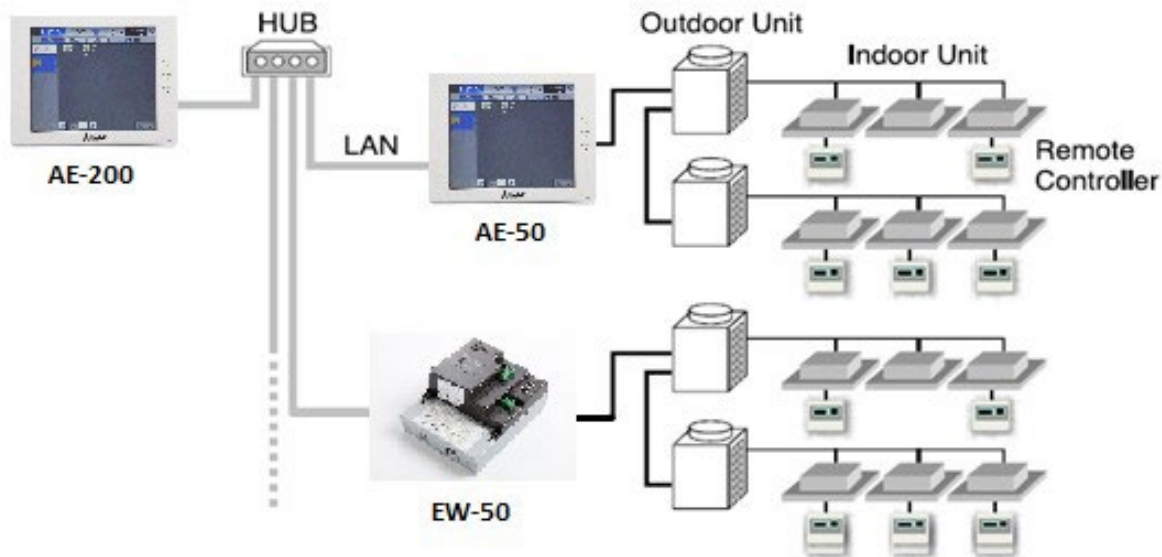
5.2 ELECTRICAL CHARACTERISTICS

- A. General:
 - 1. Controller power and communications shall be via a common non-polar communications bus and shall operate at 30VDC.
- B. Wiring:
 - 1. Control wiring shall be installed in a daisy chain configuration from indoor unit to indoor unit, to the BC controller (main and subs, if applicable) and to the outdoor unit. Control wiring to remote controllers shall be run from the indoor unit terminal block to the controller associated with that unit.
 - 2. Control wiring for centralized controllers shall be installed in a daisy chain configuration from outdoor unit to outdoor unit, to the system controllers (centralized controllers and/or integrated web based interface), to the power supply.
- C. Wiring type:
 - 1. Wiring shall be 2-conductor (16 AWG), twisted, stranded, shielded wire as defined by the Diamond System Builder output.
 - 2. Network wiring shall be CAT-5 with RJ-45 connection.

5.3 CITY MULTI CONTROLS NETWORK

- A. The CITY MULTI Controls Network (CMCN) consists of remote controllers,

centralized controllers, and/or integrated web based interface communicating over a high-speed communication bus. The CITY MULTI Controls Network shall support operation monitoring, scheduling, occupancy, error email distribution, personal web browsers, tenant billing, online maintenance support, and integration with Building Management Systems (BMS) using either LonWorks® or BACnet® interfaces. The below figure illustrates a sample CMCN System Configuration.



CMCN System Configuration

5.4 GRAPHICAL USER INTERFACE

- A. The Graphical User Interface (Integrated Centralized Control Web) shall require a field supplied PC or Tablet.
- B. ICCW
 1. The Integrated Centralized Control Web System (ICCW) interface shall enable the user to control multiple AE-200, AE-50, EW-50's and shall provide additional functions such as energy apportionment from a single network PC configured with the Charge Calculation Tool. The ICCW shall be capable of controlling up to forty AE-200/AE-50/EW-50 Centralized Controllers with a maximum of 2,000 indoor units across multiple CITY MULTI outdoor units. The ICCW shall be required if the user wants to simultaneously control more than 1 AE-200/AE-50/EW-50 Centralized Controllers from a single PC or tablet using a single web browser session. Licensing per function, per AE-200/AE-50/EW-50 Centralized Controller shall be required for the ICCW. Optional software features shall be available through the ICCW including energy apportionment and personalized web. These optional software features shall require the ICCW, advance purchase from the customer, and

licensing from ICCW.

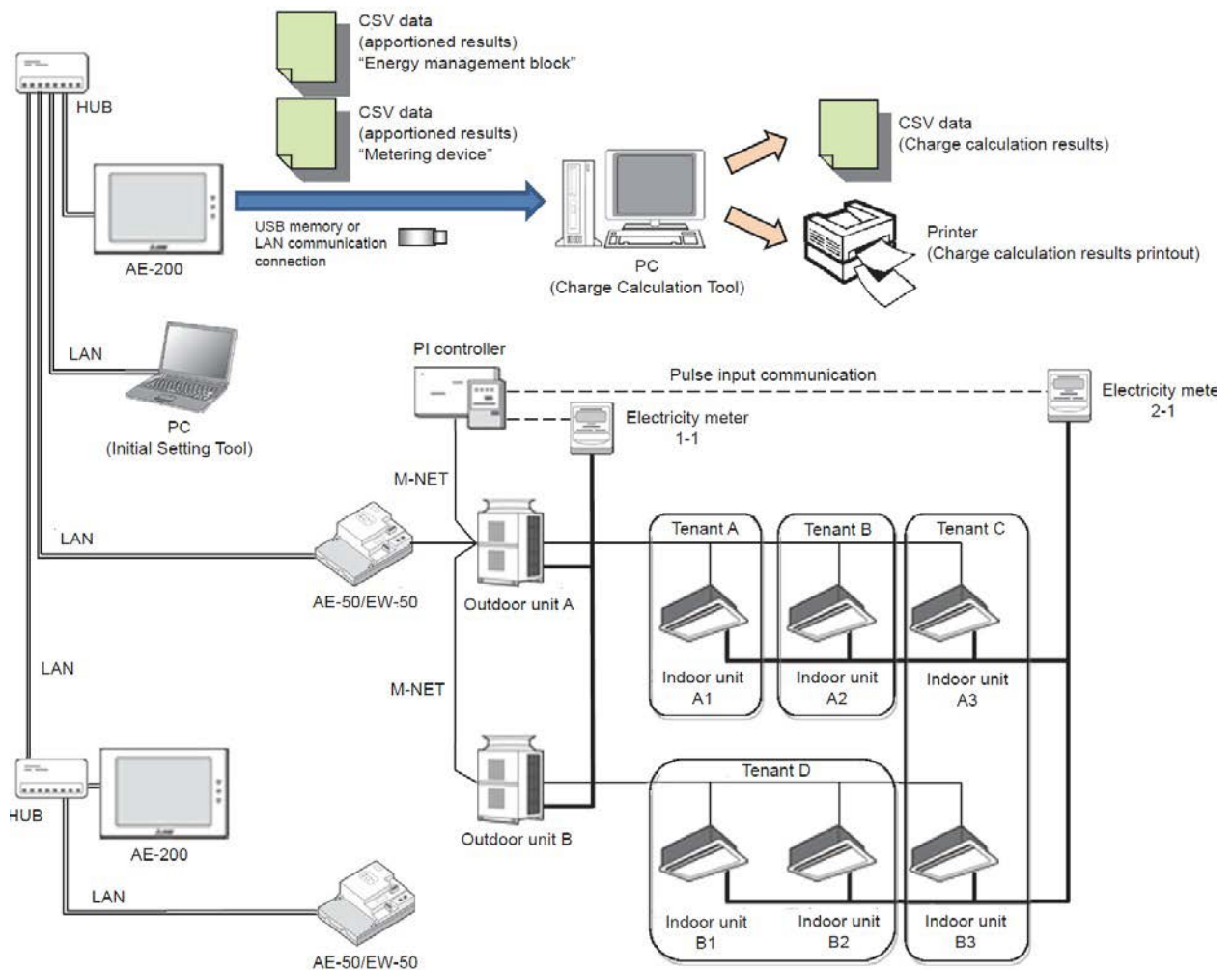
ICCW (Integrated System Software)	
Item	Details
ON/OFF	The units can turn ON and OFF for all floors or in a block, floor, or group of units.
Operation Modes	The operation mode can be switched between COOL, DRY, FAN, AUTO, and HEAT for all floors or in a block, floor, or group of units
Temperature Setting	Sets the temperature for a single group. Range of Temperature setting from 57°F – 87°F depending on operation mode and indoor unit model. Separate COOL and HEAT mode set points available depending on remote controller and connected mechanical equipment.
Fan Speed	The fan speed can be set to four stages for all floors or in a block, floor, or group of units
Air Direction	The air direction can be set in four vertical directions or to swing for all floors or in block, floor, or group of units. (The selectable air direction differs according to the model.)
Interlocked Unit ON/OFF LOSSNAY	If there is an interlocked unit (LOSSNAY), then the unit can be turned ON (strong/weak) or OFF for all floors or in a block, floor, or group of units. (Note that the ventilation mode cannot be selected for interlocked units.)
Local Operation Prohibit	The items for which operation with the local remote controller are to be prohibited can be selected for all floors or in a block, floor, or group of units. (The items that can be prohibited are ON/OFF, operation mode, set temperature and filter sign reset.)
Annual / Weekly Schedule	The annual/weekly schedule function can be used by registering the license. Two settings, such as seasonal settings for summer and winter, can be saved.
Power Rate Apportionment Charging	A watt-hour meter (WHM) with kWH pulse output is connected to calculate the air conditioning charges based on the amount each tenant's air-conditioner has operated. Five charging rates can be applied per day. ***OPTIONAL ENERGY APPORTIONMENT SOFTWARE (SW-CHARGE) and PI Controller (PAC-Y60MCA) REQUIRED
History	Up to 3,000 items for the error history and up to 10,000 items for operation history can be saved. Each history file can be output as a daily report or monthly report in CSV format. (The operation history consists only of the operations carried out with the ICCW and is limited to some
Operation Time Monitor	The cumulative operation time of each indoor unit can be viewed or output as a CSV format file. (This function is valid only when the charging function license is registered.)
Filter Sign Display Mask	The filter sign display at the remote controllers can be disabled.

Set Temperature Limit	The set temperature lower limit can be set for cooling and the upper limit for heating. (ME remote controller required)

5.5 CMCN: SYSTEM INTEGRATION

- A. The CMCN shall be capable of supporting integration with Building Management Systems (BMS) via industry standard communication protocols including BACnet and LonWorks®.

5.6 ENERGY APPOINTMENT METHOD FOR CITY MULTI CENTRALIZED CONTROLLERS



CMCN System Configuration

A. System Overview

- For centralized systems serving multiple tenants for which one-to-one electricity metering is not possible, an apportioned electricity

billing function that attributes just the electrical energy consumed by each individual tenant's air conditioner is required. The Energy Apportionment function

takes the information on the electrical energy usage gathered from Watt Hour Meters (WHM) connected to dedicated breaker panels serving the system's outdoor units and synthesizes it with the information on the operating status of the indoor units that is collected by the CITY MULTI centralized controller(s).

B. Watt Hour Meters

1. Requirements:

a. The Watt Hour Meters (WHMs) to be used to read the electrical energy consumption of the outdoor units must be capable of a pulse output, which would be configured based on the current rating of the units. The associated current transformers/ transducers (CTs) must also be sized based on the current rating of either the individual outdoor units or the dedicated air conditioning electrical panels they are to be reading. The proper quantity of meters for a particular sized system must be selected in order to ensure sufficient resolution and hysteresis in the unit pulse output of the meters so as to ascribe an acceptable level of accuracy to the apportionment of energy usage for each tenant's system. The system is designed to work with any WHM capable of a pulse output that meets ANSI C12.20 class 0.2% or 0.5% accuracy standards.

2. Connection:

a. The WHMs are to be physically connected to the integrated pulse input module or an external Mitsubishi Electric PI Controller if such an input is not available or if there is a wiring length limitation or installation hardship. The cable type of the interconnecting wiring shall be according to the wiring specifications of the WHM manufacturer.

C. CITY MULTI Centralized Controller Requirements

1. Licensing:

a. Each centralized controller (AE-200/AE-50/EW-50) to which units are assigned that require the energy apportionment function must have the "SW- Charge" software license purchased and properly unlocked in order to enable the operating status of the indoor units to be passed to the energy apportionment tool. The procedure for licensing the centralized controllers with this function and the necessary forms can be found on Mitsubishi Electric's technical documentation repository, mylinkdrive.com. Purchase Order information for the licenses will be required at the time of submission of the licensing request forms.

- i. Dedicated AE-200 for apportionment (no MNET connection)
- b. A dedicated AE-200 centralized controller, for which the SW-Charge license is purchased and the energy apportionment function enabled, must be provided in order to serve as the portal for exporting metering device and energy management data to a USB drive or to a PC via LAN connection. This means that by virtue of selecting this AE-200 to serve this function, the MNET capability of this particular centralized controller will be disabled. All indoor units must be physically wired via MNET to other centralized controllers (AE-50/EW-50), which must be physically wired via LAN with Static IP addresses and a network hub or switch to the AE-200 Apportionment controller.

D. PC for collecting charge calculation results

1. A networked PC, which does not necessarily have to be dedicated to the task of collecting energy apportionment data, can be provided and loaded with the Charge Calculation Tool software for exporting data necessary to generate billing documentation to be performed by a third party. The system requirements of the PC are as follows:

Item	Requirements
CPU	1 GHz or better (at least 2 GHz recommended)
Memory	2GB or more
Screen Resolution	1024 x 768 or better
OS	Windows 7, Windows 8.1 (32bit/64bit)
System requirements	The system should meet the minimum requirement for Windows 7 or Windows 8.1 Net Framework 4.5 or later
Internal LAN port or LAN card	100 BASE-TX or better
Porting device	Mouse, etc.

5.7 CMCN: REMOTE CONTROLLERS

A. Simple MA Remote Controller (PAC-YT53CRAU):

1. The Backlit Simple MA Remote Controller shall be capable of controlling up to 16 indoor units (defined as 1 group).
2. The Backlit Simple MA Remote Controller shall only be used in same group with Wireless MA Remote Controllers (PAR-FL32MA-E / PAR-FA32MA-E) or with other Backlit Simple MA Remote Controllers (PAC-YT53CRAU), with up to two remote controllers per group.

Simple MA Remote Controller			
Item	Description	Operation	Display
ON/OFF	Run and stop operation for a single group	Each Group	Each Group
Operation Mode	Switches between Cool/Drying/Auto/Fan/Heat/Setback. Operation modes vary depending on the air conditioner unit. Auto and Setback mode are available for the R2/WR2-Series only.	Each Group	Each Group
Temperature Setting	Sets the temperature from 40°F – 95°F depending on operation mode and indoor unit. Separate COOL and HEAT mode set points available depending on central controller and connected mechanical equipment.	Each Group	Each Group
Fan Speed Setting	Available fan speed settings depending on indoor unit.	Each Group	Each Group
Air Flow Direction Setting	Air flow direction settings vary depending on the indoor unit model.	Each Group	Each Group
Permit / Prohibit Local Operation	Individually prohibit operation of each local remote control function (Start/Stop, Change operation mode, Set temperature, Reset filter). *1: Centrally Controlled is displayed on the remote controller for prohibited functions.	N/A	Each Group *1
Display Indoor Unit Intake Temp	Measures and displays the intake temperature of the indoor unit when the indoor unit is operating.	N/A	Each Group
Display Backlight	Pressing the button lights up a backlight. The light automatically turns off after a certain period of time. (The brightness settings can be selected from Bright, Dark, and Light off.)	N/A	Each Unit
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed	N/A	Each Unit
Test Run	Operates air conditioner units in test run mode. *2 The display for test run mode will be the same as for normal start/stop (does not display “test run”).	Each Group	Each Group *2
Ventilation Equipment	Up to 16 indoor units can be connected to an interlocked system that has one LOSSNAY unit.	Each Group	N/A

Set Temperature Range Limit	Set temperature range limit for cooling, heating, or auto mode.	Each Group	Each Group

5.8 CENTRALIZED CONTROLLER (WEB-ENABLED)

A. AE-200 Centralized Controller:

1. The AE-200A Centralized Controller shall be capable of controlling a maximum of two hundred (200) indoor units across multiple CITY MULTI outdoor units with the use of three (3) AE-50A expansion controllers. The AE-200A Centralized Controller shall be approximately 11-5/32" x 7-55/64" x 2-17/32" in size and shall be powered with an integrated 100-240 VAC power supply. The AE-200A Centralized Controller shall support system configuration, daily/weekly scheduling, monitoring of operation status, night setback settings, free contact interlock configuration and malfunction monitoring. When being used alone without the expansion controllers, the AE-200A Centralized Controller shall have five basic operation controls which can be applied to an individual indoor unit, a collection of indoor units (up to 50 indoor units), or all indoor units (collective batch operation). This basic set of operation controls for the AE-200 Centralized Controller shall include on/off, operation mode selection (cool, heat, auto (R2/WR2-Series only), dry, setback (R2/WR2-Series only) and fan), temperature setting, fan speed setting, and airflow direction setting. Since the AE-200A provides centralized control it shall be able to enable or disable operation of local remote controllers. In terms of scheduling, the AE-200A Centralized Controller shall allow the user to define both daily and weekly schedules (up to 24 scheduled events per day) with operations consisting of ON/OFF, mode selection, temperature setting, air flow (vane) direction, fan speed, and permit/prohibit of remote controllers.

AE-200 (Centralized Controller)			
Item	Description	Operation	Display
ON/OFF	Run and stop operation.	Each Block, Group or Collective	Each Group or Collective
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat. (Group of Lossnay unit: automatic ventilation/vent-heat/interchange/normal ventilation) Operation modes vary depending on the air conditioner unit.	Each Block, Group or Collective	Each Group
Temperature Setting	Sets the temperature from 57°F – 87°F depending on operation mode and indoor unit.	Each Block, Group or Collective	Each Group

Fan Speed Setting	Available fan speed settings depending on indoor unit.	Each Block, Group or Collective	Each Group
Air Flow Direction Setting	Air flow direction settings vary depending on the indoor unit model. *1. Louver cannot be set.	*1 Each Block, Group or Collective	Each Group
Schedule Operation	Annual/weekly/today schedule can be set for each group of air conditioning units. Optimized start setting is also available. *1. The system follows either the current day, annual schedule, or weekly, which are in the descending order of overriding priority. Twenty-four events can be scheduled per day, including ON/OFF, Mode, Temperature Setting, Air Direction, Fan Speed and Operation Prohibition. Five types of weekly schedule (seasonal) can be set.	*2 Each Block, Group or Collective	Each Group
Optimized Start	Unit starts 5 - 60 minutes before the scheduled time based on the operation data history in order to reach the scheduled temperature at the scheduled time.	Each Block, Group or Collective	Each Block, Group or Collective
Night Setback Setting	The function helps keep the indoor temperature in the temperature range while the units are stopped and during the time this function is effective.	Each Group	Each Group
Permit / Prohibit Local Operation	Individually prohibit operation of each local remote control function (Start/Stop, Change operation mode, Set temperature, Reset filter). *3. Centrally Controlled is displayed on the remote controller for prohibited functions.	Each Block, Group or Collective	*3 Each Group
Room Temp	Displays the room temperature of the group. Space temperature displayed on the indoor unit icon on the touch screen interface.	N/A	Each Group
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed *4. When an error occurs, the LED flashes. The operation monitor screen shows the abnormal unit by flashing it. The error monitor screen shows the abnormal unit address, error code and source of detection. The error log monitor screen shows the time and date, the abnormal unit address, error code	N/A	*4 Each Unit or Collective
Outdoor Unit Status	Compressor capacity percentage and system pressure (high and low) pressure (excludes S-Series)	Each ODU	Each ODU

Connected Unit Information	MNET addresses of all connected systems	Each IDU, ODU and BC	Each IDU, ODU and BC
Ventilation Equipment	This interlocked system settings can be performed by the master system controller. When setting the interlocked system, use the ventilation switch the free plan LOSSNAY settings between “Hi”, “Low” and “Stop”. When setting a group of only free plan LOSSNAY units, you can switch between “Normal ventilation”, “Interchange ventilation” and “Automatic ventilation”.	Each Group	Each Group
Multiple Language	Other than English, the following language can be chosen. Spanish, French, Japanese, Dutch, Italian, Russian, Chinese, and Portuguese are available.	N/A	Collective
External Input / Output	By using accessory cables you can set and monitor the following. Input By level: “Batch start/stop”, “Batch emergency stop” By pulse: “batch start/stop”, “Enable/disable remote controller” Output: “start/stop”, “error/Normal” *5. Requires the external I/O cables (PAC-YG10HA-E) sold separately.	*5 Collective	*5 Collective

- B. All AE-200A Centralized Controllers shall be equipped with two RJ-45 Ethernet ports to support interconnection with a network PC via a closed/direct Local Area Network (LAN) or to a network switch for IP communication to up to three AE-50A expansion controllers for display of up to two hundred (200) indoor units on the main AE-200A interface.
- C. The AE-200A Centralized Controller shall be capable of performing initial settings via the high-resolution, backlit, color touch panel on the controller or via a PC browser using the initial settings.
- D. Standard software functions shall be available so that the building manager can securely log into each AE-200A via the PC's web browser to support operation monitoring, scheduling, error email, interlocking and online maintenance diagnostics. Additional optional software functions of personal browser for PCs and MACs and Energy shall be available but are not included. The Energy Apportionment function shall require TG-2000 Integrated System software in conjunction with the Centralized Controllers.
- E. AE-50A Expansion Controller:

1. The AE-50A Expansion Controller shall serve as a standalone centralized controller or as an expansion module to the AE-200A Centralized Controller for the purpose of adding up to 50 indoor units to either the main touch screen interface of the AE-200A. Up to three (3) AE-50A expansion controllers can be connected to the AE-200A via a local IP network (and their IP addresses assigned on the AE-200A) to the AE-200A to allow for up to two hundred (200) indoor units to be monitored and controlled from the AE-200A interface.
2. The AE-50A expansion controllers have all of the same capabilities to monitor and control their associated indoor units as the features specified above. Even when connected to the AE-200A and configured to display their units on the main controller, the individual indoor units connected to the AE-50A can still be monitored and controlled from the interface of the AE-50. The last command entered will take precedence, whether at the wall controller, the AE-50A or the AE-200A Centralized Controller.

F. EW-50GU Centralized Controller:

1. The EW-50 Centralized Controller shall be capable of controlling a maximum of 50 indoor units across multiple CITY MULTI outdoor units. The EW-50 Centralized Controller shall be approximately 8-1/2"x10" in size and shall be powered from the external power supply (PAC-SC51KUA). The EW-50 Centralized Controller shall support system configuration, daily/weekly scheduling, monitoring of operation status, free contact interlock configuration and malfunction monitoring. The EW-50 Centralized Controller shall have five basic operation controls which can be applied to an individual indoor unit, a group of indoor units (up to 50 indoor units), or all indoor units (collective batch operation). This basic set of operation controls for the EW-50 Centralized Controller shall include on/off, operation mode selection (cool, heat, auto (R2/WR2-Series only), dry, temperature setting, fan speed setting, and airflow direction setting. Since the EW-50 provides centralized control it shall be able to enable or disable operation of local remote controllers. In terms of scheduling, the EW-50 Centralized Controller shall allow the user to define both daily and weekly schedules with operations consisting of ON/OFF, mode selection, temperature setting, air flow (vane) direction, fan speed, and permit/prohibit of remote controllers.

EW-50 (Centralized Controller)			
Item	Description	Operation	Display
ON/OFF	Run and stop operation.	Each Block, Group or Collective	Each Group or Collective

Operation Mode	Indoor unit modes: COOL/DRY/FAN/AUTO/HEAT. Lossnay unit modes: HEAT RECOVERY/BYPASS/AUTO Air to water (PWFY) modes: HEATING/HEATING ECO/HOT WATER/ANTI- FREEZE/COOLING *Operation modes vary depending on the unit model connected. ** Auto mode is available for the R2/WR2-Series only.	Each Block, Group or Collective	Each Group
Temperature Setting	Sets the temperature from 40°F – 95°F depending on operation mode and indoor unit model. Separate COOL and HEAT mode set points available depending on remote controller and connected mechanical equipment.	Each Block, Group or Collective	Each Group
Set Temperature Range Limit	The range of room temperature setting can be limited by the initial setting depending on the indoor unit connected.	Each Group	Each Group
Fan Speed Setting	Available fan speed settings depend on indoor unit model.	Each Block, Group or Collective	Each Group
Air Flow Direction Setting	*Air flow direction settings vary depending on the indoor unit model. *1. Louver cannot be set.	*1 Each Block, Group or Collective	Each Group
Schedule Operation	Annual/weekly/today schedule can be set for each group of air conditioning units. Optimized start setting is also available. *2. The system follows either the current day, annual schedule, or weekly, which are in the descending order of overriding priority. Twenty-four events can be scheduled per day, including ON/OFF, Mode, Temperature Setting, Air Direction, Fan Speed and Operation Prohibition. Five types of weekly schedule (seasonal) can be set. Settable items depend on the function that is being scheduled.	*2 Each Block, Group or Collective	Each Group
Hold	Disables scheduled functions for indoor unit groups and their associated remote controller timers. *not available for general equipment	Each Block, Group or Collective	Each Group

Optimized Start	Unit starts 5 - 60 minutes before the scheduled time based on the operation data history in order to reach the scheduled temperature at the scheduled time.	Each Block, Group or Collective	Each Block, Group or Collective
Permit / Prohibit Local Operation	Individually prohibit operation of each local remote control function (Start/Stop, Change operation mode, Set temperature, Fan Speed, Air Direction and Reset filter). *3. Centrally Controlled is displayed on the remote controller for prohibited functions.	Each Block, Group or Collective	*3 Each Group
Room Temp	Displays the room temperature of the group.	N/A	Each Group
Room Humidity	Displays the percent relative humidity in the space as sensed by the Smart ME Remote Controller	N/A	Each Group
Occupancy Sensor	Displays the occupancy icon on the group icon in the condition list page when the room is occupied (blue) or vacant (gray). *The Smart ME Remote Controller Occupancy sensor is required.	N/A	Each Group
Brightness Sensor	Displays the brightness icon on the group icon in the condition list when the space is determined to be bright (yellow) or dark (gray). *The Smart ME Remote Controller Brightness sensor is required.	N/A	Each Group
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed *4. When an error occurs, the LED flashes. The operation monitor screen shows the abnormal unit by flashing it. The error monitor screen shows the abnormal unit address, error code and source of detection. The error log monitor screen shows the time and date, the abnormal unit address, error code and source of detection.	N/A	*4 Each Unit or Collective
Ventilation Equipment	This interlocked system settings can be performed by the master system controller. When setting the interlocked system, use the ventilation switch the free plan LOSSNAY settings between "Hi", "Low" and "Stop". When setting a group of only free plan LOSSNAY units, you can switch between "Normal ventilation", "Interchange ventilation"	Each Group	Each Group

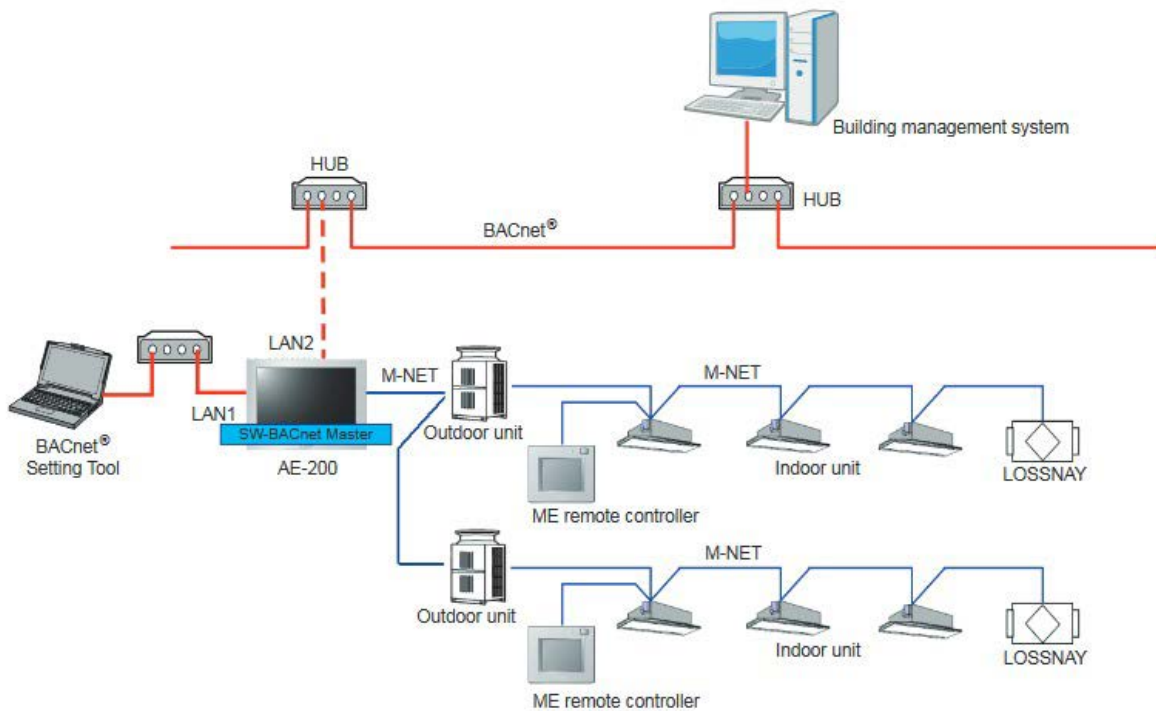
Multiple Language	Other than English, the following language can be chosen. Spanish, French, Japanese, German, Italian, Russian, Chinese, and	N/A	N/A
External Input / Output	By using accessory cables you can set and monitor the following. Input: By level: "Batch start/stop", "Batch emergency stop"; By pulse: "batch start/stop", "Enable/disable remote controller" Output: "start/stop", "error/Normal" *5. Requires the external I/O cables	*5 Collective	*5 Collective
M-Net	The "M-NET" LED lights, when AC power supply is turned ON. The LED blinks while M-NET is communicating.	N/A	Each Group (LED)
Collective ON/OFF	All the units can be operated / stopped with a DIP switch.	Collective	N/A
Measurement	Displays the Temperature and Humidity inputs of the AI Board. Supports graph display and data export.	N/A	Each Unit
AHC Status	Displays the status of the of the inputs and outputs of each Advanced HVAC Controller (DC-A2IO)	N/A	Each Unit
Free Contact Status	Displays the input/output status of the Free Contacts on the indoor units	N/A	Each Unit
Free Contact Interlock Control	Operation of indoor groups, general equipment or free contact outputs based on group(s) conditions or free contact(s) input states.	Each Group, Output or Collective	N/A
Data Back-up (PC)	Initial setting data can be exported to a PC.	Collective	N/A

2. All EW-50 Centralized Controllers shall be equipped with two RJ-45 Ethernet port to support interconnection with a network PC and BACnet/IP communication via a closed/direct Local Area Network (LAN). The EW-50 Centralized Controller shall be capable of performing initial settings online via a PC using the EW-50 Centralized Controller's initial setting browser or online/offline with the Initial Setting Tool.
3. Standard software functions shall be available so that the building manager can securely log into each EW-50 via the PC's web browser to support operation monitoring, scheduling, error email, interlocking and online maintenance diagnostics. Standard software functions shall not expire. Additional optional software functions of personal

browser for PCs and MACs and Energy Allocation shall be available. The Energy Allocation function shall require AE-200 Energy Allocation Integrated System in conjunction with EW-50 Centralized Controllers.

5.9 CMCN REMOTE CONTROLLERS: SYSTEM INTEGRATION

- A. The CMCN shall be capable of supporting integration with Building Management Systems (BMS).
- B. BAC-HD150: BACnet® Interface:
 - 1. The Mitsubishi Electric Cooling & Heating BACnet® interface, BAC-HD150, shall be compliant with BACnet® Protocol (ANSI/ASHRAE 135-2004) and be Certified by the (BTL) BACnet® Testing Laboratories. The BACnet® interface shall support BACnet Broadcast Management (BBMD). The BACnet® interface shall support a maximum of 50 indoor units. Operation and monitoring points include, but are not limited to, on/off, operation mode, fan speed, prohibit remote controller, filter sign reset, alarm state, error code, and error address.
 - 2. Licenses:
 - a. SW-BACnet Master: Master Controller license for AE-200A and EW-50A
 - b. SW-BACnet Expansion: Expansion Controller license for AE-50A and EW-50A
 - 3. SW-BACnet Specifications:
 - a. Control up to 50 groups
 - b. 1 to 16 indoor units can be collectively controlled in a group
 - c. Supports dual set point functionality (connected model dependant)
 - d. BTL Compliant
 - e. BACnet communication specifications are based on ANSI/ASHRAE Standards 135-2010
 - 4. PC Requirements:
 - a. CPU: 1GHz or higher
 - b. Memory: 1GB or more
 - c. HDD Space: 100 MB or more
 - d. Screen Resolution: 1024 x 768 or higher
 - e. OS: Microsoft Windows 7 32-bit/64-bit, Microsoft 8.1 32-bit/64-bit. Not compatible with Windows Vista
 - f. Execution Environment: Microsoft .NET Framework 4.5 or later
 - g. Others: Pointing device such as a mouse, internet connection (required when installing a .NET Framework)
 - 5. SW-BACnet – System Example



6. AE-200/AE-50/EW-50 BACnet Point List

<u>Object List</u>
On Off Setup
On Off State, Number of ON/OFF, Cumulative operation time
Alarm Signal (4-digit error code)
Error Code
Operational Mode Setup
Operational Mode State
Fan Speed Setup
Fan Speed State
Room Temp [Water Temp]
Set Temp [Set Water Temp]
Set Temp Cool

Set Temp Heat
Set Temp Auto
Filter Sign [Circulating Water Exchange Sign]
Filter Sign Reset [Circulating Water Exchange Sign Reset]
Prohibition On Off
Prohibition Mode
Prohibition Filter Sign Reset [Prohibition Circulating Water Exchange Sign Reset]
Prohibition Set Temperature
M-NET Communication State
System Forced Off
Air Direction Setup
Air Direction State
Set High Limit Setback Temp
Set Low Limit Setback Temp
Ventilation Mode Setup
Ventilation Mode State
Air To Water Mode Setup
System Alarm Signal (4-digit error code)
PI Controller Alarm Signal (4-digit error code)
Group Apportioned Electric Energy
Interlocked Units Apportioned Electric Energy
PI controller Electric Energy 1–4
Pulse Input Electric Energy 1–4

Group Apportionment Parameter
Interlocked Units Apportionment Parameter
Night Purge State
Thermo On Off State
Trend Log Room Temp
Trend Log Group Apportioned Electric Energy
Trend Log Interlocked Units Apportioned Electric Energy
Trend Log PI controller Electric Energy 1–4
Trend Log Pulse Input Electric Energy 1–4
Trend Log Group Apportionment Parameter
Trend Log Interlocked Units Apportionment Parameter

END OF SECTION 23 80 20

SECTION 23 80 30 – WALL-MOUNTED A/C UNITS



1.0 QUALIFICATIONS

Manufacturer: Company specializing in manufacture of products specified in this section, with a minimum of 5 years documented experience. Manufacturer shall have available complete catalogue data with expanded ratings, installation and maintenance instructions.

2.0 GENERAL

Furnish and install self-contained, wall mounted air conditioner, suitable for outdoor use. Unit to be manufactured by Bard Manufacturing Company, Inc in accordance with plans. The unit shall be approved and listed by Intertek ETL Listed (ETL US/C). Unit shall be factory assembled, pre-charged, pre-wired, tested and ready to operate. The manufacturer of equipment shall be ISO 9001: 2015 Certified. Unit performance shall be certified by an independent third-party testing agency, in accordance with the Air Conditioning Heating and Refrigeration Institute (AHRI) Standard 390-2003 for Single Package Vertical Units. Unit cooling efficiency shall be specified by EER.

Manufacturers: Capacities shall be as indicated on drawings and shall be manufactured by Bard Manufacturing Company, Inc. or prior approved equal.

2.0 CONSTRUCTION FEATURES

2.1 CABINET

Construction shall be a single, enclosed, weatherproof casing constructed of 20-gauge galvanized. Unit base is constructed of 16-gauge galvanized steel for painted and aluminum cabinets. Each exterior casing panel to be bonderized and finished with baked-on exterior polyester enamel paint prior to assembly. The baked-on cured paint finish shall pass the industry rub test with a minimum of 72 rubs MEK (Methyl Ethyl Ketone) or standard rub test of a minimum of 100 rubs using Toluene. Cooling section shall be fully insulated with a non – fiberglass material with heavy duty foil facing for durability and ease of cleaning. Fiberglass insulation is not acceptable. Openings shall be provided for power connections. Access openings appropriate for outside structure to all fan motors and compressor for making repairs and for removing internal components without removing unit from its permanent installation. Fresh air intake and outdoor coil shall be protected from intrusions by a sturdy metal grating with less than 1/4-inch openings.

Colors
X- Beige (standard)

Painted cabinet construction shall be a minimum of 20 gauge Zinc coated steel, painted units shall have baked on paint, designed and tested to withstand 1000 hours of salt spray test per ASTM B117-03.

2.2 DRAIN PAN

Drain pan shall be constructed of 20-gauge galvanized steel, bonderized and finished with baked-on exterior polyester enamel paint.

2.3 INSULATION

Insulation shall be non-fiberglass material with foil faced for ease of cleaning. Insulation materials used shall not contain fiberglass or formaldehyde. Insulation materials shall meet UL723 standards.

2.3.1 Filters

Filters shall be Minimum Efficiency Reporting Value of MERV8 per ASHRAE standard 52.2. Filters shall be readily available commercial sizes.

2.4 MOUNTING BRACKETS

Full-length side mounting brackets shall be an integral part of the cabinet. Bottom mounting bracket shall be provided.

2.5 REFRIGERATION SYSTEM

All models shall use a high efficiency hermetic scroll compressor. The compressor shall be covered by a 5-year parts warranty. The refrigeration circuit shall be equipped with factory installed high- and low-pressure controls, suction and liquid access valves, compressor control module and liquid line filter dryer. A refrigerant metering device is included. The compressor shall be mounted on rubber grommets. Unit shall be provided with R-454B refrigerant that meets the global objectives outlined in the Montreal Protocol and the Kigali Amendment.

2.6 OUTDOOR SECTION

The condenser coil shall be constructed of aluminum plate fins mechanically bonded to seamless copper tubes. The condenser fan, motor and shroud shall be of slide out configuration for easy access. Condenser fan motor shall be enclosed casing with ball bearings. Open winding motors are not accepted.

2.7 INDOOR SECTION

The evaporator coil shall be constructed of aluminum fins mechanically bonded to seamless copper tubes. Aluminum fins shall have hydrophilic coatings to aid in condensate drainage, inhibit mold growth and protect aluminum fins from oxidation. 5-speed indoor blower motor shall be twin wheels with forward curve blades. 5 speed indoor blower motor shall be twin wheels with forward curve blades. Motor shall be high efficiency ECM with overload protection.

2.8 ELECTRICAL COMPONENTS

Electrical components are easily accessible for routine inspection and maintenance through front service panels. Circuit breaker is standard on all 208/230-volt models and toggle disconnect standard on all 460volt models. Circuit breaker/toggle disconnect access is through lockable access panel.

2.9 CONTROL CIRCUIT

The internal control circuit shall consist of a current limiting 24VAC type transformer with resettable circuit. Auto reset high pressure switch and auto reset low pressure switch shall standard, compressor control module with adjustable voltage protection and adjustable delay on make and break shall be standard. To prevent rapid compressor short cycling, a five-minute time delay circuit shall be factory installed. A low-pressure bypass shall be factory installed to prevent nuisance tripping during low temperature start-up.

Phase rotation protection and phase failure protection shall be standard factory on all equipment with three-phase power. If unit is wired incorrectly phase monitor will lock out compressor operation and red warning light shall energize. Once power wiring is corrected at field power wiring location, a green light will energize on phase monitor. If a phase of power is lost, the phase monitor will also lock out.

3.0 COOLING OPTIONS

3.1 STANDARD COOLING

The air conditioner shall function with standard cooling sensible and latent capacities.

3.2 BALANCED CLIMATE™

The air conditioner shall function with enhanced latent capacity when BALANCED CLIMATE™ cooling mode is enabled. Unit shall include Y1 and Y2 low voltage terminal connections. A 2 stage thermostat shall be capable of operating Balanced Climate. Stage 1 cooling will operate with a preprogrammed and fully tested reduced fan speed. The reduction in fan speed increases latent capacity and reduces sensible capacity for increased runtime and increased latent capacity. If the 2-stage thermostat calls for second stage cooling, the unit

shall shift to high-speed blower and standard operation. Balanced Climate is achieved with a single stage compressor. Expanded rating in balanced climate mode shall be provided at time of submittal, and full factory performance data shall be available upon request.

4.0 HEATING OPTIONS

4.2 Electric Heat

The air conditioner shall have a factory or field installed electric resistance heater available, designed specifically for application in the W**AF Series air conditioner. Heater shall include automatic limit safety controls.

5.0 VENTILATION OPTIONS

W**AF models are designed to provide optional ventilation packages to meet all of your ventilation and indoor air quality requirements. All ventilation packages are factory or field installed, and easily removable for service.

Units shall include an independent ventilation low voltage terminal connection, allowing for an independent 24v signal provided by controls to operate the ventilation package. No additional field installed relays shall be required to provide independent ventilation. Ventilation shall be de-energized during unoccupied hours unless otherwise specified. Only one ventilation package shall be provided and must be specified

5.1 Barometric Fresh Air Damper (X)

STANDARD

Damper provided with multiple pin positions, each pin position shall allow damper to open to that pin, whenever the supply blower is energized. The damper will fall shut when supply fan is de-energized. Damper shall be shipped in closed position. No exhaust path is provided in the unit. If no ventilation package is specified, this option shall be provided.

7.0 UNIT CONTROL OPTIONS

7.1 Low ambient control and relay.

8.0 OPERATING CONTROLS (Field Installed)

8.1 Programmable Thermostat #8403-090 T6 Pro

9.0 INSTALLATION

9.1 Installation shall be done in strict adherence to Bard's Installation Instructions.

11.0 WARRANTY

11.1 The Bard product specified shall be free from defects in materials and workmanship for a period of 5 years for compressor, and for a period of 5 years for all parts. Warranty period shall start from the date of installation registered online by the installing contractor.

If not registered online warranty will start from the date of shipment from factory. Equipment must be used under normal conditions and warranty is subject to Bard Manufacturing's standard limited warranty statement.

SECTION 26 00 01 - ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL



1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions as appropriate, apply to the Work specified in this Section.
- B. Refer to all Electrical Divisions of the Specifications as well as the Specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding electrical work.

1.2 BIDDING REQUIREMENTS AND RESPONSIBILITIES

- A. Prime bidder is responsible for all work, of all trades and sub-contractors bidding this project. It is the prime bidder's responsibility, prior to submitting a bid to ensure that sub-contractors coordinate all aspects of the work between trades, sub-contractors, etc. to the fullest extent possible.
- B. Prime bidder shall ensure that all sub-contractors, suppliers, equipment vendors, etc., obtain all necessary and pertinent contract document information pertaining to their work prior to the submission of a bid. Contractor shall realize that different sub-contractors may furnish equipment, accessories, devices, etc. necessary for a complete and working installation, that require provision of services by another sub-contractor or trade.
- C. Bidders of all or any portions of this section or division are required to review all contract documents including but not limited to Architectural drawings, Structural drawings, Mechanical drawings, Plumbing drawings, Electrical drawings, etc. to coordinate requirements and responsibilities with and through prime bidder.
- D. Bidders of all or any portions of this section or division, by furnishing a bid on a portion of the prime contract are indicating that they have received all contract documents and coordinated services provided under their portion of the work with the prime bidder; they are indicating that they have expressed any pertinent questions (which would result from a detailed, thorough review of the entire set of contract documents) to the prime bidder in accordance with the general provisions of the Specifications requirements, prior to bidding.
- E. All timely, pertinent, questions provided in writing prior to bids, in accordance with the general provisions of the Specifications requirements, will be clarified, defined, or otherwise explained in a written addendum and/or addendums prior to bids, in accordance with the general provisions of the Specifications requirements.
- F. It is not the intention of these contract documents to leave any issue relating to coordination between trades or sub-contractors vaguely defined. The intention is

to define all issues, coordination matters, equipment requirements, sizes, routing, etc. to the satisfaction of the prime bidder, prior to receipt of bids.

- G. Bidders of all or any portions of this section or division, by virtue of the submission of a bid to the prime bidder, are indicating that they have reviewed the entire set of contract documents with due diligence and regard for the Owner's desire for a comprehensive and complete bid proposal; that they have expressed all concerns or questions requiring clarification on matters of coordination between trades and/or sub-contractors; that they have expressed any such concerns or questions in writing in accordance with contract document's General Provisions requirements.
- H. Prime bidders, by submission of a comprehensive bid on the project are indicating that the subcontractors selected in their bid have complied with all contract document's General Provisions requirements, that they have indicated in writing, prior to bidding, all questions or concerns requiring clarification and/or explanation and have documented any and all specific exclusions involving work that would generally be considered to be work of their trade. The prime bidder shall coordinate all work so that anything excluded by the bidder of all or any portions of this section or division, have been addressed prior to bids in one of the following manners:
 - 1. The work has been confirmed, by the prime bidder, to be work of another trade or subcontractor whose proposal is also being accepted.
 - 2. Clarification of the matter has been made through the prime design professional via written addendum and is clearly and mutually understood by the prime bidder and the party raising the issue/question or seeking clarification.
 - 3. The work has been accepted as the responsibility of the prime contractor directly.

1.3 MATERIAL AND EQUIPMENT

- A. The term "provide" when used in the Contract Documents includes all items necessary for the proper execution and completion of the work.
- B. Specific reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgement of the Architect expressed in writing is equivalent to that specified.
- C. Coordinate and properly relate all work of this Division to building structure and work of all other trades.
- D. Visit premises and become thoroughly familiar with existing conditions; verify all dimensions in field. Advise Architect of any discrepancies prior to Bid Date in accordance with contract document's General Provisions.

- E. Do not rough-in for any item or equipment furnished by others or noted "Not in Contract" (NIC), without first receiving rough-in information or determining rough-in requirements from other trades and/or Architect.
- F. Provide storage and protection for all equipment and materials in accordance with requirements of contract document's General Provisions. Replace any equipment and materials damaged by improper handling, storage, or protection, at no additional cost to the Owner.
- G. Keep premises clean in accordance with requirements of contract document's General Provisions.

1.4 SUBSTITUTIONS

- A. Substitutions are allowed under La. R.S. 38:2291 and La R.S. 38:2292. Any requests for prior approval (as provided for under La. R.S. 38:2295) including any re-submitted data, shall be received by the Architect/Engineer a minimum of ten (10) working days prior to bid date. Submittals sent via facsimile and/or electronic mail will not be accepted. The Contractor shall recognize that it may be necessary to submit certain requests for prior approval sooner than the final date listed in the Instructions to Bidders, depending upon the complexity and completeness of the submittal. If, in the opinion of the Architect/Engineer, there is neither sufficient time available nor adequate descriptive data attached to the submittal, the submittal will not be considered. Except as otherwise specified, materials and equipment shall be new and bear the approval label of the Underwriters Laboratories, Inc. for the type of installation required.
- B. Basis of design of systems is based on specific equipment for performance, size, shape, color, construction material, etc... If the use of other manufacturer's equipment, even though approved by Architect, involves additional cost due to space requirements, foundation requirements, increased mechanical or electrical services, the cost of such extra work shall be borne by the contractor. Even though a manufacturer's name appears in the Contract Documents as having acceptable equipment, his equipment shall be classified as being a substitute to the equipment originally designed for and named in the Contract Documents. Substitute equipment, materials, etc., will not be allowed to deviate from basis of design requirements.
- C. All requests for prior approval shall identify where proposed material matches or exceeds the performance of the equipment specified. In addition, such submittal shall also clearly identify all deficiencies compared to specified product. Submittal of general cut sheets will be returned rejected.
- D. The following items shall be submitted for prior approval:
 - 1. Lighting Fixtures and Poles
 - 2. Electrical Gear (Panelboards, Switchboards, Transformers, Safety Switches, Circuit Breakers, Motor Starters, Variable Frequency Drives,

Contactors/Relays). This includes Short-Circuit Study, Coordination Study and Arc-Flash Study.

3. Dimmer Switches
4. Fire Detection and Alarm System
5. Receptacles
6. Toggle Switches
7. Wiring Device Box Support Brackets
8. Photocells
9. Tele/Data Systems
10. Cover Plates
11. Pull Boxes
12. Wire
13. Occupancy/Motion Sensors
14. Dimming Systems/Lighting Control Systems
15. Time Clocks System
16. Generators
17. Transfer Switches
18. Generator Fuel System
19. Floor Boxes
20. Surface Metal Raceway Systems(s).
21. Transient Voltage Surge Suppressors (TVSS)/Surge Protective Devices (SPDs)
22. Lightning Protection System
23. Video Surveillance System
24. Lighting Emergency Battery Packs
25. Lighting System Generator Transfer Devices (GTDs)

1.5 DRAWINGS AND SPECIFICATIONS

- A. The specific intent of these Contract Documents is to provide the various systems, equipment, etc. to the Owner complete and in a thoroughly calibrated and functional condition.
- B. The Drawings shall not be construed as shop drawings. In the event of a possible interference with piping or equipment of another trade, items requiring set grade and elevations shall have precedence over other items. Should any major interference develop, immediately notify the Architect.
- C. In laying out Work, refer to mechanical, electrical, structural, and architectural drawings at all times in order to avoid interference and undue delays in the progress of the Work.

1.6 CODES AND REGULATIONS

- A. Work shall be in full accord with the LA Sanitary Code, 2020 N.E.C. (NFPA 70), local ordinances, building codes, and other applicable national, state, and local regulations.

- B. Equipment shall conform to requirements and recommendations of the National Bureau of Fire Underwriters and National Fire Protection Association (NFPA).
- C. Items provided under this Division shall comply with the American National Standards Institute (ANSI) "Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People," ANSI A 117.1, and the Americans with Disabilities Act (A.D.A.).
- D. Work called for in these Plans and Specifications shall be executed by competent workmen.
- E. In the possible event of conflict between codes or regulations and Contract Documents, notify the Architect/Engineer immediately.
- F. The drawings show approximate locations only of feeders, branch circuits, outlets, etc., except where specific routing or dimensions are indicated. The Architect reserves the right to make reasonable changes in locations indicated, before roughing-in, without additional cost to the Owner.
- G. Because of the small scale of the drawings, it is not possible to indicate all of the offsets, fittings, and accessories required. The Contractor shall investigate the structural and finish conditions affecting his work and shall arrange such work accordingly, fittings, bends, junction boxes, pull boxes, access panels, and accessories required to meet such conditions at no additional costs to the Owner.

1.7 FEES, PERMITS, AND TAXES

- A. Obtain and pay for permits required for the Work of this Division. Pay fees in connection therewith, including necessary inspection fees.
- B. Pay any and all taxes levied for Work of this Division, including municipal and/or state sales tax where applicable.

1.8 MANUFACTURER'S DIRECTIONS

- A. Install and operate equipment and material in strict accord with manufacturer's installation and operating instructions. The manufacturer's instructions shall become part of the Contract Documents and shall supplement Drawings and Specifications.

1.9 SUBMITTAL DATA

- A. Submit shop drawings, project data, and samples in accordance with requirements of the General Provisions of the contract documents. Submittals shall be received no later than thirty (30) consecutive calendar days from effective date of "Notice to Proceed".
- B. Shop drawings shall consist of published ratings or capacity data, detailed construction drawings for fabricated items, wiring and control diagrams,

performance curves, installation instructions, manufacturer's installation drawings, and other pertinent data. Submit drawings showing revisions to equipment layouts due to use of alternate or substitute equipment.

- C. Where manufacturers and suppliers of equipment, materials, etc. are unable to fully comply with Contract Document basis of design requirements, specifically call such deviations to attention of Architect/Engineer on submittals. Typed deviations on a separate sheet; underlined statements or notations on standard brochures, equipment fly sheets, etc. will not be accepted. Submittals shall clearly indicate where material submitted meets and/or exceeds the performance criteria of the equipment used as the basis of design of the project. Failure to note compliance with the basis of design material/equipment shall result in rejection of submittals.
- D. Approval of submittals shall not relieve Contractor from furnishing required quantities and verifying dimensions. In addition, approval shall not waive original intent of Contract Documents.
- E. Failure to obtain written approval of equipment shall be considered sufficient grounds for rejection of said equipment regardless of the stage of completion of the project.
- F. Contractor shall submit Submittals/Shop Drawings on all equipment listed below. In addition, contractor shall refer to subsequent sections of the Electrical portion of the specifications for additional shop drawing submittal requirements.
 - 1. Lighting Fixtures and Poles
 - 2. Electrical Gear (Panelboards, Switchboards, Transformers, Safety Switches, Circuit Breakers, Motor Starters, Variable Frequency Drives, Contactors/Relays). This includes Short-Circuit Study, Coordination Study and Arc-Flash Study.
 - 3. Dimmer Switches
 - 4. Fire Detection and Alarm System
 - 5. Receptacles
 - 6. Toggle Switches
 - 7. Wiring Device Box Support Brackets
 - 8. Photocells
 - 9. Tele/Data Systems
 - 10. Cover Plates
 - 11. Pull Boxes
 - 12. Wire
 - 13. Occupancy/Motion Sensors
 - 14. Dimming Systems/Lighting Control Systems
 - 15. Time Clocks System
 - 16. Generators
 - 17. Transfer Switches
 - 18. Generator Fuel System
 - 19. Floor Boxes
 - 20. Surface Metal Raceway Systems(s).

21. Transient Voltage Surge Suppressors (TVSS)/Surge Protective Devices (SPDs)
 22. Lightning Protection System
 23. Video Surveillance System
 24. Lighting Emergency Battery Packs
 25. Lighting System Generator Transfer Devices (GTDs)
- G. Shop drawings may be submitted electronically as described below.
1. Must be in a portable document format (PDF).
 2. Must be submitted to the prime designer and the prime designer will forward to ADG Engineering for distribution/processing.
 3. Do not submit directly to ADG Engineering's project manager.
- H. Shop Drawings/submittals shall be submitted as grouped together and stated below and shall be submitted simultaneously. Electrical gear shop drawings shall not be submitted until approval is obtained for all HVAC and plumbing equipment. Prior to submission of electrical gear shop drawings, contractor shall obtain a copy of the approved mechanical and plumbing submittals. Any modifications required to be made to the electrical gear due to changes in electrical requirements (increases and/or decreases) of the mechanical and plumbing equipment shall be clearly notated in the electrical gear submittals.
1. Light Fixtures, Occupancy/Motion Sensors, Poles, Photocells, Dimming Systems/Lighting Control systems, Generator Transfer Devices (GTDs), Emergency Battery Packs
 2. Electrical Gear, Overcurrent Protective Device Studies
 3. Tele/Data Systems
 4. Fire Detection and Alarm System
 5. Dimmer Switches, Receptacles, Toggle Switches, Cover Plates, Device Box Support Brackets, Pull Boxes, Floor Boxes, Surface Metal Raceway System(s), and Wire
 6. Generator(s), Transfer Switches, Generator Fuel Systems
 7. Transient Voltage Surge Suppressors (TVSS)/Surge Protective Devices (SPDs)
 8. Lightning Protection System

1.10 PROJECT COORDINATION

- A. Refer to applicable Electrical Specification Sections for products work of this Division.
- B. Refer to all plumbing, mechanical and fire protections specifications sections for related products affecting work of these electrical sections.
- C. Coordinate handling of all products, materials, etc., through the Contractor. Coordinate space, access, clearances, etc., through the Contractor prior to preparation of shop drawing submittal.

- D. The Contractor is herein cautioned to note that the work involved is a complicated new addition project requiring continuous owner occupancy. The Contractor should review the phasing plans/descriptions and visit the project site to determine existing conditions. The Contractor will be held responsible for allowing for these conditions in his bid.

1.11 SERVICE CONTINUITY

- A. At all times during the construction of the project, electric service shall be maintained to all portions of the site and existing facility, except with prior written approval from the Architect/Engineer of interruptions. It shall be the responsibility of the contractor to provide, install and maintain (fuel included) any required rental generators to accomplish said task. Any required interruptions of electric service due to work being performed under this Contract shall be scheduled in writing a minimum of forty-eight (48) hours in advance after consultation with the Architect/Engineer and the Owner and shall occur when permitted by the Architect/Engineer. The Contractor shall be responsible for any overtime pay required to meet these requirements, at no additional cost to the Owner.

1.12 VALUE ENGINEERING (V/E):

- A. While it may be in the Owner's interest to consider the first cost money saving that may be generated via alternatives and options generated via participation in Value Engineering, contractor shall realize that substantive offers of Value Engineering (V/E), if accepted by the Owner, constitute a design-build agreement (offer and acceptance) with the owner, and drastically change the design concept of the project, as developed by the Professional of Record identified on the Contract Documents.
- B. Should contractor offer, and the owner accept value engineering options that alter aspects of the system design, equipment, performance and/or performance verification or monitoring of respective systems, the contractor shall provide duly licensed professional engineering consultants working on behalf of the contractor (including sub-contractors and equipment vendors/manufacturers) to review, approve and take professional responsibility for performance and suitability of V/E hybrid systems, materials or operational changes related to respective V/E items. The contractor's licensed professional engineering consultants and the contractor assume any and all responsibility for the design and suitability in terms of performance, of hybrid systems installed, as contractor's Professional of Record, absolving the original project Professional of Record (identified on the original Contract Documents, released for the original project Bid/Negotiation) from responsibility for the V/E hybrid systems portion of the work.
- C. The contractor, via the offer and acceptance of value engineering items on the project agrees to provide professional engineering design services and take full and complete responsibility for the hybrid design. Further, the contractor's (V/E Items) professional of record (either employees, or independent consultants to the contractor) through the offer and acceptance of V/E items, agree to indemnify and hold harmless the project owner, the owner's original A/E team (Professional of

Record on behalf of the owner for the original Contract Documents) their heirs and assigns in regard to the V/E changes and their impact on the systems altered, affected or modified, in whole or in part. The Professional of Record shown on the original Contract Documents in regard to the systems altered, adjusted, revised, modified or otherwise affected by the value engineering items implemented, shall be absolved of design responsibility as a result of implementation of V/E items, and their original use of Engineering Seals used for original Contract Documents, shall not apply.

- D. Contractor shall refer to subsequent specification sections for additional requirements for submission and approval of VE items.

1.13 PROJECT RECORD DOCUMENTS

- A. Keep Project Record Documents in accordance with general provision requirements of the specifications.
- B. During construction period, keep accurate records of installations paying particular attention to major interior and exterior underground and concealed piping, ductwork, etc.
- C. The Contractor shall obtain a minimum of one (1) set of the contract documents including all addenda and change orders (including CAD files) as prepared by the Architect/Engineer.
- D. If the Contractor elects to vary from the Contract Documents and secures prior approval from the Architect/Engineer for any phase of the work, he shall record in a neat and readable manner all such variances on the contract documents in red ink. Prior to requesting substantial completion, the marked-up set of contract documents shall be returned to the Architect/Engineer for approval.
- E. All deviations from sizes, locations and from all other features of the installation shown in the Contract Documents shall be recorded.
- F. In addition, it shall be possible using these drawings to correctly and easily locate, identify and establish sizes of all piping, directions, and the like, as well as other features of work which will be concealed underground and/or in the finished building.
- G. Locations of underground work shall be established by dimensions to columns, lines or walls, locating all turns, etc. and by properly referenced centerline or invert elevations and rates of fall.
- H. For work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases, this may be by dimension. In others, it may be sufficient to illustrate the work on the drawings in relation to the spaces in the building near which it was actually installed. The decision of the Architect/Engineer in this matter will be final.

- I. The following requirements apply to all Record Drawings:
1. They shall be maintained at the Contractor's expense.
 2. All such drawings shall be done carefully and neatly.
 3. Additional drawings shall be obtained at the Contractor's expense.
 4. They shall be kept up-to-date during the entire course of the work and shall be available upon request for examination by the Architect/ Engineer and when necessary, by other trades, to establish clearances for other parts of the work.
 5. Record Drawings shall be returned to the Architect/Engineer upon completion of the work and are subject to approval of the Architect/ Engineer.
 6. CAD files can be provided upon request (proper release forms must be completed). Contractor shall update CAD files to reflect As-Built conditions and shall submit revised file back to Architect/Engineer as part of the close-out documents.

1.14 OPERATION AND MAINTENANCE DATA

- A. Refer to the specification Sections related to PROJECT CLOSEOUT or OPERATION AND MAINTENANCE DATA for procedures and requirements for preparation and submittal of maintenance manuals.
- B. Provide the Owner with three (3) copies of printed instructions indicating various pieces of equipment by name and model number, complete with parts lists, maintenance and repair instructions and test and balance report.
- C. COPIES OF SHOP DRAWINGS WILL NOT BE ACCEPTABLE AS OPERATION AND MAINTENANCE INSTRUCTIONS.
- D. This information shall be bound in plastic hardbound notebooks with the job name, Architect and Engineer names permanently embossed on the cover. Rigid board dividers with labeled tabs shall be provided for different pieces of equipment. Submit manuals to the Architect for approval.
- E. In addition to the operation and maintenance brochure, the Contractor shall provide a separate brochure which shall include registered warranty certificates on all equipment, especially any pieces of equipment which carry warranties exceeding one (1) year.
- F. As part of the O & M binders, contractor shall include copies of all studies and test reports performed as part of this project, including but not limited to, the following:
 1. Acceptance Testing Reports
 - a. Grounding Tests
 - b. Thermographic Tests
 - c. Equipment Tests
 - d. Torque Values
 - e. Rotation Tests

2. Fire Alarm System 100% Test Report
 3. Generator Start-up Tests
 4. Short Circuit Study Report – Updated to Reflect Installed Conditions
 5. Coordination Study Report – Updated to Reflect Installed Conditions
 6. Arc Flash Study Report – Updated to Reflect Installed Conditions
 7. Lightning Protection System Certifications
 8. Tele/Data system testing report(s)
 9. All specified photos of installations including open trenches, grounding terminations, pole foundation rough-ins, etc...
- G. The operation and maintenance brochure shall be furnished with a detailed list of all equipment furnished to the project, including the serial number and all pertinent nameplate data such as voltage, amperage draw, recommended fuse size, rpm, etc. The Contractor shall include this data on each piece of equipment furnished under this contract including but not limited to those items listed below.
1. Lighting Fixtures and Poles
 2. Electrical Gear (Panelboards, Switchboards, Transformers, Safety Switches, Circuit Breakers, Motor Starters, Variable Frequency Drives, Contactors/Relays). This includes Short-Circuit Study, Coordination Study and Arc-Flash Study.
 3. Dimmer Switches
 4. Fire Detection and Alarm System
 5. Receptacles
 6. Toggle Switches
 7. Wiring Device Box Support Brackets
 8. Photocells
 9. Tele/Data Systems
 10. Cover Plates
 11. Pull Boxes
 12. Wire
 13. Occupancy/Motion Sensors
 14. Dimming Systems/Lighting Control Systems
 15. Time Clocks System
 16. Generators
 17. Transfer Switches
 18. Generator Fuel System
 19. Floor Boxes
 20. Surface Metal Raceway Systems(s).
 21. Transient Voltage Surge Suppressors (TVSS)/Surge Protective Devices (SPDs)
 22. Lightning Protection System
 23. Video Surveillance System
 24. Lighting Emergency Battery Packs
 25. Lighting System Generator Transfer Devices (GTDs)

1.15 EXCAVATING AND BACKFILLING

- A. Provide excavating and backfilling necessary for Work of this Division. Comply with provisions of specification section pertaining to Site Work, if applicable.
- B. Trenches shall be inspected by Code Authorities and/or Owner's Representative before and after piping is laid. Give Owner's Representative 24-hour notice for each inspection. If any trenches are filled without Owner's Representative and/or authority having jurisdiction inspection and as subsequently found to be deficient, the trenches shall be uncovered, inspected, and then re-filled, if requested by Owner's Representative. Prior to covering any and all underground facilities, including but not limited to conduit, ground rods, terminations, etc., Contractor shall take clear and concise digital photos and shall forward said photos to Engineer prior to covering said utilities.
- C. Provide minimum 24 inches of cover to finish grades or paving at raceways.
- D. Protect and maintain trenches in dry condition until piping has been inspected and approved. Immediately after approval, backfill trenches in tamped layers. Repeat backfill and tamping 6 months after initial coverage has been accomplished to avoid swale development from sinking soils.
- E. Compact fill to satisfaction of Architect and/or Owner's Representative.
- F. Prior to any excavating, Contractor shall be responsible for having all utilities in the area of excavation located and marked by an approved company with a minimum of five (5) years' experience locating underground facilities. This includes all owner owned utilities on their site.
- G. Approximate locations shown on the drawings shall not be used. Any facility damaged by the Contractor's underground work shall be repaired and/or replaced at no additional cost to the Owner

1.16 CUTTING AND PATCHING

- A. Comply with requirements of the Specifications regarding cutting and patching. Locate and timely install sleeves as required to minimize cutting and patching.
- B. Cutting, fitting, repairing, patching, and finishing of Work shall be done by craftsmen skilled in their respective trades. Where cutting is required, cut in such a manner as not to weaken structure, partitions, or floors. Holes required to be cut must be cut or drilled without breaking out around the holes. Where patching is necessary in finished areas of the building, the Architect will determine the extent of such patching and refinishing.
- C. Repairing Roadways and Walks: Where this contractor cuts or breaks roadways or walks to lay the piping, he shall repair or replace these sections to match existing, unless specifically identified as the responsibility of others.

1.17 PAINTING

- A. Painting shall be provided under the Specification section regarding painting, unless specified otherwise. Leave exposed piping, materials, and equipment clean and free of rust, grease, dirt, etc. before and after painting.
- B. Factory finished equipment, fixtures, and materials which are marred, chipped, scratched, or otherwise unacceptable shall be repaired or replaced under this Division to Architect satisfaction, at no additional cost to Owner.
- C. Coordinate all painting requirements with prime bidder prior to bids.
- D. All exposed conduit, materials, hangers, anchors, etc., are to be primed and painted. Color shall match adjacent surfaces where not specifically designated otherwise. All galvanized materials shall be suitably treated prior to painting to ensure adhesion.
- E. All exterior electrical gear (panels, meter cans, CT can, switchboards, safety switches, etc.) shall be painted to match adjacent wall surface(s). All interior panels (flush mount) shall have their covers painted to match adjacent wall surface(s).
- F. All exterior receptacles, junction boxes, speakers, trumpets, shall be painted to match adjacent wall surface(s).

1.18 EXISTING CONDITIONS

- A. The Electrical Contractor shall visit the building site to determine existing conditions and will be held responsible for allowing for these conditions in his bid.
- B. Note that this area of work will have storm drainage, mechanical and electrical utilities located underground and within and under the buildings. It is part of this work for the Contractor to determine the scope and location of all utilities to be installed with this project and arrange his work around others. There will be no extra consideration for work discovered as being hidden after the bid, and no change orders for extra cost that may be caused by unknown after bid conditions. The drawings show approximate locations only of feeders, branch circuits, outlets, etc., except where specific routing or dimensions are indicated. The Architect reserves the right to make reasonable changes in locations indicated, before roughing-in, without additional cost to the Owner.

1.19 PROTECTION OF APPARATUS

- A. The Contractor shall take precautions necessary at all times to properly protect his apparatus from damage. Failure on the part of the Contractor to comply with the above to the Architect's satisfaction shall be sufficient cause for the rejection of the particular piece of apparatus in question.

1.20 MINOR DEVIATIONS

- A. The Contractor shall realize that the drawings cannot delve into every step, sequence, or operation necessary for the completion of the project without drawing on the Contractor's experience. Only typical details are shown on the plans. In cases where the Contractor is not certain about the method of installation of his work, he shall ask for details. Lack of details will not be an excuse for improper installation.

1.21 SALVAGED MATERIALS

- A. The Owner shall have priority for the selection of salvaged material and equipment. Any equipment, light fixtures, devices, ballasts, materials, etc. selected to remain property of the Owner shall be removed and delivered to a location on the site as designated by the Owner. Material and equipment not retained by the Owner shall become the property of this Contractor and shall be removed from the site by him.
- B. The Contractor shall obtain written approval of all material and equipment determined not to be salvaged by the Owner.

1.22 SAFETY PRECAUTIONS

- A. Work methods and project safety are the Contractor's sole responsibility.
- B. Contractor shall furnish and place proper guards for prevention of accidents. He should provide and maintain any other necessary construction required to secure safety of life or property, including maintenance of sufficient lights during all day and night hours as required to secure such protection.
- C. Temporary electrical services during construction should be maintained in perfect condition. Frayed, loose or opened connections should not be used for temporary services. The Contractor should use only equipment in first class working condition for construction services.

1.23 TEMPORARY CONSTRUCTION LIGHTING

- A. The Contractor should provide and install construction lighting as required by General Contractor and other trades. The installation shall conform to requirements of the National Electrical Code.

1.24 SUPERVISION

- A. Contractor shall personally, or through an authorized and competent representative, constantly supervise the work done from beginning to completion and final acceptance. To the best of his ability, he shall keep the same foreman and workmen throughout the project duration. Foreman shall be present at project site at all times while work under this section of the contract documents is being performed. Foreman shall be accessible by cellular phone at all times. Respective

telephone numbers shall be forwarded to Architect/Engineer prior to commencement of work on this project.

1.25 CAD FILES

- A. ADG will provide, upon request, CAD files to the contractors for use in preparing submittals and record drawings. Plans will be provided at a cost of \$10.00 per drawings sheet requested. By submitting request for CAD files, contractors automatically consent to the verbiage contained in the CAD release form contained in the plans. This includes any all limitations, restrictions, indemnifications, etc... contained therein.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Panelboards, safety switches, equipment cabinets, motor starters and other equipment shown on the drawings and furnished and/or installed under this section of the Specifications shall be labeled with laminated plastic nameplates inscribed to identify equipment with description shown on the drawings for panels, the name of the equipment controlled for motor starters, or the system or function involved for other equipment. Provide typewritten panelboard directories indicating the equipment served and its location using final approved room numbers, etc., as directed by the Architect. Refer to specification section – Electrical Distribution System and details(s) for additional requirements.

PART 3 - EXECUTION

3.1 COORDINATION OF TRADES

- A. Where work is in close proximity to the work of other contractors, the Contractor shall review plans of other contractors and coordinate his work with theirs. The Electrical Contractor shall verify the location of lighting fixtures, beams, structural members, conduit, ductwork, pipes or other obstructions before beginning his work in the area. Notify the Architect where proper clearances do not occur or where the work of others would interfere with the safe and/or proper operation of this work.

3.2 HARMONIC DISTORTION

- A. IEEE 519-1992 - Harmonic Control in Electrical Power Systems shall be a requirement of this project. Harmonic filters (passive or active), phase multiplication devices, or any other components required to mitigate harmonic voltage THD to 5% and current THD to 8% maximum levels shall be an integral part of the VFD system. Compliance measurement shall be based on THD added (during VFD full load operation compared to across-the-line operation) at the VFD circuit breaker terminals or actual THD measurement at the VFD circuit breaker terminals during full load VFD operation. Designs which employ shunt tuned filters must be designed to prevent the importation of outside harmonics which could

cause system resonance or filter failure. Calculations supporting the design, including a system harmonic flow analysis, must be provided as part of the submittal process for shunt tuned filters. Any filter designs which cause voltage rise at the VFD terminals must include documentation in compliance with the total system voltage variation of plus or minus 10%. Documentation of Power Quality compliance shall be part of the commissioning required by the VFD supplier. Actual job site measurement testing shall be conducted at full load and documented in the operation and maintenance manuals. Harmonic measuring equipment utilized for certification shall carry a current NiTS calibration certificate. The final test report shall be reviewed, and compliance certification stamped by a licensed professional engineer (PE).

3.3 SUPPORTS AND FOUNDATIONS

- A. Support all items covered by this Specification directly from building structural members independent of any ceilings or any other installed item. Panelboards and switches may be attached to suitably reinforced walls. Ground or slab mounted equipment shall be mounted on a separate four-inch-high concrete slab. Extending 6" beyond equipment footprint on all sides.
- B. Do not attach items of this Specification to HVAC ductwork, ceiling grids and ceiling support members, piping or other equipment unless specifically shown otherwise. Where applicable, all equipment including conduit shall be supported from overhead wall, floor or roof structures using galvanized channel or angle members for a rigid support. Position supports and equipment such that access through lay-in ceilings or panels is not impaired and all Code required clearances are maintained.
- C. Where applicable, under no circumstances is the Contractor to attach to or support from any bar joist bridging. Any supports to the bar joists or any structural systems shall be approved by the Architect. All supplemental angle or channel iron required to support equipment of this Specification shall be furnished by the Electrical Contractor.

3.4 EQUIPMENT LAYOUT

- A. The physical location and arrangements of electrical equipment is shown on the Plans and is to be used by the Contractor as a guideline in construction. It is the responsibility of the Contractor to review the Plans with the proposed equipment and equipment of other contractors that are affected, and to ensure that all Code required clearances, wiring distances and maintenance accesses, including equipment heights, of all items are maintained. Alternate arrangements to accomplish the above due to field conditions or changes in physical size of the equipment proposed for the project are to be submitted to the Architect for review before any work is begun or equipment ordered.
- B. All electrical gear arrangements shall be presented in a 1/4-inch scaled drawing showing all equipment, including those of other contractors. This includes all electrical rooms, mechanical rooms, mechanical yards, electrical yards, service

platforms, boiler rooms, etc... Include shop drawing cut sheets and applicable information. Indicate on the drawing by dimension all required Code clearances, wiring distances and maintenance access requirements. Where equipment heights are required to be coordinated with architectural or other items, indicate revised heights. Refer to "MOUNTING HEIGHTS."

3.5 GUARANTEE

- A. The Contractor shall guarantee all materials, equipment and workmanship for a period of one (1) year from the date of final acceptance of the project. This guarantee shall include furnishing of all labor and material necessary to make any repairs, adjustments or replacement of any equipment, parts, etc. necessary to restore the project to first class condition. This guarantee shall include the replacement of lamps. Warranties exceeding one (1) year are hereinafter specified with individual pieces of equipment.
- B. If the Contractor's office is in excess of a fifty (50) mile radius of the project, he shall appoint a local qualified contractor to perform any emergency repairs or adjustments required during the guarantee period. The name of the contractor appointed to provide emergency services shall be submitted to the Architect/Engineer for approval.

3.6 CLEANING

- A. Refer to the Specification Section relating to PROJECT CLOSEOUT or FINAL CLEANING for general requirements for final cleaning.
- B. Clean all light fixtures, and lenses prior to final acceptance and replace inoperable drivers or LED modules.

END OF SECTION 26 00 01



SECTION 26 05 00 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions; as appropriate, apply to the work specified in this section.
- B. Refer to all portions of the Contract Documents as well as the plans and specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding electrical work.

PART 2 - PRODUCTS

2.1 WIRE (600 VOLT AND BELOW)

- A. All conductors used in the work shall be soft drawn annealed copper having a composition of not less than 98% of pure copper. Conductors shall be standard code gauge in size, insulated, and shall have insulation rated for use at 600 volts. The contractor's bid shall reflect the use of all copper conductors unless specifically indicated otherwise. When aluminum conductors are used as part of the V.E. process, their use shall be limited to circuits, feeders and services rated 150 Amperes and larger and shall be of the high alloy, compact stranded type, Southwire SIM pull THHN, SIM pull THWN or equivalent. It shall be the contractor's responsibility for properly upsizing the conductors and associated conduit to achieve the equivalent ampere rating of the circuit/feeder/service as specified for copper conductors. As part of this VE item, Contractor shall provide an updated riser diagram (one-line diagram) indicating proposed conductor changes.
- B. Unless otherwise noted or specified, insulation shall be Type THWN. Wires shall be of the single conductor type and shall be stranded. Wire insulation shall not contain any asbestos materials.
- C. Wire #8 AWG and smaller may be type MC-cable where allowed by applicable codes and ordinances.
- D. Throughout the system, conductors shall be identified as to phase and voltage of system by color-coding. Color-coding shall be continuous the full length of wire for all wire sizes. Identification by permanent paint bands or tags at outlets will not be acceptable. Surface printing at regular intervals on all conductors shall indicate manufacturer, size, voltage, and insulation type. White and/or gray colored insulation shall be used for grounded conductors and only for grounded conductors.
- E. The color code assigned to each phase wire shall be consistently followed throughout the project. The following systems of color-coding shall be strictly adhered to:

1. 208/120 Volt, 3-Phase, 4-wire Wye Systems
 - a. Grounding leads = green
 - b. Grounded neutral leads = white
 - c. Ungrounded phase wires = black, red and blue
 2. 277/480 Volt, 3-Phase, 4-wire Wye Systems
 - a. Grounding leads = green
 - b. Grounded neutral leads = gray
 - c. Ungrounded phase wires = brown, orange, yellow
- F. Where multiple neutral conductors are installed in a common raceway, the neutral conductor for each circuit shall be separately identified in accordance with the National Electric Code (NEC).

2.2 CONDUIT

- A. Unless otherwise specified or shown on the drawings, all conduit shall be rigid galvanized steel (RGS), electrical metallic tubing (EMT), or rigid nonmetallic conduit (PVC) as allowed in the paragraphs below.
- B. RGS may be used for conduit shown run underground (red concrete encasement required), may be used in concrete slabs, and shall be used for conduit run exposed to the weather (locations defined as damp locations and wet locations in Article 100 of the NEC) and shall be run in hazardous areas.
- C. EMT shall be used for conduit not encased in concrete, not exposed to the weather, not run underground, and not run in hazardous areas.
- D. PVC may be used for conduit run in concrete slabs or may be run underground (underground only where permitted by NEC and local ordinances). Concrete encasement will not be required on underground runs unless specifically noted or specified elsewhere. PVC shall not be run exposed nor concealed in walls nor above ceilings nor in hazardous areas. When rigid nonmetallic conduit (PVC) is installed underground, it shall be Schedule 80 at all underground road crossings, at all underground driveway crossings, and when required by the NEC or local ordinance or specified otherwise. PVC Schedule 40 may be used at all other underground locations. The only use of exposed above ground PVC conduit shall be for telephone service entrance use up utility poles (Schedule 80 required), for CATV service entrance use up utility pole (Schedule 80 required) or for power utility service entrance use up utility pole (Schedule 80 required).
- E. Where PVC is utilized for underground installations, RGS 90° elbows and conduit shall be utilized to turn conduit vertical and to rise up to above grade/slab. Red concrete encasement shall be required for all elbows and vertical conduits. Refer to detail on plans.
- F. All conduit shall be new and shall bear the inspection label of the Underwriters Laboratories, Inc. (U.L.).

- G. Where multiple conduits are installed underground in the same trench, carlon snap-n-stac spacers, or approved equivalent, shall be utilized and spaced a maximum of 5'-0" apart. Provide pre-cast, 4" thick, concrete bases at each spacer and where conduits are turned to be installed in a vertical orientation. Provide spacers immediately before and after all elbows and where conduit transitions from underground to above ground.
- H. Fittings for rigid steel conduit and EMT shall be hot-dipped galvanized and shall be of an approved type specially designed and manufactured for their purpose.
- I. All flexible conduit, where installed indoors and outdoors, shall be of the flexible liquid tight metallic type. Flexible weatherproof electrical conduit is prohibited from use on this project.
- J. Metallic conduit shall be metallized, sheradized, or hot-dipped galvanized.
- K. Where conduit is installed exposed in finished spaces and on the exterior of the building (excluding mechanical, equipment and electrical rooms), conduit shall be painted to match adjacent surfaces (color as selected by the Architect/Engineer). All other conduit installations shall be complete with factory applied paint finish as manufactured by Allied Tube and Conduit (True Color EMT) or Wheatland Tube Company (Color Check Conduit). All fittings, couplings, boxes, covers, etc. shall match color of conduit. Color of conduit shall comply with color code noted below.

Power and Lighting - Non-Emergency	Standard Conduit Finish
Power and Lighting - Emergency to	Yellow with Black Lettering - Lettering to Denote branch of emergency power system (Critical, Life Safety or Equipment)
Fire Alarm	Red
Tele/Data/CATV	Green
Security/CCTV	Purple

2.3 METAL-CLAD CABLE (600 VOLTS AND BELOW)

- A. Where permitted by NEC and local codes and ordinances, metal-clad (MC) cables may be used in lieu of conduit and wiring specified elsewhere herein.
- B. Installation of MC cables shall be in compliance with the National Electric Code (NEC).
- C. Conductors shall be softdrawn annealed copper having a composition of not less than 98% of pure copper.

- D. Conductors shall be solid -type, standard Code gauge in size, insulated, and shall be rated for use at 600 volts or below. Minimum size shall be No. 12.
- E. Conductor insulation shall be of a type listed in the NEC and be rated for 75 deg. C (167 deg. F) as a minimum and shall be of a type approved for use in MC cable.

2.4 EXPANSION FITTINGS

- A. Each conduit that is buried in or rigidly secured to the building construction on opposite sides of a building expansion joint and each long run of exposed conduit that may be subject to excessive stresses shall be provided with an expansion fitting. Expansion fittings shall be made of hot-dipped galvanized malleable iron and shall have a factory-installed packing, which will prevent the entrance of water, a pressure ring, and a grounding ring.
- B. In addition to the grounding ring, a separate grounding conductor shall be provided. This grounding conductor shall be an external flexible copper ground securely bonded by approved grounding straps on each end of the fitting. Grounding conductor may be omitted when expansion fitting includes an approved integral grounding conductor or device.
- C. Where conduits are buried in concrete, they shall cross the building expansion joints at right angles. Ends of conduit shall be provided with insulated bushings.

2.5 OUTLET BOXES

- A. Outlet boxes in concealed conduit systems shall be flush mounted. Boxes shall be galvanized steel of sufficient size to accommodate devices shown and shall have raised covers. Requirements of the NEC shall be minimum.
- B. Boxes for lighting fixtures shall be four-inch (4") octagon, not less than 1-1/2" deep. Where boxes are installed in concrete, boxes designed for this application shall be used.
- C. Outlet boxes for switches and receptacles in concealed work shall be 4" square, and not less than 1-1/2" deep. Flush mounted outlet boxes shall be installed with plaster rings.
- D. Outlet boxes for switches and receptacles installed in exposed conduit system shall be cast iron or cast aluminum Type FD or approved equivalent.
- E. Where multiple outlet boxes are shown to be installed at the same location, they shall be installed using B-Line Series BB8 mounting bracket or approved equivalent. Where single boxes are shown to be installed, the B-Line Series BB2 mounting bracket or approved equivalent shall be used.
- F. Outlet boxes for adjacent rooms shall not be installed in the same stud space to minimize sound transmission.

- G. Outlet boxes used for lighting toggle switches shall have outlet box stabilizer(s) installed.
- H. Outlet boxes installed in rated walls shall receive appropriately rated putty pads as manufactured by 3M or STI.

2.6 PULL BOXES

- A. Furnish and install pull boxes. Boxes shall be code gauge galvanized steel with screw attached access panels unless noted otherwise in top, side or bottom as required.

2.7 OUTLET COVER PLATES

- A. Unless otherwise noted, all outlets including telephone outlets, television outlets, computer outlets, etc. shall be fitted with cover plates of the type indicated below.
- B. Cover plates shall be uniform in design and finish for switches, receptacles, and other outlets requiring cover plates. Plates shall be one (1) piece of the required number of gangs. Sectional plates shall not be used.
- C. Cover plates shall be smooth nylon with gray, white, black, brown or ivory finish. Color shall be selected by the Architect/Engineer to suit the wall finish.
- D. Provide blank coverplates for all un-used/empty device boxes including, but not limited to tele/data, CATV, access controls, etc....boxes.

2.8 WIRING DEVICES

- A. Wiring devices shall be as listed in the following table, except that color of device shall match color of outlet cover plate. The "*" in the model numbers indicate color selection to be made.
 1. Leviton / Hubbell (or equivalent by Pass and Seymour)
Single Pole-20A (5621-2* / DS120*)
Rocker or Paddle Switch
 2. Three Way-20A (5623-2* / DS320*)
Rocker or Paddle Switch
 3. Four Way-20A (5624-2* / DS420*)
Rocker or Paddle Switch
 4. 20A 125V 2P 3W Duplex (16342-* / DR20*)
Decora Style
Grounded Receptacle
 5. 20A 125V 2P 3W Duplex (G5362-00* / GFRST20SNAP*)
GFCI Receptacles (Indoor)

6. 20A 125V 2P 3W Duplex (G5362-WT*/ GFTWRST20*)
GFCI Receptacles (Outdoor)
7. 20A 250V 2P 3W (5461*/ HBL5461*)
Grounded Receptacle
8. 30A 250V 2P 3W (5372 / HBL9630FR)
Grounded Receptacle
9. 50A 250V 2P 3W (5374 / HBL9650FR)
Grounded Receptacle

2.9 WEATHERPROOF RECEPTACLES

- A. Weatherproof receptacles shall be duplex receptacles of the ground fault current interrupting type as specified under WIRING DEVICES, mounted in a cast iron or cast aluminum Type FD (or approved equivalent) conduit fitting with Leviton No. 5997-DGY, (or approved equivalent) clear, extra deep GFCI Style weather resistant cover. Weatherproof receptacles shall be flush mounted in exterior walls whenever possible.

2.10 PHOTOELECTRIC CONTROLS

- A. Unless otherwise noted on the drawings, photoelectric controls shall be electronic-stem/swivel with sensor on side: Intermatic EK4236S or equivalent by Voltage and power requirements of circuits controlled per drawings.

2.11 DIMMER SWITCHES

- A. Dimmer switches shall be Legrand Radiant series, Acuity Brands nLight nPODMA series, Acuity Brands sPODMA series or approved equivalent. Ratings shall be of appropriate wattage for the circuits to be controlled. Provide and install all required 0-10V. control interface units for all LED lighting circuits. Dimmer loading shall not exceed 80% of the dimmer rating. Dimmers shall be UL listed.

2.12 FLOOR OUTLETS/FLOOR BOXES

- A. Floor outlets shall consist of the assembly of wiring devices, floor boxes and fittings. Floor boxes shall be 16 gauge galvanized sheet metal complete with fusion-banded epoxy paint. Boxes shall be fully adjustable before concrete pour.
- B. Contractor shall adjust box such that coverplate is flush against floor surface. When multiple floor outlets are shown directly adjacent to each other, multiple gang type boxes with separating partitions between each gang shall be utilized. Provide separate conduit for each function.
- C. Floor boxes shall be round with threads for conduits or hubs as required and be of suitable height for concrete slab use. Box shall be capable of accepting duplex receptacles and/or other wiring devices or usage as indicated.

- D. Each floor box shall be Legrand Resource RFBA Series Round Activation floor boxes, (or equivalent) with round covers. Quantity of gangs/size of box shall be individually determined by each location's requirements. Provide equivalent fire-rated poke-thrus as required by floor assemblies.
- E. Where box is to be installed in an existing concrete slab above the ground level, caution must be taken to ensure that the structural integrity of the slab is not impaired by the box installation. Coordinate with the Architect. Use a core drill, poke through device, fire rated to at least the rating of the floor system, as per National Electrical Code (NEC). Depth of unit shall be as required. Hole by the Electrical Contractor. Color by Architect during shop drawing submittal. Color choices shall include satin brass, nickel, grey powder coated, brass, bronze, brushed aluminum, black power-coated, brass-plated, bronze-plated and/or satin nickel-plated.
- F. As a minimum, provide and install two (2) 120V duplex convenience receptacles, four (4) RJ-45 data outlets in each floor box, four (4) USB charging ports and two (2) HDMI ports.

PART 3 - EXECUTION

3.1 MOUNTING HEIGHTS

- A. Unless otherwise noted on the drawings or required by the Architect/Engineer, the mounting heights set forth below shall apply. Dimensions given are from finished floor to the top of the device unless noted otherwise noted.

1.	Toggle Switches	4'-0" to top of device
2.	Receptacles	1'-6" to bottom of receptacle
3.	Panelboards	6'-7" to top of can
4.	Tele/Data Outlets	1'-6" to bottom of outlet
5.	Motor Control Equipment	5'-0"
6.	Fire Alarm Audio/Visual and	6" from ceiling on wall and in between 80" and 96"*
7.	Fire Alarm Hand Stations	4'-0" to top of device
8.	Fire Alarm Visual Only	6" from ceiling on wall *
9.	Electric Water Cooler	Concealed behind unit **

* Mounting height shall be 6" from ceiling or maximum 80" above finished floor, whichever is lowest.

** Contractor shall be responsible for coordinating exact location in field with the plumbing contractor.

- B. Where overcurrent or safety switch devices are shown to serve exterior equipment, the Contractor shall review in detail with the Architect/Engineer proposed exterior mounting locations, mounting heights, conduit routing, etc., and receive approval prior to rough-in.

- C. Where overcurrent or safety switch devices are shown to serve condensing units, the top of the overcurrent device shall be 3'- 0" AFG or level with the top of the condensing unit(s) whichever is lower. Refer to detail on plans for additional requirements.

3.2 WIRE (600 VOLT AND BELOW)

- A. Service entrance, feeders, and motor circuit conductors shall be run their entire length without joints or splices. Splices and joints in branch circuit wiring shall be only at outlets or in accessible junction boxes.
- B. Joints and splices in branch circuit wiring shall be made with compression type solderless connectors. Connectors of the nonmetallic screw on type are not acceptable.
- C. Terminations or splices for conductors # 6 AWG and larger shall utilize Burndy Unitap, Polaris Black or equivalent connectors.
- D. Unless otherwise specified, all wiring shall be installed in conduit.
- E. No wire shall be smaller than No. 12 for power or lighting service, fixture whips or for switch legs. Wire for each branch circuit shall be of a single size and type from the branch circuit protective device to the last outlet on the circuit unless noted otherwise.
- F. Not more than three (3) branch circuits shall be installed in a raceway for three-phase electrical systems. For single phase electrical systems, the number of circuits in any one raceway shall be limited to two (2).
- G. Branch circuit home run numbers shown on the drawings shall be used for connection of circuit wiring to similarly numbered protective devices in branch circuit panelboards.
- H. Where the length of a home run, from panel to the first outlet exceeds 75 feet (75') for 120-volt circuits or 175 feet (175') for 277-volt circuits, the conductor size shall be No. 10 AWG or that shown on the drawings, whichever is larger.
- I. For all 3-phase circuits, contractor shall provide and install a full-size neutral conductor and a grounding conductor for a complete 5-wire circuit. If the neutral conductor is not required by the equipment, contractor shall install wire nuts on each end of the neutral conductor for future use.

3.3 CONDUIT

- A. When conduits are shown to be installed in the floor slab, under the floor slab, or underground, whenever possible and approved by the Architect/Engineer, conduits one-inch (1") trade size and smaller shall be installed in the concrete floor slab. Conduits embedded in concrete slabs shall have lateral spacing not less than three

diameters except where the slab has been specially designed to accommodate closer spacing.

- B. Conduits larger than one-inch (1") trade size shall not be installed in the floor slab and shall be installed a minimum of twelve inches (12") below the floor slab.
- C. Conduits shown underground but not in or under a floor slab shall be installed not less than twenty-four inches (24") below grade. Conduit locations shall be identified by means of 4" wide; detectable, red warning/ marker tape installed in trench in accordance with NEC requirements.
- D. Prior to backfilling of trenches and /or providing concrete encasement, contractor shall take photographs of conduit installation including spacers/supports and concrete support blocks. In addition, prior to backfilling trenches and after concrete encasement, take additional photographs of installation. Submit photographs to engineer upon request.
- E. Rigid conduit joints shall be made with threaded fittings made up tight with at least five threads fully engaged. Compression type threadless fittings and setscrew type fittings shall not be used for RGS unless specifically approved in writing by the Architect/Engineer.
- F. Couplings and connectors for EMT shall be compression type or cast-iron set screw type.
- G. Where conduits enter boxes or cabinets that do not have threaded hubs the conduit shall be secured in place with galvanized locknuts inside and outside and shall have bushings inside for interior locations. All exterior terminations shall be made with Meyers hubs or approved equivalent. Conduits larger than one inch (1") shall have galvanized insulating bushings.
- H. All conduits shall be installed as indicated or scheduled on the drawings and shall be of sufficient size to accommodate the required number of insulated conductors including equipment-grounding conductor. A grounding conductor shall be pulled in every raceway and properly terminated. The Contractor shall increase the conduit size from that shown on the drawings where necessary to accommodate the equipment-grounding conductor and/or where to comply with the NEC.
- I. Unless otherwise noted, conduit shall be run concealed. Conduit runs from wall mounted receptacles, toggle switches, etc. shall be run concealed in walls whenever possible.
- J. Conduit runs shall be straight; elbows and bends shall be uniform, symmetrical, and free from dents or flattening. All conduit shall be installed with runs parallel or perpendicular to walls, ceilings and structural members.
- K. Conduit shall not be run nearer than three inches (3") to hot water or steam pipes except where crossings are unavoidable. Conduit shall be kept at least one inch

(1") from covering of pipe crossed and the conductor size shall be increased one (1) size

- L. Conduit shall be held securely in place by approved hangers and fasteners of appropriate design and dimensions for the particular application. Support shall be such that no strain will be transmitted to the outlet box and/or pull box supports. Conduit shall be secured only to the building structure.
- M. All conduit runs shall be installed in accordance with all applicable sections of the National Electrical Code and local codes or ordinances.
- N. Where empty conduits are shown, a #14 pull wire shall be installed and conduits shall be capped.
- O. Terminations to all mechanical equipment and to all dry-type transformers shall be made using a minimum of 12" to a maximum of 24" liquid-tight flexible metallic conduit.
- P. At each concealed junction box in the power and lighting system, identify the panel and circuit number(s) contained in the junction box by writing in permanent marker on the outside of the junction box cover.
- Q. Where conduits are run from condition spaces to/thru un-conditioned spaces, the ends of the conduits shall be sealed (after conductor installation) to prevent the transmission of air from non-conditioned spaces into the conditioned spaces. Expanding spray foam and EYS seals are approved methods of sealing conduits.
- R. For all surface mounted devices, including fire alarm, intercom and nurse call systems, device boxes shall be Wiremold No. R5752 and R5753 or approved equivalent style boxes sized such that device does not overhang edge(s) of back box. Color of box shall match device.

3.4 METAL-CLAD CABLE (600 VOLTS AND BELOW)

- A. The metallic sheath shall be galvanized steel or aluminum corrugated sheath type and shall be terminated at outlet boxes, cabinets, etc. with fittings specifically approved for such use, which shall properly ground the metallic sheath.
- B. Each metal-clad cable assembly shall have one (1) green insulated ground conductor sized as required by NEC for the application as a minimum size.
- C. Where run in walls, cable shall be fastened using B-Line Series BX4 or approved equivalent cable fasteners. Cable shall be fastened to wall stud not more than 8" from entry into device box.
- D. MC Cable shall be supported horizontally and vertically every 5' minimum or closer where required by NEC and applicable federal, state and local ordinances.

3.5 WIRING DEVICES

- A. All wiring devices installed shall be identified as to which panel serves it and which overcurrent protection device protects the wiring device. This shall be accomplished via panel name and circuit number being written using a permanent marker on the back side of the coverplate. Panel name and circuit number shall be permanently identified on each receptacle coverplate.

3.6 MANUFACTURER'S DIRECTION

- A. Contractor shall be responsible for coordinating all aspects of equipment electrical service installation for all electrical gear, devices, mechanical, plumbing, fire protection, architectural, and owner furnished equipment. Contractor shall obtain and review actual manufacturer's installation instructions and shall install electrical facilities to said equipment in accordance with the instructions, NEC, NFPA and contract documents. Should a discrepancy exist between the manufacturer's installation directions and the contract documents, the engineer shall be notified in writing immediately.

3.7 COORDINATION WITH OTHER TRADES

- A. Prior to purchasing and installing any wire and/or conduit for all circuitry to mechanical equipment, , owner furnished equipment, and other equipment requiring electrical power furnished by other trades as part of this project, contractor shall review equipment cut sheets and shall verify exact equipment electrical requirements. Any discrepancies between contract documents and equipment submittals shall be immediately brought to the architect/engineer's attention for clarification.

END OF SECTION 26 05 00



SECTION 26 05 26 - GROUNDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions) as appropriate, apply to the Work specified in this Section.
- B. Refer to all Electrical portions of the specifications, as well as the Specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding electrical work.

1.2 GENERAL

- A. Contractor shall provide grounding of service equipment, transformers, non-current carrying conductive surfaces of equipment, cable tray, metallic raceways, fencing, metal buildings, structures and other equipment as specified herein and as shown on the drawings.

1.3 SCOPE

- A. The equipment shall be grounded as shown on the plans and as specified herein. All metal structures and equipment, including fences, shall be connected to the systems ground grid. Ground conductors must be as short and straight as possible, protected from mechanical injury and, if practicable, without splice or joint.
- B. Provide and install 1" C with insulated 3/0 C.U. service grounding conductor from grounding electrode(s) to telephone service backboard and to each and every tele/data/CATV closet.
- C. Provide and install ERICO No. TMGBA24L33PT Tamper Resistant Copper Bus Bar Kit or approved equivalent, at each telephone service backboard, data backboard, CATV backboard in the MDF Room and IDF Rooms. Terminate 3/0 C.U. conductor to each bus bar. Refer to details.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Main grounding conductors shall be bare, soft drawn, stranded, single conductor copper wire, and generally sized as follows:
 - 1. Ground grid cable: #3/0 AWG
 - 2. Equipment and structures to grid conductor: #3/0 AWG
 - 3. Fence grid conductor: #3/0 AWG

4. Fence-to-fence post conductor: #2 AWG (Stranded)
5. Fence post to grid conductor: #2 AWG (Stranded)

2.2 CONNECTORS

- A. All connectors shall be of the exothermically welded type.

2.3 GROUND RODS

- A. Ground electrodes shall be copper-clad steel rods nominal 3/4 inch in diameter and ten feet (10') long.

2.4 EXOTHERMIC WELD PROCESS

- A. All wire-to-wire exothermic welds shall be the parallel type. Wire-to-wire rod connections shall be "T" type. To establish a basis of design for quality and type, the following is a partial list of approved Cadweld type connections. Approved equivalent connectors by other manufacturers may be utilized.

Connections	Cadweld Type
Parallel cable-to-cable	PG
Cable to ground rod	GR, FT, NT or NX
Cable to steel	VN
Cable to lug	LA
Cable to rebar	Consult factory (similar to RR)

PART 3 - EXECUTION

3.1 EXPOSED NON-CURRENT-CARRYING METAL PARTS

- A. Ground connections to equipment or devices shall be made as close to the current-carrying parts as possible; that is, to the main frame rather than supporting structures, bases or shields. Grounding connections shall be made only to surfaces that are clean and dry. Steel surfaces shall be ground or filed to remove all scale, rust, grease and dirt. Copper and galvanized steel shall be cleaned to remove oxide before making welds or connections. Code size ground conductors shall be run in all conduits containing circuits protected by overcurrent devices; then properly terminated.
- B. All raceways, cable racks, cable trays, conduits, armored or shielded cable or cables with ground and all exposed non-current carrying metal parts shall be grounded. Such items shall be bonded together and permanently grounded to the equipment ground bus. Conduits shall be connected by the grounding bushings or clamps to ground bus. Flexible "jumpers" shall be provided around all raceway expansion joints. Bonding straps for steel conduit shall be copper. Jumper connections shall be provided to effectively ground all sections of rigid conduit connected into plastic pipe. No metallic conduit shall be left ungrounded. In

conduit systems interrupted by junction or switch boxes where locknuts and bushings are used to secure the conduit in the box, the sections of conduit and box must be bonded together using grounding bushings.

- C. Any conduits entering low voltage (600 volts or below) equipment through sheet metal enclosure and effectively grounded to enclosure by hub need not be otherwise bonded. Both ends of ground buses in switchboards, etc., shall be separately connected to the main ground bus to form two (2) separate paths to ground.
- D. All metal buildings shall be grounded by separate grounding conductor and ground rods. Fencing (existing and new) shall be grounded as specified herein and as shown on the drawings. Where exposed to physical damage, the ground wires shall be suitably protected with PVC conduit enclosures. Cables below grade shall be laid with a reasonable amount of slack to reduce the possibility of breakage.

3.2 EXOTHERMIC WELD PROCESS

- A. The grounding grid shall be installed and connected as specified herein and as shown on the drawings using an exothermic weld process (Cadweld or other approved manufacturer). Where bolted connections are required, brass/bronze 2-hole pads exothermically welded to the grounding conductor shall be used.
- B. All exothermic weld grounding connections shall be made using exothermic welded Cadweld (or other approved manufacturer) connections, tools and materials.
- C. Unless noted otherwise, all copper-to-copper or copper-to-steel splices and terminating specified shall be made with exothermic welds.
- D. Steel surfaces shall be ground or filed to remove the galvanizing coating and the surface cleaned and dried thoroughly prior to making the welds. All welds shall be repainted with an approved galvanized paint after the welds are made.
- E. Copper surfaces shall be sanded to remove oxides and the surface cleaned and dried thoroughly prior to making the welds. All welds shall be painted with an approved anti-oxide manufactured by T&B or Burndy (or other approved manufacturer) to prevent corrosion.
- F. Brass/bronze split bolts shall be used to connect the fence grounding conductors where shown on the drawings.
- G. Where bolted connections are specified, brass/bronze 2-hole pads shall be utilized except for equipment manufactured neutral and ground busses. The equipment to be grounded shall be cleaned of all paint, dirt, and rust prior to making the bolted connection. All bolts, nuts, washers, and lock washers shall be stainless steel. All such connections shall be coated with an approved anti-oxide compound. Only one (1) 2-hole pad shall be terminated on one (1) set of bolts, nuts and washers.

- H. Where approved in writing by the Engineer, brass/bronze pipe ground clamps or 2 set screw 2-hole pads may be used for special conditions.
- I. Where grounding conductors or PVC conduits penetrate walls, floors, etc., these openings and conduits shall be sealed with Dow Corning No. 2001 Silicone RTV (or other prior approved manufacturer) after installation is complete.
- J. Provide gradual bends for all grounding grid cables wherever possible. Sharp bends will not be permitted. The minimum bending radius should be 8 inches.
- K. The Contractor shall notify the Architect/Engineer when the buried grounding grid is completed for inspection by the Engineer prior to backfilling. Notification should be no less than 24 hours prior to scheduling the backfill of trenches.
- L. The Contractor shall test the grounding grid resistance and continuity. The testing shall be performed after all underground and above ground connections have been made. Refer to "Acceptance Testing" specification section for additional requirements.

3.3 ELECTRICAL SERVICE ENTRANCE

- A. Grounding conductor shall be installed from one (1) ground rod to the next and then looped back to the service equipment. Both ends of the grounding conductor loop shall be properly terminated on the service equipment's neutral bus. Provide all required lugs to accomplish this. Properly bond to ground bus per NEC requirements.
- B. Ground rods shall be spaced a minimum of 6'0" from each other.
- C. Extend grounding conductor to all metallic water piping, building steel, concrete reinforcing steel, all other building steel for adjacent buildings services from main electrical service and properly terminate. Refer to details for additional requirements.
- D. Grounding conductor shall be installed using 1" schedule 80 PVC conduit.
- E. Prior to pouring of slab(s) and prior to covering grounding grid, contractor shall take digital photographs of all ground rods, terminations, conductors and overall photo and shall submit to engineer prior to requesting substantial completion.
- F. Provide and install hand-hole (inspection well) with bolt-down removable cover at all ground rods to allow visual inspection of the terminations of the grounding conductors to the grounding electrode(s). Refer to details for additional requirements.

END OF SECTION 26 05 26

SECTION 26 05 71 - ACCEPTANCE TESTING

PART 1 - GENERAL



1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract apply to the Work specified in this Section.
- B. Refer to all Electrical Sections of the Specifications, as well as the Specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding electrical work.

1.2 SUMMARY

- A. This section outlines the acceptance testing requirements and division of responsibility.

1.3 SCOPE

- A. Contractor shall engage the services of a recognized independent NETA Certified testing firm or professional electrical engineering firm for the purpose of performing inspections and tests as herein specified.
- B. The testing firm shall provide all materials, equipment, labor and technical supervision to perform such test and inspections.
- C. It is the intent of these tests to assure that all electrical equipment is operational and within industry and manufacturer's tolerances and is installed in accordance with design specifications.
- D. The tests and inspections shall determine suitability for energization.

1.4 REFERENCES

- A. All inspections and tests shall be in accordance with the latest editions following applicable codes and standards except as provided otherwise herein.
 - 1. National Electrical Code – NEC
 - 2. National Electrical Manufacturer's Association - NEMA.
 - 3. American Society for Testing and Materials - ASTM
 - 4. Institute of Electrical and Electronic Engineers – IEEE
 - 5. National Electrical Testing Association – NETA
 - 6. American National Standards Institute – ANSI
 - 7. State Codes and Ordinances
 - 8. Insulation Cable Engineers Association – ICEA
 - 9. National Electrical Safety Code – NESC
- B. All inspections and tests shall utilize the following references:

1. Project Design Specifications
2. Project Design Drawings
3. Manufacturer's Instruction Manuals applicable to each particular apparatus.

1.5 QUALIFICATIONS OF TESTING AGENCY

- A. The testing/engineering firm shall be a corporately independent testing organization that can function as an unbiased testing authority, professionally independent of the manufacturers, suppliers and installers of equipment or systems evaluated by the testing firm.
- B. The testing firm shall be regularly engaged in the testing of electrical equipment devices, installations and systems.
- C. The testing firm shall have been engaged in such practices for a similar size project.
- D. The testing firm shall utilize only full-time technicians who are regularly employed by the firm. Electrically unskilled employees are not permitted to perform testing or assistance of any kind. Electricians and/or linemen may assist but may not perform testing and/or inspection services.
- E. The testing firm shall submit the "on site" foreman's qualifications and experience through the Contractor at the pre-construction conference for review and approval by the Engineer.
- F. Contractor shall submit statement of qualifications of proposed testing firm at the pre-construction conference for approval and acceptance by the Engineer.

1.6 DIVISION OF RESPONSIBILITY

- A. Testing firm shall perform the following tests as outlined in these specifications:
 1. Equipment Tests
 2. Ground Resistance Tests
 3. Relay Calibration and Tests
 4. Thermographic Survey
- B. Contractor shall perform the following tests as outlined in these specifications:
 1. Low Voltage Cable
 2. Phasing and Rotation Tests

1.7 TEST REPORT

- A. The test report shall include the following:
 1. Summary of project.

2. Description of project.
 3. Description of test
 4. Test results.
 5. Conclusions and recommendations.
 6. Appendix, including appropriate test forms.
 7. Identification of test equipment used.
 8. Signature of responsible test organization authority.
- B. Furnish three printed (3) copies of the complete report to the Engineer prior to requesting substantial completion and no later than thirty (30) days after completion of testing procedures unless directed otherwise. After acceptance of the report, Contractor shall submit an electronic copy of the report in PDF format.
- C. All tests shall be performed with apparatus de-energized except where otherwise specifically required.
- D. The testing firm shall have a designated safety representative on the project to supervise operations with respect to safety.
- E. The testing firm shall have a calibration program that assures that all applicable test instrumentation is maintained within rated accuracy. The accuracy shall be directly traceable to the National Bureau of Standards. Instruments shall be calibrated in accordance with the following frequency schedule:
- F. Field Instruments: Analog - 6 months maximum
 Digital - 12 months maximum
- G. Laboratory Instruments: 12 months
- H. Leased specialty equipment: 12 months
- I. Dated calibration labels shall be visible on all test equipment.
- J. Records must be kept up to date which show date and results of instruments calibrated or tested.
- K. An up-to-date instrument calibration instruction and procedure will be maintained for each test instrument.
- L. Calibrating standard shall be of higher accuracy than that of the instrument tested.

1.8 GENERAL

- A. An outline of tests required is included in this section. Refer to applicable NETA, ANSI, NEMA, IEEE and other test standards for exact procedures, methods and requirements.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 TESTS

- A. Upon completion of the work, the entire electrical system shall be tested and shall be shown to be in perfect working condition, in accordance with the intent of the specifications.

3.2 EQUIPMENT TESTS

- A. The Contractor shall provide the service of equipment manufacturer's field staff for inspection and testing of equipment installed under this contract. The Contractor shall coordinate and schedule test with Owner, Engineer, User Agency and Equipment Manufacturer. Adequate field tests shall be conducted to ensure Engineer, Owner and User Agency that equipment will operate in accordance with these specifications. Specific equipment requiring manufacturer field-testing shall be as follows:
 - 1. Switchboard
 - 2. Generators
 - 3. Automatic Transfer Switches
- B. Testing Agency shall perform thermographic study of all terminations in the new electrical system prior to acceptance. Thermographic study shall be performed after load is placed on the system
- C. All 600 volt and below cables shall be tested as specified after being installed but prior to being terminated.
- D. Ground resistance tests shall be performed at the pad mounted transformer, at the Service Entrance and at each step-down/step-up transformer as specified.
- E. All new relaying shall be coordinated with fuses and tested for each Interrupter specified.
- F. All terminations (lugs, split-bolts, etc.) shall have their "tightness" torque values measured and verified against NEC and manufacturer's requirements.

3.3 GROUND RESISTANCE TESTS

- A. Inspect ground system for compliance with plans and specifications.
- B. Perform 3-point fall-of-potential test per IEEE Standard No. 81, Section 9.04 on the main grounding electrode or system.
- C. Perform the 2-point method test per IEEE No. 81, Section 9.03 to determine the grounding resistance between the main grounding system and all major electrical equipment frames, system neutral and/or derived neutral points.

- D. Alternate Method to Item C Above: Perform ground continuity test between main ground system and equipment frame, system neutral and/or derived neutral point. This test shall be made by passing a minimum of ten (10) amperes dc current between ground reference system and the ground point to be tested. Voltage drop shall be measured and resistance calculated by voltage drop method.
- E. The main ground electrode system resistance to ground shall be no greater than one (1) ohm at the pad mounted transformer at the Service Entrance and at all step-down/step-up transformers.

3.4 LOW VOLTAGE CABLE, 600 V MAXIMUM

- A. Compare cable data with drawings and specifications. Inspect exposed sections of cables for physical damage and correct connection in accordance with one-line diagram.
- B. Verify tightness of accessible bolted connection by calibrated torque wrench in accordance with manufacturer's published data. Perform thermographic survey.
- C. Inspect compression-applied connectors for correct cable match and indentation.
- D. Verify cable color-coding with applicable Engineer's specifications.
- E. For all service entrances, switchboards, MCC and all panelboard feeders, perform insulation-resistance test on each conductor with respect to ground and adjacent conductors. Applied potential shall be 1000 volts dc for one minute.
- F. Perform continuity test to insure correct cable connection.
- G. Bolt-torque levels shall be in accordance with manufacturer's requirements. Measure and record results.
- H. Minimum insulation-resistance values shall be not less than 50 mega-ohms.
- I. Investigate and report on all deviations between adjacent phases.

3.5 PHASING AND ROTATION:

- A. Perform phasing test on each circuit tie section energized by separate sources.
- B. Perform tests from permanent source.
- C. Damage caused due to omission of this test shall be corrected at Contractor's expense.

3.6 THERMOGRAPHIC SURVEY:

- A. Thermographic survey shall be performed with equipment utilizing long wave technology that provides photo record of deficient areas.

- B. Equipment to be inspected shall include all current-carrying devices installed under this contract, generally, all new high and low voltage cable terminations and splices. Specific equipment to be surveyed includes the following.
1. Switchboards
 2. Panelboards
 3. TVSS Units
 4. Loadcenters
 5. Transfer Switches
 6. Safety Switches (fused and non-fused)
 7. Generators and it's terminations
- C. Inspect physical, electrical and mechanical condition. Remove all necessary covers prior to thermographic inspection.
- D. Provide report including the following:
1. Discrepancies.
 2. Temperature difference between the area of concern and the reference area.
 3. Cause of temperature difference.
 4. Areas inspected. Identify inaccessible and/or unobservable areas and/or equipment.
 5. Identify load conditions at time of inspection.
 6. Provide photographic thermograms of all equipment (non-deficient and deficient areas). Provide corresponding digital photograph (non-thermal image) of electrical equipment scanned.
 7. Inspect distribution systems with imaging equipment capable of detecting a minimum temperature difference of 1 degree C at 30 degrees C.
 8. Equipment shall detect emitted radiation and convert detected radiation to visual signal.
 9. Thermographic surveys should be performed during periods of maximum possible loading but not less than 40 percent of rated load of the electrical equipment being inspected. Refer to NFPA 70B-1994, Section 18-16 (Infrared Inspection).
 10. Temperature differences for 1 degree C to 3 degrees C indicate possible deficiency and warrant investigation.
 11. Temperature differences of 4 degrees C to 15 degrees C indicated deficiency; repair as time permits.
 12. Temperature differences of 16 degrees C and above indicate major deficiency; repair immediately.

END OF SECTION 26 05 71



SECTION 26 05 72 - OVERCURRENT PROTECTIVE DEVICE SHORT-CIRCUIT STUDY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes a computer-based, fault-current study to determine the minimum interrupting capacity of circuit protective devices.

1.3 DEFINITIONS

- A. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- B. One-Line Diagram: A diagram which shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used therein.
- C. Protective Device: A device that senses when an abnormal current flow exists and then removes the affected portion from the system.
- D. SCCR: Short-circuit current rating.
- E. Service: The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served.

1.4 ACTION SUBMITTALS

- A. Product Data: For computer software program to be used for studies.
- B. Other Action Submittals: Submit the following after the approval of system protective devices submittals. Submittals shall be in digital form.
 - 1. Short-circuit study input data, including completed computer program input data sheets.
 - 2. Short-circuit study and equipment evaluation report; signed, dated, and sealed by a qualified professional engineer.
 - a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to

ensure that the selection of devices and associated characteristics is satisfactory.

- b. Revised single-line diagram, reflecting field investigation results and results of short-circuit study.

- C. At the conclusion of the project, contractor shall have the specified studies updated to reflect "As-Installed" conditions and submit the revised studies as part of the O&M manuals. This includes the electronic software data files, PDF of the study and PDFs of the appropriate labels.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Short-Circuit Study Specialist and Field Adjusting Agency.
- B. Product Certificates: For short-circuit study software, certifying compliance with IEEE 399.

1.6 QUALITY ASSURANCE

- A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.
- B. Short-Circuit Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
 - 1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.
- C. Short-Circuit Study Specialist Qualifications: Professional engineer in charge of performing the study and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.
- D. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. SKM Systems Analysis, Inc.
 - 2. ETAP
- B. Comply with IEEE 399 and IEEE 551.
- C. Analytical features of fault-current-study computer software program shall have the capability to calculate "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.
- D. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output.

2.2 SHORT-CIRCUIT STUDY REPORT CONTENTS

- A. Executive summary.
- B. Study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpretation of the computer printout.
- C. One-line diagram, showing the following:
 - 1. Protective device designations and ampere ratings.
 - 2. Cable size and lengths.
 - 3. Transformer kilovolt ampere (kVA) and voltage ratings.
 - 4. Motor and generator designations and kVA ratings.
 - 5. Switchgear, switchboard, motor-control center, and panelboard designations.
- D. Comments and recommendations for system improvements, where needed.
- E. Protective Device Evaluation:
 - 1. Evaluate equipment and protective devices and compare to short-circuit ratings.
 - 2. Tabulations of circuit breaker, fuse, and other protective device ratings versus calculated short-circuit duties.
 - 3. For 600-V overcurrent protective devices, ensure that interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.
 - 4. For devices and equipment rated for asymmetrical fault current, apply multiplication factors listed in the standards to 1/2-cycle symmetrical fault current.
 - 5. Verify adequacy of phase conductors at maximum three-phase bolted fault currents; verify adequacy of equipment grounding conductors and grounding electrode conductors at maximum ground-fault currents. Ensure that short-circuit withstand ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

- F. Short-Circuit Study Input Data: As described in "Power System Data" Article in the Evaluations.
- G. Short-Circuit Study Output:
 - 1. Low-Voltage Fault Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
 - a. Voltage.
 - b. Calculated fault-current magnitude and angle.
 - c. Fault-point X/R ratio.
 - d. Equivalent impedance.
 - 2. Momentary Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
 - a. Voltage.
 - b. Calculated symmetrical fault-current magnitude and angle.
 - c. Fault-point X/R ratio.
 - d. Calculated asymmetrical fault currents:
 - i. Based on fault-point X/R ratio.
 - ii. Based on calculated symmetrical value multiplied by 1.6.
 - iii. Based on calculated symmetrical value multiplied by 2.7.
 - 3. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
 - a. Voltage.
 - b. Calculated symmetrical fault-current magnitude and angle.
 - c. Fault-point X/R ratio.
 - d. No AC Decrement (NACD) ratio.
 - e. Equivalent impedance.
 - f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.
 - g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Obtain all data necessary for the conduct of the study.
 - 1. Verify completeness of data supplied on the one-line diagram. Call any discrepancies to the attention of Engineer.
 - 2. For equipment provided that is Work of this Project, use characteristics submitted under the provisions of action submittals and information submittals for this Project.
 - 3. For relocated equipment and that which is existing to remain, obtain required electrical distribution system data by field investigation and surveys, conducted by qualified technicians and engineers. The qualifications of technicians and engineers shall be qualified as defined by NFPA 70E

- B. Gather and tabulate the following input data to support the short-circuit study. Comply with recommendations in IEEE 551 as to the amount of detail that is required to be acquired in the field. Field data gathering shall be under the direct supervision and control of the engineer in charge of performing the study and shall be by the engineer or its representative who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.
1. Product Data for Project's overcurrent protective devices involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
 2. Obtain electrical power utility impedance at the service.
 3. Power sources and ties.
 4. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in percent, and phase shift.
 5. For reactors, provide manufacturer and model designation, voltage rating, and impedance.
 6. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip, SCCR, current rating, and breaker settings.
 7. Generator short-circuit current contribution data, including short-circuit reactance, rated kVA, rated voltage, and X/R ratio.
 8. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.
 9. Motor horsepower and NEMA MG 1 code letter designation.
 10. Cable sizes, lengths, number, conductor material and conduit material (magnetic or nonmagnetic).

3.2 SHORT-CIRCUIT STUDY

- A. Perform study following the general study procedures contained in IEEE 399.
- B. Calculate short-circuit currents according to IEEE 551.
- C. Base study on the device characteristics supplied by device manufacturer.
- D. The extent of the electrical power system to be studied is indicated on Drawings.
- E. Begin short-circuit current analysis at the service, extending down to the system overcurrent protective devices as follows:
1. To normal system low-voltage load buses where fault current is 10 kA or less.
 2. Exclude equipment rated 240-V ac or less when supplied by a single transformer rated less than 125 kVA.
- F. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-

switching configurations and alternate operations that could result in maximum fault conditions.

- G. The calculations shall include the ac fault-current decay from induction motors, synchronous motors, and asynchronous generators and shall apply to low- and medium-voltage, three-phase ac systems. The calculations shall also account for the fault-current dc decrement, to address the asymmetrical requirements of the interrupting equipment.
 - 1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.
- H. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault at each of the following:
 - 1. Electric utility's supply termination point.
 - 2. Incoming switchgear.
 - 3. Unit substation primary and secondary terminals.
 - 4. Low-voltage switchgear.
 - 5. Motor-control centers.
 - 6. Control panels.
 - 7. Standby generators and automatic transfer switches.
 - 8. Branch circuit panelboards.
 - 9. Disconnect switches.

3.3 ADJUSTING

- A. Make minor modifications to equipment as required to accomplish compliance with short-circuit study.

3.4 DEMONSTRATION

- A. Train Owner's operating and maintenance personnel in the use of study results.

END OF SECTION 26 05 72



SECTION 26 05 73 - OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes computer-based, overcurrent protective device coordination studies to determine overcurrent protective devices and to determine overcurrent protective device settings for selective tripping.

1.3 DEFINITIONS

- A. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- B. One-Line Diagram: A diagram which shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used therein.
- C. Protective Device: A device that senses when an abnormal current flow exists and then removes the affected portion from the system.
- D. SCCR: Short-circuit current rating.
- E. Service: The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served.

1.4 ACTION SUBMITTALS

- A. Product Data: For computer software program to be used for studies.
- B. Other Action Submittals: Submit the following after the approval of system protective devices submittals. Submittals shall be in digital form.
 - 1. Coordination-study input data, including completed computer program input data sheets.
 - 2. Study and equipment evaluation reports.
 - 3. Overcurrent protective device coordination study report; signed, dated, and sealed by a qualified professional engineer.
 - a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies

will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to ensure that the selection of devices and associated characteristics is satisfactory.

- C. At the conclusion of the project, contractor shall have the specified studies updated to reflect "As-Installed" conditions and submit the revised studies as part of the O&M manuals. This includes the electronic software data files, PDF of the study and PDFs of the appropriate labels.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Coordination Study Specialist and Field Adjusting Agency.
- B. Product Certificates: For overcurrent protective device coordination study software, certifying compliance with IEEE 399.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For the overcurrent protective devices to include in emergency, operation, and maintenance manuals.
 - 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. The following parts from the Protective Device Coordination Study Report:
 - i. One-line diagram.
 - ii. Protective device coordination study.
 - iii. Time-current coordination curves.
 - b. Power system data.

1.7 QUALITY ASSURANCE

- A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.
- B. Coordination Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
 - 1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.
- C. Coordination Study Specialist Qualifications: Professional engineer in charge of performing the study and documenting recommendations, licensed in the state

where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.

- D. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

- A. Software Developers:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. SKM Systems Analysis, Inc.
 - b. ETAP
- B. Comply with IEEE 242 and IEEE 399.
- C. Analytical features of device coordination study computer software program shall have the capability to calculate "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.
- D. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.
 - 1. Optional Features:
 - a. Arcing faults.
 - b. Simultaneous faults.
 - c. Explicit negative sequence.
 - d. Mutual coupling in zero sequence.

2.2 PROTECTIVE DEVICE COORDINATION STUDY REPORT CONTENTS

- A. Executive summary.
- B. Study descriptions, purpose, basis and scope. Include case descriptions, definition of terms and guide for interpretation of the computer printout.
- C. One-line diagram, showing the following:
 - 1. Protective device designations and ampere ratings.

2. Cable size and lengths.
 3. Transformer kilovolt ampere (kVA) and voltage ratings.
 4. Motor and generator designations and kVA ratings.
 5. Switchgear, switchboard, motor-control center, and panelboard designations.
- D. Study Input Data: As described in "Power System Data" Article.
- E. Short-Circuit Study Output: As specified in "Short-Circuit Study Output" Paragraph in "Short-Circuit Study Report Contents" Article in Section 260572 "Overcurrent Protective Device Short-Circuit Study."
- F. Protective Device Coordination Study:
1. Report recommended settings of protective devices, ready to be applied in the field. Use manufacturer's data sheets for recording the recommended setting of overcurrent protective devices when available.
 - a. Phase and Ground Relays:
 - i. Device tag.
 - ii. Relay current transformer ratio and tap, time dial, and instantaneous pickup value.
 - iii. Recommendations on improved relaying systems, if applicable.
 - b. Circuit Breakers:
 - i. Adjustable pickups and time delays (long time, short time, ground).
 - ii. Adjustable time-current characteristic.
 - iii. Adjustable instantaneous pickup.
 - iv. Recommendations on improved trip systems, if applicable.
 - c. Fuses: Show current rating, voltage, and class.
- G. Time-Current Coordination Curves: Determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:
1. Device tag and title, one-line diagram with legend identifying the portion of the system covered.
 2. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.
 3. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.
 4. Plot the following listed characteristic curves, as applicable:
 - a. Power utility's overcurrent protective device.
 - b. Medium-voltage equipment overcurrent relays.

- c. Medium- and low-voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.
 - d. Low-voltage equipment circuit-breaker trip devices, including manufacturer's tolerance bands.
 - e. Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves.
 - f. Cables and conductors damage curves.
 - g. Ground-fault protective devices.
 - h. Motor-starting characteristics and motor damage points.
 - i. Generator short-circuit decrement curve and generator damage point.
 - j. The largest feeder circuit breaker in each motor-control center and panelboard.
- 5. Series rating on equipment allows the application of two series interrupting devices for a condition where the available fault current is greater than the interrupting rating of the downstream equipment. Both devices share in the interruption of the fault and selectivity is sacrificed at high fault levels. Maintain selectivity for tripping currents caused by overloads.
 - 6. Provide adequate time margins between device characteristics such that selective operation is achieved.
 - 7. Comments and recommendations for system improvements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. Devices to be coordinated are indicated on Drawings.
 - 1. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to coordination study may not be used in study.

3.2 PROTECTIVE DEVICE COORDINATION STUDY

- A. Comply with IEEE 242 for calculating short-circuit currents and determining coordination time intervals.
- B. Comply with IEEE 399 for general study procedures.
- C. The study shall be based on the device characteristics supplied by device manufacturer.
- D. The extent of the electrical power system to be studied is indicated on Drawings.

- E. Begin analysis at the service, extending down to the system overcurrent protective devices as follows:
 - 1. To normal system low-voltage load buses where fault current is 10 kA or less.
 - 2. Exclude equipment rated 240-V ac or less when supplied by a single transformer rated less than 125 kVA.
- F. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Study all cases of system-switching configurations and alternate operations that could result in maximum fault conditions.
- G. Transformer Primary Overcurrent Protective Devices:
 - 1. Device shall not operate in response to the following:
 - a. Inrush current when first energized.
 - b. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
 - c. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.
 - 2. Device settings shall protect transformers according to IEEE C57.12.00, for fault currents.
- H. Motor Protection:
 - 1. Select protection for low-voltage motors according to IEEE 242 and NFPA 70.
 - 2. Select protection for motors served at voltages more than 600 V according to IEEE 620.
- I. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and protection recommendations in IEEE 242. Demonstrate that equipment withstands the maximum short-circuit current for a time equivalent to the tripping time of the primary relay protection or total clearing time of the fuse. To determine temperatures that damage insulation, use curves from cable manufacturers or from listed standards indicating conductor size and short-circuit current.
- J. Generator Protection: Select protection according to manufacturer's written recommendations and to IEEE 242.
- K. The calculations shall include the ac fault-current decay from induction motors, synchronous motors, and asynchronous generators and shall apply to low- and medium-voltage, three-phase ac systems. The calculations shall also account for the fault-current dc decrement, to address the asymmetrical requirements of the interrupting equipment.

1. For grounded systems, provide a bolted line-to-ground fault-current study for areas as defined for the three-phase bolted fault short-circuit study.
- L. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault and single line-to-ground fault at each of the following:
 1. Electric utility's supply termination point.
 2. Switchgear.
 3. Unit substation primary and secondary terminals.
 4. Low-voltage switchgear.
 5. Motor-control centers.
 6. Standby generators and automatic transfer switches.
 7. Branch circuit panelboards.
- M. Protective Device Evaluation:
 1. Evaluate equipment and protective devices and compare to short-circuit ratings.
 2. Adequacy of switchgear, motor-control centers, and panelboard bus bars to withstand short-circuit stresses.

3.3 LOAD-FLOW AND VOLTAGE-DROP STUDY

- A. Perform a load-flow and voltage-drop study to determine the steady-state loading profile of the system. Analyze power system performance two times as follows:
 1. Determine load-flow and voltage drop based on full-load currents obtained in "Power System Data" Article.
 2. Determine load-flow and voltage drop based on 80 percent of the design capacity of the load buses.
 3. Prepare the load-flow and voltage-drop analysis and report to show power system components that are overloaded or might become overloaded; show bus voltages that are less than as prescribed by NFPA 70.

3.4 MOTOR-STARTING STUDY

- A. Perform a motor-starting study to analyze the transient effect of the system's voltage profile during motor starting. Calculate significant motor-starting voltage profiles and analyze the effects of the motor starting on the power system stability.
- B. Prepare the motor-starting study report, noting light flicker for limits proposed by IEEE 141 and voltage sags so as not to affect the operation of other utilization equipment on the system supplying the motor.

3.5 POWER SYSTEM DATA

- A. Obtain all data necessary for the conduct of the overcurrent protective device study.

1. Verify completeness of data supplied in the one-line diagram on Drawings. Call discrepancies to the attention of Engineer.
 2. For new equipment, use characteristics submitted under the provisions of action submittals and information submittals for this Project.
 3. For existing equipment, whether or not relocated obtain required electrical distribution system data by field investigation and surveys, conducted by qualified technicians and engineers. The qualifications of technicians and engineers shall be qualified as defined by NFPA 70E.
- B. Gather and tabulate the following input data to support coordination study. The list below is a guide. Comply with recommendations in IEEE 551 for the amount of detail required to be acquired in the field. Field data gathering shall be under the direct supervision and control of the engineer in charge of performing the study and shall be by the engineer or its representative who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.
1. Product Data for overcurrent protective devices specified in other Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
 2. Electrical power utility impedance at the service.
 3. Power sources and ties.
 4. Short-circuit current at each system bus, three phase and line-to-ground.
 5. Full-load current of all loads.
 6. Voltage level at each bus.
 7. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in percent, and phase shift.
 8. For reactors, provide manufacturer and model designation, voltage rating, and impedance.
 9. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker settings.
 10. Generator short-circuit current contribution data, including short-circuit reactance, rated kVA, rated voltage, and X/R ratio.
 11. For relays, provide manufacturer and model designation, current transformer ratios, potential transformer ratios, and relay settings.
 12. Maximum demands from service meters.
 13. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.
 14. Motor horsepower and NEMA MG 1 code letter designation.
 15. Low-voltage cable sizes, lengths, number, conductor material, and conduit material (magnetic or nonmagnetic).
 16. Medium-voltage cable sizes, lengths, conductor material, and cable construction and metallic shield performance parameters.
 17. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:

- a. Special load considerations, including starting inrush currents and frequent starting and stopping.
- b. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capability.
- c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.
- d. Generator thermal-damage curve.
- e. Ratings, types, and settings of utility company's overcurrent protective devices.
- f. Special overcurrent protective device settings or types stipulated by utility company.
- g. Time-current-characteristic curves of devices indicated to be coordinated.
- h. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
- i. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
- j. Panelboards, switchboards, motor-control center ampacity, and SCCR in amperes rms symmetrical.
- k. Identify series-rated interrupting devices for a condition where the available fault current is greater than the interrupting rating of the downstream equipment. Obtain device data details to allow verification that series application of these devices complies with NFPA 70 and UL 489 requirements.

3.6 FIELD ADJUSTING

- A. Adjust relay and protective device settings according to the recommended settings provided by the coordination study. Field adjustments shall be completed by the engineering service division of the equipment manufacturer under the Startup and Acceptance Testing contract portion.
- B. Make minor modifications to equipment as required to accomplish compliance with short-circuit and protective device coordination studies.
- C. Testing and adjusting shall be by a full-time employee of the Field Adjusting Agency, who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters. Perform NETA tests and inspections for all adjustable overcurrent protective devices.

3.7 DEMONSTRATION

- A. Engage the Coordination Study Specialist to train Owner's maintenance personnel in the following:
 - 1. Acquaint personnel in the fundamentals of operating the power system in normal and emergency modes.
 - 2. Hand-out and explain the objectives of the coordination study, study descriptions, purpose, basis, and scope. Include case descriptions, definition of terms, and guide for interpreting the time-current coordination curves.
 - 3. Adjust, operate, and maintain overcurrent protective device settings.

END OF SECTION 26 05 73



SECTION 26 05 74 - OVERCURRENT PROTECTIVE DEVICE ARC-FLASH STUDY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes a computer-based, arc-flash study to determine the arc-flash hazard distance and the incident energy to which personnel could be exposed during work on or near electrical equipment.

1.3 DEFINITIONS

- A. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- B. One-Line Diagram: A diagram which shows, by means of single lines and graphic symbols, the course of an electric circuit or system of circuits and the component devices or parts used therein.
- C. Protective Device: A device that senses when an abnormal current flow exists and then removes the affected portion from the system.
- D. SCCR: Short-circuit current rating.
- E. Service: The conductors and equipment for delivering electric energy from the serving utility to the wiring system of the premises served.

1.4 ACTION SUBMITTALS

- A. Product Data: For computer software program to be used for studies.
- B. Other Action Submittals: Submit the following submittals after the approval of system protective devices submittals. Submittals shall be in digital form.
 - 1. Arc-flash study input data, including completed computer program input data sheets.
 - 2. Arc-flash study report; signed, dated, and sealed by a qualified professional engineer.
 - a. Submit study report for action prior to receiving final approval of the distribution equipment submittals. If formal completion of studies will cause delay in equipment manufacturing, obtain approval from Architect for preliminary submittal of sufficient study data to

ensure that the selection of devices and associated characteristics is satisfactory.

- C. At the conclusion of the project, contractor shall have the specified studies updated to reflect "As-Installed" conditions and submit the revised studies as part of the O&M manuals. This includes the electronic software data files, PDF of the study and PDFs of the appropriate labels.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Arc-Flash Study Specialist and Field Adjusting Agency.
- B. Product Certificates: For arc-flash hazard analysis software, certifying compliance with IEEE 1584 and NFPA 70E.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance procedures according to requirements in NFPA 70E shall be provided in the equipment manuals.
- B. Operation and Maintenance Procedures: In addition to items specified in Section 017823 "Operation and Maintenance Data," provide maintenance procedures for use by Owner's personnel that comply with requirements in NFPA 70E.

1.7 QUALITY ASSURANCE

- A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are unacceptable.
- B. Arc-Flash Study Software Developer Qualifications: An entity that owns and markets computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
 - 1. The computer program shall be developed under the charge of a licensed professional engineer who holds IEEE Computer Society's Certified Software Development Professional certification.
- C. Arc-Flash Study Specialist Qualifications: Professional engineer in charge of performing the study, analyzing the arc flash, and documenting recommendations, licensed in the state where Project is located. All elements of the study shall be performed under the direct supervision and control of this professional engineer.
- D. Field Adjusting Agency Qualifications: An independent agency, with the experience and capability to adjust overcurrent devices and to conduct the testing indicated, that is a member company of the International Electrical Testing Association or is

a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

- A. Software Developers:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. SKM Systems Analysis, Inc.
 - b. ETAP
- B. Comply with IEEE 1584 and NFPA 70E.
- C. Analytical features of device coordination study computer software program shall have the capability to calculate "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

2.2 ARC-FLASH STUDY REPORT CONTENT

- A. Executive summary.
- B. Study descriptions, purpose, basis and scope.
- C. One-line diagram, showing the following:
 - 1. Protective device designations and ampere ratings.
 - 2. Cable size and lengths.
 - 3. Transformer kilovolt ampere (kVA) and voltage ratings.
 - 4. Motor and generator designations and kVA ratings.
 - 5. Switchgear, switchboard, motor-control center and panelboard designations.
- D. Study Input Data: As described in "Power System Data" Article.
- E. Short-Circuit Study Output: As specified in "Short Circuit Study Output" Paragraph in "Short-Circuit Study Report Contents" Article in Section 260572 "Overcurrent Protective Device Short-Circuit Study."
- F. Protective Device Coordination Study Report Contents: As specified in "Protective Device Coordination Study Report Contents" Article in Section 260573 "Overcurrent Protective Device Coordination Study."
- G. Arc-Flash Study Output:

1. Interrupting Duty Report: Three-phase and unbalanced fault calculations, showing the following for each overcurrent device location:
 - a. Voltage.
 - b. Calculated symmetrical fault-current magnitude and angle.
 - c. Fault-point X/R ratio.
 - d. No AC Decrement (NACD) ratio.
 - e. Equivalent impedance.
 - f. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a symmetrical basis.
 - g. Multiplying factors for 2-, 3-, 5-, and 8-cycle circuit breakers rated on a total basis
- H. Incident Energy and Flash Protection Boundary Calculations:
 1. Arcing fault magnitude with and without required Arc Energy Reduction methods.
 2. Protective device clearing time.
 3. Duration of arc.
 4. Arc-flash boundary.
 5. Working distance.
 6. Incident energy.
 7. Hazard risk category.
 8. Recommendations for arc-flash energy reduction.
- I. Fault study input data, case descriptions, and fault-current calculations including a definition of terms and guide for interpretation of the computer printout.

2.3 ARC-FLASH WARNING LABELS

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems." Produce a 3.5-by-5-inch thermal transfer label of high-adhesion polyester for each work location included in the analysis.
- B. The label shall have an orange header with the wording, "WARNING, ARC-FLASH HAZARD," and shall include the following information taken directly from the arc-flash hazard analysis:
 1. Location designation.
 2. Nominal voltage.
 3. Flash protection boundary.
 4. Hazard risk category.
 5. Incident energy.
 6. Working distance.
 7. Engineering report number, revision number, and issue date.
- C. Labels shall be machine printed, with no field-applied markings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine Project overcurrent protective device submittals. Proceed with arc-flash study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to arc-flash study may not be used in study.

3.2 ARC-FLASH HAZARD ANALYSIS

- A. Comply with NFPA 70E and its Annex D for hazard analysis study.
- B. Preparatory Studies:
 - 1. Protective Device Coordination Study Report Contents: As specified in "Protective Device Coordination Study Report Contents" Article in Section 260573 "Overcurrent Protective Device Coordination Study."
- C. Calculate maximum and minimum contributions of fault-current size.
 - 1. The minimum calculation shall assume that the utility contribution is at a minimum and shall assume no motor load.
 - 2. The maximum calculation shall assume a maximum contribution from the utility and shall assume motors to be operating under full-load conditions.
- D. Calculate the arc-flash protection boundary and incident energy at locations in the electrical distribution system where personnel could perform work on energized parts.
- E. Include medium- and low-voltage equipment locations, except equipment rated 240-V ac or less fed from transformers less than 125 kVA.
- F. Safe working distances shall be specified for calculated fault locations based on the calculated arc-flash boundary, considering incident energy of 1.2 cal/sq.cm.
- G. Incident energy calculations shall consider the accumulation of energy over time when performing arc-flash calculations on buses with multiple sources. Iterative calculations shall take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators shall be decremented as follows:
 - 1. Fault contribution from induction motors should not be considered beyond three to five cycles.
 - 2. Fault contribution from synchronous motors and generators should be decayed to match the actual decrement of each as closely as possible (e.g., contributions from permanent magnet generators will typically decay from 10 per unit to three per unit after 10 cycles).

- H. Arc-flash computation shall include both line and load side of a circuit breaker as follows:
 - 1. When the circuit breaker is in a separate enclosure.
 - 2. When the line terminals of the circuit breaker are separate from the work location.
- I. Base arc-flash calculations on actual overcurrent protective device clearing time. Cap maximum clearing time at two seconds based on IEEE 1584, Section B.1.2.

3.3 POWER SYSTEM DATA

- A. Obtain all data necessary for the conduct of the arc-flash hazard analysis.
 - 1. Verify completeness of data supplied on the one-line diagram on Drawings and under "Preparatory Studies" Paragraph in "Arc-Flash Hazard Analysis" Article. Call discrepancies to the attention of Engineer.
 - 2. For new equipment, use characteristics submitted under the provisions of action submittals and information submittals for this Project.
 - 3. For existing equipment, whether or not relocated, obtain required electrical distribution system data by field investigation and surveys, conducted by qualified technicians and engineers.
- B. Electrical Survey Data: Gather and tabulate the following input data to support study. Comply with recommendations in IEEE 1584 and NFPA 70E as to the amount of detail that is required to be acquired in the field. Field data gathering shall be under the direct supervision and control of the engineer in charge of performing the study and shall be by the engineer or its representative who holds NETA ETT Level III certification or NICET Electrical Power Testing Level III certification.
 - 1. Product Data for overcurrent protective devices specified in other Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
 - 2. Obtain electrical power utility impedance at the service.
 - 3. Power sources and ties.
 - 4. Short-circuit current at each system bus, three phase and line-to-ground.
 - 5. Full-load current of all loads.
 - 6. Voltage level at each bus.
 - 7. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in per cent, and phase shift.
 - 8. For reactors, provide manufacturer and model designation, voltage rating and impedance.
 - 9. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker settings.

10. Generator short-circuit current contribution data, including short-circuit reactance, rated kVA, rated voltage, and X/R ratio.
11. For relays, provide manufacturer and model designation, current transformer ratios, potential transformer ratios, and relay settings.
12. Busway manufacturer and model designation, current rating, impedance, lengths, and conductor material.
13. Motor horsepower and NEMA MG 1 code letter designation.
14. Low-voltage cable sizes, lengths, number, conductor material and conduit material (magnetic or nonmagnetic).
15. Medium-voltage cable sizes, lengths, conductor material, and cable construction and metallic shield performance parameters.

3.4 LABELING

- A. Apply one arc-flash label for 600-V ac, 480-V ac, and applicable 208-V ac panelboards and disconnects and for each of the following locations:
 1. Motor-control center.
 2. Low-voltage switchboard.
 3. Switchgear.
 4. Medium-voltage switch.
 5. Control panel.

3.5 APPLICATION OF WARNING LABELS

- A. Install the arc-fault warning labels under the direct supervision and control of the Arc-Flash Study Specialist.

3.6 DEMONSTRATION

- A. Engage the Arc-Flash Study Specialist to train Owner's maintenance personnel in the potential arc-flash hazards associated with working on energized equipment and the significance of the arc-flash warning labels.

END OF SECTION 26 05 74



SECTION 26 09 23 - OCCUPANCY SENSORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions) as appropriate, apply to the Work specified in this Section.
- B. Refer to all other Electrical specification sections, as well as the Specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding electrical work.

1.2 GENERAL

- A. Contractor shall provide and install motion sensors in accordance with the plans and specifications herein. System shall be installed to provide detection system coverage of the entire space the sensors are located in. It is understood that due to some manufacturer's devices providing different coverage patterns, the plans represent a generic system. Contractors shall evaluate each space individually and shall at no additional costs to the owner, provide additional detection sensors where required to provide a complete coverage pattern and shall also adjust installation locations to retain the coverage while reducing false triggers of the sensors.

PART 2 - PRODUCTS

2.1 WALL MOUNTED SENSORS

- A. For single-pole/single switch applications wall mounted motion sensors shall be IR-TecLDS700S, Watt Stopper No.: DSW-100, Lutron MS-A102, Greengate ONW-D-1001-MV, Leviton ODS10, Acuity Controls (Sensor Switch) WSX-PDT.
- B. For two-pole/dual switch applications, wall mounted motion sensors shall be IR-TecLDT700S or Watt Stopper No.: DSW-200, Greengate ONW-D-1001-DMV, Leviton ODSOD, Acuity Controls (Sensor Switch) WSX-PDT-2P.
- C. Color of sensor shall be selected by Architect/Engineer during shop drawing submittal.

2.2 CEILING MOUNTED SENSORS

- A. Ceiling mounted motion sensors shall be IR-Tec-BDS-600S, Watt Stopper No. DT-305, Lutron LOS-CDT-2000-WH, Greengate OAC-DT-2000, Sensor Switch CM-PDT-9 (or 10 depending upon coverage required for space) or approved equivalent.
- B. All relays, contactors, and power packs required to provide a fully operational system shall be provided and installed at no additional cost to the owner.

- C. Install device using properly sized device box recessed in ceiling. Utilize MC-cable to run all conductors. Install power pack in properly rated junction box.
- D. Color of sensor shall be selected by Architect/Engineer during shop drawing submittal.

2.3 POWER/SWITCH PACKS

- A. Power packs shall employ zero crossing circuit to limit inrush current. Contacts shall be dry-type (Isolated) twenty-ampere (20A). Leads shall be Class 2 Teflon insulated for use in plenums. Power pack shall be rated for both 120 volt and 277-volt operation.
- B. Install device using properly sized device box recessed in ceiling. Utilize flexible conduit to run all control voltage conductors. Install power pack in properly rated junction box.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Should a particular manufacturer's product require that additional sensors and associated wiring and accessories be provided to allow full and complete coverage of the space, the additional sensors and associated wiring and accessories shall be provided at no additional cost to the owner.
- B. Installation of motion sensor shall be such that motion is detected as soon as a person enters the particular room and with the sensor being a minimum of four feet (4') from any HVAC diffuser/register.
- C. All sensors shall be installed on the line side of all toggle switches so that power is maintained to the sensor at all times.
- D. Prior to requesting substantial completion, contractor shall coordinate with the owner to determine the length of time the sensors shall keep the lighting illuminated after the room is vacated and shall program sensors accordingly. Time shall be adjustable from a minimum of 5 minutes to a maximum of 30 minutes. Contractor shall provide a minimum of one additional setting adjustment per sensor installed for the duration of the one-year warranty period.

3.2 SUBMITTALS

- A. Prior to installation, contractor shall submit a proposed layout in shop drawings indicating all sensor and power pack locations. The sensor Contractor shall be responsible for such layout.
- B. At time of substantial completion, contractor shall submit how each and every sensor is programmed including but not limited to trigger on technology, maintain on technology, time delay to off.

3.3 MISCELLANEOUS ITEMS

- A. Contractor shall be responsible for providing all relays, contactors, power packs, etc. to provide a complete motion detecting lighting switching circuit.

END OF SECTION 26 09 23

SECTION 26 27 13 - ELECTRICAL DISTRIBUTION SYSTEM

PART 1 - GENERAL



1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions); as appropriate, apply to the work specified in this section.
- B. Refer to all Electrical specification sections, as well as the plans and specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding electrical work.

1.2 ELECTRIC SERVICE

- A. Contractor shall be responsible for obtaining a new 480 volt 3 phase 4 wire underground electric service from the local power company, Entergy, as specified herein and as shown on the Drawings. The Contractor shall be responsible for all utility company fees and for the timely coordination of all utility company work.

1.3 GENERAL

- A. All electrical gear furnished as part of this project, panelboards, switchboards, motor control centers, dry-type transformers, safety switches, etc. shall be of the same manufacturer unless specified otherwise. Electrical equipment manufactured by a subsidiary or parent company of manufacturer that is prior approved is not itself prior approved unless its own manufacturer's name specifically is listed as being prior approved.

1.4 ARC-FLASH; COORDINATION AND FAULT CURRENT STUDIES

- A. As part of the electrical gear shop drawings, the contractor shall perform and submit complete arc-flash, coordination and fault current studies, including phase-to-phase and ground faults for coordinating all elements of the distribution system. These three studies shall be performed and furnished by the successful electrical gear manufacturer. Contractor shall refer to these specification sections for specific study requirements: These studies shall be submitted simultaneously with the gear submittal, or the gear submittal will be returned un-reviewed.
 - 1. Overcurrent Protective Device Short-Circuit Study (Cannot be VE'd from project)
 - 2. Overcurrent Protective Device Coordination Study
 - 3. Overcurrent Protective Device Arc-Flash Study (Cannot be VE'd from project)
- B. Provide all arc-flash safety and short circuit current stickers on all panels, switchboards, safety switches, motor control center, etc. as required/specified.

Refer to details for additional requirements. Proposed stickers for each individual piece of gear shall be submitted for review as part of shop drawings.

- C. Provide and install a fully coordinated electrical distribution system as directed by the Overcurrent Protective Device Coordination Study at no additional costs to the Owner.
- D. In addition, this study shall indicate all required settings for adjustable circuit breakers and motor circuit protectors. These settings include instantaneous, short time, long time, ground fault trip characteristics and all-time based pick-up, drop-out and re-close parameters.
- E. The contractor shall provide all breakers, trip plugs, solid state breakers, etc. to provide a fully coordinated electrical system as identified in the coordination study. This shall be accomplished as part of the Base Bid and all alternates at no additional costs to the owner and/or design team.
- F. Refer to individual specification sections of each specified study for additional requirements.
- G. Electrical gear submittals will not be reviewed until all device studies specified are performed, submitted and approved.
- H. At the conclusion of the project, contractor shall have the specified studies updated to reflect "As-Installed" conditions and submit the revised studies as part of the O&M manuals. This includes the electronic software data files, PDF of the study and PDFs of the appropriate labels.

1.5 SERIES RATING OF EQUIPMENT

- A. The electrical gear provided and installed as part of this project shall not be series rated.

PART 2 - PRODUCTS

2.1 LOW VOLTAGE SWITCHBOARDS

- A. Switchboards shall consist of completely enclosed metal structures of the required number of formed and welded vertical panel sections incorporating circuit breakers and other associated equipment as indicated on the drawings and/or described herein.
- B. All sections of the switchboards shall be nominally ninety inches (90") high and shall be of the depth shown on the drawings. Switchboards shall be furnished in conformance with the dimensions and in the configurations shown on the drawings.
- C. All sections shall align front and back. Internal components shall be removable from the front. Front covers shall be fabricated from sheet steel not less than 12-

gauge and shall be sectionalized to permit removal during installation and maintenance. Top and side enclosing plates shall be removable. All of enclosure shall be fabricated of not less than 12-gauge steel and shall be furnished with openings for proper ventilation where required.

- D. All exterior and interior steel surfaces of the switchboard shall be properly cleaned and finished with gray enamel over rust inhibiting phosphatized primer.
- E. Bussing shall be copper. Temperature rise shall not exceed 65° C. Bussing (vertical and horizontal) shall be uniform throughout, not tapered. Bussing shall be braced for short circuit stress level as determined by fault current study.
- F. Sections shall contain group mounted protective devices with trip ratings as shown on the drawings. Circuit Breakers shall be solid-state or molded case type, automatic, with thermal and adjustable magnetic trip elements. Branch breakers shall be mounted in panelboard type construction with bolted connections to the bus and shall be front accessible. Side or rear access shall not be required for proper installation and maintenance. Breakers shall have interchangeable trip units and shall be rated for short circuit stress level as determined by fault current study.
- G. Switchboards shall be completely factory designed, tested, prewired, and assembled all in accordance with the latest applicable NEMA, IEEE, and ANSI standards. Shop drawings shall show front and side views, floor plan and section views, elementary diagram and wiring diagram.
- H. Before energizing, the Contractor shall check all accessible connections for tightness including factory connections and shall tighten those found to be loose.
- I. Switchboard shall be complete with electronic amperage, voltage and power monitor. Monitor shall display amperage per phase, voltage, phase neutral, voltage phase-phase, and maximum kW and kWh. Maximum kW and kWh shall be re-settable. Provide RJ-45 jack, all required software for monitoring/logging of metered parameters via remote PC (PC not provided as part of this project).
- J. Switchboards shall be NEMA Class 1 for indoor locations and NEMA Class 3R plus Gasketing for exterior location as manufactured by General Electric, Square D, Eaton-Cutler Hammer, Siemens or approved equivalent.

2.2 PANELBOARDS

- A. Panelboards shall be circuit breaker type using quick-make, quick-break, trip free, thermal magnetic trip indicating, bolt-on circuit breakers. Two and three pole branches and mains shall be common trip. Panelboards shall be dead front safety type with main breaker or main lugs, and number and size of branches as shown on the drawings. Panelboards shall have single, feed through, or double lugs, to accommodate feeder conductors as shown on the drawings, and shall have neutral and ground bus for termination of conductors. Bussing shall be copper.

- B. Doors shall be fitted with flush cylinder locks, keys to which shall all on project be alike. Two (2) keys shall be furnished for each lock. Cabinet fronts shall be finished as directed by the Architect/Engineer. Cabinet fronts shall not be removable with door in the locked position. Provide for each panel a directory frame with waterproof transparent plastic window on inside of door and place therein a typewritten identification of all circuits.
- C. Directories shall be made only after permanent room numbers have been assigned. Room numbers shown on the construction drawings shall not be used for making directories. Each circuit shall be clearly identified as to use and location (ex: Receptacles Rooms 201, 202 or Lighting Rooms 207, 209, 211, and 213).
- D. Cabinets shall be galvanized steel not less than twenty inches (20") in width. Gutters shall not be smaller than minimum dimensions required by the National Electrical Code.
- E. Double section panelboards shall be comprised of cabinets of equal dimensions.
- F. All panels rated NEMA 1, shall be of the door-in-door type construction providing tool-less access to interior of the panelboard(s).
- G. Panelboards shall be as shown in the schedules and shall be completely factory assembled. Do not purchase panelboards or cabinets until shop drawings have been approved. Approved manufacturers include:
 - 1. General Electric
 - 2. Square D
 - 3. Eaton-Cutler Hammer
 - 4. Siemens
 - 5. Approved Equivalent
- H. Minimum short circuit current interrupting ratings for circuit breakers shall be 10,000 amps. Where a specific interrupting rating is shown on the drawings, in the panel schedules, or as required by the coordination and fault current study, panelboards and associated circuit breakers shall be rated for that value as a minimum at no additional cost to the owner.
- I. In branch circuit panelboards having two (2) vertical columns of devices, circuit numbers shall be such that, starting at the top, odd numbers shall be used in sequence down the left-hand side. See Schedule of Panelboards on drawings for circuit device sizes and number of poles.
- J. Construction of panelboards shall be such that, where applicable, any three (3) adjacent single-pole devices are individually connected to each of the three different phases in such a manner that 2 or 3 pole devices, when available, can be installed at any location.

- K. UL Listing: Panelboards shall be listed by UL and bear the UL label.
- L. Interior panelboards shall be NEMA 1 unless noted otherwise. All exterior panelboards shall be rated NEMA 3R.

2.3 LABELS

- A. All switchboards, panelboards, starters, VFD's, contactors, transformers, safety switches and fused safety switches installed by this contractor shall have laminated phenolic tags with 1/4" characters embossed thereon identifying the equipment by name, voltage, ampacity, phase and number of current carrying conductors such as:

Panel Name
120/208 V - 400A
3 Phase - 4 Wire
Fed From Panel: _____, Circuit _____
Fused @ _____**

The tags shall be fixed to the center of the equipment cover/door with a suitable heavy duty industrial grade adhesive.

**Note – For fused safety switches, label shall include fuse sizes contained therein.

- B. Color Coding of labels shall be as follows:

Normal Power

White Background with Black Letters

2.4 DRY-TYPE TRANSFORMERS

- A. Dry-type transformers shall be three phase, 60 cycle with 480-volt delta primary windings and 120/208 volt, 4-wire wye secondary windings with capacities and mounting arrangements as indicated on the drawings. Each transformer shall have four (4) 2-1/2% FCBN taps, except that two (2) full current taps above normal and two (2) below normal will be acceptable where this is manufacturer's standard for the particular size.
- B. Transformers shall have internally isolated core and coil and shall be built with 220 Class insulation and shall have a temperature rise not to exceed 115° C where installed indoors or not to exceed 150° C where installed outdoors. Where shown on plans where transformers are stacked, both transformers shall have a temperature rise not to exceed 80° C, under full load in an ambient temperature of 40° C. Windings shall be copper.
- C. Units shall be designed for quiet operation with core and coil completely isolated from the enclosure by vibration absorbing mounts. Sound levels shall not exceed 45 db for 75 KVA or below, or 50 db for units above 75 KVA in an ambient of 24 db.

- D. Enclosures shall be NEMA 1 for secured interior locations, NEMA 3R for secured exterior locations, and totally enclosed for all unsecured locations.
- E. Enclosures shall be constructed of heavy code gauge steel with terminal compartments located at the bottom of each unit. Circuit connections shall be made through flexible metallic conduit.
- F. Transformers shall be as manufactured by Square D, General Electric, Eaton Electrical, Siemens, or approved equivalent.

2.5 MAGNETIC CONTACTORS

- A. The Contractor shall furnish and install contactors where shown on the drawings except that contactors shown mounted in branch circuit panelboards shall be factory mounted by panelboard manufacturer.
- B. Contactors shall be of the same manufacturer as the panelboards, disconnect switches, etc.
- C. Contactors shall be suitable for use at the voltage rating of the circuits controlled and shall have the number of poles and ampere rating shown on the drawings as a minimum. Where ampere ratings are not shown, ratings shall be 20 amperes minimum, or as required to match the supply feeder protective device.
- D. Main contacts shall be double break silver alloy to silver alloy type protected by arching contacts. Contacts shall be self-aligning and renewable from the front of the panel.
- E. Contactors shall be Underwriters' Laboratories, Inc. listed under UL 508, 11th Edition. Contactors shall be fully rated and marked for use with motor loads, tungsten lamp loads, and ballast lamp loads.
- F. Remote control stations shall be three-wire momentary contact type with indicator light. Stations shall be arranged as indicated on the drawings and shall be furnished by the contactor manufacturer.
- G. Contactors shall be mounted in suitable enclosures for locations shown with hinged cover and latch.

2.6 LIGHTING CONTACTORS

- A. The Contractor shall furnish and install lighting contactors where shown on the drawings except those contactors shown mounted in branch circuit panelboards shall be factory mounted by panelboard manufacturer. Contactors shall be suitable for use at voltage rating of circuits controlled and shall have the number of poles and ampere rating shown on the drawings as a minimum.
- B. The contactor amp rating shall be continuous per pole for all types of ballast and tungsten lighting, resistance and motor loads. The contactor shall have totally

enclosed, double-break silver-cadmium-oxide power contacts. Auxiliary arcing contacts are not acceptable. Contact inspection and replacement shall be possible without disturbing line or load wiring. The contactor shall have straight-through wiring with all terminals clearly marked. The contactor shall be approved per UL508 and/or CSA and be designed in accordance with NEMA ICS2-211B. They shall be industrial-duty rated for applications to 600 volts maximum. The contactor shall have the following:

1. Control-circuit fuse holder, with one (1) fuse.
 2. 0.2-60 second TDE (Time Delay Energize) and TDD (Time Delay De-energize) timer attachments.
- C. The contactor shall have a NEMA Type 1 enclosure and shall be the mechanically held type.
- D. Coil-clearing contacts shall be supplied so that the contactor coils shall be energized only during the instance of operation. Both latch and unlatch coils shall be encapsulated.

2.7 SAFETY SWITCHES

- A. Furnish and install safety switches at locations and in capacities shown on the drawings, as hereinafter specified and/or as required by the latest edition of the National Electrical Code.
- B. Safety switches shall be rated heavy duty and fusible.
- C. Safety switches exposed to the weather shall be rated NEMA 3R.
- D. Safety switches shall be of the solid neutral type where required by circuit or feeder specified.
- E. Safety switch covers shall be internally mechanically held closed when in the ON position and shall be allowed to open in the OFF position. The switch shall come equipped with provisions to allow the switch to be padlocked in the off position.
- F. Galvanized angle or other suitable supports shall be provided for switches that cannot be mounted on walls or other rigid surfaces. Switches shall not be supported by conduit alone and shall not be mounted on HVAC or other equipment unless specifically approved by the Architect/Engineer. Verify mounting heights for all exterior locations with Architect/Engineer prior to rough-in.
- G. Fuses shall be installed so that fuse rating and type are clearly and easily readable from the front of the disconnect.
- H. Safety switches shall be General Electric, Square "D", Eaton Electrical, Siemens or approved equivalent.

2.8 FUSES

- A. Unless otherwise noted or specified, all fuse holders shall be equipped with dual-element, time-lag, and current limiting fuses. Provide one (1) spare set of fuses for each size initially installed, with a minimum of three (3) fuses of each size. Spare fuses shall be turned over to the Owner's maintenance supervisor prior to requesting substantial completion inspection.
- B. Fuses shall be Gould, Bussman, or approved equivalent.

PART 3 - EXECUTION

3.1 MANUFACTURER'S DIRECTION

- A. All electrical gear shall be installed in accordance with the manufacturer's directions. Contractor shall review these directions prior to rough-in. Should any discrepancies exist between the contract documents and the manufacturer's direction, contractor shall advise the engineer in writing.
- B. All electrical terminations shall be properly tightened to manufacturer's specifications. Where manufacturer's specifications are not available, contractor shall refer to the NEC and adjust tightness values (torque) to the NEC published values.
- C. Install all safety switches, breakers, disconnects, etc., in accordance with manufacturer's directions and maintain all required NEC clearances. Coordinate exact locations in field with applicable contractors.

END OF SECTION 26 27 13

SECTION 26 32 13 - EMERGENCY GENERATOR - DIESEL

PART 1 - GENERAL



1.1 RELATED DOCUMENTS

- A. It is the intent of this specification to secure an emergency generator system that has been prototype tested, factory built, site tested, of the latest commercial design, together with all accessories necessary for a complete installation as shown on the plans and drawings and specified herein. The equipment supplied and installed shall meet the requirements of the National Electric Code and all applicable codes and regulations. All equipment shall be new, of current production by a national firm which manufactures the generator and controls, and assembles the generator set as a matched unit so that there is one-source responsibility for warranty, parts, and service through a local representative with factory-trained service personnel. Emergency power system shall include all parts and accessories to provide a NFPA 110 Level 2 Class 48 Type 10 installation.

1.2 SUBMITTAL

- A. Submittal shall include specification sheets showing all standard and optional accessories to be supplied, schematic wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each required interconnection between the generator set, the transfer switch, and other remote devices if included elsewhere in these specifications.
- B. Where a "Standard Specification" (i.e., ANSI, UL, etc.) is referenced and no manufacturers are listed the Contractor shall submit manufacturers for Prior Approval in adherence with the specified standard.

1.3 TESTING

- A. To assure that the equipment has been designed and built to the highest reliability and quality standards, the manufacturer shall be responsible for design prototype tests as described herein: Components of the emergency system, such as the engine/generator set, transfer switch, and accessories shall not be subjected to prototype tests since the tests are potentially damaging. Rather, similar design prototypes which will not be sold, shall be used for these tests. Prototype test programs shall include the requirements of NFPA-110 and the following:
 - 1. Maximum power (kW).
 - 2. Maximum starting (kVA) at 35% instantaneous voltage dip.
 - 3. Alternate temperature rise by embedded thermocouple and by resistance method per NEMA MG1-22.40 and 16.40.
 - 4. Governor speed regulation under steady-state and transient conditions.
 - 5. Voltage regulation and generator transient response.
 - 6. Fuel consumption at 1/4, 1/2, 3/4, and full load.
 - 7. Harmonic analysis, voltage waveform deviation, and telephone influence factor.

8. Three-phase line-to-line short circuit test.
9. Cooling air flow.
10. Torsional analysis testing to verify that the generator set is free to harmful torsional stresses.

1.4 WARRANTY AND PREVENTIVE MAINTENANCE

- A. The emergency generator system (including but not limited to paralleling gear, automatic transfer switches, fuel system, generator, engine, enclosure, annunciator, etc.) shall be warrantied by the manufacturer for five (5) years from the date of substantial completion. This warranty shall be a full, non-limited, non-pro-rated warranty and shall cover all parts, labor, trip charges, and incidental materials.
- B. As part of this five (5) year warranty/preventive maintenance program, the contractor shall provide a full preventive maintenance program providing all recommended and required maintenance care on the complete generator, transfer switch (s) and fuel system. This program shall be based upon an annual run-time of one hundred fifty (150) hours. Program shall include but not be limited to all fluid changes, filter changes, inspections, belts, hoses, trip charges, materials, labor, disposal fee, etc....for a complete and all-inclusive maintenance program. For service intervals where the manufacturer indicates to replace oil and oil filters, contractor shall provide a complete oil and filter change. Simple testing of the oil (and replacement determined by the testing) is not acceptable. Similarly, this applies to all manufacturer recommended fluid changes. Should a repair/replacement of the installed unit that is covered by this five (5) year warranty occur and last more than two (2) consecutive calendar days, contractor shall provide a rental generator at no additional costs to the owner for the duration of the repair/replacement. This includes any and all cable rental costs, installation and connection equipment and/or labor. Fuel shall be provided by the owner.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The standby generator set shall be rated standby power (defined as continuous operation for the duration of any power outage) 277/480 volts, 3 phase, 4 wire, .8 power factor, (Power ratings as indicated on plans) at 5000 feet altitude, 104 degrees Fahrenheit. Vibration isolators shall be provided between the engine-generator and welded steel base or between the base and the floor. Generator(s) shall be manufactured in accordance with ISO 9001 listing requirements.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 1. Cummins
 2. Caterpillar

3. Kohler - Rehlko
4. MTU
5. Blue Star
6. Approved Equivalent

2.3 FINAL PRODUCTION TESTS

- A. Each generator set shall be tested under varying loads with guards and exhaust system in place. Tests shall include:
1. Single-step load pickup.
 2. Transient and steady-state governing.
 3. Safety shutdown device testing.
 4. Voltage regulation.
 5. Rated Power.
 6. Maximum Power.

2.4 ENGINE

- A. The engine shall be equipped with the following:
1. Engine: Engine shall be stationary, liquid cooled, with a fuel system that is compatible with #2 ULSD diesel fuel. Design shall be four cycle, turbo charged and after-cooled. Engine equipment shall include, but not be limited to the following:
 - a. 50-gallon day tank with auxiliary fuel pumps solenoid fuel shut off valve, fuel filter, battery, batteries charger and flexible fuel connection.
 2. Engine protection devices shall have sensing elements located on the engine to initiate the following preliminary alarms and shutdowns:
 - a. Low coolant temperature alarm.
 - b. Low lube oil pressure alarm.
 - c. High coolant temperature alarm.
 - d. Low lube oil pressure shutdown.
 - e. High coolant temperature shutdown.
 - f. Overspeed shutdown.
 - g. Overcrank lockout and shutdown.
 3. Electronic governing system to control generator system frequency, speed regulation of +/- .25% minimum from no load to full load with automatic overspeed shutdown.
 4. Provide low coolant level shutdown which shall activate high coolant temperature lamp.
 5. Engine starting batteries - Optima Red Label or equivalent AGM type.
 6. Static dual rate 10 ampere automatic battery charger.
 7. Engine mounted thermostatically controlled jacket water heater to maintain jacket water temperature of 90 degrees F. minimum.
 8. Positive displacement, mechanical full pressure lube oil pump, full flow lube oil filter with replaceable element, pressure relief valve, and oil drain valve with hose extension.

9. An engine mounted radiator sized for operation in a 122-degree F. ambient temperature shall be provided. Also include a 50/50 mix of ethylene glycol. Where radiator is remote type, provide and install NEMA 3R variable frequency drive unit on leg of radiator. VFD shall be complete with integral fusible disconnect switch.
10. A critical grade exhaust silencer shall be provided along with a stainless-steel flexible exhaust connection as recommended by generator set manufacturer.
11. Heavy duty, dual element air cleaner
12. Water separator
13. Duplex fuel filter
14. Deep sump oil pan
15. Duplex oil filter
16. Heavy duty starting motor
17. All required fluids and lubricants for proper operation of system.

2.5 GENERATOR

- A. The alternator shall be salient-pole, 2/3 pitch, 4 busbar, self-ventilated of drip-proof construction with amortiser rotor windings and skewed for smooth voltage waveform. The insulation material shall meet the NEMA standard (MGI-22.40 and 16.40) for Class H and be vacuum impregnated with epoxy varnish non-hygroscopic varnish with a final dip of epoxy. The excitation system shall be of brushless construction controlled by a solid-state voltage regulator with adjustable Volts-per-Hertz operation capable of maintaining voltage within + or - 0.5% at any constant load from 0 to 100% of rating. the regulator must be sealed from the environment and isolated from the load to prevent tracking when connected to SCR loads. Generator shall be rated for 130C temperature rise on 40C ambient. Provide and install 120/240V anti-condensation heater.
- B. On application of any load up to the rated load, the instantaneous voltage dip shall not exceed 20% and shall recover to + or - 0.5% of rated voltage within one second.
- C. The generator shall be capable of sustaining at least 250% of rated current for at least 10 seconds under a 3-phase symmetrical short by inherent design or by the addition of an optional current boost system.
- D. The generator shall be capable of accepting the loads that were specified with the stated rated load being the largest running loads and 10% being the largest instantaneous voltage dip when loads are started as specified on the loads report.
- E. A resettable line current sensing circuit breaker with inverse time versus current response shall be furnished and shall not automatically reset preventing restoration of voltage if maintenance is being performed. This breaker shall protect the generator from damage due to its own high current capability and shall not trip within the 10 seconds specified above to allow selective tripping of downstream fuses or circuit breakers under a fault condition.

- F. The generator, having a single maintenance free bearing, shall be directly connected to the flywheel housing with a semi-flexible coupling between the rotor and the flywheel.

2.6 CONTROLLER

- A. Set-mounted controller capable of facing right, left, or rear shall be vibration isolated on the generator enclosure. The microprocessor control board shall be moisture proof and capable of operation from -40c to 85c. Relays will only be acceptable in high current circuits.
- B. Circuitry shall be of plug-in design for quick replacement. Controller shall be equipped to accept a plug-in device capable of allowing maintenance personnel to test controller performance without operating the engine. The controller shall include:
 - 1. Fused DC circuits.
 - 2. Complete two-wire start/stop control which shall operate on closure of a remote contact.
 - 3. Speed sensing and a second independent starter motor disengagement systems shall protect against the starter engaging with a moving flywheel. Battery charging alternator voltage will not be acceptable for this purpose.
 - 4. The starting system shall be designed for restarting in the event of a false engine start, by permitting the engine to completely stop and then re-engage the starter.
 - 5. Cranking cyler with 15-second ON and OFF cranking periods.
 - 6. Overcrank protection designed to open the cranking circuit after 75 seconds if the engine fails to start.
 - 7. Circuitry to shut down the engine when signal for high coolant temperature, low oil pressure, or overspeed are received.
 - 8. Adjustable engine cool down timer factory set at five minutes to permit unloaded running of the standby set after transfer of the load to normal.
 - 9. Three-position (Automatic - OFF - TEST) selector switch. In the test position, the engine shall start and run regardless of the position of the remote starting contacts. In the automatic position, the engine shall start when contacts in the remote-control circuit close and stop five minutes after those contacts open. In the off position, the engine shall not start even though the remote start contacts close. This position shall also provide for immediate shutdown in case of an emergency. Reset of any fault lamp shall also be accomplished by putting the switch to the off position.
 - 10. Indicating lights to signal:
 - a. (Not-in-auto (flashing red))
 - b. (Overcrank (red))
 - c. (Emergency stop (red))
 - d. (High engine temperature/low coolant level (red))
 - e. (Overspeed (red))
 - f. (Air damper (red))
 - g. (Battery charger malfunction (red))

- h. (Low battery voltage (red))
- i. (Low fuel (red))
- j. (System ready (green))
- k. (Pre-alarm high engine temp. (yellow))
- l. (Pre-alarm low oil pressure (yellow))
- 11. Test button for indicating lights.
- 12. Alarm horn with silencer switch per NFPA-110.
- 13. Terminals shall be provided for each signal in 10 above for connection to remote monitoring devices.
- 14. Remote annunciator indicating conditions listed in Item 10 above shall be installed where shown on the plans.

2.7 INSTRUMENT PANEL

A. A set mounted instrument panel shall include:

- 1. Dual range voltmeter, 3 ½ inch, = or - 2% accuracy.
- 2. Dual range ammeter, 3 1/2/inch, = or - 2% accuracy.
- 3. Voltmeter-ammeter phase selector switch.
- 4. Lights to indicate high or low meter scale.
- 5. Direct reading pointer-type frequency meter, 3 ½ inch, + or - 5% accuracy, 45 to 65 Hz scale.
- 6. Panel illuminating lights.
- 7. Battery charging meter.
- 8. Coolant temperature gauge (liquid cooled models).
- 9. Oil pressure gauge.
- 10. Running time meter.
- 11. Voltage adjust rheostat (+ or - 5% range).

2.8 ACCESSORIES

A. The following accessories shall be provided:

- 1. Overvoltage protection will shut down the unit after one second of 15% or more overvoltage
- 2. Battery rack, battery cables, 12-volt battery(ies) capable of delivering the minimum cold-cranking amps required at zero degrees Fahrenheit per SAE Standard J-537.
- 3. Gasproof, seamless, stainless steel, flexible exhaust connector(s) ending in pipe thread.
- 4. Flexible fuel line(s) rated 300 degrees F and 100 PSI ending in pipe thread.
- 5. Engine exhaust silencer, coated to be temperature and rust resistant, rated for critical applications. Exhaust noise shall be limited to 85 dba as measured at 10 feet in a free-field environment.
- 6. Block heater thermostatically controlled to maintain engine coolant at 90 degrees Fahrenheit (32 degrees Celsius) to meet the start-up requirement of NFPA-99 or NFPA-110 Regulations.
- 7. 10-Ampere automatic float and equalize battery charger with + - 1% constant voltage regulation from no load to full load over + - 10% AC input

line variation, current limited during engine cranking and short circuit conditions, temperature compensated for ambient temperatures from -40 degrees C to + 60 degrees C, 5% accurate voltmeter and ammeter, fused, reverse polarity and transient protected. Provide alarm circuit board to meet the requirements of NFPA-110 for low battery voltage, high battery voltage, and battery charger malfunction.

8. 16-light remote annunciator shall monitor all controller functions described in Article 10 of the controller section plus line power and generator power monitoring. An integral lamp test and horn silence switch shall be included that meets NFPA-110.
9. Main-line circuit breaker 480 V., 3-pole with parallel output lugs as required.
10. Spring-type, heavy duty, vibration isolators shall be provided between engines/generator and frame and between frame and concrete pads.
11. Provide emergency generator stop button in facility where shown on plans. Button shall be complete with clear flip cover for protection. Provide red sign with white letters indicating function of button

2.9 OUTDOOR GENERATOR SET ENCLOSURE

- A. Description: Weatherproof aluminum housing. Multiple panels are lockable and provide adequate access to components requiring maintenance. Panels are removable by one person without tools.
- B. Fixed Louvers: At air inlet and discharge. Louvers prevent entry of rain and snow.
- C. Fixed Dampers: At air inlet and discharge
- D. Air Flow Through Housing: Adequate to maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for 2 hours with ambient temperature at the top of the range specified under "System Service Conditions."
- E. Rated for windload of 150 mph sustained winds with 15mph gust factor.
- F. When generator unit is installed on a sub-base fuel tank provide and install a 4' wide welded aluminum work platform on all four (4) sides of unit complete with ADA compliant hand-rails and fixed stairs. Provide 18" diameter 4' deep, 3500 psi concrete footings for all support legs of platform.
- G. Provide and install two (2) Lithonia No, VAP-6000LM-PCL-WD-MVOLT-35k-80CRI-STSL with emergency battery pack fixtures (one on each long side of generator). Provide and install one (1) 120V weatherproof. GFCI receptacle adjacent to generator control panel.
- H. Enclosure shall be of the sound attenuating type. Enclosure shall limit total unit noise at 7 meters to a maximum sound pressure level of 75 db and a maximum 8-position average of 74 db.

- I. Provide emergency generator stop button on enclosure as a second emergency stop button to the one in the facility specified above. Button shall be complete with weatherproof and clear flip cover. Provide red sign with white letters indicating function of button.

2.10 FINISHES

- A. Outdoor Enclosures: Custom color (color shall be selected by Architect during shop drawing submittals) Field applied final finish over corrosion-resistant pretreatment and manufacturer's standard primer.

2.11 SUB-BASE FUEL TANK

- A. Unit shall be complete with factory, double-wall, containment sub-base fuel tank.
- B. UL 2085 listed.
- C. Emergency tank and rupture basin vents.
- D. Tank mounted mechanical fuel gauge.
- E. Low and high level fuel switches (interface with generator set annunciator).
- F. Basin drain.
- G. Integral 5-gallon spill basin.
- H. Sized for a continuous run-time of forty-eight (48) consecutive run-hours at 100% of unit's rated maximum load.

PART 3 - EXECUTION

- A. The equipment shall be installed as shown on the plans, in accordance with the manufacturer's recommendation and all applicable codes.

3.2 PROGRAMMING

- A. A factory authorized and trained technician shall perform initial start-up programming of the generator controller and shall adjust controller parameters to accommodate actual utility, generator, load requirements.
- B. At a time not more than one-month after the facility has been in use by the owner, a factory authorized and trained technician shall perform any necessary and/or owner desired adjustments to said programming to accommodate actual utility, generator, load requirements.

3.3 SITE TEST

- A. An installation check, start-up and building load test shall be performed by the manufacturer's local representative. The engineer, regular operators, and the maintenance staff shall be notified a minimum of one (1) calendar week prior to test of the time and date of the site test. The tests shall include:
1. Fuel, lubricating oil, and antifreeze (liquid cooled models) shall be checked for conformity to the manufacturer's recommendations under the environmental conditions present and expected.
 2. Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. This shall include: engine heaters, battery charger, generator strip heaters, remote annunciator, etc.
 3. Start-up under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during running, normal and emergency line-to-line voltage and phase rotation.
 4. Automatic start-up by means of simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper systems coordination. Engine temperature, oil pressure and battery charge level along with generator voltage, amperes, and frequency shall be monitored throughout the test.
 5. Load Bank test at 25% power for ½ hour, 50% power for ½ hour, 75% power for 1 hour and at full power for two (2) hours. Contractor shall be responsible for all costs to refill fuel tank to maximum capacity three (3) times complete.
 6. During load bank test, record the following parameters in fifteen-minute intervals. Submit results prior to requesting substantial completion for project.
 - a. Voltage L-L
 - b. Voltage L-N
 - c. Current/Phase
 - d. Oil Pressure
 - e. Coolant Temperature
 - f. Generator mounted volt meter readings (all settings)
 - g. Generator mounted amp meter readings (all settings)
 - h. Hour meter readings

3.4 TRAINING

- A. Provide six (6) hours of factory authorized training. These six (6) hours shall be divided into two (2) three-hour training sessions.
- B. Field training shall cover all the items contained in the Operation and Maintenance Manuals.
- C. As part of project close-out documents, submit original sign-in sheets of both training sessions.

END OF SECTION 26 32 13



SECTION 26 36 00 - TRANSFER SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Automatic transfer switch (ATS).

1.2 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and all Specification Sections.
- B. Shop drawings or published product data for each transfer switch, including dimensioned plans, sections, and elevations showing minimum clearances; conductor entry provisions; gutter space; installed features and devices; and materials lists.
- C. Wiring diagrams, elementary or schematic, differentiating between manufacturer-installed and field-installed wiring.
- D. Single-line diagrams of transfer switch units showing connections between automatic transfer switch, bypass/isolation switch, power source, and load, plus interlocking provisions.
- E. Operation and maintenance data for each type of product, for inclusion in Operating and Maintenance Manual specified in Division 1. Include all features and operating sequences, both automatic and manual. List all factory settings of relays and provide relay setting and calibration instructions.
- F. Manufacturer's certificate of compliance to the referenced standards and tested short-circuit closing and withstand ratings applicable to the protective devices and current ratings used in this Project, as indicated, and as specified in paragraph "Tested Fault Current Ratings."

1.3 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms are experienced in manufacturing equipment of the types and capacities indicated and have a record of successful in-service performance.
- B. Emergency Service: Manufacturer maintains a service center capable of providing emergency maintenance and repairs at the Project site with an 8-hour maximum response time.
- C. Comply with NFPA 70, "National Electrical Code," for components and installation.

- D. Comply with NFPA 110, "Standard for Emergency and Standby Power Systems."
- E. Comply with NEMA ICS 1, "General Standards for Industrial Control," ICS 2, "Industrial Control Devices, Controllers and Assemblies," and ICS 6, "Enclosures for Industrial Controls and Systems."
- F. UL Compliance: Comply with UL Standard 1008, "Automatic Transfer Switches," except where requirements of these Specifications are stricter.
- G. Single-Source Responsibility: Obtain generator(s) ATSS, paralleling gear, and remote annunciators, fuel system(s) from a single manufacturer that assumes responsibility for all system components furnished.
- H. The automatic transfer switch shall be warranted by its manufacturer for five (5) consecutive calendar years from the date of substantial completion. This warranty shall be in full, non-limited, non-pro-rated warranty and shall cover all parts, labor, trip charges and incidental materials. Should a repair/replacement of the installed unit that is covered by this five (5) year warranty occur and last more than two (2) consecutive calendar days, contractor shall provide a rental ATS at no additional costs to the owner for the duration of the repair/replacement. This includes any and all cable rental costs, installation and connection equipment and/or labor.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Cummins
 - 2. Asco
 - 3. Caterpillar
 - 4. Kohler - Rehko
 - 5. Approved Equivalent

2.2 TRANSFER SWITCH PRODUCTS, GENERAL

- A. Current and Voltage Ratings: As indicated on the drawings.
- B. Tested Fault-Current Ratings: Closing and withstand ratings exceed the indicated available rms symmetrical fault current at the equipment terminals based on testing according to UL Standard 1008, conducted at full-rated system voltage and 20 percent power factor. Rate each product for withstand duration time as follows when tested for rated short-circuit current correlated with the actual type of circuit protective device indicated for transfer switches for this Project:
 - 1. Molded-Case Circuit Breakers, 150 Amperes or Smaller: 1.5 closing and withstand duration cycles.

2. Molded-Case Circuit Breakers, Larger than 150 Amperes: 3 closing and withstand duration cycles.
- C. Solid-State Controls: Repetitive accuracy of all settings is plus or minus 2 percent or better over an operating temperature range of minus 20 deg C to 70 deg C.
- D. Resistance to Damage by Voltage Transients: Components meet or exceed voltage surge withstand capability requirements when tested according to ANSI C37.90.1, IEEE Guide for Surge Withstand Capability (SWC) Tests. Components meet or exceed voltage impulse withstand test of NEMA ICS 1.
- E. Four-Pole Switches: 4-pole switches shall be provided and shall provide full-capacity over-lapping neutral switching.
- F. Enclosures: General-purpose NEMA 3R gasketed, conforming to UL Standard 508, "Electric Industrial Control Equipment," except as otherwise indicated.
- G. Heater: Within enclosure of units exposed to outdoor temperature and humidity conditions, connect thermostat within enclosure to control heater.
- H. Factory Wiring: Train and bundle factory wiring and identify consistently with shop drawings, either by color code or by numbered or lettered wire and cable tape markers at terminations.
 1. Designated terminals accommodate field wiring.
 2. Power Terminals Arrangement and Field Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
 3. Terminals: Pressure-type, suitable for copper or aluminum conductors of sizes indicated.
 4. Control Wiring: Equipped with lugs suitable for connection to terminal strips.
- I. Electrical Operation: Where indicated, accomplish by a non-fused, momentarily energized solenoid or electric motor-operated mechanism, mechanically and electrically interlocked in both directions. Switches using components of molded-case circuit breakers or contactors not designed for continuous-duty, repetitive switching between active power sources are not acceptable.
- J. Switch Action: Mechanically held in both directions for double-throw switches.
- K. Switch Contacts: Use silver composition for switching load current. Units rated 225 amperes and more have separate arcing contacts.
- L. Overcurrent devices are not part of switch products.
- M. Refer to electrical riser diagram for voltage and amperage of switch(s).

2.3 AUTOMATIC TRANSFER SWITCHES (ATSs)

- A. Comply with Level 1, Type 10 equipment according to NFPA 110, "Standard for Emergency and Standby Power Systems." Emergency power system shall start and assume load within ten (10) seconds of a power outage.
- B. Switching Arrangement: Double-throw type with open programmed transition (center position delay for re-transfer of load).

2.4 AUTOMATIC TRANSFER SWITCH FEATURES

- A. Voltage sensing for each phase of normal source. Pick-up voltage is adjustable from 85 percent to 100 percent nominal and drop-out voltage is adjustable from 75 percent to 98 percent pick-up value. Factory set for pick-up at 90 percent and drop-out at 85 percent.
- B. Time-delay override of normal source voltage-sensing delays transfer and engine start signals. Adjustable 0 to 6 seconds, and factory set at 1 second.
- C. Voltage/Frequency Lockout Relay: Prevent premature transfer. Voltage pick-up is adjustable from 85 percent to 100 percent nominal. Factory set to pick-up at 90 percent. Pick-up frequency is adjustable from 90 percent to 100 percent nominal. Factory set to pick-up at 95 percent.
- D. Retransfer Time Delay: Adjustable from 0 to 30 minutes and factory set at 10 minutes. Provides automatic defeat of the delay upon loss of voltage or sustained under-voltage of the emergency source, provided the normal supply has been restored.
- E. Test Switch: Simulates normal source failure.
- F. Switch-Position Pilot Lights: Indicate source to which the load is connected.
- G. Source-Available Indicating Lights: Supervise sources via the transfer switch normal and emergency source-sensing circuits.
 - 1. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
 - 2. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."
- H. Unassigned Auxiliary Contacts: Two normally open SPDT contacts for each switch position.
 - 1. Rating: 10 amperes at 240 V a.c.
- I. Transfer Override Switch: Overrides automatic retransfer control so the ATS will remain connected to the emergency power source regardless of the condition of the normal source. A pilot light indicates the override status.

- J. Engine Starting Contacts: One isolated normally closed and 1 isolated normally open. Contacts are gold flashed, or gold plated and rated 10 amperes at 32 V d.c. minimum.
- K. Engine Shut-Down Contacts: Time delay adjustable from 0 to 5 minutes; factory set at 5 minutes.

2.5 FINISHES

- A. Enclosures: Indoor NEMA 1 installations. Manufacturer's standard enamel over corrosion-resistant pretreatment and primer.
- B. Enclosures: Outdoor NEMA 3R (Gasketed) installations. Custom color enamel (as selected by Architect during submittal phase) over corrosion resistant pretreatment and primer

2.6 SOURCE QUALITY CONTROL

- A. Factory test components, assembled switches, and associated equipment to ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for conformance with specified requirements. Perform dielectric strength test conforming to NEMA ICS 1.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Floor Mounting of Transfer Switches: Level and anchor the unit to the 4" thick concrete housekeeping pad.
- B. Wall mounting of Transfer Switches; Level and anchor the unit to the wall.

3.2 WIRING TO REMOTE COMPONENTS

- A. Match the type and number of cables and conductors to the control and communications requirements of the transfer switches used. Increase raceway sizes at no additional cost to the Owner if necessary to accommodate required wiring.

3.3 CONNECTIONS

- A. Tighten factory-made connections, including connectors, terminals, bus joints, mountings, and grounding. Tighten field-connected connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque tightening values. When manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standards 486A and 486B. Provide and install all required raceways and conductors/cables for a complete and fully operational system.

3.4 GROUNDING

- A. Make equipment grounding connections for transfer switch units as indicated and as required by the NEC.

3.5 PROGRAMMING

- A. A factory authorized and trained technician shall perform initial start-up programming of the ATS and shall adjust ATS parameters to accommodate actual utility, generator, load requirements.
- B. At a time not more than one-month after the facility has been in use by the owner, a factory authorized and trained technician shall perform any necessary and/or owner desired adjustments to said programming to accommodate actual utility, generator, load requirements.

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services: Provide services of a factory-authorized service representative to supervise field tests.
- B. Preliminary Tests: Perform electrical tests as recommended by the manufacturer and as follows:
 - 1. Measure phase-to-phase and phase-to-ground insulation resistance levels with insulation resistance tester, including external annunciator and control circuits. Use test voltages and procedure recommended by the manufacturer. Meet manufacturer's specified minimum resistance.
 - 2. Check for electrical continuity of circuits and for short circuits.
- C. Field Tests: Give 7-day advance notice of the tests and perform tests in presence of Owner's representative.
- D. Coordinate tests with tests of generator plant and run them concurrently.
- E. Tests: As recommended by the manufacturer and as follows:
 - 1. Contact Resistance Test: Measure resistance of power contacts for ATSS, NATSS, and BP/ISs. Resolve values in excess of 500 micro-ohms and differences between adjacent poles exceeding 50 percent.
 - 2. Ground Fault Tests: Coordinate with testing to ensure sensors are properly selected and located to optimize ground-fault protection where power is being delivered from either source.
 - a. Verify grounding points and sensor ratings and locations.
 - b. Apply simulated fault current at the sensors and observe reaction of circuit interrupting devices.
 - 3. Operational Tests: Demonstrate interlock, sequence, and operational function for each switch at least 3 times.

- a. Simulate power failures of normal source to ATSS and of emergency source with normal source available.
 - b. Simulate low phase-to-ground voltage for each phase of normal source of ATSS.
 - c. Verify time-delay settings and pick-up and drop-out voltages.
- F. Test Failures: Correct deficiencies identified by tests and prepare for retest. Verify that equipment meets the specified requirements.
- G. Reports: Maintain a written record of observations and tests. Report defective materials and workmanship and retest corrected items. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

3.7 DEMONSTRATION

- A. Training: Furnish the services of a factory-authorized service representative to instruct Owner's personnel in the operation, maintenance, and adjustment of transfer switches and related equipment. Provide a minimum of 4 hours of instruction scheduled 7 days in advance. As part of project close-out documents, Contractor shall submit original sign-in sheet of all persons present at instruction session.

3.8 ADJUSTMENTS

- A. During the one-year construction warranty, contractor shall provide up to two (2) additional (above and beyond the initial set-up) trips to adjust programming parameters.

END OF SECTION 26 36 00



SECTION 26 41 13 - LIGHTNING PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes lightning protection for buildings and associated structures and requirements for lightning protection system components.
- B. The work covered by this section of the specifications consists of furnishing all labor, materials and items of service required for the design and installation and full UL certification of the complete and entire lightning protection system.

1.3 SYSTEM DESCRIPTION

- A. Protect entire building including all roof mounted equipment.

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each component specified.
 - 1. Roof adhesive data.
 - 2. Decorative air terminal illustrations.
- C. Shop Drawings detailing lightning protection system design shall include air terminal locations, conductor routing and connections, and bonding and grounding provisions. Include indications for use of raceway and data on how concealment requirements will be met.
- D. Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include data on listing or certification by nationally recognized testing laboratory (NRTL) or trade association. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- E. Certification, signed by Contractor, that roof adhesive for air terminals is approved by manufacturers of both the terminal assembly and the single-ply membrane roofing material.

- F. Field inspection reports indicating compliance with specified requirements.
- G. The complete design drawing(s) must be signed and approved by the installing contractor, who is Lightning Protection Institute Certified Master Designer. This signature will assure the proper lightning protection design and installation.

1.5 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
 - 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.
- B. Provide UL Master Label for the entire Lightning Protection System.
- C. System shall be compliant with Lightning Protection Institute Standard LPI 175 and upon completion of project Contractor shall provide LPI certification of system.
- D. Provide NFPA 780 compliant system.

1.6 SEQUENCING AND SCHEDULING

- A. Coordinate installation of lightning protection with installation of other building systems and components, including electrical wiring, supporting structures and building materials, metal bodies requiring bonding to lightning protection components, and building finishes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by of one of the following:
 - 1. Advanced Lightning Technology
 - 2. East Coast Lightning Equipment
 - 3. Preferred Lightning Protection, LLC
 - 4. Prior approved equivalent manufacturer

2.2 LIGHTNING PROTECTION SYSTEM COMPONENTS

- A. Comply with UL 96A, LPI 175 and NFPA 780.
- B. System Materials: Copper, with solid blunt-tip air terminals, except as otherwise indicated.

- C. Air Terminals for Single-Ply Membrane Roof Mounting: Units with bases especially designed for single-ply membrane roof materials.
- D. Ground Rods: Copper-clad steel with a minimum of 27 percent of rod weight in copper cladding.
 - 1. Diameter: 3/4 inch (nominal)
 - 2. Length: 10 feet (nominal)

2.3 LIGHTNING PROTECTION EQUIPMENT

- A. All materials shall be copper and bronze and of the size, weight and construction to suit the application and used in accordance with LPI, UL and NFPA code requirements. Class I sized components may be utilized on roof levels 75 feet and below in height. Class II sized components are required for roof levels over 75 feet in height. Bolt type connectors and splicers shall be utilized on Class I and Class II structures. Pressure squeeze clamps are not acceptable. All mounting hardware shall be stainless steel to prevent corrosion.

2.4 ALUMINUM COMPONENTS

- A. Aluminum materials may not be used except on roofs that utilize aluminum, galvalume or galvanized metal roofing components. On aluminum, galvalume or galvanized metal roofs or where aluminum, galvalume or galvanized metal parapet caps exist, the entire roof lightning protection equipment shall utilize aluminum components to insure compatibility. However, the down leads and grounding are to utilize copper with the bimetal transition occurring at the through roof assembly with an approved bimetal through roof assembly.

2.5 SURGE PROTECTION DATA

- A. A surge protection device at the main electrical service entrance is required by lightning protection standards. The surge protection device must comply with UL Standard 1449 as a Type 1 lightning rated unit. Unit shall be a Current Technology SL3 series, or approved equivalent with main breaker. It shall be the responsibility of the Electrical Contractor to provide and install a surge protection device on the main electrical service. Refer to Electrical Specifications for additional requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces, areas, and conditions, with Installer present, for compliance with installation tolerances and other conditions affecting performance of lightning protection. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install lightning protection as indicated, according to manufacturer's written instructions.
- B. Comply with UL 96A, LPI-175, and NFPA 780.
- C. Conform to the most stringent requirements when more than one standard is specified.
- D. Install conductors with direct paths from air terminals to ground connections. Avoid sharp bends and narrow loops. Where indicated, run conductors in nonmetallic raceway, Schedule 40, minimum.
- E. Conceal system conductors.
- F. Conceal down conductors.
- G. Conceal interior conductors.
- H. Conceal conductors from normal view from exterior locations at grade within 200 feet of building.
- I. Provide notification at least 48 hours before concealing lightning protection components.
- J. Cable Connections: Use approved exothermic-welded connections for all conductor splices and connections between conductors and other components, except those above single-ply membrane roofing.
- K. Air Terminals on Single-Ply Membrane Roofing: Comply with adhesive manufacturer's installation instructions.
- L. Bond extremities of vertical metal bodies exceeding 60 feet in length to lightning protection components.
- M. Bond ground terminals to counterpoise conductor.
- N. All terminations to ground rods and to counter poise conductor shall be accessible through the use of hand-hole (inspection wells) with bolt-down removable covers. Refer to details for additional requirements.
- O. Bond grounded metal bodies on building within 12 feet of ground to counterpoise conductor.
- P. Bond grounded metal bodies on building within 12 feet of roof to counterpoise conductor.

- Q. Bond grounded metal bodies on building within 12 feet of roof to interconnecting loop at eave level or above.
- R. Bond lightning protection components to grounded metal bodies on building at every 60 feet with intermediate-level interconnection loop conductors.
- S. The installation shall be accomplished by an experienced installation company that is a member of the Lightning Protection Institute (LPI) and an employer of LPI Certified Master Installers of lightning protection systems and UL Listed. For example: Bonded Lightning Protection Systems, Ltd. - 1-800-950-7933 with locations in Dallas, Fort Worth, Houston, Austin, San Antonio, Oklahoma, Louisiana, Alabama. A Certified Journeyman or Master Installer shall supervise the work. All equipment shall be installed in a neat, workmanlike manner. The system shall consist of a complete conductor network at the roof and include air terminals, connectors, splicers, bonds, copper down leads, and proper ground terminals. Copper down lead conductors shall be utilized even when the aluminum is required on the roof. Down lead conductors shall be installed in conduit and shall not be brought directly through the roof. Through roof assemblies with solid brass or stainless-steel rods shall be utilized for this purpose. Structural steel may be utilized in the installation as outlined by LPI, UL and NFPA standards.
- T. The lightning protection installer will work with other trades to insure a correct, neat and unobtrusive installation. The roofing contractor will be responsible for sealing and flashing all lightning protection roof penetrations as per the roof manufacturer's recommendations. However, the lightning protection contractor will be required to coordinate locations of through roofs and submit details of through roof penetrations as required. The lightning protection contractor shall use a compatible adhesive to adhere lightning protection components to the roof when required. The lightning protection contractor shall furnish and install the adhesive and obtain an approval of the compatible adhesive from the roof manufacturer/contractor prior to the installation. Should the roofing contractor/manufacture require any special walk pads, membrane patches, pavers, etc. under the components of the lightning protection system, it shall be the responsibility of the roofing contractor to furnish and install such items. The lightning protection installer shall be responsible for marking the roof with all conductor and/or pad locations. It shall be the responsibility of the lightning protection installer to assure a sound bond to the main water service and to assure interconnection with other ground systems.
- U. Upon completion of the installation, the lightning protection installer shall conform to the requirements standards for lightning protection systems of the LPI, UL and NFPA. Upon completion the following certifications shall be delivered to the owner; a certification letter and warranty by the installation company, i.e.: Bonded Lightning Protection Systems, Ltd. and an LPI Master Certification, LPI Re-conditioned Certification or LPI Limited Scope Report from Lightning Protection Institute - Inspection Program (LPI-IP) depending on the lightning protection scope of work.

- V. The lightning protection contractor shall use a compatible adhesive to adhere lightning protection components to the roof when required. The lightning protection contractor shall furnish and install the adhesive and obtain an approval of the compatible adhesive from the roof manufacturer/contractor prior to the installation. Should the roofing contractor/manufacturer require any special walk pads, membrane patches, pavers, etc. under the components of the lightning protection system, it shall be the responsibility of the roofing contractor to furnish and install such items. The lightning protection installer shall be responsible for marking the roof with all conductor and/or pad locations.

3.3 CORROSION PROTECTION

- A. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture, unless moisture is permanently excluded from the junction of such materials.
- B. Use conductors with protective coatings where conditions would cause deterioration or corrosion of conductors.

3.4 FIELD QUALITY CONTROL

- A. Periodic Inspections: Provide the services of a qualified inspector to perform periodic inspections during construction and at its completion, according to LPI-177.
- B. UL Inspection: Apply for inspection by UL as required for UL master labeling of system. Provide a UL certificate for complete system.
- C. ETL Inspection: Provide the services of ETL to inspect completed system for conformance with specified requirements.

END OF SECTION 26 41 13

SECTION 26 43 13 - SURGE PROTECTION FOR LOW-VOLTAGE
ELECTRICAL POWER CIRCUITS



PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes field-mounted SPDs for low-voltage (120 to 600 V) power distribution and control equipment.

1.3 DEFINITIONS

- A. I-nominal: Nominal discharge current.
- B. MCOV: Maximum continuous operating voltage.
- C. Mode(s), also Modes of Protection: The pair of electrical connections where the VPR applies.
- D. MOV: Metal-oxide varistor; an electronic component with a significant non-ohmic current-voltage characteristic.
- E. OCPD: Overcurrent protective device.
- F. SCCR: Short-circuit current rating.
- G. SPD: Surge protective device.
- H. VPR: Voltage protection rating.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
 - 2. Copy of UL Category Code VZCA certification, as a minimum, listing the tested values for VPRs, I nominal ratings, MCOVs, type designations, OCPD requirements, model numbers, system voltages, and modes of protection.

3. Copies of test reports from a recognized independent testing laboratory, capable of producing 200kA surge current waveforms, verifying the suppressor can survive published surge current rating on a per mode basis using the ANSI/IEEE C62.41 impulse waveform C3 (8 x 20 microsecond, 20kV/10kA). Test data on an individual module is not acceptable. In house testing will not be accepted.
4. Copy of warranty statement clearly establishing the terms and conditions to the building/facility owner/operator.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For SPDs to include in maintenance manuals.

1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to replace or replace SPDs that fail in materials or workmanship within specified warranty period.
 1. Warranty Period: Fifteen (15) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL SPD REQUIREMENTS

- A. SPD with Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.
- C. Comply with UL 1449.
- D. MCOV of the SPD shall be the nominal system voltage. MCOV shall be a tested value per section 37.7.3 of UL1449 4th Edition.

2.2 SERVICE ENTRANCE AND TRANSFER SWITCH SUPPRESSOR (Type A)

- A. Basis of Design: Subject to compliance with requirements. Provide comparable product to the following:

1. Current Technology "TG3" Series. Equivalent by Square D SurgeLogic "EM Series"
- B. SPDs: Listed as Type 1 SPD per UL1449 4th Edition
1. SPDs with the following features and accessories:
 - a. Integral disconnect switch (where breaker not provided).
 - b. Internal thermal protection that disconnects the SPD before damaging internal suppressor components.
 - c. Indicator light display for protection status.
 - d. Form-C contacts: one normally open and one normally closed, for remote monitoring of protection status, and Advanced monitoring with status, surge counter and history log of events.
- C. Comply with UL 1283 with a maximum attenuation of 54dB based on 50ohm insertion loss test per MIL-STD-220B
- D. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per mode shall not be less than 200 kA (400kA per phase). The peak surge current rating shall NOT be the arithmetic sum of the ratings of the individual MOVs in a given mode. SPD manufacturer shall provide independent 3rd party testing validating unit is capable of surviving a single surge at the specified rating or up to and not to exceed 200,000 kA.
- E. Protection modes and UL 1449 VPR for grounded wye circuits with 480Y/277V, three-phase, four-wire circuits shall not exceed the following:
1. Line to Neutral: 1200 V for 480Y/277 V.
 2. Line to Ground: 1200 V for 480Y/277 V.
 3. Line to Line: 1800 V for 480Y/277 V.
- F. SCCR: Equal or exceed 200 kA.
- G. I nominal Rating: 20 kA and compliance to all UL96A requirements for ac surge protection.
- 2.3 PANEL SUPPRESSORS (Type B and C)
- A. Basis of Design: Subject to compliance with requirements. Provide comparable product by the following:
1. Current Technology "TG3". Equivalent by Square D SurgeLogic "EM Series"
- B. SPDs: Listed as Type 1 SPD per UL1449 4th Edition

1. Include LED indicator lights for power and protection status.
 2. Internal thermal protection that disconnects the SPD before damaging internal suppressor components.
 3. Include Form-C contacts rated at 2 to 5 A and 24- V ac to 250-V ac, one normally open and one normally closed, for remote monitoring of protection status.
- C. Peak Surge Current Rating: The minimum single-pulse surge current withstand rating per mode shall not be less than 150 kA (Type B), 300kA per Phase and 50 kA (Type C) 100kA per Phase. The peak surge current rating shall NOT be the arithmetic sum of the ratings of the individual MOVs in a given mode. SPD manufacturer shall provide independent 3rd party testing validating unit is capable of surviving a single surge at the specified rating.
- D. Comply with UL 1283 with a maximum attenuation of 34dB based on 50ohm insertion loss test per MIL-STD-220B
- E. Protection modes and UL 1449 VPR for grounded wye circuits with 480Y/277V or 208Y/120V, three-phase, four-wire circuits shall not exceed the following:
1. Line to Neutral: [1200 V for 480Y/277 V] [700 V for 208Y/120 V].
 2. Line to Ground: [1200 V for 480Y/277 V] [700 V for 208Y/120 V].
 3. Neutral to Ground: [1000 V for 480Y/277 V] [700 V for 208Y/120 V].
 4. Line to Line: [2000 V for 480Y/277 V] [1200 V for 208Y/120 V]
- F. SCCR: Equal or exceed 200 kA.
- G. Inominal Rating: 20 kA

2.4 ENCLOSURES

- A. Indoor Enclosures: NEMA 250, Type 1.
- B. Outdoor Enclosures: NEMA 250, Type 3R.

2.5 CONDUCTORS AND CABLES

- A. Power Wiring: SPD shall be equipped with mechanical lugs that can accept up to #2 AWG wire. Where conductors between SPD and switchgear exceed 10' in total length, they shall be "High Performance Interconnect" (HPI) cables with Ultra Low impedance characteristics at 10kHz and above.
- B. Class 2 Control Cables: Multi-conductor cable with copper conductors not smaller than No. 18 AWG, complying with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

- C. Class 1 Control Cables: Multi-conductor cable with copper conductors not smaller than No. 14 AWG, complying with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Install an OCPD or disconnect as required to comply with the UL listing of the SPD.
- C. Install SPDs with conductors between suppressor and points of attachment as short and straight as possible and adjust circuit-breaker positions to achieve shortest and straightest leads. Do not splice and extend SPD leads unless specifically permitted by manufacturer. Do not exceed manufacturer's recommended lead length. Do not bond neutral and ground. If installed lead length exceeds 10', SPD manufacturer shall provide a low impedance cable that improves the installed performance.
- D. Use crimped connectors and splices only. Wire nuts are unacceptable.
- E. Wiring:
 - 1. Power Wiring: Comply with wiring methods in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
 - 2. Controls: Comply with wiring methods in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.2 FIELD QUALITY CONTROL

- A. Contractor shall perform the following tests and inspections with the assistance of a factory-authorized service representative.
 - 1. Compare equipment nameplate data for compliance with Drawings and Specifications.
 - 2. Inspect anchorage, alignment, grounding, and clearances.
 - 3. Verify that electrical wiring installation complies with manufacturer's written installation requirements.
- B. An SPD will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.3 SYSTEM TESTING

- A. Upon completion of installation, provide the start-up and testing services of a factory-authorized and factory-trained local service representative. The tests shall include:
 - 1. Off-line Testing: Impulse injection to verify the system tolerances as well as verification of proper facility neutral-to-ground bond. Compare field test results to factory benchmark test parameters supplied with each individual unit.
 - 2. On-line Testing: Verify that suppression and filtering paths are operating with 100% protection as well as verification of proper facility neutral-to-ground bond by measuring neutral-to-ground current and voltage and by visual inspection.
 - 3. Voltage measurements from Line-to-Ground (L-G), Line-to-Neutral (L-N), Line-to-Line (L-L), and Neutral-to-Ground (N-G), taken at the time of the testing procedure.

3.4 DOCUMENTATION AND REPORTING

- A. Record results of field testing and compare to factory benchmark test parameters supplied with each individual surge protective device. Indicate that the integrity of neutral-to-ground bonds were verified through testing and visual inspection, and that grounding bonds were observed to be in place.
- B. Submit to the Owner's representative and to the Architect/Engineer copies of the startup test results and the factory benchmark testing results for confirmation of proper suppression filter system function, as required by this section. Provide the number of copies as required by Division One and the Electrical General Provisions section; and three copies where not otherwise specified.

END OF SECTION 26 43 13



SECTION 26 51 00 - LIGHTING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions) as appropriate, apply to the Work specified in this Section.
- B. Refer to other Electrical specifications, as well as the Specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding electrical work.

1.2 GENERAL

- A. The Contractor shall furnish and install lighting fixtures and accessories as shown on the drawings and/or described herein.
- B. Unless otherwise specified, lighting fixtures shall be permanently installed and connected to the wiring system.
- C. The Contractor shall support each new fixture independently, from the building structure. Ceiling framing members shall not be used to support fixtures except in specific areas where ceiling supports for this purpose have been specified elsewhere in these specifications.
- D. Catalog numbers scheduled on the drawings or descriptions of lighting fixtures contained herein may indicate fixture compatibility with certain types of ceiling construction. The Contractor shall determine exact type of ceilings actually to be furnished in each area and shall obtain fixtures to suit, deviating from specified catalog numbers or descriptions only where necessary, and only to the extent necessary to insure fixture-ceiling compatibility. The Contractor shall notify the Architect/Engineer in writing where such changes are to be made. Contractor shall clean all lighting fixtures of dirt and debris upon completion of project prior to requesting substantial completion inspection.
- E. Incandescent fixtures for recessed locations shall have a thermal cutout and be installed in accordance with manufacturer's requirements and in accordance with NEC.
- F. Unless noted otherwise on the drawings, lamps installed in each fixture shall be of the type specifically recommended by the manufacturer of the fixture for use in the fixture. Fixtures shall not be wired with or have any parts constructed using asbestos materials.
- G. All requests for prior approval shall contain the following:

1. Photometric data for each fixture being submitted.
2. For all exterior lighting, point by point foot candle levels shall be submitted. (Exception: Wall packs, ground mounted flood lights, landscape lighting).
3. Listing of all deviations of fixtures proposed as compared to fixtures specified.
4. For interior lighting point by point foot-candle levels shall be submitted for typical interior spaces (offices, classrooms, corridors) and for spaces with indirect and/or specialty lighting.

PART 2 - PRODUCTS

2.1 EMERGENCY BATTERY PACKS

- A. Emergency battery packs shall be provided and installed in all fixtures denoted by the letter "E" appearing at the end of the fixture type designation and where required in the light fixture schedule. Emergency battery packs shall be installed in the ballast/driver housing (not on top of the fixture) of the fixture(s) unless specifically noted otherwise on the drawings.
- B. At the contractor's option, a central inverter (or multiples thereof) may be provided in the electrical room(s) to provide emergency lighting as indicated. If contractor elects to implement this option, they shall be responsible for providing the appropriate sub-feed breaker in the lighting distribution panel as well as all required sub-feed circuitry. Any and all required generator transfer devices (GTD's) shall be provided at no additional costs. All required branch emergency circuitry shall be provided as well as all branch circuit overcurrent protective devices required in the central inverter(s). As part of the lighting submittal package, fixture supplier shall provide connection diagrams indicating installation requirements for the emergency lighting system showing all switching, inverters (battery packs), GTDs, etc.... required for a complete and fully operational emergency lighting system.
- C. Operation of the fixture shall be as follows:

<u>Normal A/C Power</u>	<u>Switch Position</u>	<u>Operation of Lamps/LED's</u>
On	On	All lamps/LED's operating
On	Off	All lamps/LED's off
Off	On	Emergency Lamps/LED'S all operating
Off	Off	Emergency Lamps/LED's all operating

- D. Emergency operation of the light fixture shall provide a minimum total lamp output of 1200 lumens for a minimum time period of ninety (90) minutes.
- E. Emergency battery packs shall be as manufactured by Bodine, Iota Engineering Co., or approved equivalent.

- F. The Contractor shall be responsible for any additional wiring, conduit, labor, etc., to provide the emergency lighting system specified at no additional cost to the Owner. This includes running of a continuously energized conductor to each and every battery pack.

2.2 LED FIXTURES

- A. Manufacturers of LED luminaires shall demonstrate a suitable testing program incorporating high heat, high humidity and thermal shock test regimens to ensure system reliability and to substantiate lifetime claims.
- B. The use of IESNA LM-80 data to predict luminaire lifetime is not acceptable.
- C. At time of manufacture, electrical and light technical properties shall be recorded for each luminaire. At a minimum, this should include lumen output, CCT, and CRJ. Each luminaire shall utilize a unique serial numbering scheme. Technical properties must be made available for a minimum of 5 years after the date of manufacture.
- D. Luminaires shall be provided with a full, non-pro-rated, non-limited, 5-year warranty covering LEDs, drivers, paint and mechanical components.
 - 1. Each luminaire shall consist of an assembly that utilizes LEDs as the light source. In addition, a complete luminaire shall consist of a housing, LED array and electronic driver (power supply).
 - 2. The rated operating temperature range shall be 30°C to +40°C.
 - 3. Each luminaire is capable of operating above 100°F° (37°C), but not expected to comply with photometric requirements at elevated temperatures.
 - 4. Photometry must be compliant with IESNA LF-79 and shall be conducted at 25°C ambient temperature.
 - 5. The individual LEDs shall be constructed such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire.
 - 6. Luminaire shall be constructed such that LED modules may be replaced or repaired without replacement of whole luminaire.
 - 7. Each luminaire shall be listed with Underwriters Laboratory, Inc. under UL 1598 for luminaires, or an equivalent standard from a nationally recognized testing laboratory.
 - 8. Power Consumption: Maximum power consumption allowed for the luminaire shall be determined by application. The luminaire shall not consume power in the off state.
 - 9. Operation Voltage: The luminaire shall operate from a 60 HZ ± 3HZ AC line over a voltage ranging from 108 VAC to 305 VAC. The fluctuation of line voltage shall have no visible effect on the luminous output.
 - 10. Power Factor: The luminaire shall have a power factor of 0.90 or greater.
 - 11. THD: Total harmonic distortion (current and voltage) induced into an AC power line by a luminaire shall not exceed 20 percent.

12. Surge Suppression: The luminaire onboard circuitry shall include fused surge protection devices (SPD) to withstand high repetition noise transients as a result of utility line switching, nearby lightning strikes, and other interference. The SPD shall protect the luminaire from damage and failure for common mode transient peak voltages up to 10 kV (minimum) and transient peak currents up to 5 kA (minimum) SPD shall conform to UL 1449 depending on the components used in the design. SPD performance shall be tested per the procedures in ANSI/IEEE C62.41-1992 (or current edition for category C (standard). The SPD shall fail in such a way as the luminaire will no longer operate. The SPD shall be field replaceable.
13. Each luminaire shall have integral UL Listed Class II power supplies. Class I power supplies will not be acceptable.
14. Operational Performance: The LED circuitry shall prevent visible flicker to the unaided eye over the voltage range specified above.
15. RF Interference: LED drivers must meet Class A emission limits referred in Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 regulations concerning the emission of electronic noise.
16. Drivers shall have a Class A sound rating.
17. Illuminance: The illuminance shall not decrease by more than 30% over the expected operating life. The measurements shall be calibrated to standard photopic calibrations.
18. Light Color Quality: The luminaire shall have a correlated color temperature (CCT) range of 3800K to 4200K. The color rendition index (CRI) shall be 80 or greater. Binning of LEDs shall conform to ANSI/G.NEMA SSL 3-2010.
19. Backlight –Uplight-Glare: the luminaire shall not allow more than 10 percent of the rated lumens to project above 80 degrees from vertical. The luminaire shall not allow more than 2.5 percent of the rated lumens to project above 90 degrees from vertical. Backlight and Glare ratings as per fixture schedule and calculated per IESNA TM-15.
20. The thermal management (of the heat generated by the LEDs) shall be of sufficient capacity to assure proper operation of the luminaire over the expected useful life.
21. The LED manufacturer's maximum thermal pad temperature for the expected life shall not be exceeded.
22. Thermal management shall be passive by design. The use of fans or other mechanical devices shall not be allowed.
23. The luminaire shall have a minimum heat sink surface such that LED manufacturer's maximum junction temperature is not exceeded at maximum rated ambient temperature.
24. The heat sink shall be aluminum.
25. The luminaires shall be dimmable from 100 percent output to 0 percent output.
26. Driver shall be integral to the fixture and field replaceable.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All surface mounted fixtures shall be properly anchored so that all sides of the fixture are butted up against the mounting surface. A minimum of two (2) anchors shall be used; however, where additional anchors are required to properly install fixture (all sides evenly spaced from ceiling), the Contractor shall provide and install them at no additional cost to the Owner.

1. Anchor types shall be as follows:

<u>Mounting Surface Material</u>	<u>Anchor type</u>
* Gypsum board (wall)	Toggle bolts or blocking with screws
Gypsum board (ceiling)	Expansion type anchor
Concrete/concrete block	Expansion type anchor
** Wood	Screws

*Anchor type shall be determined in field by Architect/Engineer as dictated by fixture weight.

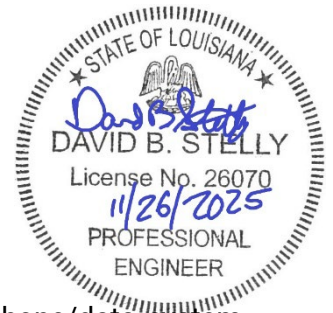
** Any fixture installed on combustible material shall be installed on ½ minimum spacers unless prior approved, otherwise in writing by Architect/Engineer.

- B. All recessed fixtures in suspended ceiling shall be supported by a minimum of two (2) support wires, at opposite corners of the fixture. Each support wire shall be continuous without splices to the building structure and separately anchored. Fixture support wires shall support only the light fixture and not the ceiling. Surface mounted fixtures installed on lay-in ceiling shall be supported as lay-in fixtures. Refer to details for additional requirements.

END OF SECTION 26 51 00

SECTION 28 05 13 - TELEPHONE/DATA/CATV COMMUNICATION SYSTEM(s)

PART 1 - GENERAL



1.1 The Contractor shall provide, install and connect the complete telephone/data system equipment, backboards, conduit, cable tray, j-hooks, wiring and testing as specified herein and shown on the drawings.

1.2 SCOPE OF WORK

- A. This installation includes the furnishing of labor, materials, and equipment required for the installation of all service, inside station, and riser cables for telephone and data use between distribution frames, and to each station outlet location required by the plans and specifications.
- B. The work shall include but is not necessarily limited to the following:
 - 1. Furnish and install telephone outlets, data outlets, TV outlets, cables, connecting blocks, backboards, conduits, mounting brackets and associated hardware for bundling, racking and cross-connecting as required.
 - 2. Furnish and install one (1) 1" C from each tele/data outlet concealed up wall to above ceiling. Turn conduits 90° and extend conduit to accessible ceiling space. Provide nylon bushings at ends of conduits.
 - 3. Furnish and install two (2) 4-pair EIA - Category 6 UTP telephone/data station cable to each tele/data outlet shown on the drawing and specified herein. Coil 36" of spare cable (for each cable installed) and secure loop at quarter points of the loop. Extend cables to respective termination point(s). Cables shall be plenum rated where installed in plenums.
 - 4. Furnish and install duplex EIA/TIA 568A, 8 pin 4-pair modular RJ45 data jacks at each telephone/data outlet shown on drawings as specified herein. Color of each jack shall comply with owner's color-coding requirements. Verify color coding requirements in writing with owner prior to purchasing jacks.
 - 5. Furnish and install 6-position modular type wall outlets for all telephone/data shown on the plans. Color of wall outlets shall match color of wall devices and shall be selected in shop drawings.
 - 6. Furnish and install grounding and ground bars as shown on the drawings and as specified. Refer to specification section "Grounding" and to details for additional requirements.
 - 7. Install 1-RG6 plenum rated quad shield coax cable from video receivers to each TV outlet and terminate as required on each end.
 - 8. Contractor shall submit an installation color coding, labeling and testing plan for each floor prior to commencing work.

1.3 APPLICABLE DOCUMENTS

- A. The following current issues of rules and regulations shall apply to this scope of work:
1. EIA/TIA 568, 569, 570, 606, TSB36, TSB40
 2. Building Industry Consulting Service (BICS)
 3. Telephone Standards Handbook GHB-155
 4. Planning Handbook CHB-156
 5. Design Handbook CHB-157
 6. REA Construction and Installation Manuals
 7. REA Specification PC4 for Acceptance Tests
 8. List of Materials Acceptable for use on telephone systems of REA borrowers
 9. National Electric Code (NEC)
 10. State and Local Codes
 11. Telco System Practices
 12. UL

1.4 GENERAL REQUIREMENTS

- A. Installation costs including all necessary materials, cables, closures, bridging clips, splice materials, and terminations are to be the responsibility of the Contractor.
- B. Cables routed above the drop ceiling and where not installed in conduit shall be supported to the structure utilizing "J" hooks. Cables are not allowed to rest on the ceiling tiles nor building steel. Maximum clearance to other electrical systems shall be maintained.
- C. All cables, wires, and equipment shall be securely and neatly installed. Inside routings shall be installed parallel and perpendicular to existing structural lines and members.
- D. All cables, wires, and equipment shall be firmly held in place. Fastening and support shall be adequate to support their load with ample safety factors.
- E. The Contractor shall be responsible for replacing, restoring, or bringing to original condition any damage to floor, ceilings, walls, furniture, grounds, pavement, etc., caused by his personnel and operations. Contractor shall restore any damage or disfigurements at his expense.
- F. Cables shall be continuous; no splices will be allowed.
- G. The Contractor shall refer to the Construction Phasing Description section of these specifications for additional information and requirements. It is intended that the Telephone and Data Communications System be placed in service and be of beneficial use to the Owner at the completion of each construction phase of the work prior to occupancy by the Owner.

- H. The Contractor shall coordinate all of his work with the Owner's Information Network Department to maintain tele/data service to the old and new systems as may be required. The Contractor will provide all new services as specified and shown on the drawings in a timely manner.
- I. The Contractor shall not interrupt existing tele/data services and systems in any way until new facilities are in place and approval is received from the Information Network Department and the Architect/Engineer.

1.5 SUBMITTALS

- A. Submit to the engineer shop drawings, product data (including cut sheets and catalog information). Submit shop drawings, product data with such promptness and in such sequence as to cause no delay in the work or in the activities of separate contractors. The engineer will indicate approval of shop drawings and product data submitted to the engineer by stamping such submittals "APPROVED" with a stamp. Submitted shop drawings shall be initialed or signed by the contractor, showing the date and the contractor's legitimate firm name.
- B. By submitting shop drawings and product data, the contractor represents that he or she has carefully reviewed and verified materials, quantities, field measurements, and field construction criteria related thereto. It also represents that the contractor has checked, coordinated, and verified that information contained within shop drawings and product data conform to the requirements of the work and of the contract documents.
- C. The engineer remains responsible for the design concept expressed in the contract documents as defined herein.
- D. The engineer's approval of shop drawings and product data submitted by the contractor shall not relieve the contractor of responsibility for deviations from requirements of the contract documents, unless the contractor has specifically informed the engineer in writing of such deviation at time of submittal, and the engineer has given written approval of the specific deviation. The contractor shall continue to be responsible for deviations from requirements of the contract documents not specifically noted by the contractor in writing, and specifically approved by the engineer in writing.
- E. The engineer's approval of shop drawings and product data shall not relieve the contractor of responsibility for errors or omissions in such shop drawings and product data.
- F. The engineer's review and approval, or other appropriate action upon shop drawings and product data, is for the limited purpose of checking for conformance with information given and design concept expressed in the contract documents. The engineer's review of such submittals is not conducted for the purpose of determining accuracy and completeness of other details such as dimensions and

quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the contractor as required by the contract documents. The review shall not constitute approval of safety precautions or of construction means, methods, techniques, sequences, or procedures. The engineer's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

- G. Perform no portion of the work until the engineer has approved the respective submittal. Such work shall be in accordance with approved submittals.
- H. Submit shop drawings and product data as a complete set within thirty (30) days of award of contract.
- I. For initial submission and for re-submission required for approval, submit one (1) electronic copy of each item. Make reproductions as required for your use and distribution to subcontractors. Reproduction of documents will be at contractor's expense. Illegible submittals will not be checked by the engineer.
- J. General: Submit the following:
 - 1. Bill of materials, noting long lead time items
 - 2. Project schedule including all major work components that materially affect any other work on the project
- K. Shop drawings: Submit the following:
 - 1. Backbone (riser) diagrams.
 - 2. System block diagram, indicating interconnection between system components and subsystems.
- L. Product Data – Provide catalog cut sheets and information for the following:
 - 1. Wire/Cable.
 - 2. Outlets, jacks, faceplates, and connectors.
 - 3. Terminal blocks and patch panels.
 - 4. Enclosures, racks, and equipment housings.
 - 5. Over-voltage protectors.
 - 6. Splice housings.
 - 7. Fiber optic cable

1.6 QUALITY ASSURANCE

- A. Commscope cabling systems, Hubbell Premise Wiring Cat 6 Cabling, and Com Tran Cable - Signamax connectivity are approved for the work of this section.
- B. The contractor shall be an authorized Manufacturer's cabling system contractor.

- C. The contractor shall have worked satisfactorily for a minimum of five (5) years on systems of this type and size and be currently operating service organization within 50 miles of project site.
- D. Material and equipment shall be new, and conform to grade, quality, and standards specified. Equipment and materials of the same type shall be a product of the same manufacturer throughout.
- E. Subcontractors shall assume all rights and obligations toward the contractor that the contractor assumes toward the owner and engineer/designer.

1.7 WARRANTY

- A. Unless otherwise specified, unconditionally guarantee in writing the materials, equipment, and workmanship, of all cabling system components, for a period of not less than twenty-five (25) years from date of acceptance by the owner.
- B. Transfer manufacturer's warranties to the owner in addition to the General System Guarantee. Submit these warranties on each item in list form with shop drawings. Final payment shall not relieve contractor of these obligations.
- C. Installation costs including all necessary materials, cables, closures, bridging clips, splice materials, and terminations are to be the responsibility of the Contractor.
- D. Installer Qualifications:
 - 1. The Data Cable System Installer shall be licensed and shall meet all applicable regulations of the local and state authorities insofar as they apply to this type of system. The proposer shall be a firm normally employed in the low voltage and data cabling industry and shall provide a reference list of ten (10) large-scale projects and contact names confirming successful Category 6 premises wiring system installations.
 - 2. The Installer shall be a local area, integrator of the manufacturer's product and must provide the manufacturer's maximum available warranty on the entire system. The contractor's certification must have been obtained and held within 75 miles of the project's location.
 - 3. The installing contractor must have a full-time employed RCDD (Registered Communications Distribution Designer) on staff. Current RCDD certification shall be provided in the product submittals.
 - 4. All individuals must be employees of the certified installer and at least 25% of the installing staff shall have undergone a training class given by the manufacturer. Current certification indicating the successful completion of the training course shall be available upon request at the project and submitted in the contractor's product submittals.

PART 2 - PRODUCTS

2.1 MATERIAL SPECIFICATIONS

A. Inside Unshielded Twisted Pair (UTP)

1. All unshielded twisted pair requirements for use shall meet EIA Category 6 specifications (plenum rated when installed in plenum spaces).
 - a. NEC
 - b. UL
 - c. ANSI/ICEA Publication S-80-576
 - d. EIA/TIA 568, 569, 570, 606, TSB 36, TSB 40
2. Multi-pair Riser Cables
 - a. Cables from the MDF shall be further distributed to each of the other closets and terminated on 110 block in the IDF's there. The intra-building inter-IDF cables shall be of the multi-pair type, conforming to or exceeding the following EMMMA 568 physical specifications of CAT 6 physical specification.
3. UTP Patch Cords
 - a. EIA Category 6 UTP patch cords (8' in length) shall be supplied at each wall outlet for each jack installed. At the MDF's and IDF's, patch cords shall be terminated at both ends in 4-pair Type 110 or equivalent connectors for plugging onto the type 110 or equivalent cross-connect panels, IDFs and MDFs. The other patch cords shall be terminated in 8 position modular male connectors at both ends conforming to FCC Part 68 Rules, Subpart F. The ends shall be wired in accordance with EIA/TIA 568B.
4. UTP Termination Wall Plates
 - a. The four-pair horizontal cables shall be terminated on 6-position modular duplex (two) outlets meeting EIA specifications for EIA Category 6 UTP and configured in compliance with T56B. The outlets shall be in compliance with FCC Part 68 Rules, Subpart F. The outlets with integrated or separate cover plates shall be installed in single standard electrical wall boxes. The data termination shall allow keyed connectors. The termination of wires shall be by the insulation displacement method equivalent to type 110 and shall require the use of the same punch down tool as the UTP termination blocks specified below.
 - b. Jacks shall allow the insertion of 4 and 6 pin plugs as well as 8 pin plugs or RG6 - Coax connectors. Metal faceplates specified for all wiring devices. Each faceplate shall have provisions for inserting colored tabs to provide use identification for each jack
5. UTP TERMINATION BLOCKS
 - a. At the MDF and IDF closets, all UTP cables shall be terminated on rack mounted two (2) "U" 48 -port patch panels and terminating blocks meeting EIA/TIA 568 specifications for EIA Category 6 UTP. These terminating blocks shall be used for MDFs, IDFs and all UTP cross-connect requirements. They shall allow termination of cables as well as the capability of connecting pre-assembled single pair and composite 4-pair patch cords. Termination blocks to be used

- for terminating outside plant cables shall be equipped with gas discharge protection units.
 - b. The blocks shall be equipped with designation strips and color coded for terminating sets of four pairs of wires in accordance with ICEA specifications.
 - c. Cable tie wraps shall be included to neatly route, store and organize the termination cables.
- 6. **INSIDE FIBER**
 - a. All fiber optic cables shall comply with the FDDI specifications published in ANSI Standard. The cables shall also comply with EIA and the FOTP specifications. The fibers in the cable shall conform to the industry standard color coding as specified by EIA. The outer jacket shall have markings indicating that it is a fiber optic cable. Other markings shall be core size and mode.
 - b. Unless specified otherwise, all fiber optic cables shall be a minimum of twelve (12) strands.
 - c. Fiber optic cable shall be tight-buffered riser cable, single-mode, OS 2, complete with flame retardant jacket.
 - d. Cables shall be NEC OFNR listed and compliant to UL-1666, CSA FT-4, and ICEA S-83-596 standards.
- 7. **FIBER CONNECTORS**
 - a. All fiber optic cables shall be terminated on connectors installed on rack mounted patch panels. The connectors shall be of the Type LC as defined in the EIA 568 or ANSI FDDI standards, constructed of ceramic or metal/ceramic materials. Plastic connectors shall not be used.
 - b. The connector design shall incorporate strain relief such that it can withstand pulling, bending or twisting of the cable during installation and removal without affecting its operating characteristics.
 - c. The connectors shall conform to all applicable EIA specifications for attenuation, durability, tensile strength, thermal shock, temperature cycling, humidity, impact, etc.
 - d. Provide and install all fiber patch cords complete with LC connectors at both ends. Patch cords shall be 3-meters in length.
- 8. **TYPE LC TERMINATING OUTLETS**
 - a. The connectors and adapters shall conform to specifications as outlined for connectors.
- 9. **FIBER OPTIC SPLICES**
 - a. All fiber optic cables shall be installed in continuous lengths without splices. If splicing is required for extra-long distances, the splices shall be constructed by fusion and offer an attenuation of no more than 0.2 dB per splice. Mechanical splices are not permitted. All splices shall be stored neatly in splice boxes that allow easy access for maintenance and testing.
- 10. **FIBER TERMINATION PANELS AND ADAPTERS**
 - a. The fiber optic cables shall be terminated in Type LC connectors. The terminated fibers shall be inserted in Type LC or equivalent

fiber optic couplings /adapters/barrels mounted on rack mounted termination panels/enclosures. The panels shall be of metal construction with the capability of neatly storing excess fiber lengths and providing protection from dust and dirt. The panels shall allow ease of access to and maintenance of fibers.

- b. The panels shall allow cables to be installed and stored such that they do not alter the attenuation of the cables (as may happen when the fibers are tightly coiled, or the fiber is excessively bent at the connector strain relief). The adapters shall be metal, of the same manufacture as the connectors and shall introduce a loss of no more than 0.1 dB when two connectors are installed in it.

11. EQUIPMENT RACKS

- a. Each closet shall be equipped with an EIA standard heavy-duty steel 4-post 19-inch equipment racks. Each rack shall be free standing with holes for anchoring it to the floor. They shall be 72 inches high and tapped with mounting holes of 19 inches in width. Provide vertical wire management system on each side of the rack.

12. UTP CABLES AND PATCH CORDS COLOR CODING

- a. Wireless access points - white.
- b. All other ethernet - blue.

PART 3 - EXECUTION

3.1 PAIR IDENTIFICATION

- A. The following room recording procedure shall be completed after each wire or cable has been pulled:
 - 1. Terminations: Telephone station cables, CATV station cables and data station cables shall be tagged at backboards with cable tags indicating telephone or data and marked with room number to which it is connected. In rooms where more than one jack exists, the jacks are to be numbered sequentially and indicated on the cable tag. The outlet number shall also be indicated on the faceplate of the jack.
 - a. Each pair terminated shall be legibly labeled on the terminal blocks according to the room number and jack with which it is associated.
 - b. Each station wire shall be plainly marked at its backboard end with the room number to which it is connected and terminated on the Type 110 termination blocks.
 - c. All cables will be legibly and permanently numbered at each end. String tags are not acceptable.

3.2 CROSS CONNECTIONS

- A. At the backboards, Contractor shall cross connect all pairs from each station cable designated for telephone and/or data use to an incoming pair of the riser cable designated for telephone and/or data use. The cross connection of these pairs

should provide four (4) continuous pair from each data outlet and one (1) continuous blue/white pair from each telephone located on that floor. Contractor shall label each pair on the Type 110 terminal according to the numbering scheme.

3.3 MDF LAYOUT AND CABLE DISTRIBUTION

- A. The MDF and IDF are constructed of a combination of a backboard on which shall be mounted to type 110 cross-connect blocks and 4-post rack. Provide a minimum of ten feet spare cable for each run coiled on wall (see detail).

3.4 UTP NETWORK

- A. The UTP network consist of the following elements:

1. Outside Plant
2. Inside Plant - Riser and Horizontal
3. MDFs
4. IDFs
5. Wall Plates
6. Patch Cables

3.5 CABLE INSTALLATION

- A. The contractor shall optimize cable utilization by designing splice points. All cable splices and cable routed through manholes shall be supported on cable racks.

3.6 INSIDE

- A. The cables in the risers and closets shall be neatly bundled and tie wrapped. Cable trays shall be provided and installed where necessary, especially between the backboards and equipment racks, and the backboard and the horizontal pathways. Cables traversing the vertical paths shall be anchored to the wall. The method and means of running horizontal cable distribution will vary. Each duplex wall outlet shall have a conduit that runs in the wall from that outlet to the wire closet. Thus, the 4-pair horizontal cable runs shall emanate at the wall outlets, run along the wall conduit, and terminate at the voice or data patch panel in the wire closet.
- B. All cables shall be labeled and color coded in accordance with the EIA 606 standard.

3.7 HORIZONTAL RUNS

- A. The wall outlets are of three types: voice, data, and CATV. The voice outlets shall be connected to the voice cross-connect panels in the wire closets. The data outlets are identified by the keyed slot, and they shall be connected to the data cross-connect panels in the wire closets. The voice and data cross- connect panels are so identified on the closet drawings. The wall outlets shall be wired in

accordance with EIA T568B configuration. At each wall outlet, 18 inches of wire shall be allowed spare for future changes.

- B. Since the cables to be terminated shall be of EIA Category 6 quality, all terminations shall ensure minimum of untwisting at the connections. The length of wire shall be untwisted only to the extent necessary for making the connection. Both the cross-connect panels and the wall outlets are of type 110. These allow the twists to be maintained to the point of termination. Also, the cable slots between the index strips provide space to maintain cable shield to the point of termination.
- C. All terminations on the cross-connect panels shall be labeled and color coded in accordance with industry standards as specified by EIA. All terminations, cables and panels shall be identified and labeled in accordance with EIA 606.

3.8 RISER CABLES

- A. The individual cable wires shall be installed in accordance with the method and color coding described under Installation and Test Instructions.
- B. The terminations on the central IDF shall be identified to indicate the MDF connections and the floor connections, both with their own sequential numbering scheme that corresponds with the other end of the cable and also indicated at the location of the other end of the cable. The terminations on the individual floor IDFs shall identify the position on the MDF.

3.9 TESTING

- A. All conductors in every cable shall be tested end-to-end to prove that they meet the cable specifications described in EIA standards and this document. The tests shall be conducted in the presence of a Telecommunications Specialist. All tests shall be completed first before any corrective action is taken. Corrected conductors shall be tested again. The Telecommunications Specialist reserves the right to request that the conductors passing the previous tests be tested again after corrective action has been taken on the faulty conductors. Conductors not passing the tests shall also be documented together with the corrective action taken. Test results shall be documented and supplied before the installation is considered for acceptance.
- B. The following tests shall be conducted as a minimum:
 - 1. Compliance with color coding
 - 2. Tip and ring polarity
 - 3. Neatness of cable routing and tie downs
 - 4. Continuity
 - 5. Shorts, grounds and opens
 - 6. Crosses (shorts to other pairs)

7. Rolls (reversed polarity)
8. Splits

3.10 ACCEPTANCE TESTING

- A. When the Contractor has completed all cable installation and termination, and he is ready for testing, he shall inform the Architect/Engineer of the intent. The Architect/Engineer shall assign the Telecommunications Specialist who shall monitor the Contractor testing. The Architect/Engineer has the authority to accept or reject any test and request, and, at his discretion, complete retesting of any portion of the plant if there are an unreasonable number of pairs not passing tests indicated above. The Architect/Engineer may request the Contractor to replace any portion of the plant if the tests indicate faulty or improper installation, or numerous repairs are necessary to pass the tests. The plant shall be accepted by the Architect/Engineer after the Contractor has demonstrated that all the pairs have passed all the tests, all the tests have been documented, the plant is labeled and recorded, and all plant records have been provided in accordance with the requirements of the Documentation Sub-Section later in this document. The Contractor shall comply with any and all warranties required by the general contract agreement with the Architect/Engineer.

3.11 RECEIVING FIBER OPTIC CABLES

- A. Before commencing installation, the Contractor shall inspect and test the cables on the reel. The reels shall be accompanied by manufacturer's test report for that particular glass strand and cable indicating such parameters as the attenuation and bandwidth. The Contractor shall at a minimum perform attenuation, break/kink and length verification tests on each strand on the reel with the aid of an OTDR. A printout of the test for each fiber shall be generated and submitted for records. A five-foot section of the cable shall be stripped back and inspected for consistency of manufacture of the jacket, buffer, plastic coating, etc. An inspection and test report shall be provided. Installation shall only proceed after the test documentation has been submitted and the cables have been accepted for installation by a telecommunication specialist.

3.12 INSTALLATION OF FIBER OPTIC CABLES

- A. The installation plan shall describe the approach that the Contractor plans to take in installing the fiber optic cables. Some of the typical factors are:
 1. Supervisory and technical staff contingent and qualifications
 2. Testing the ducts before installation
 3. Use of mechanical devices
 4. Pulling Force
 5. Manhole organization - laying on cable racks and loops of extra cable, etc.

- B. All outside fiber optic cables shall be installed in inner ducts and prominently labeled with "caution, glass fiber cables" or equivalent, at six-foot intervals wherever the cables are exposed to view. Inside cables shall be installed in inner ducts only where installation is in conduits. Open trays do not require inner ducts. Unwound cables shall be placed in figure 8 configurations when they are not on the reels. When a cable is installed, the pulling tension shall be minimal, less than the manufacturer's recommended tension. The cable on the reel shall be unwound such that there is no tension on the cable. The cable shall either be unwound manually, or by any mechanical means that turns the wheel as opposed to pulling the cable. The cable shall be hand-fed over or around any curves, bends or edges without scrapes or bends in the cable. Strain reliefs or supports shall be provided where necessary, such as in manholes or vertical risers.
- C. At each end of the cable a minimum of ten feet of service loop cable shall be allowed for termination and future use. All excess cable shall be neatly stored out of harm's way.

3.13 TERMINATIONS OF FIBER OPTIC CABLE

- A. Both single mode and multi-mode-cables are to be installed. Both these types of cables shall be terminated in LC type connectors. However, the two cable types shall be connected on separate fiber patch panels. Proper procedures shall be followed and the right tools used for terminating the fibers in the connectors. Below are examples of precautions and procedures which shall be conformed to:
 - 1. The tool used for stripping the fiber shall conform to the size of the fiber being stripped and shall leave no nicks on the fiber; the stripping shall be effortless and, for example, not require looping of the fiber around the finger for gripping.
 - 2. If crimping is required, the appropriate size apertures on the tool shall be selected.
 - 3. The jacket material remaining after stripping shall be removed by dissolving in chemicals and not by scraping.
 - 4. If the connector required adhesives or epoxy for fastening the fiber to the connector, the material shall be injected in the connector such that it oozes out, displacing all the air from the space to be occupied by the fiber.
 - 5. While seating the fiber in the adhesive filled connector, no air bubbles shall be introduced, such as by inserting and re-inserting the fiber. The fiber protruding from the connector ferrule shall have a small bead formed at its base.
 - 6. The scribe tool used for preparing the excess fiber for removal shall be of high quality and sharp so as not to shatter the glass fiber. The scribed fiber shall be pulled rather than snapped.
 - 7. Heat guns or hot-air blowers shall not be used for curing.
 - 8. Heat shrink tubing shall not be used.
 - 9. A minimum of three types of polishing paper shall be used (changing them often).

10. Polishing shall be performed using the figure 8 routine, creating a spherical polished end profile; a recessed profile shall be rejected.
11. The quality of the polish end shall be inspected using a microscope with a minimum magnification of 200x.
12. All finished terminations shall be covered with boots at all times; similarly, all adapters shall also be covered with boots.
13. Strands of fiber from loose tube cables shall be sheathed in protective fan-out tubing or spiral from the point the fiber leaves the cable to the point where it is terminated on a connector. All gel or waterproofing compounds shall have been cleaned off.
14. The terminations shall be sequentially numbered in synchronization with the color code. The terminations and cables shall be labeled to clearly describe the location at the other end.

3.14 TESTING OF FIBER OPTIC CABLE

- A. All tests shall be conducted at 1300 nm.
- B. The cable shall be tested on the reels with the OTDR before beginning installation.
- C. The fibers shall be tested with the OTDR after the cables have been pulled and the ends dressed for termination. A paper trace of the test shall be provided for each fiber. Evidence of kinked or otherwise damaged fibers shall be cause for replacement of the entire cable.
- D. Termination of the fiber on connectors shall only commence after OTDR traces have been approved by the Architect/Engineer and the cable accepted for termination. The terminated fibers shall be tested using the power meter. The OTDR - and power meter tests shall be performed from both ends using calibrated adapters and connectors.
- E. Reference measurements of the power receivers shall be checked frequently. Any deviation of 0.1 dB or more shall be cause for retesting the fibers that were tested with that reference.
- F. All test equipment, especially the OTDR and the power meter shall have been calibrated by the manufacturer or an accredited test facility within six months prior to beginning the tests on site.
- G. Acceptance Testing. When the Contractor has completed all cable installation and termination, and he is ready for testing, he shall inform the Contracting Officer of the intent. The Contracting Officer has the authority to accept or reject any test and request, and at his discretion, complete retesting of any portion of the plant if there are an unreasonable number of fibers not passing tests indicated above. The Contracting Officer may request the Contractor to replace any portion of the plant if the tests indicate faulty or improper installation, or excessive re-work is necessary to pass the tests. The plant shall be accepted by the Contracting Officer

after the Contractor has demonstrated that all the fibers have passed all the tests, all the tests have been documented, the plant is labeled and recorded, and all plant records have been provided in accordance with the requirements of Documentation, Section 3.4 later in this document. The Contractor shall comply with any and all warranties required by the general contract agreement with the Contracting Officer.

3.15 GROUNDING

- A. The buildings shall be equipped with central point grounding schemes. A master ground bar shall be installed at the MDF. Ground window bars shall be installed at the IDF in every other closet. All cables with metallic elements and all metallic hardware shall be grounded in accordance with REA Section 810 and EIAMA PN-2327 grounding specifications for telecommunications.

3.16 DOCUMENTATION

- A. The Contractor shall provide two sets of documents. One set shall provide a record of all the tests conducted on cables, terminations, etc. Another set shall depict all the telecommunications wiring and cabling installation, within and to the building.

3.17 TEST DOCUMENTATION

- A. Test records shall be provided for the following tests:
 - 1. UTP, Terminations
 - a. Manufacturing test results
 - b. Outside plant cables
 - c. Riser cables
 - d. Horizontal cables
 - 2. Fiber
 - a. Manufacturing test results
 - b. Outside plant fibers - OTDR before and after installation
 - c. Fiber terminations - power meter tests

3.18 RECORD DOCUMENTATION

- A. After all installations have been completed and tested, the Contractor shall provide records of the installation in accordance with EIA/TIA Standard 606. The records shall be required in hard copy format printed from a software such as Cable Management Systems by Microtest (CMS). CMS is a commercially available off-the-shelf software designed specifically for cable installation records. The Contractor shall supply the software and the records using the software to one FWS technician.

- B. As described in the EIA standard, the following types of records shall be supplied:
1. Fiber, voice and data terminations located in work areas, telecommunications closets, equipment rooms and entrance facilities.
 2. Telecommunications media between terminals (horizontal distribution).
 3. Pathways between terminations that contain the media.
 4. Spaces where terminations are located.
 5. Bonding/grounding as it applies to telecommunications.
- C. All the elements of the telecommunications infrastructure shall be identified and labeled by a code. The coding method to be used shall be as specified in the EIA 66 standard. On the following page is a representative list reproduced from the standard (xxx denotes a numerical designation).

CODE	DESCRIPTION
BCxxx	Bonding Conductor
BCDxxx	Backbone Conduit
Cxxx	Cable
CBxxx	Backbone Cable
CDxxx	Conduit
CTxxx	Cable Tray
ECxxx	Equipment (bonding) conductor
EFxxx	Entrance Facility
ERxxx	Equipment Room
Fxxx	Fiber
HHxxx	Hand Hole
ICxxx	Intermediate Cross-Connect (IDF)
Jxxx	Jack (Outlet)
MCxxx	Main-Cross-connect (MDF)
MHxx	Man hole or maintenance hole
PHxxx	Pull Box
Sxxx	Splice
SExxx	Service Entrance
SLxxx	Sleeve

TCxxx	Telecommunications Closet
TGBxxx	Telecommunications grounding busbar
TMGB	Telecommunications main grounding busbar
WAXxx	Work Area

3.19 MAINTENANCE CONSIDERATIONS

- A. The cable installation shall be installed to maximize the safety, maintainability, and performance effectiveness of maintenance personnel, and shall minimize demands upon skills, training and manpower. Splices/terminations shall be placed and supported so as to maximize the efficiency and ease with which it can be maintained and shall ensure accessibility.

3.20 CABLE TESTS

- A. Contractor shall perform testing of all pairs for each cable installed as directed by these specifications. Post construction cable acceptance tests consist of conductor continuity tests, and conductor insulation resistance tests. These tests assure that the cable has been terminated properly and has not been damaged during construction. An Owner's representative will be required to witness these tests.
- B. Each cable pair shall be tested for shorts (T to R and T&R to ground), continuity, and loop resistance. Maximum loop resistance from the main telephone/data panel to each jack shall be within 5% of the calculated value based on the actual length of cable installed, and the loop ohms/1000 ft. for copper conductors.

3.21 DEFECTIVE CABLE PAIRS

- A. The vendor shall test all cable pairs and shall record, on the pair assignment record, the nature of the defect for each pair found to be defective and remedies used to clear the defect. In order for the cable distribution system to be considered acceptable, there shall be no defective pairs in any cable. Any cable having defective pairs shall not be used and shall be replaced at Contractor's expense.

3.22 INSPECTIONS

- A. Routine on-site construction inspections by the Architect/Engineer and/or an Owner's representative will involve trips to the complex to inspect construction, so as to assure adherence to standard construction practices. The number of such inspections will be at the Architect/Engineer's discretion.

3.23 ACCEPTANCE

- A. The project shall be considered acceptable based upon the following:
1. Contractor has furnished and installed all equipment and materials and performed all work in accordance with these specifications.
 2. Contractor has successfully completed all the required testing assuring compliance with the required specifications.
 3. Contractor has removed all trash and debris by contractor from the area and restored site to original condition.
 4. Contractor has submitted the required documentation to state officials.

END OF SECTION 28 05 13

SECTION 28 31 10 - INTELLIGENT COMMUNICATING FIRE DETECTION
SYSTEM (FIRE WARDEN 100)



PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This section of the specification includes the furnishing, installation, connection and testing of the microprocessor controlled, intelligent reporting fire alarm equipment required to form a complete, operative, coordinated system. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, Fire Alarm Control Panel (FACP), auxiliary control devices, annunciators, and wiring as shown on the drawings and specified herein.
- B. The fire alarm system shall comply with requirements of NFPA Standard No. 72 for Local Protected Premises Signaling Systems except as modified and supplemented by this specification. The system field wiring shall be supervised either electrically or by software-directed polling of field devices.
 - 1. The Secondary Power Source of the fire alarm control panel will be capable of providing at least 24 hours of backup power with the ability to sustain 15 minutes in alarm at the end of the backup period.
- C. The fire alarm system shall comply with requirements of NFPA Standard No. 72 for Auxiliary Protected Premises Signaling Systems except as modified and supplemented by this specification. The system field wiring shall be supervised either electrically or by software-directed polling of field devices.
 - 1. The Secondary Power Source of the fire alarm control panel will be capable of providing at least 60 hours of backup power with the ability to sustain 15 minutes in alarm at the end of the backup period.
 - 2. The Secondary Power Source installed in a system backed up by a generator need to supply 4 hours of backup power.
- D. The fire alarm system shall comply with requirements of NFPA Standard No. 72 for Local Protected Premises Signaling Systems except as modified and supplemented by this specification. The system field wiring shall be supervised either electrically or by software-directed polling of field devices.
 - 1. The Secondary Power Source of the fire alarm control panel will be capable of providing at least 24 hours of backup power with the ability to sustain 15 minutes in alarm at the end of the backup period.
- E. The fire alarm system shall comply with requirements of NFPA Standard No. 72 for Remote Station Protected Premises Signaling Systems except as modified and supplemented by this specification. The system field wiring shall be supervised either electrically or by software-directed polling of field devices.

1. The Secondary Power Source of the fire alarm control panel will be capable of providing at least 60 hours of backup power with the ability to sustain 15 minutes in alarm at the end of the backup period.
 2. The Secondary Power Source installed in a system backed up by a generator need to supply 4 hours of backup power.
- F. The fire alarm system shall comply with requirements of NFPA Standard No. 72 for Local Protected Premises Signaling Systems except as modified and supplemented by this specification. The system field wiring shall be supervised either electrically or by software-directed polling of field devices.
1. The Secondary Power Source of the fire alarm control panel will be capable of providing at least 24 hours of backup power with the ability to sustain 5 minutes in alarm at the end of the backup period.
- G. The fire alarm system shall be manufactured by an ISO 9001 certified company and meet the requirements of BS EN9001: ANSI/ASQC Q9001-1994.
- H. The FACP and peripheral devices shall be manufactured 100% by a single U.S. manufacturer (or division thereof).
- I. Underwriters Laboratories Inc. (UL) - USA:
1. No. 38 Manually Actuated Signaling Boxes
 2. No. 50 Cabinets and Boxes
 3. No. 864 Control Units for Fire Protective Signaling Systems
 4. No. 268 Smoke Detectors for Fire Protective Signaling Systems
 5. No. 268A Smoke Detectors for Duct Applications
 6. No. 346 Waterflow Indicators for Fire Protective Signaling Systems
 7. No. 464 Audible Signaling Appliances
 8. No. 521 Heat Detectors for Fire Protective Signaling Systems
 9. No. 1971 Visual Notification Appliances
- J. The installing company shall employ NICET (minimum Level III Fire Alarm Technology) technicians on site to guide the final check-out and to ensure the systems integrity.

1.2 SCOPE

- A. An intelligent, microprocessor-controlled, fire alarm detection system shall be installed in accordance to the project specifications and drawings.
- B. Basic Performance:
1. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded on NFPA Style 4 (Class B), NFPA Style 6 (Class A) or NFPA 7 (Class A) Signaling Line Circuits (SLC).

2. Initiation Device Circuits (IDC) shall be wired Class B (NFPA Style B) or Class A (NFPA Style D) as part of an addressable device connected by the SLC Circuit.
3. Notification Appliance Circuits (NAC) shall be wired Class B (NFPA Style Y) or Class A (NFPA Style Z) as part of an addressable device connected by the SLC Circuit.
4. All circuits shall be power-limited, UL864 9th edition requirements.
5. A single ground fault or open circuit on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm when wired NFPA Style 6/7.
6. Alarm signals arriving at the main FACP shall not be lost following a primary power failure or outage of any kind until the alarm signal is processed and recorded.

1.3 BASIC SYSTEM FUNCTIONAL OPERATION

- A. When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:
 1. The system Alarm LED on the FACP shall flash.
 2. A local sounder with the control panel shall sound.
 3. A backlit 80-character LCD display on the FACP shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.
 4. In response to a fire alarm condition, the system will process all control programming and activate all system outputs (alarm notification appliances and/or relays) associated with the point(s) in alarm.

1.4 SUBMITTALS

- A. General:
 1. Eight identical copies of all submittals shall be submitted to the Architect/Engineer for review.
 2. All references to manufacturer's model numbers and other pertinent information herein are intended to establish minimum standards of performance, function and quality. Equivalent compatible UL-listed equipment from other manufacturers may be substituted for the specified equipment as long as the minimum standards are met.
 3. For equipment other than that specified, the contractor shall supply proof that such substitute equipment equals or exceeds the features, functions, performance, and quality of the specified equipment. This submission shall occur a minimum of ten working days prior to bid and shall comply with all requirements for prior approval as specified in Section 16001 - Electrical General Provisions. Equivalent equipment (compatible UL Listed) from other manufacturers may be substituted for the specified equipment as long as the minimum standards are met.

B. Prior Approvals:

1. All submissions for prior approvals shall include the following information as a minimum.
 - a. Standard Manufacturer's cut sheets on every piece of equipment to be provided as part of this project. Cut sheets shall indicate performance, physical sizes, construction materials, expand ability, etc.
 - b. Listing of all differences (deficiencies and betterment) between the proposed system and the specified system.
 - c. Any other supporting information required to demonstrate equivalency to system specified.

C. Shop Drawings:

1. Contractor shall be responsible for submitting printed copies through the Architect/Engineer for review and obtaining approval from the Authority Having Jurisdiction (AHJ) for installation of the Fire Alarm System. Submittal to the State Fire Marshal shall occur after Contractor has obtained a "No Exceptions Taken", or "Make Corrections Noted" comment on Fire Detection and Alarm System Shop Drawings from the Architect/Engineer. No payment will be made to the contractor for any fire alarm system work until submittal is forwarded to the AHJ for approval. All submittals to the Architect/Engineer shall include the following as a minimum:
 - a. System Riser Diagram - include all devices and components of the system by zone, group, or individual device. Each device shall be labeled indicating location in the facility.
 - b. System Wiring Diagram - Include diagrams for equipment and for system with all terminals and interconnections identified. Make all diagrams specific to this project and distinguish between field and factory wiring.
 - c. System Component Data Sheets - Indicating current draw-in alarm mode and in standby mode. Also submit component data sheets to indicate UL compatibility with system and compatibility with rest of system. Indicate all applicable data by highlighting on ALL submittal booklets.
 - d. Zone Designations, group(s) or individual device(s).
 - e. Battery Load Calculations for sizing battery for twenty-four (24) hours of continuous system operation in standby mode followed by five (5) minutes of continuous full evacuation alarm condition (fifteen (15) minutes of continuous full evacuation alarm if a voice evacuation alarm system is present in the system.) Calculations shall be on equipment manufacturer's standard form and shall clearly indicate capacity of batteries proposed to be installed.
 - f. Master list of system components by model number, description, and quantity of each.
 - g. Shop Drawings showing details of graphic annunciator

- h. Device Address List
 - i. Annunciator Lay-out, configurations.
 - j. Review Application - Contractor's portion completed
 - k. Review Application Fee - If Required
 - l. Blueline or xerox copies of plans complying with the following criteria:
 - i. Drawn to scale
 - ii. Identify each room or area
 - iii. Show all system components, identifying each
 - iv. Show all exits, door swings, ceiling height, light fixtures, exit lights (with direction arrows), HVAC openings in ceilings, whether ceilings are sloped or flat, and show all projections 0'-4" below ceilings
 - v. Shall not have Architect's/Engineer's titlebox and/or professional stamp
 - vi. No markings showing additions, deletions or revisions after copies are made
 - vii. Highlight in yellow or blue all system components
 - viii. Proposed conductor routings
 - ix. Includes north arrow
 - x. Graphic scale
 - m. Statement on type of system - must be one of the following:
 - i. Local
 - ii. Auxiliary
 - iii. Remote Station
 - iv. Proprietary
 - n. Description of this project's specific Sequence of Operation.
 - o. Description of wiring.
 - p. Designation of type
 - q. Color of insulation
2. Manufacturer's certificate certifying supplier is an authorized factory representative along with mileage distance of office to job site.
 3. Certificate showing that supplier/installer is licensed by the State Fire Marshal's Office to install, modify and maintain fire detection and alarm system.
- D. Be aware that State Fire Marshal requirements do not allow work to occur on any portion of the fire alarm system prior to receipt of their approval on shop drawings.
- E. Manuals:
1. Submit simultaneously with the shop drawings, complete operating and maintenance manuals listing the manufacturer's name(s), including technical data sheets.
 2. Wiring diagrams shall indicate internal wiring for each device and the interconnections between the items of equipment.
 3. Provide a clear and concise description of operation that gives, in detail, the information required to properly operate the equipment and system.

F. Software Modifications

1. Provide the services of a qualified technician to perform all system software modifications, upgrades or changes. Response time of the technician to the site shall not exceed 4 hours.
2. Provide all hardware, software, programming tools and documentation necessary to modify the fire alarm system on site. Modification includes addition and deletion of devices, circuits, zones and changes to system operation and custom label changes for devices or zones. The system structure and software shall place no limit on the type or extent of software modifications on-site. Modification of software shall not require power-down of the system or loss of system fire protection while modifications are being made.

G. Certifications:

1. Together with the shop drawing submittal, submit a certification from the major equipment manufacturer indicating that the proposed supervisor of the installation and the proposed performer of contract maintenance is an authorized representative of the major equipment manufacturer. Include names and addresses in the certification.

1.5 GUARANTY:

- A. All work performed, and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one-year period shall be included in the submittal bid.

1.6 APPLICABLE STANDARDS AND SPECIFICATIONS:

- A. The specifications and standards listed below form a part of this specification. The system shall fully comply with the latest issue of these standards, if applicable.
- B. National Fire Protection Association (NFPA) - USA:
1. No. 13 Sprinkler Systems
 2. No. 70 National Electric Code (NEC)
 3. No. 72 National Fire Alarm Code
 4. No. 101 Life Safety Code
- C. The system and its components shall be Underwriters Laboratories, Inc. listed under the appropriate UL testing standard as listed herein for fire alarm applications and the installation shall be in compliance with the UL listing.

- D. Local and State Building Codes.
- E. All requirements of the Authority Having Jurisdiction (AHJ).

1.7 APPROVALS:

- A. The system shall have proper listing and/or approval from the following nationally recognized agencies:
 - 1. UL Underwriters Laboratories Inc
 - 2. ULC Underwriters Laboratories Canada
 - 3. FM Factory Mutual
 - 4. MEA Material Equipment Acceptance (NYC)
 - 5. CSFM California State Fire Marshal

PART 2 - PRODUCTS

2.1 EQUIPMENT AND MATERIAL, GENERAL:

- A. All equipment and components shall be new, and the manufacturer's current model. The materials, appliances, equipment, and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a fire protective signaling system, meeting the National Fire Alarm Code.
- B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.
- C. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

2.2 CONDUIT AND WIRE:

- A. Conduit:
 - 1. Conduit shall be in accordance with The National Electrical Code (NEC), local and state requirements.
 - 2. All wiring shall be installed using conduit in un-accessible spaces and/or where exposed and j-hooks in accessible spaces. Conduit fill shall not exceed 40 percent of interior cross-sectional area where three or more cables are contained within a single conduit.
 - 3. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per NEC Article 760-55.
 - 4. Wiring for 24-volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in

the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices, and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.

5. Conduit shall not enter the fire alarm control panel, or any other remotely mounted control panel equipment or backboxes, except where conduit entry is specified by the FACP manufacturer.
6. Conduit shall be 3/4-inch (19.1 mm) minimum.

B. Wire:

1. All fire alarm system wiring shall be new.
2. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits and Signaling Line Circuits, and 14 AWG (1.63 mm) for Notification Appliance Circuits.
3. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
4. Wiring used for the multiplex communication circuit (SLC) shall be twisted and support a minimum wiring distance of 10,000 feet when sized at 12 AWG. The design of the system shall permit use of IDC and NAC wiring in the same conduit with the SLC communication circuit. Shielded wire shall not be required.
5. All field wiring shall be electrically supervised for open circuit and ground fault.
6. The fire alarm control panel shall be capable of T-tapping Class B (NFPA Style 4) Signaling Line Circuits (SLCs). Systems which do not allow or have restrictions in, for example, the amount of T-taps, length of T-taps etc., is not acceptable.

C. Terminal Boxes, Junction Boxes and Cabinets:

1. All boxes and cabinets shall be UL listed for their use and purpose.

D. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. Fire alarm control panel primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold-water pipe or grounding rod. The control panel enclosure shall feature a quick removal chassis to facilitate rapid replacement of the FACP electronics.

1. The FACP shall be capable of coding Notification Appliance Circuits in March Time Code (120 PPM), Temporal (NFPA 72), and California Code. Main panel notification circuits (NACs 1 & 2) shall also automatically synchronize any of the following manufacturer's notification appliances

connected to them: System Sensor, Wheelock, or Gentex with no need for additional synchronization modules.

2.3 MAIN FIRE ALARM CONTROL PANEL:

- A. The FACP shall be a NOTIFIER NFW2-100 (FireWarden-100-2) and shall contain a microprocessor-based Central Processing Unit (CPU). The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, and other system-controlled devices.
- B. Operator Control
 - 1. Acknowledge Switch:
 - a. Activation of the control panel Acknowledge switch in response to new alarms and/or troubles shall silence the local panel piezo electric signal and change the alarm and trouble LEDs from flashing mode to steady-ON mode. If multiple alarm or trouble conditions exist, depression of this switch shall advance the 80-character LCD display to the next alarm or trouble condition.
 - b. Depression of the Acknowledge switch shall also silence all remote annunciator piezo sounders.
 - 2. Alarm Silence Switch:
 - a. Activation of the alarm silence switch shall cause all programmed alarm notification appliances and relays to return to the normal condition after an alarm condition. The selection of notification circuits and relays that are silenceable by this switch shall be fully field programmable within the confines of all applicable standards. The FACP software shall include silence inhibit and auto-silence timers.
 - 3. Alarm Activate (Drill) Switch:
 - a. The Alarm Activate switch shall activate all notification appliance circuits. The drill function shall latch until the panel is silenced or reset.
 - 4. System Reset Switch:
 - a. Activation of the System Reset switch shall cause all electronically-latched initiating devices, appliances, or software zones, as well as all associated output devices and circuits, to return to their normal condition.
 - 5. Lamp Test:
 - a. The Lamp Test switch shall activate all system LEDs and light each segment of the liquid crystal display.
- C. System Capacity and General Operation
 - 1. The control panel shall provide, or be capable of, expansion to 198 intelligent/addressable devices.

2. The control panel shall include Form-C Alarm, Trouble and Supervisory relays rated at a minimum of 2.0 amps @ 30 VDC. It shall also include programmable Notification Appliance Circuits (NACs) capable of being wired as Class B (NFPA Style Y) or Class A (NFPA Style Z).
3. The fire alarm control panel shall include an operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display (LCD), individual color-coded system status LEDs, and an alphanumeric keypad for the field programming and control of the fire alarm system.
4. All programming or editing of the existing program in the system shall be achieved without special equipment and without interrupting the alarm monitoring functions of the fire alarm control panel. The system shall be fully programmable, configurable, and expandable in the field without the need for special tools, PROM programmers or PC based programmers. It shall not require replacement of memory ICs to facilitate programming changes. The control unit will support the ability to upgrade its operating program using FLASH memory technology. The unit shall provide the user with the ability to program from either the included keypad, a standard PS2-style PC keyboard or from a computer running upload/download software.
5. The system shall allow the programming of any input to activate any output or group of outputs. Systems which have limited programming (such as general alarm), have complicated programming (such as a diode matrix), or REQUIRE a laptop personal computer are not considered suitable substitutes.
6. The FACP shall provide the following features:
 - a. Drift compensation to extend detector accuracy during the accumulation of dust and foreign material.
 - b. Detector sensitivity test, meeting requirements of NFPA 72, Maintenance alert, with two levels (maintenance alert/maintenance urgent), to warn of excessive smoke detector dirt or dust accumulation.
 - c. The ability to display or print system reports.
 - d. Alarm verification.
 - e. Positive Alarm Sequence (PAS pre-signal), meeting NFPA 72 (2002 Edition) 6.8.1.3 requirements.
 - f. Rapid manual station reporting.
 - g. Non-alarm points for general (non-fire) control.
 - h. Periodic detector test, conducted automatically by the software.
 - i. Walk test, with a check for two detectors set to same address.
7. The FACP shall be capable of coding Notification Appliance Circuits in March Time Code (120 PPM), Temporal (NFPA 72 A-2-2.2.2), and California Code. Main panel notification circuits (NACs 1 & 2) shall also automatically synchronize the following manufacturer's notification appliances connected to them: System Sensor, Wheelock, or Gentex with no need for additional synchronization modules.

D. Central Microprocessor

1. The microprocessor shall be a state-of-the-art, high speed, 16-bit RISC device and it shall communicate with, monitor, and control all external interfaces. It shall include an EPROM for system program storage, non-volatile memory for building-specific program storage, and a "watch dog" timer circuit to detect and report microprocessor failure.
2. The microprocessor shall contain and execute all specific actions to be taken in the condition of an alarm. Control programming shall be held in non-volatile programmable memory and shall not be lost even if system primary and secondary power failure occurs.
3. The microprocessor shall also provide a real-time clock for time annotation of system displays, printer, and history file.
4. A special program check function shall be provided to detect common operator errors.
5. An auto-programming capability (self-learn) shall be provided to quickly identify devices connected on the SLC and make the system operational.
6. For flexibility and to ensure program validity, an optional Windows (TM) based program utility shall be available. This program shall be used to off-line program the system with batch upload/download. This program shall also have a verification utility which scans the program files, identifying possible errors. It shall also have the ability to compare old program files to new ones, identifying differences in the two files to allow complete testing of any system operating changes. This shall be in compliance with the NFPA 72 requirements for testing after system modification.

E. Local Keyboard Interface

1. In addition to an integral keypad, the fire alarm control panel will accept a standard PS2-style keyboard for programming, testing, and control of the system. The keyboard will be able to execute the system functions ACKNOWLEDGE, SIGNALS SILENCED, DRILL and RESET.

F. Display

1. The display shall provide all the controls and indicators used by the system operator and may also be used to program all system operational parameters.
2. The display shall include status information and custom alphanumeric labels for all intelligent detectors, addressable modules, internal panel circuits, and software zones.
3. The display shall contain an alphanumeric, text-type display and dedicated LEDs for the annunciation of AC POWER, FIRE ALARM, SUPERVISORY, TROUBLE, MAINTENANCE, ALARM SILENCED, DISABLED, BATTERY, and GROUND conditions.
4. The display keypad shall be part of the standard system and have the capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels shall be provided to prevent unauthorized system control or programming.

5. The display shall include the following operator control switches: ACKNOWLEDGE, ALARM SILENCE, DRILL (alarm activate), and SYSTEM RESET.
- G. Signaling Line Circuit (SLC)
1. The SLC interface shall provide power to and communicate with up to 99 intelligent detectors (ionization, photoelectric or thermal) and 99 intelligent modules (monitor or control) for a system capacity of 198 devices. Each SLC shall be capable of NFPA 72 Style 4, Style 6, or Style 7 (Class A or B) wiring.
 2. The CPU shall receive information from all intelligent detectors to be processed to determine whether normal, alarm, or trouble conditions exist for each detector. The software shall automatically compensate for the accumulation of dust in each detector up to allowable limits. The information shall also be used for automatic detector testing and for the determination of detector maintenance conditions.
 3. The detector software shall meet NFPA 72, Chapter 7 requirements and be certified by UL as a calibrated sensitivity test instrument.
- H. Serial Interfaces
1. The system shall provide a means of interfacing to UL Listed Electronic Data Processing (EDP) peripherals using the EIA-232 communications standard.
 2. One EIA-232 interface shall be used to connect an UL-Listed 80-column printer. The printer shall communicate with the control panel using an interface complying with Electrical Industries Association standard EIA-232D. Power to the printer shall be 120 VAC @ 60 Hz.
- I. The control panel will have the capability of Reverse Polarity Transmission or connection to a Municipal Box for compliance with applicable NFPA standards.
- J. Digital Alarm Communicator Transmitter (DACT). The DACT is an interface for communicating digital information between a fire alarm control panel and a UL-Listed central station.
1. The DACT shall be an integral component of the fire alarm control panel requiring no interconnecting wiring, plug-in module or supervisory circuitry.
 2. The DACT shall include connections for dual telephone lines (with voltage detect), per UL/NFPA/FCC requirements. It shall include the ability for split reporting of panel events up to two different telephone numbers.
 3. The DACT shall be completely field programmable locally from the control panel keypad or via PC software connected to the panel serial port. The DACT shall support upload/download of programming parameters from a remote location over a phone line using upload/download PC software.

4. The DACT shall be capable of transmitting events in at least 15 different formats. This ensures compatibility with existing and future transmission formats.
5. Communication shall include vital system status such as:
 - a. Independent Zone (Alarm, trouble, non-alarm, supervisory)
 - b. Independent Addressable Device Status
 - c. AC (Mains) Power Loss
 - d. Low Battery and Earth Fault
 - e. System Off Normal
 - f. 12 and 24-Hour Test Signal
 - g. Abnormal Test Signal (per UL requirements)
 - h. EIA-485 Communications Failure
 - i. Phone Line Failure
6. The DACT shall support independent zone/point reporting when used in the Contact ID format. In this format, the DACT shall support the transmission of up addressable points with the system. This format shall enable the central station to have exact details concerning the location of the fire for emergency response.

K. Enclosures:

1. The control panel shall be housed in a UL-listed cabinet suitable for surface or semi-flush mounting. The cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.
2. The back box and door shall be constructed of steel with provisions for electrical conduit connections into the sides and top.
3. The door shall provide a key lock and shall provide for the viewing of all indicators.
4. The cabinet shall accept a chassis containing the PCB and to assist in quick replacement of all the electronics including power supply shall require no more than two bolts to secure the panel to the enclosure back box.

L. Field Charging Power Supply: The FCPS is a device designed for use as either a remote 24-volt power supply or as a booster for powering Notification Appliances.

1. The FCPS shall offer up to 8.0 amps (6.0 amps continuous) of regulated 24-volt power. It shall include an integral charger designed to charge 18.0-amp hour batteries.
2. The Field Charging Power Supply shall have two input triggers. The input trigger shall be a Notification Appliance Circuit (from the fire alarm control panel) or a control relay. Four NAC outputs, wired NFPA Style Y or Z, shall be available for connection to the Notification devices.
3. The FCPS shall optionally provide synchronization of all connected strobes or horn strobe combinations when System Sensor, Wheelock, or Gentex devices are installed.
4. The FCPS shall function as a sync follower as well as a sync generator.

5. The FCPS shall include a surface mount backbox.
6. The Field Charging Power Supply shall include the ability to delay the reporting of an AC fail condition per NFPA requirements.
7. The FCPS shall provide 24 VDC regulated and power-limited circuitry per 1995 UL standards.

M. Power Supply:

1. The main power supply for the fire alarm control panel shall provide up to 6.0 amps of available power for the control panel and peripheral devices.
2. Provisions will be made to allow the audio-visual power to be increased as required by adding modular expansion audio-visual power supplies.
3. Positive-Temperature-Coefficient (PTC) thermistors, circuit breakers, or other over-current protection shall be provided on all power outputs. The power supply shall provide an integral battery charger or may be used with an external battery and charger systems. Battery arrangement may be configured in the field.
4. The main power supply shall continuously monitor all field wires for earth ground conditions.
5. The main power supply shall operate on 120 VAC, 60 Hz, and shall provide all necessary power for the FACP.

N. Programmable Electronic Sounders:

1. Electronic sounders shall operate on 24 VDC nominal.
2. Electronic sounders shall be field programmable without the use of special tools, to provide slow whoop, continuous, or interrupted tones with an output sound level of at least 90 dBA measured at 10 feet from the device.
3. Shall be flush or surface mounted as show on plans.
4. Where shown to be installed outside, device shall be of the weatherproof design.
5. Where installed surface mounted, provide factory backbox and/or backbox skirt so that edge of device does not overhang installation box.

O. Strobe lights shall meet the requirements of the ADA, UL Standard 1971 and shall meet the following criteria:

1. The maximum pulse duration shall be 2/10 of one second.
2. Strobe intensity shall meet the requirements of UL 1971.
3. The flash rate shall meet the requirements of UL 1971.
4. Where shown to be installed outside, device shall be of the weatherproof design.
5. Where installed surface mounted, provide factory backbox and/or backbox skirt so that edge of device does not overhang installation box.

P. Audible/Visual Combination Devices:

1. Shall meet the applicable requirements of Section A listed above for audibility.
2. Shall meet the requirements of Section B listed above for visibility.
3. Where shown to be installed outside, device shall be of the weatherproof design.
4. Where installed surface mounted, provide factory backbox and/or backbox skirt so that edge of device does not overhang installation box.

Q. Manual Fire Alarm Stations

1. Manual fire alarm stations shall be non-code, double action, non-break glass type, equipped with key lock so that they may be tested without operating the handle.
2. Stations must be designed such that after an actual activation, they cannot be restored to normal except by key reset.
3. An operated station shall automatically condition itself so as to be visually detected, as operated, at a minimum distance of 100 feet (30.5 m) front or side.
4. Manual stations shall be constructed of aluminum, with operating instructions provided on the cover. The word FIRE shall appear on the manual station in letters one half inch (12.7 mm) in size or larger.
5. All manual stations installed outdoors, in non-conditioned spaces and/or wet environments shall be installed with STI No. STI-3150-R weather stopper cover.
6. Surface mounted manual stations shall be complete with factory backbox such as the Notifier BG-2. Typical wiring device backboxes will not be accepted.

R. Conventional Photoelectric Area Smoke Detectors

1. Photoelectric smoke detectors shall be a 24 VDC, two-wire, ceiling-mounted, light scattering type using an LED light source.
2. Each detector shall contain a remote LED output and a built-in test switch.
3. The detector shall be of a separate head-in-base design.
4. The detector shall automatically provide drift compensation to minimize nuisance alarms.
5. The detector shall be capable of generating a signal when maintenance is required.
6. It shall be possible to read the sensitivity of the device in percent obscuration per foot without the need for the generation of smoke.
7. A visual indication of an alarm shall be provided by dual latching Light Emitting Diodes (LEDs), on the detector, which may be seen from ground level over 360 degrees. These LEDs shall flash every 5 seconds, indicating that power is applied to the detector.
8. The detector shall not go into alarm when exposed to air velocities of up to 3000 feet (914.4 m) per minute.

9. The detector screen and cover assembly shall be easily removable for field cleaning of the detector chamber.
10. All field wire connections shall be made to the base through the use of a clamping plate and screw.

S. Conventional Ionization Type Area Smoke Detectors

1. Ionization type smoke detectors shall be a two wire, 24 VDC type using a dual unipolar chamber.
2. Each detector shall contain a remote LED output and a built-in test switch.
3. Detector shall be provided on a twist-lock base.
4. It shall be possible to perform a calibration sensitivity and performance test on the detector without the need for the generation of smoke.
5. A visual indication of an alarm shall be provided by dual latching Light Emitting Diodes (LEDs) over 360 degrees, on the detector, which may be seen from ground level. This LED shall flash every 10 seconds, indicating that power is applied to the detector.
6. The detector shall not alarm when exposed to air velocities of up to 1,200 feet (365.76 m) per minute. The detector screen and cover assembly shall be easily removable for field cleaning of the detector chamber.
7. All field wire connections shall be made to the base through the use of a clamping plate and screw.

T. Duct Smoke Detectors

1. Duct smoke detectors shall be a 24 VDC type with visual alarm and power indicators, and a reset switch. Each detector shall be installed upon the composite supply/return air ducts(s), with properly sized air sampling tubes.

U. Projected Conventional Beam Detector

1. The projected beam type shall be a 4-wire 24 VDC conventional smoke detector device.
2. The detector shall be listed to UL 268 and shall consist of a single transmitter\receiver and corresponding non powered reflector.
3. The detector shall operate in either a short range (16' - 230') or long range (16' - 328') when used with an extender module.
4. The temperature range of the device shall be -22 degrees F to 131 degrees F.
5. The detector shall feature an optical sight and 2-digit signal strength meter to ensure proper alignment of unit without need of special tools.
6. The unit shall be both ceiling and wall mountable.
7. The detector shall have the ability to be tested using calibrated test filters or magnet-activated remote test station.}
8. The detector shall be equipped with an integral sensitivity test feature that consists of a test filter attached to a servomotor inside the detector optics. Using the remote test station, the motor shall be activated and shall move

the filter in the pathway of the light beam, thereby testing detector sensitivity. This integral sensitivity test feature shall allow the user to quickly and easily meet the annual maintenance/test requirements of NFPA 72.

V. Automatic Conventional Heat Detectors

1. Automatic heat detectors shall have a combination rate of rise and fixed temperature rated at 135 degrees Fahrenheit (57.2 Celsius) for areas where ambient temperatures do not exceed 100 degrees (37.7 Celsius), and 200 degrees (93.33 Celsius) for areas where the temperature does not exceed 150 degrees (65.5 Celsius).
2. Automatic heat detectors shall be a low profile, ceiling mount type with positive indication of activation.
3. The rate of rise element shall consist of an air chamber, a flexible metal diaphragm, and a factory calibrated, moisture-proof, trouble free vent, and shall operate when the rate of temperature rise exceeds 15 degrees F (9.4 degrees C) per minute.
4. The fixed temperature element shall consist of a fusible alloy retainer and actuator shaft.
5. Automatic heat detectors shall have a smooth ceiling rating of 2500 square feet (762 square meters).

W. Waterflow Indicator:

1. Waterflow Switches shall be an integral, mechanical, non-coded, non-accumulative retard type.
2. Waterflow Switches shall have an alarm transmission delay time which is conveniently adjustable from 0 to 60 seconds. Initial settings shall be 30-45 seconds.
3. All waterflow switches shall come from a single manufacturer and series.
4. Waterflow switches shall be provided and connected under this section but installed by the mechanical contractor.
5. Where possible, locate waterflow switches a minimum of one (1) foot from a fitting which changes the direction of the flow and a minimum of three (3) feet from a valve.

X. Sprinkler and Standpipe Valve Supervisory Switches:

1. Each sprinkler system water supply control valve riser, zone control valve, and standpipe system riser control valve shall be equipped with a supervisory switch. Standpipe hose valves, and test and drain valves shall not be equipped with supervisory switches.
2. PIV (post indicator valve) or main gate valves shall be equipped with a supervisory switch.
3. The switch shall be mounted so as not to interfere with the normal operation of the valve and adjusted to operate within two revolutions

- toward the closed position of the valve control, or when the stem has moved no more than one-fifth of the distance from its normal position.
4. The supervisory switch shall be contained in a weatherproof aluminum housing, which shall provide a 3/4-inch (19 mm) conduit entrance and incorporate the necessary facilities for attachment to the valves.
 5. The switch housing shall be finished in red baked enamel.
 6. The entire installed assembly shall be tamper proof and arranged to cause a switch operation if the housing cover is removed, or if the unit is removed from its mounting.
 7. Valve supervisory switches shall be provided and connected under this section and installed by mechanical contractor.

Y. Specific System Operations

1. Alarm Verification: Each of the intelligent addressable smoke detectors in the system may be independently programmed for verification of alarm signals. The alarm verification time period shall not exceed 2 minutes.
2. Point Disable: Any addressable device or conventional circuit in the system may be enabled or disabled through the system keypad.
3. Point Read: The system shall be able to display the following point status diagnostic functions:
 - a. Device status
 - b. Device type
 - c. Custom device label
 - d. Device zone assignments
4. System Status Reports: Upon command from an operator of the system, a status report will be generated and printed, listing all system status.
5. System History Recording and Reporting: The fire alarm control panel shall contain a history buffer that will be capable of storing up to 1000 events. Each of these activations will be stored and time and date stamped with the actual time of the activation. The contents of the history buffer may be manually reviewed, one event at a time, or printed in its entirety.
6. The history buffer shall use non-volatile memory. Systems that use volatile memory for history storage are not acceptable substitutes.
7. Automatic Detector Maintenance Alert: The fire alarm control panel shall automatically interrogate each intelligent detector and shall analyze the detector responses over a period of time. If any intelligent detector in the system responds with a reading that is above or below normal limits, then the system will enter the trouble mode, and the particular detector will be annunciated on the system display. This feature shall in no way inhibit the receipt of alarm conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.
8. The fire alarm control panel shall include Silent and Audible Walk Test functions - Silent and Audible. It shall include the ability to test initiating device circuits and Notification Appliance Circuits from the field without returning to the panel to reset the system. The operation shall be as follows:

- a. The Silent Walk Test will not sound NACs but will store the Walk Test information in History for later viewing.
- b. Alarming an initiating device shall activate programmed outputs, which are selected to participate in Walk Test.
- c. Introducing a trouble into the initiating device shall activate the programmed outputs.
- d. Walk Test shall be selectable on a per device/circuit basis. All devices and circuits which are not selected for Walk Test shall continue to provide fire protection and if an alarm is detected, will exit Walk Test and activate all programmed alarm functions.
- e. All devices tested in walk test shall be recorded in the history buffer.
- 9. Waterflow Operation
 - a. An alarm from a waterflow detection device shall activate the appropriate alarm message on the control panel display; turn on all programmed Notification Appliance Circuits and shall not be affected by the Signal Silence switch.
- 10. Supervisory Operation
 - a. An alarm from a supervisory device shall cause the appropriate indication on the control panel display, light a common supervisory LED, but will not cause the system to enter the trouble mode.
- 11. Signal Silence Operation
 - a. The FACP shall have the ability to program each output circuit (notification circuit or relay) to deactivate upon depression of the Signal Silence switch.
- 12. Non-Alarm Input Operation
 - a. Any addressable initiating device in the system may be used as a non-alarm input to monitor normally open contact type devices. Non-alarm functions are a lower priority than fire alarm initiating devices.

2.4 SYSTEM COMPONENTS:

A. Addressable Pull Box (manual station)

- 1. Addressable pull boxes shall, on command from the control panel, send data to the panel representing the state of the manual switch and the addressable communication module status. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key. Manual stations shall be of the double action type.
- 2. All operated stations shall have a positive, visual indication of operation and utilize a key type reset.
- 3. Manual stations shall be constructed of aluminum with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters, 1.75 inches (44 mm) or larger.
- 4. All manual stations installed outdoors, in non-conditioned spaces and/or wet environments shall be installed with STI No. STI-3150-R weather stopper cover.

5. Surface mounted manual stations shall be complete with factory backbox such as the Notifier BG-2. Typical wiring device backboxes will not be accepted.

B. Intelligent Photoelectric Smoke Detector

1. The detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.
2. The detectors shall be ceiling-mounted and available in an alternate model with an integral fixed 135-degree heat-sensing element.
3. Each detector shall contain a remote LED output and a built-in test switch.
4. Detector shall be provided on a twist-lock base.
5. It shall be possible to perform a calibrated sensitivity and performance test on the detector without the need for the generation of smoke. The test method shall test all detector circuits.
6. A visual indication of an alarm shall be provided by dual latching Light Emitting Diodes (LEDs), on the detector, which may be seen from ground level over 360 degrees. These LEDs shall periodically flash to indicate that the detector is in communication with the control panel.
7. The detector shall not go into alarm when exposed to air velocities of up to 1500 feet per minute (fpm).
8. The detector screen and cover assembly shall be easily removable for field cleaning of the detector chamber.
9. All field wire connections shall be made to the base through the use of a clamping plate and screw.

C. Intelligent Ionization Smoke Detector

1. The detectors shall use the dual-chamber ionization principal to measure products of combustion and shall, on command from the control panel, send data to the panel representing the analog level of products of combustion.

D. Intelligent Thermal Detectors

1. Thermal detectors shall be intelligent addressable devices rated at 135 degrees Fahrenheit (58 degrees Celsius) and have a rate-of-rise element rated at 15 degrees F (9.4 degrees C) per minute. It shall connect via two wires to the fire alarm control panel signaling line circuit.

E. Intelligent Duct Smoke Detector

1. The smoke detector housing shall accommodate an intelligent photoelectric detector that provides continuous monitoring and alarm verification from the panel.

2. When sufficient smoke is sensed, an alarm signal is initiated at the FACP, and appropriate action taken to change over air handling systems to help prevent the rapid distribution of toxic smoke and fire gases throughout the areas served by the duct system.

F. Addressable Dry Contact Monitor Module

1. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional alarm initiating devices (any normally open dry contact device) to one of the fire alarm control panel SLCs.
2. The monitor module shall mount in a 4-inch square (101.6 mm square), 2-1/8 inch (54 mm) deep electrical box.
3. The IDC zone shall be suitable for Style D or Style B operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.
4. For difficult to reach areas, the monitor module shall be available in a miniature package and shall be no larger than 2-3/4-inch (70 mm) x 1-1/4-inch (31.7 mm) x 1/2 inch (12.7 mm). This version need not include Style D or an LED.

G. Two-Wire Detector Monitoring

1. Means shall be provided for the monitoring of conventional Initiating Device Circuits populated with 2-wire smoke detectors as well as normally open contact alarm initiating devices (pull stations, heat detectors, etc).
2. Each IDC of conventional devices will be monitored as a distinct address on the polling circuit by an addressable module. The module will supervise the IDC for alarms and circuit integrity (opens).
3. The monitoring module will be compatible, and listed as such, with all devices on the supervised circuit.
4. The IDC zone may be wired for Class A or B (Style D or Style B) operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.
5. The monitoring module shall be capable of mounting in a 4-inch square (101.6 mm square), 2-1/8 inch (54 mm) deep electrical box or in a surface mount backbox.

H. Addressable Control Relay Module

1. Addressable control relay modules shall be provided to control the operation of fan shutdown and other auxiliary control functions.
2. The control module shall mount in a standard 4-inch square, 2-1/8 inch deep electrical box, or to a surface mounted backbox.
3. The control relay module will provide a dry contact, Form-C relay. The relay coil shall be magnetically latched to reduce wiring connection

requirements, and to ensure that 100% of all auxiliary relays may be energized at the same time on the same pair of wires.

4. The control relay module shall be suitable for pilot duty applications and rated for a minimum of 0.6 amps at 30 VDC.

I. Isolator Module

1. Isolator modules shall be provided to automatically isolate wire-to-wire short circuits on an SLC Style 6 (Class A) or Style 4 (Class B branch). The isolator module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC loop segment or branch. At least one isolator module shall be provided for each floor or protected zone of the building.
2. If a wire-to-wire short occurs, the isolator module shall automatically open-circuit (disconnect) the SLC. When the short circuit condition is corrected, the isolator module shall automatically reconnect the isolated section.
3. The isolator module shall not require any address setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an isolator module after its normal operation.
4. The isolator module shall mount in a standard 4-inch (101.6 mm) deep electrical box or in a surface mounted backbox. It shall provide a single LED that shall flash to indicate that the isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.

J. Serially Connected Annunciator

1. The annunciator shall communicate with the fire alarm control panel via a two wire EIA 485 (multi-drop) communications circuit.
2. The annunciator shall require no more than four wires for operation. Annunciation shall include: intelligent addressable points, system software zones, control relays, and notification appliance circuits. The following operations shall also be provided:
 - a. Up to 32 annunciators, each with up to 64 points may be installed on the system.
 - b. The annunciator shall include a single electrical key switch to disable all switch functions.
 - c. The annunciator shall provide alarm and trouble resound, with flash for new conditions.
 - d. This unit shall provide for each zone: alarm indications, using a red alarm and yellow trouble LEDs, and switches for the control of fire alarm control panel functions. The annunciator will also have an ON-LINE LED, local piezo electric signal, local acknowledge/lamp test switch, and custom slide-in zone/function identification labels.
 - e. Switches shall be available for remote annunciation and control of output points in the system, system acknowledge, telephone zone select, speaker select, global signal silence, and global system reset within the confines of all applicable standards.

3. This system shall provide a means of interfacing to graphic style annunciator.
4. The graphic annunciator interface will possess the capability of individually annunciating each individual addressable device in the system.

K. Alphanumeric LCD Type Annunciator:

1. The alphanumeric display annunciator shall be a supervised, remotely located backlit LCD display containing a minimum of eighty (80) characters for alarm annunciation in clear English text.
2. The LCD annunciator shall display all alarm and trouble conditions in the system.
3. An audible indication of alarm shall be integral to the alphanumeric display.
4. The display shall be UL listed for fire alarm application.
5. It shall be possible to connect up to 32 LCD displays and be capable of wiring distances up to 6,000 feet from the control panel.
6. The annunciator shall connect to a separate, dedicated "terminal mode" EIA-485 interface. This is a two-wire loop connection and shall be capable of distances to 6,000 feet. Each terminal mode LCD display shall mimic the main control panel.

L. Door Holders:

1. Door Holders will be available in 120 VAC and 24 VDC models.
2. 120 VAC models will be transient-protected against surges up to 600 volts.
3. Door holders will be designed for Fail Safe operation (power failure release door to close).

M. Elevator Recall:

1. Smoke detectors will be installed in the elevator hoist shaft. An alarm from such devices will signal the elevator to initiate emergency procedures. All lift call buttons; door buttons and signals will become inoperative in the lift bank serving the machine room. Lifts will immediately be sent to the main floor of egress (ground level) where they will be decommissioned until the alarm condition has been cleared or manually taken over by Fire Department personnel.
2. Smoke detectors will be installed in each elevator lobby. These detectors will function to signal the elevator to recall to the primary floor of egress (ground level) in the event of an alarm. Detectors on the first floor will signal the elevator to recall to the secondary floor of egress.

2.5 SYSTEM COMPONENTS - ADDRESSABLE DEVICES

A. Addressable Devices - General

1. Addressable devices shall employ the simple-to-set decade addressing scheme. Addressable devices which use a binary-coded address setting method, such as a DIP switch, are not an allowable substitute.
2. Detectors shall be addressable and intelligent and shall connect with two wires to the fire alarm control panel signaling line circuits.
3. Addressable smoke and thermal (heat) detectors shall provide dual alarm and power/polling LEDs. Both LEDs shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel, and both LEDs shall be placed into steady illumination by the control panel, indicating that an alarm condition has been detected. An output connection shall also be provided in the base to connect an external remote alarm LED.
4. Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72, Chapter 7.
5. Detectors shall be ceiling-mount and shall include a separate twist-lock base with tamper proof feature. Base options shall include a base with a built-in (local) sounder rated for a minimum of 85 DBA, a relay base and an isolator base designed for Style 7 applications.
6. Detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel.
7. Detectors shall also store an internal identifying type code that the control panel shall use to identify the type of device (ION, PHOTO, THERMAL).
8. Detectors shall provide address-setting means using decimal switches.

2.6 BATTERIES:

- A. Upon loss of Primary (AC) power to the control panel, the batteries shall have sufficient capacity to power the fire alarm system for required standby time (24 or 60 hours) followed by 5 minutes of alarm.
- B. The batteries are to be completely maintenance free. No liquids are required. Fluid level checks for refilling, spills, and leakage shall not be required.
- C. If necessary to meet standby requirements, external battery/charger systems may be used.

2.7 SURGE SUPPRESSION

- A. Provide and install Ditek No. 2MHLPB-WS on all initiating circuits entering/leaving the building. Also provide and install surge suppression at all devices mounted externally from the main building as well as on all Sprinkler/stand-pipe system monitoring/control devices. Provide and install devices in junction box concealed above accessible ceiling immediately at building exterior wall. Properly ground device per manufacturer's instruction.

- B. Provide and install Ditek No. DTK-120SRD-A on all 120V circuits providing power to any and all fire alarm system components. Provide and install empty cabinet adjacent to respective fire alarm system (match fire alarm system device cabinet). Cabinet to house surge protection device.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Installation shall be in accordance with the NEC, NFPA 72, local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.
- B. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. Smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage. All fire detection and alarm system devices, control panels and remote annunciators shall be flush mounted when located in finished areas and may be surface mounted when located in unfinished areas.
- C. Manual pull stations shall be suitable for surface mounting or semi flush mounting as shown on the plans and shall be installed not less than 42 inches (1067 mm), nor more than 48 inches (122 mm) above the finished floor.

3.2 TEST

- A. The service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment shall be provided to technically supervise and participate during all of the adjustments and tests for the system. All testing shall be in accordance with NFPA 72 Chapter 10. Testing shall be personally supervised by NICET Level III Certified Personnel
- B. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.
- C. Close each sprinkler system flow valve and verify proper supervisory alarm at the FACP.
- D. Verify activation of all waterflow switches.
- E. Open initiating device circuits and verify that the trouble signal actuates.
- F. Open and short signaling line circuits and verify that the trouble signal actuates.
- G. Open and short notification appliance circuits and verify that trouble signal actuates.

- H. Ground all circuits and verify response of trouble signals.
- I. Check presence and audibility of tone at all alarm notification devices.
- J. Check installation, supervision, and operation of all intelligent smoke detectors using the walk test.
- K. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.
- L. When the system is equipped with optional features, the manufacturer's manual shall be consulted to determine the proper testing procedures. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality and similar.

3.3 SPARE PARTS

- A. Contractor shall furnish the extra materials listed below, prior to installation that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents:
 - 1. Lamps for Strobe units
 - 2. Smoke Detectors
 - 3. Heat Detectors
 - 4. Duct Detectors
 - 5. Detector Bases
 - 6. Audio/Visual Units
 - 7. Visual Only Units
 - 8. Printer Ribbons
 - 9. Monitor Modules
 - 10. Control Modules
 - 11. Isolation Modules
 - 12. Manual Fire Alarm Pull Stations (Conventional or Addressable as applicable to job)
- B. Provide a quantity equal to no less than five percent (5%) of the number of units of each type installed but not less than one (1) of each type.
- C. Each spare part shall be complete with 50' of 3/4" EMT conduit, system wiring and required system programming.

3.4 SEQUENCING AND SCHEDULING

- A. Existing Fire Alarm Equipment: Maintain fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until new equipment is accepted. Remove tags from new equipment

when put into service and tag existing fire alarm equipment "NOT IN SERVICE" until removed from the building.

- B. Equipment Removal: After acceptance of the new fire detection and alarm system, remove existing disconnected fire alarm equipment and restore damaged surfaces. Package operational fire alarm and detection equipment that has been removed; deliver to Owner. Remove from site and legally dispose of remainder of existing material.

3.5 PROGRAM CODE

- A. At the end of the project and prior to requesting substantial completion, the Contractor shall provide on CD-Rom a copy of the current program code for the system.
 - 1. During program upload or download the system shall retain the capability for alarm reporting.
 - 2. The system shall download to a PC for program editing. System program shall be stored on a CD-ROM and all programming shall be multi-level password protected. A duplicate-copy of the CD-ROM shall be turned over to the Owner's personnel prior to requesting substantial completion. All system passwords shall also be turned over to the Owner at this time.

3.6 SYSTEM TESTING

- A. After installation of the Fire Detection and Alarm System is complete, the contractor shall align, adjust and balance the system and perform complete 100% operational testing as herein before described to determine conformance of the system to the requirements of the contract documents. Correct deficiencies observed in testing and replace malfunctioning or damaged items with new ones and retest until satisfactory performance and conditions are achieved. Record results using the fire alarm system printer of the testing and submit to the Engineer as part of the close-out documentation. Should the installation of a permanent printer not be part of the project, contractor shall provide and install a temporary printer and all required interface hardware, paper, toner (ink), software and programming to provide the required test reports. This temporary printer shall be available for printing test reports as required until final acceptance of the fire detection system has been issued by the engineer.
- B. In addition to the testing requirements herein before specified, testing shall also include the following as a minimum:
 - 1. Verify the absence of unwanted voltages between circuit conductors and the ground conductor(s).
 - 2. Test all conductors for short circuits.
 - 3. With each circuit pair, short circuit at the far end of the circuit and measure the circuit resistance with an ohmmeter. Record the circuit resistance of each circuit on the record drawings.

4. Test each and every initiation and signaling device for alarm operation and proper response at the control unit. Test smoke detectors with actual products of combustion.
5. Test both primary and secondary power sources for proper operation.
6. Test the system to ensure that all specified functions operate as specified. This includes all function switches and indications at all Fire Detection and Alarm System control and monitoring points.

3.7 FIRE MARSHAL'S CHECKOUT

- A. Upon completing the entire installation of the Fire Detection and Alarm System, the Contractor shall perform a demonstration of the operation of the complete system in the presence of the Architect/Engineer. The above demonstrations shall encompass the work performed under this Contract. Any deficiencies found with the Fire Detection and Alarm System installed as part of this project shall be corrected with no additional expense to the Owner prior to demonstration to "Authority Having Jurisdiction (AHJ)". After successful and accepted demonstration of the entire system to the Architect/Engineer, the Contractor shall schedule demonstration of the system with the Authority having Jurisdiction (AHJ).
- B. The Contractor shall be responsible for coordinating this demonstration with the Architect/Engineer and "Authority Having Jurisdiction (AHJ)" a minimum of forty-eight (48) hours prior to the meeting.

3.8 CLOSE-OUT DOCUMENTATION

- A. Upon successful completion of installation of the Fire Detection and Alarm System, the Contractor shall submit to the AHJ's office through the Architect/Engineer, a copy of the Fire Alarm System Certifications and Description form as described and required in NFPA 72.
- B. Contractor shall also label the Fire Detection and Alarm System as being certified by a Louisiana State Fire Marshal licensed contractor.
- C. Equipment Manuals: As part of the equipment manual submittals, the Contractor shall include the following information as a minimum:
 1. All information required to be submitted as part of the shop drawing submittal
 2. Operation and Maintenance Manual
 3. Device Address List
 4. Record of field tests of the system including the 100% operational test.
 5. Names, addresses, and telephone numbers of service department including nighttime and holiday access.

3.9 WARRANTY PERIOD REQUIRED WORK

- A. Three (3) months after date of substantial completion of the entire system, the Contractor shall provide a complete checkout and calibration of entire Fire Detection and Alarm System. A detailed report of this checkout shall be immediately submitted to the Architect/Engineer for review and acceptance.
- B. When requested by the owner within one (1) year of date of Substantial Completion, the contractor shall provide on-site assistance in adjusting sound levels, controls, and sensitivities to suit actual occupied conditions. Provide up to three (3) requested adjustment visits to the site for this purpose.
- C. At a period between eleven (11) and twelve (12) months from the date of substantial completion, contractor shall provide complete checkout and calibration of entire Fire Detection and Alarm System and shall certify the system as being fully operational.

3.10 TRAINING

- A. Contractor shall provide one (1) on-site training session with a minimum of four (4) hours of instructions on system operation to Owner's representative(s) upon completion of construction phase of the work. Contractor shall conduct instruction session prior to use by the Owner or requesting substantial completion.
- B. Contractor shall submit to the Engineer through the Architect, a sign-in sheet with the instructor's signature and signatures of all persons present during the instructional session.
- C. The sign-in sheet shall indicate time of instruction session. This sheet shall be submitted prior to use by the Owner or requesting substantial completion. Training session shall be requested in writing to the Engineer a minimum of seven (7) consecutive calendar days prior to time requested.
- D. Items to instruct the Owner's personnel on include startup, shutdown, troubleshooting, servicing, adjusting, and preventive maintenance.
- E. At the same time as the three (3) month check-out and calibration listed above, the contractor shall also provide one (1) additional training session consisting of a maximum of four (4) hours for owner's personnel. Sign-in sheets shall be submitted as hereinbefore specified. This session shall also be scheduled a minimum of seven (7) consecutive calendar days prior to requested time.

END OF SECTION 28 31 10

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, and removing unknown site utilities discovered OR abandoning site utilities in place.
7. Temporary erosion- and sedimentation-control measures.

1.3 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.
- B. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inches (25 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- C. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.
- D. Owner: City of Lake Charles

1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.



1.5 SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs or videotape.
 - 2. Include plans and notations to indicate damage conditions items designated to remain.
- B. Record Drawings: Notify engineer of conditions and existing utilities that alter from plan drawings. Identify and accurately show locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project Preconstruction Meeting.

1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated or directed by facility manager or architect.
- C. Utility Locator Service: Notify One Call for area where Project is located before site clearing.
- D. Do not commence site clearing operations until temporary erosion- and sedimentation-control and other protection measures are in place.
- E. Construction site fencing to be placed around the wetlands to restrict any disturbances to the wetlands.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 31 Section "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Flag OR Wrap a 1-inch (25-mm) blue vinyl tie tape flag around each tree trunk at 54 inches (1372 mm) above the ground or as directed by architect.
- C. Protect existing site improvements to remain from damage during construction.
 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 EXISTING UTILITIES

Utilities on site requiring removal shall be coordinated with the architect and arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing.

3.4 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches (450 mm) below exposed subgrade.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
1. Place fill material in horizontal layers not exceeding a loose depth of 6 inches (152.4 mm), and compact each layer to a density equal to adjacent original ground.

3.5 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to existing depth encountered in a manner to prevent intermingling with underlying subsoil.
1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects more than 1 inches (25 mm) in diameter; trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
1. Do not stockpile topsoil within protection zones.
 2. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.6 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically. Full-depth saw cut required.
 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.7 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, and legally dispose of them off Owner's property.

PART 4 - TEMPORARY EROSION CONTROL

4.1 DESCRIPTION

- A. This work consists of constructing and maintaining temporary erosion control features shown on the plans or as directed. Installation of temporary erosion control features shall be coordinated with construction of permanent erosion control features to the extent necessary to ensure economical, effective and continuous control of erosion and water pollution throughout the life of the contract.
- B. The contractor shall be fully responsible to comply with a Storm Water Pollution Prevention Plan (SWPPP) approved by the Department when conducting clearing or earthwork operations. The SWPPP (generated and submitted by the contractor) shall include the erosion control features as shown on the plans, or as directed, in addition to other required components of the SWPPP specified by the US Environmental Protection Agency (EPA) and the Louisiana Department of Environmental Quality (LDEQ). The plan shall indicate the use of contract items and the coordination of this work with the scheduling of clearing and earthwork.
- C. Quality assurance requirements shall be as specified in the latest edition of the Department's publication entitled "Application of Quality Assurance Specifications for Embankment and Base Course."

4.2 CONTROL OF ERODIBLE SOIL

- A. General:
 - 1. The contractor shall prevent the transmission of soil particles into streams, canals, lakes, reservoirs or other waterways. Except as necessary for construction, excavated material shall not be deposited into streams or impoundments, or in a position close enough to be washed in waterways by high water or runoff. The contractor shall not disturb lands or waters outside the limits of construction, except as authorized.
- B. Adjacent to Waterways:
 - 1. Stream banks shall be kept in their natural state. The contractor shall not unnecessarily strip protective vegetation in the vicinity of stream banks and shall conduct operations without damage to banks. Banks shall not be excavated except as shown on the plans or as otherwise approved in writing. Work roads requiring bank cuts shall be approved by the project engineer prior to making such cuts. The banks shall be restored by the contractor to the satisfaction of the project engineer.

C. Adjacent to Property:

1. The location of, and method of operation in, borrow pits, material pits and disposal areas obtained by the contractor for waste material from the project (other than commercially operated sources) shall be the contractor's responsibility.

4.3 MATERIALS

A. Materials not covered by project specifications shall meet commercial grade standards and shall be approved before being incorporated into the project. No testing of materials used in temporary erosion control features will be required. Acceptance of temporary erosion control materials will be by visual inspection.

1. Mulches: Mulch shall comply with Subsection 1018.19 and emulsified asphalt shall conform to Section 1002.
2. Seeding: Grass shall be an approved quick-growing species suitable to the area, providing a temporary cover which will not compete with permanent grasses. Rye grass is the only acceptable grass for winter cover.
3. Slope Drains: Slope drains may be constructed of pipe, fiber mats, rubble, portland cement concrete, asphaltic concrete, plastic sheets or other acceptable material.
4. Fertilizer: Fertilizer shall comply with Subsection 1018.16.
5. Silt Fencing: Silt fencing shall be wire-supported or self-supported systems. Other silt fencing systems may be used when approved.
 - a. Wire-Supported: Wire-supported silt fencing shall consist of standard woven livestock wire, and minimum of 14-gage (2.0 mm diameter) wire, a minimum of 36 inches (900 mm) in height with a maximum wire spacing of 6 inches (150 mm). Posts shall be either wood or steel installed a minimum of 2 feet (0.6 m) in the ground. Filter material shall be burlap weighing approximately 7 1/2 ounces per square yard (0.25 kg per sq m), approved jute fabric or approved geotextile fabric. Geotextile fabric shall comply with Section 1019, Class F.
 - b. Self-Supported: Self-supported silt fencing shall consist of an approved geotextile fabric suitably attached to posts of either wood or steel installed in accordance with plan details. Geotextile fabric shall comply with Section 1019, Class G.
6. Lime: Agricultural lime shall comply with Subsection 1018.17.
7. Temporary Construction Entrance: Temporary construction entrances shall consist of stone or recycled Portland cement concrete complying with Subsection 711.02, 2 lb class placed on geotextile fabric complying with Section 1019, Class D. The geotextile fabric underliner shall be placed at the locations designated for temporary construction entrances before stone or recycled cement concrete is placed. The stone or recycled Portland cement concrete shall be placed and compacted to the required thickness as directed. This work also includes additional measures required to remove mud from truck tires, such as wash racks, etc.

8. Hay Bales: Hay or straw bales shall be rectangular bales, acceptable to the project engineer. The average length of bales shall be 34 inches (850 mm) minimum.

4.4 EXPOSURE OF ERODIBLE EARTH

- A. The engineer may direct the contractor to provide immediate permanent or temporary erosion or pollution control measures to prevent contamination of streams, lakes, tidal waters, reservoirs, canals or other impoundments or prevent detrimental effects on property outside the right-of-way and damage to the project. Limitations of areas in which excavation and embankment operations are underway shall be commensurate with the contractor's capability and progress in keeping finish grading, temporary erosion control, and permanent erosion control measures in accordance with the accepted schedule.

4.5 INCORPORATION OF EROSION CONTROL FEATURES

- A. Use of temporary erosion control features will be authorized to correct unforeseen conditions that develop during construction; to control erosion prior to the time it is practical to construct permanent control features; or to provide immediate temporary control of erosion that develops during normal construction operations but is not associated with permanent erosion control features. Permanent erosion control features shall be incorporated into the project at the earliest practical time.
- B. Temporary erosion control features will be used as directed in areas where stage construction or other conditions not under control of the contractor preclude completion of a section of roadway in a continuous manner, or where subsequent construction operations will cause damage to permanent erosion control features.

4.6 CONSTRUCTION REQUIREMENTS

- A. Temporary erosion control features shall consist of, but not be limited to, temporary seeding, temporary mulching, sandbagging, slope drains, sediment basins, sediment check dams, erosion checks, artificial coverings, berms, and stone entrances. The engineer may direct use of temporary erosion control features or methods other than those included in the original contract. Soil deposits outside the right-of-way shall be immediately removed and the surface repaired at no direct pay. The engineer shall have the authority to require the contractor's operations to be discontinued until erosion deposits have been cleared and the area restored.
 1. Temporary Seeding: Seeding shall be done in accordance with Section 717, except that ground preparation will be limited to blading the area. Lime or fertilizer shall be applied in accordance with Section 718; however, lime or fertilizer may be omitted or the application rate reduced as directed.
 2. Temporary Mulching: Mulch and emulsified asphalt shall be furnished and applied in accordance with Section 716. Mulch may be omitted or the

- application rate reduced as ordered. When permanent seeding operations begin, temporary mulch materials shall be plowed under during ground preparation.
3. Sandbagging: Sandbags shall be placed as directed.
 4. Baled Straw or Hay: Baled straw or hay shall be placed as directed to form checks or dams to control erosion and siltation. Bales shall be properly staked or otherwise secured as directed, as shown on the plans. The bales shall be buried as necessary to prevent scour under the bales. A minimum of 2 stakes shall be driven through each bale.
 5. Slope Drains: Slope drains shall be constructed with acceptable materials in accordance with plan details or as directed, if necessary to prevent scour. The discharge area shall be stabilized or protected by temporary riprap as directed. Cost of discharge area protection will be included under the slope drain item.
 6. Sediment Basins: Sediment basins shall be constructed in accordance with plan details or as directed.
 7. Sediment Check Dams: Check dams shall be constructed at locations shown on the plans or as directed. Check dams shall be constructed before clearing and grubbing or grading in the area is begun unless otherwise directed.
 8. Silt Fencing: Silt fencing shall be furnished and constructed at designated locations or other locations, as directed by the engineer.
 9. Berms: Earth berms shall be constructed as directed to divert the flow of water from erodible surfaces.
 10. Unforeseen Conditions: When unforeseen conditions are encountered, the engineer may direct the contractor to construct such temporary devices as required to control erosion during construction. Details may be developed jointly by the engineer and the contractor.
 11. Maintenance of Erosion Control Features: The contractor shall install, construct, repair, and maintain temporary erosion control features within 7 calendar days of being instructed to do so by the project engineer. Temporary erosion control features shall be inspected at least once every 14 calendar days and within 24 hours after a rainfall event of 0.5 inches or greater. The features are to be maintained as described below or replaced as directed at no direct pay.
 - a. Temporary Seeding: The seeded areas showing erosion after inspection shall be reseeded if necessary.
 - b. Mulches: Mulched areas showing erosion shall be repaired and the mulch reapplied if necessary.
 - c. Straw or Hay Bale Barriers: The bale barriers shall be inspected after each rainfall and time frame as defined above and at least daily during prolonged rainfall. Close attention shall be paid to the repair of damaged bales, "end runs" and undercutting beneath bales.
 - d. Slope Drains: Slope drains shall be inspected weekly and after each rainfall as defined above, and repairs made if necessary. The contractor shall avoid the placement of any material on and prevent construction traffic across the slope drain.
 - e. Sediment Check Dams: Sediment deposits shall be removed when the deposits reach one-half the height of the check dam. Inspections

- shall be made to insure that the center of the dam is lower than the edges. Erosion around the edges shall be corrected immediately.
- f. Silt Fencing: Sediment deposits shall be removed when the deposits reach one-half the height of the fence. If the fabric on the silt fence decomposes or becomes ineffective, the fabric shall be replaced promptly.
 - g. Temporary Stone Construction Entrance and/or Wash Racks: The construction entrance shall be maintained to allow for removal of mud from the tires. The sediment from the wash rack runoff shall be removed once the wash rack is no longer performing as intended.
12. Removal of Temporary Erosion Control Features: Temporary erosion control features existing at the time of construction of permanent erosion control features shall be removed or incorporated into the soil in such manner that no detrimental effect will result. The engineer may direct that temporary features be left in place. Sediment in sediment basins, silt fences, check dams, and other catchment areas shall be removed, replaced with acceptable soils in accordance with Subsection 203.06, and compacted as directed at no direct pay.

4.7 PROTECTION DURING SUSPENSION OF OPERATIONS

- A. Prior to the suspension of operations, the contractor shall shape the top of the earthwork in such manner as to permit runoff of rainwater and shall construct earth berms along the top edges of embankments to intercept runoff water. Temporary slope drains shall be provided in the earth berm to carry runoff. When such preventive measures fail, the contractor shall immediately take other action as necessary to prevent erosion and siltation. The engineer may direct the contractor to perform other erosion control work during suspensions of contract time.

4.8 MEASUREMENT

- A. When temporary erosion and pollution control measures are required due to the contractor's negligence or failure to install permanent controls, such work shall be performed by the contractor at no direct pay.
- B. Required temporary erosion and pollution control work which is not due to the contractor's negligence will be measured as follows:
- C. When separate items for temporary erosion control devices are included in the contract, and the work is ordered, the quantities to be paid for will be the weight in pounds (kg) of Temporary Seeding and in tons (Mg) of Temporary Mulching; the volume in cubic yards (cu m) of Sandbagging with the measurement of sand being made in a batch box or other satisfactory means; the number of hay bales placed; the length in feet (m) of Temporary Slope Drains measured along the ground surface and Silt Fencing measured along ground surface between end posts; the number of Sediment Basins and Sediment Check Dams acceptably constructed; the

number of gallons (L) of emulsified asphalt, and the number of construction entrances.

- D. Temporary erosion control items may be eliminated when conditions do not justify their use.
- E. When temporary erosion control work is ordered and is not covered by contract items, the work shall be performed as extra work in accordance with Subsection 109.04 except that no extra work order will be required prior to starting work.
- F. The construction of temporary earth berms along edges of the roadway to prevent erosion during grading and subsequent operations will not be measured for payment.
- G. In case of failure of the contractor to control erosion, or siltation, the engineer may employ outside assistance or use his own forces to provide the necessary corrective measures, and the cost thereof will be deducted from payments for the work. Partial payments will be withheld until satisfactory temporary erosion control is established.

END OF SECTION 311000

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL



1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Preparing subgrades for walks, pavements, grasses, and plants.
 - 2. Drainage course for concrete slabs-on-grade.
 - 3. Subbase course for concrete walks and pavements.
 - 4. Subsurface drainage backfill for walls and trenches.
 - 5. Excavating and backfilling trenches for utilities and pits for buried utility structures, and filling depressions.
 - 6. Excavating and backfilling tree stumps and root systems.
- B. Related Sections:
 - 1. Division 03 Section "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
 - 2. Division 31 Section "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.

1.3 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Soil Cement layer placed between the subbase course and concrete paving.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

- E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
- G. Fill: Soil materials used to raise existing grades.
- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. Subbase Course: Lime treated layer, if necessary placed between the subgrade and base course for pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete walk.
- J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- K. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
 - 1. Geotextiles.
 - 2. Controlled low-strength material, including design mixture.
- B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
 - 1. Classification according to ASTM D 2487.
 - 2. Laboratory compaction curve according to ASTM D 698.

1.5 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Utility Locator Service: "One Call" for area where Project is located before beginning earth moving operations.

- C. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Structural Fill: As per notes on project drawings.
- C. Lime Treated Fill: As per notes on project drawings.
- D. Satisfactory Soils: As per notes on project drawings.
- E. Unsatisfactory soils include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- F. Subbase Material: As per notes on project drawings.
- G. Base Course: LADOTD 610 Roadbase as per contract drawings.
- H. Sand: ASTM C 33; fine aggregate.

2.2 GEOTEXTILES

- A. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability: Class 2; AASHTO M 288.
 - 2. Grab Tensile Strength: 247 lbf (1100 N); ASTM D 4632.
 - 3. Sewn Seam Strength: 222 lbf (990 N); ASTM D 4632.
 - 4. Tear Strength: 90 lbf (400 N); ASTM D 4533.
 - 5. Puncture Strength: 90 lbf (400 N); ASTM D 4833.
 - 6. Apparent Opening Size: No. 60 (0.250-mm) sieve, maximum; ASTM D 4751.
 - 7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
 - 8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.3 CONTROLLED LOW-STRENGTH MATERIAL

- A. Controlled Low-Strength Material: Self-compacting, low-density, flowable concrete material produced from the following:

1. Portland Cement: ASTM C 150, Type I or Type II.
 2. Fly Ash: ASTM C 618, Class C or F.
 3. Normal-Weight Aggregate: ASTM C 33, 3/4-inch (19-mm) nominal maximum aggregate size.
 4. Foaming Agent: ASTM C 869.
 5. Water: ASTM C 94/C 94M.
 6. Air-Entraining Admixture: ASTM C 260.
- B. Produce low-density, controlled low-strength material with the following physical properties:
1. As-Cast Unit Weight: 30 to 36 lb/cu. ft. (480 to 576 kg/cu. m) at point of placement, when tested according to ASTM C 138/C 138M.
 2. Compressive Strength: 100 psi, when tested according to ASTM C 495. Insert other physical properties, in addition to compressive strength in paragraph below, if required for a particular application.

PART 3 - EXECUTION

3.1 SITE PREPARATION

- A. Site preparation for the project site should include stripping all surface vegetation, topsoil, deleterious and/or weak soils, to expose a competent subgrade.
- B. The exposed soil subgrade should consist of competent, natural firm to stiff clay and be proof-rolled with at least a 15-ton pneumatic roller, loaded dump truck or equivalent to detect weak areas upon which proper compaction would be difficult to obtain on the backfill materials. Weak areas are generally defined as locations that pump and/or rut in excess of about 2-inches or as deemed unsatisfactory based on observations of the proof-roll process by the Geotechnical Engineer-of Record or their qualified representative. Upon identification, weak areas should be removed down to competent material and replaced with properly compacted structural clay fill. All locations for fill placement should be benched and level such that backfill can be placed in homogeneous lifts of uniform thickness
- C. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- D. Protect and maintain erosion and sedimentation controls during earth moving operations.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
- B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock.
 - 1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

3.4 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 - 2. Pile Foundations: Stop excavations 6 to 12 inches (150 to 300 mm) above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
 - 3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.
 - 1. Clearance: As indicated.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

3.7 SUBGRADE INSPECTION

- A. Notify Architect/Engineer when excavations have reached required subgrade.
- B. If Architect/Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes) to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
 - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 BACKFILL

- A. Prior to any filling or backfilling operations, samples of the proposed material sources to be used should be obtained for laboratory classification and moisture-density relationship testing. These tests will provide a basis for evaluation of fill and backfill compaction by in-place density testing. A representative of the Geotechnical Engineer should perform sufficient in-place density tests during the filling and backfilling operations to verify proper levels of compaction are being obtained.
- B. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- C. Place backfill on subgrades free of mud, frost, snow, or ice.

3.10 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 03 Section "Cast-in-Place Concrete."
- D. Trenches under Roadways: Provide 4-inch- (100-mm-) thick, concrete-base slab support for piping or conduit less than 30 inches (750 mm) below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches (100 mm) of concrete before backfilling or placing roadway subbase course. Concrete is specified in Division 03 Section "Cast-in-Place Concrete."
- E. Backfill voids with satisfactory soil while removing shoring and bracing.
- F. Place and compact initial backfill of subbase material, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- G. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- H. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 6 inches (152 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698, or as per Geotechnical Report:
 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 95 percent.
 3. Under turf or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.
 4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Turf or Unpaved Areas: Plus or minus 1 inch (25 mm).
 2. Walks: Plus or minus 1 inch (25 mm).
 3. Pavements: Plus or minus 1/2 inch (13 mm) .
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.

3.14 SUBSURFACE DRAINAGE

- A. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch (150-mm) course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches (300 mm) of filter material, placed in compacted layers 6 inches (150 mm) thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).
1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698 with a minimum of two passes of a plate-type vibratory compactor.
- B. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches (300 mm) of final subgrade, in compacted layers 6 inches (150 mm) thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).
1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698 with a minimum of two passes of a plate-type vibratory compactor.
 2. Place and compact impervious fill over drainage backfill in 6-inch- (150-mm-) thick compacted layers to final subgrade.

3.15 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 2. Place base course material over subbase course under concrete pavement.

3. Shape subbase course and base course to required crown elevations and cross-slope grades.
 4. Place subbase course and base course 6 inches (150 mm) or less in compacted thickness in a single layer.
 5. Place subbase course and base course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
 6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.
- C. Concrete Curb and Gutter: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.16 FIELD QUALITY CONTROL

- A. Testing Agency: A qualified geotechnical engineering testing agency will perform tests and inspections.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.
- D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
 2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet (46 m) or less of trench length, but no fewer than two tests.
- E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
 - 1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 313116 - TERMITE CONTROL

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data and product certificates for each type of product indicated. Include the EPA-Registered Label.
- B. Installer Qualifications: A specialist who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located, and who employs workers trained and approved by manufacturer to install manufacturer's products.
- C. Regulatory Requirements: Formulate and apply termiticides and termiticide devices according to the EPA-Registered Label.
- D. Continuing Service: Provide 12 months' continuing service including monitoring, inspection, and re-treatment for occurrences of termite activity.

PART 2 - PRODUCTS

2.1 TERMITE CONTROL PRODUCTS

- A. Soil Treatment Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in an aqueous solution.
 - 1. Service Life of Treatment: Soil treatment termiticide that is effective for not less than five years against infestation of subterranean termites.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.
- B. Soil Treatment Application: Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction:
 - 1. At foundations.

2. Under concrete floor slabs-on-grade.
 3. Under basement floor slabs.
 4. At expansion and control joints and slab penetrations.
- C. Post warning signs in areas of soil treatment application.
- D. Reapply soil termiticide treatment solution to areas disturbed by subsequent excavation or other construction activities following application.

END OF SECTION 313116



SECTION 321313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Driveways.
2. Roadways.
3. Parking lots.
4. Curbs and gutters.
5. Walks.
6. Wash Bays

- B. Related Sections:

1. Division 03 Section "Cast-in-Place Concrete" for general building applications of concrete.
2. Division 32 Section "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.

- B. Submittals:

1. Product Data: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating costs for each product having recycled content.

- C. Shop Drawings: For each area of reinforcement bar (rebar) installation.
- D. Samples for Initial Selection: For each type of product, ingredient, or admixture requiring color selection.
- E. Submittals for Verification: For each type of product or exposed finish:
 - 1. Aggregate: Sample of each mix.
 - 2. Wheel Stops: with fasteners.
- F. Other Action Submittals:
 - 1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- G. Qualification Data: For qualified Installer of detectable warnings, ready-mix concrete manufacturer and testing agency.
- H. Material Certificates: For the following, from manufacturer:
 - 1. Cementitious materials.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Fiber reinforcement.
 - 4. Admixtures.
 - 5. Curing compounds.
 - 6. Applied finish materials.
 - 7. Bonding agent or epoxy adhesive.
 - 8. Joint fillers.
- I. Material Test Reports: For each of the following:
 - 1. Aggregates.
- J. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

- C. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.
- D. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

1.6 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F (4.4 deg C) for oil-based materials, 55 deg F (12.8 deg C) for water-based materials, and not exceeding 95 deg F (35 deg C).

PART 2 - PRODUCTS

2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.
 - 1. Use flexible or uniformly curved forms for curves with a radius of 100 feet (30.5 m) or less. Do not use notched and bent forms.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

- A. Recycled Content: Provide steel reinforcement with an average recycled content of steel so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from galvanized steel wire into flat sheets.
- C. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.
- D. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- E. Plain-Steel Wire: ASTM A 82/A 82M, galvanized.
- F. Deformed-Steel Wire: ASTM A 496/A 496M.

- G. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A 767/A 767M, Class I coating. Cut bars true to length with ends square and free of burrs.
- H. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.
- I. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- J. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:
 - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project; concrete materials and additives to meet:
 - 1. Portland Cement: ASTM C 150, Type I/II. Supplement with the following: LADOTD Standard Specifications for Roads and Bridges, 2016 ed., Sect. 901
 - 2. Blended Hydraulic Cement: ASTM C 595, Type IL
 - 3. Fly Ash: ASTM C 618, Class C or F. Maximum 15% by weight.
- B. Normal-Weight Aggregates: ASTM C 33, uniformly graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: Potable and complying with ASTM C 94/C 94M.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

- F. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf.
- B. Moisture-Retaining Cover: AASHTO M 171, polyethylene sheeting or white burlap-polyethylene sheet.
- C. Water: Potable
- D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.
1. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Axim Italcementi Group, Inc.; Caltexol CIMFILM.
 - b. BASF Construction Chemicals, LLC; Confilm.
 - c. ChemMasters; Spray-Film.
 - d. Conspec by Dayton Superior; Aquafilm.
 - e. Dayton Superior Corporation; Sure Film (J-74).
 - f. Edoco by Dayton Superior; BurkeFilm.
 - g. Euclid Chemical Company (The), an RPM company; Eucobar.
 - h. Kaufman Products, Inc.; VaporAid.
 - i. Lambert Corporation; LAMBCO Skin.
 - j. L&M Construction Chemicals, Inc.; E-CON.
 - k. Meadows, W. R., Inc.; EVAPRE.
 - l. Metalcrete Industries; Waterhold.
 - m. Nox-Crete Products Group; MONOFILM.
 - n. Sika Corporation, Inc.; SikaFilm.
 - o. SpecChem, LLC; Spec Film.
 - p. Symons by Dayton Superior; Finishing Aid.
 - q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
 - r. Unitex; PRO-FILM.
 - s. Vexcon Chemicals Inc.; Certi-Vex EnvioAssist.

- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
1. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
- a. Anti-Hydro International, Inc.; A-H Curing Compound #2 DR WB.
 - b. ChemMasters; Safe-Cure Clear.
 - c. Conspec by Dayton Superior; D.O.T. Resin Cure.
 - d. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).
 - e. Edoco by Dayton Superior; DSSCC Clear Resin Cure
 - f. Euclid Chemical Company (The), an RPM company; Kurez W VOX.
 - g. Kaufman Products, Inc.; Thinfilm 420.
 - h. Lambert Corporation; AQUA KURE - CLEAR.
 - i. L&M Construction Chemicals, Inc.; L&M CURE R.
 - j. Meadows, W. R., Inc.; 1100-CLEAR SERIES.
 - k. Nox-Crete Products Group; Resin Cure E.
 - l. SpecChem, LLC; PaveCure Rez.
 - m. Symons by Dayton Superior; Resi-Chem Clear.
 - n. Tamms Industries, Inc., Euclid Chemical Company (The); TAMMSCURE WB 30C.
 - o. TK Products, Division of Sierra Corporation; TK-2519 WB.
 - p. Vexcon Chemicals Inc.; Certi-Vex Enviocure 100.
- F. White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B, dissipating.
1. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
- a. Anti-Hydro International, Inc.; A-H Curing Compound #2 WP WB.
 - b. ChemMasters; Safe-Cure 2000.
 - c. Conspec by Dayton Superior; D.O.T. Resin Cure White
 - d. Dayton Superior Corporation; Day-Chem White Pigmented Cure (J-10-W).
 - e. Edoco by Dayton Superior; Resin Emulsion Cure V.O.C. (Type II).
 - f. Euclid Chemical Company (The), an RPM company; Kurez VOX White Pigmented.
 - g. Kaufman Products, Inc.; Thinfilm 450.
 - h. Lambert Corporation; AQUA KURE - WHITE.
 - i. L&M Construction Chemicals, Inc.; L&M CURE R-2.
 - j. Meadows, W. R., Inc.; 1100-WHITE SERIES.
 - k. SpecChem, LLC; PaveCure Rez White.
 - l. Symons by Dayton Superior; Resi-Chem White.
 - m. Vexcon Chemicals Inc.; Certi-Vex Enviocure White 100.

2.5 RELATED MATERIALS

- A. Joint Fillers & Bonding Agents: Refer to Drawings; ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork in preformed strips.

2.6 WHEEL STOPS

- A. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 72 inches long. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.

- 1. Dowels: Galvanized steel, 3/4 inch in diameter, 10-inch minimum length.

2.7 DETECTABLE WARNING MATERIALS

- A. Detectable Warning Stamp: Semirigid polyurethane mats with formed underside capable of imprinting detectable warning pattern on plastic concrete; perforated with a vent hole at each dome.

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Advanced Surfaces Inc.
 - b. Matcrete Precision Stamped Concrete Tools.
 - c. Southern Color N.A., Inc.
 - d. Stampcrete International Ltd.
 - e. Superior Decorative by Dayton Superior.

- B. Liquid Release Agent: Manufacturer's standard, clear, evaporating formulation designed to facilitate release of stamp mats.

- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- a. Advanced Surfaces Inc.; Liquid Release.
 - b. Matcrete Precision Stamped Concrete Tools; Liquid Release Agent.
 - c. Southern Color N.A., Inc.; SCC Clear Liquid Release.
 - d. Stampcrete International Ltd.; Stampcrete Liquid Release.
 - e. Superior Decorative by Dayton Superior; Pro Liquid Release.

2.8 PAVEMENT MARKINGS

- A. Shall meet LADOTD Standard Specifications for Roads and Bridges 2016.
- B. Pavement-Marking Paint:

1. Color: As indicated.

2.9 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.
 1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
 2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.
- B. Proportion mixtures to provide normal-weight concrete with the following properties:
 1. Compressive Strength (28 Days): 3000 psi (20.7 MPa) or as indicated on plans.
 2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.50.
 3. Slump Limit: 5 inches (125 mm).
- C. Cementitious Materials: Limit percentage by weight of cementitious materials other than portland cement according to ACI 301 (ACI 301M) requirements as follows:
 1. Fly Ash: 15 percent.

2.10 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.
 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 1. For concrete batches of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 2. For concrete batches larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.
 - 1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph (5 km/h).
 - 2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
 - 3. Correct subbase with soft spots and areas of pumping according to requirements in Division 31 Section "Earth Moving".
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

- D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch (50-mm) overlap of adjacent mats.

3.5 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
 - 1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.
 - 1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
 - 2. Provide tie bars at sides of paving strips where indicated.
 - 3. Butt Joints: Use epoxy bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
 - 5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.
 - 1. Locate expansion joints at intervals of 50 feet (15.25 mm) unless otherwise indicated.
 - 2. Extend joint fillers full width and depth of joint.
 - 3. Terminate joint filler not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished surface if joint sealant is indicated.
 - 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 - 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.

6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes.
 - a. Tolerance: Ensure that grooved joints are within 3 inches either way from centers of dowels.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
 - a. Tolerance: Ensure that sawed joints are within 3 inches either way from centers of dowels.
 3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.
- B. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- C. Comply with ACI 301 (ACI 301M) requirements for measuring, mixing, transporting, and placing concrete.
- D. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.
- E. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

- F. Consolidate concrete according to ACI 301 (ACI 301M) by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
 - 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels and joint devices.
- G. Screed paving surface with a straightedge and strike off.
- H. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- I. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.
- J. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.
 - 1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.
- K. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:
 - 1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
- L. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 DETECTABLE WARNINGS

- A. Stamped Detectable Warnings: In addition to grooved ADA ramps, detectable warning mats may be requested. Install stamped detectable warnings as part of a continuous concrete paving placement and according to stamp-mat manufacturer's written instructions.
 1. Before using stamp mats, verify that the vent holes are unobstructed.
 2. Apply liquid release agent to the concrete surface and the stamp mat.
 3. Stamping: While initially finished concrete is plastic, accurately align and place stamp mats in sequence. Uniformly load, gently vibrate, and press mats into concrete to produce imprint pattern on concrete surface. Load and tamp mats directly perpendicular to the stamp-mat surface to prevent distortion in shape of domes. Press and tamp until mortar begins to come through all of the vent holes. Gently remove stamp mats.
 4. Trimming: After 24 hours, cut off the tips of mortar formed by the vent holes.
 5. Remove residual release agent according to manufacturer's written instructions, but no fewer than three days after stamping concrete. High-pressure-wash surface and joint patterns, taking care not to damage stamped concrete. Control, collect, and legally dispose of runoff.

3.8 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
 1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
 2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture

3.9 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.

- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm) and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.10 PAVING TOLERANCES

- A. Comply with tolerances in ACI 117 and as follows:
 - 1. Elevation: 1/4 inch.
 - 2. Thickness: Plus 3/8 inch, minus 1/4 inch.
 - 3. Surface: Gap below 10-foot- long, unleveled straightedge not to exceed 1/2 inch .
 - 4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
 - 5. Lateral Alignment and Spacing of Dowels: 1 inch.
 - 6. Vertical Alignment of Dowels: 1/4 inch.
 - 7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
 - 8. Joint Spacing: 3 inches.
 - 9. Contraction Joint Depth: Plus 1/4 inch, no minus.
 - 10. Joint Width: Plus 1/8 inch, no minus.

3.11 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.
- B. Allow concrete paving to cure for a minimum of 28 days and be dry before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. Apply paint with mechanical equipment to produce markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.
 - 1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to concrete surface. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.
 - 2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal.

3.12 WHEEL STOPS

- A. Install wheel stops in bed of adhesive applied as recommended by manufacturer.
- B. Securely attach wheel stops to paving with not less than two galvanized-steel dowels located at one-quarter to one-third points. Install dowels in drilled holes in the paving and bond dowels to wheel stop. Recess head of dowel beneath top of wheel stop.

3.13 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m), 5000 sq. ft. (465 sq. m) or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when it is 80 deg F (27 deg C) and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
- D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
- G. Concrete paving will be considered defective if it does not pass tests and inspections.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- I. Prepare test and inspection reports.

3.14 REPAIRS AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

- B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.
- C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

SECTION 321373 - CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL



1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Cold-applied joint sealants.
 - 2. Hot-applied joint sealants.
- B. Related Sections:
 - 1. Division 32 Section "Concrete Paving" for constructing joints in concrete pavement.

1.3 PRECONSTRUCTION TESTING

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, Samples of materials that will contact or affect joint sealants.
 - 1. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit no fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
 - 5. Testing will not be required if joint-sealant manufacturers submit joint-preparation data that are based on previous testing, not older than 24 months, of sealant products for compatibility with and adhesion to joint substrates and other materials matching those submitted.

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- C. Pavement-Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.
- D. Qualification Data: For qualified Installer.
- E. Product Certificates: For each type of joint sealant and accessory, from manufacturer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for joint sealants.
- G. Preconstruction Compatibility and Adhesion Test Reports: From joint-sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility with and adhesion to joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain each type of joint sealant from single source from single manufacturer.
- C. Product Testing: Test joint sealants using a qualified testing agency.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
- D. Preinstallation Conference: Conduct conference at as directed by Architect.

1.6 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.

2.2 COLD-APPLIED JOINT SEALANTS

- A. Single-Component, Nonsag, Silicone Joint Sealant for Concrete: ASTM D 5893, Type NS.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Crafcro Inc., an ERGON company; RoadSaver Silicone.
 - b. Dow Corning Corporation; 888.
 - c. Pecora Corporation; 301 NS.
 - d. LADOTD Approved Materials List
- B. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: ASTM D 5893, Type SL.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Crafcro Inc., an ERGON company; RoadSaver Silicone SL.
 - b. Dow Corning Corporation; 890-SL.
 - c. Pecora Corporation; 300 SL.
 - d. LADOTD Approved Materials List
- C. Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant for Concrete: ASTM C 920, Type M, Grade P, Class 25, for Use T.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Corporation; Urexpan NR-200.
 - b. LADOTD Approved Materials List

2.3 HOT-APPLIED JOINT SEALANTS

- A. Hot-Applied, Single-Component Joint Sealant for Concrete: ASTM D 3406.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Crafcro Inc., an ERGON company; Superseal 444/777.
 - b. LADOTD Approved Materials List
- B. Hot-Applied, Single-Component Joint Sealant for Concrete and Asphalt: ASTM D 6690, Types I, II, and III.
 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Meadows, W. R., Inc.; Sealtight Hi-Spec
 - b. Right Pointe; D-3405 Hot Applied Sealant.
 - c. LADOTD Approved Materials List

2.4 JOINT-SEALANT BACKER MATERIALS

- A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.
- B. Round Backer Rods for Cold- and Hot-Applied Joint Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
- C. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.
- D. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

2.5 PRIMERS

- A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
- B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install joint-sealant backings of kind indicated to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of joint-sealant backings.
 - 2. Do not stretch, twist, puncture, or tear joint-sealant backings.
 - 3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.

- D. Install joint sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place joint sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:
 - 1. Remove excess joint sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

3.4 CLEANING

- A. Clean off excess joint sealant or sealant smears adjacent to joints as the Work progresses, by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

3.6 PAVEMENT-JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Joints within cement concrete pavement
 - 1. Joint Location:
 - a. Expansion and isolation joints in concrete pavement.
 - b. Contraction joints in concrete slabs.
 - c. Other joints as indicated.
 - 2. Silicone Joint Sealant for Concrete: Single component, self-leveling

3. Urethane Joint Sealant for Concrete: traffic-grade
 4. Hot-Applied Joint Sealant for Concrete: Single component
- B. Joint-Sealant Application: Joints between cement concrete and asphalt pavement.
1. Joint Location:
 - a. Joints between concrete and asphalt pavement.
 - b. Joints between concrete curbs and asphalt pavement.
 - c. Other joints as indicated.
 2. Hot-Applied Joint Sealant for Concrete and Asphalt: Single component

END OF SECTION 321373

SECTION 323113 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 FENCE COMPONENTS

- A. Fabric: Metallic-coated steel, 9 gauge 2-inch diameter wire with polymer coating.
 - 1. Polymer Coating: ASTM F 668, Class 2a or 2b.
 - 2. Color: As selected by Architect.
 - 3. Selvage: Knuckled at bottom and twisted at top.
 - 4. Provide barbed wire strands and offset arms as per drawings.
- B. Posts and Rails: Galvanized-steel pipe complying with ASTM F 1043 requirements for industrial fence, and color coated to match fabric.
- C. Tension Wire: Polymer-coated steel, ASTM F 1664, in color matching fabric.
- D. Fittings and Accessories: ASTM F 626, color coated to match fabric, and as follows:
 - 1. Post and Line Caps: Provide weathertight cap for each post. Provide line post caps with loop to receive tension wire or top rail.
 - 2. Post Brace Assembly: Same material as top rail with 3/8-inch-diameter rod and adjustable tightener.
 - 3. Bottom and Center Rail: Same material as top rail with cap on each end.
- E. Gate Posts, Swing Gates, and Accessories: ASTM F 900, same metal and finish as posts and rails, with galvanized hardware and accessories.
- F. Privacy Slats: PVC, UV-light stabilized, not less than 0.023 inch thick, sized to fit mesh specified for direction indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install fence to comply with ASTM F 567.

- B. Excavation: Drill post holes 8 inches in diameter and 40 inches in depth, equally spaced, but not more than 10 feet apart as per drawings.
- C. Setting Posts: Set posts in holes approximately 4 inches above bottom of excavation. Align posts vertically and align tops. Pour concrete footings with tops 2 inches above grade, troweled to a crown to shed water.

END OF SECTION 323113

SECTION 323132 - WOOD COMPOSITE FENCES AND GATES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wood composite fences.
- B. Wood composite gates.
- C. Excavation for posts.

1.2 RELATED SECTIONS

- A. Section 033000 - Cast-in-Place Concrete.

1.3 REFERENCES

- A. ASTM C 94 - Standard Specification for Ready-Mixed Concrete.
- B. ASTM C 177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
- C. ASTM D 143 - Standard Test Methods for Small Clear Specimens of Timber.
- D. ASTM D 198 - Standard Test Methods of Static Tests of Lumber in Structural Sizes.
- E. ASTM D 1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
- F. ASTM D 1413 - Standard Test Method for Wood Preservatives by Laboratory Soil-Block Cultures.
- G. ASTM D 1761 - Standard Test Methods for Mechanical Fasteners in Wood.
- H. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
- I. ASTM D 2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
- J. ASTM D 2394 - Standard Methods for Simulated Service Testing of Wood and Wood-Base Finish Flooring.
- K. ASTM D 2395 - Standard Test Methods for Specific Gravity of Wood and Wood-Based Materials.
- L. ASTM D 4761 - Standard Test Methods for Mechanical Properties of Lumber and Wood-Base Structural Material.
- M. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

- N. ASTM F 1679 - Standard Test Method for Using a Variable Incidence Tribometer (VIT).
- O. American Wood Preservers Association (AWPA) E1-06 - Standard Method for Laboratory Evaluation to Determine Resistance to Subterranean Termites.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Design Requirements: Design fence system to withstand Miami/Dade County 110 MPH steady wind and 130 MPH gusting wind tests.

1.5 SUBMITTALS

- A. Submit under provisions of Section 013000 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used indicating sizes, profiles, surface finishes, and performance characteristics, and including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Instructions on care and cleaning of composite wood products.
- C. Verification Samples: For each finish product specified, two samples, minimum size 9 inches square, representing actual product, color, and patterns.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- E. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for cleaning and maintenance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products in accordance with the manufacturer's instructions.
- B. Store level and flat, off ground or floor, with supports at each end and maximum 24 inches on center.
- C. Do not stack wood composite over 8 feet high.
- D. Cover wood composite with waterproof covering, vented to prevent moisture buildup.

1.7 WARRANTY

- A. Provide manufacturer's 25 year residential warranty / 10 year commercial warranty providing coverage against checking, splitting, splintering, rotting, structural damage from termites, and fungal decay of wood composite.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Trex Fencing, which is located at: 160 Exeter Dr.; Winchester, VA 22603;
- B. Or approved comparable product submitted prior to bidding as per Instructions to Bidders Article 9..

2.2 MATERIALS

- A. Wood composite: Reclaimed wood and plastic with integral coloring; free from toxic chemicals and preservatives:
 - 1. Characteristics:
 - a. Abrasion resistance: 0.01 inch wear per 1000 revolutions, tested to ASTM D 2394.
 - b. Hardness: 1124 pounds, tested to ASTM D 143.
 - c. Self ignition temperature: 743 degrees F, tested to ASTM D 1929.
 - d. Flash ignition temperature: 698 degrees F, tested to ASTM D 1929.
 - e. Flame spread rating: 80, tested to ASTM E 84.
 - f. Water absorption, 24 hour immersion, tested to ASTM D 1037:
 - 1) Sanded surface: 4.3 percent.
 - 2) Unsanded surface: 1.7 percent.
 - g. Thermal expansion coefficient, 36 inch long samples:
 - 1) Width: 35.2×10^{-6} to 42.7×10^{-6} .
 - 2) Length: 16.1×10^{-6} to 19.2×10^{-6} .
 - h. Fastener withdrawal, tested to ASTM D 1761:
 - 1) Nail: 163 pounds per inch.
 - 2) Screw: 558 pounds per inch.
 - i. Static coefficient of friction:
 - 1) Dry: 0.53 to 0.55, tested to ASTM D 2047.
 - 2) Dry: 0.59 to 0.70, tested to ASTM F 1679.
 - 3) Wet: 0.70 to 0.75, tested to ASTM F 1679.
 - j. Fungus resistance, white and brown rot: No decay, tested to ASTM D 1413.
 - k. Termite resistance: 9.6 rating, tested to AWPA E-1.
 - l. Specific gravity: 0.91 to 0.95, tested to ASTM D 2395.
 - m. Compression:
 - 1) Parallel: 1806 PSI ultimate, 550 PSI design, tested to ASTM D 198.
 - 2) Perpendicular: 1944 PSI ultimate, 625 PSI design, tested to ASTM D 143.
 - n. Tensile strength: 854 PSI ultimate, 250 PSI design, tested to ASTM D 198.
 - o. Shear strength: 561 PSI ultimate, 200 PSI design, tested to ASTM D 143.
 - p. Modulus of rupture: 1423 PSI ultimate, 250 PSI design, tested to ASTM D 4761.
 - q. Modulus of elasticity: 175,000 PSI ultimate, 100,000 PSI design, tested to ASTM D 4761.
 - r. Thermal conductivity: 1.57 BTU per inch per hour per square foot at 85 degrees F, tested to ASTM C 177.

2.3 COMPONENTS

- A. Fence System: Seclusions Privacy Fence System.

1. Fence height:
 - a. 8 feet (6 feet where noted on dwgs)
2. Components:
 - a. Fence posts.
 - b. Post caps:
 - 1) Pyramid.
 - c. Top rail
 - d. Aluminum bottom rail inserts.
 - e. Bottom rail covers/Pickets, 67 inch.
 - f. Bottom rail covers/Pickets, 91 inch.
 - g. Fence brackets.
3. Surface texture: Smooth.
4. Color: As selected by Architect

2.4 ACCESSORIES

- A. Fasteners: 1-5/8 inch galvanized or corrosion-resistant coated steel. Provide finish nails where applicable.
- B. Concrete: Provide as Specified in Section 03 30 00 - Cast-in-Place Concrete; minimum 2500 PSI compressive strength at 28 days, with a 3 to 5 inch slump.
- C. Concrete: Provide concrete conforming to ASTM C 94; minimum 2500 PSI compressive strength at 28 days, with a 3 to 5 inch slump.
- D. Gate Hardware:
 1. Provide three Trex hinges per gate leaf minimum, and size to gate weight and conditions.
 2. Provide center gate stop and drop cane rod for double gates.
 3. Provide with latching mechanism.
 4. Provide with padlock provisions.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Cut and drill wood composite using carbide tipped blades.
- C. Space posts maximum 8 feet on center.
- D. Drill post holes into undisturbed or compacted soil; excavate deeper in soft or loose soils and for posts with heavy lateral loads.
- E. Drill posts to 12 inch diameter. Locate bottom of post 30 inches below grade or below frost line whichever is greater.
- F. Place top of concrete flush with finished grade.
- G. Screw fence brackets to posts with four 1-5/8 inch long exterior screws.
- H. Cut top rails, pickets, bottom rail covers and aluminum bottom rails to lengths required.
- I. Slide bottom rail covers over aluminum bottom rail pieces.
- J. Position aluminum bottom rail on fence brackets with deeper side of rail channel facing downward.
- K. Cut end pickets to height to provide clearance under brackets and screw to posts.
- L. Insert pickets into bottom rail, interlocking adjacent pieces.
- M. Position top rail and screw attach to top brackets with 1-5/8 inch long exterior screws.
- N. Use finish nails to secure pickets to rails if the pickets are not tightly interlocked.
- O. Place post caps over post tops and secure with construction adhesive or four finish nails.

3.4 CLEANING

- A. Clean wood composite to remove stains:
 - 1. Mold, mildew, and berry and leaf stains: Clean surfaces with conventional deck wash containing detergent or sodium hypochlorite.
 - 2. Rust and ground-in dirt: Clean surfaces with cleaner containing oxalic or phosphoric acid.
 - 3. Oil and grease: Clean surfaces with detergent containing degreasing agent.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 323132

SECTION 32 80 00
IRRIGATION SYSTEMS

PART I GENERAL

1.01 SUMMARY

- A. This Section includes valves, piping, sprinklers, specialties, accessories, controls, and wiring for lawn and shrubbery irrigation systems.

1.02 DEFINITIONS

- A. Pipe sizes used in this Section are nominal pipe size (NPS) in inches. Tube sizes are standard size in inches. Equivalent SI (metric) sizes are indicated in millimeters (mm) in parentheses.
- B. Pressure piping: Piping downstream from point of connection to and including control valves. Piping is under irrigation system pressure. Piping in this category includes pressure regulators, water meters, and backflow preventers, when used.
- C. Circuit Piping: Piping downstream from control valves to irrigation system sprinklers, emitters, devices, and drain valves. Piping is under pressure (less than pressure piping) during flow.
- D. Control Valve: Manual or automatic (electrically operated) valve for control water flow to irrigation system zone.
- E. Drain Piping: Downstream from circuit piping drain valves. Piping is not under pressure.
- F. Drain Valve: Manual or automatic (pressure operated) drain valve for draining of irrigation system circuit piping.

1.03 SYSTEM PERFORMANCE REQUIREMENTS

- A. Location of Sprinklers and Devices: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards.
- B. Minimum Water Coverage: Contractor shall be responsible for **100% coverage** for all irrigated areas.
- C. Components and Installation: Capable of producing piping systems with the following minimum pressure ratings: 50 psi static, 35 psi working
 - 1. Pressure Piping: 50 psi (static).
 - 2. Circuit and Drain Piping: 35 psi (working).

1.04 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections:
- B. Product data including pressure rating, rated capacity, settings, and electrical data of selected models for the following if different than specified on plans:
 - 1. Backflow preventers, including test equipment.
 - 2. Pressure regulators.
 - 3. Valves, including general-duty, underground, manual and automatic control, and quick-coupler types, and valve boxes.
 - 4. Sprinklers, including emitters, drip tubes, and devices.
 - 5. Controls, including controller wiring diagrams.
 - 6. Wiring.
- C. Maintenance data for inclusion in "Operating and Maintenance Manual" for:

1. Backflow preventers, including instructions for testing.
2. Pressure regulators.
3. Automatic control valves.
4. Sprinklers.
5. Controllers.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of utility supplying water for prevention of backflow and back-siphonage.
- B. Comply with requirements of authority with jurisdiction for irrigation systems.
- C. Product Options: Irrigation system piping, specialties, and accessories are based specific types, manufacturers, and models indicated. Components with equal performance characteristics produced by other manufacturers may be considered, provided deviations in dimensions, operations, and other characteristics do not change design concept or intended performance as judged by the Landscape Architect. The burden of proof of product equality is on the Contractor.

1.6 PROJECT CONDITIONS

- A. Perform site survey, research public utility records, and verify existing utility locations. Verify that irrigation system piping may be installed in compliance with original design and referenced standards.

1.7 SEQUENCING AND SCHEDULING

- A. Coordinate irrigation systems work with landscape work specified in Section 32 90 00 Landscape.

PART II - PRODUCTS

2.01 PIPES AND TUBES

- A. Refer to Part 3 Article "Piping Applications" for identification of systems where pipe and tube materials specified below are used.
- B. Polyvinyl Chloride (PVC) Plastic Pipe: ASTM D 1785, PVC 1120, Schedule 40, 160 psi (1100 kPA) minimum pressure rating for 8-inch (200 mm) and smaller sizes, with plain ends.

2.02 PIPE AND TUBE FITTINGS

- A. Refer to Part 3 Article "Piping Applications" for identification of systems where pipe and tube fitting materials specified below are used.
- B. Polyvinyl Chloride (PVC) Plastic Pipe Fittings: ASTM D 2467, Schedule 80, socket-type.

2.03 JOINING MATERIALS

- A. Solvent Cement: ASTM F 656 primer and ASTM D 2564 solvent cement.

2.04 BACKFLOW PREVENTERS

See Drawing for Irrigation Systems Components List.

2.5 CONTROL VALVES

See Drawing for Irrigation Systems Components List.

- A. Control Valve Boxes: Polyethylene (PE), acrylonitrile-butadiene-styrene (ABS), fiberglass, polymer concrete, or precast concrete box and cover. Size as required for application.

- 1. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3 inches (75mm) maximum to $\frac{3}{4}$ inch (19 mm) minimum.

2.6 SPRINKLERS

See Drawing for Irrigation Systems Components List.

2.7 EMITTERS, DRIP TUBES, AND DEVICES

See Drawing for Irrigation Systems Components List.

2.8 AUTOMATIC CONTROL SYSTEM

See Drawing for Irrigation Systems Components List.

- A. Description: Low-voltage controller system, made for control of irrigation system automatic control valves. Controller operates on 120 volts a.c. building power system, provides 24 volts a.c. power to control valves, and includes stations for at least the number of control valves indicated.
- B. Interior Control Enclosures: Drip-proof enclosure with locking cover and 2 matching keys. Enclosure construction complies with NFPA 70 and NEMA 250, Type 12.
 - 1. Material: Molded Metal.
 - 2. Mounting: Surface-type for wall mounting.
- C. Transformer: Internal-type, and suitable for converting 120 volts a.c. building power to 24 volts a.c. power.
- D. Wiring: UL 493, solid copper conductor, insulated cable, suitable for direct burial.
 - 1. Feeder Circuit Cables: Type UF, No. 12 AWG minimum, between building and controllers.
 - 2. Low-Voltage, Branch Circuit Cables: Type UF, No. 14 AWG minimum, between controllers and automatic control valves. Jacket color is other than feeder-circuit-cable jacket color. Furnish cables with jackets of different colors for multiple cable installation in same trench.
 - 3. Splicing Materials: Pressure-sensitive thermoplastic tape and other materials required to make specified connections.
- D. Rain Check Sensor: Install Controller with a device capable of canceling operation during periods of heavy rain. Location to be verified with Landscape Architect.

PART III – EXECUTION

3.01 EXAMINATION

- A. Investigate and determine available water supply water pressure and flow characteristics.

3.02 PREPARATION

- A. Set stakes to identify proposed sprinkler locations. Obtain landscape Architect's approval before excavation.

3.03 PIPING APPLICATIONS

- A. Refer to Part 2 of this Section for detailed specifications for pipe and fittings products listed below. Use pipe, tube, fittings, and joining methods according to the following applications. Piping in pits and above ground may be joined with flanges instead of joints indicated.
- B. Use pipe, tube, fittings, and joining methods according to the following applications.
 - 1. Pressure Piping Above ground: Use the following:
ASTM D 1785, Schedule 40 PVC pipe, ASTM D 2466 Schedule 40 PVC fittings, solvent cemented joints.
 - 2. Pressure Piping Underground: (MAIN LINES) Use the following:
ASTM D 1785 Class 200 PVC pipe, ASTM D 2466 Schedule 40 PVC fittings, and solvent cemented joints.
 - 3. Circuit Piping: (LATERAL LINES) Use the following:
ASTM D 1785 Class 200 PVC pipe, ASTM D 2466 Schedule 40 PVC fittings, and solvent cemented joints.
 - 4. Swing Joints: Use the following:
ASTM D1785 Schedule 40 PVC pipe, ASTM D 2466 Schedule 40 PVC fittings, and solvent cemented joints.
 - a. Option: Plastic piping made for this application "Funny Pipe" may be used instead of pipe and fittings specified.
 - 5. Sleeves: ASTM D 1785, Schedule 40, polyvinyl chloride (PVC) plastic pipe; ASTM D 2466, Schedule 40, PVC plastic, socket-type fittings and solvent-cemented joints.

3.04 JOINT CONSTRUCTION

- A. Polyvinyl Chloride (PVC) Piping Solvent-Cemented Joints: Construct joints according to ASTM D 2672 and ASTM D 2855.
 - 1. Handling of Solvent Cements, Primers and Cleaners: Comply with procedures in ASTM F 402 for safe handling when joining plastic pipe and fittings with solvent cements.

3.05 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. General Locations and Arrangements: Drawings indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, and in other design considerations. Install piping as indicated, except where deviations to layout are approved on coordination drawings.
 - B. Install components having pressure rating equal to or greater than system operating pressure.
 - C. Install piping free of sags and bends.
 - D. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
 - E. Install fittings for changes in direction and branch connections.
-

3.06 PIPING INSTALLATION

- A. Install underground polyvinyl chloride (PVC) plastic pipe according to ASTM D 2774.
- B. Lay piping on solid sub-base, uniformly sloped without humps or depressions.
 - 1. Slope exhaust header in drip system down toward drain valve minimum of ½ inch in 10 feet (1:240).
 - 2. Install polyvinyl chloride (PVC) plastic pipe in dry weather when temperature is above 40 deg F (4 deg C). Allow joints to cure at least 24 hours at temperature above 40 deg F (4 deg C) before testing, unless otherwise recommended by manufacturer.
- C. Drain Pockets for Drip System: Excavate to a minimum of 12" x 12". Backfill with cleaned gravel or crushed stone, graded from 3 inches (75mm) to ¾ inch (19mm) minimum.
- D. Minimum Cover: Provide following minimum cover over top of buried piping:
 - 1. Pressure Piping: Greater depth of minimum of 24 inches (915 mm) below finished grade, or not less than 18 inches (460 mm) below average local frost depth.
 - 2. Circuit Piping: 12 inches (300 mm).
 - 3. Drain Piping: 12 inches (300 mm).
 - 4. Sleeves: 24 inches (600 mm).
 - 5. Drip tube: 2"
- E. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed, by tunneling, boring, or jacking.
- F. Install piping under sidewalks and paving in sleeves provided.

3.07 VALVE INSTALLATION

- A. Valves: Install underground valves in valve boxes.
- B. Control Valves: Install in valve control valve boxes, arranged for easy adjustment and removal. Install union on downstream side.

3.8 BACKFLOW PREVENTER INSTALLATION

- A. Install backflow preventers according to plumbing code and health department authorities with jurisdiction.

3.9 SPRINKLER INSTALLATION

- A. Sprinklers: Flush circuit piping with full head of water and install sprinklers after hydrostatic test is completed.
 - 1. Install sprinklers at manufacturer's recommended heights.
 - 2. Locate sprinklers to maintain a minimum distance of 4 inches (100 mm) from walls and other structures, unless otherwise indicated.

3.10 AUTOMATIC CONTROL SYSTEM INSTALLATION

- A. Install control wiring in same trench with piping.

3.11 CONNECTIONS

- A. Connect piping to sprinklers, devices, valves, control valves, specialties, and accessories.
- B. Connect water supplies to irrigation systems. Include backflow preventers on potable water supplies.
- C. Electrical Connections: Connect to power source, controllers, and automatic

- control valves.
- D. Ground system

3.11 FIELD QUALITY CONTROL

- A. Testing: Perform hydrostatic test of piping and valves before back-filling trenches. Piping may be tested in sections to expedite work.
 - 1. Cap and subject the piping system to a static water pressure of 50 psi above the operating pressure without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.
 - 2. Repair leaks and defects with new materials and retest system of portion thereof until satisfactory results are obtained.

3.12 CLEANING AND ADJUSTING

- A. Flush dirt and debris from piping before installing sprinklers and other devices.
- B. Adjust automatic control valves to provide flow rate of rated operating pressure required for each sprinkler circuit.
- C. Carefully adjust lawn sprinklers so they will be flush with, or not more than 1/2 inch (13mm) above, finish grade after completion of landscape work.
- D. Adjust settings of controllers and automatic control valves.

3.13 COMMISSIONING

- A. Starting Procedures: Follow manufacturer's written procedures. If no procedures are prescribed by manufacturers, proceed as follows:
 - 1. Verify that specialty valves and their accessories have been installed correctly and operate correctly.
 - 2. Verify that specified tests of piping are complete.
 - 3. Check that sprinklers and devices are correct type.
 - 4. Check that damaged sprinklers and devices have been replaced with new materials.
 - 5. Check that potable water supplies have correct type backflow preventers.
 - 6. Energize circuits to electrical equipment and devices.
 - 7. Adjust operating controls.
- B. Operational Testing: Perform operational testing after hydrostatic testing is completed, backfill is in place, and sprinklers are adjusted to final position.

3.15 DEMONSTRATION

- A. Demonstrate to Landscape Architect that system meets coverage requirements and that automatic controls function properly.
- B. Demonstrate to Owner's maintenance personnel operation of equipment, sprinklers, specialties, and accessories. Review operating and maintenance information.
- C. Provide 7 days' written notice in advance of demonstration.

3.16 WARRANTY

Contractor shall warranty entire system to be complete and operational for a period of one year from the date of final project acceptance.

END OF SECTION – 32 80 00

SECTION 32 60 00 - LAWNS AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Fine grading and preparing lawn areas.
 - 2. Furnishing and applying new topsoil.
 - 3. Furnishing and applying soil amendments.
 - 4. Furnishing and applying fertilizers.
 - 5. Hydro-seeding new lawns.
 - 6. Reconditioning existing lawn areas.
 - 7. Replanting unsatisfactory or damaged lawns.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 739 LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, 2016 Edition, Section 719 LANDSCAPING

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for the following:
 - 1. Soil Amendments.
 - 2. Fertilizers.
- C. Certification of grass sod including the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production. Provide the following documentation:
 - 1. 'Sod Classification Form' stating Class "A" sod, prior to installation conference.
 - 2. Certification of grass sod (delivery tickets) at time of installation.
- D. Certification by product manufacturer that all amendment products supplied complies with requirements.
- E. Material test reports from qualified independent testing agency indicating and interpreting test results relative to compliance of the following materials with requirements indicated.

1. Analysis of existing surface soil.
 2. Analysis of imported topsoil.
- F. Planting schedule indicating anticipated dates and locations for grassing.
- G. Maintenance instructions recommending procedures to be established by Owner for maintenance of lawns during an entire year. Submit before expiration of required maintenance periods.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed grassing work similar in material, design, and extent to that indicated for this Project and with a record of successful grass establishment.
1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that grass planting is in progress.
- B. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Architect satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
- C. Topsoil Analysis: Furnish a soil analysis of existing and proposed imported topsoil made by a qualified independent soil-testing agency stating percentages of organic matter, inorganic matter (silt, clay, and sand), deleterious material, pH, and mineral and plant-nutrient content of topsoil and report suitability of topsoil for lawn growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce satisfactory topsoil.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Sod: Harvest, deliver, store, and handle sod according to the requirements of the American Sod Producers Association's (ASPA) "Specifications for Turfgrass Sod Materials and Transplanting/Installing."

1.6 COORDINATION AND SCHEDULING

- A. Planting Season: Install sod during warm season – April 15th thru October 15th. Correlate planting with specified maintenance periods to provide required maintenance from date of Substantial Completion.
- B. Weather Limitations: Proceed with planting only when existing and forecast weather conditions are suitable for work.

1.7 MAINTENANCE

- A. Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
 - 1. Sodded Lawns: 90 days after date of Substantial Completion.
 - a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established at that time, continue maintenance during next planting season.
- B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.
 - 1. Replant any bare areas with same materials specified for lawns.
 - 2. Add new mulch in areas where mulch has been disturbed by wind or maintenance operations sufficiently to nullify its purpose. Anchor as required to prevent displacement.
- C. Watering: If necessary, provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawns uniformly moist to a depth of 4 inches.
 - 1. Lay out temporary lawn-watering system and arrange watering schedule to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly seeded areas.
 - 2. Water lawn at the minimum rate of 1 inch per week.
- D. Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height without cutting more than 40 percent of the grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain following grass height:
 - 1. Mow grass to maintain height at 1" – 1 ½" level.
- E. Postfertilization: Apply fertilizer to lawn after first mowing and when grass is dry.
 - 1. Use fertilizer that will provide actual nitrogen of at least 1 lb per 1000 sq. ft. of lawn area.
 - 2. Thoroughly water grass after fertilizing.

PART 2 - PRODUCTS

2.1 SOD

- A. Sod: Certified turfgrass sod complying with ASPA specifications for machine-cut thickness, size, strength, moisture content, and mowed height, and free of weeds, larvae, worms, insects, and undesirable native grasses. Provide viable sod of uniform density, color, and texture of the following turfgrass species, strongly rooted, and capable of vigorous growth and development when planted.

1. Species: 'Cynodon Dactylon, Common Bermuda

2.2 SEED: Certified seed complying with ASPA specifications.

1. Species: 'Cynodon Dactylon, Common Bermuda

2.3 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7.4 percent organic material minimum, free of stones 1 inch or larger in any dimension, and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled on the site as available and acceptable for areas other than lawn. Supplement with imported topsoil when quantities are insufficient. Clean all topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
2. Topsoil Source: Remove existing surface soil and replace with imported topsoil to a depth of 3".

2.3 SOIL AMENDMENTS

- A. Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent, with a minimum 99 percent passing a No. 8 sieve and a minimum 75 percent passing a No. 60 sieve.

1. Provide lime in the form of dolomitic limestone.

- B. Aluminum Sulfate: Commercial grade, unadulterated.

- C. Sand: Clean, washed, natural or manufactured sand, free of toxic materials.

- D. Perlite: Horticultural perlite, soil amendment grade.

- E. Peat Humus: Finely divided or granular texture, with a pH range of 6 to 7.5, composed of partially decomposed moss peat (other than sphagnum), peat humus, or reed-sedge peat.

- F. Ground-Bark Humus: Decomposed, nitrogen-treated, of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

1. When site treated, mix with at least 0.15 lb of ammonium nitrate or 0.25 lb of ammonium sulfate per cu. ft. of loose sawdust or ground bark.
- G. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.
- H. Herbicides: EPA registered and approved, of type recommended by manufacturer.
- I. Water: Potable.

2.4 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:
 1. Composition: 1 lb per 1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- B. Slow-Release Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 PLANTING SOIL PREPARATION

- A. Limit subgrade preparation to areas that will be planted in the immediate future.

- B. Loosen subgrade to a minimum depth of 3 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter.
- C. Mix soil amendments and fertilizers with topsoil at rates indicated. Delay mixing fertilizer if planting does not follow placing of planting soil within a few days. Either mix soil before spreading or apply soil amendments on surface of spread topsoil and mix thoroughly into top 4 inches of topsoil before planting.
 - 1. A "Planting Soil Amendments Schedule" is included at the end of this Section.
 - 2. Mix lime with dry soil prior to mixing fertilizer.
 - 3. Apply superphosphate fertilizer directly to subgrade before tilling, at the rate indicated.
- D. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen.
 - 1. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
- E. Preparation of Grades: Lawn areas are to be altered and disturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:
 - 1. Remove and dispose of existing grass, vegetation, turf, and soil to depth noted. Do not turn over into soil being prepared for lawns.
 - 2. Till remaining surface soil to a depth of at least 4 inches. Apply required soil amendments and initial fertilizers and mix thoroughly into top 3 inches of soil. Trim high areas and fill in depressions. Till imported soil to a homogenous mixture of fine texture.
 - 3. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - 4. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Owner's property.
- F. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1 inch in any dimension, and other objects that may interfere with planting or maintenance operations.
- G. Moisten prepared lawn areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- H. Restore prepared areas if eroded or otherwise disturbed after fine grading and before planting.

3.4 SODDING NEW LAWNS

- A. Lay sod within 24 hours of stripping. Do not lay sod if dormant or if ground is frozen.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with

subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across angle of slopes exceeding 1:3.

C. Saturate sod with fine water spray within 2 hours of planting. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below the sod.

3.5 HYDROSEEDED LAWNS

A. Hydro-seed Cynodon Dactylon, Common Bermuda Seed per LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, 2006 Edition, Section 739 Hydro-seeding.

3.6 RECONDITIONING LAWNS

A. Recondition existing lawn areas damaged by Contractor's operations, including storage of materials or equipment and movement of vehicles. Also recondition lawn areas where settlement or washouts occur or where minor regrading is required.

1. Recondition other existing lawn areas.

B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.

C. Where substantial lawn remains, mow, dethatch, core aerate, and rake. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides. Apply seed, fertilizer, and rake area to break cores and mix with seed and fertilizer.

D. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of it off the Owner's property.

E. Till stripped, bare, and compacted areas thoroughly to a depth of 6 inches.

F. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches of soil. Provide new planting soil as required to fill low spots and meet new finish grades.

G. Apply sod as required for new lawns.

H. Water newly planted areas and keep moist until new grass is established.

3.7 SATISFACTORY LAWN

- A. Sodded and seeded lawns will be satisfactory provided requirements, including maintenance, have been met and healthy, well-rooted, even-colored, viable lawn is established, free of weeds, open joints, bare areas, and surface irregularities.
- B. Replant lawns that do not meet requirements and continue maintenance until lawns are satisfactory.

3.8 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto surface of roads, walks, or other paved areas.
- B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period until lawn is established.

3.9 PLANTING SOIL AMENDMENTS SCHEDULE

- A. Lawns: Provide soil amendments in not less than the following quantities:
 - 1. Ratio of loose peat humus to topsoil by volume: 1:2
 - 2. Weight of lime per 1000 sq. ft.: as recommended by soil report
 - 3. Weight of bone meal per 1000 sq. ft.: as recommended by soil report
 - 4. Weight of superphosphate per 1000 sq. ft.: as recommended by soil report
 - 5. Weight of potash per 1000 sq. ft.: as recommended by soil report
 - 6. Weight of commercial fertilizer per 1000 sq. ft.: as recommended by soil report

END OF SECTION 02930



SECTION 334100 - STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe and fittings.
 - 2. Nonpressure transition couplings.
 - 3. Expansion joints and deflection fittings.
 - 4. Cleanouts
 - 5. Drains.
 - 6. Encasement for piping.
 - 7. Channel drainage systems.
 - 8. Catch basins.
 - 9. Stormwater inlets.
 - 10. Stormwater detention structures.
 - 11. Pipe outlets.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
 - 1. Preformed and/or Precast Catch basins. Include plans, elevations, sections, details, frames, covers, and grates.
 - 2. Pipe and fittings.
 - 3. Headwalls and Safety End Treatments (SET's)
 - 4. Stormwater Detention Structures: Include plans, elevations, sections, details, frames, covers, design calculations, and concrete design-mix reports.
- C. Product Certificates: For each type of pipe and fitting, from manufacturer.
- D. Field quality-control reports.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic manholes, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle piping according to manufacturer's written rigging instructions.
- D. Handle catch basins, grates, and frames according to manufacturer's written rigging instructions.

1.5 PROJECT CONDITIONS

- A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
 - 1. Notify Engineer, Construction Manager, and Site Facilities Manager no fewer than two days in advance of proposed interruption of service.
 - 2. Do not proceed with interruption of service Engineer, Construction Manager, and Site Facilities Manager's written permission.

PART 2 - PRODUCTS

2.1 HDPE PIPE AND FITTINGS

- A. Corrugated HDPE Drainage Pipe and Fittings ADS N-12 Dual Wall pipe, with ADS fittings or approved equal.
 - 1. High Performance water tight joints meeting ASTM D3212

2.2 REINFORCED CONCRETE PIPE AND FITTINGS

- A. Reinforced-Concrete Pipe: ASTM C76-11, AASHTO M 170-09
 - 1. Bell-and-spigot or tongue-and-groove ends and gasketed joints with ASTM C 443, rubber gaskets, sealant joints with ASTM C 990, bitumen or butyl-rubber sealant.

2.3 PVC TYPE PSM SEWER PIPING:

- 1. Pipe: ASTM D 3034, SDR 35, PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints.
- 2. Fittings: ASTM D 3034, PVC with bell ends.
- 3. Gaskets: ASTM F 477, elastomeric seals.

2.4 NONPRESSURE TRANSITION COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.
- B. Unshielded, Flexible Couplings:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Dallas Specialty & Mfg. Co.
 - b. Fernco Inc.
 - c. Logan Clay Pipe.
 - d. Mission Rubber Company; a division of MCP Industries, Inc.
 - e. NDS Inc.
 - f. Plastic Oddities; a division of Diverse Corporate Technologies, Inc.
 - 3. Description: Elastomeric sleeve with stainless-steel shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.

2.5 DRAINS

- A. Cast-Iron Area Drains:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings, with cover and frame by East Jordan Iron Works, or comparable product by one of the following:
 - a. Josam Company.
 - b. MIFAB, Inc.
 - c. Smith, Jay R. Mfg. Co.
 - d. Tyler Pipe.
 - e. Watts Water Technologies, Inc.
 - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
 - 3. Description: ASME A112.6.3 gray-iron round body with anchor flange and round secured grate. Include bottom outlet with inside calk or spigot connection, of sizes indicated.
 - 4. Top-Loading Classification(s): H-20 Medium and Heavy Duty.

2.6 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350/350R (ACI 350M/350RM), and the following:
 - 1. Cement: ASTM C 150, Type II.
 - 2. Fine Aggregate: ASTM C 33, sand.
 - 3. Coarse Aggregate: ASTM C 33, crushed gravel.
 - 4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi (27.6 MPa) minimum, with 0.45 maximum water/cementitious materials ratio.
 - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
 - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.
- C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi (27.6 MPa) minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
 - 1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
 - a. Invert Slope: 1 percent through manhole.
 - 2. Benches: Concrete, sloped to drain into channel.
 - a. Slope: 4 percent.

2.7 CATCH BASINS

- A. Standard Precast Concrete Catch Basins per LADOTD Standard Plans for CB-01, CV-04, or CB-06, CB-07, or as indicated on project plans:
- B. Frames and Grates: As called for in LADOTD Standard Plans MC-01, ASTM A 536, Grade 60-40-18, ductile iron designed for A-16, structural loading, or as indicated on project plans. Include flat grate with small square or short-slotted drainage openings.

2.8 Catch Basin Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi (27.6 MPa) minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.

- 1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.

- a. Invert Slope: 1 percent through manhole.
- 2. Benches: Concrete, sloped to drain into channel.
 - a. Slope: 4 percent.

2.9 STORMWATER INLETS

- A. Curb Inlets: Made with vertical curb opening of specified dimension on Standard LADOTD Catch basin Details.
- B. Gutter Inlets: Made with horizontal gutter opening of specified dimension on Standard LADOTD Catch basin Details. Include heavy-duty frames and grates.
- C. Combination Inlets: Made with vertical curb and horizontal gutter of specified dimension on Standard LADOTD Catch basin Details. Include heavy-duty frames and grates.

2.10 PIPE OUTLETS

- A. Head Walls: Cast-in-place reinforced concrete, with apron and tapered sides.
- B. Riprap Basins: Broken, irregularly sized and shaped, graded stone according to NSSGA's "Quarried Stone for Erosion and Sediment Control."
 - 1. Average Size: NSSGA No. R-6, screen opening 6 inches.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install

gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

- C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.
- F. Install gravity-flow, nonpressure drainage piping according to the following:
 - 1. Install piping pitched down in direction of flow.
 - 2. Install piping with 36-inch (915-mm) minimum cover.
 - 3. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.

3.3 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, nonpressure drainage piping according to the following:
 - 1. Join corrugated PE piping according to ASTM D 3212 for push-on joints.
 - 2. Join PVC piping according to ASTM D 2321 and ASTM F 891 for solvent-cemented joints.
 - 3. Join dissimilar pipe materials with nonpressure-type flexible couplings.

3.4 DRAIN INSTALLATION

- A. Install type of drains in locations indicated.
 - 1. Use Light-Duty, top-loading H-20 classification drains in earth or unpaved foot-traffic areas.
 - 2. Use Medium-Duty, top-loading H-20 classification drains in paved foot-traffic areas.
 - 3. Use Heavy-Duty, top-loading H-20 classification drains in vehicle-traffic service areas.
 - 4. Use Extra-Heavy-Duty, top-loading H-20 classification drains in roads.
- B. Embed drains in 4-inch (102-mm) minimum concrete around bottom and sides.
- C. Fasten grates to drains if indicated.
- D. Set drain frames and covers with tops flush with pavement surface.

3.5 CATCH BASIN INSTALLATION

- A. Construct catch basins to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated.

3.6 STORMWATER INLET AND OUTLET INSTALLATION

- A. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.
- B. Construct riprap of broken stone, as indicated.
- C. Install outlets that spill onto grade, anchored with concrete, where indicated.
- D. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.

3.7 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318.

3.8 STORMWATER DISPOSAL SYSTEM INSTALLATION

- A. Piping Systems: Excavate trenches of width and depth, and install piping system, filter fabric, and backfill, according to piping manufacturer's written instructions.

3.9 CONNECTIONS

- A. Pipe couplings, expansion joints, and deflection fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
 - 1. Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.
 - a. Shielded flexible couplings for same or minor difference OD pipes.

3.10 IDENTIFICATION

- A. Materials and their installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
 - 1. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.11 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches (610 mm) of backfill is in place, and again at completion of Project.
 - 1. Submit separate reports for each system inspection.
 - 2. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
 - c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Exfiltration: Water leakage from or around piping.
 - 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
 - 4. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
 - 1. Do not enclose, cover, or put into service before inspection and approval.
 - 2. Test completed piping systems according to requirements of authorities having jurisdiction.
 - 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
 - 4. Submit separate report for each test.
 - 5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
 - a. Exception: Piping with soiltight joints unless required by authorities having jurisdiction.
 - b. Option: Test plastic piping according to ASTM F 1417.
 - c. Option: Test concrete piping according to ASTM C 924 (ASTM C 924M).

3.12 CLEANING

- A. Clean interior of piping of dirt and superfluous materials. Flush with potable water.

END OF SECTION 334100