

DIVISION 31 - EARTHWORK

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SECTION 31 11 00

CLEARING, GRUBBING AND STRIPPING

PART 1 - GENERAL

1.1 Scope: This Section covers all clearing, grubbing and stripping work required for the construction of the project.

1.2 Clearing and Grubbing:

A. The CONTRACTOR shall clear and grub areas as designated on the Drawings or required by the ENGINEER.

B. Care shall be taken to leave nothing of material size or accumulated mass which thereafter may float or obstruct any pipe or waterway.

C. The CONTRACTOR shall not cut or injure any trees or other vegetation outside the limits of the areas on which work is to be done without permission and he shall guard against like action by his employees.

1.3 Stripping: The CONTRACTOR shall strip areas which are designated by the ENGINEER. The limits of the stripping shall be within the area so designated.

PART 2 - PRODUCTS

2.1 Equipment:

A. Equipment used for clearing and grubbing shall be at the CONTRACTOR'S option.

B. Blasting will not be permitted.

PART 3 - EXECUTION

3.1 Clearing:

A. The CONTRACTOR shall cut or otherwise remove all trees, saplings, brush and vines, (except those trees and other vegetation marked for retention by the OWNER); windfalls, logs and trees lying on the ground; dead trees and stubs more than one foot high above the ground surface, but not their stumps; trees which have been partially uprooted by natural or other causes, including their stumps; and other matter such as snags, leaves, sawdust, bark and refuse.

B. Except where clearing is done by uprooting with machinery or where stumps are left longer to facilitate subsequent grubbing operations, trees, stumps, and stubs to be cleared shall be cut as close to the ground surface as practicable, with no more than six (6) inches remaining above the ground surface in the case of small trees, and twelve (12") inches in the case of large trees. Saplings, brush, and vines shall be cut off close to the ground.

3.2 Grubbing: The CONTRACTOR shall remove all stumps within the designated area completely, remove all roots larger than three (3") inches in diameter to a depth of eighteen inches (18"), and remove all roots larger than one-half inch (½") in diameter to a depth of six (6) inches. Such depths shall be measured from the existing ground surface or the proposed finished grade, whichever is lower.

3.3 Stripping: Topsoil shall be removed to a minimum depth of six inches (6") or to its full depth (whichever is greater) where it occurs in areas to be filled or excavated and shall be stockpiled for use in finish grading. All precautions shall be taken to avoid contamination of topsoil by other excavated material and to prevent washing of topsoil by other excavated material and to prevent washing of topsoil into excavations, drainage or watercourses.

3.4 Depressions: Except in areas to be excavated for buildings and/or paved areas, depressions caused by grubbing operations shall be filled with native suitable material if acceptable to Engineer which shall be compacted to conform to the surrounding ground.

3.5 Disposal:

A. All material collected in the course of the clearing and grubbing that will not remain shall become the property of the CONTRACTOR and shall be disposed of in a manner satisfactory to the OWNER. Such disposal shall be carried on after removal of the materials in the clearing and grubbing operations and shall not be left until the final clean up period.

B. Prior to depositing surplus material at any off site location, the CONTRACTOR shall obtain a written agreement between himself and the owner of the property on which the disposal is proposed giving permission for the CONTRACTOR to enter and deposit the material at no expense to the project OWNER. A copy of the agreement shall be furnished to the OWNER.

- END OF SECTION -

SECTION 31 22 10EXCAVATION, FILLING AND BACKFILLINGPART 1 - GENERAL

1.1 Scope: This Section covers all excavation, filling and backfilling as required for the proposed project.

1.2 Reference Standard: Work shall conform to the following Section of the State of Louisiana, Department of Transportation and Development, "Louisiana Standard Specifications for Roads and Bridges", 2006 Edition, except as may be modified herein:

Section 203 - Excavation and Embankment

1.3 Applicable Publications: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

American Society for Testing and Materials (ASTM) Publications.

D 698 Test Methods for Moisture - Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. (2.49 kg) Rammer and 12 inch (304.8 mm) Drop

1.4 Submittals: Submit product data under provisions of Section 01 33 00 – Submittal Procedures.

PART 2 - PRODUCTS

2.1 Suitable Fill Materials: Suitable fill materials shall conform to the following, and as further specified in the Drawings:

A. Usable Soils (Imported): "Usable Soils" shall be as defined in Paragraph 203.06(a.) of the Reference Standard.

B. Select Fill Material (Imported): Select fill material shall be free of organic or other deleterious materials, homogeneous mixture, have a maximum particle size of three (3) inches, have a liquid limit less than 40 and a plasticity index between 8 and 20, and consist of silty-clayey sands (SM-SC), low plasticity sandy clays (CL) or clayey sands (SC) as defined by the Unified Soil Classification System. The material shall have a minimum of 30% retained on the 200 mesh sieve.

PART 3 – EXECUTION

3.1 General: All excavation, embankment and backfill work shall be in accordance with the Reference Standard except as modified herein.

3.2 Stripping: Excess topsoil shall be stockpiled for reuse as needed. Any remaining topsoil shall be removed from the site.

3.3 Filling and Embankment:

A. Imported fill to complete the required grading at the site may consist of “Usable Soils” or “Select Fill” as described in Paragraph 2.1.A and 2.1.B above, except that “Select Fill” shall be required under new drives and as noted on the Drawings. Fill shall be placed in horizontal layers not exceeding eight (8") inches in loose thickness, or six (6") inches when hand operated compactors are used. After placing, each layer shall be plowed, disked, or otherwise broken up, moistened or aerated as necessary, thoroughly mixed and compacted as specified using rubber-tired, and/or pneumatic rollers using strict moisture control.

B. Embankment shall not begin until construction below finish grade has been approved, underground utilities systems have been inspected, tested and approved, forms removed, and the excavation cleaned of trash and debris. Embankment shall not be placed in wet areas. Fill shall not be placed against structures prior to seven (7) days after completion of the structures. As far as practicable, backfill shall be brought up evenly on each side of the structure and sloped to drain away from the structure.

3.4 Compaction: Compaction requirements as set forth in the Reference Standard are hereby deleted. Fill and embankment shall be compacted the following maximum dry density as determined by the Standard Proctor (ASTM D698) test within one percentage point (1%) below to three percentage points (3%) above optimum moisture content:

A. Structure and/or Paved Areas: 95% (Min.)

B. Other Areas: 90% (Min.)

If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying.

3.5 Subgrade Preparation for Concrete Pavement Repair:

A. Subgrade soils should be compacted to a density of at least 95 percent of the Standard Proctor (ASTM D-698) maximum dry density for a depth of at least eight (8) inches below the surface.

3.6 Excavation Near Existing Structures:

A. Excavation near an existing structure shall not be allowed closer to the structure than the depth of the excavation below the bottom of the structure without shoring the excavation with sheeting.

B. The CONTRACTOR'S attention is directed to the fact that storm drains and other underground utilities may exist within or immediately adjacent to the areas of proposed construction. Some of these utilities are indicated on the Drawings; however, no attempt has been made to show all of the services, and the completeness and accuracy of the information is supplied for the purpose of providing the CONTRACTOR with an indication as to the approximate locations of utilities at the work areas so that the he will be made aware of their presence.

C. All utility lines shall be located on the ground with pipe locator equipment well ahead of the work at all times. All such locations shall be plainly marked by coded paint symbols on pavement or by marked stakes in the ground. Such locations shall be established at least 50 feet in advance of all excavation. All such location work shall be provided by the CONTRACTOR, to the satisfaction of the ENGINEER.

D. As the excavation approaches pipe, conduits, or other underground structures, digging by conventional trenching machine methods shall be discontinued. Only manual methods of excavating shall be employed around buried utilities. The CONTRACTOR shall include manual excavation in the work to be done under this contract.

3.7 Protection of Existing Structures:

A. All existing pipes, poles, wires, fences, walls, curbing, property line markers, and other structures which in the opinion of the OWNER must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the CONTRACTOR. In case of damage, the CONTRACTOR shall notify the property Owner so that the proper steps may be taken to repair any and all damage done. When the property Owners do not wish to make the repairs themselves, all damage shall be repaired by the CONTRACTOR; or, if not promptly done by him, the Owner may have the repairs made at the expense of the CONTRACTOR.

B. All utility services shall be supported by suitable means so that the services do not fail when tamping and settling occurs.

3.8 Sheeting and Bracing:

A. The CONTRACTOR shall furnish, place, and maintain such sheeting and bracing as may be required to support the sides of excavation, to prevent any movements which might in any way diminish the width of the excavation below that necessary for proper construction, and to protect adjacent structures from undermining or other damage.

B. Wherever possible, sheeting shall be driven ahead of the excavation to avoid loss of material from behind the sheeting. If it is necessary to excavate below the sheeting, care shall be taken to avoid trimming behind the face along which the sheeting shall be driven. Care shall be taken to prevent voids outside the sheeting; but, if voids are formed, they shall be filled immediately with sand and compacted.

C. The ENGINEER may direct that any timber used for sheeting and bracing be cut off at any specified elevation.

D. Sheeting and bracing not left in place shall be removed carefully so as not to endanger the work or other structures, utilities, or property. All voids left or caused by withdrawal of sheeting and bracing shall immediately be backfilled with sand and compacted by ramming with tools especially adapted to that purpose, or by other means as may be directed.

E. Sheeting and bracing that is ordered to be left in place by the ENGINEER shall be separately paid at a negotiated price and a change order issued for the work. Sheeting and bracing not left in place will not be measured and paid.

3.9 Drainage:

A. At all times during construction, the CONTRACTOR shall temporarily provide, place and maintain ample means and devices with which to remove promptly, and dispose properly of, all water entering trenches and other excavations, or water that may flow along or across the site of the work. Excavations shall be kept dry until the structures, pipes and appurtenances to be built therein have been completed, to such extent that they will not be damaged. At that time, the CONTRACTOR may remove such temporary means and devices.

B. All water pumped or drained from the work shall be disposed of in a manner satisfactory to the ENGINEER, without undue interference with other work or damage to pavements, other surfaces, or property.

3.10 Grading:

A. Grading of filled and unfilled areas shall be to the lines and grades indicated on the Drawings or as specified by the ENGINEER. Grading shall be performed in conjunction with all the necessary clearing, grubbing, stripping, filling and compacting operations to the satisfaction of the ENGINEER. Grading shall be performed to such lines and grades as may be necessary to allow for the addition of loam, if required, to the proposed finished grade.

B. Grading shall be done by bulldozer or other approved means. Areas adjacent to structures and other areas inaccessible to heavy grading equipment shall be graded by manual methods.

C. Final grading shall be performed in such manner as to provide proper drainage from the project site. Finished grades shall be pitched to drain away from structures completed under this contract as indicated on the Drawings or as directed by the ENGINEER. In no case shall drainage from the project site be so altered or controlled as to result in damage, or the potential for damage, to adjacent property or to any portion of the work executed under this contract from erosion or flooding.

3.11 Finishing: The surface of all excavations, fills, embankments, and raw subgrades shall be finished to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. The degree of finish for all graded areas shall be within 0.1 foot of the grade and elevations indicated. Ditches shall be finished in a manner that will result in effective drainage. The surface of areas to be seeded shall be furnished to a smoothness suitable for the application.

3.12 Protection: Settlement or washing that occurs in graded, topsoiled, or embankment areas prior to acceptance of the work shall be repaired and grades reestablished to the required elevations and slopes.

3.13 Field Density Testing: Each lift of compacted soil should be tested by geotechnical engineer/laboratory prior to placement of subsequent lifts. Field density test shall be taken at a frequency of not less than one (1) test per 5,000 square feet of surface area per lift. Costs for required field density testing shall be borne by the OWNER.

- END OF SECTION -

SECTION 31 22 16

FILLING AND GRADING

PART 1 - GENERAL

1.1 Scope: This Section covers filling and grading as required to achieve final site contours indicated on the Drawings or as authorized by the ENGINEER.

1.2 Applicable Publications: The publications listed below form a part of this Specification to the extent referenced. The publication may be referred to in the text by basic designation only:

A. American Society for Testing and Materials

D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort

D2487 Classification of Soils for Engineering Purposes (Unified Soil Classification System)

1.3 Submittals: Submittals shall be provided in accordance with Section 01 33 00 – Submittal Procedures.

PART 2 - PRODUCTS

2.1 Suitable Materials:

A. Approved suitable materials available from excavations and not required for backfill under, around or against structures may be used for filling except as otherwise specified. Surplus excavated materials to be used as fill shall meet the requirements of these Specifications, as appropriate for intended use.

B. All fill materials, whether from the excavations or from borrow, shall be of such nature as to provide a dense, stable fill after placement and compaction by accepted procedures. Fill shall be essentially free of organic and porous materials, shall contain no visible vegetation, masses of roots, or individual roots longer than 18 inches or more than ½ inch in diameter, and shall be free of stones greater than three (3") inches in longest dimension.

C. Borrow material for filling and grading shall be approved by the ENGINEER for any type of work.

D. Unless otherwise noted on the Drawings, all fill material for filling and grading shall have a Unified Soil Classification of “ML”, “SC” or “CL” with a maximum liquid limit of 45 and P.I. range of 6 to 20.

PART 3 - EXECUTION

3.1 Moisture Control:

A. Moisture in fill materials shall be equal to that found in the natural unexcavated condition insofar as is practicable. If the ENGINEER determines that the fill material to be used is excessively wet, the CONTRACTOR shall spread the material on the areas to be filled and fill shall be permitted to dry to an allowable moisture content. The drying process shall be assisted by harrowing where necessary.

B. If, in the opinion of the ENGINEER, additional moisture is required, water shall be applied by sprinkler tanks or other sprinkling devices in such a way as to provide uniform distribution over the area to be treated with accurate control of the rate and quantity of water applied. If excessive amounts of water are added or if rain should cause excessive wetness, the area shall be allowed to dry as provided above.

C. The moisture content of the fill shall be sufficient to permit proper compaction but not so great as to cause loss of soil stability.

3.2 Preparation of Subgrade: The CONTRACTOR shall remove loam and topsoil, loose vegetable matter, stumps, large roots, etc., from all areas which are to receive placement of fill. The subgrade shall be prepared by forking, furrowing, or plowing in order that the new material to be placed thereon shall be well bonded to the subgrade (refer to Section 31 11 00 – Clearing, Grubbing and Stripping)

3.3 Filling and Compaction:

A. After the subgrade has satisfactorily been prepared, the fill material shall be placed thereon and built-up in successive layers until the required elevation is reached.

B. The filling operation shall begin in the deepest part of the area to be filled, and fill shall be brought up in essentially level lifts.

C. Fill shall be placed in layers by bulldozer or other approved method. The entire surface of the work shall be maintained free from ruts and in a condition that will permit construction equipment to travel over any section readily.

D. During the spreading process, all roots, debris, and stones greater in size than those specified in Paragraph 2.1 shall be removed from the fill areas. The CONTRACTOR shall assign a suitable number of persons to this work to guarantee satisfactory compliance with this requirement.

E. Layers of fill shall not exceed eight inches (8") in depth before compaction.

F. The top surface of each layer shall be made level or slightly sloped away from the center of the filled area. In general, the finer and less pervious materials shall be placed toward the center and the coarser and more pervious materials toward the outer limits of the filled area.

G. Each spread layer of material shall be compacted by the use of rollers, rubber-tire equipment, or other approved means so as to secure a dense, stable, and thoroughly compacted mass. The ENGINEER may require that compaction be provided by a minimum of four (4) complete coverages of the area to be compacted by the tire treads in contact with the flat earth surface.

H. Area adjacent to structures and other area inaccessible to mobile compaction equipment shall be compacted with suitable power driven tampers or other approved devices. Compaction by the latter method shall be done in six (6) inch layers, unless otherwise directed by the ENGINEER or shown on the Drawings.

I. Previously placed or new materials shall be moistened by sprinkling, if required, to ensure proper bond and compaction. No compaction shall be done when the material is too wet. If the compaction surface of the fill layer is determined to be too smooth to provide and adequate bond with the succeeding layer, the surface shall be loosened by harrowing or by some other approved method of compaction used.

J. If at any time the ENGINEER judges that the degree of compaction being obtained is insufficient, he may halt operations. Areas found deficient in degree of compaction shall be recompacted and regraded, if required, at the sole expense of the CONTRACTOR.

3.4 Grading:

A. Grading of filled and unfilled area shall be to the lines and grades indicated on the Drawings or as specified by the ENGINEER. Grading shall be performed in conjunction with all of the necessary stripping, filling, and compacting operations to the satisfaction of the ENGINEER. Grading shall be performed to such lines and grades as may be necessary to allow for the addition of loam, if required, to the proposed finished grade.

B. Grading shall be done by bulldozer or other approved means. Areas adjacent to structures and other areas inaccessible to the listed grading equipment shall be graded by manual methods.

C. Final grading shall be performed in such manner as to provide proper drainage from the project site. Finished grades shall be pitched to drain away from structures completed under this contract as indicated on the Drawings or as directed by the ENGINEER. In no case shall drainage from the project site be so altered or controlled as to result in damage, or the potential for damage, to adjacent property or to any portion of the work executed under this contract from erosion or flooding.

- END OF SECTION -

SECTION 31 23 17

TEST PITS

PART 1 - GENERAL

1.1 Scope: This Section covers all operations necessary to dig test pits in order to determine the exact location of existing utilities.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 Test Pits: Test pits for the purpose of locating underground utilities which may interfere with installation of the Work shall be excavated in advance of the Work and backfilled by the CONTRACTOR. For the purpose of bidding, the CONTRACTOR shall include ten (10) test pits. Test pits shall be backfilled immediately after their purpose has been satisfied and maintained in a manner satisfactory to the ENGINEER. Backfill shall comply with Section 31 23 33 - Excavation, Backfill and Compaction of Trenches.

- END OF SECTION -

SECTION 31 23 19

DEWATERING

PART 1 - GENERAL

1.1 Scope: This Section covers all work required to install and maintain drainage systems for handling groundwater and surface water encountered during construction of the project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 Dewatering:

A. The CONTRACTOR shall, at all times during construction, provide and maintain proper equipment and facilities to promptly remove and dispose of all water entering excavations and keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition, until the fill, structure, or pipes to be built thereon are installed or constructed.

B. Dewatering shall at all times be conducted in such a manner as to preserve the natural undisturbed bearing capacity of the subgrade soils to proposed bottom of excavation.

C. The CONTRACTOR shall furnish all materials and equipment and perform all work required to install and maintain the drainage systems he proposes for handling groundwater and surface water encountered during construction of structures, pipelines, and compacted fills.

D. Any dewatering methods must meet the approval of the ENGINEER.

- END OF SECTION -

SECTION 31 23 33EXCAVATION, BACKFILL AND COMPACTION FOR TRENCHESPART 1 - GENERAL

1.1 Scope: This Section covers excavation, backfill and compaction associated with the installation of all underground storm drainage piping (downspout header piping).

1.2 General:

A. Work specified under this section shall be satisfactorily executed, regardless of subsurface materials encountered, as shown on the Drawings or as otherwise directed by the ENGINEER.

B. Although it is the intention to adhere to the Drawings, the CONTRACTOR is informed that the locations of proposed utilities and other structures shown on the Drawings are approximate. The ENGINEER reserves the right to make changes in location, lines, and grades where such adjustments may be necessary or advantageous.

C. Excavation, dewatering, sheeting, and bracing shall be carried out in such a manner as to eliminate any possibility of undermining or disturbing the foundations of any existing structure or any work previously completed under this contract.

1.3 Care and Restoration of Property:

A. Excavating machinery and all other heavy equipment shall be operated with care to prevent damage to trees that are not designated for removal. Where required, trees not designated for removal within or adjacent to the work site shall be braced by suitable means at the ENGINEER'S direction.

B. Branches, limbs, trunks and roots of remaining vegetation shall not be cut except by permission of the ENGINEER. All cutting shall be smoothly and neatly done without splitting or crushing. In case of cutting or unavoidable damage to branches, limbs and trunks of trees, the cut or damaged portions shall be neatly trimmed and covered with an application of grafting wax or tree healing paint as directed.

C. Cultivated hedges, shrubs, and plants not designated for removal which might be injured by the CONTRACTOR'S operations shall be protected by suitable means or shall be dug up and temporarily replanted and maintained. After the construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of kind and quality at least equal to the kind and quality existing at the start of the work.

D. On paved surfaces, the CONTRACTOR shall not use or operate tractors, bulldozers, or other power operated equipment of which the treads of which are so shaped as to cut or otherwise damage such surfaces.

E. All lawns, paved surfaces, roadways, and structures which have been damaged by the CONTRACTOR'S operations shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations. The restoration of existing property and structures shall be done as promptly as practicable and shall not be left until the end of the construction period.

1.4 Applicable Publications: The publication listed below forms a part of this specification to extent referenced. The publication is referred to in the text by the basic designation only:

American Society for Testing and Material (ASTM) Publications

D 698 Test Methods for Moisture - Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. Rammer and 12 in. Drop

PART 2 - PRODUCTS

2.1 Backfill Materials for Trenches: Backfill materials for utility trenches shall be "Suitable Material" in accordance with Section 31 22 16 - Filling and Grading; except that "Select Fill" material in accordance with Section 31 22 10 - Excavation, Filling and Backfilling shall be required under all areas to be paved (drives, walks, etc.).

PART 3 - EXECUTION

3.1 General Preparation:

A. The CONTRACTOR shall make excavations in such a manner and to such a width as will give suitable room for or laying and adjoining pipe; shall furnish and place all sheeting, bracing, and supports; shall do all pumping, and draining; and shall render the bottom of the excavation firm and dry and in all respects acceptable.

B. In no case shall the earth be plowed, scraped, or dug by machinery so near to the finished grade at the bottom of the excavations as to result in disturbance of material below said grade. The last of the material to be excavated shall be removed with pick and shovel just before placing pipe. All loose materials shall be removed from the bottom of the excavation so that the bottom shall be in an undisturbed condition.

3.2 Separation of Surface Materials:

A. From areas within which excavations are made, loam and topsoil shall be carefully removed and separately stored to be used again as directed. When excavations are made

in paved surfaces, the pavement shall be saw-cut and removed so as to provide a straight, clean uniform edge with a minimum disturbance of remaining pavement.

3.3 Drainage:

A. At all times during construction, the CONTRACTOR shall temporarily provide, place and maintain ample means and devices with which to remove promptly, and dispose properly of, all water entering trenches and other excavations, or water that may flow along or across the site of the work. Excavations shall be kept dry until the pipes and appurtenances to be built therein have been completed, to such extent that they will not be damaged. At that time, the CONTRACTOR may remove such temporary means and devices.

B. All water pumped or drained from the work shall be disposed of in a manner satisfactory to the ENGINEER, without undue interference with other work or damage to pavements, other surfaces, or property.

3.4 Trench Excavation in Fill: Before laying pipe or conduit in areas of fill, the following procedure shall be required:

A. Fill material shall be placed and properly compacted to final grade or to three feet above the top elevation of the pipe, whichever is less. Under certain circumstances the CONTRACTOR may request modification of this requirement. Any modification must be detailed in writing and approved by the ENGINEER.

B. Particular care shall be taken to ensure maximum consolidation of material under the pipe location.

C. The pipe trench shall then be excavated in the prescribed manner as though in undisturbed soil.

3.5 Excavation Near Existing Structures:

A. Excavation near an existing structure shall not be allowed closer to the structure than the depth of the excavation below the bottom of the foundation without shoring the excavation with sheeting.

B. The CONTRACTOR'S attention is directed to the fact that site piping and other underground utilities may exist within or immediately adjacent to the areas of proposed construction. Some of the site piping is indicated on the Drawings; however, no attempt has been made to show all piping, and the completeness and accuracy of the information is supplied for the purpose of providing the CONTRACTOR with an indication as to the approximate locations of site piping at the work areas so that he will be made aware of their presence.

C. All utility lines shall be located by the CONTRACTOR on the ground with pipe locator equipment and by means of test pits well ahead of the work at all times. All

such locations shall be plainly marked by coded paint symbols on pavement or by marked stakes in the ground. Such locations shall be established at least 24 hours in advance of all excavation. All such location work shall be provided by the CONTRACTOR, to the satisfaction of the ENGINEER, at no extra cost.

D. As the excavation approaches pipe, conduits, or other underground structures, digging by conventional trenching machine methods shall be discontinued. Manual methods of excavating shall be employed around buried structures. The CONTRACTOR shall include manual excavation in the work to be done under this contract. No additional compensation shall be paid to the CONTRACTOR for excavations by hand.

3.6 Protection of Existing Structures:

A. All existing pipes, poles, wires, fences, curbing, property line markers, and other structures which, in the opinion of the OWNER, must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the CONTRACTOR. In case of damage, the CONTRACTOR shall notify the property owner so that the proper steps may be taken to repair any and all damage done. When the property owners do not wish to make the repairs themselves, all damage shall be repaired by the CONTRACTOR; or, if not promptly done by him, the owner may have the repairs made at the expense of the CONTRACTOR.

B. All existing piping shall be supported by suitable means so that the piping does not fail when tamping and settling occurs. No separate item is provided for timber piping supports.

C. The CONTRACTOR shall not be compensated for any additional work involved if existing piping or underground structures cross the trench line transversely above or below the utility line.

3.7 Relocation and Replacement of Existing Structures:

A. If, in the course of construction, the CONTRACTOR encounters existing piping and/or structures of any kind not indicated on the Drawings, or otherwise provided for, which encroach upon or are encountered near and substantially parallel to the edge of the excavation and which, in the opinion of the ENGINEER, will impede progress to such an extent that satisfactory construction cannot proceed, they shall be relocated, removed (later to be restored), or replaced as follow:

1. Whenever the CONTRACTOR encounters any of the conditions as described above and is so ordered in writing, he shall do the whole of or such portions of the work as directed; change the location of, remove and later restore, or replace such structures; or assist the OWNER thereof in so doing. For such work the CONTRACTOR shall be issued a change order for extra work.

2. In removing existing pipes or structures as described above, the CONTRACTOR shall use care to avoid damage to materials, and the OWNER shall include for payment only those new materials which, in his judgement, are necessary to replace those unavoidably damaged.

3.8 Backfilling and Compaction - General:

A. Backfilling shall be done as promptly as is consistent with non-injury to the work but no backfilling shall be done without the ENGINEER'S permission.

B. A bulldozer or other blade shall not be used in placing backfill; however, placement of backfill by mechanical equipment with various type buckets may be permitted at the ENGINEER'S approval.

C. The backfill material shall be free from cinders, ashes, refuse, boulders, rocks or stones, unsuitable organic material or other material which in the opinion of the ENGINEER is unsuitable. Where excavated material or any portion thereof is deemed unsuitable for backfilling material, the CONTRACTOR shall procure and place approved materials, as ordered by the ENGINEER.

D. Where the excavation is in a paved area, an area to be paved, an unpaved vehicular traveled way, or the shoulder of a paved roadway, a suitable pavement base shall be provided if shown on/specified within the Drawings.

3.9 Backfilling in Open Trench:

A. As soon as practicable after the pipe has been placed and the pipe joints have been properly made, the backfilling shall begin, and shall continue without delay. If bedding material is not used, the backfill material shall be placed simultaneously on both sides of the pipe, so that there will be no displacement of pipe alignment in strict conformance with manufacturers recommendation. In placing the material, care shall be taken that stones do not strike the pipe.

B. The backfill at the sides of the pipe up to the top of the pipe shall be hand placed and thoroughly compacted using approved hand tampers.

C. The backfill up to a level of one foot above the top of the pipe shall be placed in four inch (4") layers, leveled along the length and width of the trench and thoroughly compacted with approved hand tampers.

D. Care shall be taken in the use of mechanical tampers not to injure or move the pipe or to cause the pipe to be supported unevenly. Mechanical tampers shall not be used within one foot of the top of the pipe.

E. The backfill in the remainder of the excavation above the tamped backfill, or above the top of the bedding material, if used, shall be placed in appropriate machine

methods. Tamping will not be required in earth surface areas not subject to vehicular traffic. Backfilling or tamping with trenching machines is prohibited.

F. No large masses of backfilling material shall be dropped into the tamped layers of backfill until one foot of earth backfill has been placed over the top of the pipe.

G. Compaction by water jetting will not be permitted.

H. Whatever method of compacting backfill is used, care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material.

I. No compacting shall be done when the material is too wet to be compacted properly; at such times the compacting work shall be suspended until the previously placed materials have dried out sufficiently to permit proper compacting, or such other precautions shall be taken as necessary to obtain proper compacting.

J. All backfilled trenches in traveled areas shall be thoroughly surface tamped with a kinetic energy tamping machine approved by the ENGINEER.

K. All backfilled trenches shall be compacted in eight inch (8") maximum loose lifts to within 1% below to 3% above optimum moisture content and as follows:

1. Paved Areas - at least 95% Standard Proctor Density (ASTM D698)
2. Grassed Areas - at least 90% Standard Proctor Density (ASTM D698).

3.10 Excavated Material:

A. General:

1. Excavated material shall be placed so as minimize the inconvenience to occupants traveling on streets and driveways or adjoining properties. Excavated material shall not be deposited on private property unless written consent of the owner or owners thereof has been filed with the ENGINEER.
2. Suitable excavated material will be used as backfill, fill for embankments, or other parts of the work in accordance with the appropriate sections of the Specifications.
3. Surplus excavated material, if any, shall be disposed of by the CONTRACTOR in a legal and environmentally sound manner.

B. Clean Up and Restoration of Work Site:

1. Upon completion of the backfilling, the streets or property shall be cleaned, surplus material removed, and the surfaces restored to the condition existing before ground was broken. If the CONTRACTOR fails to promptly remove such

surplus material, the ENGINEER may have the same done, and charge the cost thereof as money paid to the CONTRACTOR.

2. Material excavated from private property shall be disposed of by the CONTRACTOR at his own expense. If the CONTRACTOR fails to remove such surplus material, the ENGINEER may have the same done, and charge the cost thereof as money paid to the CONTRACTOR.

3.11 Borrow: Should material excavated under the work of this Contract be unsuitable or of insufficient quantity for completion of the necessary backfilling operations, the CONTRACTOR shall furnish approved backfill material. Approved backfill to supplement insufficient quantity for completion shall not be paid for separately and shall be considered as a subsidiary obligation under this Contract.

- END OF SECTION -

SECTION 31 25 14

EROSION CONTROL AND SOIL STABILIZATION

PART 1 - GENERAL

1.1 Scope: This Section covers the installation of erosion control and soil stabilization materials consisting of temporary seeding, permanent sodding, and fertilizing in disturbed or designated areas. Refer to Drawings for limits of sodding.

1.2 Reference Standard: Work shall conform to the following Sections of the State of Louisiana, Department of Transportation and Development, Standard Specifications for Roads and Bridges, 2006 Edition; except as modified herein:

Section 714 - Sodding

Section 718 - Fertilizer and Agricultural Lime

All references made therein to Measurement and Payment are deleted.

1.3 Submittals: Submittals shall be provided in accordance with Section 01 33 00 – Submittal Procedures.

1.4 Planting Time: Place lawns during normal planting seasons of the project locale. If project finish out occurs during weather conditions that are not suitable to planting, planting shall be deferred until suitable and sustained weather conditions exist. This deferment shall have no effect on the substantial completion of other work.

1.5 Replacement Provisions:

A. Lawns: Warrant lawns until the date of acceptance at the end of the specified maintenance period.

B. Replace unsatisfactory landscape materials (those dead or lacking vigor) with healthy, vigorous materials. Plant only during next occurring specified planting season.

1.6 Maintenance: Maintain lawns from immediately after planting until the latest of: substantial completion of the project, or 60 days after date when hydroseeding is substantially complete, or until an acceptable lawn is established.

PART 2 - PRODUCTS

2.1 General:

A. Materials related to erosion control and soil stabilization shall conform to the following subsections of the Reference Standard:

1)	Sodding	Common Bermuda or St. Augustine
2)	Seed	Common Bermuda
3)	Water	714.07
4)	Fertilizer	1018.16
5)	Agricultural Lime	1018.17

B. Topsoil:

1. Provide friable clay loam surface soil.
2. Satisfactory Topsoil: Fertile agricultural soil, typical for locality, capable of sustaining vigorous plant growth; free of subsoil, rocks larger than 2" in diameter, clay, toxic mater, plants, weeds and roots.
3. Unsatisfactory Soil Material: silty soils, clayey soils, peat.

PART 3 - EXECUTION

3.1 General:

- A. The CONTRACTOR shall neatly dress and prepare areas designated for erosion control work as specified in the appropriate sections of these Specifications.
- B. Prepare only those areas that will be planted presently.
- C. Preparation of stripped areas: Till subgrade to a depth of at least two inches (2").
- D. Fine-grade, roll, rake and drag lawn areas cutting down high spots and filling low spots, leaving a smooth, even surface of fine-textured soil complying with required grades.
- E. The CONTRACTOR shall be required to furnish and apply water on the newly placed sod as necessary to maintain a healthy stand of vegetation until Paragraph 1.6 of this Section is satisfied.

3.2 Seeding: Seeding for temporary erosion control work shall be in conformance with Reference Standard (LDOTD – Section 717). There will be no separate measurement or payment for watering.

3.3 Sodding: Sodding work shall be in conformance with the Reference Standard (Section 714) and these Specifications. Areas to receive sod shall be graded to allow for two inches (2") of sod thickness. Finished sod elevation shall generally match elevation of adjacent pavement/surface. Limits of required sod is shown and/or noted on the Drawings.

3.4 Fertilizer: Fertilizer shall be installed in conformance with the Reference Standard (LDOTD - Section 718) and these Specifications.

3.5 Agricultural Lime: The top six (6) inches of embankment material shall have a pH between seven (7) and eight (8) which will support adequate vegetation. If required, the material shall be treated with agricultural lime to promote support of adequate vegetation.

3.6 Water: Water for irrigation purposes may be obtained from any source, except that chemically contaminated or oily water shall not be used.

3.7 Maintenance:

A. Apply a starter fertilizer with a ratio of 1:1:1 (nitrogen:phosphorous:potassium) after grass seed has germinated and growth has begun (or sod has sufficiently rooted), at a rate of one (1) pound of nitrogen per 1,000 square feet. Apply fertilizer at the above rate every month thereafter, thoroughly watering in for each application until Paragraph 1.6 of this Section is satisfied.

B. Mowing shall begin once grass reach 3" tall, if applicable for the required maintenance period. Care shall be taken to ensure that not more than one-third (1/3) of the leaf blade is removed in a single mowing.

C. Watering, fertilizing and mowing operations shall continue on the newly sodded and hydroseeded areas until Paragraph 1.6 of this Section is satisfied.

- END OF SECTION -