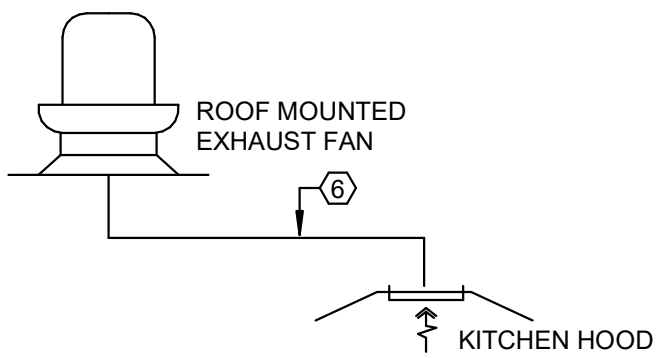


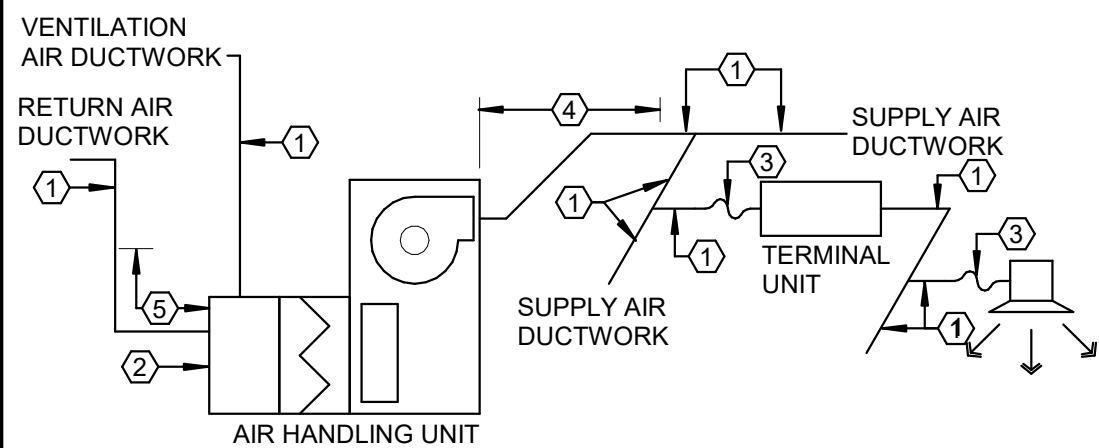
BASIS OF DESIGN
THE MANUFACTURER AND MODEL NUMBER LISTED IN THE DRAWINGS OR SPECIFICATIONS ARE THE BASIS OF DESIGN. WHEN PROVIDING EQUIPMENT BY AN ACCEPTABLE MANUFACTURER THAT IS NOT BASIS OF DESIGN, THE CONTRACTOR SHALL PROVIDE AS A PART OF THE SUBMITTAL AND/OR SHOP DRAWING AN ITEMIZED LIST OF ALL MODIFICATIONS REQUIRED TO INSTALL THE NON-BASIS OF DESIGN EQUIPMENT FROM THE INFORMATION DETAILED IN BOTH THE SPECIFICATION SECTION AND EQUIPMENT SCHEDULE. ADDITIONALLY, THE EQUIPMENT MUST ADDRESS THE PHYSICAL CONSTRAINTS OF SPACE INCLUDING COORDINATION WITH OTHER TRADES AND ALL EQUIPMENT CLEARANCES. FINALLY, THE CONTRACTOR SHALL PROVIDE AT NO ADDITIONAL COST TO THE PROJECT ANY SCOPE INCREASE BASED ON THE NON-BASIS OF DESIGN EQUIPMENT FOR THE FOLLOWING MINIMUM ITEMS:

- ELECTRICAL MODIFICATIONS, INCLUDING WIRING, CONDUIT, DISCONNECTS, OVERCURRENT PROTECTION, PANELS, MOTORS, ETC.
- PLUMBING MODIFICATIONS, INCLUDING DOMESTIC WATER, SANITARY, CONDENSATE, AND GAS PIPING, ETC.
- CIVIL MODIFICATIONS
- DUCT AND PIPE CONNECTIONS OR ARRANGEMENTS
- SPACE HEATING AND COOLING REQUIREMENTS
- EXHAUST OR VENTILATION REQUIREMENTS
- VIBRATION ISOLATION REQUIREMENTS
- CONTROLS REQUIREMENTS TO MEET SPECIFICATIONS

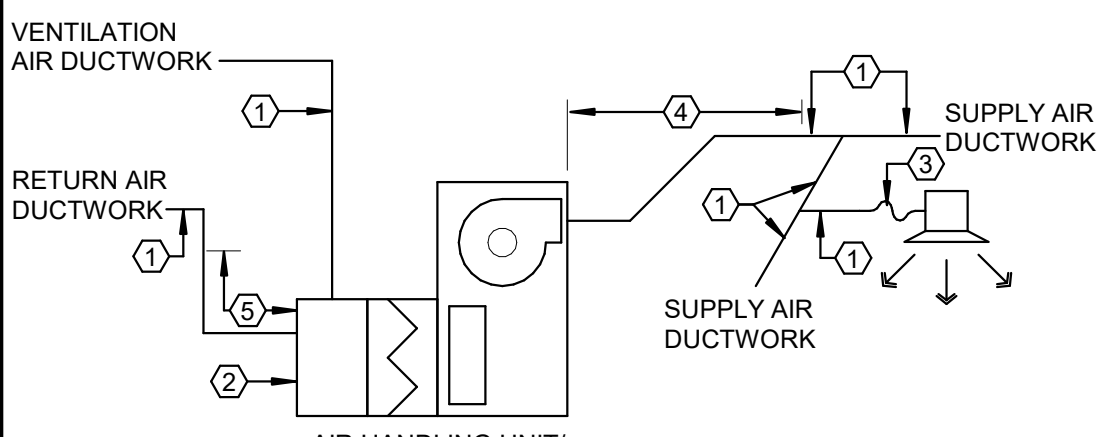
DUCT LINER AND INSULATION



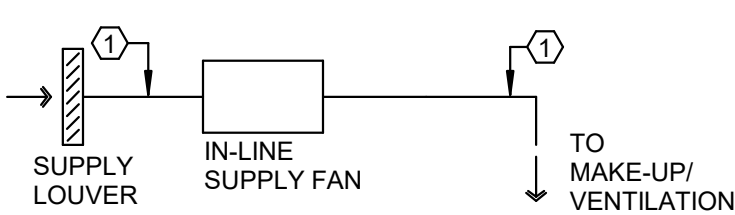
KITCHEN HOOD EXHAUST AIR SYSTEMS



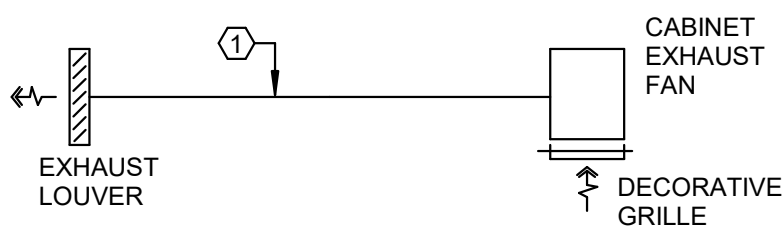
VARIABLE AIR VOLUME AIR HANDLING UNITS



AIR HANDLING UNITS AND FAN COIL UNITS



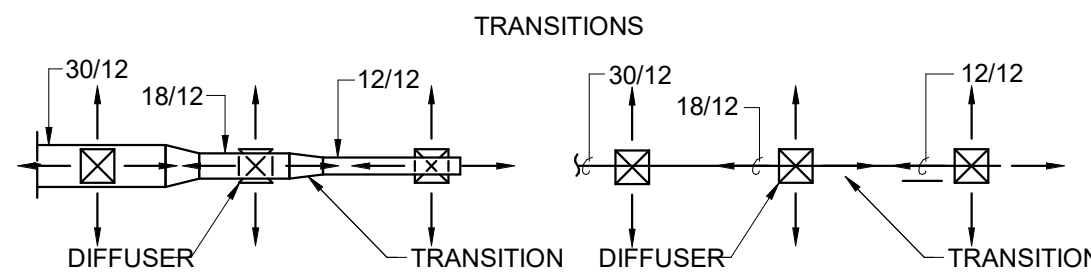
MAKE-UP/VENTILATION AIR SYSTEMS



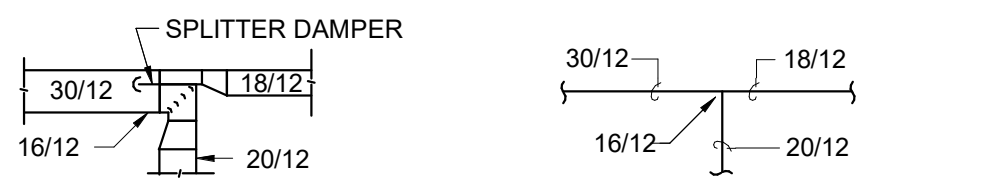
EXHAUST AIR SYSTEMS

- KEYED NOTES:**
- SHEETMETAL DUCTWORK WITH EXTERNAL DUCTWORK INSULATION AS SPECIFIED.
 - SHEETMETAL DUCTWORK RETURN AIR PLENUM WITH EXTERNAL DUCTWORK INSULATION AS SPECIFIED.
 - FLEXIBLE DUCTWORK WITH EXTERNAL DUCTWORK INSULATION AS SPECIFIED.
 - SHEETMETAL DUCTWORK WITH EXTERNAL DUCTWORK INSULATION AS SPECIFIED AND 1" THICK 1-1/2 LB LINER AS SPECIFIED FROM AIR HANDLING UNIT DISCHARGE TO 10'-0" DOWNSTREAM.
 - SHEETMETAL DUCTWORK WITH EXTERNAL DUCTWORK INSULATION AS SPECIFIED AND 1" THICK 1-1/2 LB LINER AS SPECIFIED FROM AIR HANDLING UNIT INLET TO 10'-0" UPSTREAM.
 - EXHAUST DUCTWORK AS SPECIFIED WITH FIREBOARD INSULATION AS SPECIFIED.
 - SHEETMETAL DUCTWORK ONLY. NO INSULATION REQUIRED.

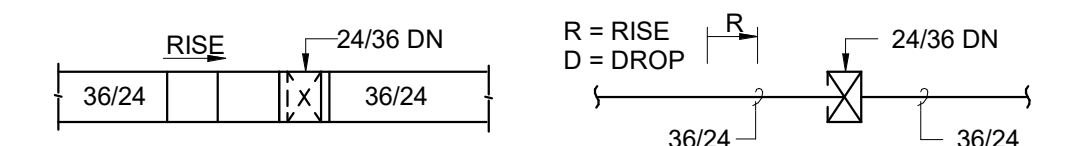
DUCTWORK SYMBOLS LEGEND



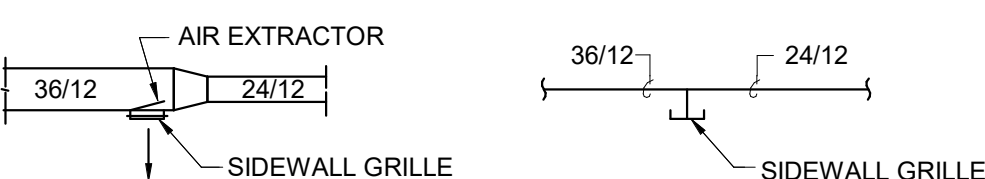
MAIN BRANCH TAKE-OFFS



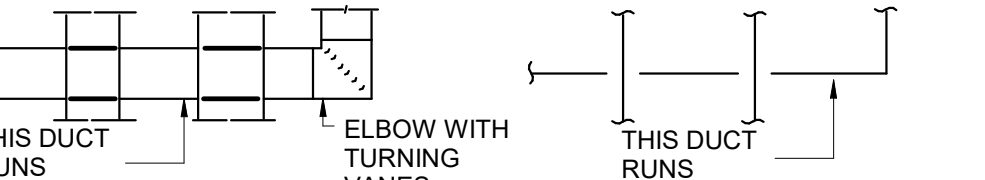
RISERS



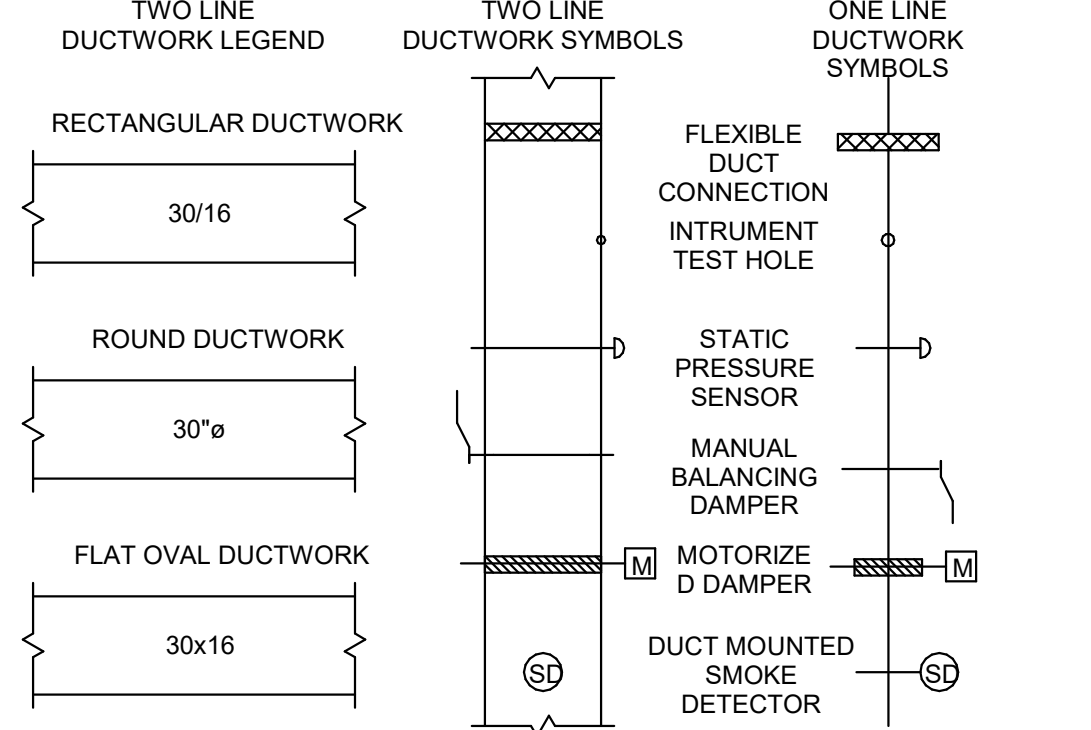
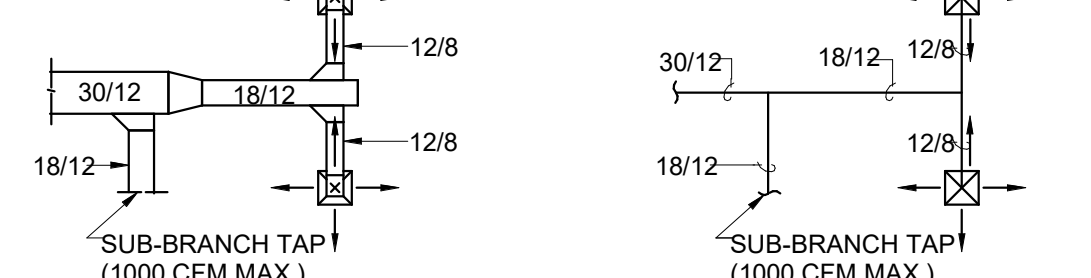
SIDEWALL REGISTERS



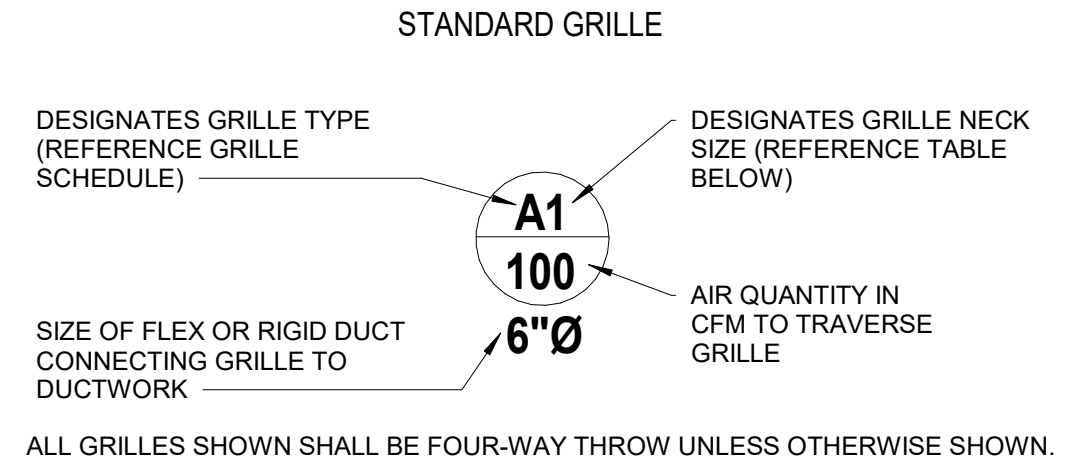
DUCT CROSSOVERS



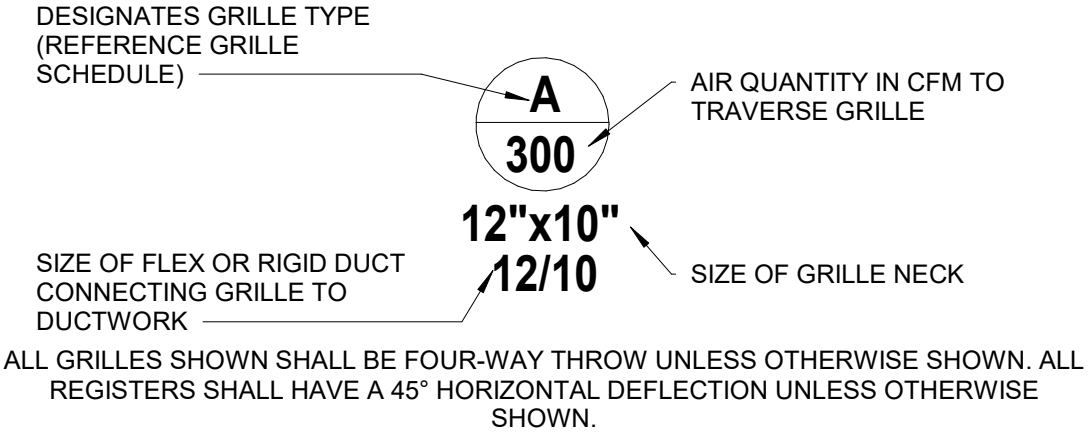
SUB-BRANCH TAP AND TEE



GRILLE SIZING SCHEDULE



REGISTER OR NONSTANDARD GRILLE



GRILLE SIZE DESIGNATION	GRILLE NECK SIZE	GRILLE SIZE DESIGNATION	GRILLE NECK SIZE
1	6" x 6"	7	15" x 15"
2	8" x 8"	8	16" x 16"
3	9" x 9"	9	18" x 18"
4	10" x 10"	10	20" x 20"
5	12" x 12"	11	22" x 22"
6	14" x 14"	12	24" x 24"

SYMBOL LEGEND

SYMBOL DESCRIPTION (DISREGARD ITEMS NOT SHOWN ON PLANS)

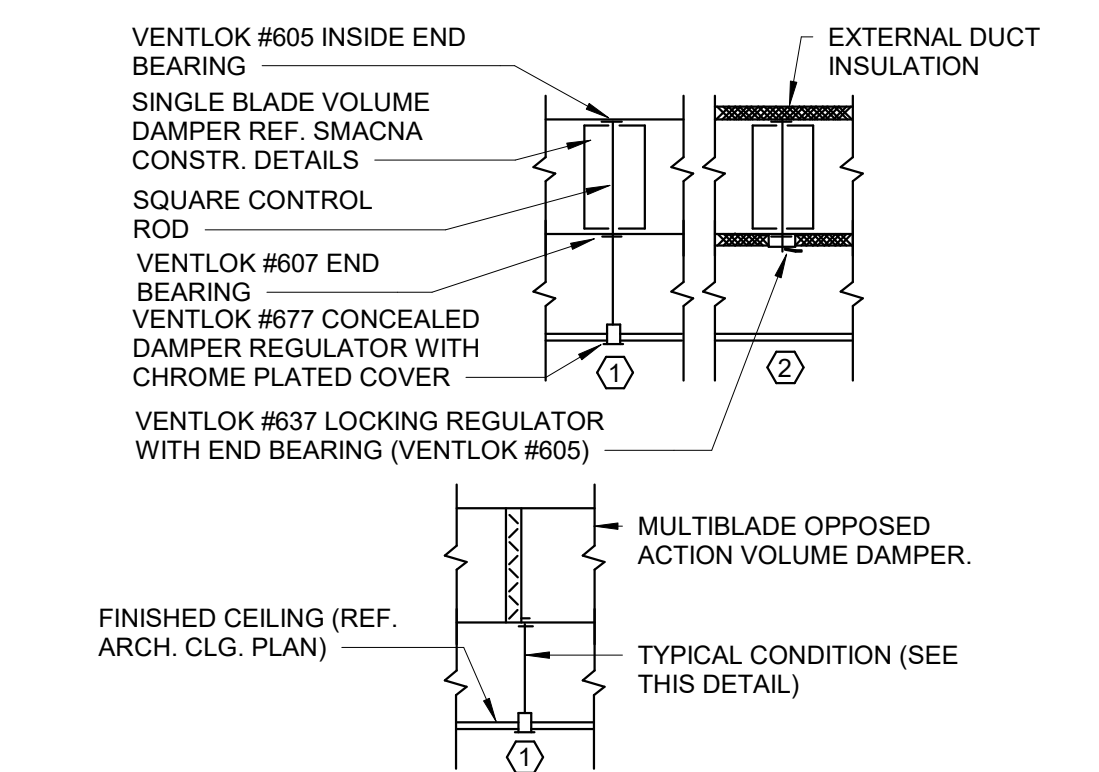
SUBSCRIPTS AND ABBREVIATIONS

AFF ABOVE FINISHED FLOOR
BBS BELOW BOTTOM OF STRUCTURE
BOD BOTTOM OF DUCT
BOP BOTTOM OF PIPE
CA COMBUSTION AIR
CFM CUBIC FEET PER MINUTE
EA EXHAUST AIR
FPM FEET PER MINUTE
NC NORMALLY CLOSED
NO NORMALLY OPEN
OA OUTSIDE AIR
RA RETURN AIR
SA SUPPLY AIR

RENOVATIONS

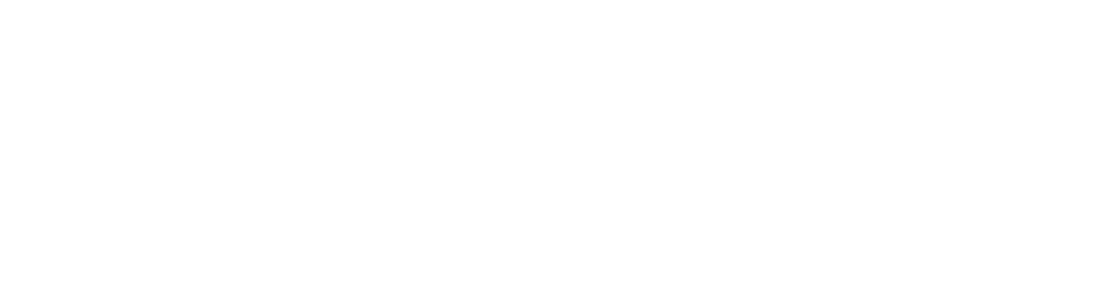
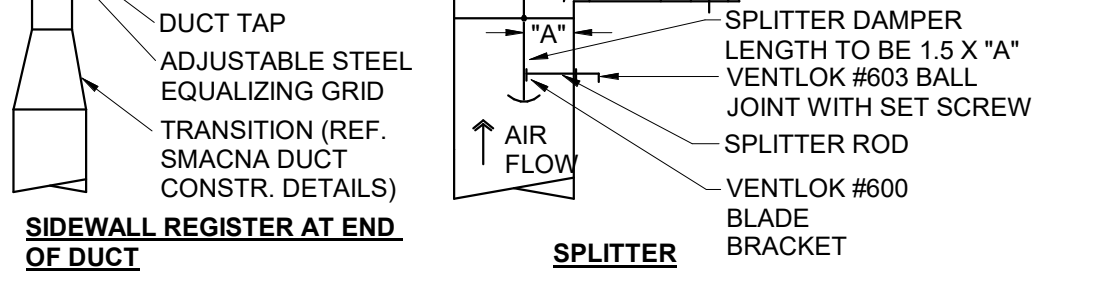
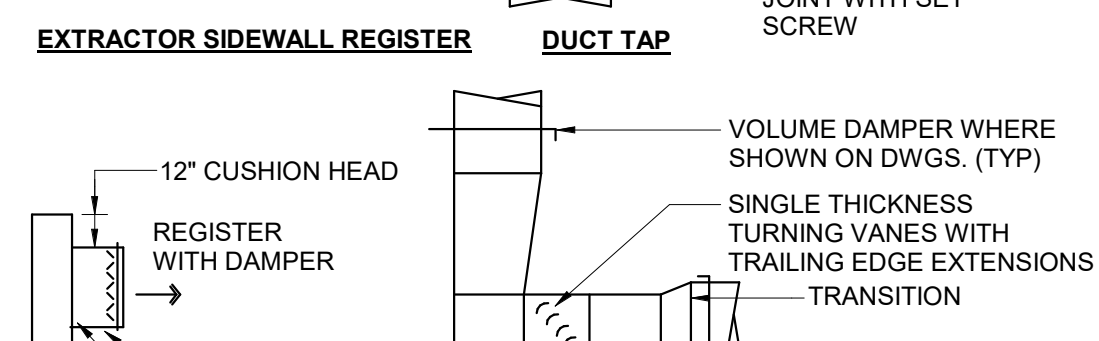
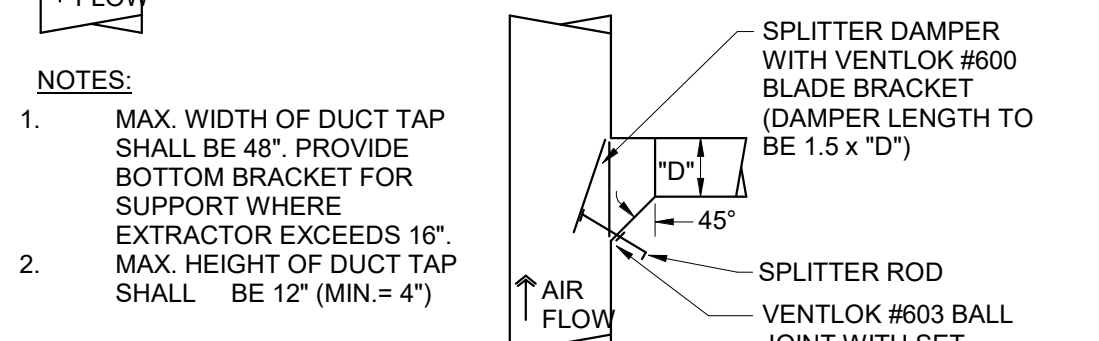
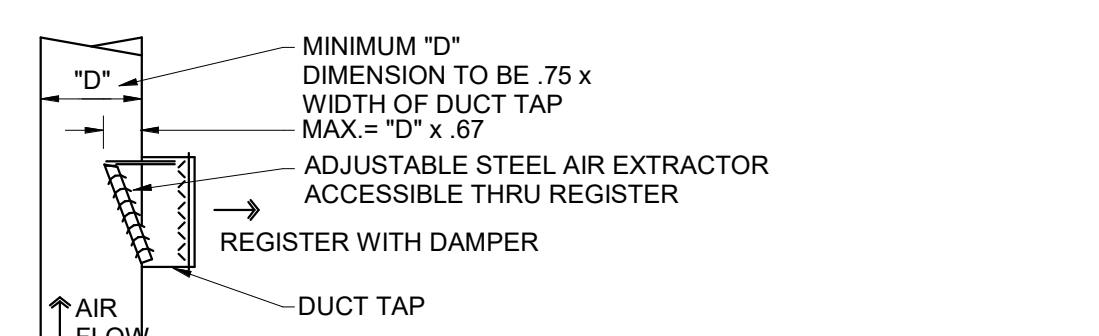
POINT OF CONNECTION FROM NEW TO EXISTING
ITEM TO REMAIN
ITEM TO BE REMOVED

DUCTWORK CONSTRUCTION DETAILS



1 DAMPER ABOVE INACCESSIBLE CEILING

2 DAMPER ABOVE LIFT-OUT CEILING



GENERAL

KEY NOTE TAG
REVISION TAG
NEW EQUIPMENT

DUCTWORK

SUPPLY AIR DUCTWORK
RETURN AIR AND OUTSIDE AIR DUCTWORK
EXHAUST AIR DUCTWORK
FLEXIBLE DUCTWORK
SUPPLY AIR DUCTWORK THROUGH HORIZONTAL PARTITION
RETURN AIR DUCTWORK THROUGH HORIZONTAL PARTITION
EXHAUST AIR DUCTWORK THROUGH HORIZONTAL PARTITION
FIRE DAMPER (VERTICAL)
FIRE DAMPER (HORIZONTAL)
SMOKE DAMPER (VERTICAL)
SMOKE DAMPER (HORIZONTAL)
COMBINATION FIRE & SMOKE DAMPER (VERTICAL)
COMBINATION FIRE & SMOKE DAMPER (HORIZONTAL)
MANUAL BALANCING DAMPER (SEE DAMPER SCHEDULE)
MOTORIZED DAMPER (SEE DAMPER SCHEDULE)

SENSORS

THERMOSTAT AND TEMPERATURE SENSOR
HUMIDISTAT
SMOKE DETECTOR
HEAT DETECTOR

AIR DEVICES

GRILLE SIZE TAG (REFER TO GRILLE SIZE LEGEND)
SUPPLY AIR GRILLE WITH FOUR-WAY THROW
SUPPLY AIR GRILLE WITH THREE-WAY THROW
SUPPLY AIR GRILLE WITH TWO-WAY THROW
SUPPLY AIR GRILLE WITH TWO-WAY CORNER THROW
SUPPLY AIR GRILLE WITH ONE-WAY THROW
RETURN AIR GRILLE
RETURN AIR GRILLE WITH SOUND BOOT
EXHAUST AIR GRILLE
SUPPLY AIR SIDEWALL GRILLE
RETURN AIR SIDEWALL GRILLE
RETURN AIR OPENING ABOVE CEILING

PIPING

-CWSAR- CONDENSER WATER SUPPLY & RETURN (TOTAL OF TWO PIPES, ONLY ONE PIPE SHOWN FOR DRAWING CLARITY)
-CWS- CONDENSER WATER SUPPLY
-CWR- CONDENSER WATER RETURN
-CHWSAR- CHILLED WATER SUPPLY & RETURN (TOTAL OF TWO PIPES, ONLY ONE PIPE SHOWN FOR DRAWING CLARITY)
-CHWS- CHILLED WATER SUPPLY
-CHWR- CHILLED WATER RETURN
-HWSAR- HOT WATER FOR HYDRONIC HEATING SUPPLY & RETURN (TOTAL OF TWO PIPES, ONLY ONE PIPE SHOWN FOR DRAWING CLARITY)
-HWS- HOT WATER FOR HYDRONIC HEATING SUPPLY
-HWR- HOT WATER FOR HYDRONIC HEATING RETURN
-D- CONDENSATE DRAIN LINE
-AD- AUXILIARY CONDENSATE DRAIN LINE
-RLR- REFRIGERANT LIQUID & GAS RECIRCULATION LINE (TOTAL OF TWO PIPES, ONLY ONE PIPE SHOWN FOR DRAWING CLARITY)
-RL- REFRIGERANT LIQUID LINE
-HG- REFRIGERANT HOT GAS LINE
-RS- REFRIGERANT SUCTION LINE
-EO- ELBOW UP
-ED- ELBOW DOWN
-90- 90° ELBOW
-45- 45° ELBOW
-TEE- TEE
-TEE DOWN
-TEE UP
-TOP- TOP BRANCH CONNECTION
-BOT- BOTTOM BRANCH CONNECTION
-II- FLANGE
-CAP- CAP
-CONT- CONTINUATION
-FLOOR- FLOOR DRAIN (REFER TO PLUMBING DRAWINGS)
-GATE- GATE VALVE
-GLOBE- GLOBE VALVE
-CHECK- CHECK VALVE
-BUTTERFLY- BUTTERFLY VALVE
-BUTTERFLY WITH OPERATOR
-PLUG- PLUG VALVE
-TWO-WAY- TWO-WAY CONTROL VALVE
-THREE-WAY- THREE-WAY CONTROL VALVE
-PRESSURE REDUCING VALVE
-PRESSURE RELIEF VALVE
-BALL- BALL VALVE
-STRAINER
-UNION
-THERMOMETER WELL
-PETE'S PLUG
-PRESSURE GAUGE
-TEMPERATURE SENSOR IN PIPE
-VENTURI- VENTURI FLOW METER
-FLOW SWITCH
-FLOW MEASURING STATION
-EXPANSION JOINT
-FLEXIBLE CONNECTION
-GAUGE COCK
-SITE GLASS
-DIFFERENTIAL PRESSURE SENSOR
-TURBINE FLOW METER
-ANCHOR
-PIPE GUIDE