GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH THE CURRENT UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL CENTER CODES AND SPECIFICATIONS, NFPA, IMC, IPC, NEC, AND ALL APPLICABLE CODES.
2. THE CONTRACTOR SHALL EXECUTE ALL WORK HEREINAFTER SPECIFIED OR INDICATED ON ACCOMPANYING DRAWINGS. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT NECESSARY AND USUALLY FURNISHED IN CONNECTION WITH SUCH WORK AND SYSTEMS WHETHER OR NOT MENTIONED SPECIFICALLY HEREIN OR ON THE DRAWINGS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FITTING HIS MATERIAL AND APPARATUS INTO THE BUILDING AND SHALL CAREFULLY LAY OUT HIS WORK AT THE SITE TO CONFORM TO THE STRUCTURAL CONDITIONS, TO AVOID ALL OBSTRUCTIONS, TO CONFORM TO THE DETAILS OF THE INSTALLATION AND THEREBY TO PROVIDE AN INTEGRATED SATISFACTORY OPERATING INSTALLATION.
4. THE MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS ARE NECESSARILY DIAGRAMMATIC BY THEIR NATURE, AND ARE NOT INTENDED TO SHOW EVERY CONNECTION IN DETAIL OR EVERY PIPE OR CONDUIT IN ITS EXACT LOCATION. THESE DETAILS ARE SUBJECT TO THE REQUIREMENTS OF STANDARDS REFERENCED ELSEWHERE IN THESE SPECIFICATIONS, AND STRUCTURAL AND ARCHITECTURAL CONDITIONS.
5. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE STRUCTURAL AND FINISH CONDITIONS AND SHALL COORDINATE THE SEPARATE TRADES IN ORDER TO AVOID INTERFERENCE BETWEEN THE VARIOUS PHASES OF WORK. WORK SHALL BE ORGANIZED AND LAID OUT SO THAT IT WILL BE CONCEALED IN FURRED CHASES AND SUSPENDED CEILINGS, ETC., IN FINISHED PORTIONS OF THE BUILDING, UNLESS SPECIFICALLY NOTED OTHERWISE. ALL EXPOSED WORK SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO THE LINES OF THE BUILDING UNLESS OTHERWISE NOTED.
6. WHEN THE MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS DO NOT GIVE EXACT DETAILS AS TO THE ELEVATION OF PIPE, CONDUIT AND DUCTS, THE CONTRACTOR SHALL PHYSICALLY ARRANGE THE SYSTEMS TO FIT IN THE SPACE AVAILABLE AT THE ELEVATIONS INTENDED WITH PROPER GRADES FOR THE FUNCTIONING OF THE SYSTEM INVOLVED.
7. PIPING, EXPOSED CONDUIT AND THE DUCT SYSTEMS ARE GENERALLY INTENDED TO BE INSTALLED TRUE AND SQUARE TO THE BUILDING CONSTRUCTION, AND LOCATED AS HIGH AS POSSIBLE AGAINST THE STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE DRAWINGS DO NOT SHOW ALL REQUIRED OFFSETS, CONTROL LINES, PILOT LINES AND OTHER LOCATION DETAILS. WORK SHALL BE CONCEALED IN ALL FINISHED AREAS.
8. WHERE MEP WORK REQUIRES DISRUPTION OF WALL, FLOOR OR CEILING FINISHES OR MATERIALS, AND FINISHES ARE NOT OTHERWISE SPECIFIED, CONTRACTOR SHALL PATCH, REPAIR, PRESERVE AND/OR REPLACE EXISTING FINISHES TO MATCH PRE-CONSTRUCTION CONDITIONS.
9. REMOVE AND DEMO ALL ABANDONED PIPING, WIRING, CONDUITS, J BOX, ALL THREADS, HANGERS WITHIN THE PROJECT SPACE AND ABOVE CEILING AREAS.

ELECTRICAL GENERAL NOTES

1. ALL ELECTRICAL WORK SHALL COMPLY WITH THE CURRENT NATIONAL (NEC), STATE, AND LOCAL ELECTRICAL CODES.
2. ALL EXISTING ELECTRICAL, TELEPHONE OUTLETS, WIRING, BUS DUCT AND CONDUIT SHOWN TO BE DEMOLISHED SHALL BE REMOVED BACK TO J-BOX AND/OR FEEDER PANEL AS REQUIRED.
3. ALL OTHER EXISTING ELECTRICAL AND TELEPHONE/DATA OUTLETS, J.BOX, ELECTRICAL PANEL, WIRING AND CONDUIT SHALL REMAIN IN PLACE UNLESS NOTED OTHERWISE.
4. ALL DATA JACK AND RECEPTACLE SHALL BE MOUNTED AT 18" A.F.F., AND GFI RECEPTACLE AT 48" A.F.F. UNLESS NOTED OTHERWISE.
5. NONSPECIFIC LABORATORY PLUG MOLD DUPLEX RECEPTACLES SHALL BE WIRED IN A STAGGERED FASHION.
6. FIRE ALARM BY ETS3.
7. IT IS THE RESPONSIBILITY OF EQUIPMENT MANUFACTURER TO FIELD VERIFY THE QUALITY OF ELECTRICAL SERVICE AND INSTALL ALL APPROPRIATE POWER CONDITIONERS
8. ALL SINGLE PHASE ELECTRICAL CIRCUITS SHALL BE WIRED WITH A DEDICATED NEUTRAL CONDUCTOR.

ELECTRICAL LEGEND

⊖	EXISTING 120V RECEPTACLE
⊖	120V RECEPTACLE NEMA# (5-20R) HUBBELL CATALOG NO. (HBL5362I)
⊖	120V SIMPLEX RECEPTACLE HUBBELL CATALOG NO. (HBL5361I).
⊖	EXISTING 120V SIMPLEX RECEPTACLE
⊕	EXISTING FOURPLEX RECEPTACLE
⊕	FOURPLEX RECEPTACLE
◎	CIRCLE W/RECEPTACLE OR DATA/PHONE, FLOOR MOUNTED
⊟	SQUARE W/RECEPTACLE OR DATA/PHONE, REPRESENTS CEILING MOUNTED
⊕ R	EXISTING FOURPLEX RECEPTACLE (RED COVER) CONNECTED TO CRITICAL BRANCH CIRCUIT.
⊕ R	FOURPLEX RECEPTACLE (RED COVER) SHALL BE CONNECTED TO CRITICAL BRANCH CIRCUIT.
⊘	208V RECEPTACLE NEMA# (6-20R) UNLESS NOTED OTHERWISE
◄─┼┼┼─	INDICATES 3-#12 THHN IN 3/4" CONDUIT, 120V, 1 PHASE, DEDICATED CIRCUIT TO J.BOX. EACH CIRCUIT SHALL HAVE A HOT, NEUTRAL, AND GROUND WIRE.
◄─┼┼┼─	INDICATES 3-#10 THHN IN 3/4" CONDUIT, 208V, 1 PHASE, 30 AMP, HOME RUN TO FEEDER PANEL. EACH CIRCUIT SHALL HAVE A HOT, HOT, NEUTRAL, NEUTRAL, AND GROUND WIRE. PROVIDE 2-GANG BOX.
◄─┼┼┼┼─	INDICATES 4-#8,#10 GND, THHN IN 1" CONDUIT, 208V, 3 PHASE, 50AMP, HOMERUN TO FEEDER PANEL. EACH CIRCUIT SHALL HAVE A HOT, HOT,HOT,NEUTRAL, AND GROUND WIRE. UNLESS NOTED OTHERWISE.
⌒	ELECTRICAL CONNECT TO EXISTING CIRCUIT, PROVIDE DEDICATED NEUTRAL
⌒	HOME RUN TO PANEL INDICATE.
◁	SPEAKER
▬	AL3000 (ALUMINUM) RACEWAY TIGHT TO BACKSPLASH. 5. NONSPECIFIC LABORATORY PLUG MOLD DUPLEX RECEPTACLES SHALL BE WIRED IN A STAGGERED FASHION. USE AL3300 (ALUMINUM) FOR POWER AND DATA. 4000AL (ALUMINUM) PLUG MOLD FOR NC BLDG)
⊖ ◀	PEDESTAL MOUNTED RECEPTACLE OUTLETS, AND DATA OUTLET PEDESTAL COMPLETE WITH SAME FINISH FACEPLATE FURNISHED AND INSTALLED BY LABORATORY FURNISHING CONTRACTOR. RECEPTACLES FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR.
◀ WAP	WIRELESS ACCESS POINT FOR IR BENEFIT ONLY BOX AND CONDUIT NOT REQUIRED.
▶	DATA INSTALL A 4" SQUARE BOX, SINGLE MUD RING, AND 1" CONDUIT STUBBED 6" ABOVE CEILING. FEATHER EDGES.
▷	EXISTING DATA/PHONE
WP ▶	WALL PHONE AT 48" A.F.F.
WP ▷	EXISTING PHONE
TG ▶	10GB DATA
TG ▷	EXISTING 10GB DATA
▭	2'X4' LIGHT FIXTURE
▨	NIGHT/EMERGENCY LIGHT
▭	UNDER CABINET LIGHT
Ⓙ	JUNCTION BOX.
◁▷	EMERGENCY LIGHT.
└□	INDICATES FUSED DISCONNECT SWITCH.
⊠	MOTOR STARTER
⊗	EXIT SIGN
▱	EXISTING ELECTRICAL PANEL.
◢	ELECTRICAL PANEL.
$	LIGHT SWITCH
$ 3	3-WAY SWITCH.
$ OC	OCCUPANCY SENSOR SWITCH
$ D	DIMMER SWITCH
$ L	LOW VOLTAGE
○	EXISTING DOWN LIGHT
Ⓢ	CEILING MOUNTED FIRE ALARM VISUAL ALARM INDICATOR
H/S	CEILING ALARM COMBINATION AUDIO/VISUAL ALARM INDICATOR
Ⓗ	CEILING MOUNTED FIRE ALARM AUDIO ALARM
Ⓢ	FIRE ALARM SMOKE DETECTOR
Ⓢ D	FIRE ALARM SMOKE DUCT DETECTOR
F	FIRE ALARM MANUAL PULL STATION
H/S	WALL MOUNTED FIRE ALARM COMBINATION AUDIO/VISUAL ALARM INDICATOR
Ⓢ	WALL MOUNTED FIRE ALARM VISUAL ALARM INDICATOR
Ⓗ	FIRE ALARM HEAT DETECTOR

MECHANICAL GENERAL NOTES

1. ROUND DUCT ELBOWS SHALL BE SMOOTH RIGID TYPE, AND RECTANGULAR ELBOWS SHALL BE RADIUS TYPE WITH INTERNAL VANES.
2. PROVIDE MANUAL DAMPER AT EACH OF THE LOW PRESSURE AND EXHAUST TAKE-OFFS.
3. BALANCE AIR CFM TO VALUE AS SHOWN ON DRAWING.
4. SIDE TAKEOFFS SHALL BE 45 DEGREE, UNLESS NOTED OTHERWISE.
5. PROVIDE 2 DUCT DIAMETER STRAIGHT RUN OR 24" MINIMUM UPSTREAM OF FLOW OR PRESSURE MEASURING DEVICES.
6. ALL VAV AND EVAV CONTROL BOXES SHALL BE ACCESSIBLE PER CODE AND FOR SERVICE.
7. HEPA FILTER SHALL BE TESTED AND REPLACED AFTER INSTALLATION.
8. ALL CONTROL VALVES SHALL BE SUPPLIED BY CONTROL CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.

CONTROLS NOTES

1. PRESSURE CONTROLLED ROOMS SHALL USE CONTROLLERS EQUIPPED WITH AUTO-ZERO MODULES. AUTO-ZERO MODULE SHALL CALIBRATE THE FLOW SENSOR EVERY 24 HOURS WITHOUT REDUCING FLOW THROUGH THE BOXES. NON-PRESSURE CONTROLLED ROOMS DO NOT REQUIRE AUTO-ZERO MODULES.
2. LABORATORY, DARKROOM AND TISSUE CULTURE ROOM CONTROLS. CONTROLS SHALL HAVE THE SUPPLY AIR FLOWS TRACK THE EXHAUST FLOWS TO MAINTAIN PROPER ROOM PRESSURIZATION AND SPACE TEMPERATURE.
3. INDIVIDUAL FUME HOOD AND DUCT BSC CONTROLLER SHALL MAINTAIN THE CFM REQUIREMENT SETPOINT FOR CONSTANT AIR VOLUME APPLICATION.
4. DDC CONTROLLER SHALL MONITOR THE STATIC PRESSURE DROP ACROSS THE HEPA FILTER, SEND ALARM TO CDAS.
5. EXHAUST FANS SHALL BE CONNECTED TO THE BAS WITH START/STOP CAPABILITY AND PROOF OF FAN STATUS. ALARM SHALL BE SENT TO THE BAS ON FAN FAILURE.
6. ANY LAB PRESSURIZATION PROGRAM SEQUENCE SHALL BE REVISED WITH AIR FLOW SET POINTS. MODIFY PROGRAM AS REQUIRED TO REMOVE DEMO'D DEVICES AND ADD DEVICES AS SHOWN ON PLAN FOR PROPER FLOW TRACKING.
7. UPDATE ALL ASSOCIATED GRAPHICS, REMOVED DEMO'D DEVICES AND ADD DEVICES AS SHOWN ON PLAN.
8. FOR NL BUILDING ONLY:

- GENERAL EXHAUST DAMPERS AND LAB SUPPLY VAV DAMPERS ARE IN THE FIRE ALARM SEQUENCE OF THE FIELD PANEL PROGRAM. CONTROLS CONTRACTOR IS REQUIRED TO REVISE THE FIRE ALARM SEQUENCE ON THIS PROJECT. DEMO'D BOXES WILL BE REMOVED FROM THE PROGRAM AND BOXES AS SHOWN ON PLAN, WILL BE ADDED TO THE PROGRAM.
- FUME HOOD OCCUPIED POINTS ARE IN THE FIRE ALARM SEQUENCE. ON FIRE ALARM THE FUME HOOD GOES TO UNOCCUPIED AND FLOW MINIMUM. FLOW MINIMUM IS EITHER SPECIFIED BY THE ENGINEER OF RECORD OR 300CFM. CONTROLS CONTRACTOR IS REQUIRED TO REVISE THE FIRE ALARM SEQUENCE ON THIS PROJECT. DEMO'D FUME HOODS WILL BE REMOVED FROM THE PROGRAM AND FUME HOODS AS SHOWN ON PLAN WILL BE ADDED TO THE PROGRAM.

PLUMBING GENERAL NOTES

1. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS OF INSTALLATIONS.
2. ALL CHILLED WATER SUPPLY/RETURN, COLD AND HOT WATER, CONDENSATE LINES SHALL BE INSULATED WITH 1-1/2" FIBERGLASS INSULATION.
3. ALL EXPOSED PIPING SHALL BE NEAT AND STRAIGHT WITH ESCUTCHEONS AT WALL PENETRATIONS.
4. PROVIDE ALL NECESSARY SUPPLEMENTARY CLAMPS, BRACES, ETC. TO PROPERLY AND ADEQUATELY SUPPORT ALL PLUMBING DEVICES.
5. WHERE PIPING PENETRATIONS A FIRE RATED ASSEMBLY, FIRE CAULK AND SEAL GAP WITH INTUMESCENT FIRESTOP SEALANT, HILTI FS-ONE OR APPROVED EQUAL.
6. IN THE INSTALLATION OR REMOVAL OF ANY PART OF EXISTING DRAINAGE SYSTEM, STEAM SYSTEM, DEAD ENDS SHALL BE PROHIBITED.
7. CONTROLS FOR FLUSH VALVES SHALL BE MOUNTED ON THE WIDE SIDE OF THE TOILET AREAS.

MEDICAL GAS NOTES

1. ALL INSTALLATIONS OF THE MEDICAL GAS PIPING SYSTEMS SHALL BE DONE ONLY BY, OR UNDER THE DIRECT SUPERVISION OF A HOLDER OF A MASTER PLUMBER LICENSE OR A JOURNEYMAN PLUMBER LICENSE WITH A MEDICAL GAS PIPING INSTALLATION ENDORSEMENT ISSUED BY THE TEXAS STATE BOARD OF PLUMBING EXAMINERS.
2. ALL MEDICAL GAS SYSTEM SHALL BE INSTALLED AND CERTIFIED IN ACCORDANCE WITH THE REQUIREMENTS OF LATEST EDITION OF NFPA 99.
3. VERIFICATION TESTS OF THE MEDICAL GAS PIPING SYSTEM, THE WARNING SYSTEM, SHALL BE PERFORMED ON ALL PIPED MEDICAL GAS SYSTEMS, AS SHOWN ON PLAN ADDITIONS,, RENOVATIONS, OR REPAIRED PORTIONS OF AN EXISTING SYSTEM. VERIFICATION SHALL BE PERFORMED BY OWNER'S SPECIFIED CONTRACTOR.
4. BEFORE PIPED MEDICAL GAS SYSTEMS, ADDITIONS, RENOVATIONS, OR REPAIRED PORTIONS OF AN EXISTING SYSTEMS ARE PUT INTO USE, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE GAS DELIVERED AT THE OUTLET IS THE GAS SHOWN ON THE OUTLET LABEL AND THAT THE PROPER CONNECTION FITTINGS ARE CHECKED AGAINST THEIR LABELS.

PLUMBING LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
LCW	LAB COLD WATER	⌼ FD	FLOOR DRAIN
LHWS	LAB HOT WATER SUPPLY	⌼ FS	FLOOR SINK
LHWR	LAB HOT WATER RETURN	⊢⊣	Y-STRAINER
— AW —	ACID WASTE	◐—	POINT OF TERMINATION
— AV —	ACID VENT	⊖ CS	CUP SINK
— SD —	SANITARY DRAIN & VENT	⋈	PRESSURE RELIEVE VALVE
— DIS —	DEIONIZED WATER SUPPLY	⋈ EGSV	EMER. GAS SHUT-OFF VALVE
—DIR —	DEIONIZED WATER RETURN	○┳	GAS OUTLET
— A —	LAB COMPRESSED AIR	⦶—	FAUCET
— V —	LAB VACUUM	⊂—	TURNED DOWN
— G —	NATURAL GAS	○—	TURNED UP
●	BALL VALVE	— HWS —	HOT WATER SUPPLY
— CWS —	CHILLED WATER SUPPLY	— HWR —	HOT WATER RETURN
— CWR —	CHILLED WATER RETURN	—⊠—	REDUCED PRESSURE BACKFLOW
— CNR —	CONDENSATE RETURN	—⋈—	PRESSURE REDUCING VALVE
—┤╲├—	CHECK VALVE	—○ FCO	FLOOR CLEAN-OUT
—┤◁├—	FLOW METER	—‖ WCO	WALL CLEAN-OUT

MECHANICAL LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
◐—	POINT OF TERMINATION	◁	ROUND TO RECTANGULAR TRANSITION
Ⓣ	THERMOSTAT	SP	STATIC PRESSURE SENSOR IN DUCT
Ⓗ	HUMIDITY SENSOR/HUMIDISTAT	T	TEMPERATURE SENSOR IN DUCT
Ⓟ	PRESSURE SENSOR	H	HUMIDITY SENSOR IN DUCT
VFD	VARIABLE FREQUENCY DRIVE	▲FD	FIRE DAMPER IN DUCT
⊠	4-WAY SUPPLY DIFFUSER	▲FSD	COMBINATION FIRE SMOKE DAMPER IN DUCT
▱ ◸	RETURN GRILLE	FD ▶ FSD ▶	FIRE DAMPER/FIRE SMOKE DAMPER IN WALL
⊠	EXHAUST GRILLE	M	MOTORIZED DAMPER IN DUCT
A / CFM	AIR DISTRIBUTION CALLOUT	AxB	RECTANGULAR OR SQUARE DUCT DIMENSIONS.
┼	BALANCE DAMPER	A"Ø	ROUND DUCT DIMENSION
R/D →	CHANGE OF ELEVATION, (R) RISE (D) DROP	AxBØ	FLAT OVAL DUCT DIMENSION
⊏	TRANSITION	◁	ACCESS DOOR IN DUCT

CORE DRILL NOTES

1. PRIOR ANY CORE DRILLS ON CONCRETE STRUCTURES, SUCH AS FLOOR OR SLAB, CONTRACTOR SHALL LOCATE EXISTING REBARS AND TENDONS USING R-METER OR PACHOMETER.
2. CONTRACTOR SHALL NOT DAMAGE ANY REBARS OR TENDONS.

SHUT DOWN NOTES

1. ALL UTILITY SHUT DOWNS SHALL BE COORDINATED WITH UTSWMC PROJECT MANAGER AND BUILDING MANAGER PRIOR TO ANY WORKS.

PROJECT COORDINATOR/ DESIGN CONSULTANT

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2641 IRVING BLVD.
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ARCHITECT/ ENGINEER

SWAssociates
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1700 Pacific Ave
Suite 2100
Dallas, TX 75201
Tel: 214.397.0211
www.SWAengineers.com
TEXAS REGISTERED ENGINEERING FIRM F-6872
PROJECT # 22659

SEAL

MIKE L. ASHCRAFT
56590
07-15-2022

PROJECT NO.: 629-003
DRAWN BY:
CHECKED BY:
RSF: 33,038

BILLINGSLEY
COMPANY

UTSW MEDICAL CENTER AT COPPELL

CYPRESS WATERS
2999 OLYMPUS BLVD.
SUITE #300
DALLAS, TX 75219

NO.	REVISIONS:	DATE:
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LANDLORD REVIEW ISSUE DATE: 07/15/2022
TENANT REVIEW ISSUE DATE: 07/15/2022
BID ISSUE DATE: 07/15/2022
PERMIT ISSUE DATE: 07/15/2022
CONSTRUCTION ISSUE DATE: XX/XX/2022

DRAWING TITLE:

MEP SYMBOL LEGENDS & NOTES

DRAWING NUMBER:

MEP1.0

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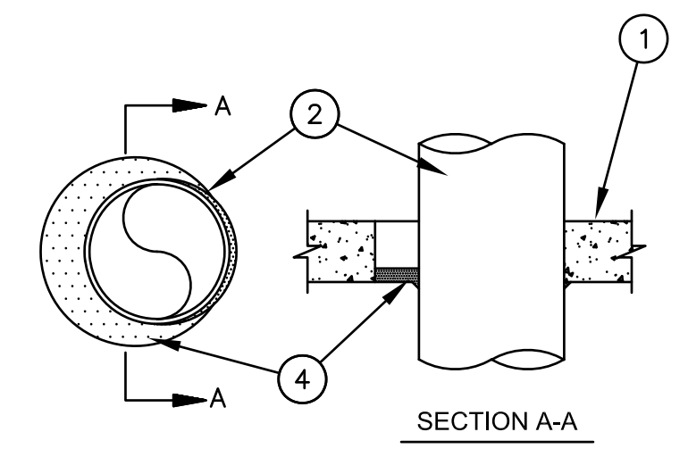
System No. C-AJ-1184

F Rating -- 3 Hr
T Rating -- 0 Hr



1. Floor or Wall Assembly -- Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Floor may also be constructed of any min 7-1/2 in. thick UL Classified hollow core Precast Concrete Units*. Max diam of opening is 14 in. when concrete floor or wall is used and max 7 in. when precast concrete units are used.

See Concrete Blocks (CAZT) and Precast Concrete Units (CFTV) categories in the Fire Resistance Directory for names of manufacturers.

2. Through-Penetrants -- One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space between pipe, conduit or tubing and periphery of opening shall be min 0 in. (point contact) to max 3-1/4 in. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

A. Steel Pipe -- Nom 10 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Iron Pipe -- Nom 10 in. diam (or smaller) cast or ductile iron pipe.
C. Conduit -- Nom 4 in. diam (or smaller) steel electrical metallic tubing or steel conduit.
D. Copper Tubing -- Nom 4 in. diam (or smaller) Type L (or heavier) copper tubing.
E. Copper Pipe -- Nom 4 in. diam (or smaller) regular (or heavier) copper pipe.

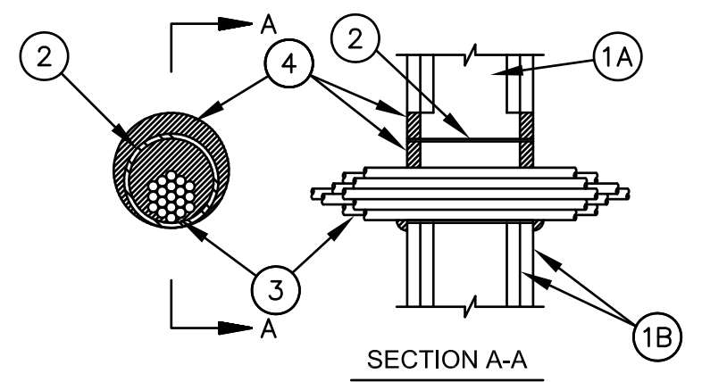
3. Forms -- (Not Shown, Optional) -- Used as a form to prevent leakage of fill material during installation. Forms to be rigid sheet material, cut to fit the contour of the penetrating item and positioned as required to accommodate the required thickness of fill material. Forms to be removed after fill material has cured. Additional forming material may be used concrete block wall is penetrated. A min 1/2 in. thickness of min 4 pcf mineral wool batt insulation is firmly packed into the annulus as a permanent form and recessed from both surfaces of the wall as required to accommodate the required thickness of fill material.

4. Fill, Void or Cavity Material* -- Sealant -- Min 1 in. thickness of fill material applied within the annulus. At the point contact location between through penetrant and concrete, a min 1/2 in. diam bead of fill material shall be applied at the concrete through penetrant interface. When precast concrete units are used, the fill material shall be installed within annular space, flush with lower surface of floor. When concrete block wall is penetrated, a min 1 in. thickness of fill material shall be applied within the annulus flush with both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- FS605 or FS-ONE Sealant

*Bearing the UL Classification Mark

System No. W-L-3065

F Ratings — 1 and 2 Hr (See Item 1)
T Rating — 0 Hr



1. Wall Assembly — The 1 or 2 fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.
B. Gypsum Board* — Nom 5/8 in. (16 mm) thick gypsum board, with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300, U400 or V400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 5-1/2 in. (138 mm) when sleeve (Item 2) is employed. Max diam of opening is 4 in. (102 mm) when sleeve (Item 2) is not employed.

The F Rating of the firestop system is equal to the fire rating of the wall assembly.

2. Metallic Sleeve — (Optional) — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing (EMT) or Schedule 5 (or heavier) steel pipe or min 0.016 in. thick (0.41 mm, No. 28 ga) galv steel sleeve installed flush with wall surfaces. The annular space between steel sleeve and periphery of opening shall be min 0 in. (0 mm, point contact) to max 1 in. (25mm). When Schedule 5 steel pipe or EMT is used, sleeve may extend up to 18 in. (457 mm) beyond the wall surfaces.

3. Cables — Aggregate cross-sectional area of cable in opening to be max 45 percent of the cross-sectional area of the opening. The annular space between the cable bundle and the periphery of the opening to be min 0 in. (0 mm, point contact) to max 1 in. (25 mm) Cables to be rigidly supported on both sides of the wall assembly. Any combination of the following types and sizes of copper conductor cables may be used:

A. Max 7/C No. 12 AWG with polyvinyl chloride (PVC) insulation and jacket.
B. Max 25 pair No. 24 AWG telephone cable with PVC insulation and jacket.
C. Type RG/U coaxial cable with polyethylene (PE) insulation and PVC jacket having a max outside diameter of ½ in. (13 mm).
D. Multiple fiber optical communication cable jacketed with PVC and having a max OD of 5/8 in. (16 mm).
E. Through Penetrating Products*— Max three copper conductor No. 8 AWG . Metal-Clad Cable+.
AFC CABLE SYSTEMS INC
F. Max 3/C (with ground)(or smaller) No. 8 AWG copper conductor cable with PVC insulation and jacketing.
G. Max 3/4 in. (19 mm) diam copper ground cable with or without a PVC jacket.
H. Fire Resistive Cables* — Max 1-1/4 in. (32 mm) diam single conductor or multi conductor Type MI cable. A min 1/8 in. (3 mm) separation shall be maintained between MI cables and any other types of cable.
Through Penetrating Product* — Any cables, Metal-Clad Cable+ or Armored Cable+ currently Classified under the Through Penetrating Products category.

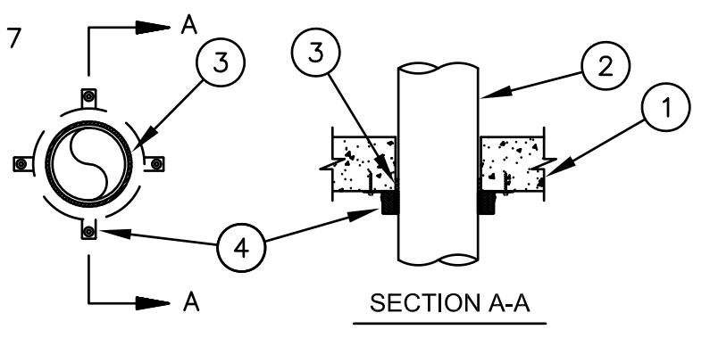
See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers

4. Fill, Void or Cavity Material*— Sealant or Putty — Fill material applied within the annulus, flush with each end of the steel sleeve or wall surface. Fill material installed symmetrically on both sides of the wall. A min 5/8 in. (16 mm) thickness of sealant is required for the 1 or 2 hr F Rating . An additional 1/2 in. (13 mm) diam bead of fill material shall be applied around the perimeter of sleeve on both sides of the wall when sleeve extends beyond surface of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S, CP606, FS-One Sealants or CP618 Putty

*Bearing the UL Classification Mark
+Bearing the UL Listing Mark

System No. C-AJ-2217

F Rating — 3 Hr
T Rating — 0 Hr



1. Floor or Wall Assembly — Min. 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks. Max diam of opening is 7 in.

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Through Penetrants — One nonmetallic pipe to be installed within the firestop system. The annular space shall be min 0 in. to max 3/8 in. Pipe to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of nonmetallic pipes may be used:

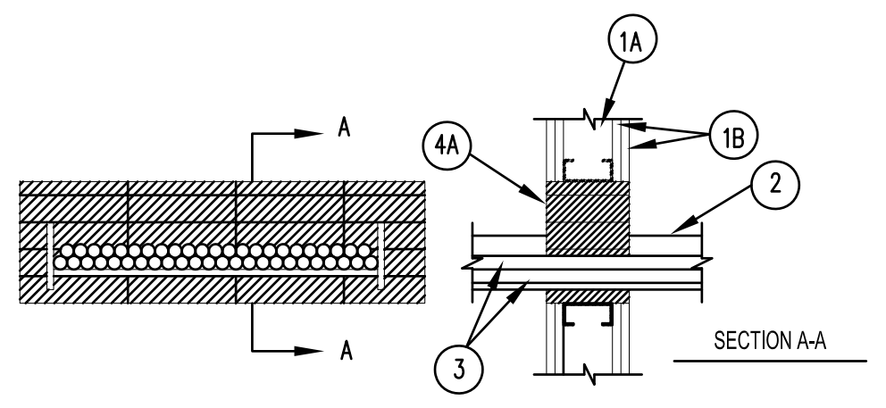
A. Polyvinylidene Fluoride (PVDF) Pipe — Nom 6 in. diam (or smaller) SDR 32.5 PVDF pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
B. Polypropylene (PP) Pipe — Nom 4 in. diameter (or smaller) schedule 40 PP for use in closed (process or supply) or vents (drain, waste or vent) piping systems.

3. Fill, Void or Cavity Material* — Sealant — Min 1 in. thickness of fill material applied within the annulus, flush with bottom surface of floor or with both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant

4. Firestop Device — Firestop collar shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to underside of floor on both sides of wall using the anchor hooks provided with the collar. (Minimum two anchor hooks for 1-1/2 and 2 in. diam pipes, three anchor hooks for 3 and 4 in. diam pipes, six anchor hooks for 6 in. diam pipes.). The anchor hooks are to be secured with min 1/4 in. diam by min 1-1/4 in. long steel expansion bolts or min 0.145 in. diam by 1-1/4 in. long powder actuated fasteners utilizing a 1-7/16 in. diam by 1/16 in. thick steel washer. As alternates to the anchors specified above, Hilti 1/4 in. diam by 1-1/4 in. long KWIK-CON II+ concrete screw anchor, Hilti 1/4 in. diam by 1-3/4 in. long KWIK-BOLT 3 steel expansion anchor or Hilti X-DNI 27 P8 S15 powder actuated floor pin with integral nom 9/16 in. diam washer may be used.

System No. W-L-4011

F Rating - 1 and 2 Hr (See Item 1)
T Rating - 0 Hr
L Rating At Ambient - 5 CFM/Sq Ft
L Rating At 400 F - 2 CFM/Sq Ft



1. Wall Assembly -- The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs -- Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC. Additional framing member shall be installed in stud cavity containing through-penetrating item to form a rectangular box around penetrant.
B. Gypsum Board* -- 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum wallboard type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max size of opening 9 in. by 30 in. The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed. Min. finished wall thickness is 5 in.

2. Cable Tray* -- Max 24 in. wide by max 6 in. deep open-ladder or solid-back cable tray with channel-shaped side rails formed of 0.10 in. thick aluminum or 0.060 in. thick steel and with 1-1/2 in. wide by 1 in. channel shape rungs spaced 9 in. OC or a 0.029 in. thick steel solid back, respectively. The annular space between the cable tray and the periphery of the opening shall be min 0 in. (point contact) to max 4 in. Cable tray to be rigidly supported on both sides of floor or wall assembly.

3. Cables -- Aggregate cross-sectional area of cables in cable tray to be max 45 percent of the cross-sectional area of the cable tray. Any combination of the following types and sizes of copper conductor cables may be used:

A. 1/C, 750 kcmil (or smaller) power cable with EPR insulation and PVC jacket.
B. 300 pair -- No. 24 AWG cable with PVC insulation and jacket
C. Twenty-four fiberoptic cable with PVC subunit and jacket.
D. Max three 1/C, No. 12 AWG wire, insulated with polyvinyl chloride, in a nom 3/4 in. Flexible Metal Conduit+.

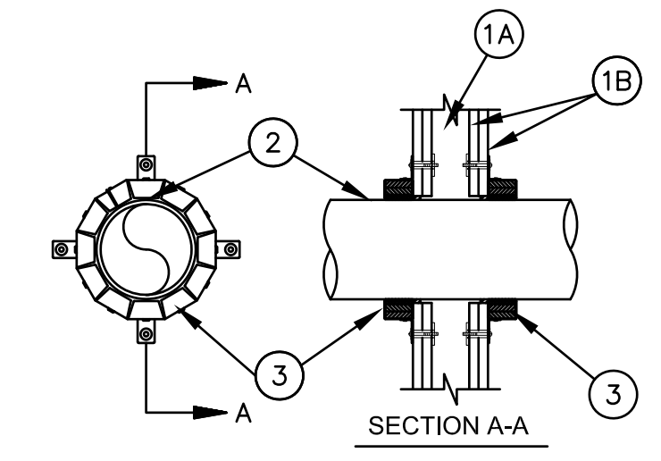
4. Firestop System -- The firestop system shall consist of the following:

A. Fill, Void or Cavity Material* - Fire Blocks -- For walls incorporating max 3-5/8 in. steel studs or max 2 by 4 in. wood studs, fire block installed with 5 in. dimension projecting through and centered in opening. For walls constructed of larger steel or wood studs, fire block installed with long dimension passing through and centered in opening. Blocks may or may not be cut flush with both surfaces of wall. When multiple layers of gypsum board are used, blocks may be recessed 1/2 in. from surface of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC -- FS-657 Fire Block
B. Fill, Void or Cavity Material* - Sealant or Putty (Not shown) -- Fill material to be forced into interstices of cables and between cables and cable trays to max extent possible on both surfaces of the penetration.
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC -- FS-ONE Sealant or CP618 Firestop Putty Stick (Note: L Ratings apply only when FS-One Sealant is used)

+Bearing the UL Listing Mark
*Bearing the UL Classification Mark

System No. W-L-2078

F Ratings — 1 and 2 Hr (See Item 1)
T Ratings — 0, 1 and 2 Hr (See Items 2 and 3)
L Rating At Ambient — 3 CFM/sq ft
L Rating At 400 F — Less Than 1 CFM/sq ft



1. Wall Assembly — The fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400 or V400 Series Wall and Partition Designs in the UL fire Resistance Directory and shall include the construction features noted below:

A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced max 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC.
B. Gypsum Board* — Nom 5/8 in. thick gypsum board, as specified in the individual Wall and Partition Design. Max diam of opening is 11-1/2 in.

The hourly F Rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through-Penetrants — One nonmetallic pipe, conduit or tubing to be installed within the firestop system. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 1/2 in. Pipe or conduit to be rigidly supported on both sides of the wall assembly. The following types and sizes of nonmetallic pipes may be used:

A. Polyvinyl Chloride (PVC) Pipe — Nom 10 in. diam (or smaller) Schedule 40 solid-core or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
B. Chlorinated Polyvinyl Chloride (CPVC) Pipe — Nom 10 in. diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
C. Acrylonitrile Butadiene Styrene (ABS) Pipe — Nom 6 in. diam (or smaller) Schedule 40 solid-core or cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems
D. Flame Retardant Polypropylene (FRPP) Pipe — Nom 6 in. diam (or smaller) Schedule 40 FRPP pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
E. Polyvinylidene Fluoride (PVDF) Pipe — Nom 4 in. diam (or smaller) PVDF pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.

When max 6 in. diam pipe is used, T Rating is equal to the hourly fire rating of the wall. When nom 8 in. or 10 in. diam pipe is used, T Rating is 0 hr.

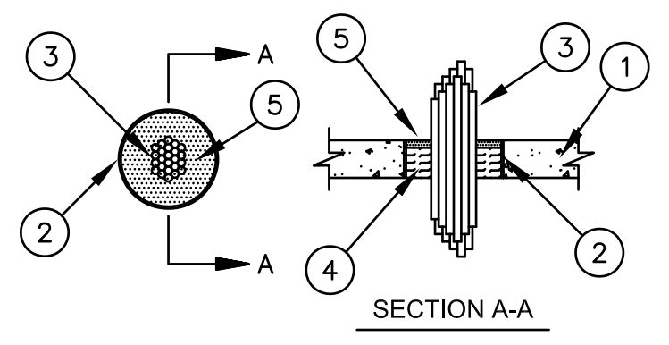
3. Firestop Device* — Firestop Collar — Firestop collar shall be installed in accordance with the accompanying installation instructions. Collar to be installed and latched around the pipe and secured to both sides of the wall using the anchor hooks provided with the collar. (Minimum two anchor hooks for 1-1/2 and 2 in. diam pipes, three anchor hooks for 3 and 4 in. diam pipes, four anchor hooks for 6 in. diam pipes, ten anchor hooks for 8 in. diam pipes and twelve anchor hooks for 10 in. diam pipes). The anchor hooks are to be secured to the surface of wall with 3/16 in. diam by 2-1/2 in. long steel toggle bolts along with washers. As an alternate for pipe sizes of nom 4 in. diam or less, min No. 10 by 1-1/2 in. long drywall or laminate screws with min 3/4 in. steel washers may be used. When the drywall or laminate screw is used, T Rating shall not exceed 1 hr.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 643 50/1.5"N, CP 643 63/2"N, CP 643 90/3"N, CP 643 110/4"N, CP 643 160/6"N, CP 644 200/8" andCP 644 250/10" Firestop Collars

4. Fill, Void or Cavity Material* — Sealant — (Not Shown) — Min 1/2 in. thickness of sealant applied within the annular space for nom 8 in. and 10 in. diam pipes, flush with each side of wall. Sealant in annular space is optional for max 6 in. diam pipes. A min 1/4 in. thickness of sealant is required within the annular space, flush with each side of wall, to attain the L Ratings for max 6 in. diam pipes.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant

*Bearing the UL Classification Mark

System No. C-AJ-3095

F Rating - 3 Hr
T Ratings - 0, 1/2 and 3/4 Hr (See Item 3)



1. Floor or Wall Assembly — Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600 2400 kg/m3) concrete floor or min 3 in. (76 mm) thick reinforced lightweight or normal weight concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 6 in. (152 mm).

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Sleeve — (Optional) — Nom 6 in. (152 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe cast or grouted into floor or wall assembly, flush with floor or wall surfaces or extending a max 3 in. (76 mm) above the floor or both surfaces of the wall. If the steel sleeve extends above the floor or both surfaces of the wall, the T Rating of the firestop system is 0 Hr.

3. Cables — Aggregate cross-sectional area of cables in opening to be min 25 percent to max 45 percent of the aggregate cross-sectional area of the opening. Cables to be rigidly supported on both sides of floor or wall assembly. Any combination of the following types and sizes of metallic conductor or fiber optic cable may be used:

A. Max 500 kcmil single copper connector power cable with thermoplastic insulation and polyvinyl chloride (PVC) jacket. When single copper conductor power cable is used, T Rating is 0 hr.
B. Max 350 kcmil single conductor power cables with either aluminum or copper conductors and cross-linked polyethylene (XPLE) insulation. When single aluminum conductor power cable is used, T Rating is 0 hr. When single copper conductor power cable is used, T Rating is 1/2 hr.
C. Max 300 pair No. 24 AWG copper conductor telecommunication cables with polyvinyl chloride (PVC) insulation and jacket material. When telecommunication cable is used, T Rating is 0 hr.
D. Max three copper connector No. 6 AWG cable with polyvinyl chloride (PVC) insulation and jacket material. When multi-connector power cable is used, T Rating is 0 hr.
E. Max 7/C copper conductor No. 12 AWG multiconductor power and control cables with PVC or cross-linked polyethylene (XLPE) insulation and PVC jacket. When multiconductor power and control cable is used, T Rating is 3/4 hr.
F. Multiple fiber optical communication cables jacketed with PVC and having a max outside diam of 1/2 in. When fiber optic cable is used, T Rating is 3/4 hr.
G. Max 3/C copper conductor No. 12 AWG with Bare aluminum ground, polyvinyl chloride (PVC) insulated steel, Metal-clad cable+. When MC cable is used, T Rating is 0 hr.
AFC CABLE SYSTEMS INC
H. Max 3/C with ground 2/0 AWG copper conductor SER cable with cross-linked polyethylene (XLPE) insulation and polyvinyl chloride (PVC) jacket. When SER cable is used, T Rating is 0 hr.
I. Max RG/U coaxial cable with polyethylene (PE) insulation and polyvinyl chloride (PVC) jacket having a max outside diameter of ½ in. When coaxial cable is used, T Rating is 0 hr.
J. Fire Resistive Cables* - Max 1-1/4 in. (32 mm) diam single conductor or multi conductor Type MI cable. A min 1/8 in. (3 mm) separation shall be maintained between MI cables and any other type of cable. When Fire Resistive Cables *are used, T Rating is 0 hr.
K. Through Penetrating Product* — Any Cables, Metal-Clad Cable+ or Armored Cable+ currently Classified under the Through Penetrating Products category.

See Through Penetrating Product (XHLY) category in the Fire Resistance Directory for names of manufacturers.

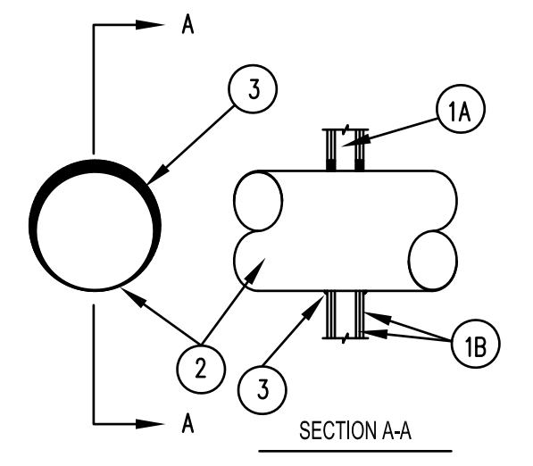
4. Packing Material — Min 2 in. (51 mm) thickness of min 4.0 pcf (64 kg/m3) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed 1/2 in. (13 mm) from top surface of floor or from both surfaces of wall as required to accommodate the fill material. If the steel sleeve (Item 2) extends above the top of the floor, the packing material shall be flush with the bottom surface of the floor.

5. Fill, Void or Cavity Material* — Sealant — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant.

*Bearing the UL Classification Mark
+Bearing the UL Listing Mark

System No. W-L-7042

F Ratings - 1 and 2 Hr
(See Items 1 and 3)
T Rating - 0 Hr



1. Wall Assembly The 1 or 2 hr fire rated wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features.

A. Studs Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced 24 in. OC.
B. Gypsum Board* For 1 hr assembly, one layer of min 5/8 in. thick wallboard as required in the individual Wall and Partition Design. For 2 hr assembly, two layers of min 5/8 in. thick wallboard as required in the individual Wall and Partition Design. Max diam of opening is 14-1/2 in. for wood stud walls and 21-3/4 for steel stud walls. The hourly F and T Ratings of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Through Penetrant Galv steel duct to be installed concentrically or eccentrically within the firestop system. The annular space between the duct and periphery of opening shall be 0 in. (point contact) and max 1-1/2 in. Duct to be rigidly supported on both sides of wall assembly.

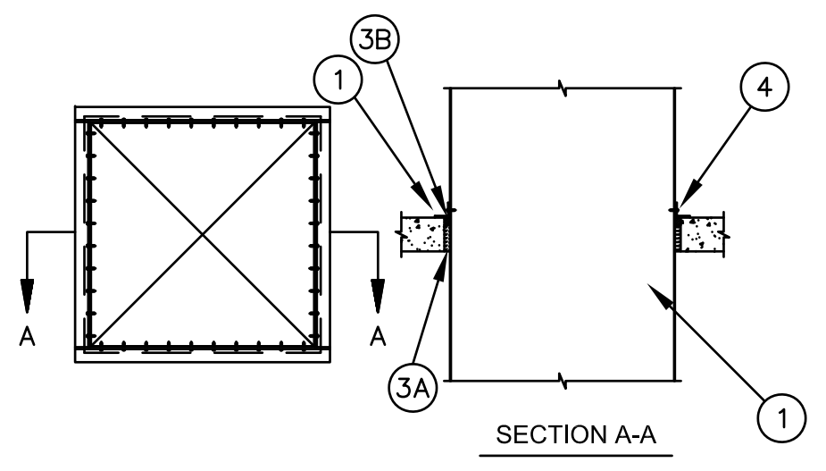
A. Spiral Wound HVAC Duct Nom 20 in. diam (or smaller) No. 24 MSG (or heavier) galv steel spriral wound duct.
B. Sheet Metal Duct Nom 12 in. diam (or smaller) No. 28 MSG (or heavier) galv sheet steel duct.

3. Fill, Void or Cavity Material*--Sealant Min 5/8 in. and 1-1/4 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly for 1 or 2 hr rated walls, respectively. At the point contact location between duct and wallboard, a min 1/2 in. diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - CP601S Elastomeric Firestop Sealant, FS-ONE Sealant or CP606 Flexible Firestop Sealant

*Bearing the UL Classification Mark

System No. C-AJ-7046

F Rating — 3 Hr
T Rating — 0 Hr



1. Floor or Wall Assembly — Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete floor or min 5-1/2 in. thick lightweight on normal weight concrete wall. Wall may also be constructed of any UL Classified Concrete Blocks*. Max area of opening is 1139 in. sq with a max dimension of 33-3/4 in.

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Steel Duct — Nom 32 by 32 by No. 24 gauge (or heavier) galv steel duct. One steel duct to be positioned within the firestop system. The annular space shall be min 1/4 in. to max 1-1/2 in. Duct to be rigidly supported on both sides of floor or wall assembly.

3. Firestop System — The firestop system shall consist of the following:

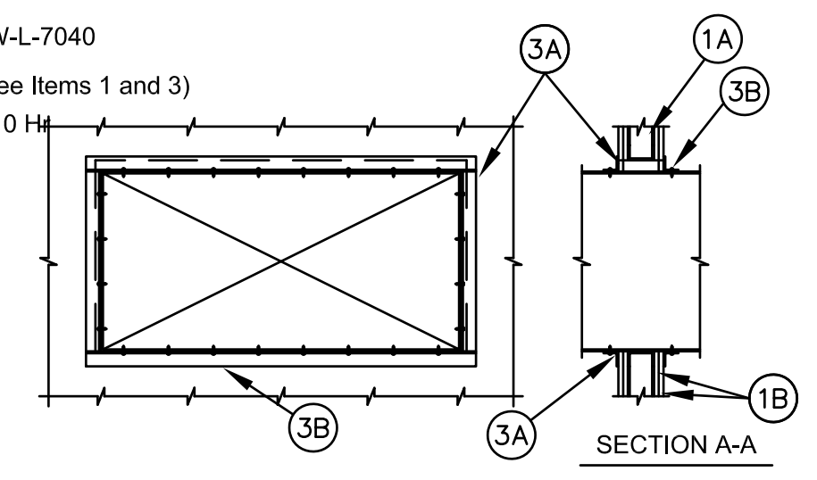
A. Packing Materials — Min 3-1/2 in. thickness of min 4 pcf mineral wool batt insulation firmly packed into opening as a permanent form between the bare steel duct and the periphery of the opening. Packing material to be recessed from top surface of floor or both surfaces of wall as required to accommodate the required thickness of fill material.
B. Fill, Void or Cavity Material* — Sealant — Min 1 in. thickness of fill material applied within the annulus, flush with top surface of floor or with both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP 601S Elasomeric Firestop Sealant or CP604 Self-Leveling Firestop Sealant

4. Steel Retaining Angle — Nom 2 in. by 2 in. by No. 16 gauge (or heavier) steel angles attached to all four sides of the steel duct on the top surface or both surfaces of the wall. The angles shall be attached with No. 8 (or larger) steel sheet metal screws spaced max of 1 in. from each end and a max of 3 in. OC.

*Bearing the UL Classification Mark

System No. W-L-7040

F Ratings — 1 and 2 Hrs (See Items 1 and 3)
T Rating — 0 Hr



1. Wall Assembly — The fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the Fire Resistance Directory and shall include the following construction features:

A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. Additional framing members shall be used to completely frame around opening.
B. Gypsum Board* — Nom 5/8 in. thick with square or tapered edges. The gypsum wallboard type, number of layers and sheet orientation shall be as specified in the individual Wall and Partition Design Number. Max area of opening is 1300 in. with the dimension of 50 in. The hourly F rating of the firestop system is equal to the hourly fire rating of the wall assembly in which it is installed.

2. Steel Duct — Nom 24 in. by 48 in. (or smaller) No. 24 gauge (or heavier) galv steel duct to be installed within the firestop system. The annular space shall be min 0 (point contact) in. to a max 2 in. Duct to be rigidly supported on both sides of the wall assembly.

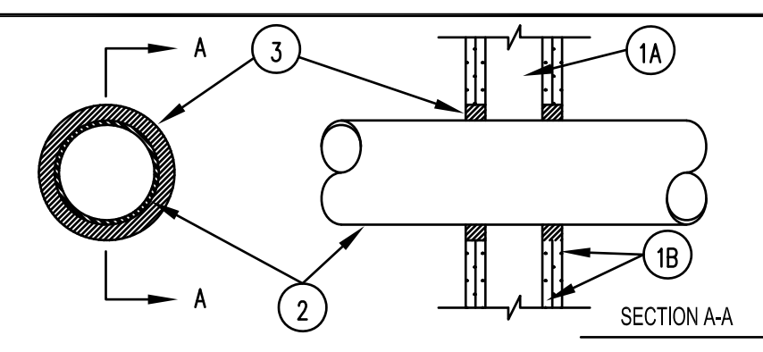
3. Firestop System — The firestop system shall consist of the following:

A. Fill, Void or Cavity Material*—Sealant — Min 5/8 in. thickness of fill material applied within annulus flush with both surfaces of wall. At point contact location, a min 1/2 in. diam bead of fill material shall be applied to the wall/duct interface on both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant, CP601S Elastomeric Firestop Sealant or CP606 Flexible Sealant.
B. Steel Retaining Angle — No. 18 MSG (0.048 in.) galv steel angles cut to fit contour of duct with a 2 in. overlap on the duct and a min 1 in. overlap on the gypsum board assembly on both sufaces of wall. 2 in. leg of angle secured to duct with min No. 8 by 3/4 in. long sheet metal screws, spaced a max of 6 in. OC. When bead of fill material is used at joint contact locations, angles shall be installed prior to full material curing.

*Bearing the UL Classification Mark

System No. W-L-1054

F Ratings - 1 and 2 Hr (See Items 1 and 3)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating At 400 F - 4 CFM/Sq Ft



1. Wall Assembly -- The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:

A. Studs -- Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced 16 in. OC. Steel studs to be min 2-1/2 in. wide and spaced max 24 in. OC. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. wider and 4 to 6 in. higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. clearance is present between the penetrating item and the framing on all four sides.
B. Gypsum Board* -- 5/8 in. thick, 4 ft wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 32-1/4 in. for steel stud walls. Max diam of opening is 14-1/2 in. for wood stud walls. The F Rating of the firestop system is equal to the fire rating of the wall assembly.

2. Through-Penetrants -- One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. to max 2-1/4 in. Pipe may be installed with continuous point contact. Pipe, conduit or tubing may be installed at an angle not greater than 45 degrees from perpendicular. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

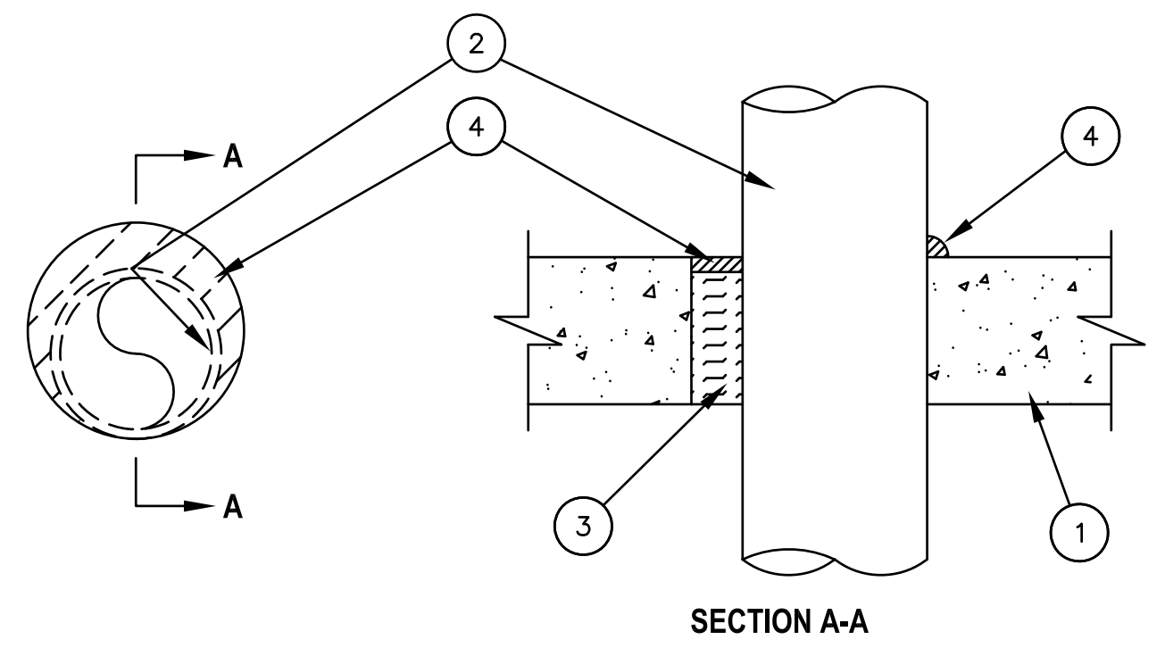
A. Steel Pipe -- Nom 30 in diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Iron Pipe -- Nom 30 in. diam (or smaller) cast or ductile iron pipe.
C. Conduit -- Nom 4 in diam (or smaller) steel electrical metallic tubing or 6 in. diam steel conduit.
D. Copper Tubing -- Nom 6 in. diam (or smaller) Type L (or heavier) copper tubing.
E. Copper Pipe -- Nom 6 in. diam (or smaller) regular (or heavier) copper pipe.

3. Fill, Void or Cavity Material* -- Sealant -- Min 5/8 in. thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point or continuous contact locations between pipe and wall, a min 1/2 in. diam bead of fill material shall be applied at the pipe wall interface on both surfaces of wall .
HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC -- FS-One Sealant

*Bearing the UL Classification Mark

System No. C-AJ-1149

F Ratings - 2 Hr
T Rating - 0 Hr



1. Floor or Wall Assembly - Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 12 in.

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Through-Penetrants - One metallic pipe, conduit or tubing to be installed within the firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The annular space shall be 0 in.)point contact) to max 1-1/4 in. The following types and sizes of metallic pipes, conduits or tubing may be used:

A. Steel Pipe - Nom 10 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Iron Pipe - Nom 10 in. diam (or smaller) cast or ductile iron pipe.
C. Conduit - Nom 4 in. diam (or smaller) steel electrical metallic tubing or steel (EMT).
D. Copper Pipe - Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.
E. Copper Tubing - Nom 4 in. diam (or smaller) Type L (or heavier) copper tubing.

3. Packing Material - Min 3 in. thickness of min 4 pcf mineral wool batt insulation for nom 4 in. diam (and smaller) pipes, conduits or tubing and a min 4 in. thickness of 4 pcf mineral wool batt insulation for pipe greater than nom 4 in. diam, firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor or from both surfaces of wall as required to accommodate the required thickness of fill material.

4. Fill, Void or Cavity Material* - Sealant - Min 1/2 in. thickness of fill material applied within the annulus, flush with top surface of floor or both surfaces of wall. At the point of contact location between pipe and concrete, a min 1/2 in. diam bead of fill material shall be applied at the concrete/pipe interface on the top surface of floor and on both surfaces of wall. W Rating applies only when CP601S or CP604 sealant is used.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - CP601S, CP604, CP606 or FS-ONE Sealant

*Bearing the UL Classification Mark

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PROJECT # 22659

SEAL

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56590
07-15-2022

PROJECT NO.:	629-003
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CHECKED BY:	
RSF:	33,038

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DALLAS, TX 75219

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LANDLORD REVIEW ISSUE DATE:	07/15/2022
TENANT REVIEW ISSUE DATE:	07/15/2022
BID ISSUE DATE:	07/15/2022
PERMIT ISSUE DATE:	07/15/2022
CONSTRUCTION ISSUE DATE:	XX/XX/2022

DRAWING TITLE:

FIRESTOP UL LISTING
(REFERENCE ONLY)

DRAWING NUMBER:

MEP2.0

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MECHANICAL

MECHANICAL SYMBOLS

SYMBOL	DESCRIPTION
▨	NEW EQUIPMENT
☐	EXISTING EQUIPMENT
⬚	EXISTING EQUIPMENT TO BE REMOVED OR RELOCATED
	NEW DUCT
	EXISTING DUCT
	EXISTING DUCT TO BE REMOVED OR RELOCATED
⊠	NEW SUPPLY DIFFUSER
⊠	EXISTING SUPPLY DIFFUSER
⊠	EXISTING SUPPLY DIFFUSER TO BE REMOVED OR RELOCATED
◪	NEW R/A OR EXHAUST GRILLE
◪	EXISTING R/A OR EXHAUST GRILLE
◪	EXISTING R/A OR EXHAUST GRILLE TO BE REMOVED OR RELOCATED
▭	NEW SLOT DIFFUSER
┼┼┼┼┼┼┼┼	FLEXIBLE DUCT
▭	EXISTING SLOT DIFFUSER
⬚	EXISTING SLOT DIFFUSER TO BE REMOVED OR RELOCATED
Ⓣ	THERMOSTAT
Ⓣ	EXISTING THERMOSTAT TO BE REMOVED OR RELOCATED
— U →	UNDERCUT DOOR
	CONICAL TAP WITH VOLUME DAMPER
	CONICAL TAP W/O VOLUME DAMPER
	MANUAL VOLUME DAMPER
—◀	FIRE DAMPER
—■	SMOKE DAMPER
—■◀	FIRE/SMOKE DAMPER
—M	MOTORIZED DAMPER
—B	BAROMETRIC DAMPER
— CHS —	CHILLED WATER SUPPLY PIPE
— CHR —	CHILLED WATER RETURN PIPE
— CS —	CONDENSER WATER SUPPLY PIPE
— CR —	CONDENSER WATER RETURN PIPE
— RL —	REFRIGERANT LIQUID PIPE
— RG —	REFRIGERANT GAS PIPE
— HS —	HEATING WATER SUPPLY
— HR —	HEATING WATER RETURN
⊕	DEMO TO THIS POINT
AFMS	AIR FLOW MEASURING STATION
HS	HUMIDITY SENSOR
TS	TEMPERATURE SENSOR
Ⓗ	HUMIDISTAT

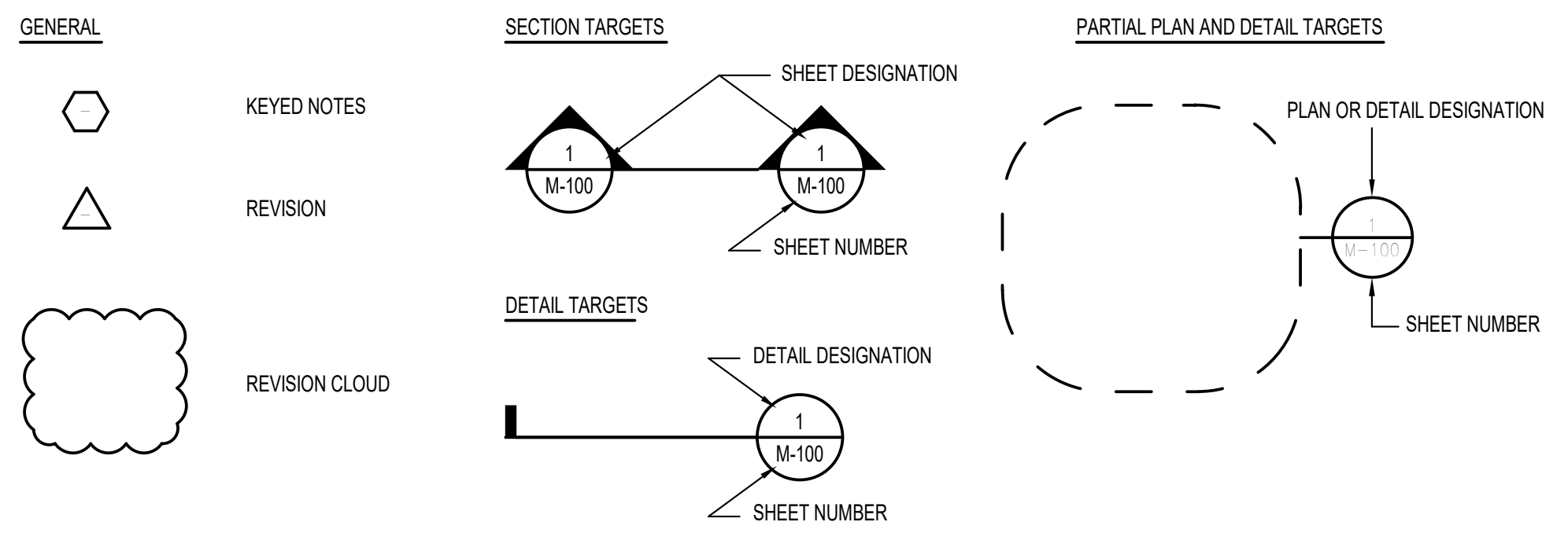
— HPS —	HIGH PRESSURE STEAM
— HPR —	HIGH PRESSURE CONDENSATE RETURN
- - - LPS - - -	LOW PRESSURE STEAM
- - - LPR - - -	LOW PRESSURE CONDENSATE RETURN
— PCR —	PUMPED CONDENSATE RETURN
— • —	DOMESTIC COLD WATER
— •• —	DOMESTIC HOT WATER
— ••• —	DOMESTIC HOT WATER RETURN
——	SANITARY WASTE LINE
— CD —	CONDENSATE DRAIN
— P —	PUMPED SANITARY LINE
— — —	VENT LINE
	DIRECTION OF SLOPE
—→—	DIRECTION OF FLOW
	EXPANSION LOOP
—▶◀—	GATE VALVE
	BUTTERFLY VALVE
	BALL VALVE
—▶•◀—	GLOBE VALVE
	TEMPERATURE AND PRESSURE RELIEF VALVE
	AUTOMATIC 2-WAY CONTROL VALVE
	AUTOMATIC 3-WAY CONTROL VALVE
	PLUG VALVE/BALANCING COCK
	SOLENOID VALVE
	CHECK VALVE
	HYDRAULIC SHOCK ARRESTOR
	VALVE IN VERTICAL
	UNION
—Ⓥ—	VACUUM BREAKER
	P-TRAP
	FLOOR DRAIN W/ P-TRAP
◎	HUB DRAIN
	FLOOR CLEANOUT OR GRADE CLEANOUT
	CLEANOUT OR WALL CLEANOUT
	PETE'S PLUG
	GAUGE COCK
	THERMOMETER
	THERMOMETER WELL
	STRAINER WITH BLOW-OFF VALVE
—⊗—	F & T STEAM TRAP
—⊠—	STEAM BUCKET TRAP
◕	CONNECT TO EXISTING
EP	ELECTRIC PNEUMATIC SWITCH
DD	DUCT MOUNTED SMOKE DETECTOR
DM	DISPLAY MONITOR
SP	STATIC PRESSURE SENSOR
DP	DIFFERENTIAL PRESSURE SENSOR
DPM	DIFFERENTIAL PRESSURE MONITOR
VFD	VARIABLE FREQUENCY DRIVE

ALL SYMBOLS SHOWN MAY NOT APPEAR IN ALL DRAWINGS.
SYMBOLS ARE SHOWN SCHEMATIC AND MAY NOT BE TO SCALE.

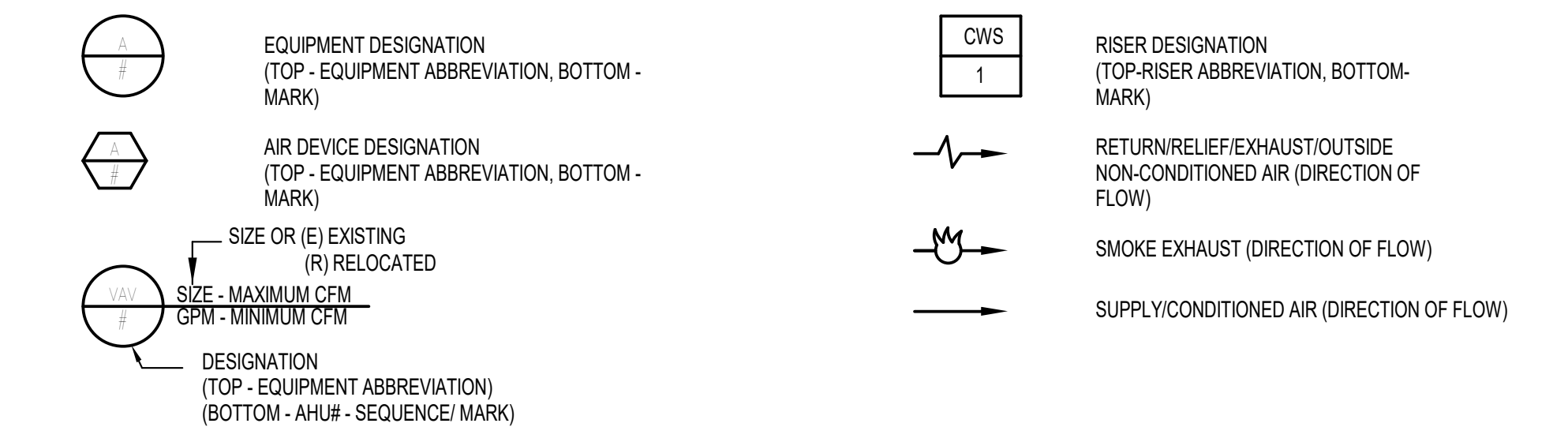
MECHANICAL ABBREVIATIONS

AC	ABOVE CEILING	CRU	COMPUTER ROOM UNIT	EUH	ELECTRIC UNIT HEATER	OBD	OPPOSED BLADE DAMPER
AFF	ABOVE FINISHED FLOOR	CU	CONDENSING UNIT	FCU	FAN COIL UNIT	R	RELOCATED
AI	ANALOG INPUT	DI	DIGITAL INPUT	FPB	FAN POWERED BOX	RA	RETURN AIR
AO	ANALOG OUTPUT	DO	DIGITAL OUTPUT	FPI	FINS PER INCH	SA	SUPPLY AIR
BF	BELOW FLOOR	DS	DISCONNECT SWITCH	GC	GENERAL CONTRACTOR	UH	UNIT HEATER
BFC	BELOW FINISHED CEILING	E	EXISTING	MVD	MANUAL VOLUME DAMPER	WHP	WATER-SOURCE HEAT PUMP
BG	BELOW GRADE	EDH	ELECTRIC DUCT HEATER	N	NEW	VAV	VARIABLE AIR VALVE
		EF	EXHAUST FAN			WH	WATER HEATER

GENERAL SYMBOLS



MECHANICAL DESIGNATION



DEMO/RENO NOTES

A. **ARCHITECTURAL DEMOLITION DRAWINGS:** REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR SCOPE OF DEMOLITION WORK, EXACT LOCATIONS, CONDITIONS, PHASING, CONSTRUCTION SCHEDULING, AND ANY ADDITIONAL DEMOLITION NOTES, REQUIREMENTS, ETC.

B. **DEMOLITION - GENERAL SCOPE OF WORK:** MECHANICAL DEMOLITION DRAWINGS ARE GENERALLY DIAGRAMMATIC AND IT IS THE INTENT AND MEANING OF THE CONTRACT DOCUMENTS THAT ALL MECHANICAL SYSTEMS SHALL BE REMOVED UNLESS NOTED AND/OR REQUIRED TO REMAIN, REWORK / MODIFY AS REQUIRED TO ACCOMMODATE ALL NEW WORK. ALL APPURTENANCES, RELATED COMPONENTS, INCLUDING ALL EQUIPMENT, FIXTURES, DUCTWORK, PIPING, ETC. AS REQUIRED AT BUILDING MAINS SOURCE. VERIFY EXACT LOCATIONS AND CONDITIONS AND COORDINATE WITH GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO REMOVING ANY EXISTING ITEMS. DO NOT ABANDON ANY ITEMS IN PLACE.

C. **EXISTING- DUCTWORK, PIPING (E):** EXISTING DUCTWORK, PIPING, ETC. AS INDICATED (BY LIGHT LINES, (E), AND / NOTED) TO REMAIN AND BE RE-USED IN EXISTING LOCATIONS. IF EXISTING ITEMS CONFLICT WITH NEW CONSTRUCTION, CONTRACTOR SHALL RELOCATE, REWORK, REROUTE, RECONNECT, AND REINSTALL COMPLETELY AS REQUIRED AS IF NEW AT NO ADDITIONAL COSTS. COORDINATE WITH GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE, ARCHITECT, ETC. PRIOR TO RELOCATION. REFER TO APPLICABLE NOTES FOR NEW ITEMS.

D. **EXISTING- REMOVED (R):** EXISTING EQUIPMENT, FIXTURES, DUCTWORK, PIPING ETC. AS INDICATED (BY DASHED LINES AND/OR NOTED) TO BE REMOVED INCLUDING ALL ITEMS NOT BEING RE-USED. ALL APPURTENANCES, RELATED COMPONENTS, INCLUDING ALL DUCTWORK, PIPING, SUPPORTS, HANGERS, BAS CONTROLS, ETC. ASSOCIATED WITH EACH ITEM SHALL BE REMOVED, CAP ALL DUCTWORK AND PIPING AS REQUIRED SERVING EACH ITEM AT BUILDING MAINS. VERIFY EXACT LOCATIONS AND CONDITIONS AND COORDINATE WITH GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO REMOVING ANY EXISTING ITEMS. DO NOT ABANDON ANY ITEMS IN PLACE.

E. **EXISTING IN CONFLICT WITH NEW:** CONSTRUCTION, EXISTING DUCTWORK, MECHANICAL / PLUMBING / FIRE SPRINKLER PIPING, ELECTRICAL CONDUIT, CABLING, ETC. WHICH MUST REMAIN AS PART OF AN ACTIVE SYSTEM AND CONFLICTS WITH NEW CONSTRUCTION, CONTRACTOR SHALL RELOCATE, REWORK, REROUTE, RECONNECT, AND REINSTALL COMPLETELY AS REQUIRED AS IF NEW AT NO ADDITIONAL COSTS. COORDINATE WITH GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE, ARCHITECT, ETC. PRIOR TO RELOCATION. REFER TO APPLICABLE NOTES FOR NEW ITEMS.

F. **ELECTRICAL AND PLUMBING FOR EXISTING EQUIPMENT/ FIXTURES REMOVED:** EXISTING EQUIPMENT / FIXTURES WHICH SHALL BE REMOVED AND/OR TO BE RELOCATED. CONTRACTOR SHALL COORDINATE WITH EACH TRADE CONTRACTOR FOR REMOVAL OF THE EXISTING ELECTRICAL AND PLUMBING SERVICES INCLUDING ALL CONDUIT, WIRING PIPING, INSULATION, APPURTENANCES, RELATED COMPONENTS, ETC. VERIFY EXACT LOCATIONS AND CONDITIONS AND COORDINATE WITH GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO REMOVING ANY EXISTING ITEMS. DO NOT ABANDON ANY ITEMS IN PLACE.

G. **EXISTING CONDITIONS:** THE INFORMATION ON THE DRAWINGS IN INCLUDED FOR INCLUDED FOR REFERENCE ONLY FOR SCOPE OF DEMOLITION AND REMODEL / RENOVATION WORK REFER TO ARCHITECTURAL DRAWINGS THESE DRAWINGS WERE PREPARED FROM THE BEST INFORMATION AVAILABLE, ORIGINAL DRAWINGS, MINIMAL FIELD OBSERVATIONS, ETC., BUT DO NOT ATTEMPT TO INDICATE THE EXACT LOCATION OF ALL EXISTING MECHANICAL AND PLUMBING EQUIPMENT AND/ OR FIXTURES. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE CONDITIONS SURROUNDING THE INSTALLATION OF HIS WORK PRIOR TO PROCEEDING WITH THE INSTALLATION. CHANGES REQUIRED TO THE DESIGN SHOWN ON THESE DRAWINGS DUE TO EXISTING CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT / ENGINEER / OWNER FOR REVIEW BY WAY OF SHOP DRAWINGS OR SKETCHES DETAILING THE EXISTING CONDITIONS AND THE PROPOSED CHANGED.

H. **JOBSITE VISIT:** CONTRACTOR SHALL BE RESPONSIBLE TO VISIT THE JOBSITE, COMPLETELY REVIEW CONTRACT DOCUMENTS, AND FIELD VERIFY EXTENT OF WORK AND EXACT LOCATIONS AND CONDITIONS OF ALL NEW AND EXISTING CONSTRUCTION, ELEVATIONS, SERVICE POINTS, ETC. AS REQUIRED FOR A COMPLETE AND CORRECTLY OPERATING SYSTEM. CONTACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE, AND REPORT IN WRITING ANY CONFLICTS, PROBLEMS, OR ANY CONDITION THAT MAY ADVERSELY AFFECT THE PROPER EXECUTION OF THE WORK THAT IS NOT INDICATED ON THE DRAWINGS. THIS SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR MAKING ANY CORRECTIONS OR ALTERATIONS DEEMED NECESSARY TO COMPLETE THE WORK AND SHALL INCLUDE ALL ASSOCIATED COSTS IN HIS BID WITH NO ADDITIONAL EXPENSE.

I. **CUTTING AND PATCHING:** CONTRACTOR SHALL COORDINATE ALL CUTTING AND PATCHING OF EXISTING WALLS, CEILINGS, ROOF AND FLOOR REQUIRED FOR HIS WORK WITH GENERAL CONTRACTOR, STRUCTURAL ENGINEER, AND OWNERS REPRESENTATIVE ALL PENETRATIONS SHALL BE SEALED AND RESTORED TO THE ORIGINAL CONDITIONS, STRUCTURAL PROPERTIES, AND FINISHED IN SAME MATERIALS AND MANNER AS ADJACENT AREAS ALL ROOF PENETRATIONS, ROOF PIPE SUPPORTS, FLASHINGS, ETC. SHALL BE MADE WATERTIGHT AND AS RECOMMENDED BY THE ROOF MANUFACTURER ALSO, ALL EXISTING PENETRATIONS WHICH ARE NOT TO BE REUSED SHALL BE PROPERLY SEALED OFF TO MAINTAIN THE STRUCTURAL, WATERPROOF, AND FIREPROOF INTEGRITY OF THE WALL, FLOOR, OR ROOF SYSTEM PENETRATED.

J. **EXISTING BUILDING OPERATIONS:** COORDINATE ALL RENOVATIONS / REMODEL / DEMOLITION WORK WITH THE OWNER REP, BUILDING ENGINEER / MAINTENANCE PERSONNEL AND OTHER TRADES PERFORMING WORK IN THE BUILDING PRIOR TO THE REMOVAL OF ANY ITEMS OF MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT, FIXTURES, OR SYSTEMS THAT WILL AFFECT OTHER SYSTEM WITHIN THE LIMIT OF NEW CONSTRUCTION, OR OTHER AREAS OF THE BUILDING. CONTRACTOR SHALL NOTE THAT THE BUILDING IS OCCUPIED, AND WILL REMAIN SO DURING CONSTRUCTION; AND, THEREFORE, UTILITIES / BUILDING SYSTEMS MUST REMAIN IN OPERATION, ANY REQUIRED OUTAGES MUST BE COORDINATED WITH GENERAL CONTRACTOR, OWNER REP, BUILDING ENGINEER / MAINTENANCE PERSONNEL. PROVIDE TEMPORARY CONNECTIONS OF UTILITIES AND AIR CONDITIONING AS NECESSARY TO FACILITATE THE PHASING OF CONSTRUCTION.

K. **CONSTRUCTION PHASING:** CONSTRUCTION PHASING, ALL WORK SHALL BE SCHEDULED AND PERFORMED IN STRUCT COORDINATION WITH CONSTRUCTION PHASING AND WITH OWNERS' SCHEDULES, OCCUPANCIES, ETC. PROVIDE ADDITIONAL VALVES, TAPS, TEMPORARY DUCTWORK, PIPING, ETC. AS NECESSARY TO PROVIDE UNINTERRUPTED SERVICE TO AREAS OUTSIDE OF THE PHASE IN WHICH WORK IS BEING PERFORMED. ALL NECESSARY SHUTDOWNS OR OUT OF PHASE WORK SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE.

L. **EXISTING BUILDING COMPONENTS PROTECTION:** PRIOR TO THE REMOVAL OF ANY MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT, FIXTURES, OR SYSTEMS, THE CONTRACTOR MUST VERIFY THE ORIGIN AND TERMINATION OF THOSE SYSTEM AND CONFIRM THAT THE ITEMS BEING REMOVED DO NOT SERVE ANY ITEMS THAT ARE TO REMAIN (INCLUDING THOSE IN AREAS OUTSIDE THE CONTRACT LIMITS). WHEN RENOVATION / REMODEL / DEMOLITION WORK IS PERFORMED, THE CONTRACTOR SHALL EXERCISE CARE IN PROTECTING EXISTING ITEMS TO REMAIN AND EXISTING ITEMS TO BE REMOVED AND RELOCATED. PROTECT ALL EXISTING BUILDING COMPONENTS, WALLS, FLOORS, ADJACENT EQUIPMENT, LIGHTING, ETC. ANY ITEMS DAMAGED OR WHERE FINISHES HAVE BEEN MARRED, SHALL BE REPAIRED AND REFINISHED TO ORIGINAL CONDITION AT NO COST TO THE OWNER. ALL ITEMS SOILED IN THE PROGRESS OF THE WORK SHALL BE CLEANED TO THEIR PRO- EXISTING CONDITIONS.

M. **EQUIPMENT OR FIXTURES REMOVED:** ALL EXISTING EQUIPMENT AND/OR FIXTURES REMOVED SHALL BE PROTECTED FROM DAMAGE IN SO FAR AS PRACTICAL. THESE ITEMS SHALL BE STORED ON SITE FOR A MINIMUM OF TWO (2) WEEKS UNLESS INDICTED OTHERWISE BY THE OWNER'S REPRESENTATIVE TO ALLOW INSPECTION BY THE OWNER. ALL ITEMS RETAINED BY THE OWNER TO BE TAGGED SHALL BE STORED ON SITE UNTIL DIRECTED OTHERWISE BY OWNER. ALL ITEMS NOT RETAINED BY THE OWNER SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE AND DISPOSED OF PROPERLY.

N. **DUCTWORK AND PIPING INSULATION DAMAGED:** REWORK AND REPAIR ALL DUCTWORK AND PIPING INSULATION DAMAGED OR REMOVED DURING RENOVATION / REMODEL / DEMOLITION AS REQUIRED TO MATCH EXISTING.

MECHANICAL GENERAL NOTES

A. THESE GENERAL NOTES APPLY TO ALL MECHANICAL DRAWINGS.

B. **DRAWING / SPECIFICATIONS:** MECHANICAL DRAWINGS/ SPECIFICATIONS ARE GENERALLY DIAGRAMMATIC IN NATURE AND INTENDED TO DESCRIBE AND ILLUSTRATE SYSTEMS THAT WILL NOT INTERFERE WITH THE ARCHITECTURAL/ STRUCTURAL CONDITIONS OF THE BUILDING AND WILL FIT INTO AVAILABLE SPACES. CAREFULLY LAY OUT ALL WORK TO CONFORM TO THE ARCHITECTURAL, STRUCTURAL, FINISH CONDITIONS, MANUFACTURER EQUIPMENT/ FIXTURE CUTSHEETS AND WITH OTHER TRADES, TO AVOID OBSTRUCTIONS, AND TO ALLOW THE PROPER INSTALLATION OF EACH ITEM. CONTRACTOR SHALL OBTAIN ALL ARCHITECTURAL DRAWINGS AND STRUCTURAL DATA, LOCATIONS OF PIERS, BEAMS, COLUMNS, JOISTS, ETC., FROM STRUCTURAL DRAWINGS, CONTRACTOR SHALL PROVIDE OFFSETS, RELOCATIONS, ETC. AS REQUIRED TO MEET THIS INTENT AT NO ADDITIONAL COST.

C. **CONTRACT DOCUMENTS:** CONTRACTOR SHALL BE RESPONSIBLE TO EXAMINE ALL THE CONTRACT DOCUMENTS CAREFULLY BEFORE SUBMITTING HIS BID, WITH PARTICULAR ATTENTION TO ERRORS, OMISSIONS, CONFLICTS WITH PROVISIONS OF LAWS AND CODES HAVING JURISDICTION, CONFLICTS BETWEEN DRAWINGS OR DRAWINGS AND SPECIFICATIONS, AND AMBIGUOUS DEFINITION OF THE EXTENT OF COVERAGE BETWEEN CONTRACTS. ANY SUCH DISCREPANCY SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION FOR CORRECTION. SHOULD ANY OF THESE ERRORS, OMISSIONS, CONFLICTS, OR AMBIGUITIES EXIST, THE CONTRACTOR SHALL HAVE THEM EXPLAINED AND AT HIS EXPENSE, SUPPLY THE PROPER MATERIALS AND LABOR TO MAKE GOOD ANY DAMAGE OR DEFECTS IN HIS WORK OR THE RESULTS OBTAINED THEREFORE, CAUSED BY SUCH DISCREPANCY. THE CONTRACTOR SHALL MAKE A CAREFUL EXAMINATION OF THE PREMISES AND THOROUGHLY FAMILIARIZE HIMSELF WITH THE REQUIREMENTS OF THE CONTRACT. UPON COMMENCEMENT OF THE CONSTRUCTION FOR THE WORK INCLUDED IN THIS CONTRACT, THE CONTRACTOR SHALL BE DEEMED TO HAVE MADE SUCH A STUDY OR EXAMINATION AND ACCEPTS ALL CONDITIONS.

D. **CONFLICTS:** WHEREVER CONFLICTS OCCUR BETWEEN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS (SUCH AS PLANS AND SPECIFICATIONS), THE GREATER QUANTITY, THE BETTER QUALITY, OR THE LARGER SIZE SHALL PREVAIL UNLESS THE ARCHITECT INFORMS THE CONTRACTOR OTHERWISE IN WRITING. THE VALUE WITH THE GREATEST COST IMPACT SHALL PREVAIL AND BE USED. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING DATA: DIMENSIONS, GAUGE THICKNESS, TEMPERATURES, PRESSURE, BTUH, SCHEDULE/ TIME DURATION, ELECTRICAL RATING, MATERIAL, SAFETY RATING, ENERGY RATING, ETC.

E. **MECHANICAL SYSTEM**: CONTRACTOR SHALL PROVIDE A MECHANICAL INSTALLATION THAT IS COMPLETE AND ALL ITEMS AND APPURTENANCES NECESSARY, REASONABLE INCIDENTAL, OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM IS NOT SPECIFICALLY CALLED OUT OR SHOWN. THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIALS, LABOR, SUPERVISION AND SERVICE NECESSARY SO AS TO PROVIDE A COMPLETE, FUNCTIONING MECHANICAL SYSTEM.

F. **EQUIPMENT, PIPING, DUCTWORK:** ALL MECHANICAL EQUIPMENT, MECHANICAL PIPING, DUCTWORK, ETC. SHALL BE LOCATED APPROXIMATELY IN GENERAL LOCATIONS SHOWN, CONFORM TO ALL ARCHITECTURAL AND STRUCTURAL CONDITIONS. PROVIDE ANY ADDITIONAL SUPPORTS, HANGERS, OPENINGS, ETC. AS REQUIRED FOR A COMPLETE INSTALLATION. MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED RECOMMENDATIONS FOR SERVICE INTENDED. EXPERIENCED CRAFTSMEN SHALL MAKE THE INSTALLATION OF ALL EQUIPMENT IN A NEAT WORKMANSHIP-LIKE MANNER, MECHANICAL EQUIPMENT SHALL BE AS SCHEDULED OR APPROVED EQUAL AND INSTALL IN FULL ACCORDANCE WITH ALL APPLICABLE CODES HAVING JURISDICTION COORDINATE BETWEEN ALL TRADED PRIOR TO STATING ANY WORK, PROVIDE ADEQUATE CLEARANCE FOR PROPER OPERATION, SERVICE/ MAINTENANCE, AIR FLOW, ETC. PIPING AND DUCTWORK ARE NOT PERMITTED IN ELECTRICAL, ELEVATOR MACHINE, TELECOM, IT, AND COMMUNICATION ROOMS. ALL ELEVATIONS INDICATED IN THIS WAY (8' – 4") ARE THE ELEVATIONS FROM THE FINISHED FLOOR DIRECTLY BELOW TO THE BOTTOM OF THE BARE PIPE OR DUCT.

G. **CODES AND ORDINANCES:** EXECUTE ALL WORK FOLLOWING LOCAL, STATE AND/OR NOTIONAL CODES, ORDINANCES AND REGULATIONS GOVERNING THE PARTICULAR CLASS OF WORK INVOLVED. THE GOVERNING CODES ARE MINIMUM REQUIREMENTS. THE DRAWINGS AND/OR SPECIFICATIONS SHALL PREVAIL WHERE THE DRAWINGS ARE/OR ACCOMPANYING SPECIFICATIONS EXCEED THE CODE REQUIREMENTS.

H. **FEES AND PERMITS:** CONTRACTOR IS RESPONSIBLE FOR FILING AND PAYING ALL FEES AND OBTAINING NECESSARY PERMITS AND CERTIFICATES OF INSPECTION. THE CONTRACTOR SHALL DELIVER ALL CERTIFICATES OF INSPECTION TO OWNER/CONSTRUCTION MANAGER INCLUDING COPIES WITH MAINTENANCE MANUALS.

I. **SHOP / RECORD DRAWINGS:** CONTRACTOR SHALL PROVIDE DETAILED AND DIMENSIONED HVAC DUCTWORK AND PIPING FABRICATION SHOP DRAWINGS FOR APPROVAL BY THE ARCHITECT/ ENGINEER. DURING THE INSTALLATIONS OF THE WORK, THE CONTRACTOR SHALL KEEP DETAILED RECORDS OF ANY AND ALL CHANGES MADE FROM THE WORK AS ACTUALLY INSTALLED, THESE RECORD DRAWINGS SHALL BE NOTED "AS-BUILT", AND SUBMITTED TO THE ARCHITECT/ ENGINEER FOR REVIEW WITH ALL O&M MANUALS.

J. **EQUIPMENT / DUCT / PIPING SUPPORTS:** PROPERLY SUPPORT ALL MECHANICAL EQUIPMENT, DUCTWORK AND PIPING WITHIN THE BUILDING AND PROVIDE ADEQUATE PROVISIONS FOR SLOPE AND ANCHORAGE. CONTRACTOR SHALL USE HANGERS, RODS AND INSERTS APPROVED BY UNDERWRITERS' LABORATORIES FOR THE SERVICE INTENDED, SECURELY SUPPORTED BY STRUCTURAL MEMBERS WHICH IN TURN ARE SUPPORTED DIRECTLY FROM THE BUILDING STRUCTURE.

K. **ELECTRICAL EQUIPMENT:** DO NOT RUN DUCTWORK, PIPING OR LOCATE EQUIPMENT, WITH RESPECT TO SWITCHBOARDS, PANELBOARDS, POWER PANELS, MOTOR CONTROL CENTERS OR DRY TYPE TRANSFORMERS WITHIN 42 INCHES IN FRONT OF EQUIPMENT, OVER EQUIPMENT, OR WITHIN 36 INCHES HORIZONTALLY OF SAME SPACE.

L. **MECHANICAL DUCTWORK AND PIPING:** DUCTWORK AND PIPING SHALL BE RUN CONCEALED ABOVE CEILINGS, INSIDES CHASES/ WALLS, ETC. IN GENERAL LOCATIONS SHOWN, UNLESS NOTED OTHERWISE. CONFORM TO ALL ARCHITECTURAL, STRUCTURAL, AND FINISH CONDITIONS OF BUILDING. WHEREVER CONDITIONS ARISE WHICH WILL CAUSE NORMALLY CONCEALED MATERIALS TO BE EXPOSED, IMMEDIATELY CALL THE SITUATION TO THE ATTENTION OF THE ARCHITECT AND STOP WORK IN THOSE AREAS UNTIL THE ARCHITECT DIRECTS THE RESUMPTION OF THE WORK AND THE PROCEDURES TO BE FOLLOWED. IN ANY CASE WHERE A PIPE OR DUCT SHOWN ON THE PLAN SHEET DIFFERS FROM THAT SHOWN IN A SCHEMATIC OR DETAIL, PROVIDE THE LARGER OF THE TWO SIZES SHOWN.

M. **HVAC PIPING:** SLOPE AND ARRANGE HVAC PIPING TO ESTABLISH HIGH POINTS FOR AIR ELIMINATION AND LOW POINTS TO PERMIT PROPER DRAINAGE, PROVIDE AIR VENTS AT HIGH POINTS AND DRAIN VALVES AT LOW POINT. CONDENSATE PIPE SHALL BE TYPE M, DRAWN-TEMPER COPPER TUBING, WROUGHT-COPPER FITTINGS, AND SOLDERED JOINTS. ALL PIPING SHOWN ON EACH PLAN IS ROUTED ABOVE THE CEILING ON THE FLOOR WHERE IT IS SHOWN, UNLESS OTHERWISE NOTED. ARRANGE PIPING CONNECTIONS TO ALL EQUIPMENT TO ALLOW EASY REMOVAL OF EQUIPMENT, COILS, FANS, MOTORS, FILTERS, ACCESS PANELS, ETC. PROVIDE UNIONS, FLANGES, AND VALVES AT CONNECTIONS. ALL EXTERIOR PIPING SHALL BE INSULATED AND JACKETED. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. PIPING RUN-OUTS TO VAV TERMINAL UNITS SHALL BE ¾" UNLESS OTHERWISE NOTED. MINIMUM PIPE SIZE FOR THE PROJECT IS ¾".

N. **THERMOSTATS / SENSORS:** THERMOSTATS/ SENSORS SHALL BE MOUNTED AT 48" ADD APPROX. AS SHOWN, MAX 12" FROM END OF WALL AND/OR DOOR JAMB. COORDINATE EXACT LOCATIONS WITH ARCHITECT AND BETWEEN TRADES PRIOR TO MOUNTING. DO NOT MOUNT ABOVE DIMMERS. THERMOSTATS ON EXTERIOR WALLS OR UNCONDITIONED WALLS SHALL BE INSULATED.

O. **FIRE, SMOKE, & FIRE/SMOKE DAMPERS:** FIRE, SMOKE, AND FIRE/SMOKE DAMPERS SHALL BE INSTALLED AS INDICATED AND WHERE MAY BE OTHERWISE REQUIRED BY LOCAL CODES AND ORDINANCES. REFER TO ARCH DWGS/ BUILDING CODE SUMMARY/ LIFE SAFETY PLANS FOR LOCATIONS OF ALL FIRE RESISTANT/ RATED WALLS, CEILINGS, CHASES/ SHAFTS, SMOKE COMPARTMENTS, AND LOCATIONS OF EGRESS CORRIDORS, PROVIDE MEANS TO ADEQUATELY SERVICE THE DAMPERS FUSIBLE LINKS, PROVIDE 12" X 12" MINIMUM METAL ACCESS DOORS IN ALL GYPBOARD AND PLASTER CEILINGS. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND UL LISTING FOR SERVICE INTENDED. PROVIDE METAL SLEEVES AS REQUIRED. PROVIDE ACCESS DOORS IN DUCTWORK AT ALL FIRE DAMPERS AND FIRE/SMOKE DAMPERS. IDENTIFY ACCESS DOORS IN ACCORDANCE WITH SPECIFICATIONS AND CODE. REFER TO ARCHITECTURAL CODE COMPLIANCE DRAWINGS FOR WALL RATINGS AND EXTENT OF WALLS AND/OR SHAFT.

P. **DUCTWORK CONSTRUCTION:** DUCTWORK SHALL BE CONSTRUCTED ACCORDING TO SMACNA STANDARDS AND SPECIFICATIONS. ALL DUCT AND FIRE DAMPER SIZES SHOWN ARE AIRSTREAM DIMENSIONS. ALL LONGITUDINAL AND TRANSVERSE SEAMS AND DUCT CONNECTIONS SHALL BE SECURELY FASTENED AND SEALED AIRTIGHT. DUCT SIZE SHOWN ON THE PLANS ARE NET FREE AIR PASSAGE DIMENSIONS. DUCT ARE NOT LINED, BUT ARE ALL SUPPLY DUCT ARE EXTERNALLY INSULATED. RETURN DUCTWORK MAY ALSO BE EXTERNALLY INSULATED, REFER TO DUCTWORK SPECIFICATION. PROVIDE DUCTWORK TRANSITIONS AS REQUIRED AT TERMINAL BOX INLET AND DISCHARGE CONNECTIONS. ALL EXPOSED SUPPLY AND RETURN AIR DUCTWORK IN OCCUPIED SPACES SHALL BE DOUBLE WALLED AND INSULATED.

Q. **AIR DEVICES:** CEILING-MOUNTED AIR DEVICES SHALL BE LOCATED APPROXIMATELY AS SHOWN, FOR EXACT LOCATION AND FRAME MOUNTING TYPES, REFER TO ARCHITECTURAL REFLECTED CEILING PLAN. ALL CEILING DIFFUSERS TO BE 4-WAT TYPE, UNLESS NOTED OTHERWISE BY AIRFLOW ARROWS ON FLOOR PLAN. (INSULATE THE BACK OF CEILING DIFFUSERS UNLESS CEILING SPACE IS USED AS A RETURN AIR PLENUM.) REFER TO DIFFUSER SCHEDULE FOR SIZE OF DUCT RUNOUT AND DIFFUSER CONNECTION SIZE. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR LOCATIONS, OF ALL CEILING FEATURES, LIGHTS, AIR DEVICES, FINISHES, CEILING HEIGHTS AND ELECTRICAL DRAWINGS FOR SPEAKERS, DETECTORS, POWER OUTLETS, ETC. AND FIRE PROTECTION SHOP DRAWINGS FOR FIRE SPRINKLER HEADS. COORDINATE EXACT LOCATIONS WITH ARCHITECT AND BETWEEN TRADES PRIOR TO MOUNTING.

R. **BRANCH DUCT RUN-OUTS:** BRANCH DUCT RUN-OUTS TO CEILING-MOUNTED AIR DEVICES SHALL BE SAME SIZE AS NECK, UNLESS NOTED OTHERWISE. PROVIDE A TWIST-IN FLARED CONICAL TAP WITH MANUAL VOLUME DAMPER AT MAIN DUCT TAP AND EXTEND AS SHOWN. EXTEND FLEX DUCTWORK A MAXIMUM OF 6'-0 FROM DIFFUSERS. INSTALL AS STRAIGHT AS POSSIBLE WITH LONG RADIUS BENDS WITH CLAMPS TO BE USED AT BOTH ENDS. ALL DAMPERS LOCATED ABOVE GYPBOARD AND PLASTER CEILINGS SHALL BE PROVIDED WITH REMOTE DAMPER ACTUATORS EQUAL TO YOUNG REGULATORS MODEL.

S. **TURNING VANES:** TURNING VANES SHALL BE INSTALLED IN ALL ELBOWS OF SUPPLY AND RETURN AIR DUCTS AND AIR EXTRACTORS OR SPLITTER DAMPERS WITH EXTERNAL ADJUSTMENTS AT ALL RECTANGULAR BRANCH DUCT TAKE-OFFS TO AIR DEVICES. PROVIDE ADEQUATE ACCESS AND MEANS TO ADJUST/ BALANCE ALL AIR EXTRACTORS AND DUCT TAKE-OFFS.

T. **MEDIUM PRESSURE DUCT RUN-OUTS:** BRANCH MEDIUM PRESSURE DUCT RUN-OUTS TO VAV AIR TERMINALS SHALL BE SAME SIZE AS AIR TERMINAL NECK, UNLESS NOTED OTHERWISE. INCREASE DUCT SIZE BY 2" IF GREATER THAN 10'-0' FROM MAIN AND/ OR MORE THAN 2-90 DEG ELBOWS.

U. **EQUIPMENT ACCESS PANEL:** ACCESS PANELS SHALL BE PROVIDED FOR EACH LOCATION WHERE MECHANICAL EQUIPMENT, MANUAL VALVES, AUTOMATIC CONTROL VALVES, AUTOMATIC DAMPER MECHANISM, FIRE/SMOKE DAMPER, ETC., ARE INSTALLED BEHIND FURRINGS, CHASES, OR NON-REMOVEABLE SUSPENDED CEILING. SIZE AND POSITION EACH ACCESS PANEL SO THAT THE CONCEALED EQUIPMENT CAN BE PROPERLY SERVICES, MINIMUM SIZE SHALL BE 24" X 24" UNLESS FIELD CONDITIONS DICTATE OTHERWISE. REFERS TO ARCH DWGS/ SPECS AND COORDINATE WITH GENERAL CONTRACTOR AND FOR EXACT LOCATION, CONDITIONS, SIZES, FINISHES, ETC.

V. **REMOTE DAMPER ACTUATORS:** PROVIDE REMOTE DAMPER ACTUATORS FOR EACH LOCATION WHERE VOLUME DAMPERS ARE INSTALLED BEHIND FURRINGS, CHASES, OR NON-REMOVABLE SUSPENDED CEILING. SIZE AND POSITION REMOTE DAMPER ACTUATORS SO THAT THE CONCEALED VOLUME DAMPERS CAN BE ADJUSTED. REMOTE OPERATOR SHALL BE A STRAIGHT SOLID SHAFT EXTENSION IN-LINE FOR DIRECT CONNECTION TO VOLUME DAMPER SHAFT WITHOUT GEAR MECHANISM. CABLE CONNECTION WILL NOT BE ACCEPTED. COORDINATE WITH ARCHITECT AND GENERAL CONTRACTOR FOR APPROVAL, EXACT LOCATION, CONDITIONS, SIZES, FINISHES, ETC.

W. **BALANCING AND REGULATING DEVICES:** HVAC SYSTEMS SHALL BE INSTALLED COMPLETE WITH ALL BALANCING AND REGULATING DEVICES NECESSARY FOR THE TAB CONTRACTOR TO PERFORM HIS WORK, COORDINATE WITH THE TAB CONTRACTOR TO DETERMINE THEIR EXACT REQUIREMENTS SHALL BE STARTED PER MANUFACTURER'S START-UP INSTRUCTIONS. REPLACE FILTERS, BELTS, SHEAVES, DAMPERS, VALVES, STARTERS AND HEATERS AS NECESSARY PRIOR TO TAB.

MECHANICAL DESIGN CRITERIA

DESIGN CRITERIA:

LOCATION:	2999 OLYMPUS BLVD. SUITE #200 DALLAS, TX 75219
LATITUDE/LONGTITUDE:	32.78° NORTH / 96.80° WEST
ELEVATION:	430 FEET
WINTER DB:	24.7° F (99.6%)
SUMMER DB:	101.5° F (0.4%)
SUMMER WB:	74.7° F (0.4%)
COOLING COIL OUTSIDE AIR DESIGN:	
SUMMER DB:	98.3° F
SUMMER WB:	75.0° F
GENERAL SPACE DESIGN TEMPERATURE:	
SUMMER DB:	74° F
WINTER DB:	70° F
PATIENT CARE SPACE DESIGN TEMPERATURE:	
SUMMER DB:	72° F
WINTER DB:	70° F

BUILDING CODES & STANDARDS

CITY OF TYLER:
AMENDMENTS AND DELETIONS TO THE 2015 IBC
AMENDMENTS AND DELETIONS TO THE 2015 IPC
AMENDMENTS AND DELETIONS TO THE 2015 IMC
AMENDMENTS AND DELETIONS TO THE 2020 NEC
AMENDMENTS AND DELETIONS TO THE 2021 IEBC
AMENDMENTS AND DELETIONS TO THE 2015 IECC
AMENDMENTS AND DELETIONS TO THE 2015 IFGC
AMENDMENTS AND DELETIONS TO THE 2015 IGCC

STATE OF TEXAS:
2015 NFPA 101 - LIFE SAFETY CODE
ASHRAE 90.1 - 2013

PROJECT INFO:
OCCUPANCY/CLASSIFICATION: REFER TO ARCHITECTURAL DRAWINGS
CONSTRUCTION TYPE: REFER TO ARCHITECTURAL DRAWINGS
BUILDING AREAS/CALCULATION: REFER TO ARCHITECTURAL DRAWINGS

GENERAL NOTES CONTIUNED

X. **TESTING, ADJUSTING, AND BALANCING:** CONTRACTOR SHALL PROVIDE ALL TESTING, ADJUSTING, AND BALANCING WORK TO INCLUDE ADJUSTMENT OF DAMPERS, BALANCE AIR DEVICES FOR DRAFT- FREE AIR DISTRIBUTION, VERIFY CORRECT SETPOINT AND CALIBRATION OF THERMOSTATS, VERIFY ALL SEQUENCE OF OPERATION, STAGING OF COOLING/ HEATING AS APPLICABLE, BALANCE OF CONDENSER AND HEATING WATER SYSTEMS, PUMPS, BOILERS, COOLING TOWERS, NOTE DEFICIENCIES IN MECHANICAL SYSTEM, ETC. FOR A CORRECTLY OPERATING MECHANICAL SYSTEM. CONTRACTOR SHALL REPLACE ALL FILTERS AND CLEAN ALL TRAINERS. TESTING AND BALANCING SUBCONTRACTOR MUST BE A MEMBER IN GOOD STANDING OF AABC AND SUBMIT REPORT ON AABC OR SMACNA FORMS FOR APPROVAL BY THE ENGINEER. PROVIDE A TEST AND BALANCE REPORT TO THE MECHANICAL INSPECTOR AT TIME OF HEATING FINAL INSPECTION. TAB CONTRACTOR SHALL LOCATE DP SENSORS IN PIPING FOR PUMPING SYSTEM AND STATIC PRESSURE SENSORS IN DUCTWORK FOR FAN SYSTEM.

Y. **ELECTRICAL:** CONTRACTOR SHALL INSURE THE FURNISHING AND INSTALLATION OF ALL BRANCH ELECTRICAL CIRCUIT WIRING, CONDUITS, PROTECTIVE DEVICES, DISCONNECTS, AND ACCESSORIES FOR ALL ELECTRICAL CONTROL POWER WIRING TO INCLUDE BUT NOT LIMITED TO; CONTROL PANELS, ACTUATORS, SMOKE DETECTORS, CONTROL/ MOTORIZED DAMPER, PRESSURE MONITORS FIR/SMOKE DAMPERS. VARIABLE FREQUENCY DRIVES, VAV TERMINALS (24V TRANSFORMER) AND ALL OTHER 120V CONTROLS AS REQUIRED FOR A COMPLETE CONTROL SYSTEM WHETHER SHOWN TO BE PERFORMED BY OTHER OR NOT. ALL ELECTRICAL WORK SHALL BE INSTALLED IN FULL ACCORDANCE WITH REQUIREMENTS OF ELECTRICAL SPECIFICATIONS. COORDINATE WITH ELECTRICAL CONTRACTOR. COORDINATE INSTALLATION OF EQUIPMENT, DUCTWORK, AND PIPING WITH ELECTRICAL CONTRACTOR TO ENSURE NEC CLEARANCE IN FRONT OF ALL ELECTRICAL PANELS. CONTRACTOR SHALL PROVIDE CLEARANCE IN FRONT, AT SIDES, AND BELOW TERMINAL UNIT CONTROL PANEL AND J-BOX AS REQUIRED BY NEC (36 INCHES).

Z. **LOUVERS:** REFER TO ARCHITECTS' DRAWINGS FOR EXACT LOCATION AND SIZE OF LOUVERS. BLANK OFF AREA OF LOUVER NOT USED FOR OUTSIDE AIR OR EXHAUST.

AA. EQUIPMENT INGRESS AND EGRESS ROUTES FOR THE RENOVATION WORK SHALL BE COORDINATES WITH THE OWNER. COORDINATE TIMES, DATES, AND DURATIONS WITH OWNER A MINIMUM OF 2 WEEKS IN ADVANCE TO ENSURE THERE ARE NO CONFLICTS IN USAGE OF EQUIPMENT/SPACES.

BB. CONTRACTOR RESPONSIBLE FOR PROTECTING EXISTING FINISHES AND FURNISHINGS FROM DAMAGE DURING WORK.

CC. CONTRACTOR TO PROVIDE TEMPORARY SPACE CONDITIONING DURING ALL MECHANICAL EQUIPMENT OUTAGES.

MISC. DESIGN CRITERIA

ROOF TOP EQUIPMENT ANCHORAGE:

1. ALL ROOF TOP EQUIPMENT CURBS, ROOF TOP MECHANICAL EQUIPMENT, EQUIPMENT TIE DOWNS, AND CONNECTIONS OF ALL EQUIPMENT TO BUILDING STRUCTURE FOR WIND LOADING ARE TO BE DESIGNED AND ENGINEERED BY A REGISTERED SPECIALTY ENGINEER RETAINED BY THE MECHANICAL EQUIPMENT SUPPLIER. SIGNED AND SEALED DRAWINGS AND CALCULATIONS ARE TO BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL. THE EQUIPMENT MANUFACTURER SHALL PROVIDE THE ATTACHMENT OF THE UNIT TO THE STRUCTURE AND SUBMIT TO THE ENGINEER LOADS, LOCATIONS, AND METHODS OF ATTACHMENT. THE STRUCTURAL ENGINEER WILL MAKE PROVISIONS IN THE DESIGN OF THE PRIMARY STRUCTURAL FRAME TO ACCOMMODATE THE LOADS AND ATTACHMENTS SUBMITTED BY THE MANUFACTURER.

HANGING DUCTS, PIPES AND EQUIPMENT FROM THE STRUCTURE:

1. ALL PIPES, DUCTS, AND OTHER EQUIPMENT SHALL BE PROPERLY SUPPORTED BY GALVANIZED OR CADMIUM PLATED ANCHOR BOLTS, ALL THREAD RODS AND WASHERS, LOCK WASHERS OR DOUBLE NUTS, AND BOLTS.
2. INSTALLING CONTRACTOR SHALL STRICTLY ADHERE TO ANCHOR BOLT MANUFACTURER'S INSTALLATION RECOMMENDATIONS REGARDING PULL-OUT LOADS, ANCHOR DIAMETER AND DEPTH OF ANCHOR INSERTION FOR DRILLING THE ANCHOR POINT IN CONCRETE.
3. SUBMIT SUPPORT LOCATIONS AND LOADS OF PIPES GREATER THAN 6" DIAMETER TO STRUCTURAL ENGINEER FOR REVIEW.
4. POST-INSTALLED ANCHOR BOLTS ARE NOT PERMITTED TO BE INSTALLED IN THE SOFFIT OF BEAMS OR JOISTS.
5. POST-INSTALLED ANCHOR BOLTS INSTALLED ON THE SIDE OF BEAMS OR JOISTS SHALL BE LOCATED A MINIMUM of 5" FROM BOTTOM OF THE BEAM OR JOIST.

PROJECT COORDINATOR/ DESIGN CONSULTANT

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DALLAS, TEXAS 75207
TEL: 214-638-6800

ARCHITECT/ ENGINEER

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Consulting Engineers
1700 Pacific Ave
Suite 2100
Dallas, TX 75201
Tel: 214.397.0211
www.SWAengineers.com
TEXAS REGISTERED ENGINEERING FIRM F-6872
PROJECT # 22659

SEAL

MIKE L. ASHCRAFT
56590
07/15/22

PROJECT NO.:	629-003
DRAWN BY:	EG
CHECKED BY:	MS
RSF:	33,038

BILLINGSLEY
COMPANY

UTSW MEDICAL CENTER AT COPPELL

CYPRESS WATERS
2999 OLYMPUS BLVD.
SUITE #300
DALLAS, TX 75219

NO.	REVISIONS:	DATE:
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LANDLORD REVIEW ISSUE DATE:	07/15/2022
TENANT REVIEW ISSUE DATE:	07/15/2022
BID ISSUE DATE:	07/15/2022
PERMIT ISSUE DATE:	07/15/2022
CONSTRUCTION ISSUE DATE:	XX/XX/2022

DRAWING TITLE:
MECHANICAL LEGENDS & NOTES

DRAWING NUMBER:
M0.01

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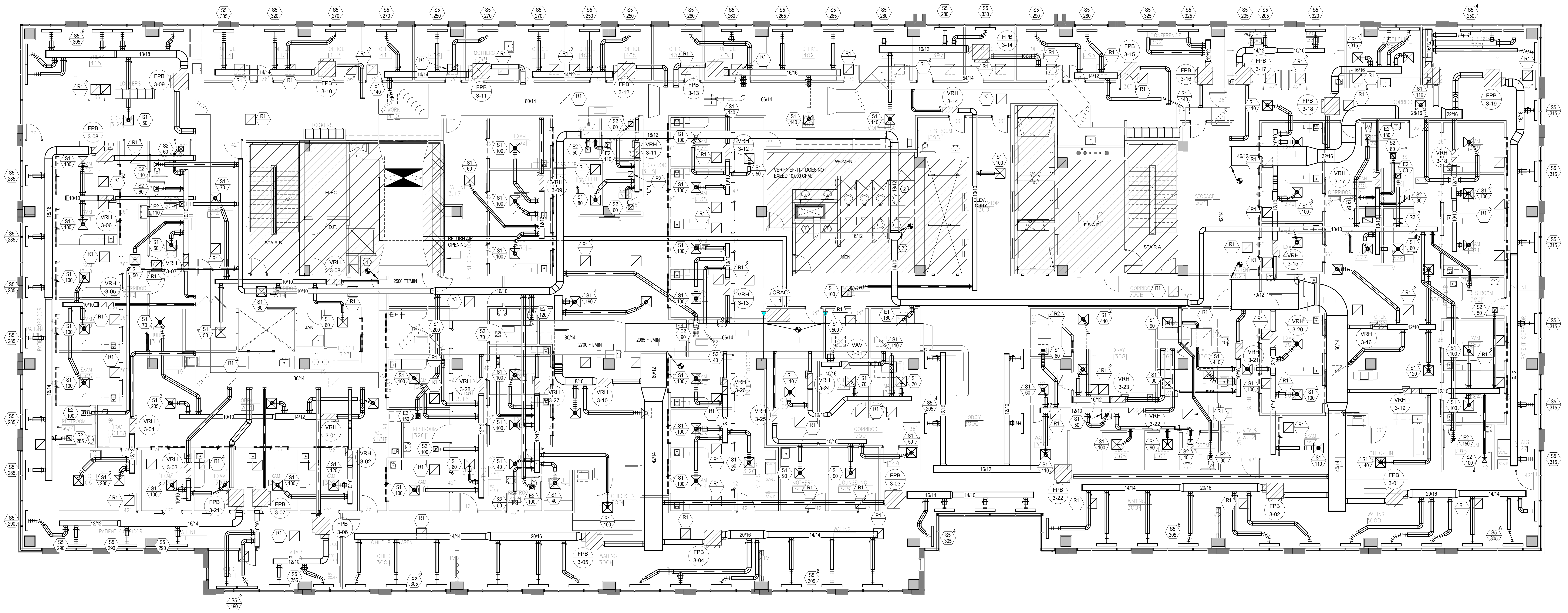

01 FLOOR PLAN - MECHANICAL

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO M0.01 MECHANICAL LEGENDS AND NOTES FOR ADDITIONAL MECHANICAL NOTES

B. REFER TO M-700 SHEETS FOR SCHEDULES

C. REFER TO M-800 SHEETS FOR DETAILS

KEYED NOTES:

NOTE: REFERENCE NUMBER INSIDE HEXAGON

1 CONNECT TO EXISTING. TYPICAL FOR ALL NEW VRH & FPB AND ASSOCIATED DUCTWORK.

2 DEMO EXISTING 12"x 6" EXHAUST DUCTS.

PROJECT COORDINATOR/ DESIGN CONSULTANT

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PROJECT NO.:	629-003
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PERMIT ISSUE DATE:	07/15/2022
CONSTRUCTION ISSUE DATE:	XX/XX/2022

DRAWING TITLE:

FLOOR PLAN - MECHANICAL

DRAWING NUMBER:

M2.01

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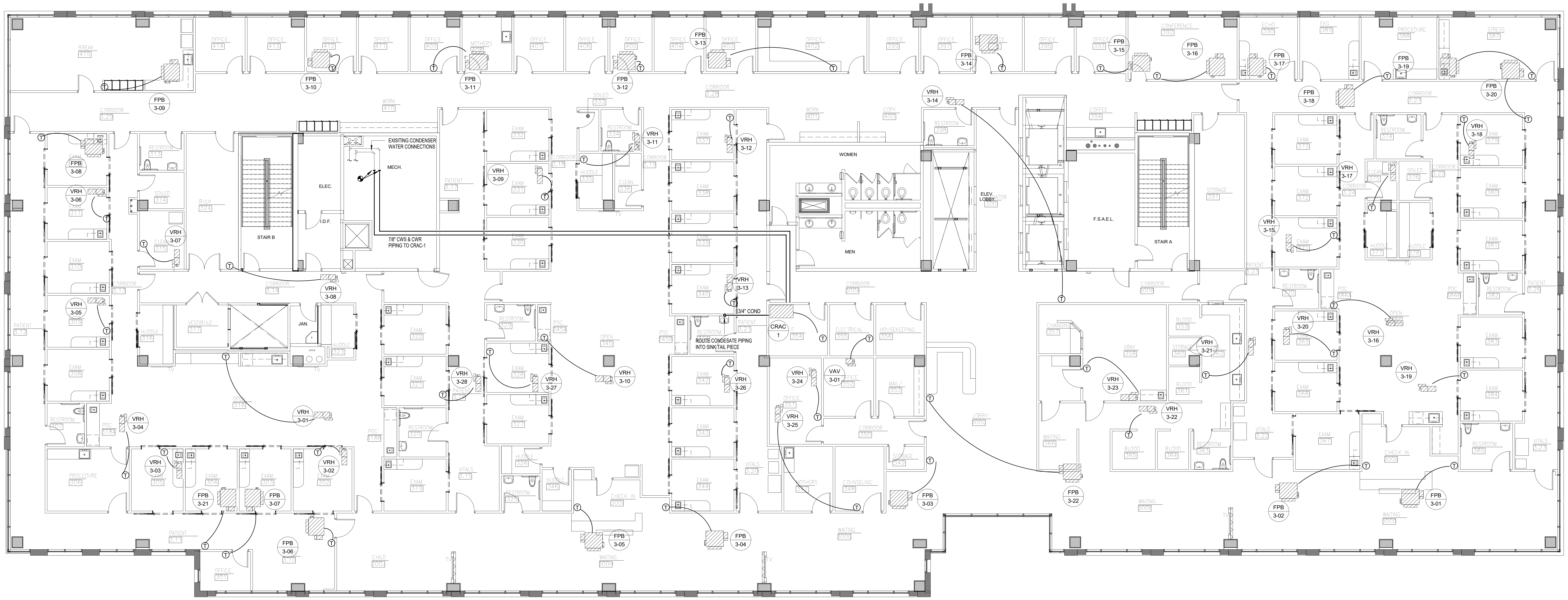

01 FLOOR PLAN - CONTROLS & PIPING

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. REFER TO M0.01 MECHANICAL LEGENDS AND NOTES FOR ADDITIONAL MECHANICAL NOTES

B. REFER TO M-700 SHEETS FOR SCHEDULES

C. REFER TO M-800 SHEETS FOR DETAILS

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SEAL

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56590

07/15/22

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DRAWN BY: EG
CHECKED BY: MS
RSF: 33,038

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LANDLORD REVIEW ISSUE DATE: 07/15/2022
TENANT REVIEW ISSUE DATE: 07/15/2022
BID ISSUE DATE: 07/15/2022
PERMIT ISSUE DATE: 07/15/2022
CONSTRUCTION ISSUE DATE: XX/XX/2022

DRAWING TITLE:

FLOOR PLAN - CONTROLS & PIPING

DRAWING NUMBER:

M3.01

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FAN POWERED BOX SCHEDULE - ALL

DESIGNATION	BOX NUMBER	SIZE	MAX SP (IN.WG)	PRIMARY AIR		HEATING COIL						HEATING COIL
				MIN. CFM	MAX. CFM	FAN CFM	EAT	LAT	kW	kW	VOLTAGE	PHASE
FPB	3-01	12	0.12	610	1,830	1,830	65 °F	95	17.2	17.2	460 V	3
FPB	3-02	12	0.12	610	1,830	1,830	65 °F	95	17.2	17.2	460 V	3
FPB	3-03	10	0.12	410	1,220	1,220	65 °F	95	11.5	11.5	460 V	3
FPB	3-04	12	0.12	610	1,830	1,830	65 °F	95	17.2	17.2	460 V	3
FPB	3-05	12	0.12	610	1,830	1,830	65 °F	95	17.2	17.2	460 V	3
FPB	3-06	8	0.12	170	510	510	65 °F	95	4.8	4.8	460 V	3
FPB	3-07	6	0.12	130	380	380	65 °F	95	3.6	3.6	460 V	3
FPB	3-08	12	0.12	670	1,995	1,995	65 °F	95	18.8	18.8	460 V	3
FPB	3-09	12	0.12	630	1,880	1,880	65 °F	95	17.7	17.7	460 V	3
FPB	3-10	8	0.12	300	895	895	65 °F	95	8.5	8.5	460 V	3
FPB	3-11	10	0.12	310	930	930	65 °F	95	8.7	8.7	460 V	3
FPB	3-12	8	0.12	260	770	770	65 °F	95	7.2	7.2	460 V	3
FPB	3-13	10	0.12	450	1,330	1,330	65 °F	95	12.5	12.5	460 V	3
FPB	3-14	10	0.12	340	1,010	1,010	65 °F	95	9.5	9.5	460 V	3
FPB	3-15	8	0.12	240	710	710	65 °F	95	6.7	6.7	460 V	3
FPB	3-16	8	0.12	220	650	650	65 °F	95	6.1	6.1	460 V	3
FPB	3-17	8	0.12	250	730	730	65 °F	95	6.9	6.9	460 V	3
FPB	3-18	10	0.12	420	1,260	1,260	65 °F	95	11.8	11.8	460 V	3
FPB	3-19	10	0.12	340	1,000	1,000	65 °F	95	9.4	9.4	460 V	3
FPB	3-20	12	0.12	630	1,890	1,890	65 °F	95	17.8	17.8	460 V	3
FPB	3-21	10	0.12	390	1,160	1,160	65 °F	95	10.9	10.9	460 V	3
FPB	3-22	8	0.12	280	820	820	65 °F	95	7.7	7.7	460 V	3
Grand total: 22				8,880	26,460							

SINGLE DUCT VRH BOX SCHEDULE

DESIGNATION	BOX NUMBER	SIZE	MAX SP DROP (IN WG)	MAX CFM	MIN CFM	REHEAT CFM	HEATING COIL					MANUFACTURER
							EAT	LAT	kW	VOLTAGE	PHASE	
VRH	3-01	8	0.12	685	230	450	55	95	5.6	480 V	3	SEE SPECIFICATIONS
VRH	3-02	6	0.12	220	80	150	55	95	1.9	480 V	3	SEE SPECIFICATIONS
VRH	3-03	6	0.12	200	70	130	55	95	1.6	480 V	3	SEE SPECIFICATIONS
VRH	3-04	8	0.12	570	190	380	55	95	4.8	480 V	3	SEE SPECIFICATIONS
VRH	3-05	6	0.10	300	100	200	55	95	2.5	480 V	3	SEE SPECIFICATIONS
VRH	3-06	6	0.12	200	70	130	55	95	1.6	480 V	3	SEE SPECIFICATIONS
VRH	3-07	6	0.10	220	80	150	55	95	1.9	480 V	3	SEE SPECIFICATIONS
VRH	3-08	6	0.10	240	80	160	55	95	2.0	480 V	3	SEE SPECIFICATIONS
VRH	3-09	8	0.12	360	120	240	55	95	3.0	480 V	3	SEE SPECIFICATIONS
VRH	3-10	10	0.12	760	260	500	55	95	6.3	480 V	3	SEE SPECIFICATIONS
VRH	3-11	6	0.10	200	70	130	55	95	1.6	480 V	3	SEE SPECIFICATIONS
VRH	3-12	6	0.12	250	90	170	55	95	2.1	480 V	3	SEE SPECIFICATIONS
VRH	3-13	6	0.12	240	70	130	55	95	1.6	480 V	3	SEE SPECIFICATIONS
VRH	3-14	6	0.10	200	70	130	55	95	1.6	480 V	3	SEE SPECIFICATIONS
VRH	3-15	8	0.12	410	140	270	55	95	3.4	480 V	3	SEE SPECIFICATIONS
VRH	3-16	8	0.12	480	160	320	55	95	4.0	480 V	3	SEE SPECIFICATIONS
VRH	3-17	6	0.10	280	100	190	55	95	2.4	480 V	3	SEE SPECIFICATIONS
VRH	3-18	8	0.12	410	140	270	55	95	3.4	480 V	3	SEE SPECIFICATIONS
VRH	3-19	8	0.10	490	170	320	55	95	4.0	480 V	3	SEE SPECIFICATIONS
VRH	3-20	8	0.12	410	140	270	55	95	3.4	480 V	3	SEE SPECIFICATIONS
VRH	3-21	8	0.12	590	200	390	55	95	4.9	480 V	3	SEE SPECIFICATIONS
VRH	3-22	8	0.12	510	180	340	55	95	4.3	480 V	3	SEE SPECIFICATIONS
VRH	3-23	10	0.12	880	300	580	55	95	7.3	480 V	3	SEE SPECIFICATIONS
VRH	3-24	8	0.10	360	120	240	55	95	3.0	480 V	3	SEE SPECIFICATIONS
VRH	3-25	6	0.10	230	80	150	55	95	1.4	480 V	3	SEE SPECIFICATIONS
VRH	3-26	6	0.12	350	120	230	55	95	2.2	480 V	3	SEE SPECIFICATIONS
VRH	3-27	8	0.12	500	170	330	55	95	3.1	480 V	3	SEE SPECIFICATIONS
VRH	3-28	8	0.12	560	190	370	55	95	3.5	480 V	3	SEE SPECIFICATIONS

SINGLE DUCT VAV BOX SCHEDULE

DESIGNATION	BOX NUMBER	SIZE	MAX SP DROP (IN WG)	MAX CFM	MIN CFM	MANUFACTURER
VAV	3-01	8	0.12	500	500	SEE SPECIFICATIONS

AIR DEVICE SCHEDULE

MARK	SERVICE	MOUNTING	FACE SIZE	NECK SIZE	DAMPER	MATERIAL	MANUFACTURER	MODEL	NOTES
S1	SUPPLY	CEILING	24"x24"	NOTE 1	NO	ALUMINUM	TITUS	OMNI	1,2,3,4,5,6
S2	SUPPLY	CEILING	12"x12"	NOTE 1	NO	ALUMINUM	TITUS	OMNI	1,2,3,4,5,6
S3	SUPPLY	SIDEWALL	SEE PLANS	12" x 12"	NO	ALUMINUM	TITUS	272RL	1,2,3,4,5,6
S4	SUPPLY	CEILING	24"x48"	NOTE 1	NO	STAINLESS	TITUS	TLF-SS	1,2,3,4,5,6,7
S5	SUPPLY	SLOT	SEE PLANS	NOTE 1	NO	ALUMINUM	TITUS	CT-480	1,2,3,4,5,6
-	-	-	-	-	-	-	-	-	-
R1	RETURN	CEILING	24"x24"	NOTE 1	NO	ALUMINUM	TITUS	PAR	1,2,3,4,5,6,9
R2	RETURN	CEILING	24"x12"	NOTE 1	NO	ALUMINUM	TITUS	PAR	1,2,3,4,5,6,9
R3	RETURN	SIDEWALL	SEE PLANS	12" x 12"	NO	ALUMINUM	TITUS	23RL	1,2,3,4,5,6
-	-	-	-	-	-	-	-	-	-
E1	EXHAUST	CEILING	24"X24"	NOTE 1	NO	ALUMINUM	TITUS	PAR-AA	1,2,3,4,5,6
E2	EXHAUST	CEILING	24"X24"	NOTE 1	NO	ALUMINUM	TITUS	PAR-AA	1,2,3,4,5,6
E3	EXHAUST	SIDEWALL	SEE PLANS	-	-	ALUMINUM	TITUS	355 FL	1,2,3,4,5,6

NOTES: 1.

SUPPLY TYPE DIFFUSERS

CFM	NECK SIZE
UP TO 100	6"Ø
101 TO 200	8"Ø
201 TO 350	10"Ø
351 TO 550	12"Ø
551 TO 800	14"Ø
801 TO 1100	16"Ø

RETURN AND EXHAUST TYPE AIR DEVICES

CFM	NECK SIZE	CFM	NECK SIZE
UP TO 120	6"Ø	UP TO 290	8"x8"
121 TO 240	8"Ø	291 TO 450	10"x10"
241 TO 380	10"Ø	451 TO 700	12"x12"
381 TO 680	12"Ø	701 TO 1000	14"x14"
681 TO 900	14"Ø	1001 TO 1400	16"x16"
801 TO 1200	16"Ø	1401 TO 1800	18"x18"

2. PROVIDE WITH APPROPRIATE MOUNTING FOR INSTALLED CEILING.
3. DO NOT SCREW THRU FACE OF DEVICE UNLESS SCREW HOLES ARE PROVIDED BY MANUFACTURER.
4. RUNOUTS SHALL BE THE SAME SIZE AS THE DIFFUSER NECK UNLESS NOTED OTHERWISE.
5. PROVIDE IN COLOR/FINISH AS DIRECTED BY ARCHITECT.
6. PROVIDE OPPOSED DAMPER ADJUSTABLE THRU THE FACE OF DIFFUSER/GRILLE FOR DIFFUSER/GRILLE LOCATED IN CONCEALED CEILING, CHASE, OR GYPSUM BOARD CEILING.
7. WITH HEPA FILTER RACK WITH FILTER. PROVIDE DOP AND PRESSURE TEST PORT WITH REMOTE MAGNAHELIC GAUGE AT NURSE STATION.
8. DIFFUSERS TO RECEIVE CUSTOM FACTORY PAINT FINISH, COLOR AS SELECTED BY ARCHITECT.
9. PROVIDE WITH RETURN AIR BOOT. SEE DETAIL ON M8.01 .

FAN POWERED PARALLEL CONFIGURATION TERMINAL UNIT WITH ELECTRIC REHEAT COIL SCHEDULE

(NOT ALL AIR TERMINAL TYPES LISTED IN THIS SCHEDULE ARE USED - REFER TO HVAC FLOOR PLANS.)

INLET SIZE	MIN. CFM COOLING	MAX. CFM COOLING	MAX. S.P.D. IN W.G.	FAN					HEATING COIL	STAGES	MANUFACTURER	NOTES
				FAN CFM	E.S.P.	MAX HP	VOLTS/PH	MAX NC	VOLTS/PH	SCR		
6"	NOTE 9	500	0.12	NOTE 3	0.40	1/8	480/3	25	480/3	SCR	TITUS	ALL
8"	NOTE 9	900	0.12	NOTE 3	0.40	1/8	480/3	25	480/3	SCR	TITUS	ALL
10"	NOTE 9	1400	0.12	NOTE 3	0.40	1/3	480/3	25	480/3	SCR	TITUS	ALL
12"	NOTE 9	2000	0.15	NOTE 3	0.40	1/3	480/3	25	480/3	SCR	TITUS	ALL
14"	NOTE 9	3000	0.15	NOTE 3	0.50	1/3	480/3	30	480/3	SCR	TITUS	ALL
16"	NOTE 9	4000	0.15	NOTE 3	0.50	1/2	480/3	30	480/3	SCR	TITUS	ALL

NOTES:

① 1" T.A. FILTER AT MAX FV = 400 FPM

② KW IS PER SHEDULE.

③ FAN CFM = (MAXIMUM PRIMARY AIR) X .60

④ INTERMITTENT FAN.

⑤ PROVIDE WITH THE FOLLOWING FEATURES:

3/4" THICK FIBERGLASS INSULATION WITH FOIL FACING OR 3/4" THICK CLOSED CELL FOAM INSULATION; NEMA 1 ENCLOSURE; FACTORY PROVIDED AND WIRED 277V/24V CONTROL VOLTAGE TRANSFORMER; PRIMARY AIR FLOW SENSOR; ELECTRIC DAMPER ACTUATOR. FUSED DISCONNECT SWITCH.

⑥ PROVIDE A UNIT CONTROLLER TO EFFECT PRESSURE INDEPENDENT SPACE TEMPERATURE CONTROL. SPACE TEMPERATURE SENSOR AND CONTROLLER MANUFACTURER/ MODEL SHALL BE COMPATIBLE WITH BUILDING CONTROLS. TEMPERATURE SENSORS SHALL HAVE AN LCD DISPLAY INDICATING THE MEASURED VALUES.

⑦ UNIT SHALL BE INSTALLED PER REQUIRED MANUFACTURER AND NEC CODE CLEARANCE REQUIREMENTS. TERMINAL BOXES SHALL NOT BE INSTALLED ABOVE CEILING MOUNTED DEVICES SUCH AS SPRINKLER HEAD, SMOKE DETECTOR, MOTION DETECTOR ETC.. THE UNITS SHALL HAVE A READILY ACCESS FOR MAINTENANCE OR ADJUSTMENT.

⑧ PROVIDE 3-SPEED MOTOR AND ADJUSTABLE DISCHARGE DAMPER

⑨ MINIMUM COOLING CFM = 0.2 X TOTAL COOLING CFM.

⑩ FAN NC RELATES TO RADIATED SOUND CRITERIA.

⑪ HEATING CFM = (MINIMUM COOLING CFM) + (FAN CFM)

⑫ INTERFACE WITH BUILDING AUTOMATION SYSTEM (BMS).

KEY:

FPB
XX-XX
SIZE - MAXIMUM CFM
KW - HEATING CFM (MINIMUM COOLING + FAN CFM)
SEQUENCE NUMBER
REPRESENTS AHU

VAV BOX W/ELECTRIC COIL SCHEDULE (VRH)

SIZE	VALVE SIZE (IN)	MIN. CFM	MAX. CFM	MAX. SPD ("WG)	MAX. N.C.	VOLTS/PH	STAGES	KW	MANUFACTURER/MODEL	NOTES
A	6	100	400	0.10	27	480/3	SCR	SEE DRAWINGS	TITUS	ALL
B	8	200	800	0.12	31	480/3	SCR	SEE DRAWINGS	TITUS	ALL
C	10	300	1200	0.12	32	480/3	SCR	SEE DRAWINGS	TITUS	ALL
D	12	400	1600	0.15	32	480/3	SCR	SEE DRAWINGS	TITUS	ALL
E	14	600	2200	0.15	36	480/3	SCR	SEE DRAWINGS	TITUS	ALL
F	16	700	2800	0.15	36	480/3	SCR	SEE DRAWINGS	TITUS	ALL

NOTES:
1. REFER TO SCHEDULE FOR KW, ACTUAL MAX. COOLING CFM AND MINIMUM CFM.
2. MAX. N.C. RELATES TO DISCHARGE AT 1.0" INLET S.P.
3. PROVIDE WITH THE FOLLOWING FEATURES: 3/4" THICK FIBERGLASS INSULATION WITH FOIL FACING OR 3/4" THICK CLOSED CELL FOAM INSULATION; NEMA 1 ENCLOSURE; FACTORY PROVIDED AND WIRED 120V/24V CONTROL VOLTAGE TRANSFORMER; PRIMARY AIR FLOW SENSOR; ELECTRIC DAMPER ACTUATOR. DISCONNECT SWITCH.
4. PROVIDE A UNIT CONTROLLER TO EFFECT PRESSURE INDEPENDENT SPACE TEMPERATURE CONTROL. SPACE TEMPERATURE SENSOR AND CONTROLLER MANUFACTURER/MODEL SHALL BE COMPATIBLE WITH EXISTING CONTROLS. TEMPERATURE SENSORS SHALL HAVE AN LCD DISPLAY INDICATING THE MEASURED VALUES.

   UNIT SHALL BE INSTALLED PER REQUIRED MANUFACTURER AND NEC CODE CLEARANCE REQUIREMENTS. TERMINAL BOXES SHALL NOT BE INSTALLED ABOVE CEILING MOUNTED DEVICES SUCH AS SPRINKLER HEAD, SMOKE DETECTOR, MOTION DETECTOR ETC. THE UNITS SHALL HAVE A READILY ACCESS FOR MAINTENANCE OR ADJUSTMENT.
5. INTERFACE WITH EXISTING BUILDING AUTOMATION SYSTEM (BMS).

NOTES:

VRH
#-#
SIZE - MAXIMUM CFM
KW - MINIMUM CFM
BOX # REPRESENTS AHU
AND SEQUENCE NUMBER

VAV BOX SCHEDULE

SIZE	INLET SIZE	MAX. CFM	MAX. S.P.D. IN W.G.	MAX. N.C.	MANUFACTURER/MODEL	REMARKS
A	6"	400	0.10	28	PRICE SDV8	ALL NOTES
B	8"	800	0.08	27	PRICE SDV8	ALL NOTES
C	10"	1200	0.08	29	PRICE SDV8	ALL NOTES
D	12"	1600	0.09	29	PRICE SDV8	ALL NOTES
E	14"	2200	0.09	28	PRICE SDV8	ALL NOTES
F	16"	2800	0.09	29	PRICE SDV8	ALL NOTES

NOTES:

① REFER TO PLANS FOR ACTUAL MAX. COOLING CFM AND MINIMUM CFM.

② MINIMUM CFM IS ZERO UNLESS NOTED OTHERWISE.

③ MAXIMUM N.C. RELATES TO S.P. DIFFERENCE BETWEEN INLET AND OUTLET @ 3.0"

④ PROVIDE 120/24 CONTROL TRANSFORMER WHERE ELECTRIC/ELECTRONIC CONTROL IS REQUIRED.

KEY:

VAV
#
SIZE - PRIMARY CFM
MINIMUM CFM (ZERO UNLESS NOTED)
REPRESENTS
AHU # - BOX #

COMPUTER ROOM A/C UNIT SCHEDULE

DESIGNATION		CRAC-1
SERVES		IT ROOM
FAN DATA	CFM	1250
	EXT. S.P.	0.3
	FAN DRIVE	BELT
	FAN MOTOR HP	0.5
	FLA	2.1
	VOLTS/PH	480/3
COOLING COIL DATA	TYPE	CHILLED WATER
	SENS. CAPACITY (MBH)	26
	TOTAL CAPACITY (MBH)	28
	GPM	5.9
	EWT/LWF °F	45/55
	WATER PD (FT.)	9.3
	ROWS	3
REHEAT COIL DATA	TYPE	NONE
	EAT EB (°F)	---
	EWT/LWT °F	---
	TOTAL CAPACITY MBH	---
	GPM	---
	WATER PD (FT.)	---
	ROWS/FINS PER. INCH	---
FILTER DATA	TYPE & THICKNESS	MERV 8
	EFFICIENCY (%)	90%
	MAX. VELOCITY (FPM)	500
	P.D. (CLEAN/DIRTY)	---
BASED ON (MANUF./MODEL NO.)		LIEBERT MINI-MATE 2 MMD40C
REMARKS/NOTES		(1) (2) (3) (4) (5)

NOTES:

(1) PROVIDE WITH CONDENSATE PUMP.

(2) PROVIDE UNIT WITH PIPING PACKAGE INCLUDING 3-WAY MODULATING CONTROL VALVE, CIRCUIT SETTER AND ISOLATION BALL VALVE.

(3) PROVIDE SINGLE POINT OF ELECTRICAL CONNECTION AND UNIT MOUNTED STARTER/DISCONNECT.

(4) PROVIDE WITH CONTROL OPTION THAT ALLOWS INTERFACE WITH THE BUILDING AUTOMATION SYSTEM.

(5) PROVIDE WITH SMOKE DETECTOR AND FILTER CLOG ALARM,

EXISTING FAN SCHEDULE (FOR REFERENCE ONLY)

Designation	EF-1-1	EF-11-1	EF-11-2	EF-0-1
Location	Level 1 Fitness	Roof	Roof	Crawl Space
Serves	Fitness Center	Toilet Exaust	Toilet Exaust	Crawl Space
Fan Type	Centrifugal Square Inline	Centrifugal Utility	Centrifugal Utility	Centrifugal inline
Wheel Type	Backward Inclined	Backward Inclined	Backward Inclined	Backward Inclined
Duty	Exhaust	Exhaust	Exhaust	Exhaust
Installation	Roof Curb	Roof Curb	Roof Curb	Wall Mount
Discharge	Upward	Upward	Upward	Inline
Air Temp. (Deg.F)	85	85	85	70
Cfm	3000	10000	750	3000
Static Press. ("WG)	0.5	1.5	1	0.4
Wheel Diameter (In.)	15	21	10	15
Max. Tip Speed	-	-	-	
Type Of Drive	Belt	Belt	Belt	Belt
Max Sones @ 5'	-	-	-	
Max Discharge (LwA)	79	93	75	76
Motor Hp	1	7 1/2	1/3	3/4
Voltage/Phase/Hz	480/3/60	480/3/60	120/60/1	120/60/2
Volume Control	VFD	VFD	None	None
Starter Furnished By	Mech Contractor	Mech Contractor	Mech Contractor	Mech Contractor
Disconnect Furnished By	Elec Contractor	Elec Contractor	Elec Contractor	Mech Contractor
Emergency Power	No	No	No	No
Other Requirements:				
Birdscreen	No	Outlet	Outlet	Inlet
Backdraft Damper	Motorized	Motorized	Motorized	Motorized
Spark Proof	No	No	No	No
Acid Proof	No	No	No	No
Fan Guard(s)	No	No	No	No
Belt Guard	Yes	Yes	Yes	Yes
Filter	No	No	No	No
Weight (lbs)	105	310	64	103
Based on Cook:	150 SQN	210 CPA	100 CPA	SE1-18-424-VG GREENHECK

Notes:
1. Refer to Specification Section for further requirements.

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PROJECT # 22659

SEAL

MIKE L. ASHCRAFT
56590

07/15/22

PROJECT NO.: 629-003
DRAWN BY: EG
CHECKED BY: MS
RSF: 33,038

BILLINGSLEY
COMPANY

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NO.	REVISIONS:	DATE:

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MECHANICAL SCHEDULES

DRAWING NUMBER:
M7.01

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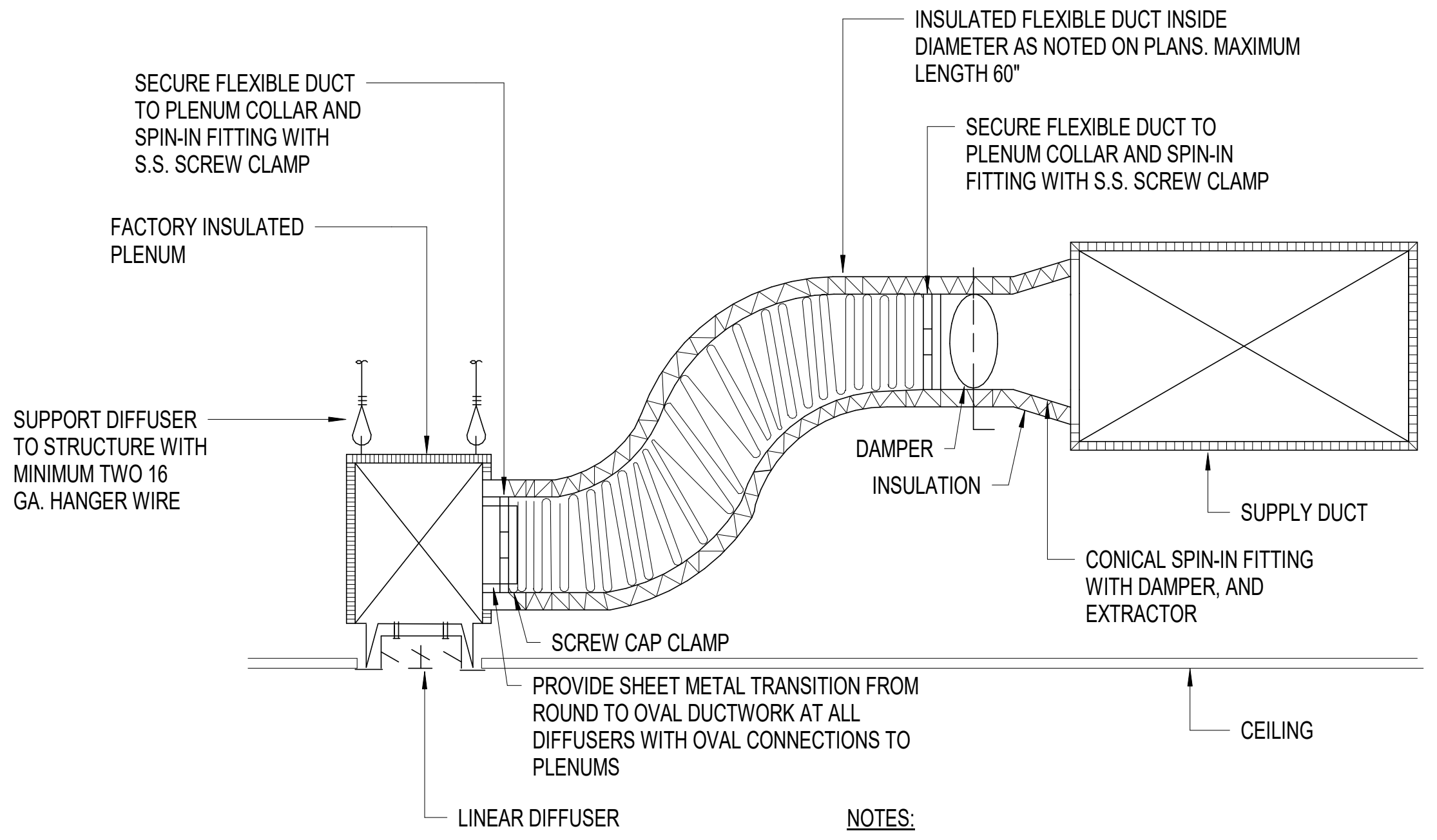
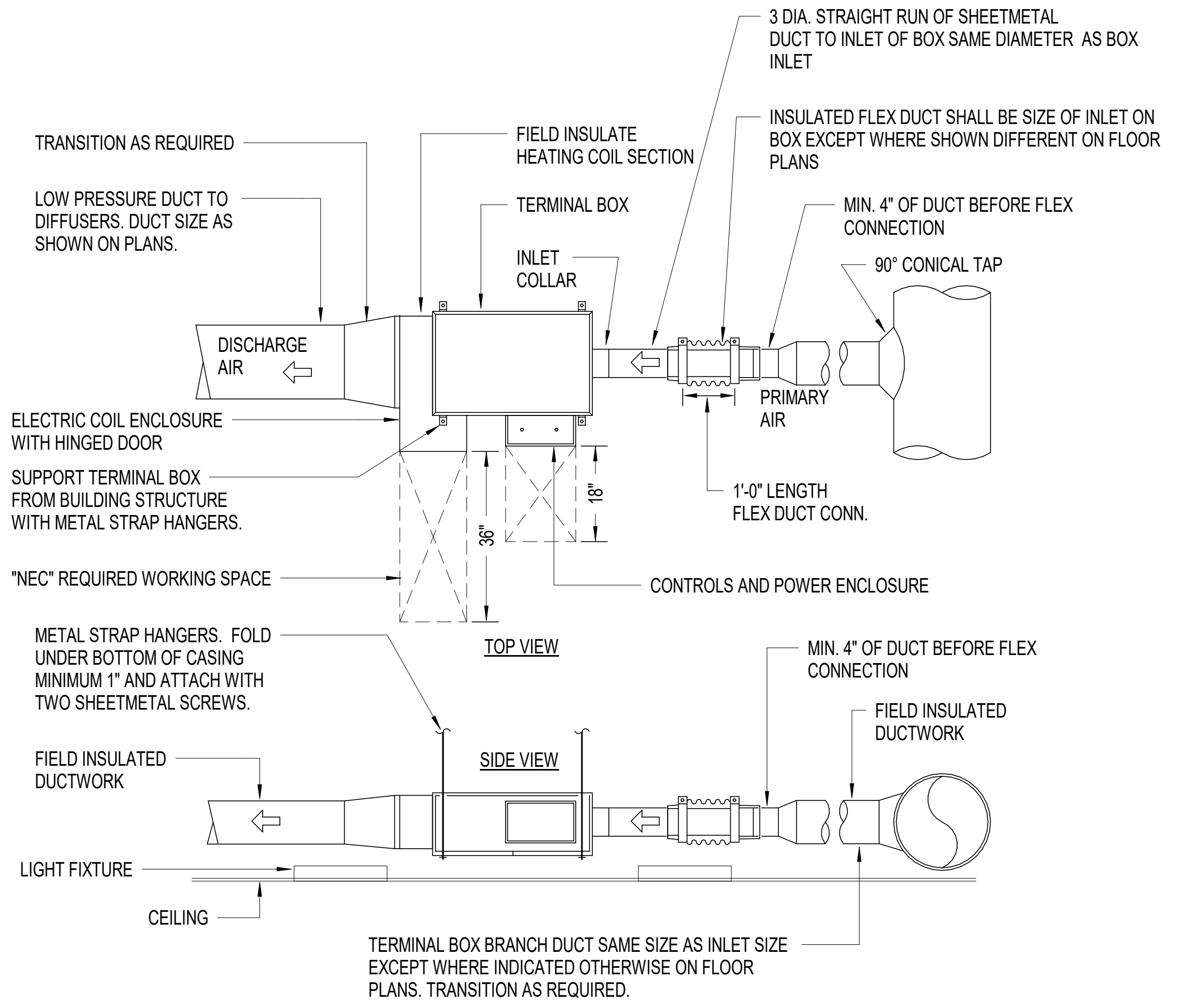


NOTES:

1. SEAL ALL JOINTS PER SPECIFICATION.
2. FLEX DUCT SAG LIMITED TO 1/2" PER FOOT.
3. MAX. 30 DEGREES OFFSET ALLOWED IN FLEX DUCT ROUTING.

01 CEILING MOUNTED LINEAR DIFFUSER CONNECTION DETAIL

SCALE: NO SCALE

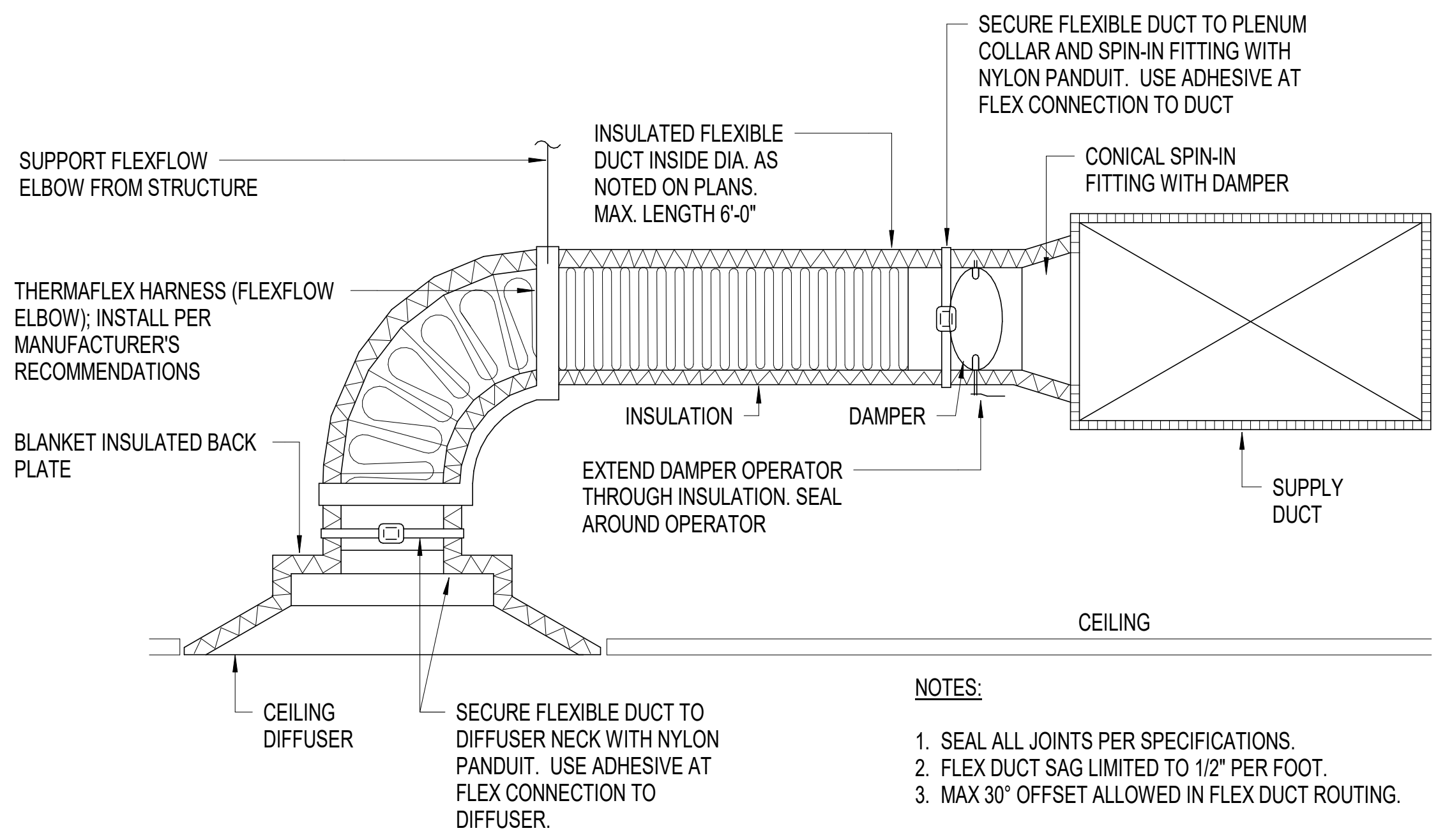


NOTES:

1. DO NOT INSTALL TERMINAL BOX DIRECTLY OVER LIGHT FIXTURES.
2. DO NOT INSTALL TERMINAL BOX OVER CABLE TRAY.
3. REFER TO PLANS FOR DUCT SIZES.

02 CV AND VAV TERMINAL BOX W/ ELECTRIC HEAT CONNECTION DETAIL

SCALE: NO SCALE



NOTES:

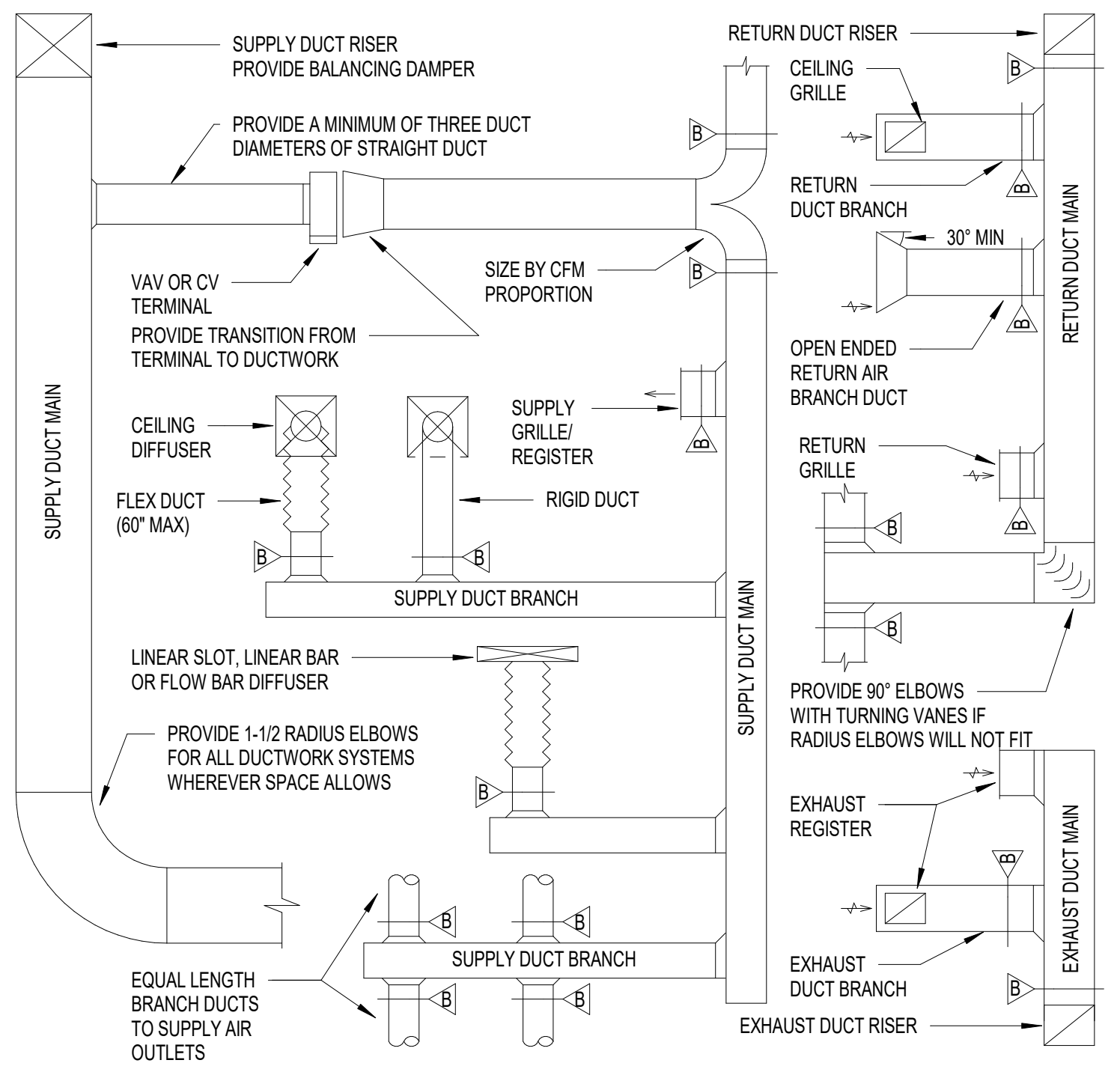
1. SEAL ALL JOINTS PER SPECIFICATIONS.
2. FLEX DUCT SAG LIMITED TO 1/2" PER FOOT.
3. MAX 30° OFFSET ALLOWED IN FLEX DUCT ROUTING.

03 CEILING DIFFUSER CONNECTION

SCALE: NO SCALE

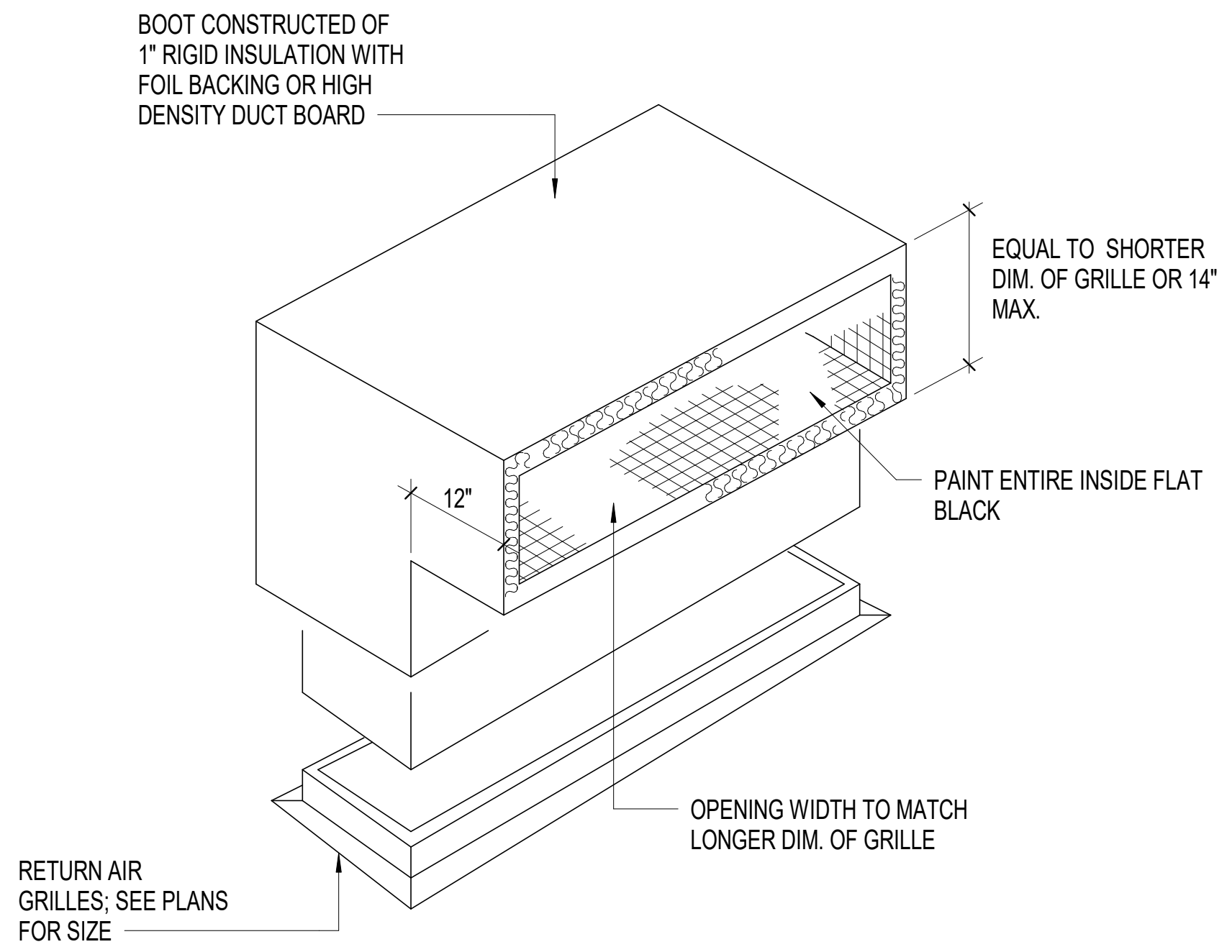
NOTES:

1. REFER TO HVAC FLOOR PLANS FOR DUCT SIZES
2. REFER TO SCHEDULES FOR GRILLES, REGISTERS, DIFFUSERS AND TERMINAL SIZES AND TYPES
3. PROVIDE A MANUAL TYPE BALANCING DAMPER FOR EACH SUPPLY OUTLET AND RETURN INLET
4. ALL DUCT RUNOUTS TO DIFFUSERS SHALL BE THE SAME SIZE AS DIFFUSER NECK SIZE, UNLESS OTHERWISE NOTED
5. FLEX DUCT WILL NOT BE ALLOWED ON RETURN OR EXHAUST DUCTWORK SYSTEMS
6. PROVIDE 12" AIR CUSHION AT THE END OF EACH SUPPLY MAIN AND BRANCH DUCT
7. INDIVIDUAL BRANCH BALANCING DAMPERS NOT REQUIRED FOR SUPPLY OR EXHAUST REGISTERS



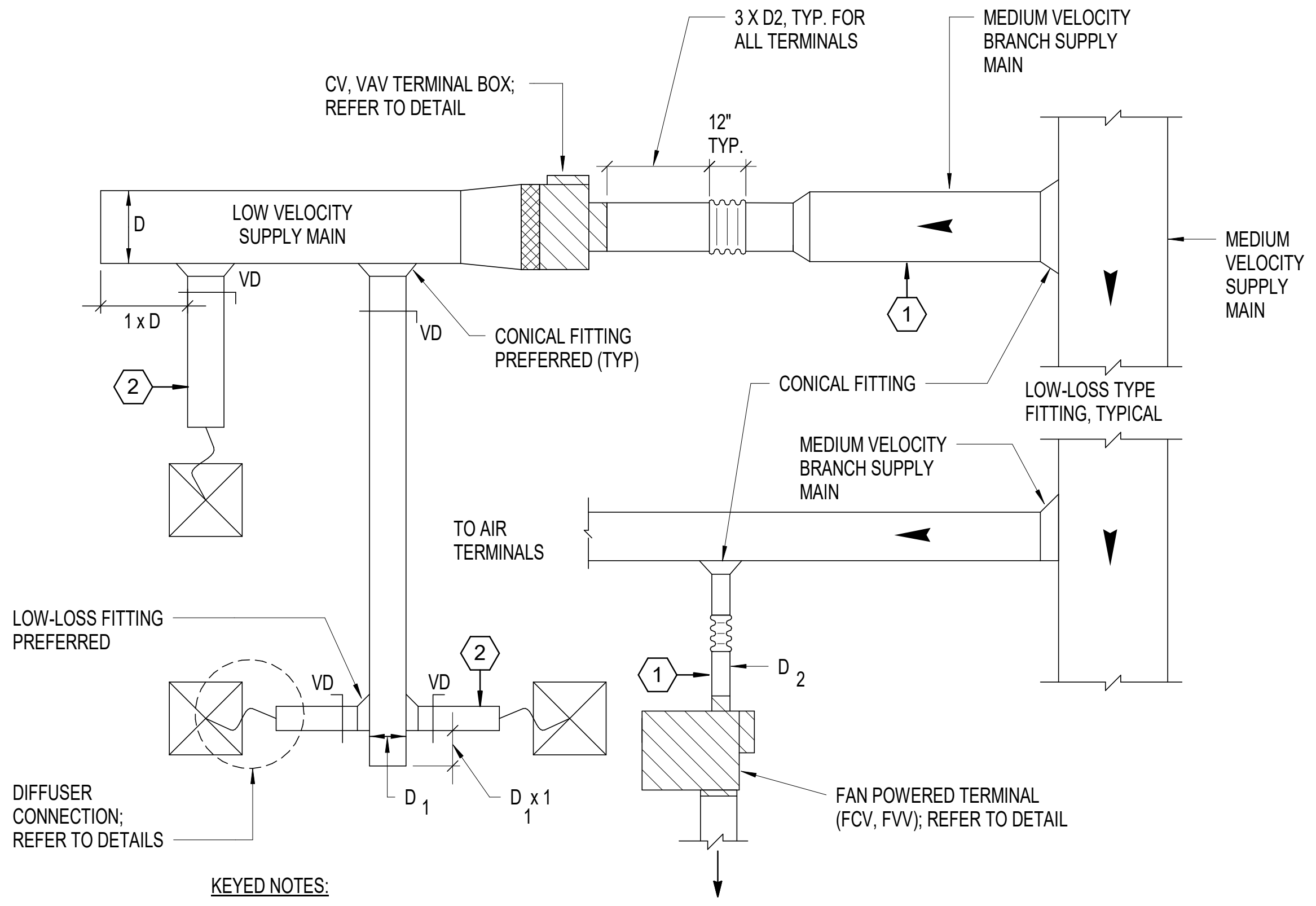
04 DUCTWORK INSTALLATION DIAGRAM

SCALE: NO SCALE



05 RETURN AIR GRILLE BOOT

SCALE: NO SCALE

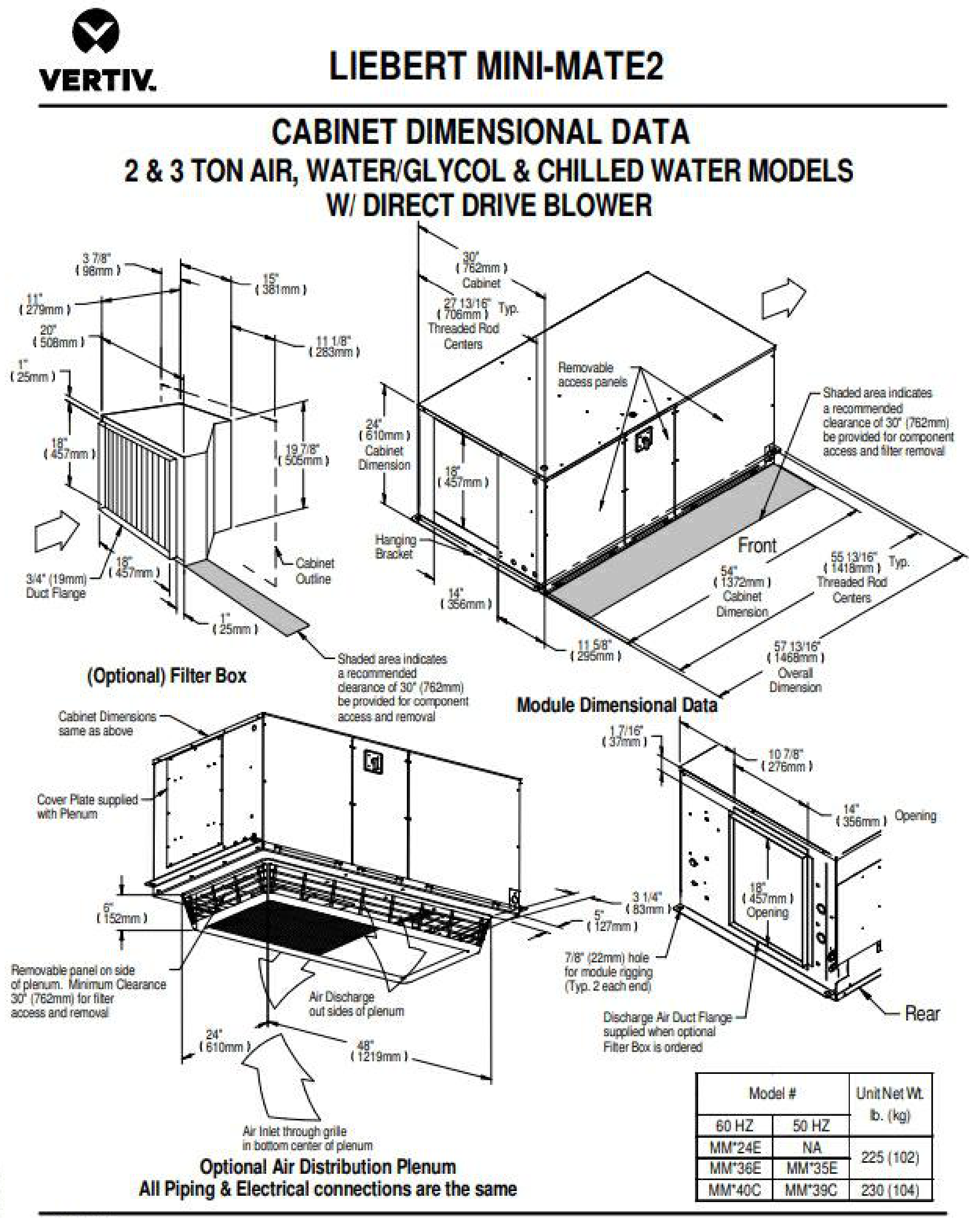


KEYED NOTES:

1. SAME SIZE AS BOX INLET UNLESS INDICATED ON DRAWINGS.
2. RUNOUTS TO DIFFUSERS SHALL BE SAME AS DIFFUSER NECK SIZE UNLESS INDICATED ON DRAWINGS.

06 TYPICAL DUCT DESIGN DETAIL

SCALE: NO SCALE



VERTIV.

LIEBERT MINI-MATE2

CABINET DIMENSIONAL DATA
2 & 3 TON AIR, WATER/GLYCOL & CHILLED WATER MODELS
W/ DIRECT DRIVE BLOWER

Optional Air Distribution Plenum
All Piping & Electrical connections are the same

Model #		Unit Net Wt. lb. (kg)
60 HZ	50 HZ	
MM*24E	NA	225 (102)
MM*36E	MM*35E	
MM*40C	MM*39C	230 (104)

07 CEILING MOUNTED CRAC UNIT

SCALE: NO SCALE

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MECHANICAL DETAILS

DRAWING NUMBER:
M8.01

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MECHANICAL SPECIFICATIONS

I GENERAL CONDITIONS:

A. THE SCOPE OF THE WORK SHALL INCLUDE THE FURNISHING AND INSTALLATION OF THE NECESSARY MATERIAL AND LABOR TO ACCOMPLISH THE WORK INDICATED BY THE DRAWINGS AND HEREIN SPECIFIED. ALL WORK BY THIS CONTRACTOR SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE AND LOCAL BUILDING CODES.

B. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THE EXISTING CONDITIONS AT THE JOB SITE BEFORE SUBMITTING PROPOSALS. SUBMISSION OF PROPOSALS SHALL BE TAKEN AS EVIDENCE THAT SUCH INSPECTION HAS TAKEN PLACE. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE COMPLETE SET OF CONSTRUCTION DOCUMENTS, AND THE LACK OF SPECIFIC INFORMATION ON THE DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY.

C. MATERIALS AND EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE NEW AND SHALL BEAR THE UL. LABEL WHERE APPLICABLE, UNLESS NOTED OTHERWISE. ALL WORK SHALL BE GUARANTEED AGAINST DEFECTIVE MATERIALS AND WORKMANSHIP FOR A PERIOD OF NOT LESS THAN ONE (1) YEAR AFTER COMPLETION AND ACCEPTANCE BY THE OWNER.

D. CONTRACTOR SHALL INSTALL MECHANICAL SYSTEMS WITHOUT INTERFERENCE AND IN STRICT COORDINATION WITH OTHER TRADES.

E. MATERIALS AND WORKMANSHIP SHALL COMPLY WITH THE CONTRACT DOCUMENTS AND APPLICABLE CODES AND STANDARDS. IN CASE OF DIFFERENCE BETWEEN APPLICABLE CODES AND STANDARDS AND THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL PROMPTLY NOTIFY THE ARCHITECT/ENGINEER AND THE OWNER IN WRITING OF SUCH DIFFERENCE. SHOULD THE CONTRACTOR PERFORM ANY WORK THAT DOES NOT COMPLY WITH THE REQUIREMENTS OF APPLICABLE CODES AND STANDARDS, HE (SHE) SHALL BEAR ALL COSTS ARISING IN CORRECTING SUCH DEFECTS. APPLICABLE CODES AND STANDARDS SHALL INCLUDE ALL ORDINANCES, UTILITY COMPANY REGULATIONS, AND APPLICABLE REQUIREMENTS OF NATIONALLY ACCEPTED CODES AND STANDARDS. SHOULD THE CONTRACTOR SUPPLY EQUIPMENT DIFFERING FROM THE SPECIFIED ITEMS IN THE CONTRACT DOCUMENTS WITHOUT NOTIFICATION TO THE ENGINEER, HE (SHE) SHALL BEAR ALL COSTS TO UPGRADE DEFICIENCIES ARISING FROM SUCH.

F. WHERE ONLY ONE MANUFACTURER'S NAME IS LISTED IN THE EQUIPMENT SPECIFICATION, OTHER MANUFACTURERS OF SIMILAR CHARACTERISTICS AND OF EQUAL OR BETTER PERFORMANCE CAPACITIES MAY BE CONSIDERED FOR "OR EQUAL" APPROVAL BY THE ENGINEER. WHERE MORE THAN ONE MANUFACTURER IS LISTED IN THE NOTES AND EQUIPMENT SPECIFICATIONS, ONLY THOSE NAMED MANUFACTURERS WILL BE CONSIDERED FOR APPROVAL.

G. SHOULD A SUBSTITUTION BE ACCEPTED, AND SHOULD THE SUBSTITUTE MATERIAL PROVE DEFECTIVE, OR OTHERWISE UNSATISFACTORY FOR THE SERVICE INTENDED WITHIN THE GUARANTEE PERIOD, THIS MATERIAL OR EQUIPMENT SHALL BE REPLACED WITH THE MATERIAL OR EQUIPMENT SPECIFIED AT NO COST TO THE OWNER.

H. PROVIDE ACCESS, INCLUDING NECESSARY ACCESS DOORS, FOR NEW AND EXISTING EQUIPMENT REQUIRING OPERATION AND/OR MAINTENANCE. RELOCATE EXISTING AND LOCATE ALL NEW EQUIPMENT SUCH THAT OPERATION OR MAINTENANCE IS NOT RESTRICTED.

I. DO NOT RUN PIPING OR DUCTWORK, OR LOCATE EQUIPMENT, WITH RESPECT TO SWITCHBOARDS, PANELBOARDS, POWER PANELS, MOTOR CONTROL CENTERS OR DRY TYPE TRANSFORMERS, WITHIN 42 INCHES IN FRONT OF EQUIPMENT, OVER EQUIPMENT, OR WITHIN 36 INCHES HORIZONTALLY OF SAME SPACE.

J. PROVIDE SNAP-ON OR ADHESIVES LABELS INDICATING CHILLED OR HOT WATER SUPPLY AND RETURN, CONDENSATE DRAINAGE, DOMESTIC HOT AND COLD WATER, MEDICAL GASES, ETC.

II PRODUCTS, EQUIPMENT AND EXECUTION:

A. RELIEF AND DRAIN PIPING SHALL BE TYPE "M" COPPER WITH 95/5 SOLDER JOINT FITTINGS OR SCHEDULE 40 BLACK STEEL PIPES WITH SCREWED FITTINGS.

B. PROVIDE AND INSTALL UNIONS AT PROPER POINTS TO PERMIT REMOVAL OF A PIPE, EQUIPMENT, ETC., WITHOUT INJURY TO OTHER PARTS OF THE SYSTEM AND TO PREVENT CORROSION DUE TO ELECTROLYSIS. ALL EQUIPMENT SHALL BE INSTALLED IN A MANNER TO PERMIT ACCESS FOR SERVICE WITHOUT DISASSEMBLY. UNIONS SHALL BE DIELECTRIC WHERE DISSIMILAR MATERIALS OCCUR. PRESSURE RATINGS SAME AS FITTINGS.

C. PROVIDE INSULATION PRODUCTS MANUFACTURED BY JOHNS-MANVILLE, OWENS-CORNING, ARMSTRONG AND CERTAINTEED. FIBERGLASS PIPE INSULATION SHALL BE ASTM C547-77, CLASS 1. PROVIDE BANDS, WIRES, AND CEMENT AS RECOMMENDED BY INSULATION MANUFACTURER FOR THE APPLICATIONS INDICATED. FLEXIBLE FIBERGLASS DUCTWORK INSULATION SHALL BE ASTM C553-70, TYPE I, CLASS B3.

1. PROVIDE COMPOSITE INSULATION (INSULATION JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVE) WITH FLAME-SPREAD RATINGS OF 25 OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS, AS TESTED BY ASTM K04 (HFFA 255) METHOD.

2. MAINTAIN INTEGRITY OF VAPOR BARRIER JACKETS ON PIPE AND DUCTWORK INSULATION, AND PROTECT TO PREVENT PUNCTURE OR OTHER DAMAGE. SEAL OPEN ENDS OF INSULATION WITH MASTIC. SECTIONALLY SEAL ALL BUTT ENDS OF CHILLED WATER INSULATION OF FITTINGS WITH WHITE VAPOR BARRIER COATING. EXTEND PIPING INSULATION WITHOUT INTERRUPTION THROUGH WALLS, FLOORS AND SIMILAR PIPING PENETRATIONS, EXCEPT WHERE OTHERWISE INDICATED. INSTALL PROTECTIVE METAL SHIELDS AND FOAM GLASS INSERTS WHERE PIPE HANGERS BEAR ON OUTSIDE OF INSULATION.

D. RECTANGULAR "LOW PRESSURE" SHEET METAL DUCT SHALL BE FABRICATED OF CONTINUOUS HOT DIP MILL GALVANIZED MINIMUM 26 GAUGE STEEL SHEETS AND INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS FOR 1.0" W.C. AND FOR THE FIRST 10 TO 15 FEET DOWNSTREAM OF A TERMINAL UNIT (FP/VAV OR VAV) SHALL HAVE AN INTERNAL DUCT LINING EQUAL TO JOHNS-MANVILLE PERMACOTE LINACOUSTIC, 1" THICK, 1.5 LB. DENSITY DUCT LINER. (DUCTS FOR MEDICAL WORK SHALL NOT BE LINED, BUT WILL BE WRAPPED.)

E. ROUND "LOW PRESSURE" DUCT FITTINGS SHALL BE FABRICATED OF CONTINUOUS HOT DIP MILL GALVANIZED MINIMUM 26 GAUGE STEEL SHEETS AND INSTALLED IN ACCORDANCE WITH SMACNA RECOMMENDATIONS FOR 0.5" W.C.

F. RECTANGULAR AND ROUND "PRIMARY AIR" SHEET METAL DUCT AND FITTINGS SHALL BE FABRICATED OF CONTINUOUS HOT DIP MILL GALVANIZED MINIMUM 26 GAUGE STEEL SHEETS AND INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS FOR 3.0" W.C., AND RECTANGULAR DUCT SHALL HAVE AN INTERNAL DUCT LINING EQUAL TO JOHNS-MANVILLE PERMACOTE LINACOUSTIC, 1" THICK, 1.5 LB. DENSITY DUCT LINER (DUCTS FOR MEDICAL WORK SHALL NOT BE LINED, BUT WILL BE WRAPPED). CONSTRUCTION METHODS:

1. RECTANGULAR - DUCTMATE SYSTEM

2. ROUND - SPIRAL DUCT SYSTEM

G. ROUND DUCTS AND UNLINED RECTANGULAR DUCTS SHALL BE INSULATED WITH 3/4 POUND PER CUBIC FOOT MINIMUM DENSITY, 2" THICK, COMMERCIAL GRADE, OWENS-CORNING FIBERGLASS FOIL BACKED ALL SERVICE DUCT WRAP, OR EQUAL.

H. FLEXIBLE DUCTS SHALL BE FLEXMASTER TYPE 8M, THERMAFLEX MKE OR WIREMOLD WK. FLEXIBLE DUCTS SHALL BE LISTED AS U.L. 181 CLASS (1) AIR DUCT AND SHALL COMPLY WITH NFPA STANDARDS 90A AND 90B.

I. CONTRACTOR SHALL BALANCE THE HVAC SYSTEMS FOR DESIGNATED AIR AND WATER QUANTITIES AND SHALL BE N.E.B.B. OR A.A.B.C. APPROVED. SUBMIT REPORT ON NEBB, AABC, OR SMACNA FORMS FOR APPROVAL BY THE ENGINEER. EXTENT OF BALANCING WORK TO INCLUDE REBALANCING OF EXISTING SUPPLY AND EXHAUST SYSTEMS AS REQUIRED TO ACHIEVE DESIGN CFM ON SUBJECT PROJECT.

J. DUCT ACCESS DOORS: PROVIDE RIGID AND CLOSE FITTING DOORS OF GALVANIZED STEEL WITH SEALING GASKETS AND QUICK FASTENING LOCKING DEVICES. FOR INTERNALLY LINED OR INSTALLED DUCTWORK, INSTALL MINIMUM ONE INCH THICK INSULATION WITH SHEET METAL COVER. INSTALL AT EACH FIRE DAMPER. DOORS TO BE EQUAL TO FLEXMASTER " THE INSPECTOR SERIES."

K. FURNISH AND INSTALL SMOKE, FIRE AND/OR FIRE/SMOKE DAMPERS WHERE SHOWN ON THE DRAWINGS, AND REQUIRED BY THE GOVERNING AUTHORITY. DAMPERS SHALL BE INSTALLED AS RECOMMENDED BY SMACNA AND COMPLY WITH U.L. AND LOCAL ORDINANCES AS REQUIRED BY THE GOVERNING AUTHORITY.

L. "VARIABLE-VOLUME" AND "CONSTANT-VOLUME" SINGLE DUCT TERMINAL BOX SHALL BE MEDIUM PRESSURE, VARIABLE AIR VOLUME, SINGLE DUCT, PRESSURE INDEPENDENT TERMINAL UNIT WITH 2 P.C.F. DENSITY MINIMUM INSULATED CASING AND FLOW CONTROLLER. VARIABLE VOLUME TERMINAL BOXES SHALL BE ENVIRO-TEC SSD-11, TITUS ESV-3000, NAILOR OR TEMPMASTER.

M. TEMPERATURE CONTROLS:

1. ALL TEMPERATURE CONTROLS NECESSARY FOR THE RENOVATION AND FINISH-OUT OF THE SPACE SHALL COMPLY TO THE BASE BUILDING SYSTEM AND CONTROL SPECIFICATIONS. BUILDING STANDARD CONTROL SYSTEM COMPONENTS SHALL BE UTILIZED.

2. NEW THERMOSTATS OR SENSORS SHALL BE COMPATIBLE WITH BUILDING CONTROLS AND SHALL BE AS INDICATED ON PLANS.

3. ALL CONTROL WIRING AND POWER WIRING FOR CONTROLS SHALL BE BY THE CONTROLS SUB-CONTRACTOR.

4. TERMINAL UNITS, FAN-COIL UNITS AND MOTORIZED SUPPLY AIR DAMPERS SHALL BE CONTROLLED BY ROOM THERMOSTATS/SENSORS WITH TWISTED PAIR, PLENUM RATED CABLE FROM SENSORS TO OPERATORS, CONTROL VALVES, ETC.

5. AT THE COMPLETION OF CONSTRUCTION, ALL NEW AND EXISTING THERMOSTATS AND SENSORS WITHIN THE CONTRACT AREA SHALL BE CALIBRATED.

N. TEST AND BALANCE:

1. THE GENERAL CONTRACTOR SHALL RETAIN THE SERVICES OF AN INDEPENDENT CERTIFIED AIR BALANCE FIRM TO PERFORM THE TESTING AND BALANCING AND PREPARE REPORTS TO THE GENERAL CONTRACTOR. IF THE MECHANICAL CONTRACTOR IS NEBB OR AABC CERTIFIED, THEY CAN BALANCE THE SYSTEM.

2. TESTING AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN ACCORDANCE WITH THE ASSOCIATED AIR BALANCE COUNCIL NATIONAL STANDARDS FOR FIELD MEASUREMENT AND INSTRUMENTATION, LATEST EDITION, OR NATIONAL ENVIRONMENTAL BALANCING BUREAU STANDARDS.

3. THE CONTRACTOR SHALL CORRECT ALL DEFICIENCIES IN THE OPERATION OF FACTORY SET VAV UNITS.

4. READINGS AND TEST OF DIFFUSERS, GRILLES AND REGISTERS SHALL INCLUDE DESIGN, INITIAL TEST, AND FINAL ADJUSTED FPM VELOCITY AND CFM. ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE BALANCED BY A HOOD THAT HAS BEEN CALIBRATED, INCLUDING A MANOMETER, AND PILOT TUBE READINGS SHALL BE TAKEN TO ESTABLISH TOTAL CFM FLOW IN ALL MAIN DUCTS. DIRECT READING INSTRUMENTS SUCH AS VELOMETERS AND ANEMOMETERS MAY BE USED AT TERMINAL UNITS.

III RECORDS FOR OWNER:

A. CONTRACTOR SHALL KEEP A CLEAN SET OF DRAWINGS ON THE JOB, NOTING DAILY ALL CHANGES MADE IN THESE DRAWINGS IN CONNECTION WITH THE FINAL INSTALLATION INCLUDING EXACT DIMENSIONED LOCATIONS OF ALL NEW AND UNCOVERED EXISTING UTILITIES AND SHALL, WITH HIS REQUEST FOR FINAL PAYMENT, TURN OVER A CLEAN, NEATLY MARKED SET OF 2 MIL REPRODUCIBLE MYLARS SHOWING "AS INSTALLED" WORK TO THE ARCHITECT FOR SUBSEQUENT REVIEW AND TRANSMITTAL TO THE OWNER. CONTRACTOR SHALL NOTE ALL CONSTRUCTION CHANGES, DATE EACH SHEET AND LABEL "AS-BUILTS" IN THE REVISION BLOCK ON THE DRAWINGS. CONTRACTOR SHALL ALSO FURNISH ONE (1) SET OF BLUELINE PRINTS FROM THE "AS-BUILTS" MYLARS.

B. IN ADDITION TO THE ABOVE, CONTRACTOR SHALL ACCUMULATE DURING THE JOB'S PROGRESS, THE FOLLOWING DATA, IN TRIPLICATE, PREPARED IN A NEAT BROCHURE OR PACKET FOLDER AND TURNED OVER TO THE ARCHITECT FOR REVIEW AND SUBSEQUENT DELIVERY TO THE OWNER.

1. ALL WARRANTIES AND GUARANTEES AND MANUFACTURER'S DIRECTIONS ON EQUIPMENT AND MATERIAL COVERED BY THE CONTRACT INCLUDING THE NAMES, ADDRESSES AND TELEPHONE NUMBERS OF THE MANUFACTURER'S REPRESENTATIVE.
2. APPROVED FIXTURE BROCHURES, WIRING DIAGRAMS AND CONTROL DIAGRAMS (ORIGINAL DATA, NO COPIES).
3. COPIES OF APPROVED SHOP DRAWINGS.
4. OPERATING INSTRUCTIONS FOR HEATING AND COOLING AND OTHER MECHANICAL SYSTEM. OPERATING INSTRUCTIONS SHALL ALSO INCLUDE RECOMMENDED MAINTENANCE AND SEASONAL CHANGEOVER PROCEDURES.
5. TEST AND BALANCE REPORTS REQUIRED BY THESE SPECIFICATIONS.
6. ANY AND ALL OTHER DATA AND/OR DRAWINGS REQUIRED DURING CONSTRUCTION.
7. REPAIR PARTS LISTS OF ALL MAJOR ITEMS AND EQUIPMENT INCLUDING NAME, ADDRESS AND TELEPHONE NUMBERS OF LOCAL SUPPLIER OR AGENT.
8. VALVE TAG CHARTS AND DIAGRAMS.

C. ALL OF THE ABOVE DATA SHALL BE SUBMITTED TO THE ENGINEER FOR HIS REVIEW AT SUCH TIME AS THE CONTRACTOR SUBMITS HIS LAST ESTIMATE PRIOR TO HIS FINAL PAYMENT, BUT IN NO CASE, LESS THAN TWO WEEKS BEFORE FINAL INSPECTION.

GENERAL MECHANICAL NOTES

A. RETURN AIR WILL BE TAKEN THROUGH RETURN AIR GRILLES.

B. LOCATIONS AND SIZES OF EXISTING SYSTEMS ARE APPROXIMATE. EXACT SIZES AND LOCATIONS OF ALL EXISTING PIPING, DUCTS, ETC. SHALL BE VERIFIED ON THE JOB BY THE CONTRACTOR.

C. CONTRACTOR SHALL INSTALL MECHANICAL SYSTEMS WITHOUT INTERFERENCE AND IN STRICT COORDINATION WITH ALL OTHER TRADES. HOLD DUCTWORK TIGHT AGAINST UNDERSIDE OF STRUCTURE ABOVE.

D. ALL DUCT SIZES ARE "AIR SIZE". SHEET METAL TO BE INCREASED TO ACCOMMODATE DUCT LINER, IF APPLICABLE.

E. TAPE AND SEAL ALL ROUND DUCT CONNECTIONS TO BE PERMANENTLY AIR TIGHT.

F. RIGID SHEET METAL DUCT SHALL BE RUN WITHIN SIX FEET OF DIFFUSERS. FLEX DUCT SHALL BE SUPPORTED AS OFTEN AS NECESSARY TO PREVENT KINKS, FOLDS OR OTHER OBSTRUCTIONS TO AIR FLOW. CEILING GRID AND ASSOCIATED SUPPORTS MAY NOT BE USED TO SUPPORT DUCTWORK. PROVIDE RIGID 90 DEGREE ELBOWS ON DIFFUSER NECKS.

G. EQUIPMENT CAPACITIES AND CHARACTERISTICS SHALL BE AS SCHEDULED ON THE DRAWINGS.

H. EXISTING CEILING DIFFUSERS MAY BE REUSED AND RELOCATED AS NECESSARY UNLESS NOTED OTHERWISE OR SIZE PROHIBITS USE.

I. NEW AIR DEVICES TO BE PRICE, TITUS, METALAIRE OR KRUEGER AND EQUAL TO TITUS MODEL AS SCHEDULED AND SUIT THE SPECIFIED SERVICE AND CEILING TYPE UNLESS NOTED OTHERWISE ON PLANS. COORDINATE WITH ARCHITECTURAL PLANS.

J. CEILING RETURN AIR GRILLES SHALL BE PRICE, TITUS, NAILOR, METALAIRE OR KRUEGER AND EQUAL TO TITUS MODEL AS SCHEDULED.

K. EXHAUST REGISTERS SHALL BE PRICE, TITUS, NAILOR, METALAIRE OR KRUEGER AND EQUAL TO TITUS MODEL AS SCHEDULED.

L. ALL DIFFUSERS AND SLOT SUPPLIES SHALL BE FURNISHED WITH SPIN-IN COLLAR. VOLUME DAMPER AND 6' OF FLEXIBLE DUCT.

M. CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL BY THE ENGINEER ALL MAJOR ITEMS OF MATERIALS AND EQUIPMENT.

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07/15/22

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