

GRILLES - REGISTERS - DIFFUSERS

DESIG.	DUTY	TYPE	MOUNTING LOCATION	MATERIAL	VOLUME CONTROL	FINISH	AIR PATTERN CONTROL	METHOD OF SUPPORT	EQUAL TO MANUFACTURER AND MODEL NO.	REMARKS
A	SUPPLY	SQUARE PLAQUE	LAY-IN CLG	STEEL	NO	OFF WHITE	YES	T-BAR	TITUS OMNI	SEE NOTE 1,2
B	RETURN	PERFORATED	LAY-IN CLG	STEEL	NO	OFF WHITE	NO	T-BAR	TITUS PAR 24X24 FACE	SEE NOTE 2
B1	RETURN	PERFORATED	LAY-IN CLG	STEEL	NO	OFF WHITE	NO	T-BAR	TITUS PAR 24X12 FACE	SEE NOTE 2
C	SUPPLY	SLOT	LAY-IN CLG	STEEL	NO	BLACK	YES	T-BAR	TITUS TB080 (11)-1/2" SLOT	SEE NOTE 1,2,4
D	SUPPLY	ADJUSTABLE LOUVERED	DUCT	ALUMINUM	NO	PRIMER	YES	SURFACE	TITUS 300FS	SEE NOTE 3
D1	SUPPLY	ADJUSTABLE LOUVERED	SIDEWALL	ALUMINUM	NO	PRIMER	YES	SURFACE	TITUS 300FS	SEE NOTE 3
E	SUPPLY	LINEAR SLOT	WOOD SLATS	ALUMINUM	YES	PRIMER	YES	SURFACE	TITUS FL-15-HT	SEE NOTE 3
F	RETURN	LINEAR SLOT	GYP BD CLG	ALUMINUM	NO	PRIMER	NO	SURFACE	TITUS FL-15-HT	SEE NOTE 4

NOTES:
1) NECK SIZES AS FOLLOWS:

DESIGNATION "A" CFM RANGE	NECK SIZE	DESIGNATION "C" CFM RANGE	NECK SIZE	LENGTH
000-300	8"RD	000-150	8"RD	2'-0"
305-435	10"RD	155-260	8"RD	4'-0"
440-600	12"RD			
605-700	18X18			

2) NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN NEW MODEL NUMBER AND EXISTING NUMBER PRIOR TO PURCHASE.
3) REFER TO DRAWINGS FOR GRILLE/NECK SIZES.
4) PROVIDE BORDER TYPE #11 WITH WALL MOUNTING KIT. PROPERLY SEAL DIFFUSER AT WALL. COORDINATE FINISH WITH ARCHITECT.
5) PROVIDE INSULATED SUPPLY AIR PLENUM WITH 1" NECK FOR EACH PLENUM. COORDINATE EXACT LENGTH OF SLOT WITH ARCHITECT. SUPPLY AIR PLENUMS TO BE FABRICATED BY TITUS. CONFIRM MOUNTING REQUIREMENTS WITH ARCHITECT PRIOR TO ROUGH-IN.
6) LEAVE OPEN FOR RETURN AIR AND PROVIDE A LIGHT SHIELD. COORDINATE EXACT LENGTH OF SLOT WITH ARCHITECT. COORDINATE BORDER TYPE WITH ARCHITECT
7) APPROVED MANUFACTURERS: PRICE, TITUS, NAILOR, GREENHECK, & KRUEGER.

EXHAUST FANS

MECHANICAL											ELECTRICAL		
DESIG.	SERVICE	LOCATION	TYPE	CONTROL	CFM	ESP (IN W.G.)	DRIVE	ACCESSORIES (SEE BELOW)	WEIGHT (LBS)	EQUAL TO BASIS OF DESIGN MFR & MODEL #	WATTS	RPM	VOLTPH
EF1-2	IT RACK	CEILING	CABINET	T-STAT	200	0.5	DIRECT	A.C.F	24	GREENHECK SP-A260	67	1000	120V1

ACCESSORIES:
(A) - BACKDRAFT DAMPER (D) - ROOFCURB (G) - INTERLOCK WITH APPLICABLE AHU SUPPLY FAN
(B) - BIRDSCREEN (E) - SPEED CONTROL (H) - VFD CONTROLLED
(C) - PRE-WIRED NON-FUSED SERVICE DISCONNECT (F) - SPRING ISOLATION

NOTES:
1) REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2) CONTROL DESCRIPTION (WHERE PROVIDED, REFER TO SEQUENCE OF OPERATION FOR ADDITIONAL INFORMATION)
3) T-STAT - LINE VOLTAGE THERMOSTAT PROVIDED BY DV 23
4) PROVIDE VFD RATED MOTOR WHEN FAN IS EQUIPPED WITH VFD. PROVIDE STARTER WHEN VFD IS NOT REQUIRED.
5) PROVIDE FANS WITH OSHA RATED GUARDS.
6) APPROVED MANUFACTURERS - GREENHECK, COOK
7) ALL SUBSTITUTIONS SHALL BE APPROVED, IN WRITING, PRIOR TO BID.

VRF DX FAN COIL UNIT SCHEDULE

DESIG.	NOM TONS	CFM	OA CFM	ESP	COOLING		HEAT MBH	MANUFACTURER	MODEL	BUILDING STOCK	MOCP	ELECTRICAL	
					SENS.	TOTAL						VOLTPH	AMPS
VRF1-4-1	1	365	75	0.5	5.3	6.9	9.5	mitsubishi	TPEFYP012MA144A		15	208V1	2.13
VRF1-4-2	2.25	880	120	0.5	17	19	21.1	mitsubishi	TPEFYP027MA144A		15	208V1	2.88
VRF1-4-3	1.5	630	160	0.5	11	13.2	14	mitsubishi	TPEFYP018MA145A		15	208V1	2.88
VRF1-4-4	1	370	140	0.5	7.8	9.4	9.5	mitsubishi	TPEFYP012MA144A		15	208V1	2.13
VRF1-4-5	1.25	490	135	0.5	9.6	12.2	11.9	mitsubishi	TPEFYP015MA144A	BUILDING STOCK	15	208V1	2.88
VRF1-4-6	2.5	1090	465	0.5	18.6	26.8	23.9	mitsubishi	TPEFYP030MA145A		15	208V1	4.25
VRF1-4-7	1.5	820	155	0.5	12.5	14.3	14	mitsubishi	TPEFYP018MA145A		15	208V1	2.88
VRF1-5-1	3	1270	160	0.5	25.6	28.9	28.3	mitsubishi	TPEFYP036MA144A	BUILDING STOCK	15	208V1	4.25
VRF1-5-2	3	1150	115	0.5	23.3	26	28.3	mitsubishi	TPEFYP036MA144A	BUILDING STOCK	15	208V1	4.25
VRF1-5-3	2.25	880	195	0.5	17.3	20.6	21.3	mitsubishi	TPEFYP027MA144A		15	208V1	2.88
VRF1-5-4	1.25	490	100	0.5	9.4	14.2	12.1	mitsubishi	TPEFYP015MA144A	BUILDING STOCK	15	208V1	2.88
VRF1-5-5	1.5	685	160	0.5	12.2	14.3	14.2	mitsubishi	TPEFYP018MA145A		15	208V1	2.88
VRF1-6-1	2	825	80	0.5	15	16.2	17.4	mitsubishi	TPEFYP024MA144A	BUILDING STOCK	15	208V1	2.88
VRF1-6-2	2	825	80	0.5	13.6	14.6	17.4	mitsubishi	TPEFYP024MA144A	BUILDING STOCK	15	208V1	2.88
VRF1-6-3	1	325	85	0.5	5.6	7	8.7	mitsubishi	TPEFYP012MA144A		15	208V1	2.13
VRF1-6-4	3	1235	195	0.5	22.2	26.3	25.9	mitsubishi	TPEFYP036MA144A	BUILDING STOCK	15	208V1	4.25
VRF1-6-5	2.5	1255	215	0.5	20	23.7	22	mitsubishi	TPEFYP030MA145A		15	208V1	4.25
VRF1-6-6	1	370	120	0.5	6.4	9.2	8.7	mitsubishi	TPEFYP012MA144A		15	208V1	2.13
VRF1-6-7	1	375	50	0.5	6.3	7.1	8.7	mitsubishi	TPEFYP012MA144A		15	208V1	2.13
VRF1-6-8	0.5	300	120	0.5	3.7	4.7	4.3	mitsubishi	TPEFYP006MA144A		15	208V1	1.75
VRF1-6-9	1	400	50	0.5	7.7	8.3	8.7	mitsubishi	TPEFYP012MA144A		15	208V1	2.13
VRF1-7-1	4	1270	200	0.5	29.1	33.1	32.8	mitsubishi	TPEFYP048MA144A		15	208V1	4.38
VRF1-7-2	1.5	880	180	0.5	12.4	16.7	12.1	mitsubishi	TPEFYP018MA145A		15	208V1	2.88
VRF1-7-3	2	880	100	0.5	13.9	15.8	16.4	mitsubishi	TPEFYP024MA144A	BUILDING STOCK	15	208V1	2.88
VRF1-7-4	2.5	1260	215	0.5	18.1	21.4	20.7	mitsubishi	TPEFYP030MA145A		15	208V1	4.25
VRF1-7-5	3	1270	160	0.5	24	27.2	24.3	mitsubishi	TPEFYP036MA144A	BUILDING STOCK	15	208V1	4.25
VRF1-7-6	2	880	170	0.5	13.7	16.2	16.4	mitsubishi	TPEFYP024MA144A	BUILDING STOCK	15	208V1	2.88

NOTES:
1) REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2) NOMINAL COOLING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 80/67 F (DBWB), OUTDOOR OF 95 F (DB)
3) NOMINAL HEATING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 70 F (DB), OUTDOOR OF 43 F (WB)
4) FULL DEMAND CORRECTED CAPACITY INCLUDES DE-RATE ASSOCIATED WITH INDOOR VS OUTDOOR CONNECTED CAPACITY INDICATED ON OUTDOOR UNIT SCHEDULE FOR ASSOCIATED SYSTEM. PARTIAL CORRECTED CAPACITY ASSUMES SUFFICIENT DIVERSITY EXISTS SUCH THAT THE CONNECTED CAPACITY DE-RATE
5) CONTROLS TO BE TRANE DDC CONTROLS. REFER TO SEQUENCE OF OPERATION FOR VRF CONTROLS AND CONNECTION TO BMS.
6) PROVIDE UNITS WITH MERV 11 FILTERS
7) PROVIDE WITH FUSED DISCONNECT
8) EQUIPMENT NEEDS TO INTERFACE WITH EXISTING MITSUBISHI CONDENSING UNIT.

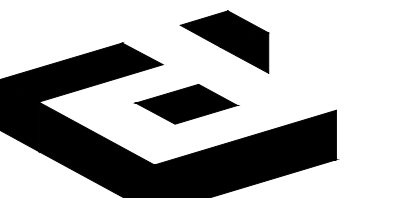
- COORDINATION WITH SHELL INSTALLATION**
- TENANT CONTRACTOR TO RELEASE THE 250PSI NITROGEN HOLDING PRESSURE
 - TENANT CONTRACTOR TO TEST ALL PIPING WITHIN INSTALLATION
 - TENANT CONTRACTOR TO VACUUM AFFECTED SYSTEMS DOWN TO LESS THAN 50MICRONS ON THE CENTRAL SYSTEM
 - TENANT CONTRACTOR SHALL PROVIDE REFRIGERATE AS REQUIRED FOR A COMPLETE SYSTEM.
 - TENANT CONTRACTOR SHALL PROVIDE WARRANTY FROM ODU TO AC UNIT.
 - FINAL LINE LENGTHS TO BE REPORTED BACK TO TRANE TO UPDATE MITSUBISHI FOR FINAL REFRIGERANT CHARGES.

GENERAL NOTES:

- ALL WORK SHALL COMPLY WITH APPLICABLE NATIONAL, STATE AND LOCAL CODES, RULES, REGULATIONS AND REQUIREMENTS.
- ALL WORK SHALL COMPLY WITH THE BUILDING TENANT CONSTRUCTION GUIDE. COORDINATE WITH BUILDING MANAGEMENT/OWNER FOR ACCESS TO ANY TENANT LEASE SPACES THAT MIGHT BE REQUIRED FOR THE INSTALLATION. UNLESS DIRECTED BY LANDLORD ALL EQUIPMENT AND WORKMANSHIP SHALL BE GUARANTEED FOR 1 YEAR.
- EXISTING CONDITIONS ARE BASED ON INFORMATION PROVIDED BY SITE SURVEY AND PREVIOUS RECORD DRAWINGS. HOWEVER, IT IS NOT INTENDED TO BE A TRUE REPRESENTATION OF ACTUAL CONDITIONS. CONTRACTOR SHALL VISIT JOB SITE PRIOR TO BIDDING TO ASCERTAIN EXISTING CONDITIONS AND SHALL NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO BID.
- CONTRACTOR SHALL ENGAGE AN INDEPENDENT AIR BALANCING COMPANY TO OBTAIN AIR QUANTITIES SHOWN ON DRAWING. AT COMPLETION OF AIR BALANCE, BALANCING DAMPER SHALL BE TIGHTENED AND PROPERLY SEALED WITH FOIL TAPE.
- ALL MEDIUM AND LOW PRESSURE DUCTWORK SHALL BE GALVANIZED SHEET METAL, FABRICATED, INSTALL AND SEAL MEDIUM PRESSURE DUCTWORK FOR 3"W.G. AND LOW PRESSURE DUCTWORK FOR 1"W.G. IN ACCORDANCE WITH SMACNA STANDARD. DUCTWORK SHALL BE INSULATED WITH FIBERGLASS BLANKET WITH FOIL FACED VAPOR BARRIER TO MEET IECC REQUIREMENT (MIN R5 VALUE).
- ALL SUPPLY AND RETURN DUCT SIZES ARE FREE AREAS.
- INDIVIDUAL DUCT RUN-OUTS TO EACH DIFFUSER SHALL BE SIZED IN ACCORDANCE TO THE DIFFUSER NECK SIZE FOUND IN THE GRILLES-REGISTERS-DIFFUSERS SCHEDULE UNLESS NOTED OTHERWISE
- OFFSET DUCTS INTO JOIST SPACE FOR CLEARANCE WHERE SPACE ABOVE CEILING IS NOT SUFFICIENT FOR DUCTS TO CROSS OTHER DUCTS OR WORK OF OTHER TRADES.
- INSULATED FLEX DUCT IN THE LOW PRESSURE SYSTEM SHALL BE LIMITED TO AN OVERALL LENGTH OF SIX (6) FEET WITH A MAXIMUM OF A 90 DEGREE CHANGE IN DIRECTION. SUPPORTS SHALL BE SADDLE BANDED TO STRUCTURE. SUPPORTING FROM FIRE PROTECTION PIPING, ELECTRICAL CONDUIT OR CEILING SUPPORT WIRES IS NOT ACCEPTABLE.
- ENSURE NEC CLEARANCES ARE MAINTAINED INCLUDING 36" IN FRONT OF 0-208V POWER AND 42" IN FRONT OF 277/480V POWER.
- ALL ENCLOSED ROOMS (INTERIOR AND PERIMETER) SHALL HAVE RETURN AIR PATH. ROOMS WITH ALL WALLS TO DECK SHALL HAVE LINED SHEET METAL RETURN AIR BOOTS PLACED IN WALL ABOVE CEILING SIZED FOR 500 FPM MAXIMUM. FIRE RATED WALLS SHALL HAVE FIRE DAMPERS WITHIN THE DUCT PER LOCAL CODE REQUIREMENTS. FIRE DAMPERS AND FIRE-SMOKE DAMPERS SHALL BE FREE AREA/OUT OF AIRSTREAM TYPE. ALL MOTORIZED DAMPERS SHALL BE FREE AREA/OUT OF AIRSTREAM TYPE.
- PIPES AND DUCTS TO BE COORDINATED ON JOB WITH BUILDING STRUCTURE AND WORK OF OTHER CONTRACTORS. ROUTE AS HIGH AS PHYSICALLY POSSIBLE.
- COORDINATE CEILING DIFFUSERS AND GRILLES WITH LIGHTING FIXTURES. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
- THERMOSTATS TO BE MOUNTED 48" ABOVE FINISHED FLOOR LEVEL UNLESS NOTED OTHERWISE ON THE PLANS. CONTRACTOR SHALL COORDINATE LOCATION OF THERMOSTATS WITH ARCHITECT IN FIELD
- REPAIR AND PATCH CONSTRUCTION DAMAGED DUE TO THE DEMOLITION OF THIS PROJECT, USING SAME METHODS AND MATERIALS TO MATCH EXISTING.
- EVAPORATORS SHALL HAVE A PRIMARY INSULATED CONDENSATE DRAIN LINE SLOPED 1/8"/FT. EXTENDED TO NEAREST FLOOR DRAIN IN MECHANICAL ROOM OR MOP SINK. GALVANIZED SHEET METAL SECONDARY DRAIN PANS SHALL HAVE LEAK DETECTION TAPE IN PAN AND ROUTE THE PAN'S INSULATED CONDENSATE DRAIN LINE SLOPED 1/8"/FT NEXT TO BUT INDEPENDENT OF PRIMARY DRAIN LINES.
- PROVIDE TEMPORARY HIGH EFFICIENCY FILTER MEDIA ON MAIN RETURN AIR AND EXHAUST FROM FLOOR AT BEGINNING OF PROJECT AND REPLACED AT TWO (2) WEEK INTERVALS UNTIL PROJECT COMPLETION AT WHICH TIME THE FILTER MEDIA SHALL BE REMOVED.
- FLEXIBLE DUCTS SHALL BE SIMILAR AND EQUAL TO THERMOFLEX: TYPE M-KE. FLEXIBLE DUCTS SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF UL-181, NFPA 90-A AND OTHER GOVERNING AUTHORITIES.
- FLEXIBLE DUCT BETWEEN DUCT AND AC UNITS AND EXHAUST FANS SHALL BE EQUAL TO VENTFABRICS "VENTGLAS".
- AIR CONDITIONING COOLING CONDENSATE PIPING TO BE ONE-HALF INCH THICK ARMAFLEX. FITTINGS SHALL BE PRE-MOLDED OF THE SAME MATERIAL. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- DUCTLINER SHALL BE 1-INCH ACOUSTICAL DUCT LINING IN ACCORDANCE WITH SMACNA STANDARDS. DUCT LINING SHALL BE OWENS-CORNING FIBERGLAS "AEROFLEX" NO. 200 OR EQUAL.
- ALL EXISTING DUCTWORK SHALL BE FIELD VERIFIED TO BE INSULATED AND IN GOOD CONDITION, ANY TORN, DAMAGED OR MISSING INSULATION WILL BE REPLACED. EXISTING CONTROLS SHALL BE CONFIRMED TO BE IN WORKING CONDITION.

HVAC SYMBOLS

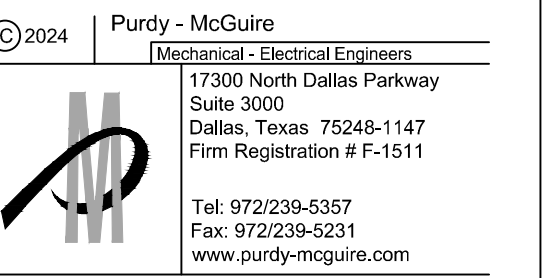
SYMBOL	DESCRIPTION
	REDISTRIBUTE AIR TO EXISTING DIFFUSER AS INDICATED ON PLAN
	INDICATES SIZE, CFM, AND DIFFUSER TYPE
	NEW CEILING SUPPLY DIFFUSER
	NEW RETURN AIR/EXHAUST GRILLE
	EXISTING RETURN AIR/EXHAUST GRILLE
	EXISTING SLOT DIFFUSER
	POINT OF CONNECTION BETWEEN NEW AND EXISTING WORK
	EXISTING TO REMAIN
	REMOVE EXISTING AS INDICATED
	CAP EXISTING DUCT
	MANUAL VOLUME CONTROL DAMPER
	DUCT TRANSITION
	NEW OR RELOCATED THERMOSTAT
	EXISTING THERMOSTAT
	FLEXIBLE DUCT CONNECTION
	INDICATES A WALL TO DECK (FOR COORDINATION PURPOSE ONLY-REFER TO ARCHITECTS PLANS FOR REQUIREMENTS)



idGROUP

2841 IRVING BLVD.
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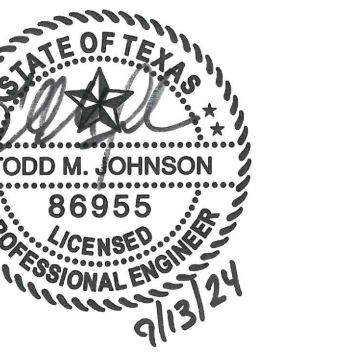
ARCHITECT/ENGINEER



PMI JOB NO. 24007.004
PROJECT MGR. TODD JOHNSON

THIS DRAWING SHALL NOT BE REPRODUCED FOR ANY PROJECT OTHER THAN THE PROJECT NOTED IN THE TITLE BLOCK WITHOUT THE WRITTEN CONSENT OF PURCHASER/ENGINEER, INC. DALLAS, TX.

SEAL



PROJECT NUMBER: 065-016
DRAWN BY: BH
CHECKED BY: MW
R.S.F.: 2/8/11

BILLINGSLEY
COMPANY

CYPRESS WATERS
SENSKE

3300 OLYMPUS BLVD.
SUITE # 180
DALLAS, TX 75019

NO.	REVISIONS:	DATE:

CLIENT/LANDLORD ISSUE DATE: 09/13/2024
BID ISSUE DATE: 09/13/2024
PERMIT ISSUE DATE: 09/13/2024

DRAWING TITLE:
MECHANICAL NOTES & SYMBOLS

DRAWING NUMBER:

M0.01

DALLAS GREEN BUILDING RQMTS.

SECTION 802.1 SCOPE. TO FACILITATE THE OPERATION AND MAINTENANCE OF THE COMPLETED BUILDING, THE BUILDING AND ITS SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF SECTIONS 802.2 AND 802.3.

802.2 AIR HANDLING SYSTEM ACCESS: THE ARRANGEMENT AND LOCATION OF AIR HANDLING SYSTEM COMPONENTS, INCLUDING, BUT NOT LIMITED TO, DUCTS, AIR HANDLING UNITS, FANS, COILS, AND CONDENSATE PANS, SHALL ALLOW ACCESS FOR CLEANING AND REPAIR OF AIR HANDLING SURFACES OF SUCH COMPONENTS ACCESS PORTS SHALL BE INSTALLED IN THE AIR HANDLING SYSTEM TO PERMIT SUCH CLEANING AND REPAIRS. PIPING, CONDUITS, AND OTHER BUILDING COMPONENTS SHALL NOT BE LOCATED SO AS TO OBSTRUCT THE REQUIRED ACCESS PORTS.

802.3 AIR HANDLING SYSTEM FILTRATION AND BYPASS PATHWAYS: AIR HANDLING EQUIPMENT AND HVAC EQUIPMENT SHALL BE DESIGNED AND INSTALLED TO LIMIT THE AMOUNT OF AIRFLOW THAT BY PASSES THE AIR FILTERS AND SHALL COMPLY WITH THE FOLLOWING:

- CHANNELS, RACKS AND OTHER FILTER-RETAINING CONSTRUCTIONS THAT DO NOT SEAL TIGHTLY TO THE FILTER FRAME BY MEANS OF FRICTION FIT SHALL BE PROVIDED WITH A MEANS TO SEAL THE FILTER FRAME TO THE FILTER-HOLDING CONSTRUCTION.
- WHERE STANDARD SIZE FILTERS ARE INSTALLED IN BANKS OF MULTIPLE FILTERS, GASKETS SHALL SEAL THE GAP BETWEEN THE FRAMES OF ADJACENT FILTERS.
- AS AN ALTERNATIVE TO GASKETS, THE FRAMES OF ADJACENT FILTERS SHALL BE COMPRESSED TIGHTLY TOGETHER BY MEANS OF SPRING ELEMENTS THAT ARE BUILT INTO THE FILTER RETAINING CONSTRUCTION.
- CHANNELS, RACKS AND OTHER FILTER-RETAINING CONSTRUCTIONS SHALL BE SEALED TO THE DUCT OR HOUSING OF THE HVAC EQUIPMENT SERVED BY THE FILTERS.
- FILTER ACCESS DOORS IN DUCTS AND HVAC EQUIPMENT SHALL BE DESIGNED TO LIMIT THE AMOUNT OF AIRFLOW THAT BYPASSES THE FILTERS.
- FIELD OR SHOP-FABRICATED SPACERS SHALL NOT BE INSTALLED FOR THE PURPOSE OF REPLACING THE INTENDED SIZE FILTER WITH A SMALLER SIZE FILTER.
- GASKETS AND SEALS SHALL BE ACCESSIBLE FOR REPAIR, MAINTENANCE AND REPLACEMENT.

803.1 CONSTRUCTION PHASE REQUIREMENTS. THE VENTILATION OF BUILDINGS DURING THE CONSTRUCTION PHASE SHALL BE IN ACCORDANCE WITH SECTIONS 803.1.1 THROUGH 803.1.3.

803.1.1 DUCT OPENINGS. DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, SHEET METAL, OR SHALL BE CLOSED BY AN APPROVED METHOD TO REDUCE THE AMOUNT OF DUST AND DEBRIS THAT COLLECTS IN THE DUCT SYSTEM FROM THE TIME OF ROUGH-IN INSTALLATION AND UNTIL STARTUP OF THE HEATING AND COOLING EQUIPMENT. DUST AND DEBRIS SHALL BE CLEANED FROM DUCT OPENINGS PRIOR TO SYSTEM FLUSH OUT AND BUILDING OCCUPANCY.

803.1.2 INDOOR AIR QUALITY DURING CONSTRUCTION. TEMPORARY VENTILATION DURING CONSTRUCTION SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 803.1.2.1 THROUGH 803.1.2.3.

803.1.2.1 VENTILATION. VENTILATION DURING CONSTRUCTION SHALL BE ACHIEVED THROUGH OPENINGS IN THE BUILDINGS EXTERIOR WALLS BY THE FOLLOWING METHODS:

- NATURAL VENTILATION IN ACCORDANCE WITH THE PROVISIONS OF THE INTERNATIONAL BUILDING CODE OR THE INTERNATIONAL MECHANICAL CODE.
- FANS THAT PRODUCE A MINIMUM OF THREE AIR CHANGES PER HOUR.
- EXHAUST IN THE WORK AREA AT A RATE OF NOT LESS THAN 0.05 CFM/FT² (0.24 L/S/IN²) AND NOT LESS THAN 10 PERCENT GREATER THAN THE SUPPLY AIR RATE SO AS TO MAINTAIN NEGATIVE PRESSURIZATION OF THE SPACE.

803.1.2.2 PROTECTION OF HVAC SYSTEM OPENINGS. HVAC SUPPLY AND RETURN DUCT AND EQUIPMENT OPENINGS SHALL BE PROTECTED DURING DUST-PRODUCING OPERATIONS.

803.1.2.3 RETURN AIR FILTERS. WHERE A FORCED AIR HVAC SYSTEM IS USED DURING CONSTRUCTION, NEW RETURN AIR FILTERS SHALL BE INSTALLED PRIOR TO SYSTEM FLUSH OUT AND BUILDING OCCUPANCY.

803.1.3 CONSTRUCTION PHASE DUCTLESS SYSTEM OR FILTER. WHERE SPACES ARE CONDITIONED DURING THE CONSTRUCTION PHASE, SPACE CONDITIONING SYSTEMS SHALL BE OF THE DUCTLESS VARIETY OR FILTERS FOR THE DUCTED SYSTEMS SHALL BE RATED AT MERV 8 OR HIGHER IN ACCORDANCE WITH ASHRAE 52.2, AND SYSTEM EQUIPMENT SHALL BE DESIGNED TO BE COMPATIBLE, DUCT SYSTEM DESIGN SHALL ACCOUNT FOR PRESSURE DROP ACROSS THE FILTER.

803.2 THERMAL ENVIRONMENTAL CONDITIONS FOR HUMAN OCCUPANCY. BUILDING SHALL BE DESIGNED IN COMPLIANCE WITH ASHRAE 55, SECTIONS 6.1, "DESIGN" AND 6.2, "DOCUMENTATION."

EXCEPTION: SPACES WITH SPECIAL REQUIREMENTS FOR PROCESSES, ACTIVITIES, OR CONTENTS THAT REQUIRE A THERMAL ENVIRONMENT OUTSIDE OF THAT WHICH HUMANS FIND THERMALLY ACCEPTABLE, SUCH AS FOOD STORAGE, NATATORIUMS, SHOWER ROOMS, SAUNAS AND DRYING ROOMS.

803.3 ISOLATION OF POLLUTANT SOURCES. THE ISOLATION OF POLLUTANT SOURCES RELATED TO PRINT, COPY AND JANITORIAL ROOMS, GARAGES AND HANGERS SHALL BE IN ACCORDANCE WITH SECTION 803.3.1.

803.3.1 PRINTER, COPIER AND JANITORIAL ROOMS. ENCLOSED ROOMS OR SPACES THAT ARE OVER 100 SQUARE FEET (9.3 M²) IN AREA AND THAT ARE USED PRIMARILY AS A PRINT OR COPY FACILITY CONTAINING FIVE OR MORE PRINTERS, COPY MACHINES, SCANNERS, FACSIMILE MACHINES OR SIMILAR MACHINES IN ANY COMBINATION, AND ROOMS USED PRIMARILY AS JANITORIAL ROOMS OR CLOSETS WHERE THE USE OR STORAGE OF CHEMICALS OCCURS, SHALL COMPLY WITH ALL OF THE FOLLOWING:

- THE ENCLOSING WALLS SHALL EXTEND FROM THE FLOOR SURFACE TO THE UNDERSIDE OF THE FLOOR, ROOF DECK OR SOLID CEILING ABOVE AND SHALL BE CONSTRUCTED TO RESIST THE PASSAGE OF AIRBORNE CHEMICAL POLLUTANTS AND SHALL BE CONSTRUCTED AND SEALED AS REQUIRED FOR 1-HOUR FIRE-RESISTANCE-RATED CONSTRUCTION ASSEMBLIES. ALTERNATIVELY, FOR JANITORIAL ROOMS AND CLOSETS, ALL CHEMICALS SHALL BE STORED IN APPROVED CHEMICAL SAFETY STORAGE CABINETS.
- DOORS IN THE ENCLOSING WALLS SHALL BE AUTOMATIC OR SELF-CLOSING.
- AN HVAC SYSTEM SHALL BE PROVIDED THAT PROVIDES SEPARATE EXHAUST AIRFLOW TO THE OUTDOORS AT A RATE OF NOT LESS THAN 0.50 CFM PER SQUARE FOOT (2.4 L/S/M²), THAT MAINTAINS A NEGATIVE PRESSURE OF NOT LESS THAN 7 PA WITHIN THE ROOM, AND THAT PROHIBITS THE RE-CIRCULATION OF AIR FROM THE ROOM TO OTHER PORTIONS OF THE BUILDINGS.

803.4 FILTERS. FILTERS FOR AIR CONDITIONING SYSTEMS THAT SERVE OCCUPIED SPACES SHALL BE RATED AT MERV 11 OR HIGHER, IN ACCORDANCE WITH ASHRAE STANDARD 52.2, AND SYSTEM EQUIPMENT SHALL BE DESIGNED TO BE COMPATIBLE. THE AIR HANDLING SYSTEM DESIGN SHALL ACCOUNT FOR PRESSURE DROP ACROSS THE FILTER. THE PRESSURE DROP ACROSS CLEAN MERV 11 FILTERS SHALL BE NOT GREATER THAN 0.45 IN. W.C. AT 500 FPM (412 PA AT 2.54 M/S) FILTER FACE VELOCITY. FILTER PERFORMANCE SHALL BE SHOWN ON THE FILTER MANUFACTURER'S DATA SHEET.

EXCEPTION: FILTERS FOR AIR CONDITIONING SYSTEMS THAT SERVE OCCUPIED SPACES IN MULTI-FAMILY RESIDENTIAL UNITS OR LIGHT COMMERCIAL SPACES SHALL BE RATED AT MERV 6 FOR SYSTEMS RATED AT 30,000 BTU/H OR LESS AND MERV 8 FOR SYSTEMS RATED OVER 30,000 BTU/H BUT NO GREATER THAN 60,000 BTU/H.

DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING

SECTION 230500 - COMMON WORK RESULTS

PART 1 - GENERAL

1.1 GENERAL NOTES AND SCOPE OF WORK

A. REFER TO SECTION 220500 ON PLUMBING SHEET P1.01 FOR INFORMATION RELATED TO HVAC GENERAL CONDITIONS, MISCELLANEOUS EQUIPMENT AND MATERIALS, AND CONSTRUCTION REQUIREMENTS.

1.2 RELATED SECTIONS

A. SECTIONS 230523, 230529, 230553 AND 230700 ARE APPLICABLE BUT THEY DO NOT APPEAR IN THESE DIVISION 23 SPECIFICATIONS. REFER TO GENERAL NOTES.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 230548 - VIBRATION CONTROLS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. REFER TO SECTION 230500.

PART 2 - PRODUCTS

2.1 EQUIPMENT PADS

A. PADS SHALL BE 3/4 INCH WATER RESISTANT NEOPRENE WITH WAFFLE PATTERN, MASON TYPE WSW, OR EQUAL.

B. ELASTOMERIC HANGERS

A. HANGER SHALL CONSIST OF RODS WITH STEEL BOX HOUSING NEOPRENE ISOLATION ELEMENT AND SPRING, MASON SERIES 30N, OR EQUAL.

2.3 RESTRAINED SPRING ISOLATORS

A. ISOLATORS SHALL UTILIZE A STEEL BASE WITH WAFFLED NEOPRENE PAD, WELDED STEEL ENCLOSURE WITH SPRING AND RESTRAINING BOLTS, MASON TYPE SLR, OR EQUAL.

2.4 ROOF CURB ISOLATORS

A. AS PART OF THE ROOF CURB, PROVIDE SPRING ISOLATORS WITH WATER-TIGHT DESIGN, RETRAINED SPRINGS AND NEOPRENE PADS, MASON TYPE RSC, OR EQUAL.

2.5 INERTIA BASES

A. PROVIDE STEEL POURING FORM FOR REINFORCED CONCRETE BLOCKS WITH FLOOR MOUNTED SPRINGS, MASON KSL, OR EQUAL.

PART 3 - EXECUTION

3.1 SCHEDULE

A. EQUIPMENT PADS - SMALL FLOOR MOUNTED EQUIPMENT OR PACKAGED EQUIPMENT WITH INTERNAL ISOLATION.

B. ELASTOMERIC HANGERS - SUSPENDED AIR HANDLING UNITS, EXHAUST FANS, TERMINAL UNITS, HEAT PUMPS, PUMPS, ETC.

C. RESTRAINED SPRING ISOLATORS - FLOOR MOUNTED FANS GREATER THAN 3/4 HP.

D. ROOF CURB ISOLATORS - FACTORY FABRICATED ROOFTOP UNITS.

E. INERTIA BASES - FLOOR MOUNTED PUMPS GREATER THAN 3/4 HP.

3.2 INSTALLATION

A. INSTALL VIBRATION CONTROLS PER THE MANUFACTURER'S INSTRUCTIONS.

END OF SECTION

SECTION 230553 - IDENTIFICATION

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. REFER TO SECTION 230500.

B. LABEL ALL NEW EQUIPMENT AND PIPING SYSTEMS.

PART 2 - PRODUCTS

2.1 PIPE LABELS

A. PRETENSION PIPE LABELS OF SEMI-RIGID PLASTIC FORMED TO COVER THE FULL CIRCUMFERENCE OF PIPE.

B. IDENTIFY THE SERVICE AND DIRECTION OF FLOW. LABELS SHALL CONTAIN AT LEAST 1/2 INCH HIGH LETTERING AND BE PLACED SO THEY ARE EASY TO READ.

2.2 VALVE TAGS

A. MULTILAYER, MULTICOLOR PLASTIC LABELS WITH MECHANICAL ENGRAVING AND CHAIN FOR ATTACHMENT TO VALVE.

2.3 EQUIPMENT LABELS

A. MULTILAYER, MULTICOLOR PLASTIC LABELS WITH MECHANICAL ENGRAVING AND HOLES FOR ATTACHMENT TO EQUIPMENT.

PART 3 - EXECUTION

3.1 PIPE LABELS

A. INSTALL PIPE LABELS WHERE PIPING IS EXPOSED OR ABOVE AN ACCESSIBLE CEILING AT MAXIMUM 20 FT. CENTERS.

3.2 VALVE TAGS

A. ATTACH TAGS TO VALVES USING CHAIN. PROVIDE A VALVE SCHEDULE FOR MOUNTING IN THE MECHANICAL ROOM.

3.3 EQUIPMENT LABELS

A. PERMANENTLY ATTACH LABELS TO EQUIPMENT. LOCATE WHERE LABEL CAN BE EASILY SEEN AND READ.

END OF SECTION

SECTION 230593 - TESTING ADJUSTING AND BALANCING

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. THE WORK INCLUDED IN THIS SECTION CONSISTS OF FURNISHING ALL LABOR, MATERIALS, INSTRUMENTS, TOOLS, AND SERVICES REQUIRED IN CONNECTION WITH THE TESTING, ADJUSTING AND BALANCING (TAB) OF THE HEATING, VENTILATING AND AIR CONDITIONING (HVAC) SYSTEMS AS DESCRIBED IN THE MECHANICAL SPECIFICATIONS AND/OR SHOWN ON THE MECHANICAL PLANS, OR REASONABLY IMPLIED THERE FROM.

B. THE TAB FIRM SHALL HAVE A LICENSED PROFESSIONAL ENGINEER SUPERVISING ALL WORK AND THE FIRM SHALL HOLD A CURRENT ABC OR NEHB CERTIFICATION.

1.2 START-UP, TEST AND ADJUST

A. PROVIDE ALL TESTS OF EQUIPMENT AND SYSTEMS REQUIRED TO PROVE COMPLIANCE WITH THE DRAWINGS AND SPECIFICATIONS. OWNER SHALL BE MADE COMPLETELY FAMILIAR WITH THE COMPLETE WORKING OF ALL THE MECHANICAL SYSTEMS.

B. THE TESTS SHALL DEMONSTRATE THE SPECIFIED CAPACITIES AND OPERATION OF ALL EQUIPMENT AND MATERIALS COMPRISING THE SYSTEMS. ALL DATA REQUIRED BY THESE SPECIFICATIONS SHALL BE PREPARED ON TYPED FORMS AND SUBMITTED TO THE ENGINEER FOR APPROVAL. COMPLETE APPROVAL WILL BE NECESSARY BEFORE FINAL PAYMENT CAN BE MADE. THE CONTRACTOR SHALL THEN MAKE AVAILABLE SUCH INSTRUMENTS NECESSARY FOR SPOT CHECKS ON THE SYSTEM.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 HVAC SYSTEM

A. THE HVAC CONTRACTOR SHALL WORK IN CONJUNCTION WITH THE TAB CONTRACTOR TO START-UP AND OPERATE ALL EQUIPMENT NECESSARY TO PROVIDE A COMPLETE AIR AND WATER TEST AND BALANCE REPORT.

B. TAB CONTRACTOR SHALL MEASURE CFM AT ALL DIFFUSERS, REGISTERS AND GRILLES, AND HVAC UNITS, AS WELL AS WATER FLOWS AT COILS AND PUMPS, TO ASSURE THAT THEY MATCH THE QUANTITIES SHOWN ON THE PLANS (PLUS OR MINUS 5 PERCENT), CONFIRM ALL SEQUENCES OF OPERATION ARE PERFORMING CORRECTLY.

C. TAB CONTRACTOR SHALL CALIBRATE ALL EQUIPMENT AND SENSORS TO WORK PROPERLY AND GIVE CORRECT INFORMATION TO THE BMS SYSTEM.

END OF SECTION

SECTION 230900 - CONTROLS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. REFER TO SECTION 230500.

PART 2 - PRODUCTS

2.1 CONTROLS SYSTEM

A. PROVIDE NEW, MODIFY OR EXTEND AUTOMATIC TEMPERATURE CONTROLS TO ALL NEW EQUIPMENT SHOWN ON THE DRAWINGS.

B. REFER TO THE DRAWINGS FOR ANY SPECIAL SEQUENCES OF CONTROL AND LOCATION OF EQUIPMENT.

C. REMODEL PROJECTS SHALL UTILIZE EQUIPMENT BY THE SAME MANUFACTURER AS CURRENTLY EXISTS.

PART - EXECUTION

3.1 DESIGN AND LAYOUT

A. THE CONTROL SYSTEM DESIGN AND LAYOUT SHALL BE PERFORMED BY A FACTORY AUTHORIZED AGENT OF THE MANUFACTURER USED.

3.2 SYSTEM OPERATION

A. AT THE CONCLUSION OF WORK, ALL EQUIPMENT AND SYSTEMS SHALL BE PROVEN TO THE ENGINEER TO OPERATE IN ACCORDANCE WITH THE NEW OR EXISTING MAIN CONTROL PANEL AND NEW/EXISTING SEQUENCES OF OPERATION ON THE DRAWINGS.

B. PROVIDE ALL WIRING REQUIRED TO CONNECT INPUT/OUTPUT DEVICES TO CONTROL PANELS.

C. TEST AND ADJUST ALL DEVICES AND DOCUMENT CALIBRATION.

D. PROVIDE NECESSARY INSTRUCTION TO THE OWNER'S PERSONNEL.

END OF SECTION

SECTION 233113 - DUCTWORK

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. REFER TO SECTION 230500.

PART 2 - PRODUCTS

2.1 GENERAL

A. CONCEALED DUCTWORK SHALL BE CONSTRUCTED OF NEW, PRIME GRADE, CONTINUOUS HOT-DIP MILL GALVANIZED, LOCK-FORMING, QUALITY STEEL. REFER TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS.

B. WHERE DUCTS EXPOSED TO VIEW PASS THROUGH WALLS, FLOORS OR CEILINGS, PROVIDE SHEET METAL COLLARS TO COVER VOIDS AROUND THE DUCTS.

C. SQUARE AND ROUND ELBOWS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SMACNA STANDARDS. ELBOWS NOT CONSTRUCTED WITH A CENTERLINE RADIUS OF AT LEAST 50 PERCENT OF THE DUCT WIDTH OR DIAMETER SHALL BE PROVIDED WITH TURNING VANES IN ACCORDANCE WITH SMACNA STANDARDS.

D. "FIBERBOARD" DUCTWORK WILL NOT BE ACCEPTED ON THIS PROJECT.

2.2 MEDIUM PRESSURE DUCT CONSTRUCTION

A. UNLESS NOTED OTHERWISE, MEDIUM PRESSURE DUCTS SHALL BE CONSTRUCTED TO A PRESSURIZATION CLASSIFICATION OF THREE (3) INCHES WG POSITIVE.

B. ALL ROUND MEDIUM PRESSURE DUCTS SHALL BE SPIRAL TYPE.

2.3 LOW PRESSURE DUCT CONSTRUCTION

A. LOW PRESSURE DUCTS CONNECTING SMALL AIR HANDLING EQUIPMENT, SHALL BE CONSTRUCTED TO A PRESSURIZATION CLASSIFICATION OF TWO (2) INCHES WG, POSITIVE OR NEGATIVE AS APPROPRIATE. THESE LOW PRESSURE ROUND DUCTS SHALL BE SPIRAL TYPE.

B. DUCTWORK DOWN STREAM OF AIR TERMINAL UNITS SHALL BE CONSTRUCTED TO A PRESSURE CLASSIFICATION OF ONE (1) INCHES WG POSITIVE. THESE LOW PRESSURE ROUND DUCTS MAY BE SPIRAL OR SNAP-LOCK TYPE.

C. SHOP FABRICATED DUCTS SHALL BE CONSTRUCTED, BRACED AND REINFORCED IN ACCORDANCE WITH SMACNA STANDARDS.

2.4 DUCT SEALING

A. SEAL ALL DUCTWORK ON THE PROJECT TO SMACNA CLASSIFICATION A.

2.5 FLEXIBLE DUCTS

A. FLEXIBLE DUCTS SHALL BE SIMILAR AND EQUAL TO THERMOFLEX TYPE M-KE AND SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF UL-181, NFPA 90-A AND OTHER GOVERNING AUTHORITIES.

B. FLEXIBLE DUCTS SHALL BE FACTORY INSULATED WITH A NOMINAL 1 INCH THICKNESS OF FIBERGLASS INSULATION, PRODUCING A THERMAL CONDUCTANCE (C") OF 0.23. DUCTS SHALL HAVE A POSITIVE INTERIOR AIR SEAL.

C. FLEXIBLE DUCTS SHALL BE RATED FOR OPERATING PRESSURE OF PLUS 6 INCHES WG THROUGH 10 INCH DIAMETER, PLUS 4 INCHES WG THROUGH 16 INCH DIAMETER AND -2 INCHES WG FOR ALL SIZES.

D. FLEXIBLE DUCTS TO DIFFUSERS AND GRILLES SHALL BE LIMITED TO 6 FOOT LENGTHS AND A MAXIMUM OF ONE (1) 90 DEGREE CHANGE IN DIRECTION. MEDIUM PRESSURE DUCTS SERVING TERMINAL UNITS SHALL BE LIMITED TO 2 FOOT LENGTHS WITH NO ELBOWS.

2.6 FLEXIBLE DUCT FABRIC

A. PROVIDE VENT FABRICS "VENTGLAS", OR EQUAL, 30 OZ PER SQ YD, BETWEEN SHEET METAL DUCTS AND AIR HANDLING EQUIPMENT, INCLUDING ALL FANS, AND POWER TYPE VENTILATORS.

2.7 DAMPERS

A. DAMPER AND SPLITTER HARDWARE FOR LOW PRESSURE DUCTS SHALL BE: END BEARINGS - VENTLOK #607 REGULATOR FINISHED AREAS - VENTLOK #666, PLAIN COVER

B. VOLUME DAMPERS SHALL BE LOCATED AT BRANCH TAKE-OFFS AT MAIN TRUNK DUCT. NO DAMPERS (SPLITTER DAMPERS) SHALL BE LOCATED IN THE CENTER OF DUCTS.

PART 3 - EXECUTION

3.1 FABRICATION

A. DUCTWORK SHOWN ON THE DRAWINGS, SPECIFIED, OR REQUIRED FOR HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS SHALL BE CONSTRUCTED AND ERECTED IN A FIRST CLASS MANNER.

B. DUCTS SHALL BE REINFORCED IN ACCORDANCE WITH THE APPROPRIATE SMACNA STANDARDS TO PREVENT BUCKLING, BREATING, VIBRATION AND UNNECESSARY NOISE.

C. PROVIDE MANUALLY OPERATED VOLUME CONTROL DAMPERS IN DUCT BRANCHES, FOR PROPER BALANCING OF AIR DISTRIBUTION. DAMPERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROPRIATE SMACNA STANDARDS.

D. PROVIDE HINGED ACCESS DOORS IN DUCTWORK FOR ACCESS TO ALL SMOKE DETECTORS, SENSORS, AND OTHER CONTROL DEVICES, MANUAL DAMPERS, AND FOR CLEANING OPERATIONS. FACTORY FABRICATED DOORS SIMILAR AND EQUAL TO MILCOR AND MEETING THESE SPECIFICATIONS SHALL BE ACCEPTABLE.

E. WHERE DUCTS CONNECT TO FANS, INCLUDING ROOF EXHAUSTERS PROVIDE FLEXIBLE DUCT FABRIC CONNECTIONS. PROVIDE A MINIMUM OF 3/4 INCH SLACK IN THE CONNECTIONS, AND A MINIMUM OF 2-1/2 INCH DISTANCE BETWEEN THE EDGES OF THE DUCTS, PLUS AN ADDITIONAL MINIMUM IF 1 INCH OF SLACK FOR EACH INCH OF STATIC PRESSURE ON THE FAN SYSTEM.

F. PROVIDE SCREENS ON DUCTS, FANS AND OPENINGS WHICH LEAD TO, OR ARE OUTDOORS. SCREENS SHALL BE 10 GAUGE, 3/4 INCH MESH, IN REMOVABLE GALVANIZED STEEL FRAMES.

G. FURNISH TEST OPENINGS WITH COVERS IN EACH DUCT FOR TAKING READINGS OF AIR VELOCITIES AND PRESSURES IN DUCTS. REFER TO THE APPROPRIATE SMACNA STANDARD FOR COVER CONSTRUCTION.

3.2 DUCT SUPPORTS

A. HORIZONTAL AND VERTICAL SHEET METAL DUCTWORK SHALL BE SUPPORTED IN ACCORDANCE WITH THE APPROPRIATE SMACNA STANDARDS.

B. HANGER DESIGN AND METHODS OF HANGING AND SUPPORTING SHALL BE COMPATIBLE WITH THE STRUCTURE.

END OF SECTION

SECTION 233713 - DIFFUSERS, REGISTERS AND GRILLES

PART 1 - GENERAL

1.1 GENERAL NOTES

A. REFER TO SECTION 230500

PART 2 - PRODUCTS

2.1 AIR INLETS AND OUTLETS

A. GRILLES, REGISTERS, CEILING OUTLETS, AND CEILING INLETS SHALL BE AS INDICATED ON THE DRAWING, AND SHALL BE PROVIDED WITH HEAVY DUTY SPONGE, OR SOFT FELT GASKETS. THE THROW SHALL BE SUCH THAT THE VELOCITY AT THE END OF THE THROW IN THE FIVE (5) FOOT OCCUPANCY ZONE WILL NOT BE MORE THAN 50 FPM NOT LESS THAN 25 FPM. NOISE LEVELS (NC CURVE) SHALL NOT EXCEED 40.

B. IF PRODUCTS OF A MANUFACTURER OTHER THAN THE ONES INDICATED ON THE DRAWINGS ARE USED, THE SIZES SHOWN ON THE DRAWING SHALL BE CHECKED FOR PERFORMANCE, NOISE LEVEL, FACE VELOCITY, THROW AND PRESSURE DROP BEFORE THE SUBMITTAL IS MADE. SELECTIONS SHALL MEET THE MANUFACTURER'S OWN PUBLISHED DATA FOR THE ABOVE PERFORMANCE CRITERIA. SHOULD DEVICES OTHER THAN THOSE SCHEDULED BY NAME BE FURNISHED, THE MANUFACTURER SHALL DEMONSTRATE COMPLIANCE WITH NOISE CRITERIA, ON REQUEST, TO THE ARCHITECT'S SATISFACTION.

C. WHERE CALLED FOR IN SCHEDULES, THE GRILLES, REGISTERS, CEILING OUTLETS, AND CEILING INLETS SHALL BE PROVIDED WITH DEFLECTING DEVICES AND MANUAL DAMPERS. THESE SHALL BE STANDARD PRODUCTS OF THE MANUFACTURER, SUBJECT TO REVIEW BY THE ARCHITECT, AND SHALL BE SIMILAR AND EQUAL TO THOSE SCHEDULED.

PART 3 - EXECUTION

3.1 INSTALLATION

A. LOCATIONS OF OUTLETS SHOWN ON THE DRAWINGS ARE APPROXIMATE. COORDINATE THE EXACT LOCATION WITH REFLECTED CEILING PLAN AND OTHER TRADES.

B. VERIFY THE TYPE OF CEILING SYSTEM AND MATERIAL INTO EACH OF THE AIR INLETS AND OUTLETS IS TO BE INSTALLED, AND PROVIDE EQUIPMENT, WHICH PROPERLY "FITS" WHETHER SPECIFICALLY, SO INDICATED OR NOT ON THE DRAWINGS.

END OF SECTION

SECTION 232300 - REFRIGERANT PIPING

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. REFER TO SECTION 230500.

PART 2 - PRODUCTS

2.1 COPPER PIPE

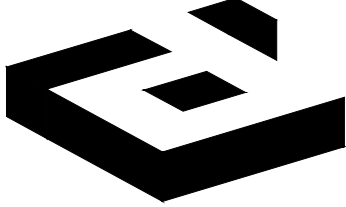
A. PIPING SHALL BE COPPER TYPE ACR WITH WROUGHT COPPER FITTINGS AND BRAZED JOINTS.

PART 3 - EXECUTION

3.1 INSTALLATION

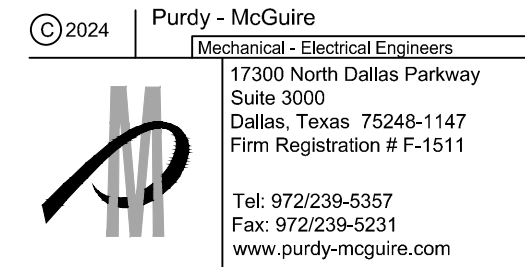
A. REFER TO SECTION 230529 FOR METHODS OF SUPPORTING ALL PIPING.

END OF SECTION



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ARCHITECT/ENGINEER



FPM JOB NO. 24007.004
PROJECT MGR. TODD JOHNSON

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R.S.F.: 2/6/11



CYPRESS WATERS

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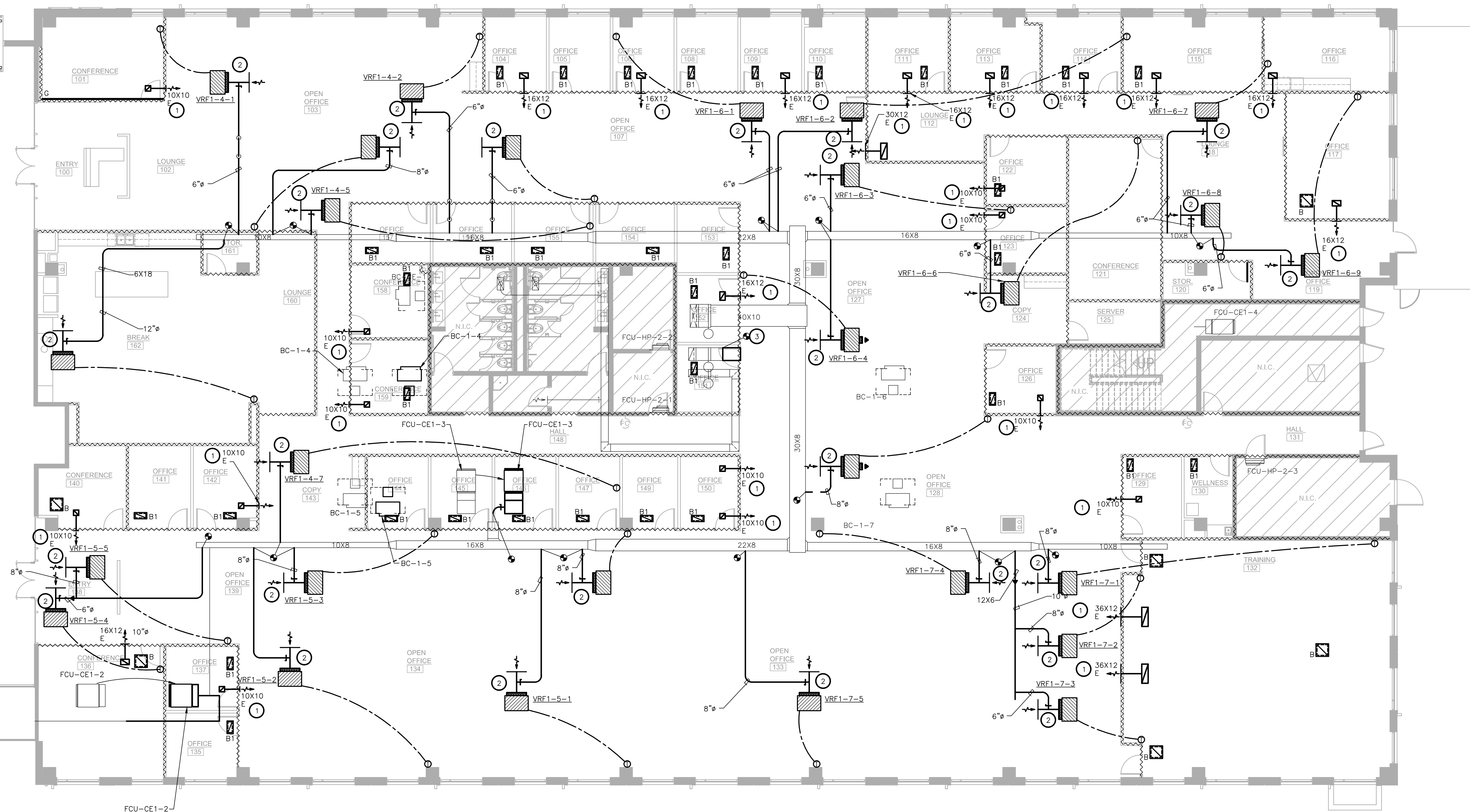
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DALLAS, TX 75019

NOTES BY SYMBOL:

1. PROVIDE ACOUSTICALLY LINED RETURN AIR BOOT TRANSFER GRILLE IN WALL TO DECK AS HIGH AS POSSIBLE ABOVE CEILING WITH INLET 90° ELBOW FACING UPWARD. SIZE PER PLANS. REFER TO DETAIL ON SHEET M3.01 FOR MORE INFORMATION.
2. EXTEND FULL SIZED RETURN PLENUM A MINIMUM OF 5'-0" OR AS FAR AS POSSIBLE FROM VRF AS SHOWN. PROVIDE WIRE MESH WITH A MINIMUM OF 50% FREE AREA AT RETURN AIR OPENING. CONNECT OUTSIDE AIR DUCT WITH BALANCING DAMPER AS SHOWN ON DETAIL LOCATED ON SHEET M3.01.
3. EXTEND FULL SIZED RELIEF DUCT THRU WALL TO DECK USING SAME METHODS AND MATERIALS TO MATCH EXISTING.

RETURN AIR NOTES:

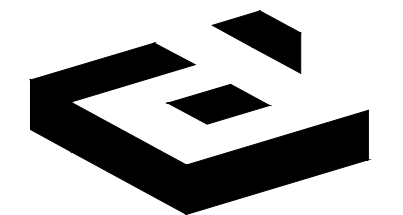
- EXISTING RETURN AIR CONDITIONS ARE BASED ON INFORMATION PROVIDED BY SITE SURVEY AND PREVIOUS RECORD DRAWINGS. HOWEVER, IT IS NOT INTENDED TO BE A TRUE REPRESENTATION OF ACTUAL RETURN AIR CONDITIONS. CONTRACTOR SHALL ENSURE A CLEAR UNOBSTRUCTED PATH BACK TO MAIN RETURN AIR IN MECHANICAL ROOM AND MAKE ALL REQUIRED MODIFICATIONS AS NEEDED TO ENSURE CLEAR RETURN AIR PATH.
- WALLS TO DECK INDICATED ON THESE DRAWINGS ARE BASED ON OUR UNDERSTANDING OF ARCHITECTURAL PLANS. COORDINATE ALL WALLS TO DECK WITH ARCHITECT AND INFORM THE ARCHITECT OF ANY DIFFERENCES WITH THIS PLAN PRIOR TO BIDDING. ANY ADDITIONAL BOOTS REQUIRED SHALL BE SIZED AT 500 FPM.
- ALL CUTTING AND CHANNELING OF EXISTING BOOTINGS SHALL BE ACCOMPLISHED IN A NEAT AND WORKMANLIKE MANNER WITHOUT REMOVAL OF EXCESS MATERIALS. THIS CONTRACTOR SHALL PATCH AND REPLACE WITH MATERIAL SIMILAR TO ADJACENT CONSTRUCTION. ALL BOOTS SHALL BE SEALED AT THE WALL PENETRATION.
- ALL WORK MUST BE COORDINATED AND SCHEDULED WITH THE OWNER AND OCCUPANTS OF THIS BUILDING SO AS TO PROVIDE THE LEAST AMOUNT OF DISRUPTION OF THE NORMAL BUILDING ACTIVITIES AS POSSIBLE. MAINTAIN CONDITIONED SPACE FOR ALL OWNER OCCUPIED AREAS DURING CONSTRUCTION.
- RETURN AIR BOOTS SHOWN ON DRAWINGS SHALL BE 1" INSULATED SHEET METAL BOOTS. CONTRACTOR SHALL PROVIDE PRICING FOR DUCT BOARD IN LIEU OF SHEET METAL BOOTS.



**SUITE 180
AVAILABLE**

REFER TO SHEET M0.01
FOR KEYED NOTES AND
ADDITIONAL SHEET NOTES.

1 LEVEL 01 MECHANICAL RETURN AIR PLAN
SCALE: 1/8"=1'-0"



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ARCHITECT/ENGINEER

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SEAL



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CHECKED BY: MW
R.S.F.: 27,611

**BILLINGSLEY
COMPANY**

**CYPRESS WATERS
SENSE**

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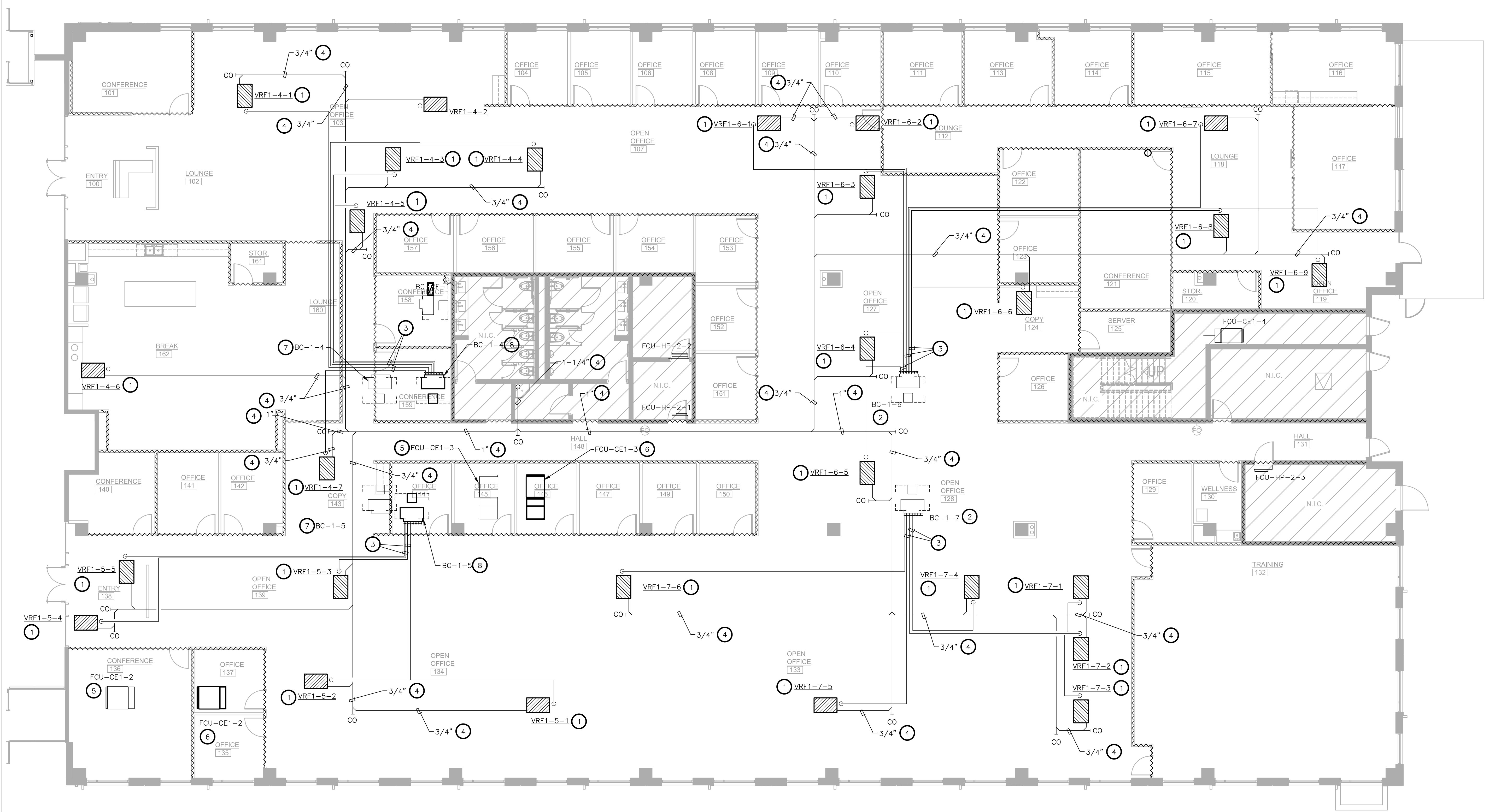
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BID ISSUE DATE: 09/13/2024
PERMIT ISSUE DATE: 09/13/2024

DRAWING TITLE:
**LEVEL 01 MECHANICAL
RETURN AIR PLAN**

DRAWING NUMBER:
M2.11

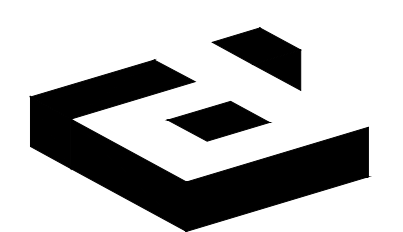
NOTES BY SYMBOL (X) :

1. FC UNIT TO BE SUSPENDED FROM STRUCTURE USING ALTHREAD HANGER RODS.
2. EXISTING BRANCH CONTROLLER SUSPENDED FROM STRUCTURE WITH ISOLATION SPRINGS.
3. COORDINATE WITH MANUFACTURER'S SPECIFICATIONS FOR REFRIGERANT REQUIREMENTS. COORDINATE ROUTING FROM FC UNIT TO BRANCH CONTROLLER. LOCATION OF FCU SHALL NOT EXCEED 150' OF PIPING BETWEEN UNITS.
4. EXTEND AN INSULATED CONDENSATE DRAIN AND DISCHARGE TO NEAREST EXISTING CONDENSATE DRAIN AS SHOWN ON DRAWINGS. ALL PIPING SHALL BE INSTALLED AS HIGH AS POSSIBLE, AND SLOPED AT 1/8" PER FOOT TOWARDS FLOOR DRAIN. PROVIDE CONDENSATE PUMP CAPABLE OF A MINIMUM OF 10' OF HEAD PRESSURE WITH UNIT IF REQUIRED SLOPE IS UNATTAINABLE.
5. EXISTING LOCATION OF FAN COIL UNIT TO BE RELOCATED UNDER THIS CONTRACT. CLEAN AND REPAIR FCU AS REQUIRED TO RESTORE TO LIKE NEW CONDITION. REMOVE EXISTING REFRIGERANT PIPING AND CONDENSATE PIPING AS REQUIRED FOR EXTENSION TO NEW LOCATION.
6. NEW LOCATION OF FAN COIL UNIT. EXTEND NEW REFRIGERANT PIPING AND CONDENSATE PIPING TO NEW LOCATION SHOW ON DRAWINGS. DRAIN AND CLEAN EXISTING REFRIGERANT PIPING PRIOR TO RECONNECTION. PROVIDE PRESSURE TESTING OF REFRIGERANT PIPING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
7. EXISTING BRANCH CONTROLLER TO BE RELOCATED. DISCONNECT EXISTING REFRIGERANT PIPING FROM INLET AND OUTLET SIDE OF CONTROLLER. REFER TO DRAWINGS FOR NEW LOCATION.
8. NEW LOCATION OF EXISTING BRANCH CONTROLLER. EXTEND INLET REFRIGERANT PIPING FROM CURRENT LOCATION TO NEW LOCATION. CONTRACTOR IS RESPONSIBLE FOR ANY EXISTING CONNECTIONS AT CONTROLLERS NEW LOCATION. RELOCATION OF UNIT SHALL BE COORDINATED WITH BUILDING MANAGEMENT AND OTHER TRADES INVOLVED.



**SUITE 180
AVAILABLE**

1 LEVEL 01 MECHANICAL RETURN AIR PLAN
SCALE: 1/8"=1'-0"



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CHECKED BY: MW
R.S.F.: 27,611

**BILLINGSLEY
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SENSE**

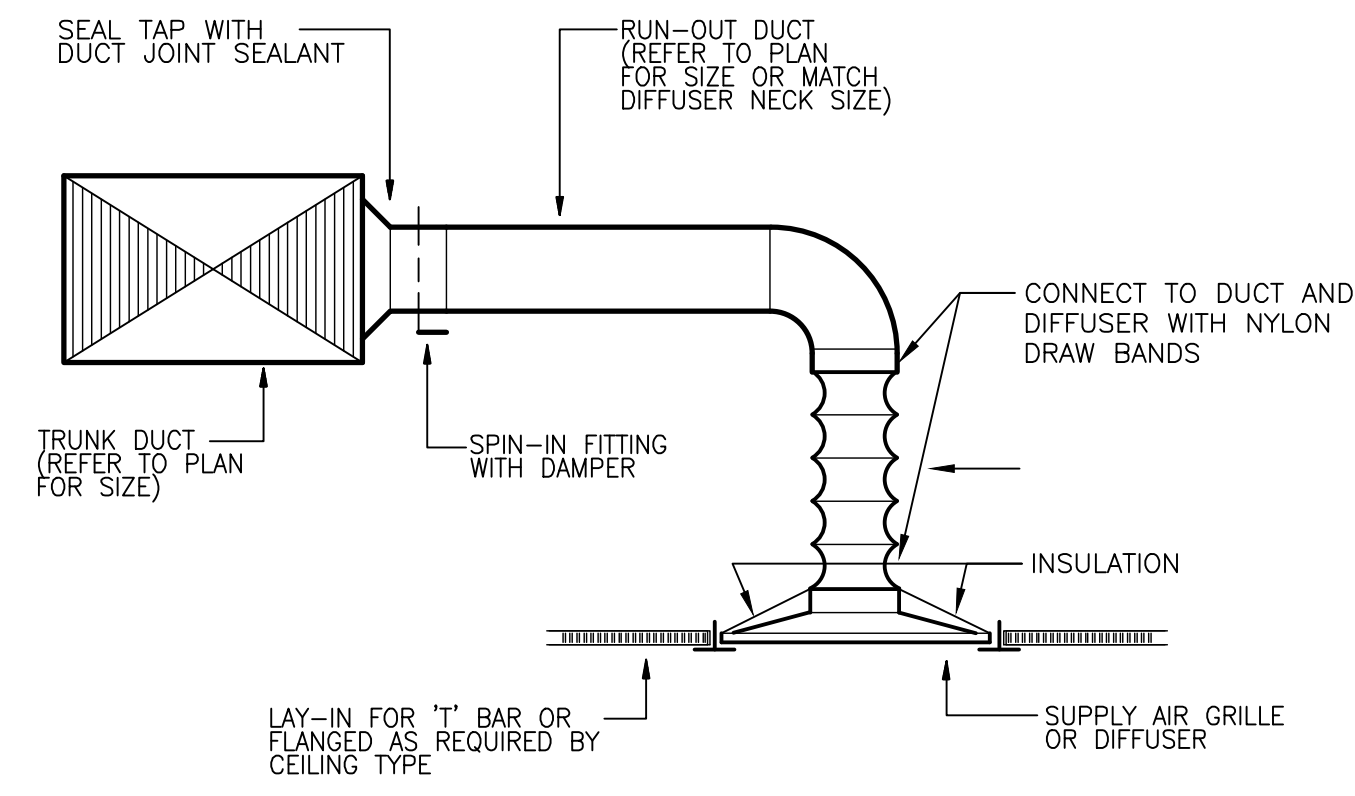
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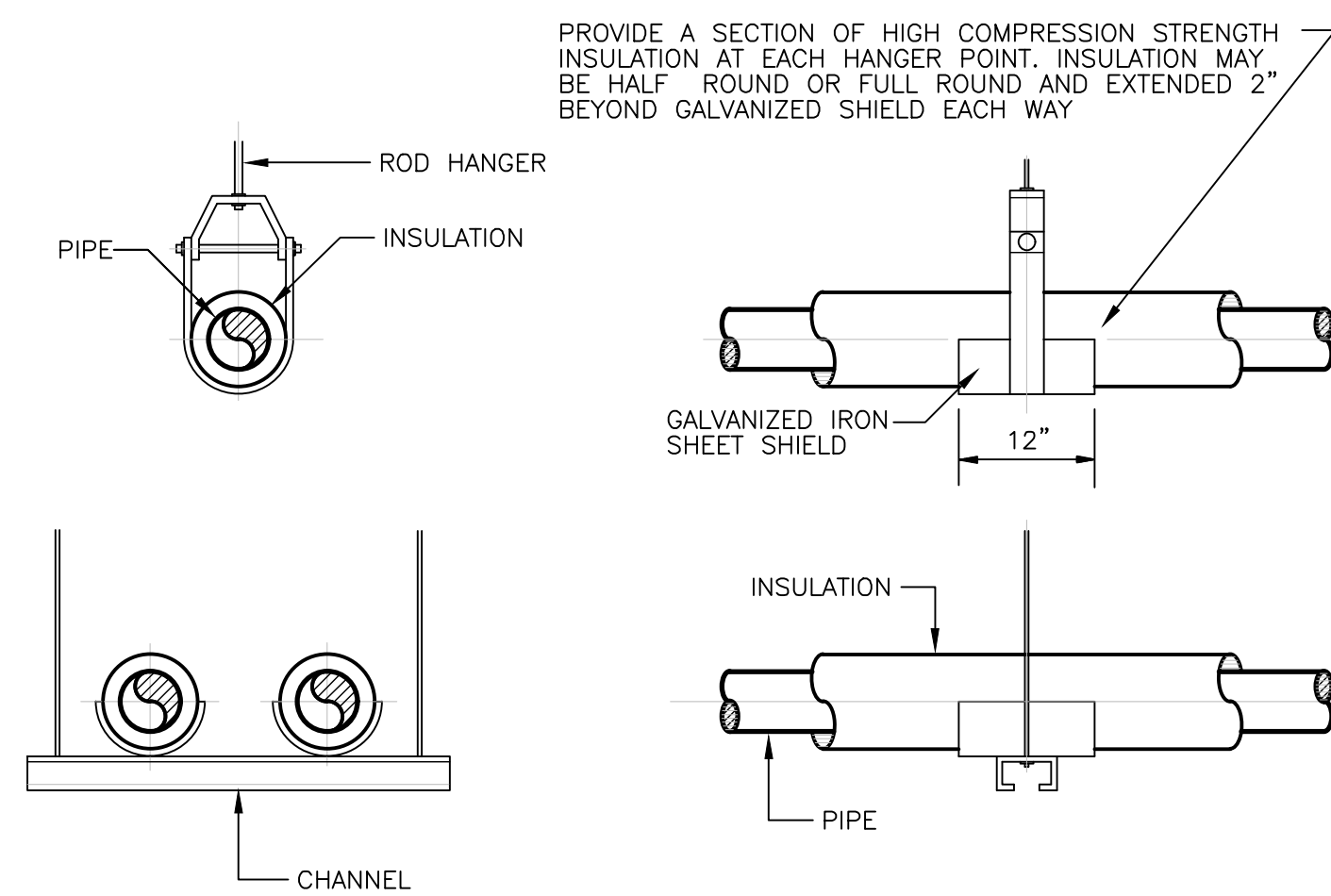
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**LEVEL 01 MECHANICAL PIPING
PLAN**

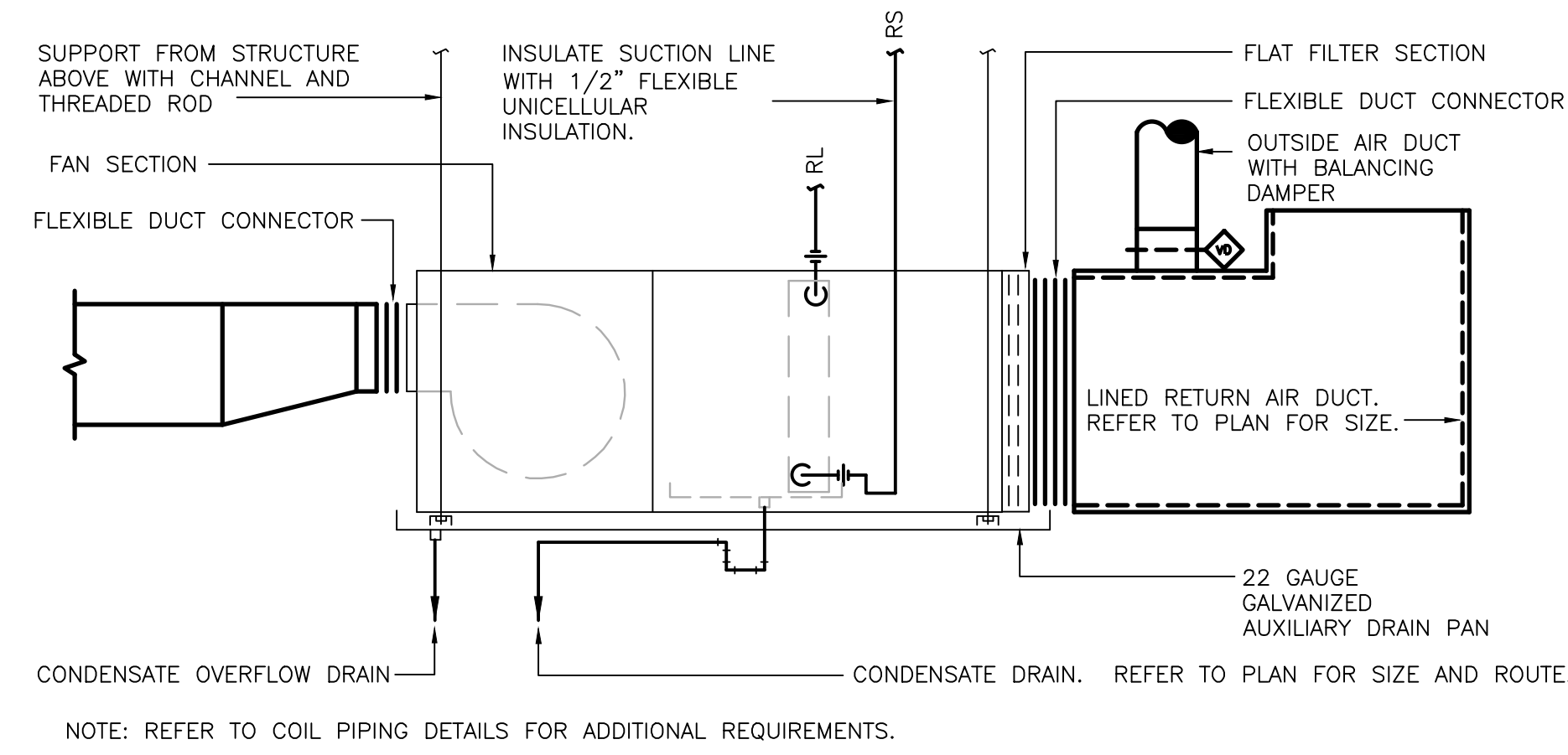
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M2.21



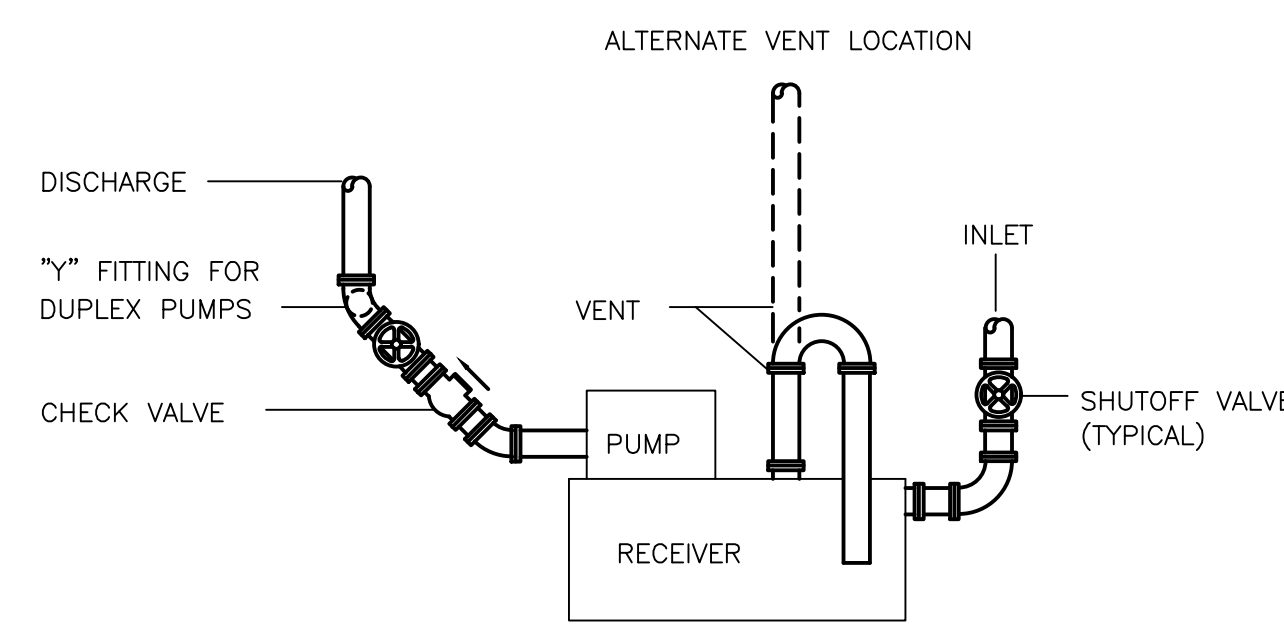
1 DIFFUSER CONNECTION DETAIL
SCALE: NOT TO SCALE



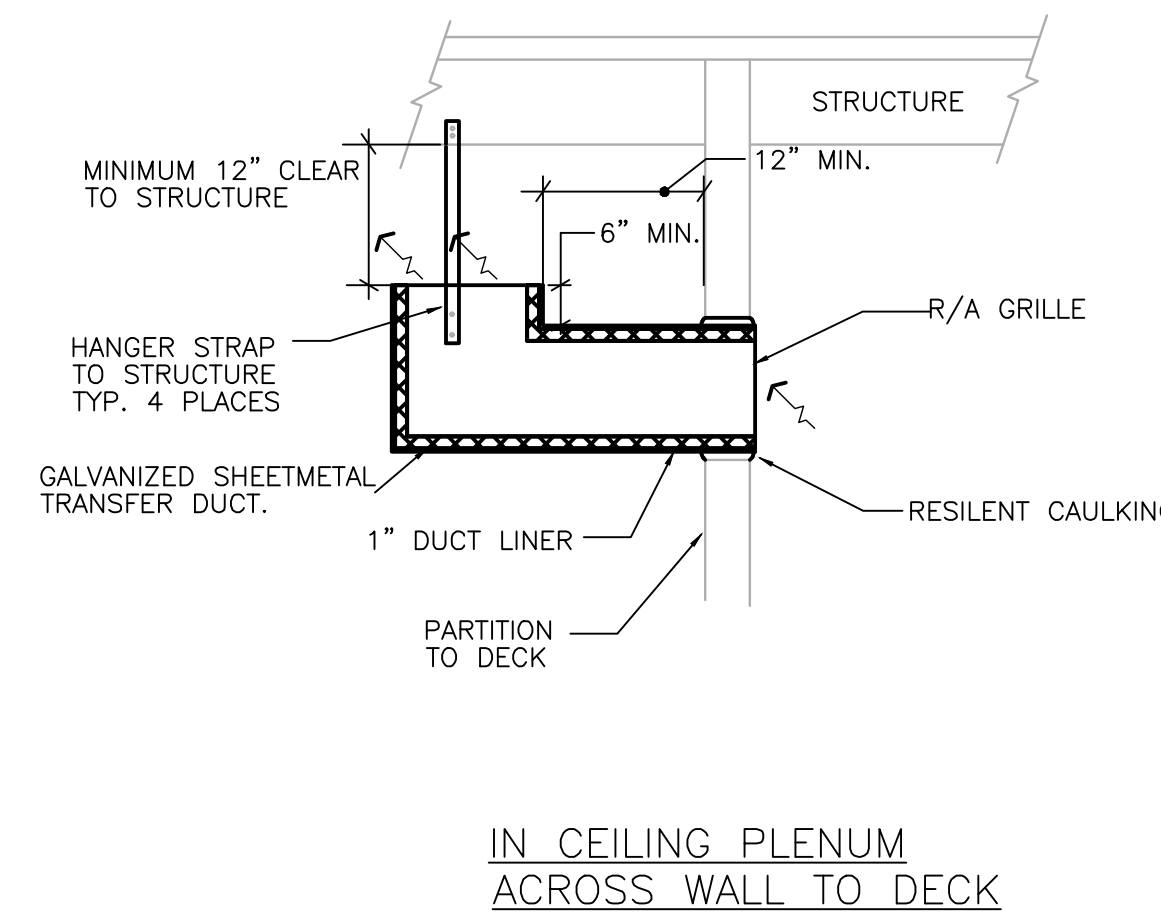
5 PIPE HANGING SUPPORT DETAILS
SCALE: NOT TO SCALE



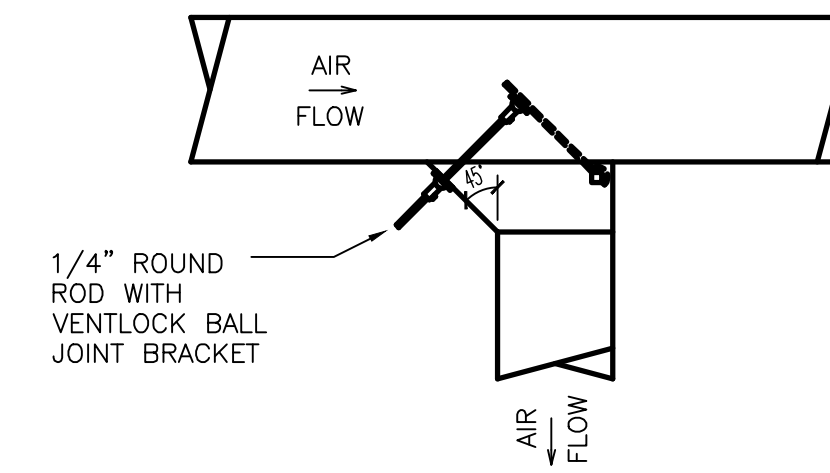
2 VFR UNIT INSTALLATION DETAILS
SCALE: NOT TO SCALE



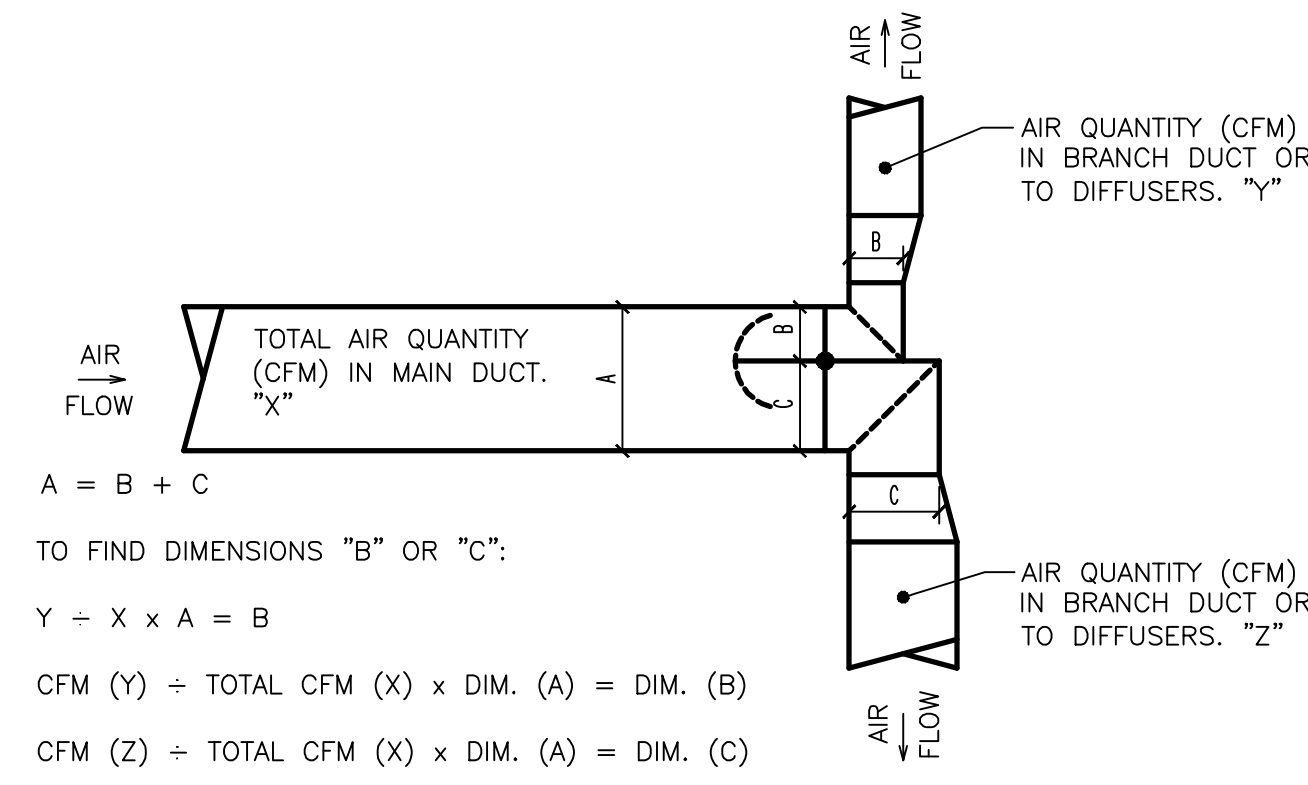
4 CONDENSATE PUMP DETAIL
SCALE: NOT TO SCALE



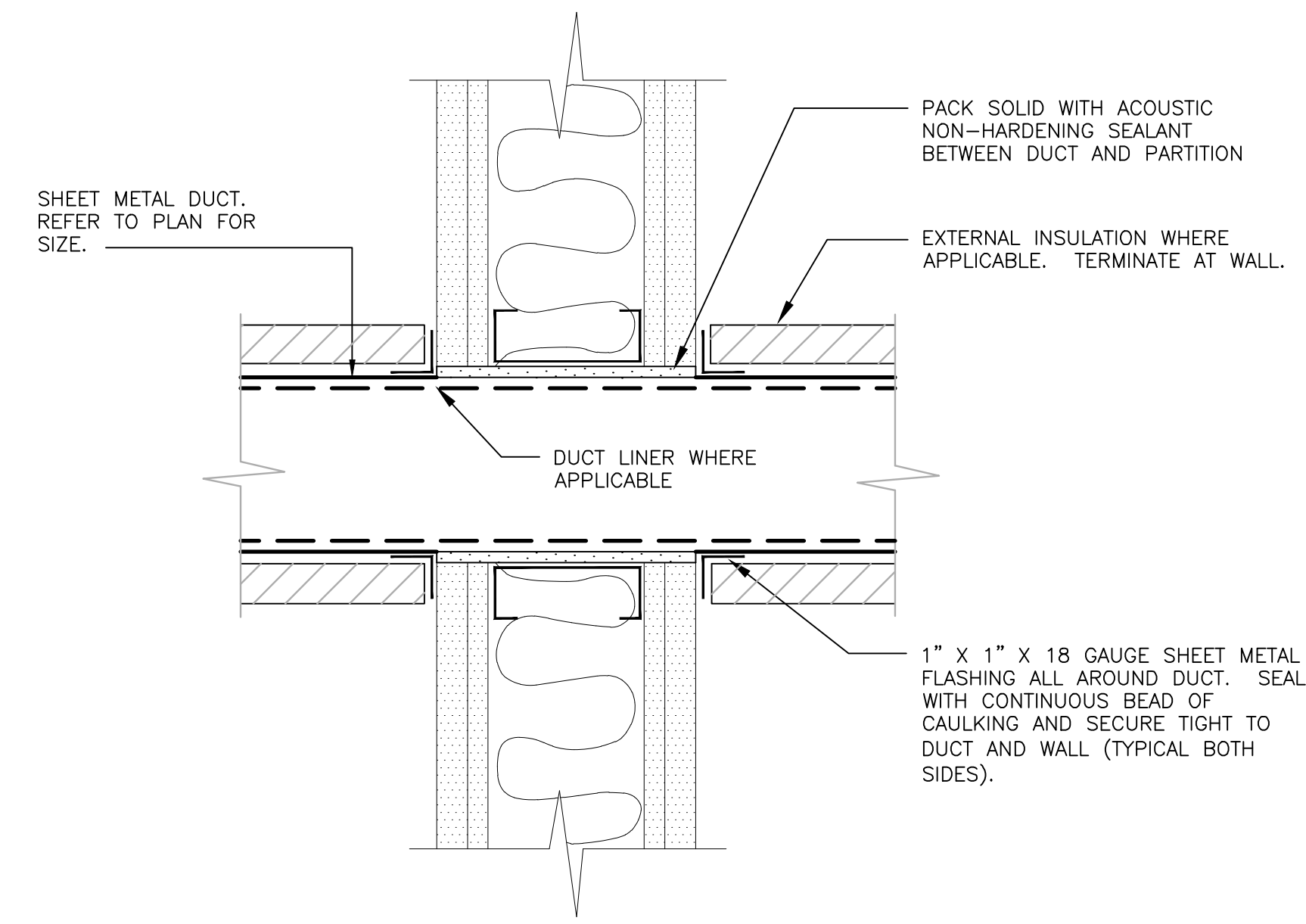
6 RA TRANSFER BOOT DETAIL
SCALE: NOT TO SCALE



3 EXPANDED TAP DETAIL
SCALE: NOT TO SCALE



5 TYPICAL SPLITTER DAMPER DETAIL
SCALE: 5



7 DUCT PENETRATION AT SOUND WALL
SCALE: NOT TO SCALE

IN CEILING PLENUM
ACROSS WALL TO DECK

NO.	REVISIONS	DATE

CLIENT/LANDLORD ISSUE DATE: 09/13/2024
BID ISSUE DATE: 09/13/2024
PERMIT ISSUE DATE: 09/13/2024

DRAWING TITLE:
MECHANICAL DETAILS

DRAWING NUMBER:
M3.01