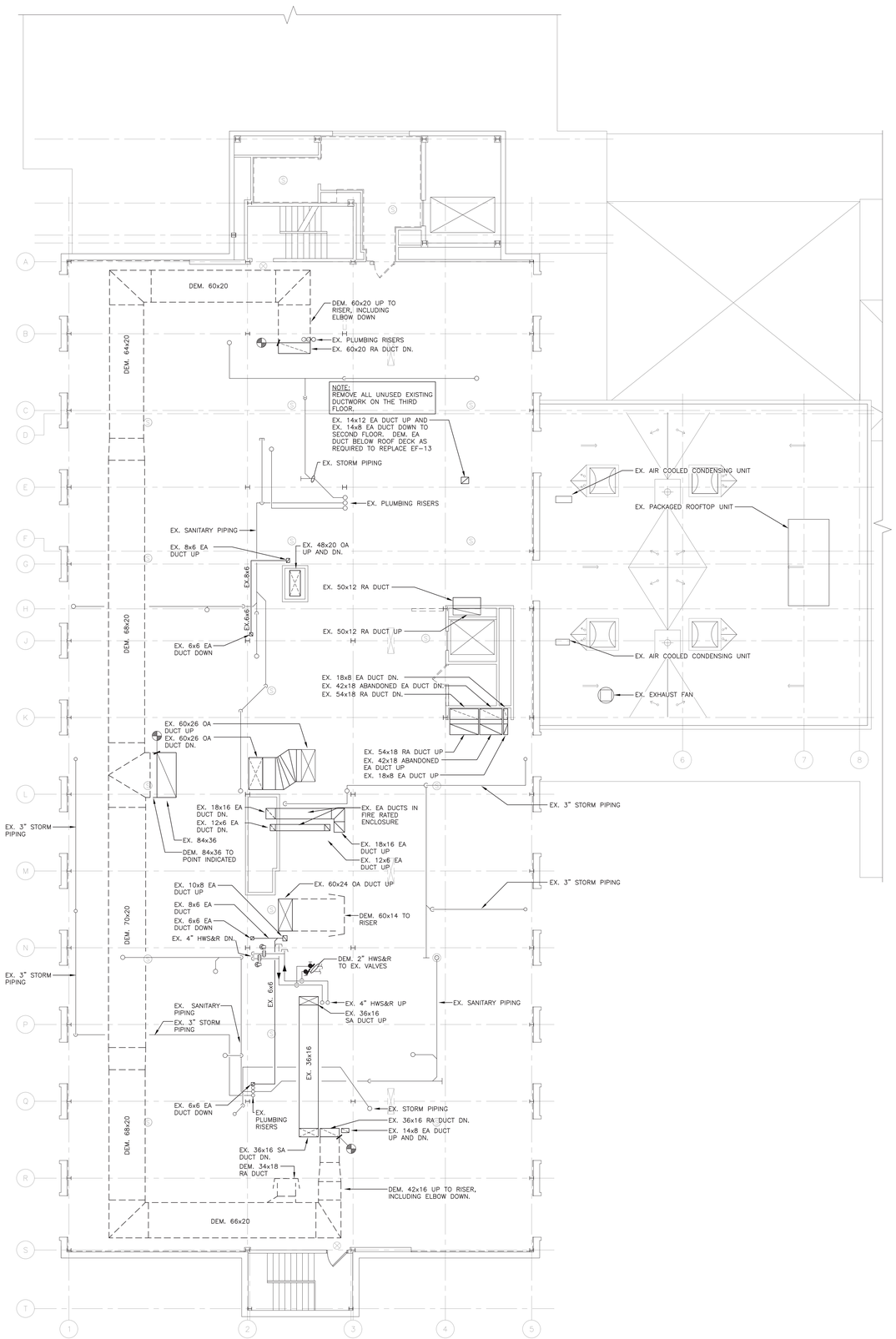
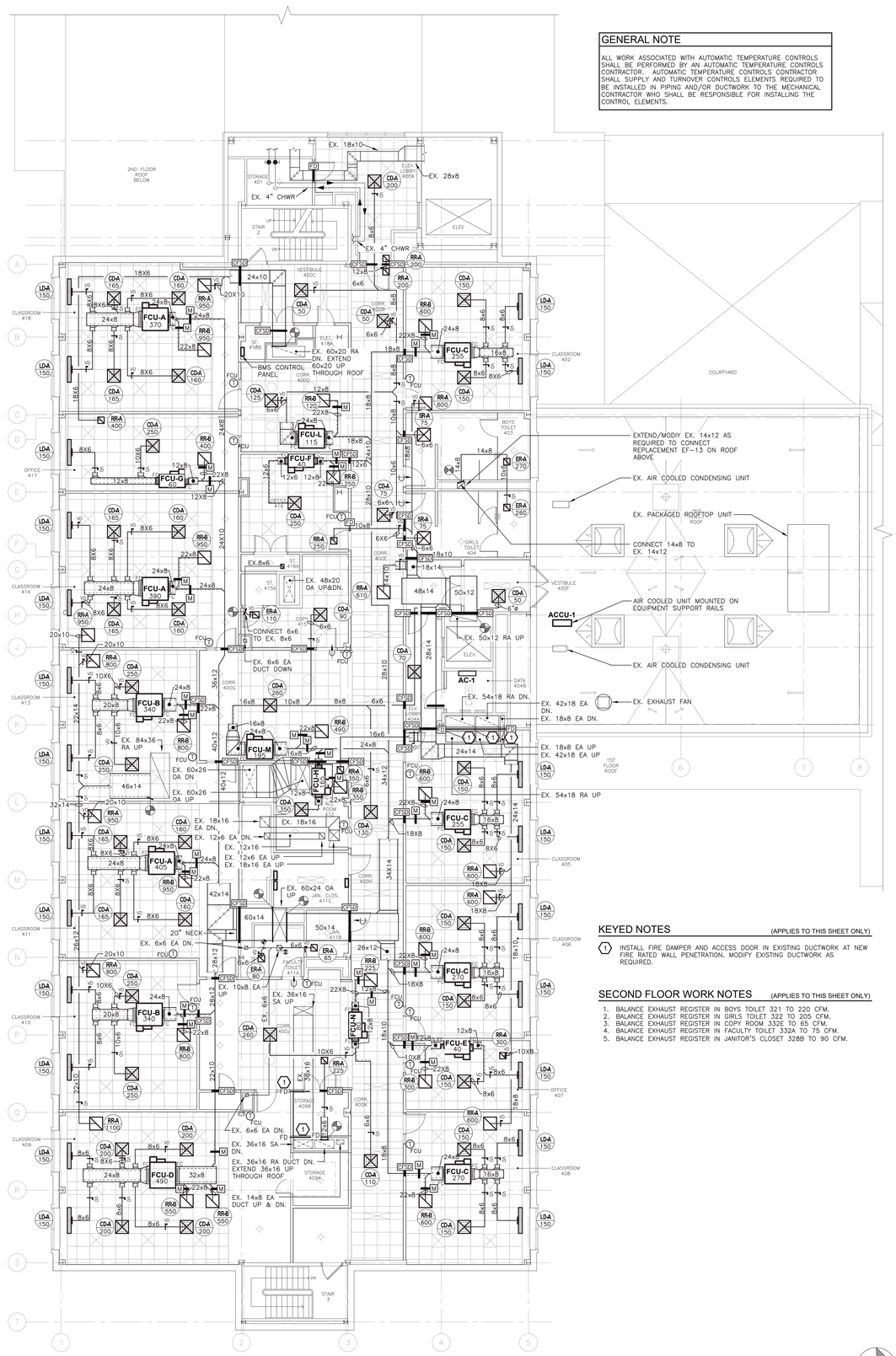


1 MECHANICAL: THIRD FLOOR DEMOLITION PLAN
1/8" = 1'-0"



2 MECHANICAL: THIRD FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTE

ALL WORK ASSOCIATED WITH AUTOMATIC TEMPERATURE CONTROLS SHALL BE PERFORMED BY AN AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR. AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL SUPPLY AND TURNOVER CONTROLS ELEMENTS REQUIRED TO BE INSTALLED IN PIPING AND/OR DUCTWORK TO THE MECHANICAL CONTRACTOR WHO SHALL BE RESPONSIBLE FOR INSTALLING THE CONTROL ELEMENTS.

KEYED NOTES (APPLIES TO THIS SHEET ONLY)

1. INSTALL FIRE DAMPER AND ACCESS DOOR IN EXISTING DUCTWORK AT NEW FIRE RATED WALL PENETRATION. MODIFY EXISTING DUCTWORK AS REQUIRED.

SECOND FLOOR WORK NOTES (APPLIES TO THIS SHEET ONLY)

1. BALANCE EXHAUST REGISTER IN BOYS TOILET 321 TO 220 CFM.
2. BALANCE EXHAUST REGISTER IN GIRLS TOILET 322 TO 205 CFM.
3. BALANCE EXHAUST REGISTER IN COPY ROOM 332E TO 65 CFM.
4. BALANCE EXHAUST REGISTER IN FACULTY TOILET 332A TO 75 CFM.
5. BALANCE EXHAUST REGISTER IN JANITOR'S CLOSET 328B TO 90 CFM.

PROJECT NORTH

0 4' 8' 16'

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

ORANGE-ULSTER BOCES Regional Education Center at Arden Hill

Interior Alterations

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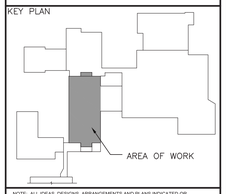
KEY PLAN



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No.	Date	Issue
2	09/22/23	ISSUED FOR BID
1	03/30/23	S.E.D. SUBMISSION

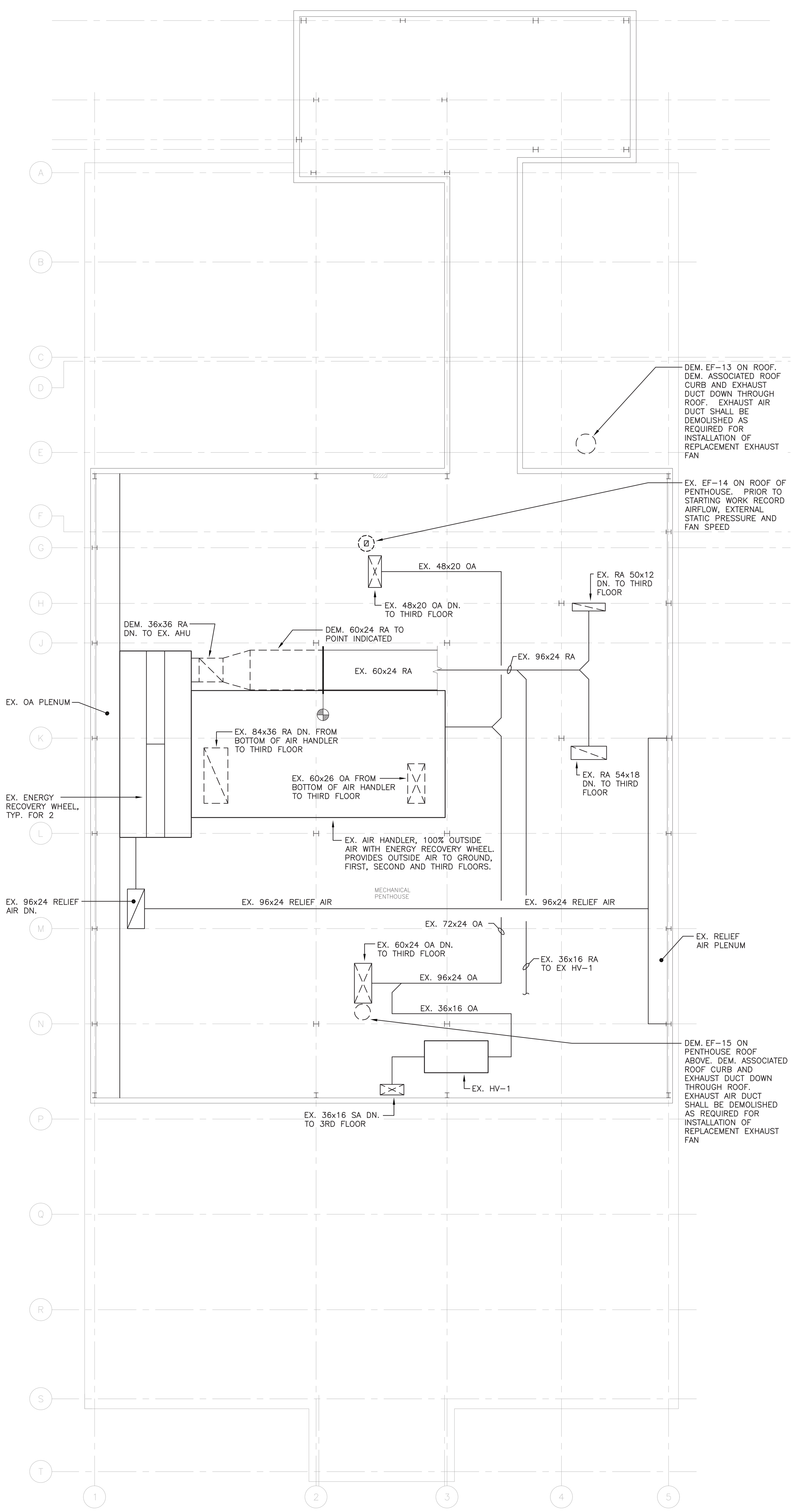
Sheet Title

MECHANICAL: THIRD FLOOR PLANS

Job No.	2023-1008
Date	03-30-23
Scale	AS NOTED
Drawn/Checked	KC/SZ

Sheet No.

M201

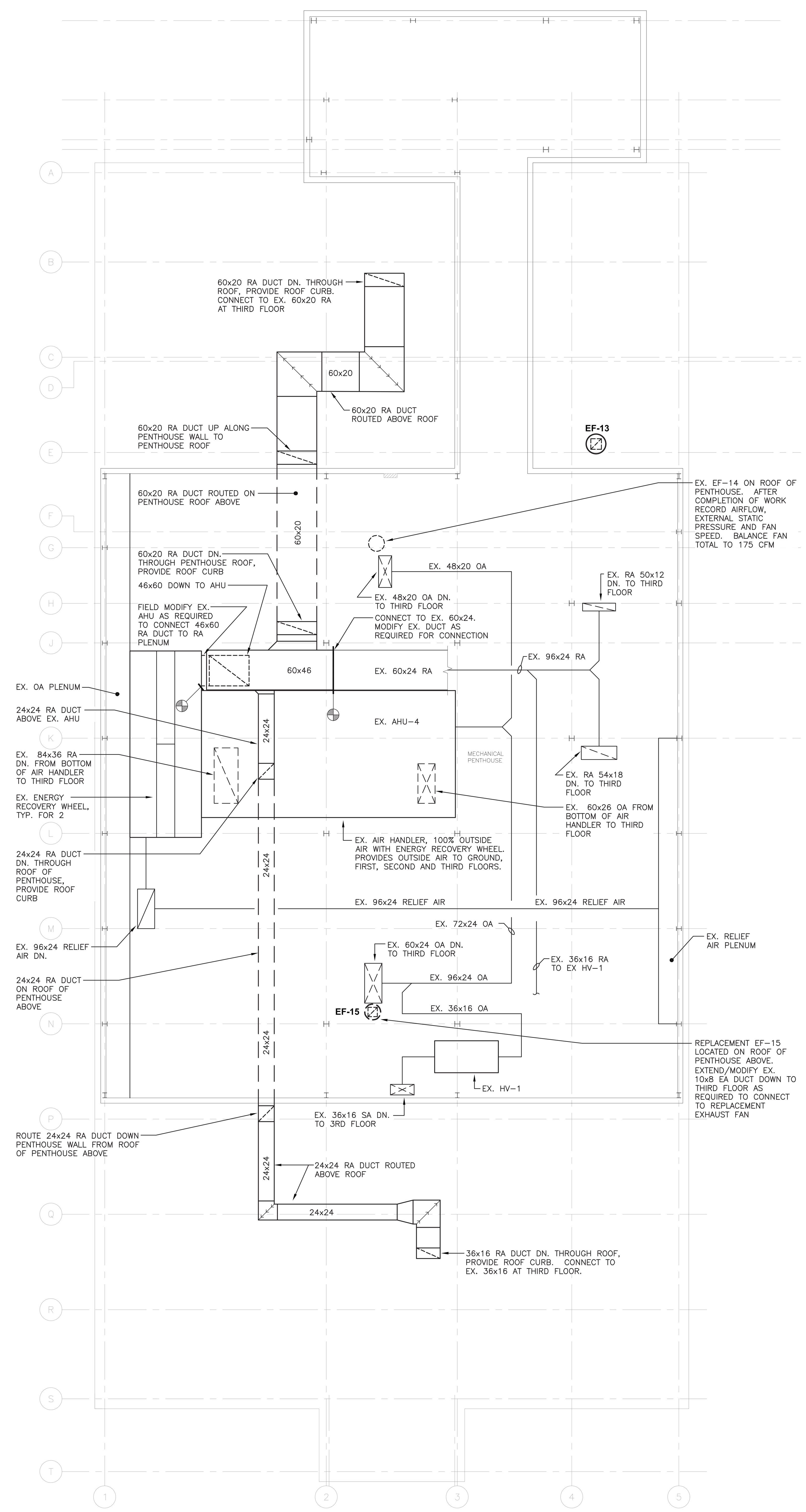


1 MECHANICAL: PENTHOUSE DEMOLITION PLAN

1/8" = 1'-0"

GENERAL NOTE

ALL WORK ASSOCIATED WITH AUTOMATIC TEMPERATURE CONTROLS SHALL BE PERFORMED BY AN AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR. AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL SUPPLY AND TURNOVER CONTROLS ELEMENTS REQUIRED TO BE INSTALLED IN PIPING AND/OR DUCTWORK TO THE MECHANICAL CONTRACTOR WHO SHALL BE RESPONSIBLE FOR INSTALLING THE CONTROL ELEMENTS.



2 MECHANICAL: PENTHOUSE PLAN

1/8" = 1'-0"

PROJECT NORTH

0 4' 8' 16'

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

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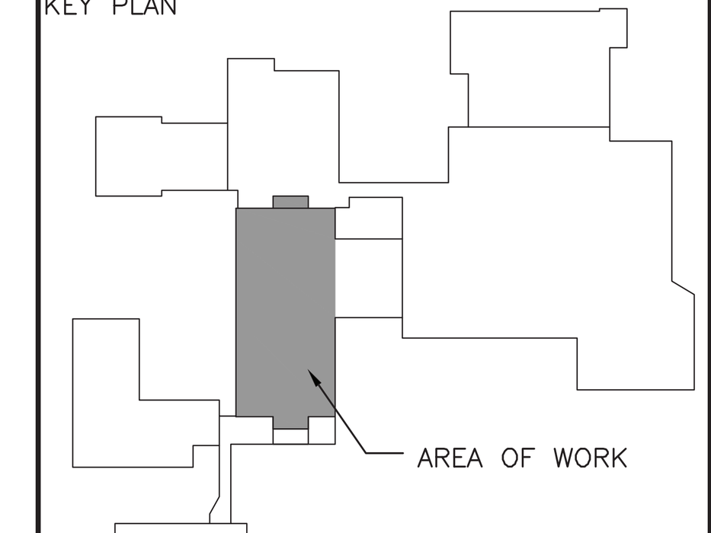
KEY PLAN



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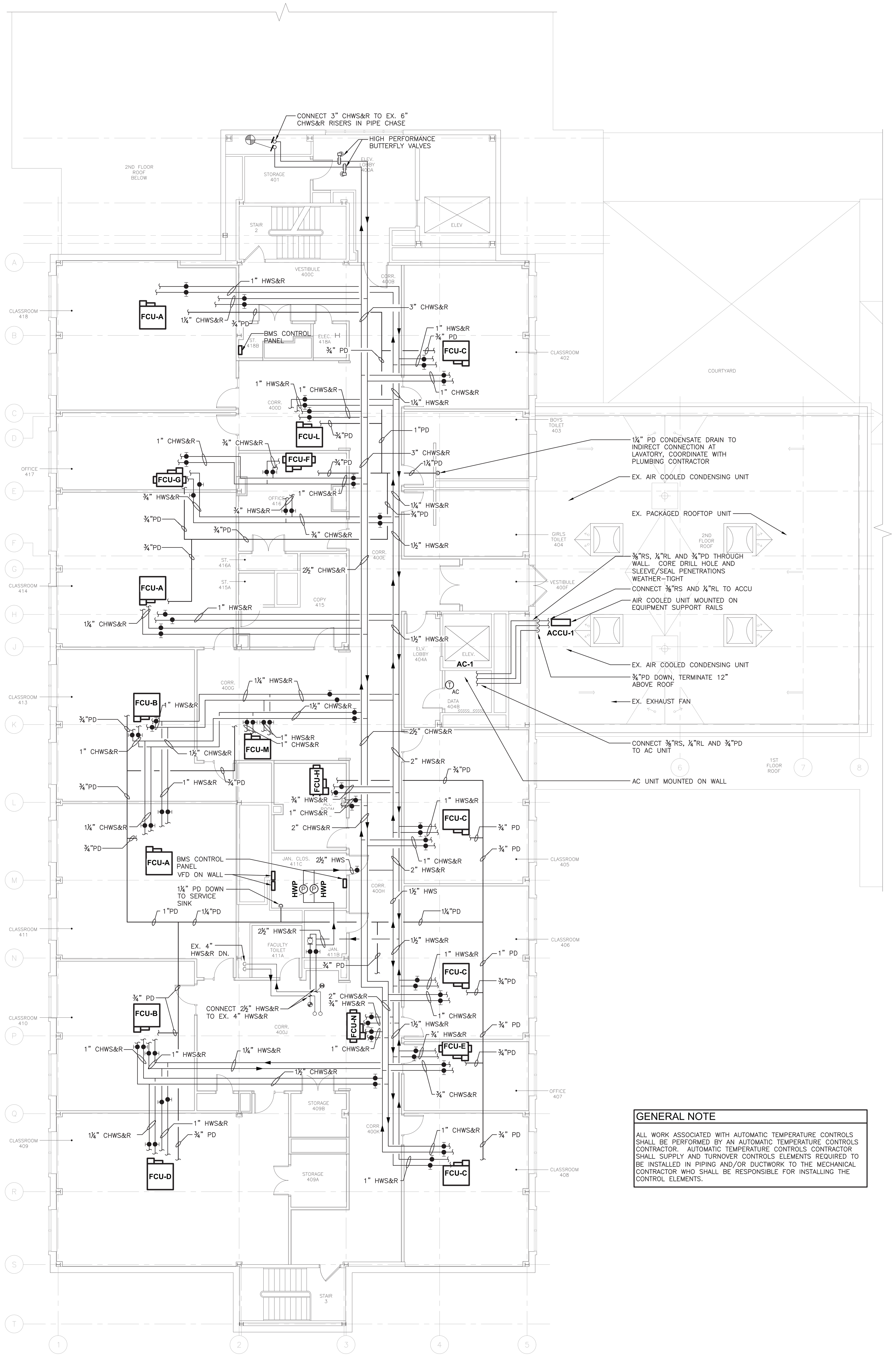
No.	Date	Issue
2	09/22/23	ISSUED FOR BID
1	03/30/23	S.E.D. SUBMISSION

Sheet Title

MECHANICAL: PENTHOUSE PLANS

Job No. 2023-1008	Sheet No. M202
Date 03-30-23	
Scale AS NOTED	
Drawn/Checked KC/SZ	



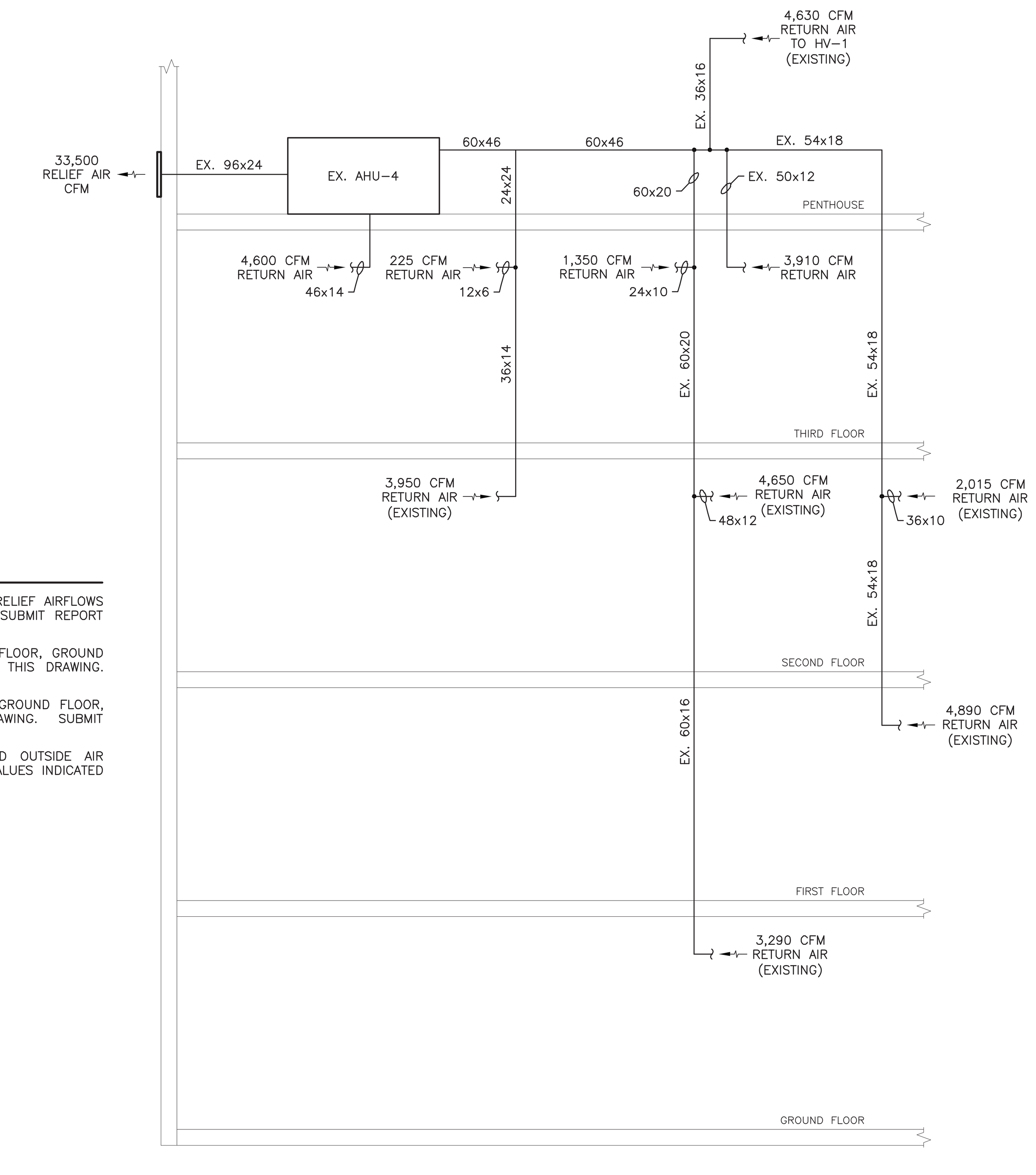
1 MECHANICAL: THIRD FLOOR PIPING PLAN
1/8" = 1'-0"

NOTES

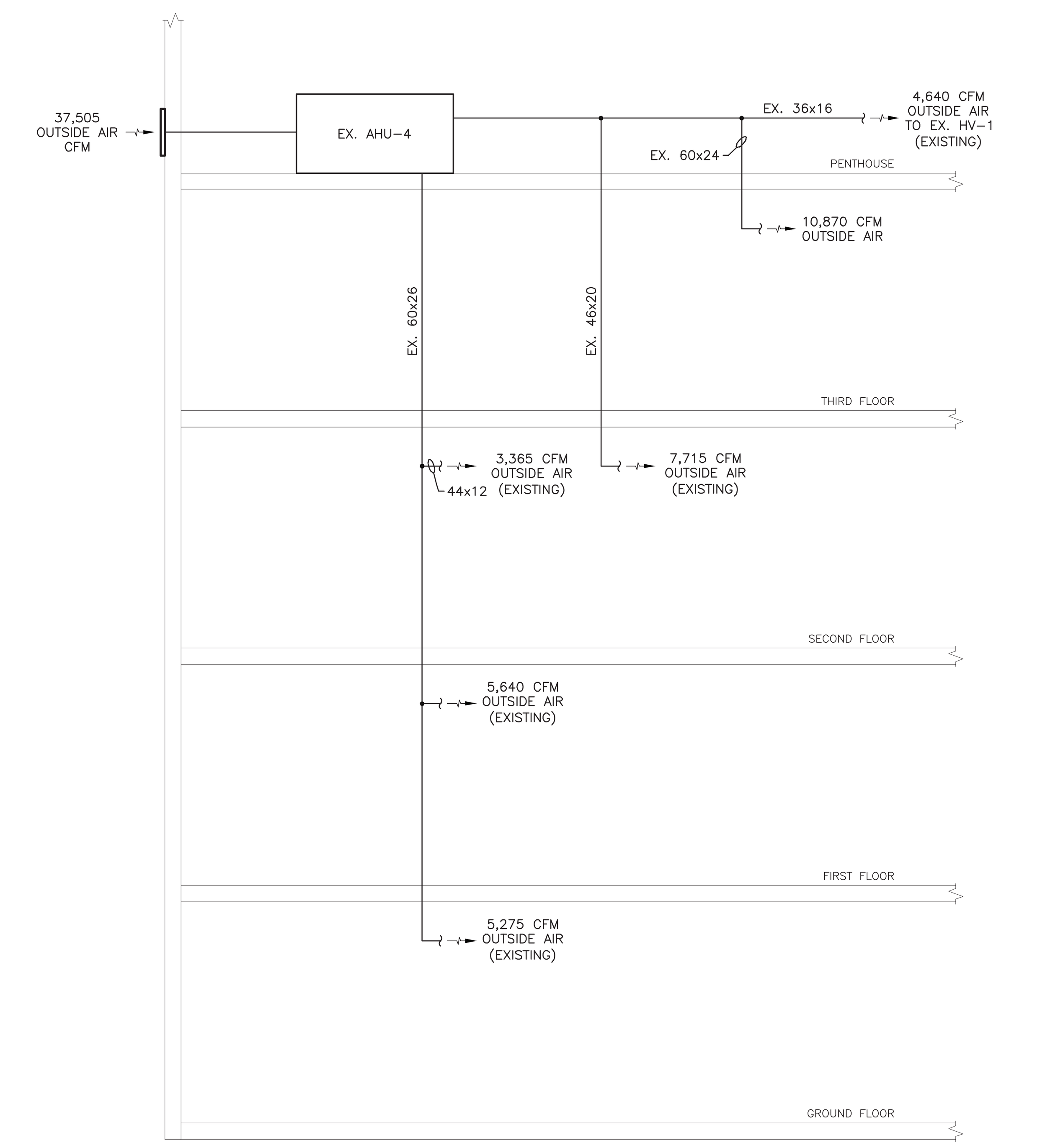
1. PRIOR TO BEGINNING WORK RECORD TOTAL SUPPLY, RETURN, OUTSIDE AND RELIEF AIRFLOWS AT EXISTING AHU-4. RECORD FAN SPEEDS AND TOTAL STATIC PRESSURES. SUBMIT REPORT TO ENGINEER.
2. PRIOR TO BEGINNING WORK RECORD OUTSIDE AIRFLOW DELIVERED TO FIRST FLOOR, GROUND FLOOR AND EXISTING HV-1. REFER TO OUTSIDE AIR RISER DIAGRAM ON THIS DRAWING. SUBMIT REPORT TO ENGINEER.
3. PRIOR TO BEGINNING WORK RECORD RETURN AIRFLOW FROM FIRST FLOOR, GROUND FLOOR, AND EXISTING HV-1. REFER TO RETURN AIR RISER DIAGRAM ON THIS DRAWING. SUBMIT REPORT TO ENGINEER.
4. AFTER COMPLETION OF WORK BALANCE EXISTING AHU-4 AND ASSOCIATED OUTSIDE AIR INTAKES AND RISERS, AND RETURN RISERS, AND RELIEF AIR DUCTWORK TO VALUES INDICATED IN RISER DIAGRAMS ON THIS DRAWING.

GENERAL NOTE

ALL WORK ASSOCIATED WITH AUTOMATIC TEMPERATURE CONTROLS SHALL BE PERFORMED BY AN AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR. AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL SUPPLY AND TURNOVER CONTROLS ELEMENTS REQUIRED TO BE INSTALLED IN PIPING AND/OR DUCTWORK TO THE MECHANICAL CONTRACTOR WHO SHALL BE RESPONSIBLE FOR INSTALLING THE CONTROL ELEMENTS.



2 EXISTING AHU-4 RETURN AIR RISER DIAGRAM
NOT TO SCALE



2 EXISTING AHU-4 OUTSIDE AIR RISER DIAGRAM
NOT TO SCALE

PROJECT NORTH

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

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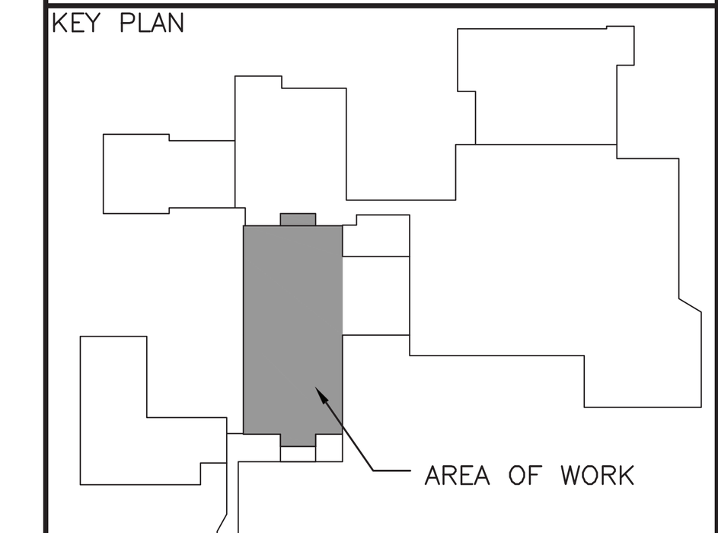
KEY PLAN



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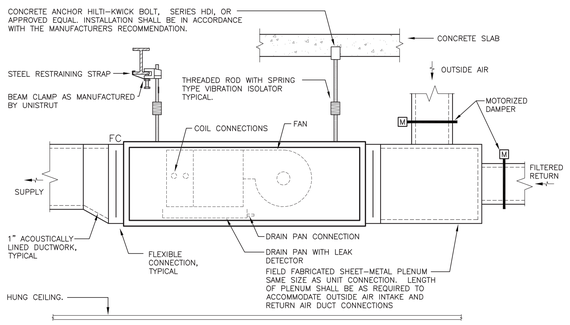
No.	Date	Issue
2	09/22/23	ISSUED FOR BID
1	03/30/23	S.E.D. SUBMISSION

Sheet Title

MECHANICAL: THIRD FLOOR PIPING PLAN & AIRFLOW RISER DIAGRAMS

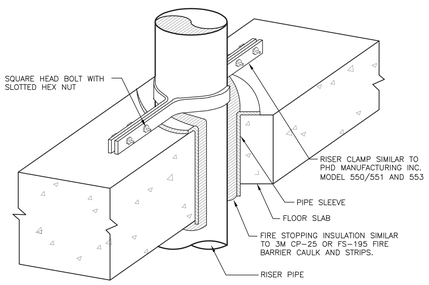
Job No. 2023-1008
Date 03-30-23
Scale AS NOTED
Drawn/Checked KC/SZ
Sheet No. M203



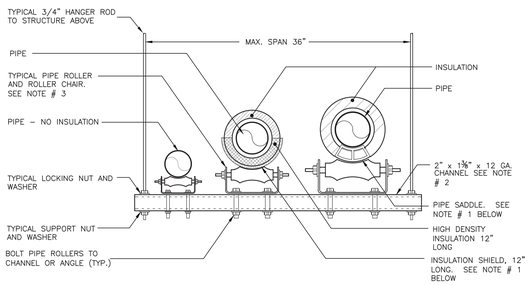
NOTES:

1. CONTRACTOR TO COORDINATE COIL CONNECTIONS AS RIGHT OR LEFT HAND IN FIELD PRIOR TO ORDERING.
2. HANG UNIT AS HIGH AS POSSIBLE FROM STRUCTURE ABOVE. COORDINATE ELEVATIONS WITH FIELD CONDITIONS.
3. REFER TO COIL PIPING AND CONDENSATE DRAIN PIPING DETAILS ELSEWHERE.
4. REFER TO FLOOR PLANS FOR DUCT SIZES.

1 CONCEALED HORIZONTAL FAN COIL UNIT DETAIL
NOT TO SCALE



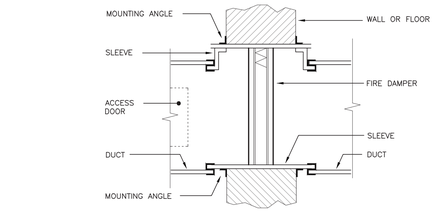
4 PIPE PENETRATION THROUGH FLOOR DETAIL
NOT TO SCALE



NOTES:

1. PROVIDE INSULATION SHIELD OR PIPE SADDLE BASED ON THE PIPING SYSTEM AND PIPE SIZE AS INDICATED IN THE SPECIFICATIONS.
2. TRAPEZE TYPE HANGER SHALL BE USED FOR A MAXIMUM 1,000 LB UNIFORM LOAD.
3. ELIMINATE PIPE ROLLERS AND ROLLER CHAIRS AT ANCHOR POINTS

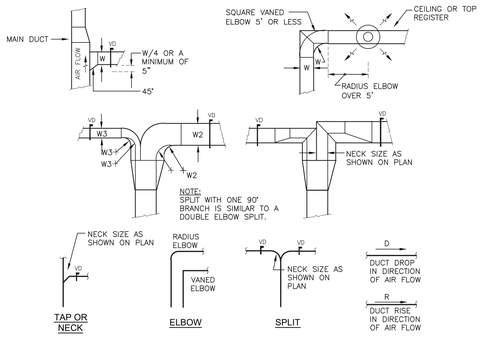
7 TRAPEZE TYPE HANGER INSTALLATION DETAIL
NOT TO SCALE



INSTALLATION REQUIREMENTS

1. REQUIREMENTS FOR AN APPROVED INSTALLATION INCLUDE THE FOLLOWING: OPENINGS IN THE FLOOR OR WALL SHALL BE ⅛" PER FOOT LARGER THAN DAMPER DIMENSIONS (3/16" LARGER PER FOOT FOR STAINLESS). MINIMUM CLEARANCE OF ¼" REQUIRED FOR ANY INSTALLATION.
2. SLEEVE GAGE SHALL BE AT LEAST EQUAL TO THE GAGE OF THE DUCT AS DEFINED BY THE APPROPRIATE SMACNA DUCT CONSTRUCTION STANDARD, AS DESCRIBED IN NFPA90A. WHEN ONE OR MORE OF THE FOLLOWING DUCT CONNECTIONS ARE USED, PLAIN S SLIP, HEMMED S SLIP, STANDING S SLIP, REINFORCED STANDING S SLIP, INSIDE SLIP JOINT, OR DOUBLE S SLIP.
3. IF ANY OTHER DUCT SLEEVE CONNECTIONS ARE USED, THE SLEEVE SHALL BE MINIMUM 16 GAGE FOR DAMPERS UP TO 36" (W) x 24" (H) AND 14 GAGE IF WIDTH EXCEEDS 36" OR HEIGHT EXCEEDS 24".
4. MOUNTING ANGLES SHALL BE MINIMUM OF 1½" x 1½" x 14" GAGE AND BOLTED. TACK WELDED PR SCREWED TO SLEEVE AT MAXIMUM SPACING OF 12" AND WITH MINIMUM OF TWO CONNECTIONS IN EACH SIDE, TOP AND BOTTOM. MOUNTING ANGLES SHALL OVERLAP WALL A MINIMUM OF ONE INCH ON ALL FOUR SIDES.
5. DAMPER SHALL BE BOLTED, TACK WELDED, OR SCREWED TO SLEEVE ON SAME SPACING AS ANGLES. SLEEVES SHALL NOT EXTEND MORE THAN 6" OUTSIDE OF WALL.
6. IF GAP BETWEEN DUCT/SLEEVE AND CONSTRUCTION IS 1" OR LESS, PACK SPACE WITH FIREPROOF FIBROUS MATERIAL AND SEAL BOTH SIDES WITH NON-HARDENING FIREPROOF SEALER. IF GAP EXCEEDS 1", WRAP DUCT WITH 1" THICK FIREPROOF FIBROUS MATERIAL AND FILL REMAINING SPACE WITH GROUT.

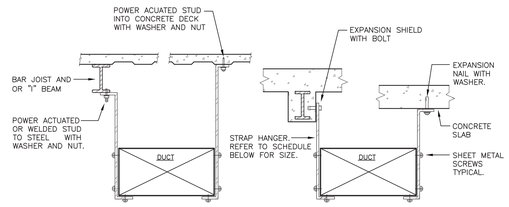
10 FIRE DAMPER DETAIL
NOT TO SCALE



NOTES:

1. SINGLE LINE REPRESENTATIONS REFER TO DOUBLE LINE DETAILS.
2. USE RADIUS OR SQUARE VANED BENDS FOR BOTH ELBOWS AND SPLITS AS DETERMINED BY SPACE LIMITATIONS, AND THE DISTANCE FROM AIR OUTLETS.
3. ALL SQUARE ELBOWS SHALL HAVE FACTORY TURNING VANES, AND MAINTAIN A CONSTANT WIDTH.
4. WHERE DUCTS SPLIT, THE SOLID LINE REPRESENTATION IS PREFERRED, UNLESS PRECLUDED BY SPACE, OR OTHERWISE INDICATED.
5. USE ELBOW SPLIT FOR BRANCH CONNECTIONS ONLY WHERE NECK SIZE IS GIVEN.

2 DUCT BRANCH TAKE-OFF DETAIL
NOT TO SCALE



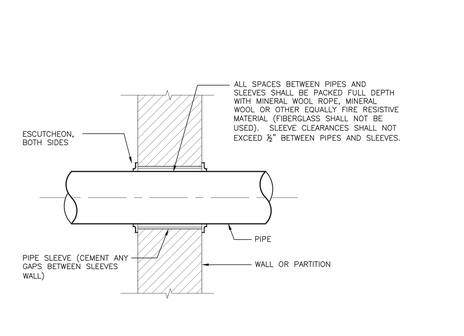
HANGER STRAP SCHEDULE

DUCT SIZE	HANGER SIZE	MAXIMUM SPACING
UP TO 2 SQ.FT.	1" X 1/16"	8'-0"
2 SQ.FT. TO 4 SQ.FT.	1" X 1/8"	8'-0"
4 SQ.FT. TO 10 SQ.FT.	1" X 1/8"	6'-0"
OVER 10 SQ.FT.	1" X 1/8"	4'-0"

NOTES:

1. FOR DUCTS OVER 49" WIDE, THE STRAP HANGER SHALL BE TURNED UNDER THE BOTTOM OF THE DUCT.
2. WHERE BUILDING STRUCTURAL COMPONENTS HAVE FIREPROOF MATERIAL, ANY AREA THAT IS DISTURBED OR DAMAGED AS A RESULT OF HANGER INSTALLATION SHALL BE PATCHED WITH UL AND FM APPROVED FIREPROOFING TO MATCH EXISTING.

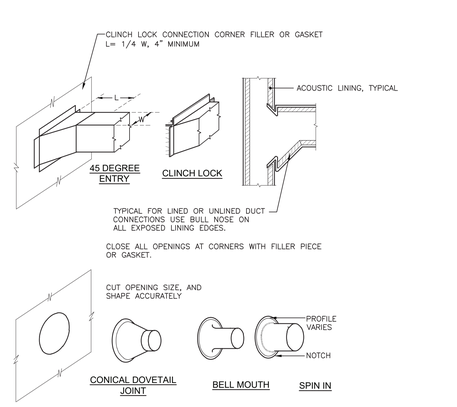
5 DUCT HANGER DETAIL
NOT TO SCALE



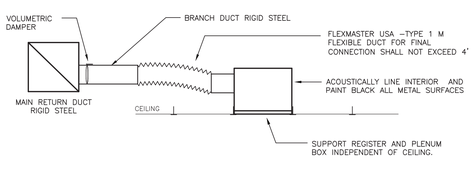
NOTES:

1. THIS DETAIL ALSO APPLICABLE TO INTERIOR NON-WATER PROOF FLOOR CONSTRUCTION. FOR WATER PROOF FLOOR CONSTRUCTION AND OTHER CONSTRUCTION - SEE SPECIFICATIONS.
2. PROVIDE FIRE STOP SEALANT ON ALL NEW AND EXISTING PIPING PENETRATING EXISTING FIRE RATED WALLS AND NEW FIRE RATED WALLS CONSTRUCTED AS PART OF THE PROJECT.

8 FIRE RATED PARTITION AND WALL PIPE PENETRATION
NOT TO SCALE



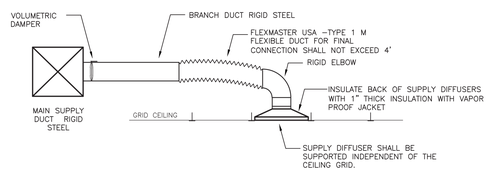
11 DUCT BRANCH CONNECTION DETAIL
NOT TO SCALE



NOTE:

1. FLEXIBLE AIR DUCT SHALL BE TESTED AND APPROVED IN ACCORDANCE WITH UL 181. ALL SUCH CONNECTORS AND FLEXIBLE AIR DUCTS SHALL BE LISTED AND LABELED AS CLASS 0 OR CLASS 1, IN ACCORDANCE WITH 2020 MCNYS SECTION 603.6.1 AND 603.6.2.

3 RETURN REGISTER DETAIL
NOT TO SCALE



NOTE:

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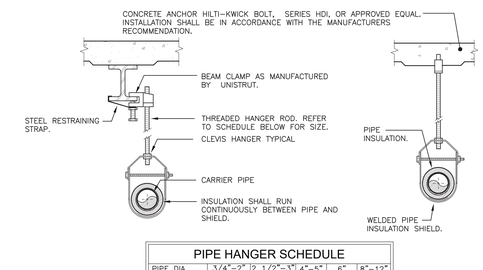
6 SUPPLY DIFFUSER LAY-IN DETAIL
NOT TO SCALE



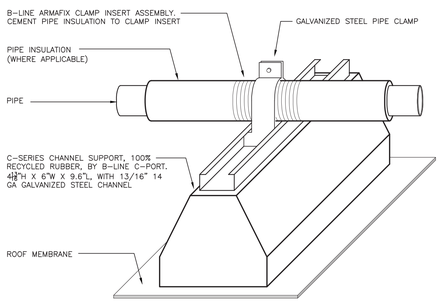
PIPE HANGER SCHEDULE

PIPE DIA.	3/4"-2"	2 1/2"-3"	4"-5"	6"	8"-12"
HANGER DIA.	3/8"	1/2"	5/8"	3/4"	7/8"

NOTES:

1. CLEVIS HANGERS WITH WELDED INSULATION SHIELDS SIMILAR TO RAUCH FIG. 100SH ON ALL PIPES LARGER THAN 1".
2. FOR PIPES 1" OR SMALLER, A BAND HANGER WITH INSULATION SHIELD MAY BE USED SIMILAR TO RAUCH FIG. NO. 1ASH.
3. FOR NON-INSULATED PIPE, INSULATION SHIELDS MAY BE OMITTED.
4. ALL PIPE HANGERS SHALL BE GALVANIZED STEEL OR FACTORY PAINTED BLACK WITH ENAMEL.
5. FOR NON FERROUS PIPING WITHOUT INSULATION, ALL HANGERS SHALL BE COPPER PLATED OR FURNISHED WITH A DI-ELECTRIC BETWEEN PIPE AND HANGERS.
6. WHERE EXISTING BUILDING STRUCTURAL COMPONENTS HAVE FIREPROOF MATERIAL, ANY AREA THAT IS DISTURBED OR DAMAGED AS A RESULT OF HANGER INSTALLATION SHALL BE PATCHED WITH UL AND FM APPROVED FIREPROOFING TO MATCH EXISTING.

9 PIPE HANGER DETAIL
NOT TO SCALE



NOTES:

1. ALL BRACKETS, HANGERS, AND FASTENERS SHALL BE GALVANIZED STEEL.
2. CLAMP INSERT ASSEMBLY SHALL INCLUDE GALVANIZED STEEL PIPE CLAMP, ARMAFLEX INSULATION WITH PAINTED ALUMINUM JACKET, AND INTERIOR SUPPORTS.
3. CEMENT RUBBER SUPPORT BLOCKS TO ROOF - USE ONLY MATERIALS COMPATIBLE WITH THE ROOFING SYSTEM

12 ROOF PIPE SUPPORT DETAIL
NOT TO SCALE

ORANGE-ULSTER BOCES
Regional Education Center at Arden Hill

Interior Alterations

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Goshen • NY 10924

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44-90-00-00-8-035-008

CONSTRUCTION DOCUMENTS

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MECHANICAL: DETAILS

Job No.	Sheet No.
2023-1008	M501
Date: 03-30-23	
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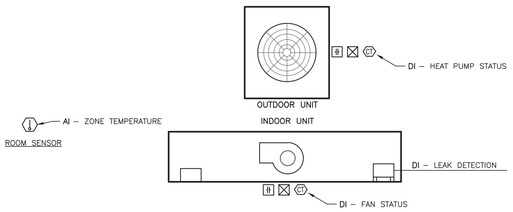
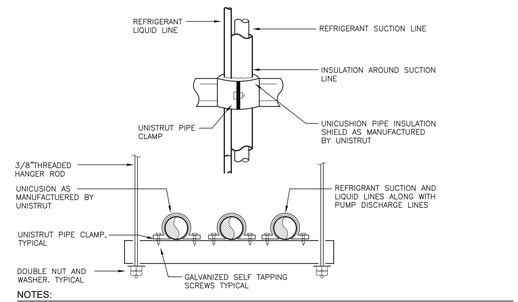


DUCTLESS SPLIT-SYSTEM POINT LIST								
POINT NAME	AI	AO	DI	DO	SCHED	TREND	ALARM	SHOW ON GRAPHICS
INDOOR UNIT FAN STATUS			×			×		×
OUTDOOR UNIT STATUS			×			×		×
LEAK DETECTION			×			×	×	×
ZONE TEMPERATURE	×					×	×	×
CONDENSATE PUMP HIGH ALARM							×	×

NOTE:
1. AT A MINIMUM THE POINTS INDICATED ABOVE SHALL BE PROVIDED.

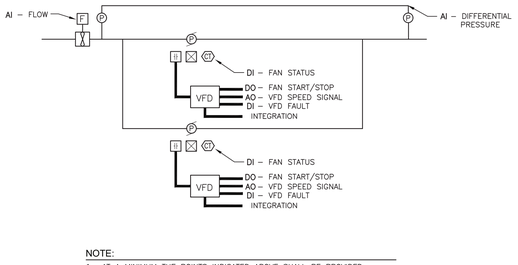
1 DUCTLESS SPLIT-SYSTEM CONTROLS SCHEMTIC
NOT TO SCALE



NOTES:
1. LIQUID AND SUCTION LINES MAY BE ROUTED TOGETHER FOR CONVENIENCE, BUT MUST BE COMPLETELY INSULATED FROM EACH OTHER. DO NOT SOLDER LIQUID AND SUCTION LINES TOGETHER. DO NOT ALLOW METAL TO METAL CONTACT.
2. LINES SHOULD BE INSTALLED WITH AS FEW BENDS AS POSSIBLE, ALLOWING SERVICE ACCESS TO THE INDOOR COIL.
3. USE LONG RADIUS ELBOWS WHEREVER POSSIBLE, EXCEPT IN OIL RETURN TRAPS, WHERE SHORT RADIUS ELBOWS SHOULD BE USED.
4. SLOPE HORIZONTAL SUCTION LINES 1 INCH EVERY 20 FEET TOWARD THE OUTDOOR UNIT.

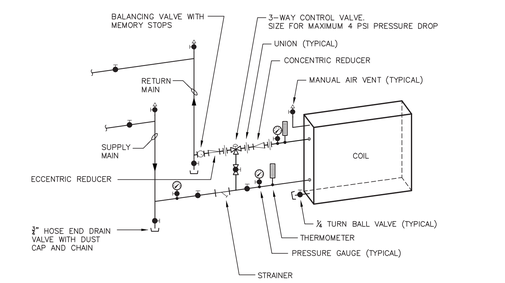
2 REFRIGERANT PIPE SUPPORT DETAIL
NOT TO SCALE

HEATING PUMP POINTS LIST								
POINT NAME	AI	AO	DI	DO	SCHED	TREND	ALARM	SHOW ON GRAPHICS
PUMP STATUS			×			×		×
PUMP START/STOP				×		×		×
FLOW	×					×	×	×
PRESSURE DIFFERENTIAL	×					×	×	×
PUMP FAILURE							×	×
SCHEDULE					×			
PUMP VFD SIGNAL		×				×		×
PUMP VFD FAULT			×				×	×



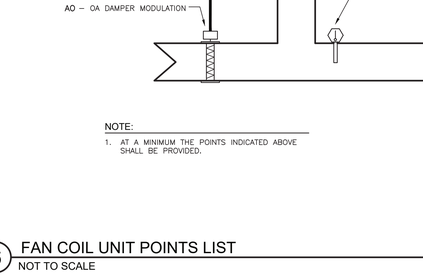
NOTE:
1. AT A MINIMUM THE POINTS INDICATED ABOVE SHALL BE PROVIDED.

3 HEATING PUMP WITH VARIABLE FREQUENCY DRIVE POINTS LIST
NOT TO SCALE



NOTES:
1. LOCATE ALL COIL UNIONS CLOSE TO, AND CLEAR OF, COIL. ARRANGE PIPING SO AS NOT TO NOT INTERFERE WITH COIL REMOVAL.
2. DETAIL IS TYPICAL FOR FAN COIL UNITS.
3. PROVIDE FLEXIBLE CONNECTION FOR THOSE COILS MOUNTED IN UNITS ON VIBRATION ISOLATORS.
4. REFER TO PLANS FOR PIPE SIZES.

4 HYDRONIC COIL WITH 3-WAY MIXING VALVE PIPING SCHEMATIC
NOT TO SCALE



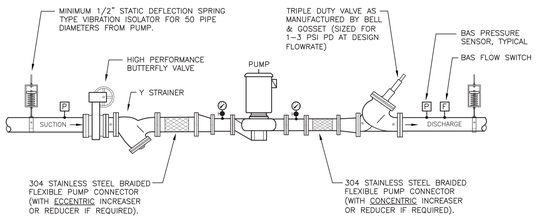
NOTES
1. INSULATED PREFABRICATED ROOF CURB SHALL BE BASED ON THYCURB MODEL TC-3. ROOF CURB SHALL BE CONSTRUCTED OF 18 GAUGE GALVANIZED STEEL WITH FULLY WELDED CORNERS, FACTORY INSTALLED WOOD NAILERS, REINFORCED SIDES, GASKETING, AND 1½" THICK 3-POUND DENSITY RIGID INSULATION. CURB HEIGHT SHALL BE 24". ROOF CURB SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR.
2. GENERAL CONTRACTOR SHALL MAKE PENETRATION WEATHER-TIGHT, REFER TO ARCHITECTURAL AND ROOFING DRAWINGS. REFER TO ARCHITECTURAL ROOF DETAILS FOR MORE INFORMATION.
3. THIS DETAIL SHALL BE USED FOR ALL DUCT PENETRATIONS THROUGH ROOF.

5 ROOF DUCT PENETRATION DETAIL
NOT TO SCALE

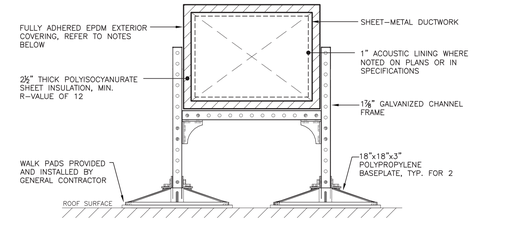
FAN COIL UNIT POINTS LIST								
POINT NAME	AI	AO	DI	DO	SCHED	TREND	ALARM	SHOW ON GRAPHICS
SUPPLY FAN STATUS			×			×		×
SUPPLY FAN START/STOP				×		×		×
SUPPLY FAN FAILURE							×	×
HOT WATER VALVE MODULATION		×				×		×
RETURN AIR TEMPERATURE	×					×		×
FREEZESTAT			×			×	×	×
DISCHARGE AIR TEMPERATURE	×					×	×	×
RETURN DAMPER MODULATION		×				×		×
OUTSIDE AIR DAMPER MODULATION		×				×		×
SCHEDULE					×			
ZONE TEMPERATURE	×					×	×	×
ZONE TEMPERATURE ADJUST	×					×		×
LEAK DETECTION			×				×	×
CHILLED WATER VALVE MODULATION		×				×		×
CONDENSATE PUMP HIGH LEVEL SWITCH			×				×	×

NOTE:
1. AT A MINIMUM THE POINTS INDICATED ABOVE SHALL BE PROVIDED.

6 FAN COIL UNIT POINTS LIST
NOT TO SCALE



7 IN LINE PUMP DETAIL
NOT TO SCALE

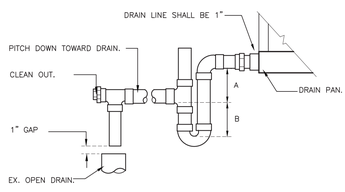


NOTES
1. ROOF DUCT SUPPORT SHALL BE BASED ON PHP SYSTEMS/DESIGN MODEL NUMBER PHP-D.
2. ALL BRACKETS, HANGERS, FASTENERS AND SUPPORTS LOCATED OUTDOORS SHALL BE GALVANIZED OR NICKEL PLATED
3. USE ONLY THOSE MATERIALS COMPATIBLE WITH THE ROOFING SYSTEM, REFER TO ARCHITECTURAL DRAWINGS.
4. SEAL ALL EXTERIOR DUCTWORK IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE-SEAL CLASS A. SEAL ALL DUCT JOINTS AND MAKE WATER-TIGHT.
5. DUCT SUPPORTS SHALL SIT ON WALK PADS PROVIDED AND INSTALLED BY GENERAL CONTRACTOR.
6. INSULATION INSTALLED ON THE TOP OF THE DUCTWORK SHALL BE SLOPED 1/2" PER FOOT.
7. INSULATION SHALL BE FASTENED TO THE DUCTWORK WITH SCREWS AND PLATES INSTALLED 12" ON CENTER IN ALL DIRECTIONS.
8. INSULATION SHALL BE COVERED WITH 60 MIL THICK, FIRE RATED, FULLY ADHERED EPDM BY THE GENERAL CONTRACTOR. THE GENERAL CONTRACTOR SHALL APPLY TWO ROLLER COATS OF WHITE ACRYLIC LATEX COATING TO EXTERIOR.

8 INSULATED ROOF DUCT SUPPORT DETAIL
NOT TO SCALE

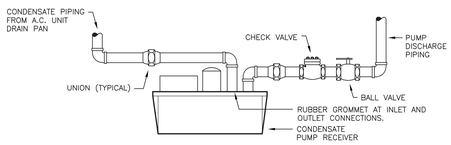
GENERAL NOTE

ALL WORK ASSOCIATED WITH AUTOMATIC TEMPERATURE CONTROLS SHALL BE PERFORMED BY AN AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR. AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL SUPPLY AND TURNOVER CONTROLS ELEMENTS REQUIRED TO BE INSTALLED IN PIPING AND/OR DUCTWORK TO THE MECHANICAL CONTRACTOR WHO SHALL BE RESPONSIBLE FOR INSTALLING THE CONTROL ELEMENTS.

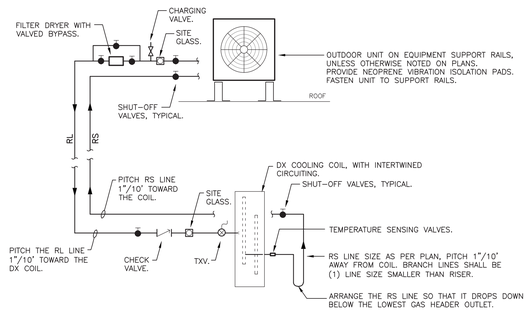


NOTE:
1. DRAW THRU UNITS; DIMENSION A (DEPTH OF SEAL) SHALL BE 2" MINIMUM AND DIMENSION B SHALL BE 1.2 x THE STATIC PRESSURE OF THE UNIT.

9 CONDENSATE DRAIN DETAIL
NOT TO SCALE



10 CONDENSATE PUMP PIPING SCHEMATIC
NOT TO SCALE



NOTES:
1. PROVIDE (1) ONE TRAP AT THE BOTTOM OF SUCTION LINE FOR RISES UP TO 50'-0". FOR RISERS BETWEEN 50'-0" AND 100'-0" PROVIDE A SECOND RISER HALF WAY UP.
2. PIPING SHALL BE INSTALLED SO NOT TO OBSTRUCT SERVICE ACCESS TO EITHER THE INDOOR OR OUTDOOR UNIT.
3. ALL FASTENERS LOCATED OUTDOORS SHALL BE GALVANIZED.
4. SLOPE HORIZONTAL SUCTION LINES APPROXIMATELY 1" EVERY 20 FEET TOWARD OUTDOOR UNIT TO FACILITATE OIL RETURN.
5. EQUIPMENT SUPPORT RAILS SHALL BE BASED ON THYBAR MODEL TEMS-3, 24" HIGH. CONSTRUCTION SHALL BE WELDED 18 GAUGE GALVANIZED STEEL SHELL, BASE PLATE AND COUNTER FLASHING WITH FACTORY INSTALLED 2"x4" WOOD NAILER AND INTERNAL BULKHEAD REINFORCEMENT. RAIL LENGTH TO EXTEND 6" ON BOTH ENDS OF UNIT. PROVIDE (2) RAILS PER UNIT. EQUIPMENT RAILS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR. REFER TO ARCHITECTURAL ROOF DETAILS FOR MORE INFORMATION.

11 DX SPLIT SYSTEM AC UNIT PIPING SCHEMATIC
NOT TO SCALE

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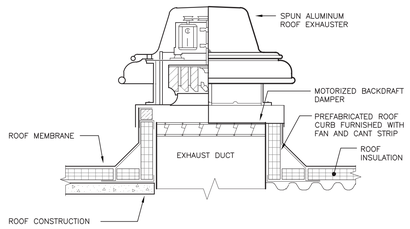

NOTES:

1. ROOF CURB TO BE PROVIDED BY MECHANICAL CONTRACTOR AND INSTALLED BY GENERAL CONTRACTOR. REFER TO ARCHITECTURAL ROOF DETAILS FOR MORE INFORMATION.
2. COORDINATE ROOF OPENINGS AS REQUIRED FOR MECHANICAL WORK WITH GENERAL CONTRACTOR.

1 ROOFTOP EXHAUST FAN DETAIL
NOT TO SCALE

SPACE MINIMUM VENTILATION AIR CALCULATIONS - Orange Ulster BOCES Regional Education Center at Arden Hill Third Floor Interior Alterations

SPACE NAME	AREA (FT^2)	OCCUPANTS PER 1000 FT^2	NUMBER OF OCCUPANTS	VENTILATION PER OCCUPANT (CFM)	OCCUPANT BASED VENTILATION (CFM)	VENTILATION AIR (CFM) PER FT^2	AREA BASED VENTILATION (CFM)	Zone Air Distribution Effectiveness	MINIMUM TOTAL SPACE VENTILATION AIR (CFM)
Corridor 400B	120	NA	NA	NA	NA	0.06	7	0.8	9
Vestibule 400C	165	NA	NA	NA	NA	0.06	10	0.8	12
Corridor 400D	340	NA	NA	NA	NA	0.06	20	0.8	26
Corridor 400E	240	NA	NA	NA	NA	0.06	14	0.8	18
Vestibule 400F	80	NA	NA	NA	NA	0.06	5	0.8	6
Corridor 400G	535	NA	NA	NA	NA	0.06	32	0.8	40
Corridor 400H	265	NA	NA	NA	NA	0.06	16	0.8	20
Corridor 400J	550	NA	NA	NA	NA	0.06	33	0.8	41
Corridor 400K	210	NA	NA	NA	NA	0.06	13	0.8	16
Classroom 402	435	35	15	10	150	0.12	52	0.8	253
Elevator Lobby 404A	95	10	1	5	5	0.06	6	0.8	13
Classroom 405	440	35	15	10	150	0.12	53	0.8	254
Classroom 406	450	35	16	10	160	0.12	54	0.8	268
Office 407	225	5	1	5	5	0.06	14	0.8	23
Classroom 408	450	35	16	10	160	0.12	54	0.8	268
Classroom 409	840	35	29	10	290	0.12	101	0.8	489
Classroom 410	490	35	17	10	170	0.12	59	0.8	286
Classroom 411	675	35	24	10	240	0.12	81	0.8	401
ALC Room 412	145	35	5	10	50	0.12	17	0.8	84
Classroom 413	530	35	19	10	190	0.12	64	0.8	317
Classroom 414	660	35	23	10	230	0.12	79	0.8	387
Office 416	250	5	1	5	5	0.06	15	0.8	25
Office 417	330	5	2	5	10	0.06	20	0.8	37
Classroom 418	630	35	22	10	220	0.12	76	0.8	370
Copy 415	160	5	1	5	5	0.06	10	0.8	18

4 MINIMUM VENTILATION AIR CALCULATIONS
NOT TO SCALE

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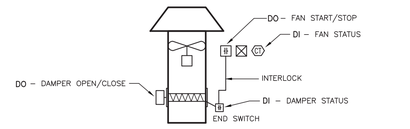
GENERAL EXHAUST FAN POINTS LIST

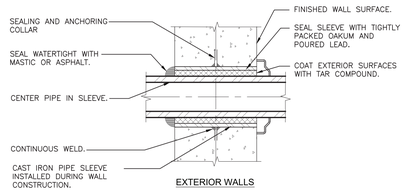
POINT NAME	AI	AO	DI	DO	SCHED	TREND	ALARM	SHOW ON GRAPHICS
DAMPER STATUS			X			X		X
FAN STATUS			X			X		X
FAN START/STOP				X		X		X
DAMPER OPEN/CLOSE				X		X		X
SCHEDULE					X			
DAMPER FAILURE							X	X
FAN FAILURE							X	X



NOTE:

1. SHALL BE USED FOR EXHAUST FANS: 13, AND 15.
2. AT A MINIMUM THE POINTS INDICATED ABOVE SHALL BE PROVIDED.

2 GENERAL EXHAUST FAN CONTROLS SCHEMATIC
NOT TO SCALE



NOTE:

1. PIPE SLEEVE FOR EXTERIOR WALL ABOVE GRADE.

3 EXTERIOR WALL PIPE PENETRATION DETAIL
NOT TO SCALE

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GENERAL HVAC NOTES

1. ALL HVAC AND AUTOMATIC TEMPERATURE CONTROLS WORK SHALL BE INSTALLED IN ACCORDANCE WITH 2022 VERSION OF NYS EDUCATION DEPARTMENT MANUAL OF PLANNING STANDARDS FOR SCHOOL BUILDINGS, MECHANICAL 2020 VERSION OF THE MECHANICAL CODE, FIRE CODE, PLUMBING CODE, BUILDING CODE, AND ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE, ALL LOCAL CODES AND GENERALLY ACCEPTED STANDARDS.
2. UNLESS OTHERWISE NOTED HVAC CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, PIPING, VALVES, ACCESS DOORS, HANGERS, FITTINGS AND MISCELLANEOUS COMPONENTS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER THE HVAC SYSTEMS COMPLETE, OPERABLE, AND IN ACCORDANCE WITH APPLICABLE CODES AND GENERALLY ACCEPTED INDUSTRY STANDARDS.
3. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL SUBMIT SHOP DRAWINGS ON ALL EQUIPMENT TO ARCHITECT FOR APPROVAL. DEMONSTRATE NEW HVAC SYSTEMS TO SCHOOL DISTRICT AND REVIEW MAINTENANCE PROCEDURES.
4. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL SEAL AROUND ALL PIPE/CONDUIT AND DUCT PENETRATIONS THROUGH FIRE RATED WALLS, FLOORS AND CEILINGS WITH HILTI INTUMESCENT FIRE STOP MATERIALS TO MAINTAIN FIRE AND SMOKE RATINGS. DUCTS PENETRATING FIRE RATED WALLS, FLOORS AND CEILINGS SHALL BE INSTALLED WITH FIRE DAMPER AND ACCESS DOORS WHETHER SPECIFICALLY SHOWN ON THE DRAWINGS OR NOT. PROVIDE FIRE STOP SEALANT ON ALL EXISTING PIPING AND DUCTWORK PENETRATING NEW FIRE RATED WALLS CONSTRUCTED AS PART OF THE PROJECT.
5. HVAC CONTRACTOR SHALL NOT DRILL OR CUT ANY STRUCTURAL MEMBERS WITHOUT PERMISSION OF ARCHITECT.
6. ALL EQUIPMENT SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS.
7. AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL FURNISH AND INSTALL ALL CONTROL WIRING (24V) FOR SYSTEMS SHOWN ON HVAC DRAWINGS AND DESCRIBED IN HVAC SPECIFICATIONS, INCLUDING ALL RELAYS, TRANSFORMERS, CONDUIT, JUNCTION BOXES, CONDUCTORS, THERMOSTATS, APPURTENANCES AND ALL NECESSARY EQUIPMENT TO MAKE SYSTEMS COMPLETE AND OPERABLE.
8. HVAC AND AUTOMATIC TEMPERATURE CONTOLS CONTRACTOR SHALL PAY FOR ALL PERMITS AND INSPECTION FEES REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
9. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL CUTTING, PATCHING AND PAINTING ASSOCIATED WITH HVAC WORK WITH THE GENERAL CONTRACTOR, WHO SHALL PERFORM THE WORK. ALL FLOORS AND WALLS WHERE AN EXISTING PIPE OR DUCT HAS BEEN REMOVED AND NOT REPLACED SHALL BE PATCHED BY GENERAL CONTRACTOR, THIS CONTRACTOR SHALL COORDINATE.
10. ALL DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH SHEET METAL AND AIR CONDITIONING HVAC CONTRACTORS NATIONAL ASSOCIATION (SMACNA) DUCT STANDARDS. PROVIDE RADIUS TURNS OR TURNING VANES ON ALL CHANGES IN DIRECTION IN ACCORDANCE WITH SMACNA STANDARDS.
11. ALL CONTROL WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (N.E.C.) AND ALL LOCAL CODES. ALL CONDUCTORS SHALL BE COPPER WITH THHN INSULATION IN EMT CONDUIT. 120V/1 – MINIMUM CONDUCTOR SIZE #12. 24V – MINIMUM CONDUCTOR SIZE #18. MINIMUM CONDUIT SIZE SHALL BE ¾". CONDUIT INSTALLED OUTDOORS SHALL BE GALVANIZED.
12. ALL DUCTWORK SHALL BE FABRICATED WITH MINIMUM 26 GAGE GALVANIZED STEEL INCLUDING ROUND DUCTS.
13. FINAL LOCATIONS OF ALL THERMOSTATS AND SENSORS SHALL BE APPROVED BY ARCHITECT PRIOR TO INSTALLATION, COORDINATE IN FIELD. THERMOSTATS AND SENSORS SHALL BE LOCATED 4'–0" ABOVE FINISHED FLOOR.
14. HVAC CONTRACTOR SHALL PROVIDE ACCESS DOORS FOR ALL VALVES AND DUCT ACCESSORIES CONCEALED IN WALLS/CEILINGS. ACCESS DOORS SHALL HAVE APPROPRIATE FIRE RATING TO MAINTAIN INTEGRITY OF WALL/CEILING. TURN OVER ACCESS DOORS TO GENERAL CONTRACTOR FOR INSTALLATION.
15. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL COORDINATE FINAL LOCATIONS OF ALL PIPING/CONDUIT IN FINISHED AREAS WITH GENERAL CONTRACTOR TO ENSURE CONCEALMENT OF ALL PIPING IN WALLS, FLOORS AND CEILINGS.
16. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL FURNISH AND INSTALL VALVE TAGS, PIPE LABELS, DUCT LABELS AND EQUIPMENT LABELS. LOC ALL TAGS AND LABELS IN A 3–RING BINDER WITH LOCATION, DESCRIPTION AND FUNCTION. SEE SPECIFICATIONS FOR MORE INFORMATION.
17. HVAC CONTRACTOR SHALL PROVIDE ALL AIR AND HYDRONIC BALANCING FOR ALL NEW HVAC SYSTEMS. PROVIDE ALL NECESSARY MOTOR, DRIVE, BELT CHANGES AND ETC. SEE SPECIFICATIONS FOR BALANCE PROCEDURES AND ADDITIONAL REQUIREMENTS. CONTRACTOR SHALL COMFORT BALANCE ALL HVAC SYSTEMS TO THE SATISFACTION OF ENGINEER/ARCHITECT.
18. HVAC CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SUPPLEMENTAL STRUCTURAL STEEL SUPPORT ASSOCIATED WITH NEW HVAC EQUIPMENT HUNG OR SUPPORTED FROM OR ON THE BUILDING STRUCTURE. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ARCHITECT FOR APPROVAL PRIOR TO STEEL FABRICATION AND INSTALLATION OF EQUIPMENT.
19. HVAC CONTRACTOR SHALL INSTALL DUCT MOUNTED SMOKE DETECTORS IN RETURN AIR DUCTWORK OR PLENUM UPSTREAM OF ANY FILTERS, EXHAUST AIR CONNECTIONS, OR OUTDOOR AIR CONNECTIONS. DUCT SMOKE DETECTORS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. CONNECTION TO FIRE ALARM SYSTEM SHALL BE BY THE FIRE ALARM CONTRACTOR. HVAC CONTRACTOR SHALL INSTALL AN ACCESS DOOR IN DUCTWORK FOR EACH SMOKE DETECTOR.
20. HVAC CONTRACTOR SHALL SUBMIT PIPING AND DUCTWORK FULLY COORDINATED SHOP DRAWINGS FOR ENGINEERS REVIEW. SEE GENERAL CONDITIONS FOR NUMBER OF SHOP DRAWINGS.
21. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL INSTRUCT SCHOOL DISTRICT AND KEY PERSONNEL ON OPERATION OF ALL HVAC SYSTEMS. SET ALL THERMOSTATS TO TEMPERATURES AND SCHEDULES AS DIRECTED BY SCHOOL DISTRICT.
22. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL INCLUDE IN BID ALL MATERIALS, RIGGING AND LABOR REQUIRED FOR THE COMPLETE AND PROPER INSTALLATION OF THE MECHANICAL SYSTEM.
23. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO THE BEGINNING OF WORK, AND COORDINATE WORK ALL OTHER TRADES.
24. PROVIDE ALL PIPE OPENINGS THROUGH PARTITIONS WITH PIPE SLEEVES.
25. PROVIDE VOLUME DAMPERS ON ALL SUPPLY, RETURN AND EXHAUST BRANCH DUCTWORK, WHETHER SPECIFICALLY INDICATED ON DRAWINGS OR NOT.
26. PROVIDE 1" ACOUSTIC LINING A MINIMUM OF 25'–0" FROM INLET AND OUTLET OF ALL FANS AND MINIMUM 5'–0" AT OUTLET OF VAV BOXES. THE FIRST FIGURE OF DUCT SIZE INDICATE DIMENSION OF FACE SHOWN OR INDICATED. DUCT DIMENSIONS SHOWN ON DRAWINGS REFER TO INSIDE CLEAR DIMENSIONS. WHERE DUCTWORK IS LINED, THE CONTRACTOR SHALL INCREASE THE SIZE OF DUCT TO COMPENSATE FOR LINING.
27. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL SCHEDULE ALL SHUT–DOWNS OF EXISTING BASE BUILDING EQUIPMENT/SYSTEMS WITH SCHOOL DISTRICT AS REQUIRED FOR PERFORMING WORK. NOTICE SHALL BE GIVEN NO LESS THAN (5) FIVE BUSINESS DAYS PRIOR REQUIRED SHUT–DOWN. SHUT–DOWNS SHALL NOT BE PERFORMED WITHOUT APPROVAL FROM SCHOOL DISTRICT.
28. BEFORE DISPOSING OF REMOVED EQUIPMENT, VERIFY WITH SCHOOL DISTRICT WHAT ITEMS ARE TO BE TURNED OVER TO SCHOOL DISTRICT AND KEPT FOR ATTIC STOCK.
29. UNLESS OTHERWISE NOTED ON THE ARCHITECTURAL DRAWINGS, CEILING REMOVAL, TEMPORARY PROTECTION, AND REPLACEMENT AS REQUIRED PERFORMING SCOPE OF WORK SHALL BE BY THIS CONTRACTOR. CEILING TILES DAMAGED AS A RESULT OF THIS CONTRACTOR'S WORK SHALL BE REPLACED AT NO ADDITIONAL COST TO THE SCHOOL DISTRICT. REFER TO ARCHITECTURAL DRAWINGS FOR EXTENT OF CEILING REMOVALS.
30. ALL MOTOR STARTERS AND DISCONNECT SWITCHES FOR HVAC EQUIPMENT SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR, UNLESS OTHERWISE NOTED. DISCONNECT SWITCHES FURNISHED BY THE MECHANICAL CONTRACTOR FOR HVAC EQUIPMENT SHALL BE HEAVY DUTY TYPE AND SHALL BE NEMA 3R WHEN LOCATED OUTSIDE.
31. CONTRACTOR SHALL BE RESPONSIBLE FOR DRAINING AND REFILLING EXISTING SYSTEMS AS REQUIRED FOR COMPLETION OF WORK.
32. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP AND MATERIAL INSTALLED UNDER THIS CONTRACT FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM DATE OF SUBSTANTIAL COMPLETION AND ACCEPTANCE BY THE OWNER AND AGREES TO REPLACE DEFECTIVE WORK (INCLUDING ALL REQUIRED LABOR AND MATERIAL) AT NO ADDITIONAL COST TO OWNER DURING THE GUARANTEE PERIOD.
33. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING START–UP AND COMMISSIONING OF ALL NEW EQUIPMENT, CONTROLS, AND ETC. TO ENSURE CORRECT OPERATION OF INSTALLED DEVICES.
34. HVAC AND AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL PROVIDE OWNER WITH CATALOG DATA, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS, AND RECORD (AS–BUILT) DRAWINGS OF ALL COMPLETED WORK.
35. ALL NEW HOLES IN WALLS AND FLOORS SHALL BE CORE DRILLED BY THIS CONTRACTOR. PRIOR TO CORE DRILLING FLOORS, RADAR SCAN FLOOR SLABS. USE CAUTION WHEN CORE DRILLING TO AVOID DAMAGE TO EXISTING EQUIPMENT, SYSTEMS, STRUCTURE AND ETC. ANY ITEMS DAMAGED AS A RESULT OF CORE DRILLING SHALL BE REPAIRED BY THIS CONTRACTOR AT NO ADDITIONAL COST TO SCHOOL DISTRICT.
36. LOW VOLTAGE CONTROL WIRING AND CONDUIT INDICATED TO BE REMOVED SHALL BE COMPLETELY REMOVED BACK TO SOURCE WHEN POSSIBLE. FOR INACCESSIBLE LOCATIONS WIRING AND CONDUIT SHALL BE SAFELY ISOLATED ON BOTH ENDS.
37. UNLESS OTHERWISE NOTED AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL PROVIDE ALL CONTROLS EQUIPMENT, WIRING, CONTROL VALVES, PROGRAMMING, GRAPHICS UPDATES AND MISCELLANEOUS COMPONENTS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER THE HVAC CONTROLS SYSTEMS COMPLETE, OPERABLE, AND IN ACCORDANCE WITH APPLICABLE CODES AND GENERALLY ACCEPTED INDUSTRY STANDARDS.

SYMBOLS AND ABBREVIATIONS

SYMBOL	ABBREVIATION	DESCRIPTION
CD-X / CFM	DESIGNATION / AIRFLOW	CEILING DIFFUSER
ER-X / CFM	DESIGNATION / AIRFLOW	EXHAUST REGISTER
RG-X / CFM	DESIGNATION / AIRFLOW	RETURN GRILLE
RR-X / CFM	DESIGNATION / AIRFLOW	RETURN REGISTER
VAV-X / CFM	DESIGNATION / MAX AIRFLOW	VARIABLE AIR VOLUME BOX
—	A	AMPS
—	AC	AIR CONDITIONING UNIT
—	ACCU	AIR COOLED CONDENSING UNIT
—	AD	ACCESS DOOR
—	AFF	ABOVE FINISHED FLOOR
—	AHC	ABOVE HUNG CEILING
—	AI	ANALOG INPUT
—	AO	ANALOG OUTPUT
—	ATC	AUTOMATIC TEMPERATURE CONTROL
—	AV	ANALOG VALUE
—	BAS	BUILDING AUTOMATION SYSTEM
—	BDD	BACKDRAFT DAMPER
—	BHP	BRAKE HORSE POWER
—	BI	BINARY INPUT
—	BO	BINARY OUTPUT
—	BTU	BRITISH THERMAL UNIT
—	BTUH	BRITISH THERMAL UNIT PER HOUR
—	BV	BINARY VALUE
—	CFM	CUBIC FEET PER MINUTE
—	DB	DRY BULB TEMPERATURE
—	DDC	DIRECT DIGITAL CONTROL
—	DI	DIGITAL INPUT
ø	DIA	DIAMETER OR PHASE
—	DN	DOWN
—	DO	DIGITAL OUTPUT
—	DS	DISCONNECT SWITCH
—	DX	DIRECT EXPANSION
—	EA	EXHAUST AIR
—	EAT	ENTERING AIR TEMPERATURE
—	EC	ELECTRICAL CONTRACTOR
—	EER	ENERGY EFFICIENT RATING
—	EF	EXHAUST FAN
—	ESP	EXTERNAL STATIC PRESSURE
—	EWT	ENTERING WATER TEMPERATURE
—	°F	FAHRENHEIT
—	FAI	FRESH AIR INTAKE
—	FCU	FAN COIL UNIT
—	FLA	FULL LOAD AMPS
—	FPI	FINS PER INCH
—	FPM	FEET PER MINUTE
—	FT H_2O	FEET OF WATER
—	FT^2	SQUARE FEET
—	GA	GAUGE
—	GC	GENERAL CONTRACTOR
—	GPM	GALLONS PER MINUTE
—	IN H_2O	INCHES OF WATER COLUMN
—	HOA	HAND–OFF–AUTO SWITCH
—	HP	HORSE POWER
—	HSPF	HEATING SEASONAL PERFORMANCE FACTOR
—	HZ	HERTZ
—	IPLV	INTEGRATED PART LOAD VALVE
—	LAT	LEAVING AIR TEMPERATURE
—	LBS	POUNDS
—	LWT	LEAVING WATER TEMPERATURE
—	MAX.	MAXIMUM
—	MBH	1000 BRITISH THERMAL UNITS PER HOUR
—	MCA	MINIMUM CIRCUIT AMPACITY
—	MER	MECHANICAL EQUIPMENT ROOM
—	MIN.	MINIMUM
—	MOCP	MAXIMUM OVERCURRENT PROTECTION
—	NC	NORMALLY CLOSED
—	NIC	NOISE CRITERIA
—	NO	NORMALLY OPEN
—	OAI	OUTSIDE AIR INTAKE
—	PC	PLUMBING CONTRACTOR
—	PRV	PRESSURE REDUCING VALVE
—	PSI	POUNDS PER SQUARE INCH
—	RA	RETURN AIR
—	RF	RETURN FAN
—	RPM	REVOLUTIONS PER MINUTE
—	RTU	ROOFTOP UNIT
—	SA	SUPPLY AIR
—	SEER	SEASONAL ENERGY EFFICIENCY RATIO
—	SQ.FT.	SQUARE FEET
—	TD	TRANSFER DUCT
—	TSP	TOTAL STATIC PRESSURE
—	TXV	THERMAL EXPANSION VALVE
—	TYP.	TYPICAL
—	V	VOLT
—	VFD	VARIABLE FREQUENCY DRIVE
—	UON	UNLESS OTHERWISE NOTED
—	VTR	VENT TO ROOF
—	WB	WET BULB TEMPERATURE
—	WG	INCHES OF WATER GAUGE
—	WMS	WIRE MESH SCREEN
— CD —	CD	CONDENSATE DRAIN
— CHWR —	CHWR	CHILLED WATER RETURN
— CHWS —	CHWS	CHILLED WATER SUPPLY
— HWS —	HWS	HOT WATER SUPPLY
— HWR —	HWR	HOT WATER RETURN
— PD —	PD	PUMP DISCHARGE, CONDENSATE
— RL —	RL	REFRIGERANT LIQUID
— RS —	RS	REFRIGERANT SUCTION
———	EX.	EXISTING TO REMAIN
- - - - - -	REL.	REMOVE AND RELOCATE
———	NEW	NEW WORK
- - - - - - -	DEM.	EXISTING TO BE REMOVED
	–	ELBOW UP
	–	ELBOW DOWN
D	–	TEE UP
R	–	TEE DN
	–	BRAIDED FLEXIBLE CONNECTION
	–	CONCENTRIC REDUCER
	–	CONCENTRIC REDUCER
	–	STRAINER
	–	FLOW ARROW
	–	CHECK VALVE
VD	–	BALANCING VALVE
	–	2–WAY VALVE
	–	3–WAY VALVE
	–	OS&Y GATE VALVE
	–	BALL VALVE
	–	BUTTERFLY VALVE – HIGH PERFORMANCE
	–	UNION
	–	MANUAL AIR VENT
	–	THERMOMETER
	–	PRESSURE GAUGE
	–	ROOF DRAIN
CO_2	–	CARBON DIOXIDE DETECTOR
P	–	PUMP
H	–	HUMIDISTAT
	VAV	VAV BOX
	UV	UNIT VENTILATOR
CD	CD	CEILING DIFFUSER
ER	ER	EXHAUST REGISTER
RG	RG	RETURN GRILLE
RR	RR	RETURN REGISTER
	–	SUPPLY/OUTSIDE AIR INTAKE DUCT UP
	–	SUPPLY/OUTSIDE AIR INTAKE DUCT DOWN
	–	RETURN/EXHAUST AIR DUCT UP
	–	RETURN/EXHAUST AIR DUCT DOWN
6 x 8	–	DUCT SIZE
	FC	FLEXIBLE CONNECTION
	–	TRANSITION FROM SQUARE TO ROUND DUCT
	–	TRANSITION
D	–	DUCT DROP
R	–	DUCT RISE
	–	SQUARE VANED ELBOW
	–	DUCT TRANSITION
	–	DUCT DROP
	–	DUCT RISE
	–	FLEXIBLE DUCTWORK
	–	ACOUSTIC LINING
VD	VD	VOLUME DAMPER
CFSD	CFSD	COMBINATION FIRE/SMOKE DAMPER WITH ACCESS DOOR
FD	FD	FIRE DAMPER WITH ACCESS DOOR
M	MD	MOTORIZED DAMPER
SD	SD	SMOKE DAMPER WITH ACCESS DOOR
S	–	DUCT MOUNTED SMOKE DETECTOR
T	–	THERMOSTAT/TEMPERATURE SENSOR
T	–	TEMPERATURE SENSOR
	–	AIR INTO REGISTER
	–	POINT OF DISCONNECT/CONNECT

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No.	Date	Issue
2	09/22/23	ISSUED FOR BID
1	03/30/23	S.E.D. SUBMISSION

Sheet Title

MECHANICAL:
SYMBOLS LIST AND NOTES

Job No.	2023-1008
Date	03-30-23
Scale	AS NOTED
Drawn/Checked	KC/SZ
Sheet No.	M701

FAN COIL UNIT SCHEDULE

DESIGNATION	MODEL	SIZE	AREA SERVED	FAN CHARACTERISTICS				ELECTRICAL			COOLING CHARACTERISTICS								HEATING CHARACTERISTICS						FILTER DATA
				CFM	OUTSIDE AIR CFM	ESP (IN H_2O)	HP	VOLTS/Ø	FLA/MCA	MOCP	TOTAL CAP. (BTUH)	SENS. CAP. (BTUH)	EAT (DB/WB)	LAT (DB/WB)	EWT/LWT	PD (FT. H_2O)	NO. OF ROWS/FPI	FLOW RATE (GPM)	SENS. CAP. (BTUH)	EAT/LAT (DB)	EWT/LWT	PD (FT. H_2O)	NO. OF ROWS/FPI	FLOW RATE (GPM)	TYPE
FCU-A	HPP	14	REFER TO PLANS	950	355	0.60	(2) 1/3	120/1	9.6/10.8	15	38,879	25,549	82.9/69.3	56.8/55.9	44/54.8	2.95	4/10	7.5	76,681	43.1/116	180/149.2	5.22	2/10	5.0	NA
FCU-B	HPP	12	REFER TO PLANS	800	340	0.55	(2) 1/3	120/1	9.6/10.8	15	32,112	21,432	84.4/70.3	58.4/57.5	44/57.4	2.52	4/10	5.0	63,008	40.1/111.2	180/137.8	3.68	2/10	3.0	NA
FCU-C	HPP	12	REFER TO PLANS	600	235	0.70	(2) 1/3	120/1	9.6/10.8	15	35,872	17,402	84.2/74	55.9/55.5	44/56.4	3.71	4/10	6.0	53,478	41.2/121.3	180/144.4	3.67	2/10	3.0	NA
FCU-D	HPP	14	REFER TO PLANS	1100	405	0.47	(2) 1/3	120/1	9.6/10.8	15	42,819	28,689	82.9/69.3	57.8/56.7	44/55.1	3.38	4/10	8.0	82,911	43.1/111.3	180/146.6	5.23	2/10	5.0	NA
FCU-E	HPP	06	REFER TO PLANS	300	40	0.70	(1) 1/3	120/1	4.8/6	15	10,135	6,505	79.4/67.2	56.8/55.3	44/52.8	4.43	3/10	2.5	17,195	59.2/109.2	180/146.6	3.86	1/10	1.0	NA
FCU-F	HPP	06	REFER TO PLANS	250	40	0.70	(1) 1/3	120/1	4.8/6	15	9,225	5,725	79.9/67.5	55.6/54.2	44/52.1	4.44	3/10	2.5	16,105	57.3/113.2	180/148.8	3.86	1/10	1.0	NA
FCU-G	HPP	08	REFER TO PLANS	400	60	0.70	(1) 1/3	120/1	4.8/6	15	13,289	8,739	80.3/67.8	58.3/56.6	44/53.4	2.9	3/10	3.0	20,061	58.2/102.4	180/153.8	1.12	1/10	1.5	NA
FCU-H	HPP	08	REFER TO PLANS	350	165	0.70	(1) 1/3	120/1	4.8/6	15	17,099	10,459	83.4/69.8	53.9/53.4	44/56	4.03	4/10	3.0	21,991	36.2/91.9	180/151.1	1.12	1/10	1.5	NA
FCU-I	NOT USED																								
FCU-J	NOT USED																								
FCU-K	NOT USED																								
FCU-L	HPP	12	REFER TO PLANS	650	115	0.70	(2) 1/3	120/1	9.6/10.8	15	24,292	17,772	81.4/66.6	54.3/53.5	44/54.3	2.54	4/10	5.0	32,848	56.2/100.7	180/158.5	1.92	1/10	3.0	NA
FCU-M	HPP	12	REFER TO PLANS	600	195	0.70	(2) 1/3	120/1	9.6/10.8	15	27,482	18,312	83.4/68.4	53.4/52.6	44/53.6	3.73	4/10	6.0	33,998	46.2/96.3	180/157.7	1.92	1/10	3.0	NA
FCU-N	HPP	08	REFER TO PLANS	370	80	0.75	(1) 1/3	120/1	4.8/6	15	15,179	10,839	82/66.8	53/52.3	44/54.7	4.05	4/10	3.0	20,101	53.2/101.1	180/153.7	1.12	1/10	1.5	NA

NOTES:

1. 4–PIPE FAN COIL UNITS SHALL BE BASED ON ENVIRO–TEC, WITH SOLID HINGED BOTTOM ACCESS PANEL.
2. ALL FAN COIL UNITS SHALL BE UL LISTED AND LABELED.
3. FAN COIL UNIT CONTROLS SHALL BE BY AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR.
4. MECHANICAL CONTRACTOR TO CONFIRM COIL SIDE CONNECTIONS IN FIELD PRIOR TO ORDERING.
5. EACH FAN COIL UNIT SHALL BE PROVIDED WITH: DISCONNECT SWITCH, INLET/OUTLET FLEXIBLE CONNECTIONS, RUBBER–IN SHEAR VIBRATION ISOLATORS, CLOSED CELL FOAM INSULATION, STAINLESS STEEL DRAIN PAN, STAINLESS STEEL AUXILIARY DRAIN PAN, AND ELECTRONICALLY COMMUTATED MOTORS WITH START/STOP RELAY AND UNIT MOUNTED THREE–SPEED SWITCH.
6. UNITS SELECTED AT MEDIUM SPEED SETTING.

MINIMUM HANGER SIZES FOR RECTANGULAR DUCT

MINIMUM HALF OF DUCT PERIMETER	PAIR AT 10Ft SPACING		PAIR AT 8Ft SPACING		PAIR AT 5Ft SPACING		PAIR AT 4Ft SPACING	
	STRAP	ROD	STRAP	ROD	STRAP	ROD	STRAP	ROD
P/2 = 30"	1" x 22ga	1/4"	1" x 22ga	1/4"	1" x 22ga	1/4"	1" x 22ga	1/4"
P/2 = 72"	1" x 18ga	3/8"	1" x 20ga	1/4"	1" x 22ga	1/4"	1" x 22ga	1/4"
P/2 = 96"	1" x 16ga	3/8"	1" x 18ga	3/8"	1" x 20ga	3/8"	1" x 22ga	3/8"
P/2 = 120"	1½" x 16ga	1/2"	1" x 16ga	3/8"	1" x 18ga	3/8"	1" x 20ga	3/8"
P/2 = 168"	1½" x 16ga	1/2"	1" x 16ga	1/2"	1" x 16ga	3/8"	1" x 18ga	3/8"
P/2 = 192"	–	–	1" x 16ga	1/2"	1" x 16ga	3/8"	1" x 18ga	3/8"

WHEN STRAPS ARE LAP JOINED USE THESE MINIMUM FASTENERS:

1" x 18, 20, 22ga – ON 1/4" BOLT
1" X 16ga – TWO 1/4" Dia.
1" X 16ga – TWO 3/8" Dia.

PLACE FASTENERS IN SERIES, NOT SIDE BY SIDE.

SINGLE HANGER MAXIMUM ALLOWABLE LOAD	
STRAP	ROD (Dia.)
1" x 22ga – 260Lbs.	1/4" – 270Lbs.
1" x 20ga – 32Lbs.	3/8" – 680Lbs.
1" x 18ga – 420Lbs.	1/2" – 1250Lbs.
1" x 16ga – 700Lbs.	5/8" – 2000Lbs.
1½" x 16ga – 1100Lbs.	3/4" – 3000Lbs.

NOTES:

1. DIMENSIONS OTHER THAN GAUGE ARE IN INCHES.
2. TABLES ALLOW FOR DUCT WEIGHT, 1 LB./SF. INSULATION WEIGHT AND NORMAL REINFORCEMENT AND TRAPEZE WEIGHT, BUT NO EXTERNAL LOADS.
3. STRAPS ARE GALVANIZED STEEL.
4. ALLOWABLE LOADS FOR P/2 ASSUME THAT DUCTS ARE 16 GA. MAXIMUM, EXCEPT WHEN MAXIMUM DUCT DIMENSION (W) IS OVER 60" THEN P/2 MAXIMUM IS 1.25 W.

HEATING AND COOLING MINIMUM PIPE INSULATION COMMERCIAL

(THICKNESS IN INCHES)

FLUID	NOMINAL PIPE DIAMETER			
	< 1-1/2"	1-1/2" < 4.0"	4.0" to 8.0"	8.0"≤
HOT WATER	1.5	2.0	2.0	2.0
REFRIGERANT	1.0	1.0	1.0	1.0
CONDENSATE	1.0	1.0	1.0	1.0
CHILLED WATER	1.5	1.5	1.5	1.5

NOTES:

1. UNLESS OTHERWISE NOTED ALL INTERIOR PIPE COVERING SHALL BE FIBERGLASS PREFORMED PIPE AND PREMOLDED FITTING INSULATION WITH: FIRE RETARDANT VAPOR BARRIER JACKET, 0.23 K–FACTOR AT 75°F MEAN TEMPERATURE, FLAME SPREAD = 25, SMOKE DEVELOPED = 50.
2. ALL INTERIOR AND EXTERIOR PIPING, FITTINGS, AND VALVES SHALL BE INSTALLED WITH 20 MIL THICK, WHITE PVC JACKETING. PVC JACKETING SHALL BE HIGH IMPACT RESISTANT, UV RESISTANT COMPLYING WITH ASTM D 1784, CLASS 16354–C. PROVIDE FACTORY FABRICATED FITTING AND VALVE COVERS WHERE AVAILABLE.
3. REFRIGERANT AND CONDENSATE PIPE INSULATION SHALL BE FLEXIBLE ELASTOMERIC FOAM SIMILAR TO ARMAFLEX. EXTERIOR INSULATIONS TO BE COATED WITH ARMAFLEX WB OR BE INSTALLED WITH PVC JACKETING.
4. FITTINGS AND VALVES SHALL BE PROVIDED WITH PREMOLDED FITTING COVERS WITH PVC JACKETING EQUAL IN THICKNESS AND MATERIAL TO ADJOINING PIPE INSULATION.

PUMP SCHEDULE

DESIGNATION	HWP
LOCATION	REFER TO PLANS
SYSTEM SERVED	HOT WATER
TYPE	E–90
MODEL	1.5AB
IMPELLER DIAMETER (IN.)	6.75"
EFFICIENCY	62.5%
GPM	55
TOTAL DYNAMIC HEAD (FT H_2O)	40
RPM	1800
MOTOR:	
HP/BHP	1.5/0.864
VOLTAGE/ø/Hz	208/3/60
STARTER:	
TYPE	VFD
LOCATION	REFER TO PLANS

NOTES:

1. PUMPS BASED ON BELL AND GOSSETT.
2. ALL MOTORS 1 HP AND LARGER SHALL BE PREMIUM EFFICIENCY, BALDOR.
3. SEALS SHALL BE BUNA–CARBON/CERAMIC.
4. ALL PUMPS FURNISHED WITH VARIABLE FREQUENCY DRIVES (VFD) SHALL HAVE INVERTER DUTY RATED MOTORS APPROVED FOR VARIABLE SPEED AND TORQUE APPLICATIONS. PUMP MOTORS AND VFDS SHALL BE SELECTED TO WORK AS A COMPLETE, COORDINATED, AND FUNCTION PACKAGE, MECHANICAL CONTRACTOR TO COORDINATE.
5. VARIABLE FREQUENCY DRIVES SHALL BE FURNISHED WITH A DISCONNECT SWITCH. VFD TO BE PURCHASED BY MECHANICAL CONTRACTOR AND INSTALLED BY ELECTRICAL CONTRACTOR. VFD SHALL HAVE NEMA 1 ENCLOSURE. VFD SHALL HAVE BY–PASS OPERATION, H–O–A SELECTOR SWITCH, AND HAVE TURN DOWN RATIO OF 10:1.

MINIMUM HANGER SIZES FOR ROUND DUCT

DIAMETER	MAXIMUM SPACING	WIRE DIAMETER	ROD	STRAP
≤10"	12'	——	1/4"	1" X 22 ga.
11" – 18"	12'	——	1/4"	1" X 22 ga.
19" – 24"	12'	——	1/4"	1" X 22 ga.
25" – 36"	12'	——	3/8"	1" X 20 ga.
37" – 50"	12'	——	TWO 3/8"	TWO 1" X 20 ga.
51" – 60"	12'	——	TWO 3/8"	TWO 1" X 18 ga.
61" – 84"	12'	——	TWO 3/8"	TWO 1" X 16 ga.

NOTES:

1. STRAPS AND RODS ARE GALVANIZED STEEL
2. TABLE ALLOWS FOR CONVENTIONAL WALL THICKNESS, AND JOINT SYSTEMS PLUS ONE lb/sf OF INSULATION WEIGHT. IF HEAVIER DUCTS ARE TO BE INSTALLED, ADJUST HANGER SIZES TO BE WITHIN THEIR LOAD LIMITS.

PIPE HANGER SCHEDULE

PIPE SIZE (INCHES)	MAXIMUM HORIZONTAL SPACING (FEET)			SINGLE STEEL ROD HANGER SIZE (INCHES)		HANGER TYPE STEEL	MAXIMUM VERTICAL SPACING (FEET)		
	COPPER TUBE	STEEL PIPE	PVC PIPE	TUBING	PIPING		COPPER TUBE	STEEL PIPE	PVC PIPE
1/2"	6	8	4	1/4"	3/8"	BAND	10	15	10
3/4"	6	8	4	1/4"	3/8"	BAND	10	15	10
1"	6	8	4	1/4"	3/8"	BAND	10	15	10
1¼"	6	9	4	1/4"	3/8"	CLEVIS	10	15	10
1½"	6	9	4	1/4"	3/8"	CLEVIS	10	15	10
2"	10	10	4	1/4"	3/8"	CLEVIS	10	15	10
2½"	10	12	4	3/8"	1/2"	CLEVIS	10	15	10
3"	10	12	4	3/8"	1/2"	CLEVIS	10	15	10
4"	——	12	4	1/2"	5/8"	CLEVIS OR ROLLER	——	15	10
6"	——	12	——	——	3/4"	CLEVIS OR ROLLER	——	15	——

NOTES:

1. INSTALL HANGER OR SUPPORT CLOSE TO THE POINT OF CHANGE OF DIRECTION IN ALL PIPE RUNS.
2. INSTALL ADDITIONAL HANGERS ON SUPPORTS AT CONCENTRATED LOADS.
3. SUPPORT ALL BRANCH PIPING OVER 5'–0" IN LENGTH.
4. USE ROLLER TYPE HANGERS (MSS TYPE 41) WHERE PIPING IS SUBJECT TO MOVEMENT CAUSED BY EXPANSION AND CONTRACTION.
5. HANGERS AND ANCHORS SHALL BE ATTACHED TO THE BUILDING CONSTRUCTION IN AN APPROVED MANNER.
6. PIPING SHALL BE SUPPORTED AT DISTANCES NOT EXCEEDING THE SPACING SPECIFIED IN SCHEDULE OR IN ACCORDANCE WITH MSS SP–69.

MINIMUM DUCT INSULATION

COMMERCIAL

ALL SUPPLY AND RETURN AIR DUCTS AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R–6 INSULATION WHEN LOCATED IN UNCONDITIONED SPACES AND WITH A MINIMUM OF R–12 INSULATION WHEN LOCATED OUTSIDE THE BUILDING ENVELOPE. WHEN LOCATED WITHIN A BUILDING ENVELOPE ASSEMBLY, THE DUCT OR PLENUM SHALL BE SEPARATED FROM THE BUILDING EXTERIOR OR UNCONDITIONED OR EXEMPT SPACES BY A MINIMUM OF R–12 INSULATION.

EXCEPTIONS:

1. WHEN LOCATED WITHIN EQUIPMENT.
2. WHEN THE DESIGN TEMPERATURE DIFFERENCE BETWEEN THE INTERIOR AND EXTERIOR OF THE DUCT OR PLENUM DOES NOT EXCEED 15°F (8°C).

ALL JOINTS, LONGITUDINAL AND TRANSVERSE SEAMS, AND CONNECTIONS IN DUCTWORK, SHALL BE SECURELY FASTENED AND SEALED WITH WELDS, GASKETS, MASTICS (ADHESIVES), MASTIC–PLUS– EMBEDDED FABRIC SYSTEMS OR TAPES. TAPES AND MASTICS USED TO SEAL DUCTWORK SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A OR UL 181B. DUCT CONNECTIONS TO FLANGES OF AIR DISTRIBUTION SYSTEM EQUIPMENT SHALL BE SEALED AND MECHANICALLY FASTENED. UNLISTED DUCT TAPE IS NOT PERMITTED AS A SEALANT ON ANY METAL DUCTS.

NOTE:

DUCT INSULATION, COVERINGS AND LINING MATERIALS AND ADHESIVES SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25, AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50, IN ACCORDANCE WITH 2020 MECHANICAL CODE OF NEW YORK STATE SECTION 604.3.

MECHANICAL PIPING MATERIAL SCHEDULE

SERVICE	SIZE (IN)	MATERIAL	TYPE/WEIGHT	STANDARD
HOT & CHILLED WATER	3" & DOWN	COPPER	HARD DRAWN TYPE L TUBING	ASTM B 88
HOT & CHILLED WATER	4" & UP	BLACK STEEL	SCHEDULE 40	ASTM A 53
CONDENSATE & CONDENSATE PUMP	ALL	COPPER	HARD DRAWN TYPE L TUBING	ASTM B 88
REFRIGERANT	ALL	COPPER	HARD OR ANNEALED TYPE ACR	ASTM B 280

MECHANICAL PIPING FITTING SCHEDULE

SERVICE	SIZE (IN)	MATERIAL	TYPE/WEIGHT	STANDARD
HOT & CHILLED WATER	3" & DOWN	WROUGHT COPPER	LEAD–FREE SOLDER ASTM B828	ASME B 16.22
HOT & CHILLED WATER	4" & UP	CARBON STEEL	BUTT WELDED OR FLANGED	ASME B 16.9 / ASME 234
CONDENSATE & CONDENSATE PUMP	ALL	WROUGHT COPPER	SOLDER	ASME B 16.22
REFRIGERANT	ALL	COPPER	SILVER SOLDER 300 PSI	ANSI B 16.22

MECHANICAL EQUIPMENT SCHEDULE

SYMBOL	MANUFACTURER	CATALOG #	DESCRIPTION
CD-A	KRUEGER	1400	STEEL HIGH PERFORMANCE CEILING DIFFUSER. MAXIMUM CORE VELOCITY: 550 FPM. MAXIMUM NOISE CRITERIA: 15 NC. SURFACE MOUNTED WITH FRAMES AND BORDERS SUITABLE FOR THE CONSTRUCTION IN WHICH THEY WILL BE INSTALLED, CONTRACTOR TO COORDINATE. BAKED ENAMEL FINISH, COLOR SELECTED BY ARCHITECT. 4–WAY DEFLECTION. 24" x 24" MODULE SIZE. ALL DIFFUSERS SHALL BE EQUIPPED WITH OPPOSED BLADE VOLUME DAMPER. CFM RANGE: / NECK SIZE: 0–100 → 6"ø 101–200 → 8"ø 201–300 → 10"ø 301–450 → 12"ø 451–650 → 14"ø
CFSD	RUSKIN	FSD60LP	CONSTRUCTED AND INSTALLED ACCORDING TO NFPA90A AND UL LABELS. UL 555S OPPOSED AIRFOIL BLADE DAMPER, HIGH PERFORMANCE AND LOW LEAKAGE CLASS 1. DAMPER SHALL BE RATED FOR DYNAMIC AIRFLOW CONDITIONS OF 2,000 FPM AND 4.0" SP. FURNISH UL RATED ELECTRIC DAMPER ACTUATOR AND CONTROL SWITCHES AS REQUIRED. FURNISH WITH FACTORY WELDED INTEGRAL WALL SLEEVE, FRAME MOUNTING ANGLES, G STYLE WITH 3/4" MOUNTING FLANGE, AND EITHER DUCTMATE OR SLIP DRIVE BREAK AWAY CONNECTIONS. 120V/1ø/60Hz; 0.25 AMPS; 23 WATTS. COORDINATE ROTATION IN FIELD. PROVIDE DISCONNECT, DAMPER TEST SWITCH AND END SWITCH. SMOKE DETECTOR PROVIDED BY OTHERS, INSTALLED BY MECHANICAL CONTRACTOR IN DUCTWORK.
ER-A RG-A RR-A	KRUEGER	S80H	STEEL RETURN REGISTER WITH 3/4" FIXED BLADE SPACING. MAXIMUM CORE VELOCITY: 500 FPM. MAXIMUM NOISE CRITERIA: 25 NC. SURFACE MOUNTED 35° FIXED DEFLECTION BLADES. BLADES PARALLEL TO LONG DIMENSION UNLESS OTHERWISE NOTED. BAKED ENAMEL FINISH, COLOR SELECTED BY ARCHITECT. REGISTERS SHALL HAVE FRAMES AND BORDERS SUITABLE FOR THE CONSTRUCTION IN WHICH THEY WILL BE INSTALLED, CONTRACTOR TO COORDINATE. REGISTERS SHALL BE PROVIDED WITH OPPOSED BLADE VOLUME DAMPERS. UNLESS OTHERWISE NOTED ON PLANS REGISTERS AND GRILLES SHALL BE SIZED PER SCHEDULE. CFM RANGE: / NECK SIZE: 0–150 → 8"x8" 151–250 → 10"x10" 251–350 → 12"x12" 351–725 → 18"x18" 726–1125 → 24"x24"
RR-B	KRUEGER	S580H	ALUMINUM RETURN GRILLE WITH 3/4" BLADE SPACING. MAXIMUM CORE VELOCITY: 350 FPM. MAXIMUM NOISE CRITERIA: 25NC. GRILLE SHALL HAVE 2" FILTER FRAME WITH 1/4 TURN FASTENER. FINISH, COLOR SELECTED BY ARCHITECT. 4–WAY DEFLECTION. 23.75" x 23.75 MODULE SIZE WITH 20" x 20" NOMINAL DUCT SIZE. ALL DIFFUSERS SHALL BE EQUIPPED WITH OPPOSED BLADE VOLUME DAMPER. PROVIDE (2) 2" MERV 11 FILTERS PER RETURN REGISTER.
FD	RUSKIN	DIBD2	1–1/2 HOUR UL555 RATED, SUITABLE FOR INSTALLATION IN WALL AND FLOOR PARTITIONS WITH FIRE RATINGS OF LESS THAN 3 HOURS. DAMPER SHALL BE A COMPLETE FACTORY PACKAGE INCLUDING UL APPROVED ANGLES, WALL SLEEVE, AND BREAKAWAY CONNECTIONS. DAMPER SHALL BE RATED FOR DYNAMIC AIRFLOW CONDITIONS OF 2,000 FPM AND 4.0" ESP. 165°F FUSIBLE LINK.
LD-A	KRUEGER	PTBS	PLENUM, HIGH FLOW, SLOT DIFFUSER WITH GASKETED ALUMINUM BLADE, EASILY ROTATED FOR ADJUSTMENT FROM HORIZONTAL TO VERTICAL FLOW. MAXIMUM NOISE CRITERIA: 25 NC. DIFFUSERS SHALL BE 4'–0" LONG WITH (1) 1" SLOT, INTERNALLY INSULATED PLENUM WITH 10" OVAL INLET. FINISH COLORS TO BE SELECTED BY ARCHITECT. FRAME SHALL BE F23A–CN. PROVIDE ADJUSTABLE PATTERN CONTROLLERS.
SD	RUSKIN	SD60	CONSTRUCTED AND INSTALLED ACCORDING TO NFPA90A AND UL LABELS. UL 555S OPPOSED AIRFOIL BLADE DAMPER, HIGH PERFORMANCE AND LOW LEAKAGE CLASS 1. DAMPER SHALL BE RATED FOR DYNAMIC AIRFLOW CONDITIONS OF 4,000 FPM AND 8.0" SP. FURNISH UL RATED ELECTRIC DAMPER ACTUATOR AND CONTROL SWITCHES AS REQUIRED. FURNISH WITH FACTORY WELDED INTEGRAL WALL SLEEVE, FRAME MOUNTING ANGLES, G STYLE WITH 3/4" MOUNTING FLANGE, AND EITHER DUCTMATE OR SLIP DRIVE BREAK AWAY CONNECTIONS. 120V/1ø/60Hz; 0.25 AMPS; 23 WATTS. COORDINATE ROTATION IN FIELD. PROVIDE DISCONNECT, DAMPER TEST SWITCH, AND END SWITCH. SMOKE DETECTOR PROVIDED BY OTHERS, INSTALLED BY MECHANICAL CONTRACTOR IN DUCTWORK.
SR-A	KRUEGER	880	STEEL SUPPLY REGISTER WITH 3/4" BLADE SPACING. MAXIMUM CORE VELOCITY: 500 FPM. MAXIMUM NOISE CRITERIA: 20NC. DOUBLE DEFLECTION BLADES PARALLEL TO LONG DIMENSION. BAKED ENAMEL FINISH, COLOR SELECTED BY ARCHITECT. REGISTERS SHALL HAVE FRAMES AND BORDERS SUITABLE FOR THE CONSTRUCTION IN WHICH THEY WILL BE INSTALLED, CONTRACTOR TO COORDINATE. REGISTERS SHALL BE PROVIDED WITH OPPOSED BLADE VOLUME DAMPERS. SIZE PER REGISTER SCHEDULE. CFM RANGE: / NECK SIZE: 0–250 → 8"x8" 251–400 → 10"x10" 401–600 → 12"x12" 601–1000 → 18"x18" 1001–2000 → 24"x24"
VFD	ABB	–	UNLESS PROVIDED AS PART OF EQUIPMENT BY MANUFACTURER, VARIABLE FREQUENCY DRIVES SHALL BE BASED ON ABB WITH BACNET IP–MS/TP COMMUNICATION FACTORY INSTALLED. THE VFD SHALL BE IN A NEMA 1 TYPE ENCLOSURE WITH A CIRCUIT BREAKER DISCONNNECT SWITCH, INDUSTRIAL RATED OPERATOR CONTROLS, USER TERMINAL STRIP CONNECTIONS AND BYPASS CONTROLS. POWER CIRCUIT CONFIGURATION SHALL BE "POWER Y CIRCUIT". VFD SHALL BE COMPLETE WITH: HAND–OFF–AUTO SWITCH AND MANUAL SPEED POTENTIOMETER, IEC–RATED ISOLATION AND BYPASS CONTACTORS WITH MECHANICAL AND ELECTRICAL INTERLOCKING AND A CLASS 20 OVERLOAD RELAY, 120 V FUSED CONTROL TRANSFORMER AND CIRCUIT BREAKER WITH LOCKOUT/TAG CAPABILITY, AFC–OFF–BYPASS SWITCH, TEST–NORMAL SWITCH, PILOT LIGHT CLUSTER "B08" (POWER ON, AFC RUN, BYPASS RUN AND AFC FAULT), LINE ISOLATION CONTACTOR AND "H09" ANALOG OUTPUT. PROVIDE AUXILIARY CONTACTS FOR "STATUS/RUN", "FAULT", AND ANALOG OUTPUT FOR "SPEED".
M	RUSKIN	CD450	HIGH PERFORMANCE CONTROL DAMPER. UNLESS PROVIDED WITH A SPECIFIC PIECE OF EQUIPMENT MOTORIZED DAMPERS SHALL BE CONSTRUCTED OF: 4"x1" EXTRUDED ALUMINUM FRAME, 6" WIDE EXTRUDED ALUMINUM AIRFOIL DAMPER BLADES, SANTOPRENE BLADE EDGE AND JAMB SEALS, LEXAN WITH ACETAL COPOLYMER BEARINGS. CLASS 1A LEAKAGE (3 CFM/FT² AT 1"WC). DAMPER SHALL HAVE OPPOSED BLADES, MOTOR AND LINKAGE. PROPORTIONAL DAMPER ACTUATORS SHALL BE 24VAC/60Hz., MAXIMUM 6 WATTS RUNNING AND 2 WATTS HOLDING POWER CONSUMPTION, COMPLETE WITH DISCONNECT SWITCH, TRANSFORMER AND END SWITCH KITS, SIMILAR TO BELIMO NF24–SR.
CIRCUIT SETTER	BELL AND GOSSETT	CB	HEAVY DUTY, CALIBRATED BALANCE VALVE, CAST–IRON CONSTRUCTION WITH FLANGED CONNECTIONS, BRASS DISC, STAINLESS STEEL STEM, 175 PSIG @ 250°F RATING.
EXPANSION COMPENSATOR	METRAFLEX	HP2	COMPENSATOR SHALL ACCOMMODATE 1/2" OF EXPANSION AND 2" OF COMPRESSION. 175 PSI WORKING PRESSURE. COMPENSATOR CONSTRUCTION: CARBON STEEL WITH MULTI–PLY 304 STAINLESS STEEL BELLOWS.
HIGH PERFORMANCE BUTTERFLY VALVE	BRAY CONTROLS	HIGH PERFORMANCE	• HIGH PERFORMANCE BUTTERFLY VALVES, ANSI CLASS 150. • VALVES SHALL PROVIDE ABSOLUTE SHUT–OFF (ZERO LEAKAGE) TO FULL ANSI CLASS RATING WITH PRESSURE IN EITHER DIRECTION. • BODY SHALL BE FULL LUG STYLE. VALVE SHALL PROVIDE DRIP–TIGHT–SHUT–OFF ON DEAD END SERVICE, WITH PRESSURE IN EITHER DIRECTION TO ALLOW FOR PIPING CHANGES OR EQUIPMENT REMOVAL. EXTENDED NECK SHALL ALLOW FOR PIPING INSULATION AND ACCESS TO PACKING ADJUSTMENT AND OPERATOR MOUNTING. • VALVE BODY AND SEAT RETAINER RING SHALL BE CARBON STEEL, ASTM A216 GR WCB / A516 GR 70. DISC SHALL BE STAINLESS STEEL ASTM A351 GR CF8M, FOR LONG TERM CORROSION RESISTANCE. DISC SHALL BE DOUBLE OFFSET DESIGN. SEAT SHALL BE LIVE LOADED RPTFE. SHAFT SHALL BE ONE–PIECE CONTSRUCTION, 17–4PH STAINLESS STEEL. • VALVES SHALL COMPLY WITH PED 97/23/EC. • FOR MANUAL VALVES, PROVIDE LEVER OPERATORS UP TO 6" SIZE, AND GEAR OPERATORS FOR VALVES LARGER THAN 6".
CONDENSATE PUMP	LITTLE GIANT	VCCA–20–P	HARDWIRED AUTOMATIC CONDENSATE PUMP WITH FLOAT ACTIVATED AUXILIARY HIGH LEVEL SWITCH. ELECTRICAL: 115V/1ø/60Hz, 1.5 AMPS, 93 WATTS, 1/3 HP. SHUT–OFF HEAD 20 FEET. PERFORMANCE: 70 GALLONS PER HOUR AT 5 FEET OF HEAD. PUMP SHALL BE COMPLETE WITH DISCONNECT SWITCH. PROVIDE AT ALL FAN COIL UNITS.
AC-1	MITSUBISHI	MSY–GL09NA	WALL MOUNTED DUCTLESS INDOOR UNIT. 9,000 BTUH RATED COOLING CAPACITY. ELECTRICAL CHARACTERISTICS: 208V/1ø/60HZ., 1.0 AMPS MCA, 15 AMPS MOCP. 24.6 SEER AND 15.4 EER. UNIT SHALL BE COMPLETE WITH WALL MOUNTED WIRELESS CONTROLLER WITH LOCK DOWN BRACKET, DISCONNECT SWITCH, CONDENSATE PUMP, AND DRAIN PAN LEVEL SENSOR.
ACCU-1	MITSUBISHI	MUY–GL09NA	AIR COOLED CONDENSING UNIT. ELECTRICAL CHARACTERISTICS: 208V/1ø/60HZ., 7 AMPS MCA, 15 AMPS MOCP. UNIT SHALL BE COMPLETE WITH: NEMA 3R DISCONNECT SWITCH AND WIND BAFFLE. R–410A REFRIGERANT. FULL CAPACITY LOW AMBIENT COOLING OPERATION DOWN TO 0°F.

EXHAUST FAN SCHEDULE

DESIGNATION	EF-13	EF-15
LOCATION	3RD FLOOR ROOF	PENTHOUSE ROOF
AREA SERVED	REFER TO PLANS	REFER TO PLANS
MODEL	G–099–VG	G–080–VG
CFM	955	310
BHP	0.17	0.06
HP	1/4	1/10
RPM	1540	1579
ESP (IN H_2O)	0.4"	0.4"
VOLTS/Ø	115/1	115/1
FLA (AMPS)	2.85	1.38
MCA/MOCP (AMPS)	4/15	2/15
SOUND DATA (dBA/SONES)	61/11.0	55/7.6

NOTES:

1. FANS BASED ON GREENHECK
2. ALL SINGLE PHASE MOTORS TO INCLUDE THERMAL OVERLOAD.
3. ALL FANS SHALL BE PROVIDED WITH MOTORIZED BACKDRAFT DAMPERS CONSTRUCTED OF A GALVANIZED STEEL FRAME AND ALUMINUM BLADES WITH SEALS. MOTORIZED DAMPER VOLTAGE SHALL BE 120 VOLTS. MOTORIZED DAMPER SHALL BE COMPLETE WITH END SWITCH AND DISCONNECT SWITCH.
4. ALL EXHAUST FANS SHALL BE PROVIDED WITH THE FOLLOWING: VARI–GREEN EC MOTOR WITH MOUNTED POTENTIOMETER DIAL, BIRDSCREEN, HOOD HASPS, CURB SEAL AND 18" HIGH ALUMINUM ROOF CURB WITH DAMPER TRAY.
5. ALL FANS SHALL BE PROVIDED WITH DISCONNECT SWITCH AT UNIT FOR SERVICE. OUTDOOR DISCONNECT SWITCHES SHALL BE NEMA 3R.
6. ROOF CURBS SHALL BE PROVIDED BY MECHANICAL CONTRACTOR AND INSTALLED BY GENERAL CONTRACTOR.

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No.	Date	Issue
2	09/22/23	ISSUED FOR BID
1	03/30/23	S.E.D. SUBMISSION

Sheet Title

MECHANICAL: EQUIPMENT SCHEDULES

Job No. 2023-1008
Date 03-30-23
Scale AS NOTED
Drawn/Checked KC/SZ
Sheet No. M702