

ABBREVIATIONS

ABS	ABSOLUTE	EWH	ELECTRIC WATER HEATER	N.O.	NORMALLY OPEN
AC	ALTERNATING CURRENT	EWT	ENTERING WATER TEMPERATURE	NO.	NUMBER
AD	AREA DRAIN	EXP	EXPANSION	NTS	NOT TO SCALE
AFF	ABOVE FINISHED FLOOR	EXP JT	EXPANSION JOINT	OA	OUTSIDE AIR
AGF	AIR GAP FITTING	EXT	EXTERIOR	OD	OUTSIDE DIAMETER
AHU	AIR HANDLING UNIT	°F	DEGREE FAHRENHEIT	OD	OVERFLOW DRAIN
AMP	AMPERE	F	FIRE PROTECTION WATER SUPPLY	OED	OPEN END DUCT
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	FCO	FLOOR CLEANOUT	%	PERCENT
APP	APPROVED	FD	FLOOR DRAIN	PCR	PUMPED CONDENSATE RETURN
APPROX	APPROXIMATE	FDC	FIRE DEPARTMENT CONNECTION	PD	PUMPED DRAIN
AV	ACID VENT	FHC	FIRE HOSE CABINET	POI	PLUMBING & DRAINAGE INSTITUTE
AVG	AVERAGE	FHV	FIRE HOSE VALVE	PG	PRESSURE GAUGE
B.O.P	BOTTOM OF PIPE	FIM	FINISH	PH	PHASE-ELECTRICAL
BFP	BACKFLOW PREVENTION DEVICE	FF	FINISHED FLOOR	PIV	POST INDICATOR VALVE
BRV	BUTTERFLY VALVE	FLFD	FUSIBLE LINK FIRE DAMPER	PLBG	PLUMBING
BHP	BRAKE HORSEPOWER	FLR	FLOOR	PP	POLYPROPYLENE PIPE
BLDG	BUILDING	FO	FUEL OIL	PRV	PRESSURE REDUCING VALVE
BLV	BALANCING VALVE	FPM	FEET PER MINUTE	PSF	POUNDS PER SQUARE FOOT
BTU	BRITISH THERMAL UNIT	FPS	FEET PER SECOND	PSI	POUNDS PER SQUARE INCH
BV	BALL VALVE	FS	FLOW SWITCH	PVC	POLYVINYL CHLORIDE PIPE
BWV	BACKWATER VALVE	FT	FEET	QT	QUART
CA	COMPRESSED AIR	FU	FIXTURE UNIT	(R)	REMOVE EXISTING
C TO C	CENTER TO CENTER	FV	FLUSH VALVE	(RE)	RELOCATE EXISTING
CD	CONDENSATE DRAIN	G	NATURAL GAS	RA	RETURN AIR
CFH	CUBIC FEET PER HOUR	GA	GAUGE	RD	ROOF DRAIN
CFM	CUBIC FEET PER MINUTE	GAL	GALLONS	R&D	RESEARCH & DEVELOPMENT
CHWR	CHILLED WATER RETURN	GALV	GALVANIZED	REQ	REQUIRED
CHWS	CHILLED WATER SUPPLY	GPD	GALLONS PER DAY	RG	RETURN AIR GRILLE
CI	CAST IRON	GPH	GALLONS PER HOUR	RH	RELATIVE HUMIDITY
CISP	CAST IRON SOIL PIPE	GPM	GALLONS PER MINUTE	RM	ROOM
CISPI	CAST IRON SOIL PIPE INSTITUTE	GR	GRAINS OF MOISTURE	RPM	REVOLUTIONS PER MINUTE
CKT	CIRCUIT	GRD	GROUND	RR	RETURN AIR REGISTER
CLG	CEILING	GWH	GAS WATER HEATER	RWC	RAINWATER CONDUCTOR
CO	CLEANOUT	H	ENTHALPY	RZPB	REDUCED PRESSURE ZONE BFP
CO ₂	CARBON DIOXIDE	HB	HOSE BIBB	SA	SHOCK ABSORBER
COL	COLUMN	HC	HANDICAP	SAN	SANITARY WASTE
COND	CONDENSATE	HD	HEAD	SCH	SCHEDULE
CONN	CONNECTION	HP	HORSEPOWER	SD	SUPPLY AIR DIFFUSER
CONT	CONTINUED	HPCR	HIGH PRESSURE CONDENSATE RETURN	F	SQUARE FEET
CONTR	CONTRACTOR	HPSS	HIGH PRESSURE STEAM SUPPLY	SH	SHOWER
CP	CONTROL PANEL	HR	HOUR	SP	STANDPIPE
CR	CONDENSER RETURN	HS	HOSE STATION	SPD	SURGE PROTECTION DEVICE
CS	CONDENSER SUPPLY	HT	HEIGHT	SPEC	SPECIFICATION
CU FT	CUBIC FEET	HTR	HEATER	SPR	SPRINKLER
CU IN	CUBIC INCH	HVAC	HEATING VENTILATION AIR CONDITIONING	SQ	SQUARE
CV	CHECK VALVE	HW	HOT WATER (DOMESTIC)	SR	SUPPLY AIR REGISTER
CW	COLD WATER (DOMESTIC)	HWR	HOT WATER RETURN (DOMESTIC)	SS	STAINLESS STEEL
DB	DECIBEL	HWR	HOT WATER RETURN	STD	STANDARD
DB	DRY BULB	HWS	HOT WATER SUPPLY	STL	STEEL
DCBP	DOUBLE CHECK BACKFLOW PREVENTER	FZ	FREQUENCY-ELECTRICAL	STR	STRAINER
DD	DECK DRAIN	ID	INSIDE DIAMETER	STRUC	STRUCTURAL
DEG	DEGREE	ID	INDIRECT DRAIN	SUCT	SUCTION
DFU	DRAINAGE FIXTURE UNIT	IE	INVERT ELEVATION	SV	SANITARY VENT
DI	DIIONIZED WATER	IW	INDIRECT WASTE	SWV	SANITARY WASTE VENT
DIA	DIAMETER	KW	KILOWATT	T&P	TEMPERATURE & PRESSURE RELIEF VALVE
DIS	DISTILLED WATER	KWH	KILOWATT HOUR	TEMP	TEMPERATURE
DISCH	DISCHARGE	LAT	LEAVING AIR TEMPERATURE	THERM	THERMOMETER
DN	DOWN	LAV	LAVATORY	T.O.P	TOP OF PIPE
DP	DEEP	LBS	POUNDS	TP	TRAP PRIMER
DS	DOWNSPOUT	LF	LINEAR FEET	TYP	TYPICAL
DSP	DRY STANDPIPE	LL	LOW LEVEL	UL	UNDERWRITERS LABORATORY
DTR	DUAL TEMPERATURE RETURN	LP	LIQUID PROPANE	UTIL	UTILITY
DTS	DUAL TEMPERATURE SUPPLY	LPCR	LOW PRESSURE CONDENSATE RETURN	VAC	VACUUM
DTTV	DOUBLE THICK TURNING VANES	LPCS	LOW PRESSURE CONDENSATE SUPPLY	VAV	VARIABLE AIR VOLUME
DVC	DRY VACUUM CLEANING	LWT	LEAVING WATER TEMPERATURE	VB	VACUUM BREAKER
DWG	DRAWING	MAU	MAKE-UP AIR UNIT	VD	VOLUME DAMPER
DWR	DOMESTIC WATER RISER	MAX	MAXIMUM	VEL	VELOCITY
(E)	EXISTING	MECH	MECHANICAL	VERT	VERTICAL
(ED)	EXISTING TO BE DEMOLISHED	MFR	MANUFACTURER	VFD	VARIABLE FREQUENCY DRIVE
(ETR)	EXISTING TO BE RELOCATED	MH	MANHOLE	VIF	VERIFY IN FIELD
EA	EXHAUST AIR	MIN	MINIMUM	VOL	VOLUME
EAT	ENTERING AIR TEMPERATURE	MISC	MISCELLANEOUS	VPC	VIA PHOTOCCELL
EFF	EFFICIENCY	MOD	MOTOR OPERATED DAMPER	VTC	VIA TIME CLOCK
EFL	EFFLUENT	MPCR	MEDIUM PRESSURE CONDENSATE RETURN	VTR	VENT THROUGH ROOF
EL	ELEVATION	MPH	MILES PER HOUR	W/	WITH
ELC	ELECTRICAL	MPSS	MEDIUM PRESSURE STEAM SUPPLY	WB	WET BULB TEMPERATURE
EMF	ELECTROMOTIVE FORCE	(N)	NEW	WCO	WALL CLEANOUT
EQ	EQUAL	NA	NOT APPLICABLE	WH	WALL HYDRANT
EQUIP	EQUIPMENT	NC	NOISE CRITERIA	WMS	WIRE MESH SCREEN
ES	EMERGENCY SHOWER	N.C.	NORMALLY CLOSED	WP	WEATHERPROOF
ESP	EXTERNAL STATIC PRESSURE	NIC	NOT IN CONTRACT	W/O	WITHOUT
EVAP	EVAPORATOR	NL	NIGHT LIGHT	WSFU	WATER SUPPLY FIXTURE UNITS</

MECHANICAL GENERAL NOTES

1. ALL WORK IS TO BE IN COMPLIANCE WITH THE 2018 INTERNATIONAL MECHANICAL CODE. NOT ALL CODE REQUIREMENTS HAVE BEEN DESCRIBED IN THIS SPECIFICATION OR INDICATED ON THE DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH THE CODES AND INSTALL THE WORK IN ACCORDANCE WITH CODES.
2. OBTAIN AND PAY FOR BUILDING PERMITS, INSPECTIONS, CONNECTION CHARGES, AND FEES.
3. THE CONTRACTOR IS TO SURVEY AND VERIFY ALL EXISTING CONDITIONS PRIOR TO BID SUBMISSION AND BECOME AWARE OF ALL CONDITIONS WHICH MAY IMPACT THE REQUIRED WORK. CONTRACTOR IS TO INCLUDE ALL ASSOCIATED COSTS (MATERIALS/ LABOR) DETERMINED TO BE REQUIRED DURING SITE INSPECTIONS. CONTRACTOR'S BID SUBMISSION IS TO BE CONSIDERED PROOF THAT THIS REQUIREMENT HAS BEEN MET.
4. DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE TAKEN AS A WHOLE. IF A CONFLICT OR CONTRADICTION EXISTS BETWEEN THE DRAWINGS AND SPECIFICATIONS, THE MORE STRINGENT WILL APPLY. THE ARCHITECT'S AND ENGINEER'S INTERPRETATION OF THE DOCUMENTS ARE TO BE BINDING UPON THE CONTRACTOR.
5. ALL WORK IS TO BE COORDINATED WITH, AND APPROVED BY THE SCHOOL PRIOR TO ANY SHUT-DOWNS. ALL REQUESTS ARE TO BE SUBMITTED, IN WRITING, TO THE SCHOOL 24, TO 48 HOURS PRIOR TO REQUESTED DELETIONS.
6. COORDINATE ALL ELECTRICAL REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR PRIOR TO PURCHASING EQUIPMENT. VERIFY ALL VOLTAGE AND AMPERE REQUIREMENTS FOR FEEDERS, AND MOCPS DEVICES.
7. ALL EXTERIOR WALL/ ROOF PENETRATIONS ARE TO BE SEALED, AIR, AND WATER-TIGHT. ALL PIPING PASSING THROUGH WALL, OR FLOOR PENETRATIONS IS TO HAVE SLEEVES. ALL WALL, OR FLOOR-RATED PENETRATIONS ARE TO BE SEALED WITH FIRE-RATED SEALANT FORMED IN PLACE (BY 3M OR HILTI).
8. PROVIDE ALL ACCESS DOORS FOR ALL VALVES, DAMPERS, DEVICES, CONTROLLERS, ETC. WHICH MAY REQUIRE SERVICE. ALL ACCESS PANELS ARE TO BE 16 GAUGE STEEL FRAME, 20 GAUGE HINGED DOOR, LOCKABLE, AND FIRE-RATED (WHEN INSTALLED IN RATED WALLS, FLOORS, "B" LABEL, 1-1/2 HOURS). FINISH AS SELECTED BY THE ARCHITECT.
9. SUBMIT SHOP DRAWINGS FOR ALL EQUIPMENT TO BE REVIEWED BY THE ENGINEER PRIOR TO ORDERING. COORDINATE ALL ELECTRICAL REQUIREMENTS WITH ELECTRICAL CONTRACTOR, AND PHYSICAL DIMENSIONS PRIOR TO SHOP DRAWING SUBMISSION.
10. SUBMIT SHOP DRAWINGS OF ALL SHEET METAL FOR REVIEW. DRAWINGS ARE TO BE NOT LESS THAN 1/4"=1'-0" SCALE AND ARE TO INDICATE ALL STEEL, PIPING, CONDUIT WIRING METHODS, LIGHTING FIXTURES, SPRINKLER, EQUIPMENT, AND ARCHITECTURAL FEATURES. DUCTWORK IS TO BE INDICATED DOUBLE-LINE, INDICATE DETAIL OF FIRE DAMPER. SHEET METAL SHOP DRAWINGS WILL BE UTILIZED FOR CONTRACTOR'S COORDINATION DRAWINGS AND IS TO BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION. IF SHEET METAL SHOP DRAWINGS ARE NOT SUBMITTED, OR IF THE CONTRACTOR INSTALLS THE DUCTWORK WITHOUT PRIOR APPROVALS, THE CONTRACTOR IS TO ASSUME ALL RESPONSIBILITIES AND FIELD COORDINATION, AND PAY ALL ASSOCIATED COSTS ASSOCIATED WITH DUCTWORK INSTALLATION DEFICIENCIES, AND FIELD COORDINATION ISSUES.
11. ALL DUCTWORK IS TO COMPLY WITH NFPA PAMPHLET 90 A. ALL DUCTWORK SEAMS ARE TO BE SEALED WITH DUCT SEALANT. ALL NEW DUCTWORK SECTIONS AND FITTINGS TO BE INSTALLED ON THE PROJECT ARE TO BE COVERED, AND SEALED FROM DUST, DIRT, DEBRIS.
12. PROVIDE THIRD-PARTY TEST, BALANCE, AND ADJUST REPORT FOR ALL AIR SYSTEMS AT THE COMPLETION OF THE WORK. BALANCE AIR QUANTITIES TO VALUES AS INDICATED ON THE DRAWINGS. SET DAMPER POSITIONS. ALLOW FOR ONE SHEAVE CHANGE PER EACH (50%) OF THE HVAC SYSTEMS. PROVIDE ONE SPEED TAP ADJUSTMENT FOR DIRECT DRIVE SYSTEMS PER EACH (100%) OF THE HVAC SYSTEMS. PROVIDE TOTAL AND STATIC PRESSURE READINGS, TRAVERSE AT FAN INLETS, AND OUTLETS. T.B.A. CONTRACTOR IS TO BE INDEPENDENT, AND AABC/ NEBB CERTIFIED.
13. ALL WORK IS TO BE CONCEALED, UNLESS OTHERWISE INDICATED.
14. NO PVC PIPING IS PERMITTED IN RETURN AIR PLENUMS.
15. ALL THREE PHASE STARTER EQUIPMENT IS TO BE PROVIDED BY THE MECHANICAL CONTRACTOR AND IS TO BE MAGNETIC, ACROSS-THE-LINE WITH AUXILIARY CONTACTS. ALL SINGLE PHASE STARTER EQUIPMENT IS TO BE PROVIDED BY ELECTRICAL CONTRACTOR.
16. PROVIDE CONDENSATE DRAIN TO ACCEPTABLE CODE APPROVED DISCHARGE POINT. 1-1/2" COPPER. ALL CONDENSATE PIPING IS TO HAVE 1/2" FIBERGLASS INSULATION WITH VAPOR BARRIER. PROVIDE CONDENSATE PUMP(S) WITH DISCHARGE CHECK VALVE(S) IF GRAVITY FLOW IS NOT OBTAINABLE. SUBMIT SHOP DRAWING FOR REVIEW AND APPROVAL AND COORDINATE ELECTRICAL WORK WITH THE ELECTRICAL CONTRACTOR.
17. PROVIDE FIRE DAMPERS IN ALL RATED WALL/ FLOOR/ SHAFT ASSEMBLIES WHERE INDICATED ON THE ARCHITECTURAL PLANS. FIRE DAMPERS ARE TO BE INSTALLED IN ACCORDANCE WITH THE UL LISTING FOR THE DAMPER AND AS DETAILED AS ON THE DRAWINGS, AND DETAILS. THE DAMPERS ARE TO BE SET IN A STEEL SLEEVE, AND ARE TO BE PROVIDED WITH BREAKAWAY CONNECTIONS. DAMPERS ARE TO BE 1-1/2 HOUR RATED. PROVIDE SMOKE DAMPERS IN ALL SMOKE-RATED WALLS/ PARTITIONS PER THE ARCHITECTURAL PLANS. COORDINATE ALL LOCATIONS AND POWER REQUIREMENTS WITH ELECTRICAL, AND FIRE ALARM CONTRACTORS.
18. PROVIDE INSULATED PREFABRICATED ROOF CURB FOR ROOF-MOUNTED EQUIPMENT. DUCTWORK, AND PIPING AS MANUFACTURED BY THE ROOF-MOUNTED EQUIPMENT MANUFACTURER. ALL DUCT/ PIPING ROOF PENETRATIONS ARE TO HAVE ROOF CURBS. ALL ROOF CURBS ARE TO BE SECURED TO THE ROOF AND COORDINATED WITH THE OWNER'S ROOFING CONTRACTOR.
19. ALL FINISHES RELATED TO MECHANICAL EQUIPMENT, TERMINAL EQUIPMENT, AIR DEVICES, PERIMETER HEATERS, LOUVERS, ACCESS PANELS, EXPOSED WIREMOLD/ RACEWAYS, ETC. ARE TO BE COORDINATED AND SELECTED BY THE ARCHITECT/ OWNER/ ENGINEER PRIOR TO SHOP DRAWING SUBMISSION, ORDERING, AND INSTALLATION.
20. FINAL LOCATIONS OF ALL THERMOSTATS, ACCESS PANELS, SPACE SENSORS, DETECTION DEVICES, ETC. IN FINISHED SPACES ARE TO BE COORDINATED AND APPROVED BY THE ARCHITECT/ OWNER PRIOR TO ROUGH-IN AND INSTALLATION.
21. PROVIDE NEW MERV 8 FILTERS FOR ALL NEW AND EXISTING HVAC EQUIPMENT. CONTRACTOR IS TO PROVIDE ONE SPARE SET OF MERV 8 FILTERS FOR EACH HVAC SYSTEM, AND TURN OVER TO THE OWNER.
22. CONTRACTOR IS TO PROVIDE TEMPORARY FILTERS IN ALL EXISTING HVAC EQUIPMENT IMPACTED BY THE RENOVATION PROJECT'S SCOPE OF WORK. CONTRACTOR IS TO COVER ALL EXISTING SUPPLY, RETURN, EXHAUST, AND RELIEF AIR OPENINGS DURING CONSTRUCTION, AND/ OR DEMOLITION TO PREVENT DUST, DIRT, AND DEBRIS FROM ENTERING THE EXISTING DUCTWORK.
23. THE CONTRACTOR IS TO PROVIDE MANUFACTURER'S START-UP OF ALL EQUIPMENT, AND SYSTEMS.
24. PROPERLY INSTRUCT OWNER'S PERSONNEL IN THE OPERATION AND MAINTENANCE OF ALL SYSTEMS AND EQUIPMENT. PROVIDE THREE INSTRUCTION AND MAINTENANCE MANUALS. SUBMIT MANUALS FOR REVIEW PRIOR TO OPERATING INSTRUCTION.
25. COORDINATE LOCATIONS AND ROUGH-IN REQUIREMENTS WITH ALL TRADES PRIOR TO INSTALLATION.
26. IF THE CONTRACTOR ELECTS TO SUBMIT ALTERNATE EQUIPMENT, MANUFACTURERS, SYSTEMS, METHODS, OR MATERIALS NOT SPECIALLY IDENTIFIED IN THE DRAWINGS AND SPECIFICATIONS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK WITH OTHER TRADES AND PAY FOR ANY ADDITIONAL COSTS ASSOCIATED WITH THE SUBSTITUTION OR CHANGE.
27. PROVIDE ONE SET OF ELECTRONIC AS-BUILT DRAWINGS AT COMPLETION OF WORK. SUBMIT TO OWNER AND ENGINEER FOR REVIEW AND APPROVAL.

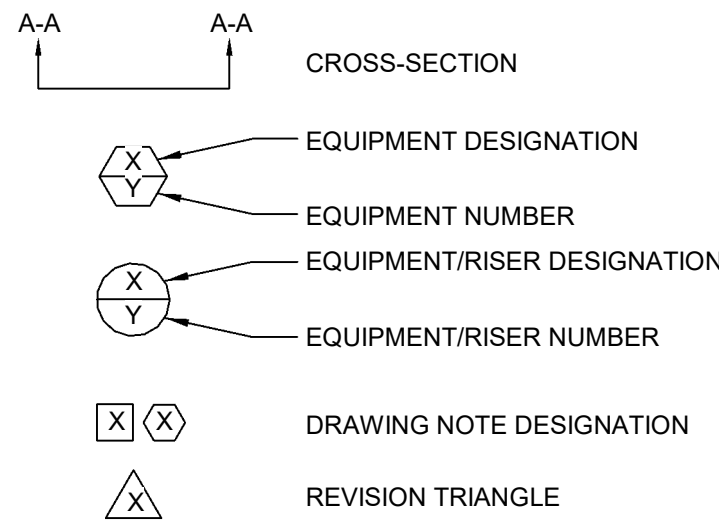
PROJECT DEDUCT/ADD ALTERNATES

REFER TO FLOOR PLANS

DRAWING LIST

NUMBER	NAME	Current Issue	Current Revision	Current Revision Date	Current Revision Description
M001	COVER SHEET- MECHANICAL	BID SET			
MD101a	PARTIAL GROUND FLOOR DEMO AREA A- MECHANICAL	BID SET			
MD101b	PARTIAL GROUND FLOOR DEMO AREA B- MECHANICAL	BID SET			
MD101c	PARTIAL GROUND FLOOR DEMO AREA C- ELECTRICAL	BID SET			
MD101d	PARTIAL GROUND FLOOR DEMO AREA D- MECHANICAL	BID SET			
MD102a	PARTIAL SECOND FLOOR DEMO AREA A- MECHANICAL	BID SET			
MD102b	PARTIAL SECOND FLOOR DEMO AREA B- MECHANICAL	BID SET			
MD102c	PARTIAL SECOND FLOOR DEMO AREA C- MECHANICAL	BID SET			
MD102d	PARTIAL SECOND FLOOR DEMO AREA D- MECHANICAL	BID SET			
MD103d	PARTIAL DEMO ROOF PLAN AREA D- MECHANICAL	BID SET			
M101a	PARTIAL GROUND FLOOR AREA A - MECHANICAL	BID SET			
M101b	PARTIAL GROUND FLOOR AREA B - MECHANICAL	BID SET			
M101c	PARTIAL GROUND FLOOR AREA C - MECHANICAL	BID SET			
M101d	PARTIAL GROUND FLOOR AREA D - MECHANICAL	BID SET			
M102a	PARTIAL SECOND FLOOR AREA A - MECHANICAL	BID SET			
M102b	PARTIAL SECOND FLOOR AREA B - MECHANICAL	BID SET			
M102c	PARTIAL SECOND FLOOR AREA C - MECHANICAL	BID SET			
M102d	PARTIAL SECOND FLOOR AREA D - MECHANICAL	BID SET			
M103d	PARTIAL ROOF PLAN AREA D- MECHANICAL	BID SET			
M401	DETAILS- MECHANICAL	BID SET			
M402	DETAILS- MECHANICAL	BID SET			
M403	DETAILS- MECHANICAL	BID SET			
M404	DETAILS- MECHANICAL	BID SET			
M405	DETAILS- MECHANICAL	BID SET			
M406	DETAILS- MECHANICAL	BID SET			
M407	DETAILS- MECHANICAL	BID SET			
M408	DETAILS- MECHANICAL	BID SET			
M409	DETAILS- MECHANICAL	BID SET			
M410	DETAILS- MECHANICAL	BID SET			
M501	SCHEDULES- MECHANICAL	BID SET			
M502	SCHEDULES- MECHANICAL	BID SET			
M503	SCHEDULES- MECHANICAL	BID SET			

DRAWING SYMBOLS LIST



DESIGN NOTES

1. DESIGN CONDITIONS
- SIZING, DESIGN AND PERFORMANCE OF THE HEATING AND COOLING SYSTEMS ARE BASED ON THE FOLLOWING DESIGN CHARACTERISTICS. MODIFICATION OF ANY OF THESE CHARACTERISTICS MAY ADVERSELY AFFECT THE HEATING AND COOLING PERFORMANCE AND LEVEL OF COMFORT TO THE BUILDING OCCUPANTS.
- WEATHER STATION LOCATIONS - PHILADELPHIA, PA
HEATING DEGREE DAYS = 4589
- OUTDOOR:
WINTER DRY BULB 14°F
SUMMER DRY BULB 90°F
SUMMER WET BULB 74°F
- INDOOR:
WINTER DRY BULB 70°F
SUMMER DRY BULB 75°F

NOTICE

THE SCHEDULES AND DRAWINGS REPRESENT ONLY CERTAIN REQUIREMENTS OF THE PROJECT. THERE ARE ADDITIONAL REQUIREMENTS IN THE SPECIFICATIONS BOOKLET WHICH THE CONTRACTOR IS BOUND TO PROVIDE. A SUPPLIER OR CONTRACTOR'S PRICING, WHICH IS BASED ONLY ON DRAWINGS OR SCHEDULES, MAY LEAVE IMPORTANT COSTS UNACCOUNTED FOR WHICH WILL ULTIMATELY BE THE CONTRACTOR OR SUPPLIER'S RESPONSIBILITY TO PROVIDE.

THE DELIVERY OF THIS DRAWING SHOULD NOT BE CONSTRUED TO PROVIDE AN EXPRESS WARRANTY OR GUARANTEE TO ANYONE THAT ALL THE DIMENSIONS AND DETAILS ARE EXACT OR TO INDICATE THAT THE USE OF THIS DRAWING IMPLIES THE REVIEW AND APPROVAL BY THE DESIGN PROFESSIONAL OF ANY FUTURE USE. A USE OF THIS INFORMATION WITHOUT THE WRITTEN APPROVAL BY THE DESIGN PROFESSIONAL IS AT THE SOLE RISK AND LIABILITY OF THE USER. THE DESIGN PROFESSIONAL RESERVES THE RIGHT TO REMOVE OUR PROFESSIONAL SEAL AND/OR TITLE BLOCK.



McHUGH
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100% Bid Set- 15 March 2023

CHESTER UPLAND S.D.

201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19001

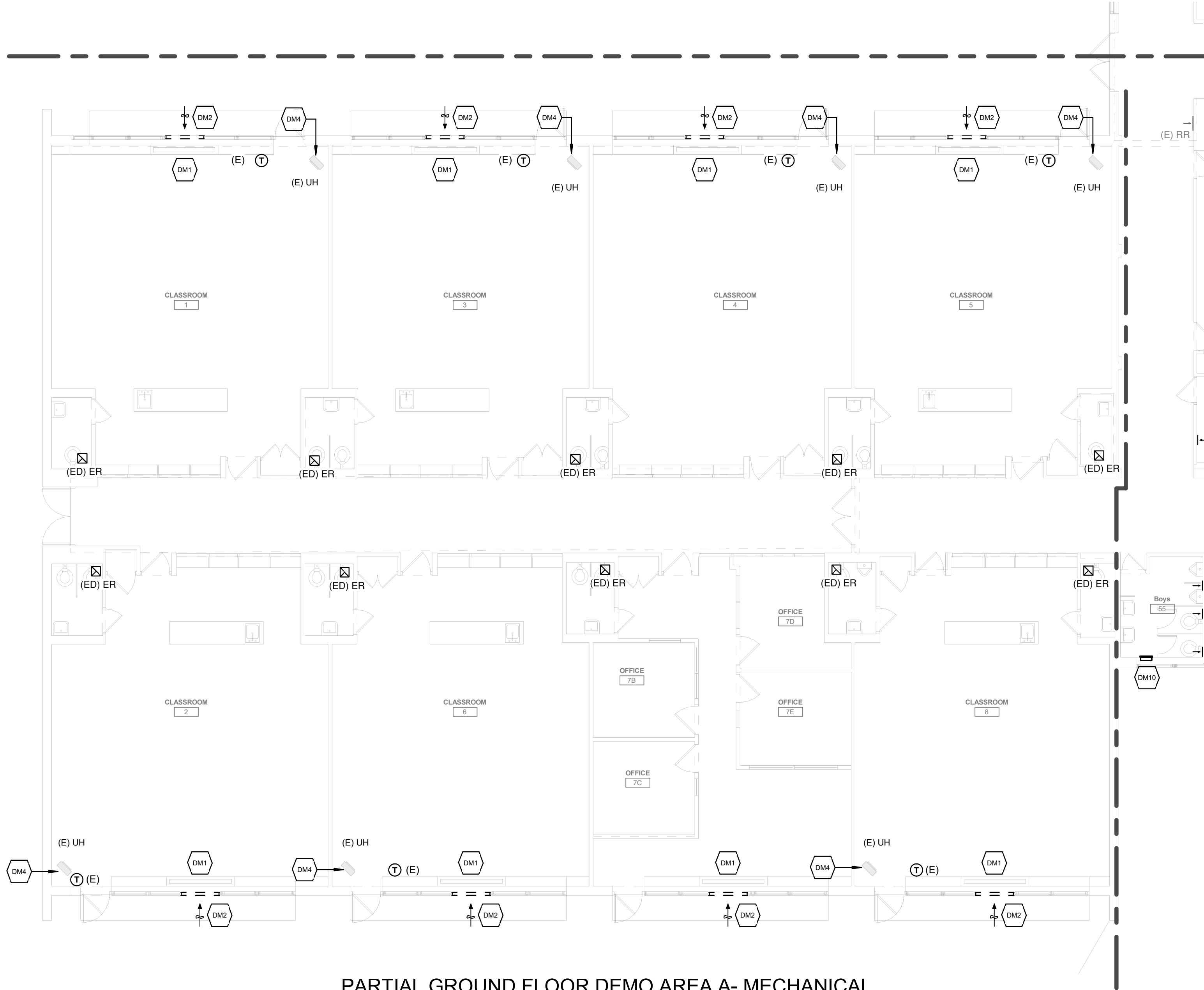
COVER SHEET- MECHANICAL

DATE: 03/19/2023

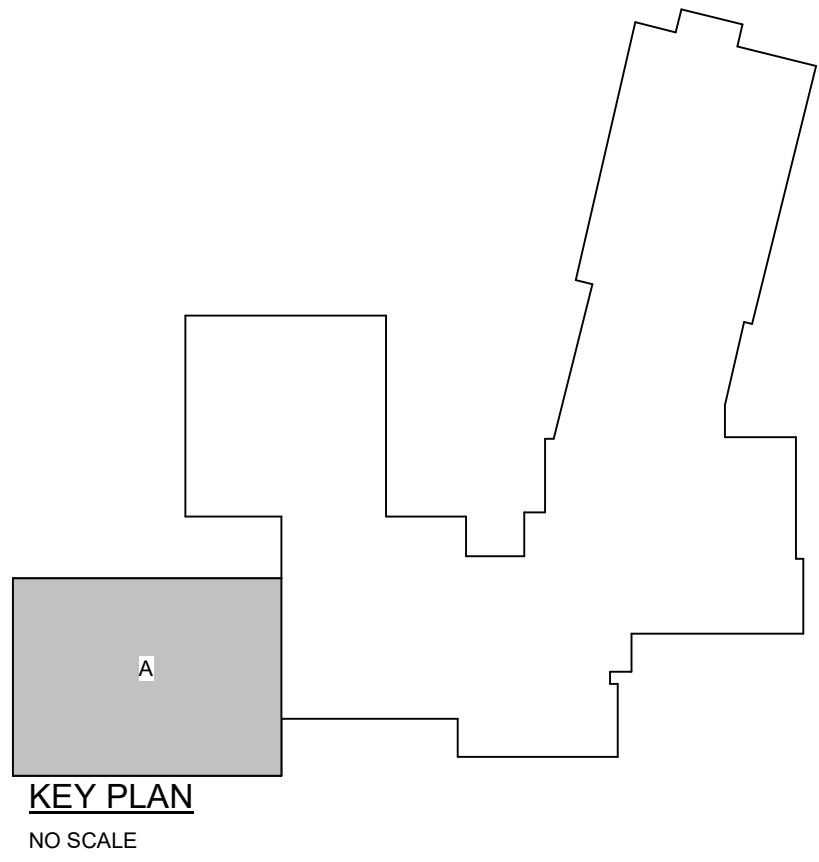
SCALE: AS NOTED

M001





PARTIAL GROUND FLOOR DEMO AREA A- MECHANICAL
1/8" = 1'-0"



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MECHANICAL DEMO NOTES:

1. CONTRACTOR SHALL DEMOLISH ALL EXISTING HVAC SYSTEMS IN THEIR ENTIRETY. DEMOLITION SHALL BE PERFORMED IN A MANNER THAT PERMITS THE EXISTING SYSTEM TO REMAIN FUNCTIONAL IN ALL LATER PHASES OF THE PROJECTS AS THE RENOVATIONS TAKE PLACE. REMOVAL OF THE EXISTING PIPING, DUCTWORK, AND EQUIPMENT WILL BE LIMITED BY THE PROJECT PHASING. CONTRACTOR TO COORDINATE ALL WORK WITH OWNER AND GENERAL CONTRACTOR. MECH CONTRACTOR WILL BE RESPONSIBLE FOR CUTTING, CAPPING, AND PROVIDING ALL REQUIRED TEMPORARY PIPING MODIFICATIONS AND VALVES NEEDED TO MAINTAIN HEAT TO ALL OCCUPIED AREAS THROUGHOUT THE LENGTH OF THE PROJECT.
2. THE CONTRACTOR IS RESPONSIBLE FOR DEMOLISHING THE SYSTEMS IN PHASES, KEEPING THE OLD SYSTEMS OPERATIONAL UNTIL THE CONSTRUCTION OF THE NEW SYSTEMS IS COMPLETED. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED SHUT-OFF VALVES FOR TEMPORARY SHUT DOWNS AND TRANSITIONS.
3. IT SHALL BE THE RESPONSIBILITY OF THE DEMOLITION CONTRACTOR TO VISIT THE SITE IN ORDER TO BEST UNDERSTAND THE SCOPE OF THE DEMOLITION WORK.
4. ALL DEMOLISHED MATERIALS SHALL BE RECYCLED WHEREVER POSSIBLE. ANY HAZARDOUS MATERIALS SHALL BE HANDLED ACCORDING TO GOVERNMENT REGULATION AND DISPOSED OF IN A SAFE MANNER.
5. GENERAL CONTRACTOR TO PATCH/REPAIR EXISTING WALL/CEILINGS AS REQUIRED BY THE ARCHITECT.
6. CONTRACTOR SHALL DEMOLISH EXISTING DUCTWORK TO POINT WHERE INDICATED ON THE DRAWING.
7. EXISTING AIR DEVICES AND DUCTWORK MARKED AS TO BE DEMOLISHED (ED) AIR DEVICES AND DUCTWORK ON PLANS ARE BASED ON THE ORIGINAL DESIGN DOCUMENTS. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND LOCATIONS IN THE FIELD PRIOR TO ANY WORK BEING PERFORMED.
8. CONTRACTOR SHALL DEMOLISH THE EXISTING CONTROL SYSTEM IN ITS ENTIRETY, WITH ALL ITS ASSOCIATED DEVICES, EQUIPMENT, TUBING / WIRES AND ACCESSORIES. THE OLD SYSTEM WILL BE REPLACED WITH A NEW ELECTRONIC DDC CONTROLS SYSTEM.

MECHANICAL DEMOLITION...

NOTED THUS

- DM1 EXISTING HEATING UNIT VENTILATOR TO BE DEMOLISHED WITH ALL ITS ASSOCIATED DUCTWORK, PIPING, ACCESSORIES, AND CONTROLS. GENERAL CONTRACTOR TO PATCH/REPAIR EXISTING WALL AND FLOOR AS INDICATED ON THE ARCHITECTURAL DRAWINGS. FOR UNIT VENTILATORS WITH UNDERFLOOR DUCTWORK CONNECTIONS, MC SHALL DISCONNECT AND CAP THE DUCT.
- DM2 EXISTING OUTSIDE AIR LOUVER TO BE DEMOLISHED. GENERAL CONTRACTOR TO PATCH/REPAIR EXISTING WALL TO MATCH EXISTING CONDITIONS.
- DM4 EXISTING ELECTRIC UNIT HEATER TO REMAIN
- DM10 EXISTING CABINET UNIT HEATER TO BE REMOVED WITH ALL ITS ASSOCIATED PIPING, ACCESSORIES, AND CONTROLS. CONTRACTOR SHALL PATCH WALL TO MATCH EXISTING.



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PARTIAL GROUND FLOOR DEMO AREA A-
MECHANICAL

PROJECT NO: 2022-327

DRAWN BY: RC

DATE: 03/15/2023

SCALE: AS NOTED

100% Bid Set- 15 March 2023

Rev. No.	Date	Description
1	10/29/22	SCHEMATIC DESIGN ISSUE
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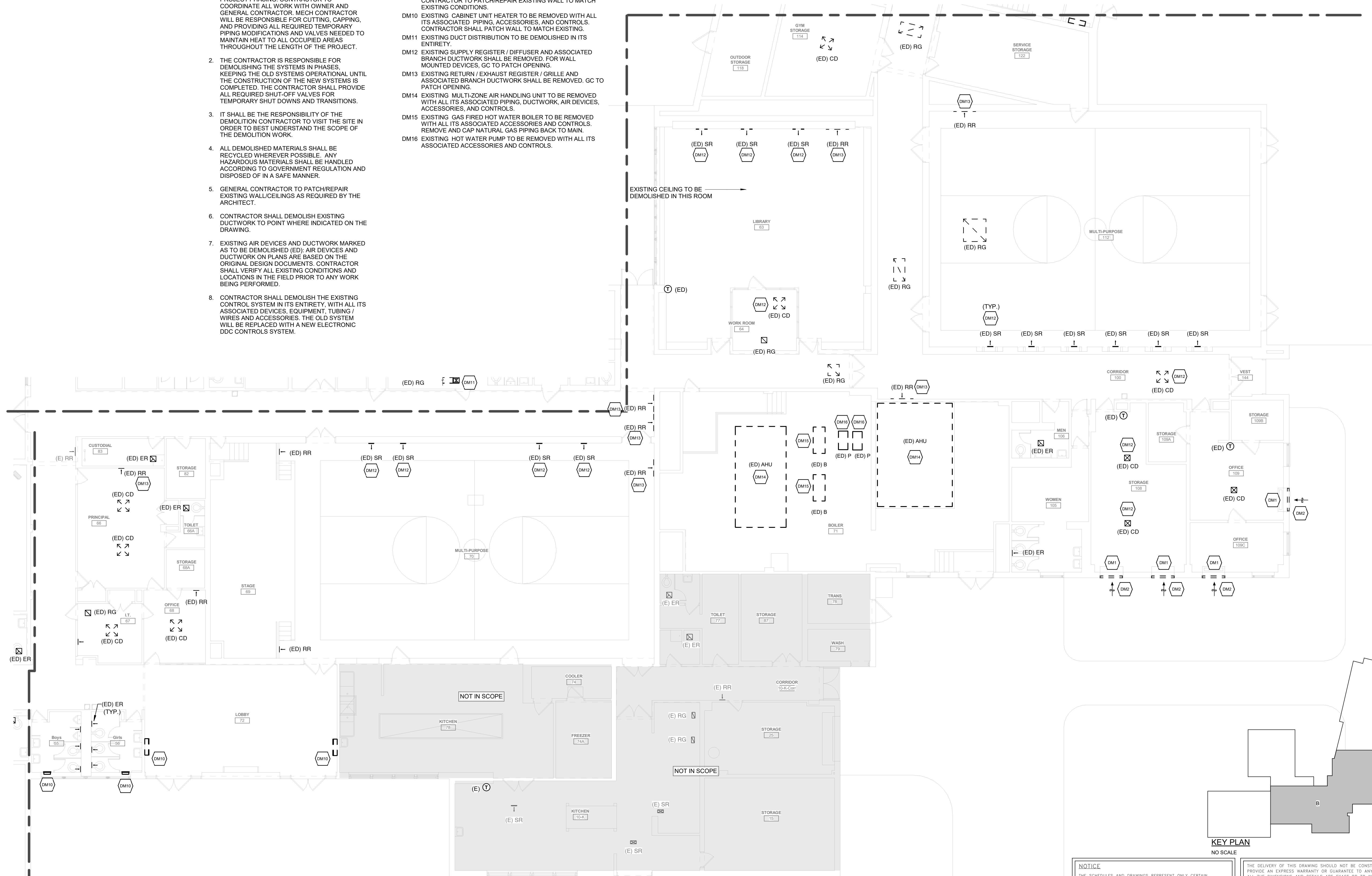
MECHANICAL DEMO NOTES:

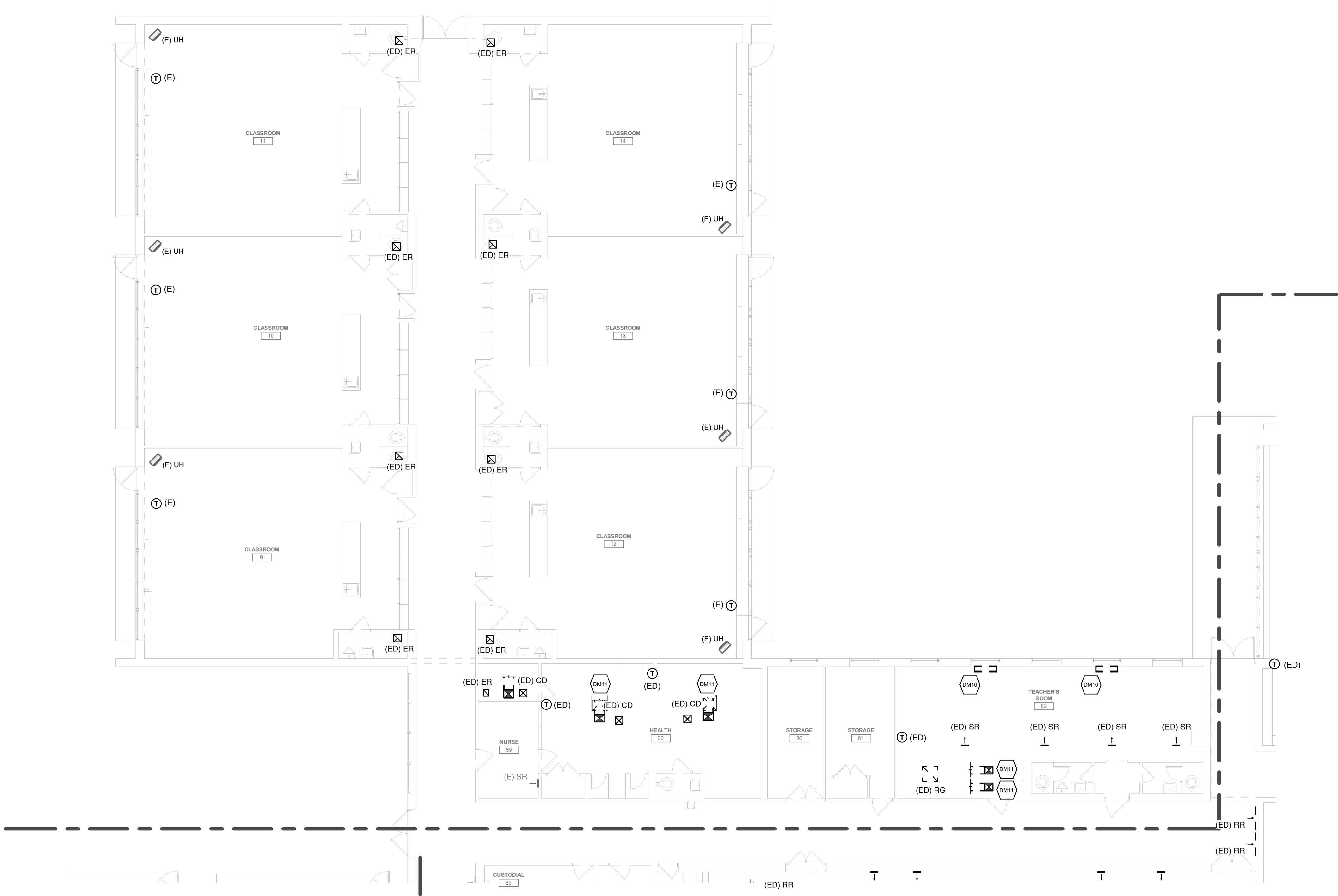
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- ALL DEMOLISHED MATERIALS SHALL BE RECYCLED WHEREVER POSSIBLE. ANY HAZARDOUS MATERIALS SHALL BE HANDLED ACCORDING TO GOVERNMENT REGULATION AND DISPOSED OF IN A SAFE MANNER.
- GENERAL CONTRACTOR TO PATCH/REPAIR EXISTING WALL/CEILINGS AS REQUIRED BY THE ARCHITECT.
- CONTRACTOR SHALL DEMOLISH EXISTING DUCTWORK TO POINT WHERE INDICATED ON THE DRAWING.
- EXISTING AIR DEVICES AND DUCTWORK MARKED AS TO BE DEMOLISHED (ED): AIR DEVICES AND DUCTWORK ON PLANS ARE BASED ON THE ORIGINAL DESIGN DOCUMENTS. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND LOCATIONS IN THE FIELD PRIOR TO ANY WORK BEING PERFORMED.
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MECHANICAL DEMOLITION...

NOTED THUS

- DM1 EXISTING HEATING UNIT VENTILATOR TO BE DEMOLISHED WITH ALL ITS ASSOCIATED DUCTWORK, PIPING, ACCESSORIES, AND CONTROLS. GENERAL CONTRACTOR TO PATCH/REPAIR EXISTING WALL AND FLOOR AS INDICATED ON THE ARCHITECTURAL DRAWINGS. FOR UNIT VENTILATORS WITH UNDERFLOOR DUCTWORK CONNECTIONS, MC SHALL DISCONNECT AND CAP THE DUCT.
- DM2 EXISTING OUTSIDE AIR LOUVER TO BE DEMOLISHED. GENERAL CONTRACTOR TO PATCH/REPAIR EXISTING WALL TO MATCH EXISTING CONDITIONS.
- DM10 EXISTING CABINET UNIT HEATER TO BE REMOVED WITH ALL ITS ASSOCIATED PIPING, ACCESSORIES, AND CONTROLS. CONTRACTOR SHALL PATCH WALL TO MATCH EXISTING.
- DM11 EXISTING DUCT DISTRIBUTION TO BE DEMOLISHED IN ITS ENTIRETY.
- DM12 EXISTING SUPPLY REGISTER / DIFFUSER AND ASSOCIATED BRANCH DUCTWORK SHALL BE REMOVED. FOR WALL MOUNTED DEVICES, GC TO PATCH OPENING.
- DM13 EXISTING RETURN / EXHAUST REGISTER / GRILLE AND ASSOCIATED BRANCH DUCTWORK SHALL BE REMOVED. GC TO PATCH OPENING.
- DM14 EXISTING MULTI-ZONE AIR HANDLING UNIT TO BE REMOVED WITH ALL ITS ASSOCIATED PIPING, DUCTWORK, AIR DEVICES, ACCESSORIES, AND CONTROLS.
- DM15 EXISTING GAS FIRED HOT WATER BOILER TO BE REMOVED WITH ALL ITS ASSOCIATED ACCESSORIES AND CONTROLS. REMOVE AND CAP NATURAL GAS PIPING BACK TO MAIN.
- DM16 EXISTING HOT WATER PUMP TO BE REMOVED WITH ALL ITS ASSOCIATED ACCESSORIES AND CONTROLS.





PARTIAL GROUND FLOOR DEMO AREA C- MECHANICAL
1/8" = 1'-0"

NOTICE
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MECHANICAL DEMO NOTES:

1. CONTRACTOR SHALL DEMOLISH ALL EXISTING HVAC SYSTEMS IN THEIR ENTIRETY. DEMOLITION SHALL BE PERFORMED IN A MANNER THAT PERMITS THE EXISTING SYSTEM TO REMAIN FUNCTIONAL IN ALL LATER PHASES OF THE PROJECTS AS THE RENOVATIONS TAKE PLACE. REMOVAL OF THE EXISTING PIPING, DUCTWORK, AND EQUIPMENT WILL BE LIMITED BY THE PROJECT PHASING. CONTRACTOR TO COORDINATE ALL WORK WITH OWNER AND GENERAL CONTRACTOR. MECH CONTRACTOR WILL BE RESPONSIBLE FOR CUTTING, CAPPING, AND PROVIDING ALL REQUIRED TEMPORARY PIPING MODIFICATIONS AND VALVES NEEDED TO MAINTAIN HEAT TO ALL OCCUPIED AREAS THROUGHOUT THE LENGTH OF THE PROJECT.
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3. IT SHALL BE THE RESPONSIBILITY OF THE DEMOLITION CONTRACTOR TO VISIT THE SITE IN ORDER TO BEST UNDERSTAND THE SCOPE OF THE DEMOLITION WORK.
4. ALL DEMOLISHED MATERIALS SHALL BE RECYCLED WHEREVER POSSIBLE. ANY HAZARDOUS MATERIALS SHALL BE HANDLED ACCORDING TO GOVERNMENT REGULATION AND DISPOSED OF IN A SAFE MANNER.
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7. EXISTING AIR DEVICES AND DUCTWORK MARKED AS TO BE DEMOLISHED (ED): AIR DEVICES AND DUCTWORK ON PLANS ARE BASED ON THE ORIGINAL DESIGN DOCUMENTS. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND LOCATIONS IN THE FIELD PRIOR TO ANY WORK BEING PERFORMED.
8. CONTRACTOR SHALL DEMOLISH THE EXISTING CONTROL SYSTEM IN ITS ENTIRETY, WITH ALL ITS ASSOCIATED DEVICES, EQUIPMENT, TUBING / WIRES AND ACCESSORIES. THE OLD SYSTEM WILL BE REPLACED WITH A NEW ELECTRONIC DDC CONTROLS SYSTEM.

MECHANICAL DEMOLITION...

NOTED THUS

- DM10 EXISTING CABINET UNIT HEATER TO BE REMOVED WITH ALL ITS ASSOCIATED PIPING, ACCESSORIES, AND CONTROLS. CONTRACTOR SHALL PATCH WALL TO MATCH EXISTING.
- DM11 EXISTING DUCT DISTRIBUTION TO BE DEMOLISHED IN ITS ENTIRETY.

CHESTER UPLAND S.D.

TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES

201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015

PARTIAL GROUND FLOOR DEMO AREA C-
ELECTRICAL

PROJECT NO: 2022-327

DRAWN BY: RC

DATE: 03/15/2023

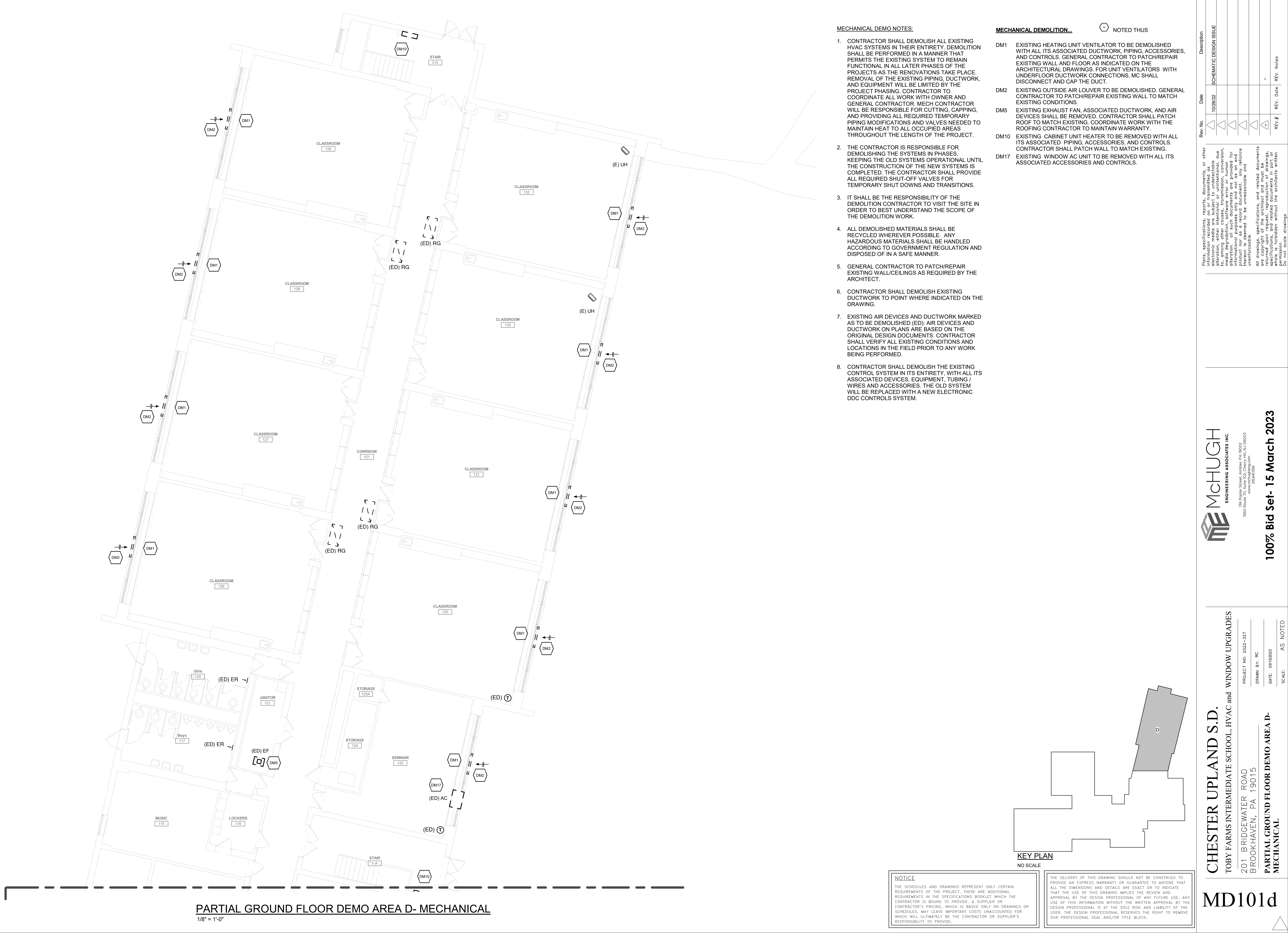
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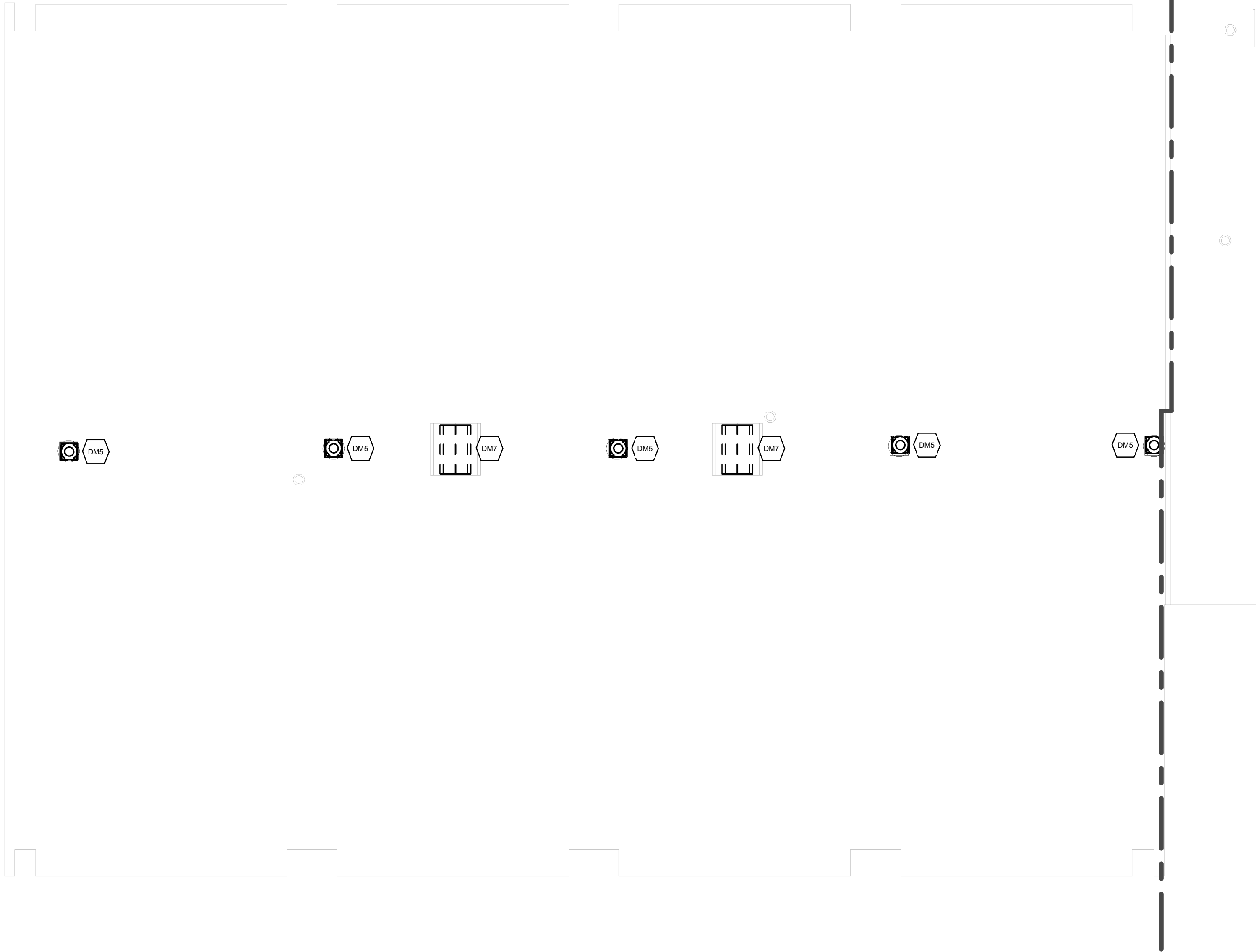


135 Eagle Street, Ambler, PA 19002
1950 Route 70, Brookhaven, NJ 08003
264.41188

100% Bid Set- 15 March 2023

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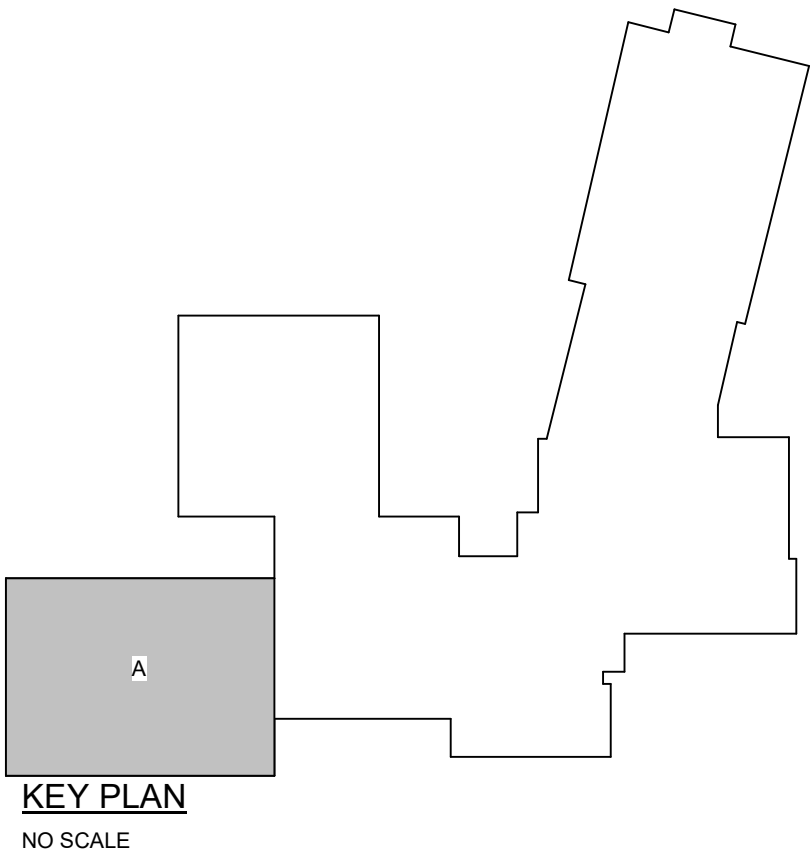




PARTIAL SECOND FLOOR DEMO AREA A- MECHANICAL
1/8" = 1'-0"

NOTICE
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- MECHANICAL DEMO NOTES:**
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- MECHANICAL DEMOLITION...**
- DM EXISTING EXHAUST FAN, ASSOCIATED DUCTWORK, AND AIR DEVICES SHALL BE REMOVED. CONTRACTOR SHALL PATCH ROOF TO MATCH EXISTING. COORDINATE WORK WITH THE ROOFING CONTRACTOR TO MAINTAIN WARRANTY.
 - DM EXISTING OUTSIDE AIR INTAKE TO BE REMOVED WITH ALL ITS ASSOCIATED DAMPERS AND ACCESSORIES. CONTRACTOR SHALL PATCH ROOF TO MATCH EXISTING. COORDINATE WORK WITH THE ROOFING CONTRACTOR TO MAINTAIN WARRANTY.

NOTED THIS

CHESTER UPLAND S.D.
TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES
201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015
PARTIAL SECOND FLOOR DEMO AREA A- MECHANICAL

PROJECT NO: 2022-327
DRAWN BY: RC
DATE: 03/15/2023
SCALE: AS NOTED

McHUGH
ENGINEERING ASSOCIATES INC.
135 Eagle Street, Ambler, PA 19002
1950 Route 70, Ambler, PA 19003
264.41188
www.mchughinc.com

100% Bid Set- 15 March 2023

Rev. No.	Date	Description
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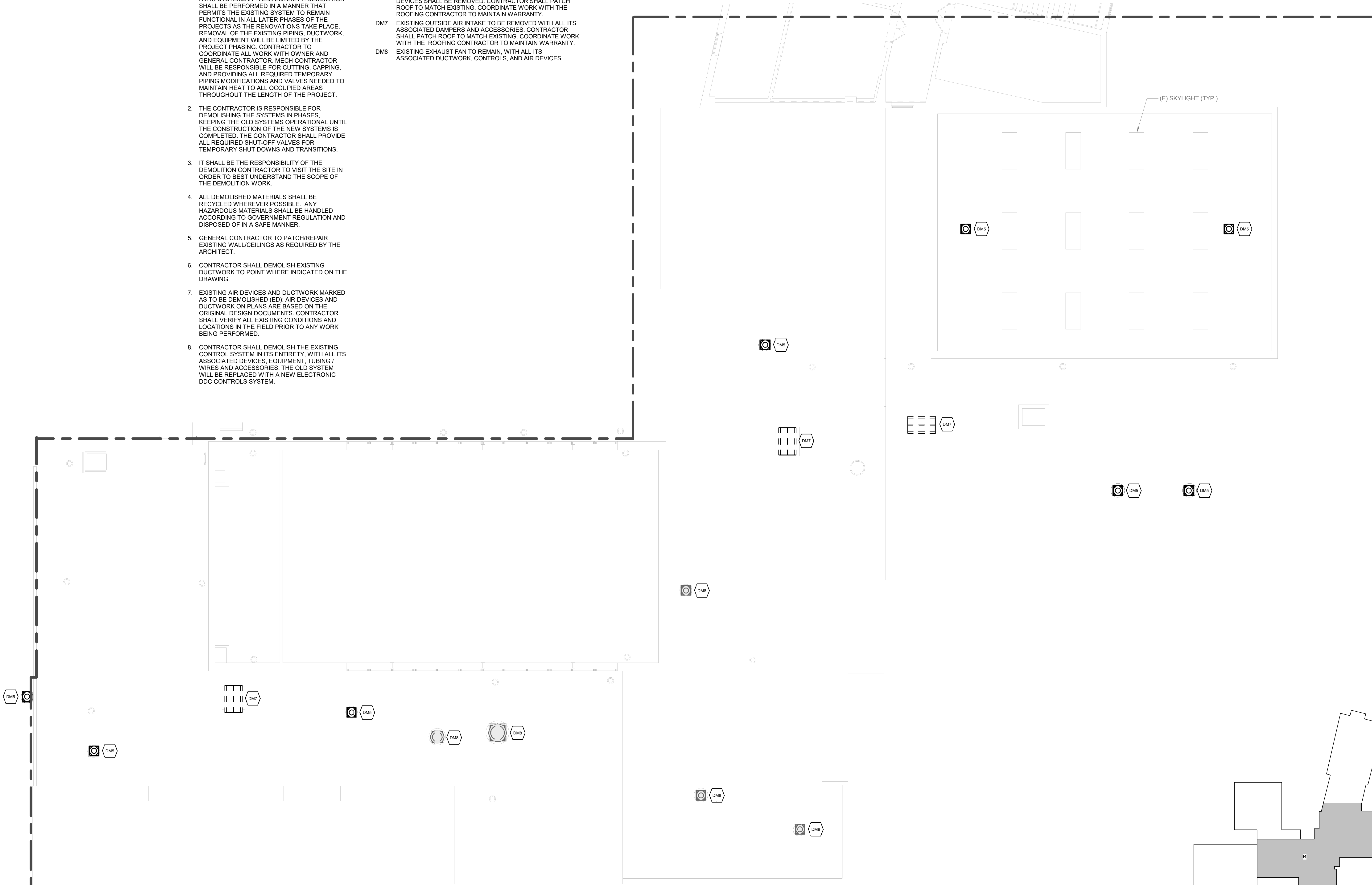
MECHANICAL DEMO NOTES:

1. CONTRACTOR SHALL DEMOLISH ALL EXISTING HVAC SYSTEMS IN THEIR ENTIRETY. DEMOLITION SHALL BE PERFORMED IN A MANNER THAT PERMITS THE EXISTING SYSTEM TO REMAIN FUNCTIONAL IN ALL LATER PHASES OF THE PROJECTS AS THE RENOVATIONS TAKE PLACE. REMOVAL OF THE EXISTING PIPING, DUCTWORK, AND EQUIPMENT WILL BE LIMITED BY THE PROJECT PHASING. CONTRACTOR TO COORDINATE ALL WORK WITH OWNER AND GENERAL CONTRACTOR. MECH CONTRACTOR WILL BE RESPONSIBLE FOR CUTTING, CAPPING, AND PROVIDING ALL REQUIRED TEMPORARY PIPING MODIFICATIONS AND VALVES NEEDED TO MAINTAIN HEAT TO ALL OCCUPIED AREAS THROUGHOUT THE LENGTH OF THE PROJECT.
2. THE CONTRACTOR IS RESPONSIBLE FOR DEMOLISHING THE SYSTEMS IN PHASES, KEEPING THE OLD SYSTEMS OPERATIONAL UNTIL THE CONSTRUCTION OF THE NEW SYSTEMS IS COMPLETED. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED SHUT-OFF VALVES FOR TEMPORARY SHUT DOWNS AND TRANSITIONS.
3. IT SHALL BE THE RESPONSIBILITY OF THE DEMOLITION CONTRACTOR TO VISIT THE SITE IN ORDER TO BEST UNDERSTAND THE SCOPE OF THE DEMOLITION WORK.
4. ALL DEMOLISHED MATERIALS SHALL BE RECYCLED WHEREVER POSSIBLE. ANY HAZARDOUS MATERIALS SHALL BE HANDLED ACCORDING TO GOVERNMENT REGULATION AND DISPOSED OF IN A SAFE MANNER.
5. GENERAL CONTRACTOR TO PATCH/REPAIR EXISTING WALL/CEILINGS AS REQUIRED BY THE ARCHITECT.
6. CONTRACTOR SHALL DEMOLISH EXISTING DUCTWORK TO POINT WHERE INDICATED ON THE DRAWING.
7. EXISTING AIR DEVICES AND DUCTWORK MARKED AS TO BE DEMOLISHED (ED): AIR DEVICES AND DUCTWORK ON PLANS ARE BASED ON THE ORIGINAL DESIGN DOCUMENTS. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND LOCATIONS IN THE FIELD PRIOR TO ANY WORK BEING PERFORMED.
8. CONTRACTOR SHALL DEMOLISH THE EXISTING CONTROL SYSTEM IN ITS ENTIRETY, WITH ALL ITS ASSOCIATED DEVICES, EQUIPMENT, TUBING / WIRES AND ACCESSORIES. THE OLD SYSTEM WILL BE REPLACED WITH A NEW ELECTRONIC DDC CONTROLS SYSTEM.

MECHANICAL DEMOLITION...

- DM5 EXISTING EXHAUST FAN, ASSOCIATED DUCTWORK, AND AIR DEVICES SHALL BE REMOVED. CONTRACTOR SHALL PATCH ROOF TO MATCH EXISTING. COORDINATE WORK WITH THE ROOFING CONTRACTOR TO MAINTAIN WARRANTY.
- DM7 EXISTING OUTSIDE AIR INTAKE TO BE REMOVED WITH ALL ITS ASSOCIATED DAMPERS AND ACCESSORIES. CONTRACTOR SHALL PATCH ROOF TO MATCH EXISTING. COORDINATE WORK WITH THE ROOFING CONTRACTOR TO MAINTAIN WARRANTY.
- DM8 EXISTING EXHAUST FAN TO REMAIN, WITH ALL ITS ASSOCIATED DUCTWORK, CONTROLS, AND AIR DEVICES.

NOTED THUS



PARTIAL SECOND FLOOR DEMO AREA B- MECHANICAL
1/8" = 1'-0"

NOTICE
THE SCHEDULES AND DRAWINGS REPRESENT ONLY CERTAIN REQUIREMENTS OF THE PROJECT. THERE ARE ADDITIONAL REQUIREMENTS IN THE SPECIFICATIONS BOOKLET WHICH THE CONTRACTOR IS BOUND TO PROVIDE. A SUPPLIER OR CONTRACTOR'S PRICING, WHICH IS BASED ONLY ON DRAWINGS OR SCHEDULES, MAY LEAVE IMPORTANT COSTS UNACCOUNTED FOR WHICH WILL ULTIMATELY BE THE CONTRACTOR OR SUPPLIER'S RESPONSIBILITY TO PROVIDE.

THE DELIVERY OF THIS DRAWING SHOULD NOT BE CONSTRUED TO PROVIDE AN EXPRESS WARRANTY OR GUARANTEE TO ANYONE THAT ALL THE DIMENSIONS AND DETAILS ARE EXACT OR TO INDICATE THAT THE USE OF THIS DRAWING IMPLIES THE REVIEW AND APPROVAL BY THE DESIGN PROFESSIONAL OF ANY FUTURE USE. ANY USE OF THIS INFORMATION WITHOUT THE WRITTEN APPROVAL OF THE DESIGN PROFESSIONAL IS AT THE SOLE RISK AND LIABILITY OF THE USER. THE DESIGN PROFESSIONAL RESERVES THE RIGHT TO REMOVE OUR PROFESSIONAL SEAL AND/OR TITLE BLOCK.

CHESTER UPLAND S.D.

TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES

201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015

PARTIAL SECOND FLOOR DEMO AREA B-
MECHANICAL

PROJECT NO: 2022-327

DRAWN BY: RC

DATE: 03/15/2023

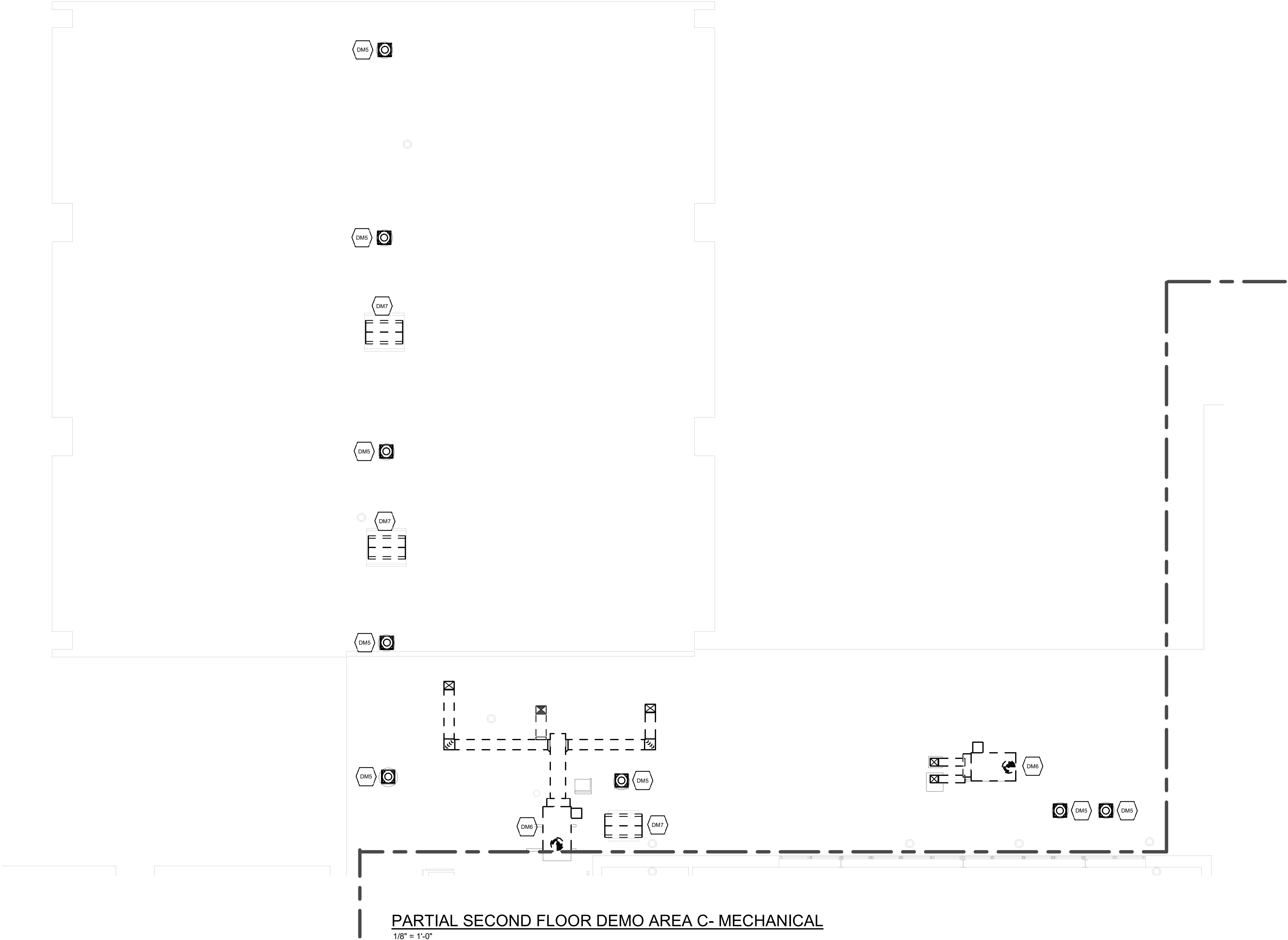
SCALE: AS NOTED



135 Eagle Street, Ambler, PA 19002
1950 Route 700, Suite 200, Ambler, NJ 08003
264.41188
www.mchugheng.com

100% Bid Set- 15 March 2023

Rev. No.	Date	Description
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MECHANICAL DEMO NOTES:

- CONTRACTOR SHALL DEMOLISH ALL EXISTING HVAC SYSTEMS IN THEIR ENTIRETY. DEMOLITION SHALL BE PERFORMED IN A MANNER THAT PERMITS THE EXISTING SYSTEM TO REMAIN FUNCTIONAL IN ALL LATER PHASES OF THE PROJECTS AS THE RENOVATIONS TAKE PLACE. REMOVAL OF THE EXISTING PIPING, DUCTWORK, AND EQUIPMENT WILL BE LIMITED BY THE PROJECT PHASING. CONTRACTOR TO COORDINATE ALL WORK WITH OWNER AND GENERAL CONTRACTOR. MECH CONTRACTOR WILL BE RESPONSIBLE FOR CUTTING, CAPPING, AND PROVIDING ALL REQUIRED TEMPORARY PIPING MODIFICATIONS AND VALVES NEEDED TO MAINTAIN HEAT TO ALL OCCUPIED AREAS THROUGHOUT THE LENGTH OF THE PROJECT.
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MECHANICAL DEMOLITION...

- DM5 EXISTING EXHAUST FAN, ASSOCIATED DUCTWORK, AND AIR DEVICES SHALL BE REMOVED. CONTRACTOR SHALL PATCH ROOF TO MATCH EXISTING. COORDINATE WORK WITH THE ROOFING CONTRACTOR TO MAINTAIN WARRANTY.
- DM6 EXISTING ROOFTOP UNIT, ASSOCIATED DUCTWORK, AND AIR DEVICES SHALL BE REMOVED. CONTRACTOR SHALL PATCH ROOF TO MATCH EXISTING. COORDINATE WORK WITH THE ROOFING CONTRACTOR TO MAINTAIN WARRANTY.
- DM7 EXISTING OUTSIDE AIR INTAKE TO BE REMOVED WITH ALL ITS ASSOCIATED DAMPERS AND ACCESSORIES. CONTRACTOR SHALL PATCH ROOF TO MATCH EXISTING. COORDINATE WORK WITH THE ROOFING CONTRACTOR TO MAINTAIN WARRANTY.

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CHESTER UPLAND S.D.

TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES

201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015

PARTIAL SECOND FLOOR DEMO AREA C-
MECHANICAL

PROJECT NO: 2022-327

DRAWN BY: RC

DATE: 03/15/2023

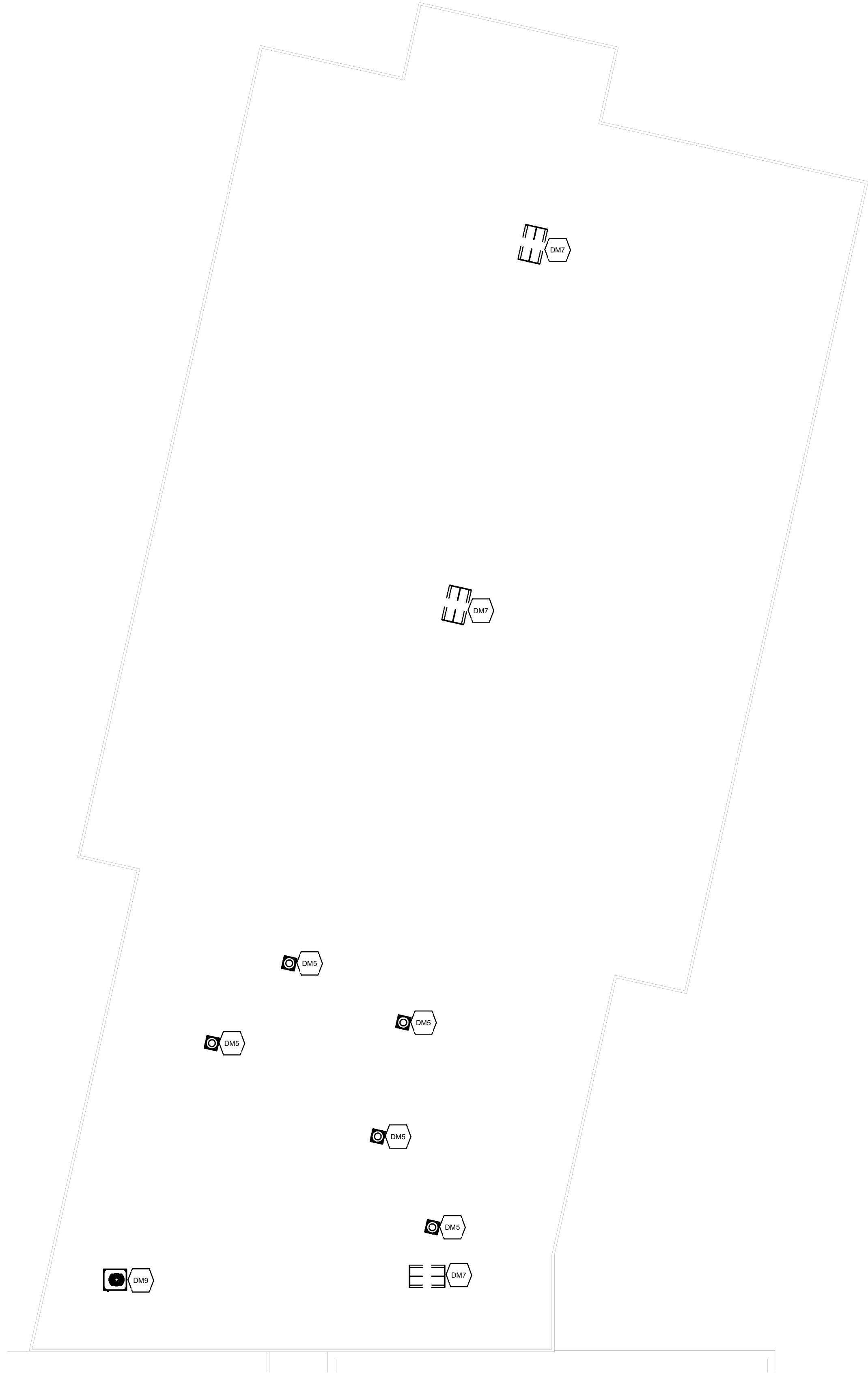
SCALE: AS NOTED



135 Eagle Street, Ambler, PA 19002
1950 Route 70, Ambler, PA 19002
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100% Bid Set- 15 March 2023

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PARTIAL ROOF DEMO AREA D - MECHANICAL
3/32" = 1'-0"

MECHANICAL DEMO NOTES:

1. CONTRACTOR SHALL DEMOLISH ALL EXISTING HVAC SYSTEMS IN THEIR ENTIRETY. DEMOLITION SHALL BE PERFORMED IN A MANNER THAT PERMITS THE EXISTING SYSTEM TO REMAIN FUNCTIONAL IN ALL LATER PHASES OF THE PROJECTS AS THE RENOVATIONS TAKE PLACE. REMOVAL OF THE EXISTING PIPING, DUCTWORK, AND EQUIPMENT WILL BE LIMITED BY THE PROJECT PHASING. CONTRACTOR TO COORDINATE ALL WORK WITH OWNER AND GENERAL CONTRACTOR. MECH CONTRACTOR WILL BE RESPONSIBLE FOR CUTTING, CAPPING, AND PROVIDING ALL REQUIRED TEMPORARY PIPING MODIFICATIONS AND VALVES NEEDED TO MAINTAIN HEAT TO ALL OCCUPIED AREAS THROUGHOUT THE LENGTH OF THE PROJECT.
2. THE CONTRACTOR IS RESPONSIBLE FOR DEMOLISHING THE SYSTEMS IN PHASES, KEEPING THE OLD SYSTEMS OPERATIONAL UNTIL THE CONSTRUCTION OF THE NEW SYSTEMS IS COMPLETED. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED SHUT-OFF VALVES FOR TEMPORARY SHUT DOWNS AND TRANSITIONS.
3. IT SHALL BE THE RESPONSIBILITY OF THE DEMOLITION CONTRACTOR TO VISIT THE SITE IN ORDER TO BEST UNDERSTAND THE SCOPE OF THE DEMOLITION WORK.
4. ALL DEMOLISHED MATERIALS SHALL BE RECYCLED WHEREVER POSSIBLE. ANY HAZARDOUS MATERIALS SHALL BE HANDLED ACCORDING TO GOVERNMENT REGULATION AND DISPOSED OF IN A SAFE MANNER.
5. GENERAL CONTRACTOR TO PATCH/REPAIR EXISTING WALL/CEILINGS AS REQUIRED BY THE ARCHITECT.
6. CONTRACTOR SHALL DEMOLISH EXISTING DUCTWORK TO POINT WHERE INDICATED ON THE DRAWING.
7. EXISTING AIR DEVICES AND DUCTWORK MARKED AS TO BE DEMOLISHED (ED): AIR DEVICES AND DUCTWORK ON PLANS ARE BASED ON THE ORIGINAL DESIGN DOCUMENTS. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND LOCATIONS IN THE FIELD PRIOR TO ANY WORK BEING PERFORMED.
8. CONTRACTOR SHALL DEMOLISH THE EXISTING CONTROL SYSTEM IN ITS ENTIRETY, WITH ALL ITS ASSOCIATED DEVICES, EQUIPMENT, TUBING / WIRES AND ACCESSORIES. THE OLD SYSTEM WILL BE REPLACED WITH A NEW ELECTRONIC DDC CONTROLS SYSTEM.

MECHANICAL DEMOLITION...

NOTED THUS

- DM5 EXISTING EXHAUST FAN, ASSOCIATED DUCTWORK, AND AIR DEVICES SHALL BE REMOVED. CONTRACTOR SHALL PATCH ROOF TO MATCH EXISTING. COORDINATE WORK WITH THE ROOFING CONTRACTOR TO MAINTAIN WARRANTY.
- DM7 EXISTING OUTSIDE AIR INTAKE TO BE REMOVED WITH ALL ITS ASSOCIATED DAMPERS AND ACCESSORIES. CONTRACTOR SHALL PATCH ROOF TO MATCH EXISTING. COORDINATE WORK WITH THE ROOFING CONTRACTOR TO MAINTAIN WARRANTY.
- DM9 EXISTING CONDENSING UNIT REMOVED WITH ALL ITS ASSOCIATED REFRIGERANT PIPING, ACCESSORIES, AND CONTROLS. CONTRACTOR SHALL PATCH ROOF TO MATCH EXISTING. COORDINATE WORK WITH THE ROOFING CONTRACTOR TO MAINTAIN WARRANTY.

NOTICE

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KEY PLAN
NO SCALE

CHESTER UPLAND S.D.

TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES

201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015

PARTIAL DEMO ROOF PLAN AREA D -

MECHANICAL

PROJECT NO: 2022-327

DRAWN BY: RC

DATE: 03/15/2023

SCALE: AS NOTED



ENGINEERING ASSOCIATES INC.

135 Eagle Street, Ambler, PA 19002
1950 Route 70, Ambler, PA 19002
264.41188

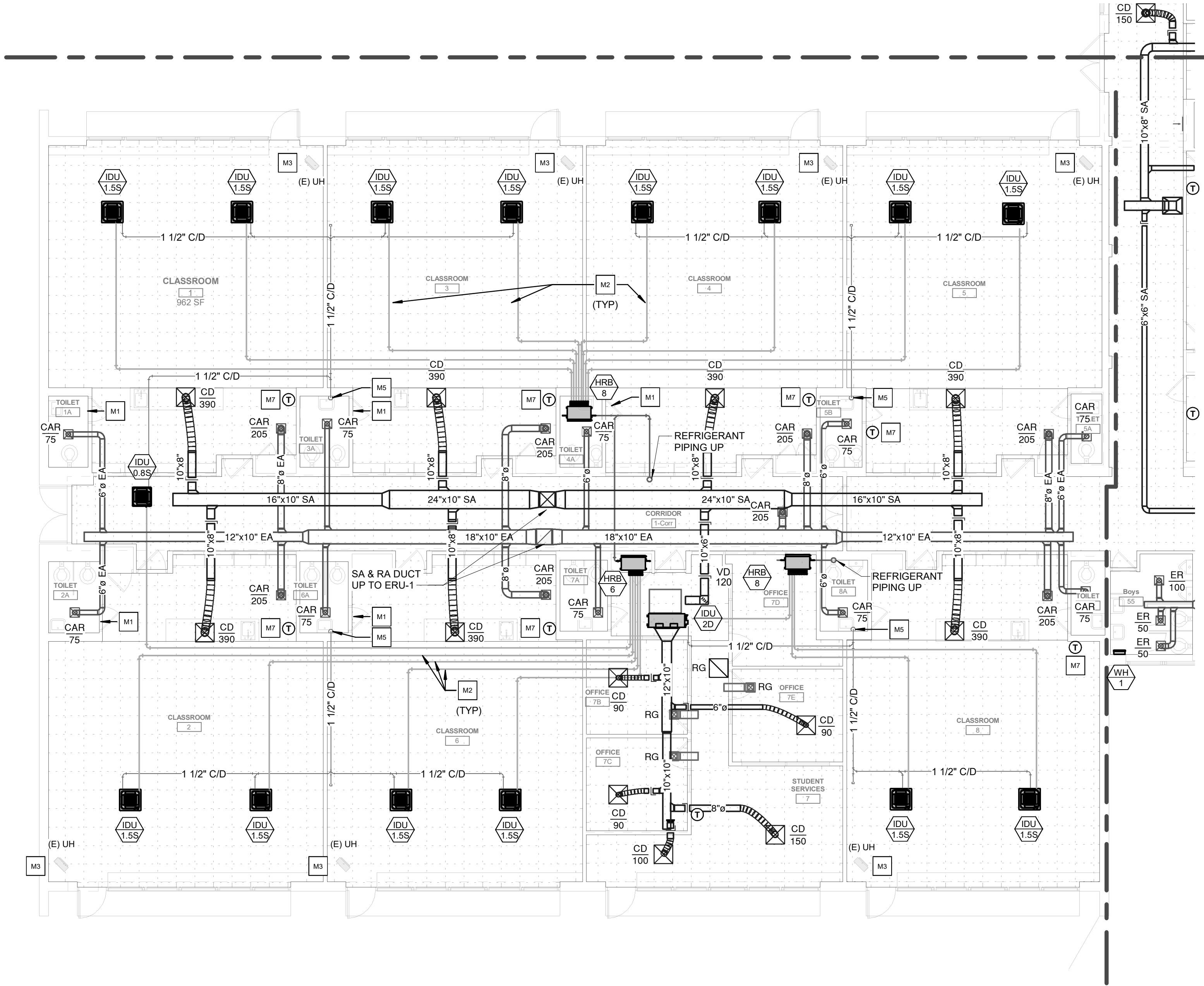
100% Bid Set- 15 March 2023

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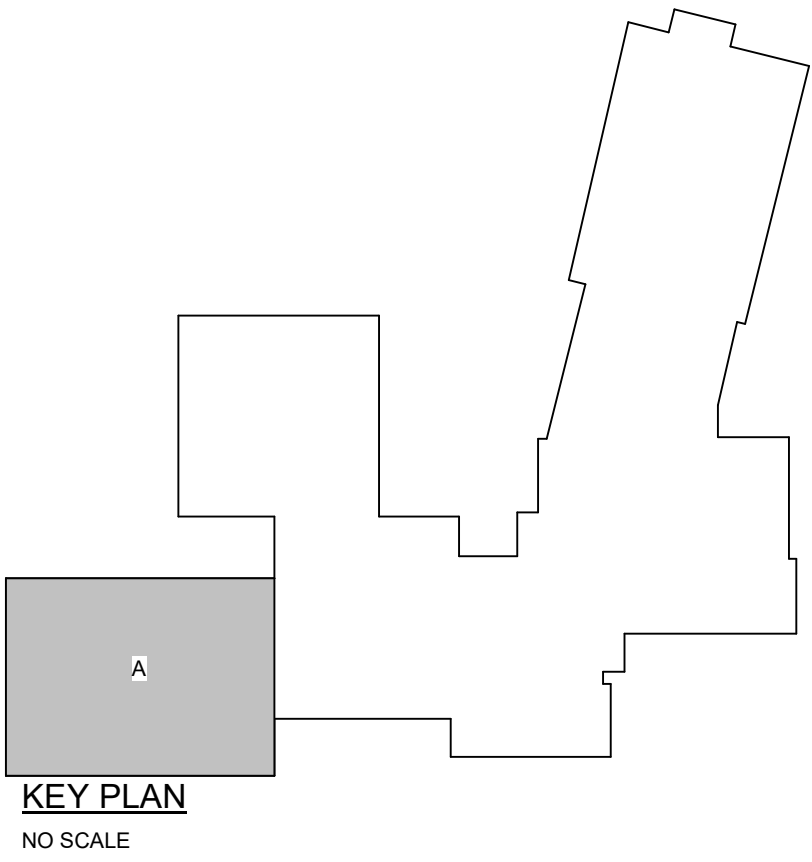
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Do not scale drawings

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PARTIAL GROUND FLOOR AREA A- MECHANICAL
1/8" = 1'-0"



MECHANICAL DUCTWORK NOTE:
DUCTWORK DRAWINGS/LAYOUT IS
DIAGRAMMATIC. ALL DUCTWORK
INSTALLATIONS AND SHEETMETAL SHOP
DRAWINGS SHALL BE IN ACCORDANCE
WITH MCHUGH ENGINEERING
ASSOCIATES DUCTWORK DETAILS AND
PER SMACNA STANDARDS.

NOTICE
THE SCHEDULES AND DRAWINGS REPRESENT ONLY CERTAIN
REQUIREMENTS OF THE PROJECT. THERE ARE ADDITIONAL
REQUIREMENTS IN THE SPECIFICATIONS BOOKLET WHICH THE
CONTRACTOR IS BOUND TO PROVIDE. A SUPPLIER OR
CONTRACTOR'S PRICING, WHICH IS BASED ONLY ON DRAWINGS OR
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USE OF THIS INFORMATION WITHOUT THE WRITTEN APPROVAL BY THE
DESIGN PROFESSIONAL IS AT THE SOLE RISK AND LIABILITY OF THE
USER. THE DESIGN PROFESSIONAL RESERVES THE RIGHT TO REMOVE
OUR PROFESSIONAL SEAL AND/OR TITLE BLOCK.

MECHANICAL NOTES:

- ALL DUCTWORK SIZES INDICATED ARE INSIDE DIMENSIONS UNLESS OTHERWISE NOTED.
- DUCT SIZES INDICATED ON DRAWING ARE BASED AFTER THE LAST DIFFUSER AND/OR BRANCH TAKE-OFF.
- CONTRACTOR TO PROVIDE A CLEAN OUT AT EVERY CHANGE IN DIRECTION OF A CONDENSATE LINE AND AT 25 FT. CENTERS.
- RUN ALL CONDENSATE PIPING TO POINT OF DISCHARGE, PROVIDE REQUIRED AIR GAP AT DISCHARGE POINT, REFER TO PLANS & SPECIFICATIONS FOR SIZES AND REQUIREMENTS.
- SHARP THROAT, RADIUS HEEL 90 DEGREE FITTINGS ARE UNACCEPTABLE. RADIUS ELBOWS (INNER AND OUTER) OR MITERED ELBOWS WITH TURNING VANES SHALL BE PROVIDED FOR ALL 90 DEGREE ELBOWS
- ALL EXHAUSTS AND VENT TERMINALS MUST BE LOCATED AT LEAST 10'-0" FROM FRESH AIR INTAKE TERMINALS AND OPERABLE PORTIONS OF ANY WINDOW.
- ALL OUTSIDE AIR DUCTWORK SHALL HAVE MINIMUM 2" EXTERNAL FIBERGLASS DUCTWRAP INSULATION.
- THE FIRST 10'-0" OF RETURN DUCTWORK FROM THE AIR HANDLER SHALL HAVE 1" OF INTERNAL ACOUSTICAL LINING.
- EXHAUST AIR SHALL NOT BE INSULATED UNLESS EXTENDING THROUGH UNCONDITIONED SPACES. PROVIDE 1 1/2" DUCTWRAP THROUGH UNCONDITIONED SPACES.

MECHANICAL KEY NOTES

- M1 MINIMUM 3/4" DOOR UNDERCUT.
M2 REFRIGERANT PIPING. REFER TO MANUFACTURER FOR SIZES.
M3 EXISTING ELECTRIC UNIT HEATER TO REMAIN WITH EXISTING CONTROLS AND WALL MTD. THERMOSTAT.
M5 1-1/2" CONDENSATE DOWN TO INDIRECT WASTE CONNECTION.
M7 WALL MOUNTED THERMOSTAT TIED TO THE BMS. THERMOSTAT CONTROLS BOTH IDUs IN THE CLASSROOM.

NOTED THUS

CHESTER UPLAND S.D.
TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES
201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015
PARTIAL GROUND FLOOR AREA A -
MECHANICAL

PROJECT NO: 2022-327
DRAWN BY: RC
DATE: 03/15/2023
SCALE: AS NOTED

MCHUGH
ENGINEERING ASSOCIATES INC.
135 Ridge Street, Ambler, PA 19002
1950 Route 70, Suite 200, Marlton, NJ 08053
264.41188

100% Bid Set- 15 March 2023

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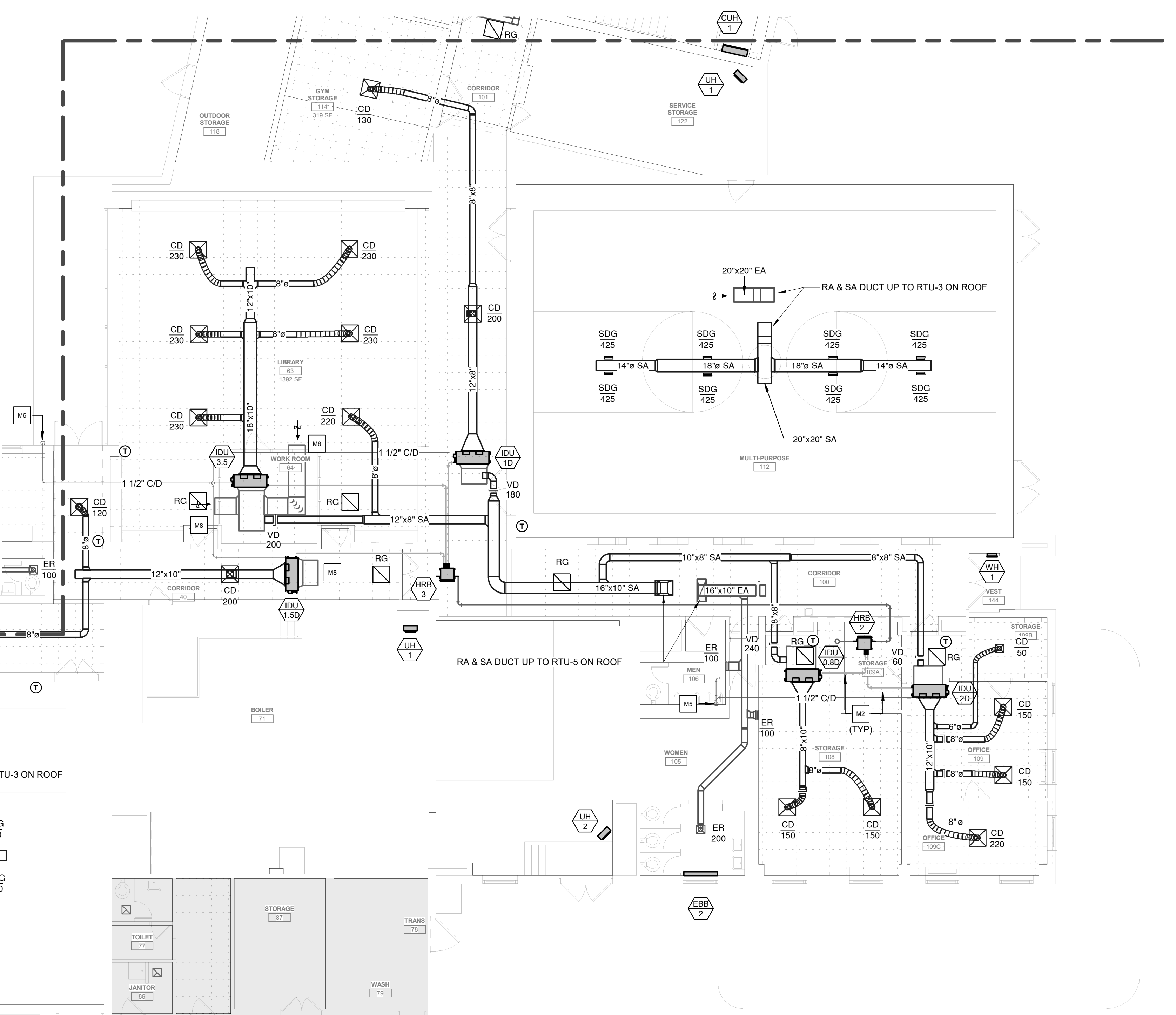
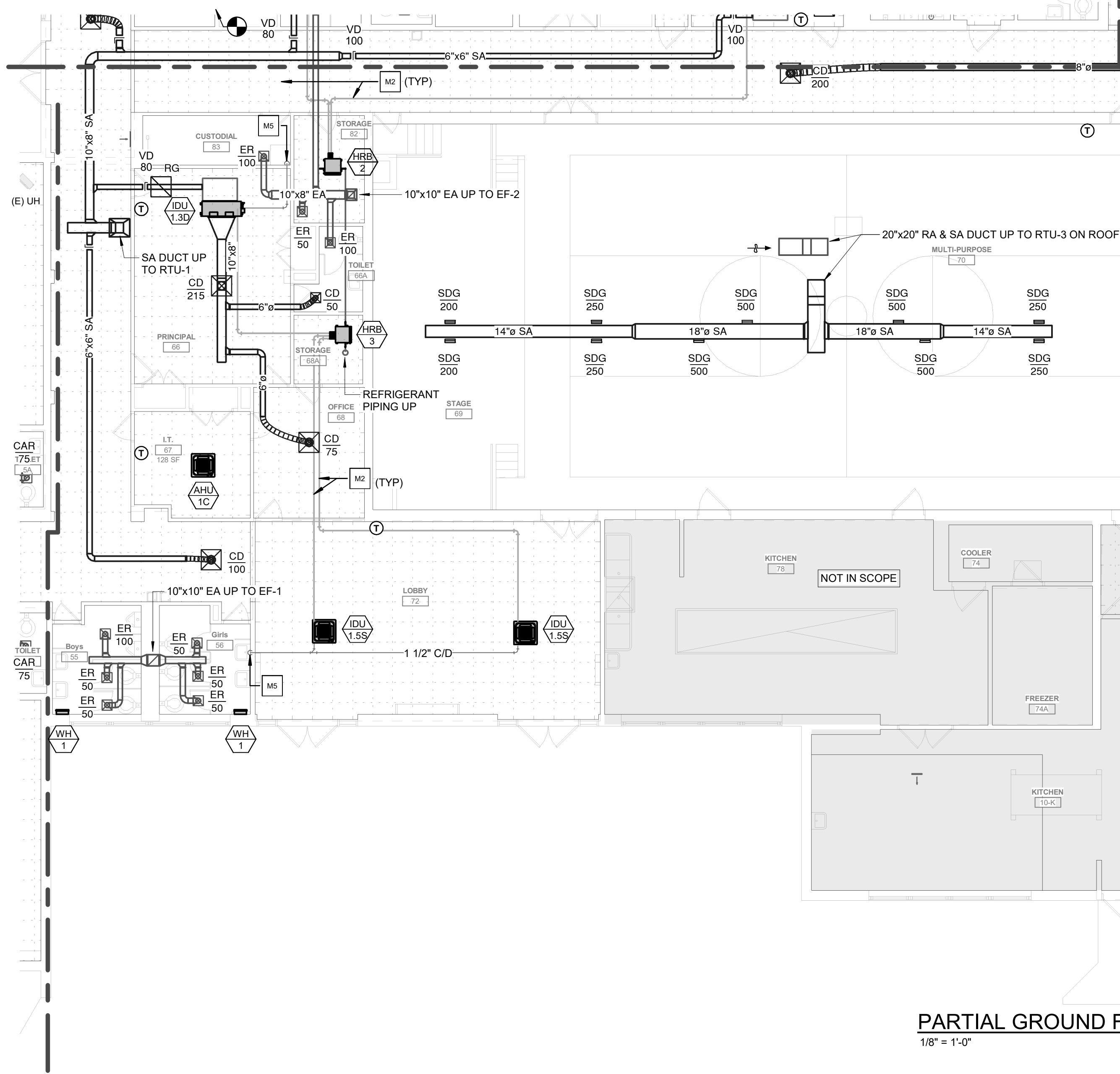
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- EXHAUST AIR SHALL NOT BE INSULATED UNLESS EXTENDING THROUGH UNCONDITIONED SPACES. PROVIDE 1 1/2" DUCTWRAP THROUGH UNCONDITIONED SPACES.

MECHANICAL KEY NOTES

- M2 REFRIGERANT PIPING. REFER TO MANUFACTURER FOR SIZES.
M5 1-1/2" CONDENSATE DOWN TO INDIRECT WASTE CONNECTION.
M6 1-1/2" CONDENSATE DOWN. SPILL ON GRADE.
M8 OPEN END DUCT ABOVE THE CEILING

NOTED THUS



MECHANICAL DUCTWORK NOTE:
DUCTWORK DRAWINGS/LAYOUT IS DIAGRAMMATIC. ALL DUCTWORK INSTALLATIONS AND SHEETMETAL SHOP DRAWINGS SHALL BE IN ACCORDANCE WITH MCHUGH ENGINEERING ASSOCIATES DUCTWORK DETAILS AND PER SMACNA STANDARDS.

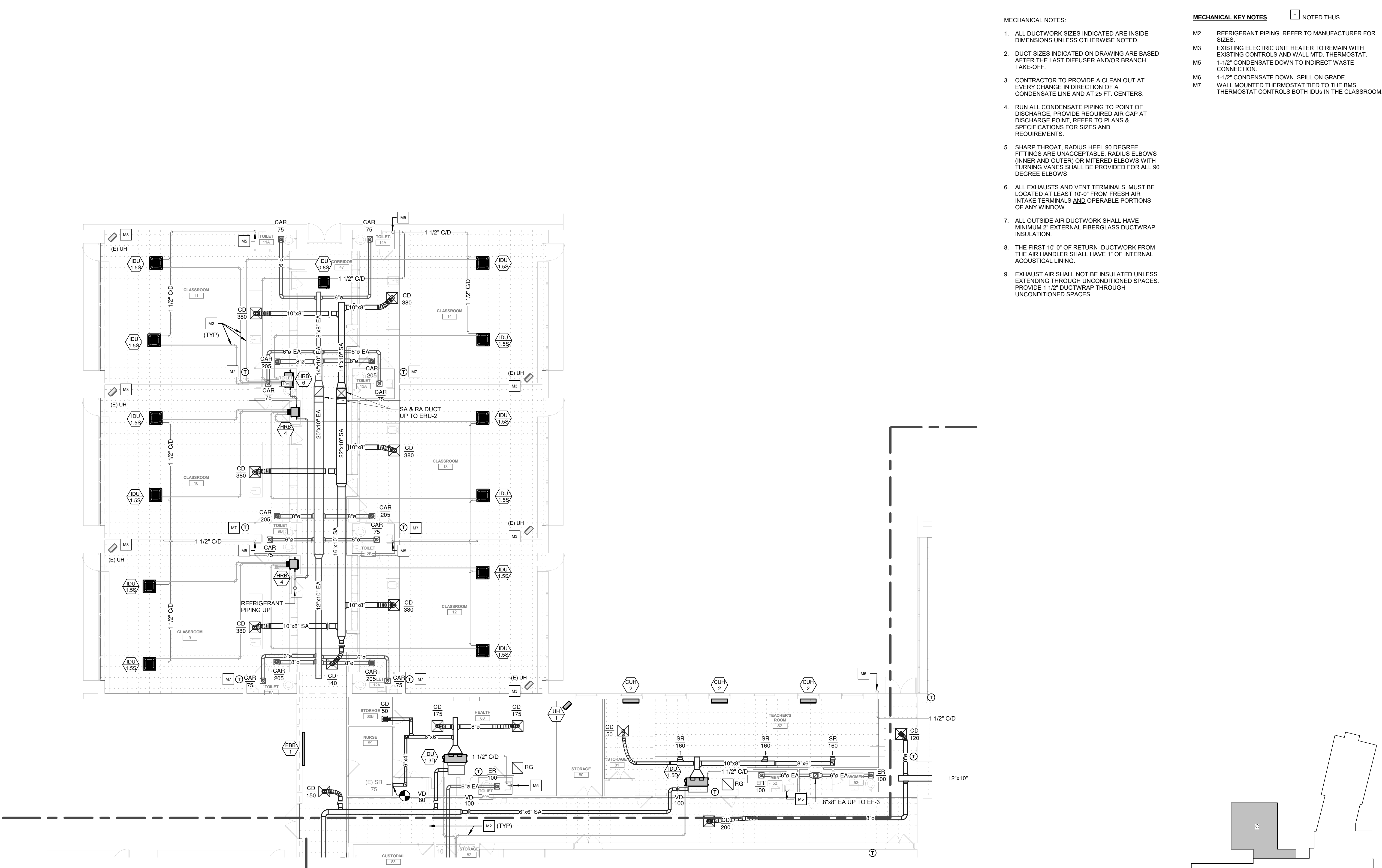
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CHESTER UPLAND S.D.
TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES
201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015
PARTIAL GROUND FLOOR AREA B -
MECHANICAL

MCHUGH
ENGINEERING ASSOCIATES INC.
135 Ridge Street, Ambler, PA 19002
1950 Route 70, Suite 200, Ambler, NJ 08003
264.41188

Rev. No.	Date	Description
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PARTIAL GROUND FLOOR AREA C- MECHANICAL
1/8" = 1'-0"

MECHANICAL DUCTWORK NOTE:
DUCTWORK DRAWINGS/LAYOUT IS
DIAGRAMMATIC. ALL DUCTWORK
INSTALLATIONS AND SHEETMETAL SHOP
DRAWINGS SHALL BE IN ACCORDANCE
WITH MCHUGH ENGINEERING
ASSOCIATES DUCTWORK DETAILS AND
PER SMACNA STANDARDS.

NOTICE
THE SCHEDULES AND DRAWINGS REPRESENT ONLY CERTAIN
REQUIREMENTS OF THE PROJECT. THERE ARE ADDITIONAL
REQUIREMENTS IN THE SPECIFICATIONS BOOKLET WHICH THE
CONTRACTOR IS BOUND TO PROVIDE. A SUPPLIER OR
CONTRACTOR'S PRICING, WHICH IS BASED ONLY ON DRAWINGS OR
SCHEDULES, MAY LEAVE IMPORTANT COSTS UNACCOUNTED FOR
WHICH WILL ULTIMATELY BE THE CONTRACTOR OR SUPPLIER'S
RESPONSIBILITY TO PROVIDE.

THE DELIVERY OF THIS DRAWING SHOULD NOT BE CONSTRUED TO
PROVIDE AN EXPRESS WARRANTY OR GUARANTEE TO ANYONE THAT
ALL THE DIMENSIONS AND DETAILS ARE EXACT OR TO INDICATE
THAT THE USE OF THIS DRAWING IMPLIES THE REVIEW AND
APPROVAL BY THE DESIGN PROFESSIONAL OF ANY FUTURE USE. ANY
USE OF THIS INFORMATION WITHOUT THE WRITTEN APPROVAL BY THE
DESIGN PROFESSIONAL IS AT THE SOLE RISK AND LIABILITY OF THE
USER. THE DESIGN PROFESSIONAL RESERVES THE RIGHT TO REMOVE
OUR PROFESSIONAL SEAL AND/OR TITLE BLOCK.

- MECHANICAL NOTES:
- ALL DUCTWORK SIZES INDICATED ARE INSIDE DIMENSIONS UNLESS OTHERWISE NOTED.
 - DUCT SIZES INDICATED ON DRAWING ARE BASED AFTER THE LAST DIFFUSER AND/OR BRANCH TAKE-OFF.
 - CONTRACTOR TO PROVIDE A CLEAN OUT AT EVERY CHANGE IN DIRECTION OF A CONDENSATE LINE AND AT 25 FT. CENTERS.
 - RUN ALL CONDENSATE PIPING TO POINT OF DISCHARGE. PROVIDE REQUIRED AIR GAP AT DISCHARGE POINT. REFER TO PLANS & SPECIFICATIONS FOR SIZES AND REQUIREMENTS.
 - SHARP THROAT, RADIUS HEEL 90 DEGREE FITTINGS ARE UNACCEPTABLE. RADIUS ELBOWS (INNER AND OUTER) OR MITERED ELBOWS WITH TURNING VANES SHALL BE PROVIDED FOR ALL 90 DEGREE ELBOWS.
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 - EXHAUST AIR SHALL NOT BE INSULATED UNLESS EXTENDING THROUGH UNCONDITIONED SPACES. PROVIDE 1 1/2" DUCTWRAP THROUGH UNCONDITIONED SPACES.

- MECHANICAL KEY NOTES
- NOTED THUS
- M2 REFRIGERANT PIPING. REFER TO MANUFACTURER FOR SIZES.
- M3 EXISTING ELECTRIC UNIT HEATER TO REMAIN WITH EXISTING CONTROLS AND WALL MTD. THERMOSTAT.
- M5 1-1/2" CONDENSATE DOWN TO INDIRECT WASTE CONNECTION.
- M6 1-1/2" CONDENSATE DOWN. SPILL ON GRADE.
- M7 WALL MOUNTED THERMOSTAT TIED TO THE BMS. THERMOSTAT CONTROLS BOTH IDUs IN THE CLASSROOM.

MCHUGH
ENGINEERING ASSOCIATES INC.
135 Ridge Street, Ambler, PA 19002
1950 Route 70, Suite 200, Marlton, NJ 08053
264.611588
www.mchughinc.com

100% Bid Set- 15 March 2023

CHESTER UPLAND S.D.
TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES
201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015
PARTIAL GROUND FLOOR AREA C -
MECHANICAL

PROJECT NO: 2022-327
DRAWN BY: RC
DATE: 03/15/2023
SCALE: AS NOTED

M101c



PARTIAL GROUND FLOOR AREA D- MECHANICAL
1/8" = 1'-0"

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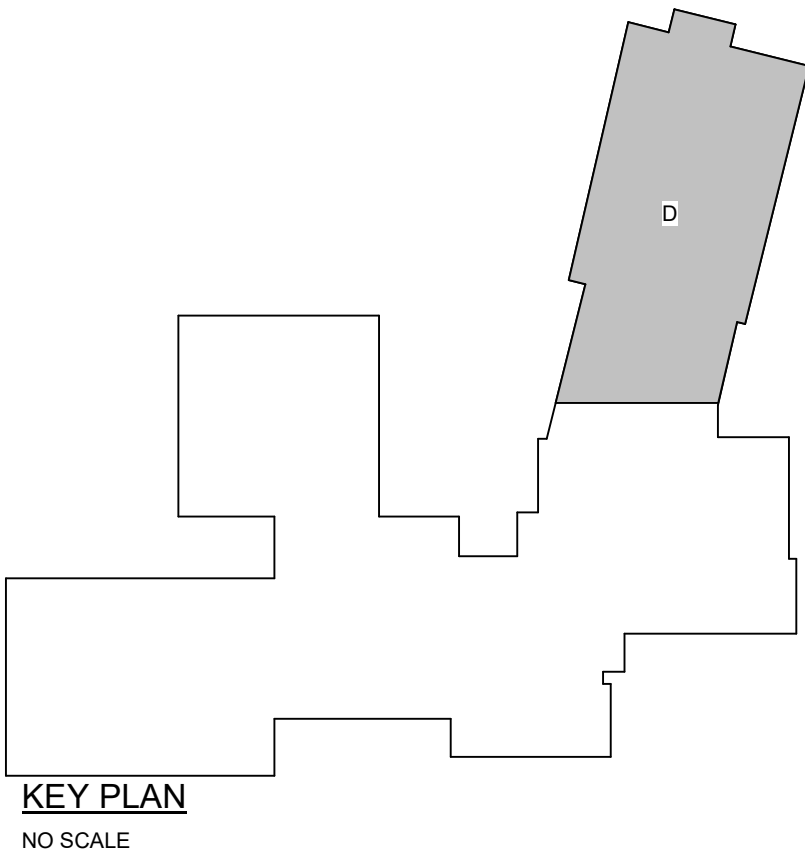
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NOTED THUS



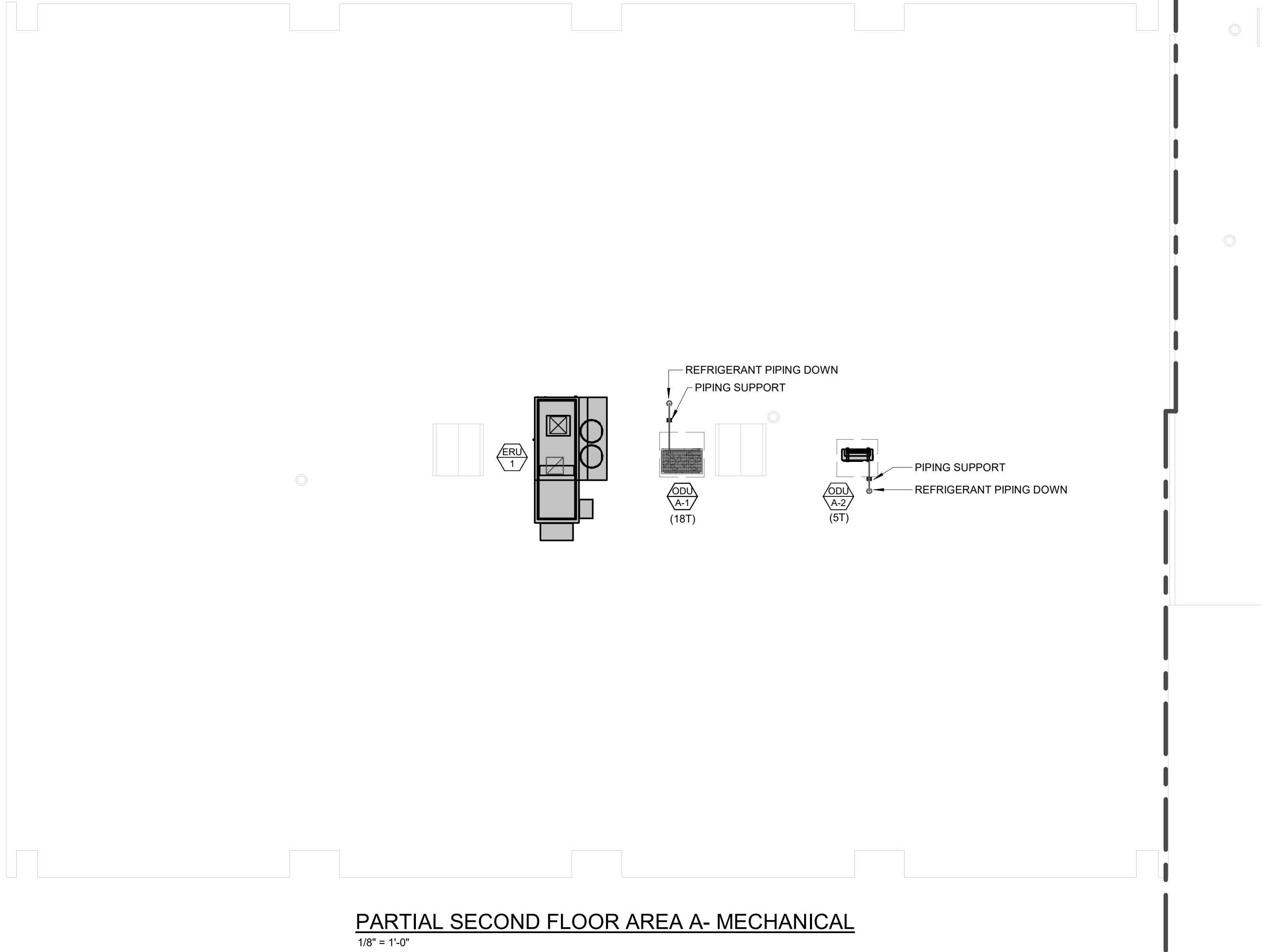
CHESTER UPLAND S.D.
TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES
201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015
PARTIAL GROUND FLOOR AREA D -
MECHANICAL

PROJECT NO: 2022-327
DRAWN BY: RC
DATE: 03/15/2023
SCALE: AS NOTED



100% Bid Set- 15 March 2023

Rev. No.	Date	Description
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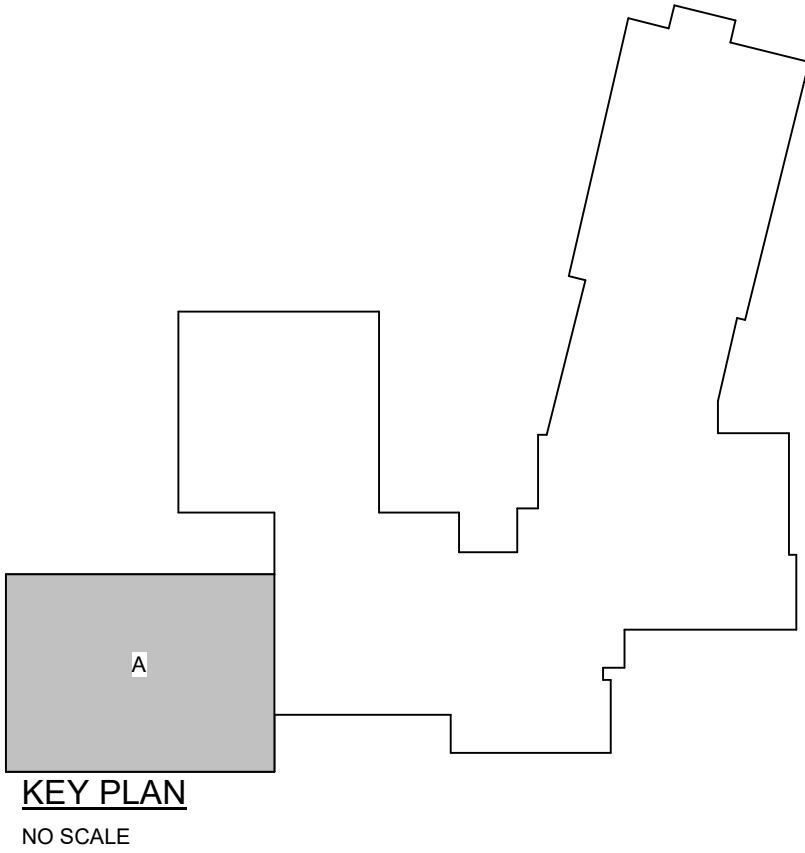


- MECHANICAL KEY NOTES**
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 - DUCT SIZES INDICATED ON DRAWING ARE BASED AFTER THE LAST DIFFUSER AND/OR BRANCH TAKE-OFF.
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 - RUN ALL CONDENSATE PIPING TO POINT OF DISCHARGE, PROVIDE REQUIRED AIR GAP AT DISCHARGE POINT, REFER TO PLANS & SPECIFICATIONS FOR SIZES AND REQUIREMENTS.
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 - ALL EXHAUSTS AND VENT TERMINALS MUST BE LOCATED AT LEAST 10'-0" FROM FRESH AIR INTAKE TERMINALS **AND** OPERABLE PORTIONS OF ANY WINDOW.
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 - THE FIRST 10'-0" OF RETURN DUCTWORK FROM THE AIR HANDLER SHALL HAVE 1" OF INTERNAL ACOUSTICAL LINING.
 - EXHAUST AIR SHALL NOT BE INSULATED UNLESS EXTENDING THROUGH UNCONDITIONED SPACES. PROVIDE 1 1/2" DUCTWRAP THROUGH UNCONDITIONED SPACES.
- ROOF DUCT WORK NOTES:**
- ALL DUCTWORK SIZES ARE INSIDE DIMENSIONS UNLESS NOTED OTHERWISE.
 - ALL EXTERIOR DUCTWORK TO BE 4" WATERGAUGE DUCT CONSTRUCTION WITH 2" RIGID INSULATION AND WEATHERPROOF COVERING IN ADDITION TO 1" LINING. SEE SPEC.
 - ALL BOTTOM OF DUCTWORK TO BE MINIMUM 2'-0" ABOVE FINISHED ROOF.
 - ALL TOPS OF EXTERIOR DUCTWORK TO SLOPE SO NOT TO ALLOW WATER ACCUMULATION.
 - CONTRACTOR TO FURNISH AND INSTALL ROOF MOUNTED DUCT CURBS TO SUPPORT EXTERIOR DUCTWORK AT ALL CHANGES OF DIRECTION AND AT A MAXIMUM OF 8'-0" O.C. PATE OR EQUAL.
 - CONTRACTOR SHALL PAINT ALL EXPOSED DUCT SUPPORTS ONE COAT RUSTOLEUM PRIMER AND 2 FINISH COATS OF ENAMEL.
 - CONTRACTOR TO FURNISH AND INSTALL NEW PIPE ROOF CURBS FOR ALL CONDUIT/POWER/CONTROLS/REFRIGERANT PIPING PENETRATIONS THROUGH THE ROOF.
 - REFRIGERANT PIPING SUPPORTS SHALL BE LOCATED NO FURTHER APART THAN 48" ON CENTER. REFER TO DETAILS.
 - LOCATE CONDENSING UNITS ON SECURED BASES WITH NEOPRENE PADS UNDERNEATH EACH AS A MINIMUM. UNITS MUST BE SECURED TO ROOF TO MEET WIND-LOAD AND SEISMIC REQUIREMENTS UNLESS WEIGHT IS DEMONSTRATED TO PROVIDE ADEQUATE STABILITY.
 - ANY PENETRATIONS TO THE ROOF MUST BE DONE IN ACCORDANCE WITH THE ROOFING WARRANTY SPECIFICATIONS. FOR EXISTING ROOFS, CONTRACTOR MUST CONTACT THE WARRANTING ROOFING CONTRACTOR OF THE EXISTING ROOF. PROVIDE ALL SEALING AND FLASHING REQUIRED.
 - ALL PIPING, CONDUIT, AND DUCT PENETRATIONS SHALL HAVE ROOF CURBS SUCH AS THOSE MANUFACTURED BY PATE.
 - NO EQUIPMENT SHALL BE LOCATED WITHIN 10'-0" OF ROOF EDGES UNLESS GUARDS OR HIGH PARAPET WALLS EXIST OR ARE INSTALLED.
 - PERMANENT ACCESS SHALL BE PROVIDED TO ANY ROOF WHERE EQUIPMENT IS LOCATED. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
 - INSTALL ALL EQUIPMENT SUCH THAT MANUFACTURER'S RECOMMENDED CLEARANCES ARE KEPT AND AT LEAST 10'-0" BETWEEN ANY INTAKE AND EXHAUST/VENT.
 - ALL ROOFTOP DIRECT-VENT TERMINALS SHALL TERMINATE A MINIMUM OF 24" ABOVE THE ROOF TO ALLOW FOR SNOW LOAD. DIRECT VENT TERMINALS SHALL BE SPACED FROM EACH OTHER IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AND NEVER LESS THAN 12" APART.

NOTICE

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CHESTER UPLAND S.D.

TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES

201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015

**PARTIAL SECOND FLOOR AREA A -
MECHANICAL**

PROJECT NO: 2022-327

DRAWN BY: RC

DATE: 03/15/2023

SCALE: AS NOTED



135 Eagle Street, Ambler, PA 19002
1950 Route 70, Ambler, PA 19002
2641158

100% Bid Set- 15 March 2023

MECHANICAL NOTES:

- ALL DUCTWORK SIZES INDICATED ARE INSIDE DIMENSIONS UNLESS OTHERWISE NOTED.
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NOTED THUS

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ROOF DUCT WORK NOTES:

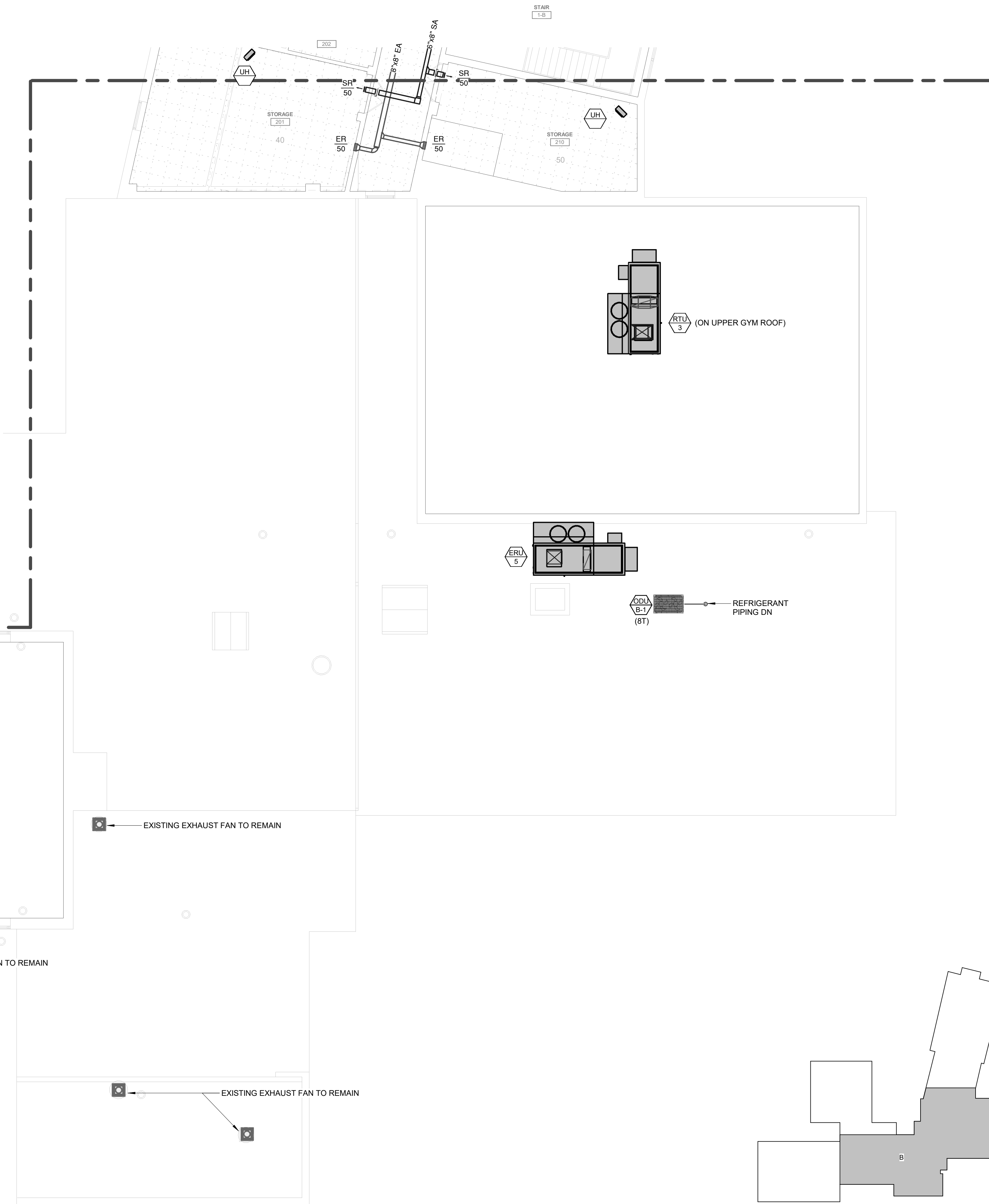
1. ALL DUCTWORK SIZES ARE INSIDE DIMENSIONS UNLESS NOTED OTHERWISE.
2. ALL EXTERIOR DUCTWORK TO BE 4" WATERGAUGE DUCT CONSTRUCTION WITH 2" RIGID INSULATION AND WEATHERPROOF COVERING IN ADDITION TO 1" LINING. SEE SPEC.
3. ALL BOTTOM OF DUCTWORK TO BE MINIMUM 2'-0" ABOVE FINISHED ROOF.
4. ALL TOPS OF EXTERIOR DUCTWORK TO SLOPE SO NOT TO ALLOW WATER ACCUMULATION.
5. CONTRACTOR TO FURNISH AND INSTALL ROOF MOUNTED DUCT CURBS TO SUPPORT EXTERIOR DUCTWORK AT ALL CHANGES OF DIRECTION AND AT A MAXIMUM OF 8'-0" O.C. PATE OR EQUAL.
6. CONTRACTOR SHALL PAINT ALL EXPOSED DUCT SUPPORTS ONE COAT RUSTOLEUM PRIMER AND 2 FINISH COATS OF ENAMEL.
7. CONTRACTOR TO FURNISH AND INSTALL NEW PIPE ROOF CURBS FOR ALL CONDUIT/POWER/CONTROLS/REFRIGERANT PIPING PENETRATIONS THROUGH THE ROOF.
8. REFRIGERANT PIPING SUPPORTS SHALL BE LOCATED NO FURTHER APART THAN 48" ON CENTER. REFER TO DETAILS.
9. LOCATE CONDENSING SACS ON SECURED BASES WITH NEOPRENE PADS UNDERNEATH EACH AS A MINIMUM. UNITS MUST BE SECURED TO ROOF TO MEET WIND-LOAD AND SEISMIC REQUIREMENTS UNLESS WEIGHT IS DEMONSTRATED TO PROVIDE ADEQUATE STABILITY.
10. ANY PENETRATIONS TO THE ROOF MUST BE DONE IN ACCORDANCE WITH THE ROOFING WARRANTY SPECIFICATIONS. FOR EXISTING ROOFS, CONTRACTOR MUST CONTACT THE WARRANTING ROOFING CONTRACTOR OF THE EXISTING ROOF. PROVIDE ALL SEALING AND FLASHING REQUIRED.
11. ALL PIPING, CONDUIT, AND DUCT PENETRATIONS SHALL HAVE ROOF CURBS SUCH AS THOSE MANUFACTURED BY PATE.
12. NO EQUIPMENT SHALL BE LOCATED WITHIN 10'-0" OF ROOF EDGES UNLESS GUARDS OR HIGH PARAPET WALLS EXIST OR ARE INSTALLED.
13. PERMANENT ACCESS SHALL BE PROVIDED TO ANY ROOF WHERE EQUIPMENT IS LOCATED. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
14. INSTALL ALL EQUIPMENT SUCH THAT MANUFACTURER'S RECOMMENDED CLEARANCES ARE KEPT AND AT LEAST 10'-0" BETWEEN ANY INTAKE AND EXHAUST/VENT.
15. ALL ROOFTOP DIRECT-VENT TERMINALS SHALL TERMINATE A MINIMUM OF 24" ABOVE THE ROOF TO ALLOW FOR SNOW LOAD. DIRECT VENT TERMINALS SHALL BE SPACED FROM EACH OTHER IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AND NEVER LESS THAN 12" APART.

MECHANICAL NOTES:

1. ALL DUCTWORK SIZES INDICATED ARE INSIDE DIMENSIONS UNLESS OTHERWISE NOTED.
2. DUCT SIZES INDICATED ON DRAWING ARE BASED AFTER THE LAST DIFFUSER AND/OR BRANCH TAKE-OFF.
3. CONTRACTOR TO PROVIDE A CLEAN OUT AT EVERY CHANGE IN DIRECTION OF A CONDENSATE LINE AND AT 25 FT. CENTERS.
4. RUN ALL CONDENSATE PIPING TO POINT OF DISCHARGE, PROVIDE REQUIRED AIR GAP AT DISCHARGE POINT, REFER TO PLANS & SPECIFICATIONS FOR SIZES AND REQUIREMENTS.
5. SHARP THROAT, RADIUS 90° DEGREE FITTINGS ARE UNACCEPTABLE. RADIUS ELBOWS (INNER AND OUTER) OR MITERED ELBOWS WITH TURNING VANCES SHALL BE PROVIDED FOR ALL 90 DEGREE ELBOWS
6. ALL EXHAUSTS AND VENT TERMINALS MUST BE LOCATED AT LEAST 10'-0" FROM FRESH AIR INTAKE TERMINALS AND OPERABLE PORTIONS OF ANY WINDOW.
7. ALL OUTSIDE AIR DUCTWORK SHALL HAVE MINIMUM 2" EXTERNAL FIBERGLASS DUCTWRAP INSULATION.
8. THE FIRST 10'-0" OF RETURN DUCTWORK FROM THE AIR HANDLER SHALL HAVE 1" OF INTERNAL ACoustICAL LINING.
9. EXHAUST AIR SHALL NOT BE INSULATED UNLESS EXTENDING THROUGH UNCONDITIONED SPACES. PROVIDE 1 1/2" DUCTWRAP THROUGH UNCONDITIONED SPACES.

MECHANICAL KEY NOTES

☐ NOTED THUS



PARTIAL SECOND FLOOR AREA B- MECHANICAL
1/8" = 1'-0"

MECHANICAL DUCTWORK NOTE:

DUCTWORK DRAWINGS/LAYOUT IS
DIAGRAMMATIC. ALL DUCTWORK
INSTALLATIONS AND SHEETMETAL SHOP
DRAWINGS SHALL BE IN ACCORDANCE
WITH MCHUGH ENGINEERING
ASSOCIATES DUCTWORK DETAILS AND
PER SMACNA STANDARDS.

NOTICE

THE SCHEDULES AND DRAWINGS REPRESENT ONLY CERTAIN REQUIREMENTS OF THE PROJECT. THERE ARE ADDITIONAL REQUIREMENTS IN THE SPECIFICATIONS BOOKLET WHICH THE CONTRACTOR IS BOUND TO PROVIDE. A SUPPLIER OR CONTRACTOR'S PRICING, WHICH IS BASED ONLY ON DRAWINGS OR SCHEDULES, MAY LEAVE IMPORTANT COSTS UNACCOUNTED FOR WHICH WILL ULTIMATELY BE THE CONTRACTOR OR SUPPLIER'S RESPONSIBILITY TO PROVIDE.

THE DELIVERY OF THIS DRAWING SHOULD NOT BE CONSTRUED TO PROVIDE AN EXPRESS WARRANTY OR GUARANTEE TO ANYONE THAT ALL THE DIMENSIONS AND DETAILS ARE EXACT OR TO INDICATE THAT THE USE OF THIS DRAWING IMPLIES THE REVIEW AND APPROVAL BY THE DESIGN PROFESSIONAL OF ANY FUTURE USE. A USE OF THIS INFORMATION WITHOUT THE WRITTEN APPROVAL BY THE DESIGN PROFESSIONAL IS AT THE SOLE RISK AND LIABILITY OF THE USER. THE DESIGN PROFESSIONAL RESERVES THE RIGHT TO REMOVE OUR PROFESSIONAL SEAL AND/OR TITLE BLOCK.

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PARTIAL SECOND FLOOR AREA C- MECHANICAL
1/8" = 1'-0"

- MECHANICAL NOTES:**
- ALL DUCTWORK SIZES INDICATED ARE INSIDE DIMENSIONS UNLESS OTHERWISE NOTED.
 - DUCT SIZES INDICATED ON DRAWING ARE BASED AFTER THE LAST DIFFUSER AND/OR BRANCH TAKE-OFF.
 - CONTRACTOR TO PROVIDE A CLEAN OUT AT EVERY CHANGE IN DIRECTION OF A CONDENSATE LINE AND AT 25 FT. CENTERS.
 - RUN ALL CONDENSATE PIPING TO POINT OF DISCHARGE. PROVIDE REQUIRED AIR GAP AT DISCHARGE POINT. REFER TO PLANS & SPECIFICATIONS FOR SIZES AND REQUIREMENTS.
 - SHARP THROAT, RADIUS HEEL 90 DEGREE FITTINGS ARE UNACCEPTABLE. RADIUS ELBOWS (INNER AND OUTER) OR MITERED ELBOWS WITH TURNING VANES SHALL BE PROVIDED FOR ALL 90 DEGREE ELBOWS.
 - ALL EXHAUSTS AND VENT TERMINALS MUST BE LOCATED AT LEAST 10'-0" FROM FRESH AIR INTAKE TERMINALS AND OPERABLE PORTIONS OF ANY WINDOW.
 - ALL OUTSIDE AIR DUCTWORK SHALL HAVE MINIMUM 2" EXTERNAL FIBERGLASS DUCTWRAP INSULATION.
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ROOF DUCT WORK NOTES:

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KEY PLAN
NO SCALE

NOTICE
THE SCHEDULES AND DRAWINGS REPRESENT ONLY CERTAIN REQUIREMENTS OF THE PROJECT. THERE ARE ADDITIONAL REQUIREMENTS IN THE SPECIFICATIONS BOOKLET WHICH THE CONTRACTOR IS BOUND TO PROVIDE. A SUPPLIER OR CONTRACTOR'S PRICING, WHICH IS BASED ONLY ON DRAWINGS OR SCHEDULES, MAY LEAVE IMPORTANT COSTS UNACCOUNTED FOR WHICH WILL ULTIMATELY BE THE CONTRACTOR OR SUPPLIER'S RESPONSIBILITY TO PROVIDE.

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MECHANICAL KEY NOTES ☒ NOTED THUS

CHESTER UPLAND S.D.
TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES
201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015
**PARTIAL SECOND FLOOR AREA C -
MECHANICAL**

PROJECT NO: 2022-327
DRAWN BY: RC
DATE: 03/15/2023
SCALE: AS NOTED



135 Eagle Street, Ambler, PA 19002
1950 Route 70, Brookhaven, PA 19003
264.411588
www.mchugheng.com

100% Bid Set- 15 March 2023

Rev. No.	Date	Description
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PARTIAL SECOND FLOOR AREA D- MECHANICAL
1/8" = 1'-0"

MECHANICAL NOTES:

1. ALL DUCTWORK SIZES INDICATED ARE INSIDE DIMENSIONS UNLESS OTHERWISE NOTED.
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6. ALL EXHAUSTS AND VENT TERMINALS MUST BE LOCATED AT LEAST 10'-0" FROM FRESH AIR INTAKE TERMINALS AND OPERABLE PORTIONS OF ANY WINDOW.
7. ALL OUTSIDE AIR DUCTWORK SHALL HAVE MINIMUM 2" EXTERNAL FIBERGLASS DUCTWRAP INSULATION.
8. THE FIRST 10'-0" OF RETURN DUCTWORK FROM THE AIR HANDLER SHALL HAVE 1" OF INTERNAL ACOUSTICAL LINING.
9. EXHAUST AIR SHALL NOT BE INSULATED UNLESS EXTENDING THROUGH UNCONDITIONED SPACES. PROVIDE 1 1/2" DUCTWRAP THROUGH UNCONDITIONED SPACES.

MECHANICAL DUCTWORK NOTE:
DUCTWORK DRAWINGS/LAYOUT IS
DIAGRAMMATIC. ALL DUCTWORK
INSTALLATIONS AND SHEETMETAL SHOP
DRAWINGS SHALL BE IN ACCORDANCE
WITH MCHUGH ENGINEERING
ASSOCIATES DUCTWORK DETAILS AND
PER SMACNA STANDARDS.

NOTICE

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MECHANICAL KEY NOTES

M2 REFRIGERANT PIPING. REFER TO MANUFACTURER FOR SIZES.
M5 1-1/2" CONDENSATE DOWN TO INDIRECT WASTE CONNECTION.

☐ NOTED THUS

CHESTER UPLAND S.D.	TOBY FARMS INTERMEDIATE SCHOOL, HVAC AND WINDOW UPGRADES	PROJECT NO.: 3322-327	DRAWN BY: RC	DATE: 03/15/2023	SCALE: AS NOTED
M102d	201 BRIDGEWATER ROAD BROOKHAVEN, PA 19015				
M102d	PARTIAL SECOND FLOOR AREA D - MECHANICAL				

CHESTER UPLAND S.D.

TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES

201 BRIDGEWATER ROAD
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PARTIAL SECOND FLOOR AREA D - MECHANICAL

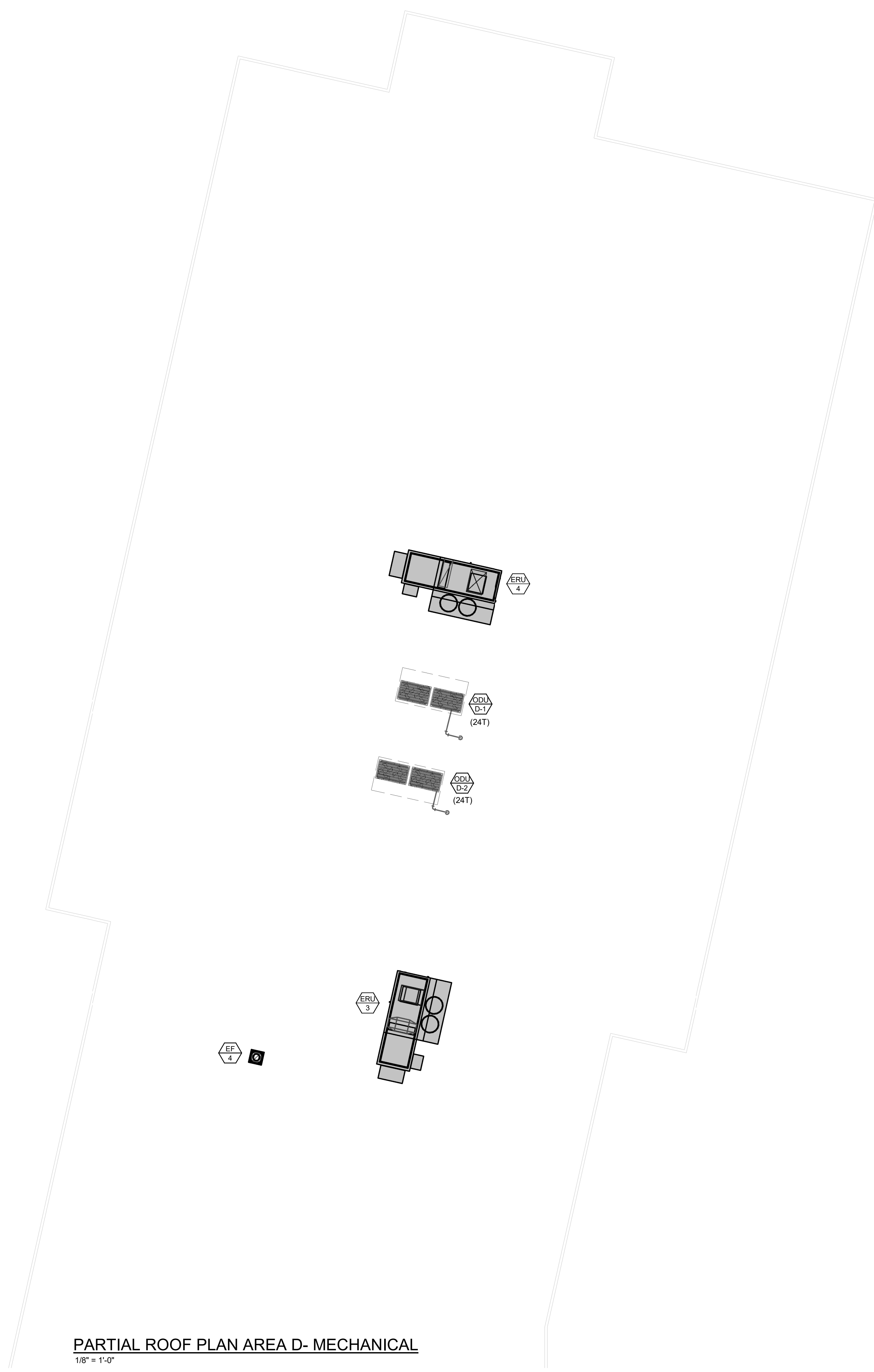


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M102d



PARTIAL ROOF PLAN AREA D- MECHANICAL

1/8" = 1'-0"

MECHANICAL NOTES

1. ALL DUCTWORK SIZES INDICATED ARE INSIDE DIMENSIONS UNLESS OTHERWISE NOTED.
2. DUCT SIZES INDICATED ON DRAWING ARE BASED AFTER THE LAST DIFFUSER AND/OR BRANCH TAKE-OFF.
3. CONTRACTOR TO PROVIDE A CLEAN OUT AT EVERY CHANGE IN DIRECTION OF A CONDENSATE LINE AND AT 25 FT. CENTERS.
4. RUN ALL CONDENSATE PIPING TO POINT OF DISCHARGE. PROVIDE REQUIRED AIR GAP AT DISCHARGE POINT. REFER TO PLANS & SPECIFICATIONS FOR SIZES AND REQUIREMENTS.
5. SHARP THROAT. RADIUS HEEL 90 DEGREE FITTINGS ARE UNACCEPTABLE. RADIUS ELBOWS (INNER AND OUTER) OR MITERED ELBOWS WITH TURNING VANES MUST BE PROVIDED FOR ALL 90 DEGREE ELBOWS
6. ALL EXHAUSTS AND VENT TERMINALS MUST BE LOCATED AT LEAST 10'-0" FROM FRESH AIR INTAKE TERMINALS AND OPERABLE PORTIONS OF ANY WINDOW.
7. ALL OUTSIDE AIR DUCTWORK SHALL HAVE MINIMUM 2" EXTERNAL FIBERGLASS DUCTWRAP INSULATION.
8. THE FIRST 10'-0" OF RETURN DUCTWORK FROM THE AIR HANDLER SHALL HAVE 1" OF INTERNAL ACOUSTICAL LINING.
9. EXHAUST AIR SHALL NOT BE INSULATED UNLESS EXTENDING THROUGH UNCONDITIONED SPACES. PROVIDE 1 1/2" DUCTWRAP THROUGH UNCONDITIONED SPACES.

ROOF DUCT WORK NOTES:

1. ALL DUCTWORK SIZES ARE INSIDE DIMENSIONS UNLESS NOTED OTHERWISE.
2. ALL EXTERIOR DUCTWORK TO BE 4" WATERGAUGE DUCT CONSTRUCTION WITH 2" RIGID INSULATION AND WEATHERPROOF COVERING IN ADDITION TO 1" LINING. SEE SPEC.
3. ALL BOTTOM OF DUCTWORK TO BE MINIMUM 2'-0" ABOVE FINISHED ROOF.
4. ALL TOPS OF EXTERIOR DUCTWORK TO SLOPE SO NOT TO ALLOW WATER ACCUMULATION.
5. CONTRACTOR TO FURNISH AND INSTALL ROOF MOUNTED DUCT CURBS TO SUPPORT EXTERIOR DUCTWORK AT ALL CHANGES OF DIRECTION AND AT A MAXIMUM OF 8'-0" O.C. PATE OR EQUAL.
6. CONTRACTOR SHALL PAINT ALL EXPOSED DUCT SUPPORTS ONE COAT RUSTOLEUM PRIMER AND 2 FINISH COATS OF ENAMEL.
7. CONTRACTOR TO FURNISH AND INSTALL NEW PIPE ROOF CURBS FOR ALL CONDUIT/POWER/CONTROLS/REFRIGERANT PIPING PENETRATIONS THROUGH THE ROOF.
8. REFRIGERANT PIPING SUPPORTS SHALL BE LOCATED NO FURTHER APART THAN 48" ON CENTER. REFER TO DETAILS.
9. LOCATE CONDENSING UNITS ON SECURED BASES WITH NEOPRENE PADS UNDERNEATH EACH AS A MINIMUM. UNITS MUST BE SECURED TO ROOF. CONTRACTOR MUST CONTACT THE WARRANTING ROOFING CONTRACTOR OF THE EXISTING ROOF. PROVIDE ALL SEALING AND FLASHING REQUIRED.
11. ALL PIPING, CONDUIT, AND DUCT PENETRATIONS SHALL HAVE ROOF CURBS SUCH AS THOSE MANUFACTURED BY PATE.
12. NO EQUIPMENT SHALL BE LOCATED WITHIN 10'-0" OF ROOF EDGES UNLESS GUARDS OR HIGH PARAPET WALLS EXIST OR ARE INSTALLED.
13. PERMANENT ACCESS SHALL BE PROVIDED TO ANY ROOF WHERE EQUIPMENT IS LOCATED. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
14. INSTALL ALL EQUIPMENT SUCH THAT MANUFACTURER'S RECOMMENDED CLEARANCES ARE KEPT AND AT LEAST 10'-0" BETWEEN ANY INTAKE AND EXHAUST VENT.
15. ALL ROOF TOP DIRECT-VENT TERMINALS SHALL TERMINATE A MINIMUM OF 24" ABOVE THE ROOF TO ALLOW FOR SNOW LOAD. DIRECT VENT TERMINALS SHALL BE SPACED FROM EACH OTHER IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AND NEVER LESS THAN 12" APART.

MECHANICAL KEY NOTES

☐ NOTED THUS

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PARTIAL ROOF PLAN AREA D-MECHANICAL

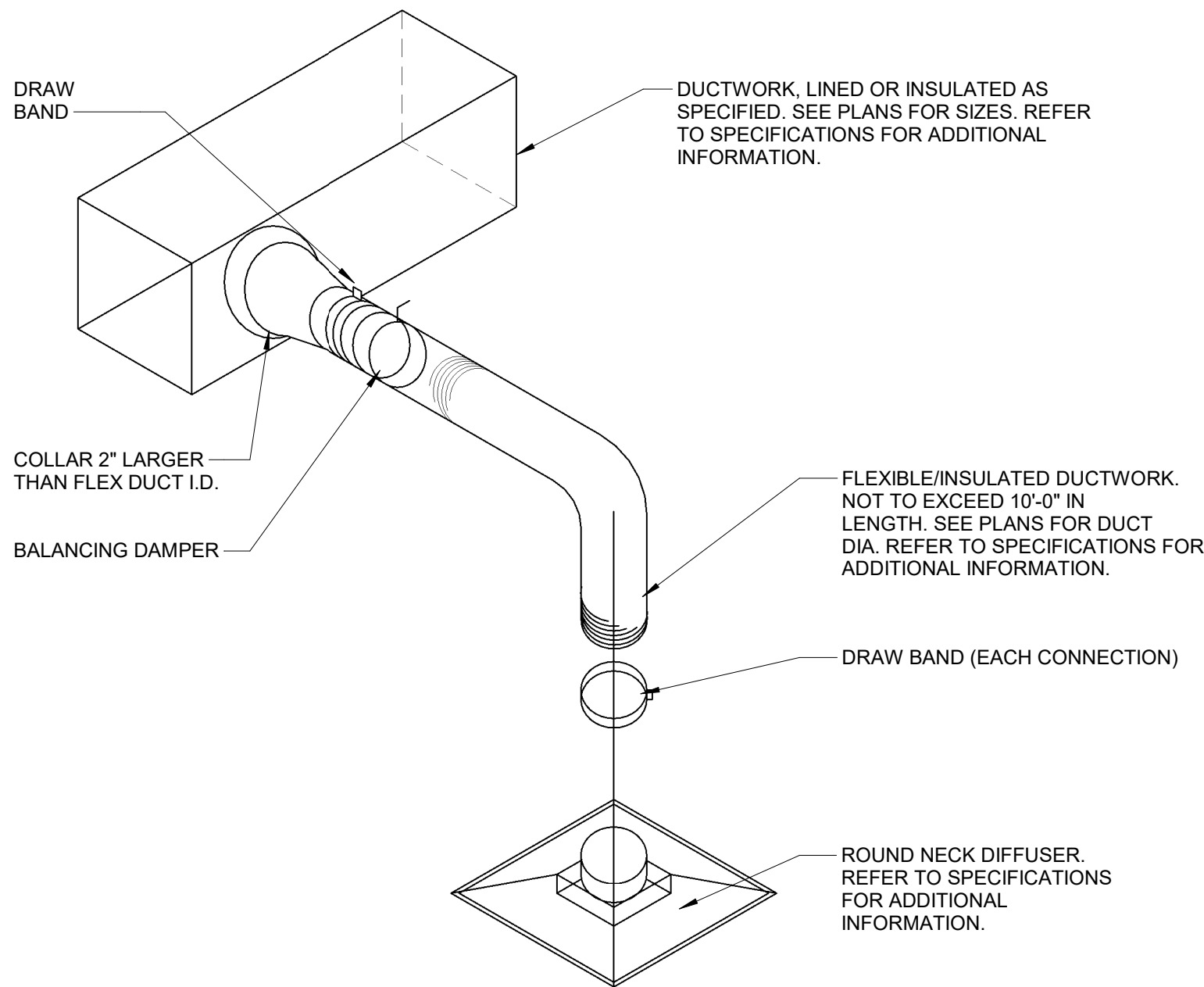
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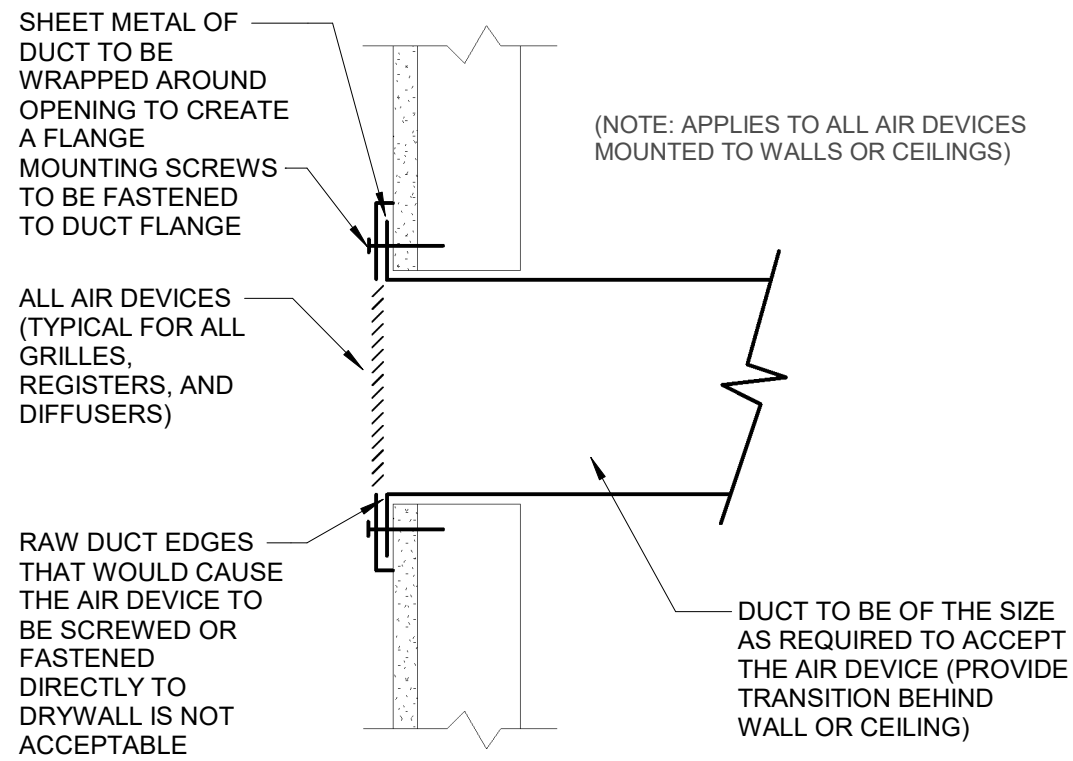
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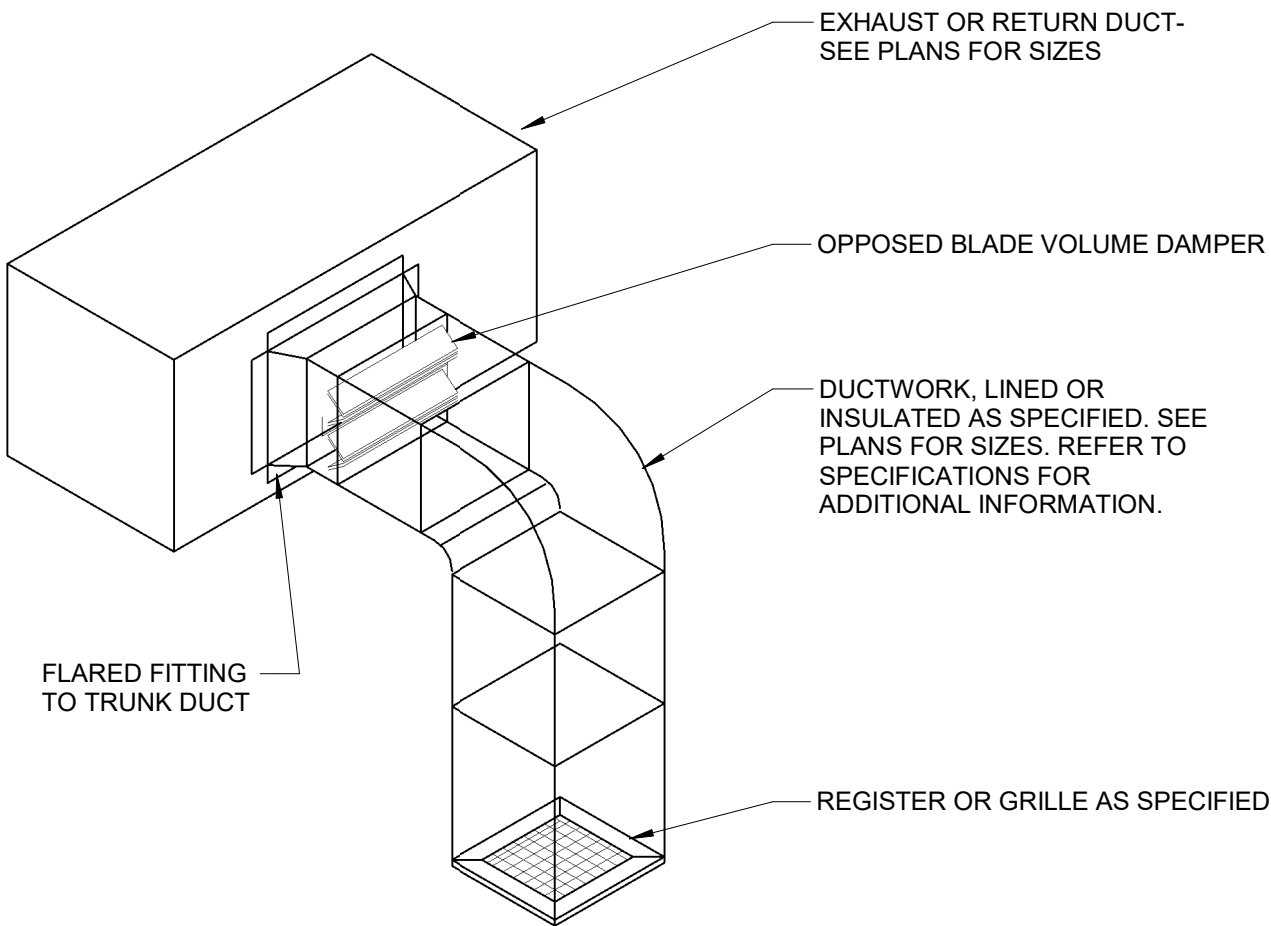
SUPPLY DIFFUSER DETAIL
SCALE: NONE

1



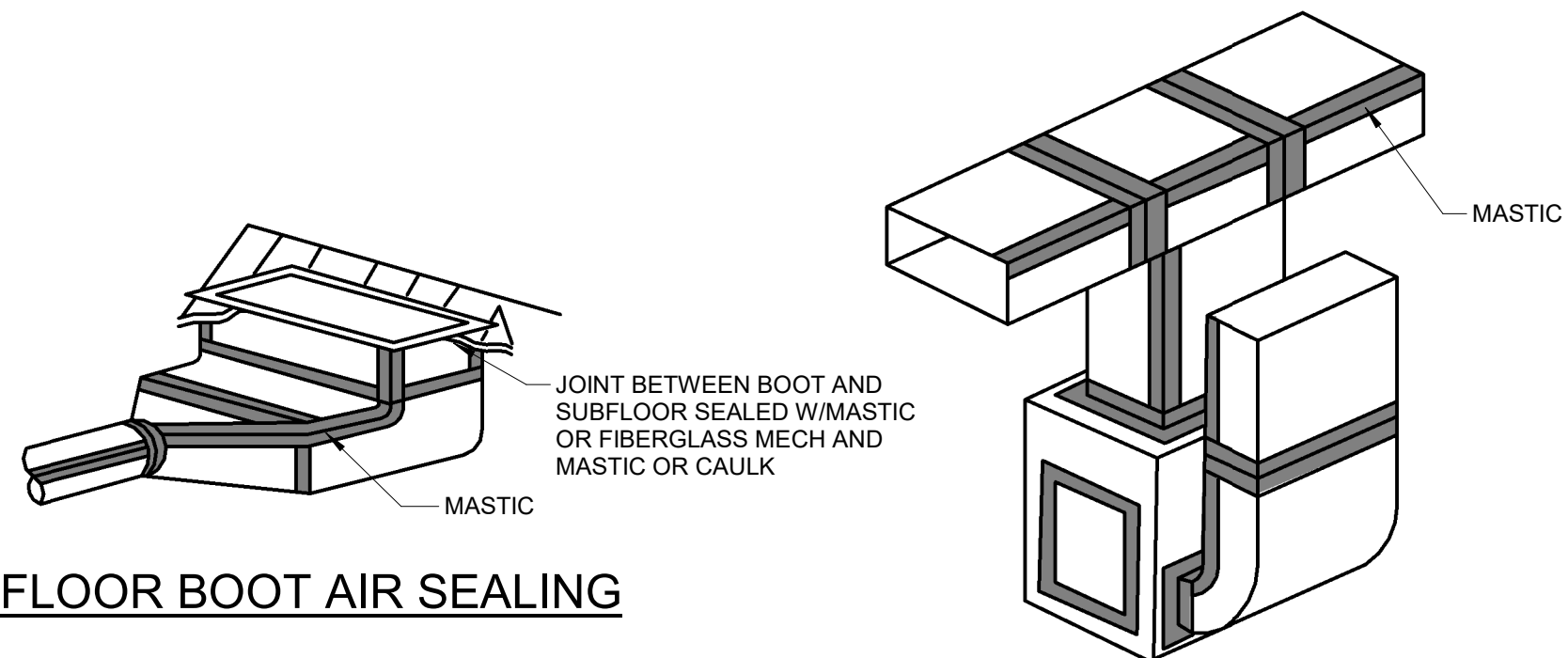
AIR DEVICE MOUNTING DETAIL
SCALE: NONE

4

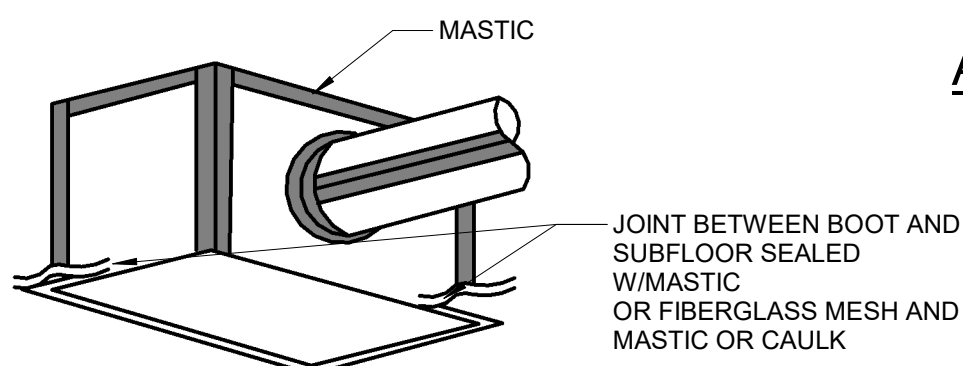


RETURN OR EXHAUST REGISTER/GRILLE DETAIL
SCALE: NONE

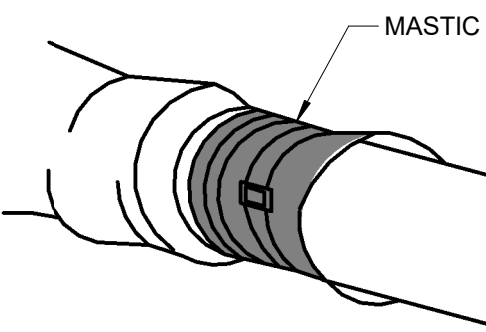
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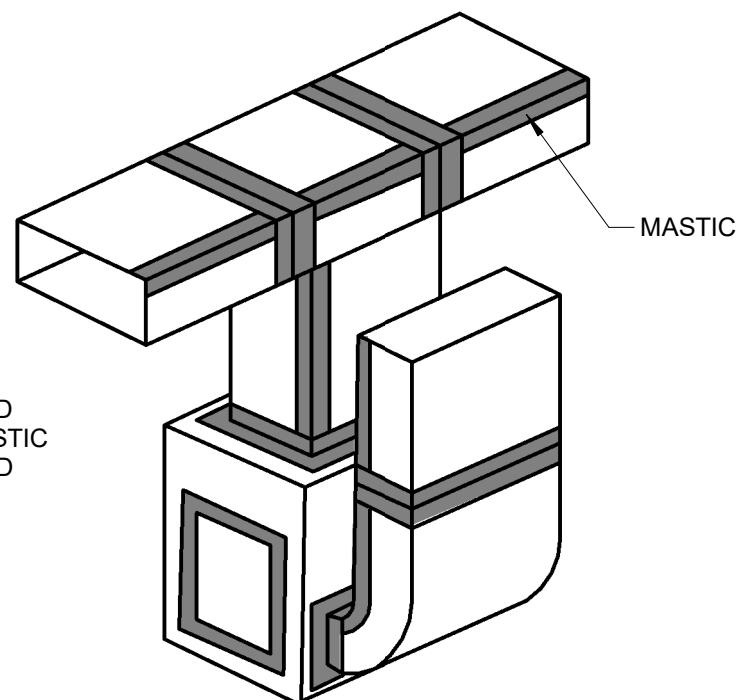
FLOOR BOOT AIR SEALING



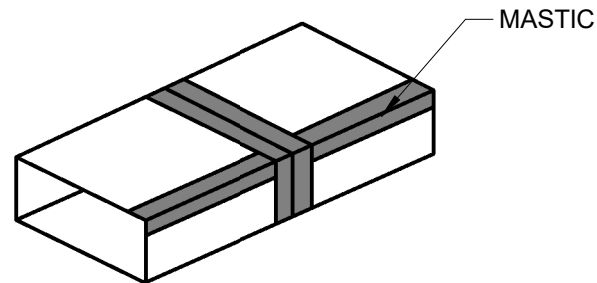
CEILING BOOT AIR SEALING



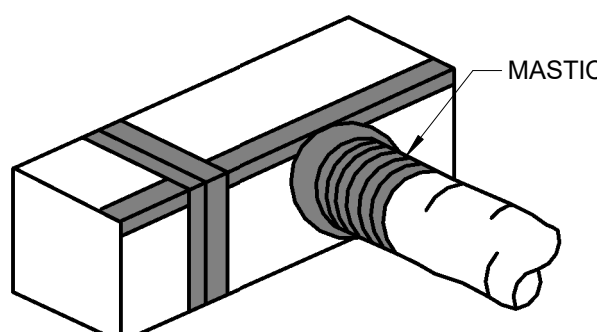
RIGID TO FLEX AIR SEALING



AIR HANDLER AIR SEALING

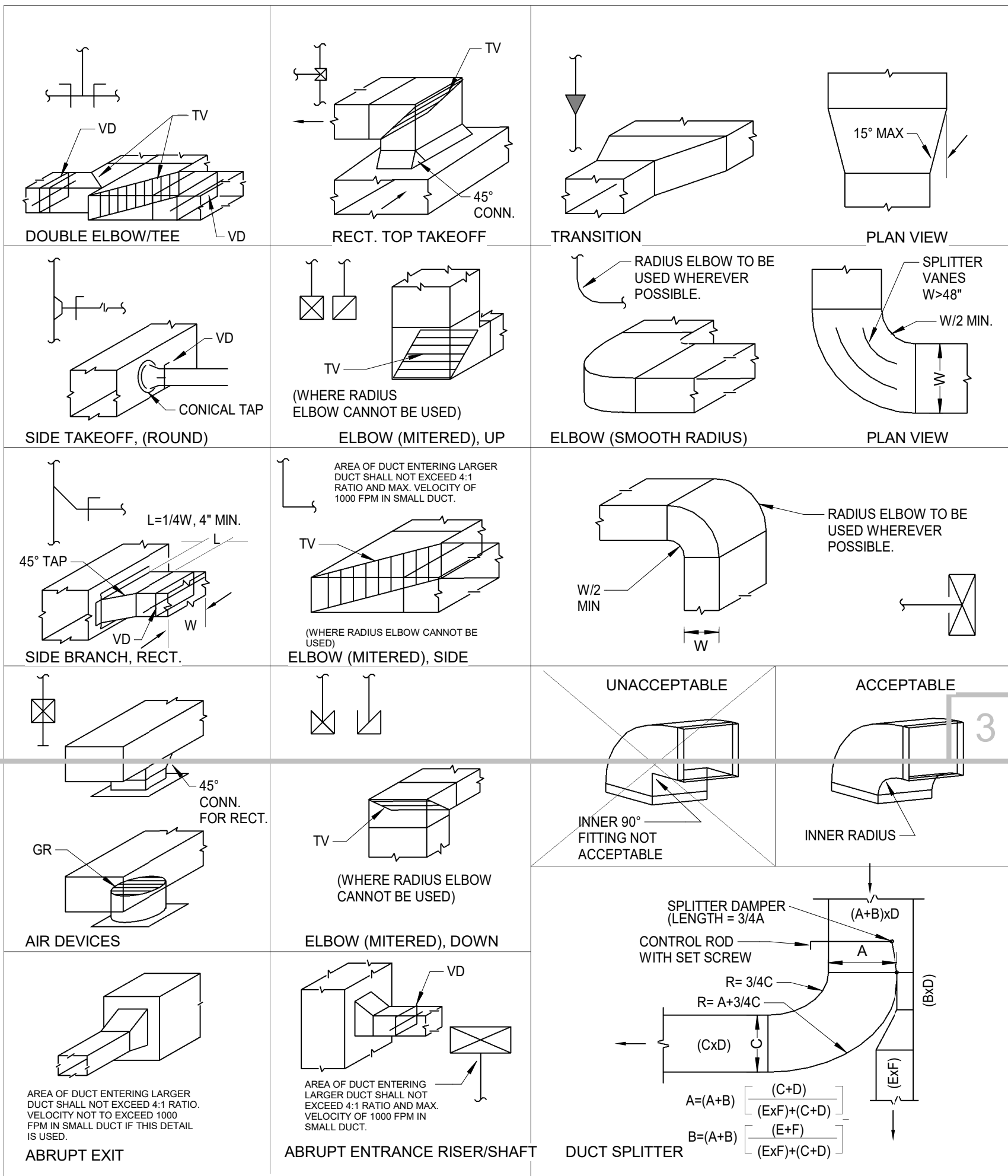


RIGID DUCT AIR SEALING



FLEX TAKE-OFF FROM RIGID AIR SEALING

5



DUCTWORK DETAIL
SCALE: NONE

ABBREVIATIONS:

- GR EQUALIZING GRID
- TV TURNING VANES
- VD VOLUME DAMPER
- AT AIR TURN OR EXTRACTOR

6

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201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015

DETAILS- MECHANICAL



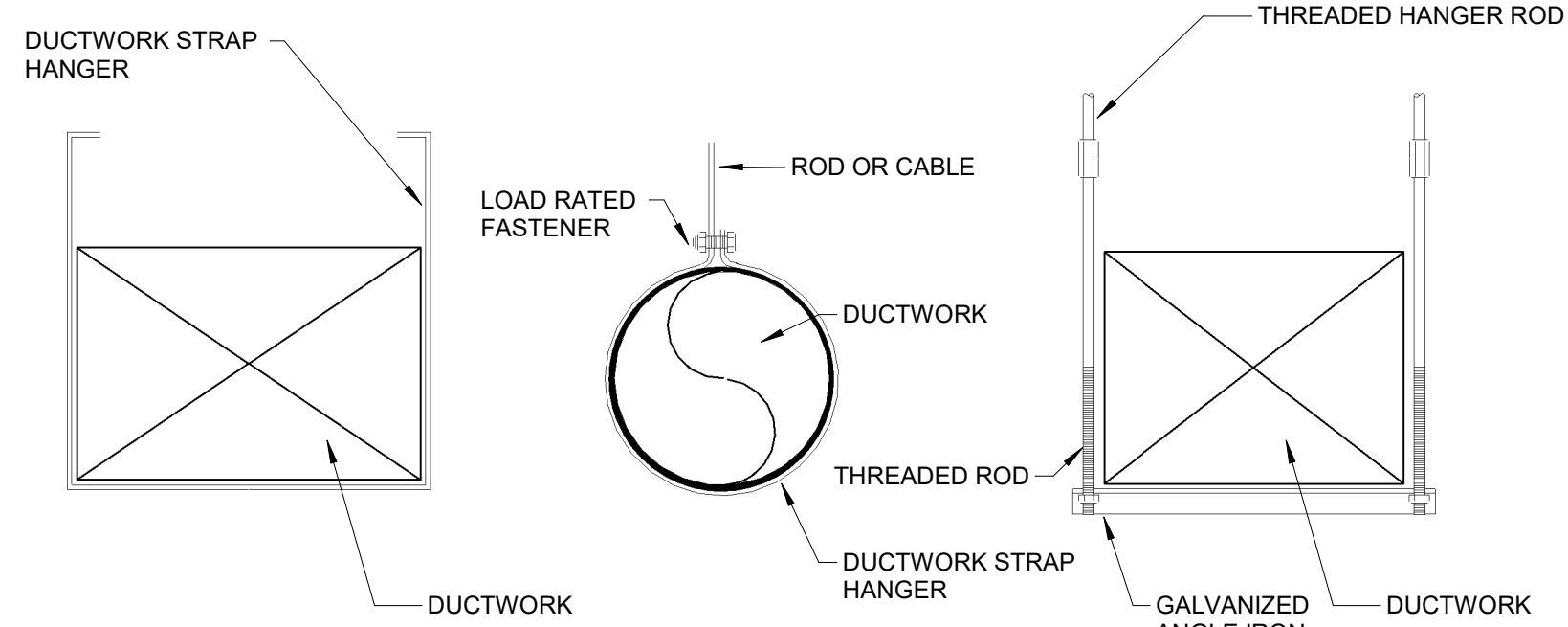
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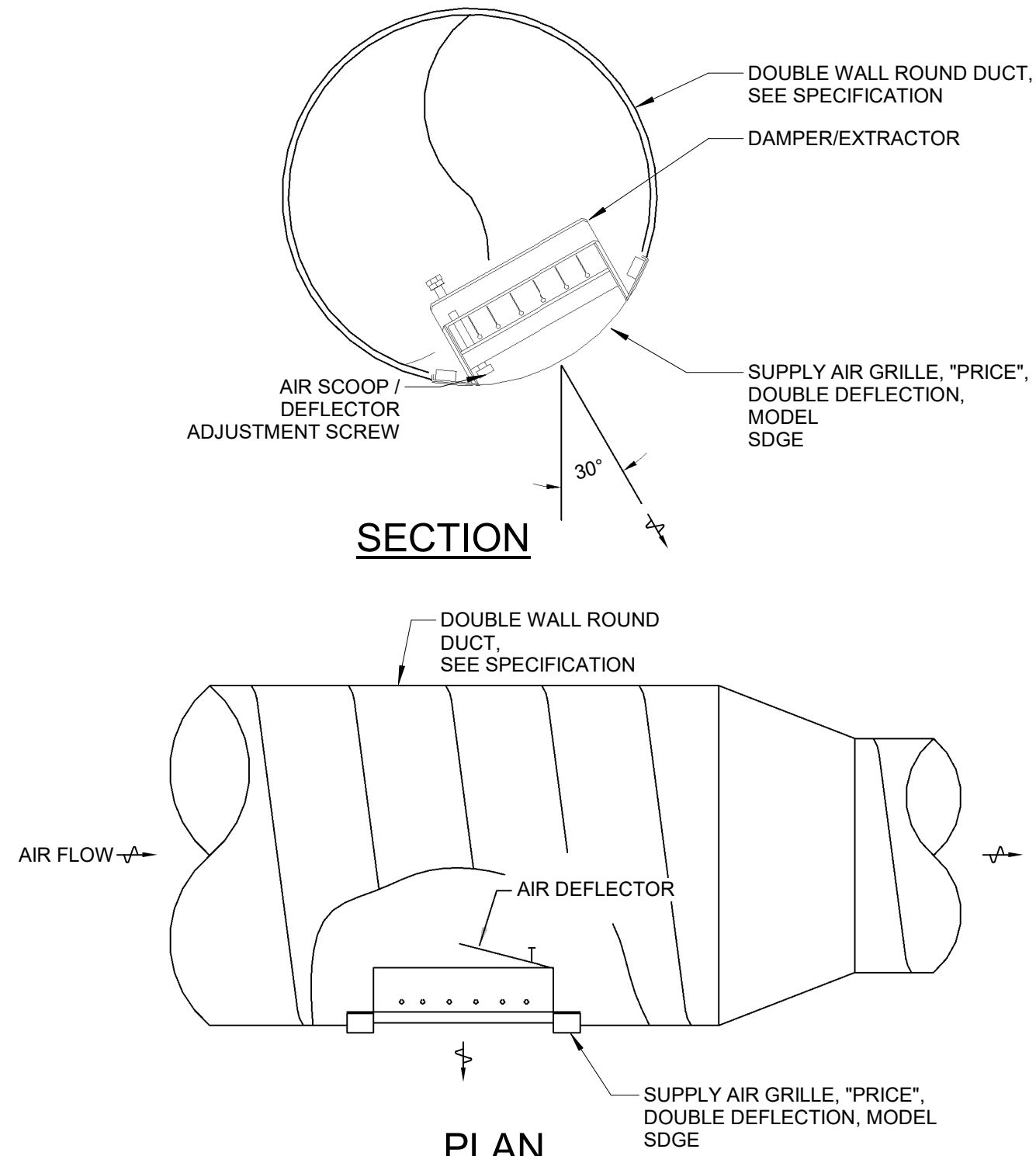
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DUCTWORK HANGER DETAIL
SCALE: NONE

NOTES:

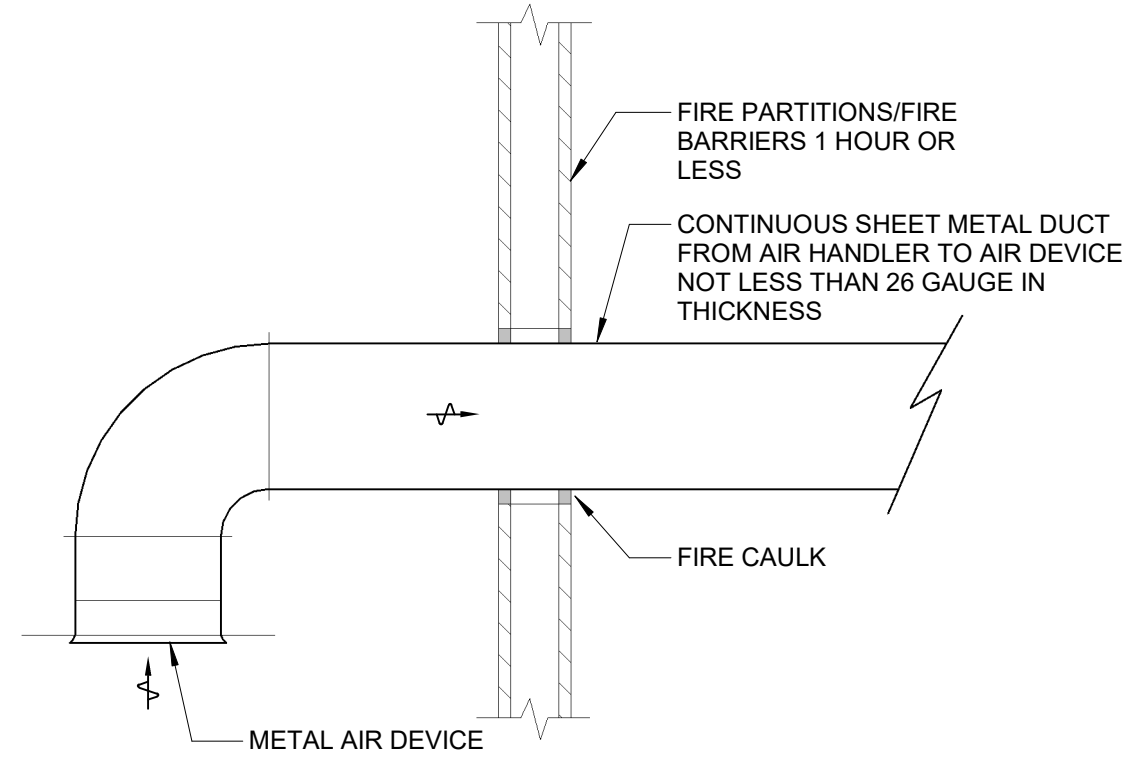
1. STRAP HANGERS TO BE CONSTRUCTED OF SAME GAUGE GALV STEEL AS DUCT.
2. STRAP HANGERS TO BE FASTENED TO DUCT WITH SHEET METAL SCREWS.



DUCT MOUNTED SUPPLY AIR GRILLE FOR SPIRAL ROUND DUCT
SCALE: NONE

NOTES:

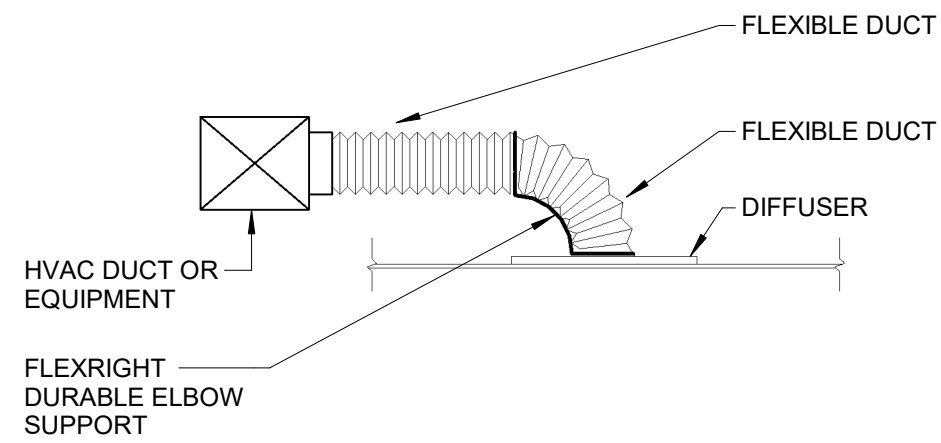
1. AVOID INSTALLING GRILLES 'BACK-TO-BACK' IN THE SAME DUCT. STAGGERED INSTALLATION IS PREFERRABLE. REFER TO FLOOR PLANS FOR LAYOUT.



FIRE BARRIER/PARTITION PENETRATION DETAIL
SCALE: NONE

NOTES:

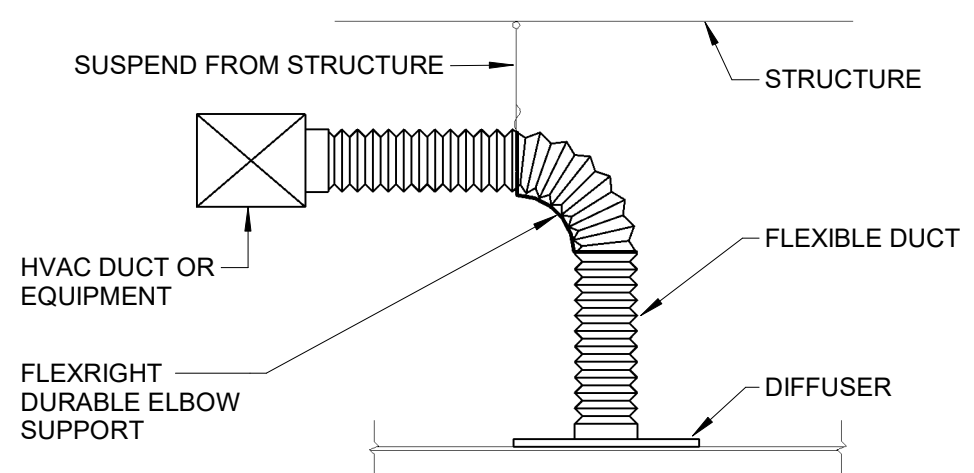
1. THIS DETAIL APPLIES TO FIRE BARRIERS & FIRE PARTITIONS 1 HOUR OR LESS IN AREAS OTHER THAN GROUP H BUILDINGS. BUILDINGS SHALL BE FULLY SPRINKLERED.
2. REFER TO THE INTERNATIONAL MECHANICAL CODE 2015/2018 SECTION 607.5.2 & 607.5.3.



FLEXIBLE DUCT CEILING DIFFUSER CONNECTION DETAIL
SCALE: NONE

NOTES:

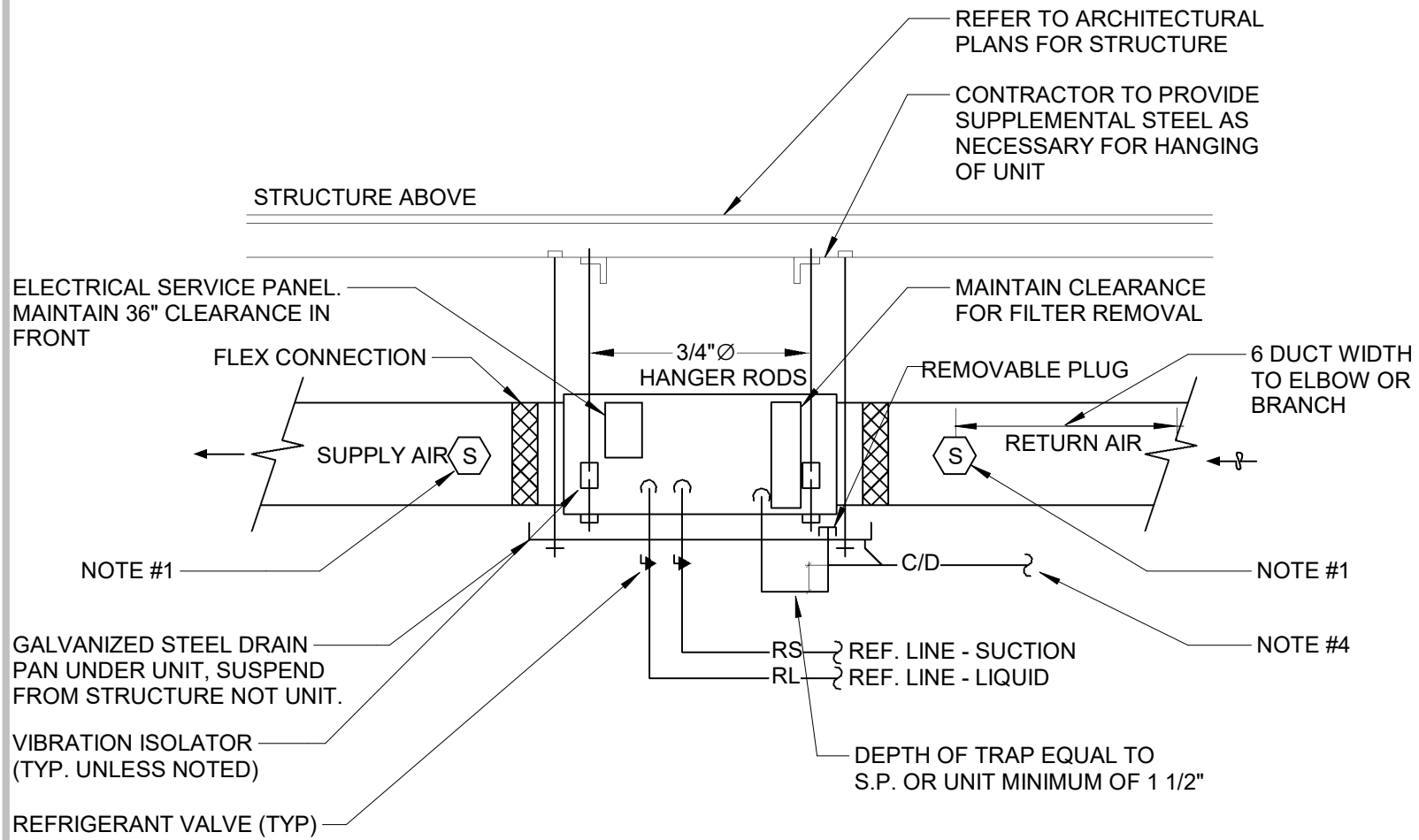
1. INSTALL FLEXRIGHT DURABLE ELBOW SUPPORTS AT ALL DIFFUSERS.
2. FLEX DUCT LENGTH NOT TO EXCEED 10 FEET.



FLEXIBLE DUCT CEILING DIFFUSER CONNECTION DETAIL
SCALE: NONE

NOTES:

1. INSTALL FLEXRIGHT DURABLE ELBOW SUPPORTS AT ALL DIFFUSERS.
2. FLEX DUCT LENGTH NOT TO EXCEED 10 FEET.

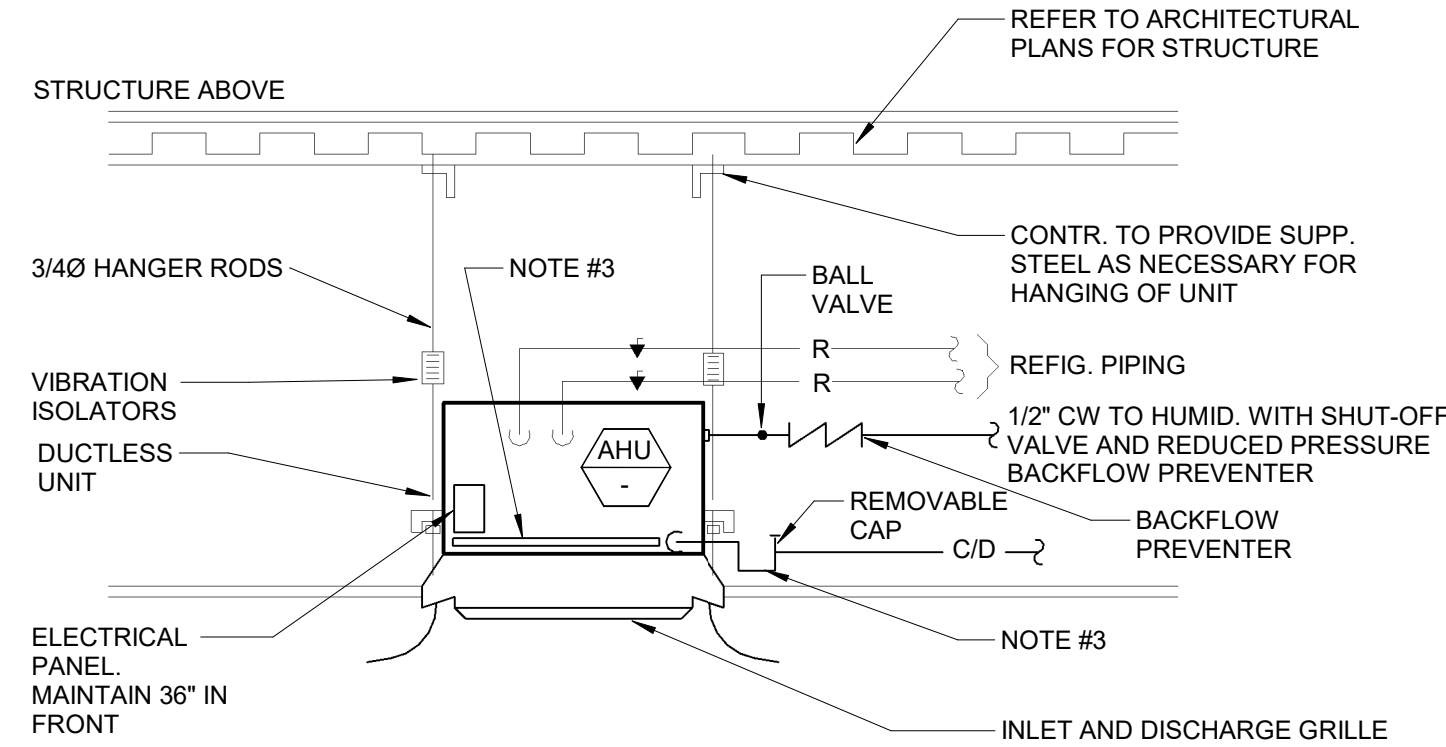


HORIZONTAL DX AIR HANDLING UNIT DETAIL

SCALE: NONE

NOTES:

1. SMOKE DETECTOR- 2000 CFM OR ABOVE. SUPPLY OR RETURN AS REQUIRED BY CODE OFFICIAL. BOTH ARE REQUIRED AT 15,000 CFM & GREATER.
2. CONTRACTOR TO FURNISH AND INSTALL A CONDENSATE PUMP IF GRAVITY CONDENSATE DRAINAGE PIPING SYSTEM IS NOT POSSIBLE. INTERLOCK CONDENSATE PUMP OPERATION WITH ASSOCIATED AIR HANDLING UNIT CONTROLS.
3. UL LISTED CONDENSATE DETECTION DEVICE ON DRAIN PAN WITH SENOR INTERLOCKED W/AIR HANDLER. SHUT UNIT DOWN IF WATER IS DETECTED
4. 1 1/2" Ø MIN. CONDENSATE LINE TO ACCEPTABLE DISCHARGE POINT. REFER TO SEPARATE CONDENSATE TRAP DETAIL



CEILING CASSETTE AIR HANDLING UNIT DETAIL

SCALE: NONE

NOTES:

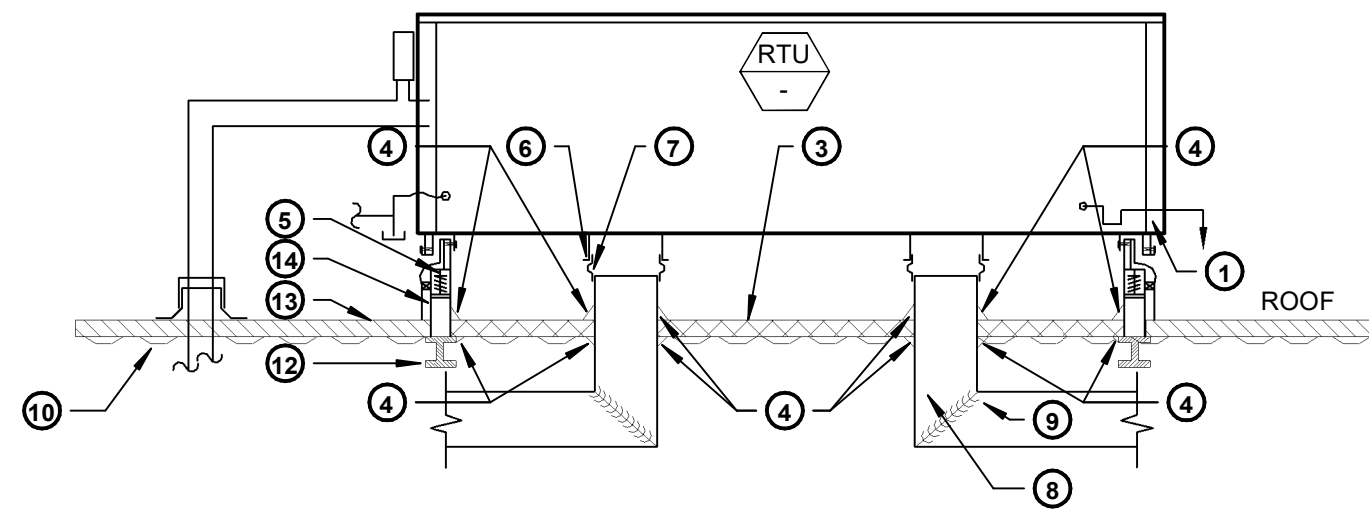
1. 24"x24" CASSETTE UNITS REQUIRE A CEILING ACCESS PANEL ADJACENT TO THE CONTROL SIDE, WHERE INSTALLED ON NON ACCESSIBLE CEILINGS
2. FILTER RACK, ALLOW CLEARANCE FOR ACCESS
3. 1 1/2" Ø MIN. CONDENSATE LINE TO ACCEPTABLE DISCHARGE POINT. REFER TO SEPARATE CONDENSATE TRAP DETAIL

NOTICE

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RTU NOISE CONTROL DETAIL
SCALE: NONE

**BY RTU UNIT
MANUFACTURER**

1. RTU BASE
2. SAIRA UNIT OPENINGS

**BY ACOUSTICAL
MANUFACTURER**

3. HUSHCORE DECK MODEL DS-57 SYSTEM-IN-CURB ACOUSTICAL TREATMENT
4. HUSH SEALANT ACOUSTICAL CAULK AT ALL DUCT DROPS, ANY PENETRATIONS WITHIN THE CURB, & CURB PERIMETER

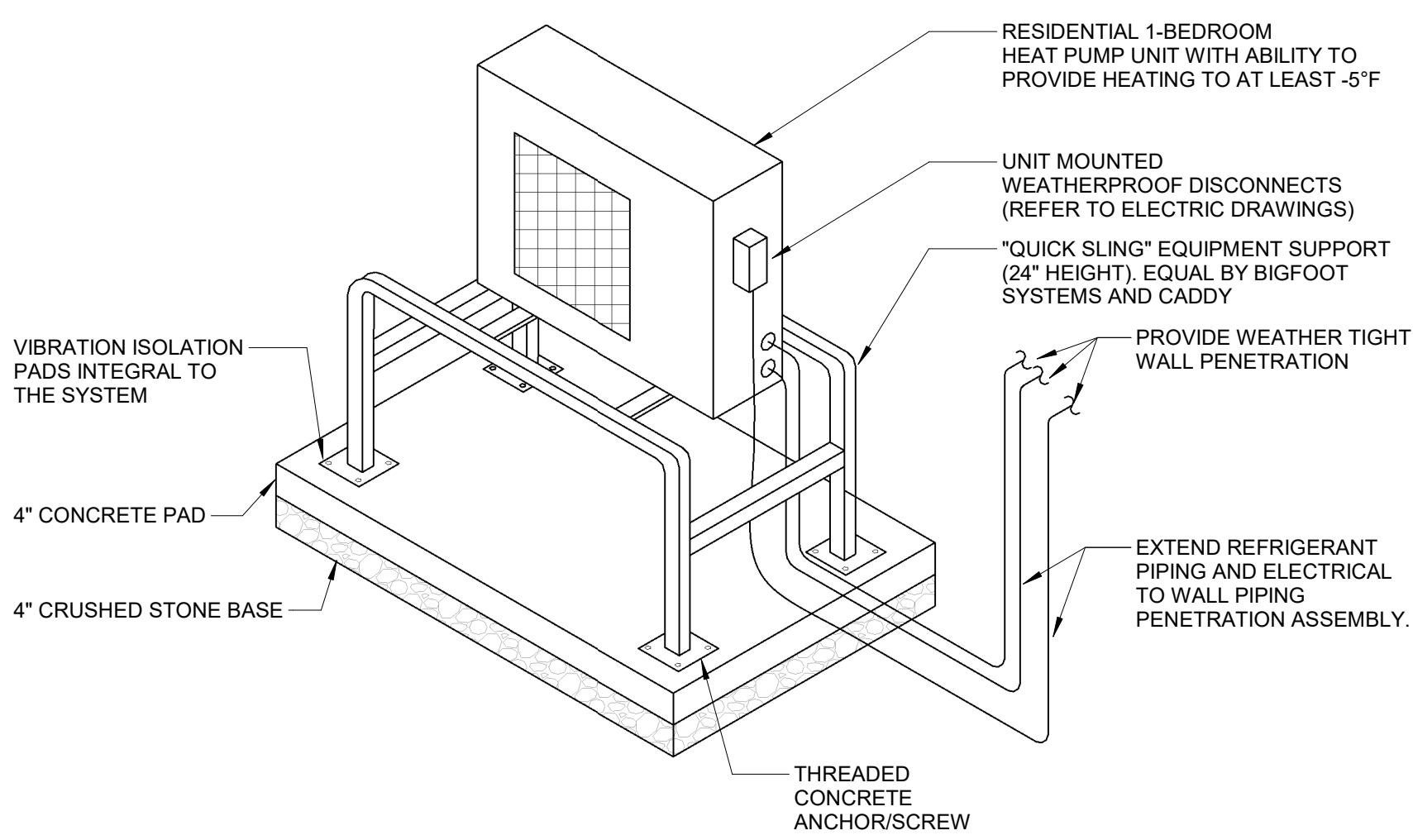
BY MECH. CONTRACTOR

5. RTU CURB
6. DUCT DROP
7. FLEX CONNECTOR
8. DUCT WORK
9. TURNING VANE
10. ROOF DECK FLASHED TO WITHIN 1/4" OF ALL DUCT DROPS & PENETRATIONS, BUT NOT IN CONTACT WITH DUCT WALL
11. SUBMIT LETTER OF CERTIFICATION FROM ACOUSTICAL SUPPLIER FOLLOWING INSPECTION

BY GENERAL CONTRACTOR

12. BUILDING STEEL
13. BUILT-UP ROOF OR CONCRETE
14. INSULATION AND CANT STRIP
15. CURB SLOPE REQUIREMENTS WHERE APPLICABLE

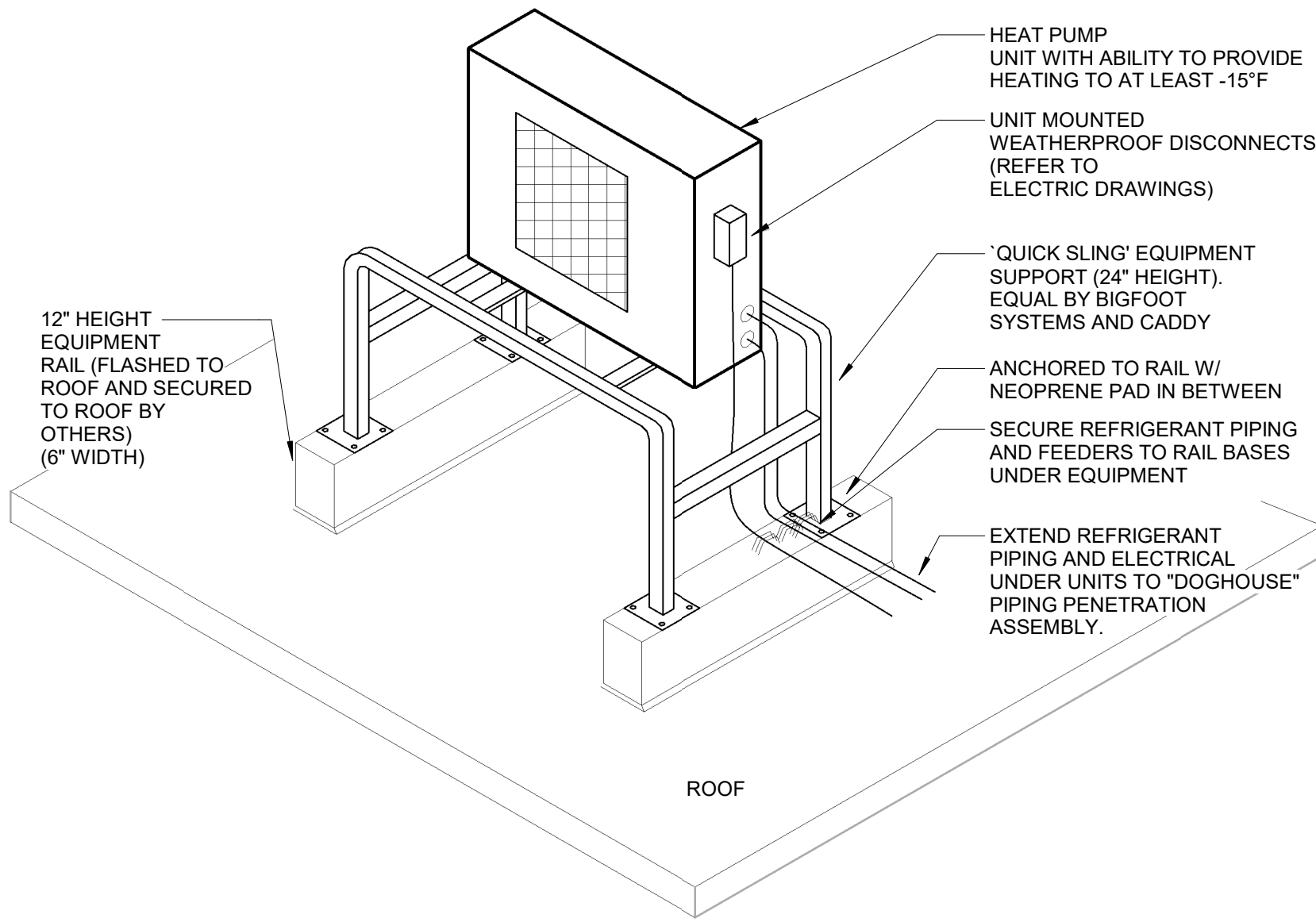
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GRADE MOUNTED ELEVATED HEAT PUMP DETAIL
SCALE: NONE

- NOTES:
1. SUPPORT HEIGHT SHALL BE DETERMINED BY MANUFACTURER REQUIREMENTS AND THE LOCATION ANTICIPATED SNOWFALL.
 2. COORDINATE WITH ARCHITECT FOR MULTIPLE HEAT PUMP ARRAY DIRECTION.

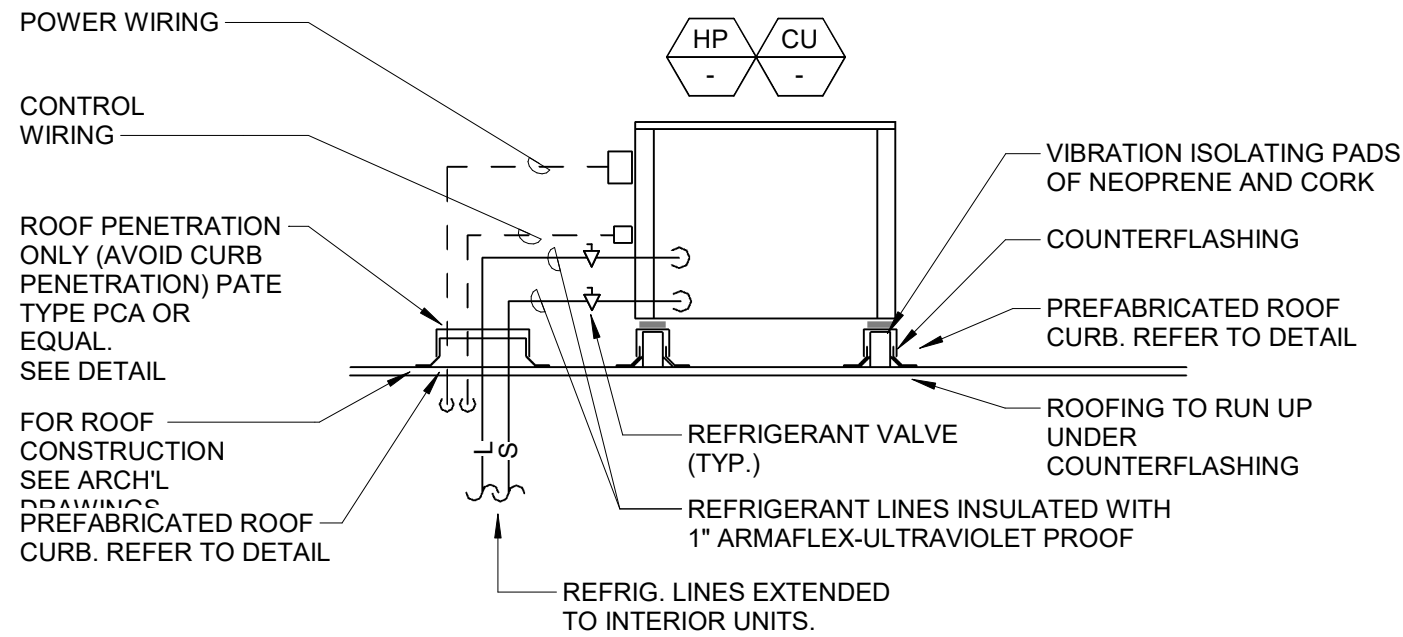
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ROOF MOUNTED ELEVATED HEAT PUMP DETAIL
SCALE: NONE

- NOTES:
1. SUPPORT HEIGHT SHALL BE DETERMINED BY MANUFACTURER REQUIREMENTS AND THE LOCATION ANTICIPATED SNOWFALL.
 2. COORDINATE WITH ARCHITECT FOR MULTIPLE HEAT PUMP ARRAY DIRECTION.

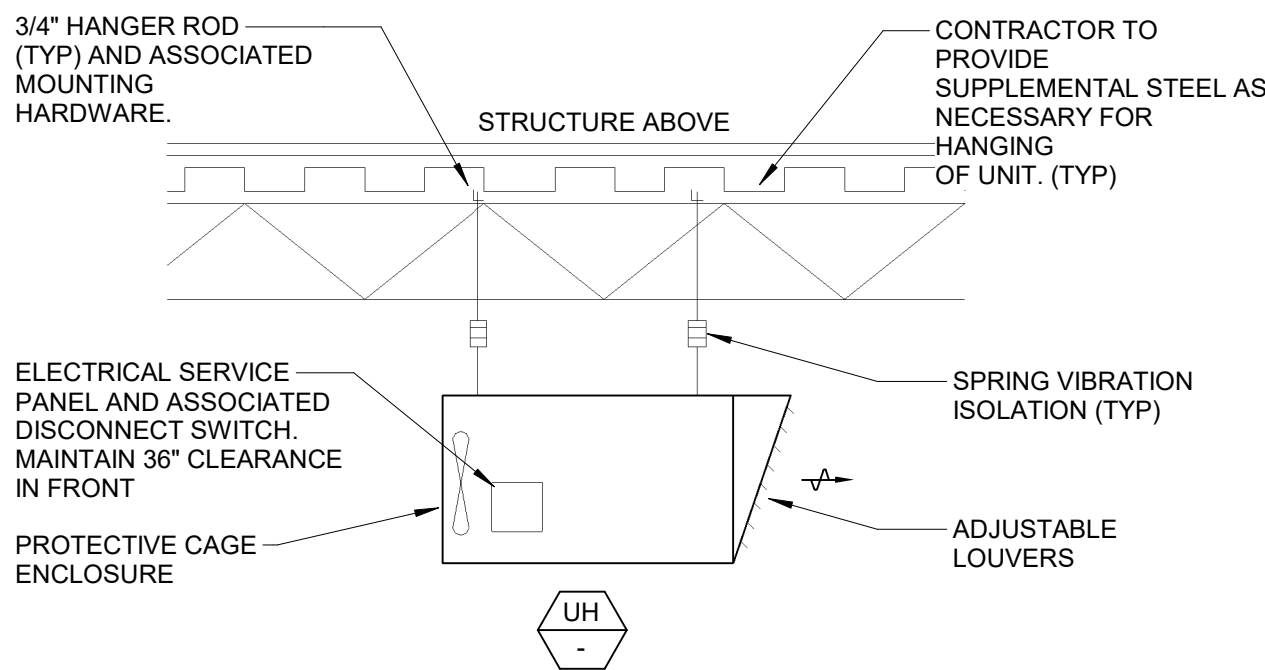
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ROOF MOUNTED HEAT PUMP OR CONDENSING UNIT
SCALE: NONE

- NOTE:
1. ALL ROOF CURBS SHALL BE SECURED TO THE ROOF IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND COMPLY WITH IBC WIND LOADING REQUIREMENTS. COORDINATE WITH STRUCTURAL ENGINEER.

4



SUSPENDED ELECTRIC UNIT HEATER DETAIL
SCALE: NONE

- NOTES:
1. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR BUILDING STRUCTURE DETAILS.

5



6

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201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015

DETAILS- MECHANICAL

PROJECT NO: 2022-327

DRAWN BY: RC

DATE: 03/15/2023

SCALE: AS NOTED



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GENERAL NOTES

(A) RETAINING ANGLES:
MINIMUM 1 1/2" X 1 1/2" X 0.054 (16GA).

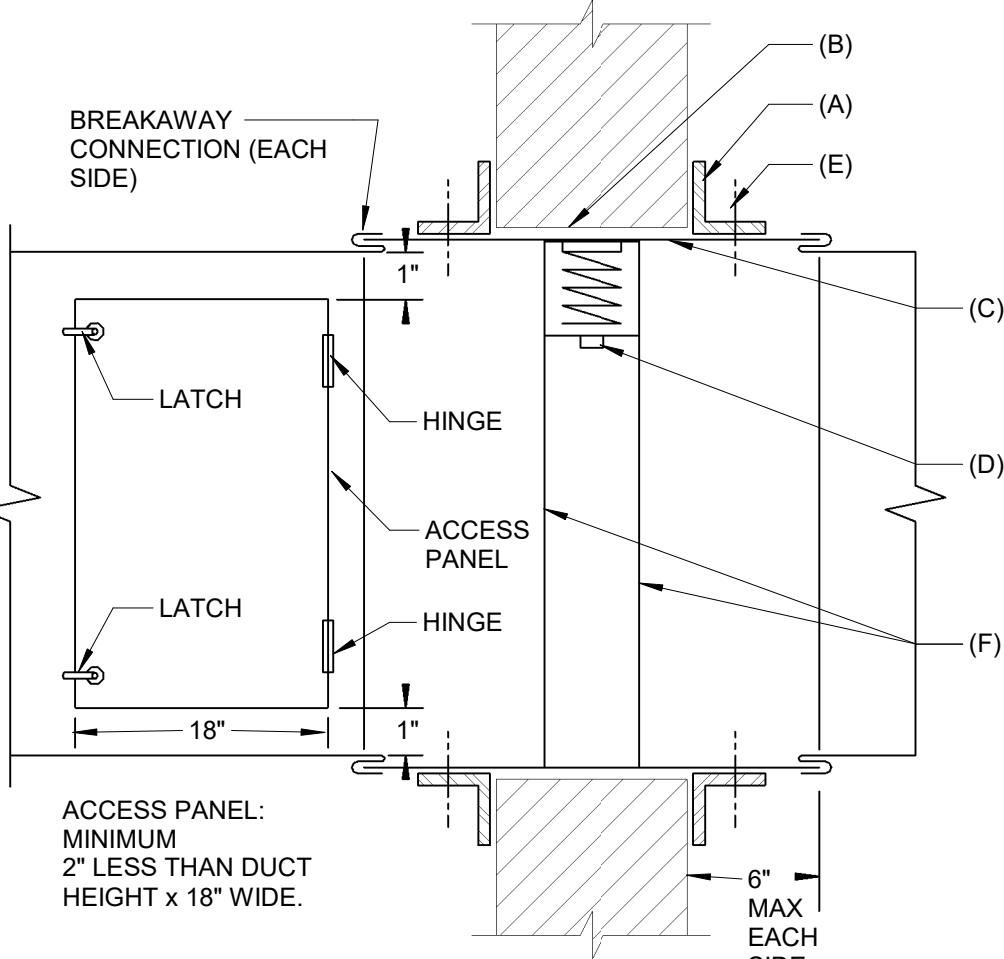
(B) CLEARANCE: 1/8" PER LINEAR FOOT
BOTH
DIMENSIONS WITH FIRESTOP CAULK.

(C) STEEL SLEEVE: 20 GAUGE STEEL

(D) U.L. LISTED FIRE DAMPER (CURTAIN OR
BLADE TYPE)

(E) SECURE RETAINING ANGLES TO
SLEEVE
ONLY ON 8" CENTERS WITH:
1. 1/2" LONG WELDS OR
2. 1/4" BOLTS AND NUTS, OR
3. NO. 10 STEEL SCREWS, OR
4. MINIMUM 3/16" STEEL RIVETS

(F) SECURE DAMPERS TO SLEEVE ON 8"
CENTERS WITH:
1. 1/2" LONG WELDS OR
2. 1/4" BOLTS AND NUTS, OR
3. NO. 10 STEEL SCREWS, OR
4. MINIMUM 3/16" STEEL RIVETS
GOVERN.

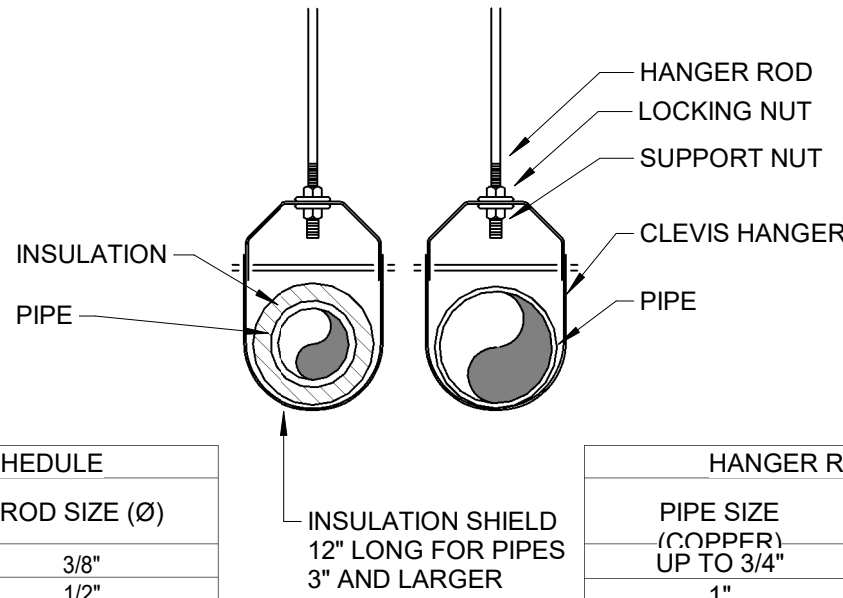


FIRE DAMPER DETAIL

SCALE: NONE

HANGER ROD SCHEDULE	
PIPE SIZE (COOPER)	ROD SIZE (Ø)
UP TO 2"	3/8"
2 1/2" TO 3"	1/2"
4"	1/2"
5"	5/8"
6"	5/8"

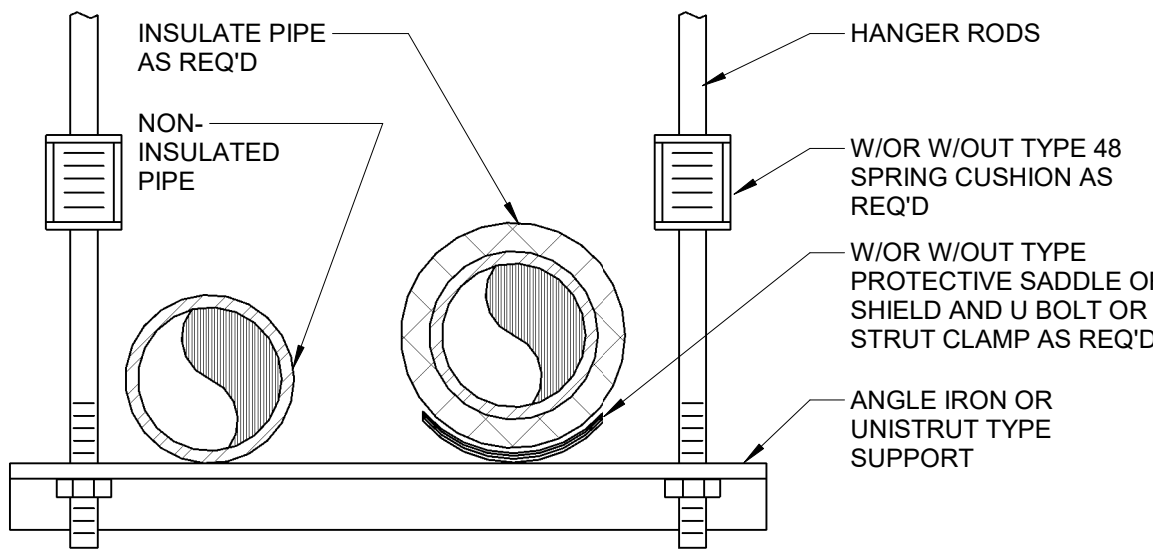
HANGER ROD SPACING	
PIPE SIZE (COOPER)	MAX ALLOWABLE SPACING
UP TO 3/4"	5'-0"
1"	6'-0"
1-1/4"	7'-0"
1 1/2" THRU 2 1/2"	8'-0"
3" AND 4"	10'-0"
5" AND 6"	12'-0"



TYPICAL COPPER PIPE HANGER DETAIL

SCALE: NONE

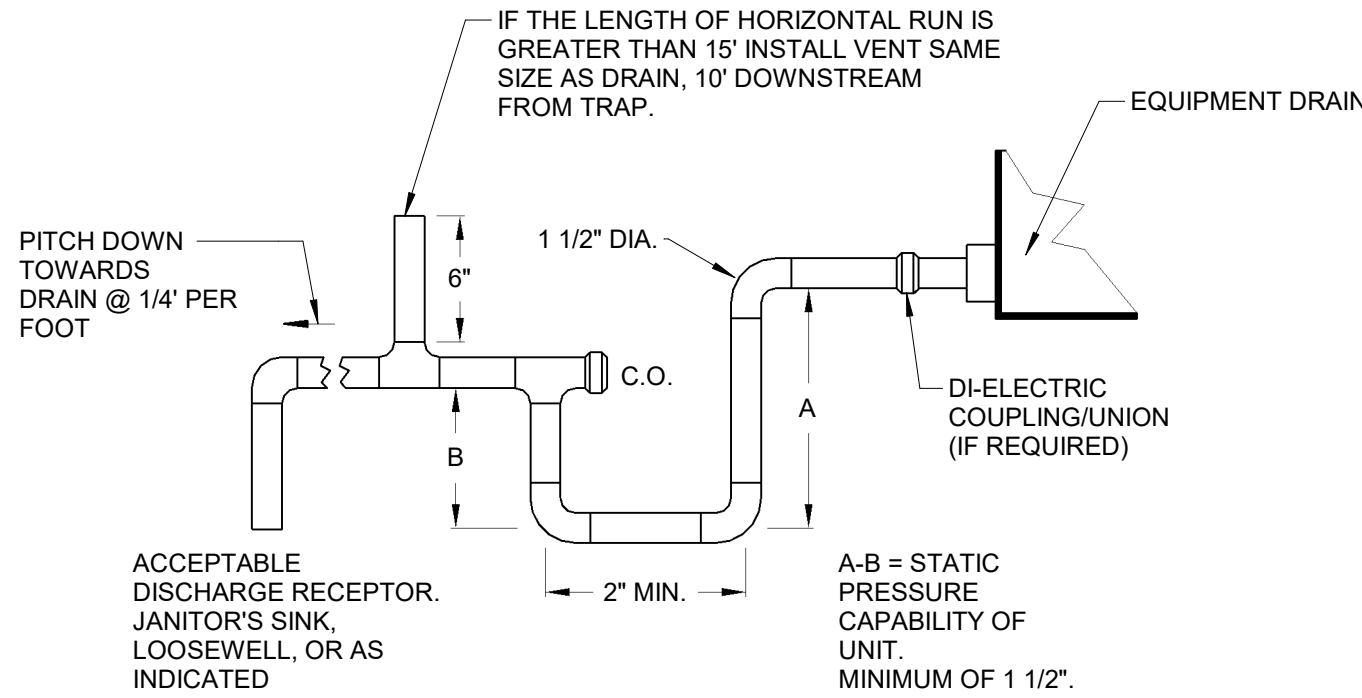
- NOTES:
1. INSTALL PLUMB.
 2. BORE OF WASHER OR SPRING RETAINER TO BE SAME SIZE AS ROD.
 3. WELD WASHER OR SPRING RETAINER TO ROD.



TRAPEZE TYPE PIPE SUPPORT DETAIL

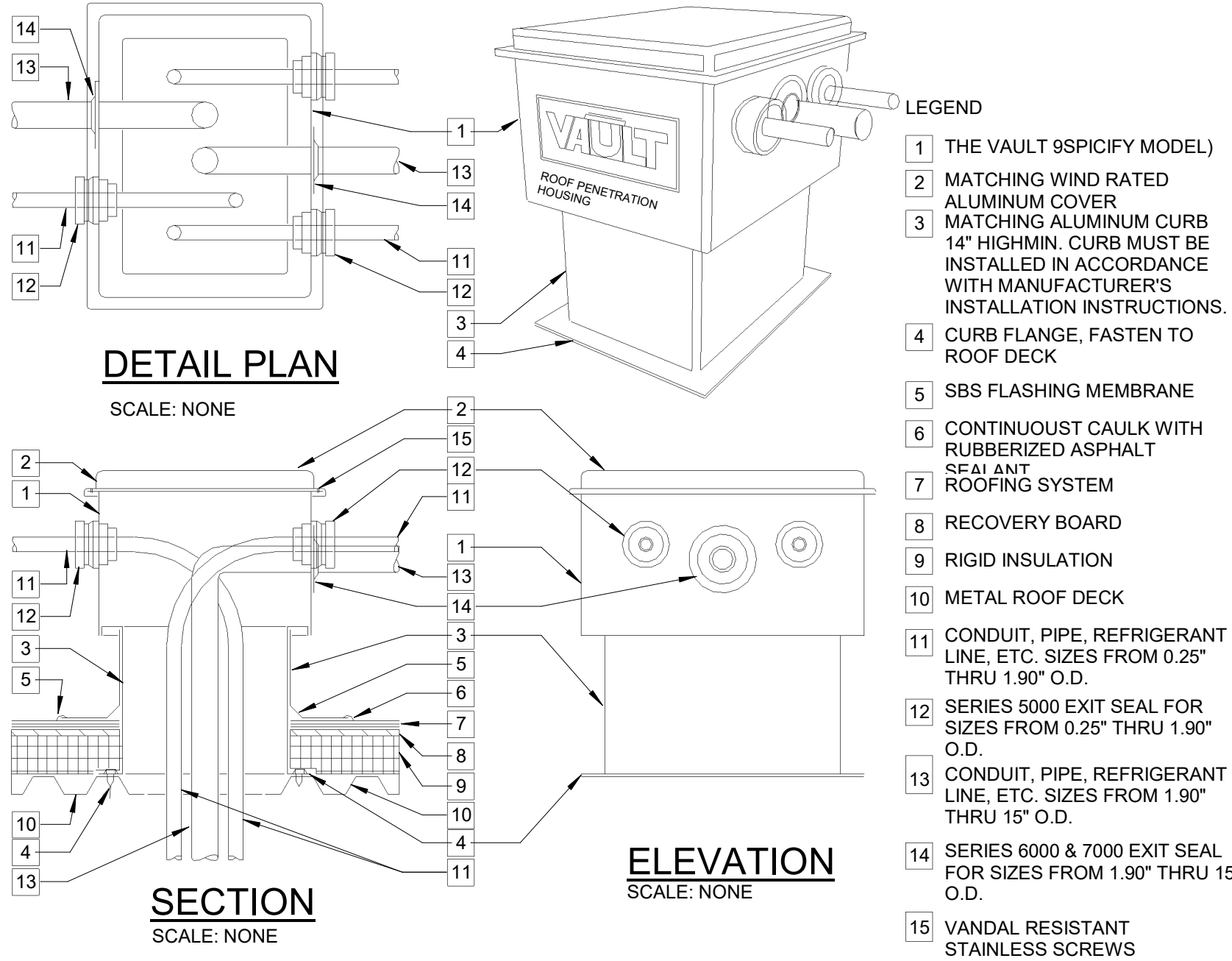
SCALE: NONE

- NOTES:
1. SIZE RODS, SPRING CUSHION, AND HORIZONTAL MEMBER APPROVED TO SATISFY LOAD REQUIREMENT WITH SAFETY FACTOR OF 5.



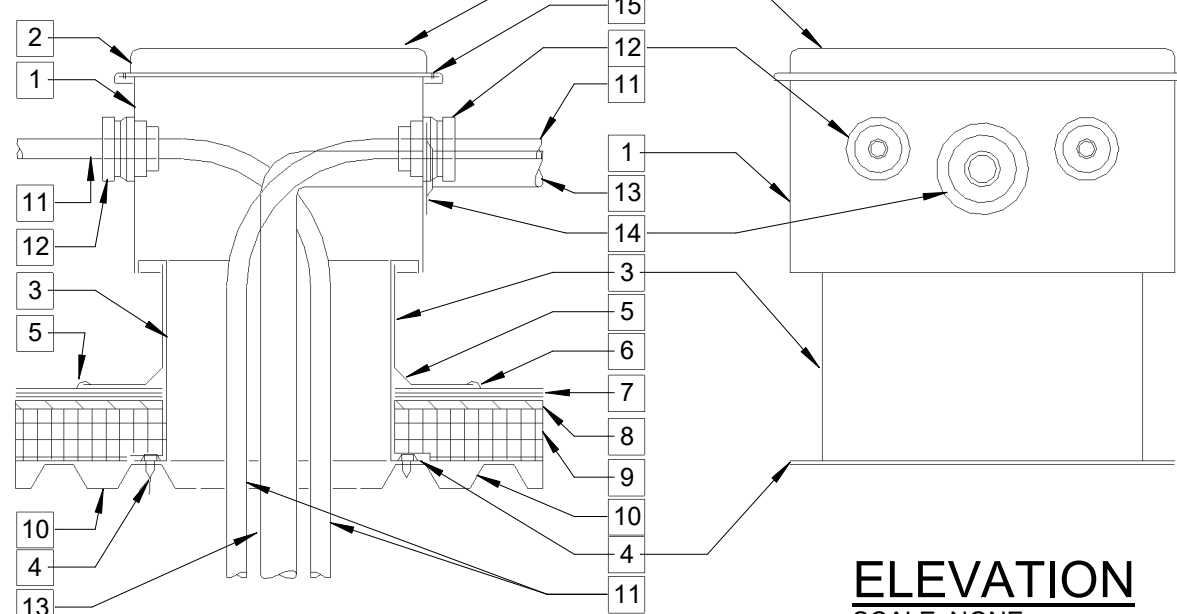
CONDENSATE TRAP DETAIL

SCALE: NONE



DETAIL PLAN

SCALE: NONE



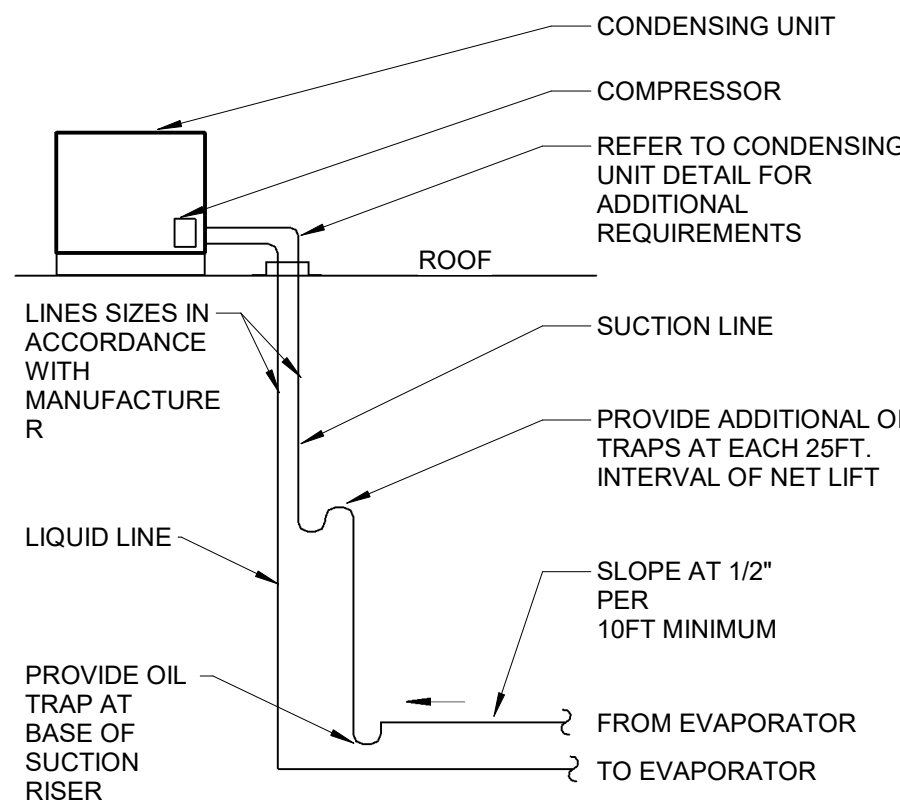
ELEVATION

SCALE: NONE

PIPE PENetration ROOF CURB DETAIL

SCALE: NONE

- NOTES:
1. ALL VAULT MODELS COMPLY WITH ICC 2015 SECTION C402.1 - BUILDING ENVELOPE ROOF AIRLEAKAGE AND FEMA/ICC-500.
 2. MECHANICAL CONTRACTOR IS RESPONSIBLE TO PROVIDE VAULT AND APPROPRIATE TRADES TO PROVIDE EXIT SEALS.
 3. COORDINATE WITH PLUMBING AND ELECTRICAL CONTRACTOR.



REFRIGERANT PIPING DETAIL

SCALE: NOT TO SCALE

- NOTES:
1. THIS DETAILS SHALL APPLY TO ANY SYSTEM WHERE THE MET REFRIGERANT PIPING RISES BETWEEN THE EVAPORATOR COIL AND THE COMPRESSOR EXCEEDS 8FT.
 2. CONTRACTOR SHALL FURNISH AND INSTALL SECONDARY SUCTION RISER IN SYSTEMS WHERE COMPRESSORS ARE STAGED OR WHERE SUCTION PRESSURE CAN BE REDUCES BY UNLOADING.
 3. ALL REFRIGERANT PIPING, LINE SIZES, MAXIMUM DISTANCES, REFRIGERANT CHARGE, ECT. SHALL BE IN COMPLETE ACCORDANCE WITH MANUFACTURES GUIDELINES.

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CHESTER UPLAND S.D.

TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES

201 BRIDGEWATER ROAD

BROOKHAVEN, PA 19015

DETAILS- MECHANICAL

PROJECT NO: 2022-327

DRAWN BY: RC

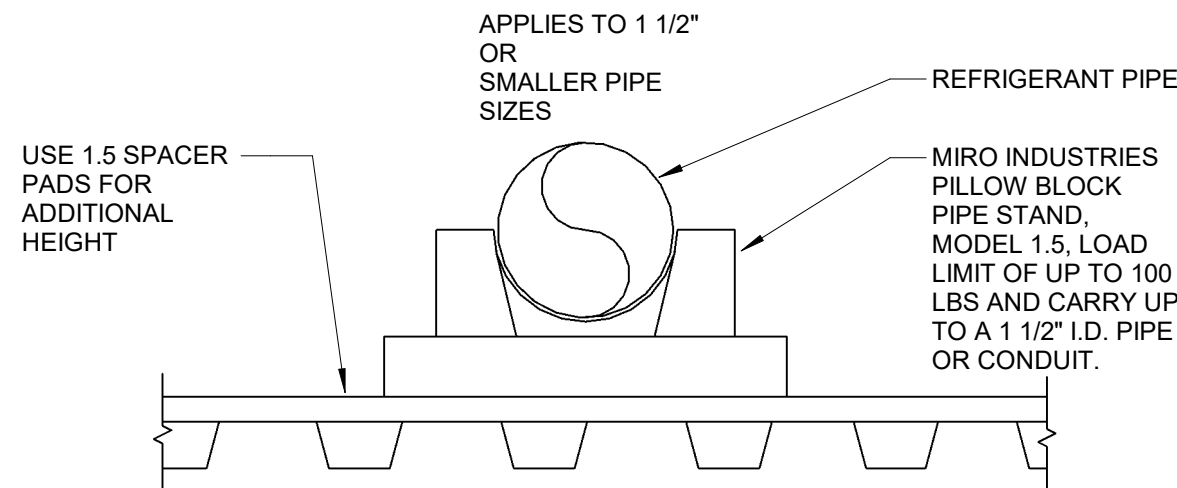
DATE: 03/15/2023

SCALE: AS NOTED

100% Bid Set- 15 March 2023

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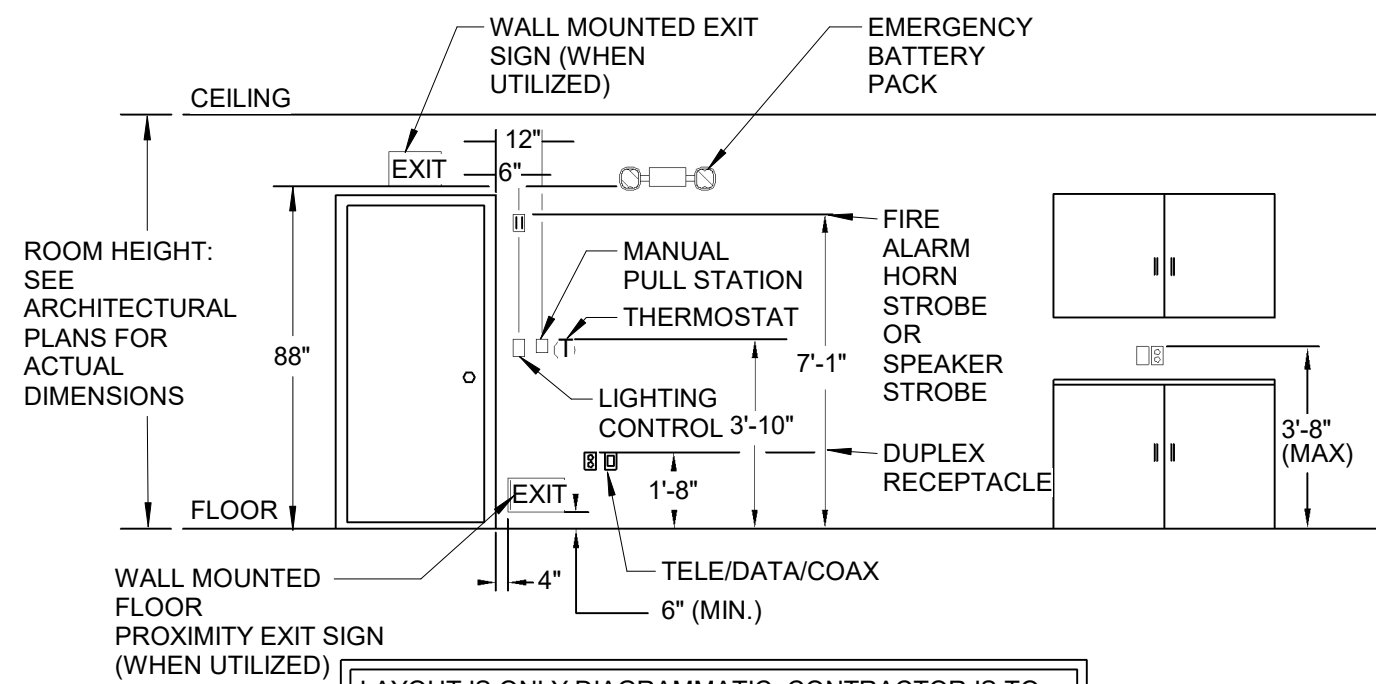
M405



REFRIGERANT PIPING NOTE:

1. GUIDE HOLES ARE PROVIDED AT THE TOP OF THE CRADLE FOR LOOSE INSTALLATION OF "PLUMBING TAPE" USING 1/2" #10SCREWS TO PREVENT SEPARATION OF THE PIPE STAND.
2. PROVIDE SUPPORT AT 4'-0" O.C. AND AT THE FITTINGS.

REFRIGERANT PIPE SUPPORT ON ROOF
SCALE: NONE



LAYOUT IS ONLY DIAGRAMMATIC. CONTRACTOR IS TO REFER TO FLOOR PLANS FOR QUANTITIES OF DEVICES. IT IS THE INTENT FOR THE CONTRACTOR TO INSTALL ALL DEVICES IN A NEAT AND ORDERLY FASHION. ALL DEVICES TO COMPLY WITH ADA AND/OR ANSI A117.1 REQUIREMENTS UNLESS NOTED OTHERWISE.

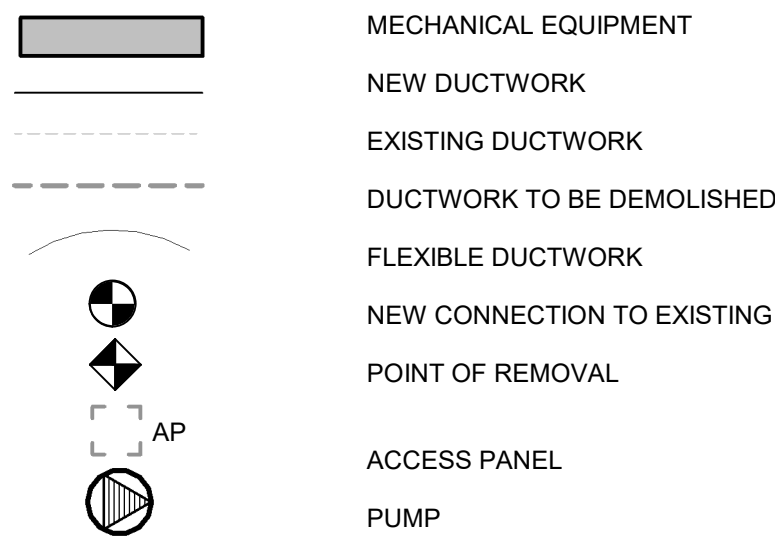
TYPICAL DEVICE ELEVATION DETAIL
SCALE: NONE

NOTE:

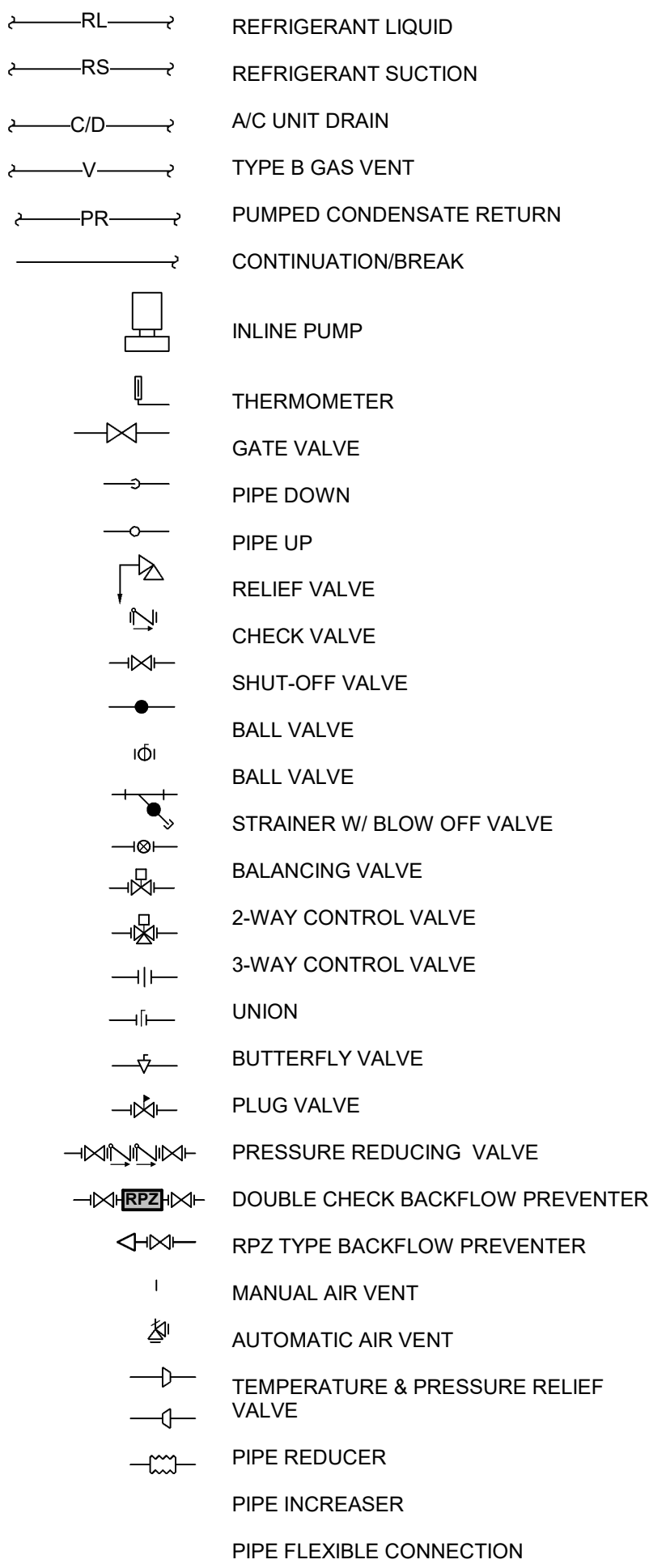
1. ALL GENERAL PURPOSE RECEPTACLES TELE/DATA/COAX OUTLETS ARE TO BE MOUNTED AT A MINIMUM OF 15" ABOVE FINISH FLOOR PER ADA TO THE BOTTOM OF THE DEVICE. 20" ABOVE FINISHED FLOOR IS TO BE STANDARD INSTALLATION HEIGHT TO THE TOP OF THE DEVICE BOX.
2. ALL GENERAL PURPOSE RECEPTACLES, LIGHTING SWITCHES AND LOW VOLTAGE OUTLETS ABOVE COUNTERTOPS ARE TO BE MOUNTED A MAXIMUM OF 44" ABOVE FINISHED FLOOR TO THE TOP OF THE DEVICE BOX. 8" ABOVE COUNTERTOP IS STANDARD.
3. LIGHTING CONTROLS AND FIRE ALARM PULL STATIONS ARE TO BE MOUNTED AT MAXIMUM OF 46" ABOVE FINISHED FLOOR. DEVIATIONS FROM THE STANDARD MOUNTING HEIGHTS ABOVE MAY BE INCORPORATED FOR EASE OF INSTALLATION DUE TO ARCHITECTURAL ITEMS SUCH AS TILES, HAND RAILS, ETC. DEVICES TO BE A MAXIMUM OF 48" ABOVE FINISHED FLOOR TO THE OPERATING HANDLE.
4. THERMOSTATS ARE INDICATED FOR SIDE REACH APPLICATIONS. WHEN LOCKABLE COVERS ARE PROVIDED, THERMOSTATS ARE TO BE MOUNTED AT 4'-6".

MECHANICAL SYMBOLS AND ABBREVIATIONS

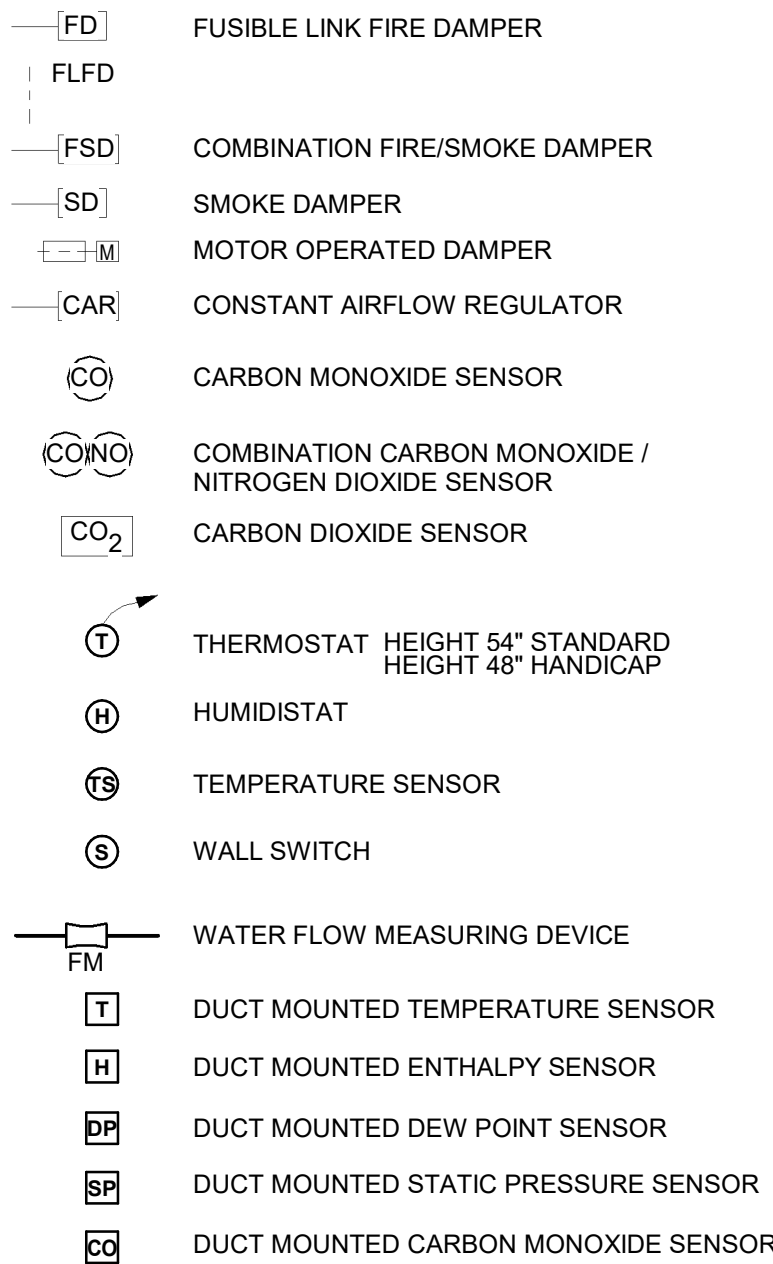
GENERAL SYMBOLS



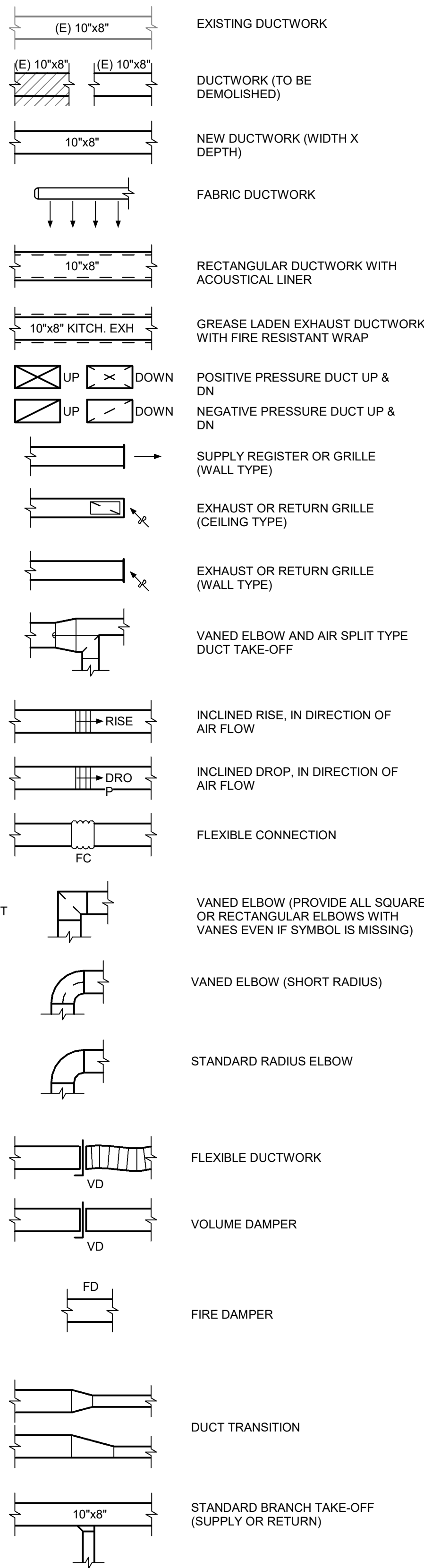
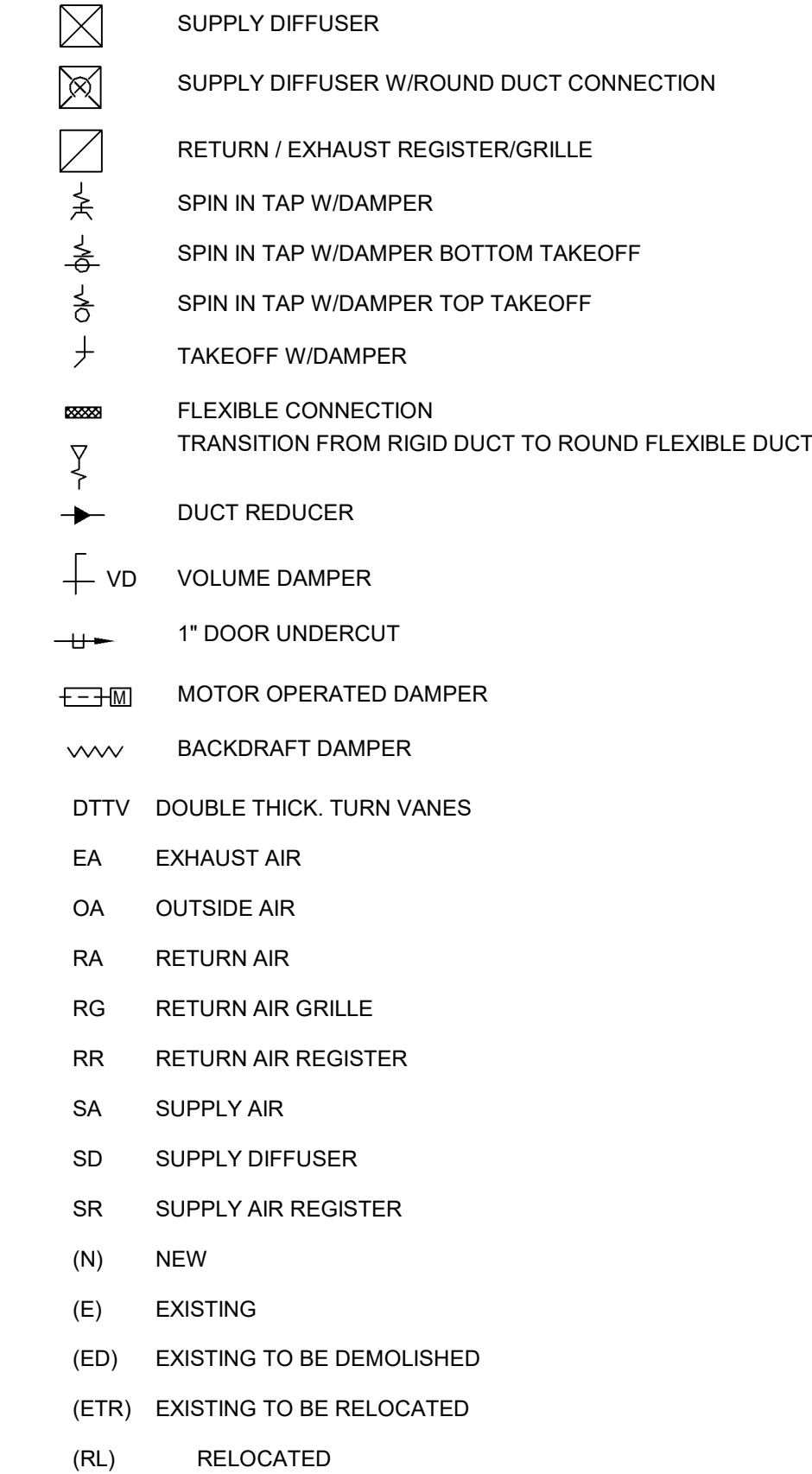
PIPING SYMBOLS



CONTROLS SYMBOLS



DUCTWORK SYMBOLS



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201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015

DETAILS- MECHANICAL

PROJECT NO: 2022-327

DRAWN BY: RC

DATE: 03/15/2023

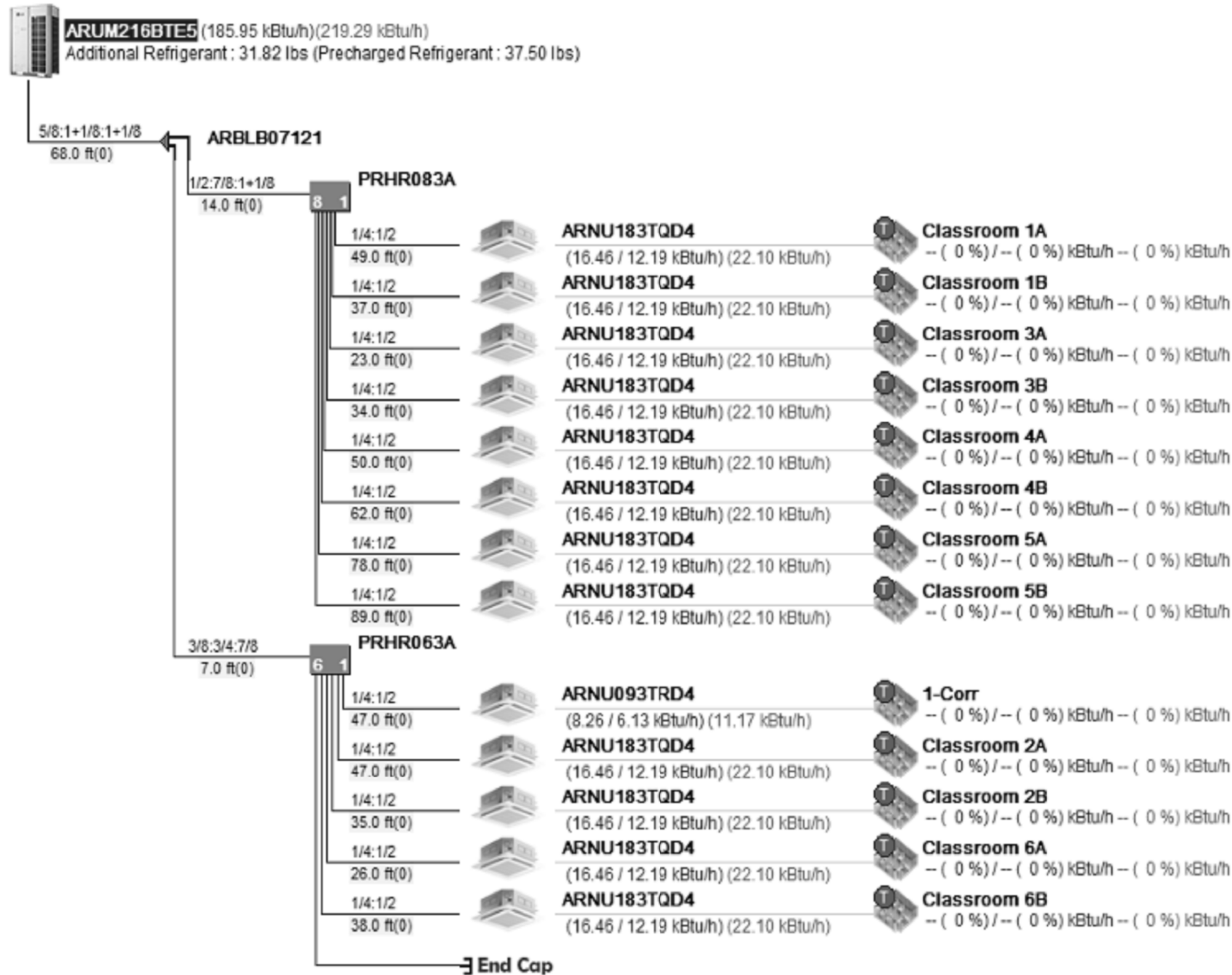
SCALE: AS NOTED



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* : Main pipe upsized
** : Conditional Application
Three pipe : Liquid : High Gas : Low Gas
Two pipe : Liquid : Gas

T Thermostat, G Group Control, D Dry Contact
S AHU Comm. Kit [Discharge (supply) air], R AHU Comm. Kit [Return air]
M AHU Comm. Kit [Main module], C AHU Comm. Kit [Communications module]

Indoor Units : 13 of 35
Combination Ratio : 225.0 of 216.0 (104%)
Total Pipe : 704.0 of 3280.8 ft
ODU factory charge : 37.50 lbs
Additional Refrigerant : 31.82 lbs
Total refrigerant : 69.32 lbs
Minimum room volume : 2666.15 ft³
(Based on 26.0 lbs / 1000.0 ft³)

ODU A-1 REFRIGERANT PIPING DIAGRAM
SCALE: NONE

1



* : Main pipe upsized
** : Conditional Application
Three pipe : Liquid : High Gas : Low Gas
Two pipe : Liquid : Gas

T Thermostat, G Group Control, D Dry Contact
S AHU Comm. Kit [Discharge (supply) air], R AHU Comm. Kit [Return air]
M AHU Comm. Kit [Main module], C AHU Comm. Kit [Communications module]

Indoor Units : 3 of 12
Combination Ratio : 60.0 of 60.0 (100%)
Total Pipe : 116.0 of 984.3 ft
ODU factory charge : 7.72 lbs
Additional Refrigerant : 5.84 lbs
Total refrigerant : 13.55 lbs
Minimum room volume : 521.27 ft³
(Based on 26.0 lbs / 1000.0 ft³)

ODU A-2 REFRIGERANT PIPING DIAGRAM
SCALE: NONE

2

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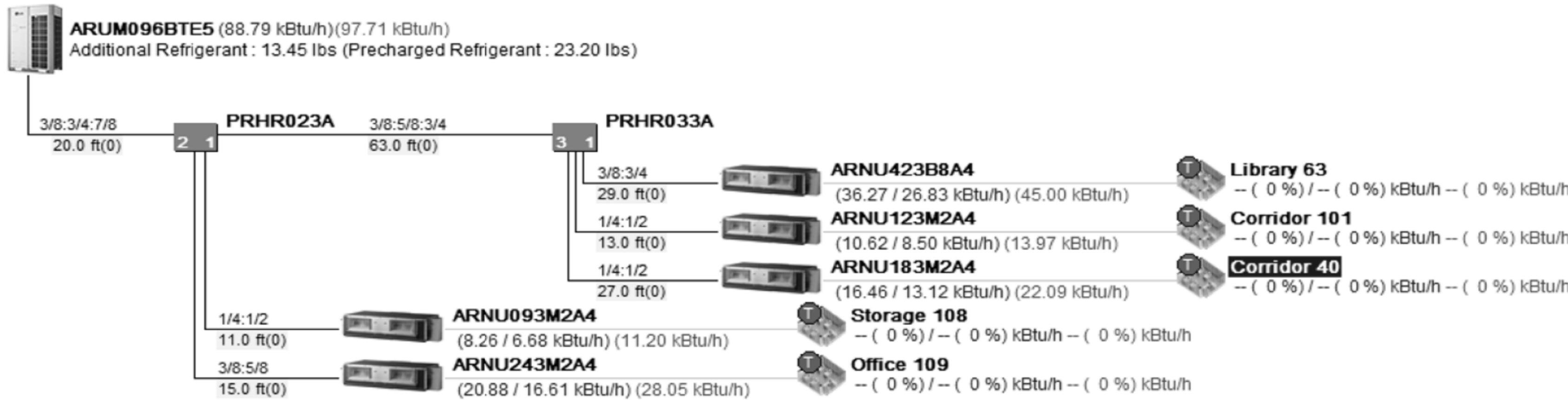
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Main pipe upsized

**

:

Conditional Application

Three pipe

:

Liquid : High Gas : Low Gas

Two pipe

:

Liquid : Gas

T

Thermostat,

G

Group Control,

D

Dry Contact

S

AHU Comm. Kit [Discharge (supply) air],

R

AHU Comm. Kit [Return air]

M

AHU Comm. Kit [Main module],

C

AHU Comm. Kit [Communications module]

Indoor Units

:

5 of 16

Combination Ratio

:

105.0 of 96.0 (109%)

Total Pipe

:

178.0 of 3280.8 ft

ODU factory charge

:

23.20 lbs

Additional Refrigerant

:

13.45 lbs

Total refrigerant

:

36.65 lbs

Minimum room volume

:

1409.58 ft³

(Based on 26.0 lbs / 1000.0 ft³)

ODU B-1 REFRIGERANT PIPING DIAGRAM

SCALE: NONE

1

ARUM096BTE5 (80.70 kBtu/h)(97.24 kBtu/h)
Additional Refrigerant : 10.18 lbs (Precharged Refrigerant : 23.20 lbs)

3/8:3/4:7/8 20.0 ft(0) **3** **1** **PRHR033A** 3/8:1/2:5/8 17.0 ft(0) **2** **1** **PRHR023A**

1/4:1/2 25.0 ft(0) **ARNU153M2A4** (13.29 / 10.70 kBtu/h) (17.57 kBtu/h) **Health 60** -- (0 %) / -- (0 %) kBtu/h -- (0 %) kBtu/h

1/4:1/2 57.0 ft(0) **ARNU183M2A4** (16.46 / 13.12 kBtu/h) (22.09 kBtu/h) **Teachers Room 62** -- (0 %) / -- (0 %) kBtu/h -- (0 %) kBtu/h

1/4:1/2 23.0 ft(0) **ARNU153M2A4** (13.29 / 10.70 kBtu/h) (17.57 kBtu/h) **Principal 66** -- (0 %) / -- (0 %) kBtu/h -- (0 %) kBtu/h

1/4:1/2 30.0 ft(0) **ARNU183TQD4** (16.46 / 12.19 kBtu/h) (22.10 kBtu/h) **Lobby 72A** -- (0 %) / -- (0 %) kBtu/h -- (0 %) kBtu/h

1/4:1/2 50.0 ft(0) **ARNU183TQD4** (16.46 / 12.19 kBtu/h) (22.10 kBtu/h) **Lobby 72B** -- (0 %) / -- (0 %) kBtu/h -- (0 %) kBtu/h

*

:

Main pipe upsized

**

:

Conditional Application

Three pipe

:

Liquid : High Gas : Low Gas

Two pipe

:

Liquid : Gas

T

Thermostat,

G

Group Control,

D

Dry Contact

S

AHU Comm. Kit [Discharge (supply) air],

R

AHU Comm. Kit [Return air]

M

AHU Comm. Kit [Main module],

C

AHU Comm. Kit [Communications module]

Indoor Units

:

5 of 16

Combination Ratio

:

84.0 of 96.0 (88%)

Total Pipe

:

222.0 of 3280.8 ft

ODU factory charge

:

23.20 lbs

Additional Refrigerant

:

10.18 lbs

Total refrigerant

:

33.38 lbs

Minimum room volume

:

1283.74 ft³

(Based on 26.0 lbs / 1000.0 ft³)

ODU B-2 REFRIGERANT PIPING DIAGRAM

SCALE: NONE

2

NOTICE

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CHESTER UPLAND S.D.

TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES

201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015

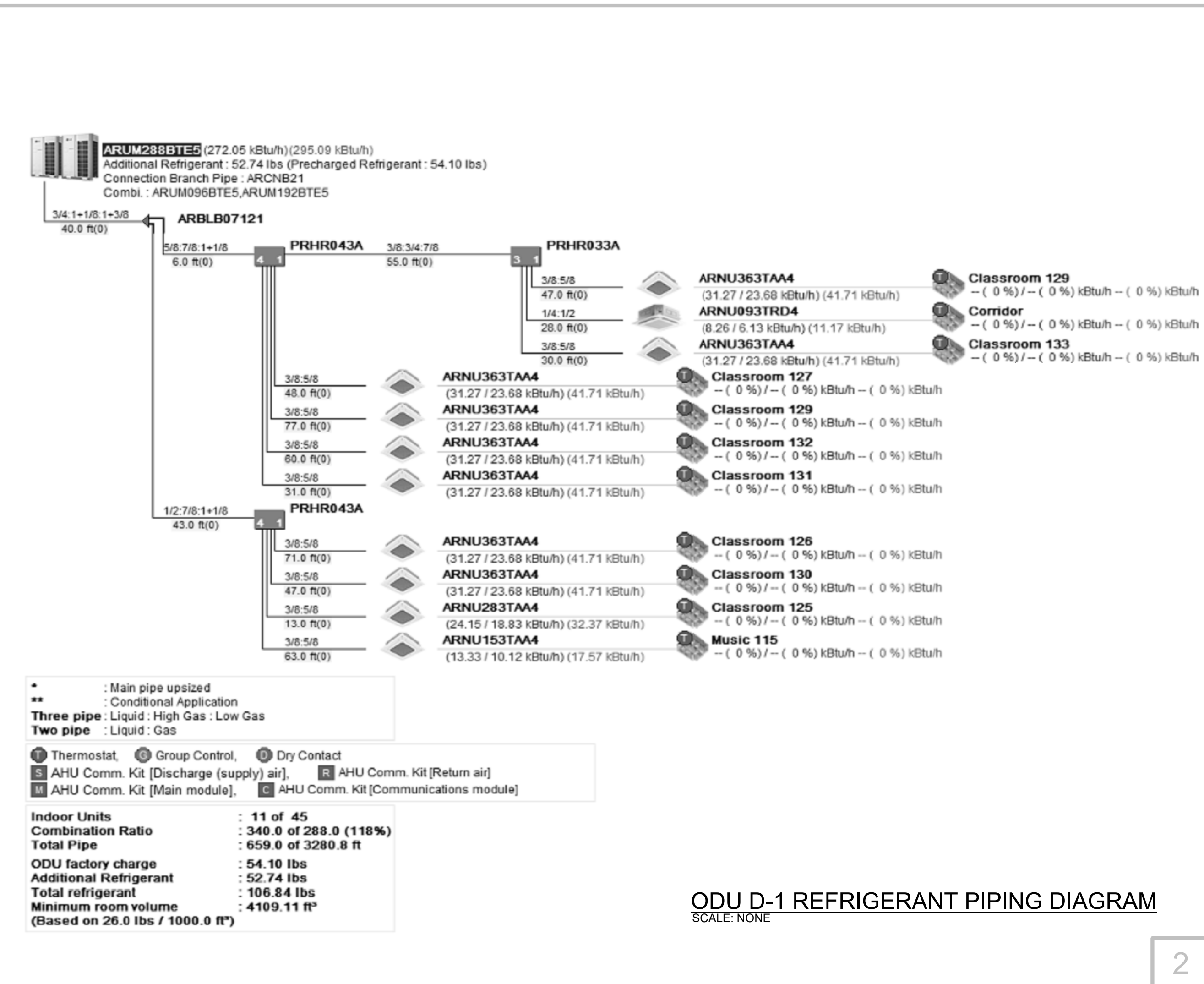
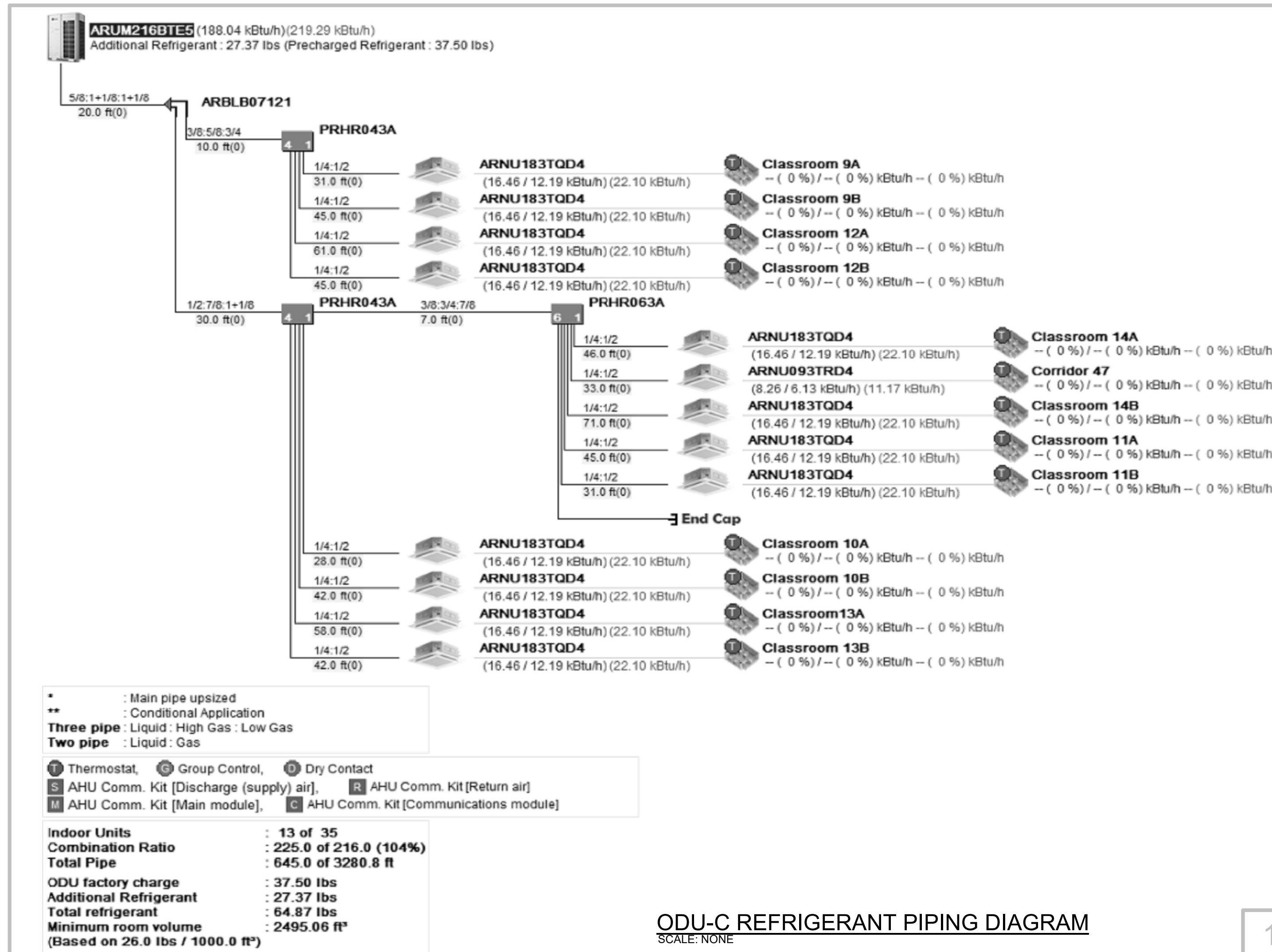
DETAILS- MECHANICAL

PROJECT NO.: 2022-327
DRAWN BY: RC
DATE: 03/15/2023
SCALE: AS NOTED

135 Poplar Street, Ambler, PA 19002
1950 Route 70, Suite 200, Ambler, NJ 08003
264.411898
www.mchugheng.com

100% Bid Set- 15 March 2023

Rev. No.	Date	Description
1	10/28/22	SCHEMATIC DESIGN ISSUE
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DETAILS- MECHANICAL

SCALE: AS NOTED



Rev. No.	Date	Description
△	10/28/22	SCHEMATIC DESIGN ISSUE
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AIR DEVICE SCHEDULE											
TAG	CFM RANGE MIN-MAX	TYPE	NECK SIZE	DEVICE SIZE	NC	DAMPER	MATERIAL	FINISH	MANUFACTURER	MODEL	COMMENTS
SR	0 - 125	SUPPLY REGISTER	8x8	8x8	XXX	YES, O.B.D.	ALUMINUM	BY ARCH.	PRICE	620	ADJUSTABLE DOUBLE DEFLECTION SUPPLY REGISTER.
	125 - 250	"	10x8	10x8	"	"	"	"	"	"	"
	250 - 325	"	12x8	12x8	"	"	"	"	"	"	"
	325 - 400	"	12x8	12x8	"	"	"	"	"	"	"
CD	0 - 125	SUPPLY CEILING DIFFUSER	6"Ø	22x22	XXX	YES	STEEL	BY ARCH.	PRICE	SPD-FR	FIRE RATED SQUARE PLAQUE DIFFUSER, ROUND CONNECTION.
	125 - 230	"	8"Ø	22x22	"	"	"	"	"	"	"
	230 - 320	"	10"Ø	22x22	"	"	"	"	"	"	"
	320 - 450	"	12"Ø	22x22	"	"	"	"	"	"	"
RR / ER	25 - 90	RETURN / EXHAUST REGISTER	6"x6"	6"x6"	XXX	YES, O.B.D.	ALUMINUM	WHITE	PRICE	630	SURFACE MOUNT LOUVERED RETURN / EXHAUST REGISTER
	90 - 150	"	8"x6"	8"x6"	"	"	"	"	"	"	"
	150 - 250	"	10"x8"	10"x8"	"	"	"	"	"	"	"
	250 - 325	"	12"x8"	12"x6"	"	"	"	"	"	"	"
RG	0 - 360	RETURN GRILLE	12"x12"	12"x12"	XXX	NO	ALUMINUM	WHITE	PRICE	630	FIXED BLADE LOUVERED RETURN GRILLE, 3/4" SPACING, 45° DEFLECTION
	360 - 625	"	16"x16"	16"x16"	"	"	"	"	"	"	"
	360 - 720	"	24"x12"	24"x12"	"	"	"	"	"	"	"
	360 - 1,000	"	24"x24"	24"x24"	"	"	"	"	"	"	"
LD	175 - 250	LINEAR SLOT DIFFUSER	8"Ø	48"L	XXX	YES, O.B.D.	STEEL	WHITE	PRICE	JS215	LINEAR SLOT SUPPLY DIFFUSER - (1) 1.5 INCH SLOT W/ INSULATED PLENUM.
	250 - 315	"	"	"	"	"	"	"	"	"	"
CAR	75, 90, 105	CONSTANT VOL. EXHAUST	6"Ø	10"x10"	XXX	INTEGRAL	ALUMINUM	WHITE	ALDES	CER-R-II	SELF REGULATING EXHAUST REGISTER WITH ROUND CONNECTION. PROVIDE WITH CEILING RADIATION DAMPER.
	125, 140, 160, 175	"	8"Ø	10"x10"	"	"	"	"	"	"	"
	205	"	8"Ø	10"x10"	"	"	"	"	"	"	"
		"	8"Ø	10"x10"	"	"	"	"	"	"	"
SDG	100-275	SPIRAL DUCT GRILLE	10"x6"	10"x6"	22	AIR SCOOP	STEEL	STEEL	PRICE	SDGE	SPIRAL DUCT SUPPLY GRILLE. PROVIDE AIR SCOOP DAMPER.
	275-350	"	12"x6"	12"x6"	19-30	"	"	"	"	"	"
	350-450	"	14"x6"	14"x6"	24-30	"	"	"	"	"	"
	450-600	"	18"x6"	18"x6"	25-30	"	"	"	"	"	"
DL-1	<250	SUPPLY DRUM LOUVER	9"x6"	9"x6"	25-30	YES, O.B.D.	STEEL	STEEL	PRICE	HCD	HIGH CAPACITY DRUM LOUVER WITH ADJUSTABLE BLADES. PROVIDE WITH FRAME FOR SPIRAL DUCT INSTALLATION. PROVIDE WITH POLE OPERATOR BRACKET
GENERAL COMMENTS:											
1. USE SCHEDULE SIZE UNLESS OTHERWISE NOTED ON THE PLANS.											
2. PROVIDE BLOW PATTERNS AS SHOWN ON DRAWING.											
3. PROVIDE AIR DEVICE FRAMES TO SUIT WALL AND CEILING CONSTRUCTION.											
4. COORDINATE FINAL AIR DEVICE SELECTIONS AND COLORS WITH ARCHITECT.											
5. ALL AIR DEVICE FRAMES / BORDERS SHALL HAVE A MOUNTING FLANGE SPECIFICALLY SELECTED FOR THE TYPE OF CEILING IN WHICH IT IS BEING INSTALLED.											

ENERGY RECOVERY UNIT (ERU)																												
TAG	SERVES	SUPPLY FAN AIRFLOW (CFM) / ESP (IN. W.C.)	EXHAUST FAN AIRFLOW (CFM) / ESP (IN. W.C.)	NOMINAL TONNAGE	REFRIGERANT	GAS CONN. (IN.)	COND. CONN. (IN.)	ENERGY RECOVERY			COOLING				HEATING (NAT. GAS)			DEHUMIDIFICATION			ELECTRICAL		DIMENSIONS L x W x H (IN.)	WEIGHT (LBS)	BASIS OF DESIGN	MODEL	COMMENTS	
								OUTSIDE / EXH AIR (CFM)	EAT DB/WB (°F) (SUMMER/WINTER)	LAT DB/WB (°F) (SUMMER/WINTER)	TOTAL / SENSIBLE CAPACITY (MBH)	EAT DB/WB (°F)	LAT DB/WB (°F)	DESIGN EER	INPUT / OUTPUT CAPACITY (MBH)	AFUE (%)	MIN-MAX GAS PRESSURE (IN. W.C.)	TURNDOWN	TYPE	CAPACITY (MBH)	LAT DB (°F) / RH	V / PH / HZ						UNIT MCA / MOPP
ERU-1	CLASSROOM WING A	2,920 / 1	2,390 / 1	10	R-410A	3/4	1	2,920 / 2,390	93 / 76 11 / 8.6	82.2 / 68.7 45.5 / 38.7	127.4 / 86.7	82.2 / 68.7	55.5 / 54.9	11.1	100 / 80	80	7 - 14	16:1	HOT GAS REHEAT	61.4	70 / 57%	208 / 3 / 60	69.5 / 100	171.6 / 86.4 / 65.9	2,993	LG	ARDE-112-36D	1 THROUGH 20
ERU-2	CLASSROOM WING C	2,420 / 1	2,035 / 1	7	R-410A	3/4	1	2,420 / 2,035	93 / 76 11 / 8.6	81.0 / 67.7 49.7 / 41.7	88.9 / 65.6	81.0 / 67.7	56.3 / 56.1	11	100 / 80	80	7 - 14	16:1	HOT GAS REHEAT	58.9	70 / 57%	208 / 3 / 60	45 / 60	171.6 / 86.4 / 65.9	2,904	LG	ARDE-112-41D	1 THROUGH 20
ERU-3	CLASSROOM WING D	3,810 / 1	2,845 / 1	15	R-410A	3/4	1	3,810 / 2,845	93 / 76 11 / 8.6	82.9 / 69.1 43.2 / 37.0	196.1 / 126.3	82.9 / 69.1	52.7 / 52.6	10.2	200 / 160	80	7 - 14	16:1	HOT GAS REHEAT	81.8	70 / 57%	208 / 3 / 60	98.1 / 125	171.6 / 86.4 / 65.9	3,199	LG	ARDE-112-41D	1 THROUGH 20
ERU-4	CLASSROOM WING D	3,860 / 1	2,845 / 1	15	R-410A	3/4	1	3,860 / 2,845	93 / 76 11 / 8.6	83 / 69.2 42.9 / 36.8	196.9 / 127.2	83 / 69.2	53 / 52.9	10.2	200 / 160	80	7 - 14	16:1	HOT GAS REHEAT	82.2	70 / 57%	208 / 3 / 60	98.1 / 125	171.6 / 86.4 / 65.9	3,199	LG	ARDE-112-41D	1 THROUGH 20
ERU-5	LIBRARY & OFFICES	980 / 1	700 / 1	5	R-410A	3/4	1	980 / 700	93 / 76 11 / 8.6	81.1 / 67.8 49.6 / 41.6	62.4 / 38	81.1 / 67.8	52 / 52	11.4	100 / 80	80	7 - 14	16:1	HOT GAS REHEAT	37.3	70 / 57%	208 / 3 / 60	31.2 / 45	171.6 / 86.4 / 65.9	2,789	LG	ARDE-112-30C	1 THROUGH 20
COMMENTS:																												
1. 1 YEAR MANUFACTURER'S WARRANTY AND START-UP. 5 YEAR COMPRESSOR WARRANTY. 2. ELECTRICAL DISCONNECT SWITCH BY E.C. 3. 120V CONVENIENCE RECEPTACLE 4. DUCT MOUNTED SMOKE DETECTOR FOR UNITS WITH AIRFLOW 2,000 CFM AND HIGHER 5. ROOF CURB WITH VIBRATION ISOLATION KIT 6. DIRECT DRIVE FAN MOTORS WITH VFD. 7. MERV-13 FILTERS 8. PROVIDE SUPPLY AIR DUCT TEMPERATURE AND HUMIDITY SENSORS. 9. ENTHALPHY WHEEL WITH VFD AND PURGE 10. MODULATING HOT GAS REHEAT 11. VARIABLE SPEED DIGITAL SCROLL COMPRESSORS. 12. STAINLESS STEEL DRAIN PANS.														13. STAINLESS STEEL GAS HEAT EXCHANGER WITH FORCED DRAFT IGNITION 14. GAS PRESSURE REGULATOR 15. CONDENSER COIL GUARDS 16. EXTEND CONDENSATE PIPING TO NEAREST ROOF DRAIN 17. SUPPLY AND RETURN DUCT SMOKE DETECTORS BY E.C. 18. ALL ROOFTOP EQUIPMENT PIPING AND POWER CONNECTIONS TO BE INSTALLED WITH PIPING CURB, SEALED TIGHT, AND WARRANTED BY ROOF CONTRACTOR. 19. FACTORY MOUNTED BACNET CONTROLLER 20. EQUIVALENTS ONLY ALLOWED IF PRE-APPROVED BY THE ENGINEER PRIOR TO BIDS DUE DATE, AND MEETS ALL PERFORMANCE, DIMENSIONAL, AND EFFICIENCY REQUIREMENTS.														

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PACKAGED DX/GAS ROOFTOP UNIT (RTU)																										
TAG	SERVES	SUPPLY FAN AIRFLOW (CFM) / ESP (IN. W.C.)	OUTSIDE AIR (CFM)	NOMINAL TONNAGE	REFRIGERANT	GAS CONN. (IN.)	COND. CONN. (IN.)	COOLING				HEATING (NAT. GAS)				DEHUMIDIFICATION			ELECTRICAL		DIMENSIONS L x W x H (IN.)	WEIGHT (LBS)	BASIS OF DESIGN	MODEL	COMMENTS	
								TOTAL / SENSIBLE CAPACITY (MBH)	EAT DB/WB (°F)	LAT DB/WB (°F)	DESIGN EER	INPUT / OUTPUT CAPACITY (MBH)	AFUE (%)	MIN-MAX GAS PRESSURE (IN. W.C.)	TURNDOWN	EAT / LAT (°F)	TYPE	CAPACITY (MBH)	LAT DB (°F) / RH	V / PH / HZ						UNIT MCA / MOCPP
RTU-1	OFFICES & CORRIDOR	510 / 1.5	510	3	R-410A	3/4	3/4	43.5 / 24.1	93 / 76	53.5 / 53.3	7.7 ISMRE	75 / 60	80	7 - 14	4:1	11 / 109	HOT GAS REHEAT	21.7	72 / 50%	208 / 3 / 60	19.7 / 25	82 x 44 x 58	1,057	LG	ARDR-12	1 THROUGH 20
RTU-2	DINING ROOM	3,400 / 1.5	1,200	12.5	R-410A	3/4	3/4	148 / 102.9	81.4 / 67.8	53.8 / 53.7	10.8	200 / 160	80	7 - 14	4:1	50.5 / 94	HOT GAS REHEAT	74.9	72 / 50%	208 / 3 / 60	60.3 / 90	171.6 x 86.4 x 60	2,819	LG	ARDR-112	1 THROUGH 20
RTU-3	GYM	3,400 / 1.5	950	10	R-410A	3/4	3/4	128.4 / 93.7	80 / 66.7	54.9 / 54.5	11.1	200 / 160	80	7 - 14	4:1	55 / 98.5	HOT GAS REHEAT	65.1	72 / 50%	208 / 3 / 60	60.3 / 90	171.6 x 86.4 x 60	2,755	LG	ARDR-112	1 THROUGH 20
<div>COMMENTS:</div> <div><div>1. 1 YEAR MANUFACTURER'S WARRANTY AND START-UP. 5 YEAR COMPRESSOR WARRANTY. 2. ELECTRICAL DISCONNECT SWITCH BY E.C. 3. 120V CONVENIENCE RECEPTACLE 4. DUCT MOUNTED SMOKE DETECTOR FOR UNITS WITH AIRFLOW 2,000 CFM AND HIGHER. 5. SUPPLY AND RETURN DUCT SMOKE DETECTORS BY E.C. 6. ROOF CURB WITH VIBRATION ISOLATION RAIL 7. DIRECT DRIVE FAN MOTORS WITH VFD. 8. MERV-8 FILTERS 9. MODULATING ENTHALPY ECONOMIZER AND POWER EXHAUST 10. INSULATED CABINET CONSTRUCTION 11. PROVIDE SUPPLY AIR DUCT TEMPERATURE AND HUMIDITY SENSORS. 12. MODULATING HOT GAS REHEAT 13. VARIABLE SPEED DIGITAL SCROLL COMPRESSORS. 14. STAINLESS STEEL DRAIN PANS.</div><div>13. STAINLESS STEEL GAS HEAT EXCHANGER WITH FORCED DRAFT IGNITION 14. GAS PRESSURE REGULATOR 15. CONDENSER COIL GUARDS 16. EXTEND CONDENSATE PIPING TO NEAREST ROOF DRAIN 17. ALL ROOFTOP EQUIPMENT PIPING AND POWER CONNECTIONS TO BE INSTALLED WITH PIPING CURB, SEALED TIGHT, AND WARRANTED BY ROOF CONTRACTOR. 18. FACTORY MOUNTED CONTROLLER 19. WALL MOUNTED PROGRAMMABLE THERMOSTAT 20. EQUIVALENTS ONLY ALLOWED IF PRE-APPROVED BY THE ENGINEER PRIOR TO BIDS DUE DATE, AND MEETS ALL PERFORMANCE, DIMENSIONAL, AND EFFICIENCY REQUIREMENTS.</div></div>																										

VRF OUTDOOR UNIT SCHEDULE																	
TAG	NOMINAL TONNAGE	REFRIGERANT	REFRIGERANT CHARGE (LBS)	COOLING			HEATING			ELECTRICAL (208V / 3Ø / 60HZ.)			DIMENSIONS L x W x H (IN.)	WEIGHT (LBS)	BASIS OF DESIGN	MODEL	COMMENTS
				TOTAL CAPACITY (MBH)	MIN CAPACITY (MBH)	EER	TOTAL CAPACITY @ 47F / 17F (MBH)	MIN CAPACITY (MBH)	COP @ 47F	NO. OF DISCONNECTS	MCA	MOCP					
ODU-A-1	18	R-410A	69.3	216	-	11.2	243 / 150	-	2.6	1	60.3	80	48 x 30 x 66	666	LG MULTI V	ARUM216BTE5	1 THROUGH 12
ODU-A-2	5	R-410A	13.56	60	-	17.7	64 / 40	-	10.45 HSPF	1	25.4	40	37 x 13 x 54	260	LG MULTI V	ARUB060GSS4	1 THROUGH 12
ODU-B-1	8	R-410A	36.6	96	-	13.5	108 / 67	-	3.6	1	28.5	80	48 x 30 x 66	507	LG MULTI V	ARUM096BTE5	1 THROUGH 12
ODU-B-2	8	R-410A	33.4	96	-	13.5	108 / 67	-	3.6	1	28.5	80	48 x 30 x 66	507	LG MULTI V	ARUM096BTE5	1 THROUGH 12
ODU-C	18	R-410A	64.8	216	-	11.2	243 / 150	-	2.6	1	60.3	80	48 x 30 x 66	666	LG MULTI V	ARUM216BTE5	1 THROUGH 12
ODU-D-1	24	R-410A	106.8	288	-	11.3	324 / 198	-	3.3	2	28.5	40	97 x 30 x 66	507	LG MULTI V	ARUM288BTE5	1 THROUGH 12
ODU-D-2	24	R-410A	101.2	288	-	11.3	324 / 198	-	3.3	2	28.5	80	97 x 30 x 66	507	LG MULTI V	ARUM288BTE5	
<div>COMMENTS:</div> <div><div>1. ELECTRICAL DISCONNECT SWITCH BY E.C.</div><div>2. MANUFACTURERS START-UP AND 1 YEAR MANUFACTURER WARRANTY</div><div>3. 5 YEAR COMPRESSOR WARRANTY</div><div>4. UNIT MUST PROVIDE FULL CAPACITY HEATING DOWN TO -4F</div><div>5. M.C. TO PROVIDE REFRIGERANT SENSORS FOR ALL SMALL VOLUME SPACES AS NOTED ON THE PLANS</div><div>6. PROVIDE RAISED ROOF BASE AS PER ROOF PLANS WITH VIBRATION ISOLATION</div><div>7. PROVIDE VIBRATION ISOLATION FOR COMPRESSORS</div><div>8. SCROLL COMPRESSORS</div><div>9. FULL DESIGN PACKAGE MUST BE SUBMITTED FOR APPROVAL</div><div>10. FACTORY PROVIDED BACNET SYSTEM</div><div>11. WEB-BASED SYSTEM MONITORING</div><div>12. TENANT BILLING SYSTEM (OPTIONAL)</div></div>																	

VRF INDOOR UNIT SCHEDULE																								
TAG	ASSOCIATED OUTDOOR UNIT	UNIT TYPE	NOMINAL TONNAGE	AREAS SERVED	AIRFLOW (CFM)	EXT. STATIC PRESSURE (IN. W.C.)	COOLING				HEATING			ELECTRICAL (208V / 1Ø / 60HZ.)			DIMENSIONS L X W x H (IN.)	WEIGHT (LBS)	SOUND RATING (DBA)	REFRIGERANT CONNECTIONS LIQ / GAS (IN.)	CONDENSATE (IN.)	BASIS OF DESIGN	MODEL	COMMENTS
							TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EAT DB/WB	LAT DB/WB	TOTAL CAPACITY (MBH)	EAT DB (°F)	LAT DB (°F)	POWER INPUT (W)	FLA	MOCP								
IDU-0.8S	-	2X2' CASSETTE	0.8	SEE PLANS	250	-	9.6	6.7	80 / 67	56 / 53	10.9	62	90	14	0.2	15	24 x 24 x 10	32	27	1/4 & 1/2	1	LG MULTI V	ARNU093TRD4	1 THROUGH 14
IDU-1.3S	-	2X2' CASSETTE	1	SEE PLANS	285	-	12.3	8.6	80 / 67	56 / 53	13.6	62	90	15	0.2	15	24 x 24 x 10	32	30	1/4 & 1/2	1	LG MULTI V	ARNU123TRD4	1 THROUGH 14
IDU-1.3S	-	2X2' CASSETTE	1.3	SEE PLANS	350	-	15.4	10.8	80 / 67	56 / 53	17.1	62	90	21	0.2	15	24 x 24 x 11	35	34	1/4 & 1/2	1	LG MULTI V	ARNU153TQD4	1 THROUGH 14
IDU-1.5S	-	2X2' CASSETTE	1.5	SEE PLANS	390	-	19.1	13.4	80 / 67	56 / 53	21.5	62	90	22	0.2	15	24 x 24 x 11	35	35	1/4 & 1/2	1	LG MULTI V	ARNU183TQD4	1 THROUGH 14
IDU-2.5	-	3X3' CASSETTE	2.5	SEE PLANS	560	-	19.1	13.4	80 / 67	56 / 53	21.5	62	90	31	1.7	15	36 x 36 x 11	60	44	3/8 & 5/8	1	LG MULTI V	ARNU183TAA4	1 THROUGH 14
IDU-3	-	3X3' CASSETTE	3	SEE PLANS	840	-	36.2	25.3	80 / 67	56 / 53	40.6	62	90	64	1.7	15	36 x 36 x 11	60	44	3/8 & 5/8	1	LG MULTI V	ARNU363TAA4	1 THROUGH 14
IDU-0.8D	-	HIGH STATIC DUCTED	0.8	SEE PLANS	300	-	9.6	6.7	80 / 67	56 / 53	10.9	62	90	21	2.3	15	50 x 27 x 10	82	52	1/4 & 1/2	1	LG MULTI V	ARNU093M2A4	1 THROUGH 14
IDU-1D	-	HIGH STATIC DUCTED	1	SEE PLANS	330-425	0.5	12.3	8.6	80 / 67	56 / 53	13.6	62	90	34	2.3	15	50 x 27 x 10	82	53	1/4 & 1/2	1	LG MULTI V	ARNU123M2A4	1 THROUGH 14
IDU-1.3D	-	HIGH STATIC DUCTED	1.3	SEE PLANS	340-425	0.5	15.4	10.8	80 / 67	56 / 53	17.1	62	90	43	2.3	15	50 x 27 x 10	82	52	1/4 & 1/2	1	LG MULTI V	ARNU153M2A4	1 THROUGH 14
IDU-1.5D	-	HIGH STATIC DUCTED	1.5	SEE PLANS	520	0.5	19.1	13.4	80 / 67	56 / 53	21.5	62	90	43	2.3	15	50 x 27 x 10	82	53	1/4 & 1/2	1	LG MULTI V	ARNU183M2A4	1 THROUGH 14
IDU-2D	-	HIGH STATIC DUCTED	2	SEE PLANS	520-640	0.5	24.2	16.9	80 / 67	56 / 53	27.3	62	90	43	2.3	15	50 x 27 x 10	82	53	3/8 & 5/8	1	LG MULTI V	ARNU243M2A4	1 THROUGH 14
IDU-2.5D	-	HIGH STATIC DUCTED	2.5	SEE PLANS	840	0.5	28	19.6	80 / 67	56 / 53	31.5	62	90	109	2.5	15	50 x 27 x 10	96	61	3/8 & 5/8	1	LG MULTI V	ARNU283M3A4	1 THROUGH 14
IDU-3D	-	HIGH STATIC DUCTED	3	SEE PLANS	1,065	0.5	36.2	25.3	80 / 67	56 / 53	40.6	62	90	478	5.2	15	61 x 28 x 18	192	43	3/8 & 3/4	1	LG MULTI V	ARNU363BBA4	1 THROUGH 14
IDU-3.5D	-	HIGH STATIC DUCTED	3.5	SEE PLANS	1,150	0.5	42	29.4	80 / 67	56 / 53	43.8	62	90	497	5.2	15	61 x 28 x 18	192	43	3/8 & 3/4	1	LG MULTI V	ARNU423BBA4	1 THROUGH 14
COMMENTS:																								
1. ALL UNITS ARE HEAT RECOVERY TYPE																								
2. ELECTRICAL DISCONNECT SWITCH BY E.C.																								
3. SINGLE POINT POWER CONNECTION.																								
4. MANUFACTURER'S START-UP AND 1 YEAR MANUFACTURER WARRANTY																								
5. M.C. TO PROVIDE REFRIGERANT SENSORS FOR ALL SMALL VOLUME SPACES AS NOTED ON THE PLANS																								
6. CONDENSATE OVERFLOW SWITCH																								
7. INTEGRAL CONDENSATE LIFT PUMP - POWERED FROM ASSOCIATED INDOOR UNIT																								
8. DIRECT DRIVE FAN MOTOR																								
9. VIBRATION ISOLATOR HANGERS. WALL BRACKETS FOR WALL MOUNTED UNITS.																								
10. MERV 8 FILTER WITH FILTER RACK FOR DUCTED UNITS																								
11. INSULATED REFRIGERANT LINES																								
12. MANUFACTURER TOI CONFIRM SIZES OF REFRIGERANT LINES																								
13. FULL DESIGN PACKAGE MUST BE SUBMITTED FOR APPROVAL																								
14. FACTORY INTEGRATED BACNET CONTROL.																								

VRF HEAT RECOVERY BOX SCHEDULE											
TAG	MODEL NUMBER	NUMBER OF PORTS	MAX PORT CAPACITY (MBH)	MAX UNIT CAPACITY (MBH)	PORT LIQUID & VAPOR LINE (IN.)	SYSTEM LIQUID & VAPOR LINE (IN.)	ELECTRICAL (208V / 1Ø / 60HZ.)		UNIT DIMENSIONS W x L x H (IN.)	UNIT WEIGHT (LBS.)	COMMENTS
							POWER INPUT (W)	FLA			
HRB-2	PRHR023A	2	60	120	3/8 & 5/8	3/8 & 3/4 / 7/8	39.8	0.06	19" x 19 x 9"	33	1 THROUGH 6
HRB-3	PRHR033A	3	60	180	3/8 & 5/8	1/2 & 7/8 / 1-1/8	39.8	0.06	19" x 19 x 9"	37	1 THROUGH 6
HRB-4	PRHR043A	4	60	230	3/8 & 5/8	5/8 & 7/8 / 1-1/8	39.8	0.06	19" x 19 x 9"	68	1 THROUGH 6
HRB-6	PRHR063A	6	60	230	3/8 & 5/8	5/8 & 7/8 / 1-1/8	75.9	0.09	31.25 x 19 x 9"	68	1 THROUGH 6
HRB-8	PRHR083A	8	60	230	3/8 & 5/8	5/8 & 7/8 / 1-1/8	75.9	0.09	31.25 x 19 x 9"	68	1 THROUGH 6

COMMENTS:

1. ELECTRICAL DISCONNECT SWITCH BY E.C.
2. MANUFACTURER'S START-UP AND 1 YEAR MANUFACTURER WARRANTY
3. VIBRATION ISOLATION HANGERS
4. SHUT-OFF VALVES ON ALL PORTS
5. PROVIDE ACCESS PANEL FOR UNITS INSTALLED ABOVE UNACCESSIBLE CEILINGS
6. TIED TO VRF BACNET SYSTEM

NOTICE

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CHESTER UPLAND S.D.

TOBY FARMS INTERMEDIATE SCHOOL, HVAC and WINDOW UPGRADES

201 BRIDGEWATER ROAD
BROOKHAVEN, PA 19015

SCHEDULES- MECHANICAL

PROJECT NO: 2022-327

NGAWN B.Y. RC

DATE: 03/15/2023

SCALE: AS NOTED

136 Poplar Street, Ambler, PA 19002
950 Route 70, Suite 102 Cherry Hill, NJ 08003

950 Route 70, Suite 102, Cherry Hill, NJ 08003
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EXHAUST FAN SCHEDULE															
TAG	TYPE	DRIVE	AREAS SERVED	AIRFLOW (CFM)	EXT. STATIC PRESSURE (IN. W.C.)	SOUND RATING (DBA / SONES)	ELECTRICAL			DIMENSIONS L x W x H (IN.)	WEIGHT (LBS)	CONTROL	BASIS OF DESIGN	MODEL	COMMENTS
							V / PH / HZ	MOTOR HP	FAN FLA						
EF-1	ROOF MTD DOWNBLAST	DIRECT	TOILET ROOMS	350	0.5	53 / 6.8	120 / 1 / 60	1/8	97 WATTS	18"Ø x 17"	46	CONSTANT OPERATION DURING OCCUPIED HOURS	LOREN COOK	90 ACE-D	1 THROUGH 5
EF-2	ROOF MTD DOWNBLAST	DIRECT	TOILET & CUSTODIAL ROOMS	350	0.5	53 / 6.8	120 / 1 / 60	1/8	97 WATTS	18"Ø x 17"	46	CONSTANT OPERATION DURING OCCUPIED HOURS	LOREN COOK	90 ACE-D	1 THROUGH 5
EF-3	ROOF MTD DOWNBLAST	DIRECT	TOILET ROOMS	200	0.5	51 / 5.9	120 / 1 / 60	1/8	77 WATTS	18"Ø x 17"	46	CONSTANT OPERATION DURING OCCUPIED HOURS	LOREN COOK	90 ACE-D	1 THROUGH 5
EF-4	ROOF MTD DOWNBLAST	DIRECT	CUSTODIAL ROOMS	300	0.5	51 / 5.9	120 / 1 / 60	1/8	77 WATTS	18"Ø x 17"	46	CONSTANT OPERATION DURING OCCUPIED HOURS	LOREN COOK	90 ACE-D	1 THROUGH 5
COMMENTS: 1. ELECTRICAL DISCONNECT SWITCH BY E. C. 2. INTEGRAL GRAVITY BACKDRAFT DAMPER 3. PRE-WIRED 120V 5A FAN SPEED CONTROLLER 4. HINGED ROOF CURB 5. ALUMINUM WHEEL															

TAG	AREA SERVED	CONFIGURATION	KW	DIMENSIONS (L x W x H)	WEIGHT (LBS)	ELECTRICAL			CONTROL	MANS OF DESIGN	MODEL	COMMENTS
						V / PH	MCA	MOCP				
WH-1	SEE DRAWINGS	FORCED WALL HEATER - SURFACE MOUNTED	1.8	16 x 5 x 20	25	120 / 1	-	15	INTEGRAL THERMOSTAT	QMARK	AWH3180	1-9, 11
WH-2	SEE DRAWINGS	FORCED WALL HEATER - SURFACE MOUNTED	1.5 - 3	16 x 5 x 20	25	208 / 1	7.2 - 14.4	15	INTEGRAL THERMOSTAT	QMARK	AWH4404	1-9, 11
CUH-1	SEE DRAWINGS	CABINET UNIT HEATER - WALL MOUNTED	3	35 x 10 x 26	-	208 / 1	-	15	INTEGRAL THERMOSTAT	QMARK	935	1-11
CUH-2	SEE DRAWINGS	CABINET UNIT HEATER - WALL MOUNTED	2	35 x 10 x 26	-	208 / 1	-	15	INTEGRAL THERMOSTAT	QMARK	935	1-11
UH-1	SEE DRAWINGS	UNIT HEATER - HUNG	3	14 x 7.5 x 16	27	208 / 1	14.5	15	INTEGRAL THERMOSTAT	QMARK	MUH03-81	1-6, 8-11
UH-2	SEE DRAWINGS	UNIT HEATER - HUNG	5	14 x 7.5 x 16	27	208 / 1	24	30	INTEGRAL THERMOSTAT	QMARK	MUH03-81	1-6, 8-11

COMMENTS:

- STANDARD FINISH AND COLOR.
- INTEGRAL DISCONNECT
- FAN DELAY SWITCH
- AIR PROVING SWITCH
- THERMAL CUTOUT
- INTEGRAL THERMOSTAT SHALL BE TAMPERPROOF
- FRONT INTAKE, FRONT DISCHARGE
- HEAVY DUTY GRILLE
- SET TO 50°F (ADJUSTABLE)
- LINE VOLTAGE THERMOSTAT SHALL BE ALLOWABLE BUT ALL WIRING SHALL STILL BE INSTALLED (OR SUBBED) BY THE M.C.
- MOUNTING BRACKETS AND HARDWARE.

HEATING BASEBOARD HEATER SCHEDULE

TAG	AREA SERVED	CONFIGURATION	BTU / HR	WATTS	DIMENSIONS (L x W x H)	WEIGHT (LBS)	ELECTRICAL			CONTROL	MANUFACTURER	MODEL	COMMENTS
							V / PH	MCA	MOCP				
EBB-1	SEE DRAWINGS	WALL MOUNT BASEBOARD CONVECTOR	5,120	1,500	72 x 3 x 6	15.5	120 / 1	12.5	15	INTEGRAL	QMARK	QMKC2516W	1 THROUGH 9
EBB-2	SEE DRAWINGS	WALL MOUNT BASEBOARD CONVECTOR	3,413	1,000	48 x 3 x 6	11.5	120 / 1	8.3	15	INTEGRAL	QMARK	QMKC2514W	1 THROUGH 9

GENERAL COMMENTS:

1. CUSTOM FINISH AND COLOR TO BE SELECTED BY THE ARCHITECT AND OWNER

2. INCLUDE ALL END CAPS, BLANK SECTIONS, CORNER PIECES, BACK PLATES, ETC FOR A CONTINUOUS INSTALLATION

3. INTEGRAL DISCONNECT

4. THERMAL CUTOFF

5. PEDESTAL MOUNT

6. LINE VOLTAGE THERMOSTAT SHALL BE ALLOWABLE BUT ALL WIRING SHALL STILL BE INSTALLED (OR SUBBED) BY THE M.C.

7. INTEGRAL THERMOSTAT SHALL BE TAMPERPROOF

8. HEAVY DUTY PENCIL PROOF GRILLE

9. BOTTOM INTAKE, TOP DISCHARGE

TAG	STYLE	AREAS SERVED	REFRIGERANT	AIRFLOW (CFM)	REFRIG. PIPING SIZE (IN.)	CONDENSATE PIPING SIZE (IN.)	INDOOR (AC)		OUTDOOR (CU)			COOLING			HEATING (AIR SOURCE HP)			ELECTRICAL		BASIS OF DESIGN	MODEL	COMMENTS
							DIMENSIONS L x W x H (IN.)	WEIGHT (LBS)	DIMENSIONS L x W x H (IN.)	WEIGHT (LBS)	SOUND RATING (DBA)	NOMINAL TONNAGE	TOTAL / MIN CAPACITY (MBH)	EER / SEER	TOTAL CAPACITY (MBH)	COP @ 47F / 17F	HSPF @ 47F	V / PH / HZ	UNIT FLA / MCA / MOCP			
AHU-1C / HP-1C	2'X2' CASSETTE	IT ROOM	R-410A	335 / 283 / 247	1/4 & 3/8	1	22.5 x 22.5 x 8.5	31	30 x 13 x 21.5	82	35	1	11.1 / -	12.6 / 19.4	14	-	10.4	208 / 1 / 60	- / 12.3 / 15	LG	LCN128HV4	1,2,3,4,5,7,8,9,11,14,15

COMMENTS:
1. 1 YEAR MANUFACTURER'S WARRANTY AND START-UP
2. 5 YEAR COMPRESSOR WARRANTY
3. UNIT MOUNTED DISCONNECT SWITCH ON OUTDOOR UNIT (BY EC)
4. SINGLE POINT POWER CONNECTION. INDOOR UNIT POWERED FROM CU
5. LOW AMBIENT CONTROL KIT. 14F MINIMUM OUTDOOR OPERATING TEMPERATURE
6. VIBRATION ISOLATION FOR OUTDOOR UNIT. KINETICS FHS OR APPROVED EQUAL. MAX 3/4" DEFLECTION
7. REFRIGERANT SIZES TO BE CONFIRMED BY EQUIPMENT MANUFACTURER
8. PROVIDE WITH INLINE CONDENSATE PUMP
9. WIRELESS PROGRAMMABLE THERMOSTAT
10. EXTENDED REFRIGERANT LINE KIT
11. CONDENSING UNIT COIL GUARD
12. WALL BRACKET KIT
13. FULLY INSULATED CABINET. VIBRATION ISOLATORS.
14. REVERSING VALVE
15. WALL MOUNTED PROGRAMMABLE THERMOSTAT

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