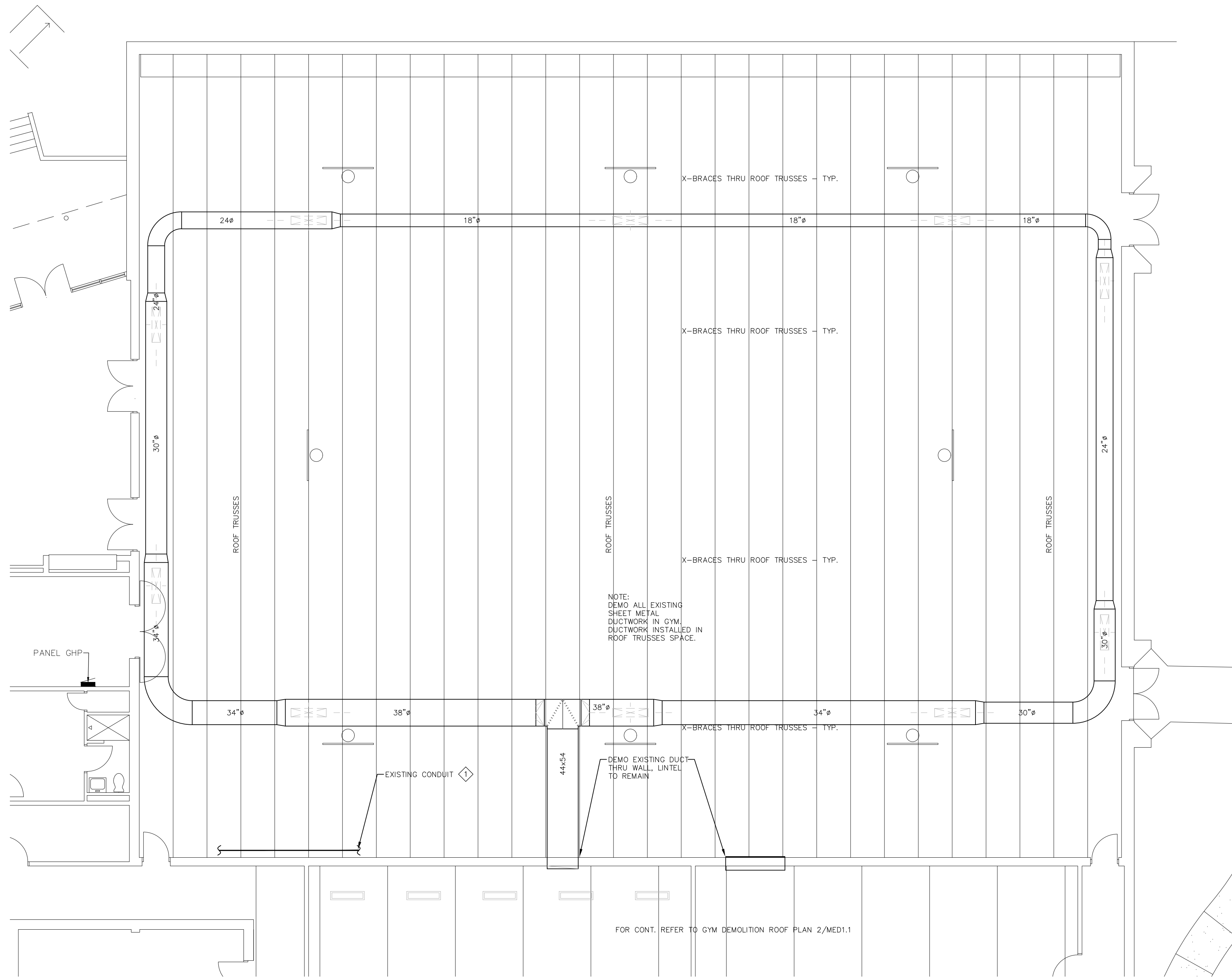
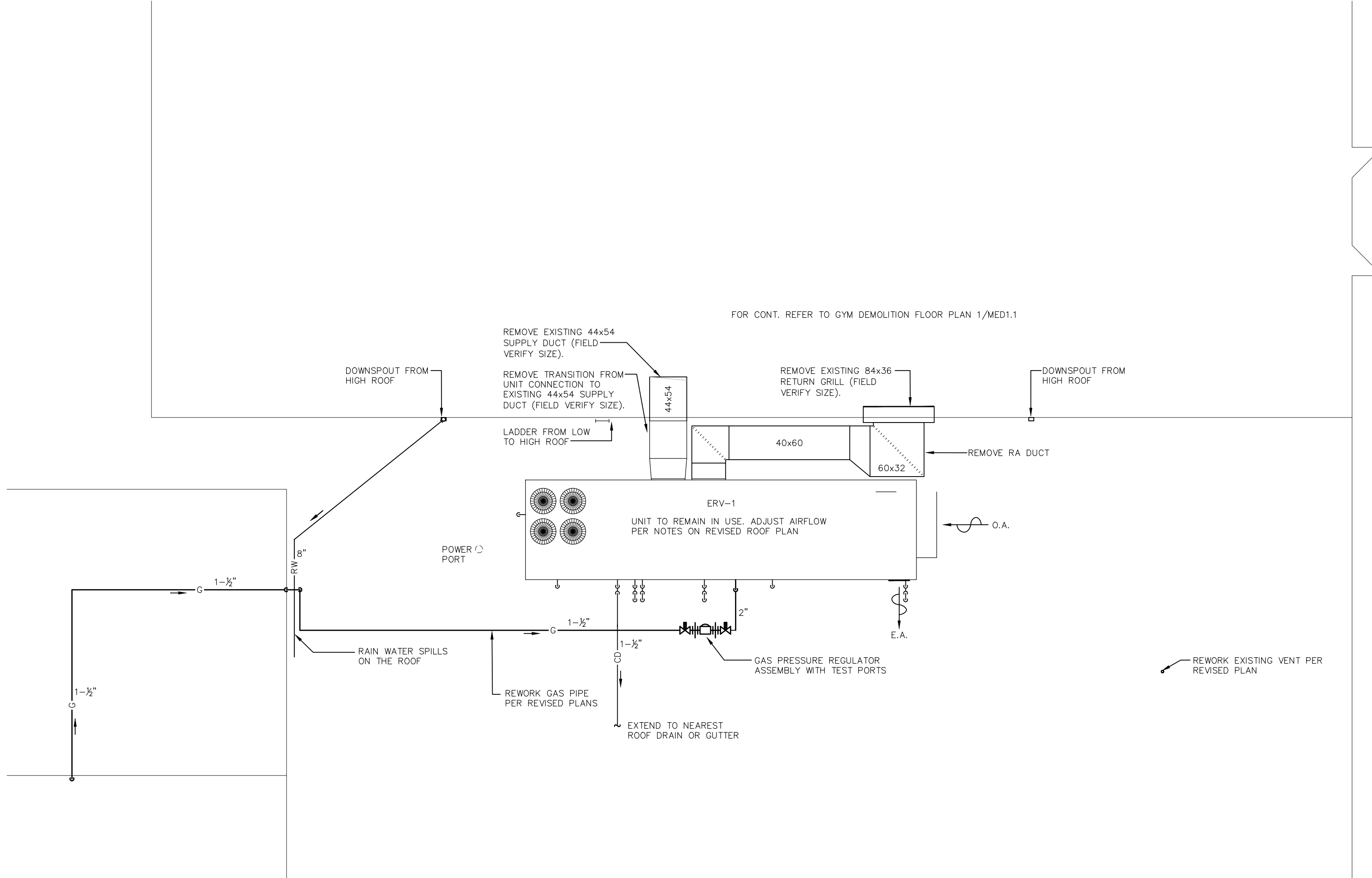




1 PLAN - GYM MECHANICAL DEMOLITION FLOOR PLAN
MED1.1 SCALE: 1/8"=1'-0"



2 PLAN - GYM MECHANICAL DEMOLITION ROOF PLAN
MED1.1 SCALE: 1/8"=1'-0"

MECHANICAL DEMOLITION & RENOVATION NOTES	
1. FOR DX UNITS INDICATED TO BE DEMOLISHED DISCONNECT AND REMOVE OUTDOOR CONDENSER AND INDOOR AIR HANDLER (WHEN APPLIED) OR PACKAGE UNIT. REMOVE PIPING & WIRING. REMOVE ALL REFRIGERANT AND CONTAINING EQUIPMENT SHALL BE DECOMMISSIONED IN ACCORDANCE WITH SECTION 608 OF THE EPA CLEAN AIR ACT AND ALL WORK SHALL BE PERFORMED BY AN EPA CERTIFIED REFRIGERANT TECHNICIAN. REFRIGERANT SHALL BE RECLAIMED INTO 125# REFRIGERANT STORAGE CYLINDERS) AND SHALL BE CLEANED AND CERTIFIED PRIOR TO BEING TURNED OVER TO THE OWNER. DOCUMENT # OF REFRIGERANT REMOVED AND # OF CERTIFIED REFRIGERANT RETURNED. THE MECHANICAL CONTRACTOR SHALL DELIVER THE REFRIGERANT TO THE OWNER AND OBTAIN A SIGNATURE OF THE RECEIVING PERSONNEL TO DOCUMENT IT BEING TURNED OVER TO THE OWNER. A COPY OF THE DOCUMENTATION SHALL BE INCLUDED IN THE PROJECT IOM MANUAL. THE MECHANICAL CONTRACTOR SHALL PROVIDE REFRIGERANT STORAGE CONTAINERS AS NECESSARY.	2. THE OWNER HAS THE FIRST RIGHT OF REFUSAL FOR ANY MATERIAL REMOVED DURING THE DEMOLITION PROCESS. ANY MATERIAL REMOVED BY THE G.C. THAT IS NOT REMAINED BY THE OWNER SHALL BE DISPOSED OF OFF SITE. 3. ALL OPENINGS IN WALLS, ROOF AND FLOORS THAT LEFT BY DEMOLITION/CONSTRUCTION OF MECHANICAL PLUMBING OR ELECTRICAL SHALL BE PATCHED AS REQUIRED BY THE CORRESPONDING CONTRACTOR TO RECEIVE NEW FINISHES MATCH TO EXISTING FIRE SEAL PENETRATIONS IN MECH. ROOM AND IN ALL FIRE RATED SURFACES. 4. CAUTION. EXISTING PIPES/EQUIPMENT MAY CONTAIN ASBESTOS INSULATION. NOTIFY OWNER IMMEDIATELY WHERE OCCUR. THE OWNER IS RESPONSIBLE TO REMOVE ASBESTOS. 5. THE MECHANICAL CONTRACTOR SHALL VISIT THE SITE AND EXAMINE EXISTING CONDITIONS PRIOR TO BIDDING. EXAMINE PROJECT DRAWINGS, DETAILS, SCHEDULES, AND SPECIFICATIONS TO DEVELOP A FULL UNDERSTANDING OF THE PROJECT SCOPE. 6. ALL DUCT SIZES WERE TAKEN FROM ORIGINAL BUILDING DRAWINGS AND FIELD OBSERVATIONS AND SHALL BE FIELD VERIFIED.

NOTES APPLY UNLESS OTHERWISE NOTED ON DRAWINGS.

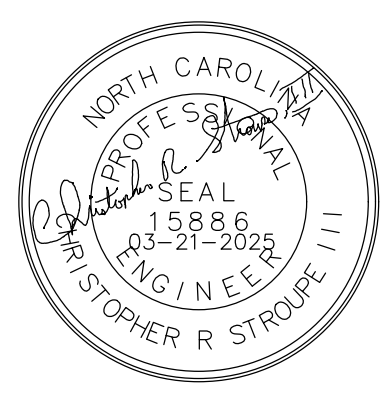
GENERAL DEMO NOTES FOR GYM
NOTES: 1. DRAIN, DISCONNECT AND DEMOLISH EXISTING INDICATING SYSTEMS WITH ALL SUPPORTS. 2. THE OWNER RESERVES THE RIGHT TO RETAIN ANY MATERIALS REMOVED. ALL MATERIALS NOT RETAINED BY THE OWNER MUST BE DISPOSED OFF OF SITE. 3. ALL OPENINGS LEFT BY DEMOLITION/CONSTRUCTION SHALL BE PATCHED AS REQUIRED TO RECEIVE NEW FINISHES. FIRE SEAL ALL WALL PENETRATIONS. 4. CAUTION. EXISTING PIPES/EQUIPMENT MAY CONTAIN ASBESTOS INSULATION. NOTIFY OWNER IMMEDIATELY WHERE OCCUR. THE OWNER IS RESPONSIBLE TO REMOVE ASBESTOS. 5. WALLS AND CEILING MAY CONTAIN LEAD PAINT. M.C. SHALL MARK ALL OPENINGS NEEDED AND HIRE CERTIFIED CONTRACTOR TO REMOVE & DISPOSE. M.C. IS RESPONSIBLE FOR ALL PATCHING.

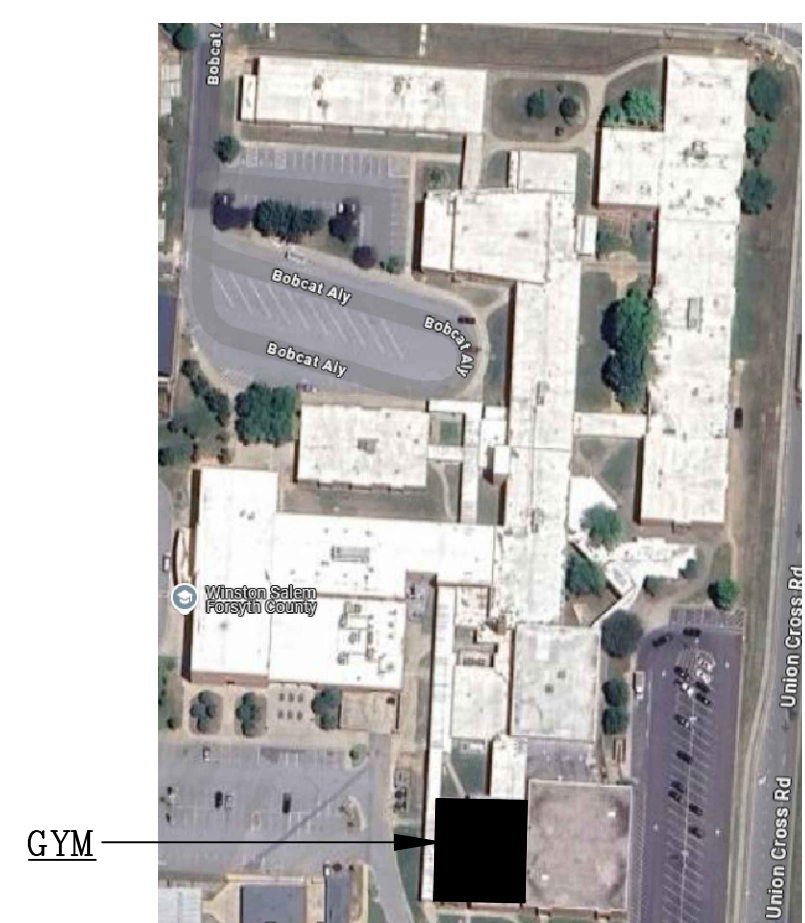
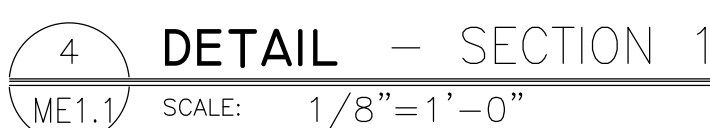
ELECTRICAL DEMOLITION NOTES 1/MED1.1
◇ E.G. TO RELOCATE EXISTING CONDUIT, WIRING AND BOXES FOR NEW DUCT OPENING. COORDINATE WORK WITH OWNER AND M.C.

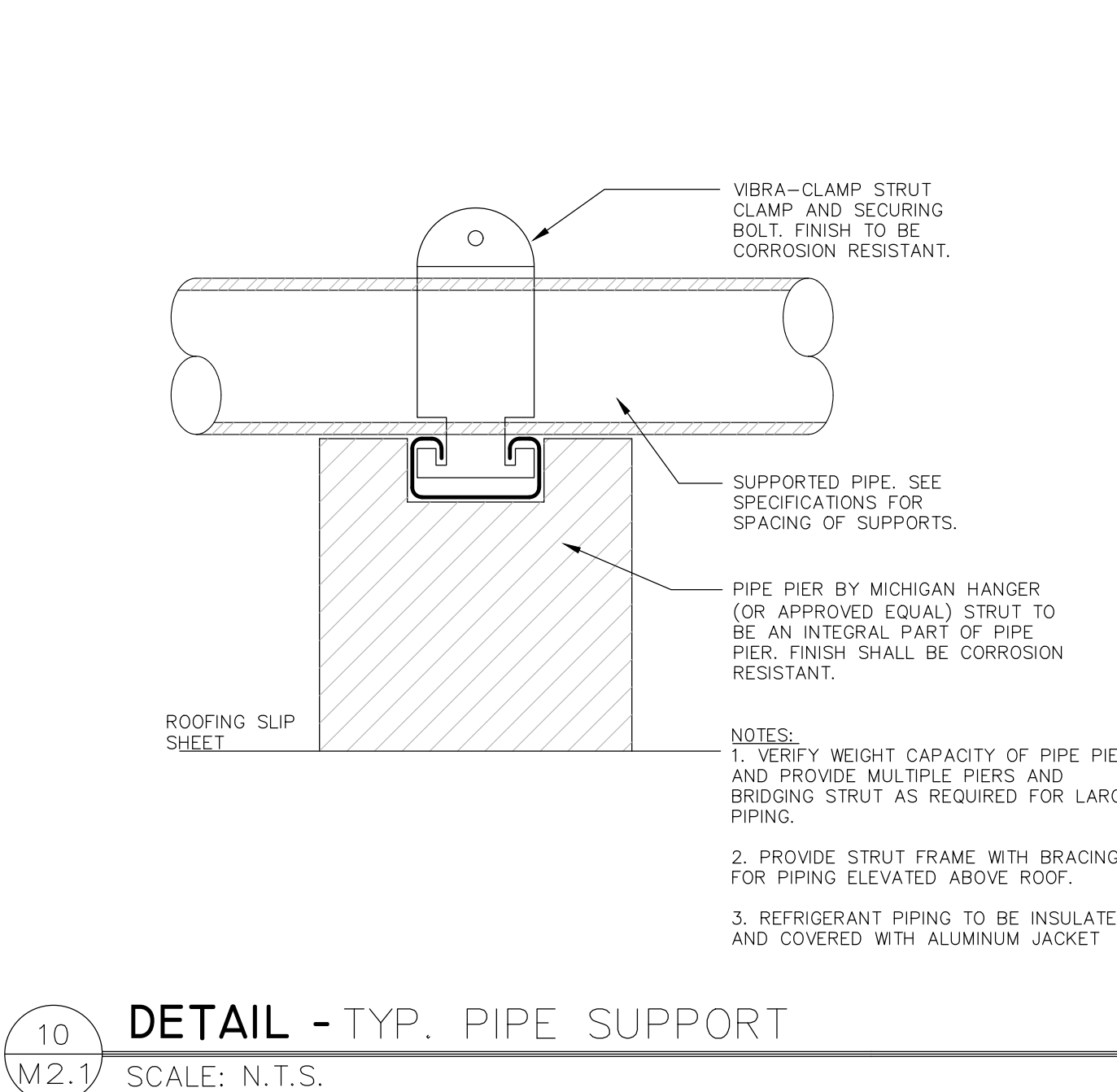
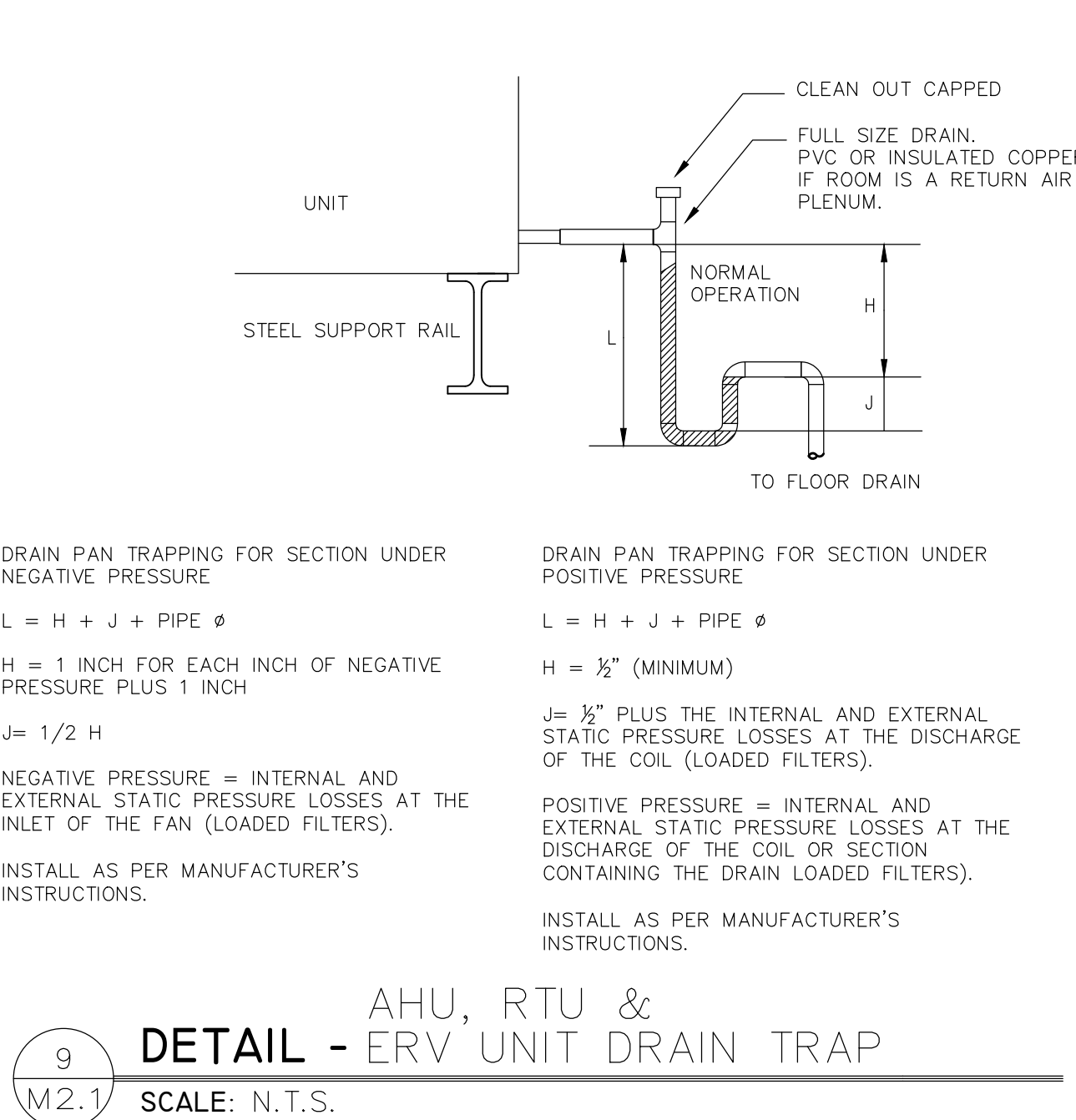
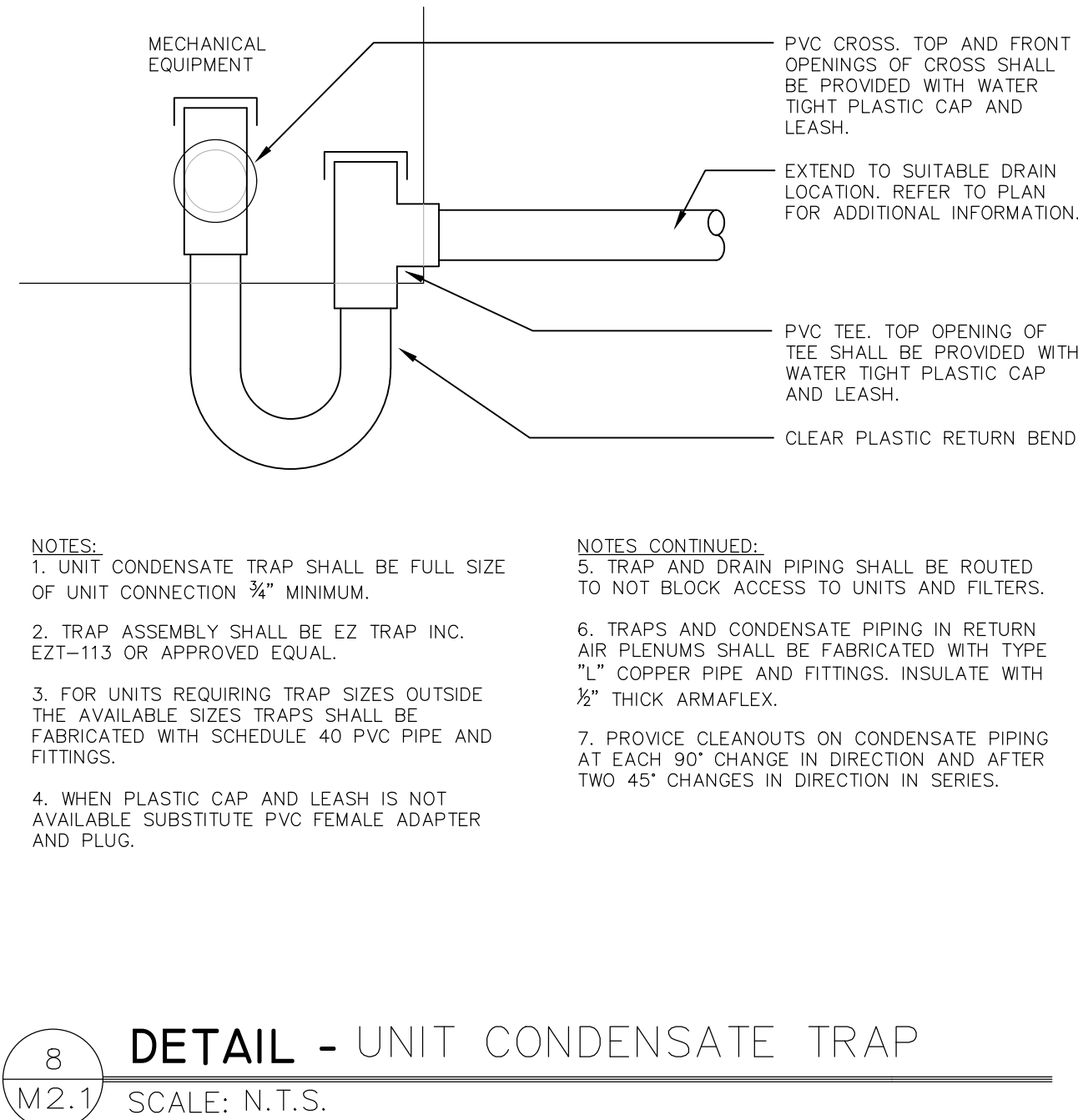
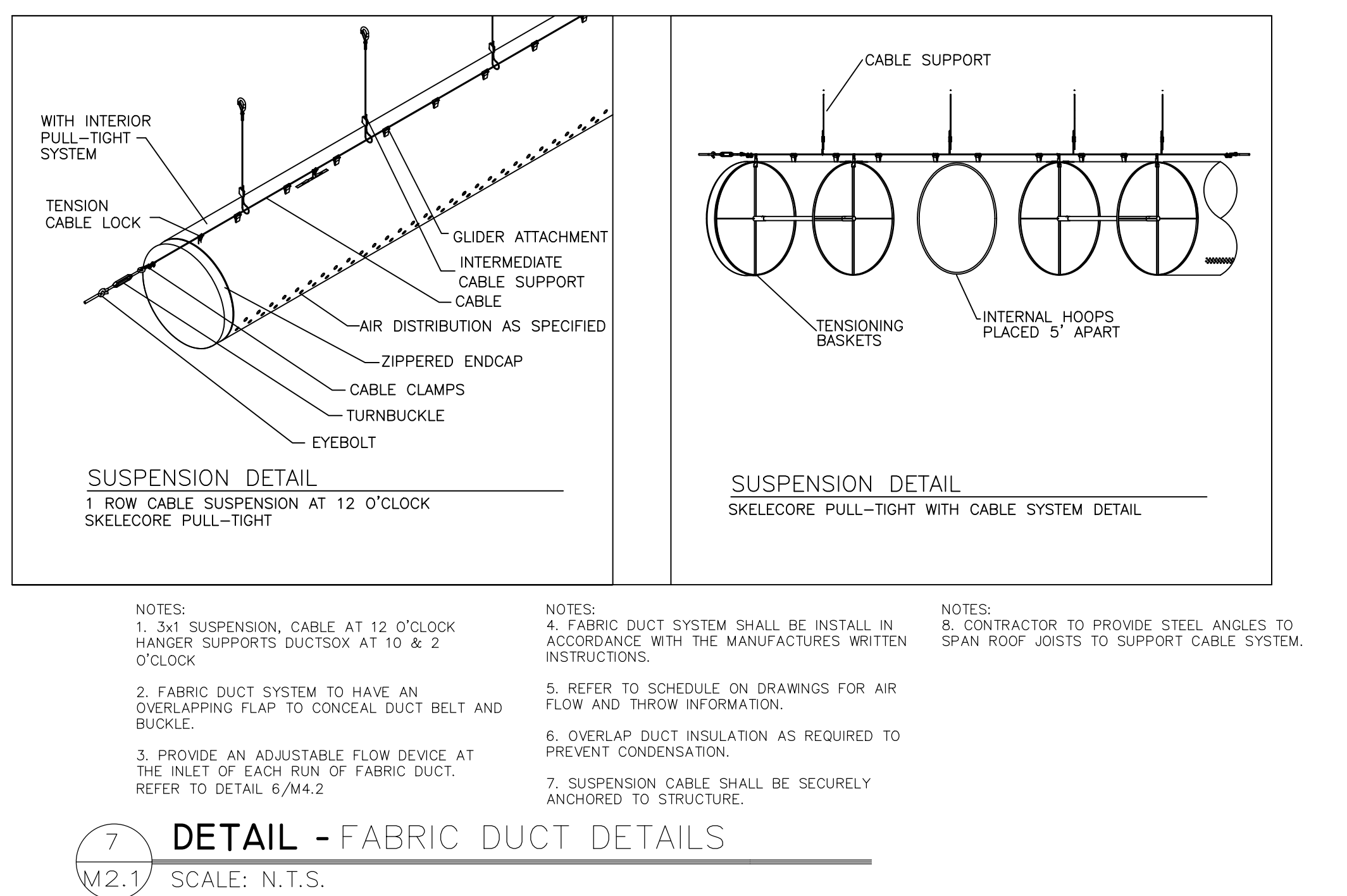
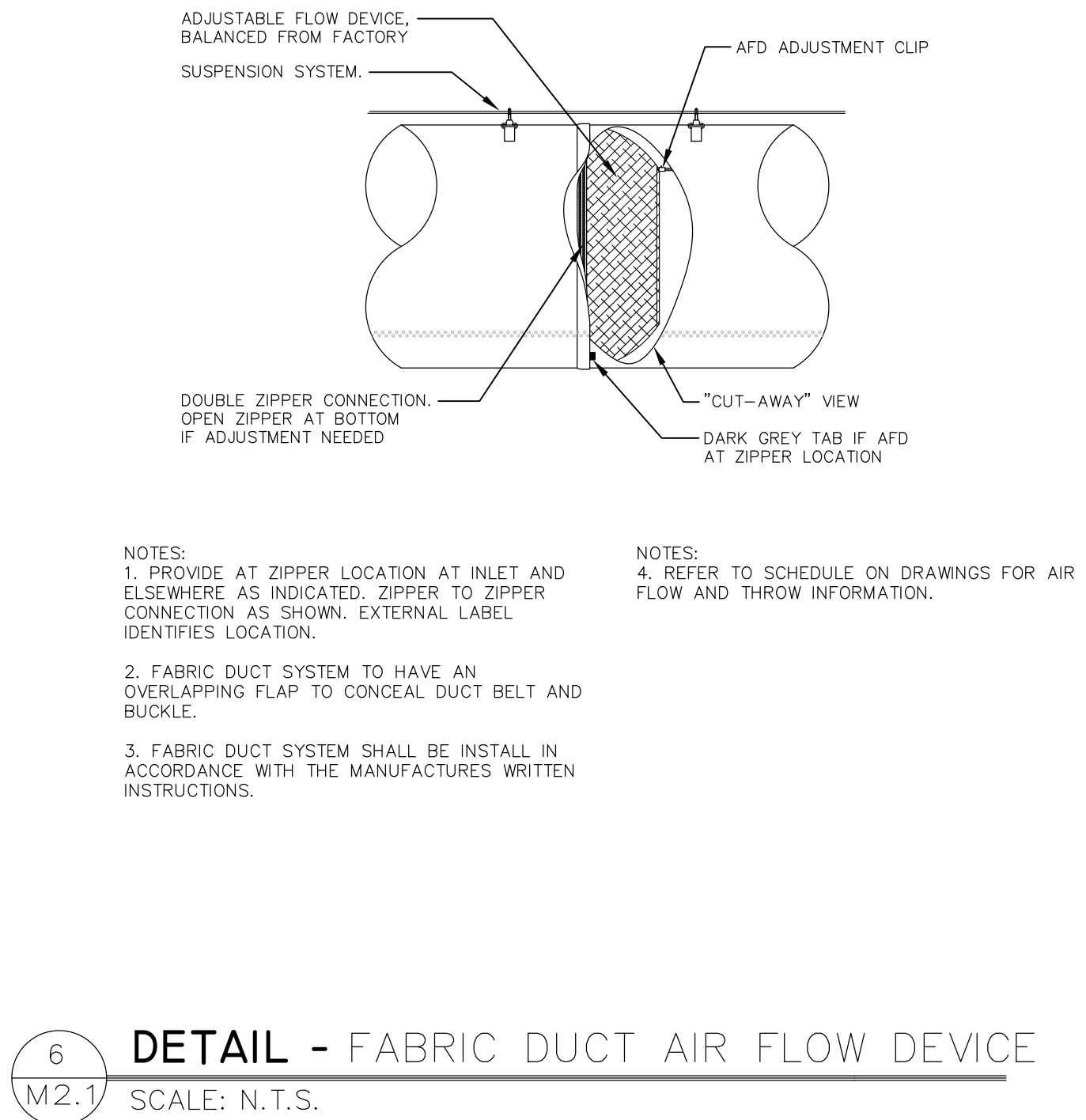
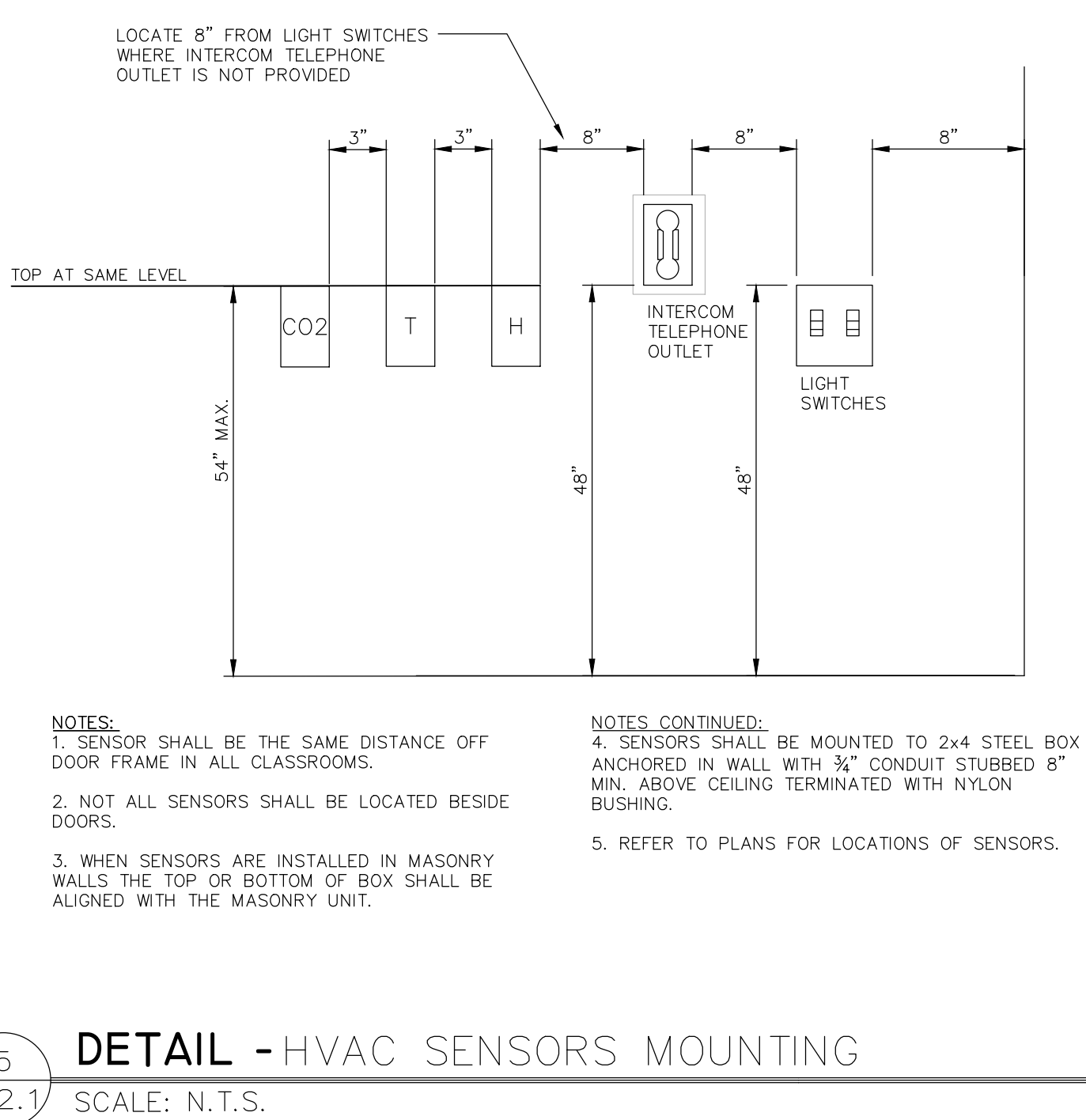
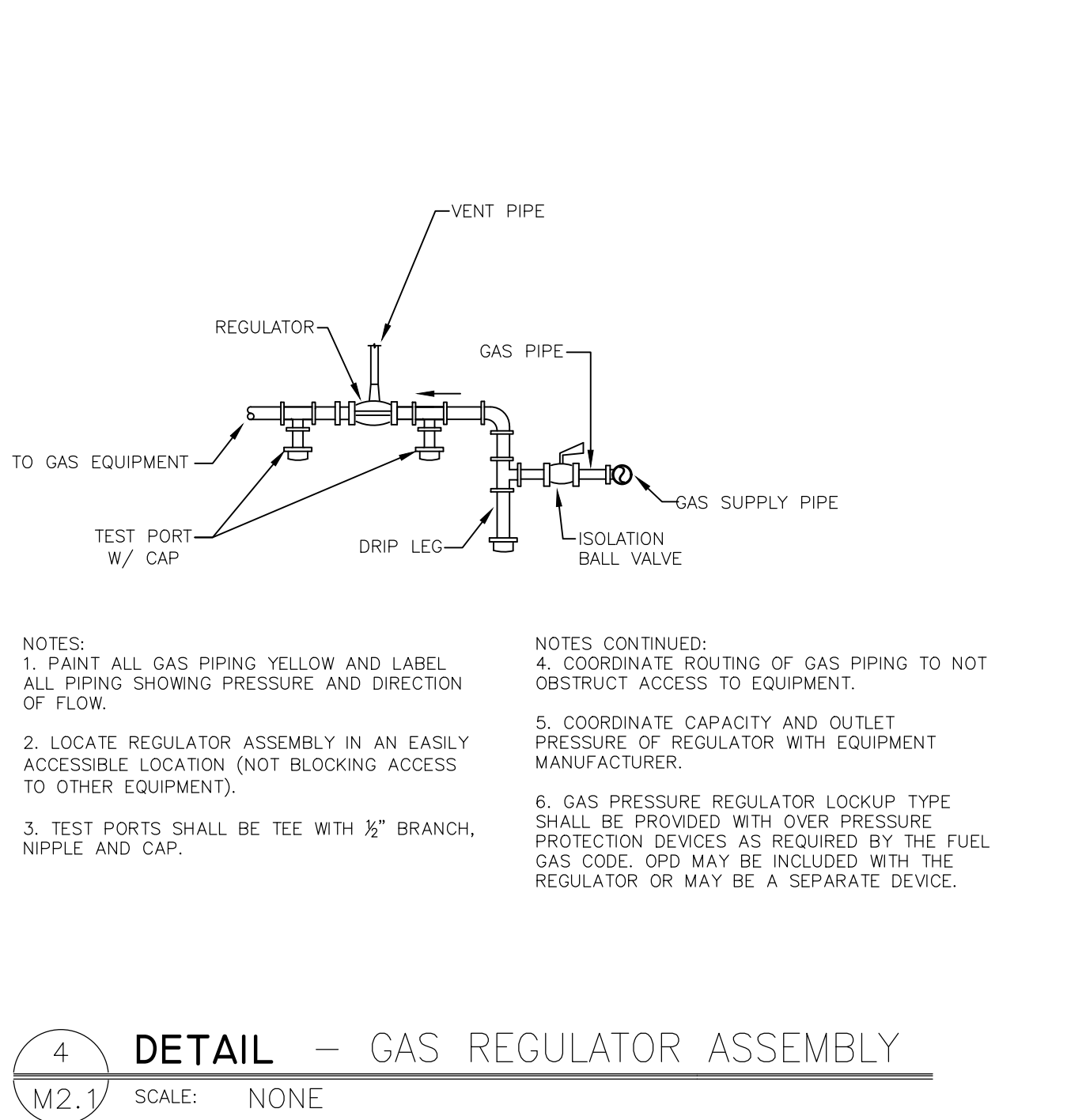
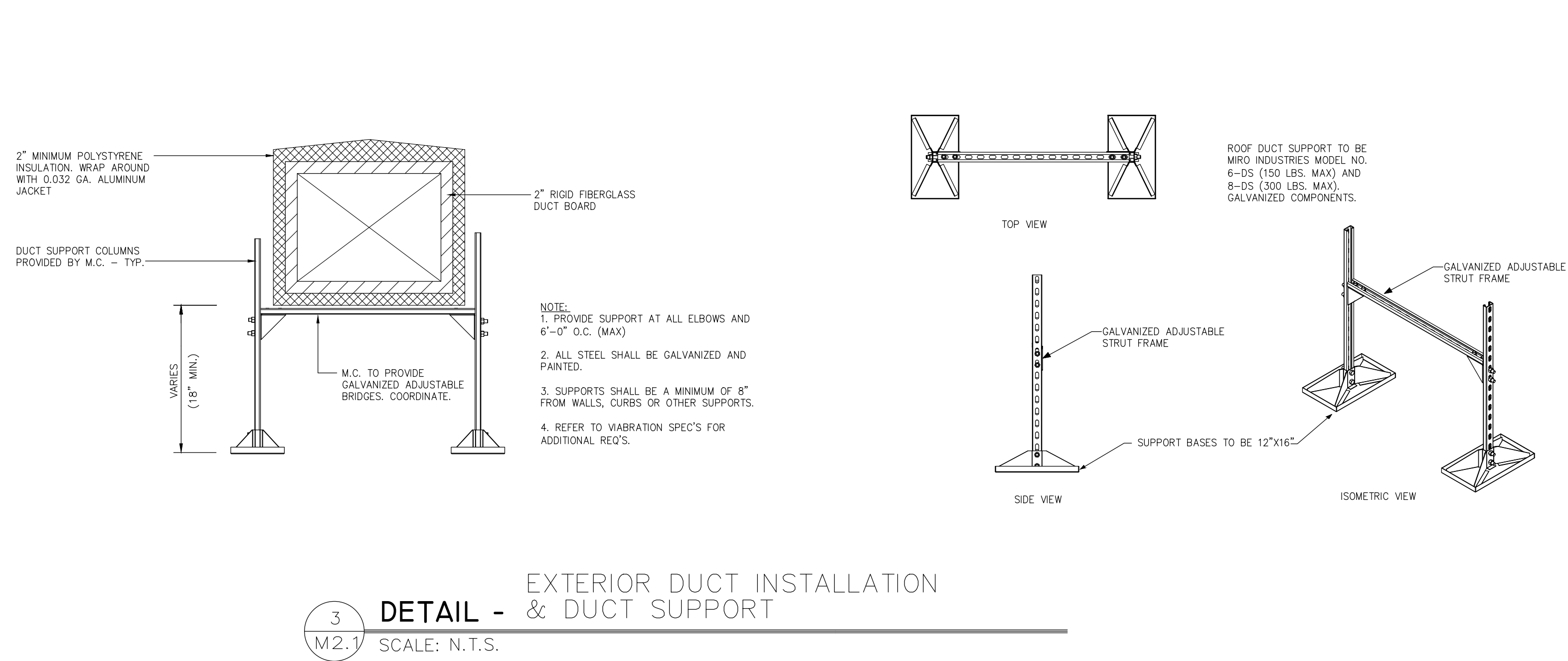
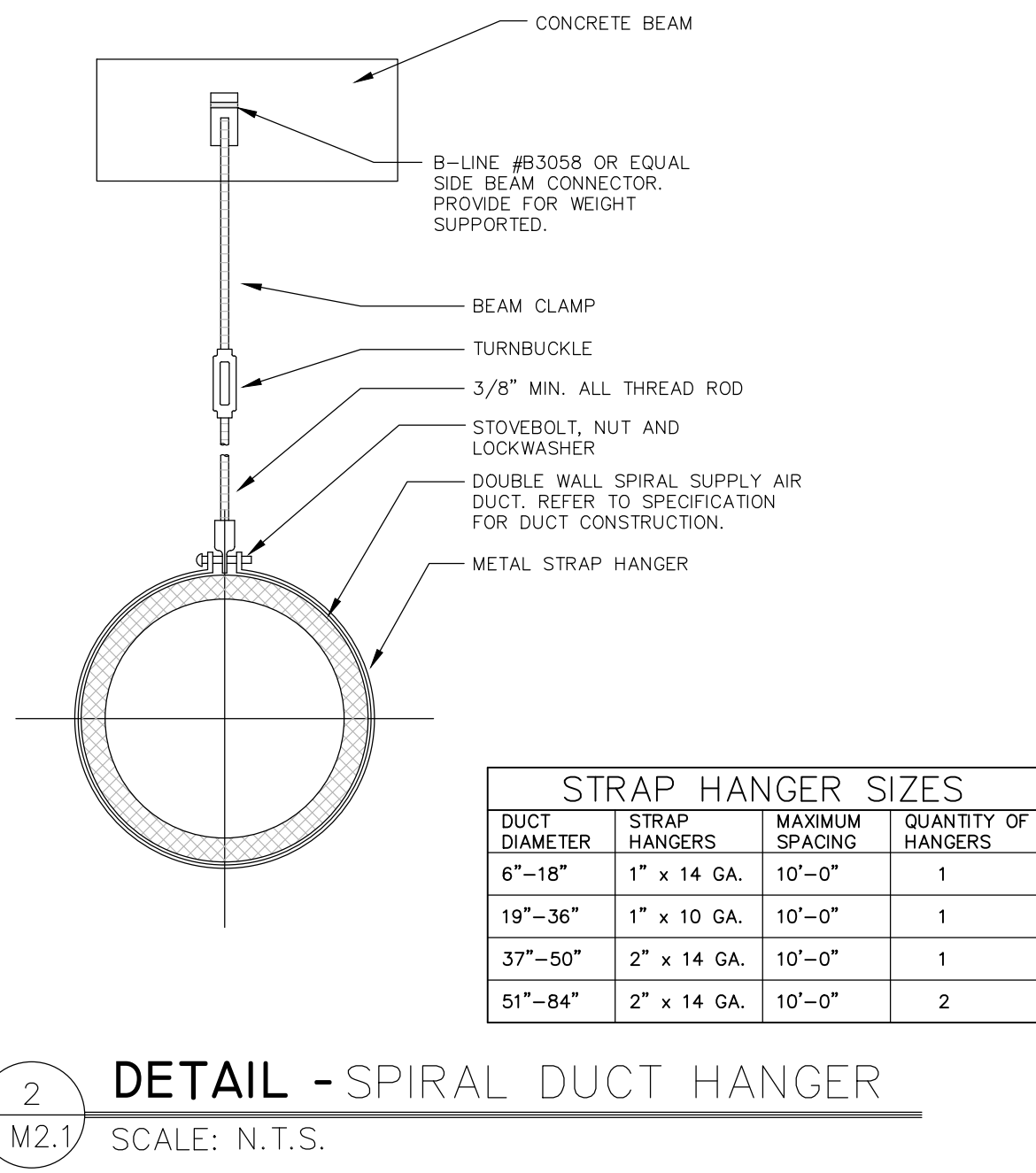
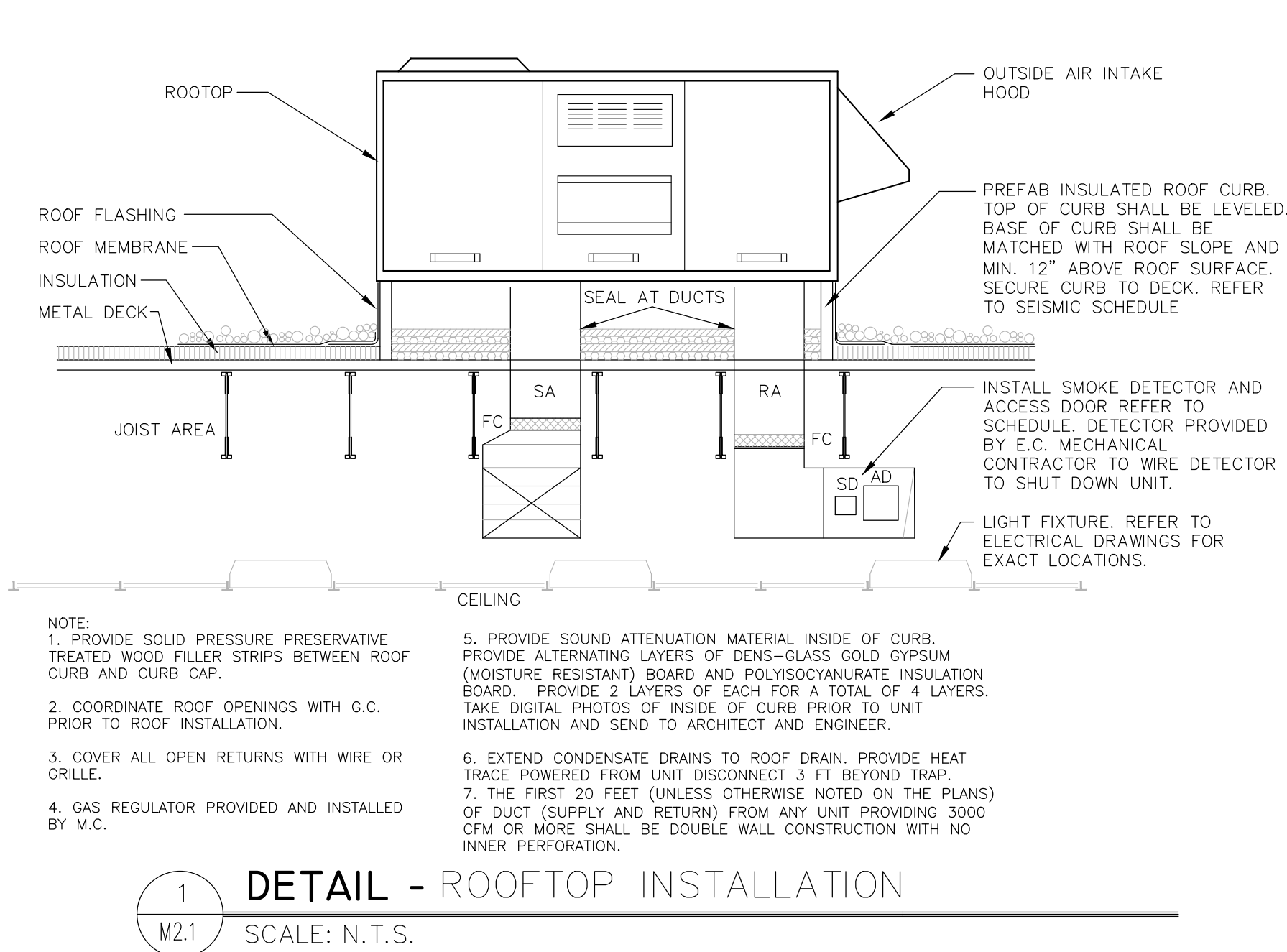


GLENN HIGH SCHOOL
FORSYTH COUNTY SCHOOL SYSTEM
GYM HVAC RENOVATION
1600 UNION CROSS RD., KERNERSVILLE, NC 27284

SHEET TITLE		DATE	
PROJECT NO. 44109		03/21/2025	
DRAWN BY ED/RH		CES LICENSE NO. F-0238	
APPROVED BY CRS			
REVISION			
REVISION			
REVISION			
SHEET NUMBER		MED1.1	







ROOFTOP PACKAGE AIR HANDLER UNIT SCHEDULE																													
PLAN IDENTITY	SERVING	MANUFACTURER	CUSTOM/PAK MODEL NO.	CFM	OA, MIN-MAX	SUPPLY FAN				EDB	EWB	DX COIL		MBH, NET	SENS, NET	HGRH MBH	NATURAL GAS HEAT				DIMENSIONS LxWxH (inches)	WEIGHT POUNDS	ELECTRICAL		REMARKS				
						QTY	ESP, INCH	HP EACH	FAN RPM			LDB	LWB				EAT	LAT	INPUT MBH	OUTPUT MBH			TURN/DOWN	VOLTAGE		MCA	MCP		
RTU-1	GYM	TRANE	YHK300	9,000	700-1400	2	1.5	3	1638	78	65	56.36	54.79	257.19	195.58	208.19	60	86.32	320	259	MEDIUM GAS	123x67x59	2,700	208/360	128	175	PACKAGED HIGH EFF. GAS ROOFTOP, 2 COMPRESSORS w/ UNILADER IN ONE, 4 STAGES, 4 ROW DX COIL, HOT GAS REHEAT, BELT DRIVEN SUPPLY FAN W/ ADJUSTABLE SHEAVES, HORIZONTAL DUCT CONNECTIONS, #410A REFRIGERANT, HINGED PANELS w/ 2" PLEATED MERV 8 FILTERS, 5/8" HEAT EXCHANGER, HAL GUARDS PROTECTION, BAGNET PROTOCOL, ECONOMIZER AND POWERED FROM UNIT FIELD INSTALLED POWER EXHAUST, 0-100% MODULATING OUTSIDE AIR DAMPER SHALL BE CONTROLLED ON SPACE CO2 SENSOR DEMAND ONLY (CO2 KIT).		
RTU-2	GYM	TRANE	YHK300	9,000	700-1400	2	1.5	3	1638	78	65	56.36	54.79	257.19	195.58	208.19	60	86.32	320	259	MEDIUM GAS	123x67x59	2,700	208/360	128	175			

NOTES:
AFMS - AIRFLOW MONITORING STATION
1. PROVIDE THE FOLLOWING WARRANTIES:
* 12 MONTHS AFTER START-UP COMPLETE PARTS
* REFER TO SPECS FOR ADDITIONAL WARRANTY REQUIREMENTS
2. FAN SAFETY SWITCHES (KILL SWITCHES) ON FAN ACCESS DOORS. INTERLOCKED DOOR HANDLES WITHIN 6 FT FROM ROOF SURFACE - CURB HEIGHT OR PLATFORM SHALL BE TAKEN INTO CONSIDERATION.
3. FACTORY START-UP
4. GFI RECEPTACLE FOR EACH UNIT WITHIN 20 FT.
5. FUSED DISCONNECT
6. ALL UNITS TO HAVE FACTORY OR FIELD INSTALLED BI-POLAR IONIZATION DEVICE.

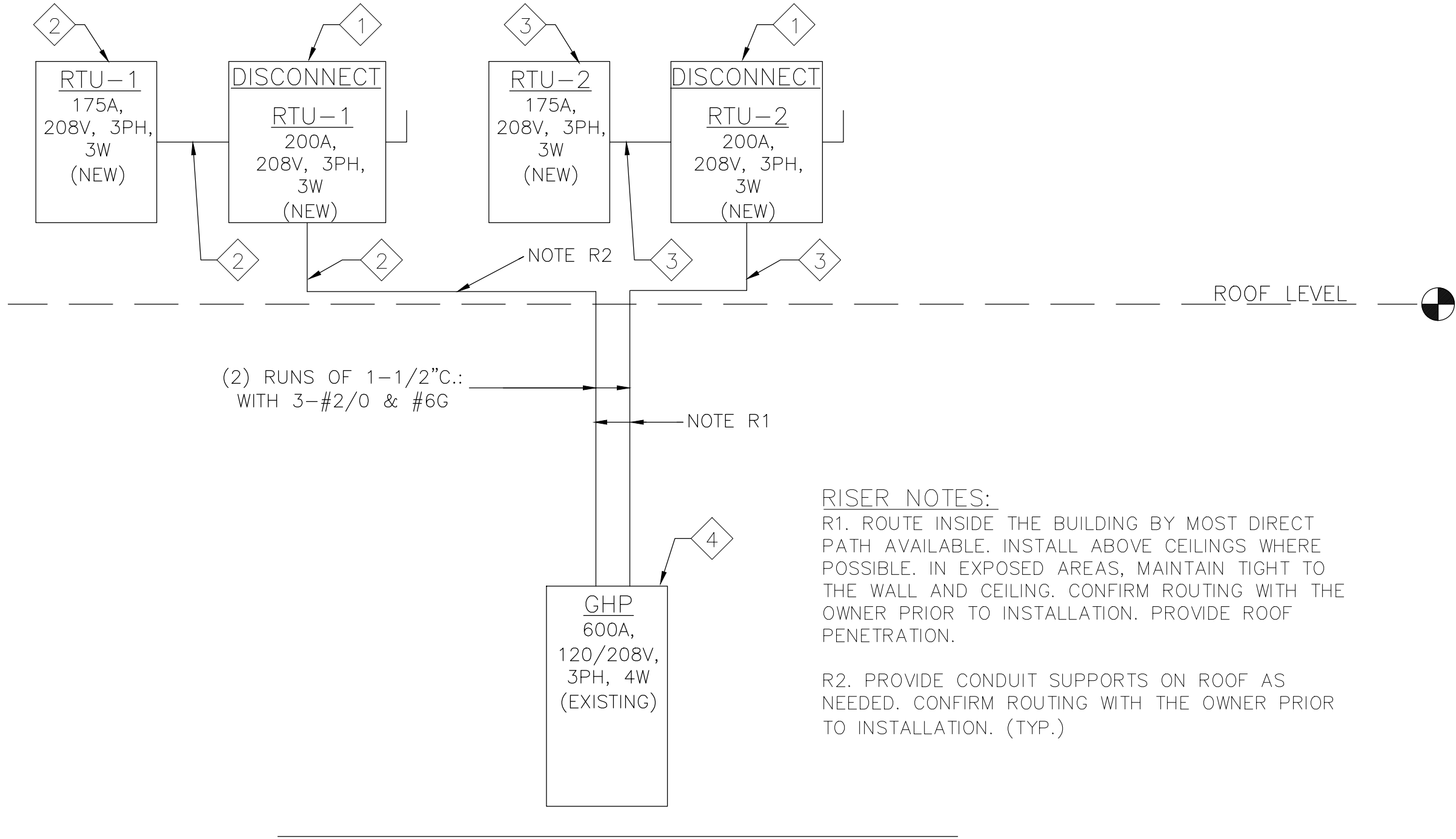
GRILLE, REGISTER & DIFFUSER SCHEDULE							
PLAN DESIGNATION	MANUFACTURER	MODEL	SERVICE	BLOW	DAMPER	FINISH	FINISH
K	PRICE	AHCD1D	SUPPLY	---	---	WHITE	
ALUMINUM ADJUSTABLE HIGH CAPACITY DRUM LOUVER, MOUNTING FRAME W/ COUNTER SUNK HOLES							
L	PRICE	95	RETURN	---	---	WHITE	
STEEL HEAVY DUTY GYM GRILLE, 3/4 BLADE SPACING, 0° DEFLECTION, L BLADES ORIENTATION, CONCEALED MOUNTING							

1. PROVIDE ADDITIONAL T-BAR MATCHING GRID SYSTEM FOR LAY-IN GRID SYSTEM.
2. PROVIDE SQUARE TO ROUND TRANSITIONS FOR GRILLES WITH SQUARE NECK.
3. ALL PLENUM RETURN GRILLES TO HAVE ELBOW WITH 12" LENGTH DUCT TO SCREEN STRUCTURES IN CEILING SPACE, INTERNALLY LINED AND PAINTED BLACK.
4. COORDINATE FINISH WITH ARCHITECT.
5. M.C. SHALL COORDINATE GRILLE SUBMITTAL W/ ARCH. FINISH SCHEDULE & REFLECTED CEILING PLAN.

ION GENERATORS					
PLAN IDENTITY	MANUFACTURER	MODEL	CFM	VOLTAGE	POWER
APD	GLOBAL PLASMA SOLUTIONS	GPS-FC	VARRIER	24 VAC	12 VA

THE DEVICE SHALL BE INSTALLED IN EACH UNIT WHERE IT'S CALLED:
1. INSTALL ION GENERATOR INSIDE INDOOR UNIT BETWEEN FILTER AND COIL.
2. ION GENERATOR SHALL BE POWERED FROM 24V FAN CONTROL POWER.
3. FAULT RESET SHALL BE AUTOMATIC. MANUAL FUSE REPLACEMENT WILL NOT BE ACCEPTED.
4. MODEL VARIANTS BASED ON AIRFLOW. COORDINATE WITH VENDOR.

GAS METER LOADS, MBH	
2 PSI PRESSURE	
ERV-1	530
RTU-1	320
RTU-2	320
TOTAL	1,170



RISER NOTES:
R1. ROUTE INSIDE THE BUILDING BY MOST DIRECT PATH AVAILABLE. INSTALL ABOVE CEILINGS WHERE POSSIBLE. IN EXPOSED AREAS, MAINTAIN TIGHT TO THE WALL AND CEILING. CONFIRM ROUTING WITH THE OWNER PRIOR TO INSTALLATION. PROVIDE ROOF PENETRATION.
R2. PROVIDE CONDUIT SUPPORTS ON ROOF AS NEEDED. CONFIRM ROUTING WITH THE OWNER PRIOR TO INSTALLATION. (TYP.)

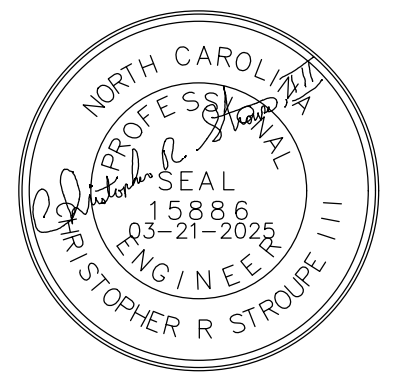
ELECTRICAL RISER NOTES 2/ME3.1

- ◇ E.C. SHALL PROVIDE AND INSTALL NEW 200AMP, 3 PHASE, 3 WIRE, NGR, 250V, HEAVY DUTY, FUSED DISCONNECT, FUSED AT 175 AMP.
- ◇ E.C. SHALL INSTALL NEW BRANCH CIRCUIT FOR RTU-1 AS FOLLOWS: INSTALL A 1-1/2" CONDUIT FROM PANEL GHP TO RTU-1 DISCONNECT WITH 3/2" & 1/2" THIN WIRE, AND FROM RTU-1 DISCONNECT TO RTU-1 UNIT WITH 3/2" & 1/2" THIN WIRE IN A 1" CONDUIT, CONNECT TO 175AMP BREAKER IN PANEL GHP. MAKE ALL FINAL TERMINATIONS ON BREAKER. RTU-1 UNIT DISCONNECT SWITCH AND RTU-1 UNIT MAKE FINAL CONNECTION WITH SEALTIGHT FLEX. COORDINATE THIS WORK WITH M.C.
- ◇ E.C. SHALL INSTALL NEW BRANCH CIRCUIT FOR RTU-2 AS FOLLOWS: INSTALL A 1-1/2" CONDUIT FROM PANEL GHP TO RTU-2 DISCONNECT WITH 3/2" & 1/2" THIN WIRE, AND FROM RTU-2 DISCONNECT TO RTU-2 UNIT WITH 3/2" & 1/2" THIN WIRE IN A 1" CONDUIT, CONNECT TO 175AMP BREAKER IN PANEL GHP. MAKE ALL FINAL TERMINATIONS ON BREAKER. RTU-2 UNIT DISCONNECT SWITCH AND RTU-2 UNIT MAKE FINAL CONNECTION WITH SEALTIGHT FLEX. COORDINATE THIS WORK WITH M.C.
- ◇ E.C. SHALL INSTALL A NEW 175/3 AMP Eaton/CB BREAKERS IN EXISTING GHP FOR SERVICE TO NEW PANEL RTU-1 & 2 ON ROOF. E.C. TO PROVIDE BREAKER AND HARDWARE, MATCH EXISTING AIC RATING OF BREAKERS.

1
ME3.1

DETAIL - NEW RISER DIAGRAM

SCALE: N.T.S.



MECHANICAL SPECIFICATIONS

1. GENERAL REQUIREMENTS: MECHANICAL CONTRACTOR SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, FEES, AND PERMITS REQUIRED FOR AND REASONABLY INCIDENTAL TO THE EXECUTION OF THE MECHANICAL WORK.

THE WORD "PROVIDE" AS USED ON THESE DRAWINGS AND IN THESE SPECIFICATIONS SHALL MEAN TO FURNISH OR INSTALL. THE WORD "COORDINATE" AS USED ON THESE DRAWINGS AND IN THESE SPECIFICATIONS SHALL MEAN THE MECHANICAL CONTRACTOR, THE WORD ENGINEER AS USED ON THESE DRAWINGS AND IN THESE SPECIFICATIONS SHALL MEAN CONSULTANT ENGINEERING SERVICE, INC.

2. MEASUREMENTS: BEFORE ORDERING ANY MATERIAL OR DOING ANY WORK, CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AT THE SITE AND SHALL BE RESPONSIBLE FOR THE CORRECTNESS OF SAME. NO EXTRA CHARGE FOR COMPLETION WILL BE ALLOWED ON ACCOUNT OF DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND THE MEASUREMENTS INDICATED ON THE DRAWINGS. ANY DIFFERENCE WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE ENGINEER, FOR CONSIDERATION BEFORE PROCEEDING WITH THE WORK.

3. CONFORMANCE TO SPECIFICATIONS AND SUBMITTAL OF MATERIALS: THE DRAWINGS ARE BASED ON THE FIRST MANUFACTURE LISTED IN THE SCHEDULE AND/OR SPECIFICATIONS. CONTRACTOR SHALL BEAR ANY COSTS FOR ALTERATIONS REQUIRED TO ANY OTHER CONTRACT OR SUB-CONTRACT RESULTING FROM A SUBSTITUTION OF MATERIAL AND/OR EQUIPMENT FOR THAT SPECIFIED OR ON WHICH THE DRAWINGS AND/OR SPECIFICATIONS ARE BASED.

4. REGULATIONS AND CODES: ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH NORTH CAROLINA STATE BUILDING CODE MECHANICAL, ENERGY, FUEL GAS AND LOCAL BUILDING CODES.

5. EXAMINATION OF SITE: BEFORE SUBMITTING A PROPOSAL, THE CONTRACTOR SHALL EXAMINE THE SITE, FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS AND OBTAIN SUCH INFORMATION AS IS REQUIRED TO ENABLE HIM TO CARRY OUT INSTALLATION. THE CONTRACTOR SHALL COMPLY WITH THIS REQUIREMENT WILL NOT RELIEVE HIM OF THE RESPONSIBILITY OF ANY ERRORS WHICH MIGHT HAVE BEEN AVOIDED BY HIS COMPLIANCE.

6. STANDARDS OF MATERIALS: ALL MATERIALS USED SHALL BE NEW UNLESS OTHERWISE SHOWN OR CALLED FOR, AND SHALL BE FURNISHED IN ACCORDANCE WITH STANDARD SPECIFICATIONS OF SAME. ALL TESTING MATERIALS, SUCH AS CONCRETE, THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, THE AMERICAN CONCRETE INSTITUTE, AND OTHER GUIDE SPECIFICATIONS.

7. APPROVAL: WHEREVER THE WORDS "OR EQUAL" OR "APPROVED" OR "APPROVAL" ARE USED, THEY SHALL MEAN "OR EQUAL APPROVED BY THE ARCHITECTS AND ENGINEERS" OR "APPROVED BY THE ARCHITECTS AND ENGINEERS" OR "APPROVAL OF THE ARCHITECTS AND ENGINEERS". ALL MAJOR EQUIPMENT AND MATERIAL MUST BE PRE-APPROVED DURING THE BID PROCESS. ALL SUBSTITUTION REQUESTS MUST BE SUBMITTED AT LEAST TWO (2) WEEKS PRIOR TO BID OPENING SO THAT THEY MAY BE INCLUDED IN AN ADDENDUM. IF ITEMS ARE NOT PUBLISHED IN AN ADDENDUM, THEY WILL NOT BE CONSIDERED DURING THE SUBMITTAL PROCESS. ALL SUBSTITUTION REQUESTS MUST BE PROVIDED BY A BONA FIDE BIDDER, NOT A VENDOR.

8. DIAGRAMS AND COORDINATION: THE DRAWINGS ARE DIAGRAMMATIC AND SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. THE DRAWINGS INDICATE OFFSETS REQUIRED, BUT BY NO MEANS INDICATE ALL SUCH SITUATIONS. DO NOT SCALE THESE DRAWINGS.

9. COORDINATION DRAWINGS: CONTRACTOR SHALL OBTAIN ACTUAL STEEL LAYOUT FROM GENERAL CONTRACTOR AND USE THIS INFORMATION TO PROVIDE MINIMUM 1/4"=1'-0" COORDINATION DRAWINGS PRIOR TO BEGINNING WORK. COORDINATE SPACE REQUIRED FOR DUCT WITH THE GENERAL CONTRACTOR PRIOR TO FABRICATION OF STEEL.

10. SHOP DRAWINGS: SHOP DRAWINGS OF ALL EQUIPMENT, MATERIALS, OR FABRICATED WORK SHALL BE SUBMITTED FOR APPROVAL. FOUR (4) SETS OF SUCH PRINTS MUST BE PRESENTED, AND NO WORK SHALL BE DONE UNTIL SUCH APPROVAL HAS BEEN OBTAINED. ADDITIONAL COPIES SHALL BE PHOTOCOPIED OR MARKED UP BY THE CONTRACTOR. THE APPROVAL OF SHOP DRAWINGS WILL BE GENERAL AND SHALL NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY FOR ANY ERROR WHICH MAY EXIST. MANY EXISTING ITEMS WILL REQUIRE FIELD MEASUREMENT. ENGINEER WILL NOT BE RESPONSIBLE FOR DIMENSIONS. A. THE CONTRACTOR OPTION SUBMITTALS MAY BE SUBMITTED ELECTRONICALLY IN PDF FORM.

11. PROTECTION OF EQUIPMENT: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK DAMAGED BY HIMSELF DURING THE COURSE OF HIS WORK. ALL WORK DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED BY HIM AND PLACED IN ORIGINAL WORKING CONDITIONS WITHOUT EXTRA COST. ANY CONSTRUCTION WORK DAMAGED SHALL BE MADE GOOD BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TIMES BE RESPONSIBLE FOR ANY DAMAGED EQUIPMENT OR WORK IN CONJUNCTION WITH EXECUTING CONTRACT. ALL EQUIPMENT THAT WAS WORKING PRIOR TO CONSTRUCTION SHALL BE MADE GOOD BY THE CONTRACTOR UNLESS THE ENGINEER IS NOTIFIED IN WRITING PRIOR TO THE START OF CONSTRUCTION.

12. PROTECTION OF PEOPLE: THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE G.C. AND/OR PROVIDING TEMPORARY FENCING, INSTALLING WARNING TAPE, INSTALLING BARRICADES, FLAG PERSONS, ETC. AS REQUIRED TO ENSURE THE SAFETY OF THE VISITORS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR IDENTIFYING AND INSTALLING ALL NECESSARY SAFETY MEASURES. DO NOT REMOVE OR INSTALL ANY ROOF TOP EQUIPMENT WHEN THE BUILDING IS OCCUPIED.

13. CLEANING-UP: THE CONTRACTOR SHALL KEEP THE PREMISES AND POINTS AT THE BUILDING FREE OF RUBBISH AND WASTE MATERIAL DUE TO THE INSTALLATION OF WORK INCLUDED IN THIS SPECIFICATION AND SHOWN ON THE PLANS. AFTER COMPLETION OF THE WORK AND ALL TESTS HAVE BEEN MADE, THE CONTRACTOR SHALL REMOVE ALL RUBBISH INCIDENTAL TO CONTRACT AND SHALL LEAVE ALL PORTIONS OF THE WORK IN A CLEAN CONDITION.

14. INSPECTIONS: THE CONTRACTOR MUST AT ALL TIMES LEND ANY ASSISTANCE NECESSARY FOR ENGINEERS OR THEIR AUTHORIZED REPRESENTATIVE TO MAKE TESTS, INSPECTIONS, ETC.

15. WORKMANSHIP: ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED AND COMPLETED IN A FIRST CLASS WORKMANLIKE MANNER. THE ENGINEERS RESERVE THE RIGHT TO REJECT ANY DAMAGED EQUIPMENT OR MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF ANY ITEM, WHICH IN THEIR OPINION SHALL NOT REPRESENT ACCEPTABLE WORKMANSHIP. SUCH REMOVAL AND REPLACEMENT SHALL BE DONE WHEN DIRECTED IN WRITING BY THE ENGINEERS AT THE CONTRACTOR'S EXPENSE AND WITHOUT ADDITIONAL COST TO THE OWNERS.

16. COORDINATION: THE MECHANICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH THAT OF ALL OTHER TRADES PRIOR TO THE INSTALLATION OF ANY OF HIS EQUIPMENT, DUCT, PIPING, CONTROLS, ETC.

17. OPENINGS, CUTTING AND PATCHING: VARIOUS OPENINGS, CUTTING AND PATCHING WILL BE REQUIRED FOR THE INSTALLATION OF THE MECHANICAL WORK, AND THE MECHANICAL CONTRACTOR SHALL COORDINATE SUCH WORK WITH THE GENERAL CONTRACTOR AND INCLUDE IN HIS BID AS DIRECTED. RESTORE AREAS AFFECTED BY SUCH WORK TO MATCH ADJACENT OR SURROUNDING SURFACES.

THE CUTTING OF OPENINGS OR HOLES IN WALLS AND CUTTING OF HOLES IN FLOORS AND CEILINGS SHALL BE DONE IN A MANNER AS NOT TO ENDANGER THE STABILITY OF THE STRUCTURE OR ANY PART THEREOF, AND ANY SUCH WORK SHALL BE COORDINATED WITH OTHER TRADES PRIOR TO BEGINNING WORK. ALL ADDITIONAL WORK REQUIRED TO CONCEAL MECHANICAL WORK WILL BE PROVIDED BY GENERAL CONTRACTOR.

18. OPERATING INSTRUCTIONS: AT THE COMPLETION OF THE WORK THE CONTRACTOR SHALL FURNISH OWNER (3) COMPLETE BOOKLETS CONTAINING ENGINEERING DATA AND CUTS OF ALL EQUIPMENT ALONG WITH TYPED OR PRINTED OPERATING INSTRUCTIONS. ALSO INCLUDE APPROVED SUBMITTAL DATA. BOOKLETS SHALL BE 3 RING BINDERS WITH SPINE LABEL AND TABLE OF CONTENTS AND ARE SUBJECT TO APPROVAL. THE CONTRACTOR SHALL PROVIDE A COMPETENT INSTRUCTOR TO ADVISE THE OWNER OR HIS REPRESENTATIVE OF THE PROPER OPERATION AND SERVICING OF EQUIPMENT INSTALLED.

GENERAL NOTES

1. NOT ALL SYMBOLS AND ABBREVIATIONS SHOWN ON THIS DRAWING MAY BE USED FOR THIS PROJECT.
2. UNLESS OTHERWISE NOTED, EACH TRADE CONTRACTOR IS RESPONSIBLE FOR CUTTING, PATCHING TO MATCH, CORE DRILLING AND AS REQUIRED TO INSTALL HIS WORK.
3. ALL CONTRACTORS SHALL COORDINATE HIS WORK WITH THE WORK OF OTHER TRADES.
4. SLEEVE AND SEAL ALL PIPING PENETRATIONS THRU ALL FIRE RATED ASSEMBLIES IN ACCORDANCE WITH UL LISTED SYSTEMS. ALL CORRIDOR WALLS SHALL BE ASSUMED TO HAVE A ONE HOUR RATING UNLESS NOTED OTHERWISE.
5. SLEEVE AND SEAL ALL PIPING PENETRATIONS THRU ALL NON-RATED ASSEMBLIES TO REDUCE SOUND TRANSFER.
6. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
7. PROVIDE EMERGENCY STOP SWITCH FOR THE HVAC SYSTEM AS REQUIRED BY LOCAL AUTHORITIES. COORDINATE LOCATION(S) WITH OWNER, LOCAL AUTHORITIES, AND FIRE MARSHAL. SHOW LOCATION ON ALL DRAWINGS.
8. ALL OUTSIDE AIR INTAKES SHALL HAVE MOTORIZED DAMPERS, OUTSIDE AIR DUCTS FROM OUTSIDE TO LOCAL UNITS SHALL HAVE MANUAL DAMPERS FOR BALANCING.
9. M.C. SHALL PROVIDE EXACT LOCATIONS OF ALL OPENINGS IN MASONRY WALLS TO THE G.C. PRIOR TO WALL BEING INSTALLED. ANY OPENINGS MISSED ARE TO BE CUT BY THE GENERAL CONTRACTOR IN STRICT ACCORDANCE WITH THE STRUCTURAL ENGINEER'S DESIGN.
10. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
11. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
12. MAINTAIN A MINIMUM OF 6"-8" CLEARANCE TO UNDERSIDE OF PIPES, DUCTS, CONDUITS, SUSPENDED EQUIPMENT, ETC., THROUGHOUT ACCESS ROUTES IN MECHANICAL ROOMS.
13. ALL VALVES SHALL BE EASILY ACCESSIBLE FROM LAY-IN CEILINGS. IF NOT ACCESSIBLE FROM LAY-IN CEILING VALVES SHALL BE INSTALLED IN ACCESSIBLE DOORS SIZED AS REQUIRED TO ACCESS VALVES. MINIMUM SIZE OF ACCESS DOORS SHALL BE 18"x18". PROVIDE FIRE RATED ACCESS DOORS AS REQUIRED BY FIRE RATINGS.
14. BALANCING DAMPERS SHALL BE PROVIDED IN ALL BRANCH DUCT CONNECTIONS TO SPECIFICATIONS. DAMPERS SHALL BE EASILY ACCESSIBLE FROM APPROXIMATELY 18" LAY-IN CEILINGS. IF NOT ACCESSIBLE FROM LAY-IN CEILING, DAMPERS SHALL BE PROVIDED WITH ACCESS DOORS SIZED AS REQUIRED TO ACCESS DAMPERS. MINIMUM SIZE OF ACCESS DOORS SHALL BE 18"x18". PROVIDE FIRE RATED ACCESS DOORS AS REQUIRED BY FIRE RATINGS. MARK ALL BALANCING DAMPERS WITH RED SPRAY PAINT TO BE EASILY SEEN FROM FLOOR LEVEL.
15. M.C. SHALL COORDINATE ALL FIRE RATINGS WITH THE ARCHITECTURAL DRAWINGS.
16. ALL JOINTS, SEAMS AND CONNECTIONS IN DUCTWORK SHALL BE SEALED IN ACCORDANCE WITH THE NORTH CAROLINA MECHANICAL CODE.
17. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
18. LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH STRAIGHT SECTION OF PIPE OR DUCT UP AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.
19. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' OUTSHEETS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS PRIOR TO FABRICATION.
20. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH NATIONAL ELECTRIC CODE AND SPECIFICATIONS.
21. CONCRETE HOUSEKEEPING PADS FOR MECHANICAL EQUIPMENT SHALL BE SIZED, LOCATED AND FURNISHED BY THE MECHANICAL CONTRACTOR. MINIMUM CONCRETE PAD THICKNESS TO BE 4" UNLESS NOTED OTHERWISE AND EXTEND 4" ON ALL SIDES OF THE EQUIPMENT.
22. WHERE JOISTS ARE INDICATED TO BE PENETRATED WITH DUCTWORK OR PIPING, COORDINATE DUCTWORK AND PIPING LAYOUT WITH JOIST OPENING SIZE AND LOCATIONS. COORDINATION SHALL BE DONE PRIOR TO FABRICATION OF DUCTWORK AND CUTTING OF PIPING.
23. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS AND NOTED OTHERWISE ONLY, THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
24. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN DETAILS FOR PIPING, DUCTWORK AND EQUIPMENT (UNLESS NOTED OTHERWISE) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
25. ALL DUCTWORK, PIPING AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH GENERAL CONTRACTOR.
26. MECHANICAL EQUIPMENT, DUCTWORK AND PIPING SHALL NOT BE SUPPORTED FROM METAL DECKING.
27. ALL ROOF MOUNTED EQUIPMENT CURBS FOR MECHANICAL EQUIPMENT SHALL BE PROVIDED AND INSTALLED BY MECHANICAL CONTRACTOR.
28. ALL AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH AIR HANDLING UNIT AND ROOFTOP UNIT SHALL BE SIZED TO MATCH FULL SIZE OF THE UNIT DRAIN CONNECTION, WITH T-P TRAP AND PIPE TO NEAREST DRAIN - BY M.C. INDOOR UNITS LOCATED ABOVE PLUMBING OR MECHANICAL PLUMBING SHALL BE PROVIDED BY M.C. REFER TO PLUMBING DRAWINGS FOR CONTINUATION OF CONDENSATE DRAINS IN WALLS UNLESS OTHERWISE NOTED. COORDINATE LOCATION OF DRAIN CONNECTIONS WITH PLUMBING CONTRACTOR.
29. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING AND EQUIPMENT INSTALLATION.
30. PROVIDE AIR VENTS AT HIGH POINTS IN LOOP AND HOT WATER PIPING. PROVIDE HOSE END DRAIN VALVES AT BOTTOM OF ALL RISERS AND LOW POINTS. SHOW LOCATIONS OF ALL VENTS AND DRAINS ON AS-BUILT DRAWINGS.

MECHANICAL SPECIFICATIONS CONTINUED

19. GUARANTEE: CONTRACTOR SHALL GUARANTEE ALL MATERIAL, EQUIPMENT AND WORKMANSHIP FOR A PERIOD OF 12 MONTHS AFTER DATE OF FINAL ACCEPTANCE OF BUILDING BY ENGINEERS AND OWNERS. AIR CONDITIONING COMPRESSORS SHALL HAVE EXTENDED 5-YEAR NON-PRORATED WARRANTY, BOTH PARTS AND LABOR. ALL GUARANTEE FAILURE SHALL BE CORRECTED OR REPLACED BY CONTRACTOR AS SOON AS POSSIBLE AFTER NOTIFICATION OF SUCH FAILURE.

20. LABELING AND IDENTIFYING: ALL PIPING SHALL BE LABELED WITH PREFAB LABELS OR STENCILED. INCLUDE DIRECTION OF FLOW ARROWS ON LABELS.

EQUIPMENT: INSTALL ENGRAVED PLASTIC MANUFACTURE SIGN OR EQUIPMENT MARKER ON OR NEAR EACH MAJOR ITEM OF MECHANICAL EQUIPMENT AND ITS DISCONNECT. LETTERING SHALL BE 1/2" HIGH, BLACK LETTERS ON WHITE LAMINATE - PERMANENTLY ATTACHED.

21. PATCHING AND PAINTING: FACTORY-FINISHED EQUIPMENT OR MATERIAL PROVIDED IN THIS DIVISION THAT HAS BEEN SCRATCHED OR BLEMISHED SHALL BE TOUCHED UP OR REPAINTED AS REQUIRED, BY THE MECHANICAL CONTRACTOR. ALL HANGERS SHALL BE PAINTED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING AN INSPECTION OF THE FACILITY AND PROVIDING DOCUMENTATION INCLUDING DATED PHOTOS OF ANY EXISTING DAMAGE IN THE FACILITY PRIOR TO STARTING WORK.

22. FILTERS: CONTRACTOR SHALL FURNISH ALL RETURN AIR FILTER GRILLES AND/OR FILTER RACKS AS SHOWN ON THE DRAWINGS. FILTERS SHALL BE 2" PLEATED MINIMUM MERV 8. ALL AIR (RETURN AND OUTSIDE AIR) MUST BE FILTERED PRIOR TO PASSING THROUGH THE UNIT COIL. PROVIDE ADDITIONAL FILTER MEDIA OVER GRILLES DURING CONSTRUCTION TO AVOID STOPPING UP THE COIL AND TO KEEP THE RETURN DUCT CLEAN. UNITS WILL NOT BE ALLOWED TO OPERATE UNTIL APPROVED BY THE ENGINEER BASED ON THE CLEANLINESS OF THE BUILDING. AT FINAL INSPECTION, CONTRACTOR SHALL HAVE CLEAN MEDIA IN ALL GRILLES AND/OR FILTER RACKS. CONSULT PLANS FOR FILTER GRILLE LOCATIONS. CONTRACTOR SHALL FURNISH ONE (1) SPARE SET OF 1" PLEATED FILTERS FOR EACH EQUIPMENT. WRAP IN PLASTIC SHEETING AND STORE ON PREMISES WHERE DIRECTED.

23. ACCESS DOORS: WHERE VALVES OR DAMPERS OCCUR IN PLASTER OR SHEET ROCK CEILINGS, OR MASONRY WALLS, MECHANICAL CONTRACTOR SHALL PROVIDE ACCESS DOORS TO SERVICE AND OPERATE. ACCESS DOORS SHALL BE SIZE SUFFICIENT FOR EASY SERVICE AND EQUIPMENT REMOVAL. HINGED ON ONE SIDE WITH STYLE 3 CAM-TYPE HEAVY DUTY LOCKING MECHANISM. ACCESS DOORS SHALL BE INSTALLED WITH GENERAL CONTRACTOR TO INSTALL DOORS.

24. ELECTRICAL WORK: THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POWER CONNECTIONS TO THE EQUIPMENT PROVIDED UNDER THIS CONTRACT. COORDINATE WITH ELECTRICAL CONTRACTOR FOR PROPER VOLTAGES. THE ELECTRICAL CONTRACTOR SHALL FURNISH HEAVY DUTY FUSIBLE DISCONNECTS, STARTERS OR COMBINATION STARTER DISCONNECTS FOR ALL EQUIPMENT PROVIDED UNDER THIS CONTRACT. THE E.C. SHALL INSTALL AND WIRE. COORDINATE ALL ELECTRICAL CONNECTIONS WITH THE ELECTRICAL CONTRACTOR.

25. DEMOLITION: THE OWNER HAS THE FIRST RIGHT OF REFUSAL FOR ALL OF OR ANY PART OR PARTS OF EQUIPMENT SHOWN TO BE REMOVED. ANY EQUIPMENT OR PARTS THERE OF THAT ARE NOT RETAINED BY THE OWNER SHALL BE REMOVED FROM THE PROJECT SITE. IT IS RECOMMENDED THAT AS MUCH AS POSSIBLE BE RECYCLED.

ALL EQUIPMENT SHOWN TO BE REMOVED THAT CONTAINS REFRIGERATION CIRCUITS SHALL HAVE THE REFRIGERANT (FIELD VERIFY TYPE) RECLAIMED INTO AN APPROVED REFRIGERANT STORAGE CONTAINER AND SHALL BE RECYCLED AND/OR PROPERLY DISPOSED OF. ALL REFRIGERANT RELATED WORK SHALL BE PERFORMED BY A CERTIFIED REFRIGERANT TECHNICIAN.

DEMOLITION OF EQUIPMENT SHALL INCLUDE THE FOLLOWING ITEMS: DISCONNECTING EXISTING POWER WIRING AND REMOVING THE BRANCH CIRCUIT BACK TO THE DISCONNECT SWITCH, NEAREST JUNCTION BOX, OR PANEL; DISCONNECTING AND REMOVING CONTROL WIRING AND COMPONENTS NOT INTENDED TO BE REUSED FOR NEW EQUIPMENT; DISCONNECTING AND REMOVING EXISTING SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCT AS NEEDED TO FACILITATE THE REMOVAL OF THE EQUIPMENT AS WELL AS THE INSTALLATION OF THE NEW EQUIPMENT; DISCONNECTING AND REMOVING EXISTING PIPING SYSTEMS FROM THE COIL/UNIT CONNECTION BACK TO AT A MINIMUM TO THE ISOLATION VALVE AND BEYOND AS NEEDED TO FACILITATE THE REMOVAL OF THE EQUIPMENT AS WELL AS THE INSTALLATION OF THE NEW EQUIPMENT; DISCONNECTING AND REMOVING EXISTING DUCTWORK FROM THE COIL/UNIT CONNECTION BACK TO THE COIL/UNIT CONNECTION BACK TO A POINT AS NEEDED TO FACILITATE THE REMOVAL OF THE EQUIPMENT AS WELL AS THE INSTALLATION OF THE NEW EQUIPMENT. ALL OF THE ABOVE ITEMS MAY NOT APPLY TO EACH PIECE OF EQUIPMENT SHOWN TO BE REMOVED. THIS NOTE IS GOOD UNLESS OTHERWISE NOTED ON THE DRAWINGS.

26. PIPING AND FITTINGS: PROVIDE VARIOUS SYSTEMS OF PIPING AS SHOWN ON THE DRAWINGS, DETAILS AND AS CALLED FOR IN THIS SPECIFICATION.

GENERAL: ALL PIPING SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO BUILDING WALLS, FLOORS OR CEILING UNLESS OTHERWISE SHOWN ON DRAWINGS. SUSPENDED PIPING SHALL BE RUN HIGH AS POSSIBLE AND SHALL OFFSET WHERE NECESSARY TO AVOID OTHER TRADES. SHEET METAL WORK SHALL TAKE PRECEDENCE OVER OTHER SYSTEMS WHEN ROUTING PIPING.

CONDENSATE DRAIN PIPING: CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 PVC WITH MATCHING PVC DRAINAGE FITTINGS. SIZE TO BE SAME AS DRAIN CONNECTION ON UNIT. TYPE "L" HARD COPPER PIPING SHALL BE USED FOR RETURN AIR PLENUMS. PROVIDE PIPE TRAP AND PIPING AT DRAIN PAN LINE LEAVING TRAP MUST BE AT LEAST 1" LOWER THAN UNIT DRAIN. EXTEND TO JANITOR SINK, CATCH BASIN OR OTHER APPROVED LOCATION. PROVIDE AUXILIARY DRAIN PAN UNDER ALL UNITS. PIPE DRAIN TO CEILING OR INSTALL FLOAT SWITCH IF PERMITTED BY LOCAL OFFICIAL.

27. HANGERS AND SUPPORTS - PIPING: CONTRACTOR SHALL PROVIDE HANGERS AND SUPPORTS FOR ALL PIPING AND FIXTURES. HANGERS FOR INSULATED PIPING SHALL BE SIZED TO PASS THROUGH INSULATION. HANGERS SHALL BE MANUFACTURED BY B-LINE, MICHIGAN, PHD OR PRIOR APPROVED EQUAL. ALL HANGER SPACING SHALL BE PER THE NORTH CAROLINA MECHANICAL CODE.

PIPING HANGERS: PIPING ON ROOF: B-LINE C-POT SERIES CXP PIPE SUPPORT, MICHIGAN HANGER PIPE PIER NOT ACCEPTABLE.

28. DUCT SYSTEMS: PROVIDE SYSTEMS OF SUPPLY, RETURN, OUTSIDE AIR AND EXHAUST DUCT AS INDICATED ON PLANS AND AS DETAILED ON DIAGRAMS. ALL DUCT SYSTEMS SHALL BE SEALED AIRTIGHT IN ACCORDANCE WITH THE NORTH CAROLINA MECHANICAL CODE. REFER TO INSULATION SECTION FOR DUCT SYSTEM INSULATION REQUIREMENTS.

SUPPLY, RETURN, OUTSIDE AIR AND EXHAUST DUCT: UNLESS NOTED OTHERWISE ALL DUCT TO BE CONSTRUCTED OF GALVANIZED STEEL SHEETS, IN ACCORDANCE WITH SMACNA GAUGES AND STANDARDS. DUCT JOINTS SHALL BE SEALED AIRTIGHT. ALL SQUARE BENDS OR ELBOW FITTINGS SHALL HAVE TURNING VANES. PROVIDE SPLIT SUPPLY DAMPERS AT SUPPLY TEES AND SIDE BRANCH FITTING WITH 45° THROAT AND DAMPER AT ALL SUPPLY AIR BRANCHES. PROVIDE BALANCING DAMPERS IN ALL DUCTS WHERE REQUIRED FOR SYSTEM BALANCING.

ALL DUCT SIZES SHOWN ARE NET FREE AREA SIZE. CONTRACTOR CAN ADJUST DUCT DIMENSIONS TO BETTER FIT THE AVAILABLE SPACE. WHEN USING DIFFERENT DUCT SIZES USE AN EQUIVALENT CROSS SECTIONAL AREA.

MECHANICAL SPECIFICATIONS CONTINUED

28. DUCT SYSTEMS CONTINUED: PROVIDE FIRE DAMPERS AND ACCESS DOORS IN ALL RATED WALL AND/OR FLOOR ASSEMBLIES. PROVIDE RADIATION DAMPERS AND BLANKETS FOR ALL DIFFUSERS IN RATED CEILING ASSEMBLIES. COORDINATE FIRE RATINGS WITH THE ARCHITECTURAL DRAWINGS AND/OR GENERAL CONTRACTOR.

PROVIDE FLEXIBLE CONNECTION AT ALL DUCT CONNECTIONS TO AIR HANDLING EQUIPMENT. FLEXIBLE CONNECTION SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURES WRITTEN INSTRUCTIONS AND SHALL NOT BE USED AS AN OFFSET, TRANSITION, AND/OR OTHER SIMILAR FITTING.

29. BALANCING: MECHANICAL CONTRACTOR SHALL UTILIZE FLOW HOOD TO BALANCE THE SYSTEM. ADJUST AIRFLOWS TO PROVIDE EVEN AIR DISTRIBUTION THAT IS EXTREMELY QUIET. ADJUST/REPLACE SHEAVES AS REQUIRED. PROVIDE TEST AND BALANCE REPORT IN OPERATING AND MAINTENANCE MANUALS. THE TEST AND BALANCE REPORT SHALL INCLUDE A COMPLETE SUMMARY OF ALL OUTSIDE AIR INTAKE (SET AT MINIMUM SETTINGS) AND ALL EXHAUST FANS. THE BUILDING SHALL REMAIN PRESSURIZED.

30. HANGERS AND SUPPORTS - DUCT: CONTRACTOR SHALL PROVIDE HANGERS AND SUPPORTS FOR ALL DUCT AND FIXTURES. ALL HANGER SPACING SHALL BE PER THE NORTH CAROLINA MECHANICAL CODE.

DUCT HANGERS: RECTANGULAR DUCTS: USE HEAVY GAUGE SHEET METAL STRAPS ATTACHED TO DUCTS WITH STAINLESS, CADMIUM PLATED, OR ZINC COATED METAL SCREWS. TURN STRAPS UNDER DUCTS AT LEAST 2". ATTACH STRAPPING TO DUCT ON BOTTOM AND TWO PLACES ON THE SIDES.

DUCT SHALL BE SUPPORTED FROM THE BAR JOISTS, BEAMS, METAL BUILDING PURLING (AS ALLOWED BY STRUCTURAL ENGINEER). NO DUCT SHALL BE SUPPORTED DIRECTLY FROM METAL DECKING.

FLEXIBLE ROUND DUCTS: PROVIDE A ONE-PIECE BAND STRAP AROUND DUCT ATTACHED TO HEAVY GAUGE HANGER STRAP, 1-1/2" WIDE. ATTACH TO STRUCTURE ABOVE.

31. EQUIPMENT VARIATIONS: SHOULD CONTRACTOR SUBMIT SUBSTITUTES WHICH VARY IN HORSEPOWER, ELECTRICAL CHARACTERISTICS, PHYSICAL SIZE, NUMBER OF MOTORS, ETC. AND CORNERS, INSULATE WITH 1" THICK 1.5 LB. DENSITY INSULATION. INTEGRAL INSULATED SUPPLY AND RETURN DUCT TRANSITIONS. PROVIDE 3/4"x1-1/2" GASKET FOR AIR TIGHT CONNECTION TO EXISTING CURB AND NEW UNIT. ALL CURB AND/OR DAMPERS SHALL BE TAPERED TO PREVENT PONDING WATER AND SHALL BE PAINTED WITH TWO COATS OF WATER PROOF MASTIC.

32. HANGERS AND SUPPORTS - EQUIPMENT: CONTRACTOR SHALL PROVIDE HANGERS AND SUPPORTS FOR ALL EQUIPMENT AND FIXTURES. ALL HANGER SPACING SHALL BE PER THE NORTH CAROLINA MECHANICAL CODE.

EQUIPMENT: ROOF TOP UNIT CURB ADAPTOR: HEAVY GAUGE GALVANIZED STEEL CONSTRUCTION (GAUGE SHALL BE AS NEEDED TO SUPPORT NEW UNIT). CONTINUOUS WELDED SEAMS AT CORNERS. INSULATE WITH 1" THICK 1.5 LB. DENSITY INSULATION. INTEGRAL INSULATED SUPPLY AND RETURN DUCT TRANSITIONS. PROVIDE 3/4"x1-1/2" GASKET FOR AIR TIGHT CONNECTION TO EXISTING CURB AND NEW UNIT. ALL CURB AND/OR DAMPERS SHALL BE TAPERED TO PREVENT PONDING WATER AND SHALL BE PAINTED WITH TWO COATS OF WATER PROOF MASTIC.

33. PACKAGED ROOFTOP OR GROUND MOUNT UNITS: PACKAGED (HEAT PUMP OR GAS FRIED) ROOFTOP UNIT SHALL BE AS MANUFACTURED BY TRANE, CARRIER, YORK, OR PRIOR APPROVED EQUAL.

34. INSULATION: PROVIDE INSULATION ON ALL NEW PIPING AND DUCT SYSTEMS. THE INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURES WRITTEN INSTRUCTIONS BY AN APPROVED INSULATION SUBCONTRACTOR. ALL PIPING AND DUCT SYSTEMS SHALL BE TESTED PRIOR TO INSULATION BEING INSTALLED. ALL DUCT SHALL EXTERNALLY INSULATED UNLESS OTHERWISE NOTED.

CONCEALED SUPPLY, RETURN, AND OUTSIDE AIR DUCT: ALL SUPPLY, RETURN AND OUTSIDE AIR DUCT OUTSIDE THE BUILDING THERMAL ENVELOPE SHALL BE INSULATED WITH 2" THICK 0.75# DENSITY FOIL FACED DUCT WRAP HAVING AN INSTALLED R-VALUE OF R-6.0 (MINIMUM R-5.0 INSTALLED R-VALUE).

ALL SUPPLY, RETURN AND OUTSIDE AIR DUCT OUTSIDE OF THE BUILDING THERMAL ENVELOPE (IN AN UNCONDITIONED ATTIC OR CRAWL SPACE) SHALL BE INSULATED WITH 3" THICK 0.75# DENSITY FOIL FACED DUCT WRAP HAVING AN INSTALLED R-VALUE OF R-8.3 (MINIMUM R-8.0 INSTALLED R-VALUE).

EXTERIOR EXPOSED SUPPLY, RETURN, EXHAUST, AND OUTSIDE AIR DUCT: ALL EXTERIOR EXPOSED RECTANGULAR DUCT SHALL BE INSULATED WITH 2" THICK FIBERGLASS RIGID BOARD WITH CORNER BEAD COVERED WITH AN 0.032" ALUMINUM JACKET (INCREASE INSULATION THICKNESS AS REQUIRED TO MEET R-8.0 MINIMUM). ALL JOINTS IN THE ALUMINUM JACKETING SHALL BE POSITIONED TO PREVENT THE NATURAL INTRUSION OF WATER AND SHALL BE SEALED WATER TIGHT. PROVIDE TWO COATS OF WATERPROOF MASTIC PRIOR TO INSULATING. REFER TO DETAILS FOR EXTERIOR DUCT INSULATION.

35. BASE BID: THE BASE BID SHALL INCLUDE ALL WORK INDICATED ON THE DRAWINGS AND SPECIFICATIONS.

36. CONTINGENCY ALLOWANCE: INCLUDE \$10,000.00 IN THE BASE BID FOR ADDITIONAL OWNER REQUESTED WORK AND/OR UNFORESEEN CONDITIONS. THE OWNER AND/OR ENGINEER WILL PROVIDE WRITTEN APPROVAL TO USE ANY ALLOWANCE FUNDS. A CHANGE ORDER WILL BE ISSUED TO REFLECT THE REMOVAL OR CREDIT CHANGE. ORDER WILL BE ISSUED TO RETURN OF UNUSED FUNDS TO THE OWNER. CONTRACTORS FAILING TO HAVE WRITTEN AUTHORIZATION FROM THE OWNER AND/OR ENGINEER FOR THE USE OF CONTINGENCY FUNDS PRIOR TO BEGINNING THE ADDITIONAL WORK COULD RESULT IN THE USE OF THE CONTINGENCY FUNDS NOT BEING APPROVED.

MECHANICAL SPECIFICATIONS CONTINUED

38. AUTOMATIC TEMPERATURE/HUMIDITY CONTROLS: PACKAGED UNITS SEQUENCE OF OPERATION: EACH NEW PACKAGED ROOF TOP UNIT SHALL BE CONNECTED TO A UNIT CONTROL WASH (JOHNSON CONTROLS MA-COM0800-0 OR EQUIVALENT) EACH PACKAGED UNIT SHALL BE STARTED AND STOPPED FROM A TIME SCHEDULE THAT IS PROGRAMMED IN THE EXISTING DDC SYSTEM AND DOWNLOADED TO THE UNIT CONTROL MODULE. THE CONTROL CIRCUIT AT EACH UNIT SHALL BE INTERRUPTED BY THE MAIN DRAIN PAN FLOAT SWITCH (WHEN NOT FURNISHED WITH THE EQUIPMENT IT SHALL BE FIELD INSTALLED). EACH NEW PACKAGED UNIT SHALL BE PROVIDED WITH A JOHNSON CONTROLS NSBB87N041-0 NETWORK TEMPERATURE SENSOR (OR EQUIVALENT) TO PROVIDE LIVE TEMPERATURE DATA TO CONTROLLER.

THE UNIT CONTROLLER SHALL DIRECTLY CONTROL AND MONITOR THE OPERATION OF THE EQUIPMENT ASSOCIATED WITH THE CONTROL MODULE AND ALL RELATED SENSORS. THE NETWORK ENGINE AND THE UNIT CONTROLLER SHALL SHARE DATA ON A WIRED COMMUNICATIONS TRUNK SO TO PROVIDE THE CONTROL AND MONITORING FUNCTIONS LISTED AS FOLLOWS:

1. OPERATING MODE
2. OPERATING STATUS
3. SUPPLY AIR TEMPERATURE
4. ZONE TEMPERATURE
5. SUPPLY FAN COMMAND
6. SUPPLY FAN STATUS
7. FAN STATIC PRESSURE
8. FAN STATIC PRESSURE SETPOINT
9. SYSTEM MODE CHANGEOVER (HEAT/COOL/ECONOMIZE/AUTO)
10. COMPRESSOR #1 COMMAND
11. COMPRESSOR #2 COMMAND
12. COMPRESSOR #1 STATUS
13. COMPRESSOR #2 STATUS
14. HEAT STAGE #1 COMMAND
15. HEAT STAGE #2 COMMAND
16. HEAT STAGE #1 STATUS
17. HEAT STAGE #2 STATUS
18. ECONOMIZER STATUS
19. OUTSIDE AIR DAMPER POSITION
20. OUTSIDE AIR DAMPER SETPOINT
21. OUTSIDE AIR TEMPERATURE

UNIT CONTROLLER SHALL BE SOFTWARE ADJUSTABLE WITH LOCK AND OVERRIDE CAPABILITY AT EACH POINT LISTED ABOVE. EQUIPMENT HARDWARE MUST ALLOW THE SUPPLY FAN TO RUN CONTINUOUSLY DURING THE OCCUPIED MODE AND A CYCLE ON A CALL FOR HEATING OR COOLING DURING THE UNOCCUPIED MODE. EQUIPMENT SHALL BE PROGRAMMED WITH LEAD/LAG FUNCTIONALITY ON A DESIGNATED ROTATION. UNITS SHALL BE PROGRAMMED VIA DDC TO ROTATE LEAD/LAG ON WEDNESDAY AT 1:00AM EASTERN STANDARD TIME WITH THE LEAD UNIT ENABLING FIRST AND PROVIDING HEATING OR COOLING TO THE SPACE AS NEEDED AND THE LAG UNIT ENGAGING TO SUPPLEMENT HEATING OR COOLING AS NEEDED. THE OWNER SHALL SIGN A COPY OF THE MANUFACTURERS STANDARD SOFTWARE AND FIRMWARE LICENSING AGREEMENT AS PART OF THIS CONTRACT. SUCH LICENSE SHALL GRANT USE OF ALL PROGRAMS AND APPLICATIONS OBTAINABLE TO OWNER AS DEFINED BY THE MANUFACTURERS LICENSE AGREEMENT, BUT SHALL PROTECT MANUFACTURERS RIGHTS TO DISCLOSURE OF TRADE SECRETS CONTAINED WITHIN SUCH SOFTWARE. ANY LICENSING COSTS FOR THE ADDITION OF THIS PROJECT TO THE EXISTING SUPERVISORY SERVER SHALL BE A PART OF THIS CONTRACT. ALL PROGRAMMING SOFTWARE MUST ALSO BE INCLUDED.

THE BAS CONTRACTOR SHALL PROVIDE A PARAGRAPH BY PARAGRAPH SPECIFICATION COMPLIANCE REPORT. THE REPORT SHALL INDICATE FOR EACH NUMBERED PARAGRAPH, HOW THE CONTRACTOR MEETS THE CRITERIA OF THE PARAGRAPH. EACH CONTROLS SYSTEM IS DIFFERENT AND THE OWNER WANTS TO KNOW HOW THESE DIFFERENCES WILL RELATE TO THE OPERATION OF THEIR UNIT. CONTRACTOR MUST COMPLY WITHOUT EXCEPTION.

COOLING SEQUENCE: ON A CALL FOR COOLING THE PACKAGED UNIT FAN AND CONDENSING SECTION SHALL BE ENERGIZED. THE CONDENSING SECTION SHALL BE STAGED ON AND OFF AS REQUIRED TO MAINTAIN SET POINT (REFER TO SCHEDULING AND/OR OTHER STAGES OF COOLING). THE AIR HANDLER FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE AND CYCLE WITH THERMOSTAT DURING UNOCCUPIED MODE.

DEHUMIDIFICATION: WHEN THE ROOM HUMIDITY IS ABOVE THE SETPOINT, THE UNIT WILL INITIATE THE HOT GAS REHEAT MODE (IF APPLICABLE).

HEATING SEQUENCE: ON A CALL FOR HEATING THE PACKAGED ROOF TOP UNIT FAN AND GAS FURNACE OR HEAT PUMP SHALL ENERGIZED. THE GAS FURNACE SHALL BE STAGED ON AND OFF AS NEEDED TO MAINTAIN SET POINT. THE PACKAGED ROOF TOP UNIT FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED MODE AND CYCLE WITH THERMOSTAT DURING UNOCCUPIED MODE.

OUTSIDE AIR DAMPER SEQUENCE: OUTSIDE AIR DAMPER SHALL BE CONTROLLED BY CARBON DIOXIDE SENSOR DURING THE OCCUPIED HOURS. ECONOMIZER OPERATION SHALL OCCUR WHEN OUTDOOR CONDITION IS FAVORABLE.

39. ENERGY RECOVERY UNIT VENTILATOR SHALL BE ON DURING OCCUPIED MODE AND SCHEDULED EVENTS TO DELIVER NEUTRAL AIR TEMPERATURE (ADJ.) TO SPACE. DURING UNOCCUPIED HOURS IT SHOULD RUN IN RECIRCULATION MODE FOR DEHUMIDIFICATION.

MECHANICAL/ELECTRICAL DRAWING INDEX

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MECHANICAL LEGEND

- | | |
|-----------------|-------------------------------|
| M.C. | MECHANICAL CONTRACTOR |
| E.C. | ELECTRICAL CONTRACTOR |
| RTU | ROOFTOP UNIT |
| CFM | CUBIC FEET PER MINUTE |
| ESP | EXTERNAL STATIC PRESSURE |
| HP | HORSE POWER |
| BTUH x 1000 | |
| BTUH | BRITISH THERMAL UNIT PER HOUR |
| TH | THERMOSTAT |
| HM | HUMIDISTAT |
| CO ₂ | CARBON MONOXIDE SENSOR |
| CO ₂ | CARBON DIOXIDE SENSOR |
| ○ | CONNECT TO EXISTING |
| ○ | REMOVE TO THIS POINT |
| ○ | SENSOR WITH GUARD |

ELECTRICAL NOTES/SPECIFICATIONS:

E1. ELECTRICAL CONTRACTOR SHALL VISIT JOBSITE PRIOR TO BIDDING IN ORDER TO FAMILIARIZE HIMSELF WITH EXISTING WORKING CONDITIONS, TYPES OF CONSTRUCTION, EQUIPMENT LOCATIONS, LAYOUT, ETC.

E2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC), IN ADDITION TO ANY STATE AND/OR LOCAL CODES.

E3. ALL MATERIALS SHALL BE NEW (UNLESS OTHERWISE NOTED), CONFORM TO NATIONAL ELECTRICAL CODE (NEC) STANDARDS, BEAR THE UNDERWRITER'S LABORATORIES, INC. (UL) LABEL AND SHALL BE COMPATIBLE WITH THE GENERAL ARCHITECTURAL AND AESTHETIC DESIGN OF THE SPACE. MATCH AS CLOSELY AS POSSIBLE THE APPEARANCE AND STYLE OF THE EXISTING FIXTURES, DEVICES, ETC. UNLESS OTHERWISE NOTED OR APPROVED.

E4. THE WORD "PROVIDE" AS USED HEREIN MEANS TO FURNISH AND INSTALL COMPLETE. E5. DURING AND UPON COMPLETION OF WORK, THE CONTRACTOR SHALL OBTAIN ALL THE NECESSARY CERTIFICATE(S) OF INSPECTION FROM THE LOCAL INSPECTION DEPARTMENT.

E6. PROVIDE GROUNDING AS SHOWN ON DRAWINGS AND/OR IN ACCORDANCE WITH ARTICLE 250 OF THE NEC. A SEPARATE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED WITH EACH FEEDER AND/OR BRANCH CIRCUIT. WHERE FLEXIBLE CONNECTIONS ARE REQUIRED, OR A NON-METALLIC RACEWAY SYSTEM IS INSTALLED, A SEPARATE EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED WITH THE CIRCUIT CONDUCTORS AND CONNECTED IN SUCH A MANNER THAT THE GROUNDING INTEGRITY IS MAINTAINED THROUGHOUT THE SYSTEM.

E7. DISCONNECTS AND CONTROLLERS FOR HVAC EQUIPMENT TO BE FURNISHED BY THE MECHANICAL CONTRACTOR. INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. OTHER DISCONNECTS AS REQUIRED SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. ALL DISCONNECTS SHALL BE "HEAVY-DUTY" RATED. WIRING SHALL INCLUDE FROM THE PANEL TO AND THROUGH THE DISCONNECTS/CONTROLLERS TO THE EMT TERMINALS OF THE EQUIPMENT. THE EMT FOR THE HVAC EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.

E8. PATCH AROUND ALL CONDUIT PENETRATIONS THROUGH WALLS, CEILINGS, FLOORS, ROOFS, SEAL WATER TIGHT WHERE APPLICABLE. USE UL LISTED AND APPROVED FIRE SEALANT COMPOUND IN PENETRATIONS THROUGH ALL RATED ASSEMBLIES.

E9. ALL POWER & LIGHTING FEEDER AND BRANCH CIRCUIT WIRING SHALL BE INSTALLED IN A RACEWAY SYSTEM UNLESS OTHERWISE NOTED OR APPROVED. RACEWAYS SHALL BE RIGID METALLIC (RMC), INTERMEDIATE METALLIC CONDUIT (IMC), ELECTRICAL METALLIC TUBING (EMT) OR PVC SUBJECT TO THE APPLICATION USED. RIGID AND IMC SHALL BE TERMINATED USING DOUBLE LOCKNUTS AND BUSHINGS (BONDING BUSHINGS WHERE REQUIRED). EMT FITTINGS SHALL BE HEXAGONAL STEEL, COMPRESSION TYPE WITH INSULATED THROAT SUITABLE FOR WET LOCATIONS UNLESS OTHERWISE NOTED OR APPROVED. FLEXIBLE CONDUIT SHALL BE PERMITTED BY NEC FOR FINAL CONNECTION TO FIXTURES AND VIBRATING LOADS. MINIMUM SIZE OF CONDUIT SHALL BE 3/4".

E10. ALL CONDUCTORS (BRANCH CIRCUIT AND FEEDER) SHALL BE COPPER WITH INSULATION RATING OF 600 VOLT UNLESS OTHERWISE NOTED OR APPROVED. CONDUCTOR S