

DUCTWORK LEGEND - SINGLE/DOUBLE LINE

DUCTWORK - SYMBOLS

PIPING - LINETYPES

PIPING - VALVES

PIPING - FITTINGS

MECHANICAL GENERAL NOTES

Table with 3 columns: SINGLE LINE SYMBOL, DOUBLE LINE REPRESENTATION, and DESCRIPTION. Contains symbols for various ductwork configurations like concentric, eccentric, and tee shapes.

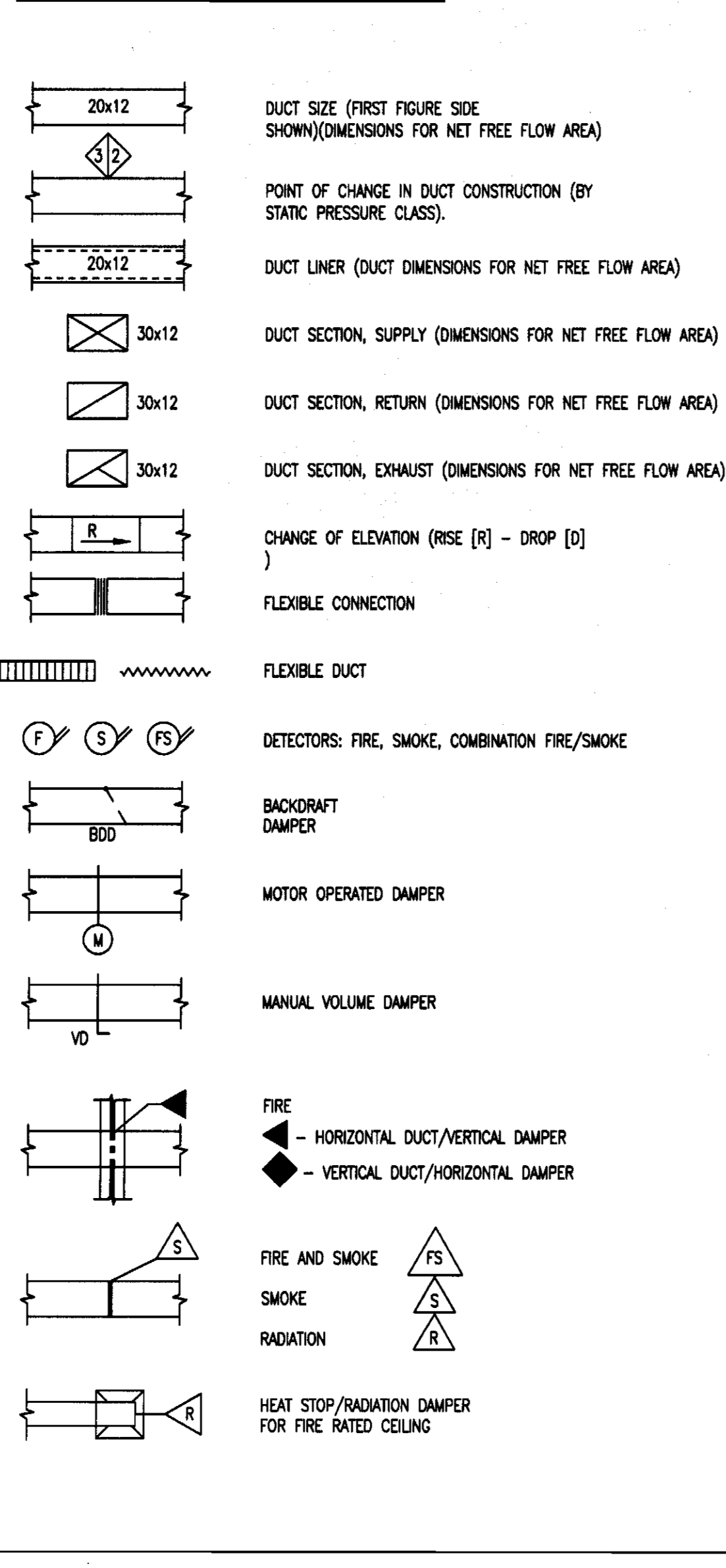


Table listing piping linetypes for HEATING, AIR CONDITIONING AND REFRIGERATION, and MISCELLANEOUS systems.

Table listing piping valves such as CHECK, SWING GATE, HOSE VALVE, AIR COCK, BALL, BUTTERFLY, GLOBE, and PLUG.

Table listing piping fittings including CAP, CROSS, ELBOW, REDUCING, and UNION.

- 1. PROVIDE ALL MATERIALS AND LABOR NECESSARY FOR COMPLETE AND PROPERLY FUNCTIONING MECHANICAL SYSTEMS.
2. WARRANTY ALL WORK AND ALL MATERIALS, EQUIPMENT AND DEVICES FOR A PERIOD OF ONE YEAR AFTER THE OWNERS ACCEPTANCE...

WALL/RATING SYMBOLS

ABBREVIATIONS

Large table of abbreviations for mechanical symbols, including terms like COP, CRU, CT, CTR, CTS, CU, etc.

SPECIALTY SYMBOLS

Table of specialty symbols for mechanical components like disconnect switches, emergency stop switches, and sensors.

Logo for North Carolina Aquarium on Roanoke Island, Roanoke Island Aquarium Turtle Rehabilitation Center, Moser Mayer Phoenix Associates, PA.

Professional seals and stamps for the design team, including a North Carolina Professional Engineer seal.

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SCO ID# 10-08584-01A

REVISIONS table with columns for NO., DATE, and DESCRIPTION. Includes project number 11007.01 and scale AS NOTED.

GENERAL NOTES, LEGENDS AND ABBREVIATIONS. Large stylized text 'M0.1' at the bottom.



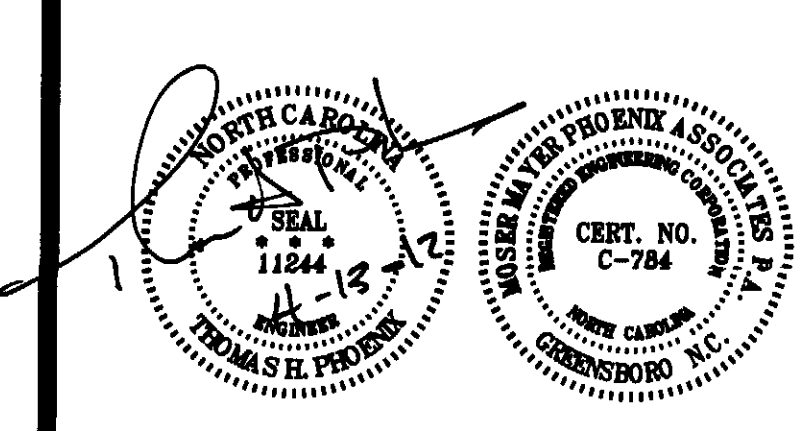
**NORTH CAROLINA AQUARIUM**  
On Roanoke Island

**ROANOKE ISLAND AQUARIUM  
TURTLE REHABILITATION  
CENTER**

374 AIRPORT ROAD  
MANTEO, NORTH CAROLINA 27954

**MOSER MAYER PHOENIX ASSOCIATES, P.A.**  
COMPLETE FACILITIES SOLUTIONS

328 E. Market Street  
Suite 200  
Greensboro, N.C. 27401  
Telephone: 336-373-5600  
Fax: 336-373-0077



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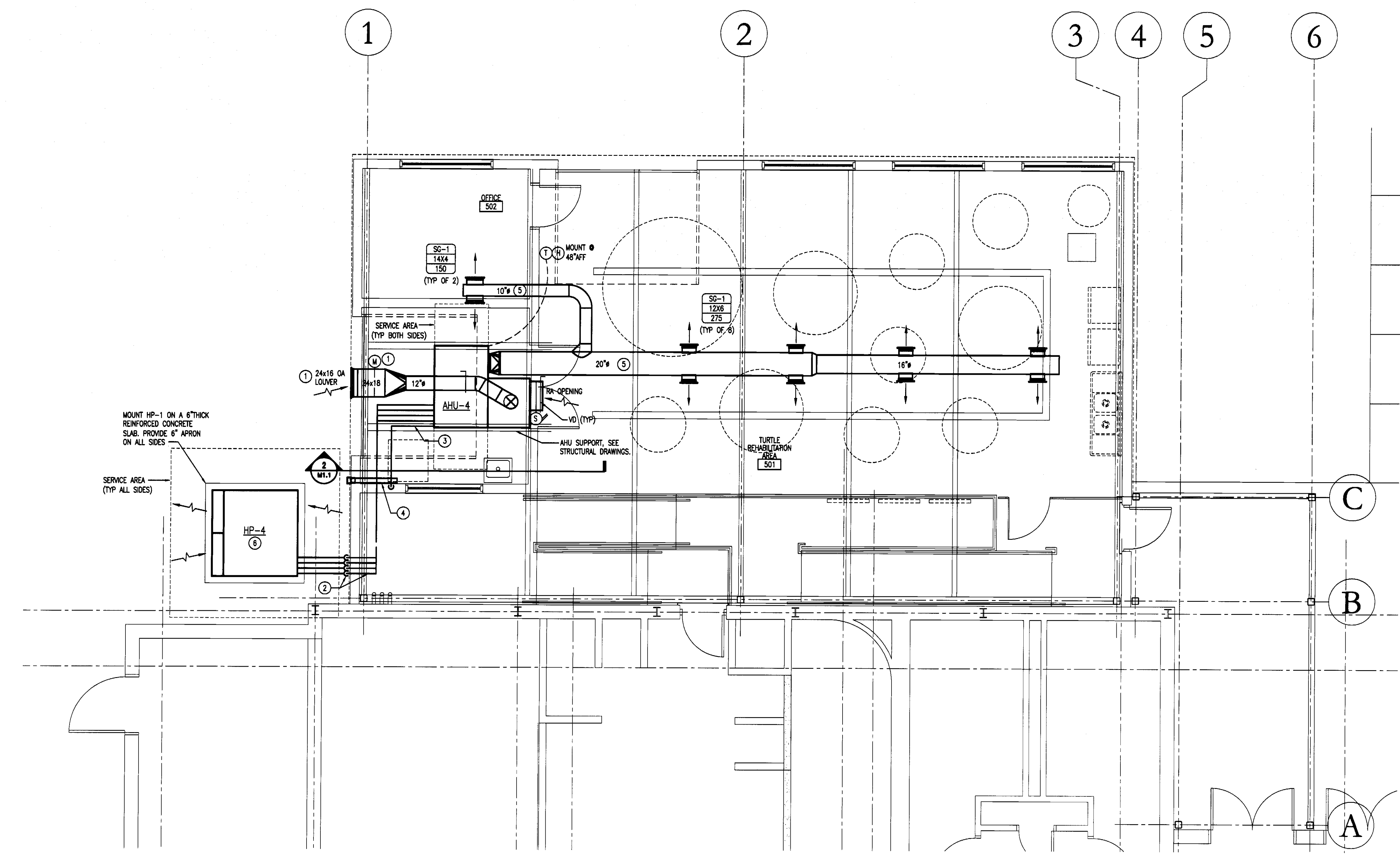
**REVISIONS**

| NO. | DATE | DESCRIPTION |
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DATE 04-13-2012  
PROJECT NUMBER 1100701  
SCALE AS NOTED  
DRAWN BY MS  
CHECKED BY THP

**MECHANICAL FLOOR PLAN**

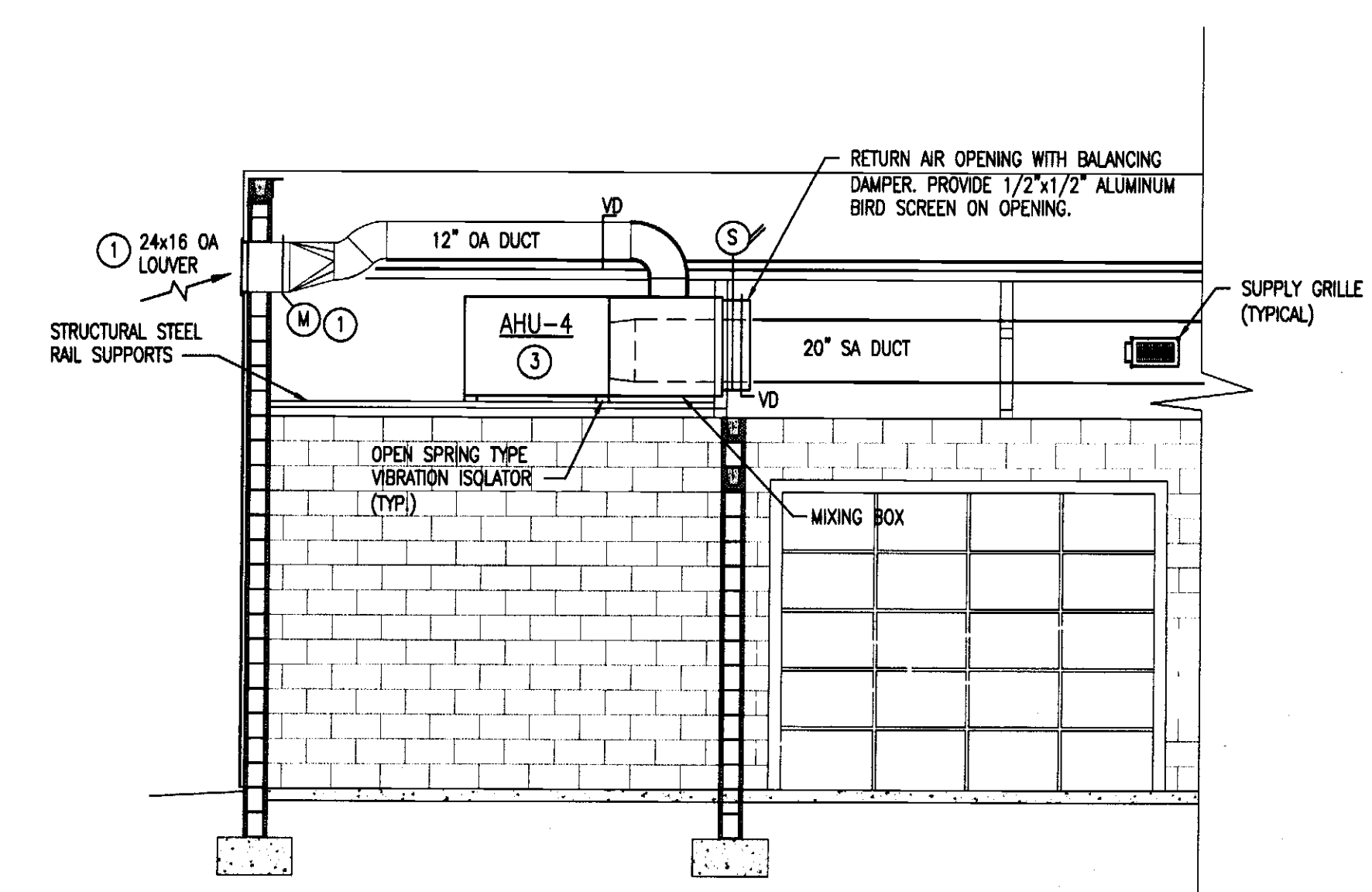
**M1.1**



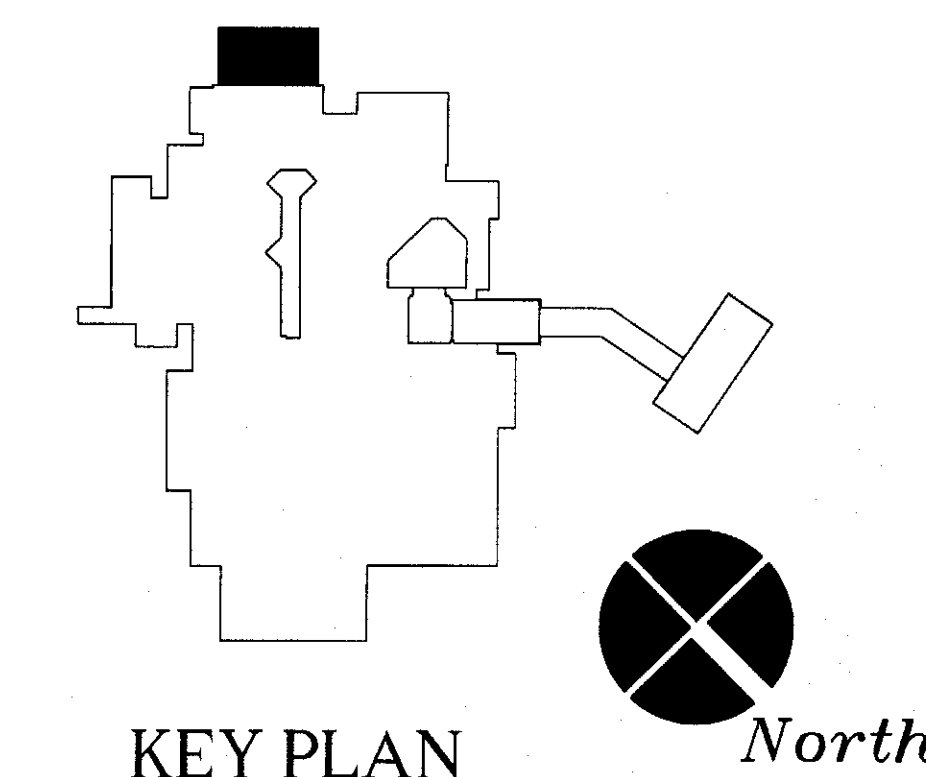
**KEYED NOTES:**

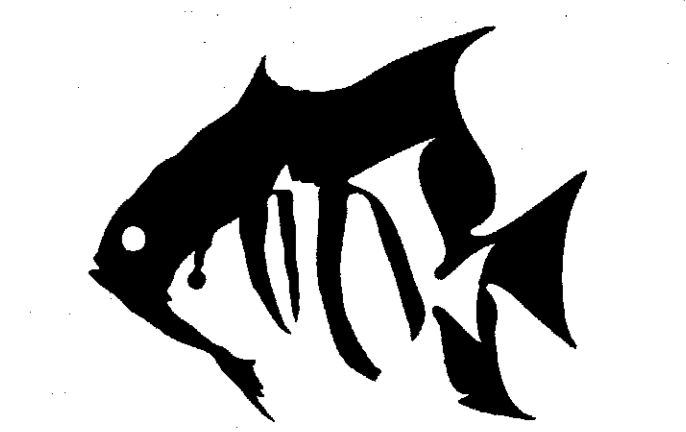
- ① DRAINABLE HURRICANE LOUVER, RUSKIN MODEL ELF3750XD WITH C250 LOW LEAKAGE DAMPER OR APPROVED EQUAL.
- ② ROUTE REFRIGERANT AND HOT GAS LINES UP ALONG EXTERIOR WALL AND OVERHEAD TO AHU. PENETRATE THRU WALL WITH SCH. 40 SLEEVES AND SEAL WATER TIGHT. SUPPORT HORIZONTAL PIPING ROUTED OVERHEAD FROM STRUCTURE ABOVE WITH THREADED HANGER RODS AND UNI-STRUT TRAPEZOIDAL HANGERS. PROVIDE GALV. SHEET METAL PIPE SADDLE AT SUPPORT LOCATIONS.
- ③ ROUTE A 1-1/4" CONDENSATE LINE FROM AHU-4 TO AUXILIARY DRAIN OF WASHER BOX IN TREATMENT ROOM. PROVIDE 2" AIR GAP. SUPPORT HORIZONTAL PIPING ROUTED OVERHEAD FROM STRUCTURE ABOVE WITH THREADED HANGER RODS AND CLEVIS PIPE HANGER. PROVIDE GALV. SHEET METAL PIPE SADDLE AT SUPPORT LOCATIONS.
- ④ PROVIDE A RIGID METAL DUCT DRYER VENT. SIZE IN ACCORDANCE WITH THE DRYER MANUFACTURER'S RECOMMENDATIONS. PROVIDE CLEAN-OUT IN VERTICAL RISER PER NCMC 504.3. PROVIDE DRYER EXHAUST DISCHARGE WITH BACKDRAFT DAMPER PER NCMC 504.4.
- ⑤ SUPPLY DUCT TO BE ROUTED THROUGH WEBBING OF STRUCTURAL STEEL I-BEAMS. COORDINATE EXACT ROUTING WITH INSTALLED I-BEAMS AND PROVIDE DUCT OFFSETS.
- ⑥ TIE DOWN OUTDOOR HEAT PUMP TO REINFORCED CONCRETE PAD WITH ANCHOR BOLTS. PROVIDE 1/4" NEOPRENE ISOLATION PADS BETWEEN UNIT AND CONCRETE PAD.

**1 MECHANICAL FLOOR PLAN**  
M1.1 1/4" = 1'-0"



**2 MECHANICAL SECTION**  
M1.1 1/4" = 1'-0"





NORTH CAROLINA  
**AQUARIUM**  
 On Roanoke Island

ROANOKE ISLAND AQUARIUM  
 TURTLE REHABILITATION  
 CENTER

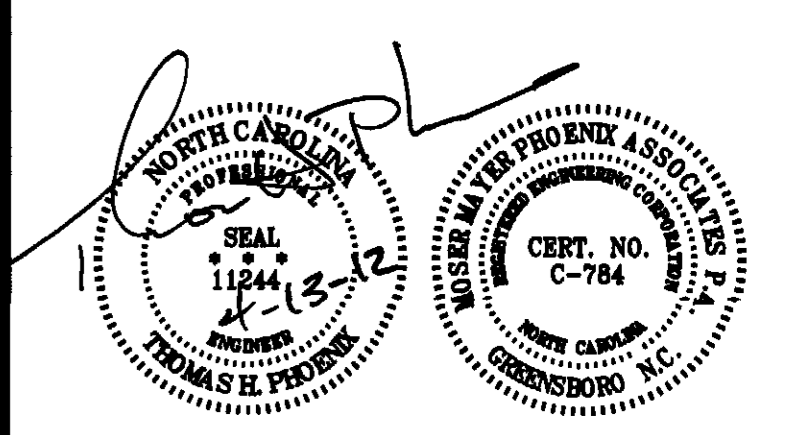
374 AIRPORT ROAD  
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MECHANICAL  
 SCHEDULES AND  
 DETAILS

M3.1

| SPLIT SYSTEM HEAT PUMP SCHEDULE - AIR COOLED |                              |              |               |            |        |             |          |            |                |                |                    |           |                      |                   |        |              |            |                     |             |        |                 |                    |         |                  |          |         |                 |               |  |                        |       |
|--|------------------------------|--------------|---------------|------------|--------|-------------|----------|------------|----------------|----------------|--------------------|-----------|----------------------|-------------------|--------|--------------|------------|---------------------|-------------|--------|-----------------|--------------------|---------|------------------|----------|---------|-----------------|---------------|--|------------------------|-------|
| MARK - INDOOR OUTDOOR                        | BASIS OF DESIGN MANUFACTURER | INDOOR MODEL | OUTDOOR MODEL | INDOOR FAN |        |             |          |            |                |                |                    |           |                      | HEATING           |        |              |            |                     |             |        |                 | OUTDOOR CONDENSING |         |                  |          |         |                 |               |  | SYSTEM DATA/ELECTRICAL | NOTES |
|  |                              |              |               | SUPPLY CFM | OA CFM | ESP IN. H2O | MOTOR HP | DRIVE TYPE | TOTAL CAP. MBH | SENS. CAP. MBH | MAX. FACE VEL. FPM | EAT DB/MB | HTG. CAP. MBH @ HIGH | ELEC. HT KW/STEPS | EAT DB | REFRIG. TYPE | COMPR. NO. | TOT. STEPS CAPACITY | FANS NO./HP | EAT DB | INDOOR UNIT MCA | MOCP               | V/PH/Hz | OUTDOOR UNIT MCA | MOCP     | V/PH/Hz | SEER/EER AT ARI | COP AT ARI    |  |                        |       |
| AHU-4 / HP-4                                 | UNITED COOL AIR              | E8G4AH15     | B8G4AHA       | 2500       | 600    | 0.40        | 1-1/2    | BELT       | 89.0           | 57.0           | 500                | 79.7/89.3 | 84.0                 | 15                | 70     | 410A         | 2          | 1 @ 2 HP            | 95          | 28.4   | 30              | 480/3/60           | 18.8    | 25               | 480/3/60 | 12.0    | 3.7             | 1, 2, 3, 4, 5 |  |                        |       |

| AIR DISTRIBUTION SCHEDULE |                              |                              |                    |           |          |             |       |
|---------------------------|------------------------------|------------------------------|--------------------|-----------|----------|-------------|-------|
| MARK                      | BASIS OF DESIGN MANUFACTURER | BASIS OF DESIGN MODEL/SERIES | TYPE               | MOUNTING  | MAX. NO. | AIR PATTERN | NOTES |
| SD-1                      | PRICE                        | SDGE                         | SPIRAL DUCT GRILLE | DUCT MTD. | 35       | 4 WAY       | 1, 2  |

SD: SUPPLY DIFFUSER; SG: SUPPLY GRILLE; LD: LINEAR SLOT; RG: RETURN GRILLE/REGISTER; EG: EXHAUST GRILLE/REGISTER

THE FOLLOWING APPLY TO THIS SCHEDULE, AS APPLICABLE:  
 A. AIR DEVICES SHALL BE FURNISHED WITH OPPOSED BLADE DAMPERS (ADJUSTABLE FROM THE DEVICE FACE) WHEN INSTALLED WHERE ACCESS TO A DUCT MOUNTED DAMPER IS NOT POSSIBLE, UNO.  
 B. ROUND BRANCH DUCT RUNOUT SIZES SHALL BE THE SAME SIZE AS THE NECK OF THE ASSOCIATED AIR DEVICE, UNO.  
 C. PROVIDE SQUARE TO ROUND TRANSITIONS AS NECESSARY.  
 D. COLOR AS SELECTED BY THE OWNER'S REPRESENTATIVE. ALL FINISHES SHALL BE SUITABLE FOR FIELD PAINTING.

NOTES:  
 1. VERTICAL FRONT BLADES  
 2. PROVIDE WITH AIR SCOOP

**MECHANICAL SUMMARY**  
 ROANOKE ISLAND AQUARIUM - TURTLE REHABILITATION CENTER  
 MANTEO, North Carolina

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT METHOD OF COMPLIANCE  
 PRESCRIPTIVE X ENERGY COST BUDGET \_\_\_\_\_  
 ASHRAE 90.1 \_\_\_\_\_

EXTERIOR DESIGN CONDITIONS  
 WINTER DRY BULB \_\_\_\_\_ DEG. F  
 SUMMER DRY BULB \_\_\_\_\_ DEG. F  
 WINTER DRY BULB \_\_\_\_\_ DEG. F  
 SUMMER DRY BULB \_\_\_\_\_ DEG. F  
 RELATIVE HUMIDITY \_\_\_\_\_ %

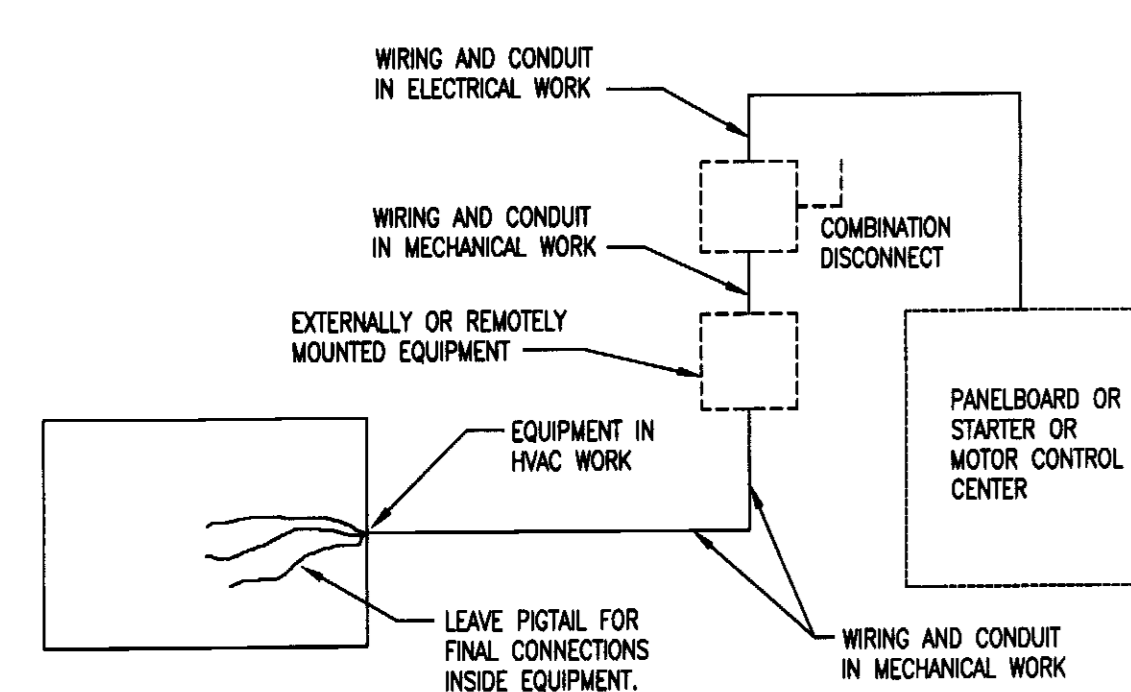
BUILDING HEAT LOAD \_\_\_\_\_ 51 MBH (BLOCK LOAD INCLUDING OIA)  
 BUILDING COOLING LOAD \_\_\_\_\_ 85 MBH (BLOCK LOAD INCLUDING OIA)

MECHANICAL SPACING CONDITIONING SYSTEM  
 UNITARY (NO NEW UNITARY EQUIPMENT)  
 BOILERS  
 TOTAL BOILER OUTPUTS: NA  
 AIR COOLED CHILLER  
 TOTAL CHILLER OUTPUT: NA  
 LIST OF EQUIPMENT EFFICIENCIES  
 BOILERS: NA  
 CHILLER: NA

EQUIPMENT SCHEDULES WITH MOTORS (MECHANICAL SYSTEMS)  
 SERVICE: AHU-4 HP-4  
 MOTOR HP: 1-1/2 2  
 NO. OF PHASES: 3 3  
 MIN. EFFICIENCY: 84 84  
 MOTOR TYPE: ODP ODP  
 # OF POLES: 4 4

DESIGNER STATEMENT:  
 TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT REQUIREMENTS OF ASHRAE 90.1

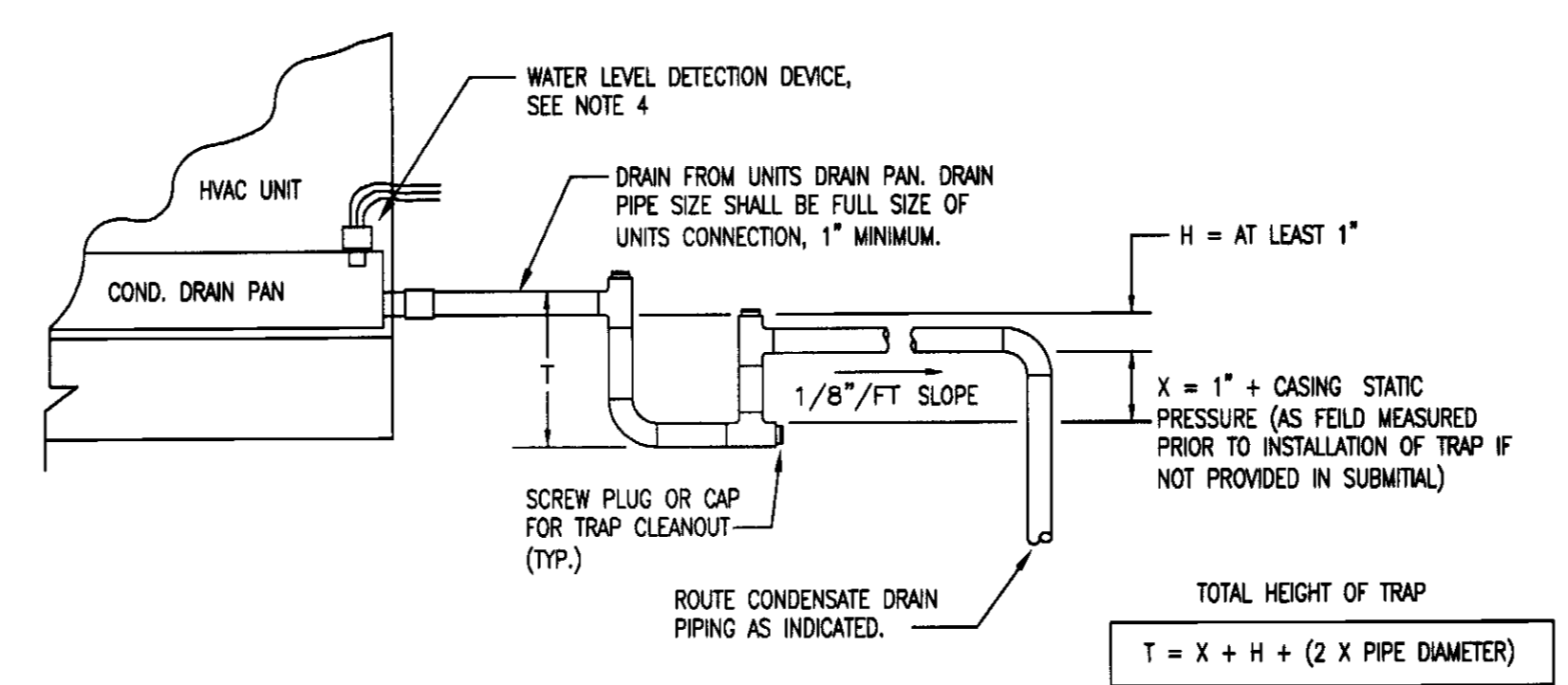
SIGNED: \_\_\_\_\_  
 NAME: THOMAS H. PHOENIX, P.E.  
 TITLE: PRINCIPAL



NOTES:  
 A. RESPONSIBILITY: UNLESS OTHERWISE INDICATED, ALL MOTORS AND CONTROLS SHALL BE FURNISHED, SET IN PLACE AND WIRED IN ACCORDANCE WITH THE TABLE AND DETAIL.  
 B. REFER TO SECTION 15030-B AND ELECTRICAL DRAWINGS FOR REQUIREMENTS WHERE THE USE OF A MOTOR CONTROL CENTER IS FURNISHED UNDER DIVISION 16 WORK BY THE EC.

| ITEM   | FURNISHED UNDER | SET IN PLACE OR MOUNTED UNDER | WIRED AND CONNECTED UNDER |
|--|-----------------|-------------------------------|---------------------------|
| EQUIPMENT MOTORS, THERMAL OVERLOADS, RESISTANCE HEATERS  | MC              | MC                            | MC                        |
| MOTOR CONTROLLERS; MAGNETIC STARTERS; REDUCED VOLTAGE STARTERS AND OVERLOAD RELAYS                                       | MC              | MC                            | MC/EC                     |
| DISCONNECT SWITCHES, FUSED OR UNFUSED, HP RATED SWITCHES, THERMAL OVERLOAD SWITCHES AND FUSES, MANUAL OPERATING SWITCHES | EC              | EC                            | MC/EC(1)                  |
| REDUCED VOLTAGE CONTROLS   | MC              | MC                            | MC                        |
| LINE VOLTAGE CONTROLS (2)  | MC              | MC                            | MC                        |
| DUCTMOUNTED FIRE & SMOKE DETECTORS (FOR HVAC EQUIPMENT)  | MC/EC(5)        | MC                            | MC(4)/EC(3)               |

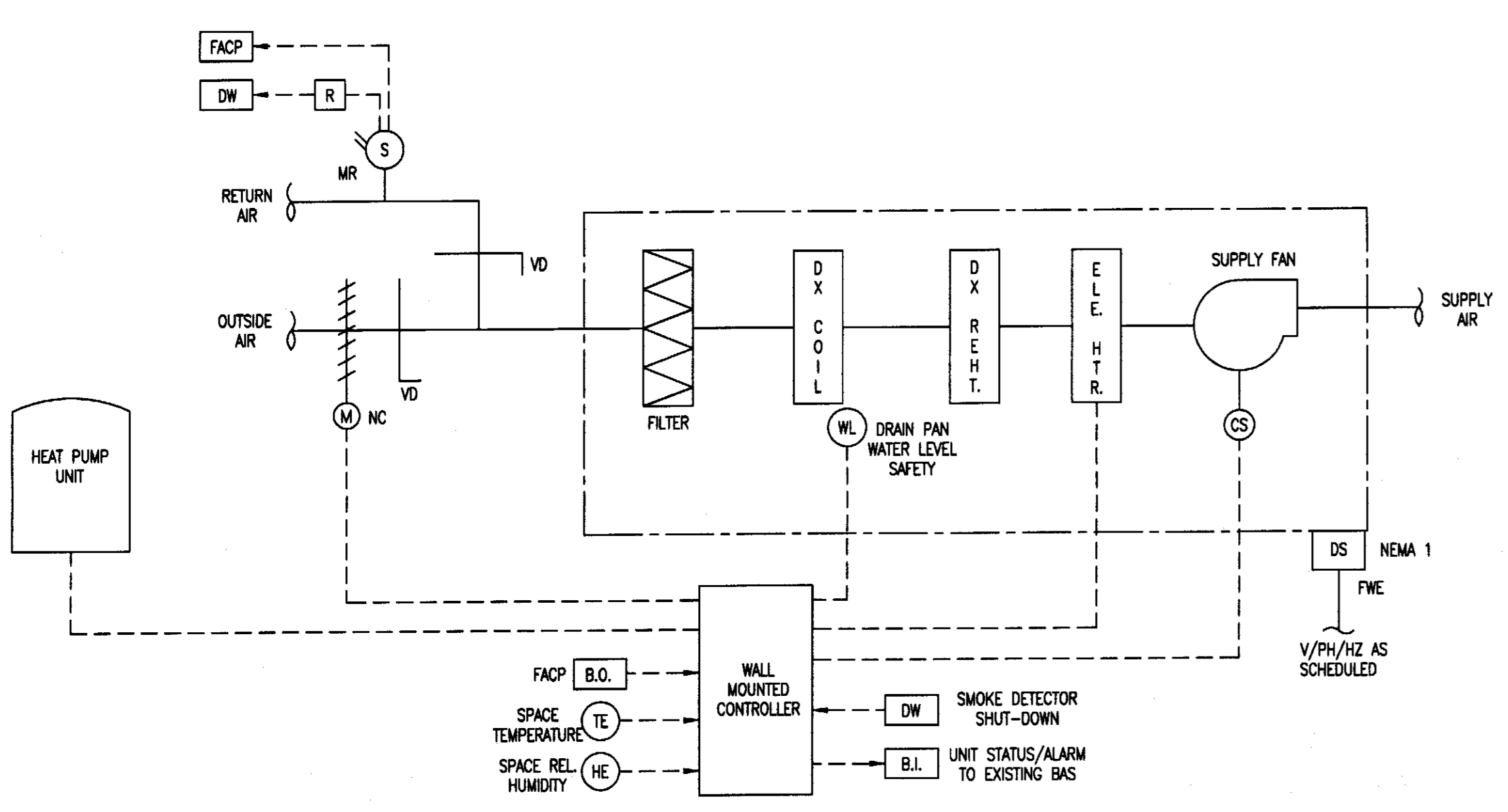
- IF FURNISHED AS PART OF FACTORY WIRED MECHANICAL EQUIPMENT, WIRING BY EC AND CONNECTIONS BY MC.
- THOSE CONTROLS WHICH CARRY FULL LOAD METER CURRENTS OR OPERATE AT NOMINAL 120 V. TO GROUND OR LESS.
- WIRING THROUGH PRIMARY CONTACTS OF THE DETECTOR TO ALARM SYSTEM BY EC. ALARM SYSTEM FURNISHED BY EC.
- MC TO WIRE AUXILIARY CONTACTS OF DETECTOR THROUGH ASSOCIATED UNIT'S CONTROL CIRCUIT IN ORDER TO DE-ENERGIZE THE OPERATION OF THE FAN TO PREVENT THE SPREAD OF SMOKE/FIRE UPON ACTIVATION.
- FURNISHED BY EC IF THE FIRE ALARM SYSTEM IS EXISTING OR IS TO BE PROVIDED BY THE EC. IF NO FIRE ALARM SYSTEM EXISTS OR IS TO BE PROVIDED, THEN THE MC IS TO FURNISH IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA 90A, CURRENT EDITION.



GENERAL NOTES:  
 1. DETAIL IS SHOWN FOR SINGLE DRAIN CONNECTION. ON UNITS WITH TWO DRAIN CONNECTIONS, TRAP EACH INDIVIDUAL DRAIN CONNECTION. DO NOT CONNECT DRAINS TO A COMMON DRAIN LINE WITH ONLY ONE TRAP.  
 2. THE UNITS DRAIN PAN MUST BE LEVEL TO WITHIN 1/4" SIDE TO SIDE.  
 3. CONDENSATE DRAIN LINES SHALL HAVE PROVISIONS FOR REGULAR CLEANING TO PREVENT SEDIMENT FROM PLUGGING THE DRAIN AND CAUSING THE DRAIN PAN TO OVERFLOW.  
 4. COOLING COIL DRAIN PAN SHALL BE PROVIDED WITH A WATER LEVEL DETECTION DEVICE TO PROVIDE SHUT OFF OF THE EQUIPMENT IN THE EVENT THE PRIMARY DRAIN IS BLOCKED IN ACCORDANCE WITH SECTION 307.2.3 AUXILIARY AND SECONDARY DRAIN SYSTEMS OF THE NORTH CAROLINA MECHANICAL CODE.

1  
 M3.1 STANDARD ELECTRIC CONNECTIONS TO EQUIPMENT AND TABLE DETAIL  
 NO SCALE

2  
 M3.1 HVAC UNIT CONDENSATE TRAP INSTALLATION DETAIL  
 NO SCALE



NOTES:  
 1. THE FACILITY IS CURRENTLY SERVED BY A BUILDING AUTOMATION SYSTEM. THE NEW AHU-4/HP-4 INTO EXISTING DDC SYSTEM FOR UNIT STATUS AND ALARM ONLY. UPDATE EXISTING BAS CONTROL SOFTWARE AND GRAPHICS TO INCLUDE NEW EQUIPMENT.

3  
 M3.1 SPLIT SYSTEM HEAT PUMP UNIT CONTROL DIAGRAM  
 NO SCALE