

**DOCUMENT 00 90 00
ADDENDUM**

ADDENDUM NO. [1] Date: September 29, 2020

**RE: WITC – RICE LAKE CAMPUS
HEAT PUMPS
1900 COLLEGE DRIVE
RICE LAKE, WI
HSR PROJECT NO. 20022-4**

**FROM: HSR Associates, Inc
100 Milwaukee Street
La Crosse, WI 54603
(608) 784-1830**

To: Prospective Bidders

This addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated September 2020. Acknowledge receipt of this Addendum in the space provided on the bid form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of [3] pages, Pre-bid attendance, Memorandum of Understanding, [1] specification section and [3] Reference Drawings.

CHANGES TO BIDDING REQUIREMENTS AND CONDITIONS OF THE CONTRACT:

1. Pre-bid attendance attached hereto.
2. **MEP Contractors wanting to perform as a Lead Contractor: Contact Toni Furlano at HSR tfurlano@hsrassociates.com to have you listed as such on our website for subcontractors to see.**
3. The Bid Opening will not be an in-person event. Bid delivery location remains the same. Contractors may join the bid opening virtually through the following link:
 - a. https://teams.microsoft.com/#/pre-join-calling/19:meeting_MDg1ZjNlMDAtNzNhOS00NDI4LWl4ZjktZTRmMmMONzJlMWZk@thread.v2
4. **Section 00 11 13 ADVERTISEMENT FOR BIDS**
 - a. The fifth paragraph starting with “Prequalified Mechanical...” shall be revised to “Prequalified Contractors in Divisions listed in Section 00 11 15 shall be the only allowed bidders. HVAC, Plumbing or Electrical Contractors may act as Lead Contractor if their bonding capacity allows.”
5. **Section 00 73 00 SUPPLEMENTARY CONDITIONS**
 - a. Add the following under Article 9:

“9.6.9.5 Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:
The retainage shall be an amount equal to not more than 5% of the estimate until 50% of the work has been completed. At 50% completion, no additional amounts shall be retained except that at 50% completion or any time thereafter when the progress of the work is not

satisfactory, additional amounts may be retained, but in no event shall the total retainage be more than 10% of the value of the work completed.”

GENERAL REQUIREMENTS:

6. Clarification: The Lead Contractor for this project could be a HVAC, Plumbing or Electrical Contractor. Any notes in the documents referring to “General Contractor” shall mean “Lead Contractor”. Follow cutting and patching direction in 01 70 00.
7. Section 01 10 00 SUMMARY
 - a. Add the following to 1.07:
“Contractors shall be responsible for managing their staff and following recommended CDC guidelines regarding COVID19. In addition Contractors shall maintain a log of personnel onsite each day (sign-in/out sheet). WITC will restrict access to the building and require entrance/exit to Work area at a single door and route to and from the job area. Contractors must wear a minimum N95 rated or approved cloth mask while on campus outside the work area. In work area(s) not enclosed a mask shall be required. These requirements may be edited or revised per current CDC guidelines as the project proceeds.”
 - b. The attached Contractor building access MEMORANDUM OF UNDERSTANDING will be required to be completed by the awarded Contractor to ensure Covid communication with the Owner.
 - c. 1.08, C: Change “30 days” to “15 days”.
8. Section 01 50 00 TEMPORARY FACILITIES AND CONTROLS
 - a. 1.07: The Owner will designate a restroom for exclusive use by the Contractors. Said room shall be cleaned daily and be kept stocked with paper supplies. Room shall be sanitized the day building is turned over to the Owner. No staff or students will be allowed to use this restroom during construction.
 - b. 1.10: Add the following;
“Room 126A is a schoolwide network closet. Min 10 mil plastic dust protection shall be provided by the contractor, including sealing the door, and also overhead if required.”
9. Section 01 70 00 EXECUTION AND CLOSEOUT PROCEDURES
 - a. 3.11: Add the following
“Contractor shall be required to “sanitize” the jobsite as part of final cleaning and just prior to substantial completion as follows: Disinfectant shall be used to wipe down all high contact surfaces including but not limited to; lite switches and other similar electrical or mechanical (t-states) devices, door handles, countertops of furniture and casework that was left installed during construction, bathroom fixtures and surfaces of the assigned restroom area, drawer pulls and similar devices affected during the work.”

CHANGES TO SPECIFICATIONS:

10. Section 23 73 23 FACTORY FABRICATED CUSTOM AIR-HANDLING UNITS
 - a. Revised section attached hereto replacing original document.

CHANGES TO DRAWINGS

11. Reference Drawings M1, M2 and M3 (attached hereto)

- a. Clarification: Reference attached supplemental record drawings for existing hot water heating pipe size and route between construction area and boiler room. Main shut-off valves do not exist between the project area and the boiler room. Contractor to provide necessary means and methods for connection of new to existing pipes. Add valves at new to existing connection. Coordinate all system and equipment shut downs with owner representative.

12. Sheet MD100 MECHANICAL DUCTWORK DEMOLITION PLAN (no drawing reissued)

- a. Revise Ductwork Demo General Note 1 to the following: "Patch roof as required. Refer to A120 for roofing requirements and Structural drawings for structure changes."

END OF DOCUMENT 00 90 00

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ARCHITECTURE
ENGINEERING
INTERIOR DESIGN

WITC Rice Lake
Heat Pump
Rebid.

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MEMORANDUM OF UNDERSTANDING

Due to the current situation with Coronavirus (COVID-19) Wisconsin Indianhead Technical College (WITC) requires all contractors working on the campus to practice social distancing and limit interactions with WITC staff onsite whenever possible, excluding life safety issues or other reasonable expectations.

Contractors agree to and will adhere to local, state, and federal mitigation requirements for limiting the spread of COVID-19. At any time if human health appears to be compromised, either party may stop the project.

While on campus contractors shall have access to the _____ entrance and _____. Access to rooms must be prearranged with campus staff. To gain access to other areas not described contact Scott Kupferschmidt at 715-234-7082 ex. 5623 or 715-205-7846. Employees who are experiencing any symptoms of COVID-19 prior to arrival shall not enter the campus. If symptoms begin while on site, the employee must immediately notify the onsite supervisor and vacate the premises. The onsite supervisor shall notify Steve Decker at 715-651-9677 immediately upon knowledge of such events.

In the event an employee of the contracted party is diagnosed with COVID-19:

- Immediately notify Steve Decker, Vice President Administrative Services at 715-651-9677 or steve.decker@witc.edu.
- The campus will be closed immediately and for 48 hours.
- After 24 hours the contracted party will be responsible for disinfecting all areas accessed by the contracted party.
- Work may resume after 48 hours.

In the event a WITC employee is diagnosed with COVID -19:

- Steve Decker, Vice President Administrative Services, will notify the project superintendent at the contact information listed below.
- The campus will be closed immediately and for 48 hours.
- After 24 hours WITC will be responsible for disinfecting all areas accessed by the WITC.
- Work may resume after 48 hours

Steve Decker
Vice President, Administrative Services
715-651-9677

General Contractor

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SECTION 23 73 23

FACTORY FABRICATED CUSTOM AIR-HANDLING UNITS

REVISED; ADDENDUM #1 09/29/2020

PART 1 GENERAL

1.01 SCOPE

- A. This section includes specifications for factory fabricated custom air handling units. Included are the following topics:
1. PART 1 – GENERAL.
 - a. Scope.
 - b. Related Work.
 - c. Reference.
 - d. Reference Standards.
 - e. Quality Assurance.
 - f. Submittals.
 - g. Operation and Maintenance Data.
 - h. Design Criteria.
 - i. Delivery, Storage and Handling.
 - j. Warranty.
 2. PART 2 – PRODUCTS.
 - a. Manufacturers.
 - b. Casing.
 - c. Doors.
 - d. Electrical and Lights.
 - e. Fans.
 - f. Coils.
 - g. Piped Service.
 - h. Filters.
 - i. Diffusers.
 3. PART 3 – EXECUTION.
 - a. Installation.
 - b. Leakage Test.
 - c. Construction Verification Items.
 - d. Functional Performance Testing.
 - e. Owner Training.
 4. APPENDIX
 - a. Factory Fabricated Custom Air Handling Unit Leakage Test Report.

1.02 RELATED WORK

- A. Section 23 05 13 - Common Motor Requirements for HVAC Equipment.
- B. Section 23 05 15 - Piping Specialties.
- C. Section 23 05 23 - General Duty Valves for HVAC.
- D. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment.
- E. Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment.
- F. Section 23 09 13 - Instrumentation and Control Devices for HVAC.
- G. Section 23 21 13 - Hydronic Piping.
- H. Section 23 31 00 - HVAC Ducts and Casings.
- I. Section 23 33 00 - Air Duct Accessories.
- J. Section 23 34 00 - HVAC Fans.
- K. Section 23 41 00 - Particulate Air Filtration.
- L. Section 23 73 12 - Air Handling Unit Coils.
- ~~M. Section 23 84 13 - Humidifiers. **ADDM #1**~~

1.03 REFERENCE

- A. Applicable provisions of Division 1 govern work under this section.

1.04 REFERENCE STANDARDS

- A. ARI 430 Standard for Central Station Air Handling Units.
- B. NFPA 90A Standard for Installation of Air Conditioning and Ventilation Systems.
- C. NFPA 90B Installation of Warm Air Heating and Air Conditioning Systems.
- D. ASTM A167 Stainless & Heat-Resisting Chromium-Nickel Steel Plate, Sheet, & Strip.
- E. ASTM A500-03a Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- F. ASTM A568 Standard Specification for Steel Sheet, Carbon, and High Strength Low-Alloy, Hot-Rolled and Cold – Rolled.
- G. ASTM A653 Steel Sheet, Zinc-Coated (Galvanized) by Hot-Dip Process, Lock Forming Quality.
- H. ASTM A90 Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
- I. ASTM B209 Aluminum and Aluminum Alloy Sheet and Plate.
- J. ASTM B429A Standard Specification for Aluminum Alloy Extruded Structural Pipe and Tubing.
- K. ASTM E-84 Surface Burning Characteristics of Building Materials.
- L. NEMA National Electrical Manufacturers Association.
- M. NFPA 70 National Electrical Code.
- N. SMACNA HVAC Duct Construction Standards, 3rd Edition - 2005.
- O. SMACNA HVAC Air Duct Leakage Test Manual.
- P. UL 1995 Heating and Cooling Equipment.
- Q. UL 723 Surface Burning Characteristics of Building Materials.

1.05 QUALITY ASSURANCE

- A. Refer to Section 01 40 00 - Quality Requirements.
- B. The manufacturer shall have been designing and producing air handling units for a minimum of ten years.
- C. The units shall be factory assembled and tested per this specification.
- D. All shipping splits must be joined at the factory to confirm proper alignment of all components before disassembly for shipping.
- E. All of the air handling unit components, adhesives, sealants, insulations, vapor retarders, and films shall have a flame spread index of not over 25 and a smoke developed index of not over 50 per ASTM-E84; NFPA-255 and UL-723.

1.06 SUBMITTALS

- A. Refer to Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Submit shop drawings including the following information:
 - 1. Dimensioned computer generated drawings showing unit plan, elevation views, all internal components, wall and floor penetrations, structural frame design, and unit weights at lifting lugs. Drawings shall be submitted at a minimum scale of 1/4"=1'-0".
 - 2. Panel joint(s) and panel details showing thermal breaks.
 - 3. Base connection details.
 - 4. Shipping split connections details.
 - 5. Indicate fan class, fan performance and motor electrical characteristics. Provide fan curves with specified operating point clearly plotted.
 - 6. Indicate metal gauges, material finishes, assembly, construction details, and field connection details including the following:
 - a. Unit electric characteristics with connected load.
 - b. Construction details and material finishes.
 - c. All required service and operation clearances.
 - d. Field connection details.

- e. Filter, coil, and damper performance data.
 - f. Piping connection diagrams and field fabrication details.
 - g. Unit specific power and control circuit wiring diagrams.
 - h. Interconnection wiring diagrams.
 - i. Catalog data and illustrations edited for each unit's application.
7. Provide calculated 8 octave maximum sound power levels at unit discharge and return connections, and maximum casing radiated sound power levels.
 8. Sound absorption coefficient of panel system obtained using ASTM method of Test for Sound Absorption of Acoustical materials in Reverberation Rooms (ASTM Designation C423-66), and sound transmission loss obtained using procedures conforming to ASTM Designation E90-70, E413-70T and other pertinent standards.
 9. Provide static pressure calculation including individual internal component pressure losses and available external static pressure.

1.07 OPERATION AND MAINTENANCE DATA

- A. All operations and maintenance data shall comply with the submission and content requirements specified under Section 01 78 00 - Closeout Submittals.

1.08 DESIGN CRITERIA

- A. Furnish factory fabricated air handling unit(s) complete meeting the configuration shown on drawings and/or as scheduled.
- B. Units to conform to NFPA 70, 90A, and 90B.
- C. The unit(s) shall bear the ETL label and/or ISO-9000 certified.
- D. The unit(s) shall contain only UL listed components.
- E. Any revisions made by the Contractor to the inlet and outlet ductwork conditions from that shown on the drawings shall not increase system effect and/or static pressure and shall not decrease mixing efficiencies.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Provide protective coverings for all openings during shipping. Loose shipped items must be contained within factory provided protective coverings, with factory installed shipping skids and lifting lugs.
- B. Store the unit in a clean dry place and protect from weather and construction traffic.

1.10 WARRANTY

- A. Provide a manufacturer's parts and labor warranty against factory defects in material and workmanship for the entire unit for a period of one year after startup.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Air Flow Equipment: www.airflowsystems.com.
- B. Buffalo: www.buffalofan.com.
- C. CES Group: www.ces-group.com.
- D. Daikin: www.daikinapplied.com
- E. Haakon: www.haakon.com.
- F. Trane: www.trane.com.
- G. York: www.york.com.
- H. Marcraft: www.johnson-marcraft.com.
- I. Substitutions: Refer to Section 01 60 00 - Product Requirements.

2.02 CASING

- A. Casing joints and seams shall be thermally broken. This includes floors, walls, roofs and all door frames. Only screws will be permitted as a thermal bridge through the panels. Caulk will not be accepted as a thermal break. Thermal break shall prevent condensate from forming on the exterior surface of the air handling unit casing at an exterior temperature of 91°DB and 74°WB and an interior air handling temperature of 50°F DB.
- B. WALL/ROOF CONSTRUCTION:

1. Construct walls and roof from 2 inch thick double wall panel assemblies. Panels shall be insulated with a minimum 3.0 lb/ft³ density rigid fiberglass insulation or 2.5 lb/ft³ density polyisocyanurate insulation or 3 lb/ft³ urethane foam type insulation. Panel assemblies shall have a heat transfer factor not greater than 0.06 btu/hr-ft³ - °F. The outer shell shall be constructed of solid, ~~minimum 16 gauge~~, G90 galvanized steel with a mill galvanized finish or 16 gauge, G60 galvanized steel with an etch bond primer and enamel finish coat. The inner liner shall be constructed of solid, ~~minimum 20 gauge~~, G90 galvanized steel. **ADDM #1**

2. Sound Transmission Loss of the panel assembly in accordance with ASTM E90 shall equal or exceed the following:

Transmission Loss (dB)	Octave Band	Center Frequency (Hz)
125	250	500
175	750	1000
225	1500	2000
281	3150	4000

3. Structural reinforcement shall be designed so no member exceeds a deflection of 1/200 of span based on equipment loading and differential static of 10" W.C.
4. Construct the internal horizontal and vertical cross members of sheet steel and/or formed carbon steel using standard shapes and sizes.
5. Internal supports shall not interfere with mechanical equipment operation or maintenance.

C. FLOOR AND BASE CONSTRUCTION:

1. Construct floors from 2 inch thick double wall assemblies. Floors shall be insulated with a minimum 3.0 lb/ft³ density rigid fiberglass insulation or 2.5 lb/ft³ density polyisocyanurate insulation or 3 lb/ft³ urethane foam type insulation. Floor assemblies shall have a heat transfer factor not greater than 0.06 btu/hr-ft³ °F. The outer shell shall be constructed of solid, minimum 22 gauge, G90 galvanized steel with a mill galvanized finish. ~~The floor plates shall be constructed of solid, minimum 12 gauge steel checker plate or 3/16 inch aluminum checker plate.~~ Steel floor plates shall be finished with rust resistive epoxy paint. **ADDM #1**
2. ~~Each section shall have a turned up lip around the section perimeter with welded corners and continuously welded seams and joints. Each section shall be capable of retaining a minimum of 1-1/2 inches of water without leakage. Locate drain connections at lowest point of each pan type floor section. Extend drain connection through the perimeter base channel and weld watertight. Provide removable cap on each drain.~~ **ADDM #1**
3. ~~The floor plates shall be welded to the unit base.~~ **ADDM #1**
4. ~~Perimeter floor frame members and intermediate members shall be welded cold formed carbon steel or aluminum using standard shapes and sizes.~~ **ADDM #1**
5. ~~Install lifting lugs to perimeter steel along the longest length of unit or unit section. Lifting lugs shall be removable after placement of equipment.~~ **ADDM #1**
6. The unit base shall be primed and finished with rust inhibiting epoxy paint.
7. Floor sections shall be constructed to prevent oil canning.

D. INTERNAL PARTITION WALL CONSTRUCTION:

1. The internal partition wall shall be constructed of solid, minimum 16 gauge, G90 galvanized steel with mill galvanized finish.
2. Panels shall form a water and airtight seal with adjacent panels. Fasteners used to attach the panel shall not penetrate into the air tunnel.
3. Panel deflection shall not exceed 1/200 of span based on maximum operating differential pressure across the panel.

E. LEAKAGE RATE:

1. Leakage rate shall meet or exceed SMACNA/ANSI/AHRI leakage class 16. ~~not exceed 1% of the total system air quantity when subjected to +/- 10" static pressure.~~ **ADDM #1**

F. CASING PENETRATIONS:

1. Install sealing collars to the interior and exterior of each penetration to prevent air leakage where coil piping, humidifier piping, air vents, drain piping, and electrical conduits penetrate air handling unit casing. Silicone sealants and duct sealants are not acceptable to seal pipe penetrations of the air handling unit casing.
2. Duct sealant and/or gaskets as indicated in specification Section 23 31 00 may be utilized to seal duct connections to the air handling unit casing. Silicone sealants are not acceptable.

2.03 DOORS

- A. Doors shall be 2 inch double wall, constructed, and insulated with the same materials used in the surrounding unit walls. ~~Extruded aluminum doors are acceptable provided that they are 4 inch double wall and insulated with the same materials used in the surrounding unit walls.~~ **ADDM #1**
- B. Door frames shall be ~~continuously welded and~~ formed of the same materials as the surrounding wall. Doors shall be sealed against the door frames with neoprene bulb type gaskets installed around the entire periphery of the door. **ADDM #1**
- C. Each door shall be furnished with corrosion resistant metal hinges or continuous piano hinge and shall have at least two stainless steel or aluminum alloy high compression type cam latches operable from either side of the unit.
- D. Doors shall open in direction against pressure of the section.
- E. Each door shall contain a double pane, tempered, reinforced or safety glass window.
- F. All doors except for fan sections shall be a minimum of 24 inches wide and 72 inches high, unless noted otherwise on the drawings. All doors located in fan sections shall be a minimum of 30 inches wide and 72 inches high, unless noted otherwise on the drawings.

2.04 ELECTRICAL AND LIGHTS

- A. Combination lighting and convenience outlet circuit is required for each section of the unit. Each access section shall contain a minimum of one marine grade light fixture. Sections wider than 6 feet shall have multiple marine grade light fixtures with maximum spacing of 6 feet.
- B. Interior wiring and conduit shall be provided by the unit manufacturer. Provide junction box for each motor at outside of unit wall and provide single point of connection for both 480V, 3-phase and 120V, single phase power for connection by the Electrical Contractor.
- C. Lights, switches, convenience outlets, wiring and conduit shall meet the requirements of Division 26.

2.05 FANS

- A. Double width, double inlet, centrifugal type, or plenum type statically and dynamically balanced fans. For variable speed applications, fan shall be dynamically balanced through entire range of operation. Fan wheels shall be airfoil type as specified or required by performance characteristics.
- B. Each fan and motor combination shall be capable of delivering 110% of air quantity scheduled at scheduled static pressure. The motor furnished with the fan shall not operate into the motor service factor when operating under these conditions.
- C. Fans to be designed for continuous operation at maximum rated static pressure.
- D. Fan bearings shall be self-aligning, pillow block, regreasable ball type selected for a minimum average L-50 life of 400,000 hours.
- E. Terminate grease lines within the unit so they are able to be easily serviced by opening the access door.
- F. Furnish variable pitch sheaves for drives 3 hp and smaller, fixed pitch sheaves for drives 5 hp and larger. Drives shall be designed for 150% of motor rating. Furnish OSHA approved belt guards for all fans.
- G. Consider drive efficiency in motor selection according to manufacturer's published recommendation or according to AMCA Publication 203, Appendix L.
- H. Furnish galvanized mesh inlet screens for fans without inlet ductwork connections.
- I. Furnish a metal wheel guard at all plenum fans.
- J. Where shown on the drawings provide fan sections with trolley beams. Design and fabricate the unit housing and structural support system to support the weight of the trolley beam fully loaded with the weight of the fan motor, trolley, and chain. Trolley beams shall be centered on access doors, or on removable component access panel, which shall be centered on fan motors. Beams shall be mounted at or near the ceiling of the fan compartment and shall extend continuously from interior wall to interior wall. Trolleys, hoists, chainfalls, and chain shall be provided "by others" in the future as needed
- K. Fan, drive and motor assembly shall integrally isolated within unit. Vibration isolation shall be in compliance with Section 23 05 48. Provide flexible connection and thrust restraints at fan discharge connection to casing.

- L. Furnish a label inside the fan section that identifies the specifications of the v-belt drive kit. Include motor sheave, drive sheave and belt data.
- M. Fan motors shall be provided in accordance with Section 23 05 13.

2.06 COILS

- A. Provided and installed by the air handling unit manufacturer in accordance with specification Section 23 73 12 except use type 304 or 316 stainless steel casing, end supports, top channel, and bottom channel to produce a rigid frame with allowance for expansion and contraction of the finned tube section.
- B. Unit manufacturer shall design and provide 304 stainless steel structure to support cooling coils and galvanized steel or 304 stainless steel structure to support all other types of coils. The coil frames shall be arranged to permit coil removal through the face of the structure without affecting the other coils in the coil bank or cutting and removal of housing panels.
- C. Entire coil frame, headers and U-bends shall be enclosed within the unit casing. Manufacturer shall extend coil piping connections, air vent and drain connections to exterior of casing.
- D. Support coils along entire length within casing and pitch coil for proper drainage.
- E. Fabricate cooling coil drain pans from 18 gauge stainless steel. Install a drain pan under each cooling coil. Extend drain pans the entire width of each coil, including piping and header if in the air stream, and from the upstream face of each coil to a distance 1/2 of the vertical coil height downstream from the downstream face. Pitch drain pans in two directions towards the outlet, with a 1/8 inch slope. Pipe drain pans individually down to the drain pan below using a minimum 1 inch type 304 stainless steel piping. The bottom drain pan shall be piped to the exterior of the unit base using a minimum of 1-1/2 inch type 304 stainless steel piping.
- F. The bottom drain pan may be substituted with a recessed pan, integral with the unit floor. It shall be constructed as specified above and incorporate required drain trap height. The floor insulation thickness at the integral drain pan shall be as indicated in the Floor and Base Construction portion of this specification.
- G. Insulate the underside of the drain pans, except those integral with the floor, with a minimum of 1 inch flexible polyolefin sheet insulation.
- H. Blank off space between coil frames and air handling unit casing airtight.

2.07 PIPED SERVICE

- A. Interior piping and equipment installation shall be complete. Piping shall be installed and tested per appropriate specification sections. Unit manufacturer shall be responsible for any leaks which occur in unit during system testing which occurs before system startup.
- B. Unit Manufacturer shall extend piping for each coil through panel casing. Terminate piping with flange for pipe 2-1/2 inches and larger or threaded connection for pipe 2 inch and smaller and caps.

2.08 FILTERS

- A. Provided and installed by the air handling unit manufacturer in accordance with specification Section 23 41 00.
- B. Construct frames of type 304 or 316 stainless steel with provisions for assembly in a bank.
- C. Filters shall be accessible from the front of the filter rack. Frames for MERV 11 filters, MERV 14 filters, HEPA filters, and activated carbon filters to have provisions for installation of MERV 7 prefilters upstream of high efficiency media. Secure prefilters by means of spring clips or a spring loaded mechanism. Spring clips or latches shall be on the upstream side of the prefilter. Provide leak-proof gaskets between prefilter media and holding frame. Prefilters shall be removable without removal of final filters.
- D. Provide static pressure taps that are arranged to prevent damage to the filter elements during replacement. Provide minimum 2 inch gap between final and prefilters for static pressure probes.

~~2.09 DIFFUSERS~~

- ~~A. Manufacturer shall provide perforated diffuser plate at fan discharge to ensure uniform airflow downstream of diffuser plate. ADDM #1~~

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install all air handling units and accessories as indicated on drawings and/or as scheduled and according to manufacturer's installation instructions.
- B. Mount units at appropriate height above floor to ensure proper condensate trap depth and condensate drainage.
- C. Install air-handling unit to provide for adequate service access. Coordinate with other trades to assure air handling unit does not infringe upon access or service clearances of other equipment.
- D. Lubricate fan bearings. Verify fan isolators have proper deflection.
- E. Upon completion of installation of air handling units, start-up and operate equipment to demonstrate capability and compliance with requirements. Field correct malfunctioning components, then retest to demonstrate compliance.
- F. Furnish one spare set of fan drive belts and one additional set of filters.

3.02 LEAKAGE TEST

- A. ~~Field~~ Factory test all factory fabricated custom air handling units at design pressure indicated on the drawings. **ADDM #1**
- B. ~~Seal all openings and dampers at the air handling unit to the pressure class listed below before performing the test. A minimal amount of ductwork may be connected to the air handling unit in order to seal off large openings. The ductwork must meet or exceed +/- 10" static pressure.~~ **ADDM #1**
- C. ~~Test draw through air handling units at 10" static pressure. The Contractor and/or the unit manufacturer may brace the access doors in positive sections of the air handling unit to meet the testing requirements.~~ **ADDM #1**
- D. If excessive air leakage is found locate leaks, repair in the area of the leak, seal, and retest.
- E. ~~Leakage rate shall not exceed more than 1% of the total system air quantity when subjected to +/- 10" static pressure.~~ **ADDM #1**
- F. Submit a signed report to the Owner's Construction Representative, indicating test apparatus used, results of the leakage test, and any remedial work required to bring air handling units into compliance with specified leakage rates.

3.03 CONSTRUCTION VERIFICATION ITEMS

- A. Contractor is responsible for utilizing the construction verification checklists supplied under Division 01 in accordance with the procedures defined for construction verification checklists.

3.04 FUNCTIONAL PERFORMANCE TESTING

- A. Contractor is responsible for utilizing the functional performance test procedures supplied under Division 01 in accordance with the procedures defined for functional performance test procedures.

3.05 OWNER TRAINING

- A. All training provided for Owner shall comply with the format, general content requirements and submission guidelines specified under Division 01.

END OF SECTION 23 73 23

**FACTORY FABRICATED CUSTOM AIR
HANDLING UNIT LEAKAGE TEST
REPORT**

Project Number: _____

Date Submitted: _____

Project

Name: _____

Location: _____

Contractor: _____

System

AHU
No: _____

Test Pressure: +/- 10" S.P.

Data

AHU Design CFM: _____

Leakage at 1% of total design CFM
(CFM): _____

Test Leakage at +10" S.P. (CFM): _____

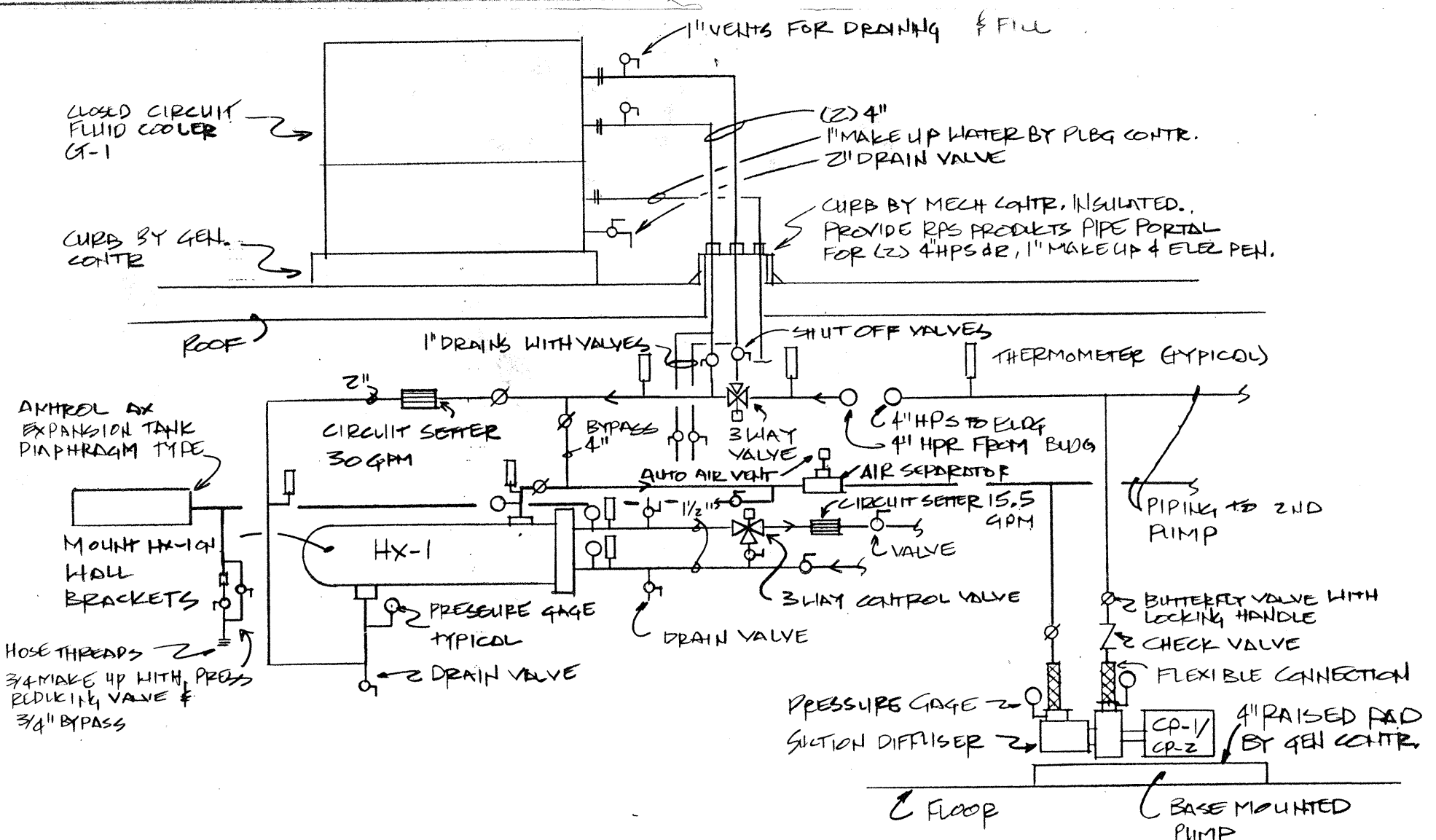
Test Leakage at -10" S.P.
(CFM): _____

Test

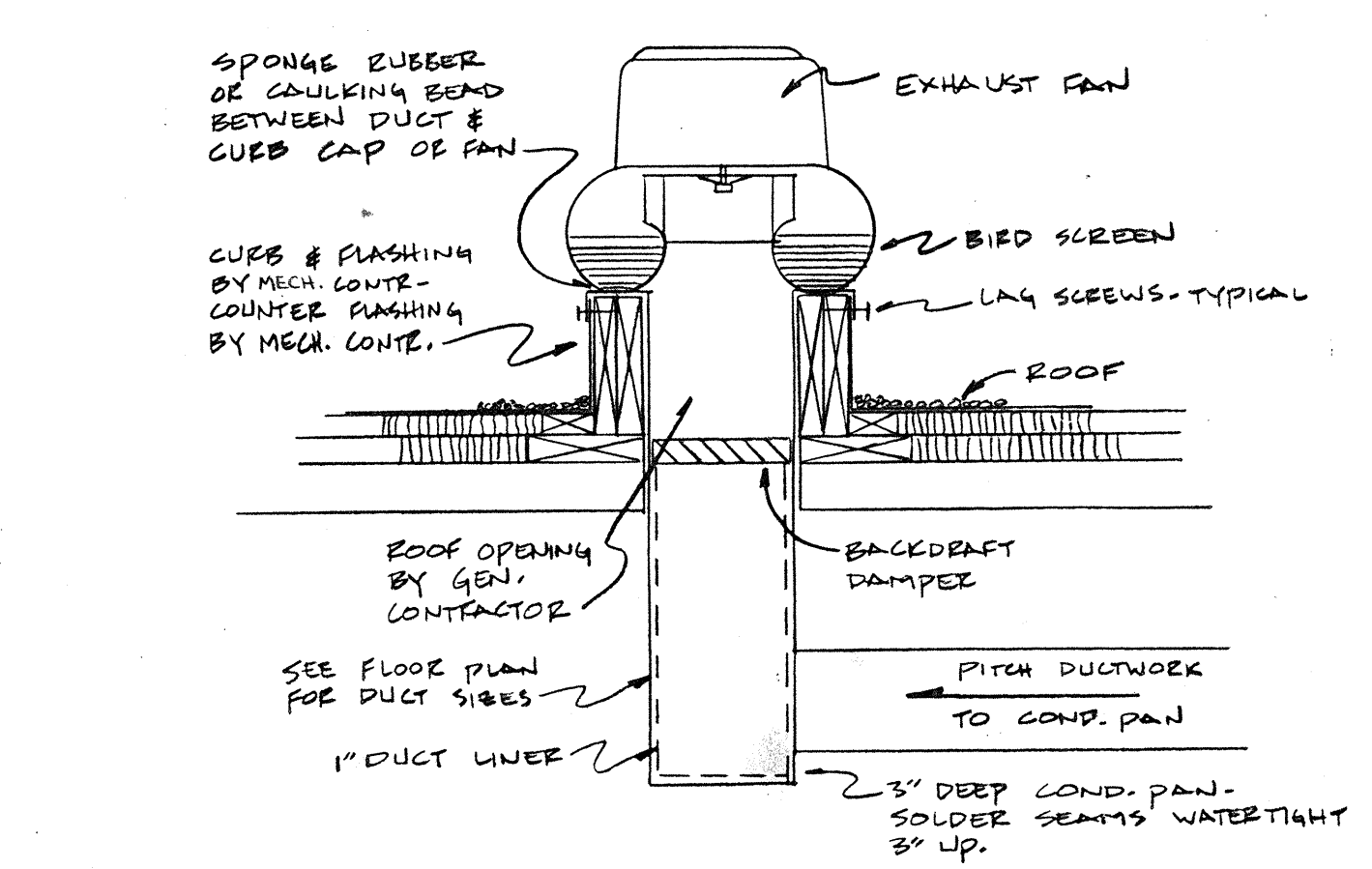
Equipment

Manufacturer: _____

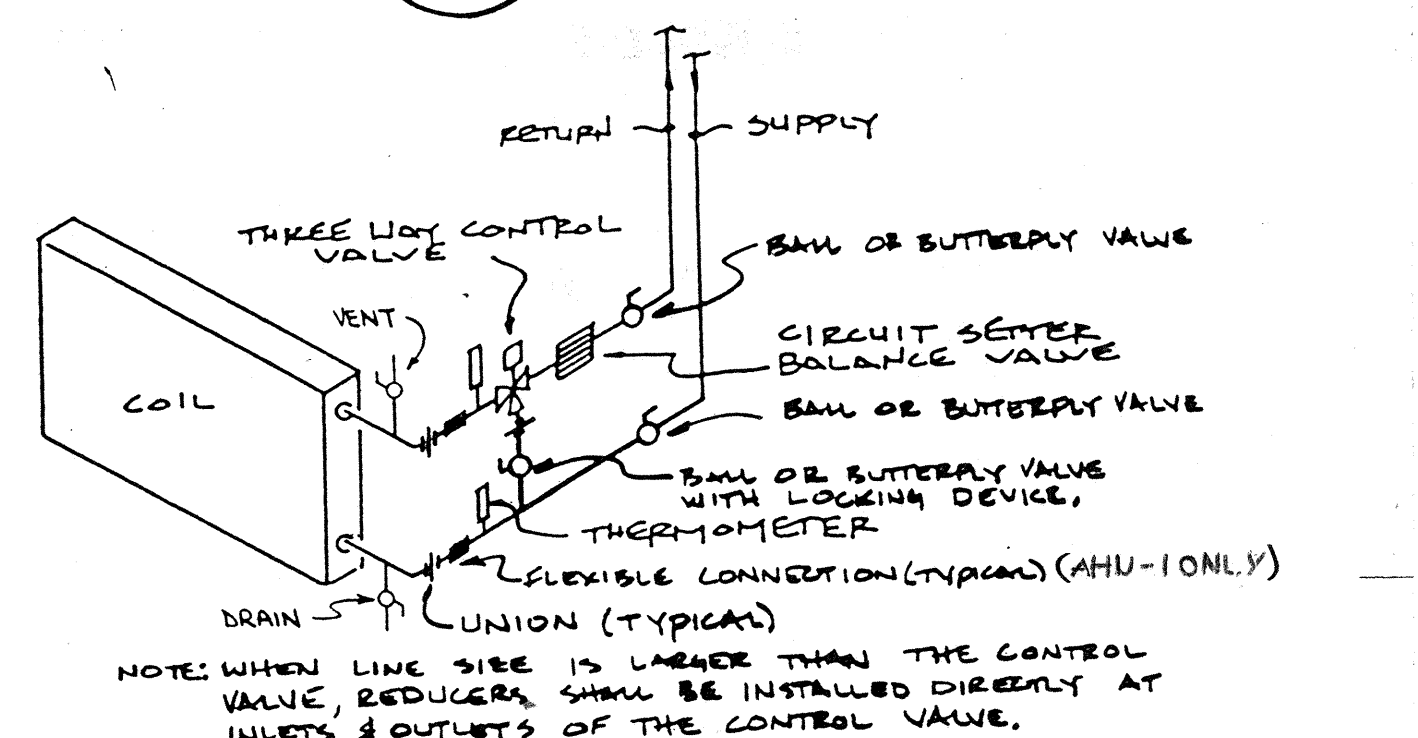
Model No: _____ Serial No: _____



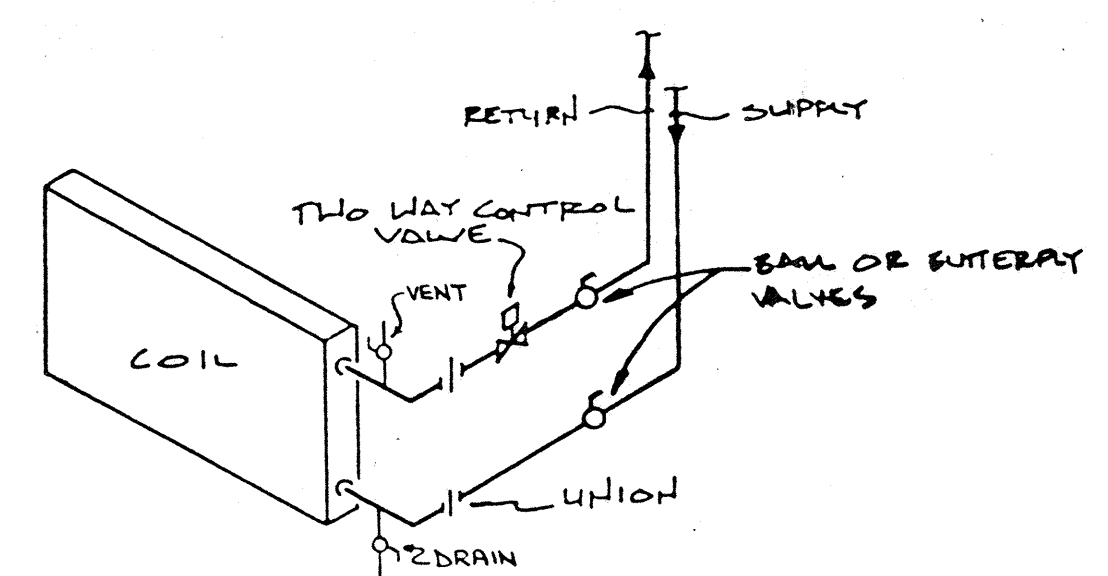
2 RM. 110 EQUIPMENT PIPING SCHEMATIC
M-1 NO SCALE



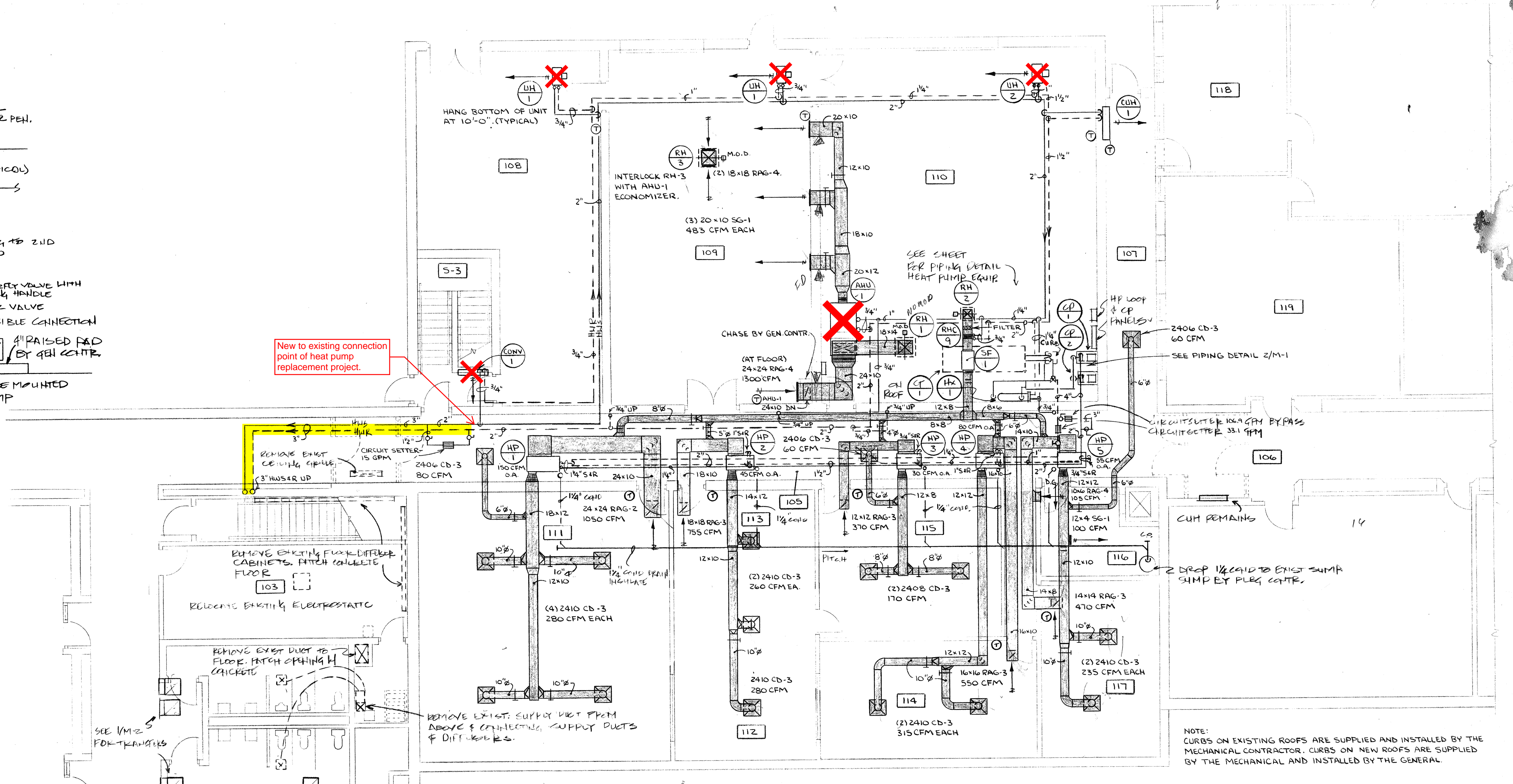
3 EXHAUST FAN DETAIL
M-1 NO SCALE



4 THREE WAY COIL VALVE DETAIL
M-1 NO SCALE

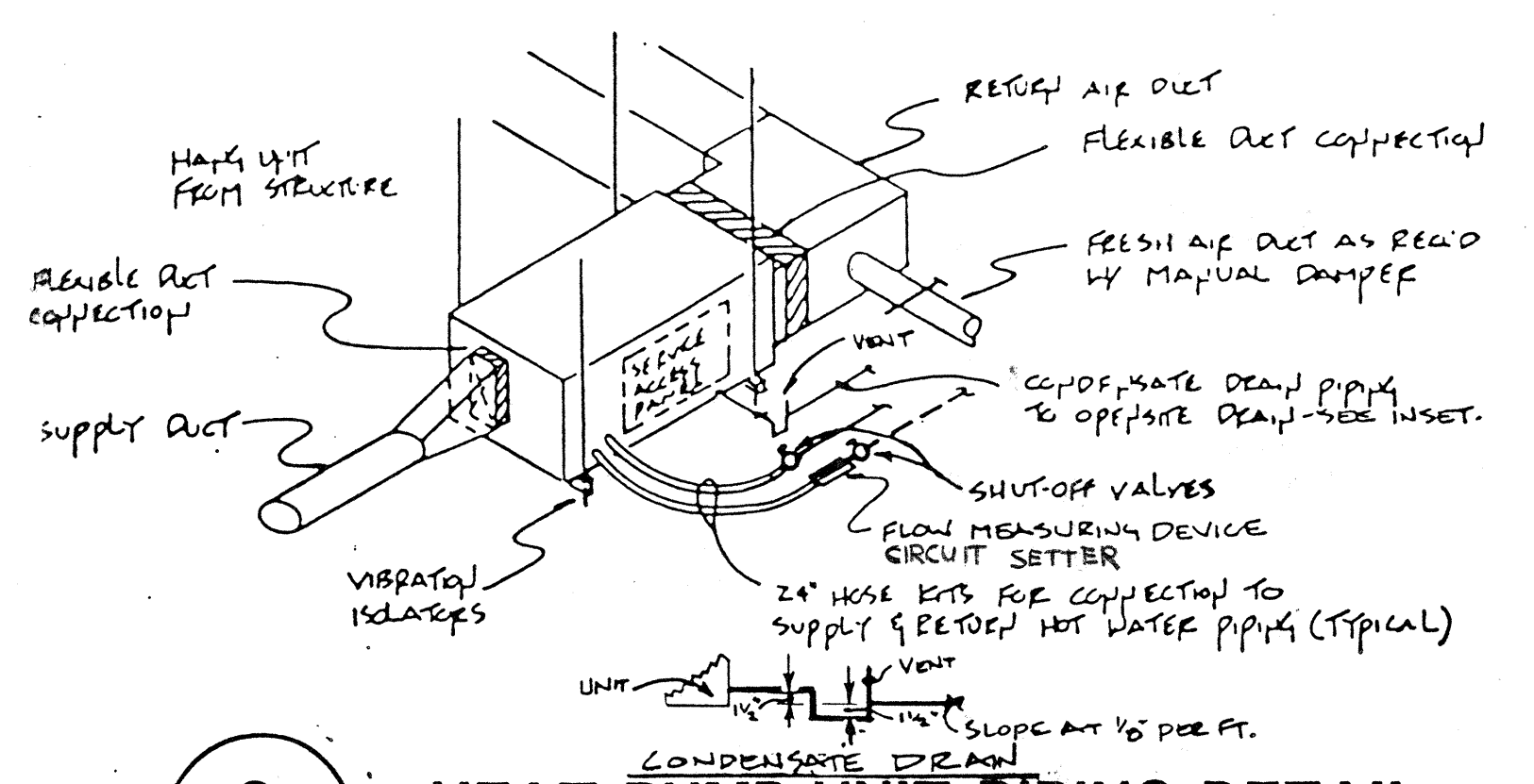


5 TYPICAL COIL PIPING DETAIL
M-1 NO SCALE

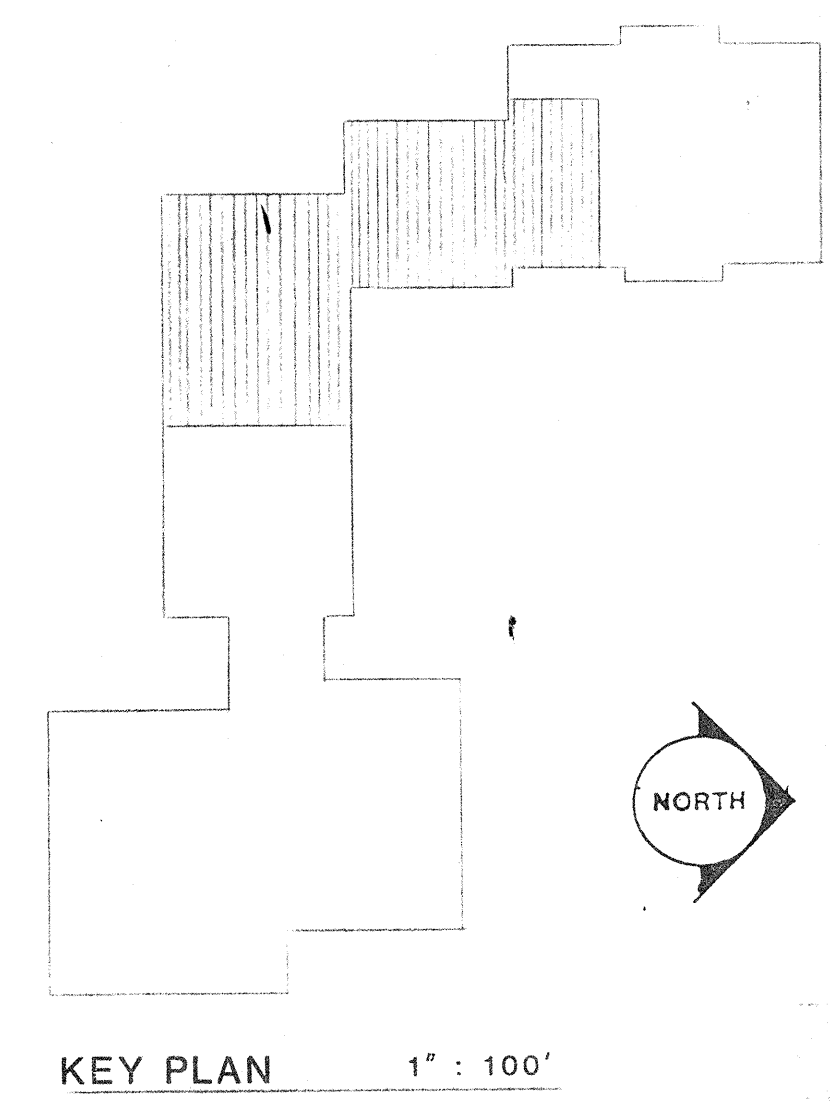


NOTE
THE DIVISION 15 CONTRACTOR SHALL REMOVE ALL EXISTING DUCTWORK, DIFFUSERS, COILS, ETC. IN THE FIRST FLOOR CEILING SPACE BELOW THE NEW T&I WING SECOND FLOOR ADDITION. FOLLOWING INSTALLATION OF SECOND FLOOR STRUCTURE, REWORK AND REINSTALL ALL FIRST FLOOR DUCTWORK, DIFFUSERS AND EQUIPMENT REMOVED DURING DEMOLITION AND RECONNECT COMPLETE.

1 LOWER LEVEL FLOOR PLAN
M-1 1/8"=1'-0"



6 HEAT PUMP UNIT PIPING DETAIL
M-1 NO SCALE

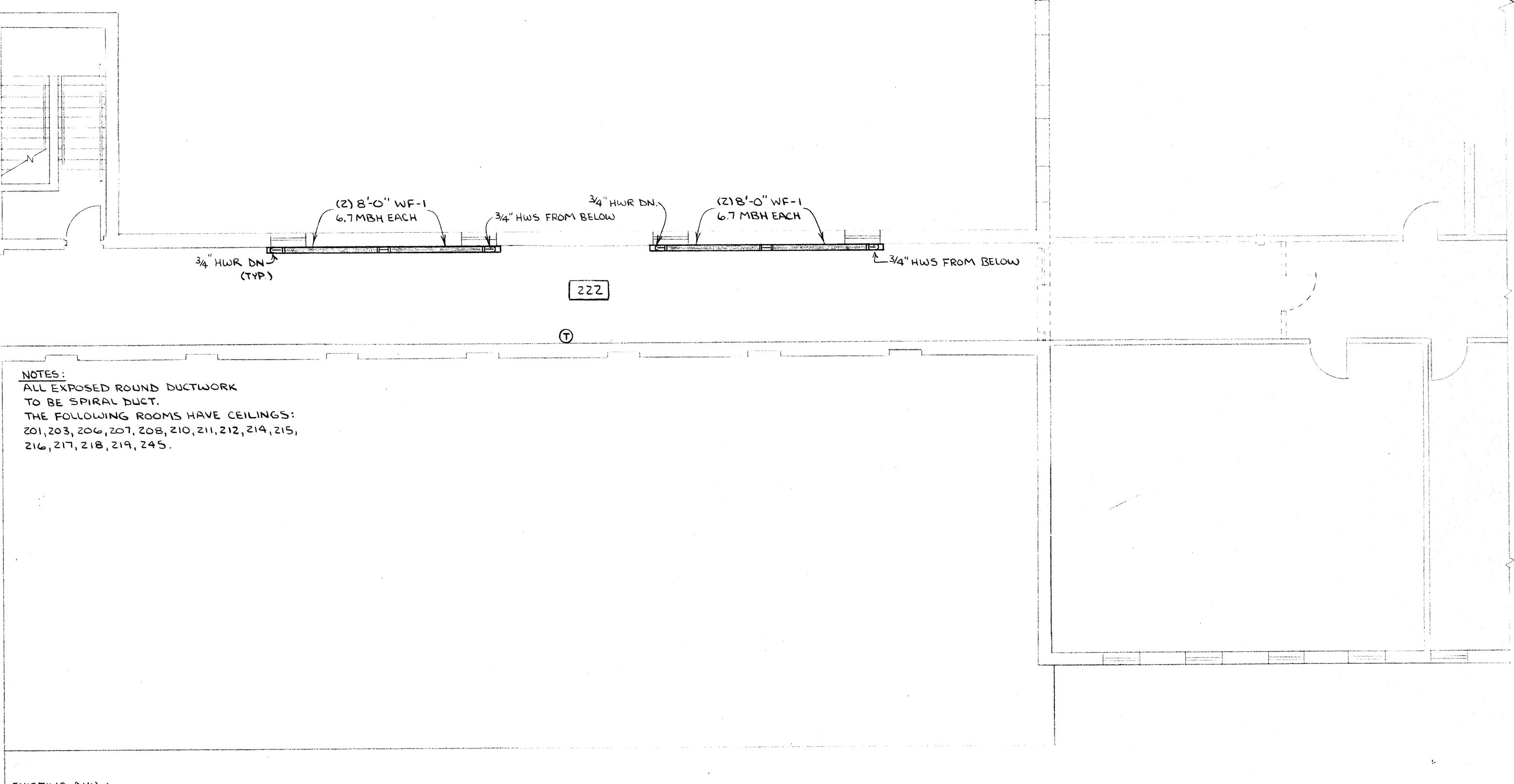
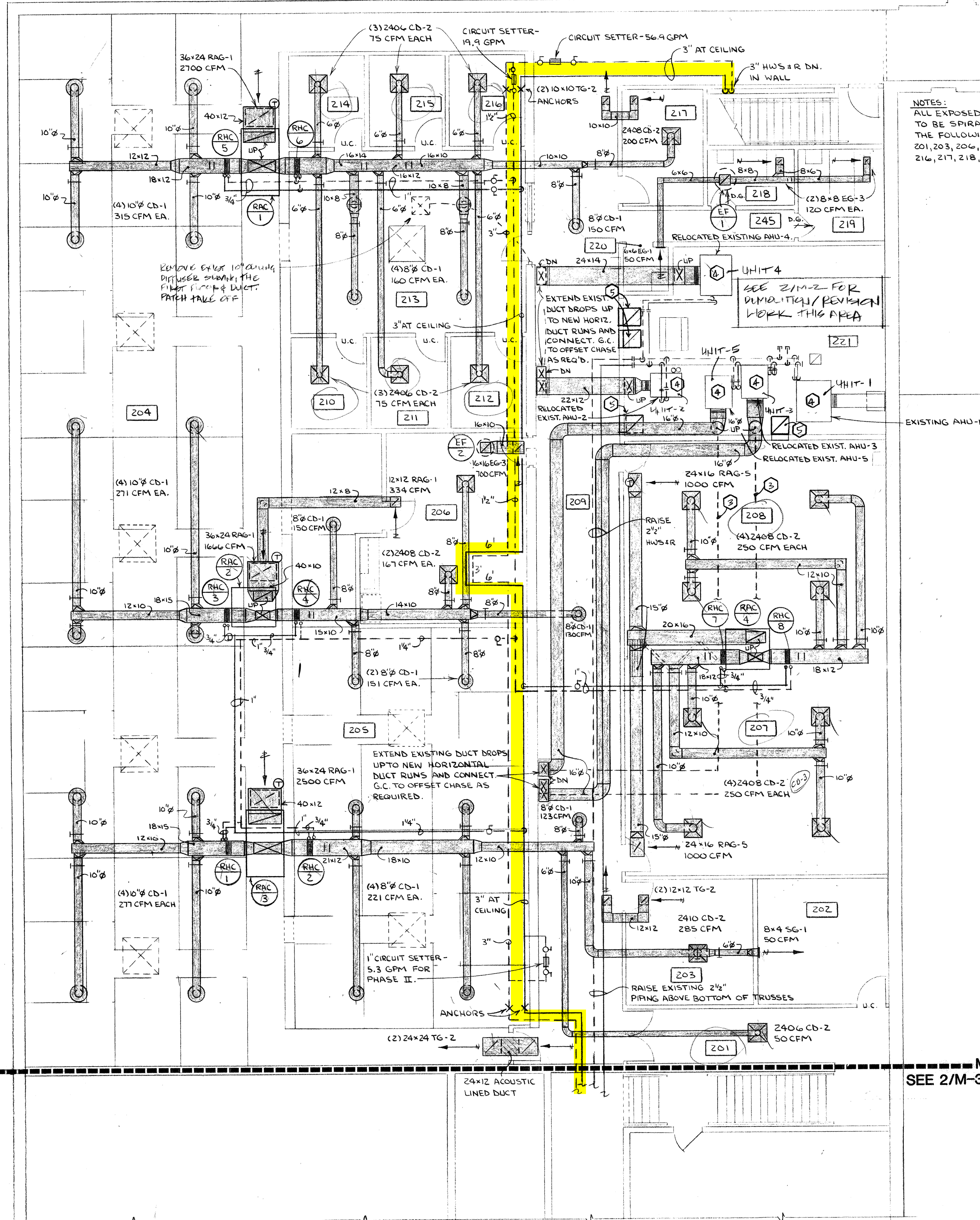


KEY PLAN 1" = 100'

WHA
WALT HESTEKIN ASSOCIATES, LTD.
Consulting Engineers
715 835-1200 FAX 715 835-3771
PROJECT NO. 89162

THE STUBENRACH ASSOCIATES, INC. ARCHITECTURE-ENGINEERING-PLANNING
 W.I.T.C. - RICE / LAKE CAMPUS ADDITIONS / REMODELING RICE LAKE, WISCONSIN
 DRAWN BY RJA/DMP
 DATE 1-19-90
 PROJ. NO. 89305.02
 M-1

NOTE:
LOCATE DUCTWORK IN TRUSS SPACE. RUN BRANCHES
THRU TRUSS WEBBING. LOCATE TOP LIP OF EXPOSED
CEILING DIFFUSERS AT SAME HEIGHT AS BOTTOM OF TRUSSES.



NOTES:
ALL EXPOSED ROUND DUCTWORK
TO BE SPIRAL DUCT.
THE FOLLOWING ROOMS HAVE CEILINGS:
201, 203, 206, 207, 208, 210, 211, 212, 214, 215,
216, 217, 218, 219, 245.

1 UPPER LEVEL FLOOR PLAN
M-2 1/8"=1'-0"

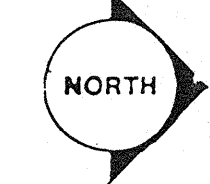
2 MECHANICAL MEZZANINE DEMOLITION PLAN
M-2 1/8"=1'-0"

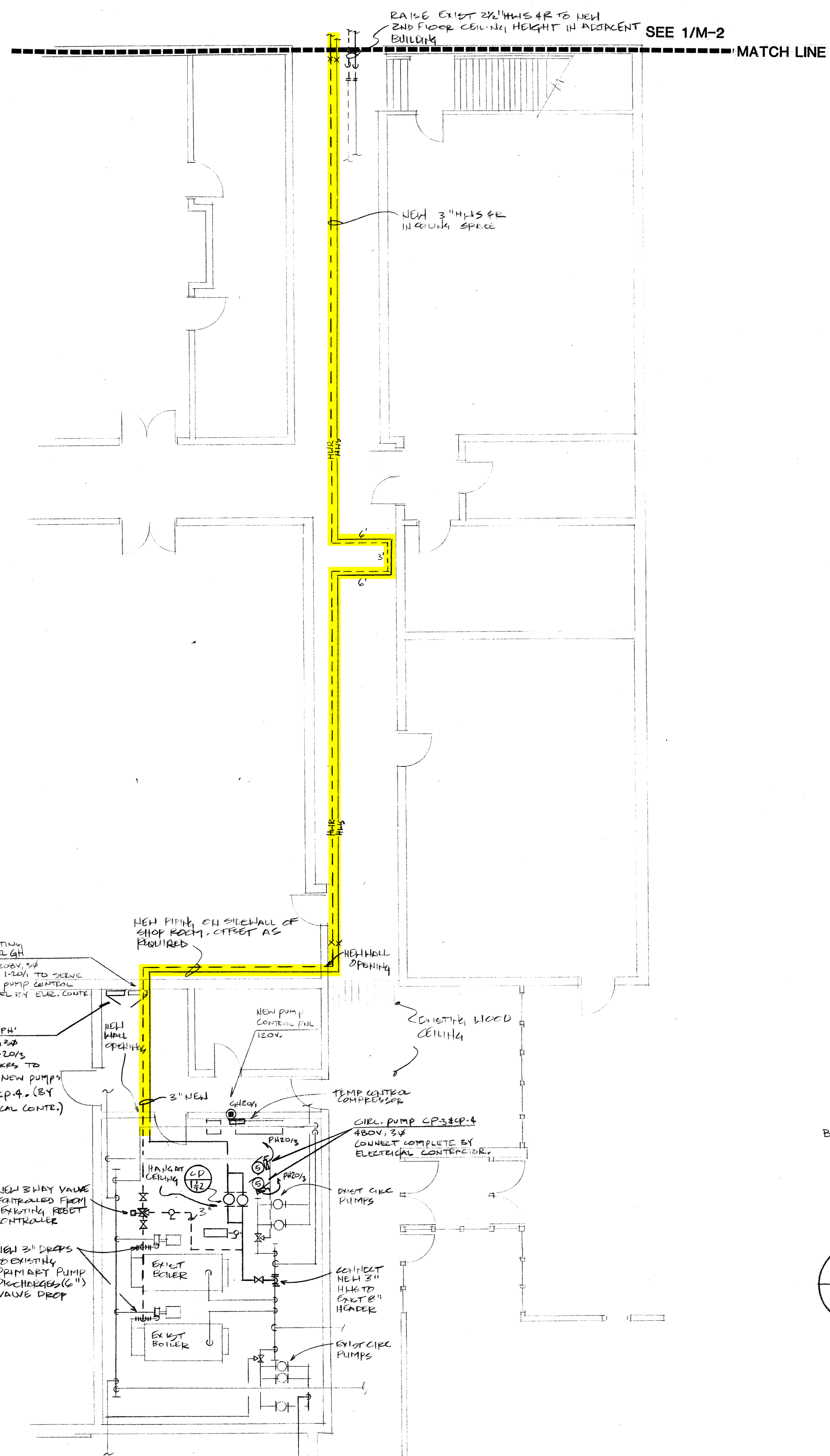
DEMOLITION/REVISION NOTES

- REMOVE EXISTING BLOWER COIL UNIT DISCONNECT PIPING AND DUCTWORK AND RECONNECT V-M-Z PLAN, RECONNECT PIPING TO UNIT AND CONNECT NEW DUCTWORK. UNIT ZONE 3 REQUIRE REFRIG. LINE RELOCATION.
- REMOVE UNIT AND DUCTWORK COMPLETE PATCH FLOOR OPENINGS TO MATCH EXISTING CONDITIONS. CAP PIPING NEAR MAIN.
- REMOVE EXISTING DUCTWORK SERVING FIRST FLOOR TO DROP.
- NEW UNIT LOCATION.
- NOT TO SCALE TO TRANSFER THRU FIRST FLOOR CEILING SPACE. CUT PATCH BY THIS CENTER. 1ST FLOOR CEILING TO RETURN PLenum.

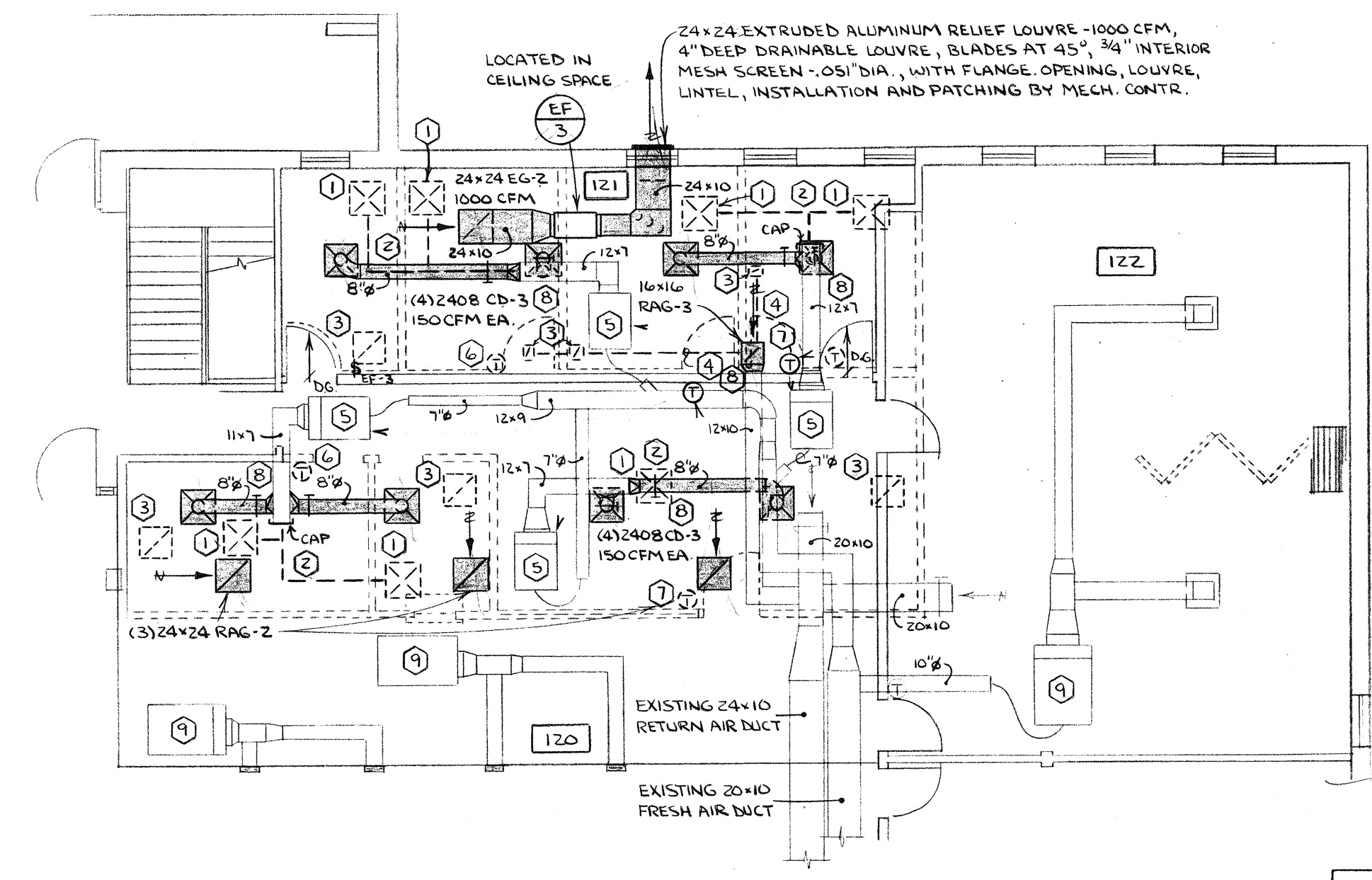
WHA
WALT HESTEKIN ASSOCIATES, LTD.
Consulting Engineers
(715) 835-1209 FAX (715) 835-3771
PROJECT NO. 89162

KEY PLAN 1" = 100'



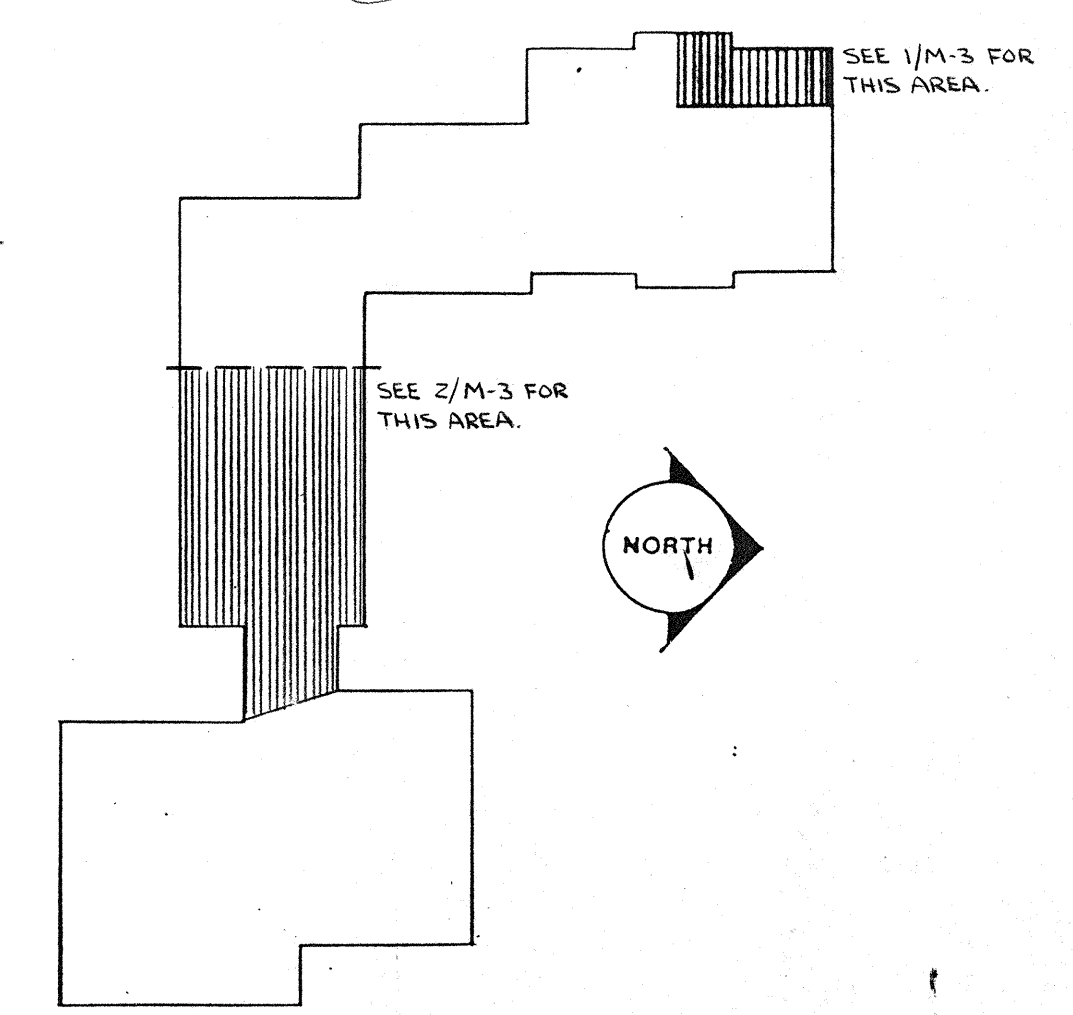


2
M-3 EXISTING T & I BUILDING FLOOR PLAN
1/8"=1'-0"

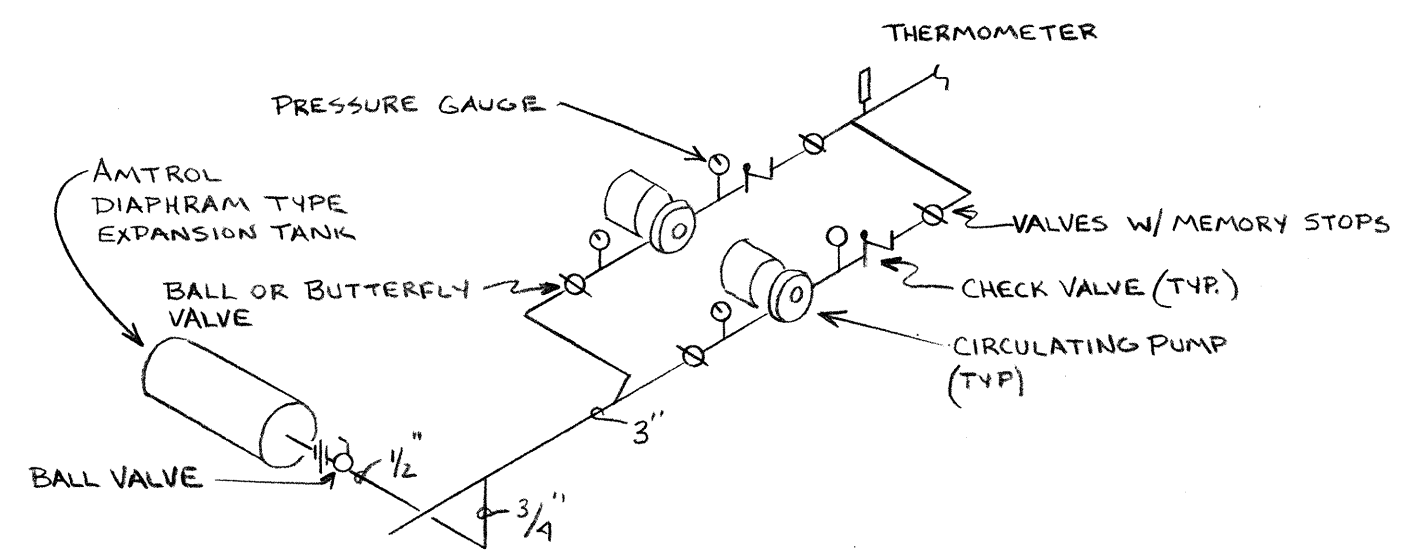


1
M-3 PARTIAL LOWER LEVEL PLAN
1/8"=1'-0"

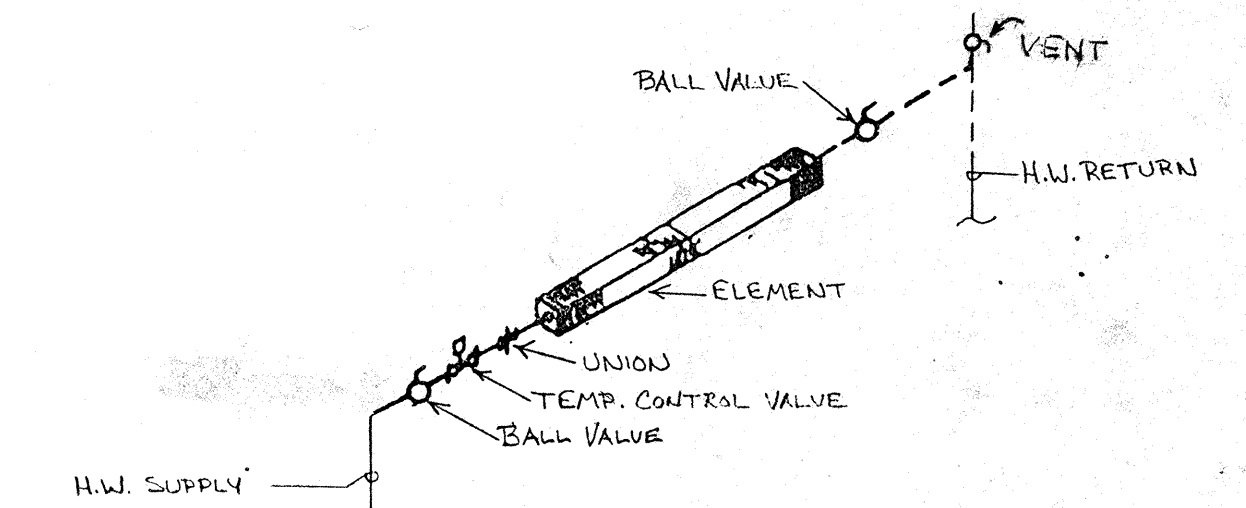
- DEMOLITION NOTES:
- 1 REMOVE EXISTING SUPPLY DIFFUSER.
 - 2 REMOVE EXISTING SUPPLY DUCTWORK.
 - 3 REMOVE EXISTING RETURN AIR GRILLE.
 - 4 REMOVE EXISTING RETURN DUCTWORK.
 - 5 EXISTING VAV UNIT TO REMAIN. SEE PLAN FOR DUCTWORK REVISIONS.
 - 6 REMOVE EXISTING T'STAT. COMBINE CONTROL OF (2) EXISTING VAV UNITS INTO (1) T'STAT.
 - 7 REMOVE EXISTING T'STAT AND RELOCATE AS SHOWN. COMBINE CONTROLS SO RELOCATED T'STAT CONTROLS (2) EXISTING UNITS.
 - 8 NEW DUCT CONNECTION TO EXISTING DUCTWORK.
 - 9 EXISTING VAV UNIT AND DUCTWORK TO REMAIN AS IS.
- COORDINATE DUCTWORK.



KEY PLAN
1" : 100'



3
M-3 IN LINE CIRCULATING PUMP DETAIL
NO SCALE



4
M-3 WALL FIN DETAILS
NO SCALE