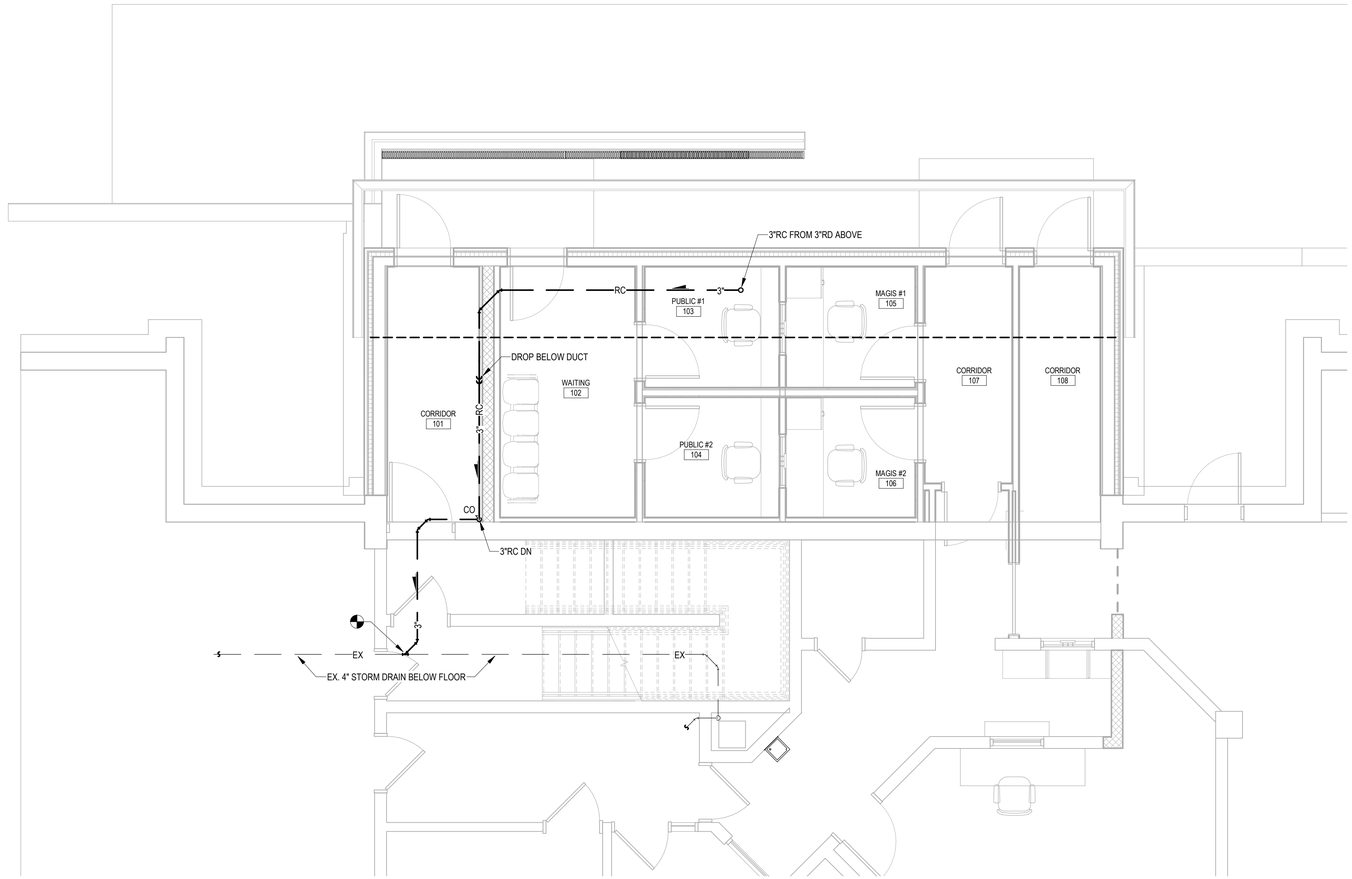


FIRST FLOOR PLAN - PLUMBING

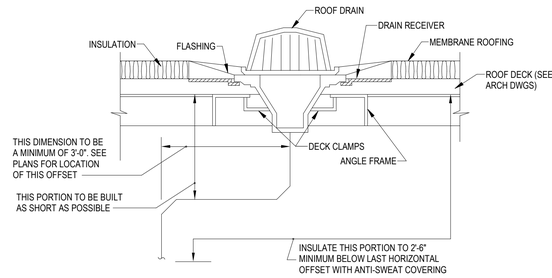
SCALE: 1/4" = 1'-0"

PLUMBING LEGEND

ABOVE	ABV	
ABOVE FINISHED FLOOR	AFF	
BELOW	BEL	
BELOW FINISHED FLOOR	BFF	
BETWEEN	BET	
CEILING	CLG	
CLEANOUT	CO	
IN HORIZONTAL OR BELOW FLOOR		CO
IN VERTICAL OR FLUSH WITH FLOOR		CO
DIRECTION OF SLOPE DOWN		
DOWN	DN	
EXISTING	EX	
FLOOR	FL	
FROM	FR	
NEW CONNECTED TO EXISTING PIPING INDICATION WITH RESPECT TO WATER FLOW		
BOTTOM TAKEOFF		
SIDE CONNECTION		
CONNECTION (BOTTOM,TEE OR TOP)		
TOP TAKEOFF		
TURN DOWN OR FROM BELOW		
TURN UP OR DOWN		
TURN UP OR FROM ABOVE		
RAIN CONDUCTOR, NEW (ABOVE CEILING)	RC	RC
RAIN CONDUCTOR, NEW (BELOW FLOOR)	RC	
EXISTING TO REMAIN	RC	EX RC
EXISTING TO BE REMOVED	RC	RC
ROOF DRAIN	RD	

PLUMBING GENERAL NOTES:

1. SEE SITE PLAN SHEET FOR THE EXTENT OF ALL PIPING LEAVING AND ENTERING BUILDING.
2. MAKE PIPING CONNECTIONS AS REQUIRED TO ALL FIXTURES AND EQUIPMENT EVEN THOUGH ALL BRANCH MAINS, ELBOWS AND CONNECTIONS ARE NOT SHOWN.
3. SLOPES AND INVERT ELEVATIONS OF SEWERS, MANHOLES, ETC., SHALL BE ESTABLISHED AND VERIFIED BY CONTRACTOR BEFORE ANY PIPING IS INSTALLED IN ORDER THAT PROPER SLOPES WILL BE MAINTAINED AND NECESSARY INVERT ELEVATIONS OBTAINED.
4. ALL PIPES SHALL BE COORDINATED WITH OTHER NEW AND EXISTING DUCTS, PIPES, LIGHTS, STRUCTURAL SYSTEM, CEILING SUPPORTS AND FRAMING BEFORE INSTALLATION. MINOR PIPE OFFSETS SHALL BE PROVIDED AS REQUIRED. MEASUREMENTS FOR VERTICAL CLEARANCES SHALL BE TAKEN AT THE JOB SITE BEFORE INSTALLATION OF ANY PIPING.
5. DOMESTIC WATER PIPING SHALL BE INSTALLED ABOVE CEILINGS UNLESS NOTED OTHERWISE. DOMESTIC WATER PIPING SHOWN IN PIPE CHASE WALLS SHALL BE INSTALLED IN CHASE SPACE, PIPING OFFSET FOR CLARITY.
6. DOMESTIC WATER PIPING SHALL NOT BE INSTALLED IN LOCATIONS SUBJECT TO FREEZING OR SPACES EXTERIOR TO BUILDING INSULATION.
7. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTRUCTIONS.
8. MATERIALS AND INSTALLATION SHALL COMPLY WITH LOCAL CODES. APPLICABLE PROVISIONS OF LATEST EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION, LOCAL UTILITY REGULATIONS AND GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION.
9. WHERE PIPE CONNECTIONS ARE SHOWN CONNECTING TO EXISTING, CONTRACTOR SHALL DETERMINE EXACT LOCATIONS AND CONNECTION SIZES PRIOR TO INSTALLATION.
10. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR SEWER CONNECTIONS TO THE CITY OF ROANOKE STORM SEWER, AND INCLUDE ALL INSTALLATION AND CONNECTION CHARGES IN THE CONTRACT.
11. LIMITS OF CONTRACT: STORM WATER PIPING SHALL BE EXTENDED UNDER THIS SECTION OF THE SPECIFICATIONS TO POPINTS 5'-0" BEYOND THE BUILDING LINES, UNLESS OTHERWISE INDICATED ON THE DRAWINGS, WHERE THE PIPES SHALL BE CAPPED OR PLUGGED AND LEFT READY FOR CONNECTION AND EXTENSION BY OTHERS, AND THE LOCATIONS MARKED WITH A STAKE OR OTHER APPROVED MEANS.
12. INFORMATION ON EXISTING PLUMBING SHOWN WAS OBTAINED FROM PLANS DATED JANUARY, 1980. THE CONTRACTOR SHALL ADJUST WORK AS REQUIRED TO SUIT ACTUAL LOCATIONS IF DIFFERENT FROM CONTRACT DOCUMENTS.
13. RETURN AIR PLENUM NOTE: ALL MATERIALS LOCATED IN THE RETURN AIR PLENUMS SHALL MEET THE REQUIREMENTS OF THE INTERNATIONAL MECHANICAL CODE, SECTION 602.2.1.
14. PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL PANELS. COORDINATE INSTALLATION OF PIPES WITH ELECTRICAL PANELS WHEN SHOWN NEAR PANELS OR OVER ELECTRICAL ROOMS.
15. THIS IS A RISK CATEGORY 4 BUILDING WITH SEISMIC DESIGN CATEGORY C. NON-STRUCTURAL COMPONENTS SHALL BE DESIGNED, ANCHORED AND ATTACHED TO THE BUILDING STRUCTURE TO RESIST SEISMIC FORCES, SEE STRUCTURAL DRAWINGS/SPECIFICATIONS.



NOTE: INSTALL ALL PRIMARY ROOF DRAINS AT LOW POINTS OF ROOF INSULATION.

ROOF DRAIN CONNECTIONS DETAIL

NO SCALE

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CR

PLUMBING LEGEND, FLOOR PLAN, NOTES AND DETAILS

PLOT SCALE: As indicated

FILENAME:

DATE: SEPTEMBER 5, 2023

PROJECT

P1.1

PLUMBING SYSTEMS NOTES AND SPECIFICATIONS

1. CODES, STANDARDS AND REGULATIONS: MATERIALS, EQUIPMENT, INSTALLATION, DISINFECTION AND TESTING SHALL BE IN COMPLIANCE WITH, BUT NOT LIMITED TO, THE FOLLOWING CODES AND STANDARDS:
   A. LOCAL CODES OR ORDINANCES.
   B. VIRGINIA CONSTRUCTION CODE (VCC).
2. SHOP DRAWINGS: FURNISH ELECTRONIC FILES OF PLUMBING MATERIALS AND EQUIPMENT TO ARCHITECT FOR REVIEW.
3. DESCRIPTION OF WORK :
   A. THE WORK INCLUDES PROVIDING A COMPLETE PLUMBING SYSTEM INCLUDING, BUT NOT NECESSARILY RESTRICTED TO, THE FOLLOWING:
      1) RAIN CONDUCTOR SYSTEM TO A POINT FIVE FEET AWAY FROM EXTERIOR BUILDING WALLS.
      2) MISCELLANEOUS WORK AS DESCRIBED HEREIN, AS SHOWN ON DRAWINGS, AND AS REQUIRED FOR A COMPLETE SYSTEM.
4. PIPE AND EQUIPMENT SUPPORTS, PIPE SLEEVES AND WALL CEILING PLATES:
   A. PROVIDE IN ACCORDANCE WITH THE VIRGINIA CONSTRUCTION CODE.
   B. PIPE SLEEVES:
      1) PROVIDE SLEEVES FOR PIPING AND CONDUIT PASSING THROUGH CONCRETE FLOOR SLABS AND CONCRETE, MASONRY, TILE, AND GYPSUM WALL CONSTRUCTION. SLEEVES SHALL NOT BE PROVIDED FOR PIPING AND CONDUIT RUNNING EMBEDDED IN CONCRETE OR SLAB ON GRADE, EXCEPT THAT COPPER PIPING SHALL REQUIRE SLEEVES THROUGH SLABS ON GRADE. SLEEVES THROUGH STRUCTURAL MEMBERS SHALL BE ONLY AS DIRECTED BY ARCHITECT. IN INTERIOR WALL, PROVIDE 1/4 INCH SPACE ALL AROUND BETWEEN SLEEVE AND CONDUIT, PIPING, OR INSULATION OF PIPING.
      2) SLEEVES PLACED IN EXTERIOR WALLS BELOW GRADE SHALL BE O.Z. GEDNEY TYPE 'FSK' OR EQUAL, THUNDERLINE 'LINK SEAL', OR EQUAL SLEEVE ASSEMBLIES SIZED FOR THE PIPE OR CONDUIT ENCOUNTERED, EXCEPT FOR CAST IRON PIPING. SLEEVE ASSEMBLY SHALL PROVIDE WATERTIGHT SEAL AND ELECTRICAL INSULATION TO REDUCE CATHODIC REACTION. WHEN A SLEEVE PASSES THROUGH A WALL BELOW A CONCRETE SLAB ON GRADE, THE SEALING ASSEMBLY SHALL BE ON THE OUTSIDE OF THE WALL. WHEN A SLEEVE PASSES THROUGH A WALL INTO A CRAWL SPACE OR THE BUILDING INTERIOR, THE SEALING ASSEMBLY SHALL BE IN THE CRAWL SPACE OR INTERIOR OF THE BUILDING. PROVIDE SLEEVE ASSEMBLY FOR COPPER PIPING THROUGH SLAB ON GRADE, WITH SEALING ASSEMBLY LOCATED ON INTERIOR SIDE OF FLOOR SLAB. WHERE CAST IRON PIPES PASS THROUGH AN EXTERIOR WALL BELOW GRADE, PROVIDE AN IRON-PIPE SLEEVE TWO (2) PIPE SIZES GREATER THAN PIPE PASSING THROUGH. CAULK BETWEEN PIPE AND SLEEVE WITH A RUBBER-BASED COMPOUND. WHERE SLEEVES ARE LOCATED THROUGH FIRE-RATED WALLS AND FLOOR/CEILING ASSEMBLIES, PROVIDE SLEEVES AND PROTECT THE PENETRATION IN ACCORDANCE WITH UNDERWRITER'S LABORATORIES, INC., FIRE RESISTANCE DIRECTORY, VOLUME II, RATINGS FOR THROUGH FIRESTOP PENETRATIONS.
      3) SLEEVES SHALL BE CONSTRUCTED OF 20 GAGE GALVANIZED SHEET STEEL WITH LOCK SEAM JOINTS FOR ALL SLEEVES SET IN CONCRETE FLOOR SLABS TERMINATING FLUSH WITH THE FLOOR. ALL OTHER SLEEVES SHALL BE CONSTRUCTED OF GALVANIZED STEEL PIPE UNLESS OTHERWISE INDICATED.
5. STORM WATER PIPING AND RAIN CONDUCTORS:
   A. CAST IRON SOIL PIPE AND FITTING: PIPE SHALL BE BELL AND SPIGOT, MODIFIED HUB, OR PLAIN END (NO-HUB) AS REQUIRED BY SELECTED JOINTING METHOD. PIPE AND FITTINGS SHALL BE LISTED BY NSF INTERNATIONAL, IAPMO, ICC OR OTHER THIRD PARTY ORGANIZATION THAT IS ACCREDITED AS AN ANSI-GUIDE 65 ORGANIZATION AS LISTED ON WWW.ANSI.ORG.
      1) MATERIAL (PIPE AND FITTINGS): ASTM A888, SPECIFICATION FOR HUBLESS SOIL PIPE & FITTINGS.
      2) JOINTS: PROVIDE ANY ONE OF THE FOLLOWING TYPES TO SUIT PIPE FURNISHED.
         a. MECHANICAL, COMPRESSION-TYPE (ASTM C564) MOLDED NEOPRENE GASKET. GASKETS SHALL SUIT CLASS OF PIPE BEING JOINTED. DUAL-SERVICE GASKETS WILL NOT BE ACCEPTED.
         b. MECHANICAL: MECHANICAL JOINT COUPLING (ASTM C564 AND ASTM C1277) SHALL CONSIST OF A STAINLESS STEEL COUPLING AND NEOPRENE GASKETS (ASTM C564) (CSA CAN/CSA-B602). DO NOT INSTALL BELOW GRADE.
      3) COATING: PROVIDE A HEAVY COAT OF ASPHALT OR BITUMASTIC PAINT ON PIPE BURIED IN EARTH OR INSTALLED IN CINDERS OR CONCRETE CONSTRUCTION.
      4) CAST IRON SOIL PIPE MARKINGS: ALL CAST IRON SOIL PIPE SHALL BE CLEARLY MARKED WITH THE MANUFACTURER'S NAME, COUNTRY OF ORIGIN, EIGHT-DIGIT DATE CODE, PIPE DIAMETER AND LENGTH, RELEVANT ASTM STANDARD AND REGISTERED TRADEMARK OF THE THIRD PARTY CERTIFIER.
      5) MATERIAL TEST REPORTS: SUPPLIER OF CAST IRON SOIL PIPE SHALL BE ABLE TO SUPPLY MATERIAL TEST REPORTS IN ACCORDANCE WITH THE RELEVANT ASTM STANDARD AND SHALL INCLUDE TESTING AND ANALYSIS ON RADIOACTIVITY, DIMENSIONAL CHARACTERISTICS, TENSILE STRENGTH AND CHEMICAL/METALLURGICAL CONTENT. SUPPLIERS SHALL ALSO SUPPLY MSDS SHEETS ON ALL COATINGS.
   B. PLASTIC PIPE: MAY BE USED FOR PIPING BELOW GROUND ONLY. FOAM CORE PIPING IS NOT ACCEPTABLE. ALL PLASTIC PIPE, FITTINGS AND COMPONENTS SHALL BE THIRD PARTY CERTIFIED TO NSF 14. PVC SHALL NOT BE USED IN RETURN AIR PLENUMS.
      1) PIPE: PVC SCHEDULE 40 DWV, ASTM D 2665.
      2) FITTINGS: PVC SCHEDULE 40 ASTM D3311 FITTINGS FOR SOLVENT JOINTS.
      3) JOINTS: ASTM F656 PURPLE PRIMER, SOLVENT ASTM D2564 (NOT PURPLE IN COLOR), JOINTS MADE IN ACCORDANCE WITH ASTM D2855.
6. CLEANOUTS:
   A. SAME SIZE AS PIPE SERVED UP TO 4 INCHES. CLEANOUTS SHALL BE EASILY ACCESSIBLE. ALL CLEANOUT PLUGS SHALL BE BRONZE, SET IN GRAPHITE GREASE. (ASTM A74, ASME A112.3.1, ASME A112.36.2M) COVERS SHALL BE SET FLUSH WITH FINISHED WALL.
      1) BASE OF VERTICAL STACKS: JOSAM 58600-COT, SMITH 4530, ZURN Z-1446 WITH STAINLESS STEEL WALL COVER. LOCATED 24 INCHES ABOVE FLOOR.
7. ROOF DRAIN AND CONNECTIONS:
   A. ROOF DRAIN: ASME A112.21.2M CAST IRON UNIT WITH CLAMPING DEVICE FOR MAKING WATERTIGHT CONNECTION. FREE OPENINGS THROUGH STRAINER SHALL BE TWICE AREA OF DRAIN OUTLET. PROVIDE INTEGRAL GRAVEL STOP FOR DRAINS INSTALLED ON ROOFS HAVING BUILT-UP ROOFING COVERED WITH GRAVEL. THE PLUMBING CONTRACTOR SHALL PROVIDE ROOF DRAINS TO THE GENERAL CONTRACTOR, WHO SHALL LOCATE AND INSTALL DRAINS AT THE LOW POINTS OF THE ROOF DECK DURING INSTALLATION OF THE METAL ROOF DECK.
   B. ROOF DRAIN SHALL BE JOSAM SERIES 21500 WITH LARGE CAST IRON OR ALUMINUM LOCKING DOME, BOLTED FLASHING CLAMP DEVICE INTEGRAL WITH GRAVEL STOP, DECK CLAMPING DEVICE SUITABLE FOR INDICATED THICKNESS OF THE DECK, STEEL DRAIN RECEIVER, AND BOTTOM OUTLET. POLYPROPYLENE DOME WILL NOT BE ACCEPTABLE. WHERE REQUIRED BY INSULATION THICKNESS, PROVIDE ADJUSTABLE COLLAR EQUAL TO JOSAM "LEVELEZE" ADJUSTABLE EXTENSION COLLAR.
8. INSULATION:
   A. ALL HORIZONTAL STORM PIPING ABOVE LOWEST FLOOR INCLUDING ROOF DRAIN FROM UNDERSIDE OF DECK TO JUST BELOW FITTING AT TOP OF VERTICAL PORTION OF STACK AND FITTINGS AT TOP AND BOTTOM OF VERTICAL SECTIONS OF HORIZONTAL OFFSETS SHALL BE INSULATED. INSULATION SHALL BE JOHNS MANVILLE, OWENS CORNING, OR ARMSTRONG. ALL MATERIALS AND PVC TYPE FITTING COVERS USED SHALL HAVE COMPOSITE FLAME-SPREAD RATING NOT EXCEEDING 25 AND A SMOKE-DEVELOPED RATING NOT EXCEEDING 50, AS TESTED UNDER PROCEDURE ASTM E-84, NFPA 90A AND 90B.
   B. PIPING INSULATION: FIBERGLASS INSULATION SHALL BE 1 INCH THICK AND SHALL HAVE A MAXIMUM THERMAL CONDUCTIVITY (K) FACTOR OF 27.0 PER INCH OF THICKNESS AT A MEAN TEMPERATURE OF 75 DEG. F. FIBERGLASS INSULATION SHALL HAVE A WHITE KRAFT BONDED TO ALUMINUM FOIL, REINFORCED WITH FIBERGLASS YARN JACKET, LAP JOINTS, TAPE AND SEAL.
   C. THE BOTTOM OF THE ROOF DRAIN, INCLUDING DECK CLAMPS, SHALL BE INSULATED WITH 1" THICK FIBER GLASS FLEXIBLE INSULATION WITH A MAXIMUM "K" FACTOR OF 0.27 AT A MEAN TEMPERATURE OF 75 DEG. F WITH 1 MIL FOIL SCRIM-KRAFT PAPER JACKET. INSULATION SHALL BE HELD SECURELY IN PLACE WITH TAPE. JOINTS SHALL BE LAPPED. JOINTS, VOIDS AND PUNCTURES IN THE JACKET SHALL BE EFFECTIVELY VAPOR SEALED WITH FOSTER VAPOR-SAFE OR VAPOR-FAS ADHESIVE.
9. INSTALLATION:
   A. GENERAL:
      1) SUSPENDED HORIZONTAL PIPING SHALL BE SUPPORTED BY ADJUSTABLE WROUGHT STEEL CLEVIS HANGERS. WHERE SUPPORTS BEAR ON COPPER PIPE, THEY SHALL BE COPPER PLATED. WHERE SUPPORTS BEAR ON INSULATED PIPING, PROVIDE INSULATION SHIELD. CHAIN, STRAP, WIRE OR OTHER MAKESHIFT DEVICES WILL NOT BE PERMITTED AS HANGERS OR SUPPORTS.
      2) COMPRESSION GASKET JOINTS FOR CAST IRON SEWER PIPE SHALL BE MADE WITH NEOPRENE COMPRESSION GASKETS CONFORMING TO ASTM C564.
      3) NO-HUB JOINTS FOR CAST IRON PIPES SHALL BE MADE WITH NEOPRENE GASKETS (ASTM C564) AND STAINLESS STEEL CLAMPS CONFORMING TO ASTM C564 AND ASTM C1277.
      4) MECHANICAL JOINTS ELASTOMERIC SEALING SLEEVE FOR CAST IRON PIPE SHALL BE IN ACCORDANCE WITH ASTM C564.
      5) SOLVENT CEMENT FOR PVC PIPING SHALL BE HANDLED IN ACCORDANCE WITH ASTM F402.
      6) PLASTIC PIPE SHALL NOT BE LOCATED IN RETURN AIR CEILING PLENUMS.
      7) PLASTIC PIPE SHALL NOT PENETRATE A FIRE ASSEMBLY OR SMOKESTOP.
      8) WHERE SUPPORTS BEAR ON INSULATED PIPING, PROVIDE INSULATION SHIELDS.
   B. PIPING SHALL CONFORM TO THE FOLLOWING:
      1) RAIN CONDUCTORS:
         a. SLOPE RAIN CONDUCTOR PIPING AS FOLLOWS:

PIPE SIZE	MINIMUM PITCH
RAIN CONDUCTORS	1/8" TO THE FOOT

         b. CHANGES IN DIRECTION OF PIPING SHALL BE MADE WITH FITTINGS.
         c. CONTRACTOR IS CAUTIONED TO VERIFY INVERT OF EXISTING STORM SEWER AND TO COORDINATE INVERTS OF NEW WORK TO SUIT CONDITIONS ENCOUNTERED.
10. IDENTIFICATION OF PIPES:
    A. PIPES SHALL BE IDENTIFIED USING PRE-PRINTED MARKERS SIZED APPROPRIATELY FOR THE PIPES BEING IDENTIFIED (SHOP DRAWINGS REQUIRED). MARKERS SHALL BE SETON "SETMARK" TYPE OR APPROVED EQUAL. PIPE IDENTIFICATION SHALL MEET THE MOST CURRENT EDITION OF ANSI SPECIFICATION A13.1. APPLY A MINIMUM OF TWO COMPLETE WRAPS OF TAPE AT EACH END OF PRE-PRINTED PIPE MARKERS EQUAL TO SETON STYLE #AR OR APPROVED EQUAL. MARKERS SHALL BE LOCATED CLOSE TO FLANGES AND ADJACENT TO CHANGES IN DIRECTION, BRANCHES AND WHERE PIPES PASS THROUGH WALLS OR FLOORS, AND AT MAXIMUM INTERVALS OF 15 FEET ON STRAIGHT RUNS. PROVIDE A COLOR CODE CHART, FRAMED WITH GLASS FRONT, INDICATING PIPING SERVICE AND COLOR CODE SCHEDULE. POST IN MECHANICAL ROOM WHERE DIRECTED BY OWNER.
    B. COLOR CODE SCHEDULE

NUMBER	BANDING CODE	COLOR CATALOG NUMBER
1)	ORANGE	NO. F65 E 36
2)	BLUE	NO. F65 L 3
3)	BROWN	NO. F65 N 11
4)	RED	NO. F65 R 1
5)	BLACK	NO. F65 B 1
6)	YELLOW	NO. F65 Y 48
7)	GREEN	NO. F65 G 40

    C. PIPE SHALL BE IDENTIFIED WITH FLOW ARROWS AS DESCRIBED BELOW:
       1) ARROWS SHALL BE STENCIL TYPE.
       2) ARROWS SHALL BE READABLE FROM FLOOR.
       3) ARROWS SHALL BE INSTALLED EVERY 15'-0" MAXIMUM.
       4) ARROWS SHALL BE PAINTED ON PIPES.
11. PROTECTION OF ELECTRICAL EQUIPMENT:
    A. PLUMBING PIPING SHALL NOT BE INSTALLED DIRECTLY OVER ELECTRICAL PANELBOARDS, SWITCHBOARDS OR MOTOR CONTROL CENTERS, UNLESS THE PIPE IS A MINIMUM OF 6 FEET ABOVE THE ELECTRICAL EQUIPMENT OR ABOVE A STRUCTURAL CEILING (CONCRETE CAP OR SIMILAR). IF COMPLIANCE WITH THIS REQUIREMENT IS NOT POSSIBLE, NOTIFY THE ENGINEER IMMEDIATELY. IF THE PIPING IS DIRECTLY ABOVE AND AT LEAST 6 FEET ABOVE THE ELECTRICAL EQUIPMENT, PROVIDE A GALVANIZED STEEL DRAIN PAN INSTALLED DIRECTLY UNDER THE PIPING. DRAIN PAN SHALL HAVE MINIMUM 2 INCH HIGH SIDES WITH A DRAIN PIPE CONNECTION AT THE LOWEST POINT AND SHALL BE FULL WIDTH OF THE ELECTRICAL EQUIPMENT BEING PROTECTED. EXTEND DRAIN PIPE TO EXTERIOR OR TO NEAREST FLOOR DRAIN.
12. PROTECTION OF PLASTIC PIPE:
    A. ALL PLASTIC PIPING SHALL BE INSTALLED WITH SUFFICIENT DISTANCE AND/OR INSULATION RELATIVE TO RECESSED LIGHT FIXTURES IN ACCORDANCE WITH PLASTICS PIPE INSTITUTE (PPI) TECHNICAL NOTE 56 "INSTALLATION OF PLASTIC PRESSURE PIPING MATERIALS NEAR IC-RATED AND NON-IC-RATED RECESSED LIGHTING FIXTURES".
13. TESTS:
    A. GENERAL: CONTRACTOR SHALL PROVIDE ALL INSTRUMENTS, MATERIALS, AND LABOR REQUIRED. TESTS SHALL BE MADE IN THE PRESENCE OF THE OWNER OR AUTHORITY HAVING JURISDICTION, OR AS OTHERWISE DIRECTED BY THE ARCHITECT, WHO SHALL BE GIVEN FIVE (5) DAYS NOTICE BY THIS CONTRACTOR OF HIS READINESS TO PERFORM SUCH TESTS. ANY LEAKS THAT DEVELOP DURING THE TESTS SHALL BE REPAIRED BY REMAKING THE JOINT OR REPLACING PIPE AND FITTINGS. TEMPORARY CAULKING WILL NOT BE PERMITTED. NO PIPING SHALL BE INSULATED OR CONCEALED UNTIL IT HAS BEEN TESTED, WITH RESULTS ACCEPTABLE TO THE ARCHITECT. AIR TESTING WILL BE ACCEPTABLE WHERE PERMITTED BY THE VIRGINIA CONSTRUCTION CODE. DO NOT PERFORM AIR TESTING ON SYSTEMS WHERE PLASTIC PIPING IS INSTALLED. TEST SYSTEMS EITHER IN ITS ENTIRETY OR IN SECTIONS.
    B. STORM WATER SYSTEMS: CONDUCT TESTS BEFORE TRENCHES ARE BACKFILLED OR FIXTURES ARE CONNECTED. CONDUCT WATER TEST AS DIRECTED IN ACCORDANCE WITH THE VIRGINIA CONSTRUCTION CODE AND THIS SPECIFICATION.
       1) WATER TEST: IF ENTIRE SYSTEM IS TESTED, TIGHTLY CLOSE ALL OPENINGS IN PIPES EXCEPT HIGHEST OPENING AND FILL SYSTEM WITH WATER TO POINT OF OVERFLOW. IF SYSTEM IS TESTED IN SECTIONS, TIGHTLY PLUG EACH OPENING EXCEPT HIGHEST OPENING OF SECTION UNDER TEST, FILL EACH SECTION WITH WATER AND TEST WITH AT LEAST 10-FOOT HEAD OF WATER. IN TESTING SUCCESSIVE SECTIONS, TEST AT LEAST UPPER 10 FEET OF NEXT PRECEDING SECTION SO THAT EACH JOINT OR PIPE EXCEPT UPPERMOST 10-FOOT HEAD OF WATER. KEEP WATER IN SYSTEM, OR IN PORTION UNDER TEST, FOR AT LEAST 15 MINUTES BEFORE INSPECTION STARTS. SYSTEM SHALL THEN BE TIGHT AT ALL JOINTS.
    C. OPTIONAL TESTS FOR CONNECTIONS TO EXISTING SYSTEMS: AFTER INSTALLATION OF PIPING AND CONNECTING TO EXISTING SYSTEMS, AND WHERE HEREIN BEFORE SPECIFIED TESTS ARE IMPRACTICAL, TEST ALL NEW PIPING UNDER ACTUAL OPERATING CONDITIONS AND PROVE TIGHT TO THE SATISFACTION OF THE ARCHITECT.
14. CLEANING:
    A. REMOVE TRASH, PLASTER, DUST, PAINT SPOTS AND ALL FOREIGN MATTER FROM INSIDE AND OUTSIDE OF ALL FIXTURES AND EQUIPMENT.
    B. THE CONTRACTOR SHALL CHECK EACH LENGTH OF PIPE BEFORE IT IS PUT IN PLACE TO MAKE CERTAIN THERE IS NOT FOREIGN MATERIAL (STONES, SAND, ETC.) IN THE SYSTEMS. PROVIDE TEMPORARY BYPASS AROUND EQUIPMENT IF OR AS REQUIRED. ALL PLUMBING PIPES SHALL BE THOROUGHLY FLUSHED WITH WATER TO REMOVE CONSTRUCTION DEBRIS BEFORE FINAL CONNECTIONS ARE MADE TO EQUIPMENT AND FIXTURES.
15. REPORTS: REPORT OF CLEANING, STERILIZING AND TESTING: CONTRACTOR SHALL VERIFY IN WRITING BEFORE COMPLETION OF THE JOB THAT ALL SPECIFIED CLEANING PROCEDURES, TESTS AND STERILIZING HAVE BEEN PERFORMED, WITH RESULTS AS SPECIFIED OR AS REQUIRED BY CODES.

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JAIL - MAGISTRATE OFFICE ADDITION
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CR

PLUMBING SPECIFICATIONS

PLOT SCALE: 12" = 1'-0"
FILENAME:
DATE: SEPTEMBER 5, 2023

PROJECT
P1.2

MECHANICAL SPECIFICATIONS:

1. SCOPE OF THE WORK: WORK SHALL INCLUDE COMPLETE HVAC SYSTEMS. PROVIDE SUPERVISION, LABOR, MATERIAL, EQUIPMENT, MACHINERY, PLANT, AND ITEMS NECESSARY FOR COMPLETE SYSTEMS TESTED AND READY FOR OPERATION.

2. REGULATIONS: MATERIALS AND INSTALLATION SHALL COMPLY WITH LOCAL CODES, APPLICABLE PROVISIONS OF LATEST EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION, LOCAL UTILITY REGULATIONS AND GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION.

3. DRAWINGS: THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED. WHERE VARIANCES OCCUR INCLUDE THE ITEMS OF BETTER QUALITY, GREATER QUANTITY OR HIGHER COST.

4. COORDINATION OF WORK: THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION AND PROPER RELATION OF HIS WORK TO THE BUILDING STRUCTURE AND TO THE WORK OF OTHER TRADES. CONTRACTOR SHALL PROVIDE DIMENSIONS AND LOCATIONS OF ALL OPENINGS, SHAFTS AND SIMILAR ITEMS TO THE PROPER TRADES AND SHALL INSTALL WORK AS REQUIRED SO AS NOT TO DELAY THE BUILDING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY HIS WORK OR WORKMEN. REPAIRING OF DAMAGED WORK SHALL BE DONE BY THE CONTRACTOR AT NO ADDITIONAL COST.

5. VISITING THE SITE: EACH CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE BEFORE PRICING THE JOB TO FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS TO BE MET IN THE EXECUTION OF THE WORK UNDER THIS CONTRACT. NO ADDITIONAL COMPENSATION WILL BE ALLOWED RELATING TO SITE CONDITIONS.

6. INTERRUPTION OF SERVICES: INTERRUPTIONS OF SERVICE TO EXISTING SYSTEMS SHALL BE COORDINATED WITH THE OWNER AS TO TIME AND DURATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY INTERRUPTIONS TO SERVICE AND SHALL REPAIR ANY DAMAGES TO EXISTING SYSTEMS CAUSED BY HIS OPERATIONS.

7. WORK IN OCCUPIED AREAS: WORK IN OCCUPIED AREAS SHALL BE COORDINATED WITH THE OCCUPANT AND OWNER AS TO TIME AND DURATION. THE CONTRACTOR SHALL PROTECT THE OCCUPIED AREA AND SHALL BE RESPONSIBLE FOR CLEANING AND REPAIRING ANY DAMAGES CAUSED BY HIS WORK. SAFETY OF BUILDING OCCUPANTS SHALL BE ASSURED AT ALL TIMES. TOOLS, MATERIAL, DIRT AND DEBRIS SHALL BE REMOVED FROM OCCUPIED AREAS WHENEVER WORK AREAS ARE LEFT UNATTENDED.

8. ACCESSIBILITY: LOCATE EQUIPMENT WHICH MUST BE SERVICED OR MAINTAINED IN FULLY ACCESSIBLE POSITIONS WHERE POSSIBLE. OTHERWISE, FURNISH ACCESS PANELS OF SUFFICIENT SIZE AND LOCATED SO THAT THE CONCEALED EQUIPMENT CAN BE SERVICED.

9. FOUNDATION PADS AND ROUGH-IN: PROVIDE 4-INCH HIGH CONCRETE FOUNDATION PADS FOR FLOOR-MOUNTED EQUIPMENT. ROUGH-IN OPENINGS SHALL ALIGN VERTICALLY AND HORIZONTALLY WITH BUILDING STRUCTURE. WALL-MOUNTED THERMOSTATS SHALL BE MOUNTED 48" ABOVE FINISHED FLOOR TO THE TOP OF THE THERMOSTAT.

10. SLEEVES: LOCATE SLEEVES DURING NORMAL COURSE OF WORK. PROVIDE SLEEVES FOR PIPING PASSING THROUGH CONCRETE FLOOR SLABS AND CONCRETE, MASONRY, TILE AND GYPSUM WALL CONSTRUCTION. SLEEVES SHALL NOT BE REQUIRED FOR PIPING EMBEDDED IN CONCRETE OR SLAB ON GRADE, EXCEPT THAT COPPER PIPING SHALL REQUIRE SLEEVES THROUGH SLABS ON GRADE. SLEEVES PLACED IN EXTERIOR WALLS BELOW GRADE SHALL BE WATERTIGHT. WHERE SLEEVES ARE LOCATED THROUGH FIRE-RATED WALLS OR FLOORS, THE SLEEVE ASSEMBLIES SHALL MAINTAIN THE FIRE RATING OF THE WALL OR FLOOR. SLEEVES SHALL BE CONSTRUCTED OF 20 GAUGE GALVANIZED STEEL WITH LOCK SEAM JOINTS FOR ALL SLEEVES SET IN CONCRETE FLOOR SLABS. ALL OTHER SLEEVES SHALL BE CONSTRUCTED OF GALVANIZED STEEL PIPE.

11. CUTTING AND PATCHING: THE CONTRACTOR SHALL PROVIDE ALL CUTTING AND PATCHING NECESSARY TO INSTALL HIS WORK. PATCHING SHALL MATCH ADJACENT SURFACES. NO STRUCTURAL MEMBERS SHALL BE CUT WITHOUT THE APPROVAL OF THE ARCHITECT.

12. CLEANING: EQUIPMENT AND PIPING SHALL BE CLEANED TO REMOVE FOREIGN MATERIALS. PROVIDE TEMPORARY FILTERS FOR AIR UNITS THAT ARE OPERATED DURING CONSTRUCTION. PLUG OR CAP OPENINGS IN EQUIPMENT, DUCTWORK, PIPING AND MATERIALS UNTIL CONNECTION IS MADE TO THE SYSTEM. REMOVE FROM THE PREMISES ALL UNUSED MATERIAL AND DEBRIS RESULTING FROM THE PERFORMANCE OF HVAC WORK.

13. WIRING: STARTERS THAT ARE SPECIFIED TO BE FURNISHED AS AN INTEGRAL PART OF THE MECHANICAL EQUIPMENT SHALL BE COMPLETE WITH PROPERLY SIZED OVERLOAD HEATERS. TEMPERATURE CONTROL WIRING, EQUIPMENT CONTROL WIRING AND CONTROL INTERLOCK WIRING FOR MECHANICAL EQUIPMENT SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR. CONTROL WIRING SHALL NOT INCLUDE ANY WIRING WHICH CARRIES MOTOR CURRENT. ALL WIRING SHALL BE IN METAL CONDUIT AND SHALL COMPLY WITH THE ELECTRICAL SPECIFICATIONS.

14. QUIET OPERATION: SYSTEMS SHALL OPERATE UNDER CONDITIONS OF LOAD WITHOUT UNUSUAL OR EXCESSIVE NOISE OR VIBRATION. UNUSUAL OR EXCESSIVE NOISE OR VIBRATION SHALL BE CORRECTED.

15. TESTING AND BALANCING: HVAC CONTRACTOR SHALL TEST ALL HVAC EQUIPMENT TO ASSURE THAT THE PROPER SEQUENCE OF CONTROL IS ESTABLISHED AND OPERATING IN A SAFE MANNER. THE AIR QUANTITIES FOR EQUIPMENT, DIFFUSERS AND REGISTERS SHALL BE BALANCED FOR THE CFM AS INDICATED ON THE DRAWING.ALL PERSONNEL INVOLVED IN THE EXECUTION OF THE WORK SHALL BE EXPERIENCED IN THE BALANCING OF MECHANICAL SYSTEMS. THE WATER QUANTITIES FOR BOILERS AND PUMPS SHALL BE BALANCED FOR THE GPM AS INDICATED ON THE DRAWING.

16. INSTRUCTIONS TO OWNER: INSTRUCT THE OWNER IN THE PROPER OPERATION AND MAINTENANCE OF THE MECHANICAL SYSTEMS UNTIL THE OWNER IS FULLY PREPARED TO OPERATE AND MAINTAIN THE SYSTEMS. HOWEVER, LENGTH OF INSTRUCTION TIME SHALL BE LIMITED TO ONE-HALF (1/2) DAY.

17. OPERATING AND MAINTENANCE: PROVIDE THE OWNER WITH TWO (2) BOUND SETS OF OPERATING AND MAINTENANCE INSTRUCTIONS FOR ALL HVAC EQUIPMENT AND CONTROLS.

18. GUARANTEE: EQUIPMENT, MATERIALS AND LABOR REQUIRED BY THESE CONTRACT DRAWINGS SHALL BE GUARANTEED TO BE FREE FROM DEFECTIVE MATERIALS OR WORKMANSHIP FOR ONE (1) YEAR AFTER FINAL ACCEPTANCE OF THE PROJECT UNLESS SPECIFIED FOR A LONGER PERIOD IN OTHER PORTIONS OF THE SPECIFICATIONS. DEFECTIVE MATERIALS OR WORKMANSHIP OCCURRING DURING THIS PERIOD SHALL BE CORRECTED AT NO ADDITIONAL COST.

19. PAINTING: GENERAL - PAINT MECHANICAL EQUIPMENT AND MATERIALS (WHERE NOT CONCEALED). PAINTING (IN CONCEALED SPACES) SHALL BE LIMITED TO EQUIPMENT AND MATERIALS NOT OTHERWISE PROTECTED FROM RUSTING SUCH AS HANGERS AND SUPPORTS. PAINT SHALL BE PRODUCTS OF SHERWIN-WILLIAMS, PITTSBURGH, PRATT-LAMBERT OR EQUAL. SURFACE PREPARATION, PRIMING AND PAINT APPLICATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. GALVANIZED SURFACES SHALL BE PRETREATED WITH A PHOSPHORIC ACID CLEANING SOLUTION AND PRIMED. AFTER PREPARATION EACH ITEM SHALL BE PAINTED, EXCEPT COLOR OF PAINT FOR EQUIPMENT AND MATERIAL WHERE NOT CONCEALED SHALL BE AS SELECTED BY THE ARCHITECT. ITEMS NOT CONCEALED IN ROOMS SHALL BE PAINTED OF THE SAME COLOR TO MATCH ADJACENT WALLS OR CEILINGS. PAINTING IS NOT REQUIRED OF ITEMS WITH A FACTORY-FINISH COAT. PATCH PAINTING IS REQUIRED OF ANY DAMAGED AREAS TO MATCH FACTORY-FINISH COAT. NAMEPLATES ON EQUIPMENT SHALL NOT BE PAINTED.

20. IDENTIFICATION OF PIPES AND EQUIPMENT: EACH MAJOR PIECE OF EQUIPMENT, SUCH AS AIR HANDLING UNITS AND PIPING SHALL BE IDENTIFIED BY MARKING THAT WILL READ THE SAME AS THE IDENTIFICATION SHOWN ON THE DRAWINGS. STENCIL LETTERS SHALL BE 2 INCHES HIGH UPPER CASE PAINTED WITH WHITE ENAMEL ON EQUIPMENT AND BLACK ENAMEL ON PIPING AND CONDUIT. IDENTIFICATION SHALL BE PAINTED ON EACH PIPE OR CONDUIT WHERE EXPOSED OR ACCESSIBLE AND SHALL BE PLACED EVERY 15 FEET ALONG THE PIPE OR CONDUIT.

21. SINGE ZONE HEAT PUMP UNIT (AHU-1 / HP-1):

A. GENERAL - EQUIPMENT AND MATERIAL SPECIFIED UNDER THIS HEADING SHALL BE FURNISHED AND INSTALLED BY A CERTIFIED REPRESENTATIVE OF THE UNIT MANUFACTURER. SYSTEM SHALL CONSIST OF TRANE, YORK, CARRIER, OR MCQUAY CONDENSING UNIT, AIR UNIT, REFRIGERANT PIPING, AND SYSTEM CONTROLS. EACH SYSTEM SHALL BE FITTED AND RATED IN ACCORDANCE WITH ARI STANDARD 210. THE UNIT IS CERTIFIED TO UL 1995.

B. CONDENSING (OUTDOOR) UNIT SHALL BE COMPLETE WITH COMPRESSOR-MOTOR UNIT, DIRECT EXPANSION CONDENSER-EVAPORATOR COIL, OUTDOOR FANS, STARTERS, CONTROLS, AND CHANGE-OVER PIPING ENCLOSED IN A SHEET STEEL ENCLOSURE RECOMMENDED FOR OUTSIDE INSTALLATION. OUTDOOR FANS SHALL BE VERTICAL DISCHARGE. PROVIDE GUARDS FOR INTAKE AND DISCHARGE TO PROTECT COIL AND FAN. CONDENSING UNIT CONTROLS SHALL PROVIDE FOR LOW AMBIENT OPERATION DOWN TO 0 DEG. F. OUTSIDE AIR TEMPERATURE. CRANKCASE HEATER SHALL BE PROVIDED IN COMPRESSOR BODY. PROVIDE COMPRESSOR ANTI-SHORT CYCLING CONTROL AND LOW AMBIENT CONTROL FOR COOLING OPERATION TO 65 DEG. F. MOUNT UNIT ON CONCRETE PAD FOR PROPER WATER DRAINAGE.

C. INDOOR FAN SECTION SHALL BE COMPLETE WITH FAN AND MOTOR WITH DIRECT DRIVE, HEATING-COOLING COIL WITH EXPANSION DEVICE, AUXILIARY ELECTRIC HEATERS, THROWAWAY FILTERS AND RACK, AND INSULATED STEEL CASING ENCLOSING FAN, MOTOR, STARTERS, DRIVE, COIL, AND FILTER. PROVIDE FAN CURVES WITH SHOP DRAWING SUBMITTALS. DRAIN PAN SHALL BE COMPLETELY WATERTIGHT. AUXILIARY ELECTRIC HEATERS SHALL BE MOUNTED IN DISCHARGE PLENUM SECTION FURNISHED AS PART OF THE UNIT. PROVIDE SINGLE POINT UNIT POWER CONNECTION. PROVIDE AN OUTDOOR THERMOSTAT FOR EACH STAGE OF ELECTRIC HEAT TO LOCK OUT THE AUXILIARY ELECTRIC HEATERS. PROVIDE RUBBER-IN-SHEAR VIBRATION ISOLATORS FOR UNIT. PROVIDE A TRAP IN THE CONDENSATE DRAIN PIPING FROM THE EVAPORATOR COIL DRAIN PAN OF SUFFICIENT DEPTH TO PREVENT BLOWOUT OR SIPHONING OF WATER.

D. REFRIGERANT LINES SHALL BE HARD-DRAWN, DEHYDRATED, AND SEALED COPPER TUBING, SIZED AND CONNECTED AS RECOMMENDED BY THE UNIT MANUFACTURER. SUCTION LINE SHALL BE INSULATED AND EFFECTIVELY VAPOR SEALED. REFRIGERANT CIRCUIT ACCESS PORTS SHALL BE FITTED WITH LOCKING TYPE TAMPER RESISTANT CAPS IN STRICT ACCORDANCE WITH THE IMC. THE OUTDOOR UNITS SHALL BE FULLY CHARGED FROM THE FACTORY FOR UP TO 15 FEET OF PIPING.

E. CONTROLS - WALL THERMOSTAT SHALL BE PROGRAMMABLE TYPE WITH LED DISPLAY, SETBACK MODE. OVERRIDE MODE, HEATING/COOLING SETPOINTS, HEATING/COOLING/AUTO MODES, EMERGENCY HEAT SWITCH AND FAN ON/OFF/AUTO MODES. PROVIDE METAL LOCKING PROTECTIVE COVER.

F. THE SYSTEM SHALL BE COMPLETELY CHARGED WITH R-410A REFRIGERANT AND OIL AND SHALL BE GUARANTEED TO BE FREE OF LEAKAGE FOR ONE (1) YEAR.

G. THE SYSTEM SHALL BE TESTED AND CHECKED OUT FOR SAFE, CONTROLLED OPERATION. ONE WEEK BEFORE FINAL INSPECTION, A LETTER FROM THE UNIT MANUFACTURER'S REPRESENTATIVE SHALL BE SUBMITTED TO THE ENGINEER CERTIFYING THAT THE SYSTEM IS PERFORMING SAFELY AND SATISFACTORILY. COMPRESSORS SHALL BE GUARANTEED TO BE FREE FROM DEFECTIVE MATERIALS OR WORKMANSHIP FOR FIVE (5) YEARS AFTER FINAL ACCEPTANCE OF THE PROJECT.

22. ELECTRIC CEILING HEATERS (CH-#)

A. GENERAL - EQUIPMENT AND MATERIAL SPECIFIED UNDER THIS HEADING SHALL BE MARKEL OR EQUAL. FURNISH AND INSTALL HEATERS WITH CAPACITIES AS INDICATED ON THE DRAWINGS.

B. CEILING HEATER SHALL BE COMPLETE WITH RECESSED ENCLOSURE (10 INCH MAX.), POWDER COATED FRONT PANEL, HEATING ELEMENT, THERMAL LIMIT SWITCH, DISCONNECT SWITCH, AND FACTORY INSTALLED THERMOSTAT.

C. HEATER ELEMENTS SHALL BE NON-GLOWING DESIGN WITH NICKEL CHROMIUM ALLOY RESISTANCE WIRE IN STEEL SHEATH WITH BRAZED STEEL FINS. ELEMENTS SHALL BE GUARANTEED FOR FIVE (5) YEARS AND SHALL BE UL APPROVED.

D. FAN MOTOR SHALL BE PERMANENTLY LUBRICATED WITH TOTALLY ENCLOSED ROTOR.

E. MOUNT UNIT RECESSED IN T-BAR CEILING OR SURFACE MOUNTED AS INDICATED ON THE DRAWINGS.

F. COORDINATE COLOR SELECTION WITH ARCHITECT.

23. AIR DEVICES.

A. CEILING DEVICES SHALL HAVE WHITE BAKED ENAMEL FINISH ALL OTHER DEVICES SHALL HAVE PRIME FINISH.

B. SUPPLY DIFFUSERS: SQUARE CEILING DIFFUSERS SHALL BE ACUTHERM "TF-HC" TYPE WITH ROUND NECK AND VOLUME CONTROL UNIT. LAY-IN DIFFUSERS SHALL BE 24" x 24" WITH ALUMINUM CONSTRUCTION.

C. RETURN AND EXHAUST REGISTERS AND GRILLES SHALL BE PRICE MODEL 530 STEEL CONSTRUCTION WITH 45 DEGREE DEFLECTING VANES AND SHALL HAVE FREE AREA NOT LESS THAN 75%. REGISTER DAMPERS SHALL BE OPPOSED-BLADE FACE-OPERATED TYPE WITH REMOVABLE KEY.

24. DUCTWORK

A. GENERAL: DUCTWORK SHALL BE ZINC-COATED SHEET STEEL OR ALUMINUM, CONSTRUCTED AND INSTALLED AS RECOMMENDED BY THE LATEST EDITION OF SMACNA.

B. DUCT CLEARANCE SHALL BE ESTABLISHED AT THE JOB SITE BEFORE ANY DUCTS ARE FABRICATED. THE CONTRACTOR WILL NOT BE ALLOWED ANY EXTRA COSTS FOR DUCTS FABRICATED AND THEN FOUND NOT TO FIT.

C. MANUAL VOLUME CONTROL DAMPERS SHALL HAVE ACCESSIBLE OPERATING MECHANISM. BLADE HEIGHT SHALL NOT EXCEED 8 INCHES.

D. AIR DEFLECTORS SHALL BE PROVIDED IN ALL SQUARE ELBOWS AND DUCT-MOUNTED SUPPLY OUTLETS.

E. HINGED ACCESS DOORS SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 90A AT ALL AUTOMATIC DAMPERS, FIRE DAMPERS, HEATERS, THERMOSTATS, ON EACH SIDE OF AIR HANDLING UNIT AND OTHER APPARATUS REQUIRING SERVICE AND INSPECTION IN THE DUCT SYSTEM. ACCESS DOORS SHALL BE 15" X 18" OR AS LARGE AS PRACTICAL.

F. PROVIDE FLEXIBLE DUCT CONNECTIONS TO AIR HANDLING EQUIPMENT.

G. FLEXIBLE DUCTS SHALL BE FLEXIBLE METAL OR METAL AND NEOPRENE-COATED CANVAS HOSE INSULATED WITH 1" THICK FIBERGLASS WITH VINYL VAPOR BARRIER. ALL ROUND DUCT TAKE-OFFS SHALL BE MADE WITH SPIN-IN FITTINGS WITH BALANCING DAMPER. THE DUCT DIAMETER SHALL MATCH THE AIR DIFFUSER SIZE UNLESS OTHERWISE INDICATED.

H. DUCT SUPPORTS SHALL CONSIST OF NOT LESS THAN 1" X 16-GAUGE GALVANIZED STRAP IRON HANGERS SPACED NOT OVER 4'-0" ON CENTER.

25. THERMAL COVERING

A. INSULATION SHALL BE JOHNS MANVILLE, OWENS CORNING, ARMSTRONG OR EQUAL. INSULATION SHALL NOT BE APPLIED UNTIL AFTER THE EQUIPMENT, PIPES OR DUCTS TO BE INSULATED HAVE PROVEN SATISFACTORY UNDER TESTS. ALL MATERIALS USED SHALL HAVE COMPOSITE FLAME-SPREAD RATING NOT EXCEEDING 25 AND A SMOKE-DEVELOPED RATING NOT EXCEEDING 50.

B. PIPING: INSULATION SHALL BE INSTALLED IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

C. FIBERGLASS PIPE INSULATION SHALL HAVE A WHITE KRAFT BONDED TO ALUMINUM FOIL, REINFORCED WITH FIBERGLASS YARN JACKET. ELASTOMERIC INSULATION SHALL BE CONSTRUCTED OF A CLOSED CELL STRUCTURE TO EFFECTIVELY RETARD THE FLOW OF MOISTURE VAPOR AND SERVE AS A VAPOR BARRIER. INSULATION THICKNESS AND TYPE FOR VARIOUS PIPING SYSTEMS SHALL BE AS INDICATED IN THE FOLLOWING TABLE (PIPE SIZE/INSULATION THICKNESS).

PIPE SIZE/INSULATION THICKNESS(1)

SYSTEM	TEMP. RANGE (F°)	LESS THAN 1"	1" TO 1-1/4"	1-1/2" TO 3"	4" TO 6"	8"& UP	INS. TYPE (2)
CONDENSATE DRAIN	45-75	0.5	0.5	1.0	1.0	1.0	A,B
REFRIG. BRINE	BELOW 40 (4)	1.0	1.0	1.5	1.5	1.5	B

NOTES:
(1) MINIMUM THICKNESS FOR INSULATION LISTED IN PRECEDING TABLE IS BASED ON THERMAL CONDUCTIVITY, 'K' NOT EXCEEDING 0.27 BTU PER INCH/HR. X SQ. FT. X DEG. F. BASED ON MEAN TEMPERATURE OF 75 DEG. F. INSULATION WITH GREATER THERMAL CONDUCTIVITY SHALL HAVE INCREASED THICKNESS TO PROVIDE SAME PERFORMANCE CHARACTERISTICS AS SPECIFIED.
(2) A - FIBERGLASS TYPE INSULATION; B - ELASTOMERIC TYPE INSULATION.
(3) RUNOUTS TO INDIVIDUAL TERMINAL UNITS (NOT EXCEEDING 12 FT. IN LENGTH).
(4) ALSO INSULATE ALL REFRIGERANT PIPES LOCATED IN HOT SPACES SUCH AS ATTICS.

A. FIBERGLASS PIPE INSULATION FITTINGS SHALL BE COVERED WITH PREMOLDED PVC FITTING COVERS. JACKETS ON FIBERGLASS PIPE INSULATION BELOW 80 DEG. F. SHALL BE VAPOR SEALED USING SELF-SEALING LAP, LAP SEAL GUN OR ADHESIVE. ALL INSULATION JOINTS, LAPS, VOIDS, PUNCTURES AND END TAPERS SHALL BE SEALED WITH 1/32" THICKNESS OF VAPOR ADHESIVE. A 12" LONG, 1/2 SECTION OF HYDROUS CALCIUM SILICATE OR FOAMGLAS INSULATION SHALL BE USED BETWEEN HANGERS AND PIPING. ON PIPE, SIZES 1-1/2" AND BELOW, HYDROUS CALCIUM SILICATE OR FOAMGLAS WILL NOT BE REQUIRED. ALL PIPING SHALL HAVE LOAD-DISTRIBUTING GALVANIZED 16 GAUGE METAL SHIELDS INSTALLED AROUND THE LOWER HALF OF THE INSULATION.

B. ELASTOMERIC PIPE INSULATION SEAMS, VOIDS AND BUTT JOINTS SHALL BE SEALED WITH A VAPOR BARRIER ADHESIVE OR TAPED WITH 1-1/2 INCH WIDE 3M #471 TAPE. FLEXIBLE ELASTOMERIC INSULATION EXPOSED TO WEATHER SHALL BE COVERED WITH TWO COATS OF ARMSTRONG ARMAFLEX FINISH (VINYL LACQUER).

C. DUCTWORK: INSULATE RETURN DUCTS IN ATTIC SPACES, CRAWL SPACES AND EQUIPMENT ROOMS. ALL SUPPLY DUCTS AND ALL OUTDOOR AIR DUCTS SHALL BE INSULATED. INSULATION WHERE DUCTS ARE NOT CONCEALED SHALL BE RIGID DUCT INSULATION MEETING ASTM C 612. ALL OTHER INSULATION SHALL BE FLEXIBLE DUCT INSULATION MEETING ASTM C 533. INSULATION SHALL HAVE A FACTORY-APPLIED FACING OF FOIL-SCRIM-KRAFT PAPER JACKET REINFORCED WITH FIBERGLASS YARN MESH. INSULATION SHALL BE SECURED TO RECTANGULAR DUCTS BY IMPALING OVER METAL STICK CLIPS SPACED 12" CENTER EACH WAY. ROUND DUCT INSULATION SHALL BE SECURED WITH NO. 18 GAUGE COPPERWELD WIRE SPACED NOT OVER 18" ON CENTER. WHERE INSULATION JOINTS OCCUR, FACING TABS SHALL BE LAPPED NOT LESS THAN 2"; ALL JOINTS, VOIDS AND PUNCTURES IN FACING SHALL BE EFFECTIVELY VAPOR SEALED WITH FOSTER VAPOR-SAFE OR VAPOR-FAS ADHESIVE. INSULATION FOR ALL OUTDOOR AIR DUCTWORK AND INSULATION FOR SUPPLY AND RETURN DUCTWORK WHERE INSTALLED IN ATTIC SPACES AND CRAWL SPACES SHALL BE 2" THICK AND SHALL HAVE A MINIMUM TOTAL THERMAL RESISTANCE (R) OF 7.4 AT A MEAN TEMPERATURE OF 75 DEG. F. INSULATION FOR ALL OTHER DUCTWORK SHALL BE 1-1/2" THICK AND SHALL HAVE A MINIMUM TOTAL THERMAL RESISTANCE (R) OF 5.6 AT A MEAN TEMPERATURE OF 75 DEG. F.

2. TEMPERATURE CONTROL SYSTEM:

A. GENERAL - THE SYSTEM SHALL BE AN EXTENSION OF THE EXISTING TRANE BAS SYSTEM. THE TEMPERATURE CONTROL CONTRACTOR SHALL BE RESPONSIBLE FOR ACHIEVING THE "SEQUENCE OF CONTROL". THE SYSTEM SHALL BE INSTALLED BY COMPETENT, TRAINED MECHANICS. ROOM THERMOSTAT LOCATIONS SHALL BE COORDINATED TO ALIGN VERTICALLY OR HORIZONTALLY WITH ADJACENT LIGHT SWITCHES OR CONTROL INSTRUMENTS. PROVIDE ALL EQUIPMENT AND MATERIALS AS REQUIRED TO ACCOMPLISH THE SEQUENCE OF CONTROL.

B. MATERIALS

1. MODULAR VAV DIFFUSER HEATING-COOLING THERMOSTATS SHALL BE AS REQUIRED FOR THE SEQUENCE OF CONTROL AND AC EQUIPMENT NOTES. THE VAV DIFFUSER THERMOSTATS SHALL BE EQUIPPED WITH ADJUSTMENTS FOR HEATING AND COOLING.

2. DAMPER ACTUATORS SHALL BE PROVIDED FOR ALL AUTOMATIC DAMPERS AND SHALL BE OF SUFFICIENT CAPACITY TO OPERATE THE CONNECTED DAMPER.

C. COORDINATION OF WORK: ALL WIRING IN CONNECTION WITH THE TEMPERATURE CONTROL SYSTEM SHALL BE FURNISHED AND INSTALLED BY THE CONTROLS SYSTEM CONTRACTOR. WIRING SHALL BE INSTALLED IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATION. WIRING WITHOUT CONDUIT ABOVE CEILINGS SHALL BE PROPERLY SUPPORTED WITHOUT SAGS. LOOSE WIRES LAYING ON CEILINGS, LIGHTS, OR PIPES WILL NOT BE ACCEPTABLE AT ANY LOCATION.

D. SERVICE AND GUARANTEE - THE ENTIRE CONTROL SYSTEM SHALL BE SERVICED AND MAINTAINED IN FIRST-CLASS CONDITION BY THE CONTROL MANUFACTURER FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE AT NO EXTRA COST TO THE OWNER.

E. SEQUENCE OF CONTROL:

1. SPLIT SYSTEM HEAT PUMP (AHU-1 / HP-1):

a. EACH MODULAR VAV DIFFUSER SHALL BE CONTROLLED BY A SPACE-MOUNTED SENSOR WIRED TO A CONTROLLER. THE THERMOSTATS AND CONTROLLERS SHALL BE FURNISHED WITH THE UNITS. THE QUANTITIES OF CONTROLLERS SHALL BE AS REQUIRED FOR PROPER SYSTEM OPERATION. THE THERMOSTATS AND CONTROLLERS SHALL BE INTEGRATED TO WORK AS A COMPLETE SYSTEM WITH THE BUILDING AUTOMATION SYSTEM (BAS).

b. THE ACUTHERM VAV DIFFUSER SYSTEM SHALL INCLUDE A SUPPLY AIR TEMPERATURE CONTROL (ACUTHERM "SMC") WITH SENSORS IN TYPE C DIFFUSERS TO MAINTAIN PROPER COOLING/HEATING MODE OF OPERATION.

c. A BYPASS DUCT SHALL BE INCLUDED AS INDICATED, WITH A STATIC PRESSURE CONTROL (ACUTHERM "PIM") TO MAINTAIN REQUIRED SYSTEM STATIC PRESSURE NECESSARY TO OPERATE VAV DIFFUSER DAMPERS.

d. OCCUPIED MODE: THE SUPPLY AIR FAN SHALL OPERATE CONTINUOUSLY. THE DX COOLING SHALL SEQUENCE AND THE ELECTRIC HEAT SHALL MODULATE TO MAINTAIN SYSTEM SUPPLY AIR DISCHARGE TEMPERATURE SETPOINT.

e. THE CONDENSATE OVERFLOW DRAIN PAN SWITCH SHALL DE-ENERGIZED THE UNIT AND ALARM THE BAS IF THE AHU CONDENSATE DRAIN LINE BECOMES CLOGGED.

2. ELECTRIC CEILING HEATER (CH-#):

a. EACH UNIT SHALL BE CONTROLLED BY A BUILT-IN THERMOSTAT. WHEN THE UNIT IS ENERGIZED, THE UNIT-MOUNTED THERMOSTAT SHALL CYCLE THE UNIT FAN AND CONTROL THE ELECTRIC HEAT TO MAINTAIN THE SPACE TEMPERATURE.

HVAC LEGEND

ABOVE	ABV
AIR HANDLING UNIT	AHU
BELOW	BEL
CAPACITY	CAP
CEILING	CLG
CEILING DIFFUSER	CD
CEILING GRILLE	CG
CLEANOUT	CO
COOLING COIL CONDENSATE DRAIN PIPE	CCCD — D
CUBIC FEET PER MINUTE	CFM
DEGREES FAHRENHEIT	°F
DIAMETER	DIA ⌀
DIRECTION OF SLOPE DOWN	
DOWN	DN
DRY BULB	DB
DUCTWORK (NEW)	
RETURN & EXHAUST	
SUPPLY	
EACH	EA
ENTERING AIR TEMPERATURE	EAT
INCH	IN
KILOWATT	KW
LEAVING AIR TEMPERATURE	LAT
MANUAL DAMPER	MD
OUTDOOR AIR	OA
PIPING INDICATION WITH RESPECT	
TO FLOW	
TURN DOWN OR FROM BELOW	
PRESSURE DROP	PD
RETURN AIR	RA
STATIC PRESSURE	SP
SUPPLY AIR	SA
THERMOSTAT OR TEMPERATURE SENSOR	T'STAT T
THOUSAND BTU PER HOUR	MBH
WET BULB	WB

COMMONWEALTH OF VIRGINIA
09/05/23
CRODNEY D. FANNING
Lic. No. 034568
PROFESSIONAL ENGINEER

REVISIONS

#	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

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HVAC LEGEND AND SPECIFICATIONS

PLOT SCALE: 1/8" = 1'-0"
FILENAME:
DATE: SEPTEMBER 5, 2023

PROJECT

M1.0

GENERAL NOTES:

1. ALL DUCTWORK AND PIPES SHALL BE COORDINATED WITH OTHER DUCTS, PIPES, LIGHTS, STRUCTURAL SYSTEM, CEILING SUPPORTS AND FRAMING BEFORE INSTALLATION. MINOR DUCT AND PIPE OFFSETS AND MINOR DUCT TRANSITIONS SHALL BE PROVIDED AS REQUIRED. WHERE TRANSITIONS ARE REQUIRED, CROSS SECTIONAL AREA OF DUCT SHALL NOT BE REDUCED. MEASUREMENTS FOR VERTICAL CLEARANCES OF DUCTWORK SHALL BE TAKEN AT THE JOB SITE BEFORE FABRICATION OF ANY DUCTWORK.
2. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTRUCTIONS.
3. MATERIALS AND INSTALLATION SHALL COMPLY WITH LOCAL CODES, APPLICABLE PROVISIONS OF LATEST EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION, LOCAL UTILITY REGULATIONS AND GOVERNMENTAL DEPARTMENTS HAVING JURISDICTION.
4. CONTRACTOR SHALL SEAL AND FLASH ALL PENETRATIONS IN EXISTING ROOF AND WALLS.
5. VERIFY ROOF AND WALL OPENINGS WITH STRUCTURE.
6. VERIFY THE LOCATION OF ALL THERMOSTATS, TEMPERATURE SENSORS, PANELS AND CONTROL INSTRUMENTS WITH THE ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
7. VERIFY LOCATIONS OF NEW AND EXISTING EQUIPMENT AND ROUTE OF DUCTWORK WITH EXISTING CONDITIONS.
8. ALL CUTTING AND PATCHING FOR THE INSTALLATION OF NEW WORK IN EXISTING BUILDING SHALL BE DONE BY THE GENERAL CONTRACTOR.
9. REFER TO ARCHITECTURAL, STRUCTURAL AND ELECTRICAL DRAWINGS TO COORDINATE THE EXACT LOCATIONS OF DIFFUSERS, REGISTERS, GRILLES, PIPING AND OTHER MECHANICAL EQUIPMENT WITH CEILING GRID, LIGHTS, BEAMS AND OTHER BUILDING COMPONENTS.
10. CONTRACTOR SHALL PROVIDE ALL SUPPORTS REQUIRED TO MOUNT MECHANICAL EQUIPMENT, PIPING AND DUCTWORK.
11. DUCTWORK SHALL BE ZINC-COATED SHEET STEEL OR ALUMINUM, CONSTRUCTED AND INSTALLED AS RECOMMENDED BY THE LATEST EDITION OF SMACNA "HVAC DUCT CONSTRUCTION STANDARDS".
12. ALL FLEXIBLE DUCTS CONNECTED TO SUPPLY DIFFUSERS SHALL BE SIZED TO EQUAL THE DIFFUSER NECK DIAMETER.
13. FLEXIBLE DUCTS SHALL BE FLEXIBLE METAL OR METAL AND NEOPRENE-COATED CANVAS HOSE INSULATED WITH 1" THICK FIBERGLASS WITH VINYL VAPOR BARRIER. ALL ROUND DUCT TAKE-OFFS SHALL BE MADE WITH SPIN-IN FITTINGS WITH 45 DEG. EXTRACTOR AND BALANCING DAMPER. THE DUCT DIAMETER SHALL MATCH THE AIR DIFFUSER SIZE UNLESS OTHERWISE INDICATED.
14. PROVIDE FLEXIBLE DUCT CONNECTIONS BETWEEN THE SUPPLY/RETURN DUCTS AND THE AIR UNITS. FLEXIBLE CONNECTIONS SHALL BE WEATHERTIGHT WHEN EXPOSED.
15. DUCT AND PIPE INSULATION SHALL MATCH EXISTING. INSULATION THAT IS DAMAGED OR REMOVED FOR NEW WORK SHALL BE REPLACED, REPAIRED AND SEALED AS REQUIRED.
16. REFRIGERANT PIPING SHALL BE TYPE "L" COPPER AND SHALL BE SIZED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. SUCTION AND LIQUID LINE SHALL BE INSULATED AS INDIVIDUAL PIPES WITH A MINIMUM OF 3/4" THICK ARMAFLEX VAPOR SEALED. VERIFY ROUTE OF PIPE WITH ARCHITECT BEFORE INSTALLATION.
17. REFRIGERANT PIPING SHALL BE DEHYDRATED AND SEALED COPPER TUBING AND SHALL BE SIZED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. SUCTION AND LIQUID LINE SHALL BE INSULATED AS INDIVIDUAL PIPES WITH A MINIMUM OF 1/2" THICK ARMAFLEX VAPOR SEALED. VERIFY ROUTE OF PIPE WITH ARCHITECT BEFORE INSTALLATION.
18. CONDENSATE DRAIN LINES SHALL BE TYPE M HARD DRAWN COPPER OR PVC TUBING. FITTINGS SHALL MATCH THE PIPING. INSULATE WITH 3/8" ARMAFLEX VAPOR SEALED WHERE SUBJECT TO SWEATING.
19. PROVIDE CONDENSATE DRAIN PIPING FROM AIR CONDITIONING UNIT'S DRAIN PAN AND EXTEND TO FLOOR DRAIN OR AS INDICATED. PIPING SHALL BE THE SAME SIZE AS THE DRAIN PAN CONNECTION AND SHALL INCLUDE A 6-INCH TRAP TO PREVENT SIPHONING BY THE SUPPLY AIR FAN.
20. CONDENSATE DRAIN LINES AND CHILLED WATER LINES SHALL BE INSULATED WITH 3-1/2 LB. DENSITY FIBERGLASS FLAME-SAFE PIPE INSULATION WITH 1 MIL FOIL-SCRIM-WHITE KRAFT PAPER JACKET. INSULATION ON CONDENSATE DRAIN LINES SHALL BE A MINIMUM OF 3/4" THICK, ALL OTHERS SHALL BE A MINIMUM OF 1" THICK. ALL JOINTS, VOIDS AND PUNCTURES IN JACKET SHALL BE VAPOR SEALED.
21. EXPOSED PIPING RUNOUTS SHALL BE INSTALLED IN PRACTICAL ALIGNMENT WITH THE BUILDING AND SHALL BE ADEQUATELY SECURED TO THE BUILDING STRUCTURE.
22. ALL CEILING DIFFUSERS SHALL BE 4-WAY THROW TYPE UNLESS NOTED OTHERWISE.
23. HVAC CONTRACTOR SHALL ADJUST CFM FOR CEILING DEVICES AND AIR UNITS AS SHOWN ON THE FLOOR PLANS.
24. FOR EXACT LOCATIONS OF CEILING DEVICES, SEE REFLECTED CEILING PLAN.
25. EQUIPMENT SUPPORTS FOR HP-1 (OUTDOOR) UNITS SHALL BE GREENHECK MODEL GESR OR EQUAL. INSTALLATION SHALL BE BY THE GENERAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL FURNISH AND COORDINATE LOCATION.
26. FINAL LOCATION OF ROOF-MOUNTED EQUIPMENT SHALL BE COORDINATED WITH ROOF FRAMING. VERIFY ROOF OPENINGS WITH STRUCTURE.
27. PROVIDE ACCESS DOORS OF SUFFICIENT SIZE FOR ALL CONCEALED CONTROLS, DAMPERS OR ANY ITEMS REQUIRING ACCESS.
28. AIR DEFLECTORS SHALL BE PROVIDED IN ALL SQUARE ELBOWS.
29. ROOF CURBS FOR AIR UNITS SHALL BE SUITABLE FOR SLOPING ROOF.
30. CONTRACTOR SHALL VERIFY THAT VFD'S ARE PROVIDED WITH INTEGRAL DISCONNECT TO DISCONNECT POWER TO THE CONTROLLER AND THE MOTOR. VFD'S SHALL BE LOCATED WITHIN SIGHT OF THE MOTOR BEING SERVED.
31. ALL REMOTE MOUNTED TEMPERATURE CONTROL DEVICES AND TEMPERATURE CONTROL WIRING SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
32. ALL EQUIPMENT SHALL BE SECURED TO CONCRETE HOUSEKEEPING PADS WITH HOLD-DOWN BOLTS TO PREVENT MOVEMENT.
33. CEILING GRID AND OTHER ITEMS SHALL NOT BE SUPPORTED FROM OR IN CONTACT WITH INDOOR UNITS (AHU-1). CONDUIT, WIRING, PIPING AND SUPPORTS SHALL NOT BE LOCATED BELOW ACCESS PANELS.
34. DUCTWORK AND PIPING SHALL NOT BE INSTALLED ABOVE ELECTRICAL PANELS. COORDINATE INSTALLATION OF DUCTWORK AND PIPING WITH ELECTRICAL PANELS WHEN SHOWN NEAR PANELS OR OVER ELECTRICAL ROOMS.
35. EQUIPMENT, MATERIALS AND LABOR REQUIRED BY THESE CONTRACT DRAWINGS SHALL BE GUARANTEED TO BE FREE FROM DEFECTIVE MATERIALS OR WORKMANSHIP FOR ONE YEAR AFTER FINAL ACCEPTANCE OF THE PROJECT UNLESS SPECIFIED OTHERWISE. DEFECTIVE MATERIALS OR WORKMANSHIP OCCURRING DURING THIS PERIOD SHALL BE CORRECTED AT NO ADDITIONAL COST.
36. REFRIGERANT CIRCUIT ACCESS PORTS LOCATED OUTDOORS SHALL BE FITTED WITH LOCKING-TYPE TAMPER-RESISTANT CAPS OR BE OTHERWISE SECURED TO PREVENT UNAUTHORIZED ACCESS.
37. THIS IS A RISK CATEGORY 4 BUILDING WITH SEISMIC DESIGN CATEGORY C. NON-STRUCTURAL COMPONENTS SHALL BE DESIGNED, ANCHORED AND ATTACHED TO THE BUILDING STRUCTURE TO RESIST SEISMIC FORCES. SEE STRUCTURAL DRAWINGS / SPECIFICATIONS.

GENERAL DEMOLITION NOTES:

1. THE CONTRACTOR SHALL REMOVE OR ALTER AS NECESSARY ALL EXISTING PIPING, EQUIPMENT, AND APPURTENANCES THAT ARE NOT REQUIRED FOR THE EXISTING SYSTEMS TO REMAIN. CONTRACTOR SHALL VISIT THE SITE TO REVIEW THE SCOPE OF THIS WORK AND VERIFY EXISTING CONDITIONS PRIOR TO PRICING.
2. EXISTING EQUIPMENT SHALL BE TURNED OVER TO THE OWNER, UNLESS DIRECTED OTHERWISE AND LOCATED ON SITE AS DIRECTED BY THE OWNER. ALL OTHER ITEMS TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED FROM THE PREMISES.
3. INSULATION ON EXISTING PIPING OR DUCT THAT IS DAMAGED OR REMOVED DUE TO THE DEMOLITION WORK SHALL BE REPLACED AND SEALED AS REQUIRED.
4. THE CONTRACTOR SHALL PROTECT EXISTING SYSTEMS TO REMAIN. SYSTEMS THAT ARE DAMAGED OR INCORRECTLY REMOVED DUE TO THE DEMOLITION WORK SHALL BE REPAIRED OR REPLACED.
5. THE CONTRACTOR IS CAUTIONED THAT THE EXISTING HVAC SYSTEM LAYOUTS ARE INDICATED AS ONLY AN APPROXIMATION OF EXISTING CONDITIONS. NOT ALL EXISTING SYSTEMS ARE SHOWN AND SELECTIVE DEMOLITION IS REQUIRED. THE CONTRACTOR SHALL VERIFY ACTUAL SYSTEM CONFIGURATIONS IN THE FIELD AND SHALL COORDINATE ACCORDINGLY.

SPLIT SYSTEM HEAT PUMPS: TRANE

MARK (INDOOR/OUTDOOR)	INDOOR FAN				COOLING CAPACITY			HEATING CAPACITY		ELECTRIC HEAT (KW)	INDOOR UNIT ELEC		OUTDOOR UNIT ELEC		MODEL NO. (INDOOR/OUTDOOR)
	AIRFLOW (CFM)	OUTSIDE AIR (CFM)	SP (IN W.C.)	MOTOR HP	TOTAL CAP (MBH)	SENS CAP (MBH)	EER	TOTAL CAP (MBH)	COP		V/PH	MCA	V/PH	MCA	
HP-1 / AHU-1	600	90	0.5	0.2	23.5	16.7	11.7	14.6	4.0	5.8	208/1	2.0	208/1	15.0	4TWR4024N1 / TEM4B0B24M21

NOTES:
1. COOLING AND HEATING CAPACITY BASED ON ARI CONDITIONS.
2. REFRIGERANT SHALL BE R-410.
3. POWER SUPPLY FOR INDOOR UNIT SHALL BE SINGLE SOURCE WITH UNIT-MOUNTED DISCONNECT SWITCH.
4. PROVIDE ACUTHERM MODEL "PIM" STATIC PRESSURE CONTROL IN BYPASS DUCT AS INDICATED.
5. PROVIDE ACUTHERM MODEL "SMC" SUPPLY AIR TEMPERATURE CONTROL, WITH SENSORS TIED INTO AHU DISCHARGE THERMOSTAT AND TYPE C DIFFUSERS.

ELECTRIC HEATERS: MARKEL

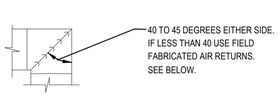
MARK	TYPE	HEATING CAPACITY (MBH)	HEATING CAPACITY (KW)	AIRFLOW (CFM)	ELECTRICAL		MODEL NO.	ROOM SERVED
					AMPS	VOLTS/PH		
CH-1	CEILING	6.8	2	80	7.2	277/1	G3482	CORRIDOR 101
CH-2	CEILING	6.8	2	140	7.2	277/1	G3482	WAITING 102
CH-3	CEILING	6.8	2	70	7.2	277/1	G3482	CORRIDOR NEW STAFF ENTRY 107
CH-4	CEILING	6.8	2	125	7.2	277/1	G3482	CORRIDOR EXISTING PUBLIC ENTRY 108

NOTES:
1. REFER TO PLANS FOR UNIT QUANTITIES.
2. PROVIDE REMOTE LOW VOLTAGE THERMOSTATS FOR CEILING HEATERS.
3. PROVIDE BUILT-IN DISCONNECT SWITCH.

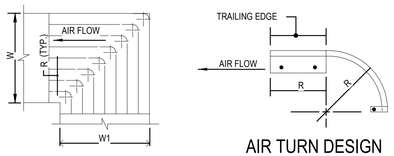
GRILLES, REGISTERS AND DIFFUSERS: PRICE (RETURN/EXHAUST) AND ACUTHERM "THERMA-FUSER" (SUPPLY)

MARK	SERVICE	TYPE	FACE SIZE, IN. x IN.	NECK SIZE, IN. x IN.	MAX AIR P.D., IN. H2O	MAX N.C.	MODEL #	NOTES
A	SUPPLY	LAY-IN DIFFUSER	24x24	6"∅	0.1	25	TF-HC	1,3
B	SUPPLY	LAY-IN DIFFUSER	24x24	8"∅	0.1	25	TF-HC	1,3
C	SUPPLY	LAY-IN DIFFUSER	24x24	10"∅	0.1	25	TF-HC	1,3
Y	RETURN/EXHAUST	SURFACE MOUNTED GRILLE	6"x6"	6"x6"	0.05	20	530FF	2, 4
Z	RETURN/EXHAUST	SURFACE MOUNTED GRILLE	8"x8"	8"x8"	0.05	20	530FF	2, 4

NOTES:
1. DIFFUSER SHALL BE 4-WAY UNLESS OTHERWISE NOTED. PROVIDE WALL-MOUNTED THERMOSTAT.
2. PROVIDE SURFACE MOUNT FRAME AS REQUIRED FOR INSTALLATION.
3. FLEX DUCT CONNECTION SHALL EQUAL THE DIAMETER OF DIFFUSER CONNECTION.
4. PROVIDE FILTER FRAME.



FACTORY FABRICATED TURNING VANES



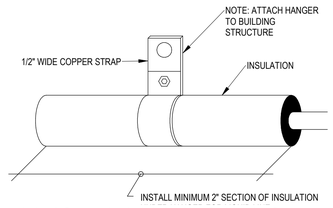
AIR TURN DESIGN

DIVIDE WIDTH OF DUCT W INTO EQUAL PARTS NOT EXCEEDING 3" SPACING IF W IS LESS THAN 24", AND NOT EXCEEDING 5" SPACING IF W IS 24" OR OVER. USE RESULTANT SPACING "R" AS RADIUS AND AS LENGTH OF TRAILING EDGE. DIVIDE DUCT W1 INTO SAME NUMBER OF EQUAL SPACES AND NOTE THAT THESE SPACES WILL BE GREATER THAN SPACES FOR DUCT WIDTH W.

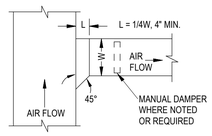
EXAMPLE;
DUCT WIDTH "W" = 40"
USE 8 SPACES; R = 5"
LENGTH OF TRAILING EDGE R = 5"

FIELD FABRICATED TURNING VANES

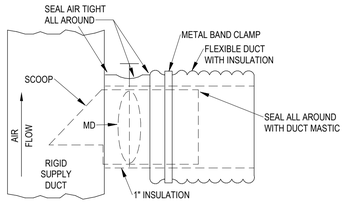
TURNING VANE DETAIL
NO SCALE



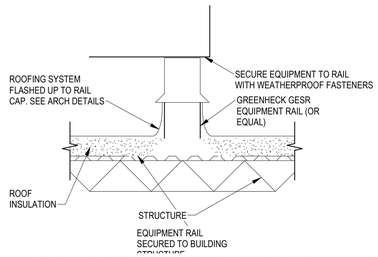
REFRIGERANT PIPING HANGER DETAIL
NO SCALE



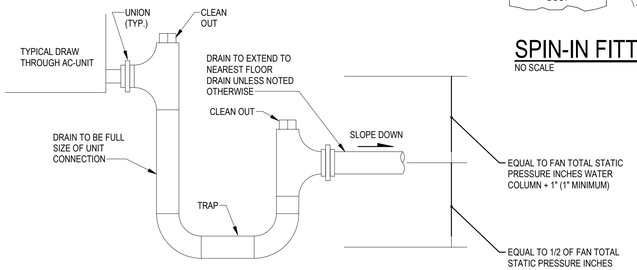
BRANCH DUCT CONNECTION DETAIL
SCHEMATIC



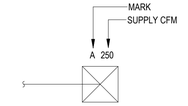
SPIN-IN FITTING DETAIL
NO SCALE



EQUIPMENT RAIL SUPPORT DETAIL
NO SCALE



COOLING COIL CONDENSATE DRAIN
NO SCALE



DIFFUSER SIZING
NO SCALE

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COMMONWEALTH OF VIRGINIA
09/05/23
RODNEY D. FANNING
Lic. No. 034568
PROFESSIONAL ENGINEER

REVISIONS

#	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

CRABTREE ROHRBAUGH & ASSOCIATES - ARCHITECTS
250 W MAIN STREET, SUITE 200, CHARLOTTESVILLE VA 22902 434-975-7262 www.cra-architects.com
MECHANICSBURG, PENNSYLVANIA TOWSON, MARYLAND WHITE SULPHUR SPRINGS, WEST VIRGINIA

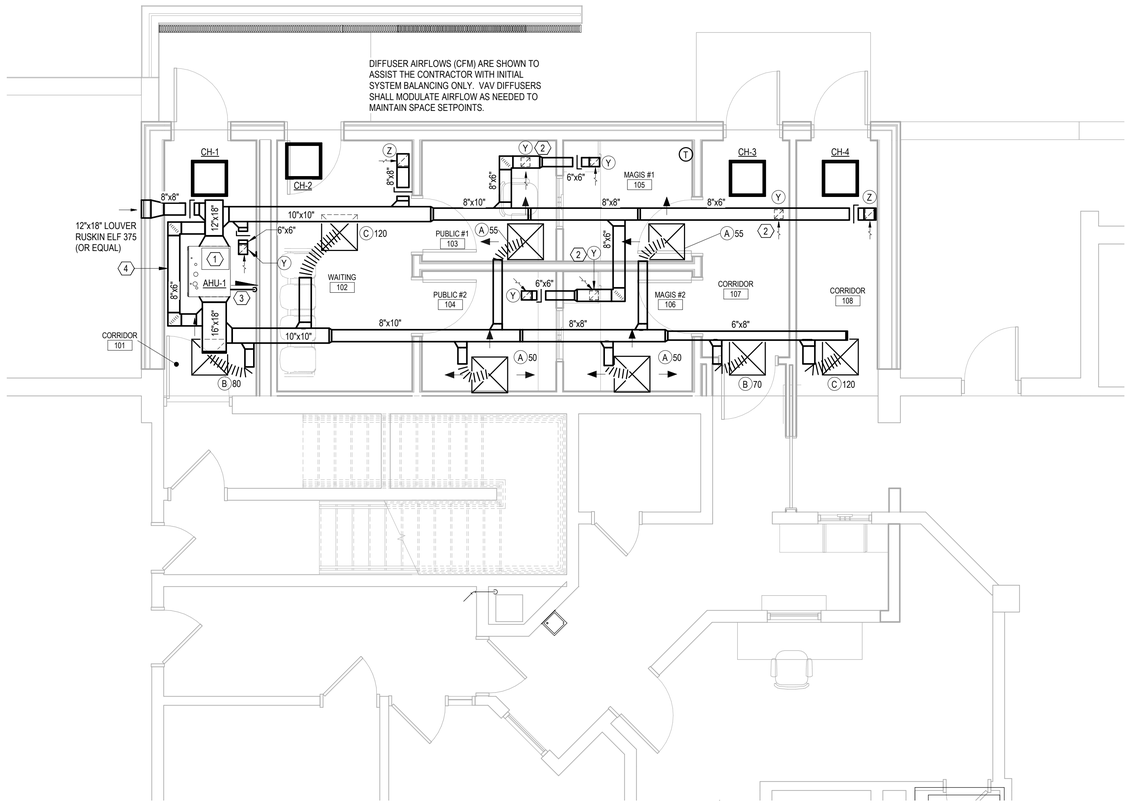
JAIL - MAGISTRATE OFFICE ADDITION
CITY OF ROANOKE
324 CAMPBELL AVE. SW, ROANOKE, VIRGINIA

HVAC SCHEDULES, NOTES AND DETAILS

PLOT SCALE: As indicated
FILENAME:
DATE: SEPTEMBER 5, 2023

PROJECT

M1.1



FIRST PARTIAL FLOOR PLAN - NEW WORK - DUCTWORK

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

PLAN NOTES

1. ROUTE REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATION.
2. MANUAL DAMPER IN VERTICAL (TYP.).
3. PROVIDE 3/4" CONDENSATE DRAIN PIPING FROM AIR CONDITIONING UNITS DRAIN PAN AND EXTEND TO FLOOR DRAIN OR AS INDICATED. PIPING SHALL BE THE SAME SIZE AS THE DRAIN PAN CONNECTION AND SHALL INCLUDE A 6-INCH TRAP TO PREVENT SIPHONING BY THE SUPPLY AIR FAN.
4. 8x6 BYPASS DUCT WITH ACUTHERM "PIM" STATIC PRFESSURE CONTROLLER.

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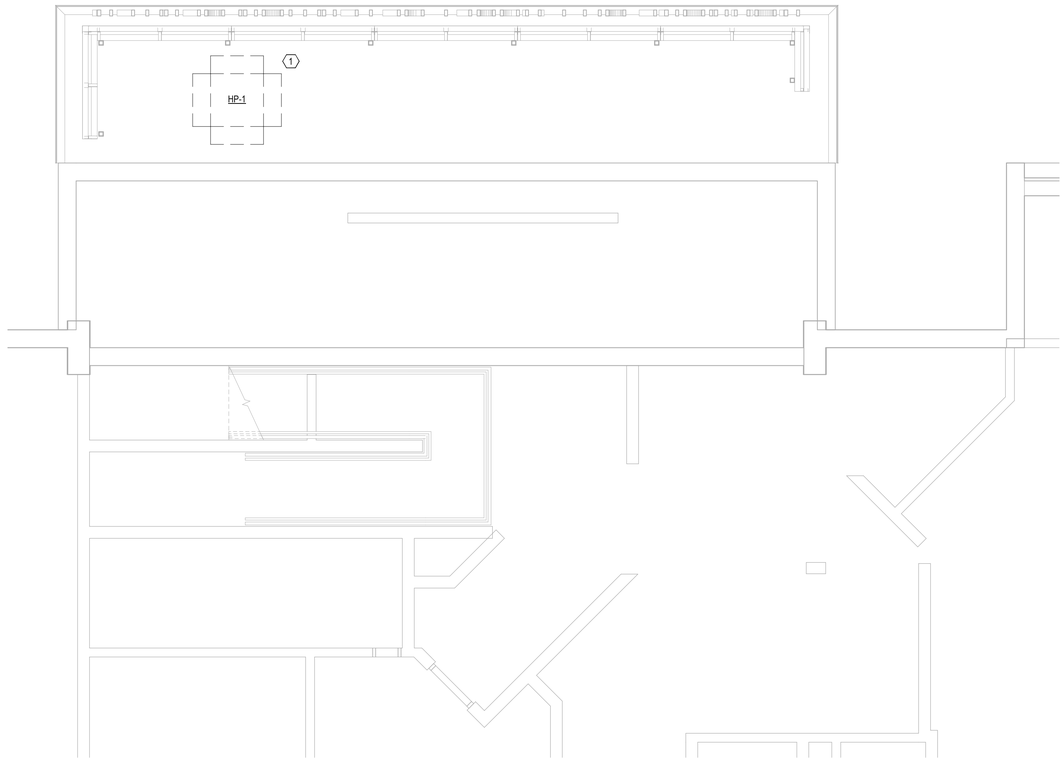
FIRST FLOOR PLANS - HVAC
PLOT SCALE: 1/4" = 1'-0"
FILENAME:
DATE: SEPTEMBER 5, 2023

PROJECT
M1.2



PARTIAL ROOF PLANS - NEW WORK - DUCTWORK

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

PLAN NOTES

1. ROUTE REFFRIDGERANT PIPING PER MANUFACTURER'S RECOMMENDATION.

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ROOF PLANS - HVAC

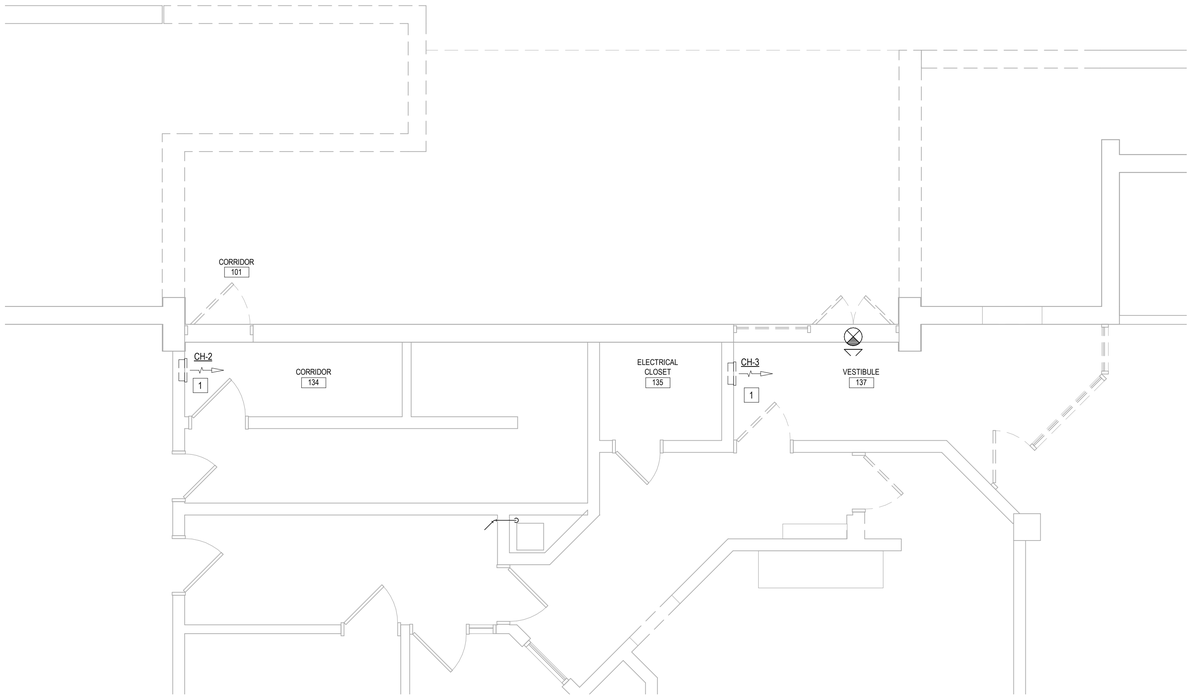
PLOT SCALE: 1/4" = 1'-0"

FILENAME:

DATE: SEPTEMBER 5, 2023

PROJECT

M1.3



PARTIAL FIRST FLOOR PLAN - DEMOLITION - DUCTWORK

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

PLAN NOTES

1. REMOVE EXISTING WALL HEATER UNITS, RELATED DUCTWORK, AND CONTROLS COMPLETE. PATCH AND REPAIR WALL, WALL INSULATION AS INDICATED ON ARCHITECTURAL DRAWINGS.

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NO	MM-DD-YR	NAME	DESCRIPTION OF CHANGES

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DEMOLITION FIRST FLOOR PLANS - HVAC

PLOT SCALE: 1/4" = 1'-0"

FILENAME:

DATE: SEPTEMBER 5, 2023

PROJECT

MD1.1