Walgreens

HVAC REPLACEMENT

STORE #21254
2265 N MAYFAIR RD.
WAUWATOSA, WI

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SHEET TITLE
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G-000

SHEET 1 OF 1

DIVISION 20 00 00 - GENERAL MECHANICAL

SECTION 20 07 00 - MECHANICAL INSULATION

1. INSULATION TO MEET OR EXCEED AHJ CODE AND BUILDING REQUIREMENTS. INSTALLATION TO MEET BEST PRACTICE.
2. FLEXIBLE ELASTOMERIC CELLULAR
   A. MATERIAL: FLEXIBLE EXPANDED CLOSED-CELL STRUCTURE WITH SMOOTH SKIN ON BOTH SIDES. COMPLY WITH ASTM C 354, TYPE I FOR TUBULAR MATERIALS AND ASTM C 354, TYPE II FOR SHEET MATERIALS.
   B. THERMAL CONDUCTIVITY: 0.30 AVERAGE MAXIMUM AT 75 DEG. F.
   C. COATING: WATER BASED LATEX ENAMEL COATING RECOMMENDED BY INSULATION MANUFACTURER.
   D. PRODUCTS: AP ARMAFLEX & AP ARMAFLEX FS BY ARMACELL OR RUBATEX INSULTUBE-180 BY RBX CORPORATION.
2. GLASS FIBER
   A. MATERIAL: INORGANIC GLASS FIBERS, BONDED WITH A THERMOSETTING RESIN.
   B. JACKET: ALL-PURPOSE, FACTORY-APPLIED, LAMINATED GLASS-FIBER REINFORCED, FLAME-RETARDANT KRAFT PAPER AND ALUMINUM FOIL HAVING SELF-SEALING LAP.
   C. BOARD: ASTM C 612, CLASS 2, SEMI-RIGID JACKETED BOARD. THERMAL CONDUCTIVITY: 0.26 AVERAGE MAXIMUM, AT 75 DEG. F MEAN TEMPERATURE. DENSITY: 6 PCF AVERAGE.
   D. BLANKET: ASTM C 553, TYPE II, CLASS F-1, JACKETED FLEXIBLE BLANKETS. THERMAL CONDUCTIVITY: 0.32 AVERAGE MAXIMUM, AT 75 DEG. F. MEAN TEMPERATURE.
   E. PREFORMED PIPE INSULATION: ASTM C 547, CLASS 1, RIGID PIPE INSULATION, JACKETED. THERMAL CONDUCTIVITY: 0.32 AVERAGE MAXIMUM, AT 75 DEG. F MEAN TEMPERATURE.
   F. ADHESIVE: PRODUCED UNDER THE UL CLASSIFICATION AND FOLLOW-UP SERVICE.
   G. TYPE: NON-FLAMMABLE, SOLVENT-BASED.
   H. SERVICE TEMPERATURE RANGE: MINUS 20 TO 180 DEG. F.
   I. VAPOR BARRIER COATING: WATERPROOF COATING RECOMMENDED BY INSULATION MANUFACTURER FOR OUTSIDE SERVICE.
   J. MANUFACTURERS: CERTAINTEED CORPORATION, JOHN MANVILLE, KNAUF INSULATION, OR OWENS- CORNING.
3. PVC JACKET
   A. HIGH-IMPACT-RESISTANT, UV-RESISTANT PVC COMPLYING WITH ASTM D 1784, CLASS 16354-C; 20 MILS THICK READY FOR SHOP OR FIELD CUTTING AND FORMING.
   B. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE THE FOLLOWING:
      a. JOHNS MANVILLE; ZESTON.
      b. P.I.C. PLASTICS, INC.; FG SERIES.
      c. PROTO PVC CORPORATION; LOSMOKE.
      d. SPEEDLINE CORPORATION; SMOKESAFE.
   C. ADHESIVE: AS RECOMMENDED BY JACKET MATERIAL MANUFACTURER.
   D. COLOR: AS SELECTED BY ARCHITECT.
   E. FACTORY-FABRICATED FITTING COVERS TO MATCH JACKET IF AVAILABLE; OTHERWISE, FIELD FABRICATE.
   F. SHAPES: 45- AND 90-DEGREE, SHORT- AND LONG-RADIUS ELBOWS, TEES, VALVES, FLANGES, UNIONS, REDUCERS, END CAPS, SOIL-PIPE HUBS, TRAPS, MECHANICAL JOINTS, AND P-TRAP AND SUPPLY COVERS FOR LAVATORIES.
4. REFRIGERANT PIPING INSULATION
   A. REFRIGERATION LINES OUTSIDE OF REFRIGERATED COMPARTMENTS SHALL BE INSULATED BACK TO REFRIGERATION CONDENSING UNIT WITH CLOSED CELL ELASTOMERIC INSULATION.
   B. MEDIUM TEMPERATURE SUCTION LINE MINIMUM INSULATION THICKNESS SHALL BE 1" INSIDE THE BUILDING.
   C. LOW TEMPERATURE SUCTION LINE MINIMUM INSULATION THICKNESS SHALL BE 1" INSIDE THE BUILDING.
   D. LIQUID LINES (IN HOT GAS DEFROST APPLICATIONS) MINIMUM INSULATION THICKNESS SHALL BE 3/4" INSIDE THE BUILDING.
   E. ALL REFRIGERATION SUCTION LINES OUTSIDE THE BUILDING SHALL BE INSULATED WITH A MINIMUM THICKNESS OF 2".
      a. ALL INSULATION OUTSIDE THE BUILDING SHALL BE PROTECTED FROM WEATHER AND UV BY A PVC JACKET OR TWO COATS OF MANUFACTURER'S APPROVED FINISH.
   F. ALL INSULATION JOINTS SHALL BE SEALED WITH APPROVED MANUFACTURER'S ADHESIVE.
   G. CONDENSATE PIPING INSULATION: WITH A MINIMUM OF ½" THICK CLOSE-CELL FLEXIBLE ELASTOMERIC INSULATION.
5. DUCTWORK INSULATION
   A. CONCEALED DUCTWORK INSIDE THE BUILDING: THE INSULATION SHALL CONSIST OF ALL SERVICE FIBER GLASS DUCT WRAP 1 1/2" THICK WITH 0.75 LBS /CU. FT. DENSITY, WITH AN INSTALLED R-VALUE OF 4.2, FSK JACKET AND A VAPOR BARRIER.
   B. PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:
      a. OWENS CORNING; SOFTR TYPE 75 ALL-SERVICE DUCT WRAP.
      b. CERTAINTEED CORP.; SOFTTOUCH DUCT WRAP.
      c. JOHNS MANVILLE; MICROLITE.
      d. KNAUF INSULATION; FRIENDLY FEEL DUCT WRAP.
   C. ALL SUPPLY AND RETURN AIR DUCTWORK SHALL BE WRAPPED (NO INTERNAL LINER ALLOWED) WITH R-5 INSULATION WRAP WITH FOIL VAPOR BARRIER OR CODE/BUILDING REQUIREMENT WHICHEVER IS GREATER. ALL JOINTS SHALL BE TAPE AND INSTALLED ACCORDING TO THE MANUFACTURES INSTALLATION REQUIREMENTS IN ORDER TO MAINTAIN THE R-VALUE RATING.
   D. THE FINAL 4' OF DUCTWORK TO THE AIR DEVISE MAY BE FLEXIBLE CLASS 1 DUCT WITH R-5 INSULATION (OR CODE/BUILDING REQUIREMENT WHICHEVER IS GREATER) AND FOIL VAPOR BARRIER. DUCTWORK MUST MEET LOCAL REQUIREMENTS AND LANDLORD'S CRITERIA.
6. INSULATION RATING
   A. FLAME SPREAD SHALL BE 25 OR LESS.
   B. SMOKE DEVELOPED SHALL BE 50 OR LESS.

DIVISION 23 00 00 - HEATING, VENTILATING, AIR CONDITIONING

SECTION 23 00 02 - GENERAL REQUIREMENTS

11. WORK TO BE ACCOMPLISHED ON THESE DRAWINGS AND SPECIFICATIONS INCLUDES FURNISHING ALL LABOR, MATERIAL, EQUIPMENT AND SERVICES FOR THE COMPLETION OF ALL MECHANICAL WORK. ALL MECHANICAL WORK UNLESS NOTED TO BE SPECIFICALLY BY THE LANDLORD IS THE RESPONSIBILITY OF THIS CONTRACTOR.
12. PLANS AND SPECIFICATIONS ARE COMPLEMENTARY AND WHAT IS CALLED FOR IN EITHER ONE SHALL BE AS BINDING AS IF CALLED FOR IN BOTH. ANY ITEM OR LABOR THAT IS NECESSARY TO COMPLETE THE WORK AND IS TYPICALLY INCLUDED IN SIMILAR WORK SCOPE SHALL BE FURNISHED AND INSTALLED AS PART OF THE CONTRACT WHETHER OR NOT IT IS SHOWN ON THE PLANS OR IN THE SPECIFICATIONS.
13. ALL PIPING, DUCTWORK AND EQUIPMENT SHALL BE FURNISHED AND INSTALLED TO PRESENT A NEAT AND CLEAN APPEARANCE USING GOOD CONSTRUCTION PRACTICES. EQUIPMENT SHALL BE INSTALLED FOR PROPER ACCESS TO OPERATE, SERVICE AND MAINTAIN THE EQUIPMENT. ANY MECHANICAL EQUIPMENT (OR EXISTING EQUIPMENT TO REMAIN) THAT REQUIRES ACCESS PANELS SHALL HAVE THOSE PANELS FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR. ACCESS PANELS TO BE HS FIRE SAFETY PRODUCTS TR-APXXX FOR DRYWALL CEILINGS. SIZE TO BE SUFFICIENT TO SERVICE EQUIPMENT.
14. UNLESS SPECIFICALLY NOTED ON THE PLANS/SPECIFICATIONS ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND BEST QUALITY TO CONFORM TO THE REQUIREMENTS OF LIFE TIME'S CRITERIA, LOCAL AND STATE CODES GOVERNING THE WORK INVOLVED AND BE MADE BY NATIONALLY RECOGNIZED MANUFACTURES WITH UL LISTINGS AND LABELS.
15. THIS CONTRACTOR SHALL COORDINATE WITH OTHER TRADES IN THE INSTALLATION OF EQUIPMENT, PIPING, CONDUIT, AND DUCTWORK. THE HVAC/ SHEET-METAL CONTRACTOR SHALL INITIATE THE COORDINATION PROCESS BY PROVIDING REPRODUCIBLE PLAN DRAWINGS SHOWING DUCTWORK AND EQUIPMENT. THE HVAC/SHEET-METAL CONTRACTOR SHALL FORWARD THE DRAWINGS TO THE PIPING CONTRACTOR, FIRE PROTECTION CONTRACTOR, AND ELECTRICAL CONTRACTOR FOR INCLUSION OF THEIR SYSTEMS WORK. THE HVAC/SHEET-METAL CONTRACTOR SHALL BE RESPONSIBLE FOR RETRIEVING ALL DRAWINGS FROM NECESSARY CONTRACTORS AND DEVELOPING NECESSARY DRAWINGS HIGHLIGHTING CONFLICTING AREAS.
16. IF A CONTRACTOR ELECTS TO PREFABRICATE PIPING AND DUCTWORK, THEY ARE STILL OBLIGATED TO ABIDE BY ALL REQUIREMENTS FOR COOPERATION WITH OTHER TRADES. THEY SHALL NOT ASSUME THAT THEIR MATERIAL WILL BE INSTALLED FIRST AND OTHER TRADES MUST FOLLOW. IF CHANGES ARE MADE BY THE ARCHITECT/ENGINEER REASONABLY IN ADVANCE OF ANTICIPATED INSTALLATION, THE OWNER SHALL NOT BE PENALIZED WITH ADDED COST BECAUSE MATERIALS WERE PREFABRICATED IN ADVANCE.

SECTION 23 00 03 - CODES

1. THIS WORK SHALL BE INSTALLED IN CONFORMITY WITH APPLICABLE LOCAL ORDINACES AND STATE STATUTES. ALL REQUIREMENTS OF THE CURRENT PLUMBING CODES, HEATING AND VENTILATION CODES, ENERGY OR CONSERVATION CODES AND NFPA BULLETINS MUST BE MET. STANDARDS AND SIZES WHICH MEET OR EXCEED THE ABOVE-MENTIONED REQUIREMENTS SHALL BE INSTALLED AS DRAWN OR SPECIFIED. NOTHING IN THE SPECIFICATIONS OR DRAWINGS SHALL BE CONSTRUED TO PERMIT DEVIATION FROM THE REQUIREMENTS OF GOVERNING CODES.
2. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INQUIRE INTO AND COMPLY WITH ALL LOCAL ORDINANCES AND INCLUDE ANY ADDITIONAL ITEMS NOT NOTED IN THE PLANS/SPECIFICATIONS.

SECTION 23 00 04 - LICENSES, PERMITS, INSPECTIONS & FEES

1. THIS CONTRACTOR IS RESPONSIBLE FOR ALL FEES, CHARGES AND OBLIGATIONS FOR OBTAINING PERMITS AND INSPECTIONS FOR PLUMBING, HEATING AND VENTILATION AND FIRE EXTINGUISHING WORK.
2. ALL PLUMBING WORK SHALL BE INSPECTED, TESTED AND APPROVED AS REQUIRED BY GOVERNING CODES. TESTS SHALL BE MADE IN THE PRESENCE OF THE PROPER INSPECTOR AND THE ARCHITECT OR THEIR AUTHORIZED REPRESENTATIVE. ALL TESTS SHALL BE MADE BY THE CONTRACTOR AT HIS OWN EXPENSE AND HE SHALL FURNISH THE ARCHITECT A CERTIFICATE THAT SATISFACTORY TESTS HAVE BEEN MADE.
3. ALL CERTIFICATES OF INSPECTION AND FINAL INSPECTIONS SHALL BE TURNED OVER TO THE OWNER AT THE COMPLETION OF THE PROJECT.
4. THIS CONTRACTOR SHALL APPLY FOR ANY UTILITY SERVICE CHARGE, INSTALLATION OR METER AND GAUGE REQUIRED AND SHALL BE RESPONSIBLE FOR THE RESPECTIVE COSTS. UPON COMPLETION OF THE PARTICULAR SECTION OF WORK THE CONTRACTOR SHALL FURNISH THE OWNER WITH PROOF OF ACCEPTANCE FROM THE PROPER LOCAL OR STATE DEPARTMENT HAVING JURISDICTION.

SECTION 23 00 05 - TRADE NAMES, MANUFACTURERS AND SHOP DRAWINGS

1. IN ANY CASE WHERE A SPECIFIC NAME OF EQUIPMENT OR MATERIAL IS MENTIONED ON THE DRAWINGS OR SPECIFICATIONS THE EXACT EQUIPMENT SHALL BE USED FOR THE BASE BID. EQUIPMENT OF EQUAL GRADE AND QUALITY WILL BE SUBJECT TO PRIOR APPROVAL BY THE GENERAL CONTRACTOR PROJECT MANAGER AND THE ENGINEER IN WRITING THRU THE SHOP DRAWING SUBMITTAL PROCESS. ANY EQUIPMENT INSTALLED WITHOUT WRITTEN APPROVAL WILL BE CHANGED OUT TO THE SPECIFIED EQUIPMENT AT THE CONTRACTORS EXPENSE.
2. APPROVED SHOP DRAWINGS ARE TO BE SUBMITTED TO PROJECT MANAGER. IF APPROVED, COPIES WILL BE STAMPED "REVIEWED" OR "REVIEWED WITH COMMENTS" AND WILL BE RETURNED TO THE CONTRACTOR. IF NOTATIONS AND MARKS INDICATE THAT REVISED INFORMATION IS REQUIRED, THEN CORRECTED INFORMATION SHALL BE SUBMITTED.
3. IF NOTATIONS AND MARKS INDICATE THAT REVISED INFORMATION IS REQUIRED BEFORE SHOP FABRICATIONS (OR OTHER WORK REPRESENTED) CAN PROCEED, REVISED OR CORRECTED INFORMATION SHALL BE SUBMITTED
4. SHOP DRAWINGS FOR EACH OF THE FOLLOWING ITEMS WHICH APPLY TO THIS PROJECT SHALL BE SUBMITTED TO THE ENGINEER:
   A. ROOFTOP UNITS
   B. HEAT PUMPS
   C. EXHAUST FANS
   D. TEST & BALANCING REPORT
   E. TEMPERATURE CONTROLS
5. THIS CONTRACTOR SHALL FURNISH THE OWNER COMPLETE CATALOG DATA, MANUFACTURER'S LITERATURE AND DETAILED MANUALS COVERING THE OPERATION AND MAINTENANCE OF ALL EQUIPMENT SPECIFIED UNDER THIS SECTION IN TWO (2) COPIES OF HARD BOUND BOOKLET MATERIAL. THE LITERATURE SHALL BE GIVEN TO THE OWNER'S OPERATOR WITH EXPLANATION AT THE TIME OF OWNER'S INSTRUCTION.

SECTION 23 00 06 - INTRA-CONTRACT BOUNDARIES

COOLING COIL DRAIN PANS AND DRAINS FROM ALL VENTILATION OPENINGS THRU ROOF OR WALL SHALL BE PIPED BY PLUMBING CONTRACTOR. FOR PLUMBING EQUIPMENT WHICH IS SPECIFIED UNDER SEPARATE SECTIONS THE PLUMBING CONTRACTOR WILL BE REQUIRED TO FURNISH AND INSTALL THE NECESSARY "P" TRAPS, STOP VALVES ETC. INCLUDING ROUGH-IN AND FINAL CONNECTIONS.

SECTION 23 00 07 - ELECTRICAL SERVICE, WIRING AND CONNECTIONS

1. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ELECTRICAL SERVICE TO ALL MOTORS AND OTHER MECHANICAL EQUIPMENT (UNLESS OTHERWISE NOTED) IN CONFORMANCE WITH DIV. 16 OF THE SPECIFICATIONS.
2. ALL WIRING FOR THE CONTROL OF MECHANICAL MOTORS AND EQUIPMENT SHALL BE FURNISHED COMPLETE BY THE MECHANICAL CONTRACTOR INCLUDING BUT NOT LIMITED TO WIRING, CONDUIT, DEVICES AND INSTALLATION BY A LICENSED SUBCONTRACTOR UTILIZING ELECTRICIANS EXPERIENCE IN THE TYPE OF SYSTEMS TO BE INSTALLED.
3. DIELECTRIC FITTINGS
   A. COMBINATION FITTING OF COPPER ALLOY AND FERROUS MATERIALS WITH THREADED, SOLDER-JOINT, PLAIN, OR WELD-NECK END CONNECTIONS THAT MATCH PIPING SYSTEM MATERIALS.
   B. PROVIDE UNION, FLANGE, COUPLING OR NIPPLE AS NECESSARY AT LOCATION OF DISSIMILAR METAL MATERIAL.

SECTION 23 00 08 - GUARANTEE

1. THIS CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ANY DEFECTS WHICH MAY DEVELOP IN ANY PART OF THE SYSTEMS CAUSED BY FAULTY WORKMANSHIP, MATERIAL OR EQUIPMENT, AND AGREES TO REPLACE ANY SUCH FAULTY WORKMANSHIP, MATERIAL OR EQUIPMENT DURING A PERIOD OF 12 MONTHS FROM THE DATE OF FINAL ACCEPTANCE WITHOUT ANY COST TO THE OWNER. ANY EXTENDED WARRANTIES (LONGER THAN 12 MONTHS) FOR EQUIPMENT WILL BE NOTED ON THE SCHEDULES, PLANS OR SPECIFICATIONS.

SECTION 23 00 09 - RECORD DRAWINGS

1. THIS CONTRACTOR SHALL MAINTAIN AT THE JOB SITE A SET OF DRAWINGS TO BE USED SPECIFICALLY FOR RECORDING CHANGES FROM THE CONTRACT DOCUMENTS. THE INFORMATION SUCH AS VALVES, DUCT AND PIPE DEVIATIONS SHOULD BE DIMENSIONED FROM EASILY RECOGNIZABLE REFERENCE POINTS INDICATING BOTH HORIZONTAL AND VERTICAL DISTANCES.
2. THE CONTRACTOR SHALL SUBMIT A FINAL SIGNED SET OF PERMIT DRAWINGS TO THE OWNER AT THE COMPLETION OF THE PROJECT.
3. THE CONTRACTOR SHALL SUBMIT TO THE OWNER AT THE END OF THE PROJECT FINAL CUT SHEETS, STARTUP REPORT, T&B REPORT AND COMMISSIONING REPORT.

SECTION 23 00 10 - DISCREPANCIES IN DOCUMENTS

THE DRAWINGS OF PIPING AND DUCTWORK SYSTEMS SHALL BE INSTALLED SUBSTANTIALLY AS SHOWN ON THE PLANS. THE EXACT POSITION OF EACH AND EVERY PIPE, DUCT, OFFSET AND TRANSITION CANNOT BE GIVEN BY SCALING THE DRAWINGS BUT SHALL IN EVERY CASE BE PLACED SO AS TO AVOID INTERFERENCE WITH OTHER WORK. ALL NECESSARY CHANGES IN THE LOCATION OF PIPE OR DUCTWORK FOR ITS PROPER INSTALLATION AND TO AVOID CONFLICT WITH OTHER TRADES SHALL BE DONE BY THE CONTRACTOR AT NO ADDITIONAL CHARGE.

SECTION 23 00 11 - DEMOLITION

1. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE DEMOLITION AND ANY EXISTING EQUIPMENT REQUIRED TO BE LEFT INTACT
2. EACH CONTRACTOR SHALL VERIFY SCOPE OF WORK WITH THE GENERAL CONTRACTOR FOR THE REMOVAL OF ALL EXISTING PIPING, HVAC UNITS, REFRIGERANT RECAPTURE, EXHAUST FANS, ETC. AND ASSOCIATED ROOF CURBS NOT BEING REUSED ON THIS PROJECT, UNLESS SPECIFICALLY NOTED OTHERWISE.
3. ROOF CURBS SHALL BE REMOVED AND THE ROOF PATCHED. ALL IN SCOPE ROOF/WALL/FLOOR TO BE PATCHED/REPAIRED TO MATCH EXISTING STRUCTURE.
4. EXISTING ABANDONED PIPES, DUCTS, OR EQUIPMENT IN THE FLOOR, EMBEDDED IN CONCRETE, OR OTHERWISE INACCESSIBLE ARE TO BE CUT OFF AND SEALED BELOW OR WITHIN FLOOR OR WALL LEVEL WHEN THEY ARE NOT TO BE REUSED IN THIS PROJECT.
5. IF REQUIRED BY OWNER OR CODES, ABANDONED PIPING AND/OR DUCTWORK MUST BE REMOVED TO POINT OF ORIGIN. CONFIRM THE EXTENT OF DEMOLITION WITH THE GENERAL CONTRACTOR TO BID AND INCLUDE IN BID PROPOSAL AS DIRECTED BY THE GENERAL CONTRACTOR.
6. PROVIDE A RECYCLED MATERIALS REPORT TO THE LANDLORD AND/OR OWNER PRIOR TO PROJECT CLOSEOUT..

SECTION 23 00 12 - INSTRUCTIONS TO OWNER

1. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN ALL EQUIPMENT FURNISHED AND INSTALLED BY MECHANICAL. REFER TO DIVISION 1 SECTION "DEMONSTRATION AND TRAINING."
2. THE CONTRACTOR SHALL ALSO SUPERVISE THE INITIAL OPERATION OF ALL EQUIPMENT AND INSTRUCT THE OPERATOR SELECTED BY THE OWNER IN SUCH OPERATION AS REQUIRED TO ACQUAINT HIM THOROUGHLY WITH THE BEST PRACTICE.

SECTION 23 00 13 - CUTTING AND PATCHING

1. THIS CONTRACTOR SHALL PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR THE INSTALLATION OF HIS EQUIPMENT IN THE BUILDING WALLS, PARTITIONS, FLOORS, CEILINGS, ETC., UNLESS OTHERWISE NOTED. ALL CUTTING AND PATCHING SHALL BE SUBJECT TO THE DIRECTION OF THE LANDLORD, ARCHITECT OR ENGINEER.
2. THIS CONTRACTOR SHALL NOT ENDANGER THE STABILITY OF THE STRUCTURE BY CUTTING, DIGGING OR OTHERWISE ALTERING THE STRUCTURE AND SHALL NOT AT ANY TIME CUT OR ALTER WORK OF ANY OTHER CONTRACTOR.
3. PATCHING OF WALLS, FLOORS AND ROOF SHALL BE OF SAME MATERIAL AND WORKMANSHIP OF THE SURROUNDING MATERIAL WITH FINISHED SURFACE APPEARING THE SAME AS THE SURROUNDING AREAS. ALL PATCHING SHALL BE PERFORMED BY WORKMEN SKILLED IN THAT TRADE.
4. DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR IN A SUITABLE MANNER ACCEPTABLE TO THE LANDLORD AND OWNER.
5. THE GENERAL CONTRACTOR WILL BE REQUIRED UNDER HIS CONTRACT TO LEAVE ALL CHASES AND OPENINGS IN NEW WALLS, FLOORS, CEILINGS, PARTITIONS, ETC., WHERE SHOWN ON THE DRAWINGS OR OTHERWISE NECESSARY, TO RECEIVE MECHANICAL WORK, BUT THIS CONTRACTOR SHALL FURNISH HIM FULL INFORMATION AS TO LOCATIONS, DIMENSIONS, ETC., OF SUCH CHASES AND OPENINGS, INCLUDING PROVISION AND PROPER SETTING OF SLEEVES AND OTHER EQUIPMENT IN SUCH TIME AS TO CAUSE NO DELAY TO WORK OF GENERAL CONTRACTOR.
6. SHOULD ANY CUTTING OF NEW WALLS, FLOORS, CEILINGS, PARTITIONS, ETC., BE REQUIRED FOR PROPER INSTALLATION OF THE WORK OR APPARATUS OF THIS CONTRACTOR OR BE MADE NECESSARY ON ACCOUNT OF HIS FAILURE TO GIVE GENERAL CONTRACTOR PROPER INFORMATION AT THE TIME REQUIRED, SUCH CUTTING SHALL BE DONE AT HIS OWN EXPENSE, RESTORING THE WORK TO ITS ORIGINAL CONDITION.
7. ALL CUTTING AND PATCHING DONE BY THIS CONTRACTOR SHALL BE SUBJECT TO THE DIRECTION AND APPROVAL OF THE ARCHITECT. THIS CONTRACTOR SHALL NOT ENDANGER THE STABILITY OF THE STRUCTURE BY CUTTING, DIGGING, OR OTHERWISE, AND SHALL NOT AT ANY TIME CUT OR ALTER WORK OF ANY OTHER CONTRACTOR WITHOUT THE ARCHITECT'S CONSENT.
8. THIS CONTRACTOR SHALL PROVIDE ALL CUTTING REQUIRED FOR INSTALLING PIPE THRU PRECAST CONCRETE FLOOR SECTIONS. ALL HOLES REQUIRED SHALL BE CORE DRILLED OF SUFFICIENT SIZE FOR PIPE AND FOR INSULATION.
9. ROOF CUT AND PATCH SHALL BE PERFORMED IN A MANNER TO MAINTAIN THE OWNERS ROOFING WARRANTY. THE CONTRACTOR SHALL CONTACT THE OWNER TO ESTABLISH THE HOLDER OF THE GUARANTEE AND SHALL EMPLOY A ROOFING CONTRACTOR CERTIFIED TO WORK ON THE ROOFING AND MAINTAIN THE GUARANTEE.

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SHEET TITLE

MECHANICAL SPECIFICATIONS

M-001

SHEET 1 OF 5

SECTION 23 00 14 - SLEEVES

1. THIS CONTRACTOR SHALL INSTALL SLEEVES IN CONNECTION WITH ALL PIPES PASSING THROUGH ALL WALLS, PARTITIONS AND FLOORS. SLEEVES SHALL EXTEND THROUGH FULL THICKNESS OF WALLS AND FLOORS AND SHALL BE CUT FLUSH WITH THE FINISHED SURFACES. SLEEVES IN SLABS SHALL BE CUT 2" ABOVE THE FLOOR SURFACE.
2. ALL SLEEVES SHALL BE 22 GAUGE GALVANIZED STEEL MINIMUM FINISHED WITH A SMOOTH EDGE AND PROPERLY SUPPORTED.
3. CORE DRILLING FLOORS AND WALLS MUST BE COORDINATED WITH THE LANDLORD AND THE TENANT'S PROJECT MANAGER.
4. THIS CONTRACTOR SHALL FURNISH AND INSTALL FIRE STOPPING AT ALL PENETRATIONS THRU RATED FLOORS TO MAINTAIN THE FIRE RATING. 3M FIRE BARRIER SYSTEMS, FLAME SAFE FIRE-RETARDANT SYSTEMS, DOW CORNING, SPECSEAL OR EQUAL. THE CONTRACTOR MUST PRESENT UL LISTING DATA HEETS TO THE TENANT'S PROJECT MANAGER AND LANDLORD TO SHOW THAT THE PENETRATIONS MAINTAIN THE FIRE RATING.

SECTION 23 00 16 - ESCUTCHEON PLATES

WHERE EXPOSED PIPES OR DUCTS PASS THRU FLOORS, WALLS OR CEILINGS IN FINISHED ROOMS, THEY SHALL BE FITTED WITH AN APPROVED TYPE METAL ESCUTCHEON PLATE (PIPE) OR METAL FLANGE (DUCT). ESCUTCHEON PLATES SHALL BE PROPERLY SIZED TO FIT SNUG AGAINST THE PIPE OR INSULATION ON THE INSIDE OF THE ESCUTCHEON AND SHALL BE LARGE ENOUGH TO COMPLETELY COVER THE WALL OR FLOOR PENETRATION OPENING. WHEREVER WET CONDITIONS ARE EXPECTED ON EITHER SIDE OF THE WALL OR FLOOR, THE PENETRATION SHALL BE SEALED WITH A RESILIENT SILICONE CAULK BEFORE THE ESCUTCHEON IS INSTALLED. PLATES ON CHROMIUM PLATED PIPE MUST BE FINISHED CAST OR STAMPED BRASS, CHROMIUM PLATED. FLANGES FOR STAINLESS STEEL OR ALUMINUM DUCT WORK SHALL BE OF A SIMILAR MATERIAL.

SECTION 23 00 17 - HANGERS

1. INSTALL HANGERS AND SUPPORTS ACCORDING TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. BUILDING ATTACHMENTS: CONCRETE INSERTS, POWDER-ACTUATED FASTENERS, OR STRUCTURAL-STEEL FASTENERS APPROPRIATE FOR CONSTRUCTION MATERIALS TO WHICH HANGERS ARE BEING ATTACHED.
3. INSTALL POWDER-ACTUATED CONCRETE FASTENERS AFTER CONCRETE IS PLACED AND COMPLETELY CURED.USE POWDER-ACTUATED CONCRETE FASTENERS FOR STANDARD-WEIGHT AGGREGATE CONCRETES OR FOR SLABS MORE THAN (4 INCHES) THICK.DO NOT USE POWDER-ACTUATED CONCRETE FASTENERS FOR LIGHTWEIGHT-AGGREGATE CONCRETES OR FOR SLABS LESS THAN (4 INCHES) THICK.ALL FASTENERS LOCATED IN THE POOL AREA MUST BE STAINLESS STEEL TO PREVENT CORROSION.
4. INSTALL UPPER ATTACHMENTS TO STRUCTURES. SELECT AND SIZE UPPER ATTACHMENTS WITH PULL-OUT, TENSION, AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS WHERE USED.
5. FURNISH AND INSTALL BRACKETS, BRACES OR REINFORCING ANGLES AS REQUIRED FOR ALL PARTITIONS NOT SUFFICIENT IN THEMSELVES TO SUPPORT PLUMBING FIXTURES OR OTHER EQUIPMENT.
6. FURNISH AND INSTALL HORIZONTAL CLEVIS: MSS SP-58, TYPES 1 THROUGH 58, FACTORY-FABRICATED COMPONENTS AND TRAPEZE HANGERS: MSS SP-69, TYPE 59, SHOP- OR FIELD-FABRICATED PIPE-SUPPORT ASSEMBLY MADE FROM STRUCTURAL-STEEL SHAPES WITH MSS SP-58 HANGER RODS, NUTS, SADDLES, AND U-BOLTS. PROVIDE VERTICAL RISER CLAMPS ON ALL PIPING. PROVIDE TRAPEZE SUPPORTS, WHEN POSSIBLE, TO SERVE PIPING IN HORIZONTAL GROUPS. PROVIDE HANGERS AND SUPPORTS COMPLETE WITH NECESSARY INSERTS, BOLTS, RODS, NUTS, WASHERS, AND OTHER ACCESSORIES.
7. PIPING SHALL BE SUSPENDED FROM CONSTRUCTION ABOVE WITH ANGLE IRON, CLAMPS, UNISTRUT, OR HANGER RODS. NO PIPING SHALL BE HUNG FROM OTHER PIPING EXISTING OR NEW. CONTRACTOR SHALL COORDINATE WITH LANDLORD CRITERIA AND ALL CODES.
8. ALL PIPES WHICH ARE SPECIFIED TO BE INSULATED SHALL HAVE PREFABRICATED INSULATED METAL SADDLES SIZED FOR THE INSULATION THICKNESS AND CONTINUOUS INSULATION THROUGH THE HANGER. ALL DISSIMILAR METALS MUST BE SEPARATED WITH DIELECTRIC MATERIAL.
9. COMPLY WITH MSS SP-69 AND MSS SP-89 FOR PIPE HANGER SELECTIONS AND APPLICATIONS THAT ARE NOT SPECIFIED IN PIPING SYSTEM SECTIONS.
10. CENTER-BEAM CLAMPS (MSS TYPE 21): FOR ATTACHING TO CENTER OF BOTTOM FLANGE OF BEAMS. C-CLAMPS (MSS TYPE 23): FOR STRUCTURAL SHAPES.
11. STRAP AND ROD SIZES: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," TABLE 4-1 (TABLE 4-1M), "RECTANGULAR DUCT HANGERS MINIMUM SIZE," AND TABLE 4-2, "MINIMUM HANGER SIZES FOR ROUND DUCT."
    A. STEEL CABLES FOR GALVANIZED-STEEL DUCTS: GALVANIZED STEEL COMPLYING WITH ASTM A 603.
    B. STEEL CABLES FOR STAINLESS-STEEL DUCTS: STAINLESS STEEL COMPLYING WITH ASTM A 492.
    C. STEEL CABLE END CONNECTIONS: CADMIUM-PLATED STEEL ASSEMBLIES WITH BRACKETS, SWIVEL, AND BOLTS DESIGNED FOR DUCT HANGER SERVICE; WITH AN AUTOMATIC-LOCKING AND CLAMPING DEVICE.
    D. DUCT ATTACHMENTS: SHEET METAL SCREWS, BLIND RIVETS, OR SELF-TAPPING METAL SCREWS; COMPATIBLE WITH DUCT MATERIALS.
    E. TRAPEZE AND RISER SUPPORTS:
    F. SUPPORTS FOR GALVANIZED-STEEL DUCTS: GALVANIZED-STEEL SHAPES AND PLATES.
    G. SUPPORTS FOR STAINLESS-STEEL DUCTS: STAINLESS-STEEL SHAPES AND PLATES.
    H. SUPPORTS FOR ALUMINUM DUCTS: ALUMINUM OR GALVANIZED STEEL COATED WITH ZINC CHROMATE.
12. SADDLES AND SHIELDS:
    A. STEEL PIPE-COVERING PROTECTION SADDLES (MSS TYPE 39): TO FILL INTERIOR VOIDS WITH INSULATION THAT MATCHES ADJOINING INSULATION.
    B. PROTECTION SHIELDS (MSS TYPE 40): OF LENGTH RECOMMENDED IN WRITING BY MANUFACTURER TO PREVENT CRUSHING INSULATION.
    C. THERMAL-HANGER SHIELD INSERTS: FOR SUPPORTING INSULATED PIPE.
13. LOAD DISTRIBUTION: INSTALL HANGERS AND SUPPORTS SO PIPING LIVE AND DEAD LOADS AND STRESSES FROM MOVEMENT WILL NOT BE TRANSMITTED TO CONNECTED EQUIPMENT.
14. INSTALL LATERAL BRACING WITH PIPE HANGERS AND SUPPORTS TO PREVENT SWAYING.
15. THERMAL-HANGER SHIELD INSTALLATION: INSTALL IN PIPE HANGER OR SHIELD FOR INSULATED PIPING.

SECTION 23 00 50 - SUMMARY OF WORK

THIS CONTRACTOR SHALL FURNISH, INSTALL, TEST AND BALANCE ALL NECESSARY EQUIPMENT FOR A COMPLETE WORKING SYSTEM. SEE PLAN FOR AREAS OF WORKING DUCTWORK LAYOUTS, SCHEDULES AND DETAILS.

SECTION 23 01 00 - MATERIALS

1. FURNISH HVAC EQUIPMENT INDICATED AND/OR SCHEDULED ON THE DRAWINGS COMPLETE WITH BASES, ISOLATORS, SUPPORTS AND OTHER REQUIRED ACCESSORIES. INSTALL COMPLETE AND PLACE IN PROPER OPERATION PER MANUFACTURERS RECOMMENDATIONS, LUBRICATE AND ADJUST AS REQUIRED. PROVIDE CLEAN SET OF FILTERS FOR NEW AND EXISTING EQUIPMENT. EQUIPMENT TO BE MAKE AND MODEL AS SHOWN ON SCHEDULE UNLESS OWNER APPROVED, EQUIVALENT QUALITY AND PERFORMANCE IS SUBMITTED AS SUBSTITUTION.
2. DUCTWORK – FIBERGLASS DUCT BOARD IS NOT APPROVED.

SECTION 23 01 01 - FINISHES

ALL PIPING, DUCTWORK AND EQUIPMENT IN FINISHED AREAS SHALL BE FURNISHED AND INSTALLED TO PRESENT A NEAT AND CLEAN APPEARANCE. ALL SURFACES EXCEPT PIPE AND DUCT THAT ARE TO RECEIVE PAINT BY GENERAL CONTRACTOR SHALL HAVE A FACTORY APPLIED PRIME COAT. ALL ITEMS THAT ARE TO HAVE FINISHED PAINT BY MECHANICAL CONTRACTOR SHALL HAVE COLOR SELECTED BY ARCHITECT/ENGINEER.

SECTION 23 08 00 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

1. TEST AND BALANCE TO INCLUDE ALL NEW AND EXISTING HVAC SYSTEMS AS WELL AS INDIVIDUAL DIFFUSERS, GRILLES, AND REGISTERS,
2. AIR FLOWS TO BE BALANCED WITHIN 10% OF DESIGN STANDARD
3. BUILDING FINAL PRESSURIZATION TO BE A MINIMUM +10% BASED ON FINAL DESIGN AND OPERATION. (OA/EA)*100 = 110%
4. TECHNICIAN TO BE TAB CERTIFIED AND REPORT TO FOLLOW AABC, NEBB AND/OR TABB GUIDELINES.
5. TAB REPORT FORMS: TAB FIRM IS TO USE STANDARD FORMS FROM AABC, NEBB, OR TABB/SMACNA.

SECTION 23 30 00 - HVAC AIR DISTRIBUTION

1. PERFORMANCE REQUIREMENTS
    A. DUCTS, FITTINGS AND JOINTS SHALL BE CONSTRUCTED OF GALVANIZED STEEL AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE FOR A STATIC PRESSURE CLASS OF NOT LESS THAN +/- 2.0 INCHES OF WATER COLUMN.
    B. AIRSTREAM SURFACES: SURFACES IN CONTACT WITH AIRSTREAM SHALL COMPLY WITH REQUIREMENTS IN ASHRAE 62.1.
    C. ASHRAE COMPLIANCE: APPLICABLE REQUIREMENTS IN ASHRAE 62.1, SECTION 5 – "SYSTEMS AND EQUIPMENT," AND SECTION 7 – "CONSTRUCTION AND SYSTEM STARTUP."
    D. ASHRAE/IES COMPLIANCE: APPLICABLE REQUIREMENTS IN ASHRAE/IES 90.1, SECTION 6.4.4 – "HVAC SYSTEM CONSTRUCTION AND INSULATION."
2. SHEET METAL DUCTWORK
    A. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE IN ACCORDANCE WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE," FOR STATIC- PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE."
    B. ALL DUCT JOINTS AND LONGITUDINAL SEAMS SHALL BE SEALED WITH A WATER BASED DUCT SEALER, DURO DYNE "DUROSEAL" OR APPROVED EQUAL.
    C. ROUND TEES AND LATERALS: SELECT TYPES AND FABRICATE IN ACCORDANCE WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE," FIGURE 3- 5, "90 DEGREE TEES AND LATERALS," AND FIGURE 3-6, "CONICAL TEES," FOR STATIC- PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE.
    D. ROUND OR OVAL ELBOWS, 90 DEGREES, SHALL BE LONG RADIUS AND DIE FORMED CONSTRUCTION TO 12 INCH DIAMETER AND 5 SEGMENT FOR LARGER THAN 12 INCH. ELBOWS, 45 DEGREES, SHALL BE DIE FORMED CONSTRUCTION TO 12 INCH DIAMETER AND 3 SEGMENT FOR LARGER THAN 12 INCH. PLEATED AND ADJUSTABLE ELBOWS ARE NOT ACCEPTABLE. SEAMS IN FITTINGS WHICH ARE NOT SPIRAL LOCKED SHALL BE WELDED.
    E. RECTANGULAR ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER DUCT CONSTRUCTION: SELECT TYPES AND FABRICATE IN ACCORDANCE WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE," CH. 4, "FITTINGS AND OTHER CONSTRUCTION," FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE."
    F. ALL ELBOWS SHALL HAVE A MINIMUM THROAT RADIUS OF ONE HALF THE DUCT WIDTH OR SHALL BE PROVIDED WITH TURNING VANES.
    G. ACCEPTABLE MANUFACTURERS OF SPIRAL PRODUCTS: ACCUDUCT MANUFACTURING, EASTERN SHEET METAL, LINDAB, OMNI DUCT SYSTEMS, SEMCO AND UNITED MCGILL, PROVIDING THEY HAVE BEEN MANUFACTURING THESE SPIRAL PRODUCTS FOR AT LEAST 10 YEARS. ALL ROUND AND OVAL DUCTS AND FITTINGS SHALL BE MANUFACTURED BY THE SAME COMPANY. FACTORY FABRICATED FITTINGS SHALL BE USED.
    H. INTERNAL LINING IS NOT ACCEPTABLE IN THE SUPPLY DUCTWORK. INTERNAL LINING IS ACCEPTABLE ONLY IN THE EXPOSED RETURN DUCTWORK IN THE GENERAL SALES FOR SOUND ATTENUATION
3. FLEXIBLE ROUND DUCTWORK
    A. FLEXIBLE ROUND DUCTWORK SHALL BE SHALL BE A FACTORY MADE WITH A LINER DUCT PERMANENTLY BONDED TO A CORROSION RESISTANT SPRING STEEL WIRE HELIX SUPPORTING A FIBERGLASS INSULATING BLANKET WITH AN R-VALUE NOT LESS THAN 4.2 AND AN ADC THERMAL CERTIFICATION SEAL. DUCTS SHALL BE UL LISTED 181 CLASS 1, COMPLYING WITH NFPA 90A, NFPA 90B, AND ALL OTHER CODES HAVING JURISDICTION.
    B. FLEXIBLE ROUND DUCTWORK SHALL BE BY ATCO, THERMAFLEX, OR EQUAL.
4. HANG DUCTWORK FROM STRUCTURE ACCORDING TO SMACNA STANDARDS. CONTRACTOR SHALL BE REQUIRED TO INSTALL SEISMIC BRACING AS REQUIRED BY LANDLORD CRITERIA AND/OR LOCAL CODES.
5. PROVIDE FLEXIBLE DUCT CONNECTIONS CONSTRUCTED OF NEOPRENE-COATED FLAMEPROOF FABRIC AT EQUIPMENT INLET AND OUTLET TO ISOLATE VIBRATION.

SECTION 23 23 00 - MECHANICAL PIPING

1. COPPER TUBE AND FITTINGS
    C. COPPER TUBE
        e. FOR WATER, ASTM B 88, TYPE L
        f. FOR REFRIGERATION: ASTM B 280, TYPE ACR
    D. WROUGHT-COPPER FITTINGS: ASME B16.22.
    E. WROUGHT-COPPER UNIONS: ASME B16.22.
    F. SOLDER FILLER METALS: ASTM B 32. USE 95-5 TIN ANTIMONY OR ALLOY HB SOLDER TO JOIN COPPER SOCKET FITTINGS ON COPPER PIPE.
    G. BRAZING FILLER METALS: AWS A5.8/A5.8M. OR PER MANUFACTURER RECOMMENDATIONS
    H. FLEXIBLE CONNECTORS:1. BODY: TIN-BRONZE BELLOWS WITH WOVEN, FLEXIBLE, TINNED-BRONZE-WIRE-REINFORCED PROTECTIVE JACKET.
        a. END CONNECTIONS: SOCKET OR THREADED ENDS.
        b. OFFSET PERFORMANCE: CAPABLE OF MINIMUM 3/4-INCH MISALIGNMENT IN MINIMUM 7-INCH- LONG ASSEMBLY.
        c. WORKING PRESSURE RATING: FACTORY TEST AT MINIMUM 500 PSIG (3450 KPA).
        d. MAXIMUM OPERATING TEMPERATURE: 250 DEG F
    I. G.COPPER PRESSURE-SEAL FITTINGS FOR REFRIGERANT PIPING:
        a. STANDARD: UL 207; CERTIFIED BY UL FOR FIELD INSTALLATION. CERTIFICATION AS A UL-RECOGNIZED COMPONENT ALONE IS UNACCEPTABLE.
        b. HOUSING: COPPER.
        c. O-RINGS: HNBR OR COMPATIBLE WITH SPECIFIC REFRIGERANT.
        d. TOOLS: MANUFACTURER'S APPROVED SPECIAL TOOLS.
        e. MINIMUM RATED PRESSURE: 700 PSIG (48 BAR).
8. PLASTIC PIPE AND FITTINGS
    A. CPVC PLASTIC PIPE: ASTM F 441/F 441M, WITH WALL THICKNESS AS INDICATED IN "PIPING APPLICATIONS" ARTICLE.
        a. CPVC PLASTIC PIPE FITTINGS: SOCKET-TYPE PIPE FITTINGS, ASTM F 438 FOR SCHEDULE 40 PIPE; ASTM F 439 FOR SCHEDULE 80 PIPE.
        b. PVC PLASTIC PIPE: ASTM D 1785, WITH WALL THICKNESS AS INDICATED IN "PIPING APPLICATIONS" ARTICLE.
        c. PVC PLASTIC PIPE FITTINGS: SOCKET-TYPE PIPE FITTINGS, ASTM D 2466 FOR SCHEDULE 40 PIPE; ASTM D 2467 FOR SCHEDULE 80 PIPE
        d. SOLVENT CEMENTS FOR CPVC PIPING: ASTM F 493.
        e. SOLVENT CEMENTS FOR PVC PIPING: ASTM D 2564. INCLUDE PRIMER ACCORDING TO ASTM F 656.
9. DIELECTRIC FITTINGS
    A. GENERAL REQUIREMENTS: ASSEMBLY OF COPPER ALLOY AND FERROUS MATERIALS WITH SEPARATING NONCONDUCTIVE INSULATING MATERIAL. INCLUDE END CONNECTIONS COMPATIBLE WITH PIPES TO BE JOINED.
    B. DIELECTRIC UNIONS:
        a. DESCRIPTION:
            - STANDARD: ASSE 1079.
            - PRESSURE RATING: MATCH PIPING SYSTEM
            - END CONNECTIONS: SOLDER-JOINT COPPER ALLOY AND THREADED FERROUS.
    D. BALL VALVES:
        a. STANDARD: MSS SP-72 AND 110
        b. ENDS: SOCKET, UNION, THREADED, OR FLANGED.
        c. SEATS: PTFE.
        d. STEM: STAINLESS STEEL.
        e. BALL: STAINLESS STEEL, VENTED.
        f. PRESSURE AND TEMPERATURE RATED APPROPRIATELY FOR APPLICATION
10. INSTALLATION OF HANGERS AND SUPPORTS:
    A. COMPLY WITH LOCAL CODE REQUIREMENTS FOR SEISMIC RESTRAINTS
    B. INSTALL HANGERS FOR COPPER TUBING AND STEEL PIPING, WITH MAXIMUM HORIZONTAL SPACING AND MINIMUM ROD DIAMETERS, TO COMPLY WITH MSS-58, LOCALLY ENFORCED CODES, AND AUTHORITIES HAVING JURISDICTION REQUIREMENTS, WHICHEVER ARE MOST STRINGENT.
    C. SUPPORT HORIZONTAL PIPING WITHIN 12 INCHES OF EACH FITTING.
    D. SUPPORT VERTICAL RUNS OF COPPER TUBING AND STEEL PIPING TO COMPLY WITH MSS-58, LOCALLY ENFORCED CODES, AND AUTHORITIES HAVING JURISDICTION REQUIREMENTS, WHICHEVER ARE MOST STRINGENT.

SYMBOL & ABBREVIATION LIST

EUH 1	EQUIPMENT TAG		RETURN GRILLE
			EXHAUST GRILLE
8	KEY NOTE TAG		SPIRAL DIFFUSER
	RETURN/EXHAUST AIR FLOW		DUCT TRANSITION
	SUPPLY AIR FLOW		THERMOSTAT
	WYE DUCT FITTING		SENSOR
	NEW CONNECTION		EXISTING DUCT
	DEMO AREA		NEW DUCT
	BACK DRAFT DAMPER	XXX-S	SUPPLY AIR FLOW TAG
		XXX-R	RETURN AIR FLOW TAG
	VOLUME DAMPER	XXX-E	EXHAUST AIR FLOW TAG
	SUPPLY DIFFUSER	XXX-T	TRANSFER AIR FLOW TAG
		R	RELOCATE SYMBOL

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Date: 10/22/2025
Expiration Date: 7/31/26

MARK	DATE	DESCRIPTION
2	10/22/25	ISSUED FOR PERMIT
1	9/26/25	ISSUED FOR 90% REVIEW

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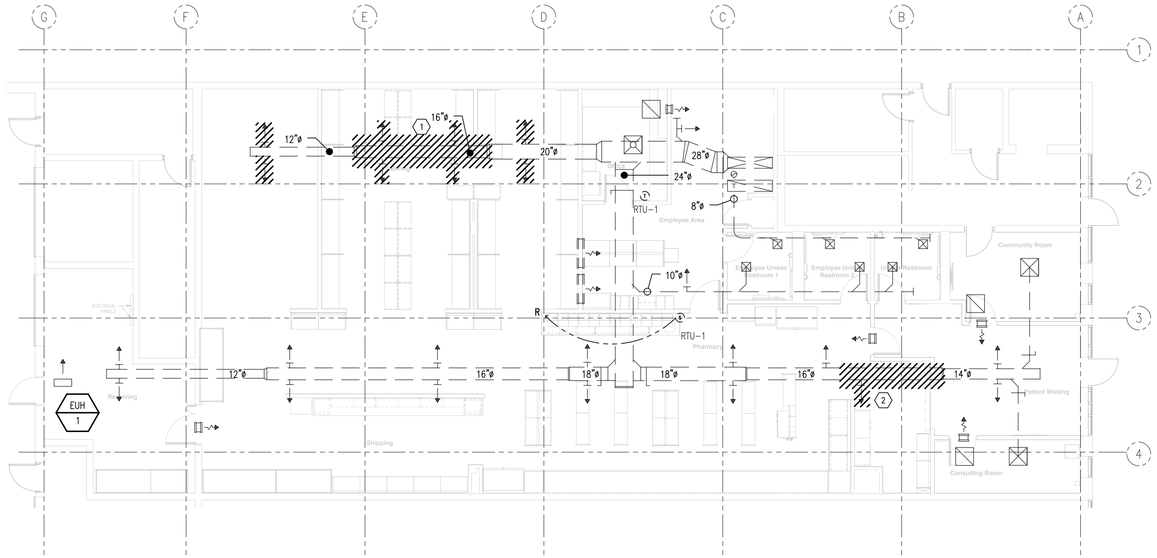
SHEET TITLE

MECHANICAL SPECIFICATIONS

M-002

SHEET 2 OF 5

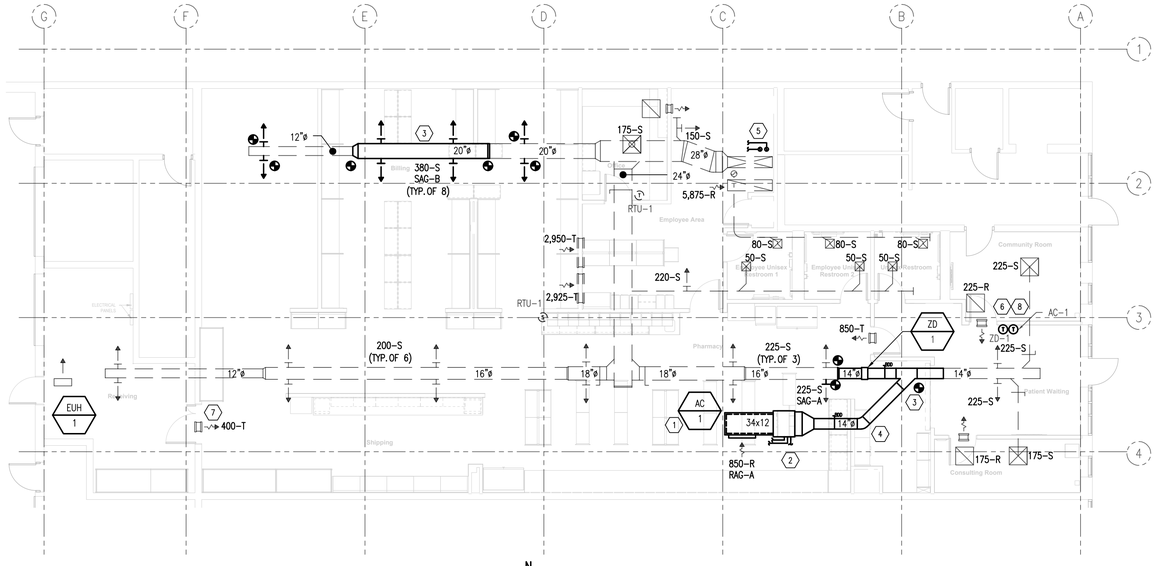


1 MECHANICAL 1ST FLOOR PLAN – DEMO

SCALE: 1/8" = 1'-0"

KEYED NOTES (DEMO):

1. CONTRACTOR TO DEMO 16"ø DUCTWORK, FITTINGS, AND ASSOCIATED DIFFUSERS.
2. DEMO DUCT AS NEEDED TO ALLOW FOR INSTALLATION OF NEW HVAC EQUIPMENT, ZONE DAMPER, BACK DRAFT DAMPERS, AND WYE FITTING. ASSOCIATED SUPPLY DIFFUSER TO BE RELOCATED AS SHOWN ON NEW WORK DRAWINGS.



1 MECHANICAL 1ST FLOOR PLAN – NEW WORK

SCALE: 1/8" = 1'-0"

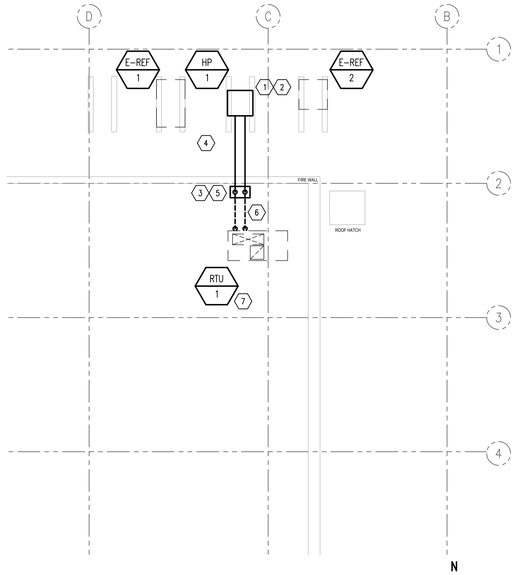
GENERAL NOTES (NEW WORK):
CONTRACTOR TO USE RADIAL ELBOW. ANY MITERED ELBOWS REQUIRE TURNING VANES.

T&B CONTRACTOR TO REBALANCE ENTIRE STORE SYSTEM BASED ON AIR FLOWS SHOWN ON DRAWINGS RESULTING FROM REBALANCE OF RTU TO 350 CFM/TON AND UPDATED DIFFUSER LAYOUT.

ALL AREAS ARE OPEN CEILINGS EXCEPT OFFICE, RESTROOMS, COMMUNITY ROOM, AND CONSULTING ROOM WHICH HAVE ACT DROP CEILINGS

KEYED NOTES (NEW WORK):

1. CONTRACTOR TO PROVIDE DRIP PAN BELOW UNIT SIZED TO EXTEND A MINIMUM OF 2" BEYOND THE EDGES OF THE UNIT WITH OVERFLOW SHUTOFF SWITCH AND AUDIBLE ALARM IN PAN.
2. ROUTE CONDENSATE PIPING TO NEAREST OPEN SITE DRAIN PITCHED PER LOCAL CODE REQUIREMETS.
3. PAINT ALL NEW DUCTWORK PIPING, AND EQUIPMENT TO MATCH EXISTING.
4. CONTRACTOR TO ALLOW FOR A MINIMUM OF 3' OF DUCT RUN PRIOR TO 1ST ELBOW.
5. CONTRACTOR TO ROUTE PIPING THROUGH JOISTS WEBS TO NEW AC-1 IN RX.
6. ZONE DAMPER THERMOSTAT TO BE SET TO 5 DEGREES ABOVE AC-1 COOLING TEMPERATURE AND 5 DEGREES BELOW HEATING TEMPERATURE. CONTRACTOR TO LOCK THERMOSTAT ONCE PROGRAMMED
7. CONTRACTOR TO PROVIDE WEATHER STRIPPING ON DOOR TO "SEAL" ½" GAP.
8. AC-1 AND ZV-1 THERMOSTATS TO BE MOUNTED SIDE BY SIDE WITH A MINIMUM OF 3" BETWEEN. IF STATS CAN'T BE MOUNTED SIDE BY SIDE STATS TO BE MOUNTED VERTICALLY ABOVE EACH OTHER WITH A MINIMUM OF 6" BETWEEN.



1 MECHANICAL ROOF PLAN – NEW WORK

SCALE: 1/8" = 1'-0"

KEYED NOTES (NEW WORK):

1. CONTRACTOR TO USE EXISTING DUNNAGE BUT PROVIDE ANY ADDITIONAL STEEL AS NEEDED TO SUPPORT HP PER MANUFACTURER RECOMMENDATIONS.
2. CONTRACTOR TO PROVIDE VIBRATION ISOLATION PER MANUFACTURER RECOMMENDATIONS.
3. CONTRACTOR TO PROVIDE PIPE PORTAL FLASHED PER INDUSTRY STANDARDS AND LANDLORD REQUIREMENTS TO MAINTAIN ROOF WARRANTY.
4. CONTRACTOR TO SIZE REFRIGERATION PIPING PER MANUFACTURER RECOMMENDATIONS AND FINAL LOCATION/ROUTING.
5. ROUTE REFRIGERATION PIPING DOWN TO AC-1 ON FLOOR ONE.
6. REFRIGERATION PIPING TO ROUTE THROUGH ROOF AND ALONG 2ND FLOOR CEILING TO ALLOW DROP THROUGH 2ND FLOOR SPACE AND INTO WAG EMPLOYEE AREA. PER LANDLORD REQUEST VERTICAL DROP THROUGH 2ND FLOOR TO BE LOCATED TIGHT ALONG EXISTING RTU-1 SUPPLY/RETURN DUCT SOFFIT & BACK WALL. NO SOFFIT TO BE PROVIDED AROUND PIPING.
7. T&B CONTRACTOR TO:
   1. RE-BALANCE RTU TO 350 CFM/TON.
   2. CONFIRM ECONOMIZER IS SET TO ENTHALPY MODE AND CONFIRM SENSORS ARE ACCURATE. RE-CALIBRATE AS NEEDED.
      - ECONOMIZER ENTHALPY SET POINT TO BE 24 BTU/LB.
   3. TURN OFF ALL NIGHT SET BACK PROGRAMMING.
   4. BALANCE STORE TO MINIMUM +10% PRESSURIZATION.
      - PRESSURIZATION AIR = TOTAL EXHAUST X 1.1
      - EA +240 CFM (T&B CONTRACTOR TO CONFIRM AFTER REBALANCE) THEREFORE TOTAL RTU OA = 265 CFM.
   5. CONFIRM PROPER CALIBRATION OF EXISTING THERMOSTAT/SENSOR (TEMPERATURE AND HUMIDITY)

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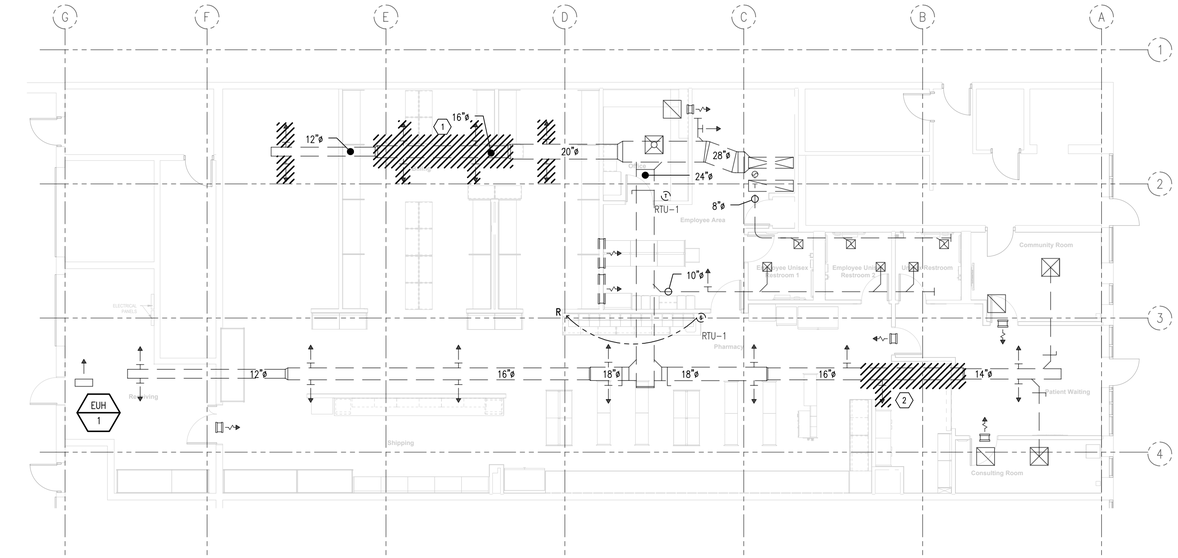
MECHANICAL PLANS

M-111

SHEET 3 OF 5

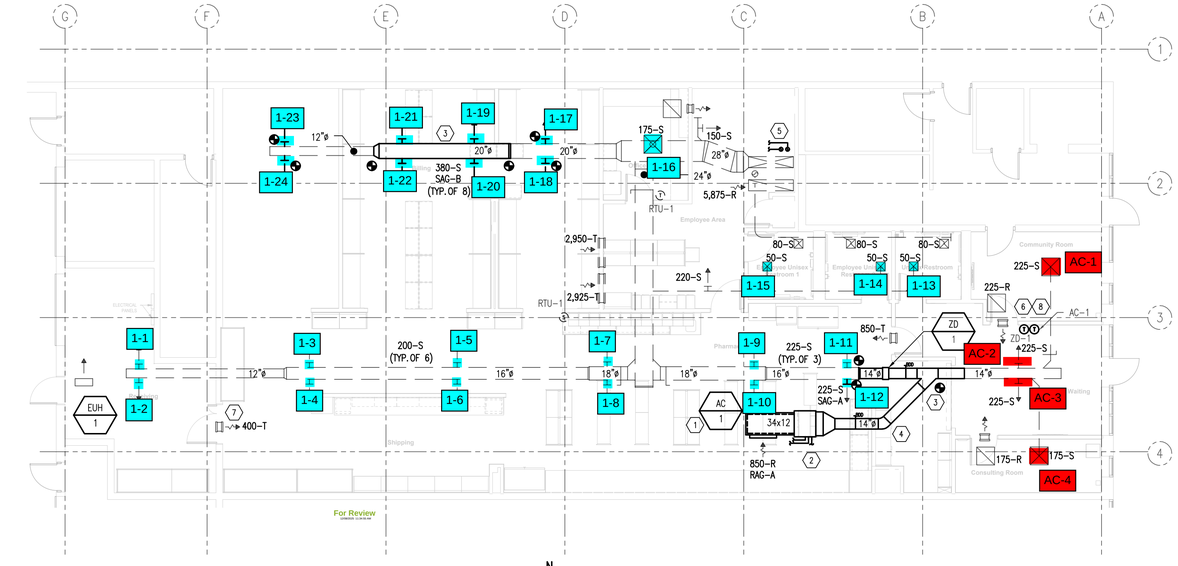


KEYED NOTES (DEMO):

1. CONTRACTOR TO DEMO 16"ø DUCTWORK, FITTINGS, AND ASSOCIATED DIFFUSERS.
2. DEMO DUCT AS NEEDED TO ALLOW FOR INSTALLATION OF NEW HVAC EQUIPMENT, ZONE DAMPER, BACK DRAFT DAMPERS, AND WYE FITTING. ASSOCIATED SUPPLY DIFFUSER TO BE RELOCATED AS SHOWN ON NEW WORK DRAWINGS.

1 MECHANICAL 1ST FLOOR PLAN – DEMO

SCALE: 1/8" = 1'-0"



1 MECHANICAL 1ST FLOOR PLAN – NEW WORK

SCALE: 1/8" = 1'-0"

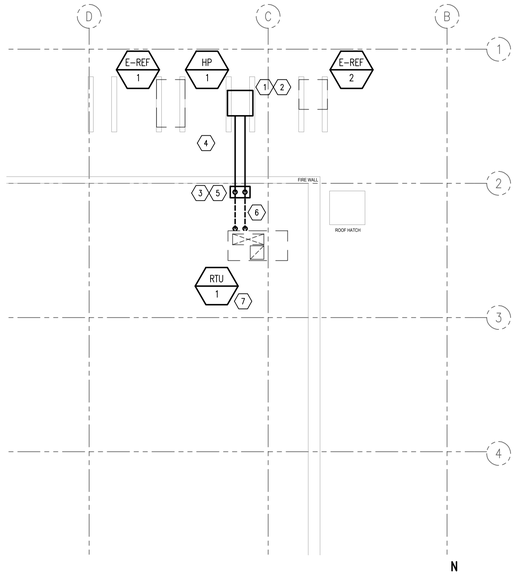
GENERAL NOTES (NEW WORK):
CONTRACTOR TO USE RADIAL ELBOW. ANY MITERED ELBOWS REQUIRE TURNING VANES.

T&B CONTRACTOR TO REBALANCE ENTIRE STORE SYSTEM BASED ON AIR FLOWS SHOWN ON DRAWINGS RESULTING FROM REBALANCE OF RTU TO 350 CFM/TON AND UPDATED DIFFUSER LAYOUT.

ALL AREAS ARE OPEN CEILINGS EXCEPT OFFICE, RESTROOMS, COMMUNITY ROOM, AND CONSULTING ROOM WHICH HAVE ACT DROP CEILINGS

KEYED NOTES (NEW WORK):

1. CONTRACTOR TO PROVIDE DRIP PAN BELOW UNIT SIZED TO EXTEND A MINIMUM OF 2" BEYOND THE EDGES OF THE UNIT WITH OVERFLOW SHUTOFF SWITCH AND AUDIBLE ALARM IN PAN.
2. ROUTE CONDENSATE PIPING TO NEAREST OPEN SITE DRAIN PITCHED PER LOCAL CODE REQUIREMETS.
3. PAINT ALL NEW DUCTWORK PIPING, AND EQUIPMENT TO MATCH EXISTING.
4. CONTRACTOR TO ALLOW FOR A MINIMUM OF 3' OF DUCT RUN PRIOR TO 1ST ELBOW.
5. CONTRACTOR TO ROUTE PIPING THROUGH JOISTS WEBS TO NEW AC-1 IN RX.
6. ZONE DAMPER THERMOSTAT TO BE SET TO 5 DEGREES ABOVE AC-1 COOLING TEMPERATURE AND 5 DEGREES BELOW HEATING TEMPERATURE. CONTRACTOR TO LOCK THERMOSTAT ONCE PROGRAMMED
7. CONTRACTOR TO PROVIDE WEATHER STRIPPING ON DOOR TO "SEAL" ½" GAP.
8. AC-1 AND ZV-1 THERMOSTATS TO BE MOUNTED SIDE BY SIDE WITH A MINIMUM OF 3" BETWEEN. IF STATS CAN'T BE MOUNTED SIDE BY SIDE STATS TO BE MOUNTED VERTICALLY ABOVE EACH OTHER WITH A MINIMUM OF 6" BETWEEN.



KEYED NOTES (NEW WORK):

1. CONTRACTOR TO USE EXISTING DUNNAGE BUT PROVIDE ANY ADDITIONAL STEEL AS NEEDED TO SUPPORT HP PER MANUFACTURER RECOMMENDATIONS.
2. CONTRACTOR TO PROVIDE VIBRATION ISOLATION PER MANUFACTURER RECOMMENDATIONS.
3. CONTRACTOR TO PROVIDE PIPE PORTAL FLASHED PER INDUSTRY STANDARDS AND LANDLORD REQUIREMENTS TO MAINTAIN ROOF WARRANTY.
4. CONTRACTOR TO SIZE REFRIGERATION PIPING PER MANUFACTURER RECOMMENDATIONS AND FINAL LOCATION/ROUTING.
5. ROUTE REFRIGERATION PIPING DOWN TO AC-1 ON FLOOR ONE.
6. REFRIGERATION PIPING TO ROUTE THROUGH ROOF AND ALONG 2ND FLOOR CEILING TO ALLOW DROP THROUGH 2ND FLOOR SPACE AND INTO WAG EMPLOYEE AREA. PER LANDLORD REQUEST VERTICAL DROP THROUGH 2ND FLOOR TO BE LOCATED TIGHT ALONG EXISTING RTU-1 SUPPLY/RETURN DUCT SOFFIT & BACK WALL. NO SOFFIT TO BE PROVIDED AROUND PIPING.
7. T&B CONTRACTOR TO:
   1. RE-BALANCE RTU TO 350 CFM/TON.
   2. CONFIRM ECONOMIZER IS SET TO ENTHALPY MODE AND CONFIRM SENSORS ARE ACCURATE. RE-CALIBRATE AS NEEDED. -ECONOMIZER ENTHALPY SET POINT TO BE 24 BTU/LB.
   3. TURN OFF ALL NIGHT SET BACK PROGRAMMING.
   4. BALANCE STORE TO MINIMUM +10% PRESSURIZATION. -PRESSURIZATION AIR = TOTAL EXHAUST X 1.1 -EA +240 CFM (T&B CONTRACTOR TO CONFIRM AFTER REBALANCE) THEREFORE TOTAL RTU OA = 265 CFM.
   5. CONFIRM PROPER CALIBRATION OF EXISTING THERMOSTAT/SENSOR (TEMPERATURE AND HUMIDITY)

1 MECHANICAL ROOF PLAN – NEW WORK

SCALE: 1/8" = 1'-0"

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Date: 10/22/2025 Expiration Date: 7/31/26

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MECHANICAL PLANS

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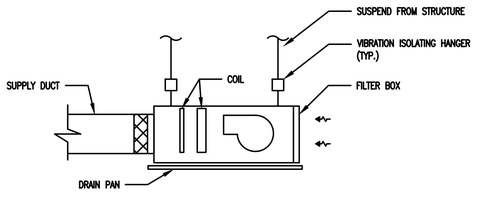
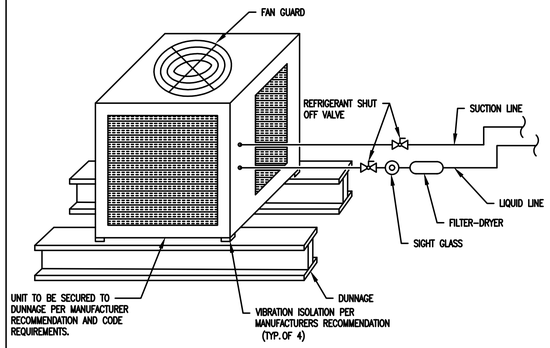
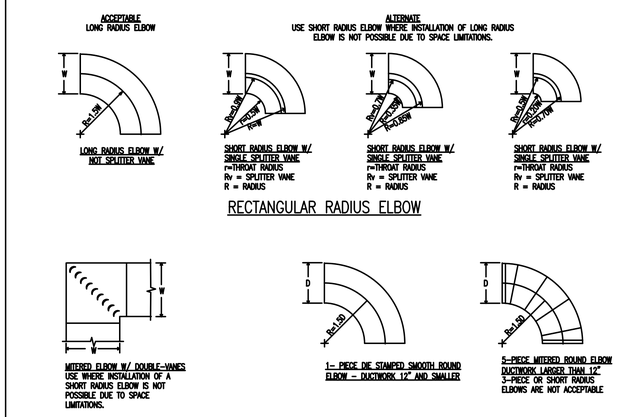
SHEET 3 OF 5



1 AC SPLIT UNIT HANGING DETAIL
NOT TO SCALE



2 CONDENSING UNIT ROOF INSTALLATION
NOT TO SCALE



3 DUCT ELBOW DETAIL
NOT TO SCALE

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MECHANICAL DETAILS & CONTROLS

M-510

SHEET 4 OF 5

SPLIT SYSTEM (HEAT PUMP) - INDOOR UNIT SCHEDULE

TAG	AREA SERVED	EVAPORATOR FAN DATA	COOLING		HEATING			ELECT DATA							
		TOTAL AIR (CFM)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	ENT AIR TEMP	LVG. AIR TEMP	CAPACITY (MBH)	MCA	MOCP	VOLTS	PHASE	HZ	MANUFACTURER	MODEL	NOTES
AC-1	PATIENT WAITING/COMMUNITY RM/CONSULTING RM.	880	30.0	22.5	70.0	105.0	34.0	2.25	-	208	1	60	TRANE	PEAD-AA30NL	1-5

NOTES:
1. MANUFACTURER TO PROVIDE CONDENSATE PUMP.
2. MANUFACTURER TO PROVIDE DISCONNECT
3. CONTRACTOR TO PROVIDE SPRING HANGING ISOLATION.
4) UNIT RATED DOWN TO -13 DEG. F. (AT 5 DEG. F HEATING CAPACITY = 32 MBH AND AT -13 DEG. F HEATING CAPACITY = 21.3 MBH)
5) POWERED BY HP

SPLIT SYSTEM (HEAT PUMP) - OUTDOOR UNIT SCHEDULE

TAG	LOCATION	AREA SERVED	FAN	DESIGN OPERATION TEMP.		EFFICIENCIES		Electric Data					MANUFACTURER	MODEL	NOTE
			COOLING CAPACITY (MBH)	COOLING TEMP. (˚F)	HEATING TEMP (˚F)	SEER	COP @ 47 DEG. F	MCA	MOCP	VOLTAGE	PHASE	HZ			
HP	ROOF	PATIENT WAITING/COMMUNITY RM/CONSULTING RM.	30.8	95	47	21.7	3.9	29	48	208	1	60	TRANE	PUZ-AK30NLHZ	1

NOTE:
1) UNIT IS RATED DOWN TO -13 DEG. F.

AIR TERMINAL SCHEDULE

TAG	AREA	RANGE (CFM)	NECK OR NOMINAL SIZE (IN)	OVERAL SIZE (IN)	BORDER	TYPE	BLOW	O.B.D.DAMPER	PRICE MODEL OR LISTED EQUAL (SEE NOTE 7)
SAG-A	PATIENT WAITING, PHARMACY, BILLING & SHIPPING	50-300	12X6	14X8	NOTE 1	NOTE 2	1 WAY	NONE	620 L OR 520 L
SAG-B	PATIENT WAITING, PHARMACY, BILLING & SHIPPING	300-400	14X6	16X8	NOTE 1	NOTE 2	1 WAY	NONE	620 L OR 520 L
RAG-A	AC-1 RETURN	550-960	36X8	38X10	NOTE 1	NOTE 2	1 WAY	NONE	630 L OR 530 L

NOTE:
1) PROVIDE PROPER BORDER AND MOUNTING OPTION THAT IS COMPATIBLE WITH THE ADJACENT SURFACE
2) ADJUSTABLE DOUBLE DEFLECTION WITH HORIZONTAL FRONT BLADES, 3/4" SPACING, PARALLEL TO LONG DIMENSION. FOR SIDEWALL MOUNTING SAG INITIAL DEFLECTION BLADES POSITIONS ARE VERTICAL - 0˚ AND HORIZONTAL -22.5˚ SPREAD.
3) TERMINAL DEVICES SHALL HAVE A WHITE FACTORY FINISH TO MATCH ADJACENT CEILING GRID OR SHALL MATCH THE ADJACENT DUCT OR EXTERNAL INSULATION SURFACE COLOR.
4) TOTAL STATIC PRESSURE DROP ACROSS AN AIR TERMINAL SHALL NOT EXCEED 0.20 IN WC.
5) ACCEPTABLE MANUFACTURERS: KRUEGER, METALAIR , NAILOR, PRICE, TITUS, TUTTLE AND BAILEY.
6) DUCT INSULATION SHALL EXTEND DOWN OVER TOP AND SIDES OF ALL SUPPLY DIFFUSERS AND GRILLES.

ZONE VALVE

TAG	AREA	TOTAL AIR (CFM)	NECK SIZE (IN)	LENGTH (IN)	MANUFACTURER	MODEL	NOTE
ZV-1	PATIENT WAITING/COMMUNITY RM/CONSULTING RM.	880	14"	16	EWC	RSD	1 & 2

NOTE:
1) CONTRACTOR TO PROVIDE EWC-MODEL 601-2 REMOTE THERMOSTAT OR EQUAL
2) DAMPER TO POWER OPEN AND FAIL CLOSED.

VENTILATION SCHEDULE

ROOM NAME	ZONE & AREA	OCCUPANCY CATEGORY	NET AREA	OCCUPANT DENSITY (#/1000)	AREA PER PERSON	# OF PEOPLE	CFM/PERSON	O.A (PEOPLE)	(CFM/SQFT)	O.A. (AREA)	EXHAUST	TOTAL OA REQUIRED BY CODE (CFM)
CONSULTING ROOM	1ST FLOOR	OFFICE	95	5	200	0	5	2	0.06	6	N/A	8
PATIENT WAITING	1ST FLOOR	OFFICE	250	5	200	1	5	6	0.06	15	N/A	21
COMMUNITY ROOM	1ST FLOOR	OFFICE	140	5	200	1	5	4	0.06	8	N/A	12
EMPLOYEE UNISEX RESTROOM 1	1ST FLOOR	TOILET ROOMS - PUBLIC	50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	70	N/A
EMPLOYEE UNISEX RESTROOM 2	1ST FLOOR	TOILET ROOMS - PUBLIC	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	70	N/A
UNISEX RESTROOM	1ST FLOOR	TOILET ROOMS - PUBLIC	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	70	N/A
PHARMACY	1ST FLOOR	PHARMACY (PREP AREA)	840	10	100	8	5	42	0.12	101	N/A	143
EMPLOYEE AREA	1ST FLOOR	OFFICE	340	5	200	2	5	9	0.06	20	N/A	29
OFFICE	1ST FLOOR	OFFICE	120	5	200	1	5	3	0.06	7	N/A	10
BILLING	1ST FLOOR	OFFICE	1,175	5	200	6	5	29	0.06	71	N/A	100
SHIPPING	1ST FLOOR	OFFICE	700	5	200	4	5	18	0.06	42	N/A	60
RECEIVING	1ST FLOOR	SHIPPING AND RECEIVING	320	N/A	N/A	N/A	N/A	N/A	0.12	38	N/A	38

NOTE:
OA PROVIDED BY EXISTING RTU NOT PART OF PROJECT SCOPE.

HVAC INDOOR DESIGN CONDITIONS

ZONE	FAN CONTROL	SCHEDULE	COOL	
			HEATING (F)	COOLING (F)
OFFICE/SALES	CONTINUOUS	OCCUPIED	67	74
	CONTINUOUS	UNOCCUPIED	60	80
SALES ONLY	CONTINUOUS	OCCUPIED	69	74
	AUTO	UNOCCUPIED	60	80
PHARMACY	CONTINUOUS	OCCUPIED	69	74
	AUTO	UNOCCUPIED	60	77
STOCK ROOM	CONTINUOUS	OCCUPIED	69	78
	CONTINUOUS	UNOCCUPIED	60	80
PHOTO/SALES	CONTINUOUS	OCCUPIED	69	74
	AUTO	UNOCCUPIED	60	80
CLINIC/MISC.	CONTINUOUS	OCCUPIED	69	74
	AUTO	UNOCCUPIED	60	77
ENTRANCE HEATER	CONTINUOUS	OCCUPIED	68	N/A
	AUTO	UNOCCUPIED	55	N/A
TECH ROOM	AUTO	OCCUPIED	N/A	76
	AUTO	UNOCCUPIED	N/A	76

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MECHANICAL SCHEDULES

M-610

SHEET 5 OF 5

COM*check* Software Version COMcheckWeb

Mechanical Compliance Certificate

Project Information

Energy Code: 2015 IECC
Project Title: WAG 21254
Location: Wauwatosa, Wisconsin
Climate Zone: 6a
Project Type: Alteration

Construction Site:
2265 N. Mayfair Rd.
Wauwatosa, Georgia 53226

Owner/Agent:
Donald Ahlschlager
Metropolitan Mechanicla Contractors, Inc.
7450 Flying Cloud Dr.
Eden Prairie, Minnesota 55344
701-205-3781
donald.ahlschlager@metromech.us

Designer/Contractor:

Mechanical Systems List

Quantity **System Type & Description**

1 HP-1 (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 34045 kBtu/h,
Proposed Efficiency = 3.90 COP, Required Efficiency = 3.20 COP
Cooling Mode: Capacity = 31387 kBtu/h, , Air Economizer
Proposed Efficiency = 12.50 EER, Required Efficiency = 9.50 EER
Proposed Part Load Efficiency = 21.70 IEER, Required Part Load Efficiency = 10.60 IEER
Fan System: FAN SYSTEM 1 -- Compliance (Motor nameplate HP and fan efficiency method) : Passes

Fans:
HP-IU-1 Supply, Single-Zone VAV, 880 CFM, 0.6 motor nameplate hp, 0.0 fan efficiency grade, 0.0 total fan efficiency, 0.0 design fan efficiency , fan exception: Single fan <= 5HP

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2015 IECC requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Michael Fox - VP Mechanical Engineering — Name - Title
Signature
10/22/25 — Date

COM*check* Software Version COMcheckWeb

Inspection Checklist

Energy Code: 2015 IECC

Requirements: 0.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2][3]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C403.2.4.5, C403.2.4.6 [FO9][3]	Snow/ice melting system sensors for future connection to controls. Freeze protection systems have automatic controls installed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6][3]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.6.3 [PL7][3]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C404.7 [PL8][3]	Water distribution system that pumps water from a heated-water supply pipe back to the heated-water source through a cold-water supply pipe is a demand recirculation water system. Pumps within this system have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME41][3]	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.13 [ME71][2]	Unenclosed spaces that are heated use only radiant heat.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.7 [ME113][2]	Fault detection and diagnostics installed with air-cooled unitary DX units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.6.1 [ME59][1]	Demand control ventilation provided for spaces >500 ft2 and >25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.6.2 [ME115][3]	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.7 [ME57][1]	Exhaust air energy recovery on systems meeting Table C403.2.7(1) and C403.2.7(2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.8 [ME116][1]	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.9 [ME60][2]	HVAC ducts and plenums insulated. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation Inspection.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.9 [ME10][2]	Ducts and plenums sealed based on static pressure and location.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.9.1.3 [ME11][3]	Ductwork operating >3 in. water column requires air leakage testing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.3 [ME62][1]	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.3.2 [ME16][1]	Economizer operation will not increase heating energy use during normal operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.4.2.3.2.2 [ME122][3]	Open- or closed circuit cooling towers have a separate heat exchanger to isolate the cooling tower from the heat pump loop, and heat loss is controlled by shutting down the circulation pump on the cooling tower loop.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.4.4.6 [ME110][3]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
C408.2.2.1 [ME53][3]	Air outlets and zone terminal devices have means for air balancing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.5, C403.5.1, C403.5.2 [ME123][3]	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.5.1 and refrigeration compressor systems that comply with C403.5.2..	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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SHEET 1 OF 2

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.3 [FI8][3]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.2 [FI27][3]	HVAC systems and equipment capacity does not exceed calculated loads.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.1 [FI47][3]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.1.1 [FI42][3]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.1.2 [FI38][3]	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.1.3 [FI20][3]	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.2 [FI39][3]	Each zone equipped with setback controls using automatic time clock or programmable control system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.2.1, C403.2.4.2.2 [FI40][3]	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C403.2.4.2.3 [FI41][3]	Systems include optimum start controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.1 [FI28][1]	Commissioning plan developed by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.3.1 [FI31][1]	HVAC equipment has been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.3.2 [FI10][1]	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C408.2.3.3 [FI32][1]	Economizers have been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.4 [FI29][1]	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.5.1 [FI7][3]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.5.3 [FI43][1]	An air and/or hydronic system balancing report is provided for HVAC systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.5.4 [FI30][1]	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

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SHEET 2 OF 2

GENERAL REQUIREMENTS
1. SHOP DRAWINGS AND SUBMITTALS
   A. SUBMIT SHOP DRAWINGS FOR ELECTRICAL EQUIPMENT IN .PDF FORMAT. SHOP DRAWING SUBMITTALS SHALL ALLOW FOR A MINIMUM OF SEVEN WORKING DAYS FOR ENGINEER REVIEW.
   B. SHOP DRAWINGS SHALL BE DETAILED, DIMENSIONED MANUFACTURER'S DRAWINGS. EACH SET OF DOCUMENTS SHALL LIST THE PROJECT NAME AND ADDRESS, AND THE CONTACTOR'S NAME, ADDRESS, AND TELEPHONE NUMBER. AN INDEX PAGE SHALL LIST INDIVIDUALLY THE ITEMS IN THE SUBMITTAL WITH THE REVERENCES TO TYPE DESIGNATIONS OR OTHER IDENTIFIERS NOTED ON THE DRAWINGS
   C. SUBMITTAL TO THE ENGINEER SHALL BE VIA THE GENERAL CONTRACTOR AND, WHERE REQUIRED, THE ARCHITECT. DO NOT SUBMIT INCOMPLETE SHOP DRAWINGS. SHOP DRAWINGS THAT ARE INCOMPLETE OR NOT SIGNED BY BOTH THE CONTRACTOR AND THE GENERAL CONTRACTOR SHALL BE RETURNED WITHOUT REVIEW.
   D. CROSS OUT INFORMATION OR OPTIONS NOT BEING PROVIDED OR DOES NOT APPLY TO THE PROJECT. FAILURE TO DO SO ASSUMES THAT EQUIPMENT, OPTIONS, AND ACCESSORIES SHOWN IN THE SHOP DRAWINGS SUBMITTED ARE INCLUDED.
   E. IF THE CONTRACTOR USES MATERIALS OTHER THAN THOSE SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT, AT NO ADDITIONAL COST TO THE OWNER.
   F. THE APPROVAL STAMP ON THE SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OR THE SUPPLIER OF THE RESPONSIBILITY FOR FULL CONTRACT COMPLIANCE.
2. OPERATIONS AND MAINTENANCE MANUALS AND RECORD DRAWINGS
   A. PROVIDE MANUALS TO THE OWNER COVERING THE OPERATION AND MAINTENANCE OF EQUIPMENT UNDER THE CONTRACT. THE MANUALS SHALL BE DIGITALLY SUBMITTED TO THE ARCHITECT/ENGINEER FOR APPROVAL VIA E-MAIL, ELECTRONIC FILES TRANSFER, OR USD. MANUALS SHALL CONTAIN THE FOLLOWING:
      1. COMPLETE MANUFACTURER CATALOG DATA, MANUFACTURER'S LITERATURE, WIRING DIAGRAMS, DETAILED OPERATING INSTRUCTIONS, AND A COMPLETE LISTING OF THE SUPPLIERS AND DISTRIBUTORS WHERE REPLACEMENT PARTS AND MAINTENANCE SERVICES ARE AVAILABLE FOR INSTALLED EQUIPMENT. INCLUDE ELECTRICAL SHOP DRAWINGS IN .PDF. PROVIDE AND AUTOCAD FILE OF DRAWINGS IF AVAILABLE.
      2. PHYSICAL DESCRIPTION AND INSTALLATION INSTRUCTIONS, USER'S MANUAL AND OPERATING INSTRUCTIONS.
      3. REPLACEMENT PARTS LIST. INCLUDE THE LIGHT FIXTURE SCHEDULE WITH REPLACEMENT LAMPS PER FIXTURE TYPE.
      4. INSPECTION CERTIFICATES, SIGNED BY THE APPROPRIATE INSPECTOR.
      5. FULL LISTING OF PRODUCT WARRANTIES AND EXTENDED WARRANTIES WITH REGISTRATION AND CONTACT INFORMATION.
      6. INDEXED .PDF DOCUMENTS OF ITEMS IN THE MANUAL.
   B. MARKUP SET OF CONSTRUCTION DOCUMENTS AS WORK PROGRESSES. SHOW ACTUAL CIRCUIT ROUTING WITH DIMENSIONED INFORMATION, SIZES, TYPES, ETC., EQUIPMENT LOCATION CHANGES, AND OTHER CHANGES OR DEVIATIONS BETWEEN PROJECT WORK, AS-BUILT, AND CONTRACT DOCUMENTS. MARKINGS SHALL BE NEAT, LEGIBLE, AND PERMANENT. TRANSFER APPLICABLE MARKINGS TO THE SECOND SET OF DOCUMENT AND PROVIDE BOTH SETS OF RECORD DOCUMENTS TO THE OWNER.
3. TEMPORARY INSTALLATIONS
   A. COMPLY WITH THE OWNER AND GENERAL CONTRACTOR REQUIREMENTS. ELECTRICAL WORK MUST CONFORM TO THE NEC ARTICLE 590 TEMPORARY INSTALLATION.
   B. CONTINUATION OF SERVICE: MAINTAIN CONTINUITY OF EXISTING EQUIPMENT TO REMAIN. MAINTAIN EXISTING CIRCUITS OF EQUIPMENT ENERGIZED. RESTORE CIRCUIT WIRING WHICH IS TO REMAN BUT WAS DISTURBED DURING DEMOLITION BACK TO THE ORIGINAL CONDITION.
   C. ELECTRIC POWER SYSTEM: PROVIDE AN ELECTRICAL DISTRIBUTION SYSTEM OF SUFFICIENT SIZE, CAPACITY, AND POWER CHARACTERISTICS REQUIRED FOR CONSTRUCTION OPERATIONS.
   D. PROVIDE TEMPORARY ELECTRICAL SERVICE AS REQUIRED FOR THE PROJECT.
      1. UTILIZE EXISTING BUILDING ELECTRICAL DISTRIBUTION IF AVAILABLE, AND SUPPLEMENT AS REQUIRED FOR THE PROJECT CONDITIONS.
      2. FOR SERVICE FOR THE DURATION OF CONSTRUCTION SO AS NOT TO INTERFERE WITH SERVICE CONSTRUCTION. PAY FOR UTILITY CHARGES ASSOCIATED WITH THE TEMPORARY SERVICE INCLUDING ENERGY BILLS.
   E. LIGHTING: PROVIDE TEMPORARY LIGHTING WITH LOCAL SWITCHING THROUGHOUT THE CONSTRUCTION AREA. PROVIDES ADEQUATE ILLUMINATION FOR CONSTRUCTION OPERATIONS, OBSERVATIONS, INSPECTIONS, AND TRAFFIC CONDITIONS.
   F. WHERE LIGHT FIXTURES EXIST IN THE AREA OF CONSTRUCTION, UTILIZE EXISTING LIGHTS AND OUTLETS AS MUCH AS PRACTICAL TO MEET THESE REQUIREMENTS. CLEAN AND RE-LAMP EACH FIXTURE USED FOR TEMPORARY AT END OF CONSTRUCTION.
   G. REMOVE THE TEMPORARY INSTALLATION OF ELECTRICAL EQUIPMENT, RACEWAY AND WIRE AT THE END OF THE PROJECT. PATCH AND SEAL SLEEVE OPENINGS.
4. DEMOLITION
   A. WHERE ELECTRICAL WORK TO REMAIN IS DAMAGED OR DISTURBED IN THE COURSE OF THE WORK, REMOVE DAMAGED PORTIONS AND PROVIDE PRODUCTS OF EQUAL CAPACITY, QUALITY, AND FUNCTIONALITY.
   B. ACCESSIBLE WORK INDICATED AS DEMOLISHED: REMOVE EXPOSED ELECTRICAL INSTALLATION IN ITS ENTIRETY. REMOVAL OF EXISTING ELECTRICAL DISTRIBUTION SYSTEM EQUIPMENT INCLUDES EQUIPMENT'S ASSOCIATED WIRING, INCLUDING CONDUCTORS, CABLES, EXPOSED CONDUIT, SURFACE METAL RACEWAYS, BOXES, AND FITTINGS, BACK TO EQUIPMENT'S SOURCE OR AS INDICATED.
   C. ABANDONED RACEWAY AND CONDUITS: WHERE RACEWAY AND CONDUITS ARE SHOWN AS ABANDONED ON THE DRAWINGS: DISCONNECT EXISTING CONCEALED WIRING FROM ITS SOURCE. REMOVE WIRING, CAP AND LABEL CONDUIT ENDS. CUT ABANDONED UNDERGROUND CONDUITS BELOW GRADE AND SEAL OPENINGS. PATCH SURFACE TO MATCH THE EXISTING FINISH.
   D. TEMPORARY DISCONNECTION: REMOVE, STORE, CLEAN, REINSTALL, RECONNECT, AND MAKE OPERATIONAL COMPONENTS INDICATED FOR RELOCATION.
5. PROTECTION OF EQUIPMENT AND MATERIAL
   A. STORE AND PROTECT FROM DAMAGE EQUIPMENT AND MATERIAL DELIVERED TO THE JOB SITE. COVER WITH WATERPROOF, TEAR-RESISTANT, HEAVY DUTY TARP OR POLYETHYLENE PLASTIC AS REQUIRED TO PROTECT FROM CONSTRUCTION DEBRIS, WATER, DUST, ETC.
   B. PLUG OR CAP OPEN ENDS OF PIPES AND DUCTS WHILE STORED OR INSTALLED DURING CONSTRUCTION TO PREVENT ENTRANCE OF DEBRIS INTO THE SYSTEMS.

PRODUCTS
DIVISION 26 ELECTRICAL
1. 260519 LOW VOLTAGE CONDUCTORS AND CABLES
   A. CONDUCTOR SIZES ARE AMERICAN WIRE GAUGE (AWG) OR CIRCULAR MILS (KCMIL) AS FOLLOWS:
      1. #12 AWG SOLID COPPER.
      2. #10 AWG AND LARGER SHALL BE STRANDED COPPER.
      3. BRANCH CIRCUITS MUST BE COLOR-CODED, COLOR IMPREGNATED WIRE.
   B. AC, CORE CLAD, OR ROMEX CABLES ARE NOT ALLOWED.
   C. CORD DROPS AND PORTABLE APPLIANCE CONNECTIONS: TYPE SO, OIL PROOF, HARD SERVICE CORD WITH STAINLESS STEEL, WIRE-MESH, STRAIN RELIEF DEVICE AT TERMINATIONS TO SUIT THE APPLICATION.
   D. HOME RUNS TO PANELBOARDS ARE INDICATED AS STARTING FROM THE OUTLET NEAREST THE PANEL AND CONTINUING IN THE GENERAL DIRECTION OF THAT PANEL. CONTINUE SUCH CIRCUITS TO THE PANEL AS THOUGH THE ROUTES WERE COMPLETELY INDICATED. TERMINATE HOME RUNS OF SIGNAL, ALARM AND COMMUNICATION SYSTEMS IN A SIMILAR MANNER
   E. PROVIDE #12 BRANCH CIRCUIT CONDUCTORS FOR 120V, 20 AMP CIRCUITS LESS THAN 75' (100' FOR 277V CIRCUITS). PROVIDE A MINIMUM #10 BRANCH CIRCUIT CONDUCTORS FOR 120V, 20 AMP CIRCUITS OVER 75' (100' FOR 277V CIRCUITS) AND INCREASE CONDUCTOR AND CONDUIT SIZE TO LIMIT VOLTAGE DROP TO 3% MAXIMUM.
   F. WHERE MORE THAN THREE CURRENT-CARRYING CONDUCTORS ARE INSTALLED IN A SINGLE RACEWAY (E.G. COMBINING MULTI-CIRCUIT HOME RUNS), CONDUCTOR AMPACITY SHALL BE DE-RATED AS REQUIRED BY THE NEC.
   G. PROVIDE DEDICATED NEUTRAL CONDUCTORS FOR EVERY 120-VOLT AND 277-VOLD BRANCH CIRCUIT.
   H. FEEDER AND BRANCH CIRCUIT CONDUCTORS MUST BE STRANDED COPPER, SINGLE CONDUCTORS IN A RACEWAY.
   I. MEGGER AND RECORD INSULATION RESISTANCE OF 600-VOLD INSULATED CONDUCTORS SIZE #3/0 AND LARGER USING 500-VOLT MEGGER FOR ONE MINUTE. MAKE TESTS WITH CIRCUITS ISOLATED FROM SOURCE AND LOAD.
   J. METAL-CLAD CABLE WITH GREEN GROUND CONDUCTOR ALLOWED ONLY FOR THE FOLLOWING CONDITIONS:
      1. ABOVE ACCESSIBLE CEILINGS FOR FINAL CONNECTIONS FROM JUNCTION BOXES TO LIGHT FIXTURES AND NOT EXCEEDING 6' IN LENGTH.
      2. FINAL CONNECTION NOT EXCEEDING 6' IN LENGTH TO ROTATING OR VIBRATING EQUIPMENT.
      3. ALLOWED FOR BRANCH CIRCUITS FISHED INTO EXISTING WALL CONSTRUCTION.
      4. ALLOWED IN CASEWORK OR BUILT UP STRUCTURES WHERE FLEXIBILITY IS REQUIRED.
2. 260526 GROUNDING AND BONDING
   A. CIRCUITS, METAL RACEWAY SYSTEMS AND OTHER PERMANENTLY INSTALLED ELECTRICAL EQUIPMENT SHALL BE SOLIDLY GROUNDED PER THE NATIONAL ELECTRICAL CODE TO FORM A CONTINUOUS, PERMANENT AND EFFECTIVE GROUNDING SYSTEM.
   B. GROUNDING ELECTRODE CONDUCTOR CONNECTIONS SHALL BE MADE WITH SOLDERLESS PRESSURE TYPE FITTINGS. WHERE WELDED CONNECTIONS ARE PRACTICAL, CONNECTIONS MAY BE MADE BY THIS USE OF MANUFACTURER RECOMMENDATIONS.
   C. BOND FLEXIBLE RACEWAY SECTIONS WITH A BARE GROUND CONDUCTOR SEPARATE FROM THE EQUIPMENT GROUNDING CONDUCTOR INSTALLED WITH THE BRANCH OR FEEDER CONDUCTORS. PROVIDE AN EXTERNAL GROUND CONDUCTOR WITH GROUNDING BUSHINGS WHERE REQUIRED.
   D. ISOLATED GROUND CONDUCTORS: GREEN COLORED INSULATION WITH A CONTINUOUS YELLOW STRIPE.
   E. GROUND RODS: 10 FEET X ¾INCH COPPER-CLAD STEEL. GROUND RODS AT EXTERIOR AREA LIGHTS: 8 FEETx5/8 INCH COPPER-CLAD STEEL.
   F. THE BUILDING AND ELECTRICAL SYSTEMS SHALL BE GROUNDED AND BONDED PER THE NEC, IEEE AND BEST PRACTICES.
   G. ELECTRICAL SERVICE AND SEPARATELY DERIVED ALTERNATING CURRENT SYSTEMS SHALL BE GROUNDED PER NEC ARTICLE 250.
   H. ALL FEEDER AND BRANCH CIRCUITS SHALL HAVE A GREEN COPPER GROUND CONDUCTOR RUN WITH THE PHASE AND NEUTRAL CONDUCTORS.
   I. BONDING INTERIOR METAL DUCTS: BOND METAL AIR DUCTS TO EQUIPMENT GROUNDING CONDUCTORS OF ASSOCIATED FANS, BLOWERS, ELECTRIC HEATERS, AND AIR CLEANERS. PROVIDE A TINNED BONDING JUMPER TO BONG ACROSS FLEXIBLE DUCT CONNECTIONS TO ACHIEVE CONTINUITY.
   J. PROVIDE A MINIMUM #6 AWG COPPER GROUND CONDUCTOR, OR LARGER AS INDICATED ON THE DRAWINGS, AND A 12-INCH GROUND BUS AT TELECOMMUNICATION DEMARCATION LOCATION.
3. 260529 HANGERS AND SUPPORTS
   A. FOR INDIVIDUAL CONDUIT RUNS NOT DIRECTLY FASTENED TO THE STRUCTURE, USE THREADED ROD AND HANGERS MANUFACTURED BY CADDY, UNISTRUT, OR POWERSTRUT.
   B. GALVANIZED STEEL SLOTTED CHANNEL SUPPORT SYSTEMS WITH SITTINGS AND SUPPORTS BY THE SAME MANUFACTURER.
   C. CONDUIT AND CABLE SUPPORT DEVICES MUST BE STEEL WITH HANGERS AND SUPPORT SUITABLE FOR RACEWAY OR CABLE MUST BE SUPPORTED.
   D. FABRICATED MEAL EQUIPMENT SUPPORT ASSEMBLIES MUST BE BOLTED STRUCTURAL STEEL OR STEEL SLOTTED SUPPORT SYSTEMS CALCULATED BY A REGISTERED STRUCTURAL ENGINEER.
7. 260533 RACEWAYS AND OUTLET BOXES
   A. PROVIDE RACEWAYS, FITTING, CONNECTORS, AND ACCESSORIES FOR A COMPLETE RACEWAY SYSTEM. RACEWAYS INCLUDE:
      1. RIGID METAL CONDUIT (RMC): HOT-DIPPED GALVANIZED.
      2. INTERMEDIATE METAL CONDUIT (IMC): HOT-DIPPED GALVANIZED.
      3. ELECTRIC METALLIC TUBING (EMT): ELECTRO-GALVANIZED.
      4. POLYVINYL CHLORIDE CONDUIT (PVC) SCHEDULE 40 FOR BELOW-GRADE INSTALLATIONS.
      5. WIREWAYS: ENAMEL FINISH, HINGED TYPE.
      6. FLEXIBLE METALLIC CONDUIT: FOR FINAL CONNECTION IN DRY LOCATIONS LESS THAN 6' LENGTHS.
      7. LIQUID-TIGHT FLEXIBLE METAL CONDUIT: FOR FINAL CONNECTION IN DAMP OR WET LOCATIONS LESS THAN 6 LENGTHS.
   B. MINIMUM ELECTRICAL CONDUIT SIZE: ½ INCH. MINIMUM BRANCH CIRCUIT OR FEEDER HOME RUN: ¾INCH. MINIMUM CONTROL VOLTAGE AND MISCELLANEOUS SYSTEMS CONDUIT: ¾INCH.
   C. PROVIDE FITTINGS AND ACCESSORIES APPROVED FOR THE PURPOSE, LISTED FOR USE, WITH THE TYPE CONDUIT OR RACEWAY. EMT CONNECTORS AND COUPLINGS SHALL BE STEEL SETSCREW TYPE INDOORS AND STEEL COMPRESSION TYPE IN DAMP OR WET LOCATIONS AND OUTDOORS.
   D. SPECIAL COLORS: FIRE ALARM CONDUITS FACTORY APPLIED RED COATING.
   E. OUTLET BOXES: 4-INCH SQUARE X 1-1/2 INCH DEEP (OR LARGER) GALVANIZED SHEET STEEL KO-TYPE WITH PLASTER RING AND COVER FOR GENERAL INTERIOR USE. CASE METAL TYPE FS OR FD WITH MATCHING SCREW COVERS FOR EXTERIOR AND EXPOSED INTERIOR LOCATIONS (PROVIDE GASKETS IN DAMP OR WET LOCATION). LARGER BOXES AS REQUIRED; SIZED FOR NEC FILL.
   F. JUNCTION BOXES SHALL BE THE SAME AS OUTLET BOXES UP TO 42 CUBIC INCHES. USE CODE-GAUGE STEEL IN LARGER SIZES WITH SURFACE OR FLUSH-TYPE SCREW-MOUNTED TRIM COVERS. BOXES AND COVERS PAINTED WITH INHIBITOR-PRIMED PAINT INSIDE AND OUT.
   G. PULL BOXES SHALL BE THE SAME AS JUNCTION BOXES UNLESS INDICATED OTHERWISE ON THE DRAWINGS, WITH COVERS.
   H. VOICE, DATA AND MISCELLANEOUS LOW VOLTAGE SYSTEM OUTLET BOXES SHALL BE THE TYPE AND SIZE REQUIRED BY THE SYSTEM VENDOR BUT NOT SMALLER THAN 4-11/16 INCH SQUARE X 2-1/8 INCH DEEP WITH A SINGLE-GANG RING. OTHER CONFIGURATIONS AS SHOWN ON THE PLAN.
   I. FLOOR BOXES (IN CONCRETE): RECTANGULAR, MODULAR, CAST BOXES WITH SOLID BRASS COVER. SEE PLANS FOR NUMBER OF GANGS. EACH SYSTEM TO HAVE INDEPENDENT COMPARTMENTS AND FLIP-UP COVERS.
   J. POKE THROUGH ASSEMBLIES: FACTORY-FABRICATED MULTI-CHANNELED THROUGH FLOOR RACEWAY/FIRESTOP WITH COMPLYING WITH UL 514 SCRUB WATER EXCLUSION. SEE PLANS FOR SERVICE DEVICES AND PLATE CONSTRUCTION.
   K. SERVICE POLES: FACTORY ASSEMBLED TWO-COMPARTMENT CHANNELS EXTENDING FROM FLOOR TO 6 INCHES ABOVE THE CEILING. STEEL WITH BAKED WHITE ENAMEL OR ANODIZED SATIN ALUMINUM CONSTRUCTION AS SPECIFIC ON PLANS.
   L. SURFACE METAL RACEWAYS: TWO COMPARTMENT STEEL, DEVICES AND FINISH COLOR AS INDICATED ON PLANS, WIREMOLD G4000 OR EQUAL. OTHER TYPES OF SURFACE METAL RACEWAYS ARE AS SPECIFIED ON PLANS.
   M. PROVIDE NECESSARY BACKING REQUIRED TO INSURE RIGID MOUNTING OF OUTLET BOXES.
   N. ENCLOSE ELECTRICAL POWER WIRING IN CONDUIT.
   O. CONDUIT CAST IN CONCRETE FLOORS IS NOT ALLOWED.
   P. FITTINGS FOR EMT SHALL BE STEEL COMPRESSION TYPE OR STEEL SET-SCREW TYPE. DIE-CAST FITTING IS NOT ALLOWED.
   Q. PROVIDE NYLON PULL CORDS IN EMPTY CONDUITS.
   R. PROVIDE EXPANSION FITTINGS CROSSING EXPANSION JOINTS OR SPANNING BETWEEN ISOLATED STRUCTURES.
   S. PROVIDE SURFACE RACEWAYS WITH REQUIRED FITTINGS, ACCESSORIES AND DEVICE OUTLETS NOTED ON PLANS. CONCEAL CONDUIT CONNECTIONS.
   T. GENERAL CONDUIT INSTALLATION:
      1. RUN CONDUIT CONCEALED UNLESS OTHERWISE NOTED OR SHOWN.
      2. RUN CONDUIT PARALLEL OR AT RIGHT ANGLES TO CENTER LINES OF COLUMNS AND BEAMS.
      3. CONDUITS ABOVE CEILING SHALL NOT OBSTRUCT THE REMOVAL OF CEILING TILES, LIGHTING FIXTURES, AIR DIFFUSERS, ETC.
      4. CONDUITS SHALL NOT CROSS DUCT SHAFT OR AREA DESIGNATED AS FUTURE DUCT SHAFT HORIZONTALLY. CONDUIT RISER, WHEN ALLOWED IN DUCT SHAFT MUST BE COORDINATED WITH MECHANICAL WORK OR AVOID CONFLICT.
   U. CONDUIT SUPPORTS:
      1. SUPPORT CONDUITS WITH UNDERWRITER'S LABORATORIES LISTED STEEL CONDUIT SUPPORT AT INTERVALS REQUIRED BY THE NATIONAL ELECTRIC CODE. WIRES OR SHEET METAL STRIPS ARE NOT ACCEPTABLE FOR CONDUIT SUPPORT. USE CONDUIT HANGERS FOR CONDUITS NOT DIRECTLY FASTENED TO STRUCTURE AND FOR MULTIPLE CONDUIT RUNS. DO NOT ATTACH THE CONDUIT TO MECHANICAL DUCTS OR PIPES.
      2. AVOID ATTACHING CONDUIT TO FAN PLENUMS. WHEN IT IS NECESSARY TO SUPPORT CONDUIT FROM FAN PLENUM, PROVIDE A LENGTH OF FLEXIBLE CONDUIT BETWEEN PORTIONS ATTACHED TO FAN PLENUM AND A PORTION ATTACHED TO THE BUILDING TO MINIMIZE TRANSMISSION OF VIBRATION TO THE BUILDING STRUCTURE.
   V. CONDUIT PENETRATION:
      1. FIRE-RATED FLOOR OR WALL: PROVIDE CONDUIT IN CONDUIT SLEEVE OR FRAMED OPENING. SEAL PENETRATION WITH FIRE RETARDANT SEALANT SPECIFIED HEREIN.
      2. ROOF OR EXTERIOR WALL: AVOID PENETRATING ROOF OR EXTERIOR WALL WHERE POSSIBLE. WHERE PENETRATIONS ARE NECESSARY, BUILDING WEATHERPROOF INTEGRITY MUST BE PRESERVED.
      3. SOUND INSULATED OR AIR PLENUM WALL: PROVIDE CONDUIT IN CONDUIT SLEEVE AND SEAL THE PENETRATION.
      4. NON-FIRE RATED DRYWALL: CONDUIT SLEEVES ARE NOT REQUIRED. PENETRATIONS MUST BE SEALED WITH PLASTER BEFORE PAINTING. PENETRATIONS MADE AFTER WALL FINISH IS APPLIED MUST BE AS SMALL AS POSSIBLE AND PROVIDED WITH ESCUTCHEONS, ONE ON EACH SIDE OF THE WALL.
      5. SUSPENDED CEILING: CUT HOLE AS SMALL AS POSSIBLE TO PERMIT CONDUIT PENETRATION. PROVIDE ESCUTCHEON FOR EACH CONDUIT BELOW THE CEILING.
   W. OUTLET BOXES:
      1. PROVIDE OUTLET BOXES AND PULL BOXES AS REQUIRED TO ACCOMMODATE LIGHTING AND RECEPTACLE BRANCH CIRCUIT WIRING.
      2. OUTLET BOXES MUST NOT BE INSTALLED BACK-TO-BACK.
      3. OUTLET BOXES USED FOR LINE VOLTAGE INCANDESCENT AND HALOGEN WALL BOX DIMMERS MAY NOT BE GANGED UNLESS NOTED ON THE DRAWINGS. WHERE WALL BOX DIMMERS ARE SHOWN GANGED OR GROUPED UNDER ONE COVER WITH OTHER SWITCHES, DE-RATE THE DIMMERS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
      4. PROVIDE CAST STEEL FLOOR BOXES TO ACCOMMODATE POWER AND DATA CONNECTIONS TO FREESTANDING EQUIPMENT AND FURNITURE PARTITIONS.
      5. ALL OUTLET BOXES SHALL BE TWO-GANG OR 4-INCH SQUARE X 2-INCH DEEP MINIMUM WITH PLASTER RING SIZED AS REQUIRED.
      6. EXTERIOR BOXES FOR BRANCH CIRCUITS MUST BE CAST ALUMINUM WITH THREADED HUBS.
   X. FLOOR BOXES, POKE-THROUGH, SERVICE POLES, AND MULTI-OUTLET ASSEMBLIES:
      1. ADJUST FLOOR SERVICE OUTLETS AND SERVICE POLES TO SUIT THE ARRANGEMENT OF PARTITIONS AND FURNISHINGS ACCESS.
9. 260533 IDENTIFICATION AND LABELING
   A. LABEL CONTROL DEVICES AND DEVICE ENCLOSURES WITH INDIVIDUAL NAMEPLATES OR LEGEND PLATES.
   B. INDIVIDUAL NAME OR LEGEND PLATES: BLACK LAMINATED PLASTIC PLATES WITH WHITE CUT LETTERS. PAPER, FOIL OR TAPE MARKERS ATTACHED WITH ADHESIVES SHALL NOT BE USED.
   C. ENGRAVED, LAMINATED ACRYLIC OR MELAMINE LABEL, PUNCHED OR DRILLED FOR SCREW MOUNTING. WHITE LETTERS ON A DARK-GRAY BACKGROUND. THE MINIMUM LETTER HEIGHT SHALL BE 3/8 INCH. LABEL THE FOLLOWING EQUIPMENT:
      1. PANELBOARDS, ELECTRICAL CABINETS, AND ENCLOSURES.
      2. ACCESS DOORS AND PANELS FOR CONCEALED ELECTRICAL ITEMS.
      3. ELECTRICAL BREAKERS IN EXISTING DISTRIBUTION PANELS.
      4. TRANSFORMERS.
      5. EMERGENCY SYSTEM BOXES AND ENCLOSURES.
      6. DISCONNECT SWITCHES.
      7. ENCLOSED CIRCUIT BREAKERS.
      8. MOTOR STARTERS.
      9. PUSH-BUTTON STATIONS.
      10. CONTACTORS.
      11. REMOTE-CONTROLLED SWITCHES, DIMMER MODULES, AND CONTROL DEVICES.
      12. PANELS, TERMINAL CABINETS, AND RACKS.
   D. FIRE ALARM SYSTEM DESIGN BUILD BY ELECTRICAL CONTRACTOR.
   E. ACCESSIBLE RACEWAYS AND CABLES OF AUXILIARY SYSTEMS: IDENTIFY THE FOLLOWING SYSTEMS AT THE PANEL AND JUNCTION BOX LOCATIONS WITHIN EACH ROOM AS FOLLOWS:
      1. FIRE ALARM SYSTEM: RED BOXES AND COVERS. RED CONDUIT.
      2. 120/208 VOLT: MARK COVERS WITH PANEL AND CIRCUIT NUMBERS.
      3. 277/480 VOLT: MARK COVERS WITH PANEL AND CIRCUIT NUMBERS.
   F. RECEPTACLES: IDENTIFY PANELBOARD AND CIRCUIT NUMBER FROM WHICH SERVED. USE PRE-MANUFACTURED HOT-STAMPED OR ENGRAVED MACHINE PRINTING WITH BLACK FILLED LETTERING ON THE FACE OF THE PLATE, AND DURABLE WIRE MARKERS OR TAGS INSIDE OUTLET BOXES.
   G. PROVIDE NAMEPLATES FOR SWITCHGEAR, PANELBOARDS, AND SIMILAR DEVICES. NAMEPLATES SHALL BE SCREWED (NO ADHESIVE) ENGRAVED PLASTIC OR PHOTO-ETCHED METALLIC NAMEPLATE IDENTIFICATION SHOWING PANEL DESIGNATION, VOLTAGE, AND PHASE.
   H. PROVIDE MACHINE LABELS ON LIGHTING SWITCHES AND CONVENIENCE AND SPECIAL PURPOSE RECEPTACLES TO SHOW PANEL AND CIRCUIT NUMBER TO WHICH THE DEVICE IS CONNECTED.
   I. PANELBAORD SCHEDULES: AFTER COMPLETION OF WORK, PROVIDE TYPEWRITTEN UPDATED PANELBOARD SCHEDULES IN A METAL-FRAMED CIRCUIT DIRECTORY INSIDE EACH PANELBOARD COVER, WITH PLASTIC PROTECTOR.
   J. COLOR CODE WIRES AS FOLLOWS:
      1. VOLTAGE PHASE A PHASE, B PHASE, C PHASE, NEUTRAL, GROUND.
      2. 120/208V BLACK, RED, BLUE, WHITE, GREEN.
      3. 277/480V BROWN, ORANGE, YELLOW, GRAY, GREEN.
   K. PROVIDE BRADY WIRE MARKERS WHERE THE NUMBER OF CONDUCTORS IN A BOX EXCEEDS FOUR.

GENERAL NOTES

1. COORDINATE ALL WORK WITH THE GENERAL CONTRACTOR TO LEAST INTERFERE WITH THE OWNER'S USE OF THE FACILITY. GENERAL CONTRACTOR MAY REQUIRE WORK INTERRUPTIONS DURING THE DAY AND MAY REQUIRE CERTAIN WORK TO BE PERFORMED ON PREMIUM TIME AT NIGHT OR ON WEEKENDS.

   SCHEDULE ANY DISCONNECTIONS AND RECONNECTION WITH THE CONTRACTING OFFICER. SEVENTY TWO (72) HOURS NOTICE IS REQUIRED. ARRANGE WORK SO AS NOT TO INTERRUPT ANY ELECTRICAL POWER, TELEPHONE, FIRE, COMMUNICATIONS AND OTHER SYSTEMS DURING NORMAL BUILDING HOURS.

   WHERE CORE DRILLING AND CUTTING OF FLOORS OR WALLS IS REQUIRED, CONTRACTOR SHALL USE XRAY EQUIPMENT, METAL DETECTORS OR OTHER APPROVED DEVICES TO DETERMINE AND AVOID INTERFERENCE WITH EXISTING CONCEALED FEEDERS AND PIPES.

   USE TEMPORARY CABLES AND ELECTRICAL APPARATUS AS REQUIRED.

   THE CONTRACTOR SHALL USE GREAT DILIGENCE AND CARE IN DISCONNECTING VARIOUS SYSTEMS. RECONNECT SYSTEMS THAT SERVE ADJACENT AREAS IF SUCH SYSTEMS HAVE BEEN DISRUPTED DURING DEMOLITION WORK.

2. REMOVE PORTIONS OF THE EXISTING CEILING SYSTEM REQUIRED FOR INSTALLATION OF THE NEW WORK. UPON COMPLETION OF THE WORK, REPLACE CEILINGS TO MATCH EXISTING FINISH IN ALL AFFECTED AREAS.

3. CIRCUIT NUMBERS ARE SHOWN FOR A GUIDE ONLY. EXACT CIRCUITS TO BE UTILIZED SHALL BE VERIFIED IN THE FIELD. UPDATE RECORD DRAWINGS WITH EXACT CIRCUITS UTILIZED.

4. PROVIDE CUTTING AND PATCHING OF EXISTING WALLS AFFECTED BY THE NEW ELECTRICAL WORK. PATCHING SHALL MATCH EXISTING AND SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR.

5. DISCONNECT, REMOVE, REINSTALL AND RECONNECT EXISTING CEILING INSTALLED ELECTRICAL EQUIPMENT (IE LIGHTING FIXTURES, SPEAKERS, SMOKE DETECTORS, NURSE CALL DOME LIGHTS, ETC,) DUE TO NEW MECHANICAL AND ELECTRICAL INSTALLATION. REPLACE EXISTING CEILING TILES, LIGHTING FIXTURE LENSES, LAMPS, ETC WHICH ARE DAMAGED DUE TO THIS INSTALLATION IN THE AFFECTED AREAS.

6. CONTRACTOR SHALL REFER TO THE MECHANICAL DRAWINGS FOR THE EXACT SIZE, NUMBER AND LOCATION OF ALL MECHANICAL EQUIPMENT. PROVIDE ELECTRICAL CONNECTIONS AS REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.

7. NOT ALL EXISTING CONDITIONS ARE SHOWN. BRANCH CIRCUITS AND FEEDERS REQUIRED TO REMAIN, BUT IN CONFLICT WITH OTHER TRADES MUST BE REMOVED AND RELOCATED. INCLUDE THESE COSTS IN THE BASE BID PROPOSAL OR IDENTIFY AS AN ALLOWANCE THE COST FOR THIS WORK.

8. CONTRACTOR SHALL VISIT THE SITE AND CAREFULLY EXAMINE THE BUILDING ELECTRICAL SYSTEMS SO AS TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AND DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THE WORK, BEFORE SUBMITTING PROPOSALS. SUBMISSION OF A PROPOSAL SHALL BE EVIDENCE THAT SUCH EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR LABOR, EQUIPMENT OR MATERIALS BECAUSE OF DIFFICULTIES ENCOUNTERED, WILL NOT BE RECOGNIZED.

9. ALL CONDUIT THAT IS ABANDONED SHALL HAVE ALL WIRING REMOVED FROM THE SOURCE, AND STUBS SHALL BE PLUGGED FLUSH WITH FLOOR OR CEILING SLABS OR WALLS. ALL EXPOSED CONDUIT, INCLUDING ABOVE DROPPED CEILING, THAT IS ABANDONED SHALL BE REMOVED UNLESS OTHERWISE NOTED.

10. MAKE THOROUGH INSPECTION OF EXISTING PANELS THAT REMAIN BUT ARE AFFECTED BY NEW WORK. CLEAN AND TIGHTEN ALL CABLE, BUS AND DISCONNECT DEVICE CONNECTIONS. REPORT ANY ABNORMAL CONDITIONS. PROVIDE ADDITIONAL BREAKERS AS REQUIRED TO EXISTING PANEL SPACES.

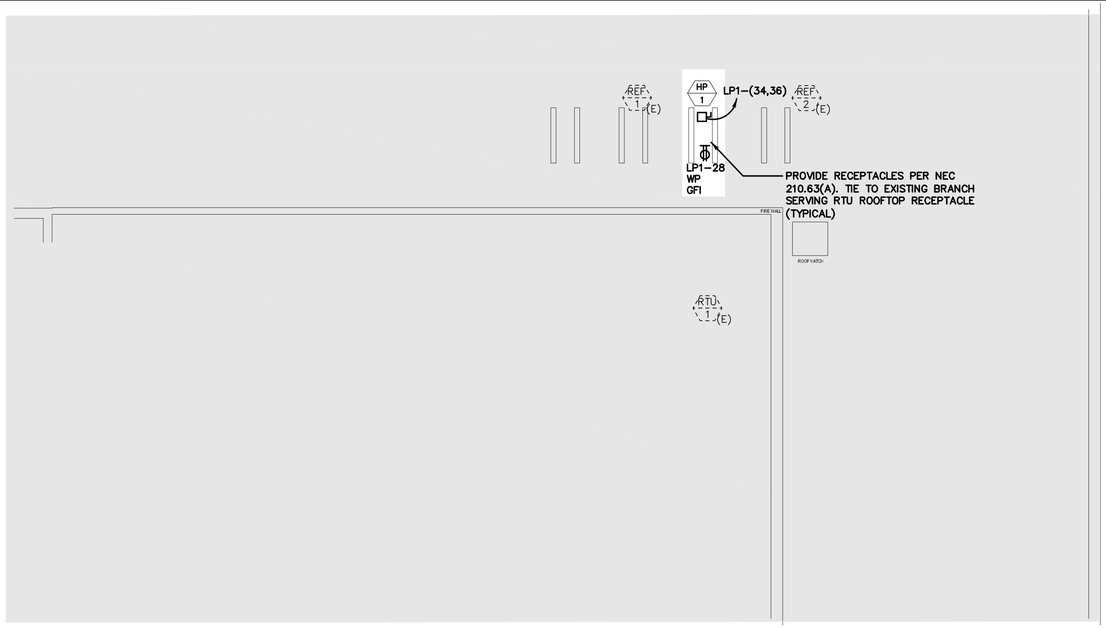
11. THE EXISTING PANELBOARDS SHOWN ON THE DRAWINGS ARE TO BE MODIFIED AND NEW OVERCURRENT DEVICES AND CONNECTIONS ADDED, CONSULT THE PANEL MANUFACTURER AND FOLLOW HIS RECOMMENDATIONS.

    SHORT CIRCUIT INTERRUPTING CAPACITY OF NEW OVERCURRENT DEVICES SHALL MATCH OR EXCEED EXISTING.

12. EXISTING SYSTEMS SUCH AS FIRE ALARM, COMMUNICATION SYSTEMS, SECURITY SYSTEM, ETC. ARE TO BE EXTENDED AND INTERFACED WITH NEW WORK IF REQUIRED. ARRANGE FOR THE ON-SITE INSPECTION AND GUIDANCE OF THE MANUFACTURER'S REPRESENTATIVE PRIOR TO THE START OF THE WORK. PROVIDE ALL MATERIALS, DEVICES AND COMPONENTS AS INDICATED SO THAT THE EXISTING AND NEW SYSTEMS SHALL BE PROPERLY INTERFACED AND FUNCTION AS ONE SYSTEM.

13. ALL ELECTRICAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND ALL OTHER DRAWINGS RELATED TO THE PERFORMANCE OF THE WORK.

14. BECOME THOROUGHLY FAMILIAR WITH THE PROJECT SPECIFICATIONS BEFORE COMMENCING ANY WORK. THE PROJECT SPECIFICATIONS AND DRAWINGS FORM THE BASIS O

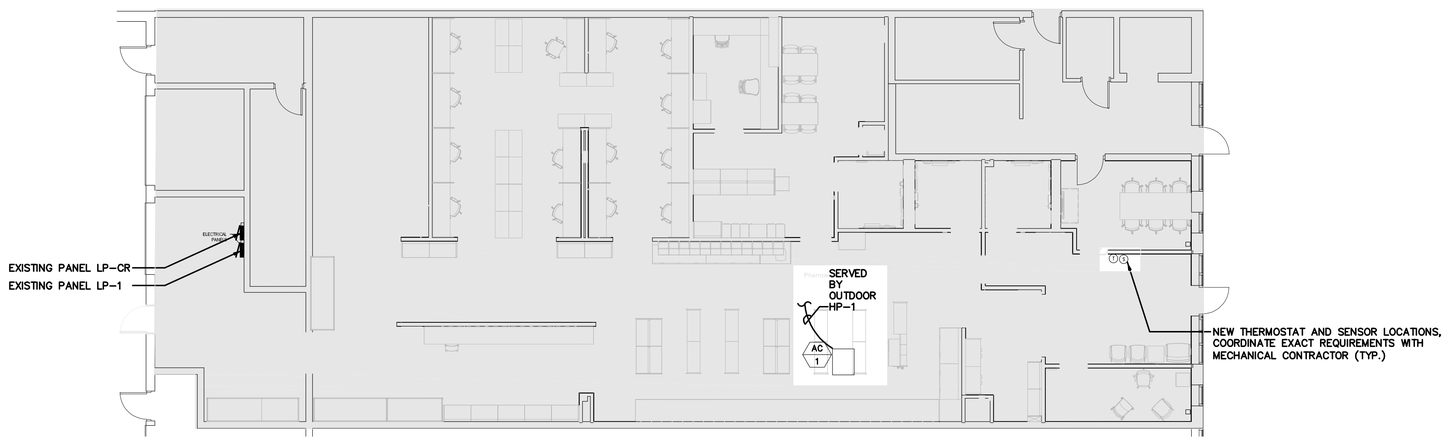


NORTH

ROOF PLAN - ELECTRICAL NEW WORK

SCALE: 1/8"=1'-0"

0' 8' 16' 24' 32'



NORTH

GROUND FLOOR PLAN - ELECTRICAL NEW WORK

SCALE: 1/8"=1'-0"

0' 8' 16' 24' 32'

WORK LEGEND:

- REFER TO SHEET E-510 FOR FEEDER SIZES AND CIRCUITS TO BE UTILIZED FOR NEW WORK
- EXISTING MECHANICAL EQUIPMENT AND CONTINUITY OF SERVICE TO REMAIN

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SIGNATURE
10/01/2025 DATE
07/31/2026 EXPIRATION DATE

MARK	DATE	DESCRIPTION
2	10/8/25	ISSUED FOR PERMIT
1	9/26/25	ISSUED FOR 90% REVIEW

PROJECT NO: **25049.06**
CAD DWG FILE:
DRAWN BY: **JC**
CHK'D BY: **SB/RS**
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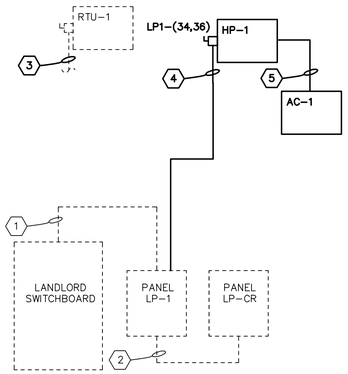
SHEET TITLE
FLOOR PLAN - ELECTRICAL NEW WORK

E-111

SHEET 2 OF 3



ELECTRICAL ONE LINE DIAGRAM - NEW WORK

NO SCALE

ONE LINE DIAGRAM LEGEND

——— DENOTES NEW WORK

- - - - - - DENOTES EXISTING TO REMAIN

FEEDER NO.	FEEDER CONDUIT & FEEDER SIZE	OVERCURRENT PROTECTION DEVICE
1	EXISTING 200A FEEDERS	200 A
2	EXISTING 60A FEEDERS	60 A
3	EXISTING 70A FEEDERS	70 A
4	3/4"C.–2 # 10 & 1 # 10 GROUND	30 A
5	NEW 3/4" C. – 2 # 14 & 1 # 14 GROUND PLUS INTERLOCK WIRING PER MANUFACTURER SPECIFICATIONS.	--

PANEL DATA SCHEDULE — PANEL NAME: LP1

LOCATION: PHARMACY
SERVICE: 120/208V.,3PH.,4W.
MAIN BREAKER:
MAIN LUGS ONLY: 225A
NEUTRAL BUS: 200A
GROUND BUS: YES
SHORT CIRCUIT RATING: EXISTING RMS SYM AMPS
NOTES: EXISTING TO REMAIN

	CONNECTED LOAD	DEMAND LOAD
PHASE A	24.34 KVA	23.54 KVA
PHASE B	21.12 KVA	19.99 KVA
PHASE C	24.87 KVA	23.99 KVA
TOTAL	70.33 KVA	67.51 KVA
	195.2 AMPS	187.4 AMPS

DEMAND LOAD

KEY: L: LIGHTING	4.18	KVA
R: RECEPTACLES	10.57	KVA
M: MOTORS	39.68	KVA
P: PANELS	13.08	KVA
T: TRANSFORMERS	0.00	KVA
E: NON-COINCIDENT	0.00	KVA
S & X: SPARE &	0.00	KVA

FLUSH ☐ SURFACE ■

* DENOTES LOCK-OUT CLIP: ** DENOTES GFI BREAKER: *** DENOTES VIA TIMECLOCK: **** DENOTES VIA CONTACTOR

EXISTING

CIRCUIT USE	CONNECTED LOAD A	B	C	CCT. NO.	CIRCUIT BREAKER	CIRCUIT BREAKER	CCT. NO.	CONNECTED LOAD A	B	C	CIRCUIT USE
L: PHARMACY LIGHTING	1,804			1	20A–1P	20A–2P	2	360			R: MISC. RECEPT
L: PATIENT WAITING LIGHTING		466		3	20A–1P		4		360		R: MISC. RECEPT
L: NIGHT/EM LIGHTS & EX. SIGNS			877	5	20A–1P	20A–2P	6			800	R: GEN. PURP. RECEPT
R: EMPLOYEE AREA REFRIGERATOR	500			7	20A–1P		8	600			R: PHARMACY PLUGMOLD
R: GFI KITCHEN RECEPT		180		9	20A–1P	20A–1P	10		500		R: PHARMACY BIOLOGICAL
R: MICROWAVE OVEN			1,000	11	20A–1P	20A–1P	12			800	R: SHIPPING CASH
R: OFFICE PLUGMOLD	600			13	20A–1P	20A–1P	14	720			R: SHIPPING PLUGMOLD
R: PATIENT WAITING RECEPT		400		15	20A–1P	20A–2P	16		1,000		M: AC
R: RECEPT (IN CASHWRAP)			600	17	20A–1P		18			1,000	M: AC
R: ELECTRIC WATER COOLER	370			19	20A–1P	20A–2P	20	1,000			R: PHARMACY BIOLOGY
L: LIGHT CONTROL PANEL		200		21	20A–1P		22		500		R: PHARMACY BIOLOGICAL
R: EF–4			600	23	20A–1P	20A–1P	24			180	R: RESTROOM EXHAUST
P: PANEL LPCR	5,400			25	60A–3P	20A–1P	26	180			R: RECEP. BELOW PANEL
P:		6,050		27		20A–1P	28		900		R: ROOFTOP RECEPT.
P:			4,700	29		50A–2P	30			3,750	M: ELECTRIC HEATER (VIF)
M: ELECTRIC WATER HEATER	1,500			31	20A–3P		32	3,750			M:
M:		1,500		33		30A–2P	34		1,508		M: HP–1 & AC–1
M:			1,500	35			36			1,508	M:
M: RTU–1	7,554			37	70A–3P	SPACE	38	0			X: SPACE
M:		7,554		39		SPACE	40		0		X: SPACE
M:			7,554	41		SPACE	42				X: SPACE
SUB TOTAL	17,728	16,350	16,831					6,610	4,768	8,038	SUB TOTAL

PANEL SCHEDULES NOTES:

P1. PROVIDE NEW CIRCUIT BREAKERS OF TYPE TO MATCH EXISTING AS SCHEDULED FOR ALL CIRCUITS AFFECTED BY NEW WORK.

PANEL LEGEND

- - - - DENOTES NEW WORK IN EXISTING PANEL

EQUIPMENT AND MOTOR SCHEDULE

ITEM	EQUIPMENT DESIGNATION	MOTOR LOCATION	HP, WATTS OR AMPS	MAXIMUM OVER-CURRENT PROTECTION	VOLTAGE & PHASE	CONTROL DEVICES: THERMOSTAT	DUCT MOUNTED SMOKE DETECTOR IN SUPPLY (> 2,000 CFM)	FAN SHUTDOWN RELAY & FIRE ALARM INTERCONNECT	PACKAGED CONTROLLER	DISCONNECT SWITCH BY E.C.
AC 1	HEAT PUMP INDOOR UNIT HP–IU–1	PATIENT WAITING	2.25 MCA	–	208V 1PH	–	–	–	MM	–
HP 1	HEAT PUMP OUTDOOR UNIT HP–OU–1	ROOF	29 MCA	48 MOCP	208V 1PH	–	–	–	MM	30A 2P WP

NOTE: UNIT HAS RECOMMENDED OVERCURRENT PROTECTION OF 30A

MOTOR SCHEDULE NOTES:

M1. REFER TO MECHANICAL DRAWINGS FOR EXACT SIZE, LOCATION, AND ELECTRICAL REQUIREMENTS FOR ALL MOTORS AND MECHANICAL EQUIPMENT. COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE ELECTRICAL CONNECTIONS AS REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.

M2. 'MM' DENOTES EQUIPMENT FURNISHED, INSTALLED AND WIRED BY DIVISION 15.

M3. 'ME' DENOTES EQUIPMENT FURNISHED UNDER DIVISION 15; INSTALLED AND WIRED UNDER DIVISION 16.

M4. 'EE' DENOTES EQUIPMENT FURNISHED, INSTALLED AND WIRED UNDER DIVISION 16.

M5. VERIFY CONTROL REQUIREMENTS OF ALL 3 PHASE MOTORS WITH MECHANICAL AND CONTROL CONTRACTORS. ALL MOTORS STARTED BY AUTOMATIC DEVICES OR INTERLOCKED TO START WITH OTHER MOTORS SHALL BE PROVIDED WITH HAND–OFF–AUTO SELECTOR SWITCHES. ALL MOTORS WITH MANUAL CONTROL ONLY SHALL BE PROVIDED WITH STOP–START PUSHBUTTONS.

M6. CONTROL PANEL (INCLUDING STARTERS, ALARMS, ETC.) AND INTERLOCK CONTROL WIRING SHALL BE FURNISHED AND INSTALLED BY EQUIPMENT SUPPLIER. POWER WIRING SHALL BE PROVIDED BY THIS CONTRACTOR.

M7. CONTRACTOR SHALL COORDINATE ALL WORK WITH GENERAL CONTRACTOR, ETC. AND WORK OF ALL OTHER TRADES.

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ELECTRICAL SCHEDULES AND DETAILS

E-510

SHEET 3 OF 3