

MECHANICAL SPECIFICATIONS

1. GENERAL

1.1 GENERAL REQUIREMENTS:

1.1.1 REQUIREMENTS UNDER DIVISION ONE AND THE GENERAL AND SUPPLEMENTARY CONDITIONS OF THESE SPECIFICATIONS SHALL BE A PART OF THIS SECTION. EACH CONTRACTOR SHALL BECOME THOROUGHLY ACQUAINTED WITH ITS CONTENTS AS TO REQUIREMENTS THAT AFFECT THIS DIVISION OR SECTION. THE WORK REQUIRED UNDER THIS SECTION INCLUDES MATERIAL, EQUIPMENT, APPLIANCES, TRANSPORTATION, SERVICES, AND LABOR REQUIRED TO COMPLETE THE ENTIRE SYSTEM AS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS. HEREFTER IN THIS SPECIFICATION, THE WORD "MECHANICAL CONTRACTOR" SHALL REFER TO THE INSTALLING MECHANICAL CONTRACTOR AND "OWNER" SHALL REFER TO TWIN STAR ENERGY.

1.1.2 THE SPECIFICATIONS AND DRAWINGS FOR THE PROJECT ARE COMPLEMENTARY, AND PORTIONS OF THE WORK DESCRIBED IN ONE, SHALL BE PROVIDED AS IF DESCRIBED IN BOTH. IN THE EVENT OF DISCREPANCIES, NOTIFY THE ENGINEER AND/OR OWNER AND REQUEST CLARIFICATION PRIOR TO PROCEEDING WITH THE WORK INVOLVED.

1.2 INSPECTION OF SITE:

1.2.1 PRIOR TO SUBMITTING BID, VISIT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED AS TO THE CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

1.3 MATERIAL AND WORKMANSHIP:

1.3.1 PROVIDE NEW MATERIAL, EQUIPMENT, AND APPARATUS UNDER THIS CONTRACT UNLESS OTHERWISE STATED HEREIN, OF BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE, AND FREE FROM ANY DEFECTS. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT NECESSARILY INTENDED TO DESIGNATE THE REQUIRED TRIM. WRITTEN DESCRIPTIONS OF THE TRIM GOVERN MODEL NUMBERS.

1.3.2 WORK PERFORMED UNDER THIS CONTRACT SHALL PROVIDE A NEAT AND "WORKMANLIKE" APPEARANCE WHEN COMPLETED. TO THE SATISFACTION OF THE ARCHITECT AND ENGINEER, WORKMANSHIP SHALL BE THE FINEST POSSIBLE BY EXPERIENCED MECHANICS. INSTALLATIONS SHALL COMPLY WITH APPLICABLE CODES AND LAWS.

1.3.3 THE COMPLETE INSTALLATION SHALL FUNCTION AS DESIGNED AND INTENDED WITH RESPECT TO EFFICIENCY, CAPACITY, NOISE LEVEL, ETC. ABNORMAL NOISE CAUSED BY RATTLING EQUIPMENT, PIPING, DUCTS, AIR DEVICES, AND SQUEAKS IN ROTATING COMPONENTS WILL NOT BE ACCEPTABLE. IN GENERAL, MATERIALS AND EQUIPMENT SHALL BE OF COMMERCIAL SPECIFICATION GRADE IN QUALITY. LIGHT DUTY AND RESIDENTIAL TYPE EQUIPMENT WILL NOT BE ACCEPTED.

1.3.4 REMOVE FROM THE PREMISES WASTE MATERIAL PRESENT AS A RESULT OF WORK, INCLUDING CARTONS, CRATING, PAPER, STICKERS, AND/OR EXCAVATION MATERIAL NOT USED IN BACKFILLING, ETC. CLEAN EQUIPMENT INSTALLED UNDER THIS CONTRACT TO PRESENT A NEAT AND CLEAN INSTALLATION AT THE TERMINATION OF THE WORK.

1.3.5 REPAIR OR REPLACE PUBLIC AND PRIVATE PROPERTY DAMAGED AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT TO THE SATISFACTION OF AUTHORITIES AND REGULATIONS HAVING JURISDICTION.

1.4 COORDINATION:

1.4.1 COORDINATE WORK WITH THAT OF OTHER TRADES SO THAT THE VARIOUS COMPONENTS OF THE SYSTEMS THAT ARE BEING INSTALLED AND/OR EXISTING SYSTEMS WILL BE INSTALLED AT THE PROPER TIME, WILL FIT THE AVAILABLE SPACE, AND WILL ALLOW PROPER SERVICE ACCESS TO THOSE ITEMS REQUIRING MAINTENANCE. ITEMS ARE TO BE INSTALLED WITHOUT REGARD TO THE ABOVE SHALL BE RELOCATED AT NO ADDITIONAL COST TO THE OWNER.

1.4.2 UNLESS OTHERWISE INDICATED, THE GENERAL CONTRACTOR WILL PROVIDE CHASES AND OPENINGS IN EXISTING CONSTRUCTION REQUIRED FOR INSTALLATION OF THE SYSTEMS SPECIFIED HEREIN. MECHANICAL CONTRACTOR SHALL FURNISH THE GENERAL CONTRACTOR WITH INFORMATION WHERE CHASES AND OPENINGS ARE REQUIRED. KEEP INFORMED AS TO THE WORK OF OTHER TRADES ENGAGED IN THE CONSTRUCTION OF THE PROJECT, AND EXECUTE WORK IN A MANNER AS TO NOT INTERFERE WITH OR DELAY THE WORK OF OTHER TRADES.

1.4.3 FIGURED DIMENSIONS SHALL BE TAKEN IN PREFERENCE TO SCALE DIMENSIONS. MECHANICAL CONTRACTOR SHALL TAKE HIS OWN MEASUREMENTS AT THE BUILDING, AS VARIATIONS MAY OCCUR. MECHANICAL CONTRACTOR WILL BE HELD RESPONSIBLE FOR ERRORS THAT COULD HAVE BEEN AVOIDED BY PROPER CHECKING AND INSPECTION.

1.4.4 PROVIDE MATERIALS WITH TRIM THAT WILL PROPERLY FIT THE TYPES OF CEILING, WALL, OR FLOOR FINISHES ACTUALLY INSTALLED. MODEL NUMBERS LISTED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS ARE NOT INTENDED TO DESIGNATE THE REQUIRED TRIM.

1.4.5 MECHANICAL CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR DUCTWORK LAYOUT TO THE CONSTRUCTION PROJECT MANAGER FOR OWNER APPROVAL PRIOR TO INSTALLATION.

1.5 ORDINANCES AND CODES:

1.5.1 WORK PERFORMED UNDER THIS CONTRACT SHALL, AT A MINIMUM, BE IN CONFORMANCE WITH APPLICABLE NATIONAL, STATE AND LOCAL CODES HAVING JURISDICTION. EQUIPMENT FURNISHED AND ASSOCIATED INSTALLATION WORK PERFORMED UNDER THIS CONTRACT SHALL BE IN STRICT COMPLIANCE WITH CURRENT APPLICABLE CODES ADOPTED BY THE LOCAL AHJ INCLUDING ANY AMENDMENTS AND STANDARDS AS SET FORTH BY THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), NATIONAL ELECTRICAL LABORATORIES (N.E.L.), OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME), AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS (ASHRAE), AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), AMERICAN SOCIETY OF TESTING MATERIALS (ASTM) AND OTHER NATIONAL STANDARDS AND CODES WHERE APPLICABLE. WHERE THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THEIR REFERENCED CODES, STANDARDS, ETC., THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE.

1.5.2 PROCURE AND PAY FOR PERMITS AND LICENSES REQUIRED FOR THE ACCOMPLISHMENT OF THE WORK HEREIN DESCRIBED. WHERE REQUIRED, OBTAIN, PAY FOR AND FURNISH COPIES OF INSPECTION TO OWNER. MECHANICAL CONTRACTOR WILL BE HELD RESPONSIBLE FOR VIOLATIONS OF THE LAW.

1.6 PROTECTION OF EQUIPMENT AND MATERIALS:

1.6.1 STORE AND PROTECT FROM DAMAGE EQUIPMENT AND MATERIALS DELIVERED TO JOB SITE. COVER WITH WATERPROOF, TEAR-RESISTANT, HEAVY DUTY POLYETHYLENE PLASTIC AS REQUIRED TO PROTECT FROM PLASTER, DIRT, PAINT, WATER, AND PHYSICAL DAMAGE. EQUIPMENT AND MATERIAL THAT HAS BEEN DAMAGED BY CONSTRUCTION ACTIVITIES WILL BE REJECTED, AND MECHANICAL CONTRACTOR IS OBLIGATED TO FURNISH NEW EQUIPMENT AND MATERIAL OF A LIKE KIND AS APPROVED BY OWNER.

1.6.2 REMOVAL OF ROOM CLEAN UP AND DESIGN MATERIAL CREATED DURING WORK PERFORMED UNDER THIS CONTRACT (PIPING, EQUIPMENT, ETC.), SHALL HAVE A NEAT AND CLEAN APPEARANCE AT THE TERMINATION OF THE WORK.

1.6.3 LOCKER CAP OPERATIONS OF DUCTWORK AND PIPING SYSTEMS WHILE STORED OR INSTALLED DURING CONSTRUCTION WHEN NOT IN USE TO PREVENT THE ENTRANCE OF DEBRIS INTO THE SYSTEMS.

1.6.4 KEEP THE MANUFACTURER PROVIDED PROTECTIVE COVERINGS ON FLOOR DRAINS, FLOOR SINKS, AND TRAP DRAINS DURING CONSTRUCTION. REMOVE COVERINGS AT THE TERMINATION OF THE WORK AND POLISH EXPOSED SURFACES.

1.7 OPERATION AND MAINTENANCE INSTRUCTIONS:

1.7.1 COLLECT AND COMPIL A COMPLETE BROCHURE OF FIXTURES, MATERIALS, AND EQUIPMENT FURNISHED AND INSTALLED ON THIS PROJECT. INCLUDE OPERATIONAL AND MAINTENANCE INSTRUCTIONS, MANUFACTURER'S CATALOG SHEETS, WIRING DIAGRAMS, PARTS LISTS, APPROVED SHOP DRAWINGS, AND DESCRIPTIVE LITERATURE FURNISHED BY THE MANUFACTURER. INCLUDE AN INSIDE COVER SHEET THAT LISTS THE PROJECT NAME, DATE, OWNER, ARCHITECT, ENGINEER, GENERAL CONTRACTOR, SUBCONTRACTOR, AND AN INDEX OF CONTENTS.

1.7.2 SUBMIT COPIES OF LITERATURE BOUND IN APPROVED BINDERS TO THE ARCHITECT AND OWNER AT THE TERMINATION OF THE WORK. PAPER CLIPS, STAPLES, RUBBER BANDS, AND MAILING ENVELOPES ARE NOT CONSIDERED APPROVED BINDERS. FINAL APPROVAL OF MECHANICAL AND PLUMBING SYSTEMS WILL BE WITHHELD UNTIL THIS EQUIPMENT BROCHURE IS DEEMED COMPLETE BY THE ARCHITECT, ENGINEER, AND OWNER.

1.8 WARRANTIES:

1.8.1 WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, DESIGN OR MATERIAL FOR A PERIOD OF 12 MONTHS FROM DATE OF SUBSTANTIAL COMPLETION, UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY IN THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS 12 MONTHS. REMEDY ALL DEFECTS, OCCURRING WITHIN THE WARRANTY PERIOD(S), AS STATED IN THE GENERAL CONDITIONS AND DIVISION 1.

1.8.2 WARRANTIES SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR REPLACEMENTS WITHOUT ANY ADDITIONAL COSTS TO THE OWNER.

1.8.3 PERFORM THE REMEDIAL WORK PROMPTLY, UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER.

1.8.4 AT THE TIME OF SUBSTANTIAL COMPLETION, DELIVER TO THE OWNER ALL WARRANTIES, IN WRITING AND PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE ONE YEAR PERIOD. EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE AND TERM.

1.9 CUTTING AND PATCHING:

1.9.1 PERFORM CUTTING OF WALLS, FLOORS, CEILINGS, ETC. AS REQUIRED TO INSTALL WORK UNDER THIS SECTION. OBTAIN PERMISSION FROM THE ARCHITECT PRIOR TO CUTTING. DO NOT CUT OR DISTURB STRUCTURAL MEMBERS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT. CUT HOLES AS SMALL AS POSSIBLE. GENERAL CONTRACTOR SHALL PATCH WALLS, FLOORS, ETC. AS REQUIRED BY WORK UNDER THIS SECTION. PATCHING SHALL MATCH THE ORIGINAL MATERIAL AND CONSTRUCTION. REPAIR AND REFRESH AREAS DISTURBED BY WORK TO THE CONDITION OF ADJOINING SURFACES IN A MANNER SATISFACTORY TO THE ARCHITECT.

1.10 ROUGH-IN:

1.10.1 COORDINATE WITHOUT DELAY ROUGHING-IN WITH GENERAL CONSTRUCTION. CONCEAL PIPING AND CONDUIT ROUGH-IN EXCEPT IN UNFINISHED AREAS AND WHERE OTHERWISE SHOWN.

1.11 STRUCTURAL STEEL:

1.11.1 STRUCTURAL STEEL USED FOR PIPE SUPPORTS, EQUIPMENT SUPPORTS, ETC., SHALL BE NEW, CLEAN, AND CONFORM TO ASTM DESIGNATION A-36.

1.11.2 SUPPORT PLUMBING AND MECHANICAL EQUIPMENT AND PIPING FROM THE BUILDING STRUCTURE. DO NOT SUPPORT PLUMBING EQUIPMENT FROM CEILINGS, OTHER MECHANICAL OR ELECTRICAL COMPONENTS, AND OTHER NON-STRUCTURAL ELEMENTS.

1.12 ACCESS DOORS:

1.12.1 PROVIDE ACCESS DOORS IN CEILINGS AND WALLS WHERE INDICATED OR REQUIRED FOR ACCESS TO CONCEALED VALVES AND EQUIPMENT INSTALLED UNDER THIS SECTION. PROVIDE CONCEALED HINGES, SCREWDRIVER-TYPE LOCK, ANCHOR STRAP, MANUFACTURED BY MILCOR ZURN, TITUS, OR EQUAL. OBTAIN ARCHITECT'S APPROVAL OF TYPE, SIZE, LOCATION, AND FINISH BEFORE ORDERING.

1.13 PENETRATIONS:

1.13.1 SEAL FLOOR, EXTERIOR WALL AND ROOF PENETRATIONS (WATER AND WEATHER TIGHT WITH APPROPRIATE NON-SHRINK, NON-HARDENING COMMERCIAL CONSTRUCTION SEALANT. SEAL ROOF PENETRATIONS WITH 4 POUND PER SQUARE FOOT LEAD PAINTING. PROVIDE A SEAL AND SEAL NON-FIRE-RATED FLOOR AND WALL PENETRATIONS WITH FLEXIBLE GLASS PACKING AND FLOOR CAULK (FOR ACOUSTICAL INSULATION).

1.13.2 COORDINATE FIRE RATING REQUIREMENTS AND LOCATION WITH THE ARCHITECT. SEAL PENETRATIONS OF FIRE-RATED ASSEMBLIES WITH 3/8" #CP-25 FIRE BARRIER CAULK. PROVIDE THICKNESS AND METHOD AS REQUIRED AND RECOMMENDED BY MANUFACTURER TO MAINTAIN THE FIRE RESISTANCE RATING OF FIRE-RATED ASSEMBLY.

1.13.3 SEAL EXTERIOR WALL PENETRATIONS BELOW GRADE WITH CAST IRON WALL PIPES AND MODULAR MECHANICAL SLEEVES. MANUFACTURED BY THUNDERLINE/LINK SEAL, CALPICO, INC AND METRAFLEX.

1.13.4 PROVIDE SLEEVES FOR HORIZONTAL PIPE PASSING THROUGH OR UNDER FOUNDATION. SLEEVES SHALL BE CAST IRON SOIL PIPE TYPE. NOMINAL PIPE SIZES LARGER THAN THE PIPE SERVED.

1.13.5 PROVIDE SLEEVES FOR VERTICAL PIPE PASSING THROUGH SLAB ON GRADE. SLEEVES SHALL BE SCHEDULE 40 PIPE. TWO NOMINAL PIPE SIZES LARGER THAN THE PIPE SERVED. SEAL AFTER INSTALLATION WITH SILICONE CAULK.

1.13.6 HEATING, VENTILATION, AND AIR CONDITIONING

2. DUCTWORK:

2.1.1 MECHANICAL CONTRACTOR SHALL PROVIDE ANY DUCTWORK NECESSARY FOR A COMPLETE INSTALLATION OF HVAC SYSTEMS (INCLUDING EXHAUST SYSTEMS). ALL DUCTWORK IDENTIFICATION AND INSTALLATION TO ADHERE TO SMACNA STANDARDS AND ALL GOVERNING CODES.

2.1.2 ROUND PIPE DUCT RUNS SHALL BE CONSTRUCTED OF METAL PIPE WITH EXTERNAL SLEEVE INSULATION.

2.1.3 DUCTWORK CONNECTIONS TO AIR DEVICES MUST BE MADE WITH HARDBOARD ELBOWS. COVERED WITH SLEEVE INSULATION. FLEX DUCT MUST NOT BE UTILIZED FOR A 90 DEGREE CONNECTION TO AN AIR DEVICE.

2.1.4 BALANCING DAMPERS WITH DOUBLE LOCKING QUADS SHALL BE PROVIDED IN ALL ROUND PIPE TAKE-OFFS FROM THE MAIN TRUNKS, UNLESS OTHERWISE NOTED ON PLANS.

2.1.5 A MAXIMUM OF 6' OF FLEX DUCT MAY BE USED FOR FINAL CONNECTION OF SIDE WALL DIFFUSERS.

2.1.6 FLEX DUCT MUST BE PROPERLY SUPPORTED WITH ONE AND ONE HALF INCH STRAPS AND CUT TO PROPER LENGTH TO PREVENT SAGGING.

2.1.7 FLEX DUCT SHALL BE OWENS-CORNING FOIL-BACK HIGH QUALITY U/L APPROVED. PLASTIC WRAPPED FLEX DUCT IS NOT ACCEPTABLE.

2.1.8 RIGID ROUND DUCT SHALL BE USED FOR HOT FOODS EXHAUST.

2.2 INSULATION:

2.2.1 SUPPLY AND RETURN DUCTWORK CONCEALED INSIDE THE BUILDING SHALL BE INSULATED WITH 1.5" THICK ACOUSTICAL LINING OR EXTERNALLY WRAPPED WITH 2" THICK GLASS FIBER DUCT WRAP WITH A MINIMUM R-VALUE OF 6.0 (K VALUE OF 0.24 - 0.27).

2.2.2 SUPPLY AND RETURN DUCTWORK OUTSIDE THE BUILDING SHALL BE INSULATED WITH 3" LINER WITH A MINIMUM R-VALUE OF 12.0 (K VALUE OF 0.24 - 0.27) AND SEAL SEAMS WEATHER TIGHT.

2.2.3 DEDICATED OUTSIDE AIR SUPPLY AND RELIEF DUCTWORK INSIDE THE BUILDING SHALL BE INSULATED WITH 4" THICK DUCT WRAP WITH A MINIMUM R-VALUE OF 12.0 (K VALUE OF 0.24 - 0.27).

2.3 FINAL TESTING AND ADJUSTMENTS:

2.3.1 AIR BALANCE SHALL BE PERFORMED AT THE COMPLETION OF THE PROJECT. BALANCE EACH SUPPLY, RETURN, OUTSIDE AIR DEVICE WITHIN 5% OF REQUIREMENTS AND FURNISH A REPORT TO THE CONSTRUCTION PROJECT MANAGER. THE ENTIRE HVAC SYSTEM MUST BE FULLY OPERABLE, BALANCED, AND APPROVED BY OWNER'S REPRESENTATIVE ON THE DAY TENANT OFFICES FOR BUSINESS.

2.3.2 ADJUST THERMOSTATS AND CONTROL DEVICES TO OPERATE AS INTENDED. ADJUST PUMPS, FANS, ETC. FOR PROPER AND EFFICIENT OPERATION. CERTIFY TO ARCHITECT THAT ADJUSTMENTS HAVE BEEN MADE AND THAT SYSTEM IS OPERATING SATISFACTORILY. CALIBRATE, SET AND ADJUST AUTOMATIC TEMPERATURE CONTROLS. CHECK PROPER SEQUENCING OF INTERLOCK SYSTEMS, AND OPERATION OF SAFETY CONTROLS.

2.3.3 VERIFY ECONOMIZER OPERATION PER MANUFACTURER PROCEDURE.

2.4 DIFFUSERS AND GRILLES (OWNER PROVIDED):

2.4.1 ALL SUPPLY AND RETURN AIR DEVICES SHALL INSTALLED BY THE MECHANICAL CONTRACTOR.

2.4.2 ALL AIR TERMINAL DEVICES SHALL BE INSTALLED AS SHOWN ON THE PLANS IN ORDER TO HANDLE THE DESIGNED AIR FLOW CAPACITIES WITH A MINIMUM AMOUNT OF NOISE AND STATIC PRESSURE.

2.5 CONDENSATE DRAINS:

2.5.1 THE MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL AS A MINIMUM A 4" DEEP P-TRAP ON CONDENSATE DRAIN OUTLETS WHERE THE CONDENSATE WATER WILL EXIT THE P-TRAP AT A POINT 1" LOWER THAN THE DRAIN CONNECTION AT THE UNIT. THE MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL CONDENSATE LINES AS REQUIRED TO MEET LOCAL CODES AND AS SHOWN ON THE MECHANICAL PLANS. THESE LINES SHALL BE SLOPED AWAY FROM THE UNITS, SUPPORTED AS REQUIRED TO ASSURE PROPER FLOW, AND AT THE MECHANICAL CONTRACTOR'S OPTION, CONDENSATE DRAIN LINES MAY BE SCHEDULE 40 PVC OR COPPER. ALL JOINTS SHALL BE SECURELY GLUED OR SOLDERED AS REQUIRED. INSULATE WITH 3/4" THICK PIPE INSULATION WHERE REQUIRED.

2.6 CONTROLS:

2.6.1 RTU CONTROLS PROVIDED BY OWNER. COORDINATE LOCATION OF THESE STAT AND SENSORS FOR ROUGH-IN.

2.6.2 SMOKE DETECTORS AND SAMPLING TUBES PROVIDED AND INSTALLED BY THE UNITS AND IN THE DUCTWORK BY CARRIER. THE SMOKE DETECTORS SHALL BE INSTALLED IN ACCORDANCE WITH THE UNIT OPERATION UPON ACTIVATION.

2.7 ELECTRICAL:

2.7.1 LOW VOLTAGE WIRING - ALL PROVISIONS FOR LOW VOLTAGE WIRING SHALL BE PERFORMED BY THE MECHANICAL CONTRACTOR UNLESS CODES OR LABOR AGREEMENTS DO NOT PERMIT. IF THE MECHANICAL CONTRACTOR CAN NOT PERFORM LOW VOLTAGE WIRING, THE MECHANICAL CONTRACTOR SHALL INFORM THE GENERAL CONTRACTOR AS PART OF THE HVAC BID DOCUMENT, TO HAVE THE ELECTRICAL SUBCONTRACTOR INCLUDE THIS WORK IN THEIR BID.

2.7.2 POWER WIRING - ALL ELECTRICAL POWER WIRING TO INCLUDE FINAL CONNECTIONS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR OR ELECTRICAL SUBCONTRACTOR.

2.8 GAS PIPING:

2.8.1 SCHEDULE 40 BLACK CARBON STEEL WITH MALLEABLE IRON THREADED FITTINGS. PROVIDE SMOOTH END VALVES, DIRT LEGS, AND UNION AT EACH ROOFTOP UNIT. PAINT ALL GAS PIPING EXPOSED TO WEATHER WITH A COAT OF PRIMER, AND TWO COATS OF RUST-PROOF PAINT. COLOR SHALL MATCH BUILDING EXTERIOR. COORDINATE WITH OWNER'S CONSTRUCTION MANAGER.

2.8.2 TREATED WOOD BLOCKING 6X6X12, 8'-0" OC MAX WITH GALVANIZED PIPE STRAP, 1 1/4" ZINC COATED LAG SCREWS, AND RUBBER WALKPAD ADHERED TO ROOF.

2.9 REFRIGERATION LINES:

2.9.1 REFRIGERATION LINE SETS FOR HVAC UNITS ARE TO BE PROVIDED AND INSTALLED BY THE MECHANICAL CONTRACTOR.

2.10 MECHANICAL CONTRACTOR RESPONSIBILITIES:

2.10.1 AFTER COMPLETION OF THE WORK DESCRIBED IN THIS SPECIFICATION AND SHOWN ON THE DRAWINGS, THE MECHANICAL CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT, REMOVING ALL LABELS AND STICKERS NOT CONTAINING OPERATION INSTRUCTION. MECHANICAL CONTRACTOR SHALL REMOVE CRATING DEBRIS, LEAVING THE INSTALLATION FINISHED AND READY FOR OPERATION, TO INCLUDING CLEAN FILTERS IN AIR HANDLING UNITS.

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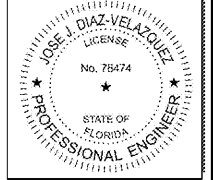


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