MECHANICAL AND PLUMBING SPECIFICATIONS

SECTION 15001 - GENERAL PROVISIONS

A. CONTRACTOR SHALL PERFORM ALL WORK SHOWN ON DRAWINGS UNLESS NOTED TO BE PERFORMED BY OTHERS.
B. EACH CONTRACTOR SHALL GIVE ALL REQUISITE NOTICES, OBTAIN AND PAY FOR ALL PERMITS, DEPOSITS AND FEES NECESSARY FOR THE INSTALLATION OF WORK UNDER THESE SPECIFICATIONS. TWO (2) COPIES OF CERTIFICATES OF APPROVAL SHALL BE OBTAINED FROM ALL AUTHORITIES ISSUING SAME AND SHALL BE TURNED OVER TO OFFICE DEPOT PRIOR TO FINAL ACCEPTANCE OF THE WORK.
C. ALL WORK SHALL CONFORM WITH ALL APPLICABLE CODES AND ORDINANCES. IT SHALL BE EACH CONTRACTOR'S RESPONSIBILITY TO INQUIRE INTO, UNDERSTAND, AND COMPLY WITH ALL APPLICABLE ORDINANCES, LAWS, CODES AND/OR REGULATIONS.
D. ALL PIPES AND DUCTS SHALL BE CONCEALED IN FINISHED AREAS UNLESS OTHERWISE NOTED. EXPOSED WORK SHALL BE KEPT AS UNOBTRUSIVE AS POSSIBLE. COORDINATE WITH ALL OTHER TRADES. AVOID CONFLICT WITH ELECTRIC FIXTURES, PLUMBING FIXTURES, STEEL BEAMS, WINDOWS, DOORS ETC. FINAL LOCATION OF PIPING AND DUCTWORK SHALL BE SUBJECT TO OFFICE DEPOT'S APPROVAL. ALL PIPING AND DUCTWORK SHALL BE RUN PARALLEL OR PERPENDICULAR TO WALLS, FLOORS AND CEILINGS.
E. CONTRACTOR SHALL PROVIDE ALL SUPPORTS, HANGERS, CONTROLS, AND OTHER ACCESSORIES REQUIRED FOR A COMPLETE OPERATING SYSTEM.
F. BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK, EACH CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AND DIMENSIONS AT THE BUILDING SITE AND SHALL BE RESPONSIBLE FOR THE CORRECTNESS OF SAME. ANY DIFFERENCES THAT MAY BE FOUND SHALL BE SUBMITTED TO THE PROJECT MANAGER AND OFFICE DEPOT FOR CONSIDERATION BEFORE PROCEEDING WITH WORK.
G. EACH CONTRACTOR SHALL CAREFULLY EXAMINE THESE SPECIFICATIONS AND ALL DRAWINGS AND SHALL REPORT TO THE PROJECT MANAGER AND OFFICE DEPOT ALL DISCREPANCIES NOTED THEREON PRIOR TO BIDDING. THE PROJECT MANAGER IN TURN WILL SEND OUT WRITTEN INSTRUCTIONS TO ALL BIDDERS. NEITHER THE PROJECT MANAGER NOR OFFICE DEPOT WILL BE RESPONSIBLE FOR ORAL INSTRUCTIONS.
H. THE ELECTRICAL CONTRACTOR WILL DO ALL ELECTRIC POWER WIRING AND CONTROL WIRING INCLUDING SETTING OF ALL MOTORS NOT DIRECTLY CONNECTED TO DRIVEN EQUIPMENT AND SETTING OF ALL CONTROLS EXCEPT THOSE CONTROLS INSTALLED IN PIPES, DUCTWORK, OR FACTORY MOUNTED ON EQUIPMENT OR PANELBOARDS. THE MECHANICAL CONTRACTOR SHALL INSTALL AND SET ALL CONTROLS AND APPURTENANCES INSTALLED IN PIPES AND DUCTWORK.
I. THE GENERAL CONTRACTOR WILL FURNISH AND INSTALL ALL LINTELS REQUIRED FOR DUCT AND LOUVER OPENINGS. THE GENERAL CONTRACTOR SHALL ALSO PROVIDE ALL CHASES AND OPENINGS FOR EQUIPMENT AS DIRECTED BY EACH MECHANICAL TRADES CONTRACTOR.
J. ALL EXPOSED PIPING, EQUIPMENT, HANGERS, ETC., INSULATED OR BARE, WILL BE PAINTED BY GENERAL CONTRACTOR, WHEN PAINTING IS REQUIRED.
K. EACH CONTRACTOR SHALL, AT HIS OWN EXPENSE, MAKE GOOD TO THE SATISFACTION OF THE PROJECT MANAGER AND OFFICE DEPOT, ALL DAMAGE CAUSED PRIOR TO ACCEPTANCE, DUE TO NEGLECT ON THE PART OF THE CONTRACTOR OR HIS REPRESENTATIVE.
L. CONTRACTOR SHALL TEST, ADJUST, START-UP AND PLACE INTO PROPER OPERATION ALL EQUIPMENT AND SYSTEMS INSTALLED UNDER HIS CONTRACT. PRIOR TO THE START-UP OF ANY EQUIPMENT OR SYSTEM, THE RESPONSIBLE CONTRACTOR SHALL MAKE CERTAIN THAT ALL EQUIPMENT IS CLEAN, FREE OF FOREIGN MATTER, ALL BEARINGS PROPERLY LUBRICATED AND ALL PRECAUTIONS IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S INSTRUCTIONS.
M. HEATING AND AIR CONDITIONING SYSTEMS - TESTS FOR THE HEATING SYSTEMS SHALL BE CONDUCTED DURING WINTER SEASON AND THAT FOR THE COOLING SYSTEMS SHALL BE CONDUCTED DURING THE SUMMER SEASON. FOR AIR COOLED REFRIGERATION EQUIPMENT, COOLING SYSTEMS SHALL BE CHARGED AND PUT INTO SERVICE AT THE TIME OF COMPLETION REGARDLESS OF THE SEASON. IF THE COOLING SYSTEMS ARE PUT INTO OPERATION DURING WINTER OR SPRING SEASON, CONTRACTOR SHALL RE-CHECK THE SYSTEMS DURING THE FOLLOWING SUMMER SEASON. IF THE HEATING SYSTEMS ARE PUT INTO OPERATION DURING WARM OR MILD WEATHER, CONTRACTOR SHALL RE-CHECK THE SYSTEMS DURING THE FOLLOWING WINTER SEASON. REFER TO SECTIONS 15700, 15750, AND 15900 FOR SPECIFIC TEST REQUIREMENTS.
N. EACH CONTRACTOR SHALL GUARANTEE ALL MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM DATE OF FINAL ACCEPTANCE AND SHALL REPLACE ALL DEFECTIVE MATERIAL AND WORKMANSHIP AND ALL OTHER WORK DAMAGED THEREBY WITHOUT ADDITIONAL COST TO OFFICE DEPOT.

SECTION 15050 - BASIC MATERIALS & METHODS

A. ALL MATERIAL AND EQUIPMENT SHALL BE NEW AND CONFORM TO THE GRADE, QUALITY AND STANDARDS SPECIFIED. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. ALL ELECTRICAL MATERIAL AND EQUIPMENT USED IN THIS BUILDING SHALL BE OF A TYPE APPROVED OR LABELED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS LABORATORIES WHERE SUCH LABELING APPLIES. ALL EQUIPMENT NOT SO LABELED SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST RULES OF THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION AND INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS.
B. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIALS, EQUIPMENT AND APPURTENANCES FURNISHED BY HIM OR HIS SUB-CONTRACTORS AND SPECIAL CARE SHALL BE TAKEN TO PROTECT ALL PARTS THEREOF FROM BEING DAMAGED. PROTECTION SHALL INCLUDE COVERS, PLUGS, CRATING, SHEDS OR ANY OTHER MEANS NECESSARY TO PREVENT WATER, DIRT, GRIT, PLASTER OR ANY OTHER FOREIGN SUBSTANCE FROM ENTERING WORKING PARTS OF EQUIPMENT.
C. WORKMEN ESPECIALLY TRAINED IN EACH BRANCH OF WORK OR TRADE SHALL BE EMPLOYED FOR THE CAREFUL EXECUTION OF THIS CONTRACT IN ALL OF ITS PHASES. WORKMANSHIP SHALL BE FIRST CLASS IN ALL RESPECTS AND MEET THE APPROVAL OF THE PROJECT MANAGER AND OFFICE DEPOT. ANY WORK POORLY DONE MUST BE REMOVED AND REPLACED AT ONCE UPON CONDEMNATION. ALL MATERIAL SHALL BE NEW AND OF GOOD QUALITY.
D. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSULATION ON ALL WORK INSTALLED UNDER HIS CONTRACT, INCLUDING EQUIPMENT FURNISHED BY OTHERS. THERMAL INSULATION WORK SHALL BE INSTALLED IN A WORKMANLIKE MANNER BY WORKMEN REGULARLY ENGAGED IN THIS TYPE WORK.
E. OWNER SHALL PROVIDE AND THE CONTRACTOR SHALL INSTALL UNDER A NATIONAL ACCOUNT ARRANGEMENT FANS AS SHOWN AND SCHEDULED ON THE DRAWINGS AND IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS.
F. EACH FAN SHALL BE PROVIDED WITH BACK DRAFT DAMPERS, DISCONNECT SWITCH, BIRD SCREEN, PREFAB ROOF CURB, AND OTHER ACCESSORIES AS NOTED IN THE SCHEDULE ON THE DRAWINGS. THE FAN MANUFACTURER SHALL FURNISH ALL ACCESSORIES, UNLESS NOTED OR SPECIFIED OTHERWISE.
G. ALL THERMAL AND ACOUSTICAL INSULATION MATERIALS SHALL BE THE PRODUCTS OF OWENS-CORNING, CERTAIN-TEED PRODUCTS CSG GROUP OR JOHNS-MANVILLE, EXCEPT AS OTHERWISE SPECIFIED. ALL THERMAL INSULATION SHALL HAVE A VAPOR BARRIER. VAPOR BARRIER SHALL BE CONTINUOUS AND UNBROKEN WITH ALL JOINTS PROPERLY SEALED.
H. ALL INSULATION MATERIALS ALSO SHALL HAVE COMPOSITE (INSULATION, JACKET OR FACING AND ADHESIVE USED) FIRE AND SMOKE HAZARD RATINGS AS TESTED BY PROCEDURE ASTM E-84, NFPA 255 AND UL 723 NOT EXCEEDING FLAME SPREAD OF 25, SMOKE DEVELOPED OF 50, AND FUEL CONTRIBUTED OF 50.
I. (VOC) LEVELS IN AEROSOL ADHESIVES SHALL COMPLY WITH GREEN SEAL STANDARD FOR COMMERCIAL ADHESIVES GS-36 REQUIREMENTS IN EFFECT ON OCTOBER 19, 2000.
J. THE CURB CAP AND CURB MOUNTED FANS SHALL BE SET IN A BED OF WATER PROOF SEALANT ON THE ROOF CURB AND SECURELY ATTACHED WITH NOT LESS THAN #10 SCREWS ON 9 INCH CENTERS. CONTRACTOR SHALL REVIEW THE STRUCTURAL PLANS FOR MORE STRINGENT REQUIREMENTS. PROVIDE AT LEAST TWO SCREWS ON EACH SIDE FOR SMALL UNITS.
K. ALL MECHANICAL SYSTEMS AND EQUIPMENT SHALL BE STORED, PROTECTED, INSTALLED, TESTED, ADJUSTED AND STARTED UP IN STRICT ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS AND INSTRUCTIONS. EACH CONTRACTOR SHALL PROMPTLY NOTIFY THE ENGINEER OF ANY CONFLICT BETWEEN ANY REQUIREMENT OF THE CONTRACT DOCUMENTS AND THE MANUFACTURERS' INSTRUCTIONS AND SHALL RECEIVE THE ENGINEER'S WRITTEN INSTRUCTIONS BEFORE PROCEEDING WITH THE WORK. ANY WORK THAT DOES NOT COMPLY WITH THE MANUFACTURERS' INSTRUCTIONS OR SUCH WRITTEN INSTRUCTIONS FROM THE ENGINEER SHALL BE CORRECTED BY THE CONTRACTOR AT NO INCREASE IN THE CONTRACT AMOUNT OR ADDITIONAL COST TO OTHER TRADES.
L. ALL MECHANICAL SYSTEMS AND EQUIPMENT SHALL BE INSTALLED TO PERMIT SERVICING AND REPLACEMENT OF PARTS, FILTERS, COILS, BELTS, MOTORS, ETC.
M. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN A RIGID AND SECURE MANNER AND SHALL BE INSTALLED PLUMB, LEVEL AND SQUARE WITH THE BUILDING, UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR SPECIFIED HEREIN. ALL PIPING CONNECTIONS TO PUMPS AND OTHER EQUIPMENT SHALL BE INSTALLED WITHOUT STRAIN, DISTORTION, OR EXCESSIVE FORCES IN THE PIPING OR ON THE EQUIPMENT.
N. ALL EXISTING INSULATION ON EXISTING PIPING, EQUIPMENT, OR SYSTEMS THAT IS DAMAGED DUE TO RELOCATION OF EQUIPMENT, NEW PIPING OR SHEET METAL CONNECTIONS, OR OTHER OPERATIONS UNDER THE CONTRACT, SHALL BE PATCHED OR REPLACED TO MATCH THE EXISTING INSULATION AND FINISHES. NEW INSULATION WORK THAT IS SUBSEQUENTLY DAMAGED DUE TO NEGLIGENCE SHALL BE REPAIRED OR REPLACED AT THE COST OF THE CONTRACTOR CAUSING THE DAMAGE.
O. PIPE AND EXTERNALLY APPLIED DUCT INSULATION SHALL BE CONTINUOUS THROUGH WALL AND FLOOR OPENINGS EXCEPT AT PENETRATIONS THROUGH FIRE RATED CONSTRUCTION AND WHERE PENETRATIONS ARE REQUIRED TO BE FIRE STOPPED. DUCT LININGS SHALL BE INTERRUPTED AT FIRE DAMPERS AS REQUIRED TO AVOID INTERFERENCE WITH THE FIRE DAMPER OPERATION. SLEEVES FOR INSULATED PIPING AND EXTERNALLY INSULATED DUCTWORK PENETRATING WALLS AND FLOORS SHALL BE SIZED TO ACCOMMODATE THE SPECIFIED INSULATION THICKNESS EXCEPT WHERE INSULATION MUST BE INTERRUPTED AS SPECIFIED ABOVE.

SECTION 15090 - PIPING INSULATION

A. THE FOLLOWING MINIMUM CRITERIA SHALL BE MET UNLESS MORE STRICT INSULATION CRITERIA APPLY DUE TO CODES IN FORCE IN THE PROJECT LOCATION.
B. COLD WATER PIPING AND INDOOR CONDENSATE DRAIN PIPING: ALL PIPING SHALL BE INSULATED WITH 1" THICK FIBERGLASS ASJ/SSL-II INSULATION WITH ALL SERVICE JACKET (ASJ).
C. HOT WATER PIPING: ALL PIPING SHALL BE INSULATED WITH 1" THICK FIBERGLAS ASJ/SSL-II INSULATION WITH ALL SERVICE JACKET (ASJ).
D. VOLATILE ORGANIC COMPOUND (VOC) LEVELS IN ALL INSULATING MATERIALS AND ACCESSORIES SUCH AS COATING, ADHESIVES, MASTICS, TAPES AND CLOTHS SHALL COMPLY WITH SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) RULE 1168.
E. INTERIOR ABOVE GRADE STORM PIPING (RAIN WATER CONDUCTORS) IF REQUIRED ON THIS STORE INSULATE ALL HORIZONTAL PIPING, INCLUDING RISER ELBOWS, AND ALL ROOF DRAIN BODIES AS SPECIFIED FOR COLD WATER PIPING.

SECTION 15150 - SANITARY WASTE & VENT PIPING

A. THE PLUMBING INSTALLATION SHALL CONFORM TO APPLICABLE CODES AND LOCAL REQUIREMENTS. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND INSPECTIONS.
B. WORKMANSHIP, MATERIALS, EQUIPMENT AND PERFORMANCE SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF THE WORK, OR ANY PORTION THEREOF. THE CONTRACTOR SHALL REPAIR, REPLACE, AND PERFORM ANY ADDITIONAL WORK REQUIRED TO CORRECT UNACCEPTABLE OR DEFECTIVE WORK DURING THIS GUARANTEED PERIOD, AT NO ADDITIONAL COST TO THE OWNER.
C. THE ENTIRE SEWER SERVICE INSTALLATION SHALL COMPLY WITH THE REGULATIONS OF THE LOCAL UTILITY COMPANY AND WITH GOVERNING BUILDING CODES. IN THE ABSENCE OF GOVERNING CODES, PROVISIONS OF THE INTERNATIONAL PLUMBING CODE SHALL GOVERN AS MINIMUM REQUIREMENTS.
D. SERVICE WEIGHT CAST IRON SOIL PIPE AND FITTINGS, ASTM A74, COATED INSIDE AND OUT WITH TAR PITCH VARNISH, SHALL BE USED IN THE FOLLOWING APPLICATIONS, AND WHERE NOTED ON THE DRAWINGS.
   1. UNDERGROUND WITHIN BUILDING LINES AND TO NOT LESS THAN FIVE (5) FEET BEYOND. (MINIMUM SIZE SHALL BE 4 INCHES FOR UNDERGROUND, INTERIOR SEWERS AND DRAINS AND 6 INCHES MAIN LINE FOR EXTERIOR BUILDING SEWERS)
   2. INTERIOR ABOVE GROUND SOIL AND WASTE PIPING 2 INCHES AND LARGER.
E. SCHEDULE 40 GALVANIZED STEEL PIPE, ASTM A120 WITH SCREWED, GALVANIZED CAST IRON DRAINAGE PATTERN FITTINGS SHALL BE USED FOR ALL INTERIOR ABOVE GROUND SOIL AND WASTE PIPING, 1-1/2" AND SMALLER AND ALL ABOVE GROUND VENT PIPING 2-1/2" AND SMALLER. VENT PIPING 3" AND LARGER SHALL BE CAST IRON SOIL PIPE MEETING ASTM A888 MANUFACTURED BY AB&E FOUNDRY, CHARLOTTE PIPE OR TYLER PIPE, OR GALVANIZED STEEL PIPE.
F. AT THE PBC'S OPTION, AND IF PERMITTED BY LOCAL CODES, UNDERGROUND AND/OR ABOVE GRADE INTERIOR DWV PIPING MAY BE SCHEDULE 40 PVC PIPE, MEETING ASTM D2665 WITH "SOLID WALL" PVC MEETING ASTM D1785, WITH DRAINAGE PATTERN FITTINGS JOINED BY SOLVENT CEMENTING OR THERMAL BONDING. INSTALLATION, JOINING, BEDDING, AND HANGER SPACING (100 DEGREES F AMBIENT BASIS) SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS FOR EACH RESPECTIVE PIPING SYSTEM. FOAM CORE PIPE NOT ALLOWED.
   1. VOLATILE ORGANIC COMPOUND (VOC) LEVELS IN ALL MATERIALS AND ACCESSORIES SUCH AS COATING, SOLVENTS, PRIMERS, ADHESIVES, MASTICS, TAPES AND CLOTHS SHALL COMPLY WITH SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) RULE 1168.
   2. (VOC) LEVELS IN AEROSOL ADHESIVES SHALL COMPLY WITH GREEN SEAL STANDARD FOR COMMERCIAL ADHESIVES GS-36 REQUIREMENTS IN EFFECT ON OCTOBER 19, 2000.
G. DWV COPPER PIPE AND FITTINGS MAY BE USED FOR ABOVE GRADE PIPING.
H. INTERIOR, ABOVE GRADE STORM DRAINAGE PIPING, WHEN INDICATED ON THE DRAWINGS, WHERE PERMISSIBLE BY CODE SHALL BE SOLID CORE SCHEDULE 40 PVC PIPE WITH DRAINAGE PATTERN FITTINGS. UNDERGROUND STORM DRAINAGE PIPING WITHIN 5 FEET OF BUILDING LINE SHALL BE SERVICE WEIGHT C.I. SOIL PIPE AS SPECIFIED FOR SANITARY SEWERS OR MAY MATCH ABOVE GRADE PIPING.
I. JOINT SHALL BE PROPERLY PACKED WITH JUTE, OAKUM, OR HEMP AND FILLED WITH MOLTEN LEAD NOT LESS THAN 1" DEEP. LEAD SHALL BE VIRGIN PIG LEAD CONFORMING TO THE STANDARDS OF THE LEAD INDUSTRIES ASSOCIATION. RECLAIMED LEAD SHALL NOT BE USED. SURFACES OF HUB AND SPIGOT SHALL BE CLEANED PRIOR TO JOINT MARK-UP.
J. AT THE CONTRACTOR'S OPTION, COMPRESSION-TYPE NEOPRENE GASKET JOINTS, SUCH AS TYLER'S "TY-SEAL" OR EQUIVALENT, MAY BE USED. JOINTS SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDATIONS UTILIZING THE PROPER GASKET LUBRICANT, SUCH AS TYLER'S "LUBRI/FAST", AND THE PROPER TOOLING TO DRIVE THE SPIGOT INTO THE GASKET HUB. THIS METHOD MUST COMPLY WITH GOVERNING CODES.
K. AT THE PBC'S OPTION, PIPE, FITTINGS, AND JOINTS MAY BE CAST IRON "NO-HUB" DESIGN CONFORMING TO STANDARD 301-72 OF THE CAST IRON SOIL PIPE INSTITUTE WHERE PERMITTED BY GOVERNING CODES. JOINTS SHALL CONSIST OF NEOPRENE GASKETS, CORRUGATED STAINLESS STEEL SHIELD AND WORM GEAR DRAW BANDS. DRAW BANDS SHALL BE TIGHTENED ALTERNATELY WITH THE PROPER TORQUE TOOLS. JOINTS IN STORM PIPING, INCLUDING CONNECTIONS TO ROOF DRAINS, SHALL BE HEAVY DUTY COUPLINGS MEETING ASTM C1540 AND FM 1680, ANACO HUSKY #SD 4000 OR CLAMP-ALL "HI TORQUE" 125 IN. LB. INSTALLATIONS SHALL COMPLY WITH THE MANUFACTURER'S RECOMMENDATIONS AND PAMPHLET 100 OF THE CAST IRON SOIL PIPE INSTITUTE
L. PROVIDE CLEANOUTS AS REQUIRED TO COMPLY WITH GOVERNING CODES. CLEANOUTS AND ACCESSORIES SHALL BE THE PRODUCTS OF JAY R. SMITH, JOSAM, WADE, OR ZURN. CLEANOUTS SHALL BE OF THE SAME SIZE AS THE PIPE SERVED UP TO AND INCLUDING 4 " LINES AND NOT LESS THAN 4" FOR LARGER LINES.
M. CLEANOUTS SHALL BE EXTENDED TO AND FLUSH WITH FINISHED FLOOR. EXTERIOR CLEANOUTS SHALL BE INSTALLED IN AN 18" X 18" X 6" THICK CONCRETE PAD FLUSH WITH FINAL GRADE THICKENED AT THE CENTER TO ENCASE THE PIPE JOINT.
N. PROVIDE FLOOR DRAINS AND SPECIAL PURPOSE DRAINS IN ACCORDANCE WITH THE DRAWINGS. ACCEPTABLE MANUFACTURERS ARE J.R. SMITH JOSAM, WADE, WATTS, AND ZURN.
O. ROOF DRAINS, IF REQUIRED, SHALL BE OF THE SAME MANUFACTURE AS THE FLOOR DRAINS, IF POSSIBLE. . MINIMUM SIZE TO BE SIX (6) INCHES.
P. VERIFY THE INVERT ELEVATION AT THE POINT OF DISCHARGE TO THE EXISTING SEWER SYSTEM AND ALL OTHER RELATED DETAILS PRIOR TO PROCEEDING WITH THE SEWER SYSTEM.
Q. MINIMUM SLOPE OF SANITARY LATERALS OUTSIDE THE BUILDING SHALL BE 2%.
R. WHERE POSSIBLE, CLEANOUTS SHALL NOT BE LOCATED IN THE SALES AREA. CLEANOUTS SHALL BE PROVIDED IN LOCATIONS INDICATED ON THE DRAWINGS AND SHALL BE SPACED PER CODE. PROVIDE A CLEANOUT ON ALL SOIL AND WASTE STACKS; LOCATE EACH STACK CLEANOUT AT 18" TO 36" ABOVE FINISHED GROUND FLOOR. CLEANOUTS SHALL BE INSTALLED WITH ACCESSIBILITY FOR RODDING PURPOSES.
S. THE PBC SHALL BE RESPONSIBLE FOR SELECTING THE PROPER TYPES OF CLEANOUTS, INCLUDING ACCESSORIES AND ACCESS COVERS, FOR EACH CLEANOUT APPLICATION. EACH CLEANOUT INSTALLED SHALL BE COMPATIBLE WITH THE SURROUNDING CONSTRUCTION AND FINISHES.
T. PLUMBING VENTS TERMINATING ON EPDM MEMBRANE ROOFING SYSTEM (OR OTHER SPECIAL ROOFING) SHALL BE INSTALLED AS RECOMMENDED BY THE ROOFING MANUFACTURER. PLUMBING VENTS TERMINATING ON CONVENTIONAL BUILT-UP ROOFING SYSTEM SHALL BE INSTALLED WITH LEAD, COPPER, OR OTHER APPROVED FLASHING. FLASHING SHALL EXTEND A MINIMUM OF 9" AROUND THE VENT PIPE HORIZONTALLY ON THE ROOF, UP THE VENT PIPE, AND TURNED DOWN A MINIMUM OF 1" INSIDE THE VENT.
U. ALL VENTS SHALL CONFORM TO GOVERNING CODES. PBC SHALL COORDINATE WITH THE ROOFER AND GENERAL CONTRACTOR FOR PROPER INSTALLATION.
V. ALL DRAIN OUTLETS SHALL BE THE SAME SIZE AS THE SIZE OF THE CONNECTING PIPING UNLESS OTHERWISE INDICATED ON THE DRAWINGS. DRAINS USED WITH HUB AND SPIGOT CAST IRON PIPE SHALL HAVE CAULKED OUTLET UNLESS OTHERWISE REQUIRED BY GOVERNING CODES.
W. ALL FLOOR DRAINS SHALL BE INSTALLED FLUSH WITH FINISHED FLOOR. ALL FLOOR DRAINS SHALL BE INSTALLED WITH DEEP SEAL P-TRAPS. PROVIDE TRAP SEAL PRIMERS ON ALL FLOOR DRAINS. CONTRACTOR MAY SUBSTITUTE SURESEAL INLINE TRAP SEAL PROTECTORS IF ACCEPTABLE TO LOCAL AUTHORITIES. FLOOR DRAINS SHALL BE PROPERLY LOCATED TO SERVE THE RESPECTIVE EQUIPMENT AND AREAS.
X. THE CONTRACTOR SHALL PROFESSIONALLY CLEAN ALL EXISTING SANITARY SEWER LINES WHICH ARE TO REMAIN AND INSURE THAT THE SYSTEM IS FREE FLOWING FROM ALL PLUMBING FIXTURES.
Y. THIS CONTRACTOR SHALL SCHEDULE PIPE TESTING WITH PROPER AUTHORITIES. REPAIRS OF DEFECTS THAT ARE DISCOVERED AS A RESULT OF INSPECTIONS, OR TESTS SHALL BE MADE WITH NEW MATERIALS. CAULKING OF SCREWED JOINTS, CRACKS OR HOLES WILL NOT BE ACCEPTED. TESTS SHALL BE REPEATED AFTER DEFECTS HAVE BEEN ELIMINATED.
Z. SEWER AND SANITARY PIPE TESTING
   1. WASTE, DRAIN AND VENT - SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH THE GOVERNING PLUMBING CODE, BUT IN NO CASE LESS THAN THE "WATER TEST" METHOD SPECIFIED IN THE INTERNATIONAL PLUMBING CODE. IN GENERAL, ALL PIPING SHALL BE TESTED WITH NOT LESS THAN 10 FEET OF WATER COLUMN EXCEPT THE UPPERMOST TEN (10) FEET OF THE SYSTEM. PIPING EXPOSED TO SUBFREEZING TEMPERATURES MAY BE TESTED BY THE "AIR TEST" METHOD WITH THE APPROVAL OF THE CODE ENFORCING AUTHORITIES.
   2. SEWERS - SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF LOCAL SEWER INSPECTION AUTHORITY. IN GENERAL, THE SEWER UNDER TEST SHALL BE SUBJECT TO A MINIMUM PRESSURE OF TEN (10) FEET WATER COLUMN, OR A FLOW TEST TO BE WITNESSED BE THE SEWER INSPECTOR.

AA. PRIOR TO TESTING, COMPLETED SECTIONS OF SEWER PIPING SHALL BE FLUSHED TO CLEAN AND ASSURE THE ABSENCE OF OBSTRUCTIONS.
BB. THE EXTERIOR OF EXPOSED SEWER PIPING SHALL BE CLEANED AS SPECIFIED FOR WATER PIPING. ALL FLOOR DRAINS, ROOF DRAINS, P-TRAPS, STRAINERS, CLEANOUTS, ACCESS PANELS, AERATORS, PIPING SPECIALTIES, AND SPECIAL FIXTURE AND TRIM SHALL BE THOROUGHLY CLEANED BEFORE BEING TURNED OVER.

SECTION 15300 - DOMESTIC WATER SYSTEMS PIPING

A. FOR DOMESTIC AND FIRE SERVICE, UNDERGROUND MAIN WATER PIPING 3" AND LARGER SHALL BE PUSH-ON JOINT, CEMENT LINED GRAY CAST IRON PIPE AND FITTINGS, ANSI A21.6 (AWWA C106), ANSI A21.10 (AWWA C110) AND ANSI A21.11 (AWWA C111), HAVING ANSI A21.SIX (6) THICKNESS DESIGNATION OF 22, EQUIVALENT CEMENT LINED DUCTILE IRON PIPE AND FITTINGS, OR J-M MANUFACTURING "BLUE BRUTE" CLASS 200.
B. UNDERGROUND WATER PIPING 2-1/2" AND SMALLER SHALL BE TYPE K COPPER TUBING WITH BRAZING-TYPE WROUGHT COPPER FITTINGS (CAST BRONZE WHEN NECESSARY). NOTE: NO WATER LINES SHALL BE RUN UNDER INTERIOR FLOOR SLAB.
C. INTERIOR ABOVE GROUND PIPING SHALL COMPLY WITH THE FOLLOWING:
   1. PIPE - TYPE L OR K COPPER TUBING.
   2. FITTINGS - SOLDER-TYPE WROUGHT COPPER, (CAST BRONZE WHERE NECESSARY)
   3. UNIONS - WROUGHT COPPER SOLDER-JOINT, COPPER - TO - COPPER
D. SOLDER FOR ALL POTABLE WATER PIPING JOINTS SHALL BE LEAD FREE.
E. IF ACCEPTABLE TO LOCAL AUTHORITIES THE CONTRACTOR MAY USE PEX PIPING, WITH ENTIRE SYSTEM OF PIPE AND FITTINGS BY THE SAME MANUFACTURER. ACCEPTABLE MANUFACTURERS ARE WIRSBO AND VIEGA.
F. VACUUM RELIEF VALVES - WILKINS #VR10 FOR WATER SERVICE ON WATER HEATERS INSTALLED ABOVE FIXTURE OUTLETS.
G. WATER PRESSURE REDUCING VALVES - WATTS WITH INTEGRAL STRAINER AND BUILT-IN BYPASS CHECK VALVE FEATURE. TYPE, SIZE AND NO-FLOW SET POINT PRESSURE AS INDICATED ON THE DRAWINGS (IF REQUIRED).
H. SHOCK ARRESTORS
   1. THE PBC SHALL BE RESPONSIBLE FOR THE QUIET OPERATION OF THE WATER SYSTEM.
   2. PROVIDE SHOCK ARRESTORS SIZED AND LOCATED AS PER MANUFACTURER'S RECOMMENDATIONS AND P.D.I., WH-201. AIR CHAMBERS NOT ALLOWED.
   3. MANUFACTURER: J.R. SMITH 5000 SERIES; JOSAM NO. 1450, SIOUX CHIEF, PRECISION PLUMBING PRODUCTS, WADE SHOCK STOPS, W-5 TO W-100 AND WP SERIES.
I. VACUUM BREAKERS
   1. PROVIDE APPROVED VACUUM BREAKERS AS INDICATED, SPECIFIED OR REQUIRED. VACUUM BREAKERS SHALL BE PROVIDED FOR PLUMBING FIXTURES AS SPECIFIED UNDER PLUMBING FIXTURES.
   2. WHEN INDICATED ON THE DRAWINGS, PROVIDE VACUUM BREAKERS AS FOLLOWS: ANGLE PRESSURE TYPE, SLOAN V-300-A, V-188-A, V-350A UP TO 3/4" OR APPROVED EQUAL 1" AND OVER WATTS NO. 9D OR APPROVED EQUAL.
J. TEST PIPING AS NOTED BELOW IN THE PRESENCE OF PROPER AUTHORITIES. REPAIRS OF DEFECTS THAT ARE DISCOVERED AS A RESULT OF INSPECTIONS OR TESTS SHALL BE MADE WITH NEW MATERIALS. TESTS SHALL BE REPEATED AFTER DEFECTS HAVE BEEN ELIMINATED.
K. DOMESTIC HOT AND COLD WATER PIPING
   1. ALL PIPING SHALL BE HYDROSTATICALLY TESTED AT 125 PSI UNTIL LEAK FREE. PRESSURE IN EACH TEST SECTION SHALL BE MAINTAINED AT THE INITIAL TEST PRESSURE FOR NOT LESS THAN 12 HOURS.
   2. ALL LEAKS SHALL BE REPAIRED AND THE PRESSURE TEST SHALL BE REPEATED AS SPECIFIED ABOVE UNTIL PROVEN LEAK-FREE. ALL DEVICES OR ITEMS OF EQUIPMENT NOT DESIGNED OR RECOMMENDED BY THE MANUFACTURER FOR THE TEST PRESSURES SHALL BE REMOVED OR EFFECTIVELY ISOLATED FROM THE TEST PRESSURE.
L. THE PBC SHALL BE RESPONSIBLE FOR THE ENTIRE WATER SERVICE INSTALLATION, INCLUDING THE PAYMENT OF ALL ONE TIME FEES OR CHARGES RELATED TO WATER METERING. THE PBC SHALL DURING BIDDING, CONTACT THE WATER DEPARTMENT TO DETERMINE FEES AND CHARGES AND TO VERIFY ALL REQUIREMENTS. DURING CONSTRUCTION, THE PBC SHALL MAKE ALL NECESSARY NOTIFICATION AND COORDINATE THE WATER SERVICE FOR THE PROJECT ON A TIMELY AND PROPER BASIS. PROVIDE ALL PIPING, VALVES, AND ACCESSORIES AS REQUIRED FOR THE INSTALLATION OF THE WATER METER. IF REQUIRED BY THE WATER DEPARTMENT, THE PBC SHALL FURNISH AND / OR INSTALL THE WATER METER.
M. PROVIDE BACKFLOW PREVENTION DEVICES OR VALVES AS REQUIRED BY CODE OR WATER DEPARTMENT.
N. THE PBC SHALL BE RESPONSIBLE TO PLAN AND COORDINATE THE WATER SERVICE PIPING TO INTERFACE WITH AND COMPLY WITH THE FIRE PROTECTION REQUIREMENTS OF THIS PROJECT. WATER PIPING INSTALLED WITHOUT REGARD TO THESE REQUIREMENTS SHALL BE REWORKED AND/OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.
O. THE INTERIOR OF ALL PIPING SHALL BE CLEANED AS IT IS BEING INSTALLED. SPECIAL CARE SHALL BE TAKEN TO KEEP POTABLE WATER PIPING CLEAN AND FREE OF CONTAMINATING MATERIALS, INCLUDING RODENTS AND VERMIN. PRIOR TO TESTING AND INSULATING, ALL WATER PIPING SHALL BE THOROUGHLY CLEANED AND FLUSHED BY OPENING VALVES AND FAUCETS, ETC., UNTIL THE DISCHARGED WATER IS CLEAN AND CLEAR. THE EXTERIOR OF ALL PLASTER, CONCRETE, CAULKING, AND OTHER LOOSE OR ADHERED FOREIGN MATERIALS.
P. ALL FIXTURES, WATER HEATERS, WATER COOLERS, AND OTHER FIXTURES AND EQUIPMENT SHALL BE THOROUGHLY CLEANED AND SHALL BE CLEAN WHEN TURNED OVER. GUMMED LABELS AND GUM RESIDUE SHALL BE REMOVED UNLESS SUCH LABEL CONSTITUTES NAME PLATE OR PERFORMANCE DATA OR IS THE CERTIFICATION OF A NATIONALLY RECOGNIZED RATING AGENCY SUCH AS U.L., AGA, ASME, ETC.
Q. AFTER ALL CLEANING, TESTING, ADJUSTING, AND INSULATING WORK IS COMPLETED ALL DOMESTIC AND POTABLE HOT AND COLD WATER PIPING SYSTEMS, INCLUDING RELATED TANKS, HEATERS, PUMPS, AND EQUIPMENT, SHALL BE THOROUGHLY DISINFECTED IN ACCORDANCE WITH GOVERNING CODES PRIOR TO PLACING INTO SERVICE FOR POTABLE USE. THE DISINFECTION SHALL BE IN ACCORDANCE WITH AWWA STANDARD C- 601-54 OR C-601-68 FOR PIPING AND AWWA STANDARD D-102-64 FOR TANKS, AND AS REQUIRED BY LOCAL CODES.
R. ALL SHUT OFF VALVES SHALL BE FULL PORT BALL VALVES. GATE VALVES NOT ALLOWED.

SECTION 15400 - PLUMBING FIXTURES AND EQUIPMENT

A. ALL PLUMBING FIXTURES TO BE WHITE.
B. ALL FLUSH VALVES SHALL BE SLOAN OR ZURN AND SHALL BE EQUIPPED WITH APPROVED VACUUM BREAKERS
C. UNLESS OTHERWISE SPECIFIED OR NOTED ON THE DRAWINGS, ALL FITTINGS AND TRIM SHALL BE CHROME PLATED BRASS AND SHALL BE OF THE SAME MANUFACTURER AS THE FIXTURES, INCLUDING P-TRAPS, SUPPLIES, STOPS, AND UNION CONNECTIONS. STRAP WRENCHES SHALL BE USED WHERE REQUIRED TO PREVENT DAMAGE TO CHROME PLATED PIPE FITTINGS.
D. PROVIDE ALL ACCESSORIES AND TRIM AS INDICATED ON THE DRAWINGS. STOP VALVES SHALL BE INSTALLED IN THE HOT AND COLD WATER SUPPLIES TO EACH FIXTURE OR PIECE OF EQUIPMENT. PROVIDE UNION CONNECTION ON THE FIXTURE OR EQUIPMENT SIDE OF EACH STOP VALVE. STOP VALVES SHALL BE NIBCO OR MCGUIRE QUARTER TURN COMMERCIAL BALL VALVES WITH LOOSE KEY HANDLES.
E. ALL FIXTURES SHALL BE SET FIRM AND SQUARELY ALIGNED WITH WALLS AND FLOORS. ALL FIXTURES SHALL BE PROPERLY CONNECTED TO SOIL, WASTE, AND VENT PIPING AND REQUIRED WATER SUPPLIES IN A RIGID AND SUBSTANTIAL MANNER, WITHOUT DAMAGE TO ANY ADJOINING WORK OR FINISH. PROVIDE CHROME PLATED ESCUTCHEONS AT EXPOSED WALL PENETRATIONS FOR ALL PIPING WORK.

SECTION 15490 - FUEL GAS PIPING

A. INSTALLATION SHALL COMPLY WITH THE FOLLOWING STANDARDS:
   1. NATIONAL STANDARDS INSTITUTE (ANSI): ANSI B31.9 - BUILDING SERVICES PIPING CODE.
   2. AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME): ASME B16.3 - MALLEABLE IRON THREADED FITTINGS.
   3. AMERICAN STANDARDS FOR TESTING AND MATERIALS (ASTM):
      a. ASTM A 53 - SPECIFICATION FOR PIPE, STEEL, BLACK AND HOT-DIPPED, ZINC-COATED WELDED AND SEAMLESS.
      b. ASTM A234 - SPECIFICATION FOR PIPE FITTINGS OF WROUGHT CARBON STEEL AND ALLOY STEEL FOR MODERATE AND ELEVATED TEMPERATURES.
   4. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA): NFPA 54 - NATIONAL FUEL GAS CODE.
B. CERTIFICATIONS REQUIRED:
   1. PRODUCT CERTIFICATES: PROVIDE MANUFACTURER'S CERTIFICATION FOR GAS REGULATORS IF REQUIRED BY AUTHORITY HAVING JURISDICTION.
   2. WELDING: PIPE WELDERS SHALL BE CERTIFIED AND BEAR EVIDENCE OF CERTIFICATION 30 DAYS PRIOR TO COMMENCING WORK ON THIS PROJECT.
C. PIPING: BLACK STEEL, STANDARD WEIGHT, SCHEDULE 40 ASTM A 53.
   1. PIPING (4 INCHES AND SMALLER): WELDED OR THREADED WITH MALLEABLE IRON FITTINGS INCLUDING COUPLINGS.
   2. PIPING (5 INCHES AND LARGER): WELDED, WITH BUTT-WELDING FITTINGS.
D. FITTINGS: ASME B16.3, MALLEABLE IRON OR ASTM A234, FORGED STEEL WELDED TYPE.
E. JOINTS: NFPA 54, THREADED OR WELDED TO ANSI B31.9, ASME SECTION 1.
F. GAS VALVES 2" AND SMALLER SHALL BE HOMESTEAD #611, SCREWED IRON BODY WITH BRASS TRIM AND FLAT HEAD. GAS VALVES 2-1/2" AND LARGER SHALL BE HOMESTEAD #612 FLANGED SEMI-STEEL BODY WITH IRON TRIM AND SQUARE HEAD. APPROVED EQUAL ARE FLOWSERVE-NORDSTROM OR RM ENERGY SYSTEMS "HERCULES".
G. GAS PRESSURE REDUCING REGULATORS: IF NECESSARY, PROVIDE COMMERCIAL STYLE REGULATOR MANUFACTURED BY MAXITROL. CAPACITY RANGES SPECIFIED ON THE PLANS ARE GENERAL RANGES. CONTRACTOR SHALL VERIFY WITH REGULATOR MANUFACTURER THE CAPACITY OF A GIVEN REGULATOR AND SELECT SPECIFIC COMPONENTS (E.G. SPRING SIZE, ORIFICE, ETC.) BASED ON SITE-SPECIFIC CRITERIA. CONTRACTOR SHALL NOT ASSUME THAT A GIVEN REGULATOR MODEL IS APPROPRIATE FOR ALL CAPACITIES WITHIN THE GENERAL RANGE SPECIFIED. REGULATORS SHALL HAVE INTERNAL PRESSURE RELIEF VALVES AND SHALL BE LISTED FOR OUTDOOR USE.
H. PROVIDE REGULATORS FOR NATURAL GAS WITH MINIMUM INLET PRESSURE, 1.5 PSI; OUTLET PRESSURE, 7 INCHES WATER COLUMN.
I. PRIME AND PAINT GAS PIPING BEFORE INSTALLATION. SEE SECTION 09900 FOR PAINTING AND FOR TOUCH-UP AT THE JOB SITE. PAINT PIPING ON ROOF OSHA SAFETY YELLOW.
J. PLUMBING CONTRACTOR TO EXTEND GAS PIPING TO GAS APPLIANCES AND INSTALL SHUT-OFF VALVE, DIRT LEG, AND UNION AT EACH APPLIANCE.
K. CONFORM TO NFPA 54, AND APPLICABLE LOCAL CODES.
L. REGULATORS TO BE MOUNTED IN UP-RIGHT POSITION WITH U-TUBE INSTALLED IN VENT TUBE.
M. GAS PIPING SHALL BE INSTALLED TO PROVIDE A MINIMUM OF 6-FOOT CLEARANCE FROM ANY ROOFTOP UNIT.
N. CONTRACTOR MAY UTILIZE EXISTING PIPING BUT IS RESPONSIBLE FOR REPAIRS TO MEET THIS INSTALLATION AND CURRENT CODES AND STANDARDS.
O. ON ROOF UNITS, GAS PIPING SHALL BE INSTALLED SQUARE TO BUILDING LINES AND ROUTED TO CLEAR ALL ACCESS DOORS SO THEY CAN OPEN FULLY.
P. ROOF SHALL BE PROTECTED AGAINST DAMAGE AT ALL TIMES DURING INSTALLATION.
Q. AFTER COMPLETION OF WORK, THE ENTIRE NEW AND EXISTING SYSTEM SHALL BE TESTED. REPAIR ANY NEW OR EXISTING SECTION OF PIPE NOT MEETING TEST.
R. GAS VALVES SHOULD BE TURNED OFF BEFORE TESTING TO PREVENT DAMAGE TO THE RTUS. FOR EACH LINE INTENDED TO BE OPERATED AT PRESSURE OF LESS THAN 1 PSIG, GIVE LEAK TEST AT A PRESSURE OF 25 PSIG OR AS REQUIRED BY LOCAL AUTHORITY IF MORE STRINGENT. FOR EACH LINE INTENDED TO BE OPERATED AT A PRESSURE OF 1 PSIG AND ABOVE, PERFORM LEAK TEST AT A PRESSURE 100 PSIG OR AS REQUIRED BY LOCAL AUTHORITY IF MORE STRINGENT. MAINTAIN FULL TEST PRESSURE FOR 30 MINUTES AND MAKE VISUAL INSPECTION FOR TIGHTNESS OF SYSTEM OR AS REQUIRED BY LOCAL AUTHORITY IF MORE STRINGENT.

SECTION 15700 - ROOFTOP UNITS

A. THE CONTRACTOR SHALL INSTALL UNDER A NATIONAL ACCOUNT ARRANGEMENT A LENNOX L-SERIES ONE PIECE AIR TO AIR DX MECHANICAL COOLING SYSTEM COMPLETE WITH AUTOMATIC CONTROLS. THE EQUIPMENT SHALL BE SHIPPED FACTORY ASSEMBLED, PRE-CHARGED, PIPED AND WIRED INTERNALLY READY FOR FIELD CONNECTIONS, HOWEVER MAY REQUIRE FIELD ASSEMBLY AND/OR INSTALLATION OF SOME ACCESSORIES. MANUFACTURER SHALL TEST THE SYSTEM AT THE FACTORY BEFORE SHIPMENT. SEE RESPONSIBILITY MATRIX ON DRAWINGS TO DETERMINE IF THE CONTRACTOR OR OWNER PURCHASES THE RTU'S, CURBS, AND CONCENTRIC DIFFUSERS.

   LENNOX INDUSTRIES
   ATTN: TERRY BUCHANAN
   2103 SHENLEY PARK LANE
   DULUTH, GA 30097
   PHONE 1-770-225-3528
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   TERRY.BUCHANAN@LENNOXIND.COM

B. SMOKE DETECTORS AND REMOTE TEST STATIONS, IF REQUIRED BY LOCAL CODE, SHALL BE FURNISHED AND MOUNTED BY THE HVAC CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WIRING THE TEST STATIONS AND DUCT SMOKE DETECTORS TO THE HVAC UNIT. THE ALARM VENDOR SHALL WIRE THE SMOKE DETECTORS TO THE BUILDING ALARM SYSTEM.
C. HVAC CONTRACTOR TO INSTALL SAFETY CHAINS ON ALL CONCENTRIC BOXES.
D. ALL EQUIPMENT SHALL BE DEAD LEVEL MOUNTED.
E. THE HAC SHALL BE RESPONSIBLE TO ACCEPT AND UNLOAD ALL HVAC EQUIPMENT, TEST, CHECK AND START UP ALL HVAC EQUIPMENT AND SYSTEMS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
F. OFFICE DEPOT WILL USE THE FOLLOWING SYSTEMS COMMISSIONING CONTRACTOR(S):

   ENTEK
   TEL: 770-449-1222
   FAX: 678-318-3170

G. THE SYSTEMS COMMISSIONING CONTRACTOR WILL BE RESPONSIBLE FOR THE FOLLOWING:
   1. WITNESS THE CONTRACTOR VERIFY PROPER OPERATION OF HVAC UNITS - RECORD PRESSURES, VOLTAGE AND AMPERAGE
   2. VERIFY PROPER INSTALLATION OF ENERGY MANAGEMENT SYSTEMS COMPONENTS
   3. SET LENNOX UNIT CONTROLLER MODULE ADDRESSES.
   4. VERIFY PROPER OPERATION OF UNIT HEATERS
   5. SET-UP LENNOX PRODIGY CONTROLLER WITH BACNET BOARD FOR PROPER OPERATION
   6. VERIFY CO2 SENSOR INSTALLATION AND OPERATION, WHEN APPLICABLE
H. MECHANICAL PRE-CHECKOUT FORM
   1. A FORM WILL BE GIVEN TO THE CONTRACTOR TO BE COMPLETED AND FAXED TO THE SYSTEMS COMMISSIONING CONTRACTOR. IT IS THE RESPONSIBILITY OR THE GENERAL CONTRACTOR TO ENSURE THIS FORM IS COMPLETED AND FAXED A MINIMUM OF ONE WEEK PRIOR TO SCHEDULED VISIT. SHOULD THE SYSTEM BE INCOMPLETE UPON ARRIVAL OF THE COMMISSIONING CONTRACTOR, THE GENERAL CONTRACTOR WILL BE RESPONSIBLE FOR REIMBURSING OFFICE DEPOT FOR ANY ADDITIONAL COST INCURRED. THE CONTRACTORS ARE ALSO RESPONSIBLE FOR ANY CANCELLATION CHARGES INCURRED BY THE COMMISSIONING CONTRACTOR IF ADVANCE TRAVEL PLANS MUST BE ALTERED AFTER THE INITIAL TRIP HAS BEEN SCHEDULED.
I. VENTILATION EQUIPMENT FILTERS SHALL BE REMOVED AT COMPLETION OF WORK IN BUILDING AND REPLACED WITH NEW FILTERS AT SUBSTANTIAL COMPLETION AND PRIOR TO FINAL ACCEPTANCE.
J. EQUIPMENT TESTS SHALL BE PERFORMED IN THE PRESENCE OF THE PROJECT MANAGER AND SHALL BE PERFORMED BY A QUALIFIED SERVICE REPRESENTATIVE OF THE MANUFACTURER OF THE EQUIPMENT BEING TESTED, SUCH AS REFRIGERATION MACHINERY, AUTOMATIC CONTROLS, ETC.
K. ALL EQUIPMENT SHALL BE TESTED WHEN OPERATING UNDER LOAD AT NORMAL OPERATING CONDITIONS PRIOR TO FINAL ACCEPTANCE OF THE WORK.
L. THE HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT SHALL BE TESTED TO DEMONSTRATE:
   1. THAT ALL EQUIPMENT IS IN SATISFACTORY OPERATING CONDITION AND THAT ALL SAFETY AND OPERATING CONTROLS FUNCTION PROPERLY.
   2. THAT ALL HEATING, VENTILATING AND AIR CONDITIONING HANDLING UNITS ARE QUIET AT NORMAL OPERATING CONDITIONS AND DELIVER THE SPECIFIED AIR QUANTITIES AT THE SPECIFIED STATIC PRESSURES.
   3. THAT ROOFTOP UNITS ARE QUIET AT NORMAL OPERATING CONDITIONS AND DELIVER THE SPECIFIED LOAD AT THE SPECIFIED OPERATING CONDITIONS AND THAT ALL OPERATING AND SAFETY CONTROLS FUNCTION PROPERLY UNDER ALL CONDITIONS.
M. OPERATE ALL SUPPLY AND EXHAUST AIR FANS. CHECK ROTATION, ADJUST V-BELT DRIVES AND FAN SPEEDS TO MEET SPECIFIED AIR QUANTITIES AT SPECIFIED STATIC PRESSURES AND SUBMIT TO THE PROJECT MANAGER FOR APPROVAL A SCHEDULE SHOWING AIR QUANTITIES AND STATIC PRESSURE, FAN SPEEDS AND RUNNING AMPERE READINGS VERSUS MOTOR AMPERE RATINGS FOR EACH FAN, AS HEREINAFTER SPECIFIED.
N. LUBRICATE ALL MOTORS AND MACHINERY PRIOR TO OPERATING EQUIPMENT.
O. NO PIPING, DUCTWORK, ETC. SHALL BE BURIED, COVERED OR CONCEALED UNTIL TESTS HAVE BEEN OBSERVED AND APPROVED BY OWNER.
P. BALANCING
   1. THE HAC SHALL OBTAIN THE SERVICES OF AN INDEPENDENT TEST AND BALANCE AGENCY THAT SPECIALIZES IN AND WHOSE BUSINESS IS LIMITED TO THE TESTING AND BALANCING OF AIR DISTRIBUTION SYSTEMS. THE AGENCY SELECTED SHALL BE FULLY CERTIFIED MEMBER OF AABC, NEBB, OR TABB.
   2. TESTING AND BALANCING SHALL BE PERFORMED IN COMPLETE ACCORDANCE WITH AABC STANDARDS FOR FIELD MEASUREMENT AND INSTRUMENTATION FORM NO. 81266, VOLUME ONE, AS PUBLISHED BY THE ASSOCIATED AIR BALANCE COUNCIL.
   3. INSTRUMENTS USED FOR TESTING AND BALANCING OF AIR SYSTEMS MUST HAVE BEEN CALIBRATED WITHIN A PERIOD OF SIX MONTHS PRIOR TO BALANCING. ALL FINAL TEST ANALYSIS REPORTS SHALL INCLUDE A LETTER OF CERTIFICATION LISTING INSTRUMENTATION USED AND LAST DATE OF CALIBRATION.
   4. THREE (3) CERTIFIED COPIES OF THE COMPLETE TEST REPORTS SHALL BE SUBMITTED TO OFFICE DEPOT PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.
   5. NAME OF TEST AND BALANCE AGENCY SHALL BE SUBMITTED FOR APPROVAL BY THE PROJECT MANAGER AND AUTHORITY IN ACCORDANCE WITH REQUIREMENTS OF CONDITIONS OF CONTRACT BY HEATING AND AIR CONDITIONING CONTRACTOR.
   6. THE BALANCE AGENCY SHALL PERFORM THE FOLLOWING TESTS, AND BALANCE OF AIR DISTRIBUTION SYSTEMS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:
      a. TEST AND ADJUST ALL FAN RPM TO DESIGN REQUIREMENTS.
      b. TEST AND RECORD AMPERAGE INPUT TO EACH PHASE OF EACH MOTOR.
      c. MAKE PITOT TUBE TRAVERSE OF MAIN SUPPLY DUCT AND OBTAIN DESIGN CFM AT FANS.
      d. RECORD RPM OF EACH FAN OR MOTOR.
      e. TEST AND RECORD SYSTEM STATIC PRESSURES, SUCTION AND DISCHARGE.
      f. TEST AND ADJUST SYSTEM FOR DESIGN RECIRCULATED AIR, CFM.
      g. RECORD OUTLET VELOCITY OF EACH FAN OR MOTOR.
      h. TEST AND ADJUST SYSTEM FOR DESIGN OUTSIDE AIR.
      i. TEST AND RECORD ENTERING AIR TEMPERATURES (D.B. HEATING AND COOLING).
      j. TEST AND RECORD ENTERING AIR TEMPERATURES (W.B. COOLING)
      k. TEST AND RECORD LEAVING AIR TEMPERATURES (D.B. HEATING AND COOLING).
      l. TEST AND RECORD LEAVING AIR TEMPERATURES (W.B. COOLING).
      m. ADJUST ALL MAIN SUPPLY AND RETURN AIR DUCTS TO PROPER DESIGN CFM.
      n. ADJUST ALL ZONES TO PROPER DESIGN CFM, SUPPLY AND RETURN.
      o. TEST AND RECORD BTU CAPACITY OF REFRIGERATION COMPRESSOR.
      p. TEST AND RECORD BTU CAPACITY OF REFRIGERATION CONDENSER.
      q. RECORD FACE VELOCITY OF COOLING COILS.
      r. TEST AND ADJUST EACH DIFFUSER, GRILLE AND REGISTER TO WITHIN 10% OF DESIGN REQUIREMENTS.
   7. EACH GRILLE, DIFFUSERS AND REGISTER SHALL BE IDENTIFIED AS TO LOCATION AND AREA.
   8. SIZE, TYPE AND MANUFACTURER OF DIFFUSERS, GRILLES, REGISTERS AND ALL TESTED EQUIPMENT SHALL BE IDENTIFIED AND LISTED. MANUFACTURER'S RATINGS ON ALL EQUIPMENT SHALL BE USED TO MAKE REQUIRED CALCULATIONS.
   9. READINGS AND TESTS OF DIFFUSERS, GRILLES AND REGISTERS SHALL INCLUDE REQUIRED FPM VELOCITY AND TEST RESULTANT VELOCITY, REQUIRED CFM AND TEST RESULTANT CFM AFTER ADJUSTMENTS.
   10. ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE ADJUSTED TO MINIMIZE DRAFTS IN ALL AREAS.
   11. AS A PART OF THE WORK OF THIS CONTRACT, THE HEATING AND AIR CONDITIONING CONTRACTOR SHALL MAKE ANY CHANGES IN THE PULLEYS, BELTS AND DAMPERS OF THE ADDITION OF DAMPERS REQUIRED FOR CORRECT BALANCE AS RECOMMENDED BY AIR BALANCE AGENCY, AT NO ADDITIONAL COST TO AUTHORITY.
Q. FINAL ADJUSTMENT
   1. ALL MOTORS, BEARINGS, ETC. SHALL BE OILED OR GREASED BEFORE BEING PUT INTO SERVICE AND AGAIN AS REQUIRED BEFORE FINAL ACCEPTANCE.
   2. ALL MOTORS CHECK FOR ALIGNMENT OF BELTS, NOISE, DIRECTION OF ROTATIONS, ETC.
R. FINAL TEST
   1. ALL TESTS SHALL BE PERFORMED IN PRESENCE OF PROJECT MANAGER'S REPRESENTATIVE.
   2. ALL PIPE SHALL BE TESTED AND BE FREE FROM LEAKS.
   3. ALL SAFETY DEVICES SHALL BE TESTED FOR CORRECT OPERATION.
   4. CHECK ALL ITEMS UNDER "FINAL ADJUSTMENT" AND "BALANCING" FOR COMPLETION AND CORRECT OPERATION.
   5. HAC SHALL HAVE FACTORY REPRESENTATIVE OF ROOFTOP UNITS GIVE OWNER'S REPRESENTATIVE COMPLETE INSTRUCTIONS ON OPERATION AND MAINTENANCE OF THEIR EQUIPMENT. ALSO, FURNISH PRINTED INSTRUCTIONS FOR A PERMANENT RECORD FOR OWNER. CONTRACTOR SHALL INSTRUCT OPERATING PERSONNEL IN ALL PHASES OF HEATING AND VENTILATING OPERATION. THE TIME OF INSTRUCTION SHALL NOT BE THE SAME AS THE TIME OF TESTING, CLEANING AND ADJUSTING, BUT SHALL BE AFTER THE RESPECTIVE EQUIPMENT HAS BEEN PLACED IN PROPER OPERATION, TESTED AND ADJUSTED AS SPECIFIED.

SECTION 15750 - GAS UNIT HEATERS

A. OWNER SHALL PROVIDE AND THE CONTRACTOR SHALL INSTALL UNDER A NATIONAL ACCOUNT ARRANGEMENT GAS FIRED UNIT HEATERS AS INDICATED AND SCHEDULED ON THE DRAWINGS AND IN ACCORDANCE WITH THIS SECTION.
B. EACH UNIT SHALL BE CONTROLLED BY AN INDIVIDUAL THERMOSTAT WHICH SHALL CONTROL THE FAN AND BURNER. UNIT HEATERS SHALL NOT BE CONNECTED TO THE ENERGY MANAGEMENT SYSTEM. UNITS SHALL HAVE ALUMINIZED STEEL HEAT EXCHANGER, SPARK IGNITED PILOT WITH ELECTRONIC FLAME SUPERVISION AND 100% SAFETY SHUT OFF, AUTOMATIC GAS VALVE, PRESSURE REGULATOR, TRANSFORMER, HIGH LIMIT AND FAN DELAY CONTROLS, GAS COCK, AND PILOT VALVE. PROVIDE FULL SIZE DIRT LEG (6" LENGTH), STOP VALVE, AND UNION CONNECTION FOR GAS SUPPLY TO EACH UNIT.
C. EXCEPT FOR DUCTED UNITS, PROVIDE HORIZONTAL LOUVERS ON ALL UNITS.
D. UNITS SHALL BE UL LISTED AND AGA CERTIFIED. MANUFACTURER'S STANDARD WARRANTY SHALL APPLY.
E. GAS VENTS: DOUBLE-WALL GAS VENTS COMPLYING WITH NFPA 211, TYPE B. INNER PIPE OF SHEET ALUMINUM, OUTER PIPE OF GALVANIZED-STEEL SHEET, EACH WITH THE FOLLOWING MINIMUM THICKNESSES:
   1. ROUND, 6-INCH (152-MM) AND SMALLER ID: 0.012-INCH (0.30-MM) INNER PIPE, 0.0187-INCH (0.5-MM) OUTER PIPE
   2. ROUND, 7- TO 18-INCH (178- TO 457-MM) ID: 0.014-INCH (0.36-MM) INNER PIPE, 0.0187-INCH (0.5-MM) OUTER PIPE.
F. GAS FLUE ACCESSORIES: TEES, ELBOWS, INCREASERS, DRAFT HOOD CONNECTORS, METAL CAP WITH BIRD BARRIER, ADJUSTABLE ROOF FLASHING, STORM COLLAR, SUPPORT ASSEMBLY, THIMBLES, FIRESTOP SPACERS, AND FASTENERS; FABRICATED OF SIMILAR MATERIALS AND DESIGNS AS VENT-PIPE STRAIGHT SECTIONS.
H. INSTALL VENTS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. LOCATE TO COMPLY WITH MINIMUM CLEARANCES FROM COMBUSTIBLES.
I. INSTALL, SUPPORT, AND RESTRAIN VENTS ACCORDING TO REQUIREMENTS OF SEISMIC ZONE.
J. EXCEPT AS NOTED ON THE DRAWINGS, UNITS SHALL BE INSTALLED AS CLOSE TO THE ROOF DECK AS PRACTICAL FOR MAXIMUM CLEARANCE TO FLOOR. PROVIDE SUPPORTING STEEL MEMBERS AND HARDWARE AS REQUIRED TO SECURE THE UNITS.

SECTION 15760 - ELECTRIC UNIT HEATERS

A. OWNER SHALL PROVIDE AND THE CONTRACTOR SHALL INSTALL UNDER A NATIONAL ACCOUNT ARRANGEMENT ELECTRIC UNIT HEATERS AS INDICATED AND SCHEDULED ON THE DRAWINGS AND IN ACCORDANCE WITH THIS SECTION.
B. EACH UNIT SHALL BE CONTROLLED BY AN INDIVIDUAL THERMOSTAT WHICH SHALL CONTROL THE FAN AND ELECTRIC HEATING COIL. UNIT HEATERS SHALL NOT BE CONNECTED TO THE ENERGY MANAGEMENT SYSTEM. THE UNIT'S ELECTRIC ELEMENT SHALL CONSIST OF A HELICALLY COILED NICKEL CHROMIUM ALLOY RESISTANCE WIRE EMBEDDED AND COMPLETELY SURROUNDED IN MAGNESIUM OXIDE, ENCLOSED IN CORROSION RESISTANT SHEATHS AND PERMANENTLY ATTACHED TO CORROSION RESISTANT STEEL FINS. MOTORS SHALL BE TOTALLY ENCLOSED INDUSTRIAL TYPE PERMANENTLY LUBRICATED AND EQUIPPED WITH THERMAL OVERLOAD PROTECTION WITH AUTOMATIC RESET. AFTER THE THERMOSTAT HAS BEEN SATISFIED, THE FAN SHALL CONTINUE TO RUN UNTIL RESIDUAL HEAT HAS BEEN DISSIPATED
C. ELECTRIC HEATERS SHALL BE EQUIPPED WITH AN AUTOMATIC RESET THERMAL CUTOUT WHICH DISCONNECTS ELEMENTS AND MOTORS IN THE EVENT NORMAL OPERATING TEMPERATURES ARE EXCEEDED.
D. CONTRACTORS, RELAYS AND CONTROL TRANSFORMERS SHALL BE FACTORY ASSEMBLED AND WIRED FOR 24-V CONTROL CIRCUIT.
E. UNITS SHALL BE UL LISTED AND DESIGNED FOR INDOOR USE. INSTALLATION SHALL MEET APPLICABLE REQUIREMENTS OF THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE. MANUFACTURER'S STANDARD WARRANTY SHALL APPLY. EQUIPMENT SHALL BE TESTED IN ACCORDANCE WITH ANSI AND AGA.
F. EXCEPT AS NOTED ON THE DRAWINGS, UNITS SHALL BE INSTALLED AS CLOSE TO THE ROOF DECK AS PRACTICAL FOR MAXIMUM CLEARANCE TO FLOOR. PROVIDE SUPPORTING STEEL MEMBERS AND HARDWARE AS REQUIRED TO SECURE THE UNITS.

SECTION 15770 - ELECTRIC BASEBOARD HEATERS

A. OWNER SHALL PROVIDE AND THE CONTRACTOR SHALL INSTALL UNDER A NATIONAL ACCOUNT ARRANGEMENT ELECTRIC BASEBOARD HEATERS AS INDICATED AND SCHEDULED ON THE DRAWINGS AND IN ACCORDANCE WITH THIS SECTION.
B. EACH UNIT SHALL BE CONTROLLED BY AN INTEGRAL THERMOSTAT WHICH SHALL CONTROL THE ELECTRIC HEATING ELEMENT. BASEBOARD HEATERS SHALL NOT BE CONNECTED TO THE ENERGY MANAGEMENT SYSTEM.
C. THE UNIT ENCLOSURE CONTROL BOXES, SUPPORT BRACKETS, AND FRONT COVER CONSTRUCTION SHALL BE STEEL THE UNIT'S ELECTRIC HEATING ELEMENT WIRE SHALL CONSIST OF 80% NICKEL, 20% CHROMIUM AND SHALL BE ENCASED IN A STEEL SHEATH WITH ALUMINUM HEAT RADIATION FINS. THE ALUMINUM FINS SHALL BE SO DESIGNED TO BLOCK HEAT TO THE BACK AND FRONT OF THE HEATER BODY AND SHALL BE PRESSURE BONDED TO THE STEEL SHEATH.
D. ELECTRIC HEATERS SHALL BE EQUIPPED WITH AN AUTOMATIC RESET THERMAL CUTOUT WHICH DISCONNECTS ELEMENTS AND MOTORS IN THE EVENT NORMAL OPERATING TEMPERATURES ARE EXCEEDED.
E. UNITS SHALL BE UL LISTED AND DESIGNED FOR INDOOR CONTINUOUS USE. INSTALLATION SHALL MEET APPLICABLE REQUIREMENTS OF THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE. MANUFACTURER'S STANDARD WARRANTY SHALL APPLY. EQUIPMENT SHALL BE TESTED IN ACCORDANCE WITH ANSI.

SECTION 15810 - AIR DISTRIBUTION SYSTEMS & ACCESSORIES

A. ALL DUCTWORK SHALL BE FABRICATED TO CONFORM TO ASHRAE AND SMACNA STANDARDS, LATEST REVISIONS. ALL SHEETMETAL DUCTWORK SHALL BE RECTANGULAR UNLESS OTHERWISE UNLESS OTHERWISE NOTED.
B. EXCEPT FOR CONCENTRIC DROP BOXES FOR THE MAIN SALES AREA ROOFTOP UNITS, ALL EXPOSED DUCTWORK SHALL BE MOUNTED AS HIGH AS POSSIBLE. CONCEALED DUCTWORK SHALL BE MOUNTED AT 13'-0" A.F.F. UNLESS OTHERWISE NOTED.
C. DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEET STEEL UNLESS NOTED. CROSS BREAKING OF DUCT SIDES REQUIRED IN ALL SIZES. GAUGES OF METAL TYPE OF JOINTS, BRACING, ETC., IN RELATION TO SIZE OF DUCT SHALL COMPLY WITH THE SCHEDULE ON THE DRAWINGS.
D. FURNISH AND INSTALL MANUAL LOCKING QUADRANT VOLUME CONTROL DAMPERS IN EACH BRANCH DUCT TO FACILITATE AIR BALANCING. DAMPER ACCESSORIES SHALL BE RUSKIN OR APPROVED EQUAL.
E. FLEXIBLE COLLARS SHALL BE PROVIDED IN ALL CONNECTIONS BETWEEN FANS AND DUCTS OR CASINGS, WHERE REQUIRED TO PREVENT EXCESSIVE MOVEMENT OF LONG DUCTS AND WHEREVER DUCTS CROSS BUILDING EXPANSION JOINTS. COLLARS SHALL BE MADE OF NEOPRENE COATED GLASS FABRIC WEIGHING APPROXIMATELY 30 OUNCES PER SQUARE YARD, OR FIRE, WATER AND WEATHER RESISTANT COTTON DUCT HAVING A FINISHED WEIGHT OF APPROXIMATELY 20 OUNCES PER SQUARE YARD AS MANUFACTURED BY VENT-FAB OR APPROVED EQUAL.
F. COLLARS SHALL BE APPROXIMATELY 4" LONG AND SHALL BE INSTALLED WITH JUST SUFFICIENT SLACK TO PREVENT TRANSMISSION OF VIBRATION. CIRCULAR COLLARS SHALL BE SEALED TO FANS AND DUCTS WITH 12-GAUGE METAL BANDS 1" WIDE. RECTANGULAR COLLARS SHALL BE SECURED TO DUCTS AND FANS WITH 1" X 1/8" FLAT BARS FASTENED WITH SCREWS OR BOLTS AT 8" INTERVALS OR WITH SLIP JOINTS SIMILAR TO THOSE SPECIFIED FOR DUCT JOINTS, THE FABRIC BEING TIGHTLY CRIMPED INTO THE SLIP JOINT AND THE COMPLETE JOINT BEING FASTENED WITH SHEETMETAL SCREWS AT 8" INTERVALS. COLLARS SHALL NOT BE PAINTED. METAL FOR FASTENING COLLARS SHALL BE THE SAME AS SPECIFIED FOR DUCTS AND BRACING.
G. FLEXIBLE DUCT SHALL BE R-6 THERMAFLEX TYPE "M-KE" OR APPROVED EQUAL. PROVIDE FLEXRIGHT SUPPORTS FOR ALL BENDS. PROVIDE TAKE-OFF FITTINGS AS MANUFACTURED BY FLEXMASTER MODEL STO, OR APPROVED EQUAL.
H. TAKE-OFF FITTINGS SHALL CONTAIN BALANCING DAMPERS. DAMPERS SHALL BE FACTORY INSTALLED WITH SPRING LOADED RETRACTABLE BEARING AND A POSITIVE LOCKING WING NUT FOR READJUSTMENT. TAKE-OFF FITTINGS SHALL BE SMC SUPER HETO WITH 2" STANDOFF AND DAMPER OR APPROVED EQUAL.
I. PROVIDE PRIMARY FIRE DAMPERS WHERE INDICATED OR REQUIRED. DAMPERS SHALL BE ADAPTED TO HORIZONTAL OR VERTICAL FLOW OF AIR AS REQUIRED. FIRE DAMPERS SHALL MEET THE REQUIREMENTS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS AND SHALL BE UL LABELED. PROVIDE ACCESS DOORS INTO DUCT AND ADJACENT WALL OR CEILING AT EACH FIRE DAMPER. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING FIRE DAMPERS TO COMPLY WITH THE FOLLOWING REQUIREMENTS:
   1. AT EACH OPENING THROUGH A REQUIRED FIRE PARTITION.
   2. AT EACH OPENING THROUGH A REQUIRED ENCLOSURE OF A VERTICAL OPENING.
   3. AT EACH DIRECT OUTLET WHERE A DUCT SYSTEM SERVES TWO OR MORE FLOORS.
   4. AT THE JUNCTION OF EACH BRANCH WHERE A DUCT SYSTEM SERVES TWO OR MORE FLOORS.
   5. AT EACH OPENING THROUGH A REQUIRED FIRE WALL.
   6. FIRE DAMPERS FOR VERTICAL INSTALLATIONS SHALL BE PREFCO PRODUCTS, INC. "MODEL 5500" E2 THIN-LINE AND "MODEL 5500" SF WITH FRAME BC FOR HORIZONTAL INSTALLATION WITH 165 FUSIBLE LINK, INTERLOCKING SHUTTER TYPE BLADES IN A 10-GAUGE AIRTIGHT STEEL FRAME. DAMPER ASSEMBLY SHALL BE 2" WIDE IN DIRECTION OF AIR FLOW FOR VERTICAL DAMPERS AND WHEN OPEN SHALL OFFER A MINIMUM RESISTANCE TO AIR FLOW. FREE AREA THRU VERTICAL DAMPERS SHALL NOT BE LESS THAN 75% OF DUCT AREA AND 100% FOR HORIZONTAL INSTALLATIONS. PROVIDE SHEETMETAL SLEEVE FOR EACH FIRE DAMPER AS PER NFPA REQUIREMENTS.
J. GRILLES AND DIFFUSERS SHALL BE METALAIRE, TITUS OR EQUIVALENT.
K. INSULATION SHALL BE APPLIED IN A NEAT AND WORKMANLIKE MANNER BY MECHANICS EXPERIENCED AND SKILLED IN THIS TYPE OF WORK. CONTRACTOR SHALL BE REQUIRED TO REMOVE AND REPLACE ALL INSULATION NOT APPLIED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS, OR NOT PRESENTING A NEAT APPEARANCE, ALL AS JUDGED BY THE OFFICE DEPOT PROJECT MANAGER.
L. NOTE: DUCT SIZES SHOWN ON DRAWINGS ARE THE CLEAR INSIDE DIMENSIONS AFTER APPLICATION OF INTERNAL DUCT LINER WHERE REQUIRED.
M. RECTANGULAR SUPPLY AND RETURN DUCTWORK IN CONCEALED AREAS SHALL BE INTERNALLY INSULATED WITH R-6 1-1/2" DUCT LINER, 1-1/2 LB. DENSITY LONG TEXTILE FIBER DUCT LINER AS MANUFACTURED BY OWENS-CORNING. COATING SHALL BE UL RATED FOR FLAME SPREAD LESS THAN 25 AND SMOKE DEVELOPED LESS THAN 50.
N. ROUND AND OVAL DUCTS IN CONCEALED AREAS WHEN ALLOWED, SHALL RECEIVE 2" THICK R-6 OWENS-CORNING FRK VAPOR BARRIER FACED ALL SERVICE DUCT WRAP, OR EQUIVALENT BY J-M OR CERTAINTEED. INSULATION SHALL BE ADHERED TO METAL AT 8" O.C. WITH FOSTER'S 85-15 BONDING ADHESIVE. LONGITUDINAL AND CIRCUMFERENTIAL JOINTS SHALL BE SECURED WITH 9/16" FLARE DOOR STAPLES AT 6" O.C. AND TAPED WITH 3" WIDE (MIN.) FOIL REINFORCED KRAFT TAPE. ALL PENETRATIONS OF FACING SHALL ALSO BE TAPED. COMPLY WITH MANUFACTURER'S SPECIFICATIONS FOR INSTALLATION.
O. ALL DUCT INSULATION SHALL HAVE AN INSTALLED R-VALUE OF AT LEAST 6.0, OR SHALL BE HIGHER WHEN REQUIRED BY APPLICABLE ENERGY CODE OR OTHER REGULATION.
P. REPLACE ALL AIR FILTERS IMMEDIATELY PRIOR TO OCCUPANCY.
Q. THE SIZE AND LOCATION OF ALL DUCTWORK IS SHOWN ON THE DRAWINGS. IF MEASUREMENTS IN THE FIELD INDICATE THAT CLEARANCES ARE INADEQUATE TO PASS THE DUCTS AS SHOWN, THE DUCTS MAY BE RESIZED OR RELOCATED SUBJECT TO THE APPROVAL OF THE PROJECT MANAGER OR OFFICE DEPOT. WHERE NECESSARY TO AVOID CONFLICT WITH THE WORK OF OTHER TRADES, THE LOCATION OF THE DUCTS MAY BE ALTERED SLIGHTLY FROM THAT SHOWN ON THE DRAWINGS, SUBJECT TO THE WRITTEN APPROVAL OF OFFICE DEPOT PROJECT MANAGER. WHERE DIMENSIONS ARE NOT SHOWN ON THE DRAWINGS, DUCTS ARE TO BE SIZED TO FIT THE EQUIPMENT.
R. ALL SEAMS AND JOINTS IN SUPPLY, RETURN, AND EXHAUST DUCTS SHALL BE SEALED IN ACCORDANCE WITH INTERNATIONAL ENERGY CONSERVATION CODE.
S. TURNS IN DUCTWORK SHALL BE MADE WITH LARGE THROAT RADII WHERE POSSIBLE AND WHERE SQUARE TURNS ARE USED PROVIDE SINGLE THICKNESS TURNING VANES CONFORMING TO THE LATEST SMACNA STANDARD.
T. ALL HORIZONTAL DUCTWORK SHALL BE ADEQUATELY SUPPORTED FROM THE BUILDING STRUCTURE ABOVE BY MEANS OF 1/8" X 1" SHEETMETAL HANGERS CONSTRUCTED OF SAME MATERIAL AS SUPPORTED DUCTWORK AND SPACED AT REGULAR INTERVALS NOT EXCEEDING 6-FT. VERTICAL DUCTWORK SHALL BE SUPPORTED FROM BUILDING STRUCTURE BY MEANS OF STRUCTURAL STEEL BRACES. NO WOOD SHALL BE USED TO SUPPORT OR BRACE DUCTS.
U. WHERE DUCTS PASS THROUGH ROOFS, FLOORS, WALLS AND PARTITIONS, PROVIDE 1-1/2" X-1/2" X 1/8" STEEL ANGLE FRAMES AT EACH SIDE OF OPENING. THE ANNULAR SPACE BETWEEN DUCT AND ANGLE FRAMES SHALL BE CAULKED WITH FOAM ROPE AND SILICONE SEALANT.
V. ALL JOINTS IN ROUND DUCT SHALL BE TAPED WITH TAPES AND MASTICS LISTED AND LABELED IN ACCORDANCE WITH UL 181A. JOINTS SHALL BE RIVETED OR CONNECTED WITH SHEETMETAL SCREWS.
   1. VOLATILE ORGANIC COMPOUND (VOC) LEVELS IN ALL INSULATING MATERIALS AND ACCESSORIES SUCH AS COATING, ADHESIVES, MASTICS, TAPES AND CLOTHS SHALL COMPLY WITH SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) RULE 1168.
   2. (VOC) LEVELS IN AEROSOL ADHESIVES SHALL COMPLY WITH GREEN SEAL STANDARD FOR COMMERCIAL ADHESIVES GS-36 REQUIREMENTS IN EFFECT ON OCTOBER 19, 2000.
W. DUCT TRANSITION, ETC., SHALL BE GRADUAL NOT EXCEEDING 15% SLOPE ON SIDE UNLESS SPECIFICALLY SHOWN OTHERWISE. IN GENERAL, STRUCTURAL MEMBERS, PIPES, ETC., SHALL NOT PASS THROUGH DUCTWORK. IF SUCH A CONDITION ARISES, DUCT SHALL BE INCREASED IN SIZE TO MAINTAIN ORIGINAL CROSS SECTIONAL AREA. ANY CHANGE IN SHAPE OR DIRECTION REQUIRED, BUT NOT SHOWN, WILL BE INSTALLED WITH GRADUAL TRANSITIONS AND TURNING VANES NOT LESS THAN 4" APART. EACH TURNING VANE SHALL BE CONSTRUCTED SO THAT THE LEAVING AIR EDGE SHALL EXTEND BEYOND THE INSIDE EDGE OF THE ENTERING AIR DUCT.
X. PROVIDE ACCESS PANELS FOR ALL DAMPERS OR EQUIPMENT IN DUCTWORK AND SUITABLE OPENINGS FOR ANEMOMETER READINGS AS DIRECTED BY OFFICE DEPOT PROJECT MANAGER. THE MECHANICAL ENGINEER SHALL BE REQUIRED TO REVIEW AND APPROVE ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS.
Y. FLEXIBLE DUCT SHALL BE INSTALLED IN ACCORDANCE WITH THE INSTALLATION INSTRUCTIONS AS DESCRIBED IN THEIR PUBLICATIONS. FLEXIBLE DUCT SHALL NOT BE OVER 6'-0" IN LENGTH (VERTICAL) AT ANY ONE DIFFUSER CONNECTION AND SHALL BE USED ONLY FOR SINGLE DIFFUSER DROPS.

SECTION 15900 - ENERGY MANAGEMENT SYSTEM (EMS)

A. SEE DRAWINGS FOR EMS ITEMS FURNISHED BY OFFICE DEPOT AND SCOPE OF EMS WORK.
B. SEE SPECIFICATION SECTION 16210 FOR ELECTRICAL REQUIREMENTS FOR EMS AND COMMISSIONING CONTRACTOR CONTACT INFORMATION.
C. THE MECHANICAL CONTRACTOR SHALL COMPLETE THE OFFICE DEPOT MECHANICAL PRE-VISIT CHECKLIST FORM AND SEND IT TO THE COMMISSIONING CONTRACTOR AS DIRECTED. THE CONTRACTOR IS RESPONSIBLE FOR THE COMPLETION OF ALL REQUIREMENTS IN THE CHECKLIST. (THE CHECKLIST WILL BE INCLUDED IN THE BID PACKAGE.)

SPRINKLER WORK

A. THE CONTRACTOR SHALL MODIFY THE EXISTING SPRINKLER SYSTEM AS REQUIRED TO ACCOMMODATE THE BUILDING ALTERATIONS.
   THE MODIFIED SPRINKLER SYSTEM SHALL BE A COMPRESSED AIR FOR EXTERIOR AREAS AS APPLICABLE.
   THE WORK CONSISTS OF FURNISHING ALL LABOR, MATERIALS, TOOLS, EQUIPMENT SERVICES AND SUPERVISION REQUIRED TO INSTALL, TEST AND PLACE INTO SERVICE A COMPLETE FIRE PROTECTION SYSTEM IN STRICT ACCORDANCE WITH THIS SPECIFICATION, ALL APPLICABLE DRAWINGS AND GOVERNING CODES AND REGULATIONS.
   THE SPRINKLER CONTRACTOR SHALL BE THE PROFESSIONAL OF RECORD FOR ALL SPRINKLER WORK PERFORMED UNDER THIS CONTRACT. THE FIRE PROTECTION SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), INDUSTRIAL RISK INSURANCE (IRI), LANDLORD'S INSURANCE UNDERWRITER AND ALL LOCAL AUTHORITIES HAVING JURISDICTION.
   TESTING OF THE SPRINKLER SYSTEM SHALL BE PERFORMED ACCORDING TO LOCAL CODES AND PRACTICES AND MUST BE WITNESSED BY THE LANDLORD'S REPRESENTATIVE AND/OR A REPRESENTATIVE OF THE LOCAL FIRE MARSHAL'S OFFICE.
B. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AND PAYING FOR ALL REQUIRED APPROVALS AND PERMITS INCLUDING LANDLORD'S CONNECTION FEES AND APPROVAL WHEN REQUIRED.
   THIS CONTRACTOR SHALL PREPARE DETAILED SHOP DRAWINGS OF THE SYSTEM AND SHALL SUBMIT REQUIRED SHOP DRAWINGS FOR REVIEW AND APPROVAL TO LOCAL AUTHORITIES AND THE LANDLORD'S REPRESENTATIVE.
   THE SYSTEM DESIGN CRITERIA PER NFPA 13 SHALL BE:
   PRE-SALES AREA:
      DENSITY - 0.30 GPM/SF
      AREA - 2000 SF
      HOSE ALLOWANCE - 500 GPM
      CLASSIFICATION - HIGH
      K-FACTOR - 11.2
      TYPE - STANDARD RESPONSE
   SALES AREA:
      DENSITY - 0.24 GPM/SF
      AREA - 2000 SF
      HOSE ALLOWANCE - 500 GPM
      CLASSIFICATION - HIGH
      K-FACTOR - 11.2
      TYPE - STANDARD RESPONSE
   OFFICE AREA:
      DENSITY - 0.10 GPM/SF
      AREA - 1500 SF
      HOSE ALLOWANCE - 100 GPM
      CLASSIFICATION - ORDINARY
      K-FACTOR - 5.6
      TYPE - QUICK RESPONSE
D. THE SYSTEM SHALL BE HYDRAULICALLY CALCULATED BASED ON THE REQUIRED COVERAGE, SUBJECT TO THE APPROVAL OF THE DESIGN BY THE LANDLORD'S INSURANCE UNDERWRITER AND LOCAL AUTHORITIES.
E. SPRINKLER MAINS AND BRANCHES:
   ALL SPRINKLER PIPING SHALL BE SCHEDULE 40 BLACK STEEL. LIGHTWEIGHT SPRINKLER PIPING SUCH AS SCHEDULE 10 ASTM A-135 MAY BE USED ONLY IF ALLOWED BY LANDLORD AND LOCAL AUTHORITIES.
   FITTINGS SHALL BE THREADED, CLASS 175. MECHANICAL COUPLINGS AND TEES OF THE ROLLED GROOVE TYPE WILL BE ACCEPTED IN LIEU OF THREADED FITTINGS ONLY IF THEY ARE BOTH U.L. AND FIRE MARSHAL LISTED AND APPROVED.
   ALL SPRINKLER PIPING SHALL BE INSTALLED TO BE CONCEALED UNLESS OTHERWISE INDICATED. ALL PIPING SHALL BE LOCATED TO AVOID INTERFERENCE WITH THE PIPING AND/OR EQUIPMENT OF OTHER TRADES. THIS CONTRACTOR SHALL COORDINATE WITH THE OTHER TRADES AS REQUIRED PRIOR TO START OF WORK TO AVOID CONFLICTS AND ANY RESULTANT DELAY OF THE PROJECT.
   SUPPORT HORIZONTAL PIPING WITH APPROVED SWIVEL SPLIT RING HANGERS WITH ROD SUPPORTS. PROVIDE ANTI-SWAY BRACING AT EVERY THIRD HANGER. HANGER SPACING FOR 1-1/4" PIPING AND SMALLER SHALL BE 10'-0" o.c. MAXIMUM; SPACING FOR 1-1/2" AND LARGER PIPING SHALL BE 15'-0" o.c. MAXIMUM.
   ALL SPRINKLER PIPING SHALL BE ROUTED AND INSTALLED SO THAT IT CAN BE THOROUGHLY DRAINED, AND WHERE PRACTICAL, ARRANGED TO DRAIN TO THE MAIN VALVE.
F. VALVES:
   DRAIN AND TEST VALVES SHALL BE THREADED BRONZE GLOBE VALVES.
G. SPRINKLER HEADS:
   SPRINKLER HEADS SHALL MATCH EXISTING.
H. THE FIRE PROTECTION SYSTEM SHALL BE CLEANED, TESTED AND SANITIZED PRIOR TO FINAL CONNECTION TO LANDLORD'S SYSTEM.
I. THIS CONTRACTOR SHALL TEST THE COMPLETED PIPING SYSTEM (WITHOUT SPRINKLER HEADS) AT 200 PSI FOR A MINIMUM OF TWO (2) HOURS. IF LEAKS APPEAR THE SYSTEM SHALL BE DRAINED, REPAIRED AND RE-TESTED. INSTALL SPRINKLER HEADS UPON COMPLETION OF TESTING.
J. UPON COMPLETION OF THE SYSTEM INSTALLATION THIS CONTRACTOR SHALL PROVIDE A MATERIAL TEST AND CERTIFICATION FORM TO THE LOCAL FIRE MARSHAL, BUILDING DEPARTMENT, THE LANDLORD'S CONSTRUCTION COORDINATOR AND THE LANDLORD'S INSURANCE CARRIER CERTIFYING SATISFACTORY COMPLETION OF THE FIRE PROTECTION SYSTEM INSTALLATION IN ACCORDANCE WITH ALL APPROVED PLANS, ALL APPLICABLE CODES, LANDLORD'S REQUIREMENTS, ACCEPTED PRACTICES AND PROCEDURES, AND SPECIFICATIONS.
K. PROVIDE SEISMIC BRACING FOR ALL EQUIPMENT AND PIPING PER THE APPLICABLE SEISMIC ZONE.
L. PROVIDE LISTED FIRESTOPPING AT ALL PENETRATIONS THROUGH RATED WALLS, FLOORS, PARTITIONS, ETC.

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PROJECT

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BOCA RATON, FL

4901 N. FEDERAL HIGHWAY
BOCA RATON, FL 33431

ISSUE DATE:	11/09/2018
STORE NUMBER:	#0409
LEASABLE AREA:	29,701 S.F.
GROSS FLOOR AREA:	28,752 S.F.
JOB NUMBER:	2018.0120.00

ISSUE

	ISSUED FOR BID	11/09/18

SEAL

JOHN M. BRUNS
LICENSE
No. 54430
STATE OF FLORIDA
PROFESSIONAL ENGINEER

JOHN M. BRUNS
#54430 | EXP. 02/28/2019

SHEET

MECHANICAL AND PLUMBING SPECIFICATIONS

DRAWN: DJH
CHECKED: JMB

MP101

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