

A GENERAL CONDITIONS

1 DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND ALL OTHER SPECIFICATION SECTIONS ARE A PART OF THIS CONTRACT AND APPLY TO ALL THE OTHER SECTIONS OF DIVISION 15

2 THE CONTRACTOR FOR THIS WORK IS REQUIRED TO READ THE ENTIRE SPECIFICATIONS AND REVIEW DRAWINGS FOR ALL OTHER TRADES

3 THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING HIS SUBCONTRACTORS WITH A FULL SET OF BID DOCUMENTS (INCLUDING SPECIFICATIONS) AND THE COORDINATION OF HIS WORK AND POSITIONING OF THE WORK AND INSPECTIONS OF HIS SUBCONTRACTORS WITH ALL OTHER TRADES ON SITE CONFORMING TO THE GENERAL CONTRACTORS TIME SCHEDULE

4 THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO ANY MODIFICATIONS HIS BID TO DETERMINE CONDITIONS OF THE WORK. BIDS SHALL SERVE AS EVIDENCE OF KNOWLEDGE OF EXISTING CONDITIONS AND ANY MODIFICATIONS WHICH ARE REQUIRED TO MEET THE INTENT OF THE DRAWINGS AND SPECIFICATIONS. FAILURE TO VISIT THE SITE DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY IN PERFORMANCE OF WORK

5 WHEN USED, THE TERM "PROVIDED BY CONTRACTOR" SHALL BE INTERPRETED AS MEANING "FURNISHED AND INSTALLED" WITH THE EXCEPTION WHERE ITEMS ARE "PROVIDED BY TENANT" WHICH MEANS "FURNISHED ONLY" (INSTALLED BY CONTRACTOR) AS SPECIFICALLY NOTED OTHERWISE.

6 GENERAL REQUIREMENTS

1 THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION AND FACILITIES NECESSARY FOR COMPLETION AND TESTING OF ALL THE WORK FOR THE PLUMBING SYSTEMS AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY JOB CONDITIONS. ALL WORK NOT SPECIFICALLY NOTED AS BEING BY THE LANDLORD SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR. CLOSELY COORDINATE THE ENTIRE INSTALLATION WITH THE LANDLORD, AS REQUIRED. FIELD VERIFY THE EXISTING TYPE, SIZE AND LOCATION OF EXISTING PIPE AND DUCTS IN THE TENANT SPACE PRIOR TO BID

2 THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIAL OR LABOR CALLED FOR IN ONE SHALL BE PROVIDED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN THE OTHER. ANY MATERIAL OR LABOR WHICH IS NOT SPECIFICALLY MENTIONED ON THE DRAWINGS OR IN THE SPECIFICATIONS, BUT WHICH IS OBVIOUSLY NECESSARY TO COMPLETE THE WORK, AND WHICH IS USUALLY INCLUDED IN THE WORK OF SIMILAR CHARACTER, SHALL BE PROVIDED AS PART OF CONTRACTOR'S RESPONSIBILITY.

3 WHERE THE DRAWINGS OR SPECIFICATIONS CALL FOR ITEMS WHICH EXCEED CODES OR THE LANDLORD'S TENANT CRITERIA, THE CONTRACTOR IS STILL RESPONSIBLE FOR PROVIDING THE SYSTEM AS DESIGNED AND DESCRIBED ON THESE DRAWINGS, UNLESS SPECIFICALLY NOTED OTHERWISE.

4 ALL MECHANICAL WORK SHALL BE INSTALLED SO AS TO BE READY ACCESSIBLE FOR OPERATION AND MAINTENANCE, AND SHALL BE INSTALLED IN SUCH A MANNER AS TO BE READY ACCESSIBLE FOR OPERATION AND MAINTENANCE. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL EQUIPMENT FOR SERVICE.

5 THE CONTRACTOR SHALL DO ALL CUTTING, CORE DRILLING, CHASING OR CHANNELING AND PATCHING REQUIRED FOR ANY WORK UNDER THIS DIVISION. CUTTING SHALL BE APPROVED BY THE TENANT'S CONSTRUCTION MANAGER AND THE LANDLORD. PATCHING SHALL MATCH FINISH OF SURROUNDING AREA.

6 CODES

1 ALL WORK SHALL BE PERFORMED IN A NEAT PROFESSIONAL MANNER USING GOOD ENGINEERING PRACTICES. ALL WORK SHALL CONFORM TO THE LANDLORD'S CRITERIA, THE STATE'S, COUNTY'S, CITY'S AND LOCAL CODES AND ORDINANCES. MECHANICAL WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE CODES AND REQUIREMENTS. THE CONTRACTOR SHALL INQUIRE INTO AND COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS. AFTER CONTRACT IS ISSUED, ANY CHANGE TO CODE ISSUES SHALL BE REMBURSED BY THE TENANT TO THE CONTRACTOR.

7 LICENSES, PERMITS, INSPECTIONS & FEES

1 THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LICENSES, PERMITS, INSPECTIONS, AND FEES REQUIRED OR RELATED TO HIS WORK

2 FURNISH TO THE TENANT'S CONSTRUCTION MANAGER ALL CERTIFICATES OF INSPECTION AND FINAL INSPECTION APPROVAL AT SUBSTANTIAL COMPLETION DATE OF PROJECT

8 DRAWINGS

1 DRAWINGS PLANS, SPECIFICATIONS, AND DETAILS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL DUCT AND PIPE DIMENSIONS, FITTINGS AND ACCESSORIES THAT MAY BE REQUIRED

2 THE LAYOUT SHOWN ON THE DRAWINGS IS BASED ON A PARTICULAR MAKE OF EQUIPMENT. IF ANOTHER MAKE OF EQUIPMENT IS USED WHICH REQUIRES MODIFICATION OR CHANGE OF ANY PART OF THE MECHANICAL SYSTEMS, THE CONTRACTOR SHALL BE RESPONSIBLE AS PART OF THIS WORK, FOR MAKING ALL SUCH MODIFICATIONS AND CHANGES, INCLUDING THOSE INVOLVING OTHER TRADES. THE COST THEREOF SHALL BE THE CONTRACTOR'S RESPONSIBILITY. IN SUCH CASE, CONTRACTOR SHALL SUBMIT DRAWINGS AND SPECIFICATIONS PRIOR TO STARTING WORK SHOWING ALL SUCH MODIFICATIONS AND CHANGES. HIS PROFESSIONAL SEAL IS SUBJECT TO THE APPROVAL OF THE TENANT'S CONSTRUCTION MANAGER.

9 EXISTING SHIELD SPACE CONDITIONS

1 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE DEMOLITION OF EXISTING MECHANICAL AND ELECTRICAL WORK, THE MECHANICAL DRAWINGS AND THE MECHANICAL DEMOLITION SHOWN ON THE ARCHITECTURAL DRAWINGS

2 THE CONTRACTOR SHALL INCLUDE, AND WILL BE HELD RESPONSIBLE FOR, THE REMOVAL OF ALL EXISTING FIRE PROTECTION, PLUMBING FIXTURES, PIPING, HVAC UNITS, REFRIGERANT RECOVERY, EXHAUST FANS, ETC. AND ASSOCIATED RIG OR CURBS NOT TO BE REUSED ON THIS PROJECT, UNLESS SPECIFICALLY NOTED OTHERWISE. CONTRACTOR MUST VERIFY WITH THE LANDLORD ALL PRESUMED ABANDONED EQUIPMENT, INCLUDING REFRIGERANT RECOVERY RIGS, RIGS, RIG CURBS SHALL BE REMOVED AND THE ROOF PATCHED UNLESS NOTED FOR REUSE OR RECONFIGURATION ON PLANS. ROOF PATCHING SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE. A KEYING CONTRACTOR APPROVED BY THE LANDLORD, ALL EXTRANEOUS ITEMS IN THE SPACE OR ON THE ROOF ABOVE THIS SPACE; NOT APPLICABLE TO THE NEW WORK OR PART OF THE LANDLORD'S OR ANOTHER TENANT'S ACTIVE SYSTEM MUST BE REMOVED AND ROOF WORK PATCHED/REPAIRED TO MATCH EXISTING STRUCTURE. EXISTING ABANDONED PIPES, DUCTS, OR EQUIPMENT IN THE FLOOR, EMBEDDED IN CONCRETE, OR OTHERWISE INACCESSIBLE ARE TO BE CUT OFF AND SEALED BELOW ON WITHIN FLOOR OR WALL LEVEL, WHEN THEY ARE NOT TO BE REUSED IN THIS PROJECT. IF REQUIRED BY LANDLORD OR CODES, ABANDONED PIPING AND/OR DUCTWORK MUST BE REMOVED TO POINT OF ORIGIN, CONFORM TO THE EXTENT OF DEMOLITION PRIOR TO BID AND INCLUDE IN BID PROPOSAL.

3 ACTIVE LANDLORD OR OTHER TENANT SERVICES ENCOUNTERED IN WORK SHALL BE PROTECTED AND SUPPORTED. IF EXISTING SERVICES NOT ANTICIPATED, REQUIRE RELOCATION. CONTACT THE TENANT'S CONSTRUCTION MANAGER IMMEDIATELY. ALL COSTS FOR REPAIR OF DAMAGES TO ACTIVE LANDLORD OR OTHER TENANT SERVICES DURING CONSTRUCTION SHALL BE PAID FOR BY THE CONTRACTOR CAUSING THE DAMAGE.

4 TENANT'S MODIFICATIONS TO EXISTING LANDLORD SERVICES MUST BE DONE WITH MINIMUM INTERRUPTION OF LANDLORD OPERATION AND DURING HOURS SPECIFIED BY THE LANDLORD. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING EXACT WORKING HOURS OF THIS WORK WITH THE LANDLORD PRIOR TO SUBMITTING BIDS. THE CONTRACTOR SHALL NOT BE CONSIDERED AS PROVIDING PREMIUM TIME REQUIRED TO PERFORM MODIFICATIONS DURING OTHER THAN NORMAL WORKING HOURS. ALL SUCH WORK MUST BE COORDINATED WITH THE LANDLORD.

5 DISCREPANCIES IN DOCUMENTS

1 DRAWINGS, PLANS, SPECIFICATIONS, AND DETAILS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS WHERE DRAWINGS, EXISTING SITE CONDITIONS, SPECIFICATIONS OR OTHER TRADES CONFLICT OR ARE UNCLEAR, ADVISE THE GENERAL CONTRACTOR WITH WRITING, PRIOR TO SUBMITTING BIDS. THE CONTRACTOR SHALL BE RESPONSIBLE TO ADVISE THE TENANT'S CONSTRUCTION MANAGER IN WRITING OF VARIATIONS TO CONTRACT DOCUMENTS PRIOR TO SUBMISSION OF BIDS. OTHERWISE, TENANT'S CONSTRUCTION MANAGER'S ACCEPTANCE OF CONTRACT DOCUMENTS OR CONDITIONS SHALL BE FINAL WITH NO ADDITIONAL COMPENSATION PERMITTED.

6 TRADE NAMES AND MANUFACTURERS

1 WHERE TRADE NAMES AND MANUFACTURERS ARE USED ON THE DRAWINGS OR IN THE SPECIFICATIONS, THE EXACT EQUIPMENT SHALL BE USED AS A MINIMUM STANDARD FOR THE BASIS BEING CONSIDERED AS AN EQUAL OR BETTER RATED ASPECTS TO THAT SPECIFIED WILL BE SUBJECT TO APPROVAL IN WRITING BY THE TENANT'S CONSTRUCTION MANAGER PRIOR TO ACCEPTANCE. THE USE OF ANY UNTESTED EQUIPMENT SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

DIVISION 15 - MECHANICAL  
SECTION 15000  
PLUMBING

I SHOP DRAWINGS

1 SUBMIT SIX COPIES OF MATERIAL LISTS AND SHOP DRAWINGS FOR ALL EQUIPMENT AND DUCT FABRICATION DRAWINGS TO THE TENANT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO THE FURNISHING, INSTALLATION, COMPLETION AND TESTING OF ALL THE WORK FOR THE PLUMBING SYSTEMS AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY JOB CONDITIONS. TO INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING (REFER TO RESPONSIBILITY SCHEDULE FOR EXACT RESPONSIBILITIES):

A COMPLETE SANITARY AND POTABLE WATER SYSTEMS OF WASTE, DRAINS, AND VENTS  
B COMPLETE GOLD AND HOT WATER PIPING SYSTEMS, APPURTENANCES AND PLUMBING FIXTURES AND EQUIPMENT AS SCHEDULED  
C COMPLETE NATURAL GAS PIPING SYSTEMS AS APPLICABLE, REFER TO PLANS  
D TESTS AND ADJUSTMENTS

2 BEFORE STARTING WORK, THIS CONTRACTOR SHALL EXAMINE THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL PLANS AND SPECIFICATIONS TO BE PROVIDED BY THE LANDLORD AND INTEGRATE THE VARIOUS ELEMENTS OF THE PLUMBING SYSTEM, MATERIALS, AND EQUIPMENT WITH OTHER CONTRACTORS TO AVOID INTERFERENCES AND CONFLICTS.

3 RELOCATION OF EXISTING WATER, GAS, WASTE, VENT, OR DRAINAGE LINES TO FACILITATE STORE DESIGN CRITERIA MUST BE INCLUDED IN BID PROPOSAL.

4 RELOCATION OF EXISTING MAINS, LATERALS, BRANCHES AND RISERS TO FACILITATE STORE DESIGN CRITERIA MUST BE INCLUDED IN BID PROPOSAL.

5 RELOCATION OF EXISTING WATER, GAS, WASTE, VENT, OR DRAINAGE LINES TO FACILITATE STORE DESIGN CRITERIA MUST BE INCLUDED IN BID PROPOSAL.

6 GENERAL PIPING REQUIREMENTS

1 GENERALLY, SANITARY AND POTABLE WATER TAPS WILL BE PROVIDED BY THE LANDLORD. FIELD VERIFY EXACT CONNECTION POINTS PRIOR TO SUBMITTING BIDS AND NOTIFY THE TENANT'S CONSTRUCTION MANAGER IF CONDITIONS ARE NOT AS SHOWN ON THE PLANS OR AS STATED IN THE SPECIFICATIONS. CONTRACTOR MUST VERIFY THE OPERABILITY OF ENTIRE SYSTEM PRIOR TO THE AS FOLLOWS:

A SMAG SANITARY FOR A DISTANCE OF 100 FEET AND REPORT ANY BLOCKAGE  
B TEST WATER PRESSURE TO INSURE MINIMUM OF 50 PSI

7 INSTALL ALL NECESSARY PIPE HANGERS, SADDLES, AND CARRIERS TO SUPPORT ALL PIPING AND FITTINGS. HANGERS SHALL BE TYPE OF PIPING PROVIDED AND BE SPACED AT A MAXIMUM SPAN OF 5 FEET. PROVIDE SWAY AND SEMI BRACING WHERE REQUIRED BY CODES

8 ESCUTOIRS SHALL BE CHROME PLATED, SIZE AS REQUIRED AND PLACED AT ALL PIPE PENETRATIONS AT WALLS, FLOORS, AND CEILINGS IN FINISHED AREAS

9 FLASHING SHALL BE SEALED WATER-TIGHT AND PERFORMED IN ACCORDANCE TO THE APPLICABLE CRITERIA. USE A LANDLORD APPROVED ROOFING CONTRACTOR WHERE APPLICABLE

10 SANITARY PIPING - NO PVC ALLOWED (STORM PIPING AS REQUIRED)

A WASTE, DRAIN AND VENT PIPING SHALL BE SERVICE WEIGHT, CAST IRON SOIL PIPE, VENT PIPING ABOVE FLOOR 2" OR SMALLER MAY BE GALVANIZED STEEL

B JOINTS - BELOW FLOOR SLAB - BELL AND SPIGOT WITH CAULKED JOINTS PER CODE

C FITCH WASTE PIPES 2" AND SMALLER NOT LESS THAN 1/4" PER FOOT. FITTINGS SHALL BE MAINTAINED NOT LESS THAN 1/4" PER FOOT

D INSTALL A CLEANOUT AT BASE OF EACH SOIL STACK AT EACH CHANGE IN DIRECTION, INCLUDING ABOVE GROUND CLEANOUTS. CLEANOUTS SHALL NOT BE INSTALLED IN PUBLIC AREAS WITHOUT SPECIFIC PERMISSION BY TENANT'S CONSTRUCTION MANAGER, BUT WHERE NECESSARY, THE WASTE LINE SHALL BE STAINLESS STEEL AND THE FLOOR COVERS ARE TO BE BRASS (FLUSH WITH FINISHED FLOOR). PROVIDE COVERS WITH INSET AREA FOR CLEANOUTS. CLEANOUTS SHALL BE APPROVED BY THE TENANT'S CONSTRUCTION MANAGER

E INSULATE ALL HORIZONTAL RUNS OF PIPING LOCATED IN CEILING SPACES WHERE APPLICABLE. INSULATION TO BE AS SPECIFIED FOR WATER PIPING

F INSULATE THE TRAP, SANITARY AND SUPPLY PIPES UNDER LAVATORY WITH 1/2" AIRSTROTH "ARMAFLEX" PIPING INSULATION OR TRIURETHR MODEL 102W "MAXI" LAQUA "MAXI" TANK OF PIPING

11 CONDENSATE PIPING SHALL BE TYPE "1" DRAWN COPPER TUBE WITH #5 S TIN ANTI-OXIDIZED JOINTS AND WROUGHT COPPER FITTINGS WITH DIELECTRIC SEPARATION BETWEEN DISSIMILAR METALS

12 POTABLE WATER PIPING

A BELOW GRADE - TYPE "K" ANNEALED TEMPERED COPPER TUBE FOR PIPE SIZES 2 INCHES AND SMALLER. BRAZE ALL JOINTS

B ABOVE GRADE - TYPE "1" DRAWN COPPER TUBE WITH WROUGHT COPPER FITTINGS AND #5 S TIN ANTIMONY SOLDER

C INSTALL AIR CHAMBER SHOCK ABSORBERS IN PIPING SYSTEM TO PREVENT NOISE AND DAMAGE DUE TO WATER HAMMER

D ALL BRANCH PIPING SYSTEM SHALL HAVE ACCESSIBLE SERVICE VALVE. PROVIDE SHUT OFF VALVES IN THE SUPPLY PIPING TO EVERY FIXTURE

E PROVIDE WATER METER AND REMOTE READER PER LANDLORD'S CRITERIA OR LOCAL UTILITIES REQUIREMENTS. REFER TO PLANS TO DETERMINE WATER METER IS REQUIRED

F SECURE PIPE AT ANGLE SLOPE

G PROVIDE FLEXIBLE INSERTS AT ALL PIPE PENETRATIONS THROUGH FRAMING TO KEEP PIPES FROM SETTLING WHEN IN OPERATION

13 GAS PIPING

A PROVIDE A COMPLETE GAS PIPING SYSTEM AS APPLICABLE. REFER TO PLANS TO DETERMINE IF GAS SYSTEM IS REQUIRED

B LOW PRESSURE: 1/4" W/C AND BELOW GAS LINES SHALL BE BLACK STEEL, SCHEDULE 40, ASTM A 133, WITH MALLEABLE THREADED FITTINGS 1/2" AND SMALLER, AND WITH WELDED JOINTS FOR 2" AND LARGER

C MEDIUM PRESSURE (ABOVE 1/4" W/C) SHALL HAVE WELDED JOINTS. PROVIDE A GAS COCK, DIRT LEG, AND UNION CONNECTION TO EACH JOINT OF EQUIPMENT. PROVIDE GAS METER AND/OR REGULATOR AS REQUIRED

D REGULATOR TO BE VENTED TO THE EXTERIOR

E FITCH PIPING AT AN INFERIOR GRADE OF 1/4" IN 15 FEET UPWARD IN DIRECTION OF FLOW. SUPPORT PIPING EVERY 5 FEET. SUPPORT AS REQUIRED BY LANDLORD CRITERIA, AS DETAIL ON DRAWINGS, OR BY STANDARD INDUSTRY PRACTICE, WHICHEVER IS MOST TRINGENT

F GAS PIPING EXPPOSED ON ROOF MUST BE PROTECTED WITH FIRE-RESISTANT FLASHING

G NOTIFICATION, TESTING AND TESTING OF GAS LINES SHALL BE DONE PER THE REQUIREMENTS OF: NFPA 54, COMPANY LOCAL CODES, AND APPLICABLE NFPA 54 CODE

H GAS PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE LOCAL GAS CODE AND ALL OTHER APPLICABLE REQUIREMENTS WITH THE LANDLORD'S APPROVAL

14 ATION

A REPLACE ALL WATER WASTEWATER CONDENSATE PIPING WITH 1" THICK (K) 1/2" TO 3/4" PIPE ON 1/2" AND 3/4" INSULATION WITH AN ALL SEAMLESS BLACK PIPE, LOCAL CODES AND UL FLAME SPREAD RATING OF 0.10. PROVIDE A GAS COCK, DIRT LEG, AND UNION CONNECTION TO EACH JOINT OF EQUIPMENT. PROVIDE GAS METER AND/OR REGULATOR AS REQUIRED. MANUFACTURER SHALL BE APPROVED BY THE LANDLORD

15 TEST & ADJUSTMENT

A LEAKAGE TESTS SHALL BE PER LOCAL CODES, MINIMUM AS FOLLOWS

1 TEST POTABLE WATER PIPING AND CONDENSATE PIPING AT 125 PSIG FOR SIX HOURS

2 TEST DRAIN WASTE VENT PIPING BY A 10" WATER COLUMN FOR TWO HOURS. ALL JOINTS SHALL BE GAS AND WATER TIGHT

3 TEST GAS PIPING WITH PER NFPA 54 CODES

4 LEAKAGE TESTS SHALL BE PER LOCAL CODES, MINIMUM AS FOLLOWS

1 WHEN COMPLETED, THE ENTIRE FIRE PROTECTION PIPING SYSTEM SHALL BE HYDROSTATICALLY TESTED AS REQUIRED BY THE RULES AND REGULATIONS OF THE AUTHORITIES HAVING JURISDICTION. SYSTEM SHALL SHOW NO SIGNS OF LEAKAGE OR OTHER DEFECTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO THE WORK OF THE OTHER CONTRACTORS OR TO THE BUILDING, OR TO ITS CONTENTS, PEOPLE, ETC., CAUSED BY LEAKS IN ANY OF THE EQUIPMENT INSTALLED BY HIM. ALL REPAIRS OR REPLACEMENT OF DAMAGES SHALL BE AT THIS CONTRACTOR'S EXPENSE.

16 PROPERLY COMPLETED AND SIGNED "SPRINKLER CONTRACTOR'S MATERIAL AND TEST CERTIFICATE" SHALL BE FURNISHED TO THE LANDLORD, AUTHORITIES HAVING JURISDICTION, AND TENANT'S CONSTRUCTION MANAGER

17 INSTALL DOUBLE THICKNESS TURNING VANES IN ALL RIGHT ANGLE ELBOWS

18 INSTALL ROUND ROD AND RECTANGULAR METAL DUCT WITH SUPPORT SYSTEMS INDICATED IN SMCNA STANDARDS. SUPPORT HORIZONTAL DUCTS WITH 2 FEET OF EACH END AND WITH A 4 FEET OF EACH BRANCH INTERSECTION USING DOUBLE STRAP HANGERS ON EACH SIDE OF FITTING. SUPPORT VERTICAL DUCTS AT A MAXIMUM INTERVAL OF 16 FEET AND AT EACH FLOOR. NO WOOD SHALL BE USED TO SUPPORT OR GRADE DUCTS. PROVIDE SWAY AND SEMI BRACING AS REQUIRED BY STATE AND LOCAL CODES OR BY LANDLORD.

19 WHERE DUCTS PASS THROUGH ROOFS AND FLOORS, PROVIDE AS MINIMUM 1-1/2"x12" 1/2" THICK STEEL ANGLE FRAMES AT EACH SIDE OF OPENING. THE ANGLAR SPACE BETWEEN DUCT AND ANGLE FRAMES SHALL BE CALKED WITH SILICONE SEALANT OR FIREPROOFED AS REQUIRED BY ASSEMBLY FIRE RATING

20 ALL TRAVELERS, JOINTS AND SCAMS IN SUPPLY AIR DUCT SHALL BE SEALED AIR TIGHT WITH DAP CMC DUCT SEALER. JOINTS ALSO SHALL BE REVISED OR CONNECTED WITH SHEET METAL SCREWS

21 SOFT ELASTOMER BUTYL GASKET WITH ADHESIVE BACKING SHALL BE USED TO SEAL FLANGED JOINTS

22 DUCT TRANSITIONS SHALL NOT EXCEED 30 DEGREES SLOPE EXCEPT AS SPECIFICALLY NOTED OTHERWISE

23 PROVIDE ACCESS TO ALL MOTORIZED DAMPERS, FIRE DAMPERS, CONTROLS, AND OTHER ITEMS IN DUCTWORK THAT REQUIRE SERVICE OR INSPECTION. IF THE ACCESS PANEL LOCATION IS EMPOWERED TO THE SALES REPRESENTATIVE, IT MUST APPROVED BY THE TENANT'S CONSTRUCTION MANAGER PRIOR TO INSTALLATION. LAY IN SUPPLY AND RETURN AIR DIFFUSERS, GRILLES AND REGISTERS WITH FLAER FACES MAY BE USED AS ACCESS LOCATIONS

DIVISION 15 - MECHANICAL  
SECTION 15000  
FIRE PROTECTION

A SCOPE OF WORK

1 THE F.P. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION AND FACILITIES NECESSARY FOR COMPLETION AND TESTING OF ALL THE WORK FOR THE MECHANICAL SYSTEMS AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY JOB CONDITIONS. TO INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING (REFER TO RESPONSIBILITY SCHEDULE FOR EXACT RESPONSIBILITIES):

A INSTALLATION OF NEW WET SPRINKLER SYSTEM AS REQUIRED TO PROVIDE COVERAGE IN ACCORDANCE WITH NFPA-13, LOCAL CODES, LANDLORD'S CRITERIA, AND INSURANCE CARRIES FOR THE MALL AND TENANT

B TAPS, RISERS, LATERALS, BRANCHES, VALVES, ALARMS, SPRINKLER HEADS AND ALL COMPONENTS REQUIRED FOR A COMPLETE SYSTEM

C CURBS AND STEEL FRAMING FOR SUPPORT (AS APPLICABLE, REFER TO PLANS)

D TESTING, ADJUSTING, AND BALANCING

E OPERATIONAL INSULATION (AS APPLICABLE, REFER TO PLANS)

F TEMPERATURE CONTROLS AND RELATED DIAGRAMS

G SEQUENCE OF OPERATION

H CONNECTION TO ANY LANDLORD ENERGY MANAGEMENT SYSTEM

2 THE CONTRACTOR THAT DOES THE ACTUAL SPRINKLER WORK IS REQUIRED TO BE A LANDLORD APPROVED SPRINKLER CONTRACTOR

3 BEFORE STARTING WORK, THE CONTRACTOR SHALL EXAMINE THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL PLANS AND SPECIFICATIONS TO BE PROVIDED BY THE LANDLORD AND INTEGRATE THE VARIOUS ELEMENTS OF THE FIRE PROTECTION SYSTEM, MATERIALS, AND EQUIPMENT WITH OTHER CONTRACTORS TO AVOID INTERFERENCES AND CONFLICTS

4 RELOCATION OF EXISTING MAINS, LATERALS, BRANCHES AND RISERS TO FACILITATE STORE DESIGN CRITERIA MUST BE INCLUDED IN BID PROPOSAL.

5 SHIP DRAWINGS

1 THE FIRE PROTECTION CONTRACTOR SHALL PREPARE DETAILED SHOP DRAWINGS AND CALCULATIONS FOR HIS WORK. SUBMIT SIX (6) COPIES TO GENERAL CONTRACTOR FOR APPROVAL. APPROVED DRAWINGS SHALL BE PROVIDED TO TENANT'S CONSTRUCTION MANAGER APPROVES HEAD AND PIPING LOCATIONS

2 THE FIRE PROTECTION CONTRACTOR IS RESPONSIBLE FOR SUBMITTING COORDINATED DRAWINGS, CALCULATIONS, HEAD TYPES AND COLORS TO ALL AUTHORITIES HAVING JURISDICTION FOR APPROVAL. NO WORK SHALL BEGIN UNTIL ALL APPROVALS HAVE BEEN RECEIVED

3 A COPY OF THE LETTER OF APPROVAL FROM THE LANDLORD'S INSURANCE RATING BUREAU SHALL BE FORWARDED TO THE LANDLORDS AGENT AND TO THE TENANT'S CONSTRUCTION MANAGER

6 SPRINKLER HEADS

A ALL SPRINKLER HEADS SHALL BE NEW (EXISTING HEADS SHALL BE REPLACED AS NECESSARY), U.L.F.M LISTED AND APPROVED AUTOMATIC SPRAY TYPE AS MANUFACTURED BY CENTRAL SPRINKLER CO., GLOBE, MA

B ALL SPRINKLER HEADS SHALL BE RATED FOR 165°F UNLESS INDICATED OTHERWISE ON DRAWINGS OR REQUIRED BY LOCAL CODES

C ALL SALES FLOORS HEADS ARE TO HAVE FACTORY APPLIED COLOR FINISH TO MATCH ARCHITECTURAL CEILING FINISH. VERIFY HEAD TYPE AND COLORS WITH TENANT'S CONSTRUCTION MANAGER AND SUBMIT WITH UNPUBLISHED DRAWINGS FOR PERMIT

D SPRINKLER HEAD TYPES SHALL BE AS FOLLOWS

1 FINISHED CEILING (SALES AREA) - FULLY RECESSED/CONCEALED TYPE

2 FINISHED CEILING (NON SALES AREA) - SEMI RECESSED TYPE

3 NO CEILING/NO CEILING - CONCEALED TYPE

NOTE: SEMI RECESSED HEADS SHALL PROTRUDE NO MORE THAN 1" BELOW LEVEL OF CEILING OF SOFFIT. ALL HORIZONTAL SPRINKLER RUNS AT SIDEWALL SOFFITS SHALL BE CONCEALED WITHIN SOFFIT

7 GENERAL PIPING

1 FIRE PROTECTION SYSTEM SIZES SHALL BE FURNISHED BY THE LANDLORD. REFER TO PLANS FOR DETAILS. PROVIDE 130 PSI FT "N" SALES AREAS AND 100 PSI FT "N" STOCK AREAS. COMPLY WITH LANDLORDS DESIGN CRITERIA. PIPE SIZING SHALL BE BASED ON NFPA ORDINARY HAZARD

2 ALL SPRINKLER LINES SHALL BE INSTALLED CONCEALED, AVOIDING INTERFERENCE WITH LIGHTS, DUCTS, PIPES, STORAGE BUCK, ETC. THE FIRE PROTECTION CONTRACTOR SHALL PREPARE COORDINATED SHOP DRAWINGS INDICATING THE LOCATIONS OF ALL SPRINKLER HEADS, SPRINKLER LINES, LIGHTS, DIFFUSERS, GRILLES AND REGISTERS PRIOR TO CONSTRUCTION. HORIZONTAL SPRINKLER RUNS AT MERCHANDISE SOFFITS SHALL BE PLACED INSIDE SOFFIT STRUCTURE. VERTICAL DROPS FROM CEILING TO STAND OFF SOFFIT SHALL BE LOCATED FLUSH AGAINST CEILING

3 WHERE POSSIBLE, REWORK THE EXISTING SPRINKLER SYSTEM TO MEET THE REQUIREMENTS OF THIS DESIGN. RELocate ALL MAINS, BRANCHES, INTERFERING WITH CEILING HEIGHTS, EQUIPMENT AND MAINS. INTERFERENTS INCLUSIVE OF ADJACENT TRADES AND COMMON AREAS ARE TO BE REMOVED PRIOR TO CONSTRUCTION

4 LOCATIONS OF HEADS SHALL BE APPROVED BY THE LOCAL FIRE PROTECTION OFFICIAL AND TENANT'S CONSTRUCTION MANAGER BEFORE INSTALLATION. HEADS MUST BE 18" MIN IN THE CLEAR, 36" MIN ABOVE LINES AND IN A SYMMETRICAL PATTERN. ALL OTHER FIXTURES, ADDITIONAL MONIES WILL NOT BE ALLOWED. HEADS ARE REQUIRED BY FIELD FIRE INSPECTOR AFTER BIDS ARE OPENED. HEADS IN MERCHANDISE SHALL BE CENTERED SIDE TO SIDE AND FRONT TO BACK

5 PROVIDE AND INSTALL A VALVED TIE CONNECTION FOR THE SPRINKLER SYSTEM WITH THE CONSTRUCTION CONTRACTOR TO PREVENT CONDENSATE FROM CARRYING COORDINATE LOCATION WITH TENANT'S CONSTRUCTION MANAGER AND LOCAL FIRE PROTECTION OFFICIAL PRIOR TO ROUGH-IN

6 RISKY HEADS LOCATED IN STOCK, CORRIDOR OR TOILET ROOM CEILING OR WALLS ABOVE 7' ABOVE THE FINISHED FLOOR ARE TO BE PROTECTED WITH UNPUBLISHED DRAWINGS FOR PERMIT

1 SCHEDULE 40, BLACK STEEL PIPE, ASTM A 53 FOR FERROUS PIPING, WELDED AND BENT IRON OR MALLEABLE IRON SCREWED FITTINGS FOR PIPES 2 INCHES AND SMALLER. SCREWED OR CAST IRON FLANGED JOINTS FOR PIPES LARGER THAN 2 INCHES

2 EXCEPT AS OTHERWISE INDICATED, FABRICATE AND INSTALL RECTANGULAR DUCTS WITH GALVANIZED STEEL SHEET, IN ACCORDANCE WITH SMCNA HVAC DUCT CONSTRUCTION STANDARDS OF THE LATEST EDITION, CONFORM TO THE SMCNA STANDARDS FOR THE DESIGN, CONSTRUCTION, INSTALLATION AND MAINTENANCE OF REINFORCING TYRES AND INTERVALS, THE ROOF APPLICATIONS, AND JOINT TYPES AND INTERVALS

3 EXCEPT WHERE OTHERWISE INDICATED, CONTRACTOR DUCT SYSTEMS TO THE FOLLOWING PRESSURE CLASSIFICATIONS: VERIFY WHETHER THEIR RETURN OR EXHAUST IS SUPPLY AND EXHAUST DUCTS: 2 INCHES WATER GAUGE, POSITIVE PRESSURE

4 SUPPLY DUCTS FOR FABRICATE: REMAKE LEAKING JOINTS AND APPLY SEALANTS AS REQUIRED TO FABRICATE A SYSTEM THAT DOES NOT EXCEED 5% LEAKAGE OR LESS AS STATED BY PRESSURE CLASS RATINGS IN SMCNA STANDARDS

4 AS A MINIMUM, CROSSBRACE ALL FLAT SURFACES OR REINFORCE WITH A BEAD APPROXIMATELY 3/4" WIDE X 3/16" DEEP ON 12" CENTERS TO PREVENT VIBRATIONS

5 INSTALL DOUBLE THICKNESS TURNING VANES IN ALL RIGHT ANGLE ELBOWS

6 INSTALL ROUND ROD AND RECTANGULAR METAL DUCT WITH SUPPORT SYSTEMS INDICATED IN SMCNA STANDARDS. SUPPORT HORIZONTAL DUCTS WITH 2 FEET OF EACH END AND WITH A 4 FEET OF EACH BRANCH INTERSECTION USING DOUBLE STRAP HANGERS ON EACH SIDE OF FITTING. SUPPORT VERTICAL DUCTS AT A MAXIMUM INTERVAL OF 16 FEET AND AT EACH FLOOR. NO WOOD SHALL BE USED TO SUPPORT OR GRADE DUCTS. PROVIDE SWAY AND SEMI BRACING AS REQUIRED BY STATE AND LOCAL CODES OR BY LANDLORD.

7 WHERE DUCTS PASS THROUGH ROOFS AND FLOORS, PROVIDE AS MINIMUM 1-1/2"x12" 1/2" THICK STEEL ANGLE FRAMES AT EACH SIDE OF OPENING. THE ANGLAR SPACE BETWEEN DUCT AND ANGLE FRAMES SHALL BE CALKED WITH SILICONE SEALANT OR FIREPROOFED AS REQUIRED BY ASSEMBLY FIRE RATING

8 ALL TRAVELERS, JOINTS AND SCAMS IN SUPPLY AIR DUCT SHALL BE SEALED AIR TIGHT WITH DAP CMC DUCT SEALER. JOINTS ALSO SHALL BE REVISED OR CONNECTED WITH SHEET METAL SCREWS

9 SOFT ELASTOMER BUTYL GASKET WITH ADHESIVE BACKING SHALL BE USED TO SEAL FLANGED JOINTS

10 DUCT TRANSITIONS SHALL NOT EXCEED 30 DEGREES SLOPE EXCEPT AS SPECIFICALLY NOTED OTHERWISE

11 PROVIDE ACCESS TO ALL MOTORIZED DAMPERS, FIRE DAMPERS, CONTROLS, AND OTHER ITEMS IN DUCTWORK THAT REQUIRE SERVICE OR INSPECTION. IF THE ACCESS PANEL LOCATION IS EMPOWERED TO THE SALES REPRESENTATIVE, IT MUST APPROVED BY THE TENANT'S CONSTRUCTION MANAGER PRIOR TO INSTALLATION. LAY IN SUPPLY AND RETURN AIR DIFFUSERS, GRILLES AND REGISTERS WITH FLAER FACES MAY BE USED AS ACCESS LOCATIONS

DIVISION 15 - MECHANICAL  
SECTION 15000  
HEATING, VENTILATION, AND AIR CONDITIONING

A SCOPE OF WORK

1 THE HVAC CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION AND FACILITIES NECESSARY FOR COMPLETION AND TESTING OF ALL THE WORK FOR THE MECHANICAL SYSTEMS AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY JOB CONDITIONS. TO INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING (REFER TO RESPONSIBILITY SCHEDULE FOR EXACT RESPONSIBILITIES):

A ROOF TOP UNITS, EQUIPMENT, AND APPURTENANCES  
B DUCTWORK, FITTINGS, DAMPERS, AND INSULATION  
C HANGERS, DIFFUSERS, GRILLES AND REGISTERS (REFER TO PLANS)  
D REFRIGERANT PIPING (AS APPLICABLE, REFER TO PLANS)  
E DIFFUSERS, GRILLES, AND REGISTERS  
F CURBS AND STEEL FRAMING FOR SUPPORT (AS APPLICABLE, REFER TO PLANS)

2 TESTING, ADJUSTING, AND BALANCING

3 OPERATIONAL INSULATION (AS APPLICABLE, REFER TO PLANS)

4 TEMPERATURE CONTROLS AND RELATED DIAGRAMS

5 SEQUENCE OF OPERATION

6 CONNECTION TO ANY LANDLORD ENERGY MANAGEMENT SYSTEM

7 BEFORE STARTING WORK, THIS CONTRACTOR SHALL EXAMINE THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL PLANS AND SPECIFICATIONS TO BE PROVIDED BY THE LANDLORD AND INTEGRATE THE VARIOUS ELEMENTS OF THE HVAC SYSTEM, MATERIALS, AND EQUIPMENT WITH OTHER CONTRACTORS TO AVOID INTERFERENCES AND CONFLICTS

8 RELOCATION OF EXISTING MAINS, LATERALS, BRANCHES AND RISERS TO FACILITATE STORE DESIGN CRITERIA MUST BE INCLUDED IN BID PROPOSAL.

9 HVAC EQUIPMENT

1 PRIMARY HEATING, VENTILATION AND AIR CONDITIONING UNITS

A PRIMARY HEATING, VENTILATION, AND AIR CONDITIONING UNITS ARE TO BE BY CARRIER AS SCHEDULED. ALL COMPRESSORS ARE TO BE REMOVED AND REPLACED WITH A NEW ONE

B EQUALS EQUIPMENT AS MANUFACTURED BY TRANE OR YORK ARE ACCEPTABLE

C EQUIPMENT SHALL BE COMPLETE IN EVERY RESPECT WITH ALL DEVICES, APPURTENANCES, AND ACCESSORIES PROVIDED TO MEET THE DESIGN INTENT AND OPERATION OF THE SYSTEMS SHOWN ON THE DRAWINGS AND SPECIFICATIONS

D EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. ALL AIR CONDITIONING EQUIPMENT MUST HAVE A CONCRETE BASE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS DATA. SEE DRAWINGS FOR ADDITIONAL DETAILS

E SECONDARY DRAIN PANS ARE REQUIRED TO BE INSTALLED BENEATH ALL MOTOR AIR CONDITIONING UNITS. PROVIDE RESTRICTED DRAININGS

F SECONDARY PANS ARE TO PROVIDE ENTIRE UNIT. PROVIDE CONDENSATE PUMPS, AS REQUIRED. CONDENSATE SHALL BE DIRECTION TO MAKE SURE OF DRAINAGE

2 VARIABLE AIR VOLUME BOXES (VAV)

A WHERE SHOWN ON DRAWINGS, PROVIDE VAV BOXES COMPLETE WITH CONTROLS, HEATING/COOLING PANS AS REQUIRED. ALL DUCT CONNECTIONS FLEXIBLE DUCT/PIPE CONNECTIONS SHALL BE PROVIDED BY THE CONTRACTOR

3 TOILET EXHAUST FANS

A WHERE SHOWN ON DRAWINGS, PROVIDE A TOILET EXHAUST FAN UNIT COMPLETE WITH GRABTY BACK DRAFT DAMPERS. ALL DUCTWORK, ROOF OPENINGS AND CAPS NECESSARY TO PROVIDE COMPLETE EXHAUST SYSTEM SHALL BE PROVIDED BY THE CONTRACTOR. REFER TO PLANS FOR APPLICABILITY

4 BASEBOARD, CABINET, AND UNIT HEATERS

A WHERE SHOWN ON DRAWINGS, PROVIDE ELECTRIC HEATING ELEMENTS WITH ELECTRIC HEATING COIL, CONTROL, INTEGRATE THE PANS

5 INLINE PURIFIER

A WHERE SHOWN ON DRAWINGS, PROVIDE A PURIFIER COUPLED PUMPS, SPRAY, AND FRESH AIR FANS SHALL BE FURNISHED BY THE CONTRACTOR. PROVIDE BRASS RINGS, FLEXIBLE DUCT SLEEVE AND MEDICAL SHIRT SEAL RATED FOR PURIFIER. PROVIDE CONTRACTOR TO INSTALL. THEY MAY BE MOUNTED IN A HANGERS AND BE TESTED TO LEAK TO BE 1750 RPM UNLESS NOTED OTHERWISE

6 METALLIC ISOLATION DEVICES

A METALLIC ISOLATION DEVICES SHALL BE PROVIDED ALL SUPPORTS, FAN FOUNDED VAV BOXES, ETC. AND STRUCTURE

B VIBRATING EQUIPMENT (FANS, ROOF TOP UNITS, AIR HANDLERS, RUBBER AND SPRING DEVICES. VIBRATING EQUIPMENT SUPPORTED FROM FLOOR OR DECK SHALL BE ISOLATED WITH HOUSED SPRING MOUNT DEVICES

C VIBRATING EQUIPMENT ISOLATION DEVICES SHALL BE PROVIDED AS PERMANENTLY ADJUST FOR PROPER ALIGNMENT AND LOADING. AVOID "GROUNDING" THE ISOLATOR

D ISOLATION DEVICES SHALL BE ALLOWABLE LOADS AT THE ISOLATING DEVICE AND AT THE UPPER AND LOWER ATTACHMENTS TO STRUCTURES, DUCTS, EQUIPMENT, ETC.

E CONSULT MANUFACTURER FOR APPLICATION DATA

7 CURBS AND STEEL FRAMING FOR SUPPORT

A THIS CONTRACTOR WILL PROVIDE ALL NECESSARY CURBS AND STEEL FRAMING REQUIRED TO INSTALL HVAC EQUIPMENT AS DESCRIBED OR IMPLIED ON THE DRAWINGS. CURBS SHALL BE A MINIMUM OF 14" HIGH OF THE SAME MANUFACTURER OF THE EQUIPMENT SUPPORTED. INSULATE UNDER THE CURBS WITH FIBERGLASS INSULATION TO THE TOP OF CURBS. ALL PENETRATIONS OF EXISTING STRUCTURE SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE SMCNA STANDARDS FOR THIS CONTRACTOR'S EXPENSE

8 METAL DUCTWORK - NO FIBERGLASS DUCT ALLOWED

1 NO DUCTWORK SHALL BE FABRICATED PRIOR TO APPROVAL BY THE TENANT'S CONSTRUCTION MANAGER. SIGNIFICANT DEVIATIONS FROM DESIGN MUST BE APPROVED BY TENANT'S CONSTRUCTION MANAGER PRIOR TO FABRICATION OR INSTALLATION. ALL DUCTS MADE: ARE TO BE RECTANGULAR UNLESS NOTED OTHERWISE. DUCTS TO BE USED TO DUCTWORK TO DIFFUSERS NOT TO EXCEED 30 DEGREES SLOPE

2 EXCEPT AS OTHERWISE INDICATED, FABRICATE AND INSTALL RECTANGULAR DUCTS WITH GALVANIZED STEEL SHEET, IN ACCORDANCE WITH SMCNA HVAC DUCT CONSTRUCTION STANDARDS OF THE LATEST EDITION, CONFORM TO THE SMCNA STANDARDS FOR THE DESIGN, CONSTRUCTION, INSTALLATION AND MAINTENANCE OF REINFORCING TYRES AND INTERVALS, THE ROOF APPLICATIONS, AND JOINT TYPES AND INTERVALS

3 EXCEPT WHERE OTHERWISE INDICATED, CONTRACTOR DUCT SYSTEMS TO THE FOLLOWING PRESSURE CLASSIFICATIONS: VERIFY WHETHER THEIR RETURN OR EXHAUST IS SUPPLY AND EXHAUST DUCTS: 2 INCHES WATER GAUGE, POSITIVE PRESSURE

4 SUPPLY DUCTS FOR FABRICATE: REMAKE LEAKING JOINTS AND APPLY SEALANTS AS REQUIRED TO FABRICATE A SYSTEM THAT DOES NOT EXCEED 5% LEAKAGE OR LESS AS STATED BY PRESSURE CLASS RATINGS IN SMCNA STANDARDS

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