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SECTION 21000: FIRE PROTECTION

A. SCOPE OF WORK

1. PROVIDE A COMPLETE AND OPERABLE FIRE PROTECTION SYSTEM AS IT APPLIES TO THE DEMISED PREMISE.
2. WHERE APPLICABLE, THE CONTRACTOR SHALL CONTRACT THIS WORK WITH A LANDLORD APPROVED FIRE PROTECTION CONTRACTOR, ALL MATERIALS AND EQUIPMENT UNDER THIS SECTION SHALL BE NEW AND LISTED BY UNDERWRITERS LABORATORIES/OF CANADA, INC. FOR FIRE PROTECTION SYSTEM INSTALLATION.
3. THE FIRE PROTECTION SYSTEM SHALL BE AS FOLLOWS:
 - a. NEW WET SPRINKLER FIRE PROTECTION SYSTEM FOR ALL AREAS OF THE RETAIL SPACE, PORTIONS THAT ARE UNHEATED OR EXPOSED TO FREEZING TEMPERATURES SHALL BE PROVIDED WITH AN AUTOMATIC DRY PIPE SYSTEM COMPLYING WITH NFPA/NFPA 13.
 - b. COVERAGE SHALL BE IN ACCORDANCE WITH EXISTING CONDITIONS, NFPA/NFPA 13, LOCAL CODES, LANDLORD'S CRITERIA, MALL INSURANCE AND LS&C'S STANDARDS AND SHALL INCLUDE:
 - (1) ALL PIPE TAPS, RISERS, LATERALS, BRANCHES, VALVES, HANGERS, ALARMS, SPRINKLER HEADS AND ALL COMPONENTS REQUIRED.
 - (2) PROVIDE PROFESSIONALLY DESIGNED AND SEALED DRAWINGS, HYDRAULIC CALCULATIONS, SUBMITTALS AND APPROVALS AS NEEDED INCLUDING ANY SEALS, PERMITS, FEES, AND CHARGES.
 - c. FIRE EXTINGUISHERS SHALL BE PROVIDED. REFER TO INSTALLATION SECTION OF THIS SPECIFICATION.
4. EXAMINE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL DOCUMENTS TO PROPERLY SEQUENCE, COORDINATE, AND INTEGRATE THE VARIOUS ELEMENTS OF THE FIRE PROTECTION SYSTEM WITH OTHER CONTRACTORS TO AVOID INTERFERENCES AND CONFLICTS.
5. CONTRACTOR SHALL USE APPROVED INDUSTRY FIRE SPRINKLER STANDARDS FOR REUSING EXISTING FIRE SPRINKLER BRANCHES AND SUBMIT CALCULATIONS TO THE LS&C'S PROJECT MANAGER UPON REQUEST OR REWORK SYSTEM TO THE LS&C PROJECT MANAGER'S SATISFACTION.
6. RELOCATION OF EXISTING MAINS, LATERALS, BRANCHES AND RISERS TO FACILITATE STORE DESIGN CRITERIA SHALL BE INCLUDED AS PART OF THIS WORK.

B. SHOP DRAWINGS AND DESIGN

1. IN ACCORDANCE WITH THE PREVAILING STANDARDS, BUT NO LESS THAN THAT REQUIRED BY NFPA/ NFPA 13, THIS FIRE PROTECTION CONTRACTOR SHALL PREPARE COMPLETE CALCULATIONS AND SHOP DRAWINGS. SIX (6) COPIES SHALL BE SUBMITTED TO THE GENERAL CONTRACTOR AND ADDITIONAL SETS AS REQUIRED TO THE PROPER CODE AUTHORITIES FOR APPROVAL (NO WORK SHALL BEGIN UNTIL ALL APPROVALS HAVE BEEN RECEIVED).
2. COPY OF THE LETTER OF APPROVAL FROM THE LANDLORD'S INSURANCE RATING BUREAU SHALL BE FORWARDED TO THE LANDLORD'S AGENT AND TO THE LS&C PROJECT MANAGER.
 - a. REQUIREMENTS IF PROJECT IS A SIMON MALL: A MINIMUM OF FIVE SETS OF SHOP DRAWINGS ALONG WITH HYDRAULIC CALCULATIONS (IF APPLICABLE) SHALL BE SUBMITTED TO GLOBAL RISK CONSULTANTS FOR APPROVAL. HYDRAULIC CALCULATIONS SHALL BE SUBMITTED REGARDLESS OF THE SCOPE OF WORK INVOLVED.
 - b. REQUIREMENTS IF PROJECT IS A SIMON WALL: FIVE SETS OF MATERIAL BROCHURES SHALL ALSO BE SUBMITTED TO CRC FOR REVIEW. BROCHURES SHALL BE LIMITED TO NEW SPRINKLER HEADS, FLEXIBLE DROPS AND VALVES. PLANS SHALL INDICATE THE TYPE OF PIPING BEING UTILIZED WITH THE GAUGE INDICATED.
3. LISTED BELOW ARE MINIMUM REQUIREMENTS FOR SPRINKLER SYSTEM DESIGN AND INSTALLATION. SYSTEM SHALL BE HYDRAULICALLY DESIGNED:
 - a. ORDINARY HAZARD, GROUP 2: PROVIDE A 0.20 GPM/SF PER 1,500 SQUARE FEET DENSITY WITH 165°F RATED 1/2" ORIFICE SPRINKLER HEADS OR FOLLOW NFPA/NFPA DENSITY/AREA CURVE FOR DENSITY COVERAGE. PROVIDE A MAXIMUM COVERAGE OF 130 SQUARE FEET PER HEAD.
 - (1) REQUIREMENTS IF PROJECT IS A SIMON MALL: MINIMUM SPACING SHALL BE 70 SQUARE FEET PER HEAD AND SPACING SHOULD NOT EXCEED 100 SF FOR DENSITIES OVER 0.25 GPM/SF.
 - (2) REQUIREMENTS IF PROJECT IS A SIMON WALL: FM GLOBAL REQUIRED DENSITY WILL BE 0.15 GPM/SF OVER THE MOST HYDRAULICALLY REMOTE 2500 SF USING 30" ORIFICE, 165 DEGREE RATED HEADS. HEAD SPACING SHOULD NOT EXCEED 130SF. OPTIMUM SPACING OPERATING AREA SHOULD BE 500SF UNLESS SPECIFIC APPROVAL IS GIVEN OTHERWISE FOR SPECIAL OCCURRENCES. THE REMOTE AREA SHOULD HAVE THE DIMENSIONS PARALLEL TO THE BRANCH LINE OF AT LEAST 1.4 TIMES THE SQUARE-FOOT OF THE REMOTE AREA. THE DENSITY DESIGN SHOULD CONFORM TO THE MOST STRINGENT FM GLOBAL OR NFPA/NFPA 13, ORDINARY HAZARD GROUP AND ANY AGENCY FOR RETAIL/COMMON/OFFICE AND MECHANICAL EQUIPMENT AREAS.
 - b. MAXIMUM HEAD SPACING: 15 FT.
 - c. SPRINKLERS SHALL BE TESTED FOR A MINIMUM OF 2 HOURS AT 200 PSIG.
 - d. DESIGN CALCULATIONS OF INSIDE PIPE SHALL USE C=100 FOR DRY AND C=10 FOR WET PIPE.

C. SPRINKLER HEADS

1. ALL SPRINKLER HEADS SHALL BE NEW EXISTING HEADS IN EXISTING LS&C STORES ARE NOT TO BE REPLACED UNLESS NOTED OTHERWISE AND F.M. LISTED AND APPROVED AUTOMATIC SPRAY TYPE AS MANUFACTURED BY AUTOMATIC SPRINKLER, GRINNELL, RELIABLE, OR VIKING.
2. ALL SPRINKLER HEADS SHALL BE RATED AS FOLLOWS OR AS REQUIRED BY LOCAL CODES:
 - a. STORAGE AREAS OR MEZZANINES: 200°-225°.
 - b. SALES AREA: 150°-170° OR 200°-225° AS NOTED ON PLANS.
3. MANUFACTURER FOR ALL SPRINKLER HEADS SHALL BE:
 - a. SALES AREA: BASE BID SHALL INCLUDE HEADS MANUFACTURED BY RELIABLE WITH ALTERNATE BIDDING BASED ON VIKING MICROMATIC MODEL M OR GRINNELL MODEL F972 AND SHALL BE APPROVED BY THE LS&C PROJECT MANAGER PRIOR TO ORDERING AND INSTALLATION.
 - b. NON-SALES AREA: ROUND BRASS FINISH MANUFACTURED BY AUTOMATIC SPRINKLER, STAR, RELIABLE, GRINNELL OR VIKING SPRINKLER COMPANY ONLY.
4. ALL SALES AREA SPRINKLER HEADS INCLUDING TRIM SHALL HAVE FINISH APPLIED FINISH. REFER TO FIRE SPRINKLER HEAD PLAN FOR FINISH REQUIREMENTS.
5. ALL SPRINKLER HEADS ON THE WALL SIDE OF TENANT'S STOREFRONT ENCLOSURE, IF ANY, SHALL MATCH LANDLORD'S TYPE.

D. PIPING, FITTINGS AND VALVES

1. SCHEDULE 40 BLACK STEEL, ASTM A-53 WELDED AND SEAMLESS, AND B-36-10-30 FOR WROUGHT STEEL PIPE.
2. IRON OR MALLEABLE IRON WELDED FITTINGS FOR PIPES 2 INCHES AND SMALLER, SCREWED OR CAST IRON FLANGED JOINTS FOR PIPES LARGER THAN 2 INCHES. FITTINGS SHALL BE APPROVED FOR 175 PSI WORKING PRESSURE.
3. GALVANNEED STEEL, MALLEABLE, WITH BRASS SEAT SCREWED UNIONS FOR PIPES 2 INCHES AND SMALLER.
4. VICTALIC TYPE VALVES ARE ACCEPTABLE WHERE APPROVED BY LOCAL CODE AND THE LANDLORD.
5. REQUIREMENTS IF PROJECT IS A SIMON MALL: APPROVED FM LIGHTWALL PIPING WITH ROLL GROOVES MAY BE USED IN SIZES LARGER THAN 2 INCHES, EXCEPT WHERE PIPE IS SUBJECT TO PHYSICAL DAMAGE.
6. REQUIREMENTS IF PROJECT IS A SIMON MALL: ALL HANGERS SHALL CONFORM TO FM GLOBAL GUIDELINES, STRUCTURAL STEEL HEADERS SHALL BE INSTALLED FOR SUPPORTING CROSS MAIN HANGERS WHERE THE MAIN IS NOT DIRECTLY BELOW A STRUCTURAL MEMBER.
7. REQUIREMENTS IF PROJECT IS A SIMON MALL: CAST IRON WALL PLATES SHALL BE PROVIDED ON EXPOSED PIPING WHERE PIPE PASSES THROUGH WALLS, PARTITIONS, CEILING, ETC., SECURED BY SETSCREWS.
8. REQUIREMENTS IF PROJECT IS A SIMON MALL: VALVES SHALL BE FM GLOBAL APPROVED AND RATED 175 PSI MINIMUM.

E. INSTALLATION

1. A FIRE PROTECTION SYSTEM TAP IS NORMALLY FURNISHED BY THE LANDLORD, VERIFY IN FIELD PRIOR TO BID.
 - a. WHENEVER AN EXISTING SPRINKLER SYSTEM IS BEING RENOVATED, THE INTEGRITY AND RELIABILITY OF THE EXISTING SYSTEM SHALL BE MAINTAINED.
2. ORIGINAL SPRINKLER SHOP DRAWINGS SHALL BE ACQUIRED THROUGH THE MALL MANAGER/PROJECT MANAGER; HOWEVER, THE SPRINKLER CONTRACTOR SHALL VERIFY THE EXISTING SPRINKLER SYSTEM IN THE FIELD AND SHALL COORDINATE WITH AND SHOW DISCREPANCIES BETWEEN THE ORIGINAL SHOP DRAWINGS AND FIELD CONDITIONS IN THE RENOVATED SHOP DRAWINGS.
3. SPRINKLER HEAD SPACING SHALL COMPLY WITH ORDINARY HAZARD, GROUP 2.
4. SYSTEM SHALL COMPLY WITH THE MOST STRINGENT OF THESE SPECIFICATIONS, THE LANDLORD'S DESIGN CRITERIA OR LOCAL CODES WITH PIPE SIZING BEING BASED ON NFPA/NFPA 13 ORDINARY HAZARD, GROUP 2 AND COMPLY WITH NFPA/NFPA 13 LATEST EDITION.
5. ALL SPRINKLER LINES SHALL BE CONCEALED AND MOUNTED AS HIGH AS IS PRACTICAL, AVOIDING INTERFERENCE WITH LIGHTS, DUCTS, PIPES, STORAGE DECK, ETC.
6. FIRE PROTECTION CONTRACTOR SHALL PREPARE COORDINATED SHOP DRAWINGS INDICATING THE LOCATIONS OF ALL SPRINKLER HEADS, SPRINKLER LINES, LIGHTS, DEFUSERS, GRILLES AND REGISTERS PRIOR TO INSTALLATION.
7. RELOCATE ALL MAINS AND BRANCHES INTERFERING WITH CEILING HEIGHTS, EQUIPMENT AND MAJOR COMPONENTS, INCLUSIVE OF ADJACENT TENANTS AND MALL COMMON AREAS, REMOVE ALL UNUSED PIPING.
8. FASTENING AND/OR SUSPENSION DEVICES MUST BE ATTACHED TO THE BUILDING STRUCTURE ONLY. SUPPORT SHALL BE FROM THE TOP OF ANY BAR JOIST OR AS DIRECTED BY THE LANDLORD OR THE BUILDING STRUCTURAL ENGINEER.
9. FURNISH AND INSTALL A VALVED TEST CONNECTION IN AN ACCESSIBLE LOCATION FOR THE SPRINKLER SYSTEM AS REQUIRED OR REQUESTED BY THE MALL, LOCAL INSPECTOR, OR INSURANCE CARRIER - COORDINATE LOCATION WITH THE LS&C PROJECT MANAGER AND LOCAL FIRE PROTECTION OFFICIAL TO ROUGH-IN.
10. 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. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO THE WORK OF THE OTHER CONTRACTORS OR TO THE BUILDING, OR TO ITS CONTENTS, PEOPLE, ETC., EXCEPT COMPLETELY FLUSH THE SYSTEM UNTIL DISCHARGE SHOWS NO DISCOLORATION.
11. PROPERLY COMPLETED AND SIGNED "SPRINKLER CONTRACTOR'S MATERIAL AND TEST CERTIFICATES SHALL BE FURNISHED TO THE LANDLORD, AUTHORITIES HAVING JURISDICTION, TENANT'S ARCHITECT, INSURANCE REPRESENTATIVE, PROJECT OFFICE AND THE LS&C PROJECT MANAGER.
12. PROVIDE VALVED DRAIN WITH HOSE THREAD AT ALL LOW POINTS OR TRAPS IN SPRINKLER PIPING. IDENTITY DRAIN VALVES IF ABOVE HARD CEILING WITH A SUITABLE CEILING MARKER AND PROVIDE ARCHITECT APPROVED METHOD FOR ACCESS AS REQUIRED.
13. COORDINATE SPRINKLER WORK WITH FIRE/ALARM CONTRACTOR WHERE THERE ARE FLOW AND TAMPER SWITCHES AND ALARM REQUIREMENTS.
14. SPRINKLER SYSTEM SHALL BE INTERFACED WITH BUILDING FIRE/LIFE SAFETY AND SMOKE EXHAUST SYSTEM IF REQUIRED. REFER TO LANDLORD TENANT CRITERIA AND REQUIREMENTS.
15. FURNISH AND INSTALL 15L.B. TYPE "ABC" FIRE EXTINGUISHERS WITH CABINETS IF REQUIRED, AND AT LEAST A "4A-80BC" RATED EXTINGUISHER. LOCATIONS ARE TO BE ESTABLISHED IN THE FIELD BY THE LS&C PROJECT MANAGER AND THE LOCAL FIRE PROTECTION OFFICIAL. MAXIMUM TRAVEL DISTANCE BETWEEN EXTINGUISHERS SHALL BE 75 FEET OR LESS AS REQUIRED BY LOCAL CODES.

SECTION 22000: PLUMBING

A. SCOPE OF WORK

1. THIS CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION AND FACILITIES NECESSARY FOR, REASONABLY IMPLIED AND INCIDENTAL TO, THE FURNISHING, INSTALLATION, COMPLETION AND TESTING OF ALL 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:
 - a. COMPLETE SANITARY PIPING SYSTEMS OF WASTE, DRAINS, AND VENTS.
 - b. COMPLETE COLD AND HOT WATER PIPING SYSTEMS, APPURTENANCES AND INSULATION.
 - c. FIXTURES AND EQUIPMENT AS SCHEDULED.
 - d. COMPLETE NATURAL GAS OR PROPANE PIPING SYSTEMS (AS APPLICABLE, REFER TO PLANS).
 - e. CONDENSATE PIPING SYSTEMS (AS APPLICABLE, REFER TO PLANS).
 - f. TESTS AND ADJUSTMENTS.
 - g. SUBMIT A COMPLETE SET OF REPRODUCIBLE AS-BUILTS.
2. BEFORE STARTING WORK, THIS CONTRACTOR SHALL EXAMINE THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL PLANS AND SPECIFICATIONS TO SEQUENCE, COORDINATE, AND INTEGRATE THE VARIOUS ELEMENTS OF THE PLUMBING SYSTEM, MATERIALS, AND EQUIPMENT WITH OTHER CONTRACTORS TO AVOID INTERFERENCES AND CONFLICTS.
3. ALL EXISTING WASTE LINES NEW OR OLD MUST UNDERGO A SEWER INTERIOR INSPECTION USING COLOR CLOSE CIRCUIT TELEVISION (CCTV) CAMERA A MINIMUM OF 30 PAST LEASE LINE IN ALL DIRECTIONS, DOCUMENT INSPECTION ON DVD WITH AUDIO LOCATION AND DATE INFORMATION. TITLE INFORMATION AND CONTINUOUS TAPE COUNTER. PROVIDE HAR COPY OF ALL INSPECTION LOGS. DO NOT COMMENCE SANITARY PIPING IN PRIOR TO APPROVAL OF INSPECTION LOGS BY LS&C PROJECT MANAGER. ANY BLOCKAGE WITHIN 30' FROM THE MAINLINE SHALL BE REPAIRED. CAMERA LENS MUST PROVIDE NOT LESS THAN 140 DEGREE VIEWING ANGLE WITH AUTOMATIC OR REMOTE FOCUS AND IRIS CONTROLS. POINTS OF INTEREST MAY INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING: DEFECTS, CRACKS, Voids, CONNECTIONS, ENCRUSTATIONS, MINERAL DEPOSITS, DEBRIS, SEDIMENT, AND ANY LOCATION DETERMINED NOT TO BE CLEAR OR PART OF AN IMPROPER LINES INSTALLATION, AND ANY DEFECTS IN LINES THAT INCLUDE BUT ARE NOT LIMITED TO BUMPS, FOLDS, TEARS, AND SLEWS.
4. RELOCATION OF EXISTING WATER, GAS, WASTE, VENT, OR DRAINAGE LINES TO FACILITATE STORE DESIGN CRITERIA MUST BE INCLUDED IN PROPOSAL.

EQUIPMENT AND INSTALLATION

1. REFER TO PLANS FOR SCHEDULES OF EQUIPMENT AND FIXTURES. AMERICAN STANDARDS AND OTHER MAY BE CONSIDERED WITH APPROVAL FROM LS&C PROJECT MANAGER.
2. SANITARY PIPING
 - a. PROVIDE ALL SANITARY WASTE, SEWERS, AND VENTS WITH PROJECT AS SHOWN WITH EXISTING DRAINAGE SYSTEMS ON-SITE. SANITARY WASTE AND VENT PIPING ABOVE FLOOR SHALL BE WROUGHT COPPER PIPE WITH WROUGHT COPPER FITTINGS AND CONNECTIONS. SANITARY WASTE AND VENT PIPING BELOW GRADE SHALL BE SCHEDULE 40, ASTM A-85, WITH MALLEABLE THREADED FITTINGS, OR SERVICE-WEIGHT CAST-IRON WITH NEOPRENE GASKET JOINT SYSTEMS AND PVC PIPE. PIPING ABOVE CEILING SHALL BE WROUGHT COPPER PIPE WITH WROUGHT COPPER FITTINGS AND CONNECTIONS. ALL DRAINAGE PIPING SHALL BE UNIFORMLY FITTED, 1/8" PER FOOT FOR PIPE SIZES 1" AND SMALLER, 1/8" PER FOOT FOR PIPE SIZES 2" AND LARGER, UNLESS OTHERWISE REQUIRED BY EXISTING FIXTURES, OR NOTED ON THE DRAWINGS.
 - b. INSULATE ALL HORIZONTAL RUNS OF PIPING LOCATED IN UNFINISHED AREAS, WHEN APPLICABLE. INSULATION TO BE AS SPECIFIED FOR WATER OR GAS.
 - c. CONDENSATE PIPING SHALL BE TYPE "L" DRAWN COPPER PIPE WITH 95-5 TIN-ANTIMONY SOLDERED JOINTS AND WROUGHT COPPER FITTINGS AND CONNECTIONS. INSULATE BETWEEN DESIGN LEVELS.
 - d. POTABLE WATER PIPING SHALL BE AS FOLLOWS:
 - a. BELOW GRADE TYPE "K", AND ABOVE GRADE TYPE "L" TEMPERED COPPER TUBE FOR PIPE SIZES 2 INCHES AND SMALLER, BRAZE ALL JOINTS. (PROGRESS FITTINGS NOT PERMITTED)
 - b. ABOVE GRADE TYPE "L" DRAWN COPPER TUBE WITH WROUGHT COPPER FITTINGS AND 95-5 TIN-ANTIMONY SOLDER.
 - c. ALL OTHER TYPE "L" DRAWN COPPER TUBE WITH WROUGHT COPPER FITTINGS AND 95-5 TIN-ANTIMONY SOLDER.
 - d. ALL DISCONNECT METALS MUST BE DIELECTRICALLY SEPARATED.
 - e. GENERALLY, SANITARY AND POTABLE WATER TAPS WILL BE PROVIDED BY THE LANDLORD. FIELD VERIFY EXACT CONNECTION POINTS PRIOR TO SETTING BIDS. NOTIFY THE LS&C PROJECT 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 TIE-IN AS FOLLOWS:
 - a. SCOPE SANITARY TO LEASE LME, SNAKE AS REQUIRED AND REPORT ANY BLOCKAGES.
 - b. TEST WATER PRESSURE TO INSURE MINIMUM PSI MATCHES MOST DEMANDED BY EQUIPMENT SUPPLIED.
 - f. INSULATE ALL HOT WATER, COLD WATER AND CONDENSATE PIPING WITH 1" THICK (K=0.23 @ 70°F) PIPE INSULATION WITH AN ALL SERVICE JACKET, INSULATION AND JACKET TO MEET LOCAL CODES AND UL/ULC FLAME SPREAD AND SMOKE DEVELOPED RATINGS, WHERE LOCAL CODE IS MORE STRINGENT OR INSULATION VALUE OR FLAME AND SMOKE SPREAD COMPLY WITH LOCAL CODE.
 - g. INSULATE THE TRAP, SANITARY AND SUPPLY PIPES UNDER LAVATORY WITH 1/2" ARMSTRONG "ARMAFLEX" PIPING INSULATION OR TRUERBRO MODEL 1029 "SHIELD LAV GUARD" INSULATION KIT.
 - h. INSTALL ALL NECESSARY PIPE HANGERS, SADDLES, AND CARRIERS TO PROPERLY SUPPORT ALL PIPING AND FIXTURES. HANGERS SHALL SUIT TYPE OF PIPING PROVIDED AND BE SPACED AT A MAXIMUM SPAN OF 5 FEET. PROVIDE SWAY AND SEISMIC BRACING WHERE REQUIRED BY CODES.
 - i. STERILIZE WATER SYSTEM IN ACCORDANCE WITH LOCAL CODES.
 - j. CLEANOUTS AND FLOOR DRAINS SHALL BE INSTALLED PER LOCAL CODES, WALL COVERS ARE TO BE STAINLESS STEEL AND FLOOR COVERS ARE TO BE BRASS, UNLESS OTHERWISE SPECIFIED. PROVIDE FLOOR COVERS WITH INSET AREA FOR CARPETED LOCATIONS. ALL CLEANOUT LOCATIONS SHALL BE APPROVED BY THE LS&C PROJECT MANAGER.
 - k. ESCUTCHEONS SHALL BE CHROME PLATED, SIZE AS REQUIRED, AND PLACED AT ALL PIPE PENETRATIONS AT WALLS, FLOORS AND CEILING IN FINISHED AREAS.
 - l. LEAKAGE TESTS SHALL BE PER LOCAL CODES MINIMUM AS FOLLOWS:
 - a. TEST WATER PIPING AT 100 PSIG FOR SIX HOURS.
 - b. TEST DRAIN, WASTE, VENT PIPING BY A 10" WATER COLUMN FOR TWO HOURS.
3. FLASHING SHALL BE SEALED WATER TIGHT AND PERFORMED IN ACCORDANCE TO THE LANDLORD'S CRITERIA. USE A LANDLORD APPROVED ROOFING CONTRACTOR, WHERE APPLICABLE.
4. PROVIDE WATER METER AND REMOTE READER PER LANDLORD'S CRITERIA OR LOCAL UTILITIES REQUIREMENTS, IF APPLICABLE. REFER TO PLANS TO DETERMINE IF WATER METER IS REQUIRED.

F. GAS PIPING

1. FURNISH AND INSTALL A COMPLETE GAS PIPING SYSTEM, IF APPLICABLE. REFER TO PLANS TO DETERMINE IF A GAS SYSTEM IS REQUIRED.
2. GAS LINES SHALL BE BLACK STEEL, SCHEDULE 40, ASTM A-85, WITH MALLEABLE THREADED FITTINGS FOR 2" AND SMALLER, AND WITH WELDED JOINTS FOR 2-1/2" AND LARGER.
3. FURNISH AND INSTALL A GAS COCK, BRASS VALVES AND UNION CONNECTION TO EACH PIECE OF EQUIPMENT.
4. SUPPORT PIPING AS REQUIRED BY CODE OR REQUIRED BY LANDLORD CRITERIA, WHICHEVER IS MORE STRINGENT.
5. GAS PIPING EXPOSED ON ROOF MUST BE PAINTED WITH RUST-INHIBITING PAINT.
6. GAS PIPING INSTALLED IN ROOMS OR PLenums SHALL BE BLEEDY AND VENTED OR WELDED IN ACCORDANCE WITH THE LOCAL GAS COMPANY, LOCAL CODE, AND APPLICABLE NFPA/NFPA 54 CODES.
7. TESTING AND PURGING OF GAS PIPING SHALL BE DONE PER THE REQUIREMENTS OF THE LOCAL GAS COMPANY, LOCAL CODES, AND APPLICABLE NFPA/NFPA 54 CODES.
8. CONTRACT AND COORDINATE GAS SERVICE, METER AND REGULATOR REQUIREMENTS WITH THE LOCAL GAS COMPANY AND THE MALL'S OPERATIONS MANAGER PRIOR TO BID. INCLUDE INSTALLATION COST OF GAS METER AND REGULATOR IN BID.

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PROJECT INFORMATION:
 REVISIONS:
 DATE ISSUED: 03/13/18
 DESIGNED BY: MAA
 DRAWN BY: TBA
 CHECKED BY: NJK

PLUMBING AND FIRE PROTECTION SPECIFICATIONS
 DRAWING NUMBER:
P04.01

1815-C-03
 51.0512.2
 NEW PACKAGE
 E5/NBC 2016
 091107078
 14/E PROJECT #

DATE ISSUED: 03/13/18
 DESIGNED BY: MAA
 DRAWN BY: TBA
 CHECKED BY: NJK

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