3. INTERIOR ABOVE GROUND PIPING SHALL BE RUN CONCEALED OF EACH SYSTEM CAN BE DRAINED. 4. COPPER WATER PIPING SHALL BE SUPPORTED BY CLEVIS a. PROVIDE HANGERS AND SUPPORTS THAT WILL NOT BE DETRIMENTAL TO THE PIPING SYSTEM. AS RECOMMENDED THE PIPING MANUFACTURER. 5. BRANCH LINES FROM SERVICE OR MAIN LINES MAY BE TAKEN OFF THE BOTTOM, TOP OR SIDE OF MAINS USING SUCH OR INSTALLATION CONDITIONS. ALL SERVICE PIPES. FITTINGS AND VALVES SHALL BE KEPT A SUFFICIENT DISTANCE FROM OTHER WORK TO PERMIT NOT LESS THAN 2 INCHES FROM FINISHED COVERING AND SUCH OTHER WORK, AND NOT LESS THAN 2 INCHES BETWEEN FINISHED COVERINGS ON THE DIFFERENT SERVICES.

6. COPPER TUBING SHALL BE CUT TRUE WITH TUBING CUTTER AND ALL BURRS REAMED OUT BEFORE MAKING JOINT. MAKE UP JOINT WITH NON-CORROSIVE FLUX AND SOLDER AND CARE SHALL BE TAKEN NOT TO OVERHEAT THE JOINT AND THEREBY ANNEALING THE FITTING. CORED SOLDER SHALL NOT BE a. PREPARE PIPING AND PROVIDE VALVES, FITTINGS AND

9. ALL FIXTURES AND DRAINAGE ON THE DRAINAGE SYSTEM

VENTED. ALL FLOOR DRAINS SHALL HAVE DEEP SEAL

10. BURIED PIPE SHALL BE FIRMLY BEDDED ON A COMPACTED

SHALL BE SEPARATELY TRAPPED AND ALL TRAPS SHALL BE

SAND BEDDING AT THE REQUIRED LINE AND GRADE SO THAT THE BARREL OF THE PIPE RESTS ON ITS ENTIRE LENGTH ON

THE BOTTOM OF THE TRENCH. THE INTERIOR OF THE PIPE

7. IN GENERAL, ALL PIPING CONNECTIONS TO EQUIPMENT SHALL BE PROVIDED WITH UNIONS AND INDIVIDUAL ISOLATION VALVES TO PERMIT ALTERATIONS AND REPAIRS. INSTALL BALL VALVES ON ALL BRANCH LINES OFF MAIN WATER PIPE SUPPLIES FOR ISOLATION OF SECTIONS OF BUILDING (REFER TO PLANS). THERMOSTATIC MIXING VALVE FOR EMERGENCY EYEWASH: CONFIRM IN WRITING WITH OWNER THE TEMPERATURE SETTING FOR THE TEPID WATER SUPPLY TO EMERGENCY YEWASH, THE CHEMICALS TO BE USED OR THAT MAY BE ON HE PREMISES, AND THE TEMPERATURE AT WHICH THEY BECOME AGGRESSIVE. a. A TEMPERATURE SETTING RANGE OF 60 TO 65 F IS ANTICIPATED TO BE THE EMERGENCY FIXTURE MIXING VALVE SETTING. (ANSI STANDARD Z358.1-2004 STIPULATES A MINIMUM OF 60 F AND NO HIGHER THAN 90 F FOR A COMFORTABLE RANGE). CONFIRM ALL SETTINGS IN WRITING AND CONFORM TO ANSI AND OSHA

JOINTS IN ACCORDANCE WITH THE PIPING

MANUFACTURER'S INSTALLATION INSTRUCTIONS

REQUIREMENTS. NOTE: HIGH TEMPERATURES CAN BE HARMFUL TO EYES, WARMER TEMPERATURES CAN OPEN PORES AND MAY CAUSE SOME CHEMICALS TO BECOME AGGRESSIVE. 9. BACKFLOW PREVENTERS AND/OR VACUUM BREAKERS SHALL BE INSTALLED WHERE REQUIRED TO PREVENT CONTAMINATION OF POTABLE WATER SYSTEM 10. WATER HAMMER ARRESTORS SHALL BE IN ACCORDANCE WITH 11. INTERIOR ABOVE GROUND PIPING SHALL BE INSULATED TO PREVENT CONDENSATION AND FOR PERSONAL PROTECTION

12. HOT WATER SHALL BE GENERATED BY AN ELECTRIC WATER a. WATER HEATER SHALL HAVE EXPANSION TANK, VACUUM RELIEF VALVE. PRESSURE RELIEF VALVE, DRAIN PIPE, AQUASTAT, AND ALL FITTINGS AND ACCESSORIES REQUIRED BY CODE AND IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. b. DOMESTIC HOT WATER SYSTEM SHALL HAVE HOT WATER RECIRCULATING LOOP WITH CIRCULATOR PUMP; PIPING SHALL RETURN FROM FURTHEST FIXTURES. INSTALI BALL VALVE, CHECK VALVE, AND FLOW METER AT END

MAXIMUM DISTANCE BETWEEN HANGERS SHALL BE AS REQUIRED BY THE PREVAILING PLUMBING CODE, OR THE MANUFACTURER'S REQUIREMENTS WHEN MORE STRINGENT. ALL MECHANICAL PIPING AND EQUIPMENT SHALL BE CONSTRUCTED AND INSTALLED TO RESIST SEISMIC FORCES, INCLUDING LATERAL AN LONGITUDINAL RESTRAINTS, COMPLYING WITH THE PREVAILING BUILDING CODE REQUIREMENTS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THE SERVICES OF QUALIFIED SUPPLIER TO DESIGN, CERTIFY, AND SUPERVISE INSTALLATION OF ALL SEISMIC RESTRAINT REQUIREMENTS FOR

ALL PIPING SHALL BE RIGIDLY SUPPORTED FROM THE BUILDING STRUCTURE AND NOT FROM PIPING OR OTHER EQUIPMENT. PIPES SHALL BE SUPPORTED SO AS TO MAINTAIN THE REQUIRED GRADING AND PITCHING OF LINES O PREVENT VIBRATION AND TO SECURE PIPING IN PLACE THEY SHALL BE ARRANGED SO AS TO PROVIDE FOR PROPER EXPANSION AND CONTRACTION OF PIPE. ONLY APPROVED HANGERS AND SUPPORTS SHALL BE USED VERTICAL LINES SHALL BE ADEQUATELY SUPPORTED AT THEIR BASES BY A SUITABLE HANGER(S), PLACED IN THE HORIZONTAL LINE NEAR THE RISER AND AT EACH FLOOR AND AT NOT MORE THAN 10-FOOT INTERVALS. LL HORIZONTAL PIPING SHALL BE SUSPENDED FROM THE BUILDING BY MILD GALVANIZED STEEL THREADED ROD CONNECTING THE PIPE HANGER TO INSERTS, BEAM CLAMPS, ANGLE BRACKETS AND LAG SCREWS AS REQUIRED BY THE BUILDING CONSTRUCTION. 4. HANGER RODS FOR OTHER INSTALLATIONS SHALL BE SIZED IN ACCORDANCE WITH RECOMMENDED LOAD CAPACITIES OF SPECIFICATION MSS SP-69. 5. ALL HANGERS ON INSULATED LINES SHALL BE SIZED TO FIT THE OUTSIDE DIAMETER OF THE PIPE INSULATION. PROVIDE INSULATION SHIELDS AND/OR PIPE COVERING PROTECTION SADDLES AS REQUIRED.

PROVIDE ALL NECESSARY ANCHORS, EXPANSION JOINTS, AND SHOCK ABSORBERS TO ALLOW NOISE-FREE MOVEMENT OF ASSOCIATED PIPING. 1. IT SHALL BE THE PLUMBER'S RESPONSIBILITY TO SUPPLY AND INSTALL AN APPROVED METHOD OF SHOCK SUPPRESSION THROUGHOUT THE BUILDING. SHOCK ABSORBERS SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO SELF-ACTUATING AND UICK CLOSING VALVES.

F. INSULATION: CLEAN AND DRY SURFACES TO BE INSULATED. STAGGER AND TIGHTLY BUTT JOINTS. INSULATE PIPES ONLY AFTER "TESTS" INSULATE PIPE FITTINGS TO SAME THICKNESS AS ADJACENT PIPE INSULATION. RUN INSULATION CONTINUOUS THROUGH HANGERS ALL INSULATION SHALL CONFORM TO THE RECOMMENDATIONS THE NFPA. ALL INSULATION SHALL BE UL APPROVED FOR A FLAME SPREAD RATING OF NOT OVER 25 AND A SMOKE DEVELOPED RATING OF NOT HIGHER THAN 50. THE ACCESS PANELS FOR CLEANOUTS AND INDIVIDUAL WATER SHUT-OFFS IN AREAS WITHOUT DROPPED ACOUSTICAL TILE CEILINGS AND IN WALL LOCATIONS SHALL BE FURNISHED BY

THE PLUMBING CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR PLUMBING CONTRACTOR TO MINIMIZE THE REQUIREMENT OF ACCESS PANELS BY INSTALLING SHUTOFFS ABOVE THE CORRIDOR ACOUSTICAL TILE CEILINGS.

CLEANOUTS SHALL BE PROVIDED AS SHOWN ON THE DRAWINGS, AT THE BASE OF EACH STACK, AT ALL TURNS GREATER THAN 45 DEGREES AND AT EACH LAVATORY AND

 PIPE SLEEVES SLEEVES FABRICATED OF SCHEDULE 40 GALVANIZED STEET PIPE SHALL BE INSTALLED AND PROPERLY SECURED AT ALI POINTS WHERE PIPES PASS THROUGH MASONRY OR CONCRETE WALLS AND FLOORS ON GRADE. PIPE SLEEVES SHALL BE TWO (2) SIZES LARGER THAN PIPING 4 INCHES AND SMALLER AND ONE SIZE LARGER THAN PIPING LARGER THAN 4 INCHES. WHERE PIPES ARE INSULATED, SLEEVES SHALL ALLOW 1/2 INCH MINIMUM CLEARANCE AROUND THE INSULATION. WALL SLEEVES SHALL BE FLUSH WITH EACH SIDE OF FINISHED WALL. PROVIDE SPLIT CHROMIUM PLATED BRASS ESCUTCHEONS WITH SET SCREWS WHERE PIPES PASS THROUGH FINISHED WALLS, FINISHED FLOORS AND CEILINGS. ESCUTCHEONS SHALL BE SECURED TO PIPE AND CONFORM CLOSELY AND NEATLY TO PIPE DIAMETER. FILL ANNULAR SPACE BETWEEN PIPE AND SLEEVES IN FLOORS WITH UL APPROVED FIRE RETARDING PACKING. RATED FOR 2 HOURS MINIMUM AND SEAL SUCH PACKING WITH A WATERPROOF, NON-SHRINKING PLASTIC COMPOUND. MODULAR/MECHANICAL SEALS AND SLEEVES: WHERE REQUIRED FOR WATERPROOFING PENETRATIONS THROUGH CONCRETE FLOOR SLABS AND EXTERIOR WALLS, UTILIZE

LINK-SEAL MODULAR SEAL RUBBER LINKS AND PENETRATION SLEEVES, OR APPROVED EQUAL. END OF SECTION 15400

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND/OR

DELIVER TO THE GENERAL CONTRACTOR ALL CERTIFICATES OF

CONNECTION AND INSPECTION FEES AS REQUIRED FOR TH

INSPECTION ISSUED BY THE JURISDICTION, BEFORE FINAL

A. THE CONTRACTOR SHALL GUARANTEE ALL WORK PERFORMED AND

B. THE DATE OF ACCEPTANCE SHALL BE THAT WHICH APPEARS ON

REQUIREMENTS. SUBMIT SHOP DRAWINGS ON ALL PLUMBING

REQUEST FOR SUBSTITUTION: SUBJECT TO COMPLIANCE WITH

SPECIFICALLY NOTED OTHERWISE; HOWEVER, THE OWNER MAY

WISH TO MAINTAIN THE SPECIFIED MANUFACTURER'S PRODUCTS

OR CONSISTENCY THROUGHOUT THEIR FACILITIES AND THIS MAY

REJECTION OF SUBSTITUTIONS MAY BE BASED ON AESTHETICS,

SUBSTITUTES WILL BE CONSIDERED FOR APPROVAL. THE

CONTRACTOR SHALL SUBMIT A "REQUEST FOR SUBSTITUTION"

) COMPARISON OF QUALITY AND CONFORMING

CHANGES REQUIRED IN OTHER ELEMENTS

EFFECT ON CONSTRUCTION SCHEDULE

AVAILABILITY OF MAINTENANCE PARTS

2. THE CONTRACTOR SHALL SUBMIT SHOP DRAWING/SUBMITTA OF THE PROPOSED SUBSTITUTION TO THE ARCHITECT FOR

THE ENGINEER'S APPROVAL PRIOR TO PURCHASE AND

CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CHANGES

REQUIRED TO PERMIT THE USE OF SUBSTITUTED EQUIPMENT SHALL BE THE COST AND INSTALLATION

DURING THE PROGRESS OF WORK, MAINTAIN AN ACCURATE SET OF

RECORD DRAWINGS REFLECTING ALL CHANGES MADE IN THE PLUMBING INSTALLATION FROM THE LAYOUT AND MATERIALS

SHOWN ON THE APPROVED DRAWINGS--INCLUDE PERTINENT

A. PROVIDE INSTRUCTION, TO THE OWNER OR OWNER'S DESIGNATED

REPRESENTATIVE, OF THE OPERATING AND MAINTENANCE

INSTRUCTÌON SHALL INCLUDE. BUT IS NOT LIMITÉD TO

PROCEDURES FOR ALL EQUIPMENT AND SYSTEMS INSTALLED.

IN ADDITION TO THE NORMALLY INCLUDED LARGER SYSTEMS AND

EQUIPMENT, SUCH AS THE WATER HEATING EQUIPMENT, THOROUGH

AUTOMATIC PRESSURE-DROP TYPE TRAP PRIMER LOCATIONS

AND ANY FUNCTIONING AND PROCEDURES THAT MAY BE

B. AT THE COMPLETION OF THE PROJECT, TURN OVER TO THE OWNER

THREE (3) COMPLETE OPERATING AND MAINTENANCE MANUALS.

THE GENERAL CONTRACTOR WILL PROVIDE OPENINGS IN WALLS,

FLOORS, ROOF, CEILINGS AND PARTITIONS TO RECEIVE PIPE

CONTRACTOR AND SECURELY SET AS REQUIRED FOR PIPING

CONTRACTOR IS RESPONSIBLE FOR ALL FIRESTOPS FOR HIS

UNIT, AT PARTY WALLS, ETC., AS IS REQUIRED. CONTRACTOR IS RESPONSIBLE FOR PROVIDING UL LISTINGS

PIPING WITH APPLICABLE FIRE RATING FROM UNIT TO

PROVIDE NAMEPLATES FOR ALL EQUIPMENT AND VALVE TAGS FOR

ALL VALVES. PROVIDE PIPE IDENTIFICATION ON ALL SYSTEMS.

TO INDICATE SERVICE AND PURPOSE OF VALVE, PIPE

FURNISH AND INSTALL PERMANENT DURABLE VALVE TAGS

SECURELY FASTENED TO ALL VALVES AND/OR COCKS, ON

MAIN LINES AND BRANCHES. TAGS SHALL BE PLACED AT

REGULAR INTERVALS AND AT ALL CHANGE OF DIRECTION ANI

a. VALVE SCHEDULE: SUBMIT VALVE SCHEDULE FOR EACH

PIPING SYSTEM. TYPEWRITTEN AND REPRODUCED ON

TAG), LOCATION OF VALVE (ROOM OR SPACE), AND

VARIATIONS FOR IDENTIFICATION (IF ANY). MARK

ADDITIONAL CAUTION SIGN: "CAUTION - USE COLD OR

CONTRACTOR SHALL FURNISH ALL CERTIFICATES OF COMPLIANCE

ALL PIPE LINES SHALL BE BLOWN OR FLUSHED CLEAN BEFORE

SHALL BE COVERED, CONCEALED, USED OR MADE INACCESSIBLE TO TESTING, INSPECTION, REPAIR, CORRECTION OR

SATISFACTORILY COMPLETED IN THE PRESENCE OF THE GENERAL

THE CONTRACTOR MUST ACCOMMODATE HIS TESTING OPERATION TO

DEFECTS APPEARING UNDER TESTS AND REPEAT THE TESTS UNTIL

SCREWED PIPING SHALL BE MADE TIGHT WITHOUT CAULKING. WHEN THE WORK IS PRESENTED FOR ACCEPTANCE, ALL VALVE

SHALL FURNISH ALL LABOR, MATERIALS AND SERVICES FOR

HE PROGRESS OF THE PROJECT AS A WHOLE AND CORRECT AL

ALL PARTS OF THE WORK HAVE WITHSTOOD THEM SUCCESSFULLY.

STEM PACKING MUST BE NEW AND WITHOUT LEAKS AND ALL GAGES

MUST BE IN PLACE AND READING ACCURATELY. THE CONTRACTOR

ESTING INCLUDING TESTING PLUGS, PUMPS AND COMPRESSORS,

AND SHALL MAKE, THEN REMOVE, ALL TEMPORARY PIPING CONNECTIONS REQUIRED FOR THE TEST AND SHALL DISPOSE OF

WORK IN GOOD ORDER, READY FOR FULL USE.
THE CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR FIVE

A. UPON COMPLETION OF THE WORK, AND AFTER ALL SYSTEMS ARE

CARRIED OUT UNDER THE SUPERVISION OF THE GENERAL

CAPACITIES ARE ADEQUATE TO MEET THE SPECIFIED

FIELD SERVICE ENGINEER TO CONDUCT ALL TESTS IN THE

PRESENCE OF THE GENERAL CONTRACTOR AND OWNER'S

EQUIPMENT, AND PERSONNEL REQUIRED FOR THE TESTS.

FURNISHED UNDER THIS CONTRACT SHALL BE THE STANDARD

PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE

MANUFACTURER'S LATEST STANDARD DESIGN THAT COMPLIES WITH

MANUFACTURER'S NAME, ADDRESS, SERIAL AND MODEL NUMBERS

ON A PLATE SECURELY ATTACHED TO THE ITEM. EACH LENGTH

F PIPE. FITTING AND DEVICE SHALL HAVE INDELIBLY MARKED

N IT, THE MAKER'S NAME, WEIGHT OR CLASS OF PRODUCT.

SETSCREWS, KEYS, AND OTHER ROTATING PARTS LOCATED SO

ENDANGER PERSONNEL OR CREATE A FIRE HAZARD SHALL BE

THAT ANY PERSON CAN COME IN CLOSE PROXIMITY THERETO

TEMPERATURE EQUIPMENT AND PIPING SO LOCATED AS TO

BELTS, PULLEYS, CHAINS, GEARS, COUPLINGS, PROJECTING

UNLESS OTHERWISE INDICATED, THE MATERIALS TO BE

PRODUCTION OF SUCH EQUIPMENT AND SHALL BE T

B. EACH MAJOR ITEM OF EQUIPMENT SHALL HAVE THE

1.16 METHODS AND MATERIALS

HE SPECIFIED REQUIREMENTS

REPRESENTATIVE. THE GENERAL OPERATING TESTS SHALL I

PERFORMED UNDER AS NEAR DESIGN CONDITIONS AS POSSIBLE

IN ACCORDANCE WITH THE SPECIFICATIONS. THE CONTRACTOR

SHALL FURNISH ALL INSTRUMENTS, LADDERS, LUBRICANTS, TEST

CONTRACTOR AND OWNER'S REPRESENTATIVE PRIOR TO THE

SET AND BALANCED, THE CONTRACTOR SHALL CONDUCT PERFORMANCE TESTS OF ALL SYSTEMS. THESE TESTS SHALL BE

PURPOSE OF DEMONSTRATING SATISFACTORY FUNCTIONAL AND

PERIOD. THE SETTING OF ALL AUTOMATIC CONTROLS SHALL BE

OPERATING EFFICIENCY AS WELL AS ADJUSTMENT. DURING THIS

CHECKED TO ENSURE THAT CONDITIONS ARE CORRECT AND THAT

REQUIREMENTS. THIS CONTRACTOR SHALL PROVIDE A COMPETENT

ACCEPTANCE OF THE SYSTEMS AND SHALL BE ARRANGED FOR THE

EST WATER AND ALL WASTES AFTER TESTS. HE SHALL LEAVE

5) WORKING DAYS PRIOR TO THE TIME THE TESTS ARE TO BE

PIPING TESTS ARE APPLIED. NO PORTION OF THE PIPING

8-1/2" X 11" BOND PAPER. TABULATE VALVE NUMBER

PIPING SYSTEM, SYSTEM ABBREVIATION (AS SHOWN ON

AND SIMILAR SPECIAL USES, BY SPECIAL "FLAGS", IN

TEPID WATER AT EYEWASH; USE OF HOT WATER MAY CAUSE

SCALDING AND DAMAGE TO EYE". SIGN SHALL BE IN RED

VALVES WHICH ARE INTENDED FOR EMERGENCY SHUT-OFF

SHALL BE CLEARLY MARKED AND CHARTED (VALVE SCHEDULE)

PASSING THROUGH WALLS, FLOORS, ROOF, CEILINGS AND

LINES. PLUMBING FIXTURES AND OTHER APPARATUS

ALL SLEEVES SHALL BE FURNISHED BY THE PLUMBING

TAGS. CHARTS. LABELING / PIPE IDENTIFICATION

IDENTIFICATION AND FLOW ARROWS.

MARGIN OF SCHEDULE

WITH APPROPRIATE COLORED TEXT.

N TRIPLICATE TO THE GENERAL CONTRACTOR.

REPLACEMENT, UNTIL TESTS THEREOF HAVE BEEN

CONTRACTOR AND CITY INSPECTOR(S)

PRESSURE TESTING

B. OTHER SIGNS AND SYSTEM IDENTIFICATION REQUIREMENTS:

A. EACH SYSTEM SHALL BE TESTED IN ACCORDANCE WITH THE GOVERNING REGULATIONS AND AS SPECIFIED HEREIN. THE

1. "EMERGENCY EYEWASH" SIGN AT EYEWASH. PROVIDE

WRITTEN (OPERATING AND PROCEDURES MANUAL) AND VERBAL

INVERTS AND DIMENSIONS. AT COMPLETION OF WORK, FURNISH

O THE GENERAL CONTRACTOR A SET OF MARKED PRINTS SHOWING

REQUIRED TO INSTALL THE SUBSTITUTION AND ANY DEVIATIONS FROM THE ORIGINAL SPECIFICATION.

a. ADDED SUPPORT STEEL, ANCHORS, BRACES, E

FOR EACH APPLICABLE PRODUCT, WHICH SHALL INCLUDE AND

TANK, MIXING VALVES, BACKFLOW PREVENTION DEVICES.

VARIATIONS (OPTIONS), AND ACCESSORIES.

EQUIPMENT OF EQUAL QUALITY AND CAPACITY, UNLESS

E A CAUSE TO REJECT SUBSTITUTIONS. IN ADDITION,

PRODUCT FEATURES, ETC., WHICH MAY HAVE BEEN A

a. FIXTURE NUMBER AND DESCRIPTION:

STANDARDS

COST COMPARISON

FIXTURES, DRAINAGE SPECIALTIES, WATER HEATER, EXPANSION

NOTE THE IDENTIFYING FIXTURE NUMBERS ON THE CATALOG

REQUIREMENTS. THE CONTRACTOR MAY PROPOSE TO SUBSTITUTE

CUTS (E.G. "P-1") AS THEY CORRESPOND TO THE PLUMBING FIXTURE SCHEDULE ON THE PLUMBING DRAWINGS.

SUBMITTALS SHALL CLEARLY IDENTIFY ALL MODEL NUMBERS.

THE OWNER'S CERTIFICATE OF FINAL PAYMENT.

A. REFER TO DIVISION 1 FOR ADDITIONAL SUBMITTAL

MATERIALS AND EQUIPMENT INSTALLED FOR ONE (1) YEAR FROM

THE DATE OF FINAL ACCEPTANCE. DEFECTS SHALL BE REPLACED

PAYING FOR ALL PERMITS, INVESTMENT FEES, TAXES,

T NO COST TO THE OWNER.

INSULATION AND PIPE ACCESSORIES

CONSIDERATION WHEN SPECIFIED.

INSTALLATION.

THE "AS BUILT" CORRECTIONS.

CUTTING AND PATCHING

1.11 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

1.10 RECORD DRAWINGS

SECTION 15400 - PLUMBING SPECIFICATIONS

PLUMBING DRAWINGS.

THIS PLUMBING SPECIFICATION):

SPACE FOR CMD's FITHE

A. FURNISH ALL SUPERVISION, LABOR, MATERIALS, TOOLS AND

A. THE WORK SHALL INCLUDE, BUT IS NOT LIMITED TO, THE

SYSTEM INCLUDING PIPING, FITTINGS, PIPING

TO ALL APPLICABLE FIXTURES.

LAVATORIES AND SINKS.

ACCORDANCE WITH THIS PLUMBING SPECIFICATION AND THE

DESCRIBED BELOW AND ON THE DRAWINGS. BY THE PLUMBING

CONTRACTOR (HEREAFTER DESCRIBED AS THE CONTRACTOR IN

1. COMPLETE DOMESTIC COLD, HOT AND HOT WATER RETURN

SLEEVES, IN-LINE BACKFLOW PREVENTERS, VACUUM

ACCESSORIES, VALVES, VALVE BOXES, HANGERS, SUPPORTS.

BREAKERS, WATER HEATER, EXPANSION TANK, CIRCUI ATOR

MIXING VALVES, FROSTPROOF WALL HYDRANTS, ETC. THE

DOMESTIC COLD WATER DISTRIBUTION PIPING SHALL TIE

INTO THE 2" COLD WATER MAIN CAPPED IN THIS TENANT

a. THE DOMESTIC WATER SERVICE ENTRANCE, INCLUDING

PREVENTER, ARE PART OF THE OWNER'S "SHELL"

b. THE HOT WATER SHALL BE GENERATED BY AN ELECTRIC

) WATER SHALL BE STORED AT 140 DEGRFF F

WATER HEATER, WITH DISTRIBUTION PIPING EXTENDING

PROVIDE MIXING VALVE SERVING THE GENERA

PURPOSE HOT WATER, WITH A SET TEMPERATURE AT

120 DEGREE F (SHALL NOT EXCEED 130 DEGREE F

PER CODE). FURTHER TEMPERATURE LIMITATION

ACHIEVED AT THE SINGLE LEVER FAUCET WITH

PING TO FURTHEST FIXTURE LOCATION WITH

FLOW METER AND CHECK VALVE AT ENDS OF RUN

NO GREATER THAN 110 DEGREE F. CAN BE

2) PROVIDE GENERAL PURPOSE HOT WATER RETURN

INTEGRAL TEMPERATURE LIMIT STOPS AT

2. COMPLETE SYSTEM OF SANITARY WASTE AND VENT PIPING

HANGERS, SUPPORTS, SLEEVES, ETC. SANITARY SHAL

EXTEND BY GRAVITY TO FLOOR CLEANOUT LOCATIONS IN

THIS TENANT SPACE. AS DESIGNATED ON THE OWNER'S

a. PROVIDE SANITARY VENTING PER CODE. VERIFY A

"SHELL" BUILDING PLANS. COORDINATE SANITARY PIPING

HVAC FRESH AIR INTAKE LOCATIONS AND LOCATE

PLUMBING VTR AT MAXIMUM DISTANCE AS POSSIBLE

(VISUAL). REFER TO PLUMBING ROOF PLAN AND

WHILE STILL BEING MINDFUL OF BUILDING AESTHETICS

INCLUDING PIPING, FITTINGS, PIPING ACCESSORIES.

SLOPE REQUIREMENTS AND ALL INVERTS IN FIELD

ETAILS FOR ADDITIONAL REQUIREMENTS

INCLUDING PIPING, FITTINGS, PIPING ACCESSORIES,

4. PLUMBING FIXTURES INCLUDING INSTALLATION, ROUGH-IN

7. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL

WITH ALL PERTINENT CODES AND REGULATIONS

TESTING, CLEANING, ADJUSTING AND PLACING IN

A. ROOF FLASHING, CUTTING AND PATCHING, PAINTING, TRENCHING, AND BACKFILLING BY THE GENERAL CONTRACTOR

HVAC SYSTEMS AND EQUIPMENT BY HVAC CONTRACTOR.

F. SANITARY SEWER SYSTEM BEYOND THIS TENANT SPACE.

WORK NOT INCLUDED IN THE ALTERNATE PRICES).

FIFCTRICAL POWER AND WIRING BY ELECTRICAL CONTRACTOR.

FIRE PROTECTION SYSTEM BY FIRE PROTECTION CONTRACTOR.

DOMESTIC WATER SERVICE ENTRANCE AND COLD WATER MAIN TO

THIS TENANT SPACE BY BUILDING OWNER; REFER TO "SHELL"

A. ALTERNATE PRICES SHALL BE SUBMITTED FOR EACH OF THE FOLLOWING, FOR A COMPLETE WORKING SYSTEM. INDICATE THE

BID SPECIFICATIONS FOR COPPER WATER PIPING

"ADD" OR "DEDUCT" TO THE BASE BID (STIPULATE ANY AND ALL

1. PROVIDE ALTERNATE PRICING FOR: PEX RUNOUTS TO EACH

BID PRODUCTS). ALTERNATE MATERIAL AS FOLLOWS:

a. PEX TUBING - WATER PIPING EXTENDING OFF COPPE

SYSTEMS, ASTM F876/F877 SDR9 CROSSLINKED

IN ACCORDANCE WITH MANUFACTURER'S

CLIPS, AND FASTENERS.

A. ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH

LIMITED TO, THE INTERNATIONAL PLUMBING CODE,

1.5 QUALITY ASSURANCE/CODES AND STANDARDS

2011 REQUIREMENTS.

REGULATION.

1.6 BASIC MECHANICAL REQUIREMENTS

FIXTURE OFF THE COPPER MAINS, IN LIEU OF THE BASE

THROUGHOUT (REFER TO "PART 2 - PRODUCTS" FOR BASE

MAINS TO FIXTURE LOCATIONS: UPONOR "AQUAPEX". OR

POLYETHYLENE (PEX-a) PIPING WITH ASTM F1960 COLD

AND LISTED TO ANSI/NSF STANDARDS 14 AND 61. WITH

APPROVED EQUAL, SUITABLE FOR DOMESTIC WATER

EXPANSION FITTINGS WITH PEX REINFORCING RINGS.

RECOMMENDATIONS AND INSTALLATION INSTRUCTIONS

SUPPORTS, PEX—a PIPE SUPPORTS, CLAMPS,

3) ALL PIPING AT WATER HEATER SHALL BE COPPER.

COMPLIANCE (HW) AND PREVENT CONDENSATION

1) PFX-a FITTINGS AND ACCESSORIES, INCLUDING

2) CHROME PLATED SUPPLIES AT FIXTURES WHERE

4) PIPE INSULATION SHALL REMAIN AS SPECIFIED

5) DOCUMENTED TRAINING TO INSTALL THE UPONOR

"AQUAPEX" PRODUCT FROM AN AUTHORIZED

(DO NOT ELIMINATE) FOR ENERGY CODE

MANUFACTURER'S REPRESENTATIVE.

PREVAILING LOCAL, STATE AND FEDERAL STANDARDS, CODES, REGULATIONS, ORDINANCES AND LAWS, INCLUDING BUT NOT

INTERNATIONAL MECHANICAL CODE, INTERNATIONAL ENERGY CONSERVATION CODES, PUBLIC UTILITY AND ALL OTHER

ADDITION, THE WORK SHALL BE IN ACCORDANCE WITH, BUT NOT LIMITED TO THE REQUIREMENTS OF:

ASME: AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

ANSI: AMERICAN NATIONAL STANDARDS INSTITUTE, INC.

ASTM: AMERICAN SOCIETY FOR TESTING MATERIALS.

8. FEDERAL "REDUCTION OF LEAD IN DRINKING WATER ACT"

NOTHING CONTAINED IN THESE SPECIFICATIONS OR INDICATED ON THE DRAWINGS SHALL BE CONSTRUED TO CONFLICT WITH

APPLICABLE PORTIONS OF ANY LAW, ORDINANCE, RULE OR

OF EQUIPMENT AND INTENDED MATERIALS TO BE INSTALLED IF

DIFFERENT THAN SCHEDULED, FOR THE ARCHITECT, GENERAL

SURVEY THE CONDITIONS TO BE ENCOUNTERED IN THE PERFORMANCE OF THE WORK. FAILURE TO FAMILIARIZE HIMSEL

PIPE, FITTING OR APPLIANCE. THE CONTRACTOR SHALL BE REQUIRED TO FURNISH, WITHOUT EXPENSE TO THE OWNER, ALL

MATERIALS AND LABOR NECESSARY TO COMPLETE THE SYSTEM IN

THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO BE

HEADING IN A DIVISION MAY NOT DESCRIBE EACH AND

MATERIALS TO BE FURNISHED. THE DRAWINGS ARE DIAGRAMMATIC AND MAY NOT SHOW ALL OF THE WORK

AND ACTUAL PLACEMENTS ARE TO BE VERIFIED IN THI

FIELD. IT IS TO BE UNDERSTOOD THAT THE BEST TRADE

SEQUENCE OF WORK: SCHEDULE THE WORK AND COORDINAT

CHEDULE WITH OTHER CONTRACTORS TO PREVENT DELAYS.

REQUIRED OR ALL CONSTRUCTION DETAILS. ALL DIMENSIONS

EVERY DETAIL CONCERNING WORK TO BE DONE AND

OMPLEMENTARY. A PARTICULAR SECTION, PARAGRAPH O

B. THE CONTRACTOR'S QUOTE SHALL INDICATE THE MANUFACTURER

THE CONTRACTOR IS REQUIRED TO INSPECT THE SITE AND

RESPONSIBILITY FOR FULL COMPLETION OF THE WORK IN

ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

ACCORDANCE WITH THE BEST PRACTICE OF THE TRADE

RACTICES OF THE DIVISION WILL PREVAIL.

INTERFERENCES WITH OTHER TRADES ARE AVOIDED.

D. ARCHITECTURAL DRAWINGS WILL TAKE PRECEDENCE OVER

PLUMBING DRAWINGS IN ANY CONFLICT OF LOCATION OF

HE DECISION AS TO WHAT WORK WILL BE RELOCATED,

IN WRITING BEFORE AWARD OF CONTRACT. OTHERWISE.

E. ADDRESS QUESTIONS ABOUT CONTRACT DOCUMENTS TO ARCHITECT

ARCHITECT'S INTERPRETATION OF MEANING AND INTENT OF

C. IT IS THE RESPONSIBILITY OF THE CONTRACTOR THAT HIS WORK BE INSTALLED IN THE MOST DIRECT AND WORKMANLIKE MANNER

WORK SHALL PRESENT A NEAT APPEARANCE, AND THAT ANY

NSTALLATION OF EQUIPMENT OR PIPING. IN THE EVENT THAT

AN INTERFERENCE SHOULD DEVELOP. THE ARCHITECT SHALL MAKE

UTHORITIES HAVING JURISDICTION OVER THE PREMISES

PLUMBING AND DRAINAGE INSTITUTE

UL: UNDERWRITERS LABORATORIES.

NSF: NATIONAL SANITATION FOUNDATION.

ADA: AMERICANS WITH DISABILITIES AC

THIS SECTION OF THE SPECIFICATION.

1.3 RELATED WORK TO BE PERFORMED UNDER OTHER SECTIONS

LUMBING ITEMS AND FIXTURES INDICATED ON THE

5. FURNISH REQUIRED ACCESS PANELS FOR INSTALLATION BY

6. PIPE INSULATION AND VAPOR BARRIER FOR THE PREVENTION

CONDENSATION, PERSONAL PROTECTION, AND ENERGY

DRAWINGS, DRAWING SCHEDULE, SPECIFIED HEREIN, OR AS

OPERATION ALL SYSTEMS AND EQUIPMENT SPECIFIED UNDER

NFFDFD FOR A PILIMBING INSTALLATION IN ACCORDANCE

3. INDIRECT WASTE PIPING FOR PLUMBING EQUIPMENT

HANGERS, SUPPORTS.

AND FINAL CONNECTIONS

E GENERAL CONTRACTOR.

BUILDING PLANS; REFER TO OWNER'S "SHELL"

BUILDING PLANS FOR ADDITIONAL INFORMATION.

EQUIPMENT AND INSTALL ALL MATERIALS REQUIRED TO PERFORM

PART 1 - GENERAL

1.2 WORK INCLUDED

LONG-LEAD ITEMS (FIXTURES, SPECIALTY PRODUCTS, ETC.) AND PURCHASE AS NECESSARY TO FACILITATE HIS WORK AND COMPLETION OF THE WHOLE PROJECT. THE WORK.

FULL INFORMATION TO THE GENERAL CONTRACTOR SUFFICIENTLY N PLACE. IN THE CASE OF FAILURE ON THE PART OF THE SHALL ASSUME THE COST OF HAVING THE WORK DONE BY THE GENERAL CONTRACTOR IN THE ORIGINAL SEALED CONTAINERS OR PACKAGES BEARING THE MANUFACTURER'S NAME AND BRAND DESIGNATION. PIPING ETC. WATER PIPING SHALL BE FLUSHED OUT PRIOR TO TESTING OF EQUIPMENT. ALL OPEN ENDS OF PIPE SHALL BE CAPPED OR ENTRANCE OF FOREIGN MATERIALS. NO PIPE SHALL BE INSTALLED OUTSIDE OF BUILDING OR IN AN EXTERIOR WALL UNLESS ADEQUATE PROVISIONS ARE MADE TO PROTEC

FROM FREEZING. THE CONTRACTOR SHALL AT ALL TIMES. PROTECT HIS WORK, MATERIALS, AND EQUIPMENT FROM ANY LOSS REFINISH OR REPLACE ALL DAMAGED OR IMPERFECT MATERIALS, REMOVE FROM THE PREMISES ALL WASTE MATERIAL PRESENT AS A RESULT OF HIS WORK INCLUDING CARTONS, CRATING, PAPER STICKERS, SCAFFOLDING, TOOLS, ETC., AND HE SHALL CLEAN ALL PIECÉS OF EQUIPMENT INSTALLED UNDER THIS CONTRACT TO

OF THE WORK. ALL EQUIPMENT AND PIPING SHALL BE SUPPORTED FROM THE CEILINGS OR IN WALLS. ELECTRICAL WORK: . ELECTRICAL EQUIPMENT FURNISHED BY THIS CONTRACTOR AND WIRED UNDER ELECTRICAL SPECIFICATIONS: (REFER

WATER HEATER AND CONTROLS. FLECTRIC WATER COOLER WITH THIS PROJECT WITH THE ELECTRICIAN BEFORE SUBMITTALS, ORDERING, OR INSTALLATION OF EQUIPMENT

NO PIPE SHALL BE INSTALLED WHICH WILL PROVIDE A CROSS OR INTERCONNECTION BETWEEN THE WATER SYSTEMS AND A POLLUTED SUPPLY OR DRAINAGE SYSTEM. ALL WATER CONNECTIONS WITH HOSE THREADED OUTLETS SHALL BE PROTECTED BY A SUITABLE AIR GAP OR APPROVED TYPE BACKFLOW PREVENTER. 2. VERIFY CONNECTION IS TO APPLICABLE SYSTEM OF DOMESTIC COLD, HOT OR HOT WATER RETURN PIPING.

AN EQUAL OR HIGHER STANDARD OR QUALITY, ALL MATERIALS AND SYSTEMS SHALL AT A MINIMUM BE IN ACCORDANCE WITH THE INTERNATIONAL PLUMBING, MECHANICAL, AND ENERGY CONSERVATION CODES. IN ADDITION, INSTALLATION OF MATERIAL SHALL BE IN ACCORDANCE WITH MANUFACTURER'S NSTALLATION INSTRUCTIONS INCLUDING, BUT NOT LIMITED TO RECOMMENDED FITTINGS AND JOINTS THE FOLLOWING PARAGRAPHS AND IN THE PLUMBING DRAWINGS ARE GIVEN TO ESTABLISH A LEVEL OF QUALITY AND PERFORMANCE AND THEY ARE NOT INTENDED TO EXCLUDE EQUIVALENT PRODUCTS OF ALTERNATE MANUFACTURERS, UNLESS SPECIFICALLY INDICATED OTHERWISE. SUBSTITUTIONS MUST BE APPROVED PRIOR TO PURCHASING AND INSTALLING. (REFER

TO "SUBSTITUTIONS" SECTION IN PART 1 OF THIS SPEC.) PER CODE OR HIGH-FEFICIENCY REQUIREMENTS AS SPECIFIED AND A.D.A. GUIDELINES AS IS APPLICABLE. CHINA FIXTURES SHALL BE AS MANUFACTURED BY KOHLER TOTO AMERICAN STANDARD OR APPROVED FOLIAL SHALL BE AS MANUFACTURED BY ÉLKAY, JUST, OR APPROVED

EACH PRODUCT SPECIFIED THROUGHOUT FINISHED AREAS SHALL BE CHROME PLATED. SHALL BE COMMERCIAL GRADE, 17 GAUGE, EQUAL TO P-TRAP WITH CLEANOUT OR REMOVABLE P-TRAP/J-BEND. ACCESSIBLE FIXTURES.

APPROVED EQUAL, WITH DISTRIBUTION UNIT TO SUIT (NOTE: SUBSTITUTES WILL ONLY BE APPROVED IF THE UNIT PERFORMS SIMILAR TO THE MIFAB UNIT, ACTIVATING WITH A PRESSURE DROP OF 3 PSI.) AND LOCAL CODES AND ORDINANCES. 1. BALL VALVES SHALL BE FULL PORT, TWO-PIECE, COPPER-

MINIMUM CWP RATING a. PRESSURE AND TEMPERATURE RATINGS: AS REQUIRED TO SUIT SYSTEM PRESSURES AND TEMPERATURES. b. SIZES: UNLESS OTHERWISE INDICATED, PROVIDE VALVES OF SAME SIZE AS UPSTREAM PIPE SIZE. END CONNECTIONS: TO SUIT. DRAINS SHALL BE AS DESCRIBED IN THE DRAWING SCHEDULE

 FLOOR AND WALL CLEANOUTS SHALL BE AS DESCRIBED IN THE DRAWING SCHEDULE BY ZURN, WADE, JOSAM, MIFAB, OR JAY R. SMITH. WALL CLEANOUTS SHALL HAVE STAINLESS STEEL COVER. FLOOR CLEANOUTS SHALL HAVE POLISHED NICKEL BRONZE TOP. 2. DANDY AND END CLEANOUTS SHALL BE AS SUPPLIED BY THE DRAINAGE SYSTEM MANUFACTURER. LECTRICALLY INSULATED FROM EACH OTHER--TO PROVIDE PROTECTION AGAINST GALVANIC AND STRAY CURRENT CORROSION——USING COUPLINGS. UNIONS OR FLANGES OMMERCIALLY MANUFACTURED FOR THAT PURPOSE AND RATED FOR SERVICE PRESSURE AND TEMPERATURE.

A. GENERAL COMMENT WHERE PERTINENT TO BUILDING CONSTRUCTION: COMPLY WITH APPLICABLE MECHANICAL CODE MATERIALS EXPOSED WITHIN PLENUMS SHALL BE NON-COMBUSTIBLE OR SHALL HAVE A FLAMESPREAD INDEX OF NOT THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.

APPLICATIONS. ALL PIPE AND FITTINGS TO BE CONFORMING TO ASTM D2665 WITH PVC DWV FITTINGS AND TESTING SHALL COMPLY WITH THE LATEST

BUILDING, AND FIRE CODE REQUIREMENTS. C. CONDENSATE AND INDIRECT WASTE:

D. THE CONTRACTOR SHALL OBTAIN DETAILED INFORMATION FROM THE MANUFACTURERS OF APPARATUS WHICH HE IS TO PROVIDE FOR THE PROPER METHODS OF INSTALLATION. HE SHALL ALSO OBTAIN ALL INFORMATION FROM THE GENERAL CONTRACTOR AND OTHER SUBCONTRACTORS WHICH MAY BE NECESSARY TO FACILITATE HIS WORK AND THE COMPLETION OF THE WHOLE 1. THE CONTRACTOR SHALL KEEP HIMSELF FULLY INFORMED OF

CONTRACTOR SHALL BE INFORMED OF LONG-LEAD ITEMS AT TIME OF BID AND SHALL BE PROMPTLY INFORMED OF ANY E. THE CONTRACTOR SHALL KEEP HIMSELF FULLY INFORMED AS TO THE SHAPE, SIZE AND POSITION OF ALL OPENINGS AND FOUNDATIONS REQUIRED FOR HIS APPARATUS AND SHALL GIVE IN ADVANCE. HE SHALL ALSO FURNISH ALL SUPPORTS HEREIN SPECIFIED, SO THAT THE GENERAL CONTRACTOR MAY BUILD SOME CONTRACTOR TO GIVE PROPER INFORMATION AS NOTED ABOVE, HE

F. ALL MECHANICAL EQUIPMENT SHALL BE DELIVERED TO THE SITE G. BEFORE FINAL ACCEPTANCE OF WORK, THE CONTRACTOR SHALL

PRESENT A NEAT AND CLEAN INSTALLATION AT THE TERMINATION BUILDING STRUCTURE. IN GENERAL, WHEREVER POSSIBLE, ALL EQUIPMENT AND PIPING SHALL BE INSTALLED CONCEALED ABOVE

TO PLUMBING FIXTURE SCHEDULE FOR ELECTRICAL REQUIREMENTS) a. CIRCULATOR PUMP

2. ALL WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, AND OTHER REQUIREMENTS SET FORTH IN OTHER PARTS OF THE CONSTRUCTION DOCUMENTS ASSOCIATED 3. CONFIRM ALL EQUIPMENT VOLTAGE AND PHASE REQUIREMENTS J. CROSS CONNECTIONS:

2.1 MATERIALS A. GENERAL: EXCEPT WHERE THEY ARE SPECIFIED BELOW TO BE OF B. THE PRODUCT MANUFACTURERS AND COMPONENT MODEL NUMBERS IN

PART 2 - PRODUCTS

2.2 FIXTURES, FITTINGS AND SPECIALTIES (REFER ALSO TO "PLUMBING FIXTURE SCHEDULE" ON DRAWINGS FOR SPECIFIC MODEL NUMBERS) A. FIXTURES SHALL MEET LOW WATER CONSUMPTION REQUIREMENT 2. STAINLESS STEEL SINKS, OF GRADE/QUALITY SPECIFIED ALL FIXTURES SHALL BE COMPLETE WITH ALL NECESSARY

SUPPLIES, P-TRAPS, FAUCETS, ESCUTCHEONS, STOPS AND TRIM . FIXTURES AND TRIM SHALL BE BY SAME MANUFACTURER FOR 2. EXPOSED PIPING AND ACCESSORIES AT FIXTURES AND IN SUPPLIES, STOPS AND TRIM SHALL BE COMMERCIAL GRADE EQUAL TO MCGUIRE OR BRASS CRAFT. P-TRAPS AND DRAINS 4. ALL ABOVE-GROUND LAVATORIES, SINKS, ETC., SHALL HAVE 5. INSULATE PIPING, TRAPS AND SUPPLIES AT ADA . SHOCK ABSORBERS SHALL BE AS MANUFACTURED BY SIOUX CHIEF, ZURN, OR APPROVED EQUAL

D. PRESSURE-DROP TRAP PRIMER SHALL BE MIFAB M500 SERIES, OR FITTINGS SHALL BE IN ACCORDANCE WITH APPLICABLE STATE F. VALVES: ALL BALL, GATE, AND CHECK VALVES SHALL BE HAMMOND, STOCKHAM, JENKINS, NIBCO, APOLLO, OR APPROVED

ALLOY BALL VALVES: BRASS OR BRONZE BODY WITH CHROME-PLATED BRONZE BALL, PTFE OR TFE SEATS, AND 400-PSIG

BY ZURN, WADE, JOSAM, MIFAB, OR JAY R. SMITH. H. CLEANOUTS: DIELECTRIC CONNECTIONS: DISSIMILAR PIPE METALS SHALL BE

J. HANGERS: ALL HANGERS SHALL BE BY CARPENTER-PATTERSON OR 2.3 PIPE AND FITTINGS REQUIREMENTS FOR PIPING RUN WITHIN PLENUMS. IN GENERAL.

B. SANITARY WASTE AND VENT PIPING - ABOVE AND BELOW SLAB 1. SCHEDULE 40 PVC WITH APPROVED PVC DWV FITTINGS AND JOINTS SOLVENT WELDED WITH SOLVENT CEMENT AS PER MANUFACTURER'S RECOMMENDATIONS, FOR NON-PRESSURE MANUFACTURED BY CHARLOTTE PIPE AND FOUNDRY CO. PVC SCHEDULE 40 SOLID WALL PIPE AND PVC DWV FITTING SYSTEM SHALL BE MANUFACTURED FROM VIRGIN RIGID PVC (POLYVINYL CHLORIDE) VINYL COMPOUNDS PER ASTM D1784. PVC SCHEDULE 40 PIPE SHALL BE IRON PIPE SIZE (IPS)

CONFORMING TO ASTM D2665. PIPE AND FITTINGS SHALL BE MANUFACTURED AS A SYSTEM AND BE THE PRODUCT O ONE MANUFACTURER. ALL PIPE AND FITTINGS SHALL BE INSTALLATION INSTRUCTIONS PUBLISHED BY CHARLOTTE PIPE AND FOUNDRY, AND CONFORM TO ALL LOCAL PLUMBING,

CONDENSATE AND INDIRECT WASTE PIPING SHALL BE DWV TYPE COPPER, OR PVC IF ACCEPTABLE BY CODE, LOCAL AUTHORITIES, AND EQUIPMENT DISCHARGE REQUIREMENTS (DISCHARGE TEMPERATURE, ETC.).

a. COPPER TUBING: CONFORM TO ASTM B88, TYPE L. IARD TEMPER, COPPER TUBE; ANSI B16.22 STREAMLINED PATTERN WROUGHT-COPPER FITTINGS. WITH SOLDERED JOINTS, OR PRO-PRESS FITTINGS AND CONNECTIONS INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. 1) SOLDER: SOLID WIRE, LEAD-FREE TIN-SILVER SOLDER (ASTM B22 ALLOY GRADE E, AC, OR HB). 2. WITHIN BUILDING — BELOW SLAB:
a. COPPER TUBING, TYPE K, SOFT TEMPER COPPER TUBE. NO JOINTS PERMITTED BELOW GROUND

3. "ALTERNATE PRICING" (REFER TO 1.4 ALTERNATES) FOR RUNOUTS ONLY OFF COPPER MAINS TO FIXTURES: a. PEX TUBING - WATER PIPING EXTENDING OFF COPPER MAINS TO FIXTURE LOCATIONS: UPONOR "AQUAPEX". OR APPROVED EQUAL. SUITABLE FOR DOMESTIC WATER SYSTEMS, ASTM F876/F877 SDR9 CROSSLINKED POLYETHYLENE (PEX-a) PIPING WITH ASTM F1960 COLD EXPANSION FITTINGS WITH PEX REINFORCING RINGS, AND LISTED TO ANSI/NSF STANDARDS 14 AND 61, WITH FITTINGS, CONNECTIONS, AND ACCESSORIES INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND INSTALLATION INSTRUCTIONS. 1) PEX-a FITTINGS AND ACCESSORIES, INCLUDING BUT NOT LIMITED TO, CONNECTORS, BEND SUPPORTS, PEX—a PIPE SUPPORTS, CLAMPS, CLIPS, AND FASTENERS. 2) CHROME PLATED SUPPLIES AT FIXTURES WHERE 3) ALL PIPING AT WATER HEATER SHALL BE COPPER. 4) PIPE INSULATION SHALL REMAIN AS SPECIFIED

D. DOMESTIC WATER PIPE:

. WITHIN BUILDING - ABOVE SLAB:

(DO NOT ELIMINATE) FOR ENERGY CODE COMPLIANCE (HW) AND PREVENT CONDENSATION 5) DOCUMENTED TRAINING TO INSTALL THE UPONOR "AQUAPEX" PRODUCT FROM AN AUTHORIZED MANUFACTURER'S REPRESENTATIVE.

A. GENERAL: PIPE COVERING SPECIFIED HEREIN FOR PIPING SYSTEMS SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS, THE BEST PRACTICE OF THE TRADE AND TO THE FULL INTENT OF THIS SPECIFICATION. B. ALL INSULATION SHALL BE UL APPROVED FOR A FLAME SPREAD RATING OF NOT OVER 25 AND A SMOKE DEVELOPED RATING OF NOT HIGHER THAN 50. C. POTABLE COLD WATER PIPE (INCLUDING ABOVE-GROUND TRAP PRIMER SUPPLIES): 1/2" THICK GLASS FIBER WITH WHITE SHALL BE COVERED WITH FIBERGLASS INSERT AND PRE-MOLDED PVC COVERS SIMILAR TO KNAUF FITTING COVER SYSTEM. WATER PIPING, INCLUDING TRAP PRIMER SUPPLIES BELOW SLAB: 1/2" THICK ARMAFLEX, OR APPROVED EQUAL, UTILIZING A JOINING SYSTEM RECOMMENDED BY THE MANUFACTURER.

D. POTABLE HOT WATER AND HOT WATER RETURN PIPE: GLASS FIBER WITH WHITE CANVAS-TYPE COVER SIMILAR TO KNAUF FITTINGS AND VALVES SHALL BE COVERED WITH FIBERGLASS INSERT AND PRE-MOLDED PVC COVERS SIMILAR TO KNAUF FITTING COVER SYSTEM. 1. FOR RUNOUTS UP TO 2" PIPE: 1/2" THICK. 2. 1/2" TO 2" PIPE: 1" THICK.

In accordance with the Energy Code (IEC 504.5), pipe insulation for automatic—circulating hot water systems shall be 1 inch thick, having a conductivity not exceeding 0.27 BTU PER INCH/H X FT2 X F.

E. PLUMBING VENTS WITHIN 6 FEET OF ROOF OUTLET SHALL BE 1/2" THICK GLASS FIBER WITH WHITE CANVAS-TYPE COVER F. P-TRAPS AND SUPPLIES AT EXPOSED ADA ACCESSIBLE FIXTURES SHALL BE COVERED WITH WHITE UNDERSINK PROTECTION SYSTEM "LAVGUARD" AS MANUFACTURED BY TRUEBRO.

PART 3 - EXECUTION

A. ALL EQUIPMENT AND SYSTEM DESIGNS, INSTALLATIONS AND TESTING SHALL BE IN CONFORMANCE WITH ASME, PDI. MANUFACTURER'S RECOMMENDATIONS AND WRITTEN INSTRUCTIONS, PUBLIC UTILITIES, PLUMBING CODES, STATE AND LOCAL CODES B. THE PLUMBING CONTRACTOR SHALL OBTAIN ALL PERMITS AND PAY ALL FEES REQUIRED FOR THIS WORK PRIOR TO THE START OF C. COORDINATE TIE-IN LOCATIONS AND OBTAIN PLAN APPROVAL OF ALL PIPING SYSTEMS WITH APPROPRIATE LOCAL AUTHORITIES PLUMBING IN THE BUILDING SHALL ALSO BE COORDINATED WITH OTHER SERVICES TO PROVIDE A SAFE, FUNCTIONAL INSTALLATION AND NEAT APPEARANCÉ. D. SURFACE CONDITIONS: EXAMINE THE AREAS AND CONDITIONS

UNDER WHICH WORK OF THIS SECTION WILL BE PERFORMED. CORRECT CONDITIONS DETRIMENTAL TO TIMELY AND PROPER COMPLETION OF THE WORK. DO NOT PROCEED UNTIL E. INSTALLATION OF THE PLUMBING WORK SHALL BE INSPECTED AND PROVED BY THE APPLICABLE LOCAL AUTHORITIES AS WOR F. PLUMBING SYSTEM LAYOUT: 1. LAY OUT THE PLUMBING SYSTEM IN CAREFUL COORDINATION

WITH THE DRAWINGS, DETERMINING PROPER ELEVATIONS FOR ALL COMPONENTS OF THE SYSTEM AND USING ONLY THE MINIMUM NUMBER OF BENDS TO PRODUCE A SATISFACTORII' NCTIONING SYSTEM. REFER TO ARCHITECTURALS FOR LATEST LAYOUT, DIMENSIONS, CEILING HEIGHTS, MOUNTING HEIGHTS AND DETAILS. 2. FOLLOW THE GENERAL LAYOUT SHOWN ON THE DRAWINGS IN ALL CASES EXCEPT WHERE OTHER WORK MAY INTERFERE. G. DISINFECTION OF WATER SYSTEM: DISINFECT ALL DOMESTIC WATER SYSTEMS.

a. PERFORM DISINFECTION IN ACCORDANCE WITH THE PREVAILING PLUMBING CODE.

3.2 INSTALLATION A. FIXTURES: 1. ALL FIXTURES SHALL BE SUPPORTED AND FASTENED SECURELY. WHERE WALL HUNG FIXTURES ARE SECURED TO STUD PARTITIONS, THIS CONTRACTOR SHALL PROVIDE CROSS PLATES, CHANNEL TYPE, EXCEPT WHERE FIXTURE CARRIERS ARE SPECIFIED, SECURED TO THE VERTICAL STUDS. FIXTURES SHALL BE FASTENED TO THE CROSS PLATES WITH 1/4 INCH THROUGH BOLTS PROVIDED WITH NUTS AND WASHERS. BOLT HEADS AND NUTS SHALL BE HEXAGON AND EXPOSED BOLTS, NUTS, WASHERS AND SCREWS SHALL BE ROMIUM PLATED BRAS 2. A STOP VALVE SHALL BE PROVIDED AT EACH WATER SUPPLY TO FACH FIXTURE AND/OR PIECE OF EQUIPMENT. WHERE STOPS ARE NOT SPECIFIED WITH THE FIXTURE. STOPS SHALL BE BALL OR COMPRESSION TYPE AND WHERE EXPOSED IN FINISHED AREAS STOPS SHALL BE CHROME PLATED.

3. JOINTS: WHERE FIXTURE COMES IN CONTACT WITH WALL AND FLOORS, THE JOINT SHALL BE WATERTIGHT. SEAL FIXTURES AND EQUIPMENT TO WALLS AND FLOORS USING SANITARY—TYPE, ONE—PART, MILDEW—RESISTANT

SILICONE SEALANT. MATCH SEALANT COLOR TO 4. BEFORE INSTALLING ANY DRAINAGE OR SERVICE PIPING FOR EQUIPMENT FURNISHED AND INSTALLED BY OTHERS, THIS CONTRACTOR SHALL VERIFY ACTUAL EQUIPMENT CONNECTIONS AND PIPING LOCATIONS WITH THE OWNER'S REPRESENTATIVE HROUGH THE GENERAL CONTRACTOR 5. VERIFY ELECTRICAL REQUIREMENTS FOR ALL EQUIPMENT PRIOR TO ORDERING, WITH ELECTRICAL CONTRACTOR. 6. INSTALL ALL FIXTURES AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS INCLUDING BUT NOT LIMITED TO WATER HEATER, MIXING VALVE, TRAP PRIMERS, SHOCK ABSORBERS, EQUIPMENT, ETC. B. SANITARY WASTE AND VENT SYSTEM:

SANITARY DRAINAGE SHALL BE COLLECTED FROM PLUMBING FIXTURES AND EXTENDED BY GRAVITY TYING INTO SANITARY MAIN INSIDE THIS TENANT SPACE AS DESIGNATED ON 2. SYSTEM SHALL BE PROPERLY VENTED IN ACCORDANCE WITH CODE REQUIREMENTS TO PREVENT EXCESSIVE BACK PRESSURE. VENTS SHALL EXTEND UNDIMINISHED THROUGH ROOFS. MINIMUM SIZE FOR VENT EXTENSIONS THROUGH ROOF IN AREAS WHERE FROST CLOSURE CAN OCCUR SHALL BE 4 INCH. VENT FLASHING SHALL BE BY THE GENERAL CONTRACTOR. 3. INTERIOR ABOVE GROUND DRAINAGE AND VENT PIPING SHALL BE CONCEALED IN WALLS AND ABOVE SUSPENDED CEILINGS

WHERE POSSIBLE. VERTICAL STACKS SHALL BE PROVIDED WITH ACCESSIBLE CLEANOUTS AT THEIR BASE. UNDERSLAB PIPING SHALL BE INSTALLED ENTIRELY BELOW HE SLAB. NO PORTION OF UNDERSLAB PIPING SHALL BE ENCASED IN CONCRETE. 5. PROVIDE ADEQUATE GROUND COVER TO PROTECT SYSTEMS PIPING FROM FROST CONDITIONS.

6. SANITARY WASTE AND VENT PIPING SHALL BE INSTALLED WITH JOINTS AS SUPPLIED BY THE PIPING MANUFACTURER VERTICAL RISERS SHALL BE SUPPORTED AT EACH FLOOR E SHALL BE SUPPORTED BY BLACK IRON CLEVIS HANGERS: 2 1/2 INCH AND SMALLER BY BLACK IRON A-BANDS. 7. ALL CHANGES IN PIPE SIZE AND DIRECTION OF THE DRAINAGE LINES SHALL BE MADE WITH Y'S AND CLEANOUTS, REDUCING FITTINGS OR RECESSED REDUCERS. Y'S AND 45 DEGREE FITTINGS OR 45 DEGREE COMBINATION FITTINGS SHALL BE USED WHEREVER POSSIBLE. USE LONG SWEEP 8. HORIZONTAL RUNS OF THE SANITARY DRAINAGE PIPING

SHALL ALL PITCH AT 1/4 INCH PER FOOT PER MAINE PLUMBING CODE (2015 UPC); REFER TO 2015 UPC FOR a. EXCEPTION: OWNER'S "SHELL" M1.10 MECHANICAL AND PLUMBING PLAN INDICATES THAT THE 4" SANITARY PIPING SHALL RUN AT 1/8" PER FOOT PITCH IN ORDER TO ACHIEVE THE AVAILABLE INVERTS: REVIEW AND COORDINATE WITH AHJ (AUTHORITY HAVING JURISDICATION) AS REQUIRED BY 2015 UPC 708.1 AND COORDINATE ALL INVERTS IN FIELD.

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SCALE: AS NOTED revisions:

date: 3/24/17

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