- C. Pipe hangers selected for supporting horizontal insulated piping shall be sized to fit around the outside of the pipe insulation. Insulated piping shall be supported on galvanized shields.
- 1. Shields shall be as follows:
- a. Pipes 2" and smaller: 18 gauge x 12" long.
- b. Pipes 2 1/2" and larger: 16 gauge x 18" long.
- 2. Shields shall be 180 degrees around the lower half of the pipe at all pipe hangers, except that on trapeze hangers, pipe racks and floor supported horizontal pipes, shields shall be 360 degrees around the entire pipe.
- D. Pipe hangers for copper piping shall be copper plated or the piping shall be dielectrically isolated from any steel hangers or clamps that are used.
- E. Steel rods, framing and clamps shall be plated or primed to prevent rust

3.0 EXECUTION

3.01 ARRANGEMENT

- A. Follow the general piping layout, arrangement, schematics and details. Provide all offsets, vents, drains and connections necessary to accomplish the installation. Fabricate piping accurately to measurements established at the project site to avoid interference with ductwork, other piping, equipment, openings, electrical conduits and light fixtures. Make suitable provision for expansion and contraction with expansion loops and offsets.
- B. Water hammer arresters shall be installed at the top of each riser and on each fixture branch in accordance with Plumbing and Drainage Institute Standard WH201.
- C. Cleanouts shall be provided at the base of all sanitary and storm risers.

.03 MINIMUM HANGER SPACING

- A. Pipe hangers or supports shall be provided within 18" of each horizontal fitting, equipment connection, valve, etc. and at not more than 10 ft. spacings along horizontal runs of straight, copper piping equal to or greater than $1-\frac{1}{2}$ diameter, 6 ft. spacing for copper piping equal to or less than $1-\frac{1}{4}$ " diameter, and 4 ft. spacing for PVC piping in accordance with table 308.5 in the 2009 NCSPC. Follow Midstory guide for maximum vertical spacing of PVC pipe 2 inches and smaller.
- B. Riser clamps shall be provided at each floor penetration.

.05 INSULATION INSTALLATION

- A. Provide blanket insulation over all horizontal roof drain piping which is within the building and including the vertical risers to the roof drains and the underbody of the roof drains.
- 1. Blanket insulation shall be wrapped around the piping and underbodies of roof drains. Ends of insulation shall overlap at least 2" and bottom of insulation shall overlap pipe insulation at pipe connection to roof drain at least 3". Adhere insulation to roof drain underbodies with 100% coverage of fire retardant adhesive and tape all joints with 3" wide foil reinforced kraft tape.
- B. Provide insulation over all above ground hot and cold water piping, except that no insulation is required on cold water lines installed inside interior plumbing chases (those chases with no exterior wall).
- 1. All joints and tears shall be sealed with matching white vapor barrier

3.06 PIPING INSTALLATION ABOVE CEILINGS

A. All domestic hot and cold water piping installed above the insulated ceilings shall be installed just above (within 2") of the top of the finished ceiling with the building insulation <u>over</u> the piping to avoid freeze—up.

3.07 DISINFECTION

A. All domestic water piping installed under this Division shall be disinfected with chlorine before it is placed into operation. The chlorinating material shall be liquid chlorine conforming to Federal Specification BB—C—120 and shall be introduced to the system by experienced operators only. The chlorine solution applied to the piping sections or system shall contain at least fifty parts per million of available chlorine and shall remain in the sections or system for a period of not less than sixteen (16) hours. During the disinfection period, all valves shall be opened and closed at least four times. After the disinfection period, the chlorinated water shall be flushed from the system with clear water until the residual chlorine content is not greater than two-tenths parts per million (0.2 PPM). Submit certification to the Architect that the system was disinfected.

END OF SECTION

SECTION 22424

WATER HEATERS AND ACCESSORIES

1.0 GENERAL

- 1.01 DESCRIPTION
- A. All work specified in this Section is governed by the Plumbing General Section
- B. This Section 22424 and the accompanying drawings cover the provisions of all labor, equipment, appliances, and materials and performing all operations in connection with the construction of the water heating systems as specified herein and as shown. These systems include, but are not limited to, the following:
- 1. Water heaters
- 2. Hot water circulator

2.0 PRODUCTS

- 2.02 INSTANTANEOUS WATER HEATER
- A. The instantaneous water heaters shall be electric instantaneous type, with an electrical rating as shown in the schedule, and shall be wall mounted. The heat exchanger shall be of brass and Lexan 140 construction.
- B. The heater shall be fitted with an electronic, solid state temperature control system adjustable from 100 degrees F. to 140 degrees F; set at 105 degrees
- C. The heating and control system shall be enclosed in an impact resistant and shock proof case of Cycolac KJW flame—retardant thermoplastic.
- D. The water heaters shall be U.L. approved and labeled without the need for a T&P relief valve.

3.0 EXECUTION

3.01 INSTALLATION

- A. The water heaters and accessories shall be installed in strict accordance with the manufacturer's recommendations and the Contract Documents.
- B. All temperature and pressure relief valves shall be piped full size to an indirect waste such as the nearest floor drain, service sink, sink tailpiece, etc.

END OF SECTION

SECTION 22450

PLUMBING FIXTURES AND TRIM

1.0 GENERAL 1.01 DESCRIPTION

- A. All work specified in this section is governed by the Mechanical General Section 22010.
- B. This Section 22450 and the accompanying drawings cover the provisions of all labor, fixtures, equipment, appliances and materials, and performing all operations in connection with the construction and installation of the plumbing fixtures and trim as specified herein and as shown.

- C. All exposed piping, valves, stops, P-traps, etc. shall be chrome-plated. Also, all exposed piping penetrations through walls, floors or ceilings shall be provided with chrome-plated cast brass escutcheons.
- D. All P-traps shall be minimum 17-gauge brass.

Zurn, T&S Bronze, Brass Works or Speakman.

- E. Flush valves shall have non-hold open feature, vacuum breakers and cover
- cap on angle-type stop.
- F. Provide all final connections to all equipment and fixtures furnished by Owner. G. Unless otherwise specified in an individual fixture description, all enameled cast-iron and porcelain fixtures shall be white.

.02INTENT

A. It is the intent of this Section of the specifications to provide complete, operable, adjusted, clean plumbing fixtures as shown and specified, which are | END OF SECTION free of leaks, noise, air, vibration and waterflow fluctuations.

.03BASIS OF DESIGN

A. The basis of design is as outlined for each fixture in the 2.0 PRODUCTS subsection. Any proposed substitutions shall be proven equal in all respects

to the equipment specified as the basis of design.

- 1.04 ACCEPTABLE MANUFACTURERS A. Acceptable fixture manufacturers are American Standard. Elier and Kohler provided that their units are equal in all respects for this specific project. Faucets and trim may be equal products as manufactured by Chicago, Delany,
- B. Flush valves may be equal products by Zurn or Delany. Stainless steel sinks and drinking fountains shall be as manufactured by those companies specified for each specific item outlined under subsection 2.0 PRODUCTS.

2.0 PRODUCTS 2.01 WATER CLOSETS

- A. Provide solid plastic white toilet seats with each water closet, selected to match the water closet noted. Toilet seats shall be elongated style with open front and check hinge; Beneke or approved equal.
- B. Fixtures P-1 shall be elongated style, 15" high, 1.6 gallon flush, syphon jet, American Standard "Madera" #3451.160, bottom outlet style with flush valve, bowl and supply stop. Flush valve shall be Sloan model G2-8111 battery operated automatic flush. Fixtures <u>P—1H</u> shall be similar; 17" high handicapped style; American Standard "Madera" #3043.102, except that they shall be mounted in accordance with the handicap code.
- C. Fixtures P-1A shall be American Standard "Afwall" #2257.103, EL1.6 vitreous china, wall hung, siphon jet action, elongated closet bowl with $1 \frac{1}{2}$ top spud complete with carriers selected to match the chase size indicated. Flush valves shall be Sloan "Royal" 111-ADA. Fixtures P-1AH shall be similar, except that they shall be mounted in accordance with the handicap

2.02 LAVATORIES

- A. Fixtures <u>P-2</u> shall be American Standard "Ovalyn" #0497-221, 21" x 17" vitreous china, undercounter, oval lavatory complete with front overflow and 1 1/4" drain. Fittings shall include a deck mounted battery operated Sloan No. EAF-250 faucet with sensor, chrome-plated finish, aerator, chrome-plated tailpieces, strainers, P—trap, supply stops, anchoring clips and all other trim. Wall supply stops, drains and tailpieces shall be offset wheelchair type.
- B. Fixtures <u>P—2A</u> shall be American Standard "Lucerne" #0356.015, vitreous china, wall hung lavatories with concealed carrier and anchoring screws; 8" centers faucet punching and $1 \frac{1}{4}$ drain. Fittings shall include a deck mounted battery operated Sloan No. EAF-250 faucet with sensor. chrome-plated finish, aerator, chrome-plated tailpieces, strainers, P-trap, supply stops, anchoring clips and all other trim. Wall supply stops, drains and tailpieces shall be offset wheelchair type.

2.03 SINKS

(Note: To meet ADA sinks depth must be 61/2" or less)**

- A. Fixtures P-3 shall be single compartment, 20 gauge stainless steel with sound-deadening, 19" x 17" outside dimensions, 16" x 11 1/2" inside dimensions, 6" deep; Elkay Model No. PSLVR-1917. Faucet punching shall be 3 hole O.C. Faucet set shall match the 3 hole punching and shall be deck-mounted, lever-style chrome-plated, all brass, gooseneck faucet with aerator: Chicago No. 786-E3-GN-8B and a stainless steel drain, cup strainer and rubber stopper. Provide complete trim such as service stops, tailpieces and P-trap..
- B. Fixtures P-4 shall be single compartment, 18 gauge stainless steel with sound-deadening, 14-1/4" x 14-1/4" and 5-1/2" deep: Elkay Model No. ELUHAD Fittings shall include a deck mounted battery operated Sloan No. EAF-750 faucet with sensor; Provide with stainless steel drain, cup strainer and rubber stopper. Provide complete trim such as service stops, tailpieces

2.04 URINALS

A. Fixture P-5 shall be American Standard "Allbrook" #6541.132, vitreous china, 1.0 gallon flush, wall hung siphon jet urinal with integral flushing rim and top spud. Flush valve shall be exposed Sloan "Royal" #186-1 or approved equal.

2.05 SHOWERS

- A. Fixtures P-6 shall be Lasco Model #1363C pre-molded shower. Provide with the following manufacturers accessory options: white finish, soap dish, center drain location, slip resistant textured bottom. Provide chrome finish curtain rod to accommodate standard shower curtain. Provide factory installed "U" shaped grab bar. Shower curtain shall be by others. Provide shower fittings by American Standard #1662.601 anti-scald, polish chrome balanced shower, wall supply, slide bar, vacuum breaker and volume control.
- B. Fixtures <u>P-6H</u> shall be Lasco Model#6036BFSC, ADA compliant, pre-molded shower. Provide with the following manufacturers accessory options: white finish, soap dish, center drain location, slip resistant textured bottom. Provide chrome finish curtain rod to accommodate standard shower curtain. Provide factory installed "U" shaped grab bar. Shower curtain shall be by others. Provide shower fittings by American Standard #1662.601 anti-scald, polish chrome balanced shower, wall supply, slide bar, vacuum breaker and volume control.

2.06 DRINKING FOUNTAINS AND WATER COOLERS

A. Fixtures P-7 shall be barrier free split level surface mounted electric water cooler with bottle filler; each complete with P-trap and supply service stops. Electric water cooler shall deliver 8.0 GPH of 50 degrees F. water at 90 degrees F. ambient and 80 degrees F. inlet water. Cooler shall have horizontal stainless steel top. Bubbler shall have flexible guard and operate between 20 and 120 psi. Separate valve and diaphragm—type automatic stream regulator shall be mounted with cabinet. Refrigeration system shall employ high efficiency, positive start compressor, non-pressurized counter—flow cooling coil with totally encapsulated insulation and shall be controlled by an integral, adjustable thermostat. Coolers shall have front pushbar water controls with raised lettering for the visually impaired. Coolers shall comply with ANSI 117.1 for both visual and motion disabilities and ADA. Cabinet shall have removable front panels and be finished in a neutral-gray baked enamel. Coolers shall be certified by ARI to meet Standard 1010. Coolers shall be Elkay LZSTL8WSSP..

3.01 INSTALLATION

- A. Units shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.
- B. All plumbing fixtures shall be free of leaks, provided completely finished, trimmed, adjusted, cleaned and ready for use. They shall be properly secured to the structure by the use of thru—bolting, backplates, carriers, expansion shields (for floor mounting only) or toggle bolts.
- C. Wall hung fixtures supported on chair carriers shall be bolted to the floor slab. Carefully coordinate space requirements and fixture mounting height requirements with supports being furnished.
- D. Fixtures supported with wall hangers on masonry chase walls shall be fastened to the wall with not less than 3/8" bolts which shall pass through the wall and through a 1/4" x 4" wide steel backplate on the unfinished chase wall side.
- E. Where fixtures are hung on single masonry walls without a pipe chase behind, they shall be mounted with 3/8" toggle bolts.

- F. Fixtures on steel stud walls shall have a 1/4" x 4" wide steel backplate wired with 1/16" steel wire to the studs. Bolts not less than 3/8" shall secure the fixtures through the fixture hanger and the backplate.
- G. All mounting holes provided in fixtures shall be used for support. In addition to the main hangers, 1/4" toggle bolts shall secure the bottom of all wall hung fixtures at each drilling provided for this purpose.
- H. Mount wall—hung fixtures at the heights indicated on the Architectural Drawings or as prescribed by local code. Special attention is called to the installation requirements of the ANSI Handicap Code.

3.02 CLEANING AND ADJUSTMENT

A. The units shall be cleaned, tested and field—adjusted to provide optimum flow and drainage.

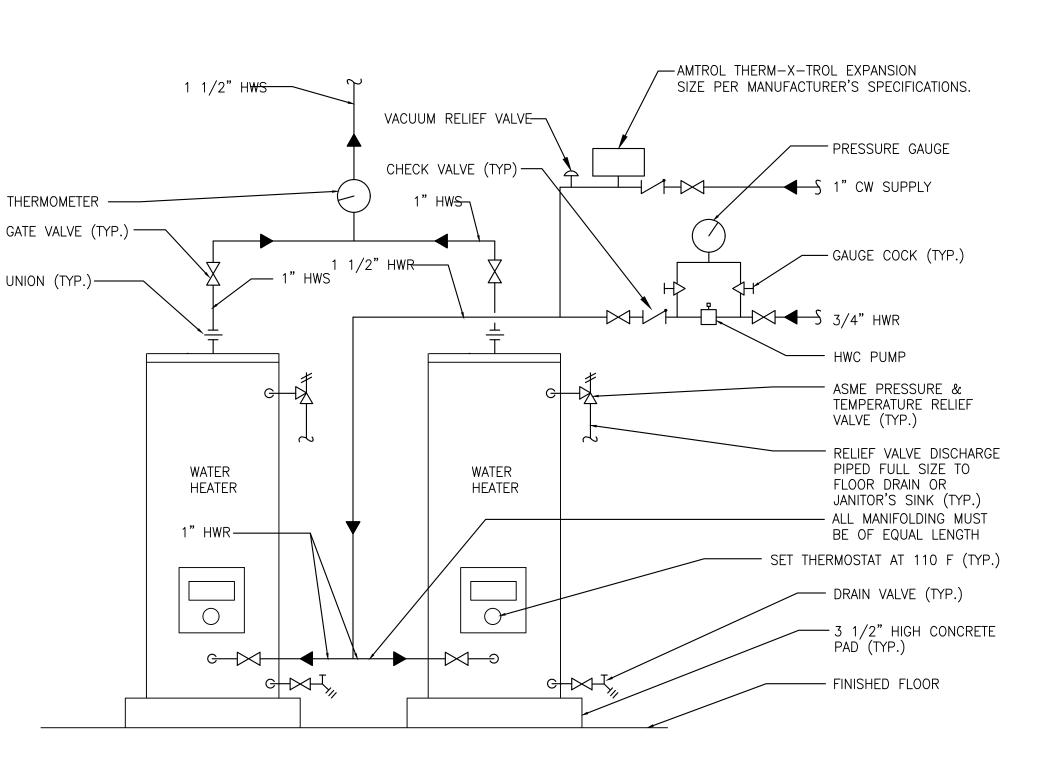
ABBREVIATIONS

| A/C AD ADJ | ABOVE CEILING ACCESS DOOR ADJUSTABLE | ID IN | INSIDE DIMENSION INCHES |
|---|--|---------------------------------------|--|
| AFF AUTO AC AHU ARP | ABOVE FINISHED FLOOR AUTOMATIC AIR CONDITIONING AIR HANDLING UNIT ACID RESISTANCE PIPING | KW | KILOWATTS |
| BAL B/F B/G BHP BCO | BALANCING BELOW FLOOR BELOW GRADE BRAKE HORSEPOWER BASE CLEANOUT | LB LWR LWS | POUNDS LOOP WATER RETURN LOOP WATER SUPPLY |
| CW CO | COLD WATER (DOMESTIC) CLEANOUT | MIN MAX MFR | MINIMUM MAXIMUM MANUFACTURER |
| DN DR do DWG | DOWN DRAIN DITTO DRAWING | NC NG NFGH NFWH NO NOM | NORMALLY CLOSED NATURAL GAS NON-FREEZE GROUND HYDRANT NON-FREEZE WALL HYDRANT NORMALLY OPEN NOMINAL |
| EA ECC EFF | EACH ECCENTRIC EFFICIENCY | OD | OVERFLOW DRAIN |
| EOD EWT | EMERGENCY OVERFLOW DRAIN ENTERING WATER TEMPERATURE | PSI | POUNDS PER SQUARE INCH |
| FCO FD FLR FOB | FLOOR CLEANOUT FLOOR DRAIN FLOOR FLAT ON BOTTOM | RAD RED RS RTU | RADIUS REDUCER REFRIGERANT SUCTION ROOFTOP UNIT |
| FOT FPM FPS FT | FLAT ON TOP FEET PER MINUTE FEET PER SECOND FEET | SAN SQ ST | SANITARY SQUARE STORM |
| 11 | | TEMP TYP | TEMPERATURE TYPICAL |
| G GA GPM | GATE GAUGE GALLONS PER MINUTE | UON | UNLESS OTHERWISE NOTED |
| GL GCO | GLOBE GRADE CLEANOUT | V VA VTR | VENT VALVE VENT THRU ROOF |
| HD HP HTG HW HWR HWRR HWS | HUB DRAIN HORSEPOWER HEATING HOT WATER (DOMESTIC) HOT WATER RETURN HOT WATER REVERSE RETURN HOT WATER SUPPLY | WC WHA WT W | WATER COLUMN WATER HAMMER ARRESTOR WEIGHT WASTE |
| | | | |

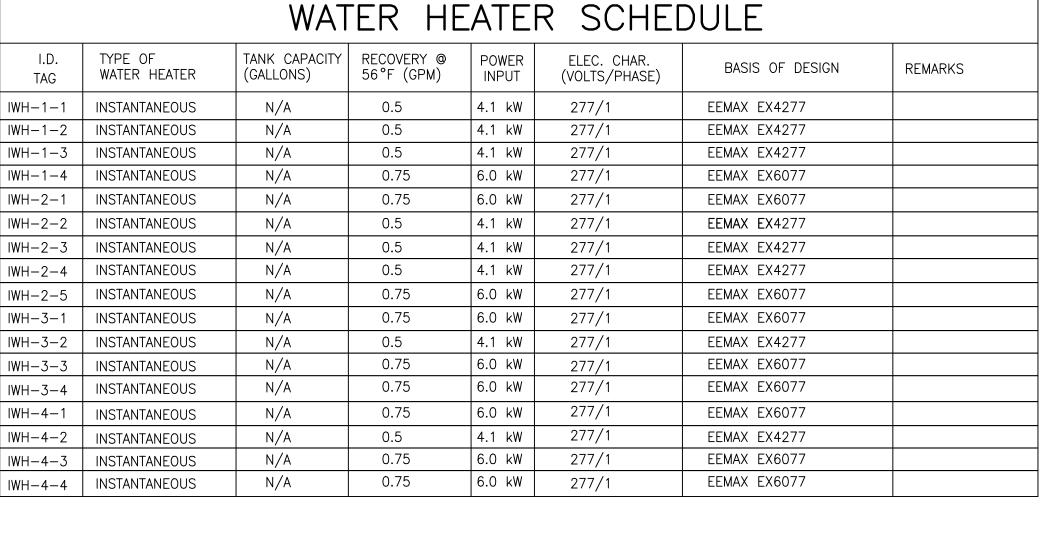
GENERAL NOTES

- THESE DRAWINGS ARE SCHEMATIC IN NATURE AND ARE NOT INTENDED TO SHOW ALL POSSIBLE CONDITIONS. IT IS INTENDED THAT A COMPLETE TENANT MECHANICAL SYSTEM BE PROVIDED WITH ALL NECESSARY EQUIPMENT, ACCESSORIES, OPTIONS AND CONTROLS, COMPLETELY COORDINATED WITH ALL DISCIPLINES. ALL ITEMS AND LABOR REQUIRED FOR A COMPLETE TENANT MECHANICAL SYSTEM IN ACCORDANCE WITH ALL APPLICABLE CODES, STANDARDS AND THE BASE BUILDING CONTRACT DOCUMENTS SHALL BE FURNISHED WITHOUT INCURRING ADDITIONS TO THE CONTRACT.
- . REFER TO THE ARCHITECTURAL DRAWINGS FOR EXACT PARTITION LAYOUTS, REFLECTED CEILING PLANS, DIMENSIONS, ETC.
- 3. EXISTING PLUMBING IS SHOWN BY DASHED LINES. NEW WORKS AND RELOCATED WORK ARE SHOWN BY SOLID LINES. EXISTING WORK TO BE REMOVED IS SHOWN CROSSHATCHED. 4. VISIT SITE AND CAREFULLY EXAMINE EXISTING CONDITIONS PRIOR TO SUBMITTING BID. THE EXISTING CONDITIONS SHOWN ARE BASED ON DOCUMENTS PROVIDED BY OTHERS AND HAVE NOT BEEN VERIFIED BY THE ENGINEER. IF EXISTING CONDITIONS DIFFER FROM DRAWINGS IN SUCH A MANNER THAT WILL AFFECT PRICING, (I.E. DUCTWORK, VAV OR PIU ARE NOT IN THE SHOWN LOCATION) CONTRACTOR WILL NOTIFY OWNER SO THAT A RESOLUTION CAN BE MADE PRIOR TO SUBMITTING BIDS. NO ALLOWANCE WILL BE MADE FOR LACK OF KNOWLEDGE OF EXISTING CONDITIONS.
- 5. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED AIR DISTRIBUTION DEVICES. IF ANY ITEMS ARE NOT SHOWN ON THE REFLECTED CEILING PLANS, PREPARE A DRAWING OF THE PROPOSED LOCATION AND PRESENT IT TO THE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION.
- 5. ALL PLUMBING FIXTURES SHALL BE PROVIDED AS COMPLETE PACKAGES PROVIDING ALL RELATED ACCESSORIES SUCH AS TAIL PIECES, SUPPLY STOPS, P-TRAPS ETC., SO AS TO FURNISH A COMPLETE JOB. SEE ARCHITECTURAL DRAWINGS FOR SINK SPECIFICATION.
- . ALL SANITARY WASTE, VENT AND WATER PIPING SHALL BE AS SPECIFIED IN THE BASE BUILDING DOCUMENTS.
- B. ALL HOT AND COLD WATER PIPING SHALL BE INSULATED WITH 1" THICK PERFORMED FIBERGLASS PIPE INSULATION WITH ALL-SERVICE JACKET. ALL LONGITUDINAL JOINTS, TEARS, ETC., SEALED WITH A MATCHING WHITE VAPOR BARRIER TAPE. ELBOWS SHALL BE MITERED OR MAY BE ZESTON COVERS FILLED WITH EQUIVALENT FIBERGLASS INSULATION.

| | LEGEND | |
|----------|--------------------|--|
| | EXISTING WORK | |
| | NEW WORK | |
| 1/////// | WORK TO BE REMOVED | |
| Ø | FLOOR DRAIN | |
| 4 | HOSE BIBB | |
| © | FLOOR CLEAN-OUT | |
| = | WALL CLEAN-OUT | |
| | SANITARY | |
| | HW | |
| | CW | |
| | GAS | |
| | VENT | |

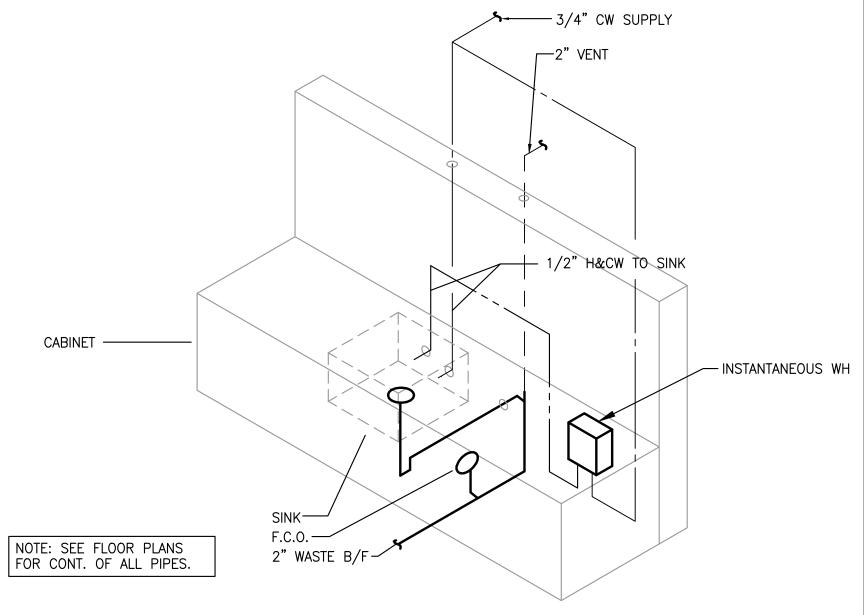






| FIXTURE SCHEDULE | | | | | | | |
|---------------------------------------|----------------|--------|---------|------|--|--|--|
| DESCRIPTION | SANITARY/WASTE | VENT | CW | HW | | | |
| WATER CLOSET (P-1, P-1H, P-1A, P-1AH) | 4" | 2" | 1-1/4" | | | | |
| LAVATORY (P-2, P-2A, P-2B) | 2" | 1-1/2" | 1/2" | 1/2" | | | |
| BREAK SINK (P-3) | 2" | 1-1/2" | 1/2" | 1/2" | | | |
| WELLNESS SINK (P-4) | 2" | 1-1/2" | 1/2" | 1/2" | | | |
| URINAL (P-5) | 3" | 1-1/2" | 1" | | | | |
| SHOWER (P-6) | 3" | 1-1/2" | 3/4" | 3/4" | | | |
| DRINKING FOUNTAIN (P-7) | 2" | 1-1/2" | 1/2" | | | | |
| FLOOR DRAIN (FD) | 3" | 2" | 1/2" TP | | | | |

| PUMP SCHEDULE | | | | | | | | | | | |
|---------------|-------|-----------------|---------------|--------------|---------------------|----------------|-------------|-----------------|-----------------------|----------------------|---------|
| I.D. TAG | FLUID | TYPE OF PUMP | FLOW (GPM) | HEAD (FT) | MAX. NPSHR (FT.) | MAXIMUM RPM | MOTOR HP | VOLTS/ PHASE | MINIMUM EFFICIENCY | BASIS OF DESIGN | REMARKS |
| RP-A | WATER | HW RECIRC PUMP | 20 | 15 | | 2,650 | 1/6 | 120/1 | | BELL & GOSSETT PL-36 | |
| RP-A | WATER | HW RECIRC PUMP | 20 | 15 | | 2,650 | 1/6 | 120/1 | | BELL & GOSSET | T PL-36 |





NOTE: SEE ARCHITECTURAL PLANS FOR ACTUAL LAYOUT OF EQUIPMENT



Tel 704.377.2725

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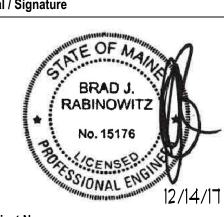
214 North Tryon Street Suite 2320 Charlotte, NC 28202 United States

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MEP JOB# 170358

12.15.2017 ISSUE FOR PERMIT AND CONSTRUCTION

Seal / Signature



Unum Workplace Transformation - Phase 2 & 3 (HO2 & HO3)

Project Number 59.6481.003

Description SPECIFICATIONS, NOTES AND DETAILS - PLUMBING

P0.002

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Scale