SECTION 22 01 00 - PLUMBING GENERAL

1 GENERAL

1.1 The work covered by this division consists of providing all labor, equipment and materials and performing all operations necessary for the installation of the plumbing work as herein called for and shown on the drawings.

1.2 Related Documents:

1.2.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.2.2 This is a Basic Plumbing Requirements Section. Provisions of this section apply to work of all Division-22 sections. Provisions of Division-23 Basic Mechanical Requirements Sections apply to work of all Division-22 sections.

1.2.3 Review all other contract documents to be aware of conditions affecting work herein.

1.2.4 Definitions:

1.2.4.1 Provide: Furnish and install, complete and ready for intended use.

1.2.4.2 Furnish: Supply and deliver to project site, ready for subsequent requirements.

1.2.4.3 Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.

1.3 Permits and Fees: Contractor shall obtain all necessary permits, meters, and inspections required for his work and pay all fees and charges incidental thereto.

1.4 Verification of Owner's Data: Prior to commencing any work the Contractor shall satisfy himself as to the accuracy of all data as indicated in these plans and specifications and/or as provided by the Owner. Should the Contractor discover any inaccuracies, errors, or omissions in the data, he shall immediately notify the Architect/Engineer in order that proper adjustments can be anticipated and ordered. Commencement by the Contractor of any work shall be held as an acceptance of the data by him after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions or inaccuracies of the said data.

1.5 Delivery and Storage of Materials: Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. All material shall be stored to provide protection from the weather and accidental damage.

1.6 Extent of work is indicated by the drawings, schedules, and the requirements of the specifications. Singular references shall not be constructed as requiring only one device if multiple devices are shown on the drawings or are required for proper system operation.

1.7 Field Measurements and Coordination:

1.7.1 The intent of the drawings and specifications is to obtain a complete and satisfactory installation. Separate divisional drawings and specifications shall not relieve the Contractor or subcontractors from full compliance of work of his trade indicated on any of the drawings or in any section of the specifications.

1.7.2 Verify all field dimensions and locations of equipment to insure close, neat fit with other trades' work. Make use of all contract documents and approved shop drawings to verify exact dimension and locations.

1.7.3 Coordinate work in this division with all other trades in proper sequence to insure that the total work is completed within contract time schedule and with a minimum cutting and patching.

1.7.4 Locate all apparatus symmetrical with architectural elements. Install to exact height and locations when shown on architectural drawings. When locations are shown only on plumbing drawings, be guided by architectural details and conditions existing at job and correlate this work with that of others.

1.7.5 Install work as required to fit structure, avoid obstructions, and retain clearance, headroom, openings and passageways. Cut no structural members without written approval.

1.7.6 Carefully examine any existing conditions, piping, and premises. Compare drawings with existing conditions. Report any observed discrepancies. It shall be the Contractor's responsibility to properly coordinate the work and to identify problems in a timely manner. Written instructions will be issued to resolve discrepancies.

1.7.7 Because of the small scale of the drawings, it is not possible to indicate all offsets and fittings or to locate every accessory. Drawings are essentially diagrammatic. Study carefully the sizes and locations of structural members, wall and partition locations, trusses, and room dimensions and take actual measurements on the job. Locate piping, ductwork, equipment and accessories with sufficient space for installing and servicing. Contractor is responsible for accuracy of his measurements and for coordination with all trades. Contractor shall not order materials or perform work without such verification. No extra compensation will be allowed because field measurements vary from the dimensions on the drawings. If field measurements show that equipment or piping cannot be fitted, the Architect/Engineer shall be consulted. Remove and relocate, without additional compensation, any item that is installed and is later found to encroach on space assigned to another use.

1.8 Guarantee:

1.8.1 The Contractor shall guarantee labor, materials and equipment for a period of one (1) year from Final Completion, or from Owner's occupancy, whichever is earlier. Contractor shall make good any defects and shall include all necessary adjustments to and replacement of defective items without expense to the Owner.

1.8.2 Owner reserves right to make emergency repairs as required to keep equipment in operation without voiding Contractor's Guarantee Bond nor relieving Contractor of his responsibilities during guarantee period.

1.9 Approval Submittals:

1.9.1 When approved, the submittal control log and submittals shall be an addition to the specifications herewith, and shall be of equal force in that no deviation will be permitted except with the approval of the Architect/Engineer.

1.9.1.1 Shop drawings, product literature, and other approval submittals will only be reviewed if they are submitted in full accordance with the General and Supplementary Conditions and Division 1 Specification sections and the following.

1.9.1.1.1 Submittals shall be properly organized in accordance with the approved submittal control log.

1.9.1.1.2 Submittals shall not include items from more than one specification section in the same submittal package unless approved in the submittal control log.

1.9.1.1.3 Submittals shall be properly identified by a cover sheet showing the project name, Architect and Engineer names, submittal control number, specification section, a list of products or item names with model numbers in the order they appear in the package, and spaces for approval stamps. A sample cover sheet is included at the end of this section.

1.9.1.1.4 Submittals shall have been reviewed and approved by the General Contractor (or Prime Contractor). Evidence of this review and approval shall be an "Approved" stamp with a signature and date on the cover sheet.

1.9.1.1.5 Submittals that include a series of fixtures or devices (such as plumbing fixtures or valves) shall be organized by the fixture number or valve type and be marked accordingly. Each fixture must include all items associated with that fixture regardless of whether or not those items are used on other fixtures.

1.9.1.1.6 The electrical design shown on the drawings supports the plumbing equipment basis of design specifications at the time of design. If plumbing equipment is submitted with different electrical requirements, it is the responsibility of the plumbing contractor to resolve all required electrical design changes (wire and conduit size, type of disconnect or overload protection, point(s) of connection, etc.) and clearly show the new electrical design on the plumbing submittal with a written statement that this change will be provided at no additional cost. Plumbing submittals made with no written reference to the electrical design will be presumed to work with the electrical design. Any corrections required will be at no additional cost.

1.9.2 If the shop drawings show variation from the requirements of contract because of standard shop practice or other reasons, the Contractor shall make specific mention of such variation in writing in his letter of transmittal and on the submittal cover sheet in order that, if acceptable, Contractor will not be relieved of the responsibility for executing the work in accordance with the contract.

1.9.3 Review of shop drawings, product literature, catalog data, or schedules shall not relieve the Contractor from responsibility for deviations from contract drawings or specifications, unless he has in writing called to the attention of the Architect/Engineer each such deviation in writing at the time of submission, nor shall it relieve him from responsibility for errors of any sort in shop drawings, product literature, catalog data, or schedules. Any feature or function specified but not mentioned in the submittal shall be assumed to be included per the specification.

1.9.4 Submit shop drawings as called for in other sections after award of the contract and before any material is ordered or fabricated. Shop drawings shall consist of plans, sections, elevations and details to scale (not smaller than ¼" per foot), with dimensions clearly showing the installation.

Direct copies of small scale project drawings issued to the Contractor are not acceptable. Drawings shall take into account equipment furnished under other sections and shall show space allotted for it. Include construction details and materials.

1.10 Test Reports and Verification Submittals: Submit test reports, certifications and verification letters as called for in other sections. Contractor shall coordinate the required testing and documentation of system performance such that sufficient time exists to prepare the reports, submit the reports, review the reports and take corrective action within the scheduled contract time.

1.11 O&M Data Submittals: Submit Operation and Maintenance data as called for in other sections. When a copy of approval submittals is included in the O&M Manual, only the final "Approved" or "Approved as Noted" copy shall be used. Contractor shall organize these data in the O&M Manuals tabbed by specification number. Prepare O&M Manuals as required by Division 1 and as described herein.. Submit manuals at the Substantial Completion inspection.

2 PRODUCTS

2.1 All materials shall be new or Owner-supplied reused as shown on the drawings, the best of their respective kinds, suitable for the conditions and duties imposed on them at the building and shall be of reputable manufacturers. The description, characteristics, and requirements of materials to be used shall be in accordance with qualifying conditions established in the following sections.

2.2 Equipment and Materials:

2.2.1 Shall be new and the most suitable grade for the purpose intended. Equipment furnished under this division shall be the product of a manufacturer regularly engaged in the manufacture of such items for a period of three years. Where practical, all of the components shall be products of a single manufacturer in order to provide proper coordination and responsibility. Where required, Contractor shall furnish proof of installation of similar units or equipment.

2.2.2 Each item of equipment shall bear a name plate showing the manufacturer's name, trade name, model number, serial number, ratings and other information necessary to fully identify it. This plate shall be permanently mounted in a prominent location and shall not be concealed, insulated or painted.

2.2.3 The label of the approving agency, such as UL, IBR, ASME, ARI, AMCA, by which a standard has been established for the particular item shall be in full view.

2.2.4 The equipment shall be essentially the standard product of a manufacturer regularly engaged in the production of such equipment and shall be a product of the manufacturer's latest design.

2.2.5 A service organization with personnel and spare parts shall be available within two hours for each type of equipment furnished.

2.2.6 Install in accordance with manufacturer's recommendations. Place in service by a factory trained representative where required.

2.2.7 Materials and equipment are specified herein by a single or by multiple manufacturers to indicate quality, material and type of construction desired. Manufacturer's products shown on the drawings have been used as basis for design; it shall be the Contractor's responsibility to ascertain that alternate manufacturer's products, or the particular products of named

manufacturers, meet the detailed specifications and that size and arrangement of equipment are suitable for installation.

2.2.8 Model Numbers: Catalog numbers and model numbers indicated in the drawings and specifications are used as a guide in the selection of the equipment and are only listed for the contractor's convenience. The contractor shall determine the actual model numbers for ordering materials in accordance with the written description of each item and with the intent of the drawings and specifications.

2.3 Requests for Substitution:

2.3.1 Where a particular system, product or material is specified by name, consider it as standard basis for bidding, and base proposal on the particular system, product or material specified.

2.3.2 Requests by Contractor for substitution will be considered only when reasonable, timely, fully documented, and qualifying under one or more of the following circumstances.

2.3.2.1 Required product cannot be supplied in time for compliance with Contract time requirements.

2.3.2.2 Required product is not acceptable to governing authority, or determined to be non-compatible, or cannot be properly coordinated, warranted or insured, or has other recognized disability as certified by Contractor.

2.3.2.3 Substantial cost advantage is offered Owner after deducting offsetting disadvantages including delays, additional compensation for redesign, investigation, evaluation and other necessary services and similar considerations.

2.3.3 All requests for substitution shall contain a "Comparison Schedule" and clearly and specifically indicate any and all differences or omissions between the product specified as the basis of design and the product proposed for substitution. Differences shall include but shall not be limited to data as follows for both the specified and substituted products:

Principal of operation.
Materials of construction or finishes.
Thickness of gauge of materials.
Weight of item.
Deleted features or items.
Added features or items.
Changes in other work caused by the substitution.
Performance curves.

If the approved substitution contains differences or omissions not specifically called to the attention of the Architect/Engineer, the Owner reserves the right to require equal or similar features to be added to the substituted products (or to have the substituted products replaced) at the Contractor's expense.

3 EXECUTION

3.1 Workmanship: All materials and equipment shall be installed and completed in a first-class workmanlike manner and in accordance with the best modern methods and practice. Any materials installed which do not present an orderly and reasonably neat and/or workmanlike appearance, or do not allow adequate space for maintenance, shall be removed and replaced when so directed by the Architect/Engineer.

3.2 Coordination:

3.2.1 The Contractor shall be responsible for full coordination of the plumbing systems with shop drawings of the building construction so the proper openings and sleeves or supports are provided for piping, ductwork, or other equipment passing through slabs or walls.

3.2.2 Any additional steel supports required for the installation of any plumbing equipment, piping, or ductwork shall be furnished and installed under the section of the specifications requiring the additional supports.

3.2.3 It shall be the Contractor's responsibility to see that all equipment such as valves, dampers, filters and such other apparatus or equipment that may require maintenance and operation are made easily accessible, regardless of the diagrammatic location shown on the drawings.

3.2.4 All connections to fixtures and equipment shown on the drawings shall be considered diagrammatic unless otherwise indicated by detail. The actual connections shall be made to fully suit the requirements of each case and adequately provide for expansion and servicing.

3.2.5 The contractor shall protect equipment, material, and fixtures at all times. He shall replace all equipment, material, and fixtures which are damaged as a result of inadequate protection.

3.2.6 Prior to starting and during progress of work, examine work and materials installed by others as they apply to work in this division. Report conditions which will prevent satisfactory installation.

3.2.7 Start of work will be construed as acceptance of suitability of work of others.

3.3 Interruption of Service: Before any equipment is shut down for disconnecting or tie-ins, arrangements shall be made with the Architect/Engineer and this work shall be done at the time best suited to the Owner. This will typically be on weekends and/or holidays and/or after normal working hours. Services shall be restored the same day unless prior arrangements are made. All overtime or premium costs associated with this work shall be included in the base bid.

3.4 Phasing: Provide all required temporary valves, piping, ductwork, equipment and devices as required. Maintain temporary services to areas as required. Remove all temporary material and equipment on completion of work unless Engineer concurs that such material and equipment would be beneficial to the Owner on a permanent basis.

3.5 Cutting and Patching: Notify General Contractor to do all cutting and patching of all holes, chases, sleeves, and other openings required for installation of equipment furnished and installed under this section. Utilize experienced trades for cutting and patching. Obtain permission from Architect/Engineer before cutting any structural items.

3.6 Equipment Setting: Bolt equipment directly to concrete pads or vibration isolators as required, using hot-dipped galvanized anchor bolts, nuts and washers. Level equipment.

3.7 Painting: Touch-up factory finishes on equipment located inside and outside shall be done under Division 22. Obtain matched color coatings from the manufacturer and apply as directed. If corrosion is found during inspection on the surface of any equipment, clean, prime, and paint, as required.

3.8 Clean-up: Thoroughly clean all exposed parts of apparatus and equipment of cement, plaster, and other materials and remove all oil and grease spots. Repaint or touch up as required to

look like new. During progress of work, contractor is to carefully clean up and leave premises and all portions of building free from debris and in a clean and safe condition.

3.9 Start-up and Operational Test: Start each item of equipment in strict accordance with the manufacturer's instructions; or where noted under equipment specification, start-up shall be done by a qualified representative of the manufacturer. Alignment, lubrication, safety, and operating control shall be included in start-up check.

3.10 Record Drawings:

3.10.1 During the progress of the work the Contractor shall record on their field set of drawings the exact location, as installed, of all piping, ductwork, equipment, and other systems which are not installed exactly as shown on the contract drawings.

3.10.2 Upon completion of the work, record drawings shall be prepared as described in the General Conditions, Supplementary Conditions, and Division 1 sections.

3.11 Acceptance:

3.11.1 Punch List: Submit written confirmation that all punch lists have been checked and the required work completed.

3.11.2 Instructions: At completion of the work, provide a competent and experienced person who is thoroughly familiar with project, for one day to instruct permanent operating personnel in operation of equipment and control systems. This is in addition to any specific equipment operation and maintenance training.

3.11.3 Operation and Maintenance Manuals: Furnish four complete manuals bound in ring binders with Table of Contents, organized, and tabbed by specification section. Manuals shall contain:

Detailed operating instructions and instructions for making minor adjustments.
Complete wiring and control diagrams.
Routine maintenance operations.
Manufacturer's catalog data, service instructions, and parts lists for each piece of operating equipment.
Copies of approved submittals.
Copies of all manufacturer's warranties.
Copies of test reports and verification submittals.

3.11.4 Record Drawings: Submit record drawings.

3.11.5 Control Diagrams: Frame under glass and mount on equipment room wall.

END OF SECTION 22 01 00

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SECTION 22 07 00 - INSULATION FOR PLUMBING PIPE AND EQUIPMENT

1 GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 Division-22 Basic Plumbing Materials and Methods Sections apply to work of this section.

1.3 Division-23 Basic Mechanical Materials and Methods Sections apply to work of this section.

1.4 Approval Submittals:

1.4.1 Product Data: Submit a producer's data sheets and installation instructions on each insulation system including insulation, coverings, adhesives, sealers, protective finishes, and other material recommended by the manufacturer for applications indicated. Submit for:

Fiberglass pipe insulation

1.5 O&M Data Submittals: Submit a copy of all approval submittals. Include in O&M Manual.

2 PRODUCTS

2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide insulation products by Armstrong, Johns Manville, Knauf, Owens Corning, Pittsburgh Corning, U.S. Rubber, or approved equal. All products shall be asbestos-free.

2.2 Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics, and adhesive) with a flame-spread rating of 25 or less, and a smoke-developed rating of 50 or less, as tested by ANSI/ASTM E84.

2.3 Pipe Insulation Materials:

2.3.1 Fiberglass Pipe Insulation: ASTM C547, Class 1 unless otherwise indicated. (Preformed sleeving with white all-service jacket, suitable for temperatures up to 450°F)

2.3.2 Flexible Unicellular Pipe Insulation: ASTM C534, Type I. (Tubular, suitable for use to 200ºF.)

2.3.3 Staples, Bands, Wires, and Cement: As recommended by the insulation manufacturer for applications indicated.

2.3.4 Adhesives, Sealers, Protective Finishes: Products recommended by the insulation manufacturer for the application indicated.

2.3.5 Jackets: ASTM C921, Type I (vapor barrier) for piping below ambient temperature, Type II (vapor permeable) for piping above ambient temperature. Type I may be used for all piping at Installer's option.

3 EXECUTION

3.1 General:

3.1.1 Install thermal insulation products in accordance with manufacturer's written instructions, and in compliance with recognized industry practices to ensure that insulation serves intended purpose.

3.1.2 Install insulation materials with smooth and even surfaces and on clean and dry surfaces. Redo poorly fitted joints. Do not use mastic or joint sealer as filler for gapping joints and excessive voids resulting from poor workmanship.

3.1.3 Maintain integrity of vapor-barrier on insulation and protect it to prevent puncture and other damage. Label all insulation "ASBESTOS FREE".

3.1.4 Do not apply insulation to surfaces while they are hot or wet.

3.1.5 Do not install insulation until systems have been checked and found free of leaks. Surfaces shall be clean and dry before attempting to apply insulation. A professional insulator with adequate experience and ability shall install insulation.

3.1.6 Do not install insulation on pipe systems until acceptance tests have been completed except for flexible unicellular insulation. Do not install insulation until the building is "dried-in".

3.2 Fiberglass Pipe Insulation:

3.2.1 Insulate the following piping systems (indoor locations):

3.2.1.1 Domestic hot water, 180° F: up to 2" pipe - 1½" thick, over 2" pipe 2" thick.

3.2.1.2 Domestic hot and tempered water, 140° F: up to 3" pipe - 1½" thick, over 3" pipe - 2" thick.

3.2.2 Apply insulation to pipe with all side and end joints butted tightly. Seal longitudinal lap by pressurizing with plastic sealing tool. Apply 3 inch wide self sealing butt strips to joints between insulation sections. Insulate all fittings, flanges, valves and strainers with premolded insulation. Apply coat of insulating cement to fittings and wrap with glass cloth overlapping each wrap 1" and adjacent pipe 2". Finish with heavy coat of general purpose mastic. Premolded PVC covers may also be used, but no flexible inserts are allowed.

3.2.3 Provide hanger or pipe support shields of 16 gauge (minimum) galvanized steel over the insulation which extends halfway up the pipe insulation cover and at least 6" on each side of the hanger.

3.2.4 Omit insulation on exposed plumbing fixture runouts from faces of wall or floor to fixture; on unions, flanges, strainer blowoffs, flexible connections and expansion joints.

END OF SECTION 22 07 00

SECTION 22 11 13 - POTABLE WATER SYSTEM

1 GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 Division-22 Basic Plumbing Requirements and Basic Plumbing Materials and Methods sections apply to work of this section.

1.3 Division-23 Basic Mechanical Materials and Methods Sections apply to work of this section.

1.4 Extent of potable water systems work, is indicated on drawings and schedules, and by requirements of this section.

1.5 Refer to other Division-22 sections for site water distribution system; not work of this section unless noted.

1.6 Refer to appropriate Division-2 sections for exterior potable water system; not work of this section unless noted.

1.7 Insulation for potable water piping is specified in other Division-22 sections, and is included as work of this section. Insulation requirements include:

1.7.1 Domestic hot water piping

1.8 Excavation and backfill required in conjunction with water piping is specified in other Division-23 sections, and is included as work of this section.

1.9 Code Compliance: Comply with applicable portions of Florida Building Code-Plumbing pertaining to selection and installation of plumbing materials and products. Comply with local utility requirements.

1.10 Approval Submittals:

1.10.1 Product Data: Submit manufacturer's technical product data and installation instructions for:

Valves
Strainers
Wall hydrants
Water hammer arresters
Meters and gauges
Relief valves
Trap primers

1.11 Test Reports and Verification Submittals:

1.11.1 Disinfection: Submit report by Health Department.

1.12 O&M Data Submittals: Submit a copy of all approval submittals. Submit maintenance data and parts lists for valves, trap primers. Include these data in O&M manual.

2 PRODUCTS

2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with Florida Building Code-Plumbing where applicable. Provide sizes and types matching pipe materials used in potable water systems. Where more than one type of materials or products is indicated, selection is Installer's option.

2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following listed for each item.

2.3 Identification: Provide identification complying with Division-23 Basic Mechanical Materials and Methods section "Mechanical Identification". Provide manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct burial service; not less than 6" wide x 4 mils thick. Provide blue tape with black printing reading "CAUTION WATER LINE BURIED BELOW".

2.4 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-22 Basic Plumbing Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:

2.4.1 Interior Water Piping:

2.4.1.1 Above Grade: Copper tube; Type L, hard-drawn temper; wrought-copper fittings, solder-joints.

2.4.1.2 Below Grade: Copper tube; Type L, soft-annealed temper; no joints below floor.

2.4.2 Exterior Water Piping:

2.4.2.1 Copper tube; Type L, hard-drawn temper; wrought-copper fittings, solder-joints.

2.4.3 Solder joints shall be made with 95-5 solder.

2.5 Piping Specialties: Provide piping specialties complying with Division-22 Basic Plumbing Materials and Methods section "Piping Specialties".

2.6 Supports and Anchors: Provide supports and anchors complying with Division-22 Basic Plumbing Materials and Methods section "Supports and Anchors".

2.7 Interior Valves: Provide valves complying with Division-22 Basic Plumbing Materials and Methods section "Valves", in accordance with the following listing:

2.7.1 Sectional and Shutoff Valves: GA1, GA2, GA3, BA1, BA2.

2.7.2 Drain Valves: GA1, GA2, BA1, BA2.

2.7.3 Throttling Valves: BA1, BA2.

2.7.4 Check Valves: CK1, CK2, CK3.

2.8 Wall Hydrants: Provide complete bronze body hose bibbs inside stainless steel box with hinged access door with cylinder lock and “WATER” stamped on cover. Provide key operated control valve with all bronze interior parts, replaceable seat washer, screwdriver operated stop valve in supply, and 3/4” male threaded hose connection. Zurn Z1350 or equal by Acorn or Woodford.

2.9 Water Hammer Arresters: Provide bellows type water hammer arresters, stainless steel casing and bellows, pressure rated for 250 psi, tested and certified in accordance with PDI Standard WH-201. Precision Plumbing Products, Josam, Zurn, Amtrol, Wade, Jay R. Smith, or approved equal.

2.10 Meters and Gauges: Provide meters and gauges complying with Division-22 Basic Plumbing Materials and Methods section "Meters and Gauges", in accordance with the following listing:

Thermometers
Pressure gauges
Calibrated balancing cocks

2.11 Combined Pressure-Temperature Relief Valves: Provide relief valves as indicated, of size and capacity as selected by Installer for proper relieving capacity, in accordance with ASME Boiler and Pressure Vessel Code. Provide bronze body, test lever and thermostat complying with ANSI Z21.22 listing requirements for temperature discharge capacity. Provide temperature relief at 210°F, and pressure relief at 150 psi. Watts, Cash, Zurn, or approved equal.

2.12 Trap Primers: Provide pressure activated trap primers per fixture schedule on P0.1.

3 EXECUTION

3.1 General: Examine areas and conditions under which potable water systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 Install plumbing identification in accordance with Division-23 Basic Mechanical Materials and Methods section "Mechanical Identification". Install underground plastic pipe markers during backfill, 6"-8" below grade.

3.3 Install water distribution piping in accordance with Division-23 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings".

3.3.1 Install piping with 1/32" per foot (¼%) downward slope towards drain point.

3.3.2 Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.

3.4 Install exterior water piping in compliance with local governing regulations. Water piping shall be installed with a minimum of 30 inches of cover unless otherwise indicated.

3.5 Install piping specialties in accordance with Division-23 Basic Mechanical Materials and Methods section "Piping Specialties".

3.6 Install supports and anchors in accordance with Division-23 Basic Mechanical Materials and

Methods section "Supports and Anchors".

3.7 Install valves in accordance with Division-23 Basic Mechanical Materials and Methods section "Valves".

3.7.1 Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves two or more plumbing fixtures or equipment connections, and elsewhere as indicated.

3.7.2 Shutoff Valves: Install on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and elsewhere as indicated.

3.7.3 Drain Valves: Install on each plumbing equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere where indicated or required to completely drain potable water system.

3.7.4 Check Valves: Install where indicated.

3.8 Hose Bibbs and Wall Hydrants: Install on concealed piping where indicated with vacuum breaker. Mount 18 inches above grade or finished floor.

3.9 Install meters and gauges in accordance with Division-23 Basic Mechanical Materials and Methods section "Meters and Gauges".

3.10 Install relief valves on each water heater, and where indicated in accordance with the manufacturer's instructions. Pipe full size outside or to floor drain. Cut the end of the pipe at a 45° angle and terminate 6 inches above the floor or grade.

3.11 Piping Runouts to Fixtures: Provide hot and cold water piping runouts to fixtures of sizes indicated, but in no case smaller than required by Florida Building Code-Plumbing.

3.12 Plumbing Equipment Connections: Connect hot and cold water piping system to plumbing equipment as indicated, and comply with equipment manufacturer's installation instructions. Provide shutoff valve and union for each connection, provide drain valve on drain connection.

3.13 Install water hammer arresters in upright position, in locations and of sizes indicated in accordance with PDI Standard WH-201.

3.14 Install trap primers as indicated, and in accordance with manufacturer's installation instructions. Provide access panels to all trap primers unless accessible through a lay-in ceiling or inside mechanical room.

3.15 Locate all valves and devices requiring access above lay-in ceiling.

3.16 Piping Tests: Test, clean, and sterilize potable water piping in accordance with testing requirements of Division-23 Basic Mechanical Materials and Methods section "Testing, Cleaning, and Sterilization of Piping Systems".

END OF SECTION 22 11 13

SECTION 22 13 16 - SOIL, WASTE AND VENT SYSTEM

1 GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 Division-22 Basic Plumbing Requirements and Basic Plumbing Materials and Methods sections apply to work of this section.

1.3 Division-23 Basic Mechanical Materials and Methods Sections apply to work of this section.

1.4 Extent of soil waste and vent systems work is indicated on drawings and schedules, and by requirements of this section.

1.5 Refer to appropriate Division-2 sections for exterior sanitary sewer system required in conjunction with soil and waste systems; not work of this section.

1.6 Excavation and backfill required in conjunction with soil, waste and vent piping is specified in other Division-23 sections and is included as work of this section.

1.7 Refer to Division-7 section "Flashing and Sheet Metal" for flashings required in conjunction with soil and waste systems; not work of this section.

1.8 Code Compliance: Comply with applicable portions of Florida Building Code-Plumbing pertaining to plumbing materials, construction and installation of products. Comply with local utility requirements.

1.9 Approval Submittals:

1.9.1 Product Data: Submit manufacturer's technical product data for:

Cleanouts
Floor drains
Grease interceptors

2 PRODUCTS

2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in soil and waste systems. Where more than one type of materials or products is indicated, selection is Installer's option.

Underground-Type Plastic Line Marker: Manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct-burial service; not less than 6" wide x 4 mils thick. Provide green tape with black printing reading "CAUTION SEWER LINE BURIED

BELOW".

2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following listed for each item.

2.3 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-23 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:

2.3.1 Above Ground Soil, Waste, and Vent Piping:

2.3.1.1 Polyvinyl chloride plastic pipe (PVC); Type DWV; PVC plastic type DWV socket-type fitting, solvent cement joints. Do not use in fire-rated assemblies or return air plenums.

2.3.2 Underground Building Drain Piping (within 5 feet of the building):

2.3.2.1 Pipe Size 6" and Smaller: Polyvinyl chloride sewer pipe (PVC); Type DWV; PVC plastic type DWV socket-type.

2.4 Pipe Specialties: Provide piping specialties complying with Division-23 Basic Mechanical Materials and Methods section "Piping Specialties".

2.5 Supports and Anchors: Provide supports and anchors complying with Division-23 Basic Mechanical Materials and Methods section "Supports and Anchors".

2.6 Cleanouts: Provide factory-fabricated drainage piping products of size and type indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements and governing regulations. Josam, Jay R. Smith, Wade, Zurn.

2.6.1 Cleanout Plugs: Cast-bronze or brass, threads complying with ANSI B2.1 countersunk head.

2.6.2 Cleanout for PVC Systems:

2.6.2.1 Floor Cleanouts: Cast-iron body with adjustable head, brass plug, and scoriated nick-brass cover. Furnish with carpet flange for carpeted floors. Furnish with recessed cover for tile floors. Furnish with clamping ring for floors with membrane. Wade W-6030 hub outlet for push-on.

2.6.2.2 Cleanouts in Piping: PVC cleanout adaptor with threaded PVC plug.

2.6.2.3 Wall Cleanouts: PVC cleanout adaptor with tapped, countersunk, threaded brass plug. Square 9”x9” wall access cover, with scoriated nickel bronze finish.

2.6.2.4 Grade Cleanouts: PVC cleanout adaptor with countersunk, threaded brass plug. Wade W-8590-D plug. In sidewalks and other finished concrete, provide access cover frames with a non-tilting tractor cover. Wade W-7035-Z or equal.

2.6.2.5 Cleanouts in Paved Areas: Cast iron body, adjustable housing, ferrule with plug and round loose scoriated tractor cover. Wade W-8300-MF. Coordinate concrete depth at site with adjustable flange.

2.7 Floor Drains: Provide floor drains of size as indicated on drawings; and type, including features, as specified herein. Josam, Jay R. Smith, Wade, Zurn.

2.7.1 Floor Drains: Provide inside caulk bottom outlet or TY-Seal hub outlet with adaptor for cast iron trap installation and a 4" deep trap seal. Provide clamping rings for floors with membrane.

2.7.2 Floor Drains in Mechanical Rooms: Provide heavy duty floor drains with dura-coated cast iron body and top, bottom outlet, sediment bucket, and trap primer connection. Provide with membrane clamp and adjustable collar with slots.

2.7.3 Strainer: Provide 5" satin-nickel bronze strainer.

2.7.4 Trap Primer Connection: Provide ½" trap primer tapping.

2.7.5 Funnel: Provide funnel where shown on the drawings.

2.7.6 Basis of Design: Zurn Z-415B-P. Basis of design for floor drains in mechanical rooms is Zurn Z-541.

2.8 Floor Sinks: 12" x 12" x 8" deep, enameled cast iron (inside only enameled) with chrome plated brass beehive strainer (less grate), 3" outlet connection. Provide running trap under floor with cleanout flush to floor finish material, coordinate with architectural finish schedule. Zurn Z-1901-1 or equal.

3 EXECUTION

3.1 Examine substrates and conditions under which soil and waste systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

3.2 Piping Installation:

3.2.1 Install above grade soil and waste piping in accordance with Division-22 Basic Plumbing Materials and Methods section "Pipes and Pipe Fittings", and with Florida Building Code-Plumbing.

3.2.2 Install underground soil and waste pipes as indicated and in accordance with Florida Building Code-Plumbing. Lay underground piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install required gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements. Clean interior of piping of dirt and other superfluous material as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. Place plugs in ends of uncompleted piping at end of day or whenever work stops.

3.2.3 Install building soil and vent piping pitched to drain at minimum slope of ¼" per foot (2%) for piping smaller than 3", and 1/8" per foot (1%) for piping 3" and larger.

3.3 Install piping specialties in accordance with Division-23 Basic Mechanical Materials and Methods section "Piping Specialties".

3.4 Install supports and anchors in accordance with Division-23 Basic Mechanical Materials and Methods section "Supports and Anchors".

3.5 Installation of Cleanouts: Install in above ground piping and building drain piping as indicated, as required by Florida Building Code-Plumbing; and at each change in direction of piping greater than 45°; at minimum intervals of 50' for piping 4" and smaller and 100' for larger piping; and at base of each vertical soil or waste stack. Install floor and wall cleanout covers for concealed piping, select type to match adjacent building finish.

3.5.1 Size: Cleanouts shall be full size up to 4". Piping over 4" shall have a reducing fitting to accommodate a 4" cleanout unless indicated otherwise on drawings.

3.5.2 Install cleanouts to allow adequate clearance for rodding.

3.5.3 Protect all finished surfaces of cleanouts with a suitable adhesive covering until construction is completed.

3.5.4 Cleanouts to Grade: Provide an 18" x 18" x 8" thick concrete pad around the cleanout. Set the cleanout ferrule, adapter, or access cover frame in the concrete as required. The cleanout shall be extended to the finished grade. The concrete pad shall slope away from the cleanout in all directions approximately one inch. Cover pad with fill to finished grade.

3.5.5 Cleanouts in Paved Areas: Provide concrete pad similar to cleanout to grade and coordinate concrete depth at site with adjustable flange. Access cover frames are required.

3.6 Flashing Flanges: Install flashing flange and clamping device with each stack and cleanout passing through waterproof membranes.

3.7 Vent Flashing Sleeves: Install on stack passing through roof, secure to stack flashing in accordance with manufacturer’s instructions. For metal roofs, sleeves and flashing are by Division-7.

3.8 Installation of Floor Drains: Install floor drains in accordance with manufacturer's written instructions and in locations indicated.

3.8.1 Coordinate flashing work with work of waterproofing and adjoining substrate work.

3.8.2 Install floor drains at low points of surface areas to be drained, or as indicated. Set tops of drains flush with finished floor.

3.8.3 Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes, where penetrated.

3.8.4 Position drains so that they are accessible and easy to maintain.

3.9 Connection of Trap Primers: Connect trap primers as indicated, and in accordance with manufacturer's installation instructions. Pitch piping towards drain trap, minimum of 1/8" per foot (1%). Adjust trap primer for proper flow.

3.10 Piping Runouts to Fixtures: Provide soil and waste piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated, but in no case smaller than required by Florida Building Code-Plumbing.

3.11 Test, clean, flush, and inspect soil and waste piping in accordance with requirements of Division-23 Basic Mechanical Materials and Methods section "Testing, Cleaning and Sterilization of Piping Systems".

END OF SECTION 22 13 16

SECTION 22 16 00 – GAS SYSTEM

1 GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specifications sections, apply to work of this section.

1.2 Division-22 Basic Plumbing Requirements and Basic Mechanical Materials and Methods sections apply to work of this section.

1.3 Division-23 Basic Mechanical Materials and Methods Sections apply to work of this section.

1.4 Extent of fuel gas systems work, is indicated on drawings and schedules, and by requirements of this section.

1.5 Excavation and backfill required in conjunction with gas service piping is specified in Division-23 sections, and is included as work of this section.

1.6 Codes and Standards

1.6.1 NFPA Compliance: Fabricate and install gas systems in accordance with NFPA 54 "National Fuel Gas Code".

1.6.2 Utility Compliance: Fabricate and install gas systems in accordance with local gas utility company requirements and standards.

1.7 Approval Submittals:

1.7.1 Product Data: Submit manufacturer's technical product data and installation instructions as follows:

Gas cocks and/or ball valves
Gas vents
Gas regulators

1.8 O&M Data Submittals: Submit a copy of approval submittals. Submit maintenance data and parts lists for gas cocks, ball valves, gas vents, regulators. Include these data in O&M manual.

2 PRODUCTS

2.1 General: Provide piping materials and factory-fabricated piping products of sizes, types, pressure ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with NFPA 54 where applicable. Base pressure rating on gas piping system maximum design pressures. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in gas systems. Where more than one type of materials or products are indicated, selection is Installer's option.

2.2 Identification: Provide identification complying with Division-23 Basic Mechanical Materials and Methods section "Mechanical Identification".

2.3 Pipes and Fittings: Provide pipes and pipe fittings complying with Division-23 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings", in accordance with the following listing:

2.3.1 Gas Service Piping: Refer to civil site utility plans.

2.3.2 Building Distribution Piping:

2.3.2.1 Pipe Size 2" and Smaller: Black steel pipe; Schedule 40; malleable-iron threaded fittings.

2.3.2.2 Pipe Size 2½" and Larger: Black steel pipe; Schedule 40; wrought-steel buttwelding fittings.

2.4 Piping Specialties: Provide piping specialties complying with Division-23 Basic Mechanical Materials and Methods section "Piping Specialties".

2.5 Sealants: Provide UL-listed or AGA approved sealants for gas piping.

2.6 Supports and Anchors: Provide supports and anchors complying with Division-23 Basic Mechanical Materials and Methods section "Supports and Anchors".

2.7 Valves: Provide valves complying with Division-23 Basic Mechanical Materials and Methods section “Valves” and in accordance with the following listing.

2.7.1 Gas Cocks 2" and Smaller: UL-listed, AGA approved, 150 psi non-shock WOG, full port, bronze straightway cock, flat or square head, threaded ends.

2.7.2 Gas Cocks 2½" and Larger: UL-listed, CGA approved, MSS SP-78; 175 psi, lubricated plug type, full port, semi-steel body, single gland, wrench operated, flanged ends.

2.7.3 Wrenches: Provide operating wrenches for all gas cocks serving boilers.

2.7.4 Acceptable Manufacturers for gas cocks: Subject to compliance with requirements, provide products of one of the following: Resun R1430 and R1431, Milliken 200M and 201M or approved equal.

2.8 Gas Appliance Tube Connectors: Provide commercial grade appliance connectors with a 2 year manufacturer’s warranty. Tubing shall be Type 304 stainless steel tubing with type 304 stainless steel braiding to protect tubing from elongation. Tubing shall be complete with factory installed end connectors. Provide products that are AGA or CGA approved. Indicate maximum BTU input for each length and size used on submittal.

2.9 Gas Vents: Provide stainless steel special gas vent system for gas-fired appliances, except where noted otherwise on the drawings. The system shall include pipe, top, flashing cone, storm collar, joist shield, support plates, firestops, and fittings as required by the manufacturer for a complete installation. Acceptable Manufacturer: Subject to compliance with requirements, provide products of one of the following: Metalbestos, Hart and Cooley or approved equal.

3 EXECUTION

3.1 Examine areas and conditions under which gas systems materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in

manner acceptable to Installer. Coordinate with gas supplier prior to starting work.

3.2 Install mechanical identification in accordance with Division-23 Basic Mechanical Materials and Methods section "Mechanical Identification".

3.3 Install gas piping in accordance with Division-23 Basic Mechanical Materials and Methods section "Pipes and Pipe Fittings".

3.3.1 Use sealants on metal gas piping threads which are chemically resistant to gas. Use sealants sparingly, and apply to only male threads of metal joints.

3.3.2 Remove cutting and threading burrs before assembling piping.

3.3.3 Do not install defective piping or fittings. Do not use pipe with threads which are chipped, stripped or damaged. Do not use bushings in the gas system.

3.3.4 Plug each gas outlet, including valves, with threaded plug or cap immediately after installation and retain until continuing piping, or equipment connections are completed.

3.3.5 Ground gas piping electrically and continuously within project, and bond tightly to grounding connection.

3.3.6 Install drip-legs in gas piping where indicated, and where required by code or gas company requirements.

3.3.7 Install "Tee" fitting with bottom outlet plugged or capped, at bottom of pipe risers.

3.3.8 Use dielectric unions where dissimilar metals are joined together.

3.3.9 Install piping with 1/64" per foot (1/8%) downward slope in direction of flow.

3.4 Install piping specialties in accordance with Division-23 Basic Mechanical Materials and Methods section "Piping Specialties".

3.5 Install supports and anchors in accordance with Division-23 Basic Mechanical Materials and Methods section "Supports and Anchors".

3.6 Installation of Valves:

3.6.1 Gas Cocks: Provide at connection to gas train for each gas-fired equipment item; and on risers and branches where indicated.

3.6.2 Locate gas cocks where easily accessible, and where they will be protected from possible injury.

3.7 Equipment Connections: Connect gas piping to each gas-fired equipment item, with drip leg and shutoff gas cock. Comply with equipment manufacturer's instructions.

3.8 Gas Vent Installation:

3.8.1 Install gas vents for all draft gas-fired appliances in accordance with NFPA 54 and the manufacturer's instructions. Provide all flashing and related materials.

3.8.2 Gas vents shall terminate at least 3 feet above the roof and 2 feet higher than any portion of a building within a horizontal distance of 10 feet.

3.8.3 Minimum vertical gas vent length is 5 feet.

3.8.4 Slope horizontal gas vent connectors upward at least ¼ inch per foot.

3.9 Piping Tests: Inspect, test, and purge gas systems in accordance with NFPA 54, local utility requirements, and Division-23 Basic Mechanical Materials and Methods section "Testing, Cleaning and Sterilization of Piping Systems". DO NOT INTRODUCT AIR INTO THE SYSTEM, VENT OR PURGE WITH NITROGEN. DISCHARGE VENT OR PURGE GASES TO THE EXTERIOR OF THE BUILDING.

END OF SECTION 22 16 00

SECTION 22 30 00 - PLUMBING FIXTURES, EQUIPMENT, TRIM & SCHEDULE

1 GENERAL

1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 Division-22 Basic Plumbing Requirements and Basic Plumbing Materials and Methods sections apply to work of this section.

1.3 Division-23 Basic Mechanical Materials and Methods Sections apply to work of this section.

1.4 Extent of plumbing fixtures work required by this section is indicated on drawings and schedules, and by requirements of this section.

1.5 Refer to Division-26 sections for field-installed electrical wiring required for plumbing fixtures; not work of this section.

1.6 Codes and Standards:

1.6.1 Plumbing Fixture Standards: Comply with applicable portions of Florida Building Code-Plumbing pertaining to materials and installation of plumbing fixtures.

1.6.2 ANSI Standards: Comply with applicable ANSI standards pertaining to plumbing fixtures and systems.

1.6.3 PDI Compliance: Comply with standards established by PDI pertaining to plumbing fixture supports.

1.6.4 UL Listing: Construct plumbing fixtures requiring electrical power in accordance with UL standards and provide UL-listing and label.

1.6.5 ARI Compliance: Construct and install water coolers in accordance with ARI Standard 1010 "Drinking-Fountains and Self-Contained Mechanically-Refrigerated Drinking-Water Coolers", and provide Certification Symbol.

1.6.6 ANSI Compliance: Construct and install barrier-free plumbing fixtures in accordance with ANSI Standard A117.1 "Specifications for Making Buildings and Facilities Accessible To and Usable By Physically Handicapped People".

1.7 Approval Submittals:

1.7.1 Product Data: Submit manufacturer's technical product data, including rated capacities of selected model clearly indicated, furnished specialties and accessories; and installation instructions. Submit manufacturer's assembly-type drawings indicating dimensions, roughing-in requirements, required clearances, and methods of assembly of components and anchorages. The submittal shall be organized by “fixture number” and each fixture package shall be so

identified. Each fixture package shall include all of the required fitting and trim, even if such devices are used for more than one fixture.

1.8 O&M Data Submittals: Submit a copy of approval submittals. Submit maintenance data and parts lists for each type of plumbing fixture and accessory; including "trouble-shooting" maintenance guide. Include these data in O&M manual.

1.9 Handle plumbing fixtures carefully to prevent breakage, chipping and scoring fixture finish. Do not install damaged plumbing fixtures; replace and return damaged units to equipment manufacturer.

2 PRODUCTS

2.1 General: Provide factory-fabricated fixtures of type, style and material indicated. For each type fixture, provide trim, carrier, seats, and valves as specified. Where not specified, provide products as recommended by manufacturer, and as required for complete installation. Where more than one type is indicated, selection is Installer's option; but, all fixtures of same type must be furnished by single manufacturer. Where type is not otherwise indicated, provide fixtures complying with governing regulations.

2.2 Model Numbers: Basis of design model numbers of a particular manufacturer are listed in the fixture schedule as an aid to contractors. Where conflicts between the model number and the written description occur, the written description shall govern. Where acceptable manufacturers are listed, products are subject to compliance with requirements.

2.3 Materials:

2.3.1 Provide materials which have been selected for their surface flatness and smoothness. Exposed surfaces which exhibit pitting seam marks, roller marks, foundry sand holes, stains, decoloration, or other surface imperfections on finished units are not acceptable.

2.3.2 All fixtures shall be white vitreous china unless otherwise specifically noted. Where enameled iron fixtures are specified, they shall be furnished with acid resisting enamel.

2.3.3 Where fittings, trim and accessories are exposed or semi-exposed provide bright chrome-plated or polished stainless steel units. Provide copper or brass where not exposed.

2.3.4 Stainless Steel Sheets: ASTM A 167, Type 302/304, hardest workable temper. Finish shall be No. 4, bright, directional polish on exposed surfaces.

2.3.5 Vitreous China: High quality, free from fire cracks, spots, blisters, pinholes and specks; glaze exposed surfaces, and test for crazing resistance in accordance with ASTM C 554.

2.3.6 Synthetic Stone: High quality, free from defects, glaze on exposed surfaces, stain resistant.

2.4 Plumbing Fittings, Trim and Accessories:

2.4.1 Faucets: At locations where water is supplied (by manual, automatic or remote control), provide commercial quality chrome-plated, cast-brass faucets, valves, or other dispensing devices, of type and size indicated, and as required to operate as indicated.

2.4.1.1 Aerators: Provide aerators of types approved by Health Department having jurisdiction.

2.4.1.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Chicago Faucet Co., Kohler Co., Speakman Co., T & S Brass and Bronze Works, Water Saver Faucet Co., Zurn.

2.4.2 Stops: Provide chrome-plated brass, angle type, manual shutoff valves and 3/8" chrome-plated flexible supply pipes to permit fixture servicing without shutdown of water supply piping systems for all fixtures. Coordinate with fixture requirements.

2.4.2.1 Provide loose key stops.

2.4.2.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Zurn or approved equal.

2.4.3 Waste Outlets: Provide removable P-traps, drains, waste arms, tailpieces and wastes-to-wall where drains are indicated for direct connection to drainage system for all fixtures unless otherwise noted. Provide drains, tailpieces and waste arms where indirect drains are indicated. Waste outlets shall be full size of fixture drain connection.

2.4.3.1 Provide chrome-plated cast-brass P-traps and drains with cleanout.

2.4.3.2 P-traps, wastes and drains of all types shall be 17-gauge.

2.4.3.3 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Zurn, or approved equal.

2.4.4 Flush Valves: Provide quiet-flush, chrome-plated, cast-brass flush valves with vacuum breaker and screwdriver stop. Where handicap service is indicated, provide ADA compliant handles with the handle on the approach side of the stall.

2.4.4.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Sloan Valve Co. or Zurn.

2.4.5 Carriers: Provide cast-iron supports for fixtures of either graphitic gray iron, ductile iron, or malleable iron or steel as indicated. Coordinate with specific fixture requirements and conditions of the project.

2.4.5.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Josam, Wade, Zurn, J.R. Smith.

2.4.6 Fixture Bolt Caps: Provide manufacturer's standard exposed fixture bolt caps finished to match fixture finish.

2.4.7 Escutcheons: Where fixture supplies and drains penetrate walls in exposed locations, provide chrome-plated brass escutcheons with friction clips.

2.4.8 Comply with additional fixture requirements listed for each fixture and as required for a complete and functional system.

2.5 Water Closets:

2.5.1 General: Provide white china siphon jet type unless otherwise noted.

2.5.1.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one

of the following for each item. American Standard, Crane, Kohler, or Zurn.

2.5.2 Fixture Seats: Provide white, heavy molded plastic fixture seats with stainless steel self-sustaining check hinges.

2.5.2.1 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Bemis Mfg. Co., Beneke Corp., Church or Comfort Seats.

2.5.3 Water Closet Schedule:

WC-1 WATER CLOSET, FLOOR-MOUNT (ADULT AND MIDDLE SCHOOL HANDICAP, MANUAL VALVE):

Vitreous china, 1.28 gallons per flush, elongated, siphon jet, white, water saver bowl with 1-1/2" top spud, 17" high for handicapped. Exposed chrome plate flush valve, with screwdriver stop, vacuum breaker, quiet flush feature, with sweat solder kit and cast wall flange. Heavy molded plastic, white, elongated, open front seat less cover, with stainless steel, self-sustaining check hinges. Hold centerline flush valve assembly off finish wall for grab bar clearances, coordinate with Architectural drawings.

Water closet	Zurn Z5665-BWL
Valve	Zurn Z6000PL-HET
Seat	Z5955SS-EL-STS
Closet Bolt/Wax Ring Kit	Z5972-COMB

WC-2 WATER CLOSET, FLOOR-MOUNT (STANDARD, MANUAL VALVE):

Vitreous china, 1.28 gallons per flush, elongated, siphon jet, white, water saver bowl with 1-1/2" top spud, 15" high for handicapped children ages 5 through 8. Exposed chrome plate flush valve, with screwdriver stop, vacuum breaker, quiet flush feature, with sweat solder kit and cast wall flange. Heavy molded plastic, white, elongated, open front seat less cover, with stainless steel, self-sustaining check hinges. Hold centerline flush valve assembly off finish wall for grab bar clearances, coordinate with Architectural drawings.

Water closet	Zurn Z5655-BWL
Valve	Zurn Z6000PL-HET
Seat	Z5955SS-EL-STS
Closet Bolt/Wax Ring Kit	Z5972-COMB

2.6 Urinals:

2.6.1 General: Provide white china siphon jet wall hung type with ¾” top spud and 2" outlet unless otherwise noted. Provide short foot carrier with top and bottom hanger plates.

2.6.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Crane, Kohler, or Zurn.

2.6.3 Urinal Schedule:

UR-1 URINAL, WALL-MOUNT (HANDICAP, MANUAL VALVE):

Vitreous china, 0.125 gallons per flush, siphon jet flush, 3/4" top spud, and 2" outlet urinal. Exposed chrome plated flush valve with screwdriver stop, vacuum breaker and quiet flush

feature. Mount to satisfy ADA requirements, coordinate with Architectural drawings (toilet room elevations) for final mounting height. Furnish floor mounted single carrier with hanger plate, bearing plate, adjustable supporting rods, structural uprights and block bases, secure base to floor for rigid connection with 1/2" x 3-3/4" threaded zinc plated steel heavy duty wedge anchors, complete with stainless steel clip, washer and threaded nut, conforming to federal spec. FF-S-325.

Urinal	Zurn Z5738
Valve	Zurn Z6003PL-ULF
Urinal Flange Kit	Zurn Z5976-URINAL
Carrier	Zurn Z-1222
Base Anchorage	B-Line Anchors AWA-50-375

UR-2 URINAL, WALL-MOUNT (STANDARD, MANUAL VALVE):

Vitreous china, 0.125 gallons per flush, siphon jet flush, 3/4" top spud, and 2" outlet urinal. Exposed chrome plated flush valve with screwdriver stop, vacuum breaker and quiet flush feature. See Architectural drawings (toilet room elevations) for mounting height. Furnish floor mounted single carrier with hanger plate, bearing plate, adjustable supporting rods, structural uprights and block bases, secure base to floor for rigid connection with 1/2" x 3-3/4" threaded zinc plated steel heavy duty wedge anchors, complete with stainless steel clip, washer and threaded nut, conforming to federal spec. FF-S-325.

Urinal	Zurn Z5738
Valve	Zurn Z6003PL-ULF
Urinal Flange Kit	Zurn Z5976-URINAL
Carrier	Zurn Z-1222
Base Anchorage	B-Line Anchors AWA-50-375

2.7 Lavatories:

2.7.1 General: Provide white china lavatories.

2.7.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. American Standard, Crane, Kohler, or Zurn.

2.7.3 Lavatory Schedule:

L-1 LAVATORY, WALL-MOUNT (HANDICAP):

Vitreous china 20" x 18", color “white” faucet, center hole, front overflow, for concealed arm support. Furnish floor-mounted single carrier with concealed arms, leveling and securing screws, structural uprights and block bases, secure base to floor for rigid connection with 1/2" x 3-3/4" threaded zinc plated steel heavy duty wedge anchors, complete with stainless steel clip, washer and threaded nut, conforming to federal spec. FF-S-325. Single or back to back system as required. Provide chrome plated 1/2” IPS x 3/8”OD, loose key operated, angle stop to wall with chrome plated 3/8" flexible copper risers, integral perforated cast brass strainer with 1-1/4" offset 17 gauge tailpiece, 1-1/4” chrome plated 17 gauge cast brass P-trap with cleanout and tube waste to wall. Polished chrome plated cast brass single water metering faucet with cover plate, aerator outlet and push button and 0.5 gpm aerator. Lavatory P-trap and single valve assemblies shall be insulated with fully molded insulation kit, light gray color with 3-piece interlocking rap assembly and 2-piece interlocking angle valve assembly. Fasteners shall be nylon-type supplied with kit. Lavatory shall be mounted with a clearance of

at least 28" from floor to bottom of the apron. Knee and toe clearances shall be as follows: 27" clear height shall be provided from finished floor to a point on underside of bowl 8" in from front apron. Toe clearance shall be a minimum height of 9" under P-trap and supplies or stops. See Architectural plans for final mounting height. Under sink mixing valve with threaded connection, bronze body, limits hot water between 80º F & 120º F, double throttling, integral inlet filter washers & check valves, tamper resistant locking cap. Meets ASSE 1070 standards.

Lavatory	Zurn Z5341
Faucet	Zurn Z86300-3M
Supply w/stop	Zurn Z8802LRLK-PC
Drain	Zurn Z8746
P-Trap	Zurn Z8700-PC
Insulation kit	Zurn Z8946-3-NT
Carrier	Zurn Z-1231(-D)
Base Anchorage	B-Line Anchors AWA-50-375
Mixing Valve	Watts MMV-UT-M1

L-2 LAVATORY, WALL-MOUNT (STANDARD):

Vitreous china 20" x 18", color “white” faucet, center hole, front overflow, for concealed arm support. Furnish floor-mounted single carrier with concealed arms, leveling and securing screws, structural uprights and block bases, secure base to floor for rigid connection with 1/2" x 3-3/4" threaded zinc plated steel heavy duty wedge anchors, complete with stainless steel clip, washer and threaded nut, conforming to federal spec. FF-S-325. Single or back to back system as required. Provide chrome plated 1/2” IPS x 3/8”OD, loose key operated, angle stop to wall with chrome plated 3/8" flexible copper risers, integral perforated cast brass strainer with 1-1/4" offset 17 gauge tailpiece, 1-1/2” chrome plated 17 gauge cast brass P-trap with 1-1/4” reducing washer, cleanout, tube waste to wall, and water saver trap primer with stainless steel primer hose. Polished chrome plated cast brass single water metering faucet with cover plate, aerator outlet and push button and 0.5 gpm aerator. Lavatory P-trap and single valve assemblies shall be insulated with fully molded insulation kit, light gray color with 3-piece interlocking rap assembly and 2-piece interlocking angle valve assembly. Fasteners shall be nylon-type supplied with kit. Lavatory shall be mounted with a clearance of at least 28" from floor to bottom of the apron. Knee and toe clearances shall be as follows: 27" clear height shall be provided from finished floor to a point on underside of bowl 8" in from front apron. Toe clearance shall be a minimum height of 9" under P-trap and supplies or stops. See Architectural plans for final mounting height. Under sink mixing valve with threaded connection, bronze body, limits hot water between 80º F & 120º F, double throttling, integral inlet filter washers & check valves, tamper resistant locking cap. Meets ASSE 1070 standards.

Lavatory	Zurn Z5341
Faucet	Zurn Z86300-3M
Supply w/stop	Zurn Z8802LRLK-PC
Drain	Zurn Z8746
P-Trap	Zurn Z1021
Insulation kit	Zurn Z8946-3-NT
Carrier	Zurn Z-1231
Base Anchorage	B-Line Anchors AWA-50-375
Mixing Valve	Watts MMV-UT-M1

L-3 LAVATORY, WALL-MOUNT (HANDICAP):

Vitreous china 20" x 18", color “white” faucet, on 8" centers, front overflow, for concealed arm support. Furnish floor-mounted single carrier with concealed arms, leveling and securing screws, structural uprights and block bases, secure base to floor for rigid connection with 1/2" x 3-3/4" threaded zinc plated steel heavy duty wedge anchors, complete with stainless steel clip, washer and threaded nut, conforming to federal spec. FF-S-325. Provide chrome plated 1/2” IPS x 3/8”OD, loose key operated, angle stop to wall with chrome plated 3/8" flexible copper risers, integral perforated cast brass strainer with 1-1/4" offset 17 gauge tailpiece, 1-1/2” chrome plated 17 gauge cast brass P-trap with 1-1/4” reducing washer, cleanout, tube waste to wall, and water saver trap primer with stainless steel primer hose. Polished chrome plated cast brass widespread faucet with 4” wrist blade handles, and 0.5 gpm aerator. Lavatory P-trap and single valve assemblies shall be insulated with fully molded insulation kit, light gray color with 3-piece interlocking rap assembly and 2-piece interlocking angle valve assembly. Fasteners shall be nylon-type supplied with kit. Lavatory shall be mounted with a clearance of at least 28" from floor to bottom of the apron. Knee and toe clearances shall be as follows: 27" clear height shall be provided from finished floor to a point on underside of bowl 8" in from front apron. Toe clearance shall be a minimum height of 9" under P-trap and supplies or stops. See Architectural plans for final mounting height. Under sink mixing valve with threaded connection, bronze body, limits hot water between 80º F & 120º F, double throttling, integral inlet filter washers & check valves, tamper resistant locking cap. Meets ASSE 1070 standards.

Lavatory	Zurn Z5348
Faucet	Zurn Z831R4-XL-3M
Supply w/stop	Zurn Z8802LRLK-PC
Drain	Zurn Z8746
P-Trap	Zurn Z1021
Insulation kit	Zurn Z8946-3-NT
Carrier	Zurn Z-1231
Base Anchorage	B-Line Anchors AWA-50-375
Mixing Valve	Watts MMV-UT-M1

2.8 Electric Water Coolers:

2.8.1 General: Provide self-contained electric water cooler with entire water system free of lead. All joints shall be made using silver solder. Units shall be complete with an air-cooled refrigeration system consisting of a hermetic compressor, cooler, pre-cooler, condenser fan, thermostat safety controls and all other related devices. The unit shall have a capacity of 8 gallons per hour. The cabinet shall be stainless steel with vermin proof insulation. The top shall be fabricated of stainless steel with a No. 4 finish. Where handicap units are indicated, the bubbler and fountain shall be ADA compliant.

2.8.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Elkay Mfg. Co., Halsey Taylor Div., Haws Drinking Faucet Co., Sunroc, Oasis.

2.8.3 Electric Water Cooler Schedule:

EWC-1 ELECTRIC WATER COOLER (DUAL PURPOSE/TWO LEVELS/BOTTLE STATION):

Wall mount, dual-purpose unit, self-contained electric water cooler with sensor-activated bottle filling station. Furnish floor mounted two levels double carrier with bearing plate, hangar plate, adjustable supporting rods, structural uprights and block bases, secure to floor with ½” bolts and anchors. Unit to be complete with hermetic air cooled refrigeration system,

cooler pre-cooler, thermostat, safety controls, condenser fan motor, silver ion antimicrobial protection on key plastic components, flexi-guard safety bubbler, vermin proof insulation, heavy gauge steel cabinet, moisture resistant finish, quiet operation. Top of cooler shall be No. 3 satin finish stainless steel. Cooler capacity shall be 8.0 gph, laminar flow, visual kilter monitor, cooling 80-degree F water to 50 degree F. Provide one-year warranty on entire cooler. Provide chrome plated stop to wall with chrome plated 3/8" flexible supply. Provide 1-1/2" chrome plated 17 gauge cast brass P-trap with cleanout. Chrome plated loose key angle stop to wall with 3/8" chrome plated flexible hot and cold water supplies. 115V/60hz, single phase, 5 full load amps, 370 rated watts, hermetically-sealed reciprocating compressor. Verify final location and mounting height with Architectural drawings. Finish to be selected by Architect. Certified to NSF/ANSI 42, 53, 61, & 372. UL 399 requirements.

EDF	Elkay LZSTL8WSSP
Trap	Zurn Z-8702-PC
Supplies	Zurn Z-8800LK
Carrier	Z1225 BL

2.9 Mop Receptors:

2.9.1 General: Provide one piece mop receptors with 3" integral stainless steel grid drain. Provide wall-mounted faucet with arm handles, vacuum breaker, stops, hose connection and hose bracket. Provide 30" hose.

2.9.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Stern-Williams Co., or Acorn.

2.9.3 Mop Receptor Schedule:

MR-1 SERVICE SINK (FLOOR TYPE, CORNER):

32" X 32" terrazzo with stainless steel caps, corner type, floor mount. Rough chrome plated faucet with top brace on 8" centers, bucket hook, vacuum breaker, stops and hose end, 3" outlet drain with strainer.

Sink	Acorn TNC-32-TF2
Faucet	Zurn Z843 M1 RC

2.10 Stainless Steel Sinks:

2.10.1 General: Provide Type 304, 18 gauge self-rimming stainless steel back ledge with No. 4 finish . Provide sound deadening material on the sides and bottom of the sink. Provide grid drain or strainer with removable crumb cup and stopper as indicated.

2.10.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Elkay, Just

2.10.3 Stainless Steel Sink Schedule:

SK-1 DOUBLE COMPARTMENT STAINLESS STEEL SINK:

29" x 22" x 7-5/8" deep (bowl is 11-1/2x16x7-1/2), type 304, 18 gauge, 8" centers, self rimming single compartment, (18-8) nickel bearing stainless steel, back ledge sink with satin finish and sound deadening materials on side and bottom of sink. Provide polished chrome

plated top mount swing gooseneck spout with straight lever handles, water saving aerator, strainer with removable crumb cup and stopper, 1-1/2 tailpiece, chrome plated 17 gauge cast brass P-trap with cleanout and tube waste to wall. Chrome plated loose key angle stop to wall with 3/8" chrome plated flexible hot and cold water supplies. Coordinate with cabinet shop drawings, base cabinet must be a true minimum 24" deep back to front in order for sink to drop into countertop opening. Sink drillings shall accommodate fitting installation, only, no other capped openings will be allowed. Under sink mixing valve with threaded connection, bronze body, limits hot water between 80ºF & 120ºF, double throttling, integral inlet filter washers & check valves, tamper resistant locking cap. Under sink mixing valve with threaded connection, bronze body, limits hot water between 80º F & 120º F, double throttling, integral inlet filter washers & check valves, tamper resistant locking cap. Meets ASSE 1070 standards.

Sink	Elkay LR-2922
Faucet	Zurn Z-871 B1
Strainer	Elkay LK-35
Waste	Elkay LK-353
Supplies	Zurn Z-8802-LK
P-trap	Zurn Z-8702 PC
Mixing Valve	Watts MMV-UT-M1

SK-2 SINGLE COMPARTMENT STAINLESS STEEL SINK:

22" x 19-1/2" x 7-1/2" deep (bowl is 18x14x7-1/2), type 304, 18 gauge, 8” centers, self rimming single compartment, (18-8) nickel bearing stainless steel, back ledge sink with satin finish and sound deadening material on sides and bottom of sink. Provide polished chrome plated widespread top mount swing 8” gooseneck faucet with 1 GPM outlet, 4” wrist blade handles, pressure compensating aerator, strainer basket with stem and rubber stopper, chrome plated brass drain fitting, Provide chrome plated 1/2” IPS x 3/8”OD, loose key operated, angle stop to wall with chrome plated 3/8" flexible copper risers, integral perforated cast brass strainer with 1-1/4" offset 17 gauge tailpiece, 1-1/4” chrome plated 17 gauge cast brass P-trap with cleanout and tube waste to wall. Chrome plated loose key angle stop to wall, with 3/8" chrome plated flexible hot and cold water supplies. Sink drillings shall accommodate fitting installation, only, no other capped openings will be allowed. Under sink mixing valve with threaded connection or soldered connection, bronze body, limits hot water between 80ºF & 120ºF, double throttling, integral inlet filter washers & check valves, tamper resistant locking cap. Meets ASSE 1070 standards. Under sink mixing valve with threaded connection, bronze body, limits hot water between 80º F & 120º F, double throttling, integral inlet filter washers & check valves, tamper resistant locking cap. Meets ASSE 1070 standards.

Sink	Elkay LR2219
Faucet	Zurn Z831C4-XL-7F
Strainer	Elkay LK35
Supplies	Zurn Z-8802-LRLK
P-trap	Zurn Z-8702 PC
Mixing Valve	Watts MMV-UT-M1 or Watts MMV-US-M1

SK-3 SINGLE COMPARTMENT STAINLESS STEEL SINK(ART ROOM):

22" x 19-1/2" x 7-5/8" deep (bowl is 18x14x7-1/2), type 304, 18 gauge, 8” centers, self rimming single compartment, (18-8) nickel bearing stainless steel, back ledge sink with satin finish and sound deadening material on sides and bottom of sink. Provide polished chrome plated widespread top mount swing gooseneck faucet with 1 GPM outlet, straight lever handles, pressure compensating aerator, strainer basket with stem and rubber stopper, chrome

plated brass drain fitting, Provide chrome plated 1/2" IPS x 3/8"OD, loose key operated, angle stop to wall with chrome plated 3/8" flexible copper risers, integral perforated cast brass strainer with 1-1/4" offset 17 gauge tailpiece, 1-1/4". Solids interceptor painted cast iron with stainless steel removable basket and gasketed cover. Chrome plated loose key angle stop to wall, with 3/8" chrome plated flexible hot and cold water supplies. Sink drillings shall accommodate fitting installation, only, no other capped openings will be allowed. Under sink mixing valve with threaded connection, bronze body, limits hot water between 80º F & 120º F, double throttling, integral inlet filter washers & check valves, tamper resistant locking cap. Meets ASSE 1070 standards.

Sink	Elkay LR2219
Faucet	Zurn Z871B1-XL
Strainer	Elkay LK35
Supplies	Zurn Z-8802-LRLK
Interceptor trap	Zurn Z-1184
Mixing Valve	Watts MMV-UT-M1 or Watts MMV-US-M1

2.11 Service Sinks:

2.11.1 General: Provide floor mounted utility sink. Provide deck mounted faucet with vacuum breaker stops and swing spout.

2.11.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. ProFlo, American Standard, Zurn, Kohler Co.

2.11.3 Service Sink Schedule:

SK-4 DOUBLE COMPARTMENT PLASTIC COMPOSITE SINK:

40" x 24" x 13 3/8" deep, floor mounted utility sink, Plastic composite, color "white", 4" and 8" sink knockouts. furnish with 4 white baked enamel steel angle legs with leveling devices. Provide two handle deck-mount 8" centers supply fitting with threaded swing-spout and vacuum breaker, chromed lever handles, strainer, 1-1/2" tailpiece, chrome plated 17 gauge cast brass tube waste to wall, 3/8" chrome plated flexible hot and cold water supplies. Sink drillings shall accommodate fitting installation only, no other capped openings will be allowed.

Sink	ProFlo PFLT4024
Faucet	Zurn Z871J1-XL
Drain kit	ProFlo PFLTDRAIN
Supplies	Zurn Z-8802-LRLK
Mixing Valve	Watts MMV-UT-M1

2.12 Water Heaters:

2.12.1 Accessories: VB, relief, pan, stand, etc.

2.12.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item. Ruud, Rheem, Mor-Flo, State, A.O. Smith.

2.12.3 Water Heater Schedule:

GWH-1 GAS FIRED WATER HEATER (2 WATER HEATERS):

Packaged atmospheric gas vertical packaged water heater with glass lined storage tank, minimal thermal efficiency @95. Storage capacity @ 100 gallons, rated for 199,000 btu/hr

input, recovery @ 336 gph, 70 degree F temp. rise, 150 P.S.I. working pressure, ASME constructed, minimum three year warranty. Furnish 115 volt, single phase electrical characteristics, for controlled electric ignition sequence. Provide galvanized steel safety drip pan and vertical concentric vent. Provide inlet and outlet shut-off valves, vacuum relief valve on inlet water supply. Provide precharged expansion tank, outer steel shell (flexible diaphragm type), on cold water inlet side of water heater for thermal expansion control, tank volume in gallons shall be of sufficient size to accommodate water heater size in gallons.

Water heater	A. O. Smith BTH 199
Vacuum relief	Watts 36A
Expansion tank	Amtrol "Therm-X-Trol"
Manifold kit	A.O. Smith 9003426205

EWH-1 ELECTRIC WATER HEATER:

ASHRAE Standard 90, glass lined tank Suitable for 150 psi working pressure, 300-psi test. Finish of durable high gloss baked enamel. Blanket glass fiber insulation over entire tank. ASME pressure and temperature relief valve. Water heater shall be acceptable for commercial application by manufacturer. Provide 3 full year warranty, snap action automatic surface mounted thermostats, immersion type heating elements and magnesium anode rod. Provide unit mounted disconnect switch. Provide precharged expansion tank, outer steel shell (flexible diaphragm type), on cold water inlet side of water heater for thermal expansion control, tank volume in gallons shall be of sufficient size to accommodate water heater size in gallons. Provide galvanized steel drip pan. 30 gal 6kw total 208v/3 phase. Two 3kw elements wired for simultaneous operation.

Water Heater	A. O. Smith DEL-30
Vacuum Relief	Watts 36A
Expansion Tank	Amtrol "Therm-X-Trol"

EWH-2 ELECTRIC WATER HEATER:

ASHRAE Standard 90, glass lined tank Suitable for 150 psi working pressure, 300-psi test. Finish of durable high gloss baked enamel. Blanket glass fiber insulation over entire tank. ASME pressure and temperature relief valve. Water heater shall be acceptable for commercial application by manufacturer. Provide 3 full year warranty, snap action automatic surface mounted thermostats, immersion type heating elements and magnesium anode rod. Provide unit mounted disconnect switch. Provide precharged expansion tank, outer steel shell (flexible diaphragm type), on cold water inlet side of water heater for thermal expansion control, tank volume in gallons shall be of sufficient size to accommodate water heater size in gallons. Provide galvanized steel drip pan. 30 gal 4.5kw 208v/1 phase. Wired for non-simultaneous operation.

Water Heater	A. O. Smith DEL-30
Vacuum Relief	Watts 36A
Expansion Tank	Amtrol "Therm-X-Trol"

2.13 Thermostatic Mixing Valves:

2.13.1 General:

2.13.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item.

2.13.3 Thermostatic Mixing Valve Schedule:

MV-1 WATER MIXING VALVE (THERMOSTATIC MIXING):

Under sink mixing valve with threaded or soldered connection, bronze body, limits hot water between 80ºF & 120ºF, double throttling, integral inlet filter washers & check valves, tamper resistant locking cap. Meets ASSE 1070 standards. Set at 95 º F for lavatory & sinks and 120 º F for showers.

Exposed Mixing Valve — Watts MMV-UT-M1 or Watts MMV-US-M1

MV-2 WATER MIXING VALVE (THERMOSTATIC MIXING):

Exposed rough bronze finish Thermostatic water mixing valve with liquid-filled motor, factory assembled. Minimum flow capacity to be 1 GPM. Maximum flow capacity to be 17 GPM @ 5 PSI system pressure drop, complete with inlet check stops and manifold piping, outlet control/shutoff color code dial thermometer limit stop set for 95º F (maximum).

Exposed Mixing Valve — Lawler 801

2.14 Miscellaneous Fixtures

2.14.1 General:

2.14.2 Acceptable Manufacturers: Subject to compliance with requirements, provide products of one of the following for each item.

2.14.3 Fixture Schedule:

UB-1 ICE MAKER HOOK-UP (REFRIGERATOR SPACE):

Recessed metal wall box constructed and suitable for fire rated partitions, complete with factory installed quarter turn valve, water hammer arrestors, and 1/4" O.D. copper outlet tested @ 100 P.S.I. Provide approximately 5'-0" of 1/4" O.D. soft copper tubing with compression fitting in tight coil. Anchor box to wall structure. Verify location and mounting height with Architectural drawings or mount to manufacturers recommendations.

Wall box — Guy Gray FRMIB12SHA

UB-2 RECESSED UTILITY BOX (CLOTHES WASHER SPACE)(FIRE RATED):

Factory fabricated Fire Rated 16 gauge steel with epoxy finish washing machine wall box with hot and cold water supply, quarter turn valves, water hammer arrestors, and 2" drain. Verify mounting height with Architectural Elevations. Make final connections this contract.

Wall box — Guy Gray FRM12SHA

CW-1 CAN WASH:

Stainless steel square top drain, removable sediment bucket, bronze adjustable spray nozzle assembly complete with flanges and weep holes. Provide water supply control box with stops and atmospheric type vacuum breaker, manifold drawn copper and no joints under concrete

slab. Submit shop drawing schematic diagram of complete assembly for approval, coordinate with kitchen equipment contractor.

Can wash	Zurn Z-1982-3NH

CP-1 CIRCULATOR PUMP (INLINE TYPE):

Infinitely variable circulator made of composite casing, housing, impeller, ceramic shaft, and carbon bearings. A 44 watt ECM permanent magnet motor and electrical characteristics are 120v/1 phase, 60 hz., with 1" connections, maximum operating pressure of 150 PSI, UL standard 778 and NSF certified. Digital timer with circulator programming. Temperature aquastat, maintains water temperature between 95ºF and 115ºF. Circuit Setter calibrated balance valve, lead-free brass, with 1/4" NPT tapped drain port, memory stop feature, set at 1 gpm. Provide Circuit Solver a self-acting thermostatic recirculation valve set at 110ºF.

Circulator	TACO 006e3
Timer	TACO 265-3
Aquastat	TACO 563-2
Circuit setter	Xylem CB-1/2S LF
Recirculation Valve (TVC)	Circuit Solver CS-1/2-110

3 EXECUTION

3.1 Examine roughing-in work of potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Also examine floors and substrates, and conditions under which fixture work is to be accomplished. Correct any incorrect locations of piping, and other unsatisfactory conditions for installation of plumbing fixtures. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 Install plumbing fixtures of types indicated where shown and at indicated heights. Install in accordance with fixture manufacturer's written instructions, roughing-in drawings, and with recognized industry practices. Install in accordance with ADA and applicable handicap code requirements. Ensure that plumbing fixtures comply with requirements and serve intended purposes. Comply with applicable requirements of Florida Building Code-Plumbing pertaining to installation of plumbing fixtures. Furnish templates for cut-outs in countertops. Coordinate exact fixture locations with countertop shop drawings.

3.3 Fasten plumbing fixtures securely to indicated supports or building structure; and ensure that fixtures are level and plumb. Secure plumbing supplies behind or within wall construction so as to be rigid, and not subject to pull or push movement. Mount at heights shown on the drawings. Fixture heights are floor-to-rim distance. Fitting heights are to centerline.

3.4 Install stop valve in water supply to each fixture.

3.5 After fixtures are set, the crack between the fixture and wall shall be caulked with DAP silicone-based caulking, or approved product specified by the architect.

3.6 Protect installed fixtures from damage during remainder of construction period.

3.7 Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct

malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.

3.8 Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect/Engineer. Remove cracked or dented units and replace with new units.

3.9 Clean plumbing fixtures, trim, aerators, and strainers of dirt and debris upon completion of installation.

3.10 Adjust water pressure at drinking fountains, faucets, shower valves, and flush valves to provide proper flow stream and specified gpm.

3.11 Adjust or replace washers to prevent leaks at faucets and stops.

END OF SECTION 223000