CITY OF LAKELAND, FLORIDA
JOKER MARCHANT STADIUM & DETROIT TIGERS
SPRING TRAINING FACILITIES REDEVELOPMENT
LAKELAND, FLORIDA

SECTION 220500

COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Common work results for requirements specifically applicable to Division 22.

B. Requirements of Division 01 Specifications, General Provisions of the Contract and General and Supplementary Conditions apply to this Division.

1.02 REFERENCES

A. AGA: American Gas Association

B. ANSI: American National Standards Institute

C. ASME: American Society for Mechanical Engineers

D. ASTM: American Society for Testing and Materials

E. AWWA: American Water Works Association

F. MSS: Manufacturer's Standardization Society of the Valve and Fitting Industry

G. NEMA: National Electrical Manufacturers' Association

H. NFPA: National Fire Protection Association

I. UL: Underwriters' Laboratories, Inc.

1.03 SUBMITTALS

A. Submit shop drawings and product data under provisions of Division 01 including required number of copies.

B. Include Products as specified in the individual sections of Division 22.

C. Group submittals to include complete information of related systems, products, and accessories in a single submittal.

D. Prepare shop drawings completely independent of the Engineer of Record's CADD files. Should the Contractor or Vendor wish to use the Engineer of Record's CADD files as the basis for developing their shop drawings, a release form, obtainable from the Engineer or Architect, must be signed and a nominal charge of $30.00 per sheet must be made payable to the engineering firm to cover the cost of preparing the drawings for use by others.

E. Assist in the preparation of coordinated room layouts as specified in Division 01 and Section 23 05 00. Include coordination of concrete pads and foundations including anchor bolt and sleeve locations.

F. Submit copies of shop drawings in accordance with Division 01, for plumbing equipment and piping systems.

G. Brochures: Submit manufacturer's product data and brochures including:
1. Complete descriptions
2. Illustrations
3. Rating data, accessories, dimensional data, and applicable options and features marked for the specific items scheduled on drawings and specified herein.
4. Capacities stated in the terms specified
5. Performance and rating data for plumbing equipment and performance curves for pumps.

1.04 QUALITY ASSURANCE

A. Lead Free: All wetted surface of pipe, fittings and fixtures in potable water systems shall have a weighted average lead content equal to or less than 0.25% per the Safe Drinking Water Act (Section 1417) as amended January 4, 2011.
1. NSF Compliance: NSF/ANSI 61 and/or NSF/ANSI 372 for valve materials for potable-water service. Valves for domestic water must be 3rd Party Certified.

1.05 REGULATORY REQUIREMENTS

A. Perform Work specified in Division 22 in accordance with standards listed below of the latest applicable edition adopted by the authority having jurisdiction. Where these Specifications are more stringent, they shall take precedence. In case of conflict, obtain a decision from the Architect.
1. U.L Fire Resistance Index
2. ASTM E814-08B: Standard Test Method for Fire Tests of Penetration Firestop Systems
3. Florida Building Code - 2010 Edition
4. NFPA 30: Flammable and Combustible Liquids Code (2008)
5. NFPA 50: Standard for Bulk Oxygen Systems at Consumer Sites (2001)
6. NFPA 54: National Fuel and Gas Code (2009)
7. NFPA 70: National Electrical Code (2008)
8. NFPA 72: National Fire Alarm Code (2007)
9. NFPA 99: Standard for Health Care Facilities (2005)
10. NFPA 101: Life Safety Code (2009)
11. NFPA 101A: Guide on Alternative Approaches to Life Safety (2007)
12. NFPA 101B: Standard on Means of Egress for Buildings and Structures (1999)
13. NFPA 105: Recommended Practice for the Installation of Smoke Control Door Assemblies (2007)
14. NFPA 110: Standard for Emergency and Standby Power Systems (2005)
15. NFPA 241: Standard for Safeguarding Building Construction, Alteration and Demolition Operations (2004)
16. FGI Guidelines for Design and Construction of Health Care Facilities - 2010 Edition
17. Special regulations, supplement, and amendments of the State and/or local authorities having jurisdiction.

B. Comply with the applicable edition date of each regulation as adopted by the authorities having jurisdiction.

1.06 PROJECT/SITE CONDITIONS

A. Layouts indicated on drawings are diagrammatical and intended to show relative positions and arrangement of piping and equipment. Coordinate work with other trades and with measurements

obtained at the job site, as applicable, prior to installation. Generally, install work in locations shown on Drawings. Provide necessary rises, drops, and offsets to fit in the available space unless prevented by Project conditions.

B. If prevented by project conditions, prepare drawings showing proposed rearrangement of Work, including changes to Work specified in other sections. Obtain permission of Architect before proceeding.

C. Place anchors, sleeves, and supports prior to pouring concrete or installation of masonry work.

D. Cause as little interference or interruption of existing utilities and services as possible. Schedule work which will cause interference or interruption in advance with Owner and all affected trades.

E. Determine sizes and verify locations of existing utilities on or near site.

F. Keep roads and other spaces clear of materials and debris.

G. Visit site and be informed of conditions under which Work must be performed.

H. Locate equipment requiring periodic servicing so that it is readily accessible. Provide means of service access, following appropriate manufacturer's recommended service clearance space or, as applicable, means of access using duct, wall, or ceiling access doors.

I. Install piping to leave sufficient space for AHJ inspection of wall construction. Coordinate pipe routing with other trades including but not limited to Divisions 21, 23, 26 and 28.

1.07 FEES AND PERMITS

A. Obtain and pay for all necessary permits and inspection fees required to perform Division 22 work.

1.08 COORDINATION DRAWINGS

A. Prior to commencement of installation, assist in preparation of coordination drawings for work under this Division, as specified in Division 01. Fully cooperate with persons coordinating and performing work under other Divisions.

B. Drawings shall not be formally submitted but shall be kept on site for reference. Notify Architect of conflicts that cannot be resolved.

1.09 COMPLETENESS OF WORK

A. The Contract Documents depict plumbing systems which are intended to be complete and functioning systems. All products, materials, and labor necessary to render a fully functional system to fulfill the design intent shown on the documents shall be provided by the Contractor.

B. Catalog numbers referenced throughout the Division 22 Drawings and Specifications are intended to convey a general understanding of the type and quality of the product required. Where written descriptions differ from information conveyed by a catalog number, the written description shall govern. No extra shall be allowed because a catalog number is found to be incomplete or obsolete.

1.10 REFERENCE STANDARDS AND DEFINITIONS

A. Comply with provisions of Division 01.

1.11 PRODUCT SUBSTITUTIONS

A. Comply with provisions of Division 01.

1.12 RECORD DRAWINGS

A. Provide record drawings that illustrate the work of Division 22 as finally constructed. Deliver record drawings to the Architect in a form suitable for production.

B. Record drawings shall reflect all changes made to the Contract Documents, whether generated by addenda, change orders, or field conditions. Maintain a daily record of these changes and keep current set of drawings showing these changes.

C. Deliver record drawings to Architect within 30 days of Substantial Completion.

1.13 OWNING AND OPERATING MANUALS

A. Comply with the requirements of Division 01, but provide a minimum of three sets.

B. Manuals shall include clear and comprehensive instructions with appropriate graphics and project specific marked data to enable owner to operate and maintain all systems specified in this Division.

C. Copies of reviewed submittals on furnished shall be included.

PART 2 - PRODUCTS

2.01 EQUIPMENT SUPPORTS

A. Structural steel for supports: ASTM A36.
   1. Use galvanized members installed in areas of high humidity or condensation, and outside.
   2. Furnish other members with shop coat of red primer.
   3. Retouch primer after field welding.

2.02 FLASHINGS AND COUNTERFLASHINGS

A. Furnish materials and coordinate installation for flashing and counterflashing roof penetrations for vents, pipe, drains, and ducts.

B. Materials:
   1. Sheetmetal: 24-gauge minimum ASTM A525, Class G90
   2. Sheet lead: 3 pounds per square foot
   3. Stainless steel: Minimum 20 gauge
   4. Sheet copper: 24 OZ/SF
   5. Vent Stack Fitting: Josam 1830 or Jay R. Smith 1750

2.03 WALL AND CEILING ACCESS PANELS

A. Style and type as required for material in which installed.

B. Size: 24"x24" minimum, as indicated, or as required to allow inspection, service and removal of items served.

C. 14-gauge minimum sheet metal for doors, 16-gauge frames of cadmium-plated or galvanized construction. Doors shall have expanded plaster rings where located in plaster walls or flanged finish where located in drywall or block construction.

D. Panels shall have spring hinges with screwdriver locks in non-public areas. Key lock, keyed alike, for panels in public areas.

E. Prime painted or rust inhibitive paint finish.

F. UL labeled when in fire-rated construction, 1-1/2 hour rating.

G. Provide in walls, floors, and ceilings to permit access to all equipment and piping requiring service or adjustment. Examples of such equipment needing access are valves, and equipment needing periodic or replacement maintenance.

H. Furnish and locate access panels under this Division. Coordinate with trades who are responsible for building system in which panels are to be installed.

I. Acceptable manufactures: Milcor, Nystrom, Karp, J.L. Industries, or Williams Brothers.
   1. For masonry and drywall construction: Milcor Style M
   2. For plastered masonry walls and ceiling: Milcor Style K
   3. For ceramic tile or glazed structural tile: Use stainless steel panels

2.04 PIPE ENCLOSURES

A. For exposed vertical piping in kitchen: 18 gauge stainless steel (type 302) with No. 4 finish.
   1. Extend from 2" above ceiling to equipment or island partition
   2. Size covers to contain number of pipes served

B. Minimize number of covers by enclosing maximum number of pipes in each drop.

C. Anchor to equipment or partition.

D. Fasten seams and joints with stainless steel pop rivets.

E. Provide 1-1/2" ceiling flange as closure.

2.05 SLEEVES

A. Materials
   1. Concrete floors, concrete and masonry walls: 18 gauge galvanized sheetmetal.
   2. Drywall partitions: 18 gauge galvanized steel sheet metal.

B. Sleeves shall be sized such that the annular space between outside surface of pipe or pipe insulation and the inside surface of the sleeve is not less than 1/2". Provide larger annular space if required by firestopping product installation instructions.

C. Sleeves supporting riser piping 4" and larger shall have three 6" long reinforcing rods welded radically at 120 degree spacing to the sleeve and shall be installed with the rods embedded in the concrete slab.

PART 3 - EXECUTION

3.01 EXCAVATING AND BACKFILLING

A. Contractor shall review Division 33 and shall perform excavation and backfilling in accordance with the most stringent requirements. Contractor shall request clarification before proceeding if there are conflicting instructions.

B. Contract Documents show the approximate location of underground utilities known to exist in the area of construction. Contractor shall determine the exact location of utilities.
   1. Locate and uncover existing utilities which require new connections before trenching in the vicinity of indicated utility connection.
   2. Clear all vegetation and other objectionable material from the area required for the excavation and backfill operations. Disposal of material removed by the clearing operation shall be approved by the Owner's Representative.

C. Provide trenching, excavating, and backfilling necessary for performance of work indicated in Contract Documents.

D. Excavate to depths indicated on the drawings or as necessary to permit the installation of pipe, bedding, backfill, structures or appurtenances. Provide a firm, undisturbed, uniform surface in the bottom of trenches. Where excavation exceeds the required depth, bring the excavation to proper grade through the use of an approved incompressible backfill material. Store excavated material and dispose of surplus excavated material.
   1. Excavate trench to sufficient depth to permit a minimum of 36" of cover over the top of the pipe unless otherwise required by pipe elevations indicated on the Drawings. The trench width shall be 18" plus the diameter of the pipe and/or the largest bell.

E. Trenching and excavation shall be unclassified. No extra will be paid in the event that rock is encountered.
   1. Should rock excavation be required, use only experienced personnel for blasting.
   2. Exercise extreme care when blasting with signals of danger given before firing any charge.
   3. Conform to and obey all public authority regulations for the protection of life and property.

F. Provide sheathing, shoring, dewatering, and cleaning necessary to keep trenches and their grades in proper condition and to meet applicable codes.

G. Provide a minimum of 6" of No. 67 crushed stone or clean sand bedding, or equal, in the bottom of the trench to maintain the required grade and continuous support of the bottom quadrant of the pipe. On bell and spigot piping, dig bell holes so bottom of bells do not support pipe.

H. Upon completion of excavation, and prior to the laying of the pipe, the trench bottom shall be brought up to the required elevation with min. 6" pipe bedding. Pipe bedding shall be select material deposited in the trench, and shall be compacted, leveled off, and shaped to obtain a

smooth compacted bed along the laying length of the pipe. Material for pipe bedding shall comply with local codes. In absence of local code requirements the bedding shall be bank sand or select back fill material approved by the Architect. Any material used shall pass a 1/4 inch screen.

I. Clean and inspect pipe for defects before lowering into trench for assembly. Install pipe in accordance with provisions of Contract Documents and with the recommendations of the pipe manufacturer.
   1. Ensure pipe is of proper strength and classification for specified service. Discard damaged or defective pipe discovered during pipe laying operations.
   2. Maintain alignment and grade during layout operation. Use acceptable method for maintaining grade and alignment to produce desired results.

J. Where crushed stone backfill is required, use No. 67 stone, clean sand or equal.
   1. After bedding has been shaped and the pipe assembled, place crushed stone carefully around the pipe and to a point 12" above the pipe. Backfill above this point shall be as described below:
      a. Backfill areas of vehicular traffic shall consist entirely of crushed stone and compacted crusher run material.
      b. Backfill for shoulders of roadways, sidewalk, and slab on grade structures shall consist entirely of crushed stone.
      c. Backfill areas not subject to vehicular traffic may consist of suitable excavated material as described above.
   2. Where crushed stone is not required, suitable excavated material may be utilized. This includes fine, dry earth or a mixture of earth and shot rock. Rocks larger than 6" in any dimension may not be included in any portion of the backfill material.
   3. Trenches shall be backfilled only after piping has been inspected, tested, and approved by the Architect. All backfill material shall be placed in the trench either by hand or by approved mechanical methods. The compaction of backfill material shall be accompanied by tamping, with hand tools or approved pneumatic tampers, by using vibratory compactors, by puddling, or by any combination of the three. The method of compaction shall be approved and all compaction shall be done to the satisfaction of the Architect. Backfill completely around pipe, including 18" above the pipe, with suitable bank sand, tamped in 4" layers under, around, and over pipe. Water down backfill as required. The remainder of the backfill shall be select backfill material tamped at intervals of no more than 12" depths. All materials to be used as selected material backfill shall be approved by the Architect. If, in the opinion of the Architect, the excavated material does not meet the requirements of selected material, the Contractor shall be required to screen the material prior to its use as selected material backfill. Material used in the upper portion of the backfill or subgrade shall not contain stone, rock, or other material larger than six inches in its longest dimension. No wood, vegetable matter, or other material which, in the opinion of the Architect, is unsuitable shall be included in the backfill. The upper 24" of backfill may be water jetted, if desired. Backfill shall be brought up to finish grade identified on the Architectural Drawings, including additional backfill required to offset settlement during consolidation.

3.02 CUTTING AND PATCHING

A. Repair or replace damage caused by cutting or installation of work specified in Division 22.

B. Perform repairs with materials which match existing and install in accordance with the appropriate section of these specifications.

3.03 FLASHING AND COUNTERFLASHING

A. Counterflash pipes where penetration of roofs and outside walls occur.

3.04 CONNECTION TO EQUIPMENT FURNISHED BY OWNER

A. Connect or install equipment shown on plumbing drawings that requires plumbing connections.

B. Provide piping, shutoff valves, unions, and other piping appurtenances required for a complete installation. Provide steam strainers, steam traps, and pressure reducing valves in steam lines. Provide backflow preventers and/or pressure reducing valves where required by the equipment design or local code. All components shall be line size unless noted otherwise.

3.05 DELIVERY, STORAGE, AND PROTECTION

A. Insofar as possible, deliver items in manufacturer's original unopened packaging. Where delivery in original packaging is not practical, provide cover and shielding for all items with protective materials to keep them from being damaged. Use care in loading, transporting, unloading, and storing to keep items from being damaged.

B. Store items in a clean, dry place, and protect from damage. Plumbing equipment may not be staged or stored outdoors unless intended for outdoor use.

C. Protect nameplates on motors, pumps, and similar equipment. Do not paint or insulate over nameplate data.

D. Protect plumbing fixtures and brass or chromium plated trim, valves and piping from damage. Cover fixtures during work of finishing trades.

E. Keep dirt and debris out of pipes and ducts.

F. Repair, restore, and replace damaged items.

G. Cover factory finished equipment during work of finished trades.

3.06 SLEEVES

A. Floors: Sleeve all pipe penetrations. Extend sleeve 1-1/2" above finished floor, except piping within pipe chases. Sleeve shall be flush with underside of floor.

B. Masonry or concrete walls: Sleeve all pipe penetrations. Sleeves shall be flush on both sides of wall.

C. Drywall partitions: Sleeve all penetrations of piping in systems over 160 degree F.

D. Seal voids between outside surface of sleeve and wall, partition or floor. Seals shall be airtight.

E. Install piping, insulation and sleeves in strict accordance with applicable U.L. Fire Resistance Index assembly and with firestop manufacturer's installation instructions for floor or partition penetrations. Coordinate with Division 07.

F. Penetrations not sleeved or firestopped:
   1. Seal voids between pipe and partition. Seals shall be airtight.

3.07 CLEANING PLUMBING SYSTEMS

A. General Cleanup:
   1. Upon completion of contract and progressively as work proceeds, clean up dirt, debris, oil materials, etc., and remove from site, keeping premises in neat and clean condition to satisfaction of the Architect. See Division 01 of specifications for further requirements.
   2. See page, discoloration or other damage to parts of the building, its finish, or furnishings due to Contractor's failure to properly clean piping systems or duct systems shall be repaired without cost to the Owner.

B. Factory Finishes:
   1. Clean items with factory finishes. Touch up bare places, scratches and other minor damage to finishes. Use only factory supplied paint of matching color and formula. If finishes are badly damaged or if there are many damaged, scratched or bare places, refinish the entire item.

C. Domestic Water System:
   1. Flush system progressively by opening building operable valves, faucets and hose bibs and permitting flow to continue from each unit until water runs clear.
   2. Sterilize system in accordance with requirements of State Department of Public Health by the following method or other methods acceptable to authority having jurisdiction.
   3. Introduce chlorine or a solution of calcium or sodium hypochlorite. Fill lines slowly and apply sterilizing agent at a rate of 50 ppm of chlorine as determined by residual chlorine tests at ends of lines. Open and close all valves while system is being chlorinated.
   4. After sterilizing agent has been applied and left standing for 24 hours, test for residual chlorine at ends of lines. If test indicates there is less than 25 ppm, repeat sterilizing process.
   5. After system has been standing 24 hours and test indicates at least 25 ppm of residual chlorine, flush out system until all traces of chemical used are removed.
   6. Have local health department check and approve system before connecting it to existing water system.

3.08 SYSTEMS TESTING

A. Test all systems and equipment installed to demonstrate proper operation.

B. Advise Architect of scheduled systems testing and completed system demonstration/operation schedules so that he may witness, if desired.

C. Correct and retest work found defective when tested.

D. Make repairs to piping systems with new materials. Peening, doping, or caulking of joints or holes will not be acceptable.

E. Domestic Water Piping: Test hot and cold water piping systems upon completion of rough-in, before fixtures are connected, at a hydrostatic pressure of 125 psig or 150% of working pressure which ever is greater for a period of two hours.

F. Drainage and vent system
   1. Test plug opening to permit system to be filled with water, and subject system to 10 foot head of water pressure. System shall hold water for 30 minutes with a drop in water level not to exceed 4 inches in a 4 inch diameter standpipe, and without visible leakage.
   2. If system is tested in sections, a minimum head of 10 feet shall apply.

END OF SECTION

SECTION 220513

MOTORS REQUIREMENTS FOR PLUMBING EQUIPMENT

PART 1 - GENERAL

1.01 RELATED WORK

A. Division 26: Electrical

1.02 REFERENCE STANDARDS

A. Design, manufacturer and test motors, controllers and components in accordance with the latest edition of the following standards:
   1. NEMA - National Manufacturers Association Standards
   2. ANSI/NEMA MG 1 - Motors and Generators
   3. NFPA 70 - National Electrical Code
   4. IEEE Standard 112, Test Method "B"
   5. IEEE Standard 519-1992
   6. NEMA - ICS-3-303
   7. IEEE Standard 444 (ANSI C34.3)
   8. Energy Policy Act of 1992 (EP Act)

B. Provide equipment and material with UL or ETL listing, in accordance with requirements of AHJs and suitable for its intended use.

1.03 SUBMITTALS

A. Submit motor information with submittals and shop drawings for Division 22 equipment.

PART 2 - PRODUCTS

2.01 MOTORS

A. Acceptable manufacturers: MagneTek, Lincoln, Marathon, Gould, Toshiba, Baldor, G. E.

B. Motor characteristics:
   1. Single phase: Capacitor start, open drip-proof type, ball bearing, internal thermal overload, 1.15 service factor, rated 40 degrees C continuous rise.
   2. Polyphase: NEMA Design B, normal starting torque, single or two speed, squirrel cage type, open drip-proof, 1.15 service factor, insulation for rating of 65 degrees C continuous rise above 40 degrees C ambient, with ball bearings rated for minimum L-10 life of 100,000 hours and fitted with grease fittings and relief parts. Provide motors with aluminum end brackets with steel inserts in bearing cavities.

C. Motors on belt driven equipment shall have slide rails with adjusting screws for belt tension adjustment. Motors exposed to the weather shall be weather protected.

D. Motors specified with variable frequency drive controllers shall be invertor duty rated.

E. Provide premium efficiency electric motors for motors 1 horsepower and above.

F. Premium efficiency motors shall have efficiency and losses determined in accordance with the latest revisions of IEEE Standard 112. Polyphase squirrel-cage motors rated 1 through 125 horsepower shall be tested by dynamometer method B. Motor insulation shall met NEMA MG1, Part 31.40.4.2. The efficiency will be determined using segregated losses in which stray load loss is obtained from a linear regression analysis to reduce the effect of random errors in the test measurements. Guaranteed minimum full load efficiency at 1800 RPM & 230/460 volts shall be as follows:
   1. HP:1 Eff:85.5%
   2. HP:1-1/2 Eff:86.5%
   3. HP:2 Eff:86.5%
   4. HP:3 Eff:90.2%
   5. HP:5 Eff:89.5%
   6. HP:7-1/2 Eff:91.0%
   7. HP:10 Eff:91.7%
   8. HP:15 Eff:93.0%
   9. HP:20 Eff:93.6%
   10. HP:25 Eff:94.1%
   11. HP:30 Eff:94.1%
   12. HP:40 Eff:94.5%
   13. HP:50 Eff:94.5%
   14. HP:60 Eff:95.0%
   15. HP:75 Eff:95.0%
   16. HP:100 Eff:95.4%
   17. HP:125 Eff:95.4%
   18. HP:150 Eff:96.2%
   19. HP:200 Eff:96.2%
   20. HP:250 Eff:96.2%

G. Sound power levels not greater than recommended in NEMA M61-12.49. VFD duty rated motors shall not increase by more than 3 dB when operating on VFD.

H. Provide motors with drive shafts long enough to extend completely through belt sheaves when sheaves are properly aligned or balanced.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Arrange and set motors.

B. Line up motors on direct drive equipment using dial type gauges.

C. Make connections and test motor for proper rotation/phasing under Division 26.

3.02 ADJUSTMENTS

A. Motors, together with driven equipment, shall be dynamically and statically balanced. Imbalance shall be reduced to minimum specified by equipment manufacturers.

END OF SECTION

CITY OF LAKELAND, FLORIDA
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LAKELAND, FLORIDA

SECTION 220523

VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 22 11 16: Domestic Water Piping

1.02 QUALITY ASSURANCE

A. Lead Free: All wetted surface of pipe, fittings and fixtures in potable water systems shall have a weighted average lead content equal to or less than 0.25% per the Safe Drinking Water Act (Section 1417) as amended January 4, 2011.
   1. NSF Compliance: NSF/ANSI 61 and/or NSF/ANSI 372 for valve materials for potable-water service. Valves for domestic water must be 3rd Party Certified.

B. Boiler valves: ASME Boiler Code Specifications.

C. Valve bodies, shells, and seats: Factory tested.

D. Bronze body valves:
   1. Materials for pressure containing parts: ASTM B-62 (less than 200 psi), B-61 (200 psi and above)
   2. Design, workmanship, testing: MSS-SP-80

E. Iron body valves:
   1. Materials for pressure containing parts: ASTM A126, Grade B
   2. Face-to-face and end-to-end dimensions: ANSI B16.10
   3. Design, workmanship, testing: MSS-SP-70, 71

F. Butterfly valves:
   1. Face-to-face and end-to-end dimensions: MSS-SP-67

G. Pressure Reducing Valves:
   1. Pressure reducing valves 2" and less to have bronze body construction meeting ASSE Standard B356, ANSI A112.26.2.
   2. Pressure reducing valves 2-1/2" and up to be cast iron construction, ASTM A126 Class B. Valve to be epoxy coated inside and outside. Unit to have low flow bronze bypass valve.

H. Valve stems: ASTM B584-78, Class 13C (cast silicon brass), ASTM B-371-79, Alloy A (rolled silicon brass), or other material equally resistant to dezincification.

I. Pressure castings: Free of impregnating materials.

J. Valve name or trademark and working pressure stamped or cast into body.

K. Standard for 200 PSI and 300 PSI valves with metallic seats: ASTM B61-76.

1.03 SUBMITTALS

A. Submit product data for review. Valves used or indicated to be used in domestic potable water systems msut be lead free in accordance with the Reduction of Lead in Drinking Water Act effective January 4, 2014.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Iron body valves: Nibco, Apollo, Stockham, Crane, Milwaukee, Dezurik, Mueller or Kennedy

B. Bronze body valves: Nibco, Apollo, Stockham, Milwaukee, Dezurik or Kennedy

C. Butterfly valves: Nibco, Apollo, Stockham, Crane, Mueller or Dezurik

D. Ball valves: Nibco, Apollo, Watts, Milwaukee, Jamesbury or Hammond

E. Pressure Reducing Valves: Watts, Apollo, Nibco.

2.02 MATERIALS

A. Nibco Figure numbers are indicated below unless noted otherwise:

B. Check Valves:
   1. Domestic Water:
      a. 2" and less, Figure T-413-Y-LF, or S-413-Y-LF, threaded or solder, Class 150
      b. 2-1/2" and up: Iron body, bronze disc, stainless steel spring, flanged, Class 125, Lead Free, globe style, F-910-LF.

C. Ball Valves
   1. Domestic Water
      a. 2" and less, Figure T585-80-LF or S-585-80-LF, 2-piece, full port, 600 psi, WOG, PTFE seats
      b. 2-1/2" and up, Watts G4000-FDA-Lead Free-200 psi, 2 piece, full port, cast iron, flanged, heat fused epoxy coating, stainless steel ball and stem, PTFE seat, Class 125 meeting MSS-SP-72-92 or equal

D. Butterfly Valves - 2-1/2" And Up:
   1. Domestic Water: Figure LD-2000, lug type, 200 psi, Class 125, EPDM liner, and aluminum bronze disc, meeting AWWA C504-88.
   2. Butterfly valves rated bubble tight for dead end service at full pressure in both directions without the need for downstream blind flange.
   3. Provide hand wheel and closed housing worm gear on valves 8 inches and larger. Provide clamp lock hand lever operators on valves less than 8 inches.

E. Pressure Reducing Valve:
   1. 2" and less, Watts Series U5 or 223 Lead Free with integral or attached strainer. 300 psi inlet pressure and bronze body construction.
   2. 2-1/2" and up, Watts ACV 115E Lead Free automatic control valves with a 263 reducing valve. 400 psi inlet pressure with stainless steel seats. Cast iron body with epoxy coating inside and outside.

F. Valve connections: Two inches and smaller - threaded; 2-1/2 inches and larger - flanged.

G. Provide chain operators for gate valves, butterfly valves, and plug cocks located in mechanical rooms as required by plumbing plans or where valves are mounted above 7'-0" A.F.F.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Furnish and install valves in each piping connection at each piece of plumbing equipment to allow equipment to be isolated from piping systems.

B. Furnish and install valves in all piping systems to isolate each floor or main section of the building. Install sufficient number of valves to minimize the portion of the system which must be shut down for service or maintenance purposes.

C. Furnish and install valves above each group of plumbing fixtures.

D. Install valves in water piping systems so ordinary maintenance work can be performed on the equipment that the valves isolate, without having to drain the system beyond the valve.

E. All valves above drywall access panels shall be located within one foot of access panels including valves located above ceilings.

F. Locate valves so as to be easily accessible by maintenance personnel.

G. Pressure reducing valves shall be installed on equipment as required per manufacturers recommendation and on main lines serving any facility when the static pressure exceeds 80 psi as required by the State or Local Plumbing Code.

H. Coordinate with Section 23 05 93 for test and balance requirements.

END OF SECTION

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SECTION 220529

HANGERS FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 22 11 16: Domestic Water Piping

B. Section 22 13 16: Sanitary Waste and Vent Piping

C. Section 22 07 00: Plumbing Insulation

1.02 SUBMITTALS

A. Submit product data for review.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Anvil, Carpenter and Patterson, Fee and Mason, B-Line, Viking, Reliable, and Michigan. Anvil numbers are used for reference.

2.02 HANGERS

A. Anvil Figure #260 MSS Type 1, clevis hangers for:
   1. Non-insulated steel and galvanized piping 2" through 24" diameter
   2. Non-insulated cast iron pipe

B. Anvil Figure #260 clevis hangers with Figure 167, MSS Type 40 galvanized insulation protection shields (sized for supporting insulation having a compressive strength of 4 psi). Support piping on outside of insulation. Size hangers so that pipe insulation passes through them without interruption.
   1. Domestic hot water piping above 160 degrees F. 4" diameter and less
   2. All other insulated piping

C. Anvil Figure CT-69, MSS Type 10 with adjustable wrought tubing ring hanger, copper plated for:
   1. Non-insulated copper tubing with no longitudinal movement

D. Anvil Figure #171, MSS Type 41 with pipe roller, Anvil Figure #16x protection saddle and Anvil Figure 167, MSS Type 40 galvanized insulation protection shields (sized for supporting insulation having a compressive strength of 4 psi, at 8 foot intervals). Support piping on outside of insulation. Size hangers so that pipe insulation passes through them without interruption. Use these for:
   1. Domestic hot water above 160 degrees F, .6" diameter and larger.

E. Anvil Figure #CT-121, MSS Type 8, riser clamps (at floor penetrations) to support:
   1. Copper pipe risers

F. Anvil Figure #261, MSS Type 8, riser clamps (at floor slab penetrations) to support:
   1. Steel pipe risers

G. Anvil Powerstrut Trapeze Hangers: Where three or more lines of pipe run parallel, support them with trapeze hangers.

H. Water piping supports within walls to be by Caddy, Holdrite, Sioux Chief or approved equivalent. Support vertical drops and piping at fixture supplies in wall. Hanger material to be suitable for piping material installed. Piping supports shall be installed per manufacturers recommendations.

2.03 INSERTS

A. Concrete Insert: Anvil Figure #281, MSS Type 18, universal concrete inserts, adequately sized and correctly positioned to support full load operating systems.

B. Concrete Insert, Wedge Type: Anvil Figure #281, 1/4" to 7/8"

C. Lightweight Concrete Insert: Anvil Figure #285

D. Continuous Concrete Insert: Anvil Powerstrut Figure #PS-349 pre-galvanized

2.04 EXPANSION ANCHORS

A. Hilti Kwik-bolt, zinc-plated, metal expansion anchor.

B. Anchor to meet U.L., ICBO-4627 and FM listings.

2.05 CLAMPS

A. C-Clamps: Anvil Figure #92, MSS Type 23.
1. Use these for attaching hangers to steel beams. Do not weld hanger rods to structural steel members.

B. Malleable Beam Clamps: Anvil Figure #218, MSS Type 30: Use these for attaching hangers to bar joists.

PART 3 - EXECUTION

3.01 PIPE HANGERS

A. Support pipes on specified hangers so that equipment, pumps, and fittings do not bear weight or stresses from vibration and swaying of pipe. Support pipe risers at regular intervals in pipe shafts at least once at each floor level or a maximum of 12'-0" apart. Do not use perforated metal, strap iron, or band iron. Do not make offsets in hangers.

B. Maximum allowable spacing of pipe hangers is listed below. Space hangers and brackets at closer intervals where necessary to maintain levels, slopes, and drainage, or to prevent sagging or swaying of pipe.

C. STEEL PIPE - Water
1. 1/4" to 1-1/2" - 7' 0" O.C.
2. 2" to 2-1/2" - 10' 0" O.C.
3. 3" to 4" - 12' 0" O.C.
4. 4" and above - 12'-0" O.C.

D. STEEL - Vapor
   1. 1/4" to 1-1/2" - 8' 0" O.C.
   2. 2" to 2-1/2" - 13' 0" O.C.
   3. 3" and above - 14'-0" O.C.

E. COPPER PIPE - Water
   1. 1/4" to 1-1/4" - 5'0" O.C.
   2. 2" to 2-1/2" - 8'0" O.C.
   3. 3" and above - 10'0" O.C.

F. COPPER PIPE - Vapor
   1. 1/4" to 1" - 5'0" O.C.
   2. 1-1/4" to 2" - 8'0" O.C.
   3. 2-1/2" to 4" - 10' 0" O.C.
   4. 5" and above - 12'-0" O.C.

G. CAST IRON PIPE
   1. Space hangers not to exceed 5 feet on centers. Provide minimum of one hanger per section close to joint on barrel and at change of direction and branch connection.

H. POLYPROPYLENE PIPE
   1. 3/4" to 3" - 2' O.C.
   2. 4" and above 4' O.C.

END OF SECTION

SECTION 220553

IDENTIFICATION OF PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Identification of plumbing piping and equipment as specified herein.

1.02 RELATED WORK

A. Division 01: Cutting and Patching.

B. Division 01: Seismic Requirements.

C. Division 01: Shop Drawings, Product Data, and Samples.

D. Division 01: Storage and Protection.

PART 2 - PRODUCTS

2.01 NAMEPLATES AND TAGS

A. Acceptable manufacturers: Seton Nameplate Corporation, Marking Services Inc. or equal.

B. Rigid plastic, "Setonite" or Bakelite with engraved lettering, minimum 1/2" high.

C. Brass tags, at least 1-1/2" inches in diameter, with alpha-numeric I.D., permanently stamped black filled letters showing the service, and black filled numbers showing the valve or equipment number. At substantial completion, a schedule of all valves shall be submitted to the Architect and Owner's Representative.

2.02 PIPE MARKERS

A. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering.

B. Plastic Tape Markers: flexible vinyl film tape with pressure sensitive adhesive and printed marking.

2.03 PIPE IDENTIFICATION AND PAINTING

A. Identify all piping as specified herein painted under Division 09.

B. Pipe Identification:
   1. Identify piping by stenciling or tagging (to denote contents and direction of flow) on piping at no more than 25 foot intervals at valves, and at least once in each separate space through which the pipe passes. Colors shall conform to ASME 13.1.
   2. Stenciling shall be a minimum of 2" high letters.

C. Buried piping does not require identification marking, unless noted otherwise in specifications.

D. All piping in central plant and mechanical rooms shall be labeled to identify contents and direction of flow.

2.04 EQUIPMENT AND APPARATUS IDENTIFICATION

A. Acceptable Manufacturers: Seton Name Plate Corporation or equal.

B. Nameplates: Rigid plastic, "Setonite" or bakelite, with engraved lettering (indicating names and numbers of mechanical apparatus), a minimum of 1/2" high. Fill engraved lettering with a permanent coloring material which contrasts with color of tag material to allow for easy reading.

C. Use names, numbers and abbreviations appearing in schedules on Contract Drawings.

D. Where stenciling is used to identify large pieces of equipment, stenciling shall be in a conspicuous place visible from control panel area and of at least one (1) inch letters and/or numbers. Large pieces of equipment may be stenciled with an oil based enamel or semi-gloss latex.

E. Provide nameplates, located in a conspicuous location directly on the equipment or apparatus, for mechanical equipment including, but not limited to:
   1. Starters
   2. Pumps
   3. Control panels
   4. Plumbing equipment

F. Name Tag Fasteners: Commercial quality, rust resisting nuts and bolts with backwashers, self-tapping screws, or rivets. If equipment surface does not allow for direct attachment, use copper or brass rings to attach tags.

G. Valve Tags
   1. Each valve shall be identified with a brass tag. The tag shall contain an alpha-numeric I.D. which shall include floor level and building section as part of the I.D.
      a. Match existing identification scheme, if applicable.
   2. A valve schedule shall be provided to Architect and Owner's Representative. Mount valve schedule under glass and mount as directed by Owner's Representative.
   3. Securely fasten tags to valves with a brass "S" hook or chain.

END OF SECTION

CITY OF LAKELAND, FLORIDA
JOKER MARCHANT STADIUM & DETROIT TIGERS
SPRING TRAINING FACILITIES REDEVELOPMENT
LAKELAND, FLORIDA

SECTION 220700

PLUMBING INSULATION

PART 1 - GENERAL

1.01 DEFINITIONS

A. Exposed - Equipment and piping in areas which will be visible without removing ceilings or opening access panels.

B. Concealed - Installed above ceiling, in walls or chases.

C. Outdoors - Exposed to the weather or ambient conditions.

D. Underground - Buried.

1.02 CERTIFICATION/QUALITY ASSURANCE

A. Insulation, adhesives, coatings, sealers, tapes, shall have a flame spread rating of 25 or less and smoke development of 50 or less in accordance with ASTM E-84 and UL 723

B. Materials shall meet the requirements of NFPA 90-A.

1.03 SUBMITTALS

A. Submit manufacturer's product data and installation procedures for review.

PART 2 - PRODUCTS

2.01 PIPE AND EQUIPMENT INSULATION

A. Materials for Pipe and Equipment: Provide factory premolded insulation for pipe, pipe fittings, and valves.

B. Fitting insulation: Same thickness and material as adjoining pipe insulation.

C. Flexible Tubular Elastomeric:
   1. Provide fire-retardant closed-cell slip-on flexible type; minimum "R" value of 2.57
   2. Acceptable manufacturers: Armacell; Nomaco K-Flex
   3. Use on the following services:
      a. Moisture condensate drains - 1/2" thick

D. Fiberglass Pipe Insulation:
   1. Acceptable manufacturers: Johns-Manville "Micro-Lok 850"; CertainTeed; Knauf; Owens Corning. Foster Jacket: ASJ fiberglass reinforced kraft paper with aluminum foil; minimum R value of 3.7.
   2. Use on the following services:
      a. Domestic hot water supply piping - 1" thick
      b. Domestic hot water recirculation piping - 1" thick
      c. Domestic cold water piping - 1/2" thick
      d. Horizontal rain water leaders and roof drain bodies - 1" thick

e. Drain bodies, traps and horizontal drain lines receiving cold condensate - 1/2" thick

2.02 MATERIALS FOR FITTINGS, VALVES, AND SPECIAL COVERINGS

A. For all services, use premolded insulation for pipe fittings, elbows, tees, butterfly valves, and couplings 2-1/2 and larger. Finish shall be as specified under Products above or as specified below. PVC fitting covers with fiberglass inserts may be used on piping fittings elbows and valves 2" and less for the following services:
1. Domestic Cold Water
2. Domestic Hot Water
3. Domestic Hot Water Recirc.

B. For piping installed above grade exposed-to-the-weather outside the building, cover straight pipe insulation with 0.016" thick aluminum jacket equivalent to Childers and cover fittings with factory formed covers equivalent to Elljacs.

C. For flexible tubular elastomeric pipe and fitting insulation when exposed-to-view inside building or exposed to the weather, finish with two coats of fire retardant self-extinguishing vinyl lacquer type highly flexible coating equivalent to Armacell "Armaflex Finish", custom color blended to match surrounding surfaces.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

A. Deliver and store insulation materials in manufacturers containers and kept free from dirt, water, chemical and mechanical damage.

B. Complete piping pressure testing prior to applying insulation.

C. Apply insulation in workmanlike manner by experienced and qualified workmen.

D. Surfaces shall be clean and dry when covering is applied. Covering to be dry when installed and before and during application of any finish, unless such finish requires specifically a wetted surface for application.

E. Adhesives, cements and mastics shall be compatible with materials applied and shall not attack materials in either wet or dry state.

F. Stop duct coverings, including jacket and insulation, at fire penetrations of fire or smoke rated partitions, floors above grade and roofs. "Fan-out" or extend jacketed insulation at least 2" beyond angle frames of fire dampers and secure to wall. Maintain vapor barrier.

3.02 FLEXIBLE SHEET ELASTOMERIC INSULATION

A. Prior to application of flexible sheet elastomeric insulation, thoroughly clean all metal surfaces, making sure that all dirt, scale, loose paint, plaster, and oil has been removed and that surfaces are dry. If surface has been primed, test a two square foot section using adhesive equivalent to Armstrong No. 520 in order to determine whether solvent in adhesive will loosen or lift the primer. If primer is loosened, then remove it. When testing proves acceptable, adhere insulation with smooth side out, using thin but adequate coating of same adhesive. Follow manufacturer's

instructions. Coat all butt edges of each sheet. Stagger all joints. Insulate all standing seams or flanges with same thickness of insulation material as that used on main surface.

3.03 INSTALLATION OF PIPE AND EQUIPMENT COVERING

A. Where glass fiber or flexible tubular elastomeric insulation is used on piping sized 2" and larger, insert a section of foamglass or calcium silicate insulation, at hanger or support points, between pipe and metal shield for full length of shield, to prevent crushing of insulation. Where insulation passes through pipe hangers and across trapeze supports, 12" long metal saddles shall be used. Insulation thickness to be same as adjoining glass fiber insulation. On cold pipe, vapor barrier should be carried through the hanger and sealed. Saddles shall be used where rigid foamglass inserts are not acceptable.

B. Apply foamglass insulation as follows:
   1. Both the circumferential and longitudinal joints shall be buttered with fire-resistive pliable sealer. Voids and cracks shall be filled with sealer. Apply appropriate mastic as specified under Part 2 - Products. Secure insulation with 3/4" wide x 0.010" thick aluminum bands on 8" centers.
   2. The circumferential joints shall be staggered.
   3. Fittings, valves, flanges, traps, and air vents shall be insulated with the same thickness of insulation using factory fabricated fitting sections or pre-molded insulated fittings.
   4. Block type insulation shall be adhered by stick-clips or bands, in addition to the sealer, as required to provide support for the insulation.
   5. Finish above furred ceilings and in chases shall be the bare insulation.
   6. Finish in equipment rooms and elsewhere where exposed-to-view shall be white ASJ jacket.
   7. Finish where exposed-to-the-weather shall be .016 inch thick, Childers, or equal, aluminum jacket on lines and Elljacs, or equal, pre-formed aluminum covering on fittings.
   8. Finish on underground insulation shall be Pittsburgh Corning Pittwrap as recommended by manufacturer.

END OF SECTION

CITY OF LAKELAND, FLORIDA
JOKER MARCHANT STADIUM & DETROIT TIGERS
SPRING TRAINING FACILITIES REDEVELOPMENT
LAKELAND, FLORIDA

SECTION 221116

DOMESTIC WATER PIPING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Piping and pipe fittings for domestic cold, hot and recirculating water piping

1.02 RELATED WORK

A. Section 22 05 00: Common Work Results for Plumbing

1.03 SUBMITTALS

A. Submit product data for review on piping and fittings. Submittal data shall include:
   1. Manufacturer of pipe.
   2. Tests or listings by recognized testing laboratory that certifies material composition is in accordance with ANSI/ASTM requirements.
   3. Product data for pipe and fittings to be used on each piping system.
   4. Solder and brazing product data and installation procedures for copper pipe.

1.04 QUALITY ASSURANCE

A. Lead Free: All wetted surface of pipe, fittings and fixtures in potable water systems shall have a weighted average lead content equal to or less than 0.25% per the Safe Drinking Water Act (Section 1417) as amended January 4, 2011.
   1. NSF Compliance: NSF/ANSI 61 and/or NSF/ANSI 372 for valve materials for potable-water service. Valves for domestic water must be 3rd Party Certified.

PART 2 - PRODUCTS

2.01 COPPER PIPE

A. Conform to ASTM B-88 specification for wrought seamless copper.

B. Type L, hard for:
   1. Domestic cold water piping
   2. Domestic hot water
   3. Domestic hot water recirculating piping

C. Use Type K, rolled, soft for: Piping installed under floor slabs.

2.02 COPPER PIPE FITTINGS

A. Sweat type, wrought copper, ASTM B62, with dimensions conforming to ANSI B16.22 and sweep patterns for copper tubing.

B. Mechanical Couplings: Roll groove rigid type by Victaulic, Gruvlok or Anvil.

C. Mechanically formed tee fittings: "T-Drill" system in compliance with Copper Development Association (CDA), Copper Tube Handbook, and ASME Code for pressure piping ANSI B31.5C.

All joints shall be brazed in accordance with CDA Copper Tube Handbook using BCuP filler material. Soft solder joints will not be approved.

D. Grooved copper system:
   1. Victaulic Style 607 or Style 641 rolled grooved copper fittings for domestic cold water and domestic hot water for sizes 4" and larger.

E. Dielectric Connections:
   1. Provide at junction of copper pipe and equipment with steel piping systems.
   2. Central, Dielectric insulating unions, and insulating flange unions, as manufactured by Central Plastic Company, or CTS Fabrication USA (1-1/2" thru 8").
   3. Provide copper solder joint to plated female iron pipe for sizes 1/2" through 2".
   4. Provide insulating flange unions, malleable female iron pipe thread to copper solder joint flange unions for sizes 2-1/2" through 4".
   5. Brass fittings and valves may not be used for dielectric union locations.

F. Unions: Brass ground joint, 250 lb. working pressure.

G. Nipples: Brass.

2.03 COMPRESSION COPPER FITTINGS

A. Viega ProPress, wrought copper, ASTM B88, with dimensions conforming to ANSI B16.22 or B16.18. The Elastomeric seal is made of non-toxic synthetic rubber that meets the requirements of ASTM D2000 and performance criteria of IAPMO PS 117. Sealing elements shall be EPDM. Fitting to have smart connect feature. Teeth type fitting of any type shall not be used.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Clean inside of pipe before installation. Keep installed piping clean, and protect ends from foreign matter by capping or plugging them.

B. Install pipe so that it does not interfere with opening of doors or apparatus, access to equipment, or to electrical equipment.

C. Do not install pipes in such a way that they will apply torque to pumps. After pumps have been installed and pumps have been operated, recheck and realign pumps if necessary.

D. Run pipes in straight lines and square with building. Install risers plumb. Make offsets only where indicated and where necessary.

E. Install branch connections using separate tee or lateral fittings for each branch. Do not combine branches into "bullhead tee" arrangement.

F. Do not install water pipes in electric rooms, tele/data rooms, transformer rooms, audio/visual rooms or elevator equipment rooms. Fire protection piping runouts serving only these rooms shall be installed in these rooms.

G. Do not install piping above electrical equipment such as starters, variable frequency drives, motor control centers, or disconnects. Maintain code required clearance above, below and to sides of electrical equipment.

H. Provide flanges or unions throughout the pipe systems at all equipment. Make provisions for servicing and removal of equipment without dismantling piping.

I. Piping Expansion:
   1. Install piping to allow thermal expansion and contraction without injury to piping, equipment or structure.
      a. Use loops or expansion joints where necessary and where detailed
      b. Provide pipe guides

J. Branch Lines:
   1. Where possible branch lines shall come off top of mains to prevent sediment, welding slag, or pipe deburrs from entering the branch lines and causing valve leakage or failure.

3.02 PIPE JOINTING

A. Preparing Pipe Ends:
   1. Machine cut pipe ends square
   2. Ream pipe ends, after cutting, to full diameter

B. Soldered and Brazed Joints:
   1. Make Type L copper pipe joints with suitable flux and 95/5, lead free solder.
   2. Make Type K copper pipe joints with silver (BAg series) brazing filler material with flux or copper-phos (BCup series) brazing filler material without flux per the recommendations of the Copper Development Association.
   3. Domestic cold and hot water piping 4" and larger shall be brazed. Copper to copper joints shall be brazed using a copper-phosphorus or copper-phosphorus-silver brazing filler metal (BCup Series) without flux. Dissimilar metals such as copper and bronze or brass shall be brazed using an appropriate flux with a silver (BAg Series) brazing filler metal.

C. Compression Copper Fittings:
   1. Copper compression fittings shall be made in accordance with the manufacturer's installation instructions. The tubing shall be fully inserted into the fitting and the tubing marked at the shoulder of the fitting. The fitting alignment shall be checked against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting. The joints shall be pressed using the tool approved by the manufacturer. Fitting shall have a 50 year warranty that the system shall be free of failure from manufacturing defects.

D. Bracing Joints:
   1. Provide braces and bridle rods as required to reinforce joints.
   2. If mechanical couplings are used, then prepare pipe ends and make joints in accordance with pipe coupling manufacturer's printed instructions.
   3. Where large pipes underground are subject to shock because of sudden changes in liquid flow rate, provide concrete "kicker" blocks at joints, fittings, and changes of pipe direction. Provide "kicker" blocks in accordance with applicable pipe industry trade or research organization recommendations.

3.03 PEX PLUMBING SYSTEM

A. Install PEX Plumbing System in accordance with the tubing manufacturer's recommendations and as indicted in the installation handbook.

B. Do not install PEX tubing within 6 inches (152 mm) of gas appliance vents or within 12 inches (305 mm) of any recessed light fixtures.

C. Do not solder within 18 inches (457 mm) of PEX tubing in the same waterline. Make sweat connections prior to making PEX connections.

D. Do not expose PEX tubing to direct sunlight for more than 30 days.

E. Ensure that no glues, solvents, sealants or chemicals come in contact with the tubing without prior permission from the tubing manufacturer.

F. PEX tubing passing through metal studs shall use grommets or sleeves at the penetrations.

G. Protect PEX tubing with sleeves where abrasion may occur.

H. Use strike protectors where PEX tubing penetrates a stud or joist and has the potential for being struck with a screw or nail.

I. Tubing manufacturer supplied bend supports shall be used where bends are less than six times the outside pipe diameter.

J. Tubing shall be supported to structural members using support methods required by local plumbing codes and the installation handbook.

K. Pressurize PEX Plumbing System with air in accordance with applicable codes or in the absence of applicable codes to a pressure of 25 psi (173 kPa) above normal working pressure of the system.

L. Comply with safety precautions when pressure testing, including use of compressed air, where applicable. Water shall not be used to pressurize the system if ambient air temperature has the possibility of dropping below 32 degrees F (0 degrees C).

3.04 ESCUTCHEONS

A. Provide chrome plated escutcheons where uninsulated pipes penetrate walls or ceilings of finished spaces.

3.05 STRAINERS

A. Install strainers so the strainer basket can be removed without spilling water on motors and electrical equipment.

3.06 AIR VENTING

A. Provide manually operated air vents at high points in vertical risers to eliminate air from systems.

B. Use ball valves for manual air vents.

3.07 VALVE ACCESS

A. Locate ceiling/wall access panels at shut-off and control valves for proper access and operation. Furnish and install access doors in accordance with Section 22 05 00 and other Divisions as applicable.

3.08 TESTING

A. Before piping is concealed or insulated, recheck it for leaks.

B. Rework or replace defective and leaking joints, and joints which are otherwise unsatisfactory. Preening, caulking, and doping are not permitted.

END OF SECTION

CITY OF LAKELAND, FLORIDA
JOKER MARCHANT STADIUM & DETROIT TIGERS
SPRING TRAINING FACILITIES REDEVELOPMENT
LAKELAND, FLORIDA

SECTION 221119

DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. This section includes requirements for:
   1. Backflow preventers.
   2. Shock arrestors.
   3. Trap primers.
   4. Inline automatic flow controller.
   5. Thermometers and pressure gauges.

1.02 RELATED WORK

A. Section 22 05 00: Common Work Results for Plumbing

B. Section 22 05 23: Valves for Plumbing Piping

C. Section 22 07 00: Plumbing Insulation

1.03 QUALITY ASSURANCE

A. Lead Free: All wetted surface of pipe, fittings and fixtures in potable water systems shall have a weighted average lead content equal to or less than 0.25% per the Safe Drinking Water Act (Section 1417) as amended January 4, 2011.
   1. NSF Compliance: NSF/ANSI 61 and/or NSF/ANSI 372 for valve materials for potable-water service. Valves for domestic water must be 3rd Party Certified.

1.04 SUBMITTALS

A. Submit product data for review.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Acceptable manufacturers are indicated in subsequent paragraphs.

2.02 BACKFLOW PREVENTERS

A. Acceptable manufacturers:
   1. Beeco
   2. Apollo
   3. Febco
   4. Cla-Val
   5. Ames
   6. Watts
   7. Wilkins Regulator Company

B. Provide completely automatic unit, fitted with tight closing shut-off valves and test cocks at each end.

C. Construct such that all parts are replaceable without removing unit from line.

D. Total pressure drop through complete backflow preventer does not exceed 12 PSI at rated flow.

E. Provide per local requirements and dimensions as detailed on drawings.

F. Backflow preventors shall meet the following standards: (Apollo Figure numbers are used for reference.)
   1. Atmospheric vacuum breaker - Apollo 38-200 series, ASSE 1001-2008
   2. Hose-connected vacuum breakers - Apollo 38-414, ASSE 1011-2004
   3. Back siphonage vacuum breakers - Apollo 4A-500-04F, ASSE 1056-2013
   4. Reduced pressure principle backflow preventers - Apollo 4ALF-200 Series, ASSE 1013-2011
   5. Double check valve assembly - Apollo 4ALF-100 Series, ASSE 1015-2011
   6. Pressure type vacuum breaker - ASSE-1020-2004

2.03 SHOCK ARRESTORS

A. Acceptable manufacturers:
   1. Josam
   2. Wade
   3. Jay R. Smith
   4. Precision Products
   5. Zurn
   6. Sioux Chief

B. Arrestor shall be piston type, polycarbonate with two EPDM O-rings, lubricated with FDA-approved Dow Corning #111 silicone compound in Type L or K copper body, suitable for 200 psig minimum pressure at 200 degrees F.

C. Arrestor shall be ANSI/ASSE 1010 Certified and be maintenance free with no access panel required.

2.04 THERMOMETERS AND PRESSURE GAUGES

A. Acceptable manufacturers: Trerice, Winters, Dwyer or approved equal.

B. Thermometers shall have a 9" aluminum case with 3.5" or 6" stem, fully adjustable, organic filled (non-mercury), +/- 1% accuracy, lead free brass or stainless steel thermowell, dual scale, 30 degrees F to 200 degrees F range.

C. Pressure gauges shall have a 4" white aluminum dial with type 304 SS case, lead free brass socket, glycerin filled with accuracy of +/- 1.5 % of full scale to 150 degrees F; dry type to 200 degrees F. Install with lead free gauge cock.

2.05 MANUAL FLOW BALANCING VALVE

A. Acceptable Manufacturers: Armstrong 'CBV'; Taco; Tour & Anderson.

B. Provide calibrated, lead free, non-ferrous valve with provisions for connecting a portable differential pressure meter for flow measurement and balance. Provide meter connections with built-in check valves.

C. Provide integral pointer to register degree of valve opening with tamper proof memory feature.

D. Provide valve with drain connection.

E. Construct valve with integral sleeves to prevent leakage around rotating element.

F. Construct valve for 125 psi working pressure at 150 degrees F.

G. Provide performed polyurethane insulation for easy access to valve without disturbing field applied adjacent insulation.

H. Provide valve with engraved tag attached indicating design flow, pressure, and flow characteristic of station.

PART 3 - EXECUTION

3.01 INSTALLATION AND TESTING

A. Backflow Preventers
1. Pipe relief through fixed air gap and discharge to sewer.
2. Install adjacent to wall and/or floor utilizing stand-off brackets, angle frame, and/or concrete piers.
3. Test unit for leaks and pressure drop. Clean and/or replace soiled strainer media.
4. Provide dual parallel reduced pressure backflow preventers on the main domestic water entrance to the facility.
5. Provide a reduced pressure backflow preventer on the domestic hot and cold water lines feeding the laboratory and morgue.
6. Provide a reduced pressure backflow preventer on the domestic cold water serving carbonators at soda machines.
7. Provide backflow prevention vacuum breaker on any water line feeding any piece of equipment which could cause back siphonage such as mechanical equipment, trap primer lines, etc.

B. Shock Arrestors:
1. Install shock arrestors at each quick closing valve, solenoid type valve, and flush valve. Size shock arrestors in accordance with manufacturer's instructions.
2. Install shock arrestors within five feet of valve, provide wall access panel as required.
3. Test and certify shock arrestors by Plumbing and Drainage Institute in accordance with ANSI/ASSE 1010.

C. Inline Automatic Flow Controllers
1. Install in accordance with manufacturer's instructions and in accordance with details on Drawings.
2. Provide valves, strainers and PT ports NSF approved for portable water systems.

END OF SECTION

CITY OF LAKELAND, FLORIDA
JOKER MARCHANT STADIUM & DETROIT TIGERS
SPRING TRAINING FACILITIES REDEVELOPMENT
LAKELAND, FLORIDA

SECTION 221123

DOMESTIC WATER PUMPS

PART 1 - GENERAL

1.01 RELATED WORK

A. Division 26: Electrical

1.02 SUBMITTALS

A. Submit product data for review.

PART 2 - PRODUCTS

2.01 DOMESTIC WATER BOOSTER PUMPS (VARIABLE SPEED)

A. Acceptable Manufacturers: Canariis Corporation, Taco, Systecon, Syncorflo or Bell and Gossett

B. Provide the number of pumps scheduled and a hydro pneumatic tank to automatically maintain system pressure even during low and no flow conditions.

C. The pump system shall be completely factory tested and fabricated on a steel skid including pumps, motors, valves, type "L" copper or type 304 stainless steel suction and discharge manifolds, all interconnecting piping, wiring and controls. Provide isolation valves, non-rising stem gate or wafer style butterfly, on the suction and discharge of each pump. Also provide factory furnished variable speed drives and control panel. All skid-mounted components shall be capable of being serviced with the booster system in operation. The complete pump package shall be factory finished with baked enamel paint.

D. Pumps shall be end suction type with ANSI flanged connections. Pump features to include foot supported casing, back pull out design, top centerline discharge with replaceable casing wear rings and hydraulically balanced impeller. The pump shall be bronze fitted suitable for domestic water service with a replaceable shaft sleeve and mechanical seal suitable for a working pressure of 175 PSIG.

E. Motors shall be manufactured to NEMA Standards furnished in an open drip-proof or totally enclosed fan cooled configuration. Motors shall be rated to have a 1.15 service factor.

F. Pump operating and sequence controls shall include alternating lead pump operation for pumps #3 and #3, constant speed bypass features (all pumps), adjustable pressure switches to sequence each pump on and vortex shedding flow sensors to sequence each pump off.

G. Variable Frequency Drives shall be six step or transistorized sinecode pulse width modulation type. Variable frequency drives shall be protected against electrical fault and shall have diagnostic ability, remote analog signal interface, speed and/or hertz indicator, individual accel./decel. adjustments, minimum and maximum speed adjustments, and an H-O-A switch for each pump with manual speed controls. Refer to "Section 23 05 14 VARIABLE FREQUENCY MOTOR DRIVES" for additional requirements.

H. Hydro Pneumatic Tank shall be constructed in accordance with Section VIII of the ASME code rated for 200 PSIG and be N.B stamped. The tank shall be carbon steel construction with an

F.D.A. approved replaceable liner to prevent water from coming in contact with the metal shell. The tank shall include an air fill valve, pressure gauge and bottom system connection suitable for 100% draw down.

I. Control Panel shall include a U.L. listed enclosed (NEMA 1) industrial control panel factory mounted and wired on the steel skid. The panel shall be furnished with programmable microprocessor based controller, main disconnect with external handle, external door mounted 4-1/2 inch suction and discharge pressure gauges, 115 and 24 volt fused control circuit transformers, current/voltage proportional D.C. input(s) and output(s) pup operation status for interface with building facility management system, pump operation and sequence controls, terminal block for sensor connections, control panel (on-off) switch and light, pump running lights, key pad entry, H.O.A. selector switches, pump minimum run timers, alpha numeric display, controller diagnostics, P.I.D. algorithmic controls, data security, motor overload indicating light with auto-start next pump, low suction pressure shutdown circuit with auto reset and light, audible alarm with silence pushbutton, auto alternation for pumps #3 and #3 and individual pump temperature probes and purge valves.

J. Factory Testing to include, as a minimum, hydrostatic testing as well as undergo a complete electric and hydraulic test from 0 to 100% design flow at the factory. All control, pump sequencing devices, alarms and instrumentation shall be tested and calibrated for proper operation during the factory-testing period.

K. Start-up Service shall include participation of an authorized factory representative during start-up of the system at the project location and operating instruction for the Owner's operational personnel.

L. Warranty shall include protection against defects in materials or factory workmanship under normal use and service for a period of one year after date of start-up and original operation.

2.02 HOT WATER RECIRCULATING PUMP

A. Acceptable manufacturers: Taco, Aurora, or Bell and Gossett
   1. Model number, capacity, accessories, and electrical characteristics as scheduled on drawings.

B. Provide in-the-line pump, all bronze construction, flange connections, hardened steel shafts, bronze sheathed, diamond bared, sleeve bearings, bronze impellers, and mechanical seals.

C. Provide flexible coupled motor, supported from pump casing and manual motor starter complete with thermal overload protection.

D. Provide test ports at unit to verify flow through pumps.

E. Provide operating and maintenance instructions.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Verify location and clearance requirements.

B. Install in accordance with manufacturer's recommendations.

C. Domestic water booster and hot water recirculating pumps.
   1. Provide factory representative or manufacturer's service representative to verify proper installation, operation and performance as specified.

D. Sump pump, pedestal mounted: Vent basin to exterior.

E. Sanitary waste pumps, pedestal mounted: Anchor pump to prevent vibration.

3.02 START-UP AND TEST

A. Start-up pump, verify integrity of connection and electrical phasing.

B. Test pumps in operation under design load conditions.

C. Coordinate with section 23 05 93 for test and balance requirements.

END OF SECTION

CITY OF LAKELAND, FLORIDA
JOKER MARCHANT STADIUM & DETROIT TIGERS
SPRING TRAINING FACILITIES REDEVELOPMENT
LAKELAND, FLORIDA

SECTION 221316

STORM AND SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

A. RELATED WORK

B. Section 22 05 00: Common Work Results for Plumbing

C. Section 22 05 29: Hangers for Plumbing Piping

D. Section 22 13 19: Sanitary Waste Piping Specialties

E. Section 23 20 00: HVAC Piping for Condensate Drain Piping

1.01 SUBMITTALS

A. Submit product data for review on piping and fittings. Submittal data shall include:
   1. Manufacturer of pipe.
   2. Tests or listing by recognized testing laboratory that certifies material composition is in accordance with ANSI/ASTM requirements.
   3. Product data for pipe and fittings to be used on each piping system.

1.02 SUBMITTALS

A. Submit product data for review.

PART 2 - PRODUCTS

2.01 CAST IRON PIPE AND FITTINGS

A. Conform to ASTM A-74, A-888, and CISPI 301 and CISPI 310.
   1. Pipe and fitttings shall be marked with the collective trademark of Cast Iron Soil Pipe Institute and be listed by NSF International.

B. Standard weight pipe with drainage fittings for:
   1. Sanitary waste, vent, and drainage pipe 2" and larger above ground.
   2. Building storm drains.
   3. Rainwater conductors inside building.
   4. Drain lines under buildings, and under exterior concrete or other paving. Extend cast iron piping at least 5 feet outside of building.

C. Joints in Cast Iron Pipe:
   1. Below grade: Bell and spigot with neoprene compression gaskets
   2. Above grade: No-Hub using stainless couplings, meeting CISPI 310-90. Provide 4-band, heavy duty couplings for piping 2" through 10" and 6-band heavy duty couplings for piping 12" and larger. Couplings shall comply with ASTM C 1540/ FM-1680 rated no hub bands for all cast iron piping material above slab on-grade.

2.02 POLYETHYLENE PIPING AND FITTINGS

A. Polyethylene piping shall be used for 4" footing drains around the building. Piping shall be flexible corrugated and perforated piping with required fitting. Pipe and fitting shall comply with ASTM F405, installation shall comply with ASTM F481.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Cast Iron Pipe Joints:
   1. Install compression gaskets and No-Hub bands in accordance with CISPI installation methods and manufacturer's instructions.

B. Grading Pipes for Drainage:
   1. Uniformly place storm drainage pipes and footing drain pipes at elevations and slopes indicated. If no elevations or slopes are indicated, slope pipes at not less than 1/8" per foot.
   2. Uniformly place sanitary sewer pipes at elevations and slopes required by the local codes

C. Bracing Joints:
   1. Provide braces and bridle rods as required to reinforce joints
   2. If mechanical lock type couplings are used, then prepare pipe ends and make joints in accordance with pipe coupling manufacturer's printed instructions.
   3. Where large pipes underground are subject to shock because of sudden changes in liquid flow rate, provide concrete "kicker" blocks at joints, fittings, and changes of pipe direction. Provide "kicker" blocks in accordance with applicable pipe industry trade or research organization recommendations.
   4. PVC stormwater piping shall be limited to 12" when penetrating any rated floor slab, due to fire penetration requirements.
   5. Clean inside of pipe before installation. Keep installed piping clean, and protect ends from foreign matter by capping or plugging them.
   6. Do not install piping above electrical equipment such as starters, variable frequency drives, motor control center's, or disconnects. Maintain code required clearance above, below and to sides of electrical equipment.
   7. Run pipes in straight lines and square with building. Install risers plumb. Make offsets only where indicated and where necessary.
   8. Piping passing through or under grade beams or through foundation walls shall be provided with a schedule 40 steel pipe sleeve two sizes greater than the piping passing through the sleeve.

END OF SECTION

CITY OF LAKELAND, FLORIDA
JOKER MARCHANT STADIUM & DETROIT TIGERS
SPRING TRAINING FACILITIES REDEVELOPMENT
LAKELAND, FLORIDA

SECTION 221319

SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. This section includes requirements for:
   1. Cleanouts
   2. Grease interceptors
   3. Trap primers

1.02 RELATED WORK

A. Section 22 05 00: Common Work Results for Plumbing

1.03 SUBMITTALS

A. Submit product data for review.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Acceptable manufacturers are indicated in subsequent paragraphs.

2.02 CLEANOUTS

A. Acceptable manufacturers:
   1. Jay R. Smith (Jay R. Smith model numbers are used below)
   2. Josam
   3. Wade
   4. Zurn
   5. Sioux Chief
   6. Watts

B. Exterior: 4250 Series heavy duty cast iron cleanout housing with internal cleanout body and plug.

C. Finished concrete floor: 4031-PB cast iron body with round adjustable polished nickel bronze top, ABS plug and carpet marker where required.

D. Ceramic tile: 4919 PB Series, cast iron body, polished nickel bronze top, 1/2" terrazzo recess and closure plug.

E. Vinyl tile floor: 4151PB Series, cast iron body, round nickel bronze top, 1/8" tile recess and closure plug.

F. Carpet: 4031-PBY. Inside caulk round brass scoriated frame and cover and provide carpet marker.

G. Wall: 4422, cast iron caulking ferrule with stainless round access cover and screws.

H. Access covers: Minimum size 12" x 12" located for access to valves, shock absorbers, trap primers, wall cleanouts, etc.

I. Furnish cleanouts occurring in waterproof floors with clamping devices.

2.03 GREASE INTERCEPTOR

A. Precast - Exterior
1. Provide exterior grease interceptors constructed of reinforced concrete and of minimum capacity, location and detail as shown on drawings.
2. Grease traps subject to vehicle loads shall be rated for traffic duty.

B. Cast Iron - Interior
1. Acceptable manufacturers: Zurn, Jay R. Smith, Josam, Rockford and MIFAB

C. Provide units of cast iron construction, enameled lined, with grease draw-off feature and flow control device. Model number, capacity, and appurtenances shall be as shown on drawings.

D. Grease traps subject to vehicle loads shall be rated for traffic duty.

2.04 TRAP PRIMERS

A. Acceptable manufacturers:
1. Josam
2. Zurn
3. Wade
4. Jay R. Smith
5. Precision Plumbing Products
6. MIFAB

B. Provide trap primer of brass construction, with removable operating parts, and integral vacuum breaker.

2.05 AIR ADMITTANCE VALVES

A. An air admittance valve shall be acceptable as a vent termination for any individual vent, common vent, circuit vent, loop vent and island fixture vent that is provided to prevent siphonage of a fixture trap. An air admittance valve can be used as an alternative to extending a vent through the roof (or sidewall) to the open atmosphere.

B. Acceptable Manufacturers:
1. Studor, Inc. or equivalent

PART 3 - EXECUTION

3.01 INSTALLATION AND TESTING

A. Cleanouts
1. Provide line size cleanouts up to 4"; 4" cleanout for lines larger than 4".
2. Locate cleanouts at all changes in direction greater than 45 degrees and in straight runs as shown 100 feet outside the building on drawing or spaced not greater than required by applicable Plumbing Code.
3. Extend inaccessible cleanouts up through floor and/or wall to provide easy accessibility.

B. Grease Interceptors
   1. Locate for easy access and cleaning.
   2. Obtain approval from local and state health department.
   3. Unit shall meet local code requirements.

C. Trap Primers
   1. Install primers in accessible location or as shown on drawings.
   2. Trap primers shall be Plumbing and Drainage Institute approved.

D. Air Admittance Valves
   1. Install air admittance valves in accessible locations. Provide access panels when required for access to valve. Install only where standard fixture vent system cannot be installed. Air admittance valves shall be limited to non-standard venting.

END OF SECTION

CITY OF LAKELAND, FLORIDA
JOKER MARCHANT STADIUM & DETROIT TIGERS
SPRING TRAINING FACILITIES REDEVELOPMENT
LAKELAND, FLORIDA

SECTION 221429

SUMP PUMPS

PART 1 - GENERAL

1.01 RELATED WORK

A. Division 26: Electrical

1.02 SUBMITTALS

A. Submit product data for review.

PART 2 - PRODUCTS

2.01 SUMP PUMP, SUBMERSIBLE

A. Acceptable manufacturers: Weil, Chicago, Worthington, Federal, Goulds, Zoeller, or Swaby.

B. Provide pump 1/3 horsepower motor, 115-volt, single phase, all bronze and complete with grounded power cord for connection to receptacle.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Verify location and clearance requirements.

B. Install in accordance with manufacturer's recommendations.

C. Sump pump, pedestal mounted: Vent basin to exterior.

3.02 START-UP AND TEST

A. Start-up pump, verify integrity of connection, electrical phasing.

B. Test pumps in operation under design load conditions.

END OF SECTION

CITY OF LAKELAND, FLORIDA
JOKER MARCHANT STADIUM & DETROIT TIGERS
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LAKELAND, FLORIDA

SECTION 223336

WATER HEATER - ELECTRIC

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 22 07 00: Plumbing Insulation

B. Section 22 11 16: Domestic Water Piping

C. Division 26: Electrical

1.02 SUBMITTALS

A. Submit product data for review.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Lochinvar

B. Bradford White

C. Hesco, Inc

D. A. O. Smith

E. State Industries

F. Rheem/Rudd

2.02 EQUIPMENT

A. Storage tank: 300 psi tested, 150 psi working pressure. ASME stamped and National Board listed. Tank lining: Vitreous glass, polymerized epoxy, or silica cement. Provide 12" x 16" manway on heater 125 gallon and larger.

B. Provide the following features:
1. Internal fusing for control and load circuits
2. Incoloy sheath elements
3. ASME rated temperature and pressure relief valve
4. Pressure and temperature gauges
5. Terminal block wiring
6. Rated for 180 degrees F. water temperature
7. U.L. Listing
8. 5 year tank warranty
9. Element control through thermostatic or solid state step proportional sequencers
10. High density anode rods

C. Safety controls:
   1. Electronic low water cut-off
   2. High/low water pressure cut-off
   3. Fused and switched, 120 volt control circuit

D. Operating and maintenance instructions.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Verify location and clearance requirements.

B. Install in accordance with manufacturer's recommendations and contract drawings.

C. Insulation for water connections as specified in Section 22 07 00.

D. Install electric connections under Division 26.

E. Clean and test unit as required by Sections 22 05 00.

END OF SECTION

CITY OF LAKELAND, FLORIDA
JOKER MARCHANT STADIUM & DETROIT TIGERS
SPRING TRAINING FACILITIES REDEVELOPMENT
LAKELAND, FLORIDA

SECTION 223337

WATER HEATER - ELECTRIC POINT OF USE

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 22 07 00: Plumbing Insulation

B. Section 22 11 16: Domestic Water Piping

C. Division 26: Electrical

1.02 SUBMITTALS

A. Submit product data for review.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Eemax

B. Chronomite

C. Stiebel Eltron

D. Hot Aqua

2.02 EQUIPMENT

A. Element shall be iron free, nickel-chrome or stainless steel material. Element shall be replaceable cartridge insert. Maximum operating pressure of 150 psi.

B. Provide the following features:
1. Internal fusing for control and load circuits
2. Provide flow control device per the manufacturers requirements
3. ASME rated temperature and pressure relief valve
4. Pressure and temperature gauges
5. Terminal block wiring
6. Rated for 140 degrees F. water temperature
7. U.L. Listing
8. 5 year tank warranty

C. Safety controls:
1. Electronic low water cut-off
2. High/low water pressure cut-off
3. Fused and switched, 120 volt control circuit

D. Operating and maintenance instructions.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Verify location and clearance requirements.

B. Install in accordance with manufacturer's recommendations and contract drawings.

C. Insulation for water connections as specified in Section 22 07 00.

D. Install electric connections under Division 26.

E. Clean and test unit as required by Section 22 05 00.

END OF SECTION

SECTION 223436

WATER HEATER, GAS FIRED BOILER WITH STORAGE TANK

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 22 05 23: Valves for Plumbing Piping

B. Section 22 07 00: Plumbing Insulation

C. Section 22 11 16: Domestic Water Piping

1.02 SUBMITTALS

A. Submit product data for review.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Lochinvar

B. Hesco Inc.

C. Bradford White

D. Patterson-Kelley

E. Teledyne Laars

F. A. O. Smith

2.02 EQUIPMENT

A. Water containing section shall be of copper, fin-tube construction employing solid copper tubes having extruded integral fins and bronze headers. The entire heat exchanger shall carry a 5 year limited warranty against failure caused by defective workmanship or material.

B. The water heater shall bear the ASME stamp and shall be National Board listed for 150 PSI working pressure. Water heater shall be AGA listed or UL listed and shall be test certified.

C. The unit will have the capability of being vented directly "through the wall" or of being vented into a conventional stack. Water heater shall be fully approved for installation either indoors or outdoors.

D. Standard operation controls and equipment shall include a automatic ignition device, operating aquastat, electric high-limit, automatic main gas valve, main gas pressure regulator capable of accepting 14" W.C. gas supply pressure, master switch with pilot light, ASME relief valve and temperature gauges.

E. The entire unit shall be factory assembled, pre-wired and tested, and shall include a properly sized bronze, circulating pump. Water heater shall meet the energy efficiency requirements of ASHRAE 90.1 (latest adopted version).

2.03 STORAGE TANK

A. Tank shall be complete with storage and overall dimensions as scheduled. The tank supplier shall guarantee the tank to deliver 80% of tank capacity without a drop in outlet temperature.

B. The tank shall be built in accordance with ASME construction requirements and so labeled, with a Working Pressure of 150 P.S.I. The tank lining shall be copper lining 3 lb. min., copper clad or silica cement with ten year guarantee. Provide a 12"x16" manhole on tanks 30" diameter and larger.

C. Provide factory supplied ASME temperature and pressure relief valve.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Furnish factory or manufacturer's service representative to verify system installation and operation.

B. Verify location and clearance requirements.

C. Install in accordance with manufacturer's recommendations and Contract Drawings.

D. Install vent line to atmosphere as shown on Drawings.

E. Insulate water connections as specified in Section 22 07 00.

F. Clean and test equipment in accordance with Section 22 05 00.

END OF SECTION

CITY OF LAKELAND, FLORIDA
JOKER MARCHANT STADIUM & DETROIT TIGERS
SPRING TRAINING FACILITIES REDEVELOPMENT
LAKELAND, FLORIDA

SECTION 224000

PLUMBING FIXTURES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Comply with provisions of Section 22 05 00.

B. Provide plumbing fixtures, trim and related items such as supplies, traps, drains, cleanouts, water closet flanges, bolts, seats and covers, fixture supports and other accessory items.

C. Coordinate fixture requirements by reviewing architectural, structural, and equipment drawings. Install fixtures in accordance with Contract Drawings and manufacturer's rough-in drawings.

1.02 RELATED WORK

A. Section 22 13 19: Sanitary Waste Piping Specialties

B. Section 22 11 16: Domestic Water Piping

1.03 CODES AND STANDARDS

A. Perform work in accordance with applicable codes and standards enforced by local authorities.

B. All barrier free fixtures shall be installed in accordance with the Americans with Disabilities Act (ADA) Rules and Regulations.

1.04 SUBMITTALS

A. Submit manufacturer's product data for review.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Fixtures: Kohler, American Standard, Toto, Gerber, Zurn, Sloan.

B. Fixture stops, supplies, faucets, mixing valves, shock absorbers or any devices in the drinking water supply shall be lead free per the "Safe Drinking Water Act."

C. Brass Trim: McGuire, Engineered Brass Company, Kohler, Cambridge Brass, ProFLo.

D. Roof Drains, Hydrant, Floor Drains, Shock Absorbers, Carriers and P-Traps: Jay R. Smith, Zurn, Wade, Josam, Watts, MIFAB.

E. Piston - Flush Valves: Sloan, Zurn, Kohler, Toto, American Standard.

F. Diaphragm Flush Valves: Sloan Regal, Zurn Z6000-PL with low force handles for ADA compliance.

G. Sensor type flush valves shall have a battery override manual flush valve actuator.

H. Toilet Seats: Bemis, Church, Kohler.

I. Faucets: T&S Brass, Delta HDF, Water Saver, Chicago Faucet Company, Kohler, Zurn, Symmons, Moen, Speakman.

J. Stainless Steel Sinks: Elkay, Just, Kohler.

K. Mixing Valves: Leonard, Lawler, Powers, Speakman, Watts, Symmons, Bradley, Apollo.

L. Shower Valves (thermostatic and/or pressure balancing type): Symmons, Leonard, Powers, Lawler, Speakman.

M. Flow Control Devices: Dole Flow Controls Company.

N. Pre-fabricated insulation on water lines and p-trap under barrier free lavatories and sinks: Trap Wrap TrueBro, Inc., Handi Lav-Guard, McGuire Pro-wrap, Plumberex-Handishield, Zurn, and Pro-Flo trap wrap.

O. Shower heads, faucets and flush valves shall meet local and state code requirements for water conservation on low consumption fixtures. Provide integral stop-checks for all shower and tub valves.

P. Provide fixtures and trim as a complete unit as required in the individual "P" numbers listed below.

2.02 MATERIALS

A. Wall Hung Lavatories: Furnish complete with wall mounting brackets.

B. Countertop Sinks: Furnished complete with mounting rings where required.

C. Fixture Color: White unless specified otherwise.

D. Faucets and Flush Valves: Provide either integral or attached supply stops with nipples.

E. Provide mixing valves per ASSE or CSA Standards as required by the local adopted code. Mixing valves used in drinking water shall be lead free. Mixing valves shall be used to supply tempered water to public hand-washing facilities and shall conform to ASSE 1070 or CSA B125.3.

F. Clamping Device: Provide for drains installed in slabs above grade.

G. Trap Primer: Provide connections for floor drain as shown on drawings.

H. Caulking: General Electric silicon sanitary sealant or equal. Color to match fixture color.

I. Provide Zurn ZR-1231 floor mounted carrier for wall hung lavatories.

J. Provide FRT wood or metal backing at wall fixtures and fixture trim connections so piping and connecting faucets and valves are rigid to wall.

K. Provide shower and floor drain water proofing membrane for non-prefabricated shower and floor drains located above slab on grade.

L. Wrist Blade Operation:
1. Pull wrist blade to operator to turn on
2. Push toward splashback to turn off faucet

M. Showers and tubs shall have non-slip walking surface.

N. All fixtures and fittings relating to drinking water shall meet the requirement of ANSI/NSF 61, Section 9. Any faucet for drinking water shall be certified by U.L. to the ANSI/NSF 61, Section 9 Standards.

O. Prefabricated insulation kit for lavatory and sink supplies, trap and drain piping shall be Truebro Model 103 (white) or equal.

2.03 PLUMBING FIXTURES

P-1A WATER CLOSET (WALL HUNG - FLUSH VALVE - 1.28 GPF)
a. Fixture: Zurn Z5615-BWL, white elongated bowl
b. Valve: Zurn Z6000AV-HET, 1.28 gallon per flush
c. Seat: Zurn Z5956SS-EL, white open front
d. Carrier: Zurn ZN1203-N4 or ZN1204-N4; provide carriers for minimum wall thickness
e. Mounting: 15-1/2 inches from finished floor to top of rim

P-1B WATER CLOSET (WALL HUNG - FLUSH VALVE - BARRIER FREE - 1.28 GPF)
a. Fixture: Zurn Z5615-BWL, white elongated bowl
b. Valve: Zurn Z6000AV-HET, 1.28 gallon per flush
c. Seat: Zurn Z5956SS-EL, white open front
d. Carrier: Zurn ZN1203-N4 or ZN1204-N4; provide carriers for minimum wall thickness
e. Mounting: 17 inches from finished floor to top of rim

P-1C WATER CLOSET (WALL HUNG - FLUSH VALVE - PHOTO SENSOR - 1.28 GPF)
a. Fixture: Zurn Z5615-BWL, white elongated bowl
b. Valve: Sloan 111-1.28-EBV-500-A, 1.28 gallon per flush
c. Seat: Zurn Z5956SS-EL, white open front
d. Carrier: Zurn ZN1203-N4 or ZN1204-N4; provide carriers for minimum wall thickness
e. Mounting: 15-1/2 inches from finish floor to top of rim

P-1D WATER CLOSET (WALL HUNG - FLUSH VALVE - PHOTO SENSOR - BARRIER FREE - 1.28 GPF)
a. Fixture: Zurn Z5615-BWL, white elongated bowl
b. Valve: Sloan 111-1.28-EBV-500-A, 1.28 gallon per flush
c. Seat: Zurn Z5956SS-EL, white open front
d. Carrier: Zurn ZN1203-N4 or ZN1204-N4, fixture carriers for minimum wall size
e. Mounting: 17 inches from finished floor to top of rim

P-2A URINAL (WALL HUNG - FLUSH VALVE - PINT PPF)
a. Fixture & Valve Assembly: Zurn Z5798.207.00, 0.125 gallon per flush, urinal and flush valve
b. Fixture & Piston Valve Assembly: Zurn Z5798, - 0.125 gallon per flush, white elongated rim; Zurn ZTR6203-ULF 0.125 gallon per flush piston flush valve, with photo sensor and manual flush

c. Carrier: Zurn #Z1222
d. Mounting: 24 inches from finish floor to flood rim

P-2B URINAL (WALL HUNG - FLUSH VALVE - BARRIER FREE - PINT PPF)
a. Fixture & Valve Assembly: Zurn Z5798.207.00, 0.125 gallon per flush urinal and flush valve
b. Carrier: Zurn #Z1222
c. Mounting: 17 inches from finish floor to flood rim

P-2C URINAL (WALL HUNG - FLUSH VALVE - PHOTO SENSOR - PINT PPF)
a. Fixture & Valve Assembly: Sloan #WEUS-1000.1403-0.13 with EBV-500-A single flush side mount urinal and flush valve
b. Carrier: Zurn #Z1222
c. Mounting: 24 inches from finish floor to flood rim

P-2D URINAL (WALL HUNG - FLUSH VALVE - PHOTO SENSOR - BARRIER FREE - PINT PPF)
a. Fixture & Valve Assembly: Sloan #WEUS-1000-1403-0.13 with EBV-500-A single flush side mount urinal and flush valve
b. Carrier: Zurn #Z1222
c. Mounting: 17 inches from finish floor to flood rim

P-3A SHOWER (TILE WALLS AND FLOOR)
a. Trim: Symmons #1-100-X single lever valve and shower head, with 2.0 GPM shower head mounted at 7'-6" above finish floor; Zurn #ZS-415-BS stainless steel drain with water proofing membrane clamping

P-3B SHOWER (TILE WALLS AND FLOOR - BARRIER FREE)
a. Fixture: Tile walls and floor with accessories furnished under Division 08 and 09
b. Trim: Symmons #96-500-B30-L/HD-V-X, with lever handle barrier free assembly with 2.0 GPM shower head, Symmons #(4-231), mounted at 7'-6" above finish floor; Zurn #ZS-415-BS stainless steel drain with water proofing membrane clamping
c. See detail on drawings.

P-3D SHOWER FAUCET ONLY, GROUP SHOWER
a. Fixture: Tile walls and floor with accessories furnished under Division 08 and 09
b. Trim: Symmons #1-100-X single lever valve and shower head, with 2.0 GPM shower head mounted at 7'-6" above finish floor.

P-4A LAVATORY (WALL HUNG - SINGLE LEVER)
a. Fixture: Zurn Z5344, 20"x18"
b. Faucet: Zurn Z7443-XL-FC lead free with 0.5 gpm flow control aerator, braided supplies and grid drain. Provide Lawler TMM-1070 mixing valve and lead free brass mixing tee with 3/8” brass supplies.
c. Trim: Zurn Z8700-PC series 1-1/4 inch semi-cast brass p-trap. Zurn Z8804-XL-PC wheel handle stops.
d. Carrier: Zurn #Z1231

P-4B LAVATORY (WALL HUNG - BARRIER FREE - REGULAR - SINGLE LEVER)
a. Fixture: Zurn Z5344, 20"x18"
b. Faucet: Zurn Z7440-XL-FC, lead-free with 0.5 gpm flow control aerator and braided supplies. Provide Lawler TMM-1070 mixing valve and lead free brass mixing tee with 3/8” brass supplies.

c. Trim: Zurn Z8700-PC series 1-1/4 inch semi-cast brass p-trap. Zurn Z8804-XL-PC wheel handle stops. Zurn Z8746-PC 1-1/4 inch offset grid drain. Provide Symmons # 7-210-CK Maxline "lead free" mixing valve under sink in accessible location.
d. Mounting: 34 inches from finished floor to flood rim. Insulate water piping and trap under lavatory.
e. Carrier: Zurn #Z1231

P-4C LAVATORY (WALL HUNG - PHOTO SENSOR)
a. Fixture: Zurn Z5344, 20"x18"
b. Faucet: Zurn Z6915-XL-F-SH-SSH-TMV-1, photo sensor faucet, lead free with 0.5 gpm flow control aerator, supply hoses for mixing valve, single stainless supply hose (lead free) and thermostatic mixing valve for single faucet.
c. Trim: Zurn Z8700-PC series 1-1/4 inch semi-cast brass p-trap. Zurn Z8804-XL-PC wheel handle stops. Zurn Z8743-PC 1-1/4 inch grid drain.
d. Carrier: Zurn Z1231

P-4D LAVATORY (WALL HUNG - BARRIER FREE - PHOTO SENSOR)
a. Fixture: Zurn Z5644, 20"x18"
b. Faucet: Zurn Z6915-XL-F-SH-SSH-TMV-1, photo sensor faucet, lead free with 0.5 gpm flow control aerator, supply hoses for mixing valve, single stainless supply hose (lead free) and thermostatic mixing valve for single faucet.
c. Trim: Zurn Z8700-PC series 1-1/4 inch semi-cast brass p-trap. Zurn Z8804-XL-PC wheel handle stops. Zurn Z8746-PC 1-1/4 inch offset grid drain.
d. Carrier: Zurn Z1231
e. Mounting: 34 inches from finished floor to flood rim. Insulate water piping and trap under lavatory.
f. Carrier: Zurn Z1231

P-4F LAVATORY (OVAL - DROP IN - SINGLE LEVER)
a. Fixture: Zurn Z5114, 20"x17"
b. Faucet: Zurn Z7443-XL-FC lead free with 0.5 gpm flow control aerator, braided supplies and grid drain. Provide Lawler TMM-1070 mixing valve and lead free brass mixing tee with 3/8” brass supplies.
c. Trim: Zurn Z8804-XL-PC wheel handle stops, Zurn Z8700-PC series 1-1/4 inch semi-cast brass P-trap

P-4G LAVATORY (OVAL - DROP IN - SINGLE LEVER - BARRIER FREE)
a. Fixture: Zurn Z5114, 20"x17"
b. Faucet: Zurn Z7440-XL-FC, lead free with 0.5 gpm flow control aerator and braided supplies. Provide Lawler TMM-1070 mixing valve and lead free brass mixing tee with 3/8” brass supplies.
c. Trim: Zurn Z8700-PC series 1-1/4 inch semi-cast brass p-trap. Zurn Z8804-XL-PC wheel handle stops. Zurn Z8746-PC 1-1/4 inch offset grid drain.
d. Mounting: See Architectural Drawings for counter height. Insulate water piping and P-trap under sink. Install 5" from counter front to edge of lavatory for ADA compliance.

P-4I LAVATORY (OVAL - DROP IN - PHOTO SENSOR)
a. Fixture: Zurn Z5114, 20"x17"
b. Faucet: Zurn Z6915-XL-F-SH-SSH-TMV-1, photo sensor faucet, lead free with 0.5 gpm flow control aerator, supply hoses for mixing valve, single stainless supply hose (lead free) and thermostatic mixing valve for single faucet.
c. Trim: Zurn Z8700-PC series 1-1/4 inch semi-cast brass p-trap. Zurn Z8804-XL-PC wheel handle stops. Zurn Z8746-PC 1-1/4 offset grid drain.

P-4J LAVATORY (OVAL - DROP IN - PHOTO SENSOR - BARRIER FREE)

a. Fixture: Zurn Z5114, 20"x17"
b. Faucet: Zurn Z6915-XL-F-SH-SSH-TMV-1, photo sensor faucet, lead free with 0.5 gpm flow control aerator, supply hoses for mixing valve, single stainless supply hose (lead free) and thermostatic mixing valve for single faucet.
c. Trim: One Zurn Z8700-PC series 1-1/4 inch semi-cast brass p-trap. Zurn Z8804-XL-PC wheel handle stops. Zurn Z8746-PC 1-1/4 offset grid drain.
d. Mounting: See Architectural Drawings for counter height. Insulate water piping and P-trap under sink. Install 5" from counter front to edge of lavatory for ADA compliance.

P-5A SINK (SINGLE COMPARTMENT)

a. Fixture: Just SLX-2019-A-GR, 20"x19"x10.5"
b. Faucet: Zurn Z82300-XL-CP8-18M, single lever faucet for 1.5 gpm laminar flow. Provide Lawler TMM-1070 mixing valve and lead free brass mixing tee with 3/8” brass supplies.
c. Trim: One Zurn Z8743-I-PC drain with 1-1/2 inch tailpiece. Zurn Z8804-XL-PC wheel handle stops. One Zurn Z8702-PC series 1-1/2 inch by 1-1/2 inch semi-cast brass P-trap.

P-5B SINK (SINGLE COMPARTMENT - BARRIER FREE)

a. Fixture: Just SL-ADA-2019-A-GR, 20"x19"x5"
b. Faucet: Zurn Z82300-XL-CP8-18M, single lever faucet for 1.5 gpm laminar flow. Provide Lawler TMM-1070 mixing valve and lead free brass mixing tee with 3/8” brass supplies.
c. Trim: One Zurn Z8748-PC offset drain with 1-1/2 inch tailpiece. Zurn Z8804-XL-PC wheel handle stops. One Zurn Z8702-PC series 1-1/2 inch by 1-1/2 inch semi-cast brass P-trap.

P-5C SINK (SINGLE COMPARTMENT - SUITE SINK)

a. Fixture: Just SL-2017-A-GR, 20"x17"x7.5".
b. Faucet: Chicago 1100-GN2AE35-317AB, 1.5 gpm laminar flow with gooseneck and wrist controls. Provide Lawler TMM-1070 mixing valve and lead free brass mixing tee with 3/8” brass supplies.
c. Trim: One Zurn Z8743-I-PC drain with 1-1/2 inch tailpiece. Zurn Z8802-XL-LR-8860-12-PC supplies with wheel handle stops and Z8702-PC series 1-1/2 inch by 1-1/2 inch semi-cast brass P-trap

P-5D SINK (DOUBLE COMPARTMENT)

a. Fixture: Just DLX-1933-A-GR, 19"x33"x10.5"
b. Faucet: Faucet: Zurn Z82300-XL-CP8-18M, single lever faucet for 1.5 gpm laminar flow
c. Trim: Two Zurn Z8743-I-PC drain with 1-1/2 inch tailpiece. Zurn Z8804-XL-PC wheel handle stops. One Zurn Z8702-PC series 1-1/2 inch by 1-1/2 inch semi-cast brass P-trap. One Z8751 continuous waste.

P-5E SINK (FIRST AID ROOM)

a. Fixture: Just SL-2017-A-GR, 20"x17"x7.5".
b. Faucet: Chicago 1100-GN2AE35-317AB, 1.5 gpm laminar flow with gooseneck and wrist controls. Provide Lawler TMM-1070 mixing valve and lead free brass mixing tee with 3/8” brass supplies.
3. Trim: One Zurn Z8743-I-PC drain with 1-1/2 inch tailpiece. Zurn Z8802-XL-LR-8860-12-PC supplies with wheel handle stops and Z8702-PC series 1-1/2 inch by 1-1/2 inch semi-cast brass P-trap

P-6 JANITORS FLOOR BASIN

a. Fixture: Stern-Williams terrazzo SB-900, 24"x24"x12" with stainless steel cap, less tiling flanges

b. Faucet: Zurn Z843M6-CS with vacuum breaker, integral stops, wall brace, and check stops.
c. Mounting: Mount faucet 36 inches above finished floor.

P-8 WASHING MACHINE CONNECTION (2 INCH DRAIN)
1. Fixture: Guy Grey Model Number MWB19, powder coated box, with 2 inch drain, quarter turn sweat connection valves, and water-hammer arresters.
b. Trim: One Zurn Z8714B-PC, 2"x2" cast brass ground joint swivel P-trap. Provide P-trap inlet side waste extension as required
c. Mounting: 42 inches from bottom of box to finished floor

P-9A WATER COOLER FOUNTAIN (HIGH-LOW - BARRIER FREE)
a. Fixture: Rectangle arm with bowl, Elkay ERFPM28RAK with stainless steel apron
b. Trim: One Zurn Z8802-XL-LR-8860-12-PC supply with wheel handle stop. Two Zurn Z8700-PC series 1-1/4 inch semi-cast brass P-trap
c. Capacity: 8 GPH at 90 degree room temperature
d. Mounting: 36 inches from low bubbler to finish floor

P-10A ROOF DRAIN
a. Fixture: Zurn #ZA100-DP with deck clamp, aluminum dome and sump receiver. Size as shown on drawings. Zurn #Z190 expansion joint if offset is not required.

P-10B ROOF DRAIN (OVERFLOW DRAIN)
a. Fixture: Zurn #ZA100-DP-DR-W2, 2" internal dam, with adjustable drain riser extension, deck clamp, aluminum dome and sump receiver. Size as shown on drawings. Zurn #Z190 expansion joint if offset is not required.

P-11A PROMENADE DECK DRAIN
a. Fixture: Zurn #ZA150-DP-89 with nickel bronze cover, sump receiver, and under deck clamp. Provide extension (suffix EA) if required. Size as shown on drawings.

P-11B SEATING TUB DRAIN
a. Fixture: Zurn #Z187, 6" x 7" or 8" x 12" Scupper drain, Dura-Coated cast iron body with Reversible back or bottom outlet, oblique aluminum grate with 90 degree combination Frame and membrane flashing clamp. Size of drain as shown on drawings.

P-11C AREA DRAIN
a. Fixture: Zurn #Z520-C-Y-P, 9" diameter top, dura-coated cast iron area drain with sediment bucket, adjustable strainer and flashing clamp device if drain is installed above slab on grade. Size as shown on the drawings.

P-11D AREA DRAIN (DOWNSPOUT COLLECTOR)
a. Fixture: Zurn #Z1902 (12"x12"x10") deep cast iron body and square, whtie acid resisting procelain enamel interior complete with white ABS anti-splash interior bottom dome strainer. Provide trap primer connection. Size of drain as shown on drawings.

P-12 DOWNSPOUT NOZZLE
a. Fixture: Zurn #Z-199-DC nickel bronze downspout cover with frame with fabricated secured perforated stainless steel hinged strainer. Size as shown on drawings.
b. Fixture: ZANB-199-SS nickel bronze downspout nozzle. Size of nozzle as shown on drawings.

P-14A FLOOR DRAIN (REGULAR - GENERAL PURPOSE)

a. Fixture: Zurn #ZN415B-Y-P cast iron floor with sediment bucket and polished nickel bronze top, adjustable, strainer and flashing clamp device if drain is installed above slab on grade. Provide trap primer connections. Size of drain as shown on drawings.

P-14B FLOOR DRAIN (EQUIPMENT ROOMS)

a. Fixture: Zurn #ZN541-P round, cast iron, 12" diameter drain with sediment bucket, flange and clamp device if drain is installed above slab on grade. Provide trap primer connections. Size of drain as shown on drawings.

P-14E FLOOR DRAIN (KITCHEN - SANITARY - HALF GRATE - 8"x8" TOP)

a. Fixture: Zurn #ZN1910-K-23-2-P cast iron floor drain with porcelain enamel interior, nickel bronze rim and half grate. Provide trap primer connection. Size of drain as shown on drawings.

P-14G FLOOR DRAIN (REGULAR - DOME TOP-INSIDE TRENCH)

a. Fixture: Zurn #ZN415B-Y cast iron floor drain with sediment bucket and ZB400G type G adjustable dome strainer top, and flashing clamp device if drain is installed above slab on grade. Size drain as shown on drawings.

P-15A SEATING BOWL DRAIN (90 DEGREE OUTLET)

a. Fixture: Zurn #Z187, 6" x 7" or 8" x 12" Scupper drain, Dura-Coated cast iron body with Reversible back or bottom outlet, oblique aluminum grate with 90 degree combination Frame and membrane flashing clamp. Size of drain as shown on drawings.

P-15B SEATING BOWL DRAIN (45 DEGREE OUTLET)

a. Fixture: Zurn #Z189, 6" x 6" x 11" Scupper drain, Dura-Coated cast iron body with 45 degree Outlet and flush type strainer with combination frame and membrane flashing clamp. Size of drain as shown on drawings.

P-16 SHOCK ABSORBER

a. Fixture: Sioux Chief 600 Series size as recommended by manufacturer

P-17A TRAP PRIMER (FLOOR DRAIN CONNECTION)

a. Fixture: Precision Plumbing Products P-1 & P-2, sized as required for the number of floor drains served, with trap primer valve and distribution unit.

P-17B TRAP PRIMER ASSEMBLY (FLUSH VALVE TUBE CONNECTION)

a. Fixture: Zurn P6000-TPO, exposed trap primer assembly, with flush tube trap primer collar, spud coupling and flange for top spud connection, supply tube and fitting, vacuum breaker, vacuum breaker tube nut and wall escutcheon.

P-17C TRAP PRIMER ASSEMBLY (GRAY WATER - SINK TAILPIECE CONNECTION)

a. Fixture: Zurn Z1021-Z assembly or TP2922-PC tailpiece with SS braided primer hose, FIP compression fitting and wall escutcheon.

P-18A WALL HYDRANT (NON-FREEZE - KEY OPERATED)

a. Fixture: Zurn Z1321-C, anti-siphon non-freeze wall hydrant, stainless steel face, with integral vacuum breaker. Mounting: 18" from center line of hydrant to finished grade

P-18B WALL HYDRANT (NON-FREEZE - BOX TYPE)
a. Fixture: Zurn Z1320-C, anti-siphon non-freeze wall hydrant, stainless steel face, with integral vacuum breaker chrome plated rough bronze box.
b. Mounting: 18" from center line of hydrant to finished grade

P-19A HOSE BIBB (COLD WATER - TOILETS)
a. Fixture: Z1341-PC chrome plated with loose key handle and vacuum breaker
b. Mounting: 18" above the finished floor

P-19B HOSE BIBB (COLD WATER - EQUIPMENT ROOMS)
a. Fixture: Zurn Z1341 with vacuum breaker, rough bronze finish

P-21 ICE MAKER BOX
a. Fixture: Water-Tite model number W9701HA water supply box with shock arrestor, 6"x5"x3.5"

PART 3 - EXECUTION

3.01 INSTALLATION

A. Connect to plumbing fixtures and equipment provided under this and other sections of specification, architectural drawings, and manufacturer's shop drawings. Provide rough-in connections as shown on drawings.

B. Use schedule and details on drawings or manufacturer's shop drawings for connection sizes to fixtures.

C. Connect wall hung urinals to waste piping with red brass nipples.

D. Provide separate P-trap for each fixture, floor drain, and piece of equipment.

E. Provide cast iron P-traps under floor drains.

F. Provide deep seal traps under floor drains in air conditioning unit plenums, walk-in cooler and freezer units, storage rooms, toilet rooms, and elsewhere as indicated on drawings.

G. Install barrier free fixtures in accordance with rules and regulations of the Americans with Disabilities Act (ADA).

H. Provide outlet devices which limit hot water flow to lavatories and sinks to a minimum of 0.5 GPM, sized as recommended by manufacturer and as required by ASHRAE 90.1-2007 and state and local energy codes.

I. Install lavatories and sinks with a minimum of 4" clearance on each side, from a wall or partition.

J. Install water closets with a minimum of 15" clearance from the centerline of the bowl to each side, from a wall, partition, divider, or another fixture.

K. Water closets shall have a minimum of 21" clearance in front of bowl.

L. Coordinate dimensions required for minimum fixture clearances with other Divisions.

M. Add trap primer connection to floor drain if required. (See drawing for requirement)

N. Where automatic electronic flushing devices are specified, coordinate installation with Division 26.

O. Provide check valves on hot and cold water supply, on janitor sink faucet or any mixing faucet not equipped with integral check valve.

P. Caulk around joints at fixtures mounted on wall or floor, or backed up to walls.

Q. Mount fixtures rigid to walls as shown on drawings or details.

R. Install a dropped eared "L" fitting, mounted on FRT wood backing for rigid support for all shower heads.

S. Flush valves: Install flush valves on wide side of water closet stall as required for ADA accessibility. Install water closet flush valve no higher than 44" above finished floor. Flush valve handles for urinals shall be mounted between 28" and 44" above finished floor.

T. Securely fasten the dishwasher waste discharge line to underside of counter top before connection to sink tailpiece.

U. Provide 12" minimum access to fixtures with concealed slip-joint connections.

V. Run connection size cold water line to back of refrigerator and connect with shut off valve at connection point. Field verify exact connections required.

3.02 TESTING AND CLEANING

A. Inspect and test all work to insure that it is installed in accordance with drawings and specification and is functioning as designed. Test procedures and pressure as required by other sections.

B. Correct all deficiencies found and retest.

C. Turn all work over to Owner in a clean, sanitary condition.

END OF SECTION