

Family Recreational Area at Northview Heights, AMP-09

IFB#600-11-26 REBID

ADDENDUM

ATTACHMENT A

SPECIFICATION

SECTION 221316

SANITARY WASTE AND VENT PIPING

SECTION 221316
SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following for soil, waste, and vent piping inside the building:
 - 1. Pipe, tube, and fittings.
 - 2. Special pipe fittings.
 - 3. Encasement for underground metal piping.

1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. EPDM: Ethylene-propylene-diene terpolymer rubber.
- C. LLDPE: Linear, low-density polyethylene plastic.
- D. NBR: Acrylonitrile-butadiene rubber.
- E. PE: Polyethylene plastic.
- F. PVC: Polyvinyl chloride plastic.
- G. TPE: Thermoplastic elastomer.

1.4 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water.

1.5 SUBMITTALS

- A. Product Data: For pipe, tube, fittings, and couplings.
- B. Field quality control inspection and test reports.

1.6 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; "NSF-drain" for plastic drain piping; "NSF-tubular" for plastic continuous waste piping; and "NSF-sewer" for plastic sewer piping.
- C. Cast Iron soil pipe and fittings shall be marked with the collective trademark of Cast Iron Soil Pipe Institute (CISPI) and listed by NSF International.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" article for applications of pipe, tube, fitting, and joining materials.

2.3 HUB-AND-SPIGOT, CAST IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 74, Service class(es).
- B. Gaskets: ASTM C 564, rubber.
- C. Calking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

2.4 HUBLESS CAST IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. Sovent Stack Fittings: ASME B16.45 or ASSE 1043, hubless, cast iron aerator and deaerator drainage fittings.
- C. Shielded Couplings: ASTM C 1277 assembly of metal shield or housing, corrosion-resistant fasteners, and rubber sleeve with integral, center pipe stop.
 - 1. Heavy Duty, Shielded, Stainless steel Couplings: Heavy Duty Couplings shall conform to CISPI 310 and ASTM C 1277. Shield Assemblies shall consist of a stainless steel bi-directional corrugated shield; stainless steel bands and tightening devices; and an ASTM C 564, rubber sleeve with integral center stop. Couplings shall bear the NSF Trademark, and be manufactured in the USA.

2. Manufacturers:
 - a. Clamp-All Corporation
 - b. Husky
 - c. Mission Rubber Company
 - d. Tyler Pipe; Soil Pipe Division

2.5 STEEL PIPE AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade A or B, Standard Weight or Schedule 40, galvanized. Include ends matching joining method.
- B. Pressure Fittings:
 1. Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106, Schedule 40, galvanized, seamless steel pipe. Include ends matching joining method.
 2. Malleable iron Unions: ASME B16.39; Class 150; hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface; and female threaded ends.
 3. Gray iron, Threaded Fittings: ASME B16.4, Class 125, galvanized, standard pattern.
 4. Cast iron Flanges: ASME B16.1, Class 125.
 5. Cast iron, Flanged Fittings: ASME B16.1, Class 125, galvanized.
- C. Grooved Joint Systems
 1. Manufacturers:
 - a. Anvil International.
 - b. Star Pipe Products; Star Fittings Division
 - c. Victaulic Company.
 - d. Ward Manufacturing, Inc.
 2. Grooved End, Steel piping Fittings: ASTM A 47/A 47M, galvanized, malleable iron casting; ASTM A 106, galvanized steel pipe; or ASTM A 536, galvanized, ductile iron casting; with dimensions matching steel pipe.
 3. Grooved end, Steel piping Couplings: AWWA C606, for steel pipe dimensions. Include ferrous housing sections, gasket suitable for water, and bolts and nuts.

2.6 DUCTILE IRON PIPE AND FITTINGS

- A. Mechanical Joint, Ductile iron Pipe: AWWA C151, with mechanical joint bell and plain spigot end, unless grooved or flanged ends are indicated.
 1. Mechanical-Joint, Ductile iron Fittings: AWWA C110, ductile- or gray iron standard pattern or AWWA C153, ductile iron compact pattern.
 2. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray iron glands, rubber gaskets, and steel bolts.

- B. Push-on-Joint, Ductile iron Pipe: AWWA C151, with push-on-joint bell and plain spigot end, unless grooved or flanged ends are indicated.
 - 1. Push-on-Joint, Ductile iron Fittings: AWWA C110, ductile- or gray iron standard pattern or AWWA C153, ductile iron compact pattern.
 - 2. Gaskets: AWWA C111, rubber.
- C. Grooved Joint Systems
 - 1. Manufacturers:
 - a. Victaulic Company.
 - 2. Grooved end, ductile iron Fittings: ASTM A 47/A 47M, malleable iron castings or ASTM A 536, ductile iron castings with dimensions matching pipe.
 - 3. Grooved end, ductile iron Piping Couplings: AWWA C606, for ductile iron-pipe dimensions. Include ferrous housing sections, gasket suitable for water, and bolts and nuts.
- D. Flanges: ASME 16.1, Class 125, cast iron.

2.7 COPPER TUBE AND FITTINGS

- A. Copper DWV Tube: ASTM B 306, drainage tube, drawn temper.
 - 1. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.

2.8 PVC PIPE AND FITTINGS (NOT USED ABOVEGROUND)

- A. Solid Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.
 - 1. PVC Socket Fittings: ASTM D 2665, socket type, made to ASTM D 3311, drain, waste, and vent patterns.

2.9 SPECIAL PIPE FITTINGS

- A. Flexible, Non-pressure Pipe Couplings: Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition pattern. Include shear ring, ends of same sizes as piping to be joined, and corrosion resistant metal tension band and tightening mechanism on each end.
 - 1. Manufacturers:
 - a. Dallas Specialty & Mfg. Company
 - b. Fernco, Inc.
 - c. Logan Clay Products Company (The)
 - d. Mission Rubber Company
 - e. NDS, Inc.

2. Sleeve Materials:
 - a. For Cast iron Soil Pipes: ASTM C 564, rubber.
 - b. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
 - c. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
- B. Shielded Non-pressure Pipe Couplings: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
 1. Manufacturers:
 - a. Cascade Waterworks Mfg. Company
 - b. Mission Rubber Company
- C. Rigid, Unshielded, Non-pressure Pipe Couplings: ASTM C 1461, sleeve-type reducing- or transition-type mechanical coupling molded from ASTM C 1440, TPE material with corrosion-resistant-metal tension band and tightening mechanism on each end.
 1. Manufacturers:
 - a. **ANACO**
- D. Pressure Pipe Couplings: AWWA C219 metal, sleeve-type same size as, with pressure rating at least equal to, and ends compatible with, pipes to be joined.
 1. Manufacturers:
 - a. Cascade Waterworks Mfg. Company
 - b. Dresser, Inc.; DMD Division
 - c. EBAA Iron Sales, Inc.
 - d. Ford Meter Box Company, Inc. (The); Pipe Products Division
 - e. JCM Industries, Inc.
 - f. Romac Industries, Inc.
 - g. Smith-Blair, Inc.
 - h. Viking Johnson
 2. Center-Sleeve Material: Manufacturer's standard.
 3. Gasket Material: Natural or synthetic rubber.
 4. Metal Component Finish: Corrosion-resistant coating or material.
- E. Flexible Ball Joints: Ductile iron fitting with combination of flanged and mechanical-joint ends complying with AWWA C110 or AWWA C153. Include gasketed ball-joint section and ductile iron gland, rubber gasket, and steel bolts.
 1. Manufacturers:
 - a. EBAA Iron Sales, Inc.

- F. Expansion Joints: Two or three-piece, ductile iron assembly consisting of telescoping sleeve(s) with gaskets and restrained-type, ductile iron, bell-and-spigot end sections complying with AWWA C110 or AWWA C153. Select and assemble components for expansion indicated. Include AWWA C111, ductile iron glands, rubber gaskets, and steel bolts.
 - 1. Manufacturers:
 - a. EBAA Iron Sales, Inc.
 - b. Romac Industries, Inc.
 - c. Star Pipe Products; Star Fittings Division
- G. Wall Penetration Fittings: Compound, ductile iron coupling fitting with sleeve and flexing sections for up to 20-degree deflection, gaskets, and restrained-joint ends complying with AWWA C110 or AWWA C153. Include AWWA C111, ductile iron glands, rubber gaskets, and steel bolts.
 - 1. Manufacturers:
 - a. SIGMA Corporation

2.10 **ENCASEMENT FOR UNDERGROUND METAL PIPING**

- A. Description: ASTM A 674 or AWWA C105, high-density, cross-laminated PE film of 0.004-inch or LLDPE film of 0.008-inch minimum thickness.
- B. Form: Sheet or tube.
- C. Color: Black or natural.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Refer to Division 31 Section 312000 "Earth Moving" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

- A. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.
- B. Aboveground, soil and waste piping NPS 4 (DN 100) and smaller shall be the following:
 - 1. Hubless cast iron soil pipe and fittings; heavy-duty shielded, stainless steel couplings; and hubless coupling joints.
 - 2. Copper DWV tube, copper drainage fittings, and soldered joints.
 - 3. Dissimilar Pipe Material Couplings: Shielded, Non-pressure pipe couplings for joining dissimilar pipe materials with small difference in OD.

- C. Aboveground, soil and waste piping NPS 5 (DN 125) and larger shall be the following:
 - 1. Hubless cast iron soil pipe and fittings; heavy-duty shielded, stainless steel couplings; and hubless coupling joints.
 - 2. Dissimilar Pipe-Material Couplings: Shielded, Non-pressure pipe couplings for joining dissimilar pipe materials with small difference in OD.
- D. Aboveground, vent piping NPS 4 (DN 100) and smaller shall be the following:
 - 1. Hubless cast iron soil pipe and fittings; heavy-duty shielded, stainless steel couplings; and hubless coupling joints.
 - 2. Copper DWV tube, copper drainage fittings, and soldered joints.
 - 3. Dissimilar Pipe-Material Couplings: Shielded, Non-pressure pipe couplings for joining dissimilar pipe materials with small difference in OD.
- E. Aboveground, vent piping NPS 5 (DN 125) and larger shall be the following:
 - 1. Hubless cast iron soil pipe and fittings; heavy-duty shielded, stainless steel couplings; and hubless coupling joints.
 - 2. Dissimilar Pipe Material Couplings: Shielded, Non-pressure pipe couplings for joining dissimilar pipe materials with small difference in OD.
- F. Underground buried within 5' of the building, soil, waste, and vent piping NPS 4 (DN 100) and smaller shall be the following:
 - 1. Service class, cast iron soil piping; gaskets; and gasketed joints.
 - 2. Solid wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
- G. Underground buried within 5' of the building, soil and waste piping NPS 5 (DN 125) and larger shall be the following:
 - 1. Service class, cast iron soil piping; gaskets; and gasketed joints.
 - 2. Solid-wall, Schedule 40, PVC pipe; PVC socket fittings; and solvent-cemented joints.

3.3 PIPING INSTALLATION

- A. Basic piping installation requirements are specified in Division 22 Section 220500 "Common Work Results for Plumbing."
- B. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.
- C. Install cleanout fitting with closure plug inside the building in sanitary force-main piping.
- D. Install underground, ductile iron, force-main piping according to AWWA C600. Install buried piping inside the building between wall and floor penetrations and connection to sanitary sewer piping outside the building with restrained joints. Anchor pipe to wall or floor. Install thrust-block supports at vertical and horizontal offsets.
 - 1. Install encasement on piping according to ASTM A 674 or AWWA C105.

- E. Install underground, ductile iron, special pipe fittings according to AWWA C600.
 - 1. Install encasement on piping according to ASTM A 674 or AWWA C105.
- F. Install cast iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 22 Section 220500 "Common Work Results for Plumbing."
- G. Install wall-penetration fitting at each service pipe penetration through foundation wall. Make installation watertight.
- H. Install cast iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Install encasement on underground piping according to ASTM A 674 or AWWA C105.
- I. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back-to-back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- J. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- K. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
 - 1. Building Sanitary Drain: Two percent downward in direction of flow for piping NPS 3 (DN 80) and smaller; 1 percent downward in direction of flow for piping NPS 4 (DN 100) and larger.
 - 2. Horizontal Sanitary Drainage Piping (2-1/2" and less): Two percent downward in direction of flow.
 - 3. Horizontal Sanitary Drainage Piping (3" and larger): One percent downward in direction of flow.
 - 4. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- L. Sleeves are not required for cast iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.
 - M. Install PVC soil and waste drainage and vent piping according to ASTM D 2665.
- N. Install underground PVC soil and waste drainage piping according to ASTM D 2321.
- O. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

3.4 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 22 Section 220500 "Common Work Results for Plumbing."
- B. Join hub-and-spigot, cast iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
- C. Join hubless cast iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless coupling joints.
- D. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.
- E. Grooved Joints: Assemble joint with keyed coupling, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.
- F. PVC Non-pressure Piping Joints: Join piping according to ASTM D 2665.
- G. Anchorage shall be provided to restrain drainage piping from axial movement.
 - 1. For pipe sizes greater than 4 inches, restraints shall be provided from drain pipes at all changes in direction and at all changes in diameter greater than two pipe sizes. Braces, blocks, rodding and other suitable methods as specified by the coupling manufacturer shall be utilized.

3.5 VALVE INSTALLATION

- A. General valve installation requirements are specified in Division 22 Section 220523 "General-Duty Valves for Plumbing Piping."
- B. Shutoff Valves: Install shutoff valve on each sewage pump discharge.
 - 1. Install gate or full-port ball valve for piping NPS 2 (DN 50) and smaller.
 - 2. Install gate valve for piping NPS 2-1/2 (DN 65) and larger.
- C. Check Valves: Install swing check valve, between pump and shutoff valve, on each sewage pump discharge.
- D. Backwater Valves: Install backwater valves in piping subject to sewage backflow.
 - 1. Horizontal Piping: Horizontal backwater valves.
 - 2. Floor Drains: Drain outlet backwater valves, unless drain has integral backwater valve.
 - 3. Install backwater valves in accessible locations.
 - 4. Backwater valve are specified in Division 22 Section 221319 "Sanitary Waste Piping Specialties."

3.6 HANGER AND SUPPORT INSTALLATION

- A. Pipe hangers and supports are specified in Division 22 Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

- B. Install the following:
1. Vertical Piping: MSS Type 8 or Type 42 clamps.
 2. Install individual, straight, horizontal piping runs according to the following:
 - a. 100 feet and less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer than 100 feet: MSS Type 43, adjustable roller hangers.
 - c. Longer than 100 feet if indicated: MSS Type 49, spring cushion rolls.
 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Install supports according to Division 22 Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.
- F. Install hangers for cast iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 60 inches with 3/8-inch rod.
 2. NPS 3 (DN 80): 60 inches with 1/2-inch rod.
 3. NPS 4 and NPS 5 (DN 100 and DN 125): 60 inches with 5/8-inch rod.
 4. NPS 6 (DN 150): 60 inches with 3/4-inch rod.
 5. NPS 8 to NPS 12 (DN 200 to DN 300): 60 inches with 7/8-inch rod.
- G. Install supports for vertical cast iron soil piping every 15 feet.
- H. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4 (DN 32): 84 inches with 3/8-inch rod.
 2. NPS 1-1/2 (DN 40): 108 inches with 3/8-inch rod.
 3. NPS 2 (DN 50): 10 feet with 3/8-inch rod.
 4. NPS 2-1/2 (DN 65): 11 feet with 1/2-inch rod.
 5. NPS 3 (DN 80): 12 feet with 1/2-inch rod.
 6. NPS 4 and NPS 5 (DN 100 and DN 125): 12 feet with 5/8-inch rod.
 7. NPS 6 (DN 150): 12 feet with 3/4-inch rod.
 8. NPS 8 to NPS 12 (DN 200 to DN 300): 12 feet with 7/8-inch rod.
- I. Install supports for vertical steel piping every 15 feet.
- J. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4 (DN 32): 72 inches with 3/8-inch rod.
 2. NPS 1-1/2 and NPS 2 (DN 40 and DN 50): 96 inches with 3/8-inch rod.
 3. NPS 2-1/2 (DN 65): 108 inches with 1/2-inch rod.
 4. NPS 3 to NPS 5 (DN 80 to DN 125): 10 feet with 1/2-inch rod.
 5. NPS 6 (DN 150): 10 feet with 5/8-inch rod.
 6. NPS 8 (DN 200): 10 feet with 3/4-inch rod.

- K. Install supports for vertical copper tubing every 10 feet.
- L. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.7 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect drainage and vent piping to the following:
 - 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
 - 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
 - 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
 - 4. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 (DN 65) and larger.

3.8 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
 - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Re-inspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for re-inspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
 - 1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 - 2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 - 3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.

4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.9 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION 221316

Family Recreational Area at Northview Heights, AMP-09

IFB#600-11-26 REBID

ADDENDUM

ATTACHMENT B

SPECIFICATION

SECTION 221319

SANITARY WASTE PIPING SPECIALTIES

SECTION 221319
SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following sanitary drainage piping specialties:

- 1. Cleanouts.
- 2. Floor drains.
- 3. Roof flashing assemblies.
- 4. Through penetration firestop assemblies.
- 5. Miscellaneous sanitary drainage piping specialties.
- 6. Flashing materials.
- 7. Fresh Air Inlets

- B. ABS: Acrylonitrile-butadiene-styrene plastic.

- C. FRP: Fiberglass reinforced plastic.

- D. HDPE: High-density polyethylene plastic.

- E. PE: Polyethylene plastic.

- F. PP: Polypropylene plastic.

- G. PVC: Polyvinyl chloride plastic.

1.3 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details for frost resistant vent terminals.

- 1. Wiring Diagrams: Power, signal, and control wiring.

- B. Field quality control test reports.

- C. Operation and Maintenance Data: For drainage piping specialties to include in emergency, operation, and maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic sanitary piping specialty components.

1.5 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Coordinate size and location of roof penetrations.

PART 2 - PRODUCTS

2.1 CLEANOUTS

A. Exposed Metal Cleanouts

- 1. Manufacturers - subject to compliance with requirements, provide products by one of the following:
 - a. Josam Company; Josam Division
 - b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - c. Tyler Pipe; Wade Division
 - d. Watts Drainage Products Inc.
 - e. Zurn Plumbing Products Group; Specification Drainage Operation.
- 2. Standard: ASME A112.36.2M for cast iron for cleanout test tee.
- 3. Size: Same as connected drainage piping
- 4. Body Material: Hubless, cast iron soil pipe test tee as required to match connected piping.
- 5. Closure: plastic plug.
- 6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
- 7. Closure: Stainless steel plug with seal.

B. Exposed Exterior Surfaced Area Cleanouts

- 1. Manufacturers - subject to compliance with requirements, provide products by one of the following:
 - a. Josam Company; Josam Division
 - b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - c. Tyler Pipe; Wade Division
 - d. Watts Drainage Products Inc.
 - e. Zurn Plumbing Products Group; Specification Drainage Operation.
- 2. Standard: ASME A112.36.2M for cast iron for cleanout test tee.
- 3. Size: Same as connected drainage piping

4. Body Material: Hubless, cast iron soil pipe test tee as required to match connected piping.
5. Closure: cast iron plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Closure: Stainless steel plug with seal.
8. Model: ZN-1400-HD manufactured by Zurn.

C. Exposed Exterior Un-Surfaced Area Cleanouts

1. Manufacturers - subject to compliance with requirements, provide products by one of the following:
 - a. Josam Company; Josam Division
 - b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - c. Tyler Pipe; Wade Division
 - d. Watts Drainage Products Inc.
 - e. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M for cast iron for cleanout test tee.
3. Size: Same as connected drainage piping
4. Body Material: Hubless, cast iron soil pipe test tee as required to match connected piping.
5. Closure: cast iron plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Closure: Stainless steel plug with seal.
8. Model: Z-1474 manufactured by Zurn.

D. Metal Floor Cleanouts

1. Manufacturers - subject to compliance with requirements, provide products by one of the following:
 - a. Josam Company; Josam Division
 - b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - c. Tyler Pipe; Wade Division
 - d. Watts Drainage Products Inc.
 - e. Zurn Plumbing Products Group; Light Commercial Operation.
 - f. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M for adjustable housing cleanout.
3. Size: Same as connected branch.
4. Type: Adjustable housing.
5. Body or Ferrule: Cast iron.
6. Clamping Device: Required.
7. Outlet Connection: Inside calk.
8. Closure: Plastic plug.
9. Adjustable Housing Material: Cast iron.
10. Frame and Cover Material and Finish: Polished nickel bronze.
11. Frame and Cover Shape: Round.
12. Top Loading Classification: Medium Duty.
13. Riser: ASTM A 74, Service class, cast iron drainage pipe fitting and riser to cleanout.
14. Standard: ASME A112.3.1.
15. Size: Same as connected branch.

16. Housing: Stainless steel.
17. Closure: Stainless steel with seal.
18. Riser: Stainless steel drainage pipe fitting to cleanout.
19. Model: ZN-1400 manufactured by Zurn.

E. Cast Iron Wall Cleanouts

1. Manufacturers - subject to compliance with requirements, provide products by one of the following:
 - a. Josam Company; Josam Division
 - b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - c. Tyler Pipe; Wade Division
 - d. Watts Drainage Products Inc.
 - e. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.
4. Body: Hubless, cast iron soil pipe test tee as required to match connected piping.
5. Closure: drilled-and-threaded plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Wall Access: Round, flat, chrome plated brass or stainless steel cover plate with screw.
8. Wall Access: Round stainless steel wall installation frame and cover.

2.2 FLOOR DRAINS

A. Cast Iron Floor Drains

1. Manufacturers - subject to compliance with requirements, provide products by one of the following:
 - a. Josam Company; Josam Division
 - b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
 - c. Tyler Pipe; Wade Division
 - d. Watts Drainage Products Inc.
 - e. Zurn Plumbing Products Group; Light Commercial Operation.
 - f. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Floor Drain (FD-1):
 - a. Standard: ASME A112.6.3.
 - b. Pattern: Floor drain.
 - c. Body Material: Gray iron.
 - d. Seepage Flange: Required.
 - e. Anchor Flange: Required.
 - f. Clamping Device: Required.
 - g. Outlet: Bottom.
 - h. Backwater Valve: Not required.
 - i. Coating on Interior and Exposed Exterior Surfaces: Acid-resistant epoxy.
 - j. Sediment Bucket: Required.
 - k. Top or Strainer Material: Nickel bronze.
 - l. Top of Body and Strainer Finish: Durra-Coated Cast Iron.

- m. Top Shape: Round.
- n. Top Loading Classification: Medium Duty.
- o. Funnel: Not required.
- p. Trap Material: Cast iron.
- q. Trap Pattern: Standard P-trap.
- r. Trap Features: Trap-seal primer valve drain connection, where required.
- s. Model: ZN-415-6-B-Y-AR manufactured by Zurn.

3. Floor Drain (FD-2):

- a. Standard: ASME A112.6.3.
- b. Pattern: Floor drain.
- c. Body Material: Gray iron.
- d. Seepage Flange: Required.
- e. Anchor Flange: Required.
- f. Clamping Device: Required.
- g. Outlet: Bottom.
- h. Backwater Valve: Not required.
- i. Coating on Interior and Exposed Exterior Surfaces: Acid-resistant epoxy.
- j. Sediment Bucket: Required.
- k. Top or Strainer Material: Nickel bronze with raised lip set flush with floor.
- l. Top of Body and Strainer Finish: Durra-Coated Cast Iron.
- m. Top Shape: Round.
- n. Top Loading Classification: Medium Duty.
- o. Funnel: Not required.
- p. Trap Material: Cast iron.
- q. Trap Pattern: Standard P-trap.
- r. Trap Features: Trap-seal primer valve drain connection, where required.
- s. Model: ZN-415-7I-Y-AR manufactured by Zurn.

2.3 ROOF FLASHING ASSEMBLIES

A. Roof Flashing Assemblies

1. Manufacturers - subject to compliance with requirements, provide products by one of the following:

- a. Acorn Engineering Company; Elmdor/Stoneman Division
- b. Thaler Metal Industries Ltd.

- B. Description: Manufactured assembly made of 6.0-lb/sq. ft., 0.0938-inch thick, flashing collar and skirt extending at least 8 inches from pipe, with galvanized steel boot reinforcement and counterflashing fitting.

- 1. Open-Top Vent Cap: Without cap.
- 2. Low-Silhouette Vent Cap: With vandal proof vent cap.
- 3. Extended Vent Cap: With field installed, vandal proof vent cap.

2.4 THROUGH PENETRATION FIRESTOP ASSEMBLIES

A. Through penetration Firestop Assemblies

1. Manufacturers - subject to compliance with requirements, provide products by one of the following:
 - a. ProSet Systems Inc.
2. Standard: UL 1479 assembly of sleeve and stack fitting with firestopping plug.
3. Size: Same as connected soil, waste, or vent stack.
4. Sleeve: Molded PVC plastic, of length to match slab thickness and with integral nailing flange on one end for installation in cast-in-place concrete slabs.
5. Stack Fitting: ASTM A 48/A 48M, gray iron, hubless-pattern, wye branch with neoprene O-ring at base and gray iron plug in thermal-release harness. Include PVC protective cap for plug.
6. Special Coating: Corrosion resistant on interior of fittings.

2.5 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Open Drains

1. Description: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast iron, soil-pipe fittings. Include P-trap, hub-and-spigot riser section; and where required, increaser fitting joined with ASTM C 564, rubber gaskets.
2. Size: Same as connected waste piping.

B. Deep Seal Traps

1. Description: Cast iron or bronze casting, with inlet and outlet matching connected piping and cleanout trap-seal primer valve connection.
2. Size: Same as connected waste piping.
 - a. NPS 2 (DN 50): 4-inch minimum water seal.
 - b. NPS 2-1/2 (DN 65) and Larger: 5-inch minimum water seal.

C. Floor Drain, Trap-Seal Primer Fittings

1. Description: Cast iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.
2. Size: Same as floor drain outlet with NPS 1/2 (DN 15) side inlet.

D. Air Gap Fittings

1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
2. Body: Bronze or cast iron.
3. Inlet: Opening in top of body.
4. Outlet: Larger than inlet.
5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

Sleeve Flashing Device

1. Description: Manufactured, cast iron fitting, with clamping device that forms sleeve for pipe floor penetrations of floor membrane. Include galvanized steel pipe extension in top of fitting that will extend 1 inch above finished floor and galvanized-steel pipe extension in bottom of fitting that will extend through floor slab.
2. Size: As required for close fit to riser or stack piping.

F. Stack Flashing Fittings

1. Description: Counterflashing-type, cast iron fitting, with bottom recess for terminating roof membrane, and with threaded or hub top for extending vent pipe.
2. Size: Same as connected stack vent or vent stack.

G. Vent Caps

1. Description: Cast iron body with threaded or hub inlet and vandal proof design. Include vented hood and setscrews to secure to vent pipe.
2. Size: Same as connected stack vent or vent stack.

H. Frost-Resistant Vent Terminals

1. Description: Manufactured or shop-fabricated assembly constructed of copper or galvanized steel.
2. Design: To provide 1-inch enclosed air space between outside of pipe and inside of flashing collar extension, with counterflashing.

I. Expansion Joints

1. Standard: ASME A112.21.2M.
2. Body: Cast iron with bronze sleeve, packing, and gland.
3. End Connections: Matching connected piping.
4. Size: Same as connected soil, waste, or vent piping.

J. Vent Caps

1. Description: FAI-1, wall type, round chrome plated nickel bronze, crowned and perforated, with 4 point locking device. Model: Z-1471-CP manufactured by Zurn.
2. Description: FAI-2, wall type, round chrome plated nickel bronze with securing cover, 4 inch pipe size, female threaded connection. Model: Z-1472-CP manufactured by Zurn.

2.6 FLASHING MATERIALS

A. Copper Sheet: ASTM B 152/B 152M, of the following minimum weights and thicknesses, unless otherwise indicated:

1. General Applications: 12 oz./sq. ft.
2. Vent Pipe Flashing: 8 oz./sq. ft.

B. Zinc-Coated Steel Sheet: ASTM A 653/A 653M, with 0.20 percent copper content and 0.04-inch minimum thickness, unless otherwise indicated. Include G90 (Z275) hot-dip galvanized, mill-phosphatized finish for painting if indicated.

- C. Elastic Membrane Sheet: ASTM D 4068, flexible, chlorinated polyethylene, 40-mil minimum thickness.
- D. Fasteners: Metal compatible with material and substrate being fastened.
- E. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation matching or compatible with material being installed.
- F. Solder: ASTM B 32, lead-free alloy.
- G. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refer to Division 22 Section 220500 "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.
- B. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
 - 1. Size same as drainage piping up to NPS 4 (DN 100). Use NPS 4 (DN 100) for larger drainage piping unless larger cleanout is indicated.
 - 2. Locate at each change in direction of piping greater than 45 degrees.
 - 3. Locate at minimum intervals of 50 feet for piping NPS 4 (DN 100) and smaller and 100 feet for larger piping.
 - 4. Locate at base of each vertical soil and waste stack.
- C. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- D. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.
- E. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
 - 1. Position floor drains for easy access and maintenance.
 - 2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
 - a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
 - b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
 - c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.
 - 3. Install floor drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
 - 4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.

- F. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof.
- G. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof.
- H. Install through penetration firestop assemblies in plastic conductors and stacks at floor penetrations.
- I. Install deep-seal traps on floor drains and other waste outlets, if indicated.
- J. Install floor drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.
 - 1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
 - 2. Size: Same as floor drain inlet.
- K. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.
- L. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.
- M. Install vent caps on each vent pipe passing through roof.
- N. Install frost-resistant vent terminals on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.
- O. Install expansion joints on vertical stacks and conductors. Position expansion joints for easy access and maintenance.
- P. Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.
- Q. Install wood-blocking reinforcement for wall mounting type specialties.
- R. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.
- S. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment to allow service and maintenance.
- C. Ground equipment according to Division 26 Section 260526 "Grounding and Bonding for Electrical Systems."
- D. Connect wiring according to Division 26 Section 260519 "Low Voltage Electrical Power Conductors and Cables."

3.3 FLASHING INSTALLATION

- A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:
 - 1. Copper Sheets: Solder joints of copper sheets.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
 - 1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
 - 2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
 - 3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.
- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.
- E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Division 07 Section "Sheet Metal Flashing and Trim."
- F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast iron sleeve having calking recess.
- G. Fabricate and install flashing and pans, sumps, and other drainage shapes.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
- B. Tests and Inspections:
 - 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.5 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221319

Family Recreational Area at Northview Heights, AMP-09

IFB#600-11-26 REBID

ADDENDUM

ATTACHMENT C

SPECIFICATION

SECTION 224000

PLUMBING FIXTURES

SECTION 224000
PLUMBING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following conventional plumbing fixtures and related components:
1. Water closets (Including flushometers, toilet seats and fixture supports).
 2. Urinals (Including flushometers and fixture supports).
 3. Lavatories (Including faucets, fixture supports, thermostatic mixing valves, and protective shielding guards).
 4. Mop basins (Including faucets and accessories).
- B. Products furnished for this project shall be "LEAD FREE" as required by Federal legislation passed on January 4, 2011. This entails the wetted surfaces of plumbing fixtures, equipment, valves, etc. described in this section to have a weighted-average lead content of no more than 0.25% when used in applications intended to convey or dispense water for human consumption through drinking or cooking.
- C. Related Sections include the following:
1. Division 10 Section "Toilet, Bath, and Laundry Accessories."
 2. Division 22 Section 221119 "Domestic Water Piping Specialties" for backflow preventers and specialty fixtures not included in this Section.
 3. Division 22 Section 224700 "Drinking Fountains and Water Coolers."

1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.
- C. Cast Polymer: Cast filled polymer plastic material. This material includes cultured-marble and solid-surface materials.
- D. Cultured Marble: Cast filled polymer plastic material with surface coating.
- E. Fitting: Device that controls the flow of water into or out of the plumbing fixture. Fittings specified in this Section include supplies and stops, faucets and spouts, shower heads and tub spouts, drains and tailpieces, and traps and waste pipes. Piping and general-duty valves are included where indicated.

- F. FRP: Fiberglass reinforced plastic.
- G. PMMA: Polymethyl methacrylate (acrylic) plastic.
- H. PVC: Polyvinyl chloride plastic.
- I. Solid Surface: Nonporous, homogeneous, cast polymer plastic material with heat, impact, scratch, and stain resistance qualities.

1.4 SUBMITTALS

- A. Product Data: For each type of plumbing fixture indicated. Include selected fixture and trim, fittings, accessories, appliances, appurtenances, equipment, and supports. Indicate materials and finishes, dimensions, construction details, and flow control rates.
- B. Shop Drawings: Diagram power, signal, and control wiring.
- C. Operation and Maintenance Data: For plumbing fixtures to include in emergency, operation, and maintenance manuals.
- D. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain plumbing fixtures, faucets, and other components of each category through one source from a single manufacturer.
 - 1. Exception: If fixtures, faucets, or other components are not available from a single manufacturer, obtain similar products from other manufacturers specified for that category.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities" for plumbing fixtures for people with disabilities.
- D. Regulatory Requirements: Comply with requirements in Public Law 102-486, "Energy Policy Act," about water flow and consumption rates for plumbing fixtures.
- E. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- F. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.
- G. Comply with the following applicable standards and other requirements specified for plumbing fixtures:
 - 1. Enameled, Cast iron Fixtures: ASME A112.19.1M.
 - 2. Plastic Mop Service Basins: ANSI Z124.6.

3. Vitreous China Fixtures: ASME A112.19.2M.
 4. Water closet, Flush Valve, Tank Trim: ASME A112.19.5.
- H. Comply with the following applicable standards and other requirements specified for lavatory and sink faucets:
1. Backflow Protection Devices for Faucets with Side Spray: ASME A112.18.3M.
 2. Backflow Protection Devices for Faucets with Hose thread Outlet: ASME A112.18.3M.
 3. Diverter Valves for Faucets with Hose Spray: ASSE 1025.
 4. Faucets: ASME A112.18.1.
 5. Hose connection Vacuum Breakers: ASSE 1011.
 6. Hose coupling Threads: ASME B1.20.7.
 7. Integral, Atmospheric Vacuum Breakers: ASSE 1001.
 8. NSF Potable water Materials: NSF 61.
 9. Pipe Threads: ASME B1.20.1.
 10. Supply Fittings: ASME A112.18.1.
 11. Brass Waste Fittings: ASME A112.18.2.
- I. Comply with the following applicable standards and other requirements specified for miscellaneous fittings:
1. Atmospheric Vacuum Breakers: ASSE 1001.
 2. Brass and Copper Supplies: ASME A112.18.1.
 3. Dishwasher Air Gap Fittings: ASSE 1021.
 4. Manual Operation Flushometers: ASSE 1037.
 5. Plastic Tubular Fittings: ASTM F 409.
 6. Brass Waste Fittings: ASME A112.18.2.
 7. Sensor Operation Flushometers: ASSE 1037 and UL 1951.
- J. Comply with the following applicable standards and other requirements specified for miscellaneous components:
1. Flexible Water Connectors: ASME A112.18.6.
 2. Floor Drains: ASME A112.6.3.
 3. Grab Bars: ASTM F 446.
 4. Hose coupling Threads: ASME B1.20.7.
 5. Hot Water Dispensers: ASSE 1023 and UL 499.
 6. Off Floor Fixture Supports: ASME A112.6.1M.
 7. Pipe Threads: ASME B1.20.1.
 8. Plastic Shower Receptors: ANSI Z124.2.
 9. Plastic Toilet Seats: ANSI Z124.5.
 10. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.6 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Faucet Washers and O-Rings: Equal to 10 percent of amount of each type and size installed.
 2. Faucet Cartridges and O-Rings: Equal to 5 percent of amount of each type and size installed.
 3. Flushometer Valve, Repair Kits: Equal to 10 percent of amount of each type installed, but no fewer than 12 of each type.

4. Provide hinged-top wood or metal box, or individual metal boxes, with separate compartments for each type and size of extra materials listed above.
5. Flushometer Tank, Repair Kits: Equal to 5 percent of amount of each type installed, but no fewer than 2 of each type.
6. Toilet Seats: Equal to 5 percent of amount of each type installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by the list of acceptable manufacturers listed below.
- B. Acceptable Manufacturers - Vitreous China Fixtures
 1. American Standard Company, Inc.
 2. Kohler Company
 3. Sloan Valve Company
 4. Zurn Plumbing Products Group
- C. Acceptable Manufacturers - Fixture Trim
 1. American Standard Company, Inc.
 2. Chicago Faucet Company
 3. T & S Brass
- D. Acceptable Manufacturers - Flush Valves
 1. Moen Commercial, Inc.
 2. American Standard
 3. Sloan Valve Company
 4. Zurn Plumbing Products Group
- E. Acceptable Manufacturers - Water Closet Seats
 1. Beneke, Sanderson Plumbing Products Inc.
 2. Bemis Manufacturing Company
 3. Centoco Manufacturing
 4. Church, Bemis Manufacturing Company
 5. Olsonite, Bemis Manufacturing Company
- F. Acceptable Manufacturers - Fixture Carriers
 1. Josam Company
 2. Smith, Jay R. Manufacturing Company
 3. Tyler Pipe; Wade Division
 4. Watts Drainage Products Inc.
 5. Zurn Plumbing Products Group

G. Acceptable Manufacturers - ASSE 1070 Thermostatic Valves

1. Lawler Manufacturing Company, Inc.
2. Leonard Valve Company
3. Powers; a Watts Industries Company
4. Symmons Industries, Inc.
5. Watts Industries, Inc.
6. Zurn Plumbing Products Group

H. Acceptable Manufacturers - Mop Basins:

1. American Standard Company, Inc.
2. Fiat Products
3. Mustee, E.L & Sons, Inc.
4. Stern Williams Company, Inc.

2.2 WATER CLOSETS

A. Water Closet (WC-1) Floor Mounted, Flush Valve, Standard Height:

1. **Bowl:** ANSI A112.19.2; floor mounted siphon jet, vitreous china, elongated rim, 1-1/2-inch top inlet spud, bolt cap with retainers, Model 2234.001 “Madera FloWise” manufactured by American Standard.
2. **Flush Valve** (1.6 gpf - Manual): ANSI A112.18.1; exposed chrome plated, diaphragm type with oscillating, manual non-hold open handle, escutcheon, integral screwdriver stop and vacuum breaker, 1.6 gallons per flush; Model 111 “Royal” manufactured by Sloan Valve Company.
3. **Seat (Open):** Solid white plastic, open front, extended back, self-sustaining check hinges, stainless steel posts, without cover; Model 95SSCT manufactured by Olsonite.

B. Water Closet (WC-2) Floor Mounted, Flush Valve, ADA Height:

1. Bowl: ANSI A112.19.2; floor mounted siphon jet, vitreous china, elongated rim, 1-1/2-inch top inlet spud, bolt cap with retainers; Model 3043.001 “Madera FloWise” manufactured by American Standard.
2. Flush Valve (1.6 gpf - Manual): ANSI A112.18.1; exposed chrome plated, diaphragm type with ADA oscillating, manual non-hold open handle, escutcheon, integral screwdriver stop and vacuum breaker, handle height and operation to meet ADA requirements, 1.6 gallons per flush; Model 111 “Royal” manufactured by Sloan Valve Company.
3. Seat (Open): Solid white plastic, open front, extended back, self-sustaining check hinges, stainless steel posts, without cover; Model 95SSCT manufactured by Olsonite.

2.3 URINALS

A. Urinal (U-1) Wall hung, Flush Valve, ADA Height:

1. Urinal: ANSI A112.19.2; vitreous china, low consumption, wall hung washout urinal with shields, integral trap, 3/4-inch top spud, steel supporting wall hanger, mounted at ADA height; Model 6590.001 “Washbrook FloWise” manufactured by American Standard.

2. Flush Valve (1.0 gpf - Manual): ANSI A112.18.1; exposed chrome plated, diaphragm type with ADA oscillating, manual non-hold open handle, escutcheon, integral screwdriver stop and vacuum breaker, handle height and operation to meet ADA requirements, 1.0 gallons per flush; Model 186-1.0 "Royal" manufactured by Sloan Valve Company.
3. Wall Mounted Carrier: ANSI A112.6.1; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing studs; Model Z1222 manufactured by Zurn Plumbing Products Group.

2.4 LAVATORIES

A. Lavatory (L-1) Wall hung, Standard Height:

1. Basin: ANSI A112.19.2: vitreous china, wall hung lavatory, 20-inch x 18 inch minimum, 4-inch-high back, drilling on (4-inch centers), rectangular basin with splash lip, front overflow, mounted at standard height; Model 0355.012 (4" centers), "Lucerne" manufactured by American Standard.
2. Trim (0.5 gpm - manual with lever handles on 4" centers): ANSI A112.18.1; two handle, chrome plated center set faucet with conventional spout, lever handles on 4-inch centers, grid drain assembly with 1-1/4-inch tailpiece, washerless ceramic disc valve cartridges, 0.5 gpm vandal proof, non-aerating spray, chrome plated loose key angle stop valves and escutcheons, chrome plated 17-gauge brass P-trap with cleanout plug and arm with escutcheon. Model 802-VE2805ABCP manufactured by Chicago Faucet Company.
3. Thermostatic Mixing Valve: ASSE 1070 & 1017; brass body, brass and stainless steel internal components, dual stainless steel strainers and checks on inlet, temperature-response element, vandal resistant universal cap/temperature adjustment handle, lead free; Model 8210CK "Maxline" manufactured by Symmons.

B. Lavatory (L-2) Wall hung, ADA Height:

1. Basin: ANSI A112.19.2: vitreous china, wall hung lavatory, 20-inch x 18 inch minimum, 4-inch-high back, drilling on (4-inch centers), rectangular basin with splash lip, front overflow, mounted at ADA height; Model 0355.012 (4" centers) "Lucerne" manufactured by American Standard.
2. Trim (0.5 gpm - manual with lever handles on 4" centers): ANSI A112.18.1; two handle, chrome plated center set faucet with conventional spout, lever handles on 4-inch centers, grid drain assembly with 1-1/4-inch tailpiece, washerless ceramic disc valve cartridges, 0.5 gpm vandal proof, non-aerating spray, chrome plated loose key angle stop valves and escutcheons, chrome plated 17-gauge brass P-trap with cleanout plug and arm with escutcheon. Model 802-VE2805ABCP manufactured by Chicago Faucet Company.
3. Wall Mounted Carrier: ANSI A112.6.1; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded studs for fixture hanger, concealed arm supports, bearing plate and studs; Model Z1231 manufactured by Zurn Plumbing Products Group, Inc.
4. Thermostatic Mixing Valve: ASSE 1070 & 1017; brass body, brass and stainless steel internal components, dual stainless steel strainers and checks on inlet, temperature-response element, vandal resistant universal cap/temperature adjustment handle, lead free; Model 7-210-CK "Maxline" manufactured by Symmons.
5. Insulation Kit: Provide ADA conforming insulating wrap as manufactured by Truebro, Inc. or equivalent. Install p-traps as high as possible under the counter to lessen the visibility of the trap.

2.5 MOP BASINS

A. Mop Basin (MB-1):

1. Basin (Molded Stone): (24 x 24 x 10-inch-high white molded stone, floor mounted, with one-inch-wide shoulders, stainless steel strainer; Model MSB-(2424) manufactured by Fiat Products, Inc.
2. Trim: ANSI A112.18.1; exposed wall type supply lever handles, spout wall brace, vacuum breaker, hose end spout, eccentric adjustable inlets, integral screwdriver stops with covering caps and adjustable threaded wall flanges; Model 897-CRCF manufactured by Chicago Faucet Company. Provide 5 feet of ½ inch diameter plan end Reinforced Rubber Hose and Hose Bracket - Model 832-AA, Mop Hanger – Model 889-CC, Stainless Steel Bumper guard - Model E-88-AA, and stainless steel Wall Guard – Model MSG (2424) manufactured by Fiat Products, Inc.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before plumbing fixture installation.
- B. Examine cabinets, counters, floors, and walls for suitable conditions where fixtures will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Assemble plumbing fixtures, trim, fittings, and other components according to manufacturers' written instructions.
- B. Install off-floor supports, affixed to building substrate, for wall-mounting fixtures.
 1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
 2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
 3. Use chair-type carrier supports with rectangular steel uprights for accessible fixtures.
- C. Install back-outlet, wall-mounting fixtures onto waste fitting seals and attach to supports.
- D. Install floor mounting fixtures on closet flanges or other attachments to piping or building substrate.
- E. Install wall mounting fixtures with tubular waste piping attached to supports.
- F. Install floor mounting, back-outlet water closets attached to building floor substrate and wall bracket and onto waste fitting seals.
- G. Install fixtures level and plumb according to roughing-in drawings.

- H. Install water supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.
 - 1. Exception: Use ball, gate, or globe valves if supply stops are not specified with fixture. Valves are specified in Division 22 Section 220523 "General-Duty Valves for Plumbing Piping."
- I. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.
- J. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.
- K. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.
- L. Install toilet seats on water closets.
- M. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- N. Install water-supply flow-control fittings with specified flow rates in fixture supplies at stop valves.
- O. Install faucet flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- P. Install traps on fixture outlets.
 - 1. Exception: Omit trap on fixtures with integral traps.
 - 2. Exception: Omit trap on indirect wastes, unless otherwise indicated.
- Q. Install escutcheons at piping wall ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings. Escutcheons are specified in Division 22 Section 220500 "Common Work Results for Plumbing."
- R. Set service basins in leveling bed of cement grout. Grout is specified in Division 22 Section 220500 "Common Work Results for Plumbing."
- S. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Sealants are specified in Division 07 Section "Joint Sealants."

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

- C. Ground equipment according to Division 26 Section 260526 "Grounding and Bonding for Electrical Systems."
- D. Connect wiring according to Division 26 Section 260519 "Low Voltage Electrical Power Conductors and Cables."

3.4 **FIELD QUALITY CONTROL**

- A. Refer to architectural drawings for exact plumbing fixture locations, mounting heights and dimensions.
- B. Verify that installed plumbing fixtures are categories and types specified for locations where installed.
- C. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.
- D. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.
- E. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

3.5 **ADJUSTING**

- A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.
- B. Adjust water pressure at faucets and flushometer valves to produce proper flow and stream.
- C. Replace washers and seals of leaking and dripping faucets and stops.

3.6 **CLEANING**

- A. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials. Do the following:
 - 1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.
 - 2. Remove sediment and debris from drains.
- B. After completing installation of exposed, factory finished fixtures, faucets, and fittings, inspect exposed finishes and repair damaged finishes.

3.7 **PROTECTION**

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 224000

Family Recreational Area at Northview Heights, AMP-09

IFB#600-11-26 REBID

ADDENDUM

ATTACHMENT D

SPECIFICATION

SECTION 224700

DRINKING FOUNTAINS AND WATER COOLERS

SECTION 224700
DRINKING FOUNTAINS AND WATER COOLERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following electric water coolers and drinking fountains and related components:
 - 1. Drinking fountains
 - 2. Fixture supports
- B. Products furnished for this project shall be "LEAD FREE" as required by Federal legislation passed on January 4, 2011. This entails the wetted surfaces of plumbing fixtures, equipment, valves, etc. described in this section to have a weighted-average lead content of no more than 0.25% when used in applications intended to convey or dispense water for human consumption through drinking or cooking.

1.3 DEFINITIONS

- A. Accessible Electric Water Coolers and Drinking Fountains: Fixture that can be approached and used by people with disabilities.
- B. Cast Polymer: Dense, cast filled polymer plastic.
- C. Drinking Fountain: Fixture with nozzle for delivering stream of water for drinking.
- D. Fitting: Device that controls flow of water into or out of fixture.
- E. Fixture: Drinking fountain unless one is specifically indicated.

1.4 SUBMITTALS

- A. Product Data: For each fixture indicated. Include rated capacities, furnished specialties, and accessories.
- B. Operation and Maintenance Data: For fixtures to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities" and Public Law 101-336, "Americans with Disabilities Act"; for fixtures for people with disabilities.
- C. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- D. ARI Standard: Comply with ARI 1010, "Self-Contained, Mechanically Refrigerated Drinking-Water Coolers," for water coolers and with ARI's "Directory of Certified Drinking Water Coolers" for type and style classifications.
- E. ASHRAE Standard: Comply with ASHRAE 34, "Designation and Safety Classification of Refrigerants," for water coolers. Provide HFC 134a (tetrafluoroethane) refrigerant, unless otherwise indicated.

1.6 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Filter Cartridges: Equal to 50 percent of amount installed for each type and size indicated, but no fewer than 5 of each.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - REMOTE DRINKING FOUNTAINS

- A. Most Dependable Fountains
- B. Murdock
- C. Elkay

2.2 DRINKING FOUNTAINS

- A. Drinking Fountain (DF-1):
 - 1. (Double, round, bi-level, Standard & ADA Heights) Fountains: ARI 1010; one-piece welded construction 304 schedule 10 stainless steel, 18 gauge electro-polished stainless steel bowl, stainless steel anti-squirt head mounted with lock nut and washer to prevent tampering, mushroom style push bar, self-closing valve, oven baked powder coat, Model 440 SMFA manufactured by most Dependable Fountains. Color **Orange**

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for water and waste piping systems to verify actual locations of piping connections before fixture installation. Verify that sizes and locations of piping and types of supports match those indicated.
- B. Examine walls and floors for suitable conditions where fixtures are to be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

- A. Use mounting frames for recessed water coolers, unless otherwise indicated.
- B. Set freestanding and pedestal drinking fountains on floor.
- C. Set remote water coolers on floor, unless otherwise indicated.
- D. Use chrome plated brass or copper tube, fittings, and valves in locations exposed to view. Plain copper tube, fittings, and valves may be used in concealed locations.

3.3 INSTALLATION

- A. Install fixtures level and plumb. For fixtures indicated for children, install at height required by authorities having jurisdiction.
- B. Install water supply piping with shutoff valve on supply to each fixture to be connected to water distribution piping. Use ball, gate, or globe valve. Install valves in locations where they can be easily reached for operation. Valves are specified in Division 22 Section 220523 "General-Duty Valves for Plumbing Piping."
- C. Install trap and waste piping on drain outlet of each fixture to be connected to sanitary drainage system.

3.4 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- C. Ground equipment according to Division 26 Section 260526 "Grounding and Bonding for Electrical Systems."
- D. Connect wiring according to Division 26 Section 260519 "Low Voltage Electrical Power Conductors and Cables."

3.5 ADJUSTING

- A. Adjust fixture flow regulators for proper flow and stream height.

3.6 CLEANING

- A. After completing fixture installation, inspect unit. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.
- B. Clean fixtures, on completion of installation, according to manufacturer's written instructions.

END OF SECTION 224700