SECTION 22 13 00 FACILITY SANITARY SEWERAGE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Sanitary sewer piping buried within building.

2. Sanitary sewer piping above grade.

3. Floor drains.

4. Cleanouts.

5. Sewage ejectors.

6. **Laboratory waste neutralization system**

B. Related Sections:

1. Division 03 - Cast-In-Place Concrete: Execution requirements for placement of concrete specified by this section.

2. Division 07 - Firestopping: Product requirements for firestopping for placement by this section.

3. Division 08 - Access Doors and Frames: Product requirements for access doors for placement by this section.

4. Division 09 - Painting and Coating: Product and execution requirements for painting specified by this section.

5. Section 22 05 03 - Pipes and Tubes for Plumbing Piping and Equipment: Product and installation requirements for piping materials applying to various system types.

6. Section 22 05 13 - Common Motor Requirements for Plumbing Equipment: Product requirements for motors for placement by this section.

7. Section 22 05 16 - Expansion Fittings and Loops for Plumbing Piping: Execution requirements for pipe expansion devices for placement by this section.

8. Section 22 05 23 - General-Duty Valves for Plumbing Piping: Product requirements for valves for placement by this section.

9. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment: Product requirements for pipe hangers and supports and firestopping for placement by this section.

10. Section 22 05 48 - Noise and Vibration Controls for Plumbing Piping and Equipment: Product requirements for vibration isolators for placement by this section.

11. Section 22 05 53 - Identification for Plumbing Piping and Equipment: Product requirements for pipe identification for placement by this section.

12. Section 26 05 03 - Equipment Wiring Connections: Execution requirements for electric connections to equipment specified by this section.

13. Division 31 - Soils for Earthwork: Soils for backfill in trenches.

14. Division 31 - Aggregates for Earthwork: Aggregate for backfill in trenches.

15. Division 31 - Excavation: Product and execution requirements for excavation and backfill required by this section.

16. Division 31 - Trenching: Execution requirements for trenching required by this section.

17. Division 31 - Fill: Requirements for backfill to be placed by this section.

1.02 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME A112.21.1 - Floor Drains.

2. ASME B31.9 - Building Services Piping.

1.03 SUBMITTALS

A. Division 01- Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes for sewage-ejectors.

C. Product Data:

1. Piping: Submit data on pipe materials, fittings, and accessories. Submit manufacturers catalog information.

2. Valves: Submit manufacturers catalog information with valve data and ratings for each service.

3. Hangers and Supports: Submit manufacturers catalog information including load capacity.

4. Sanitary Drainage Specialties: Submit manufacturers catalog information, component sizes, rough-in requirements, service sizes, and finishes.

5. Pumps: Submit pump type, capacity, certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable. Include electrical characteristics and connection requirements.

D. Manufacturer's Installation Instructions: Submit installation instructions for material and equipment.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.04 CLOSEOUT SUBMITTALS

A. Division 01 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of equipment and clean-outs.

C. Operation and Maintenance Data: Submit frequency of treatment required for interceptors. Include, spare parts lists, exploded assembly views for pumps and equipment.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with IBC-NJ.

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience, and with sewage ejector service facilities within 50 miles of Project.

B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.07 DELIVERY, STORAGE AND HANDLING

A. Division 01 - Product Requirements: Product storage and handling requirements.

B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Division 01 - Product Requirements.

B. Do not install underground piping when bedding is wet or frozen.

1.09 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.10 WARRANTY

A. Division 01 - Execution and Closeout Requirements: Product warranties and product bonds.

B. Furnish five-year manufacturer warranty for sewage ejectors.

1.11 EXTRA MATERIALS

A. Division 01 - Execution and Closeout Requirements: Spare parts and maintenance products.

B. Furnish two (2) sets of pump seals.

PART 2 - PRODUCTS

2.01 FLOOR DRAINS

A. Manufacturers: Subject to requirements of the specification, provide the following manufacturer's products by one of the following or approved equal:

1. Jay R. Smith
2. Zurn
3. Josam
4. Substitutions: Division 01 - Product Requirements.

B. Refer to Schedule on Drawings.

2.02 CLEANOUTS

A. Manufacturers: Subject to requirements of the specification, provide the following manufacturer's products by one of the following or approved equal:

1. Jay R. Smith
2. Zurn
3. Josam
4. Substitutions: Division 01 - Product Requirements.

B. Exterior Surfaced Areas: Round cast nickel bronze access frame and non-skid cover.

C. Interior Finished Floor Areas: Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round scored cover with gasket in service areas and round depressed cover with gasket to accept floor finish in finished floor areas.

D. Interior Finished Wall Areas: Line type with lacquered cast iron body and round epoxy coated cover with gasket, and round stainless steel access cover secured with machine screw.

E. Interior Unfinished Accessible Areas: Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

2.03 SUBMERSIBLE SEWAGE EJECTORS

A. Manufacturers: Subject to requirements of the specification, provide the following manufacturer's products by one of the following or approved equal:

1. Weil

2. Federal

3. Zoeller

4. Substitutions: Division 01 - Product Requirements.

B. Type: Completely submersible, vertical, centrifugal.

C. Casing: Cast iron pump body and oil filled motor chamber.

D. Impeller: Bronze; open non-clog, stainless steel shaft.

E. Bearings: Ball bearings.

F. Pit: Cast-in-place concrete.

G. Sump: Concrete by General Contractor.

H. Accessories: Oil resistant 12 foot cord and plug with three-prong connector for connection to electric wiring system including grounding connector.

I. Servicing: Slide-away coupling consisting of discharge elbow secure to sump floor, movable bracket, guide pipe system, lifting chain and chain hooks.

J. Controls: Motor control panel containing across-the-line electric motor starters with ambient compensated quick trip overloads in each phase with manual trip button and reset button, circuit breaker or fused disconnect switch, control transformer, electro-mechanical alternator, hand-off-automatic selector switches, pilot lights, high water alarm pilot light, reset button and alarm horn. Furnish mercury switch liquid level controls, steel shell switch encased in polyurethane foam with cast iron weight for pump on each pump, pump off common, pump on, back-up pump on and alarm.

K. Performance: Indicated in Schedule on Drawings.

L. Electrical Characteristics and Components: Indicated in Schedule on Drawings. Provide all power and control wiring for a complete and operational system. Refer to electrical specifications for general wiring requirements.

## 2.04 LAB WASTE NEUTRALIZATION SYSTEM (CENTRALIZED AND DECENTRALIZED)

A. Acid chemical passive neutralization/dilution system shall include limestone treatment and manufactured by Orion Plastics, Inc., with single source responsibility for this entire system.

B. System shall be complete as shown on the drawings and per manufacturer's instructions and shall consist of the following:

1. Limestone Neutralization/Dilution Tank:

a. Tank shall be constructed of molded, seamless polypropylene and shall have necessary threaded inlet, outlet and vent connections with reinforced 1/2" thick bolted neoprene gasketed cover. Inlet to have internal elbow and dip tube. Tank shall be carefully filled with water and proper limestone chips by contractor, prior to job completion. 16" M.H. in cover, to be included.

2. Limestone Chips:

a. Contractor to supply proper limestone chips (1" to 3" diameter) containing at least 90% calcium carbonate and be a random mixture from 1" to 3" size, for Tanks.

b. Contractor shall furnish three (3) tank fillings total of limestone chips for Tanks (one for initial fill and two (2) more for additional fills, for maintenance purposes, given to Owner, for later use). Contractor shall fill Tanks with water first and gently put limestone into Tanks (as not to damage tank, top gasketing or fittings), up to the bottom (invert) of the outlet connection.

3. Warning/Maintenance Sign:

a. Where indicated on plans, provide a sign stenciled in black letters, 1" high. Sign shall read:

"IMPORTANT"
BASIN MUST BE INSPECTED FREQUENTLY AND
NEUTRALIZING AGENT REPLACED WHEN NECESSARY.
FAILURE TO DO SO MAY RESULT IN SERIOUS DAMAGE
TO THE PIPING SYSTEM

4. Start-up Training, Instruction & Calibration:

a. Provide the services of an authorized manufacturer's representative and/or factory-trained technician to check installation of equipment into operation and train local operation personnel in the maintenance and operation procedures. The amount of time required for this shall not exceed one business day's labor. Contractor shall install all equipment and components in accordance with Manufacturer's recommendation prior to this factory service.

5. **Polypropylene System Shut-Off Valve:**

   a. **Contractor to furnish and install one polypropylene manual shut-off valve to turn system off when too low or high pH readings occur, until the pH levels are brought back to acceptable. Valve shall be installed in pipeline in front of this system. Threaded PP ball valve to be installed for 4" and smaller drain lines. 6" and larger are butterfly valves.**

6. **Additional Items to be provided by installer:**

   a. **Contractor shall video tape startup instructional training and give copy to Owner's Representative.**

   b. **Start-up chemicals.**

   c. **Eyewash/shower station. Add emergency eyewash/shower station adjacent to the large tank.**

   d. **Interconnecting pipes, fittings and adapters.**

7. **O&M Manuals and Perishables:**

   a. **Manufacturer shall furnish operation and maintenance manuals to be given to contractor (for turning over to Owner), prior to system startup, training and calibration, which should take place when system is ready for operation by Owner.**

8. **Warranty and Insurance:**

   a. **Entire system shall include a one-year warranty on all components, except pH electrode.**

   b. **Manufacturer shall provide insurance certificate for equipment and system. Manufacturer shall show that this type of system is part of their standard products.**

9. **Sanitary Waste After System:**

   a. **The piping after this system shall include sanitary waste and vent piping by Plumbing Contractor.**

C. **Single neutralization tank under the laboratory shall be cap sink – Orion, side inlet/side outlet, 5-gallon capacity with limestone chips, bolted cover with access port and tank vent.**

PART 3 - EXECUTION

3.01 EXAMINATION

A. Division 01 - Administrative Requirements: Coordination and project conditions.

B. Verify excavations are to required grade, dry, and not over-excavated.

3.02 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.03 INSTALLATION - PUMPS

A. Provide pumps operating at specified system fluid temperatures without vapor binding and cavitation, non-overloading in parallel or individual operation, and operating within 25 percent of midpoint of published maximum efficiency curve.

B. Provide line sized gate valve and line sized soft seated check valve on each pump discharge.

C. Decrease from line size with long radius reducing elbows or reducers. Support piping adjacent to pump independently of pump casings. Install supports under elbows on pump discharge line sizes 2 inches and larger.

D. Check, align, and certify alignment of pumps prior to start-up.

3.04 **INSTALLATION – PIPING**

A. **All materials shall be new and installed in a first class manner.**

B. **All drainage piping shall be pitched at a minimum rate of 1/8 inch per foot in direction of flow unless otherwise required by Code or indicated. Branch connections to stack or main drains shall not be made in a manner which will permit backflow.**

C. **All vent piping shall be arranged to drain any condensate back to waste piping.**

D. **Nipples: Any piece of pipe 8 inch in length and less shall be considered a nipple. All nipples shall be of weight corresponding to fitting connected. Only shoulder nipples shall be used unless otherwise directed.**

Where indicated on the drawings, plugged outlets shall be left in drainage and vent piping for future fixtures.

3.05 FIELD QUALITY CONTROL

A. Division 01 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Test sanitary waste and vent piping system in accordance with IBC-NJ, NSPC and Authorities Having Jurisdiction.

END OF SECTION