

SECTION 11400

COMMUNITY ON-LOT DISPOSAL SYSTEMS

PART 1 - GENERAL

1.01 COMMENTARY

- A. The Authority recognizes that there are many types and designs of Community On-Lot Disposal Systems (COLDS). The Authority also is aware that costs of COLDS operation, maintenance, and replacement may be significant.
- B. Therefore, the Developer shall do or cause the following elements to be done:
 - 1. COLDS will be permitted for properties located outside the existing and five year sewer service areas as defined by the current Centre Region's Sewage Facilities Plan.
 - 2. Prior to design of a COLDS, the Developer shall discuss the proposed COLDS in detail with the Authority.
 - 3. Any COLDS design shall be of a type satisfactory to the Authority and the local Sewage Enforcement Officer (SEO), and shall meet all applicable requirements of DEP.
 - 4. The intent of the Authority is to standardize components used in COLDS applications.
 - 5. Since the installation of COLDS can disturb significant quantities of soil, all applicable Erosion & Sedimentation Control Standards must be maintained throughout construction.

1.02 SECTION INCLUDES

- A. Furnish all labor, materials, and equipment to install COLDS as shown on the Drawings and as specified herein. Work shall include but not be limited to:
 - 1. Excavation
 - 2. Component placement
 - 3. Control panels and wiring
 - 4. Piping
 - 5. Backfill

1.03 RELATED SECTIONS

- A. Section 01010 - Summary of Work
- B. Section 01039 - Coordination and Meetings
- C. Section 01300 - Submittals
- D. Section 01400 - Quality Control
- E. Section 01600 - Material and Equipment
- F. Section 01650 - Starting of Systems

- G. Section 01700 - Contract Closeout
- H. Section 02225 - Excavating, Backfilling and Compacting for Utilities
- I. Section 02600 - Utility Piping
- J. Section 02605 – Manholes
- K. Section 03300 - Cast-In-Place Concrete
- L. Appendix A - Standard and Special Construction Detailed Drawings

1.04 REFERENCES

- A. Commonwealth of Pennsylvania Code, Title 25 - Environmental Resources, Chapter 73 - Standards for Sewage Disposal Facilities
- B. Technical Manual for Sewage Enforcement Officers
- C. EPA 625/1-80-012 - Environmental Protection Agency Design Manual for Onsite Wastewater Treatment and Disposal Systems
- D. National Electric Company - N.E.C.
- E. National Electric Safety Code
- F. Standard and Special Construction Detailed Drawings Nos. 19, 20, 21, and 22 for General Schematics of Septic Tanks, Pump Tanks, Distribution Networks, and Elevated Sand Mounds.

1.05 SUBMITTALS

- A. Submit shop drawings/product data from manufacturers' descriptive literature and specifications for all materials used in this Section. Submit in accordance with Section 01300.
- B. Specific submittals will be included with each project as may be required for testing, warranties, project manuals, etc.

1.06 QUALITY ASSURANCE

- A. Qualifications of Workmen: Provide at least one person who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the design and application of work described for this Section, and who shall be present at all times during progress of the work of this Section and shall direct all work performed under this Section.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Community On-Lot Disposal Systems shall normally be designed using components as specified herein with no approved equals. This is done to improve inventory control (standardization), equipment familiarization, use of proven equipment, etc.
- B. Products listed are not all inclusive. Refer to applicable project drawings and specifications.

2.02 SEPTIC TANKS

- A. Septic tanks shall meet the requirements of Title 25, Chapter 73.31 of the Pennsylvania Code.
- B. Construction:

1. Tanks shall be watertight and constructed of sound and durable material not subject to excessive corrosion or decay.
 - a. Precast concrete tanks shall have a minimum wall thickness of 2-1/2 inches and be adequately reinforced.
 - b. Precast slabs used as covers shall have a thickness of at least 3 inches and be adequately reinforced.
 - c. Tanks having a liquid capacity of 5,000 gallons or less shall not be constructed of blocks, bricks, or similar masonry construction.
 - d. Tanks having a capacity in excess of 5,000 gallons may be constructed onsite to meet the standards of the National Concrete Masonry Association for reinforcement and waterproofing as listed in the publication "Concrete Masonry Foundation Walls", copyright 1957 NCMA.
 - e. Steel tanks shall meet United States Department of Commerce Standards 177-62.
 2. The depth of liquid in any tank or its compartments shall be:
 - a. Not less than 2 feet 6 inches nor more than 5 feet for tanks having a liquid capacity of 600 gallons or less.
 - b. Not less than 3 feet nor more than 7 feet for tanks having a liquid capacity of more than 600 gallons.
 3. No tank or compartment shall have an inside horizontal dimension less than 36 inches.
 4. Septic tanks shall have more than one compartment, with the first compartment having at least the same capacity as the second but not exceeding twice the capacity of the second. Tanks or compartments shall be connected in series and shall not exceed four in number in any one installation.
- C. Inlet and outlet connections:
1. The inlet invert shall be a minimum of 3 inches above the outlet invert.
 2. Inlet baffles or vented tees shall extend below the liquid level at least 6 inches. In no case should penetration of the inlet device exceed that of the outlet device.
 3. The outlet baffles or vented tees shall extend below the liquid surface to a distance equal to 40% of the liquid depth. Penetration of outlet baffles or tees in horizontal cylindrical tanks shall be equal to 35% of the liquid depth.
 4. The inlet and outlet baffles or vented tees shall extend above liquid depth to approximately 1 inch from the top of the tank. Venting shall be provided between compartments.
- D. Treatment tank access:
1. Access to each tank or compartment of the tank shall be provided by a watertight manhole consistent with Section 02605.
 2. The ground shall slope away from any access extended to grade level.
- E. Inspection port: A maximum 4-inch diameter inspection port with sealed cover shall be installed to grade level above the inlet tee.

2.03 AEROBIC TREATMENT TANKS

- A. Aerobic treatment tanks serving single family dwellings, or establishments, with flows of 1,500 gpd or less shall either:
 - 1. Bear the seal of the National Sanitation Foundation indicating testing and approval by that agency under Standard No. 40.
 - 2. Be tested and approved by an agency other than NSF using procedures equivalent to those of NSF Standard No. 40.
- B. Units tested and awarded a seal under other than the current standard shall be approved for use until expiration of the seal. Units initially submitted for testing or resubmitted for testing shall be approved under the version of Standard No. 40 in effect at that time.
- C. Aerobic treatment tanks serving establishments with flows exceeding 1,500 GPD shall be either:
 - 1. Have NSF certification under Criteria C-9.
 - 2. Have performance data certified by NSF under the provisions of that agency's Standard Performance Evaluation Method.
 - 3. Have performance data certified by a testing agency other than NSF using test procedures equivalent to that of NSF Criteria C-9 or Standard Performance Evaluation Method.
- D. Multiple aerobic treatment tanks connected for the purpose of achieving required hydraulic capacity shall only be permitted where such tanks are connected in parallel. All tanks shall have equal capacity and receive equal loading.
- E. Every aerobic sewage treatment tank shall be equipped with a visual and audible alarm system which shall be designed to respond to any electrical or mechanical failure or malfunction of the tank or any component thereof.

2.04 DOSING TANKS

- A. Dosing tanks shall be constructed to the following specifications:
 - 1. Dosing tanks shall be constructed of materials to the specifications outlined in Section 2.02.
 - 2. The dosing tank shall be designed so that the estimated daily flow shall be discharged to the absorption area in one or more doses. Minimum dose volume shall be five times the internal liquid capacity of the delivery pipe, manifold, and laterals, or 100 gallons, whichever is greater.
 - 3. The dosing tank shall have a minimum liquid capacity equal to four times the designed dose volume.
 - 4. Sufficient space shall be provided for electrical connections and proper pump control operation.
 - 5. All electrical connections shall be moisture resistant and located at the highest point of the dosing tank or manhole extension.
 - 6. A watertight manhole, at least 20 inches square or 24 inches in diameter, extended to grade, shall be provided for access to the dosing tank. Manhole covers shall meet the specifications of Section 2.03D.

2.05 PUMPS

- A. Goulds Pumps
- B. Flygt

2.06 ACCESS FRAMES AND COVERS

- A. These shall be manufactured by Halliday Products and be of aluminum and stainless steel materials.

2.07 CONTROL PANEL FOR DOSING TANKS

- A. All control panels utilized at dosing tanks in the University Area Joint Authority service area shall be supplied by the pump manufacturer to match the pump type used.
 - 1. Enclosure
 - a. Wall mounted NEMA 4 (Hoffman or ASCO only) painted steel electrical enclosure designed to accommodate the appropriate power requirements as approved for each application by the Authority.
 - b. The size of the enclosure shall not exceed a forty-eight (48) inch height or a thirty-six (36) inch width. Final size to be approved by the Authority.
 - c. The enclosure shall have a dead front, an interior door for control and indicator functions/displays, including stand-by power operation selector, and be equipped with padlock facilities.
 - d. The enclosure also shall include a Square D exterior mounted weatherproof 15A-115V GFI duplex receptacle, and an exterior mounted weatherproof Crouse Hinds - Arktite inlet fitting (Model M-72, Cat. No. AR 631, 60A for 240 1 phase) or a (Model M-54, Cat. No. APJ 10377, 100A for 480 3 phase) for a 3 pole/3 wire + ground generator connection, in the event stand-by power is required.

2.08 PIPE

- B. PVC Pipe, Section 02600.

2.09 VALVES

- A. Gate valves shall be used where applicable. Ball valves will be accepted in limited circumstances.
- B. Gate and check valves shall be as manufactured by Kennedy.

2.10 CEMENT CONCRETE

- A. Concrete shall meet the requirements of Section 03300, Cast-In-Place Concrete for Class AA.

2.11 MONITORING EQUIPMENT

- A. Monitoring of equipment shall be site specific as to method and scope, as required and approved by the Authority.

2.12 OTHER MATERIALS

- A. All other materials, not specifically described but required for proper and complete installation of the work of this Section, shall be selected by the Contractor subject to the approval of the Authority.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine the areas and conditions under which Work of this Section will be installed. Correct conditions detrimental to proper and timely completion of the Work. Do not proceed until unsatisfactory conditions of site have been corrected.

3.02 INSTALLATION

- A. Install equipment with skilled labor in accordance with manufacturer's instructions and details as shown on the Drawings.
- B. All pre-cast or cast-in-place sections/pads shall be placed on a minimum six (6) inch depth of AASHTO No. 57 aggregate. The subgrade for the aggregate shall be properly compacted to requirements of Section 02225.
- C. Install piping using specified materials.
- D. Equipment installed shall be inspected, adjusted, approved and certified satisfactory by the manufacturer. Provide certification(s) that equipment is ready for operation.

3.03 BACKFILL AND COMPACTION

- A. Backfill around piping and enclosure shall be as detailed in Section 02225 or as specifically shown on project Drawings.
- B. Compaction shall meet the requirements of Section 02225.

3.04 OPERATION

- A. The pumps shall be controlled automatically by float switches located in the wet well. The lead pump will start automatically when the liquid level reaches the "Lead Pump" float switch level and shall continue to operate, through a holding circuit, until the liquid level drops below the "Pump Stop" float switch level. Should the liquid level continue to rise above the "Lead Pump" float switch level, and reaches the "Lag Pump" float switch level, the lag pump will start and operate in parallel with the lead pump until the liquid level drops below the "Pump Stop" float switch level. In normal operation, the lead and lag pumps shall automatically alternate after each pumping cycle has been completed.
- B. At the discretion of the Authority, a high liquid level relay with dry contacts shall be energized for a remote alarm, such as a red blinking light mounted on the exterior of the enclosure for purposes of visual notification, should the liquid level continue to rise above the "Lag Pump" float switch level and reaches the "High Level Alarm" float switch level.
- C. Contractor shall fulfill the requirements of Section 01650 - Starting of Systems.

3.05 TESTING

- A. All piping shall be tested in accordance with Section 02600.

END OF SECTION