
GENERAL

SECTION 1. INTRODUCTION

Amity Township has prepared these Standard Specifications to provide the public within the Township's service area with the requirements to apply for access to the Township's system.

SECTION 2. DEFINITIONS

Allowable Industrial Waste: Any solid, liquid, or gaseous substance, water-borne waste or form of energy ejected or escaping from any industrial, manufacturing, trade, or business process or from the development, recovery, or processing of natural resources, as distinct from sanitary sewage, which complies with all provisions of the most current Amity Township Sewer Use Ordinance and which is allowed to be discharged into the sewer system by Amity Township, Berks County, Pennsylvania, or allowable by the Standard Specifications of Amity Township.

Basement: That part of a building which is wholly below ground level.

Building Sewer or Lateral: The extension of the building drain from the curb line or property line to the public sewer or other place of disposal.

Connection: The jointure, or the process of making the jointure, of one Sewer Line to another.

Developer: An individual, group of individuals, corporation, or agency vested with ownership, legal or equitable, sole or partial, of any property situated in the service area of the Township.

Force Main: A pipe that delivers wastewater, under pressure, discharged from a pump station to its destination at a point of gravity flow downstream, or at a treatment plant.

Gravity Sewer Main: A collection pipe, to which Lateral or Building Sewers are connected, which delivers wastewater, by gravity, to a point of discharge downstream.

Improved Property: Any property within the service area upon which there is erected a structure intended for continuous or periodic habitation, occupancy, or use by human beings or animals and from which structure sanitary sewage and/or industrial wastes shall be or may be discharged.

Industrial Waste: Any liquid or gaseous substance, whether or not solids are contained therein, discharged from any industrial establishment during the course of any industrial, manufacturing, trade, or business process or in the course of the development, recovery, or processing of natural resources, as distinct from sanitary sewage.

Lateral or Building Sewer: The extension of the building drain from the curb line or property line to the public sewer or other place of disposal.

Owner: Amity Township.

Person: Any individual, industrial, partnership, co-partnership, firm, company, corporation, association, joint stock company, trust, estate, governmental entity or any other legal entity, or their legal representatives, agents, or assigns. The masculine gender shall include the feminine, and the singular shall include the plural where indicated by the context.

Plumbing Fixture: Any receptacle intended to receive and discharge any liquid, water, or water carried waste into a Building Sewer.

Right-of-Way: A public way including Streets and sanitary sewer easements.

Sanitary Engineer: An engineer retained or employed by the Township, including any authorized member of the staff of such engineer.

Sanitary Facilities: Toilets, sinks, and other Plumbing Fixtures and related piping intended to receive and discharge Sanitary Sewage into a Building Sewer or Lateral.

Sanitary Sewage: The normal water-carried household and toilet waste from any Improved Property, excluding, however, the effluent from septic tanks or cesspools, rain, storm and ground water, as well as roof or surface water drainage or percolating or seeping waters, or accumulation thereof, whether underground or in cellars or basements.

Sanitary Sewer: Any pipe or conduit constituting a part of the sewer system, or usable for sewage collection purposes.

Service Line: That part of the Sewer Line connecting to the Building Sewer or Lateral at the curb line or property line and extending to and connecting to an Improved Property.

Sewage Treatment Plant: Devices and/or structures or facilities owned by the Township for the treatment and disposal of Sanitary Sewage and Industrial Waste.

Sewer Line: Any pipe or conduit constituting a part of the Sewer System and used or usable for sewage collection or transportation purposes, including Sewer Mains, Lateral Sewers, Service Lines, and Building Sewers.

Sewer Main: Any pipe which collects and transports wastewater from Lateral or Building Sewers to the Township's Sewage Treatment Plant.

Sewer System: Sewer Mains, Lateral Sewers from a Sewer Main to the Service Line, pumping stations, sewer Force Mains, Sewage Treatment Plants, and all appurtenant facilities operated by Amity Township in furnishing sewage service.

Storm Sewer or Storm Drain: A pipe or conduit which carries storm, surface water, drainage, and certain industrial water discharges, such as cooling and air conditioning waters.

Street: A public way including any highway, street, road, lane, court, public square, alley, or other passageway.

Tenant: Any Person in possession of a whole or a part of an Improved Property, who is not an owner.

Township: Amity Township, or in appropriate cases, acting by and through its authorized representatives.

Township Representative: An authorized agent of the Township who may be the Township Solicitor, Sanitary Engineer, or an employee of the Township, representing or acting on legal issues, or being responsible for construction observation, on behalf of the Township.

Vent Pipe: Shall mean any pipe extended vertically from a Service Line to provide ventilation for the system of piping and to prevent siphonage and back pressure.

SECTION 3. CONDITIONS OF SERVICE

- A. No Connection, through which Sanitary Sewage or Industrial Waste does or may enter the Sewer System, shall be constructed, altered, repaired, or allowed to exist, which does not comply with the Township's most current edition of these Specifications entitled "*Standard Specifications and Details for Sanitary Sewer Extensions and Repairs*".
- B. Any sewers, pump stations, Force Mains, and other sewerage facilities constructed, or constructed and maintained, within the service area of the Township, by a Developer shall meet the requirements of the Township's most current Standard Specifications, specified previously, before the ownership of such facilities is accepted by the Township, or before the Township will permit sewage from said facility to discharge into the Township's system.

- C. The requirements of the Township's most current Sewer Use Ordinance shall apply to all direct and indirect contributors to the Township's system.

SECTION 4. RESPONSIBILITIES OF THE DEVELOPER

- A. It shall be the responsibility of the Developer to accomplish and bear all costs for the connections of his/her work to the existing Township facilities. The Developer shall cooperate with the Township by installing the Lateral Sewers for existing improved or unimproved properties when the new facilities are extended enroute to the Developer's project(s).
- B. The Developer shall become familiar with the laws of the Commonwealth of Pennsylvania and the requirements of the Pennsylvania Department of Environmental Protection (PaDEP), and the local municipality, including those concerning the employment of labor and the performance of work; and shall also become familiar with the requirements of the Township prior to proceeding with construction of new facilities.
- C. All pipelines should be constructed in public Streets, unless the Township agrees otherwise in writing. If the Township agrees in writing to permit pipeline construction in non-public Streets, or on private property, the Developer shall provide the Township with permanent Rights-of-Way in accordance with the requirements herein.
- D. The Developer shall provide a Palmer-Bowlus type sewage flow metering system with ultrasonic reader and recording equipment when a new sewer main is constructed outside of the Township boundaries and connected to the Township's sewer system, when such sewage flow, in the opinion of the Township's Sanitary Engineer, is of a sufficient quantity and such sewage flow would not be measured and recorded by a meter at the point of intermunicipal connection. The Developer's engineer shall contact the Township to discuss design parameters and equipment preferences.

SECTION 5. APPLICATION PROCESS

- A. Sewer Service Requests:
 - 1. Requests for sewer service within the service area shall be made by completing an "Application for Sewer System Extension" with the Township. A copy of this application can be found in the Appendix of this Manual. Said application shall be accompanied by the following:
 - a. Payment of current application fee.

- b. Photocopy of the appropriate portion of a 2000 scale USGS topographic quadrangle map showing the location of the requested sewer service.
2. In response, the Township will issue a letter stating if adequate capacity is available at the time of the request. Such letters do not constitute a reservation of capacity.

B. Preliminary Plan Submission:

1. Preliminary plan submissions for Sewer System extensions or additions shall be made after receipt of the letter from the Township indicating adequate capacity. The plans shall be accompanied by the following:
 - a. Two (2) sets of preliminary Sewer System plans and specifications prepared in accordance with the requirements of these Standard Specifications. If the preliminary plans do not include the entire development, an overall Sewer System and utility plan shall be included for the entire development. In case of submissions which are clearly incomplete or which are significantly non-responsive to the Township's standards for system additions and extensions, the Township will reject the proposed submission without extensive review, pending the receipt of plans which reasonably address the Township's requirements. It shall not be the Township's responsibility to design such extensions or additions.
 - b. Payment of the review escrow fee based on the Township's capacity letter. The review escrow fee will be used by the Township for reimbursement of review and administration costs.
2. The Township and its consulting engineer will review the preliminary plans and specifications, and provide written comments to the Developer's engineer. Each resubmittal required prior to approval of the preliminary plans shall contain two (2) sets of plans and specifications.

C. Final Approval:

1. Upon approval of the preliminary plans, the Township will issue a letter indicating special conditions that must be met, and specific documentation, information, agreements and fees which must be submitted by the Developer to gain final approval. The items required may include, but not necessarily be limited to, the following:
 - a. Two (2) copies of a completed Application for Construction of Sewerage Facilities.
 - b. Required fees.

- c. Two paper sets (2) of approved sewer plans and specifications and a CD of the same information in electronic format compatible with the Township's software.
 - d. Written approval from the Berks County Conservation District for the erosion and sedimentation control plan for the project.
 - e. Written approvals from PaDEP, as required, for stream crossing permits, sewer extension permits, water quality management permits, and planning modules.
 - f. Documentation that proper notification has been given to Berks County and the municipality(ies) where the project is located, in accordance with Act 14.
 - g. Plats and descriptions for all Rights-of-Way required for the project. These plats and descriptions will be used by the Township's Solicitor in preparing Right-of-Way agreements.
 - h. Completed Agreement for construction of the facilities.
 - i. Completed Indemnification Agreement.
 - j. The name of the Developer's proposed contractor.
 - k. Construction schedule to enable the Township to schedule its inspection personnel.
 - l. Certified construction cost opinion from the Developer's engineer.
 - m. Tapping Fees as set forth in the Township's Resolution Imposing Tapping Fees and Connection Fees. For commercial and industrial developments, these fees are based on the anticipated usage in gallons per day as it relates to cost per EDU and must be paid prior to the Township's approval. For residential developments, these fees may be paid as the development progresses; however, the Township will guarantee no capacity until the fees are paid.
 - n. Connection Fees, as set forth in the Township's Resolution Imposing Tapping Fees and Connection Fees.
2. Upon receipt of the required documentation, the application will be acted upon by the Township at a regularly scheduled meeting. Upon approval of the application, a Permit for Construction of Sewerage Facilities will be issued to the Developer. This permit will be accompanied by the following information:

- a. Special conditions of the permit.
- b. Sewage flow (in gallons per day) reserved for the development.
- c. Names of Persons to be contacted to schedule inspections.
- d. Any unusual or special issues relative to the permit.

D. Financial Security for Construction of Sewer Facilities:

The Township will not collect financial security for the construction of the proposed sewer facilities. Instead, the Developer shall submit financial security for the sewer facilities to the Township.

SECTION 6. CONSTRUCTION OF SEWER IMPROVEMENTS

A. Preconstruction Meeting:

After receipt of the construction permit, the Developer or the Developer's contractor shall conduct a pre-construction meeting at the project site. The Developer shall contact the Township at least three (3) working days prior to the proposed pre-construction meeting. Agenda items shall include schedule, sequence of construction, and a review of key components of the Township's Standard Specifications. The Developer's contractor shall provide an emergency 24-hour phone list to the Township in accordance with Section 10 of this General Section, as well as shop drawings for all materials to be used on the project. No work may proceed until emergency phone list is received and shop drawings are approved in writing by the Township.

B. Inspection During Construction:

After construction commences, the applicant shall be responsible for coordination of construction observation activities with the Township.

The construction of sewer improvements shall at all times be subject to the inspection by the Township or its authorized representative. Construction and testing of all sewer improvements shall be performed in the presence of Township personnel or a duly authorized representative of the Township with the exception of final grading, seeding, and/or paving. No pipes, manholes, or other facilities shall be backfilled, nor shall any testing be performed, unless a duly authorized representative is present. If the Developer fails to comply with this requirement, the Township reserves the right to require the Developer to uncover the facilities so that proper inspection and

retesting can be performed. The Developer is responsible for coordinating construction activities and required inspections. A 48-hour notice is required for all inspections.

In order to facilitate required inspections, no work shall be conducted by the Developer on Saturdays, Sundays, or holidays without written approval from the Township.

Additional inspection and testing requirements are provided in the Specification section of these Standard Specifications.

C. Final Inspection:

A final construction inspection will be performed after vegetative cover is well established and/or after final paving has been completed, as applicable. The Developer shall be responsible for requesting the final construction inspection. A seven calendar day notice is required for final construction inspection. The Township will issue an approval letter if all completed work is in accordance with the Standard Specifications.

SECTION 7. DEDICATION OF SEWER IMPROVEMENTS

A. Deed of Dedication and Record Plans:

After satisfactory completion of construction of the sewer improvements, the Developer will supply all deeds of dedication, easements, bills of sale, title insurance, and such other items as determined necessary by the Township, in forms provided by the Township, at the time of the requested dedication. Construction shall not be considered complete until the final paving has been installed or suitable ground cover has been established as applicable. The Developer or the Township's representative shall promptly record the deed(s) of dedication after approval of a resolution of acceptance by the Township at a regular meeting.

Along with the Deed of Dedication, the Developer shall submit record plans for the project. These plans shall be submitted in hard copy (two [2] sets of prints) and also on a CD in an electronic format that is compatible with the township's software.

Record plans shall be developed using the following information:

1. Contractor's Lateral Sewer Record Plan information.

2. Upon completion of construction and final inspection, the Developer shall survey the constructed improvements and will forward the survey data to the Sanitary Engineer. The costs associated with this survey shall be borne by the Developer.

B. Operation and Maintenance Financial Security:

The Township will not collect financial security for the operation and maintenance of the proposed sewer facilities. Instead, the Developer shall submit financial security to the municipality in which the project is located.

C. Release of Operation and Maintenance Financial Security:

Prior to the release of the operation and maintenance financial security, the Township may conduct an inspection and then inform the municipality that the work is satisfactorily completed, whereupon the municipality may then release the security provided for the sanitary Sewer System.

SECTION 8. PLAN REQUIREMENTS

A. The Township has adopted the following requirements for submission of all drawings:

1. Drawing Scales: Horizontal Scale 1" = 50' and Vertical Scale 1" = 10'.
2. Drawing Sheet Size: 24" x 36".
3. Each sheet shall show plan view at the top and its corresponding profile below.
4. All utility plans indicating proposed lot locations shall indicate lot numbers, Street addresses, and adjoining property owner's name(s), if known.
5. All utility plans shall display the north arrow (preferably pointing up).
6. All utility plans and profiles shall indicate existing and proposed sanitary sewer locations, including all manholes, as well as all proposed and existing gas mains, water mains, Storm Sewers, electric conduits, and any other underground utilities.
7. All utility profiles shall numerically indicate slopes, pipe sizes, manhole rim and pipe invert elevations, distances between manholes, manhole numbers, and piping materials proposed along the utility line.

8. All utility plan views shall indicate direction of flow using flow arrows and manhole numbers. Manhole numbers shall be assigned using the following format: Up to 4 letter prefix indicating name of development, followed by a dash, followed by the manhole number (Example: WF-1 represents the first manhole in the Wagner Farm development). In order to avoid duplication with other prefixes within its system, the Township will assign prefixes (up to 4 letters) based upon the name of each development. The Developer's engineer shall contact the Township's Collection System Supervisor for the prefix. The Developer's engineer shall assign manhole numbers, starting with #1 and numbering consecutively.
9. All utility plans shall indicate existing and new Rights-of-Way.
10. All utility plans shall indicate lands to be dedicated to the Township.
11. All plans shall include the following statement:
 - a. NOTE: Sanitary Sewer Lines shall be designed and constructed in accordance with the Armitage Township "Standard Specifications and Details for Sanitary Sewer Extensions and Repairs".
12. All plans shall be signed and sealed by a professional engineer or professional land surveyor, registered in the Commonwealth of Pennsylvania, shall be dated, and shall include all revision dates.
13. All plans shall include an overall utility plan sheet containing the following information:
 - a. Key map and relative location of the proposed facilities within the affected Municipality.
 - b. Lot numbers
 - c. North Arrow
 - d. Sanitary sewer utility
 - e. Manhole numbers
 - f. Sanitary sewer flow arrows
 - g. Pipe sizes and materials
 - h. Storm Sewer pipes and structures

- i. Water mains
 - j. Fire hydrants
 - k. Gas mains
 - l. Electric lines (overhead and underground)
 - m. Telephone lines (overhead and underground)
 - n. Cable TV lines (overhead and underground)
 - o. Existing and new utility Rights-of-Way
14. The overall utility plan sheet will not be subject to the previously stated horizontal scale.
 15. The overall utility plan shall be independent of the soil erosion and control plan.
 16. Detail sheet(s) shall be provided for the proposed sewer facilities. Details shall be sufficient for construction of the facilities, and should include the applicable details from Appendix A of these Standard Specifications.

SECTION 9. HIGHWAY AND STREET OPENING PERMITS AND RESTORATION OF SURFACE

- A. Unless otherwise determined by the Township and except as herein provided, whenever the surface of any municipal Street is disturbed by construction of the Sewer Lines, it will be the responsibility of the Developer to secure and maintain Street Opening Permits from the Municipality, or Highway Occupancy Permits from the Pennsylvania Department of Transportation. Developer shall be responsible for all costs relating to such permits, including but not limited to, insurance financial security, and inspection fees required by the agency having jurisdiction over the roadway.
- B. Unless otherwise required, all Street restoration, including curbs and sidewalks, shall be in compliance with the requirements of the Municipality or the State.

SECTION 10. EMERGENCY MAINTENANCE DURING CONSTRUCTION

- A. The Developer shall have available at all times, including non-working hours, weekends, and holidays, an emergency maintenance crew and a Person of authority and responsibility to act in cases of emergency, such as flooding, cave-ins, or other unsafe conditions, resulting from

construction activities. The Developer shall submit to the Township all the names, addresses, and telephone numbers of the emergency crew supervisor(s) prior to beginning construction operations. The Developer shall be responsible for costs resulting from such emergency work.

- B. The Developer is responsible for all costs incurred for any emergency work performed by the Township or others on the Developer's behalf.

SECTION 11. SINKHOLES

- A. Sinkholes: Where a sinkhole is found or formed during construction or warranty period, the Township shall be notified immediately. An evaluation of the sinkhole shall be conducted by the Township's Sanitary Engineer. A method of sinkhole remediation shall be chosen by the Sanitary Engineer. Remediation of the sinkhole shall be completed under the direction of the Sanitary Engineer and as specified hereinafter.
- B. Sinkhole Prevention and Remediation: Soil located above a zone of solution activity is usually soft and wet. Contractor shall maintain the depth of excavation to the absolute minimum required to accommodate the work, and shall take measures to prevent the development of localized low spots. If weak, yielding, or saturated conditions are encountered, Contractor shall perform excavation as described below:
 - 1. Perform excavation and backfill of unstable subgrade as follows:
 - a. If, during preparation of subgrade, soft or unstable areas are detected, excavate the unsuitable subgrade to the limits directed by the Engineer.
 - b. Backfill the excavated areas with on-site soil backfill material.
 - (1) Compact in layers not exceeding six inches loose depth. Compact to 95% of the soil's maximum standard dry density, to pipe trench bottom or structure aggregate base bottom.

- c. If during subgrade excavation operations a sinkhole develops, the Contractor shall remove all soft or unstable soils located in the base of the sinkhole and shall continue excavation until stable soils are encountered, the “throat” of the sinkhole is exposed, and/or the presence of rock outcrops or the depth of excavation preclude further excavation.
 - (1) Due to the instability of the sides of an existing sinkhole, extreme caution must be exercised during sinkhole remediation to prevent collapse of the soils due to pressure from equipment.

- d. Following removal of all unstable soils from the base of the sinkhole, an evaluation of the stability of the base and sidewalls shall be conducted by Township’s Geotechnical Engineer. This evaluation will be used to make specific recommendations regarding remediation of the cavity. As a guide, the sinkhole should be backfilled as described below.
 - (1) If the base of the excavation exposes a “throat” or opening into bedrock, grouting and/or concrete may be required to fill or block the throat in order to prevent additional soil from collapsing or being washed into the opening.
 - (2) Having established or modified the integrity of the base of the sinkhole, Contractor may proceed with backfilling of the excavation. Sinkhole shall be backfilled approximately 1-1/2 feet with crushed aggregate having a maximum particle size of approximately 3/4 inches.
 - (3) Backfill the final 1/2 to 2/3 of the excavation using site soils compacted to at least 95% of soil’s maximum dry density.

- e. Payment for additional work will be made using the unit prices for Miscellaneous Unclassified Excavation and Miscellaneous Aggregate Backfill.

SECTION 12. BORING, JACKING, AND TUNNELING

- A. General: Installation of pipe lines shall be by open-cut methods unless boring, jacking, and/or tunneling is approved or required by the Township, PennDOT, railroad company, or other entity having jurisdiction over a particular location where a pipe line is being installed. Prior to the start of such construction, complete plans and specifications shall be submitted to and approved by the appropriate entity.

B. Casing Pipe Materials:

1. Steel Casing Pipe: ASTM A53 or other suitable steel meeting the approval of the appropriate entity.
 - a. 35,000 psi minimum yield strength.
 - b. Full circumference welded joints.
 - c. Asphalt coated.
 - d. Minimum wall thickness: 0.375 inch.
 - e. Steel casing pipe shall be at least six inches in diameter larger than the outside diameter of the carrier pipe bell, or as required by the owner of the right-of-way, the entity issuing the permit, or the Township.
 - f. Smooth wall steel pipes with a nominal diameter of over 54 inches will not be permitted for use as casing pipe.

2. Casing Spacer:
 - a. The extender shall furnish and install casing spacers meeting the following specifications:
 - (1) Split-ring band with minimum of two runners on each half of the band.
 - (2) Band material: 14-gage, hot-rolled and pickled carbon steel with epoxy coating.
 - (3) Band liner: 0.090-inch thick PVC.
 - (4) Riser material: 10-gage carbon steel with epoxy coating.
 - (5) Runner material: UHMW polyethylene.
 - (6) Studs, nuts, and washers: Type 304 stainless steel.
 - (7) Acceptable manufacturer: Advanced Products and Systems, Inc. (APS) Model SI, Material Specification C1.

3. Casing End Seals: Synthetic rubber with Type 304 stainless steel bands; APS Model AC or AW.

4. The type of casing spacer shown in either the Casing Cradle Detail – Gravity Sewer Installation Via Boring/Jacking or the Casing Cradle Detail (Open Cut or Force Main), as applicable will also be approved for use on gravity sewers.

SECTION 13. STREAM CROSSINGS

- A. Construct stream crossing in accordance with an approved Stream Crossing Plan and an approved Sedimentation and Erosion Control Plan. Obtain all Federal, State, and Local permits.
- B. Make all necessary provisions for cofferdamming, dewatering, and removal of excess excavated material.
- C. Maintain the flow in the stream at all times.
- D. Construct stream crossings as shown on either the Casing Cradle Detail – Gravity Sewer Installation via Boring/Jacking or the Casing Cradle Detail (Open Cut or Force Main), as applicable. Encase pipe to limits shown on the Standard Detail with PennDOT 408 Class A concrete. The vertical distance between top of concrete and the lowest point in the stream bed shall be no less than 36 inches.
- E. Where rock is encountered in the stream crossings, do not use forms to construct the concrete encasement. Place concrete on firm rock below the pipe to provide a firm bond between the encasement and the rock. Where concrete encasement to the dimension shown on either the Casing Cradle Detail – Gravity Sewer Installation via Boring/Jacking or the Casing Cradle Detail (Open Cut or Force Main), as applicable is entirely in rock, the vertical distance between top of encasement and the lowest point in the stream bed may be 12 inches, but no less.

SECTION 14. PUMP STATIONS

- A. The Developer is responsible to acquire the services of a professional engineer, registered in the State of Pennsylvania, to design the pump station. The Developer's engineer shall contact the Township to discuss design parameters and equipment preferences.
- B. The Township has established, as a minimum, the following design guidelines:
 1. The wet well portion of the pump station shall be a precast reinforced concrete wet well with a flat precast concrete cover. The joints between the precast sections shall be tongue and groove and be sealed with two rows of mastic sealant or approved equal. The top of the pump station wet well shall be set above 100-year floodway elevations and the depth shall be set for proper

operation of the pumps and the pump control system. The top cover shall be provided with a lockable watertight aluminum access hatch (double leaf) that is sized appropriate for pump removal and a gooseneck stainless steel vent pipe. The bottom of the wet well shall have concrete fillets formed in the corners to funnel the sewage to the pumps to avoid sludge build-up. All penetrations through the wet well walls shall have neoprene seals cast into walls per the precast manufacturer to make a watertight seal around penetrations.

2. The valve pit portion of the pump station shall be a precast reinforced concrete valve pit with a flat precast concrete cover. The joints between the precast sections shall be tongue and groove and be sealed with two rows of mastic sealant or approved equal. The top of the valve pit shall be set above 100-year floodway elevations. The top cover shall be provided with a lockable watertight aluminum access hatch (30" x 30" minimum), an aluminum access ladder if required, and a gooseneck stainless steel vent pipe. All penetrations through the valve pit walls shall have neoprene seals cast into walls per the precast manufacturer to make a watertight seal around penetrations. Interior bottom of valve pit to have a sump hole for water removal. The sump shall drain to the wet well. The drain pipe shall have a backflow preventer or trap inside the wet well.
3. The pumps for the wet well shall be duplex non-clog sewage pumps as manufactured by Flygt Corporation. The pumps shall be rail mounted for easy removal. All pump rails, brackets, chains, and hardware shall be stainless steel. Provide a stainless steel debris basket on rails and also a stainless steel lifting mechanism for pump and basket removal. A spare pump shall be provided and delivered to the Township for proper storage.
4. The pump controls shall consist of a pressure transducer with a back-up five-float system. The controls shall provide for alternating pump operation and dual pump operation. The levels of operation shall be low water alarm, high water alarm, both pumps off, lead pump on, and lag pump on. Provide alarm and Verbatim autodialer to notify Township of high level, low level, and other alarms associated with the pumps. Two phone lines shall be provided at the pump station – one phone line for Verbatim alarm box and one for the flow analyzer. The pump control cabinet shall be as manufactured by Flygt Corporation. The autodialer and flow analyzer should be mounted in the control panel.
5. All piping throughout the pump station shall be ductile iron (Class 53) until outside of the valve pit. Joint shall be mechanical joint for exterior buried pipe and flanged for interior piping. Each discharge line in the valve pit shall have a swing check valve and a gear-operated plug valve that are easily accessible for maintenance purposes. The valves shall be equipped with

handles for manual operation. All piping in valve pit shall be properly supported and restrained against thrust.

6. Pump station shall be fitted with an automatic flow meter that records data over at least a one month time period. Direct flow readout shall be provided. Flow meter recorder and display shall be mounted in the building. The flow meter shall also be capable of transmitting a signal to a remote location designated by the Township.
7. A standby diesel generator of adequate capacity shall be provided for the pump station. The generator shall be as supplied by Katolight Emergency Systems, Inc., and shall be equipped with a belly-mounted fuel tank. Also provide an automatic transfer switch and an automatic programmable exercise option to exercise generator without operator involvement.
8. A building shall be provided to house the diesel generator, pump controls, and autodialer. The building shall be constructed of reinforced concrete footer and floor, and split-face block walls with a finish to match other Township pump stations. The roof shall be wood truss with sheathing, felt paper, and 35-year fiberglass shingles. The building shall have power ventilation activated by a thermostat and/or generator operation. The building shall be heated and insulated, and all exterior wood shall be encased in vinyl fascia and soffit. The access door and door frame for the building shall be a painted steel double door of adequate size for generator removal.

If a chemical system is required for odor control or pretreatment, all required safety equipment and alarms must be provided.

9. Locate the electric meter so the meter can be read without entering the pump station. Provide interior lighting with wall switch for the building and a separate switch for exterior lighting. Exterior lighting shall be sufficient to illuminate entire pump station area. Provide interior electrical outlets and exterior weathertight outlets for power tools and portable lighting.
10. The pump station and the building shall be enclosed with a 6-foot high aluminum chain link fence with three strands of barbed wire around the top. Provide a 16-foot wide double-leaf access gate with leaf hold-backs and a lockable latch. Posts shall be a minimum of 2½" diameter aluminum.
11. A bituminous paved access shall be provided from the street to the pump station area. Provide pavement access to the wet well, valve pit, and building. The remaining area inside the fence shall be covered with crushed stone placed over a weed-blocking landscape fabric material.

Around the outside of the fence, plant arborvitae on four-foot center for screening. The disturbed area outside the fence shall be graded with topsoil and seeded.

- C. If the development is located outside of the Township, the flow from the pump station must be metered before it enters the Township's sanitary sewer system. The flow meter shall be capable of transmitting a signal to a remote location designated by the Township.
- D. The Developer shall provide two (2) sets of prints and specifications to the Township or the Township's Sanitary Engineer for review. The information shall also be provided on a CD in an electronic format that is compatible with the Township's software.

SECTION 15. COMMUNITY TREATMENT/DISPOSAL SYSTEMS

Community treatment/disposal systems shall not be permitted within the Township's service area.

SECTION 16. LOW PRESSURE SYSTEMS

Low pressure systems, including grinder pumps and septic tank effluent pump (STEP) systems, are permitted within the Township's Sewer System only upon approval of the Sanitary Engineer.

SECTION 17. PRIVATELY-OWNED INDIVIDUAL GRINDER PUMPS AND/OR NON-CLOG SEWAGE PUMPS

A. General:

1. Application:

- a. Privately-owned individual grinder pumps or non-clog sewage pumps may be used when the individual discharges into a manhole/box outside of the right-of-way and flow from that manhole/box is by gravity through a six (6) inch lateral to the Township gravity collection system.
- b. Privately-owned individual non-clog sewage pumps shall not be used when the individual discharges into a pressurized sewage system owned and maintained by the Township.
- c. Privately-owned individual grinder pumps shall be used when the individual discharges into a pressurized sewer system owned and maintained by the Township.

2. Quality Assurance:

a. Acceptable Manufacturers:

- (1) Hydromatic
- (2) Myers
- (3) Approved Equal

b. The units shall meet accepted standards for plumbing equipment for use in or near structures and shall operate free from noise, odor, or health hazards.

c. Requirements of Regulatory Agencies:

- (1) Comply with construction code requirements of State, County, and such other political subdivision specifications as may exceed the requirements of the codes, standards, and approving bodies referenced throughout these specifications.
- (2) Provide electrical control cabinets and pump units constructed in accordance with the requirements of the Underwriters Laboratory, or other nationally-recognized certification agency, and labeled accordingly.
- (3) Units shall comply with the applicable requirements of the Pennsylvania Department of Environmental Resources and the National Sanitation Foundation.

d. Each unit shall be factory tested. The manufacturer must have the facilities to perform listed tests. The minimum test required shall be:

- (1) Watertightness of the unit at maximum depth.
- (2) Pump output in gpm at at least three different pressures.
- (3) Amperage and wattage of electrical consumption.

e. Single Source Responsibility: To ensure single source responsibility and parts supply, obtain pump units from our manufacturer.

3. Submittals:

- a. When applying for the permit, submit for approval completely dimensioned shop, layout, or setting drawings and catalog cuts as required to provide a complete description of system equipment as specified in this Section.
- b. Submit shop drawings certified for construction by the manufacturer which includes location of electrical connections, wiring diagrams, anchor bolt layout, details indicating construction and materials of construction, diameter of shafting, dimensions and rated horsepower of all motors, gear and bearing ratings, service factors, and weights of principal parts and completely assembled equipment.
- c. Submit evidence of Underwriters Laboratories (UL) listings and approvals on electrical control panels and pump units.

B. Products:

1. General:

- a. A minimum of simplex (single) pump units shall be required to be installed at all residential property locations. Duplex pump units as a minimum shall be required to be installed at all commercial and/or industrial locations.
- b. Pumps shall be installed in fiberglass-reinforced polyester basins for outdoor installation only. Indoor installations will not be permitted.
- c. The pump package shall consist of the basin, pump and motor, junction box, start-stop level controls, motor high temperature shut-off, motor seal leak alarm, high water level alarm, shut-off valve, discharge piping and fittings, and all internal wiring terminating into a junction box.
- d. An externally-mountable control panel shall be provided for each unit.
- e. The location of the pump package and control panel shall be determined by the property owner or the developer, outside of the right-of-way.

2. Non-Clog Sewage Pumps:

a. General: The qualifying non-clog sewage pumps produced by the aforementioned manufacturers are as follows:

- (1) Myers Model WHR-DS
- (2) Hydromatic Model SP50
- (3) Approved equal

b. Submersible Pump Motor:

- (1) The submersible pump shall have a minimum 2-inch NPT discharge. The pump shall be heavy-duty cast iron construction. The pump impeller shall be cast iron, threaded to a stainless steel shaft, and shall be capable of handling up to 1½-inch spherical solids and lint. The seal shall be a “double seal”.
- (2) The submersible motor shall be oil filled for cooling and lubrication of the shaft bearings. It shall have “double bearing” – upper radial – and lower thrust – bearings. To protect against overheating, the motor windings shall contain an automatic reset thermal overload for single-phase residential applications.

3. Grinder Sewage Pumps:

a. General: The qualifying grinder pumps produced by the aforementioned manufacturers are as follows:

- (1) Myers Model WG 20
- (2) Hydro-O-Matic Model SPG 200M2-2
- (3) Approved equal

b. Submersible Pump Motor: The grinder pump and motor are to be specially designed and manufactured so they can operate completely submerged in wastewater. Electrical power cord is to be sealed by use of a cord grip, with individual conductors additionally sealed into the cord cap assembly with epoxy sealing compound, thus eliminating water entering the motor by following individual conductors inside the insulation. The cord cap shall be sealed into the motor housing with a Buna-N O-ring, providing an electrical connection which is completely watertight, yet may be easily removed for service.

- c. The combination centrifugal pump impeller and grinder unit shall be attached to a common motor and pump shaft made of stainless steel. The grinder unit shall be on the suction side of the pump impeller, discharging directly into the impeller inlet leaving no exposed shaft to permit packing of ground solids. Both stationary and rotating cutters shall be made of hardened and ground stainless steel. Pump and motor housing are to be high quality grey iron castings. Impeller shall be bronze. All fasteners shall be of stainless steel.
 - d. The pump motor shaft shall be sealed by two mechanical carbon and ceramic-faced seals or similar sealing material within an oil-filled seal chamber. An electric sensing probe shall be mounted in the seal chamber to detect any water leakage past the lower seal before damage is done to the motor. The seal probe circuit sensitivity shall not be affected by cable length between the motor and the seal probe circuitry in the control panel. This probe shall be connected to an amber light and horn in the control panel. The shaft shall be supported by an upper ball radial and thrust bearing and a lower bronze radial sleeve or oversized single row ball bearing, both running in oil.
 - e. The rotor winding and rotor are to be mounted in a sealed, submersible-type housing which is filled with clean high dielectric oil or air as pump design dictates. A heat sensor thermostat, which will detect overheat conditions and stop the pump, shall be located in the motor winding. When the temperature drops to a safe level, the pump will automatically reset.
 - f. Submersible motor shall be constant speed, 3,450 rpm, minimum 2 hp, suitable to operate on a 240 volt, 60 Hz, single-phase service. The motor shall be of proper size to drive the pump at any point on the pump curve. Thrust bearings shall be of the ball type. The motor shall be a capacitor start-capacitor run type with high starting torque.
 - g. Motor shall be amply rated for the head and capacity values specified, on continuous duty, without exceeding 1.0 service factor load at the minimum capacity design point, and without exceeding the motor full service factor load at any head between shut-off and 10 feet TDH, which is the minimum expected dynamic head to be found in this installation.
4. Rail Assembly:
- a. A lift-out guide rail assembly shall be included as part of the pump unit, which will permit easy removal and installation of the pump and lower check valve without the necessity of personnel entering the basin. Cast iron guide brackets with guide brackets and guide yokes

of sufficient bearing strength to prevent binding shall bolt to the pump. The yokes shall mate over guide rails of 1-inch minimum galvanized pipe running between the upper rail support casting which shall be attached to and supported by the basin sidewalls and the fixed attachment point on the floor of the basin. The guide rails may be supported by a fixed connection to the top of the basin provided that the connection is not part of the removable access cover and is not affected by the removal of the access cover.

- b. A stainless steel lifting chain shall be securely fastened to the top of the pump and to the top of the basin to facilitate removal of the pump. The chain shall be minimum of 1/4" welded link-type to support the weight while removing and installing the pump.

5. Level Controls:

- a. Sealed float-type mercury switches shall be supplied to control sump level and alarm signal. The mercury-type switches shall be sealed in a solid polypropylene float or corrosion and shock resistance. The support wire shall have a heavy Neoprene jacket. A weight shall be attached to cord above the float to hold switch in the sump. Weight shall be above the float to effectively prevent sharp bends in the cord when the float operates. Two float switches shall be used to control level: one for pump turn-on, one for pump turn-off. A third switch shall be provided for high water alarm. The float switches shall hang in the sump and be supported by a bracket and cord snubber which will give positive support to the controls and allow flexibility in the set levels.

6. Junction Box:

- a. The junction box shall be constructed of fiberglass for corrosion resistance. The enclosure shall be of adequate thickness and properly reinforced to provide good mechanical strength. The junction box shall have a fully-gasketed cover that is held in place by four stainless steel captive screws with slotted/flat-sided heads totally encapsulated in PVC so that no metal parts are exposed. The cover shall be connected to the body with a stainless steel chain.
- b. An adequate number of sealing-type cord grips shall be supplied for incoming pump and switch cords. The cord grips shall be made of non-corrosive material, such as PVC or nylon, and shall have a rubber compression bushing that will make an effective seal around

the wire jacket. The cord grip shall also seal to the junction box wall with an "O" ring, gasket, or other effective means.

- (1) The hub shall be of a corrosion-resistant material and shall be of adequate size to accommodate the number of wires required to operate the pump.
- c. A method for sealing the incoming wires shall be supplied by the manufacturer so that condensation from the conduit or ground water will not enter the enclosure; or, an explosion-proof conduit seal shall be required. Duct seal shall not be used.
- (1) Wires shall be connected within the junction box by means of wire nuts and the connections further protected by a non-hardening sealant.
- d. Electrical cable for power and control wiring between the junction box and each pumping unit shall be supplied. Wire size shall be selected in accordance with ampacities required by the National Electrical Code.

7. Valves:

- a. Check Valves: The pumps shall be equipped with a factory-installed integral flapper-type check valve or integral ball check valve built into the discharge pipe. This valve shall provide a full-ported passageway when open, and shall introduce a friction loss of less than six inches of water at maximum rated flow. The valve body shall be made of cast iron.
- (1) Working parts of flapper-type check valves shall be made of 300 Series stainless steel and fabric-reinforced synthetic elastomer to ensure corrosion resistance, dimensional stability, and fatigue strength. A non-metallic hinge shall be an integral part of the flapper assembly providing maximum degree of freedom for assured seating even at a very low pressure.
 - (2) Ball check valve shall include a corrosion-resistant, non-metallic ball and rubber sealed seat.
- b. Ball Valve: The pump shall be equipped with an isolation ball valve which shall be of all bronze or stainless steel construction, three-piece design, full port, with TFE seals and seat. Valves shall have screwed end connections and shall be lever-operated with an extension handle extended vertically to a supporting bracket fixed not more than twelve (12) inches below finished grade. Valves shall be as manufactured by Jamesway Corporation, Worcester Controls, or approved equal.

- c. Redundant Check Valve: All pumps shall include one separate check valve per unit for installation in the discharge line between the pump and the sewer main to ensure maximum protection against backflow.
 - (1) The valve shall be of the gravity-operated flapper type or ball type. The check valve shall provide a full-ported passageway when open and shall introduce a friction loss of less than six inches of water at maximum rated flow. Working and integral parts shall be at least equal to those specified above for the check valve.
 - (2) The valve body shall be a high gloss, injection molded part made of PVC Type I-II with hub and socket compatible with PVC pressure pipe SDR 21. Dimensions for hub and socket shall be in accordance with commercial standards C5-272-65.
- d. Anti-Siphon Valve: The pump shall be constructed with a positively-primed flooded suction configuration. As added assurance that the pump cannot lose prime even under negative pressure conditions in the discharge piping system, the pump shall be equipped with an integral anti-siphoning, air relief valve in the discharge piping. This valve will automatically close when the pump is running and open to atmosphere when the pump is off.

8. Basin:

- a. General: Fiberglass basins may be provided in areas with no traffic loadings. All chambers shall register flush with finished grade. The basin shall have a minimum net effective storage volume of 250 gallons between the pump shut-off elevation and the invert of influent line from the connected structure.
- b. Fiberglass Basin: The basin shall be custom molded of fiberglass-reinforced polyester resin using lay-up and spray technique which will assure that the interior surface is smooth and resin-rich. The basin shall have a nominal wall thickness of 1/4-inch. The basin sizes shall be no less than the minimum dimensions shown on the Drawings and shall include a hopper bottom. The fiberglass basins shall be built in accordance with:
 - (1) Plastic laminate ASTM C581 and C582.
 - (2) Chemical-resistant test ASTM C581. Previous tests will be acceptable provided laminates are representative.

- c. The basin shall be free of imperfections, sound, watertight, and of high quality workmanship. Basins shall have lifting lugs or other devices for unloading and installation. All conduit and piping connections shall be provided in the locations indicated on the drawings and shall be plugged for shipment.
- d. One 4-inch diameter inlet hub shall be provided for each pumping unit. The inlet hub shall be suitable for use with 4-inch PVC, SDR 35, push-on joint pipe. Hubs shall be field installed to meet field conditions.
- e. One 2" NPT discharge coupling shall be provided for the pump unit. Internal piping shall be provided to this discharge coupling. The depth of the discharge coupling (centerline of coupling to finish grade) shall be no less than 42" and no greater than 54".
- f. Fiberglass basins shall be equipped with a steel cover coated with a high temperature baked epoxy green-colored paint. The cover shall be bolted to the basin with stainless steel cap screws. Cadmium-plated nuts for the screws shall be embedded in the fiberglass to prevent turning and for corrosion resistance. The basin cover shall be provided with a padlock. This lock shall be of the solid rustless design with a hardened steel shackle and zinc coating.

9. Electrical Control Panel:

- a. General: A separate remote electrical control panel shall be provided. Panel shall contain the items as specified. In addition, the panel shall contain a UL-listed NEMA-sized motor contractor having a guaranteed component lift span, without maintenance or contact replacement, of one million operations (definite purpose contractors will not be allowed). The panel shall have an adjustable or non-adjustable two-pole bi-metallic temperature compensated UL-listed overload relay meeting NEMA Class 10 tripping characteristics, and the auxiliary contact of the overload relay must be connected in series with the motor contractor coil to switch off the contractor in event of overload. The panel shall also have lightning protection and any other items required for proper control of the centrifugal-type pump unit.
- b. The enclosure shall contain an inner back panel for mounting of the internal components. The enclosure shall be hinged, NEMA designed for 16 gauge metal, primed, and painted gray enamel, with combination closing latch and locking hasp.

- c. The control panel shall be fitted with a through-the-door alarm horn and silence button with the horn having a 90 dB sound level when measured at 10'-0" distance. The horn unit shall be as furnished by (or approved equal):
 - (1) Edwards
 - (2) Panalarm
 - (3) Faraday
- d. Inside the control enclosure shall be a red neon glow lamp high water indication and an amber neon glow lamp for moisture leak detection. The alarm horn shall sound when either or both lights within the enclosure are activated due to a failure.
- e. A silkscreen or phenolic nameplate shall be provided above each component with the name of the component inscribed or failure inscribed when labeling the indicator lights.
- f. A "Hand-Off-Auto" selector switch shall be provided within the control panel for operating the pump manually when in "Hand", pump disable when in "Off", and normal operation when in the "Auto" position. The selector switch shall not disable the alarms under any condition.
- g. A main disconnect switch shall be provided with padlocking device to deenergize the panel. Toggle switch shall not be considered. From the load side of this switch shall be a two-pole circuit breaker for motor short-circuit protection. Also, and in parallel with the above breaker, shall be circuit breaker or fuse for protection of the control circuit.
- h. An electrical wiring diagram shall be supplied and attached to the inside of the panel enclosure. This diagram shall identify wire color, external connections to a numbered terminal block, and shall be arranged in a functional sequence ladder-type diagram.
- i. Control Panel Support: Fasten the control panel to the wall using lead expansion-type lag bolts, one for each corner of the panel. Allow at least 1'4" spacing between the wall and panel for air circulation.

10. Corrosion Protection:

- a. All materials exposed to wastewater shall have inherent corrosion protection, i.e., cast iron, fiberglass, stainless steel, or PVC. Any interior steel surfaces are to be suitably protected against corrosion. All fasteners shall be stainless steel.

C. Execution:

1. Installation of Pump:

- a. The pump unit shall be installed at a location to be determined by the property owner or developer.
- b. The depth of the pump unit will be dependent upon the location and depth of the proposed house service. The inlet port on the basin shall be set so that a minimum grade of two (2) percent for the new four (4) inch gravity service line can be maintained. The total unit depth from the invert of pump pit to top of entry hatch shall be no less than eight (8) feet.
- c. All pump basins shall be installed on a bed consisting of AASHTO No. 8 or No. 57 coarse aggregate and shall have a concrete anti-flotation collar poured around the bottom as shown on the Drawings. The remaining excavated area shall be backfilled to six inches below grade with excavated material containing no soil lumps, stones, concrete, or foreign objects larger than one (1) inch in maximum dimension. Six (6) inches of topsoil with seed and supplements shall be placed to grade the surrounding excavated area.
- d. If the excavated material does not meet the requirements described above, a backfill material consisting of AASHTO No. 8 or No. 57 coarse aggregate shall be used to a point six (6) inches below finished grade.

2. Operation of System:

- a. On sump level rise, lower mercury switch shall first be energized, then upper level switch shall next energize and start pump. With pump operating, sump level shall lower to low switch turn-off setting and pump shall stop. If level continues to rise when pump is operating, alarm switch shall energize and activate the alarm. All level switches shall be adjustable for level setting from the surface.

3. Electrical Connections:

a. Standard Property Connection:

- (1) Furnish and install a two-pole, 30 ampere branch circuit breaker in the panelboard.
- (2) Route three #10 wires with ground, Type "BX" or "ROMEX". from the branch circuit breaker to the control enclosure.

- (3) Furnish and install PVC Schedule 40 conduit from the control enclosure to the pump junction box through a rigid metal conduit explosion-proof seal at the junction box. Bury a minimum of 18 inches.
- (4) Furnish and install wire from the control enclosure to the pump junction box according to the manufacturer's recommendation. Seal the wires after testing using an approved compound within the explosion-proof seal at the junction box. Duct seal is unacceptable.

SECTION 18. STANDARD OF QUALITY

All construction, reconstruction, and alterations of sewer facilities shall be performed in accordance with recognized industry and trade standards and these specifications. The Township reserves the right, at its discretion, to stop, or require reconstruction of, any work not conforming to these Standard Specifications.

