

# STANDARD SPECIFICATIONS SANITARY SEWER MAINS AND APPURTENANCES

REVISION DATES: 06/15/1999, 01/14/2000, 12/01/2000, 6/11/01, 7/01/02, 7/01/03, 7/01/04, 7/01/06, 7/01/07, 7/01/2008, 7/07/10, 7/01/11

LAST REVISION DATE: 7/01/13

## DEVELOPER PROCEDURES

All Developer Procedures as established by Erie County Commissioners, Erie County Engineer, Erie County Regional Planning Commission and local political subdivisions shall be followed, which includes: entering into a Developers Agreement, following standards and basis of design, inspection, permits, record drawings (as-builts) on mylar media, warranty and financial assurances. One (1) electronic copy in pdf format and one (1) set of paper detail drawings (including plan and profiles, proposed and existing topography and all buried utilities) and specifications of all proposed water lines drawings on 24" x 36" sheets shall be submitted for review and approval to: Erie County Sanitary Engineer, c/o D.O.E.S., 554 River Road, P.O. Box 469, Huron, Ohio, 44839. Upon the Sanitary Engineers approval of the detail drawings and specifications for construction, the developer will have one year from approval date to complete the construction of the construction of the water and sanitary sewer lines or will have to resubmit for approval and at a minimum be subject to any new D.O.E.S. requirements.

The cost to record any and all easements and/or plats for Developer's projects for sanitary sewer lines, water lines, or pump stations to be dedicated to Erie County for ownership, operation and maintenance shall be at the cost of the Developer. The County shall invoice the Developer for these costs, the Developer shall pay said invoice within thirty (30) days of the invoice date.

## O.R.C. 307.73 AGREEMENTS

Erie County may agree to an ORC 307.73 Agreement to allow a developer install a sanitary sewer line, dedicate it to the County as a public owned and maintained line in an easement and the County will collect and return connection fees from non-participating property owners as allowed under the law under the following terms:

1. Agreement Term: not-to-exceed 10 years
2. Pro-rated front footage fees shall not exceed the County's current equalization fee as described in Water Rule 3. Section 1.C at the date of the agreement.
3. No successor and/or assignment of the agreement will be allowed for the developer.
4. Developer will pay for all costs involved in acquiring easements including the cost of recording said easements.

# WASTEWATER COLLECTION SYSTEM IMPROVEMENTS

REVISION DATES: 06/15/1999, 01/14/2000, 12/01/2000, 6/11/01, 7/01/02, 7/01/03, 7/01/04, 7/01/06, 7/01/07, 7/01/2008, 7/07/10, 7/01/11

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## **BASIS OF DESIGN**

The Sanitary Engineer shall determine whether or not the County wastewater collection and tributary treatment system has available capacity to allow for a development to proceed. Gravity sewers shall consist of a minimum size of eight inch (8") diameter for mainline sewers and six inch (6") diameter for service laterals at full flow minimum velocities of 2 fps. The Sanitary Engineer shall require sewers and pump stations to be sized and to be installed at depths for the ultimate development of the entire tributary service area. Gravity sewers shall be required in place of force mains/pressure sewers when the Sanitary Engineer determines it is in the public interest to do so.

Generally, design shall be in accordance with Ohio E.P.A. regulations, the latest version of "Ten State Standards" and shall conform to the proceeding Standard Minimum Required Specifications and Standard Drawings.

The Developer and/or Engineer shall not allow other utilities to be installed within five feet (5') horizontally of an installed sanitary sewer or in the same trench as the sanitary sewer except at crossings. Should this occur, the Developer will be responsible for maintaining the sewer mains and the Sanitary Engineer will not permit taps to said line until the other utility lines are relocated five feet (5') away from the sanitary sewer.

Sanitary sewer lines shall be located within the public road right-of-way, along with other County utilities, such as water mains, storm sewers and drainage swales. All other utilities shall be located in Easements, outside the public right-of-way.

Pursuant to EPA requirements, water mains shall be installed with at least a ten foot (10') horizontal and eighteen inch (18") vertical separation from any sanitary sewers. The County also requires a five foot (5') horizontal and eighteen inch (18") vertical separation from any storm sewers, measured from out-to-out.

Bulkheads shall be installed once for every 200 lineal feet of sanitary sewer installed. Bulkheads will consist of an impervious material which will prevent ground water from passing through pipe bedding and backfill materials. Such materials may include native clays, low strength mortar, or a mixture of ODOT 304 limestone with bentonite.

# **WASTEWATER COLLECTION MATERIAL**

## **MINIMUM REQUIRED SPECIFICATIONS AND INSTALLATION STANDARDS**

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**IN THE CASE OF CONFLICTS BETWEEN WRITTEN SPECIFICATIONS AND DRAWINGS,  
THE WRITTEN SPECIFICATION SHALL APPLY.**

### **SHOP DRAWING REQUIREMENTS**

Two (2) copies of shop drawings containing manufacturers information concerning meeting the minimum required specifications shall be submitted to the Sanitary Engineer for approval by the Contractor prior to installation for the following items: pipe, fittings, manholes with appurtenances, oil/grit interceptors, grease traps, pump stations, electrical controls, valves, castings, casing pipe, casing spacers, casing end seals, etc. All drawings shall be stamped and initialed as reviewed by the Contractor before submitting these documents to the Sanitary Engineer for acceptance. U.S. manufactured materials are preferred by Erie County and purchased from Erie County vendors where possible.

### **LINE CONSTRUCTION STAKING**

Gravity sanitary sewers and force mains shall be staked prior to the installation of new pipe. Staking shall be for both line and grade every fifty feet (50') plus at all fittings and off-set at ten feet (10'). A Professional Surveyor will be required where the Contractor does not have competent surveyors. All public gravity sewers shall be installed with the use of a laser to insure installed to grade.

### **GRAVITY MAIN LINE AND SERVICE LATERAL SEWER PIPE**

All sewer pipe should be buried below the frost line consisting of thirty-six inches (36") of cover over the top of the pipe.

Sewer pipe buried less than four feet (4') of cover in road or driveway areas shall be of Class 52, Ductile Iron Pipe, cement lined, with rubber gasket bell and spigot push on joints or PVC pipe as specified below installed in a rigid sleeve such as D.I.P. or welded steel pipe.

Sewer pipe buried with less than eighteen feet (18') of cover shall be:

PVC (solid wall pipe, PVC compounds shall meet the requirements of ASTM D-1784, cell class 12454-B), SDR 35 six inch through fifteen inch (6" - 15") diameter pipe and ASTM F-679 eighteen inch through thirty inch (18" - 30") diameter pipe, conforming to ASTM D3034, with joints conforming to ASTM D3212. Installed pipe testing shall meet or exceed ASTM D-1784 for leakage and five percent (5%) deflection. Fittings shall conform to ASTM D-3034. Gaskets shall conform to ASTM F-477. Pipe bedding shall consist of No. 8 or 9 limestone to the dimensions shown on the standard drawings haunched in place.

# **WASTEWATER COLLECTION MATERIAL**

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### **GRAVITY MAIN LINE AND SERVICE LATERAL SEWER PIPE (Continued)**

Sewer pipe buried with more than eighteen feet (18') of cover shall be:

PVC (solid wall pipe, PVC compounds shall meet the requirements of ASTM D-1784, cell class 12454-B), pipe shall meet minimum pipe stiffness rating of PS-115 and shall consist of SDR 26 or thicker walled pipe as needed, as recommended by the manufacturer for the actual buried depth, conform to ASTM D3034 through fifteen inch (15") diameter and ASTM F679 for larger sizes. Installed pipe testing shall meet or exceed ASTM D-1784 for leakage and five percent (5%) deflection. Fittings shall conform to ASTM D-3034. Pipe bedding shall consist of No. 8 or 9 limestone to the dimensions shown on the standard drawings, haunched in place. All new public sanitary gravity sewers shall be CCTV upon completion of installation and provide Erie County DOES with a DVD and log of same.

Special/alternate pipe different than those specified above for gravity sewer installations use may be considered for special conditions, such as directional drilled HDPE or steel encased cement lined D.I.P. for under roads and water courses when sewer grade elevations will permit, or other pipe subject to approval by the Erie County Sanitary Engineer. **Care should be taken not to drill through other buried utilities and the Contractor shall provide a 15 year warranty for the repair of damaged utilities.**

Service lateral pipe shall be six inch (6") diameter consisting of PVC (solid wall pipe) as meeting the above described specifications. Larger pipe may be required for larger water user customers subject to Sanitary Engineers approval. A typical sanitary sewer service drawing is included at the end of these specifications. **Service lateral pipes shall not be installed without a Connection Permit from the County and without calling two (2) work days in advance for inspection at (419) 656-0577. County service lateral inspections will only be performed during normal County work hours.** Service laterals shall only serve gravity drains in the customers structure which are above the vertical elevation of the closest downstream public sanitary sewer manhole cover. Drains below this elevation maybe connected using a grinder pump system for lower level sewage to prevent a public sewer backup into the structure. Basement or lower level gravity drains such as floor drains, toilet, sink, showers, slop sinks, clothes washer drains, etc. may not be connected by gravity to a service lateral, but will require a grinder pump system and force main/pressure sewer piped to the gravity service lateral. Service laterals shall have a clean out installed within three feet (3') of the building foundation exterior. Service laterals shall not have any bends other than 45-degree or 22.5-degree bends. 90-degree bends are not acceptable. One cleanout should be installed for every three hundred feet (300') of pipe installed and spaced and located to allow for easy cleaning. **Clean water connections of the sanitary sewer are prohibited, including, but not limited to storm water drains, yard drains, driveway drains, roof water drains, exterior footer or foundation subsurface group water by gravity or with interior sump pump, etc.**

# **WASTEWATER COLLECTION MATERIAL**

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#### **GRAVITY MAIN LINE AND SERVICE LATERAL SEWER PIPE (Continued)**

In developments where connection to a service lateral will not occur for more than thirty (30) days, the Developers Contractor shall install locator rings at their cost over the end of the service pipe meeting the inspectors requirements.

The locator ring shall be as manufactured by 3M Scotchmark #1253, green, mid-range sewer markers as sold by Hughes Supply located in Toledo (1.419.874.8487) and in Elyria (1.440.439.4040). The locator ring shall be buried on average of three feet (3') below finish grade, but not more than four feet (4') below finish grade. Record drawings shall include detail information locating in plan and vertical depth (m.s.l. elevation) the end of each service lateral.

When a building(s) is abandoned, existing service laterals shall be cut and capped with a watertight cap. A locator ring shall be installed as described above and a record drawing locating the service connection pipe end in plan and profile shall be provided to the Sanitary Engineer by the demolition contractor or property owner.

Connecting service laterals to existing sewer pipe mains shall be as follows:

- a. To PVC Sewer Mains - cut out a section of existing sewer main, install a manufactured PVC wye (with six inch (6") branch) with water tight Fernco pipe adapter(s). Where applicable Inserta-tees, manufactured by Inserta Fittings Company, (1.503.358.2110) or approved equal. Bed the pipe connection with No. 8 or 9 limestone, haunched in place to twelve inches (12") over top of pipe.
- b. To Concrete Sewer Mains - core pipe and install a manufactured flexible watertight six inch (6") rubber boot with stainless steel band(s), Model NPC Kor-N-Tee as manufactured by NPC (1.800.626.2180) or approved equal. Bed around the pipe connection with No. 8 or 9 limestone, haunched in place to twelve inches (12") over top of pipe.
- c. To Vitrified Clay Pipe Sewer Mains - remove one (1) section of existing pipe (joint-to-joint), install a manufactured watertight PVC with six inch (6") branch with sleeve section as needed with two (2) watertight Fernco pipe adapters, or where applicable Inserta-tees, manufactured by Inserta Fittings Company (1.503.357.2110), or approved equal. Bed around the pipe connection with No. 8 or 9, haunched in place to twelve inches (12") over top of pipe.

Service lateral connections to manholes shall use a KOR-N-SEAL or approved equal (only allowed in special cases and only one (1) inside drop per manhole allowed). **Service laterals from the public sewer main to the building foundation shall not be installed until the building foundation and basement construction has been completed.** A native clay bulkhead dam must be installed on all service laterals typically near the Public Road right-of-way.

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#### **GRAVITY MAIN LINE AND SERVICE LATERAL SEWER PIPE (Continued)**

##### **GREASE TRAPS**

Grease traps shall be installed in services for all food service businesses and oil/grit interceptors on all services for customers with floor drains in garage/warehouse type buildings. They will be sized as required by the State of Ohio Building and Plumbing Codes and local codes with minimum effective size of 500 gallons. The customer shall be responsible to maintain by cleaning/pumping the trap on a regular schedule. Traps shall be constructed water tight and shall meet the requirements of proceeding manhole specifications for joint construction, chemical additive in the concrete mix, external joint seam wrap, pipe connections and infiltration vacuum testing. All seals (water tight pipe to structure seals, precast concrete top and manhole seals) shall be constructed of oil resistant materials. Grease traps and interceptors shall be of precast concrete meeting the requirements of manhole concrete ring walls and ring wall joints. Grease traps and oil/grit interceptors shall be field tested for infiltration using a vacuum test at four inches (4") of mercury for five (5) minutes, with less than a one-half inch (1/2") reduction per ASTM C 1613-069.1.1. Grease trap openings/cleanouts at the top shall be sealed with ConSeal CS-102, or equal, between metal frames, grade adjustment rings, and top of trap. Two (2) openings for cleaning shall be provided, one over the inlet and the other over the outlet area of the grease trap. No internal chimney seal is required. The inlet pipe size from the building foundation to the grease trap shall be four inch (4") diameter with a four inch (4") diameter outlet to three feet (3') outside the tank, then increased to a minimum six inch (6") diameter sewer pipe for the remainder of the service to the public sewer.

Grease traps shall conform to the Ohio Administrative Code 4101:3-13-02. Grease traps for commercial/institutional kitchen wastes shall be installed so they receive all grease bearing waste except those from garbage disposals. Grease traps shall be installed immediately outside the building where there is easy access for cleaning, unless it is impractical, in which case they may be installed adjacent to and outside of the food preparation area. Grease traps shall be at least 500 gallon effective capacity or larger sized to allow for cooling of liquids before discharge. Grease traps shall be inspected frequently and cleaned frequently and as often as necessary to retain the grease wastes. The use of enzymes for the cleaning of grease traps is not permitted.

If external grease trap, follow the above standards. Contact Erie County DOES, Engineering Division, to schedule inspection and testing of new structure.



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#### **GRAVITY MAIN LINE AND SERVICE LATERAL SEWER PIPE (Continued)**

##### **OIL AND SAND / GRIT INTERCEPTORS**

Oil and sand/grit interceptors shall conform to the Ohio Administrative Code 4101:3-13-02. Oil interceptors are required for garages and service stations where automobiles are serviced. Sand/Grit interceptors are required for car washes, garages and other areas where sand, dirt, solids and semisolids, or other heavy solids potentially plugging sanitary service laterals and public sanitary sewers. Oil interceptor effective volumes will be not less than one cubic feet above the outlet for each one hundred square feet of floor area to be drained to the interceptor, should only a portion of the buildings floor area drain to the interceptor only that area needs to be considered in this calculation. Sand/Grit interceptors shall be sized and designed based on the volume of water and wastes produced and the rates of flow, thereof.

##### **PRESSURE SEWER/FORCE MAIN PIPE**

Pressure sewer/force main pipe shall be designed for a minimum pressure of 150 p.s.i. and shall consist of:

- a. PVC, conforming to AWWA C900, DR 18 (solid wall pipe with PVC compounds meeting the requirements of ASTM D-1784 meeting the requirements of cell classification 12454-A or 12454-B), pipe shall include integral bell gasketed joints with re-enforced gaskets which are locked in place at the factory; or
- b. Ductile Iron Pipe (DIP) shall have a minimum wall thickness of Class 52, with push-on type joints, cement lined (AWWA C104), and shall meet the requirements of AWWA C150 and C151.
- c. Pressure sewer pipe shall be pressure tested to 150 psi for thirty (30) minutes without leakage.
- d. Restrained joints shall be used at a minimum at all joint fittings and at the next pipe joint from each fitting in all directions. Restrained joints shall consist of Meg-a-Lugs, Model Ebba Series 1100 or equal as approved by the Erie County Sanitary Engineer.
- e. 412 stainless steel bolts shall be used on all fittings and be subject to equal cathodic protection as required for the "Water Line Material Specification".
- f. Thrust blocks shall be used at all change of direction fittings in addition to the restrained joints, same as required for the "Water Line Material Specifications".
- g. Grinder pump pressure sewers/force mains shall be a flexible, PE 3408, 200 psi, SODR9, ASTM D2737 rated waterline pipe material, jointless material to the gravity sewer.

# **WASTEWATER COLLECTION MATERIAL**

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#### **GRAVITY MAIN LINE AND SERVICE LATERAL SEWER PIPE (Continued)**

##### **PRESSURE SEWER/FORCE MAIN PIPE (Continued)**

- h. All high points in force main shall have installed an air release valve in a manhole consisting of a one inch (1") sewage combination air valve as manufactured by Apco Valve and Primer Corporation (representatives McStay & Associates: 216-439-7208), or equal.
- i. Two (2) No. 8 stranded wires shall be buried with all PVC and HDPE pressure sewer pipes located at the 10:00 and 2:00 positions and terminated in valve boxes, along with four inch (4") wide tape noting "SEWER FORCE MAIN BURIED BELOW" buried over pipe twelve inch (12") below finish grade.

#### **GENERAL PIPE REQUIREMENTS & TESTING**

All manufacturers recommendations for installation, unloading, trench preparation, assembly, backfill, pressure or infiltration test, deflection tests, etc. shall be followed unless in conflict with these specifications, latest version of Ten State Standards or with Ohio EPA requirements.

#### **SEWER PIPE BEDDING**

Sewer Pipe Bedding shall consist of No. 8 or 9 limestone haunched in place to the dimensions shown on the standard trench drawing for all gravity, service laterals and pressure sewer pipe installed by open trench method to twelve inches (12") over top of pipe. A native clay bulkhead dam will be installed at a minimum for every 200 feet of sewer pipe installed by open trench method and on every service lateral outside of the mainline sewer trench.

#### **STEEL ENCASEMENT PIPE**

Under Railroad Crossings and the Ohio Turnpike or as required by the County, sewer pipe shall be installed in welded steel encasement pipe with minimum wall thickness of 0.375 inches, with a minimum I.D. of eight inches (8") Larger than the O.D. of the sewer pipe, (measured at the bell) installed with the use of a bore machine. The annular space shall be filled with sand or approved grout mixture. All PVC sewers installed in casing pipes shall have restrained joints and shall contain at least three (3) stainless steel, plastic, or pretreated wooden casing spacers per pipe length as well as casing end seals or approved equal. All D.I.P. installed in casing pipe shall have restrained joints and shall contain at least two (2) spacers per pipe length; and all HDPE pipe installed in casings shall contain one (1) spacer for every ten feet (10') of pipe.



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## **GRAVITY MAIN LINE AND SERVICE LATERAL SEWER PIPE (Continued)**

### **MANHOLES**

All manholes are permit required confined spaces and shall be watertight structures made of precast concrete sections with full depth channels and shall meet the requirements of ASTM C478, plus have external joint wraps, chimney seals and use concrete additives for water tightness. All existing manholes, which are to receive a new sewer pipe connection may be required to be replaced if not already constructed to the proceeding specifications as determined by the Sanitary Engineer. All inspections by D.O.E.S. will be performed to determine the need for replacement or rehabilitation.

**Concrete ring walls.** Concrete for manhole ring walls shall be constructed of Class A, 4,000 psi, 28 day compressive strength (6.5 bags per c.y.), with a waterproofing additive consisting of XYPEX Concentrate Admix C-2000 as manufactured by XYPEX Chemical Corporation, 13731 Mayfield Place, Richmond, B.C., Canada VGU (1.604.273.5265), Ipanex as manufactured by IPA Systems, Inc., 2745 North Amber Street, Philadelphia, Pa., (1.800.523.3834), Penetron Admix as manufactured by ICS/Penetron International, TTD, 45 Research Way, Suite 203, East Setauket, New York 11733 (1.631.941.9700) or approved equal. Reinforced steel and ring wall dimensions shall be as shown on standard manhole drawing. Lift holes if provided shall be filled watertight. Lift holes shall be filled with a non-shrink grout after set in place if they are thru holes. Cone sections shall include a minimum two inch (2") high smooth vertical interior face at the top to allow for the installation of the lower section of the internal chimney seal.

**Ring wall joints.** Joints shall be formed entirely of concrete employing a round rubber gasket conforming to ASTM C443, shall be self-centering and made a uniform watertight joint. Joints damaged during installation shall be replaced with new ring walls. This joint seal shall be lubricated with Conseal CS-2000 or approved equal. Ring wall joints shall be further sealed for water tightness by installing an external joint/seal wrap consisting of Conseal/Con Wrap CS-212, twelve inch (12") width with CS-75 primer as manufactured by Concrete Sealants, Inc., 8917 South Palmer Road, New Carlisle, OH 45344 (1.800.332.7325), or approved equal. Minor concrete joint damage may be repaired with hydraulic cement in the field under approval of the inspector.

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#### **GRAVITY MAIN LINE AND SERVICE LATERAL SEWER PIPE (Continued)**

##### **MANHOLES (Continued)**

**Connections.** All sewer pipe connections shall be flexible and watertight. The sewer pipe at the spring line shall not extend to the manhole flow channel. Any space left between the end of pipe inside the manhole and the concrete channel shall be filled with ConSeal CS-1500, or equal, waterproof flexible joint filler in a smooth workman like manner, which will not restrict solids to pass. Connections shall consist of flexible rubber boots with stainless steel bands. Connections should be installed at the factory when possible, including future sewer pipe stubs. Factory installed connections shall be Z-LOK for four foot (4') diameter manholes with sewer pipe sizes with O.D. less than 18.25 inches or A-LOK for larger manholes and sewer pipes as manufactured by Products, Inc., P.O. Box 1647, 697 Tullytown, PA 19007 (1.800.822.ALOK), or approved equal. Connections of sewers to existing manholes shall be KOR-N-SEAL, as manufactured by NPC, Inc., 250 Elm Street, P.O. Box 301, Milford, N.H. 03055, (1.800.626.2180) or approved equal.

**Manhole Steps.** Shall conform to the requirements of ASTM C478 except that the steps shall be polypropylene with steel reinforcement. Manhole steps shall not be installed in shallow manholes (4' deep or less).

**Grade Adjustment.** Shall be of precast concrete conforming to ASTM C478, shall be held in place with tar/asphaltic cement, no more than three (3) rings used per manhole and shall not exceed twelve inches (12") of total height adjustment. Precast concrete grade rings shall not be less than a two inch (2") height. One- one inch (1") grade ring made of plastic or neoprene rubber may be used on each manhole as needed.

**Frames and Covers.** Shall be gray iron castings conforming to ASTM A48 and shall be cleaned and factory dipped in coal tar pitch varnish at the factory or cleaned and field coat applied with asphaltic paint. Covers shall have solid (without vents) lids, unless otherwise specified. Typical frame and covers shall be Neenah R-1782, East Jordan model 1710, (8-1/2 inch high), East Jordan V-1317, (5 inch high), or approved equal. Watertight frames and covers shall be Neenah R-1916-F, East Jordan "Watertite" 1047 or approved equal.

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## **GRAVITY MAIN LINE AND SERVICE LATERAL SEWER PIPE (Continued)**

### **MANHOLES (Continued)**

**Drop Manhole Connections.** Shall consist of an inside drop, conforming to the preceding connection paragraph with the addition of utilizing a GPK drop pipe fitting as manufactured by GPK Products, Inc., Fargo, ND 58108-2872 (1.701.277.3225) or approved equal, with internal drop pipe clamps at the top and bottom of the drop pipe and every four feet (4') in between manufactured of 316 stainless steel strap anchored with anchor bolts such as 3/8 inch diameter Stainless Wejet or equal anchors as supplied by Fastenal (1.419.621.8228), or Spoerr Concrete, (1.800.252.5205). Generally, drop pipe diameter shall be one pipe size smaller than the inlet sewer pipe diameter with six inch (6") diameter a minimum. At the bottom of the drop pipe will be a 45 degree bend directing the flow smoothly into the flow channel, toward the outlet sewer pipe. Leave all caps off GPK ends.

**Invert/Flow Channel.** Invert/flow channels shall be installed at the factory. The minimum flow channel width and depth shall match the O.D. of the outgoing sewer pipe diameter. The minimum radius of flow channel curvature shall be equal to 1.5 times the I.D. of the outlet sewer pipe diameter and shall be smooth. Manhole diameter shall be designed appropriately to allow for the minimum radius. Flow channel shall also be installed for all future stub sewers installed with the installation and for all drop pipe connections. The bench above the channel shall be sloped at a grade of 4:1 toward the flow channel. Flow channels shall be U shaped with a cross section width slightly larger than the outside diameter of the largest pipe connected to the manhole. All flow channel and benches shall be installed in a workman like manner. Non-smooth flow channel manhole bottoms shall be rejected and have to be remanufactured at the factory causing a possible delay to the project. All upstream connecting pipes shall be installed to "match crowns" (top outside of pipes).

**Chimney Seals.** Shall be external chimney seals as manufactured by WrapidSeal external chimney seals as manufactured by CANUSA a division of Shaw Resource Services Inc., 2408 Timberloch Place, Building C-8, The Woodlands, Texas 77380 (1.281.367.8866) or approved equal, as required by the Sanitary Engineer. Internal chimney seals must be installed in a water tight manner. The chimney seal shall start at the frame including all adjusting rings down to the first ring wall.

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## **GRAVITY MAIN LINE AND SERVICE LATERAL SEWER PIPE (Continued)**

### **MANHOLES (Continued)**

**Manhole Infiltration Test.** The manhole from invert to top of casting, with chimney seal in place, shall be field tested for infiltration using a vacuum test at ten inches (10") of mercury for sixty (60) seconds, with less than a one inch (1") reduction.

### **Backfill Material And Installation.**

Pipe backfill material over sewer pipe bedding and around manholes within a forty-five (45) degree plane of influence of gravel or paved driveways and within influence of private and public roads shall at a minimum consist of ODOT 304 limestone installed in eighteen inch (18") lifts and mechanically compacted to ninety-five percent (95%) modified proctor. In areas of public roads, the backfill shall meet the requirements of the appropriate public official whom maintains the paved road.

## **PUMP STATIONS**

### **PUBLIC SUBMERSIBLE PUMP STATIONS**

General requirements of typical wastewater pump station includes, but is not limited to, the following: Duplex submersible pumps with controls as manufactured by Hydromatic, Vaughn chopper pumps for high clogging conditions or equal, in a concrete wet well with a separate valve vault. The wet well and valve vault shall be at a minimum eight feet (8') diameter to a maximum of twelve feet (12') diameter, Class A (4,000 psi) reinforced concrete designed for H-20 highway loadings, with sufficient size top hatches to remove all pumps, valves and equipment, with hatches made of aluminum (safe Hatch from Flyght or equal), hinged and padlocked, designed to same water tight specifications as sanitary manholes and shall include steps. Wet well shall have a hopper shaped bottom with all interior concrete surfaces field coated with Aromatic Polyurea Spray for Concrete as manufactured by Elastomer Specialties, Inc., 10908 S. 264<sup>th</sup> East Ave.,

# **WASTEWATER COLLECTION MATERIAL**

## **MINIMUM REQUIRED SPECIFICATIONS**

### **AND INSTALLATION STANDARDS**

REVISION DATES: 06/15/1999, 01/14/2000, 12/01/2000, 6/11/01, 7/01/02, 7/01/03, 7/01/04, 7/01/06, 7/01/07, 7/01/2008, 7/07/10, 7/01/2011

LAST REVISION DATE: 7/01/3

## **PUMP STATIONS**

### **PUBLIC SUBMERSIBLE PUMP STATIONS (Continued)**

Broken Arrow, OK 74014 (1.800.786.4244) including a five (5) year warranty against H<sub>2</sub>S corrosion or equal. Hydromatic Pumps with flanged assembly for break away fittings are preferred with one spare pump provided. Victaulic D.I.P. shall be provided in the valve vault. In the wet well provide stainless or fiberglass guide rails to remove the pumps. Provide one (1) spare Hydromatic Pump with motor.

Size the vault for expansion to handle the ultimate service area design flow. Electric controls shall include circuit breaker system, level controls, alternating pump controls, lighting, HOA for motor starters, soft start and stop (future condition) for all motors larger than 25HP motor starters.

All electric controls in stainless steel NEMA 4X weatherproof enclosures. Four (4) wire contacts shall be provided and left open and labeled in the control panel for connection of an auxiliary portable generator to provide power during a station primary power outage.

Pump Stations shall include as a minimum the following items:

- a. Use duplex PC boards. Hydromatic Duplex Q with duplex PC boards. High level and seal failure boards for alarms only.
- b. Control panel shall have an internal Plexiglas door inside the box with control switches, gauges, etc., on the inside door and external door shall be lockable.
- c. All electrical panels shall be located a distance of four feet (4') from wet well on a separate concrete pad on a non-corrosive mounting frame of sufficient size to support both a telemetry panel and a stainless steel electrical service panel. Mounting surface shall consist of aluminum or stainless steel posts with stainless steel unistrut system with stainless steel fasteners.
- d. Three (3) stainless steel NEMA 4X terminal boxes shall be provided; one (1) for tip floats and one (1) for pumps to be located with control panel mounting frame.
- e. Check valves shall have external weighted swings.
- f. Minimum one-quarter inch (1/4") stainless steel lift chains for lifting pump and motor. Pumps shall have stainless steel lifting bail.
- g. Stainless steel bracket for hanging tip floats.
- h. Isolation valves shall be short bodied quarter turn plug valves.
- i. Dresser couplings shall be installed in forcemain pipes between wet well and valve vault.
- j. A four inch (4") quick disconnect compression type connection shall be provided in the valve vault piping to connect a portable pump hose, used for emergency by-passing the pumps or wet well.

# **WASTEWATER COLLECTION MATERIAL**

## **MINIMUM REQUIRED SPECIFICATIONS**

### **AND INSTALLATION STANDARDS**

REVISION DATES: 06/15/1999, 01/14/2000, 12/01/2000, 6/11/01, 7/01/02, 7/01/03, 7/01/04, 7/01/06, 7/01/07, 7/01/2008, 7/07/10, 7/01/2011

LAST REVISION DATE: 7/01/13

## **PUMP STATIONS**

### **PUBLIC SUBMERSIBLE PUMP STATIONS (Continued)**

- k. The pump station alarm system shall include a cellular RTU compatible with alarm website and connected to local phone line installed complete to call out alarms listed above.
- l. Conduit shall be PVC underground to terminal box, aluminum afterward with gas seals before entering control panel or telemetry panel.
- m. Provide exterior area lighting.
- n. Provide a GFI 120 volt receptacle in the control panel.
- o. All control panels shall be grounded to a six feet (6') grounding rod and grounding cable in a conduit to protect against corrosion.
- p. Valve vault shall drain to wet well through a red valve check valve, series 39 or approved equal located in a sump in valve vault with vault floor sloped to sump.
- q. Provide two (2) complete copies of O&M Manuals for all pumps, motors and controls.
- r. A one year warranty shall be provided from the manufacturer(s) of the pumps, controls, valves, piping with fittings and all structures beginning from the time of successful completion, startup and submittal of O&M Manuals, covering the cost of all material and labor defects.
- s. Level controls will consist of a submersible transducer for VFD motors and/or mercury float type for low level alarm, pumps off, lead pump on, lag pump on and high level alarm plus one spare (total of six)
- t. No spare parts for pumps are necessary except as listed above.

Developers or their agents shall own and maintain the pump station, including paying for all utilities until an equivalence of a minimum of five (5) single family homes are connected to and contributing wastewater flow to the new pump station at which time Erie County will inspect the station one last time and if in acceptable condition will accept for ownership, operation and maintenance the new pump station.



# **WASTEWATER COLLECTION MATERIAL**

## **MINIMUM REQUIRED SPECIFICATIONS AND INSTALLATION STANDARDS**

REVISION DATES: 06/15/1999, 01/14/2000, 12/01/2000, 6/11/01, 7/01/02, 7/01/03, 7/01/04, 7/01/06, 7/01/07, 7/01/2008, 7/07/10, 7/01/11

LAST REVISION DATE: **7/01/13**

### **PUMP STATIONS**

#### **GRINDER PUMP STATIONS**

Grinder pump stations may be used in homes and/or businesses where the public sewer does not meet the required depth to serve the customer by gravity as described in the Service Lateral section of these standards. It is recommended to use a submersible positive displacement type grinder pump that is designed to pump against varying heads as manufactured by Environmental One and represented by The Craun-Liebing Co. of Cleveland, Ohio (1.800.221.1251). A single submersible grinder pump with spare pump is recommended for a single-family home installation. Multiple home installations connecting to a shared grinder pump station or businesses using a submersible grinder pump station shall require a duplex (2 pumps) submersible grinder pump station, designed by a Professional Engineer, EPA Permit-to-Install, and an agreement as to ownership, use, operation and maintenance, recorded with the property deed of all customers utilizing the pump station. **Grinder pump stations shall be the responsibility of the private sewer customer(s) to own, maintain and operate.**

#### **WARRANTY**

All new public water lines, sanitary sewer lines and appurtenances installed shall have a one year warranty against any manufacturer defects, installation defects, workmanship or failures of the system. Trench backfill and pavement installed as part of a public water or sewer project shall have a two year warranty against settlement, cracking, raveling, deterioration or shrinking of joint seal products, etc. Term of the warranties shall commence upon County written acceptance of the public lines and appurtenances.