

Policy # 2011- A

Guidelines for Building Sewer Construction

Koontz Lake Regional Sewer District

Adopted	May 11, 2011
<i>Revised</i>	<i>February 23, 2012</i>
<i>Revised</i>	<i>March 12, 2012</i>
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Revised	June 22, 2020



Originally Written by: Robert S. Aloï, PS – District Secretary as of May 11, 2011

Updated & Maintained by:



KLRSD District Engineer

Guidelines for Building Sewer Construction

Koontz Lake Regional Sewer District Starke and Marshall Counties, State of Indiana

The following guidelines shall apply for all residential, commercial, industrial and institutional users connecting to the Koontz Lake Regional Sewer District (the District) sanitary sewer collection system. These guidelines cover the administrative procedure and the construction of gravity sewer lateral, pressure sewer lateral, and pressure sewer lateral from any serviced structure to an existing pressure main or grinder pump station within the jurisdiction of the Koontz Lake Regional Sewer District.

The Provisions of this document are intended to retire existing septic systems and to implement uniform sewer connection procedures to prevent infiltration and contaminants from entering and damaging the District sewer system.

Attached to this document are Pages 1-6 of typical detail drawings specific to grinder station installations within the KLRSD. These drawings are considered a part of this document and are provided for those situations where the installation of a new grinder station is required to facilitate the connection of a proposed home, business, or other type of occupied structure.

Part 1 – Administrative

1.1 Forms

The following documents shall be executed during the building sewer application process and are included as attachments herein.

1. Sewer Connection Agreement (**Form A**)
2. Application for Sewer Connection Permit. (**Form B**)
3. Sewer Location Sketch. (**Form C**)
4. Sewer Connection Permit Certificate of Approval (**Form D**)

1.2 Submittals

Property owners seeking connection to the District sanitary sewer system are required to submit the following prior to start of any building sewer connection work:

1. Fully executed Sewer Connection Agreement (**Form A**)
2. Fully executed Application for Sewer Connection permit (**Form B**)
3. Sewer Location Sketch (**Form C**)
4. Insurance Certificates from Contractor and/or Landowner, or proof of Bond
5. Payment for Permit Fee & Inspection Fee as stipulated in the Sewer Rate Ordinance effective at the time the permit is being requested

Part 2A – Codes, Standards and Ordinances

The following codes, standards and ordinances are all applicable to the work herein described, either in part or entirety, except that where more stringent requirements are set forth under codes, laws and ordinances of federal, state and/or local governing bodies having jurisdiction, those more stringent requirements take precedence.

- A. Sewer Use Ordinance No. **2010-A** as adopted by the District.
- B. Sewer Rate Ordinance No. **2010-B** as adopted by the District.
- C. BOCA National Plumbing Code, current edition, with Indiana amendments
- D. NFPA 70 National Electrical Code, current edition, with Indiana amendments
- E. Indiana State Department of Health, Bulletin S.E. 13 “On Site Water Supply and Wastewater Disposal for Public and Commercial Establishments”, current edition
- F. Indiana Administrative Code 410 IAC 6-8.1 “Residential Sewage Disposal Systems”

Part 2B – Insurance

Prior to execution of the work, all contractors must procure and maintain insurance of the types and limits specified by the Board from a carrier licensed to do business in the State of Indiana. All such insurance must be evidenced by a “Certificate of Insurance” to be submitted with the **“Application for Building Sewer Connection Permit”**.

Certificate of Insurance Requirements:

Before the District will accept the **“Application for Building Sewer Connection Permit”** The contractor shall show one of the following proofs of insurance when filing the application.

- 1) Public Liability and Property Damage Insurance in an amount not less than one Million dollars (\$1,000,000.00) in the case of damage or injury to one or more persons.
- 2) Public Liability and Property Damage Insurance filed with and in the amounts specified and required by the County in which the Contractor is engaged in the business of sewer construction or other ancillary work related to construction in the Koontz Lake Regional Sewer District within that County. Insurance filed with said County shall list the Koontz Lake Regional Sewer District as an additional insured.

Homeowners completing work without a contractor shall either present a Property Owner's policy amended, or obtain a separate policy, to cover damages to the public sewer system from their operations. Such coverage shall be issued in the amount of \$10,000 and be evidenced by a “Certificate of Insurance” to be submitted with the **“Application for Building Sewer Connection Permit”**.

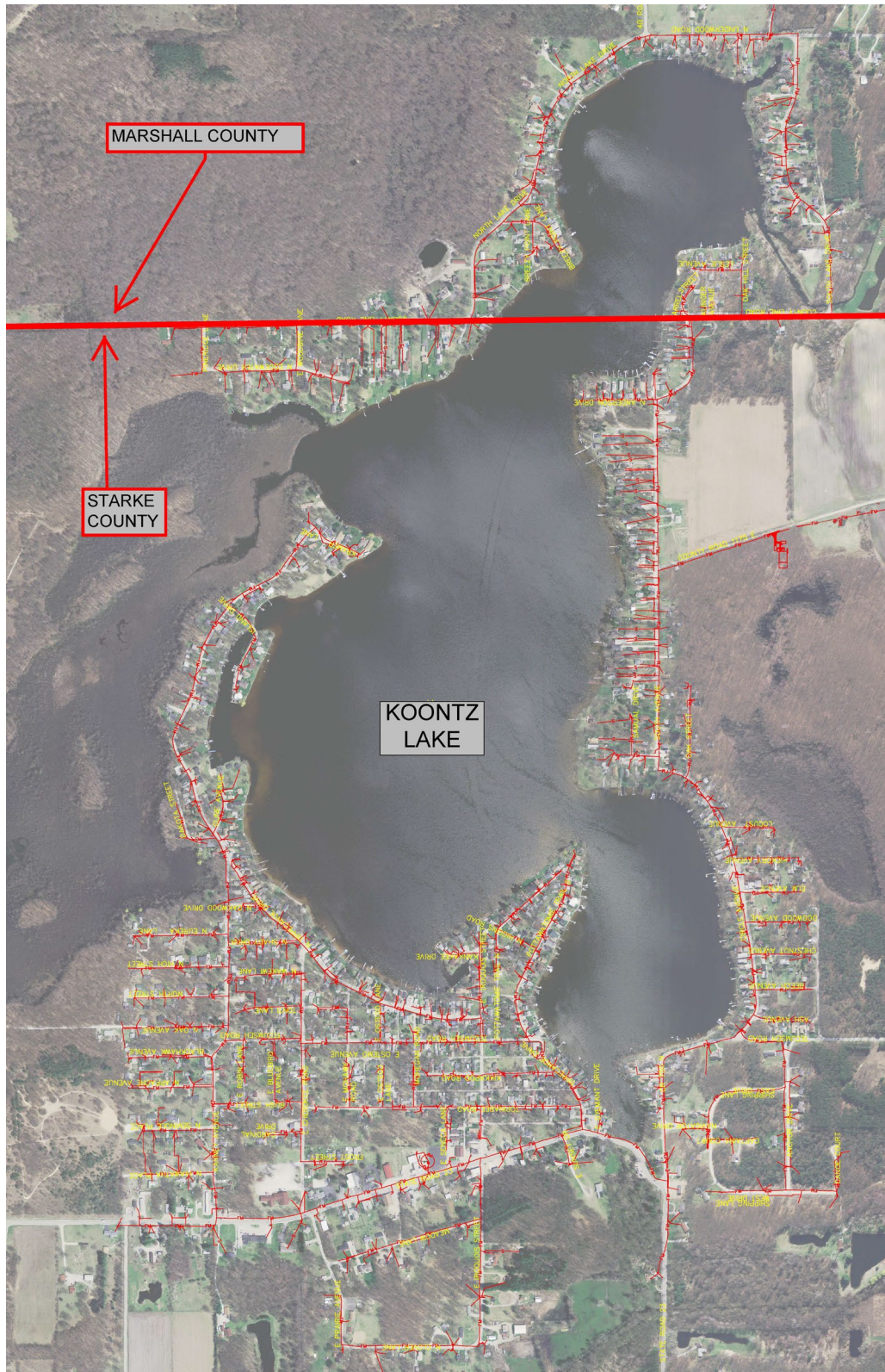
Part 2C – Bonds

In addition to Insurance, all contractors and their subcontractors engaged in providing all or any part of the work of connecting a building or buildings to the main sewer system with a building sewer must furnish guaranteed surety to the Koontz Lake Regional Sewer District in the form of a permit bond in the amount of \$5000, in the event that the contractor or subcontractor damages any part of the public sewer system for which corrective action must be taken by the District.

Part 2D – Contractor County Registration

Contractor shall obtain and maintain a current Contractor Registration if required in the County in which the Contractor plans on engaging in the business of sewer construction or other ancillary work related to the sewer construction within that portion of the Koontz Lake Regional Sewer District that lies within that County. A map displaying where the county line

between Starke & Marshall counties lies as it relates to the KLRSD collection system is provided below.



*Map of KLRSD collection system with county line for reference.
Please note that map is oriented with North to the left.*

Part 3 – Materials

3.1 Gravity Sewer and Pressure Sewer Laterals

- A. Sewer laterals 50' or more from water wells (public or private): Any new building sewer gravity laterals, installed between the structure and the grinder station, shall be SDR 35 Polyvinyl Chloride (PVC) pipe or Schedule 40 Polyvinyl Chloride (PVC) pipe with gasketed, push on joints. Glued-joint pipe is not acceptable. Existing lateral pipe conforming to current Starke or Marshall County Health Department standards may continue to be utilized, provided all other applicable standards herein are maintained.
- B. Minimum separation requirements as stipulated in IAC 410 shall be observed whenever potable water wells are located within the minimum isolation distances defined therein. An excerpt from IAC 410 follows for reference:

Section 57(a)

Section 57(c)

410 IAC 6-8.3-57 Separation distances

Sec. 57. (a) All septic tanks, dosing tanks, lift stations, and soil absorption systems shall be located in accordance with Table I as follows:

Table I – Separation Distances		
Minimum Distance in Feet from	Septic Tank and Other Treatment Units, Dosing Tank, Lift Station	Soil Absorption System
Private water supply well ^{1,2}	50	50
Private geothermal well ^{1,2}	50	50
Commercial water supply well ¹	100	100
Commercial geothermal well ¹	100	100
Public water supply well, lake, ^{1,3,4} or reservoir ^{1,3,4}	200	200
Other pond, retention pond, lake, or reservoir ³	50	50
Storm water detention area ^{3,5}	25	25
River, stream, ditch, or drainage tile ⁶	25	25
Buildings, foundations, slabs, garages, patios, barns, aboveground and belowground swimming pools, retaining walls, closed loop geothermal systems, roads, driveways, parking areas, or paved sidewalks	10 ⁷	10 ⁸
Front, side, or rear lot lines	5	5
Water lines continually under pressure	10	10
Suction water lines	50	50

¹The distances enumerated shall be doubled for soil absorption systems constructed where there exist horizons, layers, or strata within thirty-four (34) inches of the ground surface with a soil loading rate greater than seventy-five hundredths (0.75) gallons per day per square foot as determined from Table IV of section 70(b)(8) of this rule, unless that hazard can be overcome through on-site sewage system design.

²The separation distance to a private water supply well abandoned in accordance with 312 IAC 13-10-2(e) may be reduced to ten (10) feet.

³Measured from the normal or ordinary high water mark.

⁴See subsections (b) and (c).

⁵Storm water detention area: area designated for the temporary detention of storm water, with the outlet located at the lowest elevation of the depression.

⁶See section 59(f) of this rule for subsurface drainage system separation.

⁷Patios without footers, aboveground swimming pools, and sidewalks may be located within ten (10) feet of septic tank, as long as no required access points are obstructed.

⁸A minimum separation of ten (10) feet is required on all sites.

(b) A residential on-site sewage system shall not be located within two hundred (200) feet of a public water supply lake or reservoir. However, any residential on-site sewage system that includes secondary treatment and meets the following requirements may be less than two hundred (200) feet, but not less than fifty (50) feet, from the normal or ordinary high water mark of the lake or reservoir:

- (1) Meets the minimum requirements of section 60(h)(1) through (3) of this rule; or
- (2) Is a system component independent of the soil absorption field that meets the effluent quality requirements of NSF/ANSI for certification under Standard 40 as a Class I plant, and that is approved by the department under the provisions of section 52(h) of this rule.

(c) Any residential on-site sewage system approved under the provisions of subsection (b) must be maintained for the life of the system through an operating permit issued under the provisions of section 54 of this rule.

(d) Sewers shall not be located within fifty (50) feet of any water supply well or subsurface pump suction line, except as follows:

(1) Sewers constructed of waterworks grade ductile iron pipe with tyton or mechanical joints, or PVC pressure sewer pipe with an SDR rating of twenty-six (26) or less with compression gasket joints, may be located within the fifty (50) foot distance.

(2) In no case shall sewers be located closer than twenty (20) feet to dug and bored water supply wells, or closer than ten (10) feet to drilled and driven water supply wells or subsurface pump suction lines.

(e) Water lines and sewers shall not be laid in the same trench, as follows:

(1) A horizontal separation of ten (10) feet shall be maintained between water lines and sewers.

(2) Where crossings are necessary, a minimum of eighteen (18) inches vertical clearance must be maintained with the water line positioned above the sewer line when possible.

(3) When it is impossible to maintain proper horizontal and vertical separation, the sewer shall be constructed of ductile iron pipe with mechanical joints or PVC pressure sewer pipe with an SDR rating of twenty-six (26) or less, having mechanical or compression gasket joints within ten (10) feet of the water line with the water line positioned above the sewer line when possible. The sewer shall be pressure tested to assure watertightness prior to back filling.

410 IAC 6-8.3-58 Dispersal area

Sec. 58. (a) A dispersal area is required for a soil absorption system when:

- (1) the soil loading rate used to determine the size of the soil absorption system is five-tenths (0.5) gallons per day per square foot (gpd/ft²) or less; or
- (2) there is a horizon in the upper sixty (60) inches of the profile description with:

- (A) bedrock;
- (B) dense material;
- (C) dense till;
- (D) soil with fragile properties; or
- (E) layers transitional to dense till (horizons in a soil developed from Wisconsin glacial till that shows effervescence when treated with a ten percent (10%) hydrochloric acid solution), unless:
 - (i) the on-site soils evaluation report shows that the presence of the horizon is not detrimental to the proper functioning of an on-site sewage system; and
 - (ii) the determination in item (i) is made using the guidelines as set forth in the soil manuals, technical bulletins, and handbooks of the NRCS guidelines and as approved by the department.

(b) When the conditions in subsection (a) apply, the following requirements shall be met:

- (1) For soil absorption system sites with a slope of one-half percent (1/2%) or less, a minimum dispersal area as described in Table II in subsection (c) shall be maintained on each side of the outside edge of the:

- (A) outer trench parallel to the length of the trench; or
- (B) INDOT Specification 23 sand and parallel to the long axis of the elevated sand mound.

- (2) For soil absorption system sites with a slope of greater than one-half percent (1/2%), a minimum dispersal area as described in Table II in subsection (c) shall be maintained on the downslope side of the soil absorption system from the outside edge of the:

- (A) downslope trench parallel to the length of the trench; or
- (B) INDOT Specification 23 sand downslope and parallel to the long axis of the elevated sand mound.

Excerpt from IAC 410 as mentioned above.

C. Sewer lateral size and scope:

- a. All sanitary service laterals shall be four (4) inches in diameter.
- b. Sanitary service laterals shall be laid with a minimum slope of 1.33% and a maximum slope of 12.0%.
- c. 6-inch diameter laterals (if approved) shall be laid at a minimum slope of 0.67% and a maximum slope of 12.0% and will require a reducer to connect to a grinder station.

(minimum and maximum slopes taken directly from 410 IAC 6-8.2-62)

D. In instances where pressure sewer laterals must be constructed due to inadequate or negative slope between Building and grinder station, the following special provisions will apply:

- a. pipe shall be of waterworks grade, with gasket, pressure grade push on joints (i.e., SDR 21 PVC or Class 52 ductile iron pipe)
- b. the ejector pit shall be located greater than 50 feet of potable water wells (public or private).
- c. the pump a/o ejector pit shall not be capable of exceeding a flow rate of 14 gallons per minute and shall not pump waste in intervals exceeding 24 gallons. (sometimes referred to as "slugs")
- d. the District reserves the right to require anyone obtaining a permit for this type of connection to also provide pump curve performance data and shop drawings for the pump and ejector pit they are proposing to use.

3.2 Grinder Stations ***(Waived for properties connected during public sewer construction project.)***

Grinder pumps, basins, controls, and appurtenances shall meet the specific requirements of the pressure sewer system design and the standards of the District, as well as any applicable federal, state or local authority. System design is based on the use of E-One Corporation Pumps. Any deviation from the specified pump, basin, controls, and appurtenances shall require prior written approval by the District.

3.3 Pressure Sewer Laterals ***(Waived for properties connected during public sewer construction project.)***

Pressure sewer laterals installed between the grinder pump unit and the pressure sewer main, shall be SDR 11, 160 psi, high density polyethylene (HDPE) pipe, joined by the butt fusion or socket fusion method. All pipe shall be one and one quarter inches (1-1/4") in diameter, unless wastewater flows and pumping rates require larger lateral sizing, and it is specifically approved by the District.

Tapping saddles, check valves, curb stops, curb boxes, and fittings shall conform to the requirements of the District. Refer to The typical details attached hereto for material requirements for pressure lateral taps. Taps to the mainline forcemain shall only be made by contractors pre-qualified for such work by the District.

Part 4 – Installation

- 4.1 Building sewers should be installed using the shortest and most direct route to the Grinder station. Interior plumbing modifications are suggested rather than excessive changes of direction in the building sewer. Any new plumbing done inside the house to within 5 feet of the home must be performed by a licensed plumber, unless the homeowner does this work. See typical details attached hereto for typical details of installation.

- 4.2 Prior to the start of the work, both the location and elevation for the building sanitary drain and lateral connection to the sewersystem must be identified to determine if slope is available in the allowable distance. The Grinder Station location can be obtained from record drawings maintained by the District. (see 3.1 C b & c herein for minimum slopes)

If insufficient slope exists, the building sanitary sewer may be upsized to 6 inches from a minimum 4 inches diameter gravity flow pipe, requiring less slope.

Should inadequate or negative slope exist, the only method of sewer hookup available would be the use of a sewage ejector pump and pressure sewer lateral.

- 4.3 All fittings shall be installed to guide sewage in the direction of flow. There shall be no elbows or bends greater than 45 degrees.

- 4.4 When connecting laterals to pipe of differing material, a Fernco connection (or approved equivalent) shall be used. This is the only location such connector shall be used.

- 4.5 Any open trench lateral construction shall be bedded in a minimum of 3" granular material conforming to Indiana Department of Transportation (INDOT) No. 53 or No. 8 gradations. Native soils may be used only if they consist of sand or other similar materials. Native materials that include vegetable or other organic matter, all types of refuse, large pieces or fragments of concrete, large stones, boulders, or other similar materials shall not be used. Bedding shall be carefully placed up to the spring line of the pipe making sure that the lower quadrants of the pipe are firmly bedded and supported. The trench section from the spring line of the pipe to a point 3 feet above the pipe shall be carefully backfilled with suitable excavated material.

Suitable excavated material used for backfilling shall consist of loam, sand, or other similar materials. Backfill materials that include vegetable or other organic matter, all types of refuse, large pieces or fragments of concrete, large stones, boulders, or other similar materials shall not be used.

At all times during the work, proper care must be taken to keep the trench and any other excavation free from any ground and surface water. Such equipment must be supplied and maintained to keep excavations dry until the sewer pipe bedding and backfill are complete. Drain or pump water away from the work to a suitable location without interference to adjoining property

Refer to typical details attached hereto for pipe bedding and backfill requirements.

- 4.6 A sewer cleanout shall be installed a minimum of 18 inches and a maximum of 4 feet from the building.
- 4.7 Sewer cleanouts shall be installed a maximum of every 100 feet along any gravity type building sewer. Accessible cleanouts shall also be installed at every change of direction.
- 4.8 Cleanouts shall be extended to grade, pipe liners (frost sleeves) are recommended to be placed around the cleanout extension to grade. The cleanout shall be a "Y" fitting installed in the direction of sewer flow with a 45-degree fitting directed to grade. See typical details attached hereto for a detail of cleanout construction.
- 4.9 Cleanouts shall be the same diameter as the sewer lateral pipe.
- 4.10 Cleanout access shall not be covered and shall be readily accessible. Cleanouts shall be plugged or capped with an approved watertight lid.

- 4.11 All existing septic tanks, holding tanks and drywells, including any and all other buried containers and receptacles presently tied into the building and collecting waste, shall be disconnected and properly abandoned or removed. All tanks, basins, containers, etc. shall, prior to backfill or removal, be emptied clean by a licensed septage service. Such work can be evidenced by a receipt.

Containers or receptacles constructed of materials subject to deterioration over a short period of time shall be removed and hauled from site.

Those septic tanks constructed of concrete or masonry may remain in place if found in sound condition. Tops or lids shall be removed and hauled from site or crushed into the tank. If built with solid bottoms, material must be broken up to allow for proper drainage, then backfilled with a debris-free sand or granular material, compacted in place to prevent settling. Where flowable mortar is used, the septic tank top may remain intact, provided all voids within the tank are filled adequately.

Septic tank abandonment shall be inspected by the District to ensure compliance with all local and State of Indiana regulations.

Properly grade and establish vegetative cover.

If electrical power is involved, it must be disconnected at the source and all control and lines removed.

The contents of the septic tank must be disposed of in a way meeting all Local and State health department standards.

- 4.12 Those existing sewer lines presently connecting the building sanitary drain to the septic tank, holding tank, that are also tied directly to the lake, or to a storm drain or other structure emptying into the lake must be disconnected and abandoned.
- 4.13 When it is required to tap an active pressure sewer main for a new pressure sewer lateral, every effort shall be made to prevent wastewater discharge from the system. This may be accomplished through tapping the active sewer in accordance with the typical details attached hereto. The District shall be notified a minimum of 48 hours prior to the tapping of any active sewer. The completed tap shall be approved by the District prior to being backfilled. Tapping an active pressure sewer main shall only be performed by a contractor pre-qualified by the District.
- 4.14 The property owner shall make every effort necessary to avoid prohibited connections, which include but may not be limited to the following: rain, surface or subsurface water, sump pumps collecting rain and/or ground water, septic tanks, holding tanks, dry wells, and field drains. Internal piping shall be verified and inspected by the District before any connections are made. All Piping and fixtures on the property of the customer are assumed to be in satisfactory condition at the time the sewer connection is made and sewer service furnished. The District reserves the right to require the correction of any unsatisfactory plumbing condition that may affect the integrity of the District sewer system if, during the inspection, such condition is found to exist. The District reserves the right to make any necessary repairs, if the customer refuses to do so, and shall bill the customer for the cost of said repairs.
- 4.15 The sewer lateral for all non-residential properties engaged in food service or food processing must include an acceptable self-contained grease trap.

Part 5 - Inspections

- 5.1 All building sewers and sewerlaterals shall be inspected by the District to ensure compliance with these standards. A 72-hour notice for inspections is recommended.

- 5.2 The entire installation and final hookup shall be inspected prior to backfilling in order to verify materials and installation. Any building sewer lateral backfilled prior to an inspection approval shall be re-excavated at the owner's expense for inspection. In instances where service laterals are installed by directional drilling, the owner shall retain a sample of the piping material for verification by the inspector.
- 5.3 Building sewers and service laterals shall be pressure tested in the presence of the District's inspector to verify that no leaks are present. The contractor and/or property owner must make all arrangements to conduct the test, as well as furnish all labor, materials, tools, equipment, and apparatus. Gravity building sewers shall be tested by a low-pressure air test at 4.0 psig for durations as listed in Table 5-1. Pressure sewer laterals shall be air tested at maximum operating pressure for 15 minutes based upon pipe Manufacturer's specifications prior to connection to District sewer. All laterals shall be tested from the first cleanout near the building to the District connection point.

Table 5-1

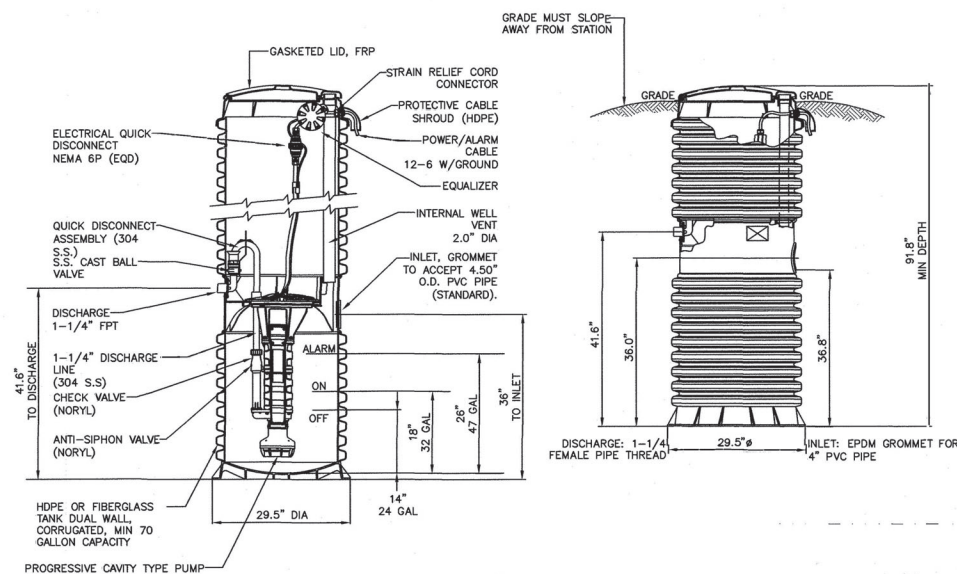
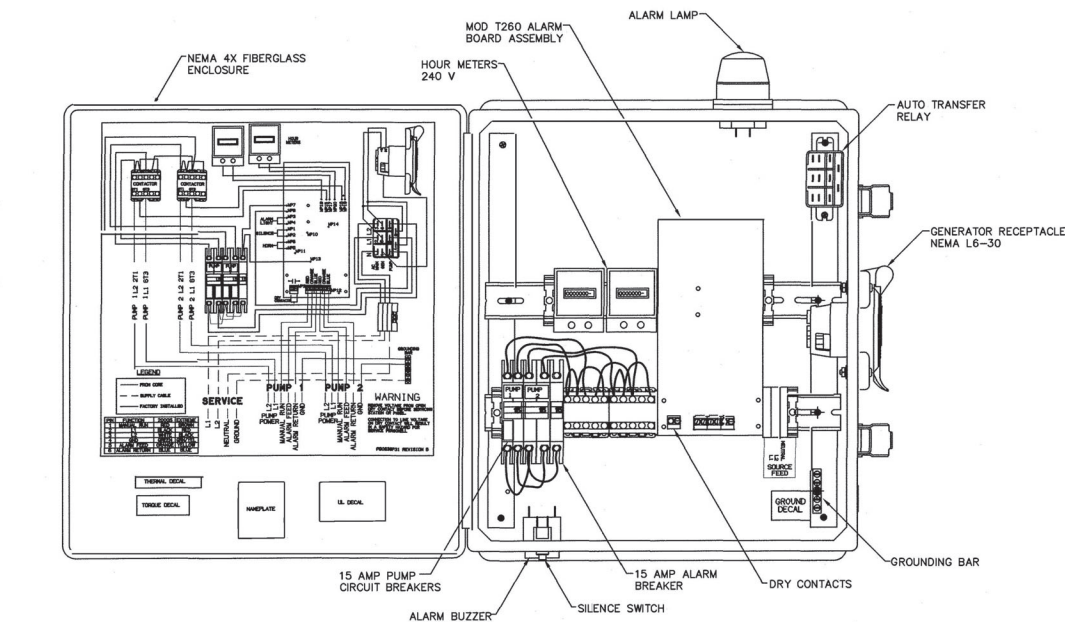
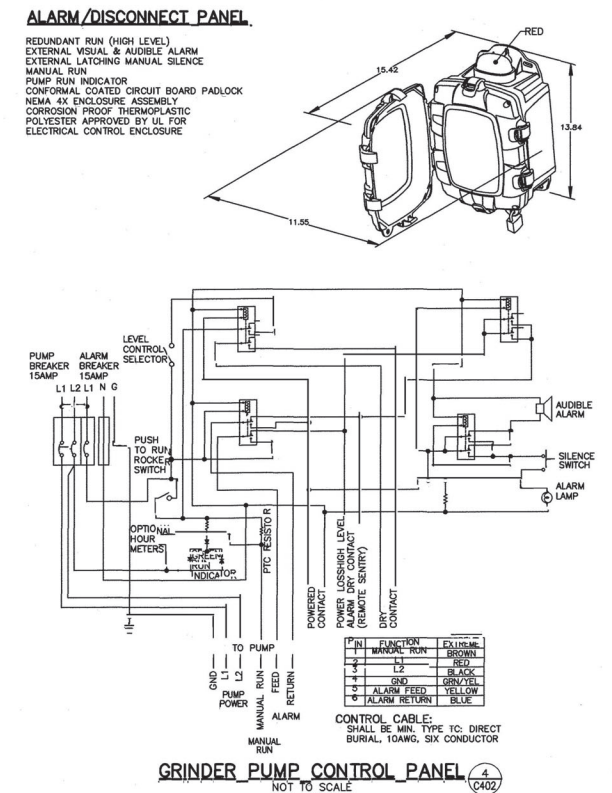
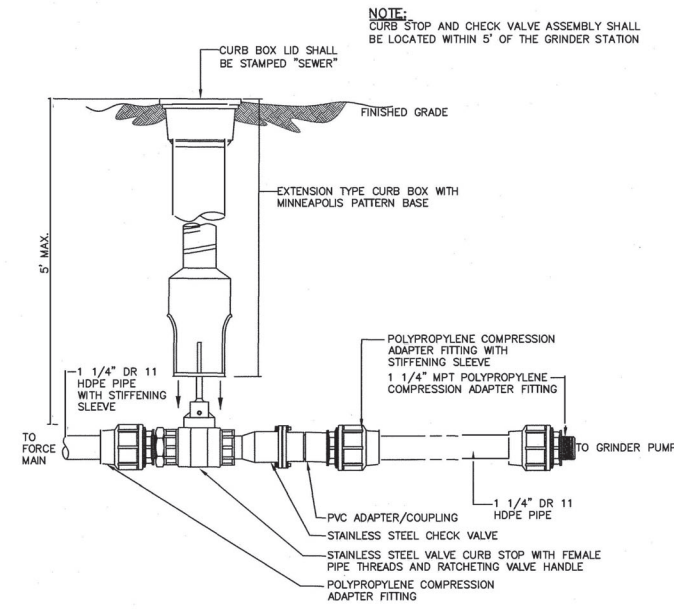
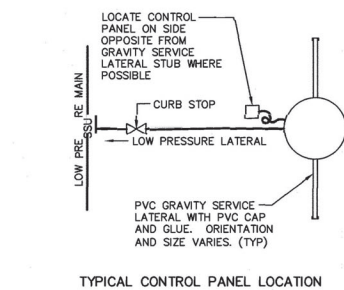
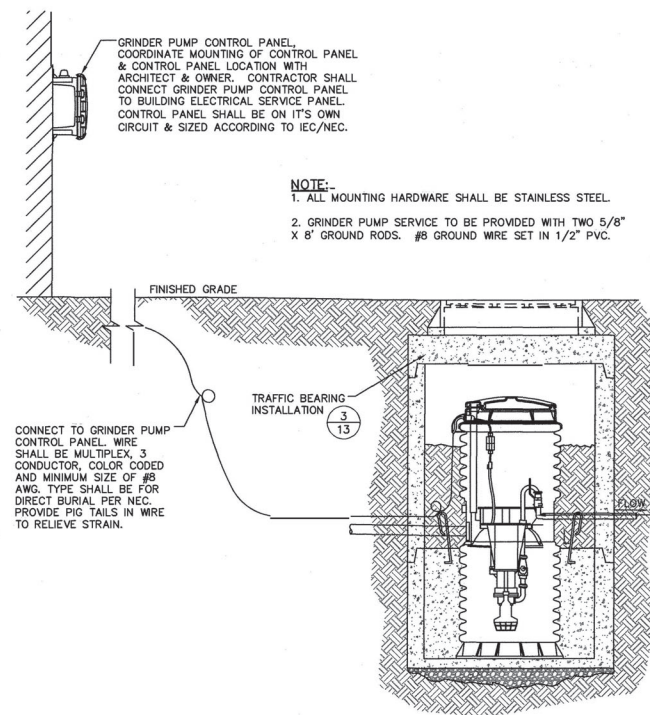
Pressure Air Test Minimum Time required for 0.5 psig Pressure Drop	
Length (ft)	Time (min:sec)
Up to 597	1:53
Greater than 597	0.190 * L

L = length of pipe (ft)

- 5.4 If it is to remain in place, the existing septic tank abandonment must be inspected prior to backfill.
- 5.5 No building sewer or sewer lateral installation or excavation of the lateral connection shall be allowed prior to completion of the District's main sewer collection and treatment systems.

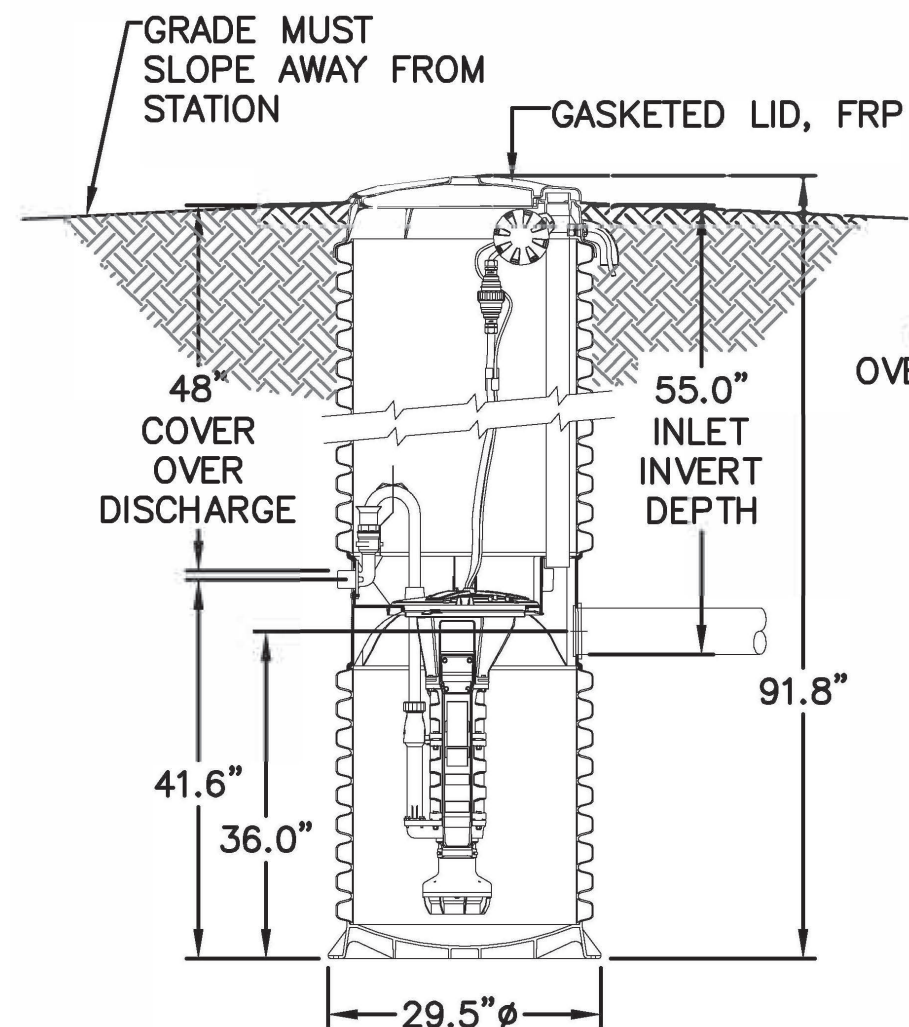
Part 6 - Special Connections

- 6.1 Any condition where the property owner must provide a new tie into the main sewer line with a lateral connection or where multiple connections are necessary will be considered on an individual basis by the District for required materials, inspections and tests.

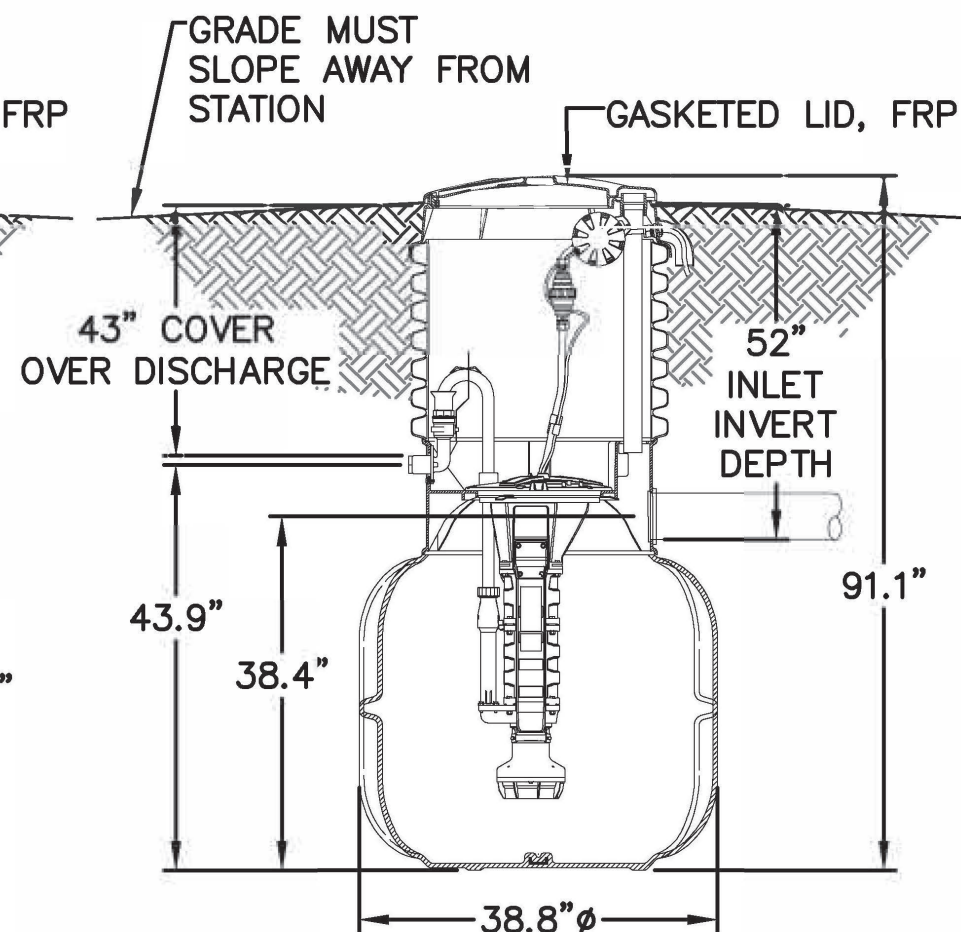


- GRINDER PUMP STATION - GENERAL ELECTRICAL NOTES:

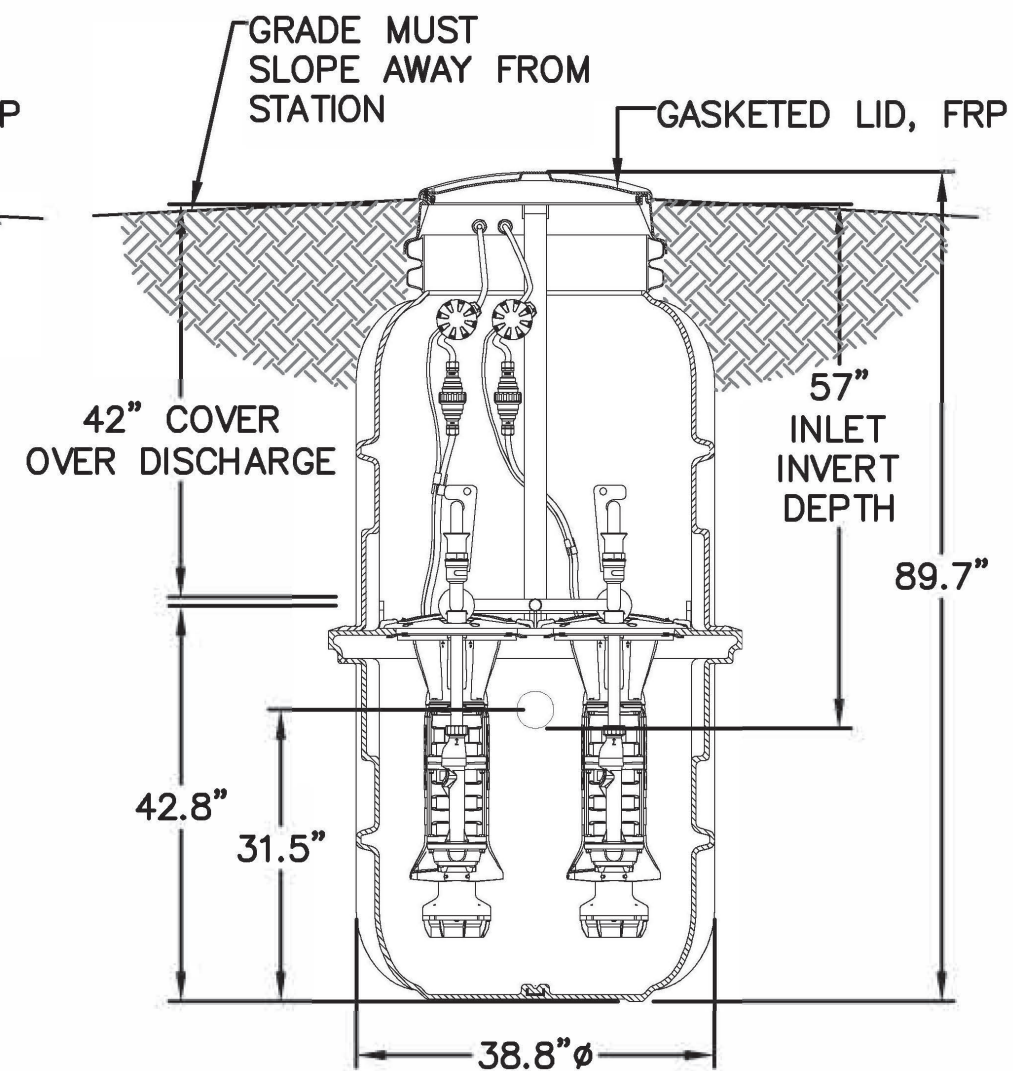
1. THE CONTRACTOR SHALL PRIDE ANY DISCONNECT SWITCH BOXES, ELECTRICAL PANELS, ALL CONDUIT, CONNECTORS, CONDUCTORS, GROUNDING, AND ALL OTHER ITEMS NECESSARY TO MAKE A COMPLETE CONNECTION. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR ALL CONDUIT, CONNECTORS, CONDUCTORS, GROUNDING, AND ALL OTHER NECESSARY ITEMS FROM THE NEW CIRCUIT BREAKER TO THE GRINDER PUMP REQUIRED FOR A COMPLETE CONNECTION.
2. THE CONTRACTOR SHALL INSTALL ELECTRICAL CONDUIT WITH COPPER WIRE CONDUCTORS FROM THE BREAKER PANEL TO THE GRINDER UNIT CONTROL PANEL. ALL TRENCHES SHALL BE BACK FILLED, COMPACTED AND RE SEEDED. ALL WORK ASSOCIATED WITH INSTALLATION OF WIRING SHALL BE INCLUDED IN THE UNIT COST FOR THE GRINDER PUMP ELECTRICAL ITEM.
3. EXPOSED DIRECT BURIED CABLES SHALL BE INSTALLED IN PVC CONDUIT TO A MINIMUM OF 24" BELOW FINISHED GRADE.
4. ALL CONDUIT CONNECTED TO THE ALARM/CONTROL PANEL SHALL BE SEALED WITH SEALANT FILLINGS AND SILICON SEALANT.
5. THE CONTRACTOR SHALL CLEANUP AND RESTORE ALL PROPERTY TO AN "EQUAL TO" OR "BETTER THAN" CONDITION UPON COMPLETION.
6. ALL DISTURBED TURF GRASS AREAS SHALL BE RESTORED WITH A 3" MINIMUM BLACK TOPSOIL AND SEED MIX (APPROVED BY THE ENGINEER) AND MULCHED.
7. THE CONTRACTOR MAY BE REQUIRED TO INSTALL CONDUIT UNDER SIDEWALKS, DRIVES, OR ROADWAYS TO MAKE THE NEAREST ELECTRICAL CONNECTION.
8. ALL ELECTRICAL EQUIPMENT AND WIRING INSTALLATION SHALL BE INSTALLED IN STRICT COMPLIANCE WITH ALL EXISTING FEDERAL, STATE AND LOCAL MUNICIPAL CODES INCLUDING THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA-70).
9. ALL NEW ELECTRICAL EQUIPMENT AND COMPONENTS SHALL BE UNDERWRITERS LABORATORY (UL) LISTED AND LABELED.
10. GRINDER PUMP CONTROL PANEL SHALL INCLUDE AN AUDIO/VISUAL ALARM AND AN OUTSIDE RESET. ATTACH PANEL TO 4x4 WOODEN POST AT TOP AND BOTTOM WITH STAINLESS STEEL FASTENERS.
11. THE CONTRACTOR SHALL DETERMINE THE SIZE OF COPPER WIRE AND THE SIZE AND MATERIAL OF CONDUIT REQUIRED TO CONNECT GRINDER PUMP CONTROL PANELS TO THE EXISTING BREAKER PANEL WITHIN THE BUILDING.



**TYPE 1 – 70 GALLON SIMPLEX
GRINDER PUMP STATION**



**TYPE 2 – 150 GALLON SIMPLEX
GRINDER PUMP STATION**

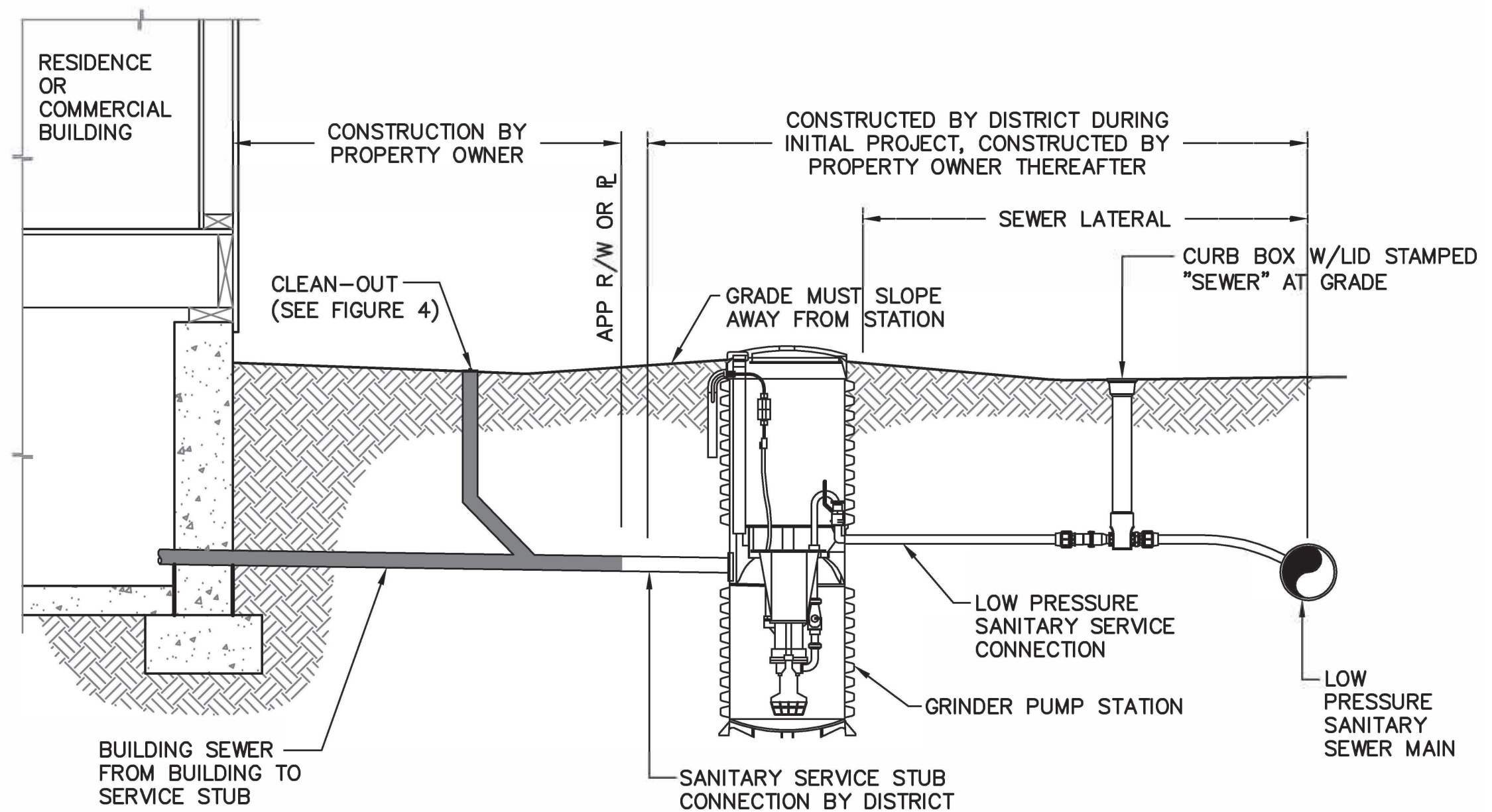


**TYPE 3 – 150 GALLON DUPLEX
GRINDER PUMP STATION**

GRINDER STATION TYPICAL DETAILS

KOONTZ LAKE REGIONAL SEWER DISTRICT



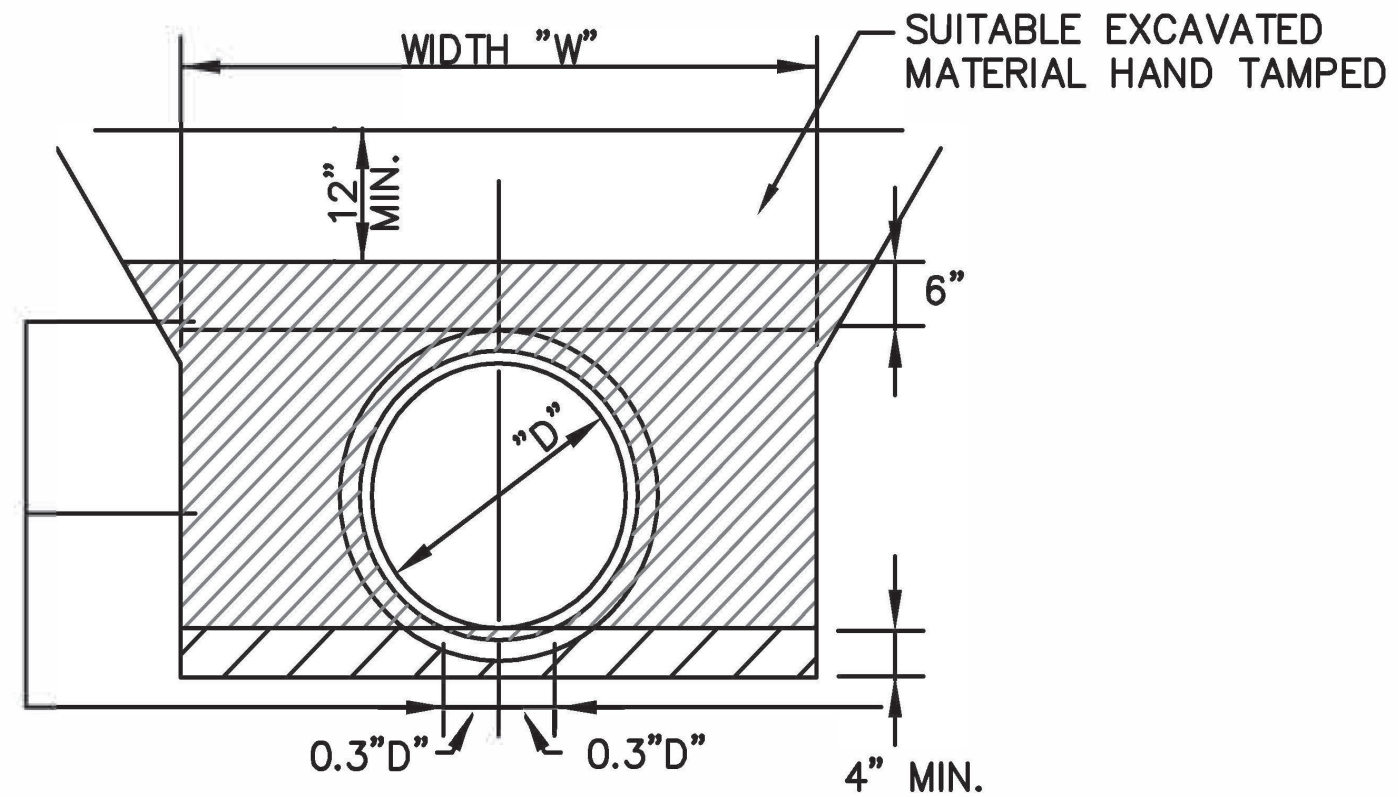


NOT TO SCALE

TYPICAL SERVICE LATERAL & BUILDING SEWER DETAILS

KOONTZ LAKE REGIONAL SEWER DISTRICT





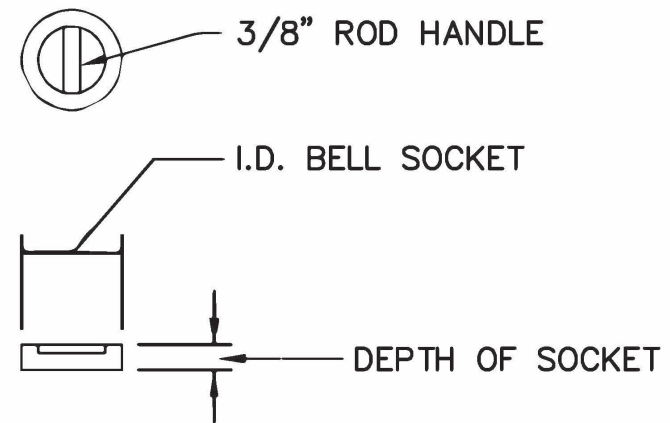
CLASS 1 CRUSHED STONE, B BORROW OR MATERIAL AS APPROVED BY THE DISTRICT

NOTE: ALL PVC PIPE SHALL BE INSTALLED FOLLOWING THE ASTM D2321

NOT TO SCALE

PIPE BEDDING TYPICAL DETAILS

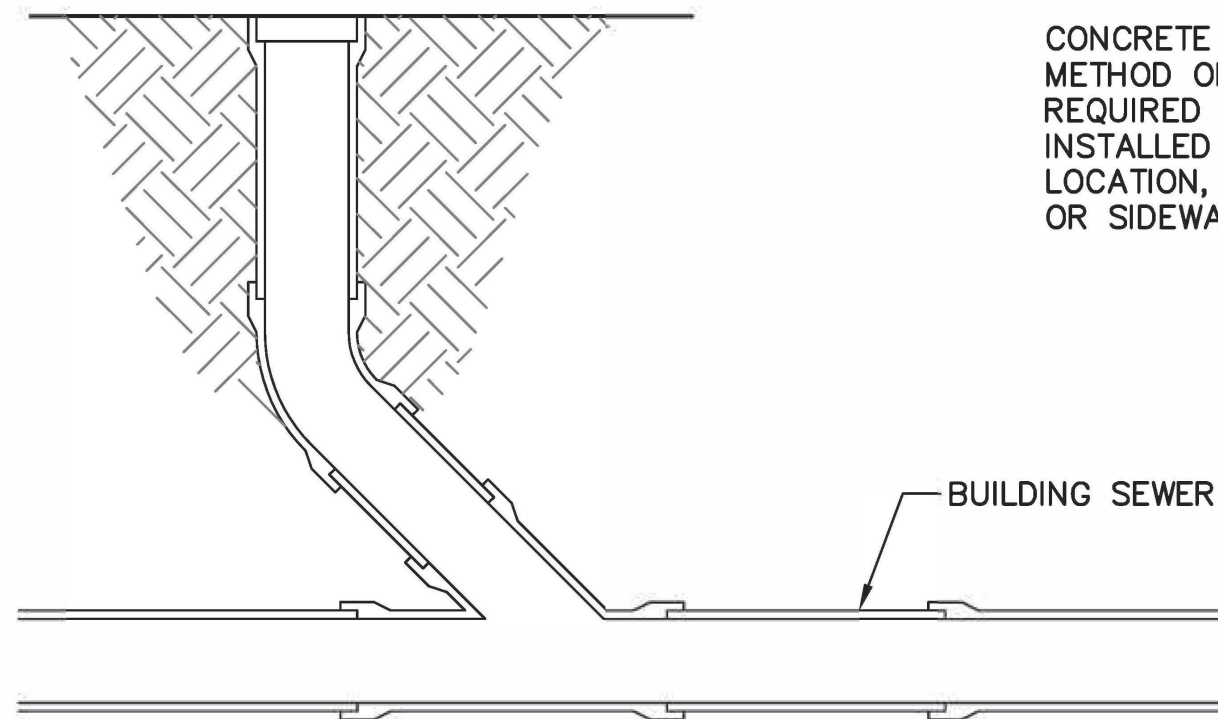
KOONTZ LAKE REGIONAL SEWER DISTRICT



PLUG

NOTE:

CONCRETE COLLARS OR A SIMILAR METHOD OF PROTECTION WILL BE REQUIRED FOR ANY CLEAN OUT INSTALLED IN A HAZARDOUS LOCATION, SUCH AS A DRIVEWAY OR SIDEWALK.

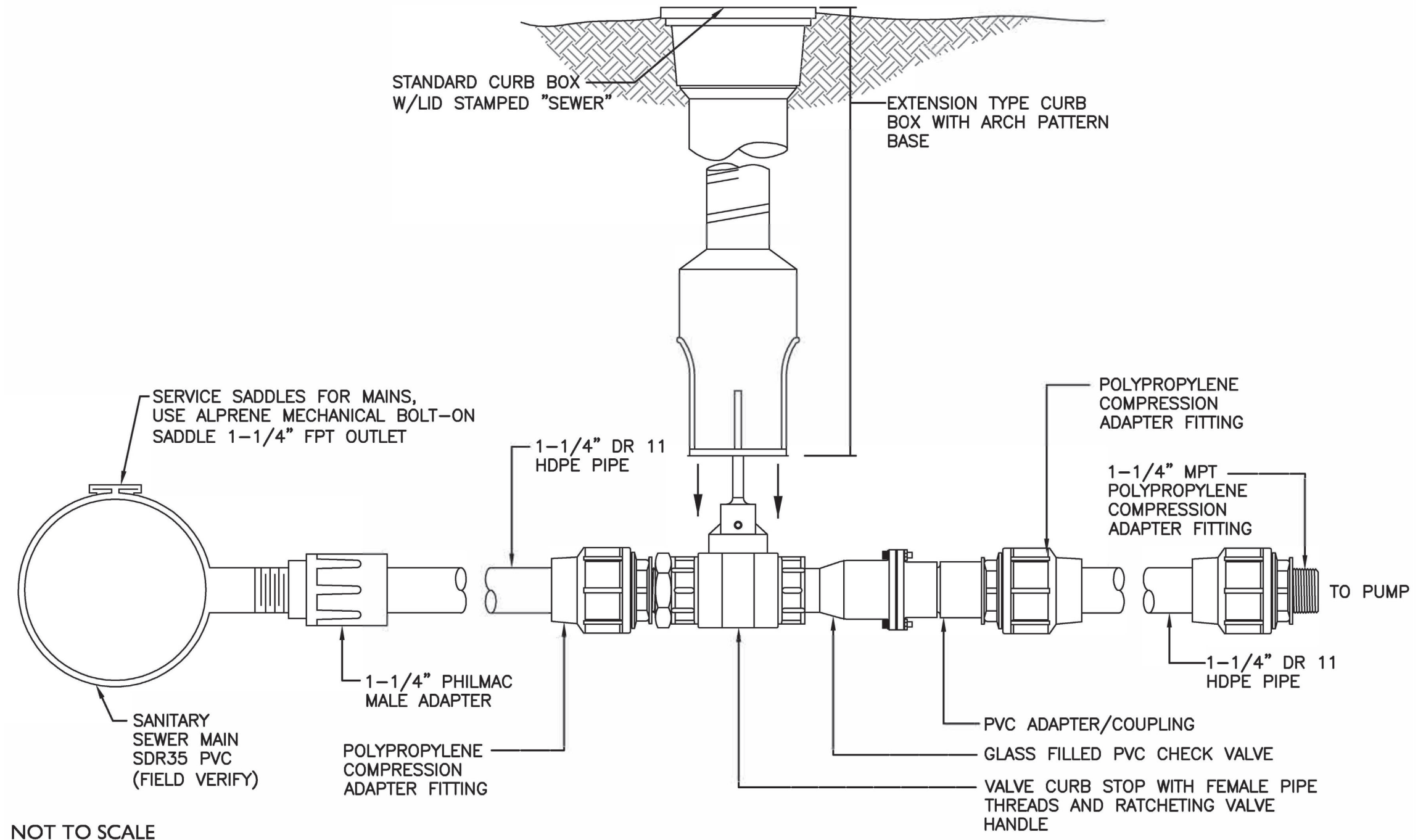


NOT TO SCALE

BUILDING SEWER CLEANOUT TYPICAL DETAILS

KOONTZ LAKE REGIONAL SEWER DISTRICT





SEWER LATERAL TYPICAL DETAILS

KOONTZ LAKE REGIONAL SEWER DISTRICT

