

LIMERICK TOWNSHIP SEWER DEPARTMENT

GUIDELINES

FOR

RESIDENTIAL GRINDER PUMPS

AND

LOW PRESSURE SEWER SYSTEMS

MAY 2015

PREPARED BY:

LIMERICK TOWNSHIP SEWER DEPARTMENT

646 W. RIDGE PIKE

LIMERICK, PA 19468

610-495-5750

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I. OVERVIEW

A Developer or Property Owner may request that the Limerick Township Sewer Department approve a residential grinder pump installation to connect an individual property to the existing gravity sewer system. Similarly, in certain situations a Developer may propose a low pressure sewer system for a land development project which cannot be practically connected by gravity to the existing Township sewer system. Once the Township and a Developer or Property Owner have agreed that the use of low pressure sewer is appropriate for a particular application, the detailed drawings and specifications for the low pressure sewer shall be submitted to the Township's Engineer for review.

Requests for Township approval of residential grinder pump installations or low pressure sewer systems shall be subject to the following conditions:

1. Developer shall bear all costs associated with both the review of plans and any additional engineering which may be required to be undertaken by the Township's Engineer. Escrows will be established by the Township for the purpose of reviewing all drawings and other materials as may be submitted with regard to the subject matter covered by these guidelines.
2. Any and all legal costs incurred by the Township with respect to the development or acquisition of the low pressure sewer system, as well as any involvement in the review process concerning the same, will be the sole and exclusive responsibility of and shall be paid by the Developer.
3. Developer will ordinarily be responsible for preparing applicable applications and securing permits/approvals from the regulatory agencies. Permit application documents will ordinarily be in the name of the Township.

These guidelines are intended for the following low pressure sewer applications:

1. Residential Grinder Pump – a pre-engineered grinder pump unit serving an individual home or business, consisting of a basin equipped with a submersible grinder pump. The unit is connected by low pressure piping to the public sanitary sewers, either by direct connection to the gravity collection system or via a low pressure sewer system.
2. Low Pressure Sewer System – a network of small diameter low pressure piping and appurtenances, located within the public right-of-ways and/or utility easements, serving multiple residential grinder pumps and discharging to the existing gravity sewer system.

All Residential Grinder Pumps, including appurtenant piping and controls contained within the property served, shall be owned and operated by the respective property owner(s). Low Pressure Sewer System shall be owned and operated by Limerick Township, except for systems located on private property. At no time will Limerick Township assume ownership or be responsible for the operation or maintenance of any Residential Grinder Pump, regardless of whether it is connected to a Low Pressure Sewer System or to gravity sewer system. Grinder pump systems other than those described above, such as grinder pump stations serving large commercial properties or multiple housing units, are not covered by these guidelines and will be considered on a case-by-case basis.

Guidance regarding such grinder pump stations is contained in the Limerick Township Sewer Department Pumping Station Guidelines.

These Guidelines are not rigid requirements. The Guidelines are subject to revision and updating and, therefore, Developers should not necessarily rely on a particular version which they might have, but, rather, should first confirm with the Township that the version in their possession is the most recent as adopted by the Township.

In addition to these Guidelines, the PADEP has design standards for low pressure sewers, which are included in the publication entitled "Domestic Wastewater Facilities Manual" which also should be taken into consideration. Depending on the scope of the installation, an application may need to be submitted to the PADEP in order to obtain a Water Quality Management Permit prior to construction of a low pressure sewer system.

II. RESIDENTIAL GRINDER PUMPS

A. GENERAL

1. GENERAL DESCRIPTION

The Residential Grinder Pump installations shall be factory-built and tested Grinder Pump Stations, each consisting of one (1) grinder pump suitably mounted in a basin constructed of fiberglass or high density polyethylene (HDPE), pump removal system, shut-off valve, anti-siphon valve, and check valve assembled within the basin, electrical alarm/disconnect panel, and all necessary internal wiring and controls.

2. OPERATING CONDITIONS

The pump shall be capable of operating reliably under initial system hydraulic conditions, as well as foreseeable future conditions if different. Grinder pumps must be capable of handling materials commonly found in sanitary sewage collection systems, such as plastics, rags, grit, wood, etc.

B. PRODUCTS

1. PUMP

The pump shall be a submersible end grinder pump, and shall be one of the following two types:

Progressing Cavity Pump

This type of pump is required for properties which connect to a low pressure sewer system, and may also be used for properties which connect directly to the gravity sewer collection system. The progressing cavity pump shall be an integral, vertical rotor, motor driven, solids handling pump. The rotor shall be constructed of hardened stainless steel, and the stator shall be of a specifically compounded ethylene propylene synthetic elastomer suited for domestic waste water service.

The motor for this pump shall be a 1 HP, 1725 RPM, 60 Hertz, 1 Phase, capacitor start, ball bearing, squirrel cage induction type with a starting current not to exceed 30 amperes and minimum starting

torque of 8.4 foot pounds. Inherent protection against running overloads or locked rotor conditions for the pump motor shall be provided. The grinder pump shall be provided with a mechanical shaft seal with a stationary ceramic seat and carbon rotating surface with faces precision lapped and held in position by a stainless steel spring.

The acceptable progressing cavity pump manufacturers are Barnes Pumps and Environment/One.

Centrifugal Pump

This type of pump may only be used for properties which connect directly to the gravity sewer collection system. The centrifugal pump shall be of cast iron construction, and all exposed hardware shall be 300 series stainless steel.

The motor for this pump shall be 230 volt, single-phase, 2 HP of the capacitor start, capacitor run design, and shall meet the performance requirements of a NEMA L speed-torque curve. Motor windings shall be contained in an oil-filled housing for heat dissipation and bearing lubrication. The grinder pump shall be provided with two (2) Type 21 shaft seals, with carbon rotating faces and ceramic stationary faces.

The recommended centrifugal pump manufacturers are Barnes Pumps and Hydromantic Pumps.

2. GRINDER

The grinder shall be placed immediately below the pumping elements and shall be direct-driven by a single, one-piece stainless steel motor shaft. The grinder shall be constructed so as to eliminate clogging and jamming under all normal operating conditions including starting. The grinder shall be capable of reducing all components in normal domestic sewage, including a reasonable amount of "foreign objects", such as paper, wood, plastic, glass, rubber and the like, to finely-divided particles which will pass freely through the passages of the pump and the 1-1/4" diameter stainless steel discharge piping.

3. BASIN ASSEMBLY

The basin shall be made of high density polyethylene, fiberglass reinforced polyester resin, or similar non-corrosive material, and shall be designed to withstand and function properly under saturated soil loading and other environmental conditions associated with direct burial. The basin shall be furnished with the appropriate fitting (s) to accept a 4.50" OD DWV pipe for house connection. All discharge piping within the basin shall be constructed of 304 Series Stainless Steel and terminate outside the access way bulkhead with a stainless steel, 1 ¼ inch female NPT fitting. The bulkhead penetration shall be factory installed and warranted by the manufacturer to be watertight. The discharge piping shall include a manual ball shut-off valve to allow service of the unit, as well as an anti-siphon valve to protect the basin from evacuating and the pump from losing prime under negative pressure conditions.

4. CHECK VALVE

The pump discharge shall be equipped with a factory installed, gravity operated, integral check valve built into the stainless steel discharge piping. Each grinder pump station shall also include one separate

check valve for installation in the 1 ¼" service lateral between the grinder pump station and the sewer main.

5. REMOVAL SYSTEM

The Grinder Pump Station shall be designed to provide for ready removal of the grinder pump or grinder pump assembly from the basin, without entering the basin. If a rail recovery system is employed, it shall be constructed of stainless steel.

6. CONTROL/ALARM PANEL

Each Grinder Pump Station shall include a NEMA 4X, UL listed panel suitable for wall or pole mounting. Each control/alarm panel shall include a complete alarm circuit, having a visual and audible alarm device. The visual alarm shall be a red fluted lens mounted to the top of the panel in such a manner as to maintain rain proof integrity. The audio device shall be capable of being de-activated by means of a silence switch mounted on the exterior of the panel. The alarm device shall indicate, as a minimum, high and low level conditions in the basin. Circuit breakers, capacitors, and all components necessary to accomplish proper pump operation may be installed either in the control panel or in the basin.

C. EXECUTION

1. FACTORY TEST

Each grinder pump shall be submerged, operated, and tested for performance compliance to its respective curve. All Grinder Pump Station components including the anti-siphon valve, check valve, discharge line, level sensors and controls shall be factory performance tested to verify proper operation of all functions prior to shipment. All completed stations shall be factory leak tested to assure the integrity of all joints, seams and penetrations.

2. INSTALLATION

The installation of all Residential Grinder Pump units, including basin assembly, control/alarm panel, wiring, connection to building sewer, and discharge piping to the right-of-way line with redundant check valve, shall be the sole responsibility of the Developer or Property Owner. Construction of lateral connection to a low pressure sewer system or direct connection to the Limerick Township's gravity sewer system shall be in accordance with Section III of these guidelines.

Installation shall be conducted by a qualified Contractor in strict accordance with the grinder pump manufacturer's recommendations. Construction of all piping systems shall be in accordance with Limerick Township standards. A diagram of the proposed installation shall be provided in advance to the Township for review and approval, and shall conform with the figures provided in these guidelines. All grinder pump and low pressure sewer installations shall be subject to inspection and approval by the Township and/or its Consulting Engineer.

3. OPERATION AND MAINTENANCE

The operation and maintenance of all Residential Grinder Pump units, including basin assembly, control/alarm panel, wiring, connection to building sewer, and discharge piping to the right-of-way line with redundant check valve, shall be the sole responsibility of the Developer or Property Owner. Grinder pump and force main operation and maintenance agreement must be entered into with Limerick Township, with O/M Agreement recorded with county recorder of deeds office.

III. LOW PRESSURE SEWER SYSTEMS

A. GENERAL

1. GENERAL DESCRIPTION

A Low Pressure Sewer System may be constructed to serve areas where gravity service is not feasible. This type of system typically consists of a pressurized network of small diameter PVC piping which connects two or more Residential Grinder Pump installations, as described in the previous section, and conveys the flows to the public sanitary sewer system.

2. OPERATING CONDITIONS

The Low Pressure Sewer System shall be designed to serve the existing connections as well as those reasonably foreseeable in the future. Operating conditions shall include a scouring velocity of two feet per second at all points in the system based on pipe diameters and projected flows, as well as operating pressures not to exceed the range of 40 to 60 psi for any appreciable time period. Cleanout connections shall be provided for routine maintenance or bypass pumping, at intervals not to exceed 500 feet.

B. PRODUCTS

1. LOW PRESSURE PIPING SYSTEM

a). Pipe and Fittings:

The pressure sewer main shall generally be constructed of plastic pipe; acceptable pipe materials are PVC with a minimum pressure rating of SDR 21 and solvent welded joints, or HDPE iron pipe size, with wire tracer which is commonly used in trenchless installations. All pipe products shall be in accordance with Limerick Township Standard Specifications.

b). Stainless Steel Pipe:

Stainless steel pipe and fittings shall be 304 Stainless Steel, Schedule 40, threaded joints, ASTM A312.

c). Plug Valves:

Cast iron, resilient faced, eccentric style with memory stop, female screwed joints, 2" square operating nut; manufactured by DeZurik (Series 100) or approved equal.

d). Valve boxes:

Cast iron, two-piece, screw type, 5-1/4" shaft; manufactured by Tyler Pipe (6850 Series) or approved equal. Cover shall contain the inscription "Sewer".

2. BUILDING SERVICE LINE

a). Curb Stop:

Copper alloy plug valve with female screwed joints, conforming to ADTM B62, manufactured by Mueller Company (Cat. Nos. H-10283) or approved equal.

b). Curb Box:

Cast iron with stationary rod and foot piece, lid with brass plug and inscription "Sewer", manufactured by Mueller Company (Cat. Nos. H-10336 (box), H-10393 (foot piece), 89981 (lid) or approved equal.

3. AIR VALVE CHAMBER

Air valve chambers shall be installed at all appropriate locations in the system, including high points and along long runs of flat piping, and shall consist of a precast reinforced concrete structure with manhole frame and cover, and manhole steps. The equipment contained within the air valve chamber shall include piping, and an automatic air valve with associated piping, shutoff valve, and flushing accessories.

a). Structure:

The chamber shall have an inside diameter of four (4) feet and an overall height as shown on the Drawings. The vertical walls shall be 5 inches thick while the top slab shall be 8 inches thick. The chamber shall be constructed of precast reinforced concrete sections which shall conform to ADTM C-478. Doghouse openings for the pressure sewer shall be provided. The chamber shall conform to the Limerick Township Standard Specifications with respect to construction of joints, protective coatings, and steps. The precast reinforced chamber structure (s) shall be provided by Atlantic Concrete Products, Inc., Monarch Precast Concrete Corporation, Modern Concrete Septic Tank Company, or approved equal.

b). Frame and Cover:

Domestic cast iron castings: ASTM A48, Class 30 or better; free of bubbles, sand and air holes, and other imperfections. Heavy duty traffic, AASHTO Loading Class H-20 (16,000# wheel loading). Contact surfaces machined and matched. All covers shall be inscribed as shown on the Details with raised letters. Letters shall have a height and width of not less than two (2) inches. Manufactured by Neenah Foundry Company, A. Quirin Machine Shop, Inc., East Jordan Iron Works, or approved equal.

c). Piping:

Stainless steel pipe, Type 304, Sch. 40, threaded joints, conforming to ASTM A312. HDPE iron pipe size with tracer wire.

d). Combination Air Valve:

The combination air valve shall be designed specifically for use on a sewage force main and shall automatically provide both air/vacuum protection and release of air, gas or vapor under pressure during system operation at a maximum operating pressure of 40 psi. The combination air valve shall have a rated working pressure of 150 psi minimum. The combination air valve shall be designed and constructed with a long body and float stem so that the operating mechanism will always be kept free from contact with sewage. The overall height of the valve less any accessories shall be a maximum of 20 inches. The mechanism, elongated stem, and float shall be designed so that the discharge orifice of the valve will be fully closed tight when the float is raised about ½ - inch by the sewage entering the inlet at the bottom of the valve body.

The combination air valve shall involve the following materials of construction:

Body and Cover	Cast Iron (ASTM A126 GR.B)
Float, Linkage & Trim	Stainless Steel
Plug	Stainless Steel or Brass
Orifice Button	Buna-N (soft)

The combination sewage air valve shall be provided with complete back-flushing and cleaning accessories and hose, consisting of a stainless steel shut-off valve at the bottom of the inlet, a blow-off valve near the bottom of the valve body, a clear water inlet valve with quick disconnect coupling at the top of the valve, and a section of rubber hose with quick disconnect couplings for the clear water inlet. The combination sewage air valve unit shall be as manufactured by APCO Valve & Primer Corp. (Model 443), Valmatic Valve and Manufacturing Company (Model VM-801BW) or approved equal.

C. EXECUTION

1. INSTALLATION

All low pressure sewer system construction, including but not limited to excavation, bedding, pipe laying, backfilling, and trench restoration, as well as concrete encasement and thrust restraint as necessary, shall be in accordance with these guidelines, Limerick Township Standard Details Nos. 22-26 provided herein, and all other applicable Limerick Township Standards.

2. CONNECTION TO EXISTING MANHOLE

For connection to an existing manhole, core an opening in the manhole wall no larger than two (2) inches around the new pipe and modify the existing bench as required to create a new channel which shall be finished with non-shrink grout. Install a resilient pipe-to-manhole connection device around the new pipe and position the pipe to the correct alignment; fill and seal the annular space between the resilient pipe-to-manhole connection device and the existing manhole wall with non-shrink grout. Apply a coal tar epoxy protective coating over the outer surface of the sealed annular opening and apply a

white epoxy protective coating over the interior surface affected by the modifications in a manhole which has a protective coating.

3. TESTING

Each newly laid low pressure sewer main, with lateral (s), shall be hydrostatically tested for a period of not less than 30 minutes at a pressure of not less than at 1.5 times the working pressure of the pipeline based on the highest calculated working pressure within the low pressure collection system, or a minimum of 100 psi, whichever is greater. Obtain test pressure from Consulting Engineer.

4. Building Sewer Connection To Grinder Pump Basin

A. 4 inch Building Sewer connection to Grinder Pump basin requires a Lateral Connection Permit and Limerick Township Sewer Department inspection before grinder pump system is approved for use.

B. Lateral inspection procedures must be followed to complete grinder pump system approval and use.

LIMERICK TOWNSHIP SEWER DEPARTMENT

LATERAL INSPECTION PROCEDURES

1. Lateral inspections are conducted by this department Monday thru Friday, 7:30 A.M. to 2:00 P.M. (Inspections will not be conducted on Sat., Sun., or Holidays).
2. A minimum of 24 hours notice is required. During busy times of the year more time may be required.
3. To schedule an inspection, contact the Township Office at (610) 495-5750.
4. The latest adopted Building Code shall govern all work.
5. Air test are required as part of the inspection. Five pounds (5lbs.) of air held for 15 minutes must be placed on the lateral. Air test equipment must be supplied by plumbing contractor. Air pressure gauge must be large enough to visually distinguish one pound increments. Example: Large 3-inch boiler gauges that indicate air pressure from 0 to 15 pounds. Test will fail if the proper gauge is not used.
6. A safe means for the inspector to reach the top of the test pipe must be provided.
7. Building sewers may not be connected to the sanitary sewer system without first obtaining a connection permit.
8. Connection permits will not be issued until the sanitary sewers have been approved for connection by the Township Engineer
9. Specifications, Standard Details, and Township Ordinances are on file at the Township Office. Copies of this information can be obtained at the Township Office.
10. Abandonment of on-lot systems is required when existing homes hook-up to the municipal system.
 - A. The influent line to the system must be cut off and capped.
 - B. The septic tank or tanks, cesspools and seepage pits must be pumped out. All tanks must be pumped through the main cover. All tanks must be backflushed and pumped until all solids are removed.
 - C. A copy of the pumpers slip of manifest must be presented to the inspector at the time of the inspection.
 - D. All septic tanks, holding tanks, and cesspools must have the top broken in and properly backfilled.
 - E. All gray water must be connected to the sewer system.
11. Sump pumps, floor or roof drains are not permitted to discharge into sanitary sewer system.

Prepared By:

Joseph J. McGrory, Jr., Esquire
Hamburg, Rubin, Mullin, Maxwell & Lupin

Record and Return to:

Joseph J. McGrory, Jr., Esquire
Hamburg, Rubin, Mullin, Maxwell & Lupin
375 Morris Road, P.O. Box 1479
Lansdale, PA 19446-0773
215-661-0400

Parcel No. _____

GRINDER PUMP OPERATION AND MAINTENANCE AGREEMENT

THIS AGREEMENT, made this ____ day of _____, 20__ , by and among _____ and _____, an individual/individuals purchasing a residence at the address of: _____

(the "Purchaser") and Limerick Township, a municipality organized and existing under the laws of the Commonwealth of Pennsylvania, with its principal mailing address of 646 W. Ridge Pike, Limerick, PA 19468, (the "Township").

WITNESSETH:

WHEREAS, Purchaser is the legal owner of a residence located at _____ (the "Property") which is connected to the Township wastewater collection, conveyance and treatment facilities, via a grinder pump and low-pressure lateral; and

WHEREAS, Purchaser has agreed to operate and maintain the grinder pump and low-pressure lateral and the Township has agreed to accept wastewater generated by the Property via the grinder pump and low-pressure lateral, in accordance with the terms and conditions set forth in this Agreement.

NOW THEREFORE, in consideration of the covenants and promises herein contained, the parties hereto, intending to be legally bound hereby, agree as follows:

1. That the recitals set forth above are incorporated herein by reference as though set forth at length.

2. The "grinder pump" shall mean a Township approved wastewater pump located on the Property designated for the conveyance of domestic wastewater, and pumping the wastewater through the low-pressure lateral to the Township wastewater system.

3. Purchaser agrees that the construction of the grinder pump and low-pressure sewer lateral on the Property, the installation, use, operation, maintenance, service, repair and replacement thereof, and the connection to the Township's wastewater system shall comply with the applicable rules and regulations of the Township in effect from time to time.

4. The Township shall bear no responsibility for the purchase, installation, use, operation, maintenance, service, repair, or replacement of the grinder pump and low-pressure lateral on the Property, except as otherwise set forth herein or as required by law.

5. The Township shall maintain control over the type of grinder pump used and shall review and inspect installed equipment and replacement equipment.

6. Township shall be notified of any repairs to the wastewater system and shall be afforded the opportunity to inspect same.

7. The Purchaser shall bear full responsibility for providing, installing, using, operating, maintaining, servicing, repairing and replacing the grinder pump and low-pressure lateral in accordance with this Agreement, except as otherwise set forth herein.

8. The Purchaser shall have full responsibility for using the grinder pump consistent with the manufacturer's instructions and shall avoid introducing into the wastewater system, materials that may damage the pump, conveyance system, collection system or treatment facilities.

9. The Purchaser shall close the wastewater system via the valve at the curb and powering off the pump and cease operations during any period when the grinder pump or low-pressure lateral is inoperable for more than three (3) days.

10. In addition to any other remedies provided in this Agreement, Purchaser acknowledges that the Township may seek abatement of any violation of this Agreement as a nuisance by seeking mitigation or appropriate equitable or legal relief from a court of competent jurisdiction.

11. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their successors and assigns. This Agreement shall be recorded, at the Purchaser's expense, in the Recorder of Deeds Office in and for Montgomery County, Pennsylvania, being indexed at **Parcel No.**_____.

12. The Purchaser shall provide a copy of this Agreement to any subsequent purchaser, successor or assign prior to transfer of the Property. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective heirs, personal representatives, successors and assigns and shall run with the land.

13. This Agreement contains the full and complete understanding between the parties with regard to the subject matter contained herein and no modifications may be made unless set forth in a separate written document executed by all parties hereto.

14. This Agreement may be executed in multiple copies, each of which when so executed shall be deemed an original.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized representatives.

PURCHASER,

LIMERICK TOWNSHIP
TOWNSHIP SECRETARY

Attest: _____

By: _____
Daniel K. Kerr

ACKNOWLEDGMENT

COMMONWEALTH OF PENNSYLVANIA :
COUNTY OF MONTGOMERY : SS

On the _____ day of _____, 20__, before me, the undersigned officer, personally appeared _____, who acknowledged himself/herself to be the _____ of _____ and that he/she as such, being authorized to do so, executed the foregoing instrument for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Notary Public

COMMONWEALTH OF PENNSYLVANIA :
COUNTY OF MONTGOMERY : SS

On the _____ day of _____, 20__, before me, the undersigned officer, personally appeared _____, who acknowledged himself/herself to be the _____ of _____ and that he/she as such, being authorized to do so, executed the foregoing instrument for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

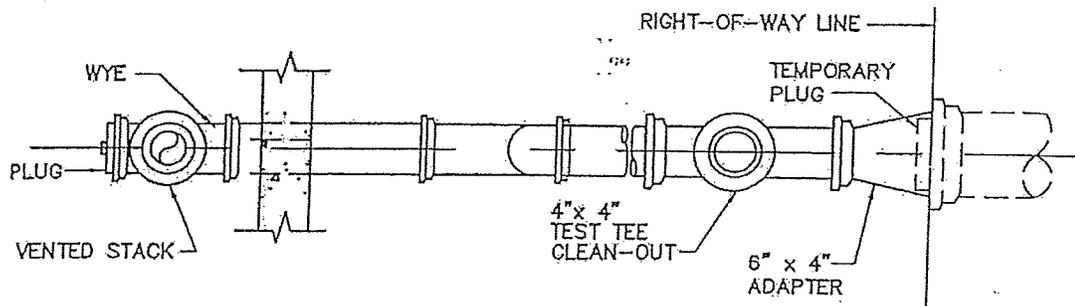
Notary Public

COMMONWEALTH OF PENNSYLVANIA :
COUNTY OF MONTGOMERY : SS

On the ____ day of _____, 20__, before me, the undersigned officer, personally appeared _____, who acknowledged himself/herself to be the Secretary of Limerick Township, a Municipal Corporation, and that he/she as such officer being authorized to do so, executed the foregoing instrument for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

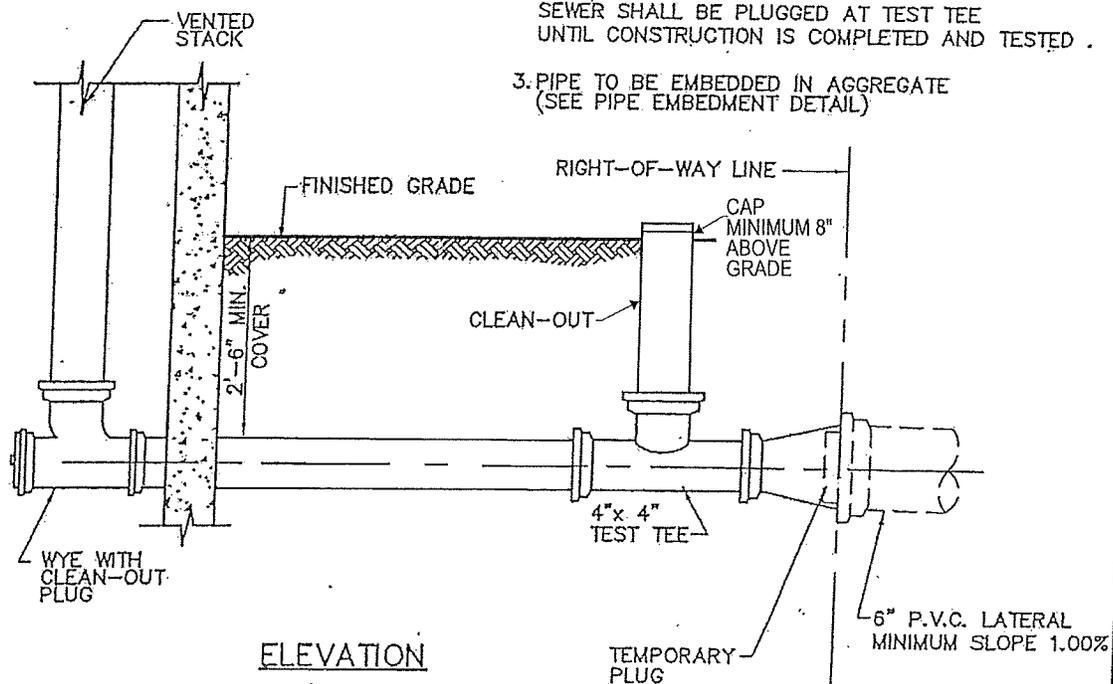
Notary Public



PLAN

NOTES:

1. BUILDING SEWER FROM RIGHT-OF-WAY LINE TO BUILDING PLUMBING SYSTEM SHALL CONFORM TO THE LATEST ADOPTED BUILDING CODE.
2. TEMPORARY PIPE PLUG TO REMAIN IN LATERAL UNTIL CONSTRUCTION OF BUILDING SEWER OCCURS. BUILDING SEWER SHALL BE PLUGGED AT TEST TEE UNTIL CONSTRUCTION IS COMPLETED AND TESTED .
3. PIPE TO BE EMBEDDED IN AGGREGATE (SEE PIPE EMBEDMENT DETAIL)



ELEVATION

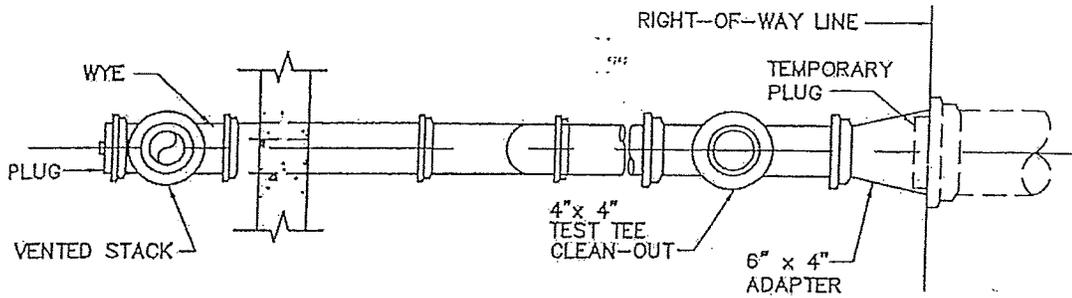
LIMERICK TOWNSHIP
SEWER DEPARTMENT

DETAIL #20

BUILDING SEWER
DETAIL

SCALE:

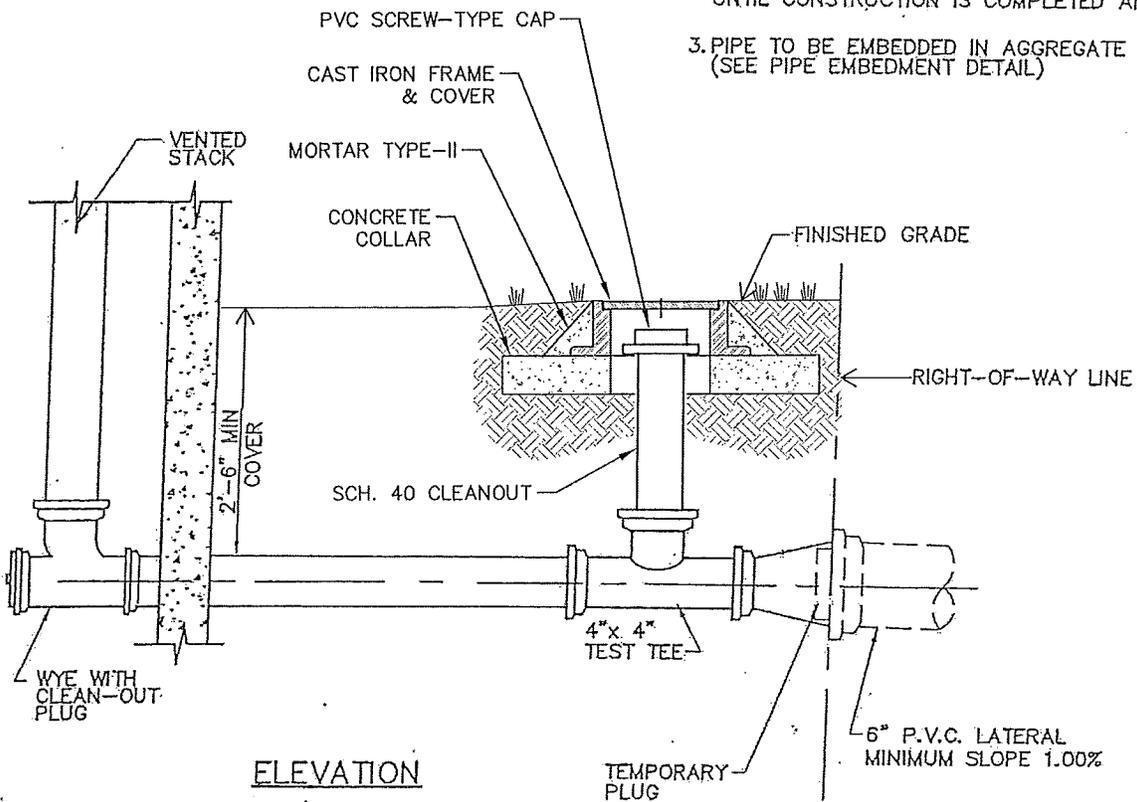
NOT TO SCALE



PLAN

NOTES:

1. BUILDING SEWER FROM RIGHT-OF-WAY LINE TO BUILDING PLUMBING SYSTEM SHALL CONFORM TO THE LATEST ADOPTED BUILDING CODE.
2. TEMPORARY PIPE PLUG TO REMAIN IN LATERAL UNTIL CONSTRUCTION OF BUILDING SEWER OCCURS. BUILDING SEWER SHALL BE PLUGGED AT TEST TEE UNTIL CONSTRUCTION IS COMPLETED AND TESTED
3. PIPE TO BE EMBEDDED IN AGGREGATE (SEE PIPE EMBEDMENT DETAIL)



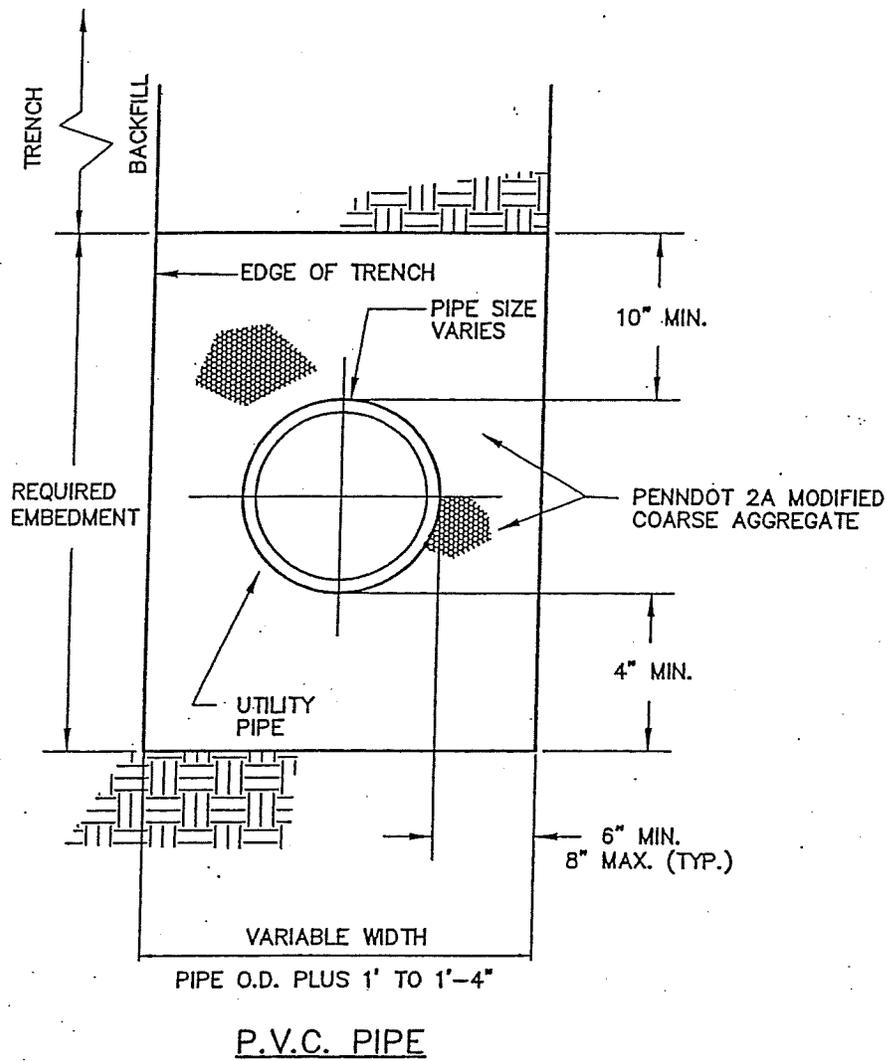
ELEVATION

LIMERICK TOWNSHIP
SEWER DEPARTMENT

DETAIL #20A

BUILDING SEWER
DETAIL

SCALE:
NOT TO SCALE

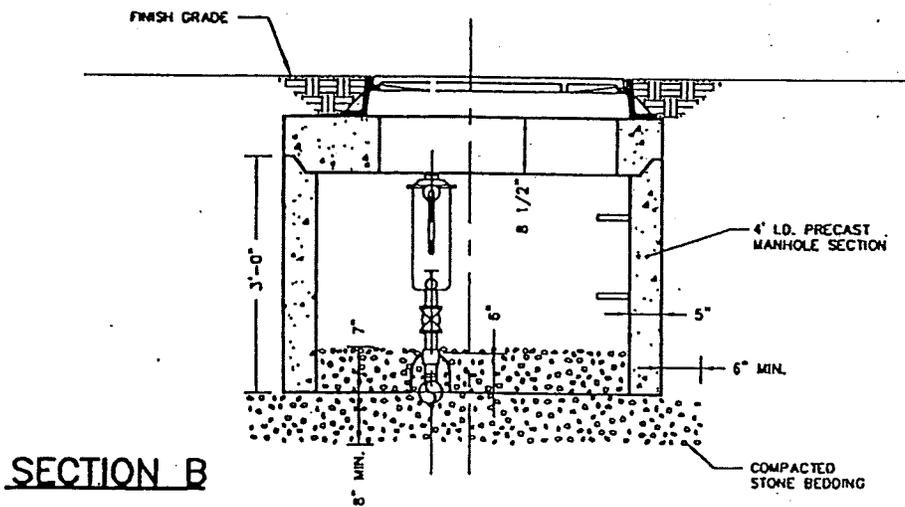
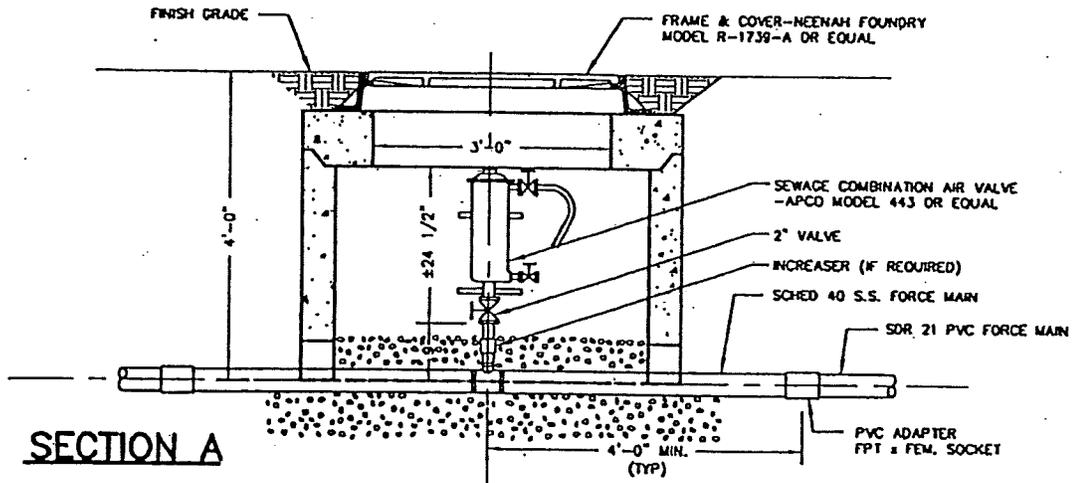
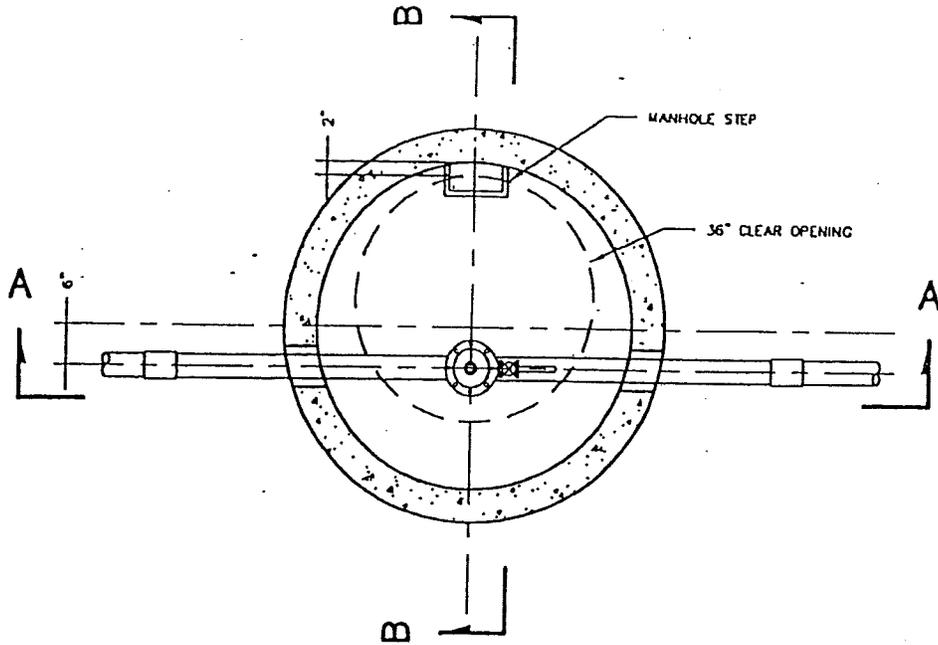


LIMERICK TOWNSHIP
 SEWER DEPARTMENT

DETAIL #21

BUILDING SEWER
 EMBEDMENT

SCALE:
 NOT TO SCALE



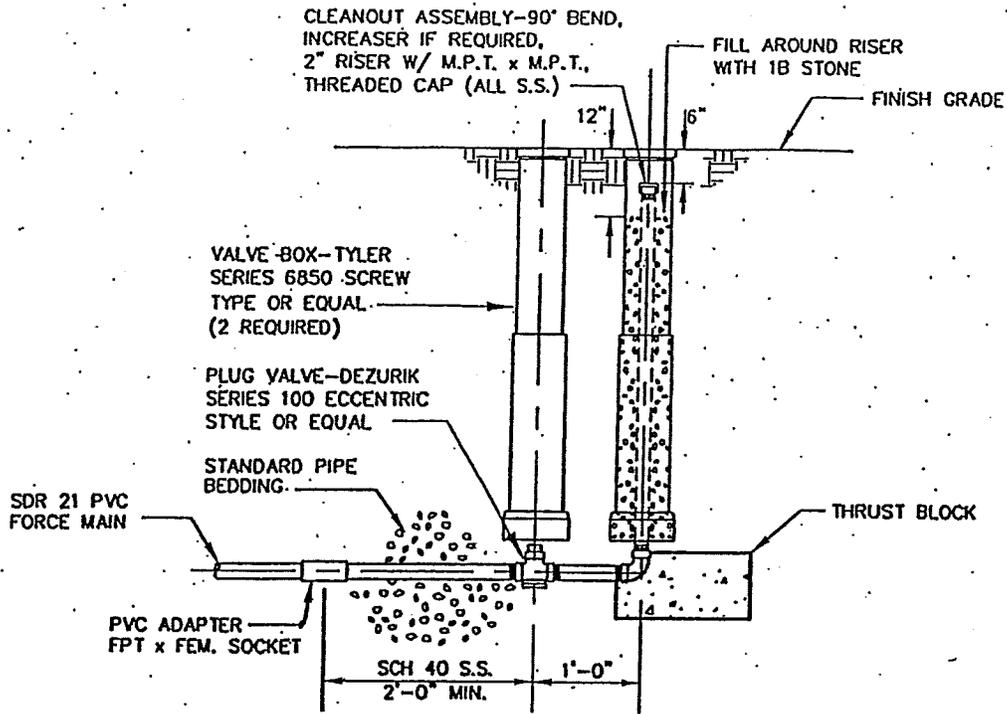
LIMERICK TOWNSHIP
SEWER DEPARTMENT

DETAIL #22

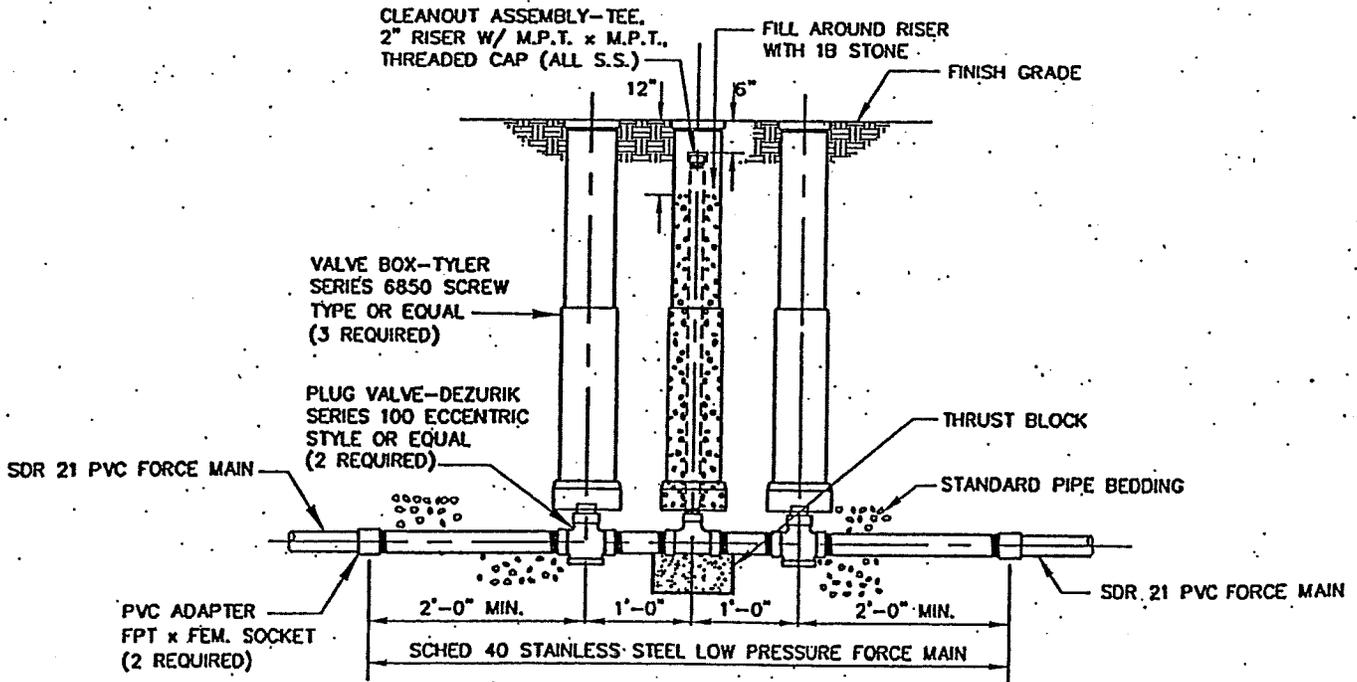
LOW PRESSURE SEWER SYSTEM
INLINE AIR VALVE CHAMBER
DETAIL

SCALE:

NOT TO SCALE



TERMINAL CLEANOUT



INLINE CLEANOUT

LIMERICK TOWNSHIP

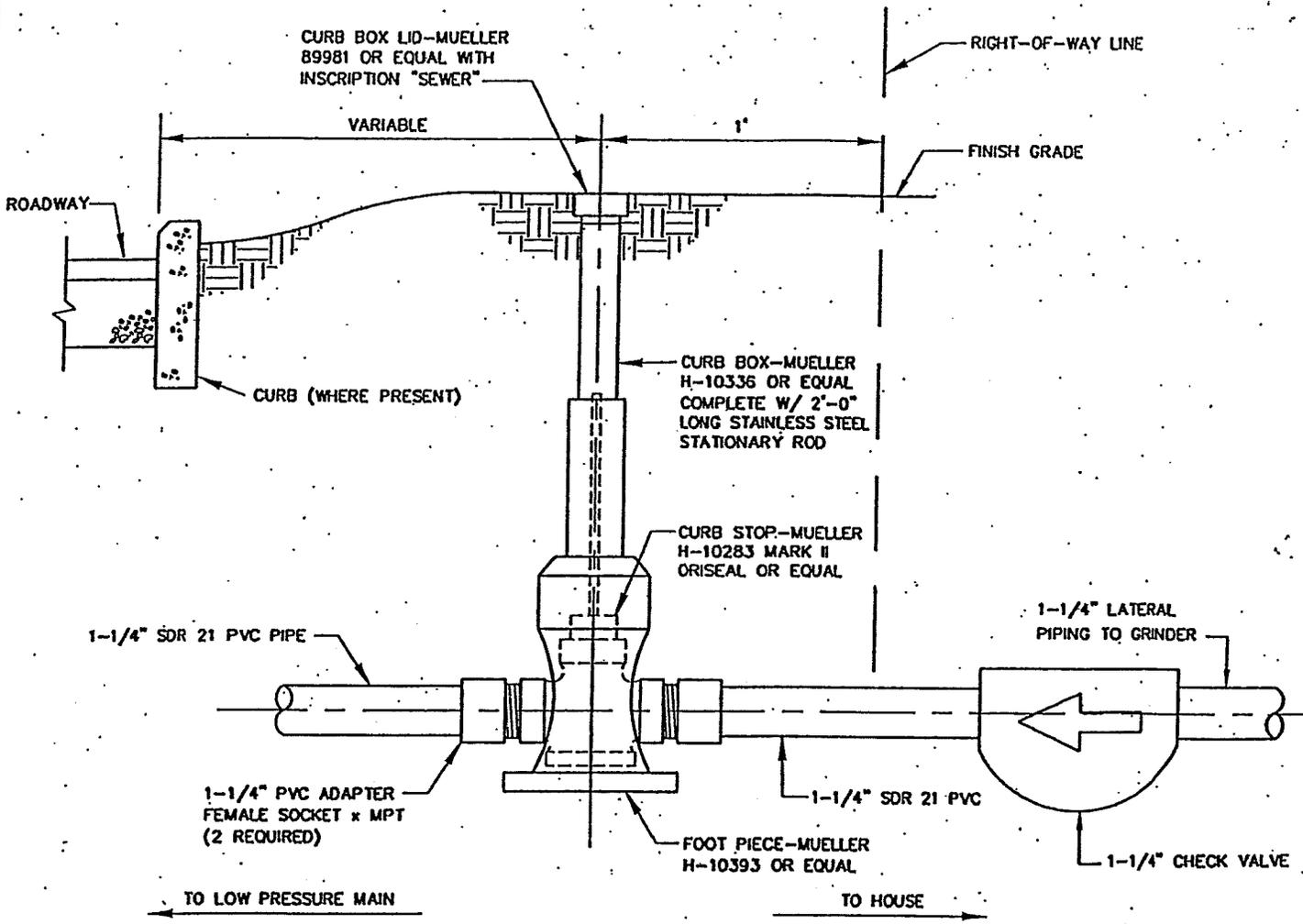
SEWER DEPARTMENT

DETAIL #24

LOW PRESSURE SEWER SYSTEM
CLEANOUT DETAILS

SCALE:

NOT TO SCALE



NOTES:

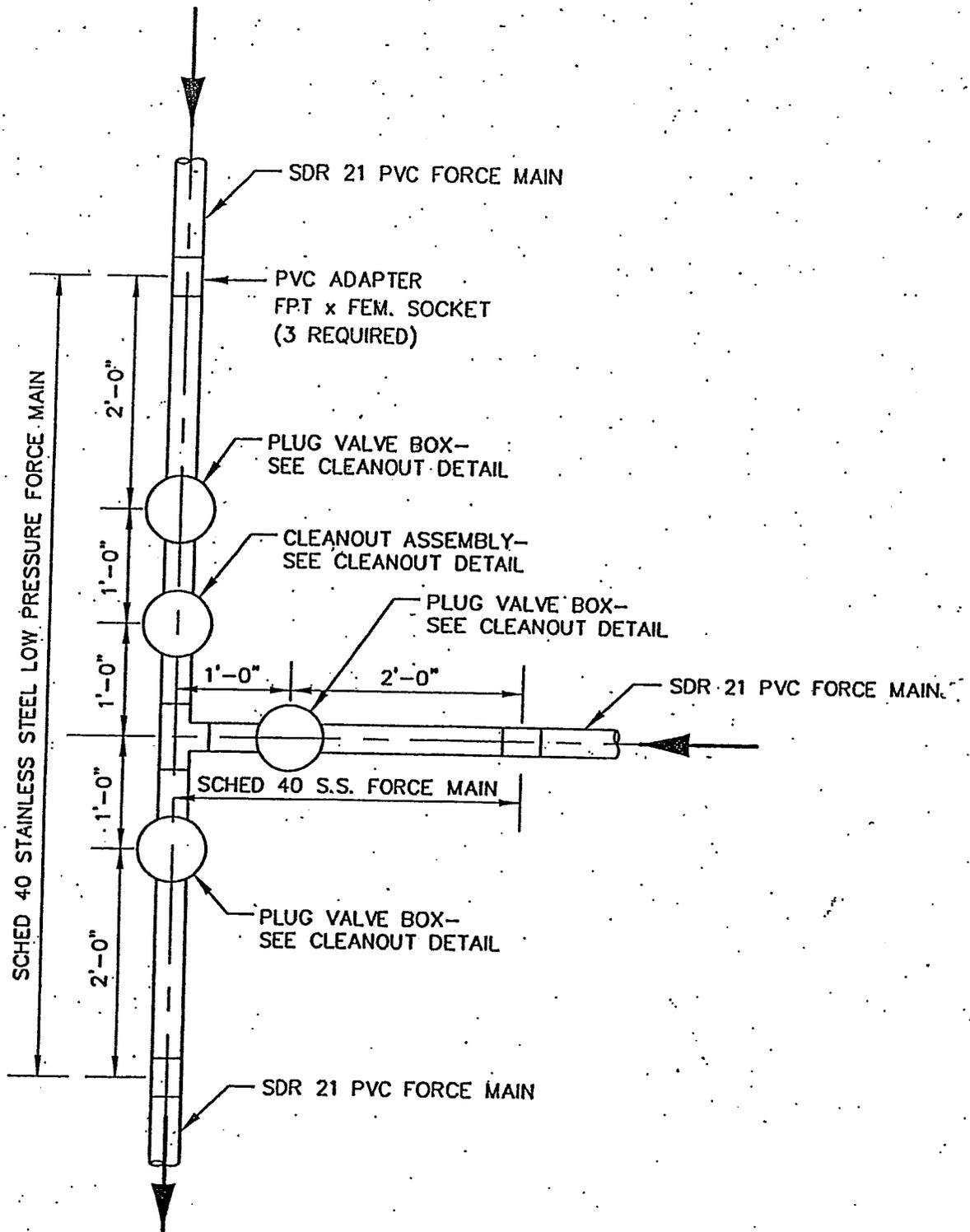
1. CURB BOX SHALL BE PLACED 1' INSIDE ROAD RIGHT-OF-WAY LINE
2. DO NOT PLACE CURB BOX IN PAVED AREAS
3. PROVIDE MINIMUM COVER OF 4' WITH RESPECT TO CURB BOX

LIMERICK TOWNSHIP
SEWER DEPARTMENT

DETAIL #25

**LOW PRESSURE SEWER SYSTEM
SERVICE CONNECTION DETAIL**

SCALE:
NOT TO SCALE



LIMERICK TOWNSHIP
SEWER DEPARTMENT

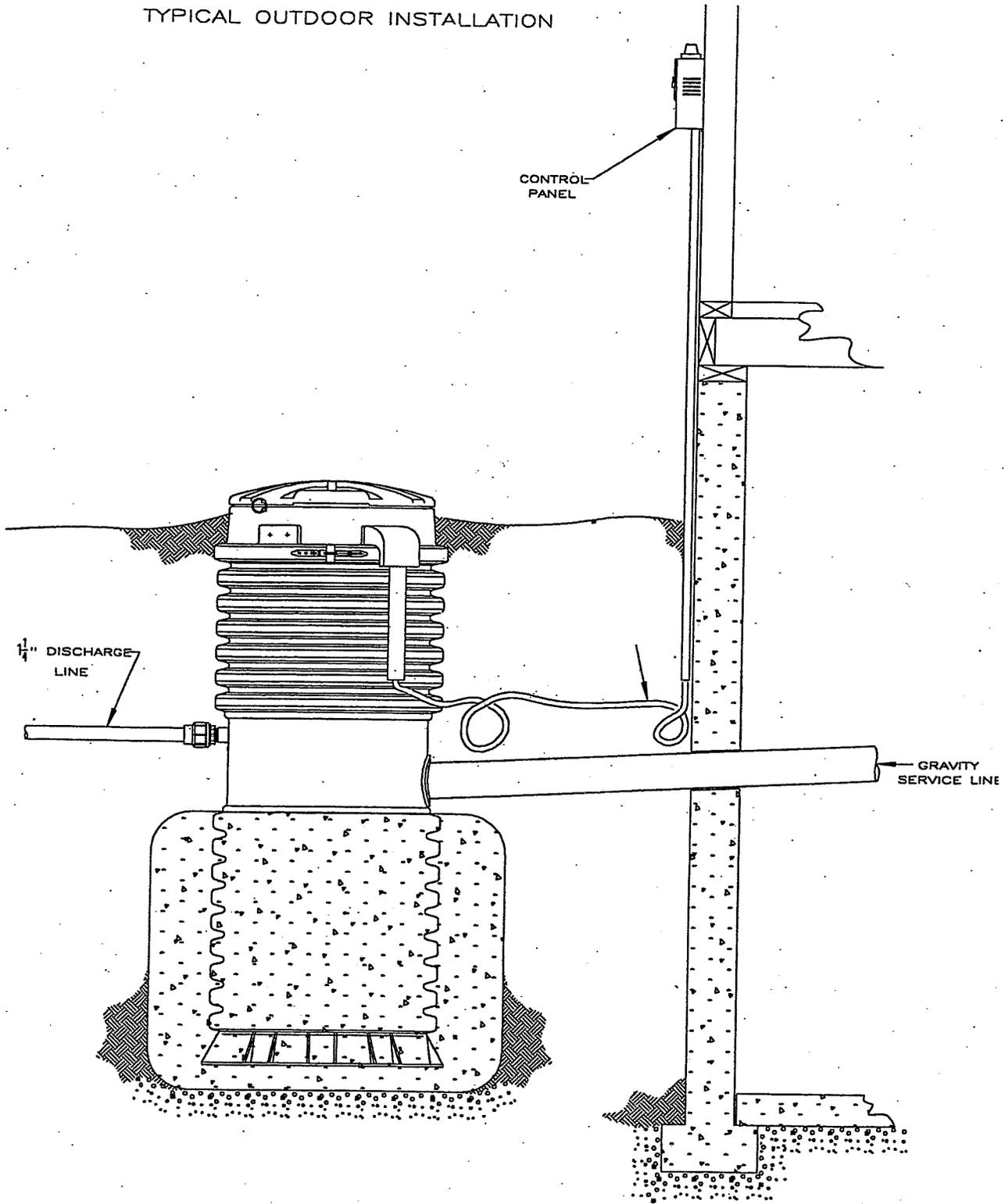
DETAIL #26

LOW PRESSURE SEWER SYSTEM
FORCE MAIN JUNCTION DETAIL

SCALE:

NOT TO SCALE

TYPICAL OUTDOOR INSTALLATION



LIMERICK TOWNSHIP

DETAIL # 27

GRINDER PUMP
DETAIL

SEWER DEPARTMENT

NOT TO SCALE