

CITY OF LAKE FOREST PARK



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SIDE SEWER SPECIFICATIONS

1. GENERAL

These specifications are intended to provide information for installation of side sewers on private property when connecting to the City's sanitary sewer system. For connections relating to work in the public right-of-way, please contact the City for project specific requirements.

The property owner ("Owner") of the connecting parcel shall be responsible for the completion of all forms and applications, payment of all charges and fees and shall comply with all City standards, details, requirements and permit conditions.

A side sewer schematic is included in the appendix of this document which provides a general overview and visual guide for a typical side sewer installation.

2. APPLICATION, FORMS AND FEE REQUIREMENTS

2.1. APPLICATION

All sewer work being performed shall require completion of the City's Application for Side Sewer Permit. This form itemizes the conditions under which the City allows connection to its system.

The Contractor, acting as an agent of the Owner, shall complete and provide the following information to the City prior to commencing any work or receiving any permits:

- Certificate of Insurance (naming the City as an additional insured)
- Contractor's Application (if not already on file)

Contractors performing the work must be licensed, qualified and competent to provide such work including incidental work and work related to restoration of the site.

Contractors who are unlicensed shall not be permitted to perform the installation of any sanitary sewer facility connecting to the City's collection system.

2.2. CONNECTION CHARGES AND FEES

All properties requesting new service shall complete the City's application and pay the City's current connection charges and fees at the time service is requested. Sewer service billing as established in the City's current rate resolution will commence once the side sewer is connected to the structure and has been approved by the City regardless of the status of water service.

2.3. SITE PLAN

A site plan shall be submitted with the application. The site plan shall indicate the proposed structure in relation to the property in a 1"=20' scale or a scale as approved by the City and be drawn in a clear and concise manner. Dimensions of the property and all sides or edges of the structure must be clearly shown. Also, the scale and north arrow must be indicated on the plan. Plan may be provided on 8 1/2" x 11" or 8 1/2" x 14" paper size. Refer to Sample Site Plan in the Appendix for additional information.

2.4. KING COUNTY SEWER USE CERTIFICATION FORM

All properties connecting to the sanitary sewer system for the first time are required to complete this document. The completed form is forwarded to King County which assesses a Sewage Treatment Capacity Charge against the property. This charge represents a share of the costs for the construction of King County's wastewater collection and treatment systems. King County bills the connecting property directly. For more information, please contact the King County Capacity Charge Program at (206) 296-1450.

2.5. OWNER HOLD HARMLESS AND LICENSE AGREEMENT FOR SIDE SEWER INSTALLATION

This document is a requirement for allowing the Owner to excavate and/or install their own side sewer line. The Owner will agree to hold the City harmless from loss or injuries suffered as a result of installing or making the side sewer connection.

2.6. RESTORATION AND RELEASE

When work occurs on adjacent property other than the Owners, a written release from the adjacent property Owner is required. The release states that the work was performed and the area was restored to his/her satisfaction.

3. EASEMENTS

Sanitary sewer lines that cross a property other than the one they serve are required to have easements. The easement form is provided by the City and shall be completed and signed by the burdened property owner(s) prior to the application being accepted by the City. The City will determine easement requirements during initial review of the application.

If a side sewer is to serve more than one property, a shared private side sewer easement is required insuring that all properties involved shall have perpetual use of and provisions for maintenance and access to the side sewer.

4. INSPECTION

All work performed by the Contractor shall be inspected by a City representative. It shall be the responsibility of the Contractor to schedule the inspection by calling the number on the side sewer permit. A minimum of 24 hours notice is required to schedule an inspection. No side sewer trench shall be backfilled or sewer pipe covered until the work has been inspected, tested and approved by the City.

The City will inspect the work. However, nothing contained herein or elsewhere in these specifications shall be construed as requiring the City to direct the method or manner or safety of performing any work by the Contractor under these specifications. The City may reject all work and materials that, in the opinion of the City, do not conform to these specifications.

It is understood and agreed, by and between the parties hereto, that the work included in these specifications is to be done under the general observation and to the complete satisfaction of the City. The decision of the City as to the true interpretation and meaning of these specifications and as to all questions arising as to proper performance of the work shall be final.

City observers shall be present on the work site to observe the progress of the work and the manner in which it is being accomplished. Failure of the observer to call to the attention of the Contractor faulty work or deviations from the specifications shall not constitute acceptance of the work.

All work performed, and all materials and equipment furnished, and the manufacture and preparation thereof, shall be subject to review by the City. For the purpose of inspection, the City shall at all times have access to all parts of the work. The Contractor shall, at all times, maintain proper facilities and provide safe access for such review. The City may reject or accept material and equipment to be incorporated in the work. However, the failure of the City to reject defective material, or any other work involving deviations, will not constitute acceptance of such work. The presence or absence of an observer on the job

shall not relieve the Contractor of its obligation to furnish satisfactory materials and workmanship. Should any work be backfilled without approval or consent of the City it must be **uncovered** for examination at the Contractor's expense.

The Contractor shall regard and obey the directions and instructions of the City with reference to correcting any defective work or replacing any materials found to be not in accordance with the specifications and plans and, in case of dispute, the Contractor may appeal to the City whose decision shall be final; but, pending such decision, the instructions shall be followed and the Contractor shall make no claims on this account.

5. MATERIALS

The Contractor shall furnish all materials for the completion of work to be performed in conformance with these specifications and shall be fully responsible for all materials until the completed project is installed, inspected and approved by the City.

Contractor shall protect materials against damage from careless handling, exposure to weather, mixture with foreign matter and all other causes. The City will reject and refuse to test materials improperly handled or stored.

All materials furnished shall be warranted by the Contractor as new and in accordance with the specifications and as suitable for the intended purpose. The type and class of materials to be used shall be in accordance with the specifications referenced herein. All materials shall be new and undamaged of a known brand, with replacement parts readily available from the general Seattle area.

5.1. PIPE BEDDING

Bedding material shall consist of clean, granular, manufactured pea gravel conforming to the following gradation:

U. S. Standard Sieve Size	% Passing by Weight
1/2"	100
3/8"	85 – 95
No. 4	5 – 15
No. 8	0 – 2

5.2. TRENCH BACKFILL

Native material may be used on private property and easements if 90% compaction can be attained. If directed by the City, import backfill material may be required at locations where the side sewer is installed under driveways, within paved access tracts or where 95% compaction is required. No wood debris, large rocks or other unsuitable debris will be allowed in the backfill material.

5.3. SEWER PIPE AND FITTINGS

Sewer pipe material shall be PVC unless special conditions (beneath rockeries, streams, wetlands, steep slopes, shallow or deep installations, unstable soil, etc.) require the use of ductile iron pipe.

A. PVC SEWER PIPE AND FITTINGS

All PVC pipe and fittings shall be integral wall bell and spigot, rubber gasket joint, unplasticized polyvinyl chloride (PVC) pipe in conformance with ASTM D3034 and shall have a maximum Standard Dimension Ratio (SDR) of 35. PVC pipe shall have a minimum "pipe stiffness" of 46 psi at 5 percent deflection when tested in accordance with ASTM Designation D2412 and a minimum impact strength of 210 foot-pounds based upon ASTM D3034.

All pipes shall be clearly marked with the manufactures identification, year, and class of pipe.

All fittings and accessories shall be manufactured and furnished by the pipe supplier, or shall be City approved equal.

Pipe joints shall use flexible elastomeric gaskets conforming to ASTM D3212.

B. DUCTILE IRON SEWER PIPE AND FITTINGS

Ductile iron pipe shall be new, Class 52, cement-lined, conforming to AWWA C151.

Ductile iron pipe shall be push-on joint. Pipe shall be furnished with a single rubber ring gasket lubricated to effect the seal. Each length of pipe shall be clearly marked with the manufactures identification, year, thickness, class of pipe and weight.

Restrained joint pipe (if required) shall be push-on joint pipe with U.S. Pipe "TR Flex" or U.S. Pipe "Field Lok" gaskets, or equal.

Each length of pipe shall be clearly marked with the manufactures identification, year, thickness, class of pipe and weight.

Ductile iron fittings shall be short body with a 350 psi pressure rating for mechanical joint fittings and 250 psi for flanged fittings. All fittings shall be cement lined and shall be in conformance with AWWA C153.

5.4. MANHOLES

Manholes shall be of the offset type, shall be precast concrete sections with a precast base, and shall be made from 3,000 psi structural concrete. All manhole joints shall be watertight and shall be confined O-ring type. All new manholes shall be installed with a prefabricated manhole base liner made of polypropylene (PP) and/or fiberglass reinforced plastic (FRP). The base liner shall be integrally cast and anchored inside the new precast concrete manhole base section at the manhole suppliers manufacturing facility. Base liners shall be manufactured and supplied by Predl Systems North America of Burnaby, B.C. Manholes shall be constructed in full compliance with the Standard Details and Specifications.

6. INSTALLATION

Side sewer installation shall be in accordance with adopted standards and details of the City of Lake Forest Park, the manufacturer's recommendation and these side sewer specifications. Refer to Side Sewer Schematic in the Appendix for additional information.

6.1. PROTECTION AND MAINTENANCE OF PRIVATE PROPERTY

The Contractor shall protect and maintain all underground and above-ground utilities and structures affected by the work and all lawns, shrubs, fences, rockeries, etc. on private property. It shall be the responsibility of the Contractor to call for utility locates prior to construction. Any damage shall be repaired and restored by the Contractor to the satisfaction of the City and property Owner.

The Contractor shall protect and maintain any natural watercourse that exists prior to construction in accordance with any permits issued for the project.

Construction work on easements shall be confined to the limits of the easements and accomplished so as to cause the least amount of disturbance and a minimum amount of damage.

It is expressly understood that the Contractor shall in particular restore all easements to a condition equal to its original condition, or superior, and in a condition satisfactory to the City and property Owner.

Where the work is done within easements, the Contractor shall obtain a written statement of satisfactory restoration (Restoration Release Form, provided by the City) from each property owner involved and furnish a copy of the signed form to the City. The signed

Restoration Release Form shall be required before the work will be accepted by the City.

6.2. SAFETY STANDARDS

In accordance with generally accepted construction practices, the Contractor will be solely and completely responsible for conditions of the job site during performance of the work, including safety of all persons and property. This requirement will apply continuously and not be limited to normal working hours.

The Contractor shall adhere to the requirements of the Occupational Safety and Health Act (OSHA), Washington Industrial Safety and Health Act, and all other Federal, State, and local safety and health statutes, which may apply.

Contractor shall provide and install trench safety systems such as shoring or trench boxes or shall employ construction techniques such as back-sloping that meet the applicable Federal, State and Local safety regulations.

6.3. PIPE BEDDING AND TRENCH BACKFILL

Pipe bedding material shall be carefully placed and firmly compacted to provide a firm, uniform cradle for the full length of pipe being installed. The minimum thickness of the layer of bedding material required beneath the pipe shall be four (4) inches. After the pipe laying operation, additional bedding material shall be placed over the pipe to a minimum height of six (6) inches above the pipe.

Trench backfill shall be placed only after the sewer pipe has been inspected, tested and approved by the City. In backfilling the trench, the Contractor shall take all necessary precautions to protect the pipe from any damage or shifting of the pipe.

6.4. SEWER PIPE INSTALLATION

All connections shall be made to the side sewer stub assigned to that property and no stub belonging to another property shall be used unless approved by the City. Connecting properties are to have individual, single side sewers four (4) inches in diameter. Side sewers on easements shall be a minimum of six (6) inches in diameter.

The City may allow additional properties connected to a single side sewer stub only if approved by the City. If additional properties are allowed, the common line portion of the side sewer is to be six (6) inches in diameter. Other requirements such as manholes, cleanouts, point of connection, etc. will be determined during the application review and as required for site specific conditions.

Commercial establishments, schools, or any building other than single family residences shall be six (6) inches in diameter. Only one commercial building will be allowed to connect to a 6-inch line. A minimum length of five (5) feet of six (6) inch diameter pipe must be used where the side sewer connects to the main line.

A 10-foot horizontal separation and 18-inch vertical separation is to be maintained between all proposed sewer lines and water lines. If the 10-foot horizontal separation cannot be achieved due to unusual conditions or site specific restrictions, the City may allow the separation to be reduced to 5 feet, provided that the lines are laid in a separate trench and 18 inches of vertical separation is maintained. The minimum separation between other utilities (gas, power, phone, cable, storm, etc.) shall be three (3) feet.

When it is necessary for sewer and water lines to cross each other, the crossing shall be made as closely to a 90° angle as possible and the sewer line shall be located three or more feet below the water line.

Side sewers shall have a minimum depth of six (6) feet below final ground elevation at the property line and a minimum depth of eighteen (18) inches of cover over the pipe once inside the property.

The maximum bend permissible for a side sewer at any one fitting shall not exceed 45°. Bends exceeding 45° with any combination of two fittings shall have a straight section of pipe not less than four (4) feet in length installed between the fittings, unless one fitting is a wye branch with a cleanout provided on the straight leg.

Unless otherwise approved by the City, the sewer pipe shall be installed upgrade from point of connection on the existing sewer or from a designated starting point. The sewer pipe shall be installed with the bell end forward or upgrade. When pipe laying is not in progress, the forward end of the pipe shall be kept tightly closed with an approved temporary plug. All side sewers shall be laid at a minimum two (2) percent and maximum forty-five (45) percent slope. The City may, at its own discretion, allow installation of side sewers to be less than two percent under certain circumstances upon the owner's signing a Release of Liability and Hold Harmless Agreement.

Pipe joints shall be installed in strict compliance with the manufacturer's recommendations. Care shall be taken to properly clean and lubricate the spigot, gasket and socket of the pipe before joining. The pipe spigot shall be forced into the socket until the reference mark on the spigot is flush with the bell end. Forcing the pipes together beyond this point prevents proper contraction and expansion at the joints.

Pipe or pipe fittings that are damaged will be rejected and required to be replaced. Ductile iron pipe that has damage to the interior cement lining will also be rejected. At the City's discretion, ductile iron pipe may be required when minimum cover cannot be achieved or when surface loading precludes the use of PVC pipe. If ductile iron pipe is to be connected to PVC pipe, a PVC to ductile iron Romac transition coupling is required. Romac couplings will also be required when connecting other dissimilar pipe types with the exception of the plumbing connection where a Fernco is allowed. Side sewers installed on steep slopes, in unstable material, within steel casings or in sensitive areas will require the use of restrained joint ductile iron pipe 3" wide, green

metallic side sewer detector tape shall be laid 12" above the pipe for the entire length of the pipe installed. Identification on the tape shall include the words "Sanitary Sewer."

If gravity flow is not available, and the City has determined that there are no other alternative methods for gravity service, a sanitary sewer grinder pump station may be allowed. All pumping equipment and accessories shall be standard manufactured items specifically for sewage use in accordance with the Standard Details. The Contractor shall submit to the City a plan showing the location of the station, shop drawings, details and pump performance curve data prior to installation. As a condition for allowing a grinder pump station, the City will require that a Pump Agreement be signed by the Owner and recorded against the property.

6.5. CLEANOUTS

For single-family residences, cleanouts shall be required at locations as shown on Standard Sewer Detail 8 and at a minimum of every 100 feet. For commercial properties, cleanouts shall be installed at locations designated by the City, but in no case, shall they exceed 100 feet. Additional cleanouts may be required at bends as determined by the City. Cleanouts shall be installed in accordance with the applicable Standard Details.

6.6. STEEL CASINGS

Any side sewer installed under rockeries or walls or as directed by the City must be installed within a steel casing in accordance with the Standard Details.

6.7. GREASE INTERCEPTORS AND OIL/WATER SEPARATORS

No grease, oil, sand, contaminated liquid or other harmful material will be allowed into the City's sewer system without the installation of a grease interceptor or oil/water separator. The interceptor or separator is to be designed to accommodate the anticipated flows. Sizing calculations, layout plan and the location of the connection point to the sewer is required to be submitted to the City for review and be in accordance with the City's approved policy on Fats, Oils and Grease (F.O.G.) program. Interceptors or separators shall be maintained by the property owner and shall be in continuous operation at all times and be accessible for routine inspection.

7. TESTING

The entire side sewer line being installed from the existing sewer stub to the proposed structure(s) shall be under the City's observation.

Before sewer lines are accepted, all lines shall be tested and corrections of any deficiencies shall be made at the expense of the Contractor. The Contractor shall test the entire length of sewer pipe installed using one of the following test methods:

7.1. WATER TEST

A 6"x 4" reducer and 6" test tee shall be installed at the end of the 6" stub and an approved plug installed in the test tee. A 4" wye shall be installed approximately 3' from the proposed structure at the upper end of the side sewer. Backfill shall only be placed to secure the pipe at the upstream and downstream of the pipe segment being tested. The side sewer shall be filled with water at the upper end until the entire pipe system is full and the upper end wye will not accept any additional water. The side sewer will be visually inspected by the City to determine if leakage occurs. Once the pipe system has been filled, the water test will commence for 10 minutes. The Contractor shall repair all defective work. If there is no evidence of leakage, the Contractor may then backfill the pipe and the test will be considered acceptable.

7.2. LOW PRESSURE AIR TEST

The low pressure air test shall be in accordance with Section 7-17.3(2)F, *Low Pressure Air Test for Sanitary Sewers Constructed of Non Air-Permeable Materials*, of the 2010 Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation. The Contractor shall furnish all equipment and personnel for conducting the air test under the supervision of the City. The Contractor may desire to make an air test prior to backfilling for his own purposes. However, the acceptance air test shall be made after backfilling has been completed and compacted.

All wyes, tees or the end of the side sewer shall be plugged with flexible joint caps or acceptable alternative, securely fastened to withstand the internal test pressures.

Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches 4.0 pounds per square inch. At least two minutes shall be allowed for temperature stabilization before proceeding further.

The requirements of this specification shall be considered satisfied if the time required in seconds for the pressure to decrease from 3.5 to 2.5 lbs. per square inch is not less than the listed values shown in the following table:

Allowable Time for Low Pressure Air Test

Diameter (inches)	Min. Test Times for Length of Main (seconds)				
	50'	100'	150'	200'	250'
4	36	72	108	144	178
6	80	160	240	320	400

Note: All test times in the above table are rounded up to the nearest even number.

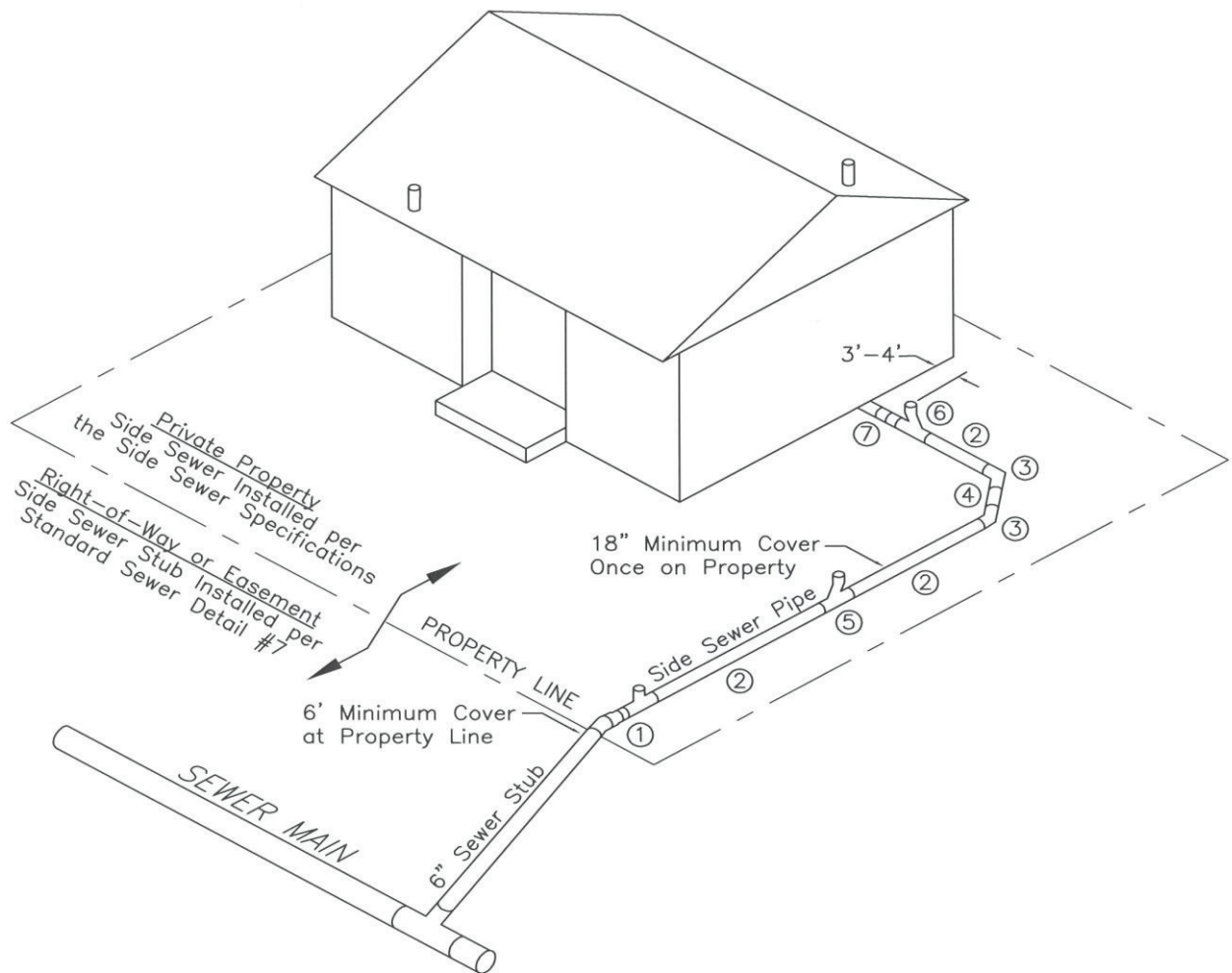
The use of air pressure for testing sewer lines creates hazards that must be recognized. The Contractor shall be certain that all plugs are securely blocked to prevent blowouts. The air testing apparatus shall be equipped with a pressure release device such as a rupture disc or a pressure relief valve designed to relieve pressure in the pipe if it exceeds the required test pressure.

Precautions shall be taken to prevent any damage caused by testing. Any damage resulting shall be repaired by the Contractor at his own expense.

7.3. ILLEGAL CONNECTIONS

It shall be unlawful to disconnect, remove or install any portion of the sewer piping without securing a permit and obtaining prior approval from the City. Any line to be disconnected shall be approved by the City and will require the line to be plugged at the location as determined by the City.

APPENDICES



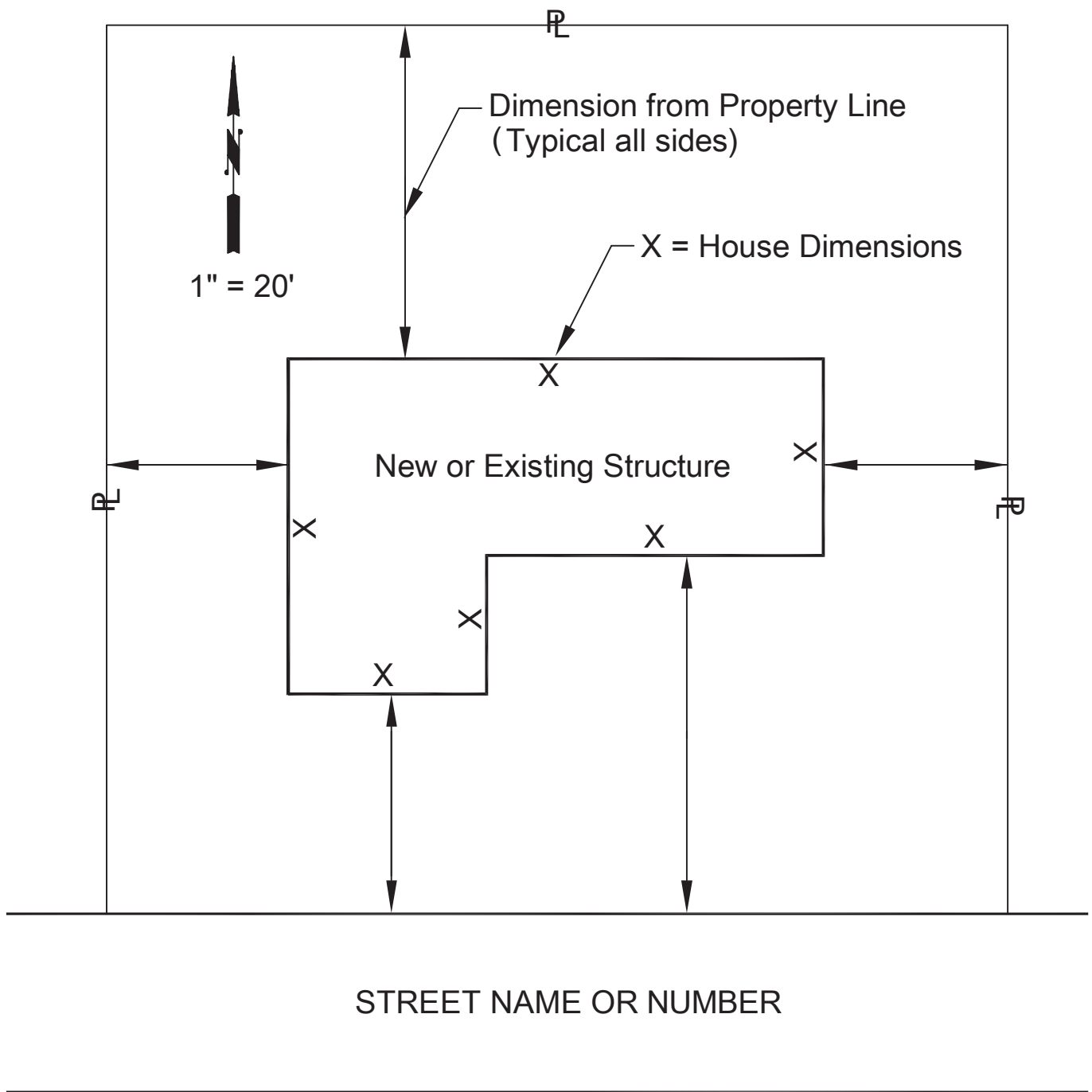
- ① CONNECT TO EXISTING 6" SEWER STUB. SEE STANDARD SEWER DETAIL 8.
- ② 4" SIDE SEWER PIPE AT 2% MINIMUM SLOPE (6" MINIMUM FOR NON-RESIDENTIAL AND WITHIN EASEMENTS). PIPE SHALL BE PVC ASTM D3034, BEDDED IN PEA GRAVEL.
- ③ 45° MAXIMUM BEND.
- ④ 4' MINIMUM LENGTH OF PIPE BETWEEN BENDS.
- ⑤ CLEANOUT EVERY 100' OR AS DIRECTED BY THE CITY.
- ⑥ CLEANOUT AS REQUIRED.
- ⑦ APPROVED ADAPTER AT PLUMBING CONNECTION (FERNCO OR EQUAL).

NOTE:
REFER TO LAKE FOREST PARK'S SIDE SEWER SPECIFICATIONS
FOR ADDITIONAL INFORMATION.

SIDE SEWER SCHEMATIC

NOT TO SCALE

Property Address _____
Tax ID Number _____
Legal Description _____



SAMPLE SITE PLAN

Grout adjusting rings inside, outside and between. Grout under casting.

Manhole Frame and Cover per the Standard Detail. Locate as shown on plan.

In unpaved areas, or as shown on the plans, provide a concrete ring around the Manhole Frame, 12" wide and 4" thick.

Minimum requirement for adjustment shall be (2) - 4" rings.

1' section below cone is required.

Confined O-ring rubber gasket joints and butyl sealant strips (typ.)

F.R.P. and/or P.P. MH base liner

Pea gravel bedding per the Specifications.

Foundation gravel per the Specifications, if required.

ELEVATION

Notes:

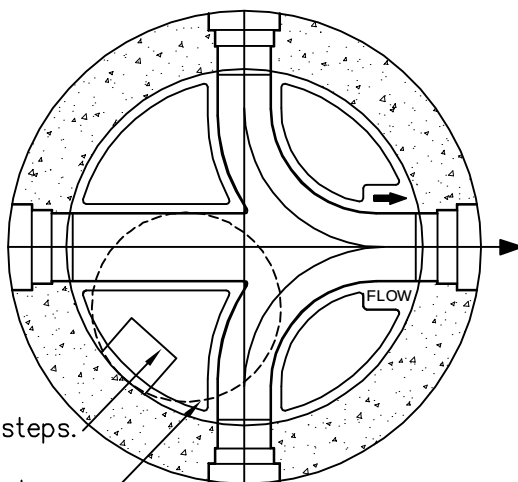
1. Minimum drop in the invert elevation through the manhole shall be 0.06'.
2. Marker posts may be required in easements.
3. The manhole baseliner shall be a Fiberglass Reinforced Plastic (F.R.P.) and/or Polypropylene (P.P.) Baseliner System per the Engineering Specifications.
4. For manholes less than 5' in depth, see Sewer Standard Detail #3, Shallow Manhole.

first step
14" min-
18" max
14" min
26" max
8" min

Install hand-hold.
Eccentric cone.

Varies- 8' (typ.)

Copolymer Polypropylene Plastic Steps & Ladder. per the Standard Detail. Locate as shown on plan view below.



Manhole steps.

Frame and cover.

PLAN

PRECAST MANHOLE W/ BASE LINER

NOT TO SCALE



LAKE FOREST PARK STANDARD SEWER DETAILS

1

February 2014
S-1(PRECASTMH).dwg

Grout adjusting rings inside, outside and between. Grout under casting.

Manhole Frame and Cover per the Standard Detail. Locate as shown on plan.

Minimum requirement for adjustment shall be (2) - 4" rings.

Eccentric cone.

1' section below cone is required.

Confined O-ring rubber gasket joints and butyl sealant strips (typ.)

varies- 8' min. (typ.)

Copolymer Polypropylene Plastic Steps & Ladder per the Standard Detail. Locate as shown on plan view below.

Provide grout at knock-out. Provide sand collar for PVC pipe.

Poured in place Class 4000 cement concrete base.

Kor-n-Seal boot by NPC, Inc., or approved equal.

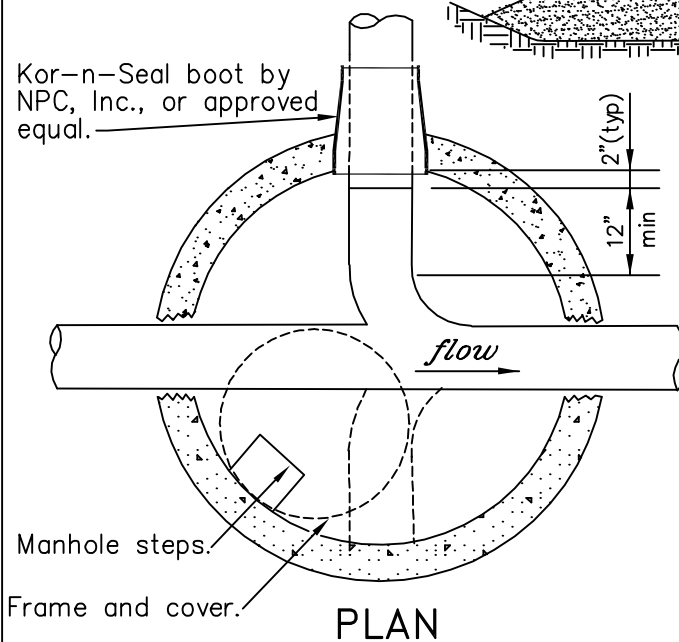
ELEVATION

Pea gravel bedding per the Specifications.

Foundation gravel per the Specifications, if required.

Notes:

1. Marker posts may be required in easements.



PLAN

SADDLE MANHOLE

NOT TO SCALE



LAKE FOREST PARK STANDARD SEWER DETAILS

2

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S-2(SADDLEMH).dwg

provide a concrete ring around the Manhole Frame, 12" wide and 4" thick.

24"

Minimum adjustment shall be (1) - 4" ring.

Grout adjusting rings inside, outside and between. Grout under casting.

18" Eccentric Cone

Confined O-ring rubber gasket joints and butyl sealant strips (typ.)

18"

12" typ.

48"

5"

F.R.P. and/or P.P. MH base liner

4.3' - 5' ± (typ.)

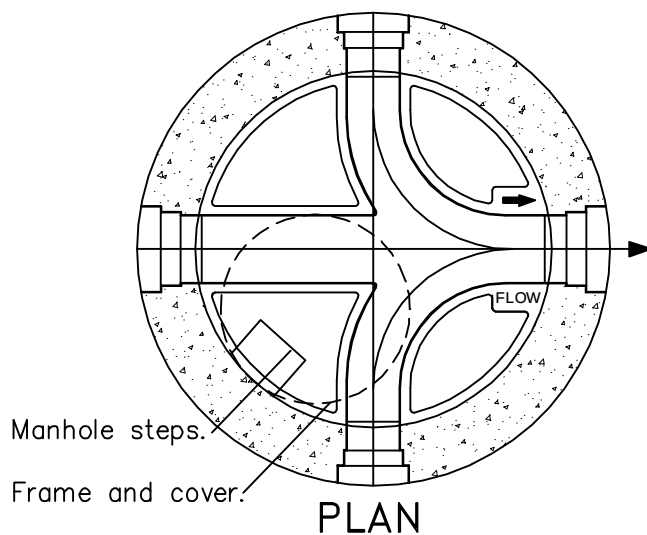
First Step 18"

Copolymer Polypropylene Plastic Steps & Ladder. per the Standard Detail. Locate as shown on plan view below.

Pea gravel bedding per the Specifications.

Foundation gravel per the Specifications, if required.

ELEVATION



PRECAST SHALLOW MANHOLE W/ BASE LINER

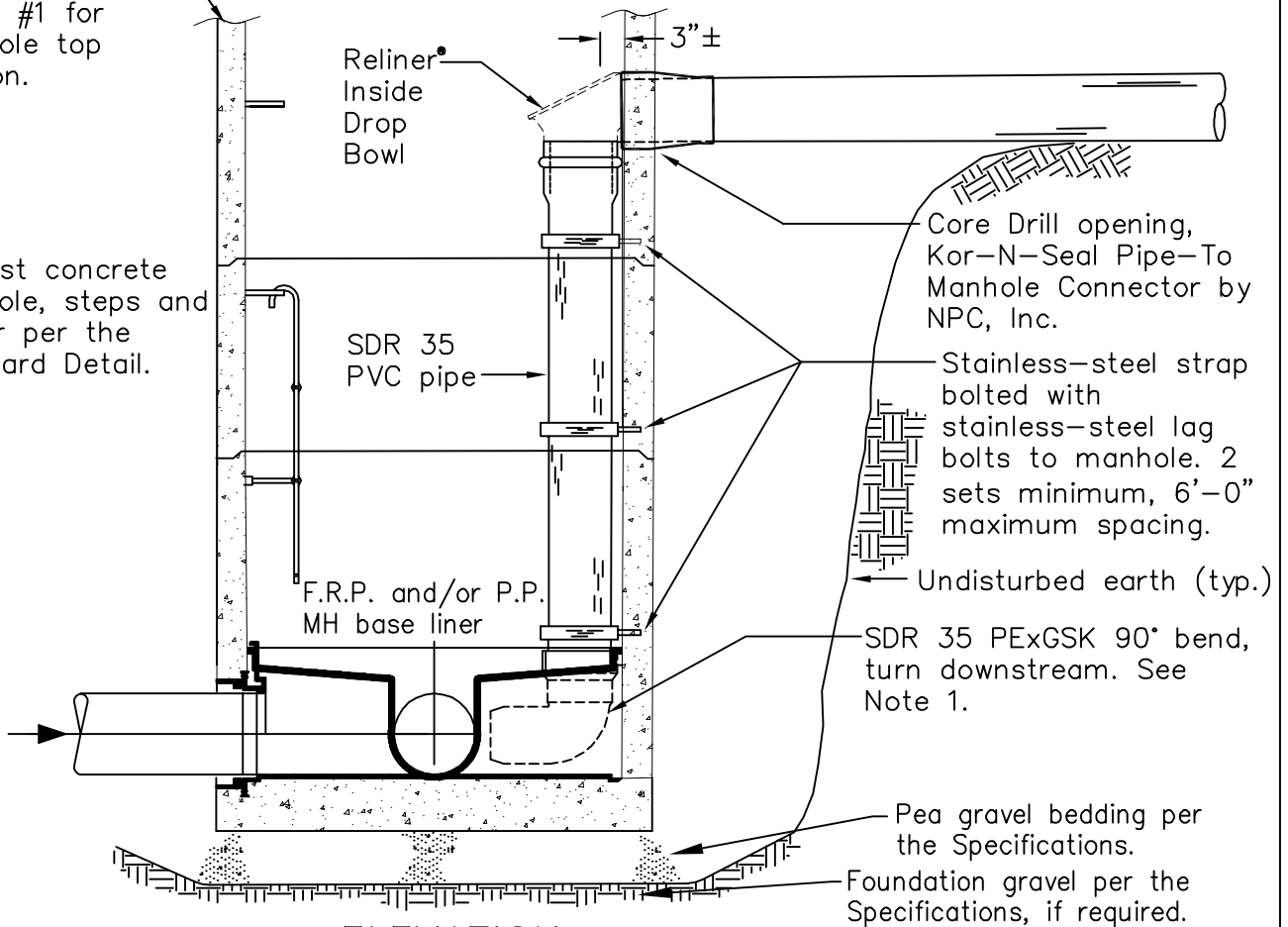
NOT TO SCALE

Notes:

1. Use 18" eccentric cone and 2' base for shallow manhole application.
2. Minimum drop in the invert elevation through the manhole shall be 0.06'.
3. Marker posts may be required in easements.
4. The manhole baseliner shall be a Fiberglass Reinforced Plastic (F.R.P.) and/or Polypropylene (P.P.) Baseliner System per the Engineering Specifications.

See LFP Sewer Detail #1 for manhole top section.

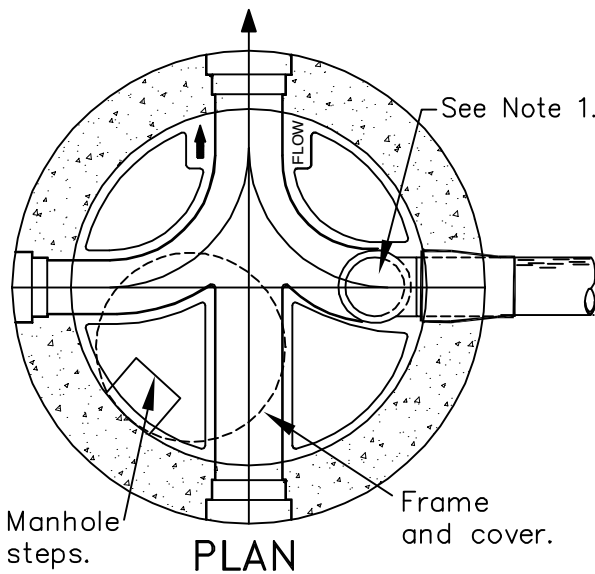
Precast concrete manhole, steps and ladder per the Standard Detail.



ELEVATION

Notes:

1. Fiberglass channel receiving the inside drop flow shall be sized one pipe size larger than the incoming pipe to accommodate the 90° bend. Bend to rest flush in the channel.
2. Existing manholes without the FRP baseliner and no concrete channel to accommodate the 90° bend, shall have the bend set on top of the existing concrete bench and grouted in-place. Additional PVC pipe may be required to direct flow to flowline.
3. Minimum drop in the invert elevation through the manhole shall be 0.06'.
4. Marker posts may be required in easements.
5. The manhole baseliner shall be a Fiberglass Reinforced Plastic (F.R.P.) and/or Polypropylene (P.P.) Baseliner System per the Engineering Specifications.



PLAN

INSIDE DROP MANHOLE W/ BASE LINER

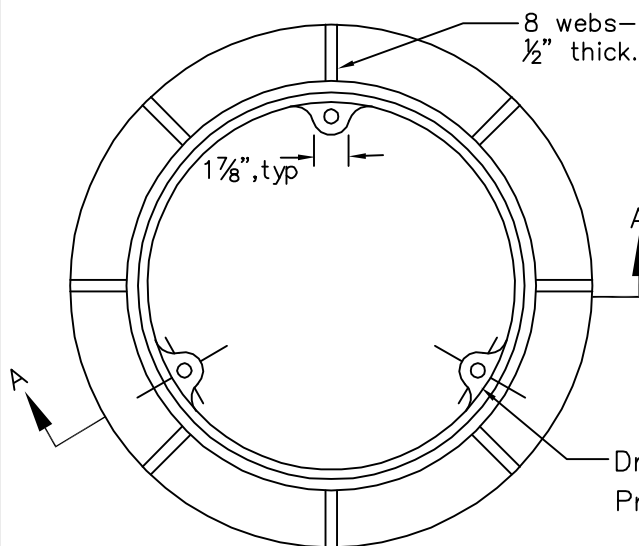
NOT TO SCALE



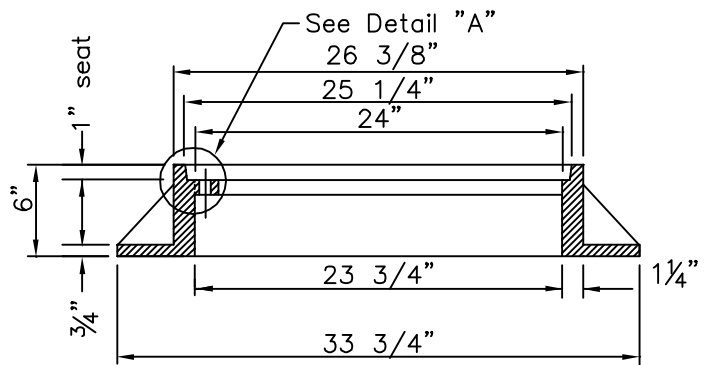
LAKE FOREST PARK STANDARD SEWER DETAILS

4

February 2014
S-4(DROP MH).dwg



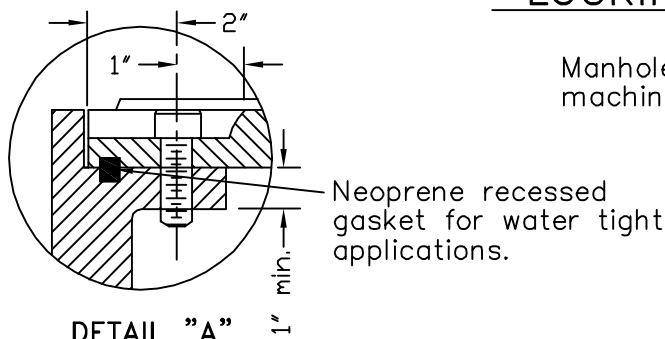
PLAN



SECTION A-A

Drill and tap: $\frac{5}{8}$ "-11 NC at 120° (typ. 3 places).
Provide $\frac{5}{8}$ "-11 NC x $1\frac{1}{4}$ " socket head screws.

LOCKING FRAME



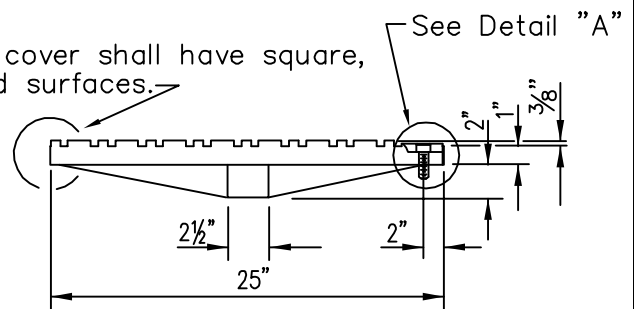
DETAIL "A"

(for locking and/or watertight applications)

Notes:

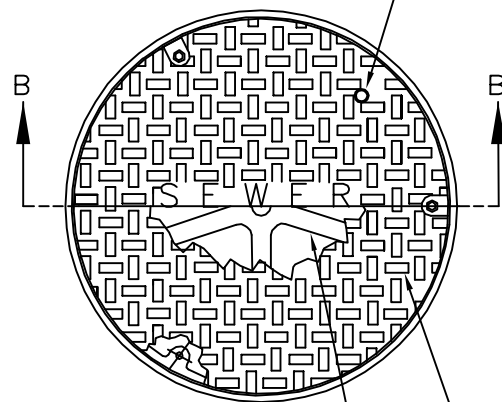
1. Frames shall be locking type, Olympic Foundry Part Number MH30AD/T or East Jordan Iron Works Part Number 370512.
2. Covers shall be locking type, Olympic Foundry part number MH30AD/T or East Jordan Iron Works part number 370523.
3. Water tight covers, where required, shall be Olympic Foundry part number MH30AW/T or East Jordan Iron Works part number 370586.
4. Holes for locking cover shall be in alignment and interchangeable.
5. Allowable tolerance between cover & frame is $\frac{1}{8}$ " maximum.
6. Cover shall have the word "Sewer" cast with 3" high letters and raised $\frac{3}{8}$ ".

Manhole cover shall have square, machined surfaces.



SECTION B-B

1" diameter lift hole.



Nonskid pattern to be cast integral on top of cover.

COVER

MANHOLE LOCKING FRAME AND COVER

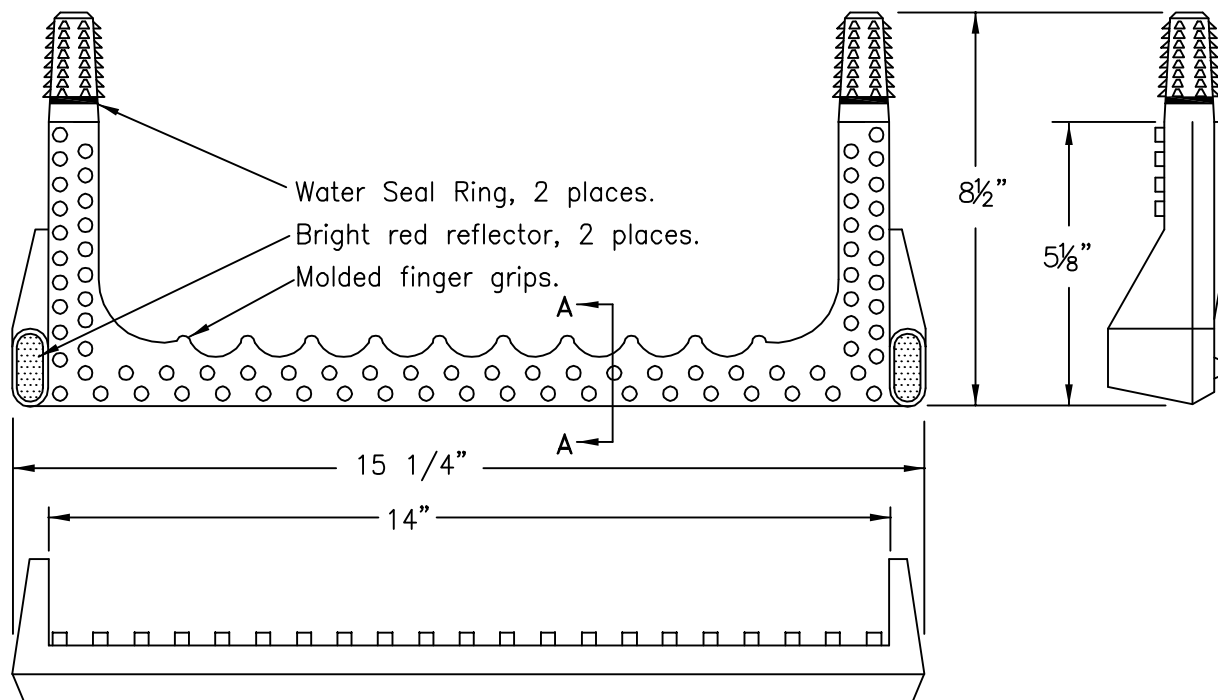
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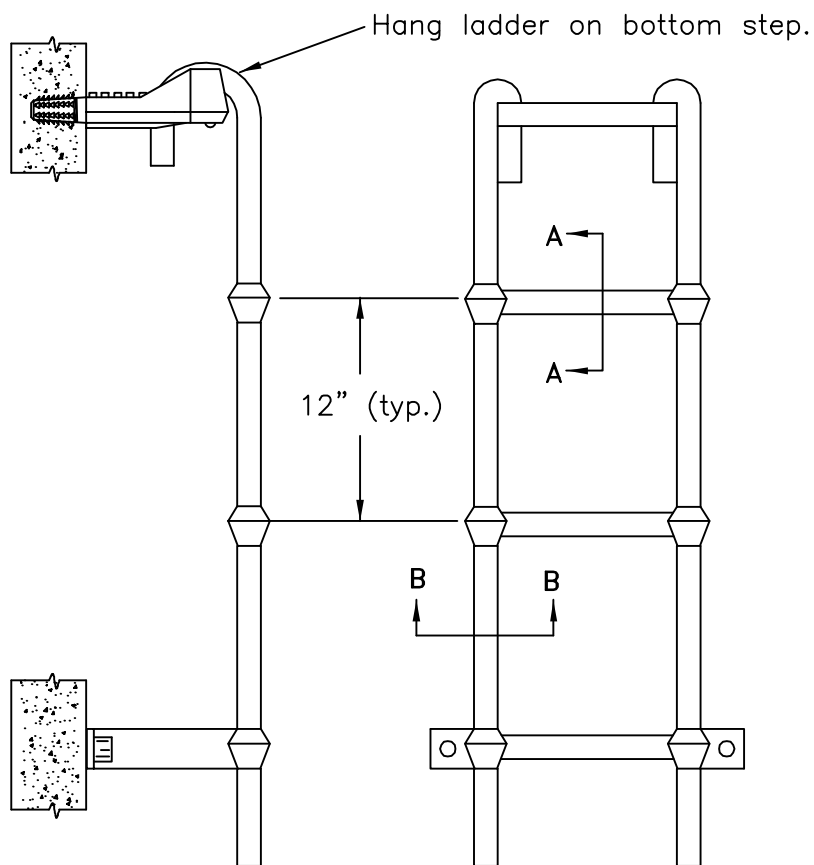
LAKE FOREST PARK STANDARD SEWER DETAILS

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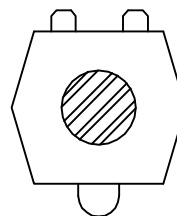
February 2014
S-5(MHCOVER).dwg



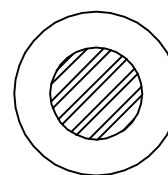
STEP



HANGING LADDER



Section A



Section B

Notes :

Steps to be Lane #P-14850 or District approved equal.

Fasten ladder to MH structure with stainless steel lag screws into lead anchors, or set ladder base into MH shelf prior to curing.

MANHOLE STEPS AND LADDER

NOT TO SCALE



LAKE FOREST PARK STANDARD SEWER DETAILS

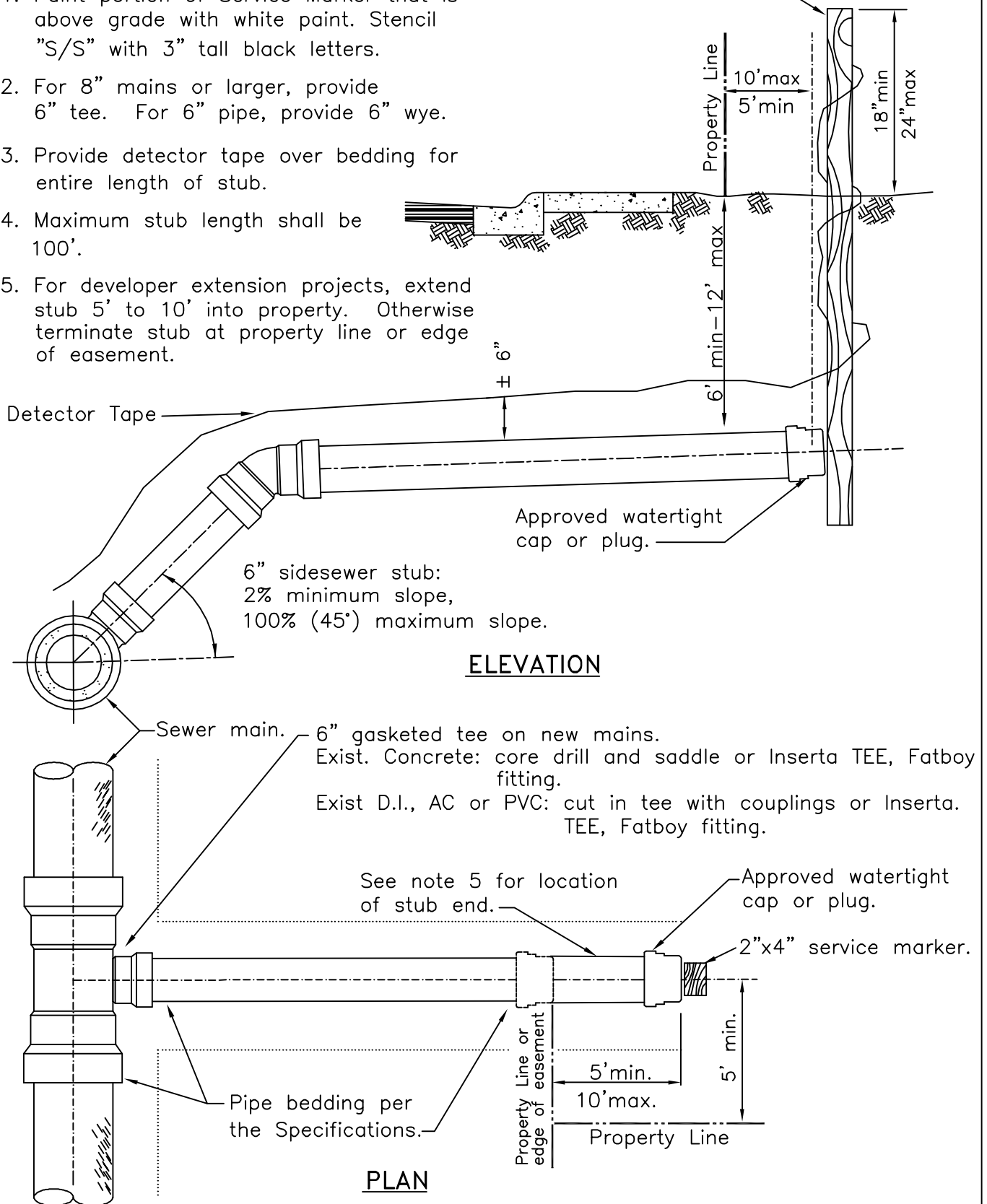
6

February 2014
S-6(STEPSLADDER).dwg

Notes:

1. Paint portion of Service Marker that is above grade with white paint. Stencil "S/S" with 3" tall black letters.
2. For 8" mains or larger, provide 6" tee. For 6" pipe, provide 6" wye.
3. Provide detector tape over bedding for entire length of stub.
4. Maximum stub length shall be 100'.
5. For developer extension projects, extend stub 5' to 10' into property. Otherwise terminate stub at property line or edge of easement.

2"x4" Service Marker, length as required. See note 1.



SIDE SEWER STUB

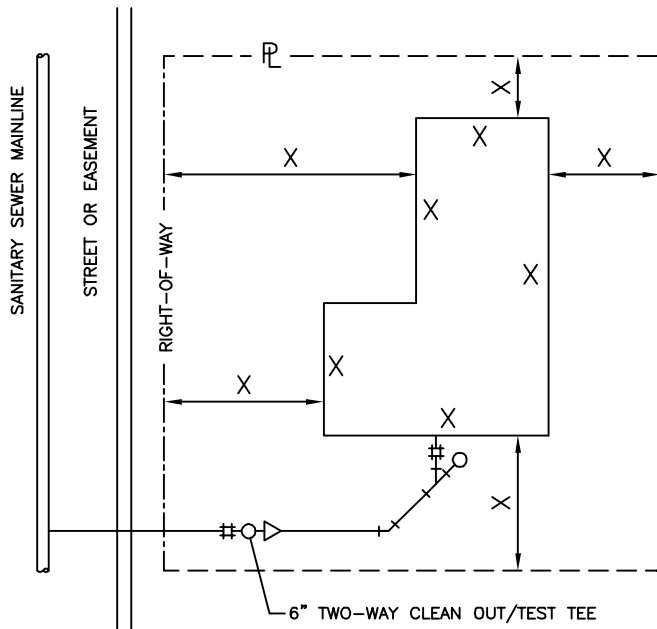
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LAKE FOREST PARK STANDARD SEWER DETAILS

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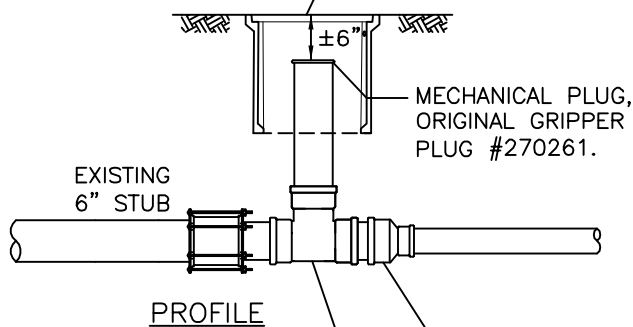
February 2014
S-7(SIDSEWER).dwg



THE FOLLOWING INFORMATION IS
REQUIRED FOR THE SIDE SEWER PERMIT:

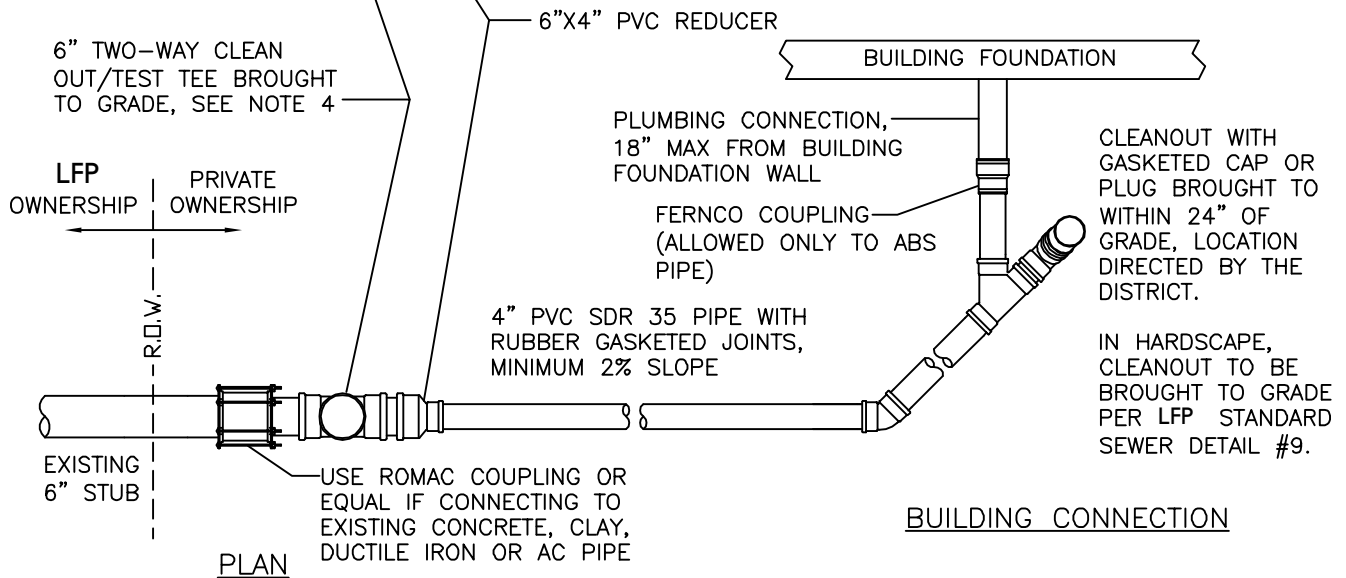
- TAX ID #
- LEGAL DESCRIPTION
- STREET ADDRESS
- PLAN WITH "X" DIMENSIONS SHOWN
AT A 1" = 20' SCALE
- COMPLETION OF A SIDE SEWER
APPLICATION.

CLEAN OUT BOX AND
COVER PER LFP STANDARD
SEWER DETAIL #9



NOTES:

1. ALL NEW SIDE SEWER PIPE SHALL BE
GASKETED PVC PIPE, SDR 35, ASTM 3034.
2. THERE SHALL BE A MINIMUM 2' OF
SEPARATION BETWEEN BENDS.
3. EXISTING SIDE SEWER STUBS ON DEVELOPER
EXTENSION PROJECTS MAY HAVE BEEN
INSTALLED 5'-10' INTO THE PROPERTY.
4. INSTALL 6" PVC, TWO WAY CLEAN-OUT IN
LIEU OF TEST TEE, SEE DETAIL BELOW. BRING
TO GRADE AFTER FINAL SIDE SEWER
INSPECTION PER LFP SEWER DETAIL #9.



HOUSE SEWER CONNECTION

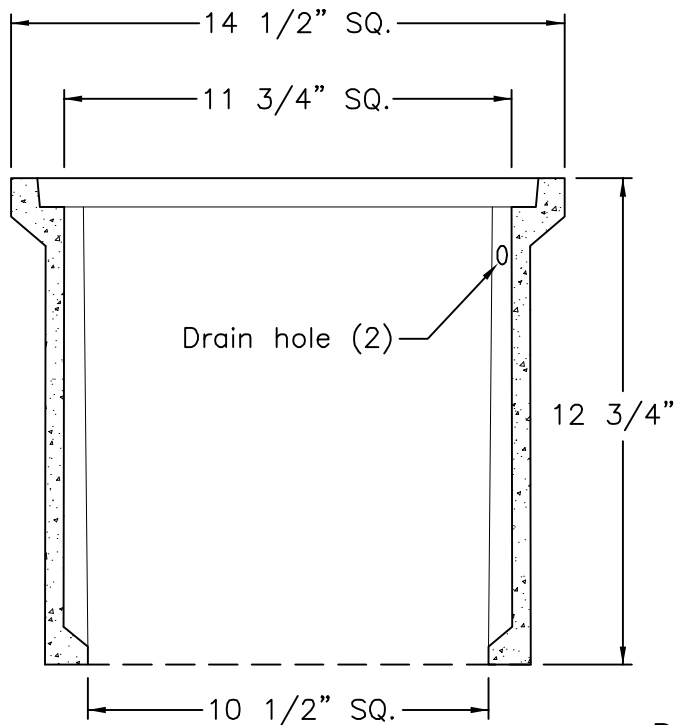
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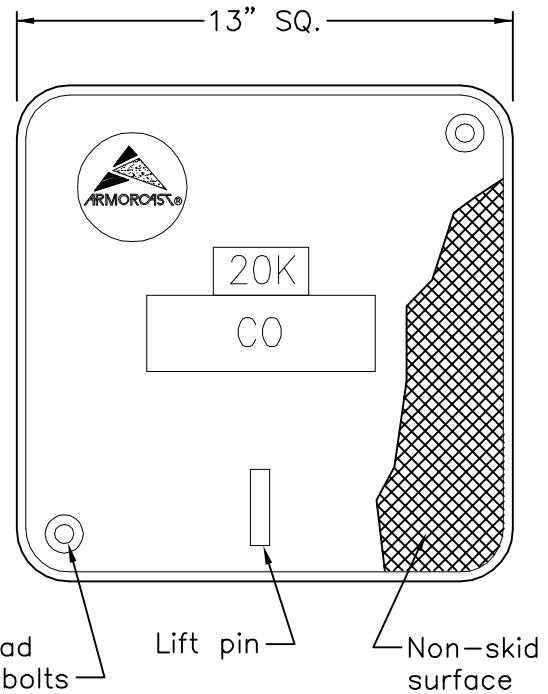
LAKE FOREST PARK STANDARD SEWER DETAILS

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S-8(HseSewerConnex).dwg



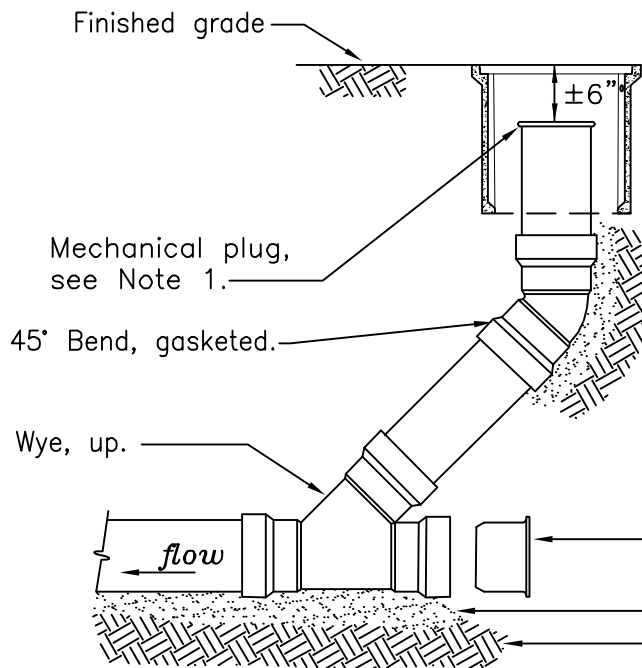
CLEAN-OUT BOX



CLEAN-OUT COVER

Notes:

1. Cleanouts shall be brought to grade and plugged watertight with a mechanical plug, Original Gripper Plug #270261.
2. Cleanout box and cover shall be Armorcast Polymer Concrete Box Assembly, part #A6001423TA, H20 rated with Pentahead locking bolts and "CO" stamped on cover. All cleanouts brought to grade shall have this box and cover installed.
3. All pipe material shall be bell & spigot type with rubber gasket joint and shall be in conformance with ASTM D3034 (SDR-35).



ELEVATION

CLEAN-OUT

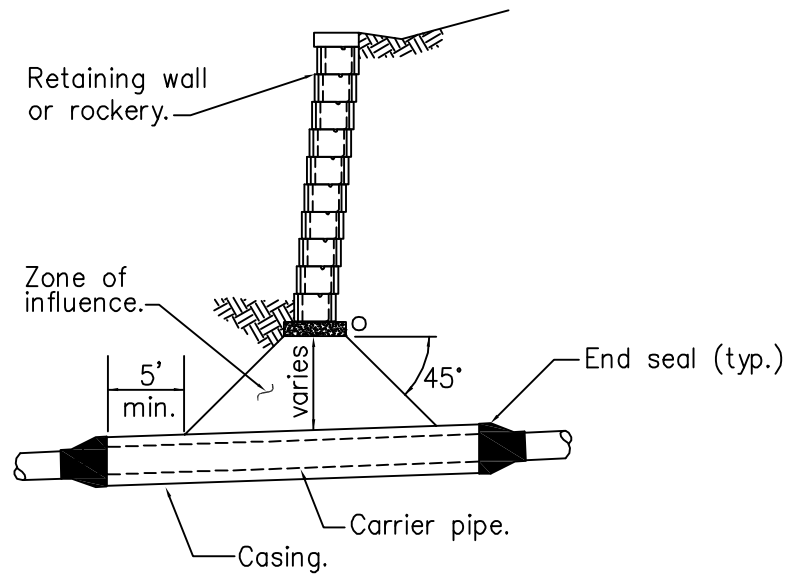
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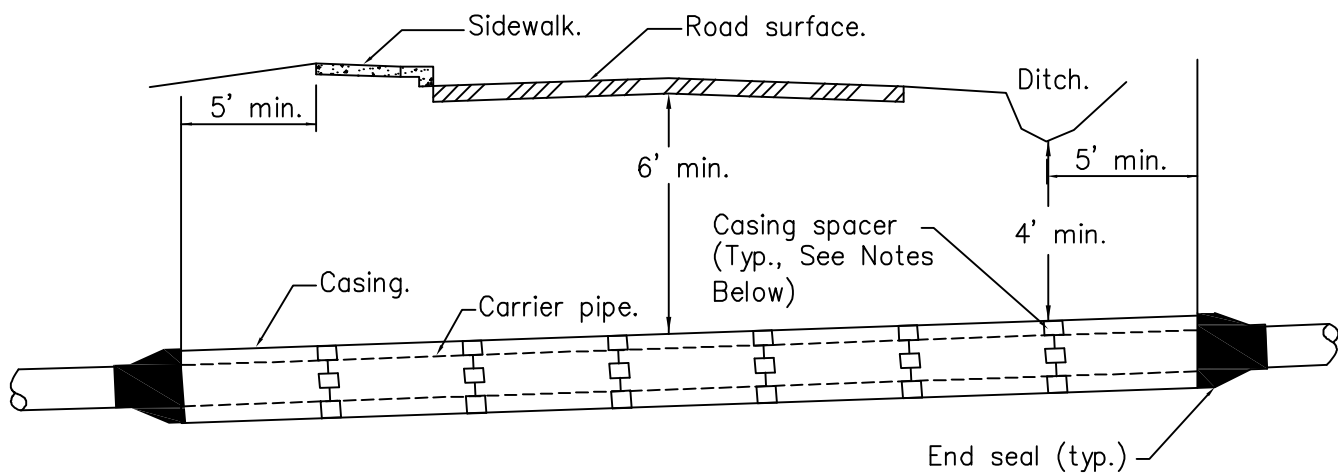
**LAKE FOREST PARK
STANDARD SEWER DETAILS**

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S-9(CLEANOUT).dwg



ROCKERY OR WALL SECTION



ROADWAY SECTION

Notes:

1. Casing length, type, location and size shall be as shown on the plans or as directed by the District and shall be in accordance with the Specifications.
2. Casing spacers shall include polyethylene runners with stainless steel bands per the Specifications.
3. Casing spacers shall be installed at a maximum 10' spacing, with a spacer located behind each pipe bell and with spacers located within 2' of casing ends.
4. Carrier pipe shall be CL 52 Ductile Iron Restrained Joint pipe unless otherwise specified.

CASING PIPE

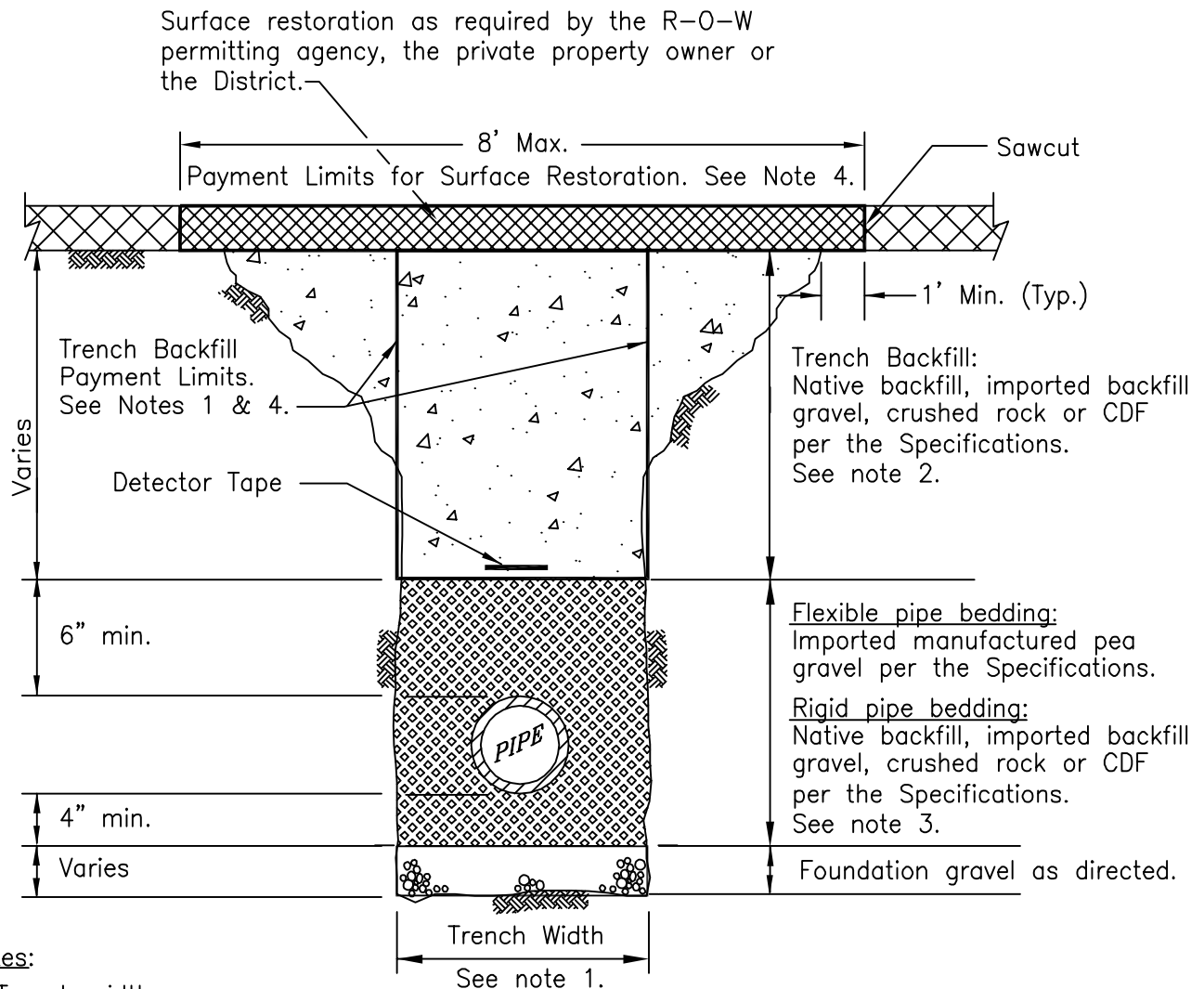
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LAKE FOREST PARK STANDARD SEWER DETAILS

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S-10(CASING).dwg



Notes:

1. Trench width:

Minimum: Pipe O.D. + 12" (6" each side of pipe).

Maximum: 40" for 15"Ø pipe and smaller.

(1-1/2 x I.D.) + 18" for 18"Ø pipe and larger.

The neat-line payment limits for trench backfill materials shall be based upon the maximum allowable trench width as shown above.

2. Native material, if allowed for trench backfill, shall meet the requirements of select borrow per the Specifications. Trench backfill shall be compacted to a minimum of ninety-five percent (95%) of Modified Proctor in the Right-Of-Way and improved easements and to ninety percent (90%) in unimproved easement areas. See the Specifications for additional information.

3. Native material, if allowed for rigid pipe bedding, shall be sand and gravel with no material larger than 1-1/2". See the Specifications for additional information.

4. The neat-line limits shown will be used to calculate the maximum quantity of trench backfill and surface restoration materials allowed. Payment for bedding gravel will be considered incidental to payment made for pipe. Payment for foundation rock will be based upon the quantities used as directed by the District. See the Contract documents for additional information.

TYPICAL TRENCH SECTION & PAYMENT LIMITS

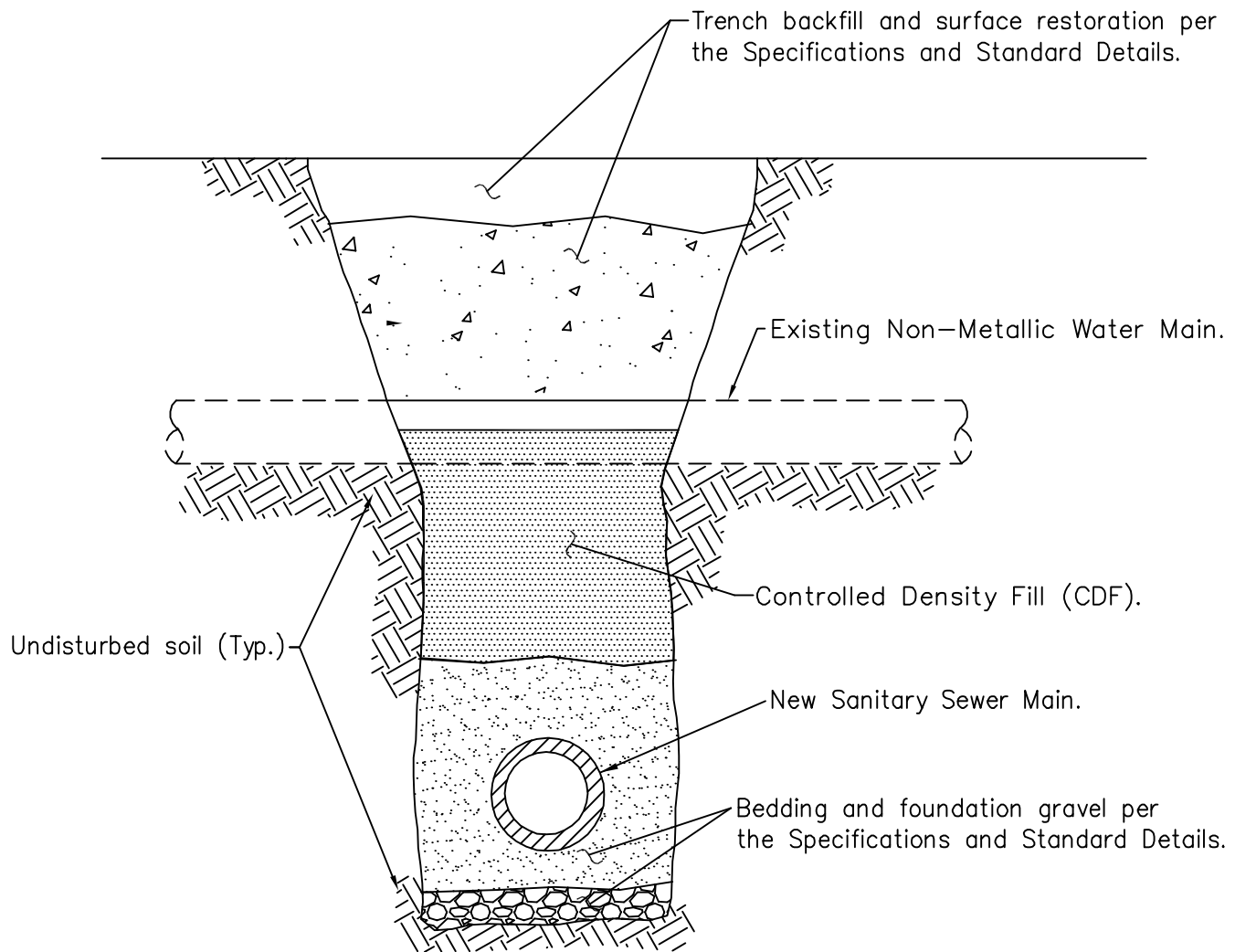
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LAKE FOREST PARK STANDARD SEWER DETAILS

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February 2014
S-11(TypicalTrench).dwg



SECTION

Notes:

1. Where utility lines cross under existing non-metallic water main such as Asbestos Cement, Permastran, or Class 200 PVC, backfill with Controlled Density Fill (CDF) between the bedding material and the spring line (mid-point) of the non-metallic pipe. Trench backfill can then be used above the CDF to the final grade.
2. If non-metallic pipe must be removed, replace with Cl. 52 ductile iron pipe, size to match. D.I. pipe to extend a minimum of 18" into undisturbed soil (All applicable Environmental Protection Agency, Puget Sound Air Pollution Control Agency, and Labor and Industry requirements and regulations shall be met in cutting, handling or disposing of Asbestos Cement pipe).

NON-METALLIC PIPE CROSSING

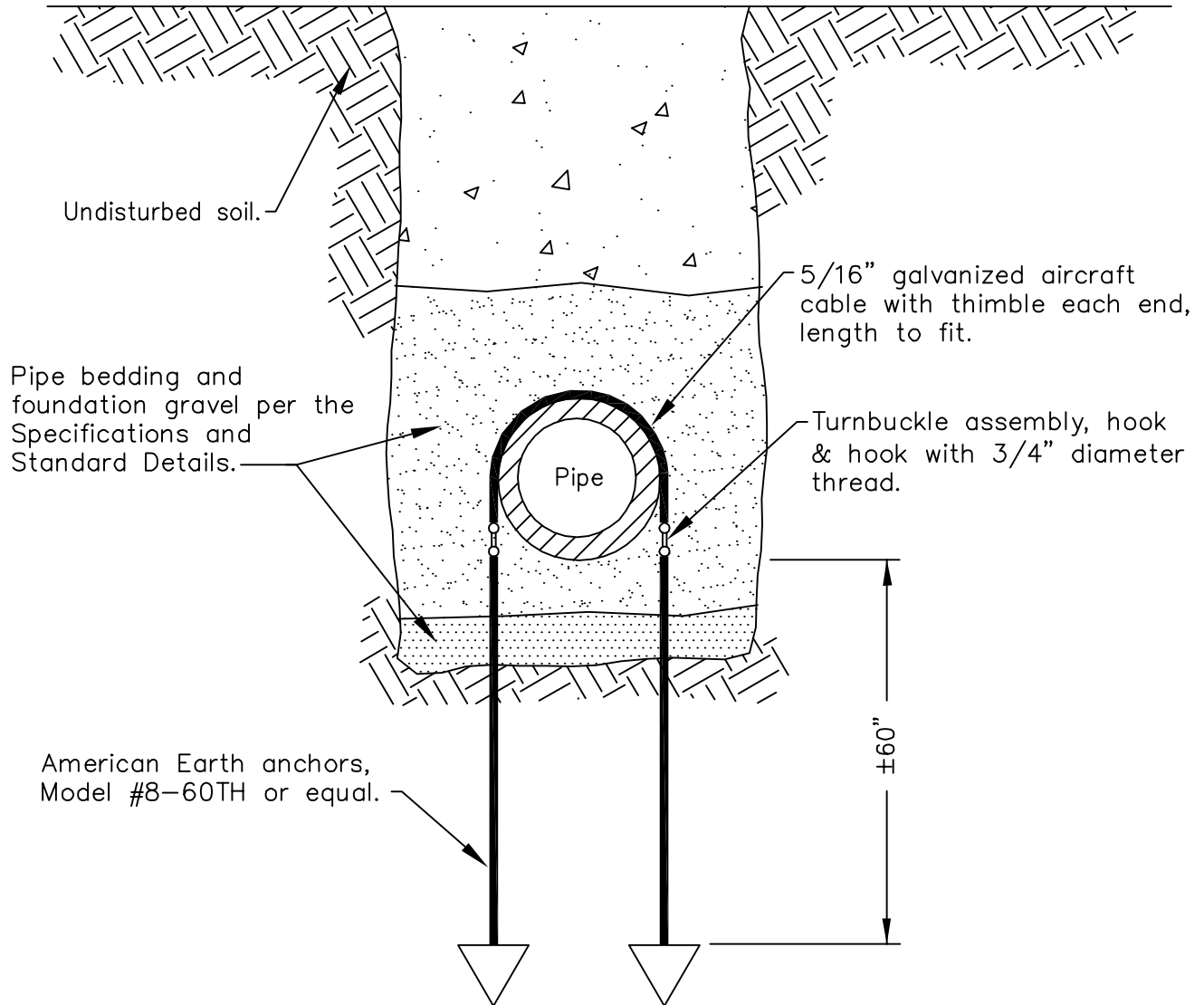
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LAKE FOREST PARK STANDARD SEWER DETAILS

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February 2014
S-12(ACCROSSING).dwg



Notes:

1. Pipe anchors shall be installed on all slopes greater than 20% with spacing as follows:
 - A. Not greater than 36 ft. on grades from 20% to 35%.
 - B. Not greater than 24 ft. on grades from 35% to 50%.
 - C. Not greater than 16 ft. on grades greater than 50%.

PIPE ANCHOR

NOT TO SCALE

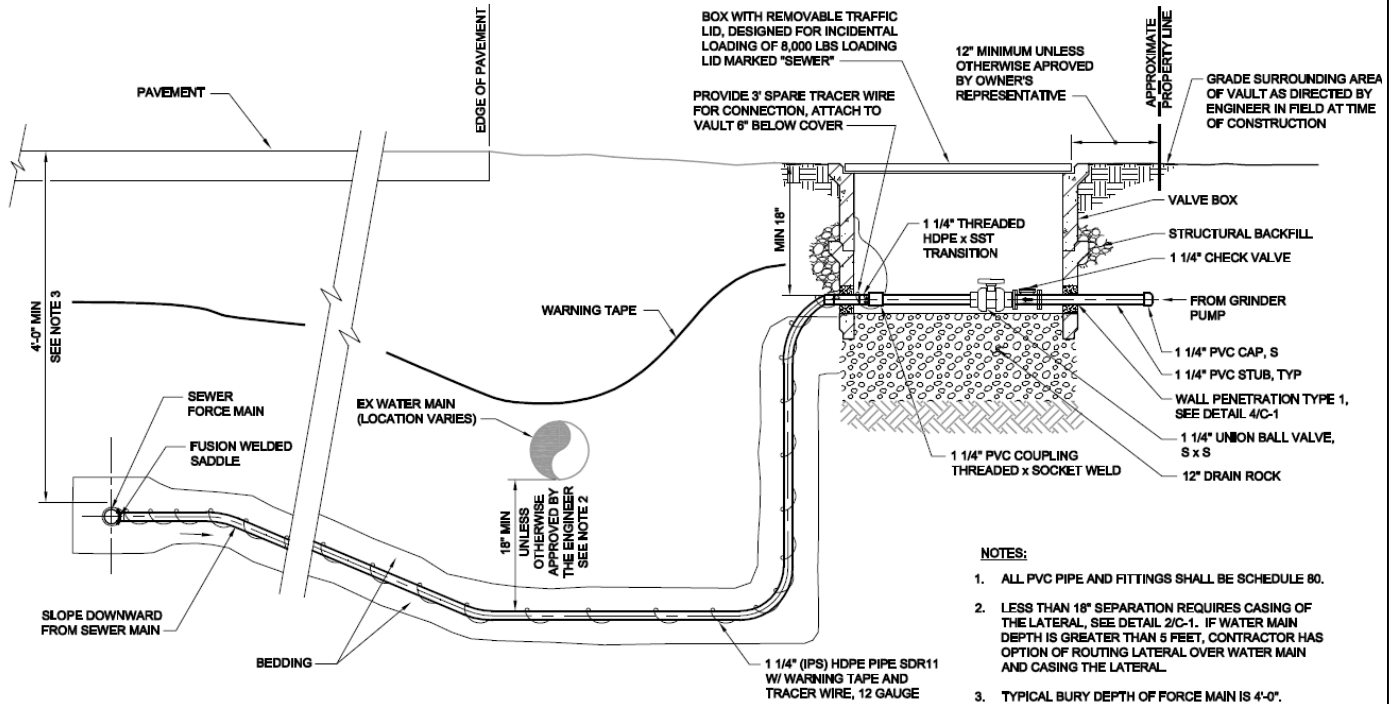


LAKE FOREST PARK STANDARD SEWER DETAILS

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S-13(ANCHOR).dwg

TYPICAL PRESSURE SIDE SEWER INSTALLATION



NOTES:

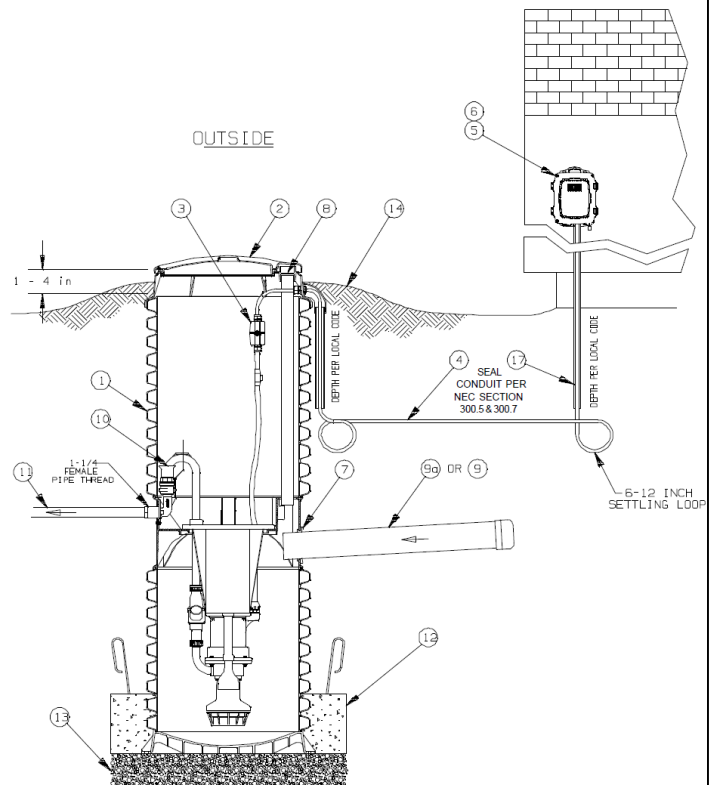
1. ALL PVC PIPE AND FITTINGS SHALL BE SCHEDULE 80.
2. LESS THAN 18" SEPARATION REQUIRES CASING OF THE LATERAL, SEE DETAIL 2/C-1. IF WATER MAIN DEPTH IS GREATER THAN 5 FEET, CONTRACTOR HAS OPTION OF ROUTING LATERAL OVER WATER MAIN AND CASING THE LATERAL.
3. TYPICAL BURY DEPTH OF FORCE MAIN IS 4'-0".
4. ALL PIPE AND FITTINGS INSIDE VALVE BOX SHALL BE LAID FLAT.

GENERAL NOTES

COMPLETE E/ONE GRINDER PUMP CAPABLE OF DELIVERING 15 GPM AGAINST A RATED TOTAL DYNAMIC HEAD OF 0 FEET (0 PSIG) AND 9 GPM AGAINST A RATED TOTAL DYNAMIC HEAD OF 138 FEET (60 PSIG). THE PUMP MUST ALSO BE CAPABLE OF OPERATING AT NEGATIVE TOTAL DYNAMIC HEAD WITHOUT OVERLOADING THE MOTOR.

1. GRINDER PUMP BASIN - HDPE, TANK MUST BE 24" I.D., AND HAVE A MINIMUM DEPTH OF 5'.
2. ACCESSWAY COVER - FRP - MUST INCLUDE A 2" PVC VENT TO PREVENT SEWAGE GASES FROM ACCUMULATING IN THE TANK.
3. ELECTRICAL QUICK DISCONNECT (EQD) - NEMA 6P ELECTRICAL QUICK DISCONNECT.
4. POWER AND ALARM CABLE
5. ALARM PANEL - WALL MOUNTED, NEMA 4X ENCLOSURE, EQUIPPED WITH CIRCUIT BREAKERS. LOCATE ACCORDING TO LOCAL CODES. ALARM PANEL MUST INCLUDE A 20 AMP, 250 VAC GENERATOR RECEPTACLE AND AUTO TRANSFER. RED ALARM LIGHT REQUIRED.
6. ALARM DEVICE - EVERY INSTALLATION IS TO HAVE AN ALARM DEVICE TO ALERT THE RESIDENTS OF A POTENTIAL MALFUNCTION. VISUAL DEVICES SHOULD BE PLACED IN VERY CONSPICUOUS LOCATIONS.
7. INLET - EPDM GROMMET (4.5" ID). FOR 4.5" OD DWV PIPE.
8. WET WELL VENT - 2.0" TANK VENT, SUPPLIED BY FACTORY IN UNITS WITH ACCESSWAYS.
9. GRAVITY SERVICE LINE - 4" DWV, (4.5" OD).
- 9A. STUB OUT - 4"X5" LONG WATERTIGHT STUB OUT, TO BE INSTALLED A TIME OF BURIAL UNLESS GRAVITY SERVICE LINE IS CONNECTED DURING INSTALLATION.
10. DISCHARGE VALVE - 1-1/4" FEMALE PIPE THREAD, STAINLESS STEEL BALL VALVE RATED FOR 200 PSI WOG.
11. DISCHARGE LINE - 1-1/4" NOMINAL PIPE SIZE
12. CONCRETE ANCHOR - SEE BALLAST CALCULATIONS FOR SPECIFIC WEIGHT FOR STATION HEIGHT.
13. BEDDING MATERIAL - 6" MINIMUM DEPTH, ROUND AGGREGATE (GRAVEL).
14. FINISHED GRADE - GRADE LINE TO BE 1" TO 4" BELOW REMOVABLE LID AND SLOPE AWAY FROM STATION.
17. CONDUIT - 1" OR 1-1/4", MATERIAL AND BURIAL DEPTH AS REQUIRED BY NATIONAL AND LOCAL CODES. CONDUIT MUST ENTER PANEL FROM BOTTOM AND BE SEALED PER NEC SECTION 300.5 & 300.7.

SIDE ELEVATION



GRINDER PUMP STATION SINGLE FAMILY RESIDENCE - CONNECTION TO PRESSURE MAIN

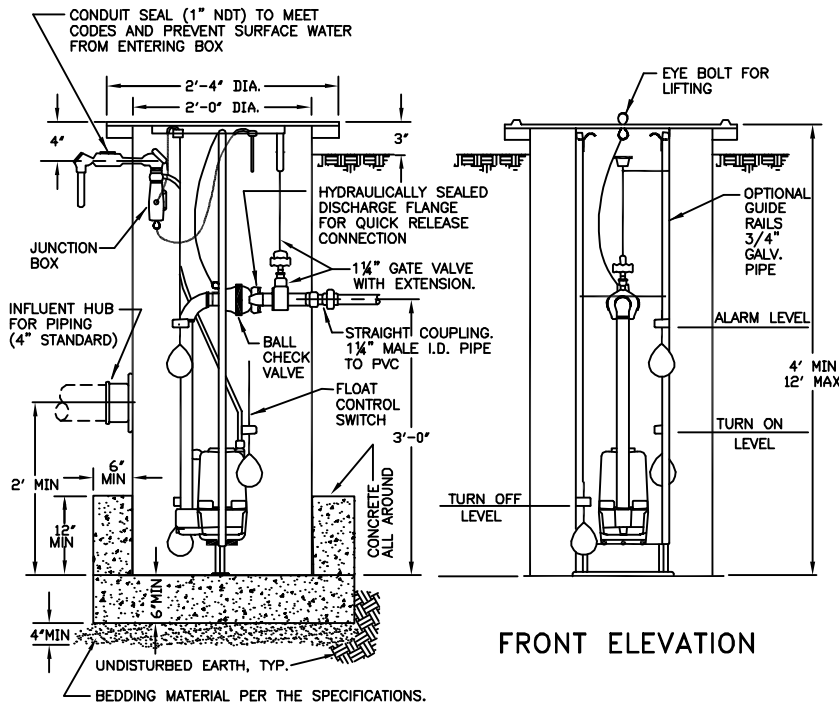
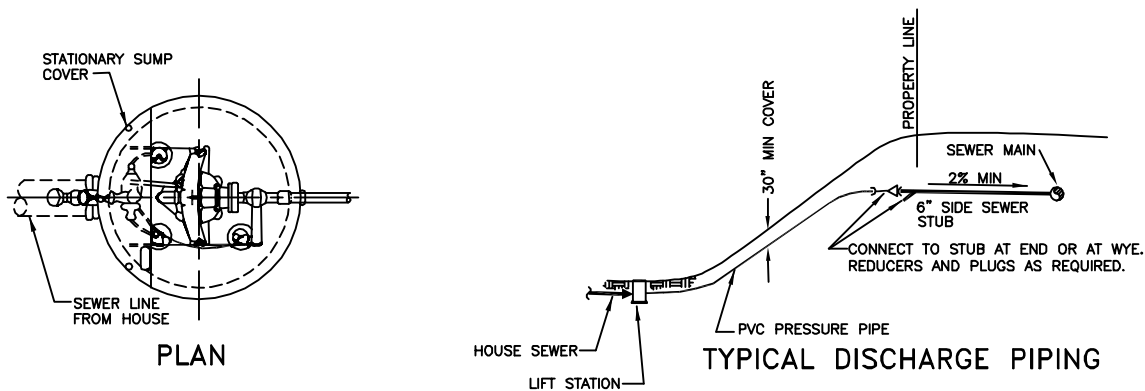
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LAKE FOREST PARK STANDARD SEWER DETAILS

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S-14(GRINDERPUMP).dwg



COMPLETE HYDROMATIC HPG-200 PACKAGED SEWER GRINDER LIFT STATION TO INCLUDE THE FOLLOWING:

- GRINDER PUMP WITH 2HP SUBMERSIBLE SINGLE PHASE MOTOR (ADEQUATE FOR SINGLE RESIDENCE UP TO 100' HEAD AT 5" IMPELLER DIA.)
- TWO SEALED FLOAT TYPE MERCURY SWITCHES FOR LEVEL CONTROL
- ONE FLOAT SWITCH FOR ALARM CONTROL
- 1" NPT MALE CONDUIT OUTSIDE OF SUMP FOR CONTROL WIRING
- DISCHARGE PIPING SHALL INCLUDE A CHECK VALVE, A GATE VALVE AND NPT FEMALE CONNECTION OUTSIDE OF SUMP (DIA. PER PRESSURE PIPE DIA.)
- INFLUENT PIPING SHALL PROVIDE HUB FOR PVC PIPE OUTSIDE OF SUMP (DIA. PER SIDESEWER DIA.)
- FIBERGLASS SUMP BASIN 24" I.D. x 5'-0" HIGH (PER BULLETIN SPC-604 (HYDROMATIC OR EQUAL))
- NEMA 3R LOCKING CONTROL PANEL WALL MOUNTED
- RED ALARM LIGHT PANEL, WALL MOUNTED

GENERAL NOTES :
THE MINIMUM REQUIREMENTS FOR A RESIDENTIAL SEWAGE PUMPING SYSTEM CONNECTING A SINGLE RESIDENCE TO THE DISTRICT'S SYSTEM ARE SPECIFIED AS FOLLOWS. THE DISTRICT ACCEPTS NO RESPONSIBILITY FOR THE DESIGN, OPERATION AND MAINTENANCE OF SUCH PRIVATELY OWNED AND OPERATED SYSTEMS.

A. ALL EQUIPMENT AND ACCESSORIES SHALL BE STANDARD MANUFACTURED ITEMS AND THOSE COMING IN DIRECT CONTACT WITH SEWAGE SHALL BE SPECIFICALLY MANUFACTURED FOR SEWAGE USE.

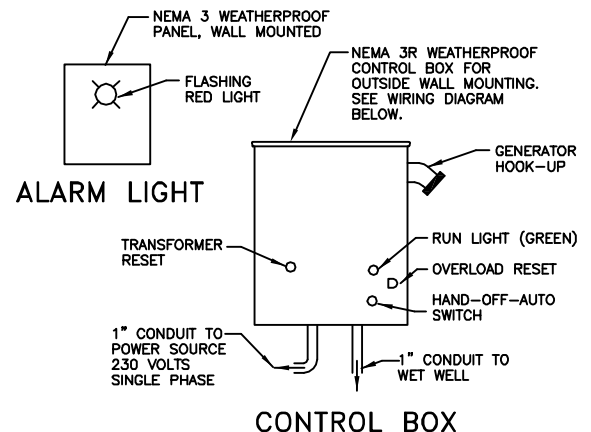
B. LIFT STATION MUST BE LOCATED OUTSIDE THE BUILDING. IF THE STATION IS COMPLETELY BURIED, INSTALL 48" I.D. MANHOLE WITH FRAME AND COVER OVER STATION FOR ACCESS.

C. THE PUMP SHALL BE A SUBMERSIBLE GRINDER TYPE, AS SPECIFIED HEREIN.

D. A 12 GAUGE TRACER WIRE, COATED AND CONTINUOUS SHALL BE WRAPPED AROUND THE FORCE LINE IT'S ENTIRE COURSE AND BROUGHT TO THE SURFACE AT THE STATION.

E. FORCE MAIN TO BE 1 1/2" MIN. SCH. 80 PIPE OR DISTRICT APPROVED EQUAL.

F. DETECTOR TAPE REQUIRED 1'-0" ABOVE PIPING WHEN FORCE MAIN CROSSES OTHER PROPERTIES OR IS LOCATED ALONG COMMON ACCESS ROADS.



GRINDER PUMP STATION SINGLE FAMILY RESIDENCE - CONNECTION TO GRAVITY MAIN

NOT TO SCALE



LAKE FOREST PARK
STANDARD SEWER DETAILS

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S-14(GRINDERPUMP).dwg