

NEW SHOREHAM, RHODE ISLAND
UTILITIES STANDARDS
(SANITARY SEWER REQUIREMENTS)



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	<u>PAGE</u>
SECTION A	
SANITARY SEWER REQUIREMENTS	SSR-1
<u>General Sanitary Sewer Requirements</u>	
1. General Requirements	SSR-1
2. Drawings	SSR-1
3. As-Built / Record Drawings	SSR-2
4. Qualifications of Material and Equipment	SSR-3
5. Product	SSR-3
6. Sewer Construction Requirements	SSR-4
<u>Sanitary Sewage Service Connections Specifications</u>	
1. Part 1 - General	SSC-1
2. Part 2 - Products	SSC-1
3. Part 3 - Execution	SSC-3
<u>Sanitary Sewage System Specifications</u>	
1. Part 1 - General	SS-1
2. Part 2 - Products	SS-2
3. Part 3 - Execution	SS-6
<u>Low Pressure Sewer Grinder Pump Stations Specifications</u>	
1. Part 1 - General	SG-1
2. Part 2 - Products	SG-2
3. Part 3 - Execution	SG-3

DETAILS

<u>Figure No.</u>	<u>Description</u>
SAN-1	Trench Detail
SAN-2	Sanitary Manhole Detail
SAN-3	Precast Manhole Detail
SAN-4	Sanitary Shallow Manhole Detail
SAN-5	External Drop Sanitary Manhole Detail
SAN-6	External Drop Sanitary Manhole Detail
SAN-7	Inside Drop Sanitary Manhole
SAN-8	Sanitary Manhole Frame & Cover
SAN-9	Bolted & Gasketed Frame & Cover
SAN-10	Standard House Connection Detail
SAN-11	Standard Deep House Connection
SAN-12	Low Pressure Sewer Trench
SAN-13	Low Pressure Sewer Manhole Connection
SAN-14	Low Pressure Sewer Service Connection
SAN-15	Low Pressure Sewer End Sewer Flushing Connection
SAN-16	Low Pressure In-Line Flushing Connection
SAN-17	Wiring Diagram for Grinder Pump Unit
SAN-18	By Pass Pumping Connection at Pumping Station Detail
SAN-19	Thrust Blocks
SAN-20	Definitions

SECTION A

SANITARY SEWER REQUIREMENTS

GENERAL SANITARY SEWER REQUIREMENTS

1. GENERAL REQUIREMENTS

- 1.1 The New Shoreham Board of Sewer Commissioners adopt the following priority among the existing enactments which affect sewer in the Town of New Shoreham.
- Public Acts establishing and amending the Sewer District: P.A. Chapter 146 (1972 as amended).
 - Current Management Agreement between the Town of New Shoreham Director of Public Works, the New Shoreham Board of Sewer Commissioners and New Shoreham Board of Water Commissioners.
 - Regulations adopted by the Sewer Commissioners subsequent to the adoption by the Rhode Island General Assembly of P.A. Chapter 146 (1972).
 - Remaining provisions of enactments by the Town of New Shoreham, which are not inconsistent or superceded by the above legal enactments and documents.
- 1.2 Plans, specifications and design calculations for proposed sanitary sewage system(s), except for sanitary service connections, shall be submitted to the Sewer Superintendent for review. Design calculations shall conform to the Department of Environmental Management requirements.
- 1.3 Plans, specifications and calculations for sanitary sewage system extensions shall be prepared and stamped by an Engineer currently registered in the State of Rhode Island.
- 1.4 An Order of Approval shall be obtained from the Department of Environmental Management, when applicable.
- 1.5 Sewer Extensions:
- Sewer extensions will be allowed only if the receiving interceptors and pumping stations are capable of adequately processing the added hydraulic load. Documentation assessing the existing interceptor(s) and pumping station(s) shall be submitted to the Board of Sewer Commissioners. The documentation shall be stamped by a professional engineer registered in the State of Rhode Island.
 - The proposed sewer extension must be consistent with the most recent Wastewater Management Facilities Plan adopted by the New Shoreham Board of Sewer Commissioners and the Rhode Island Department of Environmental Management.

2. DRAWINGS

- 2.1 The applicant must furnish drawings showing the location of the premises together with the location of all underground piping, proposed connection points, applicable details, general notes, utility conflict corrections, and other appurtenances to be installed on the premises at the time of making the application.

- 2.2 Drawings shall be submitted on a maximum size of 24" by 36" prints. Two (2) sets shall be submitted at the initial submission for indication of comments during the review stage. If a project is to be implemented in stages or phases, a master plan showing the entire site development, including all future expansion areas, shall be submitted for review during the first submission.
- 2.3 Drawings shall not be at a scale less than 1-inch per 40-feet and no more than 1-inch per 20-feet.
- 2.4 All site plans shall contain contours at a minimum of 2-foot intervals based on National Geodetic Vertical Datum (N.G.V.D.) and not with assumed elevations. Site plans shall include a locus map at a scale of not less than 1 inch = 2,000 feet and a north arrow.
- 2.5 All drawings are to be signed and wet-stamped by a registered, professional engineer licensed in the State of Rhode Island under whose direction the design has been designed.

3. AS-BUILT / RECORD DRAWINGS

- 3.1 Upon completion of the project, the developer/owner shall provide a preliminary as-built drawing documenting the record of actual construction. The preliminary as-built drawing shall be on 24" x 36" sheets (plan scale 1" = 40') for review prior to acceptance of the new construction infrastructure.
- 3.2 The owner/developer shall provide a revised as-built drawing reflecting measurements from the building foundations and above grade permanent structures and/or visible accessible permanent features. The final as-built drawing(s) set shall accurately mark the location of each infrastructure component or appurtenance as constructed including, but not limited to:
- Measured horizontal and vertical locations of the above and below grade sewer main, sewer services and appurtenances referenced to permanent surface improvements, above grade permanent structures and/or permanent visible and accessible features of the installation.
 - Information concurrent with the actual construction.
 - Three point measured swing ties from permanent surface improvements, above grade permanent structures and/or visible and accessible features of the installation to identify all bends, services and end caps.
 - Depth of main at maximum of 50-foot intervals. Ties at every 100-foot interval, each recorded service and at each bend.
 - Total overall footage.
 - Detail of sewer service connection to the main.
- 3.3 Upon approval of the "blue line" submission, a 6-mil, double matte Mylar media and print of the final "as-built" record drawing(s) shall be submitted and will remain the property of the Sewer Commission upon its approval and acceptance.

3.4 Upon final approval, the contractor shall also provide the "as-built" in AutoCad, latest edition digital format acceptable to the Sewer Commission.

4. QUALIFICATIONS OF MATERIAL AND EQUIPMENT

4.1 Specific manufacturers' names and catalog numbers are used herein to establish quality and design of a particular item.

4.2 Wherever in the Specifications any item of equipment or material is designated by reference to a particular brand, manufacturer, or trade name, it is understood that a reviewed equal product, acceptable to the New Shoreham Board of Sewer Commissioners (NSBSC), may be submitted by the Contractor.

4.3 If the Contractor proposes to use a material which, while suitable for the intended use, deviates in any way from the detailed requirements, he shall inform the NSBSC in writing of the nature of such deviations at the time the material is submitted for review, and shall request a review of the deviation from the requirements.

4.4 In requesting a review of deviations or substitutions, the Contractor shall provide evidence leading to a reasonable certainty that the proposed substitution or deviation shall provide a result at least equal in quality to that specified. If, in the opinion of the NSBSC, the evidence presented by the Contractor does not provide a sufficient basis for such reasonable certainty, the NSBSC will reject such substitution or deviation without further investigation, in which case it shall be the responsibility of the Contractor to provide another product which is satisfactory to the NSBSC.

5. PRODUCT

5.1 Sanitary Sewer Information Required:

- All vertical and horizontal alignment (profile and plan).
- Size, slopes, and materials to be used.
- Invert and rim elevations.
- Location and details of manholes.
- Other existing and proposed utilities should be shown in order to avoid conflicts during construction.
- Design sanitary flow calculations with Professional Engineer's stamp, except for sanitary service connections. Calculations shall conform to the Department of Environmental Management (DEM) requirements.

6. SEWER CONSTRUCTION REQUIREMENTS

6.1 General Requirements: Sanitary sewer improvements shall conform to the requirements of the New Shoreham Board of Sewer Commissioners, Department of Environmental Management, and any other agencies having jurisdiction.

6.2 Sanitary Sewers:

- Depth: Sewers shall be designed deep enough to drain basement fixtures and to prevent freezing. The minimum depth of cover for street installation shall be 6-feet and for cross country installation it shall be 4-feet.
- Slope: The following minimum slopes may be used only if necessary because of grade restrictions.

<u>Sewer Size Inches</u>	<u>Minimum Slope Feet/Foot</u>
8	0.0040
10	0.0028
12	0.0022
14	0.0017
15	0.0015
16	0.0014
18	0.0012
21	0.0010
24	0.0008
27	0.0007
30	0.0006
36	0.0005

- Velocity: The minimum velocity for design purposes is two (2) feet per second and the maximum velocity is ten (10) feet per second.
- Alignment: Sewers shall be laid with a straight alignment between manholes.
- Increasing Pipe Size: When a smaller sewer joins one of a larger one, the invert of the larger sewer should be lowered sufficiently to maintain the same hydraulic gradient.
- Materials: Sewers shall be constructed of materials described in Section II. Sewers crossing streams or any body of water shall be ductile iron encased in concrete.
- Manhole Locations: Manholes shall be installed at the end of each sewer line, at changes in grade, size, or alignment and at all intersections. The maximum spacing of manholes shall not exceed 300 feet.

- **Drop Manhole Type:** A drop pipe should be provided for a sewer entering a manhole at an elevation of 24-inches or more above the manhole invert. The size of the drop pipe will be the same size as the sewer inlet pipe. Where the difference in elevation between the incoming sewer and the manhole invert is less than 24-inches, the invert shall be so constructed so that there is a smooth transition of flow in the manhole.
- **Manhole Diameter:** The minimum internal diameter of manhole shall be 48-inches.
- **Flow Channel:** A drop of at least 0.1 feet shall be provided between incoming and outgoing sewers on all manholes.
- **Elevation:** In all buildings in which any building drain is too low to permit gravity flow to the public sewer, sanitary sewage carried by such building drain shall be lifted by a grinder pump system as specified in Section A and discharged to the building sewer.
- **Clean Outs:** Clean-outs shall be installed at the property line, at every fitting over 22½ degrees and at 75-foot intervals.
- **Grease, Oil and Solids Interceptors:** A user is required to install a grease removal system may install either an outdoor passive in-ground grease interceptor or an automatic electrical/mechanical grease removal unit.

In-ground grease removal systems shall have a minimum capacity of 500 gallons and shall have a capacity to provide at least a 24-hour detention period for the process flow. The process flow shall be based on a minimum of 15 gallons per seat or chair per day or based upon actual water usage for existing facilities.

The automatic electric/mechanical grease removal unit shall be the "Big Dripper" Automatic Grease Recovery System as manufactured by Thermaco, Inc., Asheboro, North Carolina, or equal. The unit shall sized in accordance with the manufacturer's written recommendation. Influent to the unit with temperatures exceeding 150° F will not be permitted.

A separate suitable sampling location as approved by the Superintendent shall be provided for sampling of the discharge from the ground grease removable systems. The automatic electrical mechanical grease removal systems shall have a sampling valve installed on the discharge piping with a minimum clearance of eight (8) inches to allow samples to be taken by representatives of the Board of Sewer Commissioners.

Dishwasher wastewater shall not be discharged into the grease removal systems. The dishwasher wastewater shall bypass the grease removal system and discharge directly into the municipal sewer collection system except that the dishwasher wastewater from the pre-rinse station shall discharge to the grease removal system.

- **Identification:**
 - a). **Underground-Type Line Markers for Non-Metallic Pipings:** Manufacturer's standard permanent detection tape, bright colored, continuous-printed polyethylene tape with a metallic core for easy detection of non-metallic underground installations, intended for direct burial service; not less than 6-inch wide x 4 mils thick. Provide green detection tape with black printing reading "CAUTION SEWER LINE BURIED BELOW" as manufactured by Seton or equal.
 - b). **Underground-Type Line Markers for Metallic Pipelines:** Manufacturer's standard permanent, bright colored, continuous-printed polyethylene tape, intended for direct-burial service; not less than six-inches wide by 4 mils thick. Provide green tape with black printing reading "CAUTION SEWER LINE BURIED BELOW" as manufactured by Seton or equal.
 - c). Installation marker two (2) feet above top of pipe.
- **Backflow Preventor:** All connections are to be equipped with a backflow preventor. Backflow preventors must conform with the New Shoreham Building Inspector's requirements and the Building Officials Code Administrators Basic National Plumbing Code, Article 10, Section P-1003.0.

SANITARY SEWAGE SERVICE CONNECTIONS SPECIFICATIONS

1. PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

- A. The work consists of furnishing and installing service connections from the property line to building or from the main line to the building including, but not limited to, installation of appropriate fittings at the main sewer line, fittings at property line, construction of chimneys if required, construction of clean-outs, excavation, bedding, sand cushion, backfilling, recording location, and all other related and appurtenant work, complete in place in accordance with details and specifications, and as directed by New Shoreham Sewer Department (NSSD).

1.2 SPECIAL REQUIREMENTS:

- A. Contractor shall obtain all required permits as set forth in the Town of New Shoreham Sewer Ordinance prior to undertaking construction of sanitary sewage service connection(s).
- B. The Sewer Superintendent shall be notified 24 hours in advance to inspect the installation of the sanitary sewage service connection(s).
- C. Connections to sanitary manholes are not allowed.

2. PART 2 - PRODUCTS

2.1 PIPE:

- A. Polyvinyl Chloride and Fittings: Polyvinyl chloride (PVC) sewer pipe and fittings shall be in accordance with the latest issue of ASTM Specification D3034, SDR-35 and applicable documents. The PVC sewer pipe and fittings shall be composed of clean, virgin class 12454-B compounds conforming to ASTM D1784 and shall be bell and spigot with rubber ring joints. The bell shall consist of an integral wall section with a solid cross section rubber ring securely locked in place to prevent dislocation of the ring. Standard lengths shall be 20-feet and 12.5-feet, plus or minus 1-inch. Minimum "pipe stiffness" at 5% deflection shall be 46 for all sizes when tested in accordance with ASTM Designation D2412, external loading properties of plastic pipe by parallel-plate loading. All fittings and accessories shall be manufactured and furnished by the pipe supplier and have bell and/or spigot configurations compatible with that of the pipe fittings and shall be of the same strength and quality as the pipe.
- B. Polyvinyl Chloride Pressure Pipe and Fittings: Polyvinyl chloride (PVC) pressure pipe and fittings shall be in accordance with AWWA C900, etc. bell and spigot with rubber ring joints. The pipe and fittings shall be Class 150 (DR18) with bell and spigot.

2.2 CHIMNEYS:

- A. Precast Units: The concrete shall be 5000 psi conforming to ASTM C150. Air entraining shall conform to ASTM C233, and the reinforcing shall conform to ASTM A615. All brackets, bolts, and nuts shall be stainless steel, and between each precast section there shall be a neoprene gasket.

2.3 FLEXIBLE COUPLINGS:

- A. Flexible couplings shall be as manufactured by Fernco or equal. The flexible coupling shall conform to ASTM C443, C425, C564, and D1869. The coupling shall have stainless steel clamps. Donuts are not allowed to be used in lieu of flexible couplings.

2.4 SEWER PIPE SADDLE:

- A. Sewer pipe saddles shall be Sealtite Type "D" Tee Sewer Pipe Saddle or Type "E" Wye Sewer Pipe Saddles as manufactured by Geneco Products or equal.
- B. Saddle shall be cast iron conforming to ASTM A-48, Class 35 and shall be coated with a black asphaltum type paint.
- C. Saddle gaskets shall be one piece, rubber O-rings, maintaining a leak-proof connection, conforming to ASTM DT869.
- D. Saddle shall be secured to the existing sewer main with type C304 stainless steel band with stainless steel bolts.

2.5 GRAVEL BASE

- A. Gravel shall be free of foreign material such as loam, silt, clay and vegetable matter and meet the following requirements:

Passing 1¼-inch sieve	100%
Passing ¾-inch sieve	30-65%
Passing No. 40	5-50%
Passing No. 100	0-10%

2.6 BEDDING MATERIAL:

- A. The bedding material shall be crushed stone consisting of durable crushed rock in durable crushed gravel stone, free from ice, snow, sand, clay, loam, or other deleterious material. The crushed stone shall conform to the requirements of 100% passing the 1-inch screen, 90-100% passing the ¾-inch screen, 10-50% passing the ½-inch screen, 0-20% passing the ⅜-inch screen and 0-5% passing the No. 4 sieve.

2.7 SAND BLANKET:

- A. The sand shall be free from ice, snow, roots, rubbish, and other deleterious or organic matter. The sand blanket shall conform to the requirements of 100% passing ½-inch screen, 85-100% passing the ¾-inch screen, 60-85% passing the No. 4 sieve, 35-60% passing the No. 16 sieve, 10-35% passing the No. 50 sieve and 2-10% passing the No. 100 sieve.

2.8 BACKFILL:

- A. Backfill shall be excavated materials free-draining clean granular soil suitable for backfill. Up to 20 percent of backfill material may be rock-like materials not to exceed 0.05 cubic feet in volume, nor more than 6-inches in length. The backfill shall not contain any debris, pavement, frozen material, organic matter, or peat.

3. PART 3 - EXECUTION

3.1 PROJECT CONDITIONS:

A. Protection of Water Line:

1. Horizontal Separation: Sewers shall be laid at a minimum at least 10-feet, horizontally, from any existing or proposed water lines or service.
 - a. Should local conditions prevent a lateral separation of 10-feet, the sewer line shall be constructed of AWWA C900 polyvinyl chloride or Class 52 Ductile Iron pressure pipe.
2. Vertical Separation: Whenever sewers cross under water lines, or services, the sewer shall be laid at such an elevation that the top of the sewer is at least 18-inches below the bottom of the water lines. When the elevation of the sewer cannot be relocated to provide this separation or the sewer line shall be constructed of AWWA C900 polyvinyl chloride or Class 52 Ductile Iron pressure pipe for a distance of 10-feet on each side of the water lines.

- B. Private Wells: Sewers shall be laid at a minimum at least 50 feet, horizontally, from any existing or proposed private well. Should local conditions prevent a lateral separation of 50-feet, the sewer main shall be constructed of AWWA C900 polyvinyl chloride or Class 52 Ductile Iron pressure pipe from manhole to manhole reach including the service connection pipe.

3.2 INSPECTION:

- A. The contractor shall notify the NSSD 24 hours in advance to make an inspection of the sanitary connection. The inspection(s) will be made prior to backfilling the trench. If more than one inspection is required to be made by the NSSD, the contractor will be required to reimburse the NSSD for the associated costs involved in the re-inspection(s).
- B. If during the inspection(s) it is found that the installation of the service connection is not in compliance with these specifications or details, the contractor shall immediately take

corrective measures, and the service connection will be reinspected at the contractor's expense.

3.2 CONNECTIONS MADE AT EXISTING SEWER MAIN:

- A. The contractor shall install a pipe saddle per manufacturer recommendations if a wye does not exist.

3.3 CONNECTIONS MADE AT PROPERTY LINE:

- A. The contractor shall connect to the sewer service pipe located at the property line with a flexible coupling.
- B. The contractor shall install a clean-out just upstream from the flexible coupling.

3.4 CLEAN-OUTS:

- A. Clean-outs shall be installed at the property line, at every fitting over 22½ degrees and at 75-foot intervals up to 150-feet. Service connections which are longer than 150-feet shall have sanitary manholes installed at a locations(s) as directed by the NSSD.

3.5 EXCAVATION AND BACKFILL:

- A. The width of the trench shall be held to a minimum consistent with the space required to permit satisfactory jointing of the pipe and tamping of the bedding and backfill material under and around the pipe. In general, the maximum trench width shall be the pipe diameter plus two feet or a minimum width of three feet, whichever is greater. If necessary, sheeting and/or shoring shall be used to prevent overcutting at the level of the top of the pipe and to maintain the trench sides. The trench bottom should be smooth, level and all large stones or rocks lying on or protruding from the trench bottom shall be removed. Over-excavation will be refilled in 6-inch lifts with approved granular material and compacted to 95% maximum density.
- B. Where unsuitable material is encountered at the trench bottom, the material shall be excavated to a stable bottom and refilled and compacted bedding material in 6-inch lifts.
- C. Backfill from the centerline of the pipe to a height of two feet above the pipe shall be sand blanket material placed evenly the full width of the trench and compacted in 12-inch layers. The remainder of the trench shall be backfilled evenly with suitable (excavated or borrow) backfill material and compacted in 12-inch layers. Cushion and backfill material shall be compacted to 95% maximum density by tamping and compacting in layers (1-foot maximum) to achieve the required compaction.

3.6 INSTALLATION OF PIPE:

- A. Each pipe length shall be inspected for cracks, defects in coating or lining, and any other evidences of unsuitability. Before lowering in place, the pipe shall be struck with a suitable tool to verify its soundness.
- B. Pipe shall be laid in the dry and at no time shall water in the trench be permitted to flow into the sewer.
- C. The pipe shall then be laid on the trench bedding as shown on the standard trench detail, and the spigot pushed home. Jointing shall be in accordance with the manufacturer's instructions and appropriate ASTM standards, and the contractor shall have on hand for each pipe-laying crew, the necessary tools, gauges, pipe cutters, etc., necessary to install the pipe in a workmanlike manner. Pipe laying shall proceed upgrade with spigot ends pointing in the direction of flow.
- D. Blocking under the pipe will not be permitted except where a concrete cradle is proposed, in which case precast concrete blocks shall be used.
- E. After the pipe has been set to grade, additional bedding material shall be placed in 6-inch layers up to the spring line of the pipe. Tamping bars shall be carefully employed to assure compaction of the bedding under the lower quadrants of the pipe for the full width of trench excavation.
- F. If inspection of the pipe is satisfactory, the contractor may then backfill the remainder of the trench in accordance to the specifications and details.
- G. If a trench box is being used and the trench box is below the spring line of the pipe, the trench box shall be lifted vertically, and the stone bedding shall be thoroughly compacted to the trench wall. The trench box shall not be pulled horizontally along the trench.
- H. At any time that work is not in progress, the end of the pipe shall be suitably closed to prevent the entry of animals, earth, etc.
- I. Unsatisfactory work shall be dug up and re-installed to the satisfactory of the NSSD.

3.7 RECORDING LOCATION:

- A. The contractor shall submit to the NSSD, after completion of the service connection(s), installation of a sketch showing the location of the service connection utilizing distances from permanent structures. The depth at the sewer main property line and at the dwelling unit shall be recorded.

END OF SECTION

SANITARY SEWAGE SYSTEM SPECIFICATIONS

1. PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

- A. The work consists of furnishing and installing a sanitary sewerage system(s) including precast concrete manholes with accessories, pipe, pipe fittings and accessories, connections to other piping and structures, testing of manholes and piping, jointing, and jointing materials, by-pass sewage handling, excavation and backfill, bedding material, sand blanket, and all other related and appurtenant work, complete in place in accordance with the requirements set forth, and/or as directed.

1.2 SPECIAL REQUIREMENTS:

- A. All approvals and permits as set forth in the **Town of New Shoreham Sewer Ordinance or New Shoreham Sewer Regulations** must be obtained prior to constructions of sanitary sewage system.
- B. **The New Shoreham Sewer Department** shall be notified 24 hours in advance to inspect construction, witness testing of pipelines and manholes and making connections to existing sanitary manholes.

1.3 QUALITY ASSURANCE:

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of sanitary sewerage system's products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

1.4 SUBMITTALS:

- A. General: All submittals shall be submitted to the Sewer Superintendent, New Shoreham Wastewater Treatment Facility, Spring Street, New Shoreham, Rhode Island.
- B. Contract Drawings: Submit three sets of drawings of proposed sanitary sewage system for review.
- C. Record Drawings: At completion of project, submit record drawings of installed sanitary sewerage piping showing a minimum of three ties from permanent installations such as poles, hydrants, etc., for manholes and service connections at main, property line, dwelling units and distances.

2. PART 2 - PRODUCTS

2.1 PIPE:

- A. Polyvinyl Chloride Pipe (6"-15") and Fittings: Polyvinyl chloride (PVC) sewer pipe and fitting shall be in accordance with the latest issue of ASTM D3034, SDR35 and applicable documents. The PVC sewer pipe and fittings shall be composed of clean, virgin class 12364-C compounds conforming to ASTM D1784 and shall be bell and spigot with rubber ring joints. The bell shall consist of an integral wall section with a solid cross section rubber ring securely locked in place to prevent dislocation of the ring. Standard lengths shall be twenty (20) feet and 12.5 feet, plus or minus 1 inch. Minimum "pipe stiffness": at 5% deflection shall be 46 for all sizes when tested in accordance with ASTM Designation D2412, external loading properties of plastic pipe by parallel-plate loading. All fittings and accessories shall be manufactured and furnished by the pipe supplier and have bell and/or spigot configurations compatible with that of the pipe fittings and shall be of the same strength and quality as the pipe.
- B. Polyvinyl Chloride Pipe (greater than 15") and Fittings: Polyvinyl chloride (PVC) sewer pipe and fittings shall be in accordance with the latest issue of ASTM F679. The PVC sewer and fittings shall be composed of clean, virgin, Class 12454C or 13364C compounds and shall be bell and spigot with rubber ring joints. The bell shall consist of integral wall section with a solid cross section rubber ring. Standard lengths shall be thirteen (13) feet plus or minus 1 inch. Minimum "pipe stiffness": at 7½% deflection shall be 46 for all sizes when tested in accordance with ASTM Designation D2412. All fittings and accessories shall be as manufactured and furnished by the pipe supplier and have bell and/or spigot configurations compatible with that of the pipe fittings and shall be of the same strength and quality as the pipe.
- C. Polyvinyl Chloride Pressure Pipe (6"-12") and Fittings: Polyvinyl Chloride (PVC) pressure pipe and fittings shall be in accordance with AWWA C900 and shall be bell and spigot with rubber ring joints. The pipe shall be manufactured from PVC cell Class 12454-13 in accordance with ASTM D1784. The pipe and fittings shall be Class 150 (DR18) with bell and spigot.
1. Restrained Joint Pipe Fittings:
In lieu of thrust blocks, mechanical joint restraints may be used. Calculations shall be submitted to the Sewer Superintendent as to the pipe lengths that will require the restraints.
- a. Retainers for PVC pipe bells shall be cast from 60-42-10 ductile iron, as manufactured by EBAA Iron, or equal. These devices shall have a sufficient number of ductile tie bolts to restrain working and test pressures as stated by the manufacturer. Each ductile clamp shall have serrations on the I.D. sufficient to hold working and test pressures. These devices shall be used to restrain pipe joints adjacent to the restrained fittings. The 1500 and 6500 are used in place of concrete thrust blocks, steel clamps and tie rods.

- b. When it is required to restrain PVC push-on joints adjacent to restrained fittings, a harness restraint device shall be used. This harness restraint shall be split to enable installation of the restraint after the spigot has been installed into the bell. The restraint shall consist of three major parts: the first part being a split ring that fits behind the bell; the second part being a split restraint ring that installs on the spigot; the third part being a number of tie bars to connect parts one and two to facilitate joint restraint. All of these components shall be cast of ductile iron conforming to ASTM A536-80. The restraint ring shall consist of a plurality of individually activated gripping surfaces to hold the spigot and maximize restrain capability. The harness restraint shall have a working pressure of at least 100 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., MEGALUG® series 1100HV, or equal.

D. Ductile Iron Pipe and Fittings: Ductile iron pipe shall be furnished in accordance with ANSI Designation A21.51. The ductile iron pipe shall be thickness Class 52. Pipes shall have normal laying lengths of at least 18 feet. In addition, each length of pipe shall be cement lined and receive a factory applied interior and exterior coating of Kopper's Bitumastic Super Service Black or an approved coating of equal specifications in accordance with ANSI Designation A21.4. Ductile iron pipe shall be push-on type of joint which employs rubber gasket. Joints shall be in accordance with the latest ANSI standard for "Rubber Gasket joints for Ductile Iron Pressure Pipe and Fittings", Designation A21.11. Fittings shall be in accordance with ANSI 23.53 with mechanical joints. The fittings shall be coated inside and outside with a bituminous asphalt paint.

1. Restrained Joint Pipe and Fitting:

In lieu of thrust blocks, mechanical joint restraints may be used. Calculations shall be submitted to the Sewer Superintendent as to the pipe lengths that will require the restraints. Mechanical joint restraints shall be incorporated in the design of the follower gland and shall include a restraining mechanism which, when actuated, imparts multiple wedging action against the pipe, increasing its resistance as the pressure increases.

- a. Flexibility of the joint shall be maintained after burial. Glands shall be manufactured of ductile iron conforming to ASTM A 536. Restraining devices shall be of ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA A21.11 and ANSI/AWWA C153/A21.53 of latest revision. Twist-off nuts shall be used to ensure proper actuating of the restraining devices. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc. MEGALUG® or equal.

- E. Flexible Couplings: Flexible couplings where used shall be as manufactured by Fernco Co. or equal.
- F. Mechanical Couplings: Mechanical couplings shall be ductile iron style 38 as manufactured by Dresser, or equal, coated with a corrosion resistant coating applied by the factory.
- G. Insulation of Underground Piping:
 - 1. Insulation: Foam glass insulation, ASTM C552, "Specifications for Cellular Glass Thermal Insulation" shall be a minimum of three-inches in thickness as manufactured by Pittsburgh Corning Corporation or equal.
 - 2. Jacketing: The jacketing shall be Pittwrap Jacketing as manufactured by Pittsburgh Corning Corporation or equal.
 - 3. Asphalt Coating: Pittcote 300 finish by Pittsburgh Corning Corp. or equal.
 - 4. Reinforcing Fabric: PC Fabric 79 by Pittsburgh Corning Corp. or equal.
 - 5. Strapping Tape: Glass fiber reinforced, 1" wide, Scotch Brand No. 880 by 3M or equal.
 - 6. Bore Coating: Hydrocal B-11 by U.S. Gypsum or equal.
- H. Thrust Blocks: Concrete for thrust blocks shall be 3000 psi concrete.

2.2 CHIMNEYS:

- A. Precast Units: The concrete shall be 5000 psi conforming to ASTM C150. Air entraining shall conform to ASTM C233, and the reinforcing shall conform to ASTM A615. All brackets, bolts, and nuts shall be stainless steel, and between each precast section there shall be a neoprene gasket.

2.3 MANHOLES:

- A. Poured-in-Place Manholes: Concrete for the bases or a complete manhole shall be 3000 psi. The bases or complete manholes shall be designed to withstand H2O loading without failure. Reinforcing steel shall be new deformed steel base conforming to ASTM 615. Grade of steel shall be ASTM Grade 40 minimum. The exterior of the manhole shall be damp proofed with an asphaltic compound as manufactured by Hydrocide.
- B. Precast Concrete Manholes: Manhole barrels, cone sections, bases, and entrance slabs shall consist of precast reinforced concrete manufactured in accordance with ASTM Standard Specifications for "Reinforced Concrete Manhole Risers and Tops", Designation C478 latest revision. The horizontal joints between sections shall be sealed using a flexible butyl resin sealant and shall conform to Federal Specifications SS-S-210A and AASHTO M-198B. The

exterior of the manhole shall be damp proofed with an asphaltic compound as manufactured by Hydrocide.

- C. Drop Manholes: Drop piping shall be the same size as sewer inlet. The concrete encasement for the drop piping shall be 3000 psi. Forms shall be used for the concrete encasement. The manhole shall be as specified for either cast-in-place or precast concrete manholes.
- D. Pipe Connectors: Resilient complying with ASTM C923. For pipes up to 24 inches, the pipe connectors shall be Kor-N-Seal and for pipe over 24 inches, the pipe connector shall be A-Lok or equal.
- E. Manhole Steps: Manhole steps shall be of safety type and shall be cast into the units during process of manufacture. Steps shall be steel reinforced copolymer polypropylene plastic step conforming to ASTM C478 or aluminum forgings alloy 6016, Temper T-16 and those parts which are embedded in the concrete shall be thoroughly cleaned and given a heavy coating of zinc chromate or other approved paint. In addition, steps shall conform to OSHA regulations.
- F. Frame and Covers: Manhole frames and covers shall be of tough gray cast iron, true to pattern and free from flaws. The bearing surfaces of the covers and frames shall be machined so as to give continuous contact throughout their circumference. The design on the cover top shall be the diamond with "sewer" lettering cast into the top surface.
- G. Brick Masonry and Mortar Cement: Brick shall be Grade SM, ASTM C32 or Grade SM, AASHTO M91. All brick shall be common hard-rubber clay brick and shall be uniform and regular in shape and size. Mortar cement for masonry shall conform to ASTM Designation C-144. The mortar shall be composed of one (1) part masonry cement to 2½ parts sand with water not to exceed 4.1 gallons per 70 pound bag of masonry cement. If using Portland cement, lime putty may be added in such amounts that the hydrated lime does not exceed 15 percent by weight of cement.

2.4 GRAVEL BASE

- A. Gravel shall be free of foreign material such as loam, silt, clay and vegetable matter and meet the following requirements:

Passing 1¼-inch sieve	100%
Passing ¾-inch sieve	30-65%
Passing No. 40	5-50%
Passing No. 100	0-10%

2.5 BEDDING MATERIAL:

- A. The bedding material shall be crushed stone consisting of durable crushed rock or durable crushed gravel stone, free from ice, snow, sand, clay, loam or other deleterious material. The crushed stone shall conform to the requirements of 100% passing the three-quarter ($\frac{3}{4}$) inch screen, 10-50% passing the one-half ($\frac{1}{2}$) inch screen, 0-20% passing the three-eighths ($\frac{3}{8}$) inch screen and 0-5% passing the number four (#4) sieve.

2.6 SAND BLANKET:

- A. The sand shall be free from ice, snow, roots, sod, rubbish, and other deleterious or organic matter. The sand blanket shall conform to the requirements of 100% passing the one-half ($\frac{1}{2}$) inch screen, 85-100% passing the three-eighths ($\frac{3}{8}$) inch screen, 60-85% passing the number four (#4) sieve, 35-60% passing the number sixteen (#16) sieve, 10-35% passing the number fifty (#50) sieve and 2-10% passing the number one-hundred (#100) sieve.

2.7 BACKFILL:

- A. Backfill shall be excavated material free-draining clean granular soil suitable for backfill. Up to 20 percent of backfill material may be rock-like materials not to exceed 0.05 cubic feet in volume, nor more than 6 inches in length. The backfill shall not contain any debris, pavement, frozen material, organic matter or peat.

PART 3 - EXECUTION

3.1 PROJECT CONDITIONS:

A. Protection of Water Line:

1. Horizontal Separation: Sewers shall be laid at a minimum at least 10 feet, horizontally, from any existing or proposed water main or service. Should local conditions prevent a lateral separation of 10 feet, the sewer line shall be constructed of Class 150 (DR18) polyvinyl chloride pressure pipe.
2. Vertical Separation: Whenever sewers cross under water mains, or services, the sewer shall be laid at such an elevation that the top of the sewer is at least 18 inches below the bottom of the water main. When the elevation of the sewer cannot be relocated to provide this separation, the sewer line shall be constructed of Class 150 (DR18) polyvinyl chloride pressure pipe for a distance of 10 feet on each side of the water main.

- B. Private Wells: Sewers shall be laid at a minimum at least 50 feet, horizontally, from any existing or proposed private well. Should local conditions prevent a lateral separation of 50 feet, the sewer line shall be constructed of Class 150 DR18 polyvinyl chloride pressure pipe from manhole to manhole reach including the service connection pipe.

3.2 INSPECTION:

- A. The Superintendent of the New Shoreham Sewer Department (NSSD) shall be notified prior to installation of a sanitary sewer system so that inspections can be made throughout the project.
- B. The testing of sewer lines and manholes shall be conducted in the presence of the Representatives of NSSD. The NSSD shall be notified 24 hours in advance of any testing.
- C. Connections made to existing manholes for lateral sewers shall be inspected by the NSSD prior to backfill.
- D. Connections to manholes for service connections are not allowed.
- E. If during inspections it is found that the sewage system is not in compliance with the specifications or details, the deficiencies shall be corrected immediately to the satisfaction of the NSSD. The NSSD will not allow any further construction of the sewage system until such time the deficiencies are corrected.

3.3 PRODUCT HANDLING:

- A. Each product shall be handled into its position in the trench in such a manner and by such means as the manufacturer recommends as satisfactory, and these operations will be restricted to those considered safe for the workmen and such as to cause no injury to the product or any property.
- B. The contractor will be required to furnish slings, straps, and/or other devices to provide satisfactory support of the pipe when it is lifted. Transportation from delivery areas to the trench shall be restricted to operations which can cause no injury to the product. The products shall not be dropped from trucks or into the trench.
- C. The contractor shall have on the job site with each crew, all the proper tools to handle the products being installed. The use of hammer and chisel or any other method which results in rough edges, chips and damages, shall be prohibited.

3.4 EXCAVATION AND BACKFILL FOR PIPES:

- A. The width of the trench shall be held to a minimum consistent with the space required to permit satisfactory jointing of the pipe and tamping of the bedding and backfill material under and around the pipe. In general, the maximum trench width shall be the pipe diameter plus two feet or a minimum width of three feet, whichever is greater. If necessary, sheeting and/or shoring shall be used to prevent overcutting at the level of the top of the pipe and to maintain the trench sides. The trench bottom should be smooth, level and all large stones or rocks lying on or protruding from the trench bottom shall be removed.

Over-excavation shall be refilled in six (6) inch lifts with approved granular material and compacted to 95% maximum density.

- B. Where unsuitable material is encountered at the trench bottom, the material shall be excavated to a stable bottom and refilled with compacted bedding material in six (6) inch lifts.
- C. Backfill from the centerline of the pipe to the height two feet above the pipe shall be sand blanket material placed evenly the full width of the trench and compacted. The remainder of the trench shall be backfill material and compacted in 12-inch layers. Cushion and backfill material shall be compacted to 95% maximum density by tamping and compacting in layers (one (1) foot maximum) to achieve the required compaction.

3.5 INSTALLATION OF PIPE:

- A. Each pipe length shall be inspected for cracks, defects in coating or lining, and any other evidences of unsuitability. Before lowering in place, the pipe shall be struck with a suitable tool to verify its soundness.
- B. Pipe shall be laid in the dry and at no time shall water in the trench be permitted to flow into the sewer.
- C. The pipe shall then be laid on the trench bedding as shown in the trench detail, and the spigot pushed home. Jointing shall be in accordance with the manufacturer's instructions and appropriate ASTM standards, and the contractor shall have on hand for each pipe-laying crew, the necessary tools, gauges, pipe cutters, etc. necessary to install the pipe in a workmanlike manner. Pipe laying shall proceed upgrade with spigot ends pointing in the direction of flow.
- D. Blocking under the pipe will not be permitted except where a concrete cradle is proposed, in which case precast concrete blocks shall be used.
- E. After the pipe has been set to grade, additional bedding material shall be placed in 6-inch layers up to the spring line of the pipe. Tamping bars shall be carefully employed to assure compaction of the bedding under the lower quadrants of the pipe for the full width of trench excavation.
- F. If a trench box is being used and the trench box is below the spring line of the pipe, the trench box shall be lifted vertically and the stone bedding shall be thoroughly compacted to the trench wall. The trench box shall not be pulled horizontally along the trench.
- G. At any time that work is not in progress, the end of the pipe shall be suitably closed to prevent the entry of animals, earth, etc.
- H. Unsatisfactory work shall be dug up and re-installed to the satisfaction of the NSSD.

- I. House service installations shall be as shown on the "Standard House Connection Detail". House services shall not be connected directly to manholes unless otherwise approved by the NSSD. The opening of the house service, wye branch or chimney shall be suitably plugged with a watertight cap or plug. Before backfilling, the contractor shall make the necessary measurements to locate the opening with a minimum of three ties later and the information shall be given to the NSSD. In addition, an approved ferrous rod or pipe shall be placed over the plugged opening, extending to within 2-inches of the final ground surface and metallic detection tape shall be installed a minimum of 24-inches above the pipe.

3.6 INSTALLATION OF MANHOLES:

- A. Bases for all sanitary sewer manholes shall be placed on a minimum of 6-inches of compacted bedding material. The excavation shall be properly dewatered and maintained dry while placing bedding material and setting the bases. Manholes shall be backfilled evenly and in layers, maximum one (1) foot thick, with suitable backfill material and compacted to achieve 95% maximum density.
- B. Sheeting and/or bracing shall be used when required.
- C. Manhole barrel and cone sections shall be set so as to be vertical and in true alignment.
- D. Where required for future connections, openings shall be cast in the manholes at the proper location and shall be sealed with plugs.
- E. Drop manholes shall be built in accordance with the details.
- F. The inverts of all manholes shall be constructed of brick and formed in accordance with the details.
- G. Bricks shall be laid in a workmanlike manner, true to line and the joints shall be carefully struck and pointed on the inside. Bricks shall be thoroughly wet when laid and each brick shall be laid in mortar so as to form full bed, end and side joints in one operation. The outside of the brickwork shall be neatly plastered with ½-inch layer of cement mortar as the work progresses. The brickwork shall be satisfactorily bonded to the concrete and cast iron frame. No brick masonry shall be laid in water, or any water allowed to rise on the brickwork until the masonry has set for at least 24 hours.
- H. All lift holes shall be filled with non-shrinking mortar such as Quick-Plug prior to backfilling.

3.7 CONNECTIONS TO EXISTING MANHOLES:

- A. Connections to existing manholes of lateral sewers shall be made so as not to damage the structure and shall be watertight with zero leakage. The crown of the new pipe shall be at the same elevation as the main of the largest existing pipe. The openings shall be cored and Kore-N-Tee boot shall be installed. The inverts shall be modified as directed to accommodate flow from the new pipe.

3.8 PLACEMENT OF THRUST BLOCKS:

- A. Thrust blocks shall be of sufficient size to withhold the test pressure, and they shall be paired against undisturbed earth. The concrete shall be kept clear of pipe joints.

3.9 RESTRAINED JOINTS:

- A. The mechanical joint restraints shall be installed in accordance with the manufacturer's written instructions.

3.10 BY-PASS SEWAGE HANDLING:

- A. As the construction of the sewer progresses and it becomes necessary to interrupt live sewage flow in any existing sanitary sewer, house lateral, manhole or portion thereof, the Contractor shall be required to divert such flows around the area of interruption.
- B. The existing sewage flow rate shall be continually maintained at all times and no loss of sewer service up or downstream of the interruption shall occur. The contractor shall utilize quality materials and equipment in good repair in meeting the requirements of this special provision and all damages resulting from interruptions in the functioning of the by-pass sewage handling system shall be borne totally by the contractor. The contractor shall complete the adjacent construction in a timely fashion to minimize the duration of by-pass sewage handling required. Existing sewage flows shall be diverted and maintained until the new sewer construction is leakage tested and accepted for service by the NSSD.

3.11 TESTING GRAVITY SEWERS:

- A. General: Testing of each section of sewer installed shall include the portions of service connections that are to be installed in the presence of the NSSD. The contractor shall test each manhole reach as soon as construction of such reach is complete. The contractor will be required to perform the pipe deflection test on each section of pipe installed, vacuum test of manholes and an infiltration test or low pressure test as applicable.
- B. Pipe Deflection: Test each section of PVC sewer pipe for vertical ring deflection 60 days following installation. In the presence of the NSSD, maximum allowable ring deflection shall be 7-1/2 percent of inside diameter.

6" pipe, inside dia.	5.742", 7.5% deflection	5.31"
8" pipe, inside dia.	7.665", 7.5% deflection	7.09"
10" pipe, inside dia.	9.563", 7.5% deflection	8.84"
12" pipe, inside dia.	11.361", 7.5% deflection	10.51"
15" pipe, inside dia.	13.858", 7.5% deflection	12.86"

- C. Infiltration Test: An infiltration test requires groundwater levels to be a minimum of 2-feet above the crown of the pipe of the high end of the section being tested. The contractor shall have on hand all plugs, pumps, weirs, water trucks, etc., necessary to conduct the tests.

1. Each manhole to manhole reach of pipeline shall be tested.
2. With all connecting pipes plugged (other than those included in test section) a V-notch weir shall be installed in the downstream end of pipe. The V-notch weir must be constructed accurately and installed to maintain a watertight seal between weir and pipe.
3. Time shall be allowed for water to build up behind weir until steady, uniform flow passes through V-notch.
4. Readings shall then be taken under direction of the NSSD and recorded.
5. Should the work fail the infiltration test, corrective action shall be taken by the contractor, in a manner approved by the NSSD. The sewer pipe shall be internally inspected with a camera to identify and locate the infiltration source(s). The contractor shall excavate and make the necessary repair to the satisfaction of the NSSD. The repair(s) shall be air tested with zero pressure drop after two minutes.
6. Leakage shall not exceed 10 gallons per inch diameter, per day, per mile of pipe. Should the pipe, as laid, fail to meet the requirements, the contractor shall perform the necessary work to meet these requirements.

D. Low Pressure Air Test:

1. After completing backfill of the pipeline, the contractor shall conduct a line acceptance test using low pressure air. The test shall be performed according to stated procedures and in the presence of the NSSD personnel. The line shall be flushed and cleaned prior to testing.
2. All pneumatic plugs shall be seal tested before used in the actual test installation. One (1) length of pipe shall be laid on ground and sealed at both ends with the pneumatic plugs to be checked.
 - a. Air shall be introduced into the plugs to 25 psig. The plugs shall hold against this pressure without bracing and without movement of the plugs out of the pipe.
3. After a manhole to manhole reach of pipe has been backfilled and cleaned, and the pneumatic plugs are checked by the above procedure, the plugs shall be placed in the line at each manhole and inflated to 25 psig. Low pressure air shall be introduced into this sealed line until the internal air pressure reaches 4 psig greater than the average back pressure of any groundwater that may be over the pipe. At least two minutes shall be allowed for the air pressure to stabilize.
4. After the stabilization period (3.5 psig minimum pressure in the pipe), the air hose from the control panel to the air supply shall be disconnected. The time required in

minutes for the pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any groundwater that may be over the pipe) shall not be less than the time shown for the given diameters in the following:

8 inches -- 4 minutes	27 inches -- 13 minutes
10 inches -- 5 minutes	30 inches -- 15 minutes
12 inches -- 6 minutes	36 inches -- 17 minutes
18 inches -- 9 minutes	42 inches -- 20 minutes
21 inches -- 10 minutes	48 inches -- 23 minutes
24 inches -- 12 minutes	

5. If the installation fails the air test, the contractor shall, at his expense, determine the source of leakage. The sewer pipe shall be internally inspected with a camera and each pipe joint shall be tested. The identified defect shall be repaired. The contractor will not be allowed to use sealants but will be required to excavate and make the necessary repair to the satisfaction of the NSSD and the pipeline shall be retested.

3.12 TESTING OF PRESSURE LINES:

- A. Upon completion of installation of the force main, the line shall be tested for leaks. The contractor shall make all necessary arrangements for obtaining potable water, furnishing all pumps, piping, hose, installing corporation stops if necessary, etc.
- B. Air shall be expelled by filling the main slowly and permitting air to escape at high points. Air bleeder shall be installed in location directed by the NSSD.
- C. Pressure shall be applied and maintained at the low end of force main by means of pressure pump and by-pass on which a water meter and pressure gauge are mounted. Observations shall be made and metered water readings taken at varying pressures up to 150 lbs. per square inch not less than 125 lbs. Pressure shall be maintained for a period of one hour.
- D. Any defective joints shall be immediately repaired, and any cracked or otherwise defective pipe shall be replaced by the contractor and the test repeated. As soon as satisfactory "test for strength" has been obtained, the by-pass with water meter and pressure gauge shall be left in service, and the section shall remain under a pressure of not less than 125 pounds per square inch until the leakage in the entire section does not exceed ten (10) gallons per day per mile of pipe per inch of nominal pipe diameter. In no case shall leakage tests be for less than 4 hours.
- E. In the event the leakage exceeds the above stated maximum allowable, the contractor shall take such steps as are required and necessary or as are directed by the NSSD to reduce leakage to below the allowable maximum amount and shall replace any and all defective piping, and the test shall be repeated until the leakage requirements are complied with at no additional compensation to the contractor.

3.13 TESTING OF MANHOLES:

- A. General: Tests shall be made and observed by the NSSD on each manhole.

- B. Vacuum Test Before Backfilling: Install vacuum tester and inflate compression band to effect a seal between the vacuum base and the manhole, connect vacuum pump to the outlet part with the valve open, draw a vacuum of 10 inches of mercury (HG), and close the valve. The manhole shall pass the test if the vacuum remains at 10 inches of HG or drops to 9-inches of HG in a time greater than 60 seconds for a 48-inch diameter manhole, time greater than 75 seconds for 60-inch diameter manhole and time greater than 90 seconds for 72-inch diameter manhole. If the manhole fails the initial test, the contractor shall make proper repairs or replace the manhole and retest at no additional compensation.

END OF SECTION

LOW PRESSURE SEWER GRINDER PUMP STATIONS SPECIFICATIONS

1. PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

- A. The work consists of furnishing and installing a grinder pump system including excavation and backfill, bedding material, grinder pump, pump chamber with accessway, piping and valves, electrical work, factory and on-site testing, and all other incidentals as specified and as shown on the contract drawings.
- B. All approvals and permits as set forth in the **New Shoreham Sewer Ordinance and Regulations** and the Department of Environmental Management requirements, when applicable, shall be obtained prior to the installation of the low pressure grinder pump station system.

1.2 SPECIAL REQUIREMENTS:

- A. Contractor shall obtain all required permits as set forth in the **Town of New Shoreham Sewer Ordinance and the Regulations of the New Shoreham Board of Sewer Commissioners** prior to undertaking construction of sanitary sewage service connection(s).
- B. The Sewer Superintendent shall be notified 24 hours in advance to inspect the installation.

1.3 SUBMITTALS:

- A. Contract Documents: Submit contract documents of proposed low pressure sewer grinder pump system including design calculations.
- B. Operation and Maintenance Service: Submit an operation and maintenance service contract for each grinder pump unit.
- C. Record Drawings: At completion of project, submit record drawings of installed system.

1.4 QUALIFICATIONS OF MATERIAL AND EQUIPMENT:

- A. Specific manufacturers' names and catalog numbers are used herein to establish quality and design of a particular item.
- B. Wherever in the Specifications any item of equipment or material is designated by reference to a particular brand, manufacturer, or trade name, it is understood that a reviewed equal product, acceptable to the New Shoreham Board of Sewer Commissioners (NSBSC), may be submitted by the Contractor.

- C. If the Contractor proposes to use a material which, while suitable for the intended use, deviates in any way from the detailed requirements, he shall inform the NSBSC in writing of the nature of such deviations at the time the material is submitted for review, and shall request a review of the deviation from the requirements.
- D. In requesting a review of deviations or substitutions, the Contractor shall provide evidence leading to a reasonable certainty that the proposed substitution or deviation shall provide a result at least equal in quality to that specified. If, in the opinion of the NSBSC, the evidence presented by the Contractor does not provide a sufficient basis for such reasonable certainty, the NSBSC will reject such substitution or deviation without further investigation, in which case it shall be the responsibility of the Contractor to provide another product which is satisfactory to the NSBSC.

2. PART 2 - PRODUCTS:

2.1 GRINDER PUMP UNIT:

- A. The grinder pump unit shall be Model GP212 or GP 214 with redundant check valve and accessway as required and a Control Panel MOD 150-4 or MOD160-Y as manufactured by Environmental One Corporation. A high level indicator lamp assembly shall be provided requiring 120 Volts and a decorative wall plate marked "Grinder Pump Monitor".

2.2 PIPING:

- A. Low pressure pipe and fittings shall be polyvinylchloride pipe Class 200 (SDR 21) with push-on joints. Bell shall be gasketed joint conforming to ASTM D3139 with gaskets conforming to ASTM F477.
- B. Schedule 80 PVC pipe and fittings shall be rigid, unplasticized, Type I, Grade I, polyvinylchloride conforming to ASTM D1784, NSF listed.

2.3 ELECTRICAL EQUIPMENT:

- A. Manual transfer switch shall be a double throw non-fuse, 3-pole square "D" 30 amp enclosed in a NEMA3R enclosure.
- B. The generator hook-up shall be a single outlet (2P-3 wire) twist lock with a weatherproof cover plate NEMA L6-30 or with a 12-2 with ground power supply cord connected to the transfer switch with a male plug.
- C. All materials shall be U.L. listed, PVC conduits, conduit wall seals and conductors-copper and shall be acceptable to the local electrical inspector.

3. PART 3 - EXECUTION

3.1 INSTALLATION OF GRINDER PUMPING UNIT:

- A. Installation of grinder pumping unit shall be in accordance with the manufacturer's written instructions.
- B. Installation of piping and valves shall be in accordance to sanitary sewage system or sanitary sewage service connections specifications.

3.2 ELECTRICAL:

- A. Contractor shall obtain all required certificates of inspection of his work as required by state and local officials and deliver same to the New Shoreham Sewer Department (NSSD).
- B. All materials furnished and all work installed shall comply with the national fire codes of the National Fire Protection Association, with the requirements of all town, state and governmental departments having jurisdiction, including applicable requirements of the U.S. Department of Labor's occupational safety and health standards.
- C. Materials and workmanship shall be new and of current production and shall conform in all respects to, applicable requirements of national electrical code, rules, and regulations governing installation of electrical work in the applicable requirements of the utility company and other state and local authorities having jurisdiction.
- D. The high level indicator lamp assembly shall be installed in a standard device box in a visible location in the interior of dwelling.

3.3 START-UP SERVICE:

- A. A factory-trained representative shall perform initial start-up of each unit and instruct dwelling owner in the operation and maintenance of the equipment, and to test for satisfactory performances of each unit in the presence of the Sewer Superintendent.

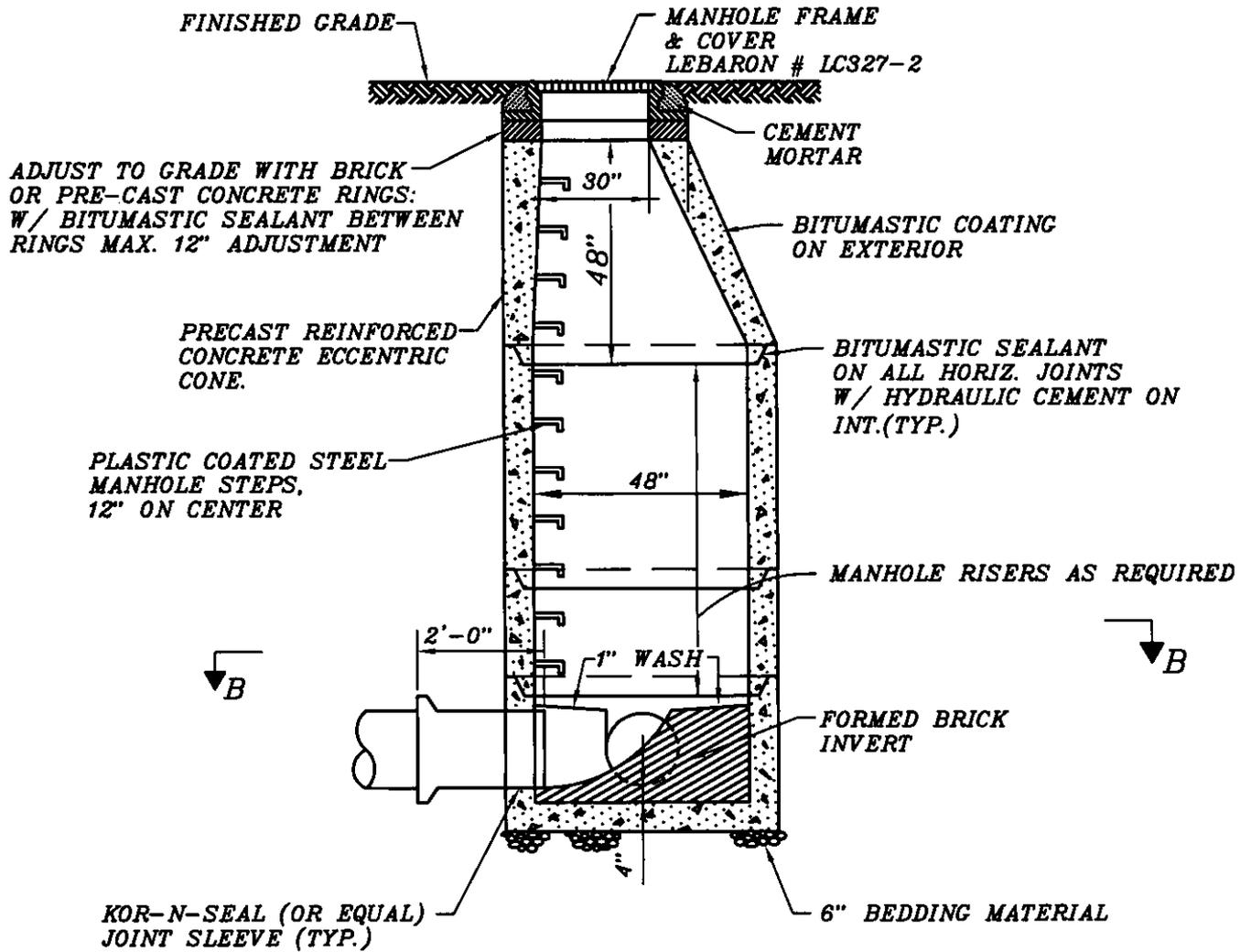
3.4 OPERATION AND MAINTENANCE SERVICE:

- A. A two (2) year operation and maintenance service contract for the pumping unit shall be obtained by the contractor or dwelling owner for each unit and submitted to the Sewer Superintendent prior to receiving a permit for installation.

END OF SECTION

SANITARY SEWER REQUIREMENTS

DETAILS



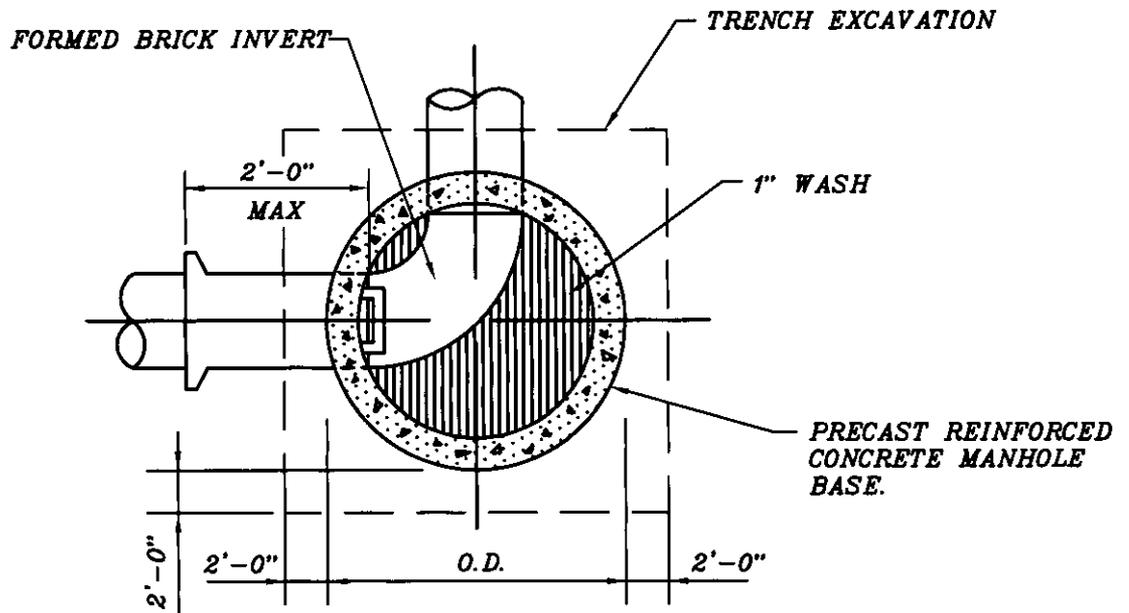
NOTE: ALL LIFTING HOLES TO BE PLUGGED IN AND OUT WITH HYDRAULIC CEMENT.



*Town of New Shoreham
Sanitary Sewer Regulations*

SANITARY MANHOLE DETAIL

Date: 01-07 | NOT TO SCALE | FIG: SAN-2



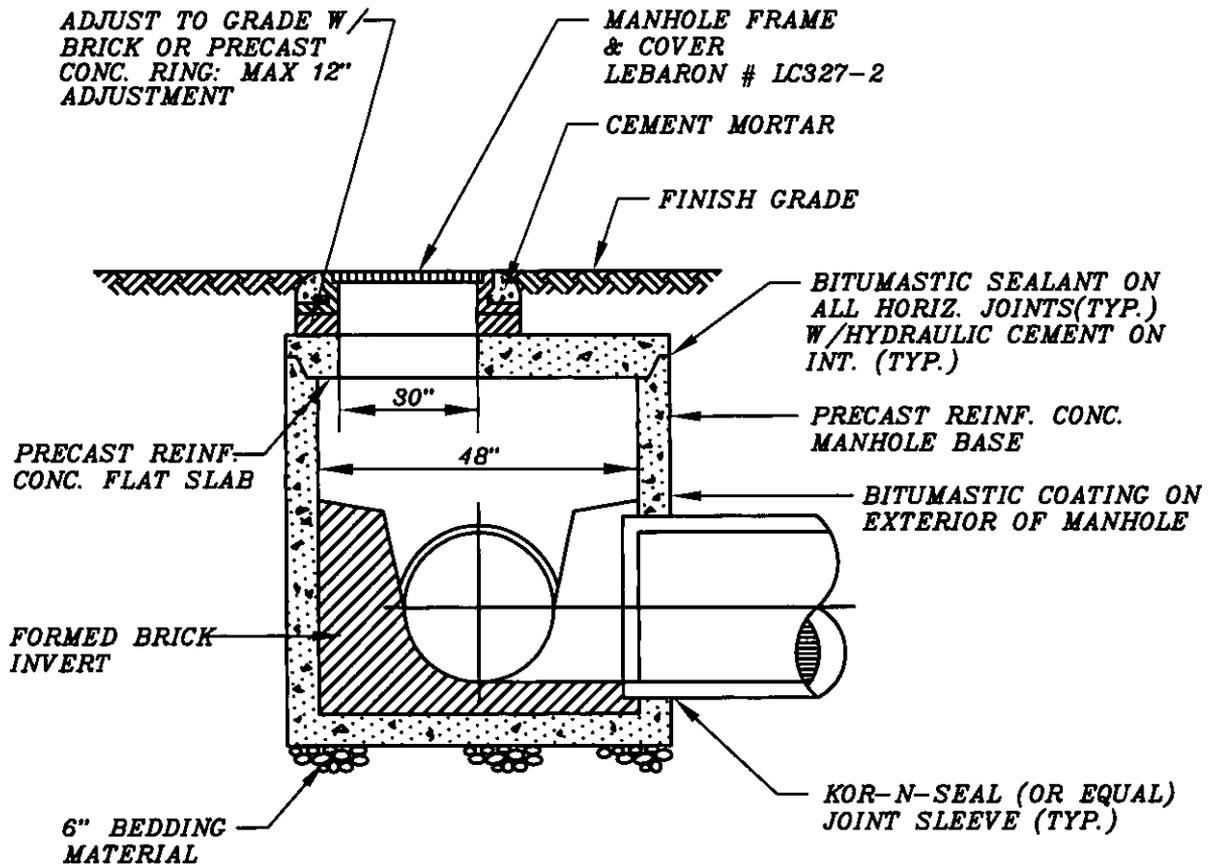
SECTION B-B



*Town of New Shoreham
Sanitary Sewer Regulations*

PRECAST MANHOLE DETAIL

Date: 01-07 | NOT TO SCALE | FIG: SAN-3



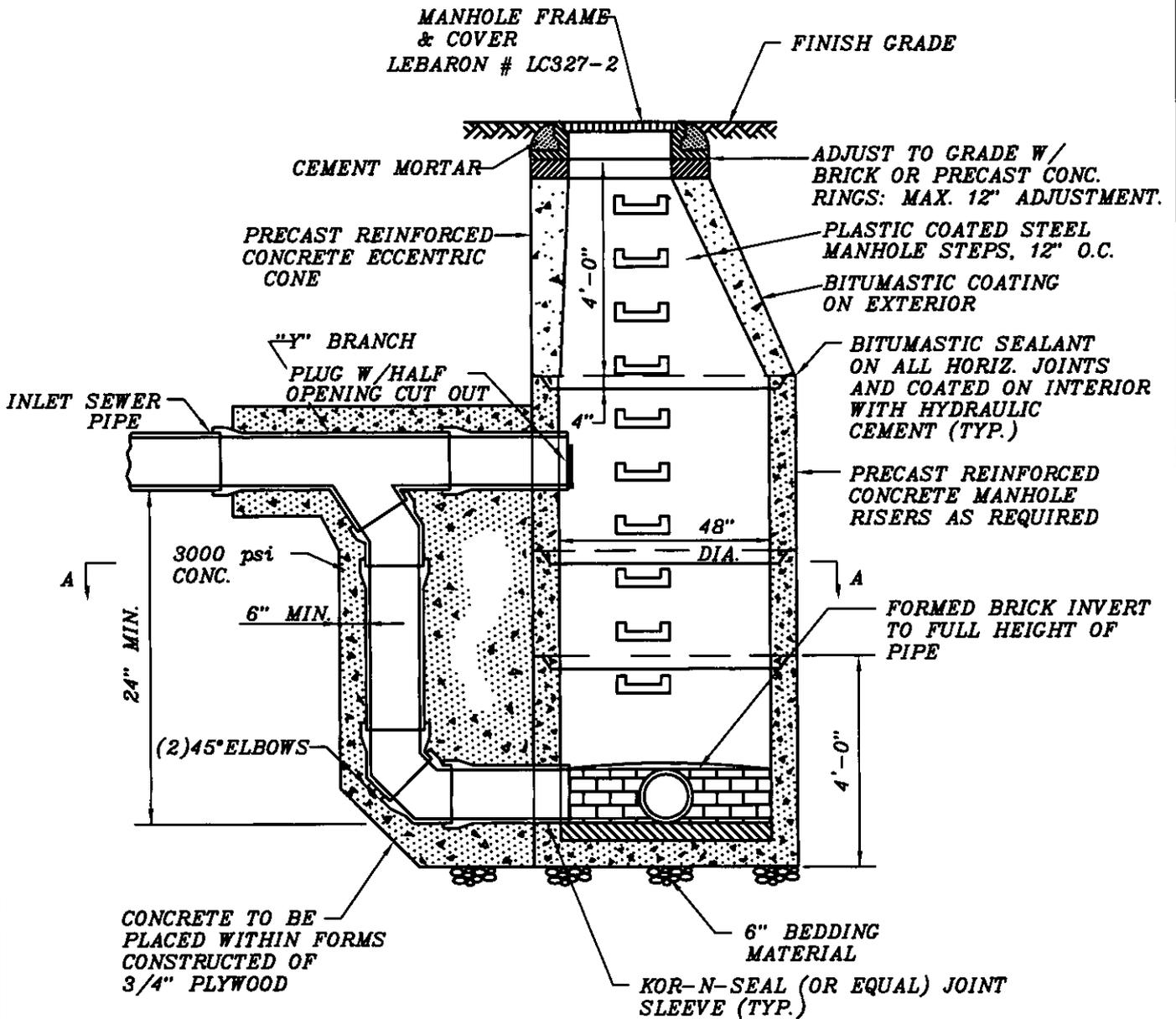
- NOTES:**
1. SHALLOW MANHOLES SHALL BE PROVIDED ONLY WHERE THE VERTICAL HEIGHT OF THE MANHOLE IS LESS THAN 6 FEET.
 2. ALL LIFTING HOLES TO BE PLUGGED IN AND OUT WITH HYDRAULIC CEMENT.



*Town of New Shoreham
Sanitary Sewer Regulations*

SANITARY SHALLOW MANHOLE DETAIL

Date: 01-07 NOT TO SCALE FIG: SAN-4



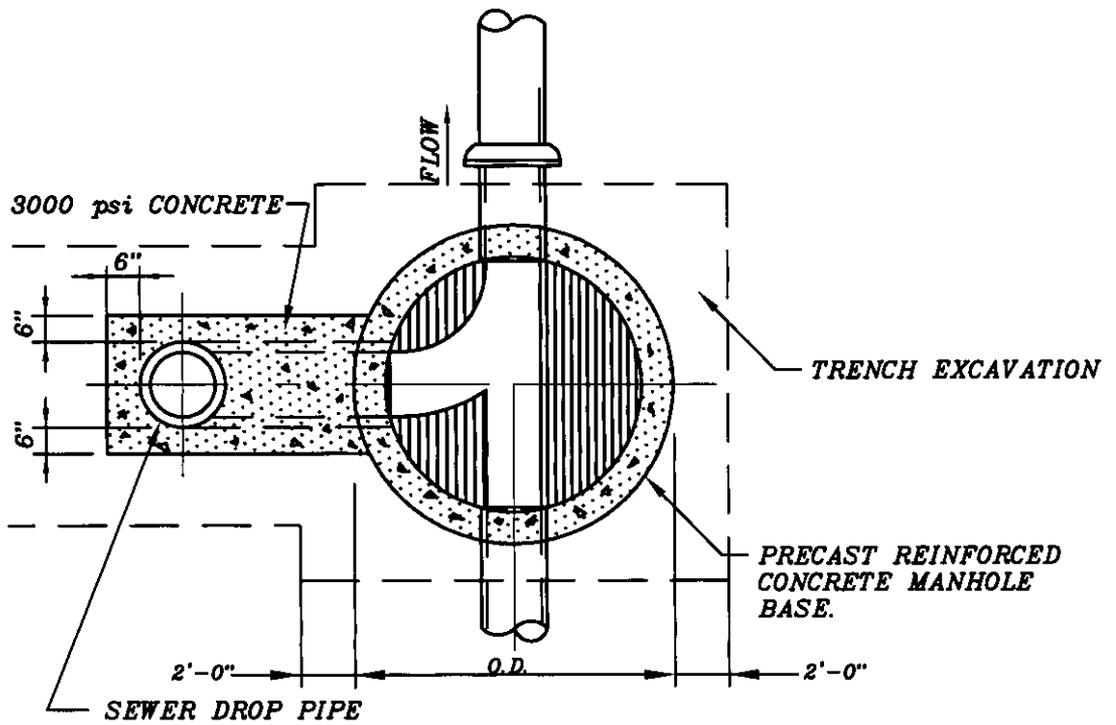
- NOTE:**
1. ALL LIFTING HOLES TO BE PLUGGED IN AND OUT WITH HYDRAULIC CEMENT.
 2. DROP PIPE SHALL BE PVC AND SAME SIZE AS INLET SEWER.



*Town of New Shoreham
Sanitary Sewer Regulations*

*EXTERNAL DROP SANITARY
MANHOLE DETAIL*

Date: 01-07 | NOT TO SCALE | FIG: SAN-5



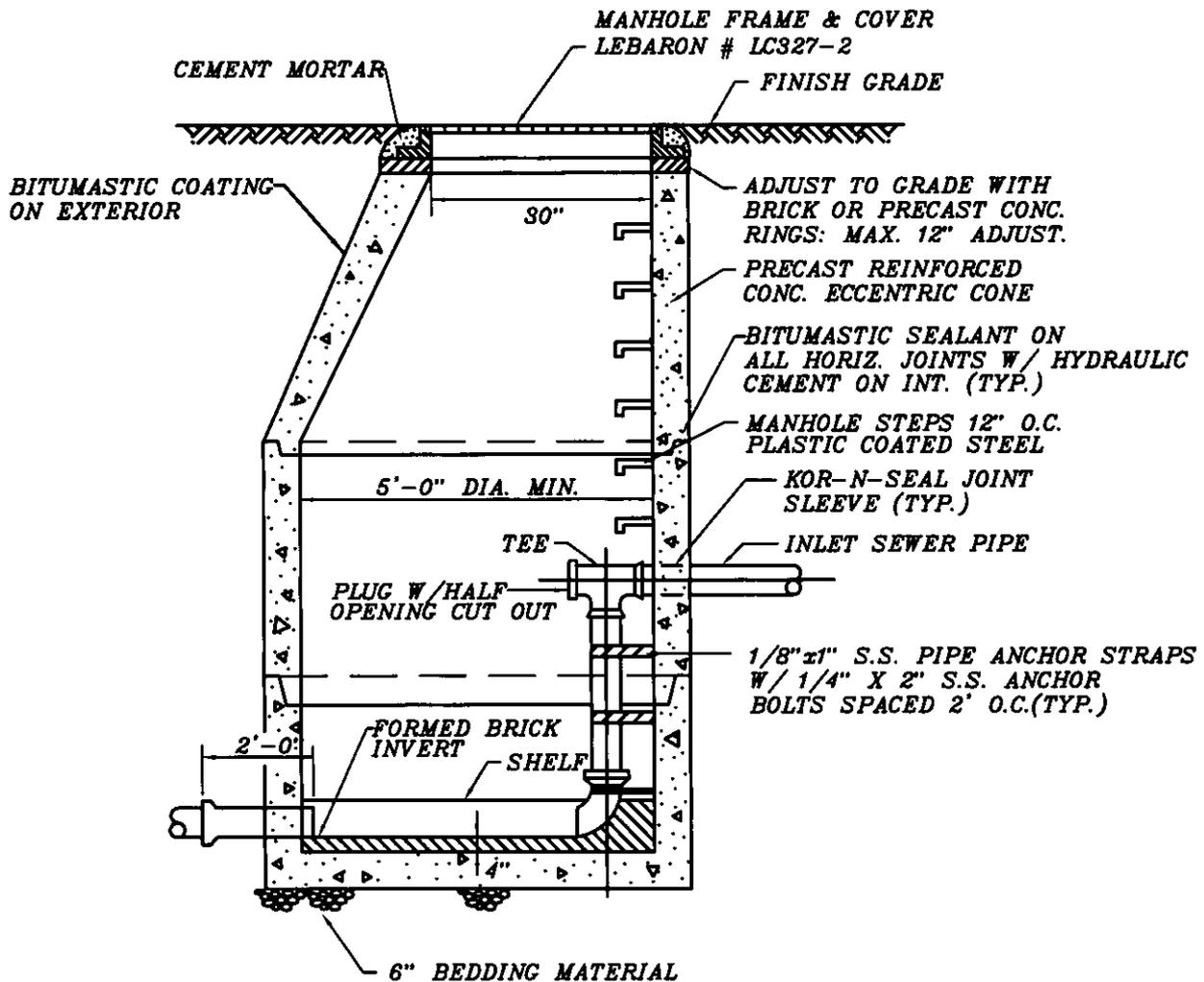
SECTION A-A



*Town of New Shoreham
Sanitary Sewer Regulations*

*EXTERNAL DROP SANITARY
MANHOLE DETAIL*

Date: 01-07 | NOT TO SCALE | FIG: SAN-6



NOTE:

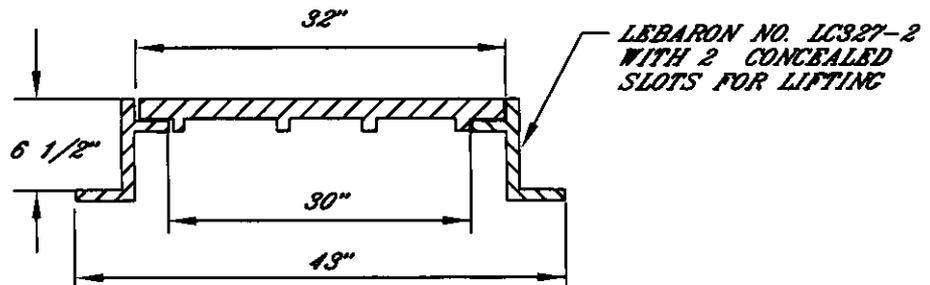
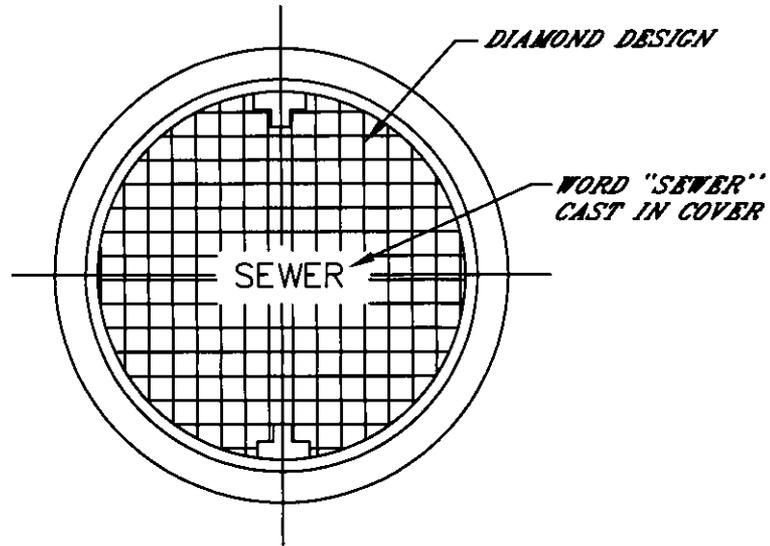
1. ALL LIFTING HOLES TO BE PLUGGED IN AND OUT WITH HYDRAULIC CEMENT.
2. DROP PIPE SHALL BE PVC AND SAME SIZE AS INLET SEWER.



*Town of New Shoreham
Sanitary Sewer Regulations*

INSIDE DROP SANITARY MANHOLE

Date: 01-07 NOT TO SCALE FIG: SAN-7



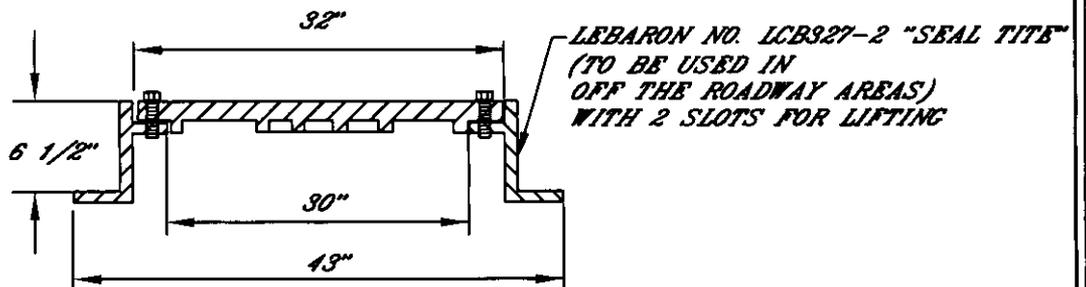
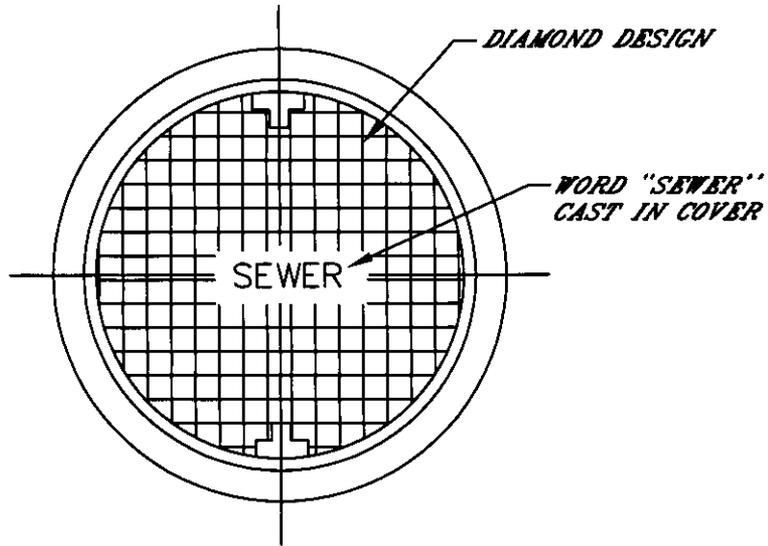
NOTE:
 1. VENTILATION HOLES OF ANY SIZE ARE NOT ALLOWED



*Town of New Shoreham
 Sanitary Sewer Regulations*

SANITARY MANHOLE FRAME & COVER

Date: 01-07 | NOT TO SCALE | FIG: SAN-8

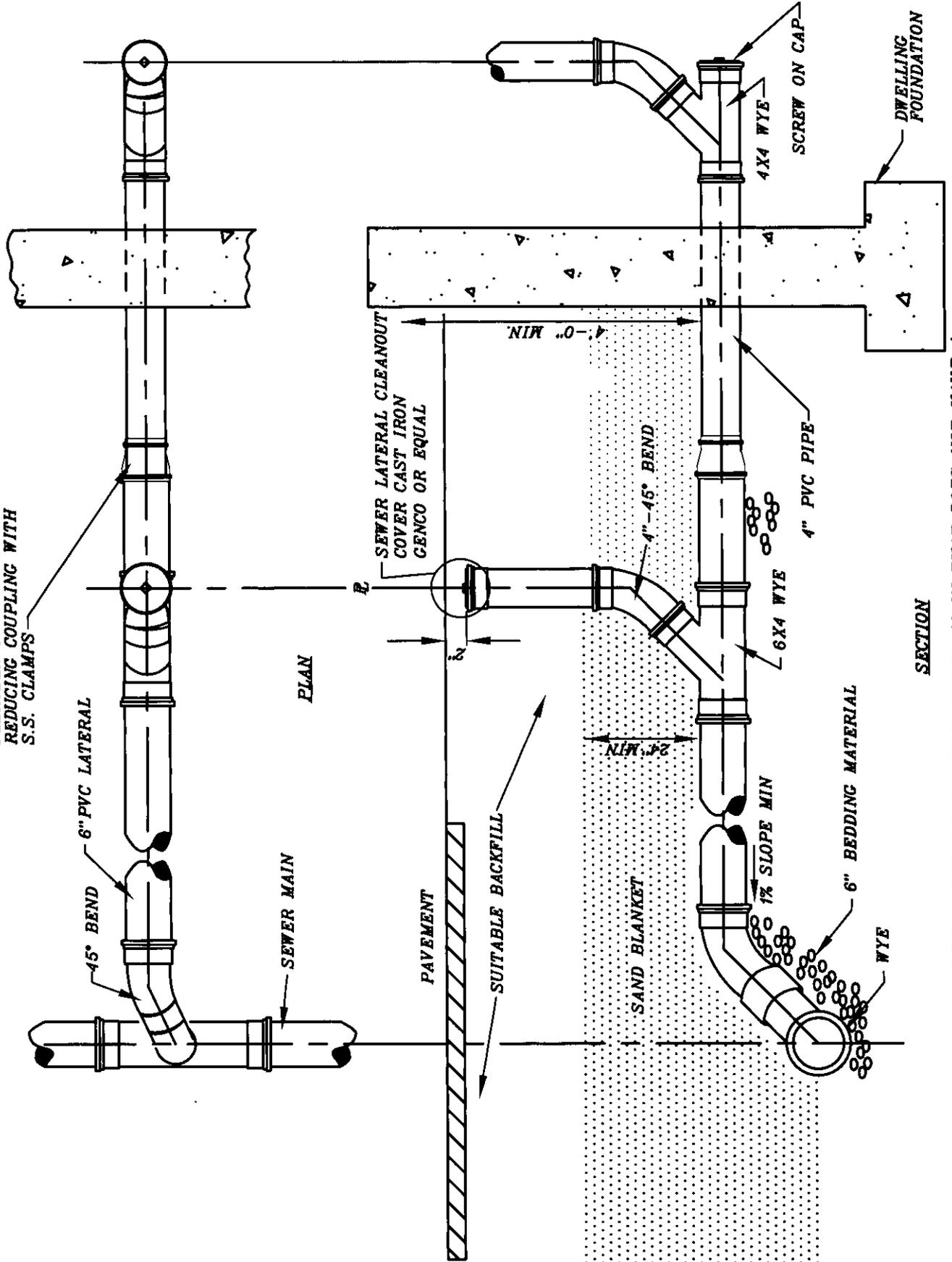


*Town of New Shoreham
Sanitary Sewer Regulations*

BOLTED & GASKETED FRAME & COVER

Date: 01-07 | NOT TO SCALE | FIG: SAN-9

FLEXIBLE TRANSITION OR
REDUCING COUPLING WITH
S.S. CLAMPS



PLAN

SECTION

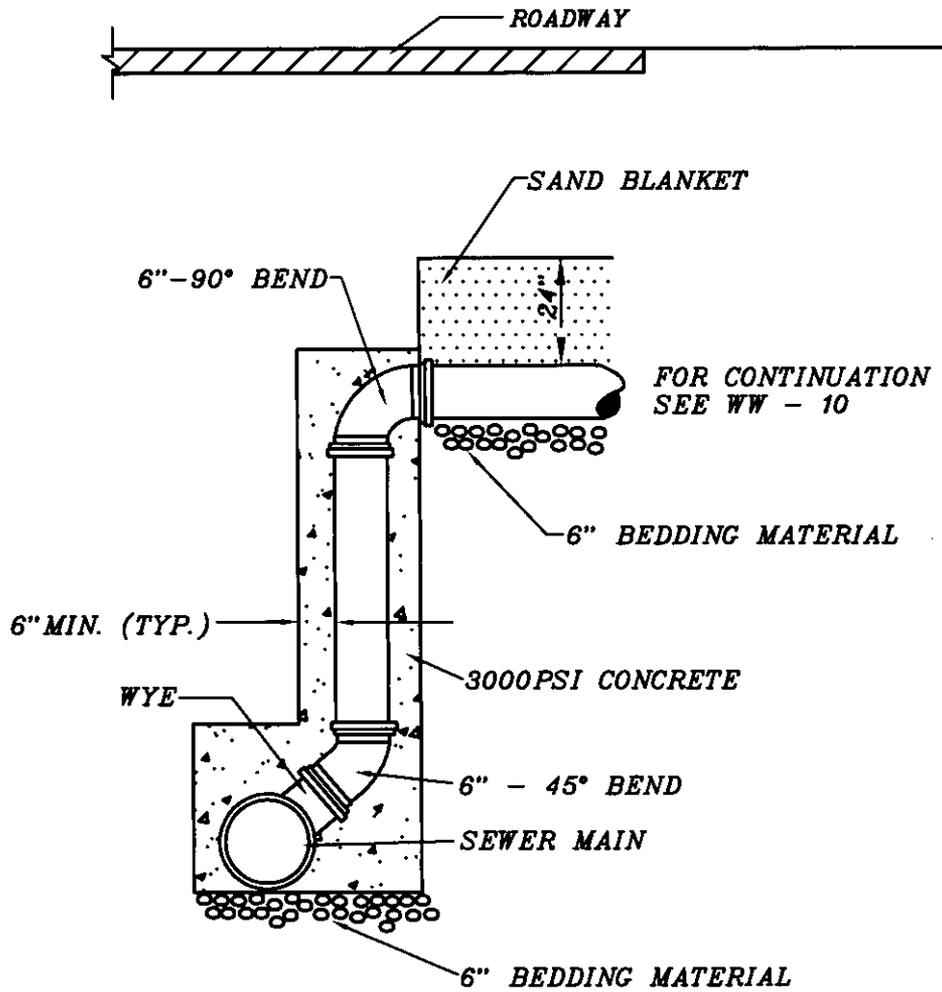
NOTE: 1. FOR AN EXISTING SEWER MAIN THAT DOES NOT HAVE A WYE INSTALLED, THE CONTRACTOR SHALL INSTALL A PIPE SADDLE.



Town of New Shoreham
Sanitary Sewer Regulations

STANDARD HOUSE CONNECTION DETAIL

Date: 01-07 | NOT TO SCALE | FIG: SAN-10



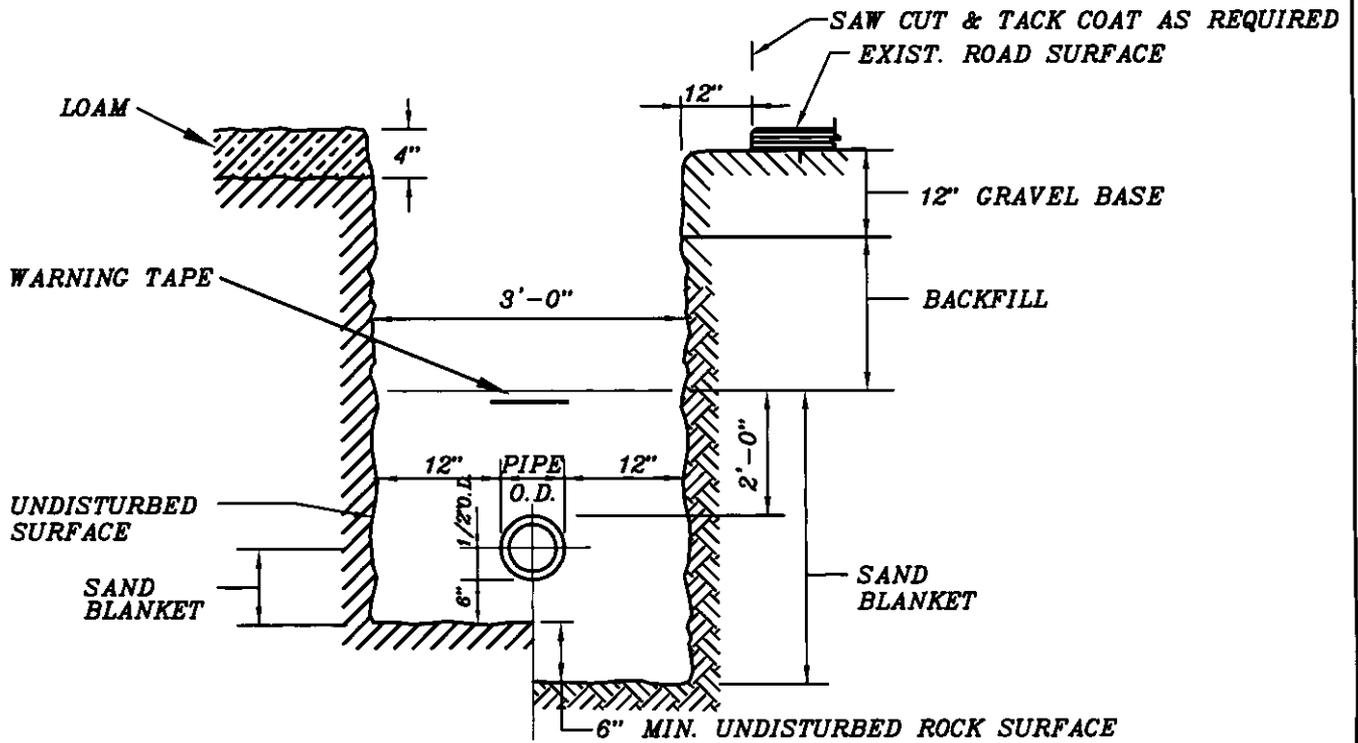
NOTE:
 FOR AN EXISTING SEWER MAIN THAT DOES NOT HAVE A
 WYE INSTALLED, THE CONTRACTOR SHALL INSTALL A PIPE SADDLE.



*Town of New Shoreham
 Sanitary Sewer Regulations*

STANDARD DEEP HOUSE CONNECTION

Date: 01-07 NOT TO SCALE FIG: SAN-11



NOTE:

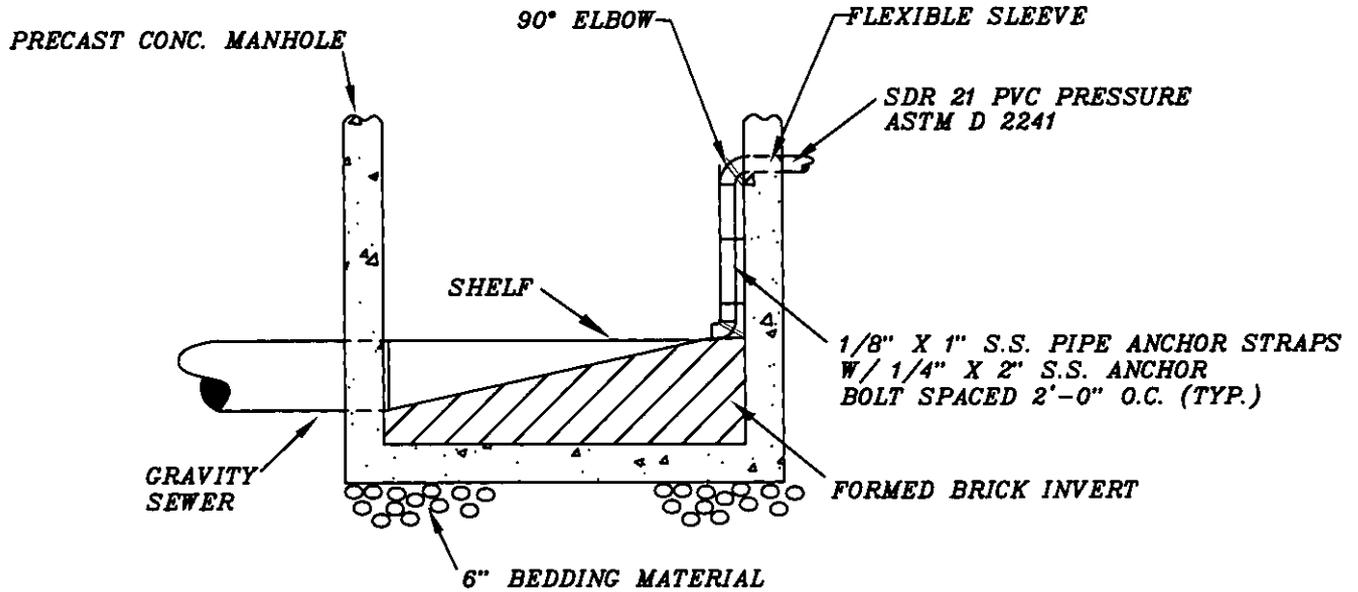
1. MINIMUM DEPTH OF COVER SHALL BE 5'-0"



*Town of New Shoreham
Sanitary Sewer Regulations*

LOW PRESSURE SEWER TRENCH

Date: 01-07 | NOT TO SCALE | FIG: SAN-12



Town of New Shoreham
 Sanitary Sewer Regulations

LOW PRESSURE SEWER
 MANHOLE CONNECTION

Date: 01-07 NOT TO SCALE FIG: SAN-13

REDUNDANT BRASS CHECK VALVE

ROADWAY VALVE MIN
4-1/2" DIA BOX LABELED
"SEWER"

EXISTING GRADE

1 1/4" SDR 21 PIPE

ROADWAY

5'-0" MIN.

CENTURY SERIES 2000
BALL VALVE CURB STOP

200 PSI TEE

24 CU. FT. CONCRETE

CONTROL PANEL

6"

DWELLING

PVC CONDUIT

1" SCH 40 PVC
SEWER PIPE
1% SLOPE MIN

MODEL CP 212 SERIES 6
ENVIRONMENT ONE
GRIDER PUMP UNIT

6" CRUSHED STONE

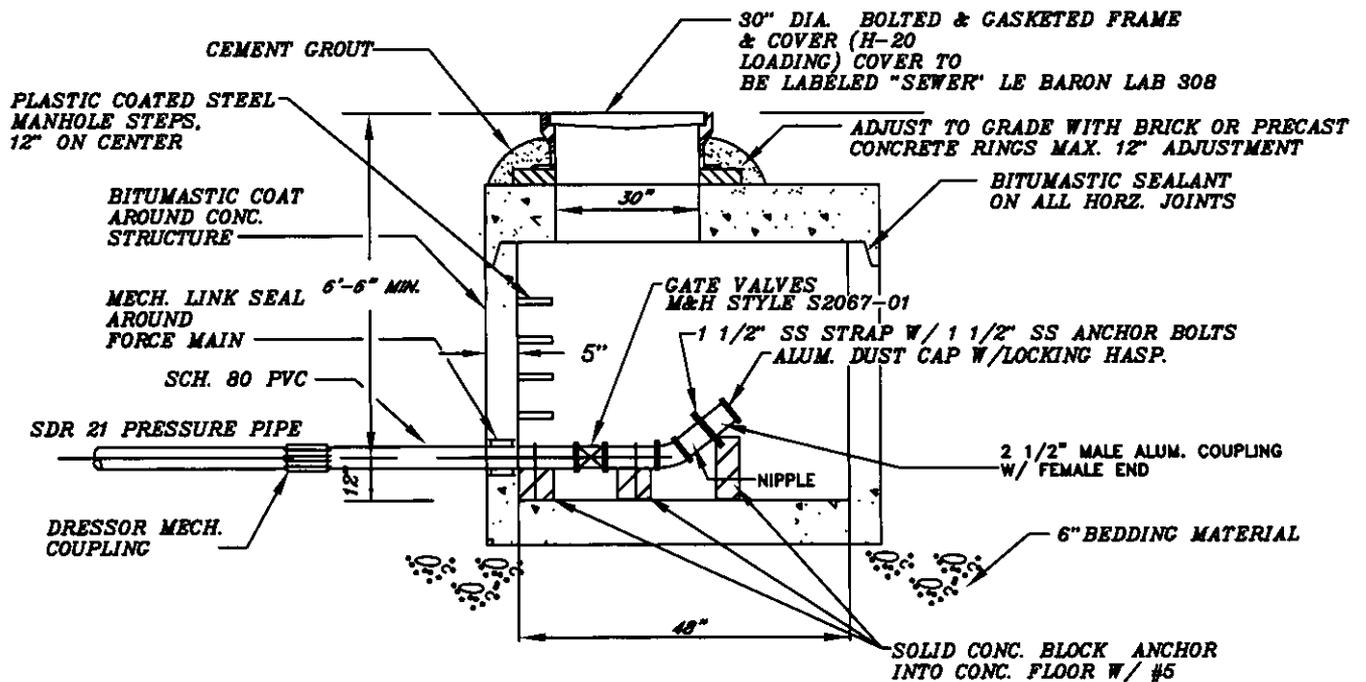
3" MIN.



Town of New Shoreham Subdivision Regulations

LOW PRESSURE SEWER SERVICE CONNECTION

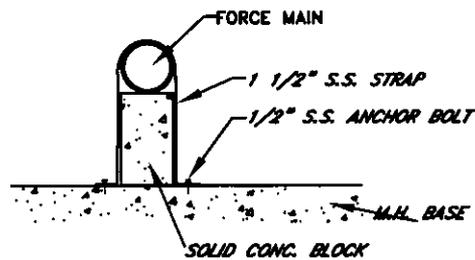
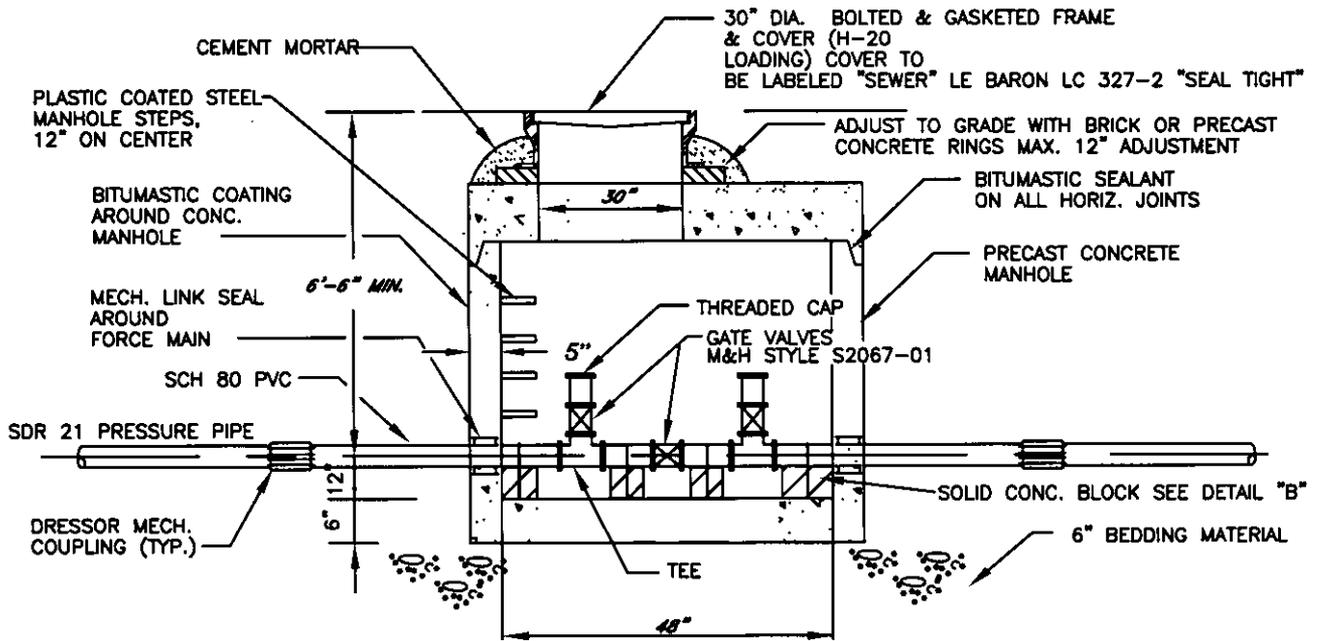
Date: 01-07 | NOT TO SCALE | FIG: SAN-14



Town of New Shoreham
Sanitary Sewer Regulations

LOW PRESSURE SEWER
END SEWER FLUSHING CONNECTION

Date: 01-07 NOT TO SCALE FIG: SAN-15



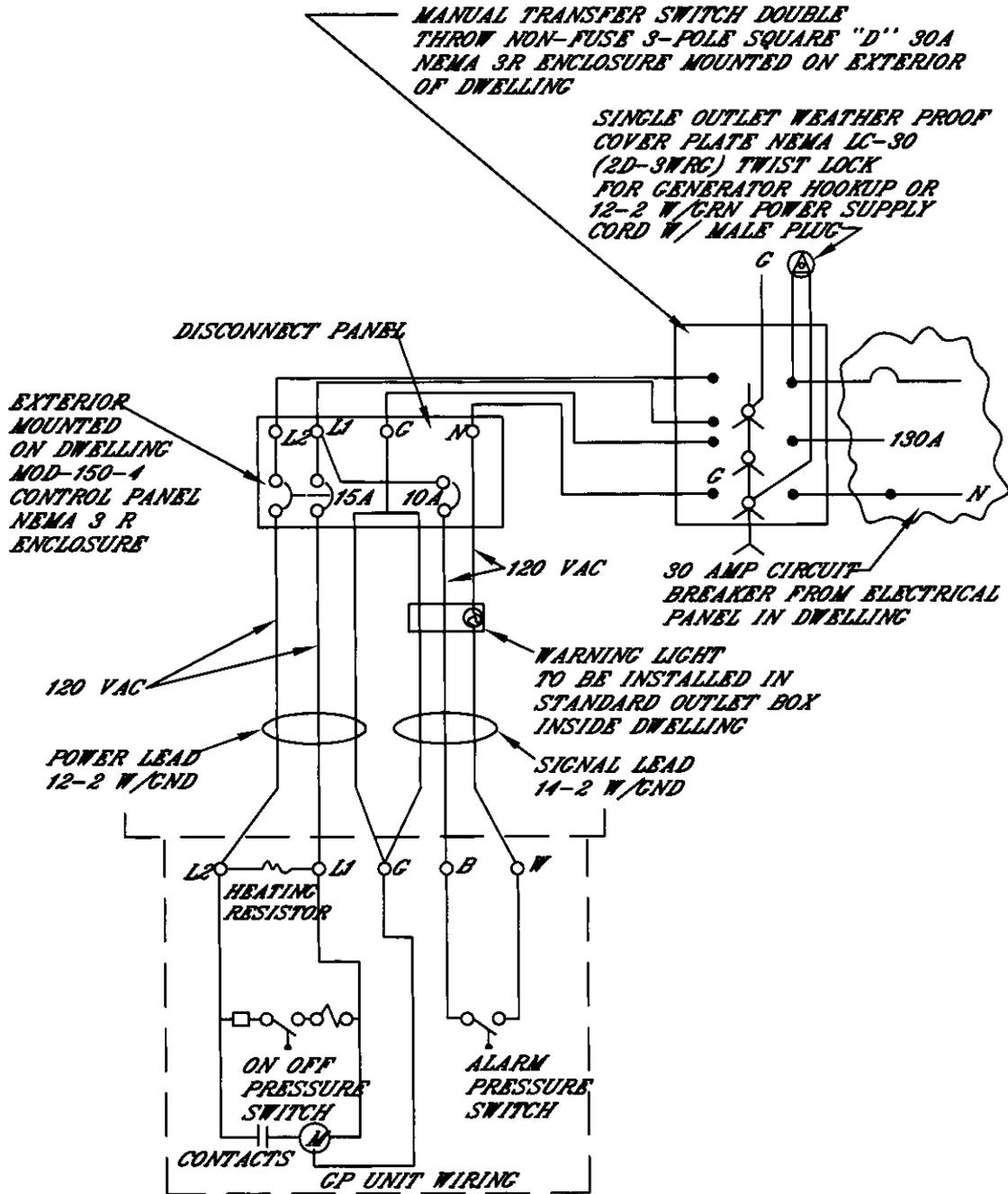
DETAIL "B"



*Town of New Shoreham
Sanitary Sewer Regulations*

*LOW PRESSURE IN-LINE
FLUSHING CONNECTION*

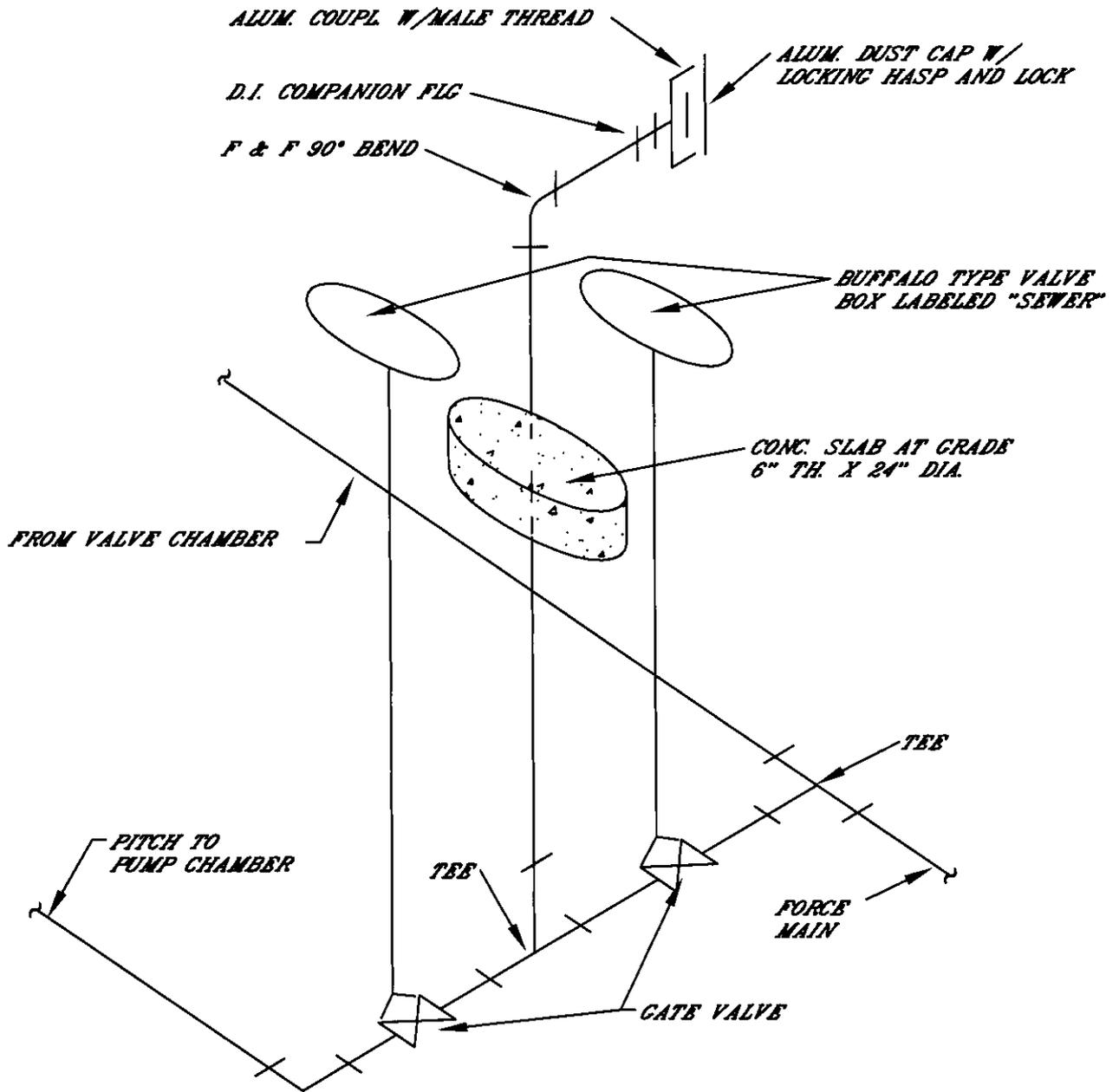
Date: 01-07 NOT TO SCALE FIG: SAN-16



**Town of New Shoreham
Sanitary Sewer Regulations**

**WIRING DIAGRAM FOR GRINDER
PUMP UNIT**

Date: 01-07 | NOT TO SCALE | FIG: SAN-17



NOTE:
 PROVIDE ONE VALVE KEY

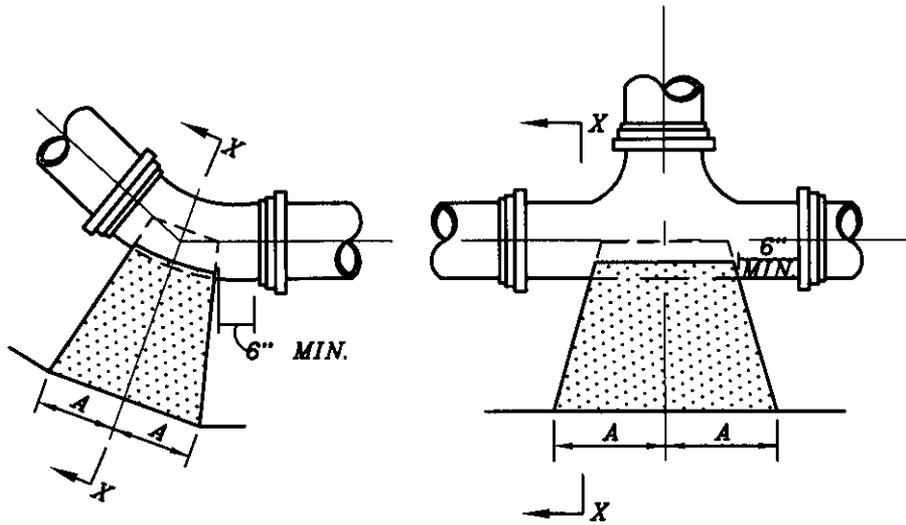


Town of New Shoreham
Sanitary Sewer Regulations

BY PASS PUMPING CONNECTION
AT PUMPING STATION DETAIL

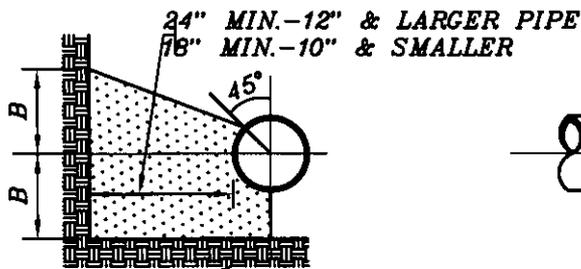
Date: 01-07 | NOT TO SCALE | FIG: SAN-18

PRINTED: 11-04 FILE NUMBER: 22-01-2007

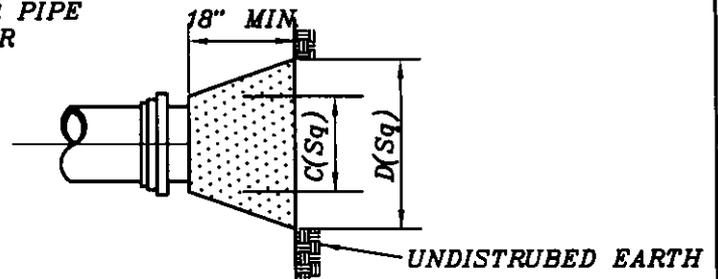


PLAN
BENDS

PLAN
TEES



SECTION X-X
BENDS & TEES



PLAN & ELEVATION
PLUGS

TYPE	SIZE	1/4 BENDS		1/8 BENDS		1/16 BENDS		TEES		PLUGS	
		A	B	A	B	A	B	A	B	C	D
TYPE 1 4000 PSF SOIL	6"	5"	10"	6"	8"	3"	8"	8"	8"	10"	15"
	8"	12"	12"	8"	10"	5"	9"	9"	12"	12"	20"
	10"	16"	14"	10"	12"	6"	10"	11"	14"	14"	25"
	12"	19"	16"	12"	14"	8"	11"	14"	16"	16"	30"
	14"	23"	18"	14"	16"	10"	12"	16"	18"	18"	34"
	16"	26"	20"	16"	18"	11"	13"	18"	20"	20"	38"
TYPE 2 8000 PSF SOIL	6"	16"	10"	9"	10"	6"	8"	10"	12"	10"	21"
	8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"
	10"	26"	17"	14"	17"	10"	13"	16"	20"	14"	36"
	12"	29"	21"	16"	21"	11"	16"	18"	24"	16"	41"
	14"	35"	24"	19"	24"	12"	20"	22"	27"	18"	48"
	16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"



Town of New Shoreham
Sanitary Sewer Regulations

THRUST BLOCKS

Date: 01-07 NOT TO SCALE FIG: SAN-19

SAND BLANKET.

THE SAND SHALL BE FREE FROM ICE, SNOW ROOTS, SOD, RUBBISH, AND OTHER DETERIOUS OR ORGANIC MATTER. THE SAND BLANKET SHALL CONFORM TO THE REQUIREMENTS OF 100% PASSING THE ONE HALF(1/2) INCH SCREEN, 85-100% PASSING THE THREE-EIGHTS(3/8) INCH SCREEN, 60-85% PASSING THE NUMBER 4(#4) SEIVE, 35-60% PASSING THE NUMBER SIXTEEN(#16) SIEVE, 10-35% PASSING THE NUMBER FIFTY(#50) SIEVE AND 2-10% PASSING THE NUMBER ONE-HUNDRED(#100) SIEVE.

BEDDING MATERIAL

THE BEDDING MATERIAL SHALL BE CRUSHED STONE CONSISTING OF DURABLE CRUSHED ROCK OR DURABLE CRUSHED GRAVEL STONE, FREE FROM ICE, SNOW, SAND, CLAY, LOAM OR OTHER DELETERIOUS MATERIAL. THE CRUSHED STONE SHALL CONFORM TO THE REQUIREMENTS OF 100% PASSING THE THREE-QUARTER(3/4) INCH SCREEN, 10-50% PASSING THE ONE-HALF(1/2) INCH SCREEN, 0-20% PASSING THE THREE-EIGHTS(3/8) INCH SCREEN AND 0-5% PASSING THE NUMBER FOUR(#4) SIEVE.

BACKFILL:

BACKFILL SHALL BE EXCAVATED MATERIAL FREE-DRAINING CLEAN GRANULAR SOIL SUITBLE FOR BACKFILL UP TO 20 PERCENT OF BACKFILL MATERIAL MAY BE ROCK-LIKE MATERIALS NOT TO EXCEED 0.05 CUBIC FEET IN VOLUME, NOR MORE THAN 6 INCHES IN LENGTH. THE BACKFILL SHALL NOT CONTAIN ANY DEBRIS, PAVEMENT, FROZEN MATERIAL, ORGANIC MATERIAL OR PEAT.



*Town of New Shoreham
Sanitary Sewer Regulations*

DEFINITIONS

Date: 01-07 NOT TO SCALE FIG: SAN-20