Wastewater Construction Manual

Revision 1

1. Introduction

All sanitary sewers shall be constructed in accordance with this Wastewater Construction Manual as well as the Standards Specifications for Public Works Construction and any technical or special provisions called out in a Board approved contract.

2. Excavation, Backfill and Trench Shoring

A detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during excavation of any trench or trenches 5 feet or more in depth are required. A registered civil or structural engineer licensed in the State of California shall prepare the plan. As a part of the plan, a note shall be included stating that the registered engineer certifies that the plan complies with the CAL/OSHA Construction Safety Orders, or that the registered civil or structural engineer certifies that the plan is not less effective than the shoring, bracing, sloping, or other provisions of the Safety Orders.

The detailed plan showing the design of shoring, etc., which the Contractor/Property Owner is required to submit to the District for acceptance in advance of excavation will not be accepted by the District if the plan is based on subsurface conditions which are more favorable than those revealed by the investigations made by the District or their sub-consultants; nor will the plan be accepted if it is based on soils related design criteria which is less restrictive than the criteria set forth in the report on the aforesaid investigations of subsurface conditions. The detailed plan showing the design of shoring, etc. shall include surcharge loads for nearby embankments and structures, for spoil banks, and for construction equipment and other construction loading. The plan shall indicate for all trench conditions the minimum horizontal distances from side of the trench at its top to the near side of surcharge loads.

The Contractor shall perform all excavation, trenching, compaction, and backfilling necessary or required for the construction of the pipelines, service laterals, and appurtenances, as shown on the drawings. Excavations shall include the removal and disposal of all materials of whatever nature encountered, including all obstructions of every nature that would interfere with the proper construction and completion of the work. The Contractor will encounter rocks of various sizes within the trench and will be required to remove the material to an approved location.

The maximum length of open trench shall not be greater than fifty (50) feet or the distance to accommodate the amount of pipe installed in a single day, whichever is less. The distance is the collective length at any location, including open excavation, appurtenance construction, pipe laying, backfill which has not been temporarily repaved, and necessary repairs to existing utilities that may have been damaged by the Contractor during construction.

The work shall include all pumping, ditching, and other required measures for the removal or exclusion of water from all excavations. It shall be the responsibility of the Contractor to dispose of and contain all wastewater released from the District's sewer mains. The Contractor shall also be responsible drainage water from the construction operations, and of storm water and wastewater reaching the right of way from any source, so that no damage will be done to the trench, pipe, and/or other structures.

The Contractor shall be responsible for any damage to persons or property on or off the right of way due to such drainage water, or to the interruption or diversion of such storm or wastewater on account of the Contractor's operations.

All earthwork including materials, excavation, and backfill will conform to SSPWC, Sections 200, 207, 211, 300, 302, 306, or any other relevant section.

Nothing contained in this article shall be construed as relieving the Contractor of the full responsibility for providing shoring, bracing, sloping or other provisions, which are adequate for worker protection.

A. Excavation

This section includes materials, testing and installation for trench excavation, backfill, and compaction of piping, and manholes.

All excavation work, including any required shoring or other provisions for worker protection, shall be performed in accordance with these Technical Provisions, the applicable provisions of Section 306-1.1 of the SSPWC, the "Construction Safety Orders" issued by the State of California Division of Industrial Safety, and the County of Los Angeles Excavation Permit.

Excavation for the pipelines, service laterals, and appurtenances shall be in open-cut trenches with vertical sides and shall be excavated to a depth of six (6) inches below an established grade line based on the outside diameter of the pipe.

Should the contractor elect to tunnel or jack any portion of the pipeline, laterals, or other appurtenances, he shall first obtain approval from the District, obtain any necessary permits, and pay any associated cost.

If it becomes necessary to excavate more than six (6) inches below the established grade line in order to remove rock, hardpan, shale, other interfering objects or due to Contractor error, the void shall be filled with pipe bedding material and compacted in accordance with SSPWC, Section 306-1.2.1 and these Special Provisions at no additional cost to the District.

The Contractor shall sawcut the existing AC pavement or concrete. Pavement breakers or stompers shall not be allowed. Contractor shall vacuum or remove AC or concrete cuttings during the sawcutting operation and shall not be allowed to wash AC or concrete cuttings into the storm drain system per County of Los Angeles permit requirements.

All native material excavated from the proposed pipe trench shall become the property of the Contractor and shall be disposed of by him/her outside the limits of work in accordance with the applicable ordinances and regulations of governmental agencies having jurisdiction. Costs of said disposal shall be the sole responsibility of the Contractor and no additional compensation shall be made therefore. It shall be the responsibility of the Contractor to locate suitable disposal sites, and obtain permits or other required authorizations.

The Contractor shall remove and dispose of all structures, debris, or other obstructions of any character necessary to accommodate the Work. Where such obstructions consist of improvements required by law, they shall be removed, maintained, and permanently replaced by the Contractor at the Contractor's expense except as otherwise specifically provided in the Contract Documents.

B. Trench Shoring

The Contractor, a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of any trench or trenches five (5) feet or more in depth shall submit to the District for

acceptance, in advance of excavation. A registered civil or structural engineer licensed in the State of California shall prepare the plan or table for any shoring that is fifteen (15) feet or greater. As a part of the plan, a note shall be included stating that the registered engineer certifies that the plan complies with the CAL/OSHA Construction Safety Orders, or that the registered civil or structural engineer certifies that the plan is not less effective than the shoring, bracing, sloping, or other provisions of the Safety Orders.

Trench shoring shall be constructed and installed in accordance with Sections 7-10.4.1 and 306-1.1.6 of the SSPWC.

C. Pipe Bedding

Pipe bedding shall be defined as that material supporting, surrounding, and extending from 6 inches below the bottom, to 12 inches above the top of pipe. Bedding material shall be ½" crushed rock and be free from clay and organic materials in accordance with, Section 200-1.2 of the SSPWC and CVWD std. drawing 40-S.

A sample of pipe bedding material shall be submitted to the District for approval before construction. The District will perform a sieve analysis in accordance with ASTM C136 to determine if the pipe bedding material meets the requirements defined above.

D. Manhole Bedding

Manhole base sections shall be placed on graded and firmly tamped granular bedding. The bedding shall be at least six (6) inches thick and extend at least twelve (12) inches beyond the limits of the base section. The bedding must be graded to ensure uniform contact and support of the manhole in a true vertical position.

E. Pipe Backfill

Backfill shall be considered as starting 12 inches above the pipe or conduit to the street sub-grade or finished ground. Backfilling operations shall conform to the applicable provisions of SSPWC, Section 306-1.3.

Backfill material shall be imported Crushed Aggregate Base (CAB) or Processed Miscellaneous Base material (PMB), Crushed Miscellaneous Base (CMB), or One Sac-Slurry (OSS) and contain no rocks or stones greater than two (2) inches in any dimension. Broken pavement or similar materials shall not be allowed. Backfill material shall be imported and approved by the District prior to placement of backfill.

Backfill within the pipe trench shall be compacted to ninety percent (90%) of relative compaction from the bedding material to the street subgrade or finished ground. Hand-directed mechanical tamping or other similar approved methods shall be permitted when cover over the top of pipe is greater than twelve (12) inches.

Backfill materials shall be compacted in maximum lift thickness of eight (8) inches. Use of equipment, which compacts by impact, vibration, or rolling, will not be permitted until cover over the pipe is in excess of twelve (12) inches. The depth of the compacted material on each side of the pipe shall be approximately the same during the entire backfilling operation.

The moisture content of the soil as determined by the required soil density shall be uniformly distributed throughout each layer. All backfill above the pipe bedding shall be mechanically compacted in accordance with SSPWC, Section 306-1.3.2.

Compaction of trench backfill by ponding or jetting will be permitted when, as determined by the District or the District's representative, the backfill material is of such character that it will be self-draining when compacted and that foundation materials will not soften or be otherwise damaged by the applied water and no damage from hydrostatic pressure will result. Ponding and jetting methods shall be conducted in accordance with SSPWC, Section 306-1.3.3. Water jetting may be supplemented by the use of vibratory or other compaction equipment when necessary to obtain the required compaction.

Where supports of any nature are used in the trench, said supports shall all be removed unless otherwise approved by the District. Where tight sheeting is used, it shall be removed systematically as soon as practicable after backfilling by pulling alternate pieces along each side of trench, alternating also from one side of trench to the other.

All surplus excavated material not used in the compacted backfill of the pipe trench shall be disposed of by the Contractor at his own expense. It shall be the responsibility of the Contractor to locate such suitable disposal sites, and obtain permits or other required authorizations.

A sample of backfill material shall be submitted to the District before construction. The District will perform a sieve analysis in accordance with ASTM C136 to determine if the pipe backfill material meets the requirements defined above.

3. Pipe Replacement

A. Materials

Unless otherwise specified or approved by the District, sewer pipe shall be limited to VCP.

All VCP and fittings shall conform to the requirements of ASTM C700 as it applies to extra strength, unglazed VCP. Each section of pipe shall be clearly stamped with either the words "Extra Strength" or the letters "ES" designating the strength class. VCP joints shall either be plain end to plain end or bell and spigot conforming to ASTM C425. Plain end to plain end joints shall consist of steel banded rubber or elastomeric polyvinyl chloride couplings with corrosion resistant Type 316 stainless steel clamps and Type 305 bolts.

B. Installation

When and existing sewer is to be relieved, and also retained as part of the system, the relief method should maintain a velocity of three feet per second of possible, but not less than the minimum velocity for which the sewer was originally designed. Sufficient flow should remain in the existing sewer to maintain that original designed velocity. Overflow relief may be one way to satisfy the minimum velocity requirement. The total combined capacity of the new sewer and the existing sewer, (whether rehabilitated or not), when both are flowing full, (d/D = 1.0), shall equal twice the estimated PDWF as projected to the end of the designed period.

Pipe laying and joining shall be done in conformance with SSPWC, Section 306-1.2.2 and 306-1.2.3 and all applicable ASTM standards.

In placing pipe in the trench, the pipe shall be held by a sling at the balancing point of the section. It shall not be dragged in the bottom of the trench or bumped, but shall be supported by the sling while being fitted into the adjacent pipe section. The Contractor shall excavate bell holes in the trench as required.

At all times when the work of installing pipe is not in progress all openings into the pipe and the ends of the pipe in the trenches or structure shall be kept tightly closed to prevent entrance of animals and foreign materials. All foreign matter, which may have entered the pipe, shall be removed from each length of pipe before it is jointed in place.

The Contractor shall maintain the inside of the pipe free from foreign materials and in a clean and sanitary condition until its acceptance by the District.

The Contractor shall take all necessary precautions to prevent the pipe from floating due to water entering the trench from any source. The Contractor/Property Owner shall assume full responsibility for any damage resulting from water entering the trench and shall at his own expense, restore and replace the pipe to its specified condition and grade if it is displaced due to floating.

C. Disposal of Damaged Material

All abandoned material removed from the proposed project site shall become the property of the Contractor and shall be disposed of by him/her outside the limits of work in accordance with the applicable ordinances and regulations of governmental agencies having jurisdiction. Costs of said disposal shall be the sole responsibility of the Contractor/Property Owner. It shall be the responsibility of the Contractor/Property Owner to locate suitable disposal sites, and obtain permits or other required authorizations.

D. Existing Facilities

The Contractor shall provide all temporary sewer system bypasses. The Contractor shall submit the details of the proposed control operations to be used for the bypass and the proposed schedule of activities to the District for approval. The District shall have approval responsibility for the procedures to be used and the schedule. If any emergency should arise during the bypass activities, the Wastewater Collection Systems Division should be contacted at (818) 445-1721 or (818) 249-2185.

Any existing sewer line to be intercepted by a new sewer line shall be maintained-in-service or bypassed until authority to connect to the new sewer line is granted by the District. Such authority is contingent upon final inspection and acceptance of all new sewer system construction downstream from the required point of connection.

Throat grade rings may be used to raise manhole frame castings to a maximum of 18 inches from top of cone to bottom of castings. If the height is greater than 18 inches, for raising castings, then the cone shall be removed and manhole rebuilt accordingly.

When frames, covers, and grates of existing manholes, inlets or other facilities are removed, a traffic rated plate shall be placed over the opening. The traffic plate shall be of a design that the possibility of dislodgement is non-existent. The required use of a traffic plate will be waived if the work of raising frames, covers or grates is accomplished the same day.

The Contractor shall exercise care in removing manhole covers and frames and install cover plates for manhole to preclude the possibility of any rubble or debris from entering the sewer pipe. Should any rubble or debris fall into the manhole, the manhole shall be immediately cleaned of any and all rubble and debris. Should the Contractor/Property Owner fail to flush and clean the sewer main, the Engineer shall order the work done by others and charge the cost to the Contractor/Property Owner.

If the manhole cover is unstable under traffic, the manhole ring and cover shall be removed and replaced with a stable ring and cover.

All connections to the existing publicly owned treatment works must be made using a manufactured wye fitting. Saddling or other tapping methods shall not be allowed.

Sanitary sewer laterals encountered in the work that obstructs or otherwise interferes with other planned improvements shall be adjusted or relocated in accordance with appropriate provisions of these specifications.

4. Manhole Construction

A. Materials

All manholes shall be constructed of pre-cast reinforced concrete eccentric cone sections with a minimum access opening of twenty-four (24) inches. Concentric cones may be used upon specific approval by the District Engineer. Any deviation from these material specifications must be approved by the District Engineer.

Precast concrete manhole components shall be in accordance with ASTM C 478 and CVWD Std. Dwg. 20-S. Manhole components shall be designed for H-20 highway wheel loading and specific site conditions. H-20 refers to loading resulting from the passage of trucks having a gross weight of 20 tons, 80% of which is on the rear axle, with axle spacing of 14 ft., center to center, and a wheel gauge of 6 ft., each rear wheel carrying one half this load or 8 tons each without impact.

Manhole bases shall be cast-in-place. Precast bases may be used if the District Engineer deems it appropriate for the application, with a formed recess shaped to match the first precast shaft section.

Pipe penetrations for sewer applications shall incorporate a watertight flexible pipe connector or ring-type seal according to the method of manhole construction. Precast manholes shall utilize either an integrally cast embedded pipe connector, or a boot-type connector installed in a circular block out opening in accordance with ASTM C 923.

Manholes frames and covers shall be cast iron with a combined weight of not less than 360 pounds and shall have a minimum clear opening of 23-3/4 inches.

B. Installation

After pouring concrete base, remove the top section of the existing pipe to the full width of pipe and diameter of the manhole. Cover exposed edges of pipe completely with mortar. Trowel all mortar surfaces smooth. All channels in the manhole shall be formed in accordance with Sections 303-1.3 and 303-1.4 of the SSPWC and CVWD Std. Dwg. 20-S.

The manhole base shall extend 9-inches below the bottom of the lowest pipe and 6-inches above the top of the largest pipe.

Place the first precast section of manhole in concrete base before concrete has set and deposit sufficient mortar on the base to assure a watertight seal between the base and the manhole wall. First section shall be properly located and plumb. Stacking additional precast manhole section shall be prohibited until the concrete has cured a sufficient amount to support the additional weight in moist conditions.

Standard pre-cast cones shall provide an eccentric reduction from 48 inches to 24 inches and shall not be less than 18 inches in height.

Manhole steps and ladders shall conform to the dimensions shown on CVWD Std. Dwg 20-S. Steps shall be 1-inch diameter galvanized deformed bar conforming to ASTM A615.

In regards to bypass and the handling of existing sewer facilities, the Contractor/Property Owner shall be totally responsible for maintaining adequate capacity for flow at all times and adequately protecting new and existing infrastructure. Construct manholes over existing operating lines at locations shown. Perform necessary excavation and construct new manholes in conformance with applicable requirements of section 4.

All frames and covers shall conform to CVWD Std. Dwg. 22-S, except that there shall be one cast in hand hold for lifting. The Contractor shall construct manholes so as to provide adjustment space for setting cover casting to a finished. Manhole ring and covers shall be adjusted to the finished elevations prior to final acceptance of the work.

The manhole neck and frame shall be adjusted to grade. Use of metal grade rings is not permitted. The finished manhole shall conform to Construction Std. Dwg. 20-S and 21-S, or as approved by the Environmental Utilities Department.

Prevent broken material or debris from entering sewer flow. Maintain flow through existing lines

C. Connection to Existing Manholes, Inlets and Concrete Structures

In regards to bypass and the handling of existing sewer facilities, the Contractor/Property Owner shall be totally responsible for maintaining adequate capacity for flow at all times and adequately protecting new and existing infrastructure. Construct manholes over existing operating lines at locations shown. Perform necessary excavation and construct new manholes in conformance with applicable requirements of section 4.

Provide all diversion facilities and perform all work necessary to maintain flow in existing lines during installation. Break out existing base or saw cut opening in wall with concrete saw. Grout in new pipe to provide watertight seal, and when applicable, smooth flow into and through existing manhole.

5. No-Dig Rehabilitation

A. Sewer Main Lining

Prior to the installation of CIPP lining materials, Contractor shall thoroughly clean the interior of the sewer line. Contractor shall remove all loose material, grease, scum, rust, mineral deposits, etc. using high pressure water, sandblast, acid wash or other approved method as necessary to secure a clean surface. Active infiltration shall be eliminated prior to placement of CIPP liner installation. Prior to the installation of CIPP, Contractor shall document the condition of the existing sewer structure. Past closed circuit television (CCTV) inspection reports for all lines involved in this project are provided in the in Appendix D. Any damage done to the infrastructure during any lining operations shall be repaired at the expense of Contractor.

Contractor shall submit plans for review and approval detailing how Contractor plans to maintain flow in the collection system during installation of the CIPP. Contractor shall provide plugs as necessary to block flow that might hamper liner installation. The Contractor shall plug upstream laterals as necessary. Mainline flows that cannot be temporarily plugged without causing a

sewage backup must be bypassed by the Contractor. A bypass plan shall be submitted to the District discussing the method and equipment to be used during the bypass for review and approval.

The length of the CIPP shall be that deemed necessary by the Contractor to effectively carry out the lining insertion. When cured, the CIPP shall extend from end to end of the sewer segment being lined forming continuous tight fitting, watertight liner. Contractor shall size CIPP as necessary to ensure the layers which constitute the pipe wall are such that when the resin cures, the total wall thickness must be homogeneous with no internal layer of plastic which might weaken the pipe wall and allow internal shear. When cured, the CIPP shall form a mechanical bond with the pipeline. The finished opening shall have a minimum diameter large enough to accommodate District cleaning and inspection equipment. No additional payment will be made for excavations for the purpose of rehabilitating these sections of pipe and the Contractor will be responsible for all costs and liability associated with such excavation and restoration work.

The curing method will be selected by the Contractor to best suit the CIPP material being used. Curing methods, test results (utilizing ASTM D790 method), and material samples shall be supplied to the District prior to any work beginning. Work will only be allowed to proceed upon approval of the material samples by the District.

The finished CIPP shall be continuous over the entire length of an insertion run and be as free from visual defects, such as foreign inclusions, dry spots, pinholes, and delamination. The CIPP shall be impervious and free of any leakage from the pipe to the surrounding ground or from the ground to the inside of the CIPP. If the CIPP fails to make a tight seal at any access point or terminating point, the Contractor shall repair seal with a resin mixture compatible with the CIPP. Connections to manholes and insertion through manholes shall be properly sealed by plugging any visible annular space with resin used to impregnate the liner creating a watertight seal. Any defects that will affect, in the foreseeable future, or warranty period, the integrity or strength of the CIPP, shall be repaired at the Contractor’s expense.

After lining is complete, lateral connections to existing structures shall be reopened without excavation. The Contractor shall submit certification that they have the equipment necessary to reestablish lateral connections prior to work beginning for review and approval by the District. Unless otherwise directed by an authorized representative from the District, all laterals will be reinstated. No additional payment will be made for excavations for the purpose of reopening connections and the Contractor will be responsible for all costs and liability associated with such excavation and restoration work.

After all work is completed, the Contractor shall perform a post lining CCTV inspection to ensure an adequate quality of work. The liner shall be free of sags, folds, lifts or other irregularities that indicate improper fit or inadequately cured zones. The liner shall have no leakage or infiltration through the wall liner. Cut ends and lateral reinstatements shall provide a solid homogenous wall section without separations or delaminating

The basis of payment for providing the work for bid Items 2-11 shall be done on a unit price per linear foot basis per completed installation in accordance with the unit prices contained in its proposal. Payment shall include all flow control, safety, labor, equipment, material, installation, testing, site restoration and all other work specified or not which is reasonably required to provide a completed installation. Any item not specified shall be considered incidental to the

work. Contractor shall include all incidental cost in the unit price for the installation of cast-in-place liner.

B. Manhole Relining

Contractor shall, prior to manhole coating, remove all debris from the manhole walls and shelf using high pressure water spray (minimum 1,200 psi). Loose and protruding brick, mortar and concrete shall be removed using a masons hammer and chisel. All non-leaking voids shall be filled with a non-shrink cement-based material containing hydraulic cement, as approved by the District at least 1 hour prior to application of the first coat of liner. Prior to the application of the sewer lining material, Contractor shall document the condition of the existing sewer structure.

Manholes shall either be lined with an epoxy coating or a fiberglass material. Coatings shall be applied in accordance with the manufacturer's recommendations, including surface preparation as specified.

For fiberglass lining, the inner surface exposed to the chemical environment shall be a resin-rich layer of 0.010 to 0.020-inch thick. The inner surface layer exposed to the corrosive environment shall be followed with a minimum of two passes of chopped roving of minimum length 0.5-inch (13 mm) to maximum length of 2.0-inch (50.8 mm) and shall be applied uniformly to an equivalent weight of 3 oz/ft. Each pass of chopped roving shall be well rolled prior to the application of additional reinforcement. The combined thickness of the inner surface and interior layer shall not be less than 0.10-inch (2.5 mm). After the inner layer has been applied the manhole wall shall be constructed with chop and continuous strand filament wound manufacturing process, which insures continuous reinforcement and uniform strength and composition. The cone section, if produced separately, shall be affixed to the barrel section at the factory with resin-glass reinforced joint resulting in a one-piece unit. Seams shall be fiberglassed on the inside and the outside using the same glass-resin jointing procedure.

After application of the fiberglass material, flow access points shall be cut in place to prevent the blockage of any drop manhole connections. The liner shall be cured a minimum of 4 hours before being exposed to flow. All applied fiberglass lining materials must conform to ASTM D 3753.

For epoxy lining, Surface to receive lining shall be saturated but free of water drops. Liner shall be sprayed on following manufacturer's recommendations. Spray material to a minimum 1.0-inch uniform thickness to ensure that all voids and crevices are filled and a smooth surface remains after troweling. Trowel to compact material into voids and crevices and to "set" the bond on the manhole surface. Below 12 feet, minimum liner thickness shall be 1.5-inch (28 mm). Top limit of the liner shall be a minimum of 1.0-inch (25 mm) up onto the casting. The shelf shall receive a single coat of a minimum 0.5-inch (7.5 mm) thickness at the invert and shall increase in thickness in the direction of the wall so as to provide the required minimum slope. The entire bench shall be coated to the edge of the invert channel. The shelf/wall intersection shall receive a radiused fillet.

For polyurethane coatings, the surface prior to spraying shall be damp without noticeable free water droplets or running water. Material shall be spray applied to a minimum uniform thickness to insure that all voids and crevices are filled and a smooth surface remains after troweling for cement-based mix. The troweling of the cement-based mix shall compact material into voids and crevices and "set" the bond on the manhole surface (brick, tile, block or concrete).

After the first application has taken an initial set, but not over 72 hours, a second coat shall be spray applied to assure a minimum total thickness of ½ inches and trowel to a smooth finish for cement-based mix and a minimum total thickness of 1/8 inches for urethane-based material. Following the second application to the walls for the cement-based mix method, the wooden bench covers shall be removed and the bench sprayed from walls to the invert in a method to produce a bench having a gradual slope from the walls to the invert with the wall/bench intersection built up and rounded to a uniform radius the circumference of the intersection. In addition, the thickness of the bench shall be no less than 1/2 inch at the invert and shall increase in the direction of the wall to provide the required slope. For the urethane-based material, the manhole wall and bottom thicknesses shall be stipulated by ground water pressure as recommended by manufacturer.

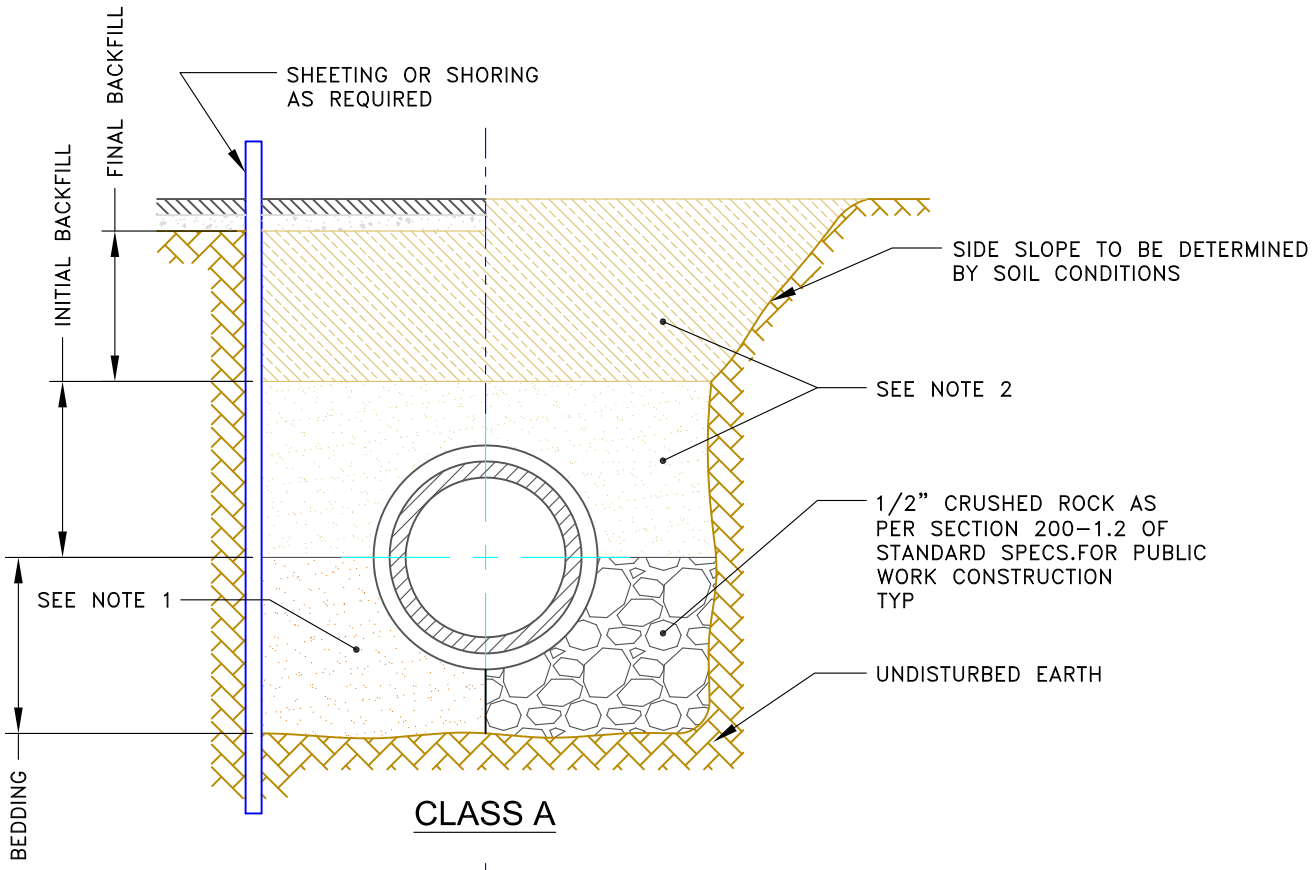
No application shall be made when ambient temperatures are less than 40°F and when freezing is exp ected within 24 hours unless specific recommendations are made by the manufacturer. Ambient temperatures of the mixture shall not exceed 90°F.

The final application shall have a minimum of 4 hours cure time before being subjected to active flow.

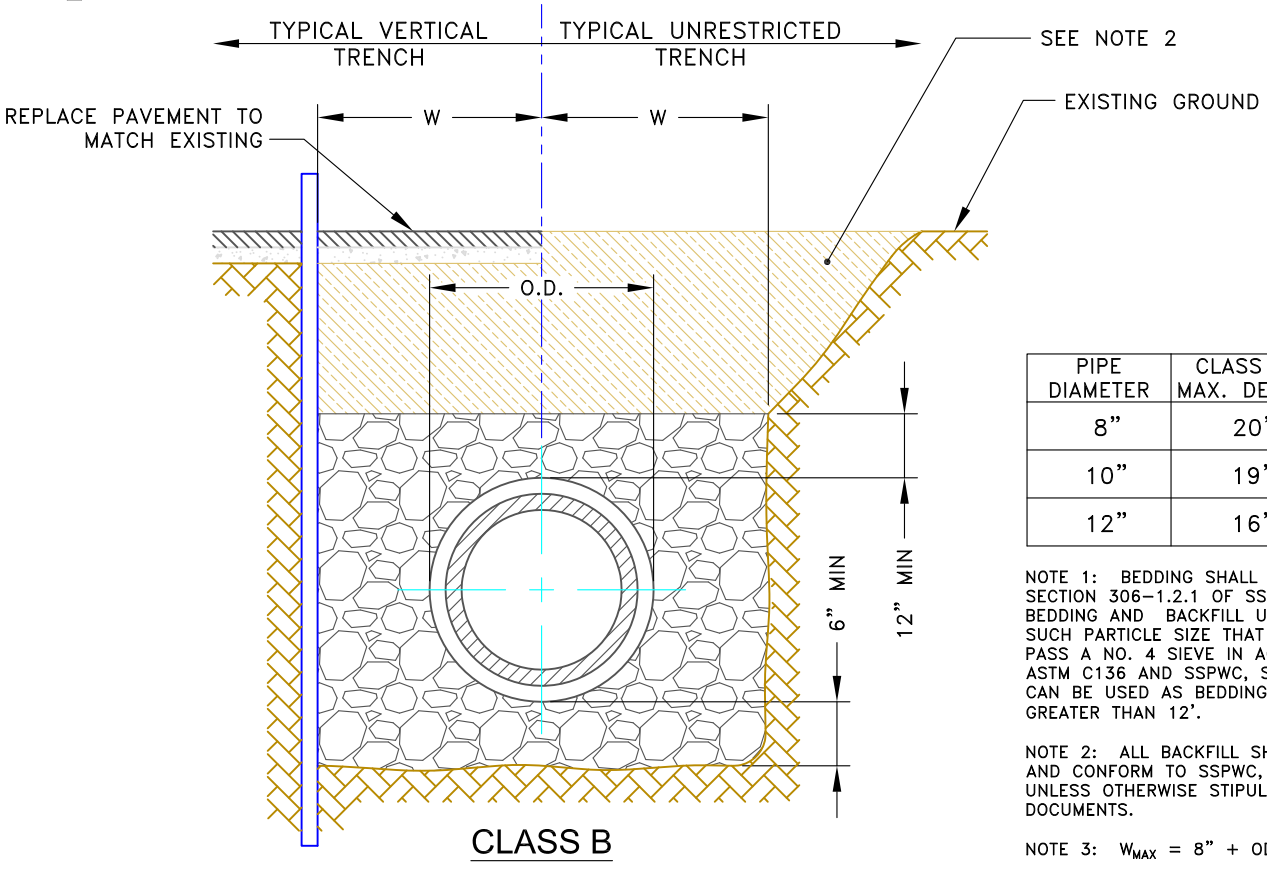
All Manhole lining shall comply with Standard Specifications For Public Works Constructions (SSPWC) specification 500-2.

After all work is completed, the Contractor shall perform a post-lining CCTV inspection to ensure an adequate quality of work. The liner shall be free of sags, folds, lifts or other irregularities that indicate improper fit or inadequately cured zones. The liner shall have no leakage or infiltration through the wall liner. Any flow lines that may have been blocked by the application shall be reopened. The liner shall be cured a minimum of 4 hours before being exposed to flow. All applied epoxy lining materials shall conform to ASTM D 4787.

Inverts with visible damage or infiltration shall be repaired. Contractor shall block flow and clean invert. Patch material shall be applied a minimum of 0.5-inch thick over the entire invert and shall extend onto the bench sufficiently to tie to subsequent liner placement.



CLASS A



CLASS B

PIPE DIAMETER	CLASS A MAX. DEPTH	CLASS B MAX, DEPTH
8"	20'	30'
10"	19'	30'
12"	16'	21.5'

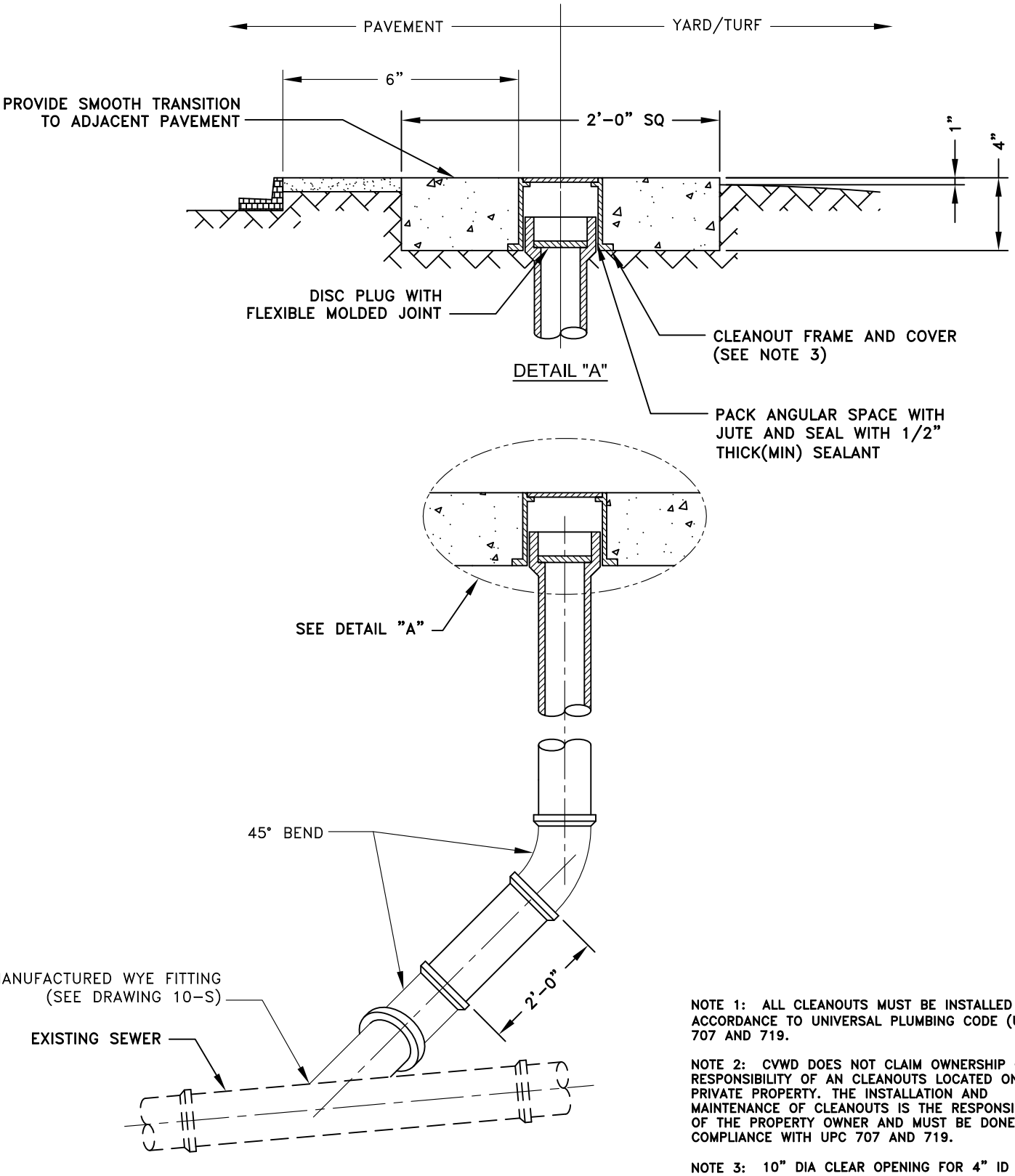
NOTE 1: BEDDING SHALL BE DONE PER SECTION 306-1.2.1 OF SSPWC FOR CLASS A BEDDING AND BACKFILL USED SHALL BE OF SUCH PARTICLE SIZE THAT 90-100% WILL PASS A NO. 4 SIEVE IN ACCORDANCE WITH ASTM C136 AND SSPWC, SECT. 306-1.2.1. CAN BE USED AS BEDDING IF DEPTH IS NO GREATER THAN 12'.

NOTE 2: ALL BACKFILL SHALL BE IMPORTED AND CONFORM TO SSPWC, SECT. 306-1.3.7 UNLESS OTHERWISE STIPULATED IN CONTRACT DOCUMENTS.

NOTE 3: W_{MAX} = 8" + OD/2

CRESCENTA VALLEY WATER DISTRICT

SCALE: NTS	TRENCH AND BACKFILL STANDARD	DATE: 03/14/2008
DRAWN BY: B. YARED		JOB NO. – / DWG NO. 40-S
APP'VD BY: D. GOULD		

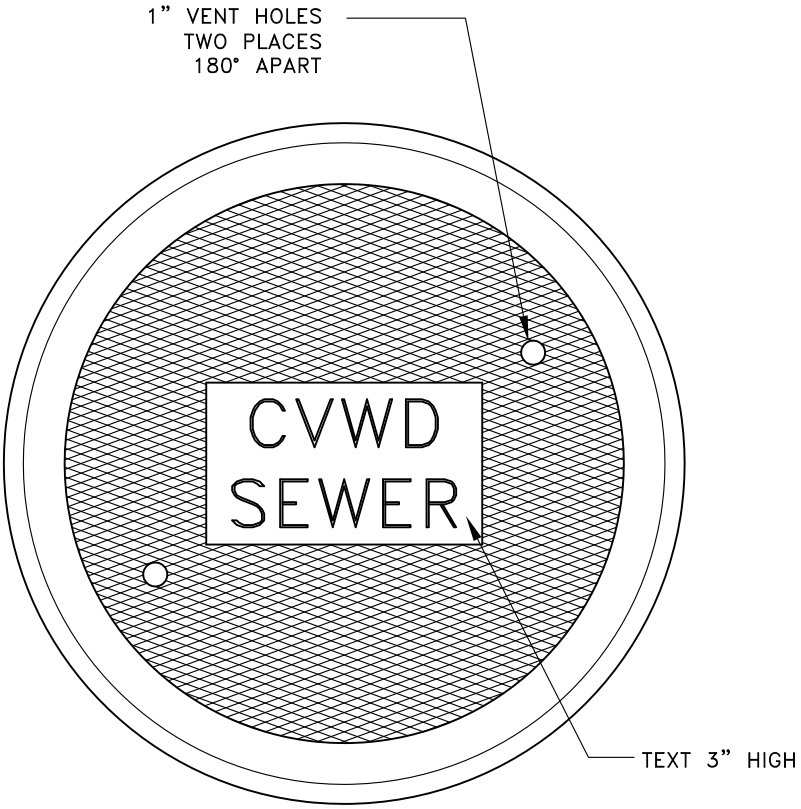


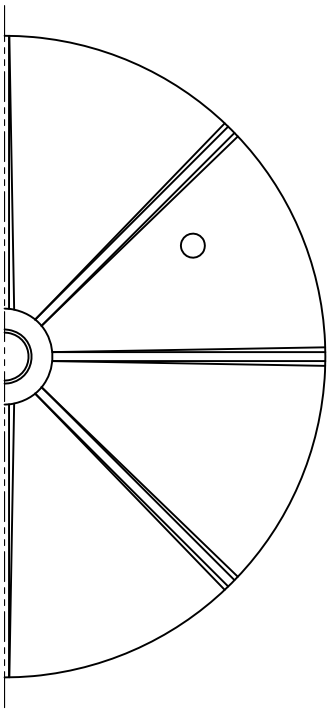
NOTE 1: ALL CLEANOUTS MUST BE INSTALLED IN ACCORDANCE TO UNIVERSAL PLUMBING CODE (UPC) 707 AND 719.

NOTE 2: CVWD DOES NOT CLAIM OWNERSHIP OR RESPONSIBILITY OF AN CLEANOUTS LOCATED ON PRIVATE PROPERTY. THE INSTALLATION AND MAINTENANCE OF CLEANOUTS IS THE RESPONSIBLITY OF THE PROPERTY OWNER AND MUST BE DONE IN COMPLIANCE WITH UPC 707 AND 719.

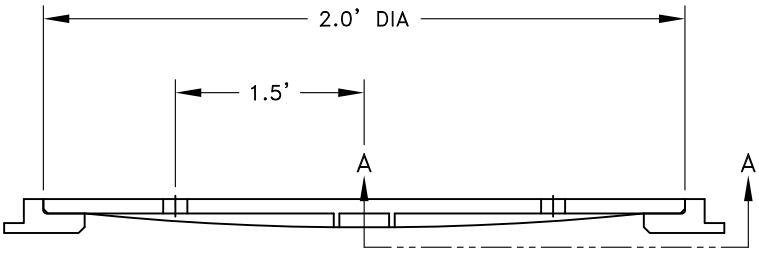
NOTE 3: 10" DIA CLEAR OPENING FOR 4" ID PIPE
12" DIA CLEAR OPENING FOR 6" ID PIPE
14" DIA CLEAR OPENING FOR 8" ID PIPE

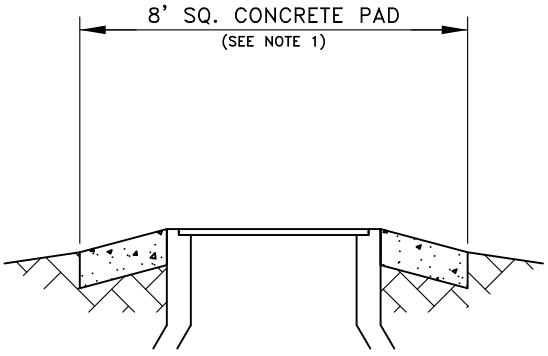
CRESCENTA VALLEY WATER DISTRICT			
SCALE: NTS	STANDARD CLEANOUT	DATE: 04/18/2008	
DRAWN BY: B YARED		JOB NO.	DWG NO.
APP'VD BY: D GOULD		–	30-S





SECTION A–A





TOP OF MANHOLE IN UNIMPROVED AREA

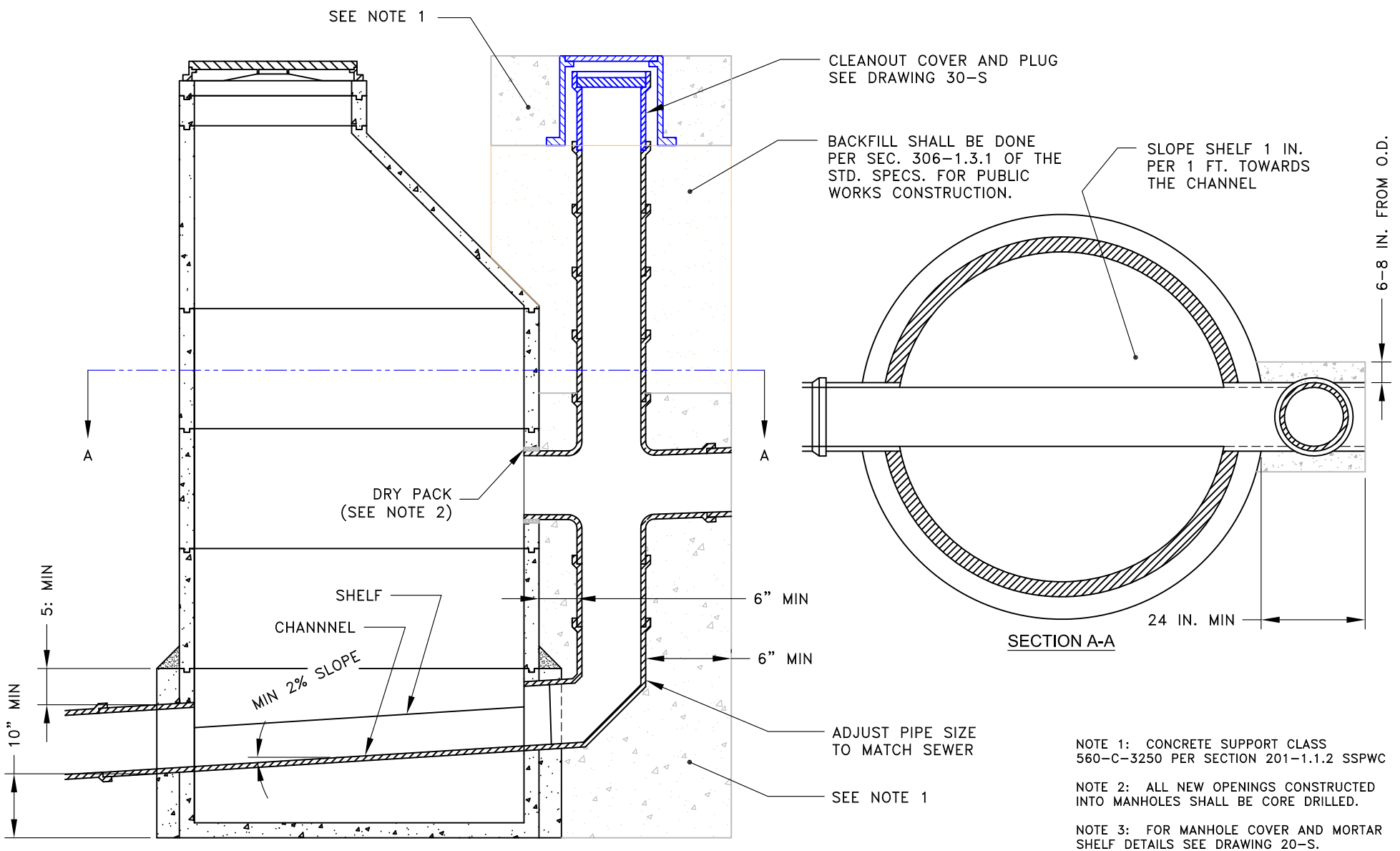
NOTE 1: MANHOLE LIDS TO BE MADE FROM CAST IRON ASTM DESIGNATION: A 48, CLASS 30B OR GREATER

NOTE 2: MANHOLE MUST WEIGH A MINNIMUM OF 260 LBS

NOTE 3: MANHOLE COVER AND RING SHALL BE LOCKING TYPE CAPAGLE OF WITHSTANDING H–20 HIGH LOADING.

NOTE 4: FOR MANHOLES IN UNPAVED AREAS USE OF A FLIP LID CAPABLE OF WITHSTANDING H–20 TRAFFIC LOADINGS IS REQUIRED.

CRESCENTA VALLEY WATER DISTRICT			
SCALE: NTS	STANDARD RING AND COVER	DATE: 02/26/2010	
DRAWN BY: B. YARED		JOB NO. –	DWG NO. 22–S
APP'VD BY: D. GOULD			



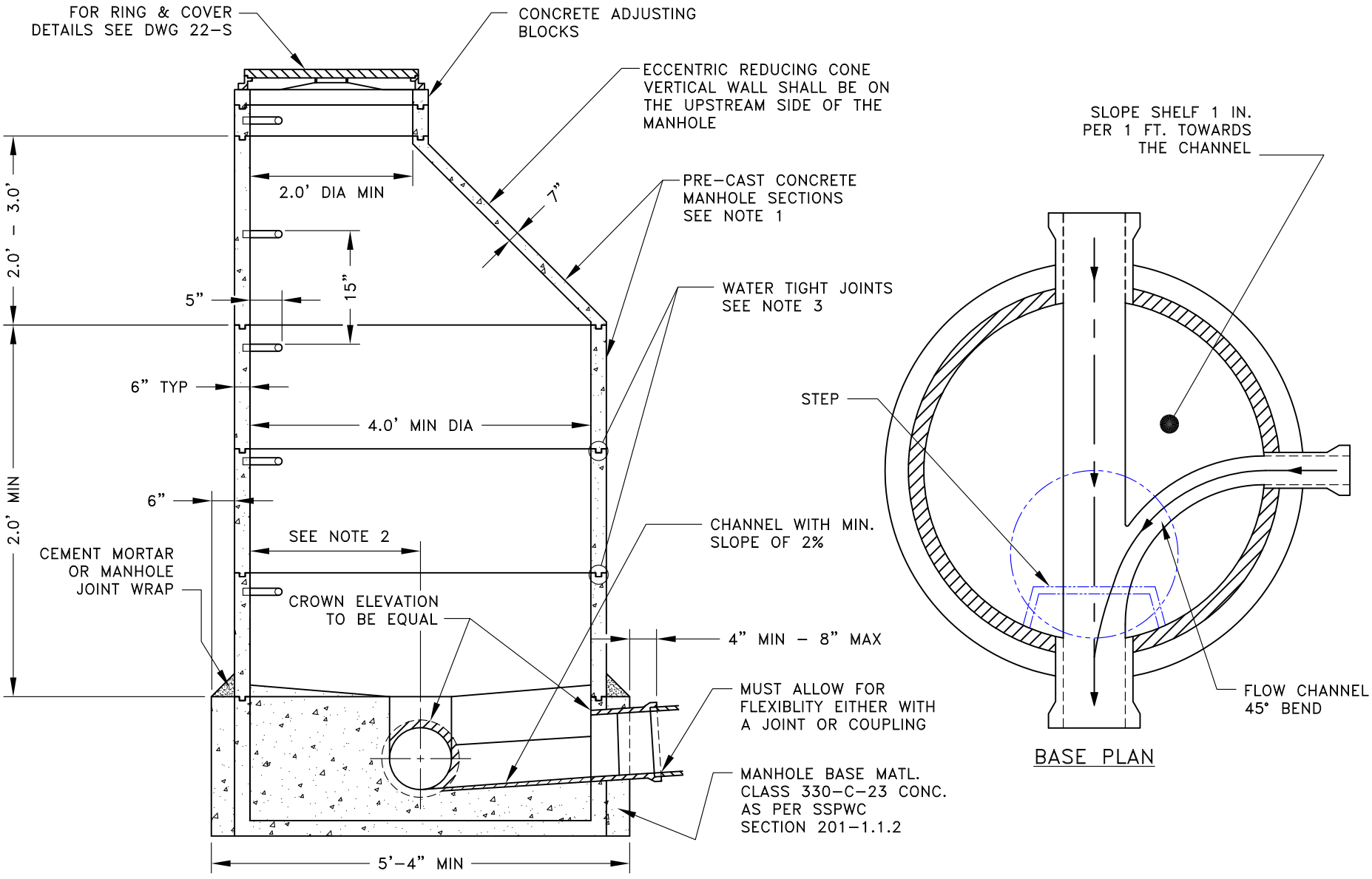
NOTE 1: CONCRETE SUPPORT CLASS 560-C-3250 PER SECTION 201-1.1.2 SSPWC

NOTE 2: ALL NEW OPENINGS CONSTRUCTED INTO MANHOLES SHALL BE CORE DRILLED.

NOTE 3: FOR MANHOLE COVER AND MORTAR SHELF DETAILS SEE DRAWING 20-S.

NOTE 4: DROP MANHOLES ONLY ALLOWED WITH SPECIAL CONSIDERATION BY THE DISTRICT.

CRESCENTA VALLEY WATER DISTRICT			
SCALE: NTS	STANDARD DROP MANHOLE	DATE: 04/09/2008	
DRAWN BY: B YARED		JOB NO.	DWG NO.
APP'VD BY: D GOULD		-	21-S



SECTION VIEW

BASE PLAN

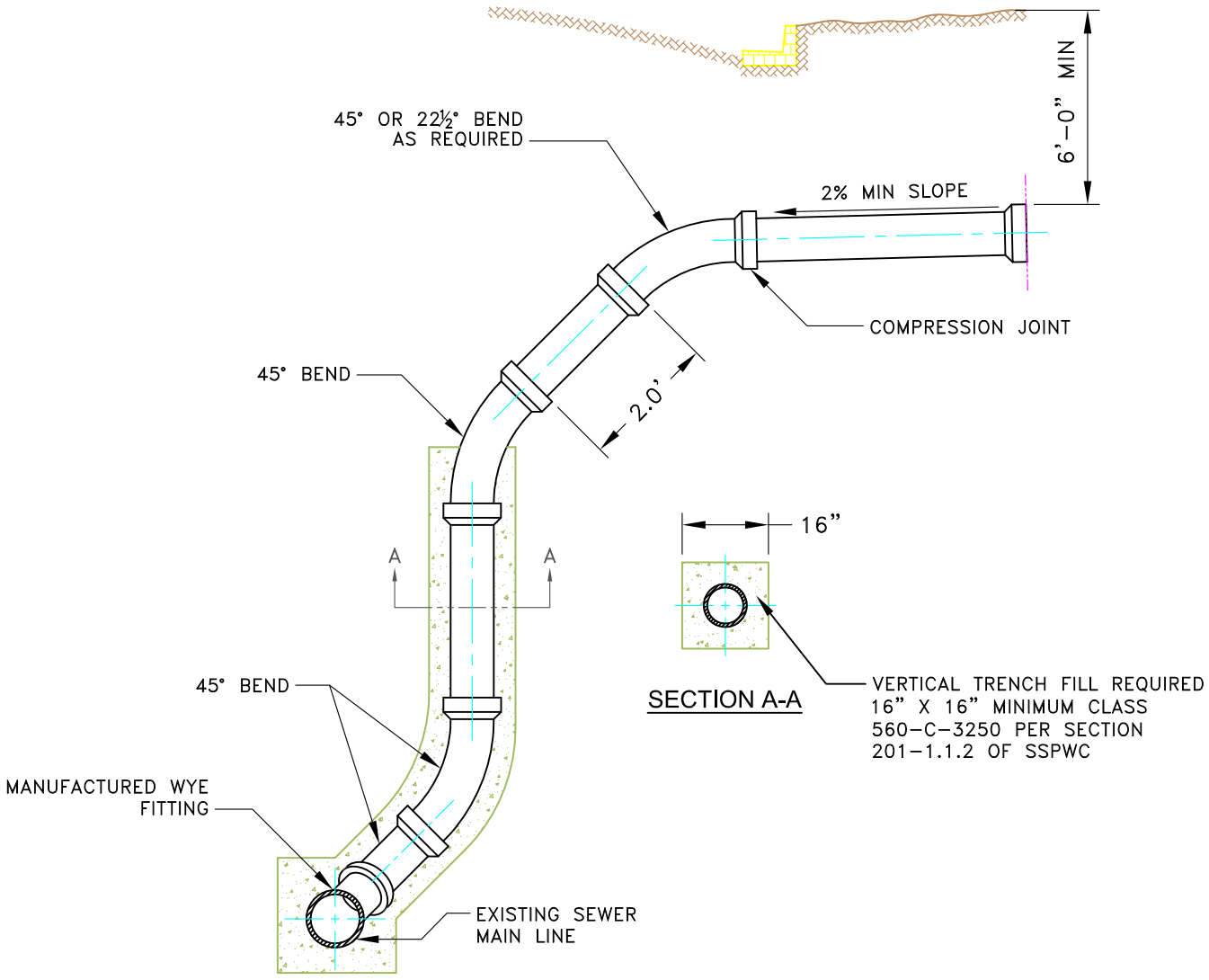
NOTE 1: NON-REINFORCED PRE-CAST MH'S SHALL BE CLASS 560-C-3250 AS PER SECT. 201-1 OF THE SSPWC. REINFORCED PRE- CAST MH'S SHALL MEET ASTM C-478 SPECS.

NOTE 2: FOR OFFSET MH'S THIS DIMENSION SHALL BE 1'-6".

NOTE 3: SUFFICIENT MORTAR SHALL BE APPLIED TO PROVIDE FOR A WATER TIGHT SEAL AROUND THE FULL CIRC. OF THE JOINT.

CRESCENTA VALLEY WATER DISTRICT

SCALE: NTS	STANDARD 48" MANHOLE	DATE: 03/13/2008
DRAWN BY: B. YARED		JOB NO. - / DWG NO. 20-S
APP'VD BY: D. GOULD		



NOTE 1: CHIMNEY SERVICE LATERALS SHALL BE INSTALLED ON ALL LINES 15' DEEP OR GREATER

NOTE 2: COMPRESSION JOINTS FOR VCP SHALL MEET ASTM C-425

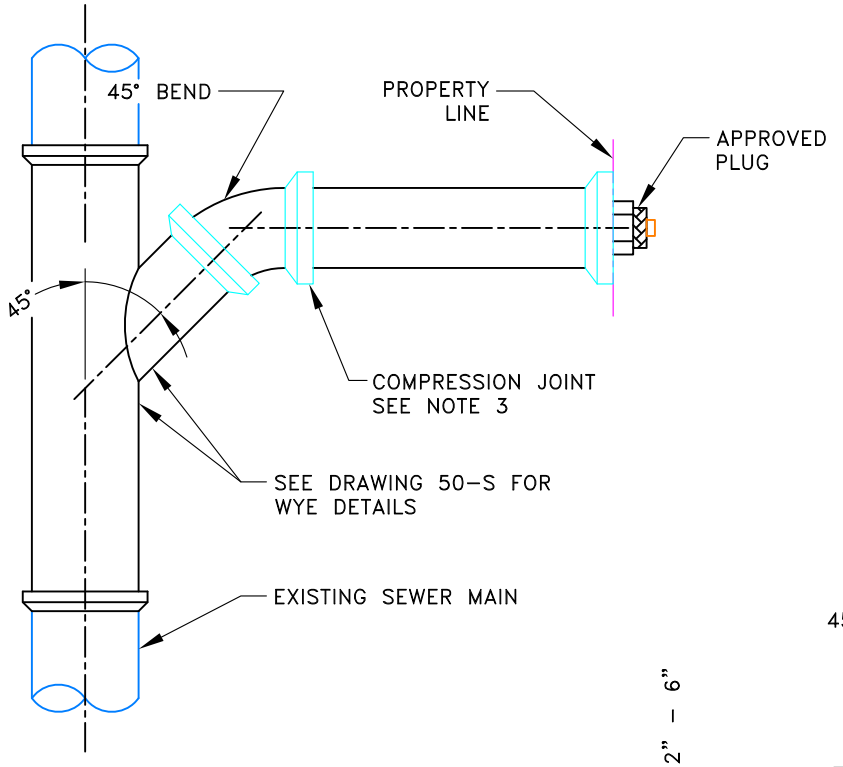
NOTE 3: SUITABLE TOILET FACILITIES, IN COMPLIANCE WITH THE UNIFORM PLUMBING CODE, MUST BE INSTALLED, AT THE OWNERS EXPENSE, IN ANY PROPERTY THAT CONNECTS TO THE PUBLICLY OWNED SEWER

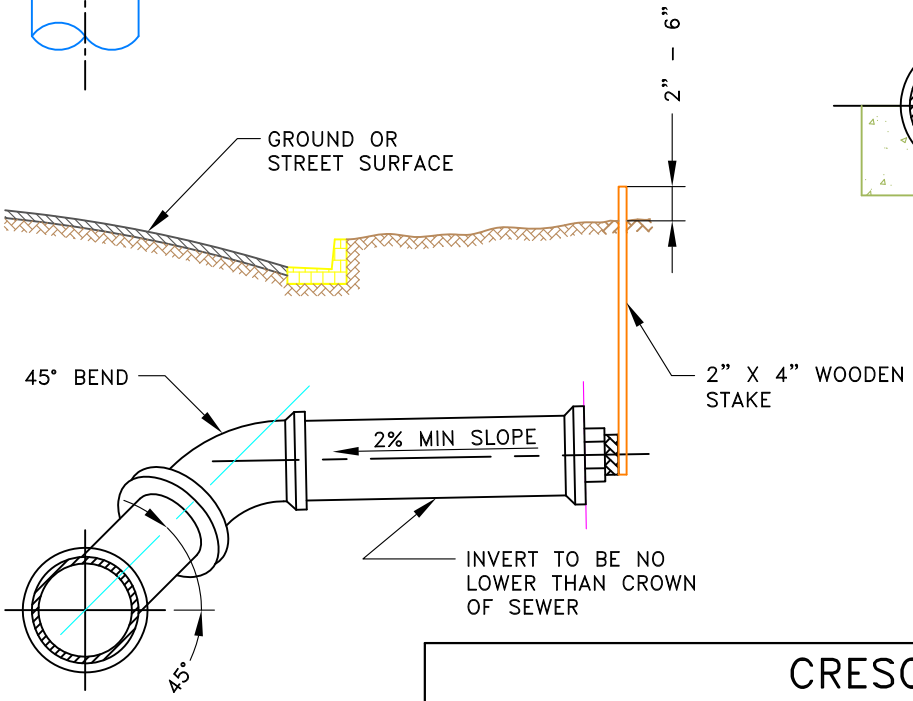
NOTE 4: ALL WORK DONE MUST BE INSPECTED AND APPROVED BY CVWD

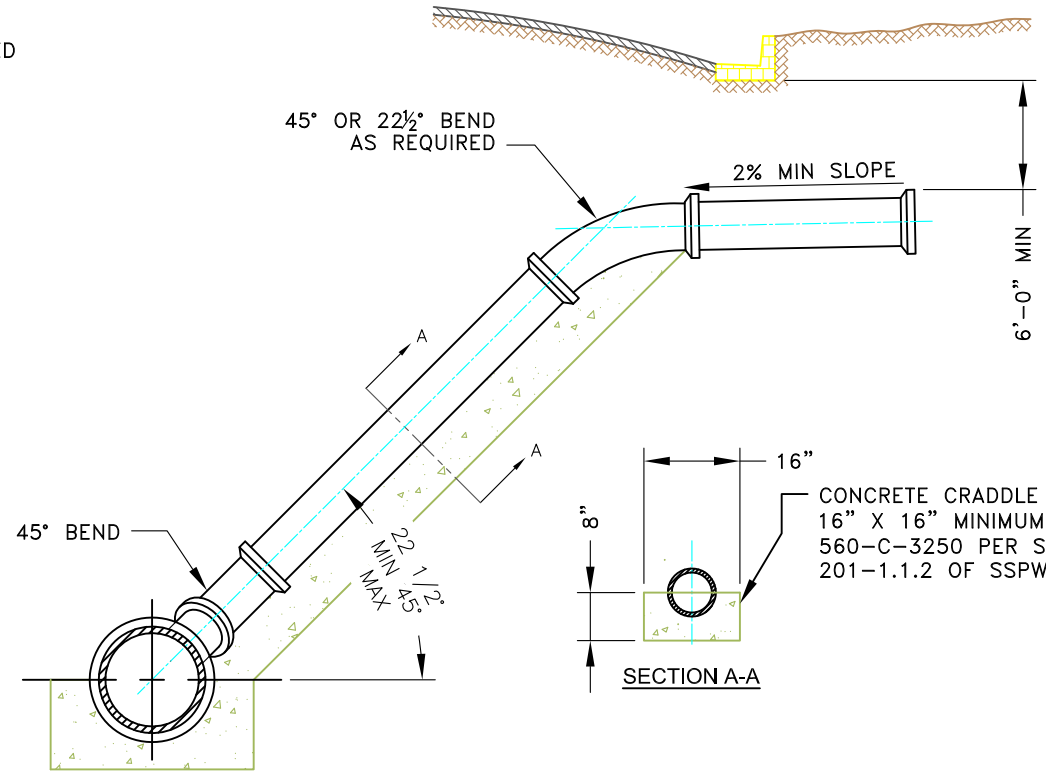
CRESCENTA VALLEY WATER DISTRICT

CVWD

SCALE: NTS	STANDARD CHIMNEY LATERAL	DATE: 03/14/2008	
DRAWN BY: B. YARED		JOB NO. –	DWG NO. 11-S
APP'VD BY: D. GOULD			







DEEP LATERAL

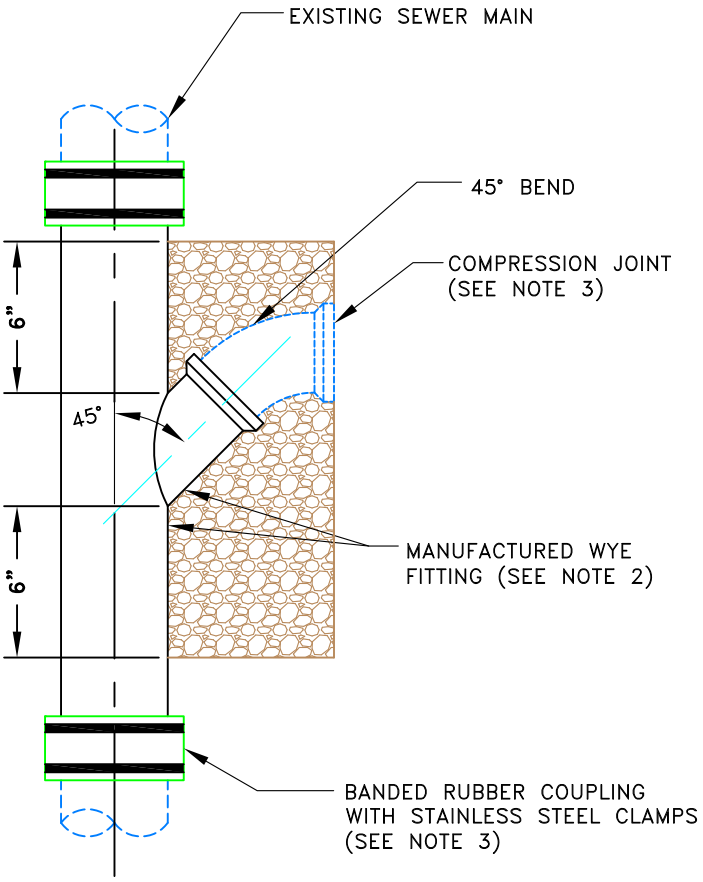
NOTE 1: FOR BEDDING DETAILS SEE DRAWING 40-S

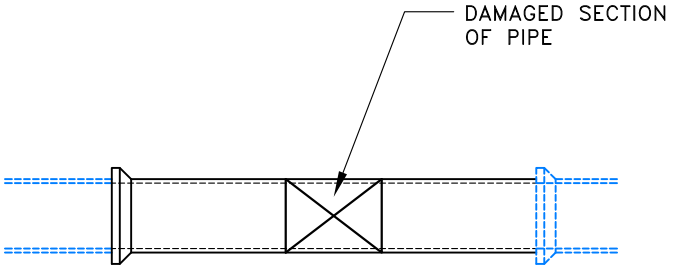
NOTE 2: COMPRESSION JOINTS FOR VCP SHALL MEET ASTM C-425

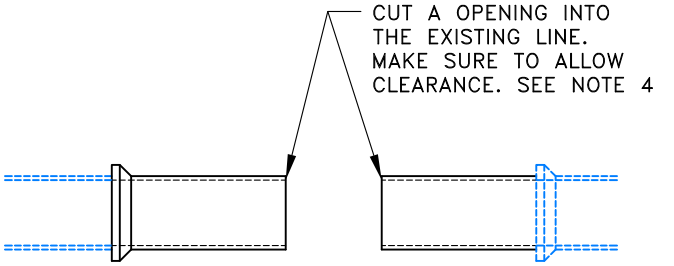
NOTE 3: SUITABLE TOILET FACILITIES, IN COMPLIANCE WITH THE UNIFORM PLUMBING CODE, MUST BE INSTALLED, AT THE OWNERS EXPENSE, IN ANY PROPERTY THAT CONNECT TO THE PUBLICLY OWNED SEWER.

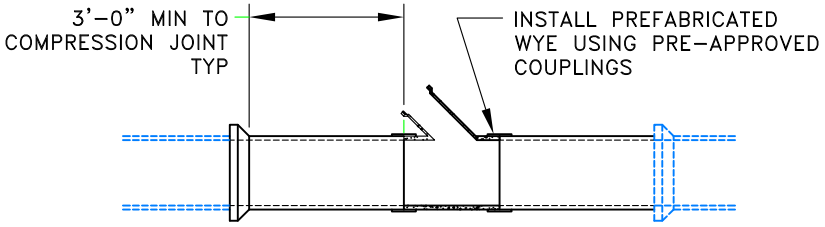
NOTE 4: ALL WORK DONE MUST BE INSPECTED AND APPROVED BY CVWD

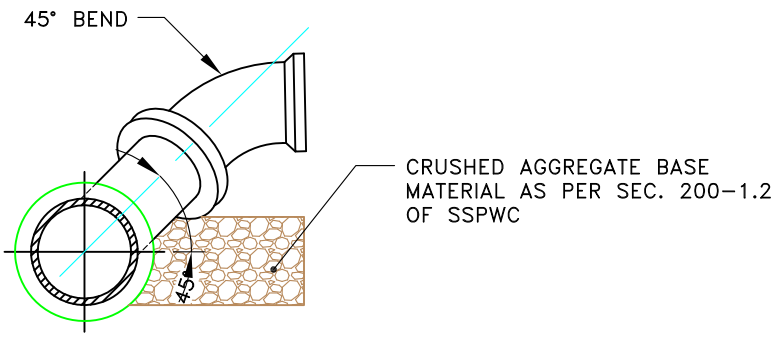
CRESCENTA VALLEY WATER DISTRICT			
SCALE: NTS	STANDARD SERVICE CONNECTION	DATE: 04/09/2008	
DRAWN BY: B. YARED		JOB NO. –	DWG NO. 10-S
APP'VD BY: D. GOULD			











NOTE 1: ALL CONNECTIONS TO THE CVWD WASTE WATER COLLECTIONS SYSTEM MUST BE DONE USING A PREFABRICATED WYE FITTING

NOTE 2: WYE PIPE BRANCH FASTENING MATERIAL SUCH AS EPOXY RESIN OR OTHER ACCEPTED MATERIAL SHALL HAVE STRENGTH EQUAL TO THE PIPE MATERIAL

NOTE 3: COMPRESSION JOINTS AND COUPLINGS FOR VCP SHALL MEET ASTM C425

NOTE 4: REMOVED PIPING SECTION MUST BE CUT CLEANLY AND ALL MATERIAL MUST BE DISPOSED OF PROPERLY

NOTE 5: ALL WORK DONE MUST BE INSPECTED AND APPROVED BY CVWD

CRESCENTA VALLEY WATER DISTRICT

CVWD

SCALE: NTS	STANDARD CONNECTION INTO EXISTING SEWER	DATE: 4/18/2008
DRAWN BY: B YARED		JOB NO. – / DWG NO. 50-S
APP'VD BY: D GOULD		