

SEWER NOTES

Unless otherwise indicated herein, all work shall be done in accordance with:

- A. The standard specifications for Public Works Construction (SSPWC) latest approved edition.
- B. The Regional Supplemental Amendments to the Standard Specifications for Public Works' Construction.
- C. The San Diego Regional Standard Drawings (SDRSD), latest approved edition.

Sewer Notes shall include the following special provisions:

1. Trench width shall be per SDRSD No. SP-02, for pipe up to 15 inches, unless otherwise noted. For pipe 15 inches and over, trench width shall be per specifications for Public Works Construction, 306-1.2.13.
2. Pipe and bedding conditions including filter fabric wrap "Burrito Wrap" with 12 inch an overlap, shall be per SDRSD SP-02, for pipe up to 18 inches. For pipe 18 inches and above, refer to SSPWC Section 306-1.2.13. Whenever the excavated material is not suitable for backfill, the Contractor shall remove this material and arrange for and furnish suitable imported backfill material which is capable of attaining the required relative density. Imported backfill material, or other backfill material shall be approved by the Engineer, and per Section 306-1.3.5 of the "Greenbook" Standard Specifications.
3. PVC pipe bedding from the bottom of pipe to 12 inches minimum above the pipe shall be 3/4 -inch crushed rock. Filter fabric wrap "Burrito Wrap" is required where crushed rock envelope is used.
4. After completion of pipe laying, all main line sewers, service laterals and structures shall be tested in the presence of the inspector. Air pressure test, per SSPWC Section 306-1.4.4.1, and Mandrel Test, per Section 306-1.212 shall be used unless otherwise directed by the County inspector.

Final acceptance of sewer lines will be subject to internal closed circuit television (CCTV) inspection. It will be the permittee's responsibility to pay for the cost of this work.

A. CCTV Inspection Procedures:

- 1) Video inspection shall show with high resolution operational and structural defects e.g., inflows, sags, offset joints, cracks, roughness, "fins" or folds in the pipelines, complete with audio commentary and inspection log.
- 2) The Sanitation District Engineer and County Inspector shall be notified a minimum of 2 Working Days in advance of video inspecting.

- 3) Video inspection shall be performed one pipe reach (e.g., manhole to manhole) at a time.
- 4) The Contractor shall video inspect the pipeline with maximum flow diverted (if required) from the pipeline. The pipe reach being inspected shall be isolated from the remainder of the pipelines with the upstream sewage flow bypassed (if required). In the event that the existing flow is interfering with the video operation, a bypass shall be performed by the Contractor to lower the flow volume sufficiently to allow for a clear video picture. Sufficient water shall be supplied to the isolated section to cause drainage reaching the downstream manhole prior to video inspecting. If existing flows are high, pre-construction video inspection can be done with partial flow. Depth of the flow shall not exceed:
 - a. Pipes 6" - 10" - 20% of the pipe diameter.
 - b. Pipes 12" - 24" - 25% of the pipe diameter.
 - c. Pipes 27" and up - 30% of the pipe diameter.
- 5) The camera shall be moved through the pipeline in a downstream direction at a uniform rate by means of power cable winches or self-propelled tractors at each manhole, stopping and rotating the camera head at each lateral connection, defect, or both to allow for adequate evaluation. The Contractor shall stop when necessary to ensure proper documentation of the pipe condition, but in no case shall the camera be pulled at a speed greater than 30' per minute. A clear picture shall be provided looking into each service connection. Both pre and post video inspections shall be submitted to the Engineer.
- 6) Measurement for location of defects shall be above ground by means of a measuring device. Footages shown in the digital files shall coincide with horizontal lengths from stationing as shown on the Plans. Footage measurements shall begin at the centerline of the upstream manhole or storm drain access point, unless permission is given by the Engineer to do otherwise.
- 7) The Contractor shall clean the sewer mains prior to video inspecting as necessary to adequately perform the video recording operations. If the camera will not pass through the entire pipeline section, the Contractor shall reset the equipment at the downstream manhole and attempt to inspect the section of pipe from the opposite direction. If the camera fails to pass through the entire section, it shall be assumed that an obstruction exists. Efforts to video record that section of pipe shall be temporarily suspended and the Contractor shall notify the Engineer. Upon removal of the obstruction, the Contractor shall complete the inspection.

- 8) If an obstruction is encountered during the post-construction video inspection, the Contractor shall remove the obstruction by excavation, repair, or other means approved by the Engineer at the Contractor's expense, in order that video inspection may continue.
- 9) The system used to move the camera through the pipe shall not obstruct the camera's view. The Contractor shall calibrate the measuring device each day with a known distance to the satisfaction of the Engineer prior to starting the inspection and video recording process.
- 10) The Contractor shall obtain the Engineer's approval for any additional point repairs.

B. Tolerances encountered following inspection shall be addressed as follows:

- 1) For new underground sewer installations, the maximum operational tolerance for sag shall be 1/2". When video recorded inspection is used to check for sag, a calibrated 1/4" diameter steel bar/"sag gage" or approved equal device, mounted in front of the camera, shall be used to measure the depth of sag.
- 2) If the Engineer determines that the deficiencies or sags are non-repairable in place, the affected portion(s) shall be reconstructed.

5. The construction of PCC sewer manhole per SDRSD SM-01 or SM-02 poured-in-place manhole bases shall be a monolithic pour finished complete at time of pour. Each new manhole shall be vacuum tested prior to back filling. The test shall be conducted immediately after placement of pre-cast units with polymer mortar/butyl sealant. All pipes in the manhole shall be securely plugged. The test head shall be placed at the inside of the top pre-cast unit prior to the installation of the grade ring, and the seal inflated in accordance with the manufacturer's recommendations.

A vacuum of 10 PSI shall be drawn and the vacuum pump shut off. With the valve closed, the time shall be measured for the vacuum to drop to 9 PSI. The manhole shall pass if the time is greater than 75 seconds for SDRSD SM-2 and 60 seconds for SDRSD SM-1 manhole. If the manhole fails the initial test, necessary repairs shall be made with no shrink grout while vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained.

6. The construction of 4-inch sewer laterals shall be per SDRSD SS-01 and SS-02. Laterals shall not discharge directly into manholes. A cleanout shall be installed approximately 2 feet inside the property line.
7. The construction of cut-off walls shall be per SDRSD No. SP-07 on all segments having a slope of 20% to 50%. Construction of slope protection walls shall be per SP-05.
8. All mains and laterals shall be constructed with 48 inches minimum cover, provided that the invert of the lateral at the property line is above the soffit line of the sewer main.

9. The final location and elevation of sewer and water laterals shall be shown on original plans, prior to acceptance for public use.
10. All design changes of sewer mains shall be approved by the district engineer, in writing, prior to acceptance of work.
11. Fill areas must be compacted to 90% prior to pipe installation.
12. The contractor shall notify the Private Development Construction Inspection department or San Diego County Sanitation District Office 48 hours in advance of beginning work to arrange for inspection of the project.
13. The contractor shall purchase a permit from the County Department of Public Works for any excavation within existing County rights-of-way.
14. Contract record drawings must be submitted prior to final acceptance of the work. They must reflect post construction verification of pipe lengths and invert elevations.
15. The contractor shall guarantee all work for a period of 1 year after the date of acceptance of the work by the owner and shall repair or replace any or all such work together with any other work that may be displaced in so doing, that may prove defective in workmanship and/or materials within the 1-year period from date of acceptance without expense whatsoever to the owner, ordinary wear and tear, unusual abuse or neglect excepted.
16. The contractor shall furnish and install, per specifications, the appropriate buried utility warning and identification tape above all public sewer lines, including sewer laterals, located in the public right-of-way.
17. The contractor must call "Dig-Alert" of Southern California to have underground service utilities located prior to construction. The call will be made at least 48 hours prior to any construction. 1-800-422-4133.
18. At all manholes, the minimum fall across manhole shall be 0.1 feet, at angles larger than 45 degrees, allow 0.2 feet fall.
19. Joint sealant and exterior water proofing (where specified)

Polymer mortar shall be used to join pre-cast components on all manholes to create watertight joints to resist infiltration. The mortar shall be mixed in accordance with the manufacturer's specifications, and shall not exceed five parts sand to one part polymer. Acceptable joint sealant products shall be skidder 31 and 32 hi-mod gel manufactured by Sika Corporation, 490 epoxy putty and 498 underwater epoxy putty manufactured by Engard Coatings, and CS 102 butyl gaskets (rope form) manufactured by concrete sealants or approved equal.

The concrete or other surfaces that are to adhere to polymer mortar shall be free from dust, loose aggregates, oil, grease or other contaminants.

On all manholes, contractor shall apply waterproofing agent consisting of a coal tar emulsion on all exterior surfaces. The emulsion shall be Tnemec 46-465, or approved equal. The emulsion shall be applied in no less than two coats to achieve a total dry thickness of 25 mils minimum. The exterior emulsion coatings shall be applied prior to delivery to the jobsite. In addition, a bitumastic band 6 inches wide shall be applied at all joints on exterior of such manholes that shall be waterproofed. Full compensation for the waterproofing of manholes shall be awarded.

When completed, all manholes shall be watertight with zero infiltration of groundwater.

20. Epoxy lining coating (where specified).

SM-07 constructed manholes as identified on each proposed sewer main profile:

Manhole bottom shall be lined with epoxy. The epoxy product shall be Raven 405 manufactured by Raven Lining Systems, or approved equal.

The primer material shall be 100% solids, moisture tolerant epoxy capable of spray application to 5 mils thickness in one continuous coat.

The lining material shall be 100% solid, high build epoxy capable of spray application to 125 mils thickness in one continuous coat. The material shall meet the requirement of the SSPWC Section 210-2.3.3, "Chemical Resistance Test", and the SSPWC Section 500-2.4.10, "Applicable Standard".

Only workers trained by, and qualified as installers by the manufacturer, shall be used on this work. Contractor shall provide manufacturer's certifications.

The epoxy lining shall be continuous without seams, uniform in color, fully cured, and free of pinholes, surface imperfections, and blisters. The lining must completely bond to the concrete. The color shall be light blue.

Testing of Manhole

The cured epoxy lining shall be spark tested for pinholes at 15,000 volts minimum. All pinholes shall be repaired as specified in Section 500-2.4.9, "Repair Methods" of the SSPWC (Greenbook).