

STORM DRAINAGE UTILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work Specified in this Section: Furnish materials and perform labor required to execute this work as indicated, as specified and as necessary to complete the Contract, including, but not limited to these major items:
 - 1. Coordinate the work of this section with other trades including off-site construction.
 - 2. Verify join elevations at the job site.
 - 3. Protect existing improvements designated to remain.
 - 4. Staking and layout.
 - 5. Storm drain lines and appurtenances.
 - 6. Trenching, backfilling and compaction.
 - 7. Connect to existing facilities.
- B. Related Work Specified Elsewhere:
 - 1. Sanitary sewer, water, gas, electrical and telephone lines.
 - 2. Site grading.
 - 3. Work within the public right-of-way.
 - 4. Interior Building Systems.

1.02 REFERENCE STANDARDS

- A. General: Conform to the latest editions, unless otherwise indicated, of the following reference standards to the extent specified.
- B. Public Works Construction Specifications (indicated hereinafter as PWC Spec.): Standard Specifications for Public Works Construction, including all amendments thereto, except where noted otherwise in this section.
- C. Ordinances, Codes and Regulations: All work shall be installed in accordance with all of the requirements of all legally constituted authorities having jurisdiction, including all local ordinances, codes and the Construction Safety Orders and General Industry Safety Orders of the State Division of Occupational Safety and Health (Cal/OSHA), CCR, Title 8.
- D. American Public Works Association (APWA).

1.03 QUALITY ASSURANCE

- A. General: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work in this section.
- B. Manufacturer's Qualifications: Firms regularly engaged in manufacture of storm drain products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than five years.

- C. Installer's Qualifications: A firm with at least two years of successful installation experience on projects with storm drain work similar to that required for the project.

1.04 SUBMITTALS

- A. Comply with pertinent provisions of Division 01.
- B. Prior to the start of any work, submit three copies of a list of all materials and equipment covered by the section to the County's Representative. The Developer Design/Builder shall allow ample time for checking and processing and to allow the work to be accomplished in accordance with the accepted Schedule, and shall assume all responsibility for delays incurred due to rejected items. No installation of the material concerned shall be made until written approval has been obtained from the County's Representative. Approval of materials and equipment shall in no way obviate compliance with the plans and specifications.
- C. Each item proposed shall be referenced to the section, page and paragraph of the specifications. For each item proposed, give name of manufacturer, trade name and the catalog data and performance data. Lists shall be complete for the project and shall be submitted at one time.
- D. Insofar as possible, all materials and equipment used in the installation of this work shall be of the same brand or manufacturer throughout for each class of material or equipment.
- E. Record Drawings:
 - 1. Comply with provisions of Division 01.
 - 2. All buried piping and indicated future connections, exterior of any building shall be located both by depth and by accurate measurement from a permanently established landmark. All notations on record drawings of buried piping shall be made before any backfilling is started.
 - 3. At completion of the work, these record drawings shall be signed by the Developer Design/Builder, dated and returned to the County's Representative.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Delivery and Storage:
 - 1. Piping: Inspect materials delivered to the site for damage. Store materials with minimum handling on site in enclosures or under protective coverings. Store plastic piping and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.
 - 2. Cement: Store cement immediately upon receipt at site of work. Store bagged cement in a suitable waterproof structure made as air-tight as practicable, and with floors elevated above ground a sufficient distance to prevent absorption of moisture. Stack bags close together to reduce circulation of air, but do not stack against outside walls; arrange storage to permit easy access for inspection and identification of each shipment.
 - 3. Metal Items: Check upon arrival and identify and segregate as to types, functions and sizes. Store in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

- B. Handling: Handle pipe, fittings and other accessories in such a manner as to ensure delivery to the trench in sound undamaged condition. Take special care not to injure fittings. Pipe shall be carried into position and not dragged. Do not leave rubber gaskets and plastic piping that are not to be installed immediately in the sunlight, but store under cover out of direct sunlight.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Buried Warning and Identification Tape: Shall be polyethylene plastic tape with a metallic core manufactured specifically for warning and identification of buried utility lines. Tape shall be provided in rolls, three inches minimum width, APWA color coded for intended service with warning and identification imprinted in bold black letters continuously and repeated over the entire tape length. Warning and identification shall be "CAUTION BURIED STORM DRAIN LINE BELOW" or similar wording. Code and letter coloring shall be permanent, unaffected by moisture and other substances contained in trench backfill material.
- B. Pipe and Pipe Fittings:
1. General: Provide pipes of the following materials, unless otherwise indicated. Provide fittings and accessories of same material and weight/class as pipes, with joining method indicated unless otherwise shown on the drawings.
 2. Reinforced Concrete Pipe: Conforming to PWC Spec. Subsection 207-2, 2000-D unless otherwise specified, with rubber-gasketed joints conforming to PWC Spec. Subsection 208-3.
 3. Cast Iron Pipe: Conforming to PWC Spec. Subsection 207-9.
 4. Polyvinyl Chloride Pipe: Conforming to PWC Spec. Subsection 207-17, with elastomeric gasketed joints.
 5. Rectangular Cast Iron Pipe: Alhambra Foundry, or equivalent.
- C. Pipe to Manhole Flexible Couplings: Conforming to PWC Spec. Subsection 208-6.
- D. Concrete: Conforming to PWC Spec. Subsection 201; 560-C-3250 for structures, 450-C-2000 for pipe bedding and encasement, 100-E-100 for slurry backfill.
- E. Reinforcing Steel: Conforming to PWC Spec. Subsection 201-2, where indicated.
- F. Metal Covers, Grates, Frames and Accessories:
1. Conforming to PWC Spec. Section 206.
 2. Hot-dip galvanize steel parts after fabrication and before installation, in accordance with PWC Spec. Section 210.
 3. Grates and Frames shall be of vandal-proof design and construction. Grates shall comply with the requirements of the Americans with Disabilities Act.
 4. Covers shall be cast with the letter "D". All letters shall be flush with the finished surface of the cover.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Site and Drawings: Carefully examine the site and compare the drawings with existing conditions. By the act of submitting bids, the Developer Design/Builder shall be deemed to have made such examination and to have accepted such conditions, and to have made allowance therefore in preparing his figure.
- B. Verification of Existing Elevations: Verify all join elevations prior to laying pipe.
- C. Verification of Dimensions: Before proceeding with any work, the Developer Design/Builder shall carefully check and verify all dimensions, sizes, etc., and shall assume full responsibility for the fitting-in of his equipment into the structure. Where apparatus and equipment have been taken from typical equipment of the class indicated, the Developer Design/Builder shall carefully check the drawings to see that the equipment he contemplates installing will fit into the spaces provided.

3.02 INSTALLATION

- A. Drainage Structures: Construct catch basins, culverts, manholes and other drainage structures at locations, and to the design and dimensions indicated conforming to PWC Spec. Subsection 303-1. Exposed concrete work shall have a smooth troweled finish with rounded corners and edges finished plumb and true. Provide grates, frames and covers for catch basins as detailed and indicated.
- B. Plastic Line Markers: During back-filling of storm drain systems, install a continuous underground-type plastic line marker, located on the center-line of the buried line at 6 to 8 inches below finished grade.
- C. Building Service Lines:
 - 1. Install storm drain lines to a point of connection within approximately five feet outside of buildings to which such service is to be connected and make connections thereto, unless otherwise noted.
 - 2. If building services have not been installed, provide temporary plugs or caps and mark the location of the service in an approved manner.
- D. Excavation, Pipe Laying and Backfilling:
 - 1. Trench Excavation: Conforming to PWC Spec. Subsection 306-1.1 and in accordance with Cal/OSHA, CCR, Title 8.
 - 2. Pipe Laying: Conforming to the requirements for the type of pipe used in accordance with PWC Spec. Subsection 306-1.2, bedding as indicated. The Developer Design/Builder may, with the written approval of the County's Representative, change the location of a manhole up to one-half of a standard pipe length (4 foot maximum) to avoid cutting a standard pipe length.
 - 3. Backfill and Densification: Conforming to the applicable sections of PWC Spec. Subsection 306-1.3.
 - 4. Trench Resurfacing: Conforming to PWC Spec. Subsection 306-1.5.
- E. Abandonment of Existing Storm Drain Pipe and Structures: Conforming to PWC Spec. Subsection 306-5.
- F. Work in Public Right-of-Way: Conform to the requirements of the City of Los Angeles.
- G. Concreted Rock Slope Protection: Conforming to PWC Spec. Subsection 300-11.

3.03 CLEANING

- A. Removal of Debris: Upon completion and before final acceptance of work, remove all debris, rubbish, left-over materials, waste test water, tools and equipment from site in accordance with regulatory requirements and in an environmentally responsible manner.
- B. Flushing of Lines: Prior to acceptance of work, flush each line to ensure that the entire system is clean and free of obstructions of any nature and provide written certification attesting thereto.

END OF SECTION