SECTION 02620
SUBDRAINAGE SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Section includes specifications for subdrainage systems (underdrains).

1.02 REFERENCE STANDARDS

A. ASTM International (ASTM):

1. D1784 Rigid PVC Compounds and CPVC Compounds

2. D3212 Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

3. F477 Elastomeric Seals (Gaskets) for Joining Plastic Pipe

4. F949 PVC Corrugated Sewer Pipe with Smooth Interior and Fittings

B. State of California, Department of Transportation Standard Specifications (Caltrans):

1. Section 19, Earthwork

2. Section 88, Engineering Fabrics

1.03 SUBMITTALS

A. Manufacturer's data sheet for pipe and fitting materials.

B. Certificate of compliance of the gradation requirements for the granular backfill material included in this Section.

C. Manufacturer’s data sheet and samples for filter fabric.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Pipe:

1. Polyvinyl Chloride (PVC), conforming to ASTM F949, 46 psi pipe stiffness, with double wall construction, PVC resin 12454 B per ASTM D1784.

2. Joints and Gaskets:

a. Joints: Push-on type, designed for elastomeric gaskets, ASTM

D3212.

b. Gaskets: Rubber, ring type, ASTM F477.

3. Perforated pipe slot geometry shall provide a minimum inflow area of 0.5 SQ IN per LF. The perforations shall consist of two rows of 3/8" holes at 3" on centers parallel to the longitudinal axis of the pipe. The rows shall be approximately 1-1/2 inches apart but not spaced over more than 155 degrees of the circumference. The rows shall be arranged in a staggered pattern so that all perforations lie at the midpoint between perforations in adjacent rows. The spigot or tongue end of the pipe shall not be perforated for a length equal to the depth of the socket, and perforations shall continue at uniform spacing over the entire length of the pipe.

B. Underdrain Granular Backfill Material: Backfill material for underdrains located within ballasted track areas shall be 3/4-inch round river rocks. Backfill for underdrains located outside ballasted track areas shall conform to the pervious backfill requirements of Caltrans Standard Specification 19-3.065.

C. Geotextile Filter Fabric: Filter fabric for underdrains in accordance with Caltrans Standard Specifications, Section 88.

D. Cleanouts:

1. Type 1, Schedule 80 PVC, as specified for PVC pipe herein. Provide cast iron bolt down type surface frames and covers adjusted to finish grade

2. Casting for Cleanouts: Cast Iron Frame and Lid, Neenah Foundry Company Floor Box Frame and Lid, or Engineer approved equal. Lid cast with the designation "Clean Out". Diameter of frame adequate to fit over outer diameter size of underdrain pipe.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General Requirements:

1. Line excavated trench with filter fabric, as shown on the Contract Drawings.

2. Unless otherwise indicated, excavate trench and backfill in accordance with Section 02300, Earthwork.

3. Cap cleanout within track ballast at the surface opening.

B. Preparation of Trench Bottom:

1. Unless otherwise indicated, excavate trench bottom to an elevation 6 inches below bottom of pipe.

2. Fill trench bottom to the bottom of pipe grade with underdrain backfill

material to ensure complete and continuous support for the barrel of the pipe.

3. Excavate bell holes to size necessary to accommodate joint.

C. Placement:

1. Lay pipes in the upstream direction to the lines and grades shown, with the bell point upgrade, and with perforations down.

2. Keep interior surfaces of pipes clean during placement. Block pipe ends with pipe caps or plugs to prevent filter material from entering the pipes.

3. Complete installation of geotextile filter fabric as shown on the Contract Drawings.

4. Prevent flooding the pipe trench before backfilling operations.

D. Unless otherwise indicated on the contract drawings, place granular backfill material for bedding uniformly along each side of the pipe in minimum widths of 6 inches, and a minimum depth of 12 inches above the top of pipe, after compaction. Space each layer to eliminate voids.

E. Make connections of solid wall outlet pipes to existing structures in accordance with Section 02630, Storm Drainage System.

3.02 FIELD QUALITY CONTROL

A. Notify and obtain Engineer's approval of pipes and accessories before lowering pipe into the trenches. Replace defective, damaged, or unsatisfactory pipes and accessories.

B. After pipe is laid and joined, notify and obtain Engineer's approval prior to backfilling. Take up and re-lay or replace, any pipe found to be out of alignment, unduly settled, or damaged.

END OF SECTION