

# 500 STRUCTURES

## ITEM 518 - DRAINAGE OF STRUCTURES

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**518.01 Description.** This work consists of constructing drainage systems.

**518.02 Fabrication.** *Fabricate scuppers according to Item 513. Select a fabricator that is at least pre-qualified at the incidental level. The City will base final acceptance of all fabricated members on the Engineer's approval that the fabricated items can be successfully incorporated into structures. Submit mill test reports for structural steel, steel castings, bronze, and sheet lead certified according to 501.07*

**518.03 Materials.** Furnish materials conforming to:

Filter fabric, Type A.....	712.09
Scuppers, structural steel and cast steel.....	513
Metal pipe.....	707
Plastic pipe .....	720.08, 720.12
Other metals .....	711

*Furnish pipe specials of a grade at least as high as the type of pipe specified.*

*Furnish porous backfill consisting of gravel, stone or air-cooled blast furnace slag, with a gradation of 100 percent passing the No. 2 (50 mm) sieve, 30 percent passing the 3/8 inch (9.5 mm) sieve, and 10 percent passing the No. 8 (2.36 mm) sieve. The sodium sulfate soundness loss shall not exceed 15 percent.*

**518.04 General.** As shown on the plans connect all parts to new or existing sewers or other outlets. Prevent sags and low points. While installing to the superstructure, take into account the deflection of spans under full dead load.

**518.05 Porous Backfill.** Place porous backfill at least 18 inches (0.5 m) thick behind the full length of abutments, wing walls and retaining walls. Measure the thickness

of porous backfill normal to the abutment or wall face. The Contractor may leave undisturbed rock or shale within 18 inches (0.5 m) of the abutment or wall. Except as noted below, start the porous backfill between 3 and 6 inches (75 and 150 mm) below the weepholes or perforated pipe. If the bottom of the perforated pipe is at the elevation of the adjacent footing, start porous backfill no lower than the bottom of the footing. Place porous backfill up to the plane created by laterally extending the subgrade surface within the roadway area to the wing walls or to the embankment side slopes. Place sufficient coarse aggregate or other material adjacent to, but not more than 6 inches (150 mm) below the bottom of the weephole to retain the porous backfill. Compact porous backfill according to Item 203. Use a combination of material sizes to obtain a rigid unyielding fill, that allows free drainage to the outlet system through voids in the material.

If shown on the plans, wrap porous backfill in filter fabric. *If the plans require drainage pipe in the porous backfill, provide plastic pipe conforming to 720.12.*

**518.06 Pipe.** For drainage pipe leading down from the superstructure use either galvanized steel pipe, 707.08 or plastic pipe, 720.08. Provide specials, elbows, tees, wyes, and other fittings essential for a complete and satisfactory installation of the same material and quality as the pipe. Construct watertight joints of adequate strength. In steel pipe, weld joints or use clamp-type couplings having a ring gasket. In plastic pipe, make joints according to the applicable ASTM standard. Securely fasten the pipe to the structure with hanger and/or clamp assemblies that are galvanized according to 711.02.

Place subsurface pipe according to Item 603.

For corrugated metal pipe, perforated specials are not required and the Contractor may make bends with adjustable elbows conforming to the thickness requirements of the pipe specifications.

**518.07 Scuppers.** Construct secure and watertight connections, including the connection to adjacent concrete. Provide sound castings true to form and dimension. Weld the joints of structural steel scuppers. Galvanize scuppers according to 711.02.

**518.08 Excavation.** Excavate all material encountered to the dimensions necessary to provide ample space to install sheet piling and bracing and to install pipe or other drainage facility behind abutment and for outlets.

**518.09 Method of Measurement.** The City will measure Porous Backfill and Porous backfill with Filter Fabric by the number of cubic yards (cubic meters). The City will measure pipe specials by the same method as the pipe. If the pipe is by linear foot (meter), the City will measure the pipe along its centerline.

**518.10 Basis of Payment.** The City will pay for accepted quantities at the contract prices as follows:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
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518	Cubic Yard (Cubic Meter),	Porous Backfill
518	Cubic Yard (Cubic Meter),	Porous Backfill with Filter Fabric
518	Linear Foot (Meter)	___ inch (___mm) ___ Pipe, Including Specials
518	Each	Scuppers, Including Supports
518	Pound or Linear Foot (Kilogram or Meter)	Trough Horizontal Conductors
518	Pound or Linear Foot (Kilogram or Meter)	Pipe Horizontal Conductors
518	Linear Foot (Meter)	___ inch (___mm) Pipe Downspout, Including Specials

*The cost to backfill, if not separately itemized in the contract, and excavation is incidental to the drainage facility that necessitates them.*