

NATURAL RESOURCES CONSERVATION SERVICE

CONSTRUCTION SPECIFICATION

587 - STRUCTURE FOR WATER CONTROL - CULVERTS

1. SCOPE

This work shall consist of furnishing materials, excavating, backfilling, and installing the culvert pipe. This work may include but is not limited to pipe, bedding, fittings, joints, outlet structures, and related appurtenances. These items shall be installed as shown on the drawings and as specified herein.

Prior to commencing construction, public utilities shall be notified in accordance with N.Y.S. Industrial Code 753.

2. MATERIALS

The materials required for the culvert shall be as shown on the drawings or as specified in Section 10. The materials specified shall meet the quality requirements as listed in the following latest revision of the appropriate ASTM Specification.

ASTM Specification

PIPE

C-14	Concrete Sewer, Storm Drain, and Culvert Pipe
C-76	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
C-655	Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe
A-760	Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains
B-745	Corrugated Aluminum Pipe for Sewers and Drains
A-53	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
A-134	Pipe, Steel, Electric-Fusion (Arc)-Welded (Sizes NPS 16 and Over)
A-135	Electric-Resistance-Welded Steel Pipe
A-139	Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over)
D-1785	Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
D-2665	Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
D-2241	Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
D-2104	Polyethylene (PE) Plastic Pipe, Schedule 40
D-2447	Polyethylene (PE) Plastic Pipe, Schedules 40 and 80
F-894	Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
F-714	Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

AASHTO Specification

M252	Corrugated Polyethylene Drainage Pipe
M294	Corrugated Polyethylene Pipe, 12-48 inch Diameter
MP7	Corrugated Polyethylene Pipe, 54 and 60 inch Diameter

3. EXCAVATION

All trench excavations over 5 feet shall be sloped or shored in accordance with OSHA part 1926 and N.Y.S. Industrial Code 23. When bracing or other supporting is required, the width of the excavation shall be adjusted to allow space for the shoring. The contractor shall furnish, place and subsequently remove such supporting installations as necessary to safeguard work and workers.

Minimum trench width shall be according to AASHTO Section 30 (1-1/2 times pipe O.D. plus 12 inches). See Table 1.

Table 1

Nominal Pipe Diameter (inches)	Minimum Trench Width (inches)
4	19
6	22
8	26
10	29
12	34
15	38
18	44

Nominal Pipe Diameter (inches)	Minimum Trench Width (inches)
24	54
30	65
36	75
42	84
48	91
60	110

4. HANDLING

The Contractor shall furnish such equipment as necessary to handle and install the pipe without bruising or damaging the pipe or coatings, and with adequate support such that it is not subject to undue stresses.

5. LAYING AND BEDDING THE CULVERT

The culvert shall be laid to the lines, grades, and elevations shown on the drawings. Unless otherwise specified, pipes with bell joints shall be placed with the bell end upstream. The pipe shall be installed in accordance with manufacturer's recommendations. The pipe shall be firmly and uniformly bedded throughout its entire length to the depth shown on the drawings.

When multiple culverts are specified, the spacing between culverts shall be a minimum of one half the outside diameter of the largest pipe or 2 feet, whichever is greater.

6. JOINTS

Pipe joints shall be watertight. Pipe lengths shall be joined in accordance with manufacturer's recommendations. Unless otherwise specified, joints shall be either bell and spigot or tongue-n-groove with gaskets or sealants, mechanical coupling bands, solvent cement, or single welded butt joints. If a lubricant is required, it shall be a type having no deleterious effect on the gaskets or pipe materials.

7. BACKFILLING

Backfill material shall contain no frozen soil, brush, roots, debris or other objectionable material. Backfill within 2 feet of the culvert shall be free of rocks larger than 3 inches. Backfill shall be placed in approximately uniform, compacted layers.

The culvert shall be loaded sufficiently during backfilling around the sides to prevent displacement and to prevent its being lifted from the bedding. Hand compaction shall be used until 2 feet of fill is in place around the culvert and a minimum of 2 feet on top, unless otherwise authorized by the approving official or designee. Selected backfill material shall be placed around the culvert in 4 inch layers. Each layer shall be thoroughly compacted with 3 passes of a vibratory plate compactor, unless otherwise authorized by an approving official. The remaining backfill operations may be accomplished by routing the construction equipment over 6 inch thick layers in such a manner that the surface of the layer will be traversed by 3 passes of the tracks or wheels.

8. INLET and OUTLET PROTECTION

Inlet and outlet will be stabilized as shown on the drawings or as specified in Section 10.

9. MEASUREMENT AND PAYMENT

Method 1

For items of work for which specific unit prices are established in the contract, the length of the culvert will be measured to the nearest linear foot along the centerline of the pipe. Payment for the culvert will be made at the contract unit price. Such payment will constitute full compensation for all labor, materials, equipment, tools, and other appurtenances necessary and incidental to the completion of the work.

Method 2

For items of work for which specific lump sum prices are established in the contract, the quantity of culvert will not be measured. Payment for the culvert will be made at the contract lump sum price. Such payment will constitute full compensation for all labor, materials, equipment, tools, and other appurtenances necessary and incidental to the completion of the work.

Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 10.

10. ITEMS OF WORK AND ADDITIONAL CONDITIONS