ITEM 29

CORRUGATED METAL PIPE ARCH AND CIRCULAR PIPE

29.01 SCOPE OF WORK

The work covered by this item shall consist of furnishing and laying corrugated metal pipe arch or circular pipe, including connecting bands and fittings as called for in the Plans and/or Specifications. This Item shall include trench excavation, bedding, and backfill as specified in this Item but does not include the construction of manholes, curb inlets, or catch basins, which items of work are covered elsewhere in these Specifications.

29.02 ASSEMBLY OF CORRUGATED METAL PIPE

(a) Reasonable care shall be taken in unloading and handling so as to protect the galvanized or bituminous coatings. Extreme care shall be taken in placing corrugated metal structures in locations of difficult access.

(b) Riveted corrugated metal pipe shall be placed with the inside circumferential laps pointing downstream. The longitudinal laps shall be at the sides or quarter point, never on the bottom.

(c) Riveted corrugated metal pipe sections shall be joined by means of corrugated connecting bands. "Two-piece" bands shall be used on the larger sizes when the installation conditions are difficult. "Watertight" bands shall be used only when shown on the Plans or requested by the Engineer.

(d) When installing bands, the corrugations of the band shall match the corrugations of the pipe sections. Care shall be taken to exclude extraneous material from the joint to insure a snug fit. Contractor shall use proper methods to insure a tight joint.

29.03 PIPE ARCH SHAPE

(a) This shape shall be fabricated by reforming a circular pipe to a multi-centered pipe having an arch-shaped top with a slightly convex curved integral bottom. The lapped longitudinal seams shall be staggered so as to alternate on each side of the center of arch top. Alternatively, the shape may be fabricated by curving individual sheets to form circular arcs as required for the pipe specified. The pipe shall conform to the tables on page 29-4.

(b) All dimensions are measured from the inside crest of corrugations. In pipe larger than thirty inch (30") equivalent, a tolerance of plus or minus one inch (1") will be permissible in span, rise, corner radius, and in the "B" dimension on page 29-4. The "B" dimension is measured vertically from the lowest portion of the pipe arch base to a horizontal line drawn across the widest part of the arch. See details on page 29-4.

29.04 BITUMINOUS COATED AND PAVED PIPE

(a) Paved pipe shall be installed with the smooth, thick pavement in the flow line. Otherwise, assembly shall be the same as for galvanized pipe.

(b) The bituminous coating shall cover approximately twenty-five percent (25%) of the interior circumference of paved-invert pipe, filling the corrugations completely. This pavement shall be placed and centered on the bottom.

(c) Any damaged spots in the bituminous coating where the metal is exposed shall be repaired before the structure is backfilled. The asphaltic material used to repair the exposed places shall be the same material as the original coating.

(d) The Engineer shall inspect all pipe before it is laid, and reject any section that is damaged by handling or is found to be defective to a degree which will materially affect the function and service of the pipe.

29.05 BEDDING

(a) Coarse aggregate for pipe bedding material shall consist of gravel or crushed stone. The aggregate shall consist of hard, durable fragments of gravel or stone, and other finely divided mineral material. It shall be free of silt and clay.

(b) Grading for coarse aggregate bedding shall be Class "A" aggregate, Grading "E",

as follows:

% Passing	Screen
100	3/4"
65	3/8"
10	100

29.06 BACKFILLING

(a) In streets, alleys, across sidewalks and driveways, and at any other places subject to vehicular traffic or other superimposed loads, crushed rock shall be placed in layers compacted to six-inches (6") from the level of twelve inches (12") above the top of the pipe upward for the full depth of the trench, in accordance with Item 2 of these Specifications.

(b) Backfilling material shall consist of crushed stone or gravel as required in Section 29.05 of these Specifications. Fill material under haunches and around the structure shall be placed simultaneously in six-inch (6") layers on both sides of the pipe maintaining the same elevation on both sides and tamping manually only.

(c) Mechanical compactors or tampers shall not be used within twelve inches (12") of the pipe.

29.07 DETERMINATION OF PAY QUANTITIES

(a) The quantities of corrugated pipe arch or circular pipe storm sewers, including common excavation, for which payment will be allowed shall be expressed in linear feet of each size and gage of pipe as shown on Plans and/or Bid Schedule and shall be the horizontal length along the centerline from end to end.

(b) No separate payment will be made for connections to existing sewers and to manholes or inlets.

(c) No separate payment will be made for furnishing and installing connecting bands, etc. The cost of these items shall be included in the unit prices bid for linear feet of pipe.

(d) No separate payment will be made for any common excavation, clearing, or backfill. The cost of these items shall be included in the unit prices bid for pipe sewers under Item 29 and as provided for in the Bid Schedule.

(e) No separate payment will be made for coarse aggregate bedding as required in Item 29.05 above. The cost of this item shall be included in the unit price bid for linear feet of pipe.

29.08 PAYMENT

(a) Payment for pipe sewers constructed under these Specifications shall be made for the quantities determined in the manner specified above at the contract price per linear foot for each of the applicable sizes and gages listed in the contract pay items in the Bid Schedule.

(b) Payment shall cover the cost of furnishing all materials, labor, tools, equipment, services and other expenses in connection with common excavation and furnishing and installing all items of work herein specified under Item 29 and when so paid, shall constitute full compensation to the Contractor.

SIZES AND LAYOUT DETAILS
CMP ARCHES - 2 2/3" X 1/2" CORRUGATION

Dimensions in Inches			Waterway Area	Layout Dimensions			
Equiv. Diameter	Span	Rise	in Square Feet	B Inches	R1 Inches	R2 Inches	R3 Inches
15	17	13	1.1	4 1/8	3 1/2	8 5/8	25 5/8
18	21	15	1.6	4 7/8	4 1/8	10 3/4	33 1/8
21	24	18	2.2	5 5/8	4 7/8	11 7/8	34 5/8
24	28	20	2.9	6 1/2	5 1/2	14	42 1/4
30	35	24	4.5	8 1/8	6 7/8	17 7/8	55 1/8
36	42	29	6.5	9 3/4	8 1/4	21 1/2	66 1/8
42	49	33	8.9	11 3/8	9 5/8	25 1/8	77 1/4
48	57	38	11.6	13	11	28 5/8	88 1/4
54	64	43	14.7	14 5/8	12 3/8	32 1/4	99 1/4
60	71	47	18.1	16 1/4	13 3/4	35 3/4	110 1/4
66	77	52	21.9	17 7/8	15 1/8	39 3/8	121 1/4
72	83	57	26.0	19 1/2	16 1/2	43	132 1/4