707 STEEL, ALUMINUM, AND PLASTIC PIPE

707.00 Acceptance. Corrugated metal pipe conforming to 707.01, 707.02, 707.03, 707.04, 707.05, 707.07, 707.11, 707.12, 707.13, 707.14, 707.15, 707.21, 707.22, 707.23, 707.24, and 707.25 may be accepted for shipment to and immediate use in construction projects when provided from suppliers certified according to Supplement 1019.

707.01 Metallic Coated Corrugated Steel Conduits and Underdrains. Provide conduits and underdrains having a corrugation depth of 1/2 or 1/4 inch (13 or 6.5 mm) and according to AASHTO M 36/M 36M, with the following modifications:

7.5 Ensure either helical lock or continuous welded seams are used.

7.7.1 Helical corrugated pipe, 12-inch (300 mm) diameter and larger, shall have at least two annular corrugations at each end of each pipe length.

8.1.2. Ensure that the minimum wall thickness (coated) of steel pipe and pipe-arches is as follows:

Pipe		Pipe-Arch	
Diameter (in)	Wall Thickness (in)	Size (in)	Wall Thickness (in)
6	0.052		
8	0.064		
10	0.064		
12	0.064		
15	0.064	17 × 13	0.064
18	0.064	21 × 15	0.064
21	0.064	24 × 18	0.064
24	0.064	28 × 20	0.064
27	0.064		
30	0.064	35 × 24	0.064
33	0.064		
36	0.064	42 × 29	0.064
42	0.064	49 × 33	0.079
48	0.064	57 × 38	0.109
54	0.109	64 × 43	0.109
60	0.109	71 × 47	0.138
66	0.138	77 × 52	0.168
72	0.138	83 × 57	0.168
78	0.168		
84	0.168		

Pipe		Pipe-Arch	
Diameter (mm)	Wall Thickness (mm)	Size (mm)	Wall Thickness (mm)
150	1.32		
200	1.63		
250	1.63		
300	1.63		
375	1.63	430 × 340	1.63
450	1.63	530 × 380	1.63
525	1.63	610 × 460	1.63
600	1.63	710 × 510	1.63
675	1.63		
750	1.63	885 × 610	1.63
825	1.63		
900	1.63	1060 × 740	1.63
1050	1.63	1240 × 840	2.01

1200	1.63	1440 × 970	2.77
1350	2.77	1620 × 1100	2.77
1500	2.77	1800 × 1200	3.51
1650	3.51	1950 × 1320	3.51
1800	3.51	2100 × 1450	4.27
1950	4.27		
2100	4.27		

Ensure that the minus tolerance conforms to AASHTO M 218, M 274, or M 289.

TABLE 707.01-1 PIPE REQUIREMENTS

Nominal Inside Diameter		Corrugation Depth Nominal		Minimum Width of Lap	
(in)	(mm)	(in)	(mm)	(in)	(mm)
27	675	1/2	13	2	50
33	825	1/2	13	2	50

8.3.2.1 Ensure that the minimum number of longitudinal rows of perforations is four.

9.1 Coupling bands shall have annular corrugations.

9.2 Ensure that coupling bands are not more than two nominal sheet thicknesses thinner than the thickness of the pipe to be connected. For pipes 48-inch (1200 mm) diameter and smaller, ensure that the coupling band is not thinner than the 0.052-inch (1.32 mm) nominal sheet thickness. For pipes 54-inch (1350 mm) diameter through 84-inch (2100 mm) diameter, ensure that the coupling band is not thinner than the 0.064-inch (1.63 mm) nominal sheet thickness. For pipe diameters over 36 inches (900 mm), provide coupling bands that have at least one annular corrugation that indexes into the inboard corrugation of each pipe section joined.

707.02 Metallic Coated Corrugated Steel Conduits [1-inch (25 mm) Corrugations]. Provide conduits according to AASHTO M 36/M 36M, with the following modifications:

7.5 Ensure either helical lock or continuous welded seams are used.

7.7.1 Helical corrugated pipe shall have at least two annual corrugations at each end of each pipe length.

8.1.2. Ensure that the minimum wall thickness (coated) of steel pipe and pipe-arches is as follows:

Pipe		Pipe-Arch	
Diameter (in)	Wall Thickness (in)	Size (in)	Wall Thickness (in)
36	0.064	40 × 31	0.109
42	0.064	46 × 36	0.109
48	0.064	53 × 41	0.109
54	0.079	60 × 46	0.109
60	0.079	66 × 51	0.109
66	0.109	73 × 55	0.109
72	0.109	81 × 59	0.109
78	0.109	87 × 63	0.109
84	0.109	95 × 67	0.109
90	0.109	103 × 71	0.109
96	0.109	112 × 75	0.109
102	0.109	117 × 79	0.109
108	0.109	128 × 83	0.138
114	0.109	137 × 87	0.138
120	0.109	142 × 91	0.169

Pipe		Pipe-Arch	
Diameter	Wall Thickness	Size	Wall Thickness

(mm)	(mm)	(mm)	(mm)
900	1.63	1010 × 790	2.77
1050	1.63	1160 × 920	2.77
1200	1.63	1340 × 1050	2.77
1350	2.01	1520 × 1170	2.77
1500	2.01	1670 × 1300	2.77
1650	2.01	1850 × 1400	2.77
1800	2.77	2050 × 1500	2.77
1950	2.77	2200 × 1620	2.77
2100	2.77	2400 × 1720	2.77
2250	2.77	2600 × 1820	2.77
2400	2.77	2840 × 1920	2.77
2550	2.77	2970 × 2020	2.77
2700	2.77	3240 × 2120	3.51
2850	2.77	3470 × 2220	3.51
3000	2.77	3600 × 2320	4.27

Ensure that the minus tolerance conforms to AASHTO M 218, M 274, or M 289.

9.1 Provide coupling bands with a minimum wall thickness (coated) of 0.064 inch (1.63 mm) and that have at least one annular corrugation that indexes into the inboard corrugations of each pipe section joined.

707.03 Structural Plate Corrugated Steel Structures. Provide structural plate pipe, pipe arch, and arch structures according to AASHTO M 167 (AASHTO M 167M), with the following modification:

5.4 Assembly bolts may be galvanized by an electrolytic process.

707.04 Precoated, Galvanized Steel Culverts. Provide conduits and coupling bands according to AASHTO M 245/M 245M, as modified by 707.01 and 707.02. Ensure that the precoated, galvanized steel sheets conform to AASHTO M 246/M 246M, Type B. Ensure that the polymeric coating is 10 mils (250 µm) on the interior and 10 mils (250 µm) on the exterior.

707.05 Bituminous Coated Corrugated Steel Pipe and Pipe Arches with Paved Invert [1/2-inch (13 mm) Corrugations]. Provide conduits and coupling bands according to 707.01 and to AASHTO M 190. Provide either Type B half bituminous coated pipe, or pipe arches with paved invert or Type C fully coated pipe, or pipe arches with paved invert.

707.07 Bituminous Coated Corrugated Steel Pipe and Pipe Arches with Paved Invert [1-inch (25 mm) Corrugations]. Provide conduits and coupling bands according to 707.02 and to AASHTO M 190. Provide either Type B half bituminous coated pipe, or pipe arches with paved invert or Type C fully coated pipe, or pipe arches with paved invert.

707.10 Square and Rectangular Steel Tubing. Provide square and rectangular steel tubing according to ASTM A 501 or ASTM A 500, Grade B, with the following modifications:

Galvanize the tubing according to 711.02.

Test the tubular steel from all heat numbers supplied for toughness according to ASTM E 436, except as modified herein. Take and test tubing test samples before delivery of the railing. Ensure that the taking of the test samples is witnessed and the testing is performed by an independent test laboratory. Submit certified test data for review and approval as specified in 501.06.

Perform testing on test specimens obtained from galvanized tubing with the same heat number as that being used. Conduct the testing at a temperature of 0 °F (-18 °C) on 2 × 9-inch (50 × 225 mm) specimens supported to provide a 7-inch (180 mm) clear span. Do not remove the galvanizing from the specimens. Cut three 2 × 9-inch (50 × 225 mm) test specimens from each of the unwelded sides for a total of nine specimens. If all three unwelded sides are not large enough to remove 2 × 9-inch (50 × 225 mm) specimens, then remove nine specimens from any unwelded side.

Disregard the three specimens from the side with the lowest average shear area when calculating the final average shear area. If specimens were not removed from three unwelded sides, then disregard the three specimens with the lowest average shear area. Calculate the final average shear area using the six remaining specimens. If the average shear area falls below 50 percent, reject material from the heat represented by these tests. However, if the average shear area is 30 percent or greater, the Department will allow one retest at a sampling frequently three times that of the first test, and with no samples excluded in calculating the average. Reject materials not having a 50 percent average shear area upon retest.

Before galvanizing, the manufacturer of the tubing shall identify the product with the steel heat number (or with some number that is traceable to the heat number) and with the manufacturer's unique identification code to facilitate acceptance or rejection of the material. Ensure that the identification method is such that identification is on only one face of the section, and is repeated at intervals no greater than 4 feet (1.2 m), and does not extend into the curved surface of the tubing at the corners.

707.11 Mortar Lined Corrugated Steel Pipe. Provide pipe according to 707.01 and 707.02 and having the interior coated with mortar according to ASTM A 849, Class C, with the following modifications:

These requirements apply to 24-inch to 120-inch (600 to 3000 mm) diameter conduit. Conduits 24 to 60 inches (600 to 1500 mm) in diameter shall conform to 707.01. Conduits 66 inches (1650 mm) and above in diameter shall conform to 707.01 or 707.02. Ensure that the minimum wall thickness of the 707.02 steel pipe is 0.109 inch (2.77 mm).

7.7 Before the mortar lining is applied, apply a bituminous coating according to AASHTO M 190, Type A, or an approved barrier coating, to the inside surface of the conduits if they are fabricated from steel sheet according to AASHTO M 274 or M 289.

7.7 The mortar lining shall have a minimum thickness of 1/4 inch (6 mm) above the crests of the corrugations. Ensure that the mortar lining is prequalified by the manufacturer by submitting to the Laboratory certified test data according to 101.03. This data will include test data for all components of the mixture, and the 7 and 28-day compressive strengths of the mixture.

14 These conduits may be accepted for shipment to and immediate use in construction projects by using the manufacturer's certification for the steel pipe and mortar. Ensure that the certification states that the mortar is of the same design as that prequalified with the Laboratory.

707.12 Corrugated Steel Spiral Rib Conduits. Provide conduits that have a center-to-center rib spacing of 7 1/2 inches (190 mm). Provide conduits and fittings according to AASHTO M 36, Type IR, with the following modifications:

6.1 Fabricate pipe from aluminum coated sheet according to AASHTO M 274.

7.2.2 The ribs shall conform to AASHTO M 196, Section 7.2.2.

7.7.1 Reroll the ends of the individual pipe sections to form at least two annular corrugations on each end. Paint the rerolled end with zinc rich paint.

8.1.2 Ensure that the minimum wall thickness (coated) of steel pipe is as follows:

Pipe			
Diameter (in)	Wall Thickness (in)	Diameter (mm)	Wall Thickness (mm)
18	0.064	450	1.63
21	0.064	525	1.63
24	0.064	600	1.63
30	0.064	750	1.63
36	0.064	900	1.63
42	0.064	1050	1.63
48	0.064	1200	1.63
54	0.109	1350	2.77
60	0.109	1500	2.77
66	0.109	1650	2.77
72	0.109	1800	2.77
78	0.109	1950	2.77
84	0.138	2100	3.51
90	0.138	2250	3.51

9.1 Coupling bands shall have annular corrugations.

9.2 Coupling bands shall conform to 707.01.

9.3 A bell and spigot joint per ASTM A760 (A760M) may be used with the following modifications:

9.3.1 These joints may be used for conduits ranging in size from 18 (450mm) to 48 (1200mm) inches in diameter.

9.3.2 Ensure the bell and spigot has a soil tight joint by use of a shop applied gasket on the bell end and a field applied gasket on the spigot end.

9.3.3 Provide a minimum of 0.064 (1.63mm) inch nominal sheet thickness or not more than two (2) nominal sheet thickness thinner than the thickness of the pipe to be joined.

14.1 Ensure that the certification and sampling conforms to 707.01.

707.13 Bituminous Lined Corrugated Steel Pipe [1/2-inch (13 mm) Corrugations]. Provide pipe according to 707.01 and AASHTO M 190, Type D.

707.14 Bituminous Lined Corrugated Steel Pipe [1-inch (25 mm) Corrugations]. Provide pipe according to 707.02 and AASHTO M 190, Type D.

707.15 Corrugated Steel Box Culverts. Provide corrugated steel box culverts according to ASTM A 964.

Ensure that all manufacturers are pre-approved. Ensure that manufacturers not pre-approved submit a structural design criteria and analysis method to the Department before the project letting for approval. The Department maintains a list of all pre-approved manufacturers.

Ensure that the manufacturer submits shop drawings and design calculations for review and written approval before manufacture. Submit a minimum of seven copies of the drawings. Allow a minimum of four weeks for approval. Ensure that the shop drawings include the following:

A. All structural design and loading information.

B. All material specifications.

C. All plan view.

D. All elevation view.

E. All headwall and wingwall attachment requirements.

F. All dimensions.

G. All maintenance of traffic phases.

H. All plate size and dimensions.

The manufacturer may modify an approved shop drawing and resubmit for approval to the Department.

707.17 Spiral Rib Steel Pipe Arch. Provide conduits according to AASHTO M36, Type IIA, with the following modifications:

6.1 Fabricate pipe from aluminum coated sheet according to AASHTO M 274.

7.2.2 The ribs shall conform to AASHTO M 196, Section 7.2.2.

9.1 Coupling bands shall have annular corrugations.

9.2 Coupling bands shall conform to 707.01.

14.1 Ensure that the certification and sampling conforms to 707.01.

Ensure that the minimum wall thickness of Spiral Rib steel pipe arches is as follows:

Pipe-Arch			
Size (in)	Wall Thickness (in)	Size (mm)	Wall Thickness (mm)
20 x 16	0.079	500 x 410	2.01
23 x 19	0.079	580 x 490	2.01
27 x 21	0.079	680 x 540	2.01
33 x 26	0.079	830 x 670	2.01
40 x 31	0.079	1010 x 790	2.01
46 x 36	0.079	1160 x 920	2.01
53 x 41	0.109	1340 x 1050	2.77
60 x 46	0.109	1520 x 1170	2.77
66 x 51	0.109	1670 x 1300	2.77
73 x 55	0.109	1850 x 1400	2.77
81 x 59	0.138	2050 x 1500	3.51

707.21 Corrugated Aluminum Alloy Conduits and Underdrains. Provide conduits and underdrains having a 1/4, 7/16, or 1/2-inch (6.5, 11, or 13 mm) corrugation depth and according to AASHTO M 196/M 196M, with the following modifications:

8.1 and 8.2 Provide helically corrugated pipe 12 inches (300 mm) in diameter and larger that have at least two circumferential corrugations at each end of each pipe length.

8.1.2 Ensure that the minimum wall thickness of aluminum pipe and pipe arches is as follows:

Pipe		Pipe-Arch	
Diameter (in)	Wall Thickness (in)	Size (in)	Wall Thickness (in)
6	0.048		
8	0.060		

10	0.060		
12	0.060		
15	0.060	17 × 13	0.060
18	0.060	21 × 15	0.060
21	0.060	24 × 18	0.060
24	0.060	28 × 20	0.075
27	0.075		
30	0.075	35 × 24	0.075
36	0.075	42 × 29	0.105
42	0.105	49 × 33	0.105
48	0.105	57 × 38	0.135
54	0.105	64 × 43	0.135
60	0.135	71 × 47	0.164
66	0.164		
72	0.164		

Pipe		Pipe-Arch	
Diameter (mm)	Wall Thickness (mm)	Size (mm)	Wall Thickness (mm)
150	1.22		
200	1.52		
250	1.52		
300	1.52		
375	1.52	430 × 330	1.52
450	1.52	530 × 380	1.52
525	1.52	610 × 460	1.52
600	1.52	710 × 510	1.91
675	1.91		
750	1.91	885 × 610	1.91
900	1.91	1060 × 740	2.67
1050	2.67	1240 × 840	2.67
1200	2.67	1440 × 970	3.43
1350	2.67	1620 × 1100	3.43
1500	3.43	1800 × 1200	4.17
1650	4.17		
1800	4.17		

Ensure that the minus tolerance conforms to AASHTO M 197/M 197M.

9.2 Provide coupling bands with a minimum wall thickness (coated) of 0.060 inch (1.52 mm). For pipe diameters 12 inches (300 mm) and larger, provide coupling bands that have at least one circumferential corrugation that indexes into the inboard corrugations of each pipe section joined.

707.22 Corrugated Aluminum Alloy Conduits. Provide conduits having a 1-inch (25 mm) corrugation depth and according to AASHTO M 196/M 196M, with the following modifications:

8.1 and 8.2 Provide helically corrugated pipe that have at least two circumferential corrugations at each end of each pipe length.

8.1.2 Ensure that the minimum wall thickness of aluminum pipe is as follows:

Pipe			
Diameter (in)	Wall Thickness (in)	Diameter (mm)	Wall Thickness (mm)
36	0.060	900	1.63
42	0.060	1050	1.63
48	0.060	1200	1.63
54	0.075	1350	1.91
60	0.105	1500	2.67
66	0.105	1650	2.67
72	0.105	1800	2.67

78	0.105	1950	2.67
84	0.105	2100	2.67
90	0.105	2250	2.67
96	0.105	2400	2.67
102	0.135	2550	3.43
108	0.135	2700	3.43
114	0.164	2850	4.17
120	0.164	3000	4.17

Ensure that the minus tolerance conforms to AASHTO M 197/M 197M.

9.2 Provide coupling bands that are not lighter than 0.060-inch (1.52 mm) nominal sheet thickness and that have at least one circumferential corrugation that indexes into the inboard corrugations of each pipe section joined.

707.23 Aluminum Alloy Structural Plate Conduits. Provide aluminum alloy plates and fasteners for structural plate conduits according to AASHTO M 219/M 219M.

707.24 Corrugated Aluminum Spiral Rib Conduits. Provide conduits that have a center-to-center rib spacing of 7 1/2 inches (190 mm). Provide conduits and fittings according to AASHTO M 196, Type IR, with the following modifications:

7.5.1 Reroll the ends of the individual pipe sections to form at least two annular corrugations on each end.

8.1.2 Ensure that the minimum wall thickness of aluminum pipe is as follows:

Pipe			
Diameter (in)	**Wall Thickness (in)**	**Diameter (mm)**	**Wall Thickness (mm)**
18	0.060	450	1.52
21	0.060	525	1.52
24	0.060	600	1.52
30	0.060	750	1.52
36	0.075	900	1.91
42	0.105	1050	2.67
48	0.105	1200	2.67
54	0.105	1350	2.67
60	0.135	1500	3.43
66	0.135	1650	3.43

9.1 Coupling bands shall have annular corrugations.

9.2 Coupling bands shall conform to 707.21.

14.1 Ensure that the certification and sampling conforms to 707.21.

707.25 Corrugated Aluminum Box Culverts. Provide corrugated aluminum box culverts according to ASTM B 864/B 864M.

Ensure that all manufacturers are pre-approved. Ensure that manufacturers not pre-approved submit a structural design criteria and analysis method to the Department before the project letting for approval. The Department maintains a list of all pre-approved manufacturers.

Ensure that the manufacturer submits shop drawings and design calculations for review and written approval before manufacture. Submit a minimum of seven copies of the drawings. Allow a minimum of four weeks for approval. Ensure that the shop drawings include the following:

A. All structural design and loading information.

B. All material specifications.

C. All plan view.

D. All elevation view.

E. All headwall and wingwall attachment requirements.

F. All dimensions.

G. All maintenance of traffic phases.

H. All plate size and dimensions.

The manufacturer may modify an approved shop drawing and resubmit for approval to the Department.

707.31 Corrugated Polyethylene Drainage Tubing. Provide corrugated polyethylene drainage tubing according to AASHTO M 252 Type C and CP,

Only provide materials from manufacturers certified according to Supplemental Specification 1066.

707.32 Corrugated Polyethylene Drainage Pipe. Provide conduits, coupling bands, and fittings according to AASHTO M 294, Type C.

Only provide materials from manufacturers certified according to Supplemental Specification 1066.

707.33 Corrugated Polyethylene Smooth Lined Pipe. This specification covers smooth lined corrugated polyethylene pipe, closed profile polyethylene pipe, couplings, and fittings which shall conform to AASHTO M 252 or AASHTO M 294, Type S, SP, or D, with the following modifications to AASHTO M 294:

1.1.1 Nominal size of 4 to 60 inches (100 mm to 1500 mm) are included. 4.1.2 Annular corrugated pipe (Type S or SP) or closed profile pipe (Type D) shall be provided.

6.1 Carbon black may be blended with the virgin resin by means of a carrier resin. The proportioning of the carrier resin to the carbon black shall not be greater than 3:1.

7.2.1 Nominal diameters shall be 4, 6, 8, 10, 12, 15, 18, 24, 30, 36, 42, 48, 54, and 60 inches (100, 150, 200, 250, 300, 375, 450, 600, 750, 900, 1050, 1200, 1350, and 1500 mm).

7.2.2 The inner liner of Type S and SP pipe, and both inner and outer walls of Type D pipe shall have the following minimum thicknesses, when measured in according to Section 7.2.2.

Diameter		Inner Wall Thickness	
(in)	(mm)	(in)	(mm)
4	100	0.020	0.50
6	150	0.020	0.50
8	200	0.025	0.60
10	250	0.025	0.60
12	300	0.035	0.90
15	375	0.040	1.00
18	450	0.050	1.30
24	600	0.060	1.50
30	750	0.060	1.50
36	900	0.065	1.70
42	1050	0.070	1.80
48	1200	0.070	1.80
54	1350	0.070	2.0
60	1500	0.070	2.0

7.4 When tested in accordance with Section 9.1, the pipe shall have a minimum pipe stiffness at 5 percent deflection as follows:

Diameter		Pipe Stiffness	
(in)	(mm)	(P/I/I)	(N/m/mm)
4	100	50	340
6	150	50	340
8	200	50	340
10	250	50	340
12	300	50	345
15	375	42	290
18	450	40	275
24	600	34	235
30	750	28	195
36	900	22	150
42	1050	20	140
48	1200	18	125
54	1350	16	110
60	1500	14	95

7.8.5 In addition, couplings for corrugated pipe shall be bell and spigot or bell-bell couplings, or clamp-on bands, for all size up to and including 36-inch (900 mm) diameter.

Couplings for Type D pipe shall be a bell-bell or bell and spigot coupling. The coupling may be welded on one end of each length of pipe by means of a full circumferential weld. Stitch welds are not permitted.

Couplings for pipe diameters 42 inches (1050 mm) and larger shall be bell-bell or bell and spigot.

9.1 Test specimens shall have a minimum length of 12 inches (300 mm) or one pipe diameter whichever is greater.

11.1.3 In addition, pipe with diameters 4 through 10 inches (100 through 200 mm) inclusive may be marked "AASHTO M252".

12.1 Only provide materials from manufacturers certified according to Supplemental Specification 1066.

707.41 Polyvinyl Chloride Plastic Pipe. Provide smooth wall perforated PVC plastic pipe and fittings with nominal size of 4, 6, and 8-inch (100, 150, and 200 mm) diameter according to ASTM F 758, Type PS 46 minimum, with the following modifications:

7.2.4 The pipe shall have has a minimum of four rows of perforations.

14 Furnish the manufacturer's certification and the report of test results.

707.42 Polyvinyl Chloride Corrugated Smooth Interior Pipe. Provide PVC profile wall pipe with a smooth interior that consists of an outer corrugated wall fused to a smooth inner wall. Nominal size of 4, 6, 8, 10, 12, 15, 18, 21, 24, 27, 30, and 36-inch (100, 150, 200, 250, 300, 375, 450, 525, 600, 675, 750, and 900 mm) diameter are included for pipe, joints, and fittings. Provide sanitary sewer pipe according to ASTM F 949, and storm sewer and drain pipe according ASTM F 949 or AASHTO M 304, with the following modifications:

A. ASTM F 949.

5.2.4 Perforated pipe may be specified.

10.1 The manufacturer shall furnish certified test data annually to the Laboratory or at any time when the method of manufacture is changed. Provide a letter or certification to cover each shipment of material verifying that it meets specification requirements.

B. AASHTO M 304.

10.5 The manufacturer shall furnish certified test data annually to the Laboratory or at any time when the method of manufacture is changed. Provide a letter or certification to cover each shipment of material verifying that it meets specification requirements.

707.43 Polyvinyl Chloride Profile Wall Pipe. Provide PVC profile wall, smooth flow, sewer pipe and fittings with integral bell joints. The inside diameters range from 4 through 48 inches (100 through 1200 mm).

A. Provide storm sewer pipe from 4 to 15-inch (100 to 375 mm) diameter and sanitary sewer pipe and fittings according to ASTM F 794, with the following modifications:

7.5 Ensure a minimum pipe stiffness of 46 or greater.

10.6 The manufacturer shall furnish certified test data annually to the Laboratory, or at any time when the method of manufacture is changed. A letter of certification shall be provided to cover each shipment of material verifying that it meets specification requirements.

B. Provide storm sewer pipe 18-inch (450 mm) diameter and greater according to AASHTO M 304, with the following modifications:

6.1 Internal sleeve joints are not permitted.

10.5 The manufacturer shall furnish certified test data annually to the Laboratory, or at any time when the method of manufacture is changed. Provide a letter of certification to cover each shipment of material verifying that it meets specification requirements.

707.44 Polyvinyl Chloride Sanitary Pipe. Provide PVC plastic pipe and fittings with nominal size of 4 through 15-inch (100 through 375 mm) diameter according to ASTM F 789, Type PS 46 minimum, with the following modification:

11.1 Furnish the manufacturer's certification and the report of the test results.

707.45 Polyvinyl Chloride Solid Wall Pipe. Provide PVC solid wall pipe and fittings with nominal size of 4 though 15-inch (100 through 375 mm) diameter according to ASTM D 3034, SDR 35, with the following modifications:

9.1 Perform inspection at the project site.

10.1 The retest provisions do not apply.

11.1 Furnish certified test data as defined in 101.03 to the Engineer.

707.46 Polyvinyl Chloride Drain Waste and Vent Pipe. Provide PVC drain, waste, and vent pipe and fittings with nominal size of 1 1/4 though 12-inch (30 through 300 mm) diameter according to ASTM D 2665, with the following modifications.

8.1 The retest provisions do not apply.

10 Furnish certified test data as defined in 101.03 to the Engineer. Perform inspection at the project site.

707.47 ABS and Polyvinyl Chloride Composite Pipe. Provide ABS and PVC composite pipe and fittings with nominal size of 4 though 15-inch (100 through 375 mm) diameter according to ASTM D 2680, with the following modifications.

11.1 Perform inspection at the project site.

12.1 The retest provisions do not apply.

13.1 Furnish certified test data as defined in 101.03 to the Engineer.

707.51 ABS Drain Waste and Vent Pipe. Provide ABS schedule 40 plastic drain waste and vent pipe and fittings with nominal size of 4 1/4 through 16-inch (30 through 150 mm) diameter according to ASTM D 2661, Type PS 46 minimum or SDR 35, with the following modifications:

6.4.1 Perform inspection at the project site.

9.1 The retest provisions do not apply.

11 Furnish certified test data as defined in 101.03 to the Engineer.

707.52 ABS Sewer Pipe. Provide ABS sewer pipe and fittings with nominal size of 3 through 12-inch (75 through 300 mm) diameter according to ASTM D 2751, SDR 35, with the following modifications:

9.1 Perform inspection at the project site.

10.1 The retest provisions do not apply.

11.1 Furnish certified test data as defined in 101.03 to the Engineer.

707.70 Welded and Seamless Steel Pipe. Provide welded and seamless steel pipe according to ASTM A 53 or ASTM A 139/A 139M, Grade B, with the following modifications:

20.1 Perform inspection at the project site. Obtain random samples from material delivered to the project site or at other locations designated by the Laboratory.

Furnish materials according to the Department's Qualified Products List (QPL).