SPECIFICATIONS

MATERIAL SPECIFICATIONS

A. PIPES AND FITTINGS

A.1. Unplasticized Polyvinyl Chloride (uPVC)

A.1.1. Pipes and fittings shall conform to the requirements of AWWA C900, ISO 1452 or PNS 65 or the latest revision or its equivalent and shall be pressure Class 150 (Series 8) with machine installed **Integral Fixed Seal**. The seal should be polypropylene (PP) with flexible EDPM Rubber homogenously bonded to stiff piping

A.1.2. PVC Pipes and fittings shall be made from clean, blue-pigmented, virgin, NSF approved Class 12454-A or 12454-B PVC compound conforming to the requirements of ASTM D1784.

A.1.3. All pipes shall be furnished in lengths of 6 meters.

Table 1. uPVC Pipe Dimensions

Nominal Pipe Size, in	2	3	4	6	8	10	12
Nominal Diameter, mm	50	75	100	150	200	250	300
Outside Diameter, mm							
Min	63	90	110	160	225	280	315
max	63.3	90.3	110.4	160.5	225.7	280.9	316.0
Wall Thickness, mm							
min	3.6	5.2	6.6	9.5	13.4	16.6	18.7
max	4.16	5.92	7.13	10.32	14.39	17.80	20.00

A.2. Galvanized Iron (GI)

A.2.1. Pipes shall conform to the requirements of the ASTM A53/A53M (Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless) or the latest revision or its equivalent and shall be Schedule 40.

Pipe fittings shall conform to the requirements of ASME/ANSI B16.3 (Malleable Iron Threaded Fittings Class 150 and 300) and shall be Class 150.

A.2.2. The pipe shall be practically straight and both ends of the pipe shall be at right angle to the axis of the pipe. The inside and outside surfaces of the pipe shall be free from injurious defects. Unless otherwise specified, the length of the pipe shall be 6 meters. The tolerance shall be plus 6 meters without negative tolerance. Pipes shall be clearly marked with Trademark, Nominal Size, Length and Class of Pipe.

A.2.3. The pipe and fitting threads shall be made according to "American Standard Pipe Taper Thread (NPT) with taper angle equal to 1°47'.

A.2.4. Pipes and fittings shall be coated with zinc, both inside and outside surfaces, in accordance to ASTM A153/A153M-05 (Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware)

Table 2. GI Pipe and Fitting Dimensions

Nominal Pipe Size, in	½	¾	1	1¼	1½	2	3	4
Nominal Diameter, mm	15	20	25	32	40	50	75	100
Pipes								
Outside Diameter, mm	21.3	26.7	33.4	42.2	48.3	60.3	88.9	114.3
Wall Thickness, mm	2.8	2.9	3.4	3.6	3.7	3.9	5.49	6.02
Tolerance								
outside diameter,	±0.397	±0.397	±0.397	±0.397	±0.397	±1%	±1%	±1%

Nominal Pipe Size, in	½	¾	1	1¼	1½	2	3	4
Nominal Diameter, mm	15	20	25	32	40	50	75	100
wall thickness	-12.5%	-12.5%	-12.5%	-12.5%	-12.5%	-12.5%	-12.5%	-12.5%
Weight per meter, kg	1.27-1.34	1.68-1.78	2.50-2.62	3.38-3.55	3.75-4.23	5.00-5.43	10.3-11.3	14.5-16.1
Fittings								
90° Elbow								
Length	28.45	33.27	38.10	44.45	46.74	57.15	78.23	96.27
Weight, kg	0.11	0.18	0.29	0.43	0.56	0.79	2.34	4
45° Elbow								
Length	22.35	24.89	28.45	32.77	36.32	42.67	55.12	66.29
Weight, kg	0.07	0.10	0.15	0.38	0.52	0.77	2.11	3.46
St. Elbow								
Length, ME	40.89	48.01	54.10	61.98	67.82	83.06	114.55	114.27
Length, FE	28.45	33.02	38.10	44.45	49.28	57.15	78.23	96.27
Weight, kg	0.11	0.18	0.29	0.49	0.66	1.06	2.99	4.94
Tee								
Length	28.45	33.27	38.10	44.45	49.28	57.15	78.23	96.27
Weight, kg	0.16	0.25	0.41	0.59	0.78	1.19	3.22	5.12
Cross Tee								
Length	28.45	33.27	38.10	44.45	49.28	57.15	78.23	96.27
Weight, kg	0.20	0.29	0.44	0.72	0.86	1.33	3.7	6.76
Coupling								
Length	34.04	38.61	42.42	49.02	54.61	64.26	80.77	93.73
Weight, kg	0.09	0.13	0.22	0.34	0.45	0.66	1.5	2.56
Union Patente								
Length	43.69	51.31	55.63	57.40	62.74	69.85	89.92	97.79
Weight, kg	0.21	0.26	0.41	0.54	0.74	1.09	2.47	4.31
Thickness, mm	2.54	3.05	3.30	3.56	3.81	4.32	5.84	6.60
Tolerance								
Dimension, CF, mm	±1.50	±1.50	±1.80	±1.80	±2.00	±2.00	±2.50	±3.00
Thickness	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%

Notes: (1) All dimensions are in millimeters except where otherwise shown.
(2) Center-to-Face dimensions apply to elbows, tees & crosses
(3) Face-to-Face dimensions apply to couplings, unions, etc.
(4) ME – Male End, FE – Female End, CF – Center-to-Face

A.3. Cast Iron (CI)

A.3.1. Cast iron pipe shall conform to the requirements of AWWA C106 (Cast Iron Pipe Centrifugally Cast in Metal Molds for Water or other Liquids) or AWWA C108 (Cast Iron Pipe Centrifugally Cast in Sand-Lined Molds for Water or other Liquids) and shall be Class 100 or Class 150 where shown in the Drawing; or ISO Recommendation R-13 (Cast Iron Pipes, Special Castings and Cast Iron Parts for Pressure Main Lines) and shall be Class LA, however, the hydrostatic test pressure shall be 2.45MPa (355 psi) for all sizes.

A.3.2. Pipe shall be furnished with bell and spigot ends with rubber "push-on" joints, flange joints, or flexible coupling.