

PIPE HANGERS & DEVICES

Cast Iron:

-Grey Cast Iron, ANSI/ASTM A48, Class #20

Malleable Iron:

-ANSI/ASTM A47, Grade Number 32510

Ductile Iron:

-ASTM A536 Grade 65-45-12

Forged Steel:

-ASTM A668 or A1030

Spring Steel:

-SAE 1066-65Mn

Carbon Steel: (3 Gauge Thickness and Below)

-ASTM A1011 CS Type A, B, or C

Carbon Steel: ($\frac{1}{4}$ " Thickness and Above)

-ASTM A36, Structural Quality

Pre-Galvanized Steel:

-ASTM A653, Grade 33 Steel Sheet Coated by Hot Dip Process

Stainless Steel:

-ASTM A240, Type 304

-ASTM A240, Type 316

ALUMINUM

The high strength to weight ratio of PHD Manufacturing, Inc. products made of aluminum greatly reduces the overall cost of installation through ease of handling and field cutting.

Aluminum owes its excellent corrosion resistance to its ability to form an aluminum oxide film that immediately reforms when scratched or cut. In most outdoor applications, aluminum has excellent resistance to "weathering". The resistance to chemicals, indoor or outdoor, can best be determined by tests conducted by the user with exposure to the specific conditions for which it is intended.

To determine the approximate load data for strut, multiply the load data found in this catalog by a factor of 0.38.

CARBON STEEL

PHD Manufacturing, Inc. products made from high-quality carbon steel are cold formed to precise dimensions. By cold working the steel mechanical properties are increased, allowing lightweight structures to carry the required load. Corrosion resistance of carbon steel varies widely with coating and alloy. See "Finishes" for more detailed information.

STAINLESS STEEL

Because of its corrosion resistance, stainless steel is recommended for applications where corrosion is a problem. Load data for PHD Manufacturing, Inc. products is the same as the load data in this catalog.

Stainless steel products are available in ASTM A-240, Type 304 or 316 material. Both are low-magnetic and belong to the austenitic stainless steels group, based on alloy content and crystallographic structure. Like carbon steel, stainless steel exhibits increased strength when cold worked.

Several conditions make the use of stainless steel ideal. These include reducing long term maintenance costs, high ambient temperatures, appearance, and stable structural properties such as yield strength, and high creep strength.

Type 304 resists most organic chemicals, dyestuffs and a wide variety of inorganic chemicals at elevated or cryogenic temperatures. Type 316 contains slightly more nickel and adds molybdenum to give it better corrosion resistance in chloride and sulfuric acid environments.

FINISHES & CORROSION

PLAIN (PL)

Plain finish designation means that the product retains the oiled surface applied to the raw steel during the forming process. The fittings have the original oiled surface of the bar-stock material.

PVC COATING (PVC)

PVC coating helps reduce noise and protect the pipe or tubing from the metal surface of the hanger. Corrosion resistance protection is minimal. PVC coating is not compatible with CPVC pipe.

COPPER COLOR EPOXY FINISH (CCEF)

Designed for use with copper tubing. This coating provides a better level of corrosion resistance than the traditional copper plated finish. It also acts as a protective barrier, avoiding contact between dissimilar metals. The copper color epoxy powder is applied by an elec-trostatic method, and the coated parts are baked at 180 degrees for 20 minutes.

POWDER COATING (PTD)

PHD Manufacturing, Inc. offers a polyester powder coating that utilizes powder material conforming to ASTM D3451. It is applied by means of an electrostatic spray at ambient temperature.

CHANNEL GREEN: POLYESTER

POWDER PROPERTIES

Test Method	Powder Properties	Tolerances
ASTM D3451 (18.30)	Specific Gravity	1.33 ± 0.03
ASTM D3451 (18.30)	Theoretical Coverage	144.58 ± 4.0 FT ² /Lb./Mil.
ASTM D3451 (13)	Volatile Content	Max. 2.5%
ASTM D3451 (13)	Storage Temperature Max	80°F

COATING PROPERTIES

All tests performed on substrate 0.032 CRS Pretreatment
Bonderite 1000

Test Method	Coating Properties	Tolerances/Specifications
ASTM D523	Gloss 20°/60°	70-80
ASTM D2454	Over Bake Resistance Time	100%
ASTM D3363	Pencil Hardness	H - 2H
ASTM D2794 (Modified)	Direct Impact (Gardner)	80 in. Lbs.
ASTM D2794 (Modified)	Reverse Impact (Gardner)	80 in. Lbs.
ASTM D3359	Adhesion (Cross Hatch)	Pass No Adhesion Loss
ASTM D522	Flexibility (Mandrel)	1/8 Bend No Fracture
ASTM B117	Salt Spray	1000 Hrs.
ASTM D2247	Humidity	500 Hrs.

APPLICATION

Test Method	Application	Cure Schedule
Electrostatic Spray	Ambient Temperature	15' @ 375°F (190°C) Recommended Minimum Film Thickness 1.5

EPOXY E-COAT

PHD Manufacturing's epoxy E-Coat offers state of the art corrosion resistance with out the use of heavy metals such as lead, chrome, and zinc. It is applied to our products by a controlled cathodic electro-deposition process. This process is accomplished by transporting the product through several cleaning, phosphatizing, rinsing, and application stages prior to being baked for 20 minutes at 375°F (190°C).

EPOXY PROPERTIES

Property	Test Method	Performance
Color	---	Various
Film Thickness	---	0.5 - 1.5 Mils
Gloss - 60 Degree	ASTM D523	65 - 85
Pencil Hardness	ASTM D3363	2H Minimum
Direct Impact	ASTM D2794	120 in-lb Minimum
Reverse Impact	ASTM D2794	100 in-lb Minimum
Cross-Hatch Adhesion	ASTM D3359	4B - 5B
Humidity	ASTM D1735	1000 Hours Minimum
Water Immersion	ASTM D870	250 Hours Minimum
Gravelometer	GM 9508P	6 Minimum
Throwpower	GM 9535P	12 - 15 Inches

All tests performed on Cold Rolled Steel Lab Panels, Zinc Phosphate Pretreatment, 0.6 Mil Average Film Thickness, Cure 20 Minutes @ 375°F

Property	Substrate / Pretreatment	Salt Spray* 500 hrs.	Salt Spray* 1000 hrs.	20 Cycle** Scab
Corrosion Resistance	CRS/Zinc Phos/Non-Chrome	0 in. (0 mm)	0 - 0.039 in. (0 - 1 mm)	0.039 - 0.079 in. (1 - 2 mm)

(Average Total Scribe Creep), * Salt Spray - ASTM B117

** Cycle Scab - GM9511P, Cold Rolled Steel Lab Panels

Cure 20 Minutes @ 375°F (190°C)

ZINC COATING

PHD offers 3 basic forms of zinc coating on its products:

- 1) **Electro-Galvanized** (Electro-Plated Zinc)
- 2) **Pre-Galvanized**
- 3) **Hot Dipped Galvanized**

For best results, a zinc rich paint should be applied to field cuts. The zinc rich paint will provide immediate protection for these areas and eliminate the short time period for galvanic action to “heal” the damaged coating.

Note: The corrosion resistance of zinc is based on its thickness, the environment, and the coating process used. The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.

Zinc offers two types of protection:

- **Barrier:** The zinc coating protects the steel substrate from direct contact with the environment
- **Sacrificial:** The zinc coating will protect scratches, cut edges, etc... through an anodic sacrificial process.

ELECTRO-GALVANIZED “EG” (ASTM B633 SC1 & SC3)

This type of coating is recommended for use indoors in relatively dry areas. The steel is submersed in a bath of zinc salts, through the process of electrolysis, a coating of pure zinc adheres to the steel with a molecular bond. A maximum of 0.5 mils of zinc per side can be applied using this method.

SC1 (Mild) is the standard finish thickness which has a zinc coating of 0.2 mils per side. SC3 (Severe) has a zinc coating of 0.5 mils per side.

PRE-GALVANIZED “PG” (ASTM A653 COATING G90)

This type of coating is suitable for extended exposure in dry or mildly corrosive atmospheres but not generally recommended for use outdoors in industrial environments. Also known as “mill galvanized” or “hot-dipped mill galvanized” pre-galvanized zinc coatings are produced by rolling the steel coils or sheets through molten zinc, at the steel mill, the material is then cut or slit to size. Zinc near the uncoated edges or weld areas becomes a sacrificial anode which protects the bare areas.

The pre-galvanized material conforms to ASTM A653 with a G90 zinc coating. The zinc thickness per side is nominally 0.75 mils thick or 0.45 oz /sq ft.

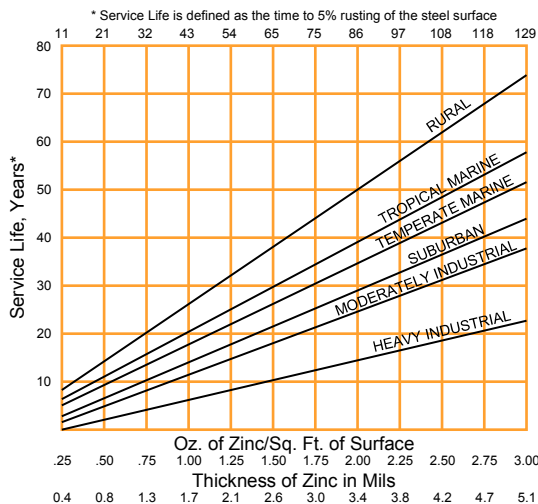
HOT-DIP GALVANIZED “HDG” (ASTM 123)

Recommended for prolonged outdoor exposure and will usually protect steel in most atmospheric environments. After fabrication the part is im-mersed in a bath of molten zinc. A metallurgical bond is formed resulting in a zinc coating that coats all surfaces including edges. Please note that some items cannot be hot-dipped galvanized due to design, tolerances, or threaded components. Check with the PHD factory or your local representative when questionable. Threaded components on hot dipped galvanized products will be electro-plated.

The hot-dip galvanized coating is typically 2.6 mils or 1.5 oz /sq ft per side.

As shown in the graph, when the zinc coating is double, the service life is double under most conditions.

Life of Protection vs. Thickness of Zinc
And Type of Atmosphere



Comparison of Zinc Finishing	
Finish	Zinc Thickness (mils)
Hot-Dip Galvanized	2.6
Pre-Galvanized	0.75
Electro-Galvanized (SC1)	0.2
Electro-Galvanized (SC3)	0.5

FINISHES & CORROSION

CORROSION

All metal surfaces are affected by corrosion. Depending on the physical properties of the metal and the environment to which it is exposed, chemical or electromechanical corrosion may occur.

Atmospheric Corrosion

Atmospheric corrosion occurs when metal is exposed to airborne liquids, solids or gases. Some sources of atmospheric corrosion are moisture, salt, dirt and sulphuric acid. This form of corrosion is typically more severe outdoors, especially near marine environments.

Chemical Corrosion

Chemical corrosion takes place when metal comes in direct contact with a corrosive solution. Some factors which affect the severity of chemical corrosion include: chemical concentration level, duration of contact, frequency of washing, and operating temperature.

Galvanic Corrosion

Galvanic corrosion occurs when two or more dissimilar metals are in contact in the presence of an electrolyte (i.e. moisture). An electrolytic cell is created and the metals form an anode or a cathode depending on their relative position on the Galvanic Series Table. The anodic material will be the one to corrode. Anodic or cathodic characteristics of two dissimilar metals will depend on the type of each material. For example: If zinc and steel are in contact, the zinc acts as the anode and will corrode; the steel acts as the cathode, and will be protected. If steel and copper are in contact, the steel is now the anode and will corrode. The rate at which galvanic corrosion occurs depends on several factors:

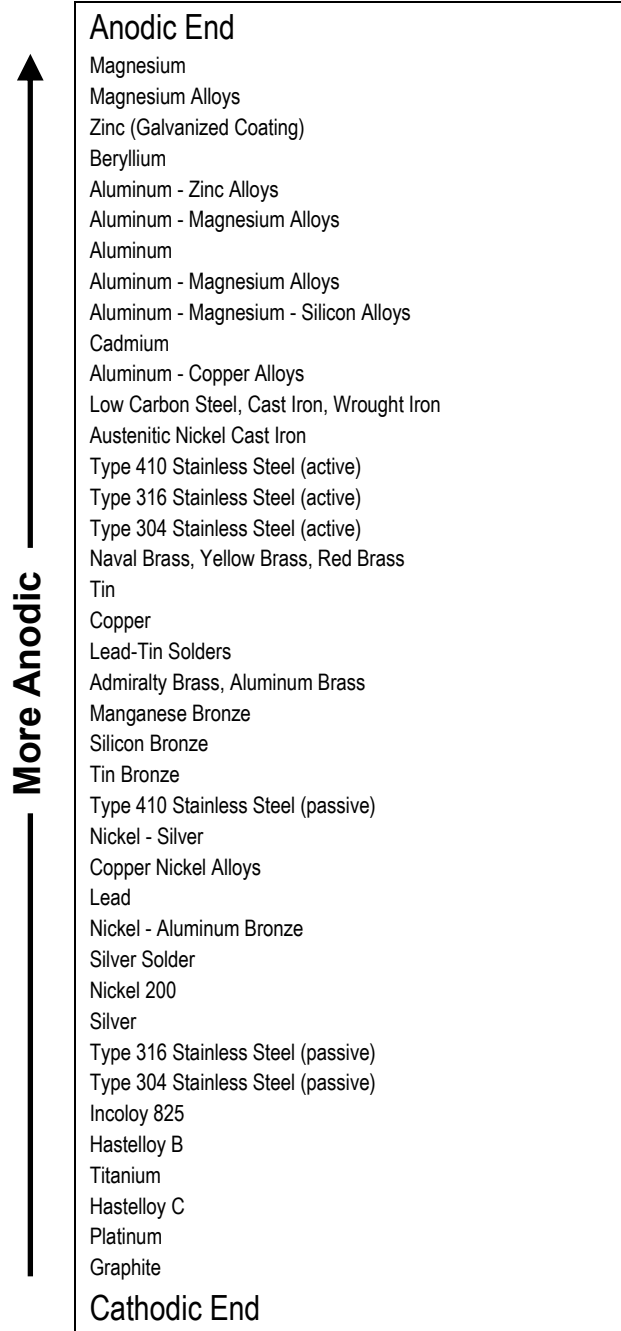
1. The relative position on the Galvanic Series Table - the further apart materials are in the Galvanic Series Table, the greater the potential for corrosion of the anodic material.
2. The amount and concentration of electrolyte present - an indoor, dry environment will have little or no galvanic corrosion compared to a wet atmosphere.
3. The relative size of the materials – a small amount of anodic material in contact with a large cathodic material will result in greater corrosion. Likewise, a large anode in contact with a small cathode will decrease the rate of attack.

Storage Corrosion

Wet storage stain (white rust) is caused by the entrapment of moisture between surfaces of closely packed and poorly ventilated material for an extended period. Wet storage stain is usually superficial, having no affect on the properties of the metal.

Light staining normally disappears with weathering. Medium to heavy buildup should be removed in order to allow the formation of normal protective film. Proper handling and storage will help to assure stain-free material. If product arrives wet, it should be unpacked and dried before storage. Dry material should be stored in a well ventilated “low moisture” environment to avoid condensation formation. Outdoor storage is undesirable, and should be avoided whenever possible.

GALVANIC SERIES IN SEA WATER



Metals in descending order of activity in the presence of an electrolyte.

FINISHES & CORROSION



CORROSION

The corrosion data given in this table is for general comparison only.

The presence of contaminants and the effect of temperature in chemical environments can greatly affect the corrosion of any material.

PHD Manufacturing, Inc. strongly suggests that field service tests or simulated laboratory tests using actual environmental conditions are conducted in order to determine the proper materials and finishes to be selected.

Chemical	Aluminum	Channel Green	Type 304 Stainless	Type 316 Stainless	Zinc Coated Steel
Acetic Acid 10%	R	NR	R	R	NR
Acetic Acid 2%	R	F	R	R	NR
Acetone	R	R	R	R	R
Ammonium Hydroxide-Conc.	R	R	R	R	-
Ammonium Hydroxide 10%	F	R	R	R	-
Ammonium Hydroxide 2%	R	R	R	R	-
Benzene	R	R	R	R	-
Bromine Water	NR	R	NR	NR	-
Butanol (Butyl Alcohol)	R	R	R	R	R
Carbon Disulfide	R	R	R	R	-
Carbon Tetrachloride	F	R	R	R	-
Chlorine Water	R	R	NR	F	R
Cutting Oil	-	R	-	-	-
Diethanolamine	R	R	-	-	NR
Ethanol	R	R	R	R	R
Ethyl Acetate	R	R	-	-	R
Ethylene Dichloride	F	R	-	-	R
Formaldehyde 20%	R	R	R	R	R
Gasoline	R	R	R	R	R
Glycerine	R	R	R	R	R
Household Detergent 10%	F	R	R	R	-
Hydrochloric Acid 40%	NR	NR	NR	NR	NR
Hydrochloric Acid 10%	NR	F	NR	NR	NR
Hydrochloric Acid 2%	NR	F	NR	NR	NR
Hydrogen Peroxide 30%	R	NR	R	R	-
Hydrogen Peroxide 3%	R	R	R	R	-
Hydrogen Sulfide (Gas)	R	R	F	R	-
JP-4 Jet Fuel	R	R	R	R	-
Lactic Acid 85%	F	R	NR	-	-
Latex	R	R	R	R	NR
Linseed Oil Fatty Acid	R	F	R	R	-
Methanol	R	R	R	R	R
Methyl Ethyl Ketone	R	R	-	-	R
Methyl Isobutyl Ketone	R	R	-	-	R
Mineral Spirits	R	R	-	-	-
Motor Oil - 10W	R	R	R	R	R
Naphtha, VM&P	R	R	R	R	R
Nitric Acid 2%	F	NR	R	R	-
Perchloroethylene	R	R	-	-	NR
Petroleum Ether	-	R	R	R	R
Phenol 10%	R	R	R	R	R
Phosphoric Acid 2%	F	NR	R	R	NR
Potassium Hydroxide 50%	NR	R	R	R	-
Potassium Hydroxide 10%	NR	R	R	R	-
Potassium Hydroxide 2%	NR	R	R	R	-
Sodium Chloride 25%	F	R	R	R	F
Sodium Hydroxide 50%	NR	R	R	R	NR
Sodium Hydroxide 10%	NR	R	R	R	F
Sodium Hydroxide 2%	NR	R	-	-	-
Sodium Hypochlorite-C1. 10%	F	R	-	-	-
Sodium Hypochlorite-C1. 6%	F	R	NR	R	-
Sulfuric Acid 50%	F	NR	NR	R	NR
Tall Oil Fatty Acid 50%	R	R	-	-	-
Tannic Acid 50%	F	R	R	R	-
Water-Deionized	R	R	R	R	F
Water-Sea	F	F	R	R	F
Water-Tap	R	R	F	F	R
Xyol	R	R	-	-	-

R = Recommended

F = May be used under some conditions

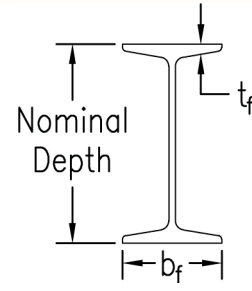
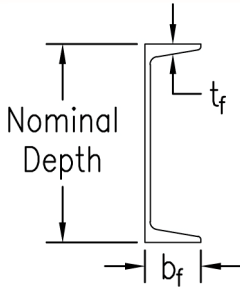
NR = Not Recommended

- = Information not available

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA

STANDARD BEAM INFORMATION



AMERICAN STANDARD 'C' SHAPE CHANNELS

Designation Nom. Depth & Weight		Flange Width b _f		Flange Thickness t _f	
in. X lbs./ft	mm X kg/m				
C3 X 4.1	(C75 X 6.1)	1 ³ / ₈	(35)	.273	(6.9)
C3 X 5	(C75 X 7.4)	1 ¹ / ₂	(37)	.273	(6.9)
C3 X 6	(C75 X 8.9)	1 ⁵ / ₈	(40)	.273	(6.9)
C4 X 5.4	(C100 X 8)	1 ⁹ / ₁₆	(40)	.296	(7.5)
C4 X 7.25	(C100 X 10.8)	1 ³ / ₄	(44)	.296	(7.5)
C5 X 6.7	(C130 X 10)	1 ³ / ₄	(44)	.320	(8.1)
C5 X 9	(C130 X 13.4)	1 ⁷ / ₈	(47)	.320	(8.1)
C6 X 8.2	(C150 X 12.2)	1 ¹⁵ / ₁₆	(48)	.343	(8.7)
C6 X 10.5	(C150 X 15.6)	2	(51)	.343	(8.7)
C6 X 13	(C150 X 19.3)	2 ¹ / ₈	(54)	.343	(8.7)
C7 X 9.8	(C180 X 14.6)	2 ¹ / ₁₆	(53)	.366	(9.3)
C7 X 12.25	(C180 X 18.2)	2 ³ / ₁₆	(55)	.366	(9.3)
C7 X 14.75	(C180 X 22)	2 ¹ / ₄	(57)	.366	(9.3)
C8 X 11.5	(C200 X 17.1)	2 ¹ / ₄	(57)	.390	(9.9)
C8 X 13.75	(C200 X 20.5)	2 ³ / ₈	(59)	.390	(9.9)
C8 X 18.75	(C200 X 27.9)	2 ¹ / ₂	(63)	.390	(9.9)
C9 X 13.4	(C230 X 19.9)	2 ⁷ / ₁₆	(61)	.413	(10.5)
C9 X 15	(C230 X 22)	2 ¹ / ₂	(63)	.413	(10.5)
C9 X 20	(C230 X 30)	2 ⁵ / ₈	(67)	.413	(10.5)
C10 X 15.3	(C250 X 22.8)	2 ⁵ / ₈	(67)	.436	(11.1)
C10 X 20	(C250 X 30)	2 ³ / ₄	(69)	.436	(11.1)
C10 X 25	(C250 X 37)	2 ⁷ / ₈	(73)	.436	(11.1)
C10 X 30	(C250 X 45)	3	(76)	.436	(11.1)
C12 X 20.7	(C310 X 30.8)	2 ¹⁵ / ₁₆	(74)	.501	(12.7)
C12 X 25	(C310 X 37)	3	(76)	.501	(12.7)
C12 X 30	(C310 X 45)	3 ¹ / ₈	(80)	.501	(12.7)
C15 X 33.9	(C380 X 50.4)	3 ³ / ₈	(86)	.650	(16.5)
C15 X 40	(C380 X 60)	3 ¹ / ₂	(89)	.650	(16.5)
C15 X 50	(C380 X 74)	3 ³ / ₄	(94)	.650	(16.5)
C18 X 42.7	(C460 X 63.5)	4	(102)	.625	(15.9)
C18 X 45.8	(C460 X 68.1)	4	(102)	.625	(15.9)
C18 X 51.9	(C460 X 77.2)	4 ¹ / ₈	(106)	.625	(15.9)
C18 X 58	(C460 X 86.3)	4 ¹ / ₄	(112)	.625	(15.9)

AMERICAN STANDARD 'S' SHAPE I-BEAMS

Designation Nom. Depth & Weight		Flange Width b _f		Flange Thickness t _f	
in. X lbs./ft	mm X kg/m				
S3 X 5.7	(S75 X 8.5)	2 ³ / ₈	(59)	.260	(6.6)
S3 X 7.5	(S75 X 11.2)	2 ¹ / ₂	(63)	.260	(6.6)
S4 X 7.7	(S100 X 11.5)	2 ⁵ / ₈	(68)	.293	(7.4)
S4 X 9.5	(S100 X 14.1)	2 ³ / ₄	(71)	.293	(7.4)
S5 X 10	(S130 X 15)	3	(76)	.326	(8.3)
S5 X 14.75	(S130 X 22)	3 ¹ / ₄	(83)	.326	(8.3)
S6 X 12.5	(S150 X 18.6)	3 ³ / ₈	(85)	.359	(9.1)
S6 X 17.25	(S150 X 25.7)	3 ¹¹ / ₁₆	(91)	.359	(9.1)
S7 X 15.3	(S180 X 22.8)	3 ⁵ / ₈	(93)	.392	(10.0)
S7 X 20	(S180 X 29.8)	3 ⁷ / ₈	(98)	.392	(10.0)
S8 X 18.4	(S200 X 27.4)	4	(102)	.425	(10.8)
S8 X 23	(S200 X 34)	4 ¹ / ₈	(106)	.425	(10.8)
S10 X 25.4	(S250 X 37.8)	4 ⁵ / ₈	(118)	.491	(12.5)
S10 X 35	(S250 X 52)	4 ¹⁵ / ₁₆	(126)	.491	(12.5)
S12 X 31.8	(S310 X 47.3)	5	(127)	.544	(13.8)
S12 X 35	(S310 X 52)	5 ¹ / ₁₆	(129)	.544	(13.8)
S12 X 40.8	(S310 X 60.7)	5 ¹ / ₄	(133)	.659	(16.7)
S12 X 50	(S310 X 74)	5 ¹ / ₂	(139)	.659	(16.7)
S15 X 42.9	(S380 X 64)	5 ¹ / ₂	(140)	.622	(15.8)
S15 X 50	(S380 X 74)	5 ⁵ / ₈	(143)	.622	(15.8)
S18 X 54.7	(S460 X 81.4)	6	(152)	.691	(17.6)
S18 X 70	(S460 X 104)	6 ¹ / ₄	(159)	.691	(17.6)
S20 X 66	(S510 X 98.2)	6 ¹ / ₄	(159)	.795	(20.2)
S20 X 75	(S510 X 112)	6 ³ / ₈	(162)	.795	(20.2)
S20 X 86	(S510 X 128)	7 ¹ / ₁₆	(179)	.920	(23.4)
S20 X 96	(S510 X 143)	7 ³ / ₁₆	(183)	.920	(23.4)
S24 X 80	(S610 X 119)	7	(178)	.870	(22.1)
S24 X 90	(S610 X 134)	7 ¹ / ₈	(181)	.870	(22.1)
S24 X 100	(S610 X 149)	7 ¹ / ₄	(184)	.870	(22.1)
S24 X 106	(S610 X 158)	7 ⁷ / ₈	(200)	1.090	(27.7)
S24 X 121	(S610 X 180)	8 ¹ / ₁₆	(204)	1.090	(27.7)

Note: All standard beam information is taken from ASTM A6-86

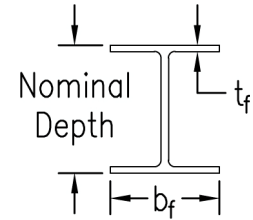
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TECHNICAL DATA



STANDARD BEAM INFORMATION

Designation Nom. Depth & Weight		Flange Width		Flange Thickness		Designation Nom. Depth & Weight		Flange Width		Flange Thickness	
in. X lbs./ft	mm X kg/m	b _f	t _f	in. X lbs./ft	mm X kg/m	b _f	t _f	in. X lbs./ft	mm X kg/m	b _f	t _f
W4 X 13	(W100 X 19.3)	4 ¹ / ₁₆	(103)	.345	(8.8)	W12 X 65	(W310 X 97)	12	(305)	.605	(15.4)
W5 X 16	(W130 X 23.8)	5	(127)	.360	(9.1)	W12 X 72	(W310 X 107)	12	(305)	.670	(17.0)
W5 X 19	(W130 X 28.1)	5	(127)	.430	(10.9)	W12 X 79	(W310 X 117)	12 ¹ / ₁₆	(306)	.735	(18.7)
W6 X 9	(W150 X 13.5)	3 ¹⁵ / ₁₆	(100)	.215	(5.5)	W12 X 87	(W310 X 129)	12 ¹ / ₈	(308)	.810	(20.6)
W6 X 12	(W150 X 18.)	4	(102)	.280	(7.1)	W12 X 96	(W310 X 143)	12 ¹ / ₈	(308)	.900	(22.9)
W6 X 16	(W150 X 24.)	4	(102)	.405	(10.3)	W12 X 106	(W310 X 158)	12 ¹ / ₄	(311)	.990	(25.1)
W6 X 20	(W150 X 29.8)	6	(152)	.365	(9.3)	W12 X 120	(W310 X 179)	12 ⁵ / ₁₆	(313)	1.105	(28.1)
W6 X 25	(W150 X 37.1)	6 ¹ / ₁₆	(154)	.455	(11.6)	W12 X 136	(W310 X 202)	12 ³ / ₈	(314)	1.250	(31.8)
W8 X 10	(W200 X 15.0)	3 ¹⁵ / ₁₆	(100)	.205	(5.2)	W12 X 152	(W310 X 226)	12 ¹ / ₂	(318)	1.400	(35.6)
W8 X 13	(W200 X 19.3)	4	(102)	.255	(6.5)	W12 X 170	(W310 X 253)	12 ⁹ / ₁₆	(319)	1.560	(39.6)
W8 X 15	(W200 X 22.5)	4	(102)	.315	(8.0)	W12 X 190	(W310 X 283)	12 ¹¹ / ₁₆	(322)	1.735	(44.1)
W8 X 18	(W200 X 26.6)	5 ¹ / ₄	(133)	.330	(8.4)	W12 X 210	(W310 X 313)	12 ³ / ₄	(324)	1.900	(48.3)
W8 X 21	(W200 X 31.3)	5 ¹ / ₄	(133)	.400	(10.2)	W12 X 230	(W310 X 342)	12 ⁷ / ₈	(327)	2.070	(52.6)
W8 X 24	(W200 X 35.9)	6 ¹ / ₂	(165)	.400	(10.2)	W12 X 252	(W310 X 375)	13	(330)	2.250	(57.2)
W8 X 28	(W200 X 41.7)	6 ¹ / ₂	(165)	.465	(11.8)	W14 X 22	(W360 X 32.9)	5	(127)	.335	(8.5)
W8 X 31	(W200 X 46.1)	8	(203)	.435	(11.0)	W14 X 26	(W360 X 39)	5	(127)	.420	(10.7)
W8 X 35	(W200 X 52)	8	(203)	.495	(12.6)	W14 X 30	(W360 X 44.8)	6 ¹ / ₄	(171)	.385	(9.8)
W8 X 40	(W200 X 59)	8 ¹ / ₁₆	(205)	.560	(14.2)	W14 X 34	(W360 X 51)	6 ¹ / ₄	(171)	.455	(11.6)
W8 X 48	(W200 X 71)	8 ¹ / ₈	(206)	.685	(17.4)	W14 X 38	(W360 X 57)	6 ¹ / ₄	(171)	.515	(13.1)
W8 X 58	(W200 X 86)	8 ¹ / ₄	(210)	.810	(20.6)	W14 X 43	(W360 X 64)	8	(203)	.530	(13.5)
W8 X 67	(W200 X 100)	8 ¹ / ₄	(210)	.935	(23.7)	W14 X 48	(W360 X 72)	8	(203)	.595	(15.1)
W10 X 12	(W250 X 17.9)	4	(102)	.210	(5.3)	W14 X 53	(W360 X 79)	8 ¹ / ₁₆	(205)	.660	(16.8)
W10 X 15	(W250 X 22.3)	4	(102)	.270	(6.9)	W14 X 61	(W360 X 91)	10	(254)	.645	(16.4)
W10 X 17	(W250 X 25.3)	4	(102)	.330	(8.4)	W14 X 68	(W360 X 101)	10	(254)	.720	(18.3)
W10 X 19	(W250 X 28.4)	4	(102)	.395	(10.0)	W14 X 74	(W360 X 110)	10 ¹ / ₁₆	(256)	.785	(19.9)
W10 X 22	(W250 X 32.7)	5 ¹ / ₄	(146)	.360	(9.1)	W14 X 82	(W360 X 122)	10 ¹ / ₈	(257)	.855	(21.7)
W10 X 26	(W250 X 38.5)	5 ¹ / ₄	(146)	.440	(11.2)	W14 X 90	(W360 X 134)	14 ¹ / ₂	(368)	.710	(18.0)
W10 X 30	(W250 X 44.8)	5 ³ / ₁₆	(148)	.510	(13.0)	W14 X 99	(W360 X 147)	14 ⁹ / ₁₆	(370)	.780	(19.8)
W10 X 33	(W250 X 49.1)	7 ¹⁵ / ₁₆	(202)	.435	(11.0)	W14 X 109	(W360 X 162)	14 ⁵ / ₈	(371)	.860	(21.8)
W10 X 39	(W250 X 58)	8	(203)	.530	(13.5)	W14 X 120	(W360 X 179)	14 ¹¹ / ₁₆	(373)	.940	(23.9)
W10 X 45	(W250 X 57)	8	(203)	.620	(15.7)	W14 X 132	(W360 X 196)	14 ³ / ₄	(375)	1.030	(26.2)
W10 X 49	(W250 X 73)	10	(254)	.560	(14.2)	W14 X 145	(W360 X 216)	15 ¹ / ₂	(394)	1.090	(27.7)
W10 X 54	(W250 X 80)	10 ¹ / ₁₆	(256)	.615	(15.6)	W14 X 159	(W360 X 237)	15 ⁹ / ₁₆	(395)	1.190	(30.2)
W10 X 60	(W250 X 89)	10 ¹ / ₁₆	(256)	.680	(17.3)	W14 X 176	(W360 X 262)	15 ⁵ / ₈	(397)	1.310	(33.3)
W10 X 68	(W250 X 101)	10 ¹ / ₈	(257)	.770	(19.6)	W14 X 193	(W360 X 287)	15 ³ / ₄	(400)	1.440	(36.6)
W10 X 77	(W250 X 115)	10 ³ / ₁₆	(259)	.870	(22.1)	W14 X 211	(W360 X 314)	15 ¹ / ₄	(400)	1.560	(39.6)
W10 X 88	(W250 X 131)	10 ¹ / ₄	(260)	.990	(25.1)	W14 X 233	(W360 X 347)	15 ⁷ / ₈	(403)	1.720	(43.7)
W10 X 100	(W250 X 149)	10 ³ / ₈	(264)	1.120	(28.4)	W14 X 257	(W360 X 382)	16	(406)	1.890	(48.0)
W10 X 112	(W250 X 167)	10 ⁷ / ₁₆	(265)	1.250	(31.8)	W14 X 283	(W360 X 421)	16 ¹ / ₈	(410)	2.070	(52.6)
W12 X 14	(W310 X 21)	4	(102)	.225	(5.7)	W14 X 311	(W360 X 463)	16 ¹ / ₄	(413)	2.260	(57.4)
W12 X 16	(W310 X 23.8)	4	(102)	.265	(6.7)	W14 X 342	(W360 X 509)	16 ³ / ₈	(416)	2.470	(62.7)
W12 X 19	(W310 X 28.3)	4	(102)	.350	(8.9)	W14 X 370	(W360 X 551)	16 ¹ / ₂	(419)	2.660	(67.6)
W12 X 22	(W310 X 32.7)	4	(102)	.425	(10.8)	W14 X 398	(W360 X 592)	16 ⁵ / ₁₆	(421)	2.845	(72.3)
W12 X 26	(W310 X 38.7)	6 ¹ / ₂	(165)	.380	(9.7)	W14 X 426	(W360 X 634)	16 ¹ / ₁₆	(424)	3.035	(77.1)
W12 X 30	(W310 X 44.5)	6 ¹ / ₂	(165)	.440	(11.2)	W16 X 26	(W410 X 38.8)	5 ¹ / ₂	(140)	.345	(8.8)
W12 X 35	(W310 X 52)	6 ³ / ₁₆	(167)	.520	(13.2)	W16 X 31	(W410 X 46.1)	5 ¹ / ₂	(140)	.440	(11.2)
W12 X 40	(W310 X 60)	8	(203)	.515	(13.1)	W16 X 36	(W410 X 53)	7	(178)	.430	(10.9)
W12 X 45	(W310 X 67)	8 ¹ / ₁₆	(205)	.575	(14.6)	W16 X 40	(W410 X 60)	7	(178)	.505	(12.8)
W12 X 50	(W310 X 74)	8 ¹ / ₁₆	(205)	.640	(16.3)	W16 X 45	(W410 X 67)	7	(178)	.565	(14.4)
W12 X 53	(W310 X 79)	10	(254)	.575	(14.6)	W16 X 50	(W410 X 75)	7 ¹ / ₁₆	(179)	.630	(16.0)
W12 X 58	(W310 X 86)	10	(254)	.640	(16.3)	W16 X 57	(W410 X 85)	7 ¹ / ₈	(181)	.715	(18.2)



WIDE FLANGE I-BEAMS

Designation Nom. Depth & Weight		Flange Width		Flange Thickness	
in. X lbs./ft	mm X kg/m	b _f	t _f	in. X lbs./ft	mm X kg/m
W16 X 67	(W410 X 100)	10 ¹ / ₄	(260)	.665	(16.9)
W16 X 77	(W410 X 114)	10 ⁵ / ₁₆	(262)	.760	(19.3)
W16 X 89	(W410 X 132)	10 ³ / ₈	(264)	.875	(22.2)
W16 X 100	(W410 X 149)	10 ⁷ / ₁₆	(265)	.985	(25.0)
W18 X 35	(W460 X 52)	6	(152)	.425	(10.8)
W18 X 40	(W460 X 60)	6	(152)	.525	(13.3)
W18 X 46	(W460 X 68)	6 ¹ / ₁₆	(154)	.605	(15.4)
W18 X 50	(W460 X 74)	7 ¹ / ₂	(191)	.570	(14.5)
W18 X 55	(W460 X 82)	7 ¹ / ₂	(191)	.630	(16.0)
W18 X 60	(W460 X 89)	7 ⁹ / ₁₆	(192)	.695	(17.7)
W18 X 65	(W460 X 97)	7 ⁹ / ₁₆	(192)	.750	(19.1)
W18 X 71	(W460 X 106)	7 ⁵ / ₈	(194)	.810	(20.6)
W18 X 76	(W460 X 113)	11	(279)	.680	(17.3)
W18 X 86	(W460 X 128)	11 ¹ / ₁₆	(281)	.770	(19.6)
W18 X 97	(W460 X 144)	11 ¹ / ₈	(283)	.870	(22.1)
W18 X 106	(W460 X 158)	11 ³ / ₁₆	(284)	.940	(23.9)
W18 X 119	(W460 X 177)	11 ¹ / ₄	(286)	1.060	(26.9)
W21 X 44	(W530 X 66)	6 ¹ / ₂	(165)	.450	(11.4)
W21 X 50	(W530 X 74)	6 ¹ / ₂	(165)	.535	(13.6)
W21 X 57	(W530 X 85)	6 ⁹ / ₁₆	(167)	.650	(16.5)
W21 X 62	(W530 X 92)	8 ¹ / ₄	(210)	.615	(15.6)
W21 X 68	(W530 X 101)	8 ¹ / ₄	(210)	.685	(17.4)
W21 X 73	(W530 X 109)	8 ¹ / ₄	(210)	.740	(18.8)
W21 X 83	(W530 X 123)	8 ³ / ₈	(225)	.835	(21.2)
W21 X 93	(W530 X 138)	8 ⁷ / ₁₆	(214)	.930	(23.6)
W21 X 101	(W530 X 150)	12 ¹ / ₄	(311)	.800	(20.3)
W21 X 111	(W530 X 165)	12 ³ / ₈	(314)	.875	(22.2)
W21 X 122	(W530 X 182)	12 ³ / ₈	(314)	.960	(24.4)
W21 X 132	(W530 X 196)	12 ¹ / ₁₆	(316)	1.035	(26.3)
W21 X 147	(W530 X 219)	12 ¹ / ₂	(318)	1.150	(29.2)
W24 X 55	(W610 X 82)	7	(178)	.505	(12.8)
W24 X 62	(W610 X 92)	7 ¹ / ₁₆	(179)	.590	(15.0)
W24 X 68	(W610 X 101)	8 ⁹ / ₁₆	(227)	.585	(14.9)
W24 X 76	(W610 X 113)	9	(229)	.680	(17.3)
W24 X 84	(W610 X 125)	9	(229)	.770	(19.6)
W24 X 94	(W610 X 140)	9 ¹ / ₁₆	(230)	.875	(22.2)
W24 X 104	(W610 X 155)	12 ³ / ₄	(324)	.750	(19.1)
W24 X 117	(W610 X 174)	12 ³ / ₄	(324)	.850	(21.6)
W24 X 131	(W610 X 195)	12 ⁷ / ₈	(327)	.960	(24.4)
W24 X 146	(W610 X 217)	12 ⁷ / ₈	(327)	1.090	(27.7)
W24 X 162	(W610 X 241)	12 ⁵ / ₁₆	(329)	1.220	(31.0)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA

STEEL PIPE DATA

Pipe Size	Schedule No.	O.D.		Wall Thickness		Weight				Pipe Size	Schedule No.	O.D.		Wall Thickness		Weight			
						Water		Pipe								Water		Pipe	
						lbs./ft	kg/m	lbs./ft	kg/m							lbs./ft	kg/m	lbs./ft	kg/m
3/8 (10)	10	0.675	(17.15)	.066	(1.68)	0.100	(0.15)	0.4325	(0.64)	5 (125)	40	5.563	(141.30)	0.134	(3.40)	9.55	(14.21)	7.77	(11.56)
	40			.091	(2.31)	0.083	(0.12)	0.567	(0.84)					0.258	(6.55)	8.67	(12.91)	14.62	(21.76)
	80			.126	(3.20)	0.061	(0.09)	0.738	(1.10)					0.375	(9.53)	7.89	(11.74)	20.78	(30.92)
1/2 (15)	10	0.84	(21.34)	.083	(2.11)	0.155	(0.23)	0.671	(1.00)	6 (150)	40	6.625	(168.28)	0.134	(3.40)	13.76	(20.48)	9.289	(13.82)
	40			.109	(2.77)	0.132	(0.20)	0.85	(1.26)					0.28	(7.11)	12.52	(18.64)	18.97	(28.23)
	80			.147	(3.73)	0.102	(0.15)	1.087	(1.62)					0.432	(10.97)	11.30	(16.82)	28.57	(42.52)
3/4 (20)	10	1.05	(26.67)	.083	(2.11)	0.266	(0.40)	0.8572	(1.28)	8 (200)	40	8.625	(219.08)	0.148	(3.76)	23.62	(35.15)	13.4	(19.94)
	40			.113	(2.87)	0.231	(0.34)	1.13	(1.68)					0.322	(8.18)	21.69	(32.28)	28.55	(42.49)
	80			.154	(3.91)	0.187	(0.28)	1.473	(2.19)					0.5	(12.70)	19.80	(29.46)	43.39	(64.57)
1 (25)	10	1.315	(33.40)	.109	(2.77)	0.410	(0.61)	1.404	(2.09)	10 (250)	40	10.75	(273.05)	0.165	(4.19)	36.97	(55.02)	18.7	(27.83)
	40			.133	(3.38)	0.375	(0.56)	1.678	(2.50)					0.365	(9.27)	34.19	(50.87)	40.48	(60.24)
	80			.179	(4.55)	0.312	(0.46)	2.171	(3.23)					0.593	(15.06)	31.14	(46.35)	64.4	(95.84)
1 1/4 (32)	10	1.66	(42.16)	.109	(2.77)	0.708	(1.05)	1.806	(2.69)	12 (300)	40	12.75	(323.85)	0.18	(4.57)	52.27	(77.79)	24.2	(36.01)
	40			.14	(3.56)	0.648	(0.96)	2.272	(3.38)					0.406	(10.31)	48.53	(72.21)	53.6	(79.77)
	80			.191	(4.85)	0.556	(0.83)	2.996	(4.46)					0.687	(17.45)	44.06	(65.57)	88.6	(131.85)
1 1/2 (40)	10	1.9	(48.26)	.109	(2.77)	0.963	(1.43)	2.085	(3.10)	14 (350)	40	14	(355.60)	0.25	(6.35)	62.05	(92.35)	36.71	(54.63)
	40			.145	(3.68)	0.883	(1.31)	2.717	(4.04)					0.437	(11.10)	58.66	(87.30)	63	(93.75)
	80			.2	(5.08)	0.766	(1.14)	3.631	(5.40)					0.75	(19.05)	53.20	(79.17)	107	(159.23)
2 (50)	10	2.375	(60.33)	.109	(2.77)	1.584	(2.36)	2.638	(3.93)	16 (400)	40	16	(406.40)	0.25	(6.35)	81.80	(121.74)	42.05	(62.58)
	40			.154	(3.91)	1.455	(2.16)	3.652	(5.43)					0.5	(12.70)	76.61	(114.01)	83	(123.52)
	80			.218	(5.54)	1.280	(1.91)	5.022	(7.47)					0.843	(21.41)	69.76	(103.82)	137	(203.88)
2 1/2 (65)	10	2.875	(73.03)	.12	(3.05)	2.364	(3.52)	3.531	(5.25)	18 (450)	40	18	(457.20)	0.25	(6.35)	104.27	(155.18)	47.39	(70.52)
	40			.203	(5.16)	2.076	(3.09)	5.79	(8.62)					0.563	(14.30)	96.95	(144.27)	105	(156.26)
	80			.276	(7.01)	1.837	(2.73)	7.66	(11.40)					0.937	(23.80)	88.54	(131.77)	171	(254.48)
3 (80)	10	3.5	(88.90)	.12	(3.05)	3.619	(5.39)	4.332	(6.45)	20 (500)	40	20	(508.00)	0.25	(6.35)	129.47	(192.67)	62.73	(93.35)
	40			.216	(5.49)	3.205	(4.77)	7.57	(11.27)					0.593	(15.06)	120.52	(179.36)	123	(183.04)
	80			.3	(7.62)	2.864	(4.26)	10.25	(15.25)					1.031	(26.19)	109.56	(163.04)	209	(311.03)
3 1/2 (90)	10	4	(101.60)	.12	(3.05)	4.814	(7.16)	4.973	(7.40)	24 (600)	40	24	(609.60)	0.25	(6.35)	188.04	(279.83)	63.41	(94.36)
	40			.318	(8.08)	3.853	(5.73)	12.51	(18.62)					0.687	(17.45)	174.31	(259.40)	171	(254.48)
	80			.318	(8.08)	3.853	(5.73)	12.51	(18.62)					1.218	(30.94)	158.33	(235.62)	297	(441.98)
4 (100)	10	4.5	(114.30)	.12	(3.05)	6.179	(9.20)	5.613	(8.35)	30 (750)	20	30	(762.00)	.5	(12.70)	286.00	(425.61)	158	(235.13)
	40			.237	(6.02)	5.519	(8.21)	10.79	(16.06)					.5	(12.70)	417.00	(620.56)	190	(282.75)
	80			.337	(8.56)	4.984	(7.42)	14.98	(22.29)										

SPACING OF HANGERS FOR STEEL PIPE

Nominal Pipe Size	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
	(15)	(20)	(25)	(32)	(40)	(50)	(65)	(80)	(90)	(100)	(125)	(150)	(200)	(250)	(300)	(350)	(400)	(450)	(500)	(600)
Max. Span	7	7	7	7	9	10	11	12	13	14	16	17	19	22	23	25	27	28	30	32
	(2.13)	(2.13)	(2.13)	(2.13)	(2.74)	(3.05)	(3.35)	(3.66)	(3.96)	(4.27)	(4.88)	(5.18)	(5.79)	(6.71)	(7.01)	(7.62)	(8.23)	(8.53)	(9.14)	(9.75)
Recommended Hanger Rod Size	3/8	3/8	3/8	3/8	3/8	3/8	1/2	1/2	1/2	5/8	5/8	3/4	3/4	7/8	7/8	1	1	1 1/8	1 1/4	1 1/4
	OR TRAPEZE																			

Note: Spacing and capacities are based on pipe filled with water. Additional valves and fittings increase the load and therefore closer hanger spacing is required. Taken from ANSI/MSS SP-58.

***Many Codes and specifications require pipe hangers to be spaced every 10 ft (3.05m) regardless of size. Check local codes.**

TECHNICAL DATA



COPPER TUBE DATA

TYPE L

Tube Size	Tubing O.D.	Wall Thickness	Weight			
			Water		Pipe	
			lbs./ft	kg/m	lbs./ft	kg/m
1/4 (6)	.375 (9.53)	.030 (0.76)	.034 (0.051)	.126 (1.88)		
3/8 (10)	.500 (12.70)	.035 (0.89)	.062 (0.092)	.198 (2.95)		
1/2 (15)	.625 (15.88)	.040 (1.02)	.100 (0.149)	.285 (4.24)		
5/8 (17)	.750 (19.05)	.042 (1.07)	.151 (0.225)	.362 (5.39)		
3/4 (20)	.875 (22.23)	.045 (1.14)	.209 (0.311)	.455 (6.77)		
1 (25)	1.125 (28.58)	.050 (1.27)	.357 (0.531)	.655 (9.75)		
1 1/4 (32)	1.375 (34.93)	.055 (1.40)	.546 (0.813)	.884 (13.16)		
1 1/2 (40)	1.625 (41.28)	.060 (1.52)	.767 (1.141)	1.140 (16.97)		
2 (50)	2.125 (53.98)	.070 (1.78)	1.341 (1.996)	1.750 (2.604)		
2 1/2 (65)	2.625 (66.68)	.080 (2.03)	2.064 (3.072)	2.480 (3.691)		
3 (80)	3.125 (79.38)	.090 (2.29)	2.949 (4.389)	3.330 (4.956)		
3 1/2 (90)	3.625 (92.08)	.100 (2.54)	3.989 (5.936)	4.290 (6.384)		
4 (100)	4.125 (104.78)	.110 (2.79)	5.188 (7.721)	5.380 (8.006)		
5 (125)	5.125 (130.18)	.125 (3.18)	8.081 (12.026)	7.610 (11.325)		
6 (150)	6.125 (155.58)	.140 (3.56)	11.616 (17.287)	10.200 (15.179)		
8 (200)	8.125 (206.38)	.200 (5.08)	20.289 (30.193)	19.260 (28.662)		
10 (250)	10.125 (257.18)	.250 (6.35)	31.590 (47.011)	30.100 (44.794)		
12 (300)	12.125 (307.98)	.280 (7.11)	45.426 (67.601)	40.400 (60.122)		

TYPE K

Tube Size	Tubing O.D.	Wall Thickness	Weight			
			Water		Pipe	
			lbs./ft	kg/m	lbs./ft	kg/m
1/4 (6)	.375 (9.53)	.035 (0.89)	.032 (0.048)	.145 (2.16)		
3/8 (10)	.500 (12.70)	.049 (1.24)	.055 (0.082)	.269 (4.00)		
1/2 (15)	.625 (15.88)	.049 (1.24)	.094 (0.140)	.344 (5.12)		
5/8 (17)	.750 (19.05)	.049 (1.24)	.144 (0.214)	.418 (6.22)		
3/4 (20)	.875 (22.23)	.065 (1.65)	.188 (0.280)	.641 (9.54)		
1 (25)	1.125 (28.58)	.065 (1.65)	.337 (0.502)	.839 (12.49)		
1 1/4 (32)	1.375 (34.93)	.065 (1.65)	.527 (0.784)	1.040 (15.48)		
1 1/2 (40)	1.625 (41.28)	.072 (1.83)	.743 (1.106)	1.360 (20.24)		
2 (50)	2.125 (53.98)	.083 (2.11)	1.310 (1.949)	2.060 (30.66)		
2 1/2 (65)	2.625 (66.68)	.095 (2.41)	2.000 (2.976)	2.920 (43.45)		
3 (80)	3.125 (79.38)	.109 (2.77)	2.960 (4.405)	4.000 (59.53)		
3 1/2 (90)	3.625 (92.08)	.120 (3.05)	3.900 (5.804)	5.120 (76.19)		
4 (100)	4.125 (104.78)	.134 (3.40)	5.060 (7.530)	6.510 (96.88)		
5 (125)	5.125 (130.18)	.160 (4.06)	8.000 (11.905)	9.670 (143.91)		
6 (150)	6.125 (155.58)	.192 (4.88)	11.200 (16.667)	13.870 (20.641)		
8 (200)	8.125 (206.38)	.271 (6.88)	19.500 (29.019)	25.900 (38.543)		
10 (250)	10.125 (257.18)	.338 (8.59)	30.423 (45.274)	40.300 (59.973)		
12 (300)	12.125 (307.98)	.405 (10.29)	43.675 (64.996)	57.800 (86.016)		

SPACING OF HANGERS FOR COPPER TUBING

Tubing Size	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	
	(15)	(20)	(25)	(32)	(40)	(50)	(65)	(80)	(90)	(100)	(125)	(150)	(200)	(250)	(300)	
Span	ft	5	5	6	7	8	8	9	10	11	12	13	14	16	18	19
	m	(1.5)	(1.5)	(1.8)	(2.1)	(2.4)	(2.4)	(2.7)	(3.0)	(3.4)	(3.7)	(4.0)	(4.3)	(4.9)	(5.5)	(5.8)

Note: Spacing and capacities are based on pipe filled with water. Additional valves and fittings increase the load and therefore closer hanger spacing is required. Taken from ANSI/MSS SP-58.

AWWA DUCTILE IRON PIPE DATA

Nominal Pipe Size	Class	O.D. D.I. Pipe	Wall Thick	Weight			
				Pipe		Water	
				lbs./ft	kg/m	lbs./ft	kg/m
3 (80)	53	3.96 (100.58)	.31 (7.87)	11.2 (16.67)	3.8 (5.66)		
4 (100)	53	4.80 (121.92)	.32 (8.13)	14.2 (21.13)	5.9 (8.78)		
6 (150)	53	6.90 (175.26)	.34 (8.64)	22.0 (32.74)	13.1 (19.49)		
8 (200)	53	9.05 (229.87)	.36 (9.14)	31.0 (46.13)	23.0 (34.23)		
10 (250)	53	11.1 (281.94)	.38 (9.65)	40.4 (60.12)	36.4 (54.17)		
12 (300)	53	13.2 (335.28)	.40 (10.16)	50.7 (75.45)	52.3 (77.83)		
14 (350)	53	15.3 (388.62)	.42 (10.67)	62.4 (92.86)	71.1 (105.81)		
16 (400)	53	17.4 (441.96)	.43 (10.92)	72.8 (108.34)	93.1 (138.55)		
18 (450)	53	19.5 (495.30)	.44 (11.18)	83.6 (124.41)	117.9 (175.45)		
20 (500)	53	21.6 (548.64)	.45 (11.43)	95.2 (141.67)	145.8 (216.97)		
24 (600)	53	25.8 (655.32)	.47 (11.94)	119.2 (177.39)	210.2 (312.81)		
30 (750)	53	32.0 (812.80)	.51 (12.95)	161.3 (240.04)	326.5 (485.89)		
36 (900)	53	38.3 (972.82)	.58 (14.73)	219.5 (326.65)	469.3 (698.40)		
42 (1050)	53	44.5 (1130.30)	.65 (16.51)	285.2 (424.42)	634.9 (944.84)		
48 (1200)	53	50.8 (1290.32)	.72 (18.29)	360.3 (536.19)	828.9 (1233.54)		

Based on AWWA C108-70, Table 8.2.

Add flange weight for flanged cast iron pipe.

GLASS PIPE DATA

REGULAR SCHEDULE

Nominal Pipe Size	O.D. D.I. Pipe	Wall Thick	Weight			
			Pipe		Water	
			lbs./ft	kg/m	lbs./ft	kg/m
1 1/2 (40)	1.84 (46.74)	.12 (3.05)	.64 (0.95)	.89 (1.32)		
2 (50)	2.34 (59.44)	.14 (3.56)	.94 (1.40)	1.45 (2.16)		
3 (80)	3.41 (86.61)	.17 (4.32)	1.60 (2.38)	3.19 (4.75)		
4 (100)	4.53 (115.06)	.20 (5.08)	2.60 (3.87)	5.79 (8.62)		
6 (150)	6.66 (169.16)	.24 (6.10)	4.70 (6.99)	12.78 (19.02)		

HEAVY SCHEDULE

1 (25)	1.31 (33.27)	.16 (4.06)	.60 (0.89)	.35 (0.52)
1 1/2 (40)	1.84 (46.74)	.17 (4.32)	.87 (1.29)	.76 (1.13)
2 (50)	2.34 (59.44)	.17 (4.32)	1.10 (1.64)	1.36 (2.02)
3 (80)	3.41 (86.61)	.20 (5.08)	2.00 (2.98)	3.06 (4.55)
4 (100)	4.53 (115.06)	.26 (6.60)	3.40 (5.06)	5.44 (8.10)
6 (150)	6.66 (169.16)	.33 (8.38)	6.30 (9.38)	12.42 (18.48)

Spacing of Hangers for glass pipe support every 8-10 ft (2.44 - 3.05 m). Pad all hangers. Use only clevis or trapeze, do not tie down pipe.

TECHNICAL DATA

PVC PLASTIC PIPE DATA

Pipe Size	Sch. No.	O.D.		Wall Thickness		Weight				Pipe Size	Sch. No.	O.D.		Wall Thickness		Weight			
						Water		Pipe								Water		Pipe	
						lbs./ft	kg/m	lbs./ft	kg/m							lbs./ft	kg/m	lbs./ft	kg/m
1/8 (3)	40	.405	(10.3)	.068	(1.73)	.025	(.037)	.043	(.064)	2 1/2 (65)	40	2.875	(73.03)	.203	(5.16)	2.072	(3.08)	1.020	(1.518)
	80			.095	(2.41)	.016	(.024)	.055	(.082)					80	.276	(7.01)	1.834	(2.73)	1.350
1/4 (6)	40	.540	(13.7)	.088	(2.24)	.045	(.067)	.074	(.110)	3 (80)	40	3.500	(88.9)	.216	(5.49)	3.20	(4.76)	1.333	(1.984)
	80			.119	(3.02)	.031	(.046)	.094	(.140)					80	.300	(7.62)	2.86	(4.26)	1.804
3/8 (10)	40	.675	(17.15)	.091	(2.31)	.083	(.124)	.100	(.149)	3 1/2 (90)	40	4.000	(101.6)	.226	(5.74)	4.28	(6.37)	1.598	(2.378)
	80			.126	(3.20)	.061	(.091)	.129	(.192)					80	.318	(8.08)	3.85	(5.73)	2.195
1/2 (15)	40	.840	(21.34)	.109	(2.77)	.132	(.196)	.150	(.223)	4 (100)	40	4.500	(114.3)	.237	(6.02)	5.51	(8.20)	1.899	(2.826)
	80			.147	(3.73)	.101	(.150)	.200	(.298)					80	.337	(8.56)	4.98	(7.41)	2.636
3/4 (20)	40	1.050	(26.67)	.113	(2.87)	.230	(.342)	.199	(.296)	5 (125)	40	5.563	(141.30)	.258	(6.55)	8.66	(12.89)	2.770	(4.122)
	80			.154	(3.91)	.186	(.277)	.259	(.385)					80	.375	(9.53)	7.87	(11.71)	4.126
1 (25)	40	1.315	(33.40)	.133	(3.38)	.374	(.557)	.295	(.439)	6 (150)	40	6.625	(168.28)	.280	(7.11)	12.51	(18.62)	3.339	(4.969)
	80			.179	(4.55)	.311	(.463)	.382	(.568)					80	.432	(10.97)	11.92	(17.74)	5.028
1 1/4 (32)	40	1.660	(42.16)	.140	(3.56)	.647	(.963)	.400	(.595)	8 (200)	40	8.625	(219.08)	.322	(8.18)	21.60	(32.14)	5.280	(7.858)
	80			.191	(4.85)	.555	(.826)	.527	(.784)					80	.500	(12.70)	19.80	(29.47)	8.023
1 1/2 (40)	40	1.900	(48.26)	.145	(3.68)	.882	(1.313)	.479	(.713)	10 (250)	40	10.75	(273.05)	.365	(9.27)	34.10	(50.75)	7.505	(11.169)
	80			.200	(5.08)	.765	(1.138)	.639	(.951)					80	.593	(15.06)	31.10	(46.28)	11.894
2 (50)	40	2.375	(60.33)	.154	(3.91)	1.452	(2.161)	.643	(.957)	12 (300)	40	12.75	(323.85)	.406	(10.31)	48.50	(72.18)	10.023	(14.916)
	80			.218	(5.54)	1.279	(1.903)	.884	(1.316)					80	.687	(17.45)	44.00	(65.48)	16.365

SPACING OF HANGERS FOR PVC PLASTIC PIPE

Schedule 40 Pipe Size	Support Spacing																			
	Temperature																			
	20°F (-6.6°C)		40°F (4.4°C)		60°F (15.6°C)		80°F (26.7°C)		100°F (37.8°C)		110°F (43.3°C)		120°F (48.9°C)		130°F (54.4°C)		140°F (60°C)		150°F (65.6°C)	
	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
1/2 - 3/4 (15-20)	5.00	(1.52)	4.75	(1.45)	4.50	(1.37)	4.25	(1.30)	4.00	(1.22)	3.75	(1.14)	3.33	(1.01)	3.00	(.91)	2.66	(.81)	2.00	(.61)
1 - 1 1/4 (25-32)	5.50	(1.68)	5.25	(1.60)	5.00	(1.52)	4.66	(1.42)	4.33	(1.32)	4.00	(1.22)	3.75	(1.14)	3.33	(1.01)	2.80	(.85)	2.25	(.69)
1 1/2 - 2 (40-50)	5.80	(1.77)	5.50	(1.68)	5.25	(1.60)	5.00	(1.52)	4.66	(1.42)	4.33	(1.32)	3.80	(1.16)	3.50	(1.07)	3.00	(.91)	2.50	(.76)
2 1/2 (65)	6.66	(2.03)	6.33	(1.93)	6.00	(1.83)	5.50	(1.68)	5.25	(1.60)	4.80	(1.46)	4.50	(1.37)	4.00	(1.22)	3.50	(1.07)	2.80	(.85)
3 (80)	6.80	(2.07)	6.50	(1.98)	6.25	(1.91)	5.80	(1.77)	5.50	(1.68)	5.25	(1.60)	4.75	(1.45)	4.25	(1.30)	3.66	(1.12)	3.00	(.91)
4 (100)	7.33	(2.23)	7.00	(2.13)	6.50	(1.98)	6.25	(1.91)	5.80	(1.77)	5.50	(1.68)	5.00	(1.52)	4.50	(1.37)	3.80	(1.16)	3.25	(.99)
6 (150)	7.80	(2.38)	7.50	(2.29)	7.00	(2.13)	6.80	(2.07)	6.33	(1.93)	5.80	(1.77)	5.33	(1.62)	4.80	(1.46)	4.25	(1.30)	3.50	(1.07)

Schedule 80 Pipe Size	Support Spacing																			
	Temperature																			
	20°F (-6.6°C)		40°F (4.4°C)		60°F (15.6°C)		80°F (26.7°C)		100°F (37.8°C)		110°F (43.3°C)		120°F (48.9°C)		130°F (54.4°C)		140°F (60°C)		150°F (65.6°C)	
	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
1/2 - 3/4 (15-20)	5.75	(1.75)	5.50	(1.68)	5.25	(1.60)	4.80	(1.46)	4.50	(1.37)	4.33	(1.32)	3.80	(1.16)	3.50	(1.07)	3.00	(.91)	2.50	(.76)
1 (25)	6.33	(1.93)	6.00	(1.83)	5.75	(1.75)	5.33	(1.62)	5.00	(1.52)	4.60	(1.40)	4.33	(1.32)	3.80	(1.16)	3.33	(1.01)	2.75	(.84)
1 1/4 - 1 1/2 (32-40)	6.66	(2.03)	6.33	(1.93)	6.00	(1.83)	5.66	(1.73)	5.25	(1.60)	4.80	(1.46)	4.50	(1.37)	4.00	(1.22)	3.50	(1.07)	3.00	(.91)
2 (50)	7.00	(2.13)	6.50	(1.98)	6.25	(1.91)	6.00	(1.83)	5.50	(1.68)	5.12	(1.56)	4.75	(1.45)	4.33	(1.32)	3.66	(1.12)	3.12	(.95)
2 1/2 (65)	7.80	(2.38)	7.50	(2.29)	7.00	(2.13)	6.66	(2.03)	6.33	(1.93)	5.80	(1.77)	5.33	(1.62)	4.75	(1.45)	4.25	(1.30)	3.33	(1.01)
3 (80)	8.20	(2.50)	7.75	(2.36)	7.33	(2.23)	7.00	(2.13)	6.50	(1.98)	6.00	(1.83)	5.50	(1.68)	5.00	(1.52)	4.33	(1.32)	3.50	(1.07)
4 (100)	8.66	(2.64)	8.25	(2.51)	7.80	(2.38)	7.33	(2.23)	6.80	(2.07)	6.33	(1.93)	5.80	(1.77)	5.25	(1.60)	4.66	(1.42)	3.75	(1.14)
6 (150)	9.80	(2.99)	9.33	(2.84)	8.80	(2.68)	8.33	(2.54)	7.80	(2.38)	7.33	(2.23)	6.50	(1.98)	6.00	(1.83)	5.12	(1.56)	4.25	(1.30)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA



CONDUIT DATA

ELECTRICAL METALLIC TUBING DATA

STEEL RIGID CONDUIT DATA

Nominal Size EMT Conduit		O.D. Conduit		Weight Conduit W/C Plg.		Approx. Max. Weight Conduit And Conductor		Nominal Size EMT Conduit	O.D. Conduit		O.D. Coupling		Weight Conduit W/C Plg.		Approx. Max. Weight Conduit And Conductor				
						Not Lead Covered									Lead Covered		Not Lead Covered		
				lbs./ft	kg/m	lbs./ft	kg/m				lbs./ft	kg/m	lbs./ft	kg/m	lbs./ft	kg/m	lbs./ft	kg/m	lbs./ft
1/2	(15)	.706	(17.93)	.29	(0.43)	.54	(0.80)	1/2	(15)	.840	(21.34)	1.010	(25.65)	.80	(1.19)	1.17	(1.74)	1.04	(1.55)
3/4	(20)	.922	(23.42)	.45	(0.67)	1.16	(1.73)	3/4	(20)	1.050	(26.67)	1.250	(31.75)	1.09	(1.62)	1.75	(2.60)	1.40	(2.08)
1	(25)	1.163	(29.54)	.65	(0.97)	1.83	(2.72)	1	(25)	1.315	(33.40)	1.525	(38.74)	1.65	(2.46)	2.62	(3.90)	2.35	(3.50)
1 1/4	(32)	1.510	(38.35)	.96	(1.43)	2.96	(4.40)	1 1/4	(32)	1.660	(42.16)	1.869	(47.47)	2.15	(3.20)	4.31	(6.41)	3.58	(5.33)
1 1/2	(40)	1.740	(44.20)	1.11	(1.65)	3.68	(5.48)	1 1/2	(40)	1.900	(48.26)	2.155	(54.74)	2.58	(3.84)	5.89	(8.77)	4.55	(6.77)
2	(50)	2.197	(55.80)	1.41	(2.10)	4.45	(6.62)	2	(50)	2.375	(60.33)	2.650	(67.31)	3.52	(5.24)	8.53	(12.69)	7.21	(10.73)
2 1/2	(65)	2.875	(73.03)	2.15	(3.20)	6.41	(9.54)	2 1/2	(65)	2.875	(73.03)	3.250	(82.55)	5.67	(8.44)	11.51	(17.13)	10.22	(15.21)
3	(80)	3.500	(88.90)	2.60	(3.87)	9.30	(13.84)	3	(80)	3.500	(88.90)	3.870	(98.30)	7.14	(10.63)	16.51	(24.57)	14.51	(21.59)
3 1/2	(90)	4.000	(101.60)	3.25	(4.84)	12.15	(18.08)	3 1/2	(90)	4.000	(101.60)	4.500	(114.30)	8.60	(12.80)	19.05	(28.35)	17.49	(26.03)
4	(100)	4.500	(114.30)	3.90	(5.80)	15.40	(22.92)	4	(100)	4.500	(114.30)	4.875	(123.83)	10.00	(14.88)	24.75	(36.83)	21.48	(31.97)
								5	(125)	5.563	(141.30)	6.000	(152.40)	13.20	(19.64)	35.87	(53.38)	30.83	(45.88)
								6	(150)	6.625	(168.28)	7.200	(182.88)	17.85	(26.56)	50.69	(75.44)	43.43	(64.63)

Note: 2 1/2" through 4" EMT is the same as steel rigid conduit

INTERMEDIATE METAL CONDUIT DATA

Nominal Size EMT Conduit		O.D. Conduit		O.D. Coupling		Weight Conduit W/C Plg.		Approx. Max. Weight Conduit And Conductor			
								Lead Covered		Not Lead Covered	
						lbs./ft	kg/m	lbs./ft	kg/m	lbs./ft	kg/m
1/2	(15)	.815	(20.70)	1.010	(25.65)	.60	(0.89)	.97	(1.44)	.84	(1.25)
3/4	(20)	1.029	(26.14)	1.250	(31.75)	.82	(1.22)	1.48	(2.20)	1.13	(1.68)
1	(25)	1.290	(32.77)	1.525	(38.74)	1.16	(1.73)	2.13	(3.17)	1.86	(2.77)
1 1/4	(32)	1.638	(41.61)	1.869	(47.47)	1.50	(2.23)	3.66	(5.45)	2.93	(4.36)
1 1/2	(40)	1.883	(47.83)	2.155	(54.74)	1.82	(2.71)	5.13	(7.63)	3.79	(5.64)
2	(50)	2.360	(59.94)	2.650	(67.31)	2.42	(3.60)	7.43	(11.06)	6.11	(9.09)
2 1/2	(65)	2.857	(72.57)	3.250	(82.55)	4.28	(6.37)	10.12	(15.06)	8.83	(13.14)
3	(80)	3.476	(88.29)	3.870	(98.30)	5.26	(7.83)	14.63	(21.77)	12.63	(18.80)
3 1/2	(90)	3.971	(100.86)	4.500	(114.30)	6.12	(9.11)	16.57	(24.66)	15.01	(22.34)
4	(100)	4.466	(113.44)	4.875	(123.83)	6.82	(10.15)	21.57	(32.10)	18.30	(27.23)

THREADED ROD DATA

Nominal Rod Dia.	Root Area Thread		Max. Rec. Load			
			650°F (343°C)		750°F (399°C)	
	in. ²	mm ²	lbs.	kN	lbs.	kN
1/4	.027	(17.42)	240	(1.07)	210	(0.93)
3/8	.068	(43.87)	730	(3.25)	572	(2.54)
1/2	.126	(81.29)	1350	(6.01)	1057	(4.70)
5/8	.202	(130.32)	2160	(9.61)	1692	(7.53)
3/4	.302	(194.84)	3230	(14.37)	2530	(11.25)
7/8	.419	(270.32)	4480	(19.93)	3508	(15.60)
1	.552	(356.13)	5900	(26.24)	4620	(20.55)
1 1/8	.693	(447.10)	7450	(33.14)	5830	(25.93)
1 1/4	.889	(573.55)	9500	(42.26)	7440	(33.09)
1 1/2	1.293	(834.19)	13800	(61.39)	10807	(48.07)
1 3/4	1.744	(1125.16)	18600	(82.74)	14566	(64.79)
2	2.300	(1483.87)	24600	(109.43)	19625	(87.30)
2 1/4	3.023	(1950.32)	32300	(143.68)	25295	(112.52)
2 1/2	3.719	(2399.35)	39800	(177.04)	31169	(138.65)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA

CAST IRON PIPE DATA

SERVICE WEIGHT CAST IRON SOIL PIPE DATA (BELL & SPIGOT TYPE)

Nominal Pipe Size		O.D. of Cast Iron Pipe		Wall Thickness		Weight			
						Pipe		Water	
						lbs./ft	kg/m	lbs./ft	kg/m
2	(50)	2.25	(57.15)	.17	(4.32)	4.00	(5.95)	1.24	(1.85)
3	(80)	3.25	(82.55)	.17	(4.32)	6.00	(8.93)	2.88	(4.29)
4	(100)	4.25	(107.95)	.18	(4.57)	8.00	(11.91)	5.15	(7.66)
5	(125)	5.25	(133.35)	.18	(4.57)	10.40	(15.48)	8.14	(12.11)
6	(150)	6.25	(158.75)	.18	(4.57)	13.00	(19.35)	11.80	(17.57)
8	(200)	8.38	(212.85)	.23	(5.84)	20.00	(29.76)	21.34	(31.76)
10	(250)	10.50	(266.70)	.28	(7.11)	29.00	(43.16)	33.62	(50.03)
12	(300)	12.50	(317.50)	.28	(7.11)	38.00	(56.55)	48.51	(72.18)
15	(380)	15.62	(396.75)	.31	(7.87)	51.00	(75.90)	76.55	(113.92)

EXTRA WEIGHT CAST IRON SOIL PIPE DATA (BELL & SPIGOT TYPE)

Nominal Pipe Size		O.D. of Cast Iron Pipe		Wall Thickness		Weight			
						Pipe		Water	
						lbs./ft	kg/m	lbs./ft	kg/m
2	(50)	2.38	(60.45)	.190	(4.83)	5.00	(7.44)	1.36	(2.03)
3	(80)	3.50	(88.90)	.250	(6.35)	9.00	(13.39)	3.06	(4.56)
4	(100)	4.50	(114.30)	.250	(6.35)	12.00	(17.86)	5.44	(8.10)
5	(125)	5.50	(139.70)	.250	(6.35)	15.00	(22.32)	8.51	(12.66)
6	(150)	6.50	(165.10)	.250	(6.35)	19.00	(28.28)	12.25	(18.23)
8	(200)	8.62	(218.95)	.310	(7.87)	30.00	(44.64)	21.78	(32.40)
10	(250)	10.75	(273.05)	.375	(9.53)	43.00	(63.99)	34.02	(50.63)
12	(300)	12.75	(323.85)	.375	(9.53)	54.00	(80.36)	48.99	(72.91)
15	(380)	15.88	(403.35)	.440	(11.18)	75.00	(111.61)	76.55	(113.92)

NO HUB CAST IRON SOIL PIPE DATA

Nominal Pipe Size		O.D. of Cast Iron Pipe		Wall Thickness		Weight			
						Pipe		Water	
						lbs./ft	kg/m	lbs./ft	kg/m
1 1/2	(40)	1.90	(48.26)	.16	(4.06)	2.70	(4.02)	0.85	(1.26)
2	(50)	2.35	(59.69)	.16	(4.06)	3.60	(5.36)	1.40	(2.09)
3	(80)	3.35	(85.09)	.16	(4.06)	5.20	(7.74)	3.12	(4.65)
4	(100)	4.38	(111.25)	.19	(4.83)	7.40	(11.01)	5.44	(8.10)
5	(125)	5.30	(134.62)	.19	(4.83)	9.60	(14.29)	8.24	(12.26)
6	(150)	6.30	(160.02)	.19	(4.83)	11.00	(16.37)	11.92	(17.74)
8	(200)	8.38	(212.85)	.23	(5.84)	18.00	(26.79)	21.34	(31.76)
10	(250)	10.50	(266.70)	.28	(7.11)	26.20	(38.99)	33.62	(50.03)
12	(300)	12.50	(317.50)	.28	(7.11)	35.50	(52.83)	48.51	(72.18)