

TRANSMITTAL OF CONTRACTOR'S SUBMITTAL



Date: 4/15/2024

To: Danny Wolff
City of Arvada
8101 Ralston Road
Arvada, CO 80002

Submittal No.: 2402-006

☒ New Submittal ☐ Resubmittal

From: Tony Grasso
T. Lowell Construction, Inc.
3211 S. I-25
Castle Rock, CO 80109

Project: Central Ralston Trunk Sewer
Project No.: 23-SR-11
Spec. Section: 522.00
Schedule Date: 4/19/2024

Submittal Type: ☐ Shop Drawing ☐ Sample ☒ Informational

Copies	Description	Spec. Section	Subm. Drawing No.	Variation to contract?	
				No	Yes
1	PVC SDR 35 PS46 Sewer Pipe	522.01 & 522.01.01	n/a	X	

T. LOWELL hereby certifies that (I) T. Lowell has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By: Tony Grasso
Tony Grasso, T. Lowell Construction, Inc.

PVC SDR35 PS46 Pipe

D3034 & F679 SEWER SPECIFICATION DATA

Diamond gravity sewer pipe 4 inches through 60 inches shall be made of compounds conforming to material requirements of ASTM D3034 and ASTM F679 in accordance with ASTM D1784. Diamond PVC Sewer Pipe meets all the dimensional, chemical, and physical requirements as outlined in ASTM D3034 and ASTM F679. A listing to CSA B182.2 is available for most of these sizes. A complete listing by manufacturing plant is available upon request.

The pipe sizes 4 inches through 60 inches are made with an integral bell "water-tight" joint that meets the requirements of ASTM D3212 and that utilizes a Rieber gasket system for sealing that meets the requirements of ASTM F477.

Each male end shall be beveled to facilitate joining and referencing marked for proper insertion depth. Diamond furnished lubricant is to be used in the joining process.

SANI-21™

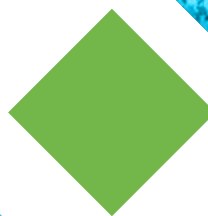
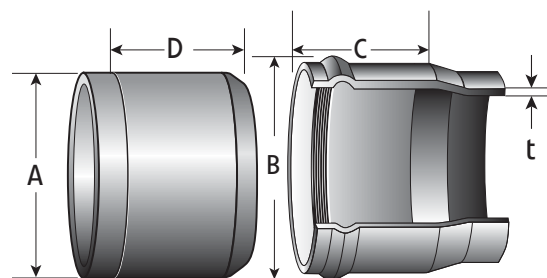
PHYSICAL PROPERTIES OF ASTM D3034 & F679

Property	ASTM TEST	Minimum 12454/12364
PIPE MATERIALS: PIPE SHALL BE MADE OF PVC PLASTIC HAVING A MINIMUM CELL CLASSIFICATION OF 12454 OR 12364 AS DEFINED IN SPECIFICATION D1784.		
Specific Gravity	D792	1.40/1.40
Tensile Strength, psi	D638	7,000/6,000
Tensile Modulus, psi	D638	400,000/500,000
IZOD Impact Strength,	D256	.65ft., lb./in.

SHORT FORM Specification for Diamond PVC Solid-Wall Sewer Pipe SDR 26 or SDR 35 or PS 46 or PS 115

All PVC Solid-Wall Sewer Pipe shall be made of compounds conforming to ASTM D1784 manufactured in accordance with the material requirements of ASTM D3034 or ASTM F679. All PVC Sewer Pipe must meet dimensional, chemical, and physical requirements as outlined in ASTM D3034 or ASTM F679. Joints shall meet the requirements of ASTM D3212 and shall be formed using Rieber Technology. PVC Sewer Pipe shall be installed according to the requirements of ASTM D2321, Uni-Bell's Uni-Pub 6 and the manufacturer's recommendations.

RIEBER JOINT ILLUSTRATION



Nominal Pipe Size in. (mm)	A Outside Diameter Inches	B Bell Socket Diameter Inches	C Socket Depth Inches	D Insert Mark Inches	t Min. Wall Thickness SDR26/PS115 Inches	t Min. Wall Thickness SDR35/PS46 Inches
D-3034 PIPE DIMENSIONS						
4" (100)	4.215	5-1/4	4-5/8"	4"	0.162	0.120
6" (150)	6.275	7-1/2	4-3/4"	4-1/8"	0.241	0.180
8" (200)	8.400	9-7/8	6-1/8"	4-7/8"	0.323	0.240
10" (250)	10.500	12-3/8	6-3/4"	5-1/4"	0.404	0.300
12" (300)	12.500	14-5/8	7-1/4"	5-1/2"	0.481	0.360
15" (375)	15.300	18	7-1/4"	4-5/8"	0.588	0.437
F-679 PIPE DIMENSIONS						
18" (450)	18.701	21-3/4"	9-1/2"	7-3/4"	0.671	0.499
21" (525)	22.047	25-1/2"	10"	8-1/2"	0.791	0.588
24" (600)	24.803	28-3/4"	11"	10"	0.889	0.661
27" (675)	27.953	32-1/2"	13-1/4"	11-1/8"	1.002	0.745
30" ciod (750)	32.000	37-1/4"	14"	13-5/8"	1.148	0.853
36" ciod (900)	38.300	43-1/4"	15"	13-7/8"	1.373	1.021
42" ciod (1050)	44.500	53"	18"	16-3/4"	1.596	1.187
48" ciod (1200)	50.800	60"	18"	16-7/8"	1.822	1.355
54" ciod (1350)	57.560	67"	22"	14"	2.064	1.535
60" ciod (1500)	61.610	72"	23"	18"	2.210	1.643

Nominal Pipe Size in. (mm)	Outside Diameter Inches	Bundle Quantity	*Feet Per Truckload	
			14'	20'
SDR35/PS46				
4" (100)	4.215	69	23,184	24,288
6" (150)	6.275	24/32	10,080	11,264
8" (200)	8.400	18/24	5544/6048	5808/6336
10" (250)	10.500	12/15	3402	3564
12" (300)	12.500	16	2688	2816
15" (375)	15.300	6	1512	1584
18" (450)	18.701	2/3/4/6	1050	1100
21" (525)	22.047	4	672	704
24" (600)	24.803	4	504/672	704
27" (675)	27.953	3	378	
30" (750)	32.000	3	378/252	
36" (900)	38.300	2	168	
42" (1050)	44.500	2	168	
48" (1200)	50.800	1	84	
54" (1350)	57.560	1	42	
60" (1500)	61.610	1	42	

Prices are subject to a firm policy of "Price in effect at time of shipment on regular purchases"

*Possession of this page does not constitute an offer of sale

*Tolerance of +/- 1/4" allowed

GravitySewer

NON-PRESSURE-RATED PVC PIPE



ASTM D3034 / F679

CSA B182.2

ASTM D1784 Cell Class 12454/12364

Gaskets: ASTM F477

Joints: ASTM D3212



DELIVERING GOOD WATER TO YOU

MARKETS



Sewer

DESCRIPTION



GRAVITYSEWER

Ring-Tite Joint

- Flexible elastomeric Rieber® locked-in gasket provides a tight seal that protects and compensates for expansion, contraction, vibration or other movements.
- Quick and easy to assemble with a simple push, there's no field mixing or application of cement.
- Meets or exceeds ASTM D3219 for joint tightness, including a 22-inch Hg vacuum and a 25-foot head pressure test.

Nominal Laying Length: 14/20 feet
(Laying length tolerances are in accordance with ASTM and CSA standards)

Color: ■ Green

ASTM D3034 TYPE PSM SIZES:

4", 6", 8", 10", 12", 15"

ASTM F679 SIZES:

18", 21", 24", 27", 30", 36", 42", 48"

Rieber® sealing ring provides tight, flexible seal.

Spigot pipe ends are supplied from the factory with bevels.

The bell is an integral part of the pipe length with the same strength.

CSA B182.2

SDR 35 (PS 46)

ASTM D3034

SDR 35 (PS 46)

SDR 26 (PS 115)

ASTM F679

PS 46

PS 115

BENEFITS

INSTALLATION

Lightweight, great for manual installation.

Field-cut with a power saw or handsaw; bevel without complicated machinery.

Does not need lining, wrapping, coating, or cathodic protection to prevent galvanic corrosion.

FEATURES

Unaffected by corrosive elements, sewer gas, sulfuric acid, alkaline, or acidic soils.

Resistance to abrasion, gouging and scouring.

Made in America

GravitySewer

NON-PRESSURE RATED PVC PIPE



DELIVERING GOOD WATER TO YOU

SUBMITTAL AND DATA SHEET

ASTM D3034 TYPE PSM GRAVITY SEWER PIPE

PIPE SIZE (IN)	AVG. O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	AVG. E. (IN)	APX. D ⁹ (IN)	APX. WGT (LBS/FT)
SDR 35						
PIPE STIFFNESS: 46 psi						
4	4.215	3.975	0.120	3.75	4.695	1.05
6	6.275	5.915	0.180	2.37	6.995	2.36
8	8.400	7.920	0.240	5.00	9.360	4.24
10	10.500	9.900	0.300	6.25	11.700	6.64
12	12.500	11.780	0.360	6.50	13.940	9.50
15	15.300	14.426	0.437	7.50	17.048	14.19
SDR 26						
PIPE STIFFNESS: 115 psi						
4	4.215	3.891	0.162	3.75	4.863	1.40
6	6.275	5.793	0.241	2.37	7.239	3.11
8	8.400	7.754	0.323	5.00	9.692	5.63
10	10.500	9.692	0.404	6.25	12.116	8.84
12	12.500	11.538	0.481	6.50	14.424	12.56
15	15.300	14.124	0.588	7.50	17.652	18.90

Product Standard:

ASTM D3034 Type PSM (4"-15")

ASTM F679 (18" - 48")

CSA B182.2 (PS46, 4" - 21")

Pipe Compound: ASTM D1784 Cell Class 12454/12364

Gasket: ASTM F477

Integral Bell Joint: ASTM D3212

Nominal Laying Length: 14/20 feet

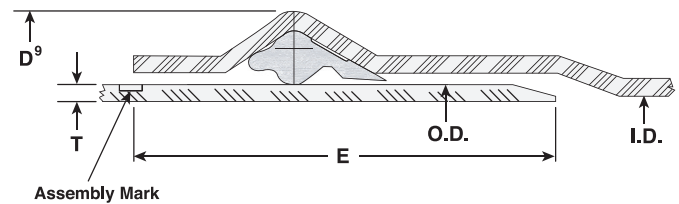
(Laying length tolerances are in accordance with ASTM and/or CSA standards.)

Installation: JM Eagle™ Gravity Sewer Installation Guide.

Manning Coefficient (n) = 0.009

Hazen-Williams Coefficient (c) = 150

*Please call prior to order regarding availability.



I.D.: Inside Diameter

O.D.: Outside Diameter

T.: Minimum Wall Thickness

D⁹: Bell Outside Diameter

E: Distance between Assembly Mark and the end of the spigot.

ASTM F679 GRAVITY SEWER PIPE

PIPE SIZE (IN)	AVG. O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	AVG. E. (IN)	APX. D ⁹ (IN)	APX. WGT (LBS/FT)
PIPE STIFFNESS: 46 psi						
18	18.701	17.564	0.536	7.37	20.845	21.43
21	22.047	20.707	0.632	8.25	24.575	29.88
24	24.803	23.295	0.711	9.12	27.647	38.96
27	27.953	26.254	0.801	10.00	31.157	49.47
30 CIOD	32.000	30.055	0.917	12.75	35.612	64.18
36 CIOD	38.300	35.972	1.098	13.87	42.816	93.00
42 CIOD	44.500	41.794	1.276	15.75	49.604	128.83
48 CIOD	50.800	47.713	1.456	16.62	56.624	168.31
PIPE STIFFNESS: 115 psi						
18	18.701	17.174	0.720	7.37	21.581	28.49
21	22.047	20.247	0.849	8.25	25.443	39.83
24	24.803	22.776	0.956	9.12	28.627	50.74
27	27.953	25.669	1.077	10.00	32.261	64.78
30 CIOD	32.000	29.386	1.233	12.75	36.348	86.55
36 CIOD	38.300	35.173	1.475	13.87	45.438	125.35
42 CIOD	44.500	40.866	1.714	15.75	51.356	171.30
48 CIOD	50.800	46.651	1.957	16.62	58.628	223.92





ASTM F679/IB PVC Gravity Sewer Pipe GASKETED INTEGRAL BELL

North American Pipe Corporation's ASTM F679 Gasketed Integral Bell PVC Pipe product line is manufactured to meet the needs of modern municipal waste water systems, storm water drainage systems, and other non-pressure applications. With top quality raw materials and modern processing technology, our ASTM F679 pipe meets all industry standards in addition to our own rigorous quality control requirements.

Our F679 pipe utilizes Rieber style gaskets throughout the entire product offering to create a leak-free joint.



Short Form Specification

Pipe Standard:	ASTM F679
Diameter Std.:	PSM – 18", 21", 24", 27" CIOD – 30", 36"
Nominal Sizes:	18", 21", 24", 27", 30", 36"
Classes & Pipe Stiffness*:	PS 46 – 46 psi PS 115 – 115 psi
Pressure Ratings:	Not rated for pressure applications
Lay Length:	14' or 20'
Color:	Green
Pipe Compound:	ASTM D1784 Cell Class 12454 or 12364
Pipe Joint Std.:	ASTM D3212
Max. Angular Joint Deflection:‡	1°
Gasket Standard:	ASTM F477
Gasket Material Offerings:	SBR
Certifications:	None
Installation Std.:	ASTM D2321

*ASTM F679 does not classify pipe in terms of Dimension Ratio (SDR or DR), but rather in Pipe Stiffness (PS) ratings.

‡See Installation Guide for more information.

NorthAmericanPipe.com

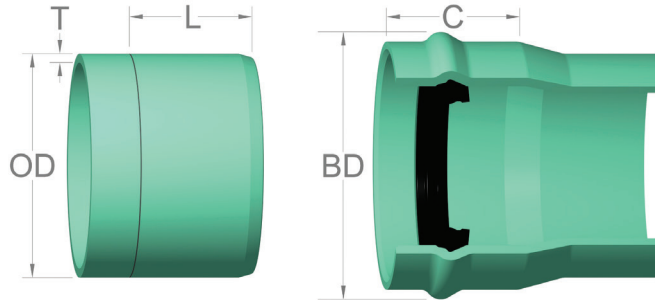
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ASTM F679/IB PVC Gravity Sewer Pipe GASKETED INTEGRAL BELL



F679/IB PIPE DIMENSIONS & PERFORMANCE

Nom. Size	Outside Diameter (OD)	Class	Pipe Stiffness (psi)	Min. Wall Thickness (T)	Internal Diameter (ID)	Approx. Bell Diameter (BD)	Bell Depth (C)	Insertion Mark (L)
18"	18.701	PS 46	46	0.499	17.703	21.000	9.500	8.500
		PS 115	115	0.671	17.359			
21"	22.047	PS 46	46	0.588	20.871	24.500	10.250	9.250
		PS 115	115	0.791	20.465			
24"	24.803	PS 46	46	0.661	23.481	27.500	11.000	10.000
		PS 115	115	0.889	23.025			
27"	27.953	PS 46	46	0.745	26.463	31.000	12.250	11.250
		PS 115	115	1.002	25.949			
30"	32.000	PS 46	46	0.853	30.294	36.000	15.125	14.125
		PS 115	115	1.145	29.710			
36"	38.300	PS 46	46	1.021	36.258	42.625	19.125	18.125
		PS 115	115	1.373	35.554			

Notes:

1. These dimensions are for estimating purposes only. All dimensions are in inches unless otherwise specified.
2. Pipe Stiffness determined using ASTM D2412 at 5% deflection. This is a property that defines the pipe's ability to resist external loading.
3. Internal diameter calculated using nominal outside diameter and minimum wall thickness.
4. Dimension given for Approx. Bell Diameter (BD) is for highest pipe stiffness.



ASTM D3034/IB PVC Gravity Sewer Pipe GASKETED INTEGRAL BELL

North American Pipe Corporation's ASTM D3034 Gasketed Integral Bell PVC Pipe product line is manufactured to meet the needs of modern municipal waste water systems, storm water drainage systems, and other non-pressure applications. With top quality raw materials and modern processing technology, our ASTM D3034 pipe meets all industry standards in addition to our own rigorous quality control requirements.

Our D3034 pipe utilizes Rieber style gaskets throughout the entire product offering to create a leak-free joint.



Short Form Specification

Pipe Standard:	ASTM D3034
Diameter Std.:	PSM
Nominal Sizes:	4", 6", 8", 10", 12", 15"
Dimension Ratios & Pipe Stiffness:	SDR 35 – 46 psi SDR 26 – 115 psi SDR 23.5 – 153 psi
Pressure Ratings:	Not rated for pressure applications
Lay Length:	14' or 20'
Color:	Green
Pipe Compound:	ASTM D1784 Cell Class 12454
Pipe Options:	Solid Wall 2 Hole Perforated 3 Hole Perforated
Pipe Joint Std.:	ASTM D3212
Max. Angular Joint Deflection:‡	1°
Gasket Standard:	ASTM F477
Gasket Material Offerings:	Standard – SBR Optional – NBR or EPDM
Certifications:	IAPMO Uniform Plumbing Code*
Installation Std.:	ASTM D2321

*IAPMO Uniform Plumbing Code listed products must be requested at time of order.

‡See Installation Guide for more information.



NorthAmericanPipe.com

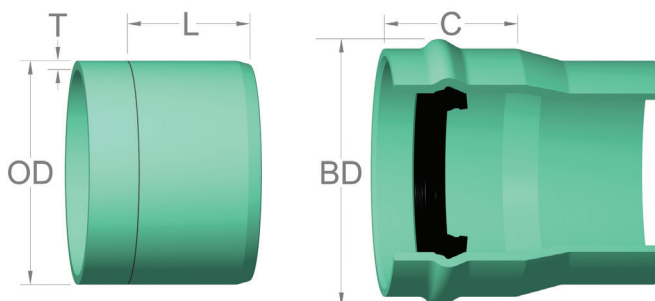
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ASTM D3034/IB PVC Gravity Sewer Pipe GASKETED INTEGRAL BELL



D3034/IB PIPE DIMENSIONS & PERFORMANCE								
Nom. Size	Outside Diameter (OD)	SDR	Pipe Stiffness (psi)	Min. Wall Thickness (T)	Internal Diameter (ID)	Approx. Bell Diameter (BD)	Bell Depth (C)	Insertion Mark (L)
4"	4.215	35	46	0.120	3.975	5.000	3.750	3.125
		26	115	0.162	3.891			
		23.5	153	0.178	3.859			
6"	6.275	35	46	0.180	5.915	7.375	4.625	4.000
		26	115	0.241	5.793			
		23.5	153	0.265	5.745			
8"	8.400	35	46	0.240	7.920	9.625	5.250	4.125
		26	115	0.323	7.754			
10"	10.500	35	46	0.300	9.900	12.250	5.875	5.125
		26	115	0.404	9.692			
12"	12.500	35	46	0.360	11.780	14.375	6.500	5.375
		26	115	0.481	11.538			
15"	15.300	35	46	0.437	14.426	17.500	7.750	7.375
		26	115	0.588	14.124			

Notes:

1. These dimensions are for estimating purposes only. All dimensions are in inches unless otherwise specified.
2. SDR = Standard Dimension Ratio
3. Pipe Stiffness determined using ASTM D2412 at 5% deflection. This is a property that defines the pipe's ability to resist external loading.
4. Internal diameter calculated using nominal outside diameter and minimum wall thickness.
5. Dimension given for Approx. Bell Diameter (BD) is for highest pipe stiffness.

VINYLTECH SEWER PIPE

TECHNICAL DATA SUBMITTAL



CONFORMANCE

These specifications designate the requirements for manufacturing and installing Vinyltech PVC sewer pipe.

ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings

ASTM F679 - Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings

ASTM D3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

ASTM D2152 - Standard Test Method for Extruded Poly (Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion

ASTM D2444 - Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of Tup (Falling Weight)

ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity-Flow Applications

ASTM D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading

IAPMO (File No. 2128) - Uniform Plumbing Code (UPC) - Vinyltech sewer pipe is IAPMO listed for ASTM D3034 SDR 35 4-15 inch and SDR 26 4-12 inch.

PIPE COMPOUND

The pipe shall be extruded from compounds meeting the requirements of Cell Classification 12454, as defined in ASTM D1784, Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

PIPE

Vinyltech pipe shall be manufactured in accordance with ASTM D3034 and ASTM F679.

GASKET JOINT

The gasket shall be reinforced with a steel ring and meet the requirements of ASTM F477. Vinyltech pipe shall have an integral bell end with a locked-in factory installed gasket and shall meet the requirements of ASTM D3212.

MARKING

The pipe shall be marked in accordance with ASTM D3034 and F679.

QUALITY CONTROL

Requirements for manufacturing and testing are conducted in strict accordance with ASTM specifications and are outlined in ASTM D3034 and F679.

INSTALLATION

Recommended installation procedure of Vinyltech Corporation and the Uni-Bell PVC Pipe Association are outlined in ASTM D2321, Underground Installation of Flexible Thermoplastic Sewer Pipe. Vinyltech recommends the Uni-Bell Handbook of PVC Pipe as an invaluable resource guide.

ASSEMBLING THE PIPE

Assembling of PVC Sewer Pipe is easily accomplished by hand or by using a bar and block. A depth of entry mark serves as a visual check for rapid, accurate joint inspection. **Do not over insert.**

- 1) Remove any mud, sand, or other foreign matter from the belled and spigot ends of the pipe. Carefully clean the gasket area.
- 2) With a clean applicator (a brush or hand) lubricate the entire surface of the pipe from the spigot end to the depth of entry mark and the contact surface of the gasket with **Vinyltech Brand Lubricant**.
- 3) Brace the bell to avoid disturbing the already installed joints. Align the pipe, insert the spigot into the bell and push.
- 4) **Do not insert past the entry mark line.**



201 S. 61st Avenue • Phoenix, AZ 85043
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AN OTTERTAIL COMPANY

SEWER PIPE

GRAVITY SEWER MAIN

TECHNICAL DATA SUBMITTAL

SEWER PIPE

ASTM D3034 SDR 35/PS 46 PVC SEWER PIPE

NOMINAL SIZE (IN) (mm)	OUTER DIAMETER (IN)	MINIMUM WALL	14' LENGTH WEIGHT (LB/100')	20' LENGTH WEIGHT (LB/100')
4 (100)	4.215	0.120	105.7	104.2
6 (150)	6.275	0.180	232.6	229.0
8 (200)	8.400	0.240	417.8	410.3
10 (250)	10.500	0.300	657.4	643.9
12 (300)	12.500	0.360	944.1	922.7
15 (375)	15.300	0.437	1390.0	1361.0

ASTM D3034 SDR 26/PS 115 PVC SEWER PIPE

NOMINAL SIZE (IN) (mm)	OUTER DIAMETER (IN)	MINIMUM WALL	14' LENGTH WEIGHT (LB/100')
4 (100)	4.215	0.162	150.0
6 (150)	6.275	0.241	320.0
8 (200)	8.400	0.323	580.0
10 (250)	10.500	0.404	900.0
12 (300)	12.500	0.481	1300.0
15 (375)	15.300	0.588	2000.0

ASTM F679 PS 46 PVC SEWER PIPE

NOMINAL SIZE (IN) (mm)	OUTER DIAMETER (IN)	MINIMUM WALL	14' LENGTH LB/100'
18 (475)	18.701	0.499	2115.0
* 21 (560)	22.047	0.588	2962.0
* 24 (630)	24.803	0.661	3740.0

ASTM F679 PS 115 PVC SEWER PIPE

NOMINAL SIZE (IN) (mm)	OUTER DIAMETER (IN)	MINIMUM WALL	14' LENGTH LB/100'
18 (475)	18.701	0.671	2790.0
* 21 (560)	22.047	0.791	3940.0
* 24 (630)	24.803	0.889	4980.0

* Northern Pipe Products