PRODUCT SUBMITTALS FOR:

VOGUS SUBDIVISION U3 (SEWER)

CONTRACTOR:

V.K.KNOWLTON

UTILITY PROVIDER:

GBRA

UNDERGROUND UTILITY MATERIAL SUPPLIED BY:

ACT PIPE & SUPPLY

4719 DODGE ST

SAN ANTONIO, TX 78217

210-946-6969

SEWER

UNDERGROUND UTILITY MATERIAL SUPPLIED BY:

ACT PIPE & SUPPLY

4719 DODGE ST

SAN ANTONIO, TX 78217

210-946-6969

JM Eagle™

Building essentials for a better tomorrow™

GRAVITY SEWER

MEETS ASTM D3034 AND F679.

APPLICATIONS

JM Eagle's Ring-Tite PVC Gravity Sewer pipe is suitable for conveying domestic sanitary sewage, as well as certain industrial wastes.

DESCRIPTION

JM Eagle's Gravity Sewer pipe ASTM D3034 is available in SDR 35 and SDR 26 in 4- to 15-inch diameters and ASTM F679 is available in PS 46 and PS 115 in 18- to 48-inch diameters. It comes in 14- and 20-foot lengths.

The pipe can be directed to most existing sewer equipment. It can also be connected to IPS cast- or ductile-iron fittings with the appropriate adapters and/or transition gaskets.

JM Eagle Gravity Sewer pipe comes with Ring-Tite joints with locked-in gaskets. Joints meet or exceed ASTM D3212 for joint tightness, including a 22-inch Hg vacuum and a 25-foot head pressure test.

BENEFITS

JM Eagle's Ring-Tite Gravity Sewer pipe features an improved design for reserve strength and stiffness to increase load-bearing capacity, maximizing sewer system capacity at a reasonable cost.

- It is unaffected by the fluids found in ordinary domestic sewage; sewer gasses and the sulfuring acid generated by the completion of the hydrogen sulfide cycle; and corrosive soils both alkaline and acidic.
- Maintains performance against tuberculation, corrosion and external galvanic soil conditions without lining wrapping, coating or cathodic protection.
- It resists abrasion, gouging and scouring far better than most common piping materials.
- Its interiors stay smooth over long years of service while maximizing system capacity, allowing for savings in pumping costs, as well as savings on the size of the pipe required.
- The light weight of the pipe reduces manpower required for installation.
- It can be field-cut with a power saw or ordinary handsaw and be beveled without the use of expensive or complicated machinery.
- Gasketed tee and wye saddles for tapping into previously installed PVC sewer lines eliminate the need for field solvent welding.

Revised 5/14/2012. This information may have been updated. Please download the latest version at www.jmeagle.com/onesheets.

JM Eagle™

Building essentials for a better tomorrow™

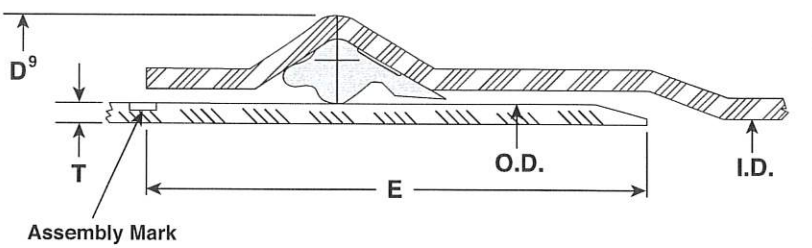
GRAVITY SEWER

SUBMITTAL AND DATA SHEET

JM EAGLE'S RING-TITE JOINT OFFERS ADDITIONAL BENEFITS.

- Seated in a deep groove, the flexible elastomeric Rieber gasket provides a tight seal that protects the line from shock, vibration and earth movement, and compensates for expansion and contraction of the pipe lengths.
- Quick and easy to assemble with a simple push, there's no field mixing or application of cement.
- The joint remains tight under normal operating conditions.

PIPE SIZE (IN)	AVERAGE O.D.(IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D^9 (IN)	APPROX. WEIGHT (LBS/FT)
SDR 35 (PS46) ASTM D3034						
4	4.215	3.975	0.120	3.50	4.695	1.05
6	6.275	5.915	0.180	4.25	6.995	2.36
8	8.400	7.920	0.240	4.75	9.360	4.24
10	10.500	9.900	0.300	6.00	11.700	6.64
12	12.500	11.780	0.360	6.25	13.940	9.50
15	15.300	14.426	0.437	7.25	17.048	14.19
SDR 26 (PS115) ASTM D3034						
4	4.215	3.891	0.162	3.50	4.863	1.40
6	6.275	5.793	0.241	4.25	7.239	3.11
8	8.400	7.754	0.323	4.75	9.692	5.63
10	10.500	9.692	0.404	6.00	12.116	8.84
12	12.500	11.538	0.481	6.25	14.424	12.56
15	15.300	14.124	0.588	7.25	17.652	18.90
PS46, ASTM F679						
18	18.701	17.629	0.499	8.00	20.845	21.43
21	22.047	20.783	0.588	9.50	24.575	29.88
24	24.803	23.381	0.661	9.60	27.647	38.96
27	27.953	26.351	0.745	10.10	31.157	49.47
30 CIOD	32.000	30.194	0.853	16.75	35.612	64.18
36 CIOD	38.300	36.042	1.021	19.02	42.816	93.00
42 CIOD	44.500	41.948	1.187	22.43	49.604	—
48 CIOD	50.800	47.888	1.355	24.78	56.624	—
PS115, ASTM F679						
18	18.701	17.261	0.671	8.00	21.581	28.49
21	22.047	20.349	0.791	9.50	25.443	—
24	24.803	22.891	0.889	9.60	28.627	—
27	27.953	25.799	1.002	10.10	32.261	—
30 CIOD	32.000	29.070	1.148	16.75	36.348	—
36 CIOD	38.300	35.464	1.373	19.02	45.438	—
42 CIOD	44.500	41.072	1.596	22.43	51.356	—
48 CIOD	50.800	46.886	1.822	24.78	58.628	—



I.D. : Inside Dameter

O.D. : Outside Diameter

T. : Wall Thickness

D^9 : Bell Outside Diameter

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

Product Standard:	ASTM 3034 (4"–15") ASTM F679 (18"–48")
Pipe Compound:	ASTM D1784 Cells Class 12454 or 12364
Gasket:	ASTM F477
Integral Bell Joint:	ASTM D3212
Pipe Stiffness:	ASTM D2412 F/ΔY = 46 PSI or 115 PSI
Pipe Length:	14 or 20 feet laying length
Installation:	ASTM D 2321 JM Eagle™ Installation Guide

Sani-21™: PVC Sewer Pipe

SPECIFICATION DATA

Sani 21™
SANITARY SEWER PIPE FOR THE 21st CENTURY

D3034 & F679
SEWER SPECIFICATION DATA

Diamond gravity sewer pipe 4 inches through 48 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.

The pipe sizes 4 inches through 48 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.

Physical Properties of ASTM D3034 & F679

Pipe Materials:
Pipe shall be made of PVC plastic having a minimum cell classification of 12454 or 12364 as defined in Specification D1784.

Property	ASTM Test	Minimum
Specific Gravity	D792	1.40
Tensile Strength, psi	D638	7,000
Tensile Modulus, psi	D638	400,000
IZOD Impact Strength,	D256	.65ft., lb./in.

Pipe Stiffness

Pipe	Modulus	
SDR	E = 400,000	E = 500,000
41	28	35
35	46	57
26	115	144

Standard laying lengths are 14 and 22 feet

SHORT FORM **Specification for Diamond PVC Solid-Wall Sewer Pipe SDR 26 or SDR 35 or PS 46 or PS 115**
Diamond 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. Diamond PVC Sewer Pipe must meet all dimensional, chemical, and physical requirements as outlined in ASTM D3034 orASTM F679. Diamond PVC Sewer Pipe shall be installed according to the requirements of ASTM D2321. Joints shall meet the requirements of ASTM D3212 and shall be formed using Rieber Technology. Uni-Bell UNI-PUB 6, "and the manufacturer's requirements."

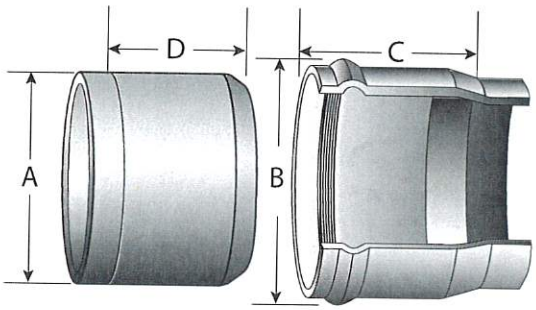
DIAMOND PLASTICS® CORPORATION

Corporate Headquarters • 1212 Johnstown Road • P.O. Box 1608 • Grand Island, NE 68802-1608

Sani-21™: PVC Sewer Pipe
SPECIFICATION DATA

Sani-21™ SANITARY SEWER PIPE FOR THE 21st CENTURY

Reiber Joint Illustration



Sani-21 is supplied in 14 foot and 22 foot laying lengths.

Sani-21™ D3034 & F679 SEWER SPECIFICATION DATA — Strength

Nominal Pipe Size Inches	Outside Diameter A Inches	Bell Socket Diameter B Inches	Socket Depth C Inches	Insert Mark D Inches	Wall Thickness SDR26/PS115 (t) Inches	Wall Thickness SDR35/PS46 (t) Inches
D-3034 Pipe Dimensions						
4	4.215	5-1/4	4-5/8"	4"	0.162	0.120
6	6.275	7-1/2	4-3/4"	4"	0.241	0.180
8	8.400	9-7/8	6-1/8"	5"	0.323	0.240
10	10.500	12-3/8	6-3/4	6	0.404	0.300
12	12.500	14-5/8	7-1/4"	6"	0.481	0.360
15	15.300	18	6-3/4	6	0.588	0.437
F-679 Pipe Dimensions						
18	18.701	21-3/4"	7-3/4"	7"	0.671	0.499
21	22.047	25-1/2"	7-3/4"	7"	0.791	0.588
24	24.803	28-3/4"	8-1/2"	7-1/4"	0.889	0.661
27	27.953	32-1/2"	8-1/2"	7-1/4"	1.002	0.745
30 ciod	32.000	37-1/4"	12"	10"	1.148	0.853
36 ciod	38.300	43-1/4"	12"	10"	1.373	1.021
42 ciod	44.500	53"	16"	13"		1.187
48 ciod	50.800	60"	16"	13"		1.355

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

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JM Eagle *Building essentials for a better tomorrow™*

IPS PRESSURE

SUBMITTAL AND DATA SHEET

PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D[9] (IN)	APPROX. WEIGHT (LBS/FT)
Rated 63 psi (SDR 64)*						
6	6.625	6.40	0.104	5.50	7.20	1.60
8	8.625	8.33	0.135	6.25	9.30	2.40
10	10.750	10.39	0.168	6.75	11.50	3.80
12	12.750	12.32	0.199	8.00	13.80	5.30
Rated 100 psi (SDR 41)*						
3	3.500	3.320	0.085	4.20	3.84	—
4	4.500	4.267	0.110	4.50	4.94	1.03
5	5.563	5.27	0.136	4.65	6.10	1.60
6	6.625	6.282	0.162	5.20	7.27	2.23
8	8.625	8.180	0.210	5.90	9.47	3.75
10	10.750	10.195	0.262	6.70	11.80	5.86
12	12.750	12.091	0.311	8.10	13.99	8.28
Rated 125 psi (SDR 32.5)*						
1.5	1.900	1.773	0.060	3.45	2.14	—
2	2.375	2.220	0.073	3.70	2.67	—
2.5	2.875	2.688	0.088	3.95	3.23	—
3	3.500	3.271	0.108	4.20	3.93	0.77
4	4.500	4.207	0.138	4.50	5.05	1.28
5	5.563	5.200	0.171	4.65	6.25	2.00
6	6.625	6.193	0.204	5.20	7.44	2.79
8	8.625	8.063	0.265	5.90	9.69	4.70
10	10.750	10.048	0.331	6.70	12.07	7.35
12	12.750	11.919	0.392	8.10	14.32	10.36
Rated 160 psi (SDR 26)* (G) (P)						
1.5	1.900	1.745	0.073	3.45	2.19	0.28
2	2.375	2.182	0.091	3.70	2.74	0.44
2.5	2.875	2.642	0.110	3.50	3.32	0.64
3	3.500	3.214	0.135	4.10	4.04	0.95
4	4.500	4.133	0.173	4.50	5.19	1.58
5	5.563	5.109	0.214	4.65	6.42	2.40
6	6.625	6.084	0.255	5.20	7.65	3.44
8	8.625	7.921	0.332	5.90	9.95	5.85
10	10.750	9.874	0.413	6.70	12.40	9.12
12	12.750	11.711	0.490	8.10	14.71	12.89

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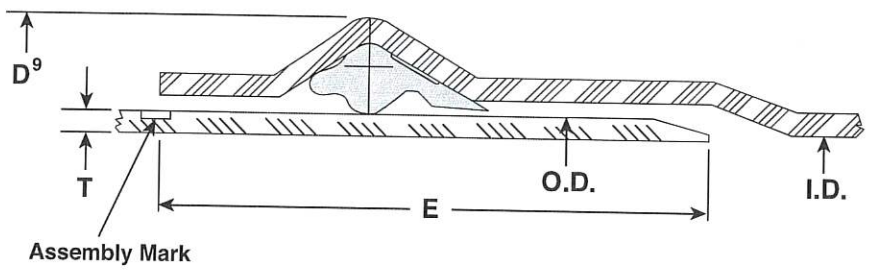
PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D^9 (IN)	APPROX. WEIGHT (LBS/FT)
Rated 200 psi (SDR 21)* (G) (P)						
1.5	1.900	1.709	0.090	3.45	2.26	0.44
2	2.375	2.135	0.113	3.70	2.83	0.54
2.5	2.875	2.585	0.137	3.95	3.42	0.79
3	3.500	3.146	0.167	4.20	4.17	1.17
4	4.500	4.046	0.214	4.50	5.36	1.93
6	6.625	5.955	0.316	5.20	7.89	4.23
8	8.625	7.754	0.410	5.90	10.27	7.18
10	10.750	9.667	0.511	6.70	12.79	11.20
12	12.750	11.465	0.606	8.10	15.17	15.82
Rated 250 psi (SDR 17)* (G) (P)						
1.5	1.900	1.641	0.112	3.45	2.39	0.58
2	2.375	2.078	0.140	3.70	2.94	0.66
2.5	2.875	2.517	0.169	3.95	3.55	—
3	3.500	3.063	0.206	4.20	4.32	1.42
4	4.500	3.938	0.265	4.50	5.56	2.36
6	6.625	5.803	0.390	5.20	8.19	5.11
8	8.625	7.553	0.508	5.90	10.66	8.69
10	10.750	9.410	0.632	6.70	13.28	13.55
12	12.750	11.160	0.750	8.10	15.75	19.20

* Prior to ordering or specifying, consult JM Eagle™ for product and/or listing availability.
(G) Green pipe available in sizes 4"–12"
(P) Purple pipe available in sizes 2"–12"



I.D. : Inside Dameter
O.D. : Outside Diameter
T. : Wall Thickness
D^9 : Bell Outside Diameter
E : Distance between Assembly Mark to the end of spigot.

Product Standard:	ASTM D2241
Pipe Compound:	ASTM D1784 Cells Class 12454
Gasket:	ASTM F477
Integral Bell Joint:	ASTM D3139
Certifications:	ANSI/NSF Standard 61
Pipe Length:	20 feet laying length
Installation:	JM Eagle™ Installation Guide

D2241
IPS PVC PRESSURE PIPE SPECIFICATION DATA

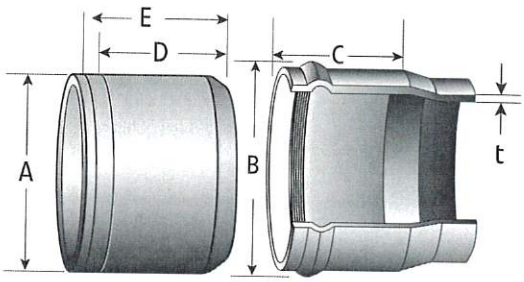
ASTM D2241 IPS SPECIFICATION DATA

Diamond IPS pressure-rated PVC pipe is made of compounds conforming to material requirements of ASTM D2241 in accordance with ASTM D1784. Pipe sizes (1 ½" through 12") are made with an integral bell to utilize the Rieber gasket system for sealing, and meeting specifications defined in ASTM F477 which conforms to the requirements of ASTM D3139.

Diamond IPS pressure-rated PVC pipe meets all the dimensional, chemical, and physical requirements as outlined in ASTM D2241. Potable water pipe carries the mark of NSF, International in accordance with Standard 61. Some factory locations produce IPS pressure pipe bearing the mark of NSF-14.

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

RIEBER JOINT ILLUSTRATION



D2241

PHYSICAL PROPERTIES OF PVC 12454:

Property	ASTM Test	Minimum
Specific Gravity	D792	1.40
Tensile Strength, psi	D638	7,000
Tensile Modulus, psi	D638	400,000
IZOD Impact Strength	D256	.65ft., lb./in.

SHORT FORM Specification for Diamond PVC Water Pipe
Diamond PVC Water Pipe shall be made of compounds conforming to ASTM D1784 with a cell classification of 12454. Diamond PVC Water Pipe must meet all the dimensional, chemical, and physical requirements as outlined in ASTM D2241 and will be supplied in 20 and 22 foot laying lengths. Joints shall be formed using Rieber Technology. Potable water pipe shall be manufactured from NSF listed ingredients.

ASTM D2241

SPECIFICATION DATA. DIAMOND IPS PRESSURE-RATED PIPE IS SUPPLIED IN 20 AND 22 FOOT LAYING LENGTHS.

Nominal Pipe Size in. (mm)	B Bell Socket Diameter Inches	C Approximate Bell Depth Inches	D Insert Mark 1 Inches *	E Insert Mark 2 Inches *
2" (50)	3-1/8"	4"	2-3/4"	3-3/4"
2.5" (62.5)	4-3/8"	5"	2"	3"
3" (75)	4-7/16"	4-1/2"	3-5/8"	4-5/8"
4" (100)	5-1/2"	4-3/4"	4-1/4"	5-1/4"
6" (150)	8-1/4"	5-1/2"	4-3/4"	5-3/4"
8" (200)	10-1/4"	6"	4-7/8"	5-7/8"
10" (250)	12-7/8"	6-1/2"	5-1/2"	6-1/2"
12" (300)	15-1/8"	7"	5-7/8"	6-7/8"

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*Tolerance of +/- 1/4" allowed

D2241
IPS PVC PRESSURE PIPE SPECIFICATION DATA

ASTM D2241
SPECIFICATION DATA

Nominal Pipe Size in. (mm)	A Outside Diameter Inches	t SDR 13.5 315 psi Inches	t SDR 17 250 psi Inches	t SDR 21 200 psi Inches	t SDR 26 160 psi Inches	t SDR 32.5 125 psi Inches	t SDR 41 100 psi Inches
MINIMUM WALL THICKNESS = (t)							
1.5" (37.5)	1.900	0.141	0.112	0.090			
2" (50)	2.375	0.176	0.140	0.113	0.091		
2.5" (62.5)	2.875	0.213	0.169	0.137	0.110		
3" (75)	3.500	0.259	0.206	0.167	0.135		
4" (100)	4.500	0.333	0.265	0.214	0.173	0.138	0.110
6" (150)	6.625	0.491	0.390	0.316	0.255	0.204	0.162
8" (200)	8.625		0.508	0.410	0.332	0.265	0.210
10" (250)	10.750		0.632	0.511	0.413	0.331	0.262
12" (300)	12.750		0.750	0.606	0.490	0.392	0.311

ASTM D2241
ASTM D2241 LOADING CHART

Nominal Pipe Size in. (mm)	Outside Diameter	Joints Per Bundle	Feet Per Bundle 20' laying lengths	*Feet Per Truckload 20' laying lengths	Feet Per Bundle 22' laying lengths	*Feet Per Truckload 22' laying lengths
SDR-41 PRESSURE RATING 100 PSI						
4" (100)	4.500	63	1,260	20,160	1,386	22,176
6" (150)	6.625	35\40	560/640/700/800	8,400	770\880	9,240
8" (200)	8.625	20\24	300/360/400/480	4,840	440\528	5,324
10" (250)	10.750	12\15	240/300	3,240	264\330	3,564
12" (300)	12.750	9\12	120/160/180/240	1,960	198\264	2,156
SDR-32.5 PRESSURE RATING 125 PSI						
4" (100)	4.500	63	1,260	20,160	1,386	22,176
6" (150)	6.625	35\40	560/640/700/800	8,400	770\880	9,240
8" (200)	8.625	20\24	300/360/400/480	4,840	440\528	5,324
10" (250)	10.750	12\15	240/300	3,240	264\330	3,564
12" (300)	12.750	9\12	120/160/180/240	1,960	198\264	2,156
SDR-26 PRESSURE RATING 160 PSI						
2" (50)	2.375	215			4,730	75,680
2.5" (62.5)	2.875	131			2,882	46,112
3" (75)	3.500	88\95			1,936\2,090	32,208
4" (100)	4.500	63	1,260	20,160	1,386	22,176
6" (150)	6.625	35\40	560/640/700/800	8,400	770\880	9,240
8" (200)	8.625	20\24	300/360/400/480	4,840	440\528	5,324
10" (250)	10.750	12\15	240/300	3,240	264\330	3,564
12" (300)	12.750	9\12	120/160/180/240	1,960	198\264	2,156

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CONTINUED NEXT PAGE

MARKING TAPE

DETECTABLE TAPE (5.0 MIL)

DETECTABLE TAPE (5.0 MIL)

Solid Aluminum Foil Core • Virgin Clear Polypropylene Film Laminated Top Structure
Virgin Clear Polyethylene Film Laminated Base Structure • Reverse Printed Polypropylene Structure
Acid, Alkali, Chemical, and Oil Resistant • Direct Burial Rated • Made in the USA

Applications and Information

- **Pro-Line's Detectable Marking Tape** is used for detecting, locating, identifying, and protecting buried utility lines for gas, water, sewer, telecommunication, and electrical markets. The width of tape used, is determined by the size of, and depth at which the underground utility line is buried. The depth at which detectable tape is buried, is determined by the width of the tape used.
- **DETECT:** Aluminum core is detected through means of inductive locating.
- **LOCATE:** Line is located and marked after inductive locating is performed.
- **IDENTIFY:** Utility type is identified by both the APWA color-code and utility legend printed on the marking tape.
- **PROTECT:** Detectable tape works 24 hours a day and year round, even if tape is not inductively located during excavation, the tape provides a "stop-sign" effect that is highly visible.

Standards and References

Pro-Line's Detectable Marking Tape meets or exceeds all applicable ASTM specifications.

- ASTM D2103-08: Standard Specification for Polyethylene Films and Sheeting.
- ASTM D882-09: Standard Test Method for Tensile Properties and Elongation of Thin Plastic Sheeting.
- ASTM D2578-08: Standard Test Method for Wetting Tension of Polyethylene and Polypropylene Films.
- ASTM D792-08: Standard Test Methods for Density of Plastics by Displacement.
- ASTM D671-93: Standard Test Method for Flexural Fatigue of Plastics.

Construction

Pro-Line's Detectable Marking Tape consists of a minimum 5.0 mil overall thickness. Construction is 0.8 mil clear virgin polypropylene film, reverse printed and laminated to a 0.35 solid aluminum foil core and then laminated to a 3.75 mil clear virgin polyethylene film. Tape is printed with our APWA Color-Coded, patented "Diagonally Striped" design with big, bold, black lettering to identify a specific buried utility line.

Specifications

DETECTABLE UNDERGROUND MARKING TAPE

Underground marking tape shall be a (2", 3", 4", 6", or 12" width), detectable marking tape, with a minimum 5.0 mil overall thickness. Tape shall be manufactured using a 0.8 mil clear virgin polypropylene film, reverse printed and laminated to a **0.35 mil solid aluminum foil core**, and then laminated to a 3.75 mil clear virgin polyethylene film. Tape shall be printed using a diagonally striped design for maximum visibility, and meet the APWA Color-Code standard for identification of buried utilities. Detectable marking tape shall be **Pro-Line Safety Products** or approved equal and made in the USA.

DETECTABLE TAPE (5.0 MIL) MARKING TAPE

TABLE 1: DETECTABLE TAPE CONSTRUCTION (Polypropylene, Aluminum Foil, and Polyethylene)

PROPERTY	2" WIDTH	3" WIDTH	4" WIDTH	6" WIDTH	12" WIDTH
Nominal Overall Thickness	5.0 mil	5.0 mil	5.0 mil	5.0 mi	5.0 mil
Aluminum Foil Core Thickness	0.35 mil	0.35 mil	0.35 mil	0.35 mi	0.35 mil
Polyethylene Film Thickness	3.75 mil	3.75 mil	3.75 mil	3.75 mi	3.75 mil
Polypropylene Film Thickness	0.80 mil	0.80 mil	0.80 mil	0.80 mi	0.80 mil
Polypropylene Print Method	Reverse Printed	Reverse Printed	Reverse Printed	Reverse Printed	Reverse Printed
Print Design #1 (Patented)	**Diagional Striped**	**Diagional Striped**	**Diagional Striped**	**Diagional Striped**	**Diagional Striped**
Print Design #2 (Custom)	Solid Block	Solid Block	Solid Block	Solid Block	Solid Block
Print Design #3 (Custom)	Solid Flood	Solid Flood	Solid Flood	Solid Flood	Solid Flood
Print Design Color-Code	APWA Color-Code	APWA Color-Code	APWA Color-Code	APWA Color-Code	APWA Color-Code

Diagional striped design is a PATENTED design of Pro-Line Safety Products that enhances tape visibility for superior protection.

Please note that there may be a nominal + or - 10% difference throughout the overall thickness.

TABLE 2: TESTING SPECIFICATIONS (Physical and Mechanical Properties)

TEST DESCRIPTION	STANDARD	2" WIDTH	3" WIDTH	4" WIDTH	6" WIDTH	12" WIDTH
Aluminum Foil Core	MFG. SPECS	Virgin Grade	Virgin Grade	Virgin Grade	Virgin Grade	Virgin Grade
Polyethylene Film	MFG. SPECS	Virgin Grade	Virgin Grade	Virgin Grade	Virgin Grade	Virgin Grade
Polypropylene Film	MFG. SPECS	Virgin Grade	Virgin Grade	Virgin Grade	Virgin Grade	Virgin Grade
Adhesive Type	MFG. SPECS	AV1257/CA100	AV1257/CA100	AV1257/CA100	AV1257/CA100	AV1257/CA100
Adhesive Bond Strength	BOILING WATER	5 hrs W/O Peel	5 hrs W/O Peel	5 hrs W/O Peel	5 hrs W/O Peel	5 hrs W/O Peel
Printed Inks	MFG. SPECS	Chromabond	Chromabond	Chromabond	Chromabond	Chromabond
Print Repeat	MFG. SPECS	Varies by Legend	Varies by Legend	Varies by Legend	Varies by Legend	Varies by Legend
Coefficient Friction	ASTM D4521-96	0.247 Static	0.247 Static	0.247 Static	0.247 Static	0.247 Static
Density	ASTM D792-66	1.09 g/cm³	1.09 g/cm³	1.09 g/cm³	1.09 g/cm³	1.09 g/cm³
Elongation (MD)	ASTM D882-80A	139%	139%	139%	139%	139%
Elongation (TD)	ASTM D882-80A	80%	80%	80%	80%	80%
Flexural Fatigue	ASTM D671-93	Pliable Hand	Pliable Hand	Pliable Hand	Pliable Hand	Pliable Hand
Printability	ASTM D2578-08	45 Dynes	45 Dynes	45 Dynes	45 Dynes	45 Dynes
Tensile Strength	ASTM D882-09	15,000 psi	15,000 psi	15,000 psi	15,000 psi	15,000 psi

WEIGHTS, MEASUREMENTS AND PACKAGING

PRODUCT PART NO.	SIZE (WIDTH)	NOMINAL OVERALL THICKNESS	NOMINAL THICKNESS OF STRUCTURAL MATERIALS			RECOMMENDED BURIAL DEPTHS FOR DETECTION	PRODUCT WEIGHT PER ROLL	STANDARD PACKAGING
			ALUMINUM FOIL THICKNESS	POLYETHYLENE THICKNESS	POLYPROPYLENE THCINKESS			
10311XXX3	2" x 1000'	5.0 MIL	0.35 MIL	3.75 MIL	0.80 MIL	6-9 inches	4.75 lbs	9 / CARTON
10312XXX3	3" x 1000'	5.0 MIL	0.35 MIL	3.75 MIL	0.80 MIL	9-12 inches	7.13 lbs	6 / CARTON
10313XXX3	4" x 1000'	5.0 MIL	0.35 MIL	3.75 MIL	0.80 MIL	12-15 inches	9.50 lbs	4 / CARTON
10314XXX3	6" x 1000'	5.0 MIL	0.35 MIL	3.75 MIL	0.80 MIL	15-18 inches	14.25 lbs	3 / CARTON
10316XXX3	12" x 1000'	5.0 MIL	0.35 MIL	3.75 MIL	0.80 MIL	18-24 inches	28.50 lbs	1 / CARTON

FOR CUSTOM LEGENDS OR SIZES CALL 800.554.3424

PRINT LEGEND	PART #
CAUTION BURIED CHILLED WATER LINE BELOW	103
CAUTION BURIED GEOTHERMAL LINE BELOW	128
CAUTION BURIED POTABLE WATER LINE BELOW	115
CAUTION BURIED WATER LINE BELOW	125
CAUTION BURIED FORCE MAIN BELOW	208
CAUTION BURIED FORCE MAIN BELOW	308
CAUTION BURIED SANITARY SEWER LINE BELOW	318
CAUTION BUIRED SEWER LINE BELOW	319
CAUTION BURIED STORM DRAIN LINE BELOW	321
CAUTION BURIED STORM SEWER LINE BELOW	322

PRINT LEGEND	PART #
CAUTION BURIED CATV LINE BELOW	402
CAUTION BURIED COMMUNICATION LINE BELOW	404
CAUTION BURIED FIBER OPTIC CABLE BELOW	406
CAUTION BURIED TELEPHONE LINE BELOW	423
CAUTION BURIED NON-POTABLE WATER LINE	512
CAUTION BURIED RECLAIMED WATER LINE BELOW	517
CAUTION BURIED ELECTRIC LINE BELOW	605
CAUTION BURIED HIGH VOLTAGE LINE BELOW	610
CAUTION BURIED GAS LINE BELOW	809
CAUTION BURIED PIPELINE BELOW	814

PRO-LINE SAFETY PRODUCTS
A DIVISION OF PRO-PAK IND. INC.

PRO-LINE SAFETY PRODUCTS COMPANY
1099 ATLANTIC DRIVE, UNIT 1 • WEST CHICAGO, IL 60185
TOLL FREE: 800.554.3424

MADE IN THE U.S.A. WITH PRIDE

FITTINGS

UNDERGROUND UTILITY MATERIAL SUPPLIED BY:

ACT PIPE & SUPPLY

4719 DODGE ST

SAN ANTONIO, TX 78217

210-946-6969

SDR 26 D-3034/PS115 F-679 "HWS" FITTING SPECIFICATIONS

1.0 **GPK PVC Heavy Wall Sewer Fittings** shall be manufactured in accordance with ASTM Standards D-3034 and F-1336 and F-679. Heavy Wall Sewer Fittings (HWS) are produced in sizes 4" through 36" diameter.

2.0 **The Purpose of GPK Heavy Wall Sewer Fittings** is to convey municipal sanitary and industrial wastes, storm water run-off and many other related applications. They are designed to be used in gravity flow and low pressure applications not to exceed 10.8 psi. Heavy Wall Sewer Fittings are typically used when a higher degree of strength is desired to give an added assurance of product reliability.

3.0 **Injection Molded Fittings** are produced in sizes 4" through 8" diameter. **Fabricated Fittings** are produced in sizes 4" through 36" diameter. A fabricated fitting is considered any fitting made from pipe or a combination of pipe and molded components.

4.0 **Chemical Resistance.** GPK fittings resist attack from certain alcohols, alkalies, salt solutions, acids and other types of chemicals. Refer to chemical resistance chart for suitability.

5.0 **Marking.** GPK fittings shall be marked with company name or logo, applicable size, "PVC", "PSM", the Heavy Wall Sewer designation "HWS" and the ASTM specification number (D-3034/F-1336/F-679). The fittings and/or packaging shall also include the manufacturer's date and shift code.

6.0 **Testing.** A test after installation of either low pressure air (Uni-B-6) or a water infiltration-exfiltration test is recommended.

7.0 **Backfilling and Tamping.** Backfilling should follow closely after assembly of pipe and fittings.

7.1 **Backfilling** with proper material is important to achieve desired density in haunching area which enables pipe, fittings and soil to work together to meet designed load requirements. This eliminates excess deflection and shear breaks due to heavy loads. Approved material shall be used properly, compacted continuously above and around the pipe and fittings as well as between the fitting and trench wall. A cushion of approved material up to a minimum of 12" over the fittings and between the trench walls shall be done in accordance with the engineers' specifications.

7.2 **Tamping.** This shall be done by hand tamping of the embedment material between the trench wall of the service line fitting and riser connection. Tamping can also be done by mechanical tampers or by using water to consolidate the embedment material. **Extreme unstable ground conditions** may require wider trenches to enable you to compact a larger area around the pipe and fittings to the density consistent of the original ground surface conditions.

8.0 **Service Lines.** Normally, service lines from the property line to the collection sewer should be a minimum depth of 3 feet at the property line and should be laid in straight alignment and uniform slope of not less than 1/4" per foot for 4" nominal pipe and 1/8" per foot for 6" pipe. Where collection sewers are deeper than 7 feet a vertical standpipe of stack is permitted but not recommended, consult the project engineer for proper installation details. Deep sewer chimney and risers necessitate extreme care during backfilling. Where surface loading is anticipated the final backfill must be compacted to a density compatible with those surface loads to be encountered.

8.1 **Backfilling around pipe service laterals on slope.** Extra attention should be given on slopes to prevent the newly backfilled trench from becoming a "French Drain." Before backfilling completely there is a tendency for ground and surface water to follow the direction of the looser soil. This flow may wash out soil from under or around pipe and branch line fittings, reducing or eliminating the support needed. To avoid this problem the backfilling should be of greater compaction. Tamping should be done in 4" layers and continued in this manner all the way up to ground or surface line of the trench. Concrete collars or other concrete poured around the fitting to stabilize unwanted movement is recommended to prevent water from undercutting the underside of the pipe and fittings.

SUMMARY: Due to various ground conditions and different situations, installation techniques vary widely. We warranty our products to be free of manufacturer's defects. We will not replace the products that are installed or used incorrectly. The design of the systems that our product is used in is a factor that cannot be overlooked.

GPK FITTING SUBMITTAL SHEET

Intro: GPK manufactures PVC HWS Fittings in accordance with ASTM D-3034 and F-1336 and F-679 to be used in gravity flow or low pressure applications. Fabricated fittings are produced in sizes 4" through 36" diameter. Injection molded fittings produced in sizes 4" through 8" diameter.

Material: Fabricated fittings are manufactured from PVC pipe and meeting all the requirements of ASTM D-3034, SDR 26 and F-679 PS115 for workmanship, extrusion quality, stiffness, impact resistance, dimensions and structural performance.

Extruded pipe components are made from PVC material with a minimum cell classification of 12454, 13343 or 12364 as defined in ASTM D-1784.

Injection molded fittings are made from PVC material with a minimum cell classification of 12454 or 13343 as defined in ASTM D1784.

Extrusion Quality: Extruded components are tested in accordance with and meet all requirements of ASTM D-2152 for properly fused PVC.

Impact Resistance: Extruded components are tested in accordance with ASTM D-2444 using a 20 lb. Tup A and a Flat Plate Holder B. The strength shall equal or exceed the values shown below:

4" - 5"	150 Ft-Lbf
6" - 8"	210 Ft-Lbf
10" - 36"	220 Ft-Lbf

Impact Resistance: Injection molded fittings are tested in accordance with ASTM D 2444 using a 20 lb. Tup A and a Flat Plate Holder B. The strength shall equal or exceed the values shown below:

4"	50 Ft-Lbf	6"	75 Ft-Lbf	8"	75 Ft-Lbf

Pipe Stiffness: Extruded components are tested in accordance with ASTM D-2412. The stiffness equals or exceeds the requirements of ASTM D-3034 and F-679.

Pipe Flattening: Extruded components are flattened as described in ASTM D-3034 and F-679 until the distance between the plates is 40% of the outside diameter of the pipe. There shall be no splitting, cracking or breaking.

Pressure/Pressure Deflection: Gasketed joints are tested in accordance with ASTM D-3212.
Pressure: 10 minutes @ 10.8 psi + 10 minutes deflected @ 10.8 psi.
Vacuum: 10 minutes @ 22" Hg + 10 minutes deflected @ 22" Hg.

Branch Bending: The chemically fused areas around thefabricated branches of tee, wye and tee-wye fittings are tested to ASTM F-1336 to verify their strength and integrity.

Pipe Stop Support: Tee and tee-wye fittings are tested to requirements of ASTM F1336 for pipe stop load support. No cracking or splitting shall occur and pipe spigot shall not protrude into waterway of the fitting.

Joining Methods: Chemically Fused Solvent Weld Joints
Solvent cement is handled and tested in accordance with ASTM D-2564 and D-2855. The Lap Shear Strength shall equal or exceed 900 psi @ 72 hours.

Heat Fusion Welded Joints (Butt Fusion Welds)

Elastomeric Seals (Gaskets)
Must meet all requirements of ASTM F-477 and D-3212.

Epoxy Reinforced Welds.

IPS SDR26 NON-PRESSURE FITTING SPECIFICATIONS

1.0 **GPK IPS SDR26 NON-PRESSURE FITTINGS** Shall be manufactured from pvc SDR26 Class 160 pipe that has a minimum cell classification of 12454 as defined in ASTM D 1784.

2.0 The **purpose** of GPK in-line fittings is to convey municipal sanitary and industrial wastes, storm water runoff and many other related applications. They are designed to be used in gravity flow and low pressure applications not to exceed 10.8 psi.

3.0 **Fabricated Fittings** are produced in sizes 4" through 12" diameter. A fabricated fitting is considered any fitting made from pipe or a combination of pipe and molded components.

4.0 **Chemical Resistance.** GPK fittings resist attack from certain alcohols, alkalies, salt solutions, acids and other types of chemicals. Refer to chemical resistance chart for suitability.

5.0 **Marking.** GPK fittings shall be marked with applicable size, "PVC", company name or logo, and IPS SDR26 Non-Pressure. The fittings and/or packaging shall include the manufacturer's date and shift code.

6.0 **Testing.** A test after installation of either low pressure air (Uni-B-6) or a water infiltration-exfiltration test is recommended.

7.0 **Backfilling and Tamping.** Backfilling should follow closely after assembly of pipe and fittings.

7.1 **Backfilling** with proper material is important to achieve desired density in haunching area which enables pipe, fitting and soil to work together to meet designed load requirements. This eliminates excess deflection and shear breaks due to heavy loads. Approved material shall be used properly, compacted continuously above and around the pipe and fittings as well as between the fitting and trench wall. A cushion of approved material up to a minimum of 12" over the fittings and between the trench walls shall be applied in accordance with the engineers' specifications.

7.2 **Tamping.** This shall be done by hand tamping of the embedment material between the trench wall of the service line fitting and riser connection. Tamping can also be done by mechanical tampers or by using water to consolidate the embedment material. **Extreme unstable ground conditions** may require wider trenches to enable you to compact a larger area around the pipe and fittings to the density consistent of the original ground surface conditions.

8.0 **Service Lines.** Normally, service lines from the property line to the collection sewer should be a minimum depth of 3 feet at the property line and should be laid in straight alignment and uniform slope of not less than 1/4" per foot for 4" nominal pipe and 1/8" per foot for 6" pipe. Where collection sewers are deeper than 7 feet a vertical standpipe of stack is permitted but not recommended, consult the project engineer for proper installation details. Deep sewer chimney and risers necessitate extreme care during backfilling. Where surface loading is anticipated the final backfill must be compacted to a density compatible with those surface loads to be encountered.

8.1 **Backfilling around pipe service laterals on slope.** Extra attention should be given on slopes to prevent the newly backfilled trench from becoming a "French Drain." Before backfilling completely there is a tendency for ground and surface water to follow the direction of the looser soil. This flow may wash out soil from under or around pipe and branch line fittings, reducing or eliminating the support needed. To avoid this problem the backfilling should be of greater compaction. Tamping should be done in 4" layers and continued in this manner all the way up to ground or surface line of the trench. Concrete collars or other concrete poured around the fitting to stabilize unwanted movement is recommended to prevent water from undercutting the underside of the pipe and fittings.

SUMMARY: Due to various ground conditions and different situations, installation techniques vary widely. We warranty our products to be free of manufacturer's defects. We will not replace the products that are installed or used incorrectly. The design of the systems that our product is used in is a factor that cannot be overlooked.

GPK FITTING SUBMITTAL SHEET

Intro: GPK manufactures IPS SDR26 drainage fittings to be used in gravity flow or low pressure applications. Fabricated fittings are produced in sizes 4" through 12" diameter.

Material: Fabricated fittings are manufactured from PVC pipe meeting the requirements of ASTM D 2241 for workmanship, extrusion quality, stiffness, impact resistance, dimensions and structural performance.

Extruded pipe components are made from PVC material with a minimum cell classification of 12454 as defined in ASTM D 1784.

Pressure/Pressure Deflection: Gasketed joints are tested in accordance with ASTM D 3212.
Pressure: 10 minutes @ 10.8 psi.
Vacuum: 10 minutes @ 22" Hg.

Branch Bending: The fused areas around the fabricated branches of tee, wye and tee-wye fittings are tested to ASTM F 1866 to verify their strength and integrity.

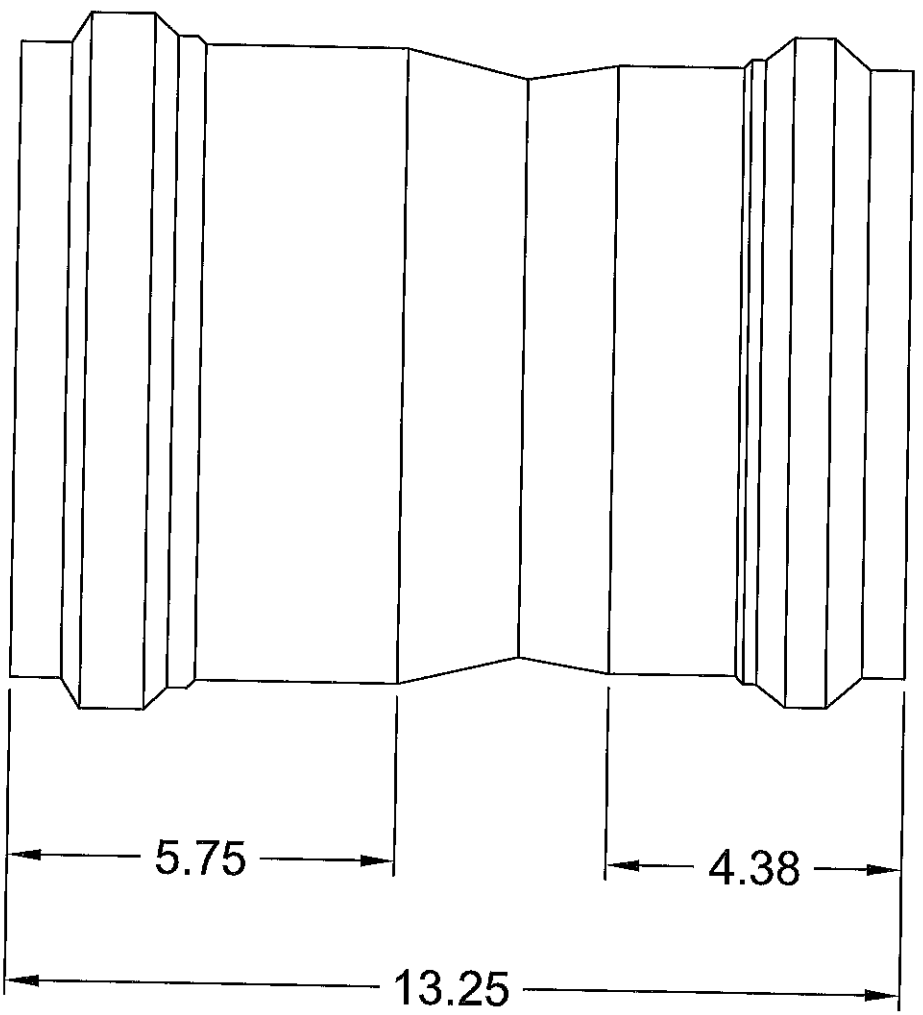
Joining Methods: Chemically Fused Solvent Weld Joints
Solvent cement is handled and tested in accordance with ASTM D 2564 and D 2855. The Lap Shear Strength shall equal or exceed 900 psi @ 72 hours.

Heat Fusion Welded Joints (Butt Fusion Welds)

Elastomeric Seals (Gaskets) Must meet all requirements of ASTM F 477 and D 3212.

Fabricated saddle tees and saddle wyes shall have skirts which can be bonded to pipe.

GPK does not recommend gasket skirts where air tests are required.



GPK PRODUCTS, INC.

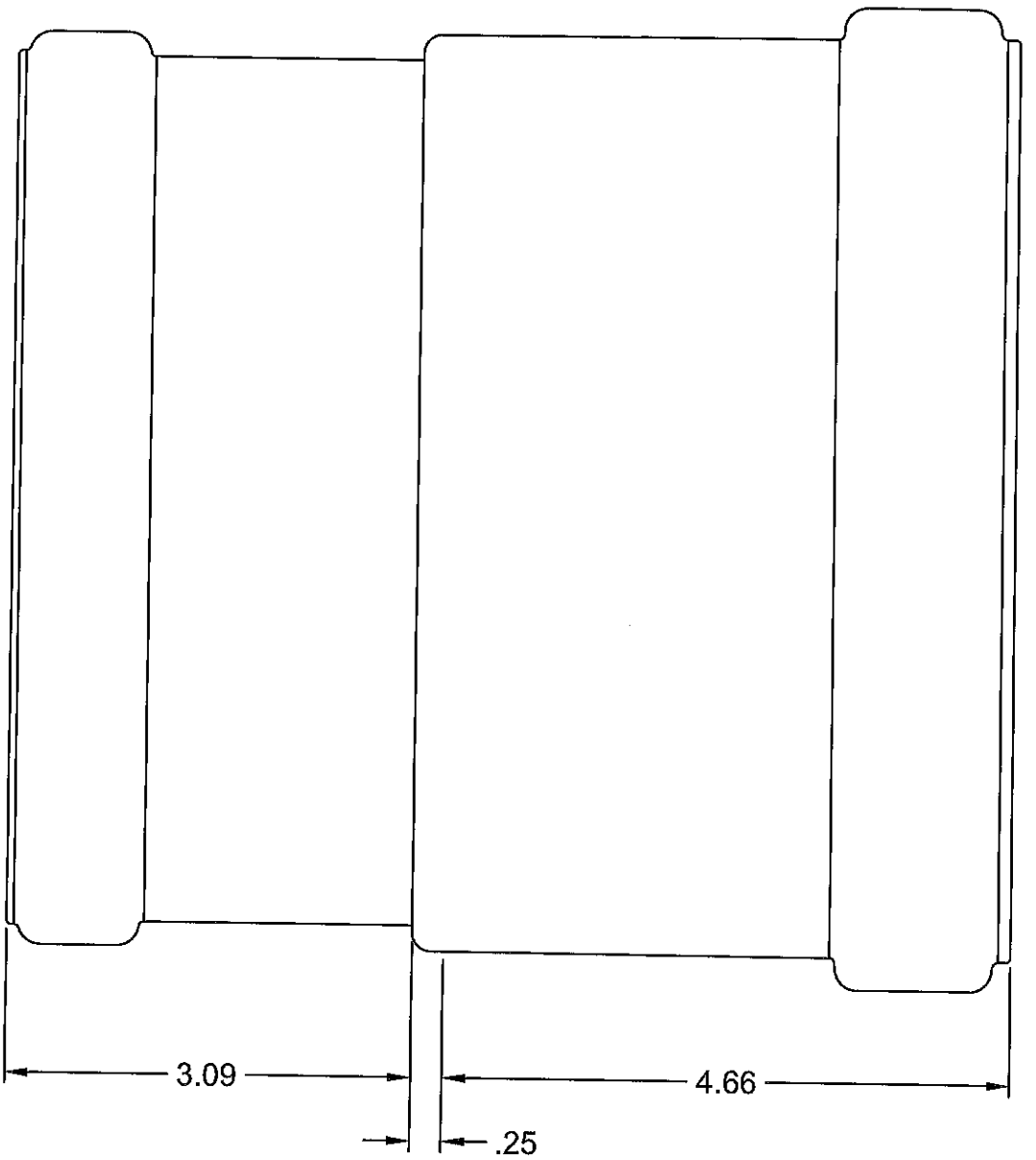
FOR REFERENCE ONLY DIMENSIONS SUBJECT TO CHANGE

TITLE

8" IPS G x HWS G ADAPTER

1-800-437-4670 FARGO, ND

DATE	SCALE	PART NO.
04-21-12	NONE	G332-0008



GPK PRODUCTS, INC.

FOR REFERENCE ONLY DIMENSIONS SUBJECT TO CHANGE

TITLE

6" DWV G x HWS G ADAPTER
SCH 40 x SDR 26 PVC

1-800-437-4670 FARGO, ND

DATE	SCALE	PART NO.
7-10-19	NONE	G332-0006

WW MANHOLE ACCESORIES

UNDERGROUND UTILITY MATERIAL SUPPLIED BY:

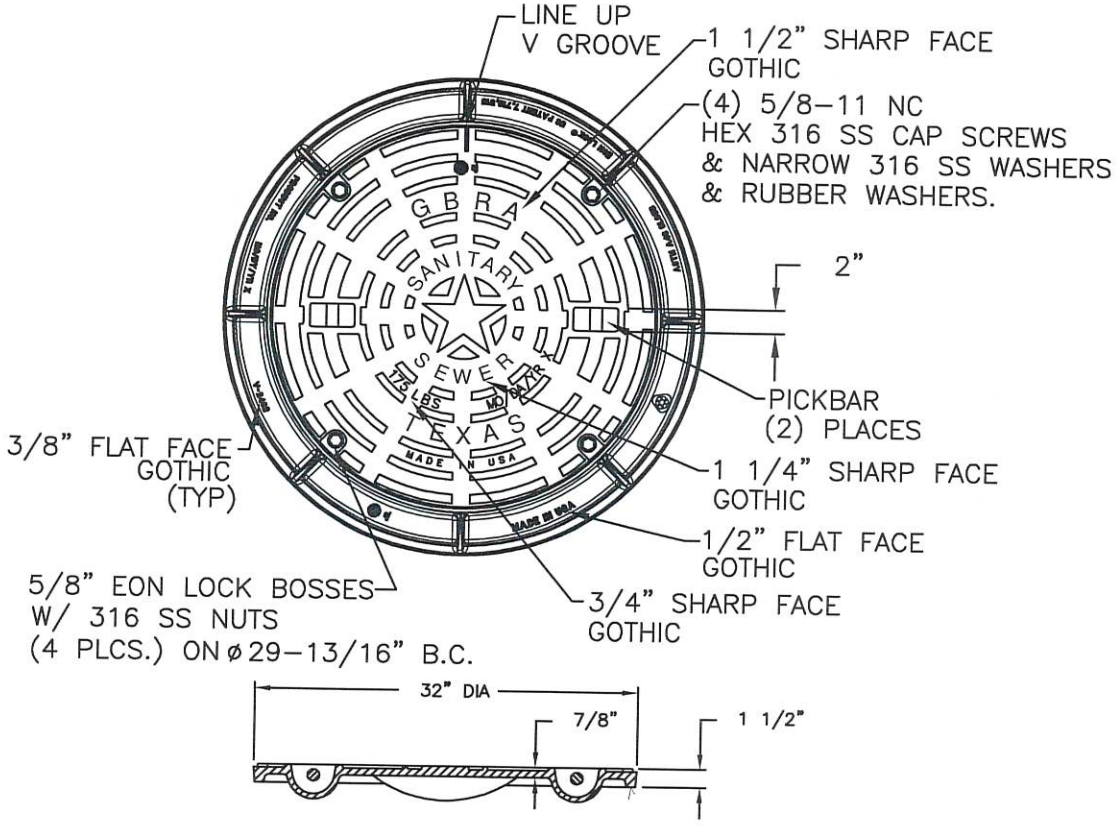
ACT PIPE & SUPPLY

4719 DODGE ST

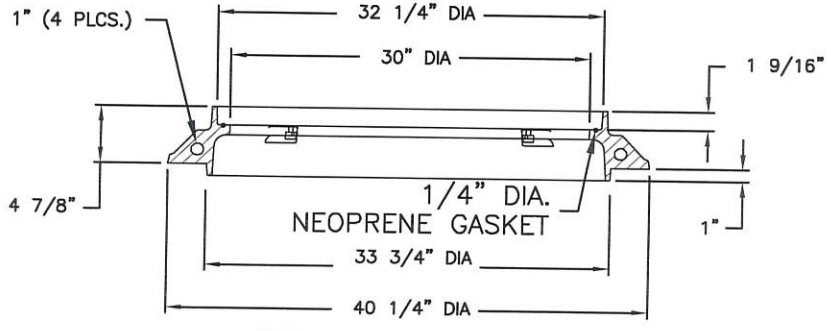
SAN ANTONIO, TX 78217

210-946-6969

V2432 V2432-1 Assembly



CROSS SECTION



FRAME SECTION

Product Number

42432109W01

Design Features

-Materials
  Frame
    Gray Iron (CL35B)
  Cover
    Ductile Iron (80-55-06)

-Design Load
  Heavy Duty
-Open Area
  n/a
-Coating
  Undipped
- √ Designates Machined Surface

Certification

- ASTM A48
- ASTM A536
-
-Country of Origin: USA

Major Components

42432009
42432109

Drawing Revision

10/5/2016 Designer: MAH
10/18/2016 Revised By: MAH

Disclaimer

Weights (lbs./kg) dimensions (inches/mm) and drawings provided for your guidance. We reserve the right to modify specifications without prior notice.

Contact

800 626 4653
ejco.com

Specializing in Concrete Products Since 1999.
That's 15 Years of Exceptional Service!

American MAATco, located in Richland Hills, Texas, has provided a line of quality products for the construction, utilities, and telecommunications industries since 1999.

Our goal for the past fifteen years has been to provide exceptional customer service. We maintain the necessary inventory and strive to be the best possible resource for every industry we serve.

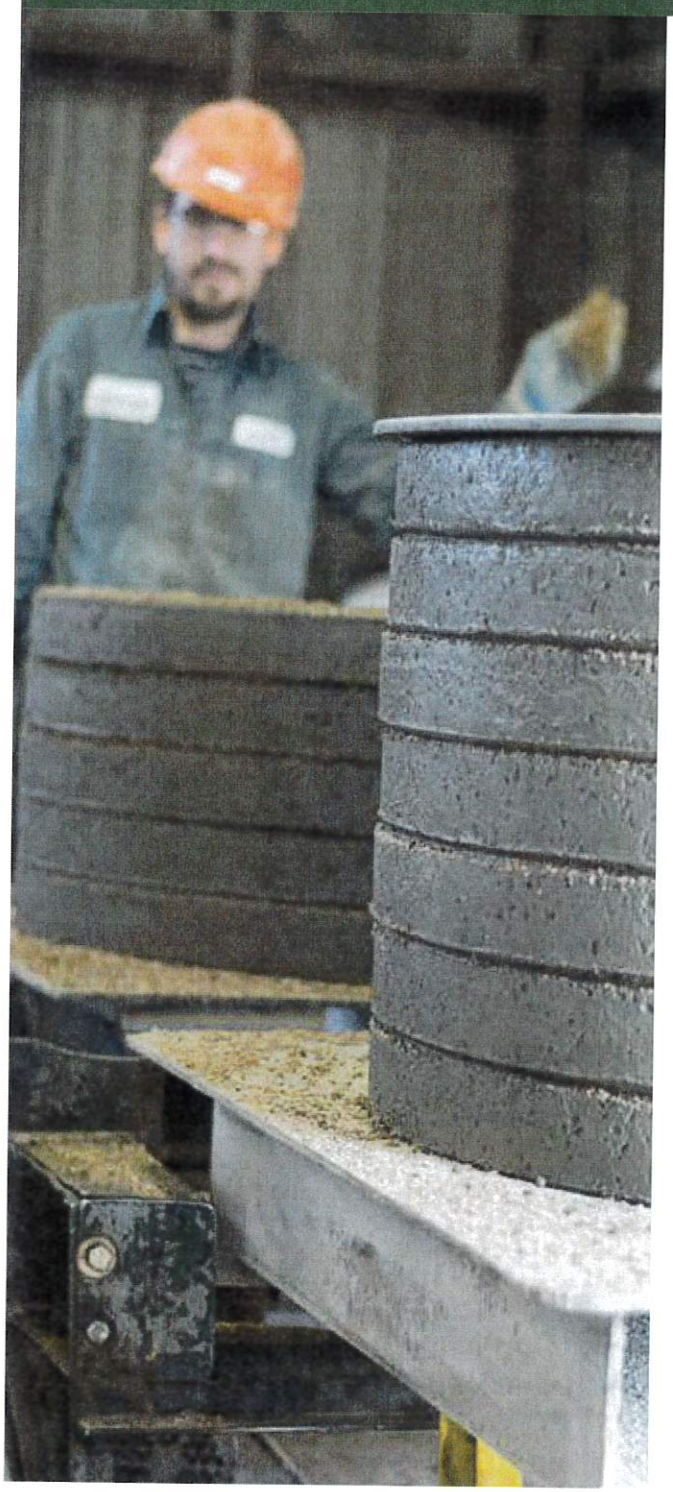
Products we manufacture:

American MAATco Products:

- Grade rings
- Dobies
- Lift hole plugs
- Terminators
- Miscellaneous Concrete Products

American MAATco

Grade Rings

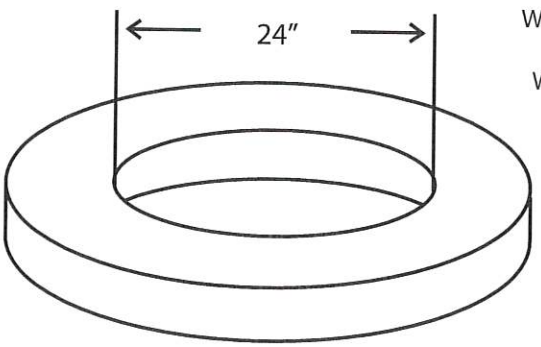


Quality Products. American MAATCO is a manufacturer of drycast and wetcast concrete grade rings and lift hole plugs. We offer a wide variety of grade rings to suit your needs from manholes to frame riser installations. Our grade rings are used for new construction or rehab work.

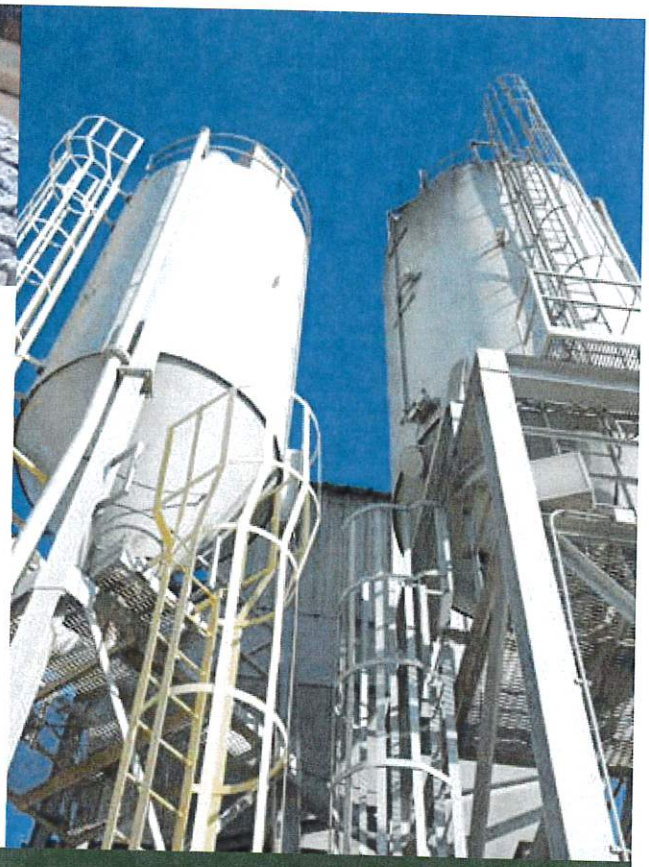
Sizes	Pcs/Cube	Sizes	Pcs/Cube
18x4x4	10	30x5x2	20
24x5x2	20	30x5x3	14
24x5x3	12	30x5x4	10
24x5x4	10	30x5x6	6
24x5x6	6	32x6x2	12
24x8x2	20	32x6x3	10
24x8x3	14	34x5x2	20
24x8x4	10	34x5x3	14
26x5x2	20	34x5x4	9
26x5x3	12	40x6x3	10
26x5x4	10	40x6x12	4
26x5x6	6		

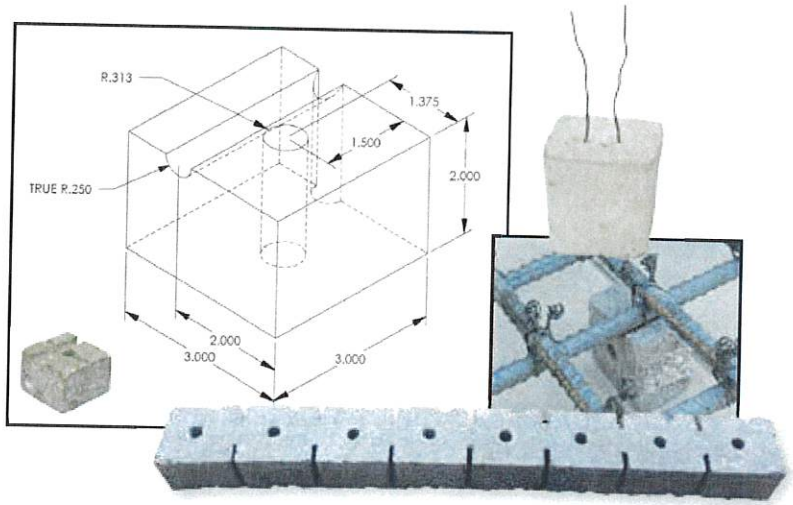
All our grade rings meet ASTM C-478 standard. Additional sizes available.

Concrete Grade Ring Sample Diagram



Diameter: 34″
Wall Thickness: 5″
Height: 2″
Weight: 116 lbs





Concrete Spacer Bricks

Application:	On-Grade or Below-Grade, Metal Decks, Side-Form Spacers
Cover Height:	From 2"-3"
Features:	Minimum of 4000 PSI. Additional strength available. Contact us for more details.

Order Code	Dimensions	Bricks Per Pallet
CWD233	2x3x3	2240
CWD333	3x3x3	1600
CWD333W	3x3x3 w/ wire	1521
CWD233W	2x3x3 w/wire	1521
C448	4x4x8	360

Pallet weighs 3058 lbs each, 14 pallets per truckload.

How can we help you?

American MAATCO Concrete Spacer Bricks are used for a variety of construction projects and meet the needs of concrete professionals. Our goal is to manufacture the highest quality concrete products to service the construction industry.

We exclusively manufacture concrete foundation products for 2000 Industries as well as lift hole plugs for the piping industry.

Ask us about specialized short runs or call us for a freighting quote!

Questions and Customer Care:

Stacy Watts, Director of Sales
817-480-4568 cell
817-284-3372 office
817-595-1506 fax
stacy@americanmaaatco.com

Raymond J. Peralez, Plant Manager:
raymond@americanmaatco.com

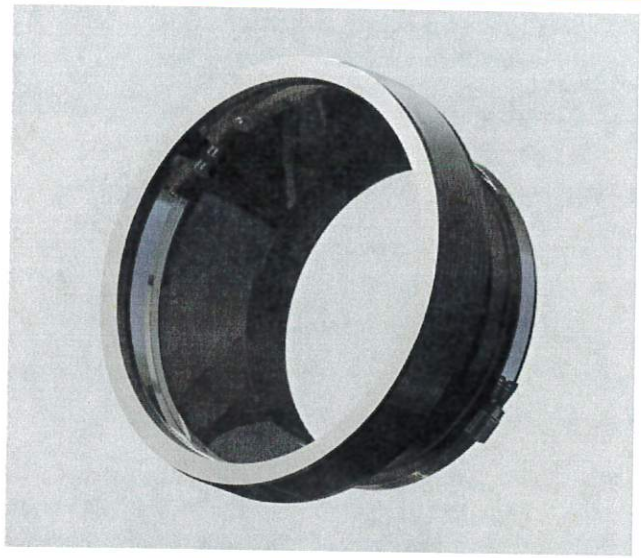
www.americanmaatco.com

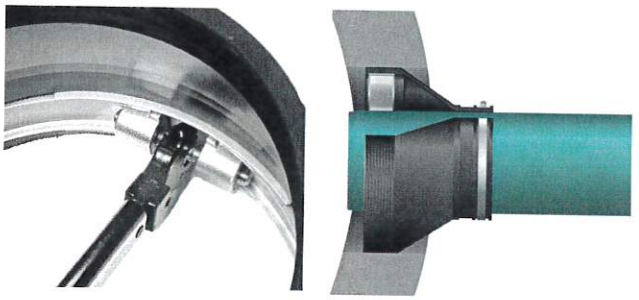
American MAATCO

2499 Austin Road | Richland Hills, Texas 76118

PSX: DIRECT DRIVE

PIPE TO MANHOLE & TANK CONNECTOR





Press-Seal Corporation is the only boot style connector manufacturer that uses multiple mechanisms under 56" as a standard.

Press-Seal recommends installation between a 10:00 and 2:00 position.

Where To Use

- Manholes
- Wet wells
- Square pump and lift stations
- Stormwater structures
- On-site treatment structures
- Junction chambers
- Grease interceptors
- Vaults

What It Is

PSX: Direct Drive is a high-performance flexible pipe-to-manhole connector that offers easy installation and long-term performance in one convenient product.

Whether you core or cast your holes, PSX: Direct Drive fits right into your production methods, ready to seal your toughest applications every time.

How It Works

- The connector fits into a cast or cored hole.
- A power sleeve made from tempered series 304 stainless steel expands with a certified installation wrench.
- Take-up clamps made from series 304 stainless steel with quick adjusting screws secure the connector to the pipe.

Why It's Better

- Safely install from outside of the manhole preventing falls from crawling down into structures.
- All stainless-steel components with no welds or rivets creating a stronger product.
- Precision molding provides accurate compensation for hole size variations.
- Additional torque and multiple adjusters on larger diameters.
- Contractor can save time and money by backfilling immediately.

All connectors are made with either EPDM or ISOPRENE rubber which meet ASTM C-923. Connectors are available in NITRILE rubber upon request. Contact your territory manager for more information

Phone: 800-348-7325
Fax: (260) 436-1908

PRESS-SEAL CORPORATION
Protecting Our Planet's Clean Water Supply
ISO 9001: Registered • Version 02.09.22.8.50

Email: sales @press-seal.com
Web: www.press-seal.com

PSX: DIRECT DRIVE
SUBMITTAL SPECIFICATIONS

Pipe-to-Manhole and Structure Connector Specification for Sanitary and Storm Sewer Applications:

All pipe-to-manhole and structure connections shall meet and or exceed ASTM C 923, Standard Specification for Resilient Connectors Between Reinforced Concrete Manholes, Structures, Pipes and laterals.

All mechanical devices, including castings, bolt assemblies, adjusters shall use non-magnetic 300 series stainless steel with no welds or rivets in its assemblies.

Connector sizes less than 28" shall employ one adjuster, 28" - 34" two adjusters and 36" and larger three adjusters.

If thermal plastic internal expansion rings are used, they must be heavy duty automotive grade material molded in one piece with an expansion installation mechanism made of a stainless steel threaded insert (not steel to plastic threads) and embedded as part of the expansion mechanism. Multiple plastic parts as part of the expansion mechanism are not allowed.

The installation of the connector shall be accomplished at one time and shall require no additional adjustments or installation at a later time to insure a watertight seal.

Take up clamps shall use non-magnetic 304 series stainless steel and be installed in the field using a T-Handle Torque wrench set to 60 inch-pounds and installation shall follow manufacturer's instructions.

The connector shall be PSX: Direct Drive and PSX: Nylo Drive as manufactured by Press-Seal Corporation of Fort Wayne, IN or approved equal.

Product Performance

PSX: Direct Drive meets or exceeds all requirements of the following Specifications and/or Test Methods:

- ASTM C 923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals
- ASTM C 1244 Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test
- ASTM C 1478 - Standard Specification for Storm Drain Resilient Connectors Between Reinforced Concrete ZPipes, and Laterals
- ASTM F 2510 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Corrugated High Density Polyethylene Drainage Pipes

Phone: 800-348-7325
Fax: (260) 436-1908

PRESS-SEAL CORPORATION
Protecting Our Planet's Clean Water Supply
ISO 9001: Registered • Version 02.09.22.8.50

Email: sales @press-seal.com
Web: www.press-seal.com

TYPE 4G & 4F PROFILE

CONCRETE PIPE AND MANHOLE GASKETS

Where To Use

- Manholes
- Wet wells
- Square pump and lift stations
- Stormwater structures
- On-site treatment structures
- Junction chambers
- Grease interceptors

CARE & STORAGE
PAGE 5

What It Is

The Type 4G & 4F profile gaskets were developed to specifically meet the needs of contemporary concrete pipe joint designs.

With the accurate profile dimensions and designs for a complete line of standard and specially designed concrete joint configurations.

How It Works

- The gasket is stretched over the spigot.
- The gasket is equalized around the entire circumference of the spigot.
- Bell joint is covered liberally with lubricant.
- Bell and spigot are homed creating a watertight seal.

Why It's Better

- Optimized profile designs for a wide variety of joint configurations.
- Accurate profile designs covering a variety of applications.
- Wide range of compounds that can be applied in multiple applications.
- Simple installation methods.

Product Performance

- ASTM C1619 Standard Specification for Elastomeric Seals for Joining Concrete Structures
- ASTM C443 Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets

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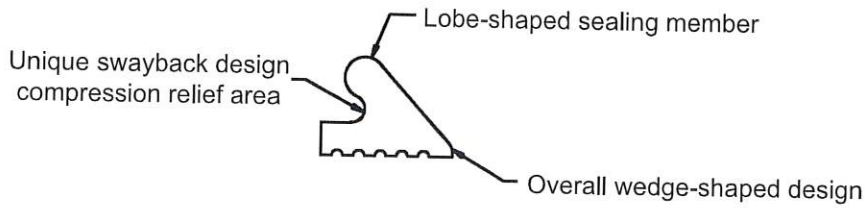
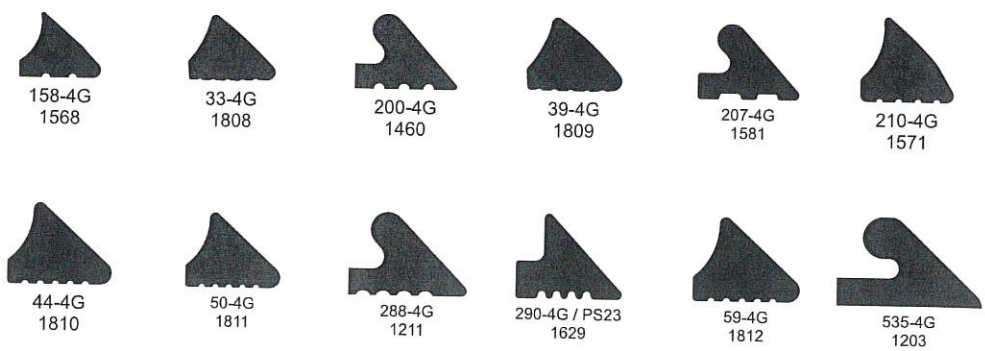
TYPE 4G & 4F PROFILE
SELECTION GUIDE

FOR SINGLE-STEP PIPE AND MANHOLE JOINTS

Available for Concrete Pipe, Manholes and Box Culverts.





Gasket Type	Gasket Height (Inch)	Gasket Height (mm)	Typ. Annular Space (Inch)	Typ. Annular Space (mm)
158-4G	.608	15.4 mm	.326	8.3 mm
33-4G	.610	15.5 mm	.326	8.3 mm
39-4G	.685	17.4 mm	.380	9.6 mm
200-4G	.700	17.8 mm	.400	10.2 mm
207-4G	.818	20.8 mm	.446	11.3 mm
210-4G	.826	21.0 mm	.446	11.3 mm
44-4G	.732	18.6 mm	.446	11.3 mm
50-4G	.799	20.3 mm	.500	12.7 mm
288-4G	.908	23.1 mm	.500	12.7 mm
290-4F (PS-23)	.918	23.3 mm	.500	12.7 mm
59-4G	.890	22.6 mm	.600	15.2 mm
535-4G	.970	24.6 mm	.525	13.3 mm
1016-4G	1.040	26.4 mm	.640	16.3 mm

Phone: 800-348-7325
Fax: (260) 436-1908

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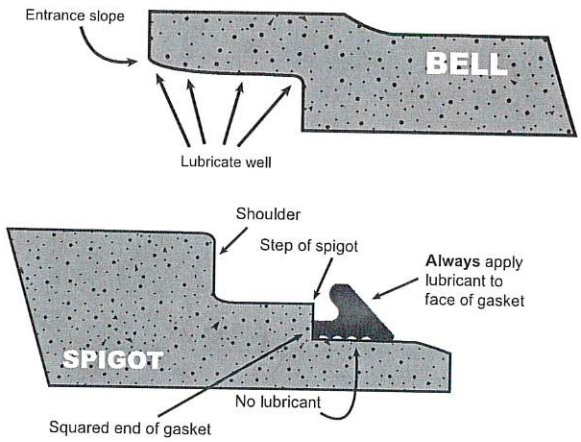
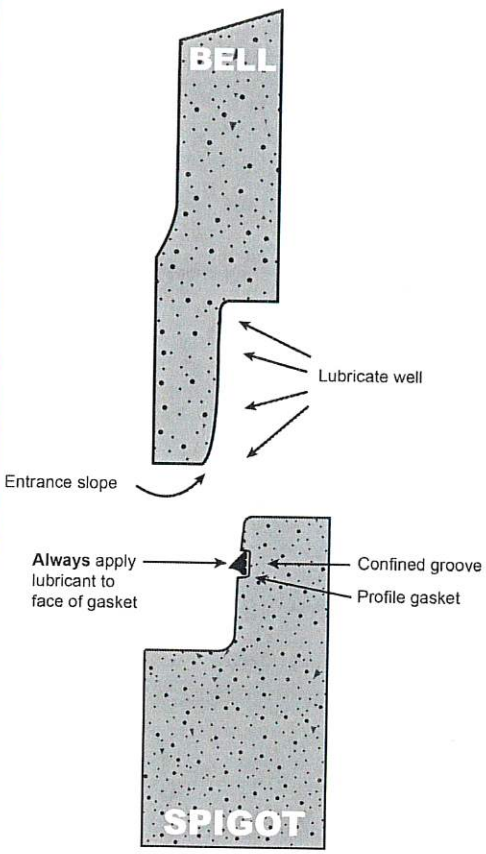
Email: sales @press-seal.com
Web: www.press-seal.com

TYPE 4G & 4F
INSTALLATION INSTRUCTIONS

PIPE INSTALLATION



MANHOLE INSTALLATION



Type 4G and 4F gaskets manufactured by Press-Seal Corporation have proved to be one of the most reliable gasket systems ever developed for concrete pipe. It is easy to ensure the best performance of the 4G and 4F gaskets by following these simple installation steps.

1. The pipe should be handled with extreme caution to avoid chipping of the spigots or bell grooves.
2. Check for and remove any loose dirt, debris or foreign material from the inside surface of the bell, spigot and gasket.
3. Stretch the gasket over the spigot end of the pipe and move it back until it is seated against the step of the spigot. Always place squared area of gasket against pipe and step.
4. The gasket should be equalized by inserting a clean round metal object between the gasket and manhole and making at least 1 -1/2 revolutions around the manhole. The gasket can also be equalized by slightly tugging/ pinching the gasket at different points around the manhole.
5. After equalization, ensure the rear of the gasket is seated firmly against the spigot step, around the full circumference of the spigot.
6. Remove all dirt and other foreign matter from the inside surface of the bell. Using Press-Seal lubricant formulated especially for concrete pipe, lubricate the entire bell area of the joint. Be sure to coat the entrance slope of the bell thoroughly with lubricant. It is important that the gasket grips the spigot during installation, so that it is not displaced from the step.
7. Carefully align pipe sections squarely and bring home slowly, so that the gasket makes contact with the bell entrance slope evenly around the entire pipe joint.
8. Complete installation by following pipe manufacturer's recommended bedding and backfilling practices.

Phone: 800-348-7325
Fax: (260) 436-1908

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Protecting Our Planet's Clean Water Supply
ISO 9001: Registered • Version 11.20.20.1044

Email: sales @press-seal.com
Web: www.press-seal.com

NICKEL-GRAF™

Nickel and Graphite Based Anti-Seize Compound

www.antiseize.com

Product Description

Nickel-Graf™ is used wherever extreme service conditions exist. It is a premium quality Anti-Seize Compound and lubricant designed especially for maximum resistance to the most corrosive and extreme temperature environments. Performs to temperatures of 2,600ºF (1,426ºC).
Nickel-Graf™ is composed of pure colloidal nickel and high purity graphite flakes dispensed in a superior high-performance petroleum carrier enhanced with the latest rust, corrosion and Extreme Pressure Additives. It does not contain any copper, lead, or molybdenum disulfide.
Nickel-Graf™ will not poison catalyst beds, reaction chambers, or special alloy fittings and can be used with anhydrous ammonia, acetylene, and other vinyl monomers. Meets the Performance Requirements of MIL-PRF-907E.

Features & Benefits

- Offers maximum protection from acids, caustics, corrosive chemicals and extreme heat
- Eliminates galling and cold welding
- Reduces friction and lowers torque
- Provides a nickel plating as a barrier between metal surfaces
- Protects against corrosion and oxidation
- Speeds assembly and disassembly

Applications include

All Nuts and Bolts, Bushings, Centers, Cam Rollers, Conveyors, Couplings, Dies, Drills, Fittings, Flanges, Gears, Keyways, Motors, Press Fits, Pumps, Shafts, Sleeves, Slides, Spark Plugs, Taps, Valves, Wristpins, and more.

Service Recommendations

-300˚ to 2600˚F (-184˚ to 1426˚C)
Not suitable for use with oxygen or concentrated chlorine

Clean up

Skin Contact: Under normal usage - removal from skin with soap and water.
Equipment: Mineral Spirit type solvents work best.

Shelf Life

Nickel Graf™ has a shelf life of 5 year or more when stored in a closed container. Shelf life may be much longer depending upon storage location and conditions. Store with container tightly sealed in a cool dry place for optimum shelf life. If slight separation occurs, stir product.
.

Product Limited Warranty

This information is based on information we believe to be reliable and accurate, but no guarantee of its accuracy is made for a particular application. We urge and recommend that Users pretest their application prior to incorporating the product into use and assume that the User will conduct such testing. Also see warranty statement on website.

Typical Properties

Property	Value
Specific Gravity	1.20
Weight per gallon	10.0 LB
Penetration, D217-60T, 100-3000 Strokes	320 - 350
Oil Separation, 30 hr. at 158˚F	1%
Flash point, ASTM D-92-85 (IP 36/65)	350˚F
Color	Nickel
Friction Coefficient	0.096
Torque Coefficient "nut factor"	K Values 0.15 ± 0.02. Testing is required to determine the exact K values & specific performance on any individual fastener using the desired anti-seize compound.
Homogeneity	Will not settle, harden or separate under normal conditions.
Solid Lubricants Nickel Graphite	38%
Carrier plus Additive	62%
RoHS 3	Compliant

Cautions

Read all information on labels and Safety Data Sheets prior to use. All products should be tested & evaluated for a particular purpose prior to use. See Warranty Statement in our Catalog or on our Website. Not for use on Oxygen systems. **:**

WARNING: This product can expose you to Nickel which is known to the State of California to cause cancer. For more information go to www.P65warnings.ca.gov

GHS compliant

This product requires GHS pictograms on labels. Refer to Label and SDS for GHS information:

Available In:

Size: 2oz BT 3oz tube 5ozBT 8oz BT 8oz tube 12.5oz Aer
P/N: 13002 13003 13005 13008 13008T 13014
15oz cart :13015

Size 1# cn 1# BT 2-1/2#cn 8# cn 42# pail 130#drum 500#drum
P/N: 13016 13018 13025 13030 13050 13130 13425

SLICKON Bolt Dip & Brush Applicator, 8 oz Refill Tube
P/N: 13338 13008T

BT=Brush Top, Aer= Aerosol can, Cart= Cartridge

ANTI-SEIZE TECHNOLOGY
2345 N. 17th AVE. • FRANKLIN PARK, IL 60131–3432
847-455-2300 • www.antiseize.com

ADEKA P-201

Technical Product Data Sheet

OCM

GENERAL DESCRIPTION

ADEKA ULTRASEAL® P-201 is a water-swelling, single component, elastic sealant. P201 is packaged in 320 ml (10.8 oz) cartridges or in 3.17 gallon bulk pails.

WATERSTOP FOR:

- Cold/construction/control joints
- Expanded metal forms
- Piping penetrations
- Crack / joint repair
- Sheet pile interlock sealant
- Precast segment sealant
  - Utility vaults
  - Manholes
  - Tunnels
  - Riser rings

P-201 is used as a waterstop in new construction and in repair applications. It can be placed on damp or uneven surfaces and functions in a wide range of temperatures and ground water conditions water.

TYPICAL USES

P-201 will expand up to 2 times (100%) by volume in the presence of water. It will expand in the direction of least resistance. When expansion is inhibited, the product will produce expansion pressure against the resisting substance. This expansion pressure will effectively seal off water penetration. The amount of concrete coverage required depends on bead size. The coverage may range from 2" (¼" bead) to 4" inside a double mat of rebar (½" bead). Bead size also determines hydrostatic head resistance

P-201 (3/16 x 3/4)	50 ft.	21.8	0.15
P-201 (3/8 x 3/4)	150 ft.	72.5	0.50

OCM, Inc.
1120 Peterson Road, Grayslake, IL 60030
Toll Free: 866-457-5710 • Phone: 847-462-4258
FAX: 847-462-4259
www.adeka.com • www.ocm-inc.com
sales@ocm-inc.com

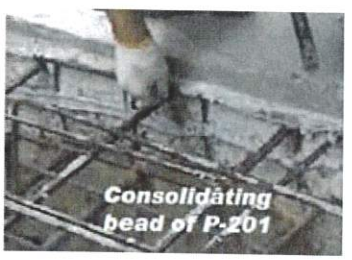
PRODUCT DESCRIPTION	
Single component hydrophilic grey paste	
Packaging	24 Cartridges per Case, 320 ml (10.8 oz) per Cartridge OR 3.17 Gallon Bulk Pails—Special Order
PROPERTIES	
Expansion Information by Volume	Approximately 100% (2 Times by Volume)
HYDROPHILIC WATERSTOP IN A CARTRIDGE One of the most versatile Adeka products.	

STAND ALONE WATERSTOP

Use in below grade cast-in-place concrete joints. P201 can replace conventional waterstop in nonmoving joints.

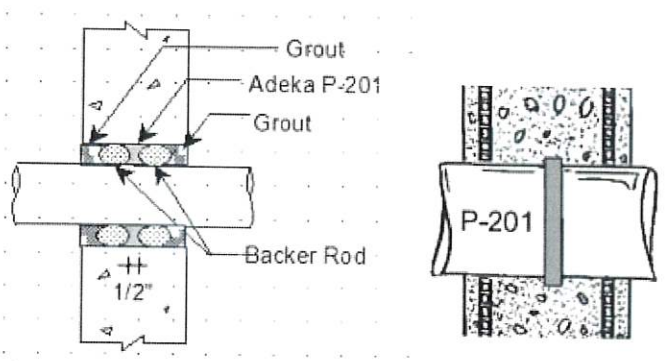
CAVEAT: P-201 must cure before placing second concrete. Curing time varies by bead size, temperature and humidity. Place concrete without displacing or deforming the bead of P-201.


Applying bead of P-201


Consolidating bead of P-201

PIPE PENETRATIONS

ADEKA ULTRASEAL® P-201 is an excellent product to seal CIP pipe penetrations or in "block out" pipe penetrations. Check www.adeka.com for details concerning annular spaces greater than 2".



PIPE PENETRATION WITH SMALL ANNULAR SPACE

ADEKA ULTRASEAL ® P-201

EXPANDED METAL WATERSTOP

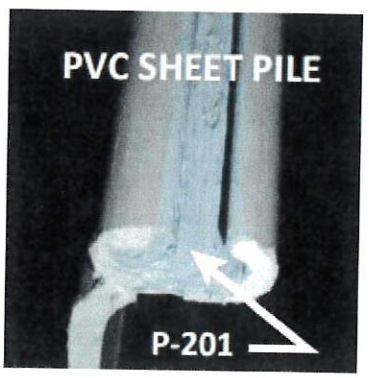
Use to waterproof expanded metal (stay in place) forms. Allow curing time before placing second concrete.

PRECAST SEGMENTS

Excellent product to seal joints between precast segments. Use on box culverts, manhole, utility vaults, riser rings and many other precast units. Apply bead of P-201 and place second segment before P-201 cures.

SEALING SHEET PILE INTERLOCKS

Use P-201 to seal PVC and AZ sheet pile interlocks.



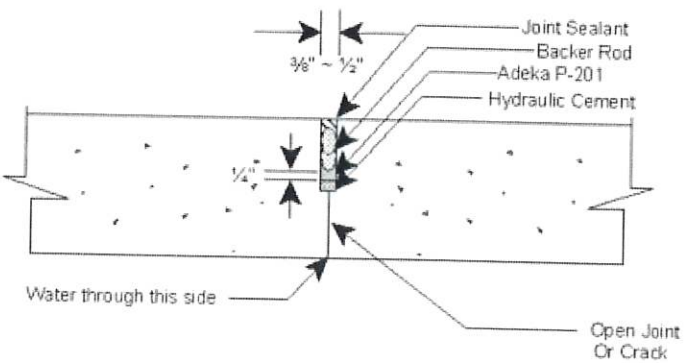
OTHER USES FOR P-201

Use to fill in rough areas when using Adeka strip products.

Apply on PVC waterstop weld seams.

Waterstop H-Piles

Waterstop Open Joints/Cracks



NOTE: The information contained herein is based on our present state of knowledge and is intended to provide general notes on Adeka Waterstops and their use. Any recommendations or suggestions, which may be made, are without guarantee, since the conditions of use are beyond our control. Furthermore, nothing contained in this publication shall be construed as a recommendation for any use that may infringe patent rights. Readers are cautioned to satisfy themselves as to the suitability of such goods for the purposes intended prior to use.

P.O. Box 2073
Bellaire, TX 77402-2073
713-672-9999
Email: ross@robinsonpipe.net

March 21, 2023

ACT Pipe & Supply
6950 West Sam Houston Pkwy
Houston, TX 77041

Re:

Attn:

This letter is to certify the specification for the following carbon steel casing being quoted to you by Robinson Pipe & Supply, Inc. The casing will be an ASTM A-252 Grade 2 which should be the equivalent or better grade than AWWA C200 or A-139 and will meet or exceed the specifications of AWWA C200 or A-139. This should provide a minimum psi yield of 36,000 and a tensile of 60,000 non-hydro. In addition, all material furnished will have a minimum wall thickness as shown below. If you need further assistance, please feel free to call me.

20” X .375 WALL CASING

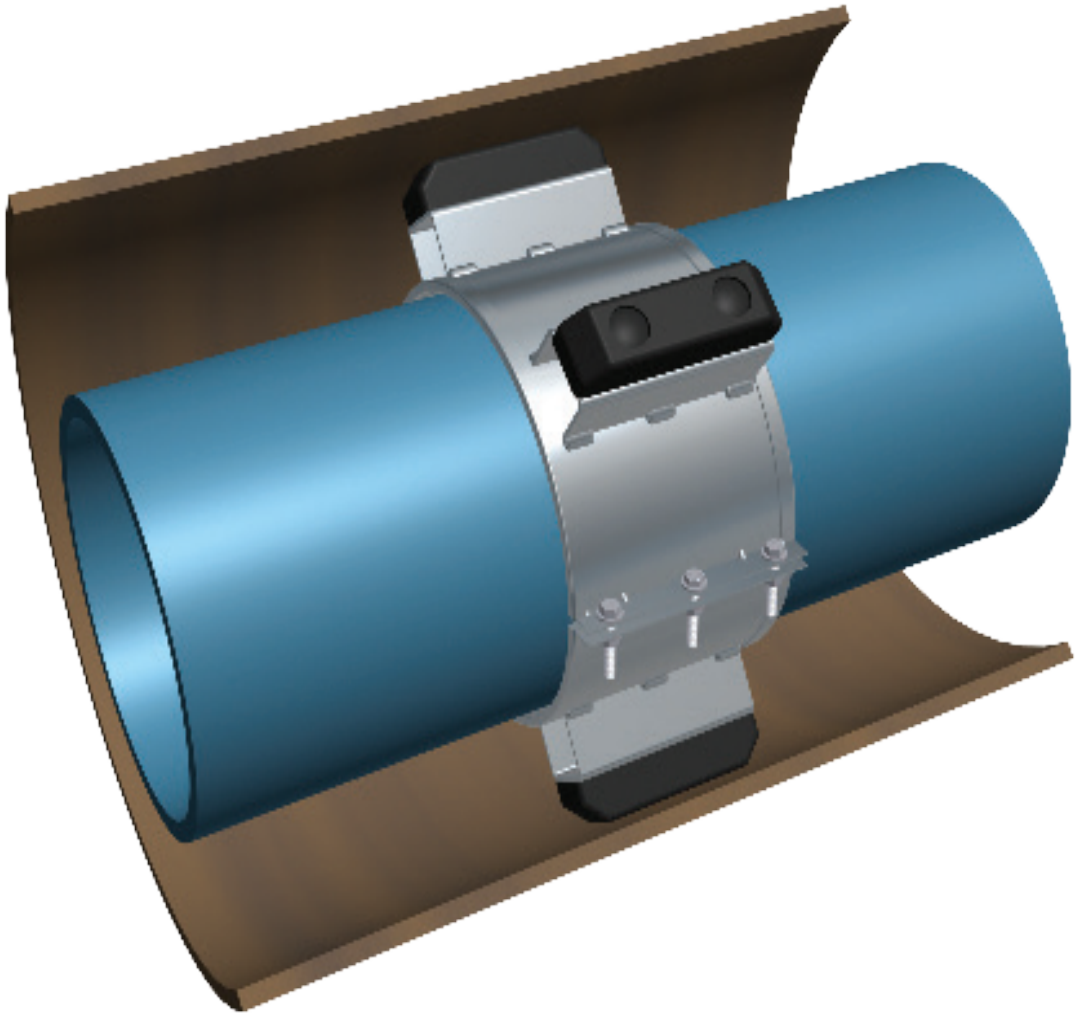
Best Regards,

Ross Robinson

Your specialist in Line Pipe, Casing, Tubing, & Supplies

Physical address: 915 McCarty Dr. Houston, TX 77029
Phone: 713-672-9999

Casing Spacers
& End Seals

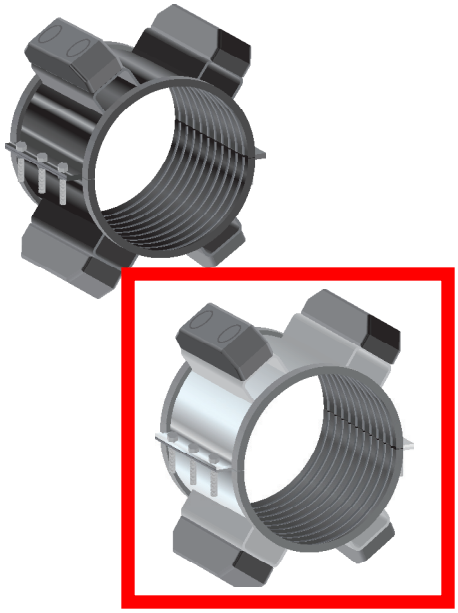


CCI Piping Systems
Pipe Protection Products

ccipipe.com • 800.867.2772

Casing Spacers & End Seals

Carbon Steel & Stainless Steel Spacers



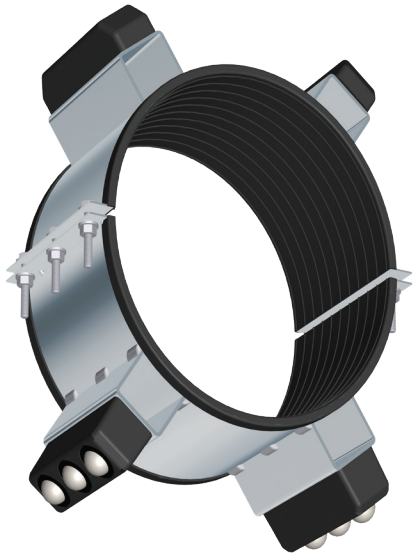
- Heavy duty two-piece T304 Stainless Steel or Carbon Steel Spacers with durable glass filled polymer runners
- Available in 8” and 12” widths (Recommend 8’’ widths through 36'' carrier pipe sizes)
- Fast and easy installation on various carrier pipe types within cased crossing applications
- Spacers are lined with ribbed PVC extrusion to prevent electrical contact between the carrier pipe and the metallic spacer.
- Carbon Steel Spacers are fabricated from pickled and oiled steel and then coated with a *fusion bonded copolymer based thermoplastic* for superior abrasion resistance and corrosion protection
- Spacers for bell & spigot joints, or large diameter applications, are designed and fabricated to ensure an extra margin of support
- CCI Piping Systems has the experience to design and manufacture virtually any configuration of casing spacer, including on-grade applications and multi-carrier clusters within a single casing.

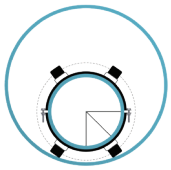
OmniRoller Spacers

The **NEW** CCI OmniRoller Casing Spacers are supplied with a patented runner equipped with an innovative multidirectional assembly designed for the following:

- Maintain cathodic protection between the carrier pipe and casing pipe to prevent premature corrosion
- Reduce the coefficient of friction within the casing pipe for ease of installation
- Allow for longer installations while maintaining the desired grade
- Prevent the carrier pipe from spiraling within the casing pipe during installation, unlike unidirectional rollers

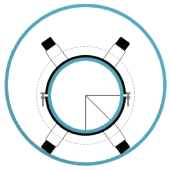
The CCI OmniRoller Casing Spacers are manufactured with an 8” wide Coated Carbon Steel or Stainless Steel shell for nominal carrier pipe sizes ranging from 4” to 24”. Each OmniRoller runner can be supplied with up to 3 multidirectional assemblies depending on the carrier pipe type and application.





CLEAR BELL

CENTERED



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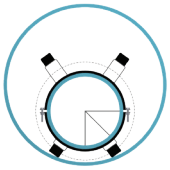
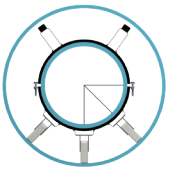
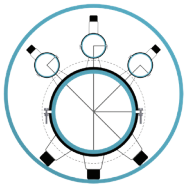


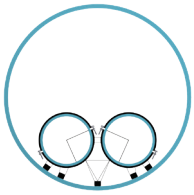
RESTRAINED



CASTER WHEEL



CLUSTERED
(PIGGY-BACK)



CLUSTERED
(SIDE-BY-SIDE)

Ordering Information

To place an order, refer to the Standard Ordering Options and provide the following:

1. Casing Spacer Material:
   - Choose from available options
2. Carrier Pipe Size:
   - Actual Barrel O.D. and Bell O.D.
   - Carrier Pipe Types (e.g. C900, C905, Ductile Iron, SDR35, HDPE, CMLC, etc)
   - Laying Length
3. Casing Pipe Size:
   - Actual I.D.
   - Casing Pipe Types (e.g. Smooth Steel, Spiral Welded Steel, Corrugated, Concrete, etc)
   - Laying Length
4. Configuration:
   - Choose from configuration options
5. Special Manufacturing Instructions:
   - Provide any Plan Detail Drawings
   - Provide any Municipal Specifications
   - Provide any Special or Additional Customer Requirements

For Carrier Pipe sizes over 48" nominal and Clustered Casing Spacers, the following additional information is required:

- *Weight per Foot of Carrier Pipe(s)*
- *Backfilling Annulus Once Installation Complete?*

To calculate the number of casing spacers required:

(Bore Length ÷ Carrier Pipe Laying Length)
x
Number of Spacers per Carrier Joint

Note: Round up to the nearest whole number

CCI reserves the right to recommend the number of casing spacers per carrier joint according to application.

CSS8 - 24 36 - CDI - CR - SP

- Special ▸
- Configuration ▸
- Carrier Pipe Type ▸
- Casing Pipe Size ▸
- Carrier Pipe Size ▸
- Casing Spacer Material ▸

Standard Ordering Options *Part Number Designation*
Special Manufacturing Instructions
CB - Clear Bell / **C** - Centered / **CR** - Centered-Restrained / **R** - Restrained / **TC** - True Centered / **GR** - On Grade / **RL** - Roller
Customer to Provide Carrier Pipe Type & Weight per Ft.
Customer to Provide Actual Casing Pipe I.D.
Customer to Provide Actual Carrier Pipe O.D. & Bell O.D.
CSC8 - 8" Wide Carbon Steel / **CSC12** - 12" Wide Carbon Steel
CSS8 - 8" Wide Stainless Steel / **CSS12** - 12" Wide Stainless Steel
CSCI - 8" Wide Carbon Steel Integral Runner
CSSI - 8" Wide Stainless Steel Integral Runner

CSPB 24 - 2.50 - EXT - 2.50 - SP

- Special ▸
- Extension Height ▸
- Extension ▸
- Runner Height ▸
- Carrier Pipe Size ▸
- Casing Spacer Material ▸

Standard Ordering Options *Part Number Designation*
Special Manufacturing Instructions
Height of Runner Extension to Center-Restrain (2.50" Max)
EXT - Used to Center-Restrain Carrier Pipe in Large Annular Spaces
Molded Height of Runner to Provide Required Top Gap
Customer to Provide Actual Carrier Pipe O.D. & Bell O.D.
CSPB - Polyethylene Casing Spacer

WARRANTY

CCI PIPING SYSTEMS warrants all products against defects in material and workmanship for a period of one year from receipt of order. There are no other warranties, expressed or implied. Customer assumes all liability in the handling, use and application of our products.

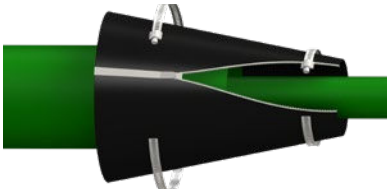
For detailed technical specifications contact CCI at:
ccipipe.com or
800-867-2772

CCI Piping Systems, LLC

1026 O'Neal Drive • Breaux Bridge, LA 70517
ccipipe.com • sales@ccipipe.com
337.332.5808 • 800.867.2772

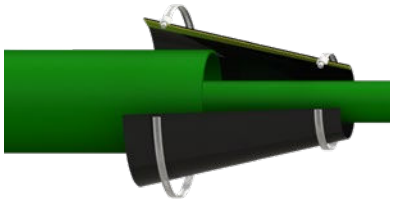
AMCE MOLDED CONE END SEAL

5 different sizes, 4.50”-24.00” OD, covers a range of carriers, closed cone feature - cut off end or use as a cap to keep debris or animals out.



AZ ZIPPER END SEAL

New construction & on existing casings that require modifications or extension. Produced as concentric & eccentric



AW WRAP-AROUND SEAL

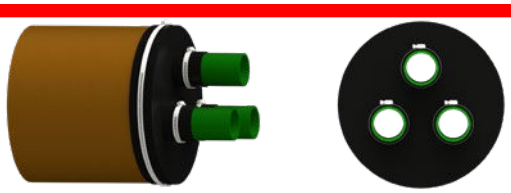
Installed when carrier line is already installed & pull is complete. Produced as concentric & eccentric

AM MOLDED END SEAL

Installed at the time of construction

AC PULL ON SEAL

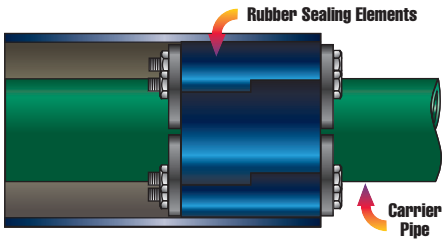
Installed at the time of construction
Produced as concentric & eccentric



APC CLUSTER

Available for multicarrier installations

INNERLYNX® MODEL END SEAL



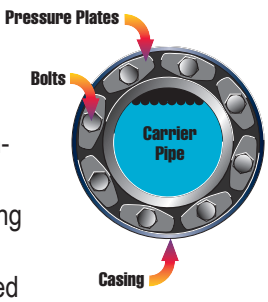
Types of Innerlynx®

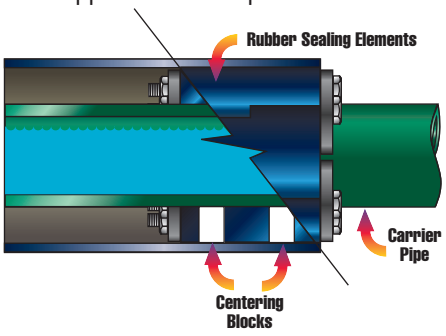
IL-C - Standard pipe Innerlynx® with insulating type plate.

IL-S316 - Pipe Innerlynx® with stain-less steel hardware.

IL-CB - Pipe Innerlynx® with centering block feature.*

IL-O Nitrile - Innerlynx® can be used for fuel applications in airports





*Centering Blocks are plastic reinforcements that assure a penetrating pipe will stay “centered” within its casing and adds extra support against heavy loads from back fill.

All APS End Seals are secured with stainless steel banding straps with a 100% non-magnetic worm gear mechanism to ensure the integrity of the clamp. Only a screwdriver is needed for installation.

APS manufactures full conical shaped end seals in the seamless pull-on, wrap-around, molded, molded cone, zipper and cluster styles. All six are made of 1/8" thick synthetic rubber assuring excellent chemical resistance and resiliency and can accommodate any combination of pipe sizes. APS offers end seals in various materials such as silicone, neoprene, and EPDM. These products outperform the costly and labor intensive brick and mortar method of sealing casing ends. While soil stress and pipe movement cause mortar to crack, the APS end seals move with the pipe insuring the integrity of your seal.

In addition, Innerlynx® form a mechanical seal between pipelines and casing. Innerlynx® form a hydrostatic seal and electrically isolate the carrier pipe from the casing. www Innerlynx ® can be installed by one person and require no special tools.

ORDER INSTRUCTIONS

Please Indicate The Following:
• Project Reference and Location

Metal Insulators
• Model number: SI (steel) or SSI (stainless steel)
• Carrier Pipe O.D. Including Coating Thickness
• O.D. of Bell or Mechanical Joint
• Casing O.D.
• Casing Wall Thickness
• Type or Size of Runner
• Height and Width of Runner
• Configuration: Clear Bell, Centered, Centered and Restrained, or Non-centered and Restrained

Plastic Insulators
• Carrier Pipe O.D. Including Coating Thickness
• O.D. of Bell or Mechanical Joint
• Casing O.D.
• Casing Wall Thickness
• Configuration: Clear Bell, Centered, Centered and Restrained, or Non-centered and Restrained

End Seals
• Model: AC (pull-on), AW (wrap-around), AZ (zipper), AM (molded), AMCE (molded cone), APC (cluster)
• Carrier Pipe O.D. Including Coating Thickness
• Casing O.D.
• Configuration: Centered or Non-centered

OTHER PRODUCTS AVAILABLE
- Flange Isolating Gasket Kits
- Integra® Series Gaskets
- Kleerband® Flange Band Protectors
- Kleergel® Corrosion Inhibiting Grease
- Radolid® Nut & Bolt Protection Caps
- Bore & Duct Bank Spacers
- Wall Sleeves
- Foreman Nite Caps
- UBolt-Cote® & Atlas Pipe Support® Pads
- IsoJoint® Monolithic Isolating Joints
- Safety Spray Shields

ADVANCE PRODUCTS & SYSTEMS, LLC

PO Box 60399
Lafayette, Louisiana 70596-0399
800-315-6009 • 337-233-6116 • Fax 337-232-3860
E-Mail: sales@apsonline.com • Website: www.apsonline.com

bsi. ISO 9001:2015 Quality Management

BBB ACCREDITED BUSINESS

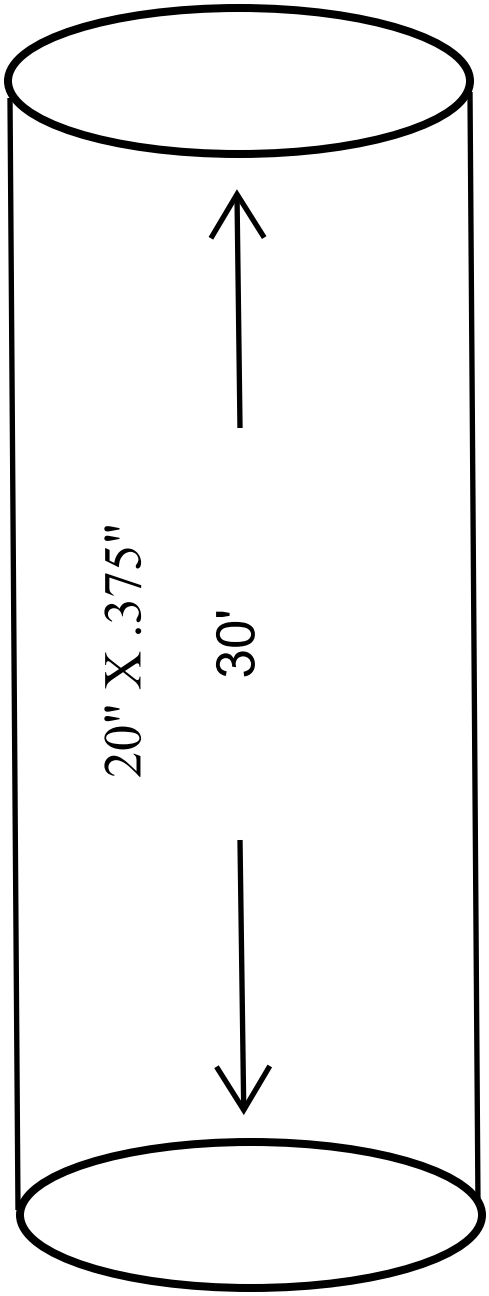
Made in USA

Distributed by:

REV 021924

VOGUES U3
20" OD X .375" WALL
30' Length

Quantity of spacers would be:
8 - 8.40" X 18.30" SPACER MEETING THE 1/2" MINIMUM TOP GAP REQUIREMENT.



CASING SPACER SPECIFICATIONS

MODEL : CSS8-0820-SDR-CR-SP

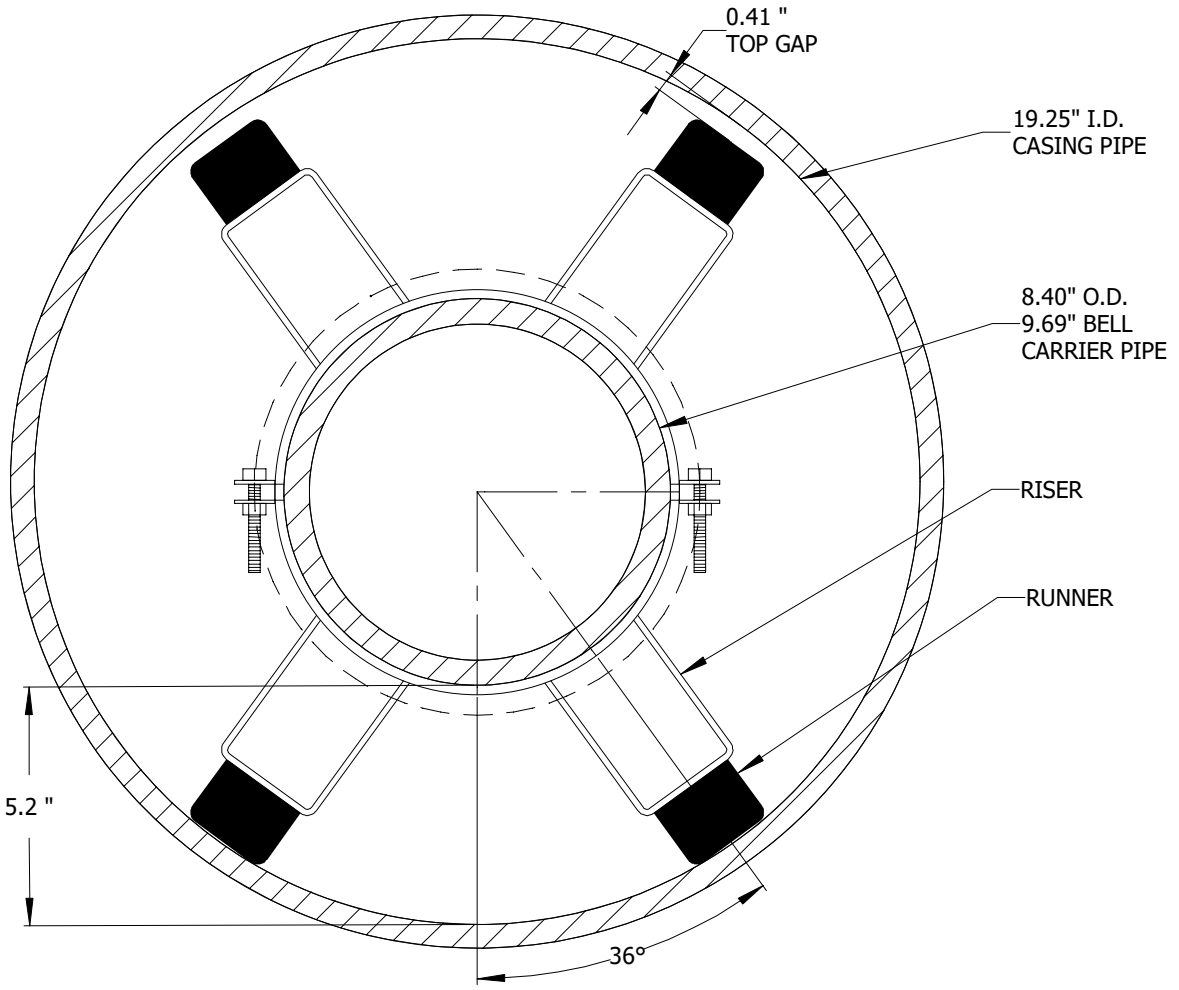
SHELL
8" WIDE
14 GA. (.074") STAINLESS STEEL
2B FINISH
RIBBED FLANGES

LINER
PVC RUBBER .090"-.120" THICK
HARDNESS DUROMETER 'A' 85-90
DIELECTRIC STRENGTH - 1,000 V/mil
WATER ABSORPTION - 1% MAX.

ASSEMBLY HARDWARE
3 SETS PER FLANGE
5/16 - 18UNC X 2" LONG S.S. BOLTS
5/16" S.S. WASHERS SAE 2330
5/16" S.S. HEX NUTS

RUNNER
2.0" WIDE X 1.5" TALL GLASS REINFORCED POLYMER
2 TOP, 2 BOTTOM

RISERS
10 GA. (.134") STAINLESS STEEL
MIG WELDED TO BAND
TOP = 3.50" TALL
BOTTOM = 3.50" TALL

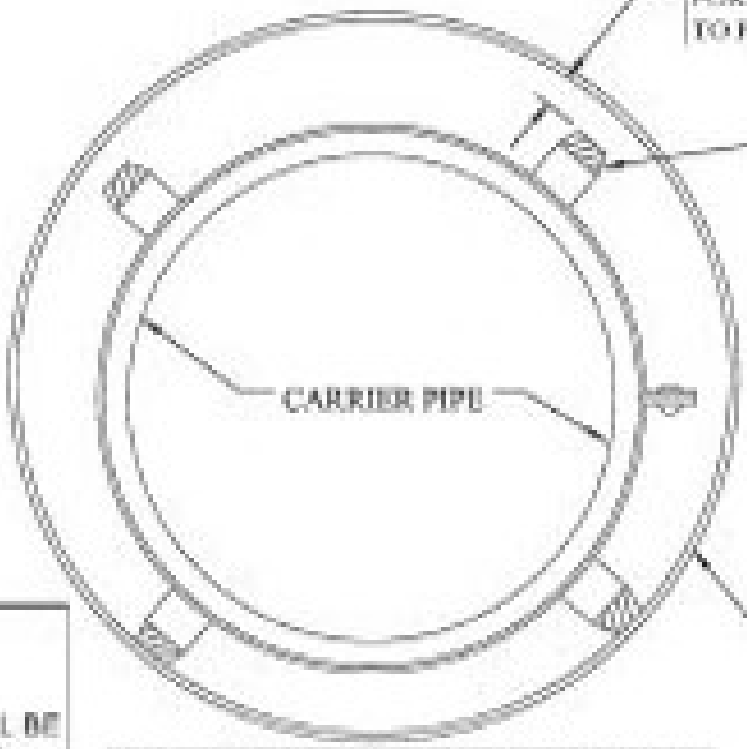


NOTES:
1. RECOMMENDED SPACING BETWEEN CASING SPACERS IS NOT TO EXCEED 8 FT.
2. CASING SPACER DESIGNED PER CUSTOMER REQUEST.
3. CCI IS NOT RESPONSIBLE FOR ANY ISSUES THAT MAY ARISE DURING INSTALLATION.

CCI PIPING SYSTEMS
1026 O'NEAL DRIVE
BREAUX BRIDGE, LA 70517
VOICE 337-332-5808 FAX 337-332-5809
Website: www.ccipipe.com Email: sales@ccipipe.com

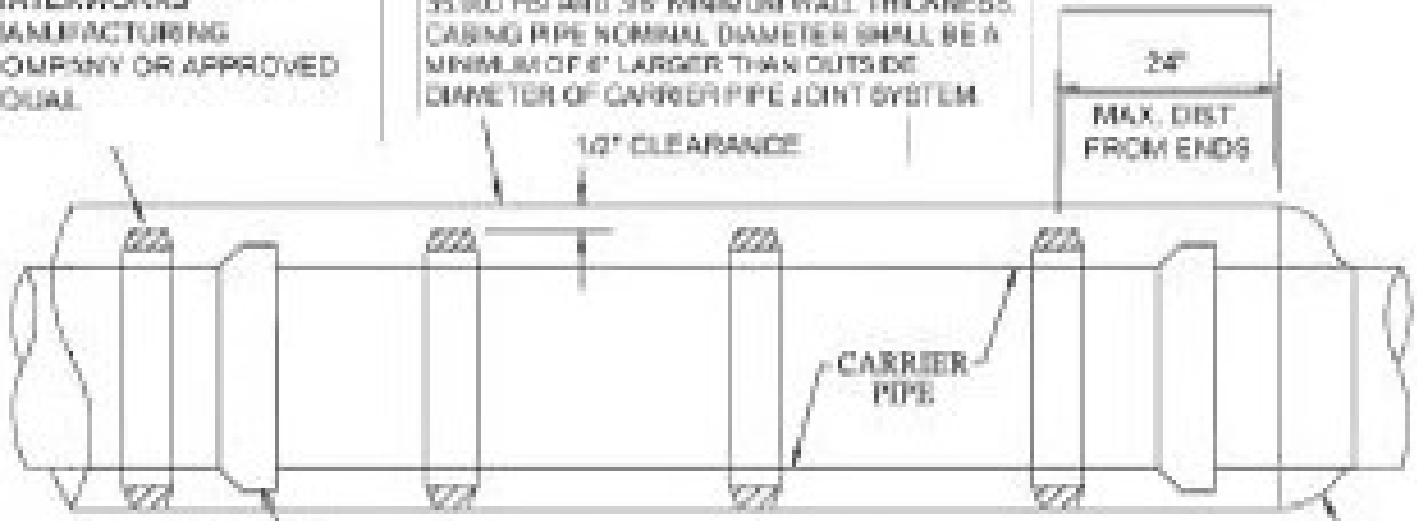
Reference:
Act Pipe

Rev:	Date:	Drawn By:	Checked By:	File Name:
A	26-JUL-24	BL	CW	8X20CR_177.TCW



CASING SPACERS SHALL BE STYLE CCS, CCS-ER, OR CCS-JR BY CASCADE WATERWORKS MANUFACTURING COMPANY OR APPROVED EQUAL

CASING PIPE SHALL BE STRUCTURAL GRADE STEEL WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI AND 3/8" MINIMUM WALL THICKNESS. CASING PIPE NOMINAL DIAMETER SHALL BE A MINIMUM OF 6" LARGER THAN OUTSIDE DIAMETER OF CARRIER PIPE JOINT SYSTEM



CARRIER PIPE SHALL HAVE RESTRAINED JOINTS.

A MINIMUM OF THREE CASING SPACERS ARE REQUIRED PER FULL JOINT OF PIPE. MAXIMUM SPACING 8 FEET (O.C.). INSTALL SPACERS A MAXIMUM OF 2 FEET ON EACH SIDE OF BELLS OR MECHANICAL JOINTS.

CASING END SEALS SHALL BE SEAMLESS RUBBER PULL-ON TYPE WITH STAINLESS STEEL BAND CLAMPS

NOTE:
THE MATERIALS SHOWN APPLY TO JACK AND BORE INSTALLATIONS AND STREAM/RIVER CROSSINGS. OPEN CUT SLEEVING OF SUBDIVISION UTILITIES UNDER STORM SEWER MAY BE C900/905 DR18 CASING (COLOR TO MATCH CARRIER PIPE) AND HDPE SPACERS WITH STAINLESS STEEL HARDWARE. THE CLEARANCES AND DIMENSIONS SHOWN APPLY TO ALL INSTALLATIONS.

Guadalupe-Blanco River Authority

CASING AND SPACERS DETAIL

C. LEWIS

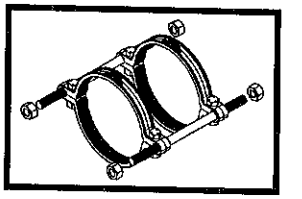
JAN. 08, 2018

THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.

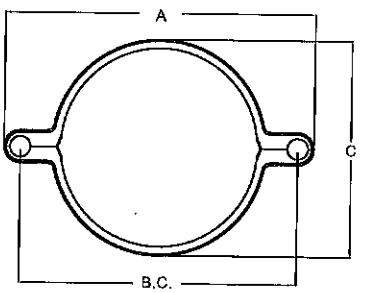
STANDARD NO.

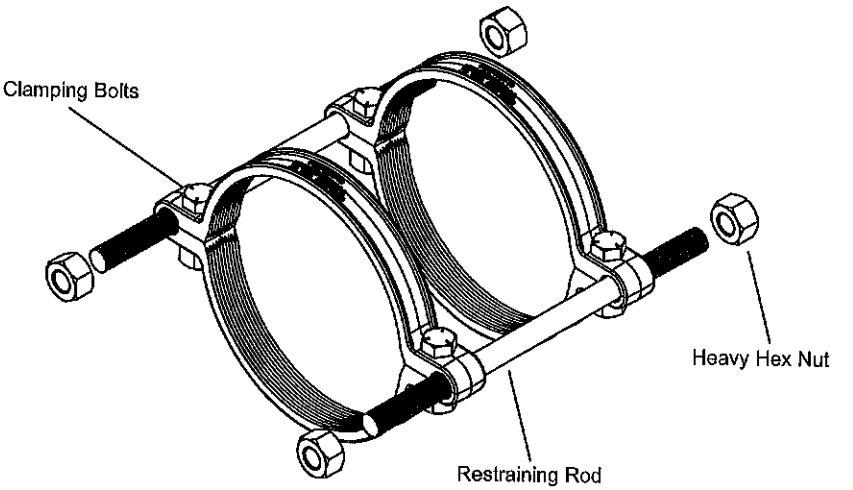
SUBMITTAL INFORMATION

Uni-Flange® Restraint - *(UFR1390-P-x-I style)*



SERIES 1390-P 4" - 12" RESTRAINT HARNESS FOR SEWER PIPE BELL JOINTS





Nom Pipe Size	Sewer Pipe OD Style 1390-P		A	B.C.	C	Restraints Bolts / Rods		Clamping Bolts Per Gland		Approx. Wt. Lbs.	✓ Submitted Items
	OD (in.)	Catalog No.				No.	Size	No.	Size		
4"	4.22	UFR1390-P-4-I	8-57/64"	7-1/2"	4-59/64"	2	3/4" x 17"	2	5/8" x 2-1/4"	9.4	
6"	6.28	UFR1390-P-6-I	10-57/64"	9-1/2"	6-63/64"	2	3/4" x 17"	2	5/8" x 2-1/4"	10.3	
8"	8.40	UFR1390-P-8-I	13-9/64"	11-3/4"	9-3/32"	2	3/4" x 17"	2	5/8" x 2-1/4"	11.3	
10"	10.50	UFR1390-P-10-I	15-23/64"	14"	11-29/64"	2	3/4" x 17"	2	5/8" x 2-1/4"	15.1	
12"	12.50	UFR1390-P-12-I	18"	16-1/4"	13-29/64"	2	3/4" x 17"	2	5/8" x 2-1/4"	17.5	

FEATURES

- Cast ductile iron per ASTM A536 grade 65-45-12, black e-coat
- Clamping bolts and nuts - Grade 5, zinc-plated
- 360° contact and support of the pipe wall
- T-bolts and nuts are high strength, low alloy steel per ASTM A242 and AWWA C111. Optional: stainless steel
- Rated at 50 psi with a 2:1 safety factor

The Ford Meter Box Company, Inc.
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
www.fordmeterbox.com

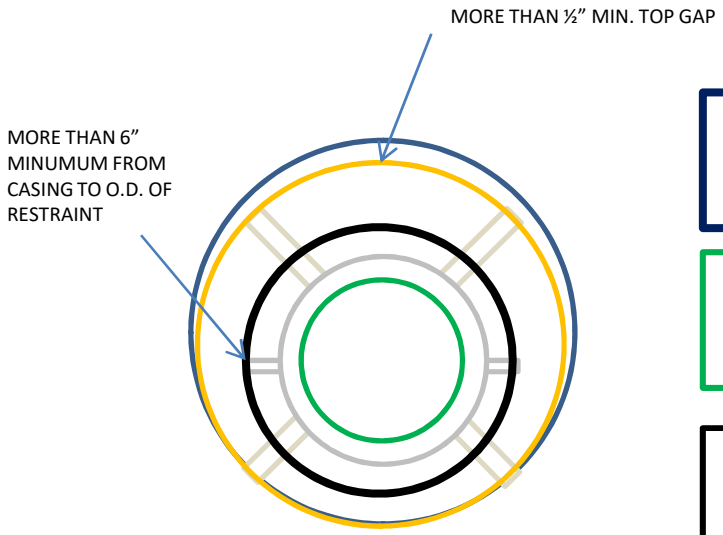
09/01/21

Submitted By:

SCALE: 1:10

18.30” O.D. CASING SPACER HAS A 1.7” DISTANCE FROM THE CASING TO THE MAX O.D. OF THE CASING SPACER MEETING THE ½” MIN. TOP GAP.

MAX O.D. (BEING WIDTH) OF THE UFR1390-P-8-1 IS 13-9/64”, MEETS THE 6” MINUMUM DISTANCE FROM SPACER TO CASING PIPE.



20” CASING PIPE .375 WALL MAX O.D. 20”

8” SDR26 PIPE MAX O.D. 8.40”

8” UFR1390-P-8-1 MAX O.D. 13-9/64”

8” CASING SPACER MAX O.D. 18.30”

PRECAST STRUCTURES & ACC.

UNDERGROUND UTILITY MATERIAL SUPPLIED BY:

ACT PIPE & SUPPLY

4719 DODGE ST

SAN ANTONIO, TX 78217

210-946-6969

Manhole Coating

STANDARD CEMENT MATERIALS, INC.

May 13, 2019

CERTIFICATION APPROVAL

INSTALLER: **DROPTINE UTILITY CONSTRUCTION**
New Braunfels, Texas

This certification is between Standard Cement Materials, Inc. [Manufacturer] and Droptine Utility Construction of New Braunfels, Texas [Installer]. The Manufacturer hereby gives Installer approval as a factory approved installer to use the Standard Lining System© Repair Products and supplemental packaged cement products. The Certification is effective on this day and continues indefinitely or until terminated, if applicable. The manufacturer will provide the Installer a source for consultation during project construction. The products approved are as follows:

1. Reliner MSP®
2. Maximum CA® Plus
3. Geocast® Geopolymer Mortar
4. FS Bench Repair Patcher
5. Custom Plug®

The Installer will follow the Manufacturer's Design Guidelines recommendations for surface preparation, mixing, application, finishing and curing of the cement compositions. The Installer shall use a Sewer Manhole Masters® Repair Trailer or approved equal to rehabilitate sewer manholes, lift station chambers, WWTP structures, pipes or other sewer structures. This certificate remains the property of the manufacturer and may be revoked should the above named firm withdraw, change or vary in any way from the specified application requirements. For details contact:

Mario Tamez Jr.
President
Standard Cement Materials, Inc.
Houston, Texas USA

STANDARD CEMENT MATERIALS, INC.

MAXIMUM CA PLUS CEMENT – 10 YEAR LIMITED WARRANTY

Installer: **Droptine Utility Construction**

This warranty extends to the OWNER of the structure to which Maximum CA Plus Cement is applied, effective as of the OWNER's acceptance of the work: Standard Cement Materials warrants to the OWNER that the Maximum CA Plus Cement product is to be free of defects and made within the product specification tolerances; when installed in compliance with the manufacturer's recommended procedure, will stop active water infiltration, adhere to the existing substrate and protect sanitary wastewater structures from biogenic corrosion caused by exposure to sanitary sewerage environment.

Claims must be filed by the OWNER within 10 years of acceptance of the work by OWNER. Standard Cement Materials obligations hereunder extend only to providing labor and material to replace the defective material. This warranty excludes consequential and incidental damages; including, without limitation, damage to equipment and peripheral facilities, service interruption, and loss of use. This warranty applies to sanitary sewage exposure only. Exposure to effluent chemicals, contaminants from industrial discharge, mechanical abuse, or other maltreatment which is not customary use of the structure will void this limited warranty.

Standard Cement Materials warrants to the INSTALLER of this product that, the product conforms to the specifications set forth in product data sheet. INSTALLER's claims under this warranty must be filed by the INSTALLER within 30 days of use of the product or 6 months of delivery to the INSTALLER, whichever comes first. The INSTALLER is responsible for poor workmanship and improper application techniques. Standard Cement Materials' sole obligation and the sole and exclusive remedy of INSTALLER under this warranty shall be the replacement of any defective product or, at Standard Cement Materials' option, the refund of the purchase price paid by the INSTALLER.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, TO OWNER OR INSTALLER EXCEPT AS PROVIDED IN THIS LIMITED WARRANTY. ALL OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXCLUDED. NO WARRANTY IS GIVEN FOR, OR MAY BE IMPLIED FROM, ANY TECHNICAL ADVICE OR RECOMMENDATIONS PROVIDED BY STANDARD CEMENT MATERIALS.

WARRANTY CLAIM PROCEDURE

Standard Cement Materials reserves the right to inspect and determine whether any claim is the result of a breach of warranty or is related to another cause; all other causes are expressly excluded from warranty coverage. Any claim under this limited warranty requiring an investigation may require laboratory testing. It is the responsibility of any party making a claim to make any product or structure requiring testing accessible and available to Standard Cement Materials within a reasonable period of time after a claim arises. Inspection, including thickness verification and the gathering of specimens for testing may require the removal of a portion of the cement lining in question or, if a structure requiring investigation cannot be made readily accessible, the removal of any frames, covers, or obstructions. At the manufacturer's option, technical investigations and testing may be performed by either Standard Cement Materials internal facilities or by an independent agency. It is the responsibility of the installer to maintain and document product installation and job acceptance reports in accordance with all applicable instructions including, without limitation, the location and date, weather and ambient temperature at time of installation, the quantities installed, the mixing methods, surface preparation procedures used, installation personnel, and existing conditions of the structure including H_2S concentrations and initial surface pH.

Product Manufacturer:

Mario Tamez Jr.

President

Standard Cement Materials, Inc.
Houston, Texas USA

Maximum CA™ Plus Cement

Repair Mortar for Sewer Infrastructure Protection

STANDARD CEMENT MATERIALS, INC©

Product Data Sheet

GENERAL DESCRIPTION

The dry packaged, Maximum CA™ Plus Cement is comprised of 100% pure-fused calcium aluminates with a calcium aluminate aggregate. Additionally, it's designed to withstand hydrogen sulfide induced corrosion and provide abrasion resistance in sewerage workings including manholes; lift station wet wells, concrete pipelines, water clarifier walls and headworks; and other existing structures.

CHARACTERISTICS

The fiber reinforced Maximum CA™ Plus Cement is spray applied at low pressure to produce a protective coating for both new and existing structures within the sewerage system. It provides toughness, durability and corrosion resistance to gases caused by hydrogen sulfide (H_2S), sulfates, salt water, chlorides, water vapor, oils, grease and dilute acids to pH 2-11.

APPLICATIONS

The Maximum CA™ Plus Cement is specially made to meet the requirements of low pH levels found in wastewater structures. Additionally, the cement may be dry gun applied as a protective coating to concrete and masonry surfaces. The thickness ranges from ½ to 4 inches. Please contact us if you are looking for something special.

PROTECTION LEVELS

Corrosion Resistance: composed primarily of pure fused calcium aluminates, the factory blended Maximum CA™ Plus Cement adds beneficial and distinctive properties to concrete including high early strength, controlled setting and hardening, improved workability, low permeability and biogenic corrosion resistance. Additionally, due to its production method, its chemical composition differs significantly from the common Portland calcium silicate hydrate cements. The fused calcium aluminates and aggregates will not corrode or attack the reinforcement steel. In contrast, it restores structural integrity, stops water infiltration and protects against substances such as fats, hydrostatic pressure and water vapor transmission.

Application: wet mixed shotcrete
Aggregate Size: 0-4 mm
Aggregate Density: 3.14 g /cm^3
Working Time at 70˚F: 75 minutes
Porosity: none
Temperature Range/ Thermal: 1150˚C to 2102˚C

CHEMICAL COMPOSITION

Maximum CA™ Plus is made of fused calcium aluminates typically used in a new and existing wastewater construction and rehabilitation applications including sewer manhole renewal.

Table 1 — Chemical Analysis of the Main Constituent

Al_2O_3	CaO	$FeO + Fe_2O_3$	SiO_2
38-40%	37-39%	15-18%	3-7%

TECHNICAL INFORMATION

Property	psi		
Compressive Strength ASTM C 109	24-hr >5,500	7-day >7,000	28-day >8,000
Tensile Strength ASTM C 190	*	*	>550
Flexural Strength ASTM C 293		*	>1,400
Bond Strength/ Slant Shear ASTM C 882			>2,100
Shrinkage at 90% RH ASTM C 596			0.0%
Chloride Permeability AASHTO T 277			<300
Freeze Thaw Durability-300 Cycles ASTM C 666			No Damage
Sulfides Resistance-90 days: 20,000 ppm (sulfuric acid) ASTM C 267			No Weight Loss
Applied Density (28 days)			135

*Test Results-obtained by an independent laboratory.

MIXING

Mix with clean, potable water to a uniform consistency. Do not add Portland cement or use any other admixtures with this product. The cement is stocked in a 50-lb plastic lined bag.

EQUIPMENT

The manufacturer or the certified [approved] applicator shall apply the cement using a **SEWER MANHOLE MASTERS™ REPAIR TRAILER** or approved equipment. The pump equipment must supply low pressure at 350-psi and 11 cfm at the nozzle.

PLACEMENT

Place immediately using a wet applied shotcrete method. Trail batches are always recommended. Follow ACI 302 "GUIDE FOR CONCRETE FLOORS AND SLAB CONSTRUCTION" and ACI 308 "STANDARD PRACTICE FOR CURING CONCRETE" to avoid potential problems due to shrinkage cracking.

CURING

Follow ACI 302, 308, 305 and hot weather concrete placement practices to minimize problems caused by decreased bleeding. Protect the cement mortar from hot weather extremes, air movement and dry conditions, and direct exposure to sunlight. Cure immediately as soon as the surface begins to harden, cover with plastic sheets or use an acceptable liquid membrane-forming curing compound per ASTM C 309. The curing compound shall contain a minimum of 25 % solids and prevent a maximum loss of water up to 0.4-kg/m^3 in 72 hours. Apply the curing compound in layers while the cement is still soft. Allow to cure approximately 4 ½ to 24 hours. The ambient temperatures and job conditions will govern specific cases. Normal curing is adequate, but, in some situations such as hot or cold weather, special care is sometimes needed. Therefore, it is important to keep the concrete moist and at a favorable temperature during the early hardening period. Make no application when the ambient temperatures are less than 40ºF or freezing temperature is expected within 24-hour.

SAFETY

Caution: the cement contains fused calcium aluminates—May Cause Eye and Skin Irritation. Clean up with soap and water. Avoid prolong exposure. Wash with water immediately after handling. If skin problems arise, flush with water and get medical help. Keep out of reach of children.

STORAGE

Store the product in a dry cool place.

TECHNICAL SERVICE

Standard Cement Materials Inc provides technical and on-site assistance within 48-hours notice.

WARRANTY INFORMATION

Standard Cement Materials, Inc offers this information for the user's consideration. The corporation warrants this product to be of good quality and performance as specified and is free from material defects within the warranty period. "Failure" will be determined (1) upon inspection of each sanitary sewer application (2) within each specific pH limit (3) maintain its adherence to the existing structure wall. If failure occurs within the specified period, the damage will be repaired to its previous state at no cost to the Owner (or within 30-days after written notification). "Failure" does not include consequential damage resulting from mechanical or chemical maltreatment or act of God. Mechanical or chemical abuse means exposing the cement liner surface to any mechanical force or action taken or chemical substance not customarily used in connection with normal wear and typical use of the structure. Report all product failures within one year from the application date. The manufacturer's liability and sole obligation and the Buyer's single remedy in connection with the product shall be limited, at its option, to either replacement of the product not conforming to this warranty only or credit to Buyer's account in the amount of the invoiced product. Standard Cement Materials Inc reserves the right to determine whether any claim is specifically related to another cause. The corporation makes no other warranties, either expressed or implied and in no event intends to infringe on any established patents or trademarks.

Standard Cement Materials, Inc.
Houston, TX 77092
Telephone: 1-888 278-1337 – Fax: (713) 680-1017
email: support@standardcement.com

TEC Services
Testing • Engineering • Consulting

May 7, 2019

Mr. Mario Tamez Jr.
Standard Cement Materials
5710 W. 34th Street, Suite A
Houston, TX 77092

Phone: 713-680-0482
Email: mtamez@standardcement.com

Subject: **Report of Results for Product Testing**
Product Name: CA Plus
TEC Services Project #: 17-1402
TEC Laboratory #: 19-236

Dear Mr. Tamez:

Testing, Engineering and Consulting Services, Inc. (TEC Services) is an AASTHO R18, ANS/ISO/IEC 17025:2005 and Army Corp of Engineers accredited laboratory. TEC Services is pleased to present this report of our test results on the submitted concrete repair product designated as "CA Plus". Our services were performed in accordance with the terms and conditions of our Service Agreement TEC-PRO-17-1402. The test results presented only pertain to the samples tested.

The CA Plus material was delivered to our Lawrenceville, GA facility on February 22, 2019. The mixing procedures were performed in accordance with the manufacture's recommendations. Mix proportions, reported in Table 1. A summary of the test results is reported in Table 2.

At the request of Standard Cement Materials, testing was performed in accordance with the following standards:

- ASTM C109-16a *Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)*
- ASTM C190 *Standard Method of Test for Tensile Strength of Hydraulic Cement Mortars*
- ASTM C293-16 *Standard Test Method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading)*
- ASTM C882-13a *Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear*

Table 1 – Mix Proportions

Material	CA Plus
Dry Material (lbs)	25
Water (lbs)	3.4
Water/Material Ratio	0.137
Mixing Time	3 minutes
Air Temperature (°F)	73
Humidity (%)	60

Table 2 – Summary of Test Results for CA Plus Product Testing

Test Method	Test Property	Test Age	Average Test Result
ASTM C109	Compressive Strength (psi)	1 Day	**7,160**
		7 Days	**8,030**
		28 Days	**8,740**
ASTM C190	Tensile Strength (psi)	28 Days	**580**
ASTM C293	Flexural Strength (psi)	28 Days	**1,450**
ASTM C882	Slant Shear Bond Strength (psi)	28 Days	**2,140**

We appreciate the opportunity to provide our services to you on this project. Should you have any questions or comments regarding this report, please feel free to contact us.

Sincerely,

TESTING, ENGINEERING AND CONSULTING SERVICES, INC.

Dean T. Roosa
Project Manager

Shawn P. McCormick
Laboratory Principal

SHEP CURE 309 REZ-ALL

RESIN-BASED, WATER EMULSION CONCRETE CURING COMPOUND

MasterFormat:
03 39 23
Revised:
05/14

DESCRIPTION

The SHEP CURE 309 REZ-ALL series of water-based concrete curing compounds is formulated from hydrocarbon resins and may be used on interior, exterior, vertical, and horizontal concrete surfaces. Once applied, SHEP CURE 309 REZ-ALL forms a premium-grade membrane that retains an optimum amount of water in freshly placed concrete for complete hydration of the cement. **NOTE:** After approximately four weeks, the membrane begins to chemically break down when exposed to UV rays. The membrane will eventually dissipate from the surface. This process is sped up by exposure to traffic and UV light, as well as weathering conditions.

USES

The SHEP CURE 309 REZ-ALL series has been used on both interior and exterior applications where paint, resilient tile, or resilient flooring may be applied later. Because of the wide variety of coatings, paints, adhesives, and toppings available, contact the manufacturer of the flooring system or subsequent coating or topping for application approval over resin-based curing compounds. A small test application is always recommended.

FEATURES & BENEFITS

- When properly applied, SHEP CURE 309 REZ-ALL produces a premium-grade film, which optimizes water retention.
- Furnished as a ready-to-use, true water-based compound.
- Produces hard, dense concrete, minimizes hair checking, thermal cracking, dusting, and other defects.
- Offers a compressive strength significantly greater than improperly cured or uncured concrete.
- Increases tensile strength for greater resistance to cracking and surface crazing.
- Improves resistance to abrasion and the corrosive actions of salts and chemicals.
- Minimizes excessive shrinkage.
- Can be applied quickly and easily with conventional commercial spray equipment.
- Formulations also available with red fugitive dye added.
- VOC-compliant.

PACKAGING

5 Gallon (18.93 L) Pails
55 Gallon (208.20 L) Drums

COVERAGE

Approximately 200 ft.²/gal. (4.91 m²/L). Coverage rate may vary depending on conditions (temperature, wind, etc.) at the jobsite, as well as the porosity and condition of the concrete.

SHELF LIFE

When stored indoors and in original, unopened containers at temperatures between 40 - 90°F (4 - 32°C), shelf life is one year from date of manufacture.

SPECIFICATIONS

- AASHTO M 148, Type 1, Classes A & B (Type 1-D also available)
- ASTM C 309, Type 1, Classes A & B (Type 1-D also available)
- Complies with U.S. EPA, LADCO states, OTC states, SCAQMD, and all other current North American VOC regulations.
- Complies with Canada VOC Concentration Limits for Architectural Coatings Regulations.
- Approved by the Ministry of Transportation, Quebec.

TECHNICAL DATA

VOC Content: 113 g/L

APPLICATION

Surface Preparation: Application equipment must be clean and free of all previously used materials.

Mixing: For optimum performance, gentle mixing or agitation is recommended. CAUTION: TO AVOID FOAMING, DO NOT MIX EXCESSIVELY. DO NOT THIN.

Application Method: Apply in a uniform film to horizontal surfaces as soon as the surface water disappears and the surface will not be marred by walking workmen. On vertical surfaces, apply promptly after the forms are removed. SHEP CURE 309 REZ-ALL may be applied with a typical commercial hand or power sprayer, such as a Chapin 1949. Use a spray nozzle that produces a flow of 0.5 GPM (1.9 LPM) under 40 psi (.276 MPa) of pressure. Do not allow the spray nozzle to drip.

Drying Time: Typically dries in 1-2 hours, depending on jobsite conditions (temperature, wind, etc.) Restrict foot traffic for at least four hours. Twelve hours is preferable.

Cleanup: Prior to drying, cleanup can be accomplished with soap and water. Once dried, use mineral spirits or other suitable petroleum solvent.

Continued on reverse side

PRECAUTIONS

KEEP FROM FREEZING. Do not apply if air and/or concrete temperature is less than 40°F (4°C). Improper or over-application may increase the amount of time necessary for the film to dissipate from the surface. SURFACE MAY DISCOLOR AND/OR YELLOW DUE TO OVER-APPLICATION. DO NOT MIX OR DILUTE WITH ANY OTHER PRODUCTS OR LIQUIDS. Do not apply paint, resilient flooring or any other subsequent coatings or toppings without first checking the specifications and securing approval from the manufacturer of the product being applied over SHEP CURE 309 REZ-ALL. A small test application is always recommended.

HEALTH AND SAFETY

Direct contact may result in mild irritation. Read and follow all application, precaution, label, and health and safety information prior to use. Refer to Safety Data Sheet for complete health and safety information.

LEED INFORMATION

May help contribute to LEED credits:

- IEQ Credit 4.2: Low-Emitting Materials: Paints and Coatings
- MR Credit 2: Construction Waste Management
- MR Credit 5: Regional Materials

DISCLAIMER

The information contained herein is included for illustrative purposes only, and to the best of our knowledge, is accurate and reliable. We cannot however under any circumstances make any guarantee of results or assume any obligation or liability in connection with the use of this information. As we have no control over the use to which others may put its product, it is recommended that the products be tested to determine if suitable for specific application and/or our information is valid in a particular circumstance. Responsibility remains with the architect or engineer, contractor and owner for the design, application and proper installation of each product. Specifier and user shall determine the suitability of products for specific application and assume all responsibilities in connection therewith.

Manhole Coating

STANDARD CEMENT MATERIALS, INC.

MAXIMUM CA PLUS CEMENT – 10 YEAR LIMITED WARRANTY

Project Name:	All Projects
Project Owner:	Guadalupe-Blanco River Authority
Certified Installer:	Droptine Utility Construction

This warranty extends to the OWNER of the structure to which Maximum CA Plus Cement is applied, effective as of the OWNER's final acceptance of the project: Standard Cement Materials warrants to the OWNER that the Maximum CA Plus Cement product is to be free of defects and made within the product specification tolerances; when installed in compliance with the manufacturer's recommended procedure, will stop active water infiltration, adhere to the existing substrate and protect sanitary wastewater structures from biogenic corrosion caused by exposure to sanitary sewerage environment.

Claims must be filed by the OWNER within 10 years of OWNER'S final acceptance of the project. Standard Cement Materials obligations hereunder extend only to providing labor and material to replace the defective material. This warranty excludes consequential and incidental damages; including, without limitation, damage to equipment and peripheral facilities, service interruption, and loss of use. This warranty applies to sanitary sewage exposure only. Exposure to effluent chemicals, contaminants from industrial discharge, mechanical abuse, or other maltreatment which is not customary use of the structure will void this limited warranty.

It is understood that some areas of delamination within the coating system may exist and will be inspected and may be remedied at the time of installation. At the discretion of the manufacturer and/or certified installer, some areas of delamination may be considered not to be detrimental to the coating system and will remain in-place and will be covered under this warranty. Repairing the delamination is a destructive repair method, often causing more delamination of the coating system. Therefore, only areas of delamination that are deemed detrimental to the coating system will be removed and replaced.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, TO OWNER EXCEPT AS PROVIDED IN THIS LIMITED WARRANTY. ALL OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXCLUDED. NO WARRANTY IS GIVEN FOR, OR MAY BE IMPLIED FROM, ANY TECHNICAL ADVICE OR RECOMMENDATIONS PROVIDED BY STANDARD CEMENT MATERIALS.

WARRANTY CLAIM PROCEDURE

Standard Cement Materials reserves the right to inspect and determine whether any claim is the result of a breach of warranty or is related to another cause; all other causes are expressly excluded from warranty coverage. Any claim under this limited warranty requiring an investigation may require laboratory testing. It is the responsibility of any party making a claim to make any product or structure requiring testing accessible and available to Standard Cement Materials within a reasonable period of time after a claim arises. Inspection, including thickness verification and the gathering of specimens for testing may require the removal of a portion of the cement lining in question or, if a structure requiring investigation cannot be made readily accessible, the removal of any frames, covers, or obstructions. At the manufacturer's option, technical investigations and testing may be performed by either Standard Cement Materials internal facilities or by an independent agency. It is the responsibility of the installer to maintain and document product installation and job acceptance reports in accordance with all applicable instructions including, without limitation, the location and date, weather and ambient temperature at time of installation, the quantities installed, the mixing methods, surface preparation procedures used, installation personnel, and existing conditions of the structure including H_2S concentrations and initial surface pH.

Product Manufacturer:

Mario Tamez Jr.

Mario Tamez, Jr.
President

Standard Cement Materials, Inc.
Chappell Hill, Texas USA

NON-SHRINK PRECISION GROUT

PRODUCT NO. 1585-00, -02

DIVISION **3**

03 62 00 Non-Shrink Grouting

PRODUCT DESCRIPTION

QUIKRETE® Non-Shrink Precision Grout is a high-strength, non-metallic, non-shrink grout designed for precision grouting and general construction applications. It can be mixed to a fluid, flowable, or plastic consistency requiring only the addition of clean water.

PRODUCT USE

Typical applications for QUIKRETE® Non-Shrink Precision Grout include grouting of:

- All types of machinery
- Steel columns
- Bearing plates
- Precast concrete
- Other anchoring or void filling conditions that require high strength

The non-shrink characteristics of Non-Shrink Precision Grout make it stable and capable of handling high load transfers.

SIZES

- 50 lb (22.6 kg) bags

YIELD

- Each 50 lb (22.6 kg) bag will yield 0.45 ft^3 (12.7 L) at flowable consistency

TECHNICAL DATA

APPLICABLE STANDARDS

- ASTM C109 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
- ASTM C827 Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures
- ASTM C939 Standard Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method)
- ASTM C1090 Standard Test Method for Measuring Changes in Height of Cylindrical Specimens from Hydraulic-Cement Grout
- ASTM C1107 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
- ASTM C1437 Standard Test Method for Flow of Hydraulic Cement Mortar
- ASTM E488 Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements
- US Army Corps of Engineers (COE) CRD-C 621 Specification for Non-Shrink Grout
- ICRI Guideline No. 310.2R Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair
- ACI 305R Guide to Hot Weather Concreting
- ACI 306R Guide to Cold Weather Concreting

PHYSICAL/CHEMICAL

QUIKRETE® Non-Shrink Precision Grout complies with the physical requirements of ASTM C1107 and CRD 621. Typical results obtained for QUIKRETE® Non-Shrink Precision Grout, when tested at 73.5 ºF ± 3.5 ºF (23.0 ºC ± 2.0 ºC), are shown in Table 2.

INSTALLATION

SURFACE PREPARATION

Wear the appropriate personal protective equipment. All grouting surfaces should be clean and free of foreign substances including corrosion, if present on steel. Remove all spalled areas and areas of unsound concrete. Preparation work done on the grouting surfaces should be completed by high pressure water blast, breaker, hammer, or other appropriate mechanical means to obtain a properly prepared surface. Saturate repair area with clean water before grouting to ensure SSD condition. No standing water should be left in the repair area. Refer to current ICRI Guide 310.2R for additional surface preparation information.

MIXING

WEAR IMPERVIOUS GLOVES, such as nitrile when handling product.

QUIKRETE® Non-Shrink Precision Grout should be mechanically mixed for a minimum of 3 minutes using a 5 gallon (19 L) bucket with a ½ in (13 mm) drill and paddle mixer. For larger applications, a standard mortar mixer may be used. Add only enough water to achieve the preferred consistency listed in Table 2. Add the powder to the water and mix to a lump free consistency. Typical starting water contents can be found in Table 1.

APPLICATION

WEAR IMPERVIOUS GLOVES, such as nitrile when handling product. Place the grout quickly and continuously using proper consolidation techniques when possible (i.e. light rodding, vibrating, tamping, etc.) to eliminate air bubbles.

The typical application depth of QUIKRETE® Non-Shrink Precision Grout is up to 3 inches (75 mm). For applications over 3 inches (75 mm) in depth, it is preferable to extend the product with high quality 3/8 in (9.5

mm) pea gravel, at a rate of approximately 25 pounds (11.3 kg) of gravel per 50 pound (22.6 kg) bag of QUIKRETE® Non-Shrink Precision Grout. For many applications, it may be placed up to 6 inches (150 mm) in depth without the extension. When placing at depths over 3 inches (75 mm) and the surface area is over 2 ft^2 (0.19 m^2), the product should be extended. For all these applications, care should be taken to not overwater, which may cause segregation.

CURING

A damp cure of at least 3 days is necessary to control the non-shrink characteristics and maintain strength levels.

PRECAUTIONS

- Additions of cement or other materials (other than gravel when extended as previously noted) will eliminate the designed product qualities
- Water quantities may be affected by temperature, mixing method and batch size
- QUIKRETE® Non-Shrink Precision Grout should not be re-tempered
- Mix no more grout than can be placed in 25 minutes
- Follow ACI 305R when using product in hot weather
- Follow ACI 306R when using product in cold weather
- Use a consistent water temperature when mixing multiple batches, to prevent performance fluctuations

TABLE 1 TYPICAL WATER DEMAND PER 50 lb (22.6 kg) BAG

Consistency	Volume
Plastic	4-1/2 qt (4.3 L)
Flowable	5 qt (4.7 L)
Fluid	5-1/2 qt (5.2 L)

SAFETY

IMPORTANT: Read Safety Data Sheet carefully before using. **WEAR IMPERVIOUS GLOVES**, such as nitrile, mask, and eye protection.
DANGER: Causes sever skin burns and serious eye damage. Prolonged or repeated inhalation of dust may cause lung damage or cancer.
KEEP OUT OF REACH OF CHILDREN

SHELF LIFE

12 months from date of manufacture as long as the undamaged package is stored in a dry location that is protected from moisture, and out of direct sunlight.

WARRANTY

NOTICE: Obtain the applicable **LIMITED WARRANTY** at www.quikrete.com/product-warranty or send a written request to The Quikrete Companies, LLC, Five Concourse Parkway, Atlanta, GA 30328, USA. Manufactured by or under the authority of The Quikrete Companies, LLC.

TABLE 2 TYPICAL PHYSICAL PROPERTIES AT 73.5 ºF (23 ºC)

Consistency	Plastic
Flow @ 5 Drops, ASTM C1437	100 to 125%
Compressive Strength, ASTM C109 (Modified)	
Age	*PSI (MPa)*
1 day	3500 (24.1)
3 days	9500 (65.5)
7 days	10000 (68.9)
28 days	14000 (96.5)
Height change, ASTM C1090	
@ 1, 3, 7 & 28 days	0.0 to 0.2%
Height change, ASTM C827	0.3%
Consistency	Flowable
Flow @ 5 Drops, ASTM C1437	125 to 145%
Compressive Strength, ASTM C109 (Modified)	
Age	*PSI (MPa)*
1 day	3000 (20.6)
3 days	9000 (62.0)
7 days	9500 (65.0)
28 days	12500 (86.2)
Height change, ASTM C1090	
@ 1, 3, 7 & 28 days	0.0 to 0.2%
Height change, ASTM C827	0.4%
Consistency	Fluid
Flow, ASTM C939	20 to 30 seconds
Compressive Strength, ASTM C109 (Modified)	
Age	*PSI (MPa)*
1 day	2500 (17.2)
3 days	5000 (34.4)
7 days	6000 (41.3)
28 days	8000 (55.1)
Height change, ASTM C1090	
@ 1, 3, 7 & 28 days	0.0 to 0.2%
Height change, ASTM C827	0.6%
Pull-Out Strength, ASTM E488[1]	35000 lbf

[1] 1-1/4 in (32 mm) bolts embedded 9 in (225 mm) deep in 3 in (75 mm) hole in 2000 psi (13.7 MPa) concrete.

CEMEX

Bedding Gravel

TX DOT 421 Grade 4

New Braunfels
2682 Wald Road
New Braunfels, TX 78132

04/04/2024

ASTM #57-1036892

Procedure	Sieve/Test	Average	Unit	TXDOT 4/57 (421-Crs)
	1 1/2" (37.5mm)	100.0	%	100-100
	1" (25mm)	100.0	%	95-100
	3/4" (19mm)	96.7	%	
	1/2" (12.5mm)	44.5	%	25-60
	3/8" (9.5mm)	18.2	%	≥0
	#4 (4.75mm)	4.1	%	0-10
	#8 (2.36mm)	1.3	%	0-5

Name/Title Robert E Latham / QC Manager

TEXAS MATERIALS

A CRH COMPANY

V K Knowlton Const & Utilities

Project: Voges Unit 3
Submittal Name: Voges Unit 3
Date Issued: 05/15/2024

Dear Sir / Madam,

We propose to furnish the following concrete mix/mixes for the above referenced project:

Mix Code Number	Specified Strength		Usage
RA125S00	2500 psi @ 28 Days	-ENCASEMENT	PIPE / MH DROP
RA130S09	3000 psi @ 28 Days	-ENCASEMENT	MH RING
CS3613L	4000 psi @ 28 Days		
RA140S23	4000 psi @ 28 Days		
QA431S12	3000 psi @ 28 Days		
FLOWT1	150 psi @ 28 Days	FLOWFILL	
FMG501	1000 psi @ 28 Days	GROUT	

Please Note: **You must use Mix Code for ordering purposes.**

The above mixes have been proportioned in accordance with the applicable portions of ACI 211 and your request.

The proposed mix designs will meet the stated strengths when test specimens are manufactured and tested in accordance with current ASTM standards and evaluated per ACI recommended standards and practices. Failure to test according to the specifications will negate all warranties. Texas Materials requests copies of all approved mix designs prior to jobsite delivery, failure to return approval prior to the first placement will constitute acceptance of these mix designs. In order to comply with ACI 301 and ASTM C-94 section 4.6 Texas Materials must be included on the distribution list for all concrete test reports at **darrel.davis@texasmaterials.com**. Use of these mixes constitutes release of these test reports to Texas Materials. Texas Materials is not responsible for pop outs. Any additional products added to these mixtures are at the liability of the requester. It is suggested that a pre-pour conference be held at the job site prior to job site delivery. The purpose of the meeting would be to answer any questions regarding responsibilities in scheduling job site operation and any other project issues.

TEXAS MATERIALS
A CRH COMPANY

Beckmann 1
18495 NW Military Hwy
San Antonio, TX 78257

05/15/2024

PLANT	Beckmann 1
MIX CODE	RA125S00 **Mix Code must be used when ordering concrete.**
SPECIFIED STRENGTH	2500 psi @ 28 Days
USAGE	
CLIENT	V K Knowlton Const & Utilities
PROJECT	Voges Unit 3
ENG CODE	COM,LS,1,2500,REG,4,1.5,T1LC25,400

MATERIAL	DESCRIPTION	SPECIFIC GRAVITY	WEIGHT lbs/yd
Cement	Blended Hydraulic Type IL - ASTM C-595	3.1	300
Additive	Fly Ash - ASTM C-618	2.7	100
Aggregate	Coarse Aggregate - ASTM C-33	2.58	1836
	Fine Aggregate - ASTM C-33	2.58	1077
	Fine Aggregate - ASTM C-33	2.63	363
Water	Municipal Water	1	259
Admixture	Water Reducer Mid Range - ASTM C-494	1	
Air	Range: fl oz/100 lb CM		
		Totals	3935 lb

Specified Slump:	4"+/- 1"	Designed Unit Weight:	145.73 lb/ft3
Specified Air:	0-3	Designed W/CM Ratio:	0.65

NOTES:
Texas Materials has no knowledge or authority regarding where this mix is to be placed unless specifically noted therefore it is the responsibility of the project architect/engineer, and or contractor to insure that the above designed mix parameters of compressive strength, water cement ratio, binder content, and air content, are appropriate for the anticipated environmental conditions (i.e. ACI- 301, 318 and the local Building Codes). Chemical admixtures are added in accordance with the manufacturer's recommendations, and may be changed to meet job site demands. These mixture proportions are proprietary, any dissemination without approval is a violation of federal law. Designed mix cementitious content, is stated as a minimum, and Texas Materials reserves the right to increase cementitious content.

W/C Ratio/Strength Relationship- Limestone

Concrete Constituents

Cement	ASTM C-595 Type 1L. S .G. 3.10
Fly Ash	ASTM C-618 CLASS C S.G. 2.70
Coarse Aggregate	ASTM C-33 Limestone #57 S.G. 2.58
Fine Aggregate	ASTM C-33 Manufact Sand S.G. 2.58
Fine Aggregate	ASTM C-33 Natural Sand S.G 2.63
AEA	ASTM C-260 - Entrapped
Admix	ASTM C-494 Type A/D

Mix Data

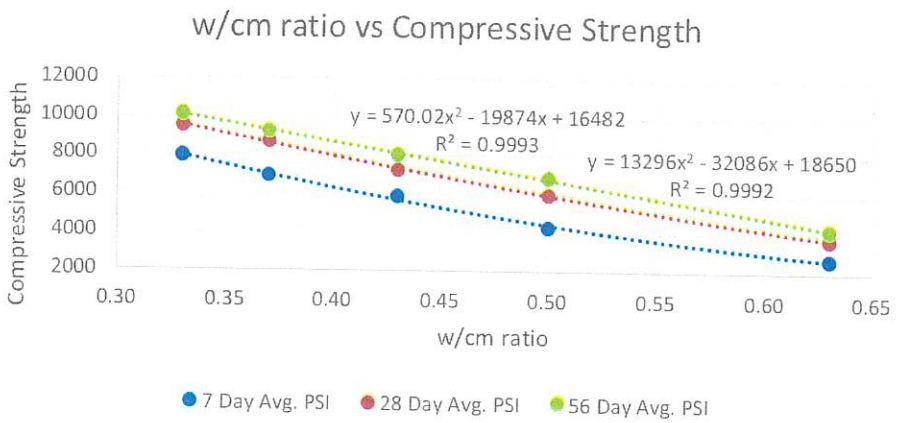
Trial #	1A-71	1A-72	1A-73	1A-74	1A-75
Cement lbs/cy	300	375	450	544	637
Fly Ash lbs/cy	100	125	150	181	213
#57 Rock (ssd) lbs/cy	1839	1809	1781	1723	1711
Man Sand (ssd) lbs/cy	1105	1062	1003	932	853
Natural Sand (ssd) lbs/cy	368	355	335	311	284
AEA oz/cy					
Type A/D oz/cwt	5	4	4	4	5
Water lbs/cy	250	250	258	271	279
w/cm	0.63	0.50	0.43	0.37	0.33

Plastic Properties

Slump inch	5.00	5.00	5.00	5.25	5.00
Air %	1.2	1.5	1.9	1.9	1.8
Unit Wt. Lb/cy	147.8	146.9	148	147.3	147.7
Concrete Temp F.	66	67	74	71	73

Hardened Properties

% Chloride	0.001	0.002	0.002	0.002	0.001
1 Day Avg. PSI	590	1160	1990	2360	3480
2 Day Avg. PSI	1230	2190	3330	4150	5240
3 Day Avg. PSI	1660	2950	4480	5570	6230
7 Day Avg. PSI	2640	4210	5820	6890	7890
28 Day Avg. PSI	3710	5960	7230	8690	9470
56 Day Avg. PSI	4170	6770	7970	9170	10030



Combined Aggregates

	#57 Limestone	Combined Fine Grading	Comb. Grad.
1 1/2 in. (37.5 mm	100.00	100.00	100.00
1 in. (25 mm)	98.00	100.00	99.00
3/4 in. (19 mm)	75.00	100.00	86.00
1/2 in. (12.5 mm)	40.00	100.00	68.00
3/8 in. (9.5 mm)	27.00	100.00	61.00
No. 4 (4.75 mm)	6.00	100.00	49.00
No. 8 (2.36 mm)	2.00	89.00	42.00
No. 16 (1.18 mm)		66.00	32.00
No. 30		49.00	24.00
No. 50		26.00	13.00
No. 100		9.00	5.00
No. 200	1.70	4.30	2.90
Pan	0.00	0.00	0.00
Fineness Modulus		2.60	4.89

TEXAS MATERIALS
A CRH COMPANY

Beckmann 1
18495 NW Military Hwy
San Antonio, TX 78257

PLANT	Beckmann 1
MIX CODE	RA130S09 **Mix Code must be used when ordering concrete.**
SPECIFIED STRENGTH	3000 psi @ 28 Days
USAGE	
CLIENT	V K Knowlton Const & Utilities
PROJECT	Voges Unit 3
ENG CODE	COM,LS,1,3000,REG,4,2.0,T1LC25,445

05/15/2024

MATERIAL	DESCRIPTION	SPECIFIC GRAVITY	WEIGHT lbs/yd
Cement	Blended Hydraulic Type IL - ASTM C-595	3.1	334
Additive	Fly Ash - ASTM C-618	2.7	111
Aggregate	Coarse Aggregate - ASTM C-33	2.58	1815
	Fine Aggregate - ASTM C-33	2.58	1074
	Fine Aggregate - ASTM C-33	2.63	370
Water	Municipal Water	1	250
Admixture	Water Reducer Mid Range - ASTM C-494	1	
Air	Range: fl oz/100 lb CM		
		Totals	3954 lb

Specified Slump:	4"+/- 1"	Designed Unit Weight:	146.45 lb/ft3
Specified Air:	0-3	Designed W/CM Ratio:	0.56

NOTES:
Texas Materials has no knowledge or authority regarding where this mix is to be placed unless specifically noted therefore it is the responsibility of the project architect/engineer, and or contractor to insure that the above designed mix parameters of compressive strength, water cement ratio, binder content, and air content, are appropriate for the anticipated environmental conditions (i.e. ACI- 301, 318 and the local Building Codes). Chemical admixtures are added in accordance with the manufacturer's recommendations, and may be changed to meet job site demands. These mixture proportions are proprietary, any dissemination without approval is a violation of federal law. Designed mix cementitious content, is stated as a minimum, and Texas Materials reserves the right to increase cementitious content.

W/C Ratio/Strength Relationship- Limestone

Concrete Constituents

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Fly Ash	ASTM C-618 CLASS C S.G. 2.70
Coarse Aggregate	ASTM C-33 Limestone #57 S.G. 2.58
Fine Aggregate	ASTM C-33 Manufact Sand S.G. 2.58
Fine Aggregate	ASTM C-33 Natural Sand S.G 2.63
AEA	ASTM C-260 - Entrapped
Admix	ASTM C-494 Type A/D

Mix Data

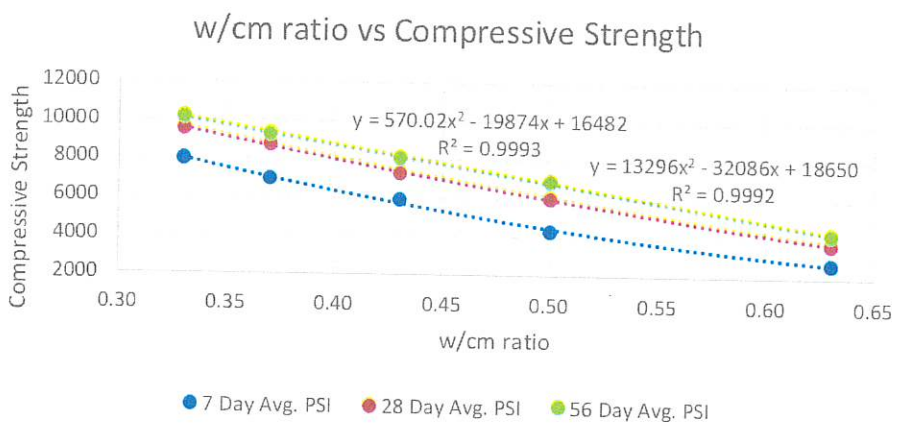
Trial #	1A-71	1A-72	1A-73	1A-74	1A-75
Cement lbs/cy	300	375	450	544	637
Fly Ash lbs/cy	100	125	150	181	213
#57 Rock (ssd) lbs/cy	1839	1809	1781	1723	1711
Man Sand (ssd) lbs/cy	1105	1062	1003	932	853
Natural Sand (ssd) lbs/cy	368	355	335	311	284
AEA oz/cy					
Type A/D oz/cwt	5	4	4	4	5
Water lbs/cy	250	250	258	271	279
w/cm	0.63	0.50	0.43	0.37	0.33

Plastic Properties

Slump inch	5.00	5.00	5.00	5.25	5.00
Air %	1.2	1.5	1.9	1.9	1.8
Unit Wt. Lb/cy	147.8	146.9	148	147.3	147.7
Concrete Temp F.	66	67	74	71	73

Hardened Properties

% Chloride	0.001	0.002	0.002	0.002	0.001
1 Day Avg. PSI	590	1160	1990	2360	3480
2 Day Avg. PSI	1230	2190	3330	4150	5240
3 Day Avg. PSI	1660	2950	4480	5570	6230
7 Day Avg. PSI	2640	4210	5820	6890	7890
28 Day Avg. PSI	3710	5960	7230	8690	9470
56 Day Avg. PSI	4170	6770	7970	9170	10030



Combined Aggregates

	#57 Limestone	Combined Fine Grading	Comb. Grad.
1 1/2 in. (37.5 mm	100.00	100.00	100.00
1 in. (25 mm)	98.00	100.00	99.00
3/4 in. (19 mm)	75.00	100.00	86.00
1/2 in. (12.5 mm)	40.00	100.00	68.00
3/8 in. (9.5 mm)	27.00	100.00	61.00
No. 4 (4.75 mm)	6.00	100.00	49.00
No. 8 (2.36 mm)	2.00	89.00	42.00
No. 16 (1.18 mm)		66.00	32.00
No. 30		49.00	24.00
No. 50		26.00	13.00
No. 100		9.00	5.00
No. 200	1.70	4.30	2.90
Pan	0.00	0.00	0.00
Fineness Modulus		2.60	4.89

TEXAS MATERIALS
A CRH COMPANY

Beckmann 1
18495 NW Military Hwy
San Antonio, TX 78257

PLANT	Beckmann 1
MIX CODE	CS3613L
SPECIFIED STRENGTH	4000 psi @ 28 Days
USAGE	
CLIENT	V K Knowlton Const & Utilities
PROJECT	Voges Unit 3
ENG CODE	CLASS C LAG ASH GR 4 WR RET

Mix Code must be used when ordering concrete.

05/15/2024

MATERIAL	DESCRIPTION	SPECIFIC GRAVITY	WEIGHT lbs/yd
Cement	Blended Hydraulic Type IL - ASTM C-595	3.1	384
Additive	Fly Ash - ASTM C-618	2.7	164
Aggregate	Coarse Aggregate - ASTM C-33	2.58	1754
	Fine Aggregate - ASTM C-33	2.58	966
	Fine Aggregate - ASTM C-33	2.63	430
Water	Municipal Water	1	249
Admixture	Water Reducer Mid Range - ASTM C-494	1	
	Range: fl oz/100 lb CM - ASTM C-494	1	
Air	Range: 2-6 fl oz/100 lb CM		
		Totals	3947 lb

Specified Slump:	5"+/- 1"	Designed Unit Weight:	146.19 lb/ft3
Specified Air:	0-3	Designed W/CM Ratio:	0.45

NOTES:
Texas Materials has no knowledge or authority regarding where this mix is to be placed unless specifically noted therefore it is the responsibility of the project architect/engineer, and or contractor to insure that the above designed mix parameters of compressive strength, water cement ratio, binder content, and air content, are appropriate for the anticipated environmental conditions (i.e. ACI- 301, 318 and the local Building Codes). Chemical admixtures are added in accordance with the manufacturer's recommendations, and may be changed to meet job site demands. These mixture proportions are proprietary, any dissemination without approval is a violation of federal law. Designed mix cementitious content, is stated as a minimum, and Texas Materials reserves the right to increase cementitious content.

Units : US

Mix Name: CS3613L

Mix Strength: 3,600 PSI at 28 Days

STRENGTH SUMMARY, Compression 4" x 8"

No. Of Tests	Avg Slump	Avg Air	Strengths Avg 7 Day	Avg 28 Day	Std Dev	ACI318 Req'd
30	4.94	1.34	4540	6300	740	4830

DETAILED STRENGTH, Compression 4" x 8"

Batch Number	Date	Slump	Air	Strengths 7 Day	28 Day	Acc Age Run Avg 3
6876646	7/8/2021	4.50	1.00	4910	6270	
6875510	7/8/2021	4.50	1.30	4820	6180	
7074790	9/28/2021		1.20	4900	6250	6230
7316692	1/18/2022	4.75		4820	6870	6430
7370316	2/15/2022	4.75		4160	6180	6430
7509786	4/27/2022	3.00	1.90	5500	7500	6850
7525420	5/6/2022	5.75	0.90	4730	6530	6730
7658806	7/18/2022	4.00	0.90	5030	7610	7210
7757882	9/15/2022	4.50	1.80	5160	6170	6770
7765823	9/20/2022	5.00	1.50	4150	6070	6620
7765448~0	9/20/2022	3.50	1.30	4950	7260	6500
7767812	9/21/2022	4.00	1.40	4430	6280	6540
7795178	10/5/2022	6.00	1.00	3980	6300	6610
7894918	12/12/2022	4.50	2.10	4440	7070	6550
7936524	1/12/2023	5.50	1.30	3700	3870	5750
7983539~0	2/21/2023	5.50	1.40	4440	6390	5780
7983539~0	2/21/2023	5.50		4740	6470	5580
7995991	2/28/2023	4.50		4510	6570	6480
8007093	3/7/2023	4.50		4340	6340	6460
8242731	7/20/2023	6.00	1.30	5230	7170	6690
8288138	8/14/2023	4.50		3650	5110	6210
8318546	8/30/2023	4.75		4730	5500	5930
8321643	8/31/2023	4.50	1.20	4640	5910	5510
8367101	9/28/2023	6.00	1.30	4350	6130	5850
8366310	9/28/2023	4.75	1.40	4490	6120	6050
8398393	10/16/2023	5.50		4580	6870	6370
8403156	10/18/2023	5.50		4310	6270	6420
8405849	10/19/2023	6.00	1.40	4130	6310	6480
8492399	12/19/2023	5.00		4750	6110	6230
8498834	12/27/2023	6.50	1.20	3810	5290	5900

Combined Aggregates

	#57 Limeston e	Combine d Fine Grading	Comb. Grad.
1 1/2 in. (37.5 mm	100.00	100.00	100.00
1 in. (25 mm)	98.00	100.00	99.00
3/4 in. (19 mm)	75.00	100.00	86.00
1/2 in. (12.5 mm)	40.00	100.00	68.00
3/8 in. (9.5 mm)	27.00	100.00	61.00
No. 4 (4.75 mm)	6.00	100.00	49.00
No. 8 (2.36 mm)	2.00	89.00	42.00
No. 16 (1.18 mm)		66.00	32.00
No. 30		49.00	24.00
No. 50		26.00	13.00
No. 100		9.00	5.00
No. 200	1.70	4.30	2.90
Pan	0.00	0.00	0.00
Fineness Modulus		2.60	4.89

TEXAS MATERIALS
A CRH COMPANY

Beckmann 1
18495 NW Military Hwy
San Antonio, TX 78257

PLANT	Beckmann 1	05/15/2024
MIX CODE	RA140S23	**Mix Code must be used when ordering concrete.**
SPECIFIED STRENGTH	4000 psi @ 28 Days	
USAGE		
CLIENT	V K Knowlton Const & Utilities	
PROJECT	Voges Unit 3	
ENG CODE	COM,LS,1,4000,REG,4,1.5,T1LC25,515	

MATERIAL	DESCRIPTION	SPECIFIC GRAVITY	WEIGHT lbs/yd
Cement	Blended Hydraulic Type IL - ASTM C-595	3.1	386
Additive	Fly Ash - ASTM C-618	2.7	129
Aggregate	Coarse Aggregate - ASTM C-33	2.58	1809
	Fine Aggregate - ASTM C-33	2.58	1023
	Fine Aggregate - ASTM C-33	2.63	345
Water	Municipal Water	1	259
Admixture	Water Reducer Mid Range - ASTM C-494	1	
Air	Range: fl oz/100 lb CM		
		Totals	3950 lb

Specified Slump:	4"+/- 1"	Designed Unit Weight:	146.30 lb/ft3
Specified Air:	0-3	Designed W/CM Ratio:	0.5

NOTES:
Texas Materials has no knowledge or authority regarding where this mix is to be placed unless specifically noted therefore it is the responsibility of the project architect/engineer, and or contractor to insure that the above designed mix parameters of compressive strength, water cement ratio, binder content, and air content, are appropriate for the anticipated environmental conditions (i.e. ACI- 301, 318 and the local Building Codes). Chemical admixtures are added in accordance with the manufacturer's recommendations, and may be changed to meet job site demands. These mixture proportions are proprietary, any dissemination without approval is a violation of federal law. Designed mix cementitious content, is stated as a minimum, and Texas Materials reserves the right to increase cementitious content.

W/C Ratio/Strength Relationship- Limestone

Concrete Constituents

Cement	ASTM C-595 Type 1L. S .G. 3.10
Fly Ash	ASTM C-618 CLASS C S.G. 2.70
Coarse Aggregate	ASTM C-33 Limestone #57 S.G. 2.58
Fine Aggregate	ASTM C-33 Manufact Sand S.G. 2.58
Fine Aggregate	ASTM C-33 Natural Sand S.G 2.63
AEA	ASTM C-260 - Entrapped
Admix	ASTM C-494 Type A/D

Mix Data

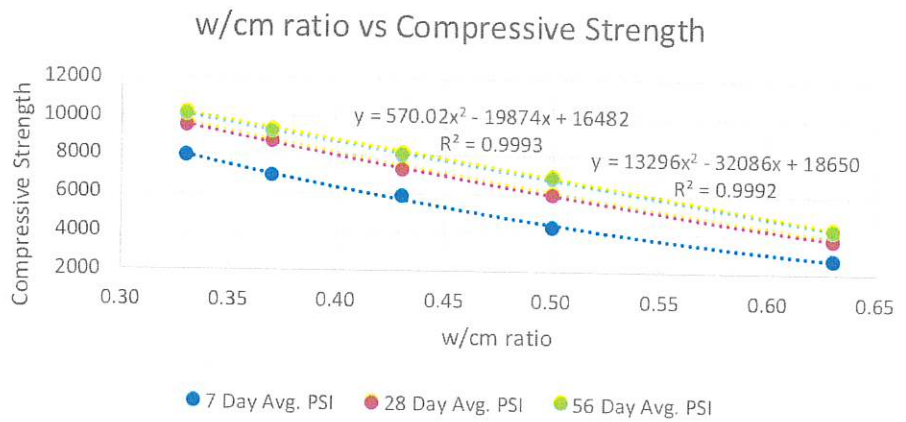
Trial #	1A-71	1A-72	1A-73	1A-74	1A-75
Cement lbs/cy	300	375	450	544	637
Fly Ash lbs/cy	100	125	150	181	213
#57 Rock (ssd) lbs/cy	1839	1809	1781	1723	1711
Man Sand (ssd) lbs/cy	1105	1062	1003	932	853
Natural Sand (ssd) lbs/cy	368	355	335	311	284
AEA oz/cy					
Type A/D oz/cwt	5	4	4	4	5
Water lbs/cy	250	250	258	271	279
w/cm	0.63	0.50	0.43	0.37	0.33

Plastic Properties

Slump inch	5.00	5.00	5.00	5.25	5.00
Air %	1.2	1.5	1.9	1.9	1.8
Unit Wt. Lb/cy	147.8	146.9	148	147.3	147.7
Concrete Temp F.	66	67	74	71	73

Hardened Properties

% Chloride	0.001	0.002	0.002	0.002	0.001
1 Day Avg. PSI	590	1160	1990	2360	3480
2 Day Avg. PSI	1230	2190	3330	4150	5240
3 Day Avg. PSI	1660	2950	4480	5570	6230
7 Day Avg. PSI	2640	4210	5820	6890	7890
28 Day Avg. PSI	3710	5960	7230	8690	9470
56 Day Avg. PSI	4170	6770	7970	9170	10030



Combined Aggregates

	#57 Limestone	Combined Fine Grading	Comb. Grad.
1 1/2 in. (37.5 mm	100.00	100.00	100.00
1 in. (25 mm)	98.00	100.00	99.00
3/4 in. (19 mm)	75.00	100.00	86.00
1/2 in. (12.5 mm)	40.00	100.00	68.00
3/8 in. (9.5 mm)	27.00	100.00	61.00
No. 4 (4.75 mm)	6.00	100.00	49.00
No. 8 (2.36 mm)	2.00	89.00	42.00
No. 16 (1.18 mm)		66.00	32.00
No. 30		49.00	24.00
No. 50		26.00	13.00
No. 100		9.00	5.00
No. 200	1.70	4.30	2.90
Pan	0.00	0.00	0.00
Fineness Modulus		2.60	4.89

TEXAS MATERIALS
A CRH COMPANY

Beckmann 1
18495 NW Military Hwy
San Antonio, TX 78257

PLANT	Beckmann 1
MIX CODE	QA431S12 **Mix Code must be used when ordering concrete.**
SPECIFIED STRENGTH	3000 psi @ 28 Days
USAGE	
CLIENT	V K Knowlton Const & Utilities
PROJECT	Voges Unit 3
ENG CODE	COM,LS,4,3000,REG,2,4.5,T1LC25,460

05/15/2024

MATERIAL	DESCRIPTION	SPECIFIC GRAVITY	WEIGHT lbs/yd
Cement	Blended Hydraulic Type IL - ASTM C-595	3.1	345
Additive	Fly Ash - ASTM C-618	2.7	115
Aggregate	Coarse Aggregate - ASTM C-33	2.58	1546
	Fine Aggregate - ASTM C-33	2.58	778
	Fine Aggregate - ASTM C-33	2.63	777
Water	Municipal Water	1	259
Admixture	Air Entrainer - ASTM C-260	1	
	Range: fl oz/100 lb CM Water Reducer Mid Range - ASTM C-494	1	
	Range: fl oz/100 lb CM - ASTM C-494	1	
Air	Range: 2-6 fl oz/100 lb CM		
		Totals	3820 lb

Specified Slump:	2"+/- 1"	Designed Unit Weight:	141.47 lb/ft3
Specified Air:	3-6	Designed W/CM Ratio:	0.56

NOTES:
Texas Materials has no knowledge or authority regarding where this mix is to be placed unless specifically noted therefore it is the responsibility of the project architect/engineer, and or contractor to insure that the above designed mix parameters of compressive strength, water cement ratio, binder content, and air content, are appropriate for the anticipated environmental conditions (i.e. ACI- 301, 318 and the local Building Codes). Chemical admixtures are added in accordance with the manufacturer's recommendations, and may be changed to meet job site demands. These mixture proportions are proprietary, any dissemination without approval is a violation of federal law. Designed mix cementitious content, is stated as a minimum, and Texas Materials reserves the right to increase cementitious content.

W/C Ratio/Strength Relationship- Limestone

Concrete Constituents

Cement	ASTM C-595 Type I/ II L S. G. 3.10
Fly Ash	ASTM C-618 Class C Ash .S.G. 2.70
Coarse Aggregate	ASTM C-33 Limestone #7 S.G. 2.58
Fine Aggregate	ASTM C-33 Manufact Sand S.G. 2.58
Fine Aggregate	ASTM C-33 Natural Sand S.G. 2.63
AEA	ASTM C-260
Admix	ASTM C-494 Type A/D

Mix Data

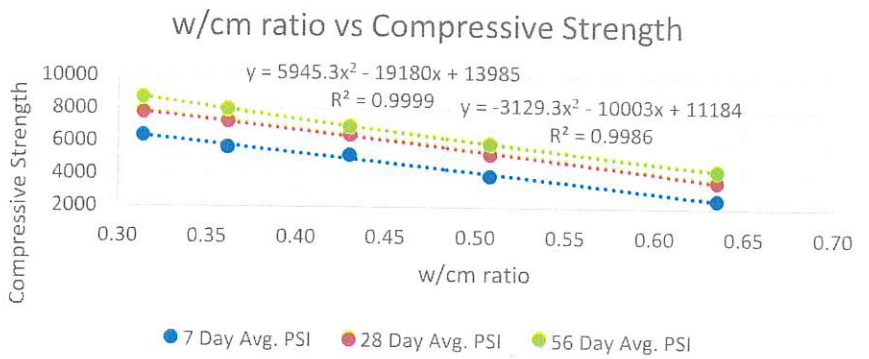
Trial #	1A-746	1A-747	1A-748	1A-749	1A-750
Cement lbs/cy	300	375	450	544	637
Fly Ash lbs/cy	100	125	150	181	213
#7 Rock (ssd) lbs/cy	1645	1596	1550	1530	1460
Man Sand (ssd) lbs/cy	1060	1035	998	926	891
Natural Sand (ssd) lbs/cy	455	443	428	397	383
AEA oz/cy	3.2	3.2	3.5	3.6	3.6
Type A/D oz/cwt	4	4	4	4	4
Type A/F oz/cwt					
Water lbs/cy	254	254	258	262	267
w/cm	0.64	0.51	0.43	0.36	0.31

Plastic Properties

Slump inch	2.50	2.50	2.75	2.75	2.75
Air %	5.8	5.4	4.8	4.6	5
Unit Wt. Lb/cy	139.7	142.6	142.8	142.8	142.2
Concrete Temp F.	66	68	67	69	70

Hardened Properties

% Chloride	0.004	0.004	0.004	0.003	0.004
1 Day Avg. PSI	500	1140	2020	2780	3020
2 Day Avg. PSI	1120	2170	3200	3860	4540
3 Day Avg. PSI	1580	2940	4040	4770	5360
7 Day Avg. PSI	2450	3830	5110	5540	6250
28 Day Avg. PSI	3590	5210	6380	7180	7700
56 Day Avg. PSI	4200	5790	6810	7850	8540



Combined Aggregates

	#7 Limestone	Combined Fine Grading	Comb. Grad.
4 in. (100 mm)	100.00	100.00	100.00
3 1/2 in. (90 mm)	100.00	100.00	100.00
3 in. (75 mm)	100.00	100.00	100.00
2 1/2 in. (63 mm)	100.00	100.00	100.00
2 in. (50 mm)	100.00	100.00	100.00
1 1/2 in. (37.5 mm	100.00	100.00	100.00
1 in. (25 mm)	100.00	100.00	100.00
3/4 in. (19 mm)	100.00	100.00	100.00
1/2 in. (12.5 mm)	100.00	100.00	100.00
3/8 in. (9.5 mm)	87.00	100.00	93.00
No. 4 (4.75 mm)	16.00	100.00	56.00
No. 8 (2.36 mm)	4.00	89.00	45.00
No. 16 (1.18 mm)	3.00	66.00	33.00
No. 30		49.00	25.00
No. 50		26.00	14.00
No. 100		9.00	6.00
No. 200	2.30	4.30	3.30
Pan	0.00	0.00	0.00
Fineness Modulus		2.61	4.30

TEXAS MATERIALS
A CRH COMPANY

Beckmann 1
18495 NW Military Hwy
San Antonio, TX 78257

PLANT	Beckmann 1
MIX CODE	FLOWT1
SPECIFIED STRENGTH	150 psi @ 28 Days
USAGE	
CLIENT	V K Knowlton Const & Utilities
PROJECT	Voges Unit 3
ENG CODE	FLOW FILL 1.5 SACK AE

05/15/2024

Mix Code must be used when ordering concrete.

MATERIAL	DESCRIPTION	SPECIFIC GRAVITY	WEIGHT lbs/yd
Cement	Blended Hydraulic Type IL - ASTM C-595	3.1	141
Aggregate	Fine Aggregate - ASTM C-33	2.58	2632
Water	Municipal Water	1	417
Admixture	Air Entrainer - ASTM C-260	1	
Air	Range: fl oz/100 lb CM		
		Totals	3190 lb

Specified Slump:	8+	Designed Unit Weight:	118.15 lb/ft3
Specified Air:	10-20	Designed W/CM Ratio:	2.96

NOTES:
Texas Materials has no knowledge or authority regarding where this mix is to be placed unless specifically noted therefore it is the responsibility of the project architect/engineer, and or contractor to insure that the above designed mix parameters of compressive strength, water cement ratio, binder content, and air content, are appropriate for the anticipated environmental conditions (i.e. ACI- 301, 318 and the local Building Codes). Chemical admixtures are added in accordance with the manufacturer's recommendations, and may be changed to meet job site demands. These mixture proportions are proprietary, any dissemination without approval is a violation of federal law. Designed mix cementitious content, is stated as a minimum, and Texas Materials reserves the right to increase cementitious content.

Units : US

Mix Name: FLOWT1

Mix Strength: 150 PSI at 28 Days

STRENGTH SUMMARY, Compression Strengths Either 4" x 8" Or 6" x 12"

No. Of Tests	Avg Slump	Avg Air	Avg 7 Day	Avg 28 Day	Std Dev	ACI318 Req'd
30	6.22	12.00	120	160	20	180

DETAILED STRENGTH, Compression Either 4" x 8" Or 6" x 12"

Batch Number	Date	Slump	Air	Strengths 7 Day	28 Day	Acc Age Run Avg 3
7445347	3/24/2022	5.00		140	180	
7485905	4/12/2022	7.75		200	190	
7492934	4/18/2022	6.00		160	160	180
7510351	4/27/2022			80	100	150
7525248	5/6/2022			130	170	140
7548244	5/17/2022	5.50		220	180	150
7570092	5/31/2022	7.00		130	160	170
7586997	6/8/2022	5.00		120	190	180
7598215	6/14/2022	6.50		110	170	170
7608002	6/17/2022	7.00		90	160	170
7616132	6/22/2022	7.00		180	150	160
7621748	6/27/2022	8.00		90	110	140
7624164	6/28/2022	8.00		100	130	130
7655870	7/15/2022	5.00		120	170	140
7687920	8/2/2022	5.00		120	170	160
7725286	8/26/2022	5.50		150	160	170
7730864	8/30/2022	4.50			180	170
7738651	9/6/2022	7.00		90	150	160
7743585	9/8/2022	7.00		80	160	160
7759840	9/16/2022	5.00		80	160	160
7763952	9/19/2022	9.00		60	120	150
7771768	9/22/2022	6.00		80	180	150
7804091	10/10/2022	6.00		150	150	150
7807298	10/11/2022	7.00		140	150	160
7864366	11/18/2022	6.00		90	190	160
7895149	12/12/2022	4.50		140	180	170
8024566	3/16/2023	5.25	11.00	110	110	160
8165635	6/8/2023			110	130	140
8168979	6/10/2023	5.50		170	200	150
8232339	7/14/2023	7.00	13.00	110	150	160

Combined Aggregates

	Stone Sand
4 in. (100 mm)	100.00
3 1/2 in. (90 mm)	100.00
3 in. (75 mm)	100.00
2 1/2 in. (63 mm)	100.00
2 in. (50 mm)	100.00
1 1/2 in. (37.5 mm	100.00
1 in. (25 mm)	100.00
3/4 in. (19 mm)	100.00
1/2 in. (12.5 mm)	100.00
3/8 in. (9.5 mm)	100.00
No. 4 (4.75 mm)	100.00
No. 8 (2.36 mm)	85.00
No. 16 (1.18 mm)	53.00
No. 30	33.00
No. 50	20.00
No. 100	11.00
No. 200	5.60
Pan	0.00
Fineness Modulus	2.98

TEXAS MATERIALS
A CRH COMPANY

Beckmann 1
18495 NW Military Hwy
San Antonio, TX 78257

PLANT	Beckmann 1
MIX CODE	FMG501 **Mix Code must be used when ordering concrete.**
SPECIFIED STRENGTH	1000 psi @ 28 Days
USAGE	
CLIENT	V K Knowlton Const & Utilities
PROJECT	Voges Unit 3
ENG CODE	FMG,500 PSI,T1L,AE,470

05/15/2024

MATERIAL	DESCRIPTION	SPECIFIC GRAVITY	WEIGHT lbs/yd
Cement	Blended Hydraulic Type IL - ASTM C-595	3.1	470
Aggregate	Fine Aggregate - ASTM C-33	2.58	1841
	Fine Aggregate - ASTM C-33	2.63	991
Water	Municipal Water	1	375
Admixture	Air Entrainer - ASTM C-260	1	
	Range: fl oz/100 lb CM Water Reducer Mid Range - ASTM C-494	1	
Air	Range: fl oz/100 lb CM		
		Totals	3678 lb

Specified Slump:	8.5+/- 1"	Designed Unit Weight:	136.20 lb/ft3
Specified Air:	3-6	Designed W/CM Ratio:	0.8

NOTES:
Texas Materials has no knowledge or authority regarding where this mix is to be placed unless specifically noted therefore it is the responsibility of the project architect/engineer, and or contractor to insure that the above designed mix parameters of compressive strength, water cement ratio, binder content, and air content, are appropriate for the anticipated environmental conditions (i.e. ACI- 301, 318 and the local Building Codes). Chemical admixtures are added in accordance with the manufacturer's recommendations, and may be changed to meet job site demands. These mixture proportions are proprietary, any dissemination without approval is a violation of federal law. Designed mix cementitious content, is stated as a minimum, and Texas Materials reserves the right to increase cementitious content.

W/C Ratio/Strength Relationship- Limestone

Concrete Constituents

Cement	ASTM C-595 Type I/ II L S. G. 3.10
Fly Ash	
Coarse Aggregate	
Fine Aggregate	ASTM C-33 Manufact Sand S.G. 2.58
Fine Aggregate	ASTM C-33 Natural Sand S.G. 2.63
AEA	ASTM C-260
Admix	ASTM C-494 Type A/D, A/F

Mix Data

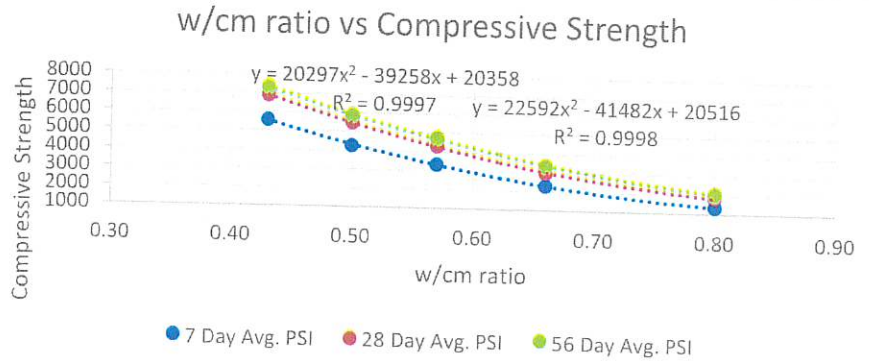
Trial #	FMG501L	FMG601L	FMG7011L	FMG801L	FMG101L
Cement lbs/cy	470	565	655	750	940
Fly Ash lbs/cy					
Man Sand (ssd) lbs/cy	1817	1767	1716	1666	1665
Natural Sand (ssd) lbs/cy	978	951	925	897	714
AEA oz/cy	0.3	0.3	0.3	0.3	0.3
Type A/D oz/cwt	5	5	5	5	5
Type A/F oz/cwt					
Water lbs/cy	375	375	375	375	404
w/cm	0.80	0.66	0.57	0.50	0.43

Plastic Properties

Slump inch	6.00	7.00	6.00	5.25	7.50
Air %	6.0	5.4	5.2	5	4.5
Unit Wt. Lb/cy	131	133.8	134.6	136.24	136.28
Concrete Temp F.	69	70	70	73	72

Hardened Properties

% Chloride	0.005	0.002	0.002	0.003	0.001
7 Day Avg. PSI	1260	2220	3260	4200	5510
28 Day Avg. PSI	1800	2940	4240	5440	6840
56 Day Avg. PSI	1950	3250	4630	5780	7230



ASH GROVE CEMENT COMPANY

Hunter Plant
7781 FM 1102
New Braunfels, Texas 78132
Phone #: (512)-805-4429

Blended Cement Type: IL(12) (HS)

Production Period February 1, 2024 - February 29, 2024 Date: March 8, 2024
ASTM C595/C595M
REQUIREMENTS

CHEMICAL

Item	Spec. Limit	Test Result
Sulfate as SO_3 (%)	3.0 max[A]	2.8
Loss on ignition (%)	10.0 max	6.5
Equivalent alkali content of Portland Cement (Na_2O_{eq} %)[F]	[B]	0.53
Limestone (%)	>5 and ≤15	12.6
$CaCO_3$ in limestone (%)	70 min	98
Optional information		
Equivalent alkali content of finished cement (Na_2O_{eq} %)	[B]	0.46

PHYSICAL

Item	Spec. Limit	Test Result
Air content of mortar (volume %)	12 max	8.4
Blaine Fineness (m^2/kg)	[B]	431
Fineness, No. 325 sieve (% retained)	[B]	3.4
Density (g/cm^3)	[B]	3.07
Compressive strength (psi)		
1 day	[B]	2170
3 days	1,890 min	3650
7 days	2,900 min	4750
28 days[E]	3,620 min	6120
Time of initial setting (Vicat)		
Not less than (minutes)	45	100
Not more than (minutes)	420	
Heat of hydration, C1702/1702M, (kJ/kg)[C]		
3 days	[B]	280
Mortar Bar Expansion, C1038/C1038M, (%)[C]	0.020 max[D]	0.008
Sulfate resistance, C1012/1012M, (%)[C]		
Expansion at 180 days	0.05 max	0.02

[A] Default table maximum may be exceeded if Test Method ASTM C1038/C1038M limit is met.

[B] Not applicable.

[C] Test results for this production period not available. Most recent test result provided.

[D] Required only if percent SO_3 exceeds the limit in Table 1.

[E] Test result based on most recent monthly production time period.

[F] As per ASTM C1778, Portland Cement is defined as "Clinker + Gypsum" constituents and is to be used for calculating equivalent alkalis in the base cement.

We certify that the above described blended cement, at the time of shipment, meets the chemical and physical requirements of the ASTM C595/C595M Type IL(HS) and AASHTO M240 Blended Hydraulic Cement specifications.

Signature:
Name: Kevin Hanna

Title: Quality Control Manager

ECOMATERIAL TECHNOLOGIES

PO Box 38
Thompsons, TX 77481-0038
P: 281.343.0079

ASTM C618 / AASHTO M295 Testing of Coal Ash Spruce Plant San Antonio, Texas Unit #1

Sample Date: December 2023
Sample Type: Monthly
Sample ID: #12-2023

Report Date: 2/8/24
MTRF ID: 66SE

Chemical Analysis	Results		ASTM Limit Class F/C	AASHTO Limit Class F/C
Silicon Dioxide (SiO_2)	38.13	%		
Aluminum Oxide (Al_2O_3)	21.07	%		
Iron Oxide (Fe_2O_3)	5.91	%		
Sum (SiO_2+Al_2O_3+Fe_2O_3)	65.11	%	50.0 min	50.0 min
Sulfur Trioxide (SO_3)	1.56	%	5.0 max	5.0 max
Calcium Oxide (CaO)	24.14	%	18.0 max / >18.0	18.0 max / >18.0
Magnesium Oxide (MgO)	4.40	%		
Sodium Oxide (Na_2O)	1.54	%		
Potassium Oxide (K_2O)	0.48	%		
Sodium Oxide Equivalent (Na_2O+0.658K_2O)	1.86	%		
Moisture	0.03	%	3.0 max	3.0 max
Loss on Ignition	0.41	%	6.0 max	5.0 max

Physical Analysis				
Fineness, % retained on 45-µm sieve	12.32	%	34 max	34 max
Fineness Uniformity	0.60	%	±5 max	±5 max
Strength Activity Index, 7- or 28-day requirement				
7 day, % of control	100	%	75 min	75 min
28 day, % of control	102	%	75 min	75 min
Water Requirement, % control	97	%	105 max	105 max
Density C-188	2.57	g/cm^3		
Density Uniformity	1.40	%	±5 max	±5 max

AUTHORIZED SIGNATURE:

ECOMATERIAL TECHNOLOGIES

PO Box 38
Thompsons, TX 77481-0038
P: 281.343.0079

ASTM C618 / AASHTO M295 Testing of Coal Ash Spruce Plant San Antonio, Texas Unit #2

Sample Date: December 2023
Sample Type: Monthly
Sample ID: #12-2023

Report Date: 2/8/24
MTRF ID: 67SE

Chemical Analysis	Results		ASTM Limit Class F/C	AASHTO Limit Class F/C
Silicon Dioxide (SiO_2)	37.16	%		
Aluminum Oxide (Al_2O_3)	20.17	%		
Iron Oxide (Fe_2O_3)	5.77	%		
Sum (SiO_2+Al_2O_3+Fe_2O_3)	63.10	%	50.0 min	50.0 min
Sulfur Trioxide (SO_3)	3.30	%	5.0 max	5.0 max
Calcium Oxide (CaO)	22.19	%	18.0 max / >18.0	18.0 max / >18.0
Magnesium Oxide (MgO)	4.07	%		
Sodium Oxide (Na_2O)	1.42	%		
Potassium Oxide (K_2O)	0.50	%		
Sodium Oxide Equivalent (Na_2O+0.658K_2O)	1.75	%		
Moisture	0.08	%	3.0 max	3.0 max
Loss on Ignition	1.22	%	6.0 max	5.0 max

Physical Analysis				
Fineness, % retained on 45-µm sieve	19.85	%	34 max	34 max
Fineness Uniformity	6.35	%	±5 max	±5 max
Strength Activity Index, 7- or 28-day requirement				
7 day, % of control	89	%	75 min	75 min
28 day, % of control	96	%	75 min	75 min
Water Requirement, % control	98	%	105 max	105 max
Density C-188	2.55	g/cm^3		
Density Uniformity	2.27	%	±5 max	±5 max

AUTHORIZED SIGNATURE:

Resource Materials Testing, Inc.

"Specialists in Pozzolan Testing"

24 Fine Drive Murphy, NC 28906 828.506.7636

REPORT OF FLY ASH ANALYSIS

TO: WM Fly Ash Direct
4228 Airport Road
Cincinnati, OH 45226

PROJECT NO. RMT-501
SAMPLE NO. 27240
DATE REC.: 03-15-24
DATE REP.: 04-17-24

PROJECT NAME: Fayette Fly Ash Quality Assurance Program
SAMPLE ID: Class C Fly Ash February 2024 Composite Sample 10510

CHEMICAL ANALYSIS:	RESULTS:	SPECIFICATION F/C ASTM C618	SPECIFICATION F/C AASHTO M295
Silicon Dioxide, SiO_2, %	35.55	----	
Aluminum Oxide, Al_2O_3, %	17.69	----	
Iron Oxide, Fe_2O_3, %	6.02	----	
Sum of SiO_2, Al_2O_3 & Fe_2O_3, %	59.27	50.0 Min./50.0 Min.	
Calcium Oxide, CaO, %	26.77	18.0 Max/>18.0	
Magnesium Oxide, MgO, %	5.96	----	
Sodium Oxide, Na_2O, %	1.86	----	
Potassium Oxide, K_2O, %	0.47	----	
Sulfur Trioxide, SO_3, %	2.32	5.0 Max	
Moisture Content, %	0.10	3.0 Max	
Loss on Ignition, %	0.70	6.0 Max	5.0 Max
Total Alkalis as Na_2O Equivalent, %	2.17	----	

PHYSICAL ANALYSIS:	RESULTS:	SPECIFICATION F/C ASTM C618	SPECIFICATION F/C AASHTO M295
Amount Retained on No. 325 Sieve, %	10.4	34 Max	
Strength Activity Index			
Portland Cement @ 7 days, % of Control	104	75 Min	
Portland Cement @ 28 days, % of Control	108	75 Min	
Water Requirement, % of Control	93	105 Max	
Autoclave Expansion, %	0.01	0.8 Max	
Density	2.73	----	
Air Entrainment of Mortar, %	0.025	----	

*Optional Requirements applicable only when requested by purchaser. This material meets the requirements of ASTM C 618 and AASHTO M 295 for the parameters tested.

By Robert T. Smith
Robert T. Smith, Ph.D.

AIRALON® 7000 Data Sheet

Air-entraining admixture ASTM C260

Product Description

AIRALON® 7000 admixture is an aqueous complex mixture of organic acid salts. It is a specially formulated concrete air-entraining admixture that provides freeze-thaw resistance and enhances the finishability characteristics of concrete. AIRALON® 7000 admixture is manufactured under stringent controls, assuring quality and uniform, predictable performance. One gallon weighs approximately 8.5 lbs (1.02 kg/L). AIRALON® 7000 complies to ASTM C260 Standard Specifications for Air-Entraining Admixtures for Concrete, and does not contain intentionally added chlorides.

Product Advantages

- Can be used in wide spectrum of mix designs
- Excellent rheological properties makes it particularly useful for longer transit times
- Uniform, predictable air entrainment
- Superior air stability minimizes air loss during placement
- Economical to use in concretes which are typically difficult to air entrain

Uses

AIRALON® 7000 admixture is recommended for use in ready-mix, precast, prestress and other concrete product plants where the intentional entrainment of a specified level of air is required. ACI 201 Guide to Durable Concrete recommends all concrete which is exposed to any level of freezing and thawing or is subjected to the application of de-icing salts during the winter months should be air entrained.

AIRALON® 7000 admixture has been found to be particularly effective in both high cement factor and low slump concrete mixes, which require a very efficient air-entraining admixture.

AIRALON® 7000 admixture may also be used when a stable air void system is required over time.

Performance

AIRALON® 7000 disperses and generates millions of discrete semi-microscopic bubbles throughout the concrete via mixing mechanics. These air bubbles act much like flexible ball bearings, thereby increasing the plasticity and workability of the concrete. Surface bleeding, plastic shrinkage and aggregate segregation are also minimized.

Through the purposeful entrainment of air, AIRALON® 7000 markedly increases the durability of concrete to severe exposures, particularly freeze-thaw cycling. It has also demonstrated a remarkable ability to impart resistance to the action of frost and de-icing salts as well as sulfate, sea and alkaline waters.

Addition Rates

AIRALON® 7000 admixture addition rates will vary according to the specified level of air required. Addition rates are influenced by several variables including: specific mix design parameters, material properties of the cement, fly ash, coarse and fine aggregates, and the effects of other chemical admixtures. Other factors such as ambient and concrete temperature, mixing time and time of addition can also affect the required dosage rates. It is recommended that pre-job testing be conducted in order to assure the correct dosage rate of AIRALON® 7000 admixture is used. Typical AIRALON® 7000 admixture addition rates range from ½ to 3 fl oz/100 lbs (30 to 200 mL/100 kg) of cement.

Concrete Mix Adjustment

Entrained air will increase the volume of the concrete making it necessary to adjust the mix proportions to maintain the cement factor and yield. This may be accomplished by a reduction in water requirement and aggregate content.

Compatibility with Other Admixtures and Batch Sequencing

AIRALON® 7000 admixture is compatible with most GCP admixtures as long as they are added separately to the concrete mix. In general, it is recommended that AIRALON® 7000 admixture be added to the concrete mix near the beginning of the batch sequence for optimum performance, preferably by "dribbling" on the sand. Different sequencing may be used if local testing shows better performance.

Please see GCP Technical Bulletin TB-0110, Admixture Dispenser.

Discharge Line Location and Sequencing for Concrete Batching Operations for further recommendations. AIRALON® 7000 admixture should not be added directly to heated water.

Pretesting of the concrete mix should be performed before use, as conditions and materials change in order to assure compatibility, and to optimize dosage rates, addition times in the batch sequencing and concrete performance. Please consult your GCP Applied Technologies representative for guidance.

Packaging & Handling

AIRALON® 7000 is available in bulk, delivered in metered tank trucks, totes and drums.
AIRALON® 7000 freezes at about 30 °F (-1 °C), but its air-entraining properties are completely restored by thawing and thorough mechanical agitation.

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement,

Dispensing Equipment

A complete line of automatic dispensing equipment is available. Accurate and simple, these dispensers are easily installed to discharge product into the water line, on the sand, or directly into the mixer.

Specifications

Concrete shall be air entrained concrete, containing 4% to 8% entrained air. The air contents in the concrete shall be determined by the pressure method (ASTM Designation C231), volumetric method (ASTM Designation C173) or gravimetric method (ASTM Designation C138). The air-entraining admixture shall be AIRALON® 7000, as manufactured by GCP Applied Technologies, or equal. The air-entraining admixture shall be added at the concrete mixer or batching plant in such quantities as to give the specified air contents.

GCP Applied Technologies Inc., 2325 Lakeview Parkway, Suite 400, Alpharetta, GA 30009, USA

GCP Canada Inc., 294 Clements Road West, Ajax, Ontario, Canada L1S 3C6

This document is only current as of the last updated date stated below and is valid only for use in the United States. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.com. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last updated: 2023-06-28

gcpat.com/solutions/products/air-entraining/airalon-7000-data-sheet

ZYLA® 610 Data Sheet

Water-reducing admixture -- ASTM C494 Type A and D

Product Description

ZYLA®610 water-reducing admixture is a proprietary formulation incorporating highly purified specialty organic chemicals. ZYLA®610 promotes more complete hydration of Portland cement and has no effect on concrete air entrainment.

The ZYLA®product line of water reducers is specially formulated to have a synergistic effect with polycarboxylate-based mid-range and high-range water reducers that improve flat-work finishability. This product does not contain intentionally added chloride and as such is essentially chloride free. It is manufactured under rigid controls that provide uniform, predictable performance. ZYLA®610 is supplied as a light brown, low viscosity liquid and is ready-to-use as received. One gallon weighs approximately 9.1 lbs (1.1 kg/L).

Product Advantages

- No impact on concrete air content
- Better control of water reduction and setting times as compared to traditional lignin-based water reducers
- Synergistic performance of polycarboxylate-based mid-range and high-range water reducers, which includes water reduction, concrete strength and air control
- In the hardened state, improves the compressive and flexural strengths at all ages of concrete versus traditional lignin-based water reducers

Uses

ZYLA®610 is used to produce concrete mixes with lower water content (typically 3% to 10% reduction), greater plasticity and higher compressive strengths. ZYLA®610 is suitable for normal weight and light weight concrete in ready-mix, precast and prestressed applications.

Finishability

The unique chemistry of ZYLA®610 positively impacts the finishability of concrete by providing a creamier and more homogenous texture, with more uniform bleed rate relative to traditional lignin-based water reducers. The influence of ZYLA®610 on the finishability of lean mixes has been particularly noticeable. Floating and troweling, by machine or hand, imparts a smooth, close tolerance surface.

Addition Rates

The addition rate range of 3 to 5 fl oz/100 lbs (195 to 325 mL/ 100 kg) of cement or cementitious is typical for most applications. However addition rates of 2 to 7 fl oz/100 lbs (130 to 455 mL/100 kg) of cement or cementitious may be used if local testing shows acceptable performance. Pretesting is required to determine the appropriate addition rate for desired performance. The optimum addition rate depends on the other concrete mixture components, job conditions and desired performance characteristics.

Compatibility with Other Admixtures and Batch Sequencing

ZYLA®610 is compatible with most GCP admixtures as long as they are added separately to the concrete mix, usually through the water holding tank discharge line. In general, it is recommended that ZYLA®610 be added to the concrete mix near the end of the batch sequence for optimum performance. Different sequencing may be used if local testing shows better performance. Please see GCP Technical Bulletin TB-0110, *Admixture Dispenser Discharge Line Location and Sequencing for Concrete Batching Operations* for further recommendations.

Pretesting of the concrete mix should be performed before use, as conditions and materials change in order to assure compatibility, and to optimize dosage rates, addition times in the batch sequencing and concrete performance. For concrete that requires air entrainment, the use of an ASTM C260 air-entraining agent (such as Daravair®or Darex® product lines) is recommended to provide suitable air void parameters for freeze-thaw resistance. Please consult your GCP Applied Technologies representative for guidance.

Packaging & Handling

ZYLA®610 is available in bulk, delivered by metered tank trucks, in totes, and in drums.

ZYLA®610 will freeze at about 23.7°F (-4.6°C), but will be completely uniform after thawing and thorough agitation.

Dispensing Equipment

A complete line of accurate, automatic dispensing equipment is available. ZYLA®610 may be introduced to the concrete mix through the water holding tank discharge line. The ZYLA®product line is formulated to be free of sediment.

Specifications

Concrete shall be designed in accordance with *Standard Recommended Practice for Selecting Proportions for Concrete*, ACI 211. The water-reducing admixture shall be ZYLA®610, as manufactured by GCP Applied Technologies, or equal. The admixture shall not contain calcium chloride as a functional ingredient. ZYLA®610 will not promote corrosion of reinforcing steel embedded in concrete. It shall be used in strict accordance with the manufacturers' recommendations. The admixture shall comply with ASTM Designation C494, Type A water reducing and Type D water reducing and retarding admixtures. Certification of compliance shall be made available on request.

The admixture shall be delivered as a ready-to-use liquid product and shall require no mixing at the batching plant or job site.

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Last Updated: 2022-08-17

gcpat.com/solutions/products/zyla-water-reducing-admixtures/zyla-610-data-sheet

RECOVER® Data Sheet

Hydration stabilizer ASTM C494 Type B and D

Product Description

RECOVER®is a ready-to-use aqueous solution of chemical compounds specifically designed to stabilize the hydration of Portland cement concretes. The ingredients are factory pre-mixed in exact proportions under strict quality control to provide uniform results. One gallon weighs approximately 9.6 lbs (1.15 kg/L).

Product Advantages

- Eliminates the need to discharge wash water from the mixer
- Prevents the waste of unused concrete
- Provides predictable extended set for continuous placement on mass concrete and tremie projects, or on long hauls to remote sites

Uses

RECOVER®is used to stabilize mixer wash water and returned or leftover concrete for extended periods, allowing for use of the materials when specified or allowed. It is also used where controlled extended set of concrete is needed. It is the concrete user's responsibility to determine if leftover, returned or extended-set concrete is specified or allowed.

Wash Water

For wash water applications, RECOVER®is used to eliminate the need to discharge wash water from the mixer. This allows the wash water to be used as mix water in the next batch of concrete produced and prevents the residual plastic concrete from hardening. Stabilization of up to 96 hours is possible depending on dosage rate.

Returned Concrete

For returned or leftover concrete, RECOVER®is used to prevent plastic concrete from reaching initial set. This allows the concrete to be stored in a plastic state and then used when specified or allowed. The use of this concrete may require the addition of freshly batched concrete and/or an accelerator such as DARACCEL®or POLARSET®.

Stabilization of concrete for up to 96 hours is possible depending on dosage rate. Use prevents the waste of unused concrete.

Set Time Control

RECOVER®is also used in situations where a controlled set time extension is required. Examples include: extended hauls, large continuous pours or pre-batching of concrete for later use.

Addition Rates

Addition rates of RECOVER®for wash water range from 6 to 128 fl oz (180 to 3800 mL) per treatment. The amount used will depend on the specific materials involved, mixer type and stabilization period. Addition rates for returned or leftover concrete will range from 3 to 128 fl oz/100 lbs (195 to 8350 mL/100 kg) of cement. The amount used will depend on the specific materials involved, concrete age, temperature conditions and stabilization period. For applications requiring set time extensions well in excess of 4 hours, RECOVER®may be used at addition ranges from 5 to 50 oz/100 lbs (325 to 3260 mL/100 kg) of cement. For use as a traditional ASTM Type B or D retarder, RECOVER® may be used at addition rates of 2 to 6 oz/100 lbs (130 to 390 mL /100 kg) of cement. Proper dosage rate selection can only be achieved through pretesting. Consult your local GCP Applied Technologies admixture representative.

Compatibility with Other Admixtures and Batch Sequencing

RECOVER®is compatible with most GCP admixtures as long as it is added separately to the concrete mix, usually through the water holding tank discharge line. In general, it is recommended that RECOVER®be added to the concrete mix near the end of the batch sequence for optimum performance. Different sequencing may be used if local testing shows better performance. Please see GCP Technical Bulletin TB-0110, *Admixture Dispenser Discharge Line Location and Sequencing for Concrete Batching Operations* for further recommendations.

Pretesting of the concrete mix should be performed before use, as conditions and materials change in order to ensure compatibility, and to optimize dosage rates, addition times in the batch sequencing and concrete performance. For concrete that requires air entrainment, the use of an ASTM C260 air entraining agent (such as Daravair®or Darex® product lines) is recommended to provide suitable air void parameters for freeze-thaw resistance. Please consult your GCP Applied Technologies representative for guidance.

Packaging & Handling

RECOVER®is available in bulk, delivered by metered tank trucks, totes and drums.

RECOVER®will freeze, but will return to full effectiveness after thawing and thorough mechanical agitation.

Performance

RECOVER®stabilizes the hydration process of Portland cement preventing it from reaching initial set. This stabilization is not permanent and is controlled by dosage rate. For wash water, the RECOVER®treated water is mixed or sprayed in a specific manner to thoroughly coat the interior of the mixer. The water is used as mix water in the next batch of concrete produced, which then scours the unhardened material from the interior of the mixer. Stabilization of returned or leftover concrete with RECOVER®maintains the plasticity of the concrete for the desired storage duration. This stabilized concrete then resumes normal hydration when the RECOVER®dosage effects subside, or when it is activated by the addition of fresh concrete and/or an accelerator. The result can be concrete with normal plastic and hardened properties.

Dispensing Equipment

A complete line of GCP dispensing equipment is available for RECOVER®. This includes the Reach 360TM System which uses an innovative spray wand technology to simplify wash water procedures.

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Last Updated: 2023-08-28
gcpat.com/solutions/products/recover-hydration-stabilizer/recover-data-sheet

Valued customer:

Based on current market conditions, Texas Materials: (TM) does not guarantee a single source of cement, supplementary cementitious material or aggregates for any project except by special advance arrangement. Cements used for this project meet both ASTM C-150 for Type I and II - low alkali, and ASTM C-595 for Type 1L respectively.

TM does not guarantee the color uniformity of ready-mix concrete due to: normal color variation in cement and aggregates, normal slump variation, or other conditions such as: weather, placement, consolidation, curing, leakage, or variations in form texture or surface treatments.

Furthermore, TM produces and supplies concrete in a "negligible freeze-thaw environment" per ACI 332.-20 Table 5.1.1. ASTM C-33: "Weather Probability Map for Concrete"; ACI 318-19 Chapter 19 Table 19.3.2.1."Exposure categories and classes": FO, and ACI 301-20 Chapter 4; table 4.2.2.6(c), "Requirements for exposure category: F". San Antonio, Texas Department of Transportation; (TxDOT) does not require any intentional air entrainment in their structural concrete applications per Reference Article 421.4.A.4., in your project area.

However, TM does have specialty air entrained concrete mixes with an air entrainment target of 4.5% plus or minus 1.5 %. TM does not perform quality checks of every ready mix truck for air entrainment compliance before it leaves the batching facility. TM must be notified of low or high air entrainment readings so mix adjustments of air entrainment can be made at the batch facility for successive loads of concrete. With the volatility of fly ash sources and production variances, inconsistencies can occur in the field that require adjustments to air entrainment dosage requirements. TM can only attempt to control air content requirements of all ready mix trucks on all daily projects. TM does NOT allow concrete to be rejected because of low air entrainment percentage because of the previously stated "negligible freeze-thaw requirements" for the state of Texas. TM will make every effort to adjust the air entrainment admixture dosage to come back into compliance of project specifications.

"Allowable water additions", are not to exceed the maximum water to cementitious ratio and/or maximum slump requirements, which may be added to the concrete is identified on the delivery ticket. This will indicate the water withheld from the batch. Water added in excess of this amount will reduce the concrete strength, durability, increase shrinkage cracking and alter aesthetic properties which will be at the customer's risk and responsibility. Maximum specified slump may not be exceeded regardless of the amount of water withheld.

Texas Materials only guarantees slump at the initial point of discharge; (ready mix truck chute) and is not responsible for slump loss due to pumping or excessive wait times on project worksites. ASTM C-94, Section 7.2 states that the ready mix supplier is only responsible for ready mixed concrete remaining in the permissible slump range for 30 minutes after arrival to the jobsite.

Unless otherwise prearranged, specialty non-standard testing on all concrete and/or constituent materials (aggregates, cements, mineral fillers, etc.) is the contractor's (buyer) responsibility and will be arranged and paid for by the buyer/contractor. This includes but is not limited to drying shrinkage values, solar reflectivity index, chloride ion, ASR, slump loss curve, 3-point water to cementitious ratio curve, etc.

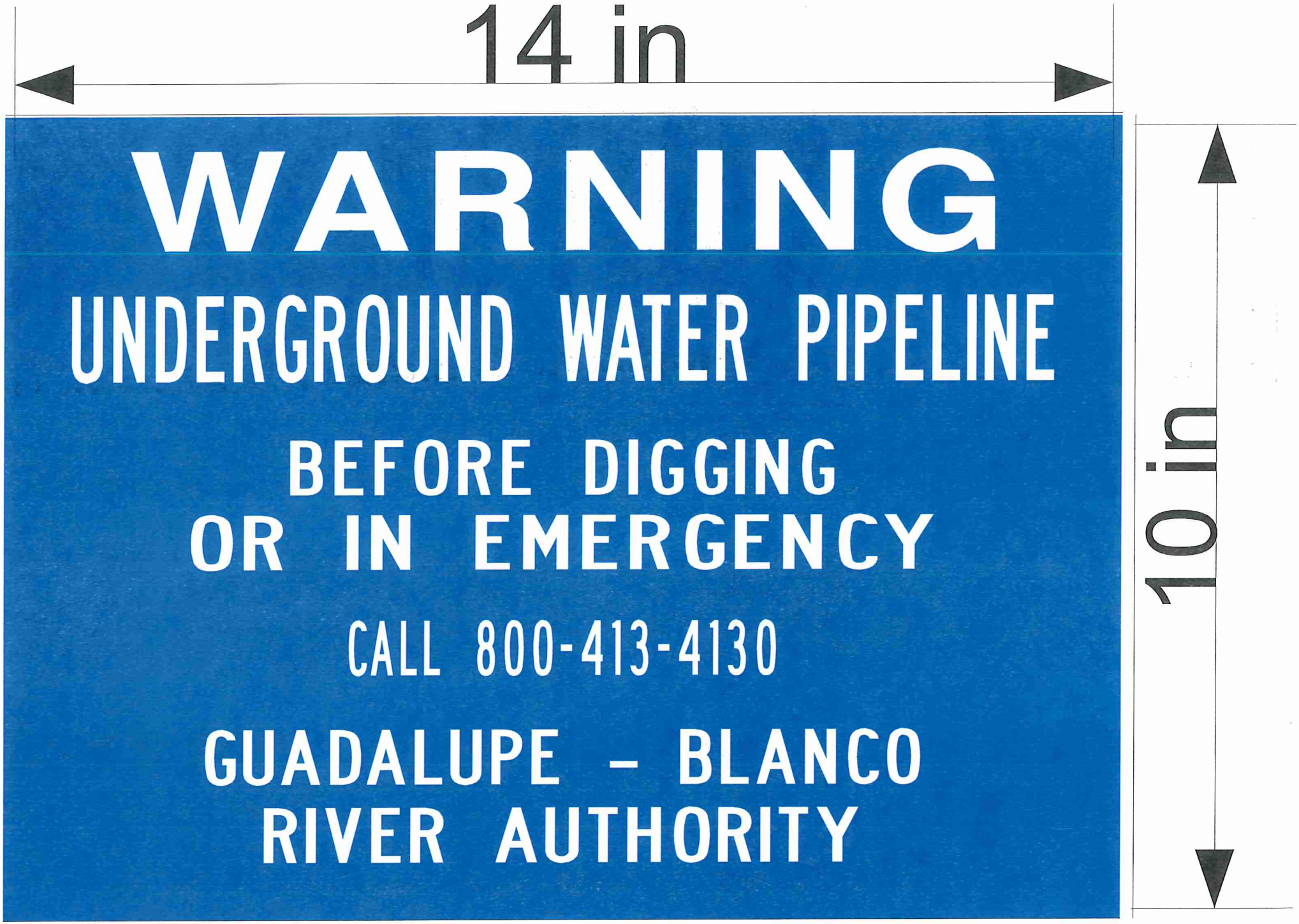
When a project specifies a maximum concrete temperature not to be exceeded it is the responsibility of the purchaser to inform TM of this maximum temperature and how the purchaser would prefer to control said concrete temperature. The purchaser can request their requirement to be controlled by Liquid nitrogen, chilled water and/or ice from the supplier. The purchaser assumes all responsibility for arranging payment to control a specified temperature requirement. TM does not have the necessary equipment to heat water and/or aggregates to attain a minimum concrete temperature specification.

Please contact your account manager for information and pricing of temperature control.

The addition of any additives not supplied by TM; including, but not limited to pigments, fibers, water proofers and/or water repellent admixtures, foaming admixtures, foaming agents, air entrainers or defoamers and others, voids the warranty of the performance of the concrete. The concrete must be tested prior/after to the addition of any additives for the strength warranty to be valid. The contractor is responsible for determining the effects such additives have on the fresh and hardened concrete.

Texas Materials per ASTM C94, Option C; 6.8 requests, "The purchaser shall ensure that the producer is provided copies of all reports of tests performed on concrete samples taken to determine compliance with specification requirements. Reports shall be provided on a timely basis".

Sincerely,
Texas Materials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