

PRODUCT CATALOG



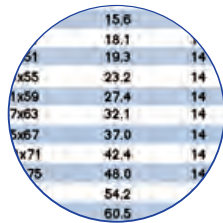
PACIFIC CORRUGATED PIPE COMPANY[®]

“At your service since 1935”



5

TYPES OF METAL & PIPE



	15.6	
	18.1	
	19.3	14
51	23.2	14
55	27.4	14
59	32.1	14
63	37.0	14
67	42.4	14
71	48.0	14
75	54.2	
	60.5	

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DESIGN TABLE



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SLOTTED DRAIN



27

HDPE SPECIFICATIONS

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COMPANY HISTORY



Winfield E. Hall moved west after graduating from business college in the early 1900's. He educated himself in the road construction business while working for William Johnson Construction Company. After several years of learning the business, Mr. Hall incorporated W.E. Hall in 1933 and focused the company on building roads, highways, subdivisions, reservoirs and horse racetracks. In fact, W.E. Hall Company participated in the construction of both the Hollywood Park and Santa Anita Racetracks in California.

Then, in 1935, the operation was formed into Pacific Corrugated Pipe Company. As Pacific Corrugated Pipe grew, Mr. Hall summoned the talents of his two sons...Robert "Bob" Ernest Hall and Winfield Earl Hall, Jr. to the company in 1942 and 1945 respectively. It was with their collective vision and commitment to growing the industry that the Halls were successful in building both the industry and Pacific Corrugated Pipe's business. Winfield, Bob and Win Jr. accomplished this by understanding that high quality products provided with courteous and professional



service kept customers coming back, and the company has evolved by creating innovations in drainage systems. The high standards that Mr. Hall and his sons put in place over 80 years ago continue to guide our business practices today. We supply our customers with quality products that are serviced with local sales support who deliver on our promises with the highest ethical business practices. We believe that a promise and a handshake are still worth something.

Pacific Corrugated Pipe produces Corrugated Metal Pipe (CMP) and Corrugated High Density Polyethylene (HDPE) Pipe, along with complementary fittings and drainage accessories, at five production and distribution facilities located throughout the Western United States. Additionally, we operate two separate stocking yards. Our administrative headquarters office is based in beautiful Newport Beach, California.



“At your service since 1935”



**FIVE MANUFACTURING
LOCATIONS SERVING
THE WESTERN STATES**
(INCLUDING ALASKA, HAWAII & GUAM)

- ★ MANUFACTURING & SALES LOCATIONS
- STOCKING YARD & SALES LOCATION
- ▲ SALES OFFICE




Pacific Corrugated Pipe Co. has been manufacturing corrugated metal pipe and related drainage products since 1935. Throughout its long history, our company has been a leader in product research and development having contributed many new products, processes, and product improvements to the industry. Some of these include Spiral Rib Pipe, fully asphalt lined corrugated pipe, the adaptation of spot welding technology and various polymeric pipe coatings to our industry.

Our goal is to earn customer loyalty and generate repeat business by:

- ★ Supplying the highest quality products at competitive prices
- ★ Maintaining the highest possible level of customer service
- ★ Providing timely delivery for all orders

We encourage all inquiries and welcome the opportunity to serve your drainage product needs.

The  is a registered trademark of Pacific Corrugated Pipe Company.

This catalog illustrates the wide variety of products available from Pacific Corrugated Pipe Company and provides useful information about these products. In many cases only a few diagrams and sentences are used to describe products which require additional brochures or catalogs. Complete descriptions, prices, brochures, and technical information on any of our products are available upon request.

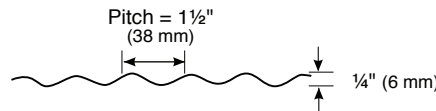
CORRUGATED METAL TYPES



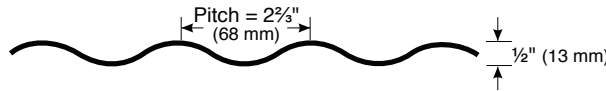
MADE
IN USA

Corrugation profiles provide structural rigidity to the pipe wall and they are intended to resist deflection during installation and provide strength to the backfilled structure. A variety of different shapes and profile sizes are available, which are summarized in the tables below. When designing a pipe system, some influencing factors for selecting the most appropriate corrugation profile include diameter, depth of burial, loading requirements, backfill material, hydraulic factors and budgetary considerations.

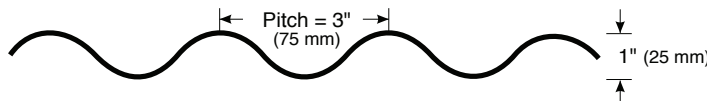
SPIRAL CORRUGATED METAL PIPE



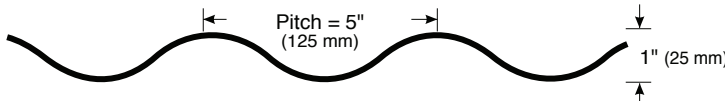
6", 8" & 10" diameters only
steel - .064" thick
aluminum - .060" thick



12" - 96" steel (.064" - .168" thick)
12" - 72" aluminum (.060" - .135" thick)

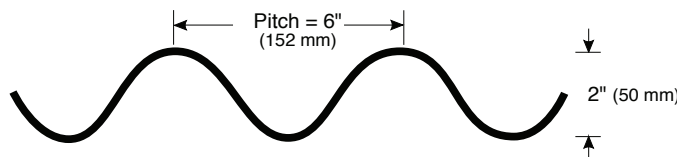


42" - 144" steel (.064" - .168" thick)
42" - 132" aluminum (.060" - .135" thick)



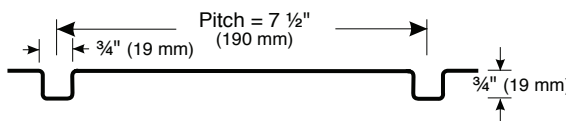
42" - 144" steel (.064" - .168" thick)

STRUCTURAL PLATE

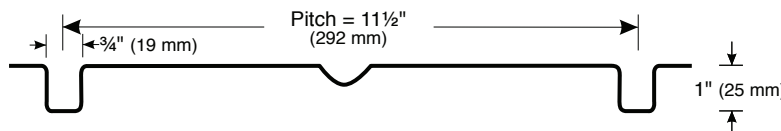


All structural plate products, which include round pipe, pipe-arch, arch, box culvert, underpass, and specialty products. Available in Steel and Aluminum.

SPIRAL RIB PIPE

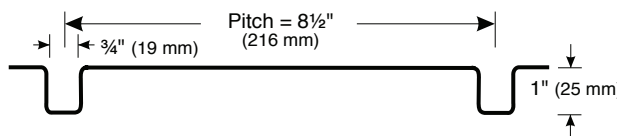


18" - 102" steel (.064", .079", & .109" thick)
18" - 72" aluminum (.060", .075", & .105" thick)



18" - 108" steel (.064", .079", & .109" thick)
24" - 72" aluminum (.060", .075", & .105" thick)

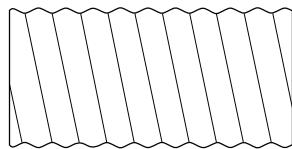
SPECIAL LARGE DIAMETER SPIRAL RIB TYPE



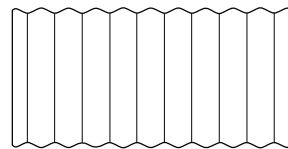
72" - 144" steel (.064", .079", & .109" thick)
72" - 96" aluminum (.075" - .105" thick)

SPIRAL RIB PIPE PRODUCTS

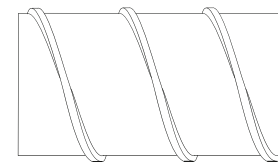
CORRUGATION TYPES



HELICAL CMP
Helical pipe has spiral corrugations



ANNULAR CMP
Annular pipe has corrugations perpendicular to the center line of the pipe



SPIRAL RIB PIPE
Outside rectangular helical ribs

CORRUGATED PIPE PRODUCTS

INQUIRE FOR PRODUCT WEIGHTS

www.pcpipe.com



CORRUGATED METAL PIPE (CMP, CSP, CASP, CAP)

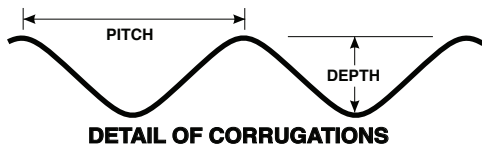
Corrugated metal pipe is used extensively in flood control, drainage and sewer systems because of its economic value, strength and durability. The pipe is usually fabricated in 20-foot sections; however, sections in other lengths are available. The available diameters range from 6 inches to 96 inches and the available wall thicknesses are .064 inches (16 gage), .079 inches (14 gage), .109 inches (12 gage), .138 inches (10 gage), and .168 inches (8 gage). The pitch of the corrugation is two and two-thirds inches and the depth is one-half inch. For 6, 8, and 10-inch pipe the pitch is one and one-half inches and the depth is one-fourth inch. (See detail on this page for definitions of pitch and depth.)



CORRUGATED METAL PIPE-ARCH (CMPA, CSPA, CASPA, CAPA)

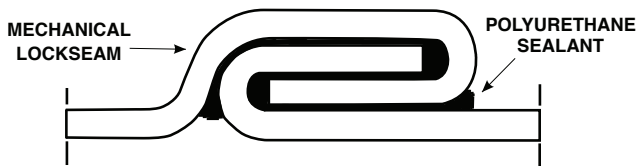
Corrugated metal pipe-arch performs the same functions as round pipe and is used primarily where there is limited headroom or cover over the pipe or where the hydraulic conditions necessitate its use. Corrugated metal pipe-arch, like corrugated metal pipe, is usually fabricated in 20-foot sections, although sections of other lengths are available.

The pipe-arch is available in many sizes. The minimum span x rise is 17 x 13 inches and the maximum is 83 x 57 inches. The available wall thicknesses are .064 inches (16 gage), .079 inches (14 gage), .109 inches (12 gage), .138 inches (10 gage), and .168 inches (8 gage). The pitch of the corrugations is two and two-thirds inches, and the depth is one-half inch (see detail on this page for definitions of pitch and depth).



PACIFIC "SEAM-TITE" LOCKSEAM SEALANT SYSTEM

"Seam-Tite" is a high performance single component polyurethane sealant placed permanently in the mechanical lockseam of corrugated or metal pipe. "Seam-Tite" is used in special applications to ensure a leak resistant pipe barrel. "Seam-Tite" is used on low pressure and gravity flow piping systems and is available on all our lockseam pipe products. Welded seam pipe is also available.



DEEP CORE (3x1 & 5x1)

Deep Core is corrugated metal pipe which has a pitch of three inches or five inches and a depth of one inch (see detail on this page for definitions of pitch and depth).

For larger diameters, this corrugation profile allows the user of lighter gauge material for any given loading condition and reduces the weight and cost of corrugated metal pipe by 30% to 60%. The use of Deep Core provides economy and strength in larger diameters. The standard length is 20 feet, although other lengths are available. The available diameters range from 42 inches to 144 inches. The available wall thicknesses are .064 inches (16 gage), .079 inches (14 gage), .109 inches (12 gage) and .138 inches (10 gage) and .168 inches (8 gage).

DEEP CORE (3x1 & 5x1) PIPE-ARCH

Deep Core can also be arched where limited head room is encountered. The available wall thicknesses are .079 inches (14 gage), .109 inches (12 gage) and .138 inches (10 gage). The minimum span x rise is 53 inches x 41 inches and maximum is 171 inches x 110 inches.

*Refer to technical manuals for heights of cover, size, and gauge tables.
Contact Pacific Corrugated Pipe Company for reference publications.*

SPIRAL RIB PIPE (SRP) is one of many innovative pipe products developed by Pacific Corrugated Pipe Company during its long history in the drainage industry. This efficient product was developed in response to the needs of drainage designers for a pipe product with the hydraulics of smooth wall pipe plus the many other advantages of corrugated metal pipe.

Pacific Corrugated Pipe Company has developed a variety of rib profiles to provide the widest range of sizes available in the industry. SRP is available in sizes of 18 inches through 144 inches in steel and 18 inches through 96 inches in aluminum alloy.

Fabrication: SRP is a flexible metal conduit manufactured from a continuous strip of galvanized steel, aluminized Type II steel, or aluminum alloy. Available steel thicknesses are .064 inch, .079 inch, and .109 inch. Available aluminum thicknesses are .060 inch, .075 inch, and .105 inch. The coil strip is passed through a forming line which forms the ribs and prepares the edges. The formed section is then helically wound into pipe and the edges are joined by mechanical lockseaming.



SRP Hydraulic Performance Characteristics: A series of tests conducted at Utah State University concluded that SRP has a Manning's "n" value of 0.011 – commensurate with both concrete and HDPE pipe. 24" and 36" diameter SRP was tested by Utah State University's Water Research Laboratory (Report No. 83, 1983)¹ in both open channel and closed conduit flow conditions. A section of the 36" SRP was also tested with the ribs filled internally using neoprene rubber to evaluate the ribs' impact on flow performance. It was found that ribs contribute a negligible increase to the "n" value.

Manning's Formula: $Q = \frac{1.486}{n} A \sqrt{S} R^{\frac{2}{3}}$

$n = 0.011$

$Q = (VA) = \text{flow rate (ft}^3/\text{s)}$

$n = \text{Manning's friction coefficient}$

$S = \text{slope of the energy grade line}$

$R = \text{hydraulic radius (ft)}$

$A = \text{cross sectional flow area (ft}^2\text{)}$

$V = \text{average flow velocity (ft/s)}$



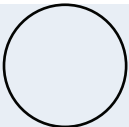
¹Tullis, J.P., "Friction Factor Tests on Spiral-Rib Pipe". Hydraulic Report No. 83, Utah Water Research Laboratory, Utah State University, April, 1983.

Applications: Spiral Rib Pipe is commonly specified for storm drain, irrigation, and small hydro projects. SRP should be considered for use on any project where hydraulic efficiency is a design criterion. Tens of millions of feet of SRP are currently in use worldwide.



Consult Pacific Corrugated Pipe Co. for additional technical information including height of cover tables, test reports, specifications, and installation information. (Separate brochures available).

DESIGN TABLE



CORRUGATED STEEL ROUND PIPE

H-20
OR H-25
LOADING

DIAMETER (INCH) PROFILE		END AREA (Sq. Ft.)	MIN. GAGE	MIN. COVER ¹ (INCH)	MAX. COVER ² (FEET)	WEIGHT (Lbs./Ft.)
2-2/3 x 1/2	3x1 / 5x1*					
12	-	0.8	16	12	248	10
15	-	1.2	16	12	198	12
18	-	1.8	16	12	165	15
24	-	3.1	16	12	124	19
30	-	4.9	16	12	99	24
36	-	7.1	16	12	83	29
42	-	9.6	16	12	71	34
48	-	12.6	16	12	62	38
54	-	15.9	14	12	67	54
-	54	15.9	16	12	56	50
60	-	19.6	12	12	80	81
-	60	19.6	16	12	51	55
66	-	23.1	12	12	68	89
-	66	23.1	16	12	46	60
72	-	28.3	10	12	75	123
-	72	28.3	16	12	42	66
-	78	33.2	16	12	39	71
-	84	38.5	16	12	36	77
-	90	44.2	16	12	34	82
-	96	50.3	16	12	32	87
-	102	56.8	16	18	30	93
-	108	63.6	14	18	35	120
-	114	70.9	14	18	33	127
-	120	78.5	14	18	30	134
-	126	86.6	12	24	39	195
-	132	95.0	12	24	36	204
-	138	103.9	12	24	33	213
-	144 ³	113.1	10	24	40	282

*Max covers are for 5x1 corrugation. Increase these 12% for 3x1 corrugation.

1. Minimum cover is measured from top of pipe to top of subgrade or top of rigid pavement. Minimum cover for heavy construction equipment or other excessive loading is 48 inches. H-20 or H-25 live loads are assumed in all cases.
2. Maximum height of cover is based on minimum gages shown. Thicker gauges, where available, can accept greater heights of cover and extend service life. Contact Pacific Corrugated Pipe Company for complete tables for all corrugated pipe products with available gages and corresponding height of cover tables.
3. 144 inch and larger diameters exceed the flexibility factor ($ff \leq 0.033$) allowable in AASHTO Bridge Specifications (Section 12) for 3"x1" or 5"x1" corrugation pipe in embankment type installations. Flexibility factor can be increased to $ff \leq 0.060$ in accordance with ASTM Specification A 796 for trench type installations. Contact Pacific Corrugated Pipe Company for information on recommended backfill materials and procedures for installing large diameter corrugated metal pipe.

NOTE: Pipe-arch dimensions shown are nominal and should not be used to design headwall structures or for other uses where dimensions are critical. Actual dimensions will be "plus" in the rise dimension and "minus" in the span dimension. Contact your Pacific Corrugated sales engineer for manufacturing tolerances and layout details for pipe-arches, and for complete height of cover tables for all other corrugated pipe products.

The information in this brochure should be checked in detail by the professional engineer responsible for the project design to verify its accuracy; also, the assumptions and methods used to obtain the information should be reviewed to make certain they are applicable and suitable for the design.

Tables adapted from AISI Handbook of Steel Drainage and Construction Products.

DESIGN TABLE



CORRUGATED STEEL PIPE-ARCH

H-20 OR H-25
LOADING

EQUIV. DIAMETER (INCH)	SPAN X-RISE (INCH)	END AREA (Sq. Ft.)	MIN. GAGE ⁵	MIN. COVER ¹ (INCH)	MAX. COVER ⁴ (FEET)	WEIGHT (Lbs./Ft.)	PROFILE (INCH)
24	28x20	2.9	16	12	15	19	2-2/3x1/2
30	35x24	4.5	16	12	15	24	2-2/3x1/2
36	42x29	6.5	16	12	15	29	2-2/3x1/2
42	49x33	8.9	14	12	15	42	2-2/3x1/2
48	57x38	11.6	12	12	15	65	2-2/3x1/2
54	64x43	14.7	12	12	15	73	2-2/3x1/2
54	60x46	15.6	14	15	25	61	3x1 / 5x1
60	71x47	18.1	10	12	15	103	2-2/3x1/2
60	66x51	19.3	14	15	25	67	3x1 / 5x1
66	73x55	23.2	14	18	24	74	3x1 / 5x1
72	81x59	27.4	14	18	21	81	3x1 / 5x1
78	87x63	32.1	14	18	20	87	3x1 / 5x1
84	95x67	37.0	14	18	20	94	3x1 / 5x1
90	103x71	42.4	14	18	20	100	3x1 / 5x1
96	112x75	48.0	14	21	20	107	3x1 / 5x1
102	117x79	54.2	12	21	19	155	3x1 / 5x1
108	128x83	60.5	12	24	19	165	3x1 / 5x1
114	137x87	67.4	12	24	19	174	3x1 / 5x1
120	142x91	74.5	10	24	19	234	3x1 / 5x1
126	150x96 ⁶	82.3	10	30	19	247	3x1 / 5x1
132	157x101 ⁶	90.3	10	30	19	259	3x1 / 5x1
138	164x105 ⁶	98.7	10	30	19	270	3x1 / 5x1
144	171x110 ⁶	107.4	10	30	19	282	3x1 / 5x1

Call for other sizes available that are less than 24".

1. Minimum cover is measured from top of pipe to top of subgrade or top of rigid pavement. Minimum cover for heavy construction equipment or other excessive loading is 48 inches. H-20 or H-25 live loads are assumed in all cases.
4. Maximum height of cover is based on 2-ton/square foot corner soil bearing pressure. Heights of cover can be increased up to 100% with proportional increase in corner soil bearing pressure. Support under and around the haunch is critical for pipe-arch structures. Trench conditions to at least 12-inches above spring line with slurry cement or other flowable backfill material is recommended.
5. Minimum gage is based on conditions approaching maximum height of cover. With proper design and appropriate installation techniques, thinner gages may be used when heights of cover are substantially reduced. (14-gage is minimum for 3"x1" and 5"x1" corrugation pipe-arch.)
6. Flexibility increases with span in pipe-arch structures. Backfill methods and materials must be carefully controlled to ensure proper installation of all pipe-arch structures, and special care must be taken with these larger sizes.

NOTE: Pipe-arch dimensions shown are nominal and should not be used to design headwall structures or for other uses where dimensions are critical. Actual dimensions will be "plus" in the rise dimension and "minus" in the span dimension. Contact your Pacific Corrugated sales engineer for manufacturing tolerances and layout details for pipe-arches, and for complete height of cover tables for all other corrugated pipe products.

The information in this brochure should be checked in detail by the professional engineer responsible for the project design to verify its accuracy; also, the assumptions and methods used to obtain the information should be reviewed to make certain they are applicable and suitable for the design.

Tables adapted from AISI Handbook of Steel Drainage and Construction Products.

BEVELED END OPTIONS AND PROTECTIVE COATINGS



BEVELED END with WEIRS: The addition of notched, log or straight rock retention weirs are beneficial to adding an additional controlling feature to any culvert. These are an ideal addition when the need to control fish passage is present.

Pacific Corrugated Pipe beveled end sections are a practical and visually attractive way to complete an installation that includes a slope at either end of a culvert. These beveled ends are an ideal way to prevent scour at the inlet and “undermining” at the outlet while increasing hydraulic efficiency. When the ends of corrugated pipe are beveled or skewed to match the embankment slope they will deliver the best hydraulic characteristics. Further, this style also provides for an attractive finish and is particularly cost-effective for large diameter culvert applications.

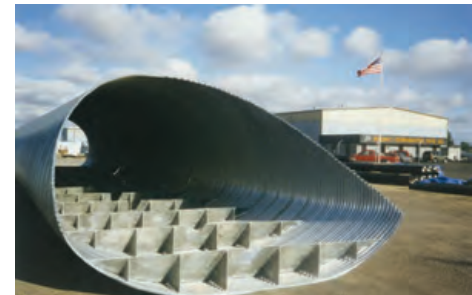


STEP BEVELED END: Our step beveled end pipe is a simple and efficient solution for passages under roadways to control the flow of water. These beveled ends allow for a natural grade to give the installation a more appealing finish.

While the principal purpose of a beveled end finish on corrugated steel pipe culverts or spillways is hydraulic efficiency – another purpose would be to improve public safety. Pacific Corrugated Pipe can fabricate our beveled end sections to blend well with any surrounding. Typical beveled ends include full beveled (also known as a mitered end), SKU-Cut or a step beveled end.

The “step beveled” end fabrications have a small vertical cut at the very end, and also at the top of the end section. Our step beveled ends can be fabricated into a single or double-step beveled end. Also, our beveled ends are available in galvanized, aluminized and poly-coated metal finishes for a wide variety of corrosion resistance and improved durability.

It should be noted that these beveled cuts interrupt the pipe ends ability to develop ring compression and measures should be taken to prevent uplift when subjected to extreme hydraulic forces. The opportunity to customize ends to your specific application should be reviewed with your local Pacific Corrugated salesperson or directly with our manufacturing plant.



LARGE DIAMETER DEEP CORE PIPE: Arch with beveled end and weir-baffles installed.

PROTECTIVE COATING OPTIONS

Supplementing the metallic coating on galvanized and aluminized type 2 steel, the following coatings can be used to develop the desired durability required to meet a variety of service conditions.



1.

1. **PARTIAL ASPHALT COATED:** A hot-dip coating of bituminous material that coats the lower 20% of the pipe. It has an approximate thickness of .05 inch on the crest of the corrugations, inside and out, and .03 inch for perforated pipe.

Asphalt provides extended service life where abrasion at the lower end of the pipe is concerned.



2.

2. **FULL ASPHALT-COATED:** A hot-dip coating of bituminous material that coats the entire pipe. It has an approximate thickness of .05 inch on the crest of corrugations, inside and out, and .03 inch for perforated pipe.

Asphalt provides extended service life where soil side corrosion is a concern.



3.

3. **POLYMERIC PRE-COATED SHEETS:** Pre-coated polymer coatings, such as Dow **Trenchcoat**® protective film, are factory applied to galvanized steel sheet prior to forming the pipe.

Polymer pre-coated steel provides a higher level of protection where interior AND exterior corrosion in mildly corrosive and/or abrasive conditions exist.



4.

4. **SPECIAL INVERT TREATMENTS:** A variety of specialized invert treatments can be used to provide protection from truly abrasive or highly corrosive flows of when a higher degree of assurance is needed. Materials commonly used for invert lining include high strength concrete, steel bars or plates and polyethylene. These can be field or factory applied.

Where abrasive or corrosive flows are most severe, special invert designs are needed to provide the highest level of protections. These systems are generally renewable and with proper maintenance can provide indefinite service life.

MOBILE MILL

Pacific Corrugated Pipe has the capability of servicing your large project at your site location with our mobile mill operation. Our mobile mill is contained on two flat bed trailers for optimal efficiency while needing limited space. Once set up,



our mill will produce corrugated steel pipe virtually identical to our fixed-mill sites which allows for installation within hours. Further, similar to our fixed-mill sites, the pipe is produced with lock seams and the end of the pipes can be “re-rolled” or re-corrugated. In essence, we are duplicating the production effort of our fixed -mills on site at your project to efficiently manufacture corrugated steel pipe for your installation.



Our mobile mill is particularly useful for projects that require large quantities of pipe; unique-sized pipe (length and/or diameter) and in support of sites that are in very remote areas where freight costs could be substantial. In many of these circumstances it becomes economically feasible to introduce our mobile mill solution. We have deployed our mobile mill operation hundreds of times with great success.



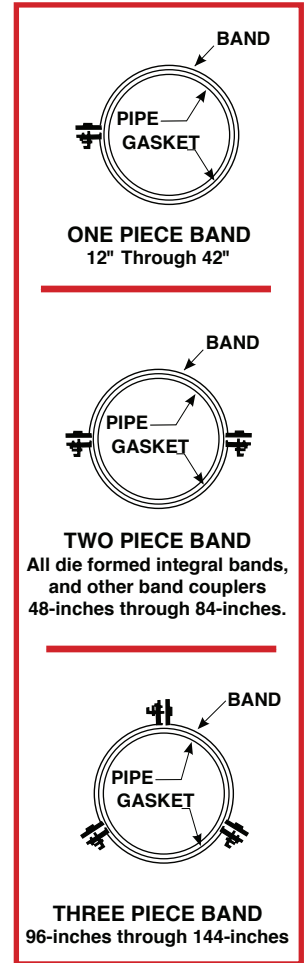
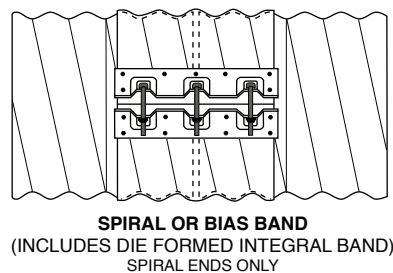
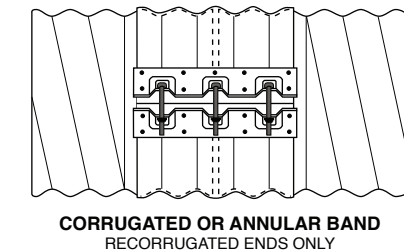
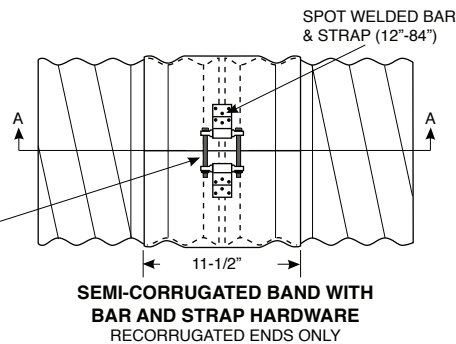
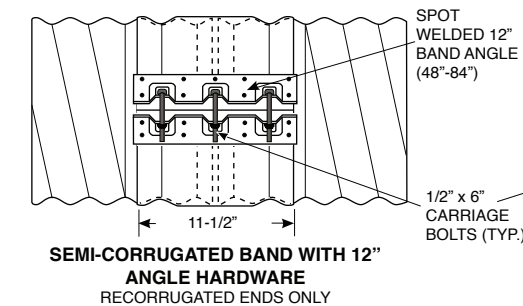
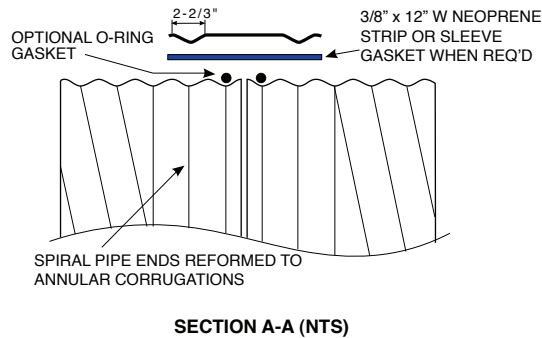
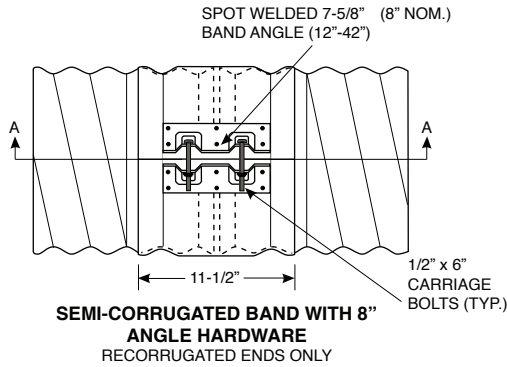
As with our fixed-mill sites, our mobile mill can produce galvanized, aluminized, polymer-coated and many other pre-coated steel product pipes. Each of these options meet the same quality construction and industry specifications of the pipe produced in our fixed-mill locations. Further, we can produce gages that range from (.064) 16 gage to (.168) 8 gage; diameters ranging from 18 inches to 21 feet; and lengths as long as 60 feet. Many corrugation profiles are available so corrugated steel pipe can be available on-site virtually anywhere (see graph below).

So, if you have a project that requires a high volume of pipe in support of caissons, large detention systems, storm drain pipe or any other CSP application our mobile mill may be your perfect solution. In order to support proper set up and delivery all site particulars should be reviewed prior to arranging and setting up our mobile operation. Contact your local Pacific Corrugated Pipe salesperson or office to discuss all the detail.



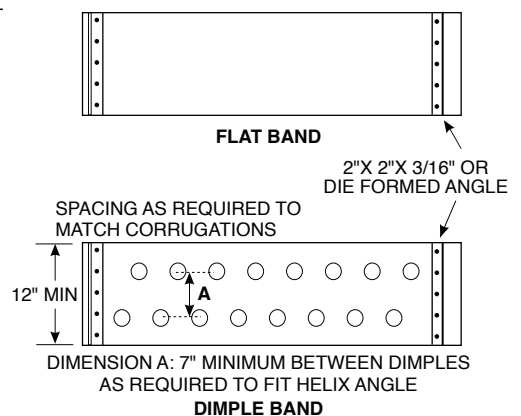
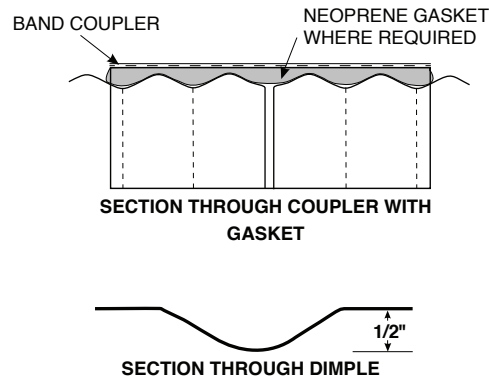
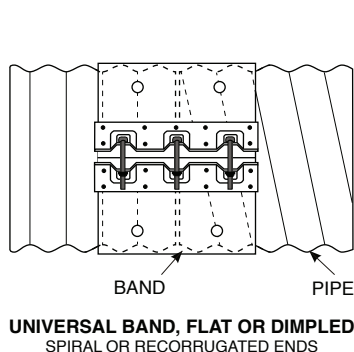
CORRUGATION PATTERN	8 GAGE	10 GAGE	12 GAGE	14 GAGE	16 GAGE
2 2/3 x 1/2	x	x	x	x	x
3 x 1		x	x	x	x
5 x 1		x	x	x	x
7 x 2		x	x	x	
SPRIAL RIB			x	x	

A band coupler is a collar or coupling which fits over adjacent ends of pipe to be joined which, when drawn tight, holds the pipe together by friction or by mechanical means. There are several types available including corrugated (annular), semi-corrugated, universal (dimple or flat), and internal expanding. Certain band couplers require specialized end treatment as indicated. Some band couplers may be available in non-standard thicknesses and widths. (Inquire)

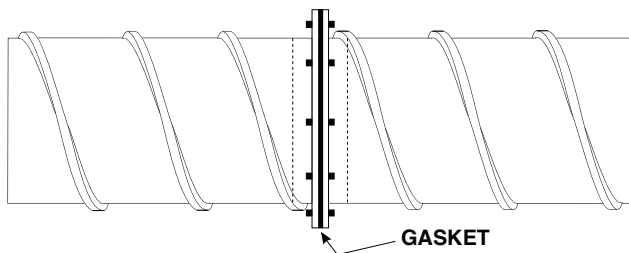


Two piece die formed bias band couplers with integral flanges are standard for all 6, 8, and 10-inch diameter pipe. They are available for all pipe with spiral ends in sizes 6-inch through 18-inch diameter, in steel or aluminum alloy.

In addition to the joint connectors shown above, the universal band may be used where the slope of the installation is minimal and backfill material is not erodible. These bands are often needed when field cutting is required or when joining to existing pipe. The flat band can be used with neoprene gaskets and recorruagated ends for silt tight joints.



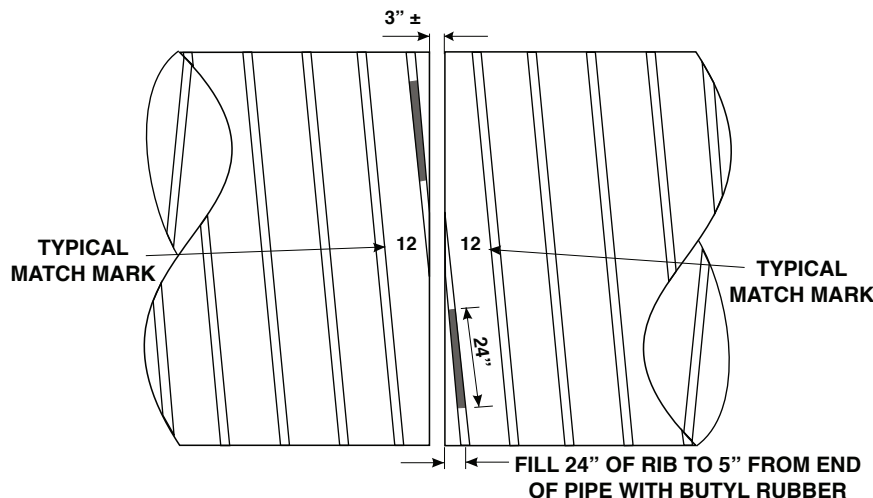
BOLTED ANGLE RING CONNECTION



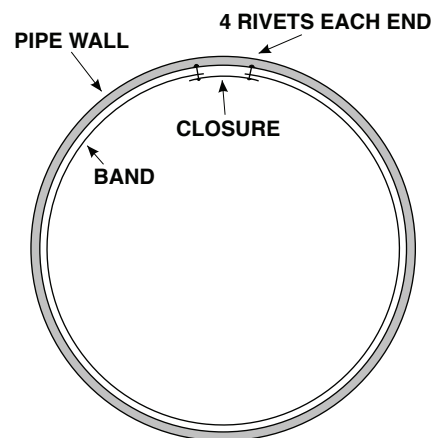
For low head installations, rolled angle flanges welded to the pipe ends with bolted connections and a full faced rubber gasket is recommended.



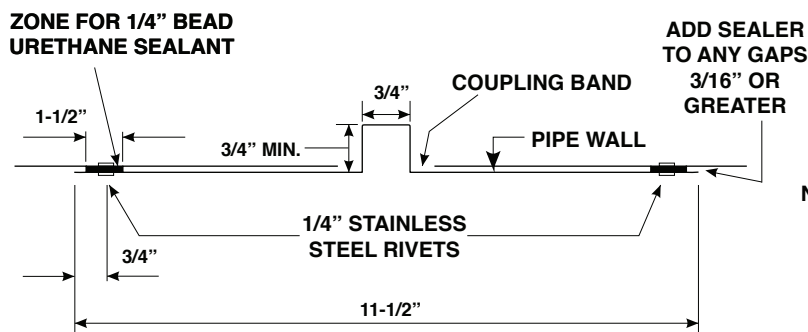
EXPANDING INTERNAL COUPLER



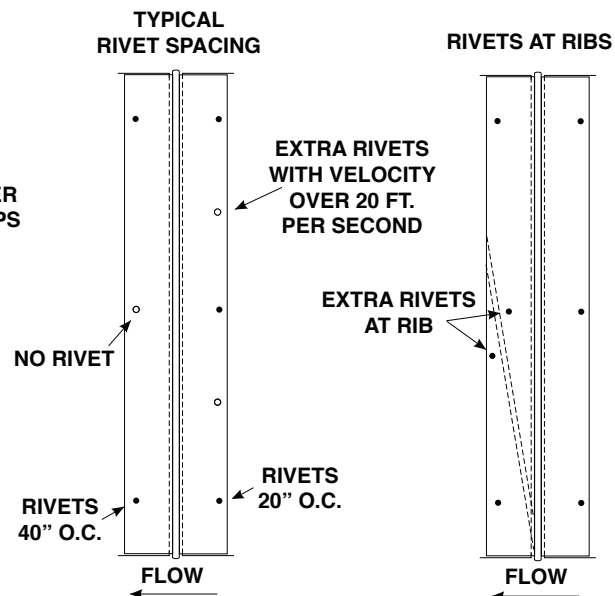
RIB ALIGNMENT AT TYPICAL JOINT



PIPE & COUPLING BAND



SECTION AT COUPLER



RIVET DETAILS

RIVETS: 1/4" HEAVY DUTY STAINLESS STEEL (HUCK, POP OR EQUAL)

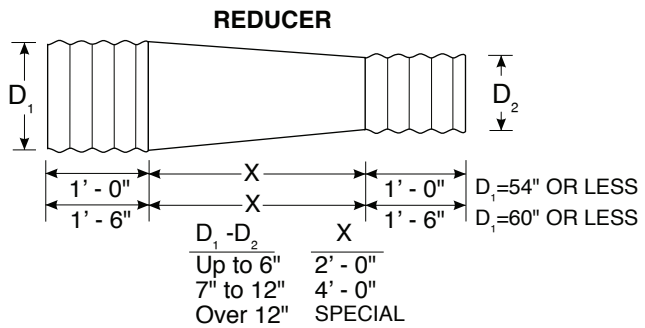
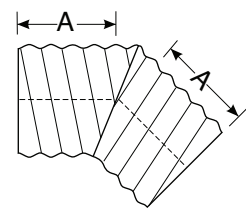
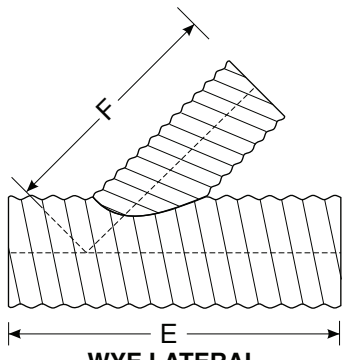
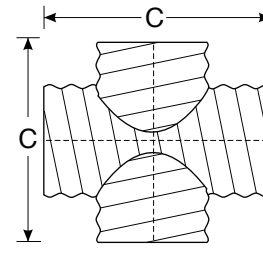
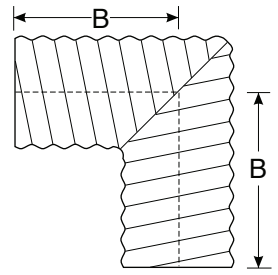
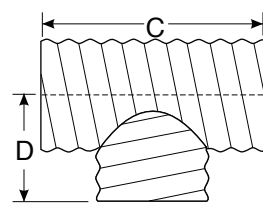
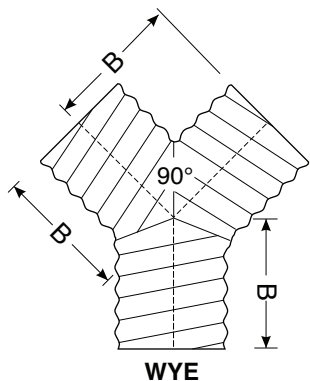
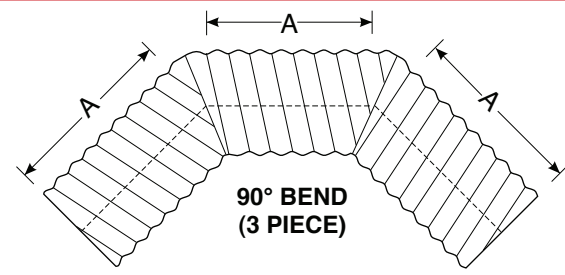
Shop fabricated fittings are available in virtually any configuration on special order. Fittings facilitate field connections and minimize flow disruption where lines merge or changes in flow direction occur.

The more common fittings are shown here. Dimensions shown on the table can be used to determine the quantity of material required for fabrication.

PIPE DIAM.	A (feet)	B (feet)	C (feet)	D (feet)	E (feet)	F (feet)
6	1	1	2	2	2	2
8	1	1	2	2	2	2
10	1	1	2	2	4	2
12	1	2	4	2	4	2
15	1	2	4	2	4	4
18	1	2	4	2	4	4
21	2	2	4	2	6	4
24	2	2	4	2	6	4
30	2	3	4	2	6	4
36	2	3	6	4	8	6
42	2	3	6	4	8	6
48	2	4	6	4	10	8
54	3	4	6	4	10	8
60	3	4	8	4	12	10
66	3	4	8	4	12	10
72	3	5	8	4	14	10
78	3	5	10	6	14	10
84	3	5	10	6	16	12
90	3	6	10	6	16	12
96	3	6	10	6	16	12

Notes:

- To use table, first refer to diagram and select letter representing desired dimension, then enter table at correct pipe dimension and read dimension in column under appropriate letter heading.
- Dimensions on table allow for use of standard 12 inch wide band coupler on sizes 12 inch through 54 inch and 24 inch wide band on 60 inch and larger sizes.
- For pipe-arch fittings, choose pipe diameter equal to or greater than arch span. (Example: 35 inch x 24 inch pipe-arch – use dimensions for 36 inch pipe).
- For mixed sizes or other configurations, inquire.
- Structural reinforcement may be required on some larger sizes.



FLASHBOARD RISERS

Flashboard risers are used to control water levels in ponds, settling basins, canals, and reservoirs. They are also used as “turnouts” to redirect water from irrigation supply canals.

Short pieces of lumber are stacked inside channels to create a variable height overflow structure.

These structures are custom fabricated to meet specific project requirements. They are available in a wide range of sizes and metal thicknesses, in steel or aluminum alloy.



TYPICAL FLASHBOARD RISER DESIGNS



FLASHBOARD RISER WITH GRATING COVER AND WING WALLS



FLASHBOARD RISER WITH WING WALLS AND GUARD RAIL

FLASHBOARD RISERS WITH SLIDE GATE

FLASHBOARD RISER W/ SCREEN, SLIDE GATE, & GRATING COVER



FLASHBOARD RISER WITH LOCKING BAR



DRAINAGE GATES

DRAINAGE GATES

There are many types of quality canal and drainage gates available to our customers. These products have been extensively used in private and municipal systems as well as projects of the U.S. Corps of Engineers, U.S. Bureau of Reclamation, and other federal and state departments of conservation and wildlife. Some common types are shown.



FLAP GATE



ALUMINUM GATE



DITCH GATE



CANAL GATE



SLUICE GATE

PERFORATED PIPE

Corrugated metal pipe is available with perforations of varying size and spacing and is primarily used for groundwater collection or recharge. Perforated pipe is used in a wide variety of applications including trench drains, structure under drains, gas collection, water wells, and dry wells. Perforated pipe is also used in retention/recharge systems where collected storm water is released into the ground through exfiltration. Pipe may be custom perforated to your specifications or in accordance with AASHTO M-36.

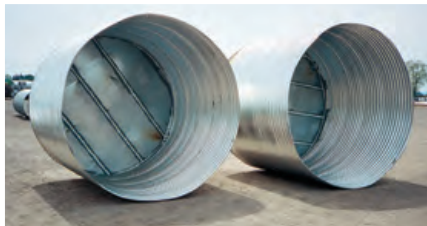


AASHTO SPECIFICATION PERFORATED FOR UNDER DRAIN

Special storm water management brochure is available on request.

CUSTOM FABRICATION

Pacific Corrugated Pipe Co. specializes in custom fabrication. Virtually any design can be fabricated in our welding shops. Our sales representatives will be happy to provide quotations for your specialized needs.



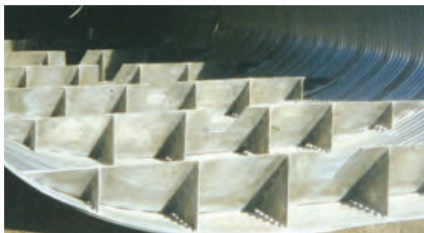
WATER TANKS



FABRICATED FITTINGS



VALVE & CONTROL BOXES



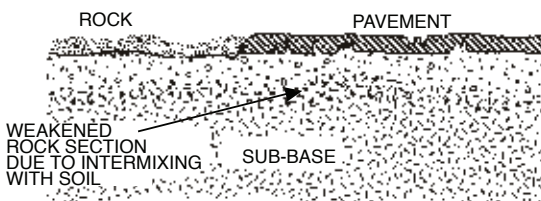
FISH BAFFLE WEIRS

GEOTEXTILES

Pacific Corrugated Pipe supplies geotextiles of virtually every type and grade. Primary functions include Separation, Reinforcement, Confinement, & Filtration. Common applications include stabilization of parking and roadway structures; filtration and drainage

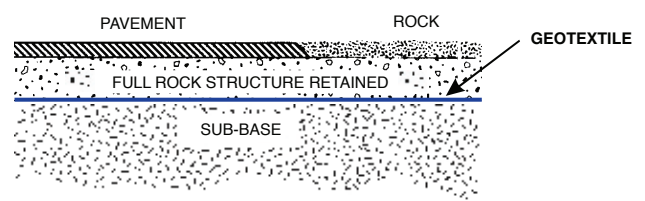
structures; construction of dams, levees, embankments, and retaining walls; landfill covers and liners; and silt fences. The full range of functions and applications are too numerous to describe here. *Contact Pacific Corrugated Pipe Co. for additional information.*

STABILIZATION FOR GRAVEL AND PAVED AREAS SUCH AS DRIVEWAYS, PARKING AND STORAGE AREAS



WITHOUT GEOTEXTILE

The "pumping action" caused by repeated wheel loading causes rock base and soil to intermix, weakening the structural base. Without a solid base, the pavement flexes and breaks up.



WITH GEOTEXTILE

Geotextile prevents intermixing of soil and rock base, retaining full rock section for maximum structural support. Reduced rock requirements and lower maintenance costs more than offset the cost of geotextile.

1. HALF ROUND PIPE (CSP, CASP, CAP)

For downslope drains, ditch liners, and areaways. Standard 10 foot lengths are furnished match punched with bolts. Also available in two foot increments in .064, .079 and .109 inch thick steel. Aluminum thicknesses are .060, .095 and .105 inch.

2. PART CIRCLE CORRUGATED SHEET

Same material as above. Available in various degrees of circle in various radii.

3. FLUME

Flume has corrugations parallel to the direction of flow and is commonly used to prevent erosion on downslope drains. Standard 10-foot lengths are fabricated from .064 inch thick galvanized steel sheets, furnished match punched with bolts. Sizes are 12 inches x 7 inches, 24 inches x 12 inches, and two piece "Super Flume", adjustable from 32 inches to 64 inches wide x 12 inches high. Anchor stakes, fittings and several types of entrance adaptors are available.

4. FLUME, STARTER SECTION

Adapts round pipe to rectangular box flume. 12 inch starter adapts 12 inch flume to 12 inch through 21 inch pipe. 24 inch starter adapts 24 inch flume to 24 inch through 36 inch pipe. Material is .064 inch thick galvanized steel. (See more flume adaptors and details on pages 21 and 22.)

5. BONNET STYLE END CAP OR COVER

Bonnet style end caps may be used to permanently or temporarily cover buried pipe ends or vertical risers. Materials and fabrication details vary with need.

6. ENTRANCE TAPER

For pipe down drains through roadside berms. Available for pipe sizes 8 inch through 24 inch in .079 inch thick galvanized steel.

7. SADDLE TEE

Saddle tees are custom fabricated for connection to existing pipe, or field located connections in new construction.

8. DROP INLETS, MANHOLES & RISERS

These structures are custom fabricated to meet specific project requirements. Manholes, risers, inlets, and outlets are made from CSP, CASP, or CAP in any available thickness. Corrugations may be 2-²/₃ inch x 1/2 inch, 3 inch x 1 inch, or 5 inch x 1 inch. Available with solid cover or open grating, with or without welded bottom. Drop inlets are commonly used to collect surface water and/or for clean outs. Manholes and risers are used for access to underground systems or to connect multiple lines.

9. END SECTION WITH BAR GATE

Permanent or removable grates can be fabricated to prevent unwanted debris or animals from entering the pipe. Grates can be fitted to round pipe, pipe-arches, beveled ends or end sections and may be black steel, painted, or hot dip galvanized.

10. ANTI-SEEP COLLAR

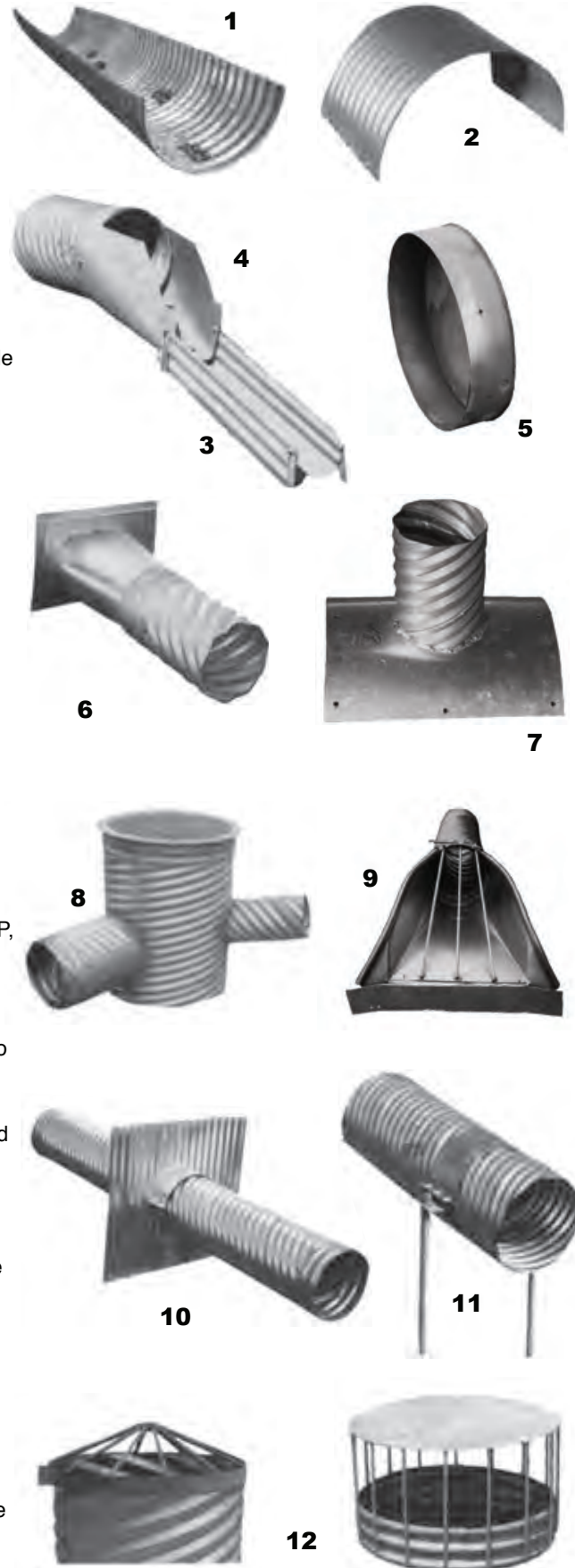
Discourages burrowing rodents and helps prevent seepage along pipe surface. Available in .064 inch through .138 inch steel and .060 inch through .135 inch aluminum thickness. Collars can be shop welded or field bolted.

11. ANCHOR ASSEMBLIES

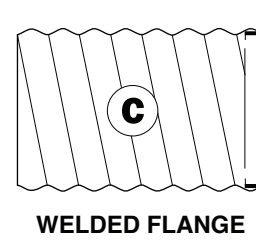
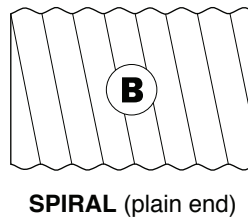
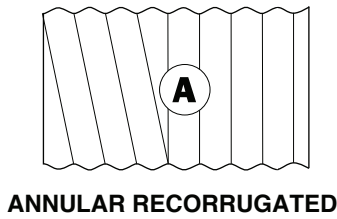
Anchor assemblies consist of a band or strap around pipe, anchor stakes, attachment plates, and necessary hardware. One of several types is shown.

12. DEBRIS RACKS

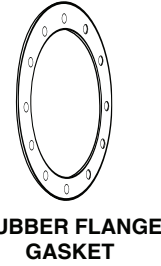
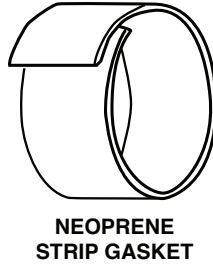
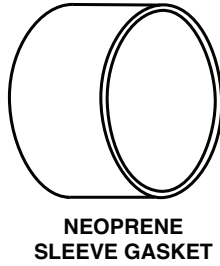
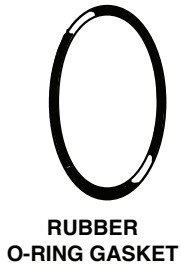
Debris racks are used to prevent clogging of pipe inlets by water borne debris. Some common types are shown but many other custom designs can also be fabricated.



AVAILABLE END TREATMENTS



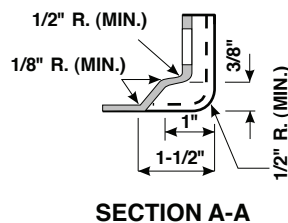
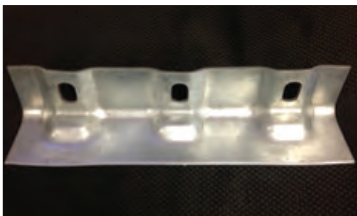
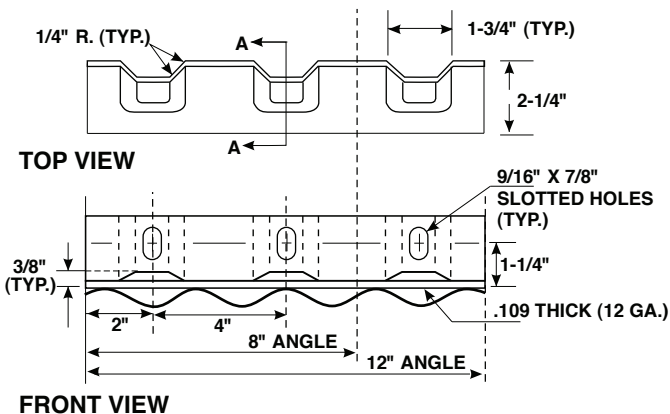
STANDARD PIPE GASKET TYPES



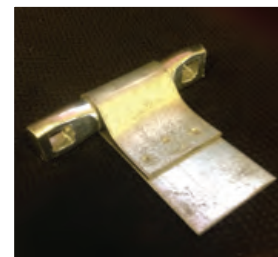
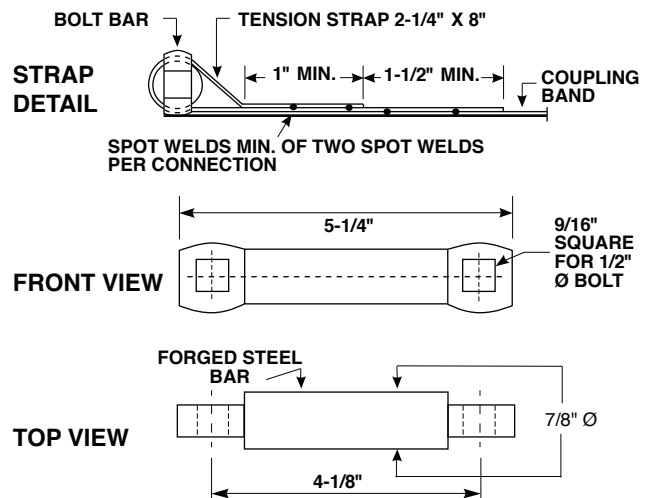
NOTE: ALL GASKETS ARE AVAILABLE IN A WIDE VARIETY OF THICKNESSES, WIDTHS, AND MATERIAL COMPOSITIONS. GASKETS ARE CHOSEN BY THE SPECIFIER TO PROVIDE THE DEGREE OF SOIL TIGHTNESS OR WATER TIGHTNESS REQUIRED.

BAND COUPLER HARDWARE

DIE FORMED ANGLE DETAIL: Die-formed angles are standard for all band sizes 12-inch and larger. 8-inch wide die-formed angles are standard for 7-inch & 12-inch wide band sizes 12-inch through 42-inch; 12-inch wide angles are standard for 12-inch wide bands in sizes 48-inch and above. 24-inch wide bands are furnished with either one or two-piece angles having a minimum total of five each 1/2-inch x 6-inch plated carriage bolts. 2-inch x 2-inch x 3/16-inch angles may be furnished in lieu of die-formed angles.



BAR AND STRAP DETAIL: Bar and strap hardware is typically used on semi-corrugated bands with O-ring gaskets.

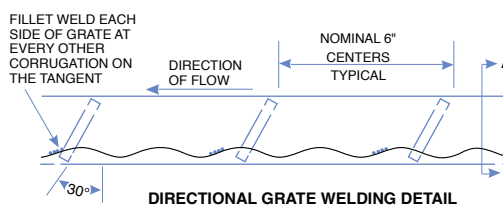
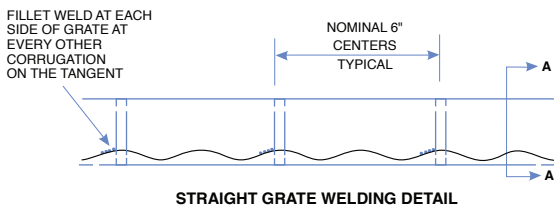
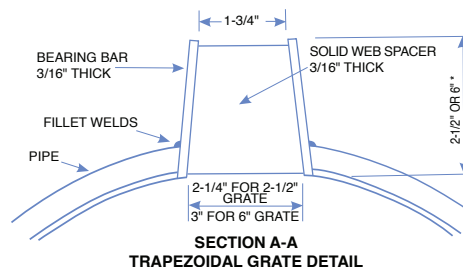
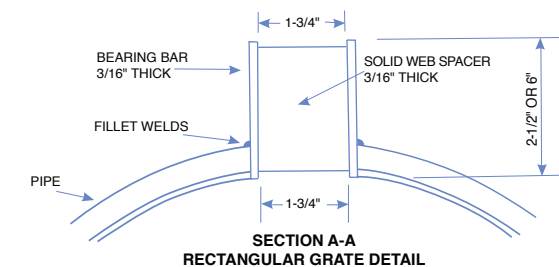


SLOTTED DRAIN CONSTRUCTION



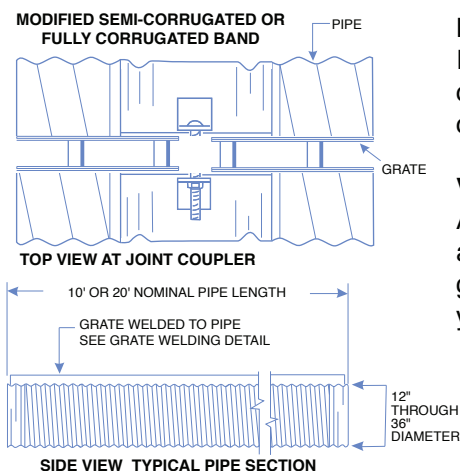
Pacific Corrugated Slotted drain pipe is a composite drainage structure consisting of a corrugated steel pipe with a fabricated linear steel grate protruding through the pipe wall, welded in place. Slotted drain can be used to effectively and economically remove surface runoff in curb and gutter applications or to intercept sheet runoff on relatively flat surfaces or local depressions. Applications include roadways, parking lots, airports, sports fields, or any other surfaces where removal of flowing or standing surface water is desirable. Regular corrugated steel pipe fittings (without grates); such as tees, elbows and reducers, are normally used with slotted drain pipe although custom fabricated fittings with grate are also available if needed.

The slotted drain's open grate is installed flush with or slightly below the surface to be drained. This allows the surface water to be channeled directly into the pipe below where it can be directed to the appropriate outfall. Pacific slotted drain eliminates the need for complex surface grading to create drainage basins where water is directed to multiple catch basins, berms, dikes, or other channeling structures.



Specifications

Slotted drain pipe is manufactured from galvanized or aluminized type 2 steel in accordance with AASHTO M 36 and ASTM A 760 national specifications. Pipe is available in sizes 12 inch through 36 inch, in .064", .079", and .109" thickness. Grates are fabricated from 3/16-inch thick ASTM A36 black or galvanized steel and are available in 2-1/2-inch or 6-inch heights.



Heel guard

In areas where pedestrian traffic is expected, Pacific slotted drain steel can be ordered with 1/2-inch (#13) galvanized expanded metal mesh welded to the top of grate to prevent smaller heels from being caught in the grate opening.

Variable height grates

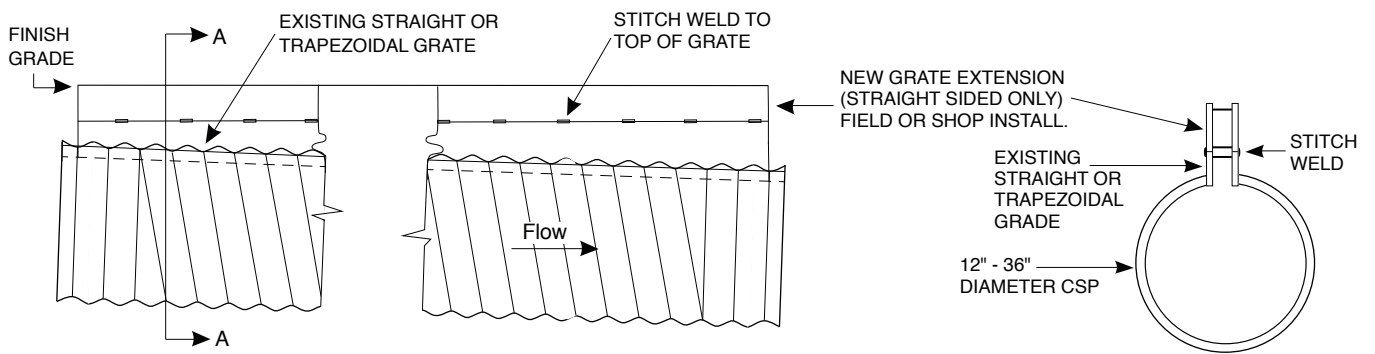
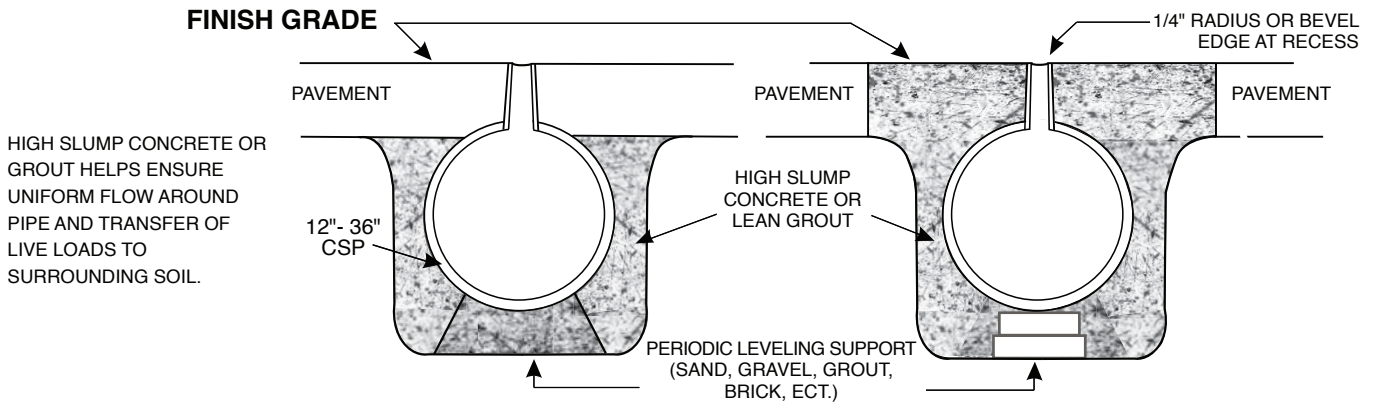
Although 2-1/2-inch and 6-inch are standard grate heights, other grate heights and variable grate heights are available on special order basis (straight sided grates only). Grate extensions for existing installations are also available. Contact your local Pacific sales engineer for availability, limitations, or other information.

Tolerances

Manufacturing tolerances are; vertical bow $\pm 3/8$ -inch, horizontal bow $\pm 5/8$ -inch, and longitudinal twist $\pm 1/2$ -inch, all based on standard 20 foot length. If lesser tolerances are needed, contact your local Pacific sales engineer with specific requirements.



SLOTTED DRAIN CONSTRUCTION



SECTION A-A



SLOTTED OPENING FOR UNDER ROADWAY BARRIER APPLICATIONS.



PLACING AND LEVELING SLOTTED DRAIN FROM MANHOLE.



COVER TOP OF GRATE WITH TAPE OR OTHER MATERIAL TO KEEP GROUT AND PAVING MATERIALS OUT OF PIPE.

STRUCTURAL PLATE

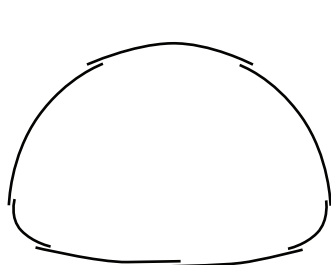


Structural plate structures, sometimes referred to as sectional plate structures, have been used for many purposes. In general, structural plate pipe (SPP) or structural plate pipe-arch (SPPA) is used when the maximum size of CSP or CSPA is exceeded or where greater or differential thicknesses are required. Structural plate pipe and pipe-arch are available in a wide range of sizes. The minimum diameter of the pipe is 5 feet and the maximum is 26 feet. The minimum span x rise of the Pipe-Arch is 6 foot-1 inch x 4 foot-7 inch and the maximum is 20 foot-7 inch x 13 foot-2 inch. Structural plate structures are commonly used in flood control, drainage and sewer systems. They have also been used successfully for overhead conveyor covers and passages; vehicular, pedestrian, and animal underpasses; and storage bins. They have also proven to be sound and economical structures in many other applications.

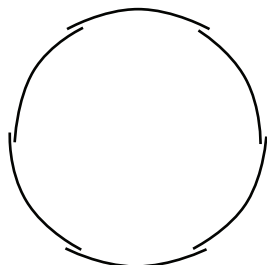


Given equal end area, height of cover, or wherever otherwise applicable, the round shape is generally more economical and easier to assemble.

TYPICAL PLATE ARRANGEMENTS



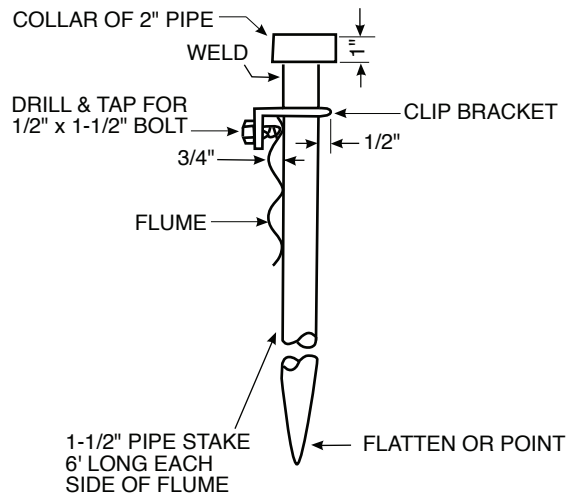
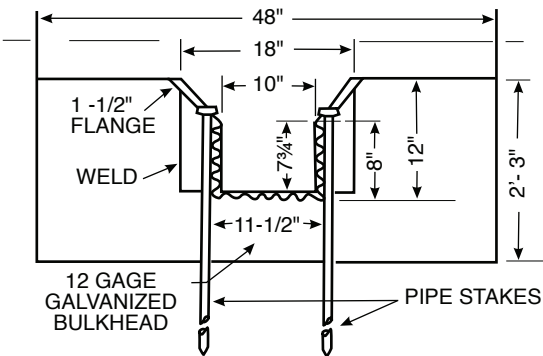
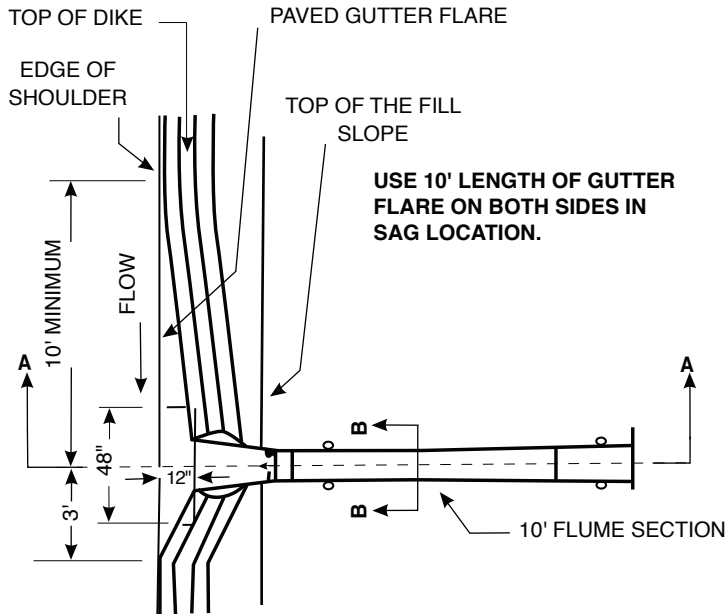
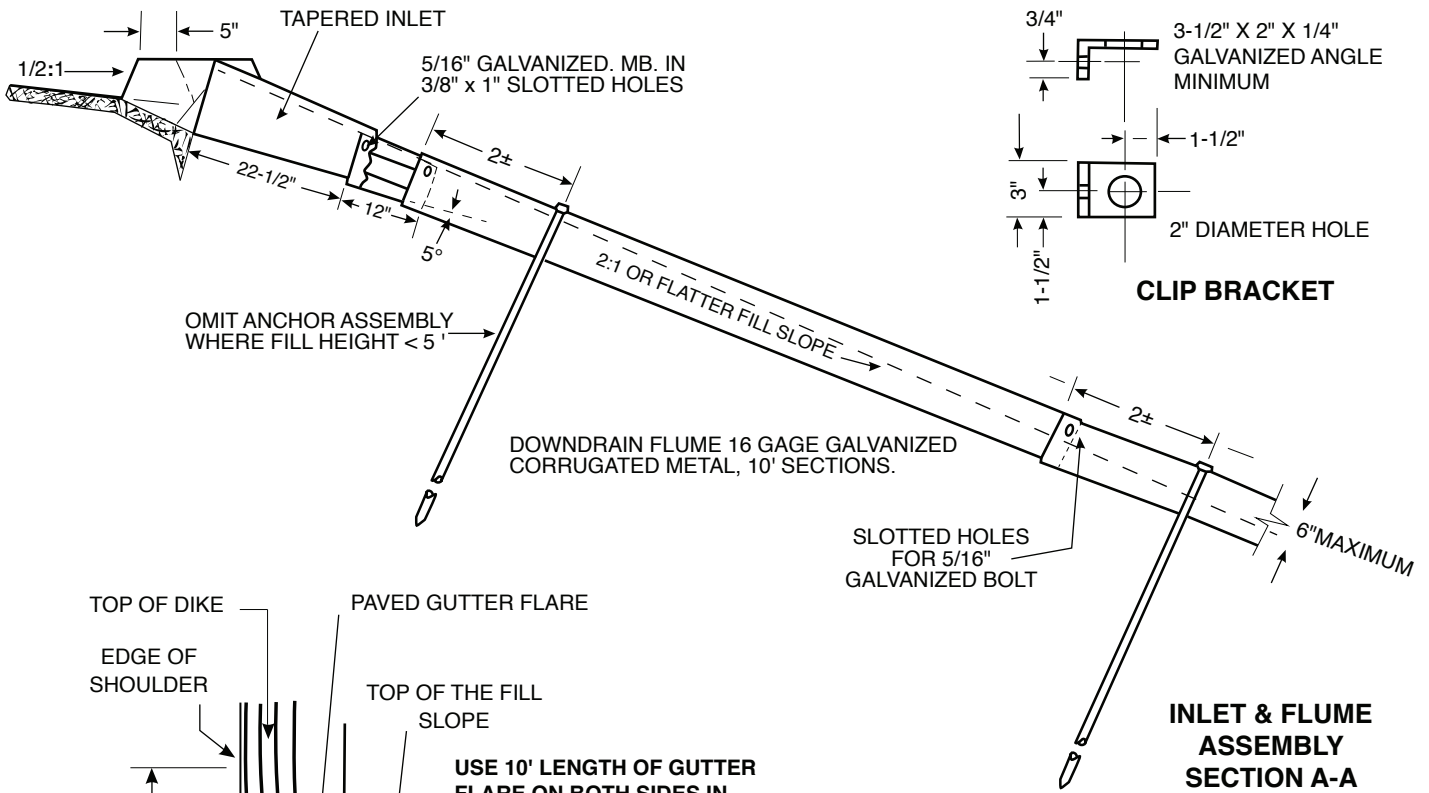
STRUCTURAL PLATE PIPE-ARCH



STRUCTURAL PLATE PIPE

Round 	5 ft. - 26 ft.	Culverts, sub drains, sewers, service tunnels, etc. All plates same radius. For medium and high fills (or trenches).
Vertical Ellipse 5% Normal 	5 ft. - 26 ft. Nominal Before Elongated	Culverts, sewers, service tunnels, recovery tunnels. Plates of varying radii; shop fabrication.
Pipe-Arch 	Span x Rise 6 ft. - 1 in. x 4 ft. - 7 in. to 20 ft. - 7 in. x 13 ft. - 2 in.	Where headroom is limited. Has hydraulic advantages at low flows. Corner plate radii are 18 inches or 31 inches.
Underpass 	Span x Rise 5 ft. - 8 in. x 5 ft. - 9 in. to 20 ft. - 4 in. x 17 ft. - 9 in.	For pedestrians, livestock or vehicles.
Arch 	Span x Rise 6 ft. x 1 ft. - 9½ in. to 25 ft. x 12 ft. - 6 in.	For low clearance large waterway opening and aesthetics.
Horizontal Ellipse 	Span 7 ft. - 4 in. to 14 ft. - 11 in.	Culverts, grade separations, storm sewers, and tunnels.
Pear 	Span 25 - 30 ft.	Culverts, grade separations, storm sewers, and tunnels.
High Profile Arch 	Span 20 - 45 ft.	Culverts, grade separations, storm sewers, tunnels, ammunition magazines and earth covered storage.
Low Profile Arch 	Span 20 - 50 ft.	Low-wide waterway enclosures, culverts, and storm sewers.
Box Culverts 	Span 10 - 26 ft.	Low-wide waterway enclosures, culverts, and storm sewers.
Specials 	Various	For lining old structures or other special purposes. Special fabrication.

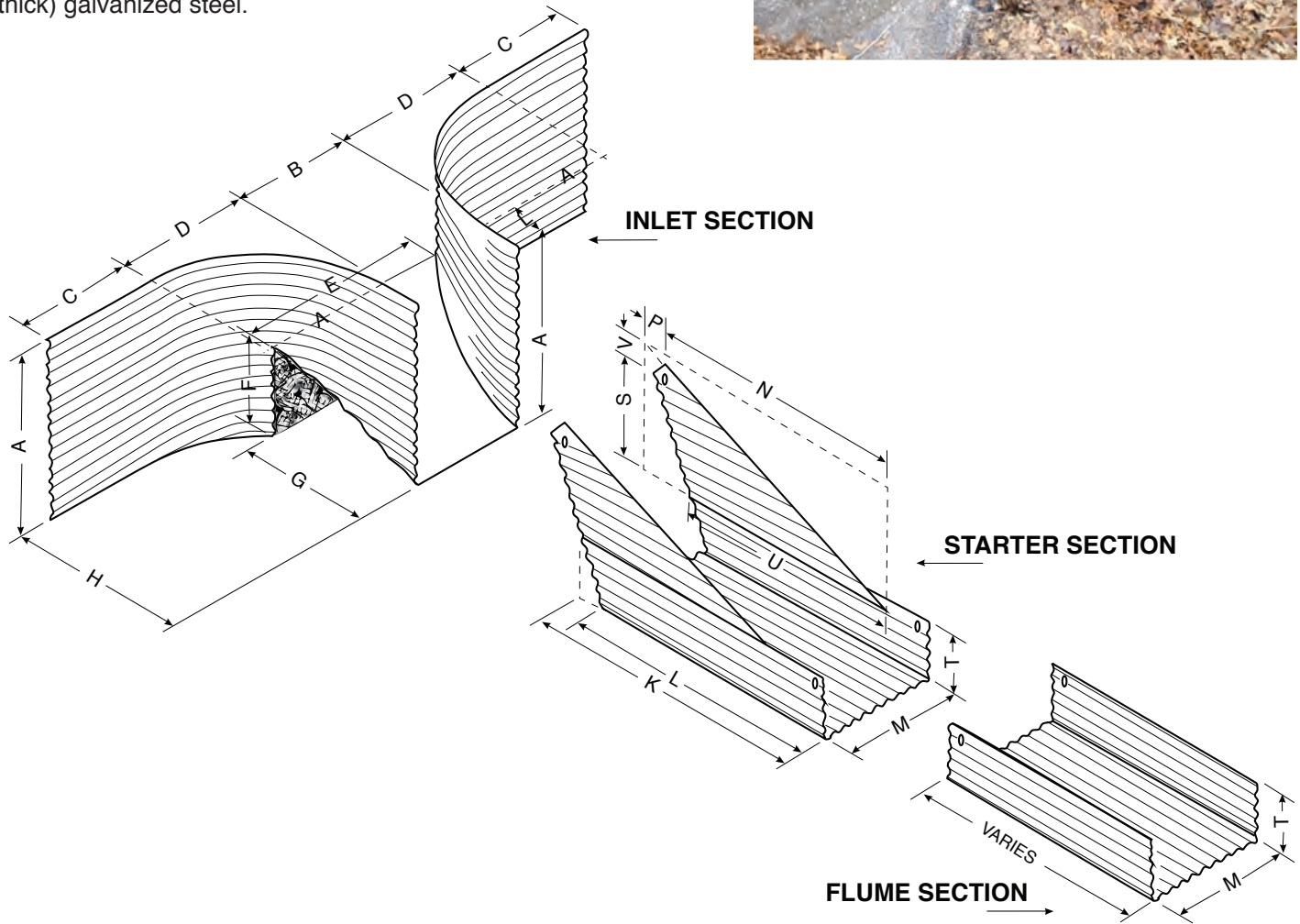
FLUME ASSEMBLY



MCCARTHY TYPE INLET WITH STARTER SECTION FOR FLUME

McCarthy type flume inlets are designed to collect and discharge roadway runoff into down-slope flume in order to prevent erosion on steep slopes. This product results from a collaborative design effort between Pacific Corrugated Pipe Company and national forest service engineers. It has since been adopted for use in the Angeles and San Bernardino National Forests and in many other areas with similar needs.

Overside drain adapter available for 12-inch wide flume (Little Mac), 24-inch wide flume (Big Mac), and 32-inch to 64-inch adjustable width flume (Super Mac). Material is 16-gage (.064 inch thick) galvanized steel.



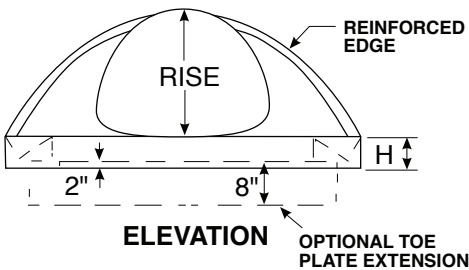
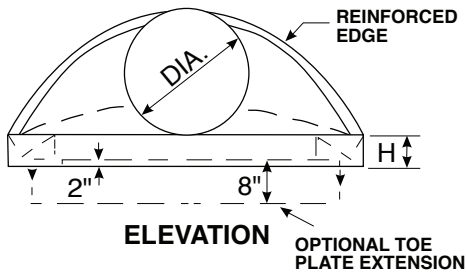
INLET SECTION

	A	B	C	D	E	F	G	H	J	R
BIG MAC	37-1/2"	24"	24"	28"	39"	18"	27"	36"	8"	28"
LITTLE MAC	25-1/2"	12"	21-1/4"	18"	16"	10"	15"	27"	9"	18"
SUPER MAC	call with specific questions									

STARTER SECTION & FLUME SECTION

	K	L	M	N	P	S	T	U	V
BIG MAC	58-1/2"	53-1/4"	24-1/2"	54"	4-1/2"	20-1/2"	12"	48"	5"
LITTLE MAC	58-1/2"	51-1/2"	12"	55-1/4"	3-1/4"	10"	12-1/4"	52-1/4"	2"
SUPER MAC	call with specific questions								

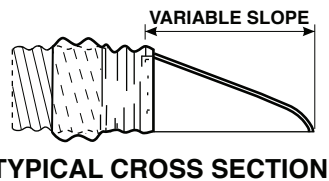
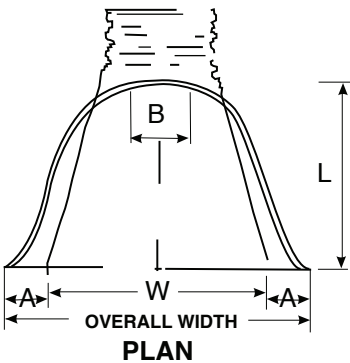
END SECTIONS FOR ROUND PIPE



DIAMETER	GAGE	WEIGHT	*A	*B	*H	*L	*W	SLOPE	OVERALL WIDTH
6"	18	10	4	1	3	8	12	2	20"
8"	18	14	5-3/4	5	4	14-1/2	16	2-1/4	27-1/2"
10"	18	17	7-5/8	6	6	14-1/2	20	2-1/2	35-1/4"
12"	16	25	7	6	6	21	24	2-1/2	38"
15"	16	33	8	8	6	26	30	2-1/2	46"
18"	16	42	8	10	6	31	36	2-1/2	52"
21"	16	49	9	12	6	36	42	2-1/2	60"
24"	16	65	10	13	8	41	48	2-1/2	68"
30"	14	123	12	16	8	51	60	2-1/2	84"
36"	14	135	14	19	9	60	72	2-1/2	100"
42"	12	320	16	22	11	69	84	2-1/2	116"
48"	12	375	18	27	12	78	90	2-1/4	126"
54"	12	440	18	30	12	84	102	2-1/4	138"
60"	12/10	610	18	33	12	87	114	2	150"
66"	12/10	697	18	36	12	87	120	2	156"
72"	12/10	720	18	39	12	87	126	2	162"
78"	12/10	810	18	42	12	87	132	1-1/2	168"
84"	12/10	850	18	45	12	87	138	1-1/2	174"
90"	12/10	910	24	37	12	87	144	1-1/2	192"
96"	12/10	985	25	35	12	87	150	1-1/2	200"

*DIMENSIONS IN INCHES PLUS OR MINUS STANDARD SHOP TOLERANCES

END SECTIONS FOR ARCHED PIPE



SPAN & RISE	ROUND EQUIVALENT	GAGE	WEIGHT	*A	*B	*H	*L	*W	SLOPE	OVERALL WIDTH
17X13	15"	16	25	7	9	6	19	30	2-1/2	44"
21X15	18"	16	32	7	10	6	23	36	2-1/2	50"
24X18	21"	16	42	8	12	6	28	42	2-1/2	58"
28X20	24"	16	52	9	14	6	32	48	2-1/2	66"
35X24	30"	14	92	10	16	8	39	60	2-1/2	80"
42X29	36"	14	133	12	18	9	46	75	2-1/2	99"
49X33	42"	12	233	13	21	12	53	85	2-1/2	111"
57X38	48"	12	315	18	26	12	63	90	2-1/2	126"
53X41	48"	12	330	18	25	12	63	90	2-1/2	126"
64X43	54"	12	357	18	30	12	70	102	2	138"
60X46	54"	12	375	18	34	12	70	102	2	138"
71X47	60"	12/10	480	18	33	12	77	114	1-1/2	150"
66X51	60"	12/10	487	18	33	12	77	116	1-1/2	152"
77X52	66"	12/10	616	18	36	12	77	126	1-1/2	162"
73X55	66"	12/10	625	18	36	12	77	126	1-1/2	162"
83X57	72"	12/10	670	18	39	12	77	138	1-1/2	174"
81X59	72"	12/10	680	18	39	12	77	138	1-1/2	174"
87X63	78"	12/10	729	20	38	12	77	148	1-1/2	192"
95X67	84"	12/10	755	20	34	12	87	162	1-1/2	206"
103X71	90"	12/10	810	20	38	12	87	174	1-1/2	216"
112X75	96"	12/10	907	20	40	12	87	174	1-1/2	222"

*DIMENSIONS IN INCHES PLUS OR MINUS STANDARD SHOP TOLERANCES

Notes:

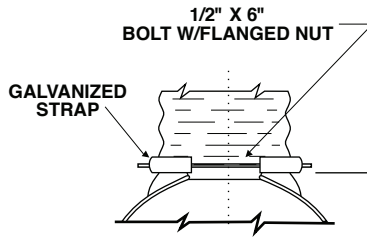
- For 60 inch and larger diameter pipe end sections, reinforced edges are to be supplemented with hot dipped galvanized stiffener angles.
- For 77 inch x 52 inch and larger pipe arch end sections, reinforced edges and center panel seams are to be supplemented by hot dipped galvanized stiffener angles.
- End sections are available in galvanized steel, aluminum alloy, or aluminized steel. Technical brochures are available for supplemental information.
- Weight shown based on galvanized ES.

FLARED END SECTIONS

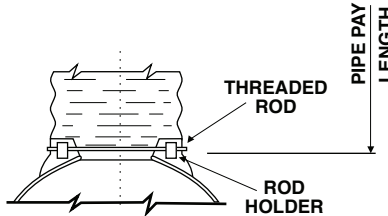


MADE IN USA

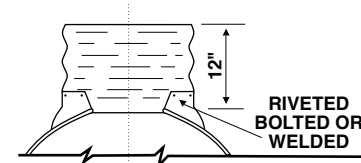
CONNECTIONS



TYPE 1
6" thru 24"



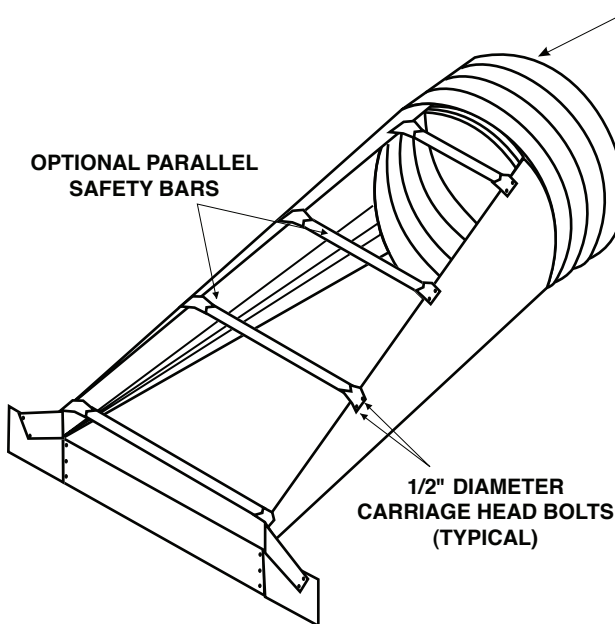
TYPE 2
for 30" and larger
for 17" x 13" and larger



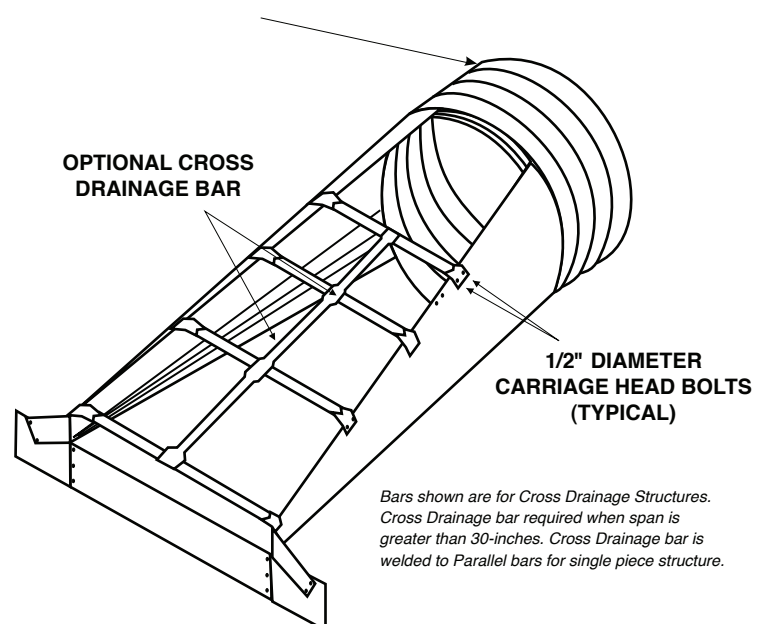
TYPE 3
(OPTIONAL FOR STUB ATTACHMENT)
for 42" thru 96"
for 64" x 43" thru 112" x 75"

SAFETY SLOPE END SECTIONS FOR CIRCULAR & ARCHED PIPES (4:1 & 6:1 SLOPES ONLY)

CORRUGATED STUB FOR ILLUSTRATION ONLY



24" PARALLEL DRAINAGE STRUCTURE



CROSS DRAINAGE STRUCTURE

SAFETY SLOPE end sections are available in galvanized or aluminized steel only.
Technical brochures are available for supplemental information.

INFORMATION AND MATERIAL SPECIFICATIONS

ITEM	DESCRIPTION	SPECIFICATION	
		AASHTO	ASTM
DESIGN			
CORRUGATED METAL PIPE	1. Structural design of corrugated steel pipe and structural plate pipe. 2. Structural design of corrugated aluminum pipe.	Bridge Sect. 12	A796 B790
MATERIALS			
ZINC COATED (GALVANIZED) STEEL SHEETS AND COILS	1. Steel base metal with 2 oz. per ft. ² zinc coating for corrugated steel pipe. 2. Steel base metal with 3 oz. per ft. ² zinc coating for structural plate pipe.	M-218 M-167	A929 A761
POLYMER PRE-COATED SHEETS AND COILS	Polymer coating applied to sheets and coils as follows: A. 10 mils, one or two sides. B. 10 mils one side, 3 mils the other side. C. Special order combination.	M-246	A742
ALUMINUM ALLOY	3004 H34 clad aluminum alloy.	M-197	B744
ALUMINUM COATED (ALUMINIZED TYPE II) STEEL SHEETS AND COILS	Steel base metal coated with 1 oz. per ft. ² of pure aluminum.	M-274	A929
FABRICATION			
SEWER & DRAIN PIPE	Corrugated pipe fabricated from any of the above sheets or coils. Pipe is fabricated by corrugating continuous coils into helical form with lockseam or by rolling annular corrugated mill sheets: 1. Galvanized Spiral Rib and corrugated steel pipe. 2. Aluminum alloy Spiral Rib and corrugated pipe. 3. Aluminized Type II Spiral Rib and corrugated steel pipe. 4. Polymeric pre-coated sewer and drain pipe. 5. Steel structural plate pipe.	M-36 M-196 M-36 M-245 M-167	A760 B745 A760 A762 A761
COATINGS & LINING			
ASPHALT COATED STEEL SEWER PIPE	Corrugated steel pipe of any of the types shown above with a 0.050 inch, high purity asphalt coating.	M-190	A849
COLD APPLIED BITUMINOUS COATINGS	Fibrated mastic or asphalt base coatings of various viscosities for field or shop coating of corrugated pipe or structural plate.	M-243	A849
GASKETS			
GASKETS AND SEALANTS	1. Standard O-ring gaskets. 2. Sponge neoprene sleeve gaskets. 3. Gasketing strips, butyl or neoprene. 4. Mastic sealant.	– – – –	D1056 D1056 D1056 D1056
INSTALLATION			
INSTALLATION	1. Corrugated steel pipe. 2. Corrugated aluminum pipe. 3. Corrugated steel structural plate pipe.	Bridge Sect. 26	A798 B788 A807

HANDLING

All pipe should be lifted off the trailer to avoid any damage while unloading. Never allow pipe to be dragged off or dropped from trailer height.

Slings should be used for lifting the pipe off the trailer and for positioning pipes in the trench.

When unloading a nested pipe shipment, make sure that the delivery site has ample room for unnesting the various pipe sizes. Special care should be taken to avoid damaging pipe while unnesting pipe.

Unnest a pipe by using a two-by-four that is one to two inches larger than the pipe's inside diameter. Wedge it into corrugation valleys and then pull on two-by-four with a chain or wire rope.



Pipe ends may be sharp. Handle with care. Use gloves and other proper protective clothing and equipment.



Safety Warning: Stack the pipe on the trailer or ground with proper blocking or strapping.

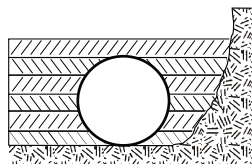


Be careful when removing binders or strapping on pipe bundles, either on the trailer or ground. Never stand on pipe bundles.

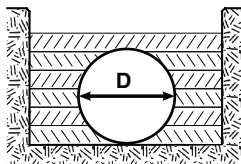
BEDDING & BACKFILLING

Use well-graded compacted granular bedding or flowable fill material to one foot above the pipe. Trench backfill should be free of rocks, frozen lumps, and foreign material that could cause hard spots or decompose to create voids, compacted to 90% standard density per ASTM D696 (AASHTO T99).

THOROUGHLY TAMP FILL IN MAXIMUM 8 INCH LOOSE LIFTS. KEEP FILL AT SAME LEVEL ON BOTH SIDES OF PIPE.

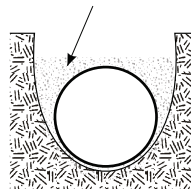


EMBANKMENT



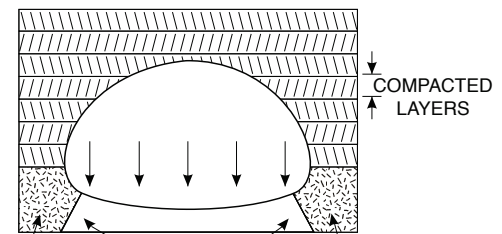
TRENCH
OUTSIDE DIAMETER (D)
PLUS SUFFICIENT ROOM
FOR COMPACTION
EQUIPMENT

FLOW ABLE FILL



SHAPED TRENCH
ALTERNATE SHAPED
TRENCH FOR SLURRY
BACKFILL.

THOROUGHLY TAMP FILL IN MAXIMUM 8 INCH LOOSE LIFTS. KEEP FILL AT SAME LEVEL ON BOTH SIDES OF PIPE-ARCHES.

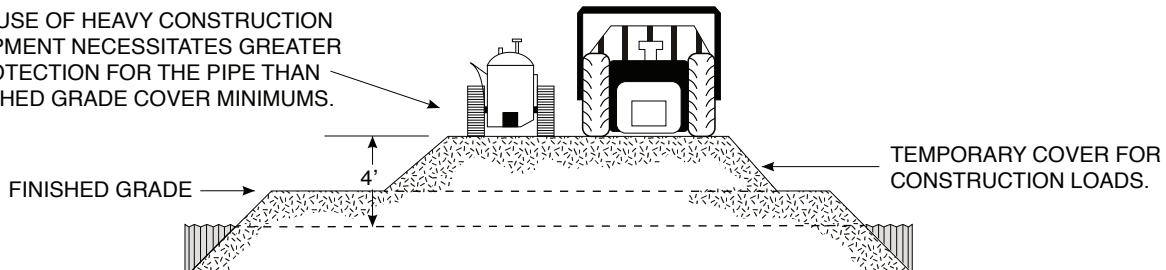


COMPACTED TO MAXIMUM DENSITY UNDER HAUNCHES

HEAVY CONSTRUCTION

For temporary construction vehicle loads (100kips/axle load), put at least four feet of compacted cover on top of the pipe (but not exceeding the maximum allowable cover over the pipe).

THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS.



Contact Pacific Corrugated Pipe Co. for detailed specifications regarding backfill methods and materials. ASTM Specification A798 - "Standard practice for installing factory made corrugated steel pipe for sewers and other applications" is a recommended reference.



HDPE Plastic Pipe

Manufactured by Pacific Corrugated Pipe

Pacific Corrugated Pipe has manufactured and supplied a complete line of corrugated metal and corrugated High Density Polyethylene (HDPE) pipe and fittings for decades. We manufacture both Type C (single wall with a corrugated interior) and Type S (double wall with a smooth interior) pipe.

Sizes on the single wall pipe range from 3-inch to 24-inch. Further, our sizes on the double wall range from 4-inch to 60-inch (integral bell and spigot style) and 8-inch to 36-inch (plain end). Both solid and perforated pipe are available on all of our pipe.

Pacific Corrugated Pipes HDPE product line is a heavy-duty pipe for storm sewers, culverts, storm water storage and water quality applications. Our HDPE load-bearing capacity is comparable to that of concrete (RCP) or metal pipes. In addition, corrugated HDPE pipe is lightweight, flexible and highly resistant to corrosion and abrasion. All Pacific Corrugated HDPE pipe are marked with the relevant AASHTO and ASTM applicable standards to which they conform so that purchasers can clearly understand the quality and grade of materials being provided. Listed below are the AASHTO and ASTM specifications that are adhered to on all Pacific Corrugated HDPE Pipe and commonly used within the corrugated HDPE pipe industry. Specifications can have multiple editions and are revised from time to time. The markings on our HDPE pipe products indicates conformance to the latest edition and revisions of such standards as of the date of production.



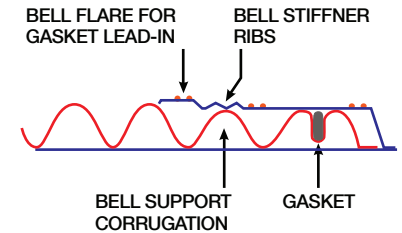
There are many other national and local standards that may be applicable to corrugated polyethylene pipe products. We welcome your questions about the specifications listed below or other related specifications.



SPECIFICATIONS

AASHTO	M252: Standard Specification for Corrugated Polyethylene Drainage Pipe: 3" - 10" (76.2mm - 254.0mm)
AASHTO	M294: Standard Specification for Corrugated Polyethylene Drainage Pipe: 12" - 60" (304.8mm - 1524.0mm)
ASTM	D2321: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM	D3212: Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM	D3350: Standard Specification for Polyethylene Plastic Pipe and Fittings Materials
ASTM	F477: Standard Specification for Elastomeric Seals (Gaskets) for Joint Plastic Pipe
ASTM	F405: Standard Specification for Corrugated Polyethylene Pipe and Fittings: 3" - 6" (76.2mm - 152.4mm)
ASTM	F667: Standard Specification for 8" - 24" (203.2mm - 609.6mm) Corrugated Polyethylene Pipe and Fittings
ASTM	F2306: Standard Specification for 12" - 60" (304.8mm - 1524.0mm) Annular Corrugated Profile-Wall Polyethylene Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications
ASTM	F2648: Standard Specification for 2" - 60" (50.8mm - 1524.0mm) Annular Corrugated Profile-Wall Polyethylene Pipe and Fittings for Land Drainage Applications

StormTite™, our 10.8 psi bell and spigot joint system has been certified by independent third party laboratories to meet “watertight” requirements defined in AASHTO M-294 and all applicable ASTM specifications including ASTM-3212. This system eliminates the need for separate couplers without giving up strength or superior hydraulic flow. This ease of installation of StormTite™, combined with its light weight and longer sections, ensures project savings over heavier materials such as reinforced concrete pipe (RCP). Using Pacific Corrugated HDPE pipe can lower your overall project construction costs as a result from the utilization of smaller crews, faster installation, easier handling of lightweight pipe and smaller equipment.



StormTite™

Sizes in the following tables outline our entire product line of pipe that are available with a plain end or integral bell and spigot joint system for pressure applications:

Dual-Wall (Type S) Bell and Spigot Style

Specification Chart

Nominal Inside Diameter (Inches)	Outside Diameter (Inches)	Minimum Wall Stiffness (psi)	Minimum Wall Thickness (Inches)	Lengths (Feet)	Weight (lbs./ft.)	Solid, Perforated or Both	Perforation Class 1,2 or Both*
4	4.7	34.0	0.002	20	0.5	Both	Class 2 Slotted
6	6.9	34.0	0.002	20	1.0	Both	Class 2 Slotted
8	9.4	50.0	0.025	20	1.6	Both	Class 2 Slotted
10	11.8	50.0	0.025	20	2.5	Both	Class 2 Slotted
12	14.5	50.0	0.035	20	3.3	Both	Both
15	17.5	42.0	0.040	20	4.9	Both	Both
18	21.5	40.0	0.050	20	6.5	Both	Both
24	27.9	34.0	0.060	20	11.4	Both	Both
30	35.7	29.0	0.060	20	15.0	Both	Both
36	42.1	22.5	0.070	20	19.6	Both	Both
42	48.2	21.0	0.070	20	26.2	Both	Both
48	54.3	20.0	0.070	20	34.5	Both	Both
60	Call	Call	Call	20	Call	Both	Both

Note- 36" HDPE pipe will not nest into 42" pipe; 42" HDPE pipe will not nest into 48" pipe.

Class 1 Perforations (uncommon)

The rows of perforations shall be arranged in two equal groups placed symmetrically on either side of the lower side of the unperforated pipe below the spring line on the outside valleys of the corrugations.

Intended use, subsurface drainage or combination storm and under drain.

Class 2 Perforations (common)

The rows of perforations are evenly spaced for each diameter around the entire circumference on the outside valleys of the corrugations.

Intended use, subsurface drainage only.

Dual-Wall (Type S) Plain End

Specification Chart

Nominal Inside Diameter (Inches)	Outside Diameter (Inches)	Minimum Wall Stiffness (psi)	Minimum Wall Thickness (Inches)	Lengths (Feet)	Weight (lbs./ft.)	Solid, Perforated or Both	Perforation Class 1,2 or Both*
8	9.4	50.0	0.025	20	1.6	Both	Class 2 Slotted
10	11.8	50.0	0.025	20	2.5	Both	Class 2 Slotted
12	14.5	50.0	0.035	20	3.3	Both	Both
15	17.5	42.0	0.040	20	4.9	Both	Both
18	21.5	40.0	0.050	20 & 30	6.5	Both	Both
24	27.9	34.0	0.060	20 & 30	11.4	Both	Both
30	35.7	29.0	0.060	20 & 30	15.0	Both	Both
36	42.1	22.5	0.070	20 & 30	19.6	Both	Both

Single-Wall (Type C) Plain End

Specification Chart

Nominal Inside Diameter (Inches)	Outside Diameter (Inches)	Minimum Wall Stiffness (psi)	Minimum Wall Thickness (Inches)	Lengths (Feet)	Weight (lbs./ft.)	Solid, Perforated or Both	Perforation Class 1,2 or Both*
3	Call	Call	Call	100	Call	Both	Class 2 Slotted
4	4.7	30/25**	0.002	100/250	0.325	Both	Class 2 Slotted
6	6.9	30/25**	0.002	100	0.760	Both	Class 2 Slotted
8	9.4	50	0.025	20	1.275	Both	Class 2 Slotted
10	11.8	50	0.025	20	1.935	Both	Class 2 Slotted
12	14.5	50	0.035	20	2.635	Both	Both
15	17.5	42	0.040	20	4.450	Both	Both
18	21.5	40	0.050	20	5.400	Both	Both
24	27.9	34	0.060	20	9.250	Both	Both

** -30psi = 5% deflection; 25psi = 10% deflection



Superior Strength, Optimum Hydraulics and Service Reliability

Research shows the corrugations of Pacific Corrugated HDPE pipe give the product an extremely high strength-to-weight ratio. Because it is made of chemically inert materials, our pipe is extremely durable and highly effective in both acidic and alkaline soils alike.

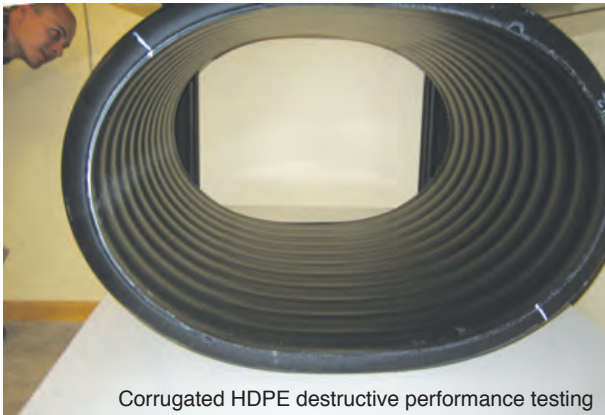
HDPE pipe resists breakdown caused by abrasion and freeze/thaw cycles and has been effectively used in environments with ambient temperatures above 120° F.

Our HDPE double wall pipe is highly efficient due to the low friction factor of the smooth pipe interior, resulting in optimum hydraulic flow design. This type of pipe has been found to have an effective Manning's "n" factor as low as 0.012. Further, in many soil conditions you can realize a service life up to 75 years.



Pacific Corrugated Pipe processes premium plastic raw materials in a clean and controlled environment. All of our products are marked with applicable specification designations. Incoming resins are subject to acceptance testing and finished product must exceed our stringent quality control standards before leaving our manufacturing facility. With primary distribution through our five western manufacturing plants, contractors can enjoy the convenience and efficiency of having corrugated metal pipe (CMP) and high density polyethylene (HDPE) plastic pipe products shipped combined on the same trucks to their job sites. In fact, we are the only manufacturer in the United States that produces both CMP and HDPE pipe in our own facilities.

Our clients are the leading builders, engineers and developers working on local, municipal and state construction projects throughout the West. The Pacific Corrugated commitment means precision manufacturing, timely delivery, a knowledgeable team of fabricators, and project support.



Corrugated HDPE destructive performance testing

Commitment to Excellence

Pacific Corrugated Pipe Company has been providing the industry with fabrication and plastic innovations in drainage, culvert crossing, bridge replacement, special hydraulic conveyance, and other applications since 1935. Our solutions utilize the most effective materials for each application, and are designed with durability and value in mind.



Contact your Pacific Corrugated Pipe Company representative or visit our website (www.pcpipe.com) for additional product details, specifications, test results, fittings, installations requirements and other needed information.

Single-wall Fittings and Couplers

Pacific Corrugated Plastic Pipe manufactures and supplies a wide range of HDPE pipe products that can suit a wide range of applications. A variety of fitting types are available including elbows, tees, wyes, lateral connections, drop inlets, bulkheads, and end caps. Fittings can be utilized for either single wall or double wall pipe runs.

These fittings are manufactured with HDPE plastic and injection-molded PVC plastic materials. We have single-wall, double-wall and perforated pipe. Also, we can attach a filter fabric "sock" to both our single-wall and double-wall pipe. Additionally, we are a certified distributor of Harco fittings should your project require a water-tight installation. For information about specifications or product details please contact us.



Tees
4" 6" 8"
10" 12" 15"



Small Tap Tees
4" (for 6" - 8")
6" (for 15" - 24")



Large Tap Tees
4" (for 10" - 12")
6" (for 30" - 36")



Internal Couplers
3" 4" 6" 8"



Snap Couplers
3" 4" 6" 8"
10" 12" 15"



Downspout Adapters
3" (2 x 3 x 3)
4" (2 x 3 x 4)
4" (3 x 4 x 4)



Split Couplers
3" - 36"



90° Single Wall Elbow
3" 4"



6" Cross Tee Reducer



Wyes
3" 4" 6" 8"



Tees
24" x 18"



Reducers
4" (4 x 3)
6" (6 x 5 x 4)
8" (8 x 6)
10" (10 x 8)
12" (12 x 10)
15" (15 x 12)
15" (15 x 12 x 10)
18" (18 x 15)
24" (24 x 18)

HDPE PLASTIC PIPE APPLICATIONS AND ACCESSORIES

Pacific Corrugated offers other complimentary pipe products and attachments. Some examples of these other items include Detention Systems, Flared End Sections, Water-Stop Gaskets for connecting corrugated HDPE pipe to concrete manholes, Geotextiles, and Underground Stormwater Chambers.



Slip Over End Caps
3" 4" 6" 8" 10"
12" 15"

HARCO FITTINGS

Harco injection molded fittings offer a one-piece design made from a virgin PVC compound reinforced for strength exactly where it is needed for critical connections.

Designed to withstand real-world conditions, Harco fittings employ the field's most substantial gaskets, and deep socket bells that keep pipes securely seated in the fitting...even with pipe expansion and contraction. Harco's product line encompass a complete range of sizes and pressure ratings, and conforms to all major industry standards.



90° Elbows
6" 8" 12"



45° Elbows
6" 8" 12"



Wyes
6" 8"



Tees
6" 8" 12"

DUAL-WALL FITTINGS

At Pacific Corrugated Pipe, our HDPE fabricators custom produce each dual-wall fitting by hand to ensure proper fit. Through the use of hot plates and plastic welders our experts diligently measure and weld together each fitting. We inventory a host of different types of fittings from plain-end to bell-bell and will have what you need to complete your project.

We manufacture a vast array of different fittings to meet the needs of our customers. Each fitting meets all required industry standards for worry-free installations. For information about fitting specifications or if your fitting needs are not represented below please speak with your sales representative on your requirements as we can likely customize a fitting to your particular specification.



11° Elbow
4" - 60"



30° Elbow
4" - 60"



90° Elbow
4" - 60"



22° Elbow
4" - 60"



45° Elbow
4" - 60"



3-Piece
90° Elbow
4" - 60"



Cross Tees
4" - 60"



Wyes
4" - 60"



DUAL-WALL FITTINGS

DUAL WALL FITTINGS



Tees
4" - 60"



Bell/Bell
11°, 22°, 30°
45° & 90°
Elbows
6" - 36"



Reducers
4" - 60"
(Available in
multiple variations)



Bell/Bell
Reducers
6" - 36"



Flare End
Sections
12" - 36"



Bell/Bell
Wyes
6" - 36"



Slip Over
End Caps
4" - 24"



Bell/Bell
Tees
6" - 36"



Bulk Head
End Caps
4" - 60"



Bell/Bell
Cross Tees
6" - 36"



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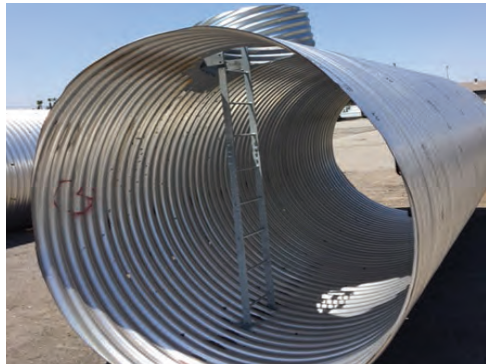
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The suitability of any of the products shown herein for the use on any particular project should be determined by the engineer responsible for the design. For specific product information or terms and conditions of sale contact Pacific Corrugated Pipe Company at locations shown herein.

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