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 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.
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.

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.
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) 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:**

\[
Q = 
\frac{1.486 A R^{2/3}}{n} \text{ ft}^{3} \text{/ sec} \quad n = 0.011
\]

\[Q = (VA) = \text{flow rate (ft}^3/\text{sec}) \]

where:

- **Q** = flow rate (ft³/sec)
- **n** = Manning’s friction coefficient
- **A** = cross sectional flow area (ft²)
- **V** = average flow velocity (ft/sec)
- **R** = hydraulic radius (ft)
- **S** = slope of the energy grade line
- **A** = cross sectional flow area (ft²)
- **V** = average flow velocity (ft/sec)

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) 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.

**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).
backfill materials and procedures for installing large diameter corrugated metal pipe. ASTM Specification A 796 for trench type installations. Contact Pacific Corrugated Pipe Company for information on recommended 3"x1" or 5"x1" corrugation pipe in embankment type installations. Flexibility factor can be increased to ff≤.060 in accordance with available gages and corresponding height of cover tables.

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 2-ton/square foot corner soil bearing pressure. Heights of cover can be increased up to proper installation of all pipe-arch structures, and special care must be taken with these larger sizes.

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

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 dry 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 coordination 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.

<table>
<thead>
<tr>
<th>DIA/PROFILE</th>
<th>END AREA</th>
<th>MIN. COVER</th>
<th>MAX. COVER</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-2½ x 1/2</td>
<td>3x1 / 5x1</td>
<td>8x1</td>
<td>12</td>
<td>48</td>
</tr>
</tbody>
</table>

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

While the principal purpose of a beveled end finish on corrugated steel pipe culverts or spillways is hydraulic efficiency – another purpose would be useful to develop ring compression and measures should be taken to prevent uplift. It should be noted that these beveled cuts interrupt the pipe ends ability to fully seal the ends while also creating potential for increased soil side corrosion. 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.

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. 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. 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. 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. 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.

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 (.264) 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.
**JOINT COUPLING SYSTEMS**

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)

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**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.

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**EXPANDING INTERNAL COUPLER**

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 recorrugated ends for silt tight joints.

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**RIB ALIGNMENT AT TYPICAL JOINT**

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**SECTION AT COUPLER**

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**RIVET DETAILS**

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

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.

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.

Pipe Diameter

<table>
<thead>
<tr>
<th>PIPE DIAM. (feet)</th>
<th>A (feet)</th>
<th>B (feet)</th>
<th>C (feet)</th>
<th>D (feet)</th>
<th>E (feet)</th>
<th>F (feet)</th>
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</thead>
<tbody>
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<td>6</td>
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<td>10</td>
<td>6</td>
<td>16</td>
<td>12</td>
</tr>
</tbody>
</table>

Notes:
1. 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.
2. 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.
3. 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).
4. For mixed sizes or other configurations, inquire.
5. Structural reinforcement may be required on some larger sizes.

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.
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.

Pipe may be custom perforated to your specialized needs.

Special storm water management brochure is available on request.

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.

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.

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.

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 downspouts, 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 .109 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 adapters 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 2-1/4 inch x 1/8 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 painted, hot dip galvanized or black painted and pregalvanized.

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.

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

PITCH BAFFLE WEIRS

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

WITH GEOTEXTILE

WITHOUT GEOTEXTILE

DRAINAGE PRODUCTS

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.
DRAINAGE PRODUCTS

AVAILABLE END TREATMENTS

ANNULAR RECORRUGATED

SPIRAL (plain end)

WELDED FLANGE

STANDARD PIPE GASKET TYPES

RUBBER O-RING GASKET

NEOPRENE SLEEVE GASKET

NEOPRENE STRIP GASKET

BUTYL MASTIC SEALANT GASKET

RUBBER FLANGE GASKET

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 12-inch wide 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 8-inch wide die-formed angles.

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

Specifications

Slotted drain pipe is manufactured from galvanized or aluminized type 2 steel in accordance with AASHTO M 36 and ASTM A 790 national specifications. Pipe is available in sizes 12-inch through 36-inch, in .064”, .079”, and .109” thickness. Grates are fabricated from ¾-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 ¼-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 ± 1⁄8-inch, horizontal bow ± 1⁄8-inch, and longitudinal twist ± 1⁄8-inch, all based on standard 20 foot length. If lesser tolerances are needed, contact your local Pacific sales engineer with specific requirements.
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.
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.
END SECTIONS FOR ROUND PIPE

<table>
<thead>
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<th>DIAMETER</th>
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*DIMENSIONS IN INCHES PLUS OR MINUS STANDARD SHOP TOLERANCES

END SECTIONS FOR ARCHED PIPE

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*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.

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

<table>
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<tr>
<th>DIAMETER</th>
<th>GAUGE</th>
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<th>A</th>
<th>B</th>
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<td>14</td>
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*DIMENSIONS IN INCHES PLUS OR MINUS STANDARD SHOP TOLERANCES

SAFETY SLOPE end sections are available in galvanized or aluminized steel only. Technical brochures are available for supplemental information.
**INFORMATION AND MATERIAL SPECIFICATIONS**

**PROJECT SITE INFORMATION**

**INSTALLATION**

1. Structural design of corrugated steel pipe and structural plate pipe.
2. Structural design of corrugated aluminum pipe.

**GASKETS & SEALANTS**

2. Sponge neoprene sleeve gaskets.
3. Gasketing strips, butyl or neoprene.
4. Mastic sealant.

**COATINGS & LINING**

**CEMENT & GROUT**

**POLYMER PRE-COATED 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.

**ZINC COATED (GALVANIZED) STEEL SHEETS AND COILS**

1. 3004 H34 clad aluminum alloy.

**COLD APPLIED BITUMINOUS**

1. 1 oz. per ft.² of pure aluminum.

**BASALT & ASPHALT BASE COATINGS**

1. 10 mils, one or two sides.
2. 3 mils the other side.

**TRADITIONAL & SEMI-FIBRATED ASPHALT BASE COATINGS**

1. 10 mils, one or two sides.

**MATERIALS**

**ASPHALT COATED STEEL SEWER 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.

**FABRICATION**

**SEWER & DRAIN PIPE**

**GASKETS**

2. Sponge neoprene sleeve gaskets.
3. Gasketing strips, butyl or neoprene.
4. Mastic sealant.

**INSTALLATION**

1. Structural design of corrugated steel pipe and structural plate pipe.
2. Structural design of corrugated aluminum pipe.
3. Structural design of corrugated steel structural plate pipe.

**CORRUGATED METAL PIPE**

**MATERIALS**

1. Corrugated steel pipe.
2. Steel structural plate pipe.
3. Structural design of corrugated aluminum pipe.
4. Polymeric pre-coated sewer and drain pipe.
5. Steel structural plate pipe.

**DESIGN**

**POLYMER PRE-COATED SHEETS AND COILS**

1. 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.

**ALUMINIZED TYPE II STEEL SHEETS AND COILS**

1. Metal coated with 1 oz. per ft.² of pure aluminum.
2. Steel base metal coated with 3 oz. per ft.² zinc coating for structural plate pipe.
3. Steel base metal coated with 1 oz. per ft.² of pure aluminum.

**STAINLESS STEEL**

**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.

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

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).

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 3-inch to 24-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.

Corrugated HDPE pipe can lower your overall project construction costs as a result of the utilization of smaller crews, faster installation, easier handling of lightweight pipe and smaller equipment.

From time to time, the markings on our HDPE pipe products indicate conformance to the grade of materials being provided. Listed below are the AASHTO and ASTM specifications to which they conform so that purchasers can clearly understand the quality and capacity is comparable to that of concrete (RCP) or metal pipes. In addition, corrugated (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.

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

<table>
<thead>
<tr>
<th>Nominal Inside Diameter (inches)</th>
<th>Outside Diameter (inches)</th>
<th>Minimum Wall Thickness (inches)</th>
<th>Minimum Wall Stiffness (psi)</th>
<th>Weight (lbs/ft)</th>
<th>Solid, Perforated or Both</th>
<th>Perforation Class 1.2 or Both</th>
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</thead>
<tbody>
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<td>11.8</td>
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<td>Call</td>
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<td>20</td>
<td>Call</td>
<td>Both Class 2 Studded</td>
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Note: 36” HDPE pipe will not nest into 42” pipe; 42” HDPE pipe will not nest into 48” pipe. The nests of perforations shall be arranged in two equal groups placed symmetrically on either side of the lower side of the unperturbed pipe below the spring line on the outside valleys of the corrugations.

Class 1 Perforations (uncommon)

- **20 psi or 5% deflection:** 20 psig or 10% deflection
- **30 psi or 10% deflection:** 30 psig or 15% deflection

### Dual-Wall (Type S) Plain End

#### Specification Chart

<table>
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<tr>
<th>Nominal Inside Diameter (inches)</th>
<th>Outside Diameter (inches)</th>
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### Single-Wall (Type C) Plain End

#### Specification Chart

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<th>Minimum Wall Thickness (inches)</th>
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<th>Weight (lbs/ft)</th>
<th>Solid, Perforated or Both</th>
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<td>0.060</td>
<td>20</td>
<td>5.400</td>
</tr>
<tr>
<td>24</td>
<td>27.9</td>
<td>34.0</td>
<td>0.060</td>
<td>20</td>
<td>9.250</td>
</tr>
</tbody>
</table>

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.
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.
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.

CORRUGATED PLASTIC FITTINGS

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.

HDPE PLASTIC PIPE APPLICATIONS AND ACCESSORIES

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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.

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DUAL WALL FITTINGS

- **Belt/Bell**
  - **Tees**
    - 4" - 60"
  - **Wyes**
    - 6" - 36"
  - **Reducers**
    - 4" - 60"
    - (Available in multiple variations)
  - **Flare End Sections**
    - 12" - 36"
  - **Slip Over End Caps**
    - 4" - 24"
  - **Bulk Head End Caps**
    - 4" - 60"
  - **Cross Tees**
    - 6" - 36"

**Stocking Locations:**
- Fontana, CA
- Sacramento, CA
- Grandview, WA
- Portland, OR
- San Diego, CA
- Seattle, WA
- Stockton, CA
- EUGENE, OR
- Stocking Locations:
  - Fontana, CA
  - Sacramento, CA
  - Casa Grande, AZ
  - Hubbard, OR
  - Santa Fe, NM
  - Grandview, WA

Website: [www.pcpipe.com](http://www.pcpipe.com)
Email: [info@pcpipe.com](mailto:info@pcpipe.com)
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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