

## CONTACT

## The American Concrete Pressure Pipe Association (ACPPA)

12607 N. Sunflower Loop

Hayden, ID, USA
714-801-0298
support@acppa.org
www.acppa.org

AMERICAN
Concrete Pressure Pipe
ASSOCIATION

## Canadian Member Companies

## DECAST

8807 County Road 56
Utopia, ON, Canada
705-734-2892

## DECAST

info@decastltd.com
www.decastltd.com

Rinker Materials
699 Boulevard Industriel
Saint-Eustache, QC, Canada
888-497-7371
www.rinkerpipe.com

## CONTENTS

About This Guide ..... 4
CPP Dimensions ..... 5
Shipping to the Job Site ..... 7
Inspection \& Acceptance of Delivery ..... 9
CPP Pipe Markings (Outside) ..... 10
CPP Pipe Markings (Inside) ..... 12
Markings on Fittings ..... 13
Unloading CPP ..... 14
On-Site Storage ..... 15
Shop Drawings ..... 16
Handling and Laying ..... 17
Joints ..... 18
Preparing Pipe Ends for Bell and Spigot Jointing ..... 24
Bringing Pipes Together to Form a Joint ..... 26
Joint Deflections ..... 28
Protecting the Joints with a Mortar Collar ..... 32
Fittings ..... 33
Closures ..... 34
8 Point Measurement ..... 35
Backfilling ..... 36
Field Services ..... 37

## ABOUT THIS GUIDE

This installation guide contains suggestions and recommendations about handling and installing Concrete Pressure Pipe (CPP).

Contract specifications take precedence over this guide. The manufacturer assumes no responsibility or liability for CPP installation by reason of supplying this guide.

## GENERAL NOTES

Please consult with the manufacturer for weights and dimensions.
Refer to project shop drawings for more specific information.

## Bar-Wrapped C303 / Prestressed C301 Lined CPP



Prestressed C301 Embedded CPP


## CPP DIMENSIONS

CPP is manufactured to an American standard in inches. The "nominal" pipe diameter is the closest millimeter diameter after unit conversion.

|  | Nominal Pipe Diameter mm | Actual Pipe Diameter mm | Joint Diameter mm | $\begin{gathered} \text { Pipe Barrel OD } \\ \mathrm{mm} \end{gathered}$ | Pipe Bell OD | Pipe Weight kg/m |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| C303 | 350 | 356 | 400 | 440 | 465 | 145 |
|  | 400 | 406 | 454 | 495 | 515 | 169 |
|  | 450 | 457 | 514 | 555 | 575 | 209 |
|  | 500 | 508 | 565 | 605 | 625 | 236 |
| C301L | 600 | 610 | 699 | 737 | 800 | 375 |
|  | 750 | 762 | 870 | 908 | 972 | 560 |
|  | 900 | 914 | 1041 | 1080 | 1143 | 710 |
|  | 1050 | 1067 | 1200 | 1251 | 1302 | 970 |
|  | 1200 | 1219 | 1372 | 1422 | 1473 | 1225 |
|  | 1350 | 1372 | 1543 | 1594 | 1645 | 1450 |
|  | 1350 | 1372 | 1565 | 1594 | 1667 | 1450 |
|  | 1500 | 1524 | 1738 | 1765 | 1838 | 1640 |
| C301E | 1650 | 1676 | 1781 | 1981 | 1981 | 2225 |
|  | 1800 | 1829 | 1940 | 2159 | 2159 | 2650 |
|  | 1950 | 1981 | 2096 | 2337 | 2337 | 3075 |
|  | 2100 | 2134 | 2254 | 2518 | 2518 | 3550 |
|  | 2250 | 2286 | 2410 | 2670 | 2670 | 3775 |
|  | 2400 | 2438 | 2569 | 2822 | 2822 | 4025 |
|  | 2550 | 2591 | 2715 | 2975 | 2975 | 4325 |
|  | 2700 | 2743 | 2873 | 3140 | 3140 | 4700 |
|  | 3000 | 3048 | 3216 | 3483 | 3483 | 6025 |
|  | 3300 | 3353 | 3521 | 3826 | 3826 | 6775 |
|  | 3600 | 3658 | 3826 | 4197 | 4197 | 7350 |

The values listed above are for a standard gauge 16 cylinder pipe. Weight per meter is provided as a guide only on this table. Weight per meter can vary based on pipe design. Please consult with the manufacturer.


## SHIPPING TO THE JOB SITE

CPP is shipped to the job site on trucks. When the truck arrives at the job site, the CPP will be on the truck stacked in the configurations shown.


One pipe configuration


Four pipe configuration


Eighteen pipe configuration


Two pipe configuration


Eight pipe configuration


Twenty four pipe configuration

Your shipment may include the following materials:
**Which remain the manufacturer's property**

- Pipe spacer
- Wedge 4"x4" heel
- Wedge 6"x6" heel
- Wedge 8"x8" heel
- Straps
- Steel bunk
- 4 " $\times 4$ " sleeper
- 6"x6" sleeper

| Nominal Pipe <br> Diameter (mm) | Weight of Pipe <br> (kg) | Standard <br> Truckload |
| :---: | :---: | :---: |
| 400 |  |  |
| 450 |  |  |
| 500 |  |  |
| 600 |  |  |
| 750 | Consult the manufacturer |  |
| 900 | for details on load limits |  |
| 1050 | for your jurisdiction |  |
| 1200 |  | $\vdots$ |
| 1350 |  |  |
| 1500 |  |  |
| 1650 |  |  |
| 1800 |  |  |
| 1950 |  |  |
| 2100 |  |  |
| 2250 |  |  |
| 2400 |  |  |

Notes:

- Quantities are for standard pipes only. Quantities may vary depending on pieces being loaded
- Unload rear pipes first


## INSPECTION (BEFORE UNLOADING) \& ACCEPTANCE OF DELIVERY

Each delivery will have a packing slip / bill of lading itemizing the products on the delivery truck.



Please check your shipment for the following:

1. Check your packing slip against your order. Notify the manufacturer's shipping department if there are any discrepancies between the order and the packing slip
2. Check for damage during transit
3. Note any damage on packing slip or missing product before accepting the shipment
Once the shipment has been verified, the packing slip must be signed and returned to the truck driver

## CPP MARKINGS (OUTSIDE)



## Steel Cylinders

The steel cylinder inside the pipe is standard 16 gauge. If the gauge is thicker than 16 gauge the pipe is marked on the outside mortar coating with paint patches on the spigot end.

| U.S. Gauge \# / <br> Thickness (in) | Steel Sheet Thickness |  |  | Marking Colour <br> Code |
| :---: | :---: | :---: | :---: | :---: |
|  | mm | 1.52 | 0.0598 |  |

## CPP PIPE MARKINGS (INSIDE)

The bell end inner concrete lining of the pipe is stenciled with:

- NSF/ANSI 61 Drinking Water System Components - Health Effects Standard
- Manufacturing Facility (M/F)
- Project Number (P/N) / Job Number ( $\mathrm{J} / \mathrm{N}$ )
- Mark Number (M/N)
- Cast Date (C/D)
- Serial Number (S/N)
- AWWA designation for CPP type
- Inspector's stamp


## MARKINGS ON FITTINGS

## Markings on Fittings Outside and Inside on 1500mm and larger

Fittings are marked to help identify the piece and aid in its installation. Fittings may contain the following markings:

- "L" (long side) and "S" (short side) are marked on the inside core and outside coating at the long and short location of the spigot end of elbows and bevels
- "TOP" is marked at the top location of the inside core and outside coating
- When installing a fitting with a top mark; the marking must be in the 12 o'clock position for proper horizontal and vertical alignment
- Branches or outlet pipe are marked with a pink stripe on the exterior mortar coating at the location of the branch or outlet



## UNLOADING CPP

Contractors are responsible for obtaining proper equipment and to ensure all health and safety laws are obeyed while unloading materials. Care must be taken to not damage the pipe in anyway. Contact the manufacturer's shipping department immediately if the pipe is damaged.

## Unloading Methods

Crane: Use steel cables or slings of sufficient lifting capacity.

Forklift: Forks must be cushioned with rubber or wood to prevent damage to the mortar coating.

## DO NOT USE CHAINS

## Multi-Tiered Shipments

When unloading; cross timbers must be secured to the trailer side rail on the unloading side. This is necessary to prevent timbers from kicking upwards and dropping the rear pipe off the back side of the trailer.

## Shipment Materials

Dunnage and timbers are the property of the manufacturer and must be returned on the delivery truck. Any dunnage or timbers removed from the trailer will be billed back
 to the contractor.

## ON-SITE STORAGE

CPP shipments include gaskets, lubricant and the diapers that are used for field grouting of joints. Grout is not included.

1. Gaskets should be stored in a cool place away from heat, sunlight, gasoline or other materials that can damage rubber
2. Joint lubricants should be stored according to the manufacturer's instructions. If freezing conditions are expected, keep indoors
3. If freezing conditions are expected, the CPP must be set on wooden skids off the ground to avoid damaging the mortar coating


## SHOP DRAWINGS

The manufacturer provides sealed (stamped) shop drawings for all CPP projects. Installers must ensure they are using the latest revision of the shop drawings obtained from the project manager. Installers must refer to the shop drawings for the following information:

## - Lists of all pipes and fittings

## - Laying direction, sequence and alignment of pipeline

## - Any special installation instructions



## HANDLING AND LAYING

When handling CPP, care must be taken to avoid damaging the outer mortar coating, the ends, or the inner concrete lining.

- Trenches must be excavated to sufficient depths to provide required bedding (see project specifications)
- Trenches must be wide enough for diaper installation and inspection
- Trench bottoms must be prepared as shown in project drawings
- Pipes and fittings have been designed for the installation and operating conditions specified in project contract documents. These conditions should not be modifieded without consulting the manufacturer's engineering department

All pipes, fittings, etc. shall be lowered into the trench using suitable pipe-laying equipment.

- Pipe must not be rolled, skidded, or dumped into the trench
- Laying equipment must have sufficient lifting capacity and stability

Pipes are to be laid with the bell ends facing the direction in which the pipe laying proceeds.


## JOINTS

## 1) Standard Bell and Spigot Joints

Bell and spigot joints are the standard joint configuration for CPP. The spigot ring is steel and has a rectangular recess that holds a circular rubber O-ring gasket.


## 2) Restrained Joints

CPP is available with restrained joints to avoid the need to construct thrust blocks. CPP can be restrained to resist the thrust forces caused by changes in direction or dead ends. Restrained joints on CPP are designed by the manufacturer.

ALL JOINTS WITH RESTRAINED JOINTS (SNAP-RING, HARNESS OR WELDED) SHALL BE GROUTED \& BACKFILLED TO THE RESTRAINED JOINTS DESIGN COVER PRIOR TO PRESSURE TESTING THE LINE.
2.1 SNAP RING Joint
2.2 Harness Clamp Joint
2.3 Welded Joint

### 2.1 SNAP RING Joint

The SNAP RING joint is a restrained jointing system. The joint is made by tightening a bolt on the outside to employ a snap-ring to secure the spigot and bell against separation.


The SNAP RING bell requires a full site inspection prior to assembly

1) The hardware of the SNAP RING must be expanded fully. The bolt must be straight and the u-nut must be in the correct position and undamaged

2) The SNAP RING insert must be seated within the insert groove and be flush or below the surface of the bell as shown below

3) The Snap Ring Clip (also called the steel skid plate) will sit flat as it bridges the gap in the insert. It will take the shape of the Bell as the gasket pushes past it. ANY DEFORMATION OR DAMAGE TO THE SNAP RING BELL, INSERT OR ITS HARDWARE MUST BE CORRECTED PRIOR TO INSTALLING JOINT

4) Shown below: SNAP RING hardware not closed and joint not homed

5) Shown below: SNAP RING hardware closed and spigot engaged


### 2.2 Harness Type Clamp Joint

Harness joints are used as a mechanical means of transmitting longitudinal thrust across the joints. Often used at locations where there is the potential for future connection and also where the application dictates a higher pressure, for example at a bulkhead. The two-part harness clamp is positioned around the joint and secured by tightening drawbolts on each side.


## Holdfast Restrained joint

The Holdfast "clamp-type" joint provides restraint utilizing 2 or 4 precision casted segments ( 2 up to 600 mm ; 4 from 750 to 1350 mm diameter) connected together once the joint is homed/mated. Also, typically used at test bulkheads for 350 to 1350 mm diameter. The other noticeable difference from the Harnessed joint described earlier is the Wedge Ring around the spigot behind the gasket groove. Once the segments are installed with bolts tightened and inspected for proper seating (per diagram below), the diaper and grout process is completed utilizing a wider diaper. Grouting process is the same as for a standard joint.

Holdfast coupling restrained joint


Harness Joints must be grouted prior to pressurizing the pipeline Bolt Torque for harness clamps is $135 \mathrm{~N} . \mathrm{mm}$ (100lb.ft)

### 2.3 Welded Joint

There are many different possibilities of welded joints. Depending on the pipe design and diameter, welding can be done from the inside or the outside. Consult manufacturer's engineering department for more information.

## Internal Field Weld



External Field Weld


## Notes:

- All joints must be protected from corrosion with a grout filled diaper
- Internally welded joints must be internally grouted as well


## PREPARING PIPE ENDS FOR BELL AND SPIGOT JOINTING

To ensure a proper, watertight joint, the following steps must be taken prior to jointing.

1. Clean the bell and spigot of the pipe to remove all dirt and foreign materials

2. Apply lubricant to the spigot groove

3. Apply lubricant to the inside of the bell

4. Place the lubricated gasket in the gasket groove of the entire spigot ring. When the gasket is in place, insert a smooth rod or a screwdriver between the gasket and spigot ring and run the screwdriver/ rod around the entire circumference of the spigot ring to ensure that the gasket is stretched evenly around the spigot. This usually takes 2 to 3 rotations to accomplish

5. Coat the gasket with a 1 mm layer of lubricant


## Notes:

- Lubricant is supplied by the manufacturer
- To ensure a water tight joint, install gaskets immediately before laying the pipe
- Do not pre-install gaskets on pipes ahead of the installation crew, the lubrication will dry out
- In winter conditions, the bell and spigot must be preheated before lubrication and connection


## BRINGING PIPES TOGETHER TO FORM A JOINT

The following diagram shows three possible methods of bringing pipe together to form joints: lifting cables, come-along with lifting cables and hydraulic puller.


Lifting Cables


Come-along with lifting cables


Hydraulic Puller

The handling method is the responsibility of the installation contractor. Care must be taken to avoid any damage to the pipe, specifically to the joint rings and mortar coating.

## Follow these steps to join pipes

1. Ensure that a space approximately 200 mm deep and 400 mm wide is excavated in the ground under the jointing area to facilitate grouting of the joint with the diaper
2. Carefully maneuver the new pipe to be added so that the nose of the spigot end is aligned into the flare of the bell end of the previously installed pipe. This is necessary so that the spigot will enter the bell end squarely. If the new pipe is properly aligned, it will slide into the pipe bell smoothly
3. Pipe must be suspended by cable or sling during jointing
4. If any dirt touches the lubricated spigot and bell before they are assembled, they must be cleaned and re-lubricated
5. It is the contractor's responsibility to ensure the gaskets are correctly placed. Feeler gauges are available from the manufacturer upon request. Contact your manufacturer's service representative for direction on using a feeler gauge to check gaskets after jointing pipes


## JOINT DEFLECTIONS

- If joint deflections are required for slight grade or line changes, they must be made after the pipes have been joined and before grouting
- After the joint is squarely in place, the pipe can be deflected within the limits shown in the following deflection tables
- Restrained joints must be fastened before they are deflected. Deflection limits for restrained joints are shown on the next page


Joint Deflection of CPP with Deep Bell and Spigot Joints

|  | Nominal Pipe Diameter mm | Max. Joint Opening mm | Max. Deflection Angle Deg | 6.1m LENGTHS |  | 7.3m LENGTHS |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Offset Std. Length mm | Curve Radius Std. Length m | Offset Std. Length mm | Curve Radius Std. Length m |
| C303 | 350 | 13 | $1^{\circ} 52^{\prime}$ | 198 | 188 | 238 | 225 |
|  | 400 | 44 | $5^{\circ} 32^{\prime}$ | 590 | 63 | 708 | 76 |
|  | 450 | 44 | $4^{\circ} 54^{\prime}$ | 522 | 72 | 626 | 86 |
|  | 500 | 44 | $4^{\circ} 27^{\prime}$ | 475 | 79 | 570 | 94 |
| $\begin{aligned} & \text { C301L } \\ & \text { Deep Joint } \end{aligned}$ | 600 | 44 | $3^{\circ} 38^{\prime}$ | 387 | 95 | 461 | 117 |
|  | 750 | 44 | $2^{\circ} 55^{\prime}$ | 311 | 119 | 371 | 145 |
|  | 900 | 44 | $2^{\circ} 26^{\prime}$ | 259 | 142 | 310 | 174 |
|  | 1050 | 44 | $2^{\circ} 7^{\prime}$ | 225 | 164 | 269 | 200 |
|  | 1200 | 44 | $1^{\circ} 51^{\prime}$ | 197 | 188 | 235 | 229 |
|  | $\begin{gathered} 1350 \\ \text { (Joint dia. }=1543 \text { ) } \end{gathered}$ | 44 | $1^{\circ} 38$ ' | 174 | 215 | 209 | 257 |
|  | $\begin{gathered} 1350 \\ \text { (Joint dia. }=1565 \text { ) } \end{gathered}$ | 41 | $1^{\circ} 30^{\prime}$ | 160 | 231 |  |  |
|  | 1500 | 44 | $1^{\circ} 27^{\prime}$ | 155 | 238 |  |  |
| C301E Standard Joint | 1650 | 28 | $0^{\circ} 55^{\prime}$ | 93 | 403 |  |  |
|  | 1800 | 28 | $0^{\circ} 50^{\prime}$ | 88 | 423 |  |  |
|  | 1950 | 27 | $0^{\circ} 44^{\prime}$ | 79 | 474 |  |  |
|  | 2100 | 31 | $0^{\circ} 48^{\prime}$ | 81 | 459 |  |  |
|  | 2250 | 30 | $0^{\circ} 43^{\prime}$ | 76 | 491 |  |  |
|  | 2400 | 30 | $0^{\circ} 40^{\prime}$ | 71 | 523 |  |  |
|  | 2550 | 44 | $0^{\circ} 56^{\prime}$ | 99 | 378 |  |  |
|  | 2700 | 45 | $0^{\circ} 54^{\prime}$ | 96 | 391 |  |  |

## Note:

- Standard pipe length: see manufacturer's details
- Joint deflections may vary based on joint geometry. All joint deflections should be verified with the specified value on the shop drawings

Joint Deflection of CPP with Mechanical Restrained Joints

|  |  |  |  | 6.1m LENGTHS |  | 7.3m LENGTHS |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Nominal Pipe Diameter mm | Max. Joint Opening mm | Max. Deflection Angle Deg | Offset Std. Length mm | Curve Radius Std. Length m | Offset Std. Length mm | Curve Radius Std. Length m |
| C303 | 400 | 13 | $1^{\circ} 36^{\prime}$ | 171 | 218 | 205 | 262 |
|  | 450 | 13 | $1^{\circ} 25^{\prime}$ | 151 | 247 | 181 | 296 |
|  | 500 | 13 | $1^{\circ} 17{ }^{\prime}$ | 137 | 272 | 165 | 326 |
| C301L | 600 | 13 | $1^{\circ} 2^{\prime}$ | 110 | 335 | 133 | 403 |
|  | 750 | 13 | $0^{\circ} 50^{\prime}$ | 88 | 417 | 107 | 502 |
|  | 900 | 13 | $0^{\circ} 41^{\prime}$ | 74 | 499 | 89 | 600 |
|  | 1050 | 13 | $0^{*} 36{ }^{\prime}$ | 64 | 576 | 77 | 692 |
|  | 1200 | 13 | $0^{\circ} 31^{\prime}$ | 56 | 658 | 68 | 791 |
|  | 1350 (Joint dia. $=1543$ ) | 13 | 0 ${ }^{\circ} 28^{\prime}$ | 50 | 741 | 60 | 890 |
|  | 1350 (Joint dia. = 1565) | 13 | $0^{\circ} 27^{\prime}$ | 49 | 751 |  |  |
|  | 1500 | 13 | $0^{\circ} 25^{\prime}$ | 44 | 833 |  |  |
| C301E | 1650 | 13 | $0^{\circ} 24^{\prime}$ | 43 | 854 |  |  |
|  | 1800 | 13 | $0^{\circ} 22^{\prime}$ | 39 | 932 |  |  |
|  | 1950 | 13 | $0^{\circ} 20^{\prime}$ | 36 | 1005 |  |  |
|  | 2100 | 13 | $0^{\circ} 19^{\prime}$ | 34 | 1082 |  |  |
|  | 2250 | 13 | $0^{\circ} 18{ }^{\prime}$ | 32 | 1156 |  |  |
|  | 2400 | 13 | $0^{\circ} 16^{\prime}$ | 30 | 1232 |  |  |



## Note:

- Standard pipe length: see manufacturer's details
- Joint deflections may vary based on joint geometry. All joint deflections should be verified with the specified value on the shop drawings


## SNAP RING Restrained Joints

1. With the snap ring in its expanded position insert the spigot of the adjoining pipe into the bell as previously described
2. After the pipe is pushed in completely, loosen the interior nut
3. The joint is assembled squarely and the insert is tightened only enough to prevent the pipe from pulling apart during deflection
4. Once the pipe has been deflected the required amount, the insert can be tightened to the extent of the bolt travel. Hand tightening is all that is required, do not force the bolt
5. Make grade/line adjustments as indicated on the shop drawings
6. Grout the joint following the procedure on page 32


Position the bottom half of the harness clamp under the joint prior to placing of the adjoining pipe

1. Assemble the bell and spigot joints as previously described
2. Position the top half of the harness clamp over the joint
3. Assemble joint by tightening the two bolts only enough to prevent the pipe from pulling apart during deflection
4. Once the pipe is deflected to the appropriate angle tighten the bolts and grout as usual
5. Make grade/line adjustments as indicated on the shop drawings
6. Grout the joint following the procedure on the next page


## Welded Restrained Joints

Several welded configurations are available. Consult the layout drawings of your project for specific information, or consult the manufacturer's engineering department

## PROTECTING THE JOINTS WITH A MORTAR COLLAR

1. Ensure a 200 mm deep and 400 mm wide space exists under the joint to guarantee grout surrounds the full circumference of the joint
2. Place the supplied grout band also known as the "diaper" around the full circumference of the joint so that it straddles the joint recess. Tighten the straps. Fill diapers prior to backfilling
3. Mix 3 parts of sand to 1 part of cement with enough water to make a free-flowing grout. Ensure that the same type of cement that was used in the pipe coating is used in the grout, as per contract specification
4. Pour the grout into the diaper on one side until the mortar circles the pipe and appears on the other side. Continue pouring the grout on the other side until the diaper is full. Ensure the grout is rodded or agitated on both sides of the pipe alternately to settle the grout and fi $l l$ all voids
5. Use stiffer mix at the top and trowel the gap at the top of the diaper, ensuring that the entire joint is covered with 25 mm of grout


Diaper is placed around the joint and straps are tightened


Grout is poured into the diaper into one side and then the other until the diaper is completely full

## Mortar the Inside of the Joint

At the discretion of the owner, for the inside joint recess of the CPP pipeline, typically 1500 mm diameter and larger, use a ratio of 3:1 (sand to cement) and enough water to make a mix that can easily be troweled. Point the inner joint recess and strike off the surface smooth with the inside of the pipe.

## FITTINGS

Fittings allow for variations and adaptability from the straight course of a pipeline. Grade and line changes are implemented using fittings. Fittings are custom-made to size and configuration based on the pipeline design. Fittings are connected to concrete pressure pipe in the same way as joints for straight pipe.


Elbow


Wye


Tee


Reducer

## CLOSURES

Closures are used to connect installed pipeline sections. They are designed and manufactured to the exact dimensions required. Contact your manufacturer's representative for assistance on field measurements of closures. Complicated geometry may require surveying equipment.


## STANDARD CLOSURE MEASUREMENT

STEP 1: EXCAVATE AND EXPOSE PIPE ENDS SO THAT FOUR COORDINATE POINTS (AT LEAST 2500 mm APART) CAN BE TAKEN AS SHOWN
STEP 2: TYPE OF JOINTS (STD, HARNESS, HOLDFAST, SNAP-RING)
TO BE DETERMINIED INCLUDING ORIENTATION (BELL OR SPIGOT) AFTER CAREFULLY CHIPPING MORTAR
STEP 3: TYPE OF PIPE (C303, C301 (L) OR (E), SSP, C300) TO BE DETERMINED
STEP 4: TAKE FOUR SHOTS (NORTHING, EASTING AND ELEVATION) AS PER DETAIL "A", ON PIPE
CENTRE LINE AT TOP WITH PROPER SURVEYING EQUIPMENT AND FILL IN TABLE 1.


## 8 POINT MEASUREMENT

## (Simple closure application. Alignment and Joints are accessible)

Closure sections are used when a new pipeline is connected to an existing pipeline, or when a connection is required after an isolated pressure test. To manufacture the closure section, the manufacturer requires the exact dimensions of the closure length.

If access to the pipe joints is available, the closure should be measured as per the diagram below. If the bulkheads cannot be removed or if complete excavation is not possible, your manufacturer's Technical Services can instruct the survey crews on how to acquire the necessary dimensions. The manufacturer will manufacture the closure to fit the existing opening. The closure may be installed with a coupling or a split welding sleeve.

Closures can be manufactured for restrained or non-restrained areas of the pipeline.


## Note:

For complex geometries, survey equipment provided by the contractor may be required to take specific measurements

## BACKFILLING

ALL JOINTS WITH RESTRAINED JOINTS (SNAP-RING, HARNESS OR WELDED) SHALL BE GROUTED \& BACKFILLED TO THE RESTRAINED JOINTS DESIGN COVER PRIOR TO PRESSURE TESTING THE LINE.

Bedding materials, and trench details are specified in contract documents and must be followed to ensure the pipe will perform as designed over time. The exterior mortar coating on CPP provides protection for the bar /prestressing wire and steel cylinder in the pipe so it is necessary to ensure that large rocks and debris are removed prior to backfilling to avoid damage to the exterior of the pipe.


## FIELD SERVICES

## On-Site Welding

Yourmanufacturer provides on-site welding services. Welders are Canadian Welding Bureau (CWB) certified. Personnel and equipment can also be provided for confined space entry.


## Live Tapping

Outlets in pipe are needed for various reasons and when the location of outlets cannot be predetermined, it is necessary to tap into existing pressure lines. Your manufacturer provides a full service field solution for pressure tapping for concrete pressure pipe and other pipe materials.


## Consultation on Connection to Existing Pipes / Existing Infrastructure Rehabilitation

Determining the appropriate connection methods to existing pipes requires situation assessment, knowledge of pipe materials, engineering analysis and implementation. Your manufacturer provides a complete solution from consultation through to implementation.

Contact your manufacturer for an estimate and quotation.


## CONTACT

## The American Concrete Pressure Pipe Association (ACPPA)

12607 N. Sunflower Loop

Hayden, ID, USA
714-801-0298
support@acppa.org
www.acppa.org

AMERICAN
Concrete Pressure Pipe

ASSOCIATION

## Canadian Member Companies

## DECAST

8807 County Road 56
Utopia, ON, Canada
705-734-2892
ロECAST
info@decastltd.com
www.decastltd.com

Rinker Materials
699 Boulevard Industriel
Saint-Eustache, QC, Canada
888-497-7371
www.rinkerpipe.com

 oveverovociowiva 0000000000000 (O)D o00000000000


