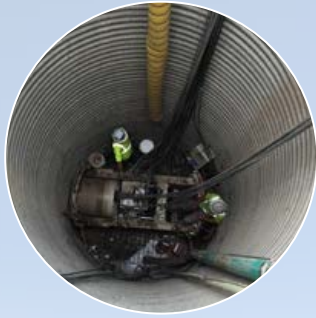


Vertical Solutions
with HEL-COR[®]



DRAFT

A History of Proven Performance

Long before the creation of the industrial bread slicer, corrugated steel pipe (CSP) was invented in the United States. CSP was first used for hydraulic cross culverts in the early 1900s. Since the first culvert application, Contech Engineered Solutions has been manufacturing HEL-COR® for a variety of construction applications. This highly automated helically corrugated steel pipe is a proven solution that can also be utilized in vertical applications.

Vertical applications of HEL-COR® include caissons for utility poles in electric transmission lines, bridge and building piers, wind turbine foundations, crane enclosures, utility sewer shafts, petroleum cellars (pits), and general concrete forms.



Efficiently Engineered for Vertical Applications

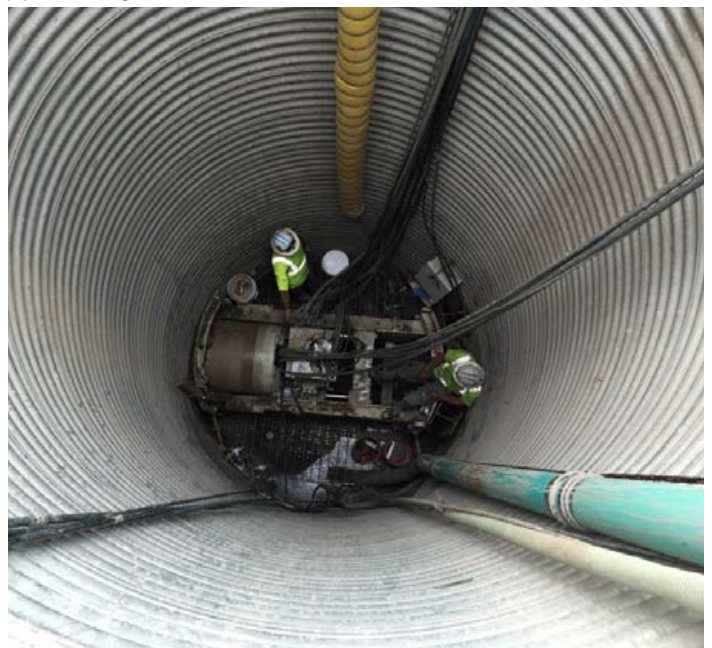
HEL-COR® CSP is fabricated with a sinusoidal corrugation to provide an increased strength of the steel conduit. Thinner gage steel that is corrugated provides an equivalent pipe stiffness compared to thicker smooth wall steel pipe. This efficiency of raw materials provides a large cost savings to the end user. Standard pipe corrugation is ½" depth. Deeper corrugation depths of 1", 2" and 5.5" have been made to allow for a larger range of pipe diameters, increasing the construction applications for vertical pipe.

HEL-COR® is the most efficient, cost-effective deep foundation solution

144" diameter HEL-COR® 5 x 1 Corrugated Steel Pipe used as a crane tower enclosure during the construction of a parking garage in an urban area.



132" diameter HEL-COR® 5 x 1 Corrugated Steel Pipe used for a sewer shaft during pipe tunneling of a new sewer line in an urban area.





Wind Turbine Foundations

Foundation systems utilizing HEL-COR® are available to support wind turbines, transmission towers, deep foundations or vertical shaft applications. Additionally, the Contech MOBILE PIPE® mill is an ideal solution for remote sites, providing fast and cost-effective on-site steel pipe manufacturing. For larger diameter foundation designs, MULTI-PLATE® and BridgeCor® structural plate can be used.

ADDITIONAL WIND FARM APPLICATIONS BY CONTECH INCLUDE:

- Culverts – Flexible options for directing storm flows where you need them to go.
- Stream Crossings – Cross streams and other environmentally sensitive areas with our reliable bridges and structures.
- Slope Stabilization – Prevent movement and downslope erosion and provide support for grade changes with our hard armor products.
- Haul Roads/Tank Trails – Easily support heavy loads with a variety of roadway and crossing solutions.

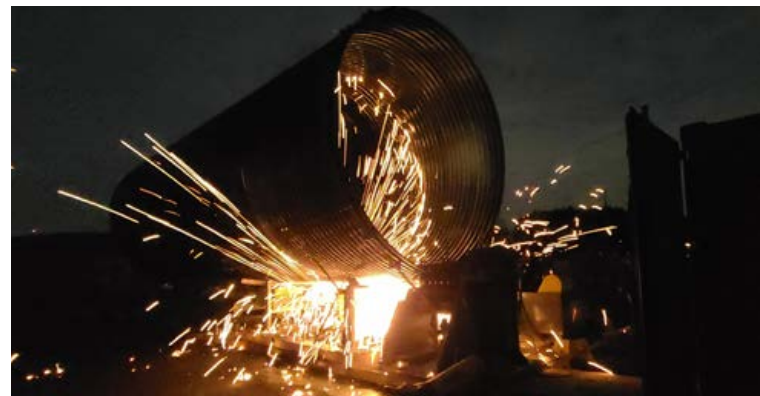
TENSIONLESS PIER & ANCHOR DEEP FOUNDATIONS

The P&H Tensionless Pier supports wind turbines on monopole towers. The foundation consists of a large diameter, cast-in-place annular pier (typically 14-feet to 16-feet in diameter and 25-feet to 35-feet deep). For hard rock site conditions, an Anchor Deep Foundation design is also available. Anchor Deep Foundation systems excel in every soil type but are superior for mountain and remote access sites.

- Turbine sizes: 100 KW to 5 MW installed, with capacity for larger. Supports the largest turbines to date both in North America and internationally.
- Most efficient, cost effective foundation solution
- Typical and historical foundation savings more than 25% as compared to shallow foundations in various soil conditions
- Most efficient utilization of time and resources
- 3-6% reduction in total project development costs
- Deep foundations are superior for seismically active zones, floodwater inundation, flood scour, frost depth, creeps and landslides



HEL-COR® is an integral part of the design of the turbine foundation.



MOBILE PIPE® is ideal for remote sites, offering on-site manufacturing.

Vertical Access Shafts

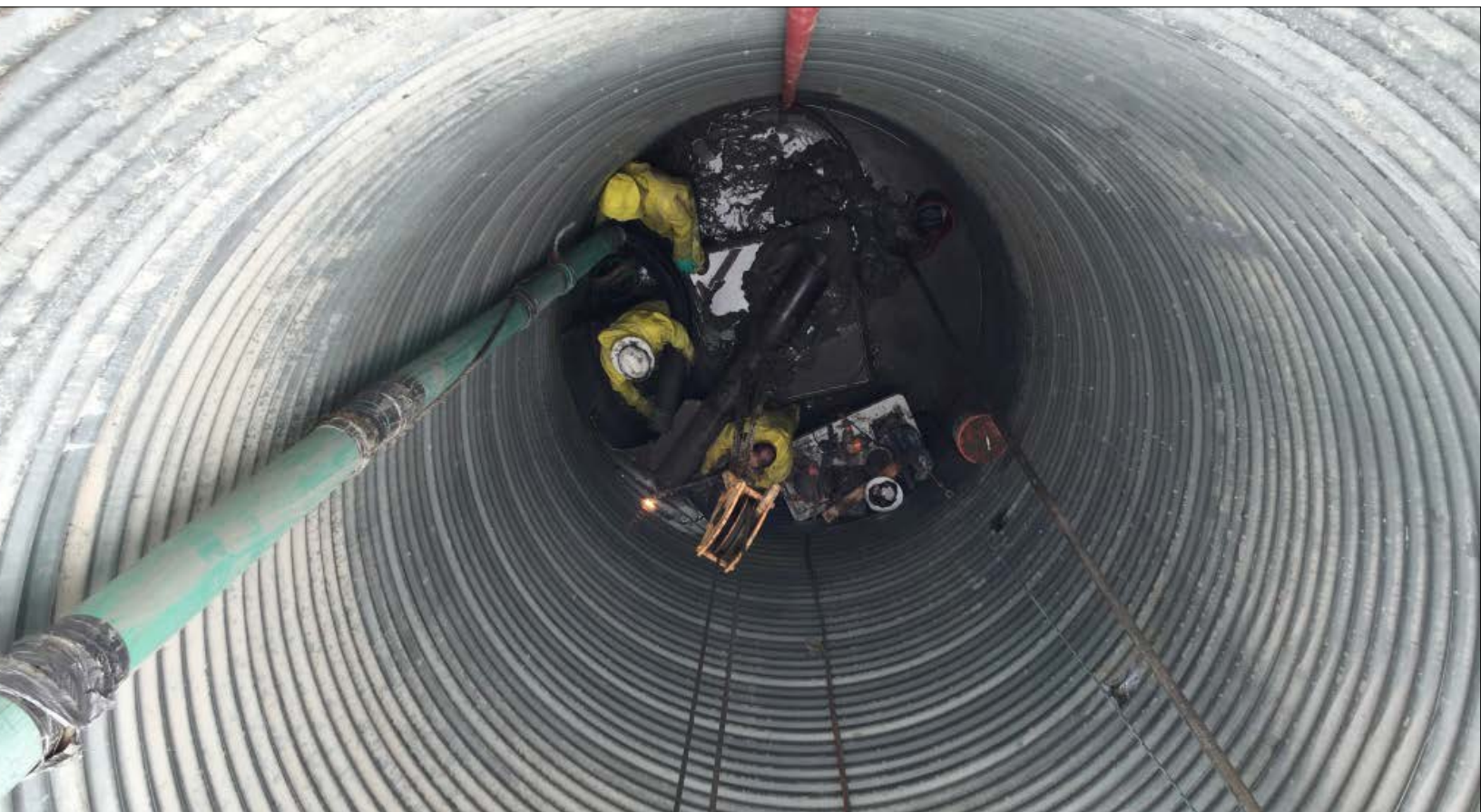
Vertical access shafts are used to enable sewer or other utility work below ground. HEL-COR® makes an excellent choice for vertical shaft construction. Vertical shafts can be constructed either through tunneling or sinking. The shaft must be constructed from the top down, as there is initially no access to the bottom.

EXAMPLES OF VERTICAL SHAFTS INCLUDE:

- Utility Access Shafts
- Mining Access Shafts
- Crane Enclosures



Vertical access shafts can be used to safely access utilities below ground.



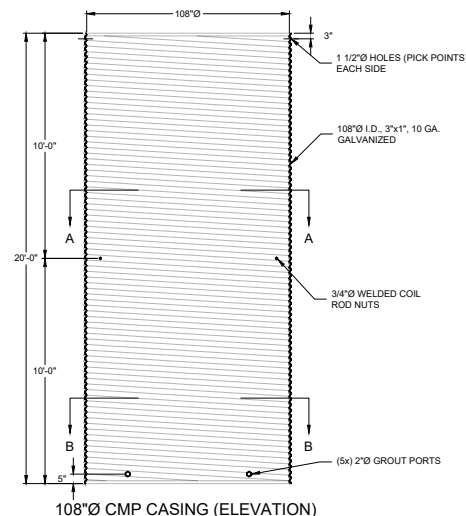
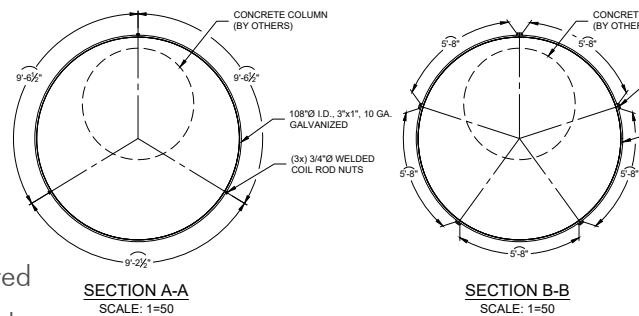


Caisson Solutions

Construction Caissons, first used and named in the 1890's, were developed in Chicago. Chicago's poor soils on the lake front created a need for deep foundations. Pile foundations, while effective, could sometime damage nearby buildings during the driving process. A new type of deep foundation, the caisson was invented to prevent damage to nearby buildings during construction. Caissons and other deep foundation technics allowed architects to design taller buildings (skyscrapers. These deep foundations were created utilizing a wooden pile technique which was further enhanced through the incorporation of corrugated steel pipe which was filled with concrete to create a permanent foundation support for utility poles and other structures.

EXAMPLES OF CAISSONS INCLUDE:

- Transmission Lines
- Bridge Piers
- Building Foundations



Cellar Solutions

A cellar is a large diameter pipe that is set into the ground to provide the initial stable structural foundation for a borehole or oil well providing a recess to ground surface for access and safety. This is typically set before any drilling operations are performed.

Utilizing HEL-COR® Cellars provides additional advantages in that it is lightweight, cost-effective and relatively easy to install.

FEATURES & BENEFITS

- Aids in soil stabilization to prevent the hole from caving into the wellbore
- Prevents unconsolidated shallow formations from washing out
- Lightweight
- Easy installation
- Durable
- Cost-effective



Setting the cellar occurs prior to any drilling.



Lightweight for easy handling and transportation.

CONTECH CSP CELLARS					
(Diameters, Lengths, Gages, and Coatings)*					
Diameter		Standard Length (inches)	Standard Length (mm)	Gage	Calibre (mm)
(inches)	(mm)				
72	1800	6', 8' and 10'	1800, 2400 and 3000	16	1.63
84	2100				
96	2400				
120	3000				

* Available in galvanized steel.

* Also available in fully nestable, bolted option.

* Check with local Contech Sales Office for availability of additional sizes and gages.



HEL-COR® Cellars provide a safe recess to ground surface access.

HEL-COR® Material Properties

CORRUGATION PROFILE	DIAMETER	MATERIALS	GAGE	STANDARD LENGTHS*
2-2/3" x 1/2"	12" - 60"	Galvanized Steel Aluminized Steel Aluminum Polymer Coated Steel	16 - 8	20' - 40'
3" x 1"	48" - 144"		16 - 8	20' - 40'
5" x 1"	48" - 144"		16 - 8	20' - 40'

* Longer lengths may be available. Please contact your local Contech representative for additional information.



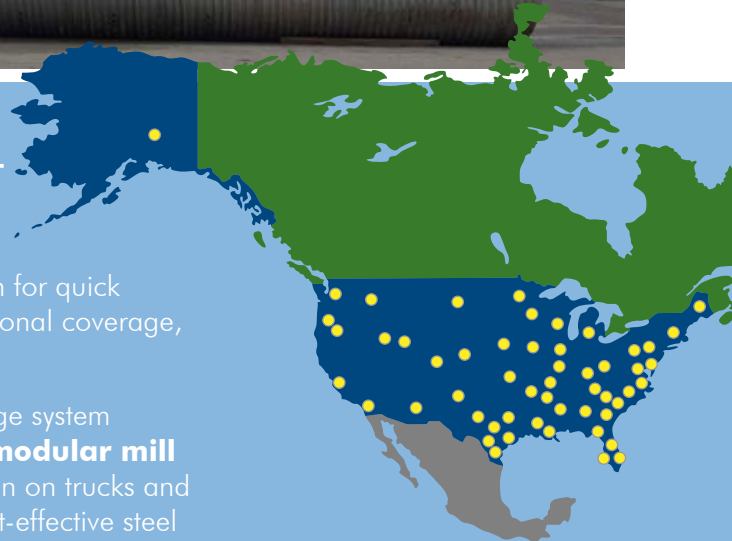
Nationwide Manufacturing Footprint

Contech manufacturing plants are available throughout the nation for quick turnaround delivered directly to your site. With fully supported national coverage, Contech is there when you need us.



For remote site applications or large system manufacturing, **MOBILE PIPE® modular mill** can be delivered to the site location on trucks and assembled on-site for fast and cost-effective steel pipe manufacturing. MOBILE PIPE can produce HEL-COR®, ULTRA FLO® and Smooth Cor™ corrugated metal pipe in a variety of sizes. Diameters from 3 to 16 feet and lengths up to 35 feet can be accommodated.

MOBILE PIPE®



Additional Contech Products Provide Versatility for Optimum Efficiency

CONTECH® TUNNEL LINER PLATE

Contech 2-Flange Liner Plate provides optimum shaft stability and protection when constructing new utility tunnels or lining vertical shafts.

Site restrictions will often not allow drilling shafts. When “hand-digging” or bucket excavation is required, 2-Flange Tunnel Liner Plate is the most effective. If drilling of the shaft is allowed and the site soil will remain stable, then larger diameter shafts can be lined with HEL-COR® corrugated steel pipe.



Tunnel Liner Plate Vertical Access Shafts

MULTI-PLATE® LINER SYSTEMS

MULTI-PLATE® 6" x 2" profile can be preassembled on the surface in large diameters (60" - 312") and long lengths, then lowered into a pre-excavated or drilled shaft. Once installed, the void between the MULTI-PLATE liner and excavated/drilled shaft is grouted. Soil conditions must allow the shaft walls to be left temporarily exposed until the liner is installed.

MULTI-PLATE shaft liners are also extremely stiff, creating a very safe shaft and, as with 2-Flange Tunnel Liner Plate, ring beam stiffeners are often not required.



MULTI-PLATE Vertical Shafts are preassembled on site.

THE CONTECH ADVANTAGE

For more than a century, Contech has provided innovative, cost-effective site solutions to engineers, contractors, and developers on projects across North America. With a portfolio that includes bridges, drainage, erosion control, retaining wall, sanitary sewer and stormwater management products, our team is ready to help you to design, build, and support your next project.

Supporting every aspect of your project, from concept to installation, Contech is here to help! Our extensive network of local experts offers you comprehensive project management, technical support, and customer service.



AGENCY/REGULATORY GUIDANCE

Our team is ready to provide you with expert advice and assistance on local regulatory requirements, resulting in faster approvals.



SOLUTION DEVELOPMENT

Our engineers can review your requirements, weigh all options, and recommend the optimal solution to integrate with your site designs.



TECHNICAL EXPERTISE

Our engineers assist by providing product-specific engineering calculations such as hydraulics, buoyancy, foundation reactions, and unit sizing.



COST ESTIMATES

We can quickly provide engineer's cost estimates to assist with your solution selection process.



SITE SPECIFIC DRAWINGS

Our engineers can provide site-specific drawings for proposals, project meetings, and submittals, helping you be more efficient with your time.



ON-SITE ASSISTANCE

Contractors know time is money, so we provide preconstruction meetings, delivery coordination, and on-site installation support to ensure a timely, smooth installation.



Contech® Engineered Solutions provides innovative, cost-effective site solutions to engineers, contractors and developers on projects across North America. Our portfolio includes bridges, drainage, erosion control, retaining wall, sanitary sewer and stormwater management products.



STORMWATER SOLUTIONS



PIPE SOLUTIONS



STRUCTURE SOLUTIONS

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www.ContechES.com | 800-338-1122

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