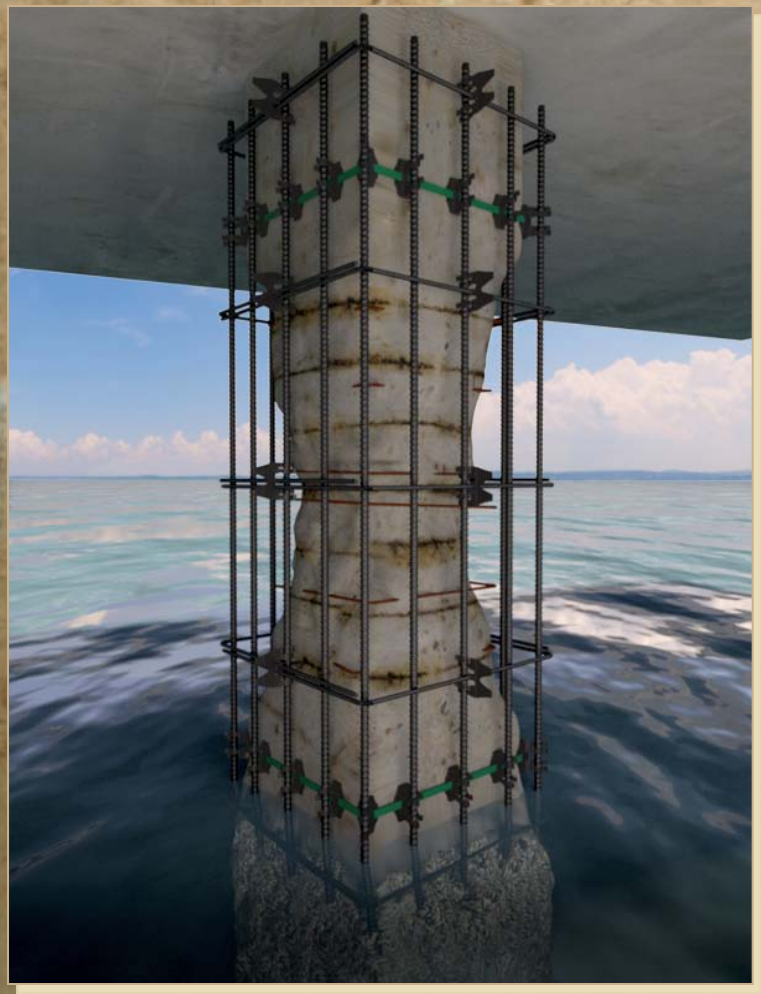
BarBandit™ & EnCap™ Systems

Pile Encapsulation and Rebar Installation Systems.

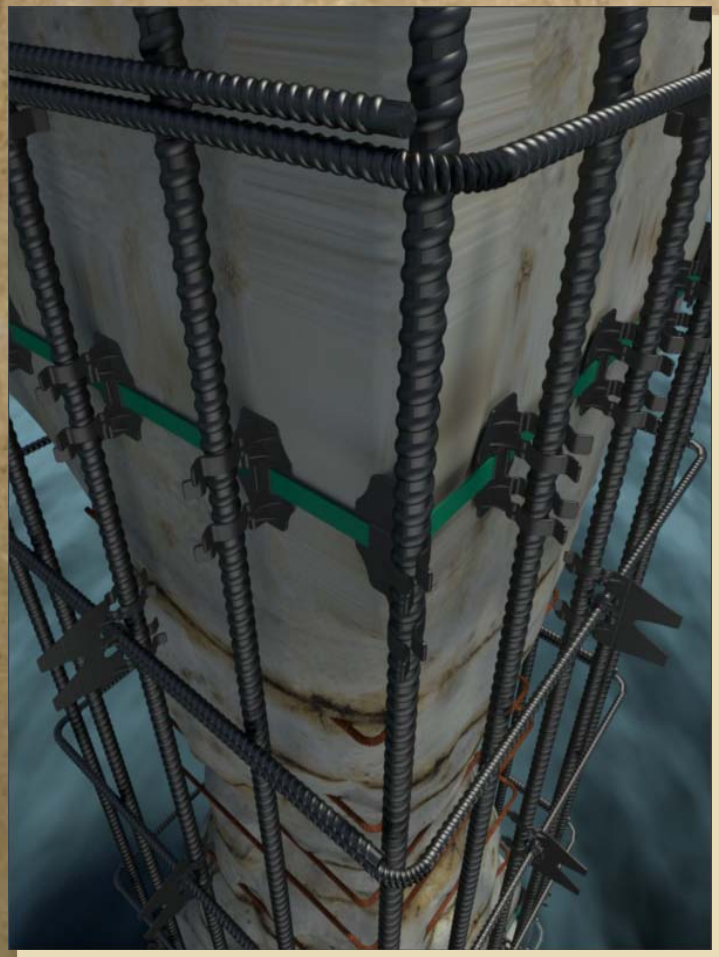
Patents Pending #61453583 & #61481970

BarBandit™



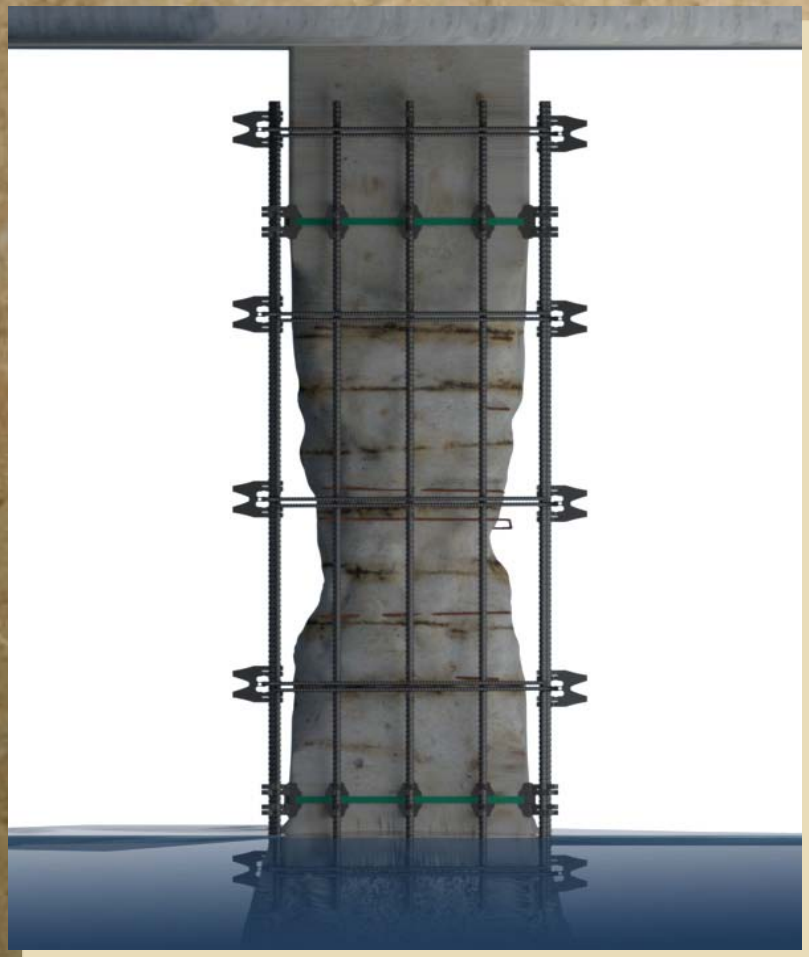
- Reduces rebar installation labor to less then 2 man hours on typical 10' x 18" pile with average layout of 16 each #6 bars vertical and #4 stirrups 1.0' on center.
- Can be installed by one or two personnel with provided hand tools without the requirement for electricity on site.
- Banding is non-metallic .040 X 5/8" non-metallic polyester with a breaking strain of 1500 psi.Supplied in 3000' rolls and cut to length on site.
- Installation results in a perfectly symmetrical reinforcement cage with minimal effort.
- Rebar support chairs consist of three components. T-1 (Tangent Chair), C-1 (Corner Chair) & PI-1 (Point of Intersection) chair / standoff.

BarBandit™



- T-1 & C-1 chairs for attachment of vertical bars accommodate bar sizes #5 through #8.
- PI-1 chairs accommodate #5 through #8 bars in the vertical plane and accommodate #3 through #5 stirrup bars in the horizontal plane. PI-1 connectors also function as form standoffs when required with break-backs for either two or three inches of rebar clearance from the form face. Break-backs are at scored points and are accomplished by hand without tools.

BarBandit™



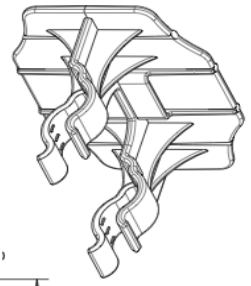
- Typical installation cost for the BarBandit system on a 10' x 18" pile with 16 #6 bars vertical and #4 stirrups @ 1.0' on center is estimated at less then $160.00 per pile. Rebar is not included in the estimate. Estimated labor cost is 2 man hours @ $30.00 per man hour. Plus approximately $100.00 per pile for the BarBandit system.
- Typical installation cost without the BarBandit system is estimated at $505.00, with 16 man hours labor @ $30.00 per man hour and $25.00 per pile for miscellaneous materials including, dowel epoxy, wire ties, "J" bolts etc.

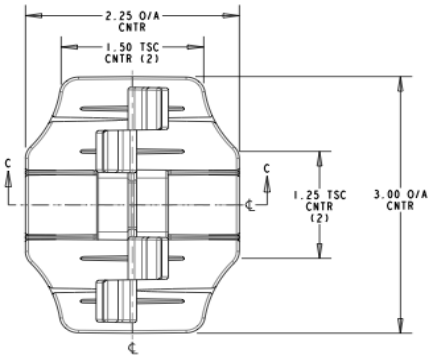
BarBandit™ T-1 Clip

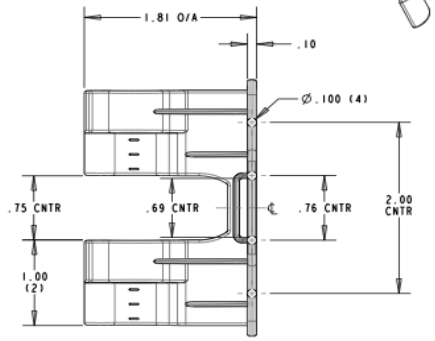
DOCUMENT REVISION	CHG BY	DATE
0 (DEVELOPMENT)	CD	5-06-11

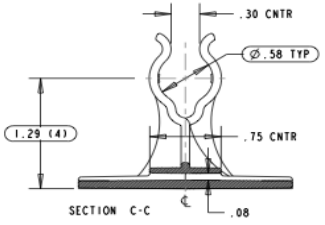
NOTES: UNLESS OTHERWISE SPECIFIED

1. PARTS TO BE FREE OF BURRS, NICKS, SCRATCHES, & COLOR DEFECTS.
2. FLAT SURFACES TO HAVE A FLATNESS TOLERANCE OF 0.010 PER INCH, NOT TO EXCEED 0.030 OVER THE ENTIRE SURFACE.
3. FINISHED PARTS TO BE PROTECTED BY PAPER OR LINER.
4. CRITICAL DIMENSIONS ARE CIRCLED.
5. REFER TO 3-D DATABASE FOR COMPLETE PART GEOMETRY. PART TO BE WITHIN SPECIFIED TOLERANCES FROM 3-D DATABASE.
6. PART IS SYMMETRICAL ABOUT CENTERLINE EXCEPT WHERE NOTED.









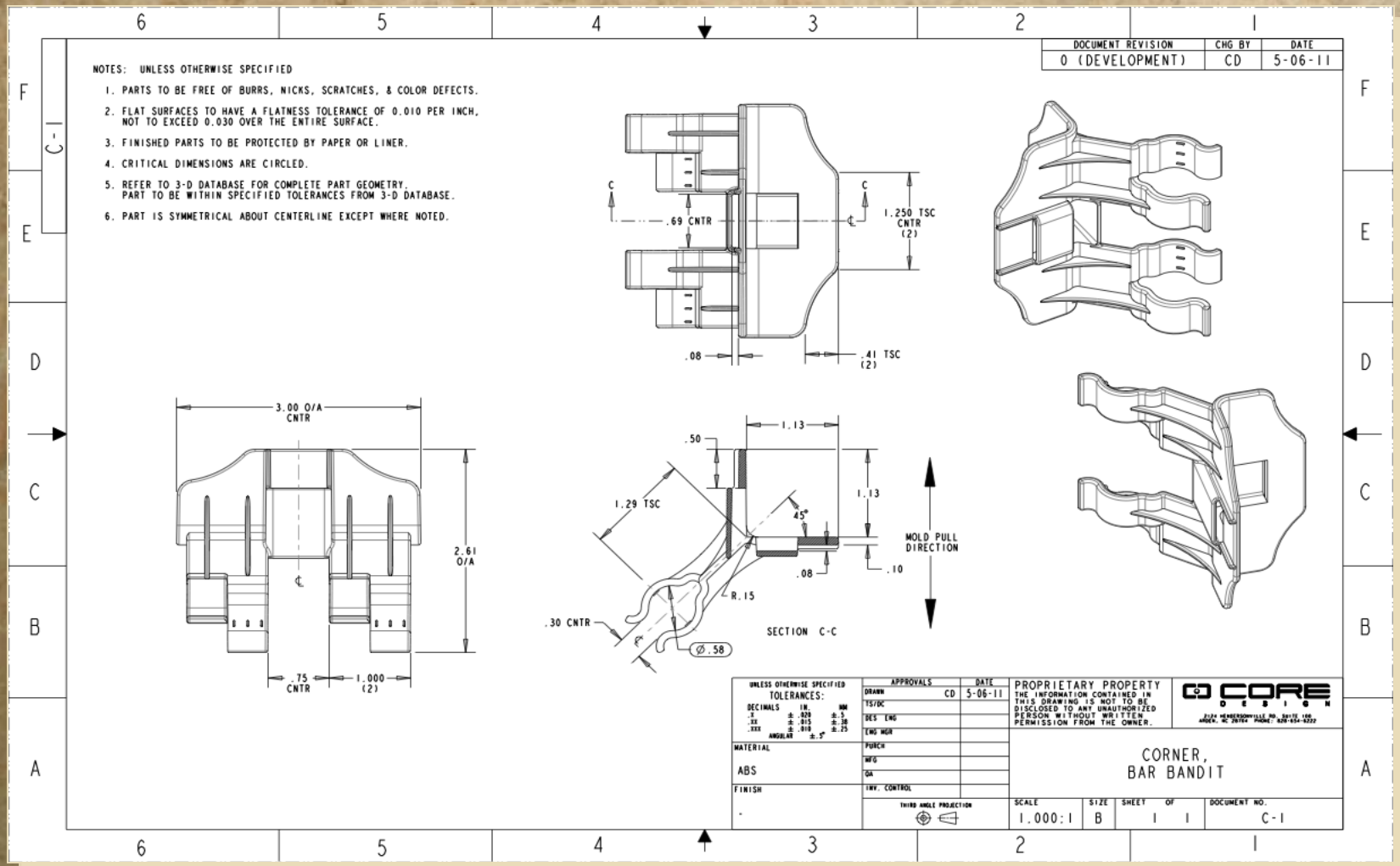
UNLESS OTHERWISE SPECIFIED TOLERANCES:	APPROVALS	DATE
DECIMALS IN. MM .X ±.020 ±.5 .XX ±.015 ±.38 .XXX ±.010 ±.25 ANGULAR ±.5°	DRAWN CD	5-06-11
	TS/DC	
	DES ENG	
	ENG MGR	
	PURCH	
	MFG	
	QA	
	INV. CONTROL	
MATERIAL: ABS	THIRD ANGLE PROJECTION	
FINISH: -		

CORE DESIGN

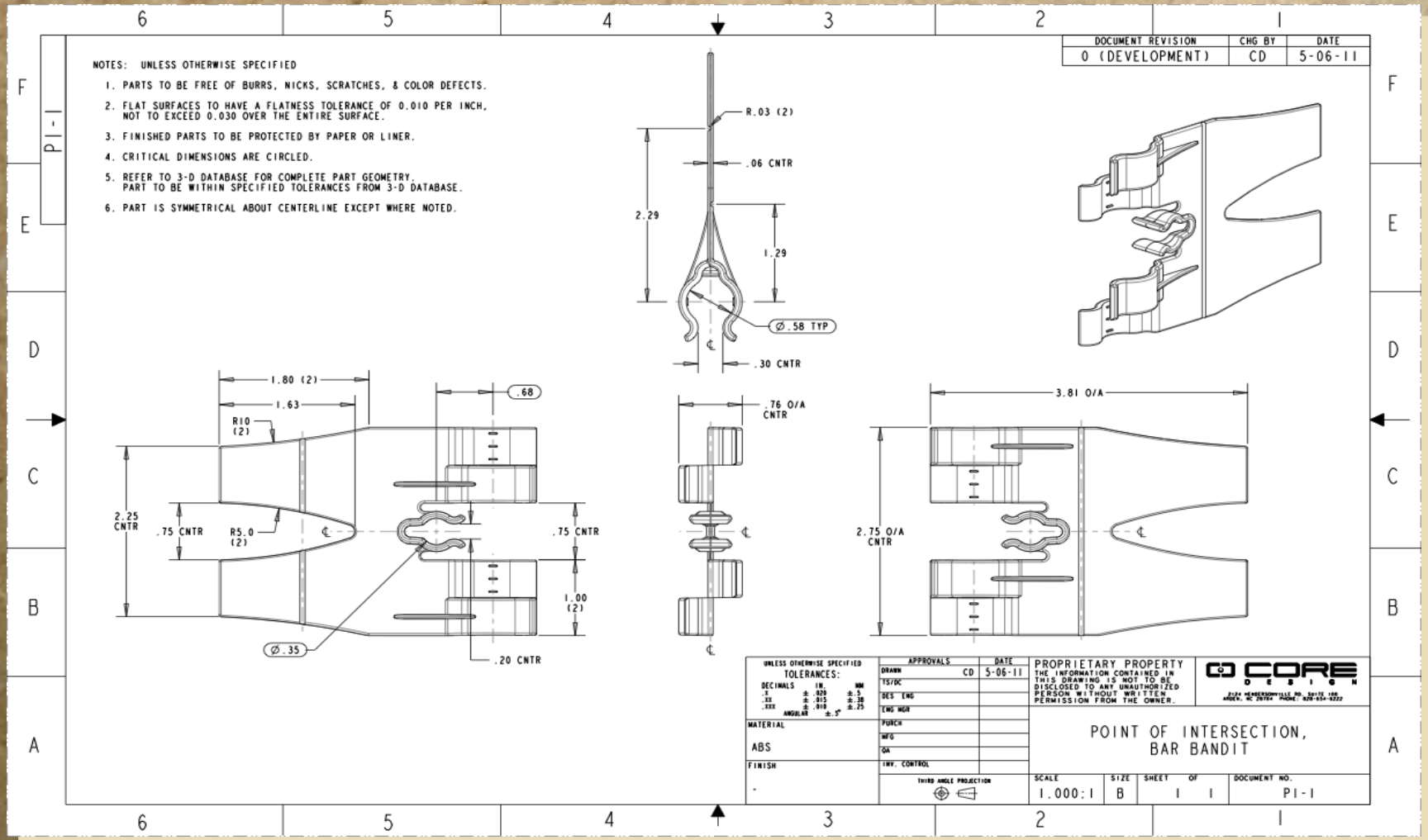
TANGENT, BAR BANDIT

SCALE	SIZE	SHEET	OF	DOCUMENT NO.
1.000:1	B	1	1	T-1

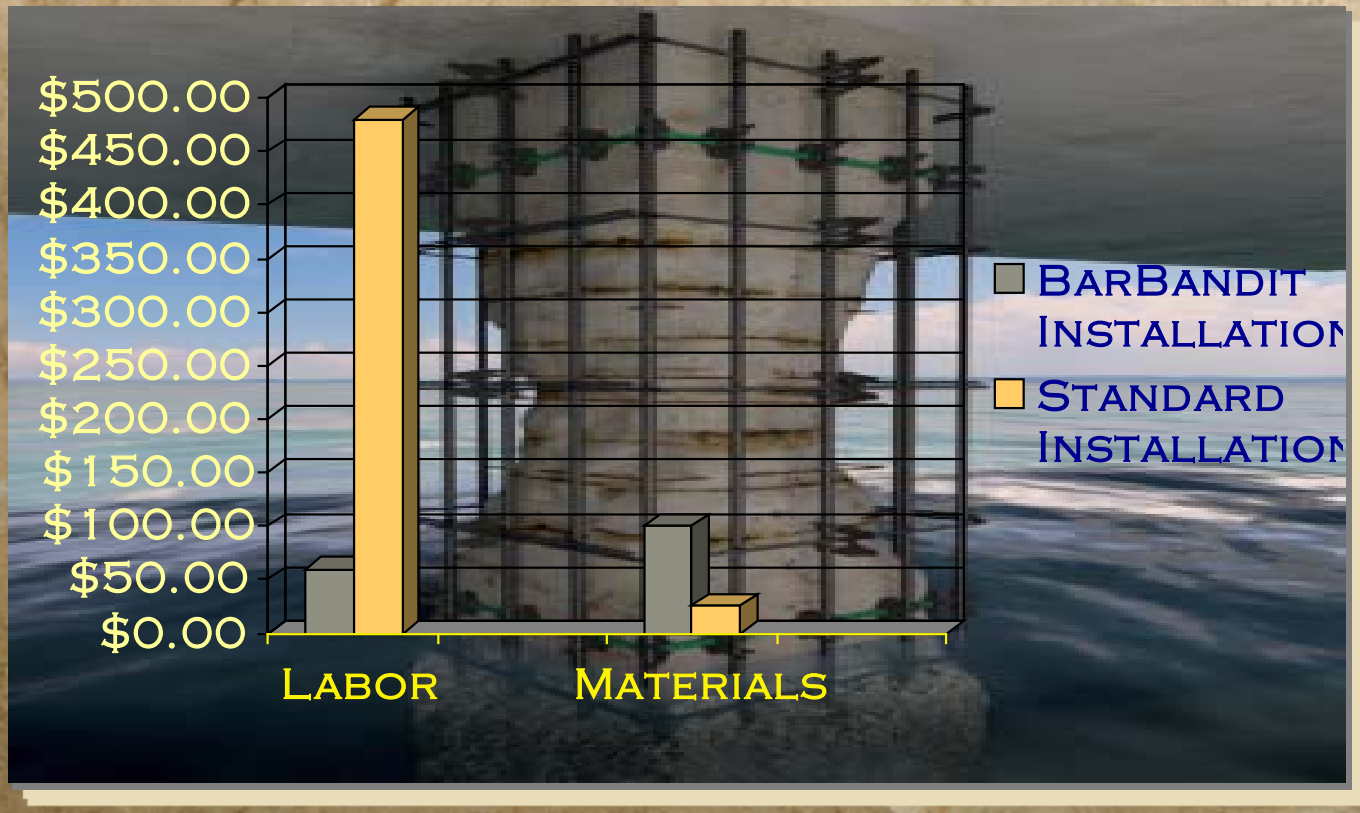
BarBandit™ C-1 Clip



BarBandit™ PI-1 Clip



BarBandit™



Cost Analysis of BarBandit Versus Standard Installation

BarBandit™

"Armed With The Best"

EnCap™ Pile Encapsulation Systems

- Rapid deployment modular aluminum forming systems.
- De-waterable when required.
- Diver-less or diver installation capabilities. Entire system can be deployed, pumped and stripped with surface personnel.
- Stand alone or utilized to deploy structural or cathodic protection "stay in place" fiberglass or composite forms.
- **Applications:**
- Marine structures piling repair.
- Parking garage and structure column rehabilitation.
- New column construction.
- Available for square pile. Round pile, "H" piling, and custom configurations.

EnCap™

Features:

*Constructed: entirely of 5052 aluminum plate and 6061, T6 aluminum shapes, .250 thickness.

*Rapid deployment: a typical 18" x 10' pile can be formed and ready for concrete pumping in less then 4 man hours.(2 men x 2 hours)

*Light Weight: The heaviest single component on a 30" X 4.0' form section weighs less then 75 lbs.

*Easy Assembly: No small hardware to lose during assembly. Sections are pinned together with 7/8" full length aluminum pins through attached Sch-80 aluminum sockets and joined at top / bottom interfaces by attached nesting collars and upper / lower friction collars.

*Very Low Maintenance: Maintenance consists of occasional pressure washing (preferably after each use) and inspection for physical damage. Any required repairs can be made on site, at a local fabrication shop, or returned to our facility.

EnCap™

Diver-Less Features:

- Topside deployed lower friction collar assembly with counter rotating acme thread closure devices.
- Topside actuated concrete gate closure (mechanical)
- 1/4 turn x 2.5" diameter quick disconnect concrete pump fitting at with invert 2.0" above form bottom.
- 60 degree 2.5" entry elbow to prevent concrete restriction at point of entry. Transitions to standard 2.0" concrete pumping hose. Removable from topside at completion of concrete placement.
- Additional 2.0" concrete pumping, dewatering ports spaced as required with conventional flanges.
- 4 each 2.0" holes in upper friction collar to allow vibration, monitoring of concrete flow and discharge of seawater and laitance at top of form.

Encap™

Dewatering Features:

- All mating surfaces on lower friction collar (LFC) gasketed for seal. (see photo this page)
- 1.0” diameter sump hole in bottom plate with 90 degree elbow and quick disconnect fitting for connection to 1.0” diameter suction hose to pneumatic double diaphragm pump. (see photo this page)
- All mating surfaces on lower form section gasketed on vertical mating surfaces for seal. (see photo this page)
- Horizontal alignment tabs of on LFC sealed internally with closed cell foam backer rod gasket. (see photo this page)

ENCAP™

Design Features:

- 1" Sch-80 pipe and 7/8" solid 6061 bar stock fabricated closure hinges, diagonally opposed and welded to 1/4" 5052 x 1/4" plate form surfaces.
- 2" x 1/4" 6061 flat bar nesting collar at welded at tops of form section for nesting additional forms.
- 2.0" mating interface at upper and lower friction collars, forms are self centering in collars, no leveling or plumbing required.
- Centered and balanced handles on all form panel faces, sized for gloves.
- 4" alum. Channel compression form compression collars to compress forms and divert pressure at hinges.
- Upper and lower friction collars constructed of 1/4" plate, 6" channel and 2" x 4" aluminum 6061 angle.
- 1/8" SS cable lifting bridles at lower friction collars.
- All welded construction, no bolted or fastened connections.
- Transition / adaptor collars are available to mate the bottom 4.0' section to any commercially available prefabricated column form system, such as Symons, Gates, etc. This allows the bottom forms to be utilized with forms already available to the Contractor, resulting in further cost savings.

EnCap™ Adjustable Dimension Forms

New for 2011, EnCap has added adjustable dimension forms. Corner inserts are fabricated to any size greater then three inches in each dimension perpendicular to the main form corner and can be added or removed in less then two minutes to expand or reduce form dimensions. Pictured is a 18" form expanded to 24" by the addition of a 6" corner expansion piece. There is no reduction in the structural integrity of the expanded form.

EnCap™ Adjustable Dimension Lower Friction Collars.

Another innovation in 2011 is adjustable dimension lower friction collars. Two sizes cover all typical DOT piling sizes. #1224 fits piling sizes 12”, 14” & 18”, #2030 fits sizes 20”, 24” and 30”. The coil rods are simply shifted to the proper hole in the 6” channel and seven 3/8” socket head machine bolts are removed and replaced in the appropriate size base-plate, time required is less then 5 minutes

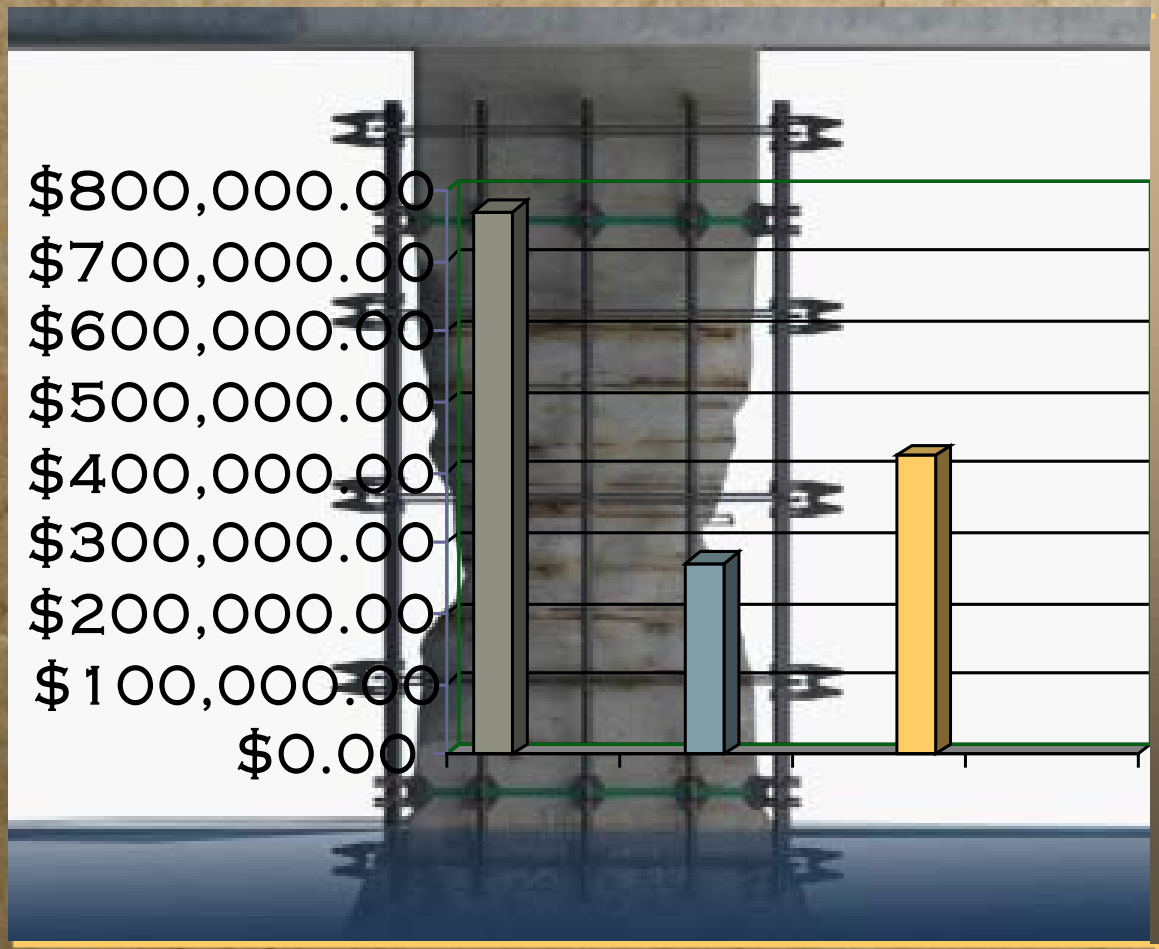
EnCap™

- **Adjustable Alignment Bolts.**
- Form sections are provided with a minimum of four 1/2" 13 TPI adjustable alignment bolts to assist in centering and retaining correct form alignment on the piling. This is particularly helpful on batter piles. Bolts are drilled and tapped into the form so there is no loose hardware to lose. Bolts can be sleeved with plastic tubing if they are to be left in position during concrete placement.
- Additional bolts and larger diameters are available for large batter piles and other situations encountered in the field.

EnCap™ Hinge Pin Pressure Compensation Set Bolts.

Previous 4” channel hinge compression collars have been replaced with 3/8” drilled and tapped hinge compression bolts located on the diagonally opposed hinges at every other hinge set. The bolts are tightened after insertion of the hinge pin and prior to pumping. This serves to prevent the pin from becoming misaligned due to internal pressure during pumping, making the pin potentially difficult to remove after concrete placement.

Installation Cost Analysis Of EnCap™ / BarBandit™ System With & Without Stay In Place Fiberglass jacket Versus Installation Costs For Leading Stay In Place Pile Jacket System.



- Installation Cost of 1000 LF of th leading 30" Stay i Place Fiberglass Jackets.
- Installation Cost For 1000 LF of 30" Encap BarBandit Jacket (No Fiberglass)
- Installation Cost For 1000 LF of Encap/BarBandit Jackets with Fiberglass Insert

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“When All The Signs Point To Success”

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