June 19 - 20, 2025
Hollywood, FL

TRANSPORTATION SYMPOSIUM

Structures Research Center Update

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FDOT Structures Research Center

Transportation Symposium Website

SCAN ME

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FDOT Structures Lab

- Outdoor facility: a 2.5-acre yard for outdoor testing, storing specimens, Impact pendulum, and two semi-trucks with steel blocks for bridge testing.
- Indoor facility: 50' x 100' strong floor, 2 movable load frames, static (1000 kips)/dynamic (460 kips), 7 DAQ systems (2 with remote capabilities), 4 high-speed cameras for NDI.
- Staff: 10 full-time and 3 part-time contract employees.
- Projects: 2 in-house, 16 contracted.

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Ready to Use Topics

Project Title	End Date
Repair of Impact Damaged Utility Poles with FRP	2015
Confinement Effect of Narrow Baseplates or Reaction Area on Anchor Breakout	2024
Aluminum Lightweight Orthotropic Deck Evaluation Project	2017
Half-Round Bearing Stiffeners for Skewed Steel I-Girders	2024
Large Reinforcing Bars Spliced In Ultra-High-Performance Concrete	2023

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New and Emerging Topics

Project Title	End Date
Evaluation of GFRP Spirals in Corrosion Resistant Concrete Piles	2023
Evaluation of Concrete Pile to Footing or Cap Connections	2024
Bond Performance of Post-Tensioning Tendons with Corrosion Inhibitor	12/2025
UHPC Piles	

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Repair of Impact Damaged Utility Poles with FRP

This utility pole (left) was damaged in a collision, but it was successfully repaired (right).

Objectives: Damaged utility poles can be repaired with fiber-reinforced polymers (FRP) without removing or replacing the them.

The objective was to develop repair guidelines for economically and effectively restoring an impact-damaged utility pole.

Variables: FRP repair system, Impact energy, pole and dent geometry, Material of Spiral Reinforcement.

Methods: FEM, Pendulum Impact, Test, Four-point Flexure Test, Full-scale Cantilever Flexure Test, Cyclic Load Fatigue Test

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Repair of Impact Damaged Utility Poles with FRP

FIBER REINFORCED POLYMER (FRP) REPAIR SYSTEM

SURFACE PREP
- Sand blast or paper
- Remove top galvanizing layer
- Clean the surface

FILL THE DENT
- Extremely viscous
- Restore the round shape of the pole

ADHESIVE LAYER
- No-sag epoxy
- Applied 30 mils thick

FRP LAMINATE
- Glass or basalt
- Bi-directional
- 24 oz/yd^2 density

FINAL COATING
- Final sanding
- Approved protective coating

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Repair of Impact Damaged Utility Poles with FRP

PENDULUM IMPACT TEST

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Repair of Impact Damaged Utility Poles with FRP

CONCLUSIONS:

1. The results of this study indicate that the FRP composite repair systems considered in this study were effective in restoring both field-damaged and laboratory-damaged tapered utility poles to acceptable capacities.
2. Dented poles (with dent of less than 30% diameter) tested in a four-point bending setup could be returned to the original plastic capacity many times with a single layer of FRP.
3. All the damaged and repaired large-scale specimens achieved more than 90% of the estimated undamaged yield capacity.
4. The design of the repair was complicated by the location and extents of the dent, potentially with the cross-sectional geometry of the pole being different than the original tapered geometry (at the center of the dent location usually).
5. Majority of poles considered contained an integral access port (hand hole) or series of pedestrian buttons that required placement of a vertical layup of the laminates.

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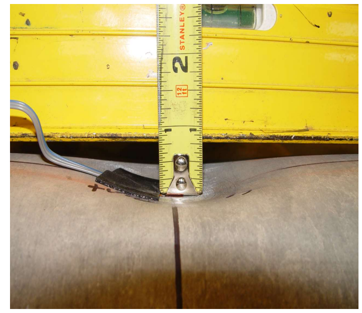
Applicability of Repair to Impact Damaged Utility Poles with FRP

INITIAL INSPECTION:

1. Perform a close investigation for cracks due to the impact.
2. Brittle cracks can lead to premature failure even with FRP repair.



MEASURE GEOMETRY:

1. Geometry of FRP wrap depends on pole features.
2. Access ports and crosswalk signal buttons in should remain accessible.
3. Repair should extend at least 6 in beyond the edges of the dent and should encompass the circumference of the pole.

Action	Dent Depth (% of Pole Diameter)	
	Aluminum	Steel
No Repair	≤5%	≤5%
Single-Layer Repair	5% to 25%	5% to 20%
Two-Layer Repair	25% to 35%	20% to 35%
Replace Pole	≥35%	≥35%

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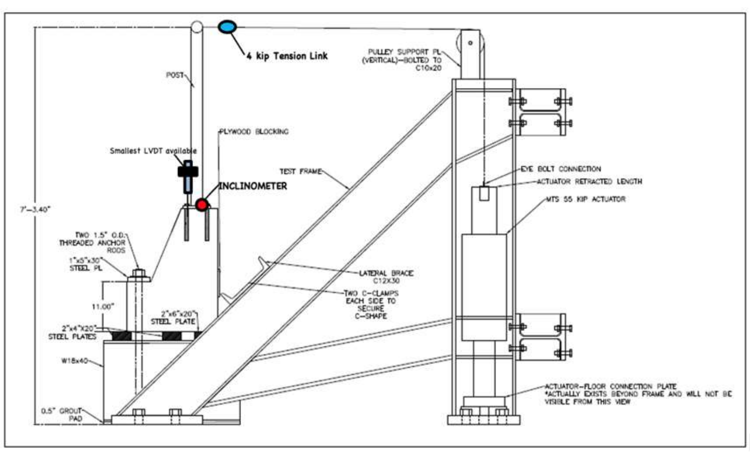
Confinement Effect of Narrow Baseplates or Reaction Area on Anchor Breakout



Objectives: Review and identify the effect of confinement baseplates on screw anchors breakout resistance.

Determine the failure mechanism and appropriate confinement modification factor of screw and adhesive anchors used in various applications.

Variables: anchor type (adhesive and screw), anchor dimensions, base plate geometry, railing type

Methods: static and cyclic loading

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Confinement Effect of Narrow Baseplates or Reaction Area on Anchor Breakout

TEST SETUP

- The load was applied to the specimens using a 55-kip hydraulic jack using a cable and frame with a pulley.
- The specimens were anchored to the strong floor.
- Concrete portion of specimen mimicked slab, gravity wall, or parapet.
- Steel railing mimicked pipe guardrail or picket railing.
- For monotonic tests, load was applied at a fixed load rate until failure.
- For cyclic tests, tensile load varied sinusoidally between 150 lbs and 300 lbs for pipe guardrail or 550 lbs for picket railings. 1000 cycles were completed, followed by monotonic load test until failure.

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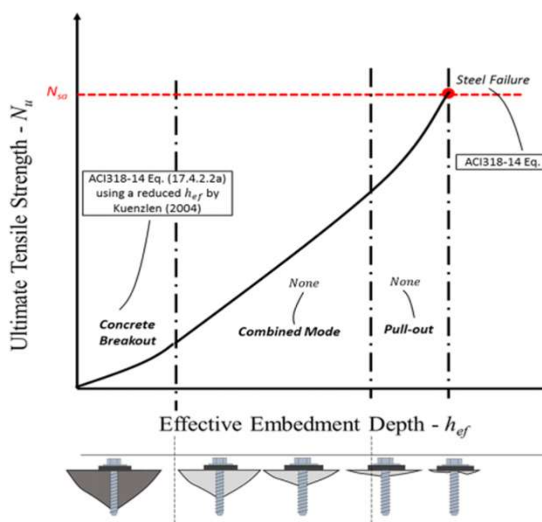
Confinement Effect of Narrow Baseplates or Reaction Area on Anchor Breakout



RESULTS

- Pull-Out failure mode was typically found in slab specimens.
  - Small conical failure near drilled hole on some specimens.
  - Multiple cracks near the drilled holes.
- Combined failure mode was typically found in gravity wall and parapet specimens.
  - Concrete breakout with prying action
  - Combined concrete crushing on the compression face and shear failure.

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Confinement Effect of Narrow Baseplates or Reaction Area on Anchor Breakout

CONCLUSIONS:

- FDOT Structures Design Guidelines (2025) section 1.6.1 was updated to revised the confinement modification factor and recognize screw anchors as a viable post-installed mechanical concrete anchor option.
- Implementation is by District Request and Developmental Specification (Dev416 and Dev937).
- Modification factor for breakout compression field effect, has been update based on research projects. See Eq. 1-6a in FDOT Structures Design Guidelines (2025).
- FDOT Structures Design Guidelines (2025) section 1.6.3 now includes screw anchors in the list of mechanical anchors (previously only undercut anchors permitted). Implementation is still via a Developmental Standard Specification.

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Aluminum Lightweight Orthotropic Deck Evaluation Project

Objectives: Identify/Develop a Viable Lightweight Deck System with Solid Surface to Replace Steel Open Grid Deck on Typical Florida Bascule Bridges.

Methods: Visual and NDE inspection, Full-scale static and cyclic testing, Heavy vehicle simulation, Wearing surface testing

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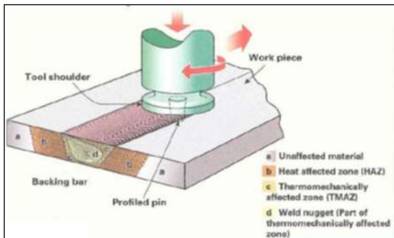
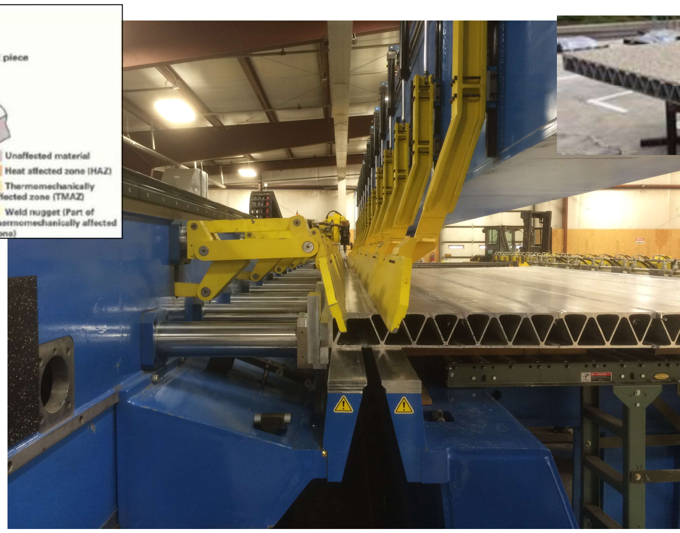
Aluminum Lightweight Orthotropic Deck Evaluation Project





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Aluminum Lightweight Orthotropic Deck Evaluation Project

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Aluminum Lightweight Orthotropic Deck Evaluation Project

TEST SETUP:

- Nine static tests, one cyclic test, and heavy vehicle simulation
- Varied loading points and support conditions. The support conditions for the steel stringers varied.
- Loads were applied corresponding to the factored Service II, Strength I and Strength II limit states.

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Aluminum Lightweight Orthotropic Deck Evaluation Project

CONCLUSIONS:

- Structurally, the test specimen performed well. The maximum demand-to-capacity ratio for strain measurements was 0.7.
- Deflection measurements were very close to the design limit, exceeding the Span/800 limit by less than 1/32".
- Fatigue is a potential design concern for the panel, as the stress range is predicted to be approximately equal to the constant amplitude fatigue threshold.
- The wearing surface proved to be an effective friction surface after rigorous testing. It is expected to perform well in-service, although frequent inspections during the trial period are appropriate since this deck system is a new technology.
- One key difference between the aluminum lightweight deck and open grid steel deck systems is the aluminum lightweight deck provides a solid driving surface, which is preferred.

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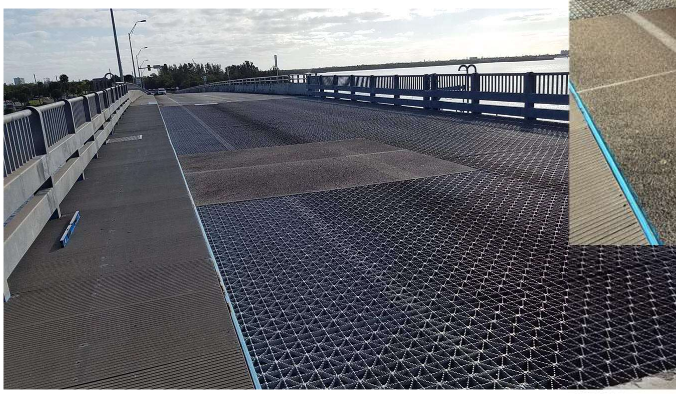
Aluminum Lightweight Orthotropic Deck Evaluation Project

FIELD EVALUATION



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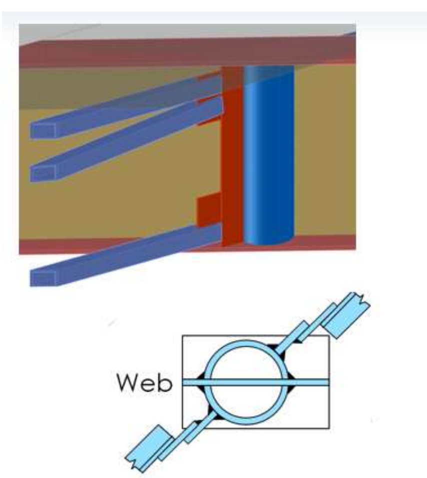
Half-Round Bearing Stiffeners for Skewed Steel I-Girders



Objectives: Determine the fatigue sensitivity of the half-round bearing stiffener connection over the intermediate support in continuous skewed steel girder bridges.

Skewed bridge design requires extra care because the structural behavior of skewed bridges can differ significantly from non-skewed bridges

Support skew has the potential to cause additional effects, including:

- Additional structural effects/responses from lack-of-fit. Fit-up forces need to be accounted for design and detailing of connections.
- Amplifying live load effects and fatigue impact because of support skew and differential deflection.

Two bridges have already been built in Florida with this detail and are in service.

Methods: 2D Grid Analysis, 3D FEM Analysis

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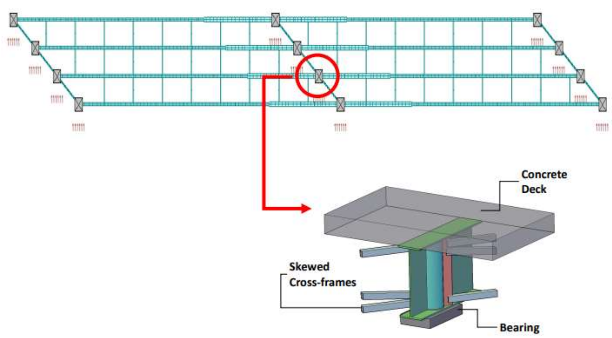
Half-Round Bearing Stiffeners for Skewed Steel I-Girders

ANALYTICAL STUDY:



26 bridges representative of FDOT skewed continuous steel girder bridges were analyzed.

Midas Civil and Midas FEA NX programs were utilized to create 2-D and 3-D finite element (FE) models.

Tensile stress variation in the girder top flange over the intermediate pier for fatigue test planning, and end cross-frame member forces for:

- Sizing and detailing of the HRBS connection
- Stress concentration considerations for the connection
- Fatigue categorization

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Half-Round Bearing Stiffeners for Skewed Steel I-Girders

CONCLUSIONS:

Refined analysis models considered the following geometry:

- The diameter of the HRBS was selected so that the flange extends at least 2-in. beyond the HRBS. A variation of thickness for the HRBS ranging from 3/8 to 3/4 in. was used to determine the appropriate thickness.
- Clipped and non-clipped conditions were considered for the HRBS. In addition, two stiffener connection plate details were modelled consisting of both welded and non-welded conditions with the girder flanges where applicable.

For the bridges studied, the top flange fatigue stress range from Fatigue I factored loading showed a range between 1.24 to 3.57 ksi with an average of 2.34 ksi.

A category C’ fatigue stress range is appropriate, based on previously completed physical testing.

It is anticipated that HRBS would be allowed on any steel I-girder bridge that has a skew complying with the limits in the FDOT Structures Design Guidelines.

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Large Reinforcing Bars Spliced In Ultra-High-Performance Concrete

Objectives: Although UHPC has been researched extensively, previous research for reinforcing bar splice and development lengths have focused on #9 and smaller diameter bars. Typically, larger diameter bars are used for substructures.

The objective was to determine the reinforcing bar splice and development length for rebar diameters larger than #8.

Potential Applications: Prefabricated bridge substructure elements can be used to accelerate construction. UHPC is an ideal material for joining precast components, such as:

- Drilled Shaft to Precast Bent Cap Connection
- Footing to Precast Column Connection
- Precast Beam Connections

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Large Reinforcing Bars Spliced In Ultra-High-Performance Concrete

MATRIX OF PARAMETERS:

- The required splice length was determined for steel deformed reinforcing bars embedded in UHPC, considering three primary variables:
  - Bar size (#8, #9, #10 and #11 bars)
  - Bar spacing (contact, 6 in. (152.4 mm), and 8.5 in. (215.9 mm)), and
  - Concrete cover (1.75 in. (44.5 mm), 2.75 in. (69.9 mm), and 3.75 in. (95.3 mm))
- 128 Individual reinforcing bar tests were completed.
- A single readily available propriety UHPC mix with 2% steel fiber by volume was used.

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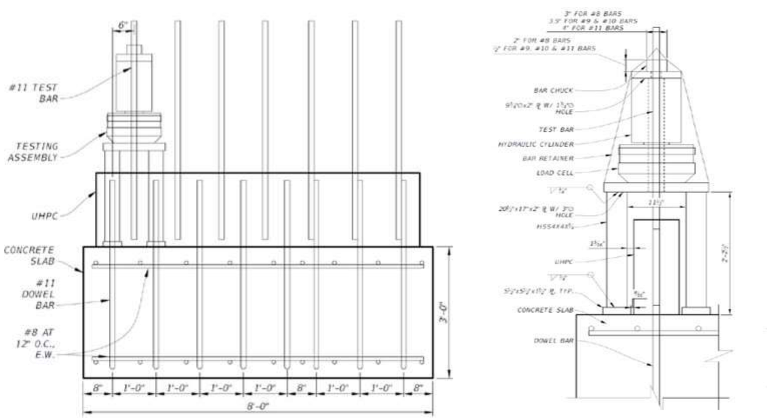
Large Reinforcing Bars Spliced In Ultra-High-Performance Concrete

TEST SETUP



- The testing equipment, shown in consisted of a hollow core load cell and hollow core cylinder in sequence.
- Splice was placed in direct tension, without any confining compressive stresses.

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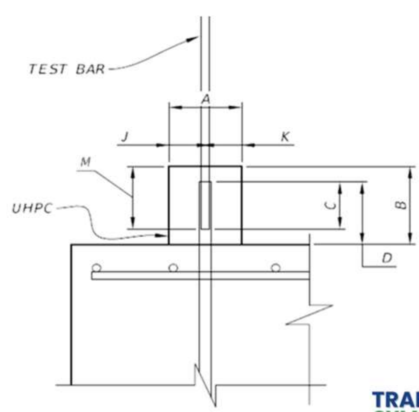
Large Reinforcing Bars Spliced In Ultra-High-Performance Concrete

CONCLUSIONS:

Additional splice or embedment length needs to be specified by designers to account for reinforcing bar length and placement construction tolerances.

Required Embedment Length (M, D) in Terms of Bar Diameters					
		Bar Size			
		#8	#9	#10	#11
Cover	1.75 in. (44.5 mm)	8	9.8	11.7	12.9
	2.75 in. (69.9 mm)	-	-	-	11.3
	3.75 in. (95.3 mm)	8	6.9	8.4	9.3

Required Splice Length (C) in Terms of Bar Diameters					
		Bar Size			
		#8	#9	#10	#11
Cover	1.75 in. (44.5 mm)	6	7.3	9.7	11.1
	2.75 in. (69.9 mm)	-	-	-	9.7
	3.75 in. (95.3 mm)	6	5	6.6	7.3



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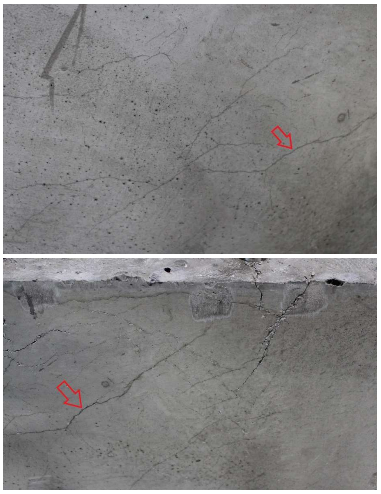
Large Reinforcing Bars Spliced In Ultra-High-Performance Concrete



OBSERVATIONS:

For one set of the tests, shrinkage cracking was apparent in the UHPC prior to testing and the results of those tests showed lower than expected bond strength. However, the results of tensile material testing did not indicate reduced capacity. Tensile sample testing is not sufficient to evaluate UHPC with shrinkage cracks.

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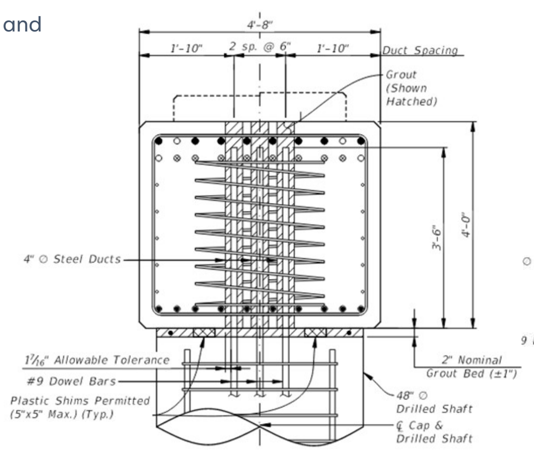
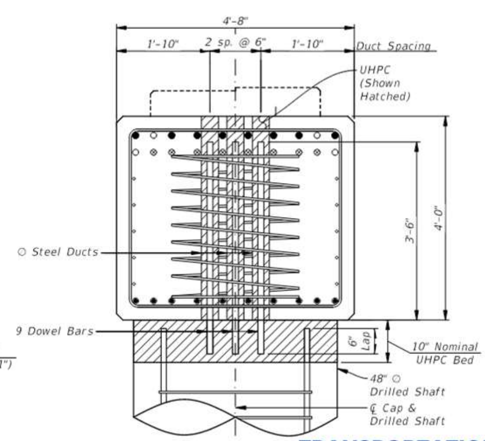
Large Reinforcing Bars Spliced In Ultra-High-Performance Concrete

Drilled Shaft to Precast Bent Cap Connection

- Increase horizontal and vertical tolerances.





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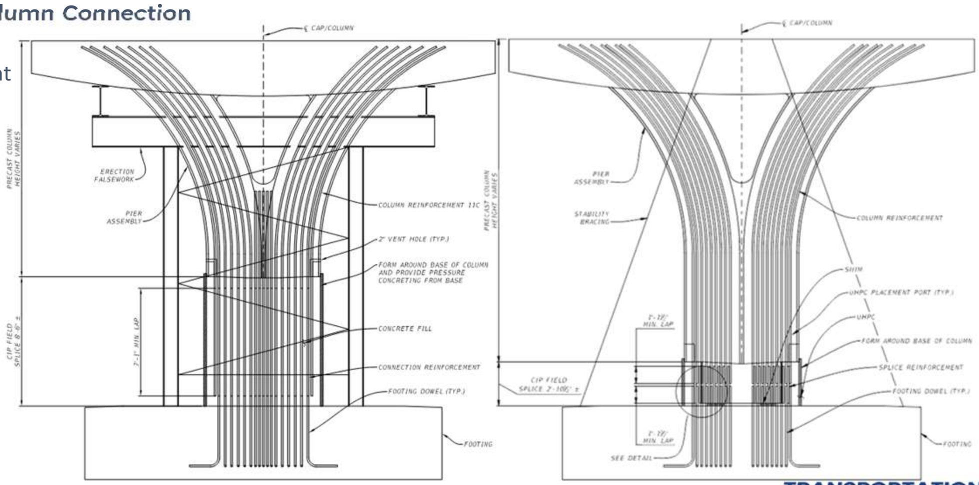
Large Reinforcing Bars Spliced In Ultra-High-Performance Concrete

Footing to Precast Column Connection

- Decrease splice height and volume of field-placed material.
- Possibly eliminate erection falsework.



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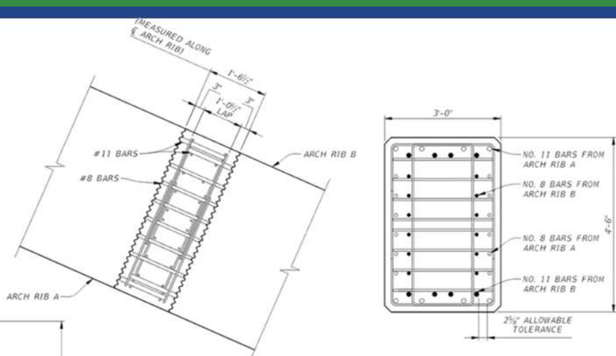
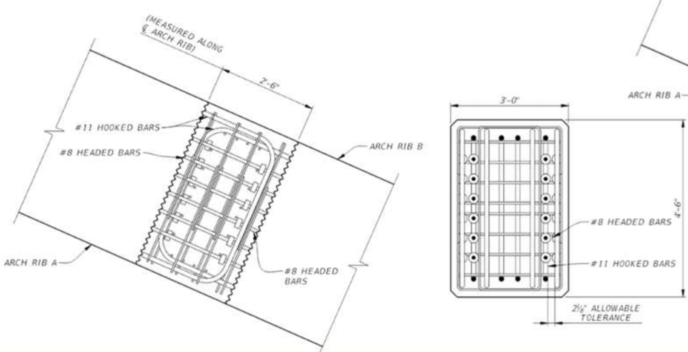
Large Reinforcing Bars Spliced In Ultra-High-Performance Concrete

Precast Beam Connections

- Decrease closure pour size.
- Eliminate hooked and headed bars.
- Increase tolerances.





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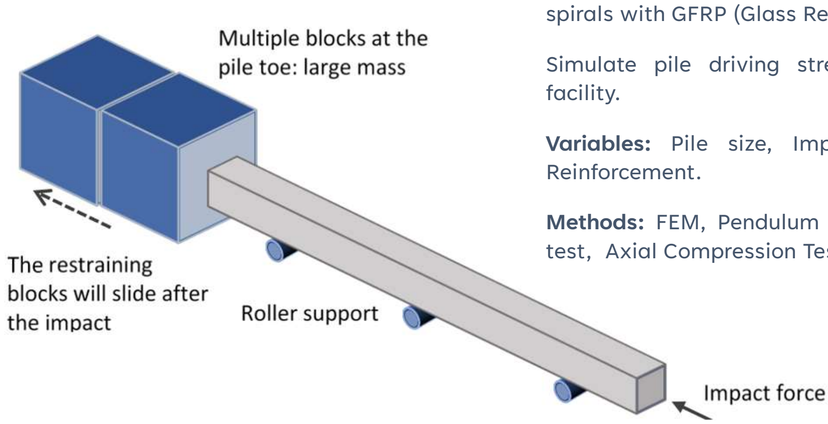
Evaluation of GFRP Spirals in Corrosion Resistant Concrete Piles

The concept



Objectives: This project investigated replacing the CFRP spirals with GFRP (Glass Reinforced Polymers (GFRP)) spirals

Simulate pile driving stresses with the FDOT pendulum facility.

Variables: Pile size, Impact energy, Material of Spiral Reinforcement.

Methods: FEM, Pendulum Impact, Test, Four-point Flexure test, Axial Compression Test.

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Evaluation of GFRP Spirals in Corrosion Resistant Concrete Piles

The SRC Pendulum facility was utilized to apply impact loading comparable to pile driving

- Horizontal setup
- 24” x 24” pile
- 5 ksi stress
- Flectionless supports
- Large blocks at the pile toe

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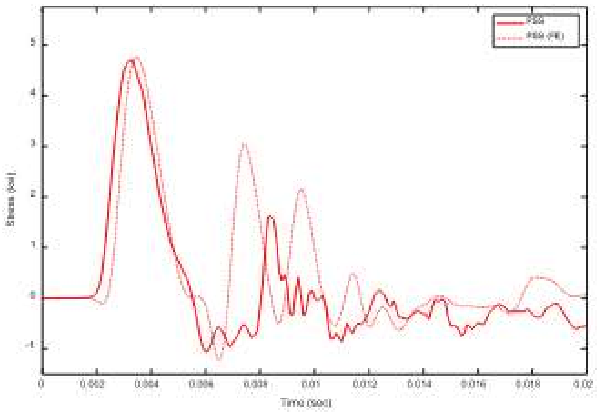
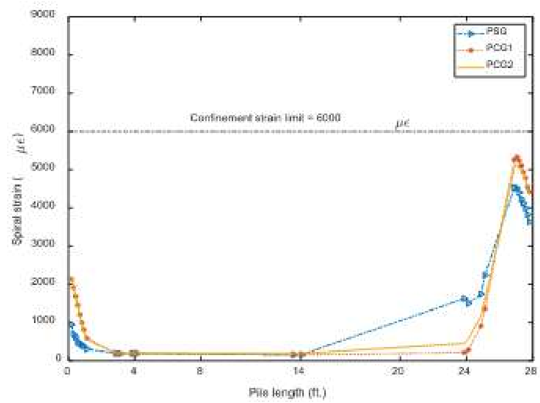
Evaluation of GFRP Spirals in Corrosion Resistant Concrete Piles



FE VS Test stress results PSS (15 ft.)



FRP spiral strain comparison for PSG, PCG1 and PCG2 (20 ft. drop heigl

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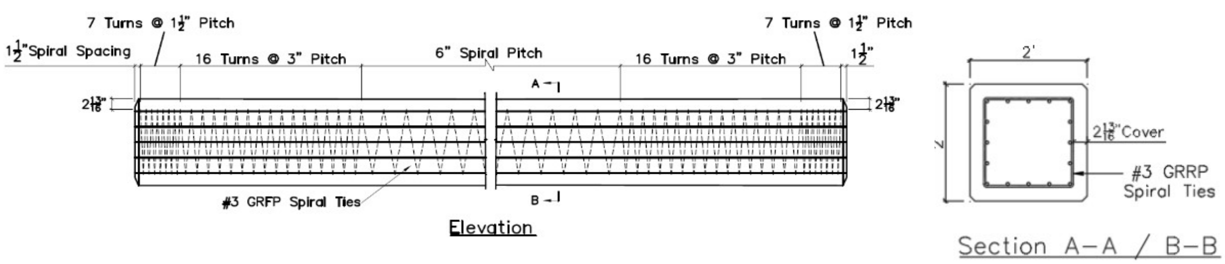
Evaluation of GFRP Spirals in Corrosion Resistant Concrete Piles



Summary: PCG1 (7 turns) and PCG2 (11 turns) showed similar compression and tension stress measurements. Therefore, the extra end-spiral turns for PSG2 provided no significant advantage under the reported test conditions. Consequently, the spiral pattern for PCG1 proved to be sufficient and recommended for standard pile design.

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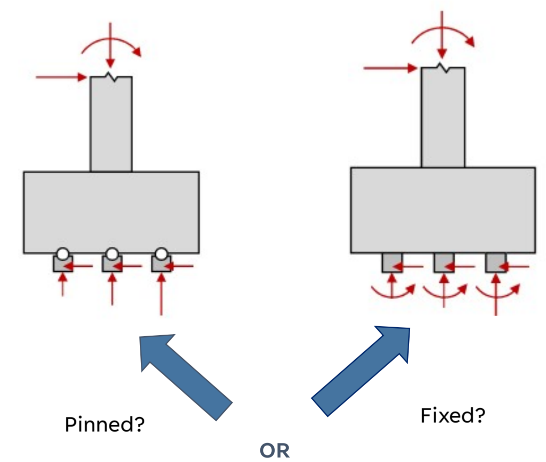
Evaluation of Concrete Pile to Footing or Cap Connections



Objective: To better understand the pile to cap or footing connection allowing FDOT to provide better design guidance along with more informed design reviews.

Background: FDOT Standard Design Guide (SDG 3.5.1.C) requires a pile embedment of 48" into a reinforced concrete footing for adequate development of the full bending capacity of the pile. 12" embedment is considered for pinned head condition (SDG 3.5.1.B).

Variables: Pile size, embedment depth, axial load, and interface reinforcement.

Methods: FEM, Full-scale Lab Test

Instrumentation: Load cells at hydraulic jack, LVDTs, Surface Strain Transducers, Vibrating wire gauge, and Digital Image Correlation (DIC).

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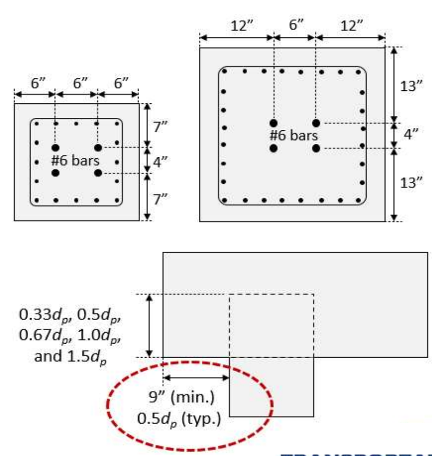
Evaluation of Concrete Pile to Footing or Cap Connections

TEST MATRIX

Specimen No.	Pile Size	Embedment Length		Interface Reinforcement	Axial Load	Pile Cap f'_c
1	18"	$0.33d_{pile}$	6"	w/o interface reinforcement	$0A_gf'_c$	Class IV
2	18"	$0.33d_{pile}$	6"	w/o interface reinforcement	$0.1A_gf'_c$	Class IV
3	18"	$0.33d_{pile}$	6"	w/interface reinforcement	$0A_gf'_c$	Class IV
4	18"	$0.5d_{pile}$	9"	w/o interface reinforcement	$0A_gf'_c$	Class IV
5	18"	$0.5d_{pile}$	9"	w/o interface reinforcement	$0.1A_gf'_c$	Class IV
6	18"	$0.67d_{pile}$	12"	w/o interface reinforcement	$0A_gf'_c$	Class IV
7	18"	$1.0d_{pile}$	18"	w/o interface reinforcement	$0A_gf'_c$	Class IV
8	18"	$1.5d_{pile}$	27"	w/o interface reinforcement	$0A_gf'_c$	Class IV
9	30"	$0.4d_{pile}$	12"	w/o interface reinforcement	$0A_gf'_c$	Class IV
10	30"	$1.0d_{pile}$	30"	w/o interface reinforcement	$0A_gf'_c$	Class IV

SPECIMEN DESIGN



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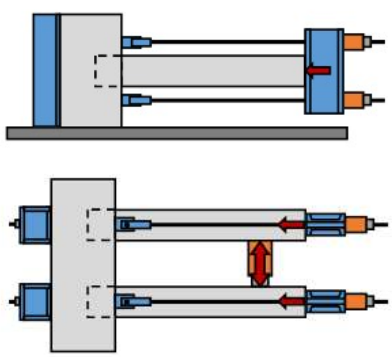
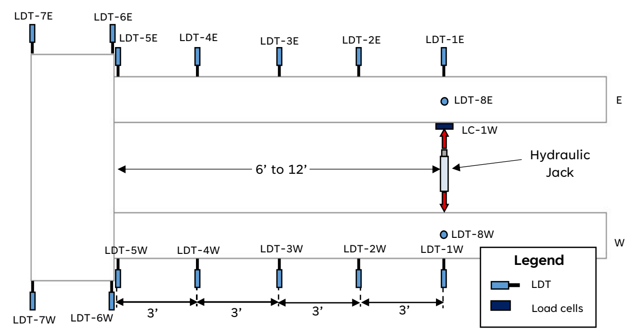
Evaluation of Concrete Pile to Footing or Cap Connections

SELF-REACTING FRAME TEST SETUP



INSTRUMENTATION PLAN



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Source: https://www.fdot.gov/structures/structuresresearchcenter/activeresearch.shtm

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Evaluation of Concrete Pile to Footing or Cap Connections

SELF-REACTING FRAME TEST SETUP

CANTILEVER FLEXURE STRENGTH TEST

CRACK OPENING TRACKING BY IMETRUM CAMERA

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Source: https://www.fdot.gov/structures/structuresresearchcenter/activeresearch.shtm

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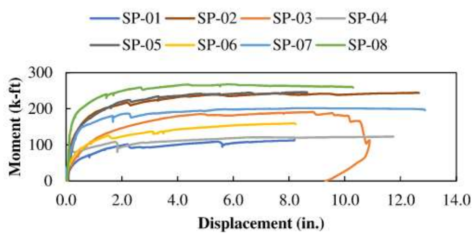
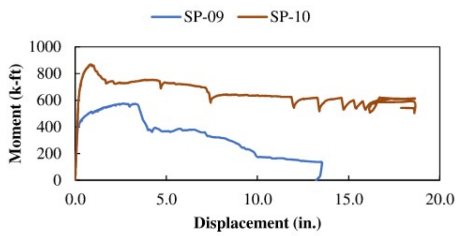
Evaluation of Concrete Pile to Footing or Cap Connections

FLEXURAL CAPACITY OF PILE-FOOTING CONNECTION





Specimen	Pile Size	Embedment	Failure Moment (k-ft)	Percentage of Pile Capacity	Failure Mechanism
SP-01	18"	6" (0.33d_p)	114.1	34%	Strand Development
SP-04	18"	9" (0.50d_p)	122.8	37%	Strand Development
SP-06	18"	12" (0.67d_p)	159.4	48%	Strand Development
SP-07	18"	18" (1.00d_p)	201.4	61%	Strand Development
SP-08	18"	27" (1.50d_p)	267.6	81%	Strand Development
SP-09	30"	12" (0.40d_p)	574.5	48%	Strand Development
SP-10	30"	30" (1.00d_p)	868.1	73%	Punching Shear

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Source: https://www.fdot.gov/structures/structuresresearchcenter/activeresearch.shtm

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Evaluation of Concrete Pile to Footing or Cap Connections

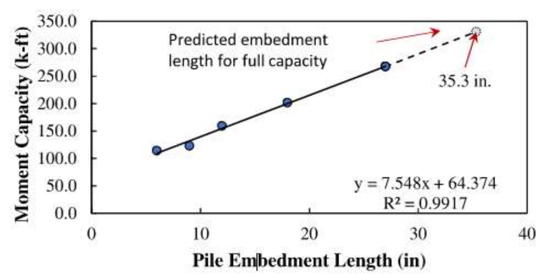
Linear variation between embedment length and moment capacity of the connection:

- Estimated 32.5-inch embedment for full moment capacity of 18-inch pile
- Estimate development length:
- Application of axial load increased the capacity by an average of 107%

AASHTO LRFD BDS → 57.7-inch
ElBatanouny and Ziehl (2012) → 33.4-inch

$$l_d = \left(\frac{f_{se}}{5000}\right) d_b + \left(\frac{f_{ps} - f_{se}}{1800}\right) d_b$$

PREDICTED EMBEDMENT LENGTH FOR FULL PILE CAPACITY



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Source: https://www.fdot.gov/structures/structuresresearchcenter/activeresearch.shtm

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Evaluation of Concrete Pile to Footing or Cap Connections

PROPOSED STRAND DEVELOPMENT LENGTH FORMULA

ACI Building Code

Required development length:

$$l_d = \left(\frac{f_{se}}{3000}\right) d_b + \left(\frac{f_{ps}-f_{se}}{1000}\right) d_b$$

Does not consider any clamping or confining stresses

ElBatanouny and Ziehl

Required development length:

$$l_d = \left(\frac{f_{se}}{5000}\right) d_b + \left(\frac{f_{ps}-f_{se}}{1800}\right) d_b$$

AASHTO LRFD BDS

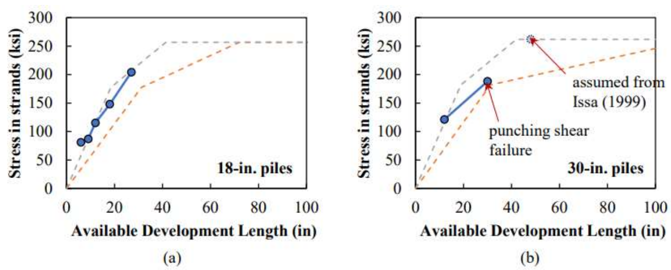
Required transfer length:

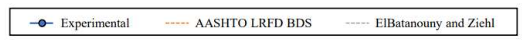
$$l_t = 60 d_b$$

Required development length:

$$l_d \geq k\left(f_{ps} - \frac{2}{3} f_{pe}\right) d_b$$

Where: $k = 0.58 \approx \frac{3}{5}$





a) 18in pile
b) 30in pile

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Source: https://www.fdot.gov/structures/structuresresearchcenter/activeresearch.shtm

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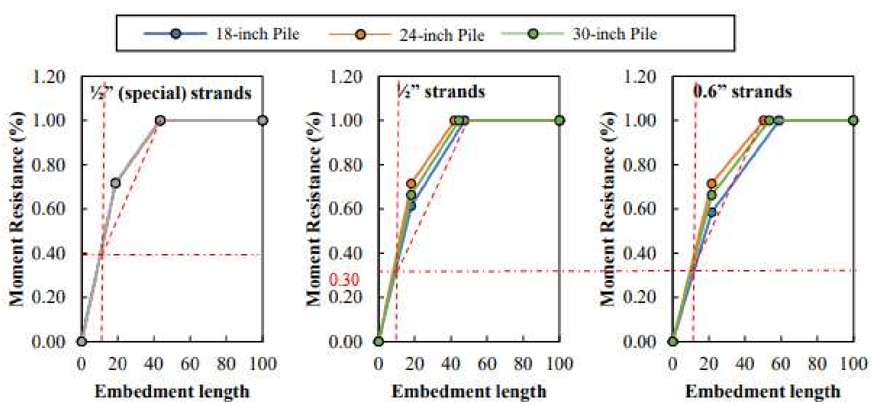
Evaluation of Concrete Pile to Footing or Cap Connections

NORMALIZED MOMENT RESISTANCE VERSUS EMBEDMENT LENGTH



½" special strands configuration | ½" strand configuration | 0.6" strand configuration

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Source: https://www.fdot.gov/structures/structuresresearchcenter/activeresearch.shtm

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Bond Performance of Post-Tensioning Tendons with Corrosion Inhibitor

Objectives: Determine whether injection of a corrosion-inhibiting liquid into grouted internal post-tensioned (PT) tendons has a detrimental effect on bond performance & and flexural capacity of girders.

Develop recommendations to include the quantifiable effect of corrosion inhibitor into the AASHTO LRFD code equation for the flexural capacity of PT girders.

Variables: Tendon size, number of strands, tendon profile, type of grout, ductal type.

Methods: Four-point flexure test

Instrumentation: Load Cells at hydraulic jack, LVDTs, Surface Strain Transducers, Vibrating wire gauges, and Digital Image Correlation (DIC).

(Source: FDOT SMO 2021)

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Source: https://www.fdot.gov/structures/structuresresearchcenter/activeresearch.shtm

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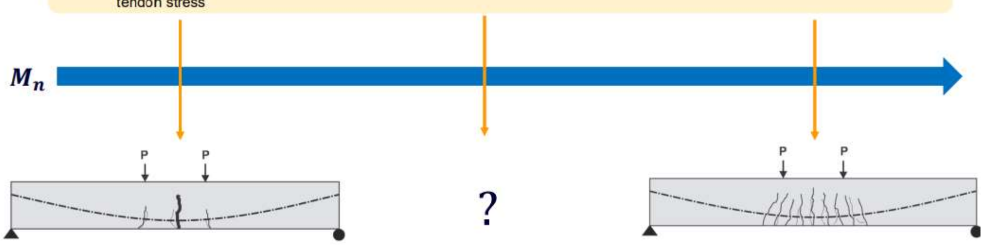
Bond Performance of Post-Tensioning Tendons with Corrosion Inhibitor

Nominal flexural strength (M_n)

Fully unbonded tendon
- No grout, strands not bonded
- Strain in strands & adjacent concrete develop independently
- Nominal flexural strength
  - AASHTO models to estimate tendon stress

Partially bonded tendon
- Tendon grouted and Inhibitor injected
- Expected bond degradation
- Nominal flexure strength:
  - TBD

Fully bonded tendon
- Tendon grouted
- Bond between strands and grout
- Nominal flexure strength
  - Strain compatibility



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Source: UF

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Bond Performance of Post-Tensioning Tendons with Corrosion Inhibitor

TEST MATRIX

Test Specimen Identifier	Group Number	Grouting Type	Cracked Before Injection	Injected with Corrosion Inhibitor
S06-M-U	1	Pre-packaged	-	-
S06-M-T			-	Yes
S06-M-CT			Yes	Yes
S12-P-U	1	Pre-packaged	-	-
S12-P-T			-	Yes
S19-M-U	1	Plain	-	-
S12-M-T			-	Yes
D19-P-U	2	Non-Proprietary	-	-
D19-P-T			-	Yes
D19-M-U	2	Non-Proprietary	-	-
D19-M-T			-	Yes

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Source: https://www.fdot.gov/structures/structuresresearchcenter/activeresearch.shtm

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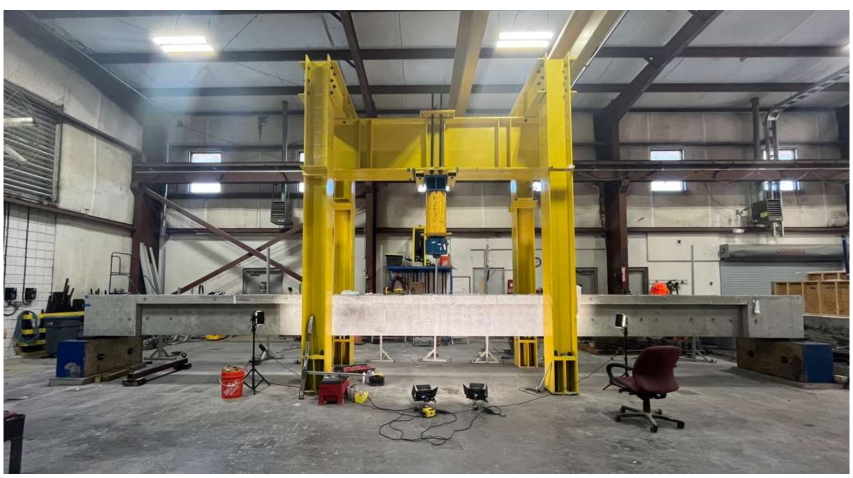
Bond Performance of Post-Tensioning Tendons with Corrosion Inhibitor



TEST SETUP

- 4-point bending test
- I beam pre-cracked
- Treated/untreated specimen couples

INSTRUMENTATION

- Foil strain Gauge (FSG)
- Fiber Optic Sensor (FOS)
- Laser Displacement Transducer (LDT)
- Digital Image Correlation(DIC)

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Source: https://www.fdot.gov/structures/structuresresearchcenter/activeresearch.shtm

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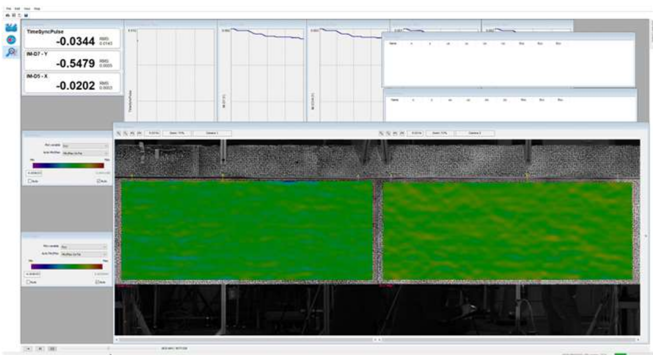
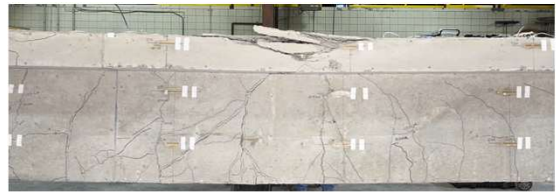
Bond Performance of Post-Tensioning Tendons with Corrosion Inhibitor

S12 FLEXURE TEST

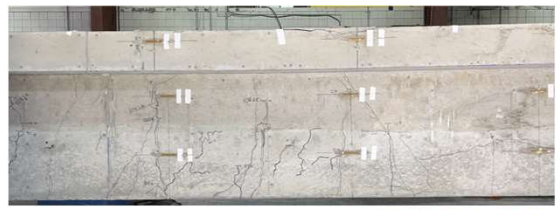
DIGITAL IMAGE CORRELATION - STRAIN MAPPING



S12-1 (CONTROL) - CRACK MAPPING



S12-2 (IMPREGNATED) - CRACK MAPPING



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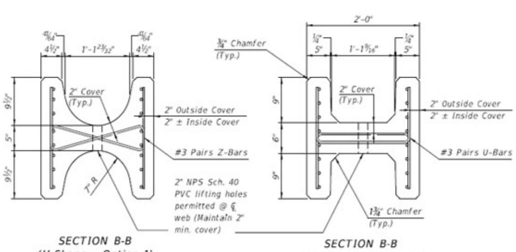
UHPC Standard Pile Section



Pros:

1. Greater Structural Capacity
2. Surface Area – Significant to contribute to Side Friction
3. Weight – Lightest of the three options (Square, hollow, H-shape)
4. Previous casting and driving experience (D2, Leeware – FL, Sac County, Iowa, Can
5. UHPC material fits precast environment & CIP environment
6. Two options are available

Cons:

1. Cost
2. Currently, FBDeep cannot run a concrete H-Pile
3. Non-symmetrical section
4. Direction of Pile is important during placement (lateral)
5. Inconsistent dimensions of flanges
6. Pile Splicing
7. Lack of Data: Pile driving data, durability data, etc.

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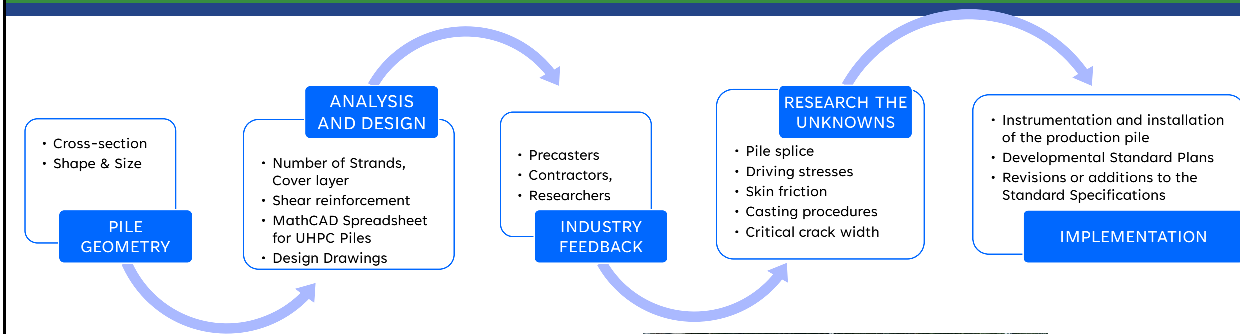
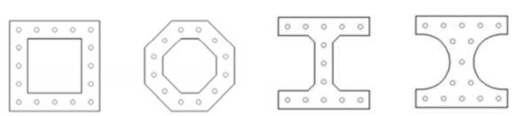
UHPC Standard Pile Section Development





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UHPC Research in Progress

Research supports the development of a standard UHPC H-Pile Section by the FDOT Structures Design Office

Project Title	Objective
Assessment and Optimization of the Casting Procedure for Precast UHPC	This project will deliver recommendations for casting UHPC members with defined/certain confidence level on the impact of fiber dispersion and orientation.
UHPC Skin Friction Evaluation	Provide a numerical measure of UHPC skin friction capacity applicable to the UHPC pile design.
Acceptable Crack Width Limit for UHPC Structural Members Under Coastal and Marine Environment	This research will determine the durability and corrosion resistance of UHPC under realistic cracking conditions and identify crack width limits for structural design.
Evaluation of Ultra-High-Performance Concrete (UHPC) Pile Splices	This project will evaluate the performance of alternate UHPC pile splice details and develop proposed details for UHPC pile splices.
Driving Assessment of UHPC Piles	This project will determine allowable driving stresses and driving energy for UHPC piles for use in construction specifications.
Combined Flexure and Axial Load Performance of UHPC Piles	This project will validate axial-flexural interaction analyses through experimental testing.

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Projects in Progress

Project Title	Anticipated End Date
Strengthening Piers to Resist Vehicular Collision	04/30/2027
Bond Performance Between Precast UHPC Substrates and Field Cast UHPC Connections	07/31/2025
FSBs With Stainless Steel Strands and GFRP Shear Reinforcement	12/31/2025
Fiber-Reinforced Concrete Traffic Railings for Impact Loading - Phase II	10/31/2026
Design and Detailing of Anchorages for Externally Bonded CFRP - Phase II	03/17/2027

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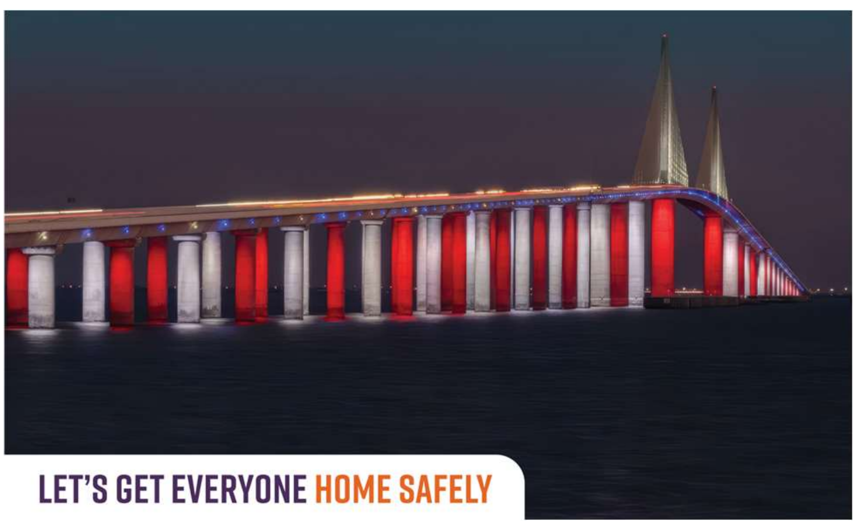
Safety Message



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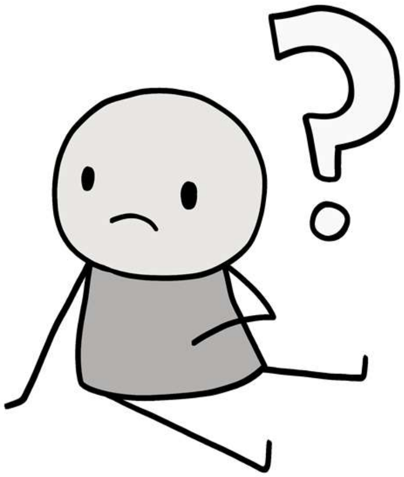
Contact Us



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June 19 - 20, 2025
Hollywood, FL

TRANSPORTATION SYMPOSIUM

Please be sure to **certify your attendance** before leaving this event or no later than **Monday, June 30**, in order to receive PDH/CEC. Detailed instructions are available on the Transportation Symposium website.

Transportation Symposium Website

SCAN ME

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