

INDEX OF STRUCTURE PLANS

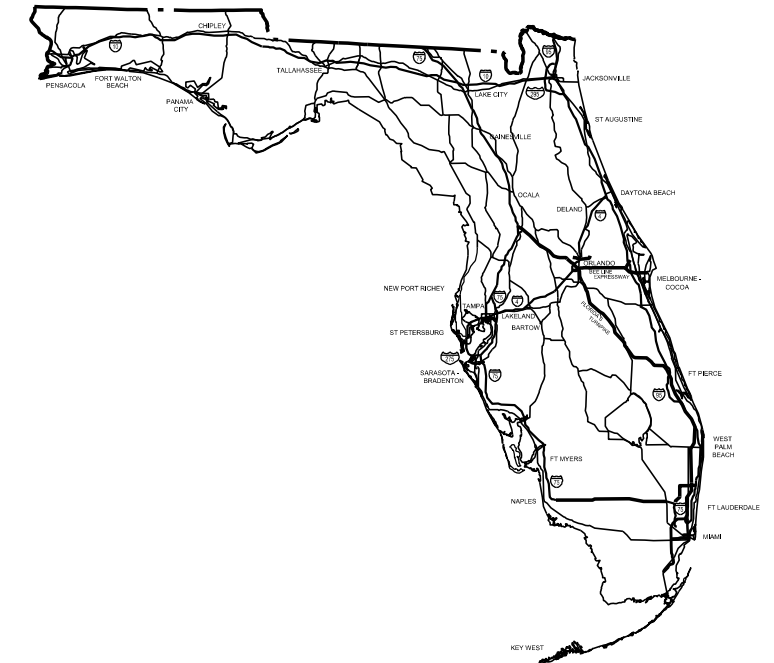
SHEET NO.	SHEET DESCRIPTION
Example 1	Precast Two-Column Pier
Sheet 1 of 4	Pier Details
Sheet 2 of 4	Pier Details
Sheet 3 of 4	Pier Details
Sheet 4 of 4	Pier Details
Example 2	Precast Two-Column Pier
Sheet 1 of 3	Column Details
Sheet 2 of 3	Column Details
Sheet 3 of 3	Column Details
Example 3	Hybrid C.I.P./Precast Hammerhead Pier
Sheet 1 of 6	Pier Details
Sheet 2 of 6	Pier Details
Sheet 3 of 6	Pier Details
Sheet 4 of 6	Pier Details
Sheet 5 of 6	Pier Details
Sheet 6 of 6	Pier Details
Example 4	Precast Pier Footing
Sheet 1 of 3	Pier Footing Details
Sheet 2 of 3	Pier Footing Details
Sheet 3 of 3	Pier Footing Details
Example 5	Precast Bent Cap
Sheet 1 of 2	Pile Cap Details
Sheet 2 of 2	Pile Cap Details
Example 6	Precast Bent Cap
Sheet 1 of 2	Bent Details
Sheet 2 of 2	Bent Details
Example 7	Precast Slab Units with Topping
Sheet 1 of 1	Superstructure Details
Example 8	Closure Pour
Sheet 1 of 3	Connection Details
Sheet 2 of 3	Connection Details
Sheet 3 of 3	Connection Details

**STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION**

PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS (PBES) CONCEPTUAL DRAWINGS

Prefabricated Bridge Elements and Systems (PBES) are structural components of a bridge built offsite or in a near site casting yard in order to reduce onsite construction time as compared to conventional construction methods. PBES components and details will vary from project to project. These drawings are not standards or preferred details; these drawings are concepts intended to assist the Designer in the development of project specific components and details. Notes to Designers have been provided as boxed text in the drawings. The information presented in this document should not be relied upon for specific application without competent professional examination and verification of accuracy, suitability, and applicability by a licensed Professional Engineer.

**NOT FOR CONSTRUCTION
CONCEPT ONLY**



STRUCTURE SHOP DRAWINGS
TO BE SUBMITTED TO:

PLANS PREPARED BY:



ISOMETRIC DRAWINGS PREPARED BY:



REFERENCED MANUALS, STANDARDS AND SPECIFICATIONS:

Florida Department of Transportation, 2015 Structures Manual
Volume 2, Chapter 25

Florida Department of Transportation, 2015 Design Standards
Index Drawings: 420, 423, 821, 926, and 21110

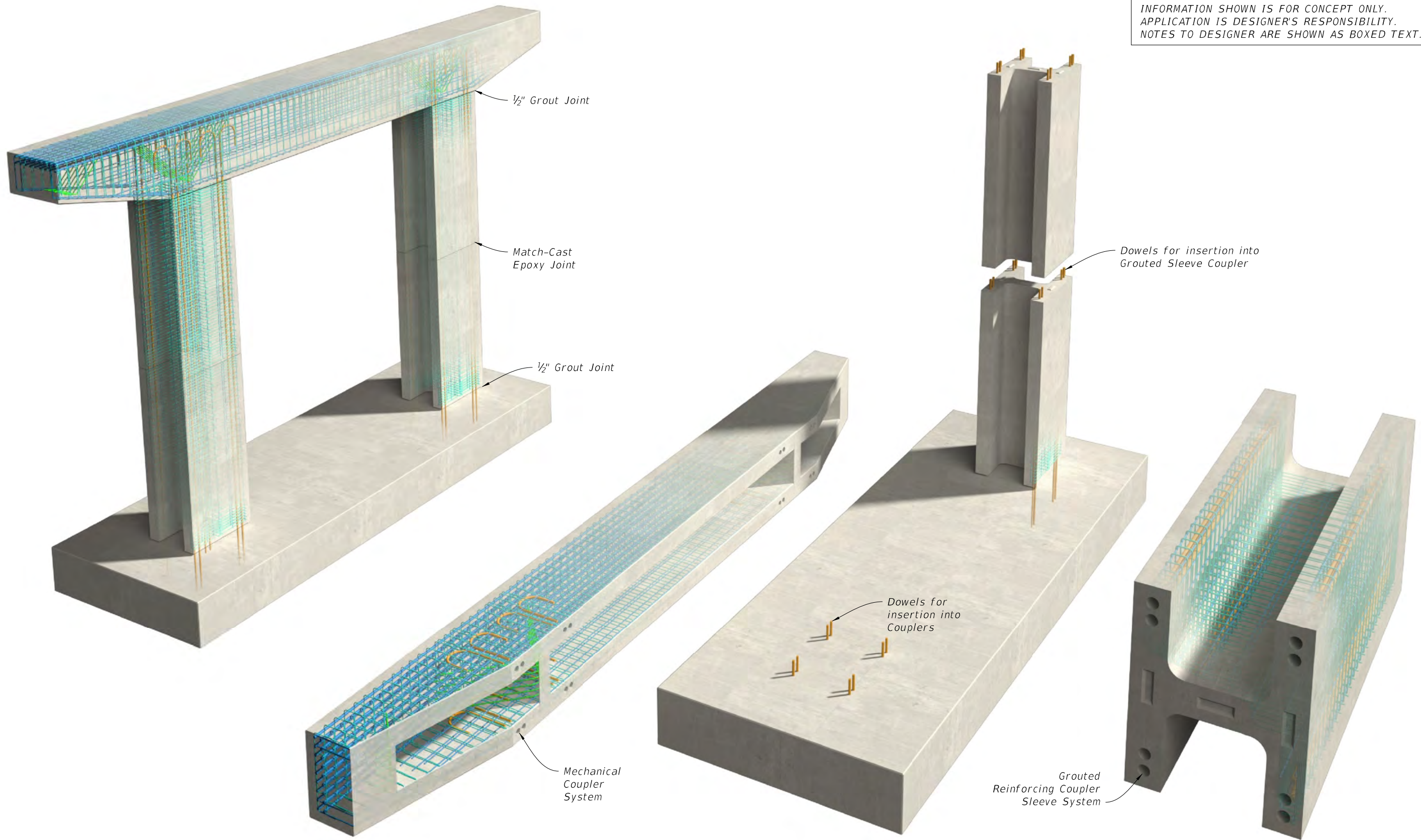
Florida Department of Transportation, 2015 Standard
Specifications for Road and Bridge Construction
Sections: 400-9 and 926-1

AASHTO LRFD Bridge Design Specifications, Sixth Edition with
2013 Interims
Section 5.14.2.4.2

NOTE: THE SCALE OF THESE PLANS MAY
HAVE CHANGED DUE TO REPRODUCTION.

FISCAL YEAR	SHEET NO.

INFORMATION SHOWN IS FOR CONCEPT ONLY.
 APPLICATION IS DESIGNER'S RESPONSIBILITY.
 NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

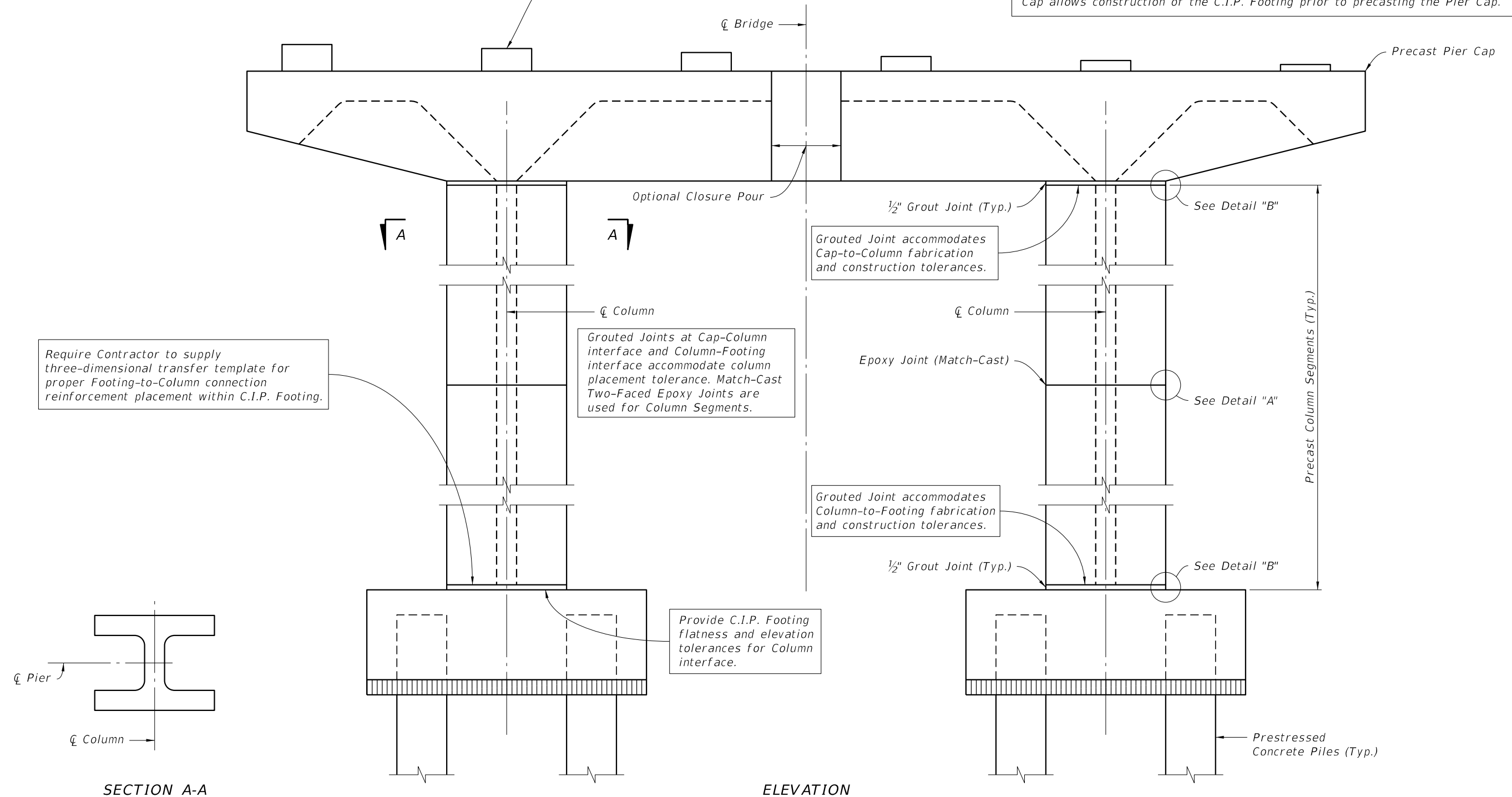


REVISIONS						STRUCTURES DESIGN OFFICE CENTRAL OFFICE 605 Suwannee Street, MS 33 Tallahassee, Florida 32399-0450	DRAWN BY: CHECKED BY: DESIGNED BY: CHECKED BY:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET TITLE: PIER DETAILS SHEET 1 OF 4	REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
										EXAMPLE 1 - PRECAST TWO-COLUMN PIER PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		

Require Shop Drawings and Erection Plan. See Structures Detailing Manual, Chapter 25, for items to be included.

Consider tolerances and means of adjustment for Precast Pedestals.

The Transfer Template is based on the Prefabricated Precast Pier Cap and provides orientation of bar placement in the C.I.P. Footings and orientation of Columns relative to each other for Multi-Column Piers. Use of the optional Closure Pour in the Precast Cap allows construction of the C.I.P. Footing prior to precasting the Pier Cap.



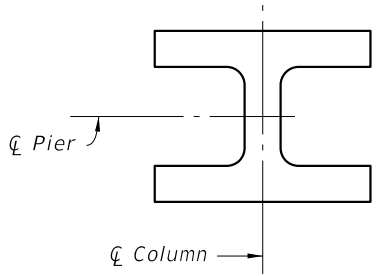
Require Contractor to supply three-dimensional transfer template for proper Footing-to-Column connection reinforcement placement within C.I.P. Footing.

Grouted Joints at Cap-Column interface accommodate column placement tolerance. Match-Cast Two-Faced Epoxy Joints are used for Column Segments.

Grouted Joint accommodates Cap-to-Column fabrication and construction tolerances.

Grouted Joint accommodates Column-to-Footing fabrication and construction tolerances.

Provide C.I.P. Footing flatness and elevation tolerances for Column interface.



SECTION A-A

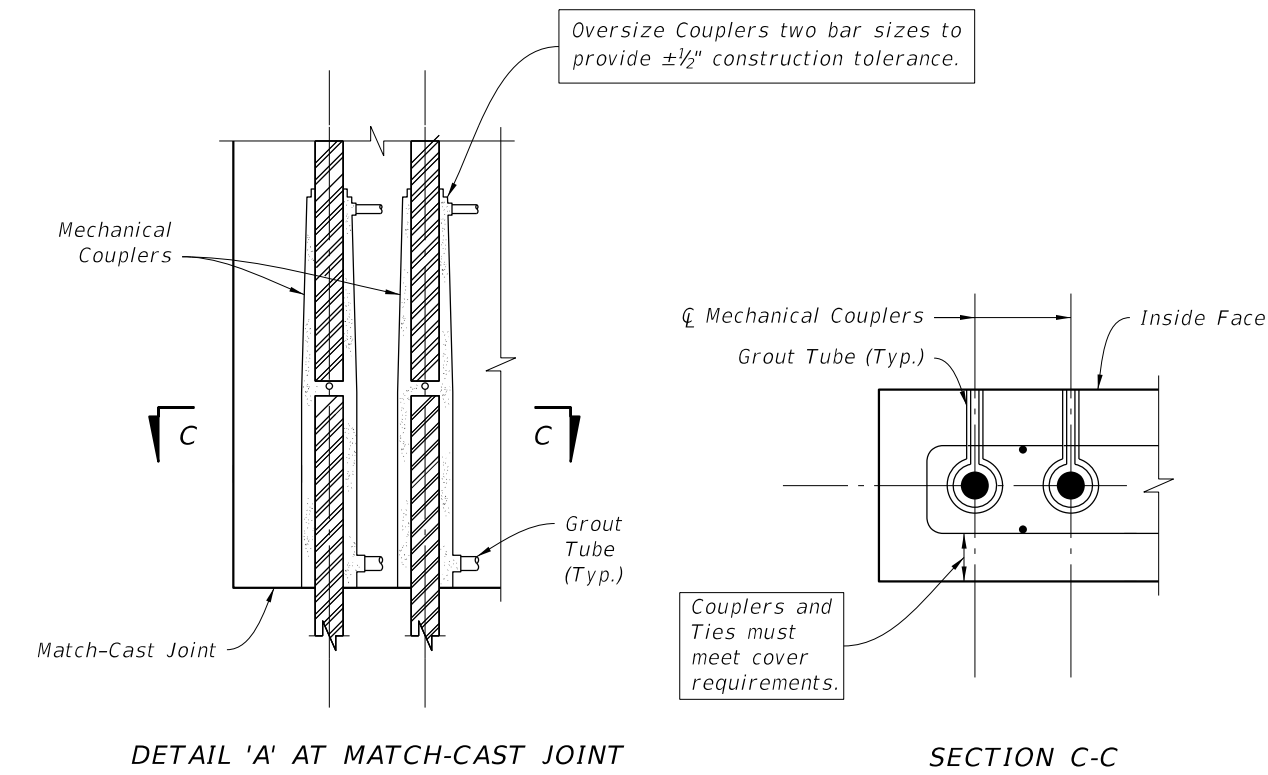
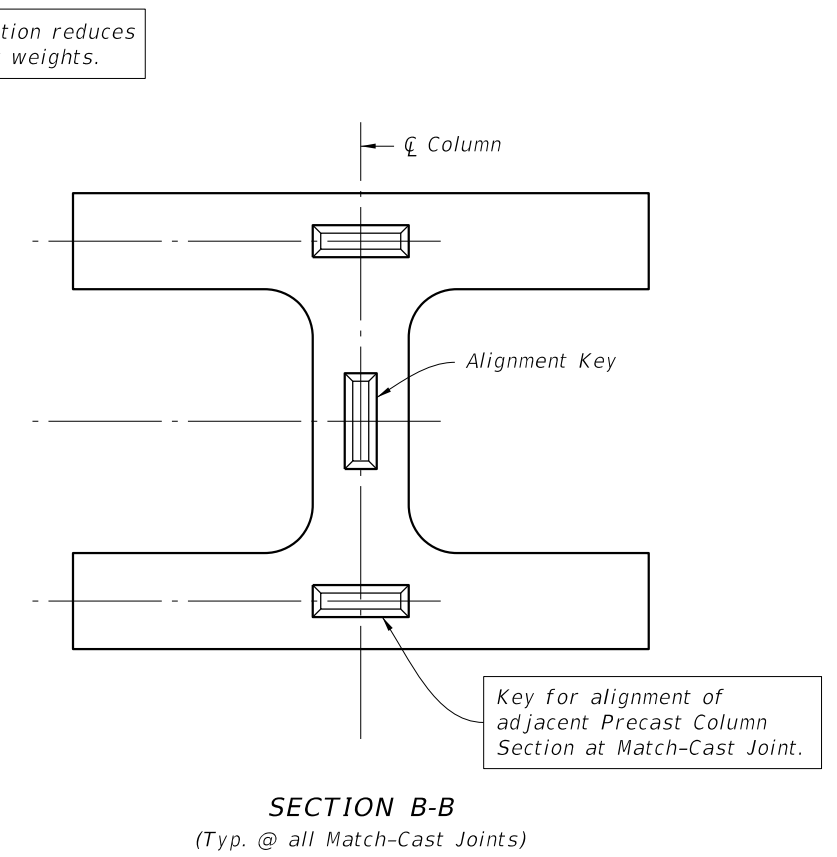
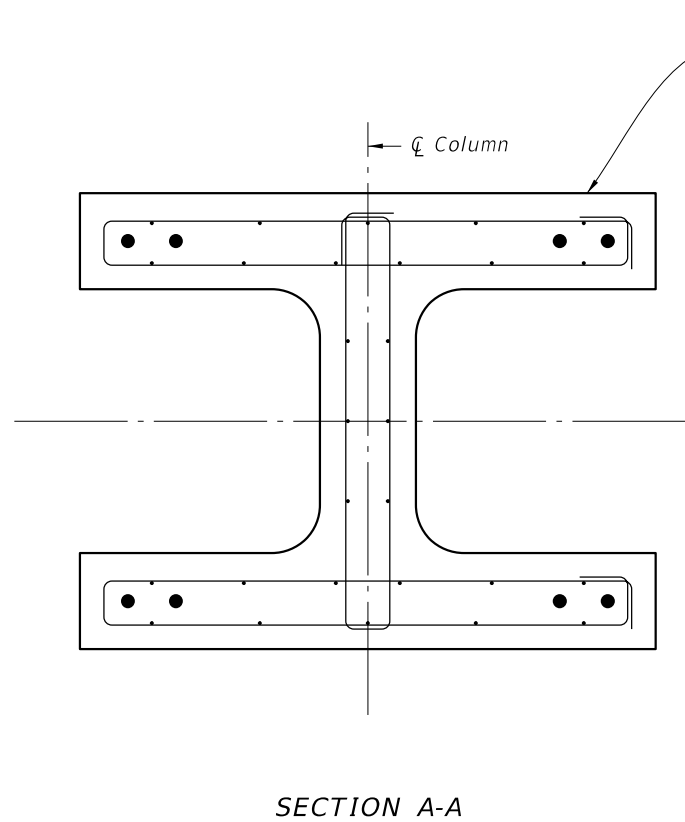
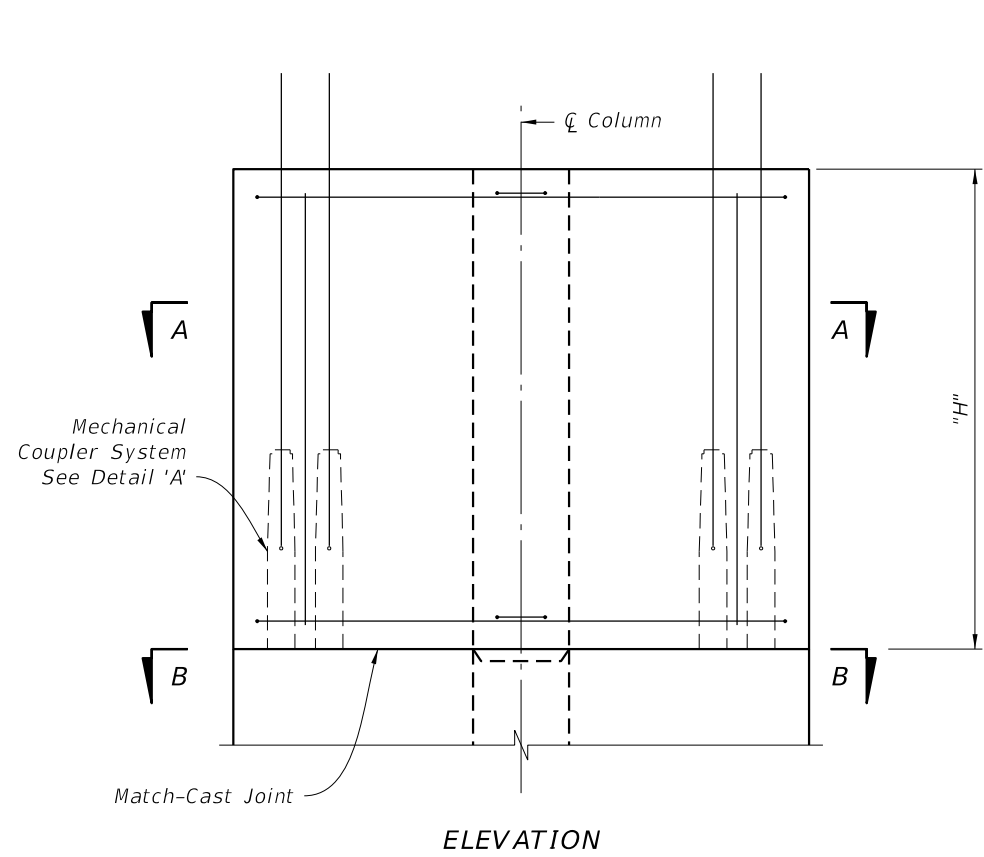
ELEVATION

- NOTES:
1. For Detail "A" at Match-Cast Joint see Sheet 3 of 4.
 2. For Detail "B" at 1/2" Grout Joint see Sheet 4 of 4.
 3. For Precast Column Segments, see Sheet 3 of 4.
 4. For Precast Pier Cap Details, see Sheet 4 of 4.

Require one full-scale mock-up of each unique grouted joint. Require component-to-component fit-up in the casting yard of all components prior to shipping to the erection site. In lieu of component-to-component fit-up, the contractor may demonstrate interfacing elements or precast components do not conflict through the use of a transfer template.

INFORMATION SHOWN IS FOR CONCEPT ONLY. APPLICATION IS DESIGNER'S RESPONSIBILITY. NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

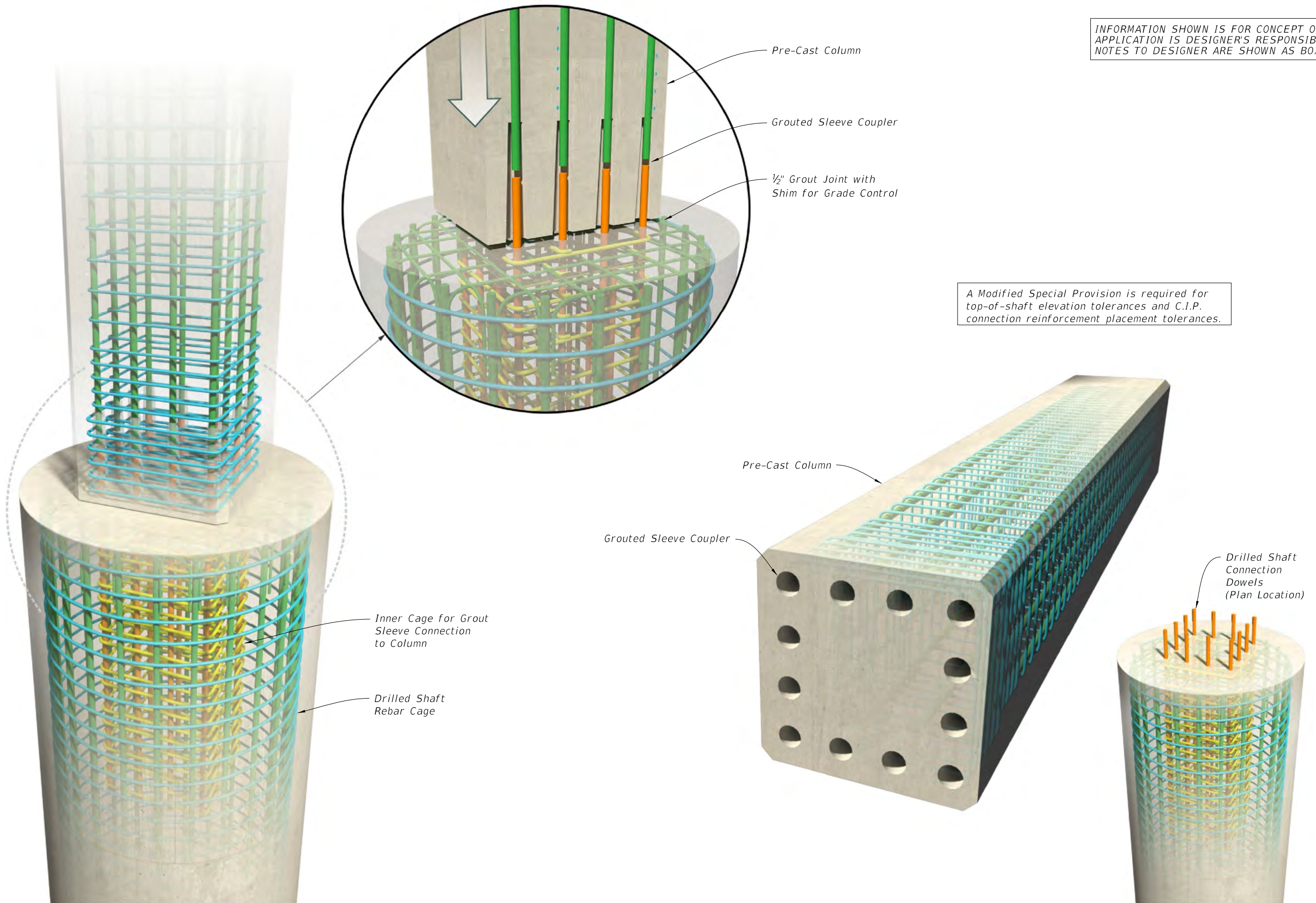
REVISIONS						STRUCTURES DESIGN OFFICE CENTRAL OFFICE 605 Suwannee Street, MS 33 Tallahassee, Florida 32399-0450	DRAWN BY: CHECKED BY: DESIGNED BY: CHECKED BY:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET TITLE: PIER DETAILS SHEET 2 OF 4	REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
										EXAMPLE 1 - PRECAST TWO-COLUMN PIER PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		



INFORMATION SHOWN IS FOR CONCEPT ONLY.
APPLICATION IS DESIGNER'S RESPONSIBILITY.
NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

REVISIONS						STRUCTURES DESIGN OFFICE CENTRAL OFFICE 605 Suwannee Street, MS 33 Tallahassee, Florida 32399-0450	DRAWN BY: CHECKED BY: DESIGNED BY: CHECKED BY:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET TITLE: PIER DETAILS SHEET 3 OF 4	REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
										EXAMPLE 1 - PRECAST TWO-COLUMN PIER PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		

INFORMATION SHOWN IS FOR CONCEPT ONLY.
APPLICATION IS DESIGNER'S RESPONSIBILITY.
NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.



A Modified Special Provision is required for top-of-shaft elevation tolerances and C.I.P. connection reinforcement placement tolerances.

REVISIONS						STRUCTURES DESIGN OFFICE			STATE OF FLORIDA			SHEET TITLE:		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CENTRAL OFFICE			DEPARTMENT OF TRANSPORTATION			COLUMN DETAILS		
						605 Suwannee Street, MS 33			ROAD NO. COUNTY FINANCIAL PROJECT ID			SHEET 1 OF 3		
						Tallahassee, Florida 32399-0450			PROJECT NAME:			EXAMPLE 2 - PRECAST TWO-COLUMN PIER		SHEET NO.
												PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		

A Modified Special Provision is required for top-of-shaft elevation tolerances and reinforcement placement tolerances.

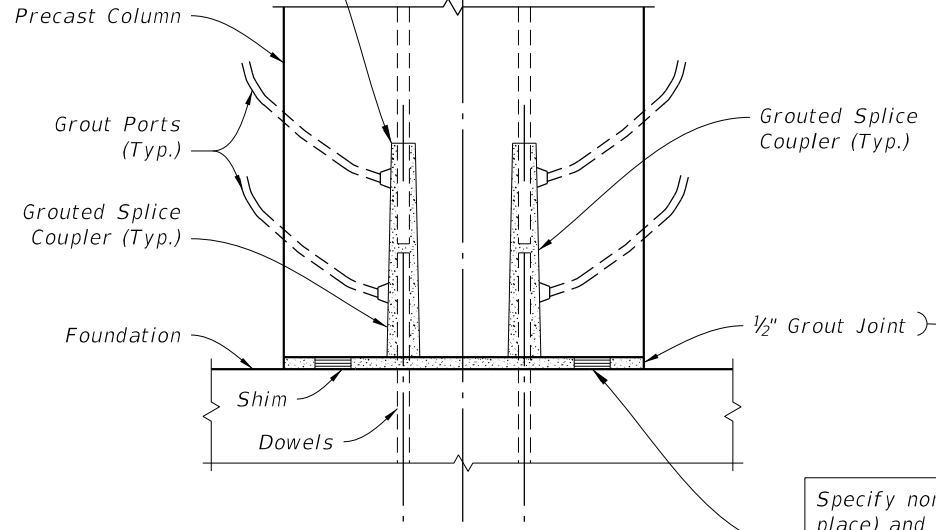
Oversize Couplers two bar sizes to provide $\pm 1/2$ " construction tolerance.

Specify APL approved non-shrink Grout and Saturated Surface Dry (SSD) condition for both interfacing surfaces. Require surfaces be prepared and cured according to Grout Manufacturer's recommendations.

Lifting Point (Typ.)
Place on Centerline
of Column

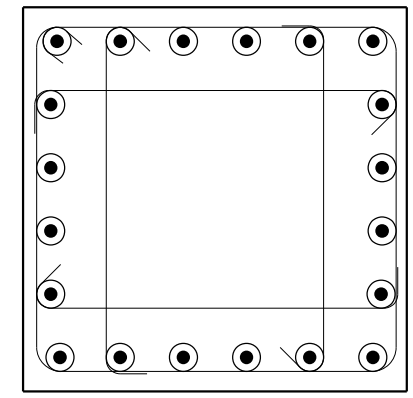
\varnothing Column

Top of Column



GROUTED SPLICE COUPLER DETAIL

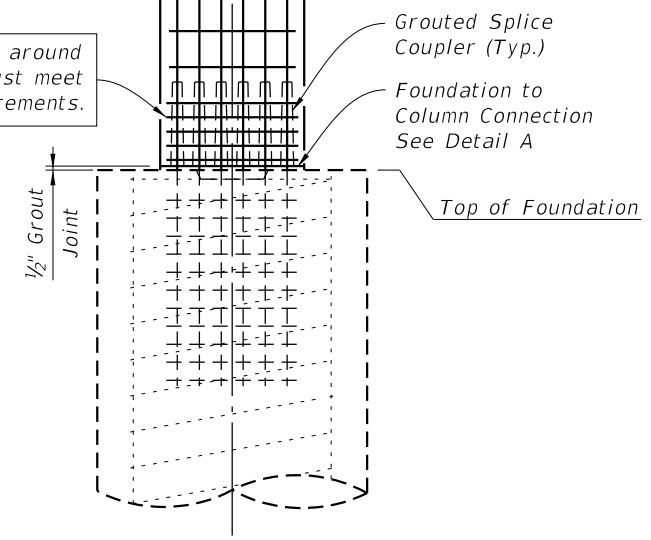
Specify non-metallic shims (left in place) and maximum shim height. Specialty Engineer to provide shim placement and loads as part of Erection Plan requirements.



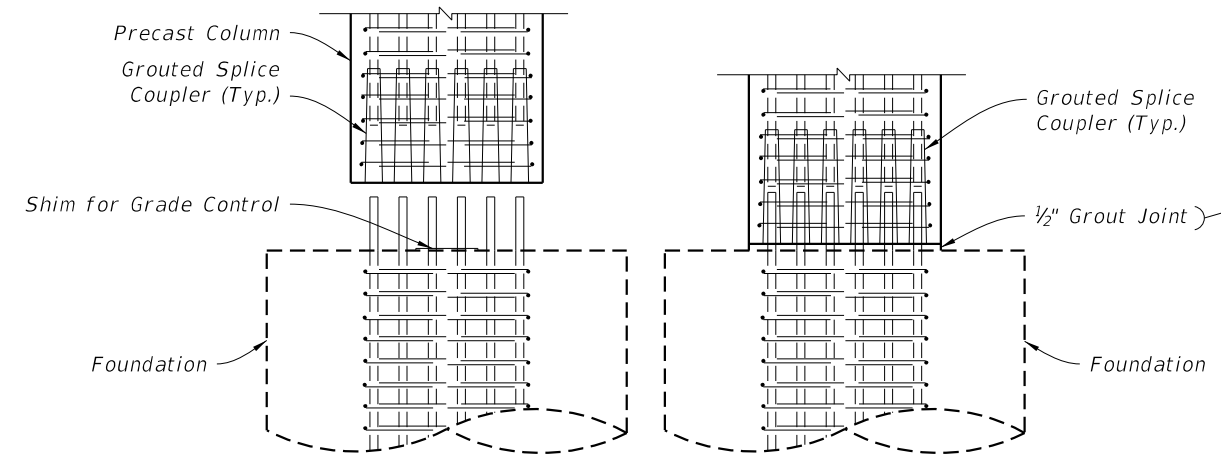
SECTION A-A
PRECAST COLUMN

NOTE:
Reinforcement shown as \odot are connected to Drilled Shaft or Footing.

Column Ties around Couplers must meet cover requirements.



COLUMN ELEVATION
(INSIDE FACE OF COLUMN SHOWN)



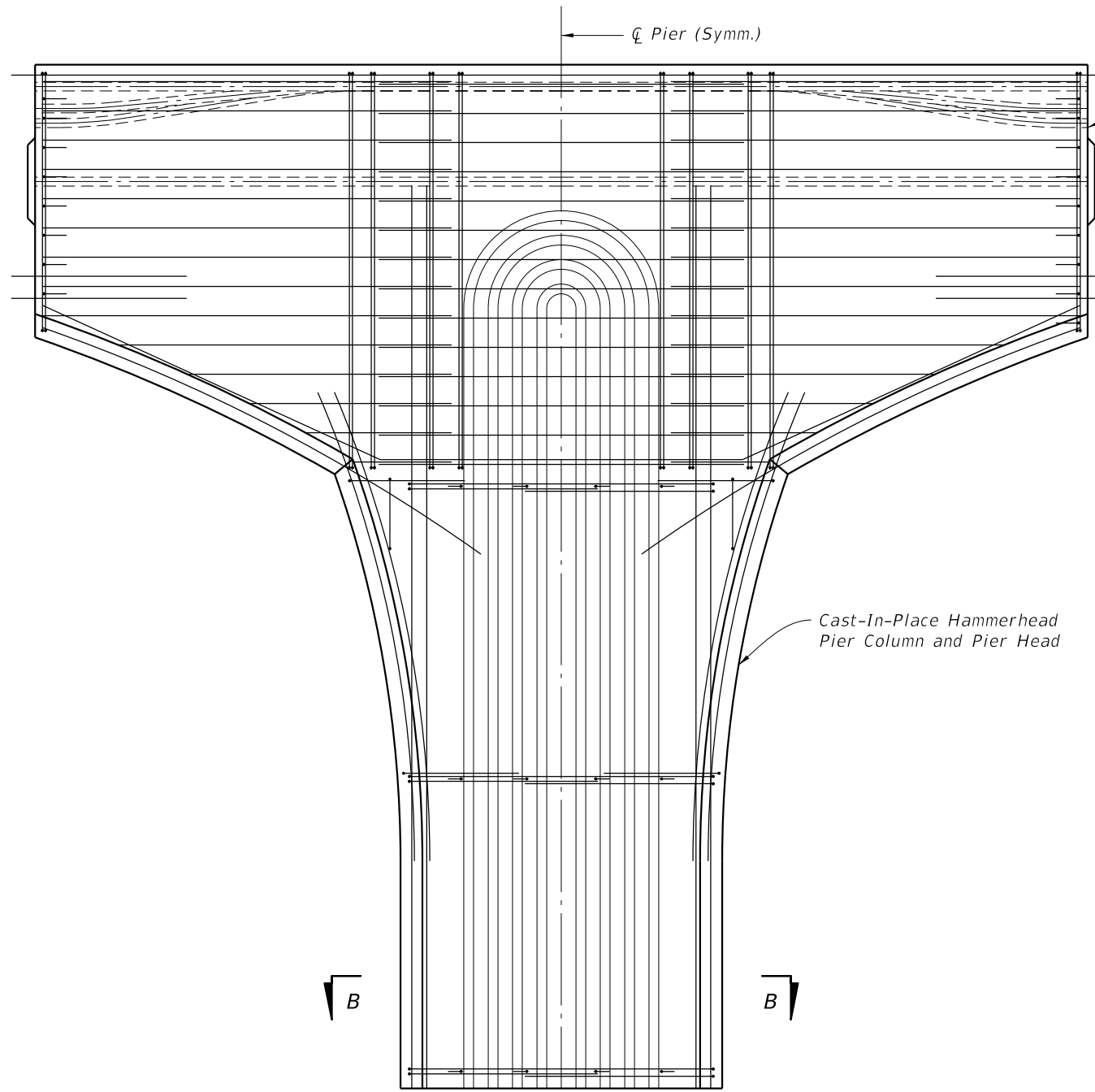
DETAIL A
FOUNDATION TO COLUMN CONNECTION

Grout Bed requires highly skilled workers to place grout properly.

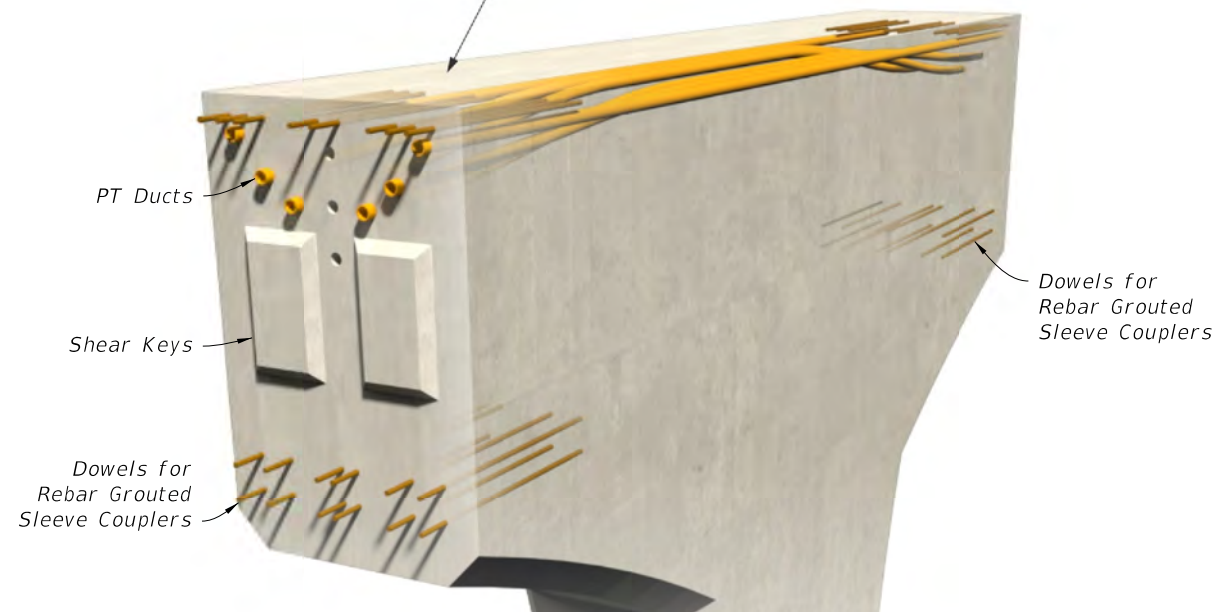
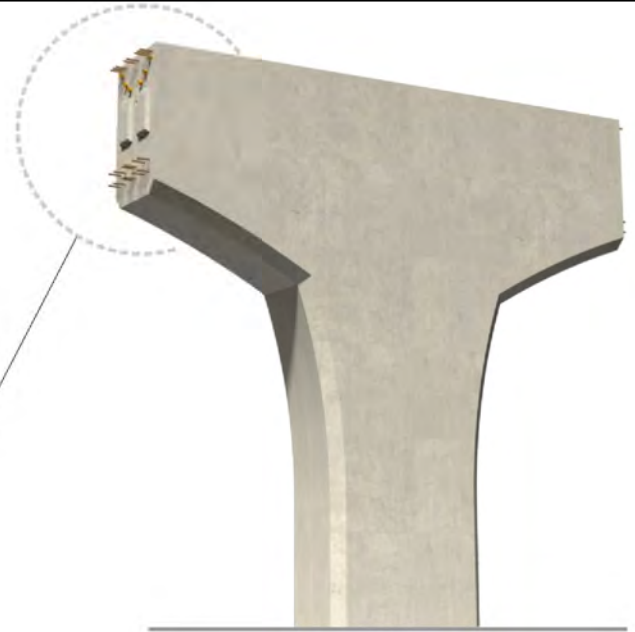
INFORMATION SHOWN IS FOR CONCEPT ONLY.
APPLICATION IS DESIGNER'S RESPONSIBILITY.
NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

REVISIONS						STRUCTURES DESIGN OFFICE CENTRAL OFFICE 605 Suwannee Street, MS 33 Tallahassee, Florida 32399-0450	DRAWN BY: CHECKED BY: DESIGNED BY: CHECKED BY:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET TITLE: COLUMN DETAILS SHEET 2 OF 3	REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
EXAMPLE 2 - PRECAST TWO-COLUMN PIER PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS											SHEET NO.	

A

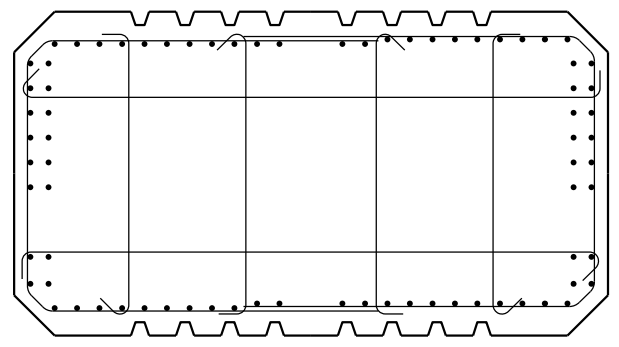


A



B B

ELEVATION

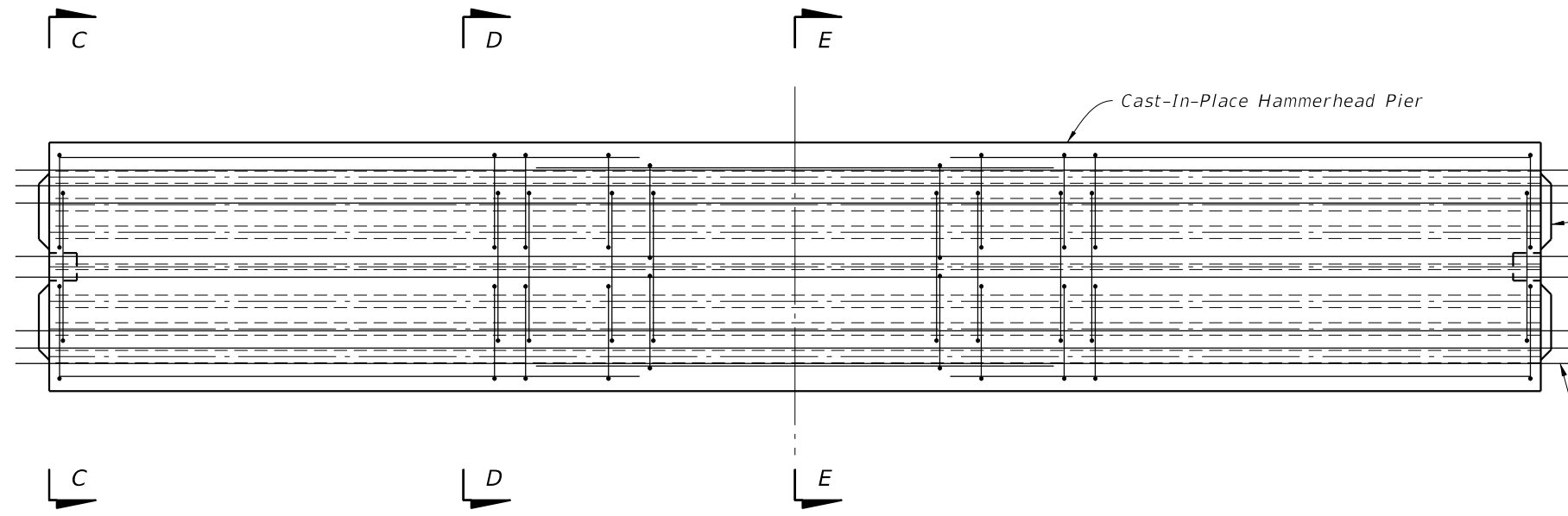


SECTION B-B

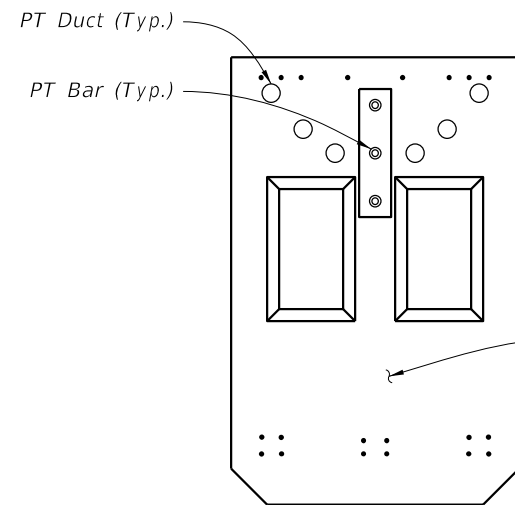
NOTE:
For Pseudo Match-Cast Process, see Sheet 5 of 7.

INFORMATION SHOWN IS FOR CONCEPT ONLY. APPLICATION IS DESIGNER'S RESPONSIBILITY. NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

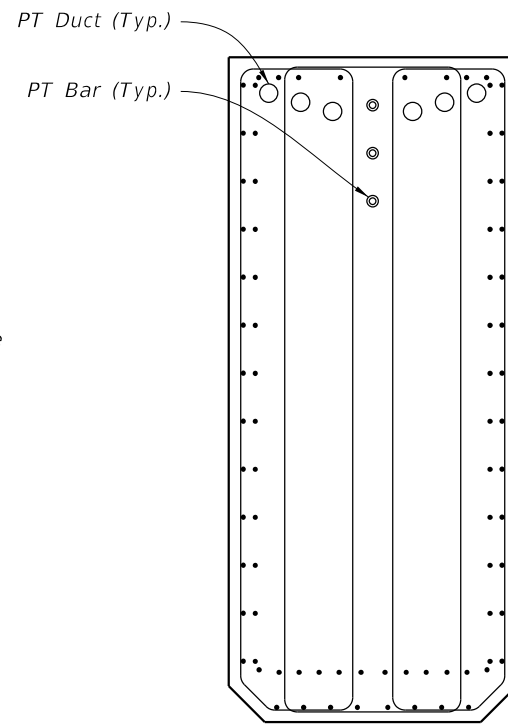
REVISIONS						STRUCTURES DESIGN OFFICE			STATE OF FLORIDA			PIER DETAILS		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CENTRAL OFFICE			DEPARTMENT OF TRANSPORTATION			SHEET 1 OF 6		
						605 Suwannee Street, MS 33			ROAD NO.	COUNTY	FINANCIAL PROJECT ID	PROJECT NAME:		SHEET NO.
						Tallahassee, Florida 32399-0450						EXAMPLE 3 - HYBRID C.I.P./PRECAST HAMMERHEAD PIER		
												PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		



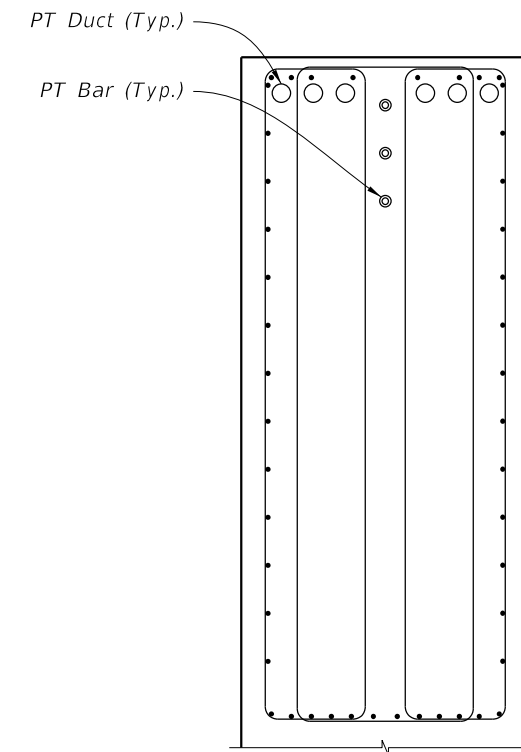
VIEW A-A



VIEW C-C



VIEW D-D



VIEW E-E

INFORMATION SHOWN IS FOR CONCEPT ONLY.
APPLICATION IS DESIGNER'S RESPONSIBILITY.
NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

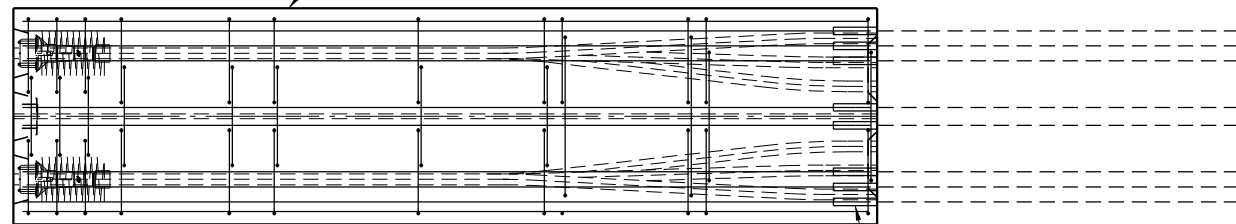
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STRUCTURES DESIGN OFFICE
CENTRAL OFFICE
605 Suwannee Street, MS 33
Tallahassee, Florida 32399-0450

DRAWN BY:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
CHECKED BY:	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
DESIGNED BY:			
CHECKED BY:			

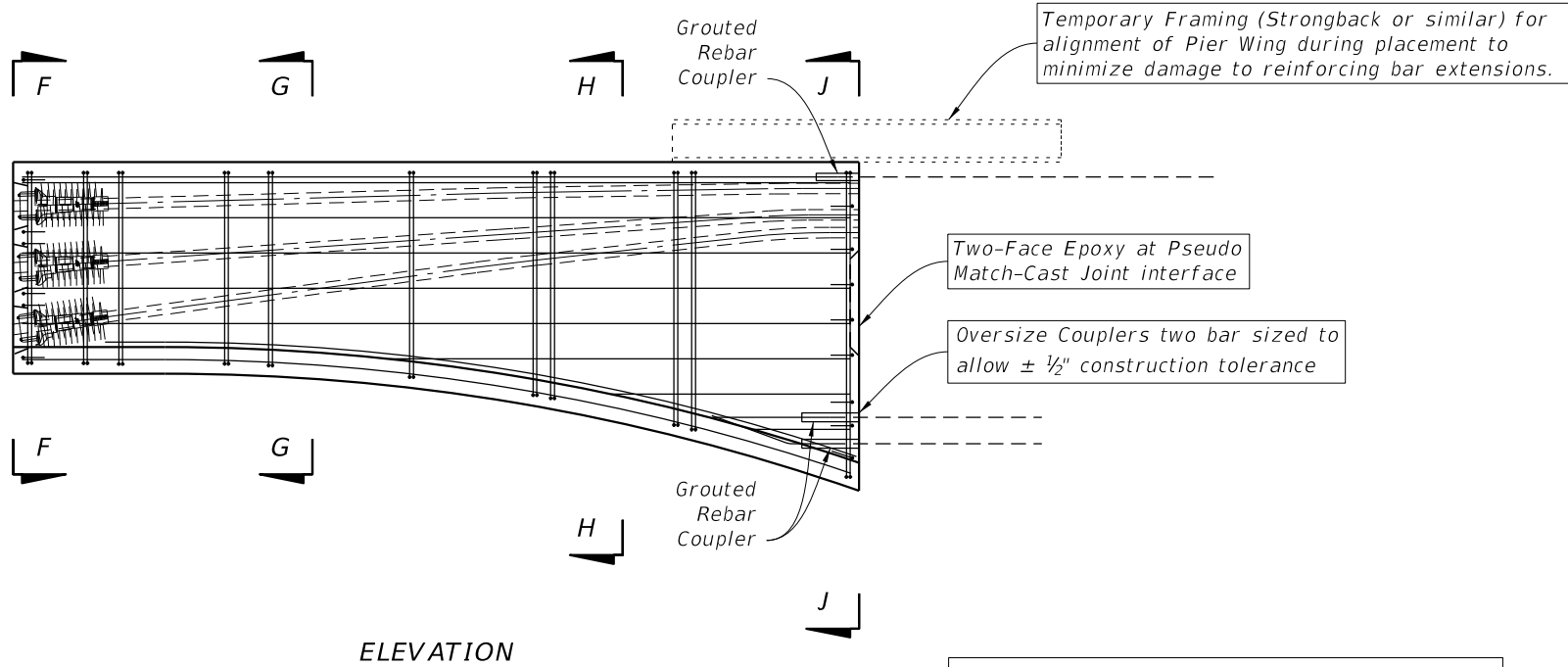
SHEET TITLE:	PIER DETAILS SHEET 2 OF 6	REF. DWG. NO.	
PROJECT NAME:	EXAMPLE 3 - HYBRID C.I.P./PRECAST HAMMERHEAD PIER PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS	SHEET NO.	

Size Precast Pier Wing for construction equipment and boom reach using site specific construction access assessment. For over-land projects, include haul route assessment for element sizing.



PLAN

Grouted Rebar Coupler



ELEVATION

Grouted Rebar Coupler

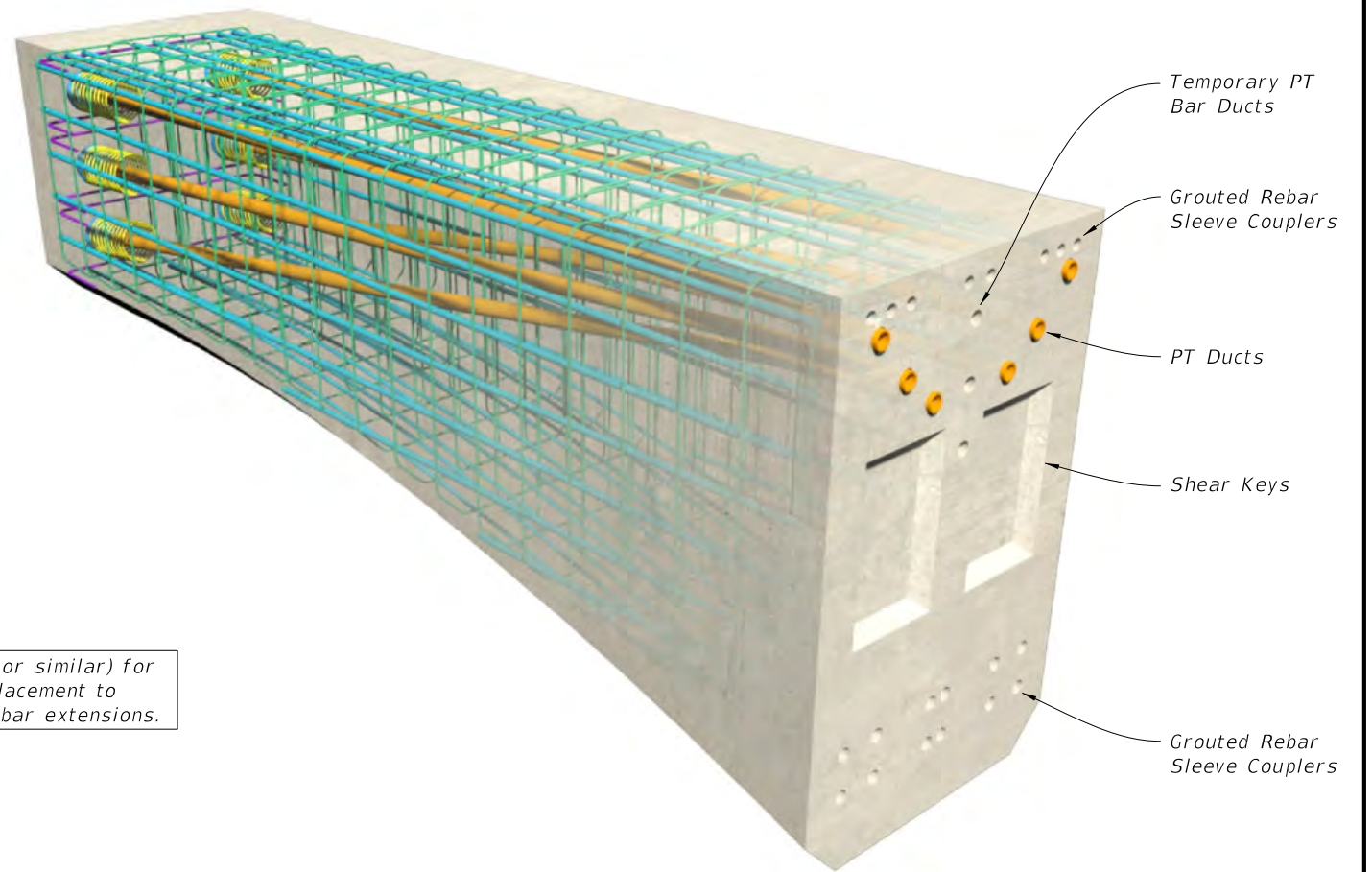
Temporary Framing (Strongback or similar) for alignment of Pier Wing during placement to minimize damage to reinforcing bar extensions.

Two-Face Epoxy at Pseudo Match-Cast Joint interface

Oversize Couplers two bar sized to allow $\pm 1/2$ " construction tolerance

Grouted Rebar Coupler

A Temporary PT System (Temporary PT Bars shown) provides a compressive stress across the Pseudo Match-Cast Joint until the epoxy has cured. See LRFD 5.14.2.4.2 for requirements.



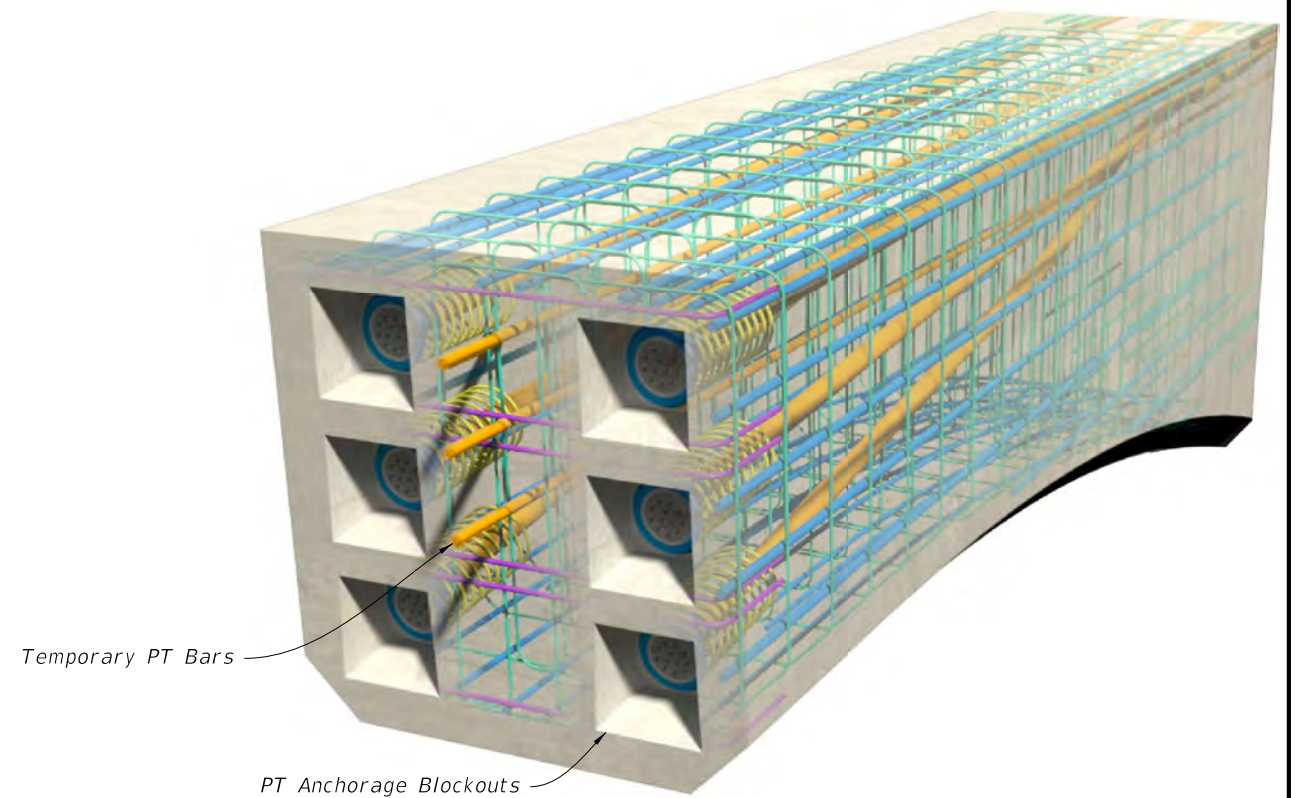
Temporary PT Bar Ducts

Grouted Rebar Sleeve Couplers

PT Ducts

Shear Keys

Grouted Rebar Sleeve Couplers

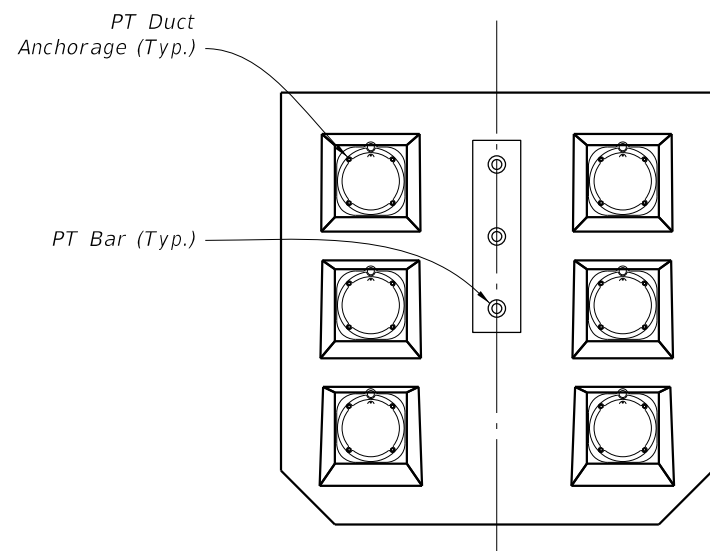


Temporary PT Bars

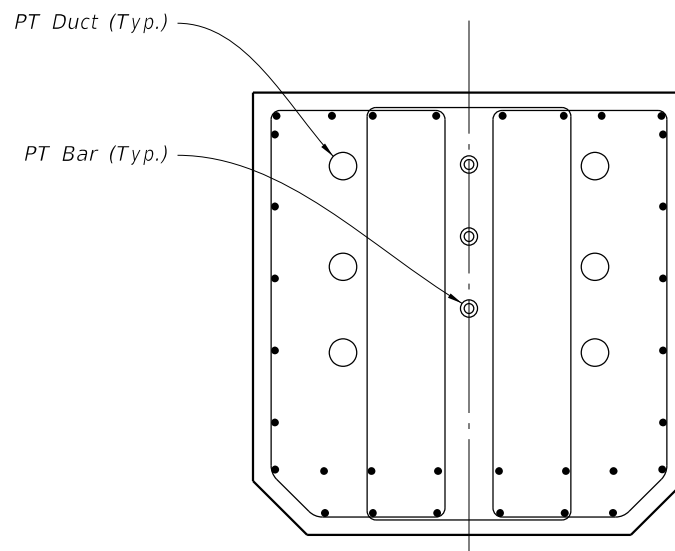
PT Anchorage Blockouts

INFORMATION SHOWN IS FOR CONCEPT ONLY. APPLICATION IS DESIGNER'S RESPONSIBILITY. NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

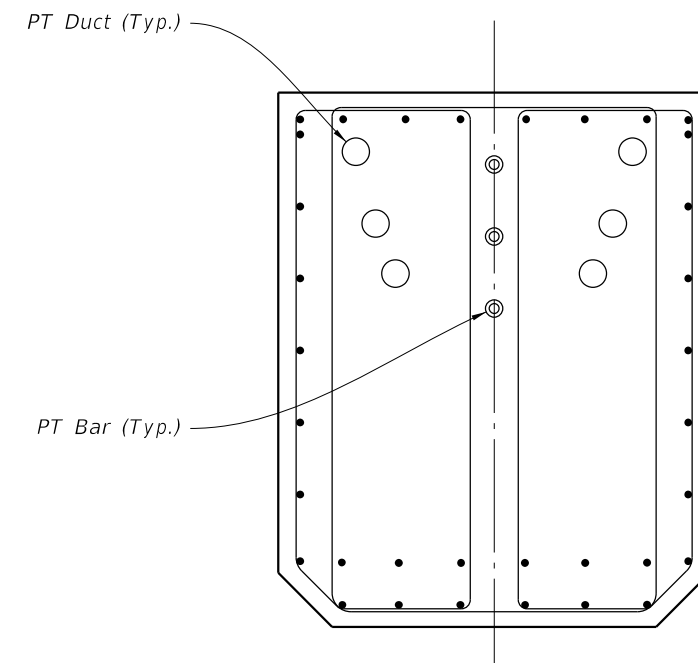
REVISIONS						STRUCTURES DESIGN OFFICE			DRAWN BY:			SHEET TITLE:		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CENTRAL OFFICE			STATE OF FLORIDA			PIER DETAILS		
						605 Suwannee Street, MS 33			DEPARTMENT OF TRANSPORTATION			SHEET 3 OF 6		
						Tallahassee, Florida 32399-0450			ROAD NO.	COUNTY	FINANCIAL PROJECT ID	PROJECT NAME:		
												EXAMPLE 3 - HYBRID C.I.P./PRECAST HAMMERHEAD PIER		
												PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		SHEET NO.



VIEW F-F

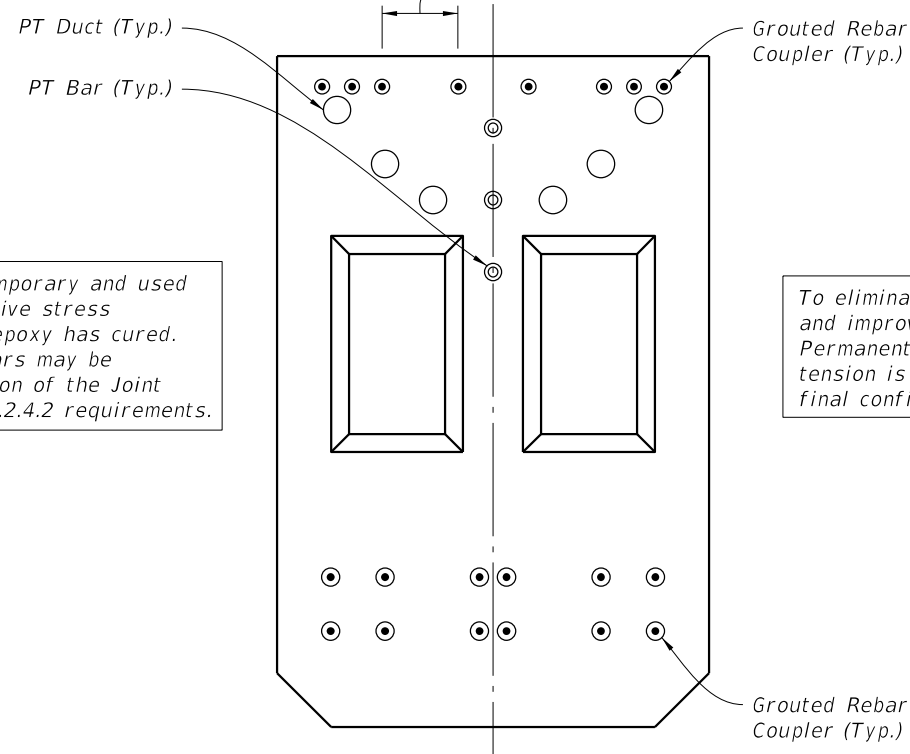


SECTION G-G



SECTION H-H

Provide gap between Grouted Rebar Couplers to facilitate coupling of PT Bars during placement of Pier Wings.



VIEW J-J

The PT Bars shown are temporary and used for maintaining a compressive stress across the joint until the epoxy has cured. Additional temporary PT Bars may be required in the lower section of the Joint to meet AASHTO LRFD 5.14.2.4.2 requirements.

To eliminate mild reinforcing at the Joint and improve fit-up, consider utilizing Permanent Post Tensioning such that zero tension is maintained at the joint in the final configuration.

INFORMATION SHOWN IS FOR CONCEPT ONLY. APPLICATION IS DESIGNER'S RESPONSIBILITY. NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

REVISIONS						STRUCTURES DESIGN OFFICE			STATE OF FLORIDA			PIER DETAILS		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CENTRAL OFFICE			DEPARTMENT OF TRANSPORTATION			SHEET 4 OF 6		
						605 Suwannee Street, MS 33			ROAD NO.	COUNTY	FINANCIAL PROJECT ID	PROJECT NAME:		SHEET NO.
						Tallahassee, Florida 32399-0450						EXAMPLE 3 - HYBRID C.I.P./PRECAST HAMMERHEAD PIER		
												PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		

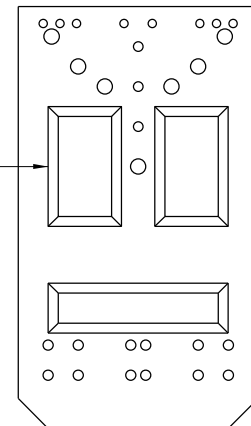
Stage 1 Notes:

1. Manufacture two identical Steel Bulkheads (left and right).
2. Pour a Precast Template using a Steel Bulkhead.
3. Precast Template to remain in casting yard for Stage 2.
4. Steel Bulkheads go to the erection site for forming the C.I.P. Hammerhead Pier Column.

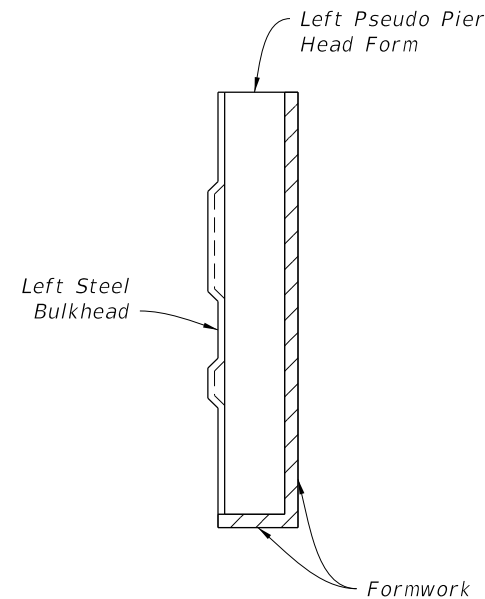
Provide Shear Keys per AASHTO LRFD Bridge Design Specifications 5.14.2.4.2.

Require one full-scale mock-up of Pseudo Match-Cast Joint prior to Pier construction. Stress across test joint and check for spalls and uniform epoxy squeeze.

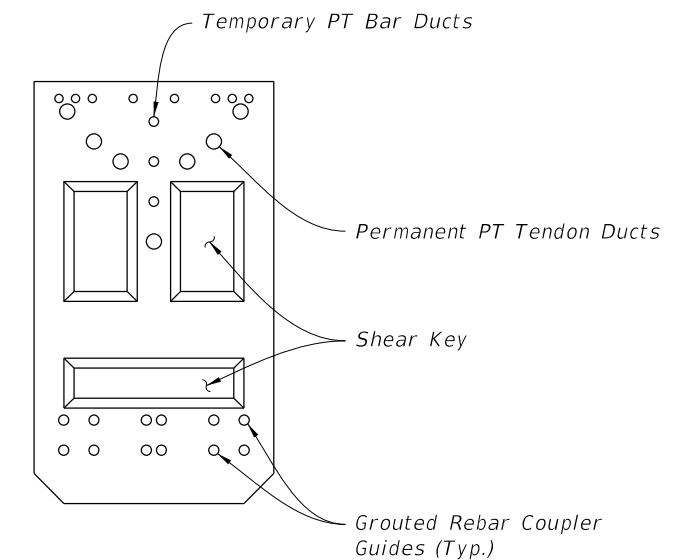
See AASHTO LRFD Bridge Design Specifications 5.14.2.4.2 for uniform compression requirements across joint.



STEEL BULKHEAD



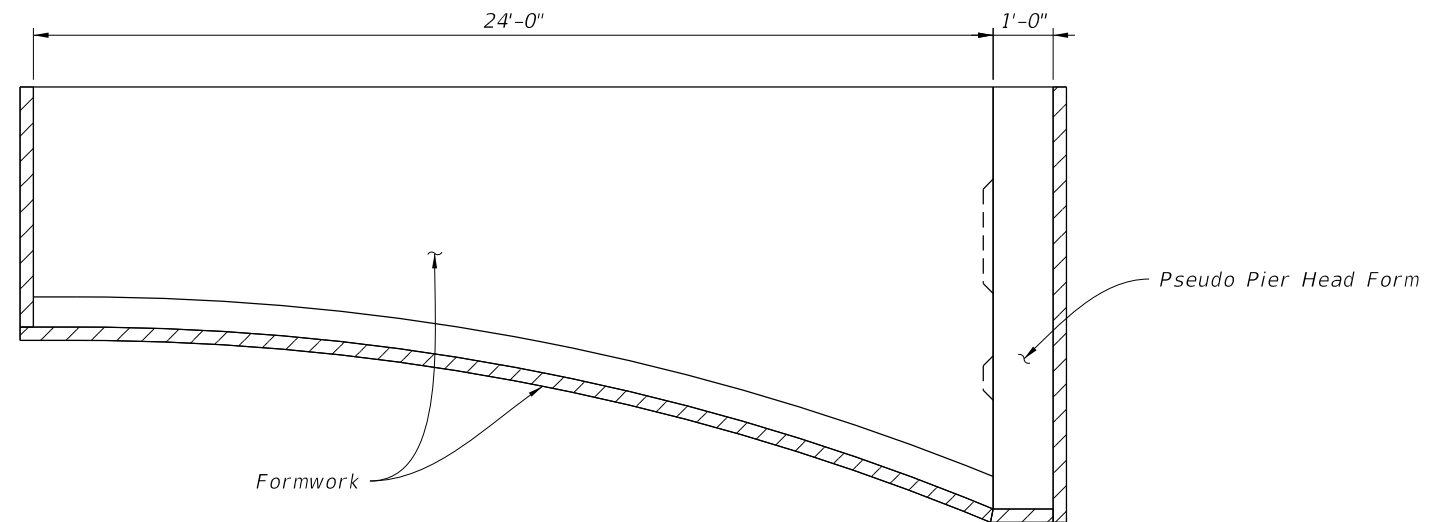
**STAGE 1
(PSEUDO MATCH-CAST PROCESS)**



PRECAST TEMPLATE

Stage 2 Notes:

1. Precast the required number of Match-Cast Wings using a Pseudo Pier Head Form.
2. Submit a Pseudo Match-Casting Process and Mock-Up Test Procedure to the Engineer for review and approval. A Mock-Up Test of the Joint shall be performed successfully prior to beginning installation. The Mock-Up shall consist of the following:
 - a. Same surface area and shear keys as depicted in the final constructed Joint.
 - b. Two-faced epoxy.
 - c. Provide a stress of 40 psi uniform compression across Joint.
 - d. Measure stress at joint interface (6 locations) using pressure cells.
 - e. All measured stresses shall be between XXX psi and XXXX psi. Provide a report documenting the process and results. If measured stress falls outside of the XXX-XXXX psi range, resubmit revised Pseudo Match-Casting Process and Mock-Up Test Procedure to the Engineer for review and approval. Repeat the process on a new test specimen until test requirements are met.



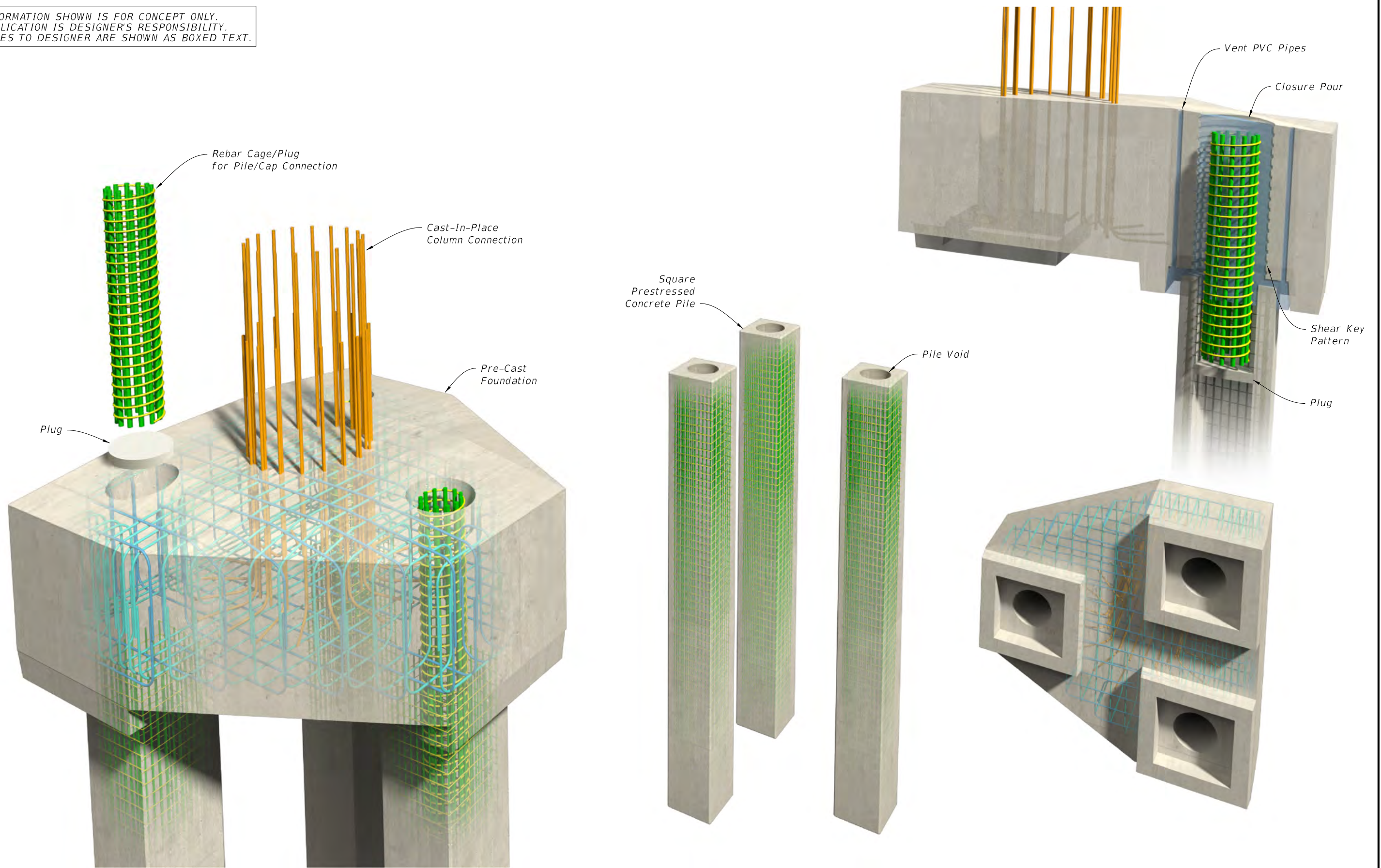
**STAGE 2
(PSEUDO MATCH-CAST PROCESS)**

LEFT PRECAST CANTILEVER SHOWN; RIGHT PRECAST CANTILEVER SIMILAR

INFORMATION SHOWN IS FOR CONCEPT ONLY.
APPLICATION IS DESIGNER'S RESPONSIBILITY.
NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

REVISIONS						STRUCTURES DESIGN OFFICE CENTRAL OFFICE 605 Suwannee Street, MS 33 Tallahassee, Florida 32399-0450	DRAWN BY: CHECKED BY: DESIGNED BY: CHECKED BY:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET TITLE: PIER DETAILS SHEET 5 OF 6	REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
										PROJECT NAME: EXAMPLE 3 - HYBRID C.I.P./PRECAST HAMMERHEAD PIER PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		

INFORMATION SHOWN IS FOR CONCEPT ONLY.
 APPLICATION IS DESIGNER'S RESPONSIBILITY.
 NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STRUCTURES DESIGN OFFICE
 CENTRAL OFFICE
 605 Suwannee Street, MS 33
 Tallahassee, Florida 32399-0450

DRAWN BY:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
CHECKED BY:	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
DESIGNED BY:			
CHECKED BY:			

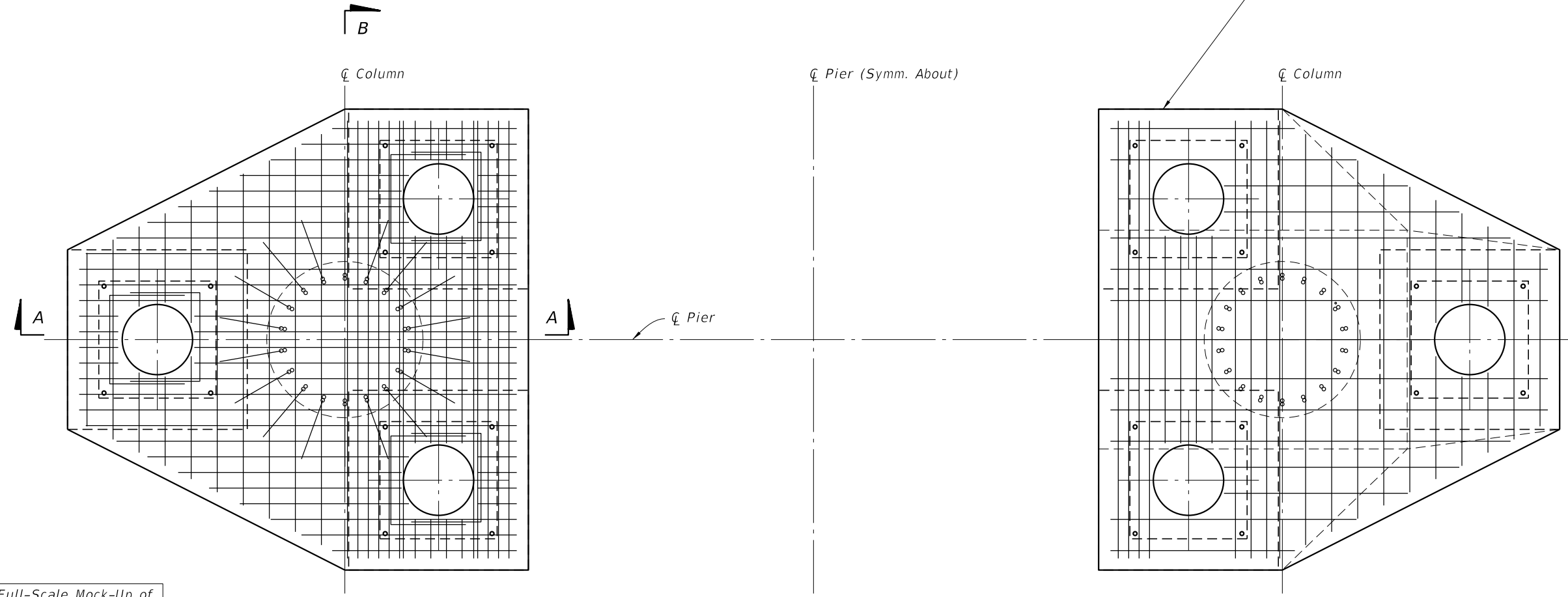
SHEET TITLE: **PIER FOOTING DETAILS**
 SHEET 1 OF 3

PROJECT NAME: **EXAMPLE 4 - PRECAST PIER FOOTING
 PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS**

REF. DWG. NO.
SHEET NO.

Require Shop Drawings and Erection Plan. See Structures Detailing Manual, Chapter 25, for items to include.

Size Foundation for construction equipment and boom reach using site specific construction access assessment. For over-land projects, include haul route assessment for element sizing.

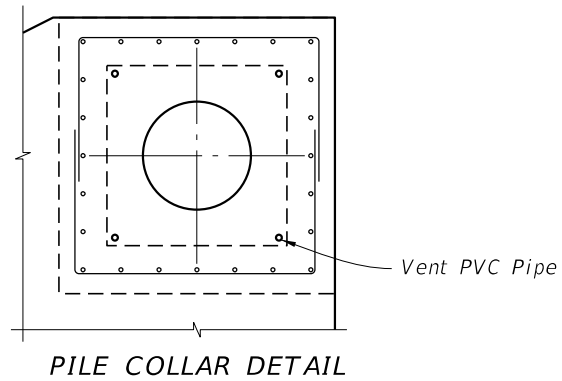


Require Full-Scale Mock-Up of a Single Pile-Cap Connection.

HALF PLAN (BOTTOM REINFORCING)

HALF PLAN (TOP REINFORCING)

PILE CAP REINFORCING PLAN

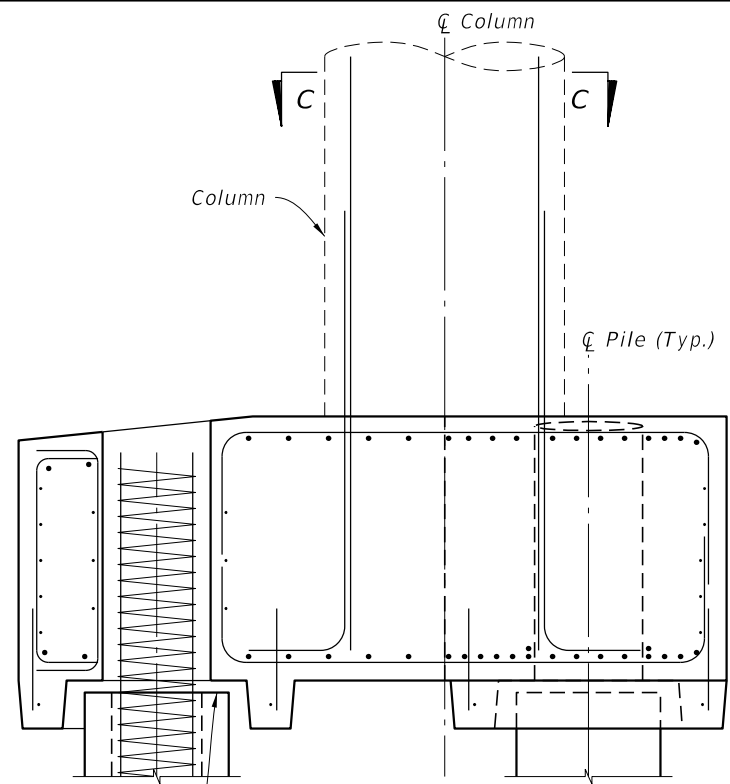


NOTES:

1. Remove forms after concrete obtains a minimum strength of XXXX psi.
2. Use high range water reducer and X" max. aggregate size for Class V Concrete (Spec).
3. Locate pick-up points symmetrical about center lines of Column and Pier (Footing).

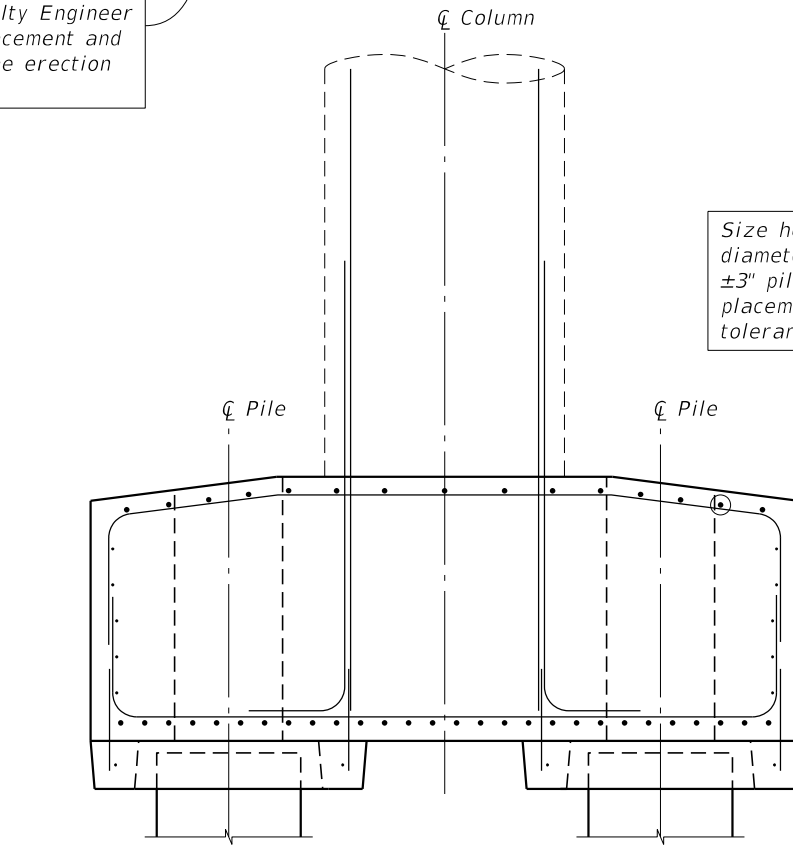
INFORMATION SHOWN IS FOR CONCEPT ONLY. APPLICATION IS DESIGNER'S RESPONSIBILITY. NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

REVISIONS						STRUCTURES DESIGN OFFICE			STATE OF FLORIDA			PIER FOOTING DETAILS		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CENTRAL OFFICE			DEPARTMENT OF TRANSPORTATION			SHEET 2 OF 3		
						605 Suwannee Street, MS 33			ROAD NO.	COUNTY	FINANCIAL PROJECT ID	PROJECT NAME:		SHEET NO.
						Tallahassee, Florida 32399-0450						EXAMPLE 4 - PRECAST PIER FOOTING		
												PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		



SECTION A-A

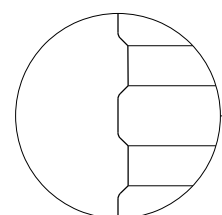
Use non-metallic shims (to be left in place). Specify maximum shim height. Specialty Engineer to provide shim placement and loads as part of the erection plan requirements.



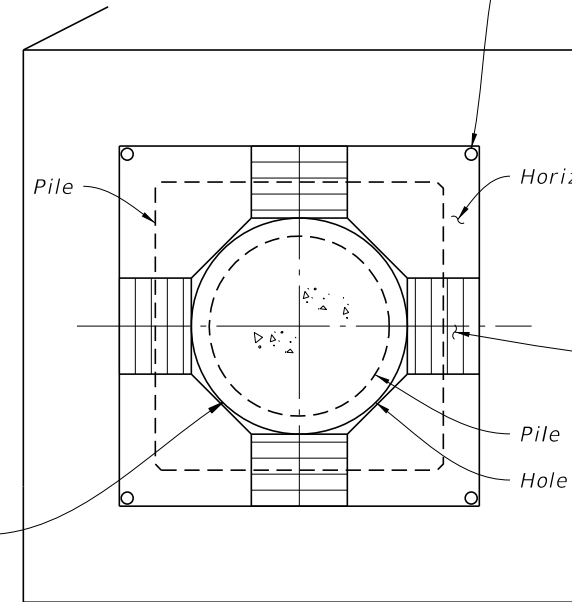
SECTION B-B

Form Shear Key with removable corrugated pipe for transfer of shear without need for reinforcement through plug-cap interface. Use hard pocket former with compressible (e.g. rubber) liner to reduce shrinkage cracks.

SHEAR KEY DETAIL



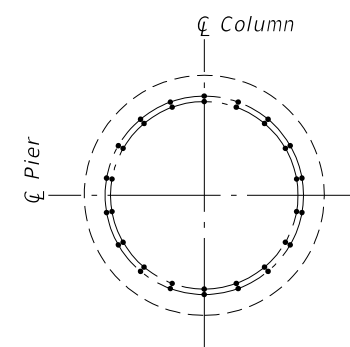
Square Pile with circular hole provides bearing area for Cap.



SECTION E-E

Size hole diameter for ±3" pile placement tolerance.

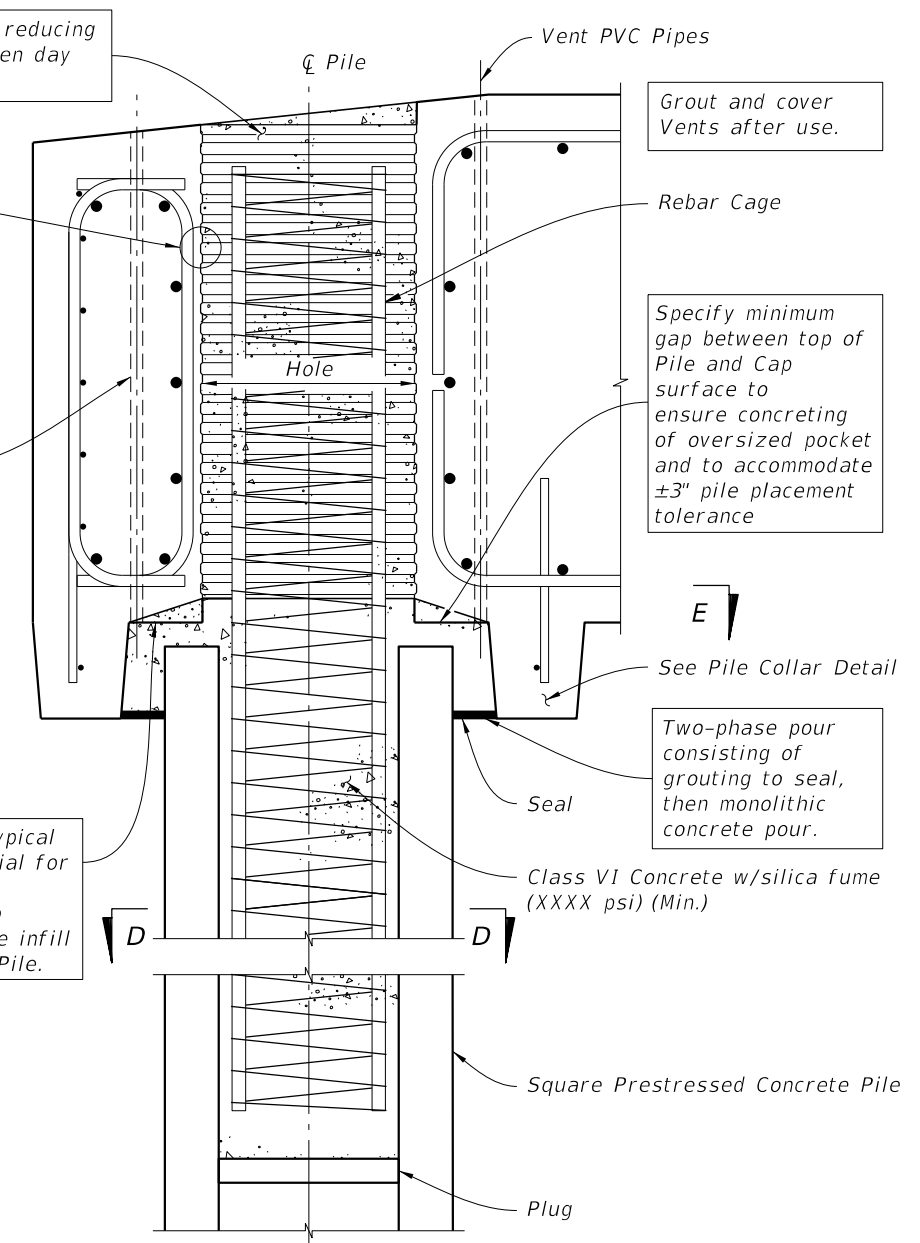
Inclined surface typical to minimize potential for trapped air and honeycombing. Also facilitates concrete infill placement around Pile.



SECTION C-C

Specify shrinkage reducing admixture and seven day moist cure.

Vent pipe to minimize potential for trapped air and honeycombing.



SECTION F-F
PILE CONNECTION DETAIL

Prepare interfacing concrete surfaces prior to concrete pour:
 1. Sand or water blast interfacing surfaces.
 2. Seal and fill void with potable water for 4 to 5 hours.
 3. Remove water to achieve SSD condition prior to pouring concrete.

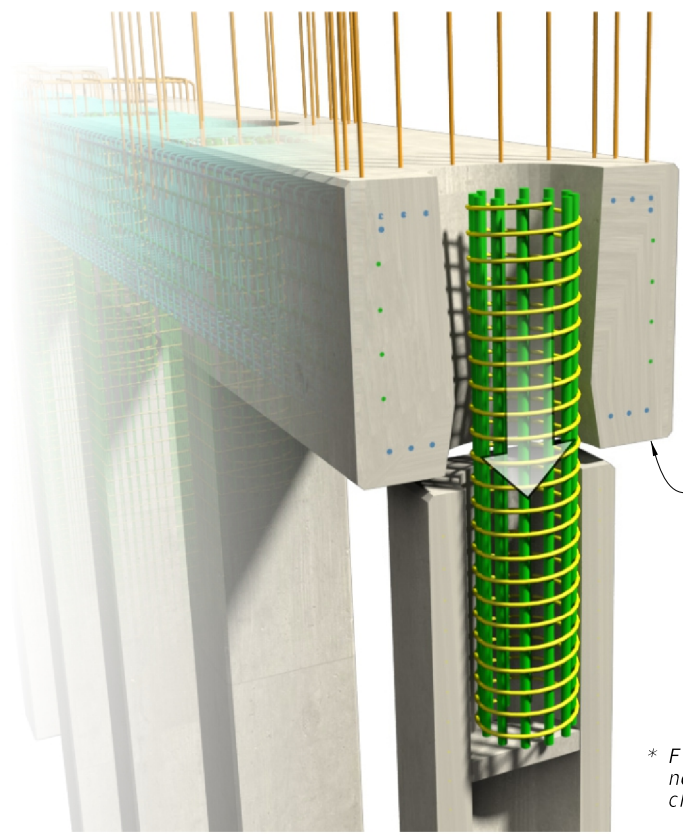
INFORMATION SHOWN IS FOR CONCEPT ONLY. APPLICATION IS DESIGNER'S RESPONSIBILITY. NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STRUCTURES DESIGN OFFICE
 CENTRAL OFFICE
 605 Suwannee Street, MS 33
 Tallahassee, Florida 32399-0450

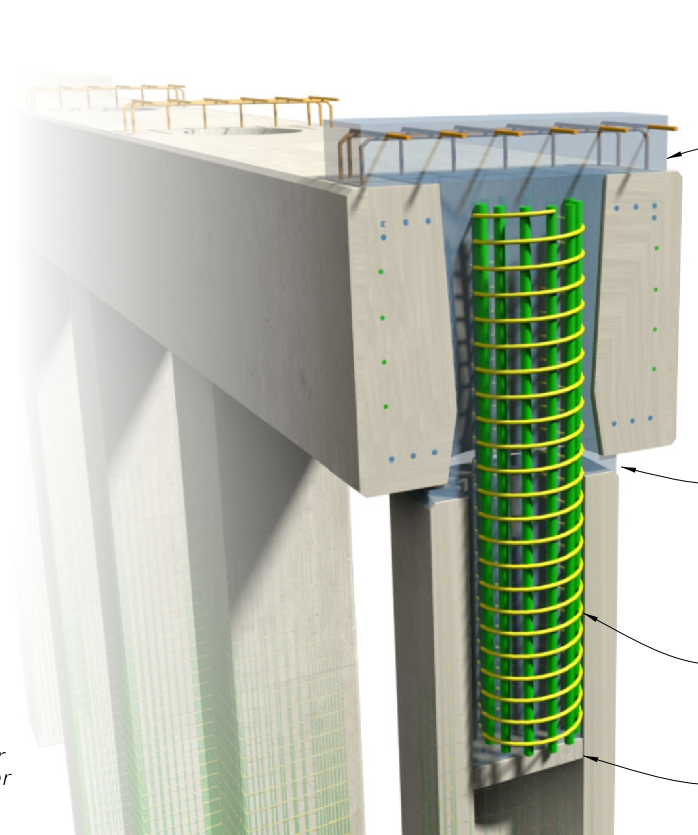
DRAWN BY:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
CHECKED BY:	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
DESIGNED BY:			
CHECKED BY:			

SHEET TITLE:	PIER FOOTING DETAILS SHEET 3 OF 3		REF. DWG. NO.
PROJECT NAME:	EXAMPLE 4 - PRECAST PIER FOOTING PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		SHEET NO.



Pre-Cast Cap

* Friction Collar not shown for clarity



Pedestal Cast Monolithically with Plug Closure

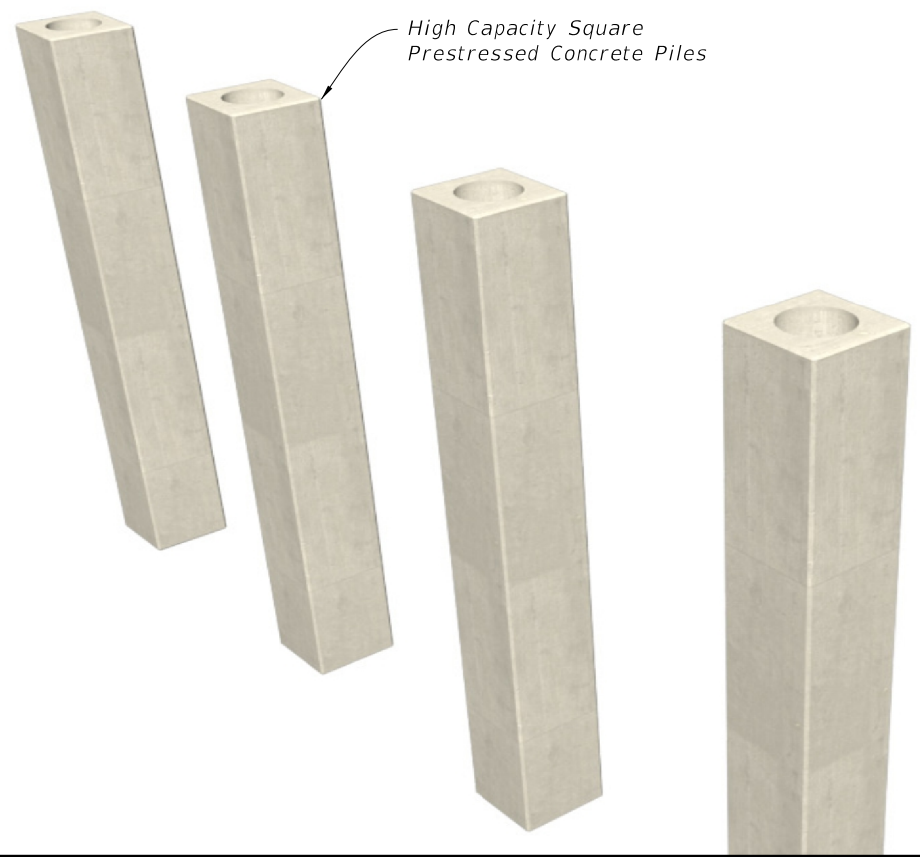
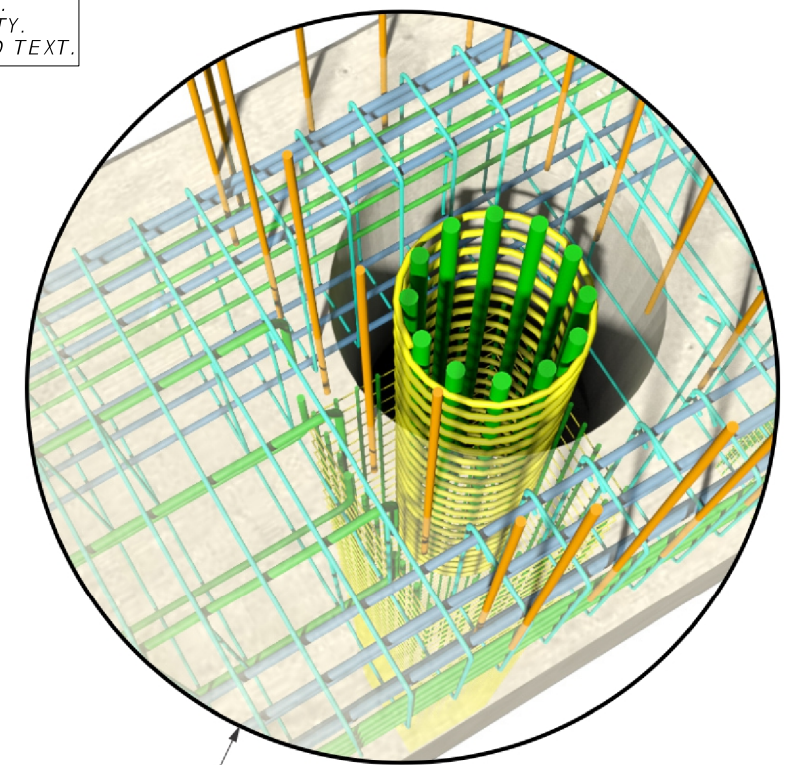
1/2" Grout Joint

Rebar Cage

Plug

INFORMATION SHOWN IS FOR CONCEPT ONLY. APPLICATION IS DESIGNER'S RESPONSIBILITY. NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

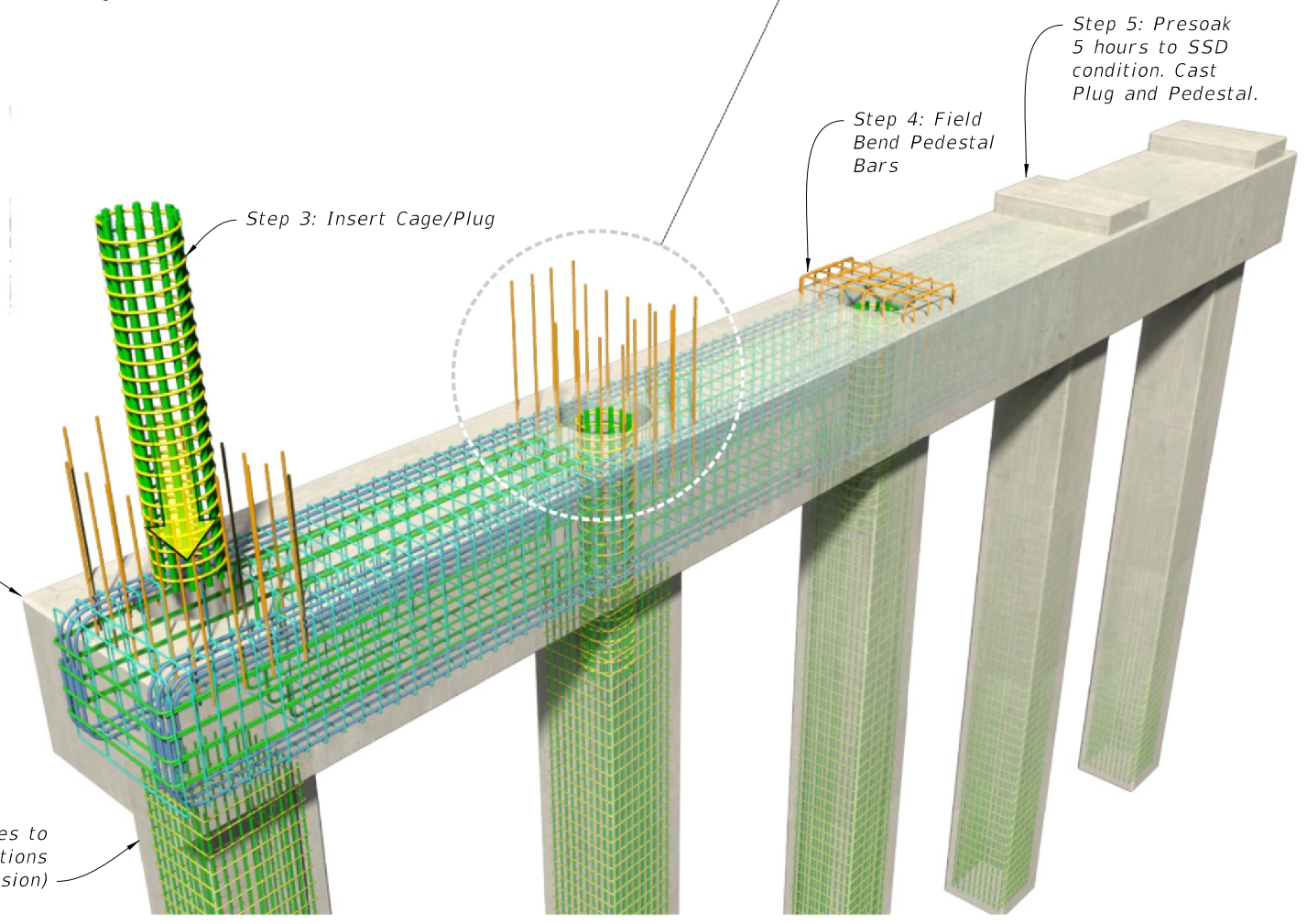
Friction Collar not shown. Require friction collars on piles to support cap prior to grouting. Do not use shims to support cap due to the small bearing area they provide and because they tend to block the flow of grout resulting in an insufficiently grouted interface.



High Capacity Square Prestressed Concrete Piles

Step 2: Set Pre-Cast Cap on bed of grout and friction collar at desired elevation, displacing excess grout.

Step 1: Cut Piles to prescribed elevations (Modified Special Provision)



Step 3: Insert Cage/Plug

Step 4: Field Bend Pedestal Bars

Step 5: Presoak 5 hours to SSD condition. Cast Plug and Pedestal.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STRUCTURES DESIGN OFFICE
CENTRAL OFFICE
 605 Suwannee Street, MS 33
 Tallahassee, Florida 32399-0450

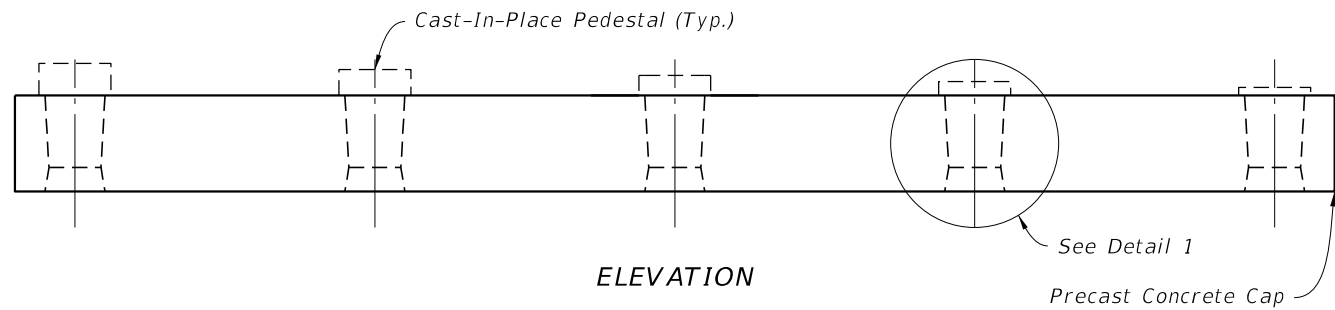
DRAWN BY:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
CHECKED BY:	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
DESIGNED BY:			
CHECKED BY:			

SHEET TITLE:
PILE CAP DETAILS
SHEET 1 OF 2

PROJECT NAME:
EXAMPLE 5 - PRECAST BENT CAP
PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS

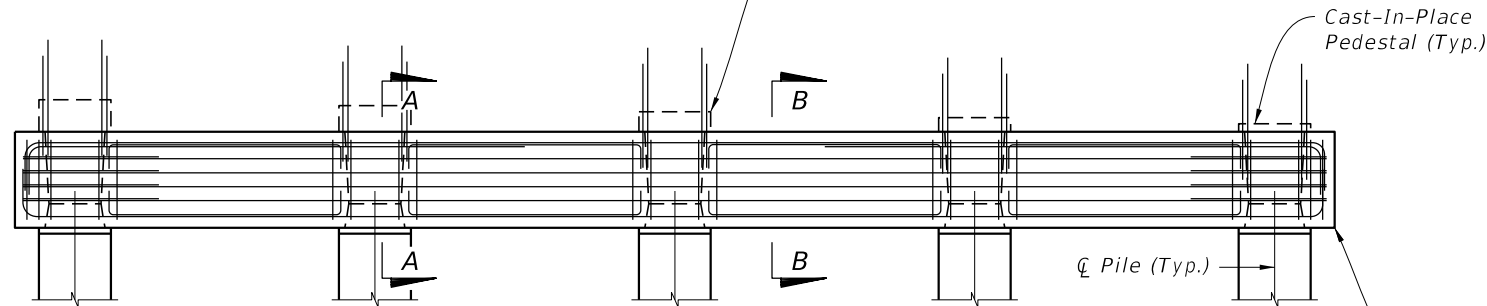
REF. DWG. NO.
SHEET NO.

Require Shop Drawings and Erection Plan. See Structures Detailing Manual, Chapter 25, for items to include.



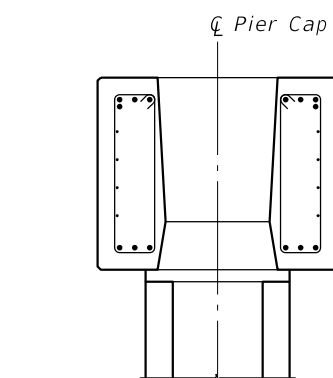
Cap installation procedure:

1. Cut piles to top of pile elevations.
2. Insert rebar cage in Cap and Pile.
3. Erect Cap on Temporary Supports or Friction Collar to appropriate elevations. Install Form around top of Pile and under Cap (if necessary). Ensure the surface of Cap and Pile are prepared in accordance with Specification 400-9.
4. Use high range water reducer and X" Max. aggregate size for Class V Concrete (Spec).
5. Remove Forms at top of Pile after concrete obtains a minimum strength of XXXX psi.



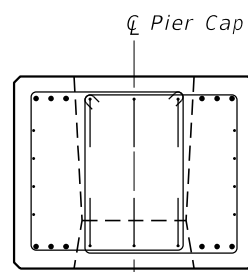
ELEVATION
NOTE: Reinforcing symmetrical about \varnothing Pier

Require friction collars on piles to support cap prior to grouting. Do not use shims to support cap due to the small bearing area they provide and because they tend to block the flow of grout resulting in an insufficiently grouted interface.

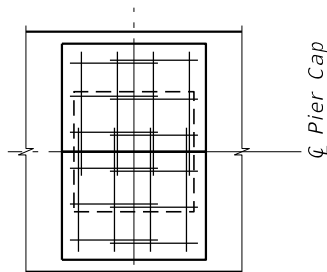


SECTION A-A

NOTE: Pile connection and Pedestal reinforcing not shown

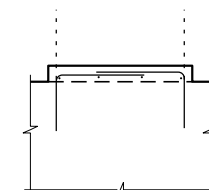


SECTION B-B

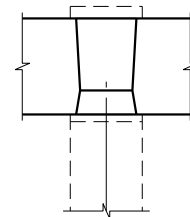


PLAN

PEDESTAL DETAILS
(PEDESTALS LESS THAN 1'-0" IN HEIGHT)



ELEVATION



DETAIL 1

Two-Phase Grout Joint/Concrete Plug placement consisting of (1) a grout bed using APL approved non-shrink grout and (2) a monolithic concrete pour.

Class V Concrete (Spec) (6000 psi)

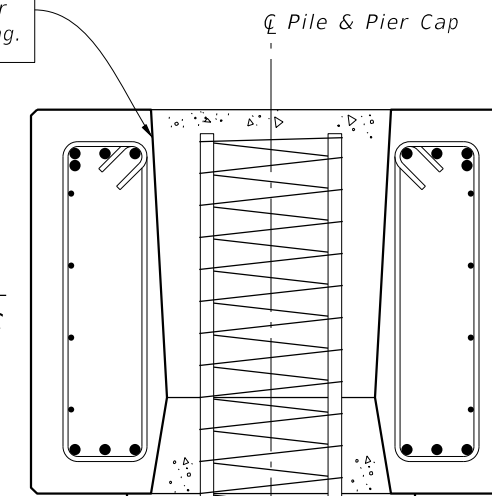
Specify shrinkage reducing admixture and seven day moist cure.

High Capacity Square Prestressed Concrete Pile
Seal Plug

Size Cap based on equipment and boom reach using site specific construction access assessment. For over-land projects include haul route assessment for cap sizing.

Taper hole to transfer shear and to minimize potential for trapped air and honeycombing.

Require one full-scale mock-up of a single Pile-to-Cap Connection.

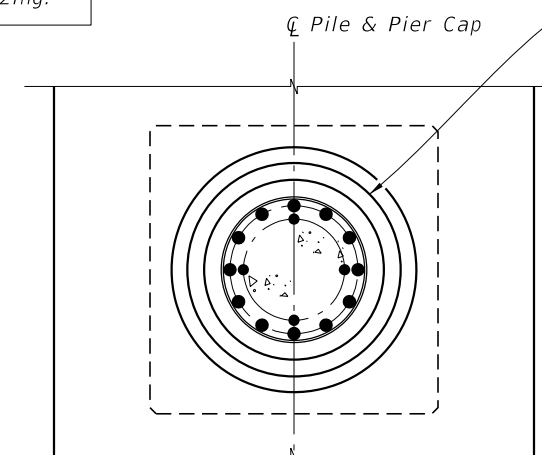


1/2" Grout Joint

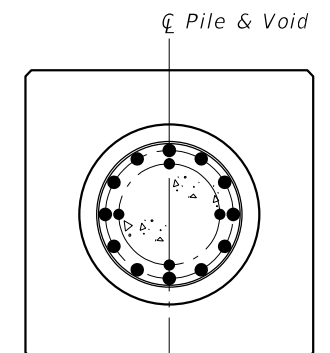
PILE CONNECTION DETAIL

Prepare all interfacing concrete surfaces prior to concrete pour as follows:
1. Sand or water blast interfacing surfaces.
2. Seal and fill void with potable water for 4 to 5 hours.
3. Remove water to a SSD condition prior to pouring concrete.

Hole diameter allows for $\pm 3"$ Pile placement tolerance. Pile placement is shown at theoretical center.



SECTION C-C

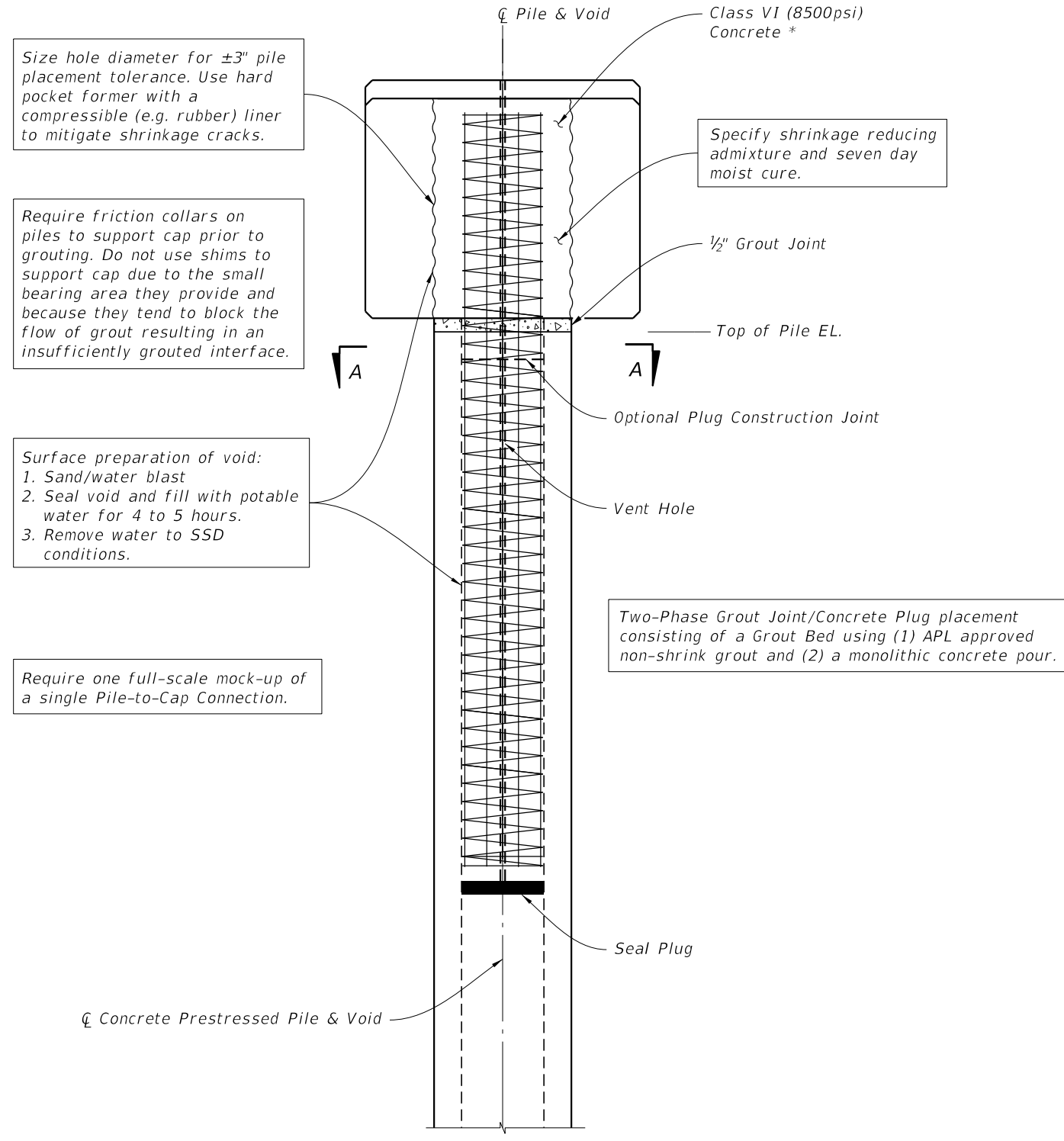


SECTION D-D

INFORMATION SHOWN IS FOR CONCEPT ONLY. APPLICATION IS DESIGNER'S RESPONSIBILITY. NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

REVISIONS						STRUCTURES DESIGN OFFICE			STATE OF FLORIDA			PILE CAP DETAILS		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CENTRAL OFFICE			DEPARTMENT OF TRANSPORTATION			SHEET 2 OF 2		
						605 Suwannee Street, MS 33			ROAD NO.	COUNTY	FINANCIAL PROJECT ID	EXAMPLE 5 - PRECAST BENT CAP		SHEET NO.
						Tallahassee, Florida 32399-0450						PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		

- Cap installation procedure:
1. Cut piles to Top of Pile Elevations.
 2. Insert rebar cage in Cap and Pile.
 3. Erect Cap on temporary supports to appropriate elevations. Install Form around top of Pile and under Cap (if necessary). Ensure the surface of Cap and Pile are prepared in accordance with Specification 400-9.
 4. Use two-phase pour sequence.
Phase one - use grout and friction collar to level Cap.
Phase two - place concrete in Cap and Pile.
 5. Contractor shall vibrate concrete to reduce the potential of trapping air in concrete.
 6. After concrete reaches a strength of XXXX psi, remove Form at top of Pile.
 7. Place zero slump grout at all locations not fully concreted in previous operations. All concrete surfaces shall be wetted to Saturated Surface Dry (SSD) conditions prior to grouting.



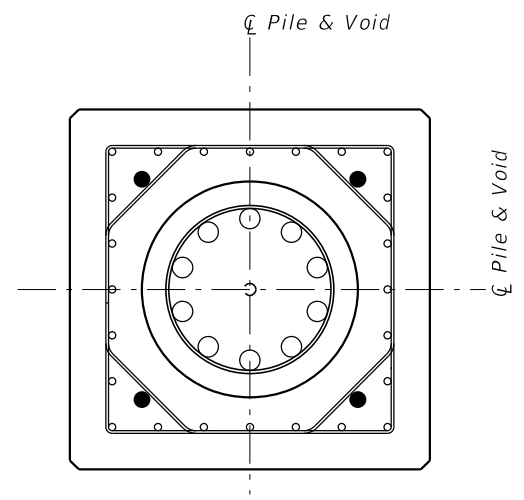
Size hole diameter for ± 3 " pile placement tolerance. Use hard pocket former with a compressible (e.g. rubber) liner to mitigate shrinkage cracks.

Require friction collars on piles to support cap prior to grouting. Do not use shims to support cap due to the small bearing area they provide and because they tend to block the flow of grout resulting in an insufficiently grouted interface.

Surface preparation of void:
1. Sand/water blast
2. Seal void and fill with potable water for 4 to 5 hours.
3. Remove water to SSD conditions.

Require one full-scale mock-up of a single Pile-to-Cap Connection.

Two-Phase Grout Joint/Concrete Plug placement consisting of a Grout Bed using (1) APL approved non-shrink grout and (2) a monolithic concrete pour.



SECTION A-A

- NOTES:
1. Work this sheet with Bent Details Sheet 1 of 2.
 2. Venting of the voided piles shall be provided by the use of 1" \emptyset PVC conduit & shall remain open. Contractor shall provide a galvanized steel wire cloth with $\frac{1}{2}$ " x $\frac{1}{2}$ " mesh and 0.063" diameter wires over the vent pipes to prevent vermin and debris from entering the void.

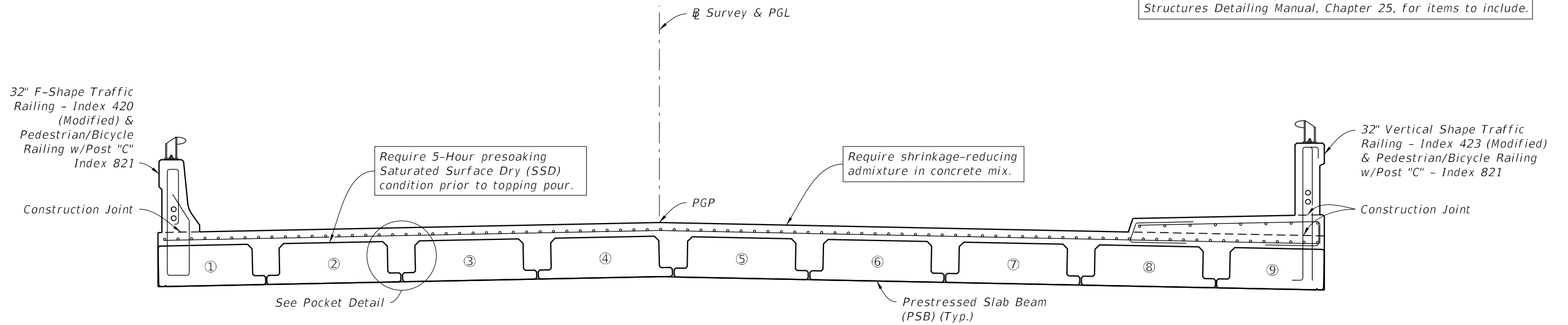
PILE CAP CONNECTION DETAIL
(PILE HEAD CUT OFF)

* C.I.P. Plug shall utilize an approved concrete mix, which contains #XX coarse aggregate (pea gravel) and has a minimum compressive strength of XXXX psi.

INFORMATION SHOWN IS FOR CONCEPT ONLY. APPLICATION IS DESIGNER'S RESPONSIBILITY. NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

REVISIONS						STRUCTURES DESIGN OFFICE			STATE OF FLORIDA			SHEET TITLE:		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CENTRAL OFFICE			DEPARTMENT OF TRANSPORTATION			BENT DETAILS		
						605 Suwannee Street, MS 33			ROAD NO.	COUNTY	FINANCIAL PROJECT ID	SHEET 2 OF 2		
						Tallahassee, Florida 32399-0450						EXAMPLE 6 - PRECAST BENT CAP		SHEET NO.
												PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		

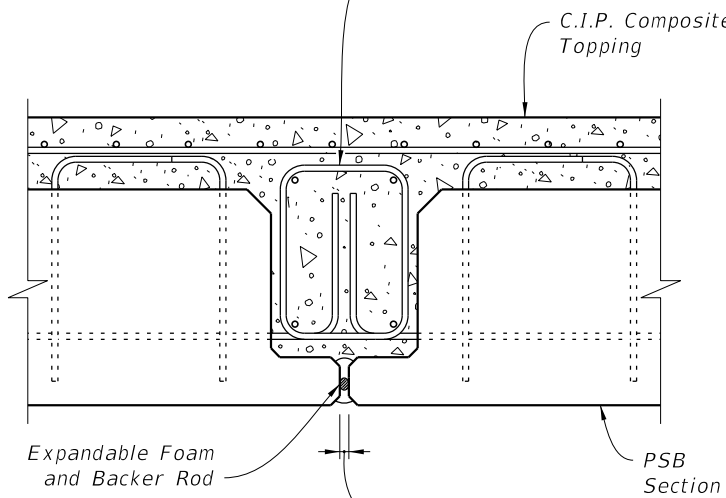
Require Shop Drawings and Erection Plan submittal. See Structures Detailing Manual, Chapter 25, for items to include.



SUPERSTRUCTURE SECTION

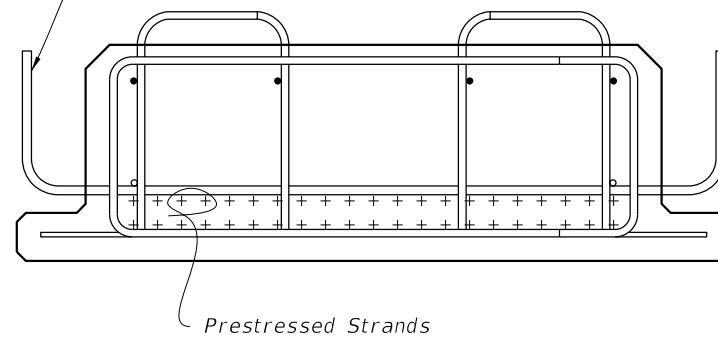
Provide adequate Hooked-Bar development length.

Add connection reinforcing to eliminate conflicts during Unit placement.



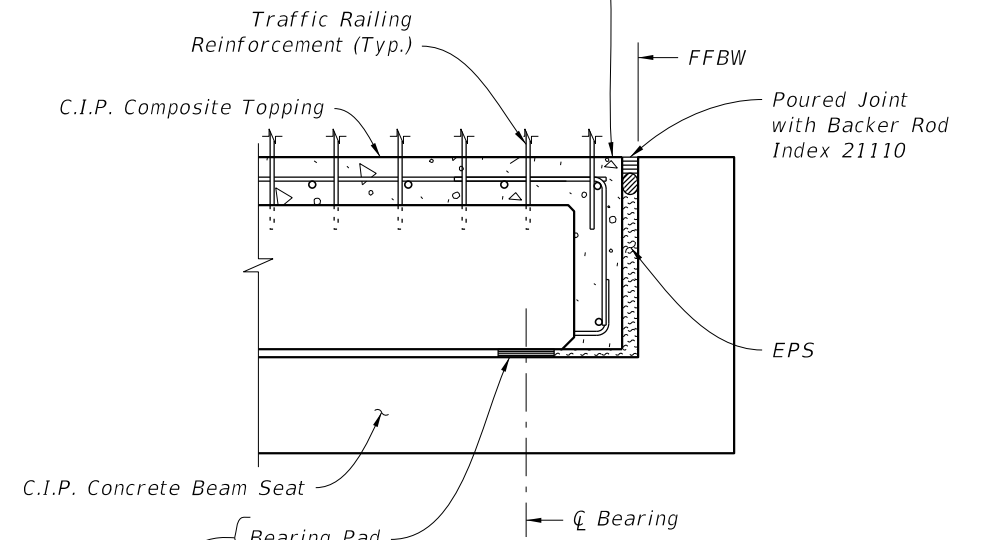
POCKET DETAIL

Detail Bars to avoid conflict with adjacent Units and for vertical placement of Unit.



TYPICAL SECTION

Inset Bearing and include End Pour to facilitate Expansion Joint fit-up.

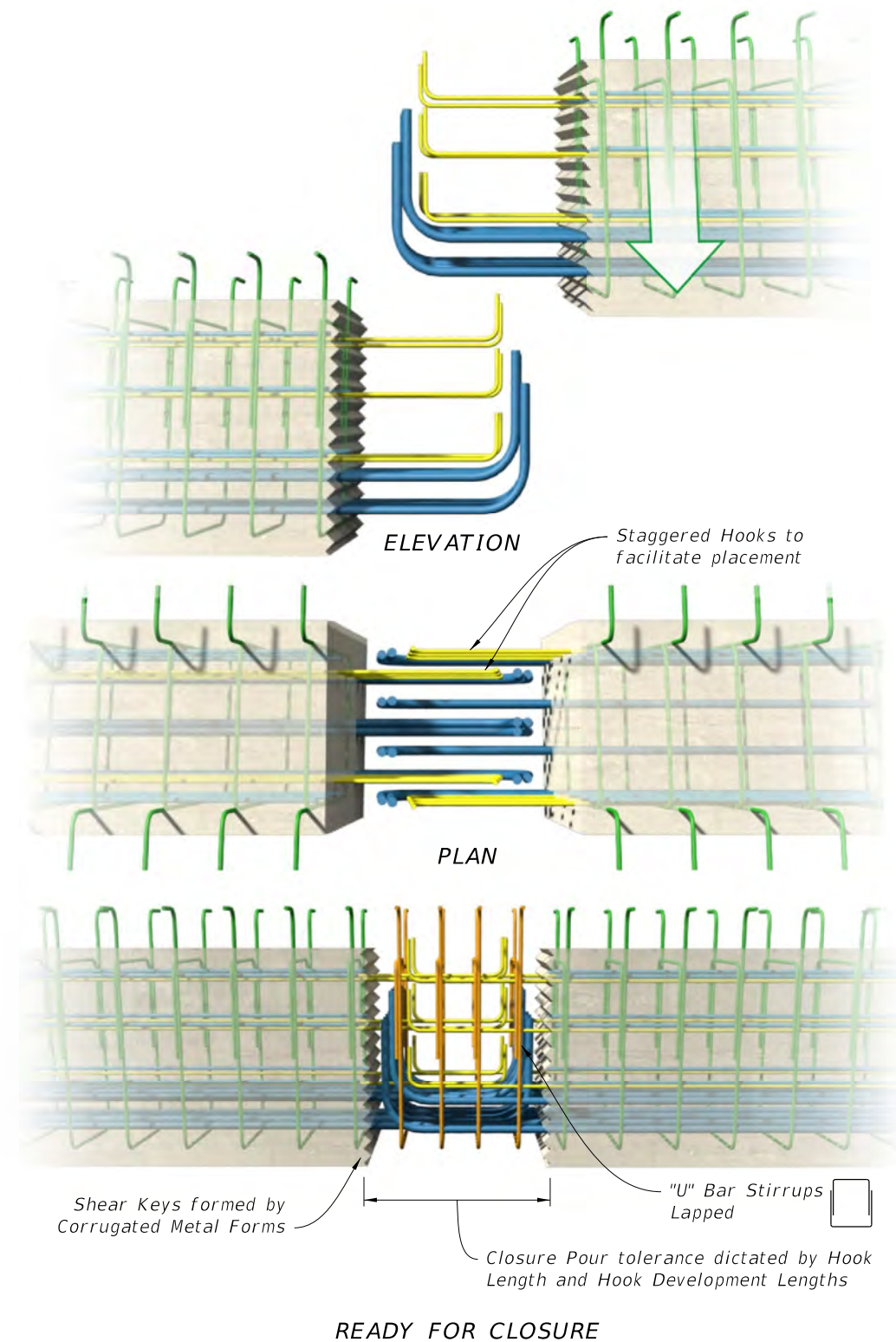
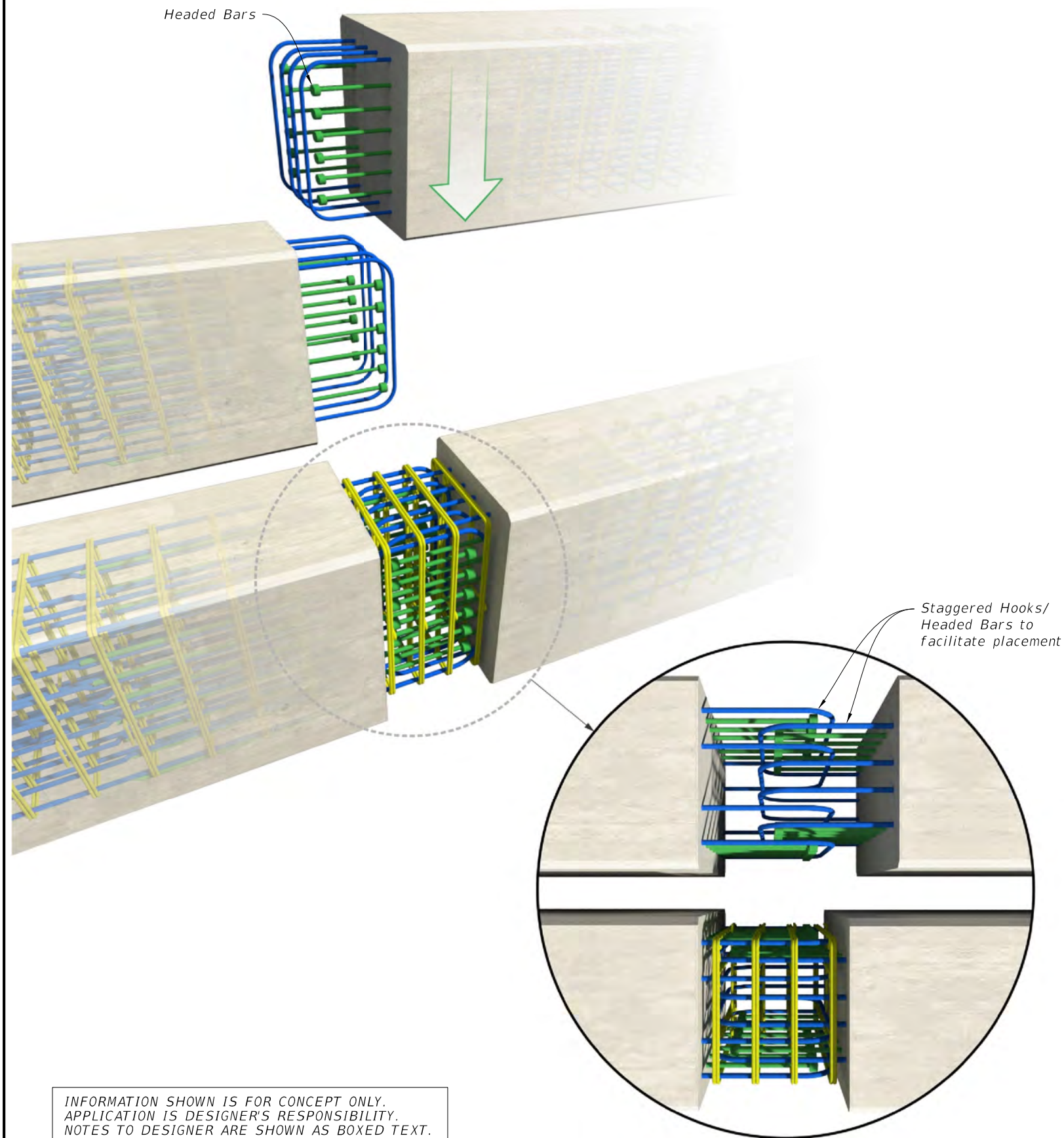


JOINT DETAIL AT BEGIN/END BRIDGE

Space Units and provide flexibility in Bearing Design to better accommodate shrinkage of Topping. Specify gap distance greater than combined construction plus fabrication tolerances.

INFORMATION SHOWN IS FOR CONCEPT ONLY. APPLICATION IS DESIGNER'S RESPONSIBILITY. NOTES TO DESIGNER ARE SHOWN IN BOXED TEXT.

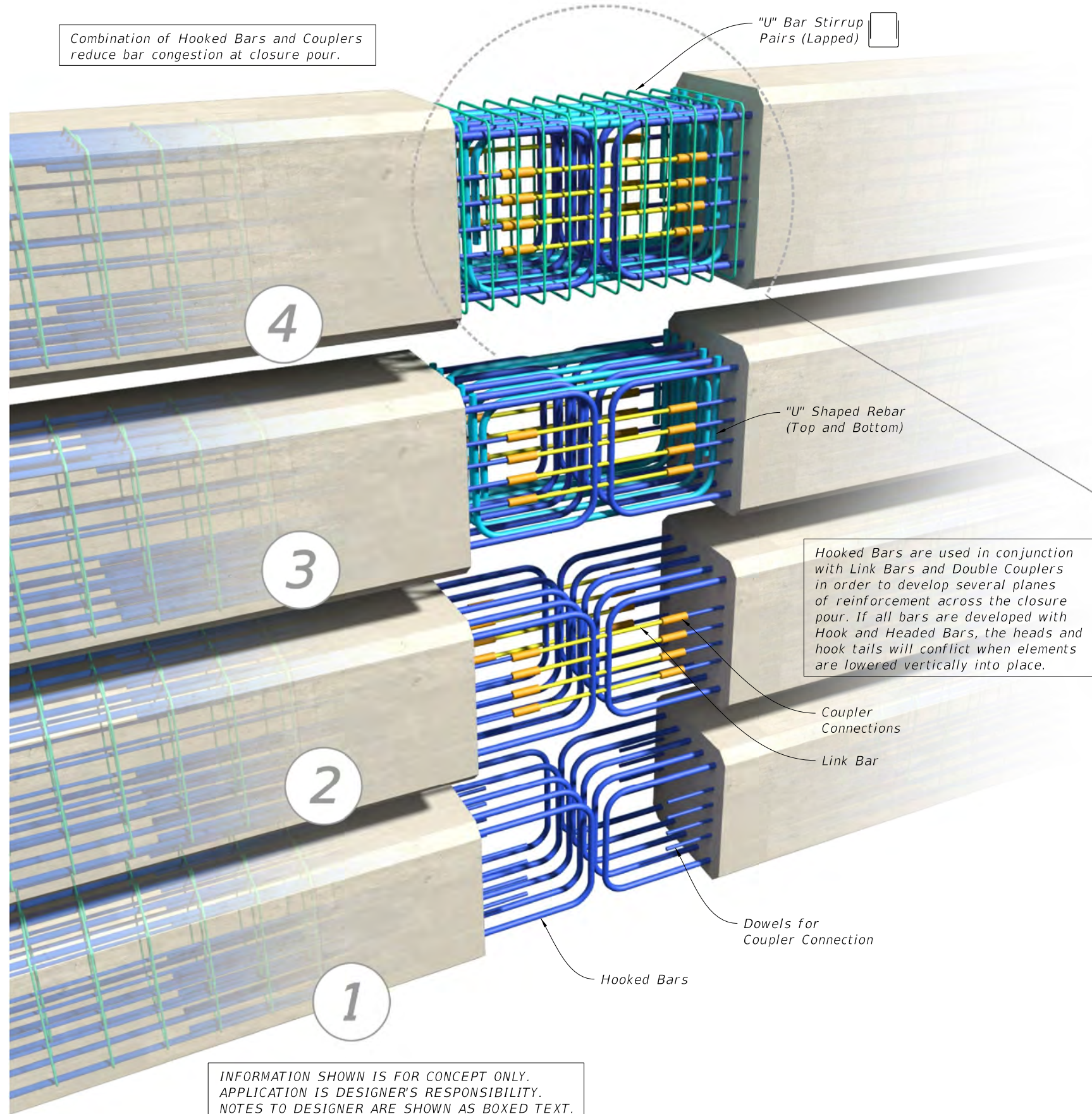
REVISIONS						STRUCTURES DESIGN OFFICE			STATE OF FLORIDA			SHEET TITLE:		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CENTRAL OFFICE			DEPARTMENT OF TRANSPORTATION			SUPERSTRUCTURE DETAILS		
						605 Suwannee Street, MS 33			ROAD NO.	COUNTY	FINANCIAL PROJECT ID	SHEET 1 OF 1		
						Tallahassee, Florida 32399-0450						EXAMPLE 7 - PRECAST SLAB UNITS WITH TOPPING		SHEET NO.
												PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		



INFORMATION SHOWN IS FOR CONCEPT ONLY.
APPLICATION IS DESIGNER'S RESPONSIBILITY.
NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

REVISIONS						STRUCTURES DESIGN OFFICE			DRAWN BY:			SHEET TITLE:		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CENTRAL OFFICE			STATE OF FLORIDA			CONNECTION DETAILS		
						605 Suwannee Street, MS 33			DEPARTMENT OF TRANSPORTATION			SHEET 1 OF 3		
						Tallahassee, Florida 32399-0450			ROAD NO.	COUNTY	FINANCIAL PROJECT ID	PROJECT NAME:		SHEET NO.
												EXAMPLE 8 - CLOSURE POUR		
												PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		

Combination of Hooked Bars and Couplers reduce bar congestion at closure pour.



Hooked Bars are used in conjunction with Link Bars and Double Couplers in order to develop several planes of reinforcement across the closure pour. If all bars are developed with Hook and Headed Bars, the heads and hook tails will conflict when elements are lowered vertically into place.

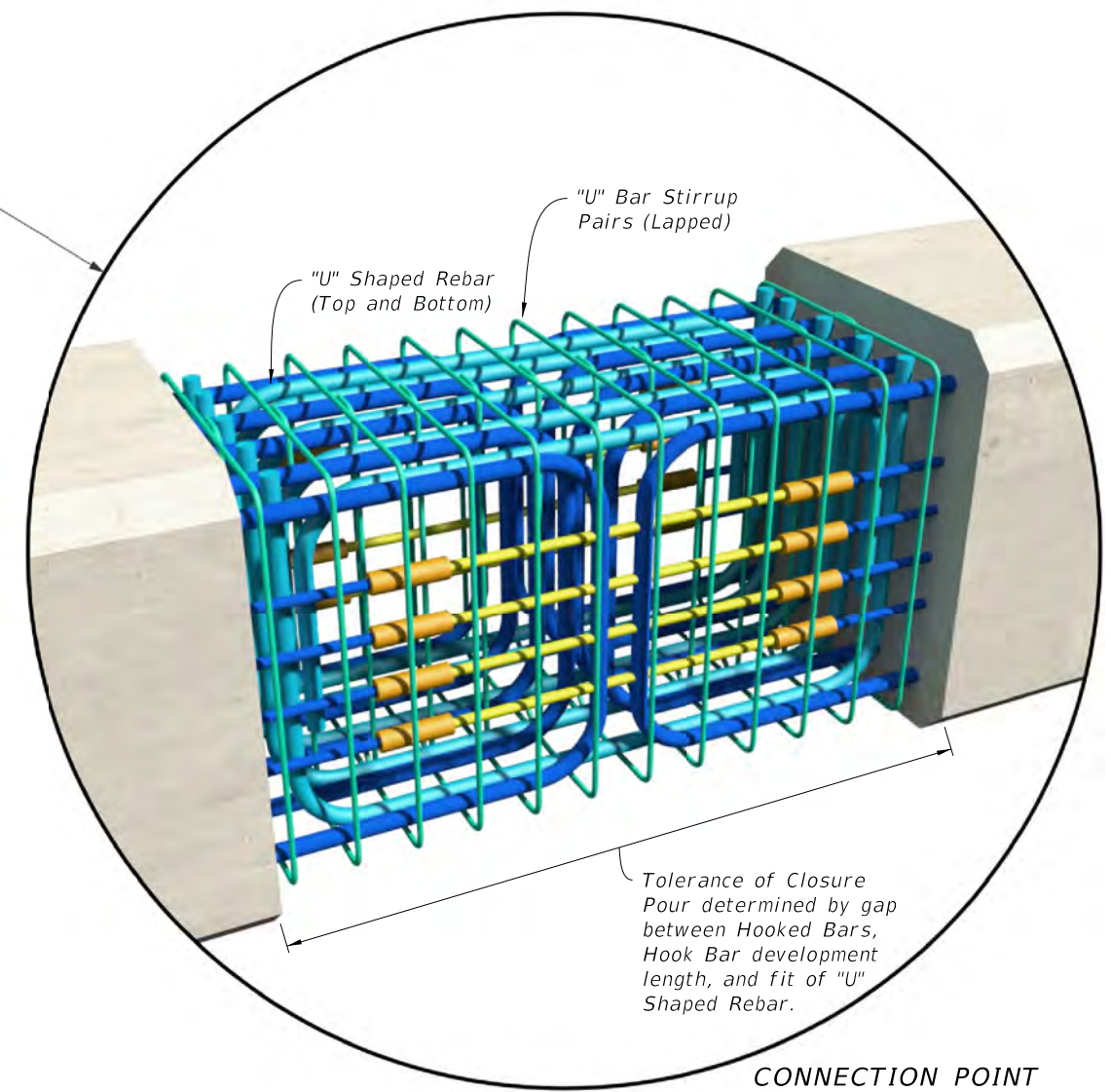
STEP ① Place Precast Segments.

STEP ② Field cut Link Bar. Place Couplers with removable stops or pins on Link Bar. Place Link Bar in position and slide Coupler to splice Link Bar to Dowels. Quality control of Coupler positioning is required. Secure Coupler according to Manufacturer's recommendations. See sketch below.



STEP ③ Install "U" shaped Rebar (Top and Bottom).

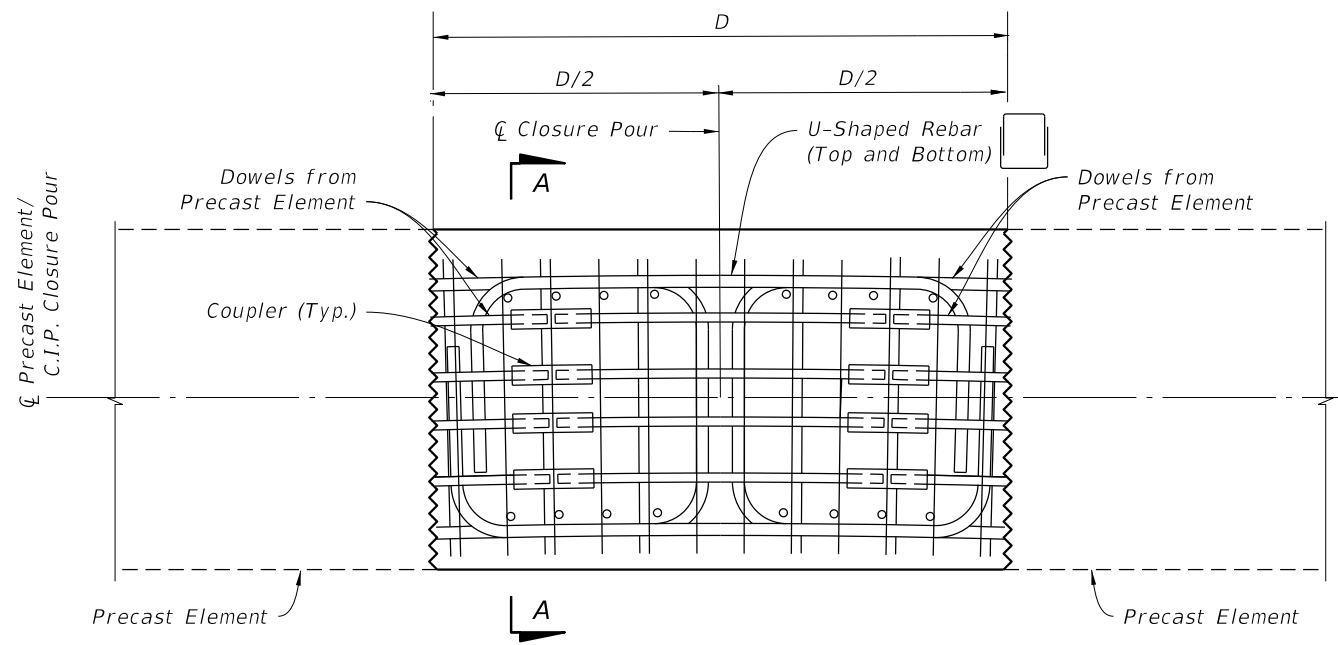
STEP ④ Install "U" Bar Stirrup Pairs (Lapped).



CONNECTION POINT
READY FOR CLOSURE POUR

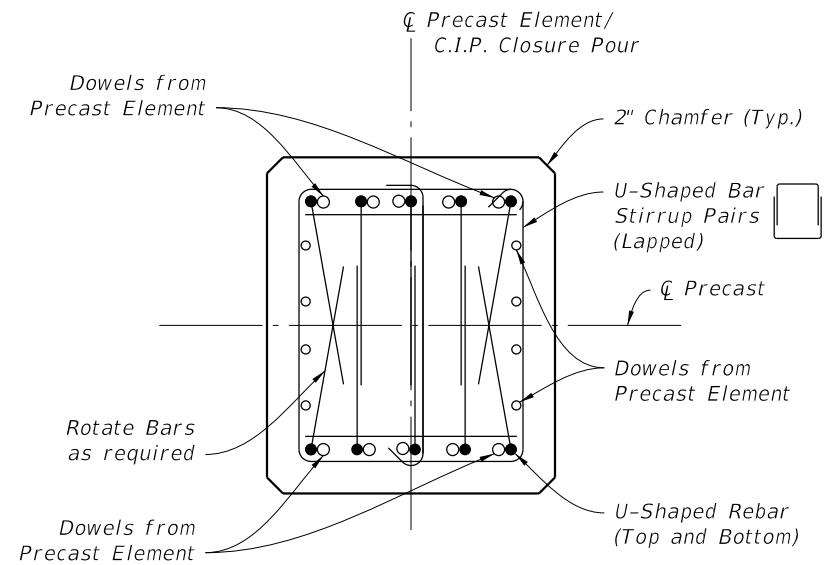
INFORMATION SHOWN IS FOR CONCEPT ONLY.
APPLICATION IS DESIGNER'S RESPONSIBILITY.
NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

REVISIONS						STRUCTURES DESIGN OFFICE			STATE OF FLORIDA			SHEET TITLE:		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	CENTRAL OFFICE			DEPARTMENT OF TRANSPORTATION			CONNECTION DETAILS		
						605 Suwannee Street, MS 33			ROAD NO. COUNTY FINANCIAL PROJECT ID			SHEET 2 OF 3		
						Tallahassee, Florida 32399-0450			PROJECT NAME:			EXAMPLE 8 - CLOSURE POUR		SHEET NO.
												PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		

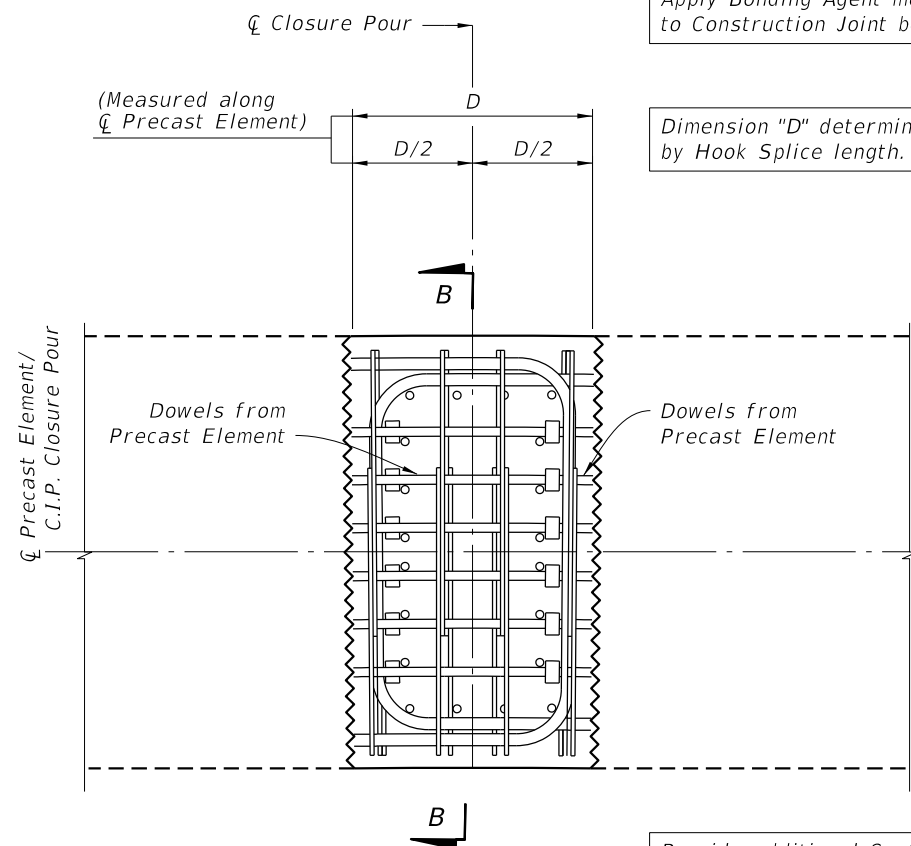


Shear Keys formed by Corrugated Metal Forms

DOUBLE COUPLER SPLICE



SECTION A-A

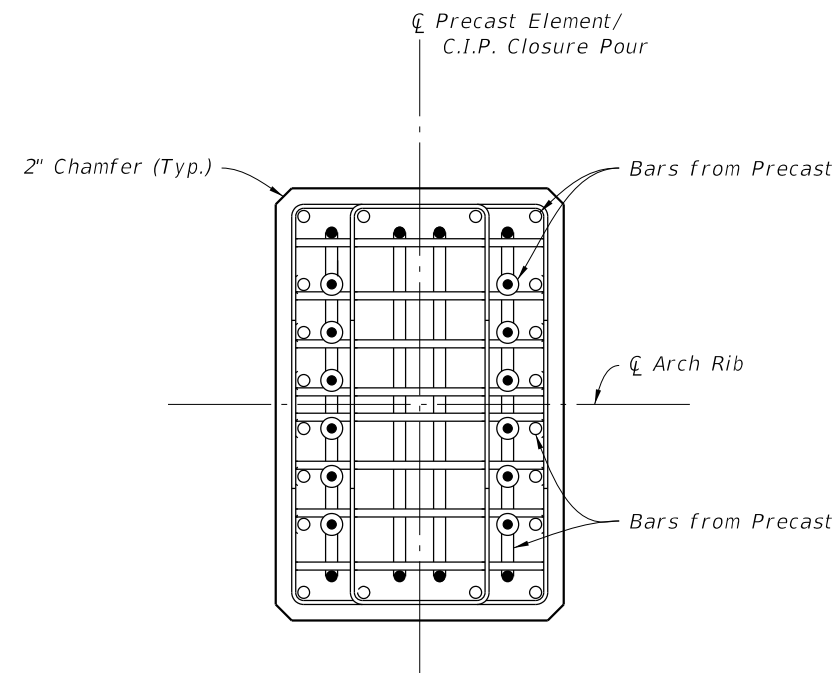


Apply Bonding Agent meeting Specification 926 (Type A) to Construction Joint before Closure Pour.

Dimension "D" determined by Hook Splice length.

Provide additional Confinement Steel for Non-Contact Lap Splice.

OVERLAP SPLICE



SECTION B-B

Stagger Hooks to facilitate placement

INFORMATION SHOWN IS FOR CONCEPT ONLY. APPLICATION IS DESIGNER'S RESPONSIBILITY. NOTES TO DESIGNER ARE SHOWN AS BOXED TEXT.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STRUCTURES DESIGN OFFICE
CENTRAL OFFICE
 605 Suwannee Street, MS 33
 Tallahassee, Florida 32399-0450

DRAWN BY:	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
CHECKED BY:	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
DESIGNED BY:			
CHECKED BY:			

SHEET TITLE:	CONNECTION DETAILS SHEET 3 OF 3		REF. DWG. NO.
PROJECT NAME:	EXAMPLE 8 - CLOSURE POUR PREFABRICATED BRIDGE ELEMENTS AND SYSTEMS		SHEET NO.