**REVISION NO. SHEET NO. INDEX NO.**

**DESCRIPTION:**

REVISION OF DESIGN STANDARDS FY 2016-17

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**PICK-UP POINTS:**

Piles shall be marked at the pick-up points to indicate proper points for attaching handling lines.

**REINFORCING BARS:**

Stainless Steel: All reinforcing steel shall meet the requirements of Specification Section 931 for Type 304, Grade 75.

Carbon FRP: All reinforcing bars shall be CFRP meeting the requirements of Specification Section 932.

**PRESTRESSING STRAND:**

Stainless Steel: Prestressing steel shall be seven-wire strand HSSS, UNS S32205 (Type 2205) or UNS S31803 strand meeting the requirements of Specification Section 933.

Carbon FRP: Prestressing strand shall be CFRP Strand meeting the requirements of Specification Section 933.

**PILE DRIVING AFTER SPlicing:**

Pile splices shall reach a minimum strength of 5500 psi before driving is resumed.

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**THE 45" Ø Void in the pile shall be positively vented to water or air after the final pile installation. If the 3½" Ø vents are included in the pile cut-off section, then venting shall be provided by the use of a 1" Ø PVC conduit through the substructure cap or column.**

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**NOTES:**

- SPIRAL TIES: One full wrap of spirals is required at both the head and tip of pile. One half turn required for spiral splices.
- CONCRETE CLASS: Concrete for all piles shall be Class V (Special). Concrete for pile splices shall be Class IV.
- CONCRETE STRENGTH: The cylinder strength shall be 4,000 psi minimum at time of transfer of the Prestressing Force.
- SPLICE BONDING MATERIAL: The material to form the joint between pile sections shall be a Type B Epoxy Compound in accordance with Specification Section 926. The bonding agent used on internal pile surfaces shall be a Type A Epoxy Compound in accordance with Specification Section 926. Epoxy Compounds used shall be contained on the Approved Products List (APL). Use Epoxy Bonding Compound or Epoxy Mortar as recommended by the Manufacturer. For Epoxy Mortar only use sand or other filler material supplied by the manufacturer and in the proportions recommended.

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**TABLE OF MAXIMUM PILE PICK-UP AND SUPPORT LENGTHS**

<table>
<thead>
<tr>
<th>Maximum Pile Length (Feet)</th>
<th>Required Storage and Transportation Detail</th>
<th>Pick-Up Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>122</td>
<td>2, 3, or 4 point</td>
<td>1 Point</td>
</tr>
<tr>
<td>174</td>
<td>2, 3, or 4 point</td>
<td>2 Point</td>
</tr>
</tbody>
</table>

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**ELEVATION**

**NOTES**

- 3½" Ø Vent Holes at Head and Tip of Pile
- Head or Tip
- 14'-10"" 10'-2""
**DESCRIPTION:**

**60" PRESTRESSED CFRP & SS CONCRETE CYLINDER PILE**

**ALTERNATE STRAND PATTERNS**

- **0.5" Ø, CFRP Single-Strand, at 39 kips**
- **0.6" Ø, CFRP 7-Strand, at 40 kips**

**SECTION A-A**

- **24 - No. 6 CFRP Bars**
- **36 - CFRP Strands @ Equal Spacings**
- **Full Epoxy Compound Joint around cylinder pile wall only (See Detail "A")**

**SECTION B-B**

- **24 - No. 6 CFRP Bars**
- **36 - CFRP Strands @ Equal Spacings**

**DETAIL "A"**

- **Concrete Seal**
- **Gasket**
- **Temporary Blocking**
- **Form to retain epoxy compound**

**REV: 01/01/16**

**INDEX NO. 22660**

**REVISION NO. 2 of 3**
**Concrete Seal**

2'-0" 3" Min. Cover

Drivers Prestressed Pile

**Drivable Unforeseen Field Splice Detail**

(Cast in Place Plug)

- Closed No. 4 SS Bars or W20 SS Wire Ties @ 1'-0" ± (Typ.)
- Roughen inside surface of 60" Ø Pile to 0.5" amplitude for Spliced Pile Section
- Full Epoxy Compound Joint around cylinder pile wall only (See Detail "A")
- 24 - No. 10 SS Bars

**SECTION A-A**

- 45° Ø Void (44 Strands)
- 48° Ø Void (36 Strands)
- 2" Min. Cover (Typ.)
- 3" Min. Cover (Typ.)
- 0.6" Ø HSSS Strands @ Equal Spaces

**SECTION B-B**

- 24 - No. 10 SS Bars @ Equal Spaces
- 1'-0" Ø Void

**ALTERNATE STRAND PATTERNS**

- 44 - 0.6" Ø HSSS Strand, at 36 kips
- 36 - 0.6" Ø HSSS Strand, at 36 kips

**DETAIL "A"**

- Full Epoxy Compound Joint around cylinder pile wall only (See Detail "A")
- Temporary Blocking Form to retain epoxy compound
- Inside Pile Wall
- Gasket
- Form to retain epoxy compound
- Outside Pile Wall

**SS POST-TENSIONED PILE DETAILS**

- W20 SS Wire Ties
- No. 4 SS Bars or W11 SS Wire
- 24 - No. 10 SS Bars @ Equal Spaces
- Closed No. 4 SS Bars or W20 SS Wire Ties @ 1'-0" ± (Typ.)
- 0.6" Ø HSSS Strands @ Equal Spaces
- 2" Min. Cover (Typ.)
- 3" Min. Cover (Typ.)
- 45° Ø Void (44 Strands)
- 48° Ø Void (36 Strands)

**DRIVABLE UNFORESEEN FIELD SPLICE DETAIL**

(Cast in Place Plug)

- Clean inside surface of 60" Ø Pile with a high pressure water blast (3000 psi Min.) and apply bonding agent for Driven Prestressed Pile
- 1'-0" Ø Void, open top and bottom to allow through venting of sections
- Roughen inside surface of 60" Ø Pile to 0.5" amplitude for Spliced Pile Section

**60° PRESTRESSED CFRP & SS CONCRETE CYLINDER PILE**

- 60° Ø Void (44 Strands)
- 48° Ø Void (36 Strands)
- 2" Min. Cover (Typ.)
- 3" Min. Cover (Typ.)
- 0.6" Ø HSSS Strands @ Equal Spaces

**SS POST-TENSIONED PILE DETAILS**

- W20 SS Wire Ties
- No. 4 SS Bars or W11 SS Wire
- 24 - No. 10 SS Bars @ Equal Spaces
- Closed No. 4 SS Bars or W20 SS Wire Ties @ 1'-0" ± (Typ.)
- 0.6" Ø HSSS Strands @ Equal Spaces
- 2" Min. Cover (Typ.)

**DRAWING OF 60° Ø VERTICAL PILE**

- Full Epoxy Compound Joint around cylinder pile wall only (See Detail "A")
- Temporary Blocking Form to retain epoxy compound
- Inside Pile Wall
- Gasket
- Form to retain epoxy compound
- Outside Pile Wall