1.  Work this Index with the Square Prestressed Concrete Pile Splices (Index 20601), the Prestressed Concrete Pile Standards (Index 20612, 20614, 20618, 20620, 20624, 20630, the High Moment Capacity Square Prestressed Concrete Pile (Index 20631) and the Pile Data Table in the Structures Plans.

2.  Concrete:
   A.  Piles: Class V (Special), except use Class VI for High Moment Capacity Pile (Index 20631).
   B.  High Capacity Splice Collar: Class V (Special).
   C.  Silica Fume: See "GENERAL NOTES" in the Structures Plans for locations where the use of silica fume, metakaolin or ultra-fine flyash is required.

3.  Concrete strength at time of prestress transfer:
   A.  Piles: 4,000 psi minimum.
   B.  High Moment Capacity Piles: 6,500 psi minimum.

4.  Carbon-Steel Reinforcing:
   A.  Bars: Meet the requirements of Specification Section 415.
   B.  Prestressing Strands: Meet the requirements of Specification Section 933.
   C.  Protect all strands permanently exposed to the environment and not embedded under final conditions in accordance with Specification Section 450.

5.  Spiral Ties:
   A.  Tie each wrap of the spiral strand to a minimum of two corner strands.
   B.  One Full turn required for spiral splices.

6.  Pile Splices: Fill dowel holes and form the joint between pile sections with a Type AB Epoxy Compound in accordance with Specification Section 962. Use an Epoxy Bonding Compound or an Epoxy Mortar as recommended by the Manufacturer.
NOTES:
1. For Sections D-D, E-E, & F-F see Index Nos. 20612, 20614, 20618, 20620, 20624 or 20630 for applicable concrete pile size and Pile Splice Reinforcement Details.

2. Prestressing strands, spiral ties and/or reinforcement are not shown for clarity.

3. In cases where pile splices are desired due to length limitations in shipping and/or handling, the "Drivable Preplanned Prestressed Precast Splice Detail" shall be used. Mechanical Pile Splices contained on the Approved Products List (APL) may also be used.

4. When preformed dowel holes are utilized, the 1" spiral tie pitch shall be continued to 4'-0" below the head of the pile, see Index Nos. 20618, 20620 & 20624. Preformed holes shall utilize either removable preforming material or stay-in-place corrugated galvanized steel ducts. Stay-in-place ducts shall be fabricated from galvanized sheet steel meeting the requirements of ASTM A653. Coating Designation 560, 26 gauge. Ducts shall be 2" diameter with a minimum corrugation (rib) height of 0.12 in. Ducts shall be fabricated with either welded or interlocked seams. Galvanizing of welded seams will not be required.

5. For tension piles where top of Prestressed Pile is less than 3 feet below Pile Cut-off Elevation, extend No. 10 Dowels into cap beyond Pile Cut-off Elevation to achieve development as approved by the Engineer.
Face of Concrete
Bottom surfaces of enclosure to be epoxy coated just prior to concrete casting per manufacturer's installation procedures.

Dataport Interface Cable (to radio module assembly)

3" 10" 3"

ELEVATION

SECTION A-A
(Strand Pattern with odd number of strands per face)

SECTION B-B
(Showing Voided Pile, Solid Pile Similar)

SECTION A-A
(Strand Pattern with even number of strands per face)

NOTES:
1. For piles 18" and larger installed for bridge foundations, provide EDC Instrumentation in accordance with Specification Section 455.
2. Attach Tip Gauge extension cable to the underside of the strand shown in Section A-A. Secure cable to strand with nylon wire ties spaced a maximum of 6ft. along cable.

EDC INSTRUMENTATION FOR SQUARE PRESTRESSED CONCRETE PILES
ALTERNATE STRAND PATTERNS

4 ~ 0.6" Ø, Grade 270 LRS, at 44 kips
8 ~ ½" Ø (Special), Grade 270 LRS, at 25 kips
8 ~ ⅜" Ø, Grade 270 LRS, at 24 kips
8 ~ ⅜" Ø, Grade 270 LRS, at 23 kips
12 ~ ⅜" Ø, Grade 270 LRS, at 16 kips

NOTES:
1. Work this Index with Index No. 20600 - Notes and Details for Square Prestressed Concrete Piles and Index No. 20601 - Square Prestressed Concrete Pile Splices.
2. Any of the given Alternate Strand Patterns may be utilized. The strands shall be located as follows:
   - Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   - The total strand pattern shall be concentric with the nominal concrete section of the pile.
**Replacement Section 20614**

**ALTERNATE STRAND PATTERNS**

- 8 ~ 0.6" Ø, Grade 270 LRS, at 33 kips
- 8 ~ 0.6" (Special), Grade 270 LRS, at 31 kips
- 12 ~ 0.6" Ø, Grade 270 LRS, at 21 kips
- 16 ~ 0.6" Ø, Grade 270 LRS, at 16 kips

**ELEVATION**

**SECTION A-A**

**SECTION D-D**

(See Nondrivable Unforeseen Reinforced Precast Splice Detail)

**SECTION E-E**

(See Drivable Unforeseen Prestressed Precast Splice Detail)

**PILE SPLICE REINFORCEMENT DETAILS**

**NOTES:**

1. Work this Index with Index No. 20600 - Notes and Details for Square Prestressed Concrete Piles and Index No. 20601 - Square Prestressed Concrete Pile Splices.

2. Any of the given Alternate Strand Patterns may be utilized. The strands shall be located as follows:

   - Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   - The total strand pattern shall be concentric with the nominal concrete section of the pile.
Description: 18' SQUARE PRESTRESSED CONCRETE PILE

NOTES:

1. Work this Index with Index No. 20600 - Notes and Details for Square Prestressed Concrete Piles and Index No. 20601 - Square Prestressed Concrete Pile Splices.

2. Any of the given Alternate Strand Patterns may be utilized. The strands shall be placed as follows:
   - Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   - The strand pattern shall be concentric with the nominal concrete section of the pile.

**See Note No. 4 on Index No. 20601**
** ALTERNATE STRAND PATTERNS **

12 – 0.6" Ø, Grade 270 LRS, at 42 kips
16 – 0.6" Ø (Special), Grade 270 LRS, at 31 kips
16 – 0.6" Ø, Grade 270 LRS, at 31 kips
24 – 0.4" Ø, Grade 270 LRS, at 21 kips

NOTES:
1. Work this Index with Index No. 20600 - Notes and Details for Square Prestressed Concrete Piles and Index No. 20601 - Square Prestressed Concrete Pile Splices.
2. Any of the given Alternate Strand Patterns may be utilized. The strands shall be located as follows:
   a. Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
   b. The total strand pattern shall be concentric with the nominal concrete section of the pile.

SEE ALTERNATE STRAND PATTERNS

SEE ALTERNATE STRAND PATTERNS
** See Note No. 4 on Index No. 20601

---

** ALTERNATE STRAND PATTERNS **

16 – 0.6" Ø, Grade 270 LRS, at 44 kips
20 – ½" Ø (Special), Grade 270 LRS, at 34 kips
24 – ½" Ø, Grade 270 LRS, at 31 kips

** NOTES:**

1. Work this Index with Index No. 20600 – Notes and Details for Square Prestressed Concrete Piles and Index No. 20601 – Square Prestressed Concrete Pile Splices.
2. Any of the given Alternate Strand Patterns may be utilized.
   - The strands shall be located as follows:
     - Place one strand at each corner and place the remaining strands equally spaced between the corner strands.
     - The total strand pattern shall be concentric with the nominal concrete section of the pile.

---

**SECTION A-A**

**SECTION D-D**

(See Nondrivable Unforeseen Reinforced Precast Pile Splice Detail)

12 ~ No. 10 Dowels
5 ~ No. 8 Bars
(Shift as required to clear strands)
W3.4 Spiral Ties
3" Cover (Typ.)
6" Pitch

**SECTION E-E**

(See Drivable Prestressed Precast Pile Splice Detail)

12 ~ No. 10 Dowels
4 ~ No. 8 Bars
(Full length)
W3.4 Spiral Ties
3" Cover (Typ.)
6" Pitch

**SECTION F-F**

(See Drivable Preplanned Pile Splice Detail)

12 ~ No. 10 Dowels
W3.4 Spiral Ties
3" Cover (Typ.)
6" Pitch

---

**ELEVATION**

** See Note No. 4 on Index No. 20601
**ALTERNATE STRAND PATTERNS**

1. Any of the given Alternate Strand Patterns may be utilized. The strands shall be located as follows:
   1. Place one strand at each corner and place the remaining strands equally spaced between the corner strands. The total strand pattern shall be concentric with the nominal concrete section of the pile.
   2. CONTRACTOR OPTION: The 30" pile may be cast SOLID by omitting the 18" Ø void. In this event, the Contractor shall submit calculations for approval and a proposed strand configuration that provide net prestressing after losses equal to 1000 psi. Alternate configurations for the Diagonal Ties, to maintain the position of the 4 ~ No. 8 Bars, may be approved by the Engineer.
   3. Work this Index with Index No. 20600 - Notes and Details for Square Prestressed Concrete Piles and Index No. 20601 - Square Prestressed Concrete Pile Splices.

20 ~ 0.6" Ø, Grade 270 LRS, at 41 kips
24 ~ 1/2" Ø (Special), Grade 270 LRS, at 34 kips
28 ~ 1/2" Ø, Grade 270 LRS, at 29 kips
1. After the pile is driven and cut to grade, the top 8'-0" of the 18" Ø Void shall be filled with concrete. Prior to filling the top 8'-0" of the 18" Ø Void with concrete, strip the cardboard form material from the void and sand/water blast all interface surfaces. Seal void and fill with potable water for 4-5 hours. Remove water to a surface-saturated-dry condition prior to making the concrete pour. In lieu of the cardboard form material and the surface preparation requirements described above, a stay-in-place corrugated thin wall galvanized pipe may be used. The concrete fill material shall be of the same type and strength as called for in the pile cap and paid for as substructure concrete.

2. Collar concrete shall reach a strength of 6,000 psi before pile driving is resumed.

3. Work this Index with Index No. 20600 - Notes and Details for Square Prestressed Concrete Piles.
1. Work this Index with the Pile Data Table in the Structures Plans.
2. Concrete:
   A. Piles: Class V (Special).
   B. Splice: Class IV.
   C. Silica Fume: See "GENERAL NOTES" in Structures Plans for locations where the use of silica fume, metakaolin or ultra-fine fly ash is required.
3. Concrete Strength at time of prestress transfer:
   A. Piles: 6,000 psi minimum.
4. Carbon-Steel Reinforcing:
   A. Bars: Meet the requirements of Specification Section 415.
   B. Prestressing Strands: Meet the requirements of Specification Section 933.
   C. Tendons: Two seven-wire ½" dia. (Special) Grade 270, low-relaxation strands tensioned to 33.8 kips.
   D. Spiral Ties:
      a. One half turn is required for carbon-steel spiral splice.
      b. One full turn is required at the pile head and tip.
5. Pile Splices:
   A. Epoxy: Type AB Epoxy Compound or Mortar must meet the requirements of Specification Section 926.
      a. Use a Type AB Epoxy Bonding Compound or Epoxy Mortar, as recommended by the Manufacturer, to form the joint between pile sections
      b. Use a Type AB Epoxy Bonding Compound as a bonding agent on internal pile surfaces.
   B. Driving: Resume pile driving after splice concrete reaches a minimum strength of 3,500 psi.
6. Mark piles at the pick-up points to indicate the proper points for attaching handling lines.
**Full Epoxy Compound Joint around cylinder pile wall only (See Detail "A")**

**DRIVABLE UNFORESEEN FIELD SPLICE DETAIL**
(Cast-In-Place Plug)

- **Concrete Seal**
- **Clean inside surface of 54" Ø Pile with a high pressure water blast (3000 psi Min.) and apply bonding agent for Driven Prestressed Pile**

**SECTION A-A**

- **4 ~ Longitudinal Spacers (No. 3 Bars or W11 wire) for Spiral Ties @ Equal Spaces**
- **3' Min. * Cover (Typ.)**
- **24 ~ No. 11 Bars @ Equal Spaces**
- **1¼" Ø Formed Hole for Tendons @ Equal Spaces**
- **1¼" Ø Formed Hole (1 tendon per hole; 2 ~ 3/8" Ø (Special) strands per tendon shown as (*)); Grout per Specification 938)***

**SECTION B-B**

- **4 ~ Longitudinal Spacer Bars (No. 3 Bars or W11 wire) for Spiral Ties @ Equal Spaces**
- **1'-0" Min. Lap Splice**
- **1'-0" Ø Void**
- **W11 Wire Spiral Ties**
- **Cast in Place Plug**
- **24 ~ No. 11 Bars @ Equal Spaces**
- **24 ~ 1½" Ø Formed Holes for Tendons @ Equal Spaces**

**DETAIL "A"**

- **Inside Pile Wall**
- **Full epoxy compound joint**
- **Temporary Blocking Form to retain epoxy compound**
- **Form to retain epoxy compound**
- **Outside Pile Wall**

---

*For Spun Cast Cylinder Piles, the following requirements for concrete cover apply:

1. Slightly or Moderately Aggressive Environments: The concrete cover may be reduced to 2 inches.
2. Extremely Aggressive Environments: The concrete cover may be reduced to 2 inches as long as the concrete has a documented chloride ion penetration apparent diffusion coefficient with a mean value of 0.005 in/year or less; otherwise, a 3-inch concrete cover is required.*

---

**For Driven Cylinder Piles, the following requirements for concrete cover apply:**

1. Slightly or Moderately Aggressive Environments: The concrete cover may be reduced to 2 inches.
2. Extremely Aggressive Environments: The concrete cover may be reduced to 2 inches as long as the concrete has a documented chloride ion penetration apparent diffusion coefficient with a mean value of 0.005 in/year or less; otherwise, a 3-inch concrete cover is required.
**NOTES**

1. Work this Index with the Pile Data Table in the Structures Plans.
2. Concrete:
   A. Piles: Class V (Special)
   B. Splice Collar: Class IV
   C. Silica Fume: See "GENERAL NOTES" in the Structures Plans for locations where the use of silica fume, metakaolin or ultra-fine flyash is required.
3. Concrete Strength at time of prestress transfer:
   A. Piles: 4,000 psi minimum.
4. Carbon-Steel Reinforcing:
   A. Bars: Meet the requirements of Specification Section 415
   B. Prestressing Strands: Use 0.6 dia. carbon-steel, Grade 770, low-relaxation strand stressed to 44.0 kips that meets the requirements of Specification Section 933.
   C. Protect all carbon-steel strands permanently exposed to the environment and not embedded under final conditions in accordance with Specification Section 450.
5. Spiral Ties:
   A. One half turn is required for carbon-steel spiral splices
   B. One full turn is required at the head and tip of each pile
6. Pile Splices:
   A. Epoxy: Type AB Epoxy Compound or Epoxy Mortar must meet the requirements of Specification Section 926.
      a. Use a Type AB Epoxy Bonding Compound or Epoxy Mortar, as recommended by the Manufacturer, to form the joint between pile sections.
      b. Use a Type AB Epoxy Bonding Compound as a bonding agent on internal pile surfaces.
   B. Splices: Resume pile driving after the splice concrete reaches a minimum strength of 5,500 psi.
7. Mark piles at the pick-up points to indicate the proper points for attaching handling lines.

---

**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>
Concrete Seal

2'-0" 3" Min. Cover

Driven Prestressed Pile

10'-6" 24 ~ No. 11 Bars @ Equal Spaces

10'-6" 1'-0" Ø Void, open top and bottom to allow through venting of sections

Roughen inside surface of 60" Ø Pile to 4" amplitude for Spliced Pile Section

Closed No. 4 Bars or W20 Wire Ties @ 1'-0" ± (Typ.)

3" Min. Cover (Typ.)

Spiral Ties

W11 Wire

2'-0" Ø Void

Full Epoxy Compound Joint around cylinder pile wall only (See Detail "A")

Cast in Place Plug

1'-0" Ø Void

60" Ø

36 ~ 0.6" Ø Strands @ Equal Spaces

45" Ø Void

1'-0" Ø Void

60" Ø

SECTION A-A

SECTION B-B

DETAIL "A"

DRIVABLE UNFORESEEN FIELD SPLICE DETAIL
(Cast in Place Plug)

Full Epoxy Compound Joint around cylinder pile wall only (See Detail "A")

Epoxi Compound (applied)

Epoxi Compound (final thickness)

Inside Pile Wall

Temporary Blocking

Form to retain epoxy compound

Gasket

Form to retain epoxy compound

Outside Pile Wall