Chapter 02 - Substructure

SECTION 04
PIERS
(SUB-PR)
1.0

ALTERNATE CAP DETAIL

Scale: $\frac{1}{2}'' = 1'-0''$

Note:
1. Detail is for roadway widths and skew angle requiring a cap length less than 50', measured along center line of pier.
2. When bridge seat elevations are such that the height of any pad becomes greater than 1'-0'' and the sloping of cap can eliminate or alleviate this condition then cap shall be sloped as indicated in "Alternate Cap Detail".
3. For Section A-A and B-B see sheet 4 of 4.

* * * GUIDE SHEET FOR PLAN DEVELOPMENT ONLY – DO NOT INCLUDE THIS SHEET IN CONTRACT PLANS * * *
**ALTERNATE CAP DETAIL**

Scale: $\frac{1}{8}'' = 1'-0''$

**ELEVATION**

Scale: $\frac{1}{8}'' = 1'-0''$

1. *GUIDE SHEET FOR PLAN DEVELOPMENT ONLY – DO NOT INCLUDE THIS SHEET IN CONTRACT PLANS*

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**DEPARTMENT OF TRANSPORTATION**

**STATE OF MARYLAND**

**OFFICE OF STRUCTURES**

**DESIGN CRITERIA FOR**

**TYPICAL REINFORCED CONCRETE PIER**

**(CAP LENGTH 50' - 68')**

**SUB-PR-101**

**STATE HIGHWAY ADMINISTRATION**

**OFFICE OF STRUCTURES**

**DETAIL NO.**

**SHEET 2 OF 4**

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**SHEET 2 OF 4**

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### ALTERNATE CAP DETAIL

* Scale: $\frac{1}{8}" = 1'-0"

- Bottom of adjacent caps shall be at same elevation.
- A $1" \times \frac{1}{2}"$ scoring all around cap to facilitate possible future widening.

### ELEVATION

* Scale: $\frac{1}{8}" = 1'-0"

- $1" \times \frac{1}{2}"$ scoring all around cap to facilitate possible future widening.

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**Note:**

1. Criteria for individual pier units shall be as shown on sheets 1 and 2 of 4.
2. When bridge seat elevations are such that the height of any pad becomes greater than 1'-0" and the sloping of cap can eliminate or alleviate this condition then cap shall be sloped as indicated in "Alternate Cap Detail".
3. Whenever possible the S dimensions shall remain equal.
4. For Section A-A and B-B see sheet 4 of 4.

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**TYPICAL REINFORCED CONCRETE PIER**

**DESIGN CRITERIA FOR SUBSTRUCTURE - PIER**

1. Reinforcing steel for column spirals shall be cold drawn steel conforming to ASTM A 82.
2. The design bearing pressure for spread footings shall be shown on applicable Pier Sheet thus: "Maximum Design Bearing Pressure for Pier ___ is ___ Tons/s.f."

**SECTION A-A WITH PILES**

Scale: $\frac{1}{4}'' = 1' - 0''$

- Maximum batter 5:12.
- Piling, as foundation conditions warrant.
- Three #6 @ 4" c/c each way over each row of piles.

**MAXIMUM NUMBER OF MAIN COLUMN BARS**

<table>
<thead>
<tr>
<th>Column Diameter</th>
<th>Reinforcing Bar Size</th>
<th>#9</th>
<th>#10</th>
<th>#11</th>
</tr>
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<tbody>
<tr>
<td>2'-6&quot;</td>
<td>#9</td>
<td>16</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>2'-8&quot;</td>
<td>#9</td>
<td>18</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>2'-10&quot;</td>
<td>#9</td>
<td>19</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>3'-0&quot;</td>
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<td>19</td>
<td>18</td>
</tr>
<tr>
<td>3'-2&quot;</td>
<td>#11</td>
<td>22</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>3'-6&quot;</td>
<td>#11</td>
<td>25</td>
<td>23</td>
<td>22</td>
</tr>
</tbody>
</table>

**SECTION A-A SPREAD FOOTING**

Scale: $\frac{1}{4}'' = 1' - 0''$

- Steel H or CP Concrete piling, as foundation conditions warrant.
- Maximum batter 5:12.
- *If rock is present these notes must appear on Plans.*

**SECTION B-B**

Scale: $\frac{1}{2}'' = 1' - 0''$

- 10" x 10" x Minimum Depressed Key, centered in column at top and bottom of column.
- 2" clear to spiral.
- Spirals

- Dowels
- Main column bars shown solid.
- Rock Line

- *For Office Use Only*
Note:
1. Angle to be steel conforming to ASTM A-36.
2. Angle to be hot dipped galvanized, after fabrication, in accordance with ASTM A-123.
Notes:
1. For fiberglass requirements see 921.11.
2. For other fiberglass jacket requirements see Special Provisions.
3. Inside of jacket shall be thoroughly cleaned.

Outside diameter of fiberglass = outside diameter of Cast-in-place Concrete Column

Scale: \( \frac{1}{4}'' = 1'-0'' \)

Limit of Protective Jacket = \( L \)

Mean Waterline (Average of mean high water and mean low water), **

2'' Epoxy Coated Slab Bolsters (Typical)

* Unless otherwise specified \( L = 8' \).
** Unless otherwise specified, locate at this elevation.
**NEW CYLINDER PILE FIBERGLASS JACKET FOR SUBSTRUCTURE - PIER**

**SECTION A-A**

- **Scale:** None

**SECTION B-B**

- **Scale:** None

**DETAIL C**

- **Scale:** None

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**Notes:**

1. No vertical joints allowed.
2. Jackets to be placed before cap or footer is poured.
3. Fiberglass shall conform to 92L11.
4. For epoxy grout material requirements see Special Provisions.
5. Inside of jacket shall be thoroughly cleaned.
6. Jacket pile areas to be cleaned just prior to placing jacket refer to Section 41B.

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**APPROVAL**

**DIRECTOR**

**OFFICE OF STRUCTURES**

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**FIBERGLASS JACKET FOR NEW CYLINDER PILE**

**DETAIL NO. SUB-PR-302**

**SHEET**
**NOTES:**
1. Fiberglass shall conform to 921.13.
2. For fiberglass and grout material requirements see Special Provisions.
3. Clean pile area to be jacketed just prior to placing jacket.
4. Cost of studs to be included in pertinent protective jacket item.

**SECTION B-B**
Scale: None

- 2" min.
- Continuous 1/2" slab bolster embedded in jacket (Typ.)
- Voids to be filled with grout
- 1/4" x 2" wide fiberglass spacer bound to inside face of jacket with fiberglass tape in shop (Typ.)
- 1/4" x 6" long studs @ 1'-0" c/c each side of web as shown
- Approximate water surface
- Approximate stream bed
- One piece 1/4" minimum fiberglass jacket (no shop or field seams)
- 1/4" x 2" wide fiberglass spacer (Typ.)
- Steel H pile

**ELEVATION**
Scale: 1/2" = 1'-0"

- See Plans for limits of fiberglass jacket
- Voids to be filled with grout

**Limits of grout within fiberglass jacket**

**限製 grout within fibreglass jacket**

**SUBSTRUCTURE - PIER**

**FIBRGLASS PROTECTIVE JACKET FOR H PILES**
(NEW CONSTRUCTION)
Notes:
1. For fiberglass requirements see 921.11.
2. For other fiberglass and epoxy grout material requirements see Special Provisions.
3. Inside of jacket shall be thoroughly cleaned.

PLAN
Scale: None

SECTION B-B
Scale: 1/8" = 1'-0"

SECTION A-A
Scale: 1/2" = 1'-0"

PROTECTIVE JACKET JOINT DETAIL
Scale: 3" = 1'-0"

1.0