March 6, 1997

MEMORANDUM TO GROUP LEADERS AND CONSULTANTS

SUBJECT: Payment of Reinforcing Steel used for Pile Anchorage

Beginning with the June 1997 Letting, the Bridge Design Office will detail reinforcing bars used for anchorage of prestressed concrete piles on the bent sheets. The summary of quantities for the bents shall include the weight (mass) for these reinforcing bars.

New standard drawings for both the English and Metric prestressed concrete piles are attached and have been revised to reflect necessary changes.

This revision is the result of an AGC request that allows the Contractor to purchase all reinforcing steel from a single source.

Randy R. Cannon
Interim Bridge Design Engineer

Attachments:

cc: Assistant Bridge Design Engineers

REL/slb
**Typical Pile Elevation**

**Standard Details**

- **SECT. A-A**
  - Equal strand low resistance strands
  - MS wire spiral

- **SECT. B-B**
  - Equal strand low resistance strands
  - MS wire spiral

- **SECT. C-C**
  - Equal strand low resistance strands
  - MS wire spiral

- **SECT. D-D**
  - Equal strand low resistance strands
  - MS wire spiral

**Square Strand Pattern**

- **SECT. A-A**
  - Equal strand low resistance strands
  - MS wire spiral

- **SECT. B-B**
  - Equal strand low resistance strands
  - MS wire spiral

**Circular Strand Pattern**

- **SECT. C-C**
  - Equal strand low resistance strands
  - MS wire spiral

- **SECT. E-E**
  - Equal strand low resistance strands
  - MS wire spiral

**Pile Anchorage Details**

- If 'T' or 'R' over 200 bars are for pile anchorage and are placed as shown, each strand shall be covered with a radial bar or strand of the same size as the strand it protects. The total number of bars shall be equal to the sum of the bar sizes in the pile. The bar sizes shall be determined by the engineer.

**Tolerances**

- **Pile Length**
  - Tolerances:
    - Construction:
      - +2"/-0"
    - Grade:
      - 4'-12" (1.2m)

- **Strand Data**
  - Diameter:
    - Tolerances:
      - Grade:
        - +0.5"/-0"
      - Construction:
        - +0.5"/-0"

**Design Data**

- **Bottom of Cap**
  - Grade:
    - +0.25"/-0"
  - Construction:
    - +0.25"/-0"

**Build-Up**

- **Notes for Build-Up**
  - All Philip cap plates shown in detail and placed in load bearing position shall be connected to the pile by a 3050 psi grouted through the pile.
  - When length of required grout embedment is greater than 15 ft, the grout shall be extended 5 ft below the bottom of Cap or with a grout up to 8 ft below the bottom of the pile.
  - If pile is driven before grout is placed, the driving load shall be reduced to 90% of the specified load.

**Materials**

- Prestressing strand:
  - Grade 190, 7-wire strand
- Prestressing duct:
  - Grade 150, 7-wire strand

**Table**

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<thead>
<tr>
<th>Pile Data</th>
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<tr>
<td><strong>PILE</strong></td>
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<tr>
<td>Diameter</td>
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<tr>
<td>20&quot;</td>
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**Pre-Stressed Concrete Piles**

**Notes**

- All dimensions are nominal and all measurements are center-to-center.

- Tolerances for pile length and grout embedment are ± 12" (305mm).

- Pile dimensions are shown as center-to-center, and all pile lengths are measured from the top of the pile to the bottom of the anchorage point.
NOTES FOR BUILD-UP

Chip back top of pile as shown in build-up detail and field holes in top of pile as shown in Section B-B. Dowel bars should be provided 150 mm (6") on-center in the holes.

When length of required build-up periods, a 40 mm pitch of the spiral should be extended 600 mm below bottom of cap or footing. Piles should be cut off an additional length to provide spiral 40 mm pitch for 600 mm below the cap or footing.

If pile Build-up is required with further driving, Dowel bars may be terminated at the top of build-up and pile anchorages accomplished as shown in the pile anchorages detail.

Pile having an embedment length less than 500 mm should be built-up as shown above and measurement made for the build-up proportion. Build-ups may be cost with bent bar instead of bent bar spirals. 30mm spirals are in place and not cost with Class 3, Design Concrete in the cap area. For the use of two bends in the spiral, 45 should be added to finish length. Additional lengths of build-ups for payments shall be made at an embedment length of 500 mm. When the build-up is cast with the bent cap.

Costs for dowel bars, pipe spirals, concrete and surface roughness for build-up shall be included in the unit price bid for prestressed concrete piles.

GENERAL NOTES

The splice of wire spirals made by full strength lap ties.

The Contractor shall submit dowel bars to the Resident Engineer for approval.

Chamber discussed 20 mm unless noted otherwise.

Inclusions relative to reinforcing steel to centers of bars except as noted.

Remove alternate sections simultaneously at opposite ends without shock.

Wire spirals not to be cold and reinforcing bars should be removed to prevent tension the spiral.

MATERIALS

 Prestressing Strand - Grade 70, Low Relaxation, AASHTO M230
 Wire Spiral - AASHTO M132-92
 Retarding Steel - Grade 420
 Concrete - Class 35

TOLERANCES

Length 25 mm to 76 mm

Pile weight 15 mm to 15 mm (allowing form draft)

Sweep tolerance from straight line perpendicular to centerline of member

Considered to be for form tolerances 1.5 mm (0.06") on 3.048 m (10 ft)

Position of strain 6 mm

Position of pick-up point 9 mm

Length and spacing of spirals 6 mm

Length of spacing of spirals 19 mm

DESIGN DATA

 Pick-Up Points

 Pick-Up Points

 Pick-Up Points

 Pick-Up Points

PRESTR. CONC. PILES