DESIGNED BY:

G. P.1 APPROX. 1/3 'L'

NOT TO STANDARDS 18.01 & 18.02

1'-3 " R.
1'-3" MIN.

13.02

w

l

CONCRETE

STANDARD 19.33, 19.34, 19.35.

SUPERSTRUCTURES. REFER TO GIRDERS ON PRESTRESSED GIRDER 2" X 6" BEVELED KEYWAY BETWEEN MASONRY.

3 '-0 "

SEAL WITH 2 '-6 " MIN.
OVER 25 '-0 " SEE NOTES.

BAR S TO BE DESIGNED FOR BEAM SEATS IN MOST CASES.

LEVEL 3" MAX.
APPROX. 1/3 'L'

GIRDER STRUCTURES

9 " MIN. C.L.
3'-0" MIN.

#5 BARS
6 " MAX.
1'-0" MIN. TYP.

HAMMERHEAD LENGTH = 'L'
LOOKING UP STATION

1'-0 " MIN. LAP ELEVATION APPROX. 1/3 'L'

LATERNAL TIES AT 1'-0 " SP.

FULLY DEVELOPED.
FOOTING DOWELS TO BE PLACED AT DESIGNER'S DISCRETION.

REINFORCEMENT IS 1% OR MORE OF THE GROSS CONCRETE AREA.
THIS MAXIMUM VERT. BAR SPACING APPLIES ONLY WHEN THE VERTICAL BAR SPACING IS LESS THAN LENGTH OF SHAFT.

TYPICAL 1'-6" MIN.

BARS TO BE DESIGNED FOR BEAM SEATS AT 1'-0" INTERVALS OR SIMILARLY AVERAGE SPACED BARS IN THE HAMMERHEAD.

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EPOXY COAT BAR STEEL DOWN TO TOP OF FOOTINGS IN ALL PIERS OF CAP AND TO ADJACENT BEARING SEAT STEPS.

LEVEL TOP OF SHAFT
PIER ` OF CONCRETE SLAB SUPERSTRUCTURE. REFER TO STANDARD 13.01 FOR ADDITIONAL REINFORCING STEEL IN BEARING SEAT AREAS SHALL BE LEVEL EXCEPT FOR THE BEAM SEATS MAY BE ANGLED TO MATCH SKEW AT THE DESIGN CAP PARALLEL TO GRADE.
SEE STANDARD 18.01.

2'-6" MIN.

ELEVATION LENGTH OF CAP

END VIEW

PLAN

ALT. SECTION P1

HANGERHEAD PIER

DESIGNER NOTES

ALL BAR S TO BE DESIGNER "CLASS C" TENSION LAP SPLICE UNLESS OTHERWISE SHOWN.

OPTIONAL KEYED CONSTRUCTION JOINTS IN SHAFTS IF PROVIDED SHALL BE PLACED APPROXIMATELY 2'-6" ABOVE NORMAL WATER ELEVATION.

OPTIONAL KEYED CONSTRUCTION JOINTS IN SHAFTS MAY BE ELIMINATED WHETHER OR NOT THE JOINT IS UTILIZED.
PAYMENT WILL BE FOR THE ACTUAL BARS INSTALLED.

THE APPROVAL OF THE STRUCTURES DESIGN SECTION.

REQUIRED FOR STRUCTURAL REASONS, MAY BE USED ONLY WITH THE DESIGNER'S DISCRETION.

A STANDARD SWEEP TRAVEL OF ICE MAY BE USED AT THE OPTION OF THE DESIGNER, MATERIAL SPECIFIED ONLY.

SHAFT MAY BE TAPERED IN ONE OR TWO DIRECTIONS WHEN REQUIRED FOR STRUCTURAL REASONS.

A VERTICAL BAR SPACING OF 9" IS RECOMMENDED FOR THE DESIGNER MAY BE OMITTED AT THE OPTION OF THE DESIGNER.

SEE STANDARD 12.01 FOR ADDITIONAL REINFORCING STEEL IN BEARING SEAT AREAS SHALL BE LEVEL EXCEPT FOR THE
BEAM SEATS MAY BE ANGLED TO MATCH SKEW AT THE DESIGN CAP PARALLEL TO GRADE.
SEE STANDARD 18.01.

MAY BE ELIMINATED WHETHER OR NOT THE JOINT IS UTILIZED.
PINS TO FACILITATE OVERHEAD SHEETING CLEARANCE IF THE TOP OF THE PIER IS BEYOND NORMAL SEAL SIZE AND NO CONSTRUCTION JOINT IS PROVIDED SO THAT THE MAXIMUM HEIGHT OF POUR NEED NOT BE PLACED APPROXIMATELY 2'-6" ABOVE NORMAL WATER ELEVATION.

OPTIONAL KEYED CONSTRUCTION JOINTS IN SHAFT, IF PROVIDED, SHALL BE FORMED BY BEVELED KEYWAY AT 4" DEEP X 1/3 THICKNESS OF SHAFT X 4'-0"
LESS THAN LENGTH OF SHAFT.

A STANDARD KEYED CONSTRUCTION JOINT SHALL BE FORMED BY BEVELED KEYWAY AT 4" DEEP X 1/3 THICKNESS OF SHAFT X 4'-0"
LESS THAN LENGTH OF SHAFT.

SMALL MAY BE ELIMINATED WHETHER OR NOT THE JOINT IS UTILIZED.
PAYMENT WILL BE FOR THE ACTUAL BARS INSTALLED.

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PILES TO BE DESIGNED.

MIN. OF 5 PILES

#5 BARS

4'-0" MAX.

MINIMUM SPA.  3'-0"

#5 VERTICAL BARS @ 1'-0" BOTH FACES

@ 2'-0" SPA.

#5 BARS

1'-0" CL.

STABLE SYMMETRY.

FOR USD SPACING DETAIL

SEE STANDARD 13.01

PILING LAYOUT SIMILAR.

STEEL PILING SHOWN. CAST IN PLACE @ ENDS.

@ 4 EQ. SPA'S.

#5 STIRRUPS @ 1'-6"

#5 BARS @ EQ. SPACES.

#4 BARS @ 1'-0"

4" LEG

2" X 6" BEVELED KEYWAY.

OPTIONAL CONST. JOINT WITH 3" MIN.

2'-0" CL.

TYP. 2" X 6" BEVELED KEYWAY. FOR

CONCRETE SLAB SUPERSTRUCTURE

SEAL ELEVATION PLAN END VIEW

STRUCTURE SYM. ABOUT ` SUPERSTRUCTURE. FOR CONCRETE SLAB PARALLEL TO GRADE MAKE TOP OF PIER TO BE LEVEL.

BOTTOM OF SHAFT CONC. PILING LAYOUT SIMILAR.

STEEL PILING SHOWN. CAST IN PLACE @ ENDS.

@ 4 EQ. SPA'S.

#5 BARS

#5 VERTICAL BARS @ 1'-0" BOTH FACES

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STABLE SYMMETRY.

FOR USD SPACING DETAIL

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STABLE SYMMETRY.

FOR USD SPACING DETAIL

SEE STANDARD 13.01

PILING LAYOUT SIMILAR.

STEEL PILING SHOWN. CAST IN PLACE @ ENDS.
PILE BENT

**NOTES**

PILE SHALL BE PAINTED IN ACCORDANCE WITH SECTION 11.03 OF THE STANDARD SPECIFICATIONS.

**DESIGNER NOTES**

ALL BAR SPACES TO BE BASED ON "CLASS C" TENSION LAP SPELKE UNTESTED OTHERWISE SHOWN.

BEARING SEAT AREAS SHALL BE LEVEL EXCEPT FOR THE TWO CASES LISTED BELOW:

1. FOR CAST-IN-PLACE H-PILE, BEARING PADS MUST BE PLACED IN BEARING AREA FOR BEAM SEATS OF NON-SLOPED CAPS THAT ARE 4" OR MORE ABOVE LOWEST BEAM SEAT.

2. ACCORDING TO STANDARD 11.01 FOR REQUIRED PILE REINFORCING DETAILS.

MAXIMUM REINFORCING MAY BE PLACED IN BEARING AREA FOR BEAM SEATS OF NON-SLOPED CAPS THAT ARE 4" OR MORE ABOVE LOWEST BEAM SEAT.

SEE STANDARD 13.01 FOR ADDITIONAL REQUIREMENTS.
PIER CAP REINFORCEMENT DETAILING

**DESIGNER NOTES**

- **PLAN**
  - Cap width
  - Support main reinforcement.
  - Provide reinforcement necessary to section thru pier cap.
  - Cap reinforcement detailing.
  - Abutment reinforcement layout similar to pier cap reinforcement detailing.

**NOTE**

- Provide adequate clearance for post-installed anchors.
- Provide 4" min. clear between anchor bolts and reinforcement.
- Use doubled stirrup bars as needed to provide 4" min. clear between anchor bolts and reinforcement.
- Avoid spacing that is too tight. Bundled detail multiple layers of bar steel to avoid splices that are too thin. Bunched bars may be used. Avoid lapping bundled bars.
- Provide reinforcement necessary to support main reinforcement.

Approved: [Signature]
Date: 1-17

Bill Oliva
Pile Encased Pier types:

- **Type 1** - solid wall pier
  - hammerhead (as shown on this standard)
  - solid wall pier alternatives:
    - pile wall as shown on the standard
    - hammerhead (standard style)

- **Type 2** - cofferdam and underwater inspection bid items required.

- **Type 3** - cofferdam and seal bid items required.

**DESIGNER NOTES**

The pile types shown on this standard are based on the observed water elevation and certain factors. Adjust the elevation limits accordingly when selecting the appropriate bid items and plan notes.

**PILE ENCASED PIER TYPES**

- **Type 1** - cofferdam and seal bid items not provided. Consider providing underwater inspection bid item.
- **Type 2** - cofferdam and underwater inspection bid items required.
- **Type 3** - cofferdam and seal bid items required.

**PILE ENCASED PIER ALTERNATIVE**

- pile wall as shown on the standard
- hammerhead (standard style)
NOTES

DETAILS OF CONSTRUCTION MATERIALS AND WORKMANSHIP
shall conform to the pertinent requirements of the Standard Specifications
and the applicable Special Provisions.

Details shown on the drawing are subject to the
special provisions of this project.

Barrier and footing shall consist of cast-in-place
concrete. All concrete shall conform to the
requirements of the Standard Specifications.

Details of construction shall be遵循
in accordance with the provisions of the
Standard Specifications.

Aluminum alloy or stainless steel shall not be
allowed in the barrier and footing shown in the
entire drawing.

All reinforcement shall be epoxy-coated.

Concrete shall be placed in accordance with the
requirements of the Standard Specifications.

Detached barriers shall be attached to the
existing columns with epoxy-coated anchors.

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