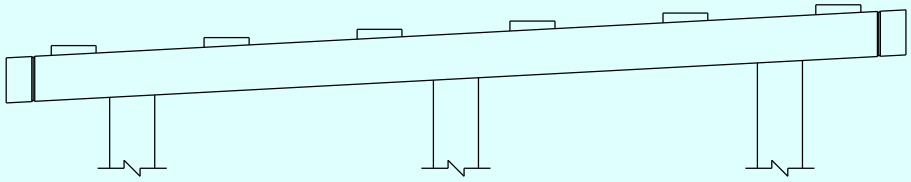
Chapter 02 - Substructure

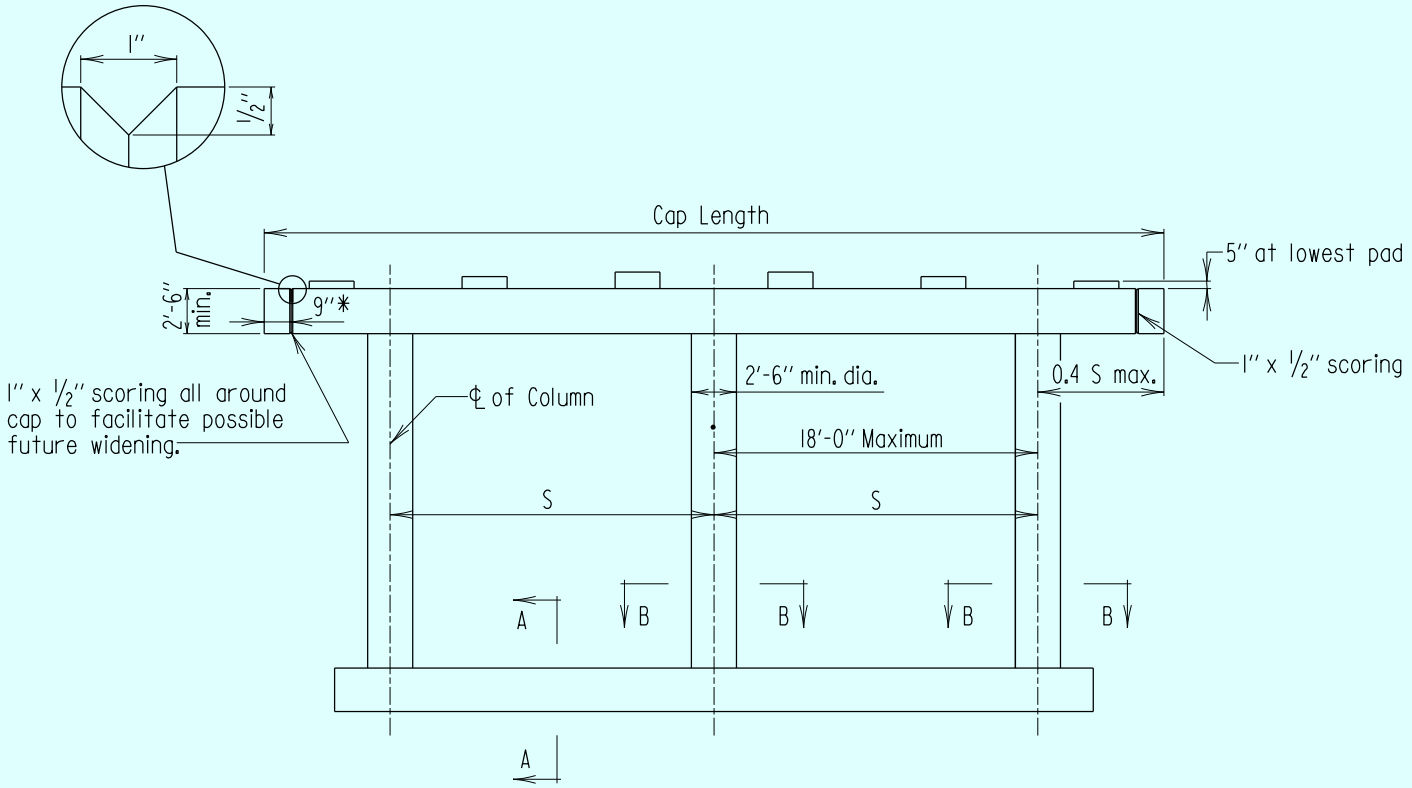
SECTION 04

PIERS

(SUB-PR)



ALTERNATE CAP DETAIL
Scale: 3/32 '' = 1'-0''



ELEVATION
Scale: 3/32 '' = 1'-0''

* All main bars to be extended into this area so that the welded extension indicated on REBAR-ER-101 can be utilized. Designer must keep in mind this might necessitate more steel than required for original design.

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.

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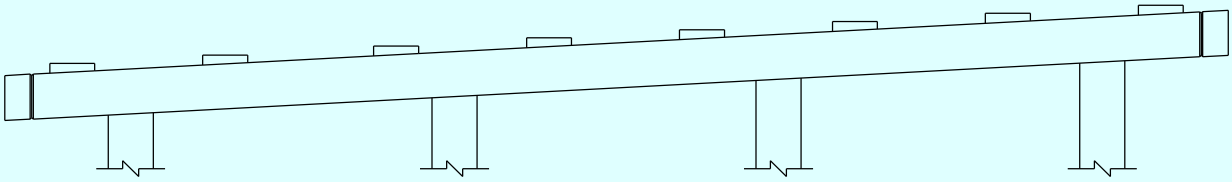
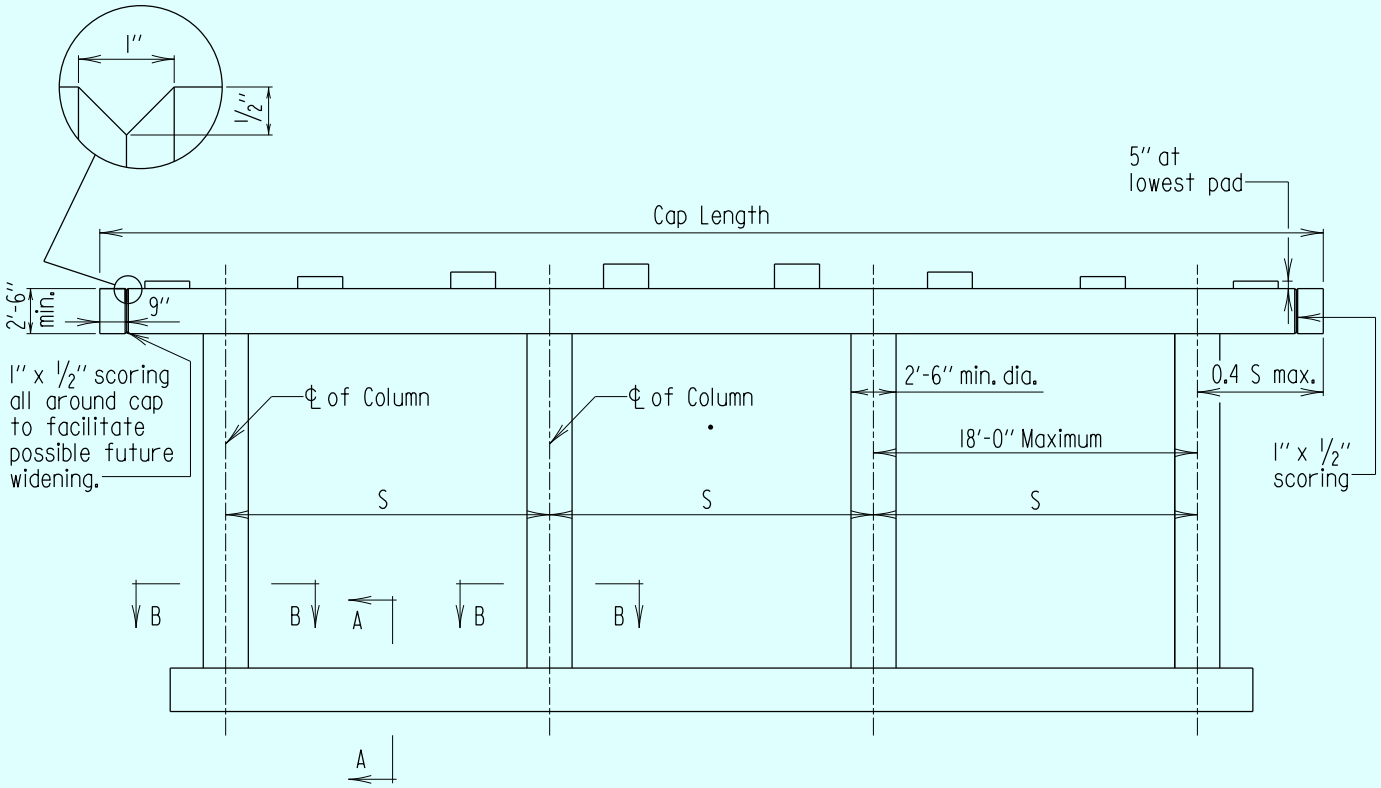
E.S. Freedman DIRECTOR OFFICE OF STRUCTURES DATE: 07/26/2006	DESIGN CRITERIA FOR TYPICAL REINFORCED CONCRETE PIER (CAP LENGTH LESS THAN 50')
VERSION 1.0	DETAIL NO. SUB-PR-101 SHEET 1 OF 4

SUBSTRUCTURE - PIER



ALTERNATE CAP DETAIL
Scale: 3/32 '' = 1'-0''



ELEVATION
Scale: 3/32 '' = 1'-0''

* All main bars to be extended into this area so that the welded extension indicated on REBAR-ER-101 can be utilized. Designer must keep in mind this might necessitate more steel than required for original design.

Note:
1. Detail is for roadway widths and skew angle requiring a cap length between 50' and 68', 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.

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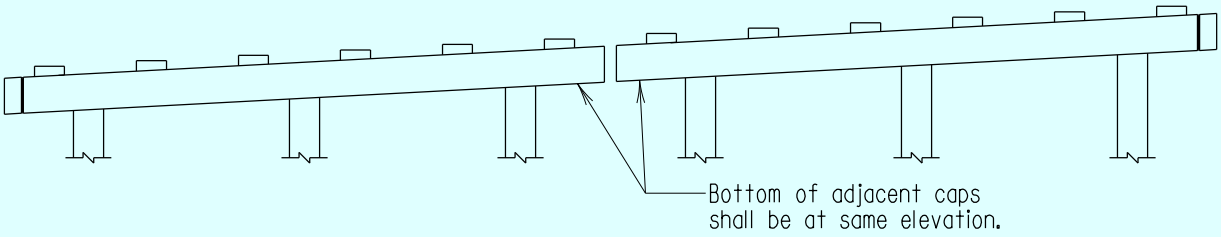
DESIGN CRITERIA FOR TYPICAL REINFORCED CONCRETE PIER (CAP LENGTH 50' - 68')

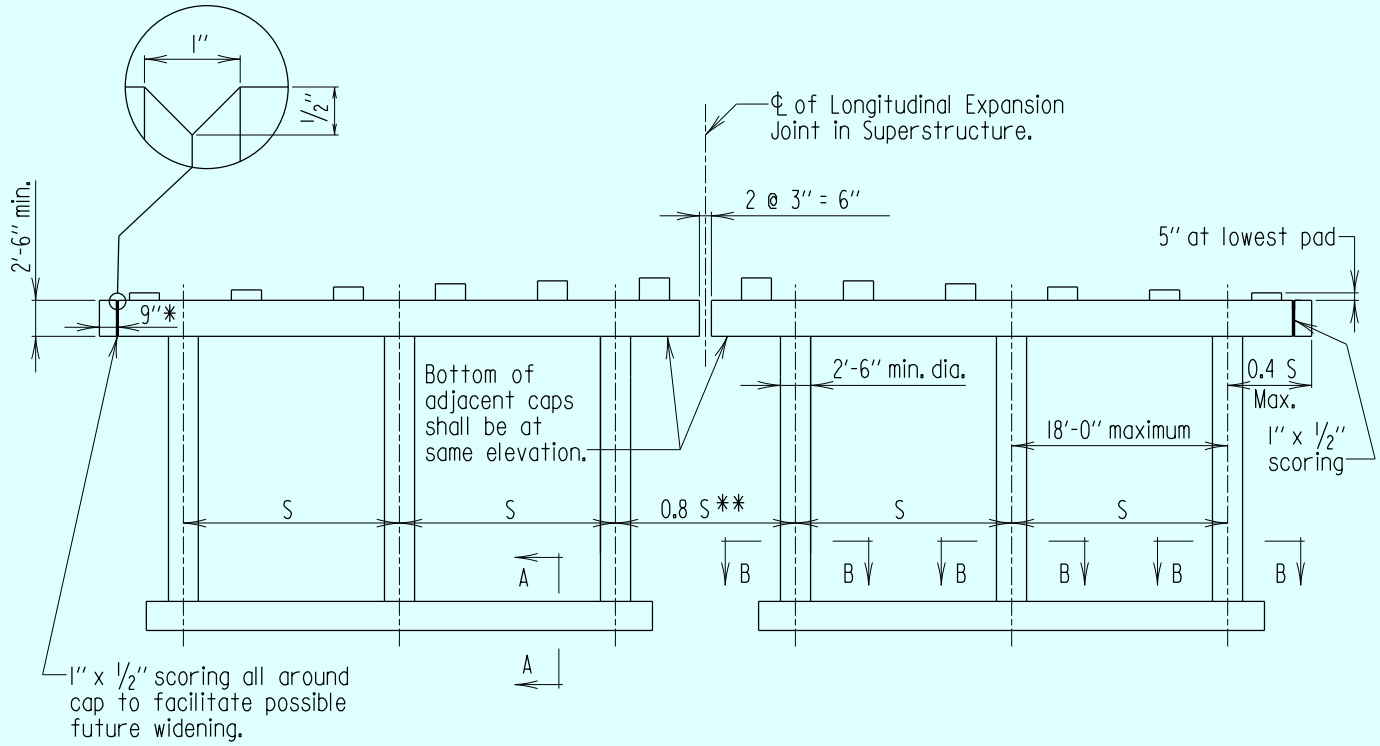
DETAIL NO. SUB-PR-101 SHEET 2 OF 4

SUBSTRUCTURE - PIER



ALTERNATE CAP DETAIL

Scale: 3/32 '' = 1'-0''



ELEVATION

Scale: 3/32 '' = 1'-0''

* All main bars to be extended into this area so that the welded extension indicated on REBAR-ER-101 can be utilized. Designer must keep in mind this might necessitate more steel than required for original design.

** If possible

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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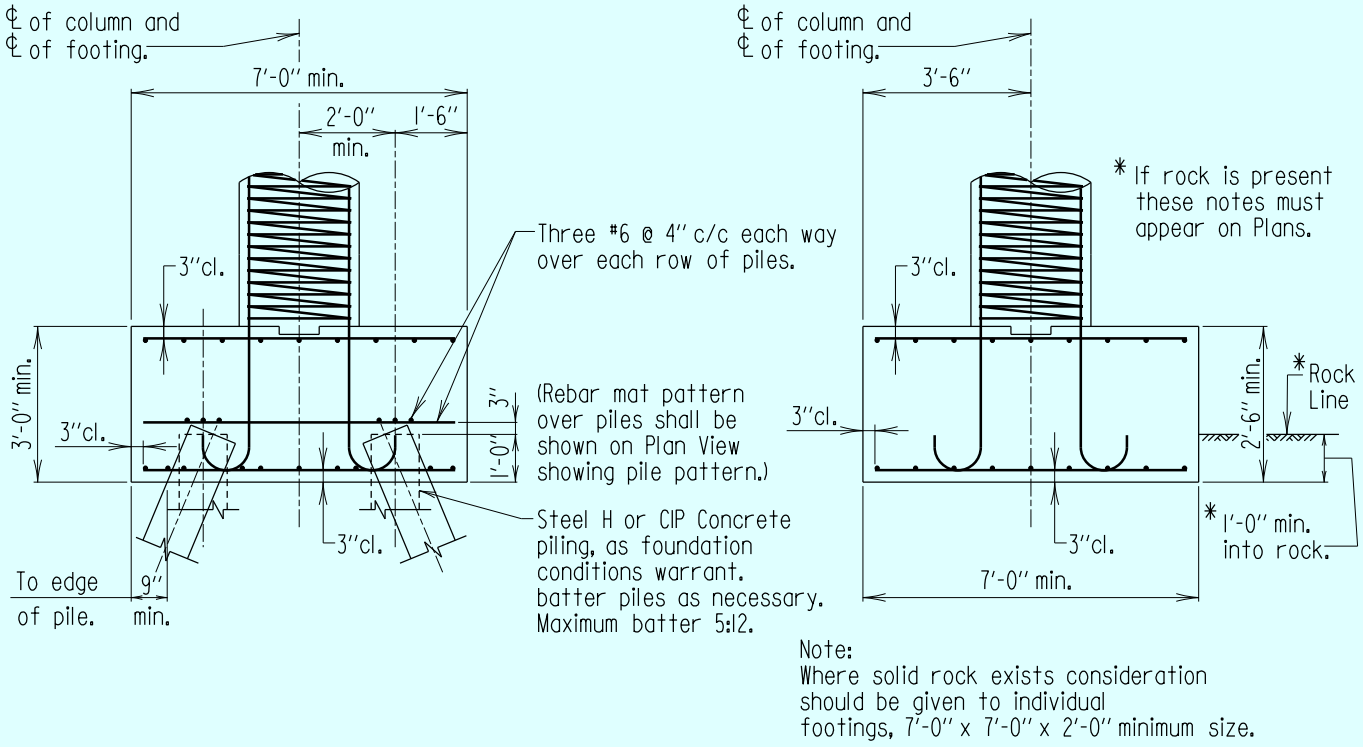
DESIGN CRITERIA FOR TYPICAL REINFOCRED CONCRETE PIER (CAP LENGTH LESS THAN 50')

DETAIL NO. SUB-PR-101 SHEET 3 OF 4

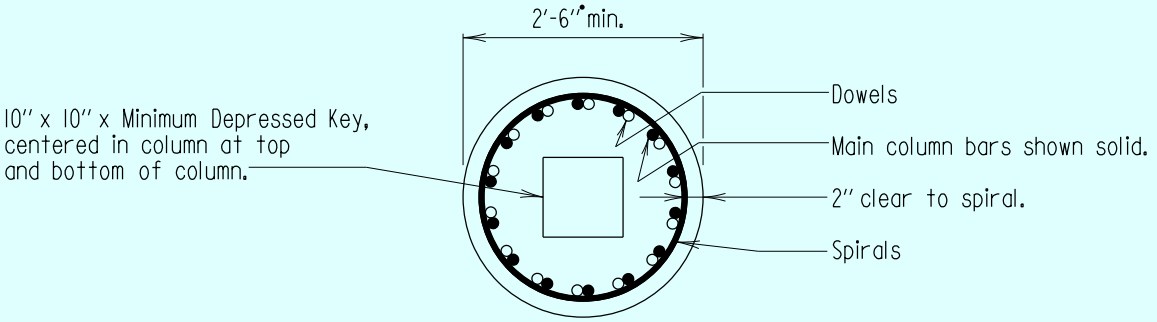
SUBSTRUCTURE - PIER



Note:
Where solid rock exists consideration should be given to individual footings, 7'-0" x 7'-0" x 2'-0" minimum size.

SECTION A-A WITH PILES
Scale: 1/4" = 1'-0"

SECTION A-A SPREAD FOOTING
Scale: 1/4" = 1'-0"



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

MAXIMUM NUMBER OF MAIN COLUMN BARS			
Column Diameter	Reinforcing Bar Size		
	#9	#10	#11
2'-6"	16	15	14
2'-8"	18	16	15
2'-10"	19	18	17
3'-0"	20	19	18
3'-2"	22	20	19
3'-6"	25	23	22

Note:
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."

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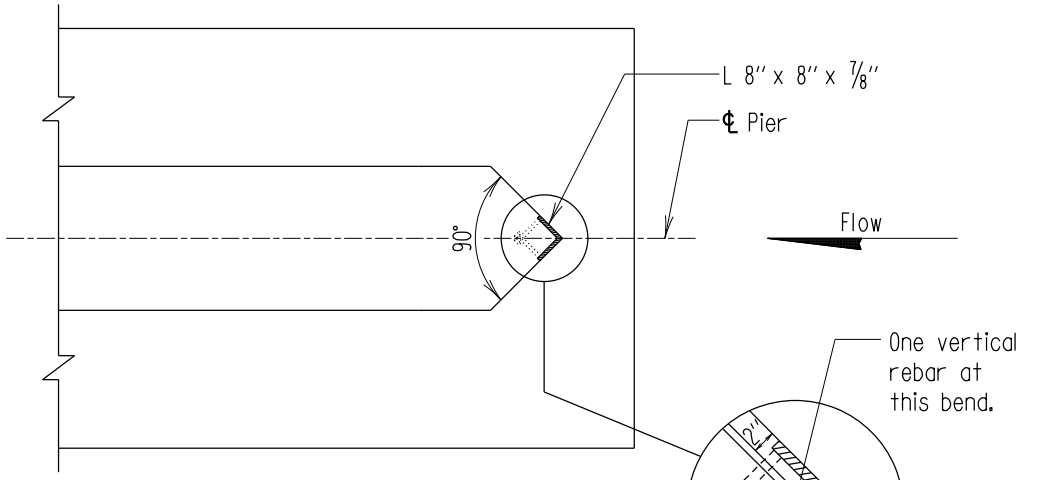
DESIGN CRITERIA FOR TYPICAL REINFORCED CONCRETE PIER

DETAIL NO. SUB-PR-101 SHEET 4 OF 4

SUBSTRUCTURE - PIER

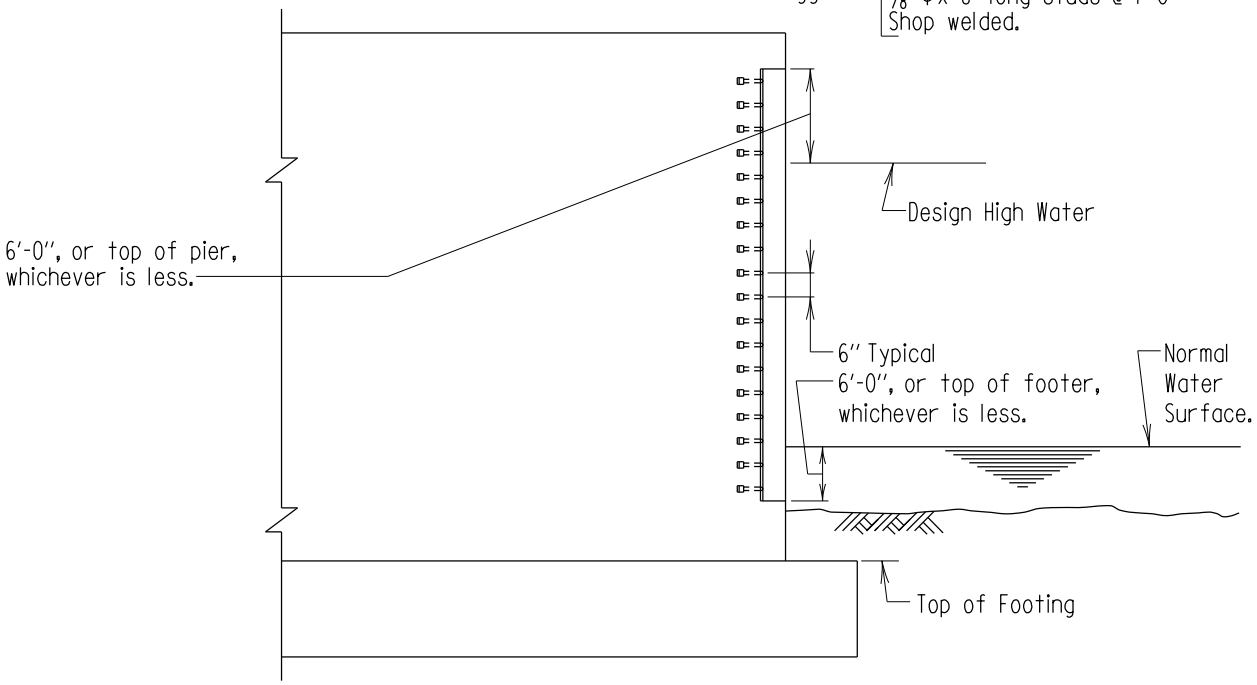


PLAN

Scale : 1/4" =1'-0"

Corner rebar to be continuous around corner.

Staggered { 7/8"Φ x 8" long studs @ 1'-0" / 7/8"Φ x 8" long studs @ 1'-0" } Shop welded.



ELEVATION

Scale : 1/4" =1'-0"

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.

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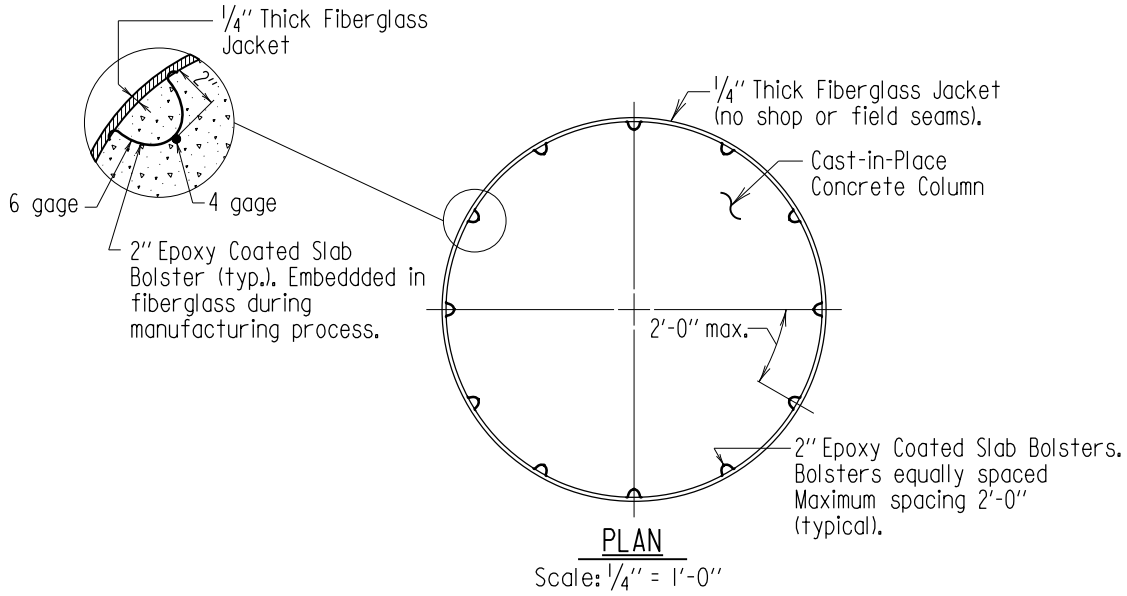
NOSE ANGLE FOR SOLID SHAFT WATER PIER

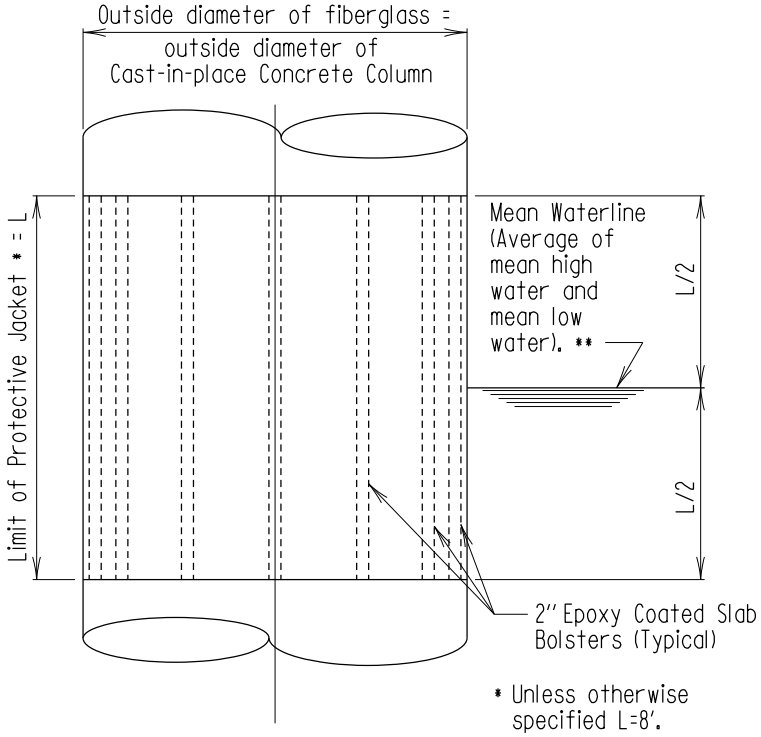
DETAIL NO. SUB-PR-201 SHEET 1 OF 1

SUBSTRUCTURE - PIER



PLAN

Scale: 1/4" = 1'-0"



ELEVATION

Scale: 1/4" = 1'-0"

* Unless otherwise specified L=8'.

** Unless otherwise specified, locate at this elevation.

Notes:

1. For fiberglass requirements see 921.11.
2. For other fiberglass jacket requirments see Special Provisions.
3. Inside of jacket shall be thoroughly cleaned.

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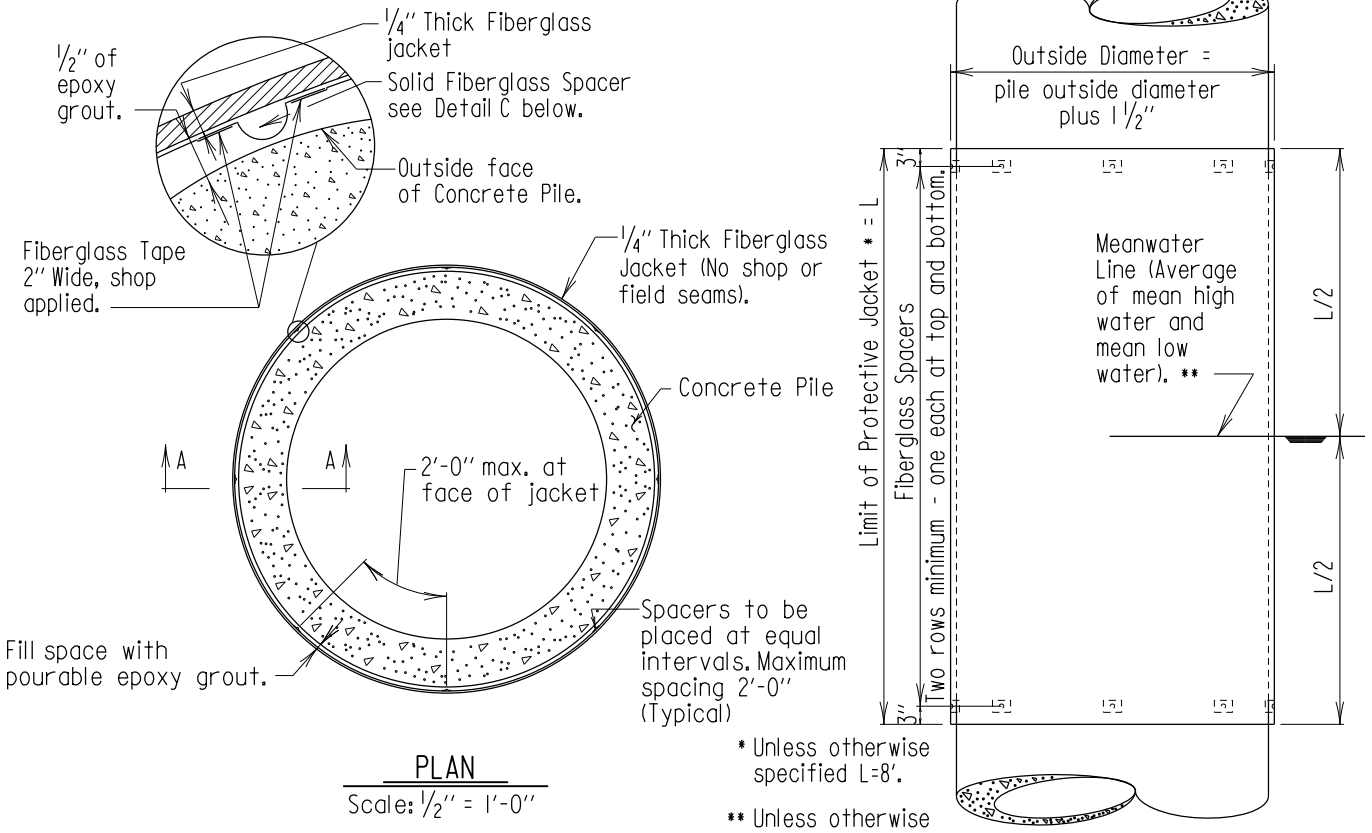
FIBERGLASS JACKET FOR CAST-IN-PLACE CONCRETE COLUMN

DETAIL NO. SUB-PR-301 SHEET 1 OF 1

SUBSTRUCTURE - PIER



PLAN

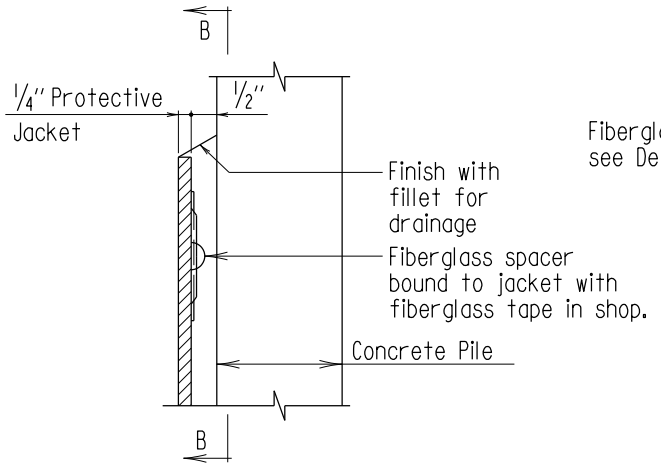
Scale: 1/2" = 1'-0"

* Unless otherwise specified L=8'.

** Unless otherwise specified, locate at this elevation.

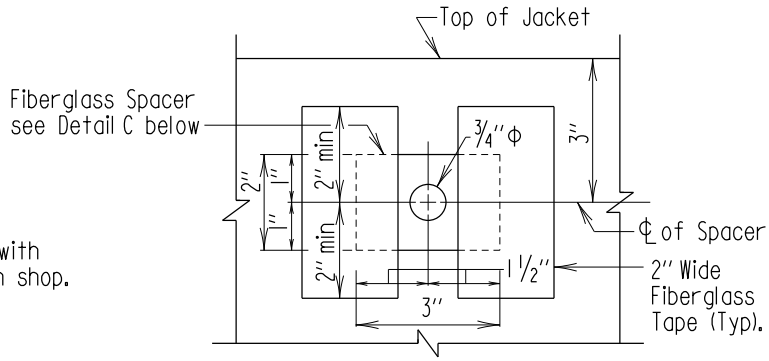
ELEVATION

Scale: 3/8" = 1'-0"



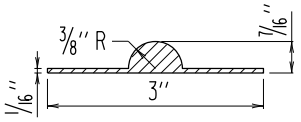
SECTION A-A

Scale: None



SECTION B-B

Scale: None



DETAIL C

Scale: None

Notes:

1. No vertical joints allowed.
2. Jackets to be placed before cap or footer is poured.
3. Fiberglass shall conform to 921.11.
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 418.

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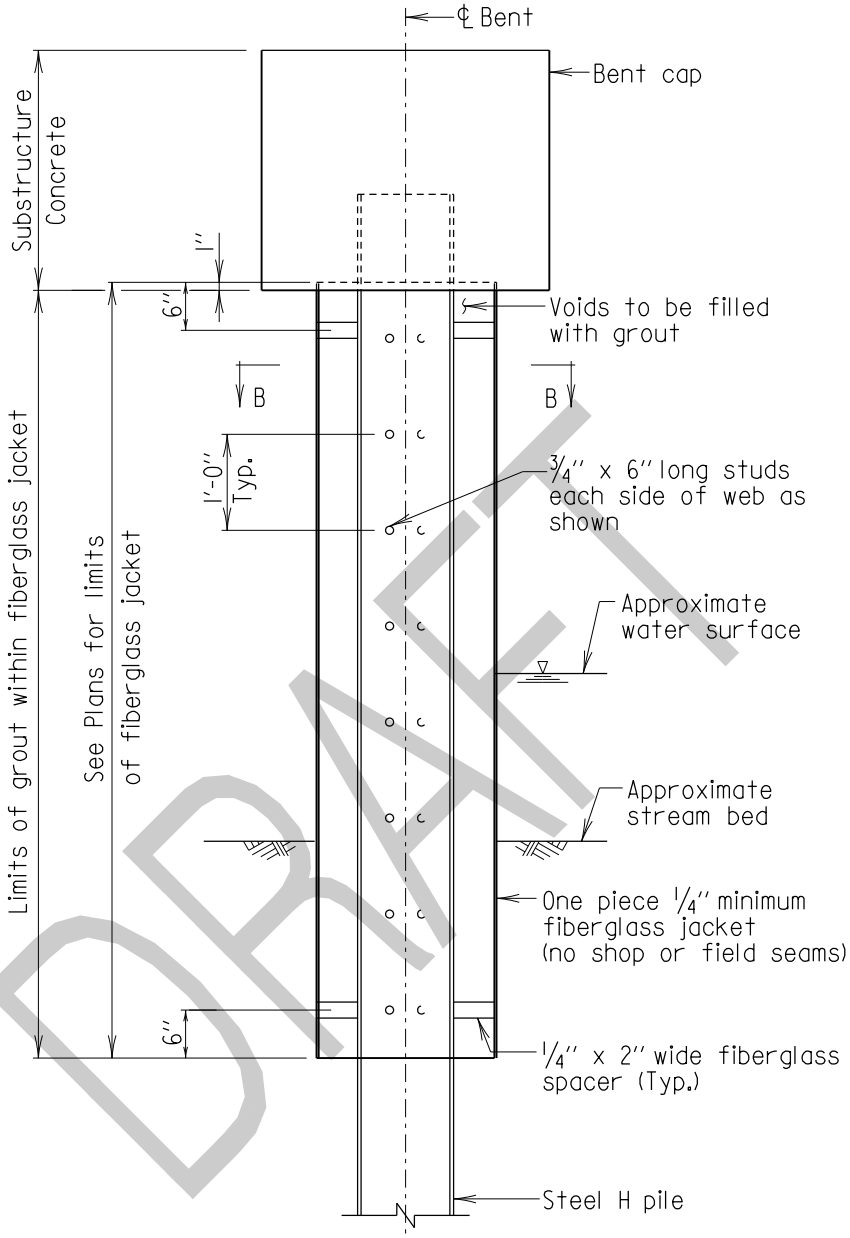
FIBERGLASS JACKET FOR NEW CYLINDER PILE

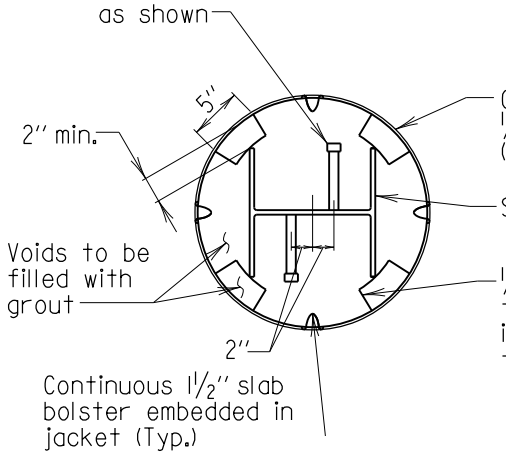
DETAIL NO. SUB-PR-302 SHEET 1 OF 1

SUBSTRUCTURE - PIER



ELEVATION

Scale: 1/2''= 1'-0''



SECTION B-B

Scale: None

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.

* PRELIMINARY DRAFT *

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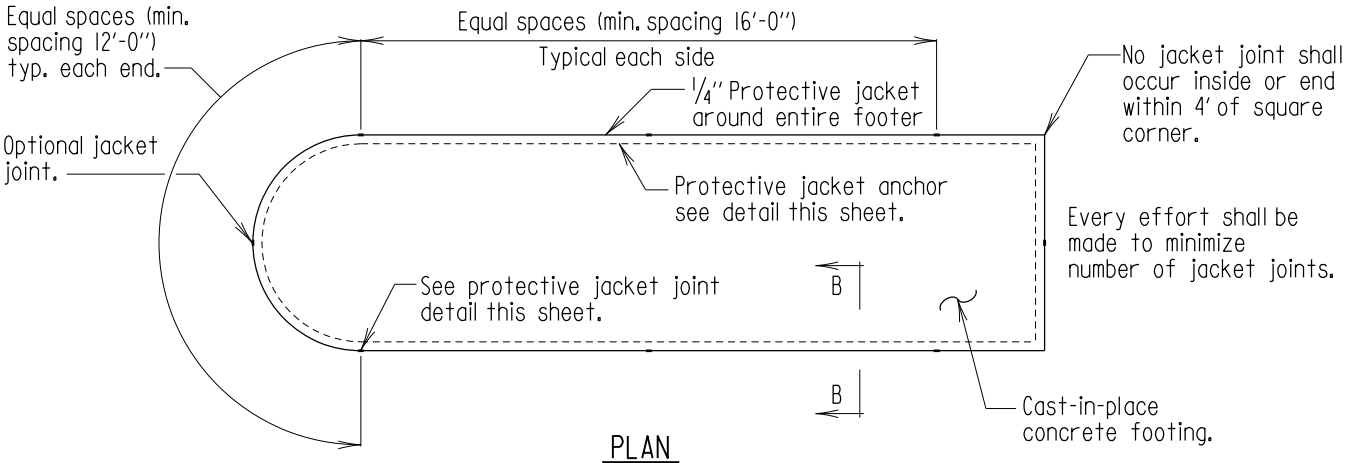
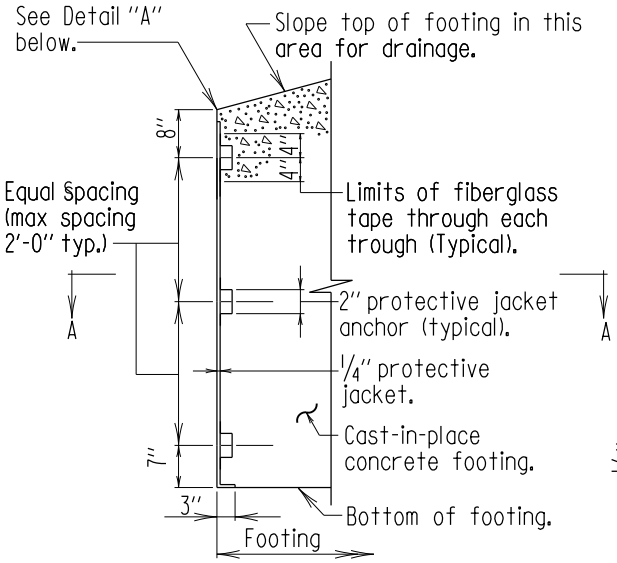
VERSION DRAFT	DETAIL NO. SUB-PR-303 SHEET 1 OF 1

SUBSTRUCTURE - PIER



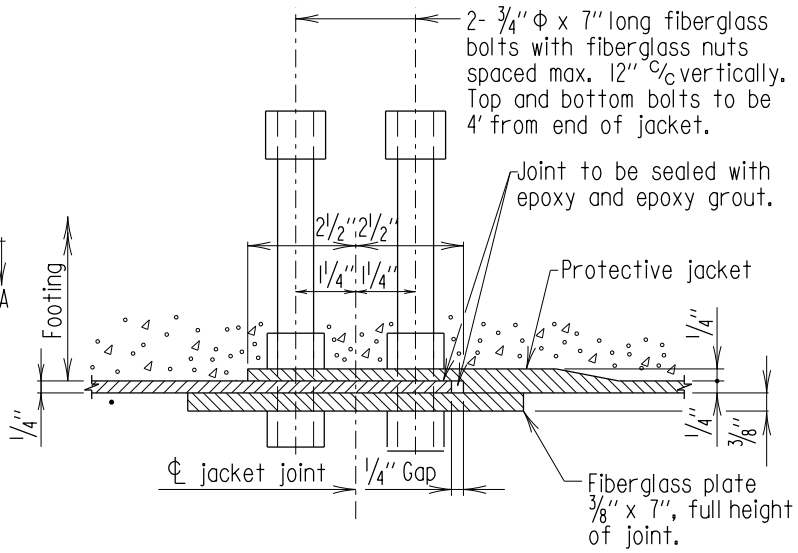
PLAN

Scale: None



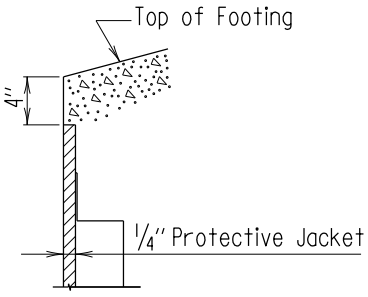
SECTION B-B

Scale: 3/8" = 1'-0"



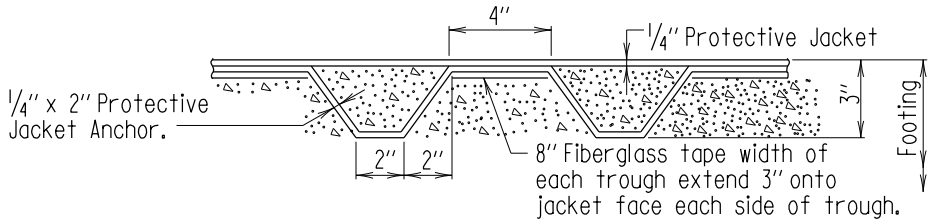
PROTECTIVE JACKET JOINT DETAIL

Scale: 3" = 1'-0"



DETAIL A

Scale: None



SECTION A-A

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

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.

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FIBERGLASS JACKET FOR CAST-IN-PLACE CONCRETE FOOTING

DETAIL NO. SUB-PR-304 SHEET 1 OF 1

SUBSTRUCTURE - PIER