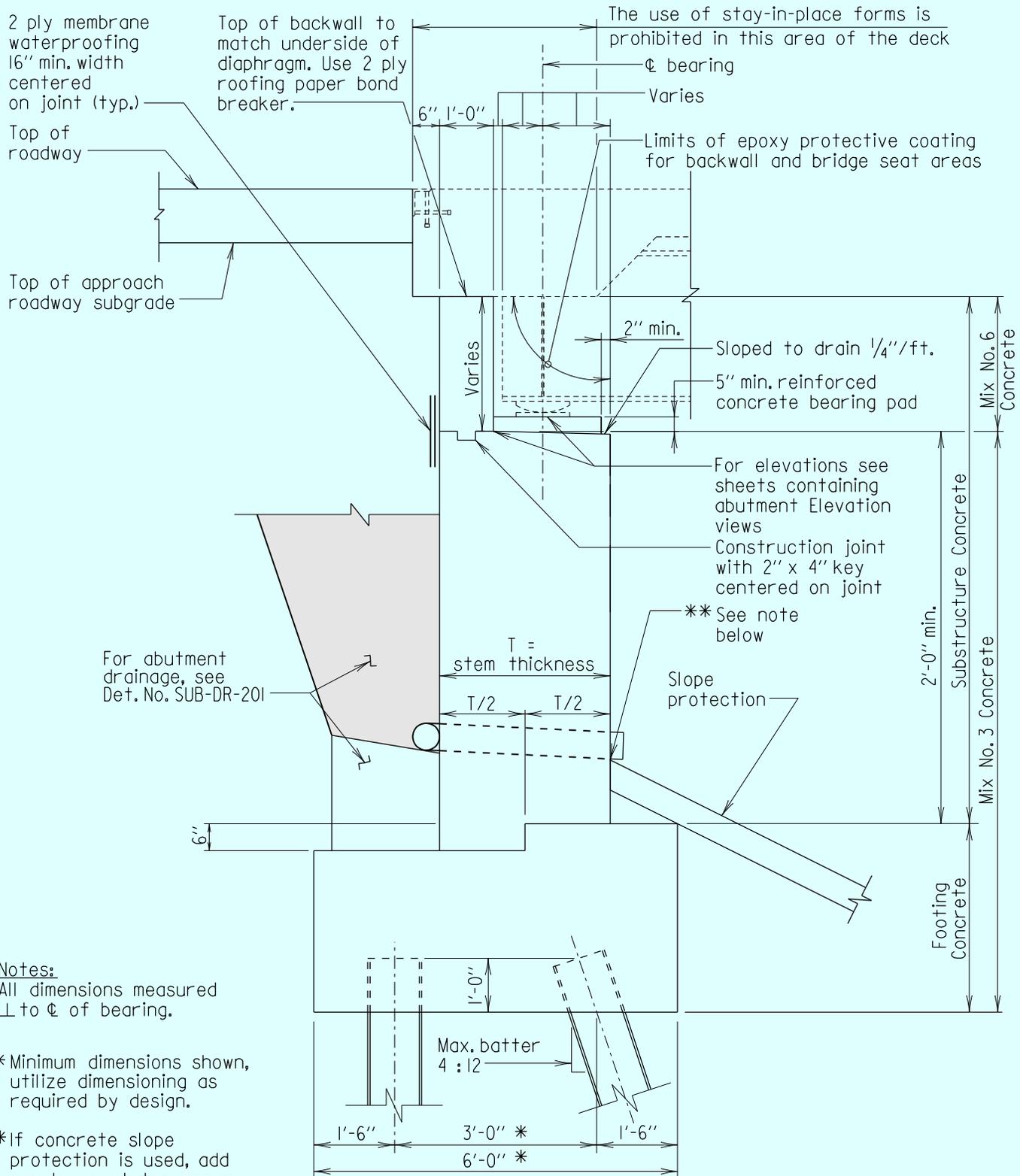


Chapter 02 - Substructure

SECTION 02

ABUTMENT (SUB-AB)



Notes:
 All dimensions measured \perp to ϕ of bearing.

* Minimum dimensions shown, utilize dimensioning as required by design.

** If concrete slope protection is used, add one layer of tar paper full contact area where substructure unit is adjacent to slope protection. The open joint that remains after slope protection has cured shall be filled with joint sealer conforming to Specifications.

SECTION

Scale: $\frac{3}{8}'' = 1'-0''$

*** FOR OFFICE USE ONLY ***

APPROVAL
<i>E.S. Friedman</i> DIRECTOR OFFICE OF STRUCTURES
DATE: 06/26/2013
VERSION
1.0

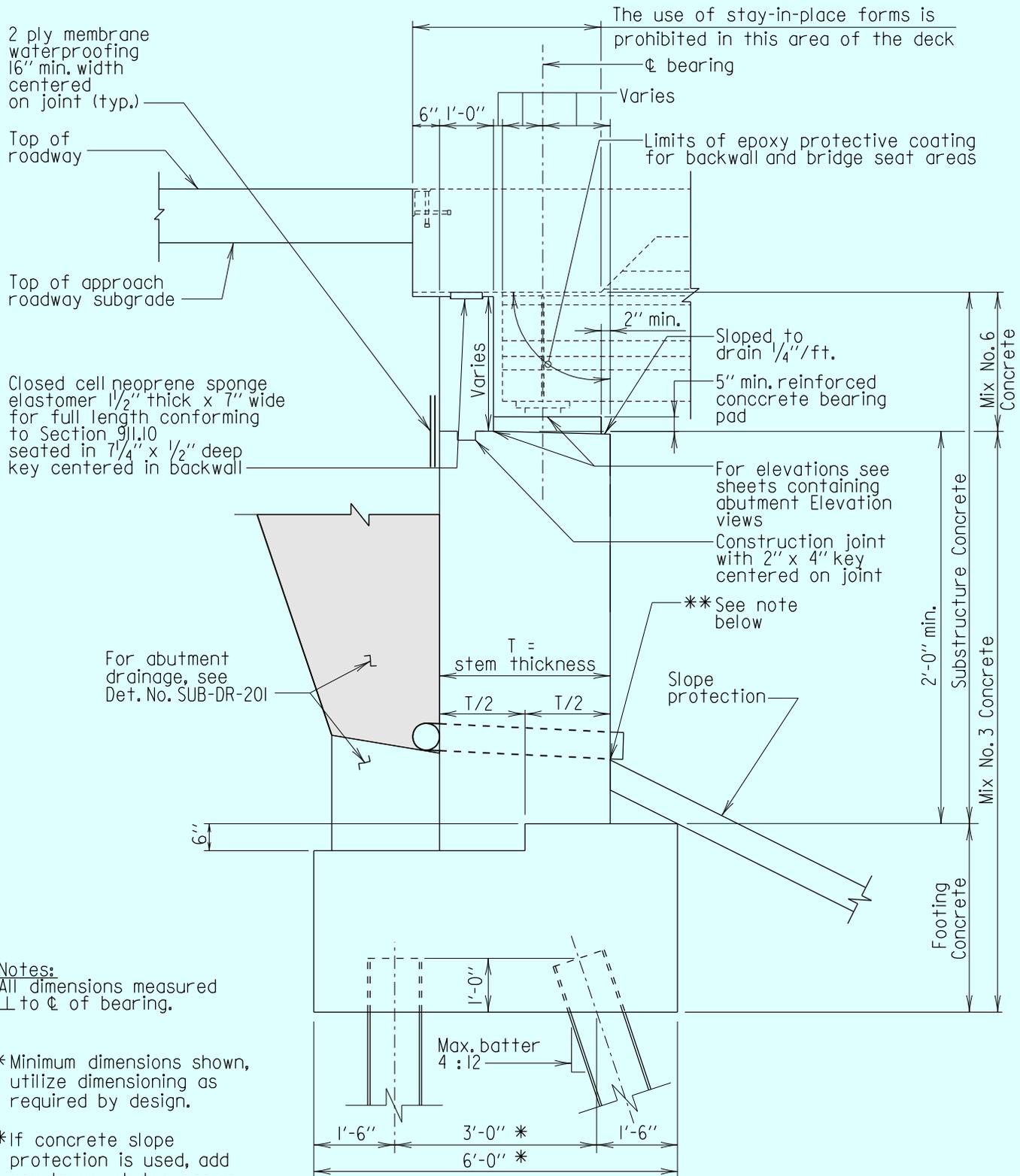
STATE OF MARYLAND
 DEPARTMENT OF TRANSPORTATION
 STATE HIGHWAY ADMINISTRATION
 OFFICE OF STRUCTURES

TYPICAL SECTION FOR CANTILEVER ABUTMENTS ON PILES CARRYING STEEL GIRDERS WITH STEEL FIXED BEARINGS OR STEEL EXPANSION BEARINGS WITH LENGTH CONTRIBUTING TO EXPANSION < 70 FT.

DETAIL NO. SUB-AB-101

SHEET 1 OF 4

SUBSTRUCTURE - ABUT



Notes:
 All dimensions measured \perp to \O of bearing.

* Minimum dimensions shown, utilize dimensioning as required by design.

** If concrete slope protection is used, add one layer of tar paper full contact area where substructure unit is adjacent to slope protection. The open joint that remains after slope protection has cured shall be filled with joint sealer conforming to Specifications.

SECTION

Scale: $\frac{3}{8}'' = 1'-0''$

*** FOR OFFICE USE ONLY ***

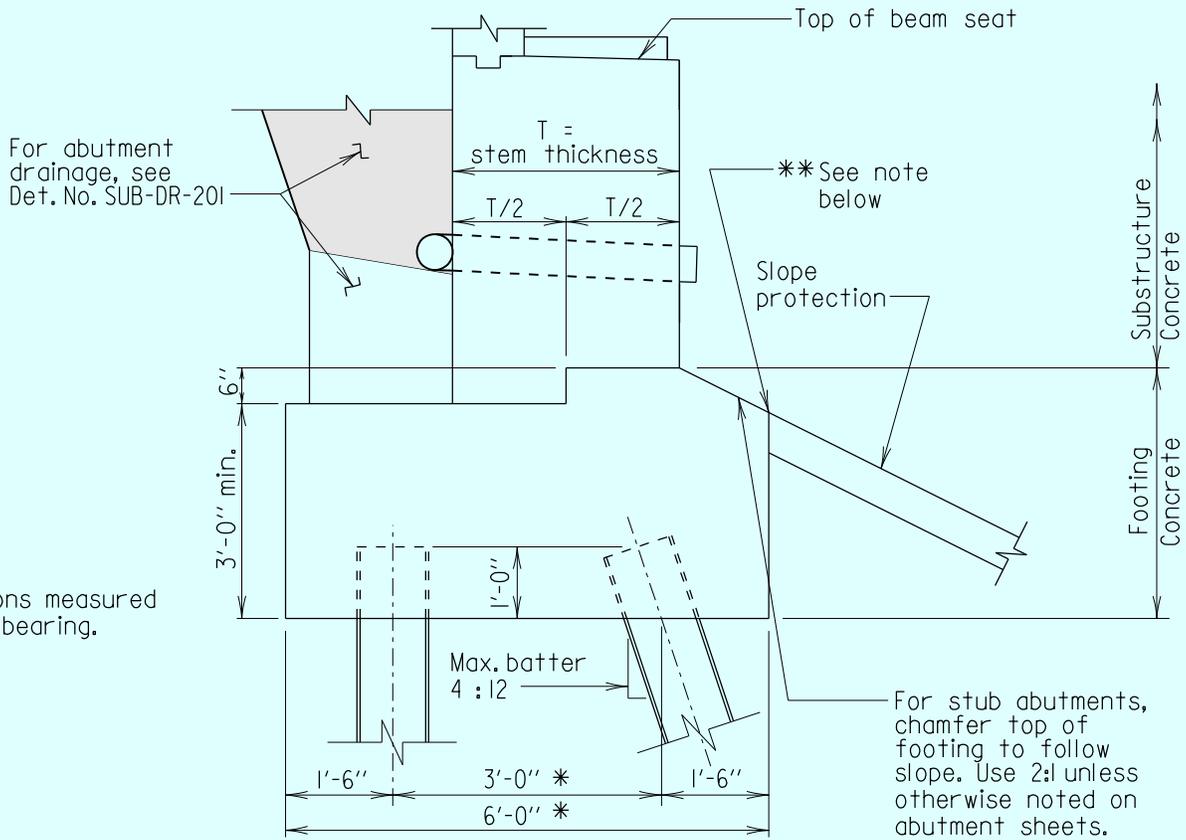
APPROVAL
<i>E.S. Friedman</i> DIRECTOR OFFICE OF STRUCTURES
DATE: 06/26/2013
VERSION
1.0

STATE OF MARYLAND
 DEPARTMENT OF TRANSPORTATION
 STATE HIGHWAY ADMINISTRATION
 OFFICE OF STRUCTURES

**TYPICAL SECTION FOR CANTILEVER ABUTMENTS ON PILES
 CARRYING PRESTRESSED CONCRETE GIRDERS WITH
 ELASTOMERIC FIXED BEARINGS OR ELASTOMERIC EXPANSION
 BEARINGS WITH LENGTH CONTRIBUTING TO EXPANSION \leq 70FT.**

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

SUBSTRUCTURE - ABUT

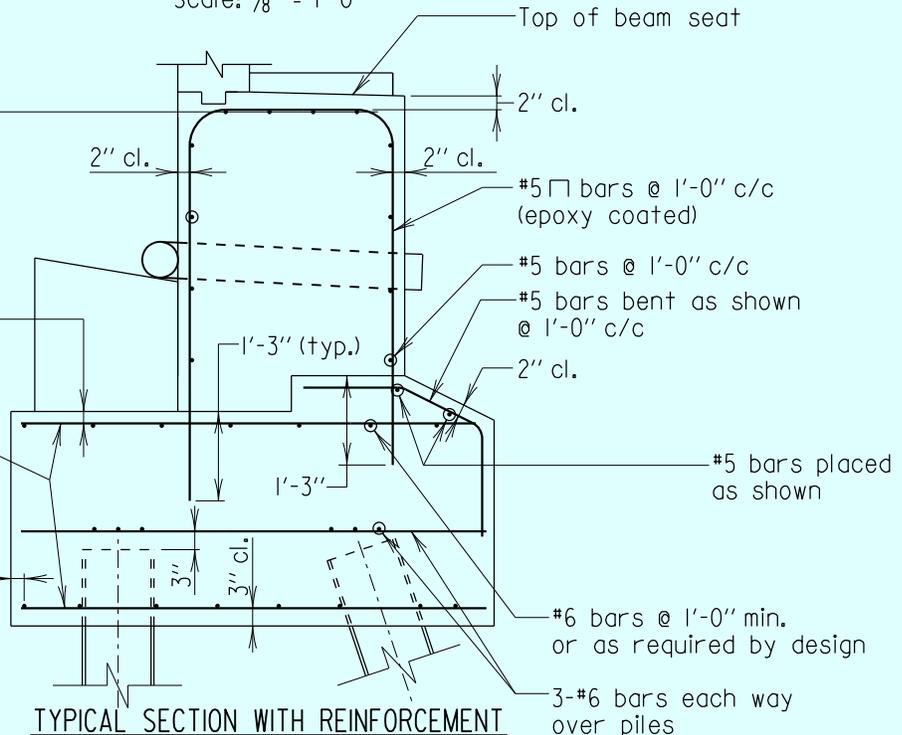


Note:
All dimensions measured \perp to $\text{\textcircled{C}}$ of bearing.

TYPICAL SECTION

Scale: $\frac{3}{8}'' = 1'-0''$

4-#5 bars spaced as shown min. (epoxy coated) add #5 bars as required @ 1'-0" c/c



TYPICAL SECTION WITH REINFORCEMENT

Scale: $\frac{3}{8}'' = 1'-0''$

Notes:
For beam seat, beam pad and backwall details, see Sheets 1,2 and 3 of this detail.

* Minimum dimensions shown, utilize dimensioning as required by design.

**If concrete slope protection is used, add one layer of tar paper full contact area where substructure unit is adjacent to slope protection. The open joint that remains after slope protection has cured shall be filled with joint sealer conforming to Specifications.

*** FOR OFFICE USE ONLY ***

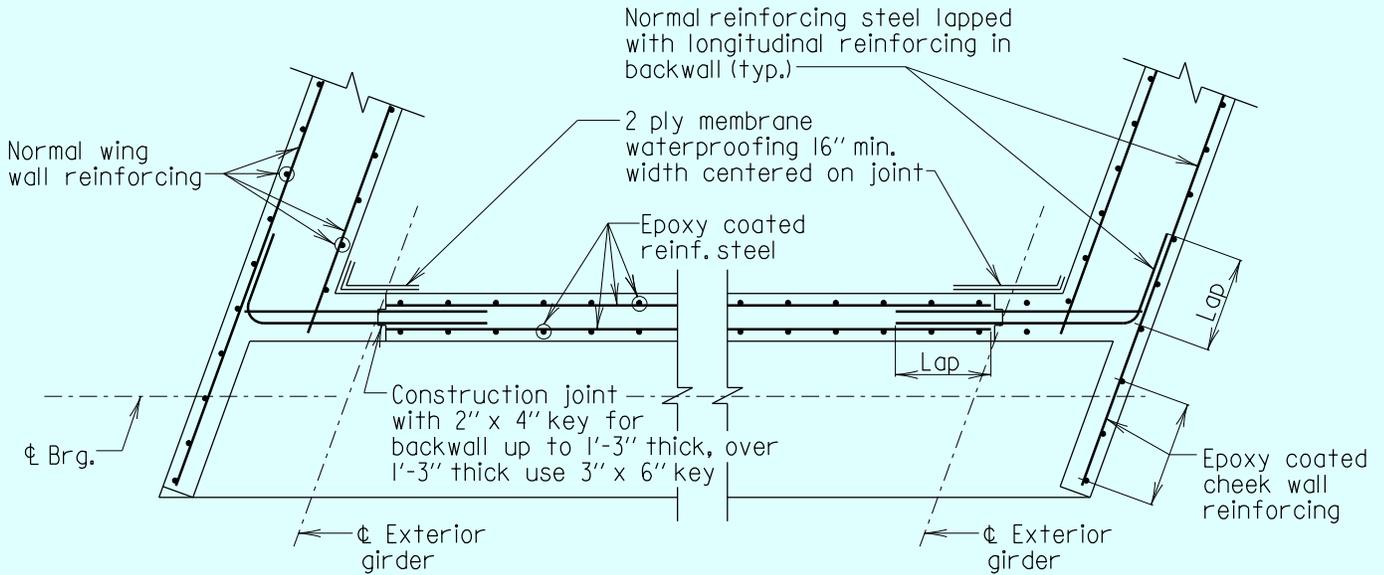
APPROVAL
<i>E.S. Friedman</i> DIRECTOR OFFICE OF STRUCTURES
DATE: 06/26/2013
VERSION
1.0

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF STRUCTURES

**TYPICAL SECTION FOR STUB ABUTMENTS
ON PILES WITH FIXED BEARINGS OR EXPANSION BEARINGS
WITH LENGTH CONTRIBUTING TO EXPANSION \leq 70FT.**

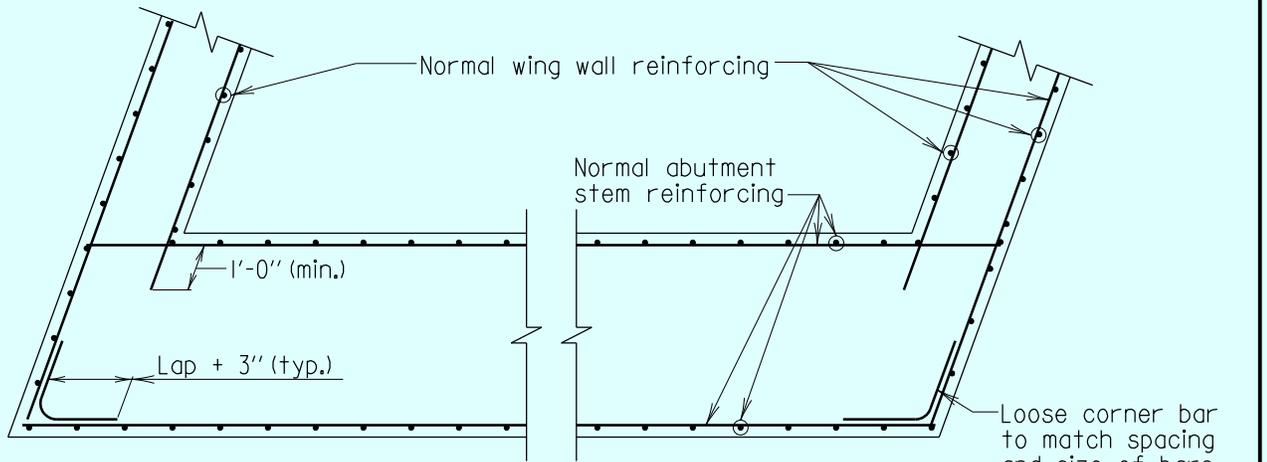
DETAIL NO. SUB-AB-101 SHEET 4 OF 4

SUBSTRUCTURE - ABUT



SECTION ABOVE BRIDGE SEAT

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



SECTION BELOW BRIDGE SEAT

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

Note:

1. For bar lap lengths, see appropriate bar lap charts.
2. For normal reinforcing steel size and spacing refer to typical abutment and wing wall sections.

*** FOR OFFICE USE ONLY ***

APPROVAL
<i>E.S. Friedman</i> DIRECTOR OFFICE OF STRUCTURES
DATE: 12/20/2011
VERSION
1.0

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF STRUCTURES

WING WALL/ABUTMENT CONNECTIONS FOR FIXED BEARINGS OR EXPANSION BEARINGS WITH LENGTH CONTRIBUTING TO EXPANSION ≤ 70FT. REINFORCING DETAILS

DETAIL NO. SUB-AB-102 SHEET 1 OF 1

SUBSTRUCTURE - ABUT

The use of stay-in-place forms is prohibited in this area of the deck

2 ply membrane waterproofing 16" min. width centered on joint all around (typ.)

Top of roadway

Top of approach roadway subgrade

Expansion joint cross beam shall not be placed until adjacent deck placement has been completed

Construction joint with 2" x 6" x 6" key

Construction joint with 2" x 6" x 1'-2" key

For abutment drainage, see Det. No. SUB-DR-202

1'-6" x 2'-2" exp. jt. cross beam support columns equally spaced at 15'-0" max. c/c across rear face of abutment stem. For staged construction and columns at wing walls, see Det. No. SUB-AB-202. ****

Notes:

All dimensions measured \perp to ϕ of bearing.

* Minimum dimensions shown, utilize dimensions as required by design.

** If concrete slope protection is used, add one layer of tar paper full contact area where substructure unit is adjacent to slope protection. The open joint that remains after slope protection has cured shall be filled with joint sealer conforming to Specifications.

*** X = joint opening dimension see chart on joint seal details.

**** The Contractor has the option to cast the exp. jt. cross beam support column monolithically with the abutment and backwall stem or in a separate pour. No additional compensation will be given for either alternate selected.

Top of backwall to match underside of diaphragm. Use closed cell neoprene sponge elastomer 1/2" thick x 7" wide for full length, conforming to Section 911.10, seated in 7/4" x 1/2" deep key centered in backwall between ϕ to ϕ exterior stringers.

Varies

Limits of epoxy protective coating for backwall and bridge seat areas

Sloped to drain 1/4"/ft.
5" min. reinforced concrete bearing pad

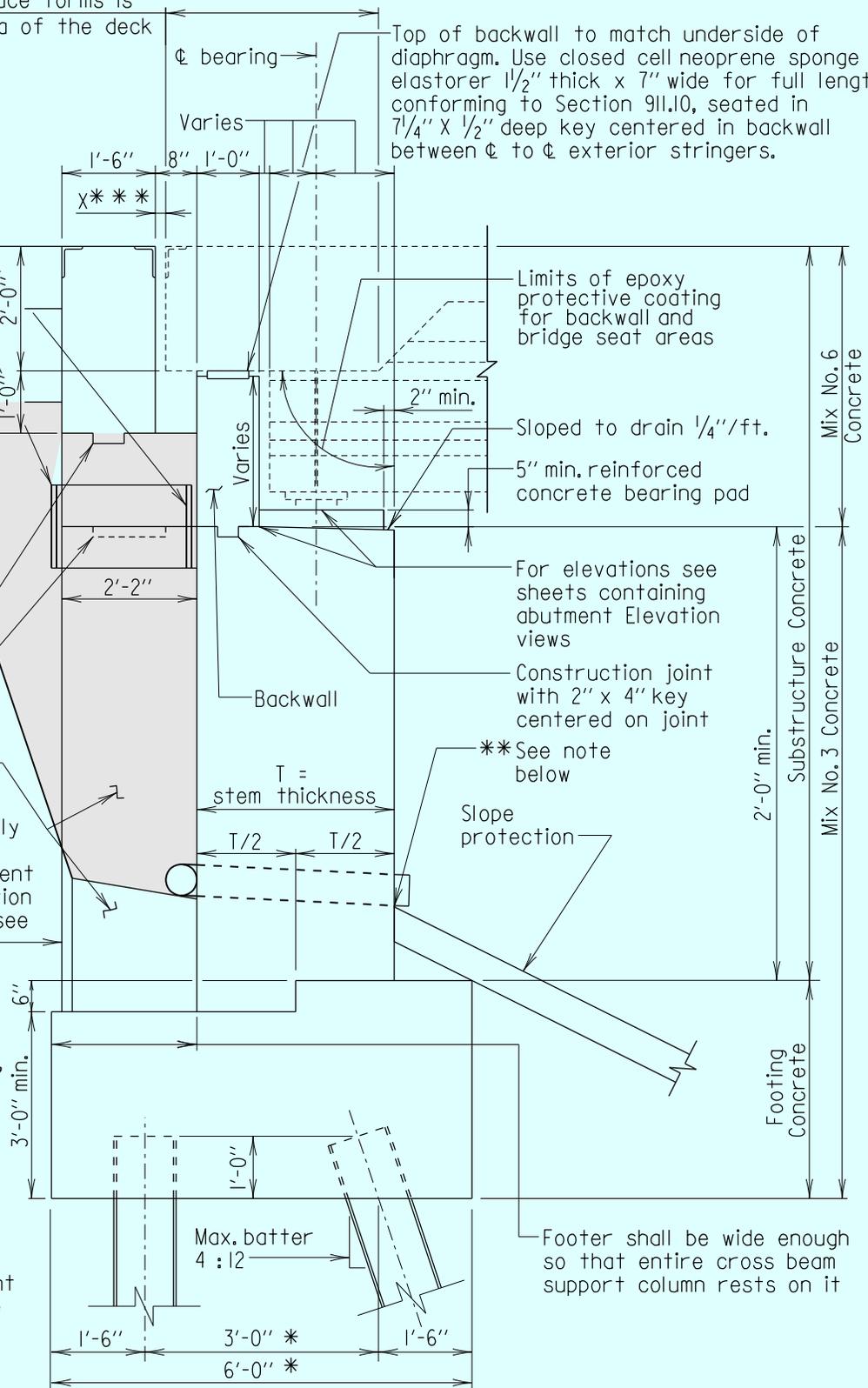
For elevations see sheets containing abutment Elevation views

Construction joint with 2" x 4" key centered on joint

** See note below

Slope protection

Footer shall be wide enough so that entire cross beam support column rests on it



SECTION

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

*** FOR OFFICE USE ONLY ***

APPROVAL
<i>E.S. Friedman</i> DIRECTOR OFFICE OF STRUCTURES
DATE: 10/03/2013
VERSION
1.0

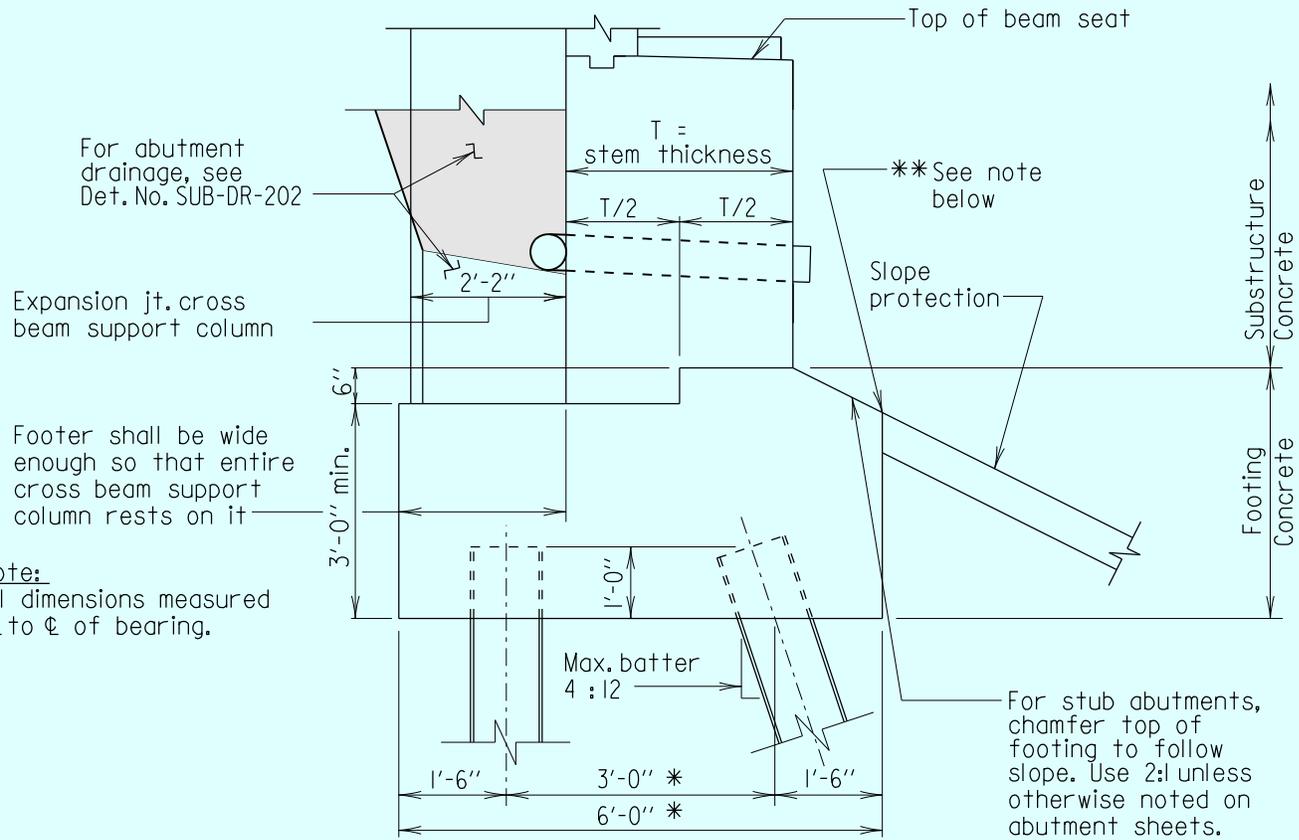
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF STRUCTURES

**TYPICAL SECTION FOR CANTILEVER ABUTMENTS
ON PILES CARRYING PRESTRESSED CONCRETE GIRDERS
WITH ELASTOMERIC EXPANSION BEARINGS
WITH LENGTH CONTRIBUTING TO EXPANSION > 70 FT.**

DETAIL NO. SUB-AB-201

SHEET 2 OF 4

SUBSTRUCTURE - ABUT



Note:
All dimensions measured
⊥ to ϕ of bearing.

SECTION

Scale: $\frac{3}{8}'' = 1'-0''$

4-#5 bars spaced as shown min. (epoxy coated) 1'-0" c/c

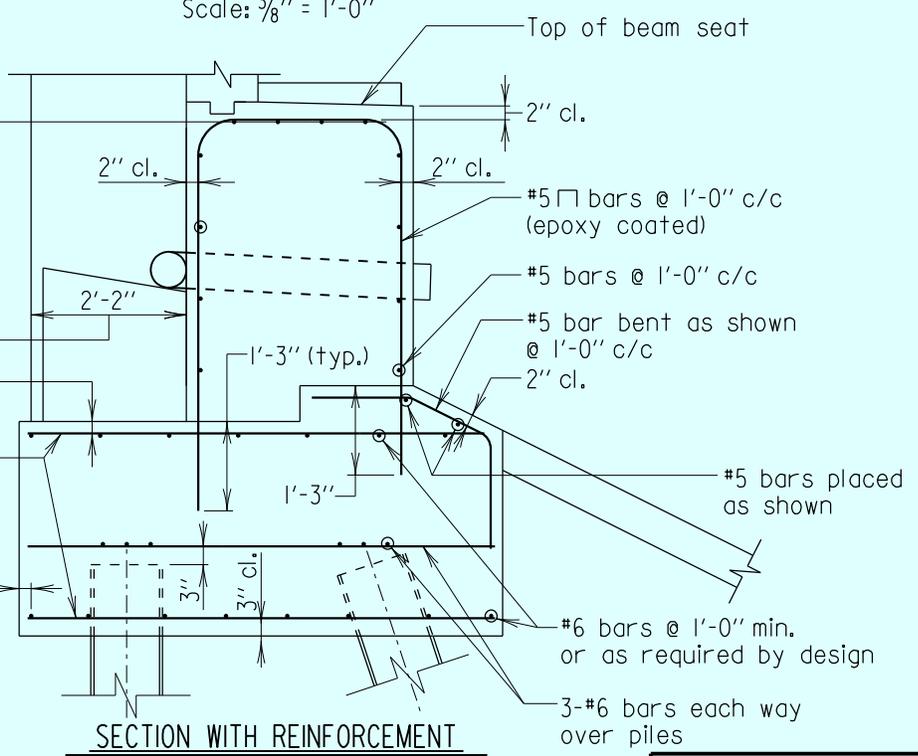
Expansion jt. cross beam support column 2" cl. min.

#5 bars @ 1'-0" c/c min. or as required by design

Notes:
For beam seat, beam pad and backwall details, see Sheets 1, 2 and 3.

* Minimum dimensions shown, utilize dimensioning as required by design.

** If concrete slope protection is used, add one layer of tar paper full contact area where substructure unit is adjacent to slope protection. The open joint that remains after slope protection has cured shall be filled with joint sealer conforming to Specifications.



SECTION WITH REINFORCEMENT

Scale: $\frac{3}{8}'' = 1'-0''$

*** FOR OFFICE USE ONLY ***

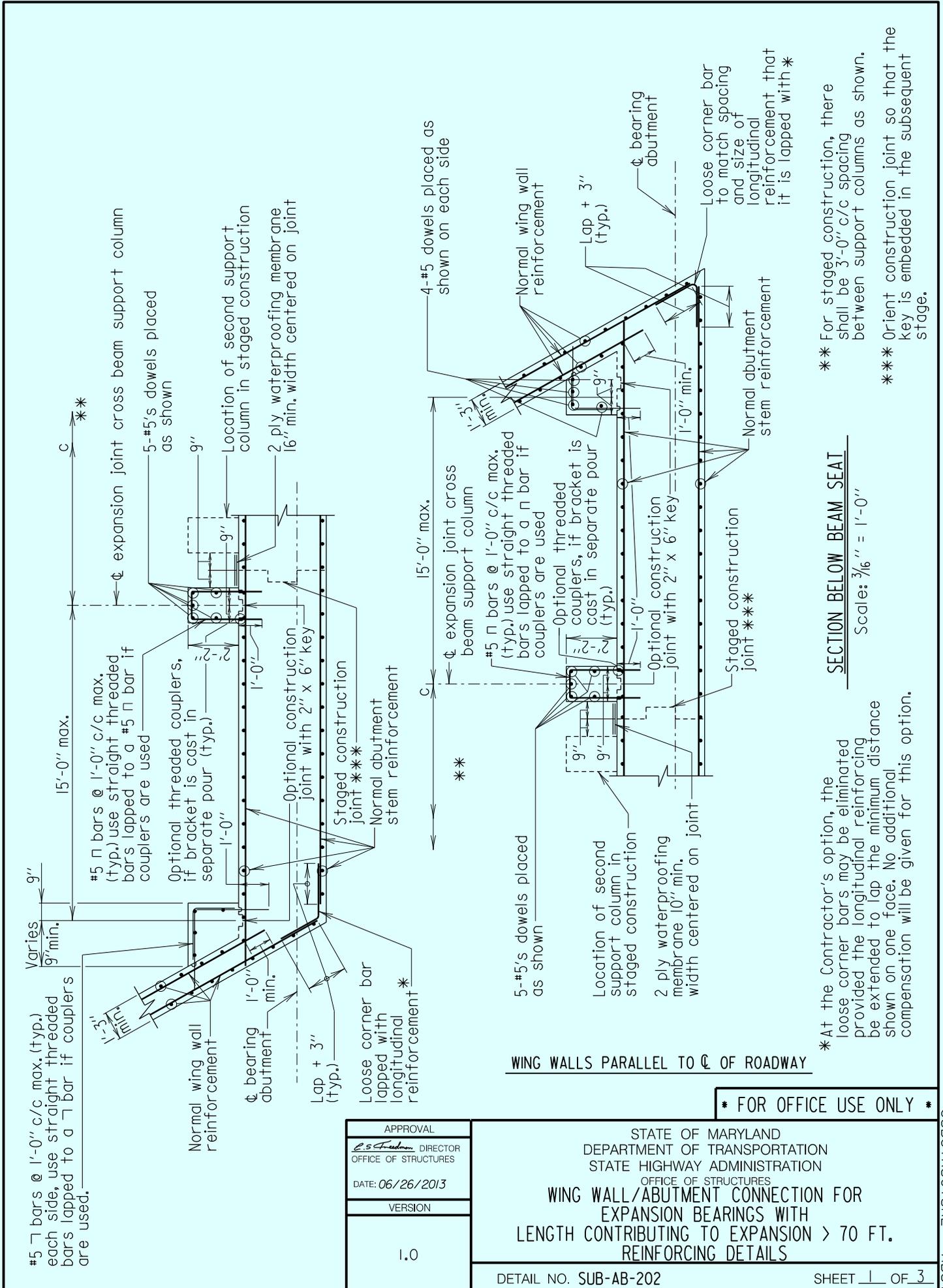
APPROVAL
<i>C. S. Friedman</i> DIRECTOR OFFICE OF STRUCTURES
DATE: 10/03/2013
VERSION
1.0

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF STRUCTURES

TYPICAL SECTION FOR STUB ABUTMENTS ON PILES WITH EXPANSION BEARINGS WITH LENGTH CONTRIBUTING TO EXPANSION > 70 FT.

DETAIL NO. SUB-AB-201 SHEET 4 OF 4

SUBSTRUCTURE - ABUT



#5 bars @ 1'-0" c/c max. (typ.) each side, use straight threaded bars lapped to a 7 bar if couplers are used.

15'-0" max.

C

expansion joint cross beam support column
5-#5's dowels placed as shown
Location of second support column in staged construction
2 ply waterproofing membrane 16" min. width centered on joint

#5 bars @ 1'-0" c/c max. (typ.) use straight threaded bars lapped to a #5 bar if couplers are used
Optional threaded couplers, if bracket is cast in separate pour (typ.)
Optional construction joint with 2" x 6" key
Staged construction joint ***
Normal abutment stem reinforcement

Normal wing wall reinforcement
bearing abutment
Lap + 3" (typ.)
Loose corner bar lapped with longitudinal reinforcement *

15'-0" max.
expansion joint cross beam support column
4-#5 dowels placed as shown on each side

#5 bars @ 1'-0" c/c max. (typ.) use straight threaded bars lapped to a n bar if couplers are used
Optional threaded couplers, if bracket is cast in separate pour (typ.)
Optional construction joint with 2" x 6" key
Staged construction joint ***

5-#5's dowels placed as shown
Location of second support column in staged construction
2 ply waterproofing membrane 10" min. width centered on joint

WING WALLS PARALLEL TO C OF ROADWAY

Normal wing wall reinforcement
Lap + 3" (typ.)
bearing abutment
Loose corner bar to match spacing and size of longitudinal reinforcement that it is lapped with *
Normal abutment stem reinforcement

** For staged construction, there shall be 3'-0" c/c spacing between support columns as shown.
*** Orient construction joint so that the key is embedded in the subsequent stage.

SECTION BELOW BEAM SEAT
Scale: 3/16" = 1'-0"

* At the Contractor's option, the loose corner bars may be eliminated provided the longitudinal reinforcing be extended to lap the minimum distance shown on one face. No additional compensation will be given for this option.

* FOR OFFICE USE ONLY *

APPROVAL	
<i>E.S. Friedman</i>	DIRECTOR
OFFICE OF STRUCTURES	
DATE: 06/26/2013	
VERSION	
1.0	

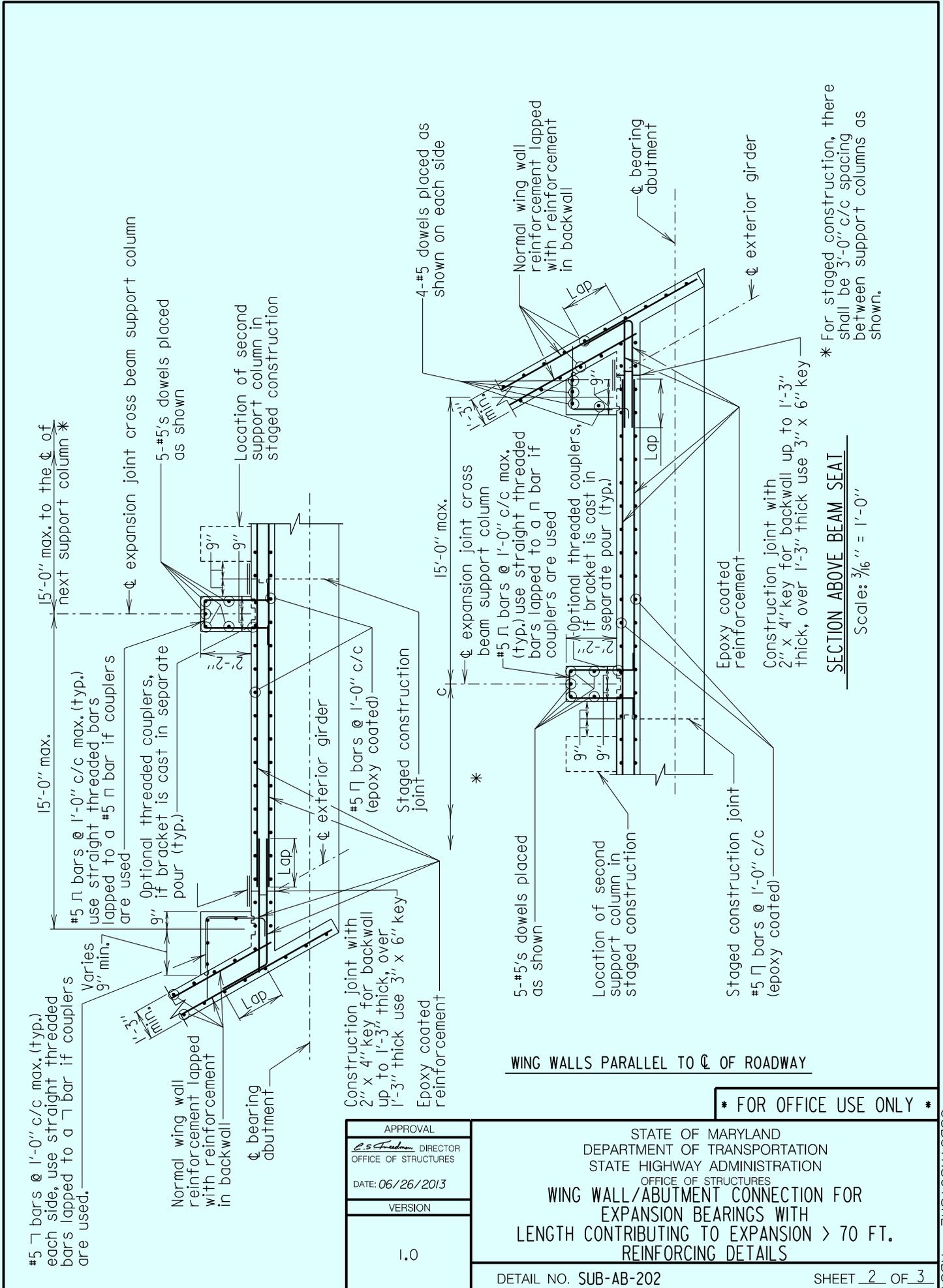
STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF STRUCTURES

**WING WALL/ABUTMENT CONNECTION FOR
EXPANSION BEARINGS WITH
LENGTH CONTRIBUTING TO EXPANSION > 70 FT.
REINFORCING DETAILS**

DETAIL NO. SUB-AB-202

SHEET 1 OF 3

SUBSTRUCTURE - ABUT



#5 \sqcap bars @ 1'-0" c/c max. (typ.) use straight threaded bars lapped to a \sqcap bar if couplers are used.

Optional threaded couplers, if bracket is cast in separate pour (typ.)

Normal wing wall reinforcement lapped with reinforcement in backwall

Construction joint with 2" x 4" key for backwall up to 1'-3" thick, over 1'-3" thick use 3" x 6" key

Epoxy coated reinforcement

#5 \sqcap bars @ 1'-0" c/c (epoxy coated)

Staged construction joint

15'-0" max. expansion joint cross beam support column

#5 \sqcap bars @ 1'-0" c/c max. (typ.) use straight threaded bars lapped to a \sqcap bar if couplers are used

Optional threaded couplers, if bracket is cast in separate pour (typ.)

Epoxy coated reinforcement

Staged construction joint

#5 \sqcap bars @ 1'-0" c/c (epoxy coated)

Construction joint with 2" x 4" key for backwall up to 1'-3" thick, over 1'-3" thick use 3" x 6" key

Epoxy coated reinforcement

15'-0" max. expansion joint cross beam support column

4-#5 dowels placed as shown on each side

Normal wing wall reinforcement lapped with reinforcement in backwall

bearing abutment

exterior girder

WING WALLS PARALLEL TO ϕ OF ROADWAY

* FOR OFFICE USE ONLY *

APPROVAL	
<i>E.S. Friedman</i>	DIRECTOR
OFFICE OF STRUCTURES	
DATE: 06/26/2013	
VERSION	
1.0	

STATE OF MARYLAND
 DEPARTMENT OF TRANSPORTATION
 STATE HIGHWAY ADMINISTRATION
 OFFICE OF STRUCTURES

**WING WALL/ABUTMENT CONNECTION FOR
 EXPANSION BEARINGS WITH
 LENGTH CONTRIBUTING TO EXPANSION > 70 FT.
 REINFORCING DETAILS**

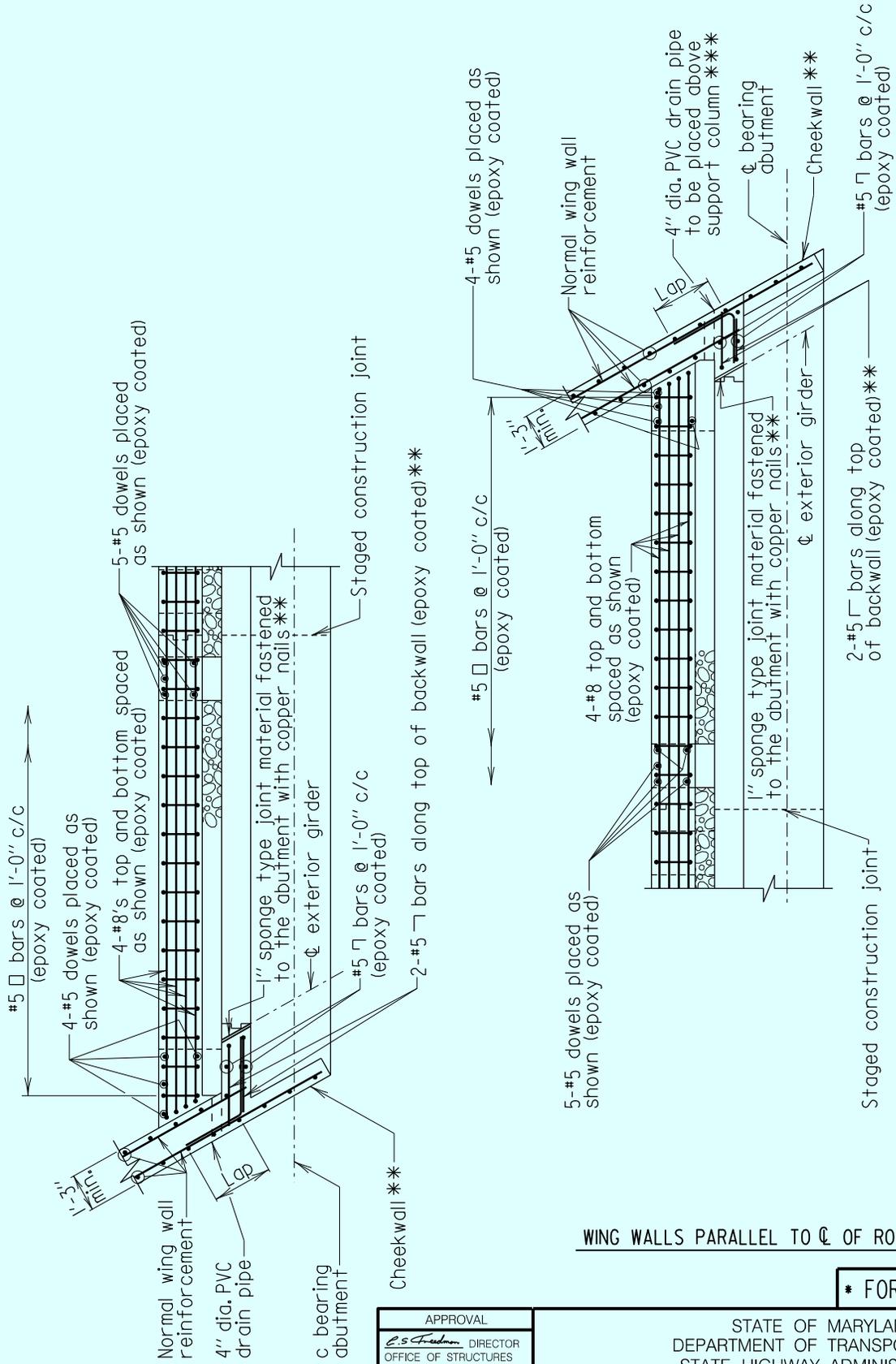
DETAIL NO. SUB-AB-202

SHEET 2 OF 3

* For staged construction, there shall be 3'-0" c/c spacing between support columns as shown.

SECTION ABOVE BEAM SEAT
 Scale: 3/16" = 1'-0"

SUBSTRUCTURE - ABUT



SECTION ABOVE BEAM SEAT THROUGH EXPANSION JOINT CROSS BEAM

Scale: 3/16" = 1'-0"

**For more details, see "Cheek Wall at Bridge Abutment" detail.

**Designer shall show this conduit on wing wall elevation sheets.

* FOR OFFICE USE ONLY *

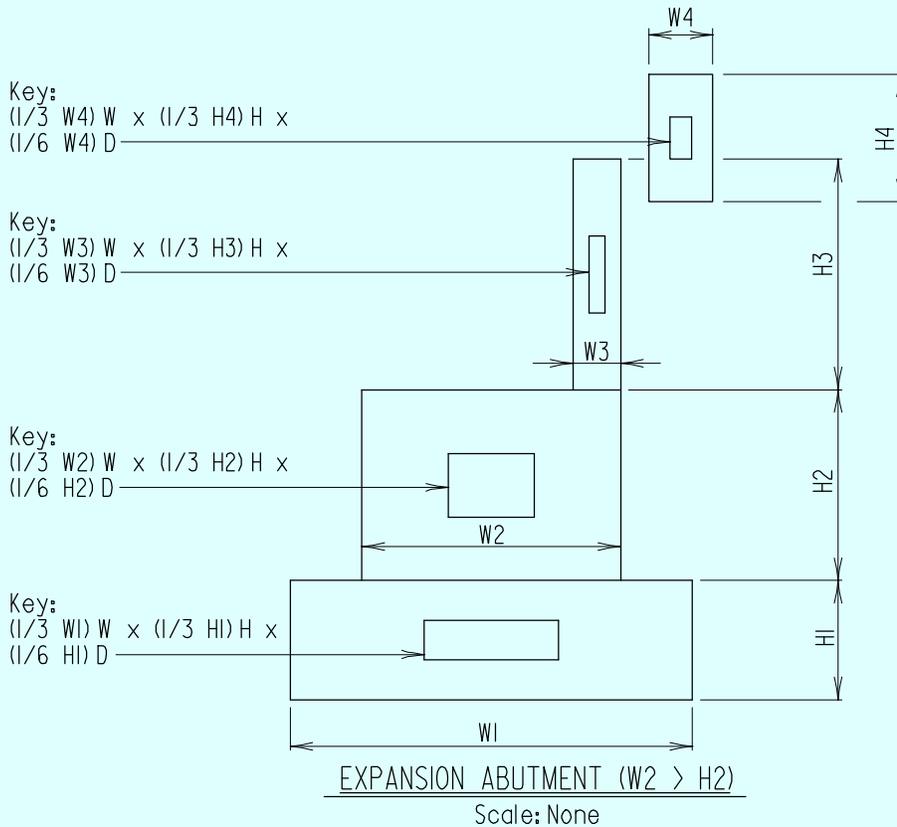
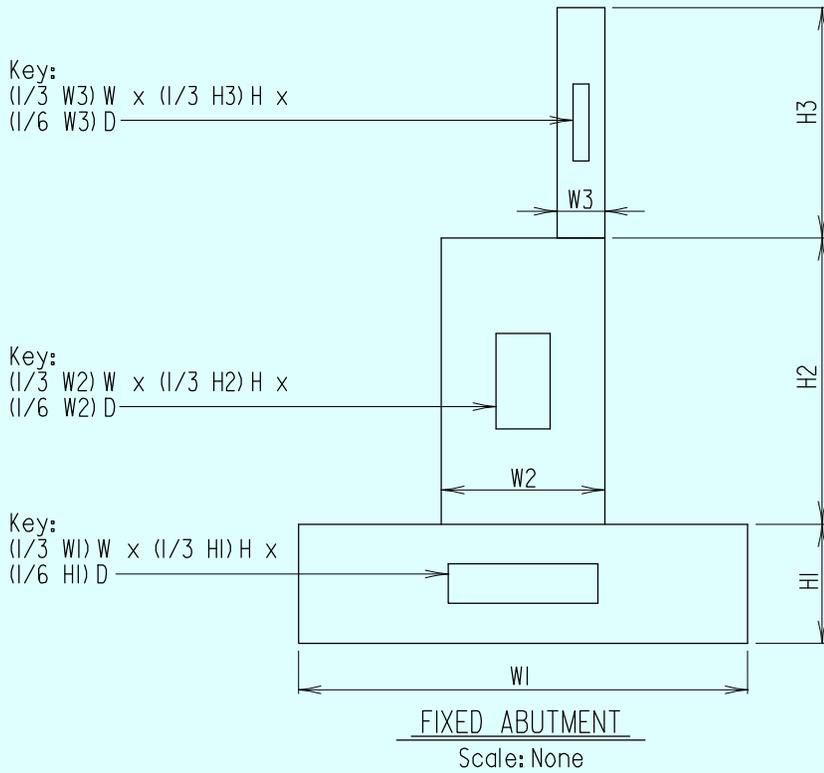
APPROVAL	
<i>C.S. Friedman</i>	DIRECTOR
OFFICE OF STRUCTURES	
DATE: 06/26/2013	
VERSION	
1.0	

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF STRUCTURES

**WING WALL/ABUTMENT CONNECTION FOR
EXPANSION BEARINGS WITH
LENGTH CONTRIBUTING TO EXPANSION > 70 FT.
REINFORCING DETAILS**

DETAIL NO. SUB-AB-202 SHEET 3 OF 3

SUBSTRUCTURE-ABUT



Note:
A detail showing the keyways at construction joints in the abutments shall be included in the Contract Plans. The information provided in this Detail is for guidance only.

APPROVAL
<i>Gene C. [Signature]</i> DIRECTOR OFFICE OF STRUCTURES DATE: 05/07/2018
VERSION
1.0

FOR OFFICE USE ONLY
STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION OFFICE OF STRUCTURES
KEYWAYS AT CONSTRUCTION JOINTS IN ABUTMENTS
DETAIL NO. SUB-AB-301
SHEET <u> </u> OF <u> </u>

SUBSTRUCTURE - ABUT