Chapter 03 - Superstructure

SECTION 02

TRAFFIC BARRIERS (PARAPETS) (SUP-TB)
Chapter 03 - Superstructure

Section 02 – Traffic Barriers

**SUB-SECTION 01**

42” F-SHAPE PARAPET  
(SUP-TB(42F))

and

42" SINGLE SLOPE PARAPET  
(SUP-TB(42SS))
Notes:
1. All #7 and #8 longitudinal bars shall be placed continuously in the parapet from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. Key is nominal size.
3. All reinforcing steel to be epoxy coated.
4. Concrete deck reinforcing steel not shown.

**In order to ensure a smooth and acceptable surface, 420.03.11 (Construction joints) will be strictly adhered to.**

**Slab depth minus 1".”

MASH COMPLIANT TL-5 BRIDGE RAILING

STATE OF MARYLAND
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LEVEL OR LOW SIDE OF CROSS SLOPE 42" F-SHAPE PARAPET WITH STRAIGHT BACK

SUPER - TRAFFIC BARRIERS
Front face configuration constructed perpendicular to roadway surface.

Contractor has the option of either constructing rear face plumb or on a slope perpendicular to roadway surface. However, whatever option is chosen must be used throughout all structure(s) at a particular crossing. No additional compensation will be provided to the contractor for whatever option is chosen.

Note: For all details not shown see sheet 1 of 2.

SCALE: 1" = 1'-0''

SECTION

MASH COMPLIANT TL-5 BRIDGE RAILING

SUPER - TRAFFIC BARRIER
Notes:
1. All #7 and #8 longitudinal bars shall be placed continuously in the parapet from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. Key is nominal size.
3. All reinforcing steel to be epoxy coated.
4. Concrete deck reinforcing steel not shown.

MASH COMPLIANT TL-5 BRIDGE RAILING

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LEVEL OR LOW SIDE OF CROSS SLOPE 42" F-SHAPE PARAPET WITH DIAMOND BACK

SHEET 1 OF 2

DETAIL NO. SUP-TB(42F)-102
Note:
For all details not shown see sheet 1 of 2.

MASH COMPLIANT TL-5 BRIDGE RAILING

SUPER - TRAFFIC BARRIER

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HIGH SIDE OF CROSS SLOPE
42" F-SHAPE PARAPET
WITH DIAMOND BACK

APPROVAL
DIRECTOR
OFFICE OF STRUCTURES
DATE: 08/16/2019
VERSION 1.01

DETAIL NO. SUP-TB(42F)-102 SHEET 2 OF 2
Notes:
1. All #5, #7 and #8 longitudinal bars shall be placed continuously in the parapet from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. Key is nominal size.
3. All reinforcing steel to be epoxy coated.
4. Concrete deck reinforcing steel not shown.

MASH COMPLIANT TL-5 BRIDGE RAILING
Note:
For all details not shown see sheet 1 of 2.

MASH COMPLIANT TL-5 BRIDGE RAILING

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HIGH SIDE OF CROSS SLOPE
42” F-SHAPE PARAPET
WITH ARCHITECTURAL FINISH

Detail No. SUP-TB(42F)-103
Sheet 2 of 2
Notes:
1. All #7 and #8 longitudinal bars shall be placed continuously in the parapet from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. Key is nominal size.
3. All reinforcing steel to be epoxy coated.
4. Concrete deck reinforcing steel not shown.

In order to ensure a smooth and acceptable surface, 420.03.11 (Construction joints) will be strictly adhered to.

** Slab depth minus 1".

**SCALE: 1" = 1'-0"

MASH COMPLIANT TL-5 BRIDGE RAILING

LEVEL OR LOW SIDE OF CROSS SLOPE 42" SINGLE SLOPE PARAPET WITH STRAIGHT BACK

SUP-TB(42SS)-101

1.01
Note:
For all details not shown see sheet 1 of 2.

Contractor has the option of either constructing rear face plumb or on a slope perpendicular to roadway surface. However, whatever option is chosen must be used throughout all structures at a particular crossing. No additional compensation will be provided to the contractor for whatever option is chosen.
Front face of parapet to be dimensioned from a plumb line.

Notes:
1. All #7 and #8 longitudinal bars shall be placed continuously in the parapet from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. Key is nominal size.
3. All reinforcing steel to be epoxy coated.
4. Concrete deck reinforcing steel not shown.

SCALE: 1" = 1'-0"

MASH COMPLIANT TL-5 BRIDGE RAILING

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LEVEL OR LOW SIDE OF CROSS SLOPE 42° SINGLE SLOPE PARAPET WITH DIAMOND BACK

DETAI NO. SUP-TB(42SS)-102 SHEET OF
Note:
For all details not shown see sheet 1 of 2.

SECTION
Scale: 1" = 1'-0"

MASH COMPLIANT TL-5 BRIDGE RAILING

SUPER - TRAFFIC BARRIER

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HIGH SIDE OF CROSS SLOPE
42" SINGLE SLOPE PARAPET
WITH DIAMOND BACK
Notes:
1. All #5, #7 and #8 longitudinal bars shall be placed continuously in the parapet from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi span bridge.
2. Key is nominal size.
3. All reinforcing steel to be epoxy coated.
4. Concrete deck reinforcing steel not shown.

SCALE: 1" = 1'-0"

SECTION

SUPER - TRAFFIC BARRIER

MASH COMPLIANT TL-5 BRIDGE RAILING

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LEVEL OR LOW SIDE OF CROSS SLOPE 42" SINGLE SLOPE PARAPET WITH ARCHITECTURAL FINISH

DETAIL NO. SUP-TB(42SS)-103 SHEET 1 OF 2
SUPER - TRAFFIC BARRIER

MASH COMPLIANT TL-5 BRIDGE RAILING

SECTION

Scale: 1" = 1'-0"

Note:
For all details not shown see sheet 1 of 2.

**This dimension can vary (½" ± max.) according to the form liner chosen. The Contractor must contact SHA Project Engineer to verify form liner and this dimension.

STATE OF MARYLAND
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HIGH SIDE OF CROSS SLOPE
OFFICE OF STRUCTURES
42" SINGLE SLOPE PARAPET
WITH ARCHITECTURAL FINISH

DETAIL NO. SUP-TB(42SS)-103
SHEET 2 OF 2

APPROVAL
DIRECTOR
OFFICE OF STRUCTURES
DATE: 08/16/2019
VERSION
1.01
Chapter 03 - Superstructure

Section 02 – Traffic Barriers

SUB-SECTION 02
PARAPET WITH SIDEWALK (SUP-TB(SW))
Notes:
1. All longitudinal bars are #5 spaced as shown and shall be placed continuously in the parapet from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. All keys are nominal size.
3. Portions of normal longitudinal deck steel and truss bars are not shown.
4. All reinforcing steel to be epoxy coated.
5. This barrier is to be used only for posted speeds of 45 mph or less.

**In order to ensure a smooth and acceptable surface, 420.03.11 (Constr. joints) shall be strictly adhered to.**

**Unless otherwise indicated on "Typical Cross Section".**

**Slab Depth - 1"**

**MASH COMPLIANT TL-2 COMBINATION RAILING**

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LEVEL OR LOW SIDE OF CROSS SLOPE SIDEWALK AND PARAPET WITH STRAIGHT BACK

<table>
<thead>
<tr>
<th>APPROVAL</th>
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<td>Date: 08/16/2019</td>
<td>OFFICE OF STRUCTURES</td>
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</table>

DETAIL NO. SUP-TB(SW)-101

SHEET 1 OF 2
**Unless otherwise indicated on "Typical Cross Section".

Note:
1. For all details not shown see sheet 1 of 2.
2. This barrier is to be used only for posted speeds of 45 mph or less.

**SECTION A**
(WHEN BOTTOM OF OVERHANG IS LOWER THAN BOTTOM OF TOP FLANGE)
Scale: $\frac{1}{4}'' = 1'-0''$
For all dimensions see SECTION A above.

**SECTION B**
(WHEN BOTTOM OF OVERHANG IS HIGHER THAN BOTTOM OF TOP FLANGE)
Scale: $\frac{1}{4}'' = 1'-0''$

MASH COMPLIANT TL-2 COMBINATION RAILING
AND PARAPET WITH STRAIGHT BACK

**APPROVAL**

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STATE HIGHWAY ADMINISTRATION
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HIGH SIDE OF CROSS SLOPE SIDEWALK
AND PARAPET WITH STRAIGHT BACK

DETAIL NO. SUP-TBSW-101

STATE HIGHWAY ADMINISTRATION
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DATE: 08/16/2019

VERSION

SHEET 2 OF 2
Notes:
1. All longitudinal bars are #5 spaced as shown and shall be placed continuously in the parapet from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. All keys are nominal size.
3. Portions of normal longitudinal deck steel and truss bars are not shown.
5. All reinforcing steel to be epoxy coated.
6. This barrier is to be used only for posted speeds of 45 mph or less.

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

MASH COMPLIANT TL-2
COMBINATION RAILING

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LEVEL OR LOW SIDE OF
CROSS SLOPE SIDEWALK AND
PARAPET WITH DIAMOND BACK

Detail No. SUP-TB(SW)-102
Note:
1. For all details not shown see sheet 1 of 2.
2. This barrier is to be used only for posted speeds of 45 mph or less.

SUPER - TRAFFIC BARRIER

MASH COMPLIANT TL-2 COMBINATION RAILING

HIGH SIDE OF CROSS SLOPE SIDEWALK
AND PARAPET WITH DIAMOND BACK
Notes:

1. All longitudinal bars are #5 spaced as shown and shall be placed continuously in the parapet from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. All keys are nominal size.
3. Portions of normal longitudinal deck steel and truss bars are not shown.
5. All reinforcing steel to be epoxy coated.
6. This barrier is to be used only for posted speeds of 45 mph or less.

**Unless otherwise indicated on "Typical Cross Section",**

**This dimension can vary (1/2" + max.) according to the form liner chosen. The Contractor must contact SHA Project Engineer to verify form liner and this dimension.**

***Slab depth - 1"***

**MASH COMPLIANT TL-2 COMBINATION RAILING**

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LEVEL OR LOW SIDE OF CROSS SLOPE SIDEWALK AND PARAPET WITH ARCHITECTURAL FINISH

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VERSION
2

DETAIL NO. SUP-TB(SW)-103
Note:
1. For all details not shown see sheet 1 of 2.
2. This barrier is to be used only for posted speeds of 45 mph or less.

**SUPER - TRAFFIC BARRIER**

**SUP-TB(SW)-103**

2.00

Plumb

Finished Roadway

Scale: 1" = 1'-0"

10''

Drip groove

3/4''

6''

**SECTION**

(WHEN BOTTOM OF OVERHANG IS LOWER THAN BOTTOM OF TOP FLANGE)

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

For all dimensions see SECTION above.

**SECTION**

(WHEN BOTTOM OF OVERHANG IS HIGHER THAN BOTTOM OF TOP FLANGE)

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

*Unless otherwise indicated on "Typical Cross Section".
**This dimension can vary 1/2'' + max.
according to the form liner chosen. The Contractor must contact SHA Project Engineer to verify form liner and this dimension.

**MASH COMPLIANT TL-2 COMBINATION RAILING**

AND PARAPET WITH ARCHITECTURAL FINISH

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HIGH SIDE OF CROSS SLOPE SIDEWALK

DETAIL NO. SUP-TB(SW)-103

SHEET 2 OF 2
Chapter 03 - Superstructure

Section 02 – Traffic Barriers

SUB-SECTION 03

TUBE RAIL PARAPET
(SUP-TB(TR))
GENERAL NOTES:
1. All railings shall be fabricated and erected as indicated on the Plans.
2. Rails shall be parallel to the grade of the roadway. Rail sections shall be attached to as many posts as possible, but not less than two.
3. The center line of any splice and/or expansion joint shall be located at least 2'-0" away from center line of a post except where indicated otherwise on Plans. Expansion and/or splice joints for each strand of three strand railing shall be placed in the same location and in the same plane.
4. Rail elements shall be structural tubing in accordance with ASTM A500 Grade B, A618 or A501.
5. Steel posts and plates shall conform to ASTM A36 unless otherwise noted.
6. Posts shall be set perpendicular to top of curb. For post spacing see Plans (Maximum 10'-0" Spacing).
7. All structural steel including fasteners shall be hot-dip galvanized as per ASTM A-123 after fabrication, except as noted. All anchor plates shall be attached before galvanizing.
8. In setting anchor bolts be sure enough threads are exposed so that nuts can be completely attached (4" min).

Note:
- For anchor bolt length and curb reinforcing details see Detail No. SUP-TB(TR)-201 for bridge decks or SUP-TB(TR)-101 for precast slab panels.
- For Section A-A see sheet 2 or 3 of 5.
 SECTION A-A (BRIDGE DECK)  
Scale: 1" = 1'-0"

1'-8'' minimum

1'-6" minimum

ELEVATION - RAIL ANCHOR PLATE DETAIL  
Scale: 1" = 1'-0"

- Top of post at rail
- 3" x 1'-6'/2 x ½" anchor plate (top)
- 1" x 2" slotted holes in anchor plate (typ.)
- 6" x 1'-6'/2 x ½" anchor plate

MASH COMPLIANT TL-4 BRIDGE RAILING  
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OFFICE OF STRUCTURES  
THREE STRAND STRUCTURAL TUBE RAIL  
CURB MOUNTED - DETAILS  
CONCRETE BRIDGE DECK MOUNTED  

DETAIL NO. SUP-TB(TRI)-101  SHEET 2 OF 5
**SECTION A-A (PRECAST SLAB PANEL)**

Scale: 1" = 1'-0"

1'-6"

3-6"

6"

TS 7" x 4" x 1/4"

TS 7" x 4" x 1/2"

W8x24 post

Roll anchor plate (typ.)

Threaded 3/4" reduced weld base stud 2" long with 1-Plate Washer, Hex washer & Nut, (6 per post). See Sht.5 of 5 for details of plate washer.

Tack weld anchor plate to each bolt head at two places (typ.)

Finished deck

Typ.

- 3" x 1'-6"/2" x 1/2" anchor plate (top)
- 1" x 2" slotted holes in anchor plate (typ.)
- 2" typ.
- 6" x 1'-6"/2" x 1/2" anchor plate

Top of post at rail

Top of curb

3"

Typ.

3"

Typ.

6"

Typ.

Top of rail anchor plate

ELEVATION - RAIL ANCHOR PLATE DETAIL

Scale: 1" = 1'-0"

MASH COMPLIANT TL-4 BRIDGE RAILING

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THREE STRAND STRUCTURAL TUBE RAIL
CURB MOUNTED - DETAILS
PRECAST SLAB PANEL MOUNTED

DETAIL NO. SUP-TB(TRI)-101 SHEET 3 OF 5
RAIL SPLICE DETAILS (TS 7" x 4" x 1/4")
Scale: 1/8" = 1'-0"

RAIL SPLICE DETAILS (TS 7" x 4" x 1/2")
Scale: 1/8" = 1'-0"

MASH COMPLIANT TL-4 BRIDGE RAILING
BASE PLATE DETAIL

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

ANCHOR PLATE DETAIL

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

PLATE WASHER

Scale: 6" = 1'-0"

Note:
Position washers to completely cover slotted hole.

MASH COMPLIANT TL-4 BRIDGE RAILING

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THREE STRAND STRUCTURAL TUBE RAIL
CURB MOUNTED - DETAILS

DETAIL NO. SUP-TB(TRI)-101  SHEET 5 OF 5
PLAN
Scale: $\frac{1}{4}'' = 1'-'0''$

END ROLL POST

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

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

Note:
See Std. No. MD 605.41-01 for additional details on Thrie Beam Anchorage Post Spacing.
SECTION A-A
Scale: $\frac{3}{8}'' = 1'-0''$

SECTION B-B

SECTION C-C

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

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THREE STRAND STRUCTURAL TUBE RAIL
THRIE BEAM CONNECTION PLATE
THREE STRAND STRUCTURAL TUBE RAIL
THRIE BEAM CONNECTION PLATE

DETAIL NO. SUP-TB(TRI)-102

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SUPER TRAFFIC BARRIER

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DATE: 02/10/2017
VERSION

Sheet 3 of 3
**Details of Bridge Deck Curb Detail**

- **Scale:** 1" = 1'-0" (Elevation)
- **Section A-A:**
  - 
  - 
  - 
  - 
  - 
  - 
  - 
  - 
  - **Notes:**
    1. All longitudinal bars are #5 spaced as shown.
    2. Normal concrete deck reinforcing not shown.
    3. All reinforcing steel shall be epoxy coated.

---

**Construction Joint with 2" x 6" continuous key**

- **#5 @ 12" c/c maximum (see note above)**
- Do not chamfer *

---

**Addition of 6 - #5 bars → 5'-0" long placed as shown at each post**

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**Notes:**

* In order to insure a smooth and acceptable surface, Section 420.03.11 (Construction Joints) will be strictly adhered to.

**May vary with application.**

(USE WITH DETAIL NO. SUP-TB(TR)-101)

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**BRIDGE DECK CURB DETAIL FOR THREE STRAND STRUCTURAL TUBE RAIL**

**Detail No. SUP-TB(TR)-201**

**Sheet 1 of 1**
Notes:
1. The cost of curb including reinforcing, PVC conduit will be included in Superstructure Concrete item.
2. The cost of anchor bolts and plates will be included in the Railing item.
3. All reinforcing steel shall be epoxy coated.
4. Longitudinal reinforcing steel in the precast slab panel not shown.
5. Prestressing strands in the precast slab panel not shown.
6. For size and spacing of precast slab panel stirrups see precast slab panel details.

* May vary with application.
Chapter 03 - Superstructure

Section 02 – Traffic Barriers

SUB-SECTION 04

MEDIAN BARRIER

(SUP-TB(MB))
Notes:
1. Place ½" saw cut joints to match joint spacing of outside parapet.
2. Concrete deck reinforcing steel not shown.
3. All #7 and #8 longitudinal bars shall be placed continuously in the barrier from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
4. All keys are nominal size.
5. No increase in any prices bid will be allowed for barrier modifications due to roadway slope.

Slab depth minus 1″.
NOTES:
1. All #7 and #8 longitudinal bars shall be placed continuously in the barrier from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. All reinforcement bars shall be epoxy coated.
3. The Contractor has the option of substituting cast-in-place epoxy coated open coil inserts with threaded holes for the bars shown. The inserts in the back face of the parapet shall have a minimum working load tension strength of 6000 lb. and a minimum length of 4 3/8". The inserts in the front face shall have a minimum working load tension strength of 8000 lb. and a minimum length of 5 1/2". The cost of epoxy coated inserts shall be included in the pertinent Superstructure Concrete item.
4. Concrete deck reinforcing steel not shown.
5. Place 1/2" saw cut joints to match joint spacing of outside parapet.
6. No increase in any prices bid will be allowed for barrier modifications due to roadway slope or maintenance of traffic.

SCALE: 1” = 1'-0"

* Slab depth minus 1".

MASH COMPLIANT
TL-5 BRIDGE RAILING

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42" F-SHAPE MEDIAN BARRIER FOR BRIDGE
WITHOUT LONGITUDINAL JOINT WHERE TRAFFIC WILL USE AREA PRIOR TO PLACING BARRIER
MASH COMPLIANT TL-5 BRIDGE RAILING

42" F-SHAPE MEDIAN BARRIER
FOR BRIDGE WITH OPEN LOGITUDINAL JOINT

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42" F-SHAPE MEDIAN BARRIER
FOR BRIDGE WITH OPEN LOGITUDINAL JOINT

Notes:
1. All #7 and #8 longitudinal bars shall be placed continuously in the barrier from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. All reinforcing steel epoxy coated.
3. Concrete deck reinforcing steel not shown.
4. Place ½" saw cut joints to match joint spacing of outside parapet.
5. All keys are nominal size.
6. No increase in any prices bid will be allowed for barrier modifications due to roadway slope.

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DETAIL NO. SUP-TB(4B)-201 SHEET ___ OF ___
Front face of parapet to be dimensioned from a plumb line.

Notes:
1. All #7 and #8 longitudinal bars shall be placed continuously in the barrier from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. All reinforcement bars shall be epoxy coated.
3. The Contractor has the option of substituting cast-in-place epoxy coated open coil inserts with threaded holes for the bars shown. The inserts in the back face of the parapet shall have a minimum working load tension strength of 8000 lb. and a minimum length of 4½". The inserts in the front face shall have a minimum working load tension strength of 6000 lb. and a minimum length of 5½". The cost of epoxy coated inserts shall be included in the pertinent Superstructure Concrete item.
4. Concrete deck reinforcing steel not shown.
5. Place ½" saw cut joints to match joint spacing to outside parapet.
6. No increase in any prices bid will be allowed for barrier modifications due to roadway slope or maintenance of traffic.

MASH COMPLIANT
TL-5 BRIDGE RAILING

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42" F-SHAPE MEDIAN BARRIER FOR BRIDGE WITH LONGITUDINAL JOINT WHERE TRAFFIC WILL USE AREA PRIOR TO PLACING BARRIER WITHIN TRAFFIC BARRIER SUPER TRAFFIC BARRIER

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DATE 08/20/2019

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DETAIL NO. SUP-TB(MB)D-202 SHEET 1 OF 1
Notes:
1. Place ½" saw cut joints to match joint spacing of outside parapet.
2. Concrete deck reinforcing steel not shown.
3. All #7 and #8 longitudinal bars shall be placed continuously in the barrier from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
4. All keys are nominal size.
5. No increase in any prices bid will be allowed for barrier modifications due to roadway slope.

* Slab depth minus 1".
Notes:
1. All #7 and #8 longitudinal bars shall be placed continuously in the barrier from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. All reinforcement bars shall be epoxy coated.
3. The Contractor has the option of substituting cast-in-place epoxy coated open coil inserts with threaded holes for the bars shown. The inserts in the back face of the parapet shall have a minimum working load tension strength of 8000 lb. and a minimum length of 4½". The inserts in the front face shall have a minimum working load tension strength of 6000 lb. and a minimum length of 5½". The cost of epoxy coated inserts shall be included in the pertinent Superstructure Concrete item.
4. Concrete deck reinforcing steel not shown.
5. Place ½" saw cut joints to match joint spacing of outside parapet.
6. No increase in any prices bid will be allowed for barrier modifications due to roadway slope or maintenance of traffic.

MASH COMPLIANT TL-5 BRIDGE RAILING

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42" SINGLE SLOPE MEDIAN BARRIER FOR BRIDGE WITHOUT LONGITUDINAL JOINT WHERE TRAFFIC WILL USE AREA PRIOR TO PLACING BARRIER
Notes:
1. All #7 and #8 longitudinal bars shall be placed continuously in the barrier from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. All reinforcing steel epoxy coated.
3. Concrete deck reinforcing steel not shown.
4. Place 3/4" saw cut joints to match joint spacing of outside parapet.
5. All keys are nominal size.
6. No increase in any prices bid will be allowed for barrier modifications due to roadway slope.

Front face of parapet to be dimensioned from a plumb line.

Plumb Line

Front face configuration constructed perpendicular to roadway surface.

MASH COMPLIANT TL-5 BRIDGE RAILING

STATE OF MARYLAND
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42" SINGLE SLOPE MEDIAN BARRIER
FOR BRIDGE WITH OPEN LOGITUDINAL JOINT

APPROVAL
DIRECTOR
OFFICE OF STRUCTURES
DATE: 08/16/2019

VERSION
13.01

DETAIL NO. SUP-TB(MB)-401
SHEET ______ OF ______
Notes:
1. All #7 and #8 longitudinal bars shall be placed continuously in the barrier from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.
2. All reinforcement bars shall be epoxy coated.
3. The Contractor has the option of substituting cast-in-place epoxy coated open coil inserts with threaded holes for the bars shown. The inserts in the back face of the parapet shall have a minimum working load tension strength of 8000 lb and a minimum length of 4 1/2". The inserts in the front face shall have a minimum working load tension strength of 8000 lb and a minimum length of 5 1/2". The cost of epoxy coated inserts shall be included in the pertinent Superstructure Concrete item.
4. Concrete deck reinforcing steel not shown.
5. Place 1/2" saw cut joints to match joint spacing of outside parapet.
6. No increase in any prices bid will be allowed for barrier modifications due to roadway slope or maintenance of traffic.

MASH COMPLIANT
TL-5 BRIDGE RAILING

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42" SINGLE SLOPE MEDIAN BARRIER FOR BRIDGE WITH LONGITUDINAL JOINT WHERE TRAFFIC WILL USE AREA PRIOR TO PLACING BARRIER

APPROVAL
OFFICE OF STRUCTURES
STATE HIGHWAY ADMINISTRATION

DATE 08/20/2019

VERSION

1.01

DETAIL NO. SUP-TB(MB)-402

SHEET 1 OF 1
Chapter 03 - Superstructure

Section 02 – Traffic Barriers

SUB-SECTION 05

CONDUIT PLACEMENT
(SUP-TB(CP))
Bonding Jumper (Tinned Braided Copper Wire-Underwriters Lab Approved) with 4" loop. For larger movement joints, two jumper cables may be bolted together to provide a minimum of a 6" loop and necessary connection length.

For conduit size see Superstructure "Typical Section" sheet. Vertical location of conduit shall be at least 4" below bottom of railing or fencing anchorage systems.

Expansion fittings for use with rigid galvanized steel conduit shall consist of a malleable iron head and steel sleeve which shall be hot-dipped galvanized and assembled with a watertight packing gland, an insulated bushing, pressure ring and gasket and a tinned-copper bond to assure continuity of ground. The fitting shall provide, unless otherwise noted on the plans, 4" of movement for all compression seal roadway joints and 8" of movement for all other roadway joints, such as steel finger joints.

Notes:
1. Place expansion joint in pipe conduit and parapet at every expansion joint of supports in bridge deck.
2. #10 galvanized pull wire to be provided for full length of conduit and left in place.
3. Contractor may furnish either PVC conduit as shown on sheet 2 of 2 or material shown on this detail. However only one type can be used throughout a structure.
Expansion Joint for Conduit in Parapet

Parapet

Deck Grade Rising (±%)

 Expansion fitting

 Measured perpendicular to inside face of parapet at level of pipe.

Parapet Expansion Joint

Notes:
1. Place expansion joint in pipe conduit and parapet at every expansion joint of supports in bridge deck.
2. #10 galvanized pull wire to be provided for full length of conduit and left in place.
3. All pipe and expansion joint must be U.L. approved for encasement in concrete.
4. Fittings to be PVC, except for expansion joint.
5. Nonmetallic conduit shall conform to 921.07.02.

** Expansion fittings for use with rigid galvanized steel conduit shall consist of a malleable iron head and steel sleeve which shall be hot-dipped galvanized and assembled with a water-tight packing gland, an insulated bushing, pressure ring and gasket and a tinned-copper bond to assure continuity of ground. The fitting shall provide, unless otherwise noted on the plans, 4" of movement for all compression seal roadway joints and 8" of movement for all other roadway joints, such as steel finger joints.

* For conduit size see Superstructure "Typical Section" sheet. Vertical location of centerline of this conduit shall be at least 4" below bottom of railing or fencing anchorage systems.

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

SECTION

Note: No bonding jumper cable is required.

Rigid nonmetallic conduit.

Minimum wall thickness for 4" pipe to be 0.337". Minimum wall thickness for 3" pipe to be 0.300".

Galvanized steel conduit nipple (12" long).

PVC to steel female conduit adapter.

PVC to steel female conduit adapter.

** Expansion fitting

All joints to be solvent welded.

Parapet Expansion Joint

See pertinent detail sheet for size.

Notes:
1. Place expansion joint in pipe conduit and parapet at every expansion joint of supports in bridge deck.
2. #10 galvanized pull wire to be provided for full length of conduit and left in place.
3. All pipe and expansion joint must be U.L. approved for encasement in concrete.
4. Fittings to be PVC, except for expansion joint.
5. Nonmetallic conduit shall conform to 921.07.02.
Notes:
1. The conduit and junction box are to be placed only when indicated in the Superstructure "Typical Section." If the length of end junction boxes exceed 200', then additional junction boxes shall be placed in parapet, between control joints, so that the maximum distance between boxes is 200'. Junction boxes for light standards may be utilized. All junction boxes to have 1/2" drain at low point of box.
2. Conduit may be either PVC or galvanized pipe.

Note: For Section A-A and B-B see sheets 2 & 3 of 3. For View D-D see sheet 2 of 3.
Notes:
1. Parapet is placed continuously.
2. Saw cut control joint to be sawed same day as concrete is poured.
3. Fencing not shown.
4. F-Shape barrier is shown for illustrative purposes only. See plans for barrier type.

SECTION B-B
Scale: \( \frac{\text{\ }}{\text{\ }} = 1'-0'' \)

SECTION A-A
Scale: None

SECTION C-C
Scale: None

VIEW D-D
Scale: \( \frac{\text{\ }}{\text{\ }} = 1'-0'' \)
Notes:
1. Place vertical paraffin joint, shown hatched, at centerline of pier on multi-span bridges.
2. Joints shall be formed by placing alternate sections.
3. The placement of adjacent sections shall have a 40 hour delay between placements.
4. Fencing not shown.
5. F-Shape barrier is shown for illustrative purposes only. See plans for barrier type.

*In order to ensure a smooth and acceptable surface, 420.03.11 (Construction Joints) will be strictly adhered to.
Notes:
1. The conduit and junction box are to be placed only when indicated in the Superstructure "Typical Section." If L to L of end junction boxes exceed 200', then additional junction boxes shall be placed in parapet, between control joints, so that the maximum distance between boxes is 200'. Junction boxes for light standards, may be utilized. All junction boxes to have ½" drain at low point of box.
2. Conduit may be either PVC or galvanized pipe.
Notes:
1. Parapet is placed continuously.
2. Saw cut control joint to be sawed same day as concrete is poured.
3. Fencing not shown.
Notes:
1. Place vertical paraffin joint, shown hatched, at centerline of pier on multi span bridges.
2. Joints shall be formed by placing alternate sections.
3. The placement of adjacent sections shall have a 40 hour delay between placements.
4. Fencing not shown.

*In order to ensure a smooth and acceptable surface, 420.03.11 (Construction Joints) will be strictly adhered to.
Notes:

1. The conduits and junction boxes are to be placed only when indicated in the Superstructure "Typical Section." If 4 to 6 of end junction boxes exceed 200', then additional junction boxes shall be placed in parapet, between control joints, so that the maximum distance between boxes is 200'. Junction boxes for light standards, may be utilized. All junction boxes to have 1/2" drain at low point of box.

2. Conduit may be either PVC or galvanized pipe.

Additional junction boxes shall be placed in parapet, between control joints, so that the maximum distance between boxes is 200'. Junction boxes for light standards, may be utilized. All junction boxes to have 1/2" drain at low point of box.

Conduit may be either PVC or galvanized pipe.

Note: For Section A-A & B-B see sheet 2 of 3.
For View D-D see sheet 2 of 3.
For Sections A-A and B-B at centerline of pier on multi-span continuous bridges, see sheet 3 of 3.
1. Notes:
   - Roadway finished connected Cap, if not connected do not chamfer.
   - Saw cut joint do not chamfer.
   - Saw cut joint do not chamfer.
   - Saw cut joint do not chamfer.
   - Saw cut joint do not chamfer.
   - Saw cut joint do not chamfer.
   - Saw cut joint do not chamfer.
   - Saw cut joint do not chamfer.
   - Saw cut joint do not chamfer.

2. Saw cut control joint to be sawed same day as concrete is poured.

3. Parapet is placed continuously.

4. F-Shape barrier is shown for illustrative purposes only. See plans for barrier type.

5. Super traffic barrier.

SECTION A-A
- Scale: None
- Inside face of parapet
- Varied
- 1/2" drain (typ.). Connect drain to low point of junction boxes for intermediate junction boxes.
- Outlet drain thru bottom of superstructure.

SECTION B-B
- Scale: 1/2" = 1'-0"
- Outside face of parapet
- 1/2" drain (typ.). Connect drain to low point of junction boxes for intermediate junction boxes.
- Outlet drain thru bottom of superstructure.

SECTION C-C
- Scale: None
- Inside face of parapet
- 3/8" drain (typ.). Connect drain to low point of junction boxes for intermediate junction boxes.
- Outlet drain thru bottom of superstructure.

VIEW D-D
- Scale: 1/2" = 1'-0"
- Inside face of parapet
- 1'-0" min.
- 2'-6" max.

1'-0" conduits

2.0 SLOPE PARAPET PLACEMENT WITH 42" F-SHAPE AND SINGLE PARAPET CONTROL JOINT AND DUAL CONDUIT
**Notes:**

1. Place vertical paraffin joint, shown hatched, at centerline of pier on multi-span continuous bridges.
2. The placement of adjacent sections shall have a 40 hour delay between placements.
3. Fencing not shown.
4. F-Shape barrier is shown for illustrative purposes only. See plans for barrier type.

*In order to ensure a smooth and acceptable surface, 420.03.11 (Construction Joints) will be strictly adhered to.*
Notes:
1. The conduits and junction boxes are to be placed only when indicated in the Superstructure "Typical Section." If 1 to 2 of end junction boxes exceed 200', then additional junction boxes shall be placed in parapet, between control joints, so that the maximum distance between boxes is 200'. Junction boxes for light standards, may be utilized. All junction boxes to have 1/2" diameter drain at low point of box.
2. Conduit may be either PVC or galvanized pipe.

Note: Detail shown is for parapet without fencing. Fencing details are similar. On bridges with no fencing, see Plans for parapet control joint spacing.
Notes:
1. Parapet is placed continuously.
2. Saw cut control joint to be sawed same day as concrete is poured.
3. Fencing not shown.
Notes:
1. Place vertical paraffin joint, shown hatched, at centerline of pier on multi-span continuous bridges.
2. The placement of adjacent sections shall have a 40 hour delay between placements.
3. Fencing not shown.

*In order to ensure a smooth and acceptable surface, 420.03.11 (Construction Joints) will be strictly adhered to.
Chapter 03 - Superstructure

Section 02 – Traffic Barriers

SUB-SECTION 06
MISCELLANEOUS DETAILS
(SUP-TB(MISC))
1. All longitudinal bars shall be placed continuously in the parapet/median barrier from expansion opening to expansion opening in a simple span bridge and expansion opening to centerline of pier in a multi-span bridge.

Note:
- Coat weld with epoxy touch up.
- See appropriate detail for rebar types and spacing pattern.
- Saw cut joint (typ.)
- Top of Parapet
- 10' Maximum sections for full length of parapet/median barrier
- Tack weld to each #5 A bars as shown *
  - 1 additional #5 for outside parapet or single face median barrier - back face, inside of normal rebars.
  - 2 additional #5 for double faced median barrier.

ELEVATION-MULTISpan AT PIER
Scale: 1/2'' = 1'-0''

42'' PARAPET OR MEDIAN
**Sup-TB(MISC)-201**

1.01 equal spaces

* Number, shape and size of bars is contingent upon the height and style of parapet that is chosen. See Typical Section for details.

**Notes:**
1. All reinforcing steel to be epoxy coated.
2. Compression seal not shown.
3. F-Shape barrier is for illustrative purposes only. See plans for barrier type.

**PLAN**
Scale: 1" = 1'-0"

**REINFORCING PATTERN FOR TRANSITION AREA ONLY**

Notes:
- Use both bars at ends of barrier.
- Number, shape and size of bars is contingent upon the height and style of parapet that is chosen. See Typical Section for details.
- Dashed area of reinforcing to be eliminated in transition area.
- Compression seal not shown.
- F-Shape barrier is for illustrative purposes only. See plans for barrier type.
**SPACING OF DELINEATORS**

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

<table>
<thead>
<tr>
<th>Radius of Horizontal Curve</th>
<th>C/C Distance Between Delineators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2000'</td>
<td>115'</td>
</tr>
<tr>
<td>2000' to 3000'</td>
<td>130'</td>
</tr>
<tr>
<td>3000' to 5000'</td>
<td>160'</td>
</tr>
<tr>
<td>Over 5000'</td>
<td>200'</td>
</tr>
<tr>
<td>Tangent Area</td>
<td>200'</td>
</tr>
</tbody>
</table>

* Place one delineator at each end of each wall, even if wall is shorter than lengths indicated below.

**CONCRETE BARRIER DELINEATOR**

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

Note:
- F-Shape barrier is for illustrative purposes only. See plans for barrier type.
- Solid median barrier:
  - 3¾" hole and 1 3/4" delineator.
  - 3¾" delineator(s).
  - 2" + 2" x 4" long galvanized bolts in Bulldog Gold Digger Flush Drill Anchors for Approved Equal. As alternate, the Contractor may cast 2 - 1/4" x 4" galvanized bolts in the concrete. Use galvanized nuts and washers to fasten support to barrier.
  - Bottom of 6" leg of angle to be thoroughly coated with an approved caulking compound or an approved zinc chromate paint.

END VIEW

SIXE VIEW

**Note:**

See plans for barrier type.
Chapter 03 - Superstructure

Section 02 – Traffic Barriers

SUB-SECTION 07

34 " VERTICAL PARAPET WITH THRIE BEAM (SUP-TB(34T))
MASH COMPLAINT TL-3 BRIDGE RAILING

Notes:
1. All #6 longitudinal bars shall be placed continuously in the parapet from expansion opening to expansion opening in a simple span bridge.
2. Key is nominal size.
3. All reinforcing steel to be epoxy coated.
4. Concrete deck reinforcing steel not shown.
5. 5/8" Dia drilled fasteners to be stainless steel or galvanized. Zinc coated fasteners will not be permitted.

*In order to ensure a smooth and acceptable surface, 420.03.11 (Construction joints) will be strictly adhered to.

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

LEVEL OR LOW SIDE OF CROSS SLOPE 34° THRIE BEAM ATTACHED TO VERTICAL WALL PARAPET

APPROVAL
DIRECTOR
OFFICE OF STRUCTURES
DATE: 08/27/2019

VERSION
1.0

DETAIL NO. SUP-TB(34T)-101 SHEET 1 OF 2
Note:
For all details not shown see sheet 1 of 2.

Finished Roadway Surface (High side cross slope)

Front face configuration constructed perpendicular to roadway surface.

Contractor has the option of either constructing rear face plumb or on a slope perpendicular to roadway surface. Whatever option is chosen must be used throughout all structure(s) of a particular crossing. No additional compensation will be provided to the contractor for whatever option is chosen.

SECTION
Scale: 1" = 1'-0"

MASH COMPLAINT TL-3 BRIDGE RAILING

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

HIGH SIDE OF CROSS SLOPE
34" THRIE BEAM ATTACHED TO VERTICAL WALL PARAPET

DETAIL NO. SUP-TB(34T)-101

SUPER - TRAFFIC BARRIERS