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<td>Ornamental Metal Railing (Design T-4 Curb Mount)</td>
<td>Nov. 06, 2013</td>
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<td>5-397.164</td>
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<td>5-397.165</td>
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<td>5-397.166(A)</td>
<td>Concrete Parapet (Type P-1, TL-2) Integral or Semi-Integral Abutment (Without Concrete Wearing Course) With Raised Sidewalk</td>
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<td>5-397.166(C)</td>
<td>Concrete Parapet (Type P-1, TL-2) Integral or Semi-Integral Abutment (With 2” Concrete Wearing Course) With Raised Sidewalk</td>
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<td>5-397.166(D)</td>
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<td>5-397.166(E)</td>
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<td>5-397.166(F)</td>
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<td>Concrete Curb For Use With Ornamental Railing</td>
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* Refer to [http://www.dot.state.mn.us/bridge/](http://www.dot.state.mn.us/bridge/) for current Bridge CADD Standards
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<td>Concrete Slope Paving Under Bridges</td>
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<td>5-397.402</td>
<td>Conduit System For________</td>
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**DESIGN AIDS** (Not a Standard)

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**BRIDGE SUPERSTRUCTURE**

**APPROVED: JANUARY 05, 2017**

**REVISED: FEBRUARY 22, 2018**

---

**GENERAL NOTES**

Refer to Spec. 2557 and Special Provisions for additional requirements and basis of payment.

---

**INSIDE ELEVATION OF RAILING**

Inside face of fence

---

**TYPICAL SECTION THROUGH FENCE**

Intermediate post shown

---

**GENERAL NOTES**

Refer to Spec. 2557 and Special Provisions for additional requirements and basis of payment.

---

**WIRE FENCE (DESIGN W-1) AND CONCRETE PARAPET (TYPE P-1)**

---

**CERTIFIED BY**

---

**CHECK**

---

**DESIGNER NOTE**

---

**DATE**

---

**PLAN**

---

**ELEVATION**

---

**SECTION**

---

**DETAILS**

---

**SECTIONS**

---

**FIG. 5-397.119**

---

**SHEETS**

---
**GENERAL NOTES**

LENGTH OF "TYPE F (TL-5) WITH GLARE SCREEN RAILING CONCRETE (3Y46 OR 3Y46A)" FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE BARRIER.

CONCRETE BARRIER = 670 LBS./FT. (0.165 CU. YDS./FT.)

FINISH ALL EDGES OF BARRIER WITH 1" VEE JOINT, EXCEPT WHERE OTHERWISE NOTED.

GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, Mn/DOT SPEC. 3304.

GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, Mn/DOT SPEC. 3304.

MAXIMUM SPACING OF 1" VEE JOINTS SHALL BE 10 FT.

CONCRETE BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR "TYPE F (TL-5) WITH GLARE SCREEN RAILING CONCRETE (3Y46 OR 3Y46A)".
FIG. 5-397.131

PLAN VIEW OF APPROACH BARRIER

BILL OF REINFORCEMENT FOR BARRIER

GENERAL NOTES

CONCRETE BARRIER SHALL BE CONC. MIX 3Y46 OR 3Y46A.
CONCRETE BARRIER = 634 LBS./FT. (0.157 CU. YDS/FT.)
CONCRETE BARRIER SHALL BE CONC. MIX 3Y46 OR 3Y46A.

RAIL MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350.

不影响的注释

MAXIMUM SPACING OF CONCRETE DEFLECTION JOINTS SHALL BE 20 FT.
WHERE OTHERWISE NOTED.
FINISH ALL EDGES OF BARRIER WITH 1/4" VEE EXCEPT CONCRETE BARRIER = 634 LBS./FT. (0.157 CU. YDS/FT.)

CONCRETE BARRIER SHALL BE CONC. MIX 3Y46 OR 3Y46A.

USE 2-M504E AS AN ALTERNATE FOR M505E OR M506E.

BASED ON 10" SLAB.

SPLIT MEDIAN BARRIER TYPE F

T.HOLD 05-03-2016

CERTIFIED BY

NAME:

LICENSED PROFESSIONAL ENGINEER

LICENSE NO.

DATE

APPROVED:

OCTOBER 29, 2004

REVISED: 04-17-2013

DO NOT USE

TEMPORARY HOLD

CALL (651) 366-4484
## Solid Median Barrier

### Bill of Reinforcement

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<td>4</td>
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<td>5</td>
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### Dimensions

- Barriers vertical
- Barrier longitudinal
- Barrier horizontal

### Notes

- General Notes
  - For barrier design and construction, refer to the relevant specifications.
  - All materials are to be installed in accordance with the approved plans and specifications.
  - The barrier shall be constructed using Type F concrete with a concrete mix of 3Y46 or 3Y46A.

### Miscellaneous

- Rail meets test level 4 requirements of NCHRP Report 350.
Fig. 5-397.136

General Notes:
Concrete barrier shall be Conc. mix 3Y46 or 3Y46A.
Concrete barrier:
Section A-A, Bridge Barrier:
Concrete barrier shall be Conc. mix 3Y46 or 3Y46A.
Concrete barrier:
Superstructure:

Bill of Reinforcement for Barrier:
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</tbody>
</table>
SECTION C-C

13 SPS. @ 6" = 6'-6"

R502E
R503E
VIEW F-F

CONNECTION (WITHOUT CONCRETE WEARING COURSE)

STATE BRIDGE ENGINEER

NAME: ____________________________

DATE: ____________

REVISION: MAY 10, 2017

FIG. 5-397.138(A)

CONTROL JOINT DETAILS

FOR SLIPFORM CONSTRUCTION IMMEDIATELY AFTER CONCRETE IS PLACED AND BEFORE IT IS STILT WET CREATE A ONE INCH STRAIGHT GROOVE USING A TROWEL DESIGNED TO PRODUCE AN EXTRUSION INTO GROOVE TO A DEPTH 1/2" BELOW THE SURFACE Finish OVER GROOVE COMPLETELY AVOIDING THE EXTRUSION.

CONTROL JOINT DETAILS

FOR SLIPFORM CONSTRUCTION IMMEDIATELY AFTER CONCRETE IS PLACED AND WHILE IT IS STILL WET, CREATE A ONE INCH STRAIGHT GROOVE USING A TROWEL DESIGNED TO PRODUCE AN EXTRUSION INTO GROOVE TO A DEPTH 1/2" BELOW THE SURFACE Finish OVER GROOVE COMPLETELY AVOIDING THE EXTRUSION.

ELEVATION VIEW

SECTION A-A

PANEL PLANS)

SECTION B-B

SECTION D-D

STOP PLATES, SEE DETAILS SHEET NO. __ FOR ADDITIONAL INFORMATION.

BILL OF REINFORCEMENT FOR BARRIER

CONCRETE BARRIER = 416 LBS./FT. (0.123 CU. YDS./FT.)

GENERAL NOTES

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE EDGES OF THE SUPERSTRUCTURE.

CONCRETE BARRIER = 416 LBS./FT. (0.123 CU. YDS./FT.)

FINISH ALL SIDES OF BARRIER WITH 1/8" CHAMfers, EXCEPT WHERE INDICATED.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM, REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

GUIDANCE CONNECTION TO BE STRUCTURAL STEEL SPEC. 2009, GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO BARRIER.

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

1) PLACE BAR ON TOP OR BOTTOM REINFORCEMENT MAT IN DECK.

2) JOINT SEALANT PER WOODY APPROVED QUALITY PRODUCTS LIST - Calcium Joint Sealant - Silicon Joint Sealant

3) REMOVE CONCRETE FROM PIPE ENDS AFTER SLIPFORMING OR FORM REMOVAL.

FIG. 5-397.138(A)

REVIEWED MAY 10, 2017
APPROVED AUGUST 24, 2016

CERTIFIED BY: ____________________________

LEED PROFESSIONAL ENGINEER

NAME: ____________________________

LEED PROFESSIONAL ENGINEER

SHEET NO. OF SHEETS

BRIDGE NO.
GENERAL NOTES

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE EDGES OF THE BARRIER.  CONCRETE BARRIER = 337 LBS./FT.  0.037 CU. YDS./FT.

FINISH ALL EDGES OF BARRIER WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM, REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INSTRUCTIONS.

GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, SPEC. 3306.

GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO BARRIER.

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

1) PLACE BARS ON TOP OF BOTTOM REINFORCEMENT IN DECK.

2) JOINT SEALANT PER WOOST APPROVED QUALIFIED PRODUCTS LIST

3) REMOVE CONCRETE FROM PIPE ENDS AFTER SUPPORTING OR FORM REMOVAL.

Christmas holiday And while it is still wet, create a one inch straight groove using a trowel. Insert rigid plastic extrusion into groove to a depth 3⁄4" below the surface/surface over groove completely along the extrusion.
TAPER:
5"
5'-0"
4"
LINE A
6"
3"

THE SURFACE; FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.

PARAPET ABUTMENT WITH GUARDRAIL CONNECTION

TROWEL. INSERT RIGID PLASTIC EXTRUSION INTO GROOVE TO A DEPTH "" BELOW AND WHILE IT IS STILL WET, CREATE A ONE INCH STRAIGHT GROOVE USING A TROWEL.

CERTIFIED BY

REVISION:   MAY 10, 2017

SLIPFORM CONSTRUCTION

CAST-IN-PLACE CONSTRUCTION

R506E, R507E, R508E

COVER PLATE DETAILS.

3 Ž " REMOVE CONCRETE FROM PIPE ENDS AFTER SLIPFORMING OR FORM REMOVAL.

1 "  J O IN T

& R507E

2'-5 "  T O  2'-7 "

2 '-8 "  T O  3 '-1 "

THR" " PIPED TO 10'-8" MINIMUM BARRIER LENGTH SHOWN

10  "  BARRIER LONGIT.

R 502 E  & R 501 E

GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, SPEC. 3306.

3'-0" (THICKENED END)

BARRIER VERTICAL

2" CLR.

R 503 E

= 2'-6"

6" MAX.

3" E Q UA L  S P S .

2" CLR.

R 504 E

= 2'-0"

6" MAX.

3" E Q UA L  S P S .

2" CLR.

R 505E

= 1'-4"

6" MAX.

3" E Q UA L  S P S .

2" CLR.

R 506E

= 1'-0"

6" MAX.

3" E Q UA L  S P S .

2" CLR.

R 507E

= 0'-4"

6" MAX.

3" E Q UA L  S P S .

2" CLR.

R 508E

= 0'-0"

6" MAX.

3" E Q UA L  S P S .

2" CLR.

R 509E

= 0'-0"

6" MAX.

3" E Q UA L  S P S .

2" CLR.

R 510E

3" TAPER

BARRIER VERTICAL BARS, 12" MAX. SPACING.

2" CLR.

R 511E

BARRIER VERTICAL

BARRIER VERTICAL

BARRIER VERTICAL

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BARRIER VERTI
INSIDE ELEVATION OF BARRIER

BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

EXPANSION JOINT

LOCATION: EXPANSION JOINT NOT SHOWN

MINIMUM BARRIER LENGTH ON APPROACH PANEL IS 10'-6" WITH MINIMUM OF 15'-0" AND ROUGH SMOOTH SURFACE WITHOUT SHADOWS OR GROOVE COMPLETELY HIDING THE EXTRUSION.

GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, SPEC. 3306.

GENERAL NOTES

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE EDGES OF THE BARRIERS.

CONCRETE BARRIERS = 537 LBS./FT. (0.133 CU. YDS./FT.)

EXPANSION JOINT

LOCATION: EXPANSION JOINT NOT SHOWN

MINIMUM BARRIER LENGTH ON APPROACH PANEL IS 10'-6" WITH MINIMUM OF 15'-0" AND ROUGH SMOOTH SURFACE WITHOUT SHADOWS OR GROOVE COMPLETELY HIDING THE EXTRUSION.

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CONCRETE BARRIERS = 537 LBS./FT. (0.133 CU. YDS./FT.)

REVIEWING MAY 10, 2017

APPROVED AUGUST 24, 2016

ADDRESS:

CERTIFIED BY

LICENSED PROFESSIONAL ENGINEER
SECTION C-C

LINE A

LICENSED PROFESSIONAL ENGINEER

1'-0" (TAPERED)

LINE B

STATE BRIDGE ENGINEER

LIC. NO.

PARAPET ABUTMENT WITH BRIDGE SLAB SIDEWALK AND

(TYPE S, TL-4)

CHK:

BRIDGE NO.

APPROVED:

DES:

CONCRETE BARRIER 54"

CERTIFIED BY

R506E, R507E & R508E

DIMENSIONS TO BE DETERMINED BASED ON THE BRIDGE DECK SLOPE.

REFER TO "WATERPROOF EXPANSION DEVICE"

R503E, R504E, R505E, & R508E

WEARING COURSE (SEE APPROACH CURVE)

5.3

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET

THICKNESS IS GREATER AT BARRIER END

GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO BARRIER.

BARRIER RUSTICATION

CONSTRUCTION JOINT

CONSTRUCTION JOINT

BILL OF REINFORCEMENT FOR BARRIER

R507E

WEARING COURSE AT GUTTERLINE

END VIEW

MILD PIPE LINE A

TOP PIPE LINE A

MILD PIPE LINE B

TOP PIPE LINE B

MILD PIPE LINE C

TOP PIPE LINE C

X 1'-8" PLATE

SECTION A-A

CONSTRUCTION JOINT DETAIL

BASEMENT CONCRETE PER SPEC. 3394

EXTRA WEIGHT = 34 LBS

EXPANSION JOINT

INSIDE ELEVATION OF BARRIER

CONCRETE WEARING COURSE NOT SHOWN

GENERAL NOTES

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE ENDS OF THE BARRIER.

CONCRETE BARRIER = 4" @ 90°, 10" OLD @ 90°, 1/2" AT OTHER

FROM END PLATES OF BARRIER AT 5" CHAMFERED EXCEPT WHERE CONNECTIVE NOTES

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM REFER TO SUPERSTRUCTURE SHEET

FOR SPECIFIC SPACING INFORMATION.

GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL SPEC. 3396

GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO BARRIER.

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

R501E, R502E, & R508E

TO BE DETERMINED BASED ON THE BRIDGE DECK SLOPE

R503E, R504E, R505E, R506E, R507E, & R508E

REMOVE CONCRETE FROM PIPE ENDS AFTER SLIPFORMING OR FORM REMOVAL.

REFERENCES TO "WATERPROOF EXPANSION DEVICE"

SLIPFORM CONSTRUCTION

CAST-IN-PLACE CONSTRUCTION

FOR SLIPFORM CONSTRUCTION, AFTER BARRIER IS PLACED AND WHILE IT IS STILL WIPE, CREATE A ONE INCH STRAIGHT SIDING USING A

MOISTURE AND TEXTURING EXTENSION TO THE BOTTOM SURFACE OF BARRIER COMPLETELY MOLDING THE EXTENSION.

JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST

BARRIER RUSTICATION

GENERAL NOTES

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE ENDS OF THE BARRIER.

CONCRETE BARRIER = 4" @ 90°, 10" OLD @ 90°, 1/2" AT OTHER

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SPACE CONTROL JOINTS AT 10 FT. MAXIMUM REFER TO SUPERSTRUCTURE SHEET

FOR SPECIFIC SPACING INFORMATION.

GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL SPEC. 3396

GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO BARRIER.

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

R501E, R502E, & R508E

TO BE DETERMINED BASED ON THE BRIDGE DECK SLOPE

R503E, R504E, R505E, R506E, R507E, & R508E

REMOVE CONCRETE FROM PIPE ENDS AFTER SLIPFORMING OR FORM REMOVAL.
BARRIER ON EACH SIDE MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

SECTION D-D

SECTION A-A

BILL OF REINFORCEMENT FOR BARRIER

GENERAL NOTES

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE EDGES OF THE BARRIER FROM THE BRIDGE MEASURED LENGTH FOR ONE SIDE OF THE SPLIT MEDIAN BARRIERS.

COMPLETELY HIDING THE EXTRUSION.

TO A DEPTH 3" BELOW THE SURFACE; FINISH OVER GROOVE USING A TROWEL. INSERT RIGID PLASTIC EXTRUSION INTO CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.

FOR SLIPFORM CONSTRUCTION: IMMEDIATELY AFTER CONCRETE PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT IN DECK.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

BAR E5 joint. Measured Length is for one side otherwise noted.

PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT IN DECK.

JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST PER APPROVED PRODUCTS LIST.

DESIGNER NOTE: AVOID LAYOUTS WITH HORIZONTAL GAP BETWEEN SPLIT MEDIAN BARRIERS OF 2" TO 6", AS BARRIERS CANNOT BE SPLIT FOR ADDITIONAL REQUIREMENTS REGARDING BARRIER PLACEMENT.

BARRIERS CANNOT BE SPLIT FOR ADDITIONAL REQUIREMENTS REGARDING BARRIER PLACEMENT.

DESIGNER NOTE: AVOID LAYOUTS WITH HORIZONTAL GAP BETWEEN SPLIT MEDIAN BARRIERS OF 2" TO 6", AS BARRIERS CANNOT BE SPLIT FOR ADDITIONAL REQUIREMENTS REGARDING BARRIER PLACEMENT.

DESIGNER NOTE: AVOID LAYOUTS WITH HORIZONTAL GAP BETWEEN SPLIT MEDIAN BARRIERS OF 2" TO 6", AS BARRIERS CANNOT BE SPLIT FOR ADDITIONAL REQUIREMENTS REGARDING BARRIER PLACEMENT.
**BARRIER ON EACH SIDE MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.**

For lateral construction immediately after concrete is placed and before it is new, it is necessary to create a one inch square groove of a typical joint using plastic extrusion into groove to a depth of 1/2 below the surface from which groove is being inserted the extrusion.

**SECTION C-C**

<table>
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<tr>
<th>BAR No.</th>
<th>LENGTH (FT)</th>
<th>SHAPE</th>
<th>LOCATION</th>
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<tr>
<td>B</td>
<td>10'-0&quot;</td>
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**PLANS FOR COVER PLATE DETAILS.**

**REFER TO "WATERPROOF EXPANSION DEVICE" STANDARD PLANS FOR COVER PLATE DETAILS.**

**GENERAL NOTES**

- Measure payment length between the outside edges of the barrier from the CH joint. Measured length is for one side of the split median barrier. Concrete barrier 2 1/44 LBF/LEF, 0.20 CU YDS./FT. PER SIDE.
- Finish all edges of barrier with 1/2" chamfer, except where otherwise noted.
- Space control joints at 10 ft. maximum. Refer to superstructure sheet for specific spacing information.
- Joint sealant per MnDOT approved/qualified products list.
- Barrier quantities are listed in summary of quantities for superstructure.

**FIG. 5-397.146(D)**

**SECTION A-A**

*Dimension shown is to the top of the wearing course at gutterline.*

**BARRIER LONGIT.**

**INSIDE ELEVATION OF BARRIER**

**CONTROL JOINT**

**JOINT AT ABUTMENT**

**INSIDE ELEVATION OF BARRIER**

**PLAN VIEW OF APPROACH BARRIER**

**BILL OF REINFORCEMENT FOR BARRIER**

**SHEET NO.**

**REVISION:** MAY 10, 2017

**APPORVED:**

**CERTIFIED BY:**

**REVISED BY:**

**APPROVED:**

**DESIGNER NOTE:**

Remove prior to plotting final plans. Verify length of barriers on approach panels with roadway designer refer to B-20 for additional requirements regarding barrier placement.

Avoid layouts with horizontal gap between split median barriers of 2" to 6" as barriers cannot be split formed if gap exceeds 4" consider using standard figure 5-397.142 or 342 in lieu of this standard.

**STATE BRIDGE ENGINEER**

**SHEET NO.**

**NAME:**

**LID NO:**

**DATE:**

**CHECK:**

**CHECK:**

**REVISION:**

**APPORVED:**

**CERTIFIED BY:**

**REVISED BY:**

**APPROVED:**

**STATE BRIDGE ENGINEER**

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**DATE:**

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**REVISION:**

**APPORVED:**

**CERTIFIED BY:**

**REVISED BY:**

**APPROVED:**

**STATE BRIDGE ENGINEER**
DETAILS BELOW
SEE CONTROL JOINT
THE WEARING COURSE AT GUTTERLINE.
DIMENSION SHOWN IS TO THE TOP OF
CONCRETE APPROACH PANEL.

BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS
ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

**GENERAL NOTES**
MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE EDGES OF THE BARRIER FROM THE E8 JOINT.
CONCRETE BARRIER = 688 LBS./FT. (0.170 CU. YDS/FT.)

FINISH ALL EDGES OF BARRIER WITH 1/8" CHAMFER EXCEPT SUPERSTRUCTURE.
BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO WHERE OTHERWISE NOTED.
FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.
EXTRUSION INTO GROOVE TO A DEPTH 1" BELOW THE SURFACE;
STRAIGHT GROOVE USING A TROWEL. INSERT RIGID PLASTIC
IS PLACED AND WHILE IT IS STILL WET, CREATE A ONE INCH
THICKNESS IS GREATER THAN 9".
LEGS IF DECK SLAB
INCREASE M401E VERTICAL
1" JOINT DEPTH.

1'-0" MAX. SPG.
M401E & M403E

CREASE BARRIER VERTICAL
LEGS IF DECK SLAB THICKNESS IS GREATER THAN 9".
LEGS IF DECK SLAB
INCREASE M401E VERTICAL
1" JOINT DEPTH.

CRACK AND JOINT MATERIALS:
SILICONE JOINT SEALERS.
JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST
FOR SUPERSTRUCTURE.
BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES
SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO
WHERE OTHERWISE NOTED.
FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.
EXTRUSION INTO GROOVE TO A DEPTH 1" BELOW THE SURFACE;
STRAIGHT GROOVE USING A TROWEL. INSERT RIGID PLASTIC
IS PLACED AND WHILE IT IS STILL WET, CREATE A ONE INCH
THICKNESS IS GREATER THAN 9".
LEGS IF DECK SLAB
INCREASE M401E VERTICAL
1" JOINT DEPTH.

CRACK AND JOINT MATERIALS:
SILICONE JOINT SEALERS.
JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST
FOR SUPERSTRUCTURE.
BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES
SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO
WHERE OTHERWISE NOTED.
FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.
EXTRUSION INTO GROOVE TO A DEPTH 1" BELOW THE SURFACE;
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IS PLACED AND WHILE IT IS STILL WET, CREATE A ONE INCH
THICKNESS IS GREATER THAN 9".
LEGS IF DECK SLAB
INCREASE M401E VERTICAL
1" JOINT DEPTH.
INSIDE ELEVATION OF BARRIER

EXPANSION JOINT ①
DETAILED BELOW
SEE CONTROL JOINT

SECTION A-A

BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

GENERAL NOTES

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE EDGES OF THE BARRIER FROM THE END JOINT.

CONCRETE BARRIER = 638 LBS./FT. (0.157 CU. YDS/FT.)

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES SUPERSTRUCTURE SHEET.

1) PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT IN DECK.
2) JOINT SEALANT PER APPROVED/QUALIFIED PRODUCTS LIST.
3) REFER TO "WATERPROOF EXPANSION DEVICE" STANDARD PLANS FOR COVER PLATE DETAILS.

REVISED: MAY 10, 2017
APPROVED: AUGUST 24, 2016

LIC. NO. 2016.01

BILL OF REINFORCEMENT FOR BARRIER

<table>
<thead>
<tr>
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<th>LENGTH</th>
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<th>LOCATION</th>
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</tr>
<tr>
<td>M402E</td>
<td>10'-0&quot;</td>
<td>BARRIER CORNER</td>
<td></td>
</tr>
<tr>
<td>M403E</td>
<td>10'-0&quot;</td>
<td>BARRIER VERTICAL</td>
<td></td>
</tr>
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<td>M404E</td>
<td>10'-0&quot;</td>
<td>BARRIER VERTICAL</td>
<td></td>
</tr>
<tr>
<td>M4__E</td>
<td>10'-0&quot;</td>
<td>BARRIER LONGITUDINAL</td>
<td></td>
</tr>
<tr>
<td>M4__E</td>
<td>10'-0&quot;</td>
<td>BARRIER LONGITUDINAL</td>
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<tr>
<td>M4__E</td>
<td>10'-0&quot;</td>
<td>BARRIER LONGITUDINAL</td>
<td></td>
</tr>
</tbody>
</table>

MATERIALS:

SUMMARY OF QUANTITIES

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES SUPERSTRUCTURE SHEET.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

1) PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT IN DECK.
2) JOINT SEALANT PER APPROVED/QUALIFIED PRODUCTS LIST.
3) REFER TO "WATERPROOF EXPANSION DEVICE" STANDARD PLANS FOR COVER PLATE DETAILS.
### Bridge Superstructure

#### Control Joint Details

**Inside Elevation of Barrier**

Concrete wearing course not shown

**Barrier**

Meets NCHRP 350 TL-4 Requirements on Bridge Deck and TL-3 on Approach Panel.

#### Expansion Joint Details

Expansion device not shown

**General Notes**

- Measure payment length between the outside ends of the barrier from the LS joint.
- Concrete barrier = 688 lb./ft. (0.170 cu. yds./ft.)
- Finish all edges of barrier with 1/8" chamfer except where otherwise noted.
- Space control joints at 10 ft. maximum, Refer to Superstructure Sheet for specific spacing information.
- BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
- SPACE CONTROL JOINTS AT 10 FT. MAXIMUM, REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
- BARRIER LENGTH SHOWN ON SKEW DEPENDING INCREASE IN DEPENDING.
- BARRIER VERTICAL LEGS IF DECK SLAB THICKNESS IS GREATER THAN 9".
- FOR ADDITIONAL REQUIREMENTS REGARDING BARRIER PLACEMENT, REFER TO MEMO TO DESIGNERS (2016-01)
- VERIFY LENGTH OF BARRIER ON APPROACH PANEL (REMOVE PRIOR TO PLOTTING FINAL PLAN):
- PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT IN DECK.
- JOINT SEALANT PER WOOST APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.
- REFER TO "WATERPROOF EXPANSION DEVICE" STANDARD PLANS FOR COVER PLATE DETAILS.

#### Control Joint Details

**Concrete Barrier Details**

- For slipform construction immediately after concrete is placed and while it is still wet, create a one inch straight groove using a trowel. Insert rigid plastic extrusion. Finish over groove completely hiding the extrusion.
- Cast-in-place construction:
  - For slipform construction, immediately after concrete is placed and while it is still wet, create a one inch straight groove using a trowel. Insert rigid plastic extrusion. Finish over groove completely hiding the extrusion.
  - SLIPFORM CONSTRUCTION: IMMEDIATELY AFTER CONCRETE IS PLACED AND WHILE IT IS STILL WET, CREATE A ONE INCH STRAIGHT GROOVE USING A TROWEL. INSERT RIGID PLASTIC EXTRUSION. "CRACK AND JOINT MATERIALS: PER APPROVED PRODUCTS LIST"
Inside Elevation of Barrier

Barrier meets NCHRP 350 TL-4 Requirements on Bridge Deck and TL-3 on Approach Panel.

General Notes:
- Measure payment length between the outside ends of the barrier from the E8 joint.
- Concrete barrier = 700 lbs/ft (0.173 cu. yds/ft).
- Finish all edges of barrier with 3/4" chamfer except where otherwise noted.
- Space control joints at 10 ft maximum. Refer to Superstructure sheet for specific spacing information.
- Barrier quantities are listed in summary of quantities for superstructure.
- Space control joints at 10 ft maximum. Refer to Superstructure sheet for specific spacing information.
- Barrier quantities are listed in summary of quantities for superstructure.

Design Note:
- Remove prior to plotting final plans. Verify length of barrier on approach panel with roadway designer. Refer to Memo to Designers (2016-01) for additional requirements regarding barrier placement.

Bill of Reinforcement for Barrier:

<table>
<thead>
<tr>
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<td>L</td>
<td>M</td>
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<tr>
<td>M403E</td>
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Concrete Approach Panel:

For slipform construction: Immediately after concrete is placed and made it is still wet, create a 1 inch straight groove using a trowel. Insert rigid plastic extrusion into groove to a depth of 3/8" below surface finish. Mix concrete completing the extrusion.

For cast-in-place construction: Immediately after concrete is placed and made it is still wet, create a 1 inch straight groove using a trowel. Insert rigid plastic extrusion into groove to a depth of 3/8" below surface finish. Mix concrete completing the extrusion.

Barrier Meeting NCHRP 350 TL-4 Requirements:

- Barrier = 700 lbs/ft (0.173 cu. yds/ft).
- Finish all edges of barrier with 3/4" chamfer except where otherwise noted.
- Space control joints at 10 ft maximum. Refer to Superstructure sheet for specific spacing information.
- Barrier quantities are listed in summary of quantities for superstructure.

General Notes:
- Measure payment length between the outside ends of the barrier from the E8 joint.
- Concrete barrier = 700 lbs/ft (0.173 cu. yds/ft).
- Finish all edges of barrier with 3/4" chamfer except where otherwise noted.
- Space control joints at 10 ft maximum. Refer to Superstructure sheet for specific spacing information.
- Barrier quantities are listed in summary of quantities for superstructure.

Design Note:
- Remove prior to plotting final plans. Verify length of barrier on approach panel with roadway designer. Refer to Memo to Designers (2016-01) for additional requirements regarding barrier placement.

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Concrete Approach Panel:

For slipform construction: Immediately after concrete is placed and made it is still wet, create a 1 inch straight groove using a trowel. Insert rigid plastic extrusion into groove to a depth of 3/8" below surface finish. Mix concrete completing the extrusion.

For cast-in-place construction: Immediately after concrete is placed and made it is still wet, create a 1 inch straight groove using a trowel. Insert rigid plastic extrusion into groove to a depth of 3/8" below surface finish. Mix concrete completing the extrusion.

Barrier Meeting NCHRP 350 TL-4 Requirements:

- Barrier = 700 lbs/ft (0.173 cu. yds/ft).
- Finish all edges of barrier with 3/4" chamfer except where otherwise noted.
- Space control joints at 10 ft maximum. Refer to Superstructure sheet for specific spacing information.
- Barrier quantities are listed in summary of quantities for superstructure.

General Notes:
- Measure payment length between the outside ends of the barrier from the E8 joint.
- Concrete barrier = 700 lbs/ft (0.173 cu. yds/ft).
- Finish all edges of barrier with 3/4" chamfer except where otherwise noted.
- Space control joints at 10 ft maximum. Refer to Superstructure sheet for specific spacing information.
- Barrier quantities are listed in summary of quantities for superstructure.

Design Note:
- Remove prior to plotting final plans. Verify length of barrier on approach panel with roadway designer. Refer to Memo to Designers (2016-01) for additional requirements regarding barrier placement.

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Concrete Approach Panel:

For slipform construction: Immediately after concrete is placed and made it is still wet, create a 1 inch straight groove using a trowel. Insert rigid plastic extrusion into groove to a depth of 3/8" below surface finish. Mix concrete completing the extrusion.

For cast-in-place construction: Immediately after concrete is placed and made it is still wet, create a 1 inch straight groove using a trowel. Insert rigid plastic extrusion into groove to a depth of 3/8" below surface finish. Mix concrete completing the extrusion.

Barrier Meeting NCHRP 350 TL-4 Requirements:

- Barrier = 700 lbs/ft (0.173 cu. yds/ft).
- Finish all edges of barrier with 3/4" chamfer except where otherwise noted.
- Space control joints at 10 ft maximum. Refer to Superstructure sheet for specific spacing information.
- Barrier quantities are listed in summary of quantities for superstructure.

General Notes:
- Measure payment length between the outside ends of the barrier from the E8 joint.
- Concrete barrier = 700 lbs/ft (0.173 cu. yds/ft).
- Finish all edges of barrier with 3/4" chamfer except where otherwise noted.
- Space control joints at 10 ft maximum. Refer to Superstructure sheet for specific spacing information.
- Barrier quantities are listed in summary of quantities for superstructure.

Design Note:
- Remove prior to plotting final plans. Verify length of barrier on approach panel with roadway designer. Refer to Memo to Designers (2016-01) for additional requirements regarding barrier placement.

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Concrete Approach Panel:

For slipform construction: Immediately after concrete is placed and made it is still wet, create a 1 inch straight groove using a trowel. Insert rigid plastic extrusion into groove to a depth of 3/8" below surface finish. Mix concrete completing the extrusion.

For cast-in-place construction: Immediately after concrete is placed and made it is still wet, create a 1 inch straight groove using a trowel. Insert rigid plastic extrusion into groove to a depth of 3/8" below surface finish. Mix concrete completing the extrusion.

Barrier Meeting NCHRP 350 TL-4 Requirements:

- Barrier = 700 lbs/ft (0.173 cu. yds/ft).
- Finish all edges of barrier with 3/4" chamfer except where otherwise noted.
- Space control joints at 10 ft maximum. Refer to Superstructure sheet for specific spacing information.
- Barrier quantities are listed in summary of quantities for superstructure.

General Notes:
- Measure payment length between the outside ends of the barrier from the E8 joint.
- Concrete barrier = 700 lbs/ft (0.173 cu. yds/ft).
- Finish all edges of barrier with 3/4" chamfer except where otherwise noted.
- Space control joints at 10 ft maximum. Refer to Superstructure sheet for specific spacing information.
- Barrier quantities are listed in summary of quantities for superstructure.
**INSIDE ELEVATION OF BARRIER**

Concrete wearing course not shown.

Barrier meets NCHRP 350 TL-4 requirements on bridge deck and TL-3 on approach panel.

Barrier width is 42". No. 4 barrier dowel is placed at a 1" clearance from the E8 joint. Measure payment length between the outside ends of the barrier from the E8 joint.

Concrete barrier = 75.0 lbs./ft. (0.185 cu. yds./ft.)

Finish all edges of barrier with 1/4" chamfer except concrete barrier = 75.1 lbs./ft. (0.185 cu. yds./ft.)

Barrier quantities are listed in summary of quantities through complete saw cut joint.

**GENERAL NOTES**

Space control joints at 10 ft. maximum. Refer to superstructure sheet for specific spacing information.

**BILL OF REINFORCEMENT FOR BARRIER**

**SECTION C-C**

**CAST-IN-PLACE CONSTRUCTION**

Control joint details.

**SLIPFORM CONSTRUCTION**

For slipform construction, immediately after concrete is placed and while it is still wet, create a 1" x 1" groove into the surface of the slab at a depth of 0.5" below the surface finish. Over groove completely hiding the extrusion.

**GENERAL NOTES**

Place bar on top of bottom reinforcement mat in deck.

Joint sealant per MnDOT approved/qualified products list - crack and joint materials - silicon joint sealers.
INSIDE ELEVATION OF BARRIER

BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

GENERAL NOTES:
- MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE EDGES OF THE BARRIER FROM THE E8 JOINT.
- CONCRETE BARRIER = TOO LIGHT/FT, M402E 12/700/LF/FT
- FINISH ALL EDGES OF BARRIER WITH 1/8" CHAMFER EXCEPT WHERE OTHERWISE NOTED.
- SPACE CONTROL JOINTS AT 10 FT. MAXIMUM REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
- BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.
- PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT IN DECK.
- JOINT SEALANT PER MNDOT APPROVED QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.
- REFER TO WATERPROOF EXPANSION DEVICE STANDARD PLANS FOR COVER PLATE DETAILS.

SECTION B-B
CONCRETE APPROACH PANEL

FOR SLIPFORM CONSTRUCTION IMMEDIATELY AFTER CONCRETE IS PLACED AND WHILE IT IS STILL WET CREATE A ONE INCH STRAIGHT GROOVE USING A TROWEL. INSERT RIGID PLASTIC EXTRUSION INTO GROOVE TO A DEPTH OF BELOW THE SURFACE. FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.

FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.

SECTION C-C
CAST-IN-PLACE CONSTRUCTION

PER APPROVED PRODUCTS LIST. CRACK AND JOINT WATERPROOFING TYPE RIGID PLASTIC EXTRUSION:

SECTION C-C
SLIPFORM CONSTRUCTION

CONTROL JOINT DETAILS

EXPANSION JOINT

CONTROL JOINT DETAILS

HIGH TEMP. EXPANSION JOINT DETAILS BELOW

SECTION A-A
CONCRETE APPROACH PANEL

BARRIER MONEY-

BAR NO. LENGTH DIM. LOCATION
M401E 6'-10" 7' BARrior CORR.
M402E 6'-10" 7' BARrior CORR.
M403E 6'-10" 7' BARrior CORR.
M404E 6'-10" 7' BARrior CORR.
M4__E 6'-10" 7' BARrior CORR.
M4__E 6'-10" 7' BARrior CORR.
M4__E 6'-10" 7' BARrior CORR.
INSIDE ELEVATION OF BARRIER
CONCRETE WEARING COURSE NOT SHOWN

BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

GENERAL NOTES
MEASURE PAYMENT LENGTH BETWEEN THE OUTER END OF THE BARRIER FROM THE 30' JOINT.
CONCRETE BARRIER = 751 LBS./FT. (0.185 CU. YDS/FT.)

CRACK AND JOINT MATERIALS: SILICONE JOINT SEALERS.
JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST

FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.
EXTRUSION INTO GROOVE TO A DEPTH """" BELOW THE SURFACE; STRAIGHT GROOVE USING A TROWEL.

FOR SLIPFORM CONSTRUCTION IMMEDIATELY AFTER CONCRETE IS PLACED AND WHILE IT IS STILL WET, CREATE A ONE INCH STRAIGHT GROOVE USING A TROWEL. INSERT RIGID PLASTIC EXTRUSION INTO GROOVE TO A DEPTH OF NOT LESS THAN 1/2"""".""""
BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

GENERAL NOTES

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE EDGES OF THE BARRIER FROM THE EX JOINT.

CONCRETE BARRIER 3 1/4" (NO. 4 LONGITUDINAL) (NO. 4 LONGITUDINAL)

FINISH ALL EDGES OF BARRIER WITH 1/8" CHAMFER EXCEPT WHERE OTHERWISE NOTED.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO WHERE OTHERWISE NOTED.

FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.

FOR SLIPFORM CONSTRUCTION IMMEDIATELY AFTER CONCRETE IS PLACED AND WHILE IT IS STILL MUD, CREATE A ONE INCH STRAIGHT GROOVE USING A TROWEL, INSERT RIGID PLASTIC EXTRUSION INTO GROOVE TO A DEPTH OF ½" BELOW THE SURFACE FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.

CRACK AND JOINT MATERIALS:

- SILICONE JOINT SEALERS.
- JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST FOR SUPERSTRUCTURE.

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT IN DECK.

BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS.
BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

GENERAL NOTES

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE EDGES OF THE BARRIER FROM THE EX-JOINT.

CONCRETE BARRIER = 970 LBS./FT. (0.240 CU. YDS/FT.)

FINISH ALL EDGES OF BARRIER WITH 1/8" CHAMFER EXCEPT BARRIER FROM THE E8 JOINT.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO WHERE OTHERWISE NOTED.

CONCRETE APPROACH PANEL. FOR ADDITIONAL REQUIREMENTS REGARDING BARRIER PLACEMENT, VERIFY LENGTH OF BARRIER ON APPROACH PANEL (REMOVE PRIOR TO PLOTTING FINAL PLAN): MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE ENDS OF THE APPROACH PANEL.

CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS. JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST FOR SUPERSTRUCTURE. BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

SHIFT CONSTRUCTION: IMMEDIATELY AFTER CONCRETE IS PLACED AND WHILE IT IS STILL WET, CREATE A ONE INCH DEEP GROOVE USING A TROWEL. RIGID PLASTIC EXTRUSION IS PLACED AND WHILE IT IS STILL WET, CREATE A ONE INCH DEEP GROOVE COMPLETELY AROUND THE EXTRUSION.

FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION. INSERT RIGID PLASTIC EXTRUSION INTO GROOVE TO A DEPTH OF BELOW THE SURFACE; STRAIGHT GROOVE USING A TROWEL. INSERT RIGID PLASTIC EXTRUSION.
BARRIER SUPERSTRUCTURE

10'-0" MAX. SPG.

CONTROL JOINT DETAILS

INSIDE ELEVATION OF BARRIER

BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

SECTION B-B
CONCRETE APPROACH PANEL

CONTROL JOINT DETAILS

SECTION C-C
CAST-IN-PLACE CONSTRUCTION

SECTION C-C
SLIPFORM CONSTRUCTION

GENERAL NOTES
MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE ENDS OF THE BARRIER FROM THE EB JOINT.

CONTROL JOINTS ARE TYPED.
BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

GENERAL NOTES

- MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE EDGES OF THE BARRIER FROM THE END JOINTS.
- BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
- SPACE CONTROL JOINTS AT 10 FT. MAXIMUM REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
- BAR QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
- REFER TO "WATERPROOF EXPANSION DEVICE" STANDARD PLANS FOR COVER PLATE DETAILS.
- BARRIER FROM THE E8 JOINT.
- CONCRETE BARRIER = 970 LBS./FT. (0.240 CU. YDS/FT.)
- MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE ENDS OF THE BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.
- BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
- SPACE CONTROL JOINTS AT 10 FT. MAXIMUM REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
- BAR QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
- REFER TO "WATERPROOF EXPANSION DEVICE" STANDARD PLANS FOR COVER PLATE DETAILS.

CAST-IN-PLACE CONSTRUCTION

- SLAB CONSTRUCTION

CONTROL JOINT DETAILS

- FOR SLAB CONSTRUCTION IMMEDIATELY AFTER CONCRETE IS PLACED AND WHILE IT IS STILL WET, CREATE A CRAWL EXPANSION JOINTS USING A PARALLEL TAB WITH A PLASTIC EXTRUSION.
- FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.

Concrete Wearing Course Not Shown

- EXPANSION DEVICE NOT SHOWN

INSIDE ELEVATION OF BARRIER

Concrete Wearing Course Not Shown

- EXPANSION DEVICE NOT SHOWN

SECTION A-A

- EXPANSION JOINT (TYP.)

SECTION B-B

- CONCRETE APPROACH PANEL

SECTION C-C

- CONCRETE APPROACH PANEL

BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS

ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

CONTROL JOINT Details

- FOR SLAB CONSTRUCTION IMMEDIATELY AFTER CONCRETE IS PLACED AND WHILE IT IS STILL WET, CREATE A CRAWL EXPANSION JOINTS USING A PARALLEL TAB WITH A PLASTIC EXTRUSION.
- FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.

Concrete Wearing Course Not Shown

- EXPANSION DEVICE NOT SHOWN

INSIDE ELEVATION OF BARRIER

Concrete Wearing Course Not Shown

- EXPANSION DEVICE NOT SHOWN

SECTION A-A

- EXPANSION JOINT (TYP.)

SECTION B-B

- CONCRETE APPROACH PANEL

SECTION C-C

- CONCRETE APPROACH PANEL

BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS

ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.

CONTROL JOINT Details

- FOR SLAB CONSTRUCTION IMMEDIATELY AFTER CONCRETE IS PLACED AND WHILE IT IS STILL WET, CREATE A CRAWL EXPANSION JOINTS USING A PARALLEL TAB WITH A PLASTIC EXTRUSION.
- FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.
STRUCTURAL TUBE RAILING DESIGN D-1

GENERAL NOTES

- PROVIDE STRUCTURAL STEEL AND PLATE WASHERS IN ACCORDANCE WITH SPEC. 3310.
- PROVIDE CORRECT ALIGNMENT FOR ANCHORAGES BY PLACING THEM ACCURATELY FOR SPECIFIC SPACING INFORMATION.
- REMOVE CONCRETE FROM PIPE ENDS AFTER FORM REMOVAL.
- PROVIDE STRUCTURAL TUBES PER ASTM A500, GRADE B AS SPECIFIED IN SPEC. 3361.
- PROVIDE STRUCTURAL STEEL AND PLATE WASHERS IN ACCORDANCE WITH SPEC. 3310.
- APPLY COATINGS TO METAL RAILING, SEE THE SPECIAL PROVISIONS.
- FABRICATION.
- GALVANIZE ALL OTHER STRUCTURAL STEEL IN ACCORDANCE WITH SPEC. 3394, AFTER FABRICATION.
- GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL IN ACCORDANCE WITH SPEC. 3366.

CONCRETE PARAPET = 374 LBS./FT. (0.092 CU. YDS./FT.)

MEASURE PAYMENT LENGTH OF "TYPE P-2 (TL-4) BARRIER CONCRETE (3S52)"
FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.
CONTINUOUSLY GROUND ALL METAL RAILINGS, SEE THE SPECIAL PROVISIONS.

GUIDE RAIL POSTS NORMAL TO GRADE.

INSTALL RAIL POSTS NORMAL TO GRADE.

GUARDRAIL CONNECTION DETAILS TO BE CONSIDERED INCIDENTAL.

GUARDRAIL CONNECTION AND NAMEPLATE TO BE CONSIDERED INCIDENTAL.

BILL OF REINFORCEMENT FOR PARAPET

<table>
<thead>
<tr>
<th>BAR NO.</th>
<th>LENGTH</th>
<th>SHAPE</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>R501E</td>
<td>1'-0&quot;</td>
<td>TYP.</td>
<td>R502E, R503E, R504E</td>
</tr>
<tr>
<td>R502E</td>
<td>1'-11&quot;</td>
<td>TYP.</td>
<td>R503E</td>
</tr>
<tr>
<td>R503E</td>
<td>1'-10&quot;</td>
<td>TYP.</td>
<td>R504E, R505E</td>
</tr>
<tr>
<td>R504E</td>
<td>1'-1&quot;</td>
<td>TYP.</td>
<td>R505E</td>
</tr>
</tbody>
</table>

APPROVED: APRIL 09, 2020
REVISED: ""
DESIGNER NOTES

MINIMUM PARAPET LENGTH ON APPROACH PANEL IS 15'-4" WITH MINIMUM OF 7" FIGURE DOOWELS WITH ACCOMPANYING APPROPRIATE PARAPET VERTICAL BAR SUPPORT SPACING. COORDINATE WITH ROADWAY DESIGNER TO SEE IF GUARDRAIL CONNECTION IS NEEDED. ADD DETAILS FROM STANDARD FIGURE 5-397.166(D) IF GUARDRAIL CONNECTION IS NEEDED. IF GUARDRAIL CONNECTION IS INCLUDED, METAL RAILING OR FENCE ON TOP OF PARAPET MUST TERMINATE AT LEAST 5'9" AWAY FROM THE END OF THE PARAPET.

VERIFY THAT UTILITIES OR CONDUITS PLACED WITHIN THE PARAPET DO NOT INTERFERE WITH ANCHORAGE PLACEMENT/CONCRETE WEARING COURSE.

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS. SEE THE SPECIAL PROVISIONS FOR THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

FOR SLIPFORM CONSTRUCTION, THE BARS OF THE REINFORCEMENT BARS INTERSECTIONS OF THE PARAPET SHOULD BE STAYED OR DEVELOPED ACCORDINGLY.

MEASURE LENGTH BETWEEN THE OUTSIDE EDGES OF THE PARAPET.

CONCRETE PARAPET MEASUREMENTS (BASED ON A 4" SIDEWALK HEIGHT) TO A PRECISELY CENTERED LOCATION OF THE PARAPET TO BE CONSIDERED INCIDENTAL.

PARAPET QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

NAMEPLATE TO BE CONSIDERED INCIDENTAL.

PARAPET QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

NAMEPLATE TO BE CONSIDERED INCIDENTAL.

CONCRETE PARAPET QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

NAMEPLATE TO BE CONSIDERED INCIDENTAL.

CONCRETE PARAPET QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

NAMEPLATE TO BE CONSIDERED INCIDENTAL.
PARAPET LONGIT.
PARAPET VERTICAL

END VIEW

CONTROL JOINT DETAILS

JOINT AT ABUTMENT
INSIDE ELEVATION OF PARAPET

CONTROL JOINT

FIG. 5-397.166(E)

APPROVED: ____________

BIL OF REINFORCEMENT
FOR PARAPET

GENERAL NOTES
CONTINUOUSLY GROUND ALL METAL RAILINGS.

NOTE: FOR SLIPFORM CONSTRUCTION, REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE EDGES OF THE PARAPET.

CONCRETE PARAPET (TYPE P-1, TL-2) REQUIREMENTS

PARAPET QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

SPACE CONTROL JOINTS AT 10 FT.

BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INSTRUCTIONS.

NAMETAPE TO BE CONSIDERED INCIDENTAL.

PARAPET QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

SPACE CONTROL JOINTS AT 10 FT.

BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INSTRUCTIONS.

NAMETAPE TO BE CONSIDERED INCIDENTAL.

PARAPET QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.
VERIFY THAT UTILITIES OR CONDUITS PLACED WITHIN THE PARAPET DO NOT INTERFERE WITH ANCHORAGE PLACEMENT.

IF GUARDRAIL CONNECTION IS INCLUDED, METAL RAILING OR FENCE ON TOP OF PARAPET MUST TERMINATE AT LEAST 3'-0" AWAY FROM THE END OF THE PARAPET.

FOR ADDITIONAL INFORMATION, SEE CONTROL JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST.

RECORD ALL EDGES OF PARAPET WITH 1" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

CONCRETE PARAPET WITH ADJACENT SIDEWALK (BASED ON A __" SIDEWALK HEIGHT) = ___ LBS./FT. (_.___ CU. YDS./FT.)

LIMIT DISTANCE BETWEEN CONTROLLING BARS TO 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.

CONTINUOUSLY GROUND ALL METAL RAILINGS. SEE THE SPECIAL PROVISIONS. REFER TO THE SPECIAL PROVISIONS FOR BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

JOIN SEAMOverlay APPROVED/QUALIFIED PRODUCTS LIST:
- CRACK AND JOINT MATERIALS: SILICONE JOINT SEALER;
- VERTICAL METAL RAILING POST IF NOT PROTECTED BY A TRAFFIC BARRIER.

PARTIAL PARAPET LENGTH ON APPROACH PANEL IS 13'-4" WITH MINIMUM OF 18 F502E COORDINATE WITH ROADWAY DESIGNER TO SEE IF GUARDRAIL CONNECTION IS NEEDED.

MINIMUM RAISED SIDEWALK WIDTH IS 6'-0".

GENERAL NOTES

BILL OF REINFORCEMENT FOR PARAPET

FOR SLIPFORM CONSTRUCTION, TIE 100% OF THE REINFORCEMENT BAR INTERSECTIONS BONDBLING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.
COPING
EDGE OF CURB
CURB
SECTION H-H
FOR PEDESTRIAN WALKS
8 FT. WIRE FENCE
FIG. 5-397.205
STATE BRIDGE ENGINEER
GRADE OF FENCE
2 WAY CLAMP
O
0° TO 2°
2° TO 6°
6° TO 10°
0°
4°
8°
BENDING TABLE
2 WAY CLAMP
FENCE POST
INSIDE FACE OF FENCE
ON OUTSIDE.
NUT AND LOCKWASHER
" DIA. BOLT. PLACE
PROJECTION
" MAX.
ON OUTSIDE.
NUT AND LOCKWASHER
" DIA. BOLT. PLACE
PROJECTION
" MAX.
FENCE POST
END POST
FENCE POST
INSIDE FACE OF FENCE
JUNCTION "Z"
DETAIL
SEE PIPE SLEEVE DETAIL
SEE DETAIL "C"
SEE DETAIL "D"
SEE DETAIL "B"
JUNCTION "Y"
POST DETAILS
SEE SUSPENDED POST DETAILS
FABRIC TIE
PIPE SLEEVE DETAIL ①
TYPICAL SECTION THRU FENCE
GENERAL NOTES
REFER TO SPEC. 2557 AND SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS AND BASIS OF PAYMENT.
REFER TO CONCRETE CURB PLAN SHEET FOR CURB DETAILS AND REINFORCEMENT.
MEASURE THE LENGTH OF WIRE FENCE FOR PAYMENT BETWEEN THE CENTERS OF END RAILPOSTS.
CONTINUOUSLY GROUND ALL METAL FENCE SEE THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.
ALL PIPE DIAMETERS ARE NOMINAL.
MAX. SPACING FOR 3" STANDARD PIPE POSTS IS 8 FT.
INSTALL FENCE POSTS AND ANCHORAGES VERTICAL UNLESS OTHERWISE NOTED. FOR POST SPACING, MAX. SPACING FOR 3" STANDARD PIPE POSTS IS 8 FT.
INSTALL ALL POSTS WITH A MEANS TO SECURELY HOLD THE TOP TENSION WIRE IN POSITION AND ALLOW FOR THE REMOVAL AND REPLACEMENT OF A POST WITHOUT DAMAGING THE TOP TENSION WIRE.
USE 12 GA. GALVANIZED STEEL OR 9 GA. ALUMINUM ALLOY 1350-H19 HOG RINGS FOR TENSION WIRE REQUIREMENTS AS VINYL COATED FABRIC.
FUSION BONDED VINYL COATING (9 GA. AFTER COATING). USE SAME VINYL THICKNESS COATING VINYL COATING (6 GA. AFTER COATING) OR 10 GA. (0.135" CORE) STEEL CL. 3 GALV. WIRE WITH
FREQUENTLY MEASURE THE LENGTH OF WIRE FENCE FOR PAYMENT BETWEEN THE CENTERS OF END RAILPOSTS.
REFER TO CONCRETE CURB PLAN SHEET FOR CURB DETAILS AND REINFORCEMENT.
PROVIDE PIPE SLEEVE IN SPAN BETWEEN THE VERTICAL FENCE POSTS AT EXPANSION JOINT. SEE TIES.
USE 12 GA. GALVANIZED STEEL OR 9 GA. ALUMINUM ALLOY 1350-H19 HOG RINGS FOR TENSION WIRE REQUIREMENTS AS VINYL COATED FABRIC.
INSTALL ALL POSTS WITH A MEANS TO SECURELY HOLD THE TOP TENSION WIRE IN POSITION AND ALLOW FOR THE REMOVAL AND REPLACEMENT OF A POST WITHOUT DAMAGING THE TOP TENSION WIRE.
USE 12 GA. GALVANIZED STEEL OR 9 GA. ALUMINUM ALLOY 1350-H19 HOG RINGS FOR TENSION WIRE REQUIREMENTS AS VINYL COATED FABRIC.

REV 5-2017 APPROVED: JANUARY 05, 2017
CERTIFIED BY
LICENSED PROFESSIONAL ENGINEER
NAME:
TITLE:
DATE
SHEET NO. OF SHEETS
APPROVED:
CHK:
DES:
BRIDGE NO.
FIG. 5-397.205
A FT. WIRE FENCE
FOR PEDESTRIAN WALKS
FIG. 5-397.302

GENERAL NOTES
SLOPES ARE EXPRESSED AS A RATIO OF VERTICAL DISTANCE/HORIZONTAL DISTANCE.
REFER TO SPECIFICATION 2514 FOR ADDITIONAL INFORMATION.
PREVENTIVE TREATMENT PER SPEC. 3491.
TABLE SHELL PRODUCT AND USAGE CATEGORY EL.
AWPA USE CATEGORY UC4B.
REFER TO MNDOT TABLE 3491-1, PRODUCT AND USAGE CATEGORY E2.
PRESERVATIVE TREATMENT PER SPEC. 3491.

SECTION A-A

SECTION B-B

SECTION C-C

ELEVATION SHEET FOR DITCH SLOPES
SEE BRIDGE GENERAL PLAN AND LAYOUT FOR SLOPES STEEPER THAN 1:2

STABILIZED AGGREGATE SLOPE PAVING UNDER BRIDGES

APPROVED: SEPTEMBER 26, 2003

APPROVED: SEPTEMBER 26, 2003

STATE BRIDGE ENGINEER

REVISION: 09-11-2014
GENERAL NOTES

GEOTEXTILE FILTER TYPE T PER SPEC. 7731.
RIPRAP PER SPEC. 3733, RANDOM RIPRAP
CLASS ___ BY THE CU. YD.
SLOPES ARE EXPRESSED AS A RATIO OF
VERTICAL DISTANCE : HORIZONTAL DISTANCE.
SLOPES BETWEEN BRIDGES
1:2 MAX.

1. SEE PLAN SHEET NO. FOR DIMENSIONS, AND
   FOR ELEVATIONS OF RIPRAP TOE AND
   PASSAGE BENCHES.
2. PLACE RIPRAP STARTING FROM THE BOTTOM OF THE SLOPE.
   DO NOT PLACE RIP RAP IN TRENCH UNTIL RIP RAP BEEN
   PLACED ON ENTIRE SLOPE BENEATH THE TRENCH.
3. OVERLAP GEOTEX TLE FILTER 2'-0" MINIMUM.
4. WRAP GEOTEXTILE FILTER AROUND TOE, OVERHANG
   BETWEEN 1ST AND 2ND LAYER OF RIPRAP. USE
   HAND PLACEMENT OR SIMILAR METHODS TO ESTABLISH
   BETWEEN 1ST AND 2ND LAYER OF RIPRAP. USE
   WRAP GEOTEXTILE FILTER AROUND TOE, OVERHANG
   ABUTMENT FACE TO PROVIDE POSITIVE DRAINAGE.
5. BURY EDGES OF GEOTEXTILE FILTER TO DIRECT
   WATER FLOW OVER THE FABRIC WITHOUT
   UNDERMINING.
6. OUT THE TRENCH SHOWN IN DETAIL "D" AND THE
   15'-0" MAXIMUM SPACING BETWEEN TRENCHES FOR
   PASSAGE BENCHES.
7. SURFACE DESIGNS WITH AGGREGATE CLASS 9
   OCCIDENTAL TO RIPRAP TO PROVIDE SLOPES 1:2 OR FLATTER.

FILTER (SLOPES 1:2 AND FLATTER)
RIPRAP SLOPE WITH GEOTEXTILE
GEOTEXTILE FILTER TYPE 7 PER SPEC. 3733,
REPEAT AS NEEDED

RIPRAP THICKNESS = T (*)
FILTER (SLOPES 1:2 AND FLATTER)
RIPRAP SLOPE WITH GEOTEXTILE
GEOTEXTILE FILTER TYPE 7 PER SPEC. 3733,
CONCRETE INSERT

(HEX ENDS) TURNBUCKLE

†" x 6" FORGED STEEL
LOCK NUT OR JAM NUT

& LOCK NUT OR JAM NUT

¼" BOLT, FLAT WASHER

" x 1" PIPE CLAMP
LOCK NUT OR JAM NUT

4 "

CAST IRON JUNCTION BOX

2" x ¼" BENT BAR

CONCRETE INSERT

BRIDGE STRUCTURE

CHAIN

PRECAST HAND HOLES (STD. PLATE 8117)

" X  " CAST IRON JCT. BOX & SUPPORTS

" RIGID STEEL CONDUIT

COMBINATION EXPANSION/DEFLECTION FITTING

DRAINAGE TEE

HANGER ASSEMBLY

CONDUIT SLEEVE

CONCRETE INSERT

†" CONC. INSERTS

†" ROD

2" x 2" x " CAST IRON JUNCTION BOX & SUPPORTS

2 SPS. 5"

1'-0"

2 ' " MIN.

" DIAM. R.S.C.

2" SPACER

1'-1 ½"

1'-0"

C3x5

†" THREADED ROD

SEE DETAIL "A"

OF CONCRETE INSERT, †" DIA. ROD,
EACH HANGER ASSEMBLY SHALL CONSIST

OF PIPE SLEEVES AT 10'-0" MAXIMUM CENTERS.

CAP ENDS.

2" x 2" x " CAST IRON JCT. BOX & SUPPORTS

OF DECK BOTTOM

" DIAMETER HOLE

STEEL INT. DIAPH.

CONDUIT SYSTEM (FOR CONDUIT SYSTEM)

TRANSVERSE SECTION

HANGER ASSEMBLY FOR CONDUITS

CONDUIT SYSTEM (FOR CONDUIT SYSTEM)

LONGITUDINAL SECTION

GENERAL NOTES

RIGS, EYE BOLTS AND PIPE CLAMPS SHALL COMPLY WITH SPEC. 3313, TYPE I.

BOLTS, NUTS, WASHERS, TURNBUCKLES, AND EYE BOLTS SHALL COMPLY WITH A.S.T.M. A235 CLASS A MINIMUM REQUIREMENTS.

FLAT STEEL EYE BOLT WITH THREAD 2¼" FORGED STEEL EYE BOLT WITH ⅝" DIAMETER HOLE

LOCK NUT OR JAM NUT

1½" OR 2½" LOCK NUT OR JAM NUT

1½" BOLT, FLAT WASHER AND LOCK NUT OR JAM NUT, ⅝" x 1¼" SLOTTED HOLES IN BAR.

2½" x ½" HANG BAR

CAST IRON JUNCTION BOX

HANGER ASSEMBLY

JUNCTION BOX DETAILS

CENTERING DEVICE DETAIL - SIDE VIEW

LOCATED ONLY ON A HANGER ADJACENT TO PIER

E Beam

Concrete Insert

Conduit Hanger Detail

(for _____ Conduit System)

Concrete Insert

Bridge Structure

Concrete Insert

Hanger Assembly

Each Hanger Assembly Shall Consist Of Concrete Insert, ½½" Rod, Pipe Clamps, Nuts, Bolts, Assembly, Turnbuckles And Eye Bolt

CONDUIT SYSTEM FOR

CONDUIT SYSTEM (______)

SUMMARY OF QUANTITIES FOR

CONDUIT SYSTEM (______)

PRECAST HAND HOLES (STD. PLATE 8117)

HANGER ASSEMBLY

CAST IRON JCT. BOX & SUPPORTS

CONDUIT Casing

BOLTS, NUTS, WASHERS, TURNBUCKLES, EYE BOLTS AND PIPE CLAMPS SHALL COMPLY WITH SPEC. 3392. GALVANIZE BOLTS, NUTS, WASHERS, TURNBUCKLES, EYE BOLTS AND PIPE CLAMPS SHALL COMPLY WITH SPEC. 3324, GRADE 350. PIPE SLEEVES SHALL COMPLY WITH SPEC. 3394.

CONCRETE INSERTS SHALL BE APPROVED TYPE MALLEABLE IRON MATERIAL AS PER SPEC. 3306, GRADE 350. PIPE SLEEVES SHALL COMPLY WITH SPEC. 3356.

SPACE HOLES AT 10'-0" MAXIMUM CENTERS.

CAST IRON JUNCTION BOX

CAST IRON JUNCTION BOX

CAST IRON JUNCTION BOX

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CAST IRON JUNCTION BOX

CAST IRON JUNCTION BOX
CONTRACTOR SHALL VERIFY STABILITY OF FASCIA BEAMS FROM OVERTURNING (NO PERMANENT BEAM DIAPHRAGMS ARE PRESENT), CONTRACTOR SHALL PROVIDE TEMPORARY BRACING.

OVERHANG SUPPORT CONCEPT SKETCH
SEE THE CONSTRUCTION NOTES ON FRONT PORTION OF THE BRIDGE PLAN, THIS CONCEPT HAS BEEN USED SUCCESSFULLY ON PREVIOUS PROJECTS, CONTRACTORS MAY CONSIDER THIS OR ANOTHER SYSTEM AT THEIR DISCRETION.

DESIGNER NOTES:
MIN. DISTANCE BETWEEN THREADED INSERT AND END OF BEAM IS 3".

QUALITY CONTROL:
DATE REVISION:
10/22/2019
APPROVED:
DECEMBER 20, 2018
REVISED:
OCTOBER 22, 2019

35MH PRESTRESSED CONCRETE BEAM
(PRETENSIONED) 35MH-

OVERVIEW OF CONSTRUCTION NOTES
— A TOLERANCE OF 1'-0" WILL BE PERMITTED IN THIS DIMENSION.

GENERAL NOTES
PROVIDE HANDLING MARKS OR DEVICES AS REQUIRED BY CONTRACTOR.
MAKE EACH BEAM MARKING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM. ENSURE ALL MARKINGS ARE NOT LOCATED AT THE END OF THE BEAM PERMITTED TO BE CASTED, NOTE ALL BEAM MARKINGS SHOWN HAVE BEEN CAST, MAY BE PERMITTED TO BE CASTED, AND ENSURE LEGIBILITY.
NOTE ALL MATERIALS AND WORK SHOWN ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAM. SEE SPEC. 2405.

SEE FRAMING PLAN FOR BEAM END MARKED "X".
AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY PROVIDE BARS OR DEVICES AS REQUIRED BY CONTRACTOR.

MINIMUM CONCRETE STRENGTH - KSI

MIN. REQUIRED CONCRETE STRENGTH, MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

CONCRETE NODULAR CASTING DATE:
Provides a non-ferrous, nongrindable casting date that is visible throughout the life of the structure.

MIN. REQUIRED CONCRETE STRENGTH - KSI

ELASTIC SHORTENING LOSS - KSI
LONG TERM LOSSES - KSI
EXTERNAL LOSSES - KSI
TOTAL LOSSES - KSI

MINIMUM CONCRETE STRENGTH - KSI

MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

DRAPED STRANDS

DRAPED STRANDS

DIRECT STRANDS

STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

MIN. REQUIRED CONCRETE STRENGTH, MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

MINIMUM CONCRETE STRENGTH - KSI

MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.

DRAPED STRANDS

DIRECT STRANDS

STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.

MIN. REQUIRED CONCRETE STRENGTH - KSI

MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.

MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.
**CONTRACTORS MAY CONSIDER THIS OR ANOTHER SYSTEM AT THEIR DISCRETION.**

This concept has been used successfully on previous projects. This concept is used on all beam designs. See article A6.1 for details.

**DESIGNER NOTE:** Add standard temporary bracing along the edge of the beam near each end for the special provisions.

1. **MINIMUM CONCRETE STRENGTH AT TOP OF BEAM TRANSVERSELY.**

Provide handling hooks or devices as required by contractor. Mark each beam showing beam number, casting date, and individual items used. Provide handling hooks or devices as required by contractor. See framing plan for beam end marked "X." As an alternate to this, each beam end should be marked "X." An approved ladder or device may be used.

**GENERAL NOTES**

Y distances (LH):
- No. span: end
- Strand strands:...
- Total strands:...

Y = Distance to center of gravity of strands from bottom of beam. All strands spaced center to center horizontally and vertically, except as noted. A tolerance of ±1" will be permitted in this dimension.

Contractor shall verify stability of fascia beams from overturning if permanent beam diaphragms are present. Contractor shall provide temporary bracing.

**CALCULATED PRESTRESS LOSSES**

<table>
<thead>
<tr>
<th>Loss Type</th>
<th>KSI</th>
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<tbody>
<tr>
<td>Elastic Shrinkage</td>
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</table>

**MINIMUM CONCRETE STRENGTH - KSI**

1. **FV**
2. **K**
3. **K**
4. **K**

Contractor shall provide temporary bracing. See detail "A" for additional information.

**MINIMUM CONCRETE STRENGTH - KSI**

1. **FV**
2. **K**
3. **K**
4. **K**

Designer notes are standard temporary bracing notes for Y=... To the construction notes on the front portion of the plans.

**DESIGNER NOTE:** Add standard temporary bracing notes to the construction notes on the front portion of the plans.

Contractor will take elevations at top of beams after erection and will allow for deflection shown, to ensure building forms are correct grade and specified slab thickness, provide copy of elevations to the engineer.

Provide handling hooks or devices as required by contractor. Mark each beam showing beam number, casting date, and individual items used. Provide handling hooks or devices as required by contractor. See framing plan for beam end marked "X." An approved ladder or device may be used.

**GENERAL NOTES**

Y distances (LH):
- No. span: end
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Contractor shall provide temporary bracing. See detail "A" for additional information.

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Provide handling hooks or devices as required by contractor. Mark each beam showing beam number, casting date, and individual items used. Provide handling hooks or devices as required by contractor. See framing plan for beam end marked "X." An approved ladder or device may be used.

**GENERAL NOTES**

Y distances (LH):
- No. span: end
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Contractor shall verify stability of fascia beams from overturning if permanent beam diaphragms are present. Contractor shall provide temporary bracing.

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**MINIMUM CONCRETE STRENGTH - KSI**

1. **FV**
2. **K**
3. **K**
4. **K**

Contractor shall verify stability of fascia beams from overturning if permanent beam diaphragms are present. Contractor shall provide temporary bracing.
**Bean Elevation**

**Calculated Prestress Losses**

- Elastic Shortening Loss: \( \text{ksi} \)
- Long Term Losses: \( \text{ksi} \)
- Total Losses: \( \text{ksi} \)

**Minimum Concrete Strength - KSI**

- \( f_c \): \( \text{ksi} \)
- \( f_p \): \( \text{ksi} \)

**General Notes**

- Provide handling hooks or devices as required by contractor.
- Mark beam showing bridge number, casting date, and individual identification letter or number.
- Use 2" (51mm) dia. holes (interior face). Ensure all markings are stencilled and clearly legible.

**Concrete End Diaphragm**

- Parapet Abutment (See detail BRM for Diaphragm Details)

**Steel Intermediate Diaphragm**

- See detail SBD for Diaphragm Details.

**Design Notes:**

- Use 2'-0" (610mm) dia. holes (interior face).
- Use 2'-0" (610mm) dia. holes (interior face) for rebar.
- Use 2'-0" (610mm) dia. holes (interior face) for additional information.

**Concrete End Diaphragm**

- Integral or semi-integral, see superstructure details.
- Reinforcement for Diaphragm Details.

**Steel Intermediate Diaphragm**

- See detail SBD for Diaphragm Details.
CONCRETE END DIAGRAM ANCHORAGES

**Detail A**

**Detail B**

---

**General Notes:**
- Provide handling hooks or devices as required by contractor.
- Provide temporary bracing.
- Contractor will take elevations at top of beams after installation to determine deflections.
- Provide copy of elevations to the engineer.

**Section Height:**
- **H**: Height of the beam.
- **h**: Thickness of the beam.

**Calculated Prestress Losses:**
- Elastic shortening losses
- Long term losses
- Total losses

**Minimum Concrete Strength:**
- **f'c**: Minimum concrete strength.

**Prestressing Strand Diameter:**
- **G405E**: Strand diameter.

---

**Contractor shall verify stability of fascia beams from overturning (no permanent beam diaphragms are present). Contractor shall provide temporary bracing.**

---

**Overhang Support Concept Sketch:**
- See the construction notes on the front portion of the plans. Contractors may consider another system at their discretion.

---

**Beam Elevation:**
- **Initial Pressures:**
- **Load Deflection:**
- **Total Losses:**

---

**Strand Arrangement:**
- **Location:**
- **No. of Strands:**
- **Top Row:**
- **Bottom Row:**
- **Total:**

---

**Camber Diagram:**
- **Dead Load Deflection:**
- **Estimated Dead Load Deflection:**
- **Erection Camber:**

---

**Strain Diagram:**
- **Strain in the Box:**
- **Span:**
- **Total Stress:**

---

**Vendor:**
- **14", 18" & 22" Rectangular Prestressed Concrete Beam (Pretensioned) RB:**
- **Span:**
- **Concrete Strength:**

---

**Approved:**
- **Bridge No.:**
- **Sheet No.:**
- **Of Sheets:**
SNOW PLOW PROTECTION WATERPROOF EXPANSION DEVICE (USE ON SKEWS OVER 15° AND LESS THAN 50°)

DO NOT GALVANIZE PLOW FINGERS.

GENERAL NOTES

1. WELDING PROCEDURE FOR PLOW FINGERS
   - All welding shall be done with \( \frac{3}{8} \)" diameter low hydrogen shielded metal arc welding type E7016 or E7018.
   - Prior to welding, remove the galvanized coating in the weld area by pounding.
   - Weld pass one in areas A and B first, then area C, follow with passes two and three in same order as shown in detail "B".
   - Remove all weld slag and other residue between passes.
   - Allow at least 5 minutes cooling time between each of the nine welding passes.

2. DO NOT GALVANIZE PLOW FINGERS.
   - Varies with skew and expansion opening.
   - Minimum in closed position.
   - Every snow plow finger shall have full and direct bearing on the plate that is located under the movement side of the finger. No clicking noise will be allowed.
   - Modify if lane width differs from 12 ft.
   - Omit last plow finger on device with curved end.

3. PLAN VIEW AT EXPANSION DEVICE

4. DETAIL "A"

5. DETAIL "B"

6. DETAIL "C"

7. DETAIL "D"

8. SECTION A-A

9. SECTION B-B

10. SECTION C-C

11. SECTION D-D

12. VIEW A-A

13. VIEW B-B

14. VIEW C-C

15. VIEW D-D

16. PLAN VIEW AT EXPANSION DEVICE

17. SEE DETAIL "A"

18. SEE DETAIL "B"
WEARING COURSE

☐ LOW SLUMP
☐ OTHER _____________________________

EXPANSION JOINTS

JOINT MANUFACTURER _____________________________

MANUFACTURER'S IDENTIFICATION MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED

GLAND MANUFACTURER _____________________________

MANUFACTURER'S IDENTIFICATION MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND USED

ELASTOMERIC BEARING PADS

PAD MANUFACTURER _____________________________

SPECIAL SURFACE FINISH

PRODUCT NAME _____________________________ COLOR & TEXTURE _____________________________

FINISHING ROADWAY FACES OF BARRIER OR PARAPET

PRODUCT NAME _____________________________ COLOR & TEXTURE _____________________________

ANTI-GRAFFITI COATING

MANUFACTURER _____________________________

PRODUCT NAME _____________________________ LOCATION _____________________________

PAINT SYSTEM

WOOD SPECIFICATION NUMBER _____________________________ 2479 OR 2479 OR OTHER

MANUFACTURER NAME AND ADDRESS (CITY, STATE) _____________________________

PRIME COAT _____________________________ WOOD MATERIAL SPECIFICATION NUMBER _____________________________

INTERMEDIATE COAT _____________________________ WOOD MATERIAL SPECIFICATION NUMBER _____________________________

FINISH COAT _____________________________ WOOD MATERIAL SPECIFICATION NUMBER _____________________________ COLOR _____________________________

PLAN QUALITY

RATE (AGREE), 2 (NEUTRAL), OR 3 (DISAGREE, PLEASE COMMENT BELOW)

DIMENSIONING AND DETAILING ADEQUATELY DESCRIBED REQUIRED CONSTRUCTION,

BAR LISTS AND QUANTITIES WERE TYPICALLY COMPLETE AND FREE OF ERRORS,

SCALE OF DRAWINGS AND OVERALL LEGIBILITY OF LINES AND TEXT WAS GOOD,

ISS SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT,

COMMENTS _____________________________

NUMBER OF BRIDGE _____________________________ COST $ _____________________________

NOTIFICATION TO ADD, REMOVE, OR REHAB A STRUCTURE

PLEASE GO TO THE FOLLOWING WEBSITE AND COMPLETE THE FORM WHEN ADDING, REMOVING OR REHABILITATING A STRUCTURE:

https://www.dot.state.mn.us/bridge/new-structure.html - WHEN ADDING A NEW STRUCTURE - (SEND WHEN THE BRIDGE IS OPEN TO TRAFFIC)

https://www.dot.state.mn.us/bridge/remove-structure.html - WHEN REMOVING A STRUCTURE - (SEND WHEN THE BRIDGE IS NO LONGER IN SERVICE)

https://www.dot.state.mn.us/bridge/rehab-structure.html - WHEN REHABILITATING A STRUCTURE - (SEND WHEN THE REHABILITATION IS COMPLETE)

CHANGE OF VERTICAL CLEARANCE

PLEASE GO TO THE FOLLOWING WEBSITE WHEN CHANGING THE VERTICAL CLEARANCE OF EXISTING BRIDGE STRUCTURES:

https://www.dot.state.mn.us/bridge/new-structure.html - WHEN ADDING A NEW STRUCTURE - (SEND WHEN THE BRIDGE IS OPEN TO TRAFFIC)

https://www.dot.state.mn.us/bridge/remove-structure.html - WHEN REMOVING A STRUCTURE - (SEND WHEN THE BRIDGE IS NO LONGER IN SERVICE)

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THE AS-BUILT INFORMATION WAS ADDED TO THE PLAN BY:

INSPECTOR(S) SIGNATURE _____________________________ DATE _____________________________

PROJECT ENGINEER/SUPERVISOR SIGNATURE _____________________________ DATE _____________________________

WHEN BRIDGE IS OPEN TO TRAFFIC, COMPLETE THIS AS-BUILT BRIDGE DATA SHEET AND SUBMIT TO THE BRIDGE OFFICE VIA EMAIL AT: BridgeForms.dot@state.mn.us.

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REVISING: _____________________________ DATE: _____________________________

APPROVED: _____________________________ DATE: _____________________________

AS-BUILT DETAILS (AS Needed)

AS-BUILT BRIDGE DATA

TITLE: _____________________________ SHEET NO. OF SHEETS: _____________________________

FIG. 5-397.900

OTHER ITEMS

1 UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS,

FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES ☐ NO ☐

REPAIR (SF)

REINF. (SF)

CLEAN & PAINT

WEARING COURSE

CONCRETE SURFACE

REMOVE & PATCH QUANTITIES (SF)

SUMMARY OF SIGNIFICANT AS-BUILT CHANGES

NOTIFICATION TO ADD, REMOVE, OR REHAB A STRUCTURE

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AS-BUILT DETAILS (AS Needed)

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FIG. 5-397.900