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<td>Steel Railing (Temporary)</td>
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<td>Steel Railing, Type TP-1</td>
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<td>Temporary concrete barrier for stage construction</td>
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<td>R-28</td>
<td>Bridge Fence Railing (Parapet Mounted)</td>
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<td>Bicycle Railing</td>
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<td>Bridge Fence Railing (Parapet Mounted)</td>
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<td>Bridge Fence Railing (Sidewalk Mounted)</td>
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<td>Steel Railing, Type SM with concrete wearing surface and curb</td>
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<td>Concrete Bridge Railing for bridges with steel beams or girders</td>
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<td>Concrete Bridge Railing for bridges with steel beams or girders</td>
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<td>R-36 (1 of 2)</td>
<td>Concrete Bridge Railing for slab bridges</td>
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<td>Concrete Bridge Railing for slab bridges</td>
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<td>Bicycle Railing (Parapet Mounted)</td>
<td>11/22/2016</td>
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In lieu of the cast-in-place anchor device shown, the Contractor has the option of drilling and setting stainless steel anchor rods of the same diameter and grade as the specified cap screws according to Article 509.06 of the Standard Specifications. Embedment shall be according to the manufacturer's specifications.

For Bottom Rail

2-1/8'' holes with 5° draft in base of post for 2 1/8'' x 1 1/2'' hex. hd. cap screws. Std. flat washers. Stainless Steel

For Top Rail

2-1/8'' holes with 5° draft in base of post for 2 1/8'' x 1 1/2'' hex. hd. cap screws. Std. flat washers. Stainless Steel

**RAIL TERMINAL SECTION**

Note: The end rail post shall be set back as required for the terminal rail section.

**BILL OF MATERIAL**

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**DEPARTMENT OF TRANSPORTATION**

**STATE OF ILLINOIS**

**ALUMINUM RAILING, TYPE L**

**STRUCTURE NO.**

**BILLBOARD NO.**

**TOP RAIL**

1/2'' x 1/2'' x 7/8'' bar

**BOTTOM RAIL**

1/2'' x 1/2'' x 7/8'' bar

**RAIL SPLICE**

1/2'' x 1/2'' x 7/8'' bar

**RAIL POST DETAILS**

- For Top Rail
  - 5/8'' Round bar stock AASHTO M600-00 - top for 3/4'' x 1 3/4'' hex. hd. cap screws.

- For Bottom Rail
  - 5/8'' Round bar stock AASHTO M600-00 - top for 3/4'' x 1 3/4'' hex. hd. cap screws.

**RAIL POST CLAMP BAR**

- For Top Rail
  - 5/8'' Stainless Steel

- For Bottom Rail
  - 5/8'' Stainless Steel

**RAIL END TREATMENT FOR TYPE 5 AND 6 TERMINAL**

- All Posts shall be capped per parapet.
- All joints in rail shall be primed prior to paint.
- All exposed rail ends shall be capped per detail.
- Provide 1-1/4'' and 2-1/4'' Aluminum

**Limits of Payment**

- Cap railing ends
- Aluminum Railing Type L
For multi-span bridges, sufficient 5/8 x 6" x 1-5/8" galvanized steel shoes shall be provided to align rail between adjacent spans. Cast-in with Steel Railings, Type T-1.

All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.

** The studs of the anchor devices shall be placed below the top reinforcement bar and the outermost longitudinal reinforcement bar shall be placed directly above the studs of the rail post anchor device.

** The anchor devices shall be placed below the top reinforcement bar and the outermost longitudinal reinforcement bar shall be placed directly above the studs of the rail post anchor device.
EXISTING SLAB

Stage construction line

Stage removal line

See Standard 704001
Temporary Concrete Barrier

6''

SECTIONS THRU SLAB OR DECK BEAM

NEW SLAB OR NEW DECK BEAM

EXISTING DECK BEAM

RESTRAINING PIN

When "A" is 3'-1" or less, the temporary concrete barrier shall be restrained to the new slab according to Detail I, II or III. No restraint is required when "A" is greater than 3'-1".

When hot-mix asphalt wearing surface is present, the restraint shall be 3" plus the wearing surface depth.

Cost of restraining pins are included with Temporary Concrete Barrier. Traffic side only.

Drill 3'-1" } Holes in existing slab for restraining pins. 1'-10"

When "A" is greater than 3'-1". Temporary Concrete Barrier. No restraint is required when "A" is greater than 3'-1".

Temporary Concrete Barrier shall be restrained to the new slab according to Detail I, II or III. No restraint is required when "A" is greater than 3'-1".

Stage construction line

Stage removal line

See Standard 704001
Temporary Concrete Barrier

6''

US Std. 1" I.D. x 2" O.D. x approx. 8 gauge thick washer

6''

6"}

6"}

RESTRAINING PIN

DETAIL I - Installation for a new bridge deck or bridge slab.

DETAIL II - Installation for a new deck beam with an initial concrete wearing surface.

DETAIL III - Installation for a new deck beam with no initial wearing surface or with an initial hot-mix asphalt (HMA) wearing surface present.

DETAIL II - Installation for a new deck beam with an initial concrete wearing surface. Additional bar splicers shall be provided at 6'-0" centers along the length of the beam. The cost of the additional bar splicers is included with the deck beam. A pair of bar splicers, 6" apart, shall be placed at 6'-0" centers along the length of the beam. The cost of the additional bar splicers is included with the deck beam.

DETAIL III - Installation for a new deck beam with no initial wearing surface or with an initial hot-mix asphalt (HMA) wearing surface present. The deck beam directly beneath the temporary concrete barrier shall be fabricated with bar splicer inserts in the slabs of the beam, as detailed, to accommodate the installation of the retainer assemblies. A pair of bar splicers, 6" apart, shall be placed at 6'-0" centers along the length of the beam. The cost of the bar splicer is included with the deck beam.
ANCHOR BOLT DETAILS

In lieu of the cast-in-place anchor device shown, the Contractor has the option of drilling and setting 5/8" x 5'-0" long anchor bolts according to Article 509.05 of the Standard Specifications. Embedment shall be according to the manufacturer's specifications.
The designer should add the appropriate note as applicable.

A. When railing is galvanized:

All steel rail elements shall be galvanized according to Article 509 of the Standard Specifications.

B. When railing is painted:

All post, railing, splices, anchor devices, and bent posts shall be painted using the (List the appropriate paint system for Structural Steel).

Only one of the above notes would appear on Contract Plans.

Notes:

All structural steel tubing, post and railing, for parapet railing shall be CVN tested according to 1006.34(b) of the Standard Specifications.

It is the option of the Contractor to use the cast-in-place anchor device shown, or to drill and set †"} anchor rods according to Article 509.06 of the Standard Specifications.

In lieu of the cast-in-place anchor device shown, the Contractor has the option of drilling and setting †"} x 2" hex. hd. mach. bolts for †"} x 2" hex. hd. mach. bolts at 50° F.

In lieu of the cast-in-place anchor device shown, the Contractor has the option of drilling and setting †"} x 2" hex. hd. mach. bolts at 50° F.

The designer should add the appropriate note as applicable.

A. When railing is galvanized:

All steel rail elements shall be galvanized according to Article 509 of the Standard Specifications.

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A. When railing is galvanized:

All steel rail elements shall be galvanized according to Article 509 of the Standard Specifications.

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All post, railing, splices, anchor devices, and bent posts shall be painted using the (List the appropriate paint system for Structural Steel).

Only one of the above notes would appear on Contract Plans.

Notes:

All structural steel tubing, post and railing, for parapet railing shall be CVN tested according to 1006.34(b) of the Standard Specifications.

It is the option of the Contractor to use the cast-in-place anchor device shown, or to drill and set †"} anchor rods according to Article 509.06 of the Standard Specifications.

In lieu of the cast-in-place anchor device shown, the Contractor has the option of drilling and setting †"} x 2" hex. hd. mach. bolts at 50° F.

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The designer should add the appropriate note as applicable.

A. When railing is galvanized:

All steel rail elements shall be galvanized according to Article 509 of the Standard Specifications.

B. When railing is painted:

All post, railing, splices, anchor devices, and bent posts shall be painted using the (List the appropriate paint system for Structural Steel).

Only one of the above notes would appear on Contract Plans.

Notes:

All structural steel tubing, post and railing, for parapet railing shall be CVN tested according to 1006.34(b) of the Standard Specifications.

It is the option of the Contractor to use the cast-in-place anchor device shown, or to drill and set †"} anchor rods according to Article 509.06 of the Standard Specifications.

In lieu of the cast-in-place anchor device shown, the Contractor has the option of drilling and setting †"} x 2" hex. hd. mach. bolts at 50° F.
Steel Railing, Type 2399

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STEEL RAILING, TYPE 2399
STRUCTURE NO.

Specifications, to Article 509.06 of the Standard Specifications.

Stainless steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.

Provide one " and two ³ steel shims for 25% of the posts.

Shims shall be similar to base plates in size and holes. Shims shall be similar to base plates in size and holes.

Drilled and set according to Article 509.06 of the Standard Specifications.

Provide 4 -³ washers and self-locking nuts or nuts and jam nuts for 25% of the posts.

Provide ¾" reduced base welded studs.

Provide ¾" washers and locknut and flat washer. ³ bolts in hollow structural section and post.

Provide one ³ and two ³ steel shims for 25% of the posts.

Shims shall be similar to base plates in size and holes.

All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.

Steel Bridge Rail expansion joint shall be provided between any two (2) posts which span a bridge expansion joint, up to a point that will allow rail movement.

Expansion joint shall be provided with locknuts and shall be tightened to a point that will allow rail movement.

Steel Shall not be located closer than 1'-3" to an existing bridge expansion joint or end of bridge.

Provide one ³ and two ³ steel shims for 25% of the posts.

Shims shall be similar to base plates in size and holes.

All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.

Steel Shims Rail expansion joint shall be provided between any two (2) posts which span a bridge expansion joint, up to a point that will allow rail movement.

Provide one ³ and two ³ steel shims for 25% of the posts.

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Steel Shims Rail expansion joint shall be provided between any two (2) posts which span a bridge expansion joint, up to a point that will allow rail movement.
The designer should add the appropriate note as applicable

A. When railing is galvanized

All steel rail elements shall be galvanized according to Article 509.06 of the Standard Specifications

B. When railing is painted

All post, railing, splice, anchor devices, and plates shall be painted using the 1.06.04 for Structural Steel.

Only one of the above notes would appear on Contract Plans.

The designer should add the appropriate note as applicable.

A. When railing is galvanized. All steel rail elements shall be galvanized according to Article 509.06 of the Standard Specifications.

B. When railing is painted. All post, railing, splice, anchor devices, and plates shall be painted using the 1.06.04 for Structural Steel.

Only one of the above notes would appear on Contract Plans.
**RAIL SPLICE CONNECTION AT EXPANSION JT.**

**SECTION AT RAIL POST**

**RAIL SPLICE CONNECTION**

**AS REQUIRED**

**SECTION AT RAIL SPLICE**

**PLAN-BOTT. SPLICE R**

**TYPICAL**

**BILL OF MATERIAL**

**STATE OF ILLINOIS**

**DEPARTMENT OF TRANSPORTATION**

**RAIL SPLICE CONNECTION**

- **Details:**
  - Hole sizes in angles and plate:
  - 5/8" holes
  - 3/4" holes in angles
  - 3/4" holes in post
  - 7/8" x 6" x 6" flat washer
  - 7/8" x 3" x 3" flat washer
  - 7/8" x 2" x 2" Bar
  - 1 1/4" x 1 1/4" x 1 1/4" Cap Screw

- **Hole Types:**
  - 1/4" x 7/8" x 1/4" flat washer
  - 1/4" x 7/8" x 1/4" flat washer
  - 1/4" x 7/8" x 1/4" flat washer
  - 1/4" x 7/8" x 1/4" flat washer
  - 1/4" x 7/8" x 1/4" flat washer
  - 1/4" x 7/8" x 1/4" flat washer

- **Notes:**
  - For multi-span bridges, sufficient 1 1/4" x 6" x 1 1/4" galvanized steel shims shall be provided to align rail between adjacent spans.
  - Cost included with Steel Railing, Type SM.
  - All steel railing elements shall be galvanized according to Article 1006.32 of the Standard Specifications.

**Splice Dimensions**

**Anchor Device**

- Threaded areas shall be plugged or plugged out during coating of beam. Galvanized after fabrication.

**Splice Dimensions**

- **Steel Railing, Type SM**

**State of Illinois**: 6/34WSC

**Contract No.**: 636022

**Bill of Material**

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**Sections:**

- Section A-A
- Section B-B
- Section C-C
- Section D-D
- Section E-E

**Plan-Bott. Splice R**

**Typical**

**Rail Post**

**Anchor Device**

- Threaded areas shall be plugged or plugged out during coating of beam. Galvanized after fabrication.

**Splice Dimensions**

- **Steel Railing, Type SM**

**State of Illinois**: 6/34WSC

**Contract No.**: 636022

**Bill of Material**

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**Sections:**

- Section A-A
- Section B-B
- Section C-C
- Section D-D
- Section E-E

**Plan-Bott. Splice R**

**Typical**

**Rail Post**

**Anchor Device**

- Threaded areas shall be plugged or plugged out during coating of beam. Galvanized after fabrication.

**Splice Dimensions**

- **Steel Railing, Type SM**

**State of Illinois**: 6/34WSC

**Contract No.**: 636022

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All concrete for railing wall shall be Class B5 according to Article D101.0.A of the Standard Specifications. Surface of railing shall receive a rubbed finish according to Article 503.15 of the Standard Specifications. All parts of the railing including concrete and reinforcing will be paid for at the contract unit price per foot for Concrete Bridge Railing. Holes and recesses must be formed or cored. Drilling is not permitted. Aluminum sheets shall be according to ASTM B209 alloy 3003-H14.

Aluminum sheets shall be according to ASTM B209 alloy 3003-H14.

Notes:
- Bars e(E) thru e (E) and d (E) are included in the cost of Concrete Bridge Railing.
- Bars e(E) thru e (E) and d (E) are included in the cost of Concrete Bridge Railing.
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A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z

SPAN PILASTER

PIER PILASTER

INSIDE ELEVATION OF RAIL

SECTION A-A

THRU WINDOW ON SLAB BRIDGE

MIN. BAR LAP

#5 bars = 3'-1"

#7 bars = 5'-10"

TYPICAL REINFORCEMENT PLACEMENT

BAR LIST

The designer shall place additional joints in parapet (full height) as specified in Manual Figures 3.2.4-6 and 3.2.4-7.

R-36

Sheet No. 1 of 2

STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

CONCRETE BRIDGE RAILING

STRUCTURE NO.
**BILL OF MATERIAL**

**SUPERSTRUCTURE**

**CONCRETE BRIDGE RAILING**

**DEPARTMENT OF TRANSPORTATION**

**STATE OF ILLINOIS**

**FILE NAME** = USER NAME

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**BILL OF MATERIAL**

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<td>Steel</td>
<td>#5</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Steel</td>
<td>#6</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Epoxy Coated</td>
<td>Reinforcement Bars, Plastic Reinforcement Bars, Plastic rebar, Fiberglass reinforcement bars, Fiberglass reinf.</td>
<td>5&quot;</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>

---

**DETAIL A**

**SECTION E-E**

(For spans greater than 50'-0")

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**SECTION F-F**

---

**WINDOW DETAIL**

---

**SECTION G-G**

---

**TOP PLAN**

---

**ALUMINUM JOINT DETAILS**
The designer shall place additional joints in a stairwell at the height as specified in Bridge Manual Figures 3.2.4-6 and 3.2.4-7.

<table>
<thead>
<tr>
<th>STRUCTURE NO.</th>
<th>CONTRACT NO.</th>
<th>SHEETS</th>
<th>SHEET NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCRETE BRIDGE RAILING, SIDEWALK MOUNTED</td>
<td>R-37</td>
<td>1-2</td>
<td>1</td>
</tr>
</tbody>
</table>

**TYPICAL REINFORCEMENT PLACEMENT**

**SECTION A-A**

**MIN. BAR LAP**
- #7 bars = 5'-10"
- #5 bars = 3'-1"

**Bar List**

- #7 bars
- #5 bars

**Notes:**
- All concrete for railing walls shall be Class 65 according to Article 1020.04 of the Standard Specifications. Surface of railing shall receive a rubbed finish according to Article 503.15(b) of the Standard Specifications. Surface of railing shall receive a rubbed finish according to Article 503.15(c) of the Standard Specifications.
- All parts of the railing, including concrete and reinforcing, shall be paid for at the contract unit price per foot for Concrete Bridge Railing, Sidewalk Mounted. Windows and recesses must be formed or cored. Drilling is not permitted.
- Reinforcement shall be in accordance with ASTM B209 alloy 3003-H14.
- Aluminum sheets shall be in accordance with ASTM B209 alloy 3003-H14.
- Aluminum sheets shall be in accordance with ASTM B209 alloy 3003-H14.
Typical Panel (10' Min.; 33' Max.)

INSIDE ELEVATION OF RAILING

MINIMUM BAR LAP
#4 bar = 2'-8''
### RAILING JOINT DETAILS

#### Typical Side Reveals

- **Typical Side Reveals Diagram**

#### Inside Face of Railing

- **Inside Face Diagram**

### SECTION A-A

- **Bar Dimensions**
  - Size: 3/4" cl.
  - Length: 1'-5"

### SECTION B-B

- **Section B-B Diagram**

### SECTION C-C

- **Section C-C Diagram**

### SECTION D-D

- **Section D-D Diagram**

### SECTION E-E

- **Section E-E Diagram**

### BAR LIST

<table>
<thead>
<tr>
<th>Bar No.</th>
<th>Material Type</th>
<th>Size Description</th>
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</thead>
<tbody>
<tr>
<td>D(E)</td>
<td>Aluminum</td>
<td>3/4&quot; cl.</td>
</tr>
<tr>
<td>E(E)</td>
<td>Rubber</td>
<td>2&quot;</td>
</tr>
</tbody>
</table>

### TWO RAILINGS

#### For information only:

- **Bar List**
  - D(E), E(E)

### BILL OF MATERIAL

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>Concrete Bridge Railing, TL-4</td>
<td>Foot</td>
<td>10'</td>
</tr>
</tbody>
</table>

**Notes:**

- All concrete for railing wall shall be Class BS according to Art. 1020.04 of the Standard Specifications. Surface of railing shall receive a rubbed finish according to Art. 503.15 of the Standard Specifications.
- All parts of the railing including concrete and reinforcing will be paid for at the contract unit price per foot for Concrete Bridge Railing, TL-4.
- Hooks and recesses must be formed or cored. Drilling is not permitted.