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**ABBREVIATIONS**

- BCD = BRIDGE CONSTRUCTION DETAILS
- TCD = TRAFFIC CONTROL DETAILS
- CD = ROADWAY
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CONCRETE, CLASS B

\(4\%\)

GRAY CONCRETE, CLASS B

\(4\%\)

*3" TYPICAL FOR FUTURE RESURFACING*

CONCRETE ISLAND PAVEMENT, 4" THICK

#25 REINFORCEMENT STEEL 8" LONG, 4'-0" C. TO C. LONGITUDINALLY (TYP.)

NOTE:

MASH TL-3 AJ BARRIER CURB

CONSTRUCTION DETAILS

NOTE:

1. USE GENERAL NOTES APPLYING TO ALL BARRIER CURB CD-607-2.
2. COMPACT ADDITIONS TO SUBGRADE IN SITU.
3. SHAKE AND COMPACT THE FILL BETWEEN THE BUMP TO A TYP MASH TL-3 AJ BARRIER CURB, DIRECT OR SUBGRADE MATERIAL, AND SHAKE WITH ACCEPTABLE MATERIAL AND COMPACT.

APPROACH CURVED GORE AREA TREATMENT

CONCRETE ISLAND, 4" THICK

THESE SURFACES TO BE GIVEN A LIBERAL COAT OF CUTBACK ASPHALT PRIOR TO POURING CONCRETE AGAINST THEM.

THESE SURFACES TO BE GIVEN A LIBERAL COAT OF CUTBACK ASPHALT PRIOR TO POURING CONCRETE AGAINST THEM.
GENERAL NOTES:

1. WHERE DOWELLED BARRIER CURB IS TO BE CONSTRUCTED ON EXISTING CONCRETE PAVEMENT OR EXISTING CONCRETE BASE OR CONCRETE SLAB, OMIT THE DOWELS IN THE SHORTER COURSE.

2. INSTALL TRANSVERSE JOINTS IN THE CURB AT AND DIRECTLY OVER TRANSVERSE JOINTS IN THE EXISTING CONCRETE PAVEMENT OR EXISTING CONCRETE BASE. FILL THE JOINTS WITH PREFORMED BITUMINOUS-IMPREGNATED FIBER JOINT SEALANTS AS REQUIRED.

3. ALL THE TRANSVERSE JOINTS WITH PREFORMED BITUMINOUS-IMPREGNATED FIBER JOINT SEALANTS ARE LocateD so that they are directly above long joints in the existing pavement. THE REQUIRED THICKNESS OF JOINT SEALANT IS TO BE DEEMED SATISFACTORY TO THE RE.

4. WHERE REQUIRED, #13 EPOXY COATED REINFORCEMENT STEEL, 10'-0" LONG, TO BE SET IN NON-SHRINK GROUT IN DRILLED HOLES 2" FROM EXPOSED SURFACE OF CURB. CONSTRUCT THE CURB IN THIS PORTION OF THE CURB.

5. THE FINISHED SURFACE OF THE BARRIER CURB IS TO BE SMOOTH, DENSE UNPITTED AND FREE FROM AIR BUBBLE CRACKS, 4" OVER PAVEMENT JOINTS WHERE SLAB LENGTH VARIANCE IS MORE THAN 15'-0".

6. INSTALL FLEXIBLE DELINEATORS ON BARRIER CURB.

7. WHERE BARRIER CURB IS TO BE CONSTRUCTED ON EXISTING PAVEMENT, INSTALL TRANSVERSE JOINTS SPACED 4'-0" C. TO C. LONGITUDINALLY OR BASE COURSE, OMIT THE DOWELS IN THE SHORTER COURSE:

(a) WHERE DOWELLED BARRIER CURB IS TO BE CONSTRUCTED OVER TRANSVERSE JOINTS IN THE EXISTING CONCRETE PAVEMENT OR EXISTING CONCRETE BASE, FILL THE JOINTS WITH PREFORMED BITUMINOUS-IMPREGNATED FIBER JOINT SEALANTS AS REQUIRED.

(b) THE THICKNESS OF THE TRANSVERSE JOINTS IN THE EXISTING CONCRETE PAVEMENT OR EXISTING CONCRETE BASE MUST BE AT LEAST 3" TYPICAL FOR FUTURE RESURFACING.

(c) THE FINISHED SURFACE OF THE BARRIER CURB IS TO BE SMOOTH, DENSE UNPITTED AND FREE FROM AIR BUBBLE CRACKS, 4" OVER PAVEMENT JOINTS WHERE SLAB LENGTH VARIANCE IS MORE THAN 15'-0".

8. INSTALL TRANSVERSE JOINTS IN THE CURBS AT AND DIRECTLY OVER TRANSVERSE JOINTS IN THE PAVEMENT. TREAT DEFINITE PORTION OF THE PANEL WITH 45# SMOOTH ROLL ROOFING GREASE TO MAKE EQUAL SECTIONS NOT OVER 15'-0" IN LENGTH.

9. THE THICKNESS OF THE ULTIMATE FEATHER EDGE IS TO BE DEEMED SATISFACTORY TO THE RE.

10. WHERE THE REQUIRED THICKNESS OF CURB IS TO BE GIVEN A WOOD TO OBTAIN THE ABOVE MENTIONED FINISHED SURFACE, USE 4" OPENING TO BE CONSTRUCTED IN BARRIER CURB.

11. OPENINGS TO BE CONSTRUCTED IN BARRIER CURB AS SPECIFIED PRIOR TO THE CONSTRUCTION OF THE CURB.

12. THE REQUIRED GROUTING IS TO BE DEEMED SATISFACTORY TO THE RE.

13. INSTALL TRANSVERSE JOINTS IN THE CURBS AT AND DIRECTLY OVER TRANSVERSE JOINTS IN THE PAVEMENT. TREAT DEFINITE PORTION OF THE CURB. CONSTRUCT THE CURB IN THIS PORTION OF THE CURB.

14. THE FINISHED SURFACE OF THE BARRIER CURB IS TO BE SMOOTH, DENSE UNPITTED AND FREE FROM AIR BUBBLE CRACKS, 4" OVER PAVEMENT JOINTS WHERE SLAB LENGTH VARIANCE IS MORE THAN 15'-0".

15. INSTALL TRANSVERSE JOINTS IN THE CURBS AT AND DIRECTLY OVER TRANSVERSE JOINTS IN THE PAVEMENT. TREAT DEFINITE PORTION OF THE CURB. CONSTRUCT THE CURB IN THIS PORTION OF THE CURB.
CONCRETE, CLASS B

4% 4%

7.5"

THESE SURFACES TO BE GIVEN A LIBERAL COAT OF CUTBACK ASPHALT PRIOR TO POURING CONCRETE AGAINST THEM.

CONCRETE CLASS B

3" TYPICAL FOR FUTURE RESURFACING

NOTES:

HMA = HOT MIX ASPHALT

MASH TL-5 F SHAPE BARRIER CURB

#13 REINFORCEMENT STEEL

#25 REINFORCEMENT STEEL, 8" LONG, TO BE SET IN NON-SHRINK GROUT IN DRILLED HOLES SPACED 4'-0" C. TO C. LONGITUDINALLY

#13 REINFORCEMENT STEEL

#25 REINFORCEMENT STEEL, 8" LONG, TO BE SET IN NON-SHRINK GROUT IN DRILLED HOLES SPACED 4'-0" C. TO C. LONGITUDINALLY

15" x VARIABLE HEIGHT F SHAPE CONCRETE BARRIER CURB

15" x 51" F SHAPE CONCRETE BARRIER CURB

VARIABLE WIDTH x VARIABLE HEIGHT F SHAPE CONCRETE BARRIER CURB

MASH TL-5 F SHAPE BARRIER CURB

#13 EPOXY COATED REINFORCEMENT STEEL

#13 REINFORCEMENT STEEL

#25 REINFORCEMENT STEEL, 8" LONG, TO BE SET IN NON-SHRINK GROUT IN DRILLED HOLES SPACED 4'-0" C. TO C. LONGITUDINALLY

1. USE GENERAL NOTES APPLICABLE TO ALL BARRIER CURB 20-429-4.

2. COMPACT ACCORDING TO REQUIREMENTS.

3. SHAPE AND COMPACT THE FILL BETWEEN THE CURB TO A FIRM FRESH SURFACE USING SUITABLE MATERIAL AND REPLACE WITH ACCEPTABLE MATERIAL AND COMPACT.

4. REINFORCEMENT STEEL TO BE IN VERTICALLY.
NOTES:
1. THIS DETAIL IS TO BE USED ONLY AT THE TRAILING END OF BARRIER CURB SEPARATING SAME DIRECTION TRAFFIC OR WHERE THE TERMINAL IS BEYOND THE CLEAR ZONE.
2. PAYMENT FOR NJ BARRIER CURB TAPERED END WILL BE MADE UNDER ITEM "CONCRETE BARRIER CURB".
3. PAYMENT FOR F SHAPE BARRIER CURB TAPERED END WILL BE MADE UNDER "F SHAPE CONCRETE BARRIER CURB".

1. 32" NJ BARRIER CURB TAPERED END
2. 24" F SHAPE BARRIER CURB TAPERED END
3. 1'-6" BARRIER CURB TAPERED END

PLAN VIEW

BARRIER CURB
TAPERED END

CONSTRUCTION DETAILS

NEW JERSEY DEPARTMENT OF TRANSPORTATION
**General Notes:**

1. If the end of the guide rail is buried in the slope, the limit of nonvegetative surface relative to the buried guide rail will be determined by the RE.

2. See typical sections for curb slopes in medians, border, or sidewalk areas.

3. Leave-outs can be filled as follows:
   - In certain areas, leave-outs may be filled with nonvegetative surface or HDMA, depending on the specific site conditions.
   - In other areas, leave-outs may be filled with nonvegetative surface or HDMA, depending on the specific site conditions.

**Nonvegetative Surface:**

- **Roadway or Shoulder:**
  - **Width of Nonvegetative Surface:**
    - For widths greater than 4'-0".
    - For widths less than or equal to 4'-0".

- **Nonvegetative Surface Around Flared Guide Rail:**
  - Where guide rail offset from edge of pavement is greater than 4'-0".
  - Where guide rail offset from edge of pavement is 4'-0" or less.

- **Nonvegetative Surface Around Umbrella Section:**
  - When guide rail is used.

- **Nonvegetative Surface Around Beam Guide Rail Anchorages:**
  - Where X is less than or equal to 4', use Y to determine nonvegetative surface treatment for that side of guide rail.

- **Nonvegetative Surface Around Guide Rail Behind Curb or Raised Berm:**
  - Where guide rail offset from edge of pavement is greater than 4'-0".

- **Nonvegetative Surface Around Overhead Sign Foundations and Under Large Ground-Mounted Signs:**
  - The nonvegetative surface is to form a rectangular pad whose outside limits extend a minimum of 3'-0" beyond the position posting.

**Notes:**

- See typical sections for curbs slopes in medians, border, or sidewalk areas.

- Leave-outs can be filled with nonvegetative surface or HDMA, depending on the specific site conditions.

- In certain areas, leave-outs may be filled with nonvegetative surface or HDMA, depending on the specific site conditions.

- In other areas, leave-outs may be filled with nonvegetative surface or HDMA, depending on the specific site conditions.

**Nonvegetative Surface:**

- **Roadway or Shoulder:**
  - **Width of Nonvegetative Surface:**
    - For widths greater than 4'-0".
    - For widths less than or equal to 4'-0".

- **Nonvegetative Surface Around Flared Guide Rail:**
  - Where guide rail offset from edge of pavement is greater than 4'-0".
  - Where guide rail offset from edge of pavement is 4'-0" or less.

- **Nonvegetative Surface Around Umbrella Section:**
  - When guide rail is used.

- **Nonvegetative Surface Around Beam Guide Rail Anchorages:**
  - Where X is less than or equal to 4', use Y to determine nonvegetative surface treatment for that side of guide rail.

- **Nonvegetative Surface Around Guide Rail Behind Curb or Raised Berm:**
  - Where guide rail offset from edge of pavement is greater than 4'-0".

- **Nonvegetative Surface Around Overhead Sign Foundations and Under Large Ground-Mounted Signs:**
  - The nonvegetative surface is to form a rectangular pad whose outside limits extend a minimum of 3'-0" beyond the position posting.

**Notes:**

- See typical sections for curbs slopes in medians, border, or sidewalk areas.

- Leave-outs can be filled with nonvegetative surface or HDMA, depending on the specific site conditions.

- In certain areas, leave-outs may be filled with nonvegetative surface or HDMA, depending on the specific site conditions.

- In other areas, leave-outs may be filled with nonvegetative surface or HDMA, depending on the specific site conditions.
RAIL ELEMENT TO BE SUPPLIED IN LENGTHS OF 13'-6" OR 26'-0"

**IN-PLANE RAIL ELEMENT**

**RAIL SPLICE**

**POST ASSEMBLY, DUAL FACED**

**SPlice & RAIL NUT & BOLT**

**BEAM GUIDE RAIL, DUAL FACED**

**MASH TL-3**

**NOTES:**
1. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
2. INSTALL AN END TERMINAL AS SHOWN ON THE PLANS. USE THE END SECTION (ROUNDED) ON THE END OF THE RAIL ELEMENT WHERE DUAL FACED BEAM GUIDE RAIL ENDS AND SINGLE FACED BEAM GUIDE RAIL BEGINS.
3. WHERE TRANSITIONING TO EXISTING GUIDE RAIL, AN END TERMINAL OR A CRASH CUSHION MOUNTED AT A HEIGHT OTHER THAN 2'-7", THE VERTICAL TRANSITION TO BE ACCOMPLISHED IN A MINIMUM LENGTH OF 6'-0" FOR EACH 2" OF VERTICAL CHANGE, AS SHOWN.

**INSTALLATION OF BEAM GUIDE RAIL**

**CONSTRUCTION DETAILS**

**NOTE:**
- All dimensions are subject to manufacturing tolerances.
- Use the end section (rounded) on the end of the rail element where dual faced beam guide rail ends and single faced beam guide rail begins.
RUB RAIL MAY BE SUPPLIED IN LENGTHS OF 12'-5" OR 24'-11"

1. 7" x 10GA x 13'-1" THICK PLATE

2. INSTALL RUB RAIL WHERE SHOWN ON THE PLANS.

NOTES:

- NEW JERSEY DEPARTMENT OF TRANSPORTATION
- CONSTRUCTION DETAILS

NEW JERSEY DEPARTMENT OF TRANSPORTATION

RUB RAIL ANGLE ATTACHMENT

MATERIAL:

1. 7" x 10GA x 13'-1" THICK PLATE
2. INSTALL RUB RAIL WHERE SHOWN ON THE PLANS.

NOTES:

- USE EITHER C6 x 8.2 OR BENT PLATE FOR RUB RAIL.
- INSTALL RUB RAIL WHERE SHOWN ON THE PLANS.

TABLE:

<table>
<thead>
<tr>
<th>L</th>
<th>TERMINAL LENGTH (T)</th>
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<tbody>
<tr>
<td>1&quot;</td>
<td>FULL LENGTH</td>
</tr>
<tr>
<td>8&quot;</td>
<td>1&quot; x 2&quot;</td>
</tr>
<tr>
<td>14&quot;</td>
<td>THRU</td>
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</table>

BEND PLATE

RUB RAIL

CARRIAGE BOLT DETAIL

NOTES:

1. 7" x 10GA x 13'-1" THICK PLATE
2. INSTALL RUB RAIL WHERE SHOWN ON THE PLANS.

CONSTRUCTION DETAILS
TANGENT GUIDE RAIL TERMINAL

FLARED GUIDE RAIL TERMINAL

NOTES:
1. NUMBER OF POSTS, TYPE OF POST, POST SPACING, FLARE RATE, AND MATERIALS TO BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE DEPARTMENT'S QUALIFIED PRODUCTS LIST.
2. RAIL SPLICE LOCATIONS MAY VARY. SEE MANUFACTURER'S OPTIONAL PANEL CONFIGURATIONS.
3. WHERE GUARD RAIL IS INSTALLED FLUSH WITH THE GUTTER LINE, CONSTRUCT THE TANGENT TERMINAL WITH A STRAIGHT FLARE FOR ITS ENTIRE LENGTH TO PROVIDE A ONE FOOT OFFSET SO THAT THE EXTRUDER HEAD DOES NOT PROTRUDE INTO THE ROADWAY.
4. WHERE THE DOWNSTREAM GUIDE RAIL IS ON A HORIZONTAL CURVE, CONSTRUCT THE FLARED OR TANGENT TERMINAL IN A STRAIGHT LINE AS SHOWN ON THIS DETAIL (DO NOT FOLLOW THE HORIZONTAL CURVE).

PLASTIC COVER WITH REFLECTIVE SHEETING

PLASTIC COVER WITH REFLECTIVE SHEETING

NEW JERSEY DEPARTMENT OF TRANSPORTATION
CONSTRUCTION DETAILS

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NEW JERSEY DEPARTMENT OF TRANSPORTATION

CONSTRUCTION DETAILS

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SHOULDER FLARE AS SHOWN ON PLANS

NOTES:

TRAFFIC

PIERS

BEAM GUIDE RAIL

ANCHORAGE

MINIMUM 12'-6" BEFORE FLARE

BEAM GUIDE RAIL, DUAL FACED

SHOULDER

4' OR MORE (SEE NOTE 2)

17' X 17' CONCRETE PAD

SWALE

12'

A

B

SECTION A-A

SWALE

6'

A

45°

NOTE 3

NOTE 1

NOTE 3

NOTE 1

NOTE 3

17' X 17' CONCRETE PAD (SEE NOTE 4)

OVERLAPPING DUAL FACED MEDIAN BEAM GUIDE RAIL

MEDIAN GUIDE RAIL TREATMENTS

LOCATION OF CONCRETE PAD AS SHOWN ON THE PLANS.

ATTACH AN END SECTION (ROUNDED) WHERE DUAL-FACED BEAM GUIDE RAIL TERMINATES. SEE CD-609-2.

WHERE CLEARANCE FROM THE OBSTRUCTION TO THE FACE OF RAIL IS LESS THAN 4', REDUCED POST SPACING IS REQUIRED. SEE CD-609-8.

EXTEND DUAL FACED GUIDE RAIL A MINIMUM OF ONE 6'-3" SPACE (TWO POSTS) BEYOND A 45 DEGREE LINE EXTENDED FROM THE LAST POST OF THE BEAM GUIDE RAIL ANCHORAGE.

LOCATION OF CONCRETE PAD AS SHOWN ON THE PLANS.

CONCRETE SURFACE COURSE, 8" THICK

EDGE OF TRAVELED WAY

OVERLAPPING DUAL FACED MEDIAN BEAM GUIDE RAIL WITH CONCRETE PAD
**CLEAR AREA FREE OF FIXED OBJECTS**

- **6'-3" POST SPACING**
- **6'-3" POST SPACING**

**UNSUPPORTED SPAN**

- **2'-0"**
- **2'-7"**

**3 CRT POSTS**

**GROUND LINE**

**2'-7"**

**GUTTER LINE**

**3 CRT POSTS**

**WIDTH OF POST SPACING**

**6" x 8" x 6'-0" WOOD POST**

- **3 CRT POSTS**

**CD-609-8A**

**6" x 8" x 14" WOOD BLOCK**

**3 CRT POSTS**

**NOTE:**

1. A MANSION OF THE 6'-3" POST SPACING OF TANGENT GUIDE RAIL ARE REQUIRED BETWEEN TWO CONSECUTIVE SINGLE POINT OMISSIONS.
2. THE OUTER CFT POSTS MUST BE A MANSION OF THE 6'-3" POST SPACING FROM THE APPROACH END OF A TANGENT TERMINAL. POSTS 6'-3" POST SPACING FROM THE APPROACH END OF A PLATED TERMINAL AND 8'-0" POST SPACING FROM THE BEGINNING OF A PLANE OR MITER POST SPACING.
3. THE OUTER CFT POSTS MUST BE A MANSION OF THE 6'-3" POST SPACING FROM THE LAST POST OF AN END TERMINAL.
4. THE OUTER CFT POSTS MUST BE A MANSION OF SIX 6'-3" POST SPACING FROM A THREE BEAM TO STANDARD TRANSITION SECTION.
5. WHERE THERE IS CURB, THE MAXIMUM CURB HEIGHT IS 2" FROM 25' IN ADVANCE OF THE FIRST CRT POST ON THE APPROACH END TO 25' PAST THE LAST CRT POST ON THE TERMINAL END.
6. THE REQUIRED CLEAR AREA FREE OF FIXED OBJECTS IS 8' FOR AN 18'-9" UNSUPPORTED SPAN AND 5' FOR A 25'-0" UNSUPPORTED SPAN.
7. **IF THERE IS A VERTICAL DROP OFF BEHIND THE UNSUPPORTED SPAN THE FACE OF RAIL MUST BE A MANSION OF 6" FROM THE DROP OFF.**

**18'-9" OR 25'-0" UNSUPPORTED SPAN**

**BEAM GUIDE RAIL TREATMENTS**

(MASH TL-3)

**RAIL HEIGHT DETERMINATION**

**CONSTRUCTION DETAILS**

**CD-609-8A.1**

**CD-609-8A.2**

**CD-609-8A.3**

**NOTE:**

1. A MANSION OF THE 6'-3" POST SPACING OF TANGENT GUIDE RAIL ARE REQUIRED BETWEEN TWO CONSECUTIVE SINGLE POINT OMISSIONS.
2. THE OUTER CFT POSTS MUST BE A MANSION OF THE 6'-3" POST SPACING FROM THE APPROACH END OF A TANGENT TERMINAL. POSTS 6'-3" POST SPACING FROM THE APPROACH END OF A PLATED TERMINAL AND 8'-0" POST SPACING FROM THE BEGINNING OF A PLANE OR MITER POST SPACING.
3. THE OUTER CFT POSTS MUST BE A MANSION OF THE 6'-3" POST SPACING FROM THE LAST POST OF AN END TERMINAL.
4. THE OUTER CFT POSTS MUST BE A MANSION OF SIX 6'-3" POST SPACING FROM A THREE BEAM TO STANDARD TRANSITION SECTION.
5. WHERE THERE IS CURB, THE MAXIMUM CURB HEIGHT IS 2" FROM 25' IN ADVANCE OF THE FIRST CRT POST ON THE APPROACH END TO 25' PAST THE LAST CRT POST ON THE TERMINAL END.
6. **THE REQUIRED CLEAR AREA FREE OF FIXED OBJECTS IS 7' FOR AN 18'-9" UNSUPPORTED SPAN AND 8' FOR A 25'-0" UNSUPPORTED SPAN.**

**12'-6" UNSUPPORTED SPAN**

**PAID FOR UNDER "BEAM GUIDE RAIL" ITEM**

**NOTE:**

1. A MANSION OF THE 6'-3" POST SPACING OF TANGENT GUIDE RAIL ARE REQUIRED BETWEEN TWO CONSECUTIVE SINGLE POINT OMISSIONS.
2. THE OUTER CFT POSTS MUST BE A MANSION OF THE 6'-3" POST SPACING FROM THE APPROACH END OF A TANGENT TERMINAL. POSTS 6'-3" POST SPACING FROM THE APPROACH END OF A PLATED TERMINAL AND 8'-0" POST SPACING FROM THE BEGINNING OF A PLANE OR MITER POST SPACING.
3. THE OUTER CFT POSTS MUST BE A MANSION OF THE 6'-3" POST SPACING FROM THE LAST POST OF AN END TERMINAL.
4. THE OUTER CFT POSTS MUST BE A MANSION OF SIX 6'-3" POST SPACING FROM A THREE BEAM TO STANDARD TRANSITION SECTION.
5. WHERE THERE IS CURB, THE MAXIMUM CURB HEIGHT IS 2" FROM 25' IN ADVANCE OF AND ON THE TRAILING END OF THE OMITTED POST.

**NOTE:**

1. A MANSION OF THE 6'-3" POST SPACING OF TANGENT GUIDE RAIL ARE REQUIRED BETWEEN TWO CONSECUTIVE SINGLE POINT OMISSIONS.
2. THE OMITTED POST MUST BE A MANSION OF THE 6'-3" POST SPACING FROM THE APPROACH END OF A TANGENT TERMINAL. POSTS 6'-3" POST SPACING FROM THE APPROACH END OF A PLATED TERMINAL AND 8'-0" POST SPACING FROM THE BEGINNING OF A PLANE OR MITER POST SPACING.
3. THE OMITTED POST MUST BE A MANSION OF THE 6'-3" POST SPACING FROM THE LAST POST OF AN END TERMINAL.
4. THE OMITTED POST MUST BE A MANSION OF SIX 6'-3" POST SPACING FROM A THREE BEAM TO STANDARD TRANSITION SECTION.
5. WHERE THERE IS CURB, THE MAXIMUM CURB HEIGHT IS 2" FOR A MINIMUM LENGTH OF 18'-9" IN ADVANCE OF AND ON THE TRAILING END OF THE OMITTED POST.
NOTE:
2" 
5" 
5" 
2"
14" 
2" 
2"
2"
2"
5" 
5"
2"
14" 
2"
2"

NOTE 2
EDGE OF PAVEMENT
NORMAL GUIDE RAIL OFFSET
SLOPE

NOTE 3
TOP OF SLOPE
50' BURIED GUIDE RAIL TERMINAL (NOTE 3)
GUIDE RAIL TERMINAL PAY LIMIT FOR BURIED
BEAM GUIDE RAIL TERMINAL HOLES
3 - 1" DIA. HOLES (NOTE 7)

NOTE 4
TOP OF RAIL ELEVATION AT SECTION C-C SHOULD BE 2" TO 12" LOWER THAN THE TOP OF RAIL ELEVATION AT SECTION B-B.

NOTE 5
STEEL PLATE SEE NOTE 5

NOTE 6
STEEL PLATE SEE NOTE 6

NOTE 7
DRILL 3 - 1" DIA. Holes IN BEAM GUIDE RAIL.

NOTE 8
12" MIN. COVER

NOTE 1
STANDARD GUIDE RAIL (MID-POST SPLICES)
2'-7"
3'-1" POST SPACE
6'-3" POST SPACES
2'-7"
2'-7"
2'-7"
2'-7"
2'-7"

FORESLOPE GRADED AWAY FROM ROADWAY - ELEVATION VIEW

FORESLOPE GRADED AWAY FROM ROADWAY - SECTION VIEW

FORESLOPE GRADED TOWARDS ROADWAY - SECTION VIEW

TOP OF GUIDE RAIL TO BE PARALLEL TO ROADWAY GRADE WHERE FORESLOPE IS GRADED AWAY FROM SHOULDER.
WHEN CLEARANCE FROM BOTTOM OF RAIL TO GROUND EXCEEDS 21", ADD RUBRAIL AND 8' LONG POSTS.
TAPER GUIDE RAIL HEIGHT TO PROVIDE 12" MINIMUM COVER AT LAST POST.
FLARE AS SHOWN ON CONSTRUCTION PLAN.
ATTACH STEEL PLATE TO POST WITH FOUR - " x 1" LONG HEX HEAD BOLTS W/ HEX HEAD NUTS.
ATTACH RAIL TO STEEL PLATE WITH FOUR - " x 2" LONG HEX BOLTS W/SQUARE WASHER AND NUT.

NOTE 11
1. TOP OF BEAM RAIL TO BE PARALLEL TO PROPOSED HIGHWAY WHERE FORESLOPE IS GRADED AWAY FROM SHOULDER.
2. USE CLEARANCE FROM BOTTOM OF RAIL TO GROUND EXCEEDS 21" ADD RUBRAIL AND 8' LONG POSTS.
3. TOP OF BEAM RAIL HEIGHT TO PROVIDE 12" MINIMUM COVER AT LAST POST.
4. PLANS AS SHOWN ON CONSTRUCTION PLAN.
5. ATTACH STEEL PLATE TO POST WITH FOUR - " x 1" HEX HEAD BOLTS W/ HEX HEAD NUTS.
6. ATTACH RAIL TO STEEL PLATE WITH FOUR - " x 2" HEX BOLTS W/SQUARE WASHERS AND NUTS.
7. DRILL 3 - 1" HOLES IN BEAM GUIDE RAIL.
8. THE TOP OF RAIL ELEVATION AT SECTION C-C SHOULD BE 2" TO 12" LOWER THAN THE TOP OF RAIL ELEVATION AT SECTION B-B.

NOTE 12
WIND OR WEATHER RAIL POSTS
6' TERMINAL POST

NOTE 13
WIND OR WEATHER RAIL POSTS
6' TERMINAL POST

NOTE 14
TERMINAL POSTS

STANDARD POST AND BLOCKOUT
6' TERMINAL POST
STEEL PLATE
STEEL PLATE

NOTE 15
4 - 1" x 1" SLOTS

NOTE 16
STEEL PLATE

NOTE 17
GROUND LINE AT GUIDE RAIL PVI

NOTE 18
FORESLOPE GRADED TOWARDS ROADWAY - SECTION VIEW

NOTE 19
FORESLOPE GRADED TOWARDS ROADWAY - ELEVATION VIEW

NOTE 20
TOP OF GUIDE RAIL TO BE PARALLEL TO ROADWAY GRADE WHERE FORESLOPE IS GRADED AWAY FROM SHOULDER.
**NOTE TO DESIGNER:**

This sheet requires design specific information to be added and included in the contract plans.

Remove this note after design specific information is added.

**STATION TO STATION GRADING**

- **BDC16D-01-ORIGINAL SHEET**
  - Standard grading for flared and tangent terminals.
  - Alternate grading for tangent terminals only.

**TERMINAL LENGTH**

- Minimum 2'.
- PVI to toe of slope.
- Gutter line.

**RECOVERY AREA AT FLARED AND TANGENT GUIDE RAIL TERMINALS**

- Where guide rail is installed flush with the gutter line, the tangent terminal is to be constructed with a straight flare for its entire length to provide a one foot offset so that the extruder head does not protrude into the roadway.

**CONSTRUCTION DETAILS**
DOUBLE RAIL THICKNESS ACROSS ATTACHMENT AREA

POST 1

(NOTE 2)

2'-11"
1'0"
1"
1"
1"

W6x8.5 OR W6x9 POST

MODIFIED THRIE BEAM SECTION

FACE OF GUIDE RAIL AND GUTTERLINE

ATTACH BLOCKOUTS TO POSTS WITH TWO POST BOLTS USING DIAGONALLY OPPOSITE HOLES. SEE CD-609-18 FOR POST BOLT AND RAIL BOLT DETAILS.

BEAM GUIDE RAIL ATTACHMENT TO SIDEWALK (NCHRP 350 TL-3)

BASE PLATE

4 - 1/4" DIA. HIGH STRENGTH ANCHOR BOLTS, 6" MIN. EMBEDMENT

14" BLOCKOUT

SEE CD-609-18

W6 x 20 POST - SEE CD-609-18 FOR HOLE PATTERN TO ATTACH 14" BLOCKOUT

W6 x 20 POST - USE HOLE PATTERN SHOWN FOR 6" BLOCKOUT

6" BLOCKOUT - SEE NOTE 7

W6 x 20 POST - PAY LIMIT FOR W6x20 POSTS AND 14" BLOCKOUTS

8" SYNTHETIC BLOCKOUT

SEE CD-609-1

1'-0" TYP.

4 - 1/2" DIA. HIGH STRENGTH ANCHOR BOLTS, 6" MIN. EMBEDMENT

FACE OF GUIDE RAIL AND GUTTERLINE

ATTACH BLOCKOUTS TO POSTS WITH TWO POST BOLTS USING DIAGONALLY OPPOSITE HOLES. SEE CD-609-18 FOR POST BOLT AND RAIL BOLT DETAILS.

ONE ADDITIONAL 3'-1" POST SPACING MAY BE NEEDED TO TRANSITION TO 6'-3" POST SPACING WITH MID-POST SPLICES.

WHERE THERE IS NO CURB, THE SIDEWALK SHALL BE CONSTRUCTED LEVEL WITH ADJACENT GROUND OR PAVEMENT.

THIS DETAIL CAN IMPROVE IMPACT PERFORMANCE OF A BRIDGE WITH SAFETYWALKS. THIS DETAIL SHALL NOT BE USED ON A BRIDGE DECK REPLACEMENT OR SUPERSTRUCTURE REPLACEMENT PROJECT.

NOTE 1.

1. USE "BEAM GUIDE RAIL, BRIDGE" ITEM OR "THRIE BEAM GUIDE RAIL, BRIDGE" ITEM IF SIDEWALK IS ON A STRUCTURE. IF SIDEWALK IS NOT ON A STRUCTURE, USE "BEAM GUIDE RAIL, BRIDGE" ITEM OR "THRIE BEAM GUIDE RAIL, BRIDGE" ITEM AND SIDEWALK IS TO BE A MINIMUM 8" THICK WITH A MINIMUM WIDTH EQUAL TO THE NONVEGETATIVE REQUIREMENTS SHOWN ON EXHIBITS.

NOTE 2.

1. WHERE THE CONSTRUCTION OF SAFETYWALKS USES BARRIERS ON A STRUCTURE, THE W6x20 POST MAY BE ATTACHED TO THE ABUTMENT HEADER WITH THE USE OF A BASE PLATE..Mutable per-steel and shapes to conform to ASTM A36 and be galvanized per ASTM A123.

NOTE 3.

2. STEEL BOLTS, NUTS AND WASHERS TO CONFORM TO ASTM A307, UNLESS DESIGNATED AS HIGH STRENGTH STEEL. HIGH STRENGTH BOLTS, NUTS AND WASHERS TO CONFORM TO ASTM F3125, GRADE A325. HARDWARE TO BE GALVANIZED PER ASTM A153.

NOTE 4.

3. HIGH STRENGTH BOLTS FOR BASE PLATE ANCHORAGE TO BE FULLY THREADED. USE AN ADHESIVE ANCHOR BOLT SYSTEM MEETING THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. INSTALL BOLTS A MINIMUM 6" EMBEDMENT AND AS PER MANUFACTURER'S RECOMMENDATION TO ENSURE A MINIMUM PULLOUT STRENGTH OF 24,000 POUNDS. CARE TO BE EXERCISED TO AVOID DAMAGE TO EXISTING REINFORCEMENT.

NOTE 5.

4. WELD POSTS TO BASE PLATES ACCORDING TO THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

NOTE 6.

5. ATTACH BLOCKOUTS TO POSTS WITH TWO POST BOLTS USING DIAGONALLY OPPOSITE HOLES. SEE CD-609-18 FOR POST BOLT AND RAIL BOLT DETAILS.

NOTE 7.

6. ONE ADDITIONAL 3'-1" POST SPACING MAY BE NEEDED TO TRANSITION TO 6'-3" POST SPACING WITH MID-POST SPLICES.

NOTE 8.

7. WHERE THERE IS NO CURB, THE SIDEWALK SHALL BE CONSTRUCTED LEVEL WITH ADJACENT GROUND OR PAVEMENT.

NOTE 9.

8. THIS DETAIL CAN IMPROVE IMPACT PERFORMANCE OF A BRIDGE WITH SAFETYWALKS. THIS DETAIL SHALL NOT BE USED ON A BRIDGE DECK REPLACEMENT OR SUPERSTRUCTURE REPLACEMENT PROJECT.

NOTE 10.

9. BEAM GUIDE RAIL ATTACHMENT TO SIDEWALK (NCHRP 350 TL-3)

NOTE 11.

10. MODIFIED THRIE BEAM GUIDE RAIL ATTACHMENT TO SIDEWALK (NCHRP 350 TL-4)

NOTE 12.

11. PAY LIMIT FOR BEAM GUIDE RAIL, BRIDGE STANDARD W-BEAM GUIDE RAIL

NOTE 13.

12. PAY LIMIT FOR THRIE BEAM GUIDE RAIL, BRIDGE STANDARD MODIFIED THRIE BEAM GUIDE RAIL

NOTE 14.

13. USE "BEAM GUIDE RAIL, BRIDGE" ITEM OR "THRIE BEAM GUIDE RAIL, BRIDGE" ITEM IF SIDEWALK IS ON A STRUCTURE. IF SIDEWALK IS NOT ON A STRUCTURE, USE "BEAM GUIDE RAIL, BRIDGE" ITEM OR "THRIE BEAM GUIDE RAIL, BRIDGE" ITEM AND SIDEWALK IS TO BE A MINIMUM 8" THICK WITH A MINIMUM WIDTH EQUAL TO THE NONVEGETATIVE REQUIREMENTS SHOWN ON EXHIBITS.
**NEW JERSEY DEPARTMENT OF TRANSPORTATION**

**CONSTRUCTION DETAILS**

**BEAM GUIDE RAIL ATTACHMENTS**

**NOTES:**
1. BEAM GUIDE RAIL ATTACHMENT TO AN EXISTING BALUSTRADE
2. TACK WELD BEFORE GALVANIZING
3. SCHEDULE 40 GALV. PIPE DIAMETER AS REQUIRED x 1'-1"
4. POST 1 (NOTE 1)

**BEAM GUIDE RAIL, BRIDGE STANDARD W-BEAM**

**W6x15 BLOCKOUTS**

- May be tack welded to plate before galvanizing

**W6x20 POST**

- When the configuration of bridge abutments and wingwalls do not accommodate the installation of Post 1, the W6x20 post may be attached to the abutment header with the use of a base plate.

**STRUCTURAL STEEL PLATES AND SHAPES**

- Conform to ASTM A36 and be galvanized per ASTM A123.

**STEEL BOLTS, NUTS AND WASHERS**

- Conform to ASTM A307, unless designated as high strength steel.
- High strength bolts, nuts and washers to conform to ASTM F3125, Grade A325.
- Hardware to be galvanized per ASTM A153.

**THIS DETAIL CAN IMPROVE THE IMPACT PERFORMANCE OF A SUBSTANDARD BALUSTRADE RAILING, BUT IT MAY NOT BRING THE BALUSTRADE RAILING INTO FULL COMPLIANCE WITH AASHTO DESIGN CRITERIA. THIS DETAIL SHALL NOT BE USED ON A BRIDGE DECK REPLACEMENT OR SUPERSTRUCTURE REPLACEMENT PROJECT.**
**ELEVATION**

- **TOP OF ROADWAY**: 2'-7"
- **SIDEWALK (ON SPAN)**
- **SIDEWALK (ON WINGWALL)**
- **STANDARD PARAPET**
- **REINFORCEMENT**

**SECTION: B-B**
- **SIDEWALK**

**SECTION: B'-B'**
- **SIDEWALK**

**SECTION: A'-A'**
- **SIDEWALK**

**NOTES:**
1. See CD-609-13 for additional notes and details.
2. The minimum taper length is based on parapet height. The taper must be 5:1 or flatter with 8:1 desirable. See bridge plans for taper length.
3. The taper must be in metric units.
4. For additional parapet details and dimensions, refer to BCD-509-6.
5. Not shown: The parapet reinforcement is in metric units.

**END OF PARAPET**
- 3'-1"

**TOP OF PARAPET**
- 2'-7"

**GUTTER LINE**
- 1'-6"

**BEAM GUIDE RAIL ATTACHMENTS**

**NEW JERSEY DEPARTMENT OF TRANSPORTATION**

**CONSTRUCTION DETAILS**

**SECTION: C-C**
- **LIP CURB (VARIES)**

**SECTION: D-D**
- **TOP OF SIDEWALK**

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CD-609-16
**ELEVATION**

2'-7" 

**SIDEWALK**

**B**

**B'**

**TYPE A ATTACHMENT**

**TYPE B ATTACHMENT**

**PLAN**

**TRAFFIC**

**SECTION: B-B**

**SECTION: A-A**

**SECTION: B'-B'**

**SECTION: A'-A'**

(SIDEWALK)

(SIDEWALK)

(SIDEWALK)

(SIDEWALK)

**SIDEWALK**

**STANDARD PARAPET**

**REINFORCEMENT**

**N.T.S.**

**BEAM GUIDE RAIL ATTACHMENTS**

**NEW JERSEY DEPARTMENT OF TRANSPORTATION**

**CONSTRUCTION DETAILS**

**INDEX RAIL ATTACHMENT - NEW CONSTRUCTION - DESIGN SPEED 45 MPH OR LESS (MASH TL-2)**

**SIDEWALK WITH CMS RAIL STEEL NINE ROUND PARAPET**

**CD-609-16A.1**
NOTES:
1. SEE CD-609-13 FOR ADDITIONAL NOTES AND DETAILS.
2. THE TAPER MUST BE 5:1 OR FLATTER WITH 8:1 DESIRABLE. SEE BRIDGE PLANS FOR TAPER LENGTH.
3. REINFORCEMENT STEEL IS IN METRIC UNITS.
5. SEE CD-609-17A.1 FOR ADDITIONAL NOTED AND DETAIL.
6. TYPE A ATTACHMENT
7. TYPE B ATTACHMENT
8. VARY WIDTH OF LAST 3 RODS TO CLEAR 4" X 12" CHAMFER
9. 5 FORMED HOLES FOR THROUGH BOLTS
10. 10 - #13 @ 10"
11. 10 - #19 @ 4"
12. 10 - #19 @ 12"
13. 1" END OF CONCRETE PYLON
14. LAP IN DIRECTION OF TRAFFIC
15. 4-BAR OPEN STEEL BRIDGE RAILING PARAPET
16. INTERIOR ELEVATION PYLON REINFORCEMENT
17. TYPE A ATTACHMENT
18. BEAM GUIDE RAIL ATTACHMENTS
19. NEW JERSEY DEPARTMENT OF TRANSPORTATION
20. CONSTRUCTION DETAILS
21. NEW JERSEY DEPARTMENT OF TRANSPORTATION
GUIDE RAIL ATTACHMENT - DESIGN SPEED GREATER THAN 45 MPH (MASH TL-3)
EXISTING NJ BARRIER PARAPET (WITH ROADWAY CURBING ON APPROACH)
THREE BEAM RAIL ELEMENT AND BACKUP PLATE

THREE BEAM RAIL SPICE

BACK-UP PLATE AT NON-SPLICE POSTS

THREE BEAM END SECTION (ROUNDED)

POST ASSEMBLY

MODIFIED THREE BEAM GUIDE RAIL

MODIFIED THREE BEAM GUIDE RAIL, DUAL FACED (NCHRP 350 TL-4)

NOTES:
1. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
2. POSTS TO BE HIDDEN IN LENGTHS OF 13'-6" OR 26'-0"
3. SEE NOTE 3 FOR TRANSITION TO DUAL FACED BEAM GUIDE RAIL AND AN END TERMINAL. USE THE THREE BEAM END SECTION (ROUNDED) ON THE END OF THE RAIL ELEMENT WHERE DUAL FACED MODIFIED THREE BEAM GUIDE RAIL ENDS AND SINGLE FACED MODIFIED THREE BEAM GUIDE RAIL BEGINS.
1. A THRIE BEAM TO W-BEAM ASYMMETRICAL TRANSITION SECTION IS USED WHERE A VERTICAL TRANSITION IS NOT REQUIRED SUCH AS A TRANSITION FROM THRIE BEAM AT A BRIDGE ATTACHMENT TO W-BEAM GUIDE RAIL.

2. A THRIE BEAM TO W-BEAM SYMMETRICAL TRANSITION SECTION IS USED WHERE A VERTICAL TRANSITION IS REQUIRED SUCH AS A TRANSITION BETWEEN THE SYMMETRICAL TRANSITION SECTION AND AN END TERMINAL OR FLARE.

3. A MINIMUM LENGTH OF STANDARD W-BEAM GUIDE RAIL IS REQUIRED BETWEEN THE SYMMETRICAL TRANSITION SECTION AND AN END TERMINAL OR FLARE: 12'-6" FOR A TANGENT TERMINAL AND 25' FOR A FLARE TERMINAL.

NOTES:

- POST BOLT SLOTS
- MID-POST SPLICE
- SPLICE BOLT SLOTS
- POST BOLT SLOTS
- MID-POST SPLICE
- SPLICE BOLT SLOTS

THRIE BEAM SECTION FOR TL-2 BRIDGE ATTACHMENTS

THRIE BEAM SECTION FOR TL-3 BRIDGE ATTACHMENTS

THRIE BEAM GUIDE RAIL TRANSITIONS
SECTION A-A

DECK REINFORCEMENT STEEL AT PARAPET JOINTS

ENFORCEMENT STEEL BENDING DETAILS

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

BCD-507-9

3'-6" HIGH F-SHAPE PARAPET DETAILS

NOTES:

1. PROVIDE "OPEN DEFLECTION JOINT IN PARAPETS AT INTERVALS NOT EXCEEDING 20'-0" AND CONTRACTION JOINTS AT THE MIDPOINT BETWEEN THE OPEN JOINTS.

2. STOP "OPEN JOINT AT THE LINE INDICATED AND PROVIDE A CONTRACTION JOINT BELOW THAT LINE.

3. PROVIDE FULL DEPTH JOINTS AT LOCATION OF TRANSVERSE DECK JOINTS. ENSURE THAT THE FULL DEPTH JOINT OPENING WIDTH IS EQUAL TO THE TRANSVERSE DECK JOINT OPENING WIDTH.

4. PROVIDE "OPEN JOINT IN PARAPET IN CORNER PROTRUSIONS.

5. PERMANENT METAL STAY-IN-PLACE FORMS NOT PERMITTED IN THE DECK OVERHANG AREA.

6. FASCIA RUSTICATION AND CONFIGURATION AS PER SPECIFICATIONS.

7. FOR ADDITIONAL REINFORCEMENT STEEL THAT IS REQUIRED IN THE VICINITY OF PARAPET JOINTS TO PREVENT CONCRETE CRACKING IN THE OVERHANG PORTIONS OF THE DECK SLAB, SEE DETAIL 1.

8. SEE BRIDGE PLANS FOR TAPER LENGTH. THE TAPER MUST BE 5:1 OR FLATTER WITH 8:1 DESIRABLE. THE MINIMUM TAPER LENGTH IS BASED ON PARAPET HEIGHT.

9. FOR GUIDERAIL ATTACHMENT AND PARAPET TRANSITION DETAILS SEE CD-609-14 THROUGH CD-609-17E.

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING
BRIDGE CONSTRUCTION DETAILS

BCD-507-9

3'-6" HIGH F-SHAPE PARAPET

REINFORCEMENT STEEL BENDING DETAILS

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING
BRIDGE CONSTRUCTION DETAILS

BCD-507-9.1

SECTION A-A

DECK REINFORCEMENT STEEL AT PARAPET JOINTS

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING
BRIDGE CONSTRUCTION DETAILS

BCD-507-9

3'-6" HIGH F-SHAPE PARAPET DETAILS

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NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING
BRIDGE CONSTRUCTION DETAILS

BCD-507-9

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NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING
BRIDGE CONSTRUCTION DETAILS

BCD-507-9

3'-6" HIGH F-SHAPE PARAPET DETAILS

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