WIDENING IS REQUIRED IF FINISHED SHOULDER IS LESS THAN 2'-0" (0.6 m) FROM THE TRAFFIC LANE.

DO NOT INSTALL W-BEAM GUARDRAIL FOR OBSTACLES WITHIN 5'-0" (1.5 m) OF THE EDGE OF BARriers OR RAIL ELEMENT LENGTH = 13'-6 1/2" (4.13 m).

USE LOWER HOLE ON NEW CONSTRUCTION INSTALLATIONS. SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.

NOTES:

1. INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE OF INSTALLATION.

2. USE WOOD BLOCKS OR OTHER MASH APPROVED BLOCKS. AFFIX BLOCKS TO POSTS WITH TWO 16 PENNY GALV. NAILS OR 14 GAUGE WIRE WRAP.

3. INCLUDING TERMINAL SECTIONS, FASTEN REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC. FABRICATE PER SECTION 704 OR PLASTIC REFLECTORS WITH A URETHANE HINGE. FASTEN REFLECTOR TO WOOD POST USING TWO 16 PENNY RING-SHANKED GALVANIZED NAILS.

4. POST ELEMENTS SPLICED AT 6'-3" (1.905 m) EXTENDING FROM TOP OF RAIL = 2'-0" (0.6 m) FROM THE TRAFFIC LANE.

5. BLOCKING IS REQUIRED FOR FINISHED SHOULDER OR FABRICATE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC.

6. DO NOT INSTALL IN BEAM GUARDRAIL FOR OBSTACLES WITHIN 5'-0" (1.5 m) OF THE EDGE OF BARriers OR 1'-3" (380 mm) MIN. LETTERING AND COLORS.

7. USE LOWER HOLE IN NEW CONSTRUCTION INSTALLATIONS.

8. USE W-BEAM POSTS FOR STANDARD INSTALLATIONS.

9. INSTALL IN BRACKETS 1" ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

REFERENCE

METAL GUARDRAIL - WOOD POSTS (MGS)

METRON DEPARTMENT OF TRANSPORTATION

SECTION A-A

ELEVATION

PLAN

WOOD POST AND MOUNTING DETAIL

WOOD BLOCK (PDB01*)

WOOD POST (PDE02*)

POST HOLE DETAIL

NORMAL FINISHED SHOULDER

SIDE OF TRAFFIC LANE

LEVEL AT TRAFFIC CURB

PRE-DRILLED HOLES

RECESS NUT (FBB04*)

WASHER (FWC16a*)

GUARDRAIL BOLT (FBB04*)

WOOD POST DETAIL IN PAVEMENT APPLICATIONS

SECTION A-A

POST DETAIL IN PAVEMENT APPLICATIONS

W-BEAM SPLICE (LAY IN DIRECTION OF ADJACENT TRAFFIC)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD POST (PDE02*)

POST HOLE DETAIL

NORMAL FINISHED SHOULDER

SIDE OF TRAFFIC LANE

LEVEL AT TRAFFIC CURB

PRE-DRILLED HOLES

RECESS NUT (FBB04*)

WASHER (FWC16a*)

GUARDRAIL BOLT (FBB04*)

WOOD POST DETAIL IN PAVEMENT APPLICATIONS

SECTION A-A

POST DETAIL IN PAVEMENT APPLICATIONS

W-BEAM SPLICE (LAY IN DIRECTION OF ADJACENT TRAFFIC)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD POST (PDE02*)

POST HOLE DETAIL

NORMAL FINISHED SHOULDER

SIDE OF TRAFFIC LANE

LEVEL AT TRAFFIC CURB

PRE-DRILLED HOLES

RECESS NUT (FBB04*)

WASHER (FWC16a*)

GUARDRAIL BOLT (FBB04*)

WOOD POST DETAIL IN PAVEMENT APPLICATIONS

SECTION A-A

POST DETAIL IN PAVEMENT APPLICATIONS

W-BEAM SPLICE (LAY IN DIRECTION OF ADJACENT TRAFFIC)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD POST (PDE02*)

POST HOLE DETAIL

NORMAL FINISHED SHOULDER

SIDE OF TRAFFIC LANE

LEVEL AT TRAFFIC CURB

PRE-DRILLED HOLES

RECESS NUT (FBB04*)

WASHER (FWC16a*)

GUARDRAIL BOLT (FBB04*)

WOOD POST DETAIL IN PAVEMENT APPLICATIONS

SECTION A-A

POST DETAIL IN PAVEMENT APPLICATIONS

W-BEAM SPLICE (LAY IN DIRECTION OF ADJACENT TRAFFIC)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD POST (PDE02*)

POST HOLE DETAIL

NORMAL FINISHED SHOULDER

SIDE OF TRAFFIC LANE

LEVEL AT TRAFFIC CURB

PRE-DRILLED HOLES

RECESS NUT (FBB04*)

WASHER (FWC16a*)

GUARDRAIL BOLT (FBB04*)

WOOD POST DETAIL IN PAVEMENT APPLICATIONS

SECTION A-A

POST DETAIL IN PAVEMENT APPLICATIONS

W-BEAM SPLICE (LAY IN DIRECTION OF ADJACENT TRAFFIC)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD POST (PDE02*)

POST HOLE DETAIL

NORMAL FINISHED SHOULDER

SIDE OF TRAFFIC LANE

LEVEL AT TRAFFIC CURB

PRE-DRILLED HOLES

RECESS NUT (FBB04*)

WASHER (FWC16a*)

GUARDRAIL BOLT (FBB04*)

WOOD POST DETAIL IN PAVEMENT APPLICATIONS

SECTION A-A

POST DETAIL IN PAVEMENT APPLICATIONS

W-BEAM SPLICE (LAY IN DIRECTION OF ADJACENT TRAFFIC)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD POST (PDE02*)

POST HOLE DETAIL

NORMAL FINISHED SHOULDER

SIDE OF TRAFFIC LANE

LEVEL AT TRAFFIC CURB

PRE-DRILLED HOLES

RECESS NUT (FBB04*)

WASHER (FWC16a*)

GUARDRAIL BOLT (FBB04*)

WOOD POST DETAIL IN PAVEMENT APPLICATIONS

SECTION A-A

POST DETAIL IN PAVEMENT APPLICATIONS

W-BEAM SPLICE (LAY IN DIRECTION OF ADJACENT TRAFFIC)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD POST (PDE02*)

POST HOLE DETAIL

NORMAL FINISHED SHOULDER

SIDE OF TRAFFIC LANE

LEVEL AT TRAFFIC CURB

PRE-DRILLED HOLES

RECESS NUT (FBB04*)

WASHER (FWC16a*)

GUARDRAIL BOLT (FBB04*)

WOOD POST DETAIL IN PAVEMENT APPLICATIONS

SECTION A-A

POST DETAIL IN PAVEMENT APPLICATIONS

W-BEAM SPLICE (LAY IN DIRECTION OF ADJACENT TRAFFIC)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD POST (PDE02*)

POST HOLE DETAIL

NORMAL FINISHED SHOULDER

SIDE OF TRAFFIC LANE

LEVEL AT TRAFFIC CURB

PRE-DRILLED HOLES

RECESS NUT (FBB04*)

WASHER (FWC16a*)

GUARDRAIL BOLT (FBB04*)

WOOD POST DETAIL IN PAVEMENT APPLICATIONS

SECTION A-A

POST DETAIL IN PAVEMENT APPLICATIONS

W-BEAM SPLICE (LAY IN DIRECTION OF ADJACENT TRAFFIC)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD BLOCK (PDB01*)

WOOD POST (PDE02*)

POST HOLE DETAIL

NORMAL FINISHED SHOULDER

SIDE OF TRAFFIC LANE

LEVEL AT TRAFFIC CURB

PRE-DRILLED HOLES

RECESS NUT (FBB04*)

WASHER (FWC16a*)

GUARDRAIL BOLT (FBB04*)

WOOD POST DETAIL IN PAVEMENT APPLICATIONS
STIFFENED GUARDRAIL SECTION PAY LIMITS

15'-7 1/2" (476m) TRANSITION

(OMIT ON DIVIDED ROADWAYS)

STIFFENED GUARDRAIL SECTION

15'-7 1/2" (476m) TRANSITION

STANDARD MGS

PAY LIMITS

6'-3" (1905)

2 SPACES @ 6'-3" (1905)

3'-1 1/2" (955)

6 SPACES @ 1'-6 3/4" (475)

6 SPACES @ 1'-6 3/4" (475)

3'-1 1/2" (955)

2 SPACES @ 6'-3" (1905)

7'-11" TO 3'-8" [0.9m TO 1.12m]

OBSTACLE

DIRECTION OF TRAFFIC

12'-6" [3.81 m] (TYP)

QUARTER POST SPACING

HALF POST SPACING

3'-1 1/2" (955)

4 SPACES @ 3'-1 1/2" (955)

4 SPACES @ 3'-1 1/2" (955)

6'-3" (1905)

DIRECTION OF TRAFFIC

12'-6" [3.81 m] (TYP)

6'-3" (1905)

2 SPACES @ 6'-3" (1905)

3'-1 1/2" (955)

6 SPACES @ 1'-6 3/4" (475)

6 SPACES @ 1'-6 3/4" (475)

3'-1 1/2" (955)

HALF POST SPACING

3'-1 1/2" (955)

4 SPACES @ 3'-1 1/2" (955)

4 SPACES @ 3'-1 1/2" (955)

6'-3" (1905)

UNIT SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.
LONG POSTS - WOOD

METAL GUARDRAIL - UNLESS OTHER UNITS ARE SHOWN.

METRIC AND ARE IN MILLIMETERS (mm)

UNITS SHOWN IN BRACKETS [ ] ARE

2 : 1 MAX (SEE NOTE 7)

SLOPE VARIES APPROX.

REFLECTOR (SEE NOTE 3)

DIA. (TYP.)

3/16" [5]

3/4" [20]

1 1/2" [35]

[100 TO 130]

4" TO 5"

[635]

2'-1"

[490]

1'-7"

SHOULDER FINISHED NORMAL

POST WOOD TOP OF PROFILE DTL. DWG. NO. 606-05A & 606-05B.

POSTS CANNOT BE PROVIDED, AS PER THE 2'-0" [610] WIDENING BEHIND THE

THIS GUARDRAIL SYSTEM IS USED WHEN NOTE:

YELLOW PER MUTCD SHEETING WHITE OR INTENSITY)

TYPE III (HIGH REFLECTORIZED

3 /4 " [2 0 ]

3 " [7 5 ]

8" [205]

[25]

1"

[75]

8"

[1470]

4'-10"

[175]

7'-6"

[2290]

6" X 8" X 14"

[155 X 205 X 350]

[108]

4 1/4"

[19.1 X 63.5]

3/4" x 2 1/2"

[19.1 X 63.5]

POST BOLT SLOT PATTERN

[108]

4 1/4"

[301]

8 1/2"

[216]

8 1/2"

[264]

29/32" x 1 1/8"

[23.0 x 28.6]

SPLICE BOLT SLOT

[108]

4 1/4"

[330]

7"

[524]

3" [75]

[19.1 X 63.5]

3/4" x 2 1/2"

[155]

6"

[175]

7"

[350]

14"

[252]

SPLICE BOLT

[214]

2 1/2"

[50]

2"

[19.1 X 63.5]

3/4" x 2 1/2"

[175]

7"

[2290]

7'-6"

[350]

14"

[547]

1"

[155]

6"

[175]

7"

[553]

7"

[175]

7"

[517]

3" [75]

[330]

7"

[229]

31"

[790]

3"

[188]

3'-1 1/2"

[183]

3'-1 1/2"

[419]

31"

[419]

3"

[338]

183" [4.65 m]

[303]

6'-3" [1.905 m]

[199]

6'-3" [1.905 m]

[203]

RAIL ELEMENT LENGTH = 13'-6 1/2" (4.13 m)

IN RAIL ELEMENT (TYP.)

BOLT SLOT PATTERN

TOP OF RAIL POST ELEVATION

RAIL ELEMENTS SPACED AT 12'-6" INTERVALS (3.82 m)

DIRECTION OF ADJACENT TRAFFIC

NOTES:

1. INSTALL ALL RAILS WITH heads ON TRAFFIC SIDE OF INSTALLATION.

2. USE WOOD BLOCKS OR OTHER "MASH" APPROVED BLOCKS, AFTER BLOCKS TO POSTS WITH TWO 16 PENNY GALV. NAILS OR 14 GAUGE WIRE WRAP.

3. ATTACH REFLECTORS TO POSTS AWAY 22 1/4" (572 mm), INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC FABRICATE REFLECTORS FROM COPPER, BRASS, STAINLESS STEEL, OR ALUMINUM. FASTEN REFLECTORS TO WOOD POST USING TWO 16 PENNY RING-SHAPED GALVANIZED WOOD AND TWO 3/16" [4.8] WASHERS IN PRE-DRILLED HOLES. USE DIA. HOLES 6 3/4" [19] INSERTION.

4. ON EXISTING GUARDRAIL INSTALLATIONS, THE MINIMUM RAIL HEIGHT IS 27 3/4" [705].

5. DO NOT INSTALL LONG POST W-BEAM GUARDRAIL FOR DISTANCES WITHIN 3'-6" (1.06 m) OF THE FACE OF THE RAIL.

6. USE LOWER HOLE ON NEW CONSTRUCTION INSTALLATIONS.

7. INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE.

8. ATTACH REFLECTORS TO POSTS AWAY 22 1/4" (572 mm), INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC FABRICATE REFLECTORS FROM COPPER, BRASS, STAINLESS STEEL, OR ALUMINUM. FASTEN REFLECTORS TO WOOD POST USING TWO 16 PENNY RING-SHAPED GALVANIZED WOOD AND TWO 3/16" [4.8] WASHERS IN PRE-DRILLED HOLES. USE DIA. HOLES 6 3/4" [19] INSERTION.

9. NOTE: REFLECTORS TO WOOD POST USING TWO 16 PENNY RING-SHAPED GALVANIZED WOOD AND TWO 3/16" [4.8] WASHERS IN PRE-DRILLED HOLES.

10. INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE.

11. ATTACH REFLECTORS TO POSTS AWAY 22 1/4" (572 mm), INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC FABRICATE REFLECTORS FROM COPPER, BRASS, STAINLESS STEEL, OR ALUMINUM. FASTEN REFLECTORS TO WOOD POST USING TWO 16 PENNY RING-SHAPED GALVANIZED WOOD AND TWO 3/16" [4.8] WASHERS IN PRE-DRILLED HOLES. USE DIA. HOLES 6 3/4" [19] INSERTION.

12. INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE.

13. ATTACH REFLECTORS TO POSTS AWAY 22 1/4" (572 mm), INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC FABRICATE REFLECTORS FROM COPPER, BRASS, STAINLESS STEEL, OR ALUMINUM. FASTEN REFLECTORS TO WOOD POST USING TWO 16 PENNY RING-SHAPED GALVANIZED WOOD AND TWO 3/16" [4.8] WASHERS IN PRE-DRILLED HOLES. USE DIA. HOLES 6 3/4" [19] INSERTION.

14. INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE.

15. ATTACH REFLECTORS TO POSTS AWAY 22 1/4" (572 mm), INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC FABRICATE REFLECTORS FROM COPPER, BRASS, STAINLESS STEEL, OR ALUMINUM. FASTEN REFLECTORS TO WOOD POST USING TWO 16 PENNY RING-SHAPED GALVANIZED WOOD AND TWO 3/16" [4.8] WASHERS IN PRE-DRILLED HOLES. USE DIA. HOLES 6 3/4" [19] INSERTION.

16. INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE.

17. ATTACH REFLECTORS TO POSTS AWAY 22 1/4" (572 mm), INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC FABRICATE REFLECTORS FROM COPPER, BRASS, STAINLESS STEEL, OR ALUMINUM. FASTEN REFLECTORS TO WOOD POST USING TWO 16 PENNY RING-SHAPED GALVANIZED WOOD AND TWO 3/16" [4.8] WASHERS IN PRE-DRILLED HOLES. USE DIA. HOLES 6 3/4" [19] INSERTION.

18. INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE.

19. ATTACH REFLECTORS TO POSTS AWAY 22 1/4" (572 mm), INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC FABRICATE REFLECTORS FROM COPPER, BRASS, STAINLESS STEEL, OR ALUMINUM. FASTEN REFLECTORS TO WOOD POST USING TWO 16 PENNY RING-SHAPED GALVANIZED WOOD AND TWO 3/16" [4.8] WASHERS IN PRE-DRILLED HOLES. USE DIA. HOLES 6 3/4" [19] INSERTION.

20. INSTALL ALL BOLTS WITH HEADS ON TRAFFIC SIDE.

21. ATTACH REFLECTORS TO POSTS AWAY 22 1/4" (572 mm), INCLUDING TERMINAL SECTIONS, WITH THE REFLECTORIZED SURFACE FACING ADJACENT TRAFFIC FABRICATE REFLECTORS FROM COPPER, BRASS, STAINLESS STEEL, OR ALUMINUM. FASTEN REFLECTORS TO WOOD POST USING TWO 16 PENNY RING-SHAPED GALVANIZED WOOD AND TWO 3/16" [4.8] WASHERS IN PRE-DRILLED HOLES. USE DIA. HOLES 6 3/4" [19] INSERTION.

NOTE: SHOWN IN BRACKETS [ ] ANY METRIC DIMENSIONS IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.
UNLESS OTHER UNITS ARE SHOWN.
METRIC AND ARE IN MILLIMETERS (mm)

UNITS SHOWN IN BRACKETS [] ARE

FLATTER 10:1 OR
3:1 OR
EDGE OF SHOULDER OR FACE OF GUARDRAIL

SECTION FLARE RATE
OPTIONAL TERMINAL
POST LOCATION
LENGTH OF NEED
3'-7" [1090] WIDENING

OPTIONAL TERMINAL SECTION WIDENING TRANSITION

TRINITY SOFTSTOP

ROAD SYSTEMS MSKT W/IM 9'-4 1/2" RAIL PANEL

DISTANCE OF 5'-0" [1.52m] IS REQUIRED BEHIND POST LOCATION #1.
LENGTH OF NEED POST LOCATION EQUALS STATION LIMITS THAT IS NOT WITHIN THE MANUFACTURER'S HEIGHT TOLERANCE.
SEE DTL. DWG. NO. 606-20 IF CONNECTING TO EXISTING RAIL
SEE DTL. DWG. NO. 606-05A AND 606-05B FOR MGS GUARDRAIL.
MANUFACTURER'S DETAIL AND ASSEMBLY INSTRUCTIONS.
OPTIONAL TERMINAL SECTION SYSTEMS VARY, REFER TO
MANUFACTURER'S DETAIL AND ASSEMBLY INSTRUCTIONS.

DISTANCE OF 5'-0" [1.52m] IS REQUIRED BEHIND POST LOCATION #1.
LENGTH OF NEED POST LOCATION EQUALS STATION LIMITS THAT IS NOT WITHIN THE MANUFACTURER'S HEIGHT TOLERANCE.
SEE DTL. DWG. NO. 606-20 IF CONNECTING TO EXISTING RAIL
SEE DTL. DWG. NO. 606-05A AND 606-05B FOR MGS GUARDRAIL.
MANUFACTURER'S DETAIL AND ASSEMBLY INSTRUCTIONS.
OPTIONAL TERMINAL SECTION SYSTEMS VARY, REFER TO
MANUFACTURER'S DETAIL AND ASSEMBLY INSTRUCTIONS.

OPTIONAL TERMINAL SECTION SYSTEMS VARY, REFER TO
MANUFACTURER'S DETAIL AND ASSEMBLY INSTRUCTIONS.
GUARDRAIL TRANSITION

EXISTING POST MOUNTING HEIGHT TRANSITION

EXISTING POST

MID SPAN SPLICE

MID SPAN SPLICE

TRANSITION FROM 27 3/4" [705] (OR GREATER) TO 31" [775] GUARDRAIL MOUNTING HEIGHT

NOTES:

1. THE MGS TO METAL GUARDRAIL TRANSITION IS PRICED FOR
   AS LINEAR FEET OF MGS GUARDRAIL.

2. SEE DETAIL SECTIONS 606-05A, 606-05B, 606-11A, AND 606-11B
   FOR MGS GUARDRAIL AND ASSOCIATED HARDWARE.

3. LAY AL L W-BEAM RAIL IN THIS DIRECTION OF ADJACENT TRAFFIC.

UNITS SHOWN IN BRACKETS [ ] ARE

METRIC AND ARE IN MILLIMETERS (mm).

UNITS SHOWN IN BRACKETS [ ] ARE UNLESS OTHER DATA IS SHOWN.
SURFACE AS DIRECTED
WIDEN WITH BITUMINOUS
(SEE DETAIL THIS SHEET)
PLATE WASHER W/ ROUND HOLE
MIN.) WOOD POST
1 HEX NUT (FNX22b*)
PLATE WASHER AND
BOLTS (FBX22b*) W/ 1
HIGH STRENGTH
7/8" [M22] DIA. x 1'-0"
RWE02a-b (SEE DTL.
3/4" [19] CHAMFER (TYP.)
STANDARD BARRIER
DOWELS DRIVEN THRU PIPE SLEEVES
1" [25] DIA. x 3'-0" STEEL
END OF BARRIER
WOOD BLOCKOUT
11 5/8" [295] x 9 5/8" (MIN.)
END OF BARRIER
3 1/2"
1'-6 3/4" [476.25] TAPERED CONCRETE CURB
7'-0" [2100] TAPERED CONCRETE CURB
3 1/2" [89]
3 1/2"
1'-11" [585]
ROADWAY
TOP OF
4" [102]
7 3/4" [195]
1'-6 3/4" [476.25]
7'-0" [2100] TAPERED CONCRETE CURB
A
A
8
5
9
6
4
7
3
2
1
SECTION A-A
NOTE:
TAPER THE END OF THE CONCRETE BARRIER RAIL AS SHOWN.
NOTE:
TAPER THE END OF THE TAPERED CONCRETE CURB
AS SHOWN.
AS SHOWN.
CONCRETE BARRIER RAIL
TAPER THE END OF THE
NOTE:
TAPERED CONCRETE CURB)
1'-11"
1'-6 3/4" [476.25]
3'-1 1/2" [952.50]
1'-6 3/4" [476.25]
STANDARD BARRIER
DOWELS DRIVEN THRU PIPE SLEEVES
1" [25] DIA. x 3'-0" STEEL
END OF BARRIER
WOOD BLOCKOUT
11 5/8" [295] x 9 5/8" (MIN.)
END OF BARRIER
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 1
~
1" [25]
1/4" [6] GALV. METAL PLATE
2" [50]
1'-6 3/4" [476.25]
3'-1 1/2" [952.50]
GUARDRAIL IS ATTACHED TO
ALL POSTS WITH STANDARD
GUARDRAIL BOLTS
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 1
~
1" [25]
1 1/2"
[38]
3" [76]
1 1/2"
[38]
1 1/2"
[38]
1" [25]
1/4" [6] GALV. METAL PLATE
2" [50]
1'-6 3/4" [476.25]
3'-1 1/2" [952.50]
GUARDRAIL IS ATTACHED TO
ALL POSTS WITH STANDARD
GUARDRAIL BOLTS
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 2
~
1" [25]
1 1/2"
[38]
3" [76]
1 1/2"
[38]
1 1/2"
[38]
1" [25]
1/4" [6] GALV. METAL PLATE
2" [50]
1'-6 3/4" [476.25]
3'-1 1/2" [952.50]
GUARDRAIL IS ATTACHED TO
ALL POSTS WITH STANDARD
GUARDRAIL BOLTS
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 2
~
1" [25]
1 1/2"
[38]
3" [76]
1 1/2"
[38]
1 1/2"
[38]
1" [25]
1/4" [6] GALV. METAL PLATE
2" [50]
1'-6 3/4" [476.25]
3'-1 1/2" [952.50]
GUARDRAIL IS ATTACHED TO
ALL POSTS WITH STANDARD
GUARDRAIL BOLTS
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 3
~
1" [25]
1 1/2"
[38]
3" [76]
1 1/2"
[38]
1 1/2"
[38]
1" [25]
1/4" [6] GALV. METAL PLATE
2" [50]
1'-6 3/4" [476.25]
3'-1 1/2" [952.50]
GUARDRAIL IS ATTACHED TO
ALL POSTS WITH STANDARD
GUARDRAIL BOLTS
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 3
~
1" [25]
1 1/2"
[38]
3" [76]
1 1/2"
[38]
1 1/2"
[38]
1" [25]
1/4" [6] GALV. METAL PLATE
2" [50]
1'-6 3/4" [476.25]
3'-1 1/2" [952.50]
GUARDRAIL IS ATTACHED TO
ALL POSTS WITH STANDARD
GUARDRAIL BOLTS
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 3
~
1" [25]
1 1/2"
[38]
3" [76]
1 1/2"
[38]
1 1/2"
[38]
1" [25]
1/4" [6] GALV. METAL PLATE
2" [50]
1'-6 3/4" [476.25]
3'-1 1/2" [952.50]
GUARDRAIL IS ATTACHED TO
ALL POSTS WITH STANDARD
GUARDRAIL BOLTS
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 3
~
1" [25]
1 1/2"
[38]
3" [76]
1 1/2"
[38]
1 1/2"
[38]
1" [25]
1/4" [6] GALV. METAL PLATE
2" [50]
1'-6 3/4" [476.25]
3'-1 1/2" [952.50]
GUARDRAIL IS ATTACHED TO
ALL POSTS WITH STANDARD
GUARDRAIL BOLTS
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 3
~
1" [25]
1 1/2"
[38]
3" [76]
1 1/2"
[38]
1 1/2"
[38]
1" [25]
1/4" [6] GALV. METAL PLATE
2" [50]
1'-6 3/4" [476.25]
3'-1 1/2" [952.50]
GUARDRAIL IS ATTACHED TO
ALL POSTS WITH STANDARD
GUARDRAIL BOLTS
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 3
~
1" [25]
1 1/2"
[38]
3" [76]
1 1/2"
[38]
1 1/2"
[38]
1" [25]
1/4" [6] GALV. METAL PLATE
2" [50]
1'-6 3/4" [476.25]
3'-1 1/2" [952.50]
GUARDRAIL IS ATTACHED TO
ALL POSTS WITH STANDARD
GUARDRAIL BOLTS
METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 3
~
1" [25]
1 1/2"
[38]
3" [76]
1 1/2"
[38]
1 1/2"
[38]
USE DOUBLED GUARDRAIL BEAMS

METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 1

(SEE BRIDGE PLANS)

USE DOUBLED GUARDRAIL BEAMS

FOR TAPERED CONCRETE CURB DETAILS, SEE DTL.

DWG. NO. 606-24A

& 606-26

GUARDRAIL IS ATTACHED TO

ALL POSTS WITH STANDARD

GUARDRAIL BOLTS

9 5/8" x 9 5/8" (MIN.) x 8'-0" [245 x 245 (MIN.) x 2440] POST

W/ 11 5/8" x 9 5/8" (MIN.) x 1'-2" [295 x 245 (MIN.) x 350] BLOCKOUT

7 5/8" x 5 5/8" x 7'-0" [195 x 145 x 2135] POST

W/ 11 5/8" x 5 5/8" (MIN.) x 1'-2" [295 x 145 (MIN.) x 350] BLOCKOUT

7 5/8" x 5 5/8" x 6'-0" [195 x 145 x 1830] POST

W/ 7 5/8" x 5 5/8" (MIN.) x 1'-2" [195 x 145 (MIN.) x 350] BLOCKOUT

1'-6 3/4" [476.25] POST

3-1 1/2" [952.50] POST

METAL GUARDRAIL-BRIDGE APPROACH SECTION TYPE 2

( FOR SKEWED BRIDGES USING CONCRETE BARRIER RAIL)

TAPERED CONCRETE CURBS:

TYPE 1, SEE DTL.

DWG. NO. 606-26

TYPE 3, SEE DTL.

DWG. NO. 606-27

GUARDRAIL IS ATTACHED TO

ALL POSTS WITH STANDARD

GUARDRAIL BOLTS

9 5/8" x 9 5/8" (MIN.) x 8'-0" [245 x 245 (MIN.) x 2440] POST

W/ 11 5/8" x 9 5/8" (MIN.) x 1'-2" [295 x 245 (MIN.) x 350] BLOCKOUT

7 5/8" x 5 5/8" x 7'-0" [195 x 145 x 2135] POST

W/ 11 5/8" x 5 5/8" (MIN.) x 1'-2" [295 x 145 (MIN.) x 350] BLOCKOUT

7 5/8" x 5 5/8" x 6'-0" [195 x 145 x 1830] POST

W/ 7 5/8" x 5 5/8" (MIN.) x 1'-2" [195 x 145 (MIN.) x 350] BLOCKOUT

1'-6 3/4" [476.25] POST

3-1 1/2" [952.50] POST

NOTES:

1. TAPERED CONCRETE CURBS:

   TYPE 1, SEE DTL.

   DWG. NO. 606-26

   TYPE 3, SEE DTL.

   DWG. NO. 606-27

2. TAPERED CONCRETE CURBS ARE ALSO REQUIRED ON CONCRETE APPROACH SLABS.

3. LAP GUARDRAIL IN THE DIRECTION OF THE ADJACENT TRAFFIC LANE.

   (SEE DTL.

   DWG. NO. 606-05A).

4. LAP W-BEAM TERMINAL CONNECTOR (RWE02a-b) IN THE DIRECTION

   OF THE ADJACENT TRAFFIC LANE.

5. USE WOOD BLOCKS OR OTHER NCHRP 350 APPROVED BLOCKS

   FOR BLOCKOUTS.

6. DO NOT FLARE BRIDGE APPROACH SECTIONS.

7. SEE DTL.

   DWG. NO. 606-24A FOR ADDITIONAL INFORMATION.

8. SEE DTL.

   DWG. NO. 606-05A FOR METAL GUARDRAIL (W-BEAM).

DUAL UNITS SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (MM)

UNLESS OTHER UNITS ARE SHOWN.

DETAIL DRAWING

REFERENCE

DWG. NO.

606-25A

STANDARD SPEC.

SECTION 606

SKewed BRIDGE APPROACH SECTIONS - WOOD POSTS

MONTANA DEPARTMENT

OF TRANSPORTATION
METAL GUARDRAIL - BRIDGE APPROACH SECTION TYPE 1
(FOR SKEWED BRIDGES USING CONCRETE BARRIER RAIL)

GUARDRAIL IS ATTACHED TO ALL POSTS WITH STANDARD GUARDRAIL BOLTS

GUARDRAIL BOLTS

USE DOUBLED GUARDRAIL BEAMS

METAL GUARDRAIL - BRIDGE APPROACH SECTION TYPE 3
(FOR SKEWED BRIDGES WITH EXISTING CONCRETE CURBS)

GUARDRAIL IS ATTACHED TO ALL POSTS WITH STANDARD GUARDRAIL BOLTS

NOTES:
1. TAPERED CONCRETE CURBS:

   TYPE 1, SEE DTL. DWG. NO. 606-26
   TYPE 3, SEE DTL. DWG. NO. 606-27

2. TAPERED CONCRETE CURBS ARE ALSO REQUIRED ON CONCRETE Approach slabs.

3. LAP GUARDRAIL IN THE DIRECTION OF THE ADJACENT TRAFFIC LANE.
   (SEE DTL. DWG. NO. 606-05B).

4. LAP W-BEAM TERMINAL CONNECTOR (RWE02a-b) IN THE DIRECTION
   OF THE ADJACENT TRAFFIC LANE.

5. USE WOOD BLOCKS OR OTHER NCHRP 350 APPROVED BLOCKS
   FOR BLOCKOUTS.

6. DO NOT FLARE BRIDGE APPROACH SECTIONS

7. SEE DTL. DWG. NO. 606-248 FOR ADDITIONAL INFORMATION.

8. SEE DTL. DWG. NO. 606-058 FOR METAL GUARDRAIL (W-BEAM).

UNITS SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (mm)
UNLESS OTHER UNITS ARE SHOWN.

SKEWED BRIDGE APPROACH SECTIONS - STEEL POSTS

REFERENCE
DWG. NO.
STANDARD SPEC.
SECTION 606
606-258

MONTANA DEPARTMENT OF TRANSPORTATION
TABLE OF REINFORCING STEEL (ONE SECTION ONLY)

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METRIC TABLE OF REINFORCING STEEL (ONE SECTION ONLY)

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NOTES:

1. TAPERED CONCRETE CURB IS USED WITH BRIDGE APPROACH SECTION.
2. FURNISH WIRE ROPE MEETING SECTION 705.
3. ALL CONCRETE IS CLASS GENERAL.
4. FURNISH GRADE 60 [420] REINFORCING STEEL MEETING SECTION 711.
6. TAPERED CONCRETE CURB IS USED WITH BRIDGE APPROACH SECTION.
7. TOTAL CONCRETE PER 7' [2100 mm] TAPERED CURB EST. = 0.2 C.Y. [0.17 m³].
8. TOTAL REBAR WEIGHT PER 7' [2100 mm] TAPERED CURB EST. = 34 LB [15.1 kg].
**Bill of Reinforcing Steel (One Section Only)**

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**Notes:**
1. Remove the existing surface under the new tapered concrete curb as approved by the project manager. Embed the tapered concrete curb a minimum of 4" (100mm) below the grade measured at the finish face of the existing curb.
2. Furnish Grade 40 (250) reinforcing steel meeting Section 555 and 711.
3. All concrete is Class General. Total concrete per 6' (1800) tapered curb est. = 0.2 C.Y. (0.16 m³).
4. Tapered concrete curb is used with bridge approach section Type 3 (see DTL. Dwg. No. 606-24A and 606-24B).
5. Adjust dimension to match existing curb.

**Detailed Drawing Reference:** Dwg. No. 606-27

**Tapered Concrete Curb Detail**
1" x 6" [25.4 x 152] SLOTS IN BOX BEAM RAIL (TYP. TOP AND BOTTOM)

TRAFFIC SIDE

2" [50] GAP

1" [25.4] DIA. HOLES IN BOX BEAM RAIL (TYP. TOP AND BOTTOM)

PLAN

ELEVATION

SPICE DETAIL

NOTES:

1. USE BOX BEAM RAIL IN MINIMUM NOMINAL LENGTHS OF 18 FT. [5.49 m] UNLESS APPROVED BY THE PROJECT MANAGER.

2. INSTALL Expansion Joints On all BOX BEAM GUARDRAIL INSTALLATIONS GREATER THAN 300 FT. [90 m] IN LENGTH AT INTERVALS NOT TO EXCEED 500 FT. [150 m].

3. ATTACH REFLECTIVE TABS TO EVERY FOURTH POST (24 FT. [7.32 m] TYP.). ANGLE TABS SLIGHTLY TOWARDS TRAFFIC. DO NOT USE REFLECTIVE TABS ON WY-BET TERMINALS. WY-BET TERMINALS RECEIVE REFLECTIVE CHANNELS.

4. DO NOT INSTALL BOX BEAM GUARDRAIL FOR OBSTRUCTIONS WITHIN 3-1/2" [8.9 m] OF THE FACE OF THE RAIL.

5. WIDENING IS REQUIRED IF FINISHED SHOULDER IS LESS THAN 2'-0" [606 mm] BETWEEN THE TRAFFIC LANE.

6. PROVIDE SHOP BENT BOX BEAM RAIL FOR ROADWAY CURVATURE WITH RADIUS OF LESS THAN 715 FEET [218 m].

* SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.

UNITs SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (MM) UNLESS OTHER UNITS ARE SHOWN.
1/2" (12.7) DIA. HOLES FOR 3/8" DIA. x 1 1/2" [M10 x 191] HEX BOLT (FBX10a*) AND NUT (FNX10a*) WITH 2 FLAT WASHERS (FWC10x*)

END COVER PLATE (3/16" [4.8] THICK)

1/2" x 1 1/2" [M12 x 38] HEX BOLT (FBX12a*) AND NUT (FNX12a*) WITH 2 FLAT WASHERS (FWC12x*)

NOTES:

1) SEE DTL. DWG. NO. 606-50 FOR STANDARD BOX BEAM GUARDRAIL AND ASSOCIATED DETAILS.

* SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.

UNITS SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.
The diagram illustrates various components of a bridge approach section, including:

- Concrete Bridge Rail:
  - Standard Box Beam Bridge Approach Section Pay Limits
  - Box Beam Bridge Approach Section - Type 3

- Guardrail widening detail:
  - Type at Posts P1 & P2
  - Type at Posts P3 Thru P5
  - Post P6
  - Post P7

- Anchor Rail Section:
  - Type at Posts P1 & P2
  - Type at Posts P3 Thru P5

- Note:
  - Include cost of entire anchor rail section, along with all standard necessary attachments to concrete bridge rail, in cost of bridge approach section.

- Components:
  - Transition Rail
  - Standard Box Beam Rail Splash
  - Guardrail Widening Detail

- Units shown in brackets [ ] are metric and are in millimeters (mm) unless other units are shown.
1\" (25.4) DIA. HOLES IN BOX BEAM
RAIL FOR 3/4\" DIA. x 8\" (M20 x 203)
HIGH STRENGTH HEX BOLT (FBX20b*)
AND NUT (FX20b*) WITH TWO
HARDENED FLAT WASHERS (FWC20b*)

CONNECTION SLEEVE ATTACHED TO
BRIDGE RAIL (TYP.7**) (1/4\" [6.4] THICK
STEEL FORM FIT TUBE TO RECEIVE
T56 x 6 x 3/16 [1512 x 152 x 4.8]
BOX BEAM RAIL)

1\" x 4\" (25.4 x 101.6) SLOTS
REQUIRED TOP AND BOTTOM
OF CONNECTION SLEEVE

NOTES:
1. SEE DTL. DWG. NO. 606-50 FOR STANDARD
   BOX BEAM GUARDRAIL AND ASSOCIATED
   DETAILS.
2. USE ON EXIT END OF ONE-WAY TRAFFIC
   BRIDGES ONLY.

* SEE DTL. DWG. NO. 606-80 FOR
  SCHEDULE OF GUARDRAIL HARDWARE.
** SEE BRIDGE PLANS FOR MORE DETAILED
  INFORMATION ON BRIDGE RAIL AND
  CONNECTION DETAILS.

UNITS SHOWN IN BRACKETS (\[]) ARE
METRIC AND ARE IN MILLIMETERS (mm)
UNLESS OTHER UNITS ARE SHOWN.
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<tr>
<td>F606-53</td>
<td>5/8&quot; DIA HEX BOLT</td>
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<td>F606-57</td>
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<td>F606-58</td>
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<td>F606-59</td>
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<td>F606-61</td>
<td>5/8&quot; DIA HEX BOLT</td>
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<tr>
<td>F606-62</td>
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<td>MILD HEX BOLT 82</td>
</tr>
<tr>
<td>F606-63</td>
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<td>F606-64</td>
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<td>F606-76</td>
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<td>5/8&quot; DIA HEX BOLT</td>
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<td>F606-78</td>
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<td>F606-80</td>
<td>5/8&quot; DIA HEX BOLT</td>
<td>MILD HEX BOLT 82</td>
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</tbody>
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**NOTES:**

1. *TORQUE TRANSFER VIA SCREWS TO BE DETERMINED IN ACCORDANCE WITH FD IC & FED SPECIFICATIONS.*
2. **GUARDRAIL TYPE CODES:**
   - C = CABLE GUARDRAIL
   - B = BOX BEAM GUARDRAIL

All METRIC DESCRIPTION dimensions are MILLIMETERS UNLESS OTHERWISE NOTED.
### GUARDRAIL HARDWARE

#### HEX BOLTS

<table>
<thead>
<tr>
<th>BOLT SIZE</th>
<th>DESIGNATION</th>
<th>TRANSVERSE</th>
<th>L (IN.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot; DIA.</td>
<td>FBB01-07*</td>
<td>3 1/8&quot;</td>
<td>1 3/4&quot;</td>
</tr>
<tr>
<td>1/2&quot; DIA.</td>
<td>MBB01-07*</td>
<td>3 1/8&quot;</td>
<td>1 3/4&quot;</td>
</tr>
<tr>
<td>3/4&quot; DIA.</td>
<td>FBB01-07*</td>
<td>3 1/8&quot;</td>
<td>1 3/4&quot;</td>
</tr>
<tr>
<td>1&quot; DIA.</td>
<td>MBB01-07*</td>
<td>2 1/2&quot;</td>
<td>2 1/2&quot;</td>
</tr>
<tr>
<td>1 1/8&quot; DIA.</td>
<td>MBB01-07*</td>
<td>2 1/2&quot;</td>
<td>2 1/2&quot;</td>
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<tr>
<td>1 1/4&quot; DIA.</td>
<td>MBB01-07*</td>
<td>2 1/2&quot;</td>
<td>2 1/2&quot;</td>
</tr>
<tr>
<td>1 5/8&quot; DIA.</td>
<td>FBB03-07*</td>
<td>2 1/2&quot;</td>
<td>2 1/2&quot;</td>
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<tr>
<td>2&quot; DIA.</td>
<td>MBB03-07*</td>
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#### HEX NUT

<table>
<thead>
<tr>
<th>NUT SIZE</th>
<th>DESIGNATION</th>
<th>TRANSVERSE</th>
<th>L (IN.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot; DIA. SQUARE NUT</td>
<td>FNS20*</td>
<td>3 1/8&quot;</td>
<td>2 1/2&quot;</td>
</tr>
</tbody>
</table>

#### FLAT WASHERS

<table>
<thead>
<tr>
<th>WASHER SIZE</th>
<th>DESIGNATION</th>
<th>TRANSVERSE</th>
<th>L (IN.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2&quot; DIA. SQUARE WASHER</td>
<td>FWC24a</td>
<td>1 1/4&quot;</td>
<td>1 1/4&quot;</td>
</tr>
<tr>
<td>1&quot; DIA. SQUARE WASHER</td>
<td>FWC24a</td>
<td>1 1/4&quot;</td>
<td>1 1/4&quot;</td>
</tr>
<tr>
<td>1 1/4&quot; DIA. SQUARE WASHER</td>
<td>FWC24a</td>
<td>1 1/4&quot;</td>
<td>1 1/4&quot;</td>
</tr>
<tr>
<td>1 5/8&quot; DIA. SQUARE WASHER</td>
<td>FWC24a</td>
<td>1 1/4&quot;</td>
<td>1 1/4&quot;</td>
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</tbody>
</table>

### METRIC GUARDRAIL HARDWARE

#### HEX BOLTS

<table>
<thead>
<tr>
<th>BOLT SIZE</th>
<th>DESIGNATION</th>
<th>TRANSVERSE</th>
<th>L (MIN.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12mm</td>
<td>M20 SQUARE NUT</td>
<td>28</td>
<td>24</td>
</tr>
<tr>
<td>14mm</td>
<td>M20 SQUARE NUT</td>
<td>305</td>
<td>254</td>
</tr>
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#### HEX NUT

<table>
<thead>
<tr>
<th>NUT SIZE</th>
<th>DESIGNATION</th>
<th>TRANSVERSE</th>
<th>L (MIN.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12mm</td>
<td>FNS20*</td>
<td>103</td>
<td>102</td>
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#### FLAT WASHERS

<table>
<thead>
<tr>
<th>WASHER SIZE</th>
<th>DESIGNATION</th>
<th>TRANSVERSE</th>
<th>L (MIN.)</th>
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</thead>
<tbody>
<tr>
<td>12mm</td>
<td>FWC24a</td>
<td>457</td>
<td>457</td>
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#### M16 GUARDRAIL BOLT & RECESSED NUT

<table>
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<tr>
<th>DESIGNATION</th>
<th>L (MIN.)</th>
<th>W (MIN.)</th>
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<tbody>
<tr>
<td>M16 GUARDRAIL BOLT &amp; RECESSED NUT</td>
<td>4&quot; (MIN.)</td>
<td>38 (MIN.)</td>
</tr>
</tbody>
</table>

### NOTES

1. Use bolts and anchor rods meeting the requirements of Subsection 705.01.1.
2. Use high-strength bolts meeting the requirements of Subsection 711.06.
3. Calibrate bolts, nuts and washers in accordance with Subsection 705.01.1.
4. Use thread angle for bolts FB01-07.

* See DTL. DWG. NO. 606-80 for schedule of guardrail hardware.
NOTES:

1. FOR RELATED FASTENER HARDWARE SEE FWC24a*, FNX24a* AND FPA01*.

2. MACHINE THE SWAGED FITTING FROM HOT-ROLLED CARBON STEEL CONFORMING TO THE REQUIREMENTS OF ASTM A576 (A576 M), GRADE 1035, AND ANNEXED SUITABLE FOR COLD SWAGING, GALVANIZE THE SWAGED FITTING IN ACCORDANCE WITH SUBSECTION 711.08 BEFORE SWAGING, DRILL A LOCK PIN HOLE TO ACCOMMODATE A 1/4" [6.4 mm], PLATED SPRING STEEL PIN THROUGH THE HEAD OF THE SWAGED FITTING TO RETAIN THE STUD IN THE PROPER POSITION.

3. THE SWAGED FITTING, STUD AND NUT [FNX24a*] MUST DEVELOP THE BREAKING STRENGTH OF THE WIRE ROPE.


5. THE STUD IS TO CONFORM TO THE REQUIREMENTS OF ASTM F568 [F568M] CLASS B. PRIOR TO GALVANIZING, MILL A 3/8" [9.5 mm] SLOT INTO THE STUD END FOR THE LOCKING PIN.

6. FOR RELATED FASTENER HARDWARE SEE FWC24a*, FNX24a* AND FPA01*.

7. MACHINE THE SWAGED FITTING FROM HOT-ROLLED CARBON STEEL CONFORMING TO THE REQUIREMENTS OF ASTM A576 (A576 M), GRADE 1035, AND ANNEXED SUITABLE FOR COLD SWAGING, GALVANIZE THE SWAGED FITTING IN ACCORDANCE WITH SUBSECTION 711.08 BEFORE SWAGING, DRILL A LOCK PIN HOLE TO ACCOMMODATE A 1/4" [6.4 mm], PLATED SPRING STEEL PIN THROUGH THE HEAD OF THE SWAGED FITTING TO RETAIN THE STUD IN THE PROPER POSITION.

8. THE SWAGED FITTING, STUD AND NUT [FNX24a*] MUST DEVELOP THE BREAKING STRENGTH OF THE WIRE ROPE.


**W-BEAM END SECTION (FLARED)**

- **RWE01a-b* or RWM02a-b* (25°-0° [7.62 m] LENGTH)

- **RWE02a-b* (12°-6° [3.81 m] LENGTH)

- **RWE03a-b* (10°-0° [3.05 m] LENGTH)

- **RWE04a-b* (8°-0° [2.44 m] LENGTH)

- **RWE05a-b* (6°-0° [1.83 m] LENGTH)

**W-BEAM TERMINAL CONNECTOR**

- **RWE06a-b* (23°-0° [6.06 m] LENGTH)

**W-BEAM END SECTION (BUFFER)**

- **RWE07a-b* (21°-0° [5.84 m] LENGTH)

**W-BEAM METAL GUARDRAIL HARDWARE**

**NOTES:**

- **SUFFIX**
  - a: 12 GAUGE [2.7 mm]
  - b: 10 GAUGE [3.5 mm]

- **METAL THICKNESS**
  - 12 GAUGE [2.7 mm]
  - 10 GAUGE [3.5 mm]

- **UNITS SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.**

- **DESTINATION THICKNESS**

- **THICKNESS (SEE NOTES)**

- **TOLERANCE**
  - (0°+ 3/16") [-0.0,+4.8 mm]

- **SPLICE**
  - 2 1/4" +1 1/4" [50(5.5,30)]

- **POST BOLT SLOT**
  - 3/4" x 2 1/2" [19.1 x 63.5]

- **SPLICE BOLT SLOT**
  - 29 32" x 3 5/8" [23.0 x 28.6]

- **SLOTED HOLES**
  - 29 32" x 3 1/8" [23.0 x 28.6]

- **POST BOLT SLOT**
  - 1 1/2" [38.1]

- **SPLICE**
  - 2 1/4" [57.2]

- **THICKNESS (SEE NOTES)**

- **TOLERANCE**
  - (0°+ 3/16") [-0.0,+4.8 mm]

- **SPLICE**
  - 2 1/4" +1 1/4" [50(5.5,30)]

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- **THICKNESS (SEE NOTES)**

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- **SLOTED HOLES**
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- **POST BOLT SLOT**
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- **SPLICE**
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- **THICKNESS (SEE NOTES)**

- **TOLERANCE**
  - (0°+ 3/16") [-0.0,+4.8 mm]

- **SPLICE**
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- **SLOTED HOLES**
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- **POST BOLT SLOT**
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- **THICKNESS (SEE NOTES)**

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- **POST BOLT SLOT**
  - 1 1/2" [38.1]

- **SPLICE**
  - 2 1/4" [57.2]
CABLE END ASSEMBLY
RCE03*

CABLE WEDGE
FMM01*

3/4" [19.1] DIA. 3 x 7 WIRE ROPE

3/4" [19.1] DIA. CABLE
RCM01*

NOTES:

1. WIRE ROPE AND CONNECTING HARDWARE ARE TO CONFORM TO THE REQUIREMENTS OF AASHTO M30 [M30M] TYPE 1 CLASS A, 3/4" ROPE. CONNECTING HARDWARE MUST DEVELOP THE FULL STRENGTH OF A SINGLE CABLE (25,000 LB [111.2 kN]). CAST STEEL COMPONENTS ARE TO CONFORM TO THE REQUIREMENTS OF AASHTO M103 [M103M] (ASTM A27 [A27M]). MALLEABLE IRON CASTINGS ARE TO CONFORM TO THE REQUIREMENTS OF ASTM A47 [A47M].

2. AT ALL LOCATIONS WHERE THE CABLE IS CONNECTED TO A CABLE SOCKET WITH A WEDGE TYPE CONNECTION, CRIMP ONE WIRE OF THE CABLE OVER THE BASE OF THE WEDGE TO HOLD IT FIRMLY IN PLACE.

3. DESIGN SOCKET BASKETS FOR USE WITH THE WEDGE DETAILED IN THIS DRAWING.

4. ALTERNATE HARDWARE DESIGNS WILL BE CONSIDERED FOR APPROVAL PROVIDED THEIR CONNECTION DETAILS, FOR THE PURPOSE OF MAINTENANCE SUBSTITUTIONS, ARE COMPATIBLE WITH THE DETAILS OF THIS DRAWING AND THEIR OPERATING CHARACTERISTICS ARE SIMILAR TO THOSE OF THE HARDWARE IN THIS DRAWING.

* SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.

UNITS SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAIL DRAWING
REFERENCE
DWG. NO. 606-94
STANDARD SPEC. 606
SECTION 406
LOW-TENSION CABLE GUARDRAIL HARDWARE