

THRIE-BEAM BULLNOSE END TERMINAL



SET03a-b

SHEET NO.

DATE:

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8/1/2013

INTENDED USE

Thrie-Beam Bullnose End Terminal (SET03a-b) is a non-proprietary system for shielding of median hazards and gore areas. Lateral clearance between the tangent segments of the bullnose barrier system and the face of the hazard must be considered. Previous testing conducted by TTI on a thrie beam longitudinal barrier system found a maximum dynamic deflection of 26 3/4" [674] and a working width of approximately 46 1/8" [1172]. Based on this data, the minimum recommended lateral clearance between the back of the posts and the face of the hazard is 27.6" [700]. In addition, a minimum of 62'-9" [19.125-m] of guardrail, as measured longitudinally, or five sections of guardrail downstream of post no. 1 of the system is recommended in front of any hazard in order to prevent vehicle impacts with the hazard during end-on impacts with the system. The Thrie-Beam Bullnose End Terminal is TL-3 NCHRP 350 accepted.

COMPONENTS

Unit Length = 414 3/8" [10525] (Nose to Post No. 9)

DESIGNATOR	COMPONENT	SYSTEM A	SYSTEM B
FBB01	Guardrail bolt & recessed nut	72	72
FBB03	Guardrail bolt & recessed nut	4	6
FBB04	Guardrail bolt & recessed nut	4	14
FBB05	Guardrail bolt & recessed nut	12	-
FBX16a	Hex bolt & nut	4	4
FBX22a	Hex bolt & nut	4	4
FCA01	BCT cable anchor assembly	2	2
FMM02	BCT post sleeve	2	2
FPA01	Anchor cable bracket	2	2
FWC16a	Plain round washer	60	46
FPB01	BCT bearing plate	2	2
FWC22a	Plain round washer	8	8
PDB01	W-Beam timber blockout for timber posts	14	-
PDB12	W-Beam tapered blockout for timber posts	14	-
PDE02	Timber guardrail post	2	2
PDE16	CRT timber guardrail post	12	-
PDF04	BCT Timber post for thrie-beam bullnose end terminal	4	4
PTE06	Bullnose foundation tube	2	2
PTE07	Bullnose foundation tube	2	2
RTM07a	Slotted & bent thrie-beam guardrail	1	1
RTM07d	Slotted & bent thrie-beam guardrail	2	2
RTM07e	Slotted & bent thrie-beam guardrail	2	2
RTM02a	2-Space thrie-beam rail	2	2
-----	16D double head nail	28	28
RCM02	Nose cable	2	2
FPA04	Nose cable anchor plate	4	4
FBU01	U-Bolt and nuts	6	6
FWR10	U-Bolt plate washer	6	6
PWE11	Wide-Flange bullnose end terminal post	-	12
PWE02	Wide-Flange slip guardrail post	-	2
FWC12b	Flat washer	-	192
FBX12a	2 1/2" [64] long hex tap bolts & nuts	-	48
PDB20	Tapered Timber Blockout for Steel Guardrail Post	-	14
PDB09	W-beam Timber Blockout for Steel Guardrail Post	-	14
PTE08	Foundation Tube for Bullnose End Terminal Slip Post	-	12

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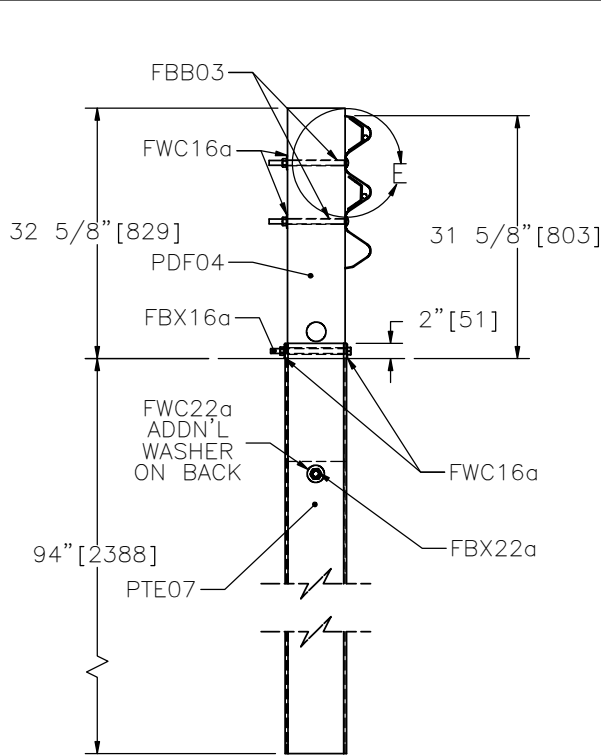


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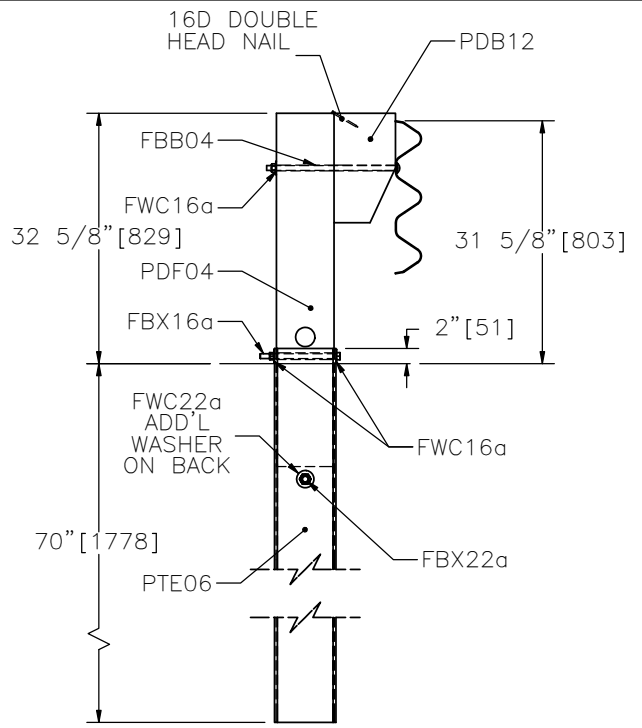
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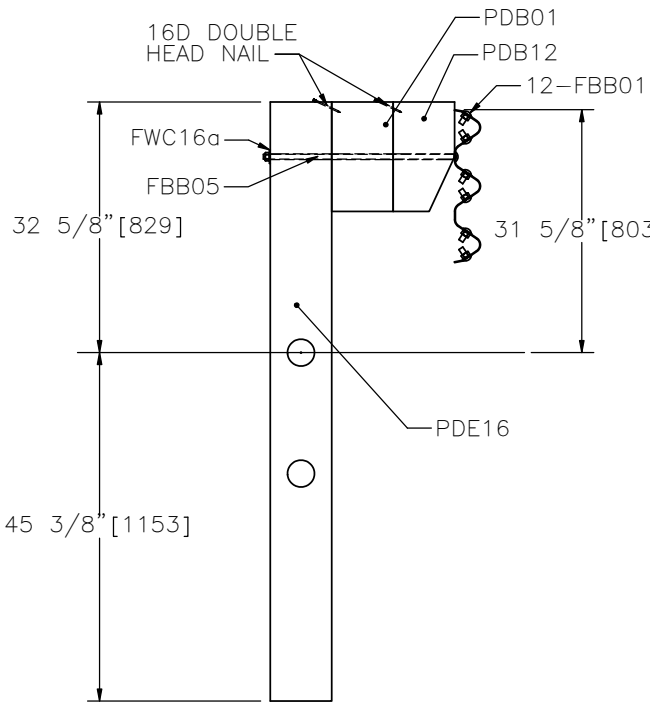
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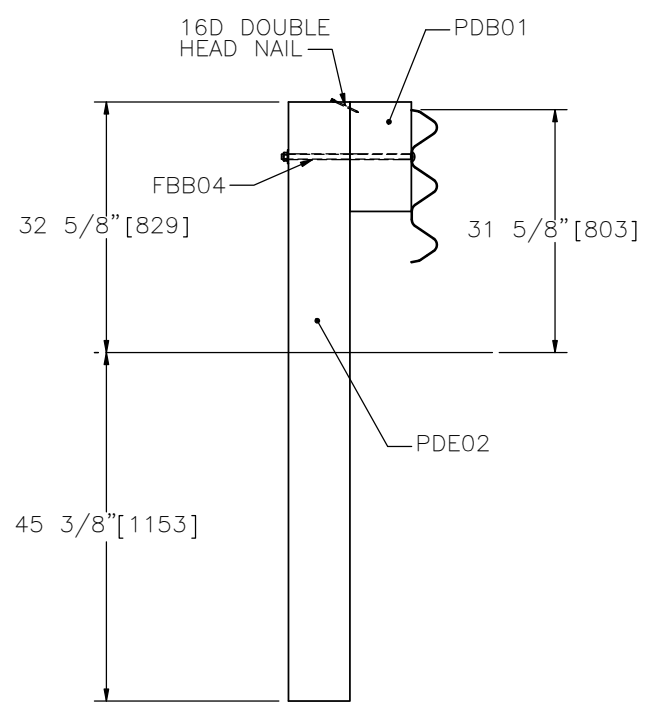
POST NO. 1



POST NO. 2



SECTION A-A
POST NO. 3-8



SECTION B-B
STANDARD THRIE BEAM LINE POST

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ACCEPTANCE

FHWA Acceptance Letter CC-68, November 8, 2000.

FHWA Acceptance Letter CC-68A, August 19, 2011.

REFERENCES

Bielenberg, B.W., Reid, J.D., Faller, R.K., Rohde, J.R., Sicking, D.L., Keller, E.A., Holloway, J.C., and Supencheck, L., *Phase III Development of a Bullnose Guardrail System for Median Applications*, Final Report to the Midwest State's Regional Pooled Fund Program, Transportation Research Report No. TRP-03-95-00, Project No. SPR-3(017)-Years 7 and 8, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, June 1, 2000.

Bielenberg, B.W., Reid, J.D., Faller, R.K., Rohde, J.R., Sicking, D.L., Keller, E.A., and Holloway, J.C., *Phase II Development of a Bullnose Guardrail System for Median Applications*, Final Report to the Midwest State's Regional Pooled Fund Program, Transportation Research Report No. TRP-03-78-98, Project No. SPR-3(017)-Years 7 and 8, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, December 18, 1998.

Bielenberg, B.W., Faller, R.K., Reid, J.D., Rohde, J.R., Sicking, D.L., and Keller, E.A., *Concept Development of a Bullnose Guardrail System for Median Applications*, Final Report to the Midwest State's Regional Pooled Fund Program, Transportation Research Report No. TRP-03-73-98, Project No. SPR-3(017)-Year 7, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, May 22, 1998.

Bielenberg, R.W., Reid, J.D., and Faller, R.K., *NCHRP Report No. 350 Compliance Testing of a Bullnose Median Barrier System*, Paper No. 01-0204, Transportation Research Record No. 1743, Transportation Research Board, National Research Council Washington, D.C., January 2001. pp. 60-70.

Reid, J. R., Bielenberg, B. W., *Using LS-DYNA Simulation to Solve a Design Problem: A Bullnose Guardrail Example*, Paper No. 99-0554, Transportation Research Record No. 1690, Transportation Research Board, National Research Council Washington, D.C., November 1999. pp. 95-102.

Arens, S. W., Faller, R.K., Rohde, J.R., and Polivka, K.A., *Dynamic Impact Testing of CRT Wood Posts in a Rigid Sleeve*, Final Report to the Minnesota Department of Transportation, Transportation Research Report No. TRP-03-198-08, Midwest Roadside Safety Facility, University of Nebraska-Lincoln, April 11, 2008.

Arens, S.W., Sicking, D.L., Faller, R.K., Reid, J.D., Bielenberg, R.W., Rohde, J.R., Lechtenberg, K.A., *Investigating the Use of a New Universal Breakaway Steel Post*, Final Report to the Minnesota Department of Transportation, Transportation Research Report No. TRP-03-218-09, Project No. SPR-3(017), Midwest Roadside Safety Facility, University of Nebraska-Lincoln, August 3, 2009.

Schmidt, J.D., Sicking, D.L., Faller, R.K., Reid, J.D., Bielenberg, R.W., Lechtenberg, K.A., *Investigation the Use of a New Universal Breakaway Steel Post-Phase 2*, Final Report to the Minnesota Department of Transportation, Transportation Research Report No. TRP-03-230-10, Project No. SPR-3(017), Midwest Roadside Safety Facility, University of Nebraska-Lincoln, August 9, 2010.

Schmidt, J.D., Sicking, D.L., Faller, R.K., Reid, J.D., Bielenberg, R.W., Lechtenberg, K.A., *Investigation the Use of a New Universal Breakaway Steel Post-Phase 3*, Final Report to the Minnesota Department of Transportation, Transportation Research Report No. TRP-03-244-10, Project No. SPR-3(017), Midwest Roadside Safety Facility, University of Nebraska-Lincoln, December 16, 2010.

CONTACT INFORMATION

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THREE-BEAM BULLNOSE END TERMINAL

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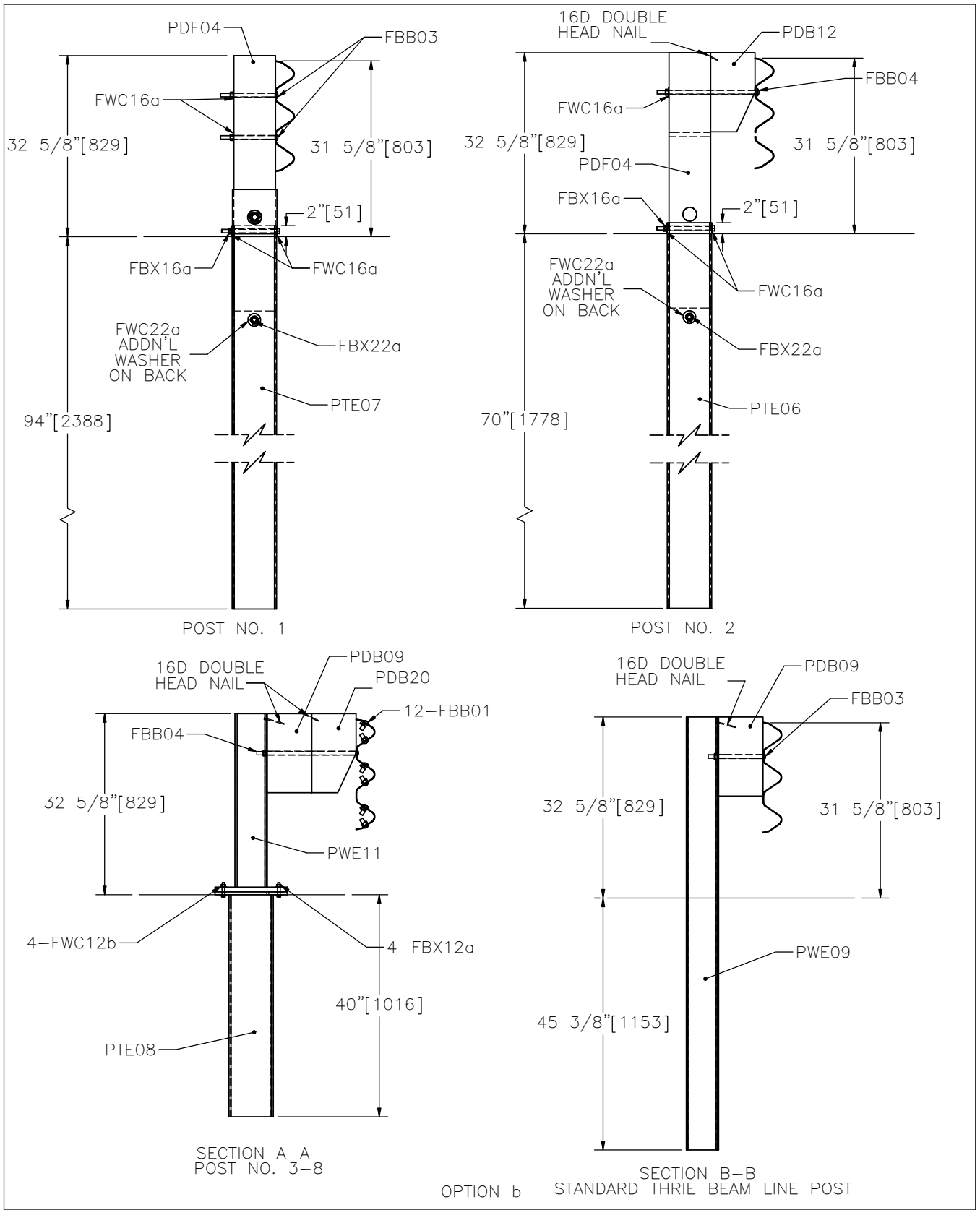
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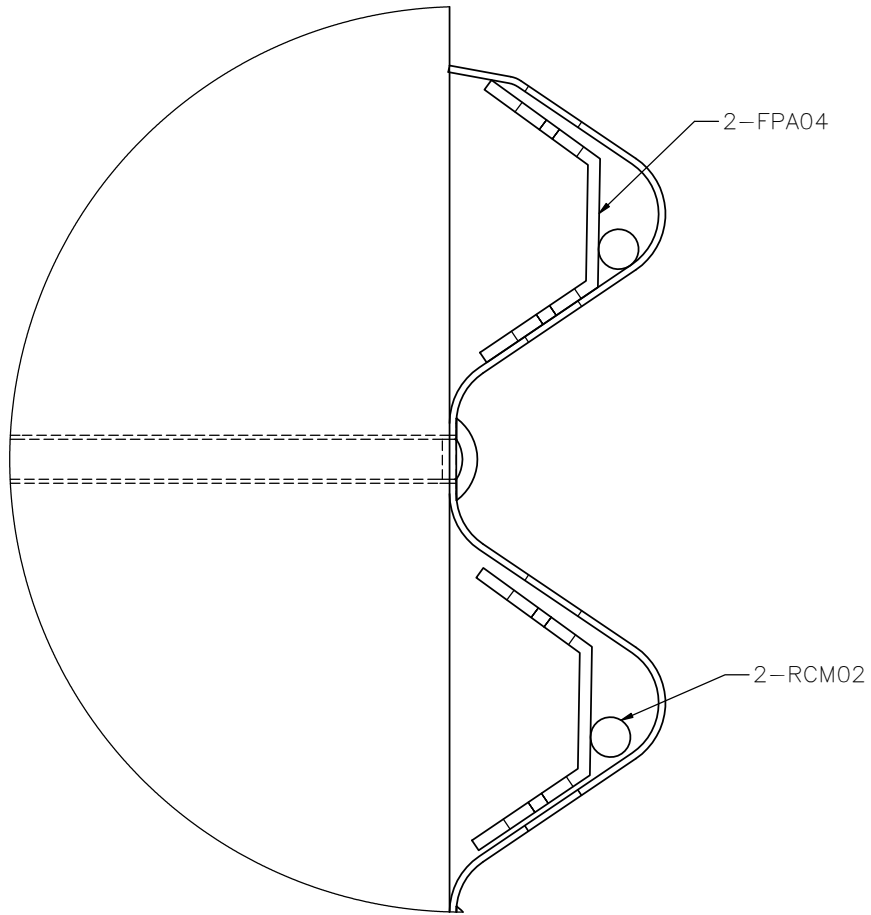
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DETAIL E

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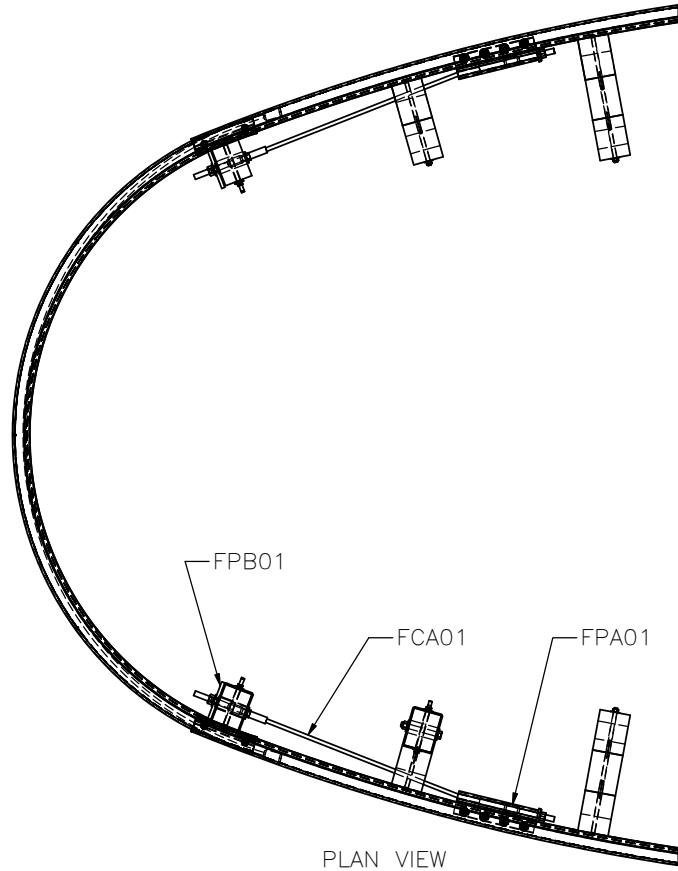
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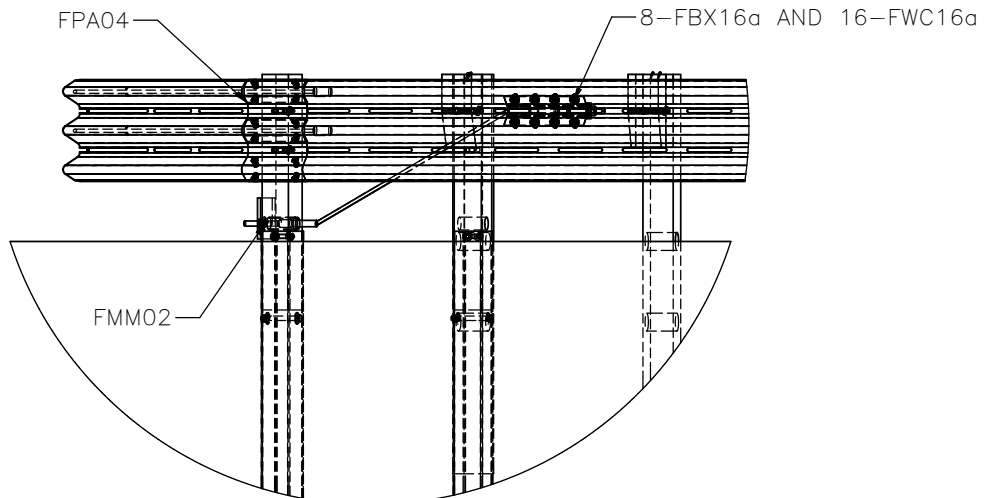
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PLAN VIEW
DETAIL D



ELEVATION VIEW
DETAIL C

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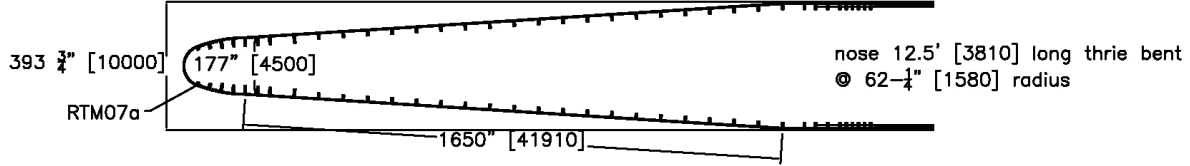
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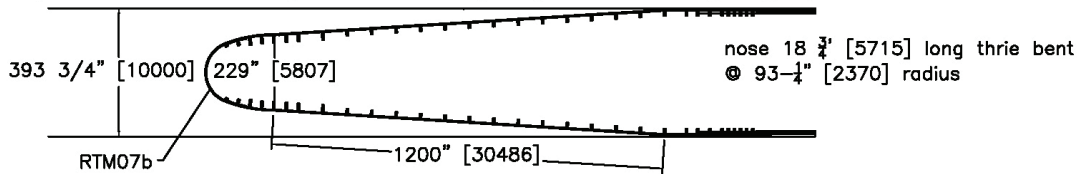
Protection of dual bridges separated by a median

- Allowable taper angle and the corresponding system length (15:1 taper allowable)
- Application of taper to existing design (beginning at start of section 3 as shown)

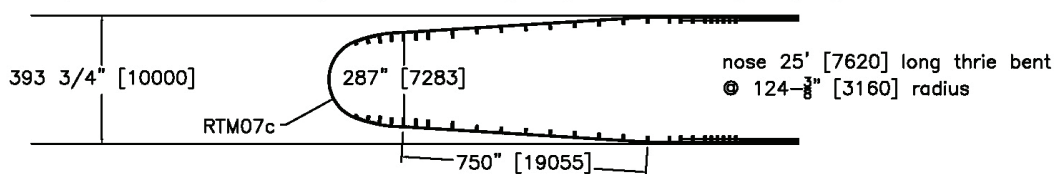
Symmetrical Bullnose Design No. 1 - 177" [4500] wide before beginning taper



Symmetrical Bullnose Design No. 2 - 229" [5807] wide before beginning taper



Symmetrical Bullnose Design No. 3 - 287" [7283] wide before beginning taper



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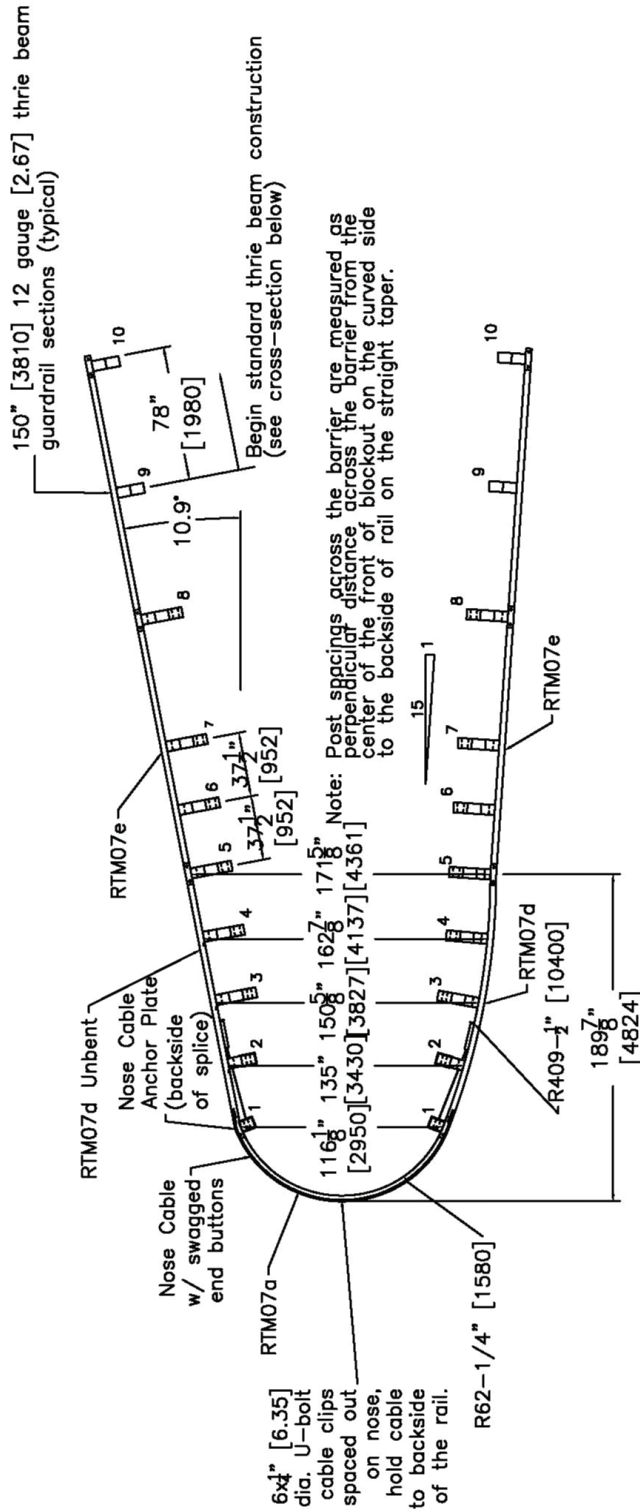
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FHWA Accepted Non-Symmetrical Bullnose System – Design No. 5



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