AS-BUILTS

MONTANA
DEPARTMENT OF TRANSPORTATION

BRIDGE PLANS AND QUANTITIES

FEDERAL AID PROJECT NO. NH-IM 0002(270) P.E.
NHTSA 0002(393) CONSTRUCTION

D4-NON-INTERSTATE GUARDRAIL

VALLEY, ROOSEVELT, RICHLAND, CUSTER, GARFIELD, McCONE AND PHILLIPS COUNTIES

LIST OF DRAWINGS

SHEET NO.	DWG. NO.	TITLE
B2	18743 Q2	QUANTITY SUMMARY
B3	18744	BRIDGE RAIL REVISION ON ROUTE N-1 AT RP 508+0.888 AND RP 514+0.737
B4	18745	BRIDGE RAIL REVISION ON ROUTE N-1 AT RP 514+0.943
B5	18746	BRIDGE APPROACH SECTIONS ON ROUTES N-20, N-22 AND N-57
B6	18747	BARRIER END MODIFICATION ON ROUTE N-20 AT RP 37+0.515
B7	18748	BRIDGE APPROACH SECTIONS ON ROUTE N-23 AT RP 15+0.943
B8	18749	BRIDGE RAIL REVISION ON ROUTE N-57 AT RP 231+0.023 AND RP 232+0.710
B9	18750	BRIDGE RAIL REVISION ON ROUTES N-1, N-57 AND N-61
B10	18751	BRIDGE RAIL REVISION ON ROUTE N-57 AT RP 239+0.257
B11	18752	DRILLED SHAFT ANCHOR POST
B12	18753	SWAY BRACING DETAILS ON ROUTE N-57 AT RP 232+0.710, 247+0.394 AND 255+0.300
B13	7020	EXISTING GENERAL LAYOUT ON ROUTE N-1 RP 508+0.888
B14	7026	EXISTING GENERAL LAYOUT ON ROUTE N-1 RP 514+0.737
B15	7032	EXISTING GENERAL LAYOUT ON ROUTE N-1 RP 514+0.943
B16	3700	EXISTING GENERAL LAYOUT ON ROUTE N-1 RP 645+0.625
B17	1809	EXISTING GENERAL LAYOUTS ON ROUTE N-57 RP 231+0.023 AND RP 232+0.710
B18	2057	EXISTING GENERAL LAYOUTS ON ROUTE N-57 RP 232+0.566 AND RP 235+0.652
B19	2176	EXISTING GENERAL LAYOUT ON ROUTE N-57 RP 234+0.523
B20	1810	EXISTING GENERAL LAYOUT ON ROUTE N-57 RP 239+0.257
B21	1949A	EXISTING GENERAL LAYOUT ON ROUTE N-57 RP 247+0.394
B22	1812	EXISTING GENERAL LAYOUT ON ROUTE N-57 RP 248+0.831
B23	1813	EXISTING GENERAL LAYOUTS ON ROUTE N-57 RP 249+0.748 AND RP 253+0.331
B24	1813A	EXISTING GENERAL LAYOUTS ON ROUTE N-57 RP 254+0.769, RP 254+0.838, RP 255+0.300 AND RP 257+0.150
B24A	1814	EXISTING GENERAL LAYOUT ON ROUTE N-57 RP 260+0.150
B25	2280	EXISTING GENERAL LAYOUTS ON ROUTE N-61 RP 133+0.425 AND RP 136+0.511
B26	2177	EXISTING GENERAL LAYOUT ON ROUTE N-61 RP 137+0.076

Misty Miner
22-10-2005

ADDENDUM NO. 1
ATTACHMENT NO. 3

NHTSA 0002(393) B2

AS-BUILTS

GENERAL NOTES

GENERAL: Plans were prepared from original drawings and as-built drawings. No additional survey information was procured for this project. Existing structure dimensions may vary from those shown on the drawings. Verify all dimensions necessary to complete the work.

SPECIFICATIONS: Montana Department of Transportation and the Montana Transportation Commission Standard Specifications for Road and Bridge Construction, 1995 edition, and any amendments thereto, and the Special Provisions govern unless otherwise noted. Design was prepared in accordance with AASHTO Standard Specifications for Highway Bridges, 17th Edition - 2002, and any amendments thereto.

REINFORCING STEEL: Use new deformed type reinforcing steel meeting the requirements of AASHTO M 31M Grade 60 (420).

Replace existing reinforcing steel damaged during construction that is called out to remain in place at no additional cost to the State.

Include cleaning exposed existing reinforcing steel in other items of work.

GALVANIZING: Galvanize all bolts, nuts and washers in accordance with AASHTO M 232M. Galvanize metal guardrail in accordance with ASTM Specification A 653M or AASHTO M 111M.

EPOXY RESIN BONDING AGENT: Thoroughly coat all existing concrete in contact with new concrete with an epoxy bonding agent (AASHTO M 235-91 Type V) immediately prior to placing new concrete. Include all costs associated with providing and applying the epoxy bonding agent in the other items.

TRAFFIC CONTROL PLAN AND SEQUENCE OF OPERATION: See Special Provisions.

DIMENSIONS: All dimensions are in millimeters except as noted. Verify all necessary dimensions of the existing structures in the field before ordering materials. Obtain approval of shop plans from the State of Montana, Department of Transportation before beginning fabrication. If the dimensions and details of the existing structure are not as shown on the plans, vary construction as necessary to best suit existing conditions and the nature of the intended work.

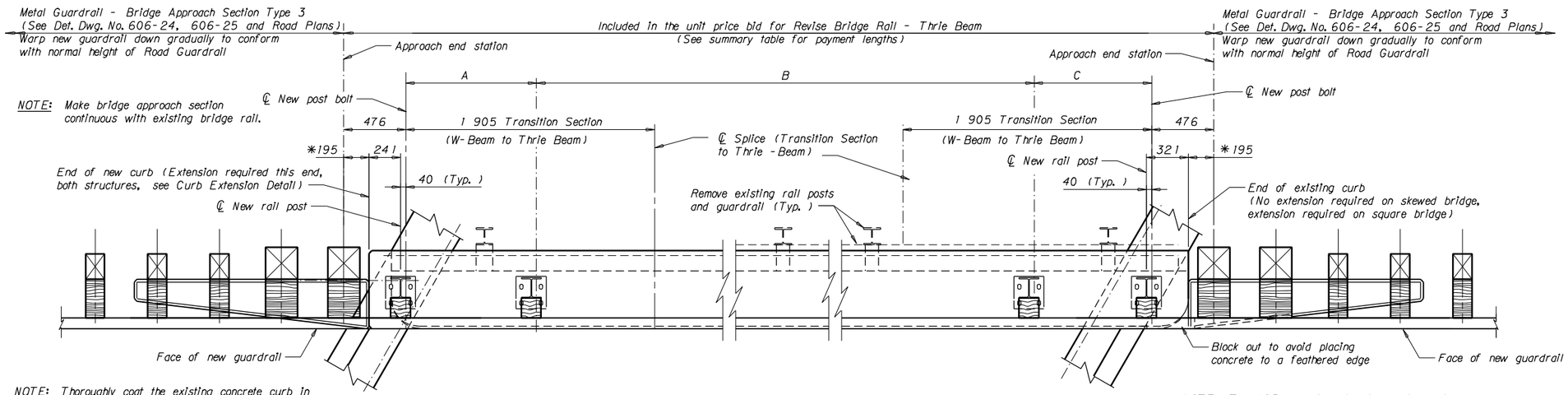
ESTIMATED BRIDGE PLAN QUANTITIES

ROUTE	REFERENCE POST	BRIDGE ID NUMBER	FEATURE CROSSED	REVISE BRIDGE RAIL-THRIE BEAM (m)	REVISE BRIDGE RAIL-CONCRETE BARRIER (m)	REVISE TIMBER BRIDGE RAIL-T101 (m)	ANCHOR POST (EACH)	TREATED TIMBER m^3	SPLIT
N-1	508+0.888	P00001508+0888	BEAVER CREEK	107.62					7
N-1	514+0.737	P00001514+0737	MILK RIVER	218.17					8
N-1	514+0.943	P00001514+0943	MILK RIVER OVERFLOW		89.27				9
N-1	645+0.625	P00001645+0625	SHEEP CREEK			~~42.54~~ 42.544	4		10
N-57	231+0.023	P00057231+0023	DRAINAGE			~~42.54~~ 42.544	4		11
N-57	232+0.566	P00057232+0566	DRAINAGE			~~22.22~~ 22.224	4		12
N-57	232+0.710	P00057232+0710	DRAINAGE			~~52.70~~ 52.704	4	~~0.79~~ 0.777	13
N-57	234+0.523	P00057234+0523	DRAINAGE			~~67.94~~ 67.944	4		14
N-57	235+0.652	P00057235+0652	DRAINAGE			~~62.86~~ 62.864	4		15
N-57	239+0.257	P00057239+0257	LITTLE DRY CREEK			~~253.36~~ 253.364	4		16
N-57	247+0.394	P00057247+0394	DRAINAGE			~~67.94~~ 67.944	4	~~0.14~~ 0.292	17
N-57	248+0.831	P00057248+0831	TIMBER CREEK			~~83.18~~ 83.184	4		18
N-57	249+0.748	P00057249+0748	SKULL CREEK			~~80.64~~ 80.644	4		19
N-57	253+0.331	P00057253+0331	DRAINAGE			~~57.78~~ 57.784	4		20
N-57	254+0.769	P00057254+0769	DRAINAGE			~~57.78~~ 57.784	4		21
N-57	254+0.838	P00057254+0838	DRAINAGE			~~52.70~~ 52.704	4		22
N-57	255+0.300	P00057255+0300	DRAINAGE			~~62.86~~ 62.864	4	~~1.5~~ 1.504	23
N-57	257+0.150	P00057257+0150	COULEE			~~52.70~~ 52.704	4		24
N-57	260+0.150	P00057260+0150	STOCKPASS			~~17.14~~ 17.144	4		25
N-61	133+0.425	P00061133+0425	BIG WARM SPRING CREEK			~~67.94~~ 67.944	4		26
N-61	136+0.511	P00061136+0511	WILD HORSE CR OVERFLOW			~~42.54~~ 42.544	4		27
N-61	137+0.076	P00061137+0076	WILD HORSE CREEK			~~67.94~~ 120.648	~~8~~ 8		28
TOTAL				325.79	89.27	~~1255.30~~ 1308.08	~~76~~ 80	~~2.44~~ 2.573	

Misty Miner
22-10-2005

D4-NON-INTERSTATE GUARDRAIL
FEDERAL AID PROJECT NO. NHTSA 0002(393)
FEDERAL AID PROJECT NO. NHT
VARIOUS COUNTIES
QUANTITY SUMMARY

6-11-03 L.M.S.
6-11-03 L.M.S.
6-26-03 D.J.R.
REVISED



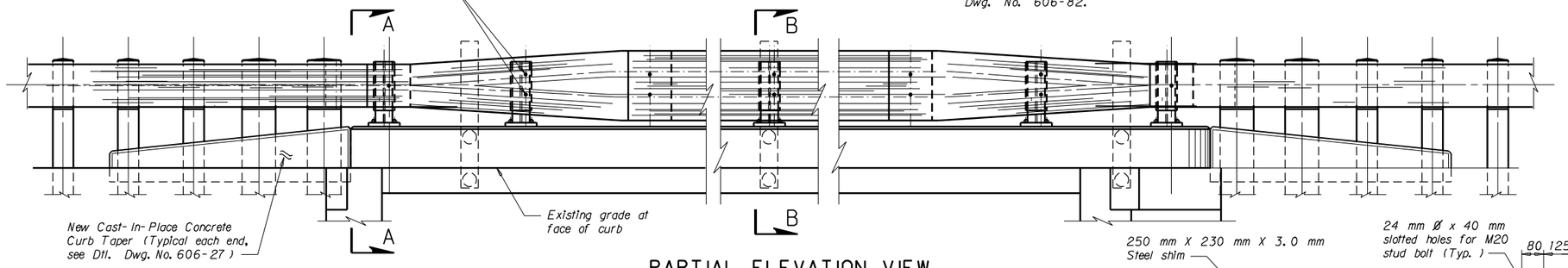
NOTE: Thoroughly coat the existing concrete curb in contact with new concrete with an epoxy bonding agent (AASHTO M 235-91 Type V) immediately prior to placing new concrete.

Drill 18 mm Ø holes in blockout and post after transition section has been erected

PARTIAL PLAN VIEW

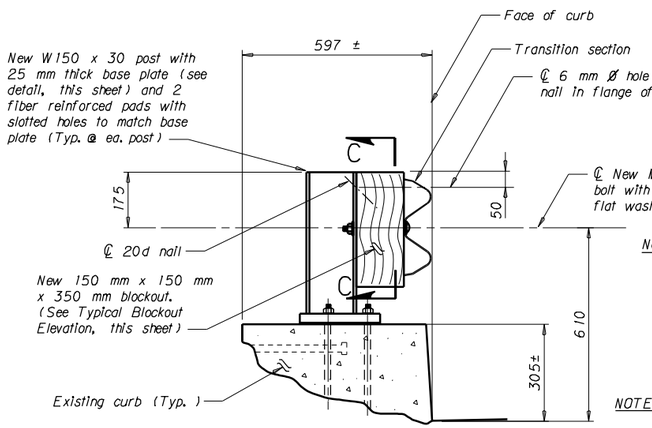
NOTE: Plug predrilled holes in rail with standard splice bolts. See Detailed Dwg. No. 606-82.

* NOTE: The 195 mm dimension is required with wood posts. The contractor has the option to use steel posts. See Detailed Drawings for dimensions.



PARTIAL ELEVATION VIEW

RAIL REVISION SUMMARY TABLE (Details shown apply to both sides of the structure)									
STRUCTURE LOCATION		GENERAL LAYOUT DWG. NO.	SKEW	DIMENSIONS			LENGTH OF RAIL (ONE SIDE ONLY) (m)	TOTAL LENGTH FOR PAYMENT (m)	APPROACH END STATIONING
				A	B	C			BENT NO. 1 / BENT NO. 3 or 5
Route N-1	508+0.888	7020	30°	1 028	20 Spa. @ 2 540 = 50 800	1 028	53.808	107.616	10+45.72 Rt. 10+45.72 Lt. / 9+54.28 Lt. 9+54.28 Rt.
Route N-1	514+0.737	7026	0°	727	42 Spa. @ 2 540 = 106 680	727	109.086	218.172	10+45.72 Rt. 10+45.72 Lt. / 9+61.90 Lt. 9+61.90 Rt.



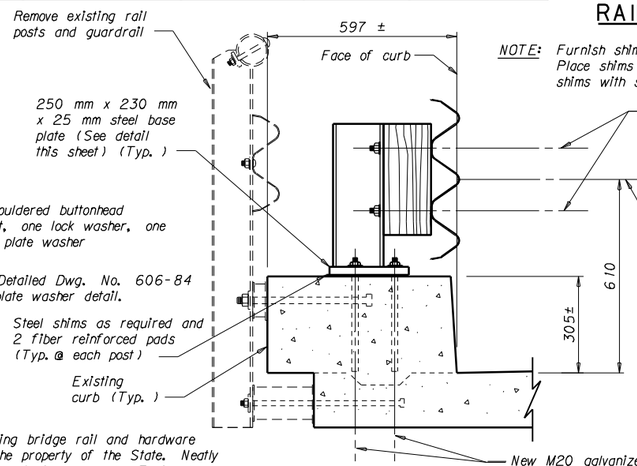
SECTION A-A

Scale ~ 1: 10

NOTE: See Detailed Dwg. No. 606-84 for plate washer detail.

NOTE: The existing bridge rail and hardware remains the property of the State. Neatly stockpile as indicated by the Engineer.

NOTE: Place blockouts made of treated timber with the wood grain perpendicular to the bolt centerline.



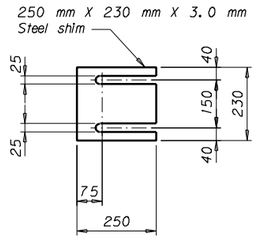
SECTION B-B

Scale ~ 1: 10

NOTE: Furnish shims as necessary to adjust rail to grade. Place shims between fiber reinforced pads. Place shims with slots toward roadway centerline.

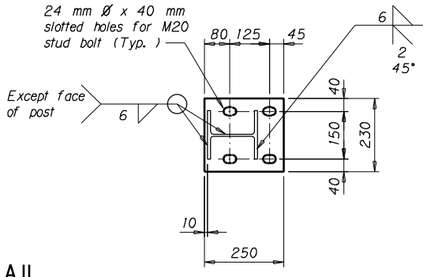
NOTE: Use fiber reinforced pads meeting the requirements of subsection 711.16 of the Standard Specifications. Size and position the pads so that not less than 10 mm of the pad protrudes on all sides of the base plate. Punch slotted holes in pads to match base plate.

NOTE: Install M20 stud bolts such that a minimum pullout strength of 78 kN is achieved assuming a concrete strength of f'c of 21 MPa. Do not tighten nuts before achieving full required strength.



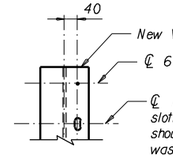
RAIL POST SHIM DETAIL

Scale ~ 1 : 10



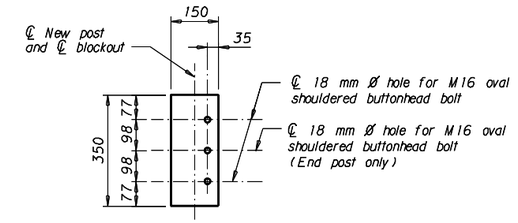
BASE PLATE DETAIL

Scale ~ 1 : 10



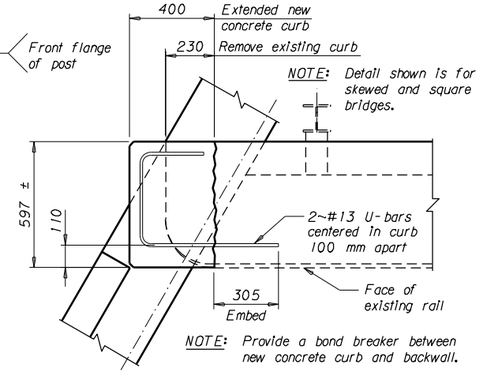
SECTION C-C

Scale ~ 1 : 10



TYPICAL BLOCKOUT ELEVATION

Scale ~ 1 : 10



CURB EXTENSION DETAIL

Scale ~ 1 : 15

2 extensions required on skewed bridge
4 extensions required on square bridge

NOTES

NHTSA 0002(393) B3

AS-BUILTS

PAINTING: Paint all posts and plates (except as noted) in accordance with the Standard Specifications. Galvanizing the posts and plates in accordance with AASHTO M 111M will be allowed.

REFLECTORS: Place a reflector on each end rail post and at approximately equal spacing (every third rail post but not to exceed 7620 mm) between end rail posts. Mount reflectors with reflectorized face toward oncoming traffic. See Dtl. Dwg. No. 606-05B for reflector detail.

PAYMENT: Revise Bridge Rail ~ Thrie Beam is paid for by the linear meter which is full compensation for all resources necessary to complete the item. The number of linear meters of Revise Bridge Rail ~ Thrie Beam for payment is shown on the Summary Table on this sheet. Use new posts and plates conforming to AASHTO M 270M Grade 250T3. Use metal guardrail conforming to AASHTO M 180 and lap in direction of traffic. Use Thrie Beam sections meeting the requirements of AASHTO designation Type I Class B. Use 1905 mm transition sections, from standard metal guard rail to thrie beam, meeting the requirements of AASHTO designation Type 1 Class A.

ERECTION: Set the rail parallel to the roadway grade. Adjust rail to proper rail height using vertical slots in rail post or rail post shims.

Replace any item which is to be incorporated in the rehabilitated structure that is damaged during construction at no additional cost to the State.

Misty Miner
22-10-2005

REVISED
1-29-03 L.M.S.
2-24-03 L.M.S.
6-17-03 D.J.R.

D4-NON-INTERSTATE GUARDRAIL

ON ROUTE N-1 AT RP 508+0.888 & 514+0.737

FEDERAL AID PROJECT NO. NHTSA 0002(393)

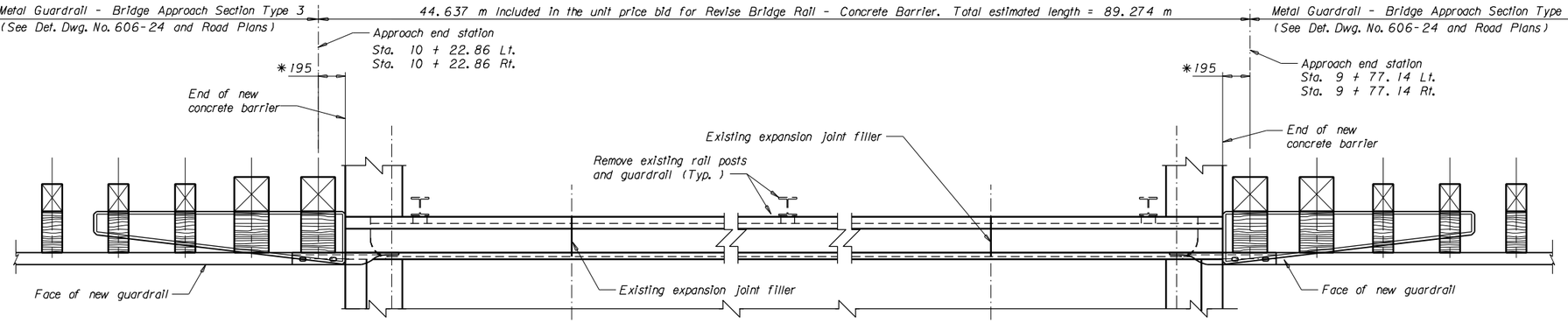
VALLEY COUNTY

BRIDGE RAIL REVISION

Scale ~ 1 : 20 except as noted

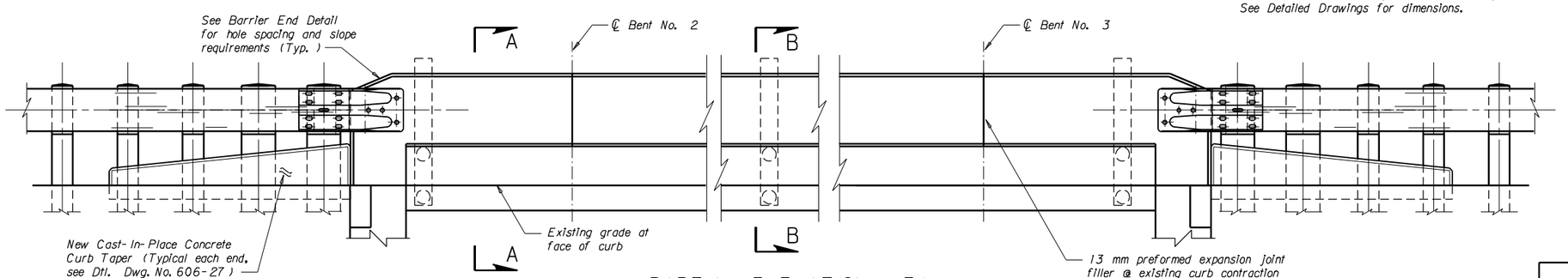
AS-BUILTS

NHTSA 0002(393) B4



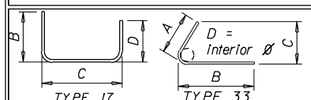
PARTIAL PLAN VIEW

*NOTE: The 195 mm dimension is required with wood posts. The contractor has the option to use steel posts. See Detailed Drawings for dimensions.



PARTIAL ELEVATION VIEW

BILL OF REINFORCING STEEL (FOR INFORMATION ONLY)



STRAIGHT BARS				BENT BARS (All dimensions are out to out)								
Mark	Size	No.	Length	Mark	Size	No.	Type	Length	A	B	C	D
B100	#13	30	12 190	B1	#13	8	33	1 590	770	770	230	90
B101	#13	20	2400	B2	#13	4	33	1 400	670	670	230	110
B102	#13	10	3820	B3	#13	294	33	1 010	480	480	205	90
				B4	#13	8	17	1 150		690	160	300
D1	#13	294	740									

NOTES:

REFLECTORS: Place a white reflector on top of concrete barrier at 9.15 meter spacing between ends of barrier. Mount reflectors with reflectorized face toward oncoming traffic. See Dtl. Dwg. No. 606-60 for reflector detail.

PAYMENT: With the exception to Bridge Approach Sections, the unit price bid for Revise Bridge Rail - Concrete Barrier includes all resources necessary to complete the item as shown on the plans.

See General Layout Dwg. No. 7032 for more information.

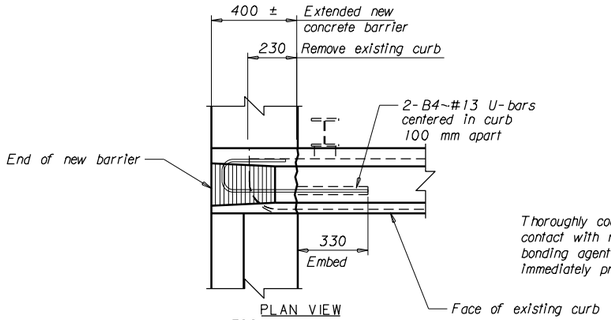
Use Class SD concrete in barriers. Galvanize all new hardware.

Details shown on this drawing apply to both sides for the entire length of the structure.

Replace existing reinforcing steel damaged during construction that is called out to remain in place at no additional cost to the State.

The existing bridge rail and hardware remains the property of the State. Neatly stockpile as indicated by the Engineer.

REVISE BRIDGE RAIL - CONCRETE BARRIER				
STRUCTURE LOCATION		GENERAL LAYOUT NO.	LENGTH OF BARRIER (one side only)	TOTAL LENGTH
Route N-1	514 + 0.943	7032	44.637 m	89.274 m



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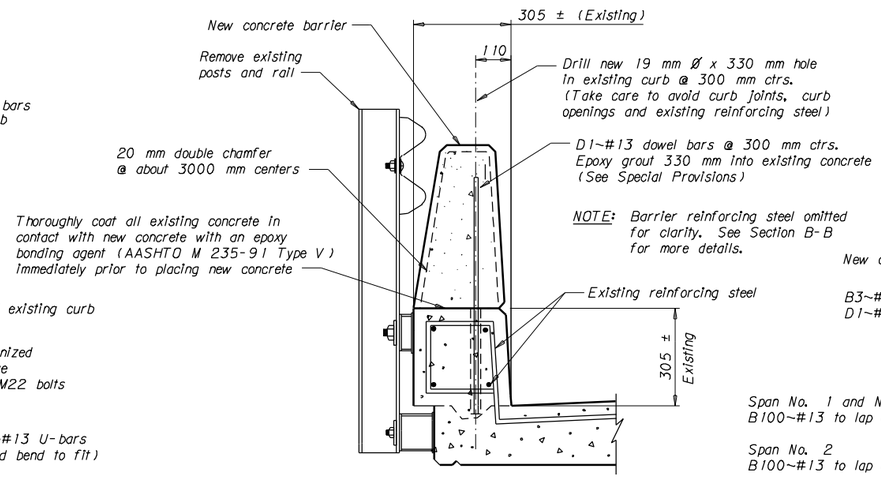
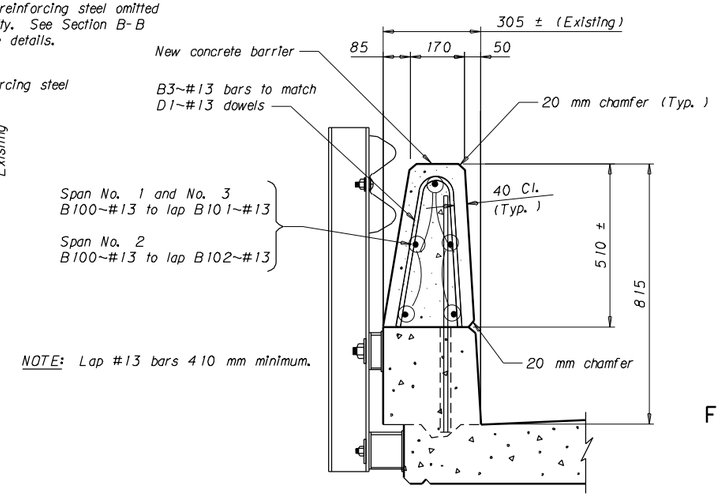
BARRIER END DETAIL
Scale ~ 1 : 15



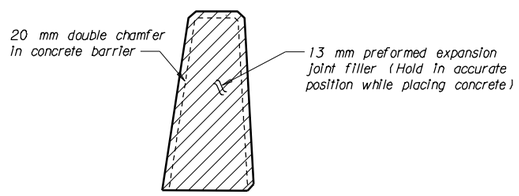
SECTION A-A
Scale ~ 1 : 10

VIEW D-D
Scale ~ 1 : 15



NOTE: Lap #13 bars 410 mm minimum.

SECTION B-B
Scale ~ 1 : 10



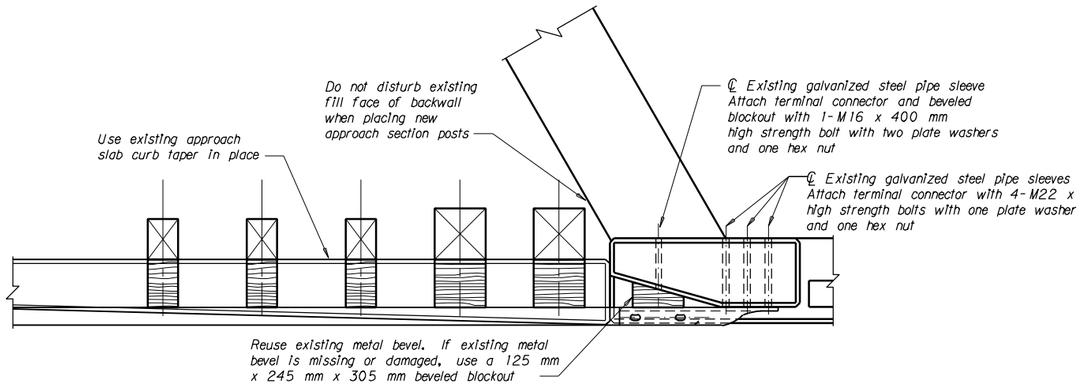
BARRIER EXPANSION JOINT
Scale ~ 1 : 10

REVISED
3-10-03 L.M.S.
3-11-03 L.M.S.
6-18-03 D.J.R.

D4-NON-INTERSTATE GUARDRAIL
ON ROUTE N-1 AT RP 514+0.943
FEDERAL AID PROJECT NO. NHTSA 0002(393)
VALLEY COUNTY
BRIDGE RAIL REVISION

Scale ~ 1 : 20 except as noted

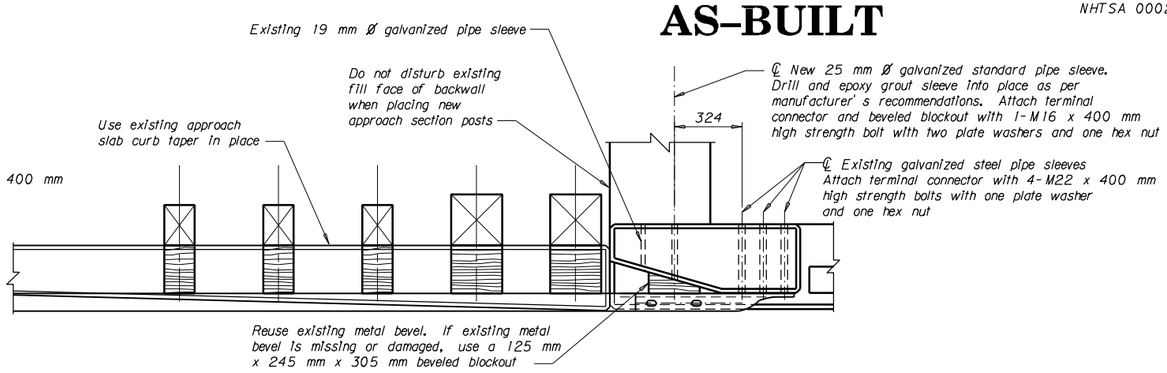
AS-BUILT



PARTIAL PLAN VIEW

NOTE: See Detailed Drawing No. 606-24 for more details and notes.

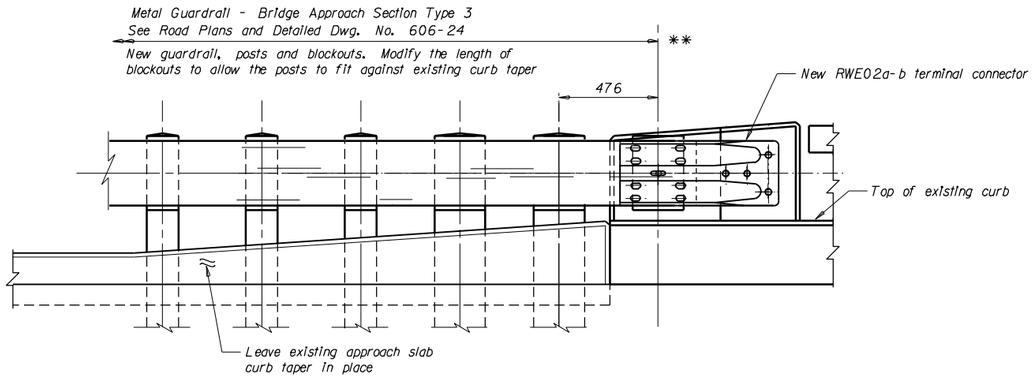
** See revised bridge approach section this sheet.



PARTIAL PLAN VIEW

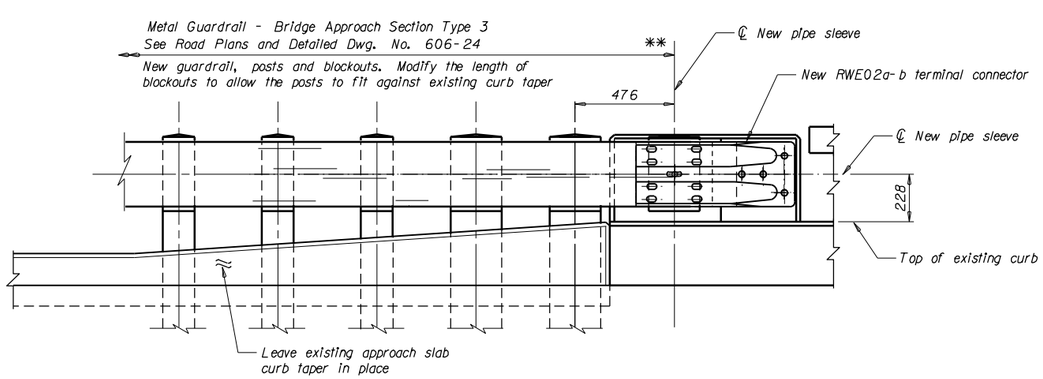
NOTE: See Detailed Drawing No. 606-24 for more details and notes.

** See revised bridge approach section this sheet.



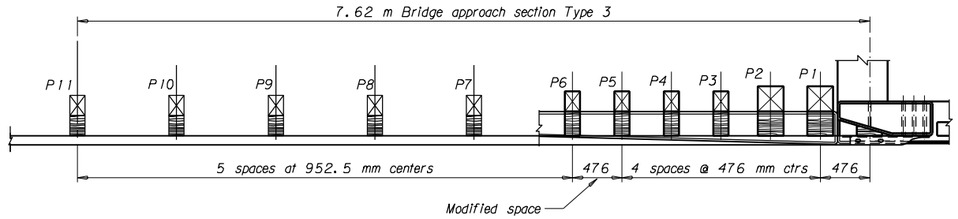
PARTIAL ELEVATION VIEW

R.P. P00 020 032+0.107
R.P. P00 020 032+0.399
R.P. P00 020 032+0.652
R.P. P00 020 046+0.683
R.P. P00 022 065+0.625
R.P. P00 057 161+0.243
R.P. P00 057 187+0.853



PARTIAL ELEVATION VIEW

R.P. P00 022 075+0.877



** REVISED TYPE 3 BRIDGE APPROACH SECTION

SUMMARY TABLE

STRUCTURE LOCATION		* GENERAL LAYOUT DRAWING NO.	BRIDGE APPROACH SECTIONS		RAIL ATTACHMENT STATIONS (METERS)			
			New Curb Tapers	TYPE 3				
Route N-20	032+0.107	10466	NO	4	BENT 1 LEFT 10 + 30.48	BENT 1 RIGHT 10 + 30.48	BENT 2 LEFT 9 + 69.52	BENT 2 RIGHT 9 + 69.52
Route N-20	032+0.399	10470	NO	4	BENT 1 LEFT 10 + 30.48	BENT 1 RIGHT 10 + 30.48	BENT 4 LEFT 9 + 69.52	BENT 4 RIGHT 9 + 69.52
Route N-20	032+0.652	10475	NO	4	BENT 1 LEFT 10 + 00.00	BENT 1 RIGHT 10 + 00.00	BENT 2 LEFT 9 + 69.52	BENT 2 RIGHT 9 + 69.52
Route N-20	046+0.683	10366	NO	4	BENT 1 LEFT 10 + 53.34	BENT 1 RIGHT 10 + 53.34	BENT 4 LEFT 9 + 69.52	BENT 4 RIGHT 9 + 69.52
Route N-22	065+0.625	11058	YES (4)	4	BENT 1 LEFT 10 + 30.48	BENT 1 RIGHT 10 + 30.48	BENT 6 LEFT 9 + 69.52	BENT 6 RIGHT 9 + 69.52
Route N-22	075+0.877	9626	NO	4	BENT 1 LEFT 10 + 15.24	BENT 1 RIGHT 10 + 11.43	BENT 3 LEFT 9 + 50.47	BENT 3 RIGHT 9 + 50.47
Route N-57	161+0.243	10821	NO	4	BENT 1 LEFT 10 + 30.48	BENT 1 RIGHT 10 + 30.48	BENT 3 LEFT 9 + 69.52	BENT 3 RIGHT 9 + 69.52
Route N-57	187+0.853	10521	NO	4	BENT 1 LEFT 10 + 30.48	BENT 1 RIGHT 10 + 30.48	BENT 2 LEFT 9 + 69.52	BENT 2 RIGHT 9 + 69.52

* NOTE: The General Layouts are available from the MDT Bridge Bureau.

Misty Miner
22-10-2005

NOTES

PAYMENT: Guardrail - Steel/Bridge Approach Type 3 is paid for by the unit price bid which is full compensation for all resources necessary to complete the item.

Plug predrilled holes in rail with standard splice bolts. See Detailed Dwg. No. 606-82.

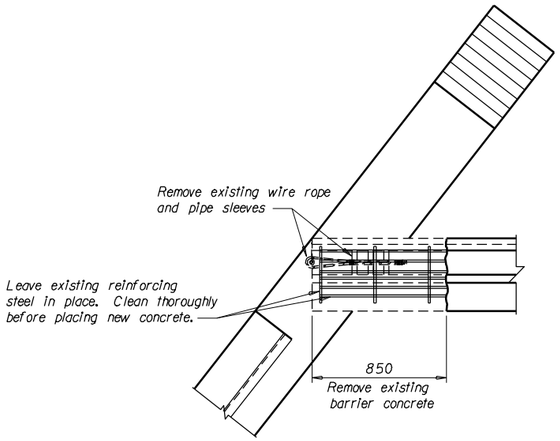
D4-NON-INTERSTATE GUARDRAIL
ON ROUTES N-20, N-22 AND N-57
FEDERAL AID PROJECT NO. NHTSA 0002(393)
RICHLAND COUNTY
BRIDGE APPROACH SECTIONS

4-25-03 L.M.S.
4-28-03 L.M.S.
6-19-03 D.J.R.
** REVISED 12-9-03 L.M.S.

Scale ~ 1 : 15

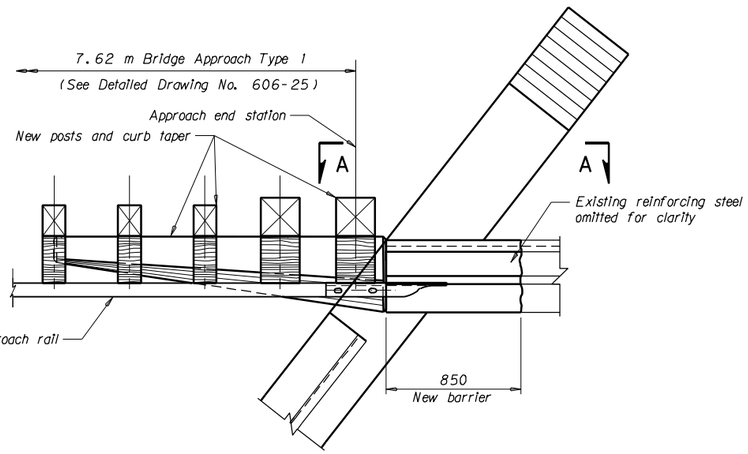
AS-BUILT

NHTSA 0002(393) B6



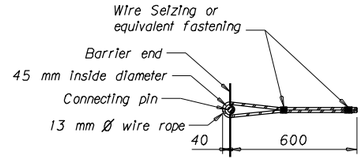
EXISTING BARRIER END MODIFICATION DETAILS - PLAN VIEW

Bent No. 1 - Left side only



NEW BARRIER END DETAILS - PLAN VIEW

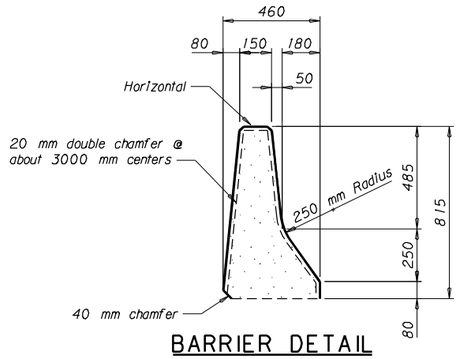
Bent No. 1 - Left side only



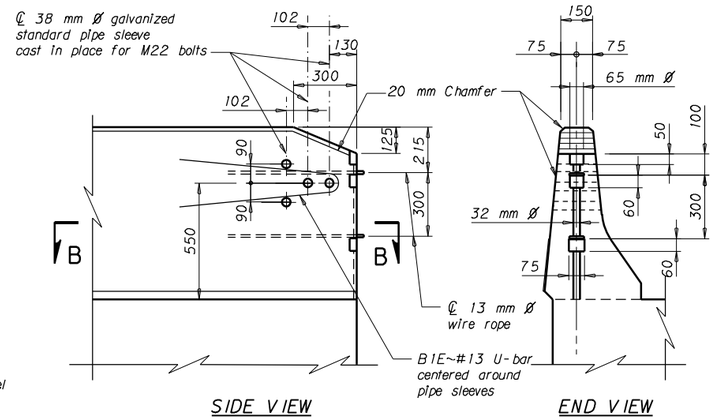
SECTION B-B

NOTE: Use zinc-coated steel wire (7) strand utilities grade wire rope with minimum breaking strength of 111.2 kN conforming to ASTM A 475.

NOTE: Use a connecting pin meeting the requirements of AASHTO M 227M Grade 310.



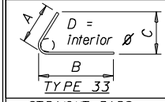
BARRIER DETAIL



SIDE VIEW END VIEW

VIEW A-A

BILL OF REINFORCING STEEL (FOR INFORMATION ONLY)



STRAIGHT BARS			
Mark	Size	No.	Length

BENT BARS (All dimensions are out to out)

Mark	Size	No.	Type	Length	A	B	C	D
B1E	#13	1	33	1 450	730	730	220	60

NOTES:

PAYMENT: Include all costs associated with furnishing materials, equipment, labor and incidentals necessary to complete the item in the unit price bid for Guard Rail - Steel/Bridge Approach Type 1.

General Layout Dwg. No. 13438 is available from the MDT Bridge Bureau.

Use Class SD concrete in barrier. Galvanize all new hardware.

Misty Miner
22-10-2005

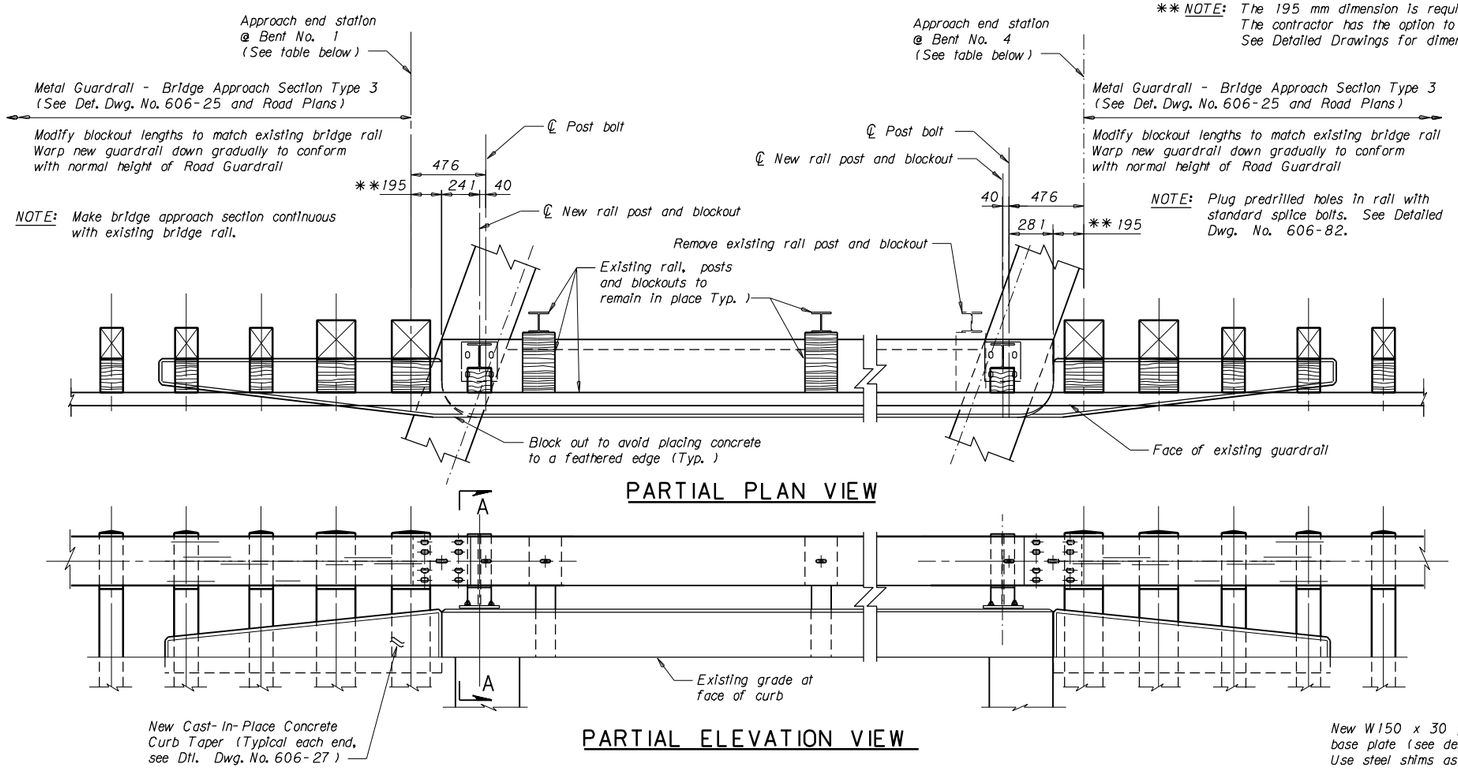
D4-NON-INTERSTATE GUARDRAIL
ON ROUTE N-20 AT RP 37+0.515
FEDERAL AID PROJECT NO. NHTSA 0002(393)
RICHLAND COUNTY

BARRIER END MODIFICATION

Scale ~ No Scale

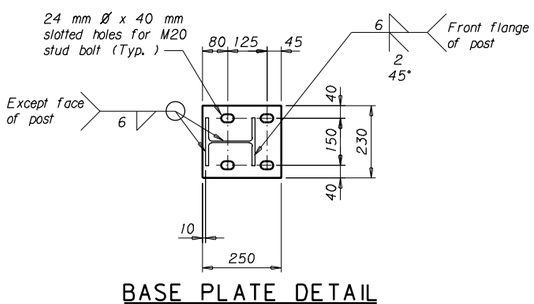
REVISED
4-25-03 L.M.S.
4-28-03 L.M.S.
6-19-03 D.J.R.

AS–BUILT

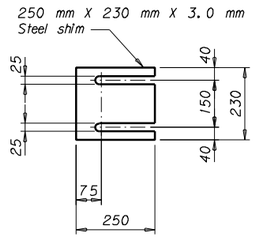


RAIL REVISION SUMMARY TABLE (Details shown apply to both sides and ends of the structure)						
STRUCTURE LOCATION		GENERAL LAYOUT DWG. NO.	SKEW	TYPE 3 BRIDGE APPROACH SECTIONS (EACH)	APPROACH END STATIONING	
					BENT NO. 1	BENT NO. 4
Route N-23	0154+0.943	*5155	20°	4	10 + 22.86 Rt. 10 + 22.86 Lt.	9 + 77.14 Rt. 9 + 77.14 Lt.

* NOTE: The General Layout is available from the MDT Bridge Bureau.

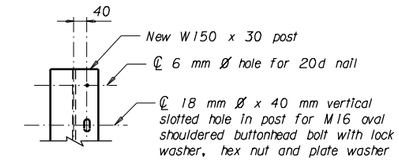


BASE PLATE DETAIL
Scale ~ 1:10

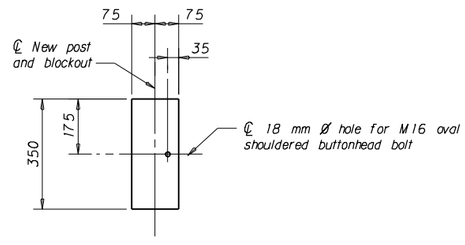


RAIL POST SHIM DETAIL
Scale ~ 1:10

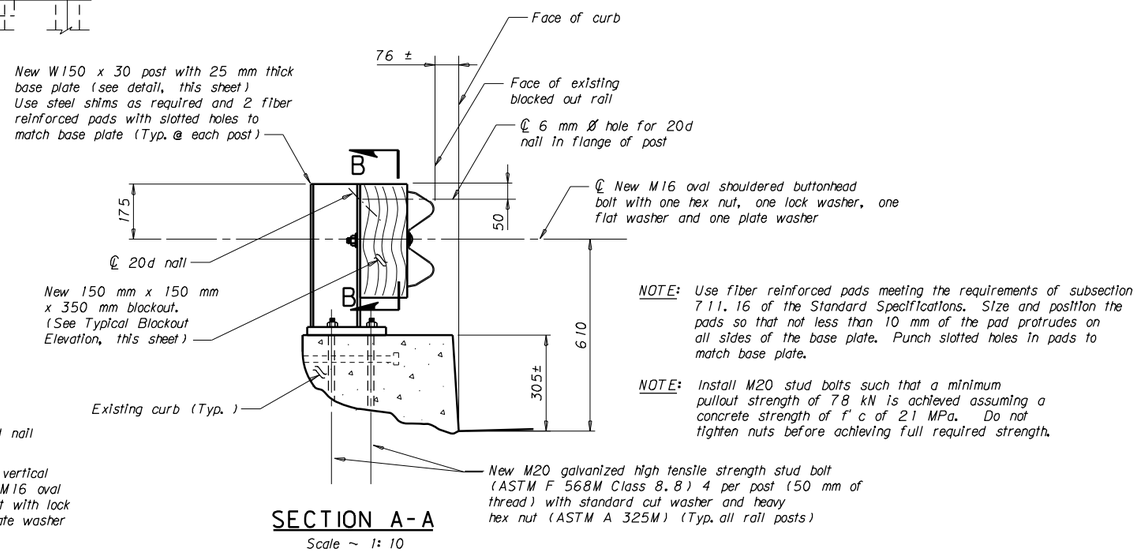
NOTE: Furnish shims as necessary to adjust rail to grade. Place shims between fiber reinforced pads. Place shims with slots toward roadway centerline.



SECTION B-B
Scale ~ 1:10



TYPICAL BLOCKOUT ELEVATION
Scale ~ 1:10



SECTION A-A
Scale ~ 1:10

NOTE: Use fiber reinforced pads meeting the requirements of subsection 711.16 of the Standard Specifications. Size and position the pads so that not less than 10 mm of the pad protrudes on all sides of the base plate. Punch slotted holes in pads to match base plate.

NOTE: Install M20 stud bolts such that a minimum pullout strength of 78 kN is achieved assuming a concrete strength of f'c of 21 MPa. Do not tighten nuts before achieving full required strength.

NOTES

NHTSA 0002(393) B7

PAINTING: Paint all posts and plates (except as noted) in accordance with the Standard Specifications. Galvanizing the posts and plates in accordance with AASHTO M 111M will be allowed.

REFLECTORS: Place a reflector on each end rail post and at approximately equal spacing (every third rail post but not to exceed 7620 mm) between end rail posts. Mount reflectors with reflectorized face toward oncoming traffic. See Dtl. Dwg. No. 606-05B for reflector detail.

PAYMENT: Include all costs associated with furnishing materials, equipment, labor and incidentals necessary to complete the item in the unit price bid for Guard Rail - Steel/Bridge Approach Type 3. Use new posts and plates conforming to AASHTO M 270M Grade 250T3. Use metal guardrail conforming to AASHTO M 180 and lap in direction of traffic.

ERECTION: Set the rail parallel to the roadway grade. Adjust rail to proper rail height using vertical slots in rail post or rail post shims.

Cut existing rail sections square. Flame cutting is not permitted. Coat new cut ends and holes with an approved galvanizing paint.

Place blockouts made of treated timber with the wood grain perpendicular to the bolt centerline.

Misty Miner

22-10-2005

D4-NON-INTERSTATE GUARDRAIL ON ROUTE N-23 AT RP 154+0.943

FEDERAL AID PROJECT NO. NHTSA 0002(393)

CUSTER COUNTY

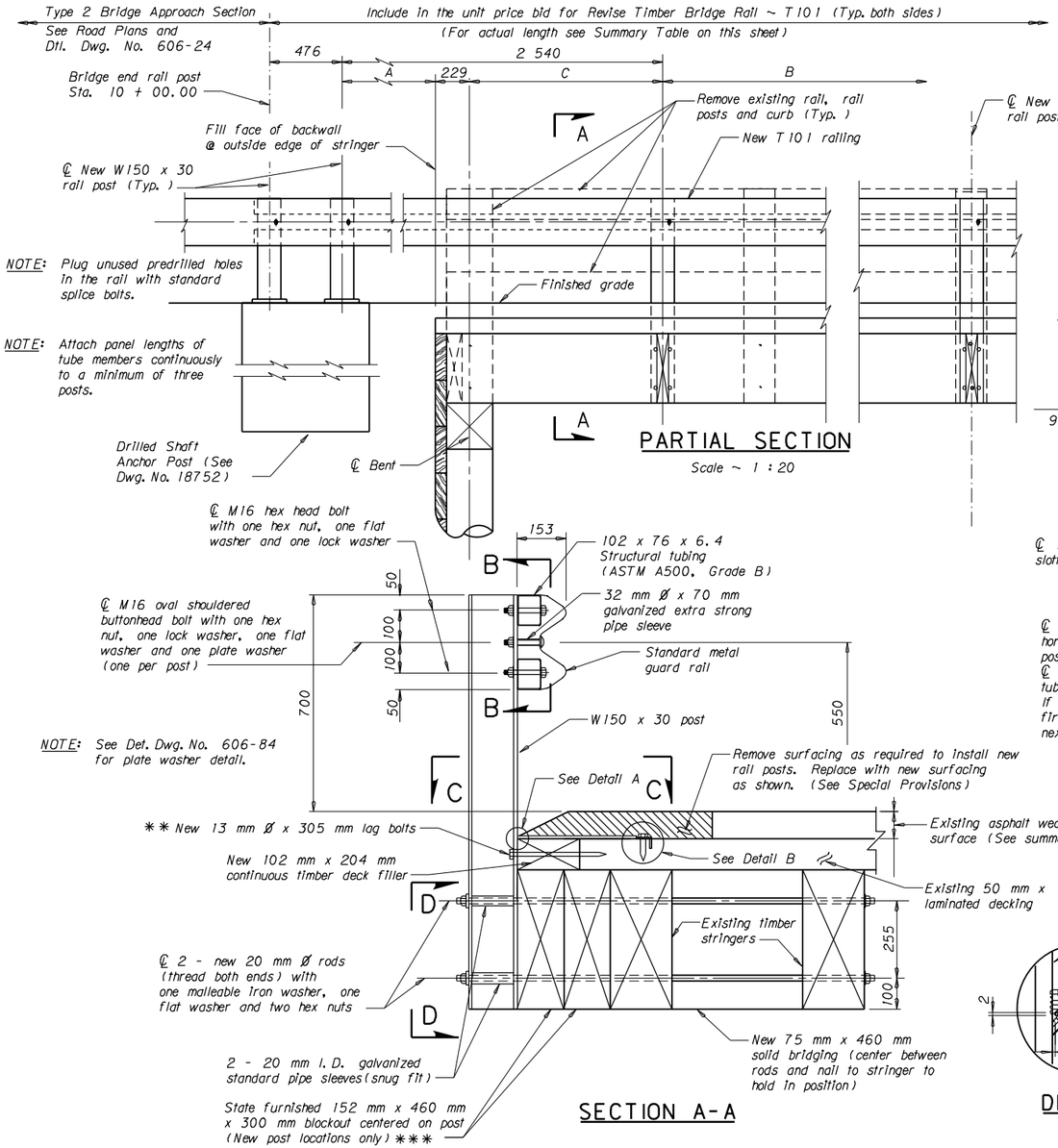
BRIDGE APPROACH SECTIONS

Scale ~ 1:20 except as noted

REVISED
4-29-03 L.M.S.
4-30-03 L.M.S.
6-21-03 D.J.R.

AS-BUILT

NHTSA 0002(393) B8



NOTES

REFLECTORS: Place a reflector on each end rail post and at approximately equal spacing (every third rail post but not to exceed 7620 mm) between end rail posts. Mount reflectors with reflectorized face toward oncoming traffic. See Detail see Dtl. Dwg. No. 606-05 for reflector detail. Mount reflector to W-beam post web with an approved adhesive. Include the cost of the reflector in the unit price bid for Revise Timber Bridge Rail -T101.

PAYMENT: Revise Timber Bridge Rail - T101 is paid for by the linear meter which is full compensation for all resources necessary to complete the item. The number of linear meters of Revise Timber Bridge Rail - T101 for payment is the distance between centerlines of the drilled shaft posts as shown on this sheet (See Summary Table below). Use posts and plates conforming to AASHTO M 270M Grade 250T3. Use metal guardrail conforming to AASHTO M 180 and lap in direction of traffic.

ERECTION: Set the rail parallel to the roadway grade. Set rail posts perpendicular to adjacent roadway grade and vertical in relation to roadway cross slopes. Adjust rail to proper rail height using vertical slots in rail posts.

PAINTING: Paint all posts, structural tubing and plates (except as noted) in accordance with the Standard Specifications. Galvanizing the posts, structural tubing and plates in accordance with AASHTO M 111M is allowed.

SELECT STRUCTURAL TIMBER FOR SOLID BRIDGING: Use standard sawn inter-mountain Douglas Fir, Western Larch or Pacific Coast Douglas Fir conforming to AASHTO M 168 meeting the requirements for numerical stress values shown on the table below for Dense No. 1 timber for solid bridging. Clearly note the grade of timber on the shop plans to avoid oversight. AASHTO classification for solid bridging is Beams and Stringers.

DESCRIPTION	EXTREME FIBER IN BENDING Fb & TENSION PARALLEL TO GRAIN Ft (MPa)		HORIZ. SHEAR Fv (MPa)	COMPRESSION (MPa)		MODULUS OF ELASTICITY E (MPa)
				PERPENDICULAR TO GRAIN Fc⊥	PARALLEL TO GRAIN Fc	
75 x 460 Bridging	Fb	Ft	0.59	5	7.6	11 700
	10.7	5.3				

Details shown on this drawing apply to both sides for the entire length of the structure.

Remove existing rails, rail posts, curb and hardware as shown on this drawing. Removed items become the property of the contractor. (See Special Provisions for disposal of unwanted materials.) Removal costs are included in the unit price bid for Revise Timber Bridge Rail - T101.

Replace any timber which is to be incorporated in the rehabilitated structure that is damaged during construction at no additional cost to the State.

Chamfer edge of new timber deck filler directly under location where 12 mm plate connects with rail post to clear fillet weld as shown in Detail A.

Plug open holes exposed by revisions with treated dowels. Thoroughly coat all new holes, cuts and chamfers as per Standard Specifications.

** NOTE: Run new 102 mm x 204 mm deck filler continuous along existing deck edge. Center filler ends at new posts. Equally space 3-13 mm Ø x 305 mm lag bolts between posts.

*** NOTE: The State of Montana will supply salvaged stringers for the contractor to cut into 300 mm lengths. The stringers will be stock piled for the contractor's use at a maintenance yard stated in the Special Provisions

RAIL REVISION SUMMARY TABLE (Details shown apply to both sides of the structure)

STRUCTURE LOCATION		GENERAL LAYOUT DWG. NO.	SKEW	WEARING SURFACE DEPTH (mm)	DIMENSIONS A	DIMENSIONS B	DIMENSIONS C	LENGTH OF RAIL (ONE SIDE ONLY) (m)	TOTAL LENGTH FOR PAYMENT (m)	ANCHOR POST (EACH)
Route N-57	231+0.023	1809	0°	152 ±	1 244	6 Spa. @ 2 540 = 15 240	1 067	21.272	42.544	4
Route N-57	232+0.710	1809	0°	152 ±	889	8 Spa. @ 2 540 = 20 320	1 422	26.352	52.704	4

Misty Miner
22-10-2005

REVISED
3-14-03 LMS/KFM
3-18-03 L.M.S.
6-21-03 D.J.R.

D4-NON-INTERSTATE GUARDRAIL
ON ROUTE N-57 AT RP 231+0.023 & 232+0.710
FEDERAL AID PROJECT NO. NHTSA 0002(393)
GARFIELD COUNTY
BRIDGE RAIL REVISION

Scale ~ 1 : 10 except as noted

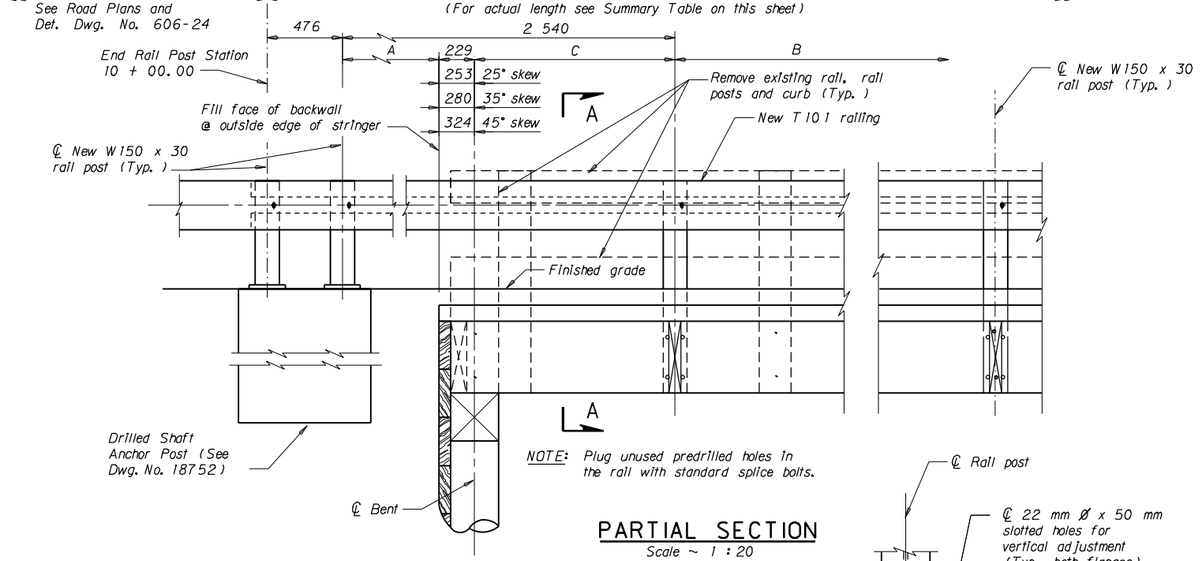
AS-BUILT

NOTE: See Dwg. No. 18749 for Section B-B, Detail A, Detail B and additional notes and details.

NHTSA 0002(393) B9

Type 2 Bridge Approach Section
See Road Plans and Det. Dwg. No. 606-24

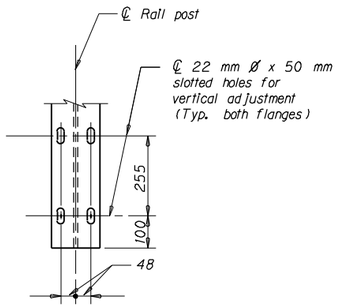
Include in the unit price bid for Revise Timber Bridge Rail ~ T101 (Typ. both sides)
(For actual length see Summary Table on this sheet)



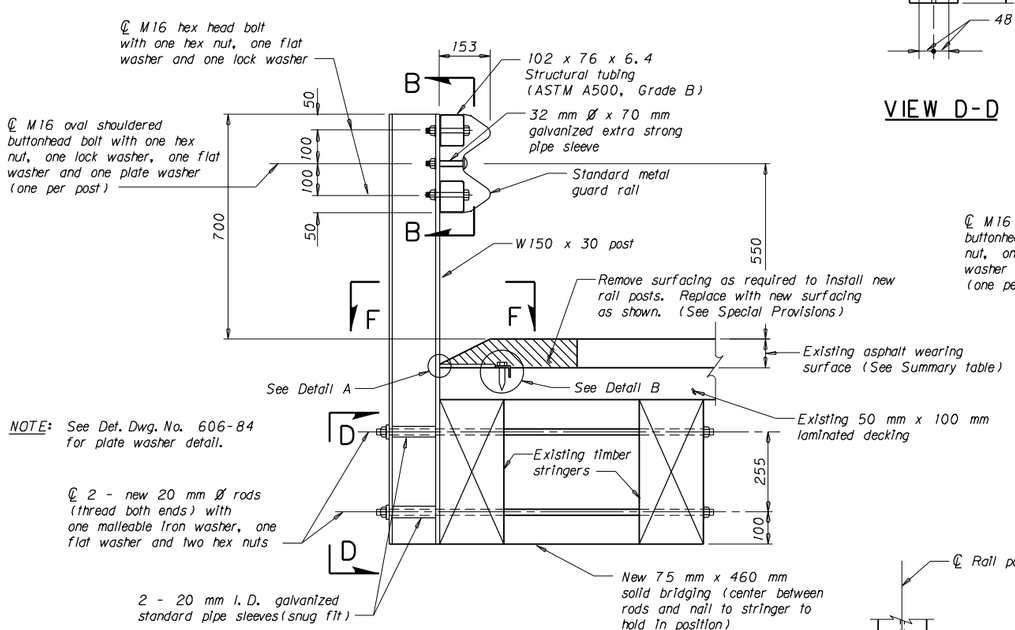
NOTE: Plug unused predrilled holes in the rail with standard splice bolts.

PARTIAL SECTION
Scale ~ 1 : 20

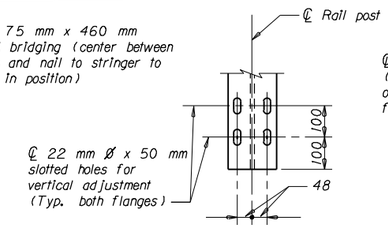
NOTE: Attach panel lengths of tube members continuously to a minimum of three posts.



VIEW D-D

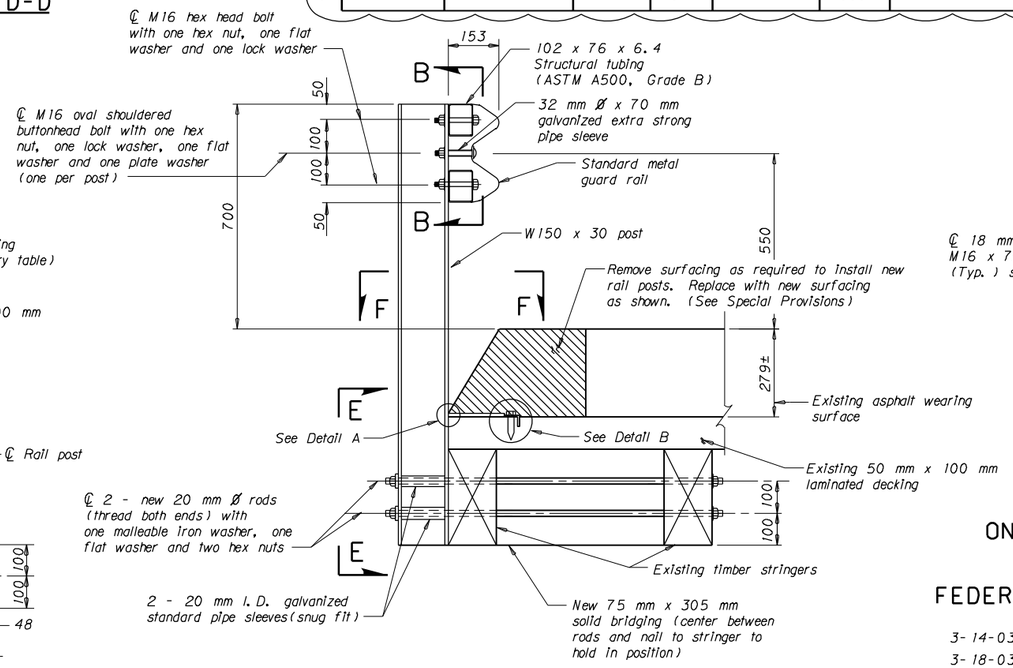


SECTION A-A

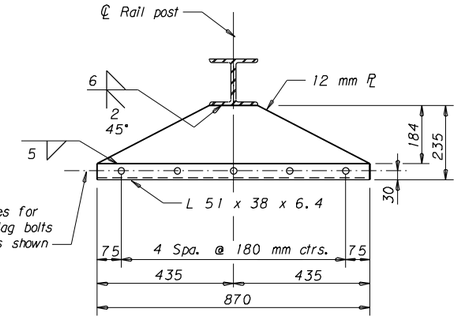


VIEW E-E

RAIL REVISION SUMMARY TABLE (Details shown apply to both sides of the structure)										
STRUCTURE LOCATION		GENERAL LAYOUT DWG. NO.	SKEW	WEARING SURFACE DEPTH (mm)	DIMENSIONS A	DIMENSIONS B	DIMENSIONS C	LENGTH OF RAIL (ONE SIDE ONLY) (m)	TOTAL LENGTH FOR PAYMENT (m)	ANCHOR POST (EACH)
Route N-1	645+0.625	3700	0°	178 ±	1 244	6 Spa. @ 2 540 = 15 240	1 067	21.272	42.544	4
Route N-57	232+0.566	2057	0°	152 ±	1 041	2 Spa. @ 2 540 = 5 080	1 270	11.112	22.224	4
Route N-57	234+0.523	2176	0°	178 ±	889	11 Spa. @ 2 540 = 27 940	1 422	33.972	67.944	4
Route N-57	235+0.652	2057	35°	178 ±	787	10 Spa. @ 2 540 = 25 400	1 473	31.432	62.864	4
Route N-57	247+0.394	1949A	0°	102 ±	1 803	11 Spa. @ 2 540 = 27 940	508	33.972	67.944	4
Route N-57	248+0.831	1812	25°	178 ±	1 017	14 Spa. @ 2 540 = 35 560	1 270	41.592	83.184	4
Route N-57	249+0.748 Lt.	1813	0°/45°	178 ±	635~0° 540~45°	15 Spa. @ 2 540 = 38 100	1 676	44.132	80.644	2
Route N-57	249+0.748 Rt.	1813	0°/45°	178 ±	787~0° 692~45°	12 Spa. @ 2 540 = 30 480	1 524	36.512		2
Route N-57	253+0.331	1813	0°	203 ±	787	9 Spa. @ 2 540 = 22 860	1 524	28.892	57.784	4
Route N-57	254+0.769	1813A	45°	229 ±	692	9 Spa. @ 2 540 = 22 860	1 524	28.892	57.784	4
Route N-57	254+0.838	1813A	0°	229 ±	889	8 Spa. @ 2 540 = 20 320	1 422	26.352	52.704	4
Route N-57	255+0.300	1813A	35°	203 ±	482	10 Spa. @ 2 540 = 25 400	1 778	31.432	62.864	4
Route N-57	257+0.150	1813A	0°	203 ±	1 041	8 Spa. @ 2 540 = 20 320	1 270	26.352	52.704	4
Route N-57	260+0.150	1814	0°	279 ±	1 905	1 Spa. @ 2 540 = 2 540	406	8.572	17.144	4
Route N-61	133+0.425	2280	0°	102 ±	1 041	11 Spa. @ 2 540 = 27 940	1 270	33.972	67.944	4
Route N-61	136+0.511	2280	0°	102 ±	1 244	6 Spa. @ 2 540 = 15 240	1 067	21.272	42.544	4
Route N-61	137+0.076	2177	0°	127 ±	1 041	11 Spa. @ 2 540 = 27 940	1 270	33.972	67.944	4
* Route N-99	017+0.400	3044	0°	178 ±	889	8 Spa. @ 2 540 = 20 320	1 422	26.352	52.704	4



SECTION A-A
(At Structure N-57 260+0.150 only)



SECTION F-F

Misty Miner

22-10-2005

D4-NON-INTERSTATE GUARDRAIL
ON ROUTES N-1, N-57, N-61 AND N-99*
LOCATIONS AS SHOWN
FEDERAL AID PROJECT NO. NHTSA 0002(393)
VARIOUS COUNTIES
BRIDGE RAIL REVISION
Scale ~ 1 : 10 except as noted

3-14-03 LMS/KFM
3-18-03 L.M.S.
6-21-03 D.J.R.
12-9-03 L.M.S.
* REVISED

AS-BUILTS
ADDENDUM NO. 1
ATTACHMENT NO. 4

Type 2 Bridge Approach Section
See Road Plans and Dtl. Dwg. No. 606-25

126.682 m included in the unit price bid for Revise Timber Bridge Rail ~ T101 (Typ. both sides)

Sta. 10 + 00 Bent 1
Sta. 10 + 00 Bent 11

476 | 1 041 | 229 | 2 540 | 1 270 | 5 spaces @ 2 540 mm ctrs. = 12 700 | 2 175 | 1 000 | 17 spaces @ 2 540 mm ctrs. = 43 180 | 1 270

Dimensions are symmetrical about this line

℄ Pier No. 3 or 9
℄ Pier No. 6
*Existing expansion joint
Existing expansion joint*

Remove existing rail, rail posts and curb (Typ.)
New T101 railing
Fill face of backwall @ outside edge of stringer
℄ New W150 x 30 rail post (Typ.)
Finished grade
Drilled Shaft Anchor Post (See Dwg. No. 18752)
℄ Bent

A
A
G
G

NOTE: Plug unused predrilled holes in the rail with standard splice bolts.

NOTE: Do not provide a tube splice in first panel. Provide tube splices for tubes within panel over expansion joints.

NOTE: Tube shop splices are not allowed.

* NOTE: Place expansion splice in rail at either the first or second post either side of expansion joint. Provide expansion slot in rail at first post when splice is made at second post to allow for movement.

NOTE: Attach panel lengths of tube members continuously to a minimum of three posts.

NOTE: Place rail posts as shown in details, perpendicular to adjacent roadway grade and vertical in relation to roadway cross slopes.

NOTE: See Dwg. No. 18749 for Section B-B, Section C-C, Detail A, Detail B, View D-D and additional notes and details. See General Layout Dwg. No. 1810 for expansion joint locations.

PARTIAL ELEVATION

℄ M16 hex head bolt with one hex nut, one flat washer and one lock washer
℄ M16 oval shouldered buttonhead bolt with one hex nut, one lock washer, one flat washer and one plate washer (one per post)
153
102 x 76 x 6.4 Structural tubing (ASTM A500, Grade B)
32 mm Ø x 70 mm galvanized extra strong pipe sleeve
Standard metal guard rail
50 | 100 | 100 | 50 | 700 | 550
B
B
W150 x 30 post
See Detail A
C
C
Remove surfacing as required to install new rail posts. Replace with new surfacing as shown. (See Special Provisions)
** New 13 mm Ø x 305 mm lag bolts
Existing asphalt wearing surface
127 ±
New 102 mm x 203 mm continuous timber deck filler
See Detail B
Existing 50 mm x 100 mm laminated decking
D
D
Existing timber stringers
255
100
℄ 2 - new 20 mm Ø rods (thread both ends) with one malleable iron washer, one flat washer and two hex nuts
New 75 mm x 460 mm solid bridging (center between rods and nail to stringer to hold in position)
2 - 20 mm I.D. galvanized standard pipe sleeves (snug fit)
State furnished 152 mm x 460 mm x 300 mm blockout centered on post (New post locations only) ***

SECTION A-A

** NOTE: Run new timber deck filler continuous along existing deck edge. Center filler ends at new posts. Equally space 3-13 mm Ø x 305 mm lag bolts between posts.

*** NOTE: The State of Montana will supply salvaged stringers for the contractor to cut into 300 mm lengths. The stringers will be stock piled for the contractor's use at a maintenance yard stated in the Special Provisions.

MISTY MINER
2-11-2005

℄ M16 hex head bolt with one hex nut, one flat washer and one lock washer
℄ M16 oval shouldered buttonhead bolt with one hex nut, one lock washer, one flat washer and one plate washer (one per post)
153
102 x 76 x 6.4 Structural tubing (ASTM A500, Grade B)
32 mm Ø x 70 mm galvanized extra strong pipe sleeve
Standard metal guard rail
50 | 100 | 100 | 50 | 700 | 550
B
B
W150 x 30 post
See Detail A
C
C
Remove surfacing as required to install new rail posts. Replace with new surfacing as shown. (See Special Provisions)
** New 13 mm Ø x 305 mm lag bolts
127 mm ± Existing asphalt wearing surface
New 152 mm x 203 mm continuous timber deck filler
See Detail B
Existing 50 mm x 152 mm laminated decking
H
H
100
255
℄ 2 - new 20 mm Ø rods (thread both ends) with two lock washers and two hex nuts
Existing W 683 x 135
2 - 20 mm I.D. galvanized standard pipe sleeves (snug fit)
State furnished 152 mm x 460 mm x 300 mm and 203 mm x 430 mm x 300 mm blockouts centered on post (New post locations only) ***
(Vary thickness of 152 mm blockout as needed to match existing edge of deck)

SECTION G-G

NOTE: See Det. Dwg. No. 606-84 for plate washer detail.

℄ Rail post
New timber deck filler
℄ 22 mm Ø x 50 mm slotted holes for vertical adjustment (Typ. both flanges)
100
255
48
Timber blockouts centered @ new post locations

VIEW H-H

D4-NON-INTERSTATE GUARDRAIL
ON ROUTE N-57 AT RP 239+0.257
FEDERAL AID PROJECT NO. NHTSA 0002(393)
GARFIELD COUNTY
BRIDGE RAIL REVISION

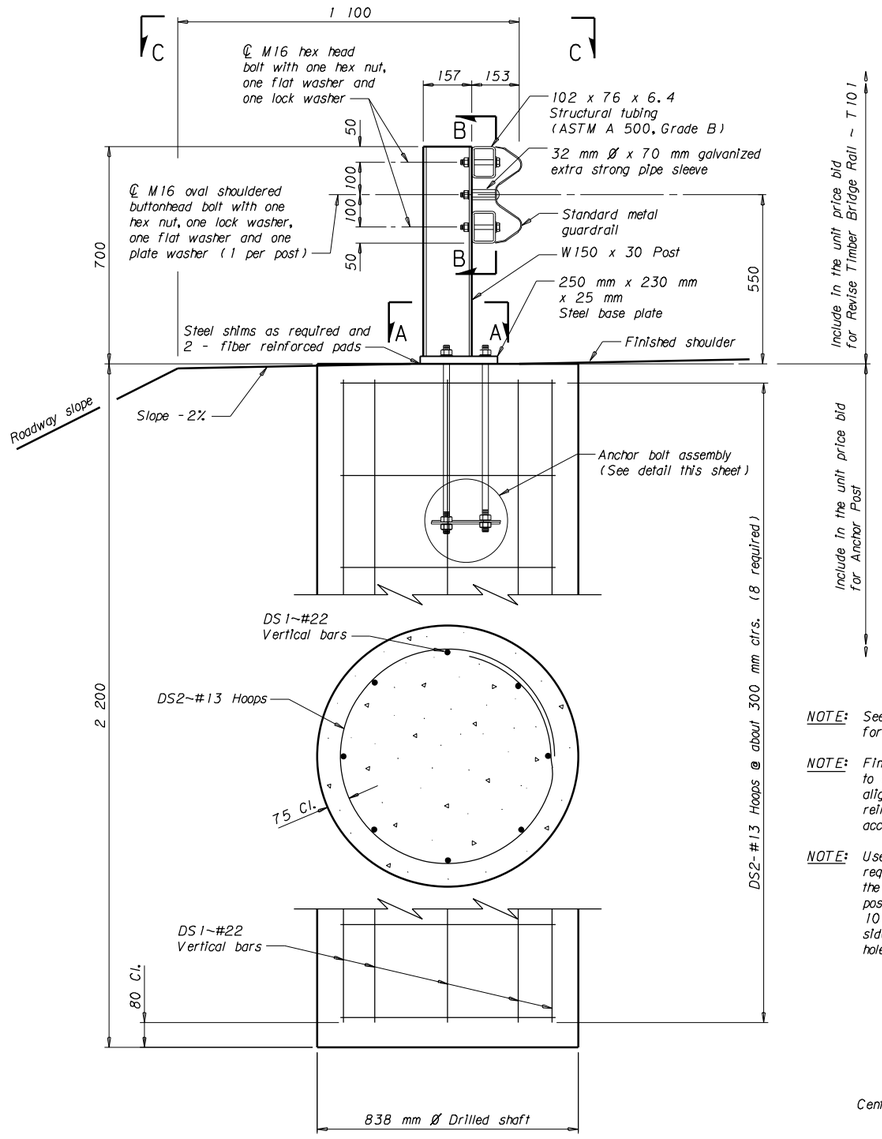
REVISED
4-25-03 L.M.S.
6-11-03 L.M.S.
6-22-03 D.J.R.

Scale ~ 1 : 10 except as noted

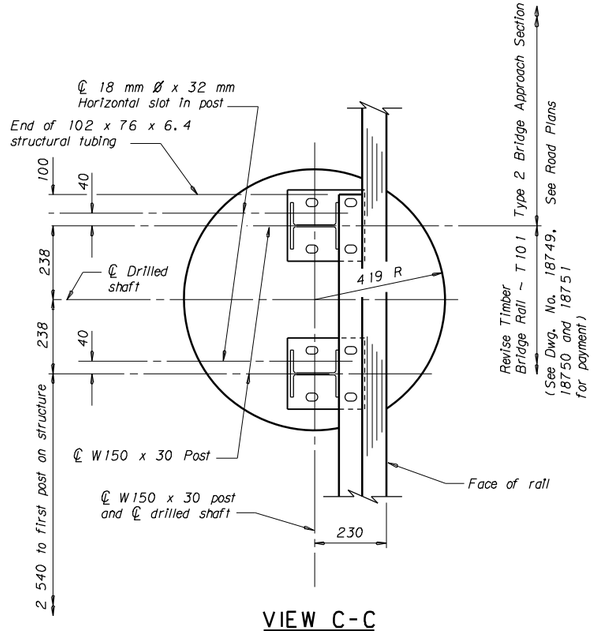
BRIDGE BUREAU

AS-BUILTS

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NHTSA 0002(393)	B11



ELEVATION

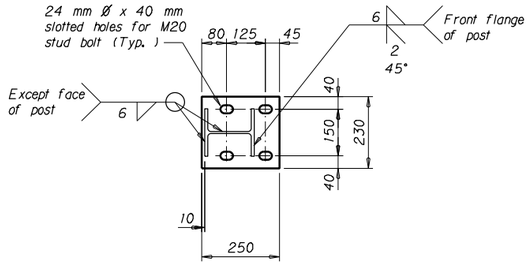


VIEW C-C

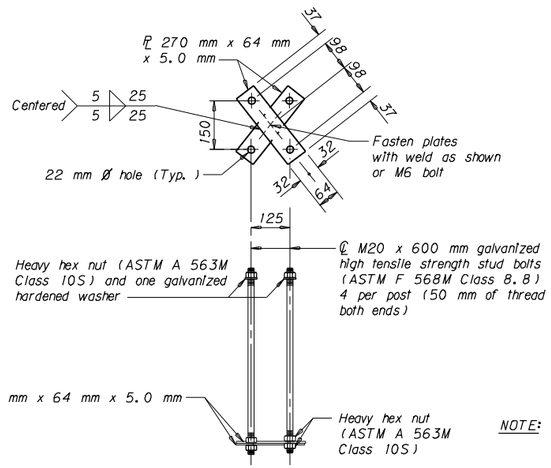
NOTE: See Dtl. Dwg. No. 606-84 for rectangle plate washer detail.

NOTE: Finish the top of the shaft under each rail post to a smooth and uniform surface to assure a proper alignment of the post and a tight fit between the fiber reinforced pad and concrete. Bush hammering is acceptable only to remove high spots.

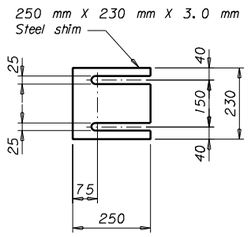
NOTE: Use fiber reinforced pads meeting the requirements of subsection 711.16 of the Standard Specifications. Size and position the pads so that not less than 10 mm of the pad protrudes on all sides of the base plate. Punch slotted holes in pads to match base plate.



SECTION A-A

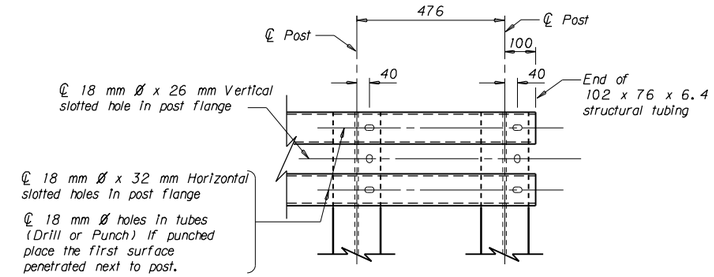


ANCHOR BOLT ASSEMBLY DETAIL



RAIL POST SHIM DETAIL

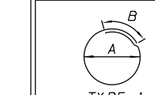
NOTE: Furnish shims as necessary to adjust rail to grade. Place shims between fiber reinforced pads. Place shims with slots toward roadway centerline.



SECTION B-B

MISTY MINER
2-11-2005

BILL OF REINFORCING STEEL (One Anchor Post)



TYPE 1

STRAIGHT BARS			
Mark	Size	No.	Length
DS1	#22	8	2 070

BENT BARS (All dimensions are out to out)						
Mark	Size	No.	Type	Length	A	B
DS2	#13	8	1	2 680	690	510

NOTES

PAYMENT: Anchor Post is paid for at the unit price bid which is full compensation for all resources necessary to complete the item.

ERECTION: Set rail posts perpendicular to roadway grade and set rail parallel to the roadway grade. Adjust rail to proper rail height using vertical slots in the rail posts or rail post shims.

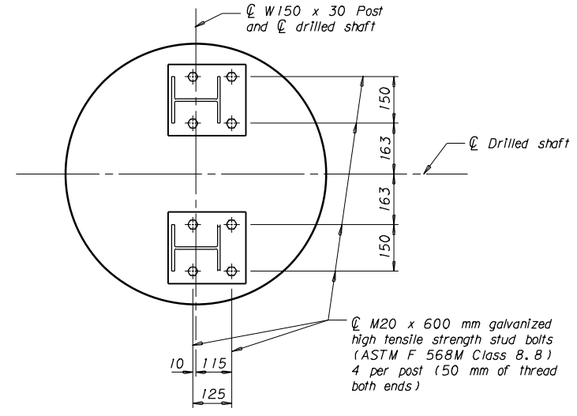
Use Class DD Concrete. Estimated volume per shaft = 1.2 cubic meters

Use new deformed type reinforcing steel meeting the requirements of AASHTO M 31M Grade 60 (420). Estimated rebar mass = 72 kg

Construct the portion of the approach fills, where the drilled shaft is constructed, of select material meeting the specified requirements for embankments.

See Dwg. No. 18749 for additional notes and details.

Remove all loose or disturbed material from the bottom of the shaft excavation prior to placing reinforcing steel or concrete. Clean the drilled shaft so the thickness of loose or disturbed material remaining in the excavation does not exceed a thickness of 50 mm. Add 0.25 bag (10.5 kg) cement to the loose material remaining in the excavation and dry mix with the loose material using the drill bit or other means approved by the Engineer prior to placing any reinforcement or structural concrete in the shaft excavation.



T101 POST ANCHOR BOLT LOCATION

MONTANA DEPARTMENT OF TRANSPORTATION

D4-NON-INTERSTATE GUARDRAIL
AT VARIOUS LOCATIONS
FEDERAL AID PROJECT NO. NHTSA 0002(393)
VARIOUS COUNTIES

DRILLED SHAFT ANCHOR POST

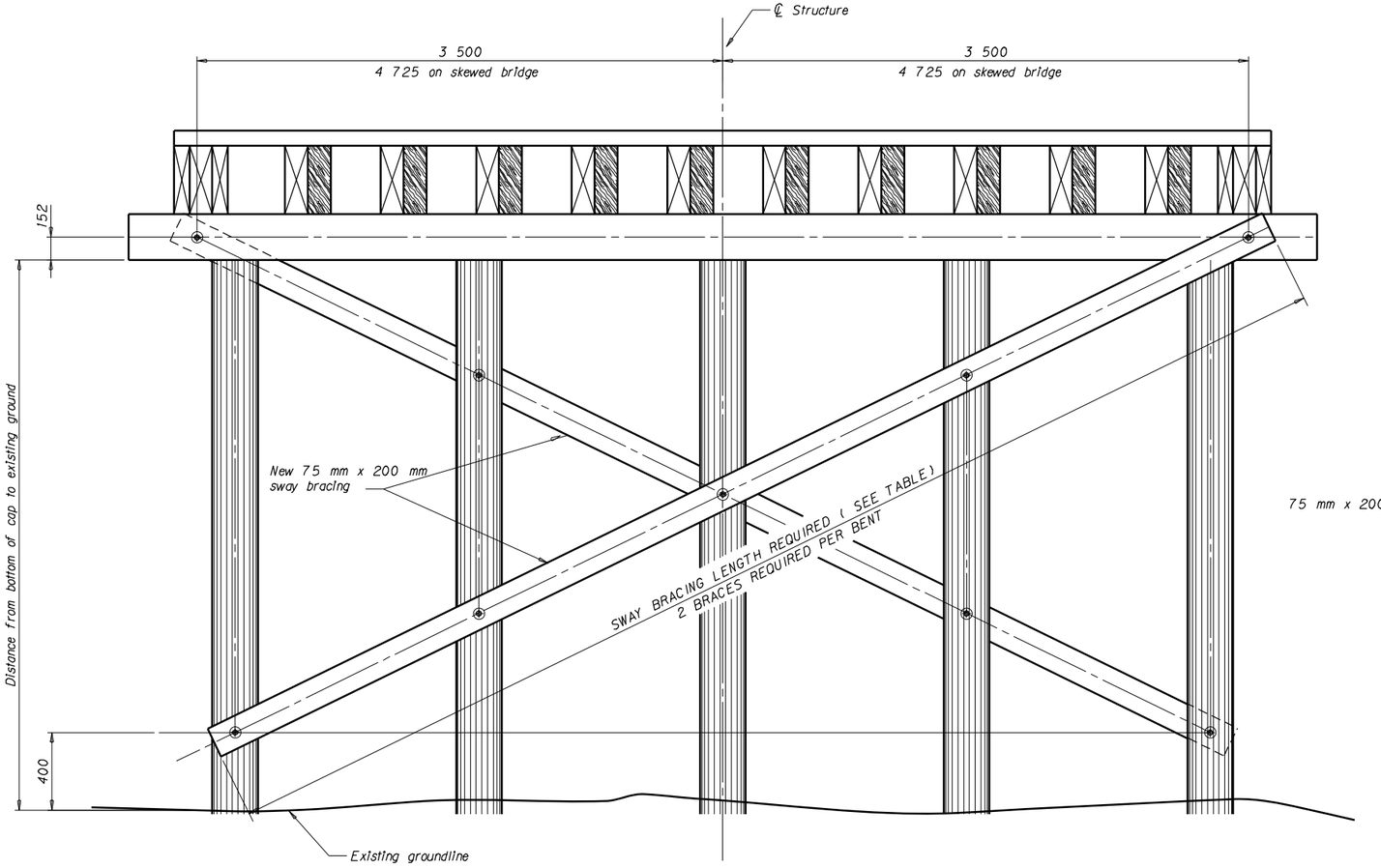
Scale ~ 1 : 10

CONVERTED	3-27-96	L.R.T.
DRAWN	3-27-96	L.R.T.
CHECKED	3-29-96	D.J.R.
REVISED	3-4-03	L.M.S.
REVISED		
REVISED		

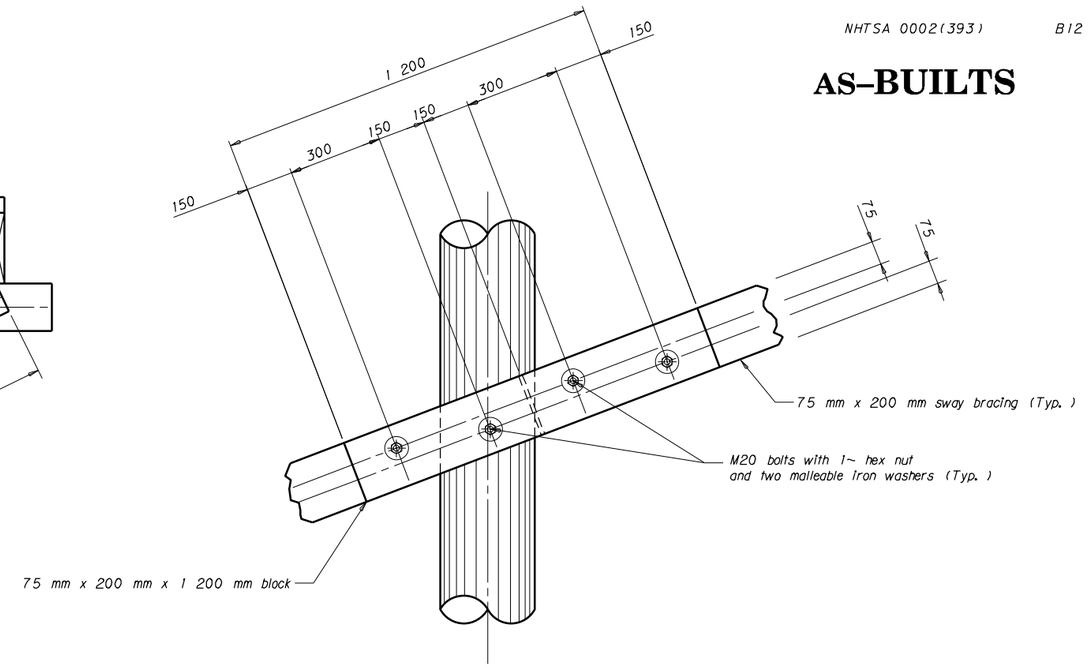
FILENAME: D457BRDSD001.DGN DRAWING NO. 18752

C:\dgn\D457BRDSD001AB.DGN
5/21/2019
1:03:06 PM u6149

AS–BUILTS



NEW SWAY BRACING DETAIL



SWAY BRACING SPLICE

NOTES

PAYMENT: Include the sway bracing in the unit price bid for Treated Timber which is full compensation for all resources necessary to complete the item.

SELECT STRUCTURAL TIMBER FOR SWAY BRACING: Use standard sawn Inter-mountain Douglas Fir, Western Larch or Pacific Coast Douglas Fir conforming to AASHTO M 168 meeting the requirements for numerical stress values shown on the table below for Dense No. 1 timber for solid bridging. Clearly note the grade of timber on the shop plans to avoid oversight. AASHTO classification for sway bracing is Beams and Stringers.

DESCRIPTION	EXTREME FIBER IN BENDING Fb & TENSION PARALLEL TO GRAIN Ft (MPa)		HORIZ. SHEAR Fv (MPa)	COMPRESSION (MPa)		MODULUS OF ELASTICITY E (MPa)
				PERPENDICULAR TO GRAIN Fc⊥	PARALLEL TO GRAIN Fc	
75 x 200 Sway bracing	Fb	Ft	0.59	5	7.6	11 700
	10.7	5.3				

SWAY BRACING SUMMARY TABLE

STRUCTURE LOCATION		GENERAL LAYOUT DWG. NO.	SKEW	SWAY BRACING LENGTH REQUIRED (m)				NUMBER OF SPLICES PERMITTED (EACH)	TREATED TIMBER m³
				BENT NO. 2	BENT NO. 3	BENT NO. 4	BENT NO. 5		
Route N-57	232+0.710	1809	0°	7620	7620	7620	NA	1	0.79
Route N-57	247+0.394	1949A	0°	NA	7880	NA	NA	1	0.14
Route N-57	255+0.300	1813A	35°	10 100	10 330	10 330	10 100	2	1.51

MISTY MINER

2-11-2005

REVISED

6-20-03 L.M.S.
6-20-03 L.M.S.
6-22-03 D.J.R.

D4-NON-INTERSTATE GUARDRAIL

ON ROUTE N-57 AT RP 232+0.710, 247+0.394 AND RP 255+0.300

FEDERAL AID PROJECT NO. NHTSA 0002(393)

GARFIED & McCONE COUNTIES

SWAY BRACING DETAILS

Scale ~ 1: 30 except as shown

D457BRRRV009.DGN 18753