

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

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B2	18743 Q2	QUANTITY SUMMARY
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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
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B9	18750	BRIDGE RAIL REVISION ON ROUTES N-1, N-57 AND N-61
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B13	7020	EXISTING GENERAL LAYOUT ON ROUTE N-1 RP 508+0.888
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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





PREPARED BY: L.M.S. 3-10-03 CHECKED BY: D.J.R. 6-18-03

03/04/04
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ADDENDUM NO.1
ATTACHMENT NO.3

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NHTSA 0002(393)	B2

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 m³
N-1	508+0.888	P00001508+0888	BEAVER CREEK	107.62				
N-1	514+0.737	P00001514+0737	MILK RIVER	218.17				
N-1	514+0.943	P00001514+0943	MILK RIVER OVERFLOW		89.27			
N-1	645+0.625	P00001645+0625	SHEEP CREEK			42.54	4	
N-57	231+0.023	P00057231+0023	DRAINAGE			42.54	4	
N-57	232+0.566	P00057232+0566	DRAINAGE			22.22	4	
N-57	232+0.710	P00057232+0710	DRAINAGE			52.70	4	0.79
N-57	234+0.523	P00057234+0523	DRAINAGE			67.94	4	
N-57	235+0.652	P00057235+0652	DRAINAGE			62.86	4	
N-57	239+0.257	P00057239+0257	LITTLE DRY CREEK			253.36	4	
N-57	247+0.394	P00057247+0394	DRAINAGE			67.94	4	0.14
N-57	248+0.831	P00057248+0831	TIMBER CREEK			83.18	4	
N-57	249+0.748	P00057249+0748	SKULL CREEK			80.64	4	
N-57	253+0.331	P00057253+0331	DRAINAGE			57.78	4	
N-57	254+0.769	P00057254+0769	DRAINAGE			57.78	4	
N-57	254+0.838	P00057254+0838	DRAINAGE			52.70	4	
N-57	255+0.300	P00057255+0300	DRAINAGE			62.86	4	1.51
N-57	257+0.150	P00057257+0150	COULEE			52.70	4	
N-57	260+0.150	P00057260+0150	STOCKPASS			17.14	4	
N-61	133+0.425	P00061133+0425	BIG WARM SPRING CREEK			67.94	4	
N-61	136+0.511	P00061136+0511	WILD HORSE CR OVERFLOW			42.54	4	
N-61	137+0.076	P00061137+0076	WILD HORSE CREEK			67.94	4	
TOTAL				325.79	89.27	1255.30	76	2.44

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.



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

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

FILENAME: D457BRQSH002.DGN DRAWING NO. 18743 02



Metal Guardrail - Bridge Approach Section Type 3
(See Det. Dwg. No. 606-24, 606-25 and Road Plans)
Warp new guardrail down gradually to conform
with normal height of Road Guardrail

Included in the unit price bid for Revise Bridge Rail - Thrie Beam
(See summary table for payment lengths)

Metal Guardrail - Bridge Approach Section Type 3
(See Det. Dwg. No. 606-24, 606-25 and Road Plans)
Warp new guardrail down gradually to conform
with normal height of Road Guardrail

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NHTSA 0002(393)	B3

NOTES

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 Det. 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 I 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.

NOTE: Make bridge approach section continuous with existing bridge rail.

End of new curb (Extension required this end, both structures, see Curb Extension Detail)

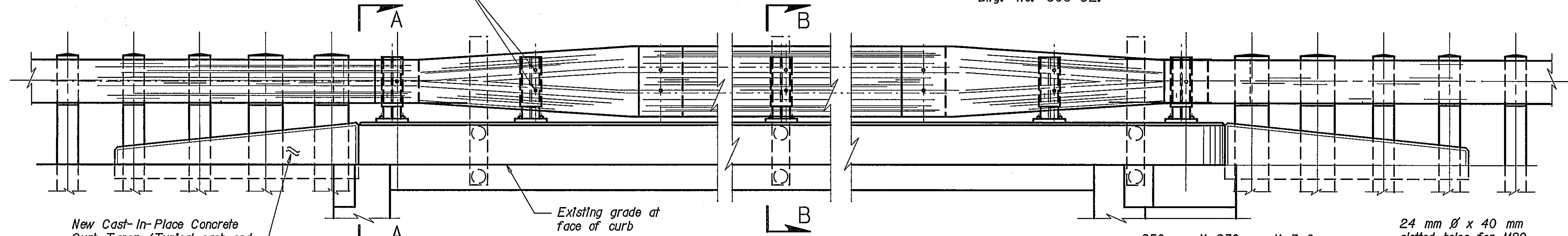
NOTE: Thoroughly coat the existing concrete curb in contact with new concrete with an epoxy bonding agent (AASHTO M 235-91 Type V) immediately prior to placing new concrete.

Drill 18 mm ϕ 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.

New W150 x 30 post with 25 mm thick base plate (see detail, this sheet) and 2 fiber reinforced pads with slotted holes to match base plate (Typ. @ ea. post)

New 150 mm x 150 mm x 350 mm blockout. (See Typical Blockout Elevation, this sheet)

Existing curb (Typ.)

SECTION A-A

Scale ~ 1:10

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

Remove existing rail posts and guardrail

250 mm x 230 mm x 25 mm steel base plate (See detail this sheet) (Typ.)

ϕ New M16 oval shouldered buttonhead bolt with one hex nut, one lock washer, one flat washer and one plate washer

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

Steel shims as required and 2 fiber reinforced pads (Typ. @ each post)

Existing curb (Typ.)

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

SECTION B-B

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.

ϕ New M16 oval shouldered buttonhead bolt with one hex nut, one lock washer, one flat washer and one plate washer

ϕ New metal Thrie-beam

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.

New M20 galvanized high tensile strength stud bolt (ASTM F 568M Class 8.8) 4 per post (50 mm of thread) with standard cut washer and heavy hex nut (ASTM A 325M) (Typ. all rail posts)

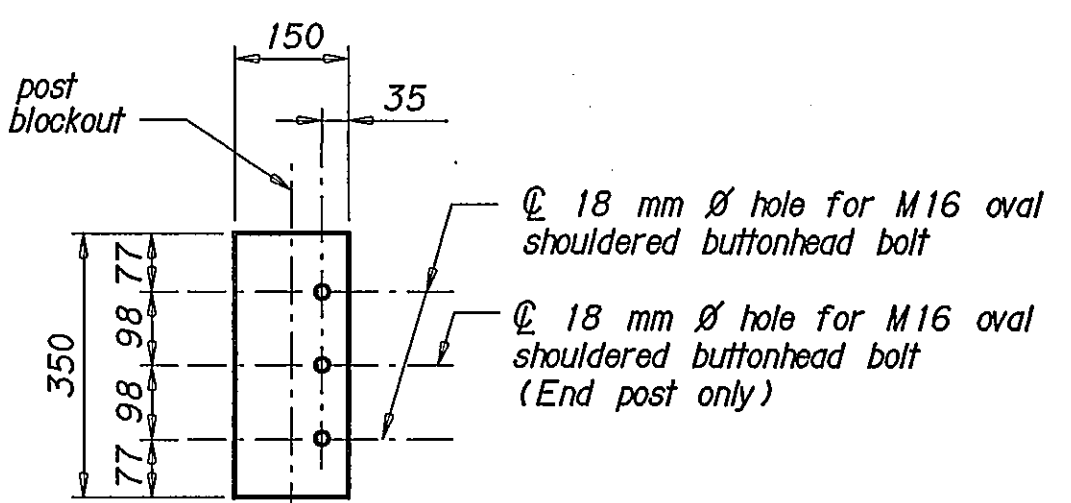
BASE PLATE DETAIL

Scale ~ 1:10

New W150 x 30 post
 ϕ 6 mm ϕ hole for 20d nail
 ϕ 18 mm ϕ x 40 mm vertical slotted hole in post for M16 oval shouldered buttonhead bolt with lock washer, hex nut and plate washer

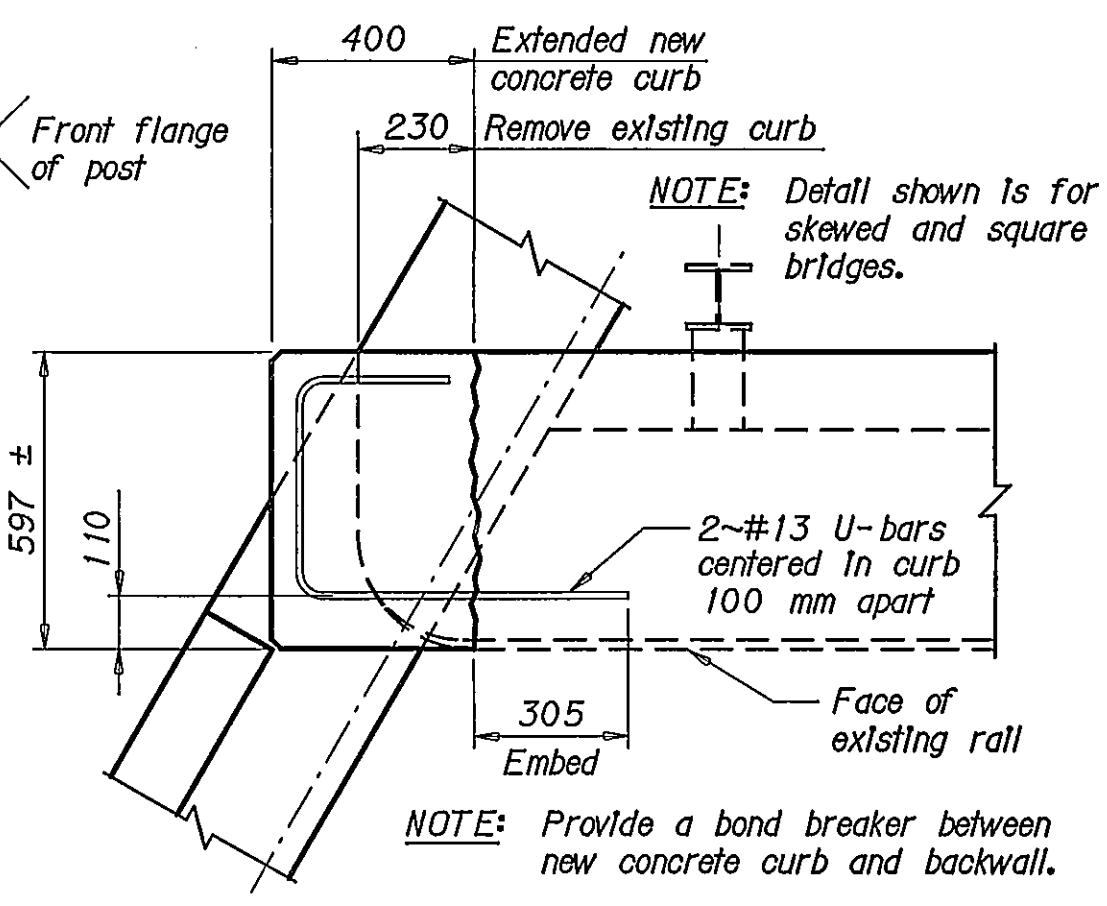
SECTION C-C

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



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

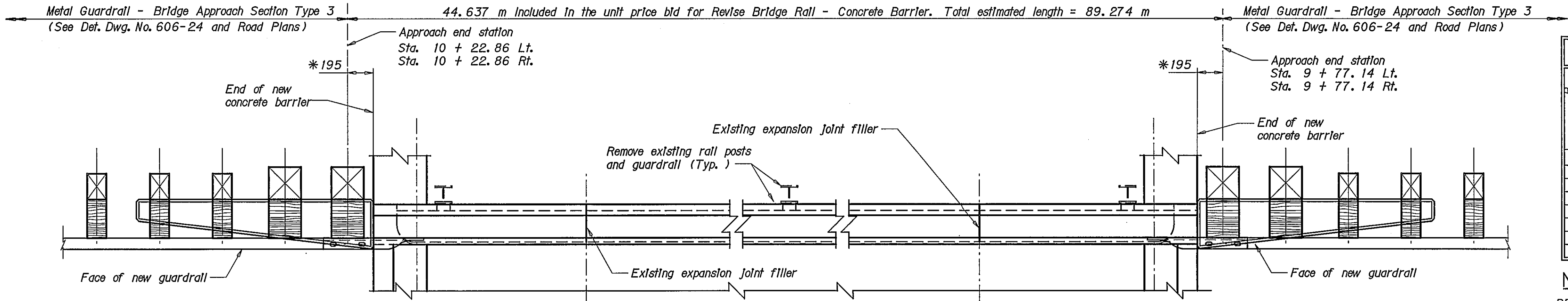
Scale ~ 1:20 except as noted

FILENAME: D457BRRV001.DGN DRAWING NO. 18744

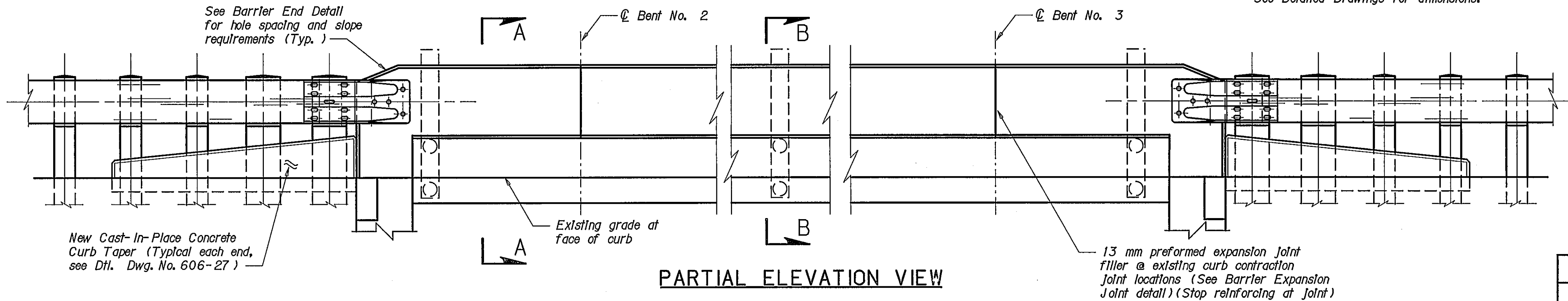
DESIGNED	1-29-03	L. M. S.
DRAWN	2-24-03	L. M. S.
CHECKED	6-17-03	D. J. R.
REVISED		
REVISED		
REVISED		

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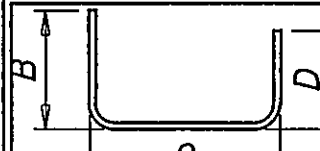
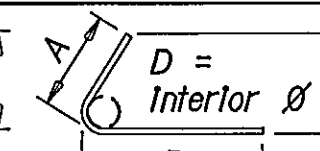
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NHTSA 0002(393)	B4



PARTIAL PLAN VIEW



BILL OF REINFORCING STEEL (FOR INFORMATION ONLY)

												
TYPE 17				TYPE 33								
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.

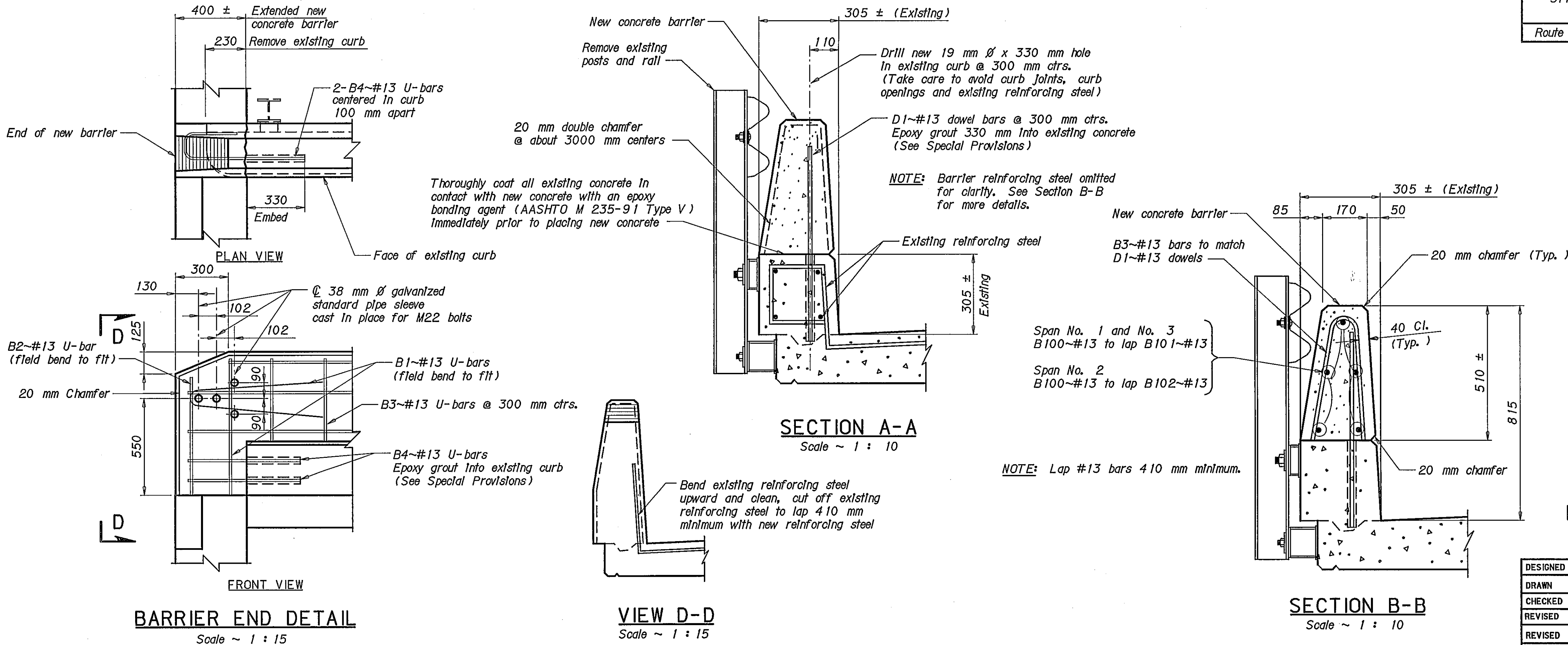
Details shown on this drawing apply to both sides for the entire length of the structure.

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



BARRIER EXPANSION JOINT

Scale ~ 1 : 10



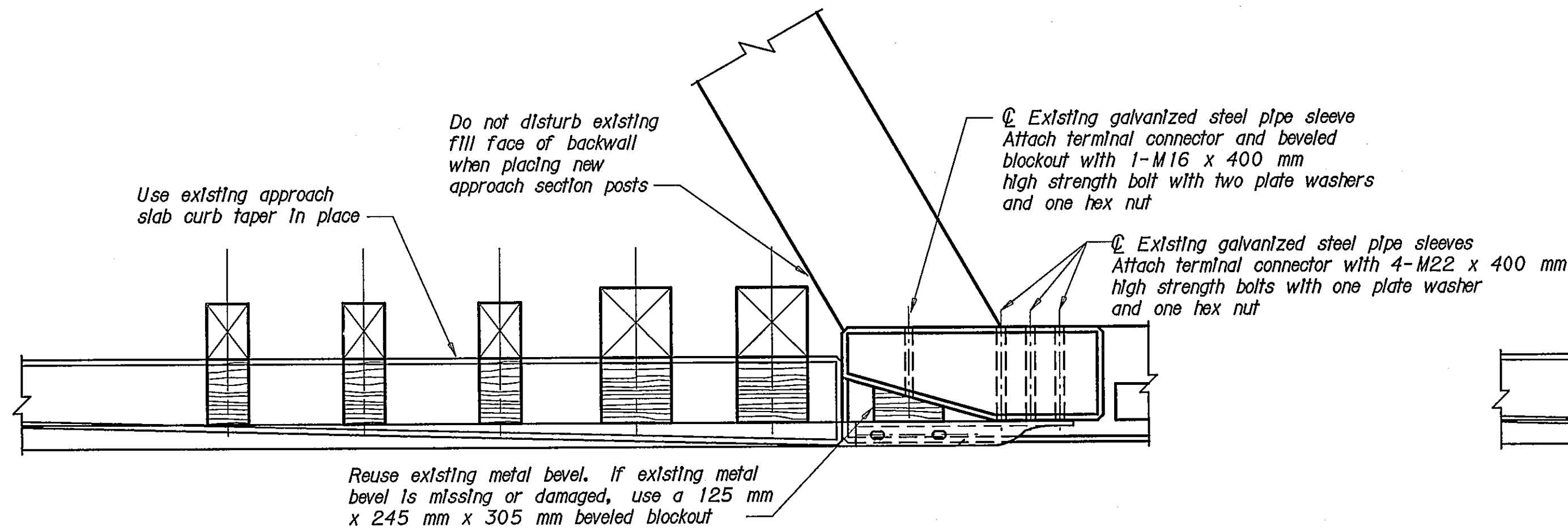
D4-NON-INTERSTATE GUARDRAIL
ON ROUTE N-1 AT RP 514+0.943
FEDERAL AID PROJECT NO. NHTSA 0002(393)
VALLEY COUNTY
BRIDGE RAIL REVISION

Scale ~ 1 : 20 except as noted

FILENAME: D457BRRV002.DGN DRAWING NO. 18745

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

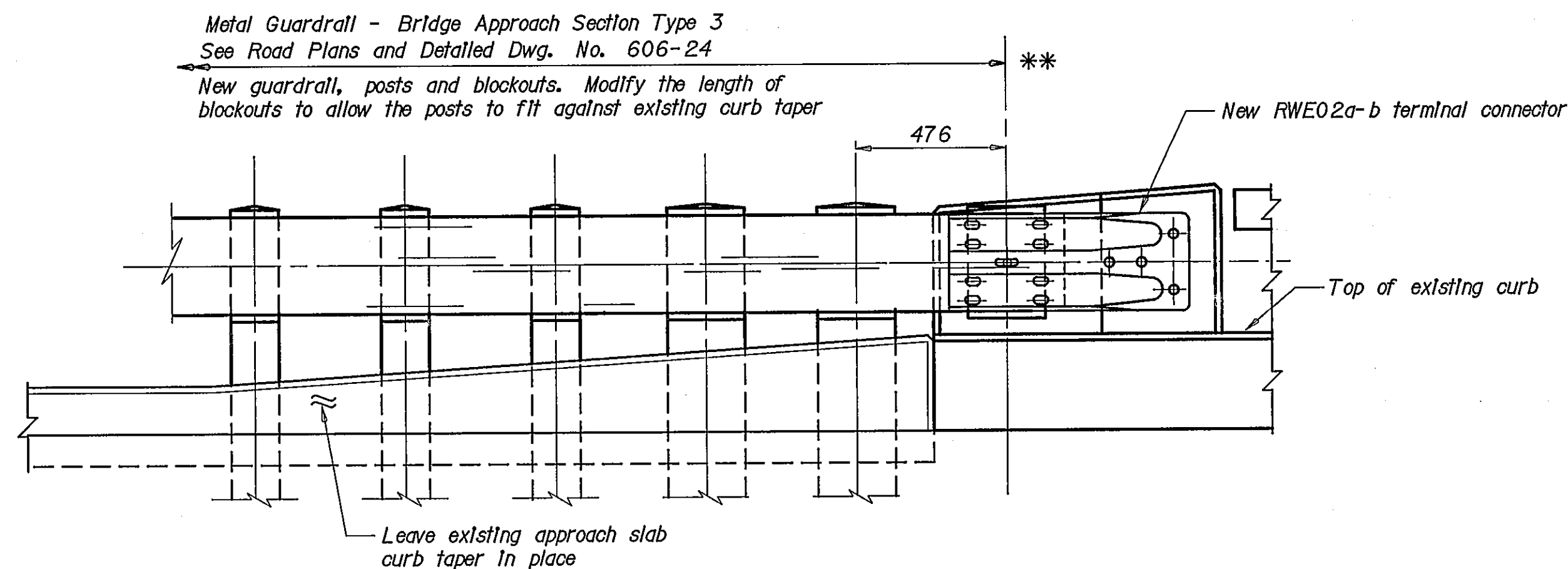
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PARTIAL PLAN VIEW

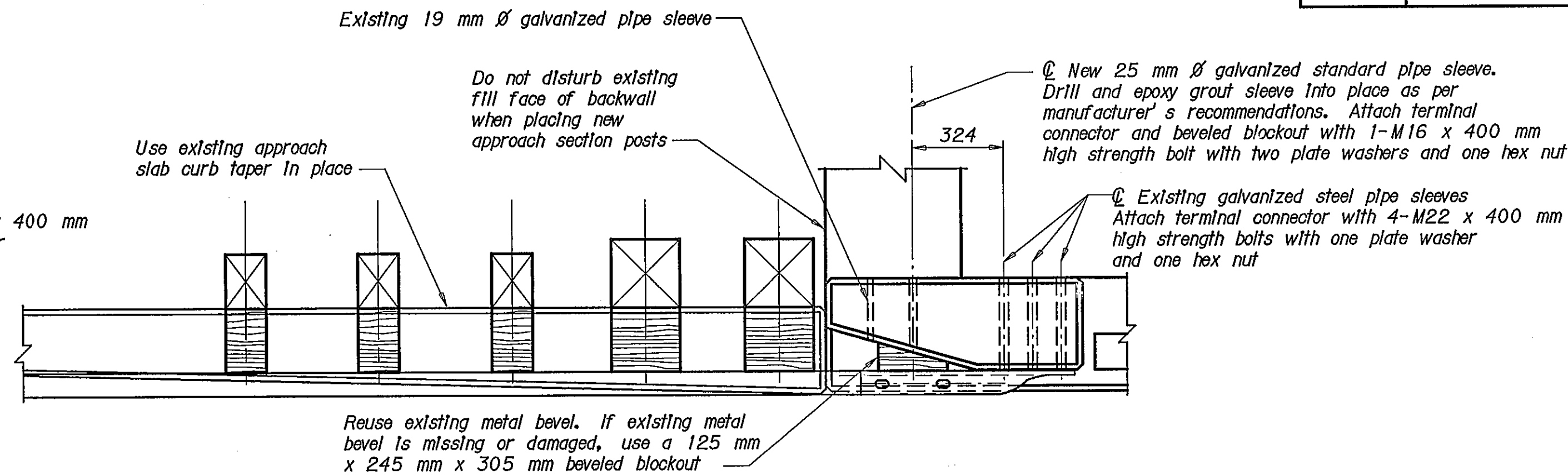
NOTE: See Detailed Drawing No. 606-24 for more details and notes.

** See revised bridge approach section this sheet.



PARTIAL ELEVATION VIEW

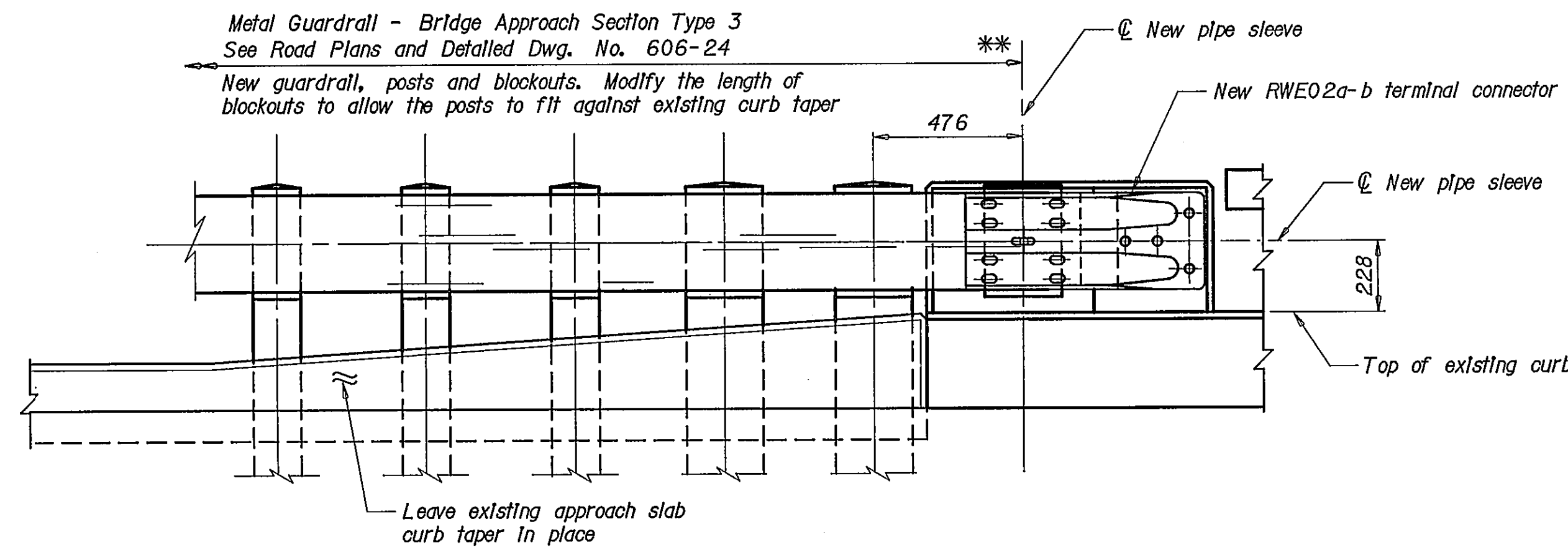
R. P. P00 020 032+0.107
R. P. P00 020 032+0.399
R. P. P00 020 032+0.652
R. P. P00 020 046+0.683
R. P. P00 022 065+0.625
R. P. P00 057 161+0.243
R. P. P00 057 187+0.853



PARTIAL PLAN VIEW

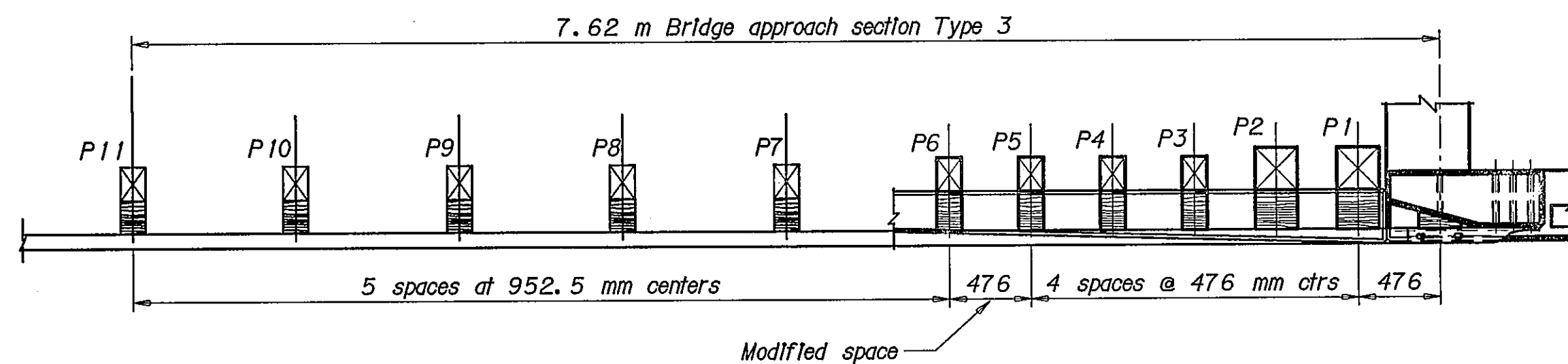
NOTE: See Detailed Drawing No. 606-24 for more details and notes.

** See revised bridge approach section this sheet.



PARTIAL ELEVATION VIEW

R. P. P00 022 075+0.877



** REVISED TYPE 3 BRIDGE APPROACH SECTION



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

Scale ~ 1 : 15

FILENAME: D457BRRRV004.DGN DRAWING NO. 18746

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.

DESIGNED	4-25-03	L. M. S.
DRAWN	4-28-03	L. M. S.
CHECKED	6-19-03	D. J. R.
REVIS	12-9-03	L. M. S.
REVIS		
REVIS		

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.

BILL OF REINFORCING STEEL (FOR INFORMATION ONLY)

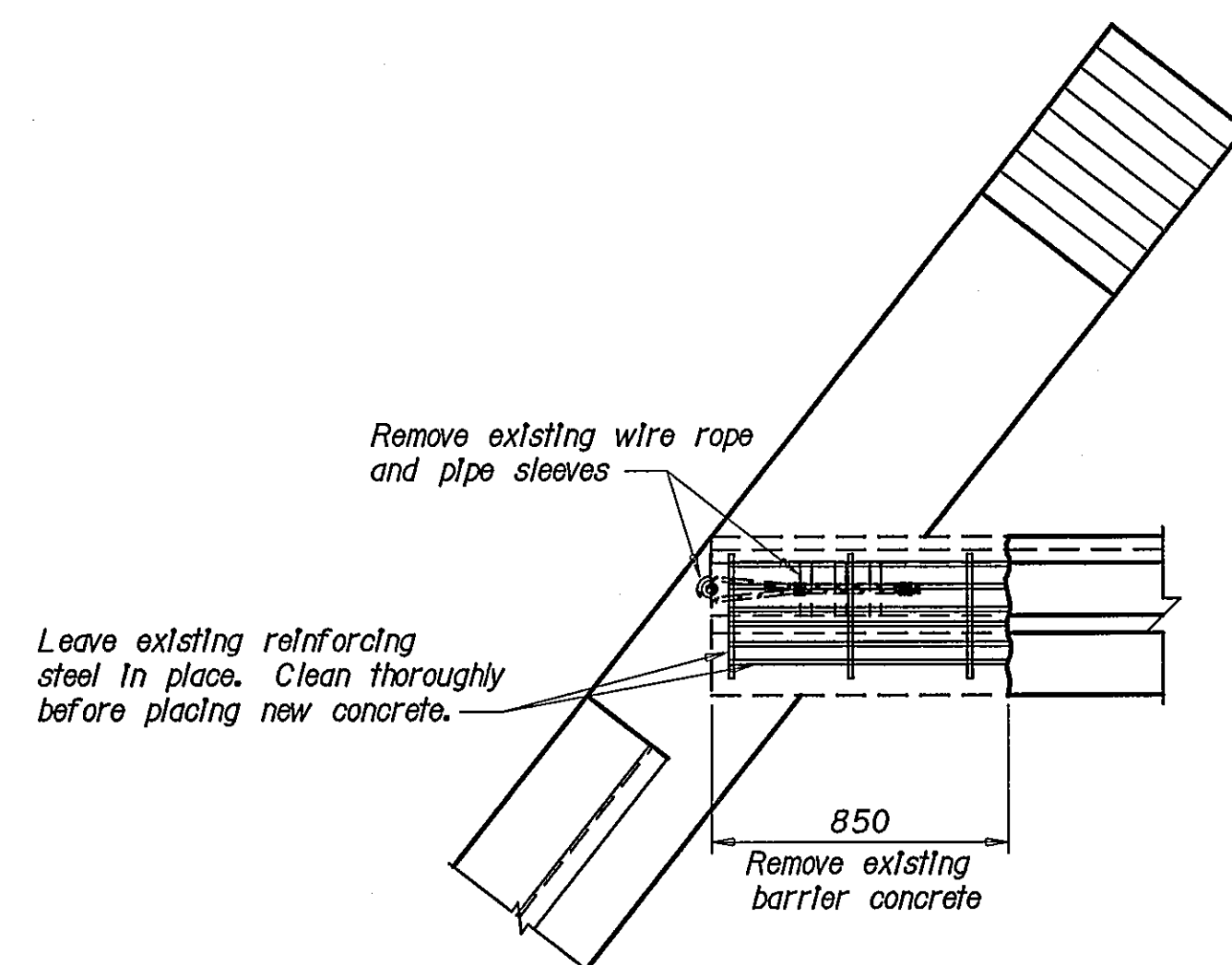
Diagram of a bent bar with dimensions A, B, C, D, and E. A is the height of the bent part, B is the length of the straight part, C is the height of the bent part, D is the interior diameter, and E is the thickness of the bar. The diagram is labeled "TYPE 33".

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.

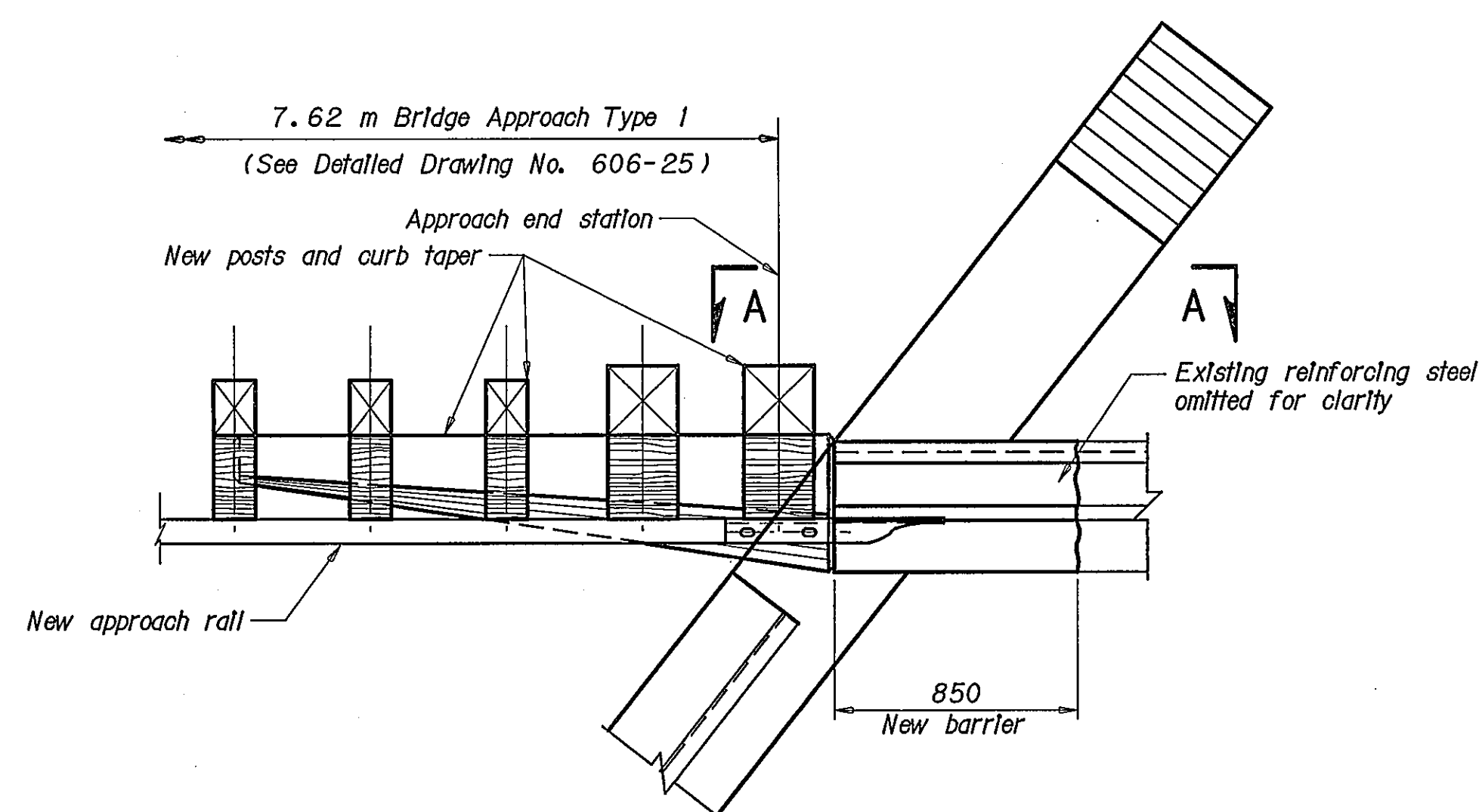
General Layout Dwg. No. 13438 is available from the MDT Bridge Bureau.

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



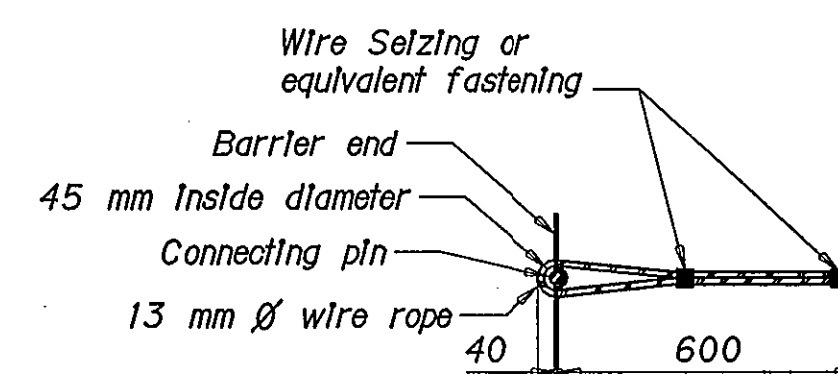
EXISTING BARRIER END MODIFICATION
DETAILS - PLAN VIEW

Bent No. 1 - Left side only



NEW BARRIER END DETAILS - PLAN VIEW

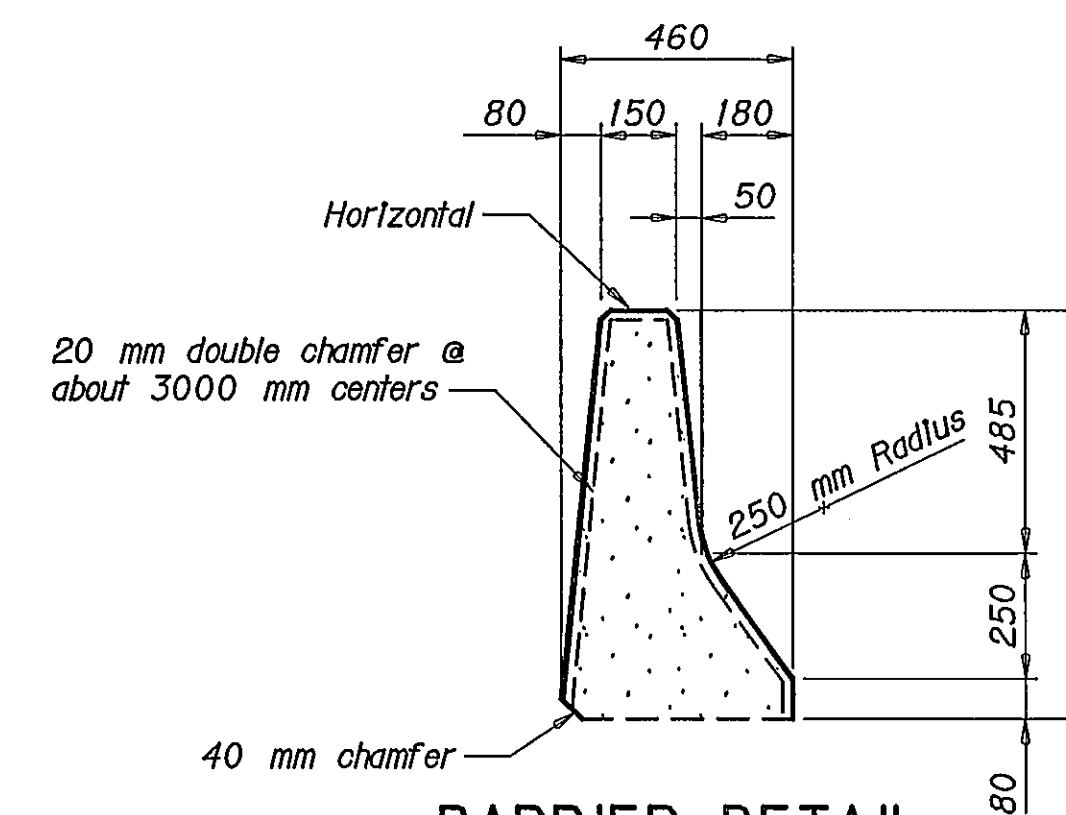
Bent No. 1 - Left side only



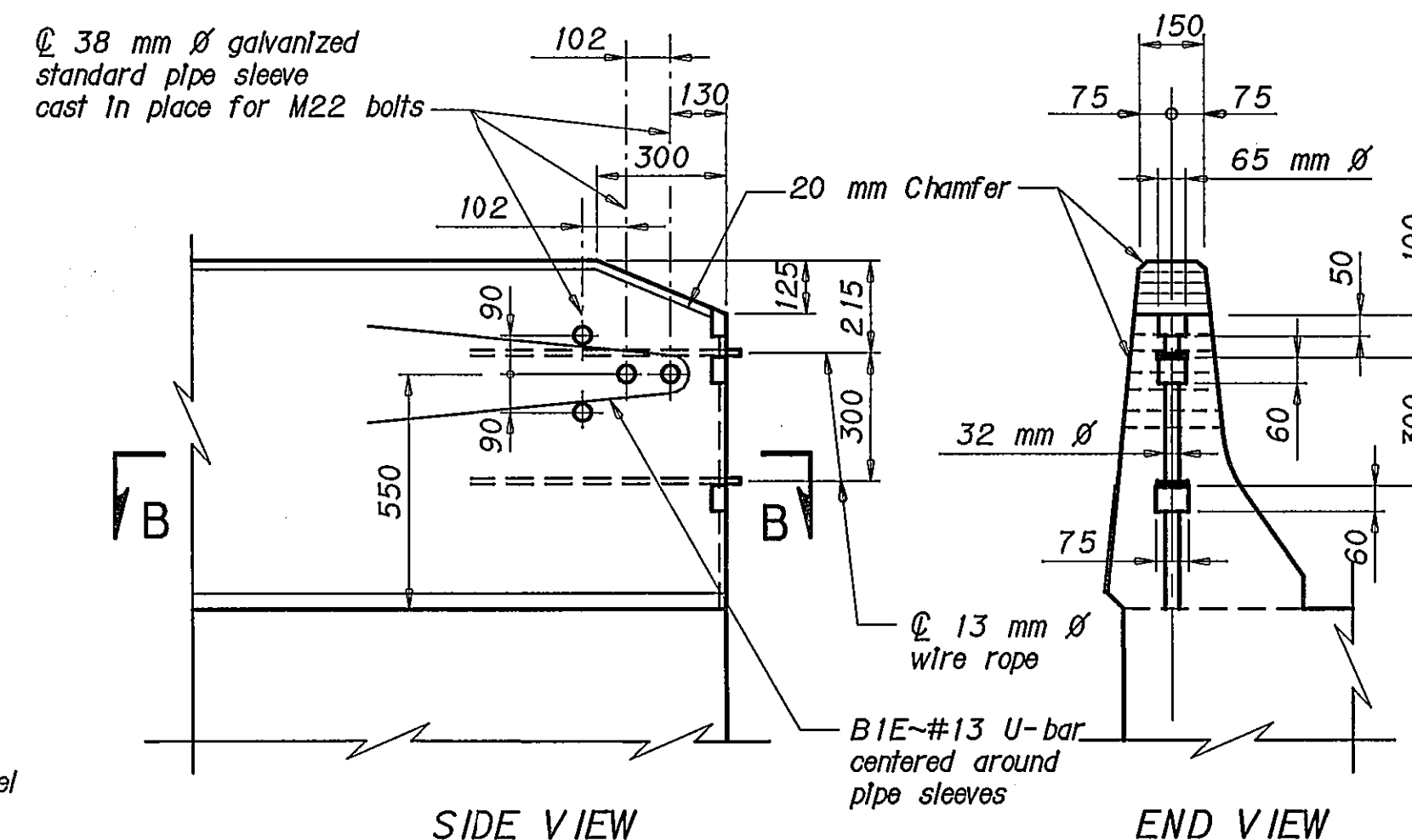
SECTION B-B

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



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

FILENAME: D457BRRRV005.DGN DRAWING NO. 18747

DESIGNED	4-25-03	L. M. S
DRAWN	4-28-03	L. M. S
CHECKED	6-19-03	D. J. K
REVISED		
REVISED		
REVISED		

NOTES

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.

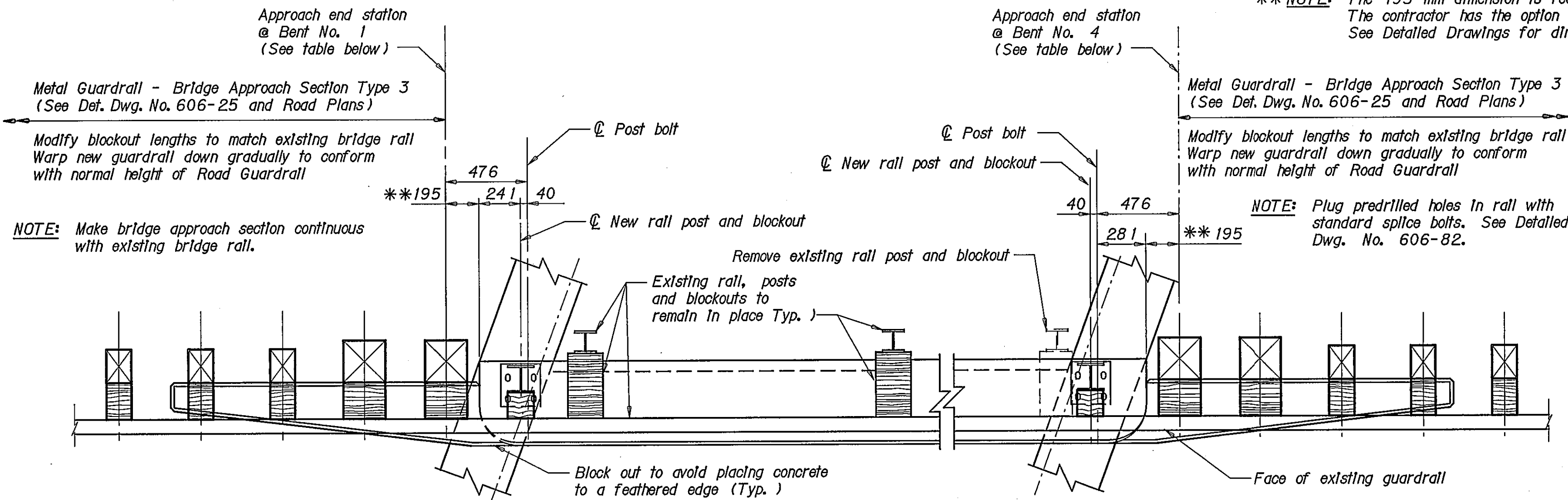
REFLECTORS: Place a reflector on each end rail post and at approximately equal spacing (every third rail post but not to exceed 7620 mm) between end rail posts. Mount reflectors with reflectorized face toward oncoming traffic. See Det. Dwg. No. 606-05B for reflector detail.

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.

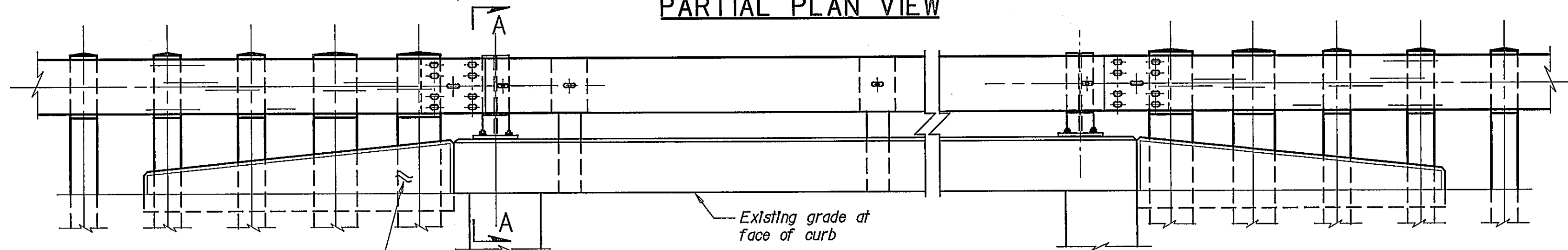
ERECTION: Set the rail parallel to the roadway grade. Adjust rail to proper rail height using vertical slots in rail post or rail post shims.

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.



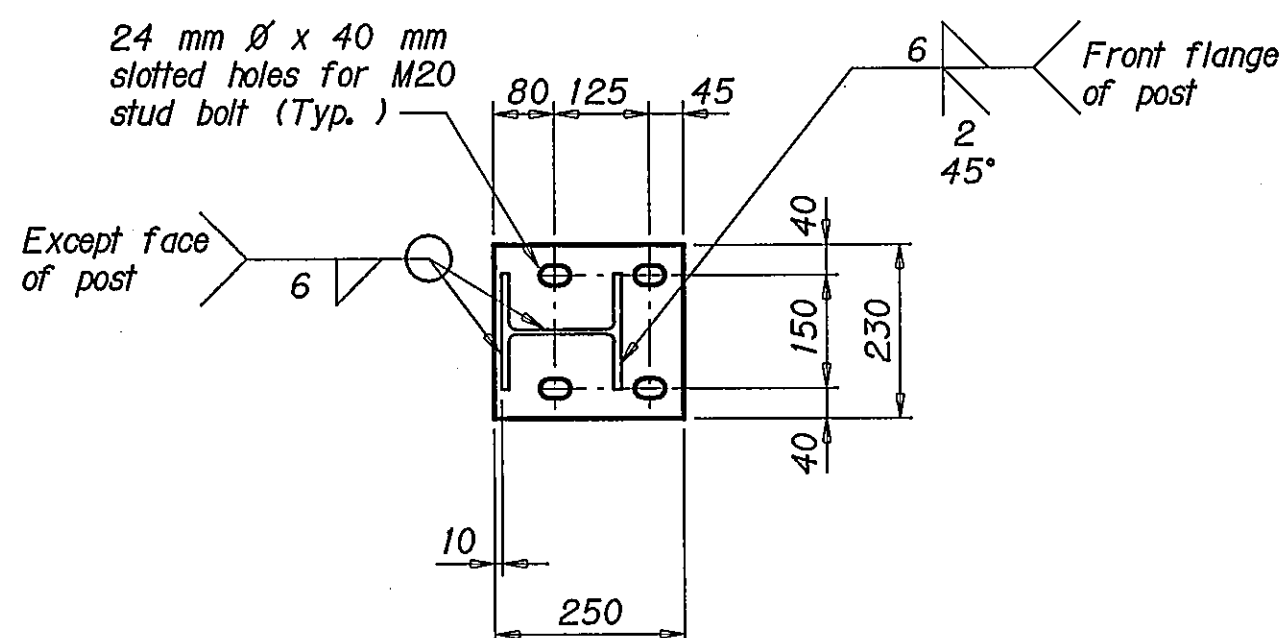
PARTIAL PLAN VIEW



PARTIAL ELEVATION VIEW

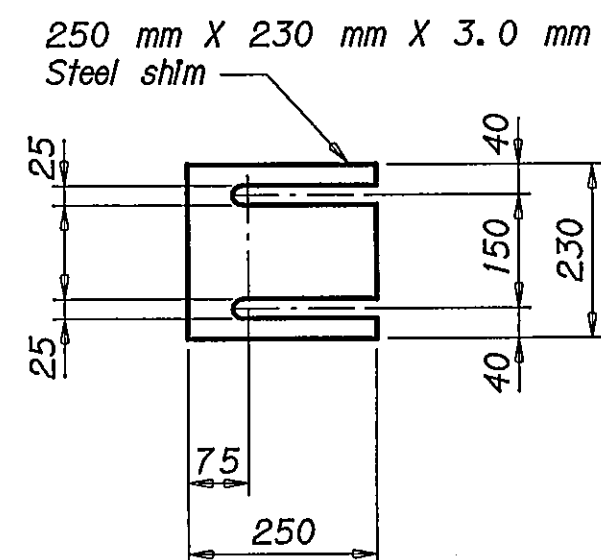
RAIL REVISION SUMMARY TABLE (Details shown apply to both sides and ends of the structure)					
STRUCTURE LOCATION	GENERAL LAYOUT DWG. NO.	SKEW	TYPE 3 BRIDGE APPROACH SECTIONS (EACH)	APPROACH END STATIONING	
				BENT NO. 1	BENT NO. 4
Route N-23 015+0.943	*5155	20°	4	10 + 22.86 Rt. 10 + 22.86 Lt.	9 + 77.14 Rt. 9 + 77.14 Lt.

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



BASE PLATE DETAIL

Scale ~ 1:10



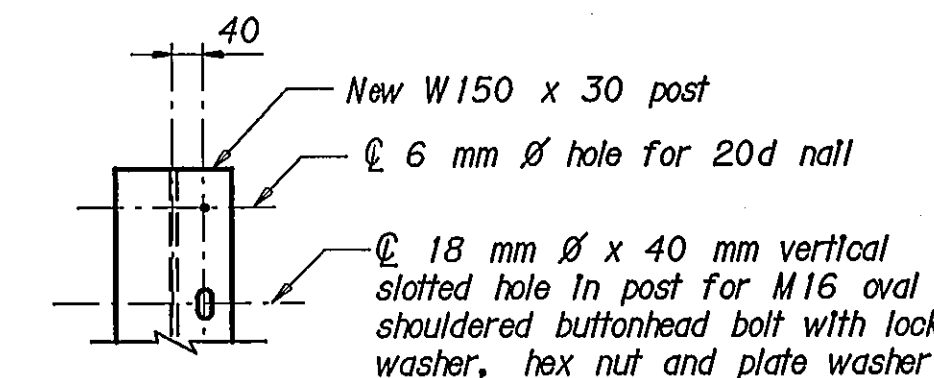
RAIL POST SHIM DETAIL

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.

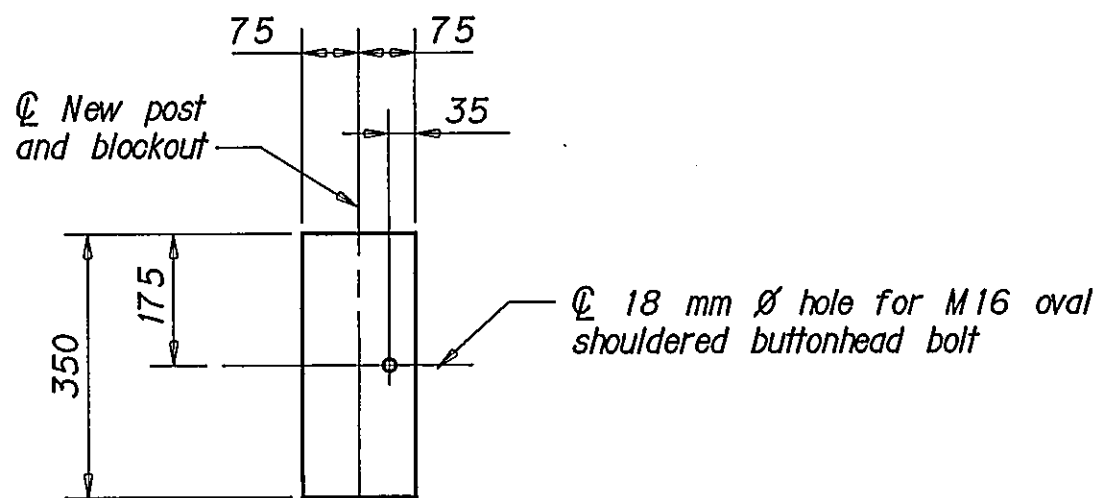
New W150 x 30 post with 25 mm thick base plate (see detail, this sheet). Use steel shims as required and 2 fiber reinforced pads with slotted holes to match base plate (Typ. @ each post).

New 150 mm x 150 mm x 350 mm blockout. (See Typical Blockout Elevation, this sheet)



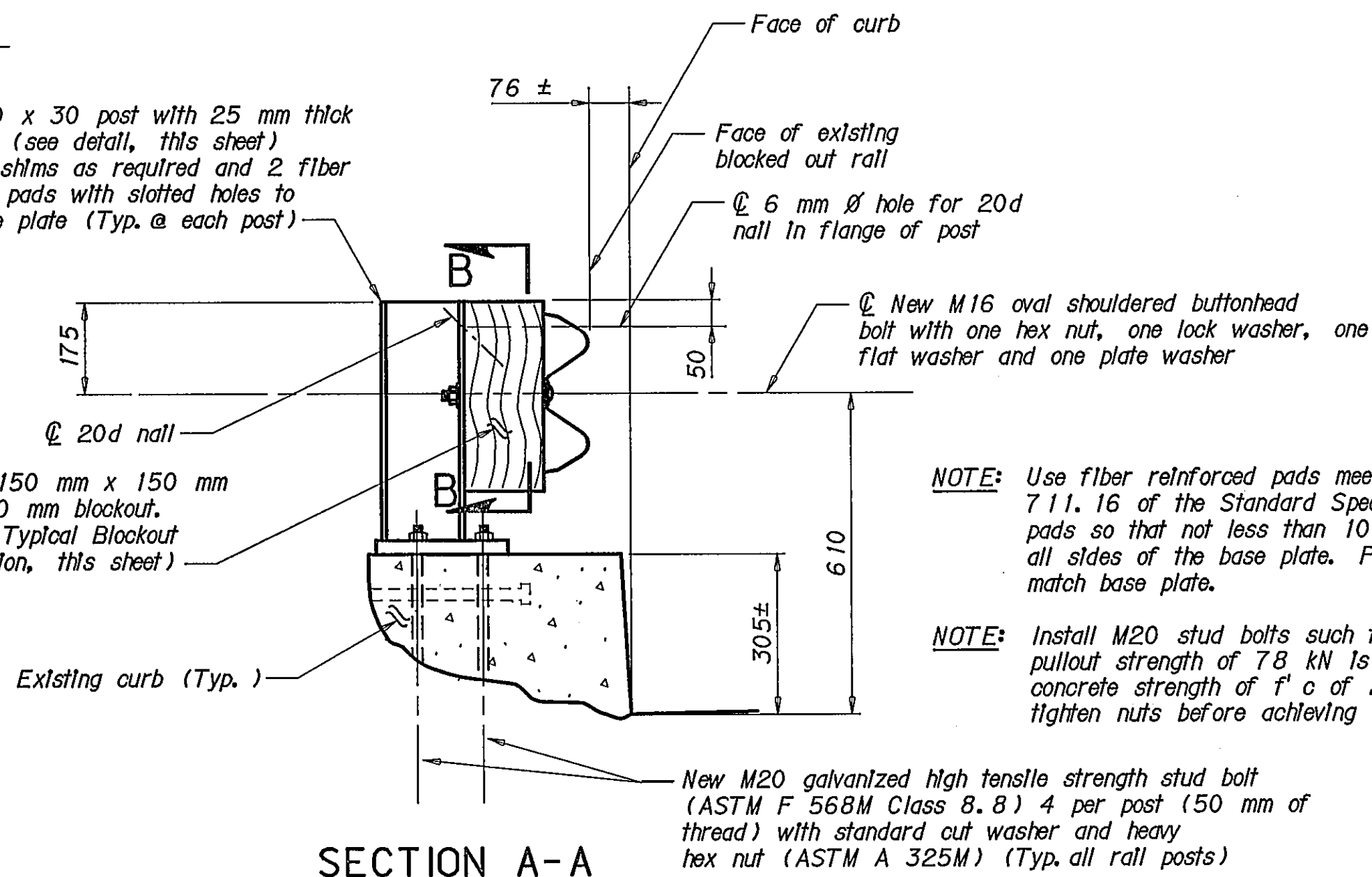
SECTION B-B

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.



D4-NON-INTERSTATE GUARDRAIL
ON ROUTE N-23 AT RP 15+0.943
FEDERAL AID PROJECT NO. NHTSA 0002(393)

CUSTER COUNTY

BRIDGE APPROACH SECTIONS

Scale ~ 1:20 except as noted

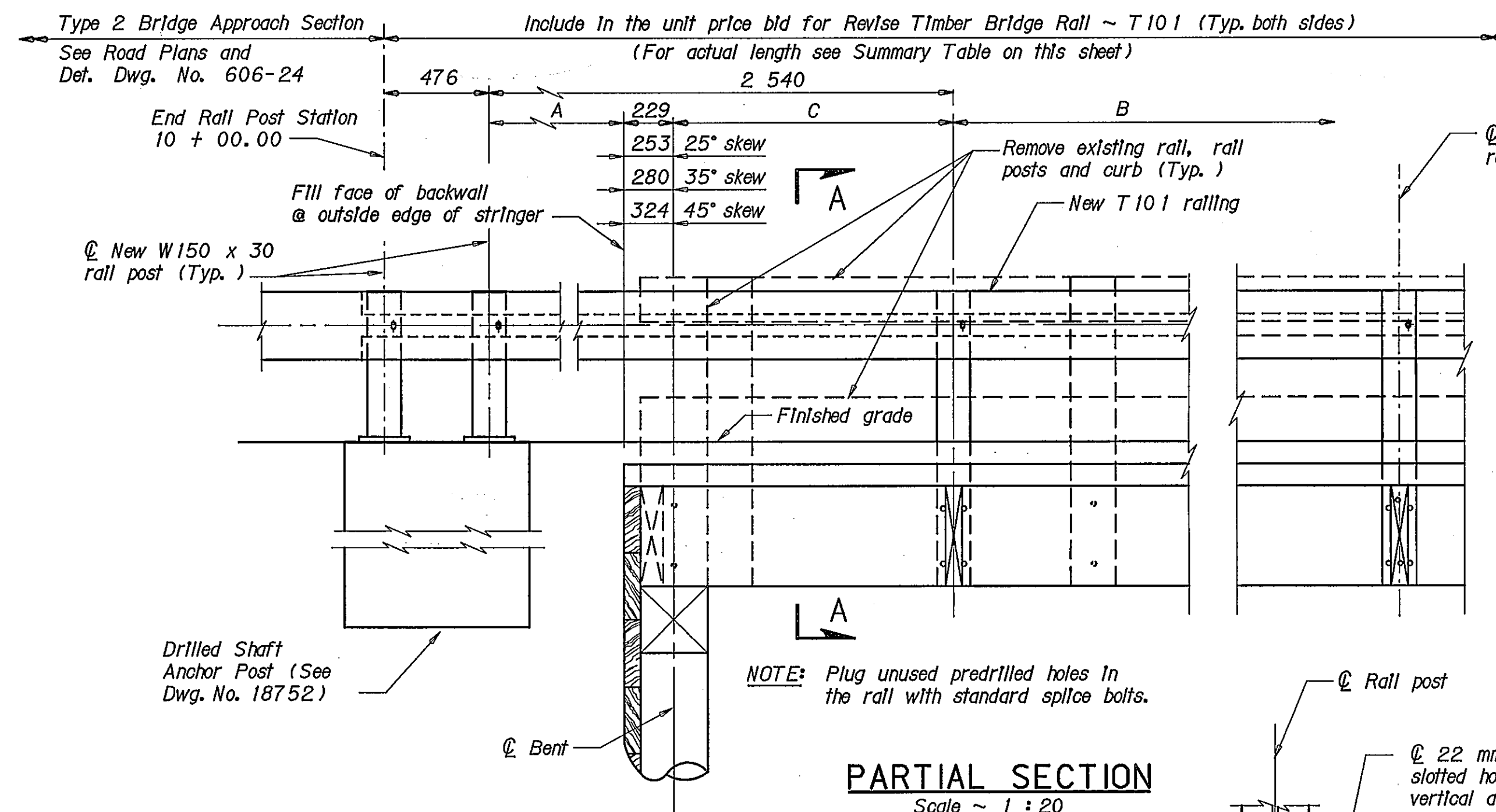
FILENAME: D457BRRV006.DGN DRAWING NO. 18748

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

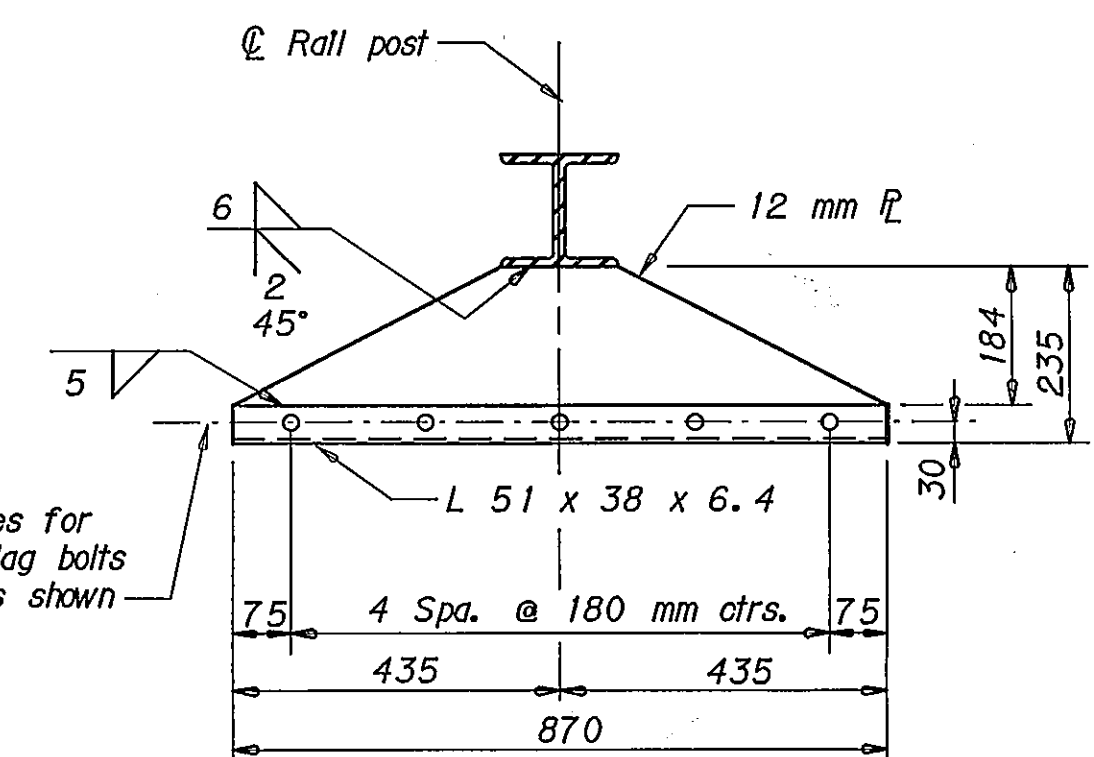
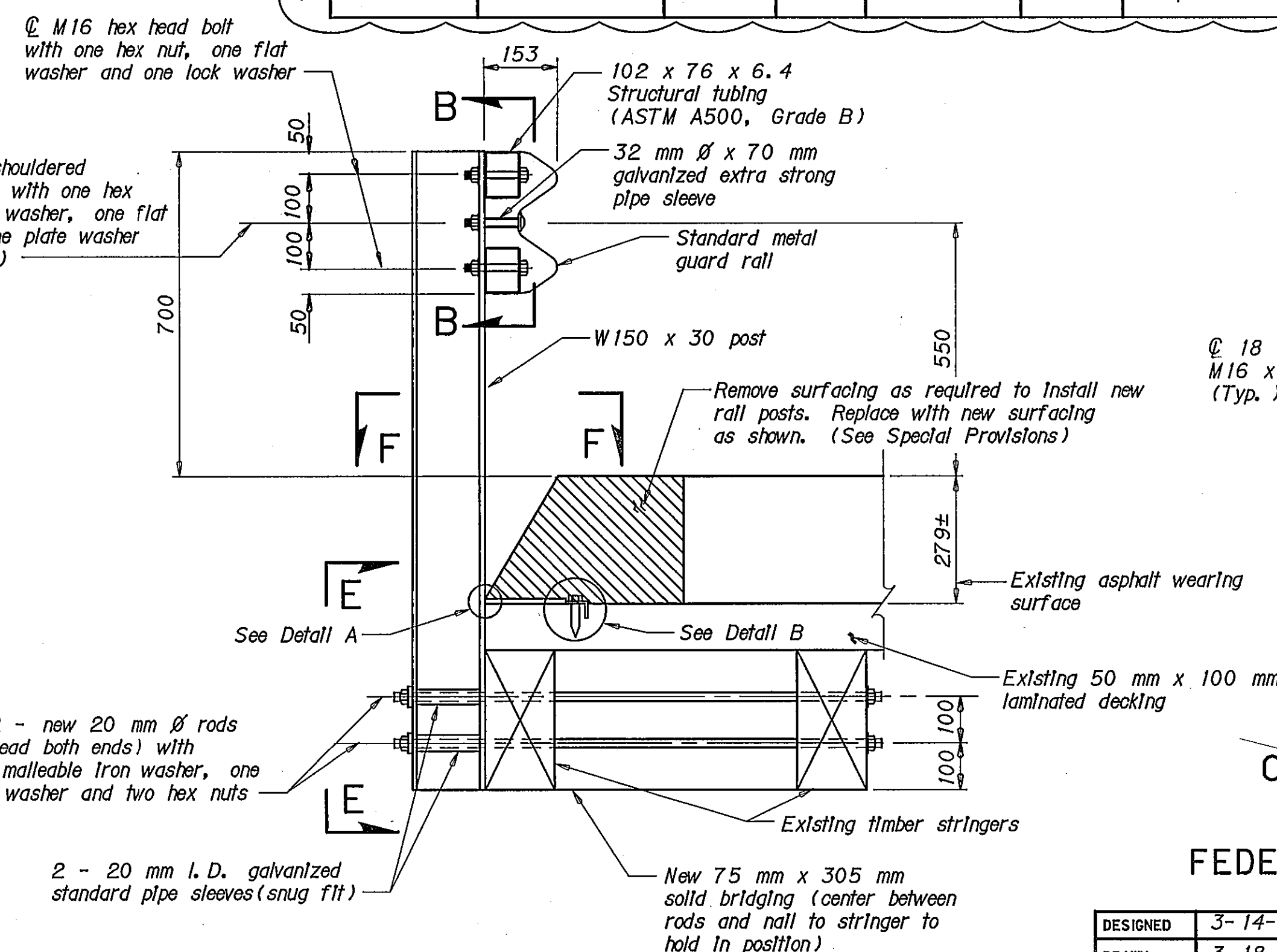
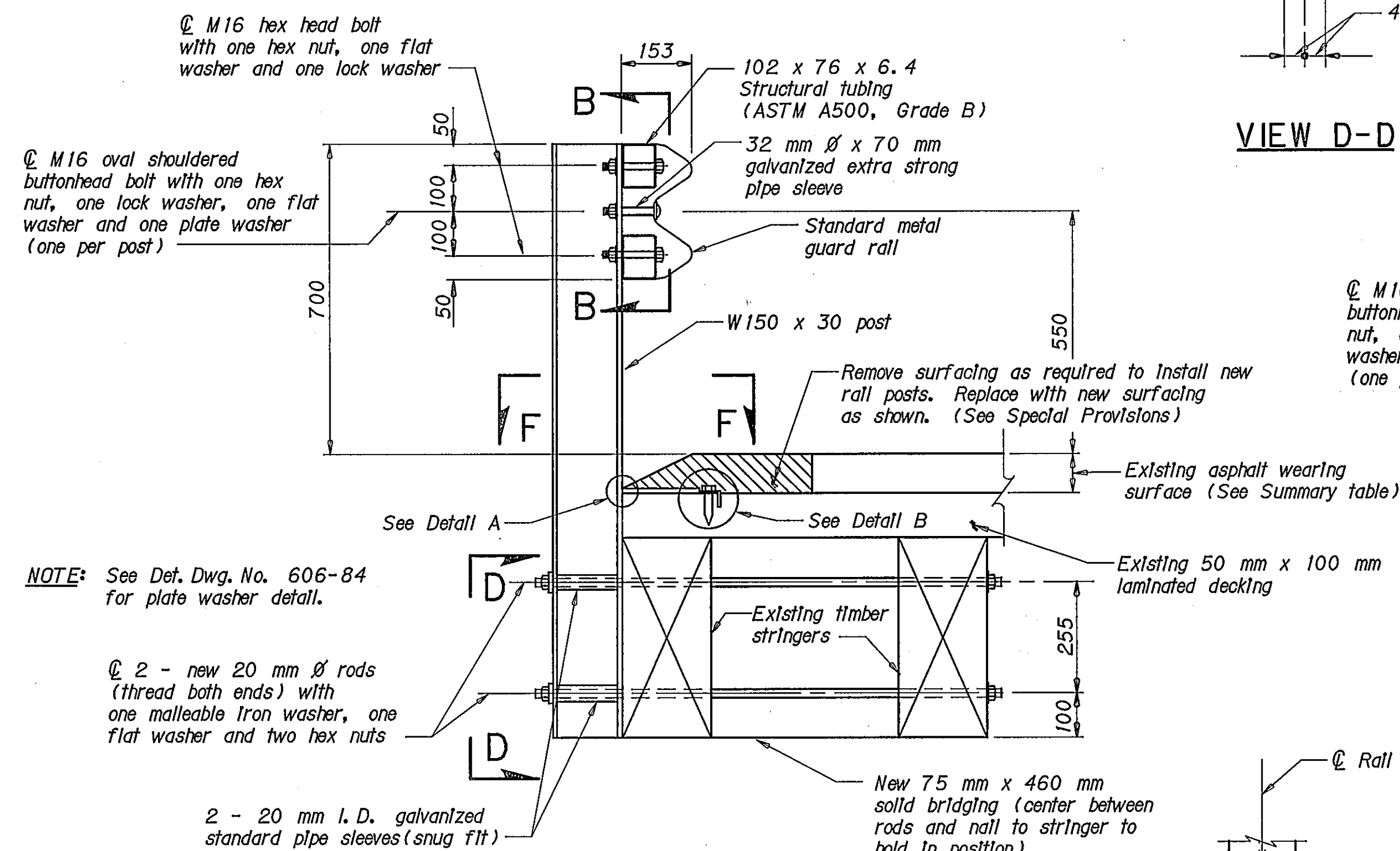
NOTE: See Dwg. No. 18749 for Section B-B, Detail A, Detail B and additional notes and details.

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			LENGTH OF RAIL (ONE SIDE ONLY) (m)	TOTAL LENGTH FOR PAYMENT (m)	ANCHOR POST (EACH)
					A	B	C			
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



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



MONTANA DEPARTMENT OF TRANSPORTATION

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

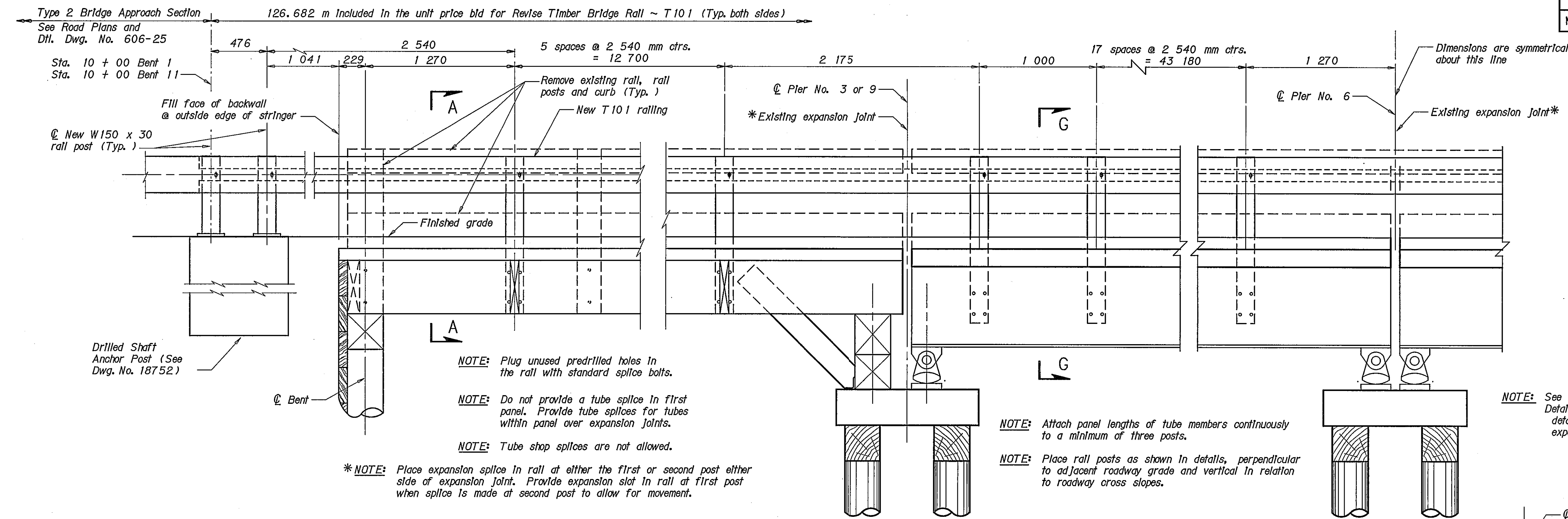
BRIDGE RAIL REVISION

Scale ~ 1 : 10 except as noted

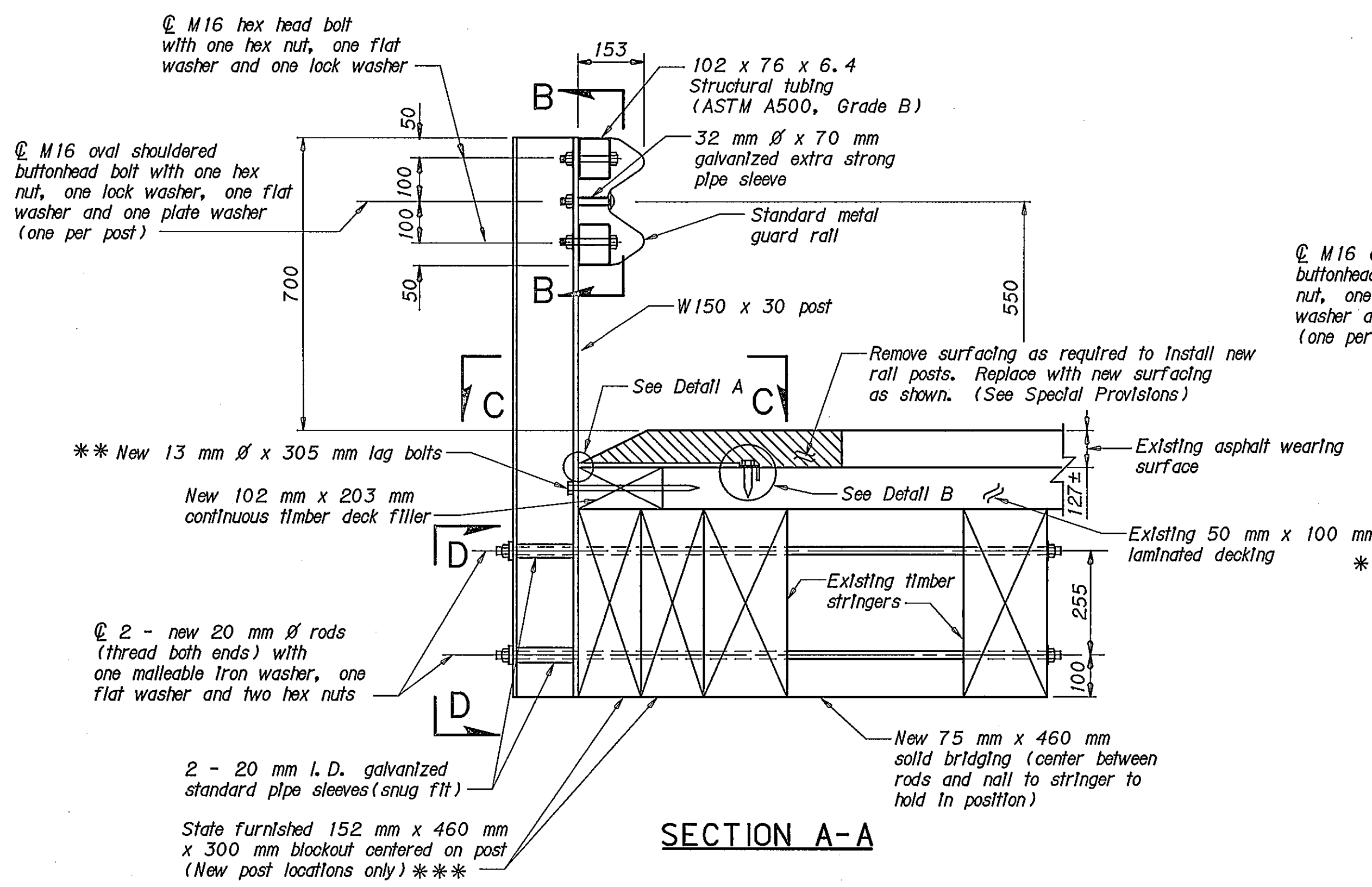
FILENAME: D457BRRV003.DGN DRAWING NO. 18750

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

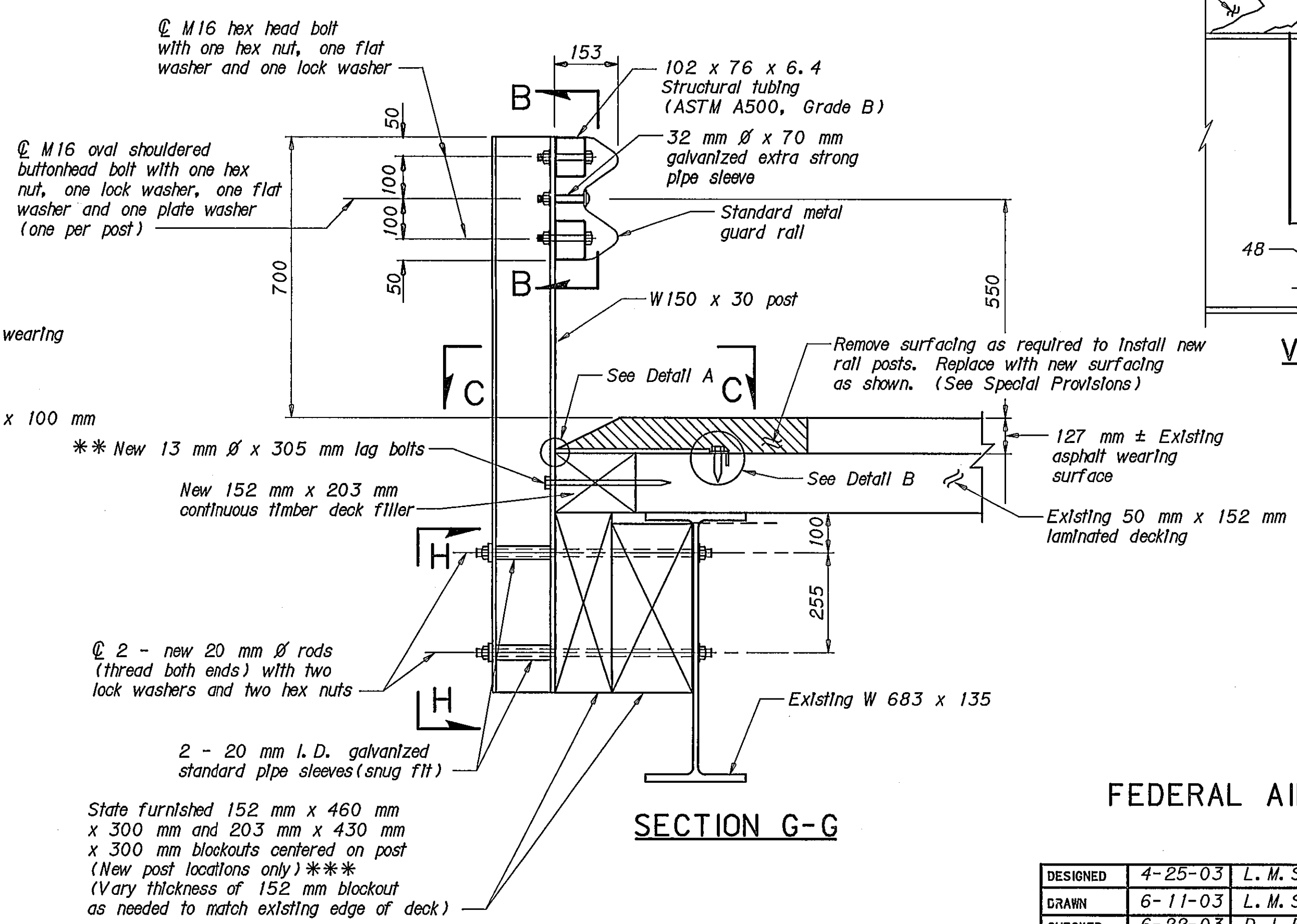
ADDENDUM NO.1 ATTACHMENT NO.4



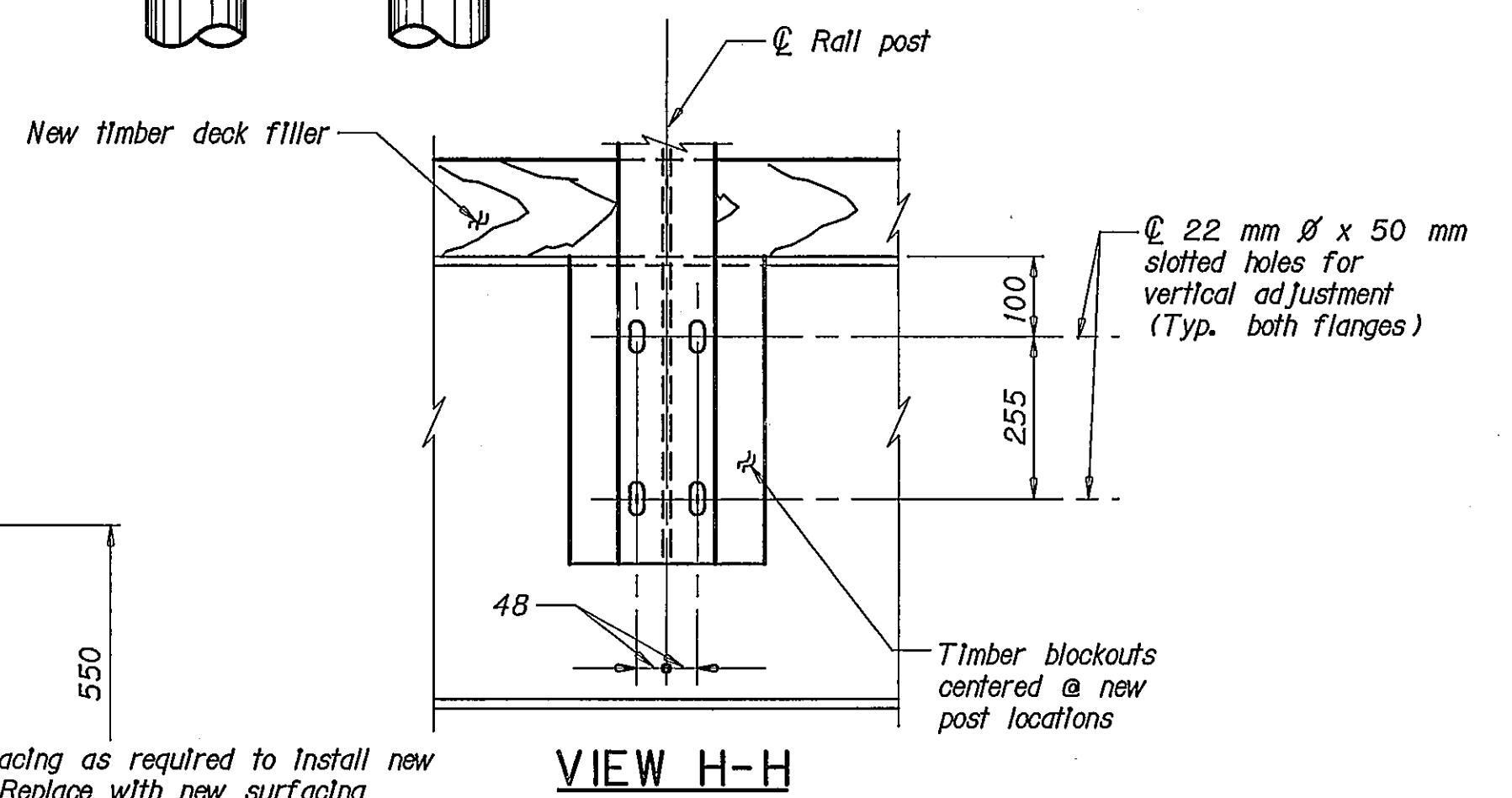
PARTIAL ELEVATION



SECTION A-A



SECTION G-G



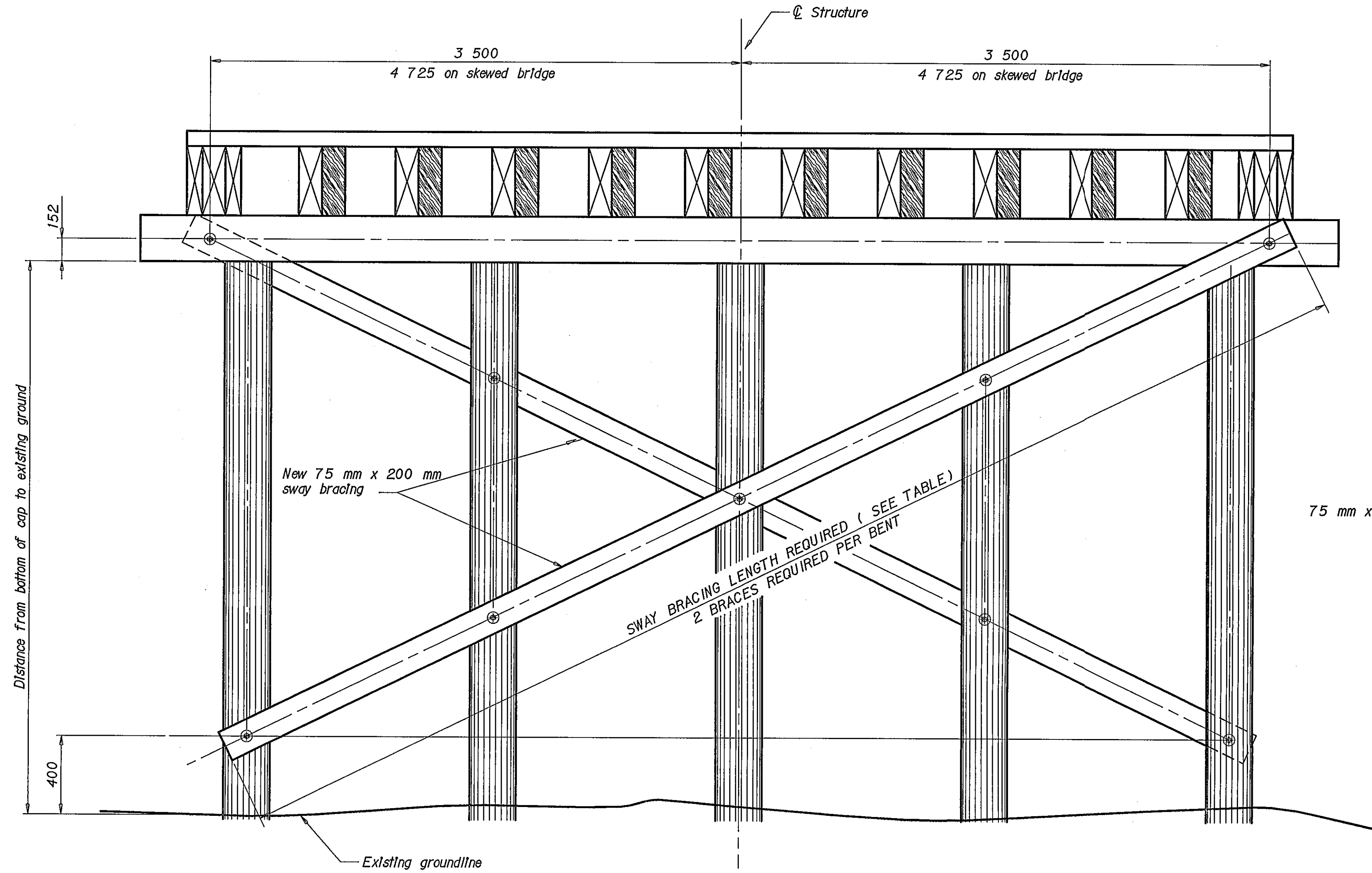
VIEW H-H



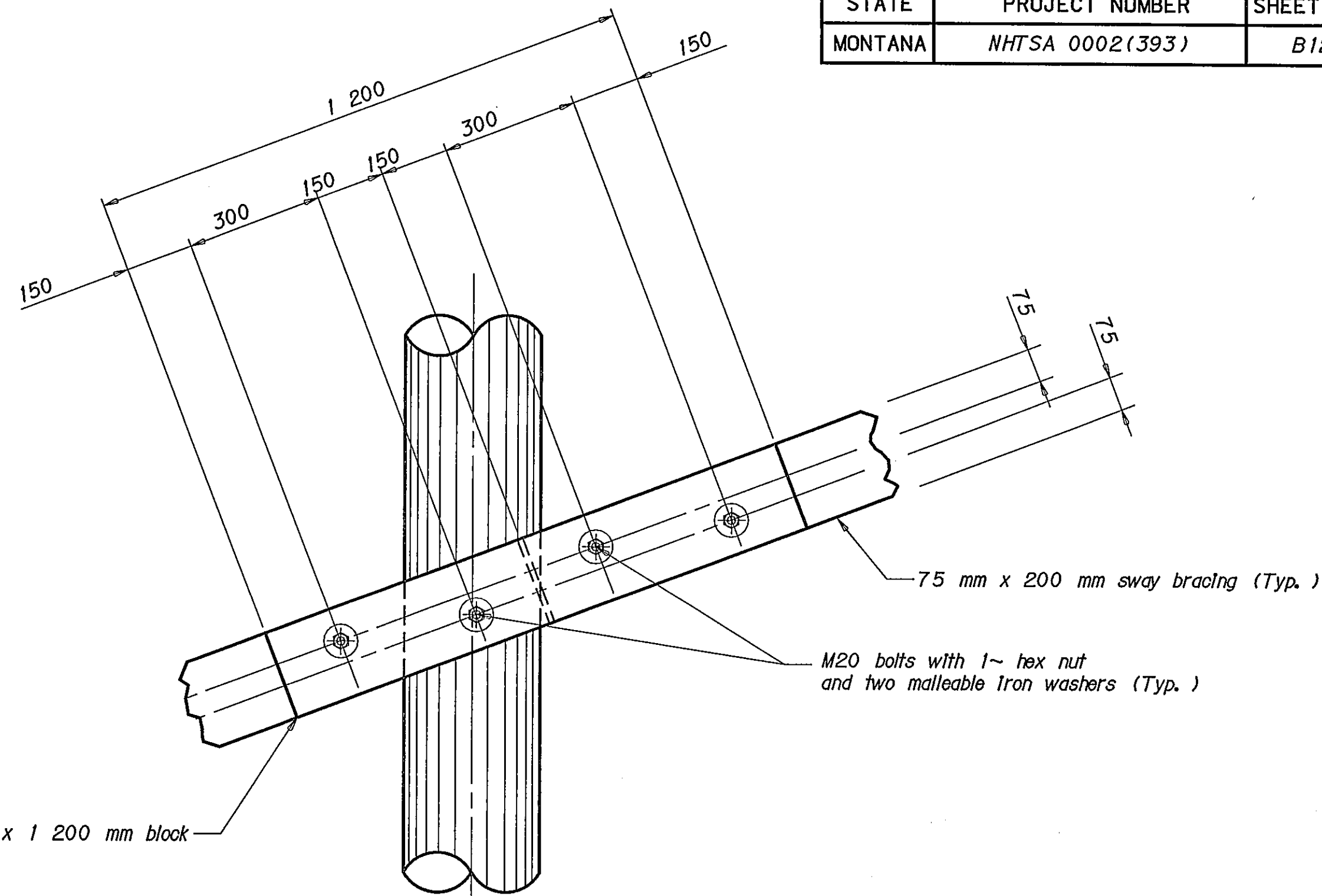
D4-NON-INTERSTATE GUARDRAIL
ON ROUTE N-57 AT RP 239+0.257
FEDERAL AID PROJECT NO. NHTSA 0002(393)
GARFIELD COUNTY
BRIDGE RAIL REVISION

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

03/04/04
 07:38:26 AM
 C:\P\B\BRRRV008.DGN
 03/04/04
 07:38:26 AM
 C:\P\B\BRRRV008.DGN



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 F_b & TENSION PARALLEL TO GRAIN F_t (MPa)		HORIZ. SHEAR F_v (MPa)	COMPRESSION (MPa)		MODULUS OF ELASTICITY E (MPa)
				PERPENDICULAR TO GRAIN $F_c \perp$	PARALLEL TO GRAIN $F_c \parallel$	
	F_b	F_t				
75 x 200 Sway bracing	10.7	5.3	0.59	5	7.6	11 700

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



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)
GARFIELD & McCONE COUNTIES
SWAY BRACING DETAILS
Scale ~ 1: 30 except as shown
FILENAME: D457BRRV009.DGN DRAWING NO. 18753

DESIGNED	6-20-03	L. M. S.
DRAWN	6-20-03	L. M. S.
CHECKED	6-22-03	D. J. R.
REVISED		
REVISED		
REVISED		