

Public domain transition from strong-post W-Beam to rigid concrete barrier

SBTA 21-005, August 2021
Review data, August 2023



Preamble

Austrroads project SBA156 was undertaken to develop and test a public domain transition from strong post W-beam to rigid concrete barrier to the requirements of AS/NZS 3845. This Technical Advice documents the outcome and recommendation.

Audience

- Road Agencies,
- Road Designers.
- Safety Barrier Industry

Commentary

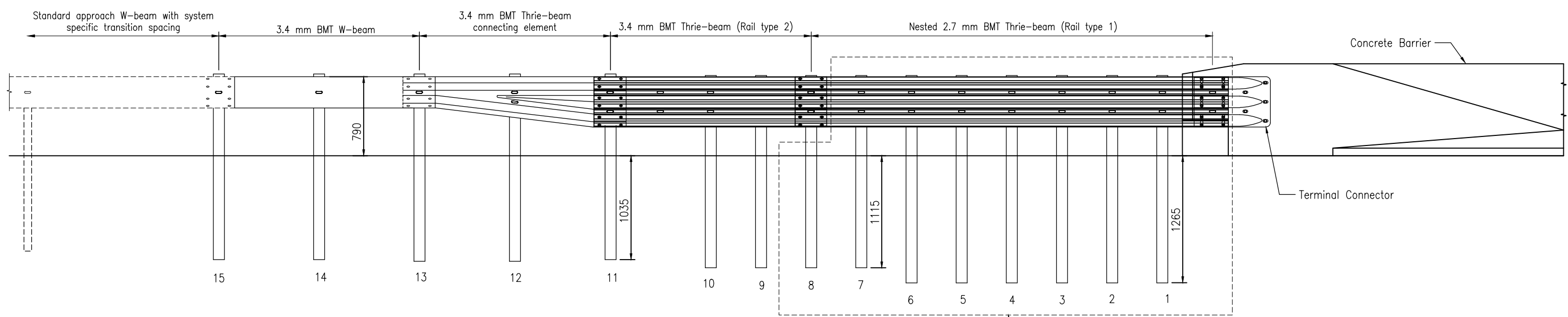
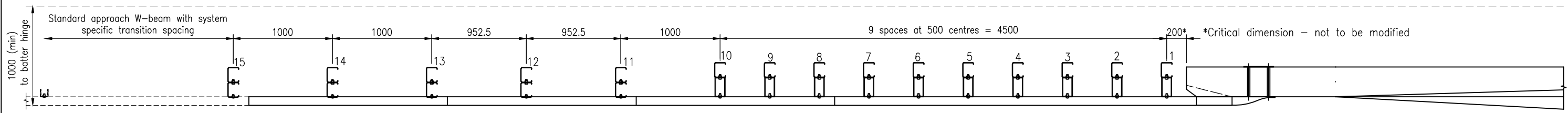
A transition in a safety barrier system is a short section between a more flexible system and a less flexible system. A transition is constructed so that the flexibility decreases along its length. While transitions can be used to connect different flexible and stiffer systems, Austrroads project SBA156 concentrated on transitions from strong-post public-domain W-beam or thrie beam systems to rigid concrete barrier.

Two transitions were tested at CrashLab in NSW. The design of these transitions was based on a successful transition tested at the Midwest Roadside Safety Facility (MwRSF) at the University of Nebraska - Lincoln. The design was altered slightly to use local Australian and New Zealand components. The occupant injury measures (the ride-down acceleration and the occupant impact velocity) for the tests met the preferred limits specified by MASH (AASHTO, 2016) and is consistent with the Australasian standard AS/NZS 3845, but demonstrated differing vehicle stability to the MwRSF testing.

A detailed independent review of the tests was undertaken by MwRSF and identified the major differences in the design and testing of the transitions. Reviewing all of the information and following industry consultation, it was decided to recommend a transition that incorporated local components but was closer to the design used by MwRSF.

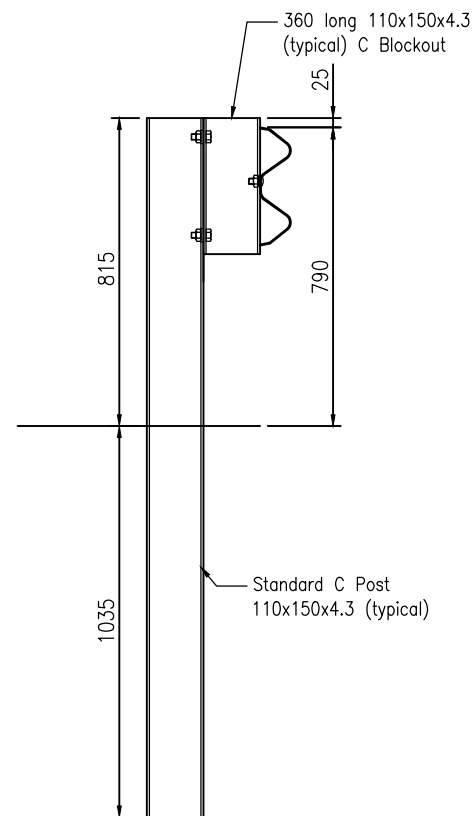
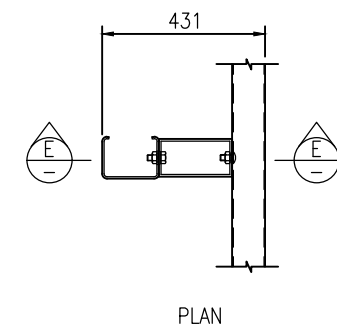
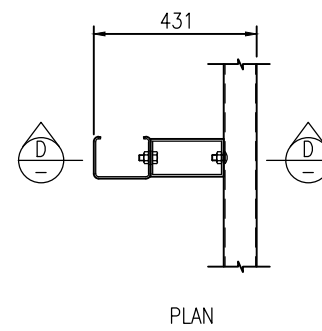
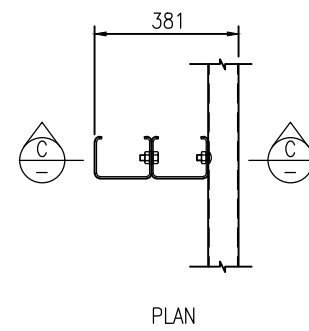
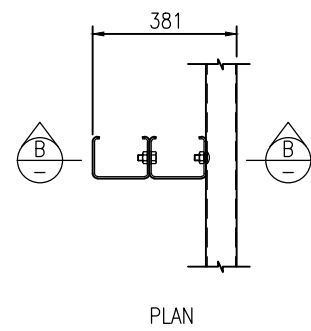
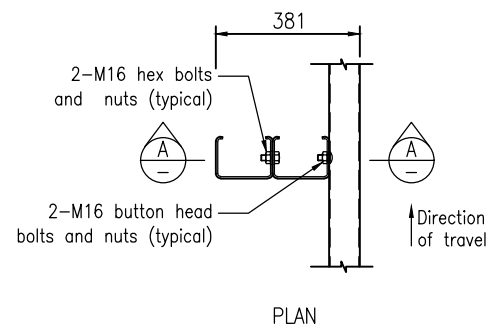
Recommendation

It is recommended to adopt a transition using Australian and New Zealand components as shown on attached drawings SBTA 21-005 (sheets 1 – 8).

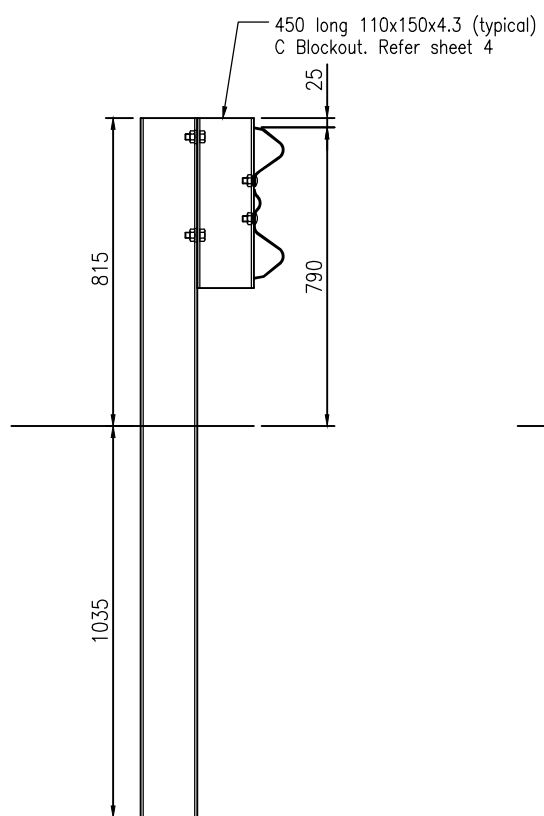


Refer to note 8 on sheet 8

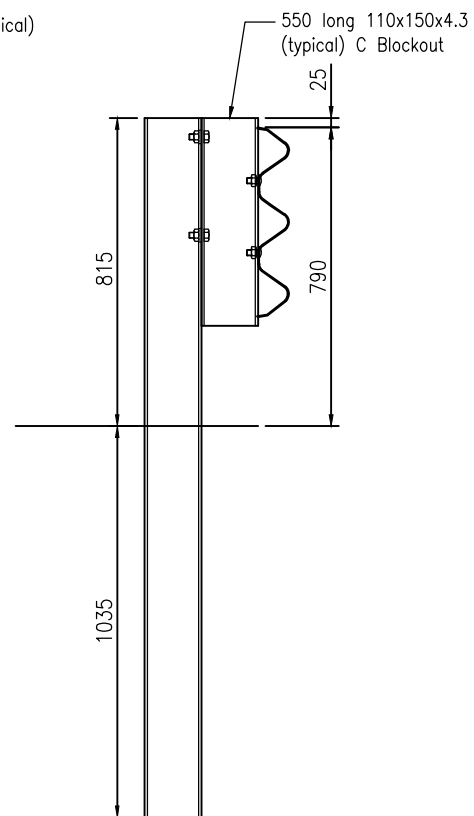
No.	Revision	Date	Recommended ASBAP	Date 02/2021	Series Road Safety Barrier	Ref./Number SBTA 21-005
			Endorsed Austroads	Date 02/2021		
1	ORIGINAL ISSUE	08/21			Sheet Sheet 1 of 8	Rev. 1



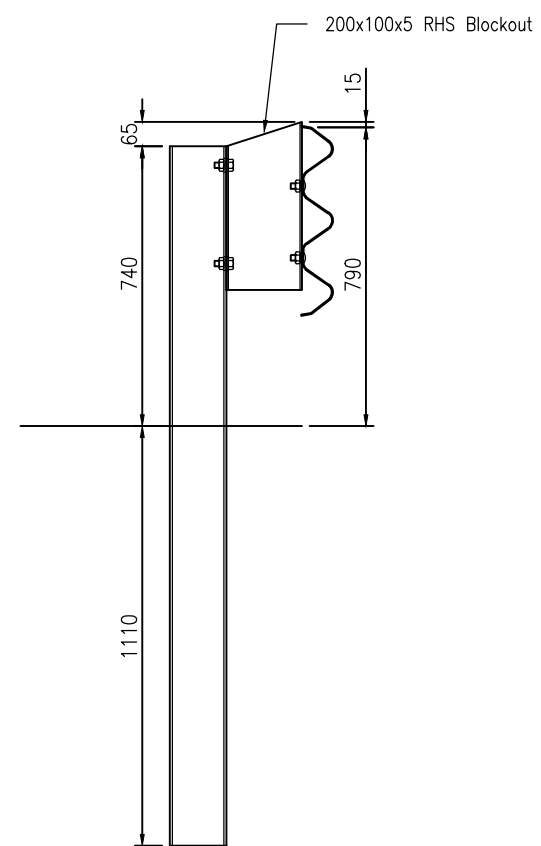
SECTION A
POSTS 13-15
NTS



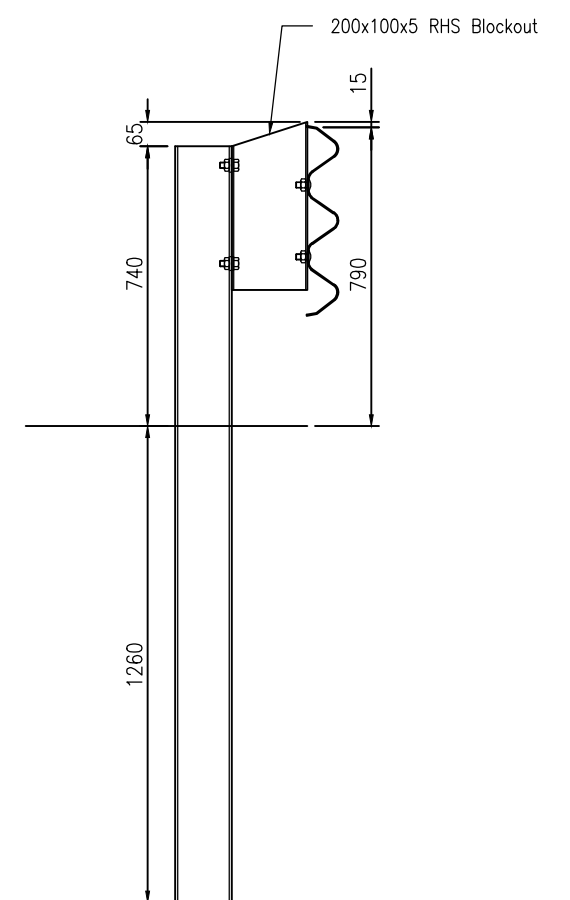
SECTION B
POST 12
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SECTION C
POST 11
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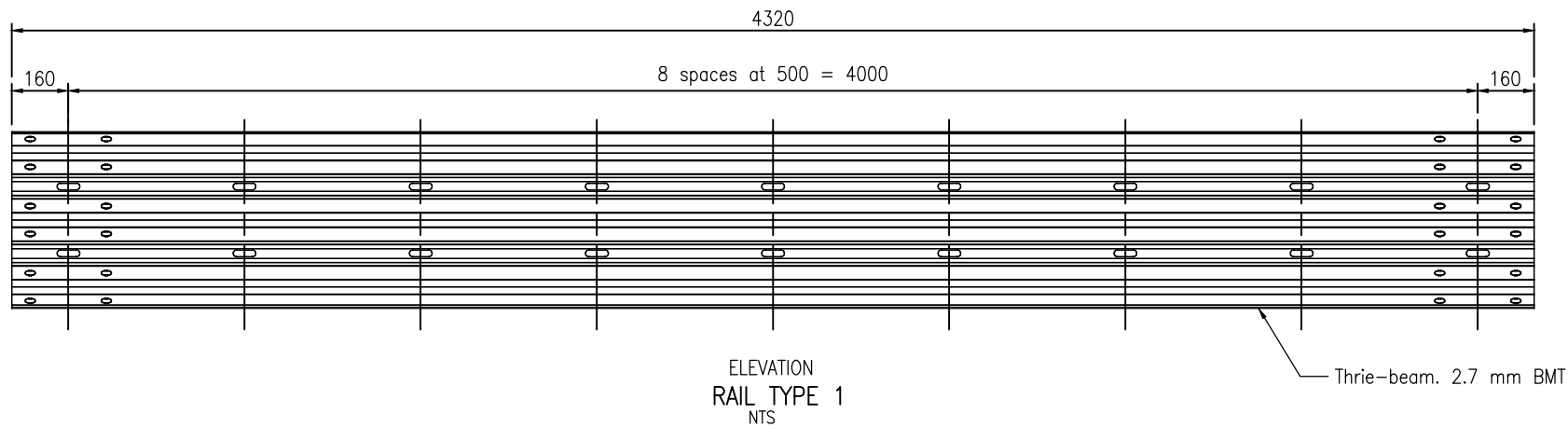
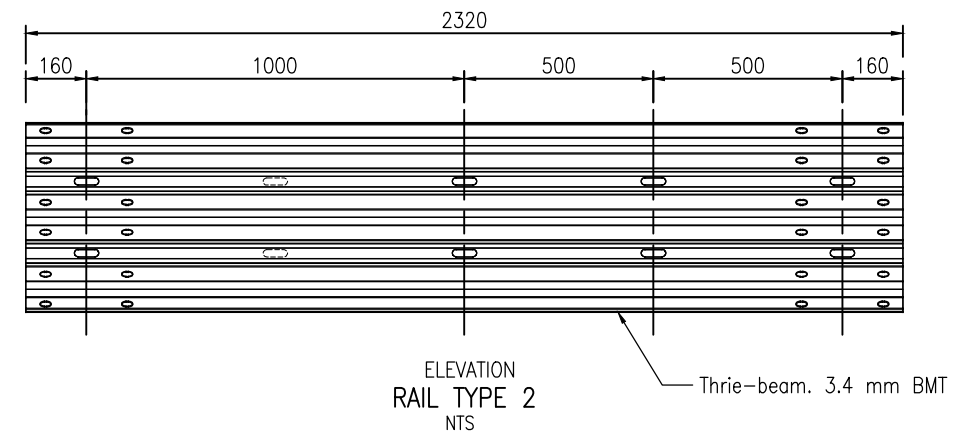
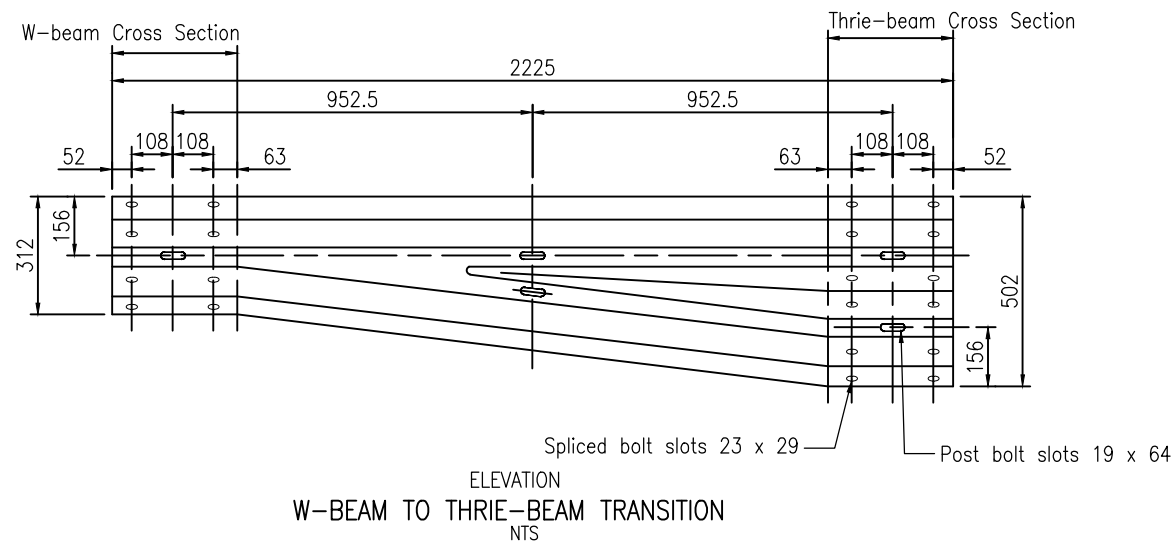


SECTION D
POSTS 7-10
NTS

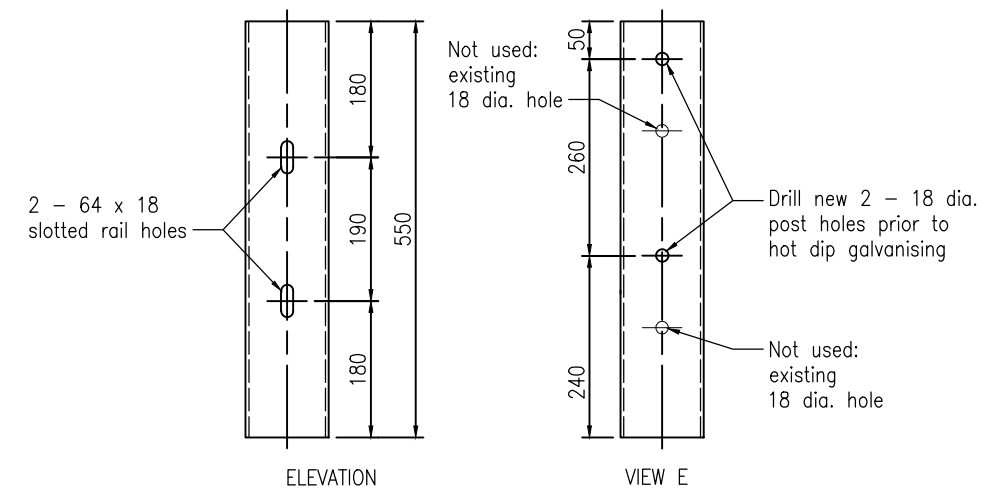
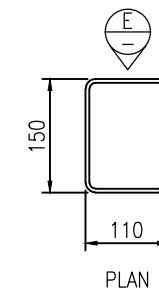
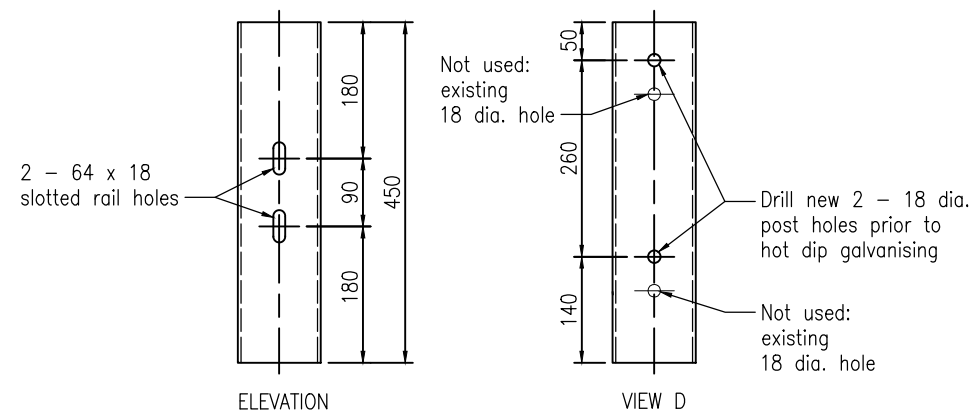
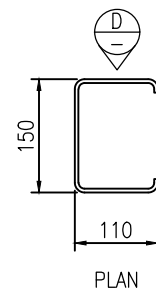
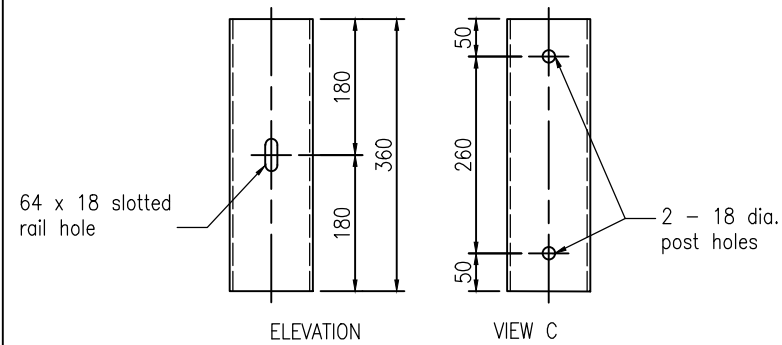
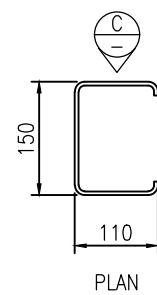
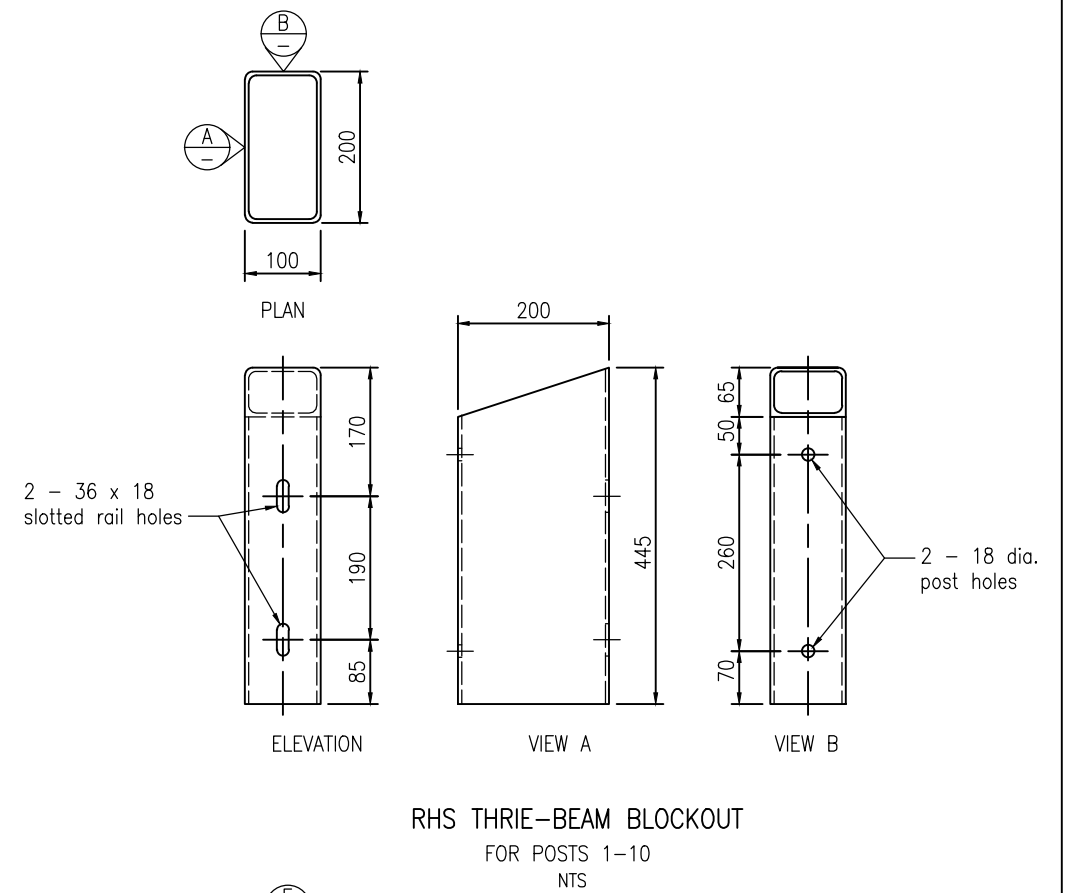
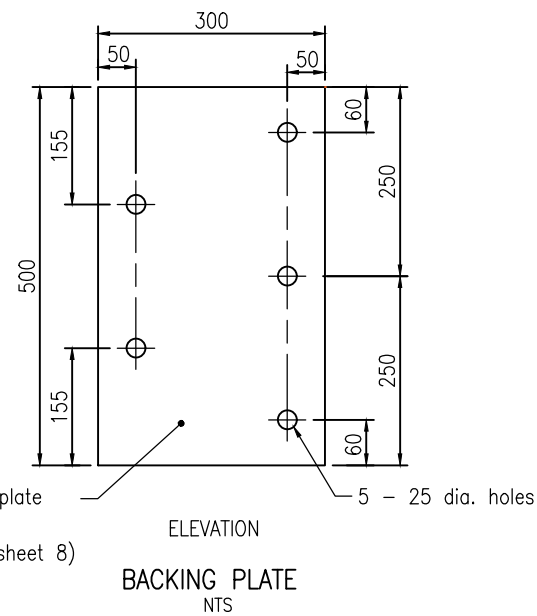
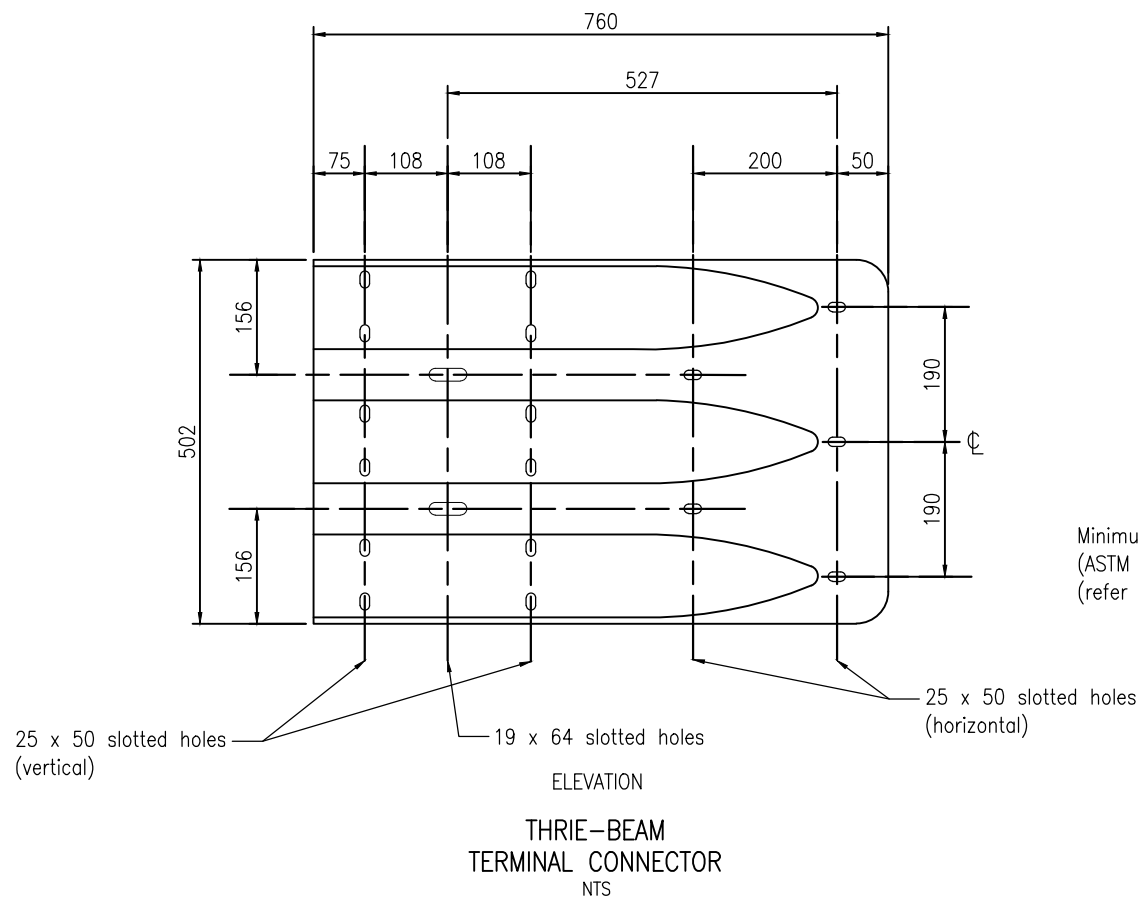


SECTION E
POSTS 1-6
NTS

No.	Revision	Date	Recommended ASBAP	Date 02/2021	Series Road Safety Barrier	Ref./Number SBTA 21-005
			Endorsed Austroads	Date 02/2021		
					Title W-beam to Rigid Concrete Transition MASH TL-3	Sheet Sheet 2 of 8
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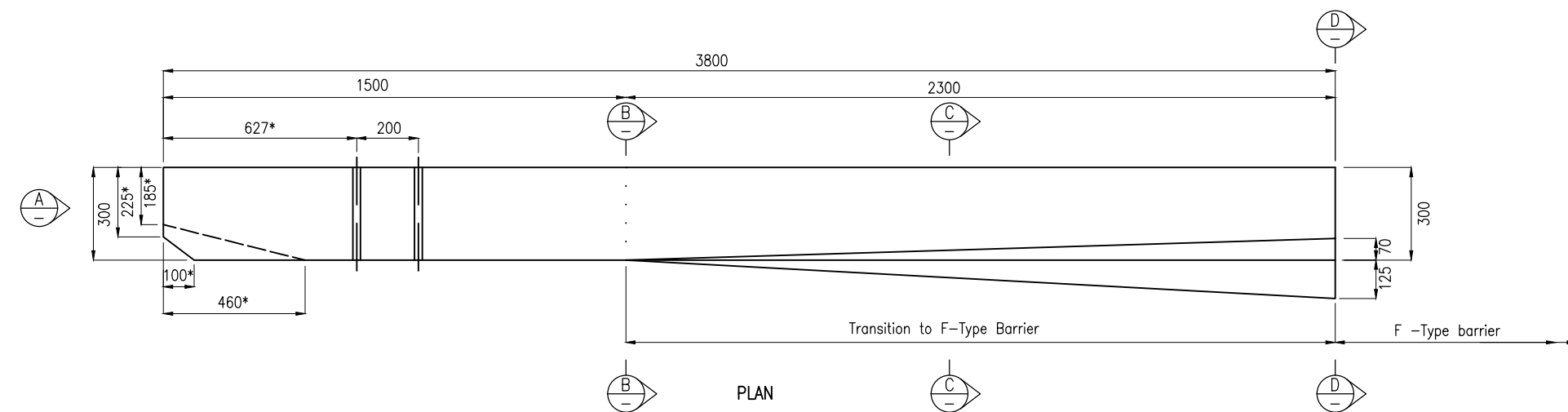
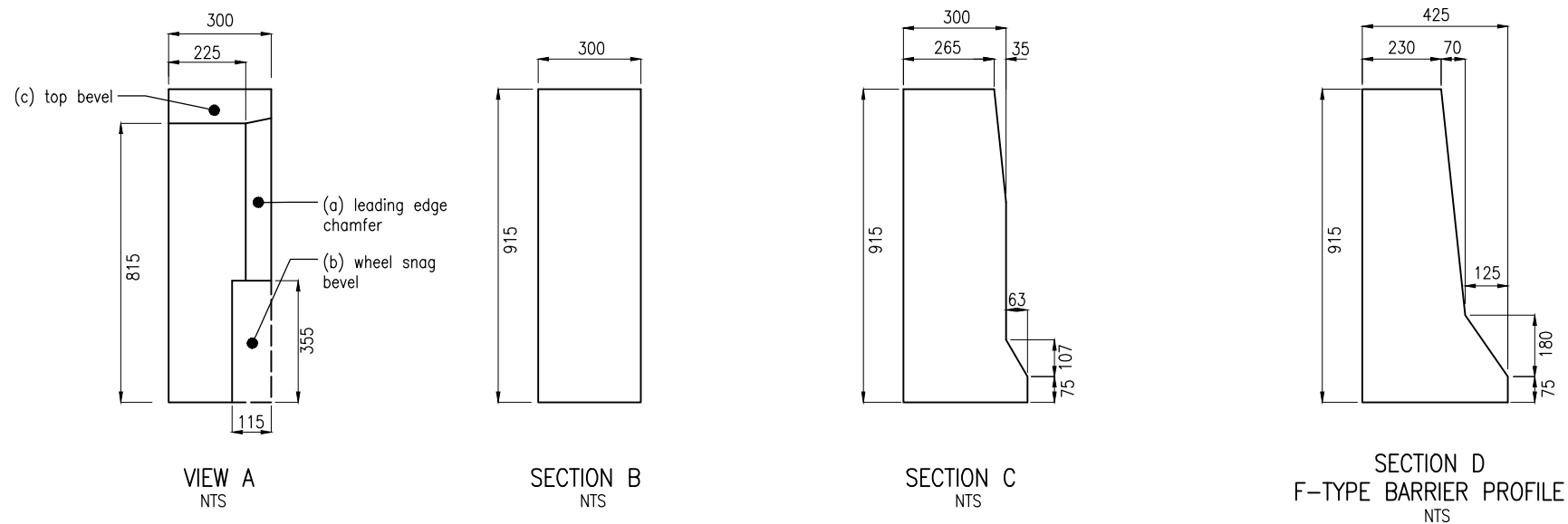
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			Endorsed Austroads	Date 02/2021		
					Title W-beam to Rigid Concrete Transition MASH TL-3	Sheet Sheet 3 of 8
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No.	Revision	Date	Recommended	Date
			ASBAP	02/2021
			Endorsed Austroads	Date 02/2021
1	ORIGINAL ISSUE	08/21		

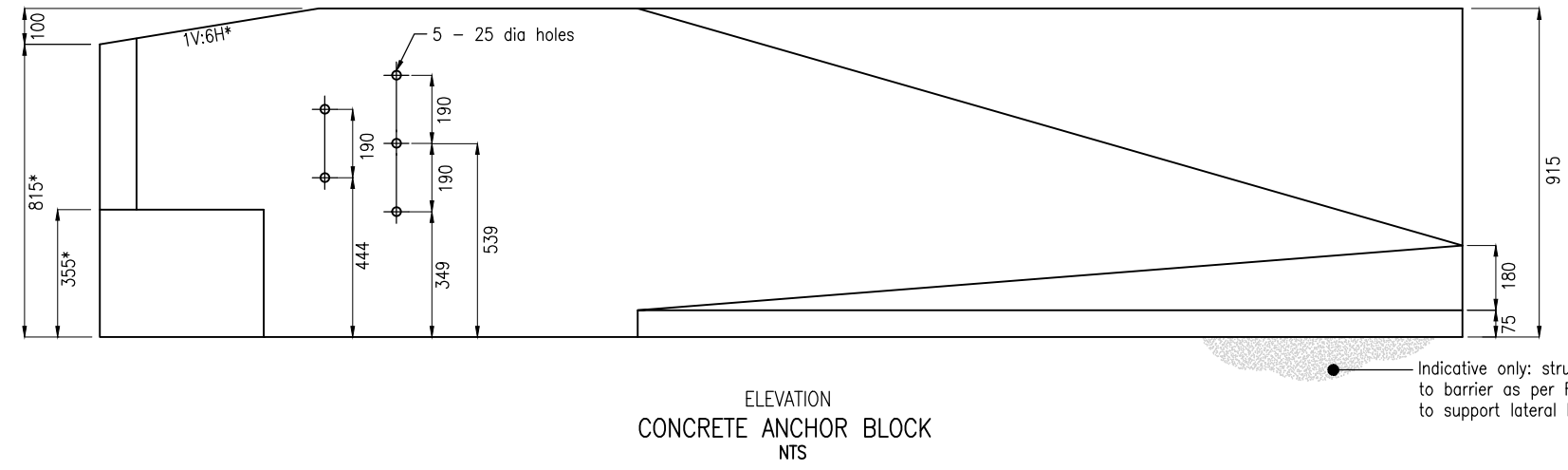
Series	Road Safety Barrier
Title	W-beam to Rigid Concrete Transition MASH TL-3

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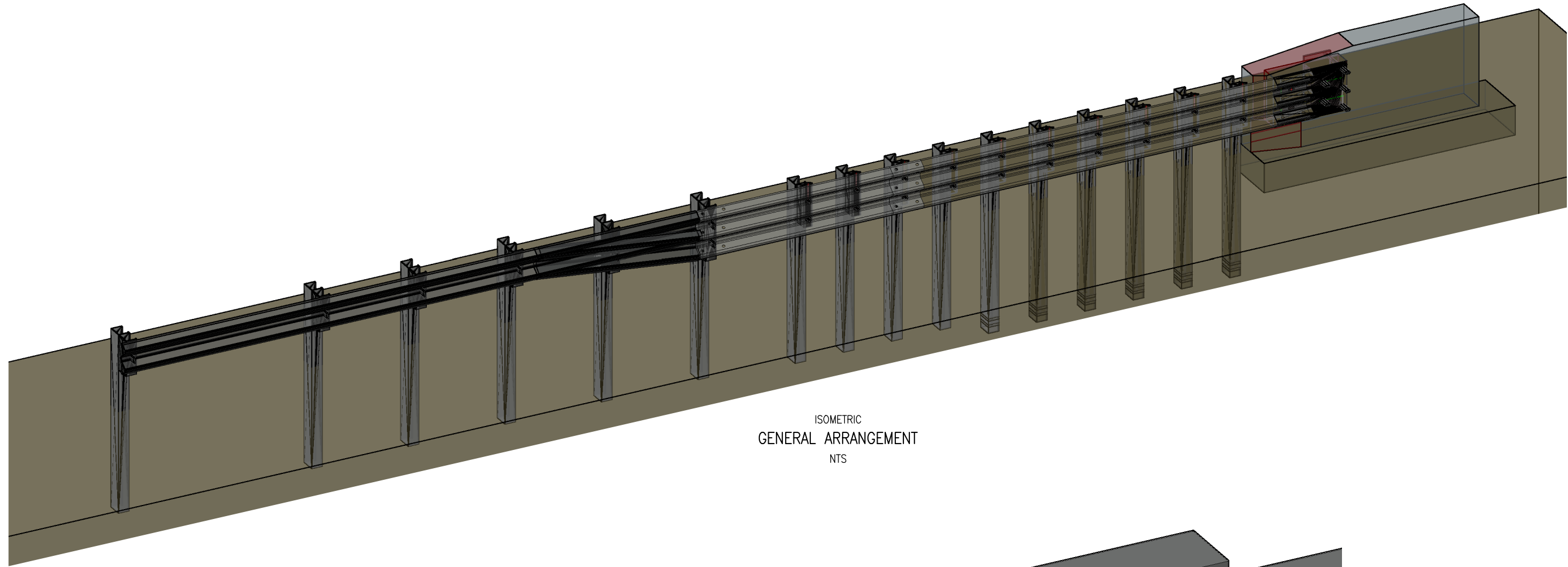


CRITICAL DIMENSIONS
(not to be modified)
(a) - leading edge chamfer
(b) - wheel snag bevel
(c) - top bevel

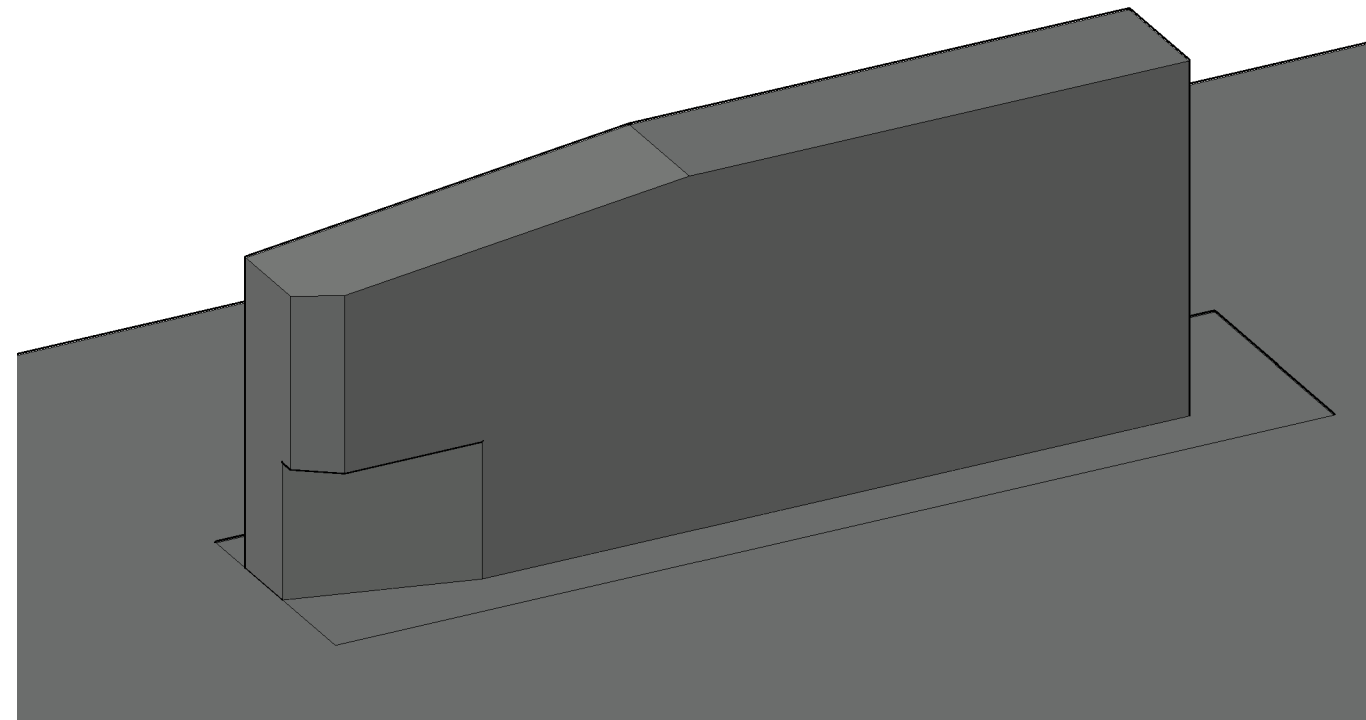
*Critical dimensions shown with an asterisk



No.	Revision	Date	Recommended	Date	Series	Road Safety Barrier	Ref./Number	SBTA 21-005
			ASBAP	02/2021				
			Endorsed	Date			Sheet	Rev.
			Austrads	02/2021			Sheet 5 of 8	1
1	ORIGINAL ISSUE	08/21						

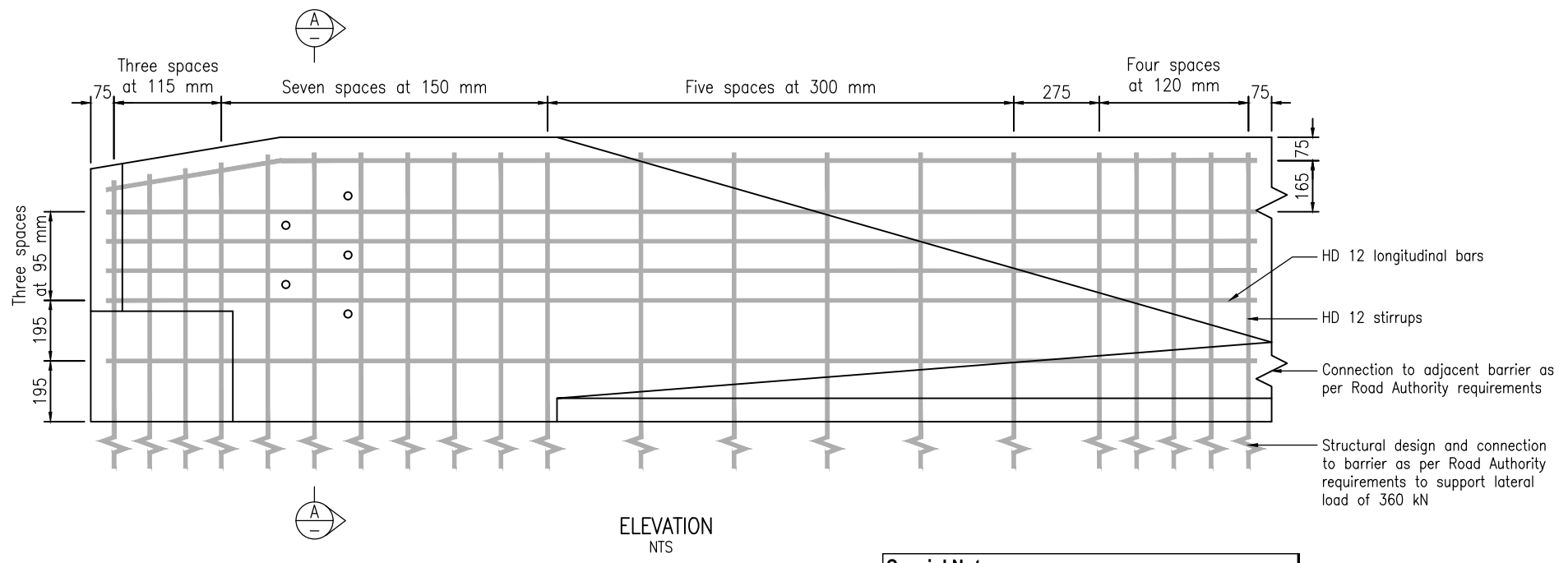
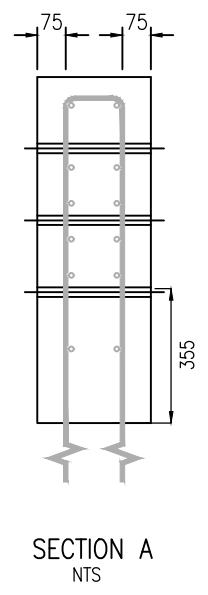


ISOMETRIC
GENERAL ARRANGEMENT
NTS



ISOMETRIC
CONCRETE ANCHOR BLOCK
NTS

No.	Revision	Date	Recommended ASBAP	Date 02/2021	Series Road Safety Barrier	Ref./Number SBTA 21-005
			Endorsed Austroads	Date 02/2021		
					Title W-beam to Rigid Concrete Transition MASH TL-3	Sheet Sheet 6 of 8
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Special Note
Structural design is indicative only - to be confirmed by Road Authority or Installation Designer

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Item	Quantity	Dimensions	Location	AASHTO Reference	Notes
Long C post	6	2000 long, 110 x 150 x 4.3 (typical)	Posts 1-6		Bolt holes on both faces
Standard C post	9	1850 long, 110 x 150 x 4.3 (typical)	Posts 7-15		Bolt holes on both faces
W-beam rail	1				Half-length rail, 3.4 mm BMT
W-beam to Thrie-beam transition	1			RWT02a-b	Opposite asymmetry required for trailing installation
Thrie-beam rail type 1	2			RTM08a-b	Nested
Thrie-beam rail type 2	1				
Thrie-beam terminal connector	1			RTE01b	Otherwise known as structure connector
Backing plate	1			FPB07	May be replaced by an accepted alternative, such as 80 x 80 x 6 mm washers
RHS blackout	10	200 x 100 x 5	Posts 1-10		
Transition Thrie-beam C blackout	1	550 long, 110 x 150 x 4.3 (typical)	Post 11		
Modified Thrie-beam C blackout	1	450 long, 110 x 150 x 4.3 (typical)	Post 12		Drill additional holes, refer to sheet 4
Standard W-beam C blackout	3	360 long, 110 x 150 x 4.3 (typical)	Posts 13-15		
M16 button head bolt & oversized nut	44	M16 x 32	Rail splices	FBB01-05	Grade 8.8
M16 button head bolt & nut	27	M16 x 50	Rails to posts		Grade 4.6
M16 hex head bolt & nut	30	M16 x 30	Posts to blockouts		Grade 4.6

- General Notes**
- All work to be as per Road Authority specifications.
 - All dimensions in millimetres unless noted otherwise.
 - Drawings are not to scale and some non-critical dimensions have been rounded to the nearest 5 mm or nearest 10 mm. Tolerances are as per AS/NZS 3845.1.
 - Posts to be stamped with identification e.g. length (2000/1850) or posts 1-6, posts 7-13
 - For Australia concrete barriers shall be as per State or Territory Road Authority specifications.
 - For New Zealand concrete barriers shall be as per Waka Kotahi NZTA Specification M23.
 - Upstream rail sections should overlap downstream rail sections, with respect to the nearest travel dimension.
 - Trailing transitions installed on roads divided by a median barrier may be a modified design that is acceptable to the Road Authority.
 - Structure connector backing plate may be replaced by an accepted alternative such as five 80 x 80 x 6 mm washers.

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