

Product Manual

MASH TL3 COMPLIANT

EN1317-8 COMPLIANT



Release 09/21

www.ingalcivil.co.nz

1.0 Introduction

The Ingal Motorcyclist Protection Rail (Ingal MPR) is a protective enhancement installed on existing four-wheel vehicle restraint systems to reduce the chances of serious injury to motorcyclists and pillion passengers in run-off-road accidents.

Traditional highway safety barriers installed on the road carriageways to restrain vehicles from impacting roadside hazards, these typically take the form of the W-Beam rail supported by a series of posts. These posts introduce a significant hazard to an errant motorcyclist in a run-off-road accident. The Ingal MPR consists of an under-riding rail which is mounted on a spring bracket. Upon impacting this rail, the spring bracket deflects back absorbing some of the impact energy from the motorcyclist, whilst the rail contains and re-directs the motorcyclist away from the rigid posts and hazards.

The installer should ensure any variants of this product are approved by the final asset owner.

2.0 Specification

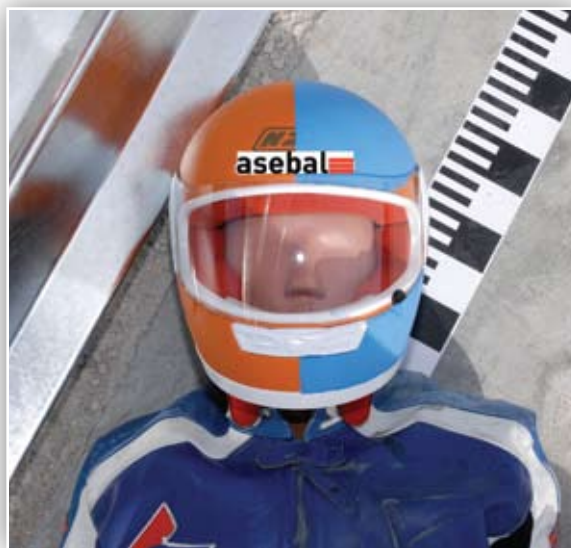
Ingal MPR Rail Length:	3.81m NLL
4m MPR Rail Mass:	12.3kg
Ingal MPR System Mass:	4.65kg per metre
Rail Height Above Ground:	60mm
Post Spacing:	2m or 3.81m
Ingal MPR Crash Test Impact Severity:	Level 1

The Ingal MPR rails and brackets are manufactured from hot-rolled steel flat products in accordance with AS/NZS1594. These items are hot dip galvanised in accordance with AS/NZS 4680 after fabrication leaving no surface untreated.

3.0 Crash Test Analysis

Crash test guidelines provide a minimum set of requirements that a roadside barrier has to meet in order to demonstrate its satisfactory impact performance. Whilst crash test guidelines cannot include all possible impact conditions that may be experienced in the real world, the crash test matrix is selected to represent a "worst practical condition" for a roadside barrier impact. The Ingal MPR system has been fully crash tested and evaluated according to Standards UNE 135900-1 and 2 and UNE EN-1317-1 and 2, and has produced satisfactory results in the following full scale crash tests. **The dummy tests recorded an impact severity of Level 1 which is the lowest severity for this testing standard.**

- TM1.6.0: Dummy to post, 60 km/h 30° angle of impact.
- TM.3.60: Dummy to point on barrier midway between posts, 60 km/h 30° angle of impact
- TB11: 900 kg car at 100 km/h and 20° angle of impact.
- TB32: 1,500 kg car at 110 km/h and 20° angle of impact



4.0 Features and Benefits

- The specially designed anchoring system fully facilitates the positioning of the guard rail at the correct height, ensuring a uniform distance from the ground throughout the run and compensating for uneven terrain and height differences in the existing barriers. The mounting bracket also allows the motorcyclists rail to be raised to match alterations in the level of the road surface.
- The motorcyclist rail can be assembled and raised without the need to modify the traditional vehicle barrier system
- More space between the system and the ground (60mm), allowing water drainage, snow clearance, cleaning of hard shoulders, etc.
- The mounting bracket is symmetric, and is therefore the same for both the right and left side of the carriageway.
- Small number of components and ease of installation make the system very cost-effective.

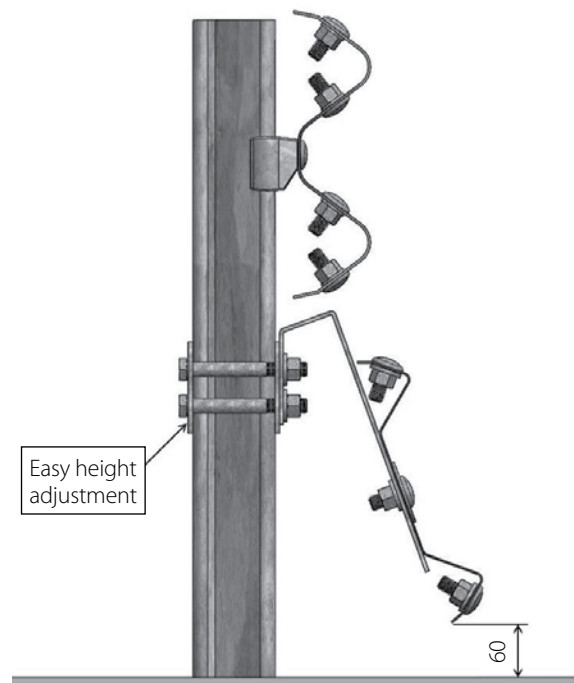
5.0 Installation

The specially designed anchoring system facilitates the positioning of the guard rail at the correct height, allowing deflection of the system when impacted.

Only items provided by Ingal are to be used for the installation of the Ingal MPR. The following written instructions are to be read in conjunction with Ingal's drawings. A generic Safe Work Method Statement is available upon request for installation operations.

5.1 Site Preparation

This site should be prepared free of obstructing vegetation and other hazards that may interfere with the installation or operational performance of the system. Some sites may require minor grading if installed beyond the edge of the pavement shoulder.



5.2 Assembly

- Step 1 Assembly should be initiated with placing the post bracket around the guardrail posts, particular care should be taken to ensure the bracket is oriented in the correct direction with the open side facing the oncoming traffic for verge installations.
- Step 2 Attach the rail bracket to the post bracket with the M16 x 190 Hex Bolts. Typically the rail bracket will need to be abutting the underside of the block in the G4 guardrail system for convenient assembly. Tighten all fasteners to snug tight.
- Step 3 Mount the rail on the rail brackets with the appropriate fastener configuration. Before tightening, ensure a 60mm clearance between finished ground level and MPR rail.
- Step 4 Terminate beginning and end of run with MPR terminal piece.



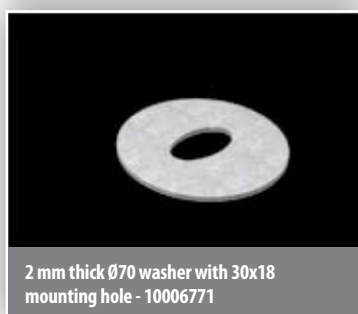
6.0 Product Storage

All posts and rails are hot dip galvanized in accordance with AS/NZS 4680. It is important that stored galvanized work is stacked so that each item is well ventilated and can adequately drain rainwater from its surfaces.

Poor storage can give rise to wet storage stain (white rust) which is caused by water (rain or condensation) in badly drained or ventilated conditions. This can occur very quickly, particularly in warm, humid conditions.

5.3 Curved Installations

The MPR rails can be field curved down to a radius of 26m. Rails can be machine curved down to a radius of 5m. Contact your local Ingal office for details.



Ingal MPR Installation Checklist

Customer:

Project:

Barrier ID:

Barrier Length:

Checked By:

Signed:

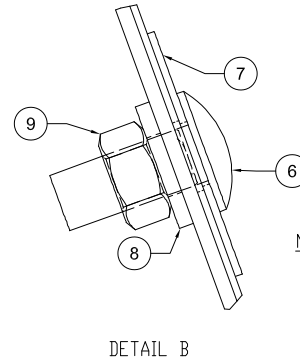
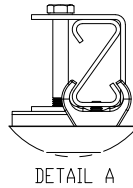
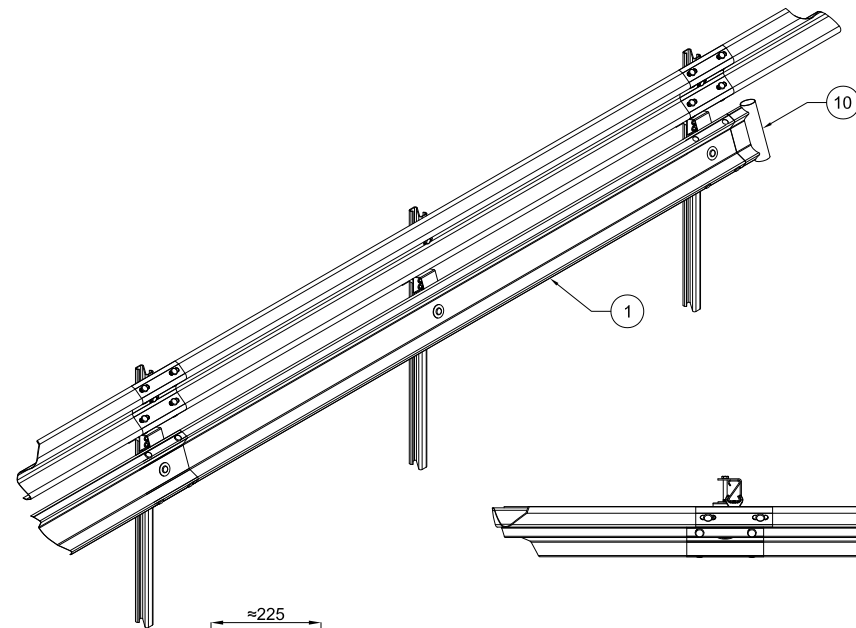
Date

Is the MPR rail ground clearance within tolerance of 60mm \pm 20mm	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has each end of the run been terminated with an MPR Terminal End	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have all fasteners been tightened to snug tight	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has a Ø70 x 2mm slot washer been used on the traffic side of the rail mounting	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has a Ø35 x 17 x 4mm washer been used on the verge side of the rail mounting	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has any minor damage been repaired using two coats of an organic zinc rich paint	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is the barrier system free from humps, sags or other irregularities	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Are the barrier components free from splits, burrs or sharp edges after installation	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Does the barrier form a smooth line vertically and horizontally when viewed along the run	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Notes

Disclaimer:

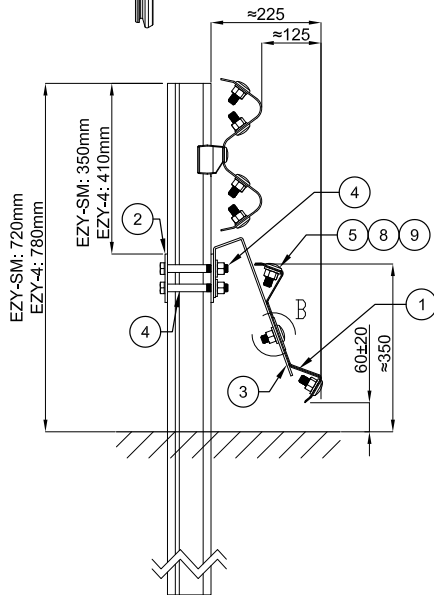
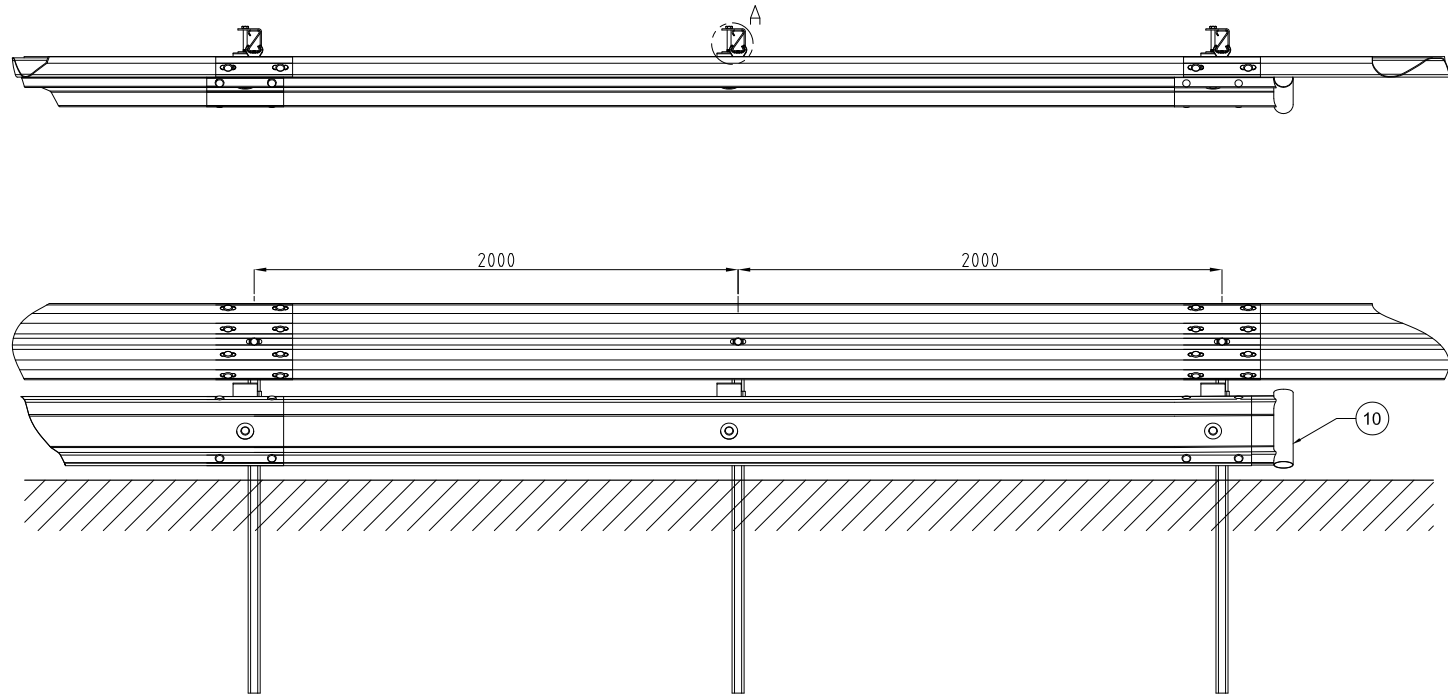
Important Note: The conformity of the installation is the responsibility of the installation contractor, and Ingal Civil Products accepts no liability for or in connection with any installation that is outside of the specifications of this manual or the NZTA. For more information, please refer to our Standard Terms and Conditions of Sale available on our website: www.ingalcivil.co.nz.



DETAIL B

NOTES:

1. ALL STEELWORK TO BE HOT DIP GALVANISED AFTER FABRICATION TO AS/NZS 4680 AND STRAIGHTENED AFTER GALVANISING IF REQUIRED.
2. TO BE READ IN CONJUNCTION WITH THE INGAL MPR PRODUCT MANUAL.



EZY-GUARD CONFIG - MPR BILL OF MATERIALS (4 m)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10006773	Motorcyclist protection beam
2	2	10007332	Z-Post Bracket
3	2	10006772	Rail mounting bracket
4	4	10003618	M16x130 Bolt, Nut & Washer
5	4	10001248	Round head bolt M16x32
6	2	10006769	Round head bolt M16x40
7	2	10006771	Slot Washer ø70x2
8	6	10006770	Washer ø35x17x4
9	6	10001254	M16 nut
10	1	10006767	MPR END TERMINAL

REVISIONS

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
8	26-05-2021	SECTION DIMS ADDED	VB	LG	LG
7	29-06-2020	ITEM 9 UPDATED	VB	LG	LG
6	29-05-2017	DIM CORRECTION	LG	BM	LG
5	25-05-2017	DIMS ADDED	MC	LG	MC
4	22-11-2016	WASHER QTY REDUCED	LG	MC	LG
3	17-11-2016	BOM CORRECTION	LG	MC	LG
2	26-07-2016	Z POST BRACKET PART NUMBER ADDED	MC	LG	MC
1	20-07-2015	BOM CORRECTION - ITEM 10	LG		

REFERENCES

DRAWING NUMBER	REFERENCE DRAWINGS

NAME	DATE
DRAWN	A.R. 28/07/2014
CHECKED	
APPROVED	
SCALE	N.T.S. @ A3
ISSUE FOR	INFORMATION ONLY



INGAL CIVIL PRODUCTS
57-65 AIRDS ROAD
MINTO, N.S.W.
AUSTRALIA 2566
PH. +61 2 9827 3333
FAX +61 2 9827 3300
www.ingalcivil.com.au

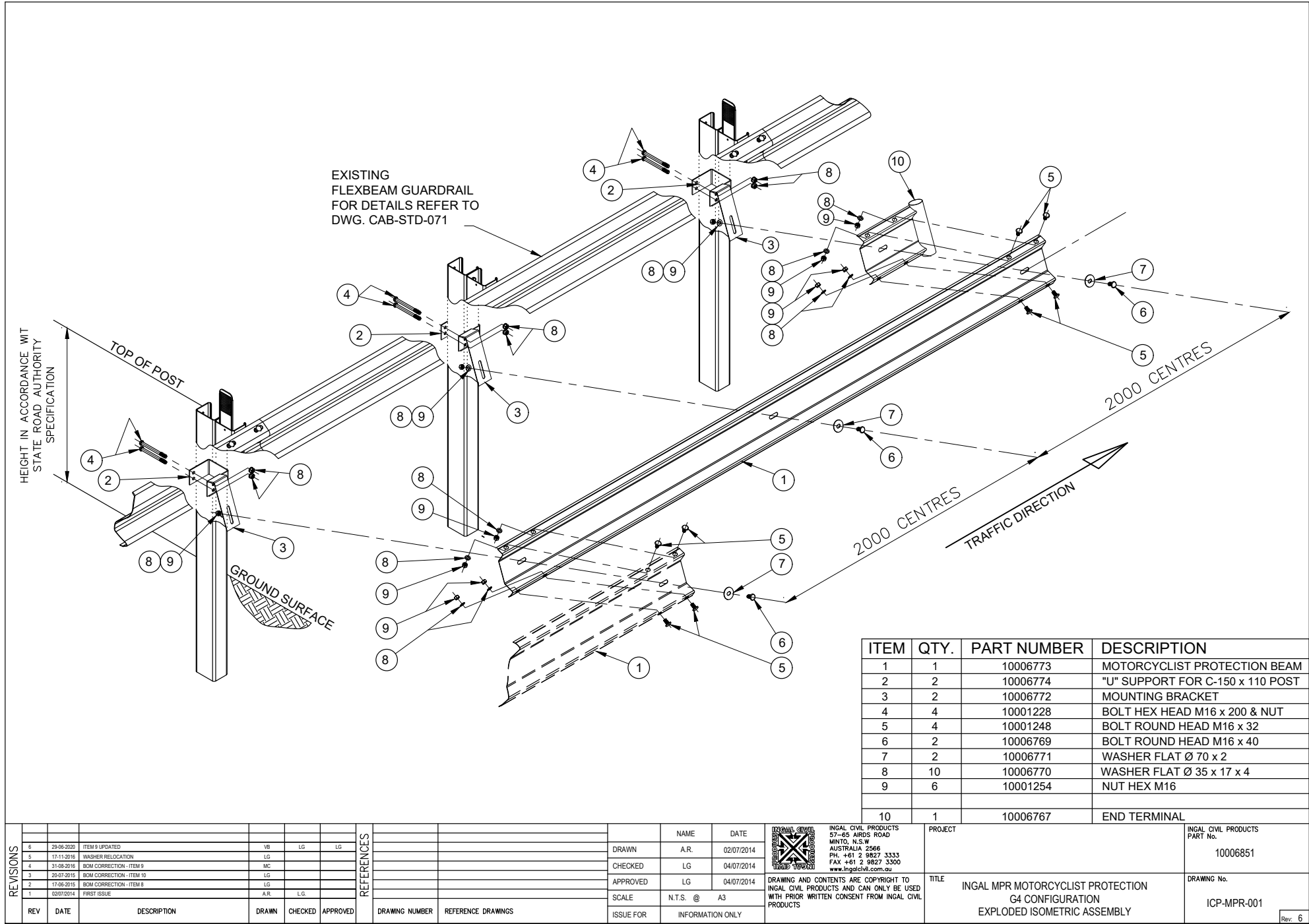
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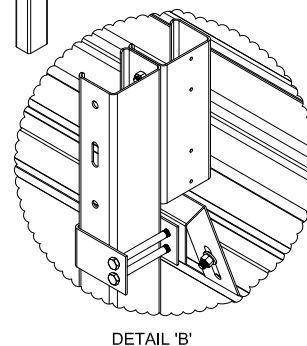
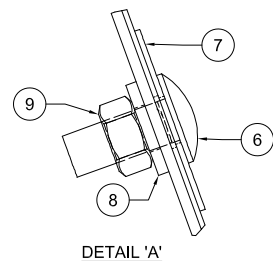
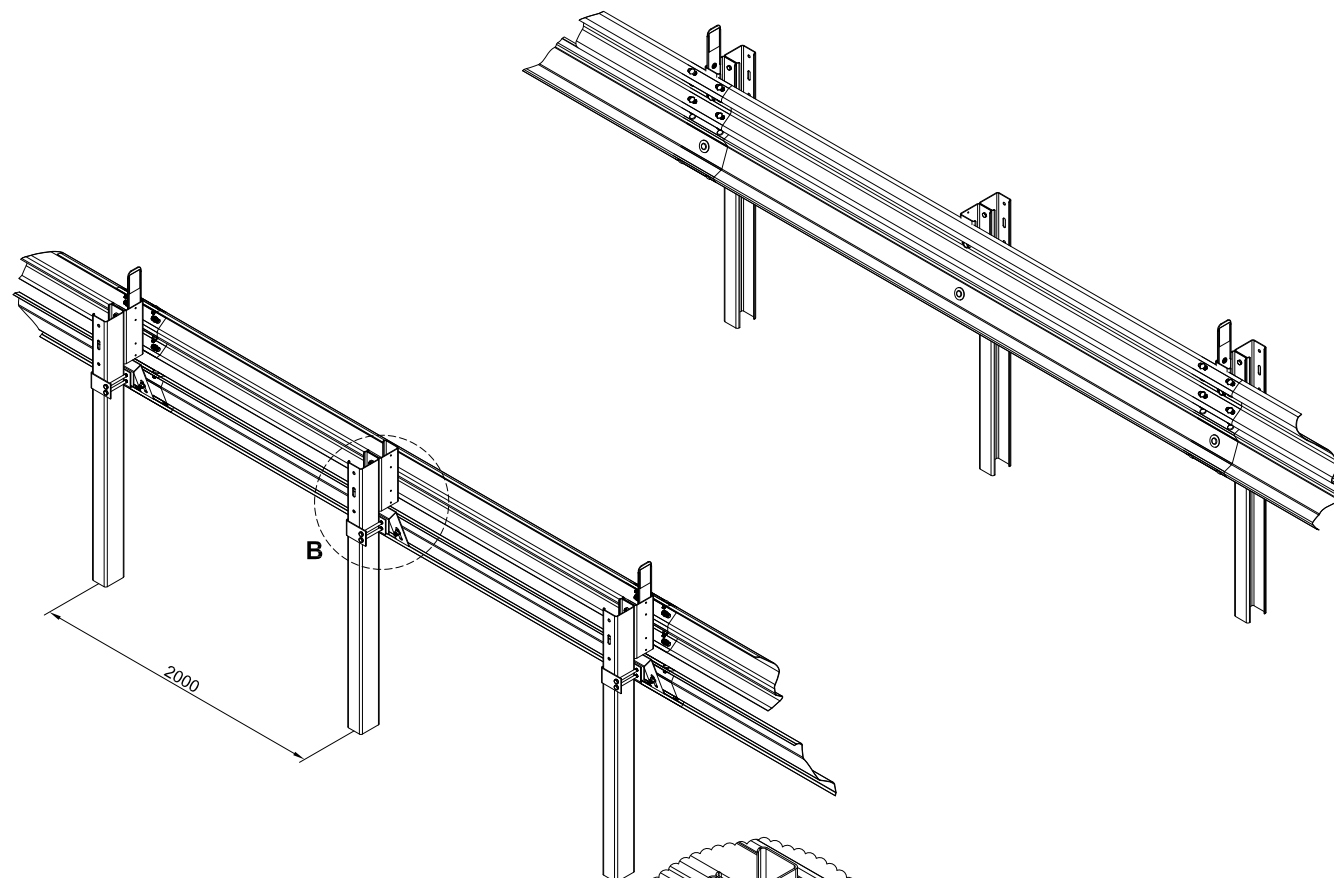
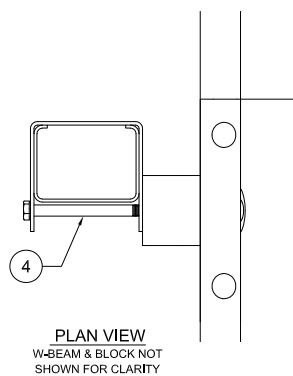
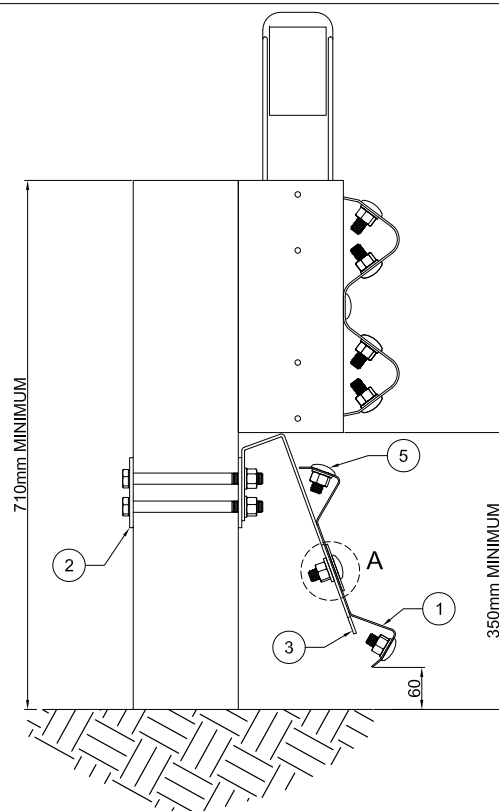
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INGAL CIVIL PRODUCTS PART No.	DRAWING No.
ICP-MPR-003	ICP-MPR-003

Rev: 8

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G4 CONFIG - MPR BILL OF MATERIALS (4 m)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10006773	Motorcyclist protection beam
2	2	10006774	MPS C-Post Bracket
3	2	10006772	Rail mounting bracket
4	4	10001228	M16x190 hex bolt
5	4	10001248	Round head bolt M16x32
6	2	10006769	Round head bolt M16x40
7	2	10006771	Slot Washer $\phi 70 \times 2$
8	10	10006770	Washer $\phi 35 \times 17 \times 4$
9	6	10001254	M16 nut

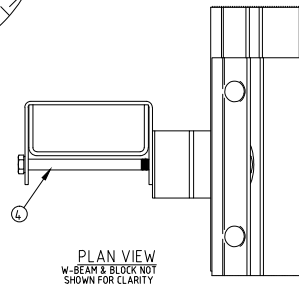
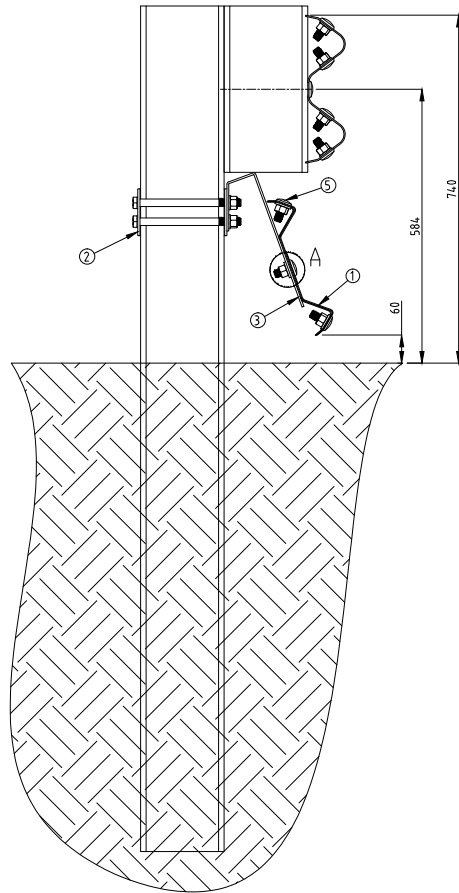
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5	05-08-2021	MIN HEIGHT DIMS ADDED	VB	LG	LG											N/A	
4	29-09-2020	ITEM 9 UPDATED	VB	LG	LG												
3	31-08-2019	BOM CORRECTION - ITEM 9	MC														
2	26-07-2019	BOM CORRECTION - ITEM 8	LG														



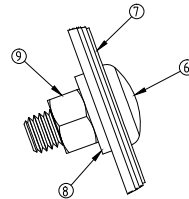
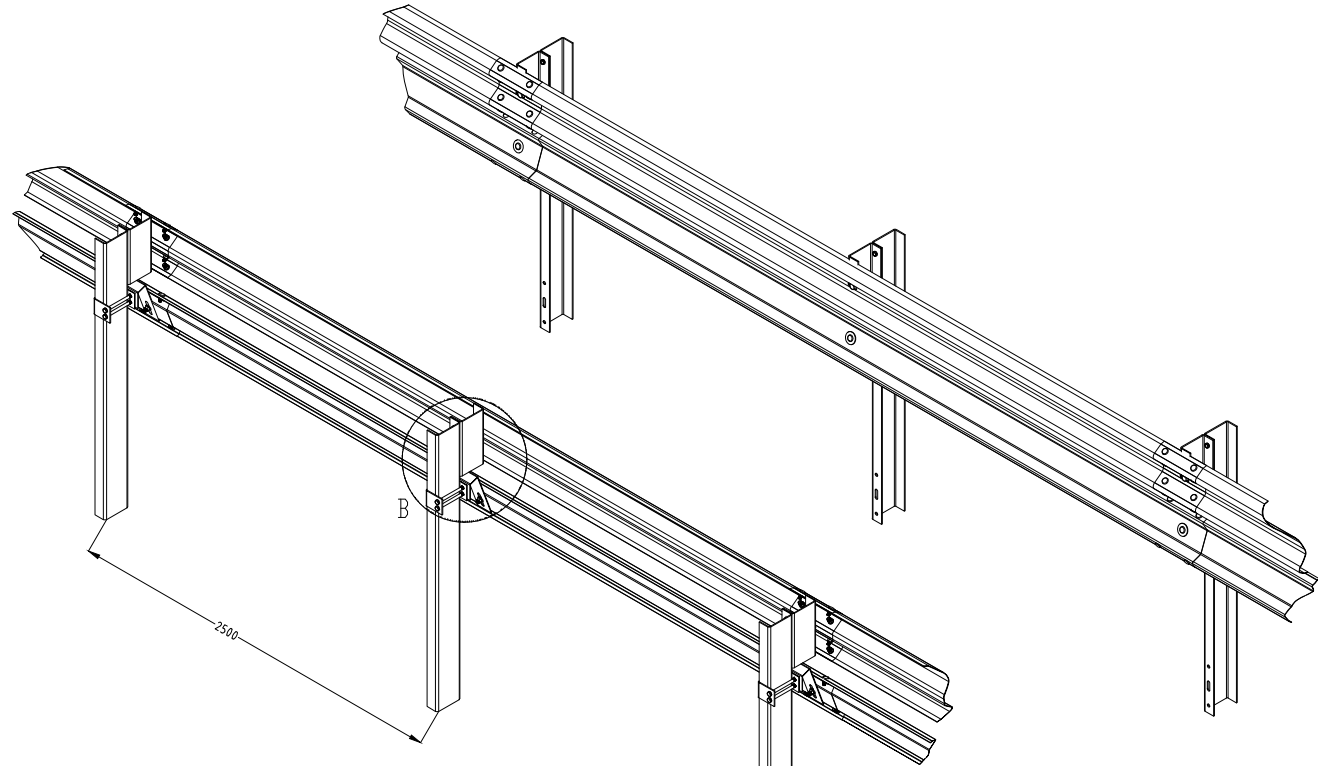
INGAL CIVIL PRODUCTS
57-65 AIRDS ROAD
MINTO, N.S.W.
AUSTRALIA 2566
PH. +61 2 9827 3333
FAX +61 2 9827 3300
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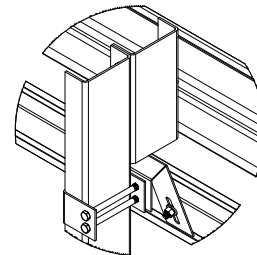
Rev. 5



PLAN VIEW
W-BEAM & BLOCK NOT
SHOWN FOR CLARITY



DETAIL A
1 : 2



DETAIL B
2 : 25

TYPE B - U-POST - BILL OF MATERIALS			
ITEM	QTY	PART No	DESCRIPTION
1	1	10007376	Motorcyclist protection beam 5m NLL
2	2	10006768	MPS U-Post bracket
3	2	10006772	Rail mounting bracket
4	4	10004064	M16x220 HEX HEAD BOLT GALV
5	4	10001248	Round head bolt M16x32
6	2	10006769	Round head bolt M16x40
7	2	10006771	Slot washer ϕ 70x2
8	10	10006770	Washer ϕ 35x17x4
9	10	10007834	M16 nut

REVISIONS			REFERENCES			DRAWING INFORMATION			PROJECT			DRAWING No.		
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									APPROVED	LG	11-12-2014			
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									ISSUE FOR	INFORMATION ONLY				



INGAL CIVIL PRODUCTS
57-65 AIRDS ROAD
MINTO, N.S.W.
AUSTRALIA 2566
PH. +61 2 9827 3333
FAX +61 2 9827 3300
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PROJECT

TITLE

INGAL MPR MOTORCYCLIST PROTECTION
TYPE-B GUARDRAIL CONFIGURATION
ASSEMBLY DETAILS

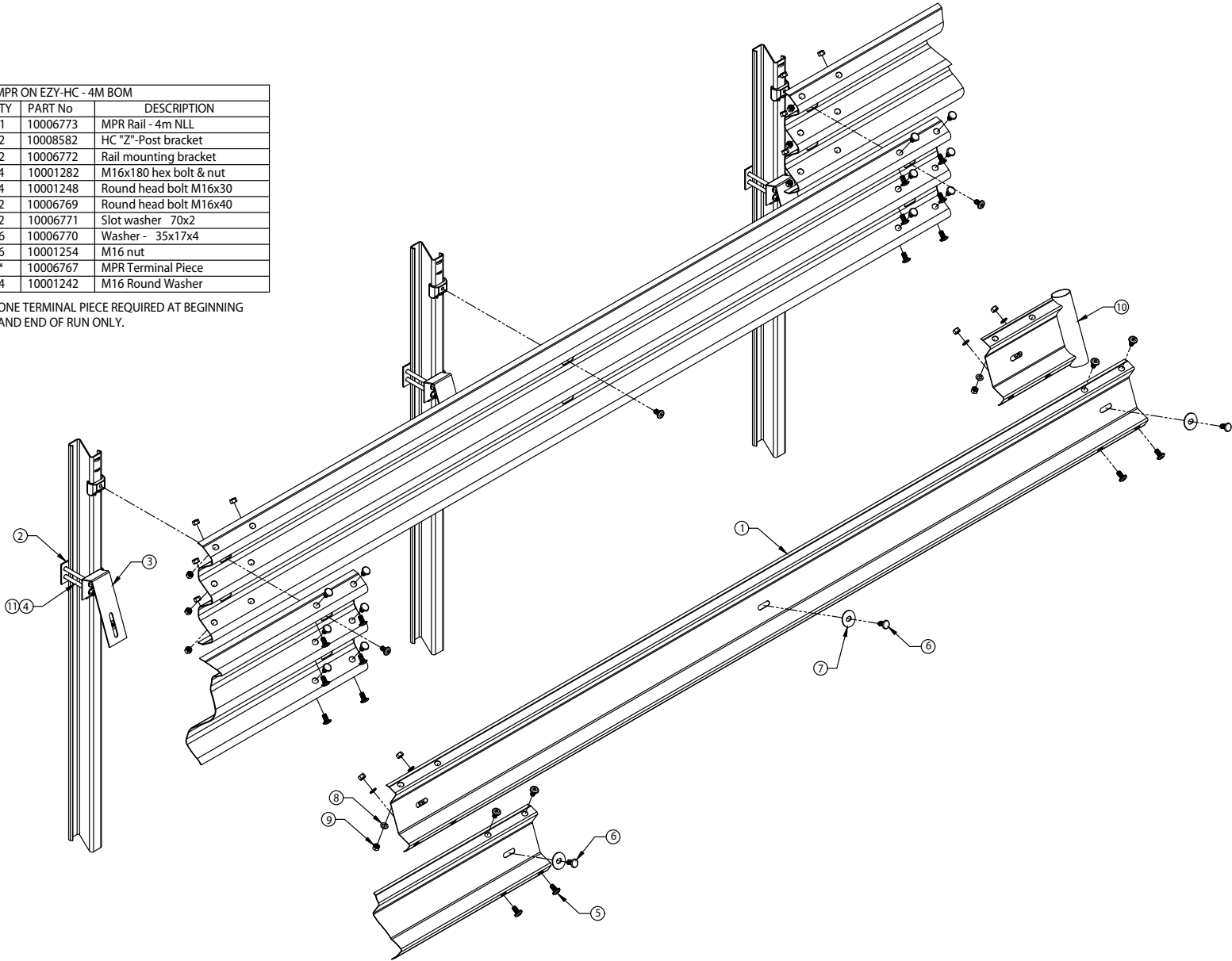
INGAL CIVIL PRODUCTS
PART No.

DRAWING No.

ICP-MPR-004

INGAL MPR ON EZY-HC - 4M BOM				
ITEM	QTY	PART No	DESCRIPTION	
1	1	10006773	MPR Rail - 4m NLL	
2	2	10008582	HC "Z"-Post bracket	
3	2	10006772	Rail mounting bracket	
4	4	10001282	M16x180 hex bolt & nut	
5	4	10001248	Round head bolt M16x30	
6	2	10006769	Round head bolt M16x40	
7	2	10006771	Slot washer 70x2	
8	6	10006770	Washer - 35x17x4	
9	6	10001254	M16 nut	
10	*	10006767	MPR Terminal Piece	
11	4	10001242	M16 Round Washer	

* ONE TERMINAL PIECE REQUIRED AT BEGINNING AND END OF RUN ONLY.

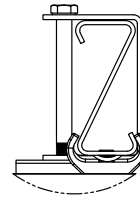
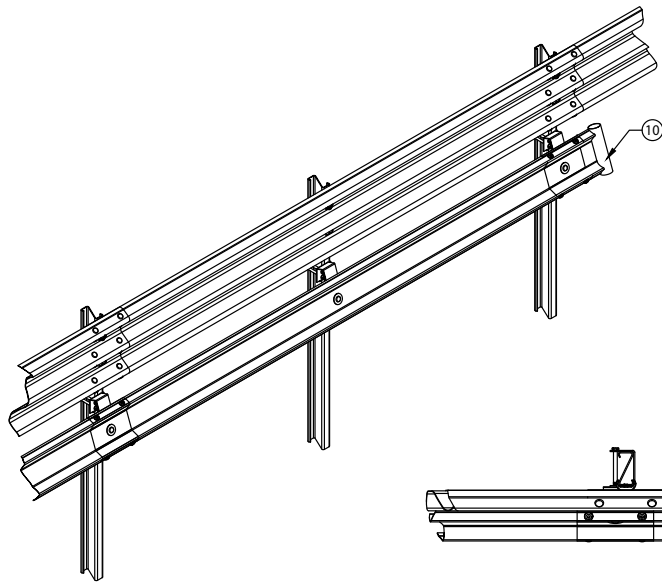


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1	17-08-2020	UPDATED QUANTITY FOR ITEM 8	VB	LG	LG			WD	09-03-2018	N.T.S.	INFORMATION ONLY					INGAL MPR - MOTORCYCLIST PROTECTION EZY-GUARD HC CONFIG EXPLODED ASSEMBLY	ICP-MPR-015	1		

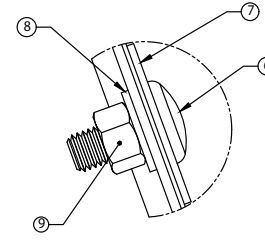


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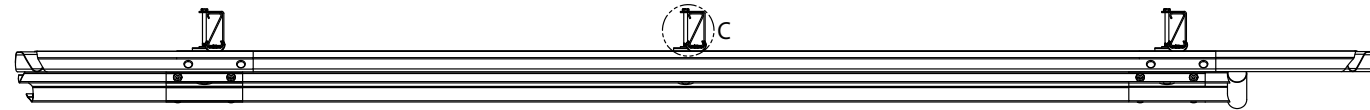
DETAIL C



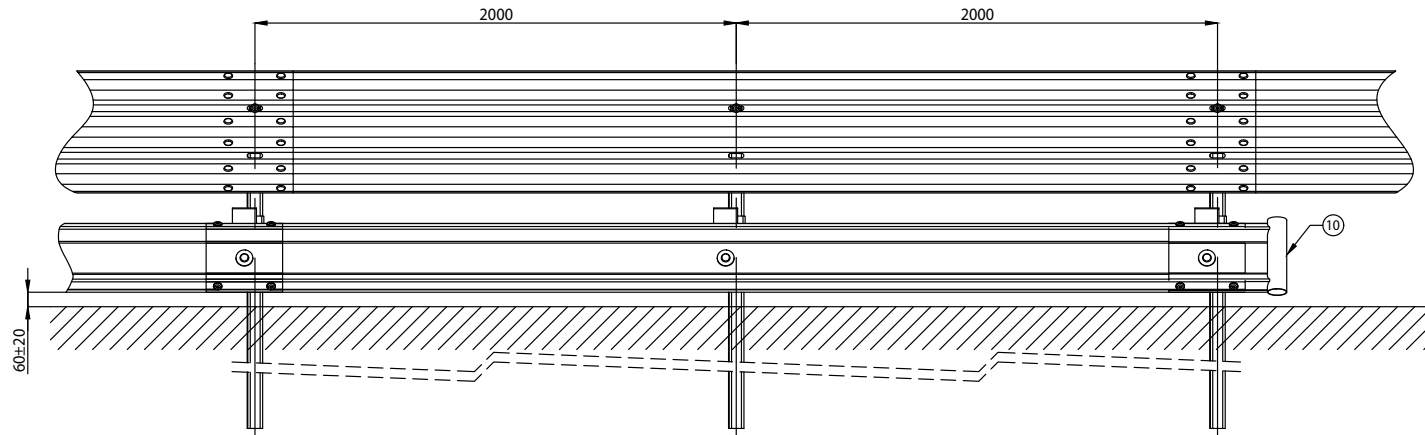
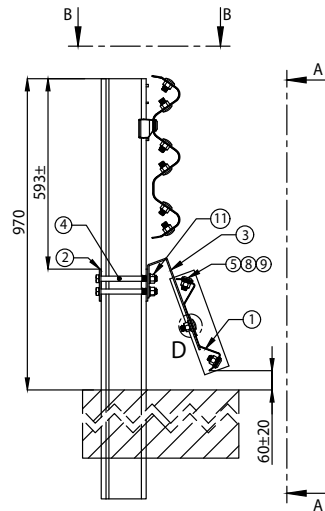
DETAIL D

INGAL MPR ON EZY-HC - 4M BOM			
ITEM	QTY	PART No	DESCRIPTION
1	1	10006773	MPR Rail - 4m NLL
2	2	10008582	HC "Z"-Post bracket
3	2	10006772	Rail mounting bracket
4	4	10001282	M16x180 hex bolt & nut
5	4	10001248	Round head bolt M16x30
6	2	10006769	Round head bolt M16x40
7	2	10006771	Slot washer 70x2
8	6	10006770	Washer - 35x17x4
9	6	10001254	M16 nut
10	*	10006767	MPR Terminal Piece
11	4	10001242	M16 Round Washer

* ONE TERMINAL PIECE REQUIRED AT BEGINNING AND END OF RUN ONLY.



SECTION B-B



SECTION A-A

NOTES:
1. ALL STEELWORK TO BE HOT DIP GALVANISED AFTER FABRICATION TO AS/NZS4680.

REVISIONS			REFERENCES			NAME			DATE			PROJECT		
REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED	DRAWING NUMBER	REFERENCE DRAWINGS	SCALE	N.T.S. @	A3	ISSUE FOR	INFORMATION ONLY	TITLE	INGAL CIVIL PRODUCTS PART No.
1	17-06-2020	UPDATED QUANTITY FOR ITEM 8	VB	LG	LG								INGAL MPR - MOTORCYCLIST PROTECTION EZY-GUARD HC CONFIG GENERAL ARRANGEMENT	DRAWING No. ICP-MPR-014



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MINTO, N.S.W 2566
PH. +61 2 9827 3333
www.ingalcivil.com.au



Ingal MPR Motorcyclist Protection





For more information

contact us on the web

www.ingalcivil.co.nz

Auckland

12 Offenhauser Drive, East Tamaki,
Auckland 2013, New Zealand
Ph: 09 920 838
Email: sales@ingalcivil.co.nz

Christchurch Ph: 021 1983 311

Wellington Ph: 021 2464 997

Head Office: Sydney

57-65 Airds Road, Minto, NSW 2566
Ph: +61 2 9827 3333
Fax: +61 2 9827 3300
Local call (within Australia):
1300 446 425
Email: sales@ingalcivil.com.au