

Ingals MPR

Motorcyclist Protection

Product Manual

MASH TL3 COMPLIANT

EN1317-8 COMPLIANT



Release 12/23

www.ingalcivil.com.au

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.

2.0 Specification

Ingal MPR Rail Length:	4m NLL
4m MPR Rail Mass:	12.3kg
Ingal MPR System Mass:	4.65kg per metre
Rail Height Above Ground:	60mm
Post Spacing:	2m or 2.5m
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.

Ingal MPR has also been crash tested to MASH Test Level 3, this is the containment of a 2270kg utility and 1100kg car at 100 km/h.



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 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.

6.0 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.

6.1 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.



6.2 Assembly

Refer detailed assembly drawings to end of this manual. Typical assembly steps as follows.

6.2.1 Assembly with Post Bracket

- Step 1a 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 2a 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.



6.2.2 Assembly with U-Bolt (Ezy-Guard 4 only)

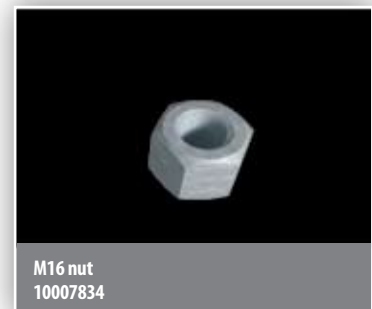
- Step 1b Assembly should be initiated with placing the M12 U-Bolt into the guardrail posts with specific pre-drilled mounting holes. The bolt will be inserted from the inside to the outside of the Z-post
- Step 2b Attach the rail mounting bracket to the U-Bolt and secure to post via two flanged M12 flanged 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.

6.2.3 Assembly of Ingall MPR Rail

- 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.

6.3 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 12m. Contact your local Ingall office for details.



Ingal MPR Installation Checklist

Customer:

Project:

Barrier ID:

Barrier Length:

Checked By:

Signed:

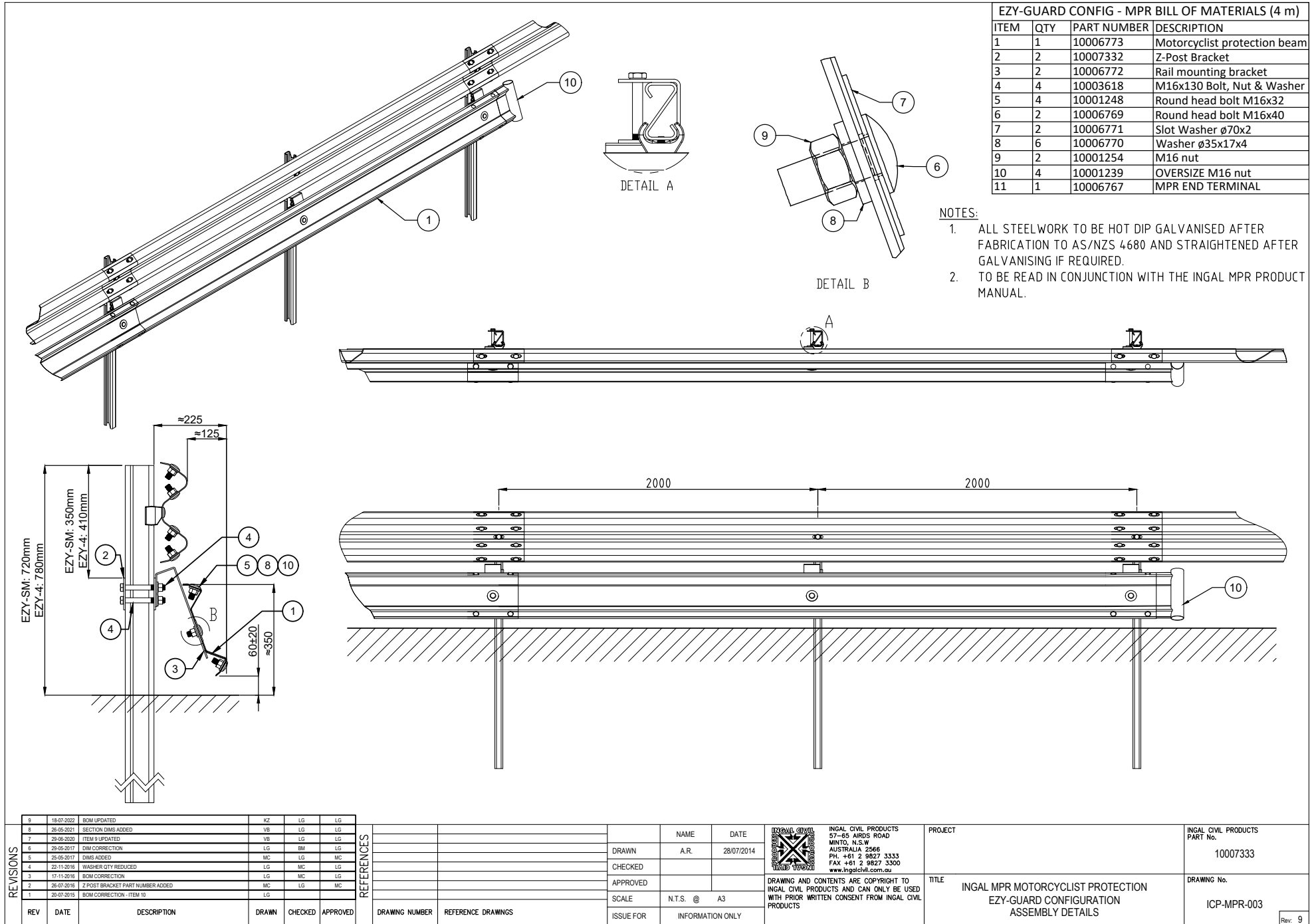
Date

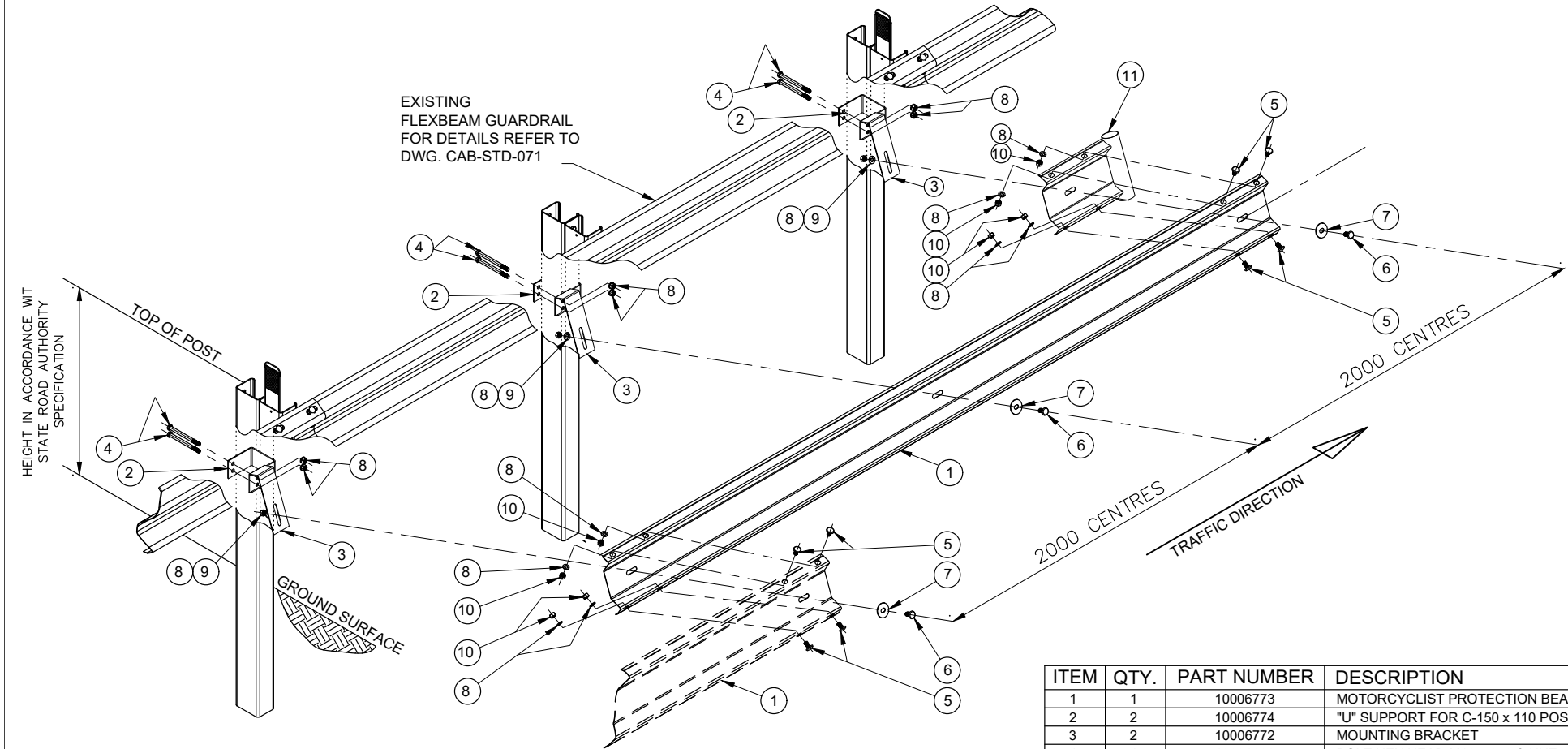
Is the MPR rail ground clearance within tolerance of 60mm \pm 20mm	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has each end of the run been terminated with an MPR Terminal End	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have all fasteners been tightened to snug tight	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has a \varnothing 70 x 2mm slot washer been used on the traffic side of the rail mounting	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has a \varnothing 35 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 Road Controlling Authority. For more information, please refer to our Standard Terms and Conditions of Sale available on our website: www.ingalcivil.com.au.

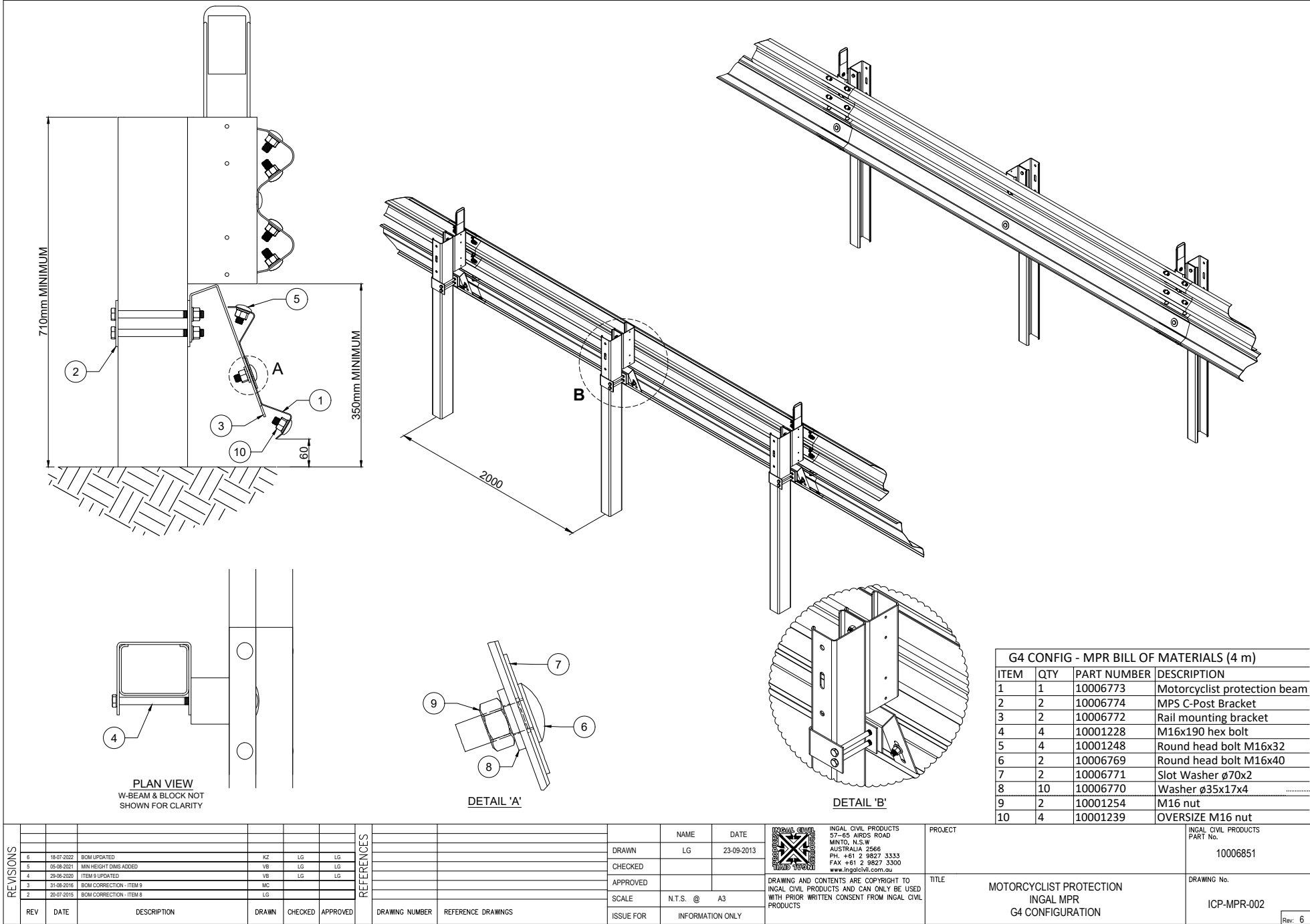


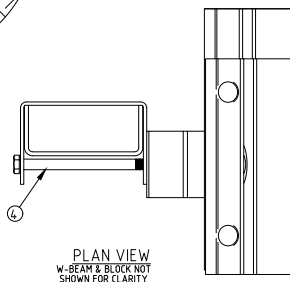
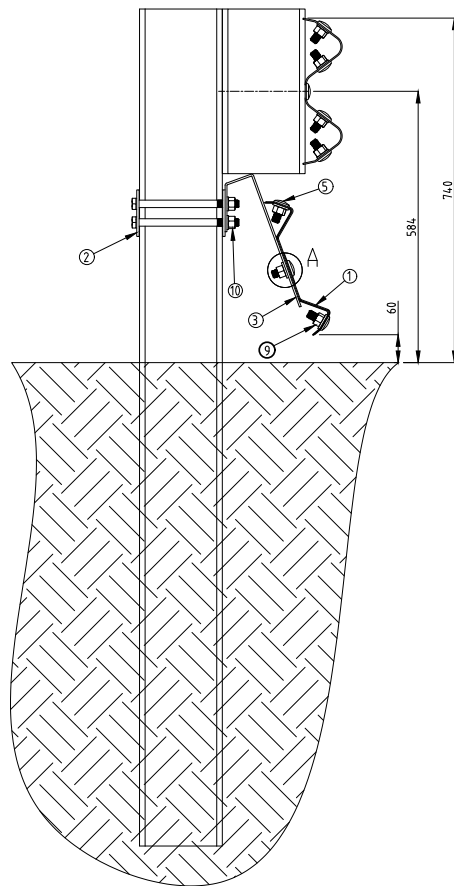


ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	10006773	MOTORCYCLIST PROTECTION BEAM
2	2	10006774	"U" SUPPORT FOR C-150 x 110 POST
3	2	10006772	MOUNTING BRACKET
4	4	10001228	BOLT HEX HEAD M16 x 200 & NUT
5	4	10001248	BOLT ROUND HEAD M16 x 32
6	2	10006769	BOLT ROUND HEAD M16 x 40
7	2	10006771	WASHER FLAT Ø 70 x 2
8	10	10006770	WASHER FLAT Ø 35 x 17 x 4
9	2	10001254	NUT HEX M16
10	4	10001239	OVERSIZE NUT HEX M16
11	1	10006767	END TERMINAL

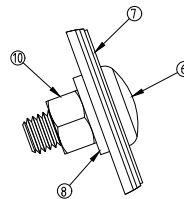
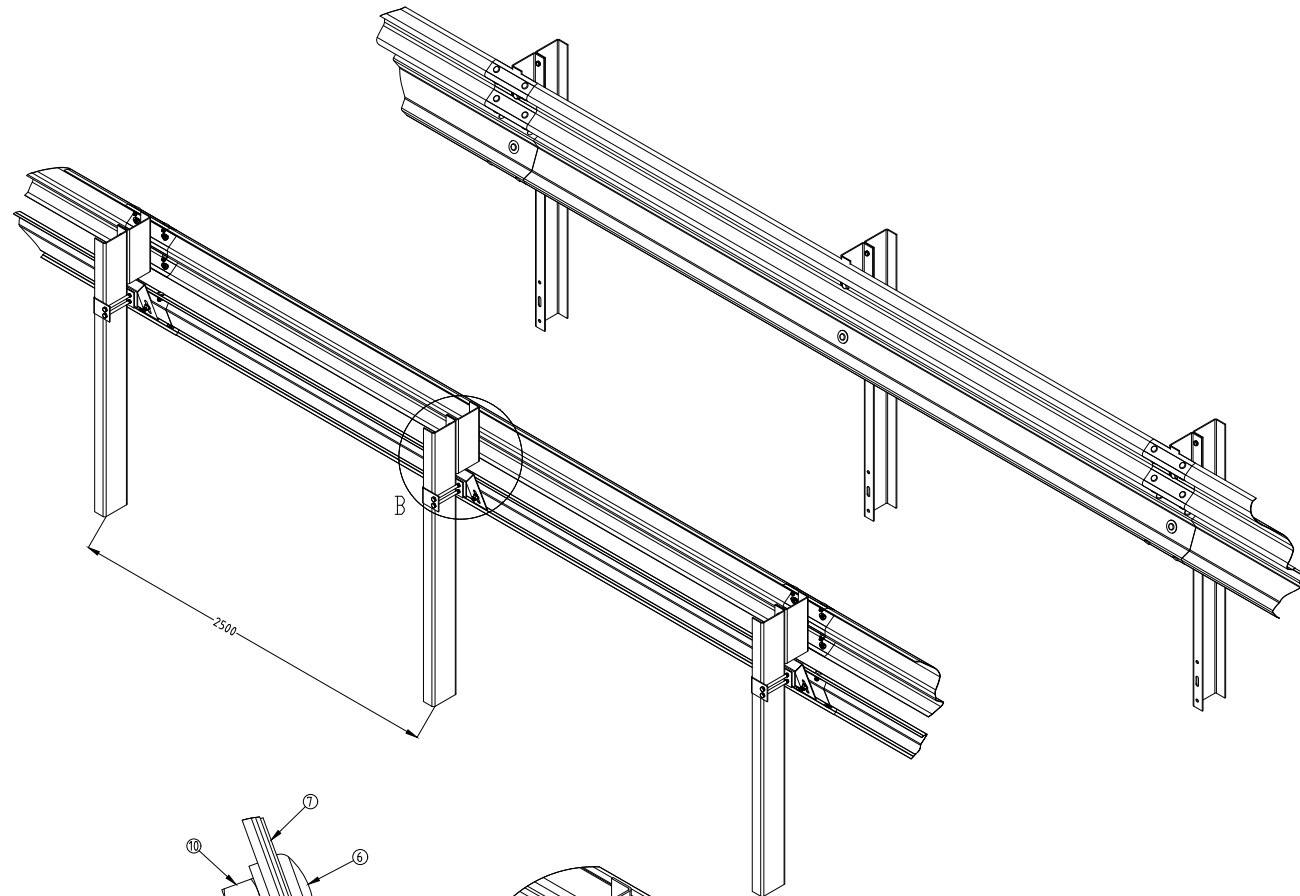
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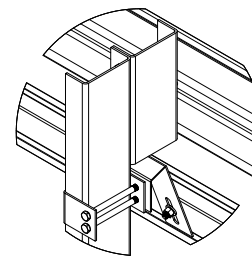




PLAN VIEW
W-BEAM & BLOCK NOT
SHOWN FOR CLARITY




DETAIL A
1 : 2



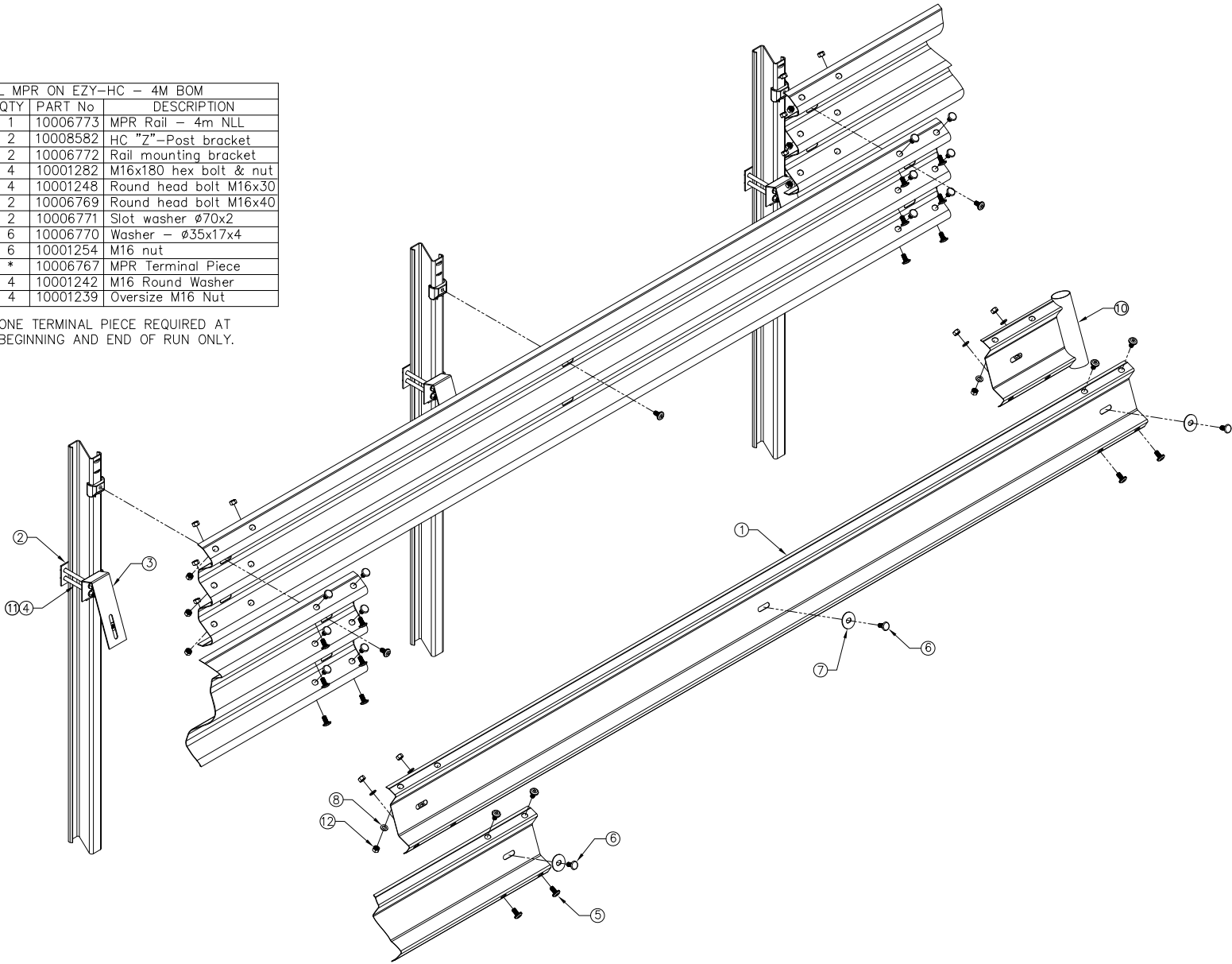
DETAIL B
2 : 25


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	4	10001239	OVERSIZE M16 nut
10	6	10001254	M16 nut Grade 8.8

REVISIONS							REFERENCES			NAME	DATE		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	PROJECT	INGAL CIVIL PRODUCTS PART No.	
3	18-07-2022	BOM UPDATED	KZ	LG	LG			DRAWN	A.R.	11-12-2014					10007768	
2	29-06-2020	ITEM 9 UPDATED	VB	LG	LG			CHECKED	LG	11-12-2014						
1	30-10-2015	BOM UPDATED	MC	LG	LG			APPROVED	LG	11-12-2014						
0	11-12-2014	ORIGINAL ISSUE	AR	LG	LG			SCALE	N.T.S. @	A3						
REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED	DRAWING NUMBER	REFERENCE DRAWINGS	ISSUE FOR	INFORMATION ONLY		DRAWING AND CONTENTS ARE COPYRIGHT TO INGAL CIVIL PRODUCTS AND CAN ONLY BE USED WITH PRIOR WRITTEN CONSENT FROM INGAL CIVIL PRODUCTS		TITLE	DRAWING No.		
													INGAL MPR MOTORCYCLIST PROTECTION TYPE-B GUARDRAIL CONFIGURATION ASSEMBLY DETAILS		ICP-MPR-004	
															Rev: 3	

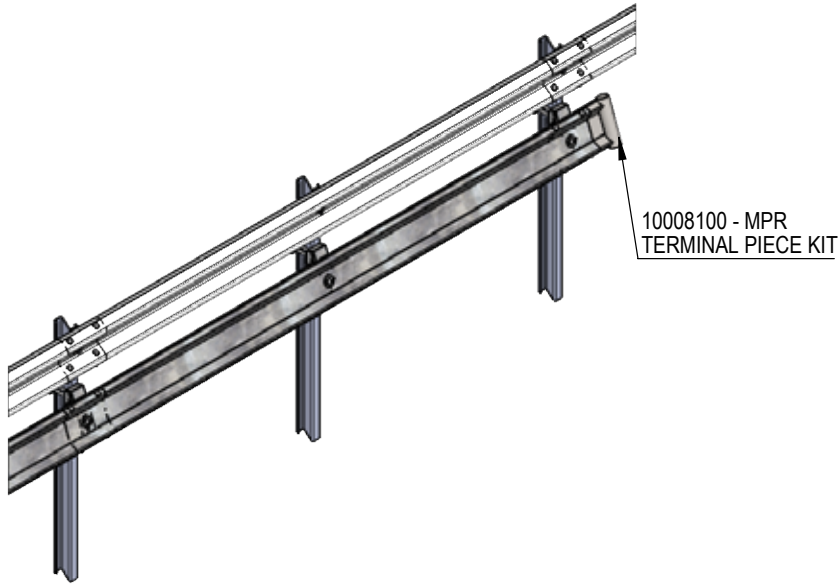
INGAL MPR ON EZY-HC – 4M BOM			
ITEM	QTY	PART No	DESCRIPTION
1	1	10006773	MPR Rail – 4m NLL
2	2	10008582	HC "Z"-Post bracket
3	2	10006772	Rail mounting bracket
4	4	10001282	M16x180 hex bolt & nut
5	4	10001248	Round head bolt M16x30
6	2	10006769	Round head bolt M16x40
7	2	10006771	Slot washer Ø70x2
8	6	10006770	Washer – Ø35x17x4
9	6	10001254	M16 nut
10	*	10006767	MPR Terminal Piece
11	4	10001242	M16 Round Washer
12	4	10001239	Oversize M16 Nut

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

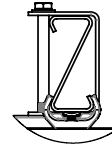


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REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED	DRAWING NUMBER	REFERENCE DRAWINGS	SCALE	ISSUE FOR		TITLE	DRAWING No.
1	26-07-2022	EZY-LDS DETAILS ADDED		KZ	LG			DRAWN	WD	09-03-2018	INGAL MPR - MOTORCYCLIST PROTECTION EZY-GUARD HC/LDS CONFIG EXPLODED ASSEMBLY	10009373
2	16-07-2022	BOM UPDATE		KZ	LG			CHECKED	HF	09-03-2018		
1	17-08-2020	UPDATED QUANTITY FOR ITEM 8		VB	LG			APPROVED	LG	09-03-2018		
												ICP-MPR-015
										<small>57-65 AIRDS ROAD MINTO, N.S.W 2566</small> <small>PH. +61 2 9827 3333 www.ingalcivil.com.au</small>		Rev: 3

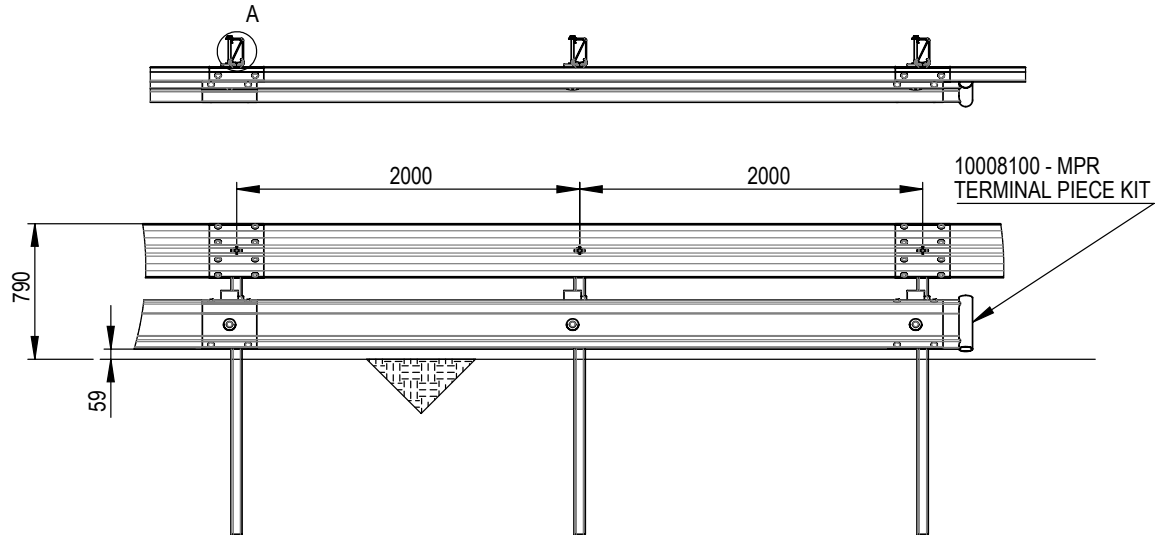
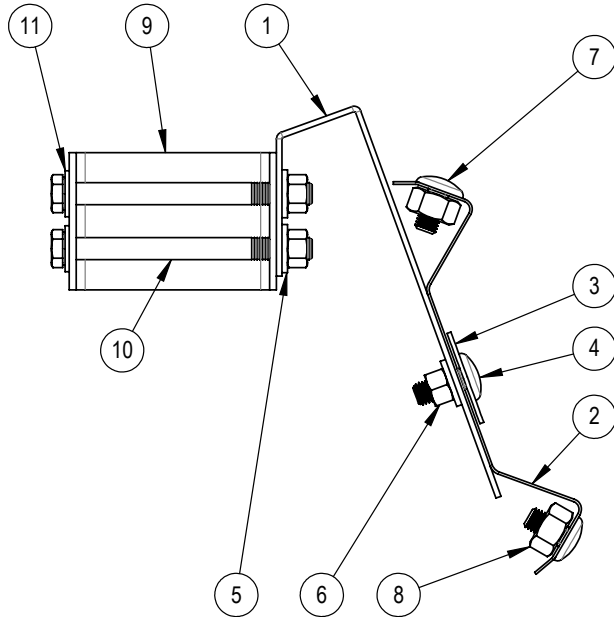
2:SALES & MARKETINGDRAWINGSINGAL MPRICP-MPR-015 - EZY-GUARD HC/LDS EXPLODED ASSEMBLY.DWG



10008100 - MPR
TERMINAL PIECE KIT




DETAIL A
SCALE 1 : 10



NOTE:

1. ALL STEELWORK TO BE HOT DIP GALVANISED AFTER FABRICATION TO AS/NZS4680
2. TO BE READ IN CONJUNCTION WITH THE INGAL MPR PRODUCT MANUAL
3. EZY-GUARD HD SYSTEM SHOWN FOR ILLUSTRATION
4. ONE TERMINAL PIECE KIT REQUIRED AT BEGINNING AND END OF RUN ONLY

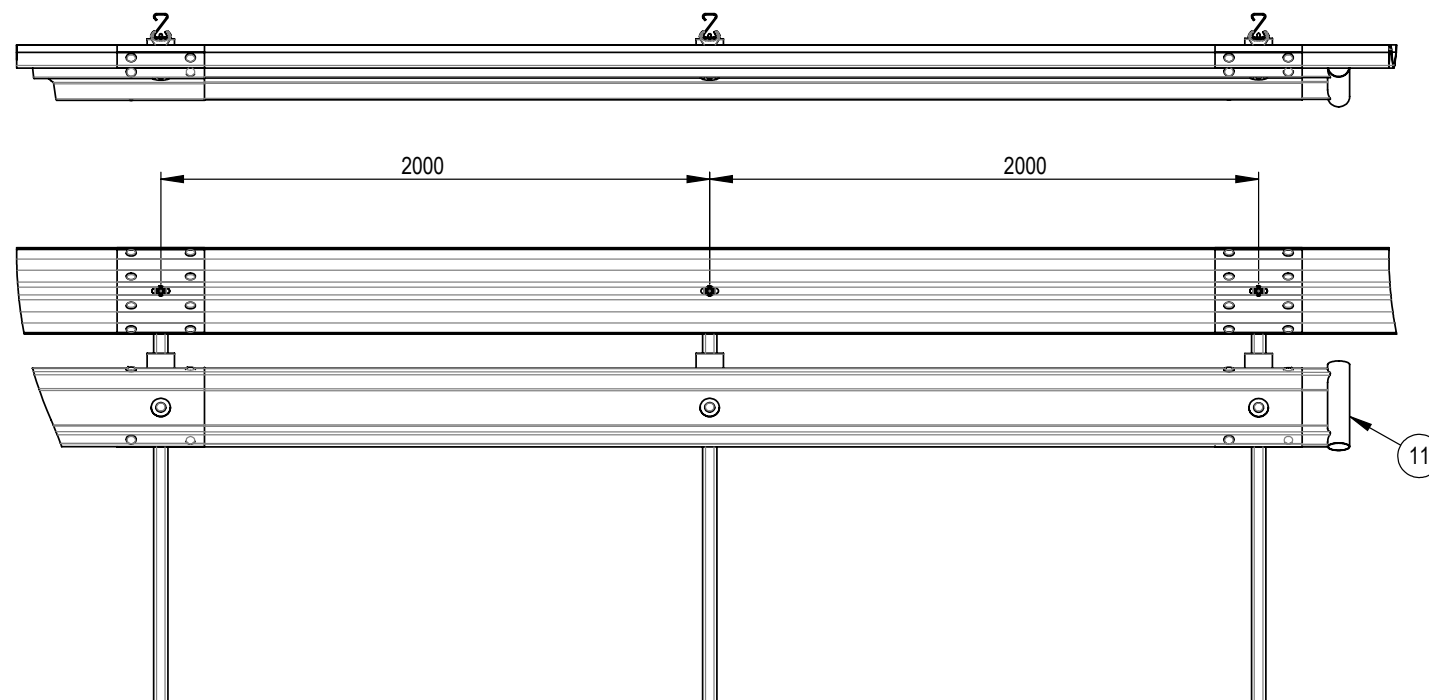
ID	DESCRIPTION	PART NO.	QTY.
1	MPR MOUNTING BRACKET	10006772	2
2	MPR RAIL 4m NLL	10006773	1
3	MPR 70 DIA SLOTTED WASHER	10006771	2
4	M16 X 40mm SPLICE BOLT	10006769	2
5	MPR M16 WASHER OD35 ID17 4mm THICK	10006770	6
6	M16 NUT GRADE 8.8	10001254	2
7	M16 X 32 SPLICE BOLT	10001248	4
8	M16 OVERSIZE NUT	10001239	4
9	HC Z-POST MPR BRACKET	10008582	2
10	M16 x 180mm HEX HEAD BOLT NUT GRADE 8.8 GALV	10001282	4
11	M16 ROUND WASHER 33.5 x 17.5 x 3mm	10001242	4


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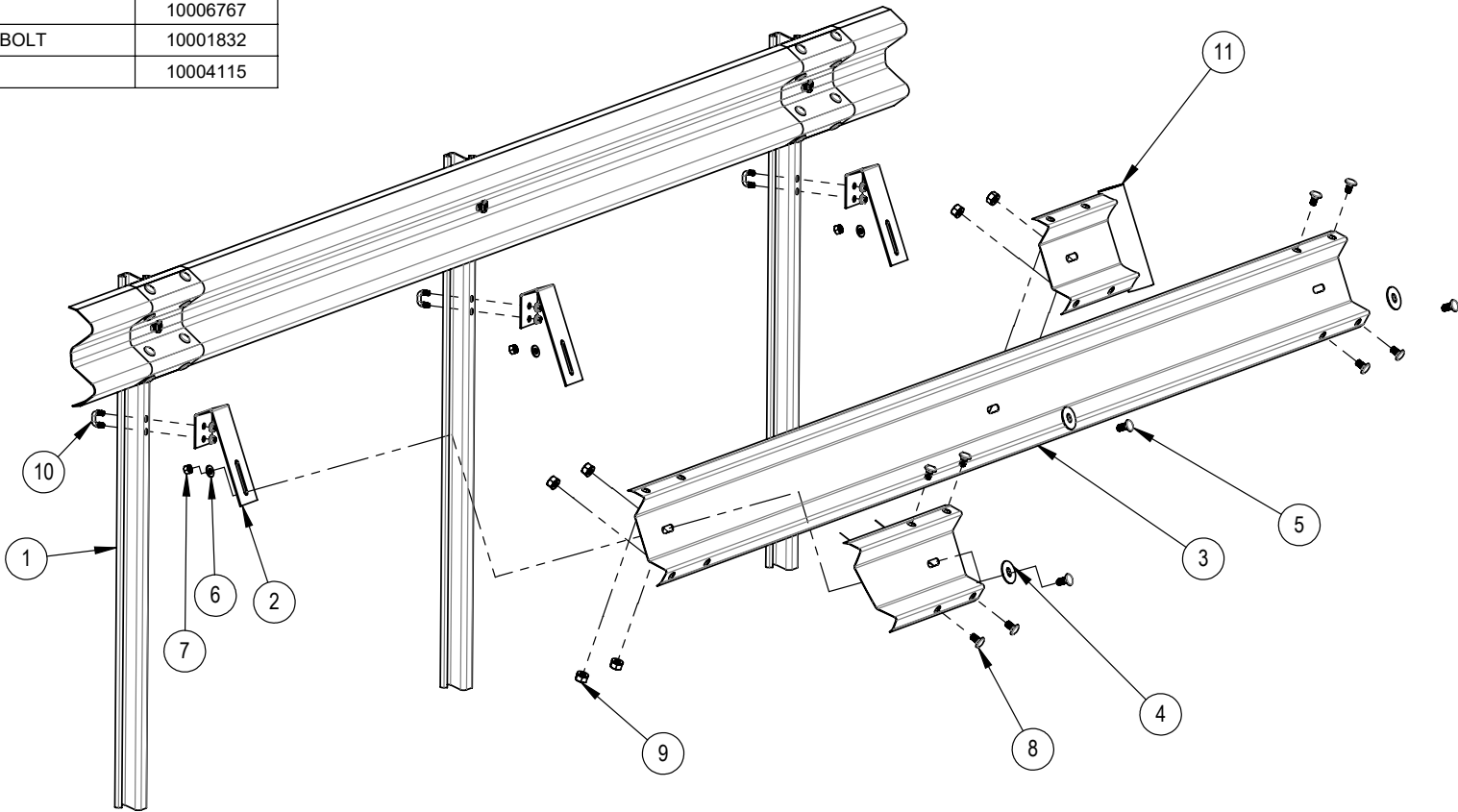
NOTE:


1. ALL STEEL WORK TO BE HDGALV AFTER FABRICATION TO AS/NZS 4680 AND STRAIGHTENED AFTER GALVANISING IF REQUIRED
2. TO BE READ IN CONJUNCTION WITH THE INGAL MPR PRODUCT MANUAL



REVIEWS											<div><div>INGAL CIVIL PRODUCTS a valmont COMPANY</div></div>	PROJECT		INGAL CIVIL PRODUCTS PART No.	
												TITLE		DRAWING No.	
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											REFERENCES				
											DRAWN	KZ	10-08-2023		
											CHECKED	LG	10-08-2023		
											APPROVED	LG	10-08-2023		
											SCALE	1:25	SHEET: 1 of 1		
											ISSUE FOR				
											DRAWING NUMBER	REFERENCE DRAWINGS			
											DRAWING AND CONTENTS ARE COPYRIGHT TO INGAL CIVIL PRODUCTS AND CAN ONLY BE USED WITH PRIOR WRITTEN CONSENT FROM INGAL CIVIL PRODUCTS 57-45 AIRDS ROAD MONTELS, P.E.J.W. ZGAA PH +1 2 9827 3333 www.ingalcivil.com/en				
1	16/08/2023	ADDED PART NUMBER FOR THE POST							KZ	L.O	L.O				
REV.	DATE	DESCRIPTION							DRAWN	CHECKED	APPROVED				

ID	DESCRIPTION	PART NO.
1	EZY-GUARD 4 Z-POST 1650mm - WITH MPR HOLES	10010576
2	MPR MOUNTING BRACKET	10006772
3	MPR RAIL 4m NLL	10006773
4	MPR 70 DIA SLOTTED WASHER	10006771
5	M16 X 40mm SPLICE BOLT	10006769
6	MPR M16 WASHER OD35 ID17 4mm THICK	10006770
7	M16 NUT GRADE 8.8	10001254
8	M16 X 32 SPLICE BOLT	10001248
9	M16 OVERSIZE NUT	10001239
10	M12 SQUARE U-BOLT & NUT KIT 27 x 30mm	10010370
11	MPR END PIECE	10006767
12	M16 x 30mm EZY-GUARD SMART POST BOLT	10001832
13	EZY-GUARD CARRIAGE	10004115



REVISED							REFERENCES				NAME	DATE		PROJECT	INGAL CIVIL PRODUCTS PART NO.	
									DRAWN	KZ	10-08-2023					
									CHECKED	LG	10-08-2023					
									APPROVED	LG						
									SCALE	1:20	SHEET: 1 of 1					
1	16/08/2023	ADDED PART NUMBER TO THE POST				KZ	LG	LG				DRAWING AND CONTENTS ARE COPYRIGHT TO INGAL CIVIL PRODUCTS AND CAN ONLY BE USED WITH PRIOR WRITTEN CONSENT FROM INGAL CIVIL PRODUCTS	TITLE	MPR EZY-GUARD 4 CONFIGURATION WITH U-BOLT - EXPLODED	DRAWING No. ICP-MPR-021	
REV	DATE	DESCRIPTION				DRAWN	CHECKED	APPROVED	DRAWING NUMBER	REFERENCE DRAWINGS	ISSUE FOR					37-45 AIRDS ROAD MINTO, N.S.W 2566 PH: +61 2 9827 3333 www.ingalcivil.com.au

FOLDER: F:\ENGINEERING\3. CURRENT DRAWINGS\COMPONENT DRAWINGS\SLDDRW\B. SOLID MODEL\INGAL MPR\CURRENT DRAWING\MODEL





For more information

contact us on the web

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Email: sales@ingalcivil.com.au

Our Locations:

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• Melbourne • Newcastle

• Perth • Sydney • Wagga

• Auckland • Christchurch