

Product Manual

MASH TL3 COMPLIANT

EN1317-8 COMPLIANT



Release 05/24

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

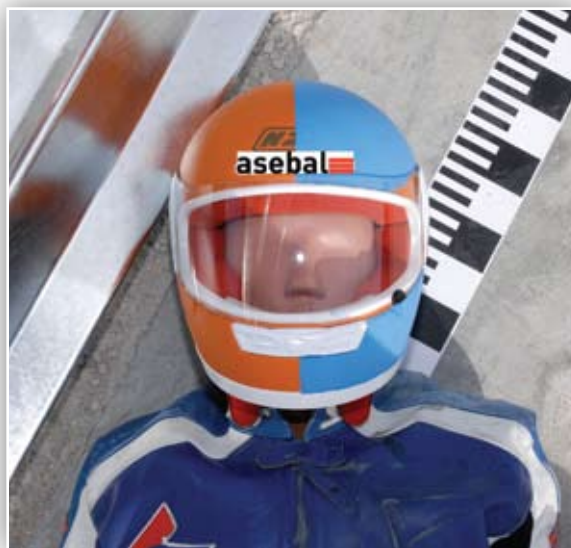
Ingal MPR Rail Length:	3.81m NLL
4m MPR Rail Mass:	12.3kg
Ingal MPR System Mass:	4.65kg per metre
Rail Height Above Ground:	60mm
Post Spacing:	1.905m
Ingal MPR Crash Test Impact Severity:	Level 1

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.

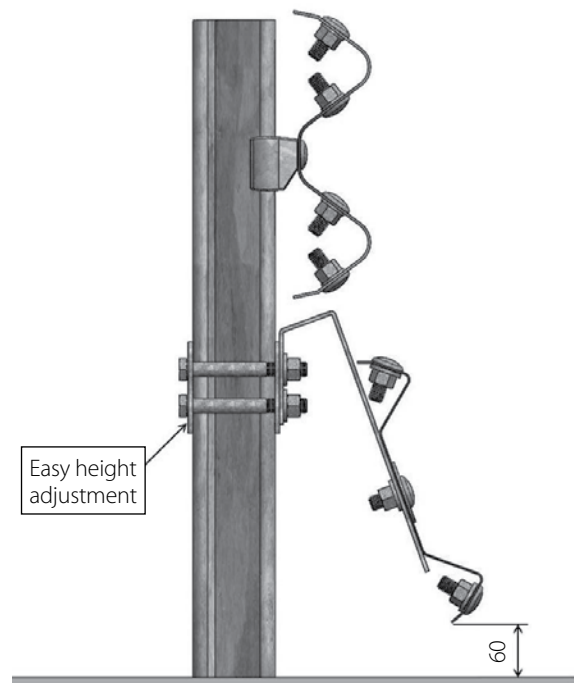
5.0 Installation

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 12m. Contact your local Ingal office for details.



Ingal MPR Installation Checklist

Customer:

Project:

Barrier ID:

Barrier Length:

Checked By:

Signed:

Date

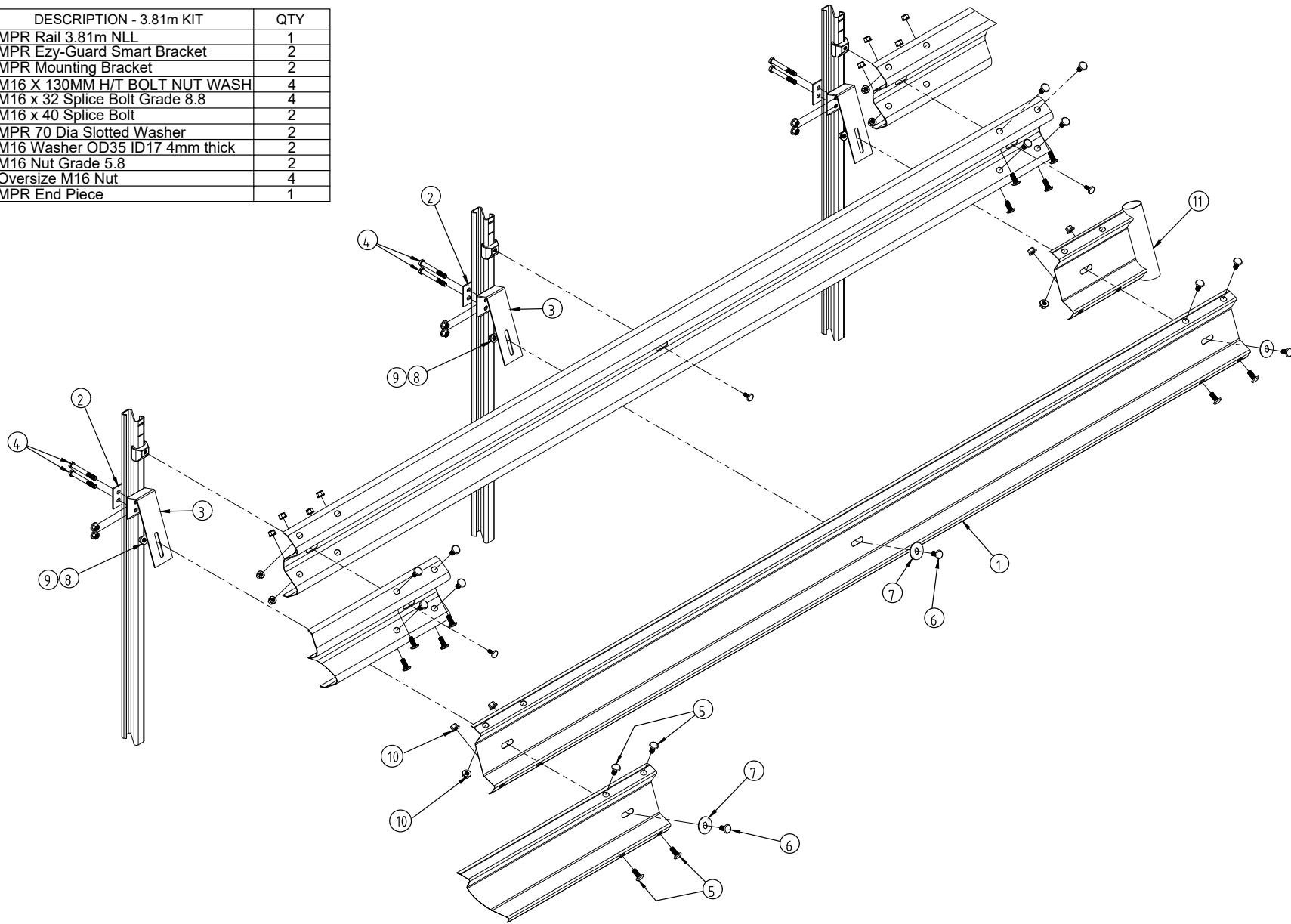
Is the MPR rail ground clearance within tolerance of 60mm \pm 20mm	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has each end of the run been terminated with an MPR Terminal End	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have all fasteners been tightened to snug tight	<input 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.

ITEM	PART No	DESCRIPTION - 3.81m KIT	QTY
1	10007769	MPR Rail 3.81m NLL	1
2	10007332	MPR Ezy-Guard Smart Bracket	2
3	10006772	MPR Mounting Bracket	2
4	10003618	M16 X 130MM H/T BOLT NUT WASH	4
5	10001248	M16 x 32 Splice Bolt Grade 8.8	4
6	10006769	M16 x 40 Splice Bolt	2
7	10006771	MPR 70 Dia Slotted Washer	2
8	10006770	M16 Washer OD35 ID17 4mm thick	2
9	10007834	M16 Nut Grade 5.8	2
10	10001239	Oversize M16 Nut	4
11	10006767	MPR End Piece	1



REVISIONS

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
6	03-05-2024	BOM ADJUSTMENT BY NZ	KZ	BM	KZ
5	15-03-2024	OVERSIZE NUT REPLACED BY STANDARD NUT	KZ	MM	KZ
4	18-07-2022	BOM UPDATE	KZ	LG	LG
3	29-06-2020	ITEM 9 UPDATED	VB	LG	LG
2	22-11-16	WASHER QTY REDUCED	MC	LG	MC
1	31-01-16	BOM UPDATED	MC	LG	MC

REFERENCES

DRAWING NUMBER	REFERENCE DRAWINGS

NAME	DATE
DRAWN AR	29-10-2015
CHECKED LG	29-10-2015
APPROVED LG	29-10-2015
SCALE N.T.S. @ A3	
ISSUE FOR INFORMATION ONLY	

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A valmont COMPANY

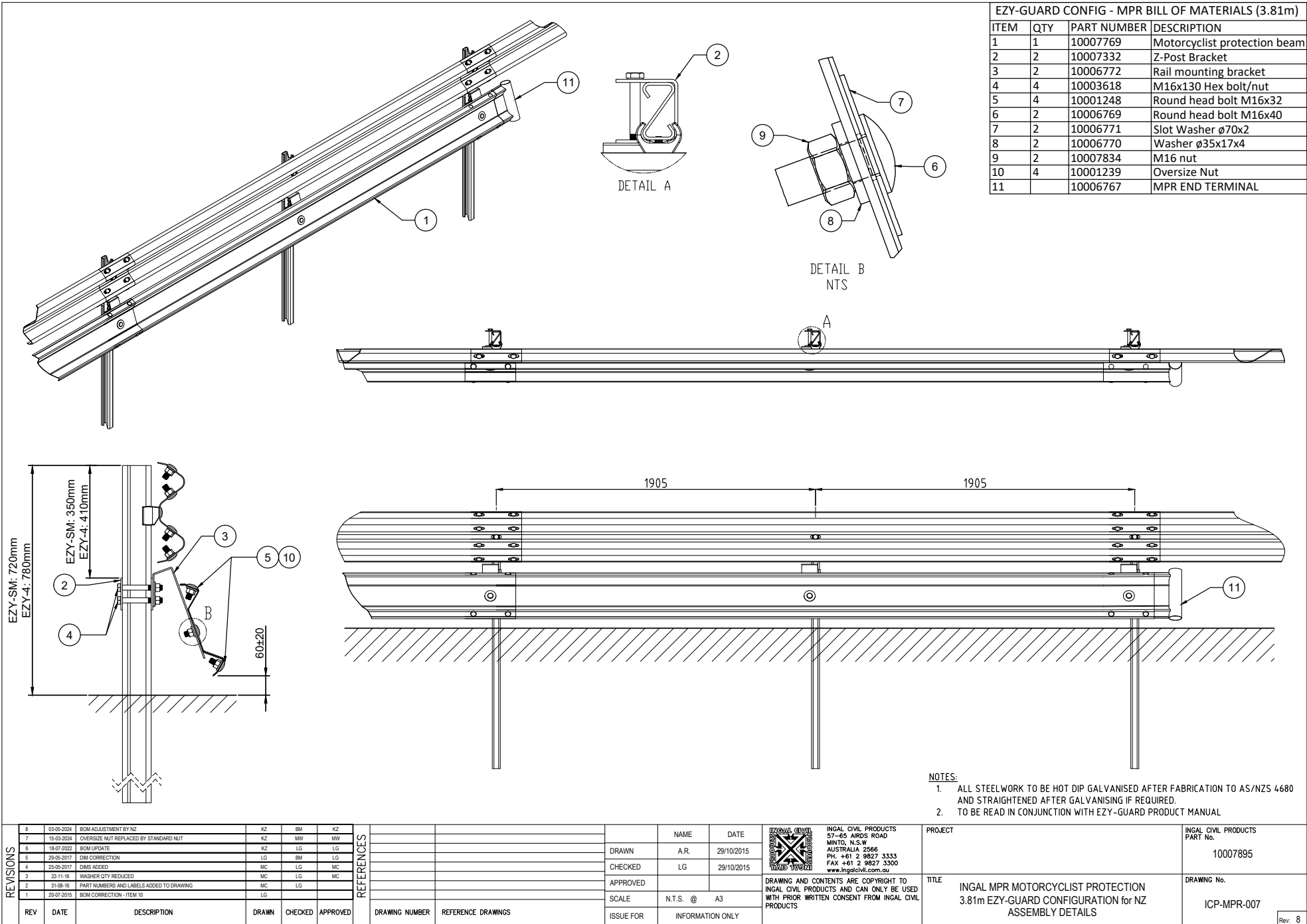
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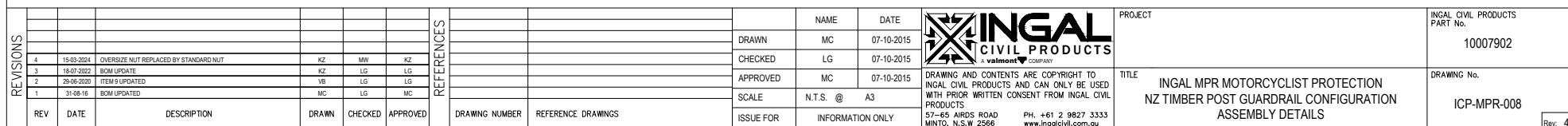
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DRAWING No.	Rev.
ICP-MPR-006	6

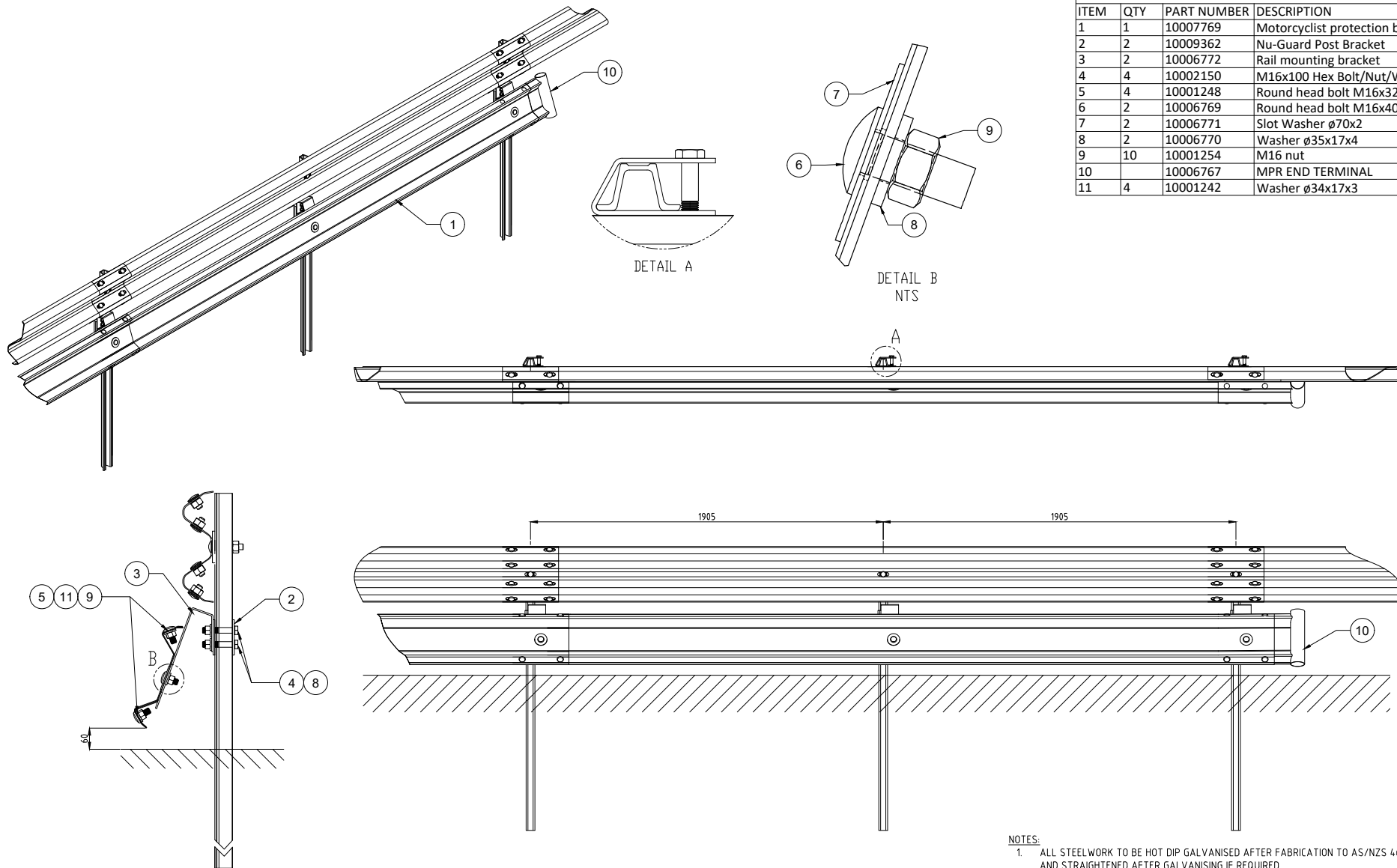
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Nu-Guard CONFIG - MPR BILL OF MATERIALS (3.81m)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10007769	Motorcyclist protection beam
2	2	10009362	Nu-Guard Post Bracket
3	2	10006772	Rail mounting bracket
4	4	10002150	M16x100 Hex Bolt/Nut/W
5	4	10001248	Round head bolt M16x32
6	2	10006769	Round head bolt M16x40
7	2	10006771	Slot Washer ø70x2
8	2	10006770	Washer ø35x17x4
9	10	10001254	M16 nut
10		10006767	MPR END TERMINAL
11	4	10001242	Washer ø34x17x3



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 INGAL MPR PRODUCT MANUAL

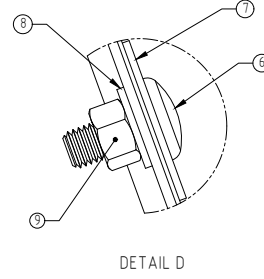
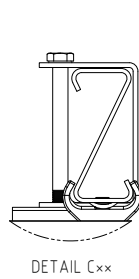
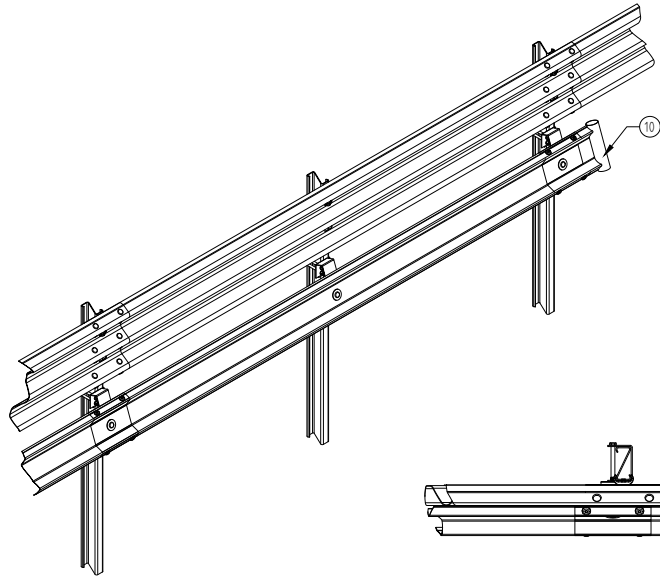
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2	18-07-2022	BOM UPDATE	KZ	LG	LG												
1	29-06-2020	ITEM 9 UPDATED	VB	LG	LG												

NAME	DATE
DRAWN VB	31/01/2020
CHECKED LG	31/01/2020
APPROVED LG	31/01/2020
SCALE	N.T.S. @ A3
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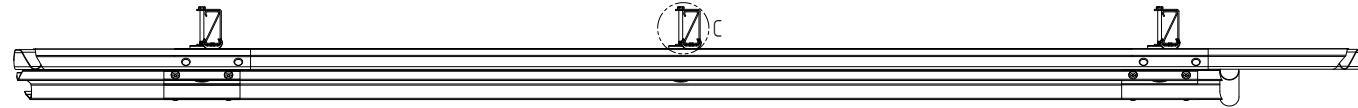
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INGAL CIVIL PRODUCTS PART No. 10009375	INGAL MPR MOTORCYCLIST PROTECTION 3.81m NU-GUARD CONFIGURATION ASSEMBLY DETAILS

DRAWING No.	Rev.
ICP-MPR-012	3

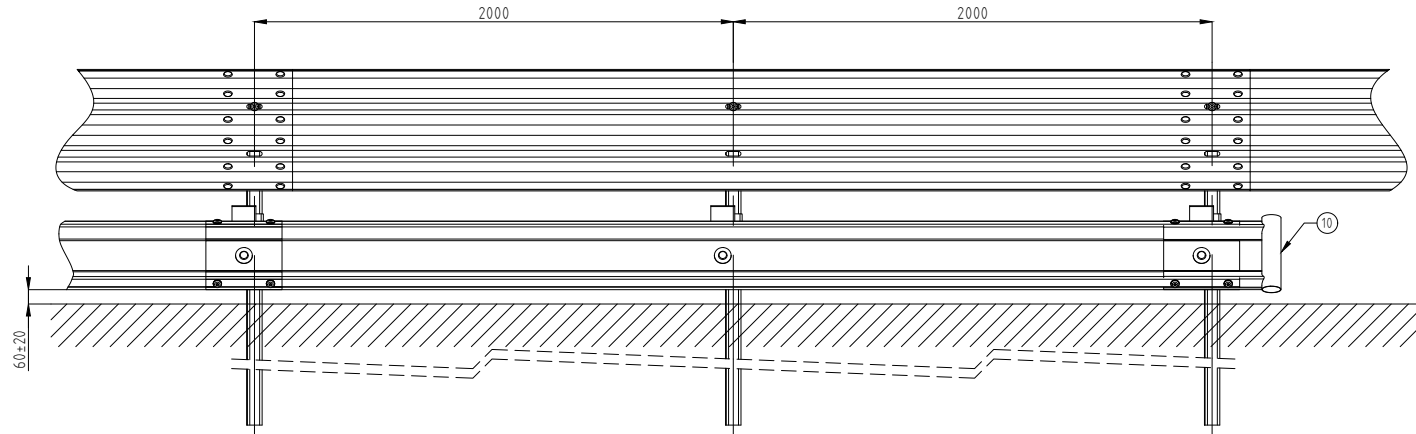
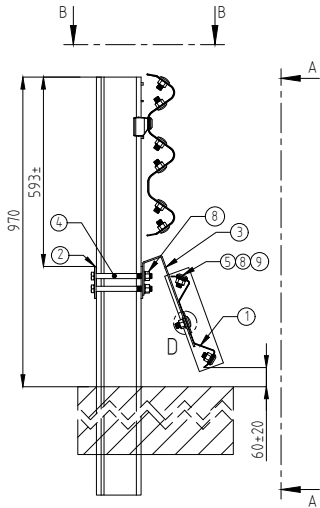


INGAL MPR ON EZY-HC - 4M BOM			
ITEM	QTY	PART No	DESCRIPTION
1	1	10006773	MPR Rail - 4m NLL
2	2	10008582	HC "Z"-Post bracket
3	2	10006772	Rail mounting bracket
4	4	10001282	M16x180 hex bolt & nut
5	4	10001248	Round head bolt M16x32
6	2	10006769	Round head bolt M16x40
7	2	10006771	Slot washer $\phi 70 \times 2$
8	10	10006770	Washer - $\phi 35 \times 17 \times 4$
9	6	10001254	M16 nut
10	x	10006767	MPR Terminal Piece

- × ONE TERMINAL PIECE REQUIRED AT BEGINNING AND END OF RUN ONLY.
×× EZY-GUARD HC POST SHOWN FOR CLARITY.



SECTION B-B



SECTION A-A

- NOTES:
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.

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3	26-07-2022	LDS DETAILS ADDED	KZ	LG	LG			CHECKED	HF	09-03-2018										
2	18-07-2022	BOM UPDATE	KZ	LG	LG			APPROVED	LG	09-03-2018										
1	17-06-2020	UPDATED QUANTITY FOR ITEM 8	VB	LG	LG			SCALE	N.T.S. @	A3										
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												INGAL MPR - MOTORCYCLIST PROTECTION			EZY-GUARD HC/LDS CONFIG			GENERAL ARRANGEMENT		
												Rev. 4								

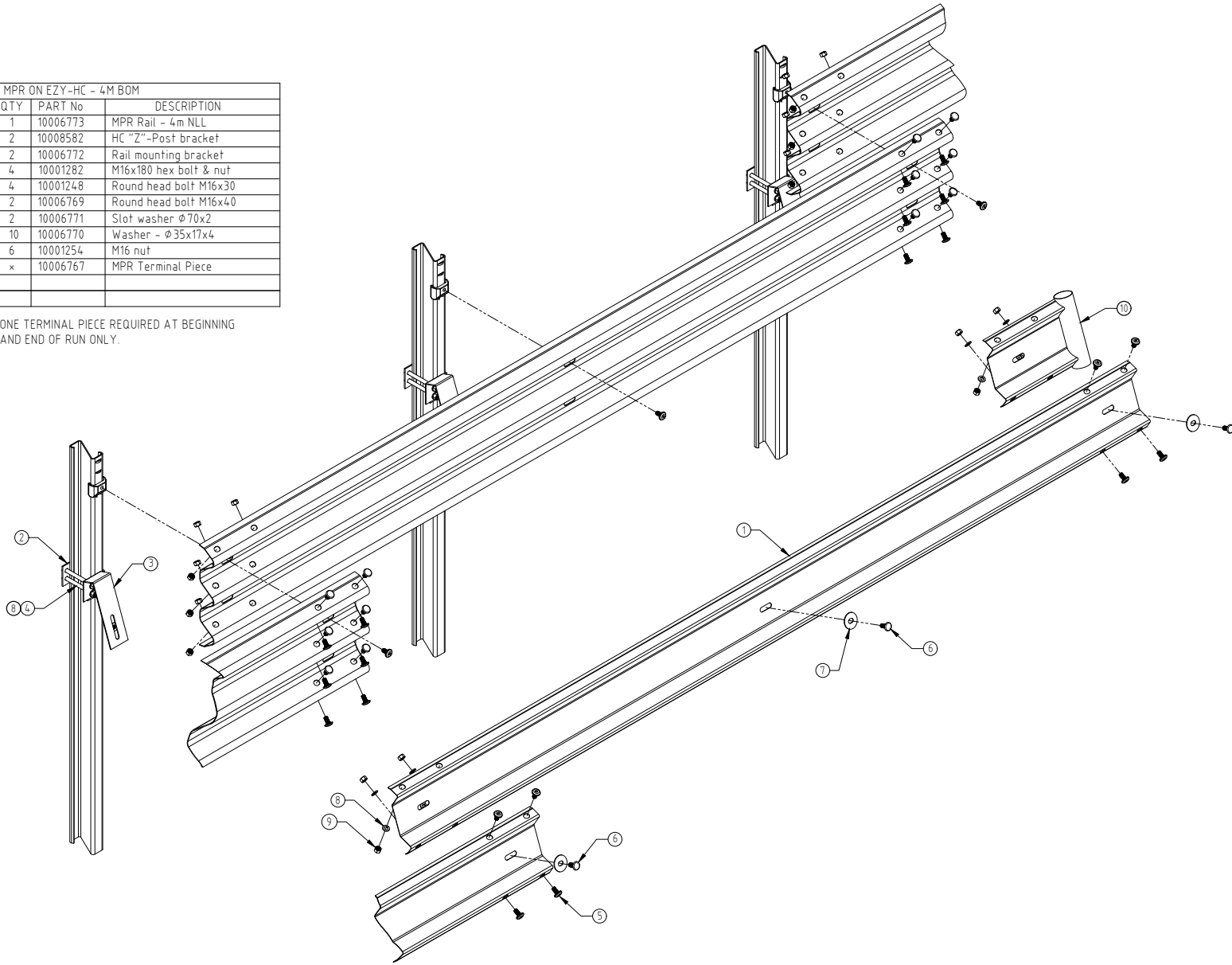
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INGAL MPR ON EZY-HC - 4M BOM			
ITEM	QTY	PART No	DESCRIPTION
1	1	10006773	MPR Rail - 4m NLL
2	2	10008582	HC "Z"-Post bracket
3	2	10006772	Rail mounting bracket
4	4	10001282	M16x180 hex bolt & nut
5	4	10001248	Round head bolt M16x30
6	2	10006769	Round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

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



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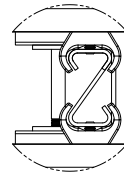
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1	17-06-2020	UPDATED QUANTITY FOR ITEM 8	VB	LG	LG			SCALE	N.T.S. @ A3								
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														Rev. 4		

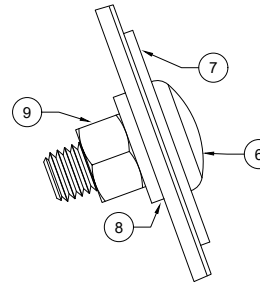
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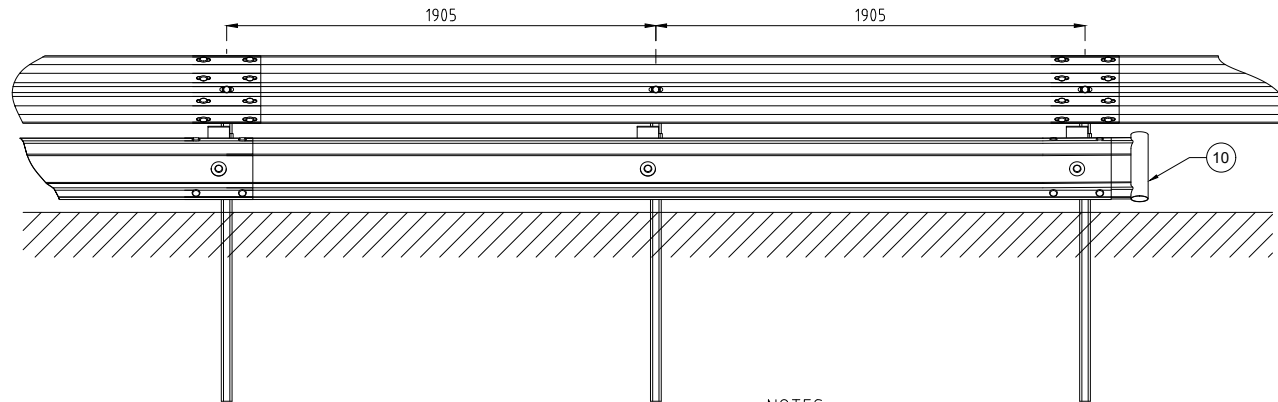
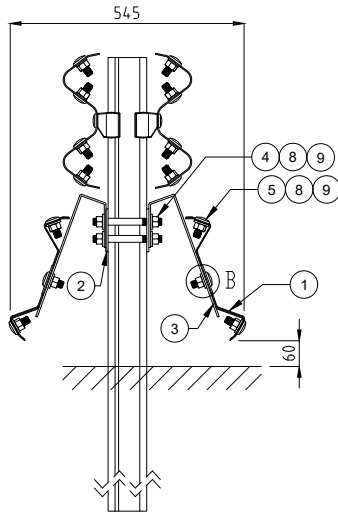
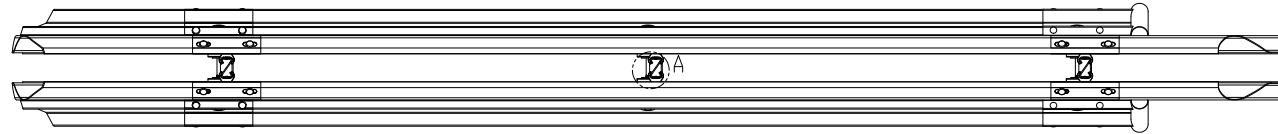


DETAIL A



DETAIL B

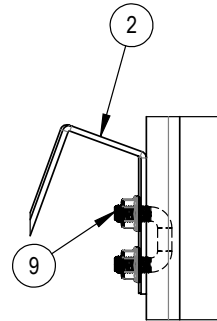
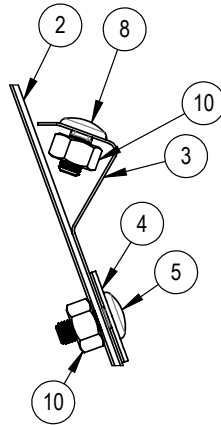
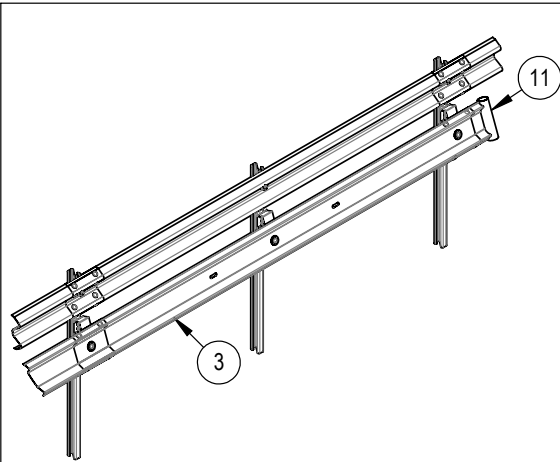
EZY-GUARD - MPR MEDIAN CONFIG - BoM (3.81 m)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	10007769	MPR Rail 3.81m NLL
2	2	10007332	Z-Post Bracket
3	4	10006772	Rail mounting bracket
4	4	10008536	M16x150 Stud
5	8	10001248	Round head bolt M16x32
6	4	10006769	Round head bolt M16x40
7	4	10006771	Slot Washer ø70x2
8	20	10006770	Washer ø35x17x4
9	20	10001254	M16 nut
10	2	10006767	MPR END TERMINAL



NOTES:

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

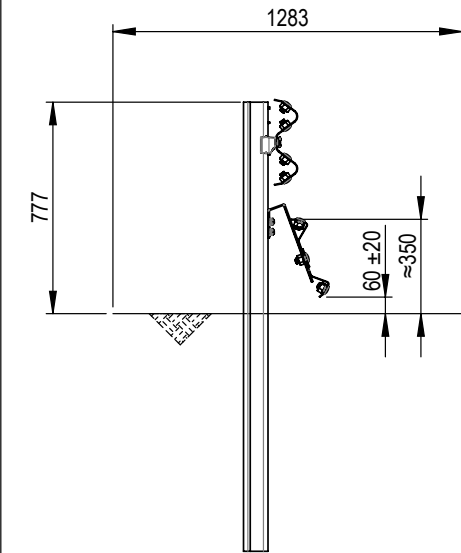
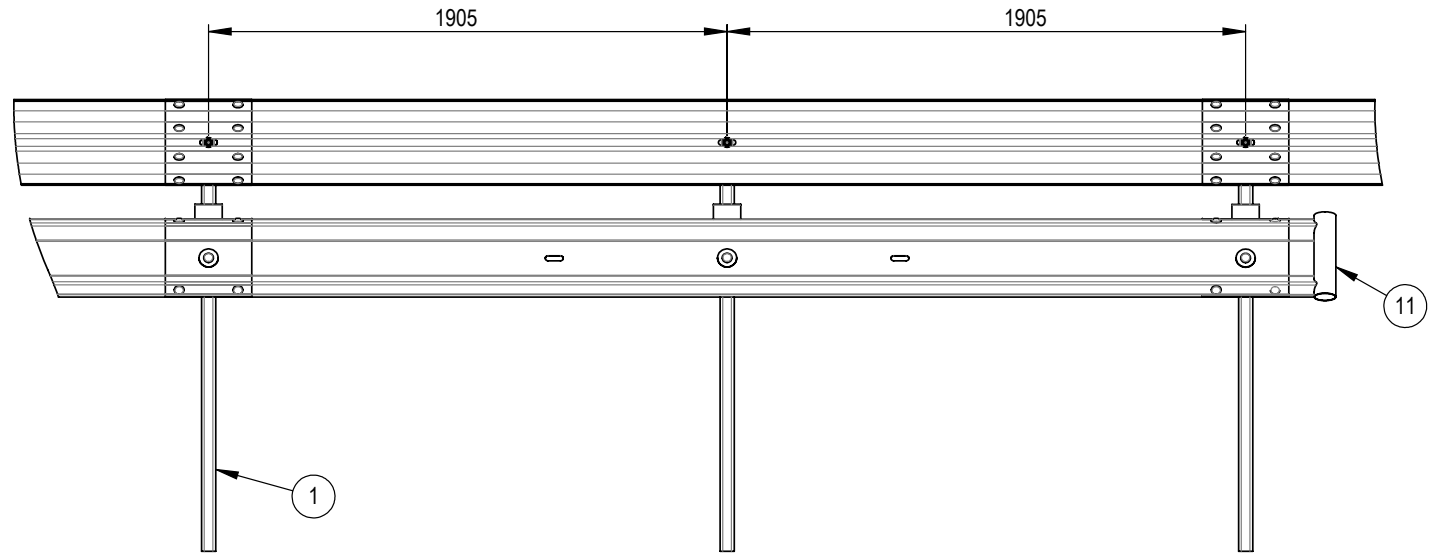
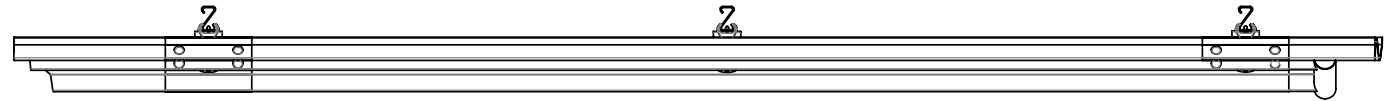
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2	18-10-2021	DNM CORRECTION	VB	LG	LG																		
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												DRAWING NO.			EZY-GUARD BACK-TO-BACK CONFIGURATION NZ ASSEMBLY DETAILS			ICP-MPR-010-NZ			Rev. 4		




ID	DESCRIPTION	PART NO.
1	EZY-GUARD 4 Z-POST 1650mm - WITH MPR HOLES	10010576
2	MPR MOUNTING BRACKET	10006772
3	MPR RAIL 3.81m NLL	10007769
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	M12 SQUARE U-BOLT & NUT KIT 27 x 30mm	10010370
10	M16 OVERSIZE NUT	10001239
11	MPR END PIECE	10006767

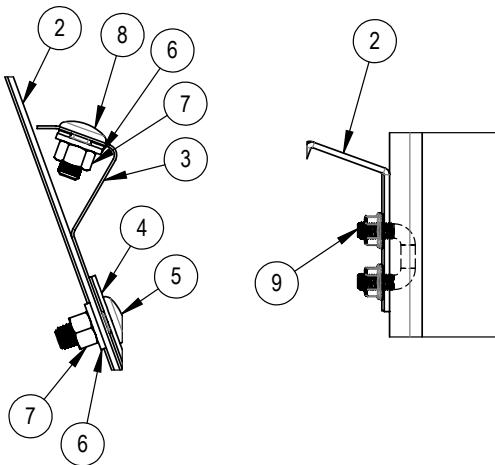
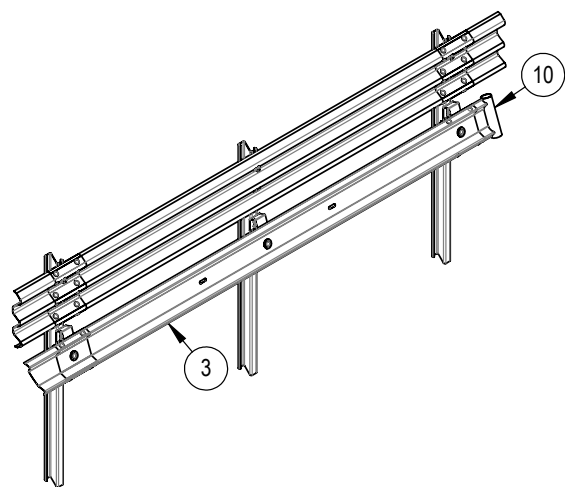
NOTE:

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



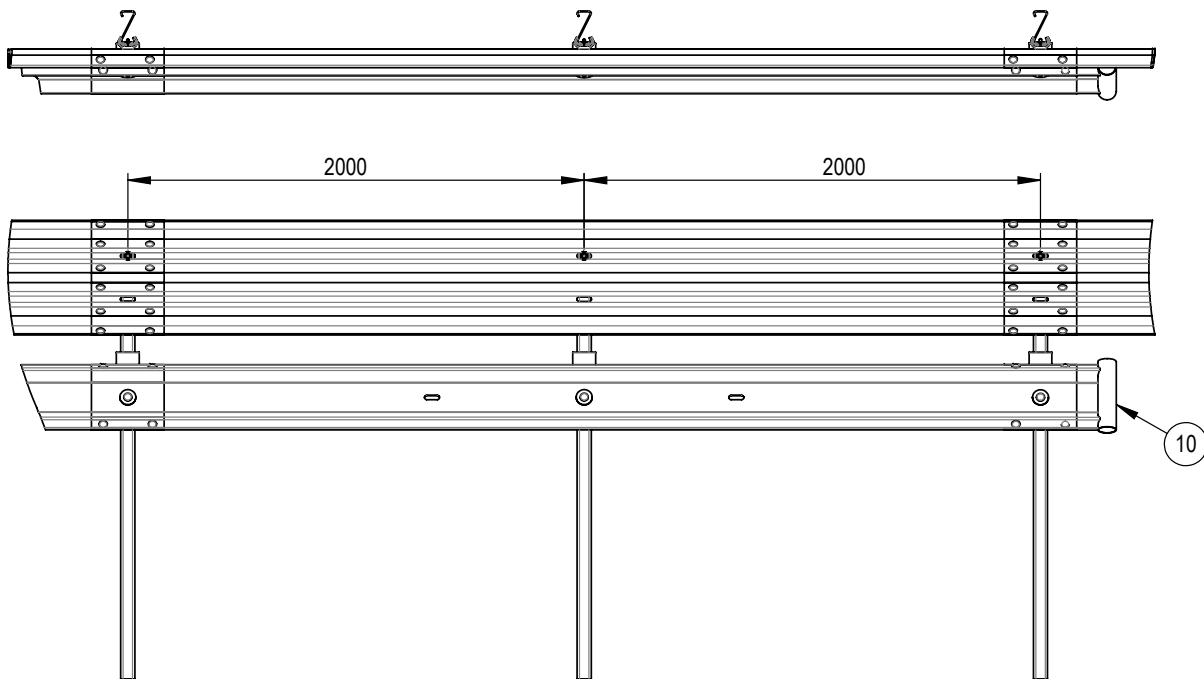
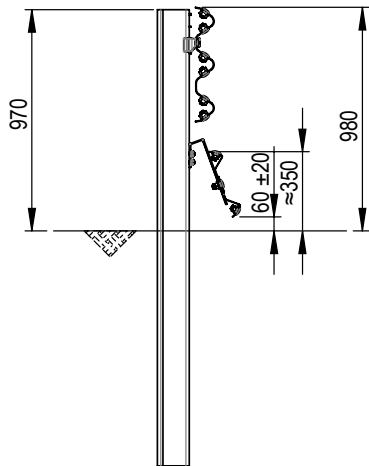
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								DRAWN	KZ	03-05-2024	
								CHECKED	BM	03-05-2024	
								APPROVED	KZ	03-05-2024	
								SCALE	1:25	SHEET: 1 of 1	
								ISSUE FOR			
											
								DRAWING AND CONTENTS ARE COPYRIGHT TO INGAL CIVIL PRODUCTS AND CAN ONLY BE USED WITH PRIOR WRITTEN CONSENT FROM INGAL CIVIL PRODUCTS			
								37-45 AIRDS ROAD MENDO, N.S.W 2566 PH: +61 2 9827 3833 www.ingalcivil.com.au			
								TITLE MPR EZY-GUARD 4 CONFIGURATION WITH U-BOLT			
								DRAWING No. ICP-MPR-020-NZ			
								Rev: 0			

FOLDER: F:\ENGINEERING4. DRAWINGS IN PROGRESS\ SOLIDWORKS MODEL IN PROGRESS\INGAL MPR\CURRENT DRAWING\MODEL



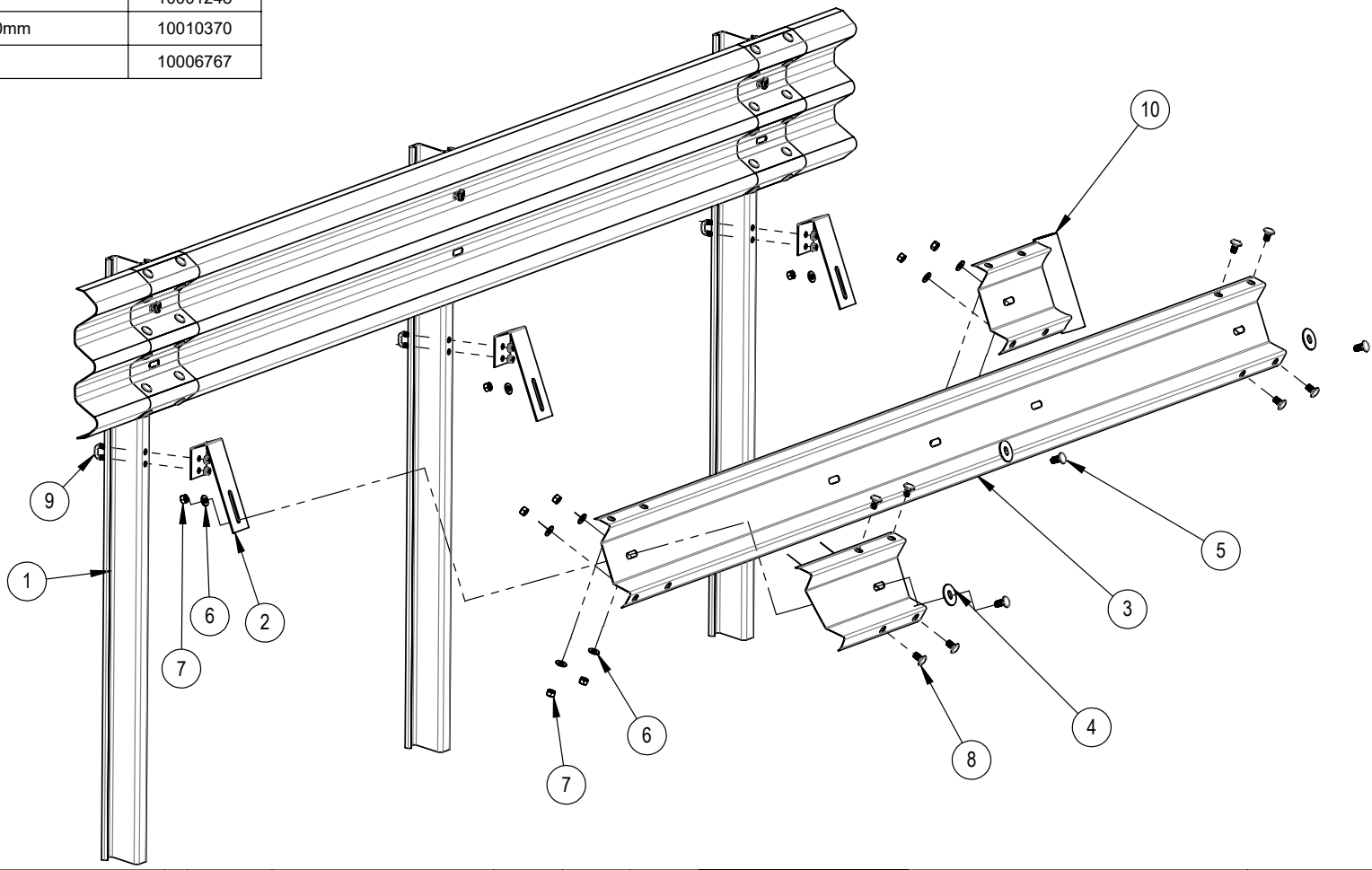
ID	DESCRIPTION	PART NO.
1	EZY-GUARD HEAVY DUTY Z-POST 2000mm WITH MPR HOLES	10010713
2	MPR MOUNTING BRACKET	10006772
3	MPR RAIL 4m NLL	10006773
4	MPR 70 DIA SLOTTED WASHER	10006771
5	M16 X 40mm SPLICE BOLT	10006769
6	MPR M16 WASHER OD35 ID17 4mm THICK	10006770
7	M16 NUT GRADE 8.8	10001254
8	M16 X 32 SPLICE BOLT	10001248
9	M12 SQUARE U-BOLT & NUT KIT 27 x 30mm	10010370
10	MPR END PIECE	10006767

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



REVISIONS				REFERENCES				DRAWING INFORMATION			
1	20/03/2024	OVERSIZE NUT REPLACED BY STANDARD NUT	KZ	MW	KZ			DRAWN	KZ	31-01-2024	
REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED	DRAWING NUMBER	REFERENCE DRAWINGS	CHECKED	LB	31-01-2024	
								APPROVED	KZ	31-01-2024	
								SCALE	1:30	SHEET: 1 of 1	
								ISSUE FOR			
								INGAL CIVIL PRODUCTS			
								PROJECT			
								TITLE			
								MPR EZY-GUARD HC CONFIGURATION WITH U-BOLT			
								INGAL CIVIL PRODUCTS PART NO.			
								10010771			
								DRAWING NO.			
								ICP-MPR-030			
								Rev: 1			

ID	DESCRIPTION	PART NO.
1	EZY-GUARD HEAVY DUTY Z-POST 2000mm WITH MPR HOLES	10010713
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	M12 SQUARE U-BOLT & NUT KIT 27 x 30mm	10010370
10	MPR END PIECE	10006767



REVISIONS							REFERENCES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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www.ingalcivil.co.nz

North Island

Ph: 021 2464 997

South Island

Ph: 021 1983 311

Email: sales@ingalcivil.co.nz

Head Office: Sydney

57-65 Airs 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