

Ingal MPR

Motorcyclist Protection



Product Manual

MASH TL3 COMPLIANT

EN1317-8 COMPLIANT



Release 03/24

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

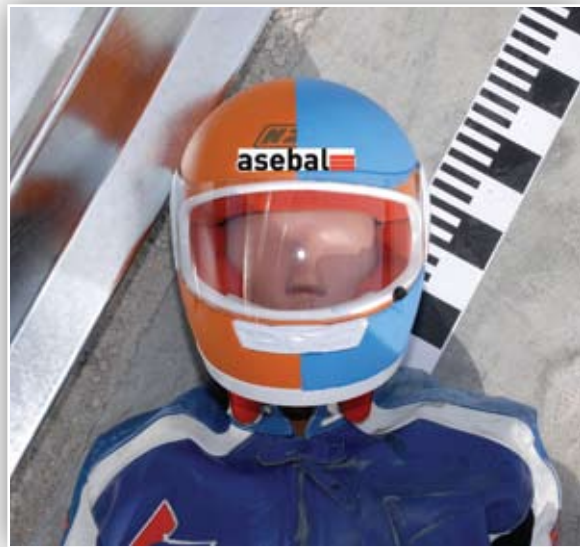
Ingal MPR Rail Length:	3.81m NLL
4m MPR Rail Mass:	12.3kg
Ingal MPR System Mass:	4.65kg per metre
Rail Height Above Ground:	60mm
Post Spacing:	1.905m
Ingal MPR Crash Test Impact Severity:	Level 1

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.

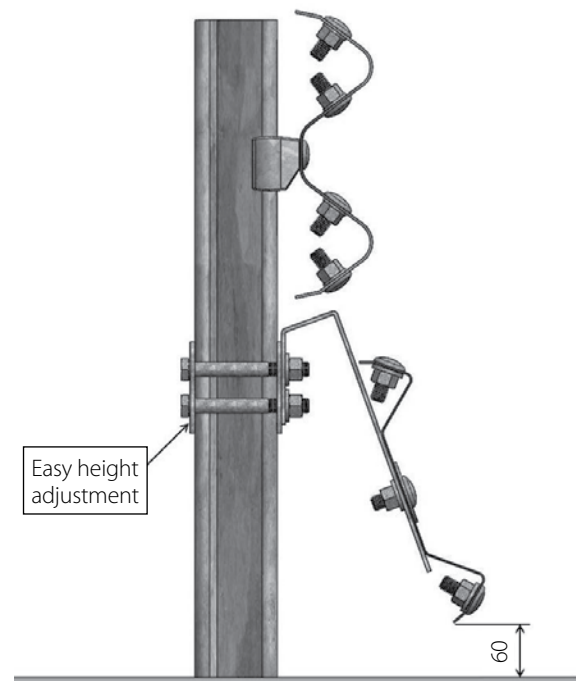
5.0 Installation

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.



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.

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.



Motorcyclist Protection Rail
10007769



"Z" post bracket
10007332



M16x30 oval headed bolt
10001248



M16x40 oval headed bolt
10006769



Rail Mounting Bracket
10006772



M16x200 hex bolt
10003618



Ø35x17x4 mm Washer
10006773



2 mm thick Ø70 washer with 30x18
mounting hole - 10006771



M16 nut
10007834



Ingal MPR Installation Checklist

Customer:

Project:

Barrier ID:

Barrier Length:

Checked By:

Signed:

Date

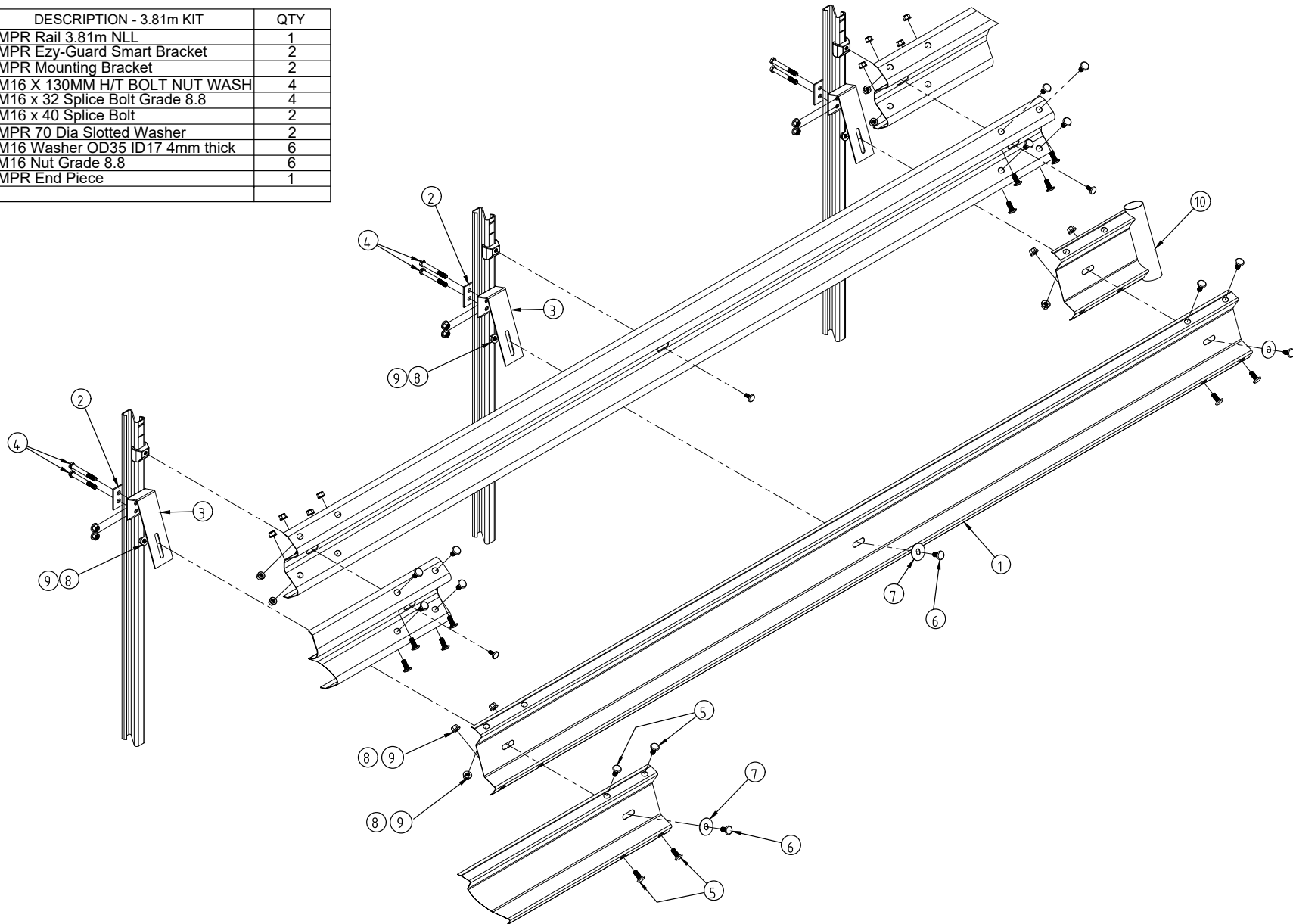
Is the MPR rail ground clearance within tolerance of 60mm \pm 20mm	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has each end of the run been terminated with an MPR Terminal End	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Have all fasteners been tightened to snug tight	<input 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 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	6
9	10001254	M16 Nut Grade 8.8	6
10	10006767	MPR End Piece	1



REVISIONS

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
5	15-03-2024	OVERSIZE NUT REPLACED BY STANDARD NUT	KZ	MW	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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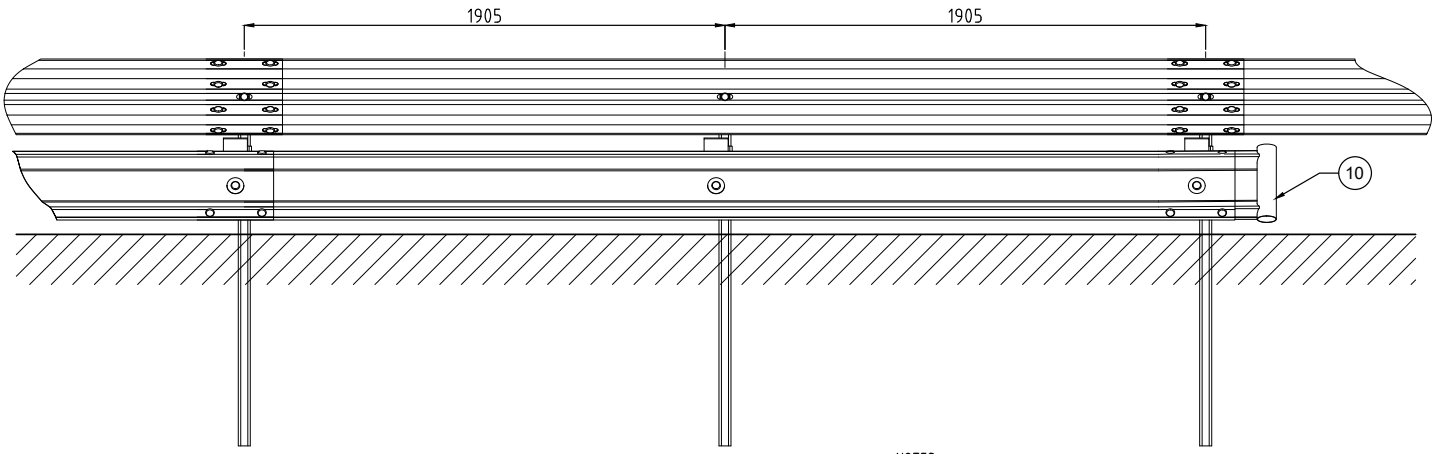
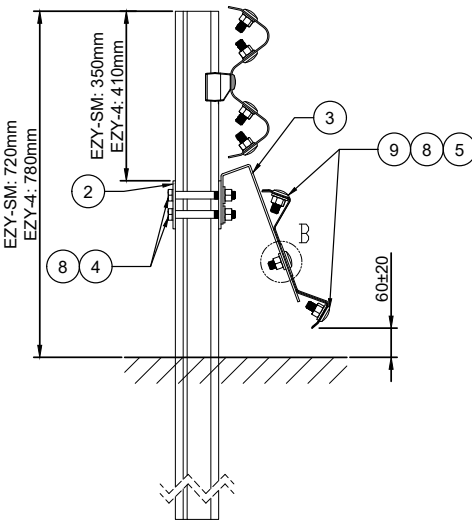
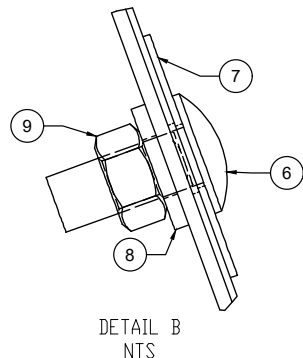
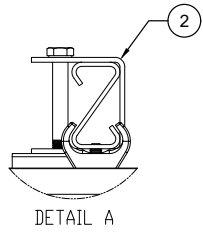
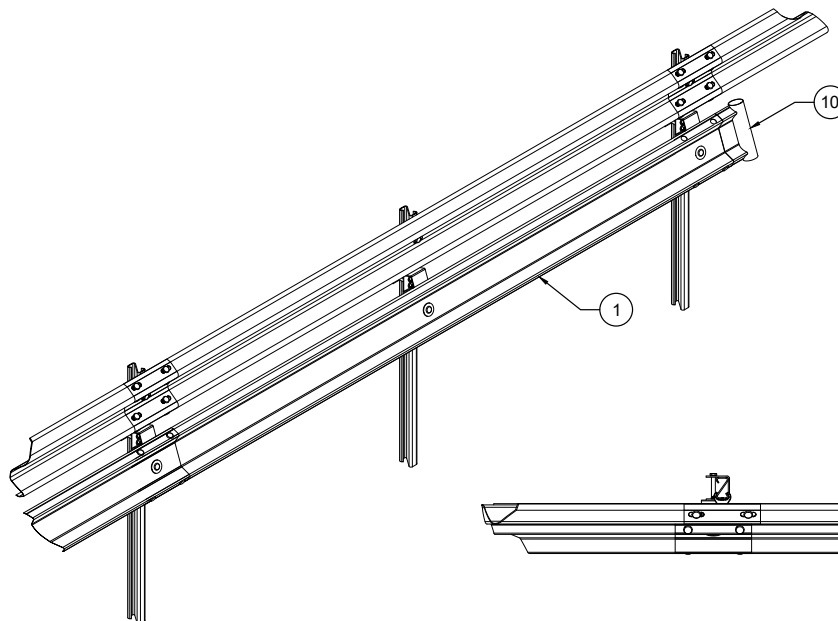
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PROJECT	TITLE
	INGAL MPR - 3.81m NLL EZY-GUARD CONFIGURATION EXPLODED VIEW

INGAL CIVIL PRODUCTS PART No. 10007895
DRAWING No. ICP-MPR-006

Rev. 5

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EZY-GUARD CONFIG - MPR BILL OF MATERIALS (3.81m)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10007769	Motorcyclist protection beam
2	2	10007332	Z-Post Bracket
3	2	10006772	Rail mounting bracket
4	4	10003618	M16x130 Hex bolt/nut
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 Grade 8.8
10		10006767	MPR END TERMINAL

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 EZY-GUARD PRODUCT MANUAL

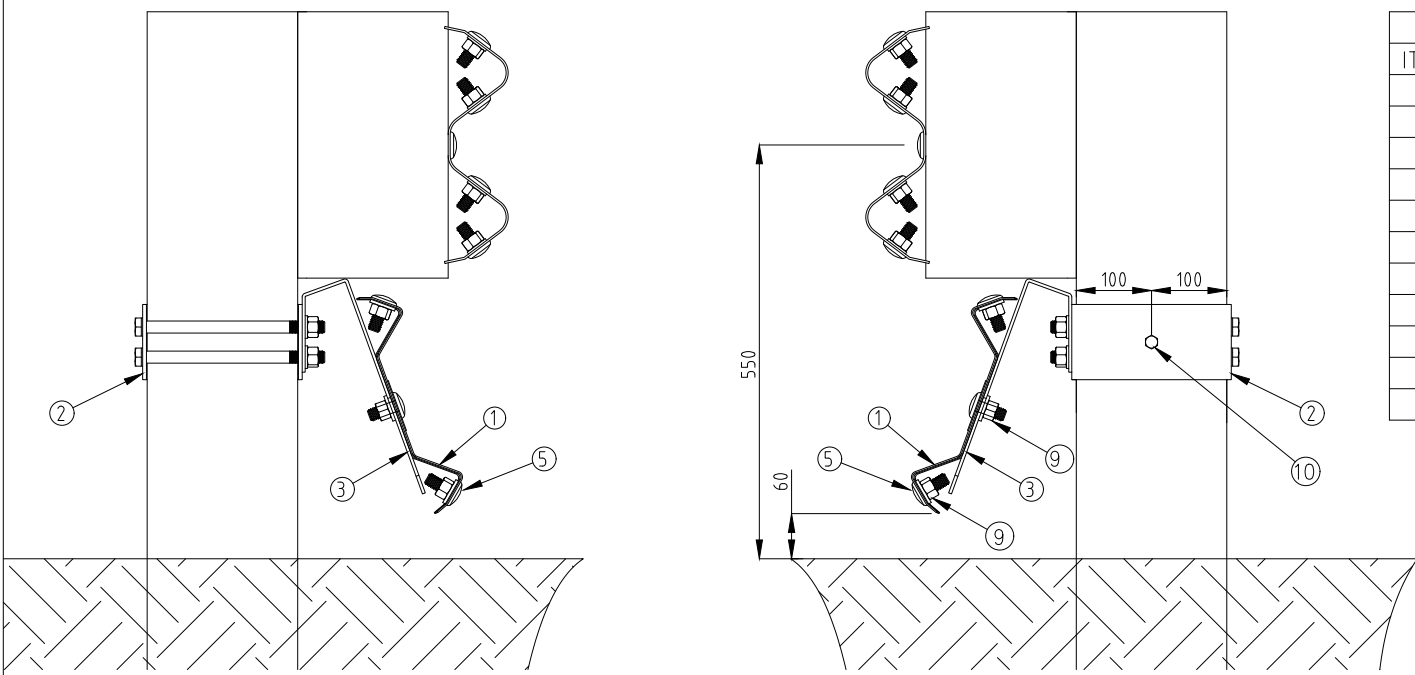
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7	15-03-2024	OVERSIZE NUT REPLACED BY STANDARD NUT	KZ	MW	MW
6	18-07-2022	BOM UPDATE	KZ	LG	LG
5	29-05-2017	DIM CORRECTION	LG	BM	LG
4	25-05-2017	DIMS ADDED	MC	LG	MC
3	25-11-16	WASHER CITY REDUCED	MC	LG	MC
2	31-08-16	PART NUMBERS AND LABELS ADDED TO DRAWING	MC	LG	MC
1	20-07-2015	BOM CORRECTION - ITEM 10	LG		

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

NAME	DATE
DRAWN A.R.	29/10/2015
CHECKED LG	29/10/2015
APPROVED	
SCALE	N.T.S. @ A3
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<p>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</p>	PROJECT TITLE INGAL MPR MOTORCYCLIST PROTECTION 3.81m EZY-GUARD CONFIGURATION ASSEMBLY DETAILS
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INGAL CIVIL PRODUCTS PART No. 10007895	DRAWING No. ICP-MPR-007
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APPROACH-SIDE
ELEVATION VIEW

DEPARTURE-SIDE
ELEVATION VIEW

G4 CONFIG - MPR BILL OF MATERIALS			
ITEM	QTY	PART No	DESCRIPTION
1	1	10007769	Motorcyclist protection beam
2	2	10007777	MPR Timber Post bracket
3	2	10006772	Rail mounting bracket
4	4	10001224	M16x240 Hex Bolt & Nut
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	6	10001254	M16 nut Grade 8.8
10	2	10001220	M10x100 hex head coach bolt

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
4	15-03-2024	OVERSIZE NUT REPLACED BY STANDARD NUT	KZ	MW	KZ
3	18-07-2022	BOM UPDATE	KZ	LG	LG
2	29-06-2020	ITEMS UPDATED	NB	LG	LG
1	31-08-16	BOM UPDATED	MC	LG	MC

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

NAME	DATE
DRAWN MC	07-10-2015
CHECKED LG	07-10-2015
APPROVED MC	07-10-2015
SCALE	N.T.S. @ A3
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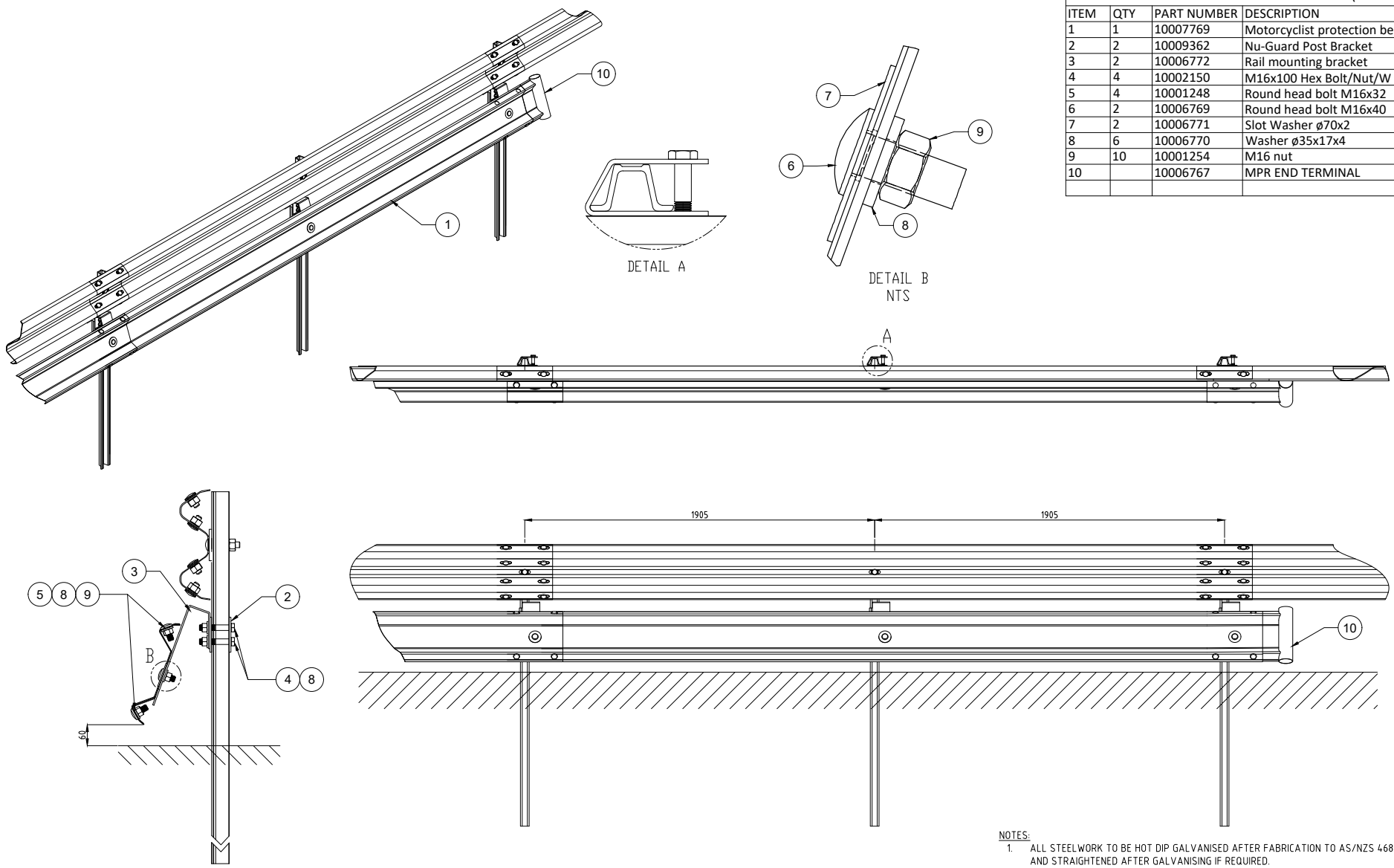
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TITLE	INGAL MPR MOTORCYCLIST PROTECTION NZ TIMBER POST GUARDRAIL CONFIGURATION ASSEMBLY DETAILS

INGAL CIVIL PRODUCTS PART No.	10007902
DRAWING No.	ICP-MPR-008


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Nu-Guard CONFIG - MPR BILL OF MATERIALS (3.81m)

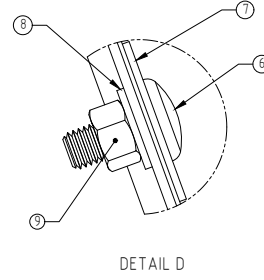
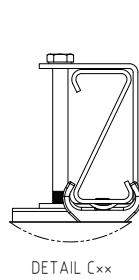
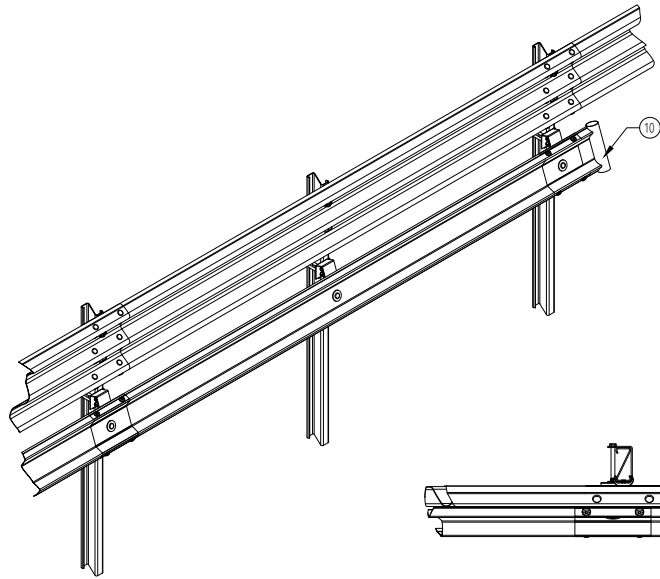
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10007769	Motorcyclist protection beam
2	2	10009362	Nu-Guard Post Bracket
3	2	10006772	Rail mounting bracket
4	4	10002150	M16x100 Hex Bolt/Nut/W
5	4	10001248	Round head bolt M16x32
6	2	10006769	Round head bolt M16x40
7	2	10006771	Slot Washer ø70x2
8	6	10006770	Washer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



- 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

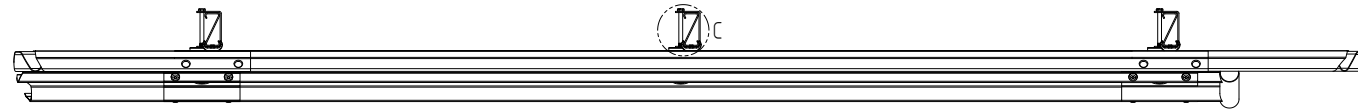
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2	18-07-2022	BOM UPDATE		KZ	LG			LG	31/01/2020		DRAWING No.	
1	29-06-2020	ITEM 9 UPDATED		VB	LG			LG			ICP-MPR-012	
												Rev. 3

ENGINEERING SALES @ ARET@DRAWING@INGAL MPR@ICP-MPR-012 - NUGUARD 3.81M WITH MPR@ING

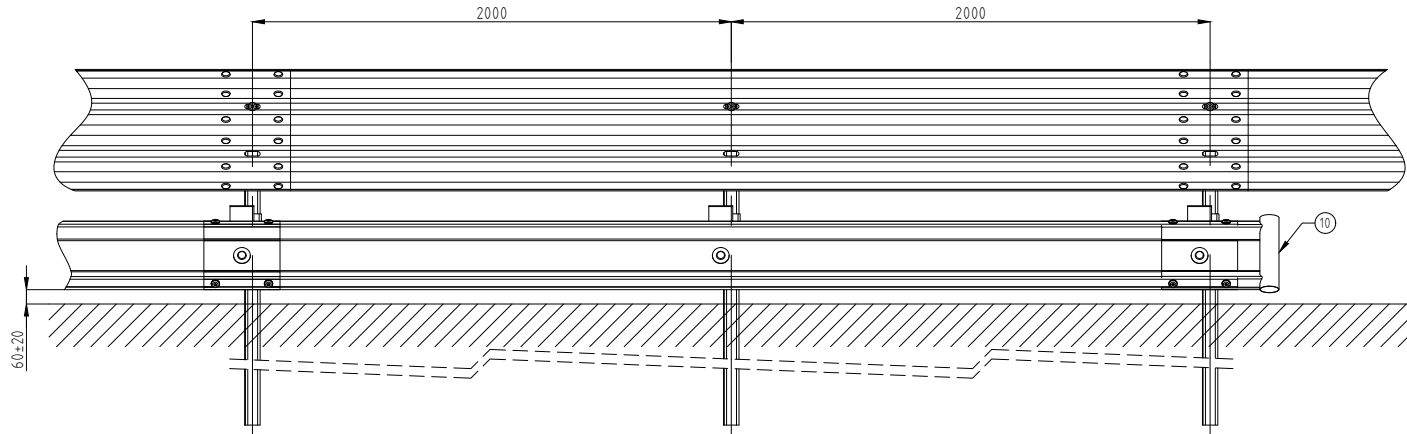
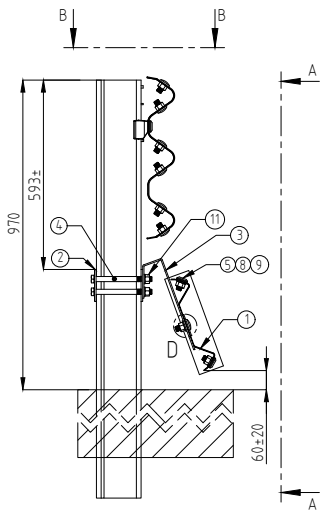


INGAL MPR ON EZY-HC - 4M BOM			
ITEM	QTY	PART No	DESCRIPTION
1	1	10006773	MPR Rail - 4m NLL
2	2	10008582	HC "Z"-Post bracket
3	2	10006772	Rail mounting bracket
4	4	10001282	M16x180 hex bolt & nut
5	4	10001248	Round head bolt M16x32
6	2	10006769	Round head bolt M16x40
7	2	10006771	Slot washer $\phi 70 \times 2$
8	6	10006770	Washer - $\phi 35 \times 17 \times 4$
9	10	10001254	M16 nut
10	x	10006767	MPR Terminal Piece
11	4	10001242	M16 Round Washer

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



SECTION B-B



SECTION A-A

- NOTES:
- ALL STEELWORK TO BE HOT DIP GALVANISED AFTER FABRICATION TO AS/NZS4680.
 - TO BE READ IN CONJUNCTION WITH THE INGAL MPR PRODUCT MANUAL.

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
4	20-03-2024	OVERSIZE NUT REPLACED BY STANDARD NUT	KZ	MW	KZ
3	26-07-2022	LDS DETAILS ADDED	KZ	LG	LG
2	18-07-2022	BOM UPDATE	KZ	LG	LG
1	17-06-2020	UPDATED QUANTITY FOR ITEM 8	VB	LG	LG

DRAWING NUMBER	REFERENCE DRAWINGS

NAME	DATE
DRAWN WD	09-03-2018
CHECKED HF	09-03-2018
APPROVED LG	09-03-2018
SCALE	N.T.S. @ A3
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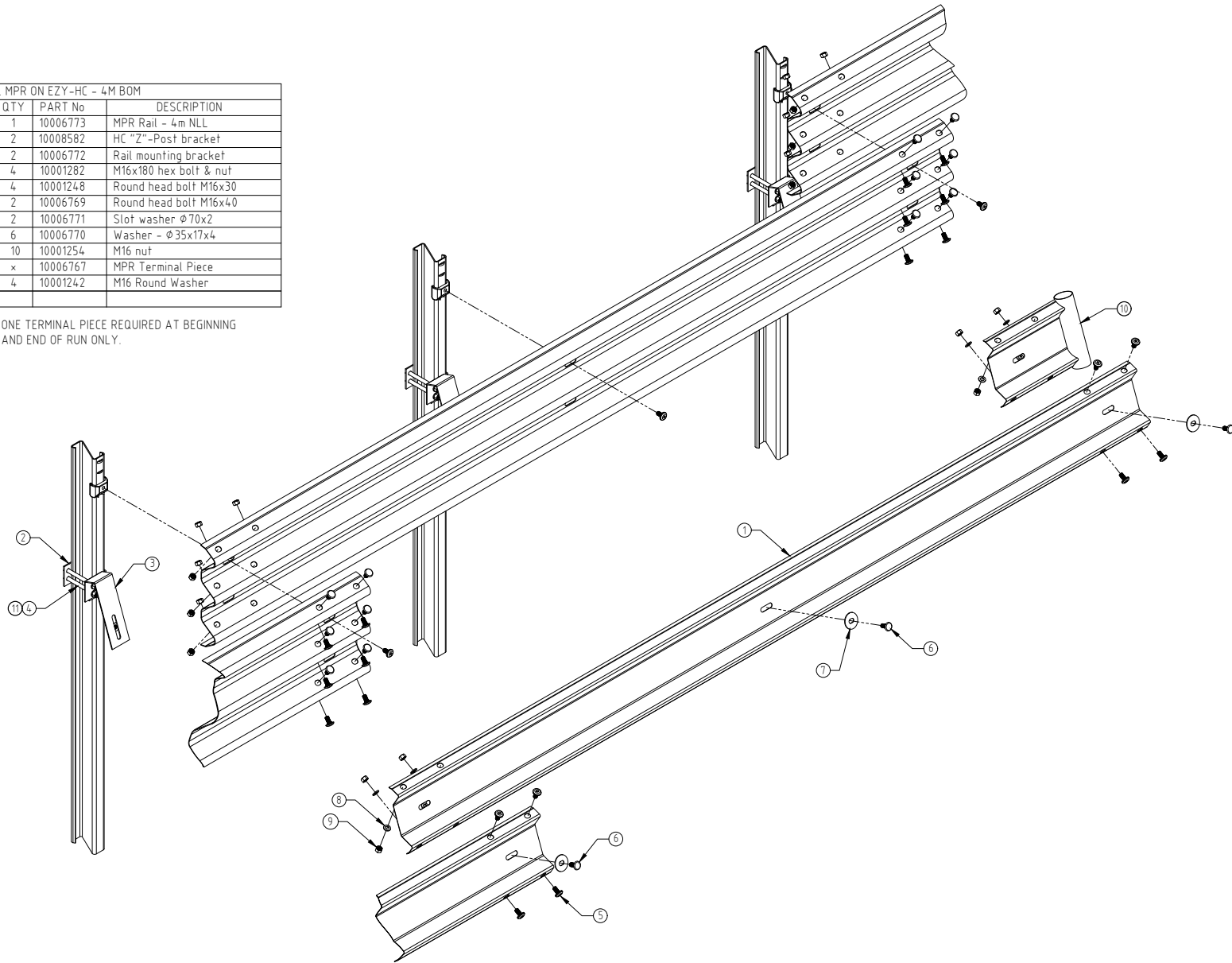
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INGAL CIVIL PRODUCTS PART No. 10009373	INGAL MPR - MOTORCYCLIST PROTECTION EZY-GUARD HC/LDS CONFIG GENERAL ARRANGEMENT

DRAWING No.	Rev.
ICP-MPR-014	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 ϕ 70x2
8	6	10006770	Washer - ϕ 35x17x4
9	10	10001254	M16 nut
10	x	10006767	MPR Terminal Piece
11	4	10001242	M16 Round Washer

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



REVISIONS

REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
4	20-03-2024	OVERSIZE NUT REPLACED BY STANDARD NUT	KZ	MW	KZ
3	26-07-2022	EZY-LDS DETAILS ADDED	KZ	LG	LG
2	18-07-2022	BOM UPDATE	KZ	LG	LG
1	17-06-2020	UPDATED QUANTITY FOR ITEM 8	VB	LG	LG

REFERENCES

DRAWING NUMBER	REFERENCE DRAWINGS

NAME	DATE
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CHECKED: HF	09-03-2018
APPROVED: LG	09-03-2018
SCALE: N.T.S. @ A3	
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PROJECT	TITLE
	INGAL MPR - MOTORCYCLIST PROTECTION EZY-GUARD HC/LDS CONFIG EXPLODED ASSEMBLY

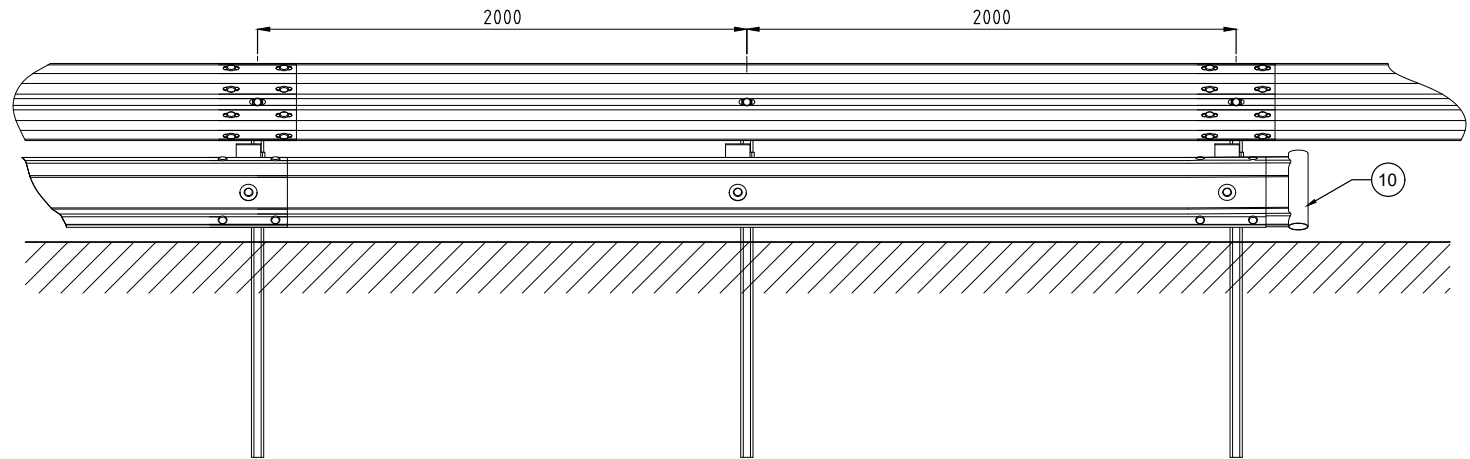
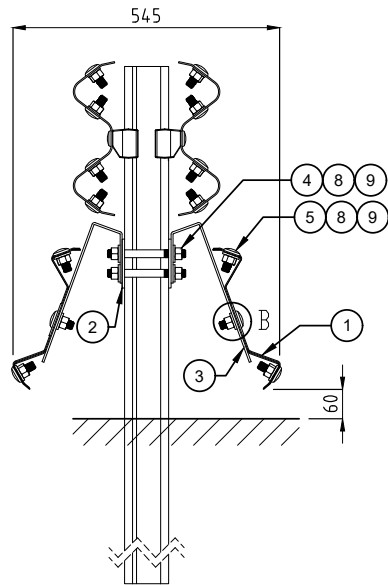
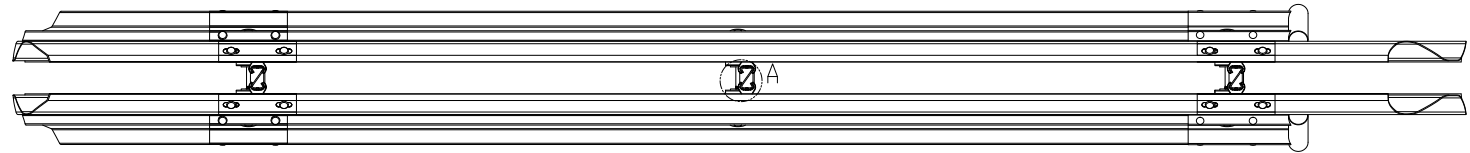
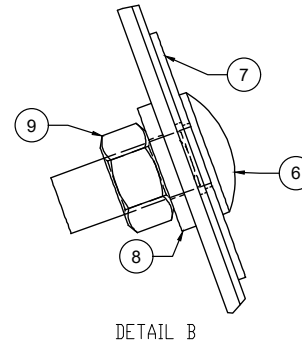
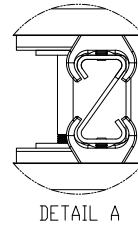
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DRAWING No. ICP-MPR-015

Rev: 4

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EZY-GUARD - MPR MEDIAN CONFIG - BoM (4 m)

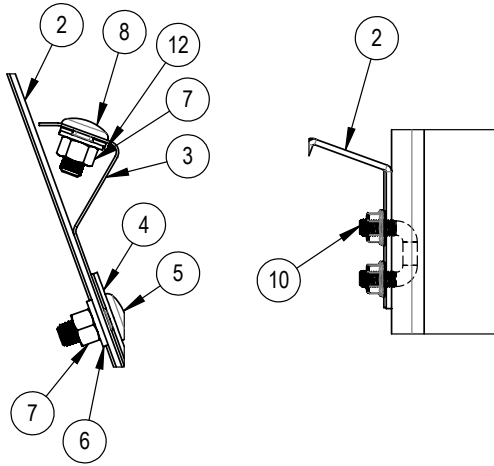
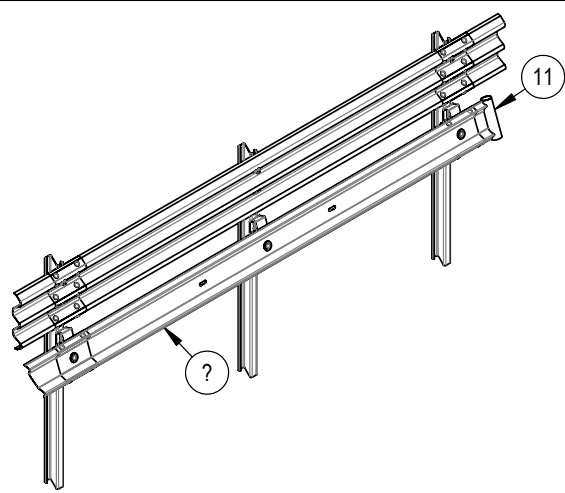
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	10006773	Motorcyclist protection beam
2	2	10007332	Z-Post Bracket
3	4	10006772	Rail mounting bracket
4	4	10008536	M16x150 Stud
5	8	10001248	Round head bolt M16x32
6	4	10006769	Round head bolt M16x40
7	4	10006771	Slot Washer ϕ 70x2
8	20	10006770	Washer ϕ 35x17x4
9	20	10001254	M16 nut
10	2	10006767	MPR END TERMINAL



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 PRODUCT MANUAL

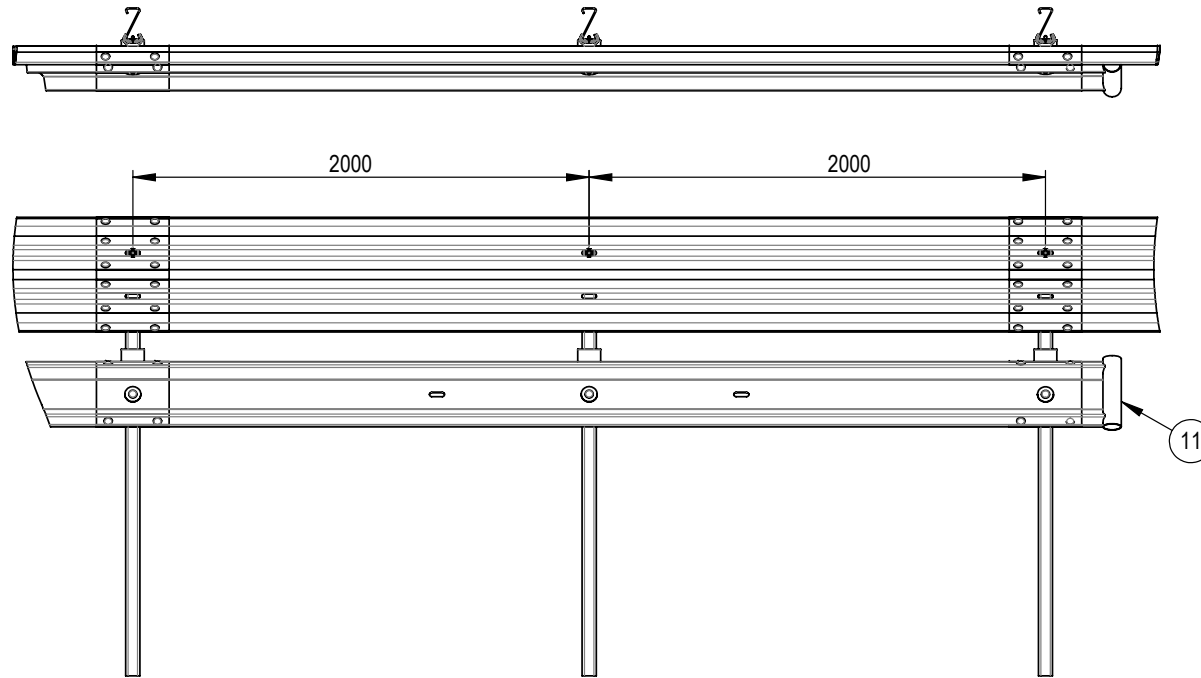
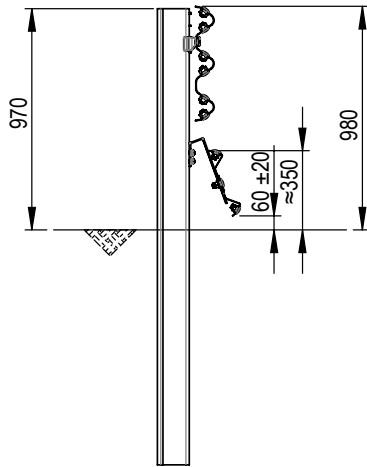
REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED	DRAWING NUMBER	REFERENCE DRAWINGS	SCALE	ISSUE FOR	NAME	DATE	PROJECT	TITLE	INGAL CIVIL PRODUCTS PART No.	DRAWING No.
4	15-03-2024	OVERSIZE NUT REPLACED BY STANDARD NUT	KZ	MW	KZ					INGAL CIVIL PRODUCTS 57-65 AIRDS ROAD MINTO, N.S.W. AUSTRALIA 2566 PH. +61 2 9827 3333 FAX +61 2 9827 3300 www.ingalcivil.com.au	25/07/16	INGAL CIVIL PRODUCTS MPR010 - EZY-GUARD WITH MPR BACK-TO-BACK DWG	INGAL MPR MOTORCYCLIST PROTECTION EZY-GUARD BACK-TO-BACK CONFIGURATION ASSEMBLY DETAILS	10008537	ICP-MPR-010
3	18-10-2021	DIM CORRECTION	VB	LG	LG						25/07/16				
2	29-06-2020	ITEM 9 UPDATED	VB	LG	LG						25/07/16				
1	21-06-2017	STUD UPDATED	LG	AS	LG										



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	M16 OVERSIZE NUT	10001239
10	M12 SQUARE U-BOLT & NUT KIT 27 x 30mm	10010370
11	MPR END PIECE	10006767
12	M16 ROUND WASHER 33.5 x 17.5 x 3mm	10001242

NOTE:

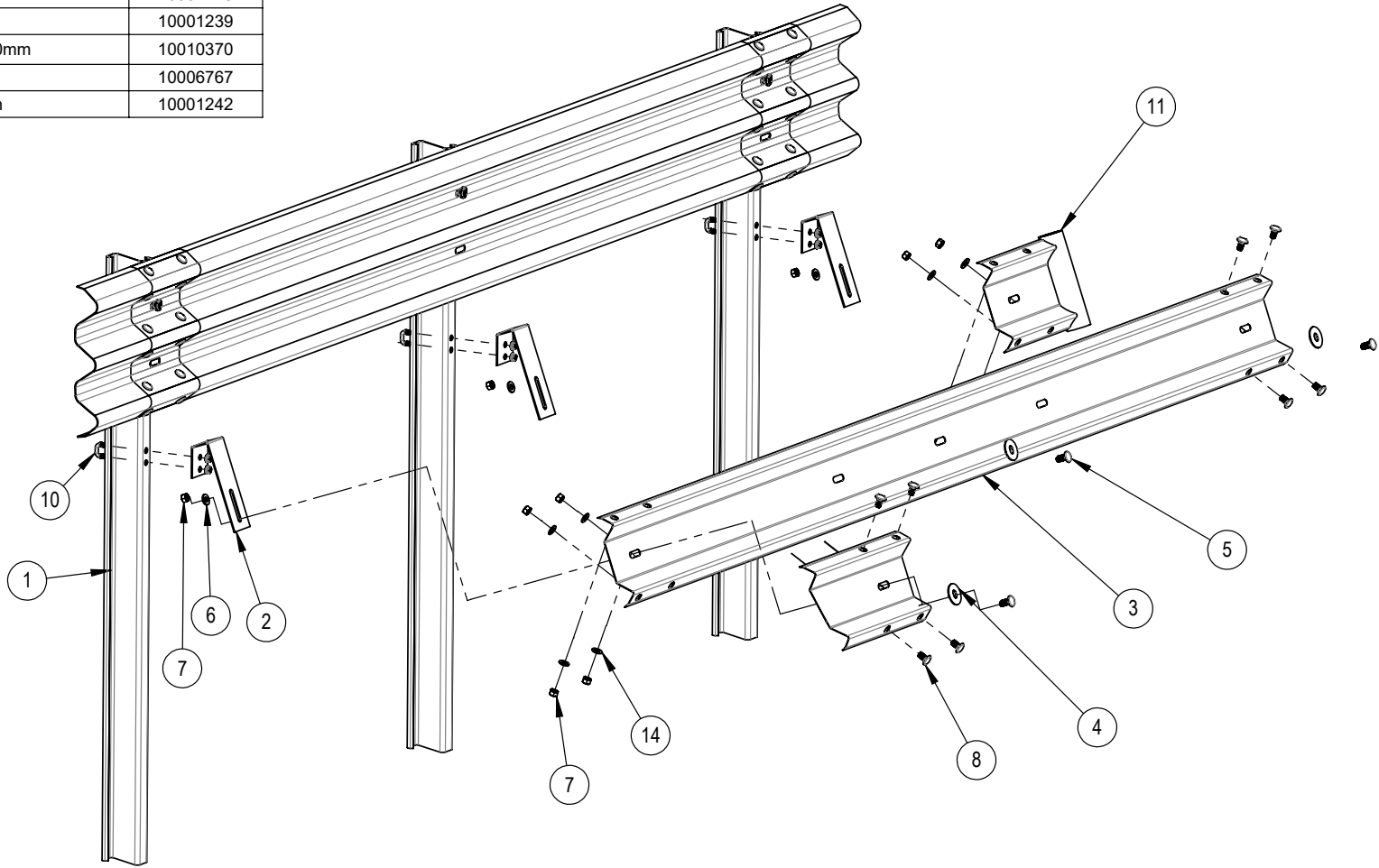
- ALL STEEL WORK TO BE HDGALV AFTER FABRICATION TO AS/NZS 4680 AND STRAIGHTENED AFTER GALVANISING IF REQUIRED TO BE READ IN CONJUNCTION WITH THE INGAL MPR PRODUCT MANUAL
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REVISIONS				REFERENCES				DRAWING NUMBER		REFERENCE DRAWINGS		NAME		DATE		INGAL CIVIL PRODUCTS		PROJECT		INGAL CIVIL PRODUCTS PART No.	
1	20/03/2024	OVERSIZE NUT REPLACED BY STANDARD NUT	KZ	MW	KZ																
REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED																

FOLDER: F:\ENGINEERING\4. DRAWINGS IN PROGRESS\INGAL 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
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REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED	DRAWING NUMBER	REFERENCE DRAWINGS	ISSUE FOR	NAME	DATE	PROJECT	TITLE	DRAWING No.	Rev.
1	20/03/2024	OVERSIZE NUT REPLACED BY STANDARD NUT	KZ	MW	KZ							MPR EZY-GUARD HC CONFIGURATION WITH U-BOLT - EXPLODED	ICP-MPR-031	1
													PROJECT: MPR EZY-GUARD HC CONFIGURATION WITH U-BOLT - EXPLODED DRAWING No. ICP-MPR-031	
											DRAWING AND CONTENTS ARE COPYRIGHT TO INGAL CIVIL PRODUCTS AND CAN ONLY BE USED WITH PRIOR WRITTEN CONSENT FROM INGAL CIVIL PRODUCTS		INGAL CIVIL PRODUCTS PART No. Rev. 1	
											57-45 ARDS ROAD MINTO, N.S.W 2566 PH: +61 2 9827 3333 www.ingalcivil.com.au			

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INGAL
CIVIL PRODUCTS
A valmont  COMPANY

For more information

contact us on the web

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