

### *Product Manual*



Release 04/16

### 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

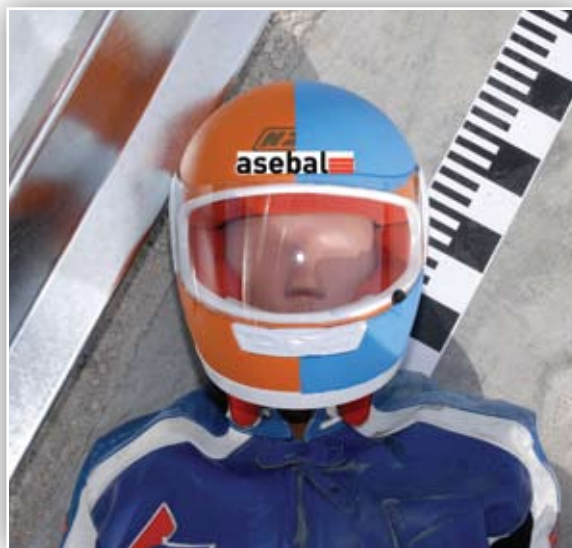
Ingal MPR Rail Length:	3.81m NLL
4m MPR Rail Mass:	12.3kg
Ingal MPR System Mass:	4.65kg per metre
Rail Height Above Ground:	60mm
Post Spacing:	2m or 3.81m
Ingal MPR Crash Test Performance:	<b>Level 1</b>

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.

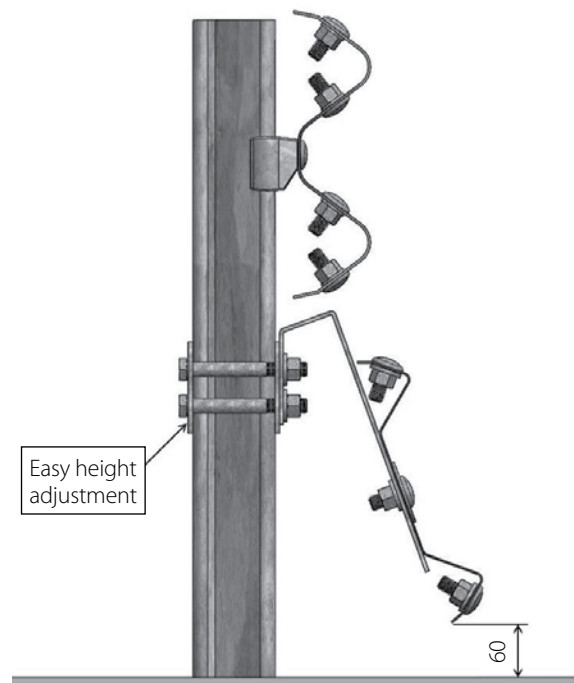
## 5.0 Installation

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.

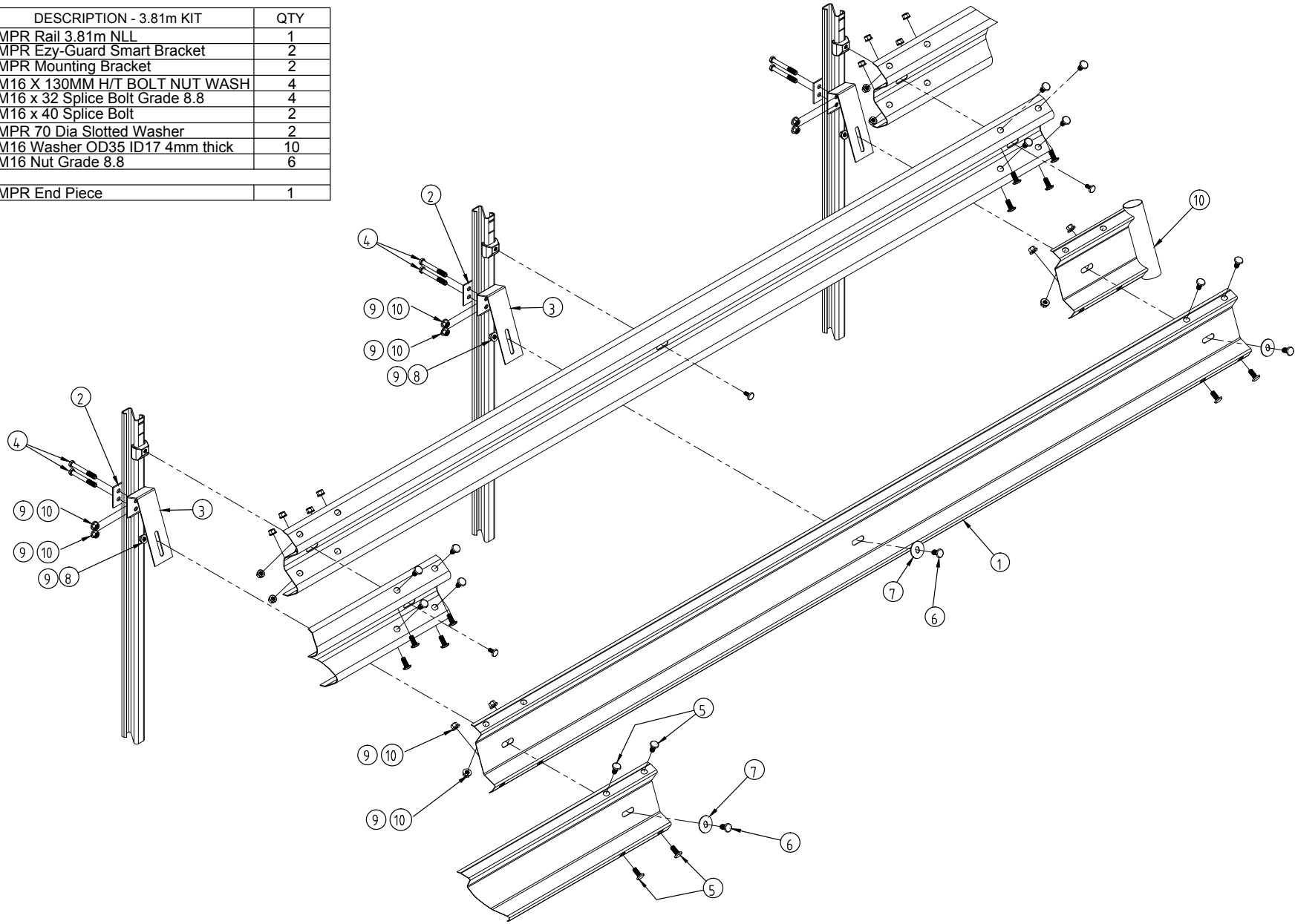


### 5.3 Curved Installations

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

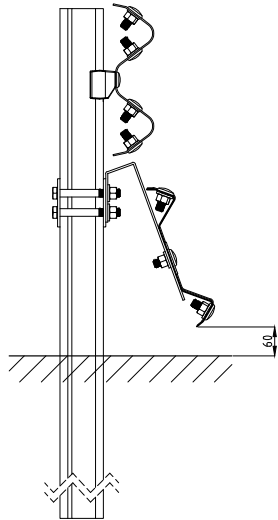
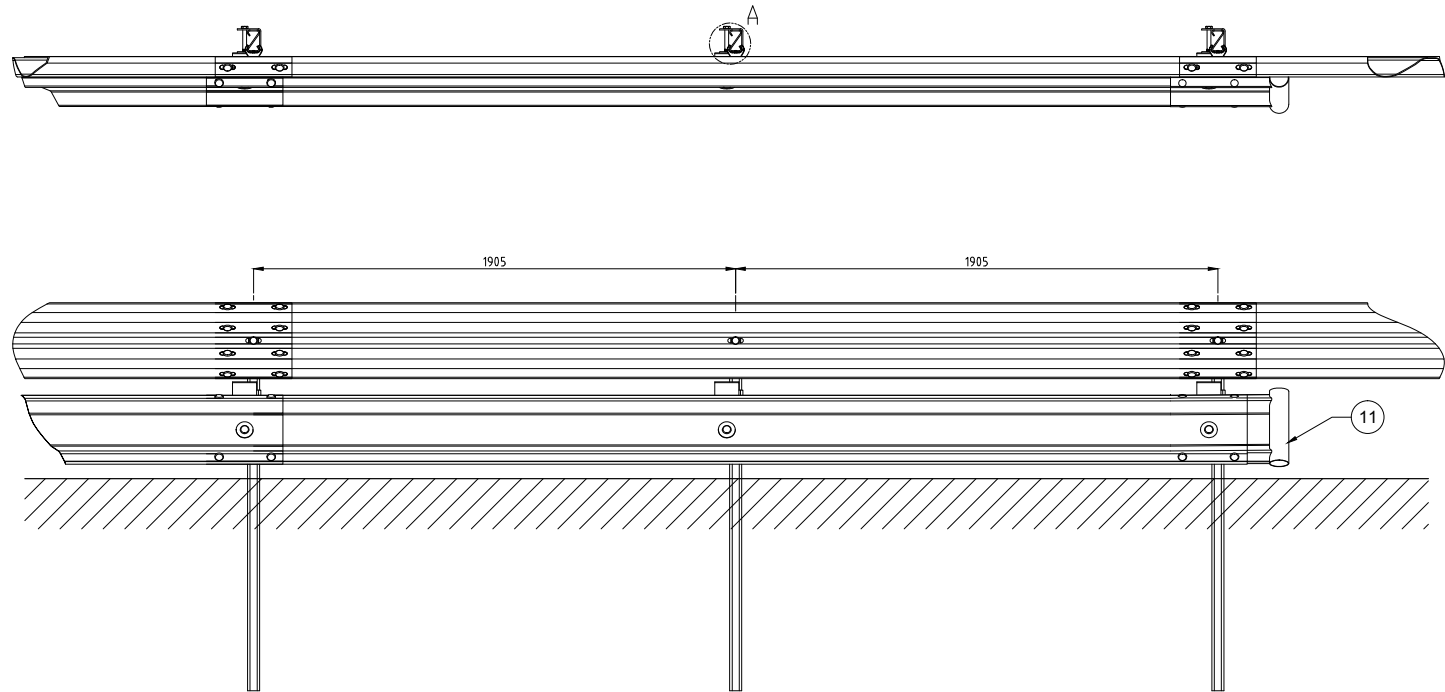
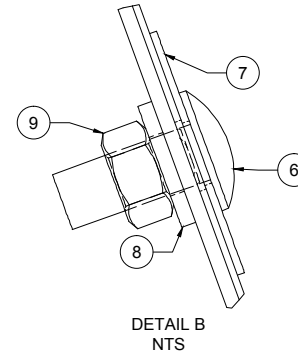
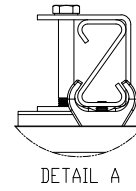
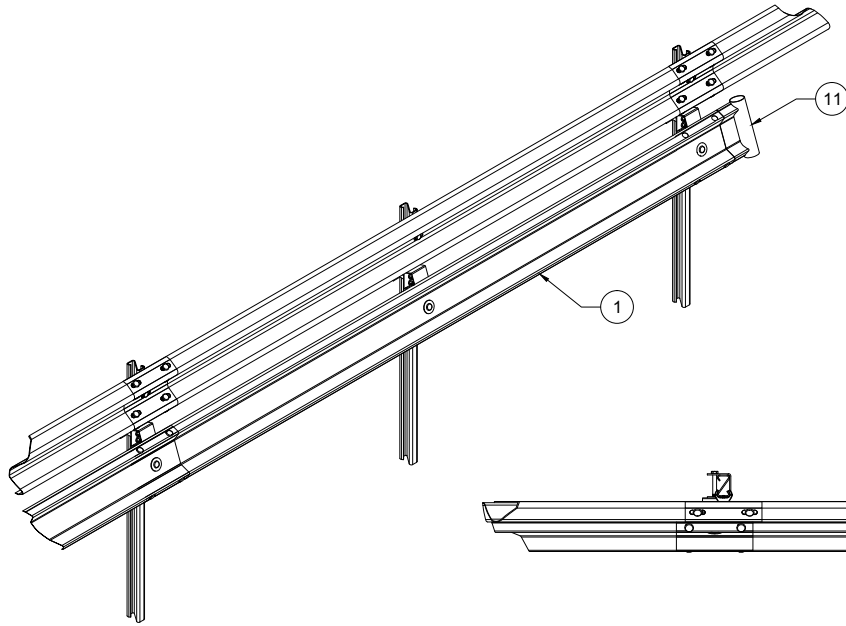


ITEM	PART No	DESCRIPTION - 3.81m KIT	QTY
1	1000xxxx	MPR Rail 3.81m NLL	1
2	10007332	MPR Ezy-Guard Smart Bracket	2
3	10006772	MPR Mounting Bracket	2
4	10003618	M16 X 130MM H/T BOLT NUT WASH	4
5	10001248	M16 x 32 Splice Bolt Grade 8.8	4
6	10006769	M16 x 40 Splice Bolt	2
7	10006771	MPR 70 Dia Slotted Washer	2
8	10006770	M16 Washer OD35 ID17 4mm thick	10
9	10001254	M16 Nut Grade 8.8	6
10	10006767	MPR End Piece	1




REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED	DRAWING NUMBER	REFERENCE DRAWINGS	NAME	DATE	INGAL CIVIL PRODUCTS A valmont company	PROJECT	INGAL CIVIL PRODUCTS PART No. 1000
								DRAWN	AR	29-10-2015		
								CHECKED	LG	29-10-2015		
								APPROVED	LG	29-10-2015		
								SCALE	N.T.S. @	A3		
								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 57-65 AIRDS ROAD PH. +61 2 9827 3333 MINTO, N.S.W 2566 www.ingalcivil.com.au				
								TITLE INGAL MPR MOTORCYCLIST PROTECTION 3.81m EZY-GUARD CONFIGURATION EXPLODED VIEW				
								DRAWING No. ICP-MPR-006				
								Rev: 0				

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EZY-GUARD CONFIG - MPR BILL OF MATERIALS (3.81m)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	1000XXXX	Motorcyclist protection beam
2	2	10000000	Z-Post Bracket
3	2	10006772	Rail mounting bracket
4	4	10003618	M16x130 Hex bolt
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
11	1	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 EZY-GUARD PRODUCT MANUAL

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.
1	20-07-2015	BOM CORRECTION - ITEM 10	LG					DRAWN	A.R.	29/10/2015			
								CHECKED	LG	29/10/2015			
								APPROVED					
								SCALE	N.T.S. @	A3			
REV	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED	DRAWING NUMBER	REFERENCE DRAWINGS	ISSUE FOR	INFORMATION ONLY			TITLE	DRAWING No.
												INGAL MPR MOTORCYCLIST PROTECTION 3.81m EZY-GUARD CONFIGURATION ASSEMBLY DETAILS	ICP-MPR-007

Rev: 0







*For more information*

contact us on the web

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