RiderPro® MPR - Motorcycle Protection Rail

for Sentry Barrier TL-4 Thrie-Beam System

Updated September 2022

Trusted infrastructure products

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CSP® may make changes to this Product Manual from time to time. Please check the CSP website prior to using this Product Manual to ensure that you have the latest version.

Main Features

Leading Safety

Crash tested in Class C60 according to the European Technical Specification CEN/TS 1317-8, with sliding 86 kg test dummy impacting at 60 km/h with a 30° angle of impact.

Additionally, the RiderPro MPR, the same design being utilised with the Sentry Barrier TL-4 Thrie-Beam System, has undergone MASH TL-3 compliance crash testing attached to the Sentry Barrier system with both MASH Test 3-10 (1100 kg vehicle) and Test 3-11 (2270 kg vehicle) successfully tested. It is important to note this compliance testing is not a specific requirement for motorcyclist protections systems but was conducted to assure the highest standards of safety for the motorcyclist safety system are met.

Flexible Design

The flexible mounting bracket absorbs rider impact energy providing a forgiving impact.

The controlled deformability of the corrugated beam contains and redirects the biker, avoiding any snagging and / or trapping for the biker on the device.

Compatibility

Designed to fit Thrie-Beam Barrier Systems such as the Sentry Barrier.

Introduction

RiderPro MPR is a motorcyclist restraint system designed to reduce the impact severity for riders when colliding with a roadside Thrie-Beam guardrail barrier.

RiderPro MPR is positioned below the Thrie-Beam guardrail and prevents a sliding motorcyclist from contacting the supporting posts of the guardrail barrier.

In this application, RiderPro MPR has been engineered in order that it can be fitted to the following road safety barrier systems:

Sentry Barrier TL-4 Thrie-Beam System with RiderPro MPR, refer to Appendix on Page 18.

Specifications

Panel section length	4.0m
Mounting bracket spacing	2.0m
System mass	5.8kg/m
Panel material	350 Mpa Yield Strength Steel Thickness 1.0 mm
Bracket material	275 Mpa Yield Strength Steel Thickness 5.0 mm
System coating	Continuously hot-dipped pregalvanised

How RiderPro® MPR Works

RiderPro MPR is adapted to be installed as a motorcycle restraint system for the Sentry Barrier System either in a new installation or as retrofitting to existing installation, as determined by the local Road Controlling Authority.

RiderPro MPR provides safe rider containment and redirection through the combination of the spring-effect of the mounting brackets and the controlled deformation of the corrugated beams. The brackets attach directly to the post, so that the bracket is in contact with the post and absorbs the impact energy of the fallen rider. Whereas, the corrugated beam acts to contain and redirect the fallen rider.

The position of RiderPro MPR beneath the guardrail prevents rider contact with the posts and provides effective containment and smooth redirection.

The RiderPro MPR mounting bracket position is an important design consideration as vertical alignment with the face of the guardrail reduces the potential for rider snagging.

Crash Test Performances

RiderPro MPR has been successfully crash tested in Class C60 with Severity Level I in accordance with the European Technical Specification CEN/TS 1317-8, attached to Sentry TL-4 Thrie-Beam barrier system.

This crash test procedure is recognised by AS/NZS 3845.2:2017 Road safety barrier systems and devices.

Crash testing simulates an 86 kg dismounted rider sliding into a 20 m long installed barrier as follows:

- Impact at the post at 60 km/h and 30°, and
- Impact mid-span between the posts at 60 km/h and 30°.

Additionally, the RiderPro MPR Sentry has successfully undergone testing according to MASH-16 TL3 which included Test 3-30 (1100kg vehicle) and 3-31 (2270kg vehicle). These additional tests were conducted to assure the highest safety for the motorcyclist safety system are met.

Design Considerations

Length of Need

The beginning of the LoN is placed at:

Sentry Barrier TL-4 Thrie-Beam System: at the midspan between the 3th and the 4th post. Refer to Appendix on Page 21.

Minimum Installation Length

The minimum installation length of the RiderPro MPR is:

Sentry Barrier TL-4 Thrie-Beam System: 20 meters (No. 5 panels). Refer to Appendix on Page 21.

Site Grading

It is recommended that the area in advance of the barrier be limited to a grading of 10H:1V and free of undulations that may adversely affect the trajectory of a dismounted rider.

Kerbs

Placing kerbs in front of the barrier is not permitted. As an alternative subsurface grated drainage should be considered.

Retrofitting

The RiderPro MPR mounting bracket connection to the post just below the Thrie-Beam with a 12mm hole placed in the post allows for appropriate vertical alignment with of the MPR system with the guardrail. This alignment reduces the potential for rider snagging.

Attachment of RiderPro MPR does not require any dismantling or loosening of the existing barrier and associated hardware. This reduces installation time and avoids problems where debris and/or vegetation can accumulate around the post.

Reinforced Concrete Foundation

Placement Within Guardrail End Terminals

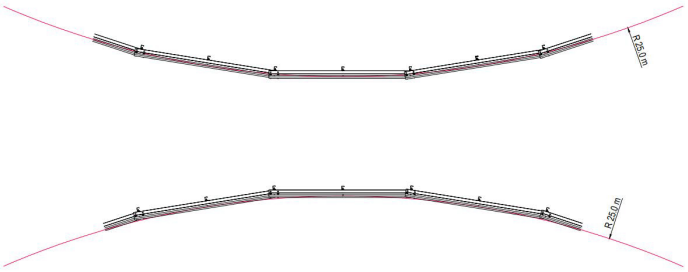
The end terminals of W-Beam guardrail barriers are designed to reduce the severity of a vehicle impact near or at the end of the system.

These terminals may incorporate yielding posts, energy-absorbing impact heads or a combination of both.

It is recommended that RiderPro MPR not be installed within the guardrail end terminal section.

Minimum Horizontal Radius (Installation Curvature Radius)

The RiderPro MPR can achieve a minimum horizontal radius curvature of 25m onsite installed onto the Sentry Barrier TL-4 Thrie-Beam System, when supplied with standard straight RiderPro MPR panels (Refer to Appendix on Page 22). For installation curvatures of less than 25m radius, pre-curved RiderPro MPR panels need to be ordered prior to installation. Contact your CSP representative for further information once the installation radius is identified.



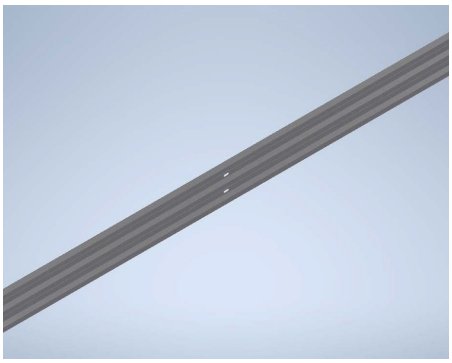
End Termination

A specifically designed end terminal is available for attachment to the RiderPro MPR.

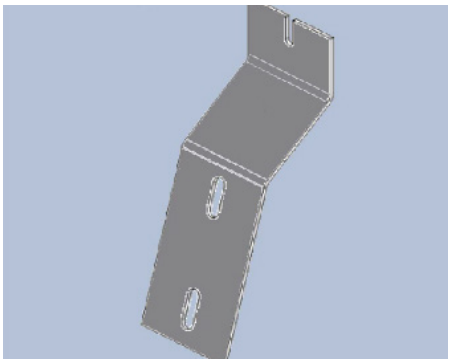
It is a requirement that the RiderPro MPR End Terminal is installed on both ends of the system.

Parts Identification

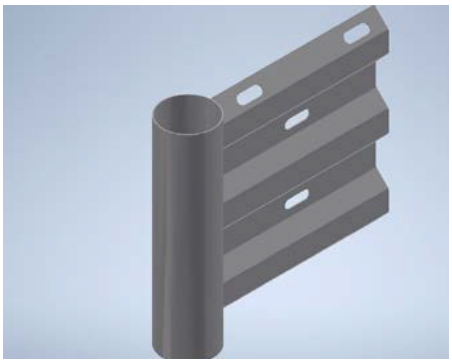
Before starting the installation of the RiderPro MPR to an Sentry Barrier TL-4 Thrie-Beam System, check the Bill of Materials to ensure that all the following components have been identified and delivered on site with the quantity required for the length to install.



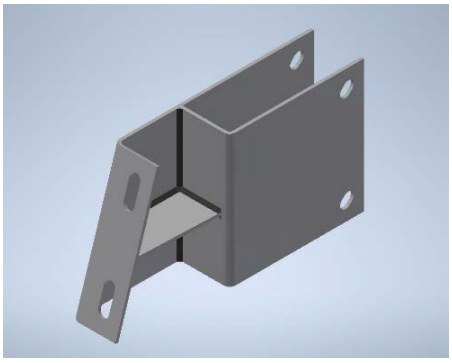
Corrugated Beam
Part No. EE00500001; Weight: 15.0 kg



Mounting Bracket
Part No. EE00500005 Weight: 3.6 kg

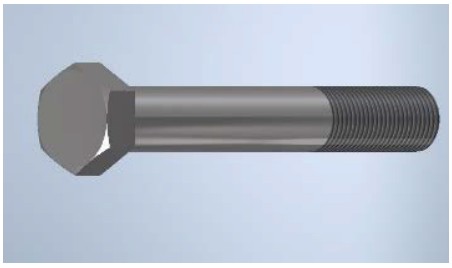


Beam End Terminal
Part No. EE00590000 Weight: 4.3 kg

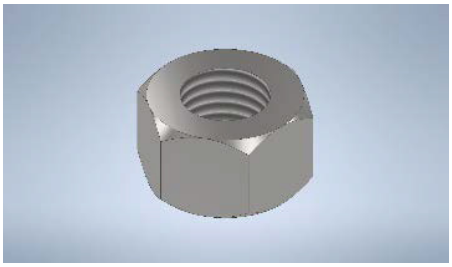


Terminal Mounting Bracket
Part No. EE00590001 Weight: 6.6 kg

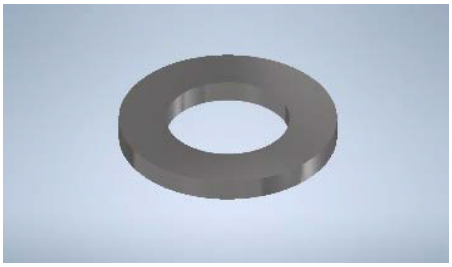
Guardrail bolt with hexagonal socket
M16 x 35 mm Gr.8.8



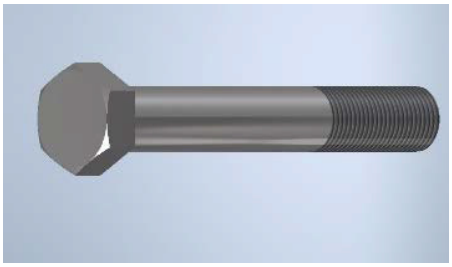
M16 x 110 mm Hex Bolt
Gr.8.8



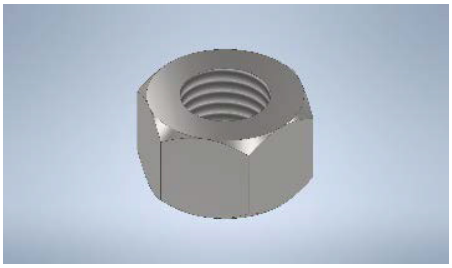
M16 nut



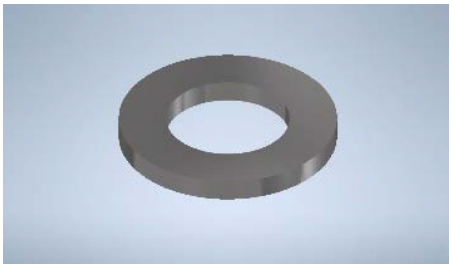
M16 Washer



M10 x 25 mm Hex Bolt Gr.8.8



M10 nut



M10 Washer

Tools Required

The installation of RiderPro MPR requires the following tools:

- Hammer
- Measuring tape
- 24 mm ratcheting wrench
- 17 mm wrench and socket
- 1/2 in. drive 10 mm hex bit socket
- Cordless impact wrench
- 1/2 in. drive 24 mm hex socket
- 1/2 in. drive ratchet
- Pinch bar (with tapered end or alignments)
- 12 mm high strength drill bit for carbon steel

Recommended PPE

In order to ensure the safety of the operations in the installation of the RiderPro MPR, it is recommended to wear the following ordinary personal protective equipment (PPE):

- Safety footwear;
- Gloves;
- Hearing protection; and
- High visibility clothing.

Site Establishment

Traffic Control

Prior to the commencement of any work, the site should be evaluated for risks to workers, pedestrians and other road users. The establishment of traffic control should provide safe travel for passing vehicles and/or pedestrians and appropriately protect workers near the roadside.

Overhead Obstructions

The site should be evaluated for potential overhead obstructions that may present a risk during the installation process. These obstructions typically include power lines, signage or trees.

Unloading Exclusion Zone

Only appropriate load-rated slings or chains should be used for safe unloading. It is recommended that an exclusion zone be maintained around the unloading process. This provides distance between moving machinery and workers in the event that goods or the machinery move unexpectedly.

Unloading and the storing of the product on a level surface is recommended. Storing product adjacent to the installation area eliminates the requirement for workers to carry items over long distances.

Installation to the Sentry Barrier TL-4 Thrie-Beam System

New Installation

When supplied as part of a new guardrail barrier installation, prior to commencing the installation of the RiderPro MPR system, it is recommended that the installation of the barrier is completed in accordance with its “Product and Installation Manual”.

Retrofitting Installation

When supplied for the retrofitting of an existing guardrail barrier, prior to install the RiderPro MPR system, it is recommended to identify if the Sentry Barrier post has a RiderPro MPR 12mm mounting hole located 600mm from the top of the Sentry Barrier post. If the RiderPro MPR mounting hole is not present in these post be prepared to drill a 12mm hole 600mm from the top of the Sentry Barrier post.

Sequence of Installation

The major steps in the installation of RiderPro MPR are as follows:

- Installing the mounting brackets;
- Attaching and splicing the RiderPro MPR beams
- Installing the end terminals; and
- Adjusting the ground clearance of the beams.

Attaching the Mounting Brackets

Potential Hazards: Injury from movements and posture, hand injury from pinch points, strain to wrists from tightening bolts and excessive noise from the use of an impact driver.

Recommended Control Measures: Observe correct posture, wear gloves, use an impact wrench to tighten bolts and wear appropriate hearing protection.

The RiderPro MPR mounting bracket is attached via the 12mm mounting hole which is located 600mm from the top of the Sentry Posts and affixed using the M10x25mm bolt.

Install the RiderPro MPR mounting bracket now.

Tighten the M10 bolt connecting the RiderPro MPR mounting bracket to the Sentry Barrier post to a torque range of 40 to 80 inch-pounds (4.5 to 9Nm).

Figure 1: Sentry Barrier attachment of Mounting Bracket

Figure 2: Sentry Barrier Mounting Bracket attached (rear view

Attaching the Beams

Potential Hazards: Injury from movements and posture, hand injury from pinch points, strain to wrists from tightening bolts and excessive noise from the use of an impact driver.

Recommended Control Measures: Observe correct techniques when lifting rails (bend at the knees), wear gloves, use a pinch bar to align holes, use an impact wrench to tighten bolts and wear appropriate hearing protection.

Position the RiderPro MPR beams below and parallel to the guardrail. Attach them to the mounting brackets with two M16 x 35 mm guardrail bolt (Ref. (1) in Figure 3) using standard nuts and round washers, but do not fully tighten them yet.

The beams must be overlapped with the flow of traffic so that the leading edge of the splice is shielded from the nearside approaching traffic.

Splice beams together using four M16 x 35 mm 8.8 guardrail bolts (Ref. (2) in Figure 3), standard nuts and round washers.

It could be helpful to use a pinch bar to align the holes at the splice, to make bolt installation easier. Any elongation of the splice holes is strictly FORBIDDEN.

Tighten the four bolts of the splice to snug fit (no specific torque is required), avoiding for now to tighten the two bolts that connect the beams to the mounting brackets.

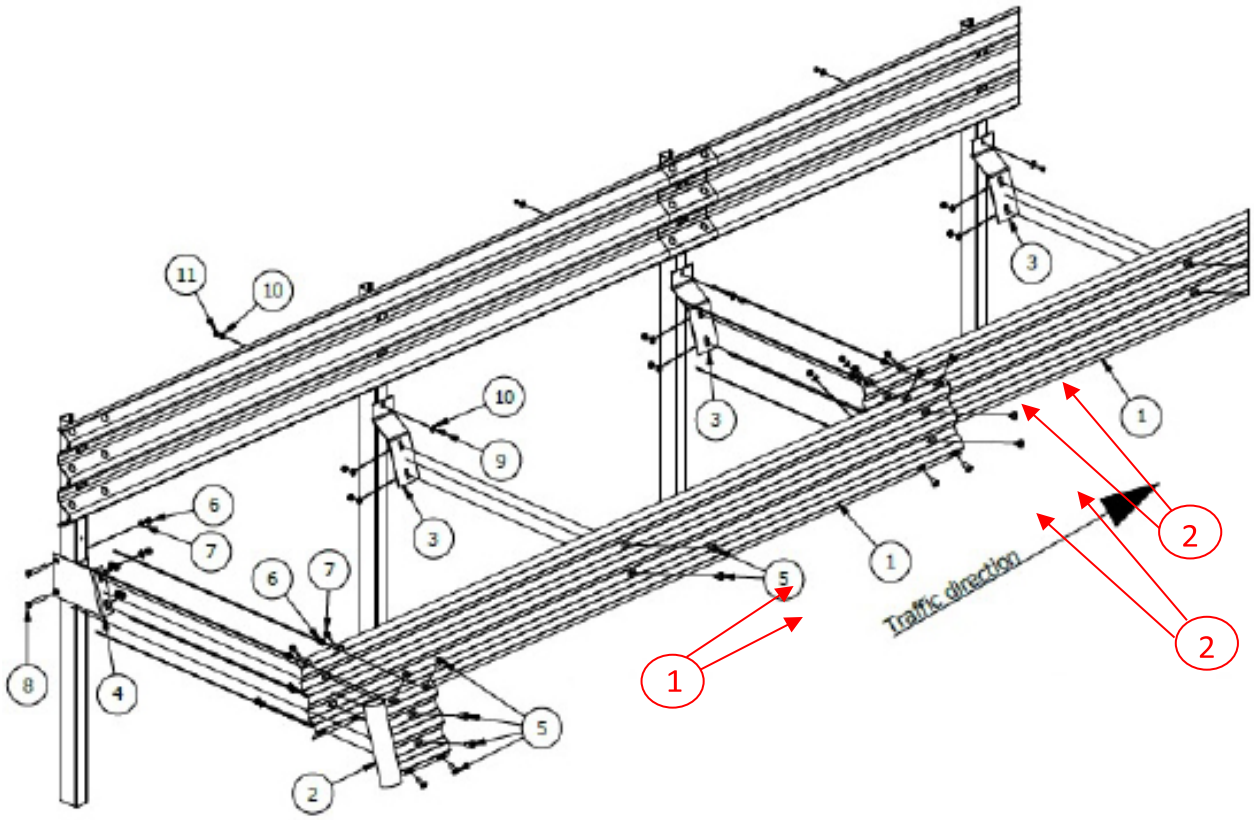


Figure 3. Attachment of the RiderPro MPR beams to the Sentry Barrier TL-4 Thrie-Beam System

Attaching the End Terminals

Potential Hazards: Injury from movements and posture, hand injury from pinch points, strain to wrists from tightening bolts and excessive noise from use of impact driver.

Recommended Control Measures: Observe correct techniques (bend at the knees), wear gloves, use a pinch bar to align holes, use an impact wrench to tighten bolts and wear appropriate hearing protection.

Attach the RiderPro MPR End Terminal (1) to the beam using four M16 x 35 mm guardrail bolts (2), standard nuts and round washers. The End terminal must overlap the beam so that the splice is with the flow of traffic.

Place the end post bracket (3) at the last/first guardrail post and fix it by means of two M16x110 mm Hex Head Blots (4), standard nuts and round washers, but do not fully tighten them for the moment.

Align the 18 mm wide slots of the end post bracket with the 18 x 50 mm centered slots of the RiderPro MPR beam and attach them with two M16 x 35 mm guardrail bolts (5) standard nuts and round washers.

Before tightening the bolts too snug, pay attention to adjust the ground clearance of the beam.

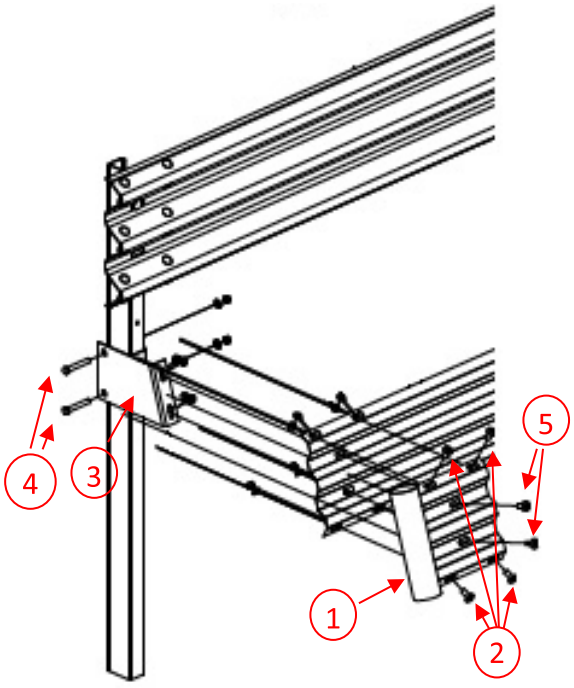


Figure 4: Termination of RiderPro MPR to the Sentry Barrier TL-4 Thrie-Beam System

Adjusting the ground clearance

Prior to tightening the bolts that connect the RiderPro MPR beams to the brackets, it is recommended to adjust the height of the bottom of the beams from the ground, according to the installation clearance (30 mm) in Figure 5. At this point it may be necessary to loosen the M10x25 bolt used to RiderPro MPR mounting bracket to the Sentry Barrier post to achieve the appropriate installation clearance. Should that be necessary it is require to reapply the recommended 40 to 80 inch-pounds (4.5 to 9.0 Nm) of torque.

Recommended Control Measures: wear gloves, use an impact wrench to tighten bolts and wear appropriate hearing protection.

The adjustment completed, bolts connecting the beams to the brackets can now be tightened forming a snug connection (there is not a specific torque value required).

The finished position of the RiderPro MPR beam should be parallel to the guardrail and to the ground.

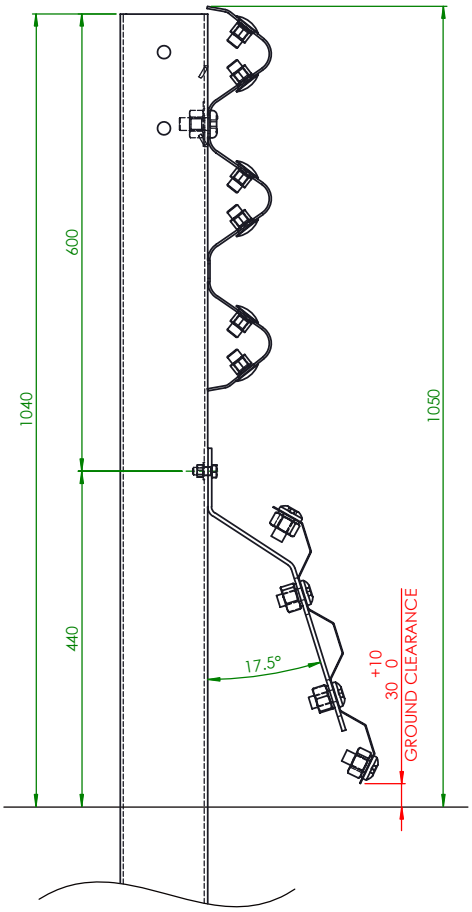


Figure 5: Sentry Barrier System RiderPro MPR ground clearance

Installation Checklist

Item	Y	N
The RiderPro MPR has been installed in accordance with proprietor or state road agency specifications.		
The RiderPro MPR mounting brackets are positioned such that they are in direct contact with the guardrail post and at each guardrail post.		
The RiderPro MPR mounting brackets have been connected to the Sentry Barrier Post with the M10x25 hardware with the appropriate torque apply.		
The RiderPro MPR beams are secured to each mounting bracket with two M16 x 35mm bolt, standard nut and round washer.		
The RiderPro MPR beams are spliced with four M16 x 35 mm bolts, standard nuts and round washers.		
The RiderPro MPR beams are lapped with the flow of traffic.		
The RiderPro MPR system does not extend into the guardrail terminal section.		
The End terminal of the RiderPro MPR is correctly installed at both ends of the length.		
The ground clearance is correct along all the length of the RiderPro MPR.		
All bolts are tightened.		
The RiderPro MPR system follows an even alignment with the upper guardrail.		
The RiderPro MPR ground clearance is respected.		

Job Number:			
Location:			
Client/Asset Owner:			
Principal Contractor:			
Installer:			
Installed by:		Date:	
Inspected by:		Date:	

Contact CSP for more information on this or other road safety products.

Maintenance

Traffic Control

RiderPro MPR is a low maintenance protection device. Except for repairs due to impacts, it is recommended that an annual inspection is undertaken to assess the following:

- Debris has not accumulated around the barrier which may impede the function of the barrier;
- Vegetation around the barrier is appropriately maintained;
- Nuisance impacts have not gone undetected; and
- End terminals are fitted to the ends of the RiderPro MPR system.

Repair

Unloading Exclusion Zone

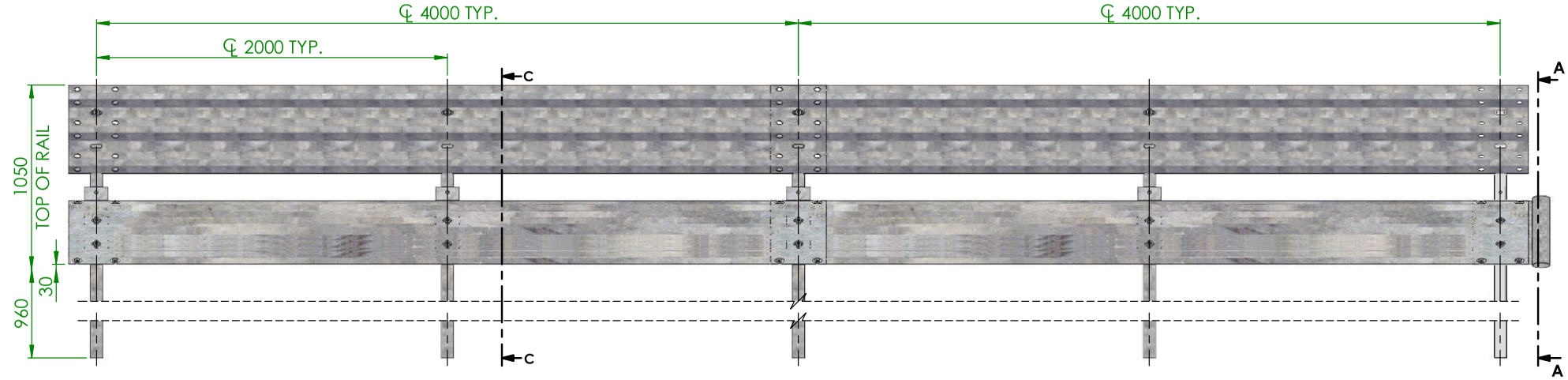
In the event of an impact, damage to the RiderPro MPR system is to be assessed in accordance with Table 1. Typically, impacts with RiderPro MPR will require replacement of damaged sections of mounting brackets and beams. It is also recommended the use of new bolts where mounting brackets and beams have been replaced.

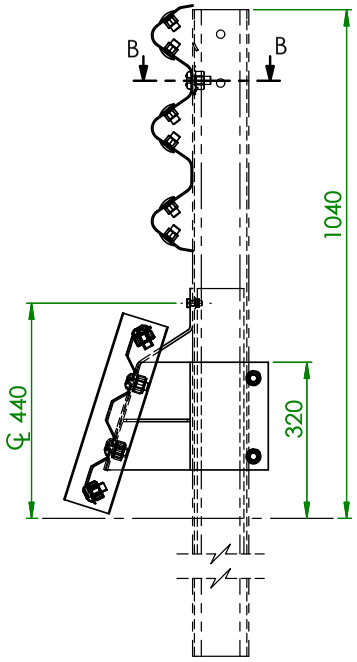
Similar to the installation sequence, it is recommended that the guidelines contained on Page 10 be observed in the establishment of traffic control and an unloading exclusion zone in addition to investigation for underground services and overhead obstructions.

Type of damage	Description of the damage	Action
Damage to the galvanised coating on the beams.	The sum total of the damaged area does not exceed 180 cm^2 (0.5% of the total surface area) and no individual damaged area exceeds 40cm^2.	An organic zinc rich paint is to be applied to the repair area in two coats.
	The sum total of the damaged exceeds 180cm^2 (0.5% of the total surface area) and no individual damaged area exceeds 40cm^2.	The beam is to be replaced.
Damage to the beams.	The beam is dented, twisted or flattened. There are nicks in any part of the beam. The slots in the beam are distorted.	The beam is to be replaced.
Damage to the mounting brackets.	The bracket is bent, twisted or flattened.	The mounting bracket is to be replaced.
Damage to the bolts.	The body of the bolt is distorted. The thread of the bolt is damaged.	The bolt is to be replaced.

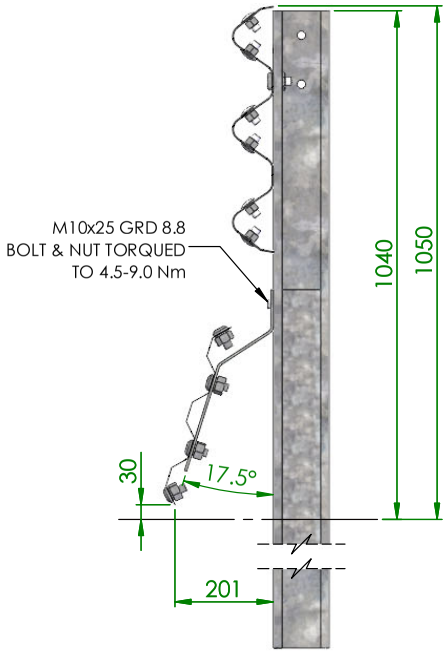
Appendix

Technical Drawings

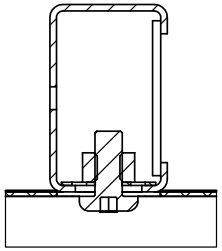




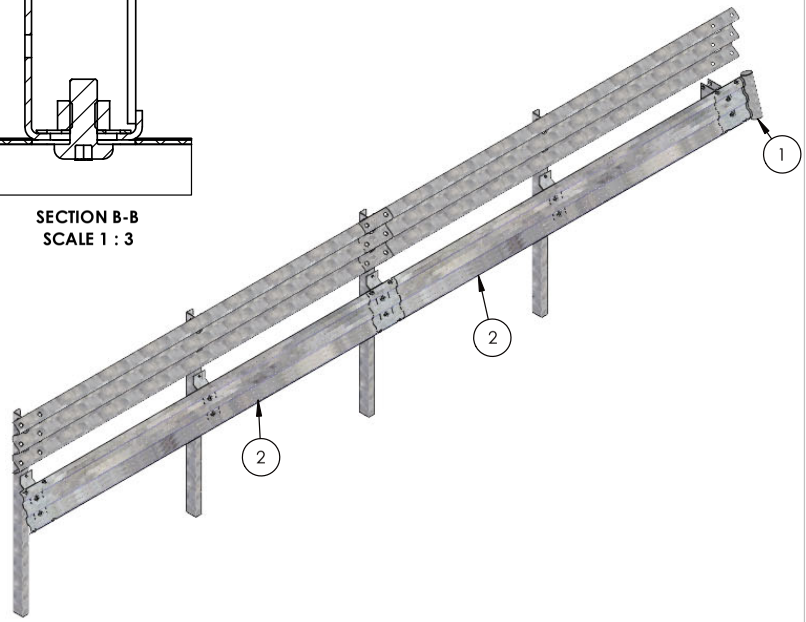
SECTION A-A
SCALE 1 : 10



SECTION C-C
SCALE 1 : 10



SECTION B-B
SCALE 1 : 3



ITEM NO.	PART NO.	DESCRIPTION	QTY.	WEIGHT EA. (KG)	DWG No.
1	2084121	MPR RIDERPRO BEAM END TERMINAL ASSY	1	9.93	FX755-2
2	2084130	MPR RIDERPRO TL4 12G 4000 SENTRY ASSY	2	125.84	FX755A-1

NOTES:

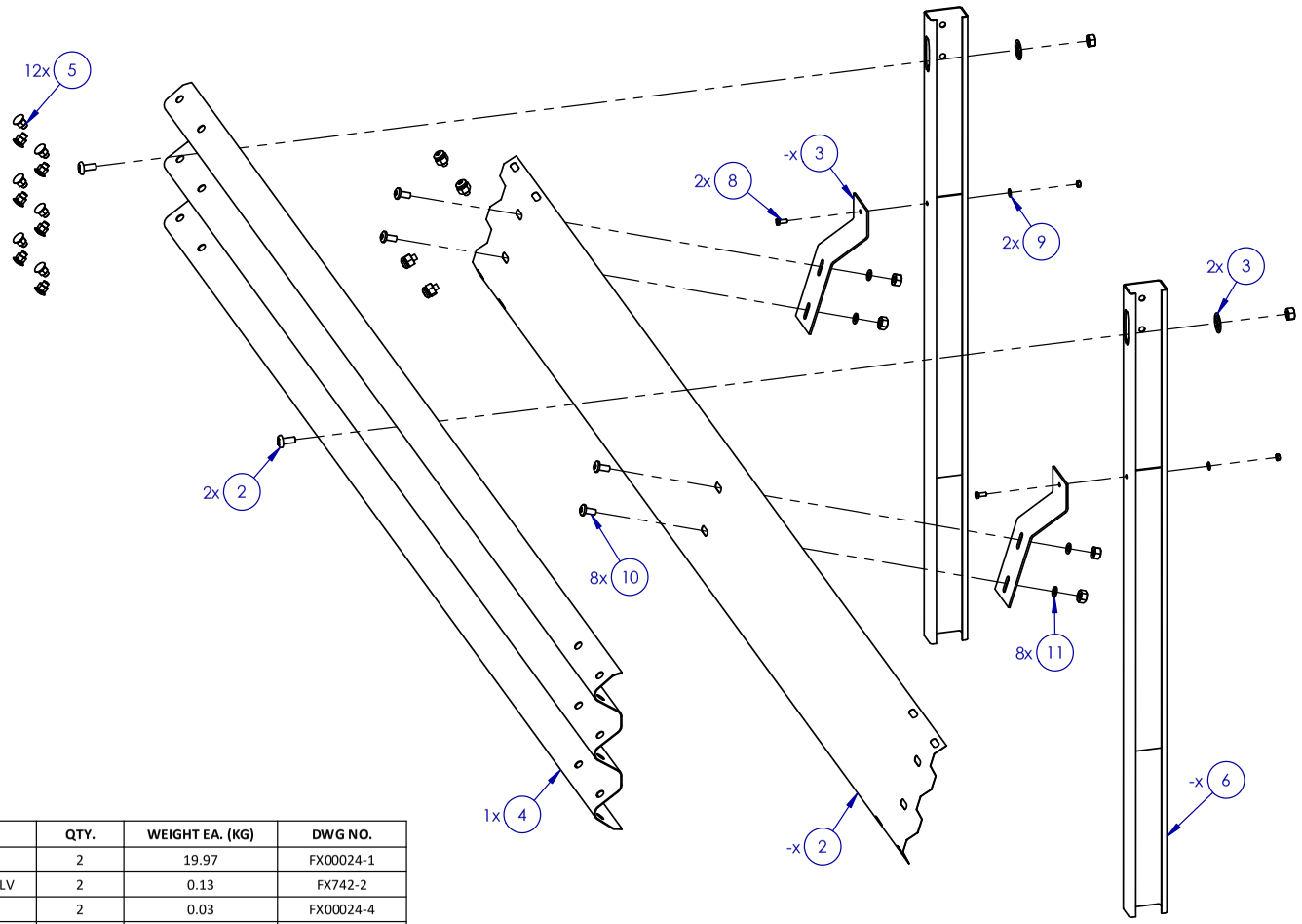
REVISION	REV.DATE	CHANGES MADE

CSP PACIFIC
304 Neilson Street, Onehunga
Auckland, New Zealand
Telephone: 09 634 1239
www.csppacific.co.nz

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN

SCALE A3	1:22	DESCRIPTION	MPR RIDERPRO TL4 SENTRY WITH END TERMINAL ASSY
ASSEMBLY NO.	2084130		
WEIGHT(Kg)			

DRAWN	SANDIP KERAI	DESTROY ALL PREVIOUS ISSUES
DRW NO.	FX755A	0
DATE		



ITEM NO.	PART NO.	DESCRIPTION	QTY.	WEIGHT EA. (KG)	DWG NO.
1	2082780	SENTRY TL4 POST 2m WELDMENT GALV	2	19.97	FX00024-1
2	2082800SEN	BNW MUSHROOM HEAD BOLT M16 X 50mm LNG & OVERSIZED NUT GALV	2	0.13	FX742-2
3	2082794	FL WASHER SENTRY TL4 58 O.D X 2mm GALV	2	0.03	FX00024-4
4	2080360A	THRIEBEAM 4M 12G GALV	1	67.96	FX382
5	2080128	BNW SPLICE BOLT M16 X 32mm LNG & NUT HT	12	0.09	
6	2084131	MPR RIDERPRO BEAM 4.0M	1	15.00	
7	2084101	MPR RIDERPRO SENTRY MTG BRACKET M10	2	0.29	
8	2081115HT	BNW BOLT & NUT M10 X 25 GALV G8.8	2	0.03	
9	2081128	BNW WASHER ROUND M10X24X3 GALV	2	0.00	
10	2084104	BNW MUSHROOM HEAD BOLT & NUT M16X35 G8.8	8	0.01	
11	2084105	BNW WASHER ROUND M16X35X4 GALV	8	0.00	

NOTES:

REVISION	REV.DATE	CHANGES MADE

CSP PACIFIC
304 Neilson Street, Onehunga
Auckland, New Zealand
Telephone: 09 634 1239
www.csppacific.co.nz

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES. TOLERANCES ±1mm AND ±0.5°

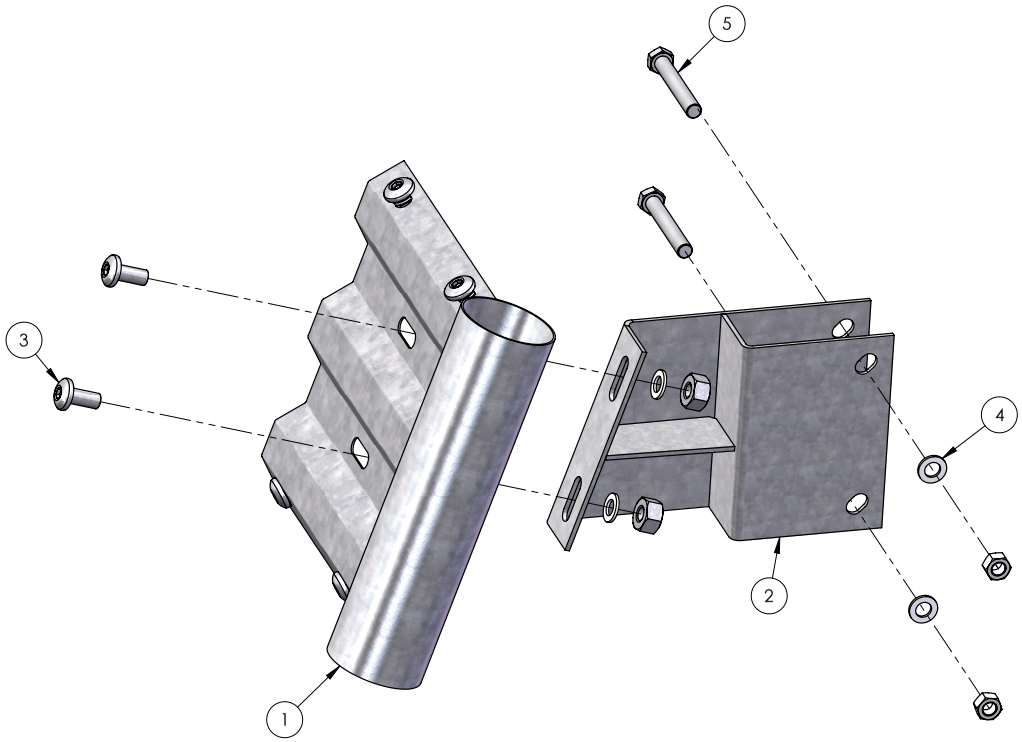
SCALE A3	1:14
ASSEMBLY NO.	2084130
WEIGHT (Kg)	125.84

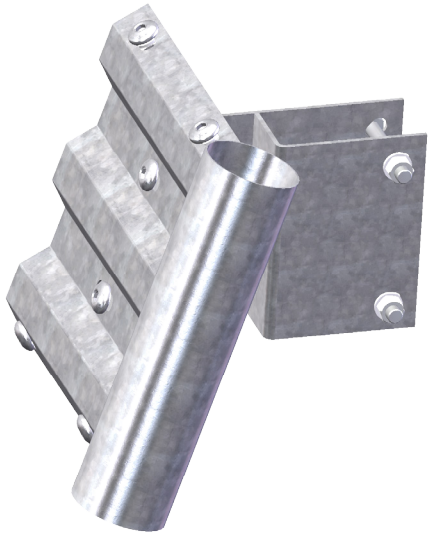
DESCRIPTION
MPR RIDERPRO TL4 12G 4000
SENTRY ASSY

DRAWN	SANDIP KERAI
DRW NO.	FX755A-1
DATE	22/07/2021

DESTROY ALL PREVIOUS ISSUES
0
REVISION

ITEM NO.	PART NO.	DESCRIPTION	QTY.	WEIGHT EA. (KG)	ACCUM. WEIGHT (KG)
1	2084102	MPR RIDERPRO BEAM END TERMINAL NOSING	1	4.26	4.26
2	2084103	MPR RIDERPRO END POST BRACKET	1	5.38	5.38
3	2084104	BNW MUSHROOM HEAD BOLT & NUT M16x35 G8.8	6	0.01	0.06
4	2084105	BNW WASHER ROUND M16x35x4 GALV	8	0.00	0
5	2081130C	BNW ENG BOLT & NUT M16x110 GALV	2	0.03	0.06





NOTES:

REVISION	REV.DATE	CHANGES MADE

CSP PACIFIC
304 Neilson Street, Onehunga
Auckland, New Zealand
Telephone: 09 634 1239
www.csppacific.co.nz

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES. TOLERANCES ±1mm AND ±0.5°

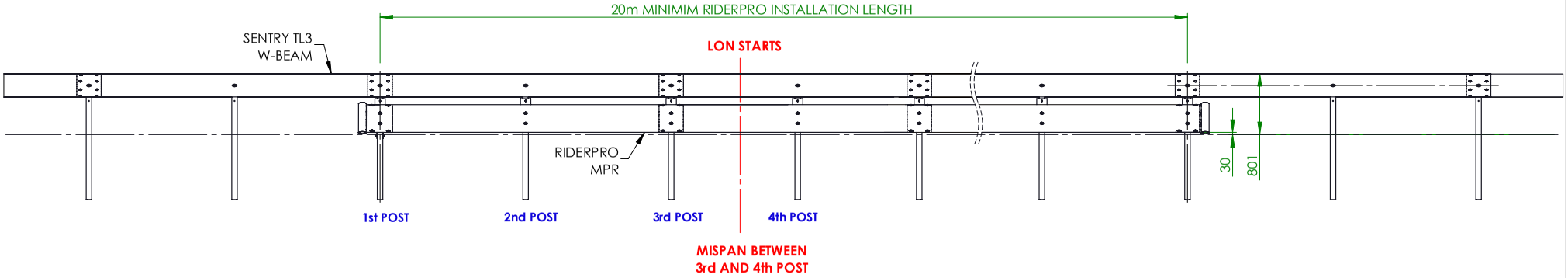
SCALE A3	1:5
ASSEMBLY NO.	2084121
WEIGHT(Kg)	9.93

DESCRIPTION
MPR RIDERPRO BEAM END TERMINAL ASSY

DRAWN	SANDIP KERAI
DRW NO.	FX755-2
DATE	18/01/2021

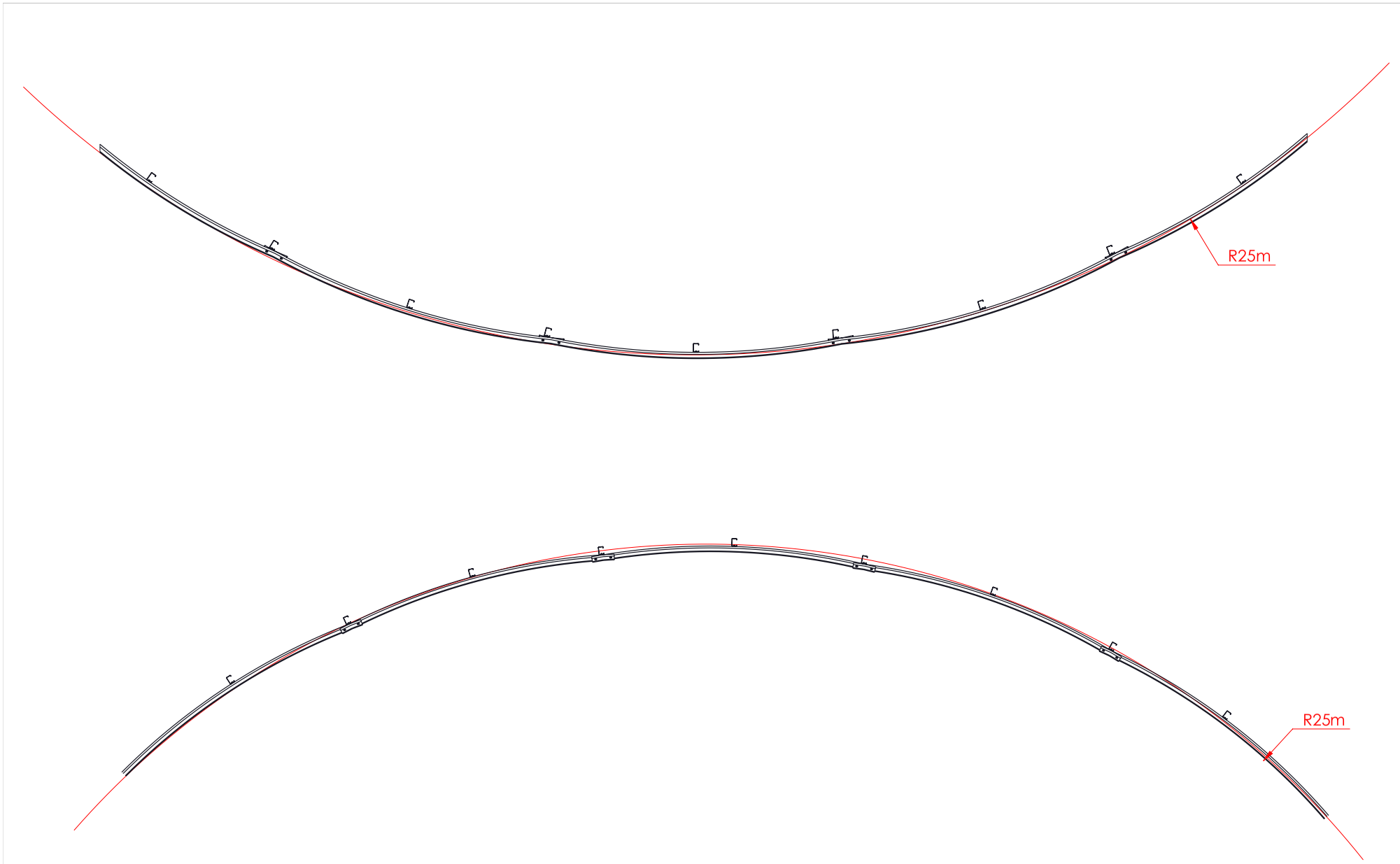
DESTROY ALL PREVIOUS ISSUES
0
REVISION

PLAN VIEW



ELEVATION VIEW

NOTES:	**REVISION** **REV.DATE** **CHANGES MADE**	CSP PACIFIC 304 Neilson Street, Onehunga Auckland, New Zealand Telephone: 09 634 1239 www.csppacific.co.nz *UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES. TOLERANCES ±1mm AND ±0.5°*	**SCALE A3** 1:50 **ASSEMBLY NO.** **WEIGHT(Kg)**	**DESCRIPTION** MPR RIDERPRO WITH SENTRY TL3 MINIMUM LENGTH OF INSTALLATION	**DRAWN** SANDIP KERAI **DRW NO.** FX755-3 **DATE** 15/02/2021	DESTROY ALL PREVIOUS ISSUES 0 REVISION



NOTES:	**REVISION** **REV.DATE** **CHANGES MADE**	CSP PACIFIC 304 Neilson Street, Onehunga Auckland, New Zealand Telephone: 09 634 1239 www.csppacific.co.nz *UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETRES. TOLERANCES ±1mm AND ±0.5°*	**SCALE A3** 1:22 **ASSEMBLY NO.** **WEIGHT(Kg)**	**DESCRIPTION** MPR RIDERPRO WITH SENTRY TL3 MINIMUM CURVE INSTALLATION RADIUS	**DRAWN** SANDIP KERAI **DRW NO.** FX755-4 **DATE** 18/01/2021	DESTROY ALL PREVIOUS ISSUES 0 REVISION