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RiderPro

Motorcycle Protection for ACP Sentry Barrier TL-4 ThrieBeam System



Product and Installation Manual

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RiderPro 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, the same design being utilized with the Sentry Barrier TL-4 ThrieBeam System, has undergone MASH TL-3 compliance crash testing attached to the ACP Sentry W Beam 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 W and Thriebeam Barrier Systems such as the *ACP Sentry Barrier*.

Easy Assembly

Can be installed in a new guardrail installation or retrofitted to existing guardrails. **RiderPro** is easy to assemble and fast to install in all its applications.

1 Introduction

RiderPro is a motorcyclist restraint system designed to reduce the impact severity for riders when colliding with a roadside thrie beam guardrail barrier.

RiderPro 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** has been engineered in order that it can be fitted to the following road safety barrier systems:

- **ACP Sentry Barrier W beam System, Drawing No ACP9016-000**
- **ACP Sentry Barrier TL-4 ThrieBeam System, Drawing No S.B.TL-4-RIDERPRO**

2 Specifications

	<i>RiderPro Sentry Barrier ThrieBeam System</i>
Panel section length	4.0 m
Mounting bracket spacing	2.0 m
System mass	5.8 kg/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	Hot-dip and continuous galvanized

3 How **RiderPro** Works.

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

RiderPro 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** beneath the thrie beam guardrail prevents rider contact with the posts and provides effective containment and smooth redirection.

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

4 Crash Test Performances.

RiderPro 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:

- **ACP Sentry Barrier W beam System, Drawing No ACP9016-000**

This crash test procedure is recognized 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 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.

5 Design Considerations.

5.1 Length Of Need.

The Beginning of the LON is placed at:

- **ACP Sentry Barrier ThrieBeam System:** at the midspan between the 3th and the 4th post from the RiderPro End Terminal.

5.2 Minimum installation Length:

The Minimum installation Length of the **RiderPro** is:

- **ACP Sentry Barrier ThrieBeam System:** 20 meters (No 5 panels).

5.3 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.

5.4 Kerbs

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

5.5 Retrofitting

The **RiderPro** 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 w-beam guardrail. This alignment reduces the potential for rider snagging.

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

5.6 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** not be installed within the guardrail end terminal section.

5.7 Minimum Horizontal Radius (Installation curvature radius)

The **RiderPro** can achieve a minimum horizontal radius curvature of 25m onsite installed onto the **Sentry ThrieBeam system**, when supplied with standard straight **RiderPro** panels. For installation curvatures of less than 25m radius, pre-curved **RiderPro** panels need to be ordered prior to installation. Contact your **ACP** representative for further information once the installation radius is identified.

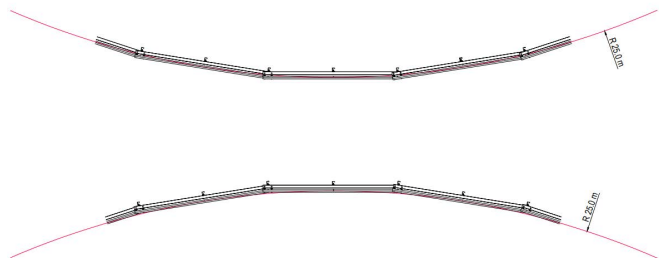


Figure 2. ACP Sentry Barrier and RiderPro Sentry: Minimum Horizontal Radius

5.8 End Termination

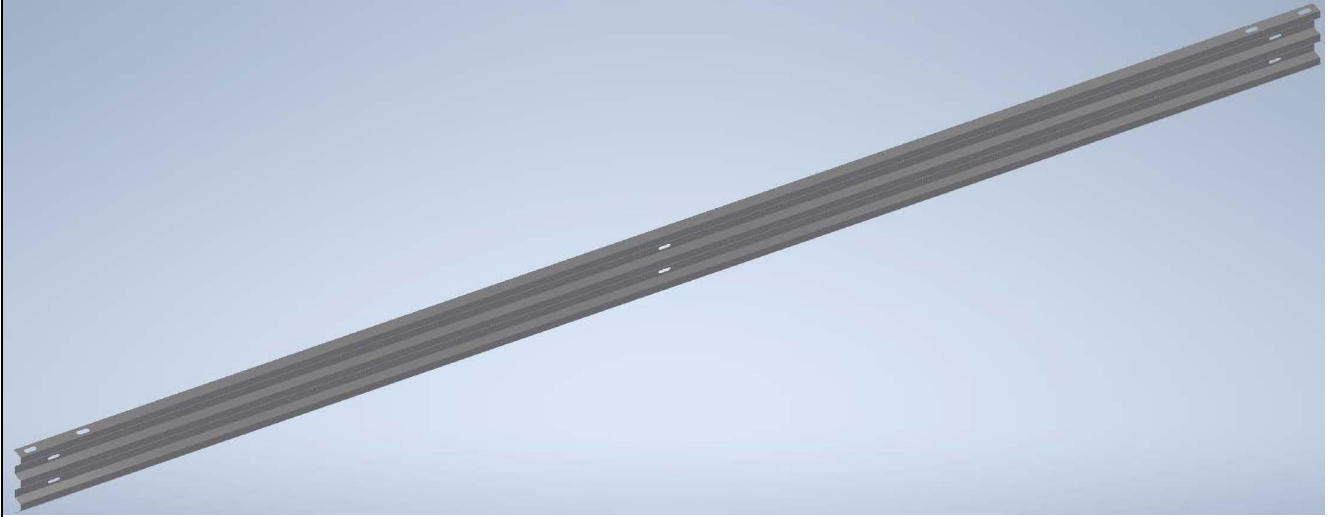
A specifically designed end terminal is available for attachment to the **RiderPro**.

It is a requirement that the **RiderPro** end terminal is installed on both ends of the system.

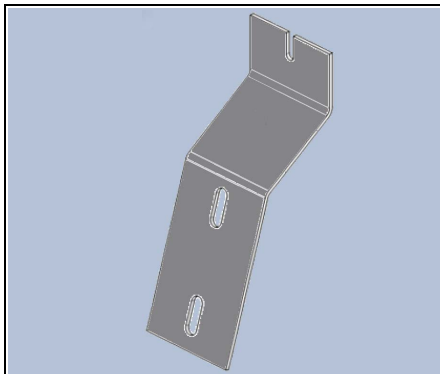
6 RiderPro Components Identification.

6.1 Components for the ACP Sentry TL4 ThrieBeam Barrier System

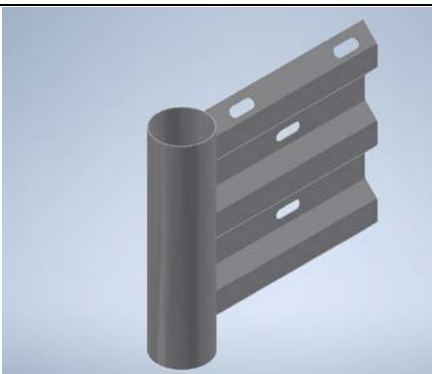
Before starting the installation of the **RiderPro** to an ACP Sentry Barrier ThrieBeam System, check the bill of materials to ensure that all the following components have been identified and delivered on site with the quantity required for the length to install.



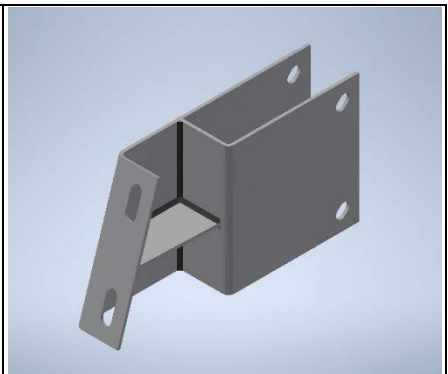
Corrugated Beam
Part No. **EE00500001**; Weight: **15.0 kg**



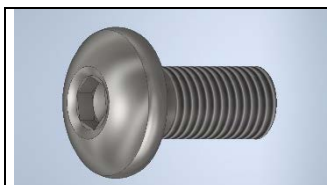
Mounting Bracket
Part No. **EE00500005**
Weight: **3.6 kg**



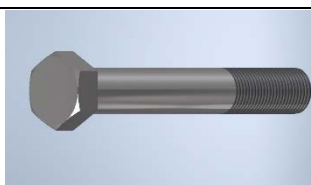
Beam end terminal
Part No. **EE00590000**
Weight: **4.3 kg**



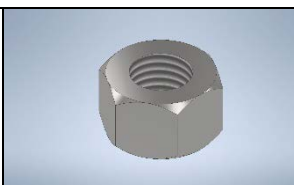
Terminal mounting Bracket
Part No. **EE00590001**
Weight: **6.6 kg**



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



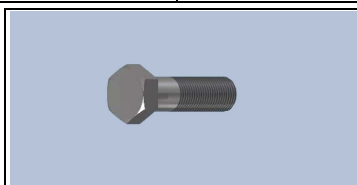
M16 x 110 mm Hex Bolt
Gr.8.8



M16 nut



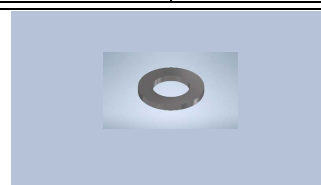
M16 Washer



M10 x 25 mm Hex Bolt
Gr.8.8











M10 nut



M10 Washer

7 Tools Required

The installation of **RiderPro** 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	
High power cordless impact wrench and drill	
1/2 in. Drive 24 mm Hex Socket	
1/2 in. Drive Ratchet	
Pinch bar (with tapered end for alignments)	
12mm high strength drill bit for carbon steel	

7.1 Recommended PPE

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

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

8 Site Establishment

8.1 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.

8.2 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.

8.3 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.

9 Installation to the ACP Sentry ThrieBeam Guardrail System.

9.1 New installation.

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

9.2 Retrofitting installation.

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

9.3 Sequence of installation.

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

1. Installing the mounting brackets;
2. Attaching and splicing the **RiderPro** beams
3. Installing the end terminals; and
4. Adjusting the ground clearance of the beams.

9.4 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 use of impact driver.

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

The **RiderPro** 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 mounting bracket now.

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



Figure 2. ACP Sentry Barrier: Attachment of Mounting Bracket.



Figure 3. ACP Sentry Barrier: Mounting Bracket attached (rear view).

9.5 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 use of 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** beams below and parallel to the thrie beam guardrail. Attach them to the mounting brackets with two M16 x 35 mm guardrail bolt (Ref. ① in Figure 4) 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 4), 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 (see § 9.7).

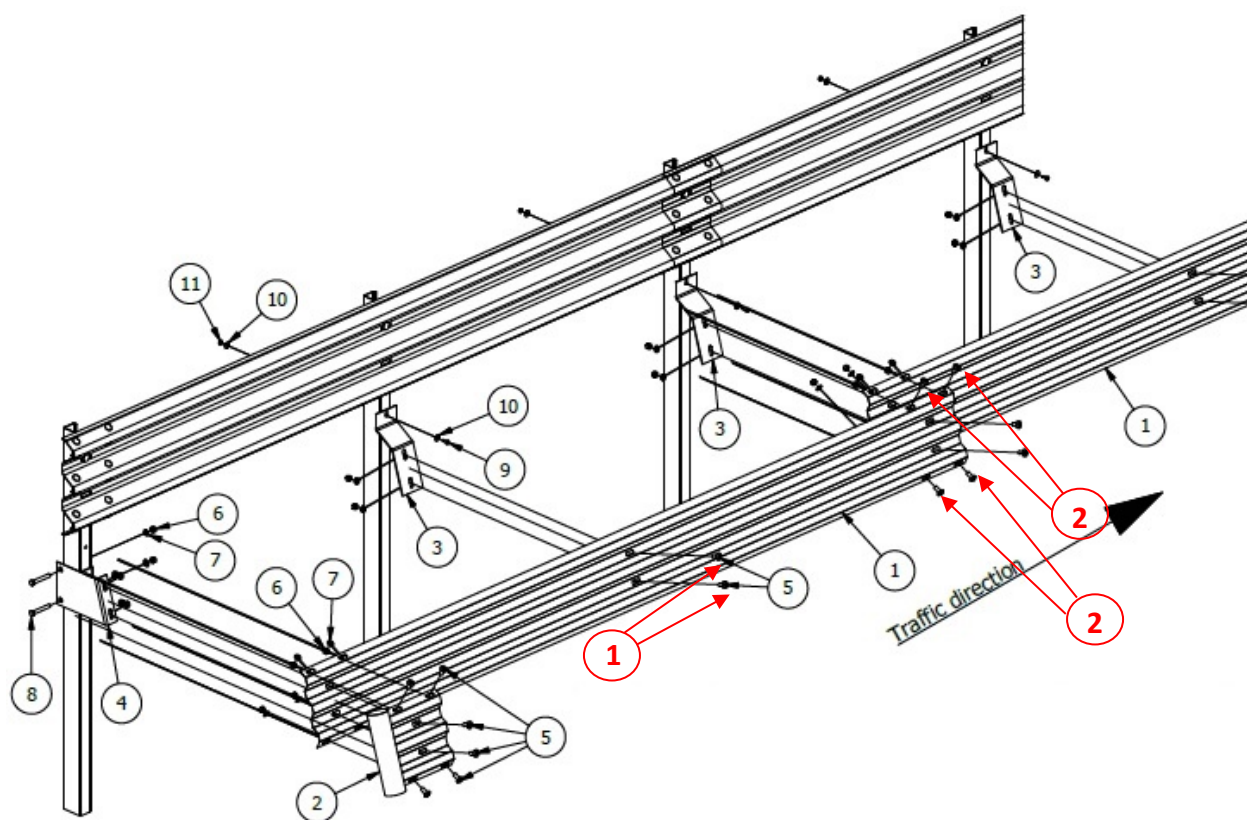


Figure 4. Attachment of the RiderPro Beams to the ACP Sentry Thrie Beam Barrier System.

9.6 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** 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 Bolts (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** beam and attach them with two M16 x 35 mm guardrail bolts (⑤) standard nuts and round washers.

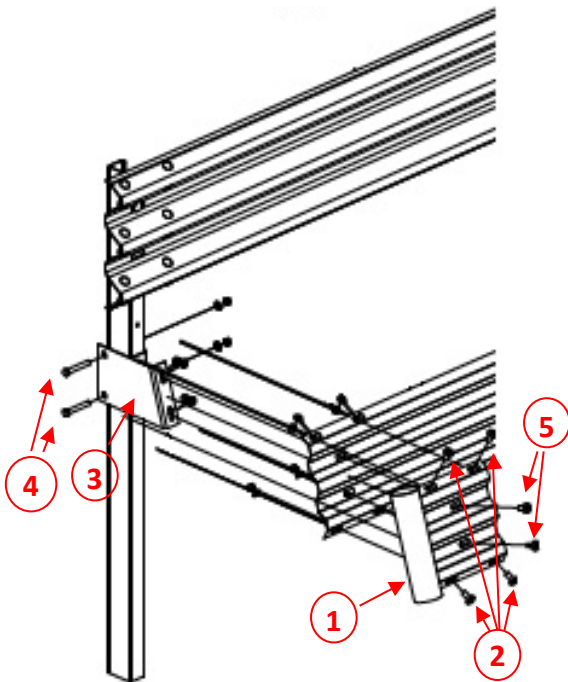


Figure 5. Termination of RiderPro attached to the ACP Sentry Barrier U Beam System.

Before tightening the bolts ref. ④ and ⑤ too snug, pay attention to adjust the ground clearance of the beam (see § 9.7).

9.7 Adjusting the ground clearance

Prior to tightening the bolts that connect the **RiderPro** 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 6. At this point it may be necessary to loosen the M10x25 bolt used to RiderPro mounting bracket to the Sentry 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.

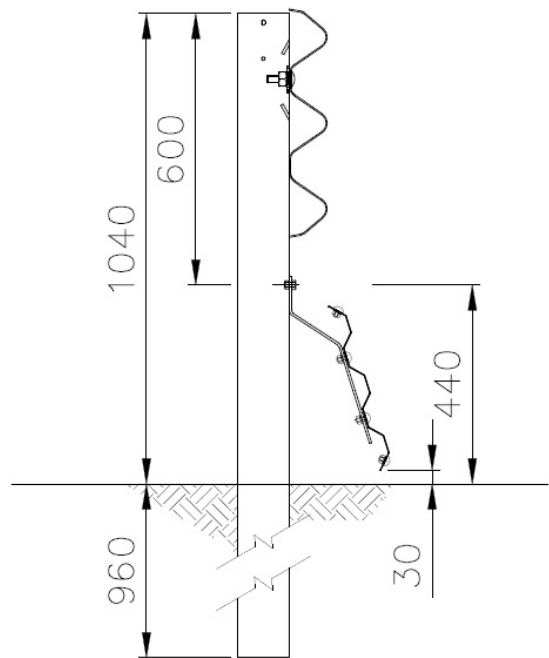


Figure 6. ACP Sentry Barrier: RiderPro Ground clearance.

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** beam should be parallel to the beam guardrail and to the ground.

RiderPro Installation Check List

Client: _____

Location: _____

Installed by: _____

Inspected by: _____

Date: _____

Signature: _____

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

10 Maintenance

RiderPro 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** system.

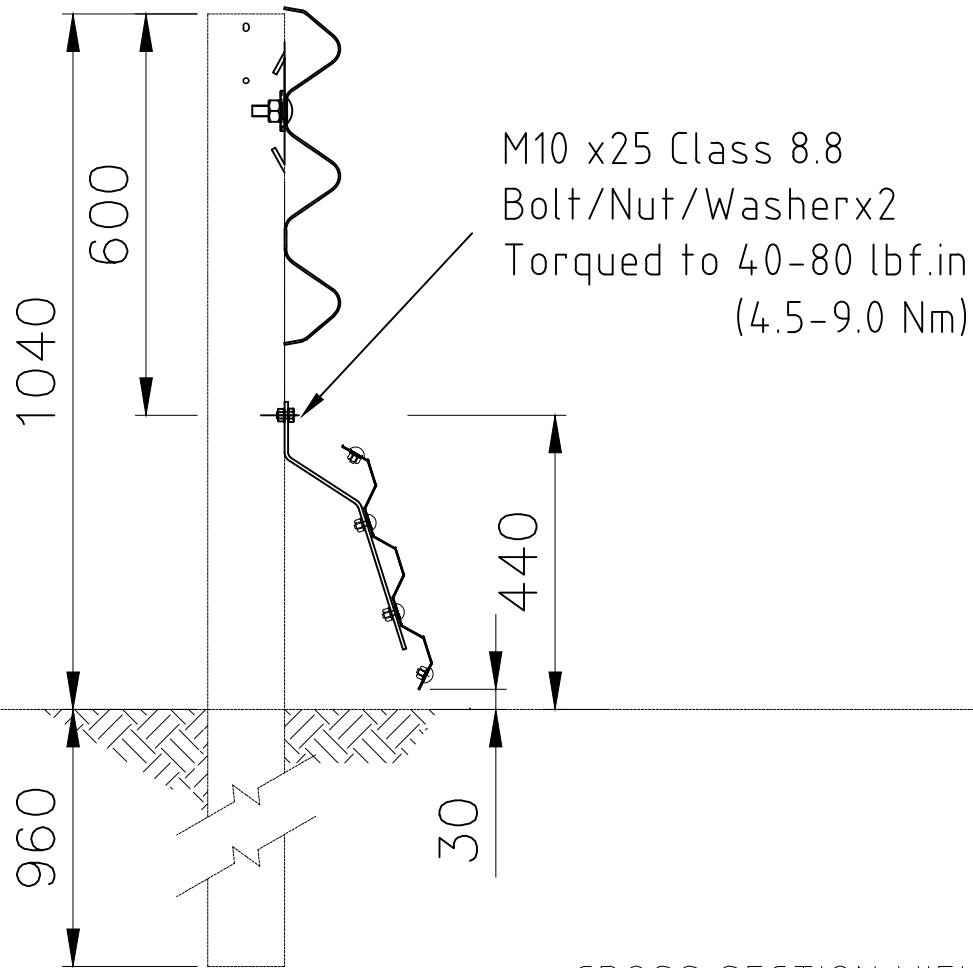
11 Repair

In the event of an impact, damage to the **RiderPro** system is to be assessed in accordance with Table 1. Typically, impacts with **RiderPro** 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.

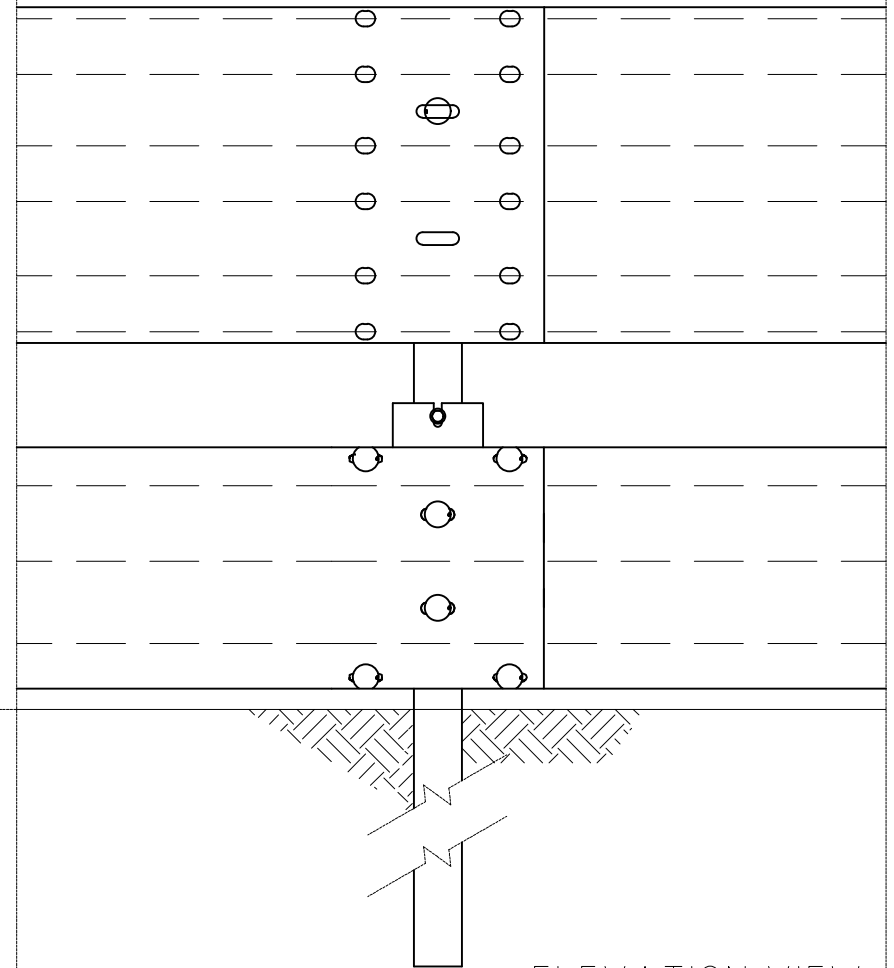
Similar to the installation sequence, it is recommended that the guidelines contained in Section 8.0 be observed in the establishment of traffic control and an unloading exclusion zone in addition to investigation for underground services and overhead obstructions.

Table 1: Damage Assessment Guidelines

Type of Damage	Description of the Damage	Action
Damage to the galvanized 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.	The beam is to be replaced.
	There are nicks in any part of the beam.	
	The slots in the beam are distorted.	
Damage to the mounting brackets.	The bracket is bent, twisted or flattened.	The mounting bracket is to be replaced.
Damage to bolts.	The body of the bolt is distorted.	The bolt is to be replaced.
	The thread of the bolt is damaged.	



CROSS SECTION VIEW



ELEVATION VIEW



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TOLERANCES

Whole Numbers ± 2
One Decimal Place ± 0.05
Bend Angle : ± 2
Straightness : $1.5 \text{ per } 1500$

Scale: N.T.S.

CLIENT

MATERIAL

FINISH

ITEM

ACP SENTRY TL-4 THRIE BEAM SYSTEM
WITH RIDERPRO MOTORCYCLIST DEVICE

DRAWING NUMBER

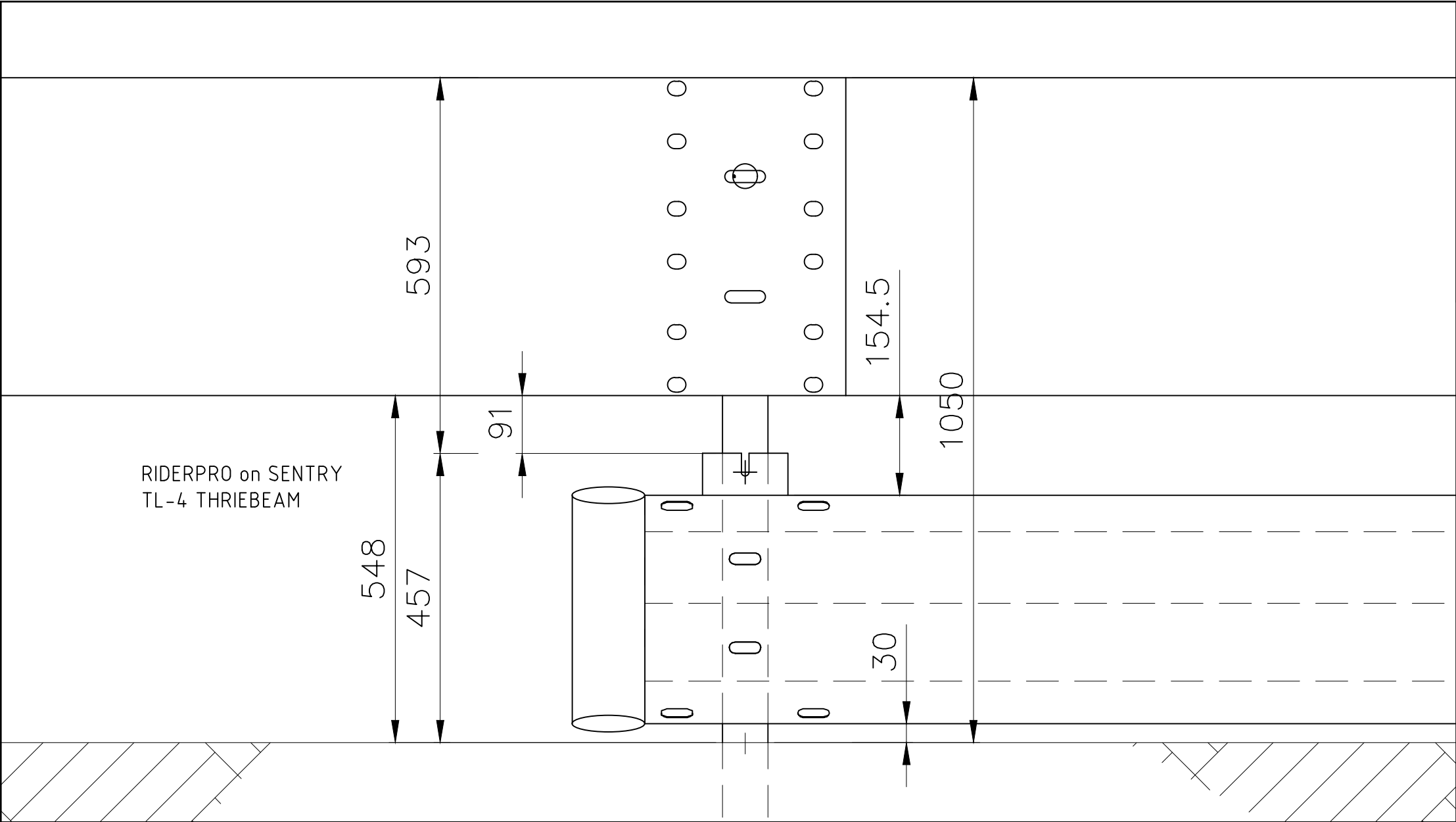
S.B TL-4 - RIDERPRO


DRAWN
W.R.

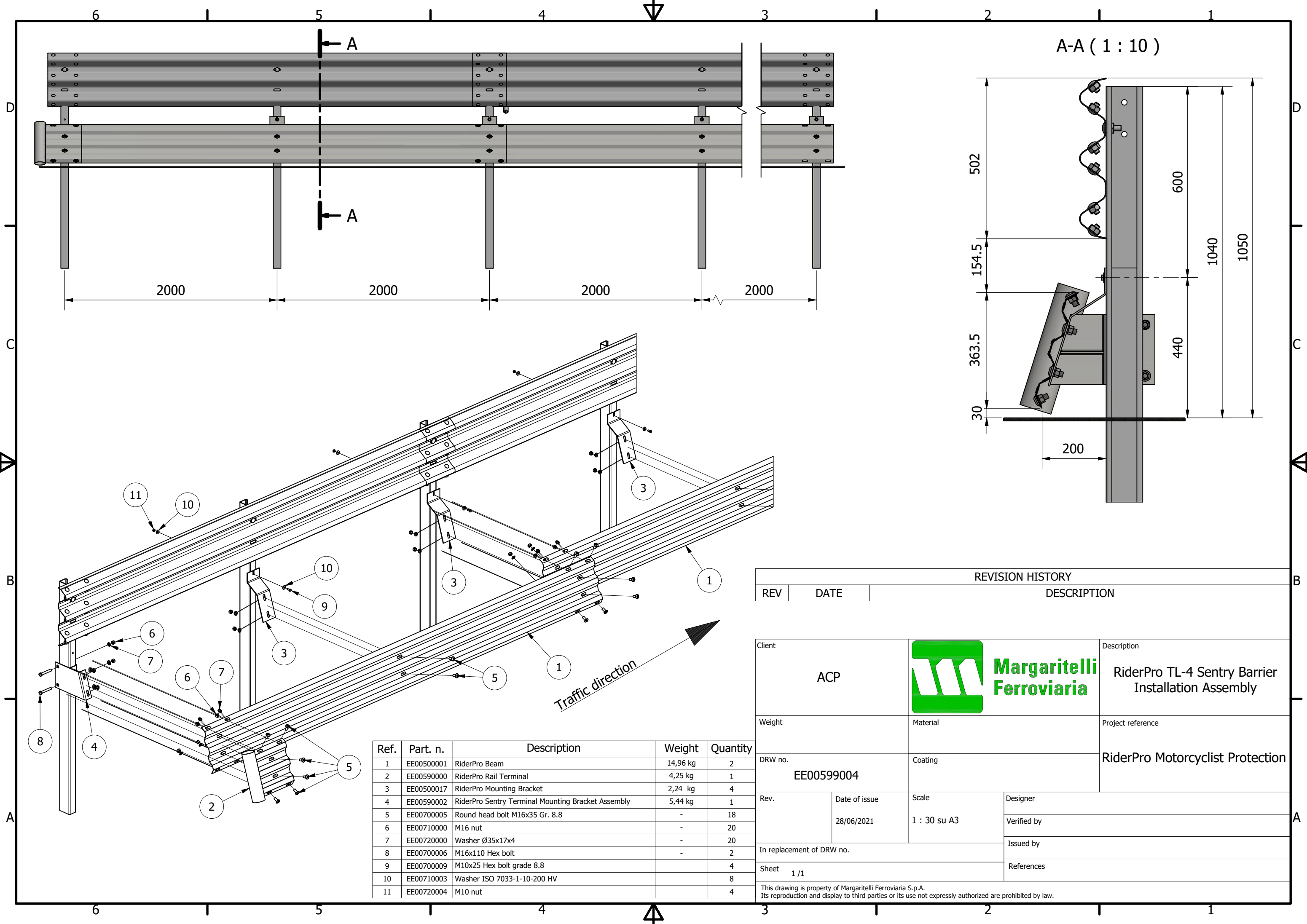
CHECKED

APPROVED

REV	DESCRIPTION	APPD	DATE
B	REVISED ISSUE	W.R.	03.03.21
A	ORIGINAL ISSUE	W.R.	04.02.21



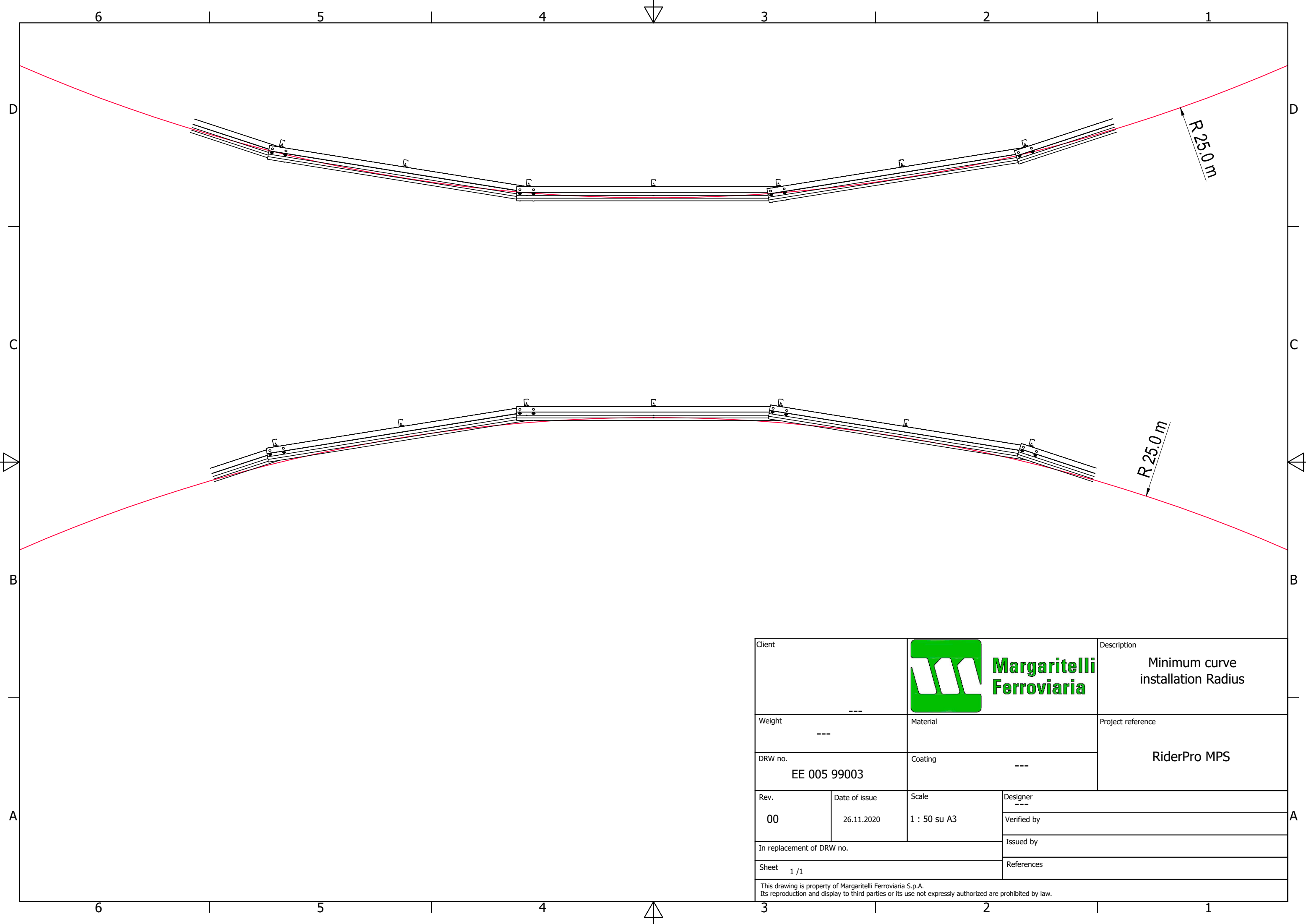
				<div><div>ACP</div><div>AUSTRALIAN CONSTRUCTION PRODUCTS</div><div>Australian Construction Products Pty Ltd</div><div>339 Horsley Road Milperra NSW 2214</div><div>P.O. Box 565 Panania NSW 2213</div><div>Tel: +61 2 9772 4172 Fax: +61 2 9792 6272</div></div> <div>TOLERANCES</div> <div>Whole Numbers ± 2</div> <div>One Decimal Place ± 0.05</div> <div>Bend Angle : ± 2</div> <div>Straightness : $1.5 \text{ per } 1500$</div> <div>Scale: N.T.S.</div>	CLIENT		ITEM		
							RIDERRPO ON SENTRY TL-4		
					MATERIAL		DRAWING NUMBER		
							S.B TL-4 - R.PRO DETAIL		
					FINISH				
B	DIMENSION REVISED	W.R.	30.06.21				DRAWN	CHECKED	APPROVED
A	ORIGINAL ISSUE	W.R.	11.02.20				W.R.		
REV	DESCRIPTION	APPD	DATE						




A-A (1 : 10)

REVISION HISTORY		
REV	DATE	DESCRIPTION

Client		 <div>Margaritelli Ferroviaria</div>		Description	
ACP				RiderPro TL-4 Sentry Barrier Installation Assembly	
Weight		Material		Project reference	
DRW no. EE00599004		Coating		RiderPro Motorcyclist Protection	
Rev.	Date of issue 28/06/2021	Scale 1 : 30 su A3	Designer		
			Verified by		
			Issued by		
In replacement of DRW no.			References		
Sheet 1 / 1					
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Client		 Margaritelli Ferroviaria		Description
---				Minimum curve installation Radius
Weight ---		Material		Project reference RiderPro MPS
DRW no. EE 005 99003		Coating ---		
Rev. 00	Date of issue 26.11.2020	Scale 1 : 50 su A3	Designer ---	
In replacement of DRW no.			Verified by	
			Issued by	
			References	
Sheet 1 / 1				
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