

# Single Steel Guardrail "BMS4PR-N2"

## INSTALLATION MANUAL

December 2022



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## **SINGLE STEEL GUARDRAIL "BMS4PR-Π2": INSTALLATION WORKS**

The Single Steel Guardrail "BMS4PR-Π2" is a longitudinal safety barrier made entirely of galvanized steel and specifically designed to be installed so much in lateral margins as median of any type of road.

The Single Steel Guardrail "BMS4PR-Π2" is composed by a continuous horizontal W-Beam exposed to traffic with both peak waves oriented to it, and regularly supported by C-shaped vertical posts.

All the components are assembled one to each other by threaded joints by means of "Bolt - Washer - Nut" assemblies. Continuity of the horizontal (W-beam) is obtained through partial overlapping of consecutive elements through threaded joints with bolts, nuts and washers.

### **Installation works.**

#### **1.- Post Insertion.**

Posts are to be embedded in soil. Posts shall be driven in soil using a hydraulic or pneumatic hammering machine or any other system equivalent to mechanical post-driving. Posts shall be driven with 4 meters spacing and at the proper depth to meet the barrier height.



The machine can be guided setting the motorized wheel inside the sine of the W-Beam, this would be used as guide and the torn holes of the W-Beam would be taken as reference for embedding the posts.



In those particular cases where the soil conditions do not allow an adequate post-driving, an equivalent insertion system is to be executed:

- *In hard soils*, a cylindrical hole of 200mm diameter and aprox. 900mm deep shall be bored with appropriate equipment (crown-boring machine), the C-120 steel post shall be positioned partially embedded in the hole using timber wedges in order to fasten it. Then, the hole shall be totally filled with soil, well compacted and the upper surface totally covered by an impermeable layer of cement mortar.

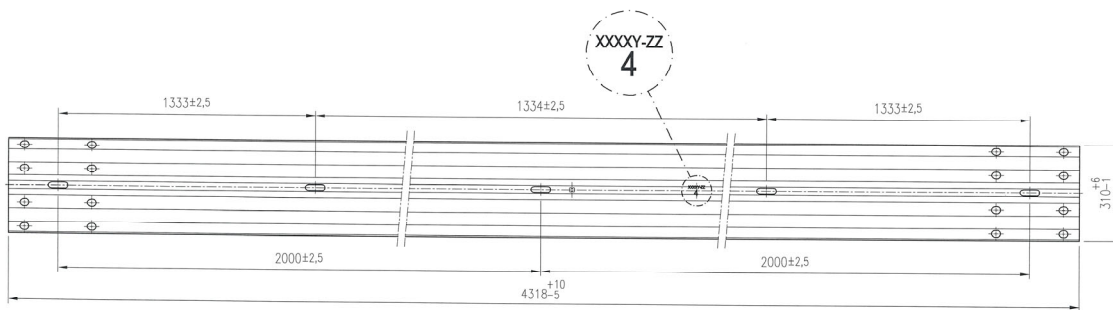


- *In weak soils*, a cubic foundation made of concrete shall be executed leaving a cylindrical hole of 200mm diameter and aprox. 900mm deep just in the centre (a tube can be used), the C-120 post shall be positioned partially embedded in the hole using timber wedges in order to fasten it. Then, the hole shall be totally filled with soil, well compacted and the upper surface totally covered by an impermeable layer of cement mortar.

## 2.- Assembly.

The “in-site” assembly of all the barrier components, once the posts are driven in soil, shall be made only by tightening bolts (screw, nuts and washers) meeting both the configuration, dimensions and tolerances defined in attached drawings.

**Important:** W-Beams of this system are identified with the reference code number “4” just under traceability code, located in the sine of their profile, by the middle of the W-Beam.



W-Beam

The W-Beam is set up in place and attached directly to the posts through bolts CRF-10.5 M16x40(+10), washer 140x70x4,5mm M16, squared flat washer 35x35x5mm and nut M16. Washers 140x70x4,5mm M16 are located under head bolt and above the W-Beam. Squared washers are located under the nut, inside the post.

The splice between the consecutive W-Beams is carried out and definitively tightened by TBC M16x30 bolts. The vertical alignment of the W-Beam and posts is then properly adjusted in order to, finally, proceed to the definitive tightening of the bolts CRF-10.5 M16x40(+10) attaching W-Beam to posts.

For ramping down end sections at both the beginning and end of the extension of barrier, the assembly sequence is similar to that described for the straight section of the barrier described above.

### **3.- Tightening of Bolts.**

The bolts CRF-10.5 M16x40(+10) fastening the W-Beam to Post shall be tightened with a torque from 30 N.m to 50 N.m.

Bolts TBC M16x30 fastening consecutive W-Beams shall be tightened with a torque from 90 N.m to 110 N.m.

**Attached to this specification, the ANNEX 1 includes all installation drawings needed (general drawings of standard barrier section and end terminals) and ANNEX 2 shows the installation steps:**

- A. Post insertion**
- B. Fastening of the W-Beam to inserted post**
- C. W-Beams assembly**
- D. Vertical alignment and definitive tightening**

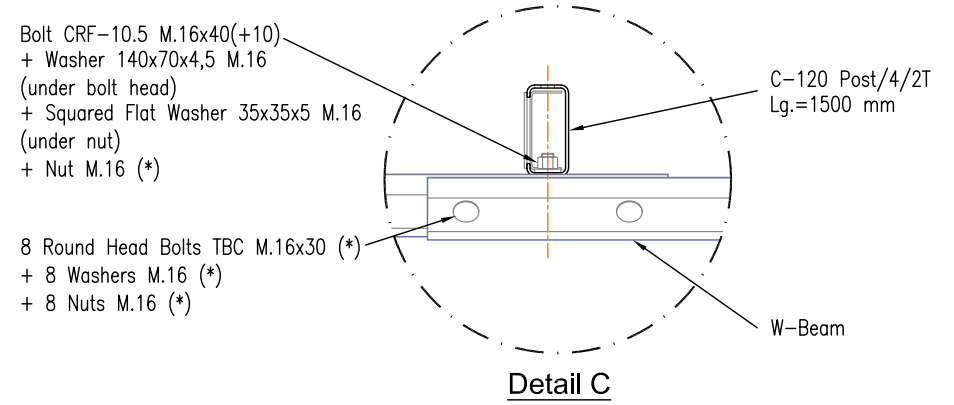
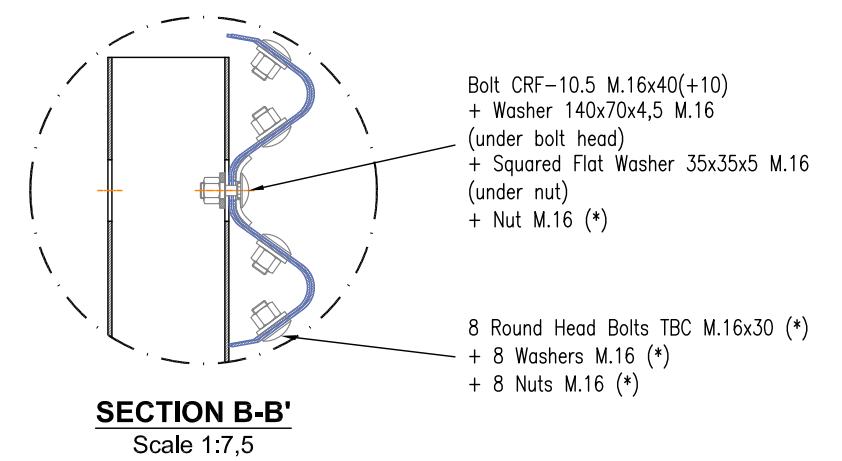
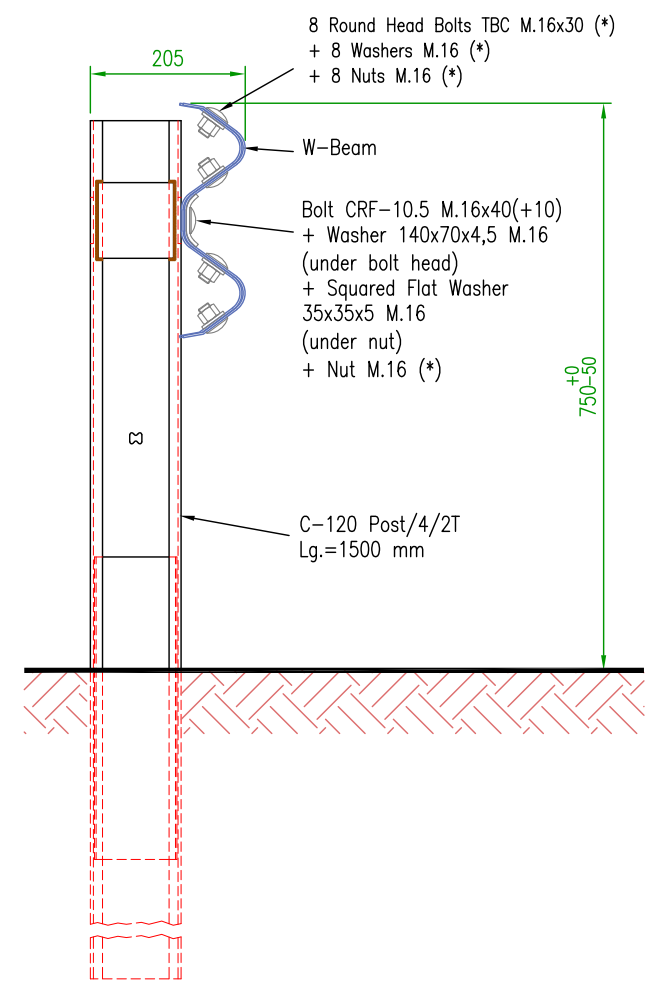
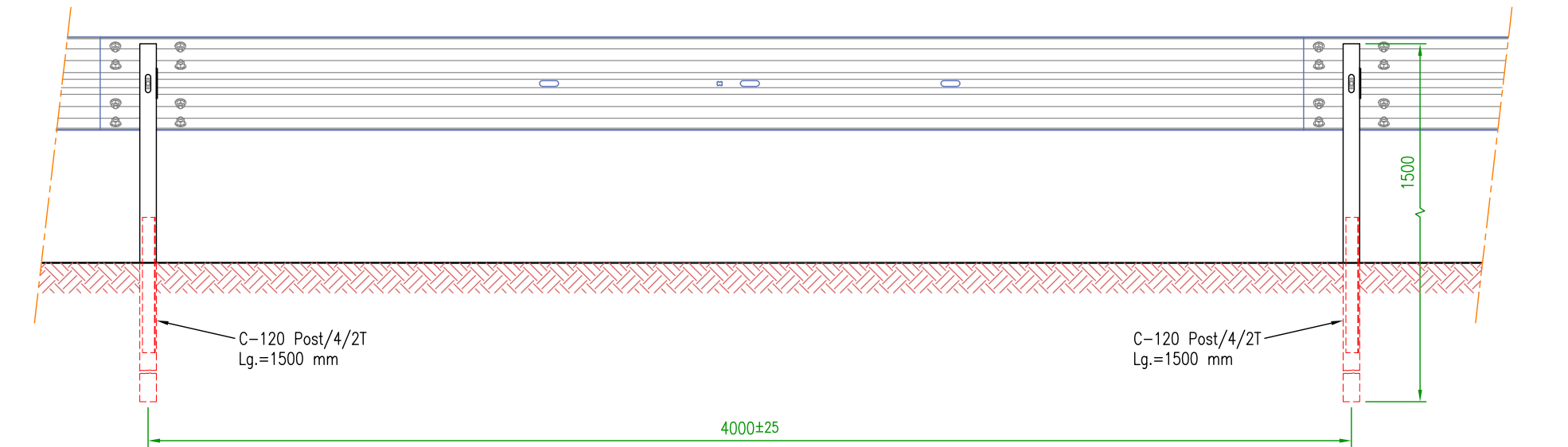
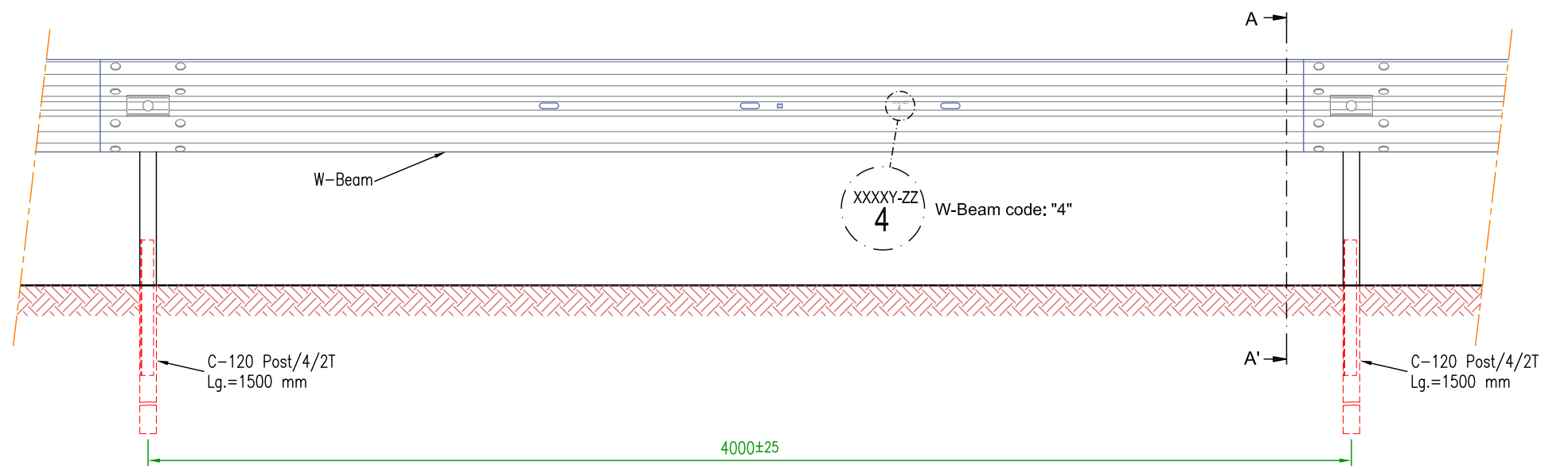
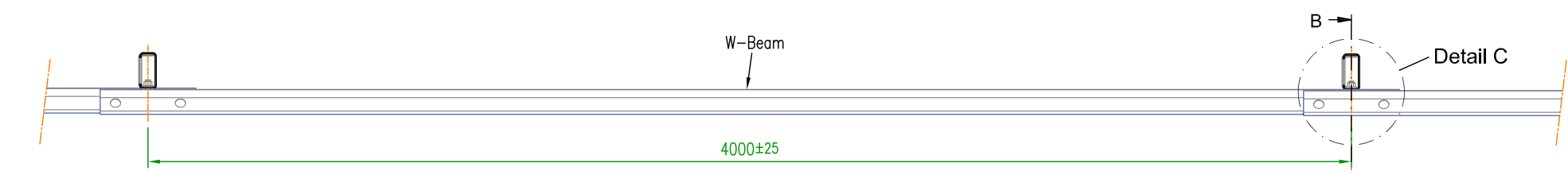
# **Single Steel Guardrail "BMS4PR-N2"**

## **Annex 1: Installation Drawings**

**December 2022**



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**NOTE:**  
W-Beams of this system are identified with the reference code number "4", just under traceability code, located in the central sine of their profile, by the middle of W-Beam.

Note (informative):  
Round Head Bolt TBC M.16x30 (\*)  
Washer M.16 (\*)

Material complying the Spanish Standard UNE 135122

Note (informative):  
Nut M.16 (\*)

Material complying the Spanish Standard UNE 135122 (UNE-EN ISO 4034)

Dimensions in mm

	DATE	NAME	SIGNATURES
Draw	20-12-2022	Jonathan Cordero P.	
Review	20-12-2022	Diego Santiago G.	
Accept	20-12-2022	Antonio Amengual P.	
SCALE	<b>BMS4PR-N2 SINGLE STEEL GUARDRAIL</b>		
1:7,5	<b>GENERAL DRAWING</b>		
1:10			
1:20			

**Road Steel Engineering**

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+34 983 990468

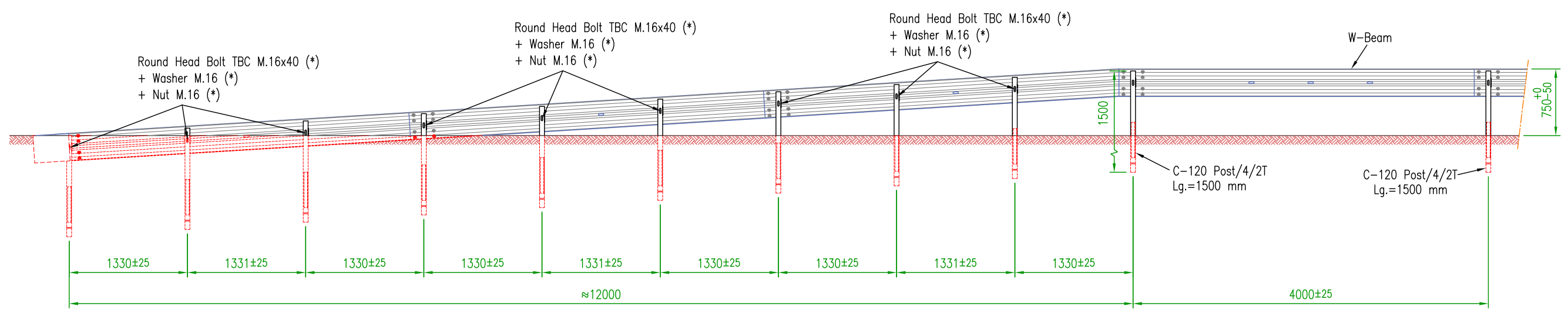
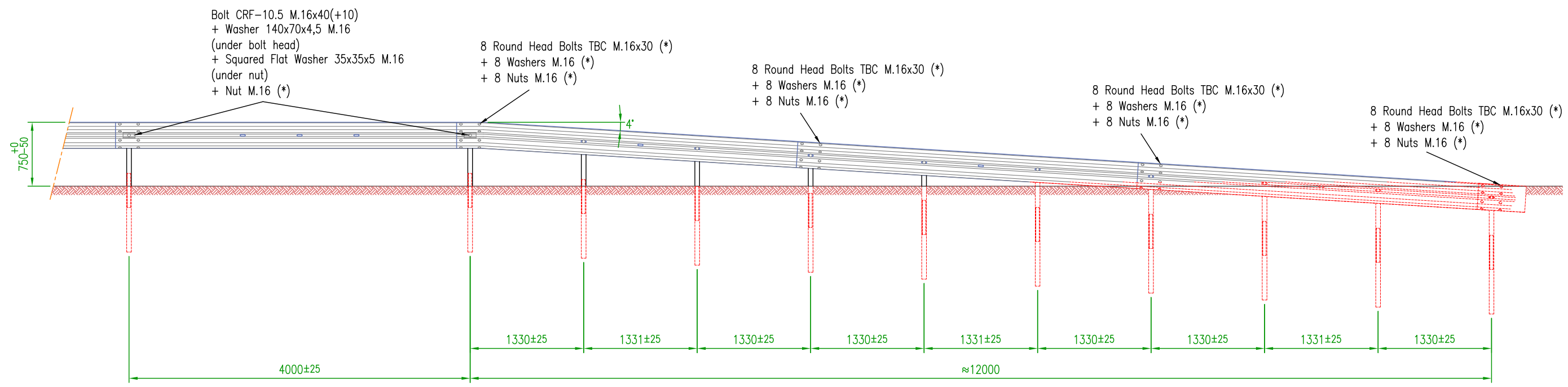
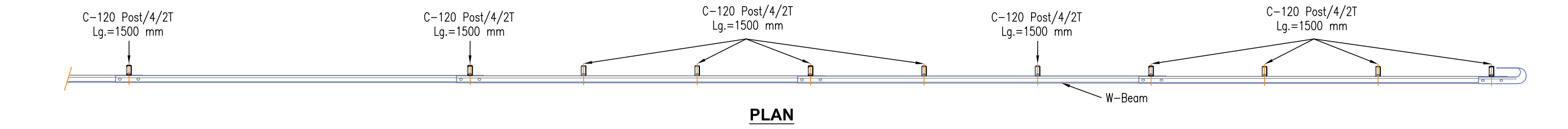
info@roadsteel.com  
http://www.roadsteel.com

Drawing N°: BMS4PR-N2-201222-MAN-001

Replace to:

Replaced for:





**Note (informative):**  
 Round Head Bolt TBC M.16x30 (\*)  
 Round Head Bolt TBC M.16x40 (\*)  
 Washer M.16 (\*)

Material complying the Spanish Standard UNE 135122

**Note (informative):**  
 Nut M.16 (\*)

Material complying the Spanish Standard UNE 135122 (UNE-EN ISO 4034)

Dimensions in mm

	DATE	NAME	SIGNATURES
Draw	20-12-2022	Jonathan Cordero P.	
Review	20-12-2022	Diego Santiago G.	
Accept	20-12-2022	Antonio Amengual P.	
SCALE	<b>BMS4PR-N2 SINGLE STEEL GUARDRAIL</b>		
1:50	<b>DRAWING OF END RAMPING DOWN SECTION</b>		

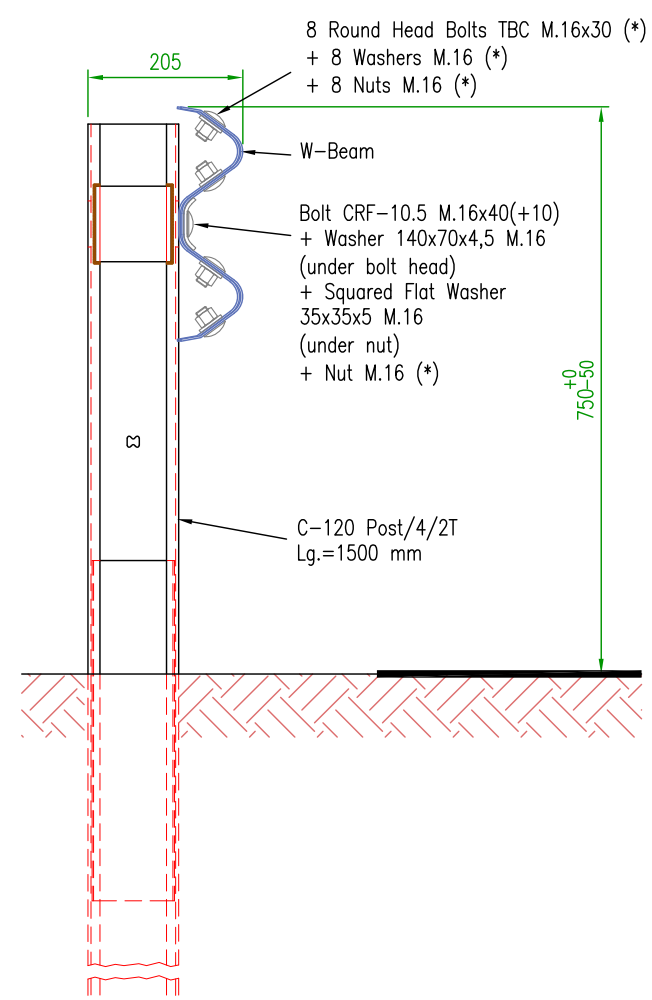
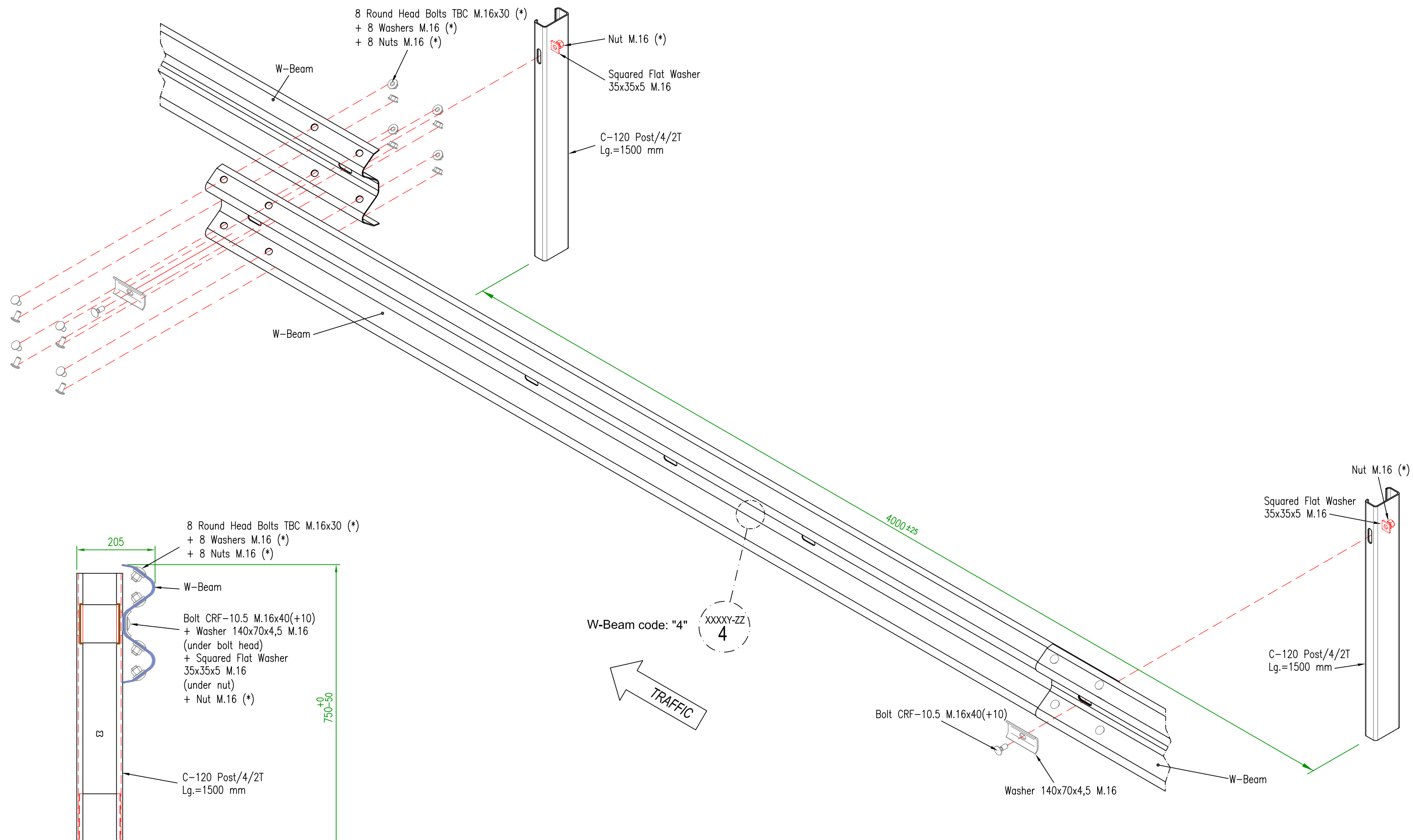
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Drawing N°: BMS4PR-N2-201222-MAN-002

Replace to:

Replaced for:





**CROSS SECTION AT POST**

**Note (informative):**  
 Round Head Bolt TBC M.16x30 (\*)  
 Washer M.16 (\*)

Material complying the Spanish Standard UNE 135122

**Note (informative):**  
 Nut M.16 (\*)

Material complying the Spanish Standard UNE 135122 (UNE-EN ISO 4034)

**NOTE:**  
 W-Beams of this system are identified with the reference code number "4", just under traceability code, located in the central sine of their profile, by the middle of W-Beam.

	DATE	NAME	SIGNATURES
Draw	20-12-2022	Jonathan Cordero P.	
Review	20-12-2022	Diego Santiago G	
Accept	20-12-2022	Antonio Amengual P.	

SCALE	<b>BMS4PR-N2 SINGLE STEEL GUARDRAIL</b>
-	<b>- INSTALLATION -</b>

*Dimensions in mm*



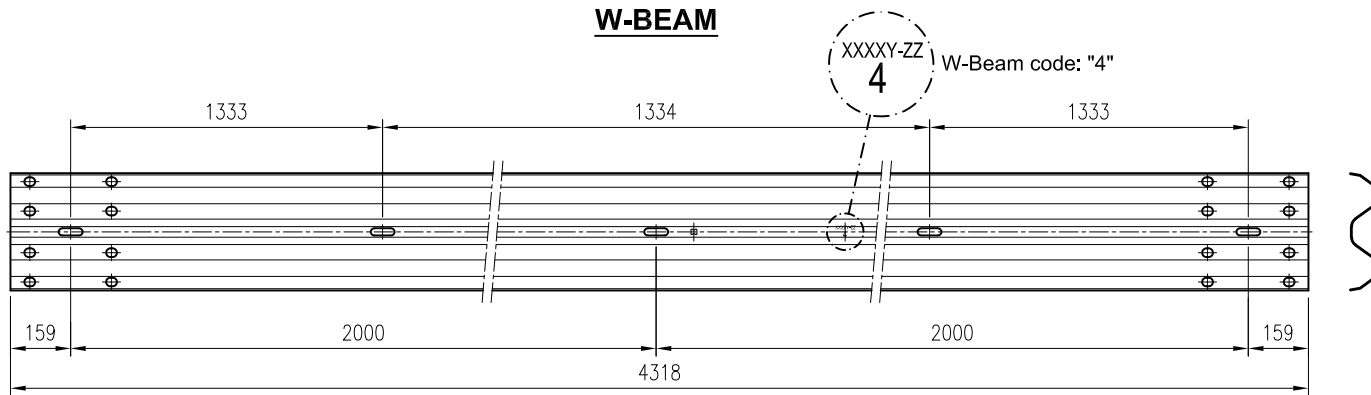
Tel: +34 985 128200  
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info@roadsteel.com  
http://www.roadsteel.com

Drawing N°: BMS4PR-N2-201222-MAN-003

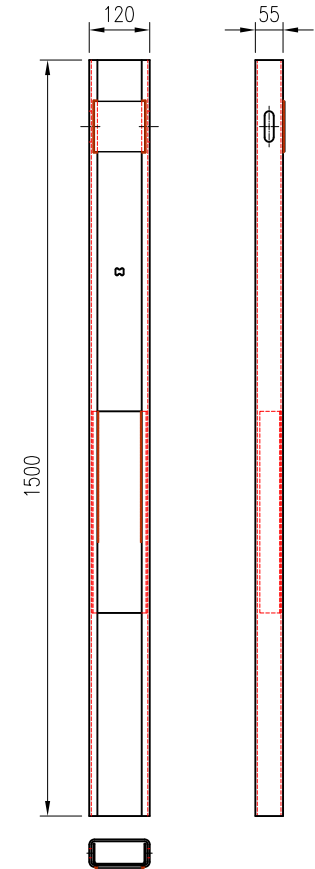
Replace to:

Replaced for:

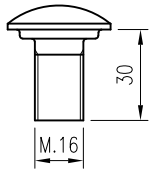
**W-BEAM**



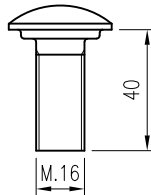
**C-120 POST (Lg 1500 mm)**



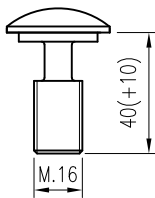
**BOLT TBC M.16x30**



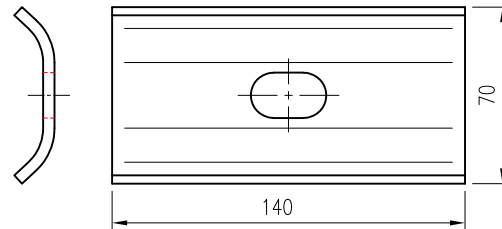
**BOLT TBC M.16x40**



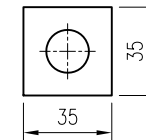
**BOLT CRF-10.5 M.16x40(+10)**



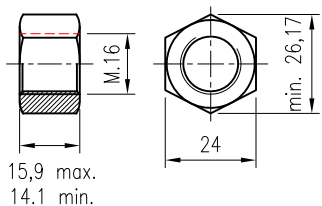
**WASHER 140x70**



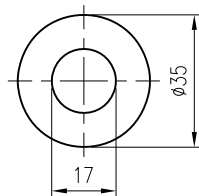
**SQUARED FLAT WASHER 35x35**




**NUT M.16**



**WASHER M.16**



Dimensions in mm

	DATE	NAME	SIGNATURES	 Tel: + (34) 985 128200 + (34) 983 990468 info@roadsteel.com http://www.roadsteel.com
Draw	20-12-2022	Jonathan Cordero P.		
Review	20-12-2022	Diego Santiago G.		
Accept	20-12-2022	Antonio Amengual P.		
SCALE	BMS4PR-N2 SINGLE STEEL GUARDRAIL			Drawing N°: BMS4PR-N2-201222-MAN-004
-	COMPONENTS			Replace to:
				Replaced for:

# Single Steel Guardrail "BMS4PR-N2"

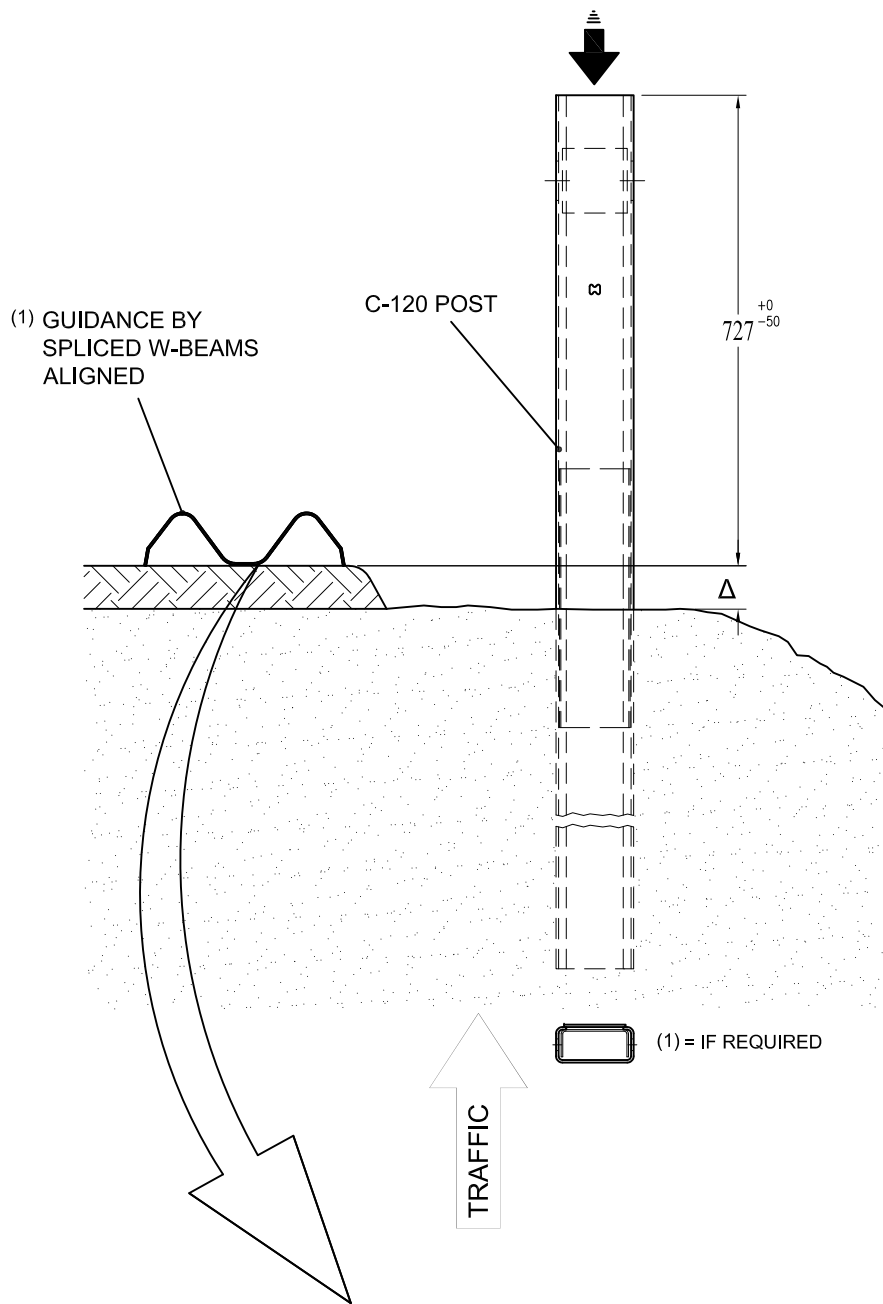
## Annex 2: Installation Steps

**December 2022**

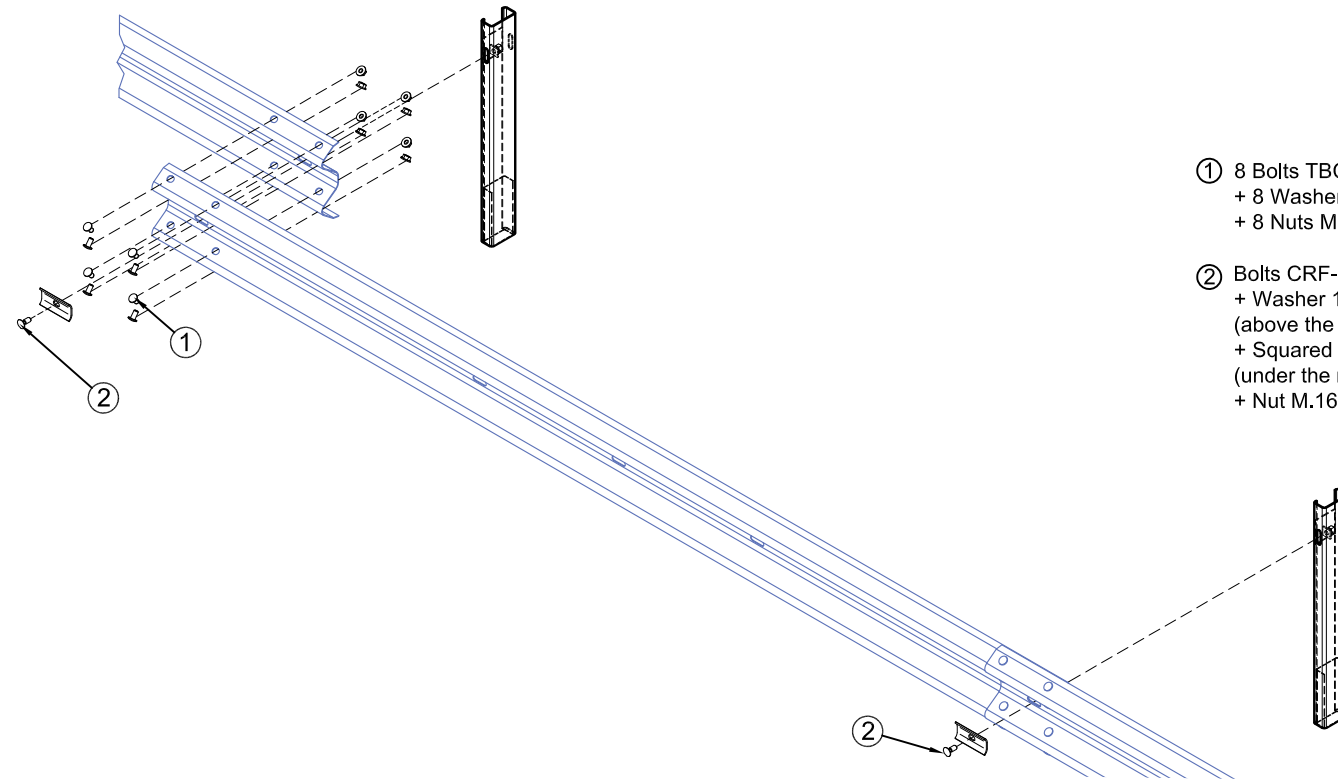


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**A POST INSERTION**

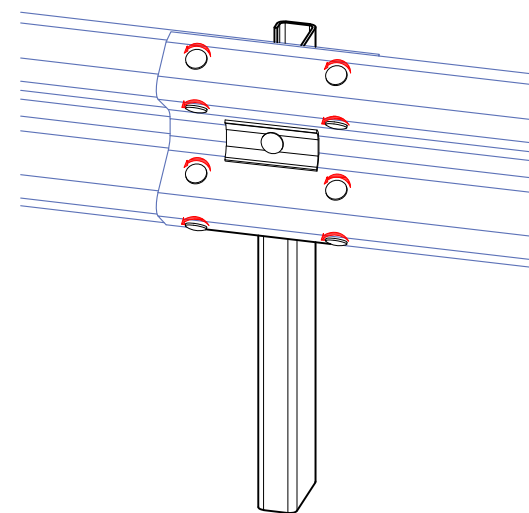


**B FASTENING OF THE W-BEAM TO INSERTED POST**

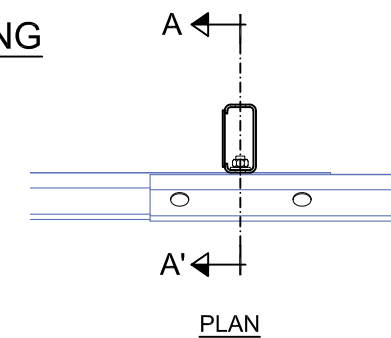
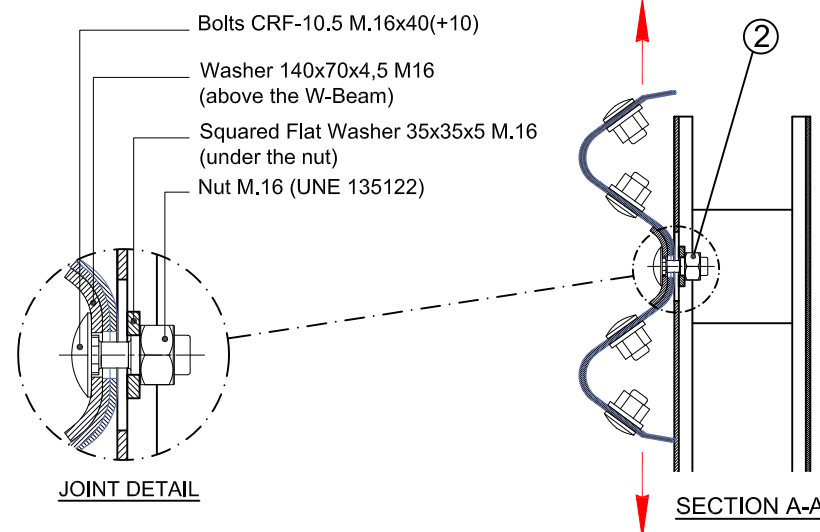


- ① 8 Bolts TBC M.16x30 (UNE 135122)  
+ 8 Washers M.16 (UNE 135122)  
+ 8 Nuts M.16 (UNE 135122)
- ② Bolts CRF-10.5 M.16x40(+10)  
+ Washer 140x70x4,5 M16  
(above the W-Beam)  
+ Squared Flat Washer 35x35x5 M.16  
(under the nut)  
+ Nut M.16 (UNE 135122)

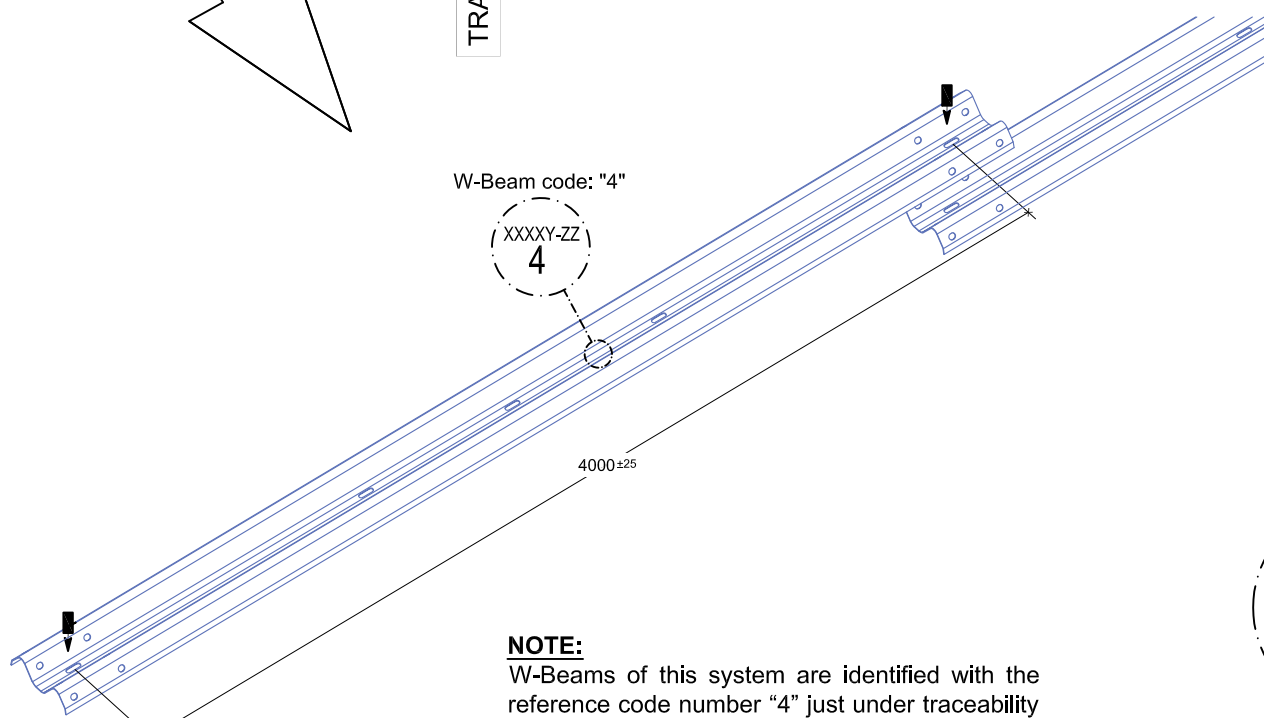
**C W-BEAMS ASSEMBLY**



**D VERTICAL ALIGNMENT AND DEFINITIVE TIGHTENING**

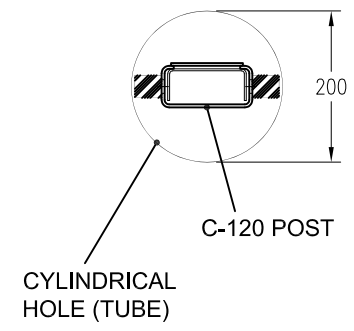
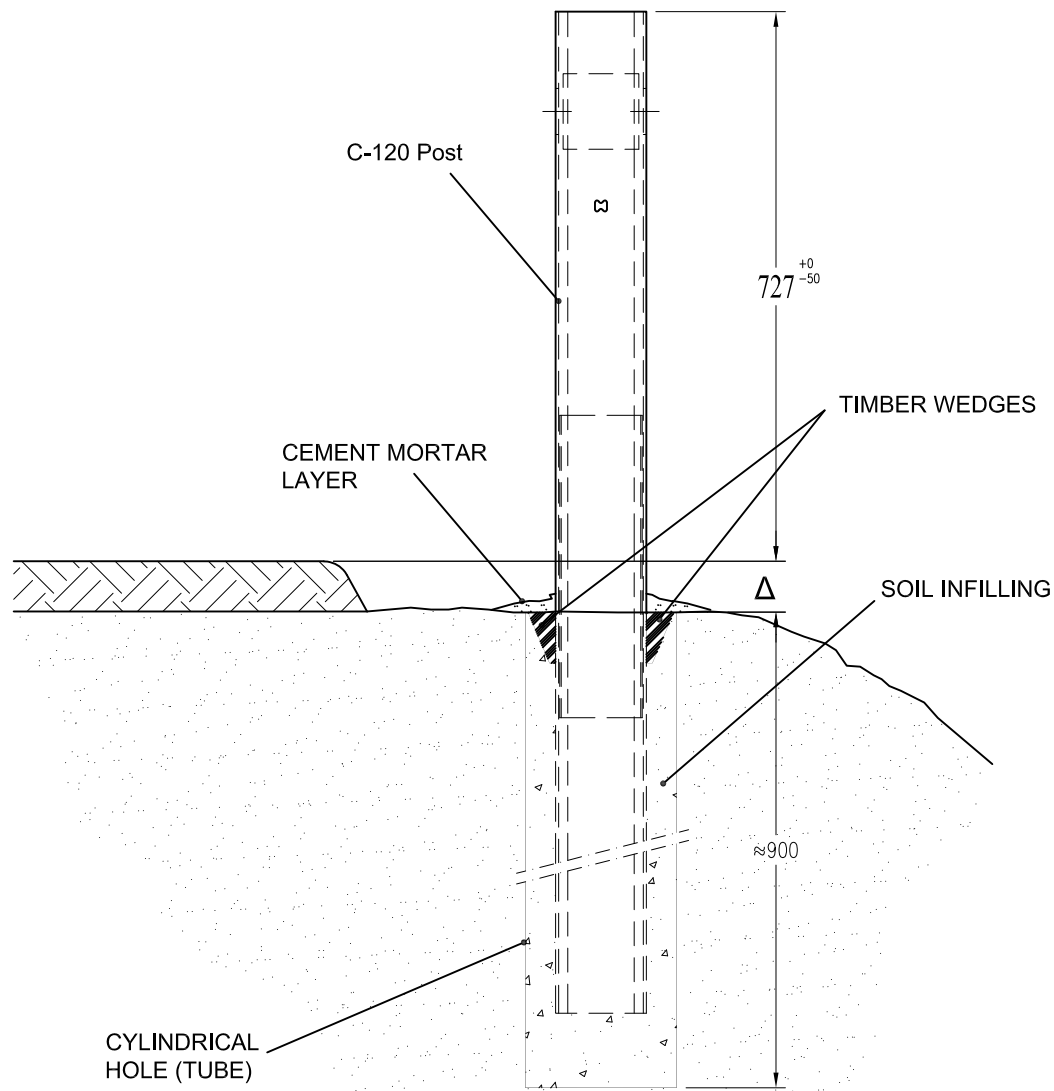


Note: Definitive tightening of bolts ② with a torque of 30-50 N·m.



Dimensions in mm

**A'** POST INSERTION IN HARD SOILS



**A''** POST INSERTION IN WEAK SOILS

