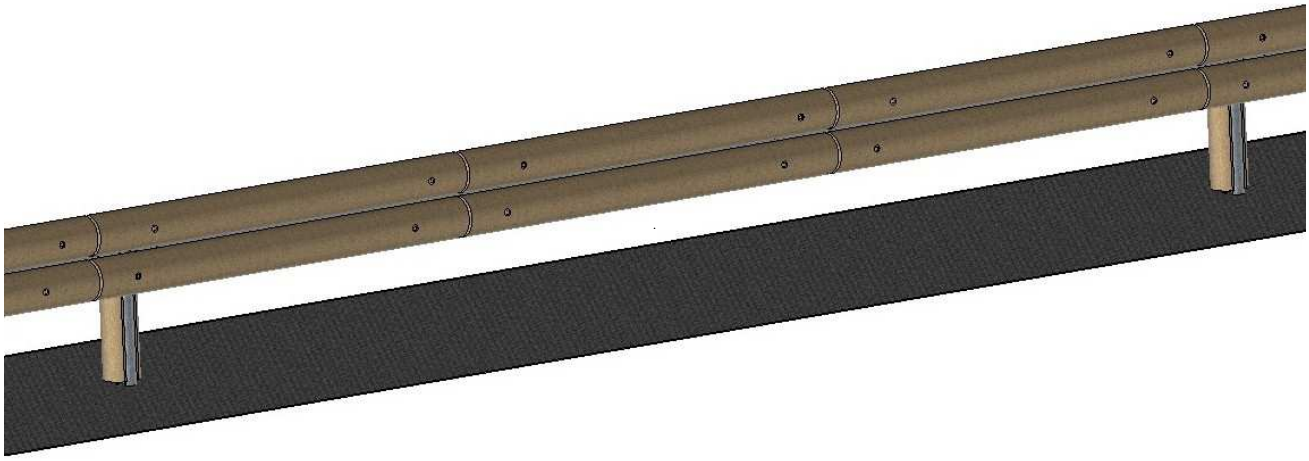
Rondino Road®

INSTALLATION MANUAL



GRP-6M
N2 / W5 / A

CE

RONDINO
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42604 MONTBRISON Cedex - FRANCE

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Date : 24/12/2015
Version : 4

CE

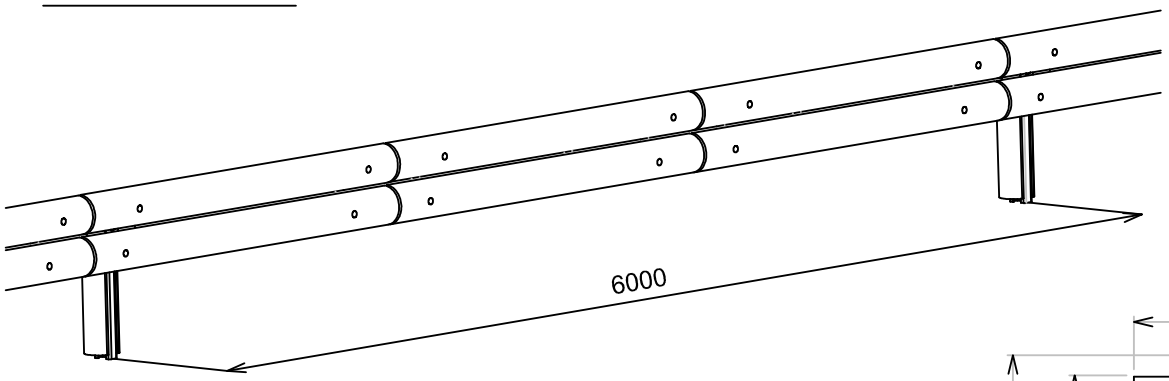
PERFORMANCE DECLARATION
N°2015001
GRP-6M - Wood - Steel barriers

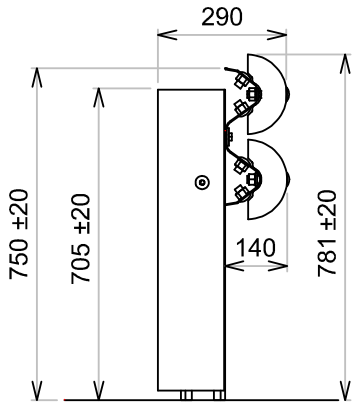
Rondino Road®

GAILLARD RONDINO
BP 195
42604 MONTBRISON CEDEX
FRANCE

DECLARE, THAT PRODUCT	**GRP-6M**
IS CERTIFIED BY	ASCQUER 58 rue de l'Arcade 75384 PARIS CEDEX FRANCE
CERTIFYING ORGANISATION N°	1826
CE CERTIFICATE N°	1826-CPR-09-02-04-DR06
EUROPEAN NORMS CONCERNED	EN 1317-1 :2010 , EN 1317-2 : 2010 and EN 1317-5 :2007+A2 :2012
PERFORMANCES	Containment level : **N2** Severity level : **A** Working width (W_N) : **W5 (1.40m)** Dynamic deflexion (D_N) : **1.20m**
PRODUCT USE	GRP-6M barrier is intended to be installed on traffic areas.
DURABILITY	WOOD : Pine Class 4 / EN 335 STEEL : Hot dip galvanized / EN ISO 1461
DANGEROUS SUBSTANCE	NONE
Savigneux, 17th july 2015	GALLIEN Marlène General Manager

1- Introduction :





2- Nomenclature :

Reference	Description	Qty 6 ml	Treatment
860 010	C100 post Lg = 1.50m	1	Hot dip galvanized (EN ISO 1461)
860 110	Steel beam type A Lg = 6.315m	1	
PLAQ-11	Special plaque 80×40×5mm, Ø11mm	1	
860 201	Squared plaque 30×30	12	
860 112	Main wood beam Lg = 1.985m	6	Pine Class 4 (EN 335)
860 020	Wood mask for C100	1	
850 050	TRCC - M10×160 - 5.8	1	Hot dip galvanized (EN ISO 1461)
TRCC.M16X090.G	TRCC - M16×90 - 8.8	12	
TRCO.M16X030.G	TRCO - M16×30 - 5.8 + nut 16×32	8	
H.M10X050.G	H - M10×50 - 6.8 + nut + wide washer	1	
800 203	Washer - 12	1	

GRP-6M guardrail is a mixt restraint system (wood-steel). It is made of metallic elements covered with wooden ½ logs. Whole system is fixed on post type C100 covered with wood mask.

Guardrail has been tested at LIER-TRANSPOLIS laboratory, realized within conditions defined by EN 1317 standards. GRP-6M guardrail satisfy to performances required for level N2.

Main features of the presented model are :

- Use of steel post, of type C100, driven into the ground (setting tool is same like the one used to install metallic guardrails), every 6m.
- A wood mask envelops the post.
- Use of a steel beam, length 6m, covered with wooden ½ logs.
- Use of a fixing bolt, to maintain the beam on supports.

During an impact on guardrail, the thrust of the vehicle on the beam causes a deformation of steel post. The beam then forms a retaining action that helps to guid and to slow down the vehicle.

Wood beams and wood masks are made from pine class 4, according to EN 335 standard and PEFC certified in the context of sustainable management of wood.

Wood should have following features :

- Growth rings whose width of five consecutive rings does not exceed 1cm.
- The beams, diameter and knots less than 7cm.
- No damage due to fungicides attacks or insect attacks. Woods must have received a preservation treatment corresponding to class 4 according EN 335 standard.

Moisture delivery will be less than 30% after treatment.

Steel pieces are protected against corrosion by galvanization, according to EN ISO 1461 standard.

3- Tools :

Use of 3 keys : n°32, n°24 and n°17, for installation of the whole guardrail.

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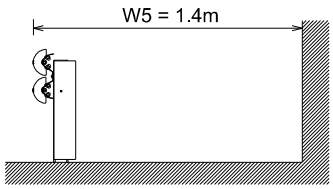
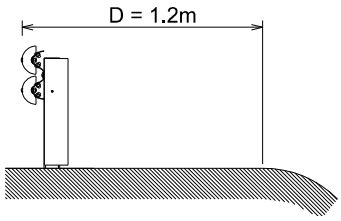
4- Specification of installation :

4-1-Space before obstacle



4-2-Space before a drop



4-3- Lenght of the deformation : 18.40m

4-4- A lenght of 84m except terminals is necessary to ensure a good device operation. This lenght can be reduced to 60m on secondary network.

4-5-Curves

Curves made with 6m beams have a minimum radius of 40m. In case of tight inner or outer curves up to 13m, use beams of 2m. (see paragraph 15)

4-6-Terminals

Each end of the barrier is equipped with terminal. A 0.30m to 1m rearward offset is recommended. (see paragraph 10 & 11). These terminals can drowned in slopes at a constant height.

5- Specifications for C100 post :

5-1-Safety barriers anchorage

5-1-1 Consistency of the ground

Anchorage of barriers is done by the driving of the C100 posts into the ground. Resistance must be sufficient to support efforts transmitted during vehicle impact.
Ground's strength can be verified by a pull test which measures the displacement at the top and at the bottom of the support according to the applied effort.

5-1-2 Supports lengths

The C100 length of post is 1.50m. In case of soft ground, the length of the post must be 2.00m. In case of soft ground, the use of anchor supports fixed on concrete sleepers is recommended.

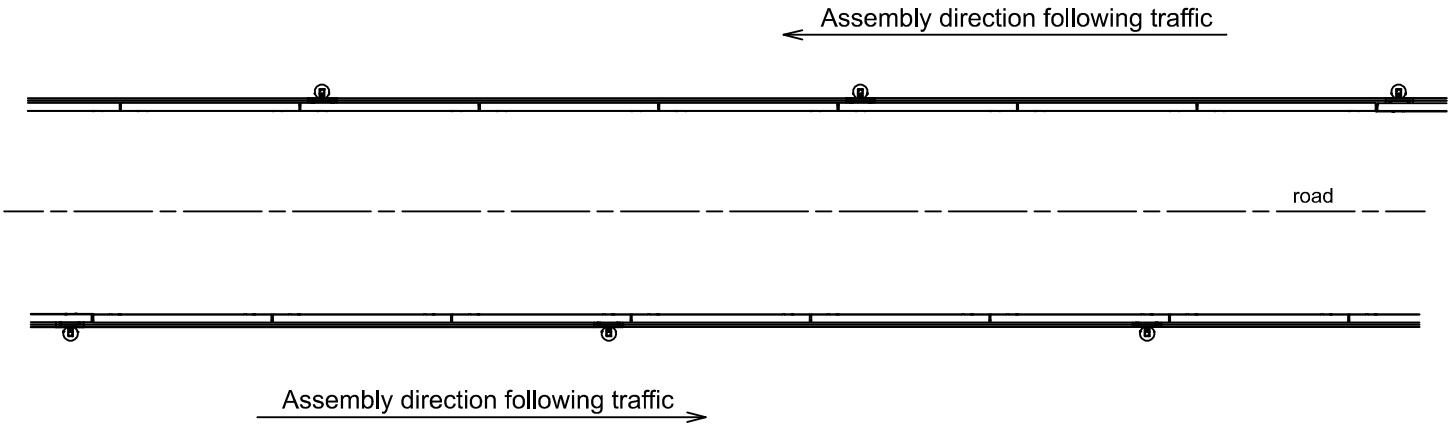
5-1-1 Supports assembly

The supports of type C100 are driven into the ground until measurement is 0.705m (±20mm). They are covered with a wood mask that recovers the top section of the C100 post. The distance between post centres is 6m.

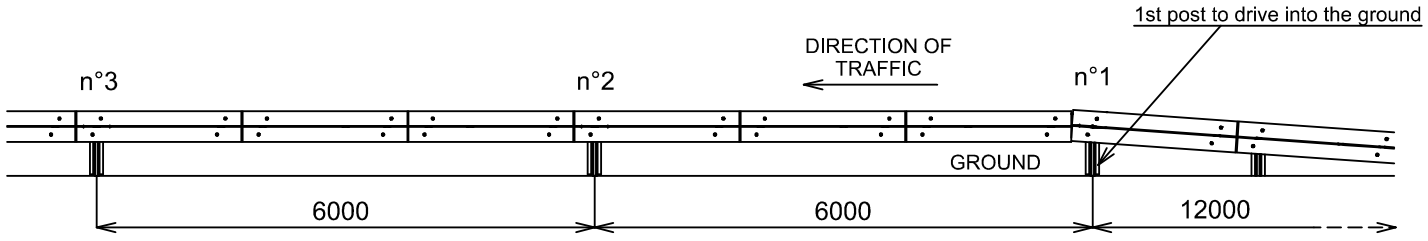
5-2-Settings and tolerances

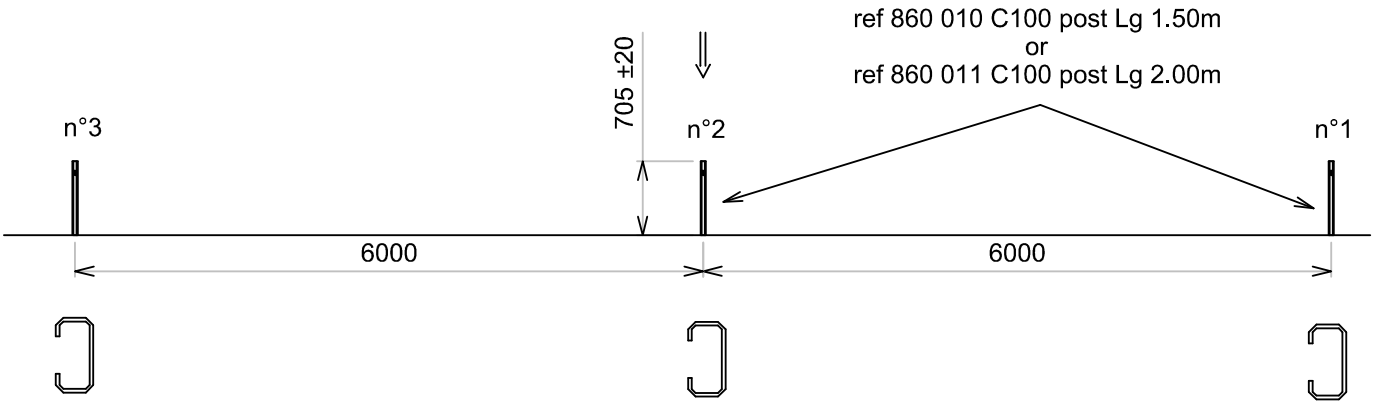
Drilling of holes for the C100 posts allows an easy and perfect adjustment of longitudinal alignment.
Tightening torques of TRCO16×30mm = 130Nm and H10×50mm = 40Nm.

6- Assembly direction :



7- Implantation :





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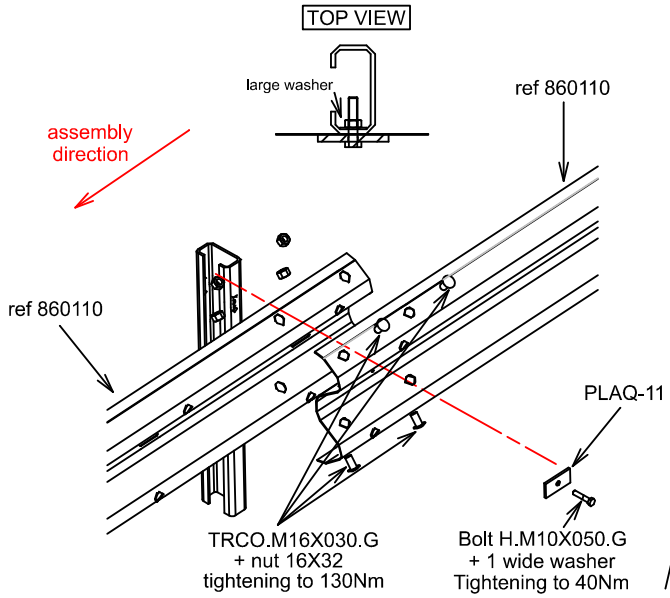
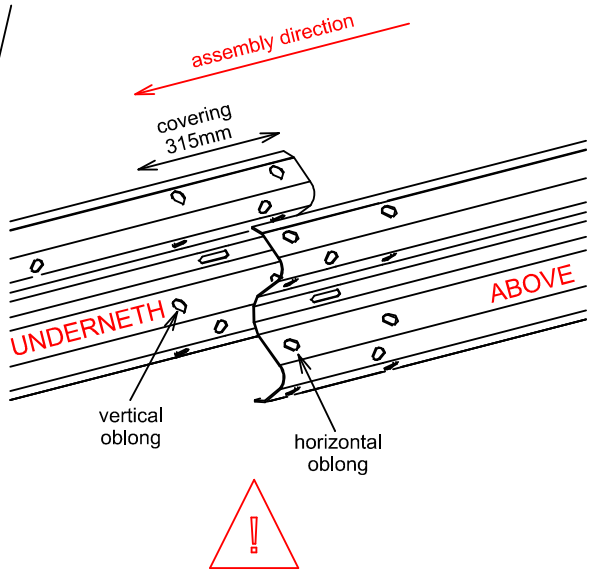
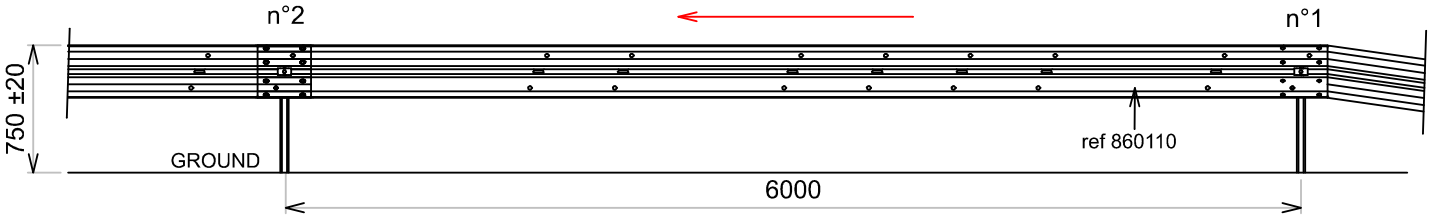
8- Assembly of steel beam :



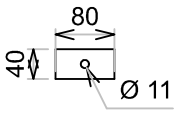


BE CAREFUL WITH DIRECTION OF THE COVERING OF STEEL BEAMS

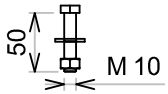


TRCO.M16X030.G

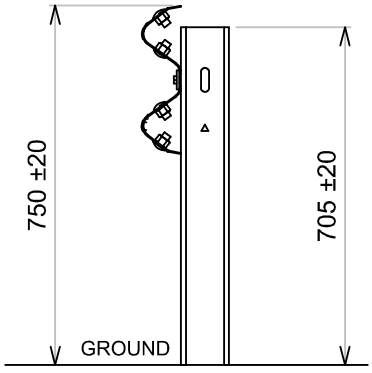
PLAQ-11

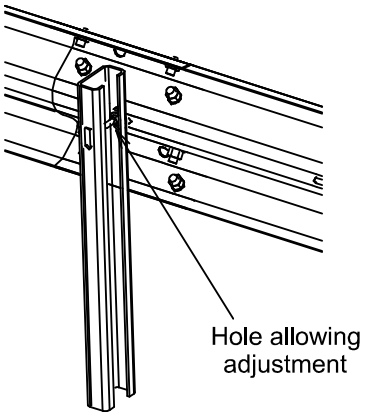


bolt H.M10X050.G



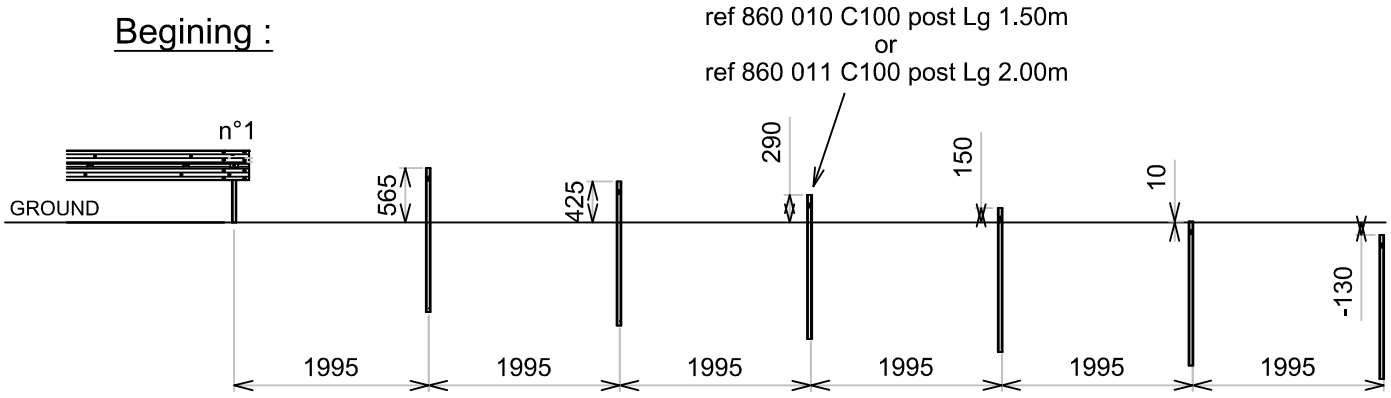
9- Adjustment of the height of steel beams :

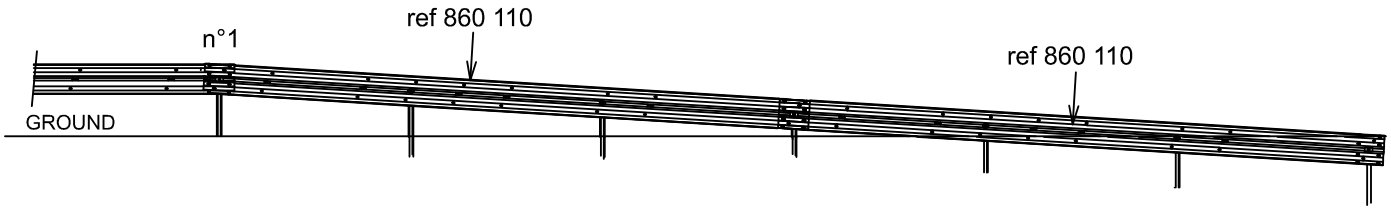


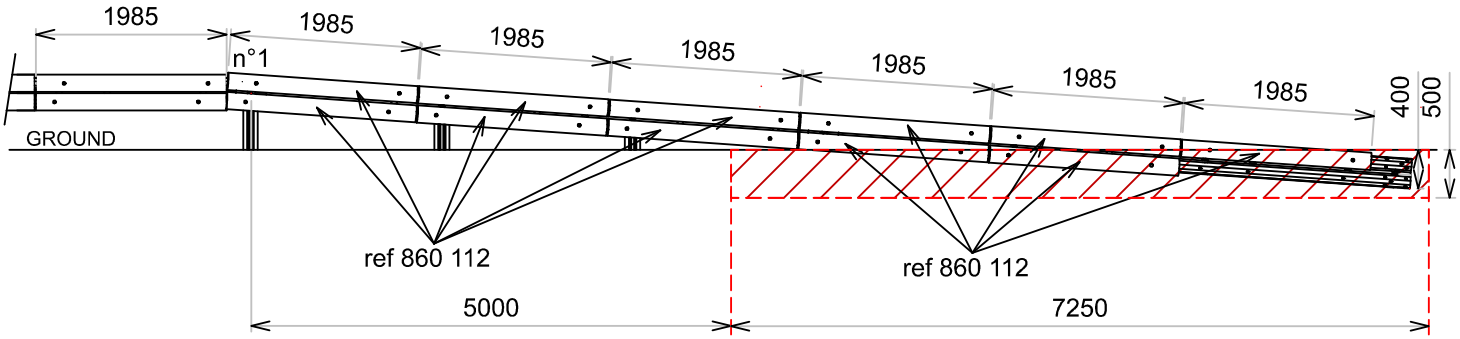


10- 12ml terminals :

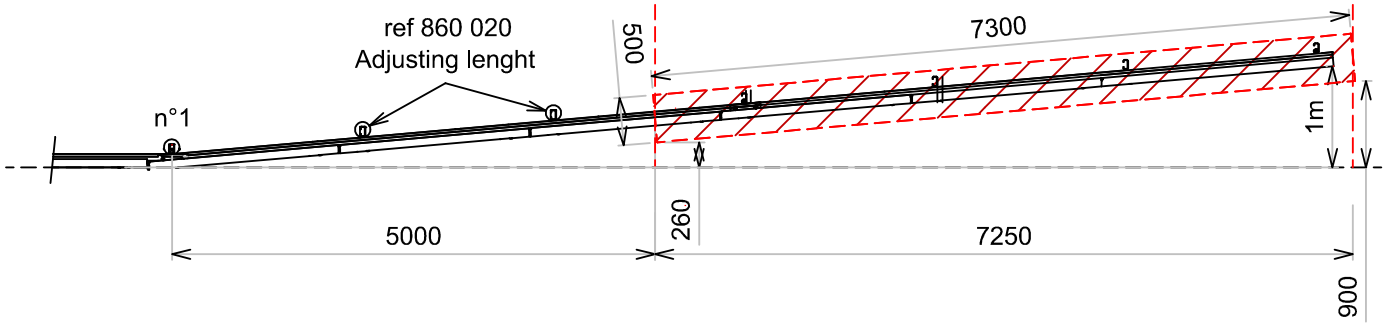
Begining :







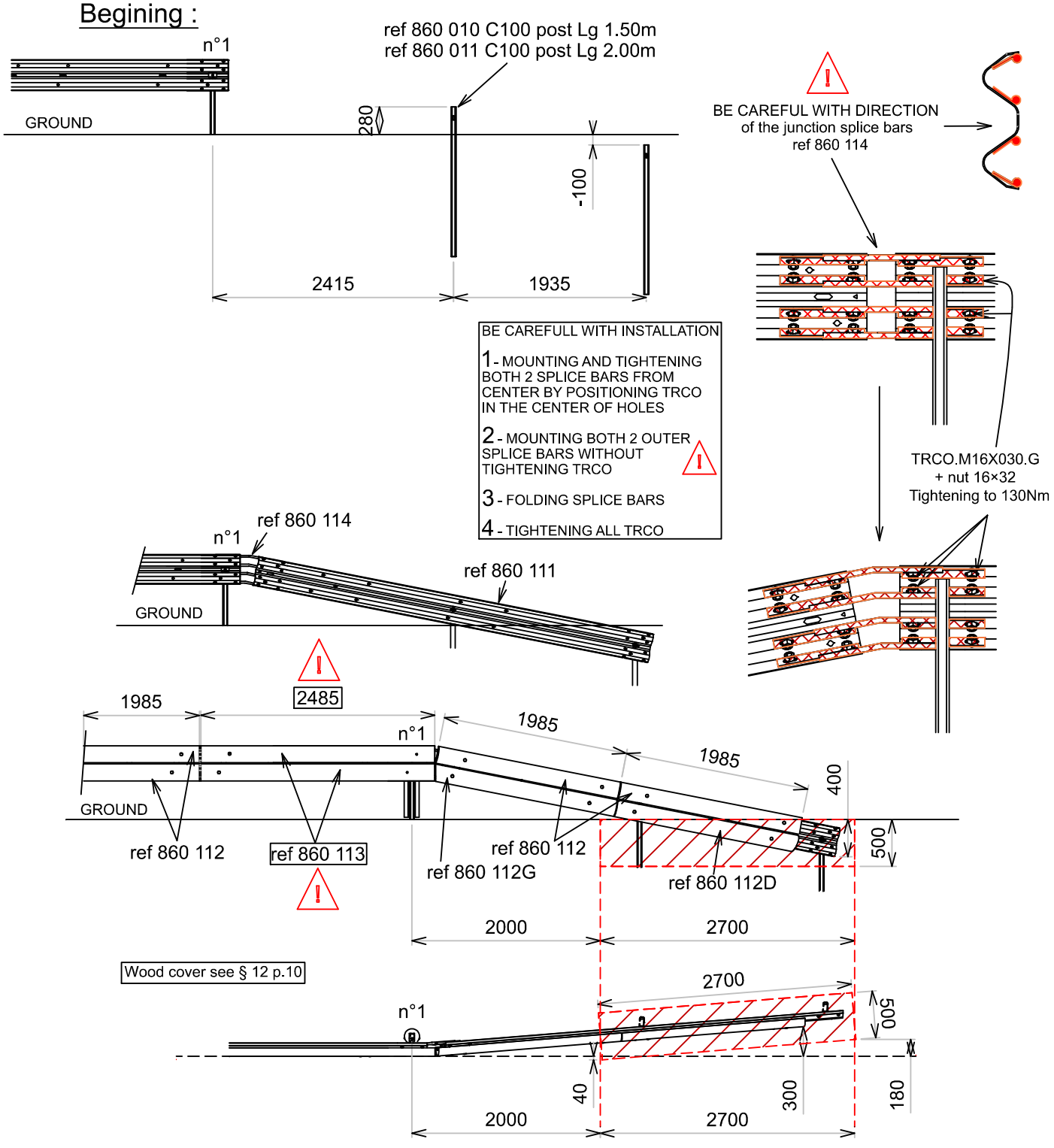
Wood cover see §12 et 13 p.10



End : SYMMETRIC

11- 4ml terminals :

Begining :



End : SYMMETRIC

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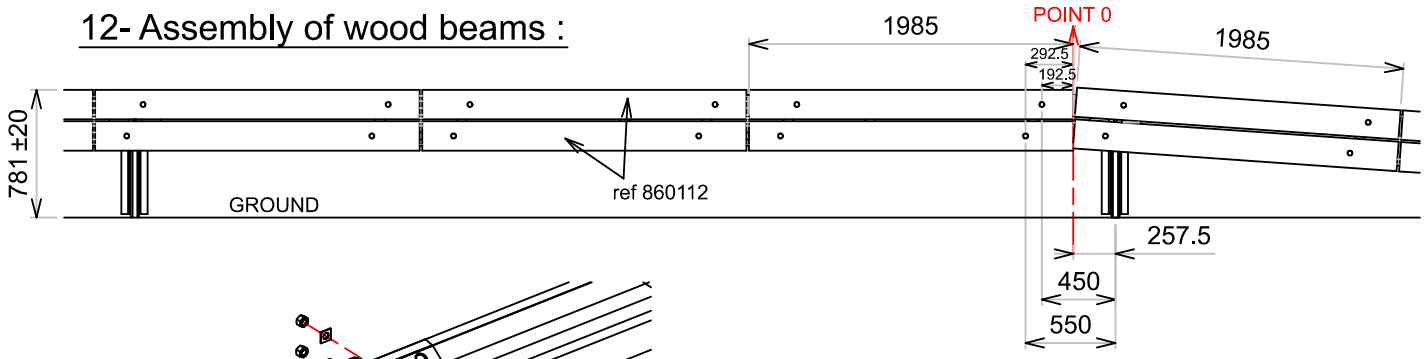
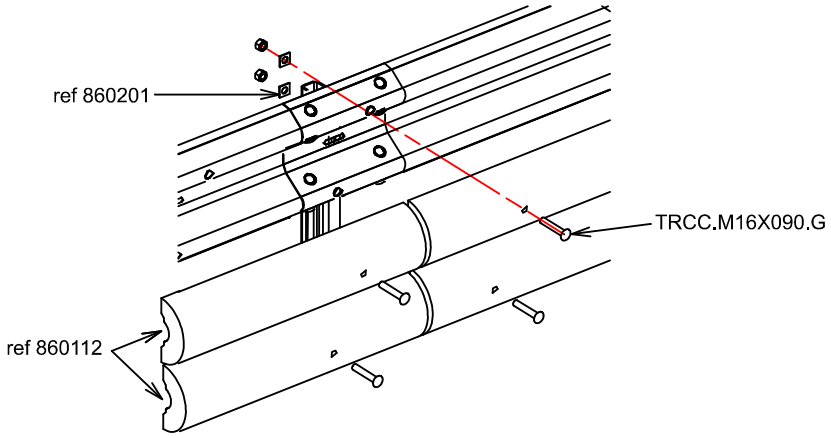
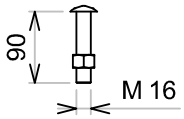
12- Assembly of wood beams :

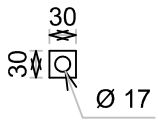




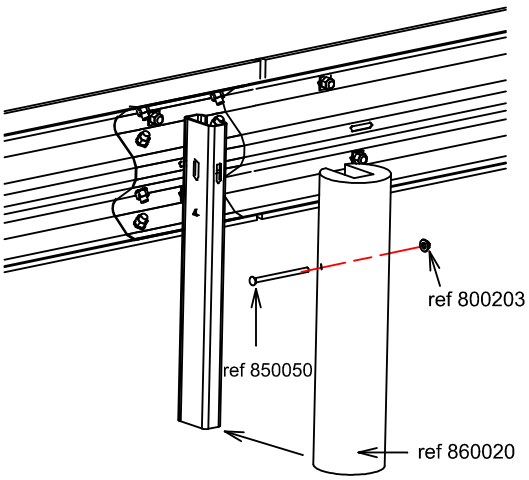
bolt TRCC.M16X090.G



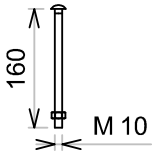
ref 860201



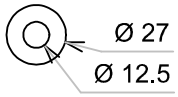
13- Assembly of wood mask for C100 post :

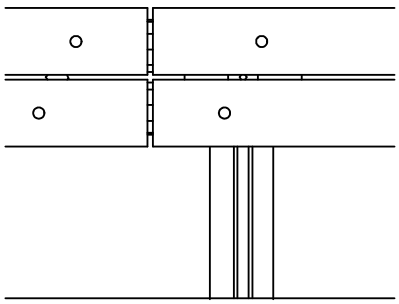


bolt TRCC.M10X160.G



ref 800203



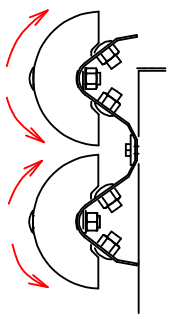


14- Height adjustment of whole system :

See paragraph 1 & 9

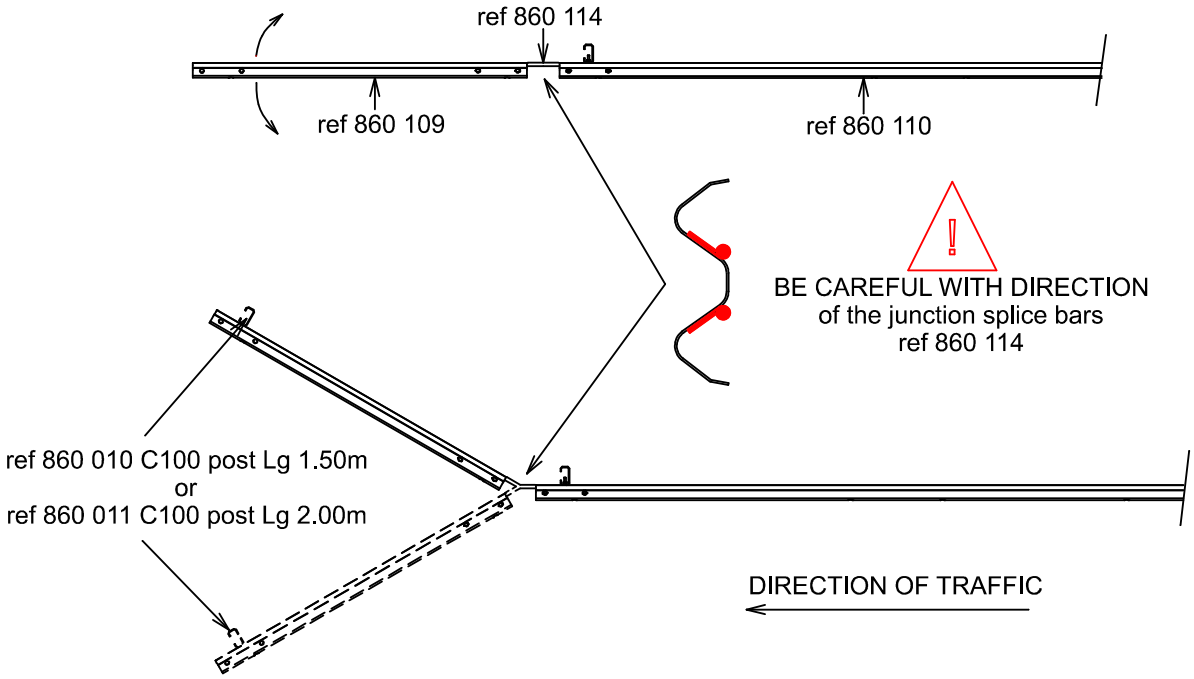
1 - Adjust the height of the steel beam into the hole of C100 post (paragraph 9)

2 - Align the wood beams thanks to the holes on steel beams.

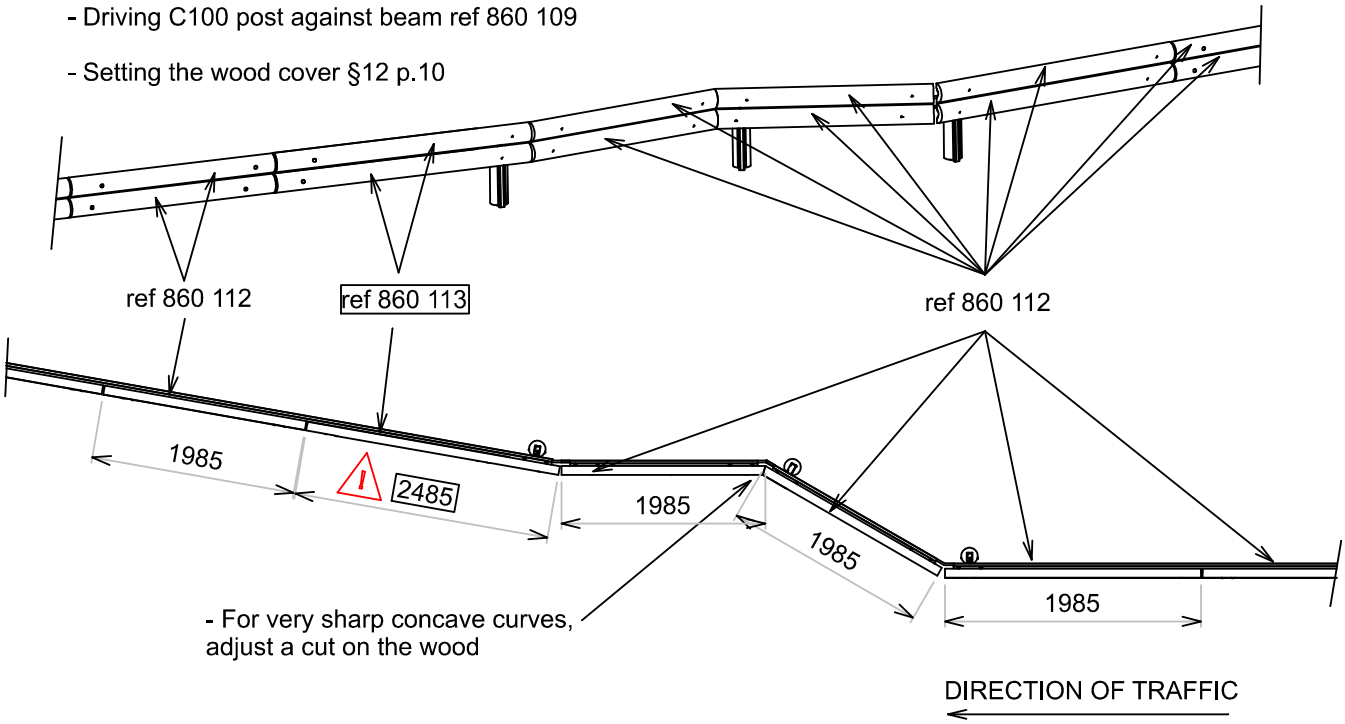


15- Mounting in curve < 40m :

- Assembling the beam ref 860 109 on beam 860 110, with 2 splice bars ref 860 114 + TRCO16×30



- Folding splice bar ref 860 114 according to necessary angle
- Driving C100 post against beam ref 860 109
- Setting the wood cover §12 p.10



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16- Marking and traceability :

Each element of wood beam are individually identified by a mark on one end. It includes letter R accompanied by two last numbers of the year of manufacture.

The CE marking + n° Lot are affixed to the main steel parts. (beam & C100 post)

The CE marking is also noted on commercial documents, that is :

- AR order confirmation
- BL delivery note
- Commercial invoices

17- Repair :

- Disassemble damaged wood beams
- Replace if necessary deformed steel beams and posts
- Reassemble new wood beams
- Replace broken wood masks
- Repeat settings (paragraph 13)

  Remark : During an impact eventual possibility of ejection of wood pieces of more than 2Kg (wood mask)

18- Maintenance :

Our wood/steel guardrails do not need any specific maintenance.

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19- Product durability :

Assessment of the product durability

Our guardrails are exclusively treated **PINE CLASS 4 in accordance with EN 335.**
This treatment helps us to guaranty the best durability of our products installed subjected to weather conditions.
By use we guaranty our products 10 years against rot and insect attack.
Concerning sustainability assessment, our experience feedback help us to say that it will be at least 20 years and up to 30 years depending on the case.

Product life can effectively vary depending of climate (high wet) and of physical location (urban environment, saline environment, etc.)

OUR EXPERIENCE :

We are the first manufacturers to commercialize wood / steel guardrails since 1984 so more than 30 years of experience and more 3000km installed.

TREATMENT :

Wood : Pine class 4 according to EN 335.
Steel : hot dip galvanized according to EN ISO 1461.

CTB B+ & CTB P+ CERTIFICATIONS :

CTB B+ and CTB P+ certifications are an additional guarantee of quality of wood treatment. We are audited twice a year by this organization with samplings made to check the wood treatment quality.

ENVIRONMENT :

Treated wood do not need any specific recycling in end of life.
PEFC certification as part of sustainable forests managment.