PRODUCT SPECIFICATION

H2BP-02

CE 0497

ECO PLATFORM EPD VERIFIED

PEFC Promoting Sustainable Forest Management PEFC/18-31-56 www.pefc.org

ON THE ROAD

MARGARITELLI ROAD SAFETY

SPD 025 Rev 16

GENERALITY

Bridge safety barrier (parapet) made of laminated wood and steel, CE CERTIFIED in H2 containment class according to the harmonized standard EN 1317-5.

Certificate of Constancy of Performance CE n° **0497/CPR/3247** issued by CSI SpA – Bollate.

Figure 1 Transparent surface treatment, natural color – with single rear post cover

Figure 2 Deep brown color surface treatment – with single rear post cover

Figure 1 Transparent surface treatment, natural color – with no rear post cover

Figure 4 Deep brown color surface treatment – with no rear post cover

SUSTAINABILITY

At Margaritelli Road Safety, our commitment to sustainability is evident across all aspects of environmental management. This includes strict adherence to environmental legislation, the efficient use of energy and natural resources, the promotion of a circular economy through waste recovery, and active efforts to combat climate change by minimizing greenhouse gas emissions generated during the production of safety devices.

For the H2BP-02 barrier, an EPD (Environmental Product Declaration) has been registered and published on www.environdec.com. This declaration, prepared in accordance with the voluntary certification scheme outlined by the **ISO 14025** and **EN 15804** standards, pertains to the environmental performance of the product. The EPD serves as an objective assessment tool for evaluating the environmental performance of a product. It is based on the application of LCA (Life Cycle Assessment) methodologies, which assess the environmental footprint throughout the entire life cycle, from the extraction of raw materials to the product's end-of-life ("Cradle to grave") or to the factory gate ("Cradle to gate").
In the "Cradle to gate" analysis for the H2BP-02 barrier, the total global warming potential (GWP) indicator due to greenhouse gases is expressed in kilograms of CO_2 equivalent emitted per meter of product.
This value is:

Total GWP = **31,42** kg CO_2 eq

In order to manage the environmental aspects characterizing Margaritelli Ferroviaria's activities more effectively and sustainably, the Perugia and Bettona offices operate with an Environmental Management System certified in accordance with the **ISO 14001** standard.

PEFC CHAIN OF CUSTODY

The implementation and maintenance of a PEFC Chain of Custody is the tool through which Margaritelli Road Safety demonstrates its commitment to halting deforestation, conserving biodiversity, and acting responsibly on a social level, through the adoption of a legal and sustainable raw material supply system: the wood used in the Bettona facility for the production of the device comes exclusively from sustainably managed forests.

MAIN DIMENSIONAL CHARACTERISTICS OF THE BARRIER.

Height of the rail from the top surface of the foundation *	830	mm
Height of the handrail from the top surface of the foundation	1100	mm
Maximum lateral clearance	348-370	mm
Top surface of the foundation from the road surface	0	mm
Minimum foundation width	400	mm
Posts spacing	2000	mm
Minimum length (tested barrier section)	70	m

*** t**o be respected in the case of a curb with a raised top surface relative to the pavement.

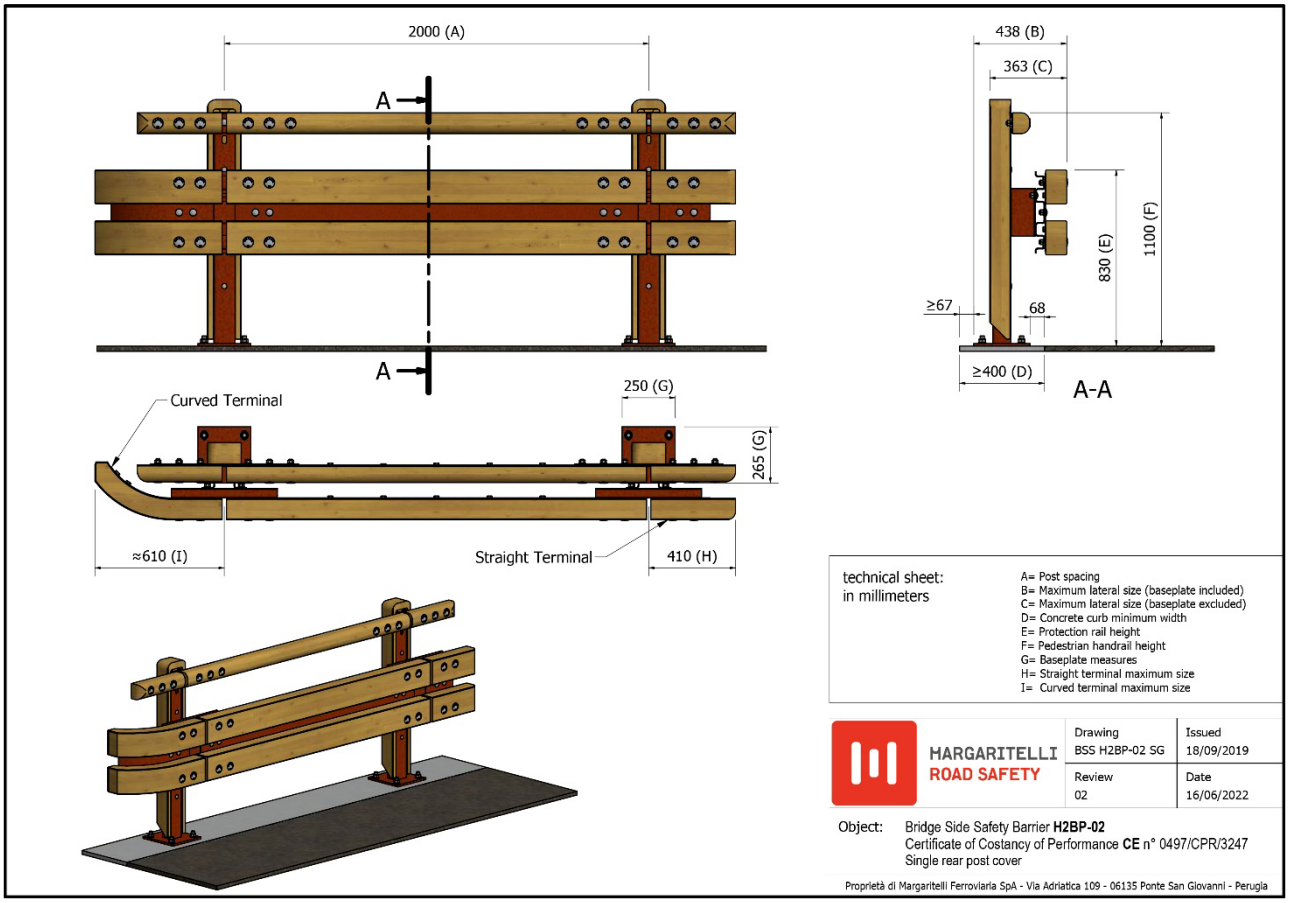

Figure 5 H2BP-02 barrier in standard version

METHOD OF FIXING TO THE CURB.

During crash tests.

Characteristic strength of the concrete	R_{ck} 40	N/mm^2
Anchor bar	M20 Class 6.8 bars	
Chemical Anchor	Two-component polyester mortar	

Alternative system with certified anchors.

Characteristic strength of the concrete	R_{ck} 40	N/mm^2
Anchor bar	M16 Class 8.8 bars	
Chemical Anchor	HILTI HIT-HY 200-R Resin	

Anchors to the foundation.

4 threaded rods in class 6.8 galvanized steel, Ø 20, minimum driving depth 200 mm, inserted on Ø 24 holes and fixed with two-component polyester mortar, must be used. Check the type of product used for compatibility with on-site temperatures below 5°C.

PERFORMANCE CHARACTERISTICS.
Tests carried out.

CSI Test N°	Proof	Velocity	Angle	Mass	Vehicle Type
0014\ME\HRB\09 of 01/07/09	TB 11	100 km/h	20°	900 kg	Car
0013\ME\HRB\09 of 02/07/09	TB 51	70 km/h	20°	13000 kg	Bus

Dynamic performance.

PARAMETER	Detected value	Limit value	CSI SPA Test N°
ASI index	1.0 – Grade A	≤ 1.0	0014\ME\HRB\09
L_C containment level (kJ)	280	> 288 – 5%	0013\ME\HRB\09
Working Width Level (TB11)	W2 class (0.70 m)	≤ 0.8 m	0014\ME\HRB\09
Working width level (TB51)	W6 class (1.80 m)	≤ 2.1 m	0013\ME\HRB\09
Vehicle Intrusion (TB51)	VI7 Class (2.3 m)	≤ 2.5 m	0013\ME\HRB\09
Dynamic Deflection (TB51)	1.5 m		0013\ME\HRB\09
THIV (km/h)	30,1	≤ 33.0	0014\ME\HRB\09

Terminals.
To complete the barrier at the beginning and end of each section, untested terminal elements must be inserted, two for each distinct section, even of different types (straight or curved).
The placement of the non-certified terminals must be appropriately designed to avoid direct impacts. Otherwise, it is advisable to use certified energy-absorbing terminals.

The **P1-01** and **P2-01 Beaver** terminals can be directly connected to the barrier using a special fitting. To use the **T50-01**, an appropriately long section of lateral edge barrier must be provided between the bridge edge barrier and the terminal itself.

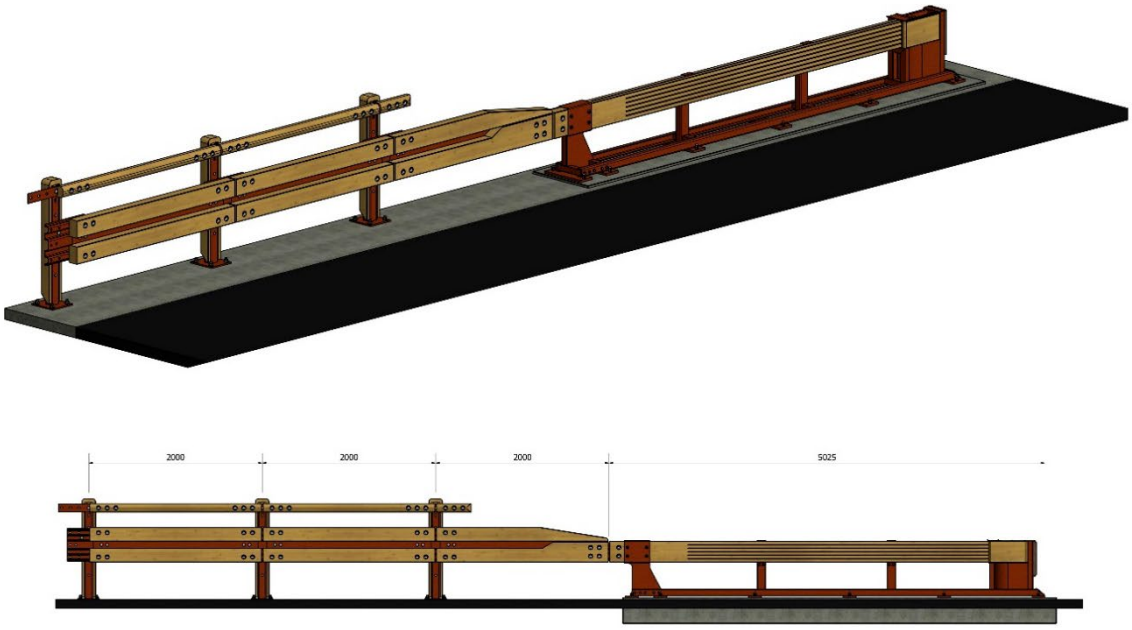

Figure 6 H2BP-03 barrier with direct connection with P1-01 or P2-01 Beaver terminal

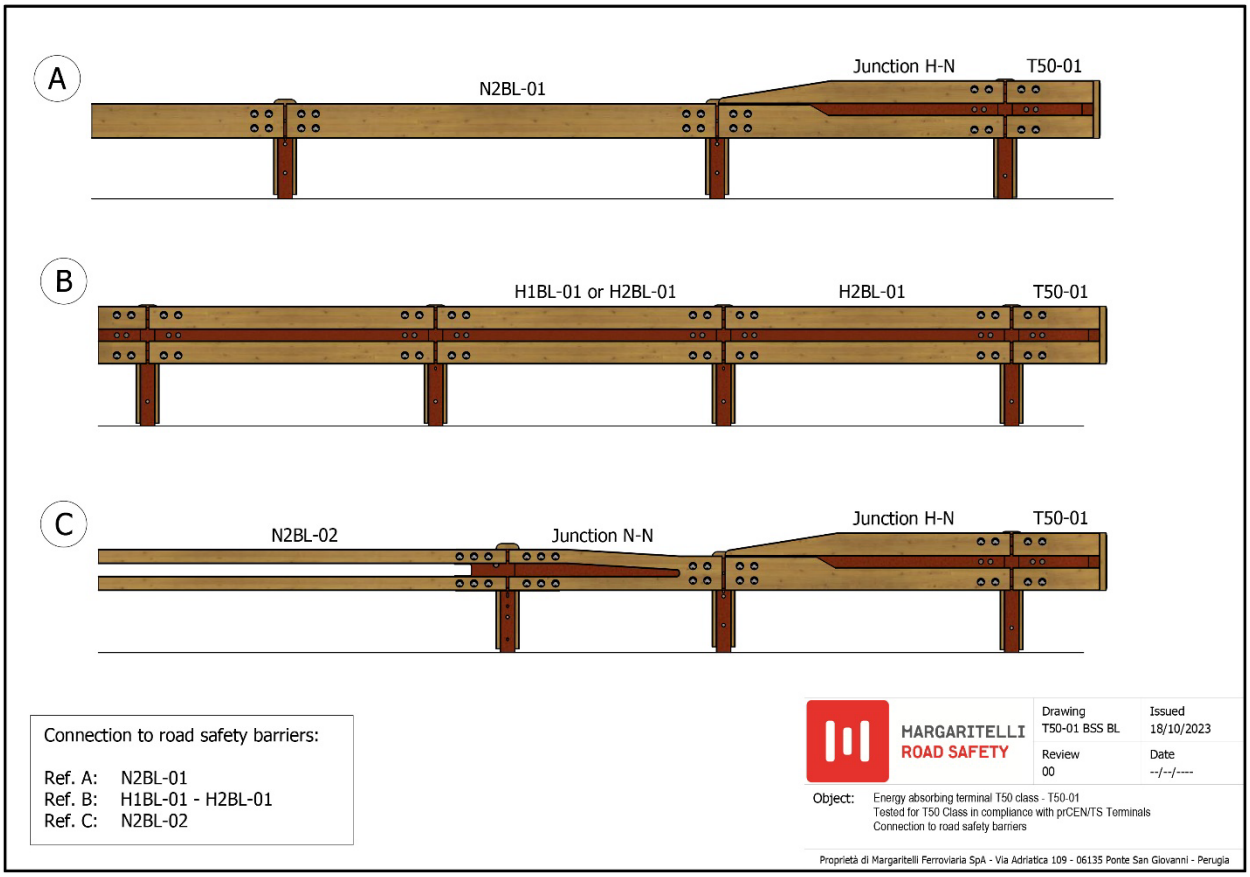

Figure 7 Connection between side edge barrier and T50-01 terminal

MATERIALS.

Steel.

EN 10025-S355J0WP steel, CE-certified for structural applications, offers enhanced resistance to atmospheric corrosion (commonly referred to as Corten steel). This steel contains specific alloying elements that improve its resistance to weathering by forming a protective oxide layer on the base metal when exposed to atmospheric agents.

Laminated wood.

The laminated wood used is CE-certified for structural applications in accordance with the harmonized standard EN 14080.

The beams must be manufactured in compliance with the UNI EN 386 standard for Service Class 3, with minimum mechanical properties corresponding to Class GL24C, as specified in UNI EN 1194. This ensures uniformity in the mechanical characteristics of the finished product and compliance with the prototype subjected to crash test evaluations.

The adhesive used is Type I as defined by EN 301, making it suitable for climatic conditions involving relative air humidity equivalent to full exposure to weather.

Additionally, the bonding process is carried out to ensure resistance to autoclave impregnation treatments.

High-strength galvanized steel bolts.

Special bolts for road barriers in high-strength galvanized steel (class 8.8 for screws, class 8 for nuts).

Hexagonal head wood screws Ø 14 x 90 mm made of galvanised steel (class 4.6).

WOOD PRESERVATIVE TREATMENTS.

Autoclave pressure impregnation treatment.

The pressure impregnation treatment in an autoclave, using preservative substances, ensures that the wood is protected both on the surface and deep within against the degenerative effects of atmospheric agents and biological attacks to which the barrier is exposed in outdoor environments (refer to SPD 022).

Treatment: Pressure impregnation with salts using a vacuum/pressure/vacuum cycle in an autoclave. Preservative substance: Eco-friendly, completely odorless preservative based on copper salts, boron, and

organic compounds, free of chromium and arsenic. Absorption: Not less than the R3 value, as specified by CTBA certificate. Usage conditions: Suitable for Risk Class 3 according to EN 355-1, corresponding to the intended use conditions.

Surface treatment – optional pigmentation.
To protect the wood from the degenerative effects of sunlight and atmospheric agents, a hydrophobic surface treatment is applied. This treatment enhances the wood's natural appearance while significantly slowing the typical graying process that occurs with any wood exposed to outdoor environments.
The presence of resins in the surface impregnating agent also reduces moisture exchange with the environment, thereby decreasing the tendency to crack—a common issue for wood used outdoors.
Additionally, the surface treatment can be complemented with a dark walnut finish achieved through the use of specific pigments.

Surface treatment
Transparent
Natural color
Standard production
Ready for shipping

Surface treatment
Pigmented
Deep brown color
On specific request
Delivery in 30 days

DURABILITY AND MAINTENANCE.
Due to the materials used, the construction techniques, and the treatments applied to the wooden components, the installed barrier does not require any maintenance and retains its performance characteristics over time.
However, wood, like any other material permanently exposed to the outdoor environment, tends to lose its original color, more or less quickly, over time due to the degenerative effects of UV rays. In the case of a walnut-colored finish, it may be necessary, after a few years (depending on the extent of exposure to sunlight), to restore the original aesthetic appearance of the barrier by repeating the surface treatment on-site using a manual application of staining impregnators.

CLASSIFICATION OF TREATED TIMBER AS WASTE.
The laminated wood used, subjected to the double impregnation treatment, is assigned the EWC code 170201 (Wood). Therefore, it is classified as NON-HAZARDOUS WASTE, making it easily manageable in the event of replacement during maintenance after accidents.

DECLARATION OF NON-EMISSION OF HAZARDOUS SUBSTANCES.
The use of CE-certified laminated wood, in accordance with the harmonized standard EN 14080, guarantees the non-emission of harmful or dangerous substances listed in the European Community directive 76/769/EEC.

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