

ASECAP's Road Safety Webinar "Building a wide road safety culture to reach Vision Zero goal"

22.06.2101

Development and Certification of a new Safety Barrier solution for bridges and viaducts with 30cm concrete kerbs

/ 01 SAFETY BARRIERS UPGRADING PROGRAM

/ Ascendi's road concessions were awarded between 1999 and 2007 (868 km).

/ The road design considered the requirements for safety barriers available at the time (developed by *Infraestruturas de Portugal, SA* - former *Estradas de Portugal*).

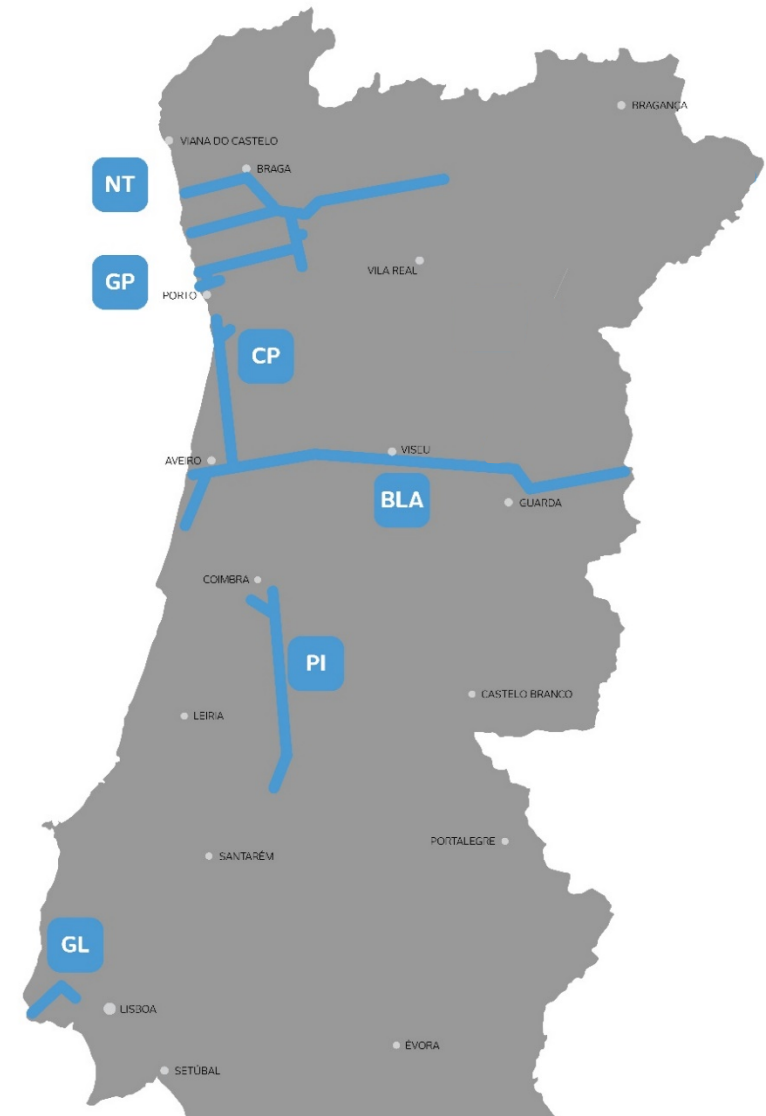
/ During the construction phase the European Standard for Vehicle Restraint Systems (EN 1317) was partially adopted by Portugal – only Part 8 regarding Motorcyclist Protection devices.

/ To evaluate the network compliance with best practices regarding Safety Barriers, in 2018 and 2019, Ascendi carried out an external audit, that set 4 priority interventions:

1. Median barriers
2. **Bridges**
3. Slopes
4. Obstacles and transitions

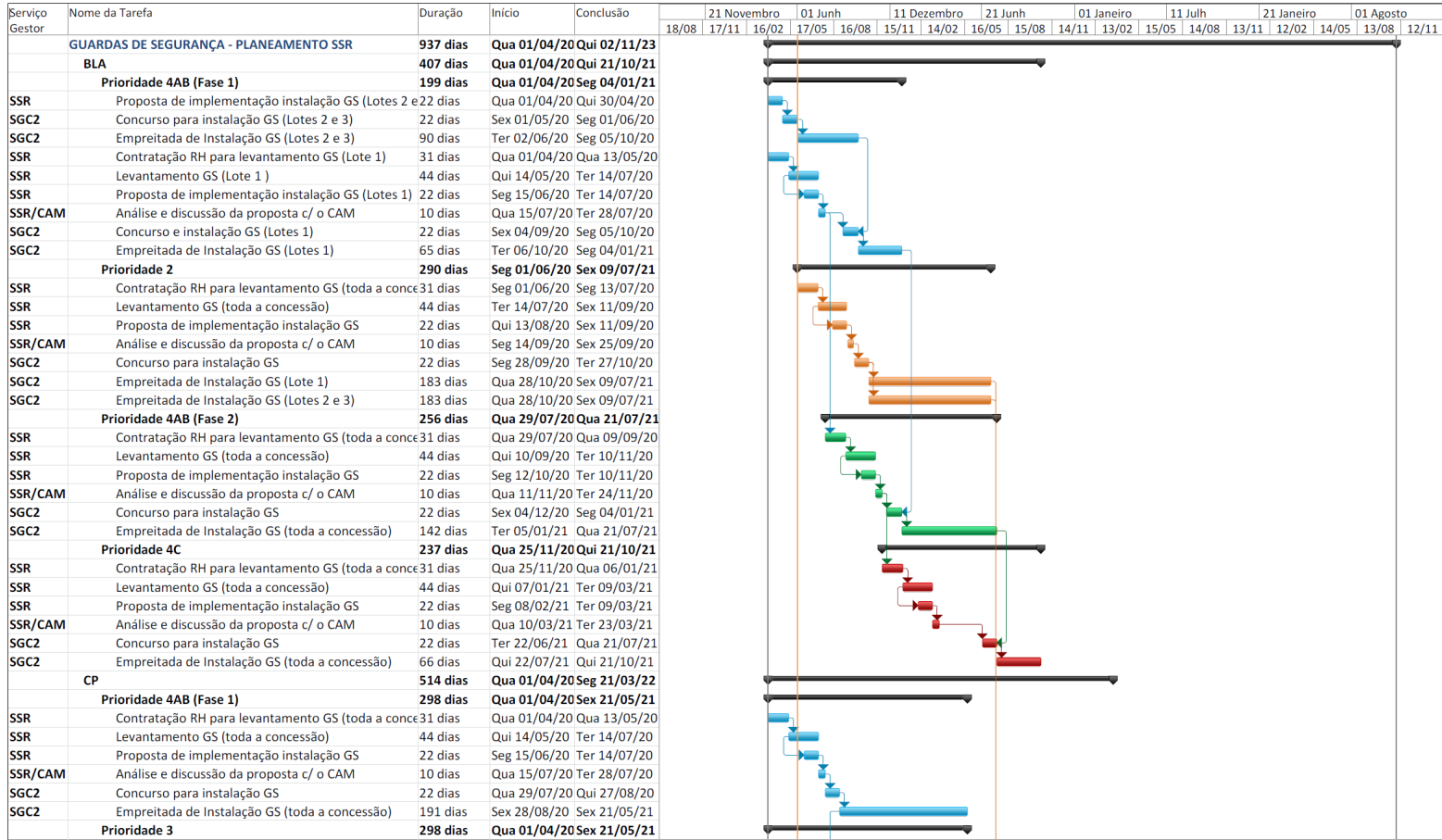


Safety barriers upgrading program



THE PROGRAM

- 4 Priorities / Intervention types
- 6 Road Concessions
- Duration: until 2023
- Estimated investment: 17M€
- Monitoring: continuous and annual



THE PROBLEM

- No certified solution available in the market to be installed over a bridge's 30 cm high curb.
- Every new solution has to have a Motorcycle Protection System (mandatory in Portugal)
- Currently installed solutions have no CE certification => => unknown performance (containment level)

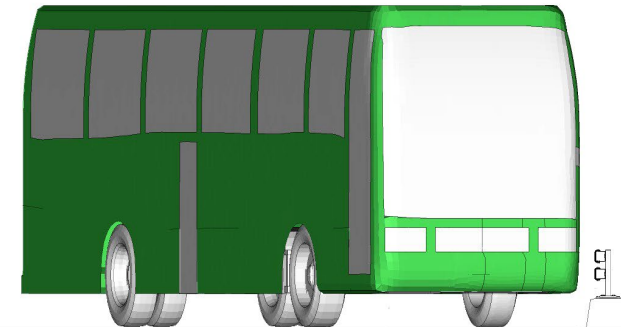


Development and Certification of a new Safety Barrier solution for bridges and viaducts with 30cm concrete kerbs



STRATEGY

- / Partnership with ROADSTEEL ENGINEERING
- / Preliminary testing of the currently implemented solution
- / Computer modelling and simulation to reach optimal solution
- / Full scale crash testing according to the EN1317 standards
- / Validation and certification of the final solution



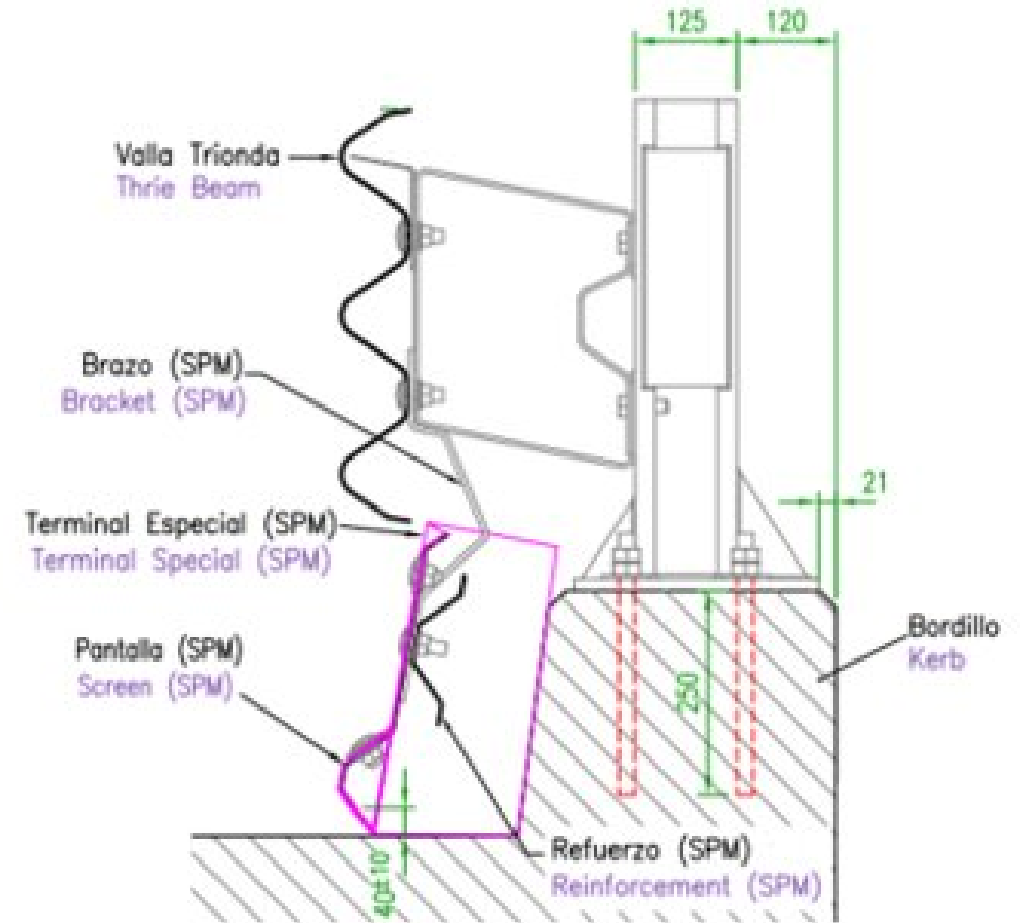
FULL SCALE CRASH TESTING



THE SOLUTION

New Safety Barrier solution for bridges and viaducts with 30cm concrete kerbs:

- Containment level: H2
- Working width: W2
- Severity level: B
- With MPS
- Installation on the 30cm kerb
- CE marking



CE PRODUCT CERTIFICATION

Bureau Veritas Certification

CE

CERTIFICATE OF CONSTANCY OF PERFORMANCE

Certificate nb: 1035-CPR-ES1055474-159-A

In compliance of the Regulation No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products, it has been stated that the product:

STEEL PARAPET WITH MOTORCYCLIST PROTECTION DEVICE "ASC-H2P30-SPM (A1)"

The characteristics are detailed in the attached annex

Manufactured by:

HIERROS Y APLANACIONES S.A. (HIASA)

Produced in:

Polígono industrial de Cancienes 33470 Corvera, Asturias, España

They are submitted by the manufacturer to factory production control established at the standard EN 1317-5:2007+A2:2012 Road restraint systems. Part 5: Product requirements and evaluation of conformity for vehicle restraint systems, and the initial type testing by accredited laboratory of samples taken at the factory.

The notified body BUREAU VERITAS CERTIFICATION has performed the initial inspection of the factory and of the factory production control and performs the continuous surveillance, assessment and approval of the factory production control established in the harmonized standard concerned.

This certificate attests that all provisions concerning the attestation of factory production control described in the Annex 2A of the harmonised standard were applied and it authorizes the manufacturer or its agent to fit the CE marking. This certificate remains valid as long as the conditions laid down with the harmonised standard concerned or the manufacturing conditions in the factory or the PPC itself are not modified significantly.

Place and date of initial issuing: **04 - March - 2021**

Bureau Veritas Certification

Bureau Veritas Iberia, S.L., Edificio Caoba, C/ Valporillo Primera 22-24
28108 Alcobendas (MADRID)

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Bureau Veritas Certification

CE

TECHNICAL DATA SHEET ANNEXED TO CERTIFICATE OF CONSTANCY OF PERFORMANCE

Nº: 1035-CPR-ES1055474-159-A
Date of approval: 04 - March - 2021

ASC-H2P30-SPM (A1)

Bureau Veritas Certification

Dimensions in mm

STANDARDS	PERFORMANCE PARAMETERS	ACCORDING TO UNE-EN 1317-2
UNE EN 1317-1 UNE EN 1317-2 UNE EN 1317-5	a) Performance Level b) Impact Severity Level c) Normalized Working Width d) Normalized Dynamic Deflection e) Normalized Vehicle Intrusion f) Resistance to snow removal	H2 B W1 = 0,8 m (W2) D1 = 0,5 m 1,6m (VIS) NPD
DETACHED PIECES:	Totally detached elements having a solid mass > 2.0 Kg; NO	
SOIL DESCRIPTION:	Concrete foundation	
HAZARDOUS SUBSTANCES:	NPD	
OBSERVATIONS:	This steel parapet is a modified product of the steel parapet "ASC-H2P30-SPM" (Certificate of Constancy of Performance: 1035-CPR-ES1055474-159-A) according to section 8.2.1.9 of the EN 1317-5 standard, with modification category "C" according to annex A, consisting in changing the anchor bars.	
INITIAL TYPE-TEST LABORATORY:	FUNDACIÓN CIDAUT, Valladolid (Spain)	
VEHICLE IMPACT TEST CODES:	820-1086 820-1159	TB11 TB31
MATERIALS:	Steel UNE-EN 10025	Hot dip galvanizing UNE-EN ISO 1461, UNE-EN ISO 14713
DURABILITY:		

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IMPLEMENTATION

/ Site 1: Viaduct over Vale do Vouga railway line - Pk 30+800 da A25

/ Site 2: Bridge over Caima River - Pk 31+500 da A25



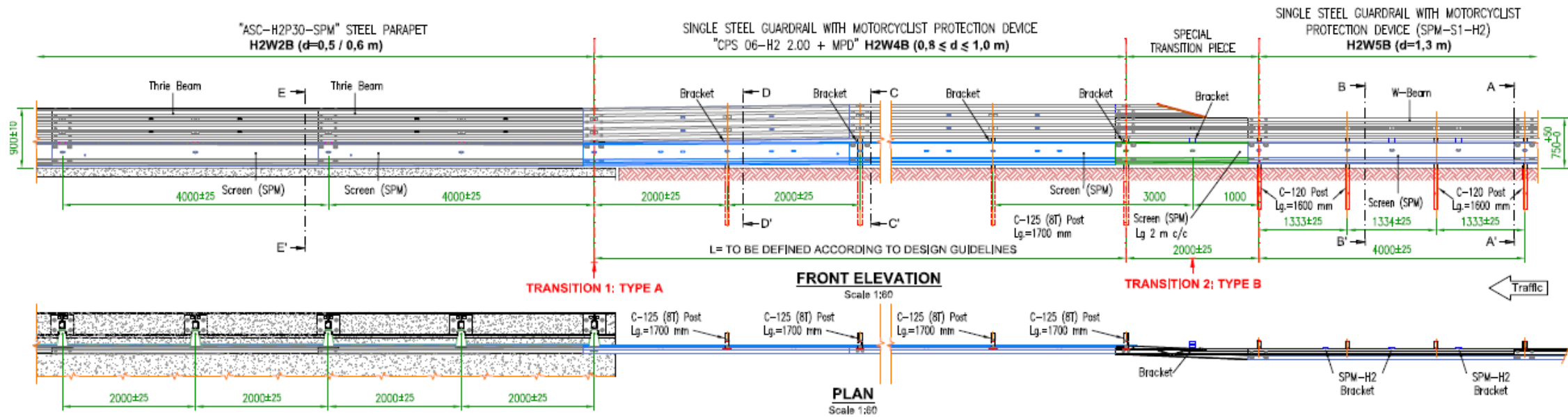
/ Before



/ After

/ 6000 m of new safety barrier to be installed in A25 highway until the end of 2021

ONGOING WORK - TRANSITIONS



/ Expected to be fully developed and certified on the 2nd semester 2022

Thank you

João Neves
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