PREALUX
Passion for Road Safety

CRASH CUSHION SYSTEMS

PREALUX
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INDEX

REDIRECTIVE CRASH CUSHION SYSTEMS

WHAT IS A CRASH CUSHION?

A Crash Cushion System is a device that is designed to absorb impact energy and is generally installed in potentially dangerous points for vehicles, such as exit cusps, motorway toll booths, pillars, etc.
The system absorbs the impact energy of the vehicle, slowing it down in the event of a frontal impact or redirecting it into the lane following a side impact.

TYPES
VERSIONS CCS-I AND CCS-II
Parallel / Non Parallel

SPEED CLASSES
50 km/h, 80 km/h, 100 km/h, 110 km/h

CERTIFICATES
Tested according to EN 1317-3
at 50 km/h, 80 km/h, 100 km/h and 110 km/h

Parallel CCS-I

Non parallel CCS-I

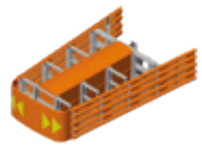
Parallel CCS-II

Non parallel CCS-II

VERSIONS AND INSTALLATION POINTS

50 KM/H CRASH CUSHION
VERSIONS CCS-I AND CCS-II

Parallel CCS-I
Length 3680 mm
Width 800 mm
Height 1010 mm
Weight 785 kg



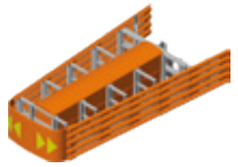
Non Parallel CCS-I
Length 4316 mm
Width 2600 (1989) mm
Height 1010 mm
Weight 1196 kg

Parallel CCS-II
Length 3700 mm
Width 608 mm
Height 808 mm
Weight 450 kg

Non Parallel CCS-II
Length 3600 mm
Width 3000 (2570) mm
Height 780 mm
Weight 816 kg

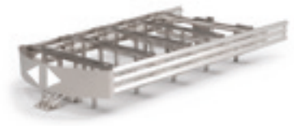
80 KM/H CRASH CUSHION
VERSIONS CCS-I AND CCS-II

Parallel CCS-I
Length 4560 mm
Width 800 mm
Height 1010 mm
Weight 924 kg



Non Parallel CCS-I
Length 5196 mm
Width 2600 (1849) mm
Height 1010 mm
Weight 1388 kg

Parallel CCS-II
Length 4650 mm
Width 608 mm
Height 808 mm
Weight 528 kg



Non Parallel CCS-II
Length 5590 mm
Width 3000 (2300) mm
Height 780 mm
Weight 1138 kg

INSTALLATION POINTS
50 AND 80 KM/H VERSIONS

Motorway toll booths, concrete or plastic barrier terminals

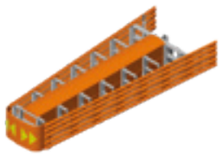
Bridge pillars, tunnels and urban area underpasses

Cusps etc.

VERSIONS AND INSTALLATION POINTS

100 KM/H CRASH CUSHION
VERSIONS CCS-I AND CCS-II

Parallel CCS-I
Length 8080 mm
Width 800 mm
Height 1010 mm
Weight 1420 kg



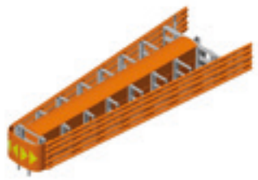
Non Parallel CCS-I
Length 6952 mm
Width 2600 (1569) mm
Height 1010 mm
Weight 1803 kg

Parallel CCS-II
Length 6550 mm
Width 608 mm
Height 808 mm
Weight 690 kg

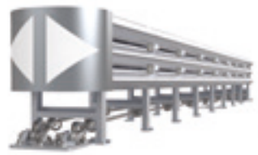
Non Parallel CCS-II
Length 7390 mm
Width 3000 (2040) mm
Height 780 mm
Weight 1456 kg

110 KM/H CRASH CUSHION
VERSIONS CCS-I AND CCS-II

Parallel CCS-I
Length 8080 mm
Width 800 mm
Height 1010 mm
Weight 1420 kg



Non Parallel CCS-I
Length 7829 mm
Width 2600 (1429) mm
Height 1010 mm
Weight 2026 kg



Parallel CCS-II
Length 8550 mm
Width 608 mm
Height 808 mm
Weight 850 kg

Non Parallel CCS-II
Length 8340 mm
Width 3000 (1905) mm
Height 780 mm
Weight 1608 kg

INSTALLATION POINTS
100 AND 110 KM/H VERSIONS

Motorway cusps

Motorway junctions

PREALUX
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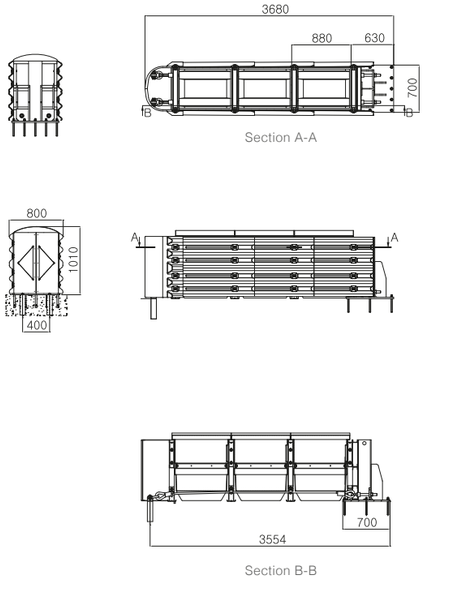
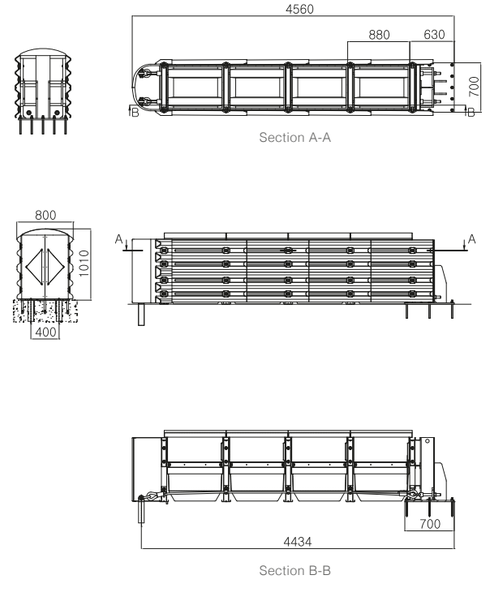
CCS-I

TECHNICAL DRAWINGS / PARALLEL

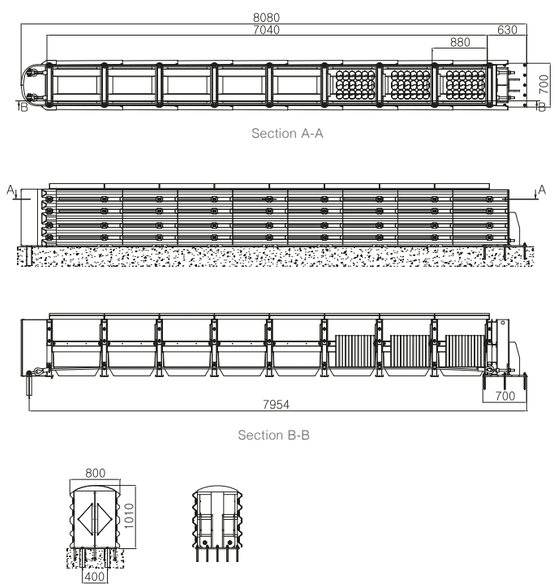
50 km/h



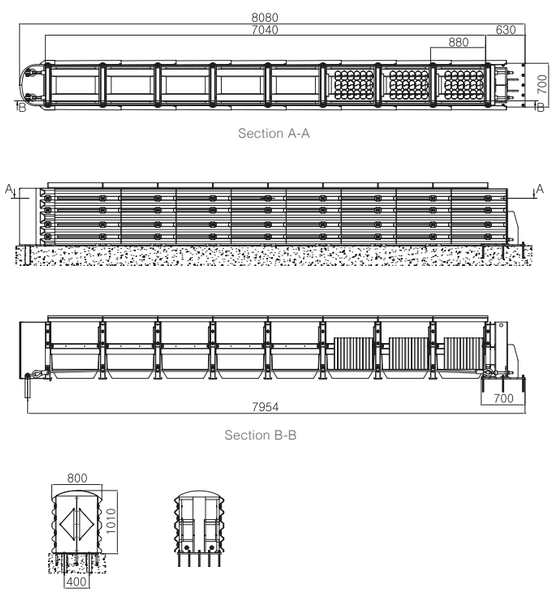
80 km/h



100 km/h

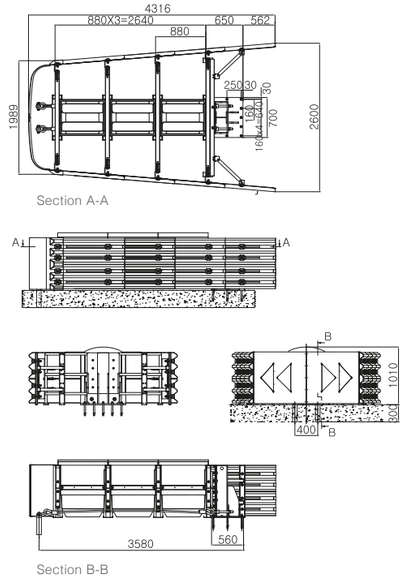


110 km/h

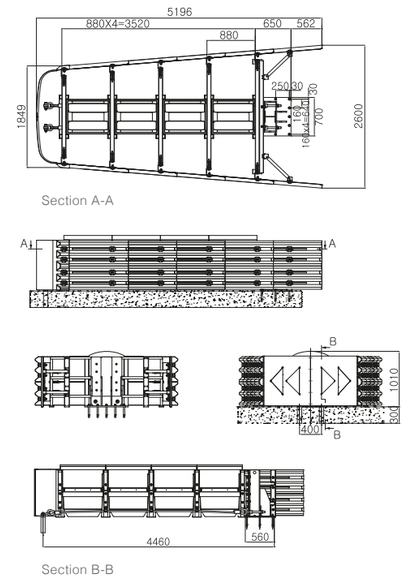


TECHNICAL DRAWINGS / NON PARALLEL

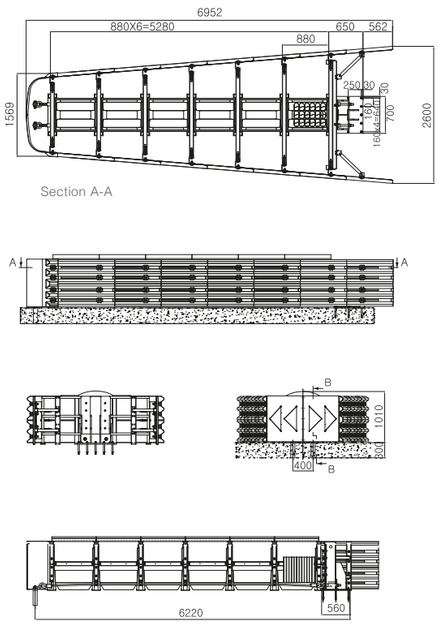
50 km/h



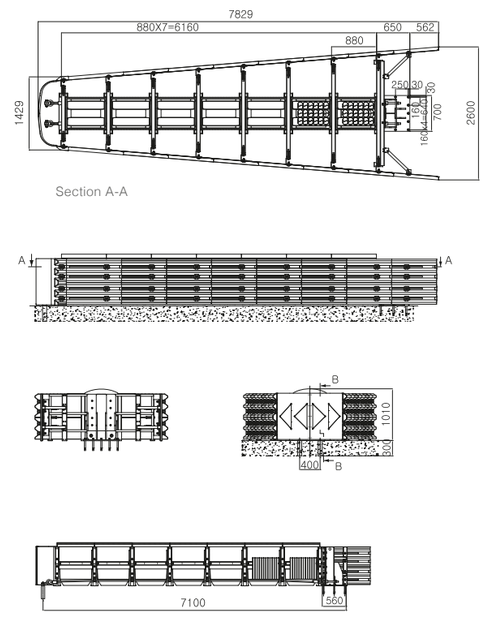
80 km/h



100 km/h



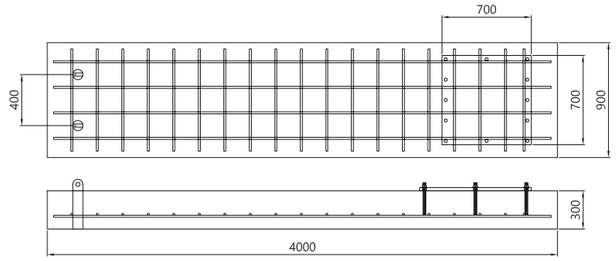
110 km/h



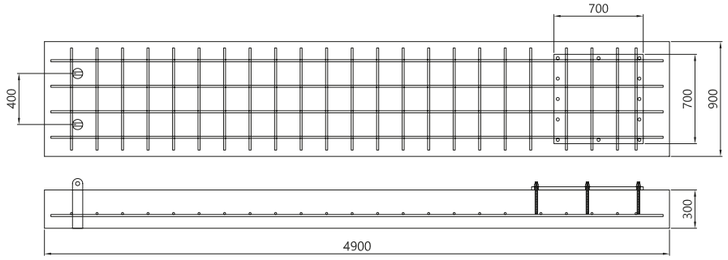
CCS-I

CONCRETE FOUNDATIONS

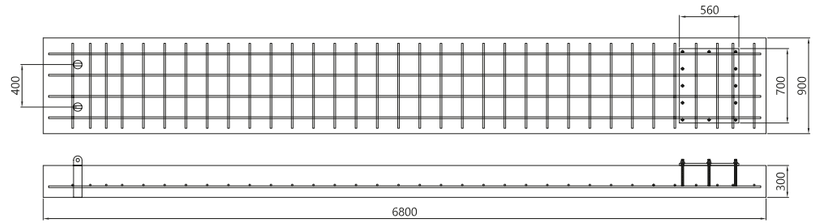
Speed class: 50 km/h - parallel and non parallel crash cushion



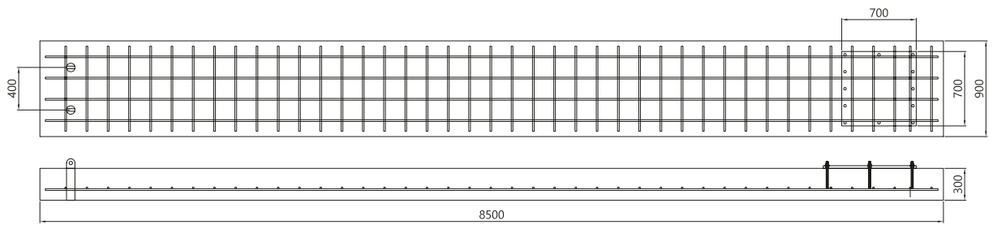
Speed class: 80 km/h - parallel and non parallel crash cushion



Speed class: 100 km/h - non parallel crash cushion



Speed class: 100 km/h and 110 km/h - parallel crash cushion
Speed class: 110 km/h - non parallel crash cushion



CERTIFICATIONS

EN 1317 COMPLIANT CE MARKED CRASH CUSHIONS

All parallel and non-parallel crash cushion systems produced by Shindo have passed the tests required by the European standard EN 1317-3 (approved by CEN, the European Committee for Standardization) and obtained the Certificate of Constancy of Performance issued by the Notified Body TZUS.

FEATURES

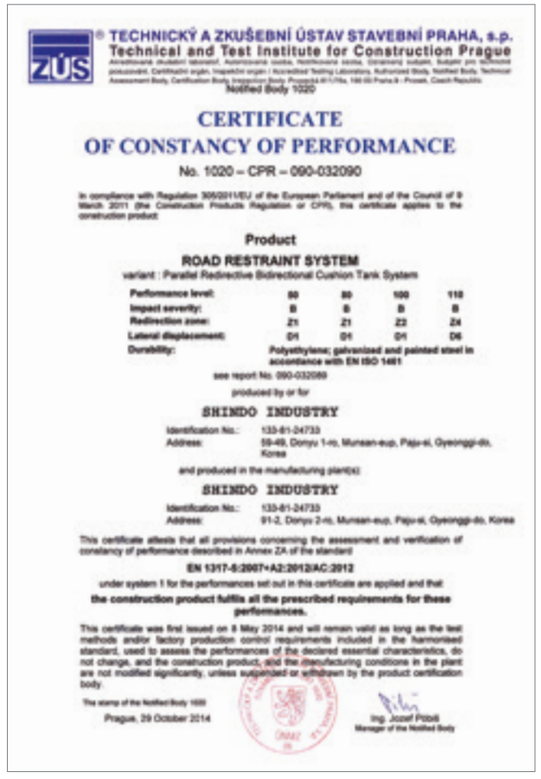
1. Redirective parallel CCS for speed classes: 50, 80, 100 and 110 km/h.
2. Redirective non-parallel CCS for speed classes: 50, 80, 100 and 110 km/h.
3. Designed for an easy inclusion in suburban and urban environments.
4. Easy maintenance and repair after an impact, thanks to the simple structure of the systems.

Details of the tests performed on the CCS:

1. Speed classes: 50, 80, 100, 110 km/h for parallel and non-parallel systems.
2. Test Institute: tests on parallel and non-parallel CCS were performed by “TRL” (Transport Research Laboratory, UK) and by the notified body “CSI Certificazione e Testing” based in Bollate (MI).
3. Certificates of Constancy of Performance issued by Notified Body TZUS.

CCS-I

CERTIFICATE OF CONSTANCY OF PERFORMANCE / PARALLEL CCS



TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Technical and Test Institute for Construction Prague
Notified Body 1020

CERTIFICATE
OF CONSTANCY OF PERFORMANCE

No. 1020 – CPR – 090-032090

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product:

Product

ROAD RESTRAINT SYSTEM

variant : Parallel Redirective Bidirectional Cushion Tank System

Performance level:	80	80	100	110
Impact severity:	B	B	B	B
Redirection zone:	Z1	Z1	Z2	Z4
Lateral displacement:	D1	D1	D1	D6
Durability:	Polyethylene; galvanized and painted steel in accordance with EN ISO 1461			

see report No. 090-032089

produced by or for

SHINDO INDUSTRY

Identification No.: 133-81-24733
Address: 59-49, Donyu 1-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea

and produced in the manufacturing plant(s):

SHINDO INDUSTRY

Identification No.: 133-81-24733
Address: 91-2, Donyu 2-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard

EN 1317-5:2007+A2:2012/AC:2012

under system 1 for the performances set out in this certificate are applied and that

the construction product fulfils all the prescribed requirements for these performances.

This certificate was first issued on 8 May 2014 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonised standard, used to assess the performances of the declared essential characteristics, do not change, and the construction product, and the manufacturing conditions in the plant are not modified significantly, unless suspended or withdrawn by the product certification body.

The stamp of the Notified Body 1020

Prague, 29 October 2014

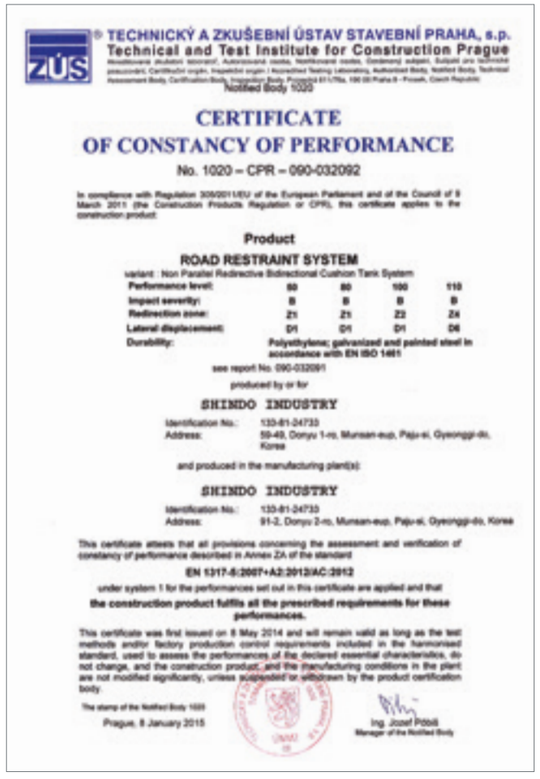
Ing. Josef Pöss
Manager of the Notified Body

Video images of the tests performed according to EN 1317-3






CERTIFICATE OF CONSTANCY OF PERFORMANCE / NON-PARALLEL CCS



TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Technical and Test Institute for Construction Prague
Notified Body 1020

CERTIFICATE
OF CONSTANCY OF PERFORMANCE

No. 1020 – CPR – 090-032092

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product:

Product

ROAD RESTRAINT SYSTEM

variant : Non Parallel Redirective Bidirectional Cushion Tank System

Performance level:	80	80	100	110
Impact severity:	B	B	B	B
Redirection zone:	Z1	Z1	Z2	Z4
Lateral displacement:	D1	D1	D1	D6
Durability:	Polyethylene; galvanized and painted steel in accordance with EN ISO 1461			

see report No. 090-032091

produced by or for

SHINDO INDUSTRY

Identification No.: 133-81-24733
Address: 59-49, Donyu 1-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea

and produced in the manufacturing plant(s):

SHINDO INDUSTRY

Identification No.: 133-81-24733
Address: 91-2, Donyu 2-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard

EN 1317-5:2007+A2:2012/AC:2012

under system 1 for the performances set out in this certificate are applied and that

the construction product fulfils all the prescribed requirements for these performances.

This certificate was first issued on 8 May 2014 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonised standard, used to assess the performances of the declared essential characteristics, do not change, and the construction product, and the manufacturing conditions in the plant are not modified significantly, unless suspended or withdrawn by the product certification body.

The stamp of the Notified Body 1020

Prague, 8 January 2015

Ing. Josef Pöss
Manager of the Notified Body

Video images of the tests performed according to EN 1317-3

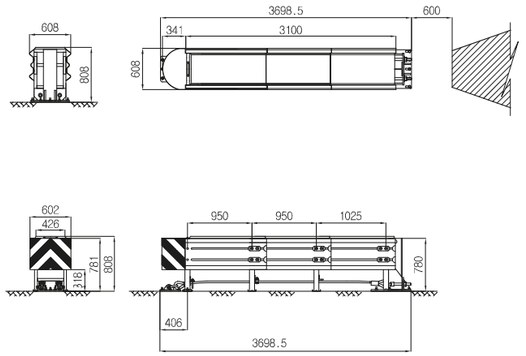




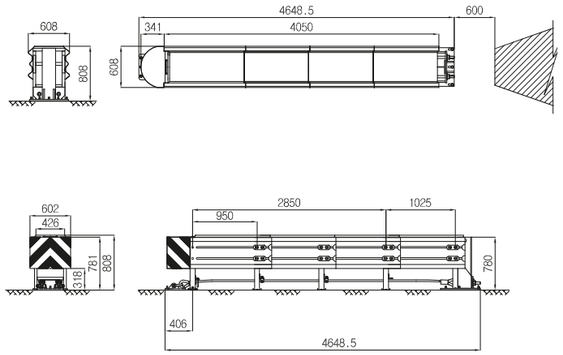

CCS-II

TECHNICAL DRAWINGS / PARALLEL

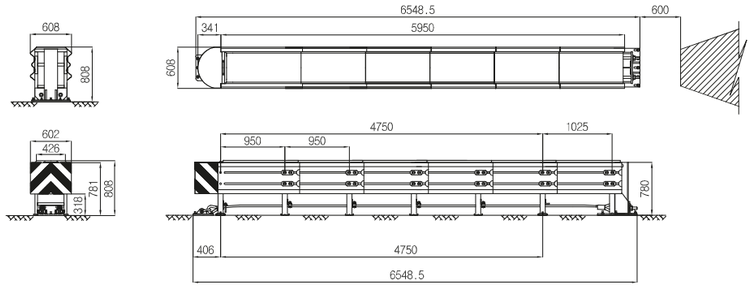
50 km/h



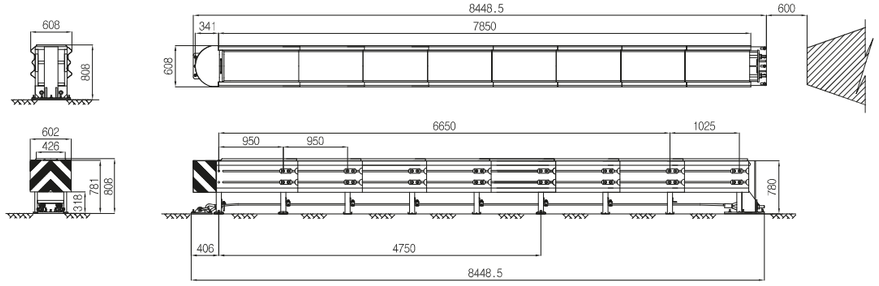
80 km/h



100 km/h

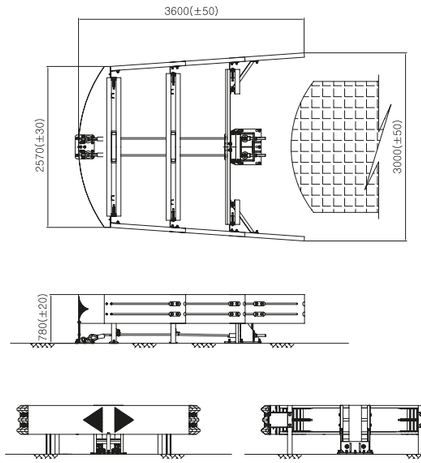


110 km/h

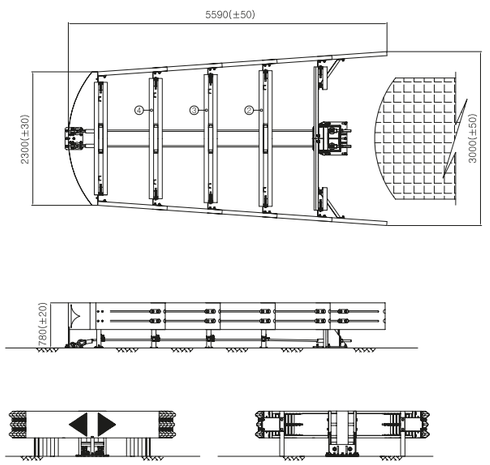


TECHNICAL DRAWINGS / NON PARALLEL

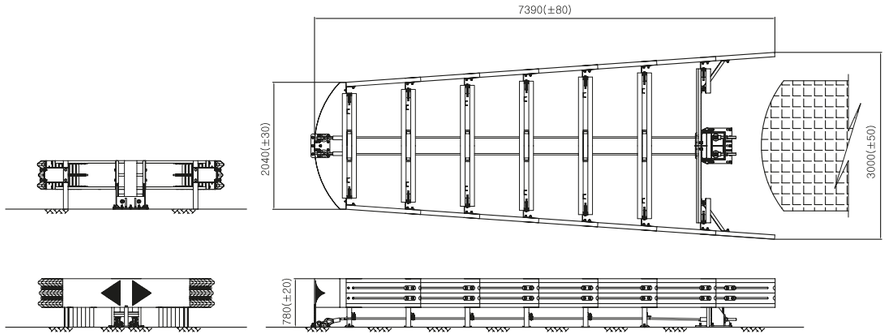
50 km/h



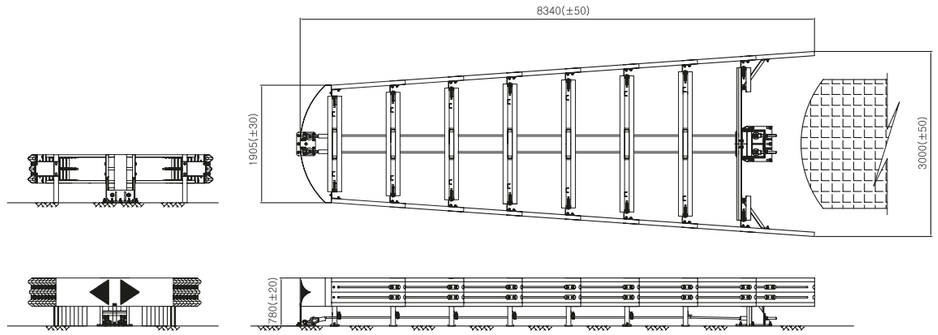
80 km/h



100 km/h

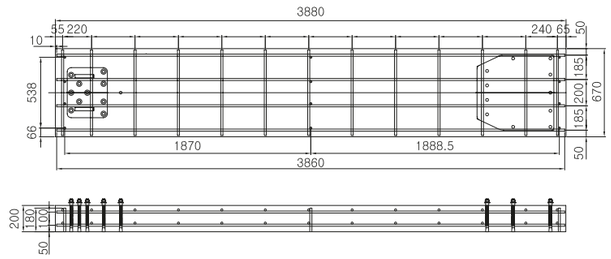


110 km/h

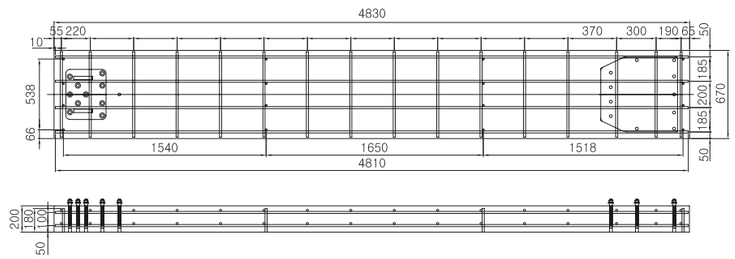


CONCRETE FOUNDATIONS EXAMPLES

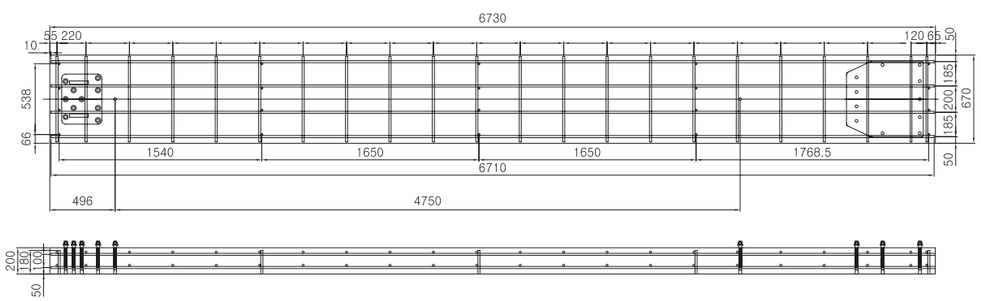
Speed class: 50 km/h - parallel crash cushion



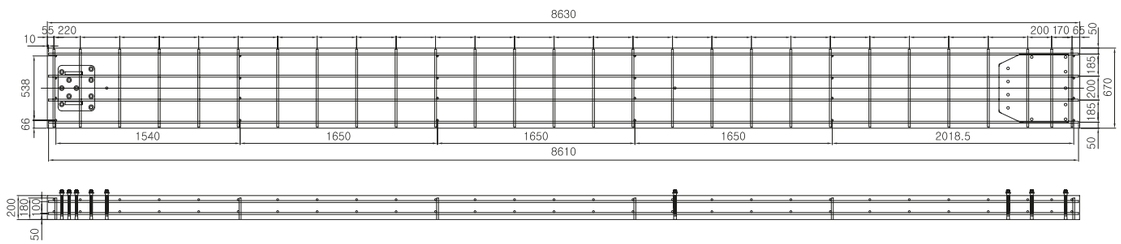
Speed class: 80 km/h - parallel crash cushion



Speed class: 100 km/h - parallel crash cushion



Speed class: 110 km/h - parallel crash cushion



CERTIFICATIONS

EN 1317 COMPLIANT CE MARKED CRASH CUSHIONS

All parallel and non-parallel crash cushion systems produced by Shindo have passed the tests required by the European standard EN 1317-3 (approved by CEN, the European Committee for Standardization) and obtained the Certificate of Constancy of Performance issued by the Notified Body TZUS.

FEATURES

1. Redirective parallel CCS for speed classes: 50, 80, 100 and 110 km/h.
2. Redirective non-parallel CCS for speed classes: 50, 80, 100 and 110 km/h.
3. Designed for an easy inclusion in suburban and urban environments.
4. Easy maintenance and repair after an impact, thanks to the simple structure of the systems.

Details of the tests performed on the CCS-II:

1. Speed classes: 50, 80, 100, 110 km/h for parallel and non-parallel systems.
2. Test Institute: tests on parallel and non-parallel CCS were performed by Korea Expressway Corporation Research Institute, a KOLAS Notified Body.
3. Certificates of Constancy of Performance issued by Notified Body TZUS.

CCS-II

CERTIFICATE OF CONSTANCY OF PERFORMANCE
/ PARALLEL CCS

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Technical and Test Institute for Construction Prague
Notified Body 1020

CERTIFICATE OF CONSTANCY OF PERFORMANCE

No. 1020 – CPR – 090-031643

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product

Product

ROAD RESTRAINT SYSTEM

variant : Redirective crash cushion

type : EU CCS II

Performance level	**50**	**80**
Impact severity	**A**	**A**
Redirection zone	**Z1**	**Z1**
Lateral displacement	**D1**	**D1**

produced by or for

SHINDO INDUSTRY

Identification No.: 133-81-24733
Address: 59-49, Donyu 1-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea

and produced in the manufacturing plant(s):

SHINDO INDUSTRY

Identification No.: 133-81-24733
Address: 91-2, Donyu 2-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea

a

KM Tech

Identification No.: 130-86-98624
Address: 77-2, Nae-dong, Ohjong-gu, Bucheon-si, Gyeonggi-do, Korea

a

Woosung Egineering Co. Ltd.

Identification No.: 127-81-80645
Address: 564-1, Bongyang-dong, Yangju-si, Gyeonggi-do, Korea

Prague, 23 February 2016

Ing. Josef Pöss
Manager of the Notified Body

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Technical and Test Institute for Construction Prague
Notified Body 1020

CERTIFICATE OF CONSTANCY OF PERFORMANCE

No. 1020 – CPR – 090-031677

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product

Product

ROAD RESTRAINT SYSTEM

variant : Redirective crash cushion

type : EU CCS II

Performance level	**100**	**110**
Impact severity	**A**	**A**
Redirection zone	**Z2**	**Z2**
Lateral displacement	**D1**	**D1**

produced by or for

SHINDO INDUSTRY

Identification No.: 133-81-24733
Address: 59-49, Donyu 1-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea

and produced in the manufacturing plant(s):

SHINDO INDUSTRY

Identification No.: 133-81-24733
Address: 91-2, Donyu 2-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea

a

KM Tech

Identification No.: 130-86-98624
Address: 77-2, Nae-dong, Ohjong-gu, Bucheon-si, Gyeonggi-do, Korea

a

Woosung Egineering Co. Ltd.

Identification No.: 127-81-80645
Address: 564-1, Bongyang-dong, Yangju-si, Gyeonggi-do, Korea

Video images of the tests performed according to EN 1317-3






CERTIFICATE OF CONSTANCY OF PERFORMANCE
/ NON-PARALLEL CCS

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Technical and Test Institute for Construction Prague
Notified Body 1020

CERTIFICATE OF CONSTANCY OF PERFORMANCE

No. 1020 – CPR – 090-035374

In compliance with Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product

Product

ROAD RESTRAINT SYSTEM

variant: Non Parallel Redirective Bidirectional Crash Cushion

type: CCSII-NP

Performance level:	**50**	**80**
Impact severity:	**A**	**A**
Redirection zone:	**Z1**	**Z1**
Lateral displacement:	**D1**	**D1**

placed on the market under the name or trade mark of

SHINDO INDUSTRY

Identification No.: 133-81-24733
Address: 59-49, Donyu 1-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea

and produced in the manufacturing plant(s):

SHINDO INDUSTRY

Identification No.: 133-81-24733
Address: 91-2, Donyu 2-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard

EN 1317-5:2007+A2:2012/AC:2012

under system 1 for the performance set out in this certificate are applied and that the factory production control conducted by the manufacturer is assessed to ensure the

constancy of performance of the construction product.

This certificate was first issued on 23 February 2016 and will remain valid as long as neither the harmonised standard, the construction product, the AVCP methods nor the manufacturing conditions in the plant are modified significantly, unless suspended or withdrawn by the notified product certification body

The stamp of the Notified Body 1020

Prague, 23 February 2016

Ing. Josef Pöss
Manager of the Notified Body

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Technical and Test Institute for Construction Prague
Notified Body 1020

CERTIFICATE OF CONSTANCY OF PERFORMANCE

No. 1020 – CPR – 090-035375

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Product

ROAD RESTRAINT SYSTEM

variant: Non Parallel Redirective Bidirectional Crash Cushion

type: CCSII-NP

Performance level:	**100**	**110**
Impact severity:	**B**	**A**
Redirection zone:	**Z2**	**Z2**
Lateral displacement:	**D1**	**D1**

placed on the market under the name or trade mark of

SHINDO INDUSTRY

Identification No.: 133-81-24733
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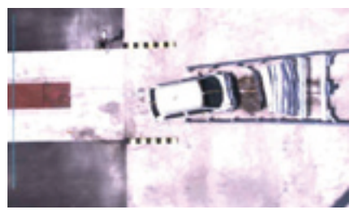
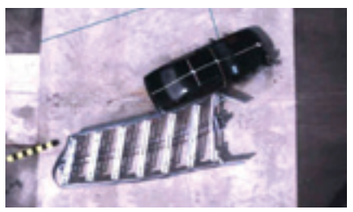
Video images of the tests performed according to EN 1317-3

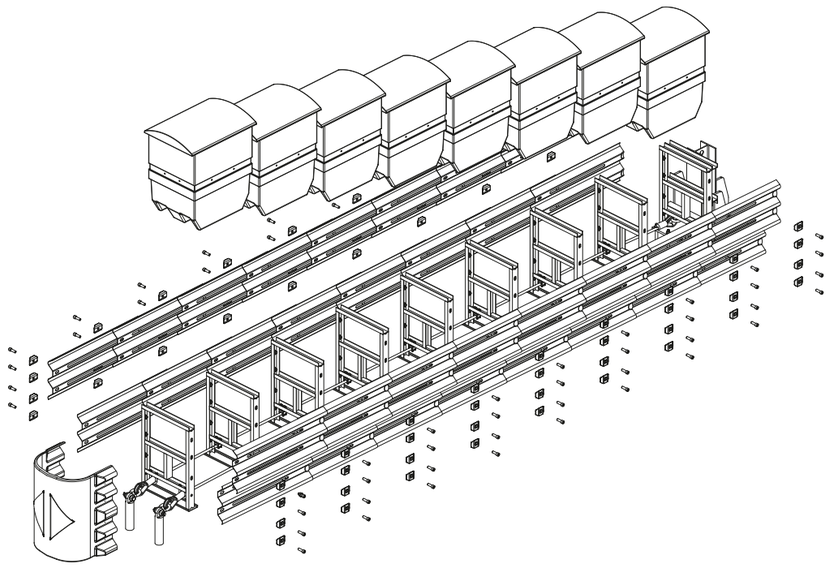


SIMPLE MAINTENANCE

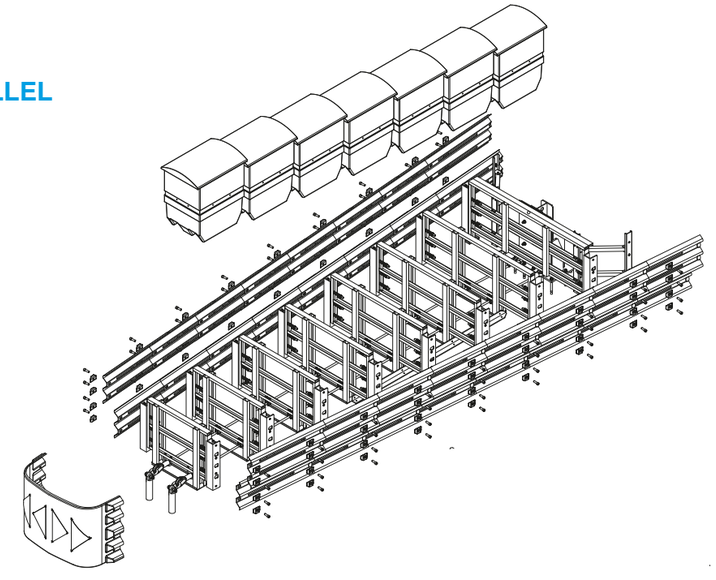
Parallel and non-parallel crash cushion systems are assembled with mostly common components for the entire range and therefore easily replaceable in the event of maintenance following an impact.

CCS-I

PARALLEL

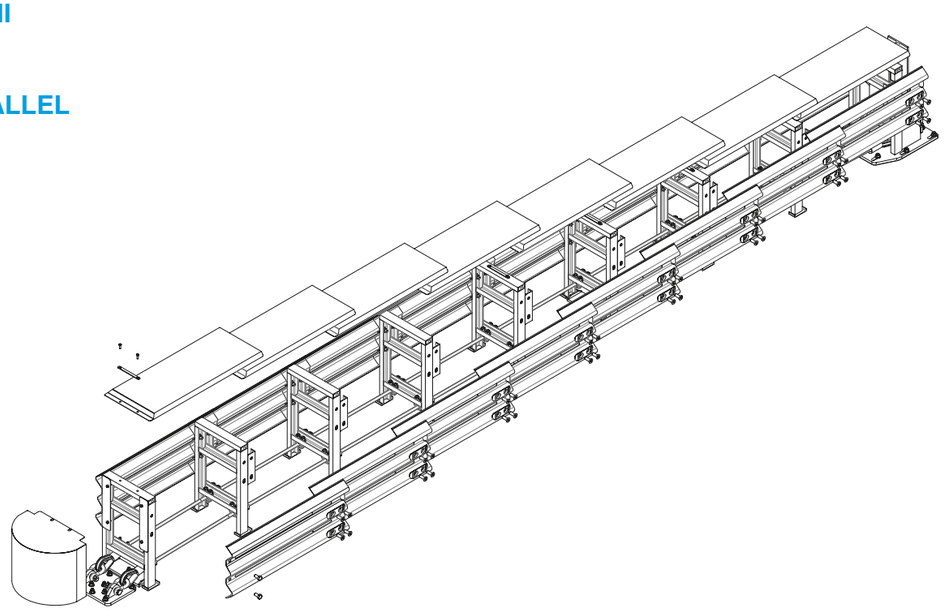


NON PARALLEL



CCS-II

PARALLEL



INSTALLATION PICTURES

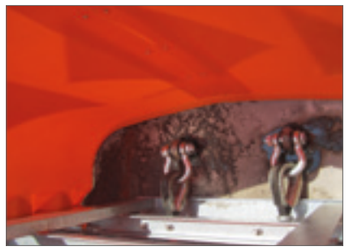
Motorway installation

Exit cusp installation

Drilling operations

Cusp installation

Back-stop detail



Front anchoring detail

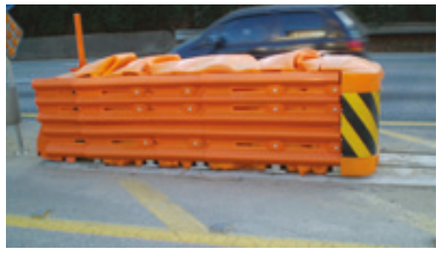
Foundation drilling

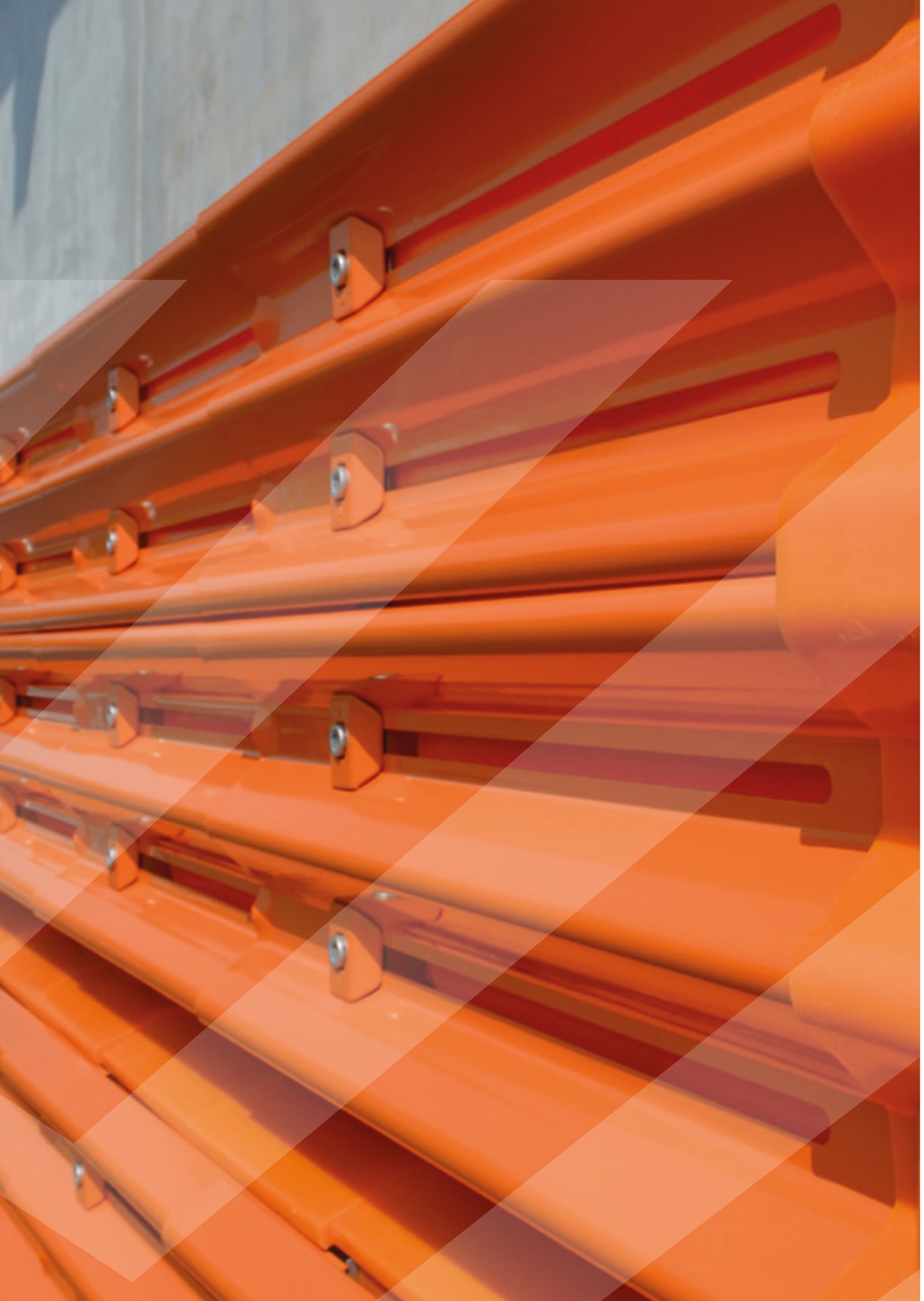
Tunnel entrance installation

The direction arrows applied on the front of the CCS will be supplied in accordance with the specific requirements given by national regulations.

INSTALLED SYSTEMS

AFTER AN IMPACT



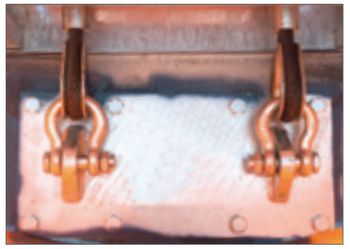


PREALUX
Passion for Road Safety

INSTALLATION PICTURES

NON-ASSEMBLED CCS-I

1A) Drill holes and place the wire holding pins (if on concrete)



1B) Drill holes and fix the front plate with threaded rods (if on asphalt)

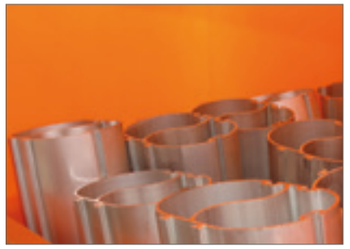
2) Fix the back structure

3) Places the wires and the vertical elements

4) Assemble the bottom guardrail beams

5) Assemble the top guardrail beams

6) Insert the intermediate PVC absorbing element



7) Insert the aluminium absorbers inside the PVC element (100-110 km/h)

8) Absorbing elements insertion completed

9) Assemble the front absorbing element (nose)

10) Mount the back cover (if present)

11) Installation complete

INSTALLATION PICTURES

NON-ASSEMBLED CCS-II

1) Draw a line along the centre by using a string

2) Position the front plate and the rotation plate

3) Drill holes for the back structure and for the front plate

4) Insert the anchor bolts for the back structure

5) Position and fix the plates with nuts and washers

6) Fix the back structure element with nuts and washers

7) Connect the wires to the back structure with nuts and washers

8) Position the vertical frame elements

9) Connect the wire ropes to the front plate and to the vertical elements

10) Connect the beams with spacer bars, nuts and washers and place the front element

11) Tighten the wire ropes

12) Installation complete

TMA

TRUCK MOUNTED ATTENUATORS

TMAs are designed to absorb impact energy in the event of a rear-end collision, preventing vehicles from crashing into the truck and limiting any damage to the equipment.

The different options we offer, all successfully tested in accordance with the American NCHRP-350 regulation, allow you to satisfy any requirement, from the need of more safety in the city or on state roads, to the better-known safety on motorways.

In addition to the vehicle-mounted models, TMA 70 km/h and TMA 100 km/h, there is also an additional version, TTMA 100 km/h, which allows to be towed by a truck or a service vehicle, and to be easily mounted and disassembled.

VERDEGRO®

LIGHT TRUCK MOUNTED ATTENUATOR (LTMA)

TRAILER TRUCK MOUNTED ATTENUATOR (TTMA)

TRUCK MOUNTED ATTENUATOR-US (TMA-US)

CONTACT INFO

PREALUX s.r.l.
via Angeretti 30, 24055 Cologno al Serio (Bg) - Italy

ph. +39 035 36.25.10 - fax +39 035 36.25.04
info@prealux.it - www.prealux.it

Company subject to management and coordination by Road Enterprise s.r.l.
based in Bergamo, via Sant'Alessandro n. 58 - REA: BG 403476

www.prealux.it