® TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Technical and Test Institute for Construction Prague
Akreditovaná zkušební laboratoř, Autorizovaná osoba, Certifikační orgán, Notifikovaná osoba, Inspekční orgán
Accredited Testing Laboratory, Authorized Body, Certification Body, Notified Body, Inspection Body
Prosecká 811/76a, 190 00 Praha 9 - Prosek, Czech Republic
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.: 130-86-56624
Address: 77-2, Nae-dong, Ohjong-gu, Bucheon-si, Gyeonggi-do, Korea

a

Woosung Egineering Co. Ltd.

Identification No.: 127-81-90645
Address: 564-1, Bongyang-dong, Yangju-city, Gyeonggi-do, Korea

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

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

under system 1 are applied and that

the product fulfils all the prescribed requirements set out above.

This certificate was first issued on 25 April 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 performance of the declared characteristics, do not change, and the product, and the manufacturing conditions in the plant are not modified significantly.

The stamp of the Notified Body 1020

Prague, 25 April 2014

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
OZNÁMENÝ SUBJEKT 1020
ÚNMZ
09

Ing. Jozef Pôbiš
Manager of the Notified Body

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
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Prosecká 811/76a, 190 00 Praha 9 - Prosek, Czech Republic

Notified Body 1020
Branch 0900 – Technical Engineering Services

REPORT

on the outcome of the assessment and verification of constancy of performance of the product

according to the Regulation (EU) 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), Art. 1.2 of the Annex V

No. 090-031642

Trade name:

ROAD RESTRAINT SYSTEM
variant : Redirective crush cushion
type : EU CCS II

Producer:

SHINDO INDUSTRY

Identification No.:	133-81-24733
Address:	59-49, Donyu 1-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea
Producer:	SHINDO INDUSTRY
Address:	59-49, Donyu 1-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea
Production plant:	1. SHINDO INDUSTRY 2. KM Tech 3. Woosung Egineering Co. Ltd.,
Address:	1. 91-2, Donyu 2-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea 2. 77-2, Nae-dong, Ohjong-gu, Bucheon-si, Gyeonggi-do, Korea 3. 564-1, Bongyang-dong, Yangju-city, Gyeonggi-do, Korea
Order:	Z090130606

Number of report pages including title-page: 6 Number of Annexes: 0

Stamp of the Notified Body 1020

Prague, 25 April, 2014

TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p. OZNÁMENÝ SUBJEKT 1020 ÚNMZ 09

Roman Ondruška
Head Assessor

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1. General

1.1 Information about the manufacturer

- Producer: SHINDO INDUSTRY

  59-49, Donyu 1-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea

- Production plant:
  1. SHINDO INDUSTRY, 91-2, Donyu 2-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea
  2. KM Tech, 77-2, Nae-dong, Ohjong-gu, Bucheon-si, Gyeonggi-do, Korea
  3. Woosung Egineering Co., Ltd., 564-1, Bongyang-dong, Yangju-city, Gyeonggi-do, Korea

1.2 Information about the product and its intended use

Road restraint system – Guided crash cushion, type EU CCS II, is a single-sided absorbing system designed for installation on roads to increase traffic safety. The crash cushion was tested pursuant to EN 1317-1 and 3 and this test demonstrated the following basic properties of the test sample.

Type of the crash test	**110**	110 km/hod
Acceleration severity index	**ASI**	
- TC 1.1.100		1,0
- TC 1.2.100		0,8
- TC 2.1.100		0,9
- TC 3.2.100		0,9
- TC 4.2.100		1,0
- TC 5.2.100		0,8
- TC 1.3.110		0,9
- TC 3.3.110		1,0
- TC 1.2.80		0,8
- TC 1.1.50		0,7
Theoretical head impact velocity	**THIV**	km / hod
- TC 1.1.100		37
- TC 1.2.100		35
- TC 2.1.100		37
- TC 3.2.100		37
- TC 4.2.100		21
- TC 5.2.100		22
- TC 1.3.110		35
- TC 3.3.110		37
- TC 1.2.80		32
- TC 1.1.50		25

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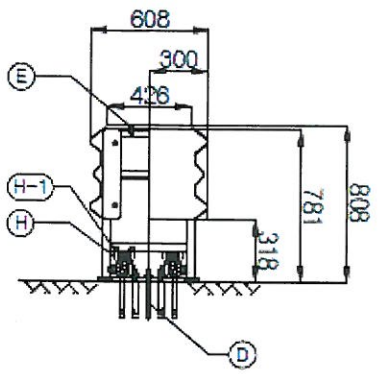
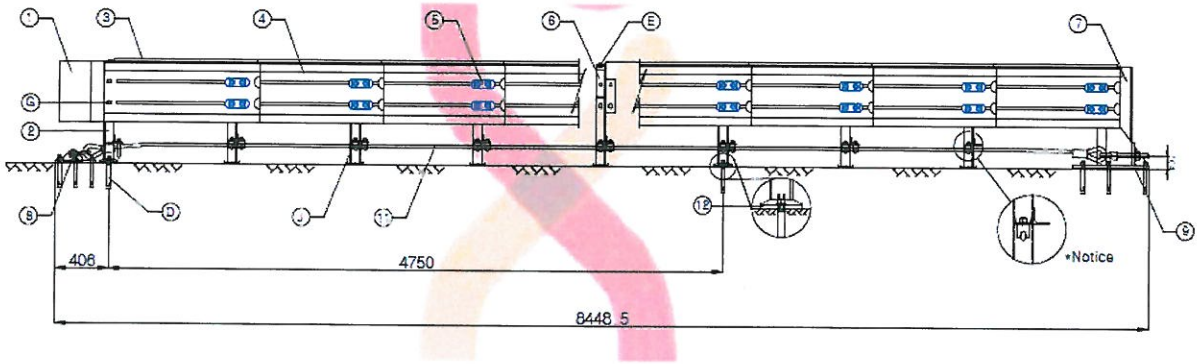
Class of redirection	**Z**
- TC 1.1.100	**Z 1**
- TC 1.2.100	**Z 1**
- TC 2.1.100	**Z 2**
- TC 3.2.100	**Z 2**
- TC 4.2.100	**Z 1**
- TC 5.2.100	**Z 1**
- TC 1.3.110	**Z 1**
- TC 3.3.110	**Z 2**
- TC 1.2.80	**Z 1**
- TC 1.1.50	**Z 1**
Class of lateral displacement of Crash Cushion	**D**
- TC 1.1.100	**D 1**
- TC 1.2.100	**D 1**
- TC 2.1.100	**D 1**
- TC 3.2.100	**D 1**
- TC 4.2.100	**D 1**
- TC 5.2.100	**D 1**
- TC 1.3.110	**D 1**
- TC 3.3.110	**D 1**
- TC 1.2.80	**D 1**
- TC 1.1.50	**D 1**

The road restraint system – Guided crash cushion, type EU CCS II composed from front cover and front frame, guard-rail length 1200 mm, middle frame, back stop frame, wire hold plate, wire ropes, base bracket, top cover bracket and connecting accessories. The length of the crash cushion for class 50 is 3698 mm, for class 80 is 4648 mm, for class 100 is 6548 mm and for class 110 is 8448 mm. Total height of the crush cushion is 808 mm, width is 608 mm. Terminal part of crush cushion and wire hold place is anchored in concrete basis by expansion anchors M20x250.

All parts are protected against corrosion by galvanized coating and painting. The system is installed in accordance with the attached drawings and the mounting instructions.





Schematic view of the crash cushion, type EU CCS II

1.3 List of documentation provided by the manufacturer to the assessment and verification of constancy of performance (AVCP)

- application for performance of activity of notified body – AVCP system1
- Drawings of the elements
- Description of product
- Assembly instruction
- Specific attest of steel 3.1 EN 10024
- Product catalogue
- Test protocol CT13-116326 (steel)
- Test protocol CT13-116324 (steel+Zn)

1.4 List of the other documentation used during the product AVCP

- None

1.5 Technical specification relating to the AVCP

- EN 1317–5+A2:2012/AC:2012 Road restraint systems – Part 5: Product requirements and evaluation of conformity for vehicle restraint systems

1.6 Information about previous AVCP

The producer did not demonstrate any previous product certification.

2 Product Assessment

2.1 Technical requirements

The product was assessed under 1317–5+A2:2012/AC:2012 Road restraint systems – Part 5: Product requirements and evaluation of conformity for vehicle restraint systems, with respect to the following monitored properties:

- Type of the crash test
- Acceleration severity index
- Theoretical head impact velocity
- Class of redirection
- Class of lateral displacement of Crash Cushion
- Durability

2.2 List of the Test Reports:

- Protocol on the Testing of Road Restraint Systems No. 2014-3-007-015, issued Korean Expressway Corporation Research Institute, on 14 March 2014

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2.3 Evaluation of the results of the product tests and assessment

Monitored property	Test Protocol	Test procedure	Test result	Required / declared level	Evaluation
1	2	3	4	5	6
Durability – material properties	1.3.7 1.3.8	EN 1317-5+A2 odst. 6.2.1.3 EN 10024-1,2 EN 10204 EN 1317-5+A2 odst. 6.2.1.3 EN ISO 1461	Test report CT13-116326 CT13-1163264 inspection certificates	D: Conformity of attestation with technical document., steel class S235JR. under EN 10025-1 P: coating thickness	conforms conforms
Performance level	2.2.1	EN 1317-1 EN 1317-3	Test report 2014-3-007-015	**R: crash test** TC 1.1.100 TC 1.2.100 TC 2.1.100 TC 3.2.100 TC 4.2.100 TC 5.2.100 TC 1.3.110 TC 3.3.110 TC 1.2.80 TC 1.1.50	conforms
Impact severity	2.2.1	EN 1317-1 EN 1317-3	Test report 2014-3-007-015	R: max. ASI max.THIV 1,0 37 0,8 35 0,9 37 0,9 37 1,0 21 0,8 22 0,9 35 1,0 37 0,8 32 0,7 25	Conforms of level A A A A A A A A A A
Redirection zone	2.2.1	EN 1317-1 EN 1317-3	Test report 2014-3-007-015	R: Redirectio zone **Z** Za – 4 m / Zd – 4 m	Conforms of class Z 1 Z 1 Z 2 Z 2 Z 1 Z 1 Z 1 Z 2 Z 1 **Z 1**
Lateral displacement	2.2.1	EN 1317-1 EN 1317-3	Test report 2014-3-007-015	R: Permanent laterál displacement zones **D** Da ≤0,5 m , Dd ≤ 0,5 m	Conforms of class **D 1** **D 1** **D 1** **D 1** **D 1** **D 1** **D 1** **D 1** **D 1**

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Evaluation conclusion: the product confirms to and complies with the declared purpose.

3 Factory Production Control Assessment

The product assessment was performed in the production plants SHINDO INDUSTRY, 91-2, Donyu 2-ro, Munsan-eup, Paju-si, Gyeonggi-do, Korea, KM Tech, 77-2, Nae-dong, Ohjong-gu, Bucheon-si, Gyounggi-do, Korea and Woosung Egineering Co., Ltd., 564-1, Bongyang-dong, Yangju-city, Gyeonggi-do, Korea on 2 April 2014.

3.1 Requirement of the technical specification regarding Factory Production Control:

The requirements on the production management system are stipulated in EN 1317–5+A2:2012/AC:2012 Road restraint systems – Part 5: Product requirements and evaluation of conformity for vehicle restraint systems

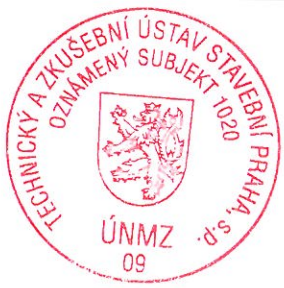
3.2 Evaluation of the Factory Production Control assessment results:

- The technical documentation of the producer SHINDO INDUSTRY contains a description of the production management system in the internal document Technological Guideline for Type EU CCS II.
- The production management system complies with the technical documentation and ensures that the marketed products conform to the technical specifications, and is assessed as conforming

4 Conclusion

- The sample of product fulfils the requirements of the technical specification.
- The FPC is in accordance with the harmonised technical specification and ensures that the declared performances are achieved.
- Findings and conclusions mentioned in this Report are valid providing the conditions under which FPC assessment was carried out remain unchanged (e.g. technical regulations, technical specifications, production technology, incoming raw and manufacturing equipment).
- In compliance with provision of the CPR Art. 1.2, Annex V Surveillance Reports containing FPC assessment and evaluation have to be complementary to the technical documentation.

5 Annexes

The documents are not part of this Protocol and are kept by the author.

Prepared by: Roman Ondruška