

CONSTRUCTION



NOISE PROTECTION



**PBS d.o.o.**  
 Generala Živka Pavlovića 7  
 RS 11030 Beograd-Čukarica  
 Tel.+381 11 367 22 49  
 www.pbsis.rs



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The company **PBS d.o.o.** is an engineering company and producer of noise-protection barriers, founded in the year 2011. We work in cooperation with the company **PHS d.o.o.** from Slovenia, which supplies the absorption boards used in our noise-protection barriers.



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Ecology and economy go hand in hand

## PBS wood-concrete boards



The materials used by PHS show that ecology and economy aren't necessarily contradicting one another, as wood-concrete is mainly made of shredded wood.

Wood chips are milled to the desired size. After that, they are mixed with cement, water and calcium-chloride.

The leading principle behind production is avoiding any unnecessary strain on the environment, especially to ensure the cleanliness of air and water. Any left over material is reused in the production process.

The use of wood-concrete also reduces CO2 emissions, as the carbon in the wood stays inside the boards and is not released into the environment.

The research centre in Seibersdorf, Austria, has marked the PHS production process as „Very good“.

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## Noise protection



**PBS Noise-protection barrier**

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## How we understand noise protection:

# „Something nice against the noise“

PBS supplies noise-protection barriers that are not only effective against noise, but also quite an eyecatcher.

With many different structures, colouring and alignment options of the boards (vertikal, horizontal, diagonal), the sky is the limit in terms of creative design.



Design is very important – after all, noise protection barriers along highways and railways can stretch through the landscape for kilometers.

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## Noise protection

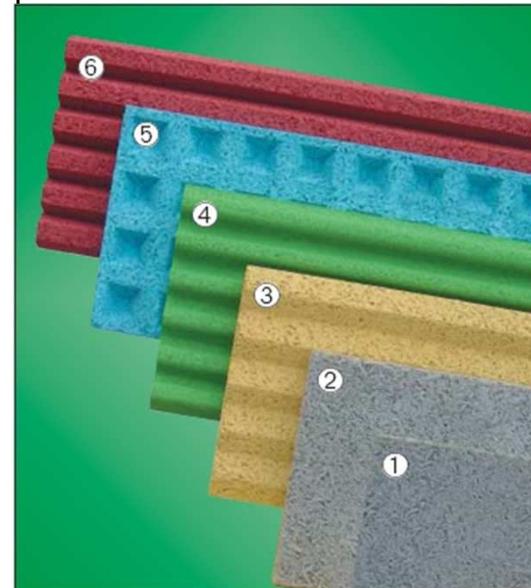
# PBS is a system supplier!

PBS doesn't supply just the noise-protection boards, we supply the entire system!

PBS offers different noise protection barriers: either on a concrete panel or on a wooden frame, the boards, which can be delivered with different surface structures, are mounted on the base already during production.

**The finished element is then delivered to the construction site.**

Različite površinske strukture ploča



1. WSDA 35 smooth surface structure
2. WSA 50 smooth surface structure
3. WSR 50 wavy surface structure
4. WSO 80 gouge surface structure
5. WSW 75 waffle surface structure
6. WSW 100 trapezoid surface structure

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## Noise protection solutions with added value

# PBS noise protection wall

The prefabricated noise protection systems are mounted on a concrete board between two HEA profiles.

The absorption board are mounted on a frame of impregnated wood or a concrete core.

**Format:** max. length 5 m

### **Technical data:**

Gap between HEA-profiles 4,01, 4,20 or 5,01 m. The design options of the systems are unlimited (vertikal, horizontal).

HEA-profiles are concealed.

Conform with SIST EN 1794-1 & EN 1793-1.



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## CE Certifikate for noise protection barriers with wood-concrete boards




**EG - KONFORMITÄTSERKLÄRUNG**

Hiermit erklärt der

Hersteller: VELOX-Werk Ges.mBH  
Dachberg 10  
A-9422 Maria Rojach

nach EG-Bauproduktenrichtlinie 98/106/EWG, dass das

Bauprodukt: Lärmschutzeinrichtungen an Straßen  
Typ XL und M

des Herstellerwerkes: VELOX-Werk Ges.mBH  
Dachberg 10  
A-9422 Maria Rojach

den Bestimmungen der EN 14388:2008 10 01 entspricht und die Voraussetzungen für die CE-Kennzeichnung gemäß Anhang ZA EN 14388:2008 10 01 erfüllt.

Zur Zertifizierung der Anfangstypenprüfung wurde die notifizierte Stelle:

Technische Universität Graz  
Institut für Hochbau & Bauphysik  
Inffeldgasse 24  
A-8010 Graz

eingeschaltet.

Maria Rojach, am 15. Juni 2009

  
 Günther LEOPOLD  
Geschäftsführer

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## System on a wooden frame

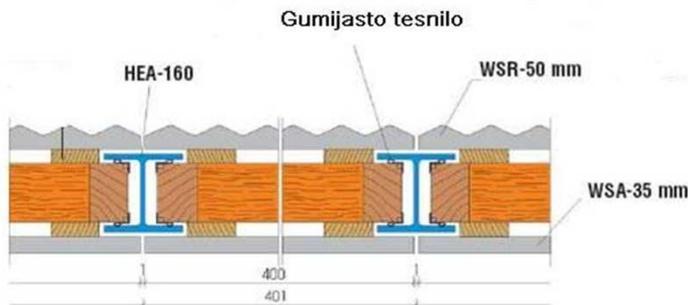
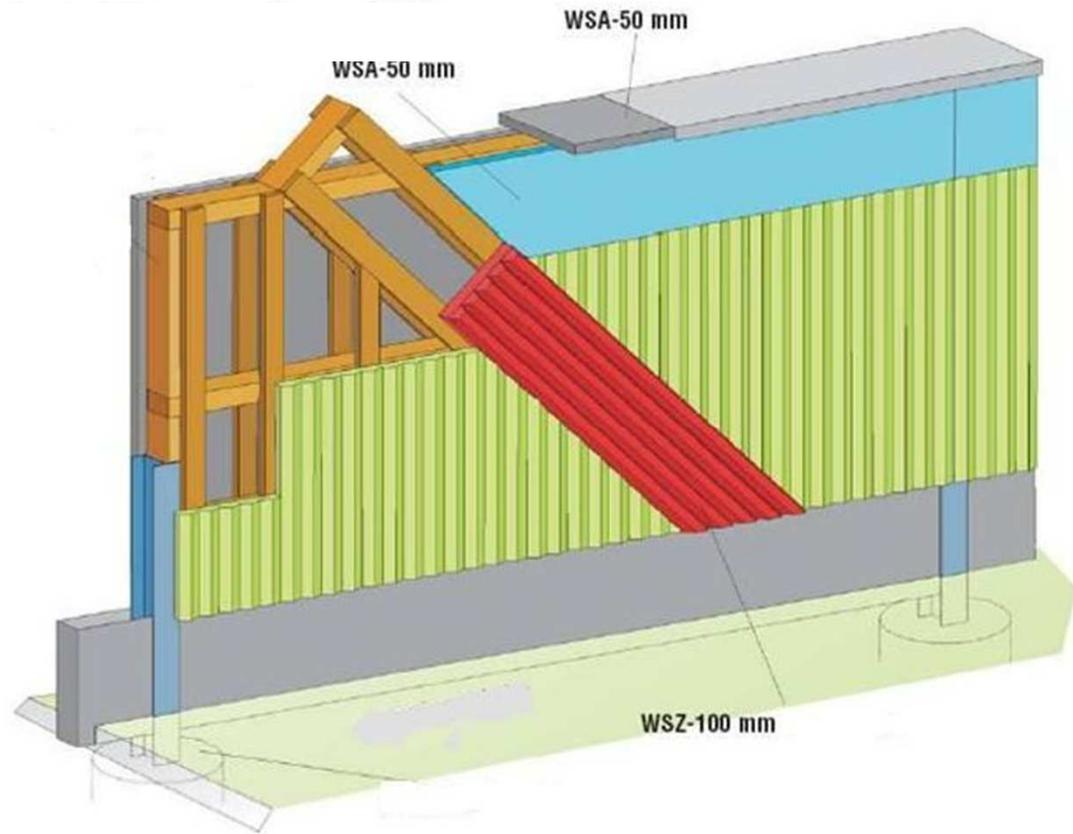
# Detailed description

**Sound absorption:** normal and high (one-sided or double-sided)

**Sound isolation:**  
25 dB to 40 dB

**Design:**  
Possible on one or both sides

**Dimensions:**  
400 (500) x 200 cm, suppliable in 50 cm steps



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## System on a wooden frame

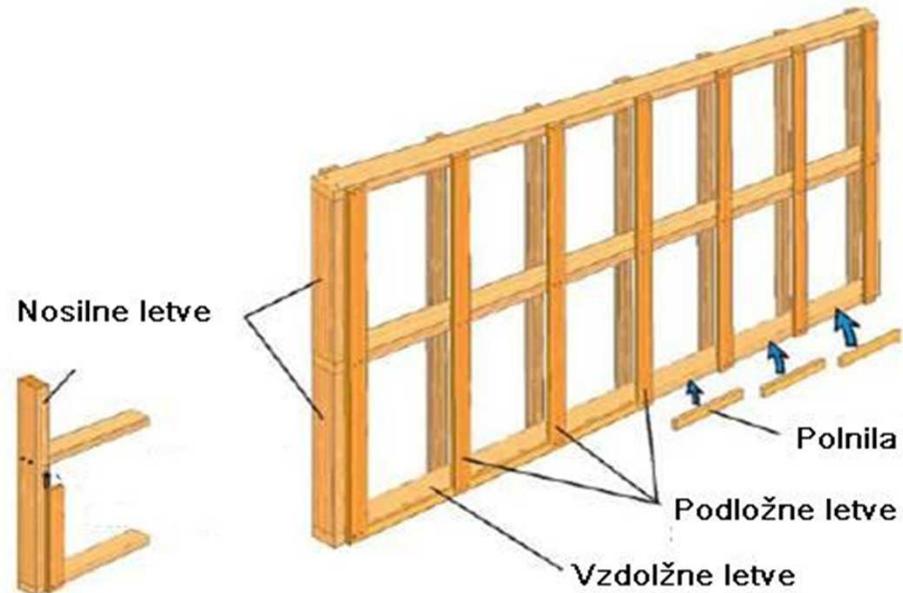
# Detailed description

Wooden spacers, 30 mm thick and 100 mm wide, are mounted on the wooden frame in 500 mm intervals. This allows the covering the HEA-beams and makes the various design options possible.

The noise protection boards are mounted without spacing on the wooden frame and are sealed with polyurethane foam.

With one-sided noise protection walls, non-structured boards (without noise absorption) are mounted on the back side of the frame. Should double-sided noise-absorption be required, then the back side is identical to the front side.

## Construction of the wooden frame



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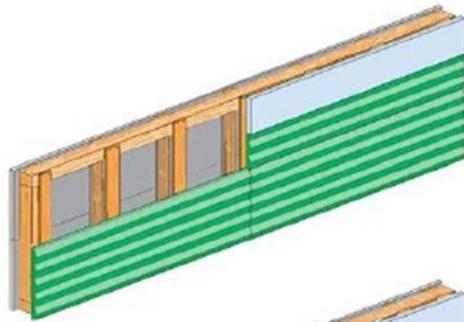


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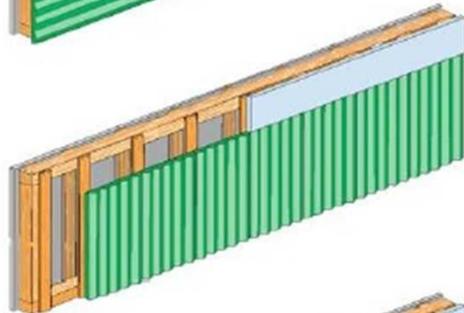
## Detailed description

# Examples of mounting options



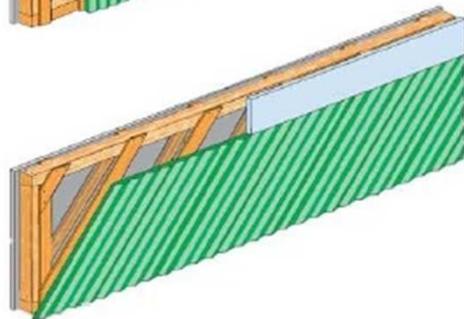
### Horizontal

Max. 660 mm gap between wooden spacers.



### Vertical

Max. 500 mm gap between wooden spacers.



### Diagonal

Max. 500 mm gap between wooden spacers.



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## Detailed description

# Mounting height of HEA-beams and concrete foundation boards

## Noise protection height – HEA-Profile mounting height

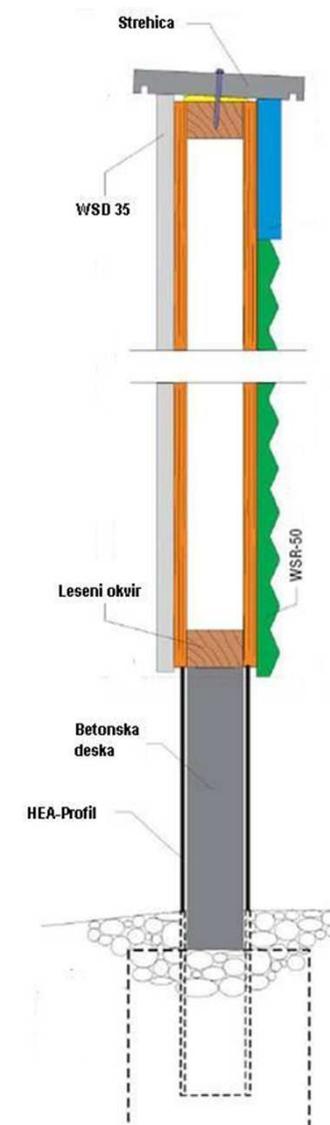
The noise protection height is the total height of the concrete foundation board and noise protection element. The necessary burial of the concrete foundation board and the additional roof (5 cm) are not accounted for in this specification. Generally, the mounting height of the HEA-beams should be 1 – 1,5 cm lower than the noise protection height, so that the roof can be mounted on the noise protection barrier without difficulty.

## Barrier elements

PHS noise protection elements are fabricated with a 2 cm smaller wooden frame to prevent noise spreading lengthwise along the foundation board. The elements on the back side of the wall are mounted with a 1 cm displacement, so that the roof can be mounted in a slight angle (ca. 5%).

## Concrete foundation board

The concrete foundation boards are made from C25/30/B7 (B300/FTB/SA/b/GK22) quality concrete.



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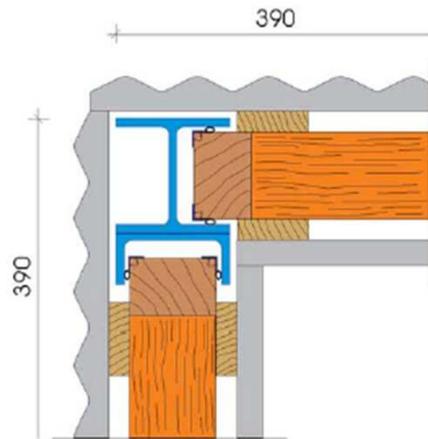
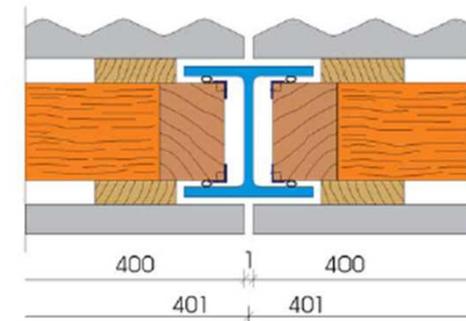


## Detailed description

# Spacing of HEA-beams

### Gap

The total length of the noise protection elements is 4,00m. Therefore, the gap between the HEA-beams must be 4,01m, in order to guarantee easy installation.

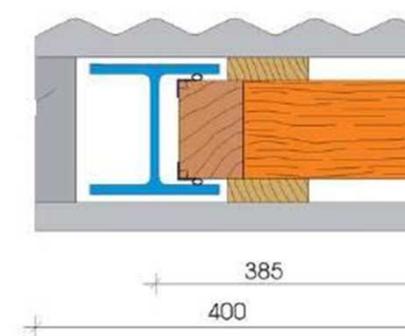


### Corners

Corners are made by welding a U-beam on the end of a HEA-beam. It is important to remember that the distance from the last HEA-beam to the corner element must not exceed 3,90m. If so, it becomes impossible to close the corner element.

### Beginning/Ending a barrier

With beginning/ending elements, the distance between the last and beforelast HEA-beam must not exceed 3,85m, as it is otherwise impossible to install the ending board to close the noise protection barrier.



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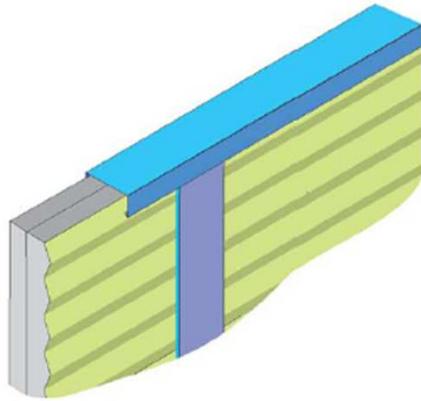


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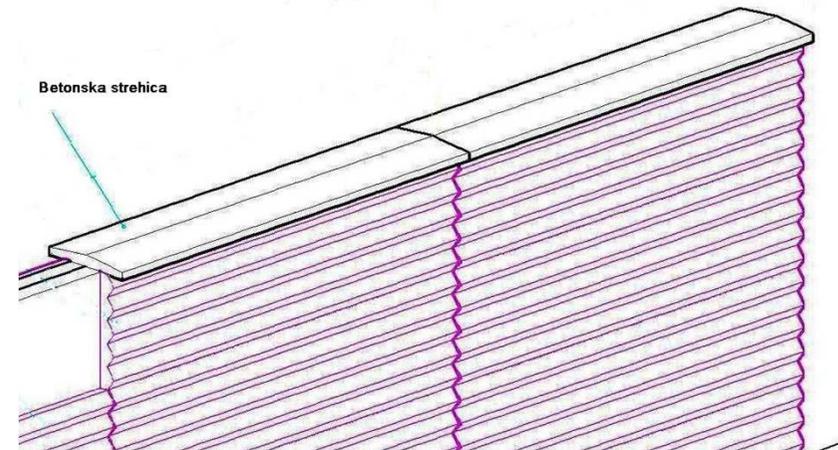
## Detailed description

# Roof



### Roof made of aluminium sheets

Mounted directly on the noise protection barrier with added drip edge, available in all colours of the RAL colour selection.



### Concrete roof

Produced in different sizes in order to fit onto noise protection barriers of different dimensions. It's mounted with Inox-screws and rubber seals.

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## System on a concrete panel

### Detailed Description

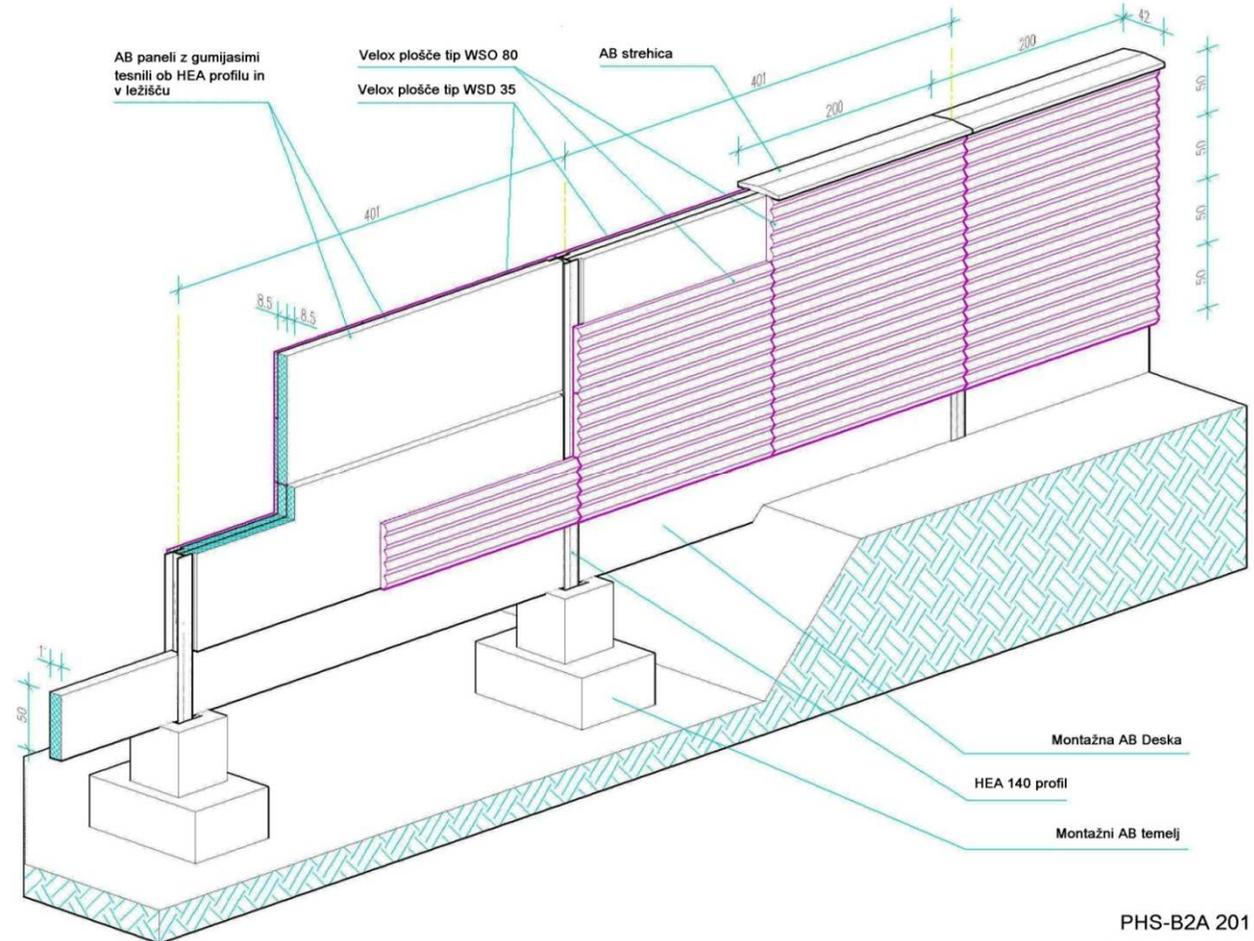
**Noise absorption:** normal and high (one-sided or double-sided)

**Noise isolation:**  
35 dB to 40 dB

**Design:**  
Possible on one or both sides

**Dimensions:**  
400 (420) x 200 cm

**Reinforced concrete panels:**  
To produce a RC panel, we put absorption boards with attached anchors into molds and then filled with concrete. The panels are sealed on all sides with rubber seals.



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## System on a concrete panel

### Side view

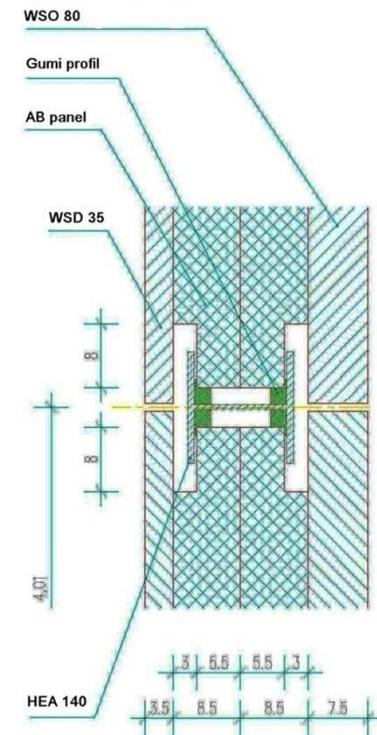
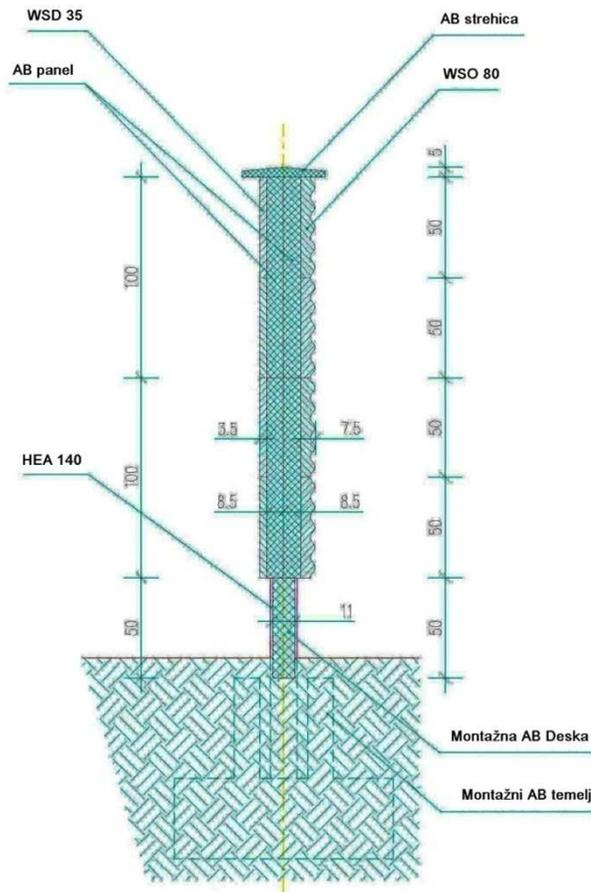
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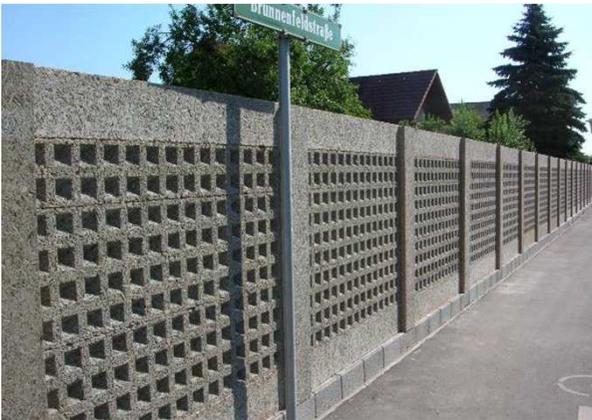
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## Detailed description

# Colouring

There are three possibilities to colour our noise protection barriers, all of them can be combined in any way.



**No colouring: natural gray**

**Pigmentation; gray, ochre, rust red**

**Airless: all RAL colours**

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## Noise protection solutions with added value

### PBS noise protection barriers

#### Design advantages:

1. **Board surface structure** – there are 5 different surface structures: smooth, wavy, gouge, waffle, trapezoid
2. **Colouring** – colouring is possible in all colours of the RAL colour collection. Pigmentation colouring is also possible.
3. **Positioning of the boards** – any option is possible
4. **Combinations** – PBS barriers can be harmonically combined with any other noise protection system made of concrete, wood, aluminium or acrylic glass



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## Noise protection solutions with added value

### PBS noise protection barriers

#### Other advantages:

1. **Concealed HEA-beams** – allows designing barriers without breaking patterns or structures!
2. **High barriers can be moved in one piece!**
3. **In case of emergency** – easily accessed with standard firefighter equipment!
4. **In case of damage** – boards can be replaced easily
5. **Less pollutant emissions during transport** – due to the low weight of the noise protection barriers, less trucks are needed and consequently less pollutants are expelled into the atmosphere



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## References



BDC Maribor

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## References



Koseze – Ljubljana

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## References



Danfoss - Črnomelj

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Smednik – Krška vas

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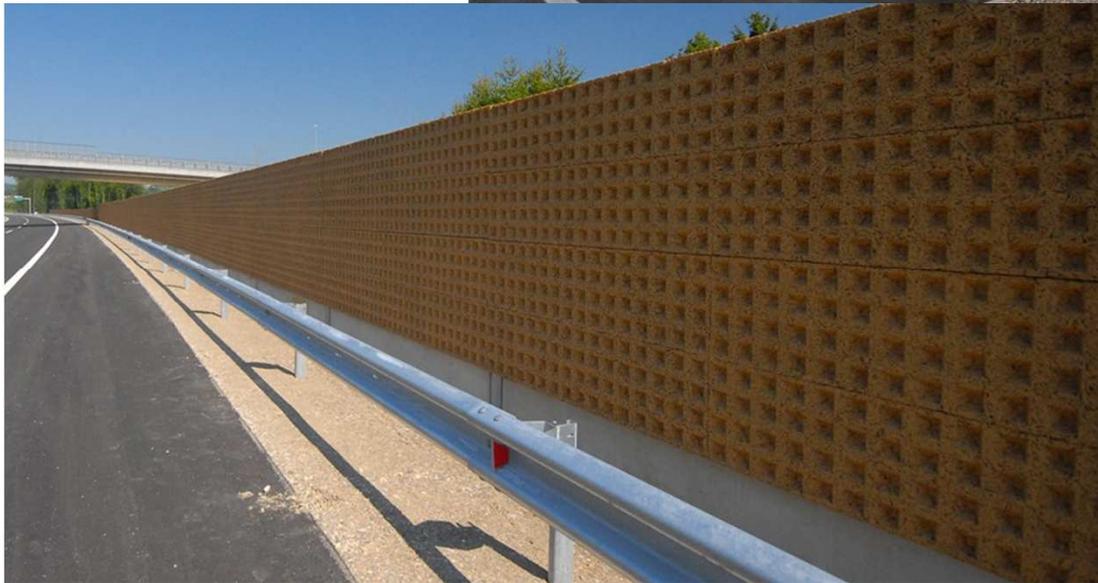
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## References



Maribor - Lenart

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## References



Interspar Maribor

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## References



Krško - Obrežje

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## References



Lenart

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Letališče Maribor

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Murska Sobota

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## References



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## References



Vrtić Rogaška Slatina

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## References



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Železnica Murska Sobota - Hodoš

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