

# Slab Track System ÖBB–PORR Elastically Supported Track Base Plate



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# ÖBB-PORR Slab Track System with Elastically Supported Track Base Plate

Advisor: Jörg Fenske, Dipl.-Ing.

## Overview

*Überblick*

- Why the slab track system was adopted in Austria  
*Entscheidungsfindung FF-System in Österreich*
- Description of the ÖBB-PORR slab track system  
*Systembeschreibung FF ÖBB-PORR*
- ÖBB-PORR slab track projects  
*Projekte FF ÖBB-PORR*
- System advantages  
*Systemvorteile*

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## Why the slab track system was adopted in Austria

*Entscheidungsfindung FF-System in Österreich*

- Construction (space requirements,...)  
*Konstruktion (Platzbedarf, ...)*
- Method (sensitivity of placement,...)  
*Verfahren (Sensibilität der Verlegung, ...)*
- Quality + Safety (track bed, acoustics,...)  
*Qualität + Sicherheit (Gleislage, Akustik, ...)*
- Economy  
*Wirtschaftlichkeit*



**The ÖBB–PORR elastically supported track base plate is now the STANDARD SYSTEM in Austria**

*Elastisch gelagerte Gleistragplatte ÖBB – PORR REGELSYSTEM in Österreich*



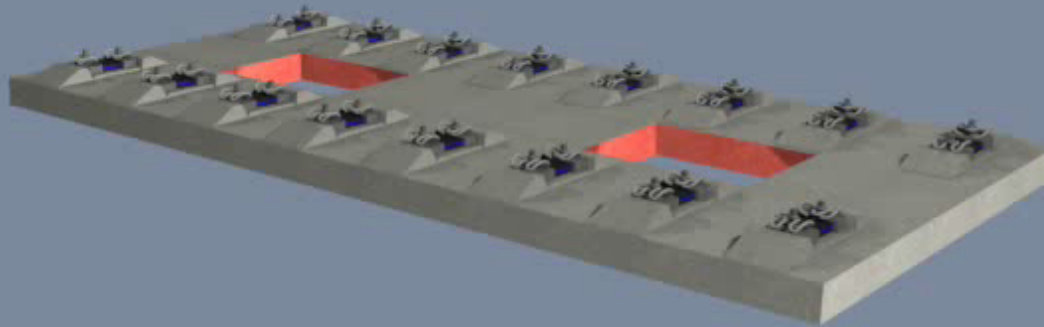


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## Description of the system

*Systembeschreibung*



Main element  
- track support layer -  
(TSL) slab

*Hauptelement*  
- Gleistragplatte -  
(GTP)



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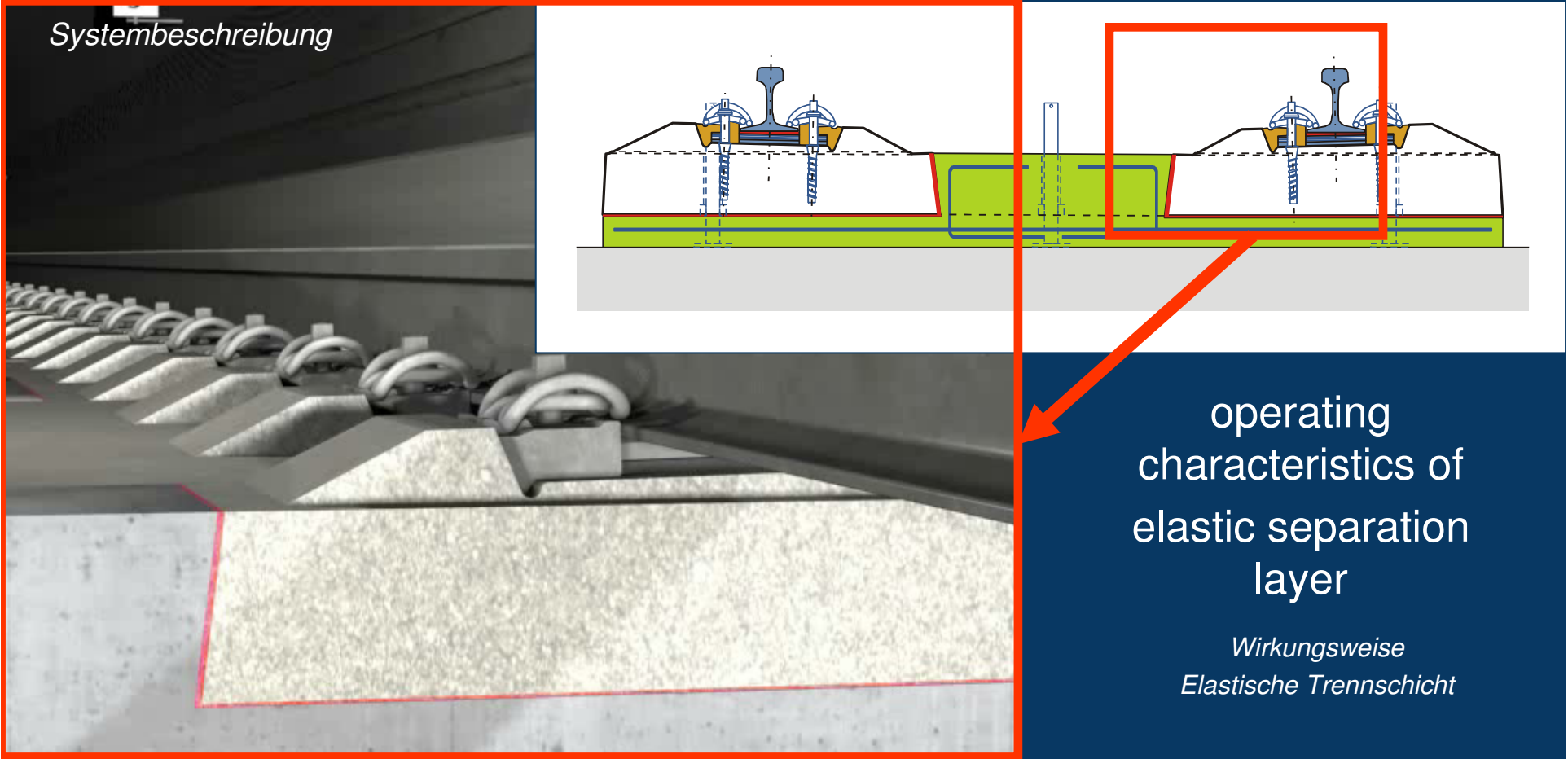
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## Description of the system

Systembeschreibung



operating  
characteristics of  
elastic separation  
layer

Wirkungsweise  
Elastische Trennschicht



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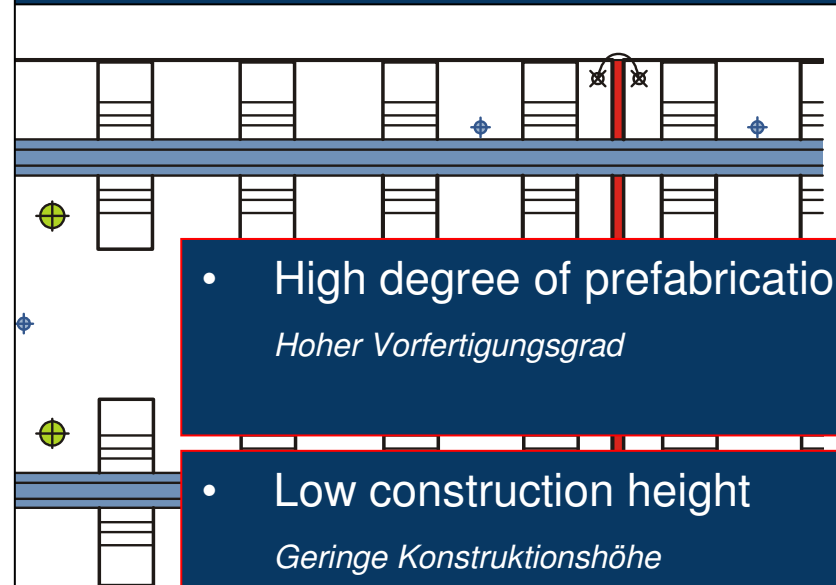
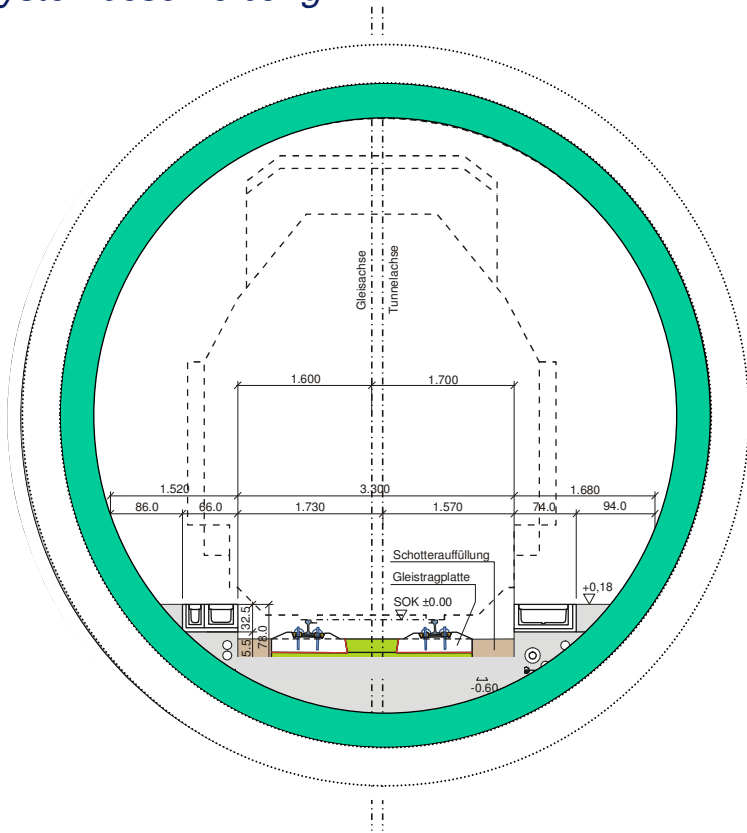


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## Description of the system

### Systembeschreibung

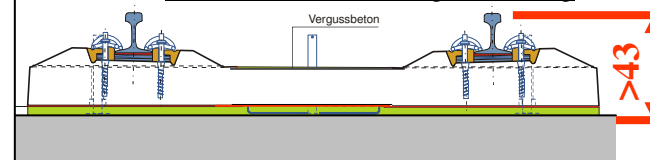


- High degree of prefabrication  
*Hoher Vorfertigungsgrad*

- Low construction height  
*Geringe Konstruktionshöhe*

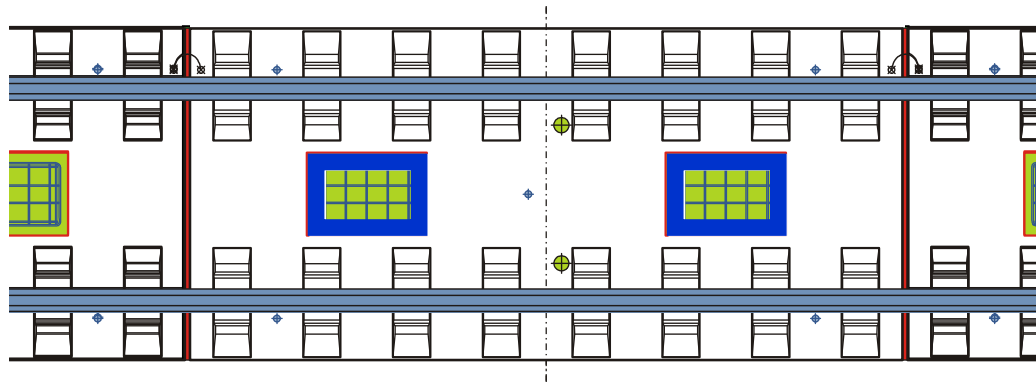
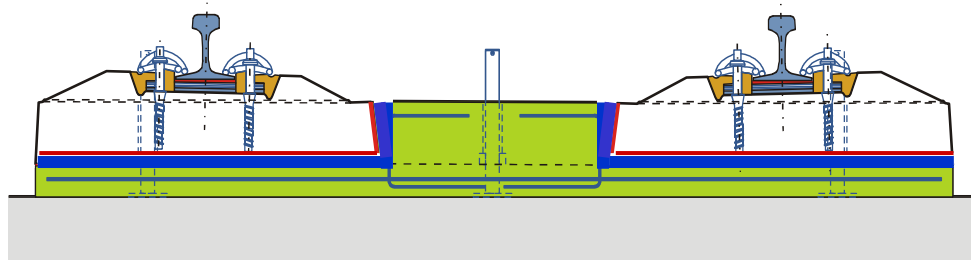
### Cross-section beside pouring aperture

*Querschnitt neben Vergussöffnung*



## Description of the system

### Systembeschreibung



### Repair plan:

- Cut free
- Remove TBP slab
- Lay 1 cm thick corrective TSL slab
- Pour concrete
- 50 m in 10 hours

### Reparaturkonzept:

- Freischneiden bzw. Freischrämen
- Abheben der GTP
- Verlegen der 1 cm dünneren Havarie-GTP
- Verguss
- 50 m in 10 Stunden

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## Construction



Construction  
process

*Bauablauf*



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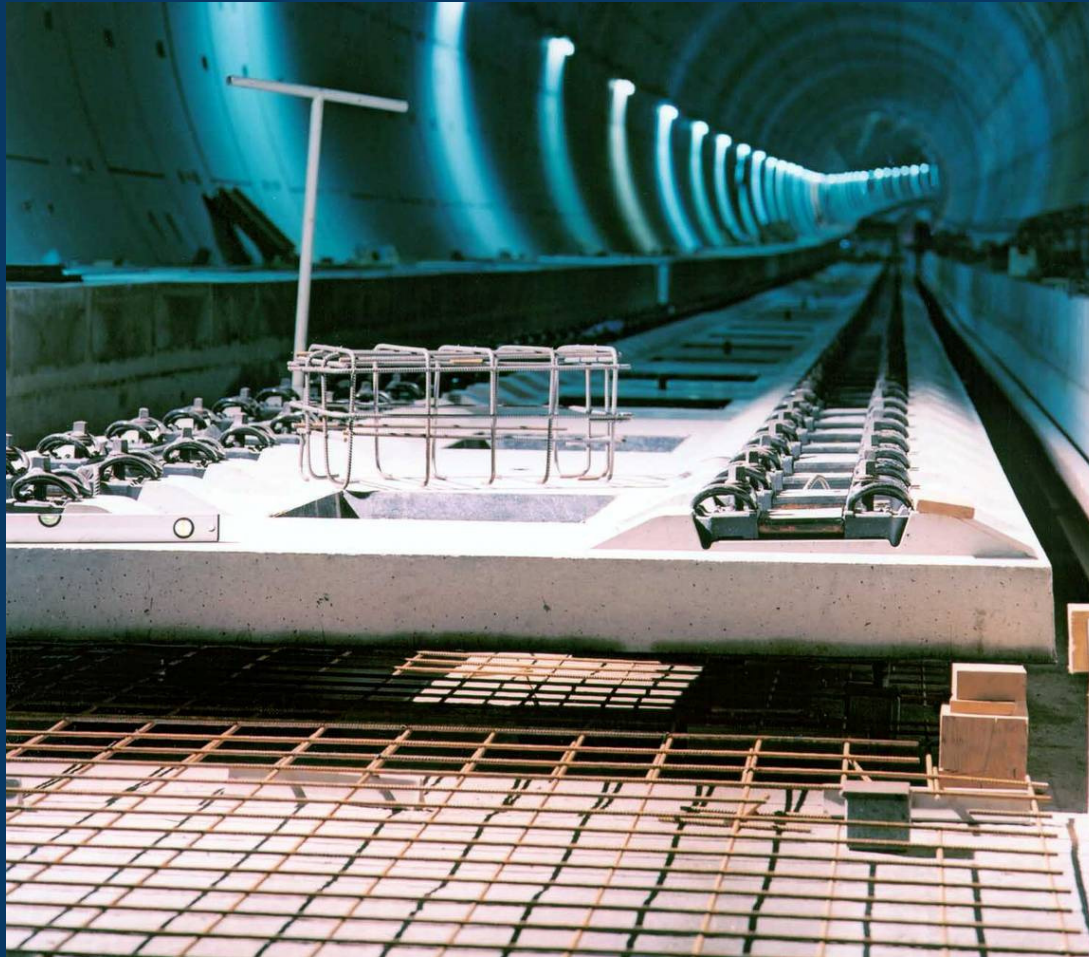
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# ÖBB-PORR Slab Track System with Elastically Supported Track Base Plate

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## Construction



### Project Berlin– Ost-West- Connection

*Projekt – Ost-West-Verbindung*

#### Phase 1

*Bauphase 1:*

- **Elastomeric layer**  
*Elastomere*
- **Drainage formwork**  
*Entwässerungshalbschalen*
- **Endstops**  
*Stoßfugen*
- **Reinforcement mat**  
*Bewehrungsmatten*
- **Earthing rod**  
*Erdungsband*



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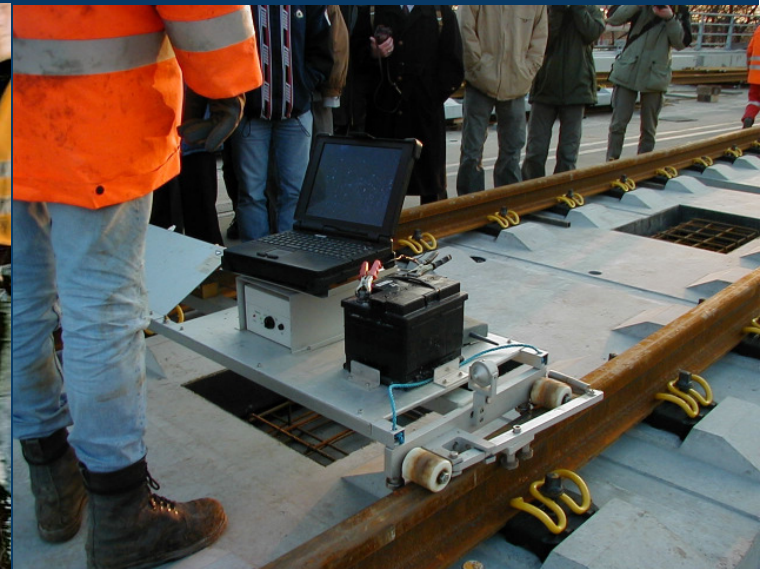
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## Construction



### Phase 2:

*Bauphase 2:*

- Track Base Plates  
*Gleistragplatten*
- Rails  
*Langschienen*
- Positioning  
*Justierung*

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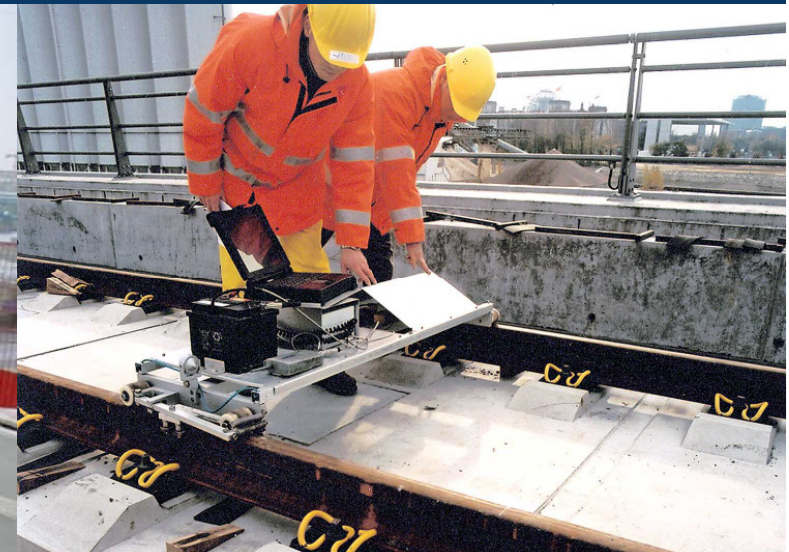
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## Construction



### Phase 3:

Bauphase 3:

- **Formwork**  
*Schalung*
- **Reinforcement cage**  
*Bewehrungskörbe*
- **Concreting with SCC**  
*Betonage mit SCC*
- **Documentation of track**  
*Dokumentation der Gleislage*



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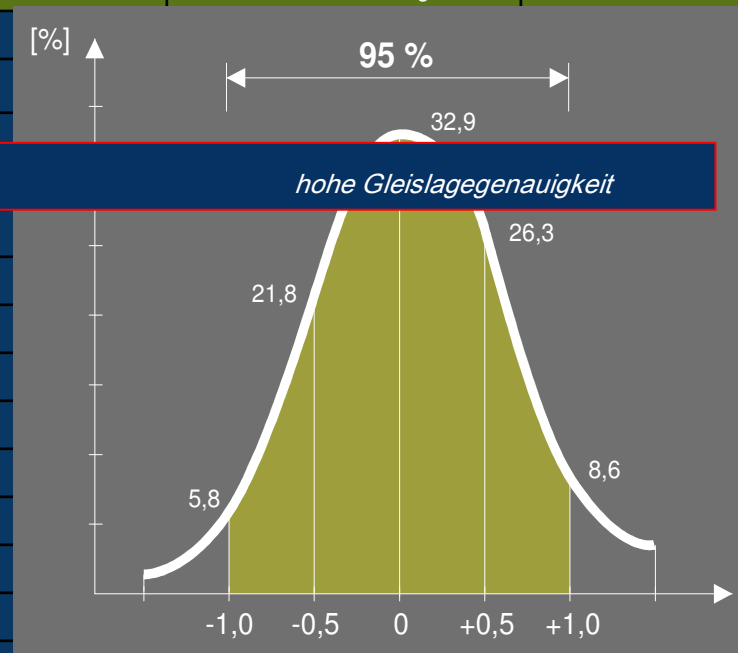
## Track Alignment Quality

Qualitätssicherung Gleislage

Frequency distribution of variations Häufigkeitsverteilung der Abweichungen

Deviation Abweichung	Position Lage	Height Höhe	Cant Überhöhung	Track width Spurweite	Position of Creep Wandersehne Lage	Height of Creep Wandersehne Höhe
-4		0,2				
-3,5		0,6				
-3		1,3				
-2,5						
-2	0,2	10,5				
-1,5	0,2	18,5	1,1			
-1	9,1	21,9	5,8			
-0,5	46,4	19,9	21,8			
0	37,5	14,3	32,9			
0,5	6,6	5,6	26,3			
1	0,2	2,5	8,6			
1,5		0,2	3,4			
2						
2,5		0,2				

High precision of track position



Wagram nodes - 638 measurement points, value as %  
Knoten Wagram – 638 Stellen der Vermessung, Wert in %

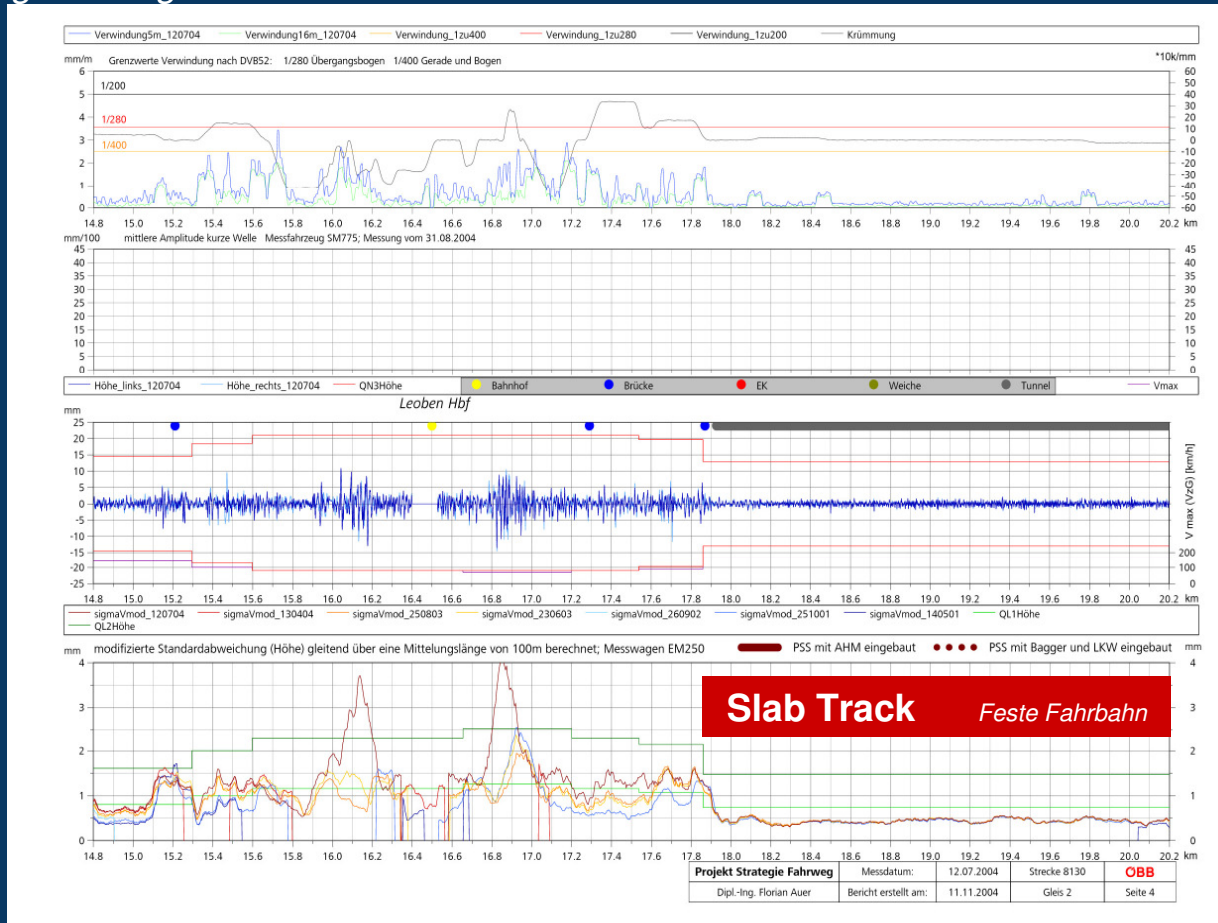


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## Track Alignment Quality

Qualitätssicherung Gleislage



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## Options



**Smooth, level  
surface**

*glatte und ebene Oberfläche*



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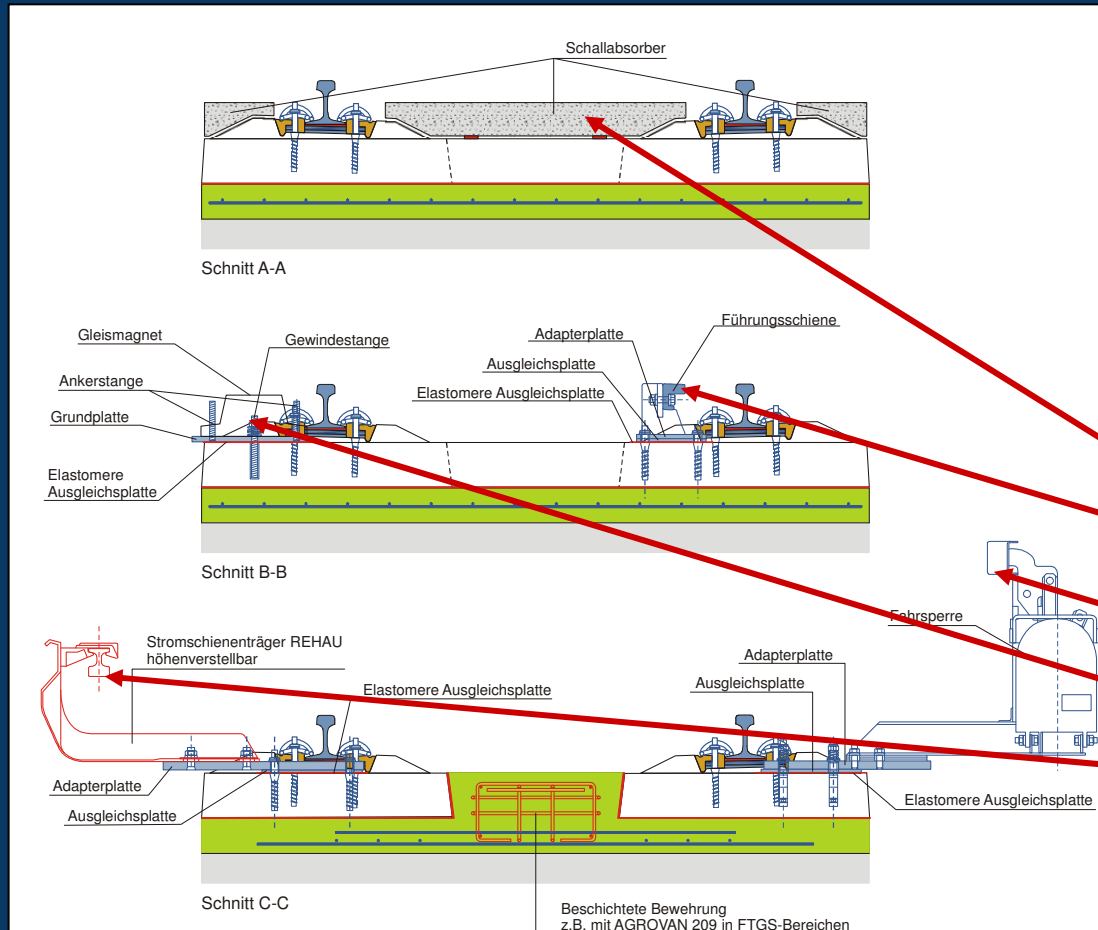


# ÖBB-PORR Slab Track System with Elastically Supported Track Base Plate

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## Options

Optionen



### Auxiliary equipment: *ZUSATZAUSRÜSTUNG*

- Noise absorbers fit for traffic  
*Befahrbare Schallabsorber*
- Guard rails  
*Führungsschienen*
- Buffer stops  
*Fahrsperren*
- Track magnets  
*Gleismagnete*
- Power rails  
*Stromschienen*



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## Options

*Optionen*



**Accessible noise dampers for emergency road vehicles**

*Belag befahrbare Schallabsorber*



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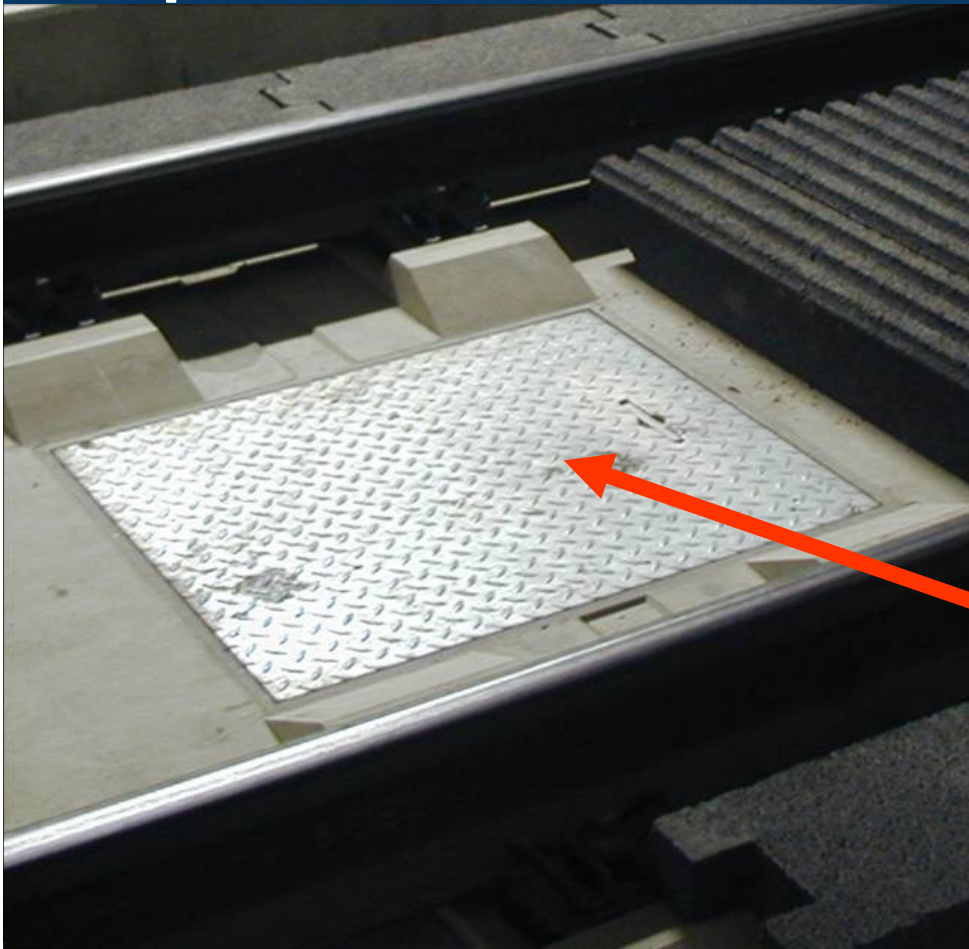


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## Options

*Optionen*



### Large openings

*große Aussparungen*



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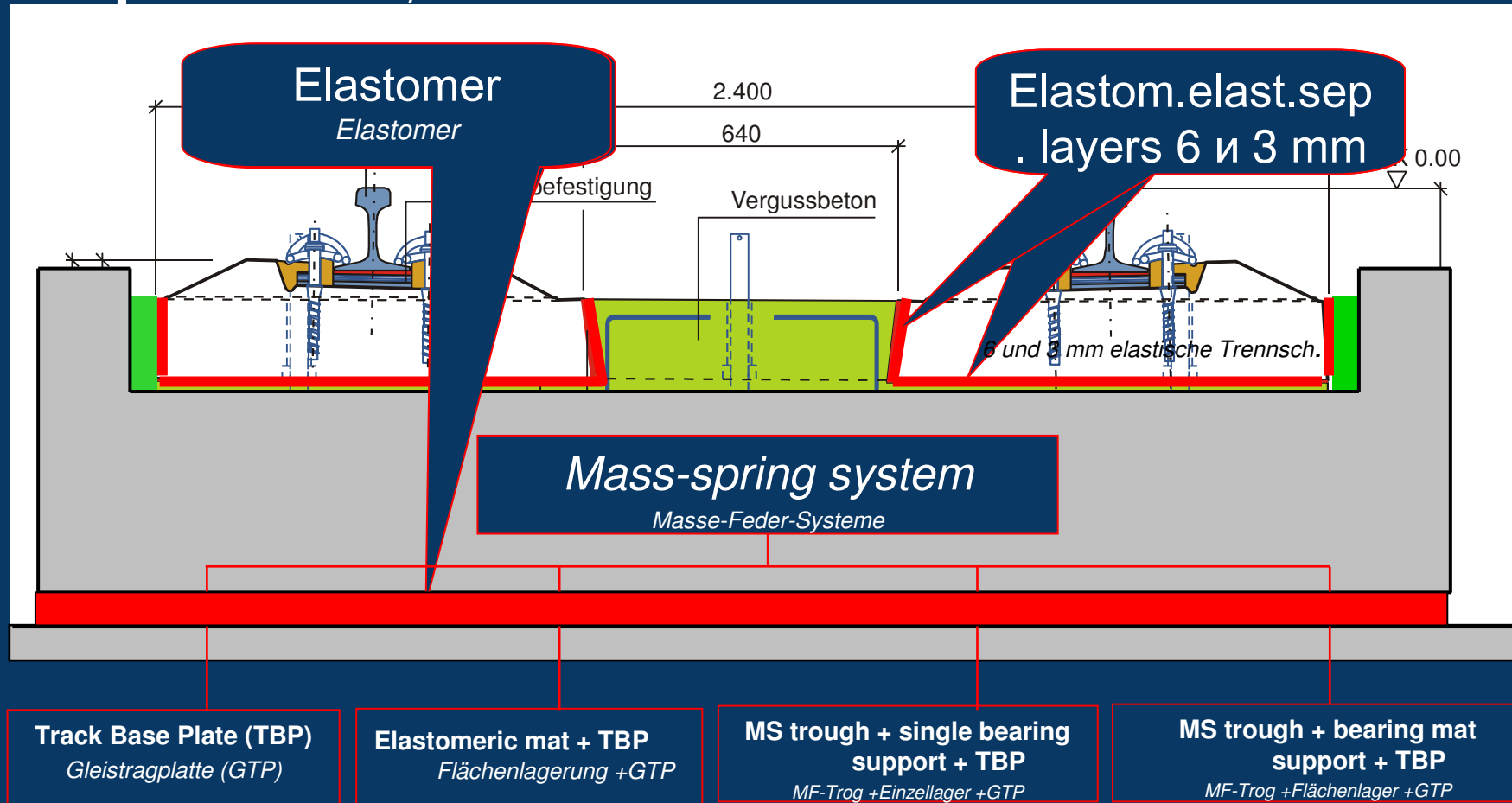
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## Options *Optionen*



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## Slab track projects

*FF-Projekte*



### Austria – Melk

*Österreich - Melk*

- **8 km of slab track**  
*8 km FF*
- **800 m in MS system**  
*800 m MFS*
- **In tunnel**  
*im Tunnel*
- **On bridge**  
*auf Brücke*
- **On open land**  
*auf Freier Strecke*

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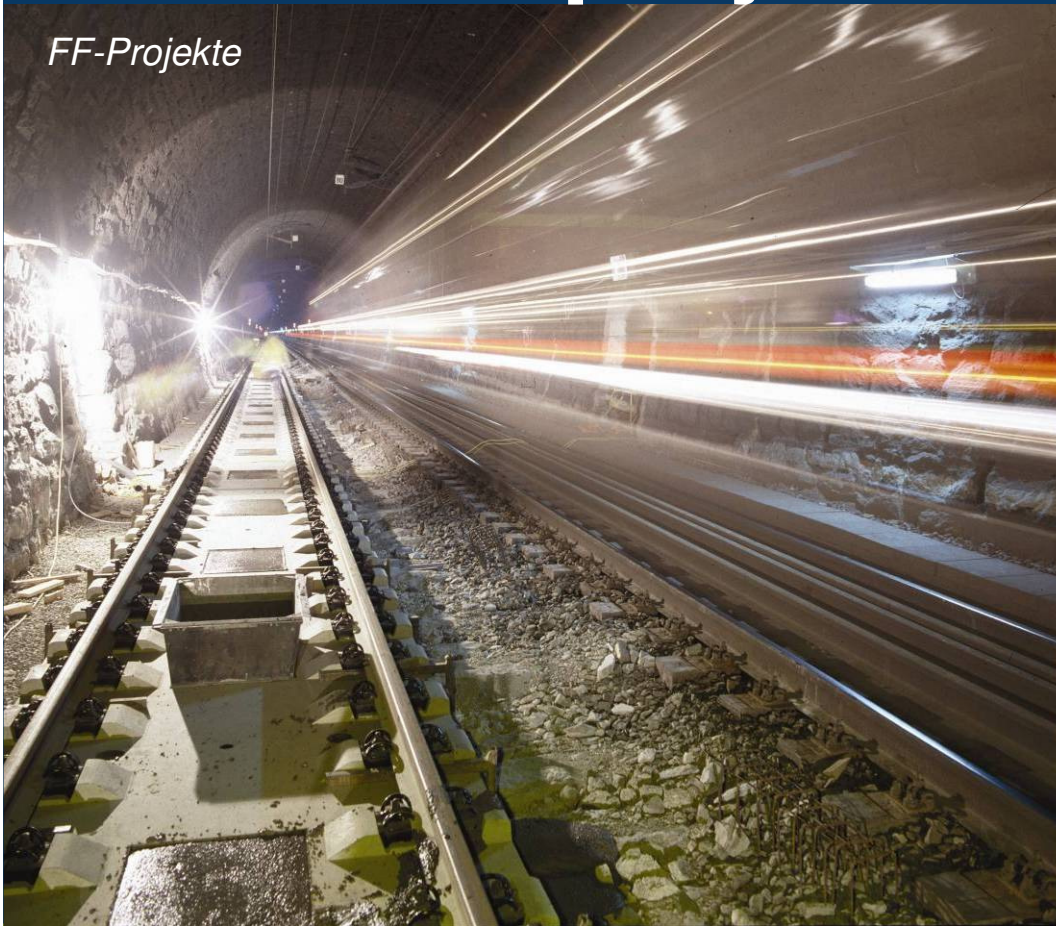


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## Slab track projects

FF-Projekte



### Austria – Tauern Tunnel

*Österreich - Tauerntunnel*

- **12.5 km of slab track**  
*12,5 km FF*
- **In tunnel**  
*im Tunnel*
- **Reduction of track gradient**  
*Absenkung der Gleisgradiente*
- **To increase clearance**  
*zur Vergrößerung des Lichtraumprofils*
- **Construction during single-track operation**  
*Bauen unter einseitigen Betrieb*



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## Slab track projects

*FF-Projekte*



### Berlin Lehrte station East–West connection

Berlin Lehrter Bahnhof  
Ost-West-Verbindung

- **On 25 bridges**  
*auf 25 Brücken*
- **5.6 km of slab track**  
*5,6 km FF*
- **With MS system**  
*mit MFS*
- **4 Turnouts in slab track**  
*4 Weichen in FF*
- **6 RMJ's in slab track**  
*6 SAV in FF*
- **50 track transition constr.**  
*50 FÜK*



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## Slab track projects

FF-Projekte



### Berlin Lehrte station north-south connection

*Berlin Lehrter Bahnhof  
Nord-Süd -Verbindung*

- **In tunnel**  
*im Tunnel*
- **20 km of slab track**  
*20 km FF*
- **13 km of light, medium & heavy MS systems**  
*13 km leichte, mittlere und schwere MFS*
- **49 turnouts in slab track**  
*49 Weichen in FF*



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## Advantages of the system

*Systemvorteile*

**No maintenance required**

*wartungsfrei*

**Structural-born noise and vibration control**

*Körperschallreduktion*

**Small construction width and height**

*geringe Bauhöhe u. Baubreite*

**High track precision**

*hohe Gleislagegenauigkeit*

**Fast installation**

*hohe Verlegeleistung*

**High degree of prefabrication**

*hoher Vorfertigungsgrad*

**Large openings possible**

*große Aussparungen*

**High early strength of SCC**

*hohe Frühfestigkeit des SCC*

**Even surfaced concrete quality**

*Sichtbetonqualität*

**Great driving comfort**

*Hoher Fahrkomfort*

**Little reworking**

*geringe Nacharbeiten*

**Repair plan**

*Reparaturkonzept*

**High added value**

*hohe Wertschöpfung*



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*Thank you for listening!*

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TECHNOBAU



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