



VLAD METAXA, PORR
RUDOLF FELSNER, VCE

Highly versatile and Proven Slab Track Technology for a Range of Demanding Railway Applications

UEEIV Railway Forum Napoli 06. November 2025

A high-speed train, white with red and grey accents, is traveling on a modern slab track. The track is set in a grassy field with overhead power lines and poles. In the background, a long bridge spans a valley, and a small town is visible on a hillside.

General Information Slab Track Austria

GENERAL INFORMATION PORR SLAB TRACK

DECISION-MAKING OF SLAB TRACK SYSTEM IN AUSTRIA



Langenlebern - First Installation PORR Slab Track System in 1989

Heaviest operated track (ÖBB Western Railway Line)
approx. 1,4 billion gross tons to date (25 tons axle load).

Construction

(space requirements, reduced self weight)

Method and Maintenance

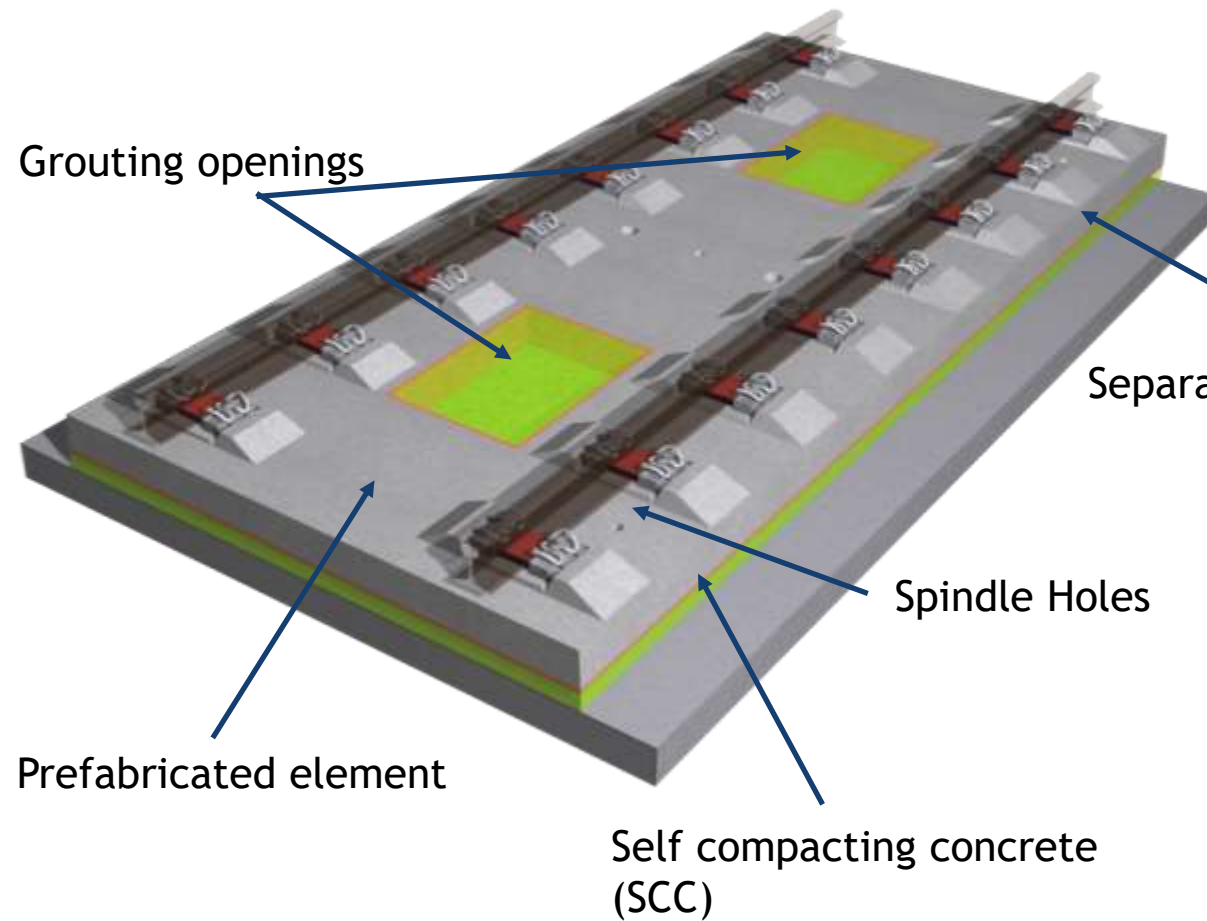
(track laying precision, rapid installation, ease of replacement)

Quality

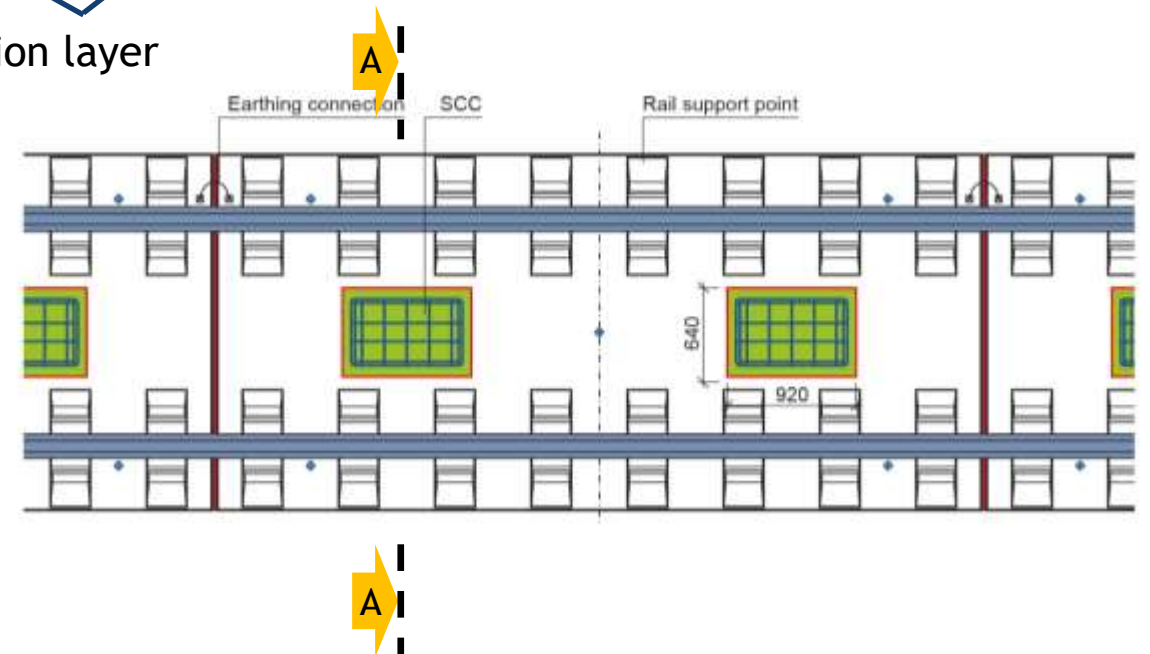
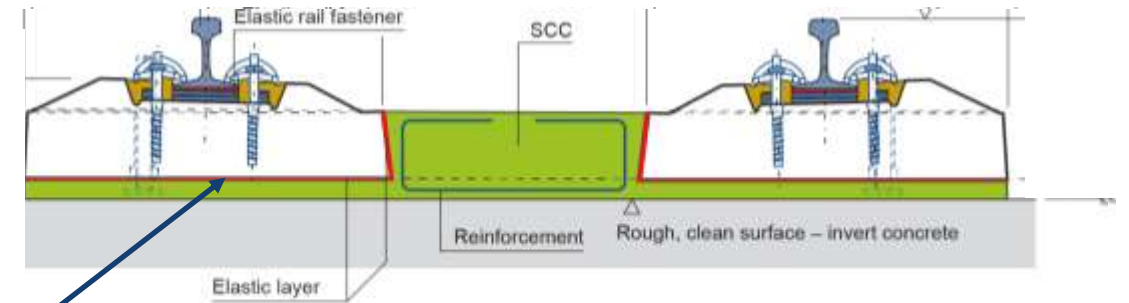
(prefabrication, decreased noise emission, high ride quality)

Cost-Effectiveness

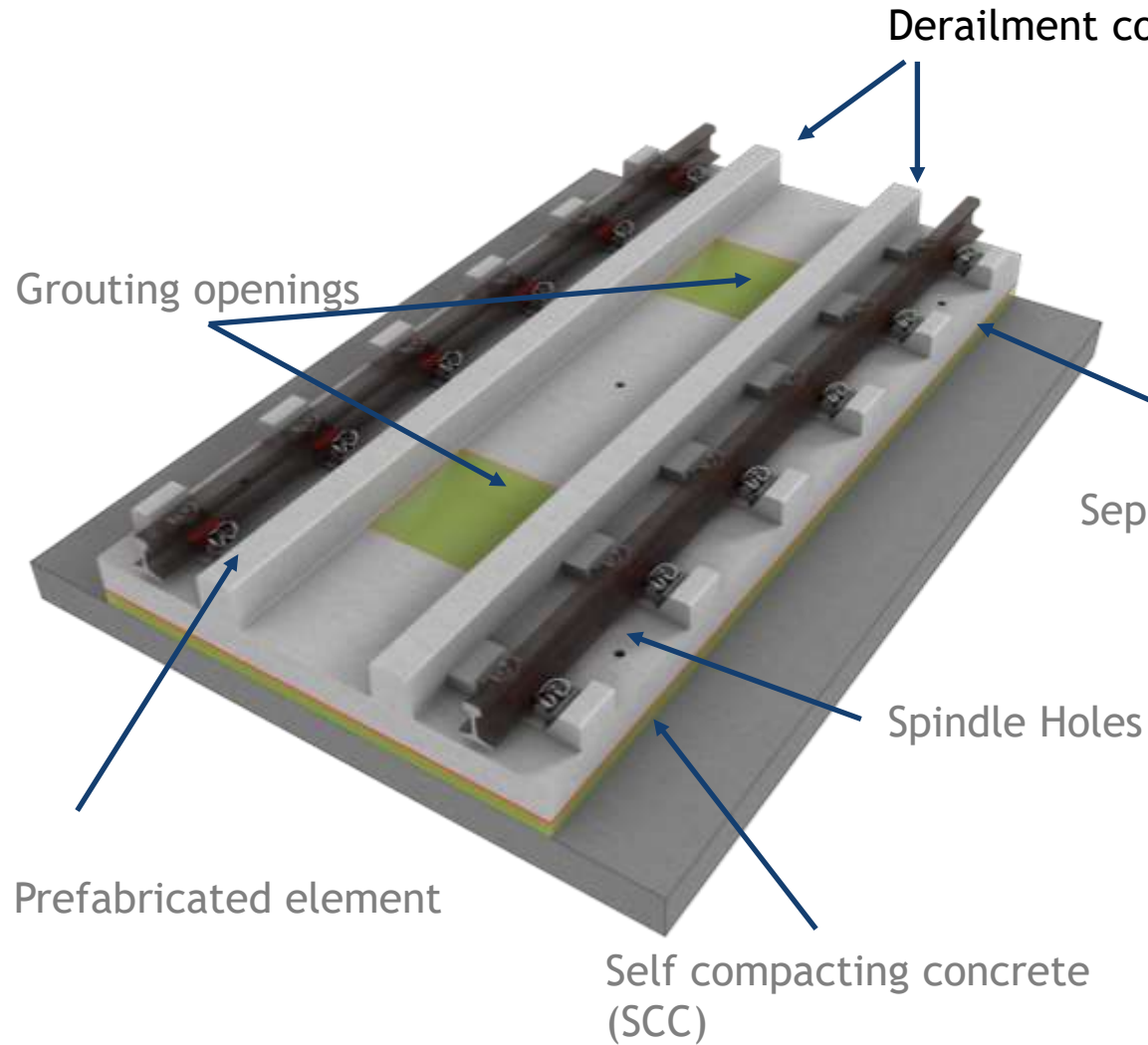
GENERAL INFORMATION PORR SLAB TRACK COMPONENTS



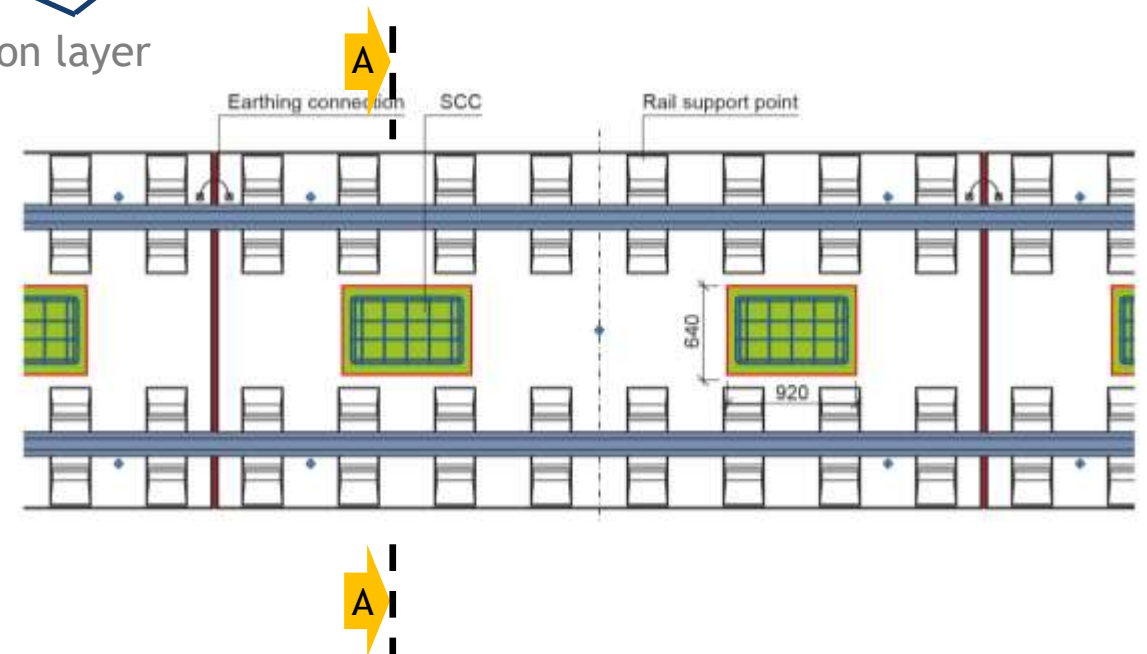
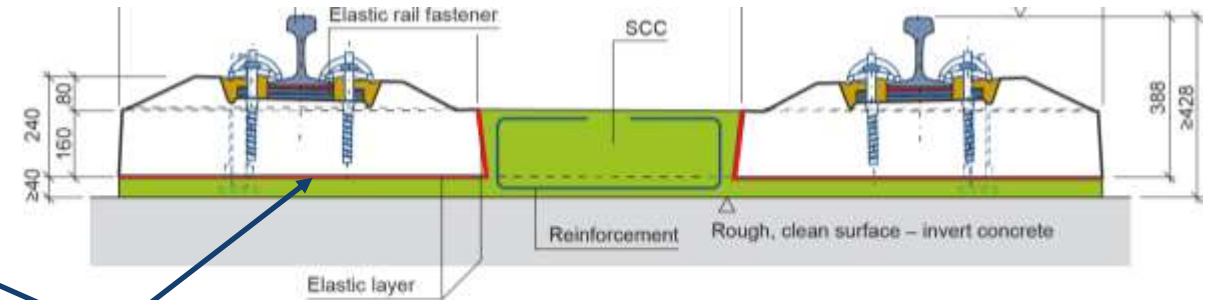
Section A-A



GENERAL INFORMATION PORR SLAB TRACK COMPONENTS

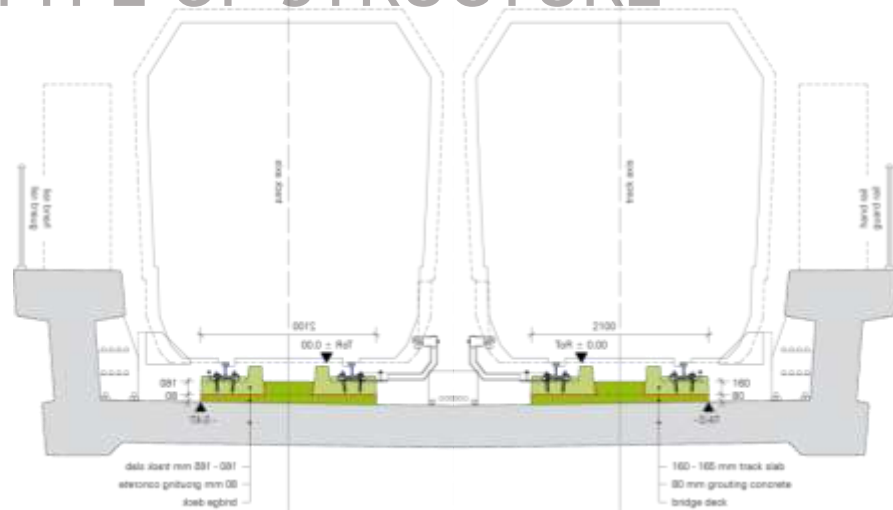


Section A-A



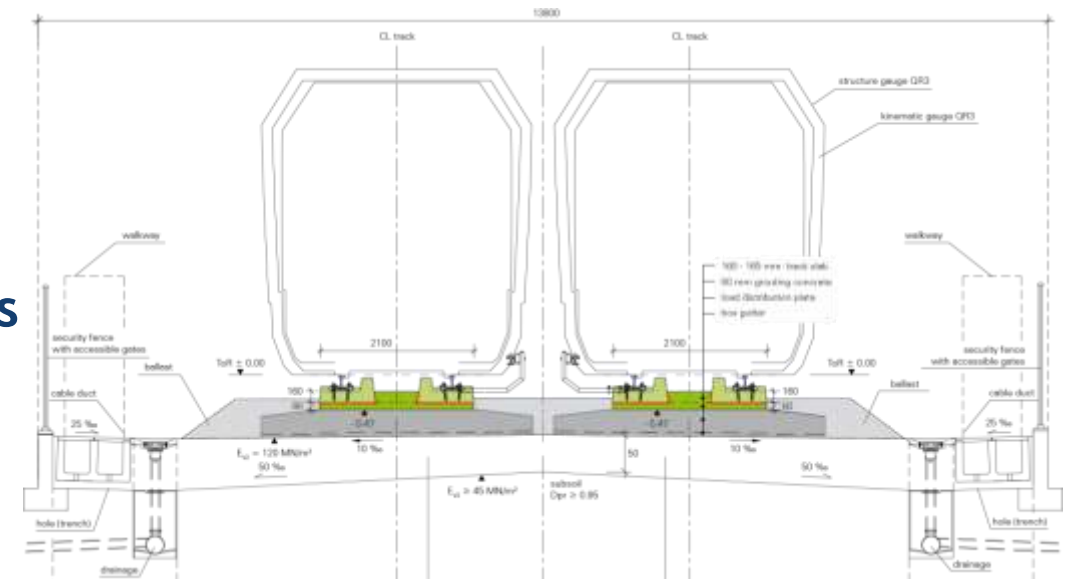
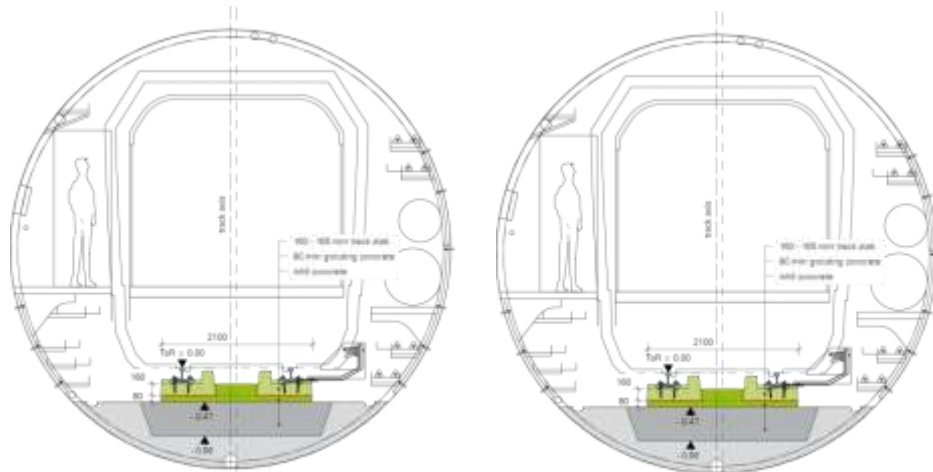
GENERAL INFORMATION PORR SLAB TRACK

TYPE OF STRUCTURE



Applicability for viaducts

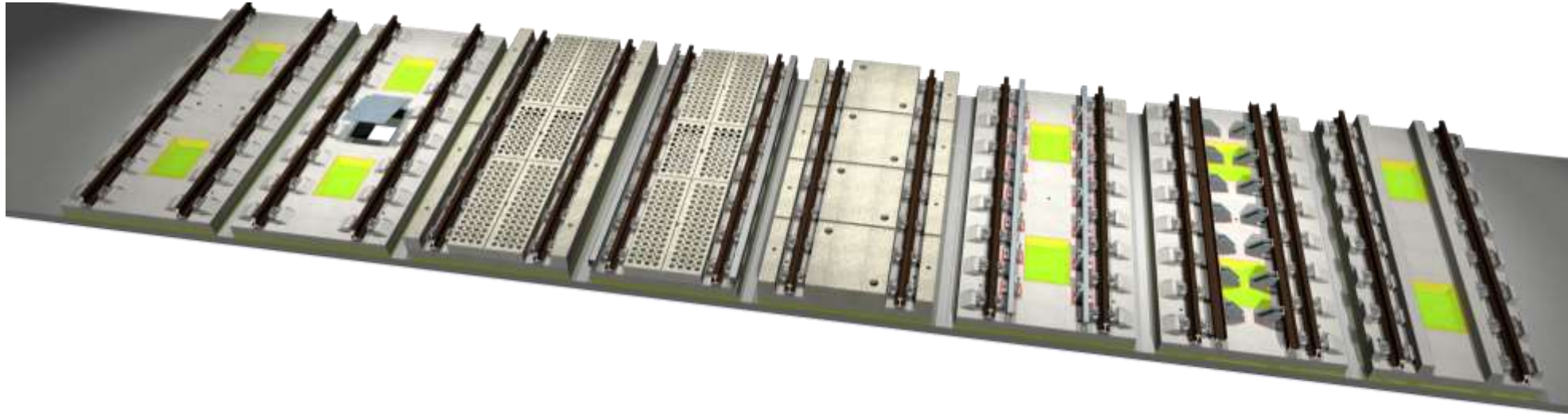
Applicability for at-grades sections



Applicability for tunnels sections

GENERAL INFORMATION PORR SLAB TRACK

MODULAR EQUIPMENT COMPONENTS





project challenges and our approach

SPEED AND TRACK ACCURACY HS2 IN THE UK

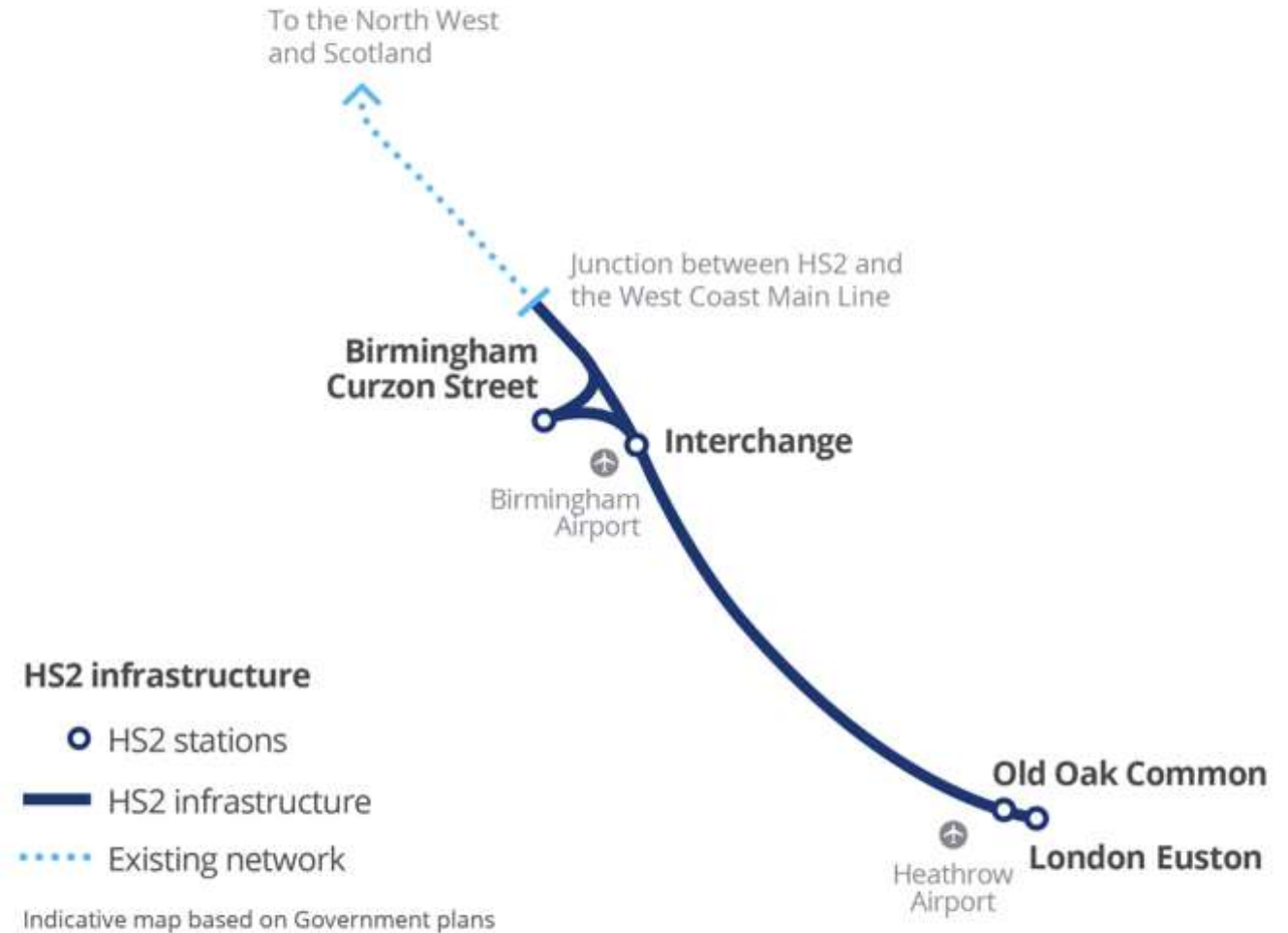
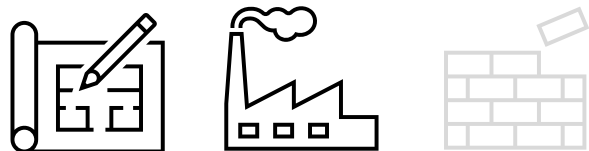
Record speed requirements for a railway line in Europe

- 360 km/h operating speed
- 400 km/h design speed

early award of contract for slab track design and supply

- reduce interface risks
- structure design fit for purpose

Design & Supply



SPEED AND TRACK ACCURACY HS2 IN THE UK

PORR/VCE challenges and approach

- Design stage:
 - design optimization (clearance)
 - interface management (fit for purpose)
 - Weight & material reduction (lower self-weight)
 - Information Modelling (AIM instead BIM)
- Execution stage:
 - precision in slab prefabrication
 - Concrete mix design and components specifications
 - Excellence and precision in construction



HIGH SPEED TRACK VDE 8.2 IN GERMANY

- 300 km/h operating speed

Total length 188km double track

25 tunnels (55 km / 29 %)

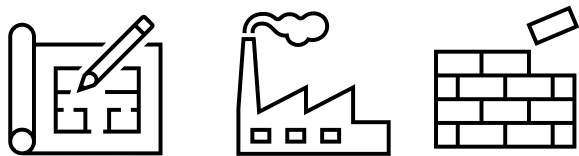
32 bridges (27 km / 14 %)

earthworks (106 km / 56 %)

-> Full operation since 12/2015



Design & Supply & Build



HIGH SPEED RECORD

VDE 8.2 IN GERMANY

- Successful DB test drives on the PORR Slab Track Austria VDE 8.2 high speed line in Germany
- Record speed of 405 km/h
- 300 km/h operational and 330 km/h design speed
- high quality after 10 years of operation



SPACE CONSTRAINTS KORALMBAHN IN AUSTRIA

- Challenges:
 - Space constraints (small tunnel diameter combined with the length of 2x33 km in twin bores)
 - Extensive N&V attenuation requirements
 - Manholes for drainage in the middle of the track
- Solutions
 - STA slabs with reduced width (212 cm)
 - reduced/optimized construction height
 - combined Mass-Spring-System (MSS) with integrated STA technology
 - Rapid installation enabled by a high degree of prefabrication

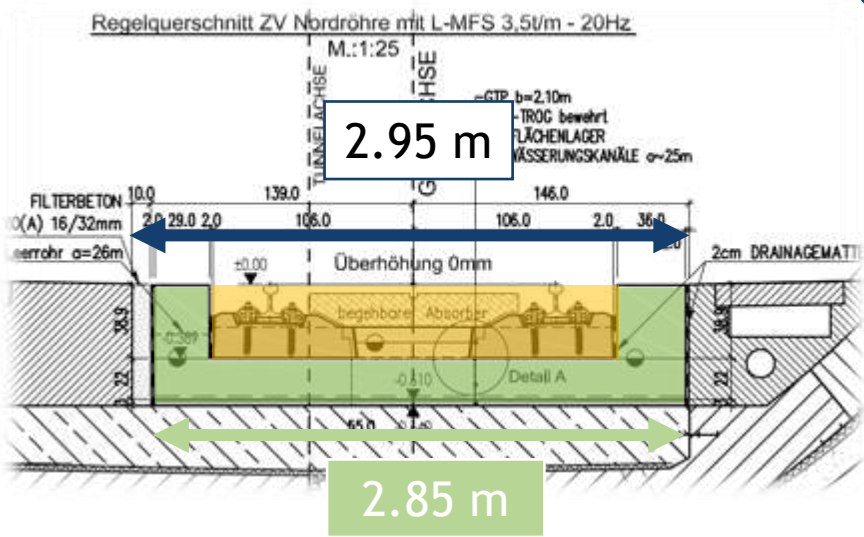


SPACE CONSTRAINTS

KORALMBAHN IN AUSTRIA - SYSTEM DEVELOPMENT

typical design

Mass Spring System - Trough



Submission 2007

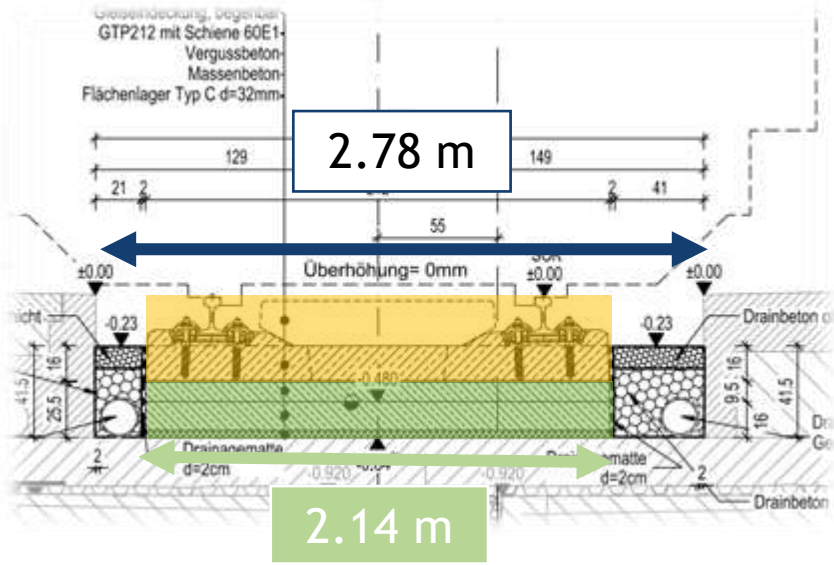
25% Reduction
in system width

>Tunnel tolerances
-17 cm

< Alignment changes
-71 cm

improved design

Mass Spring System -Slab



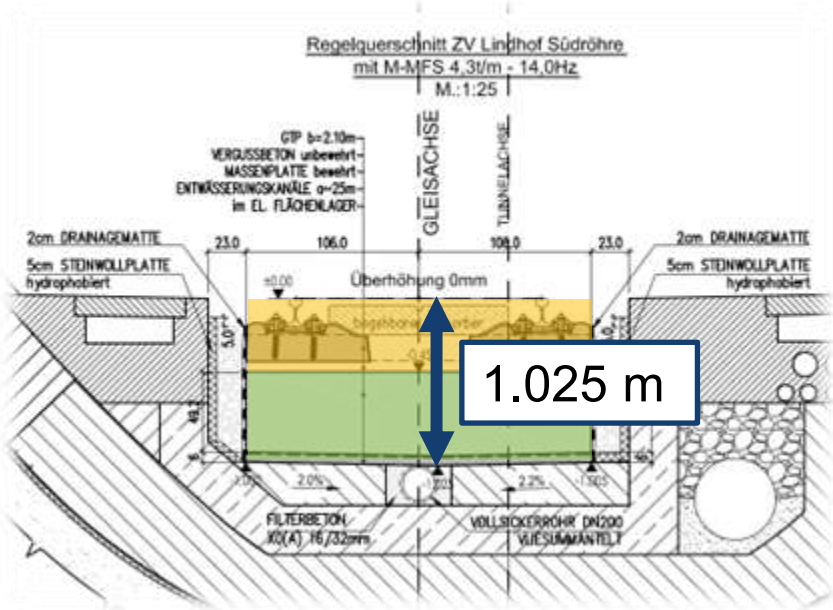
Execution 2020

SPACE CONSTRAINTS

KORALMBAHN IN AUSTRIA - SYSTEM DEVELOPMENT

typical design

Mass Spring System <15 Hz



Submission 2007

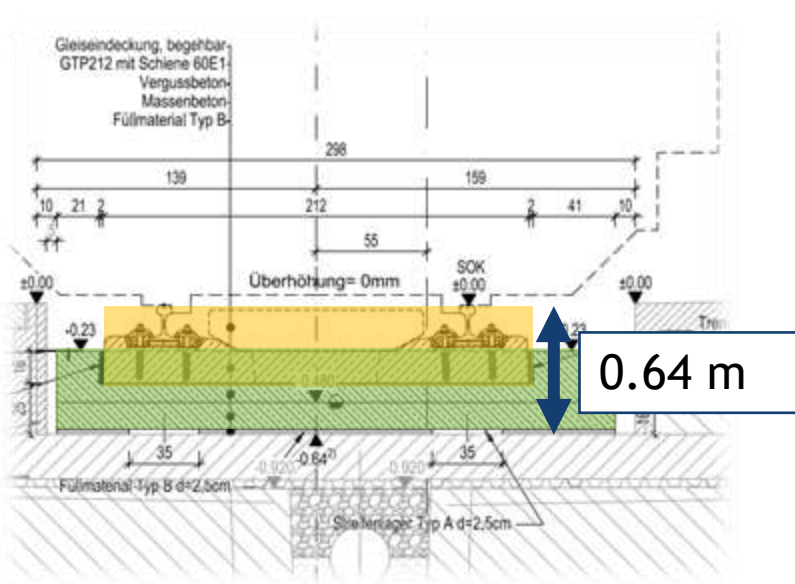
„from fixed to flexible“

Less alignment changes
no special tunnel shapes
flexible N&V adjustments

< System height
-38.5 cm

improved design

Mass Spring System <15 Hz

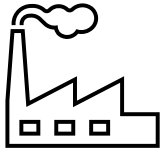


Execution 2020

VALUE ADDED APPROACH METRO TUNNEL MELBOURNE

- **Broad gauge** - proven STA system tailored to the **local specifications**
- **Integrated derailment containment** - cost reduction
- **Complex N&V requirements** - urban environment
- **Prefabricated mass spring systems** - reduction construction time
- Different CAD System

Design & Supply & Supervision

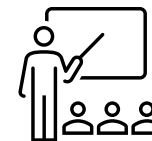


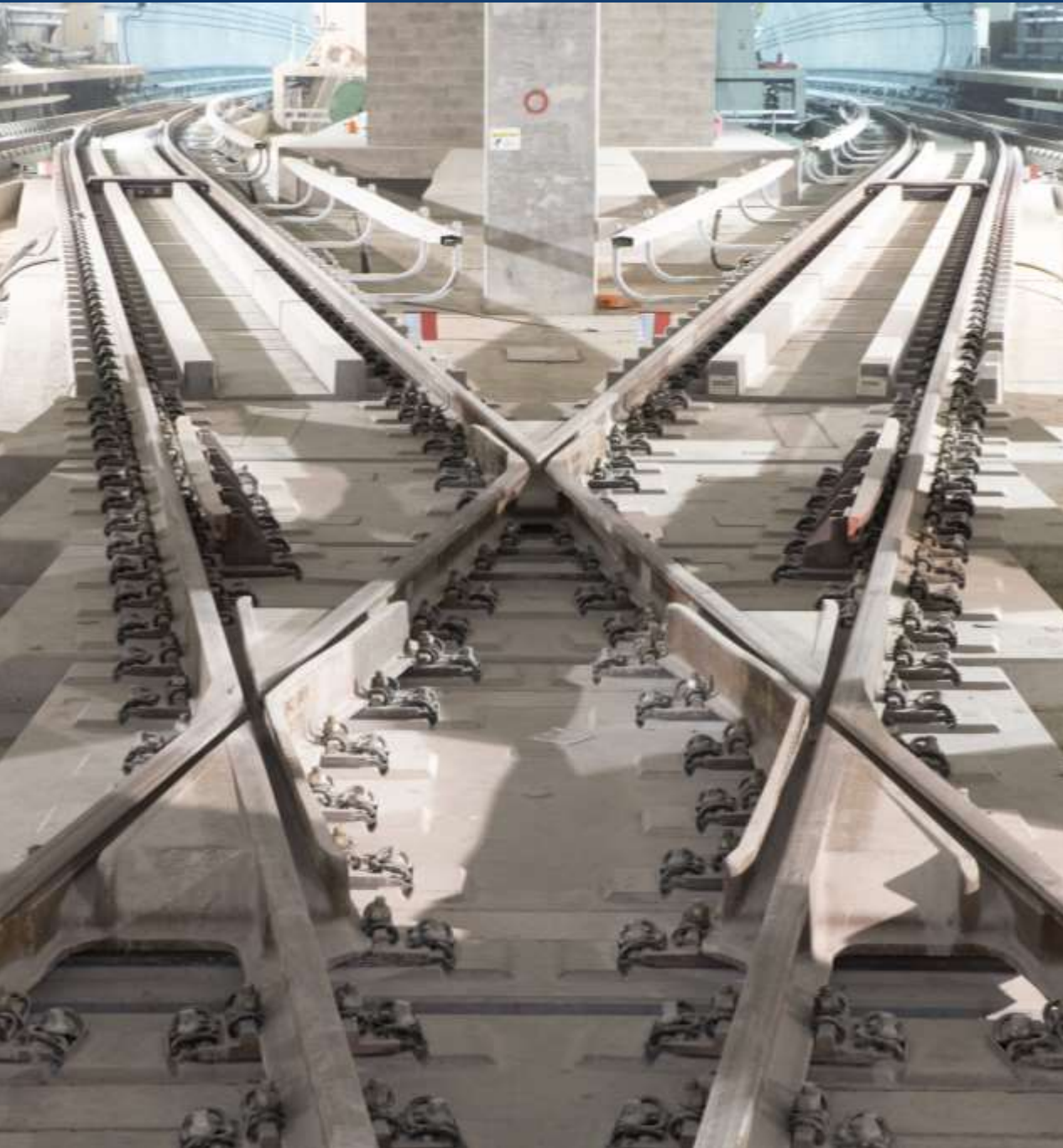


VALUE ADDED APPROACH DELHI-MEERUT IN INDIA

- **standard gauge** - proven STA system tailored to the **local specifications**
- **Integrated derailment containment** - cost reduction
- **Installed throughout** - on bridges, earthworks and in tunnels
- **Slab Track Austria system supply for**
 - mainline
 - turnouts
 - diamond crossings

Systemdesign & supervision (prod./inst)

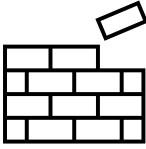
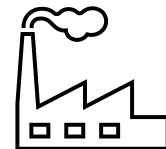
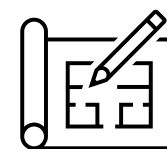




VALUE ADDED APPROACH DOHA METRO, QATAR

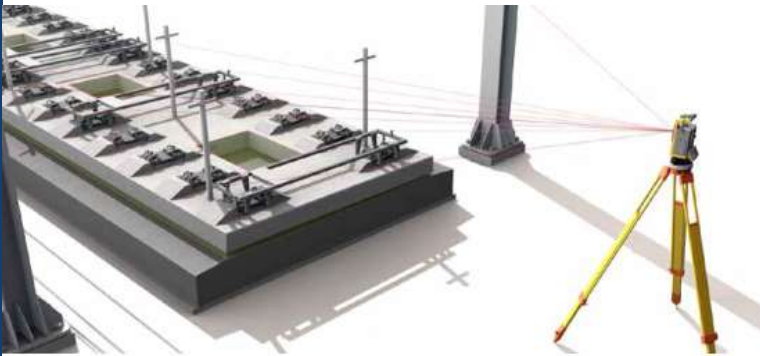
- **Metro Application** proven STA system tailored to the **local specifications**
- **Very complex interfacing processes** with the civil contractors (7 different packages)
- **Installed throughout** - on bridges, earthworks and in tunnels
- **Complex N&V requirements** - urban environment leads up to >20km Mass Spring Systems
- **BIM from day one**

Design & Supply & Build

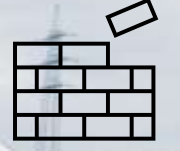


INSTALLATION W/O RAIL STUTT GART 21

- slab track completion before final rail delivery
- Slab track installation for the entire length of the 33 km in tunnel had to be done without the final rail
- High precision of key points on the precast slab enabled rail-free installation at high quality



Design & Supply & Build



ASPHALT BASE LAYER STUTTGART 21

Design approach - addressing challenges of previous asphalt abase layer application and providing improvements

- **Asphalt** mix was modified - for longer durability
- The asphalt layer was covered on sides and it is fully covered under the slab
- **Asphalt layer without strict tolerance** for application (compensated by the SCC)
- **Strong asphalt-SCC bond** - no connection or shear dowels needed

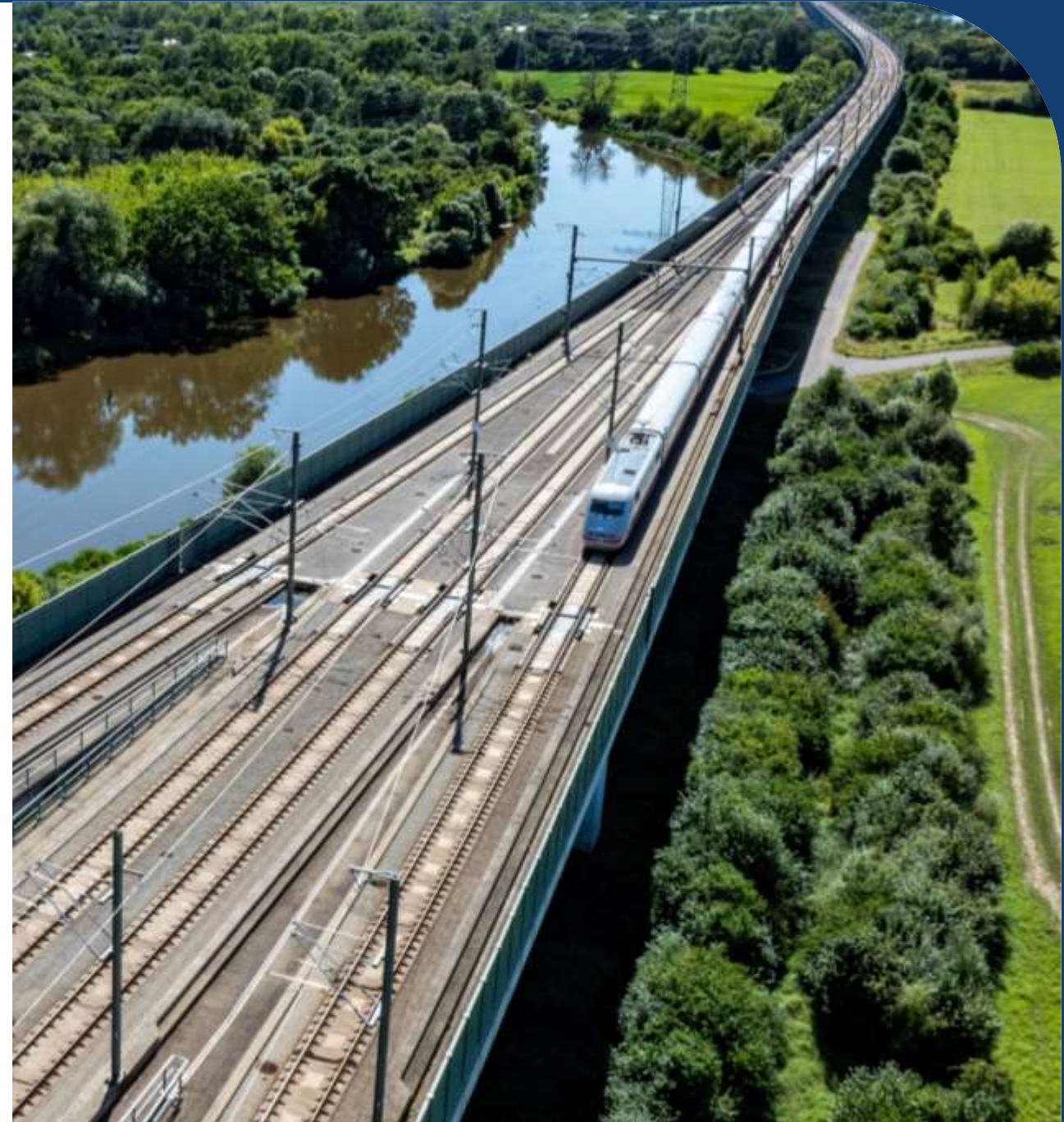


SLAB TRACK AUSTRIA

BENEFITS

- modular system for every environment
- industrialized construction - quality and speed
- Efficient on-site assembly
- High precision under complex conditions
- Early system choice in planning saves costs.
- Decades of proven performance

"Ready to take on new design challenges"



SLAB TRACK AUSTRIA



PRECISION, PERFORMANCE AND PARTNERSHIP

GET IN TOUCH

IF YOU HAVE ANY QUESTIONS, PLEASE DON'T HESITATE TO CONTACT US.

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