

# RAILWAY CONSTRUCTION





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## STRABAG – THE GROUP

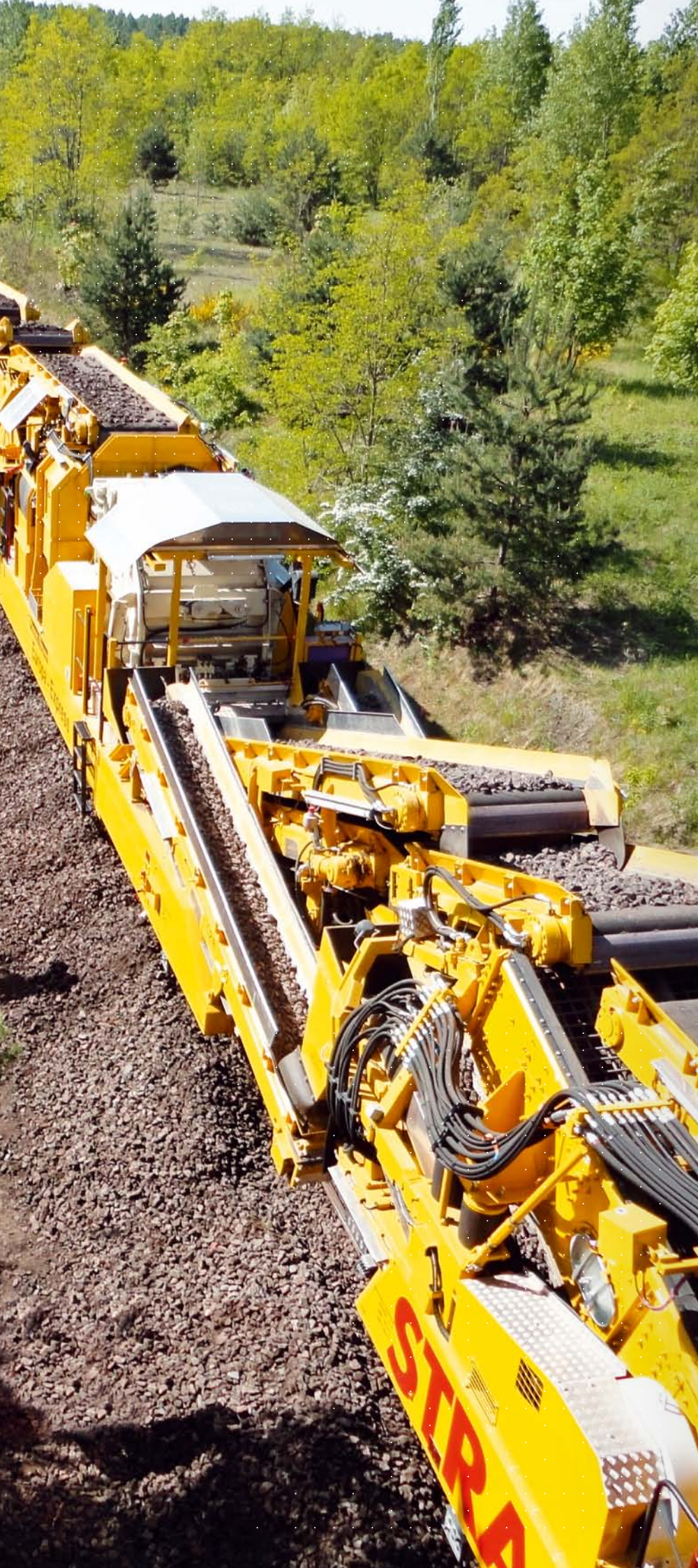
STRABAG is one of the leading construction groups in Austria and Germany and across Central and Eastern Europe. The company has operations worldwide, employing more than 76,900 employees (2011). Thanks to its innovative and extensive range of products, the STRABAG Group has become a leader in complex structural and civil engineering projects. From the initial groundbreaking to the handover of the keys STRABAG is THE competent partner for projects of any size in the structural and civil engineering, transportation infrastructures and special divisions & concessions segments. The high concentration of specialist expertise within each segment and the close cooperation between the areas allow for the successful implementation of even the most complex ideas.

## STRABAG RAIL GMBH

STRABAG Rail is a German railway construction company which is part of the STRABAG SE Group. With more than 85 years of experience, STRABAG Rail provides valuable inputs in the planning phase and sets high standards of quality for the execution of construction work while meeting the time standards and financial parameters of the railway construction sector. We define railway construction as a turnkey railway traffic installation from A to B. With our extensive range of machinery which is always state-of-the-art, overhead line construction, our own rail switch production and our innovative track construction products, we can execute all projects quickly and flexibly.

As a result, STRABAG Rail and its incorporated companies are your specialist partners for railway construction - in line with our company motto, we are "Your partner in all rail matters" for meeting all the challenges associated with railway construction.





## YOUR COMPETENT PARTNER IN THE RAILWAY INDUSTRY

— **Consultation on areas ranging from maintenance services to project management for general contractors.**

— **Construction of rail track systems with ballasted tracks for**

- High-speed traffic
- The urban railway and regional trains
- All infrastructure providers
- Industrial railways and feeder lines

— **Mechanical rail track conversion**  
(renewal train/ballast cleaning)

— **Rail milling technology**  
(rail-bound and rail-road-truck milling technology)

— **Tramway systems**

— **Mechanical flash butt track welding**

— **Sound-absorbing elastic footing for sleepers**

— **Track-bound underground engineering**

- Installation of substructures (PSS), frost protection layers (FSS) and drainage systems
- Laying of railway cables

— **All types of level crossings**

— **Cable duct systems**

- Track-bound cable duct systems including shafts
- fully equipped above-ground switchgear houses and subterranean stations

— **Platforms**

- platform21 – Prefabricated component platform system
- lift21 – Modular elevator shaft system
- tunnel21 – Modular underpass system
- Mobile makeshift platforms

— **Railway engineering**

- Forward-shift construction type railway bridges
- Auxiliary bridges

— **Recording and measurement of the tracking system**

— **Railway logistics**

— **Overhead lines for short- and long-distance traffic**

— **Switches and large switch parts**

# THE HIGHEST EFFICIENCY IN RAILWAY CONSTRUCTION

## TRACK LAYING MACHINERY

### Measuring, tamping and leveling technology

- Track pre-measurement wagon  
EM-SAT 120  
Digital track measuring system  
GEDO CE
- Dynamic track stabilizer DGS 62 N
- Track tamping machines CSM 09-32  
(fits ALC/EM-Sat / 6-MKS)  
CSM 09-3X (2 vehicles)  
(fits ALC/EM-Sat / 8-MKS / reference  
chord laser)
- Universal tamping machines 08-475  
UNIMAT 4S  
(fits ALC/EM-Sat / 8-MKS)  
B66 UC (2 vehicles) (fits Catt/EM-  
Sat / 8-MKS)  
09-32 UNIMAT 4S Dynamic (Catt)
- Ballast profiling machines for the  
associated tamping machines  
SSP 110 SW (6 vehicles) R24

### Crane technology

- Track and switch construction cranes  
100 t – GS.08 T 100  
100 t – KRC 910+  
150 t – KRC 1200+
- Hydraulic portal crane for track loading  
Donelli PHT 350

### Track welding

- Mobile track welding systems  
AMS 100 SRM 25 (2 vehicles)

### Cleaning, wagon/track renewal technology

- High capacity ballast cleaning machine  
including ballast recycling and  
addition of new ballast  
RM900 VB
- Material conveyor and silo units  
MFS 100 (17 vehicles)
- High capacity track renewal train  
P95 SR
- Track vehicles  
GKW 54.20
- Sleeper transport wagons  
Rlps (60 vehicles)

### Rail milling

- Rail milling machines  
SF02 W-FS Truck (2 vehicles)  
SF03 W-FFS (2 vehicles)  
(rail-bound)

## EIVEL

### Logistics - Eichholz EIVEL GmbH

- Locomotives  
BR 203 (2 vehicles)  
Nohab My 1147
- Bogie-flat wagon  
Res-type wagon (43 vehicles)





## OVERHEAD LINE CONSTRUCTION

**STRABAG Rail Fahrleitungen GmbH** is the specialist for the construction of overhead line systems for long-distance traffic and is a certified full-range supplier (planning, construction, maintenance), listed as a Q1 supplier, of standard overhead line systems for DB AG (German Railways). In addition to planning and statics calculations, we also execute foundations, carry out mast erection work, draw overhead carrier cables and contact cables, install overhead line systems and lay railway earthing systems in addition to OSE and OLSP systems.

With qualified employees and a high level of competence in overhead line construction, STRABAG Rail has expedited a large number of developments in this sector, e.g. a measuring system for detecting and recording the position of the contact wire (ELDIS) and software for the calculation of booms and hangers for mechanical prefabrication (PROLIS).

For more than 60 years, **FAHRLEITUNGSBAU GmbH** has been a valued and proficient partner for the planning and construction of overhead lines for trams, urban commuter railways, regional railways and industrial railways.

Our most highly-trained and flexible employees have an extensive range of special-purpose vehicles at their disposal for installation and maintenance with which they meet the high quality requirements set by customers - customer-oriented, flexible and reliable. Using high-quality, innovative technology, we create ideal conditions for rail traffic.

We repeatedly set new technical standards with the overhead line products we have developed. Synthetic boom technology, tension insulators and the use of cutting-edge silicone insulation materials can be traced back to the impetus given by our company and are now state-of-the-art worldwide.



# YOUR COMPETENT PARTNER IN THE RAILWAY INDUSTRY



## SWITCHES CONSTRUCTION

Our switch factory produces switches and major switch components from all customary types of rail (vignol and grooved rails) for all gauges, also mixed gauges, up to a radius of  $R = 500$  m.

Here is a detailed list of our services:

- Construction of special switches
- Production of switches, major switches components and crossings
- Delivery of sleeper sets for switches
- Induction hardening and tempering of rail tracks and major switch components
- Manufacturing of stationary insulation joints
- Fastening devices for railway crossings, including the "Lindau" system in particular
- Guard rail constructions
- Rail expansion joints for bridges
- Transformer crossings
- Production
- Manufacture of transition rails
- Q1 supplier of DB AG

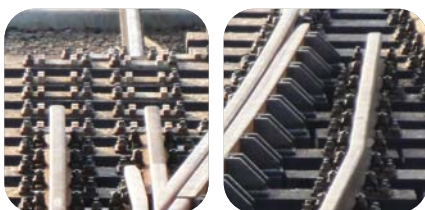
We can also deliver switches and major switch components as well as sets of sleepers made of new, second-hand or reworked material.

Furthermore, we also perform:

- Switch and track inspections in accordance with DS 820/821 of the Deutsche Bahn AG
- Welding work on tracks based on the certificates granted by the Deutsche Bahn AG
- Using multi-lined bending machines to bend rails of all types into all shapes
- Reconditioning of old switches and crossings

Welding works in factories according to DB AG Ril 826.1021: CLASS 2

- Stationary flash butt welding (RA stationary)
- Stationary insulated rail joint manufacturing (MT and MT-reinforced)
- Manual metal arc welding (Process 111)
- Metal arc welding with filler wire electrodes (Process 114)





## CONSTRUCTION ENGINEERING

### Bridges in cast-in-situ concrete

- Abutments and pillars in reinforced concrete
- Superstructures in reinforced concrete and/or pre-stressed concrete
- Concrete slab with pre-bent rolled steel joists (RSJ)

### Various types of construction

- Mixed construction
- Compound construction
- Modular construction
- Frame mode

### Provisional bridges

- Mounting of flat or deep foundations
- Erecting, maintenance and expansion of single or multi-section temporary bridges

### Subways in cast-in-situ concrete

- Full-framed subways, in in-situ concrete
- Complementing this with ramps, lift shafts and stairways

### Bridges using displacement construction methods

- Full or half-framed, and one or multiple-section bridges
- Girder-style bridges
- Mounting outside the platform
- Displacement of bridges via displacement tracks

### Steel bridges

### Bridge renovations (whilst in operation)

### Retaining walls

- Mounting of retaining walls in in-situ concrete or prefabricated parts
- Gabions





# SERVICES THAT MEET EVERY REQUIREMENT

## UNDERGROUND ENGINEERING

### Underground engineering work on tracks

- Installation and renewal of protective surfaces
- Ground enhancement and stabilisation
- Longitudinal installation of tracks and preservation of ballast
- Drainage systems and route-accompanying underground cable engineering work

### Pipeline underground engineering

- Renovation of waste water systems
- Waste water (rain and dirty water)

### Special constructions

- Preparing subways and water crossings up to DN 400
- Underground engineering for light signal systems, including related road construction work

### Developments

- Waste water systems
- Cable system (media)
- Electricity supply cables
- Lighting cables

### Telecommunications lines

- Building cable systems as well as shaft constructions
- Installation and laying of telecommunications and signal cables (DB AG, EVU, VB)
- Laying of fibre-glass cables
- Feeding in cables

### Electrical power lines

- Underground engineering and laying of cables for power utilities in the low, medium and high-voltage ranges
- Cable duct trough systems including special constructions
- Construction of converter substations and special constructions

### Road construction and landscaping

- Restoration of all types of surfaces
- Building of access roads in bitumen and plaster
- Plastering and natural stone work, laying of all kinds of slabs
- Yard fixtures and design of space





## TRAMWAY CONSTRUCTION - LRT-TRACKS

Track building is more than mere execution – quality, profitability and reliability must be part of the construction process. This is why we have purposefully chosen to include key areas such as new constructions, reconstructions and the repair of track systems with all types of gauges, rail and sleeper profiles in our service portfolio. It is also why we use the most advanced technology and have employed a competent and experienced team of specialists.

### Our range of services includes:

- Earthworks and underground engineering
- Manufacturing of base courses
- Retrieval of building material and recycling
- Cable duct systems, piping, drainage
- Track construction: slab track and ballasted tracks
- Tracklaying as slab track, green track or ballasted track
- Creation of complete platforms and stations
- Concrete, plaster and asphalt surface treatments
- Level crossings round off our service portfolio



# SERVICES THAT MEET EVERY REQUIREMENT

## SYSTEM CONSTRUCTION STATION21

System construction offers a turn-key "station 21" product portfolio from one-stop concrete finished parts at a fixed price, incl. certification and framework agreement with the German Federal Railway Authority (EBA).

Accurate and particularly fast installation on-site includes planning, prefabrication, transportation and assembly of prefabricated platforms and subways.

### station21

- All from one source
- EBA type certification
- Simple planning
- Fixed price
- Life-long flexibility
- Persistently high level of quality
- Construction based on module 813
- Quality according to DIN EN ISO 9001
- Variable contact spacing
- Very short construction periods
- System benefits, such as a type solution

### Benefits of the platform21 system

- Platform facilities are fixed with screws and dowels retrospectively
- Platform roof connection is integrated into the foundations
- Allows for construction on top of existing platforms
- Minimal remaining mass
- No building in the track's pressure range
- High level of pre-manufacturing
- Can be used for arcs up to a radius of 300 m
- No longitudinal installation of tracks is necessary
- Type solution for connection to subway system "Stuttgart" (tunnel21)

### System benefits tunnel21

- High level of prefabrication
- Modular connection to platform system platform21
- Fast mounting is possible during periods of track possession



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