HERING®
SYSTEME

modula® system platforms

Building sustainably and systematically

HERING SYSTEME

modula® system platforms

The development of modula® in 1997 has revolutionised platform construction in Germany and beyond. Over the past two decades, we have successfully installed more than 500 system platforms in numerous European countries, including Denmark, Luxembourg, England and Austria. Their high manufacturing quality is regularly tested and confirmed through external audits carried out by the supplier management of DB AG. The variety of design and construction variants enables the construction, conversion or subsequent changes to the boarding level of existing platforms both individually and as needed. Over the years, the great diversity of our customers' demands has brought about a large number of new and further developments and therefore to a whole range of different types of system platforms. The challenge of offering intelligent solutions already begins with in-house planning and consulting. Today, we offer a wide range of system platforms to meet the varying requirements of long-distance, local and urban transport, which are described in more detail in this brochure.

Important characteristics

- High quality due to production in our own precast plant
- TT slab construction with large spans for both free-standing and backfillable platforms
- Detached platform systems and variants for rehabilitation and construction
- Foundation outside the pressure range of railway traffic loads
- Variety of foundation variants
- Simple foundation and assembly for embankments and subsoil with poor load-bearing capacity
- Very short assembly times
- High degree of prefabrication (weather-independent production)
- Environmentally conscious and sustainable production (EMAS certification)
- Q1 supplier status with DB AG
- Certification according to DIN ISO 9001

Contents

Photographers: David Hollnack, Mats Karlsson, Bernhard Krause, Jan Krüger, Jola Bartnik-Milz, Christian Bedeschinski, HERING-Group

Performance, planning, quality

HERING's service package includes the technical processing, production and Europe-wide delivery and optionally installation of system platforms with experienced personnel and "made in Germany" quality.
As early as in the pre-planning phase, HERING brings its expertise to bear in project-related consulting. Furthermore, we can provide planning aids ranging from individual standard details and design examples to Revit component families of each platform type free of charge on request.
In the HERING technical office, we work to optimise the cost-effectiveness of elements for production, transport and assembly. Production takes place independently of weather conditions and under hall-specific conditions in our Q1-certified concrete plant. The precast concrete elements we produce are ready for installation, including the necessary hatchings, the guide system for the blind, the platform edge and anchorages for superstructures (e.g. lighting masts or weather-protected buildings). Following production, the platform elements are delivered by truck or, if necessary, as rail freight, frequently just-in-time.
A maximum truck load of 24 tonnes ensures economical transport. The choice of element dimensions and weights is already taken into account when designing the components. Depending on the element size and type, various aids are used to assemble the platform elements: either lifting beams with load hooks or anchors embedded in the surface that are permanently sealed with a concrete plug after assembly.

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Surface variety

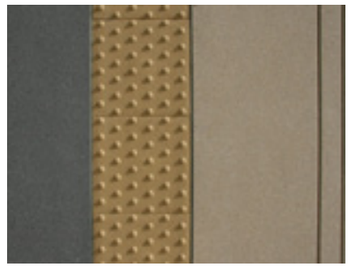
The dark surface is produced using high-quality concrete formulations with facing concrete in dark granite or basalt. This guarantees long-lasting colours. The necessary guidance systems and hatchings are integrated directly into the surface at the factory by means of glued-in tiles or concrete casting. In addition, we can also create individual multi-coloured surface designs to meet customer wishes.

The highly durable surfaces have all certifications for slip resistance and luminance contrast (LRV value) and clearly exceed the requirements of the relevant regulations for resistance to frost and de-icing salt; the values for weathering are only 10 to 20 per cent of the permissible limit values.

All surface design requirements can also be met for non-federal railways and numerous foreign railway companies in accordance with the applicable national regulations.

modula®
surface variants

- finely washed (DB AG standard) (see fig. on p.6)
- acidified
- blasted
- surface with dummy joints in ashlar format (not DB AG standard)
- platform edge with non-slip matrix structure
- guide strips for the blind and optional danger zone hatching can be produced by means of glued-in tiles or as matrix castings
- ground surfaces (only in protected areas)



Two-colour surface with glued-in tile (Great Britain)

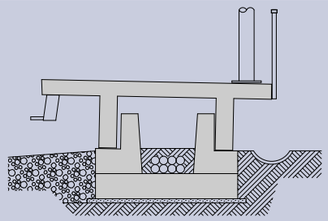
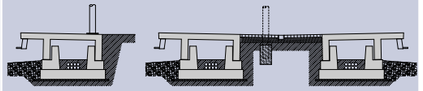
Platform surface with integrated dummy joints

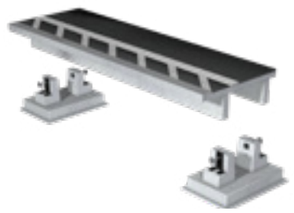
Platform surface with guide system for the blind as concrete casting

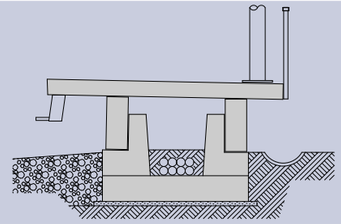
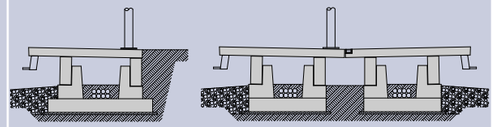
Two-colour surface with glued-in "yellow dots" (Denmark)

Acidified platform surface

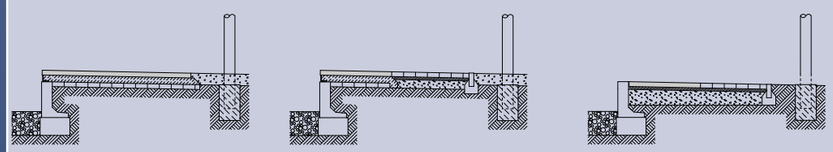
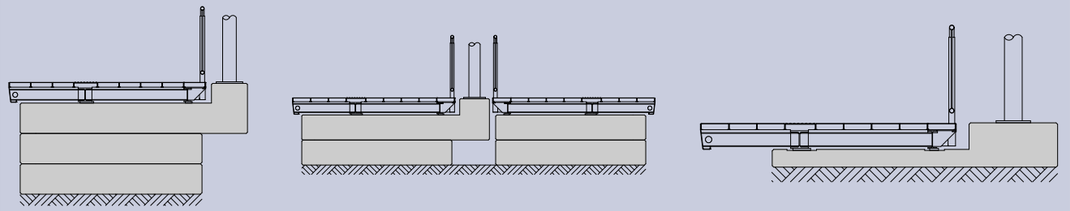
modula® type overview

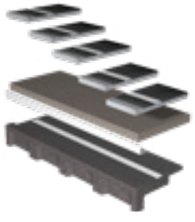
	modula® – the TT slab type 1	modula® – the TT slab type 1b
System sketch		
Application	Construction of new free-standing outdoor platforms	Subsequent modification of the boarding level
Nominal heights	38, 55, 76, 96 cm above top of rail or variably selectable	from 55 to 76 cm above top of rail and vice versa from 76 to 96 cm above top of rail and vice versa
Description of the system	Reinforced concrete TT slab	Reinforced concrete TT slab is raised or lowered by means of a concreted steel toe or precast concrete spacer (distances!)
Dimensions / weight	Length up to 9.60 m infinitely variable, width 3.50 m infinitely variable, ideal element weight 12.0 t (max. 24 t), structural analysis for the type available for various standard applications.	Length up to 9.60 m infinitely variable, width 3.50 m infinitely variable, ideal element weight 12.0 t (max. 30 t), structural analysis for the type available for various standard applications.
Foundation	Shallow: precast foundation on gravel bed Deep: e.g. bored pile or driving girder with head beam	Shallow: precast foundation on gravel bed Deep: bored pile or driving girder with head beam
Inner earthing	Continuous ø 16 mm earthing iron with 2 welded connection bushings for connecting with earthing connectors	Continuous ø 16 mm earthing iron with 2 welded connection bushings for connecting with earthing connectors
Construction suitable for	Installation during short track possessions, on embankments, subsoil with poor load-bearing capacity, economic advantages overall compared to conventional construction (construction costs, construction time, quality, maintenance)	Creation of a modified barrier-free boarding level, e.g. due to the use of new rail cars
Approval	Operator approval	Operator approval



modula® light type 1	modula® light type 1b
	
New construction of backfillable external platforms or centre platforms with conventional middle core filling or suspended plate	Raising of existing platforms and construction of new free-standing and backfilled platforms using the separate casting method
38, 55, 76, 96 cm over top of rail or variable	55, 76, 96 cm over top of rail
Reinforced concrete TT slab	Reinforced concrete flat slab 17 cm (up to 30 cm) and bar/foundation system up to 7.50 m in length
Length up to 9.60 m infinitely variable, width 3.50 m infinitely variable, ideal element weight 12.0 t (max. 24 t), structural analysis for the type available for various standard applications	Element weight max. 4.0 t for installation with two-way excavator, 17 cm slab on bar/foundation construction, 18 cm slab at max. 3.50 m foundation distance, 22 cm slab at max. 4.80 m foundation distance, 26 cm slab at max. 5.40 m foundation distance, 30 cm slab at max. 6.00 m foundation distance
Flat: Precast foundation on in-situ concrete load distribution plate (dimensions depending on subsoil) Deep: e.g. bored pile or driving girder with head beam	Shallow: bar/foundation system on gravel bed, in-situ concrete transverse foundations or in-situ concrete cushions Deep: driven pile foundation
Continuous ø 16 mm earthing iron with 2 welded connection bushings for connecting with earthing connectors	Continuous ø 16 mm earthing iron with 2 welded connection bushings for connecting with earthing connectors
Installation during short track possessions, on embankments, subsoil with poor load-bearing capacity, economic advantages overall compared to conventional construction (construction costs, construction time, quality, maintenance)	Installation with two-way excavator or wheeled excavator, installation during short track possessions and poorly accessible installation sites
Operator approval	Operator approval

modula® type overview

	modula® flex	modula® temporär
System sketch		
Application	Raising of platforms and repair of platform surfaces, surface rehabilitation and retrofitting of guide strips for the blind and/or danger zone hatching	Temporary platform (side or island platform) on a rental basis. Suitable for new construction or reworking existing platforms
Nominal heights	to 38 cm above top of rail, 55 to 76 cm above top of rail, from 76 to 96 cm above top of rail 55, 76, 96 cm above top of rail with platform edge 51, 21 and 42 (supplementary variant) or variably selectable	38, 55, 76 cm above top of rail and all intermediate levels following technical clarification
Description of the system	Flat slab reinforced with high-performance glass-fibre fabric, cuts possible, as there is no reinforcement corrosion	Steel construction in modular design with simple plug-in system for fastening railings and mounting lighting masts with base plate
Dimensions / weight	Element thickness 8 cm Element lengths along track of 1.34 m Element widths 1.20 m, 2.50 m, 3.00 m (standard), further element widths on request	Steel elements with length span of 5.00 m and standard widths of 2.50 m and 3.00 m (special widths on request)
Foundation	Stable, intact platform edge; frost-proof, stable subsoil, laying concrete foundation level C25/30, XF1, XC2, WF with layer thicknesses of approx. 5–13 cm	On stackable precast block foundations (standard) or with special foundations on adequately load-bearing existing platform, foundation on anti-frost layer ≥ 80 cm with 0/45 mm, permissible design ground pressure ≥ 200 kN/m²
Inner earthing	No earthing required	Steel elements are earthed to each other, including railings and lamp posts
Construction suitable for	Installation with two-way excavator, retrofitting of guide strips for the blind and danger zone hatching, reduction of work in danger zone Projection of 10–15 cm over load-bearing support (e.g. platform edge) possible	Very quick installation (140 m in approx. 5–6 layers), environmentally friendly alternative to wooden platforms with coating, as it is 100 % reusable
Approval	Operator approval	Operator approval



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modula® type 1 and 1b – the TT slab

modula® type 1 – free-standing outdoor platforms

The classic among all platform types is a free-standing outdoor platform, usually with a precast shallow foundation. The TT slab construction used for this offers valuable structural advantages and allows large spans of up to 9.0 m. Moreover, the system consists of just a single component, making it very quick to install with little adjustment work and few fastening accessories.

modula® type 1b - backfillable outdoor platforms and centre platforms

The backfillable platform with flush walkway on the side facing away from the track requires no rear guardrail and can also be used with a conventional middle core filling as an island platform.

Advantages of both systems

- Element length type 1: up to 9.30 m infinitely variable, depending on height
- Element length type 1b: up to 8.40 m infinitely variable, depending on height
- Platform width: up to 3.00 m infinitely variable (in exceptional cases up to 3.50 m)
- A maximum truck unloading is achieved with an element weight of 2 x 12 t (24 t)
- Individual dimensions can be planned variably for all modes of transport
- Factory-integrated guide strips for the blind and optional danger zone hatching

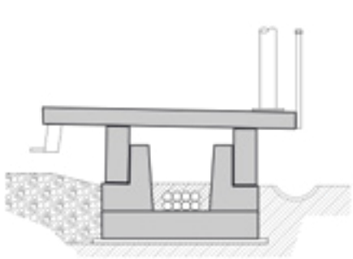
Foundation variants and raising with modula® shift

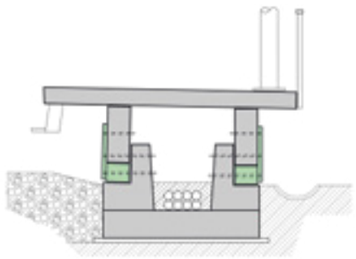
modula® foundation variants

- Shallow foundations with precast foundations, some with additional in-situ concrete slab for load distribution depending on the subsoil
- Deep foundations with bored piles or driving girder with precast or in-situ concrete head beam
- Deep foundations with bored piles or driving girder with precast or in-situ concrete head beam

modula® shift – the system for subsequent height modification of modula® platforms

For applications in which the final height level has not yet been established at the time of building the platform, modula® shift offers a highly economical solution for free-standing platforms. The boarding level can be subsequently raised or lowered using concreted steel toes or precast concrete spacers, ensuring barrier-free boarding.





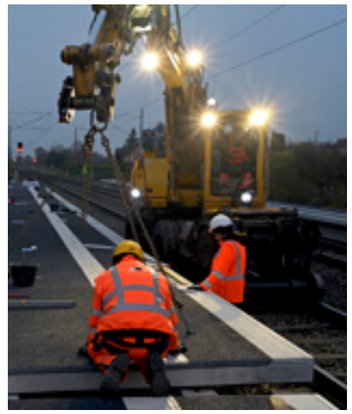
Advantages of the modula® shift system

- Completed within a very short construction time
- Significant cost advantage, as all components can be reused and there are no disposal and landfill costs
- If railings or other superstructures are installed separately on individual elements, there is no need for disassembly and reassembly when changing the level

modula® light

modula® light – the detached platform system with max. element weights of 4.0 tonnes

Thanks to its reduced dimensions, the 16 to 30 cm thick modula® light is particularly lightweight, making it ideally suited for installation with small lifting equipment, such as two-way or wheeled excavators. The elements can be mounted on various substructures, consisting of foundations, precast longitudinal beams or steel girders.
Depending on the subsoil conditions, the foundation can be deep, shallow or installed directly on the existing platform surface (for platform raising). The system is suitable both for new construction projects and for upgrading existing platforms.



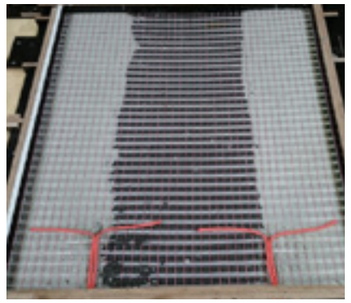
Advantages of the modula® light system

- Can be used for short track possessions and poorly accessible installation sites
- Factory-integrated guide strips for the blind and optional danger zone hatching
- Quick installation with two-way excavator possible
- Various substructures possible (reinforced concrete beams, individual foundations, steel girders, etc.)

modula® flex

modula® flex – the innovative system for surface rehabilitation and retrofitting of guide systems for the blind and danger zone hatching, as well as for raising conventional platforms with an excessively low boarding level

modula® flex – the innovative system for surface rehabilitation and retrofitting of guide systems for the blind and danger zone hatching, as well as for raising conventional platforms with an excessively low boarding level zone hatching can be produced as a cast in concrete or by means of glued-in tiles. The system is installed on a prepared fresh concrete bed that is applied directly over the existing platform at the exact height required. This eliminates both dismantling costs and costs for soil replacement or landfill waste. The system can easily be installed using a two-way excavator or even a mini-excavator. The standard slabs are designed for platform widths e.g. of 2.50 m, 2.75 m or even 3.00 m (as a complete platform surface covering) or in a width of 1.20 m (as a supplementary slab with platform edge, danger zone hatching and guide strips for the blind). The element lengths of the components are 1.35 m. Special widths are also possible on request.



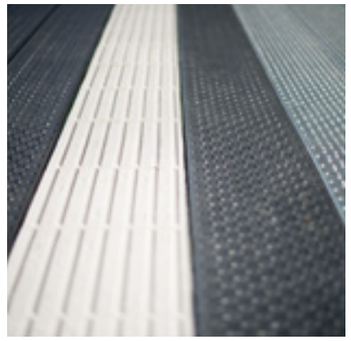
Advantages of the modula® flex system

- Distinct advantages due to textile reinforcement:
  - Low component weight due to extremely slim elements
  - No earthing required
  - Non-corroding reinforcement
  - Local adjustment cuts (e.g. manhole covers) can be made quickly and easily
- Flexible use for platform renovation and raising
- After installation, further surfacing work can be carried out outside the danger zone (reduced costs for safety equipment)

modula® temporär

modula® temporär – the rental platform for temporary use

If the period of use of a platform is already expected to be limited at the time of construction, temporary platforms can be used, for example, as a makeshift platform, as an additional stop (e.g. for trade fairs and events), or as a temporary platform extension or elevation. Temporary steel platforms from HERING can be rented individually for the necessary period of time. The scope of services includes delivery and assembly of the elements, as well as storage, rental, and dismantling. The reusability of the standard components saves valuable resources. The elements are available with a length span of 5.00 m and in standard widths of 2.50 m to 3.00 m (generally 2.50 m wide). The entire construction is hot-dip galvanised. The surface consists of perforated sheet steel gratings with a slip resistance of R12. Rainwater can simply drip through the perforations, making additional dewatering necessary. Railings are supplied as standard and are attached to the steel structure of the modules as a plug-in system. Lighting masts, weather shelters, stairs, and ramp elements can also be integrated as needed.



Advantages of the modula® temporär system

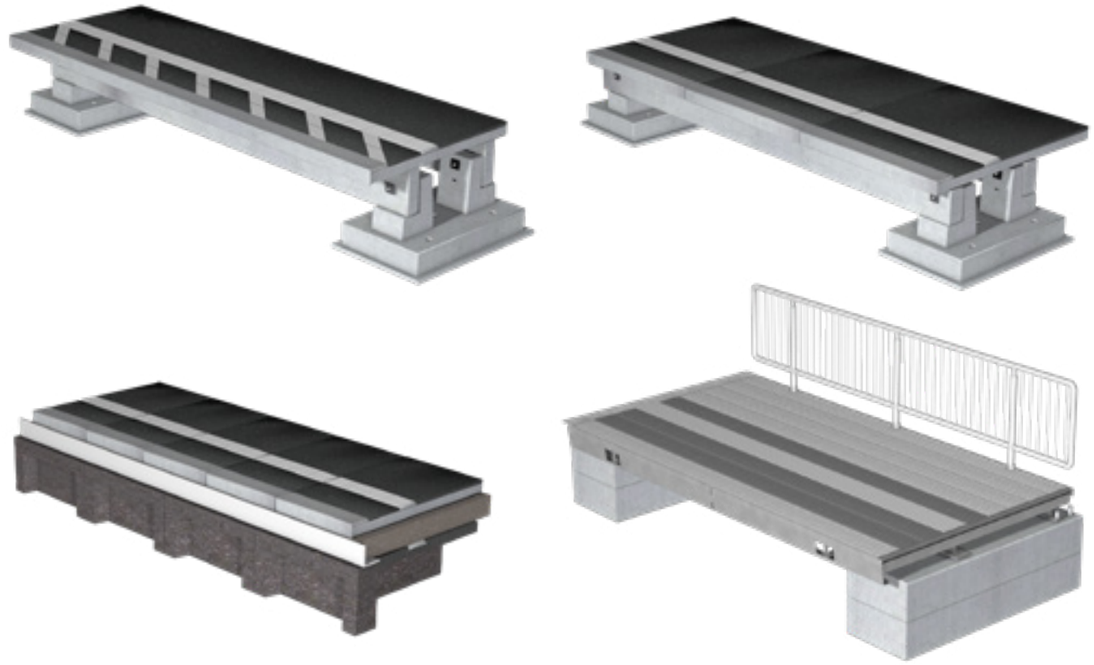
- Solid, weatherproof, and maintenance-free construction
- Very quick installation (140 m in approx. 5 layers)
- Simple plug-in system for fastening railings and lighting masts
- All boarding levels possible
- No water drainage necessary thanks to flat drainage system
- Environmentally friendly alternative to wooden platforms, as it is 100 % recyclable.
- EBA type-approved system
- Operator approval by DB S&S

Digital planning catalogue | BIM | Revit

HERING Bau provides planning and engineering offices with the system documents required for draft planning, such as standard sections, overviews, and details, as well as specifications of work and services.

HERING also provides solutions for projects, variant comparisons, and cost estimates for modular system solutions with no charge and no obligation.

Sample plans for the various modular platform systems, including fixing details, e.g. anchor baskets for lighting masts and installation parts for railings, are also provided for planning purposes. Revit families for planning in BIM are available on request.



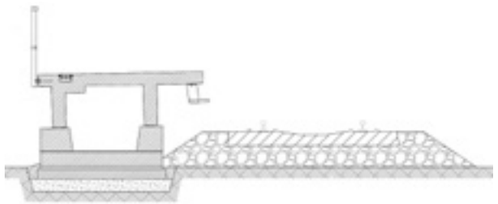
Resource comparison modula®
vs. conventional without rear guiding

Resource conservation and the reduction of CO^2 emissions are among the most important criteria of modern construction, along with design, economic, and construction time aspects. Especially when it comes to the construction of new transport stations or platforms in the network of DB Station & Service AG, modular concepts with precast concrete elements such as the modula® system from HERING offer great potential over conventional construction methods.

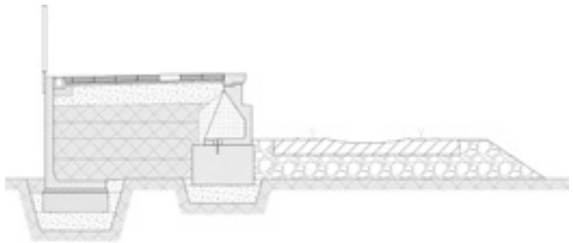
In a direct comparison of resources and masses, the system modula® precast concrete platform from HERING beats the competition thanks to its high degree of precast elements, absolute mass advantages due to in-situ concrete, hollow inner core, and the resulting elimination of backfill materials such as earth, chippings, and track ballast – with ballast only used as frost protection for the foundation (see Fig. 2).

Mass comparison of precast concrete platform system modula® and conventional platform edge construction method

modula®



Conventional



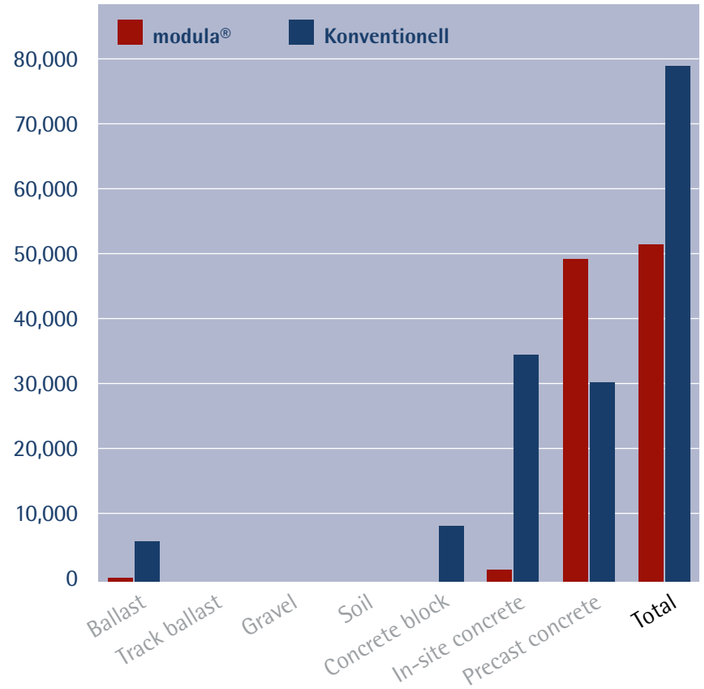
Material	modula®	Conventional	modula® advantage
Ballast	12.6 m³	175.2 m³	-162.6 m³
Track ballast	0 m³	38.4 m³ (removal)	-38.4 m³
Gravel	0 m³	12.3 m³	-12.3 m³
Soil	16.0 m³ (removal)	124.3 m³	-108.3 m³
Concrete block / paving	0 m³	24.5 m³	-24.5 m³
In-situ concrete	9.3 m³	159.7 m³	-150.4 m³
Precast concrete	111.7 m³	68.8 m³	+42.9 m³

Fig. 2 Mass comparison of precast concrete platform modula® and conventional platform edge construction method

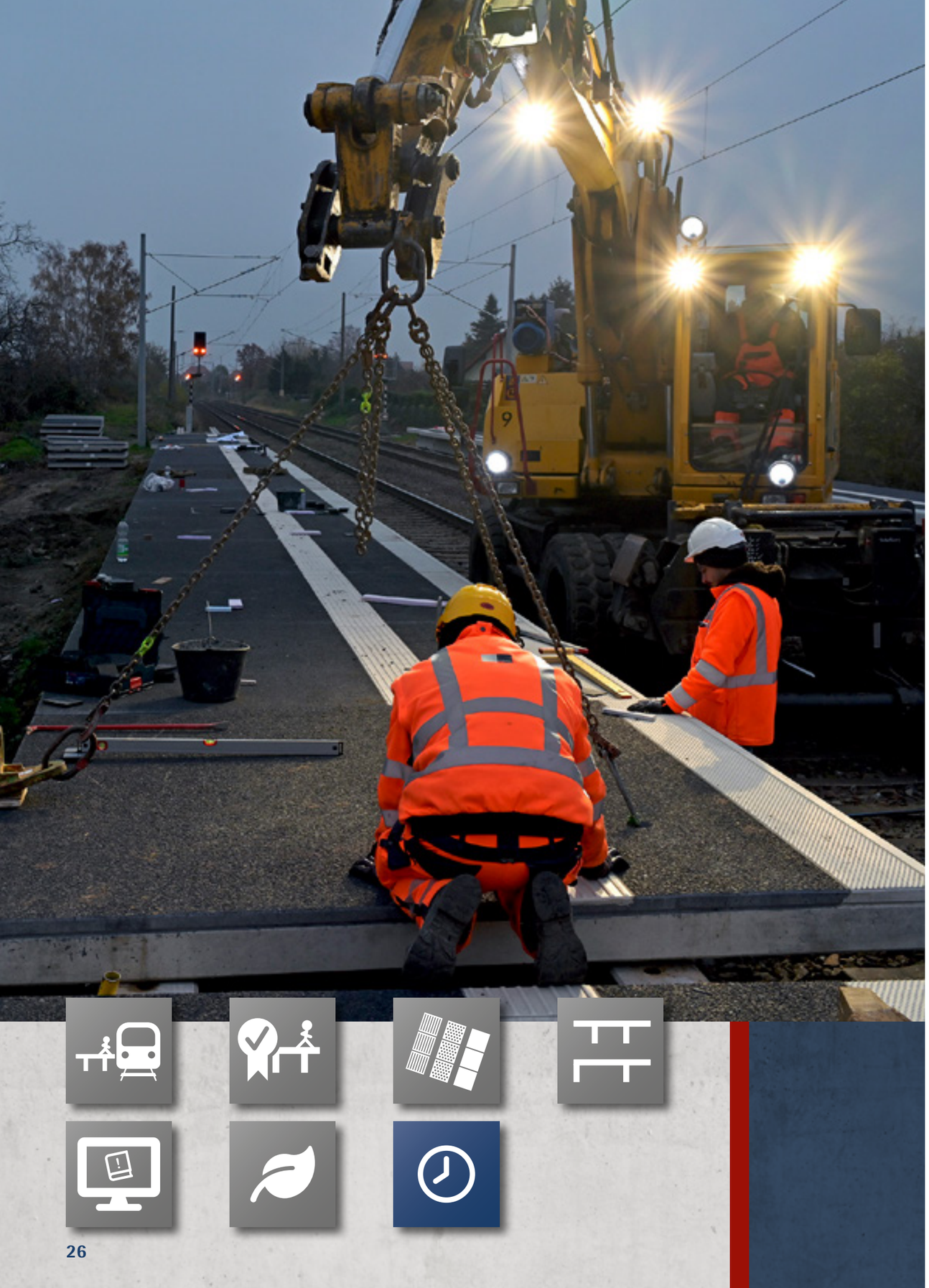
Eco-balance comparison over the entire life cycle between precast concrete platform modula® and conventional BSK construction method

The direct comparison of carbon emissions confirms the potential of modular precast concrete platforms in the field of sustainable construction. A running metre of platform according to the construction standard of DB-Station & Service AG was chosen as the carbon equivalent for the life cycle assessment comparison. While conventionally constructed platforms emit 78 t of CO2 equivalent over the entire life cycle, modular precast concrete platforms of the modula® type emit only 52 t CO2 equivalent.

A saving of 26 t CO2 with modular construction results in particular from the high degree of prefabrication, absolute mass advantages due to in-situ concrete, and the elimination of backfill materials.



Preparation of the life cycle assessment according to DIN EN 15804 (binding data basis for the Sustainable Building Assessment System (BNB)) and DIN EN ISO 14040 or DIN EN ISO 14044



Comparison of construction times modula® vs. conventional

To determine the construction times in a direct comparison between modular and conventional platform edge construction methods, the new construction of a centre platform with a length of 405 m and a width of around 15 m in 3 phases as well as nightly track possessions of 6 hours and a net working time of 5 hours per shift is assumed as a case study. Phases 1 and 2 describe the construction of the two platform edges in a width of 3 m with a modular and conventional construction respectively, with subsequent commissioning. Phase 3 describes the construction of the central core area, which is executed conventionally in both variants and is therefore not considered for the comparison, as there are no differences in the construction method.

The table shows the duration of the construction of a platform in both construction methods. As the comparison shows, the modular construction eliminates 53 shifts of the total construction time. This difference is mainly due to the prefabrication of the prefabricated platforms and the faster assembly. Thanks to the precise planning and prefabrication, the foundation at the platform is carried out on punctual precast concrete foundations, which bring time advantages compared to conventional construction methods, especially in the case of new platform construction, and reduce closure pauses to a minimum.

Differences in the execution time with modular and conventional construction

	Modular construction	Conventional construction	Difference
Procedures	Duration [d]	Duration [d]	Duration [d]
Technical processing	25	15	+10
Precasting	40		(-40)
Longitudinal track extension		8	+8
Earthworks for foundation preparation	7	13	-6
Installation of foundations including subbase, earthworks	13	11	+2
Longitudinal track removal		2	-2
Cable construction	10	15	-5
Platform superstructures	11	44	-33
Restoration of the faulty track position		2	-2
Duration of overall platform construction	70	123	-53

HERING®
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