



ROMEX® - ISATEC®

System solution for large-format slabs and pavers made of natural stone or concrete

ROMEX®



The new system: ROMEX® - ISATEC®

Implement projects safely

For over 30 years, ROMEX® has been a globally successful family business with excellent, award-winning products - especially for the public sector. Innovative solutions and sustainable systems secure your paver projects. We are your reliable project partner for the renovation and re-design of inner-city squares and traffic areas with ROMEX® products, which have proven themselves thousands of times over.

These products include the high-quality 2-component paving grouts, quick-hardening repair mortars, decorative solutions for binding aggregates and our displacement protection system, which is unique on the market ROMEX® - ISATEC®.

I Innovative
S Special grout
A Anchor
TEC Technology



ROMEX® is a pioneer in the field of displacement protection for large format slabs and pavers made of natural stone or concrete. Years of development work with experts from the road construction industry make our system solutions unique in their kind and offer the best protection.

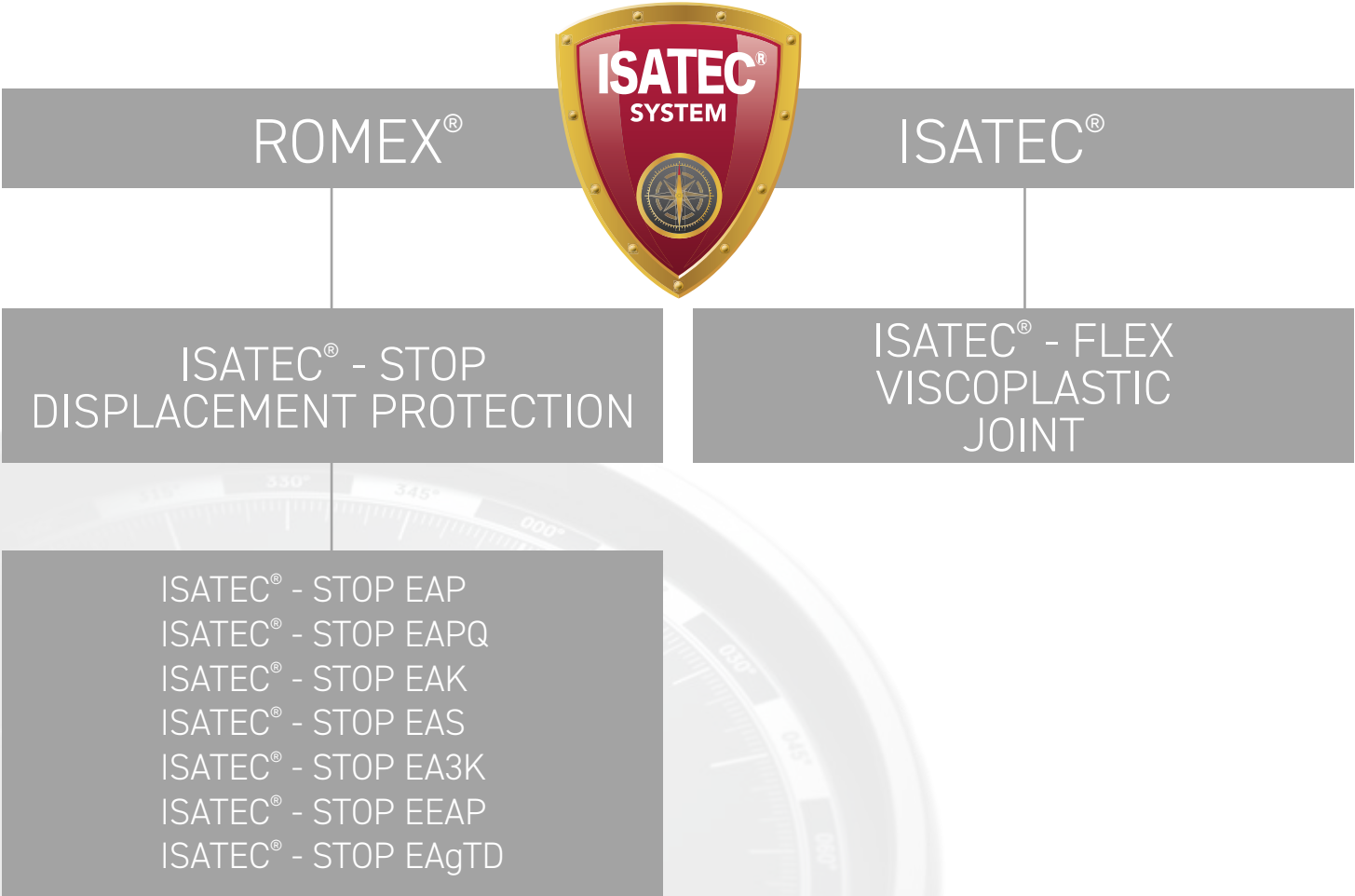
In order to secure particularly stressed traffic areas and prevent displacements, ISATEC® - FLEX is installed as a visco-elastic joint filler system with the displacement protection ISATEC® - STOP (Bk3.2 RStO 12).

ISATEC® - FLEX is viscoplastic, water-permeable and complies german regulations (see page 19). It is the first and only viscoplastic special joint mortar on the market which, due to its outstanding technical properties in the sense of the SLG Code of Practice on concrete slabs for trafficable traffic areas (January 2021), works as a jointing from 5 mm joint width

for the upper 30 mm. To prevent the displacement of joint material, e.g. due to traffic load, use of vacuum sweepers or fast-flowing surface water, special grout should be used. This protected project solution, including a ROMEX®-SYSTEM GUARANTEE (RSG), is only available from ROMEX® in this form.

It is not only the corresponding axle transitions that are important. The towing curves of vehicles must also be taken into account. In projects, there are always areas that are exposed to particularly high loads. These include turning points, gradient and stop sections, entrances and exits, bus stops, fixtures, cross joint bracing, etc.

When planning traffic areas that can be driven on, the expected load must be correctly assessed from the outset.





Problem



Large-format slabs and pavers made of concrete or natural stone

Inner-city traffic areas, such as pedestrian zones, city squares and other prestigious design areas, are increasingly exposed to heavy traffic. When designing these areas, large-format slabs and pavers are increasingly being used.

Sweeping and cleaning vehicles drive in the pedestrian zones, and there is also delivery traffic. Hotels and restaurants have increased bus traffic. Markets and festivals are held in city squares, which in turn lead to increased visitor traffic. These festivals are often also accompanied by fairground rides. These are huge, steel constructions that move in action.

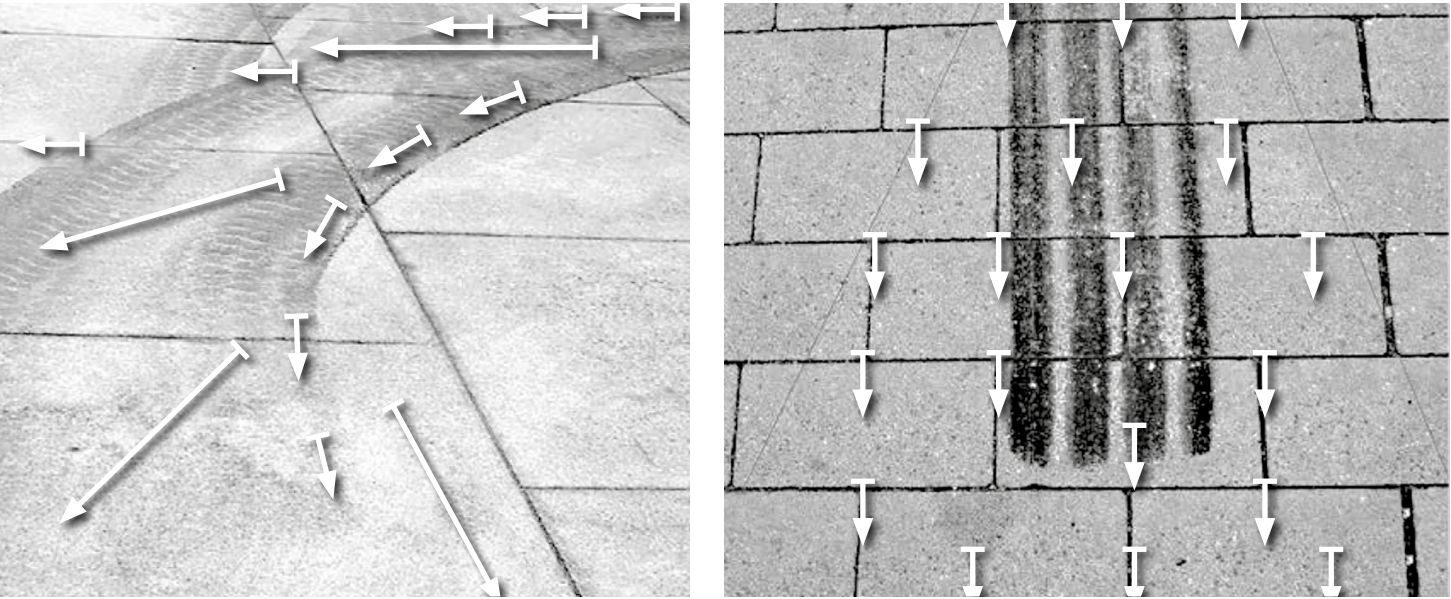
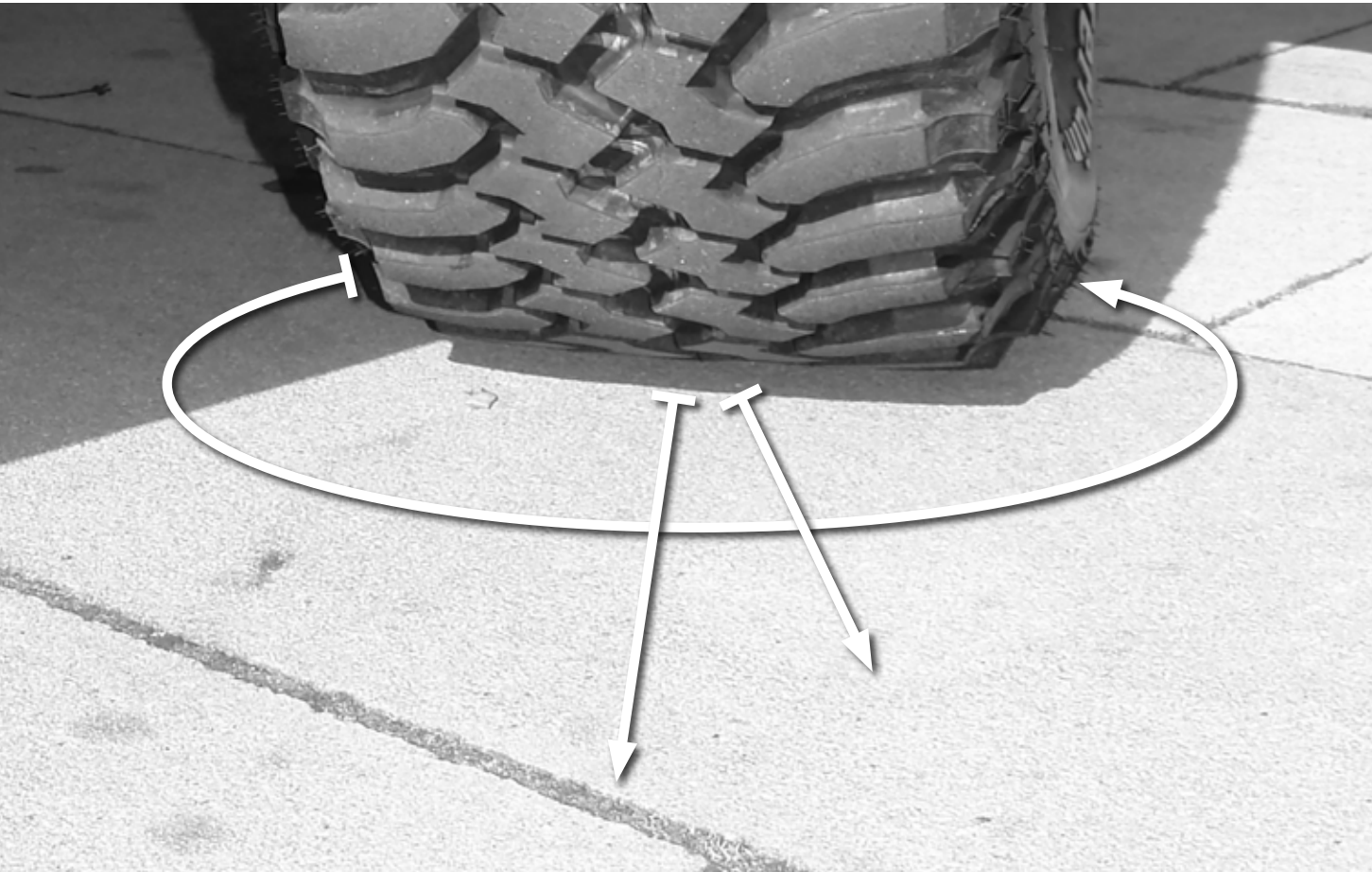
The resulting forces act on the paving material. The delivery and removal of fairground rides by articulated trucks and heavy goods vehicles also has a huge impact on the surface despite the relatively low speed of these vehicles. The assembly of mobile cranes results in enormous point loads on the pavers. Undesirable displacements, which can occur in particular with unbound pavement, should be prevented at all costs.

Engineering and planning offices had relatively few means for solutions at their disposal to avoid the aforementioned damages and to additionally secure their projects against postponements. Although the problem has been known for a long time, very elaborate methods were used to try to include additional safety. Steel rails, deep shelves or gearing cams were the main protective measures known and used so far.



A displaced surface causes damage and results in visual defect. A broken panel also means a damaged surface. Ultimately, the functionality of the entire surface is impaired.

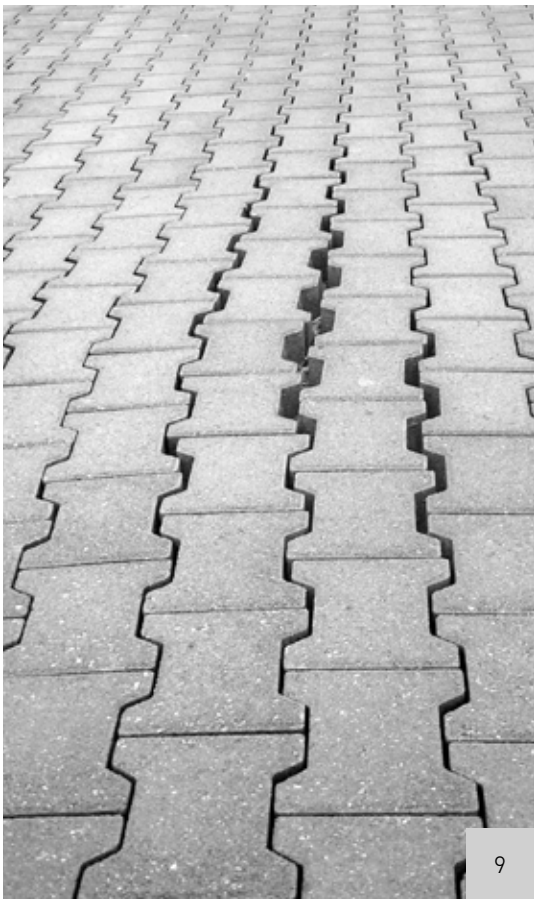
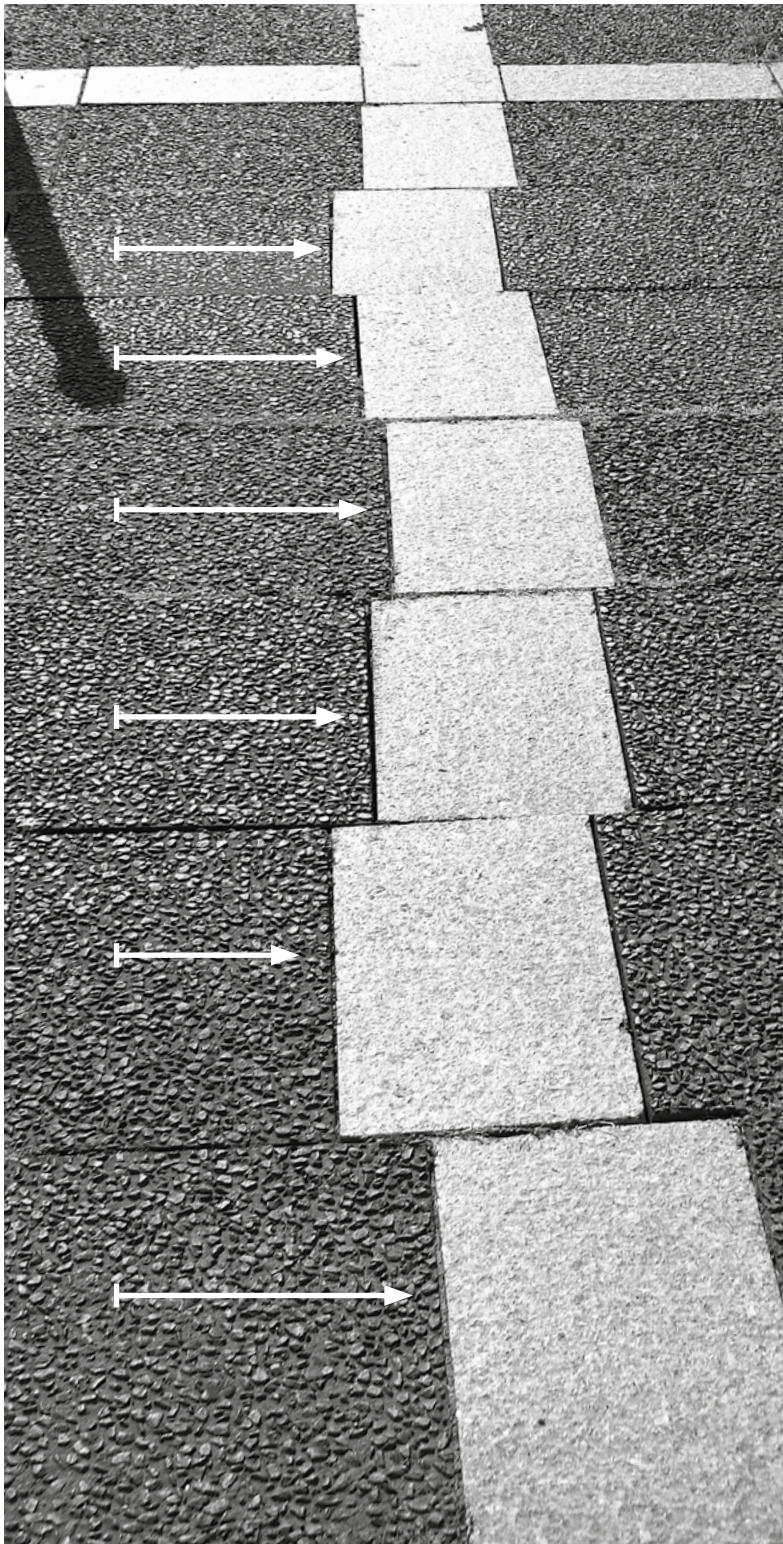
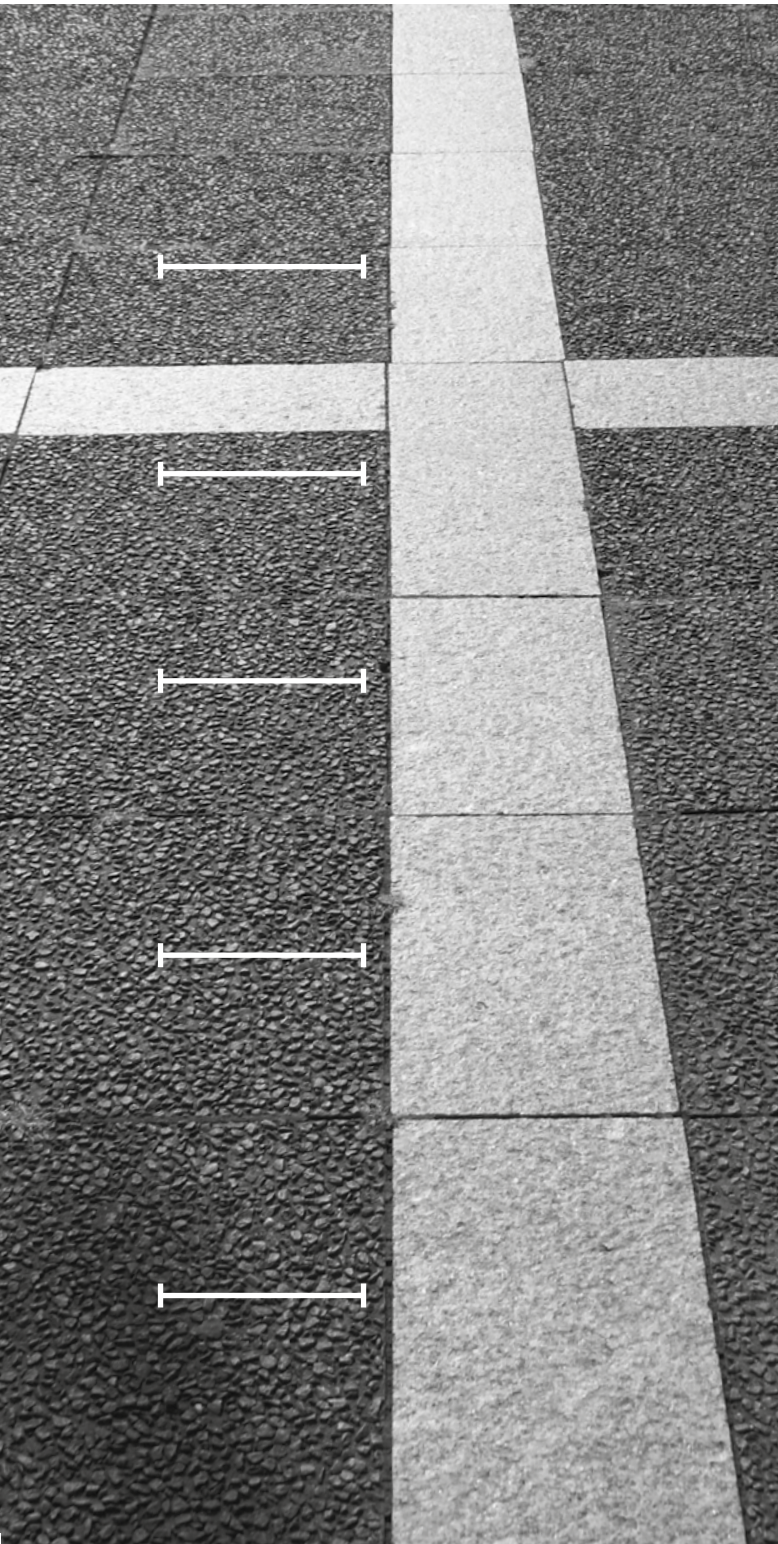
To avoid trouble, additional costs and wasted time, it is important to prevent such damage as much as possible.



Heavy vehicles in motion develop high static and equally high dynamic forces.

Newly built area WITHOUT displacement protection

Damage caused by dynamic forces





Solution





Displacement protection is immensely important for planning and execution of paver installation

Surfaces under traffic load (VB) must be provided with protection against displacement (source: Forschungsgesellschaft für Straßen- und Verkehrswesen FGSV). Displacements are damaging and influence the functionality of the entire traffic surface. In addition to the correct **dimensioning of the superstructure**, it is important to protect areas which are at risk. Only these areas are given separate **displacement protection with ISATEC® anchors**. In addition to displacement, the upper area of the joints is subject to constant danger of being worn out. A lack of joint material weakens the entire system. A permanent **joint sealant** provides the necessary safety.

Dimensioning

Studies by the industry and the research community show that slabs under traffic load must be dimensioned accordingly. RStO 12 bases its calculations on axle loads of up to 10 tonnes. With modern heavy goods vehicles, these can even be as high as 11.5 tonnes. Not only do high dynamic driving forces occur here, but also high static forces due to the dead weight of the heavy vehicles having to be absorbed. In specialist circles, this is referred to as "inclined-train main tension". Consequently, not only the fracture behaviour of the panel but also the problem of displacement must be taken into account at the same time when calculating dimensions.

Displacement protection

An additional displacement protection for slabs and pavers, for surfaces in the unbound version, counteracts the dynamic forces caused by heavy traffic or heavy vehicles, such as buses or trucks, and protects the pavement from shifting. This displacement protection can be achieved by conservative measures such as low shelves, steel rails, etc., or modern displacement protection

Joint filler

A permanent joint closing, in the sense of the current code of practice "Concrete slabs for traffic areas", of the SLG, is produced by the installation of a viscoplastic special grout. This strengthens the bond and thus the overall system by ensuring that the joint material is not worn out and can permanently fulfil its load-bearing function. A viscoplastic joint is optimal as this can absorb slight settlement processes such as those which still occur at the start of use.





When planning, the expected load must be correctly assessed right from the start. It is not only a question of the corresponding axle transitions, but also of the towing curves of the vehicles. This means that the course of movement on the surface to be planned should be simulated. This makes it clear which movement profiles the vehicles generate on the surface.

To prevent the panels from breaking and shifting from the outset, the bond, slab thickness and superstructure must be selected and executed accordingly. In practice, however, temporary overloads occasionally occur during prolonged periods of use.

In order to be able to better manage this problem, the FGSV Cologne (Research Association for Roads and Transport) has published the MFG information sheet. It contains guidelines for the planning and execution of large format slabs made of concrete and natural stone, as well as solutions for preventing damage caused by displacement. Special attention is paid to heavily loaded areas, such as turning points, sloping sections, stopping sections, driveways and exits. Special measures must be taken to prevent displacement.

For the most diverse areas of application, the **SYSTEM ROMEX® - ISATEC®**, with versatile displacement protectors, for almost all types of bracing, including herringbone bracing, as well as a viscoplastic, water-permeable and standard-compliant joint filler was developed.



Planning

The planning of a project with large formats under traffic load must meet the requirements that the deformation of the base courses and breaking of the slabs is excluded. Nevertheless, temporary overloading of the traffic areas occurs again and again. This is not always foreseeable during the planning stage. The elements must be planned and arranged in such a way that the expected traffic loads can be absorbed without additional measures. Changes of use, increase in axle crossings or changes in traffic routing can be made during existing conditions. For these reasons, it is only prudent to take additional measures to prevent damage in any form. The problem solver: The ROMEX® - ISATEC® system.

The development of our SYSTEM ROMEX® - ISATEC® has opened up completely new possibilities to provide additional protection in the areas at risk. The systems are completely flexible and can be used for almost all formats and situations. They can be variably be installed in the rows to be secured. The securing anchors against displacement are only to be installed at the particularly at risk areas.

Only in the case of large formats in a cross-joint bond under heavy traffic load should a full-surface displacement protection be taken into consideration. This is also a result from the important note from DIN 18318-2009 („Cross-joint bonds under VB should not be used, they tend to shift“).

The joints predefined by the ISATEC® - STOP ensure a minimum joint width, which guarantees a functional joint when using standard-compliant joint. In addition to the additional protection of the entire surface by absorbing shear forces, the viscoplastic special joint mortar ISATEC® - FLEX ensures that the joint material remains in place for a long time and for a permanently attractive joint appearance (available in three different colours) and, due to its water permeability, reduces excessive surface water.

Scenario

Through the use of ISATEC® - STOP the construction company has the possibility to ensure a speedy construction process. The installation of the conservative displacement protection (low shelves, steel rails, etc.) has a disruptive effect on the curing time of the concrete and construction schedule. Due to natural tolerances that occur and are permissible, additional cutting and adjustment work is necessary.

When using ISATEC® - STOP, these considerations are omitted completely. Even if the already installed surfaces are dismantled, the displacement protectors can be removed and re-installed without any problems. A displacement lock cannot be used more optimally than this.

The comprehensive range of displacement protections oriented to the laying bracings means that the corresponding special displacement protections can be used in an overall project with different bracings. The exact assignment of the hazardous areas is used to decide which ISATEC® - STOP displacement protection is best used in which endangered area. Only a continuous displacement protection row forms a corresponding abutment in the bond. Depending on the assessment, the displacement protection row must be inserted repeatedly in the bond or in the hazard section.

Hazardous areas are:

- Stopping distances
- Turning points
- Downhill sections
- Curved areas, etc.

Experience and craftsmanship

Despite the extensive scientific and technical documentation in road construction, one of the most important factors is the craftsmanship. Unfortunately, it is often observed on construction sites that e.g. unskilled or semi-skilled workers are paving. This creates the risk that the required standards are not observed and implemented.

For example:

- Press laying
- Wrong bond
- Bedding too thick
- Filter stability/bedding/joint material
- Insufficient slope, E - module, etc.

Ruts, displaced pavement and waterlogging are also only the “tip of the iceberg” in terms of damage. Thus the principle applies: Craftsmanship and the implementation of the specifications from the regulations guarantee the long-term and durable functionality of the construction.





ISATEC® - STOP

Safety displacement protection for paved areas

Corresponding displacement protections have been developed for every type of dynamic load. With the special range of ISATEC®- STOP displacement protections, damage is avoided in the long term.

The bending of these metal constructions ensures three functional properties. A forced joint of 8 mm | $\frac{3}{8}$ " is secured. The horizontal support surface absorbs the dead load of the covering material and thus ensures the fixation of the displacement protection. The vertical bends penetrate into the bedding and base layer. This prevents the structure from shifting under traffic loads.

Proceed according to the ROMEX® instructions. The displacement protection should only be used in the hazardous areas foreseen by the design. The anchoring points are to be taken from the construction drawing or the installation plan. The ISATEC® - STOP safety anchors are to be driven down to the bedding with an approx. 1400 g. hammer down to the bedding level. After the displacement protection has been inserted, the joints can be filled. Always secure a complete continuous row. The laying algorithm is chosen depending on the expected axle crossings or the expected trailing curves of the heavy traffic. By using a vibratory plate on slabs or large pavers, the earth anchors are additionally driven into the superstructure. When using concrete slabs with moulded on cams, the ISATEC® safety anchors must be positioned in the existing spaces.

The displacement protection is a metal construction made from a separate steel alloy with additional hot-dip galvanising and powder coating.

- Steel grade: cold rolled plate, special tempering
- Corrosion protection by hot-dip galvanising min. 10µ
- Powder coating min. 80µ
- RAL ED40043

Properties

- Hot-dip galvanised
- Special alloy
- Oil-hardened
- RAL colouring
- Cam formation



ISATEC® - FLEX

Tough elastic special grout for upper joint filling

The viscoplastic and water-permeable special grout ISATEC® - FLEX has optimal functional properties. The mortar compensates for the movements of the covering that occur in unbound construction of the pavement. Due to the high level of flank adhesion, flank cracks are virtually avoided. The functionality is not impaired by individual hairline cracks. The filling with the flexible joint seal should be approx. 3 cm | 1 $\frac{1}{4}$ ". The minimum joint width is set at 5 mm | $\frac{1}{4}$ ". Joint irons should be used to ensure that the joints run evenly. The bedding and jointing material should ideally consist of a mineral mixture of 0/8 mm | 0 $\frac{3}{8}$ " crushed sand-chip mixture (hard stone). It should be certified and comply with the standards.

If the bedding and joint material have different grading curves, the filter stability must be ensured. Deviating grading curves must be declared and confirmed separately by the contractor.

Advantages of joint sealing with ISATEC® - FLEX

- No rinsing
- No washing out
- No weed growth
- Water permeable
- Frost and de-icing salt resistant
- Bk3,2 RSt0 12 (in the system with ISATEC® - STOP)

The colour shade is determined by sampling. When using ISATEC® - FLEX a short-term colour intensification of the stone surface can be seen. However, the synthetic resin film and the associated colour deepening disappear after a few months due to natural weathering and stress.

Supplementary regulations

- ZTV path construction, 2013
- DIN 18318, 2019
- ZTV Pflaster STB 20
- M FG (Code of practice for pavements with large formats, 2013)
- SLG Merkblatt Plattenbeläge aus Beton für befahrbare Verkehrsflächen, january 2021





Technology





ROMEX® - ISATEC® - SYSTEM for load class Bk0.3 to 3.2



For unbound construction of pavement and slabs from load class 0.3 according to RStO 12.

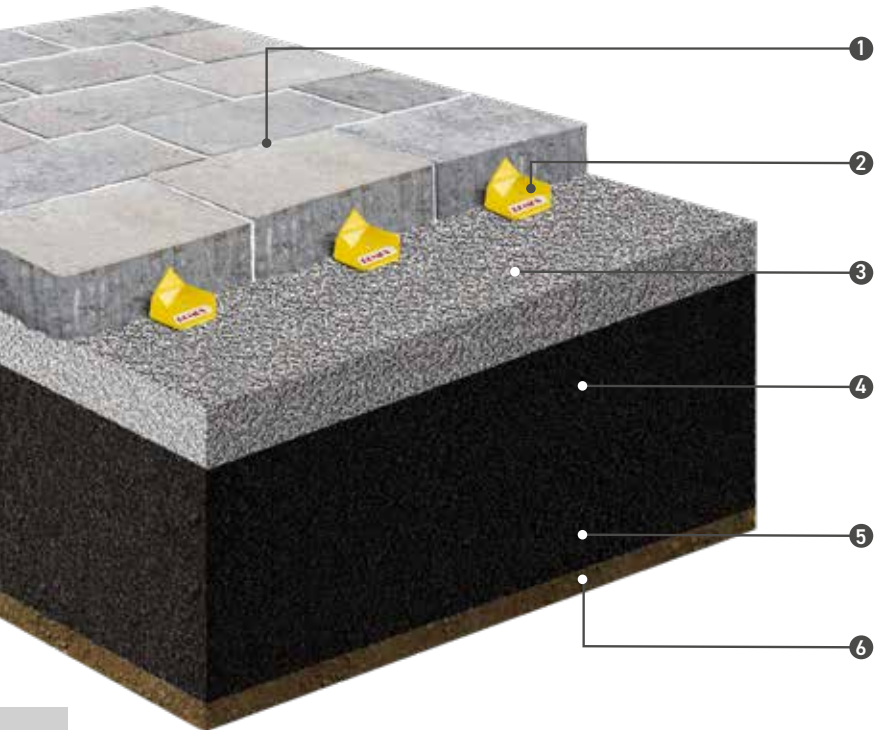
Load class Bk0.3 to 3.2



and special cases such as bus stations and bus stops as well as roundabouts. Passenger car traffic including a low proportion of heavy goods vehicles up to 65 buses/day, e.g. commercial streets, main shopping streets, local shopping streets, as well as increased heavy traffic up to 130 buses/day, e.g. local access roads.

Minimum requirement for fasteners/surface covering:
Minimum nominal thickness (stone height) = 100 mm | 4"

Special cases such as bus stations and bus stops as well as roundabouts:
Minimum requirement for fastening elements/surface covering:
Minimum nominal thickness (stone height) = 120 mm | 4 3/4"



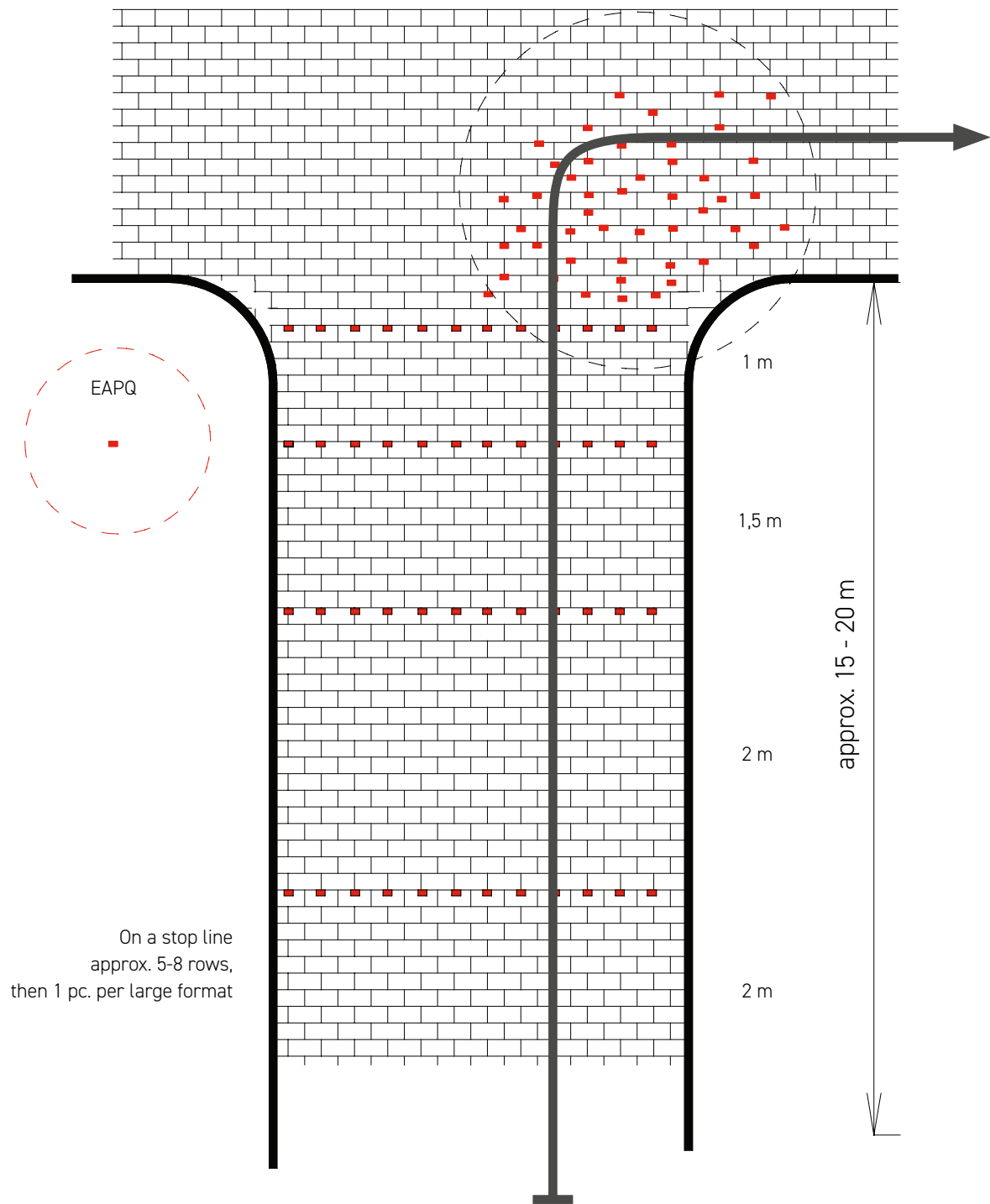
- 1 ISATEC® - FLEX
Joint filler 3 cm | 1 1/4" (consumption depending on stone format and joint dimension), minimum joint width 5 mm | 1 1/4"
- 2 ISATEC® - STOP
(Determination of requirements based on site plan and hazard areas)
- 3 Bedding
3-5 cm | 1 1/4"-2" Aggregates
e.g. 0/4 mm, 0/5 mm or 0/8 mm | 0 1/8", 0 1/4" or 0 3/8" according to DIN 18318
- 4 Base course of crushed stone (30 cm | 12 1/2")
or gravel, chippings, sand mixture
EV2= 150 MPa/m² for paving and 180 MPa/m² for slabs for slabbed surfaces
- 5 Frost protection layer of crushed stone (20 cm | 8")
or gravel, chippings, sand mixture
EV2 > 100 MPa/m²
- 6 Substructure/subsoil



Displacement protection lines

Stop area with curve

- Runners' association
- Right-hand turn
- Gate valves
- Gullies
- Gutters and similar

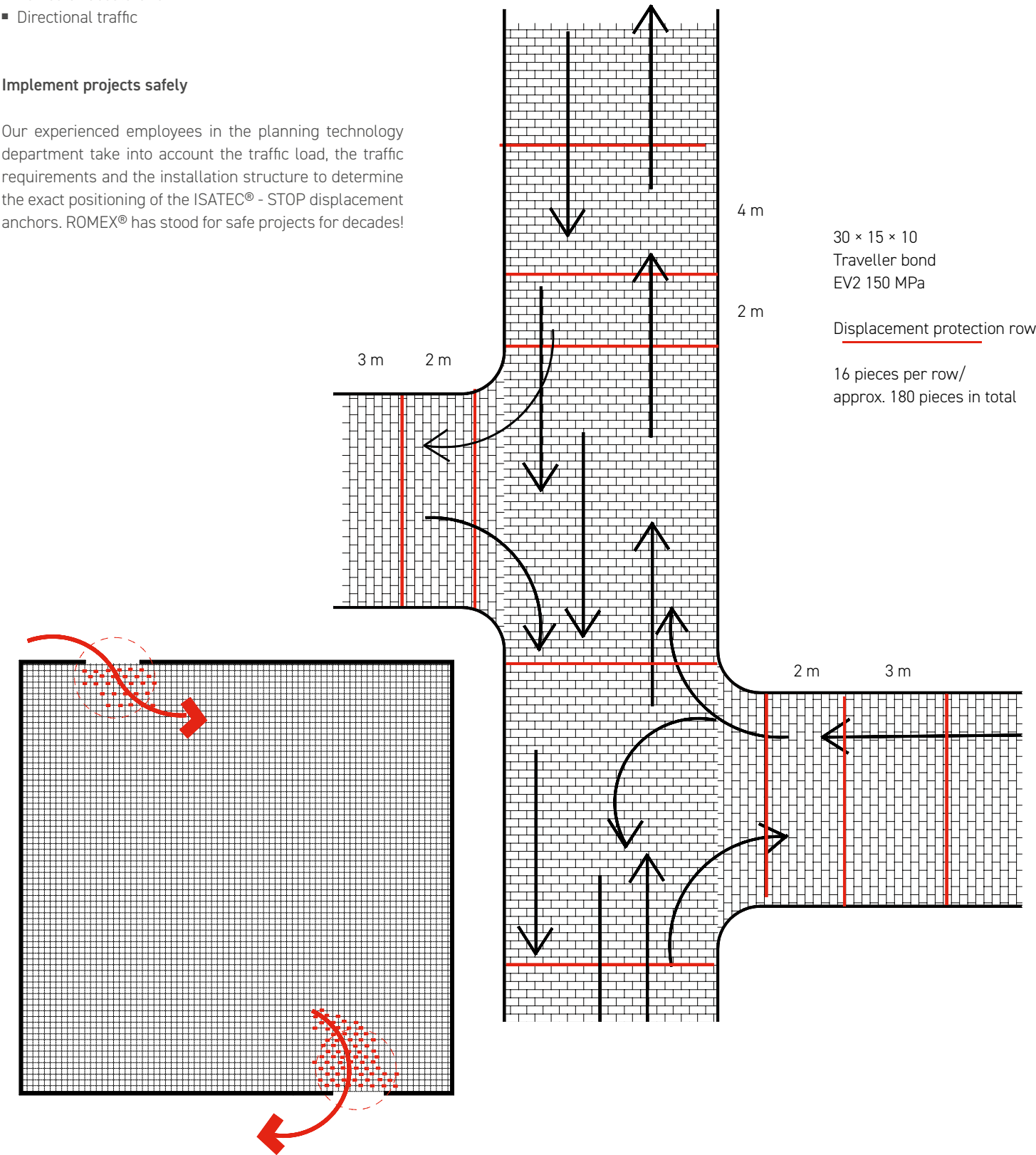


Stop area with bus bay

- Breaking and stopping areas
- Movement profile into the bus bay
- Vehicular acceleration
- Directional traffic

Implement projects safely

Our experienced employees in the planning technology department take into account the traffic load, the traffic requirements and the installation structure to determine the exact positioning of the ISATEC® - STOP displacement anchors. ROMEX® has stood for safe projects for decades!

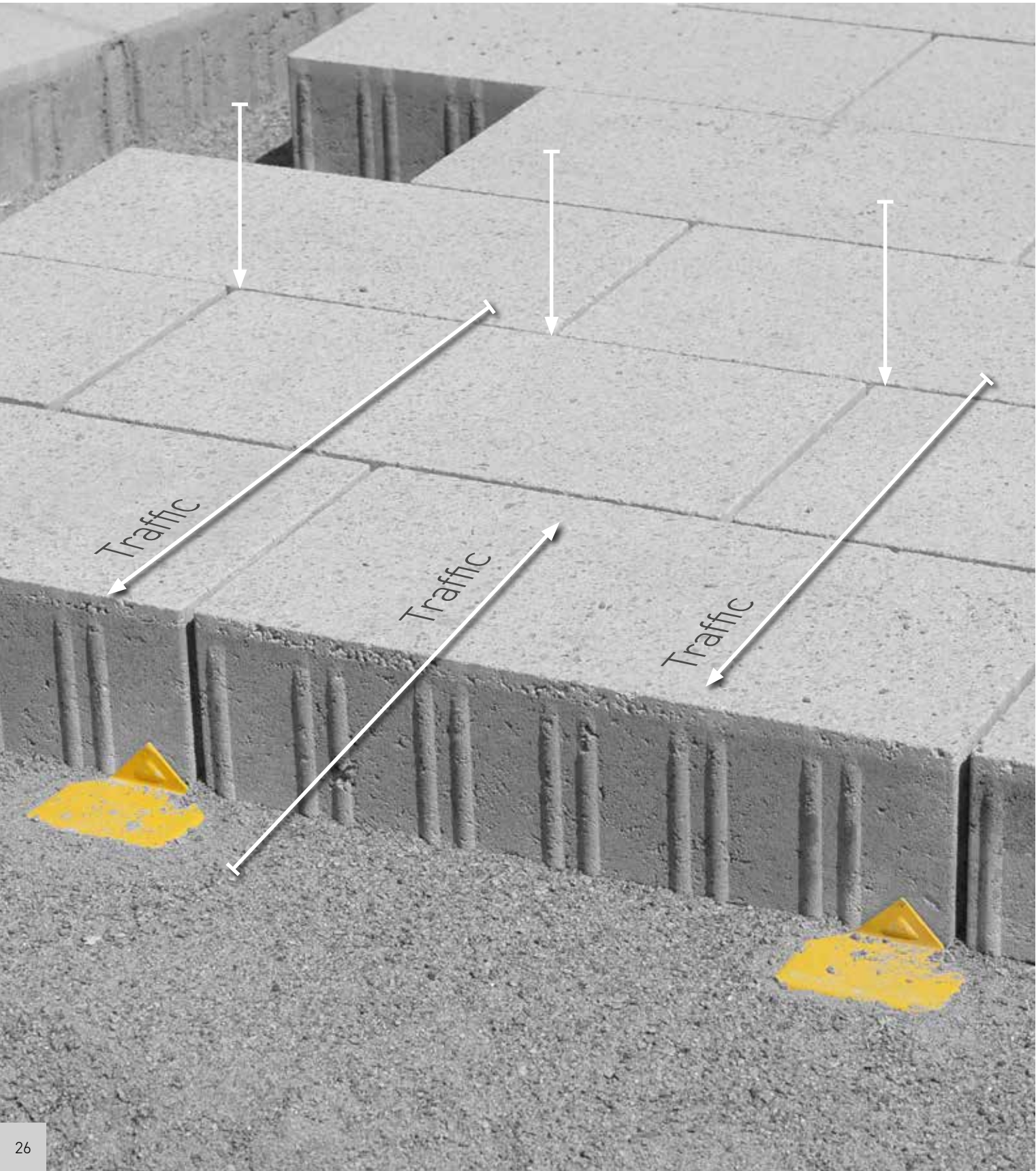




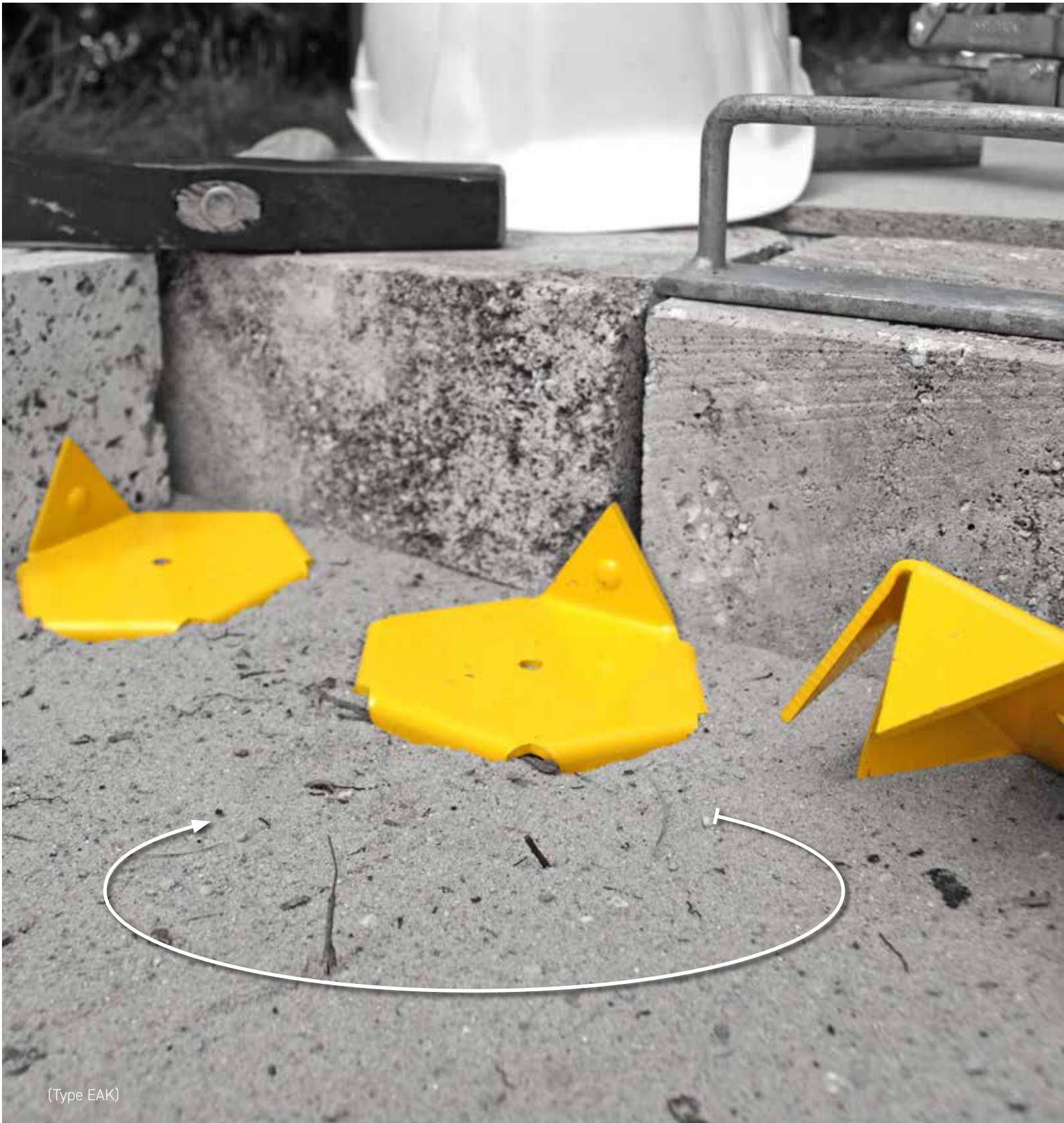
APPLICATION TECHNOLOGY - Linear installation with the displacement protection EAP

The picture shows the most frequently used displacement protection. Particularly the types EAP and EAPQ can be used almost universally. Due to the combination, linear structures can be protected and stabilised very well.

Even when the direction of travel changes (curves), the EAPQ displacement protection type can be used. Due to the upwardly angled corners, these displacement protections can absorb additional forces.



Notes: Torsional forces/turning ranges



For circular movements of heavy traffic, displacement protection type EAK should be used. Due to the crimping in the superstructure (every 60°), shear absorption is possible from any approach angle. This ensures twisting of the stones is avoided. Example of use: "Turning ramp".



Warranty with system





ROMEX® SYSTEM GUARANTEE (RSG)

The ROMEX® SYSTEM GUARANTEE is a competitive advantage for every customer. ROMEX® is the first and only manufacturer in the field of paving and slabbing that offers its customers such a guarantee. ROMEX® means security, especially for specialist companies, who nowadays often give their end customers a five-year guarantee on their construction services in accordance with the construction work.

The ROMEX® BEDDING AND JOINTING SYSTEMS have been used for decades in both the private and public sectors. When professionally installed, ROMEX® offers a SYSTEM WARRANTY of up to 10 years and an average life expectancy of up to 50 years.



ROMEX® ISATEC® GUARANTEE PUBLIC AREAS (streets/paths/plazas)



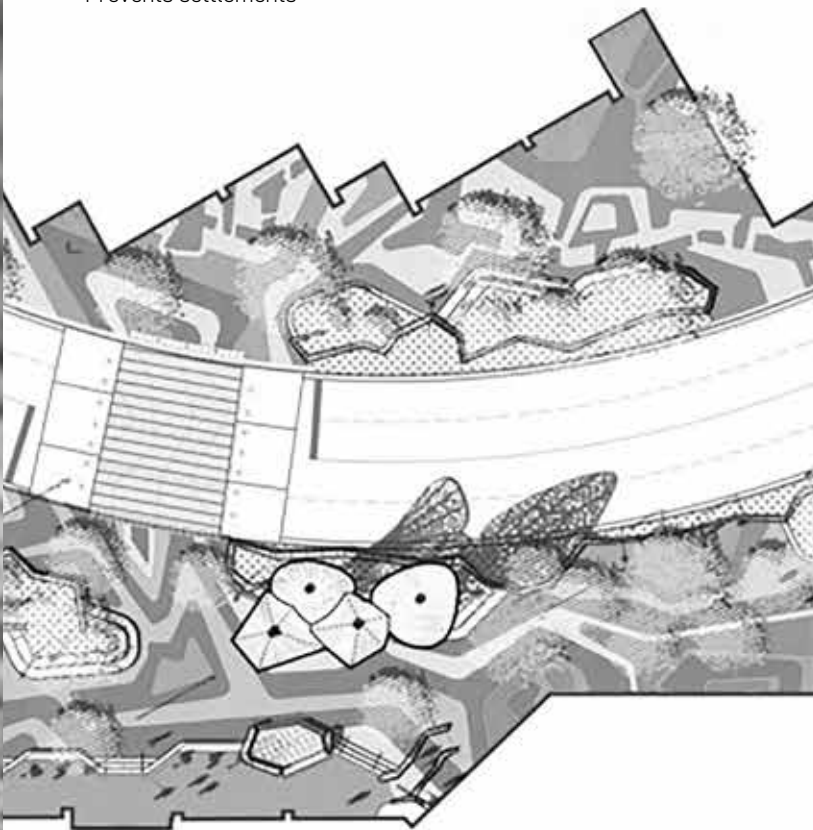
Public areas include paving and slabs on roads, paths and squares. The construction in accordance with the regulations is subject to the requirements of the VOB and the RStO 12. The load classes are structured according to loads. The basis is provided by the equivalent of 10 t axle transitions in the regular period of use. It starts with Bk0.3 (300,000 equivalent 10-tonne axle transitions) up to Bk3.2 (3,200,000 equivalent 10-tonne axle transitions). In addition, exceptional situations are considered separately, for example bus stops, bus stations or roundabouts.

External influences such as frost and de-icing salt, permanent high loads due to torsion and shear forces as well as the stress caused by vacuum sweepers or municipal events pose great challenges that the superstructure, pavement and joint have to withstand. We would like to provide architects, planners and building owners with the necessary security of long-lasting surface installations.

With professional execution in accordance with the valid regulations, we guarantee with the ROMEX® - ISATEC® - SYSTEM that load class Bk0.3 to 3.2, can withstand all influences and loads without any problems.

YOUR ADVANTAGES

- Long-lasting system compatibility of joint and bedding
- No weed growth through the joints
- 100 % frost and de-icing salt resistant
- Resistance to weathering
- Long-lasting durability
- Prevents settlements



TESTED SYSTEM
Research and development: We have the proof!

**Horizontal deformation behaviour
at the Technical University of Dresden:**
After 1 million load cycles, the first joint after the load plate in the direction of the horizontal force in the tests with ROMEX® - ISATEC® restraints compared to the tests without these restraints, a significantly lower horizontal displacement occurred.



Final report of the investigation into the horizontal deformation behaviour of slab floors with displacement protections 10/2008 Technische Universität Dresden; Faculty of Civil Engineering; Professorship for road construction.



* Preparation of the subsoil/superstructure:
The earth subgrade must have the appropriate stability (min. 45 MPa). The following superstructure layers must be sufficiently load-bearing, water-permeable, deformation-resistant and frost-proof. The mineral mixtures (base courses/bedding/joints) in unbound execution must meet the requirements of the respective type of construction. The relevant additional current contract conditions for road construction (ZTV) must be complied with. A deviation should only be made with sufficiently positive regional experience. The applicable regulations and codes of practice such as ZTVT, ZTVE, RStO 12, ATV DIN 18318, MFP 2015, MFG and TL-Pflaster-StB must be observed.



A FEW STEPS TO THE GUARANTEE

The ROMEX® SYSTEM-GUARANTEE (RSG) is a real competitive advantage for every customer and at the same time means a high level of security.

1

Registration of the construction project:

Request and complete the ROMEX® SYSTEM WARRANTY APPLICATION (PDF form). Simply send ROMEX® the completed application by e-mail to: info@romex-ag.de
Alternatively, you can print out the application, fill it out by hand and fax it to us: 02225 70954-19.

2

Registration of the construction project:

The application is promptly registered and checked by the technical department of ROMEX® and possible open questions will be clarified immediately. The registration number will be entered by ROMEX® into the application, signed and sent to your e-mail address.



3

After completion of the construction project:

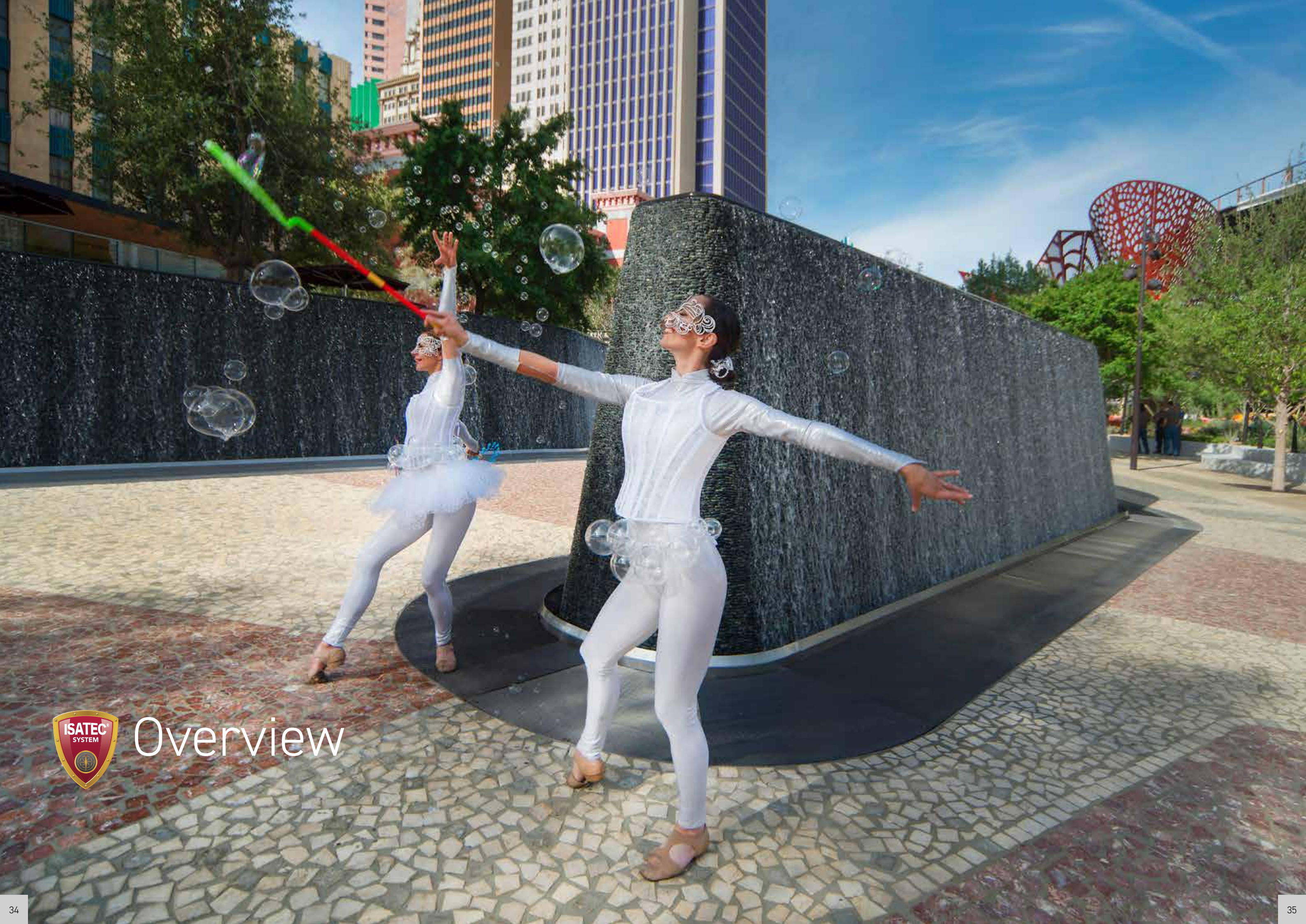
In order for the guarantee to become effective and the certificate to be issued please send the following documents and photos in full to ROMEX® (by e-mail or post):

- Photo of completed area
- Acceptance certificate
- Copies of the dealer invoice of the purchased ROMEX® products as well as of the fixed elements (paving-slab covering)

4

Sending/handing over of the certificate:

As soon as all requirements for the fulfillment of the guarantee are met, we will send/hand over the guarantee certificate to you.



Overview



ISATEC® - STOP
SHIFTING LOCKS & ACCESSORIES

Article no.	Article	Article description	Description
141		ISATEC® - STOP EAP	Universal use, preferably for linear bandages
139		ISATEC® - STOP EAPQ	Universal use, preferably for linear bandages with shear force transmission
138		ISATEC® - STOP EEAP	Earth deck anchor plates especially for cross joint bracing
137		ISATEC® - STOP EAK	Area of application on turning points. Installation also in private sector
140		ISATEC® - STOP EAgTD	Universal use, preferably for diagonal bracing, also with bound base layer
136		ISATEC® - STOP EA3K	Ground anchor with triple interlocking for extreme shear forces
135		ISATEC® - STOP EAS1200	Use for extremely large formats. Support of at least three large formats. Can be used with unbound and bound base for use with unbound and bound base course. Plus 15 hexagon nuts SW13, 15 M8 grub screws and perforated tape
1992		ISATEC® Project case	Sample and presentation case with product documentation, references, paving joint mortar samples and various ISATEC® anchors
1235		Threaded pin M8 × 60 mm 2 3⁄8" (hexagon socket)	For fixing to ground anchors
1237		Threaded pin M8 × 100 mm 4" (hexagon socket)	For mounting on the ground anchor rail EAS1200
1236		Hexagon nut SW13 - M8	For fixing to ground anchors
1240		Perforated tape (17 × 10 × 0,8 mm 3⁄4" × 3⁄8" × 1⁄16") (1 roll for approx. 7 EAS1200 ground anchor rails)	For mounting on the ground anchor rail EAS1200



ISATEC® - FLEX
VISCOELASTIC JOINT

Article no.	Article	Article description	Description
2111		ISATEC® - FLEX Colour: neutral	<p>Tough-elastic, standard-compliant special joint mortar with the following properties:</p> <ul style="list-style-type: none">• Joint width from 5 mm 1 1⁄4"• Joint depth 3 cm 1 1⁄4"• For unbound construction• In combination with ISATEC® - STOP up to Bk3.2• Can be applied in drizzle• Frost and de-icing salt resistant• Highly permeable to water• No cement haze• Resistant to vacuum sweepers <p>PU: 25 kg 55 lbs bucket Storage: 12 months, frost-free and dry</p> <div><div>ZTV N3 usage category</div><div>DIN >3.5to limitation of use</div><div>RS10 3.2 load class</div></div>
2112		ISATEC® - FLEX Colour: stonegrey	
2113		ISATEC® - FLEX Colour: basalt	



Berlin, Airport Berlin Brandenburg (BER), Germany



Berlin, Philharmonic Hall on Scharoun Square, Germany



Augustaanlage Mannheim, Germany



Berlin, Philharmonic Hall on Scharoun Square, Germany



Würzen, Germany



Kaunas, Maironiestreet, Lithuania



Kaunas, Maironiestreet, Lithuania



Kaunas, Maironiestreet, Lithuania



Soest, Germany



Soest, Germany



Vancouver Station Square Metrotown, USA

ROMEX® GmbH
Industriepark Kottenforst
Mühlgrabenstraße 21
53340 Meckenheim
+49 (0) 2225 70954-20
www.romex-ag.de
GERMANY

