Leviat®
A CRH COMPANY

Isedio ShieldJoint

Floor jointing solutions for industrial floors

May 2022

ISEDIO

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60 locations

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Isedio ShieldJoint

Isedio ShieldJoint is an innovative zero impact, sealant-free load transfer system.

Isedio ShieldJoint is unique since it eliminates impact caused by Mechanical Handling Equipment (MHE) such as forklift trucks crossing the joint, but additionally does not require any joint sealing. Its clever design ensures that no debris can enter into the vertical gap between the two slabs. This design feature is particularly useful in foodstuff warehouses or food preparation areas where pest control is paramount.

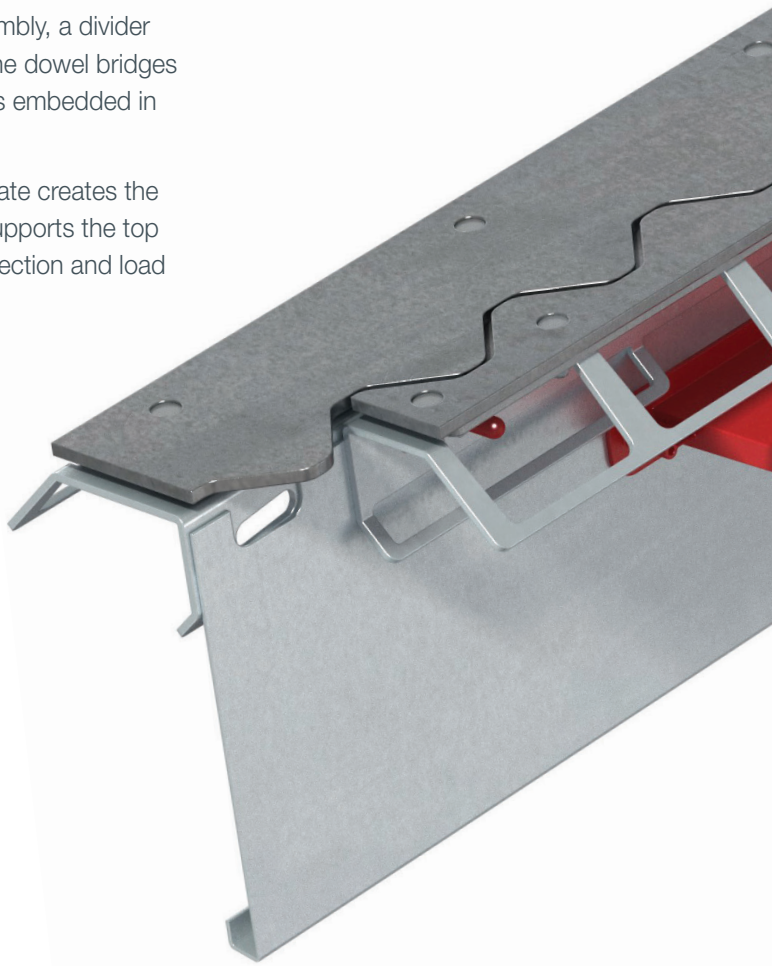
Part of the Isedio range of leave-in-place arris protection systems, ShieldJoint is an excellent solution for high traffic areas such as loading docks, doorways or VNA aisles where a seamless floor is required. The unique trapezoidal split line is engineered so that even the smallest wheeled pallet trucks do not cause an impact. A floor can be future-proofed for other uses by installing ShieldJoint.

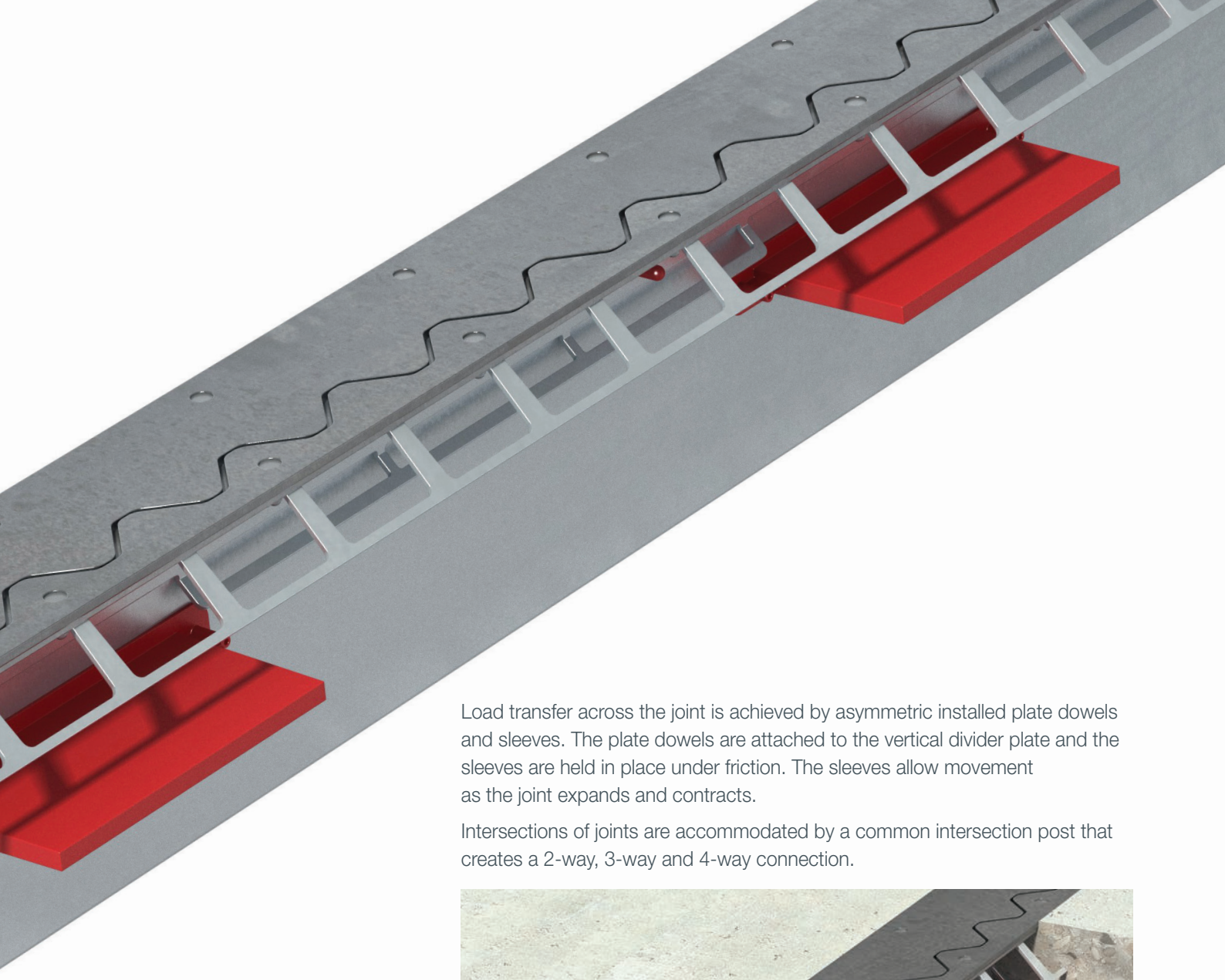
The joint system comprises two top wave plates, a divider plate, load transfer plate dowels and sleeves. The divider plate height fits the slab depth and, to ensure the plate dowel is always located at the mid-height of the slab, is manufactured to order.

Slab arris protection is provided by way of the top wave plates which create a seamless floor thus eliminating impact loads when traversed. The top wave plates are continuously anchored to the concrete by perforated angled wings.

The joint is designed so that once cast in-situ, as the two slab panels either side of the joint begin to cure and shrink, the joint separates. One slab panel contains the sleeve and one half of the top wave assembly, and the other slab panel has the other half of the top wave assembly, a divider plate and a dowel. The dowel bridges across the joint and is embedded in both slab panels.

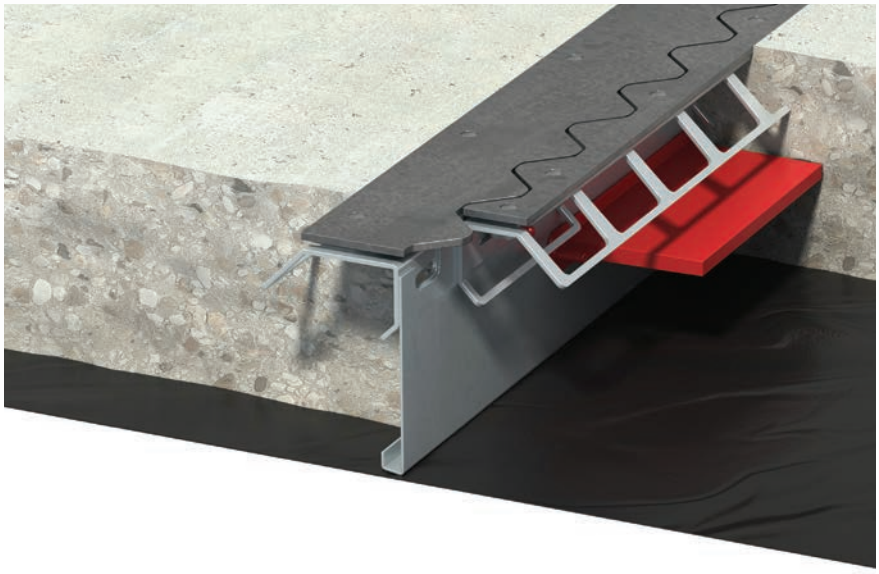
The vertical divider plate creates the formwork and also supports the top wave plate edge protection and load transfer plate dowels.





Load transfer across the joint is achieved by asymmetric installed plate dowels and sleeves. The plate dowels are attached to the vertical divider plate and the sleeves are held in place under friction. The sleeves allow movement as the joint expands and contracts.

Intersections of joints are accommodated by a common intersection post that creates a 2-way, 3-way and 4-way connection.



- Zero Impact
- Easy Installation
- Based on TR34.4
- Load Transfer Through Plate Dowels
- Sealant-Free
- Arris Protection
- Engineering Support
- Safe Installation
- Minimise Joint Maintenance Costs

Isedio ShieldJoint

Material Specification

Component	Material
Top Plate	Hot rolled plate - AS/NZS 1594 (can be supplied in stainless steel or hot-dip galvanised)
Hot-dip Galvanised	55µm – AS/NZS 4680:2006
Frangible Fastener	Nylon
Load Transfer Plate Dowel	6mm, 8mm & 12mm - AS/NZS 1594-Grade 350 (can be supplied in stainless steel or hot-dip galvanised)
Sleeve	6mm - ABS I 8mm & 12mm - PP
Lateral Movement Allowance	20mm in each direction

Dimensions

Description	Dimension & Tolerance
Joint Length	1955mm, +/-2.0mm
Straightness	+/-1mm in 1000mm
General Dimensional Tolerance	Dimensions < 12mm +/- 0.5mm Dimensions > 12mm +/- 2.0mm
Dowel Spacing	500mm and 650mm

ShieldJoint Adjustable

ShieldJoint Adjustable utilises an adjustable divider plate to suit different slab heights.

The lower divider plate is attached to the upper divider plate using a bespoke, patented fixing that requires no tools for adjustment.

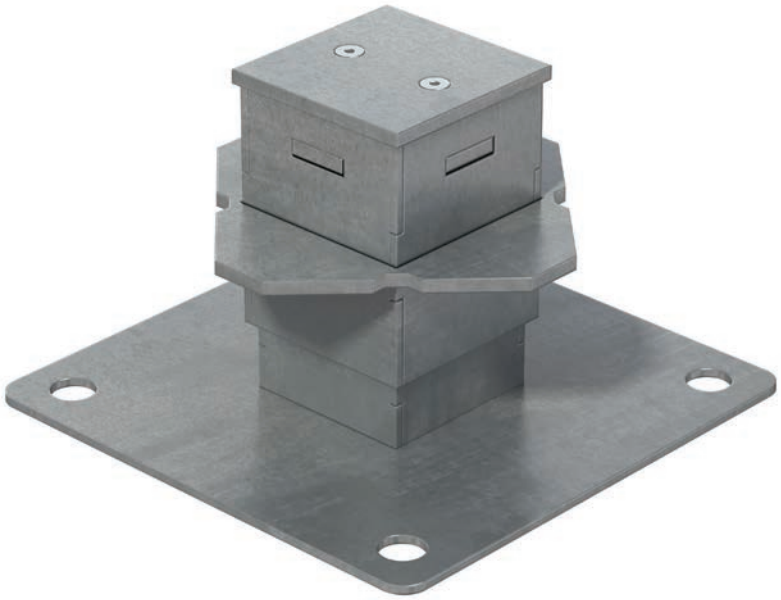
The adjustable divider plate enables contractors to keep one system size on site to suit various slab heights.

Contact the Leviat technical team for more information.

Isedio Accessories

Prefabricated Intersection Post

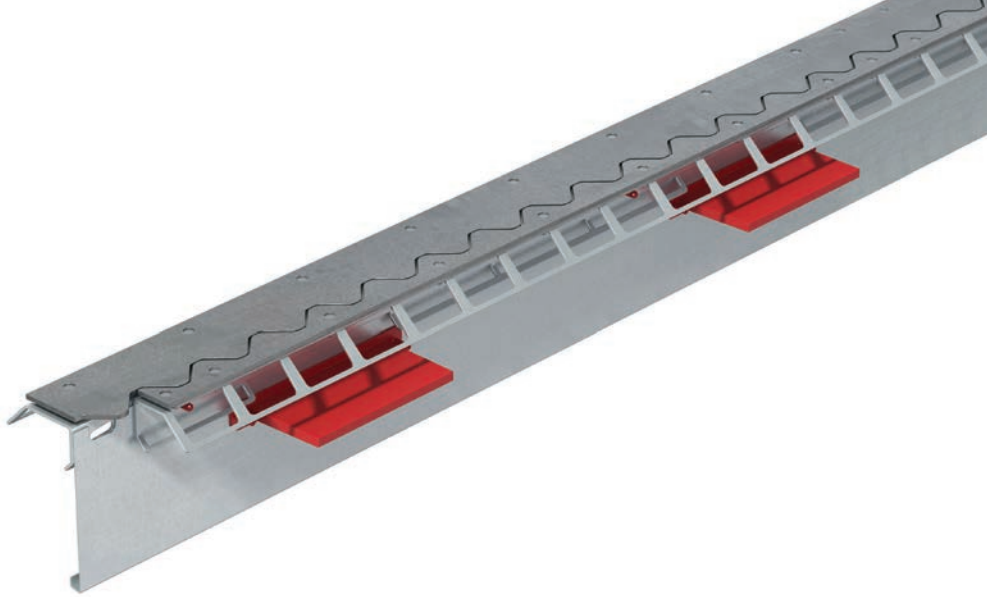
The ShieldJoint intersection post is available in different heights with 50mm adjustability to suit various ShieldJoint profile heights.



Installation Jacks

Installation Jacks are reusable items that facilitate speedy and accurate installation of Isedio ShieldJoint. Use of installation jacks eliminates the risks associated with the conventional ‘pin and weld’ method, in particular the risk of cracking posed by the pins restraining movement at the joint opening.

Isedio ShieldJoint



Load Transfer Capacities

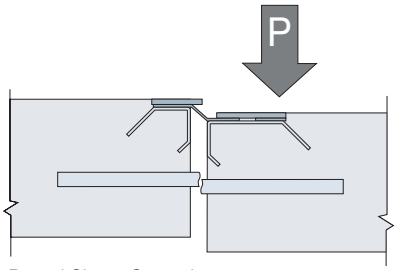
The use of Isedio ShieldJoint ensures that shear loads are safely transferred across the joint through dowels. We recommend referring to *TR34 – Fourth Edition – Concrete Industrial Ground Floors* to determine the dowel capacity.

Section 6.5 of TR34 provides guidance on the calculation of dowel capacities for the following failure modes.

Dowel Shear Capacity

The shear capacities for the plate dowels provided in the table below have been calculated using equation 18 of TR34. In most situations, at the point of ultimate load, the concrete would typically fail before the dowel.

Dowel Type	Thickness (t) (mm)	Finish	Shear Area (0.9xA) (mm^2)	Capacity (P_{sh}) (kN)
150 x 150 x 6	6	Black/HDG	810	150.0
150 x 170 x 8	8	Black/HDG	1080	200.0
150 x 150 x 12	12	Black/HDG	1620	300.1

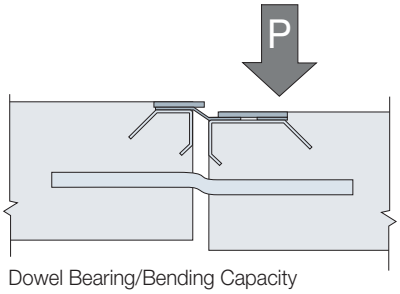


Dowel Shear Capacity

Dowel Bearing/Bending Capacity

Bearing/Bending is a combined failure mode that checks the bending capacity of the dowel as well as the bearing capacity of the surrounding concrete. Equation 19 of TR34 defines the bearing/bending capacity of a dowel.

Please find the dowel bearing/bending capacities for different conditions in the combined capacity tables on page 9. For any other configurations, please contact Leviat.

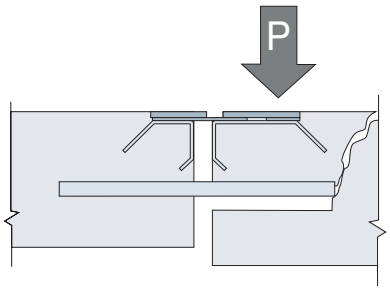


Dowel Bearing/Bending Capacity

Punching Shear (Bursting Forces)

Section 6.5.3 of TR34 recommends calculating the bursting load of the concrete by adapting the EC2 approach for punching failure using an effective depth of 0.75 times the depth between the dowel and the surface of the concrete slab.

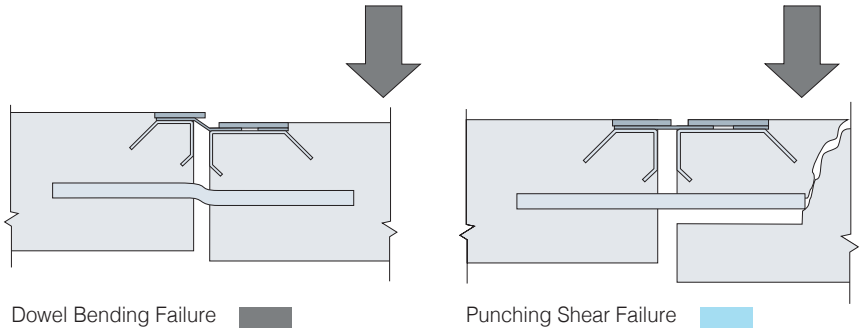
Please find the punching shear capacities for different conditions in the combined capacity tables on page 9.



Punching Shear (Bursting Forces)

Deformation of the intermediate plate in the drawings above has been exaggerated for clarity.

Design Capacity Tables



Dowel Bending Failure

Punching Shear Failure

Shear capacity of Isedio ShieldJoint in 40 MPa concrete with a dowel spacing of 500mm (kN/m)

Dowel Type	Joint Opening	Slab Depth (mm)										
	mm	150	160	170	180	190	200	210	220	250	300	350
150 x 150 x 6	10	41.2	45.8	50.5	55.6	60.8	66.2	71.9	77.8	93.8	112.4	113.2
150 x 150 x 6	20	41.2	45.8	50.5	55.6	60.8	66.2	71.9	72.4	72.4	72.4	72.4
150 x 170 x 8	20	41.4	46.1	50.8	55.9	61.2	66.6	72.3	78.3	94.9	113.7	118.8
150 x 170 x 8	25	40.8	45.3	50.0	55.0	60.3	65.7	71.4	77.3	93.8	101.4	101.4
150 x 150 x 12	20	38.6	43.0	47.6	52.5	57.6	62.9	68.5	74.2	91.5	110.2	128.8
150 x 150 x 12	25	38.6	43.0	47.6	52.5	57.6	62.9	68.5	74.2	91.5	110.2	128.8

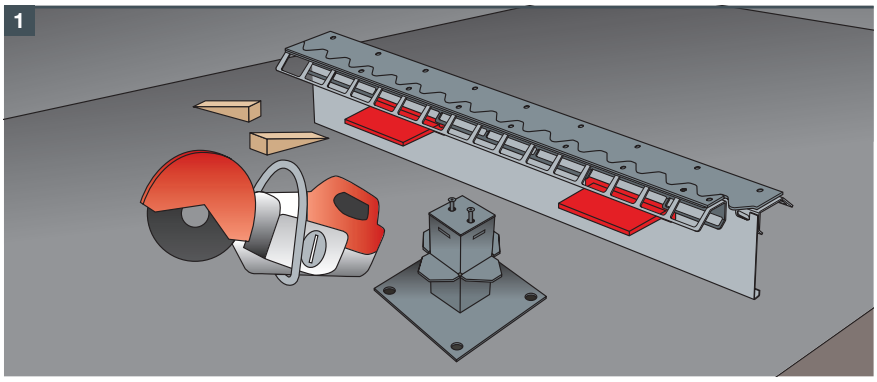
Shear capacity of Isedio ShieldJoint in 40 MPa concrete with a dowel spacing of 650mm (kN/m)

Dowel Type	Joint Opening	Slab Depth (mm)										
	mm	150	160	170	180	190	200	210	220	250	300	350
150 x 150 x 6	10	31.7	35.2	38.9	42.8	46.8	50.9	55.3	59.8	74.5	87.1	87.1
150 x 150 x 6	20	31.7	35.2	38.9	42.8	46.8	50.9	55.3	55.7	55.7	55.7	55.7
150 x 170 x 8	20	31.9	35.4	39.1	43.0	47.0	51.3	55.6	60.2	74.9	91.3	91.3
150 x 170 x 8	25	31.4	34.9	38.5	42.4	46.4	50.6	54.9	59.4	74.0	78.0	78.0
150 x 150 x 12	20	29.7	33.0	36.7	40.4	44.3	48.4	52.6	57.1	71.4	98.7	128.8
150 x 150 x 12	25	29.7	33.0	36.7	40.4	44.3	48.4	52.6	57.1	71.4	98.7	128.8

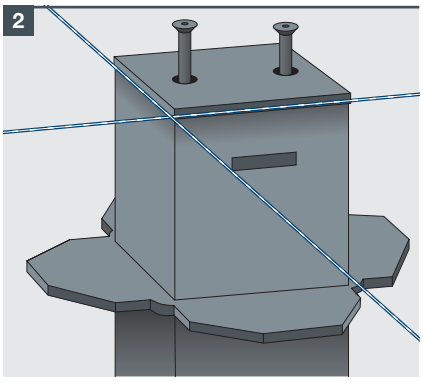
Note: For any other configurations and for Isedio ShieldJoint Adjustable capacities, please contact the Leviat technical team on 1300 304 320 or email technical.au@leviat.com.

Isedio ShieldJoint

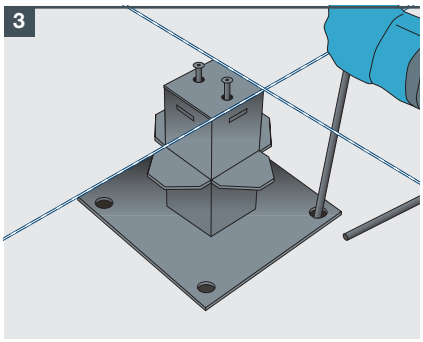
Installation



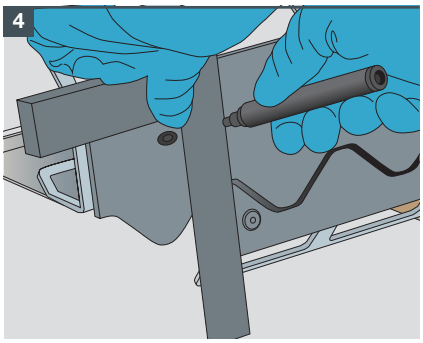
Set up laser dumpy level on-site, ensuring you have finished floor level (FFL) datum and relevant hand tools available. Ensure sub-base has been correctly prepared and relevant membranes placed.



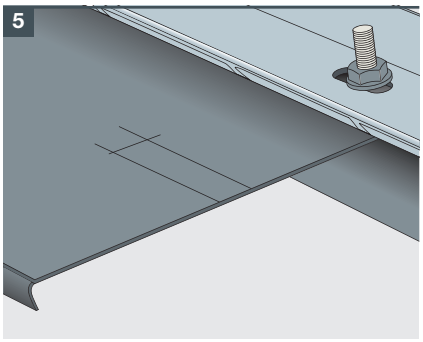
Set up string lines along the joint lines at the finished floor level.



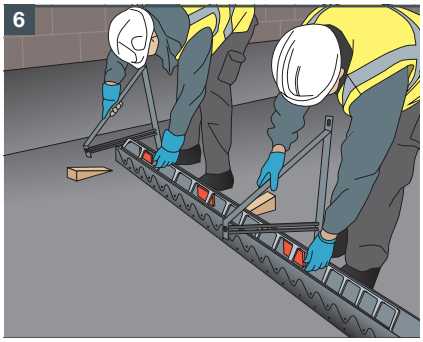
Position the intersection post and pin in place. Remove the cap and use the internal adjustment bolt for height adjustment. Adjust height ensuring cap surface is level with the finished floor level.



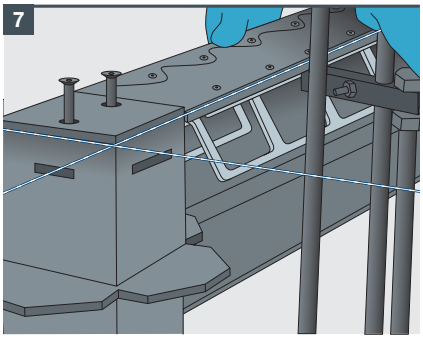
Cut the end of the first ShieldJoint, ensuring it is square, to butt up against the intersection post.



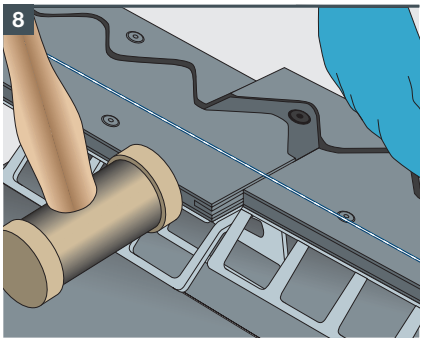
Cut away a slot for the load transfer plate on the intersection post and fold back to the fixed side of the joint (non sleeve side) or remove completely.



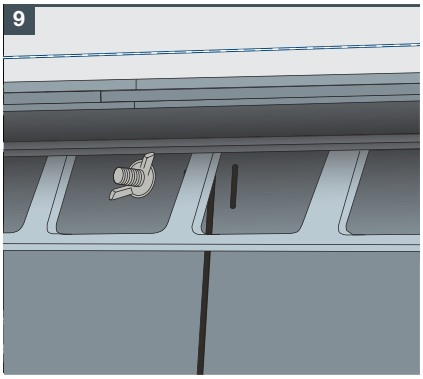
Fit ArmourFix jacks to the ShieldJoint with ShieldJoint jack fittings (these can be ordered separately).



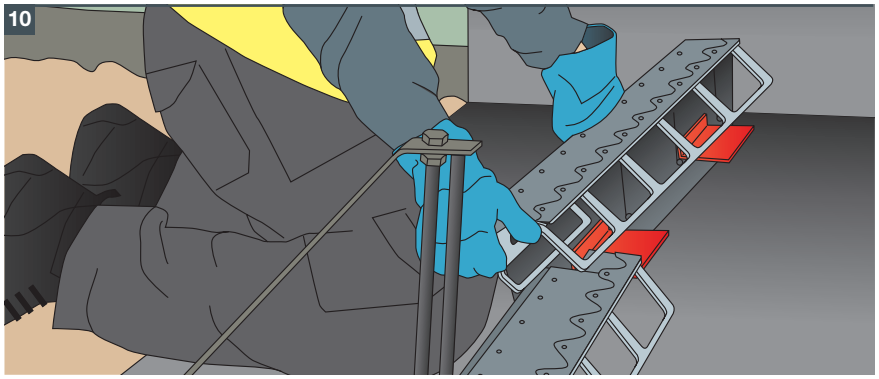
Position ShieldJoint with jacks fitted up against the intersection post. Ensure the cut end is fitted up against the intersection post.



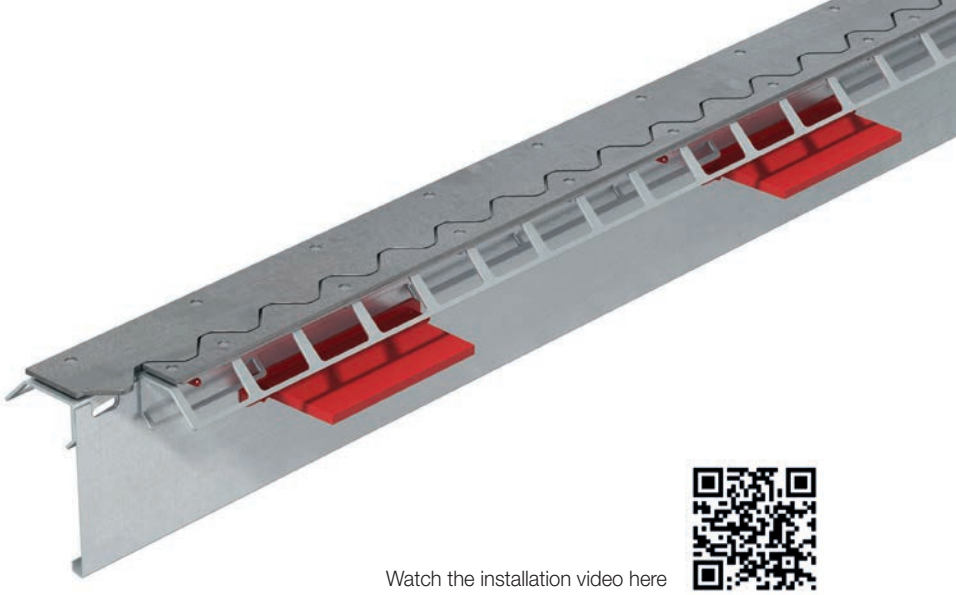
Continue to fit ShieldJoint with jacks along the joint line using a soft face mallet to secure the top plates together.



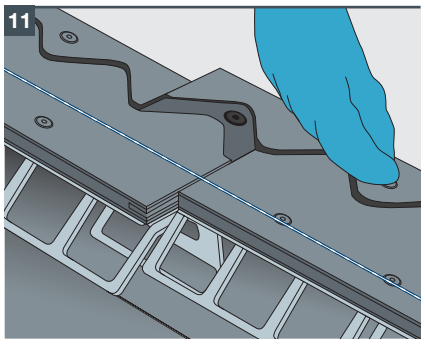
Join the lengths using the nylon bolts and wingnuts supplied.



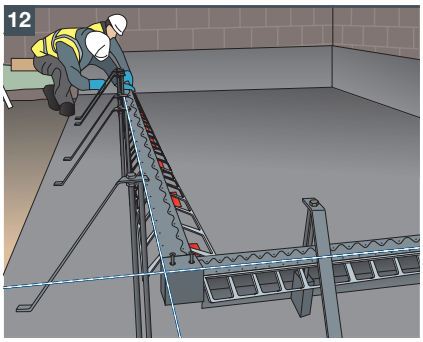
Measure the distance for the final piece along the joint line, and cut the ShieldJoint piece to length, ensuring it is square at the wall end. Also ensure an allowance is made for any isolation material required between the slab and the wall / fixture.



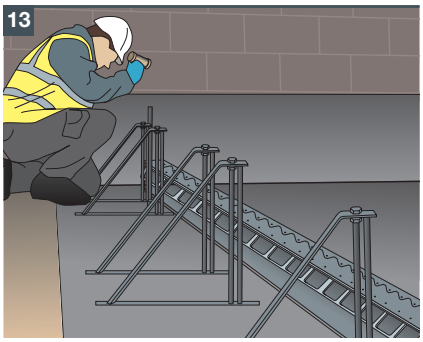
Watch the installation video here



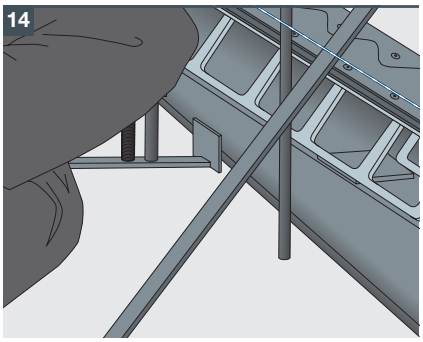
Continue in other directions where required.



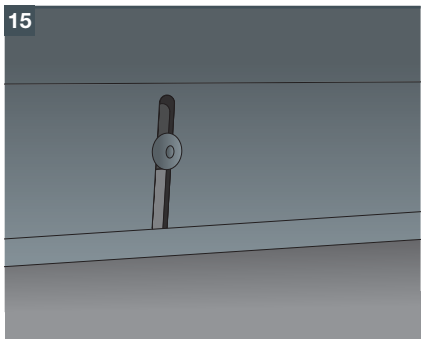
Manually position ShieldJoint sections in line with the string line.



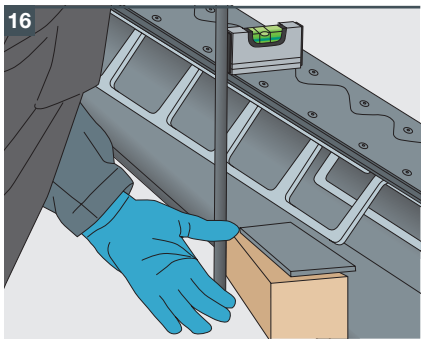
Pin ArmourFix jacks into place.



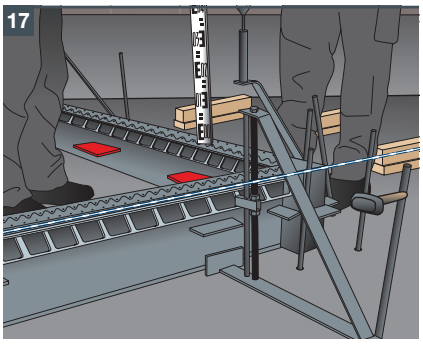
Drive pins in near to ShieldJoint sections, between the ArmourFix jacks.



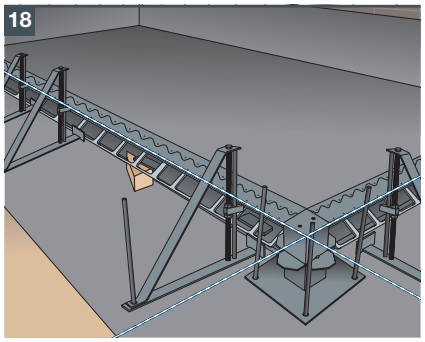
If using adjustable divider plates, ensure the divider plate is dropped to the sub-base level.



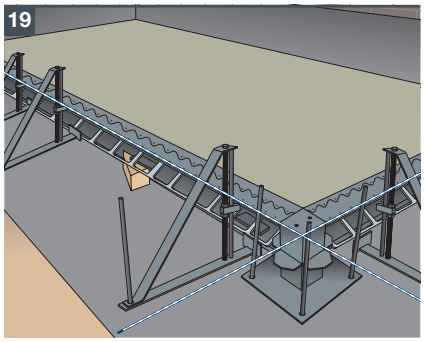
Place a small spirit level across the width of the ShieldJoint top plate and use wooden wedges between the pins and the ShieldJoint to adjust the top plate ensuring it is level. This is a critical point as the top surface of the installed joint must be level.



Check and adjust ShieldJoint height to the finished floor level using a staff and laser level.



Double check that the joints are in line with the string line and adjust if necessary.

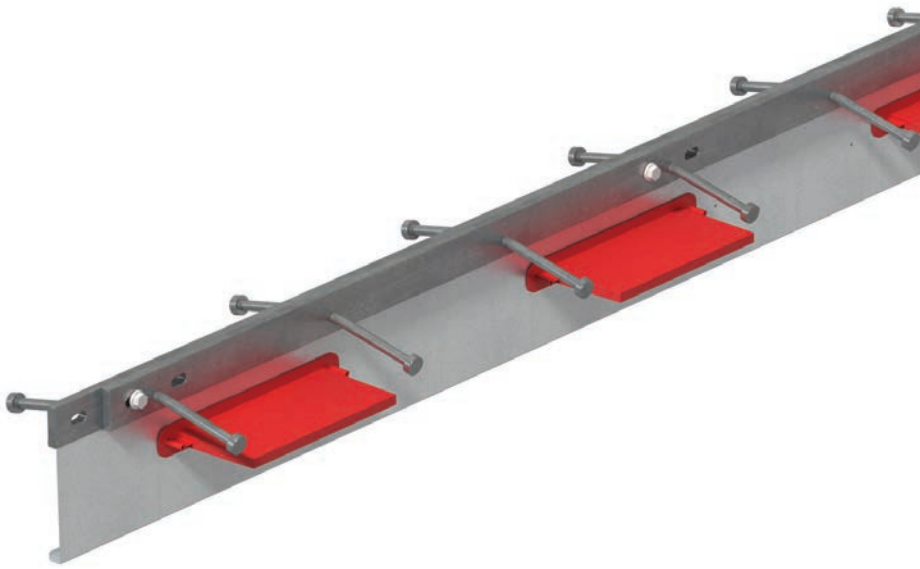


Cast concrete, checking and adjusting for height and level as necessary. Before the next pour, ensure all installation jacks and pins have been removed.

Isedio Product Range

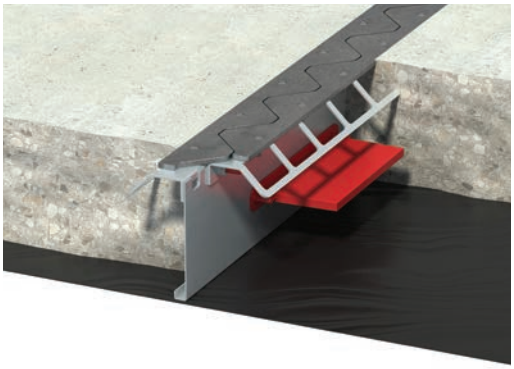
ArmourJoint

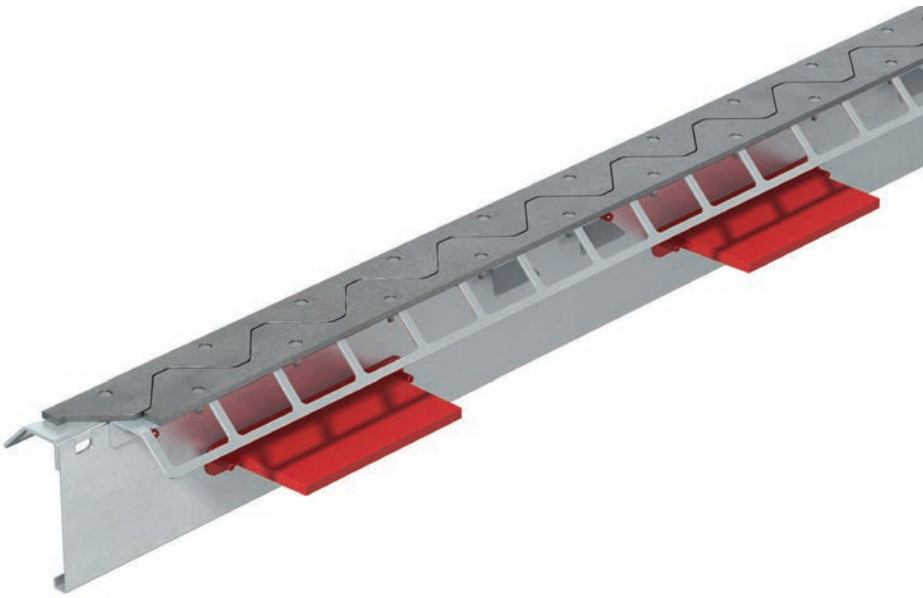
ArmourJoint is a leave-in-place formwork, load transfer and edge protection joint system suitable for heavy duty industrial concrete floors.



GuardJoint

GuardJoint adds to the ArmourJoint features. A disruptive face top plate and continuous anchor wings provide silent, smooth wheel travel across joint openings up to 25mm. Suitable for heavy duty industrial concrete floors.





SteelDeckJoint®

SteelDeckJoint® is a revolutionary floor joint solution, which solves many of the complexities and time consuming elements of forming a construction joint on a steel deck floor using timber formwork.

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Innovative engineered products and construction solutions that allow the industry to build safer, stronger and faster.

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