

QuicDiamond Edge Wave

FREE MOVEMENT JOINT

Silent and Robust Free Movement Joint System

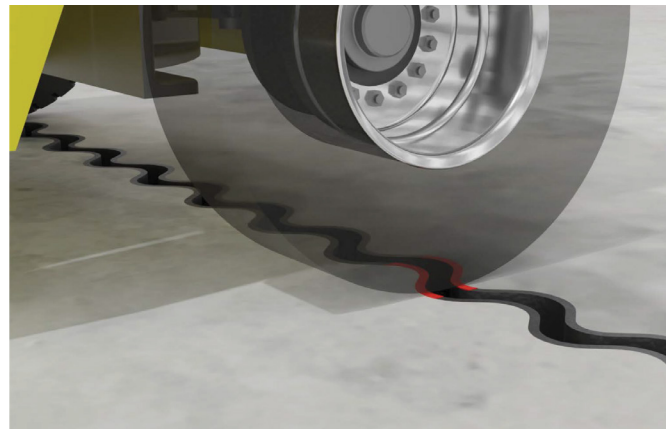
- QuicDiamond Edge Wave is specially designed for smooth and silent transition across the joints
- Prefabricated leave-in-place free movement joint system with a variety of fixed load transfer mechanisms to suit all floor loadings.
- Ideal for high-traffic environments, including forklift lanes and heavy-duty industrial applications.
- Suitable for the high flatness category floor and superflat floor construction.
- Fast track installation with a selection of fixing methods and accessories.
- Suitable for joint opening up to 1 3/16"
- Crosses and Tees are available for intersections
- Top strips are available for use with timber formers during installation
- Compatible with QuicDiamond Edge.
- All materials used in this product are 100% recyclable.

QuicDiamond Edge Wave is prefabricated heavy-duty movement joint systems, suitable for all large area construction methods for ground and pile supported

(or ground-bearing and pile-supported) concrete floors. The wavy steel rails provide extremely durable protection to the slab arises with silent crossing of joint, making it ideal for floors with highly intensive traffic environment.

The system ensures reliable load transfer in formed free movement joints with openings of up to

1 3/16" (30mm) wide, and suitable for slab depths from 4" (100mm) to 12" (300mm)



QuicDiamond Edge Wave®

1. Product Properties

QuicDiamond Edge Wave is a prefabricated leave-in-place joint system designed to create (/construct) formed shrinkage free movement joints, consisting of heavy duty arris armoring, permanent formwork, and a load transfer system. QuicDiamond Edge Wave allows the wheels to roll smoothly over the joint. The arris armoring is provided by 40 × 6 mm cold drawn steel profiles, which are connected by yield able plastic bolts. The profiles are anchored into the slab by means of a number of 3/8 × 4" welded anchors. One of the profiles is welded onto the steel divider plate, which has the dowels (load transfer system) positioned. Two rebars, one to each side, has welded to anchors provide additional stiffness to joint.

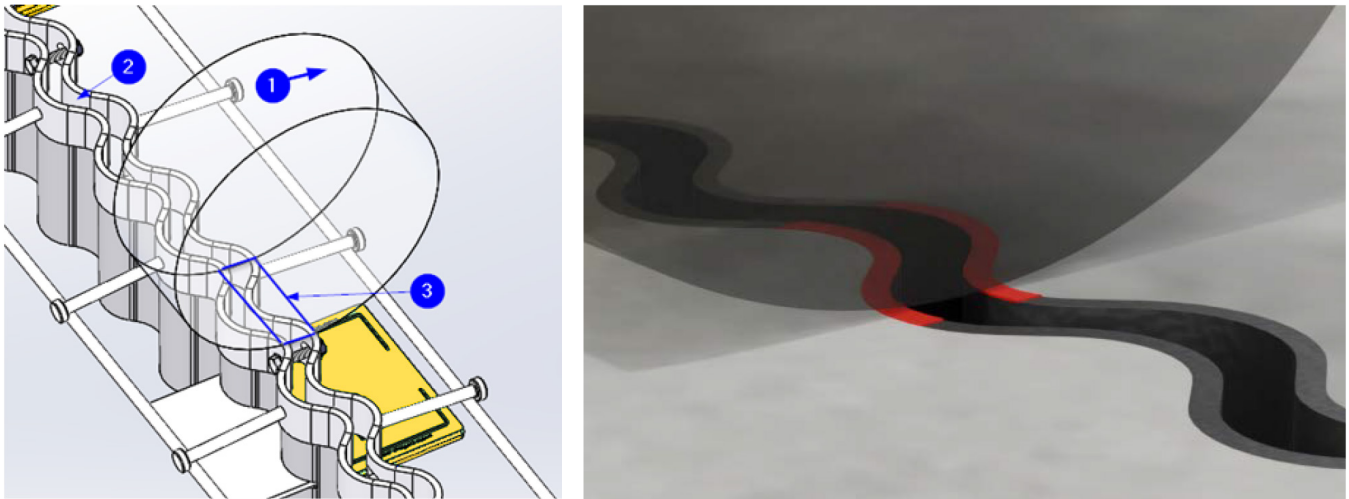


Figure 1. Example: $\text{Ø}10'' \times 4''$ wheel **1** is crossing QuicDiamond Edge Wave, joint opening .80" **2**, pressure area of wheel 1.25in × 14in² **3**. When crossing the QuicDiamond Edge Wave, the wheel carries on/from both sides of slab at the same time.

The QuicDiamond Edge Wave can be used in high-precision floor applications, meeting the highest standards of flatness and levelness required for industrial facilities. It is suitable for floors designed to support high-reach trucks operating above 42 feet (13 meters) without side-shift, ensuring smooth and reliable performance.

Refer to ACI 360R-10 and F-Number System (ASTM E1155) for floor flatness (FF) and levelness (FL) standards.

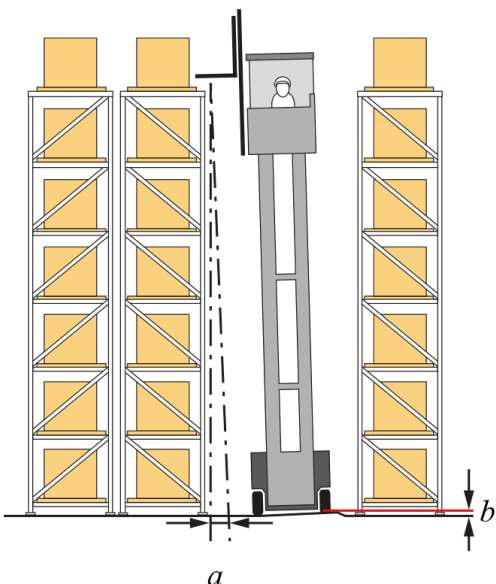


Figure 2. Static lean (a) because of variation in floor level (b).

QuicDiamond Edge Wave is installed into position on the sub-base at the correct height, before the slab is cast. Once the concrete is cast, the shrinkage forces generated by the drying concrete slabs cut the plastic bolts connecting the two steel profiles together, which causes the joint to open.

QuicDiamond Edge Wave transfers vertical loads between adjacent slabs and minimizes vertical displacement of the slabs. The load transfer system is accomplished by utilizing high strength steel discrete plate dowels, moving within rigid plastic release sleeves.

QuicDiamond Edge Wave with rectangular QP-8 dowels is free movement joint solution for maximum 1 3/16" (30mm) openings.

The limiting factor of load transfer in most cases is the punching shear resistance of the concrete. These resistances can be found in section 2. It is recommended that no more than 50% of the applied load should be transferred by the load transfer system and the slab itself should be designed to carry the rest of the load.

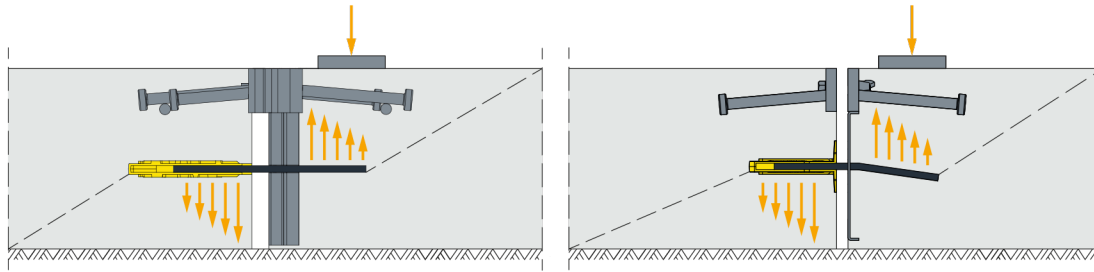
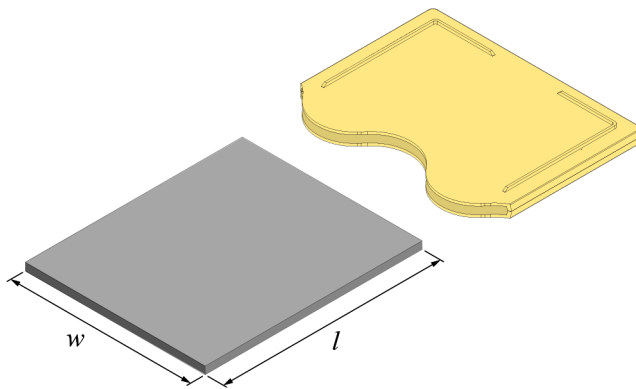


Figure 3. QuicDiamond Edge Wave and QuicDiamond Edge dowels have similar Load Transfer.

Table 1. QuicDiamond Edge Wave Dowel Type.



Dowel type	QuicPlate rectangular 10 mm QP-10
thickness	.375"/10 mm
Dimensions $w \times l$	5.7"x 6.8" / 145 mm \times 175 mm
Sleeve Color	Yellow
adjustable Joint opening	0-.8" (0-20mm)recommended 0-1.1875" (0-30mm)maximum

1.1 Materials and Dimensions

Materials

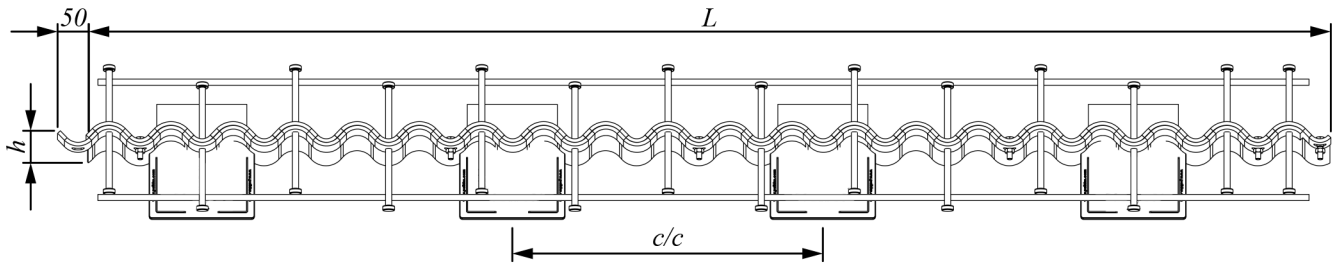
Table 2. Materials and standards of QuicDiamond Edge Wave QP-10

Version	top rails	Divider Plate	Plate Dowels	anchors	Sleeves
QuicDiamond Edge Wave	e Q235B	DC01	S355J2 + N	S235J2 + C450	ABS

QuicDiamond Edge Wave is suitable for dry internal conditions. Please contact BoMetals for HDG options

Dimensions

Table 3. Dimensions of QuicDiamond Edge Wave QP-10



type	Height h min	Dowel type	Dowel Centers c/c	Length L	Weight [lb]	adjustable Slab Depth	Sleeve Color
QDE-WAVE-W	1.6"	N/A	N/A	6.6' 200mm	15	ALL DEPTHS	Yellow
QDE-WAVE-6	5.4"	QP-10	19-5/8" 500mm		48	6"	
QDE-WAVE-7	6.4"				49	7"	
QDE-WAVE-8-10	7.8"				55	8"-10"	

Intersection

BoMetals offers a full range of intersection solutions, including Cross and Tee configurations, designed to seamlessly integrate with the QuicDiamond Edge Wave® system. These intersections ensure continuous load transfer, proper joint alignment, and enhanced durability for industrial flooring applications.



QuicDiamond Edge Wave Cross



QuicDiamond Edge Wave Tee

Quality

BoMetals is committed to delivering high-quality, engineered solutions for concrete construction. With a focus on durability, performance, and innovation, our products are designed to meet the highest industry standards, including ACI and TR34 guidelines. We take pride in providing reliable joint systems, dowels, and accessories that enhance the longevity and integrity of industrial and commercial concrete floors. Through precision manufacturing and rigorous quality control, BoMetals ensures that every product performs with excellence in demanding applications.

Resistances.

The resistances of QuicDiamond Edge Wave® dowels are determined based on ACI 302.1R-15 and ACI 318-19 for slab-on-ground and structural applications.

Table 4. Load transfer and required verifications for single plate dowels.

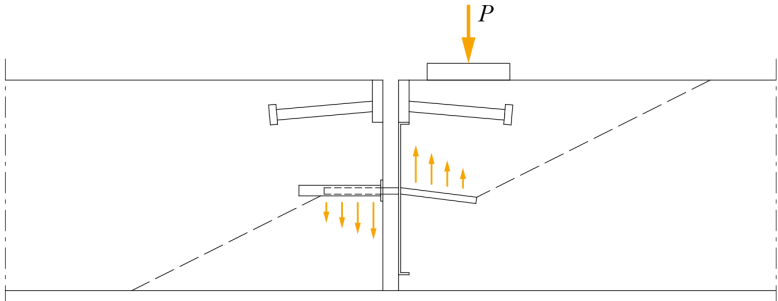
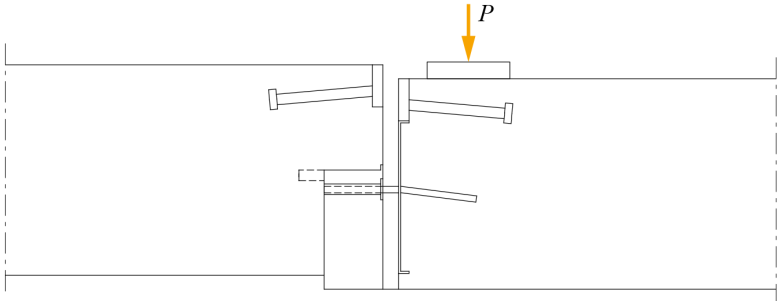
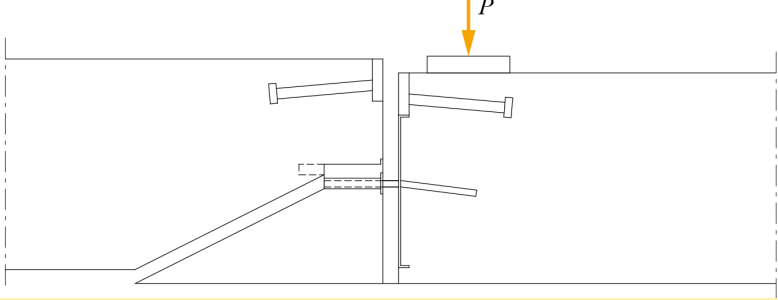
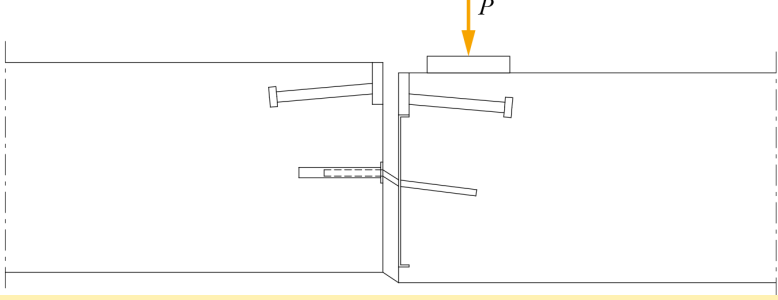
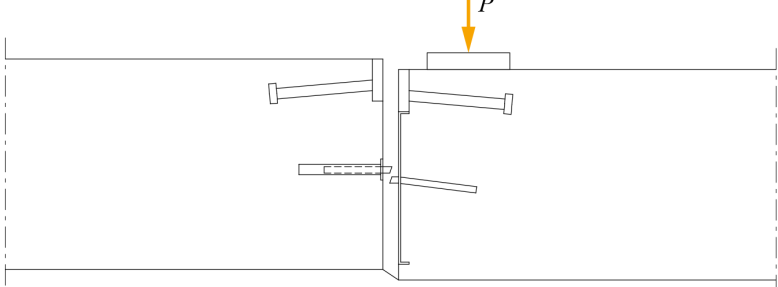
Load transfer	
Punching shear at the face of the loaded area	
Punching shear on the critical perimeter	
Bearing/bending capacity of dowel	
Shear capacity of dowel	

Table 5. Design resistance of a single dowel in shear (P_{sh}) and bearing/bending ($P_{max,plate}$) [lbf/kN] based on ACI 302.1R-15 for 5,000 psi concrete.

Dowel type	Joint opening x	Shear P_{sh}	$P_{max,plate}$
QP-10	.79" / 20MM	40,767 lbf / 181.3 kN	9,546 lbf / 42.5 kN
QP-10	1.18" / 30MM	34,652 lbf / 154.1 kN	8,114 lbf / 36.1 kN

Table 6. Design resistance QuicDiamond Edge Wave® QP-10 according TR34.4/ ACI 302.1R-15 for .79"(20MM) joint opening.

Slab thickness	3,600 psi/C25/30	4,000 psi/C28/35	5,000 psi/C32/40	5,500 psi/C35/45
4 in / 100 mm	6,093 lbf / 27.1 kN	6,476 lbf / 28.8 kN	7,706 lbf / 34.3 kN	8,080 lbf / 36.0 kN
6 in / 150 mm	10,606 lbf / 47.2 kN	11,241 lbf / 50.0 kN	13,506 lbf / 60.1 kN	14,162 lbf / 63.0 kN
8 in / 200 mm	14,538 lbf / 64.7 kN	15,407 lbf / 68.5 kN	18,498 lbf / 82.3 kN	19,335 lbf / 86.1 kN
10 in / 250 mm	18,470 lbf / 82.1 kN	18,788 lbf / 83.5 kN	21,570 lbf / 96.0 kN	22,058 lbf / 98.1 kN

Table 7. Design resistance QuicDiamond Edge Wave® QP-10 according TR34.4/ ACI 302.1R-15 for 1.18"(30MM) joint opening.

Slab thickness	3,600PSI/C25/30	4,000 psi/C28/35	5,000 psi/C32/40	5,500 psi/C35/45
4 in / 100 mm	5,179 lbf / 23.1 kN	5,505 lbf / 24.5 kN	5,902 lbf / 26.2 kN	6,143 lbf / 27.3 kN
6 in / 150 mm	9,015 lbf / 40.1 kN	9,555 lbf / 42.5 kN	10,217 lbf / 45.5 kN	10,686 lbf / 47.6 kN
8 in / 200 mm	12,357 lbf / 55.0 kN	13,096 lbf / 58.3 kN	13,987 lbf / 62.3 kN	14,641 lbf / 65.1 kN
10 in / 250 mm	15,700 lbf / 69.9 kN	16,133 lbf / 71.8 kN	16,776 lbf / 74.6 kN	17,237 lbf / 76.7 kN

Design resistance covers all required verifications listed in Table 4.

The punching shear resistances are calculated for plain concrete without any additional reinforcement, following the guidelines of TR34.4 and ACI 302.1R-15 / ACI 318-19. The same approach applies to steel and macro-synthetic fiber-reinforced concrete. These calculations are provided for reference only and should not replace site-specific structural analysis. Actual performance may vary based on material properties, construction methods, and loading conditions. It is the responsibility of the engineer to verify all calculations and ensure compliance with applicable building codes and project requirements.

Selecting QuicDiamond Edge Wave®

QuicDiamond Edge Wave® is selected according to following criteria:

- **Slab depth.** It is recommended that the joint depth, QuicDiamond Edge Wave height, is at least 10 mm shallower than the slab depth. Advisable slab depths are stated in Table 3.
- **Designed joint opening.** QuicDiamond Edge Wave QP-10 is recommended for joint openings of up to .79"(20MM) wide. Load transfer and resistances are guaranteed for joint openings of up to 30 mm wide.
- **Environment.** For internal floors, we would suggest the plain steel QuicDiamond Edge Wave version. QuicDiamond Edge Wave is also available in a hot dipped galvanized version (HDG).
- **Joint aspect ratio.** Individual slabs should ideally have an aspect ratio of 1:1; this may not always be possible, but the ratio should never exceed 1:1.5.

Installing QuicDiamond Edge Wave® Free Movement Joint

General

The handling of QuicDiamond Edge Wave Free Movement Joints must be done by following safety instructions. The free movement joints on site must be protected from weather, damage during handling and possible damage during removal on the packing. Joints should be stored in dry and sheltered conditions.

Before use, the free movement joints are inspected visually for completeness and any signs of damage that might have occurred during transport or storage.

The assessment of the products is based on the assumption that during the estimated working life no maintenance is required, though regular check should be carried out on the slab surface to ensure that any damage is detected and repaired as soon as possible. In case of a repair, it is necessary to perform an assessment for mechanical resistance.

Installation tolerances

Joints should be installed as precisely vertical as possible and checked with a spirit level to ensure proper function of the dowels during slab movement. The levelness and straightness of the joint installation should be according to the relevant requirements of the floor slab design, and again checked using a standard laser level device or optical sight level.

Installation

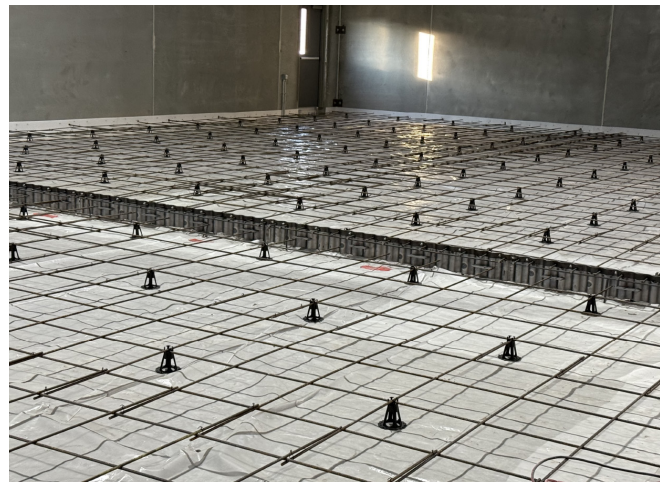
STEP 1. SUB-BASE LEVEL

The sub-base must be made as accurate and level as possible to the requirements on the slab drawing. The tolerance of the level must be considered when ordering joints. Typically, the joint height will be .25" to .50" less than the slab depth.



STEP 2. JOINT LOCATION

The required layout, position and height of the joints will be specified on the floor slab drawing which must be followed closely. String lines are placed to identify the position of joints according to the slab layout dimensioned drawings. String lines can be aside of QuicDiamond Edge Wave if center line is hard to see.



STEP 3. JOINT INSTALLATION

Joints are placed sequentially away from vertical column/wall. The first joint is placed adjacent to column or wall allowing for isolation material.

2. The joints are placed in the correct position according to the string line, and the height is adjusted. The height should be verified by laser level or similar at both ends, and the joint should be set vertical using a spirit level which can be placed across the top edges.

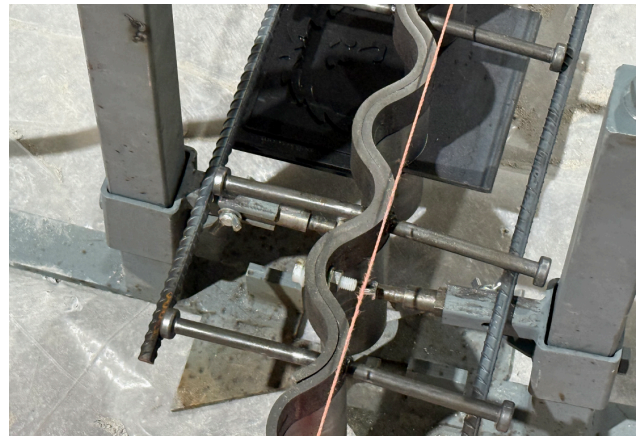
3. The joint can be easily adjusted using BoMetals Leveling Jacks. Position one leveling jack at each end of the joint and one on each side, for a total of four per joint length. Rest the joint securely on the attachment points of the leveling jacks to allow for precise adjustments. Use a laser level or string line to check horizontal alignment. Ensure the joint is vertically plumb using the laser level or visual inspection.

Make small adjustments to the leveling jacks to achieve proper vertical alignment. Adjust the leveling jacks individually by turning their knobs to raise or lower the joint as needed.

4. After the joint is aligned, secure it to the substrate to hold it in place: Drive re-bar or nail stake into the substrate and weld it to the joint for a strong hold. For slabs up to 8" deep, 4 pins per joint are required, (up to 10" 6 pins per joint). The pins should be spaced equally along one side of the joint, on the opposite side to the first pour. Pins can be simply driven into place with a suitable impact gun or hammer.

5. Subsequent joints are aligned, fixed at the overlap using dowel bushings, plastic bolts and nuts, adjusted and fixed in the same manner. The joints should be fixed so that the ends of adjacent top strips are not touching but have a clearance gap of between 1/32" to 1/16" for longitudinal movement.

6. The final joint in any run will usually require being cut to length. The gap between the column/wall and the penultimate joint is measured taking account of suitable isolation material. The final joint is cut to length and installed in the same manner as previous joints.



STEP 4. POURING CONCRETE

Once the rails are correctly positioned, pouring of concrete can commence. Concrete may be placed on one side of QuicDiamond Edge Wave. Concrete should be poured to the level of the rails with attention to consolidation around the dowels and sleeves. All plate type dowels require close attention to filling around the dowels to eliminate the possibility of air entrapment. This should be done with a suitable vibrating poker. Once placement is complete of side 1 of the QuicDiamond Wave. It is recommended that all of the temporary bracing is removed or cut away before placing concrete on side 2. This will allow unobstructed joint movement.

