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DOWEL SYSTEMS

SPEED PLATE DOWEL

AN ECONOMICALLY SMART CHOICE FOR FLAT PLATE DOWEL SYSTEMS

The SPEED PLATE system reduces the number of dowels required when compared with conventional doweling systems. Fewer dowels and simpler installation means reduced cost of installation. The conversion chart below gives the equivalent size and spacing of SPEED PLATE dowels when substituted for conventional smooth round dowels in concrete slabs.

The SPEED PLATE is a patented sleeve and steel plate dowel system. The SPEED PLATE provides load transfer across construction joints and immediately accommodates lateral and axial movement produced by concrete shrinkage and differential slab movement. The large, non-tapered plate design reduces bearing stresses on the concrete and ensures consistent bearing stresses on the concrete at the joint face and fully embedded depth of the dowel.

KEY FEATURES

- Provides exceptional load transfer across the joint
- Allows for horizontal & lateral movement
- A dowel method recommended by ACI 302-04
- Does not allow vertical movement
- Eliminates problems of dowel misalignment
- One piece design with alignment marks and pre-installed nails makes installation quick and easy
- Integral, patented sleeve insert that eliminates lateral restraint between slab panels
- Non-tapered plate profile ensures consistent bearing stresses at the joint face and full depth of dowel
- Eliminates the need to drill holes in timber formwork
- Ribs on the sleeve provide anchorage in concrete and increase the rigidity of the sleeve
- A system with uniform plate width to ensure minimal bearing stresses at the joint face and through-out the full embedded length of the dowel

APPLICATIONS

- Warehouse/Distribution centres
- Manufacturing facilities
- Commercial/Industrial complexes
- Entertainment centres
- Recreational complexes
- Parking lots & site paving

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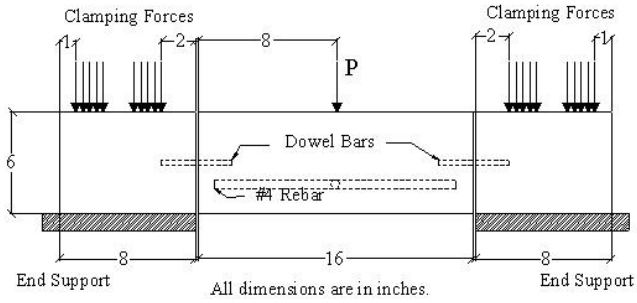
TESTING & RESEARCH

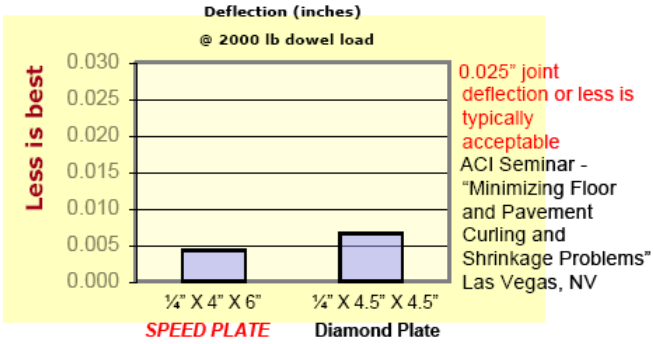
Greenstreak's engineering department dedicated numerous laboratory hours to investigate load transfer systems. Independent tests were conducted to provide an unbiased evaluation of all dowelling methods available, including round bar, square bar, flat bar and diamond plate. The tests, which utilised a modified version of the AASHTO T253 test for load transfer devices, were designed to determine the following:

- Bearing stresses imparted to the concrete at the joint face
- Total joint deflection under load
- Failure mode of each dowelling system

Modified AASHTO T253 Test Diagram



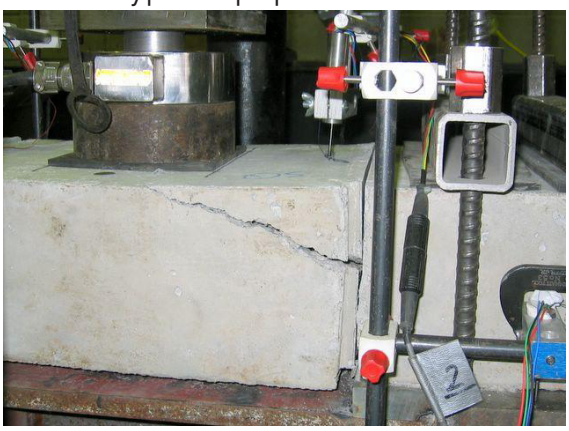
Test Results:



0.025" joint deflection or less is typically acceptable
ACI Seminar - "Minimizing Floor and Pavement Curling and Shrinkage Problems" Las Vegas, NV

Load Test Frame

Typical "pop-out" failure



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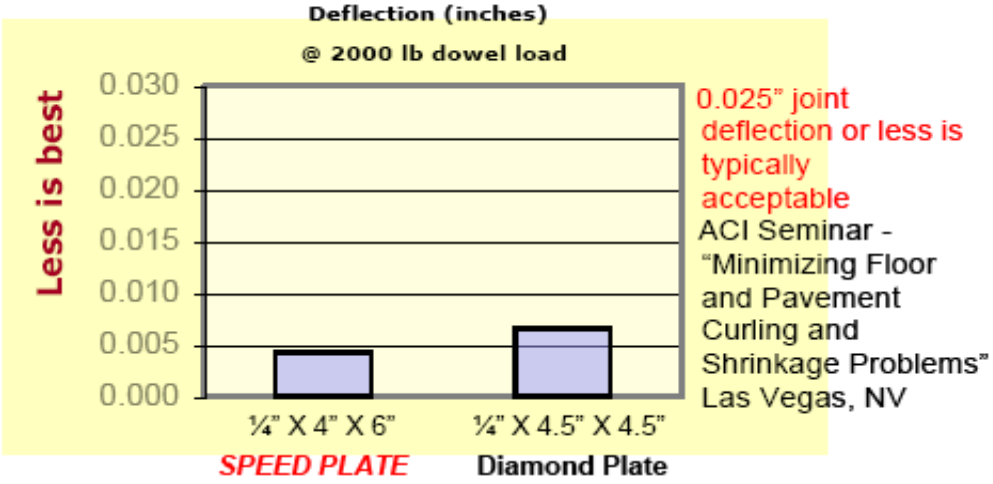
TESTING & RESEARCH CONCLUSIONS

- Tests of all dowel systems resulted in a tensile “pop-out” failure of the concrete.
- All dowel types provided deflections substantially less than the typically accepted value of 0.64mm when loaded to 907kg per dowel (equivalent to 4535kg axle load). Deflections greater than 0.64mm can lead to joint failure due to impact from wheeled traffic. Minimising deflection is the key to ensuring the durability of a control joint.
- Dowels with rectangular cross sections and larger widths are effective in reducing bearing stresses on concrete. Adding sleeves to dowels of all types also reduces the bearing stress on the surrounding concrete. Speed Plate dowels produce the lowest bearing stress on the surrounding concrete. Bearing stress alone, however, does not predict ultimate dowel loads. All dowel systems tested failed at a wide range of bearing stress but at similar applied loads.
- Flat plates or square dowels with sleeves that allow movement in the direction of the joint, are effective in eliminating lateral restraint between concrete sections. The Speed Plate sleeve incorporated an integral, custom insert that provides lateral movement capability between concrete sections.
- It is critically important to thoroughly vibrate the concrete around plate dowel.

Test Results:



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CONSIDERATIONS IN DOWEL SELECTION

Historically a round Dowel Bar had been the industry standard, with one half of the bar wrapped in denso.

Now you have choices to suit the right application, the slab design and also ease of construction is now the industry standard.

All dowels are not equal and do not believe anyone who says one dowel size and centers will suit all slabs. When making a dowel selection we are aware of the effect the ground conditions, slab thickness, concrete strength and anticipated live and dead loads will have on the dowel.

Canzac are the only supplier in the country to offer our design load program developed by an engineer for engineers, the only plate dowel supplier to have had any independent testing performed on our plate dowel systems. Other plate suppliers have shown a 6mm speed plate limitation when comparing it to a 10mm plate and we agree with this totally, that is why we have a 10mm and even a 20mm, so why use a 10mm plate dowel when you can use a 6mm, also our sleeve is a single piece unit, not two, two pieces will and do split.

We know that a plate dowel has its limitations and can advise alternatives from our vast range.

DOWEL THICKNESS SELECTION
A plate selection we are working towards to give you a quick summary would be as below

Slabs on grade up to 150mm thick	6mm Speed Plate
150mm - 200mm thick slab on grade	10mm Speed Plate
Slab on grade 200mm & above	USE 20mm CANZAC MONSTA DOWEL

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PRODUCT SIZES & CODES

PRODUCT	CODE	DESCRIPTION	UNIT
	12 000	6mm Red Speed Plate Sleeve & 6x100x150mm Plate, BLACK	Set
	12 050	6mm Red Speed Plate Sleeve & 6x100x150mm Plate, GALV	Set
	12 005	10mm Yellow Speed Plate Sleeve & 10x100x150mm Plate, BLACK	Set
	12 055	10mm Yellow Speed Plate Sleeve & 10x100x150mm Plate, GALV	Set

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