



DANLEY™

**Industrial Slab-On-Ground
Load Transfer System**

Diamond™

Dowel

Product Guide

NEW ✓
from Danley™

**Danley™ 20mm
Diamond™ Dowel**



Faster set-up than traditional round & square dowels

Reduces the risk of restraint at the joint

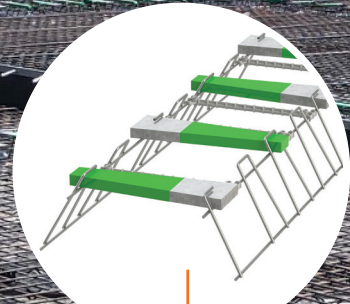
Complies with the requirements of TR34 (4th Edition)

Refer to the back of this
booklet for contact information.

Need Load Transfer for seriously heavy-duty slabs?



**Danley™ 20mm
Diamond™ Dowel**



**Danley™ 20mm
PD3™ Cradle
with RynoBar™**



**Danley™ 20mm
Hyper ArmourMate™**

The Danley™ 20mm Diamond™ Dowel & PD3™ Cradle with RynoBar™ provide Load Transfer in heavy duty slab-on-ground environments, including:



Port facilities
Container terminals



Freight and
transport facilities



Heavy rail and
intermodal facilities



Airports, hangers
and runways



Mining and heavy
haulage hardstands



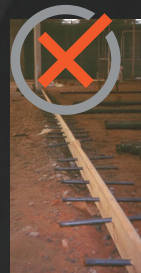
**Danley™ 20mm PD3™
Cradle with RynoBar™**

For Contraction (saw-cut) joints.
Provides load transfer
& lateral movement.
Limits deflection to ACI 360R-10.
Faster: RynoBar™ eliminates
cutting of travel bars.



**Danley™ 20mm
Diamond™ Dowel**

For Construction joints.
Provides lateral movement.
Complies with TR34 (4th Edition).
Load capacity at 20mm joint widths.
Fast & easy to install.



The Danley™ 20mm Diamond™ and PD3™ Cradles provide significant benefits over traditional round and square dowelled joints in industrial pavement applications.

Diamond™ Dowel

Product Description

Diamond™ Dowels are a plate dowel and sleeve system designed for construction joint applications in concrete slabs and pavements. Diamond™ Dowels are designed as a fast fix system that provides load transfer across the joint and minimises differential deflection between adjacent slab panels.

Diamond™ Dowels provide a low in-place cost solution by eliminating the need for the drilling or processing of formwork that is required with traditional round and square dowel systems. Diamond™ Dowels attach directly to wooden formboard or metal formwork plates and come pre-packaged with all components ready for installation.

New! Diamond™ Dowel 20mm is designed for construction joints in heavy duty concrete slabs, hardstands and pavements including airport runways, roads, ports & wharves and docks.

Features

- Available in 3 dowel sizes: 6mm, 10mm and 20mm.
- Standard Diamond™ Dowel plates are manufactured from steel to AS/NZS 3679.1 Grade 300.
- Maximises surface area at the joint.
- Nailing flange provides secure attachment to formboards.
- Double-headed nails help retain the sleeve in the concrete when stripping the formboards.
- Sleeve system ensures the dowel is perpendicular to the formboard and is stable.
- Sleeves moulded from durable, non-compressible plastic.
- Hot-dip galvanised steel to AS/NZS 4680.

Simplifies form removal, can also be integrated into formwork systems including Danley ArmourMate™

Trade Benefits

Concrete Benefits

- Speed and accuracy of dowel placement.
- Lowest placement cost.
- Ensures the flattest floors at the joint.
- Double-headed nails retain sleeve during formwork removal.
- Greater satisfaction from stakeholders.

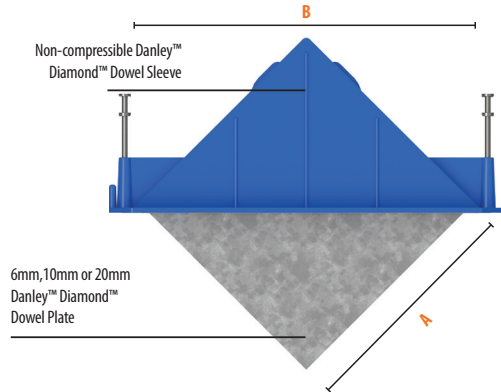
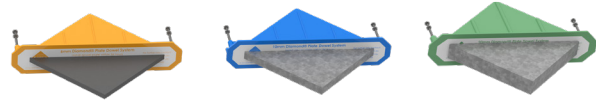
Asset Protection Benefits

- Reduces floor maintenance and downtime costs over the life-cycle of the facility.
- Reduces wear and tear on tenant's materials handling equipment.
- Provides a smoother floor surface at the joints which ensures tenant efficiency.
- Increase tenant satisfaction and return on investment.

Engineering Benefits

- Complies with TR34 (4th Edition) load capacity at 20mm joint width.
- Allows for perpendicular and parallel differential shrinkage.
- Diamond shape reduces risk of restraint.
- Limits slab deflection to ACI360R-10.
- Sleeve provides expansion capacity of 5mm.

Technical Data



Diamond™ Dowel Dimensions (mm):

Plate Thickness	A	B
6	110	156
10	110	156
20	114	161

Range

- Available in 6mm, 10mm and 20mm plate thicknesses.
- Sleeves are colour-coded, 6mm (Orange), 10mm (Blue) and 20mm (Green).
- 6mm and 10mm Diamond™ Dowel plates available in Black, Galvanised and 316 grade stainless steel.
- Diamond™ Dowel Trade Packs available in 3 configurations.

Packaging

Diamond™ Dowel Trade Pack - Designed for the rigours of onsite construction, the Danley™ Diamond™ Dowel Trade Pack is a sturdy, durable and easy to carry carton that is work-site tough. Diamond™ Dowel Trade Pack configurations:

6mm: 25 sets x 6mm Diamond™ Dowels & Sleeves (Orange)

10mm: 15 sets x 10mm Diamond™ Dowels & Sleeves (Blue)

20mm: 7 sets x 20mm Diamond™ Dowels & Sleeves (Green)



Each sleeve is fitted with two doubled-headed steel nails.

Bulk Pack (pallet) Packaging (6mm & 10mm): The Diamond™ Dowels in bulk pack format are palletised for bulk orders. The sleeves are packaged in one large box with 500 units. The dowels are packed flat onto a skid and the sleeves box is packed on top and shrink-wrapped. For more information, contact our national customer service team.

Available Sizes

Product Code	Dowel Thickness (mm)	Finish	Pack Size	Pack Weight (Kg)
DDSLPL06X110B	6	Black	25	15.3
DDSLPL06X110BPK	6	Black	500	270
DDSLPL06X110G	6	Galv.	25	15.6
DDSLPL06X110GPK	6	Galv.	500	280
DDSLPL06X110S	6	316 SS.	1*	0.7
DDSLPL10X110B	10	Black	15	15.1
DDSLPL10X110BPK	10	Black	500	430
DDSLPL10X110G	10	Galv.	15	15.2
DDSLPL10X110GPK	10	Galv.	500	450
DDSLPL10X110S	10	316 SS.	1*	1.0
DDSLPL20G	20	Galv.	7	14.2

*Stainless Steel Diamond™ Dowel sold individually.

Local Supply



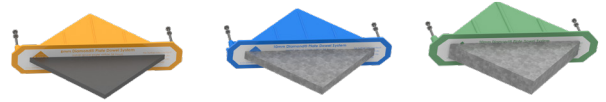
At ramsetreid, we pride ourselves in being a local manufacturer and supplier of concrete construction solutions throughout Australia and New Zealand.

Material Technical Data (Diamond™ Dowel Plates)

Component	Dimension (mm)	Material Type	Material Standard		Steel Grade Equivalent	Yield Stress (Mpa)	Tensile Strength (Mpa)
			Black	Galv			
6mm Plate	6 x 110 SQ.	Steel	AS/NZS 3679.1	AS/NZS 4680:2006	≥ Grade 300	325	450
10mm Plate	10 x 110 SQ.	Steel	AS/NZS 3679.1	AS/NZS 4680:2006	≥ Grade 300	325	450
20mm Plate	20 x 114 SQ.	Steel	AS/NZS 3679.1	AS/NZS 4680:2006	≥ Grade 300	325	450

Note: 6mm and 10mm Diamond™ Dowels are also available in Grade 316 Stainless Steel.

Performance Data



Diamond™ Dowel Design Capacities

- All values per TR34 (4th Edition) - Sections 6.4 and 6.5 (plain unreinforced concrete).
- Values below are single dowel limiting load capacities.

Slab thickness (mm)	Dowel Size	Single Dowel Design Capacity (kN)	Single Wheel Design Load (kN) (mid panel joint)	Single Wheel Design Load (kN) (edge loading)
125	Diamond™ Dowel 6mm	11.7	63	35
150		16.1	92	51
150	Diamond™ Dowel 10mm	16.1	92	51
175		21.3	127	70
200		27.1	174	96
250	Diamond™ Dowel 20mm	38.4	281	154
300		54.4	431	237
350		73.1	635	349
400		94.5	889	489
450		118.7	1184	651

Concrete Compressive Strength Effect

Strength (MPa)	30	32	35	40	45
Factor	1.00	1.03	1.08	1.15	1.22

Note: Dowel spacing 450mm.

Concrete strength 30MPa.

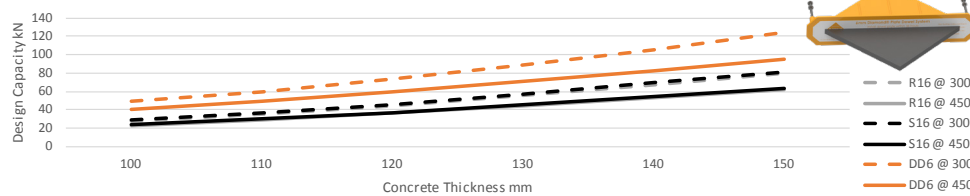
Joint opening 10mm.

Design capacities should be compared with factored loads.

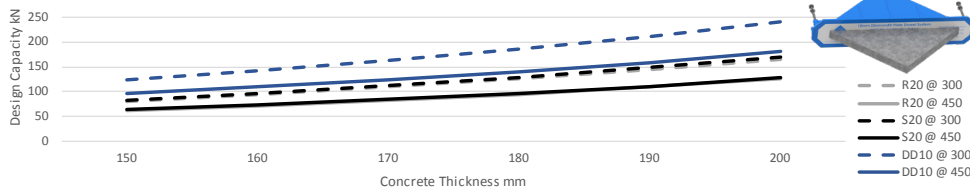
Limiting capacity is concrete shear cone capacity.

Diamond™ Dowel Performance vs Round and Square Dowels

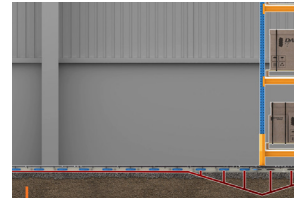
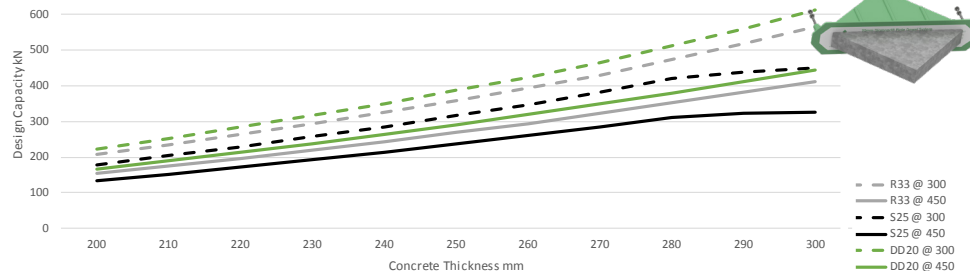
Light Duty



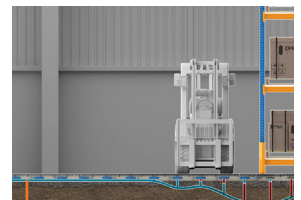
Medium Duty



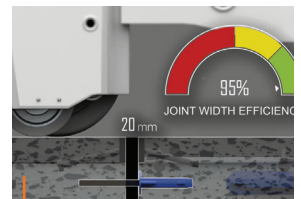
Heavy Duty



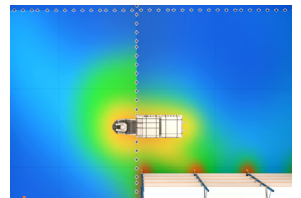
Typical rack load in a materials handling environment.



Depicts load distribution curve around the critical dowel.



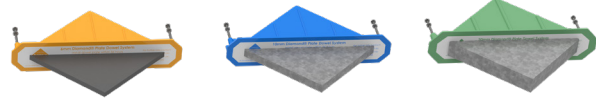
Joint Width Efficiency as joints open from 10mm up to 20mm.



Distribution of combined loads in a materials handling environment.

Contact Danley Customer Service for additional dowel capacity information required for project specific slab thicknesses, joint width openings, or concrete grades.

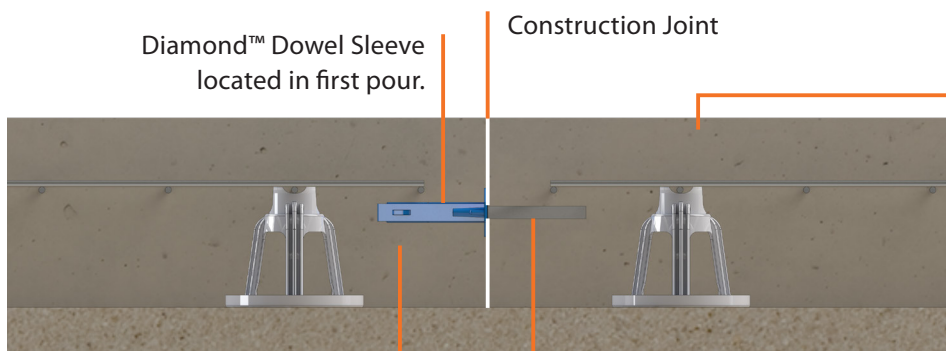
How to Specify



How to Specify the Danley™ Diamond™ Dowel

Danley™ Diamond™ Dowel - tapered plate dowel (Grade 300, AS/NZS 3679) providing bilateral movement equal to joint opening and with expansion capability. The non-compressible sleeve limiting differential deflection.

6mm and 10mm available in Black, Galvanised and Stainless Steel. 20mm available in Galvanised.



Diamond™ Dowel Sleeve located in first pour.

Construction Joint

Diamond™ Dowel Plate Dowel and Sleeve system provides load transfer for construction joint applications in concrete slabs and pavements.

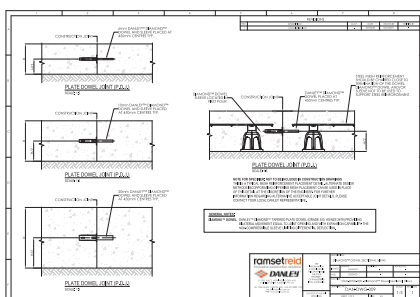
Danley™ Diamond™ Dowel placed at 450mm centres (typical).

In the absence of any other information, this mesh placement is a suggestion only, and is superseded by the engineer's design.

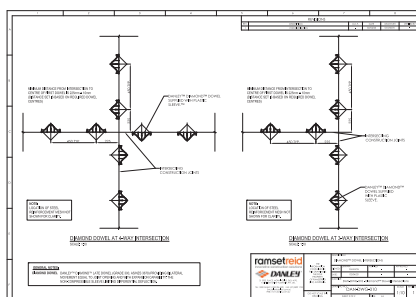
Reinforcement should be supported correctly with bar chairs complying to AS/NZS 2425:2015. The Danley™ Diamond™ Dowel is not to be used as reinforcing support.

Danley™ Diamond™ Dowel Specification Details

DWG format: Scan this QR Code to access the Diamond™ Dowel details in DWG format.



Danley™ Diamond™ Dowel Sectional Details



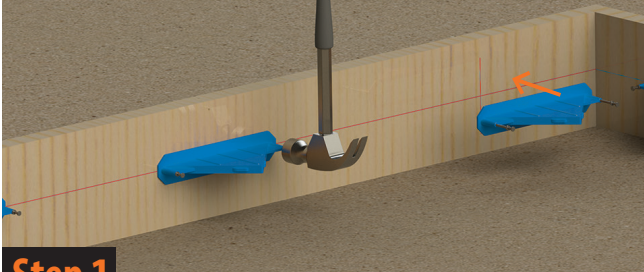
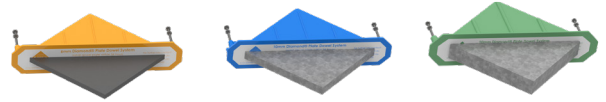
Danley™ Diamond™ Dowel Intersection Details



Visit our website, or scan the QR Codes to download a copy of the

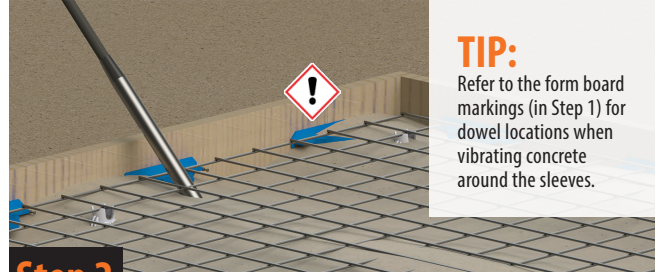
Danley™ Diamond™ Dowel Specification Details.

Installation Process



Step 1

- Mark the form for slab centre and Diamond™ Dowel spacing (typically 450mm). Using the 2 nails provided, attach the sleeves to the form.



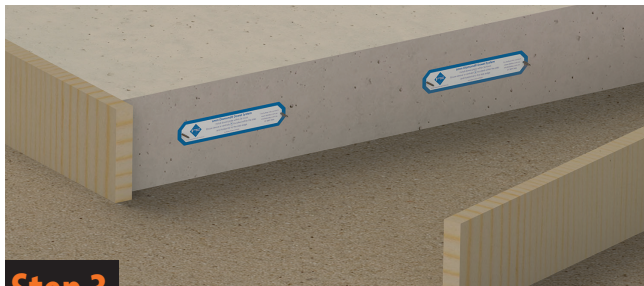
Step 2

- Install any required concrete reinforcing. Place concrete. Edge of slab must be vibrated to consolidate concrete around the Diamond™ Dowel sleeve (avoid contacting the sleeve with the vibrator shaft).

! IMPORTANT: Do not place or support the mesh on the Diamond™ Dowel sleeves. Use mesh chairs to support the mesh. Refer to the specification diagram on page 6.

TIP:

Refer to the form board markings (in Step 1) for dowel locations when vibrating concrete around the sleeves.



Step 3

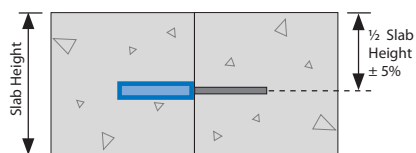
- Strip the form. This is best accomplished by starting at one end and working along the form.



Step 4

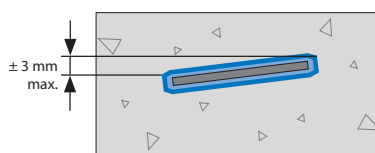
- Insert the Diamond™ Dowel plates into the sleeves (at centre point of the sleeve) as soon as possible, and no later than 36 hours after the concrete pour. The second pour can now be placed.

Installation Tolerances



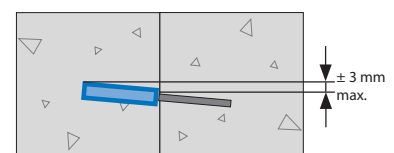
Scenario 1

Location = $\frac{1}{2}$ x slab thickness $\pm 5\%$ e.g. for 200mm thick slab, location is 100mm ± 10 mm from top of slab. **This positions the dowel in the most effective location in the concrete, maximising shear load transfer.**



Scenario 2

Parallel to top of slab - one end of the nailing plate to be no more than 3mm higher than the other end. **If the dowel is severely misaligned parallel to the top edge of the slab, the dowel would restrict the slabs from moving parallel (i.e. laterally) to each other.**



Scenario 3







Perpendicular to the face of the dowel joint - the top of the sleeve at the apex should be no more than 3mm higher or lower than the face of the sleeve behind the nailing flange. **This kind of misalignment is normally considered to be worst case as this restricts joint opening during concrete curing.**

Product Compliance

Compliance statement

Danley™ Diamond™ Dowel complies with the New Zealand Building Code clauses identified below.

Compliance details: NZBC

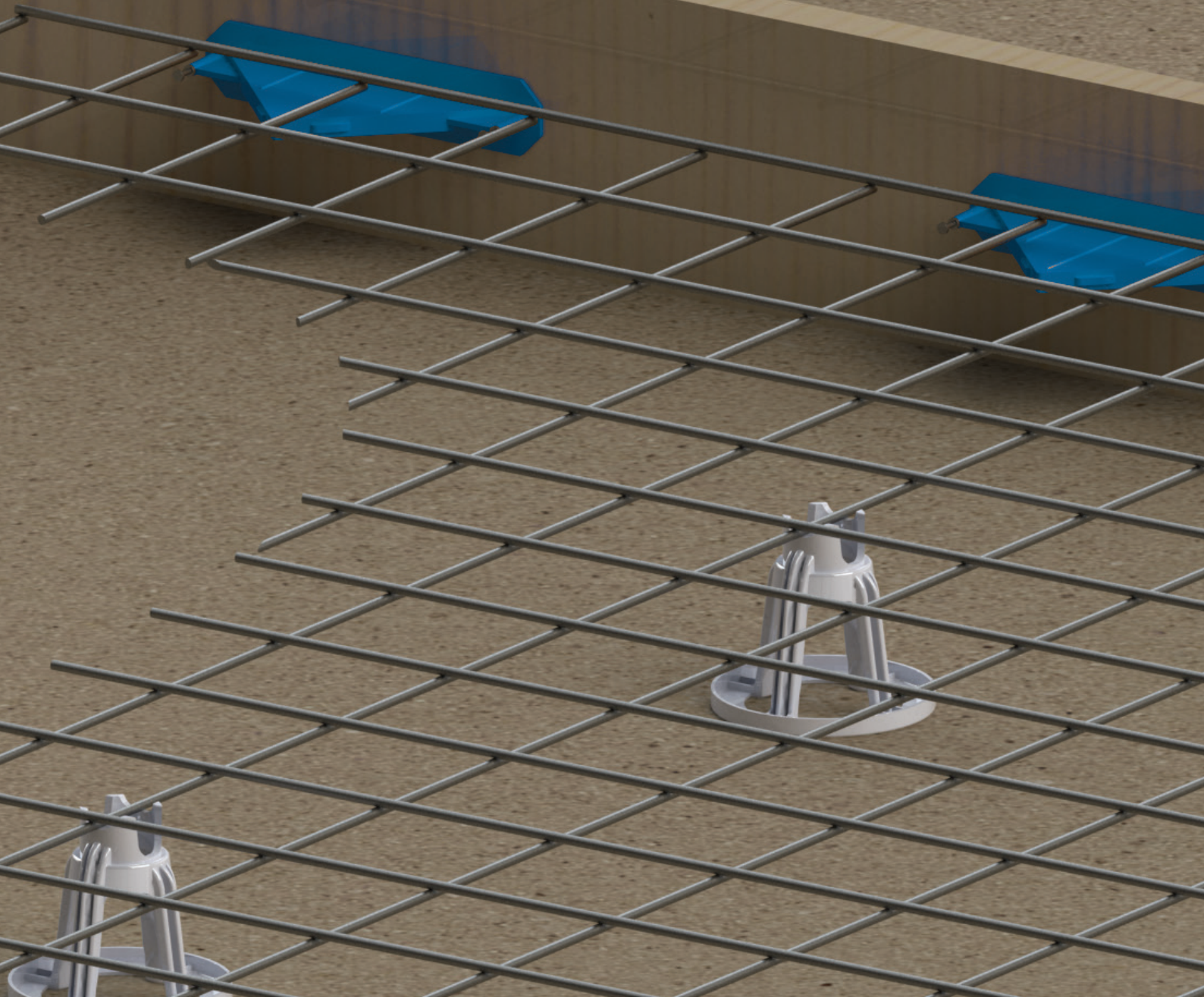
NZBC Clause	Criteria	Compliance Status
B1.3.1	'Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives.'	
B1.3.2	'Buildings, building elements and sitework shall have a low probability of causing loss of amenity through undue deformation, vibratory response, degradation, or other physical characteristics throughout their lives, or during construction or alteration when the building is in use.'	
B1.3.3 (a), (b), (d), (e), (f), (g), (h), (j), (q)	'Account shall be taken of all physical conditions likely to affect the stability of buildings, building elements and sitework, including: (a) Self weight, (b) Imposed gravity loads arising from use . . . (d) Earth pressure, (e) Water and other liquids, (f) Earthquake, (g) Snow, (h) Wind . . . (j) Impact . . . (q) Time dependent effects including creep and shrinkage.'	
B1.3.4	'Due allowance shall be made for: (a) The consequences of failure, (b) The intended use of the building, (c) Effects of uncertainties resulting from construction activities, or the sequence in which construction activities occur, (d) Variation in the properties of materials and the characteristics of the site, and (e) Accuracy limitations inherent in the methods used to predict the stability of buildings.'	
B2.3.1 (a)	'Building elements must, with only normal maintenance, continue to satisfy the performance requirements of this code for the lesser of the specified intended life of the building, if stated, or: (a) The life of the building, being not less than 50 years, if (i) Those building elements . . . Provide structural stability to the building, or (ii) Those building elements are difficult to access or replace, or (iii) Failure of those building elements to comply with the building code would go undetected during both normal use and maintenance of the building.'	
F2.3.1	'The quantities of gas, liquid, radiation or solid particles emitted by materials used in the construction of buildings, shall not give rise to harmful concentrations at the surface of the material where the material is exposed, or in the atmosphere of any space.'	

Item Diamond® Dowel System
is 100% guaranteed when 30 hour
cure time is followed. • Located within the slab
and protected by the side edge
channel.

For further details
visit www.diamondslabs.com
or call 1-800-444-4444

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