Leviat®
A CRH COMPANY

Staisil-HLD

Acoustic Shear Dowel

Independently tested to EN ISO 10140: 3: 2010: Measurement of impact sound insulation

Shear load dowels offering a

27% impact sound reduction

over rigid concrete floor connections

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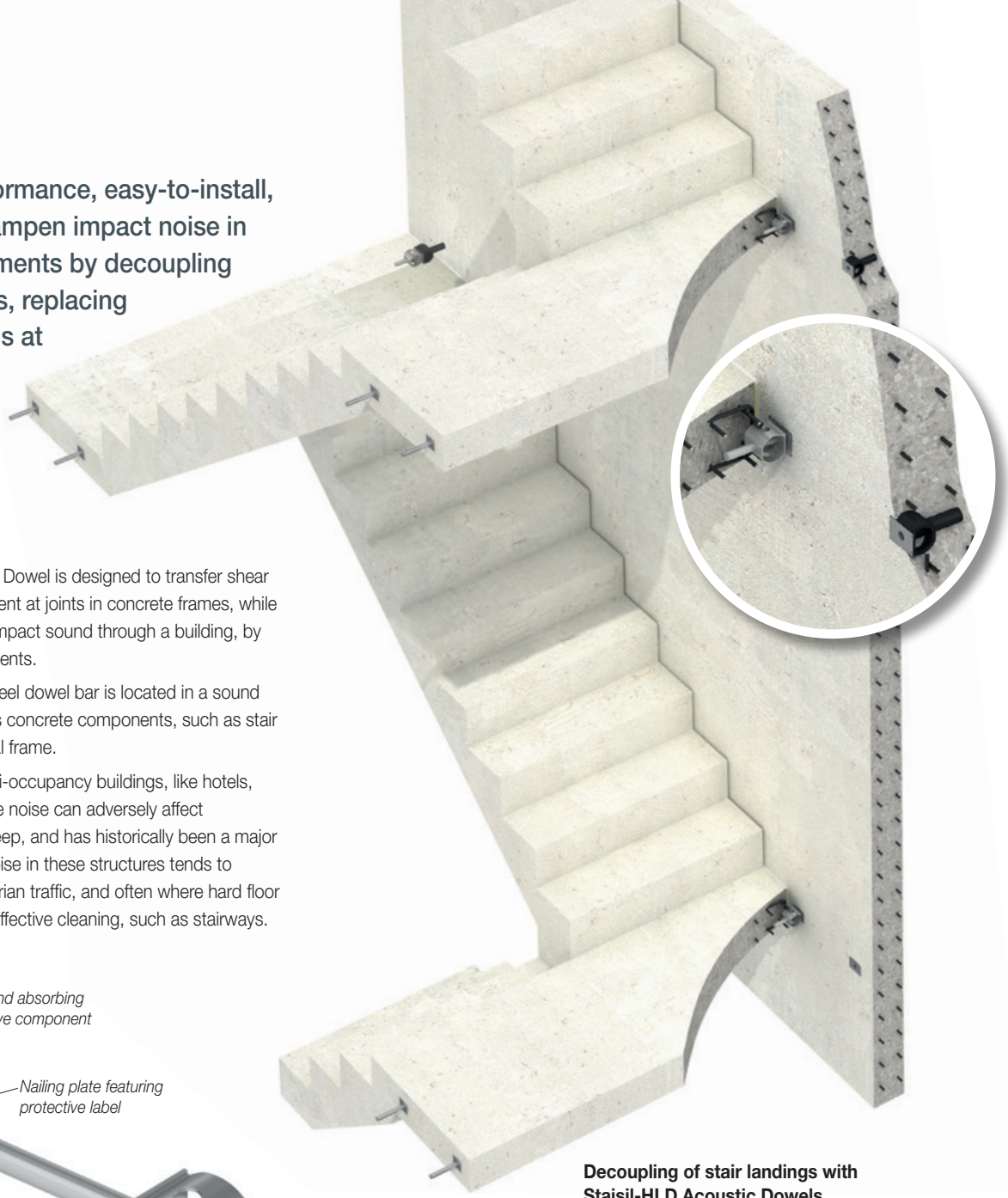
Staisil-HLD

Innovative, high performance, easy-to-install, Acoustic Dowel to dampen impact noise in multi-storey developments by decoupling concrete components, replacing rigid floor connections at locations such as stairs, landings and walkways.



Decoupling of stair landings with Staisil-HLD Acoustic Dowels

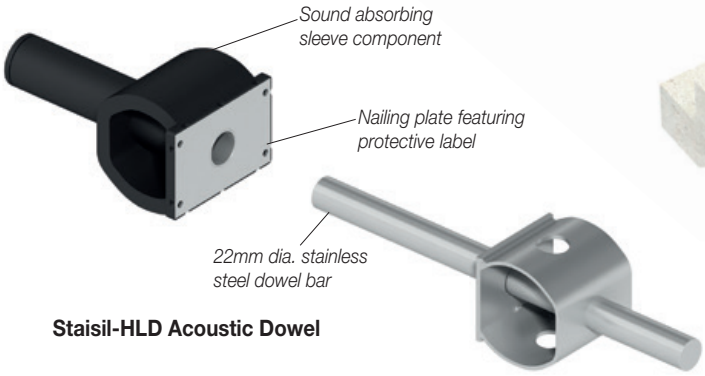
Ancon Acoustic Dowel

The Ancon Staisil-HLD Acoustic Dowel is designed to transfer shear load and allow essential movement at joints in concrete frames, while also reducing the oscillation of impact sound through a building, by isolating adjacent concrete elements.

The 22mm diameter stainless steel dowel bar is located in a sound absorbing sleeve that decouples concrete components, such as stair landings from the main structural frame.

Typical applications include multi-occupancy buildings, like hotels, apartments and hospitals, where noise can adversely affect concentration, relaxation and sleep, and has historically been a major source of complaints. Impact noise in these structures tends to originate in areas of high pedestrian traffic, and often where hard floor coverings are used to facilitate effective cleaning, such as stairways.

Product Components



Staisil-HLD Acoustic Dowel

Acoustic Performance Testing

The Ancon Staisil-HLD has been independently tested by the Fraunhofer Institute for Building Physics in Stuttgart, a leading research authority on acoustics. Tests were conducted in accordance with EN ISO 10140: 3: 2010: Acoustics: Laboratory measurement of sound insulation of building elements: Measurement of impact sound insulation, with additional calculations to EN ISO 717-2: 2013.

A decoupled concrete configuration, featuring Staisil-HLD Acoustic Shear Dowels, offers an 18dB impact sound reduction over a rigid concrete floor connection, verified by the Fraunhofer Institute.

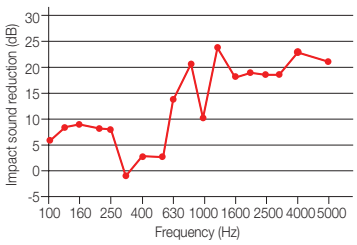
A control concrete specimen and a test concrete specimen were cast. The first replicated a typical rigid concrete connection, while the latter featured a pair of Staisil-HLD dowels spaced at 600mm. The acoustic performance of both specimens was calculated, with the Staisil-HLD configuration showing a 27% improvement over the control specimen.

Impact Sound Reduction

Control Specimen*	Test Specimen*	Impact Sound Reduction of Staisil-HLD Acoustic Dowel
67 dB	49 dB	**18 dB**

*Weighted normalised impact sound pressure level

Impact sound reduction at one-third octave bands



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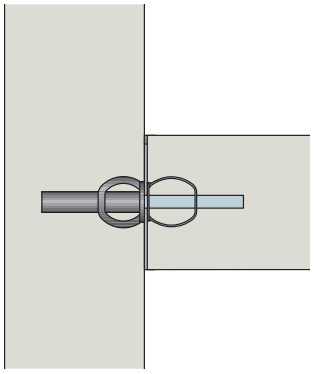
Design Capacity

F_{RD} Design Capacity (kN) for various Joint Widths and Slab Thickness

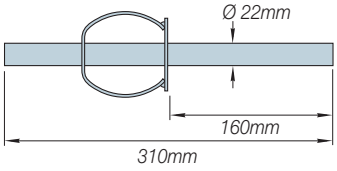
Joint Width	Slab Thickness (mm)							
(mm)	180	200	220	240	260	280	300	320
10	35	37	39	39	39	39	39	39
15	35	37	39	39	39	39	39	39
20	35	37	39	39	39	39	39	39
25	35	37	39	39	39	39	39	39
30	35	37	39	39	39	39	39	39
35	34	37	39	39	39	39	39	39
40	34	37	39	39	39	39	39	39
45	33	37	39	39	39	39	39	39
50	33	37	39	39	39	39	39	39
55	33	37	39	39	39	39	39	39
60	32	37	39	39	39	39	39	39

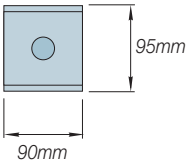
Minimum concrete grade C25/30



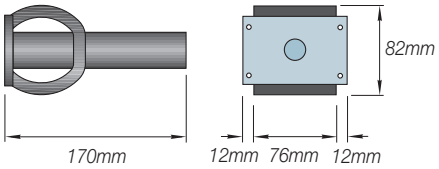
Dimensions and Spacings

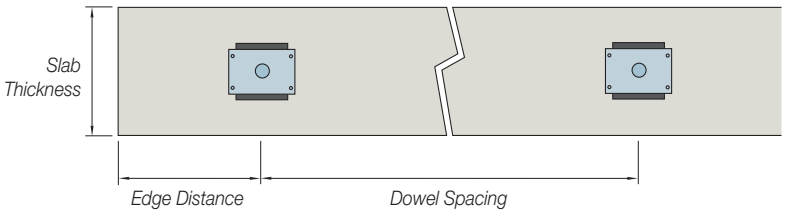
Dowel





Sleeve



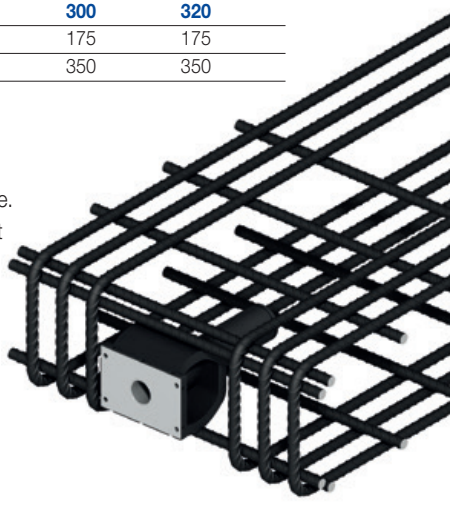


Minimum Dowel Spacing

Slab Thickness (mm)	180	200	220	240	260	280	300	320
Minimum Edge Distance (mm)	180	180	180	175	175	175	175	175
Minimum Dowel Spacing (mm)	360	360	360	350	350	350	350	350

Reinforcement Details

Local reinforcement is required to guarantee that the forces are transferred between the connectors and the concrete. The tables show proposals for the type and spacing of the main reinforcement, together with details of reinforcement above and below the connectors.

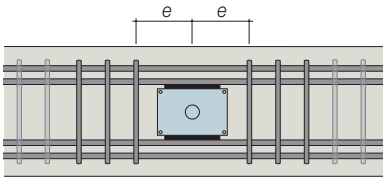


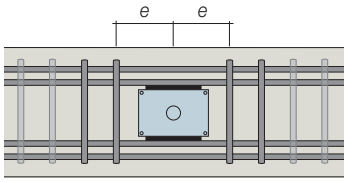
Options for Main Reinforcement (No. of u-bars each side)

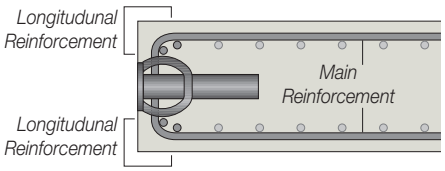
H10	H12
3	2

Longitudinal Reinforcement (No. of bars top and bottom)

H10
2







Spacing of Main Reinforcement

Slab Depth (mm)	Dimension e
180	80
200-320	100

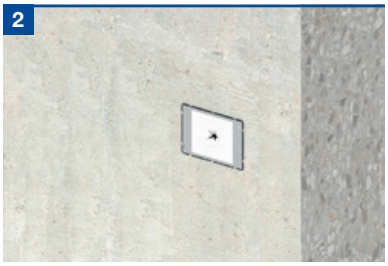
Installation

The Staisil-HLD is a two-part shear connector comprising a sleeve and a dowel component.

1

Nail the sleeve component to the shuttering ensuring that the sleeve is correctly orientated for the direction of the load. Check that the minimum spacing and edge distances are not exceeded. The label prevents debris from entering into the sleeve aperture and should not be removed. Fix all necessary reinforcement and pour the concrete.

2

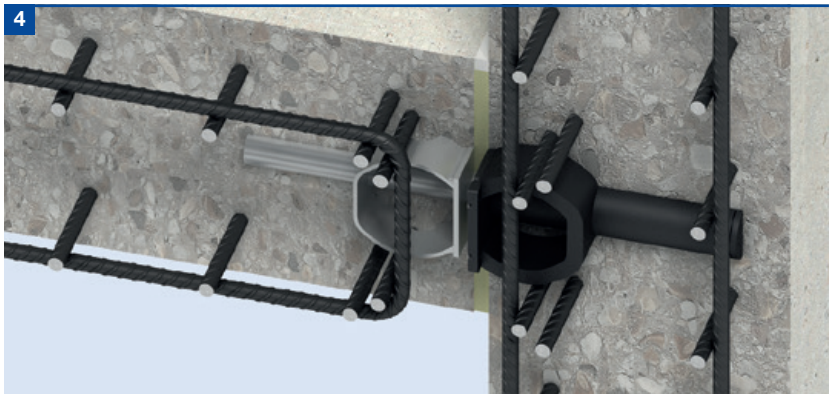


When the concrete has achieved sufficient strength, strike the shuttering. Puncture the label to reveal the hole for the dowel.

3

Position compressible joint filler of an appropriate width for applications where movement is expected between two sections of concrete. Push the dowel component through the joint filler until it is fully located in the sleeve component. It may be necessary to tap the dowel component to overcome the dimple which pinch holds the dowel in the sleeve and prevents dislocation when the concrete is vibrated.

4



Fix the reinforcement around the dowel component and pour the concrete to complete the installation.

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