MAGRYN

CERTIFICATE

500mm WIDE BATTENS
INSTALLED AT 90° OR 45° ANGLE TO WALL

Project:	Standard Certification Battens (500mm wide) & Fixings	Project No:	16391
		Date:	November 2016
		Engineer:	Nicola Austel
For:	Knotwood Pty Ltd		

SCOPE

Magryn & Associates have been engaged to undertake structural calculations and specify fixings to install the Knotwood Aluminium Clip-Batten system to various wall materials in various regions of Australia. This is to specify and certify the structural adequacy of the battens and their fixings and comply with the current relevant Australian Standards.

GENERAL

The Knotwood Clip-Batten system can be used as aluminium cladding or as an architectural feature. The battens are available in 50mm, 100mm, 150mm and 200mm widths and can be installed perpendicular to the wall or at 45° using an angled joiner. The components of the system are Wall Brackets (KWB5050A), 50mm Battens (KWB5050B), 100mm Battens (KWB50100B), 150mm Battens (KWB50150B), 200mm Battens (KWB50200B), Batten Joiners (TS55111/B), 45° Joiners (TS55656/C), 150mm Elliptical Caps (TS55885/A) and 200mm Elliptical Caps (TS55884/A). The components are manufactured from 6063-T6 Aluminium alloy.

The maximum overall batten width considered in this certification is 500mm installed at 90° or 45° angle to the wall.

This certification is for the wall fixings and the 'Clip-in' connections of the components only; the structural adequacy of the wall studs and the building structure has not been checked by Magryn & Associates.

Design loads considered are self-weight and wind loads for Regions A, B and C in Australia. The fixings have been designed to be installed to steel stud, timber stud, concrete, and masonry walls.

The structural calculations are based on information and drawings provided by Knotwood Pty Ltd.

DESIGN STANDARDS

Calculations have been undertaken in accordance with the following Australian Standards and conditions.

Australian Standards:

- AS/NZS 1170.0-2002 Structural design actions Part 0: General principals
- AS/NZS 1170.1-2002 Structural design actions Part 1: Permanent, imposed and other actions
- AS/NZS 1170.2-2011 Structural design actions Part 2: Wind actions
- AS 1664.1-1997 Aluminium structures

Conditions:

- Wind average recurrence interval of 500 years
- Terrain Category 2
- Building height ≤ 20m
- Shielding and Topographic Multiplier M_s and M_t taken as 1.0
- Aspect ratio correction and angle of inclination factors K_{ar} and K_i taken as 1.0

RESULT

All fixing anchors to the wall are to be stainless steel. Alternatively, hot dipped galvanised steel fixings can be used in combination with a neoprene washer to isolate the fixing anchor from the aluminium.

Fixing screws are to be installed in pairs of two at 25mm centres to the perforated groove in the Wall Bracket at maximum centres detailed below, and with one pair of screws at each end of each Wall Bracket component.

Fixing bolts are to be installed as single bolts to the centre of the Wall Bracket at maximum centres detailed below, and with one bolt at each end of each Wall Bracket component. The screw flutes are to be removed locally to allow for installation of the bolts centrally in the Wall Bracket.

Additionally to the 'Clip-in' connections, all components in the Batten installation are to be connected to each other with Aluminium rivets on each side to each component at maximum centres detailed below.

All fixings are to be installed in accordance with manufacturer's specifications.

Fixing into steel stud wall:

	Wind Region A	**Wind Region B**	**Wind Region C**
Steel stud 0.55BMT	2 No. Buildex **#14-10 TPI Screws** at 80mm centres	not suitable	not suitable
Steel stud 0.75BMT	2 No. Buildex **#14-10 TPI Screws** at 100mm centres	not suitable	not suitable
Steel stud 1.20BMT	2 No. Buildex **#14-10 TPI Teks** at 100mm centres	not suitable	not suitable
Connection between components	Min. 1 No. Buildex **#30 Aluminium Rivets** at 4000mm centres on each side of batten to each batten component		

Fixing into timber stud wall:

	Wind Region A	**Wind Region B**	**Wind Region C**
Timber stud Pine	2 No. Buildex **#14-10 TPI Screws** at 100mm centres	not suitable	not suitable
Timber stud Hardwood	2 No. Buildex **#14-10 TPI Screws** at 100mm centres	not suitable	not suitable
Connection between components	Min. 1 No. Buildex **#30 Aluminium Rivets** at 4000mm centres on each side of batten to each batten component		

- Nominal embedment depth to timber to be 36mm.
- Fixing to be central in timber stud.

Fixing into concrete wall:

	Wind Region A	**Wind Region B**	**Wind Region C**
Concrete ≥ Grade N25	Hilti **HRD 10** Frame Anchors at 135mm centres	not suitable	not suitable
	Alternatively:		
	Hilti **HUS3-10** Screw Anchors at 450mm centres	not suitable	not suitable
Connection between components	Min. 1 No. Buildex **#30 Aluminium Rivets** at 4000mm centres on each side of batten to each batten component		

- Nominal embedment depth to be 70mm for Hilti HRD Frame Anchors and 75mm for Hilti HUS3 Screw Anchors.
- Minimum thickness of concrete to be 120mm for Hilti HRD Frame Anchors and 130mm for Hilti HUS3 Screw Anchors.
- Minimum distance from the concrete edge to be 140mm For Hilti HRD Frame Anchors and 90mm for Hilti HUS3 Screw Anchors.

Fixing into masonry wall:

Fixing into clay brick, perforated clay brick or hollow concrete block is not suitable for a batten width of 500mm.

For Magryn & Associates Pty Ltd

Nicola Austel
P. Eng.

Attachments: - Structural Calculations (sheets 1-23)