



BRANZ Appraised

Appraisal No. 968 [2017]

VELUX SKYLIGHTS



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BRANZ Appraisals

Technical Assessments of products for building and construction.



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Product

- 1.1 Velux Skylights are for use on roofs to provide natural light into interior spaces within buildings. Velux Skylights come in two ranges – low-pitch models include the FCM, VCM and VCS series, suitable for use on roof pitches between 0° and 60°, and FS, VS, VSE and VSS series which are for use with roof pitches between 15° and 60°. Some models are openable and can be used to provide ventilation.

Scope

- 2.1 Velux Skylights [FS, VS, VSE and VSS series] have been appraised for use on buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with respect to building height and maximum floor plan area; and,
 - with roof structures designed and constructed to meet the requirements of the NZBC; and,
 - with masonry tile, pressed metal tile, and profiled metal roof cladding systems complying with NZBC Acceptable Solution E2/AS1; and,
 - with a roof pitch between 15° and 60°; and,
 - situated in NZS 3604 Wind Zones, up to and including Extra High.
- 2.2 Velux Low-Pitch Skylights [FCM, VCM and VCS series] have been appraised for use on buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with respect to building height and maximum floor plan area; and,
 - with roof structures designed and constructed to meet the requirements of the NZBC; and,
 - with pitched roof cladding types and profiles and minimum pitches as specified in E2/AS1; or,
 - for use on flat or nominally flat roofs making use of membrane roof systems; and,
 - with a roof pitch between 0° and 60°; and,
 - situated in NZS 3604 Wind Zones, up to and including Extra High.
- 2.3 Velux Skylights must be installed in accordance with the Technical Literature supplied by Velux New Zealand Ltd.



Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Velux Skylights, if designed, used, installed, and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC.

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.3. Velux Skylights meet the requirements for loads arising from snow, wind and impact [i.e. B1.3.3 (g), (h) and (j)]. See Paragraphs 8.1 to 8.3.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years. Velux Skylights meet this requirement. See Paragraphs 9.1 and 9.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Velux Skylights meet these requirements. See Paragraph 11.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. and F2.3.3 (a). Velux Skylights meet these requirements and will not present a health hazard to people and are unlikely to cause injury to people. See Paragraphs 8.1 to 8.3.

Clause G4 VENTILATION: Performance G4.3.1 and G4.3.3. Openable Velux Skylights will contribute to meeting these requirements. See Paragraph 13.1.

Clause G7 NATURAL LIGHT: Performance G7.3.1 and G7.3.2. Velux Skylights will contribute to meeting these requirements. See Paragraph 14.1.

Clause G9 ELECTRICITY: Performance G9.3.1. Velux Skylights meet this requirement. See Paragraph 15.1.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 and H1.3.2E. Velux Skylights will contribute to meeting these requirements. See Paragraph 16.1.

Technical Specification

4.1 Velux Skylights (FS, VS, VSE and VSS series) are a range of fixed and opening skylights which are manufactured from preservative treated softwood frames and sashes, finished on the interior faces with a white semi-gloss paint. External cappings are 'grey friars' coloured PVDF lacquered aluminium.

4.2 Velux Low-Pitch Skylights (FCM, VCM and VCS series) are a range of fixed and opening low-pitch skylights which are finished on the interior faces with a white semi-gloss paint. The FCM Low-Pitch Skylight has an aluminium frame to the perimeter of the insulated glazing unit and an integral rubber gasket to seal the unit to the curb. The VCM and VCS Low-Pitch Skylights have aluminium frames and sashes with white PVC interior frames. External cappings for Velux Low-Pitch Skylights are aluminium. All aluminium components of Velux Low-Pitched Skylights are pre-finished with a 'grey friars' coloured PVDF lacquer. Velux Low-Pitch Skylights are primarily suited for use with roof membranes and wide-profile metal roofing. Flashings and roof detailing for Velux Low-Pitch Skylights must be specifically designed in all instances.



4.3 The Velux Skylight models covered by the Appraisal are:

Skylights

- **Fixed Skylight [FS]**

Models:

- FS C01: 550 x 700 mm
- FS C04: 550 x 980 mm
- FS M04: 780 x 980 mm
- FS M06: 780 x 1180 mm
- FS M08: 780 x 1400 mm
- FS S01: 1140 x 700 mm
- FS S06: 1140 x 1180 mm

- **Opening Skylight [VS]**

Models:

- VS C04: 550 x 980 mm
- VS M04: 780 x 980 mm
- VS M06: 780 x 1180 mm
- VS M08: 780 x 1400 mm
- VS S01: 1140 x 700 mm
- VS S06: 1140 x 1180 mm

- **Integra® Skylight [VSE] / Integra® Solar Skylight [VSS]**

Models:

- VSE/VSS C04: 550 x 980 mm
- VSE/VSS M04: 780 x 980 mm
- VSE/VSS M06: 780 x 1180 mm
- VSE/VSS M08: 780 x 1400 mm
- VSE/VSS S01: 1140 x 700 mm
- VSE/VSS S06: 1140 x 1180 mm

Low-Pitch Skylights

- **Low-Pitch Fixed Skylight [FCM]**

Models:

- FCM 2222: 692 x 692 mm
- FCM 2234: 692 x 997 mm
- FCM 2246: 692 x 1302 mm
- FCM 2270: 692 x 1911 mm
- FCM 3030: 895 x 895 mm
- FCM 3046: 895 x 1302 mm
- FCM 3434: 997 x 997 mm
- FCM 4646: 1302 x 1302 mm

- **Low-Pitch Opening Skylight [VCM]**

Models:

- VCM 2222: 692 x 692 mm
- VCM 2234: 692 x 997 mm
- VCM 2246: 692 x 1302 mm
- VCM 3030: 895 x 895 mm
- VCM 3046: 895 x 1302 mm
- VCM 4646: 1302 x 1302 mm



- **Low-Pitch Integra® Solar Skylight [VCS]**

Models:

- VCS 2222: 692 x 692 mm
- VCS 2234: 692 x 997 mm
- VCS 2246: 692 x 1302 mm
- VCS 3030: 895 x 895 mm
- VCS 3046: 895 x 1302 mm
- VCS 4646: 1302 x 1302 mm

Glazing

- 4.4 VELUX Skylights are factory glazed using sealed double-glazed insulated glass units [IGU's]. The IGU's are provided in two types – either marked 04 or 05 which are identified in the product codes on the packaging and on the IGU itself on the spacer bar between the glazing and on the glass panes.
- 4.5 Type 04 units comprise either a 3 or 3.9 mm thick toughened outer pane with a low emissivity [Low-E] coating, a 9 mm argon-filled cavity and a 5.36 mm thick inner pane of laminated toughened safety glass. The outer pane has a coating which is designed to reduce the buildup of dirt and ease cleaning.
- 4.6 Type 05 units comprise either a 3 or 3.9 mm thick toughened outer pane with a low emissivity [Low-E] coating, an 11 mm argon-filled cavity and a 3 mm or 4 mm thick inner pane of toughened safety glass.
- 4.7 The units carry markings to show compliance with American National Standards Institute Standard ANSI Z97.1.

Flashings

- 4.8 EDW, EDL and EKW Flashings are a range of Kynar 500 painted aluminium flashings designed for use with Velux Skylights [FS, VS, VSE and VSS series]. Flashings and roof detailing for the Low-Pitch Skylight must be specifically designed and are outside the scope of the Appraisal.

Handling and Storage

- 5.1 Handling and storage of all components of Velux Skylights is under the control of the skylight installer. Components must be kept dry and under cover at all times. Care must be taken to avoid surface damage to the skylight components and flashings during the installation process.

Technical Literature

- 6.1 Refer to Velux New Zealand Ltd for details of the current Technical Literature for Velux Skylights. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed. Technical literature is supplied with each skylight.

Design Information

General

- 7.1 Velux Skylights are for use on roofs to provide natural light into interior spaces within buildings. Velux Skylights come in two ranges – low-pitch models include the FCM, VCM and VCS series, suitable for use on roof slopes between 0° and 60°. FS, VS, VSE and VSS series are for use with roof slopes between 15° and 60°. Installation of Velux Skylights on roofs with other pitches is outside the scope of this Appraisal and their installation must be specifically designed in all instances.
- 7.2 Velux Skylights are suitable for most existing timber framed roofs. For such installations, it is important that the roof structure is checked by a suitably qualified person for structural adequacy and suitability of the existing roof cladding.

- 7.3 Velux Skylights meet the safety glass requirements of NZS 4223.4 for sloped glazing up to an installed height above floor level of not more than 5 metres. *[Note: The installed height means the height to the highest part of the glazing]* Where the installed height is more than 5 metres, only Velux Skylights marked with '04' type glazing may be used. See Paragraphs 4.4 to 4.5. Refer to Velux New Zealand for advice or confirmation of type if necessary.
- 7.4 When installed on new roofs, whenever possible, the installation should be carried out concurrently with the roof cladding installation.

Structure

Wind

- 8.1 Velux Skylights are suitable for use in NZS 3604 Wind Zones up to and including Extra High.

Snow

- 8.2 Velux Skylights are suitable for use in areas where buildings are designed for a 1 kPa snow loading.

Point Loads

- 8.3 Velux Skylights have been assessed for point loads from AS/NZS 1170 for situations where supports should be placed over the surface when access is necessary.

Durability

Serviceable life

- 9.1 Velux Skylights are expected to have a serviceable life of at least 15 years, provided they are maintained in accordance with this Appraisal and the Technical Literature.
- 9.2 On exposure to the weather, the coil coated aluminium may gradually lose the original surface finish. A faster reduction in both surface finish and overall serviceable life can be anticipated in severe industrial, geothermal and marine exposures.

Maintenance

- 9.3 The internal surface of the glazing on Velux Skylights can be simply cleaned from inside the building where reasonable access is provided. The exterior glass surface of Velux Skylights can only be cleaned from the exterior of the building.
- 9.4 The glazing and external surfaces of the Skylights can be cleaned using a mild, non-abrasive glass cleaner along with a soft brush or other non-abrasive applicator to maintain the surface appearance.
- 9.5 Interior surfaces of Skylight models VSE, VS & FS with pre-finished wood frames need to be inspected annually. As with any finished surface it is subject to peeling, cracking or fading and will need to be re-finished/re-painted periodically. To re-finish/re-paint the skylight interior wood surfaces, prepare the Skylight by removing the factory finish.
- 9.6 Keep all leaves clear from around Skylights. Ensure all exposed fasteners are secure. Inspect roofing and flashing for excessive wear or scratches on the roofing finish. Scratches in the cladding finish may be fixed with touch up paint available through Velux. Damaged claddings or flashings should be replaced as soon as they are detected.
- 9.7 The internal workings of the manual and the Integra electric operators are considered maintenance free over the lifetime of the Skylight. Mechanisms are pre-lubricated and need no additional lubrication. The chains and hinges should be checked and lubricated as required.

Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to Velux Skylights from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 11.1 Velux Skylights when installed in accordance with this Appraisal and the Technical Literature will prevent the penetration of moisture that could cause undue dampness or damage to building elements.

Internal Moisture

- 12.1 Experience with double-glazed skylights has shown that in normal domestic or similar applications, the windows do not pose a significant risk of condensation when correctly installed.

Ventilation

- 13.1 Velux Skylights that contain an openable aperture will contribute to the compliance of a building with NZBC Clause G4. Consideration must be given to the 'net openable area' required for a particular space by the designer. NZBC Acceptable Solution G4/AS1 provides guidance on required ventilation.

Natural Light

- 14.1 Velux Skylights all contain transparent apertures which can contribute to the compliance of a building with NZBC Clause G7. Consideration of the amount of illuminance provided by the Skylight for a particular space will depend on a wide range of factors unique to each installation – e.g. room size, position, sun orientation, angle, etc. The use of Velux Skylights to supplement natural light from other sources is an Alternative Solution to G7.

Electricity

- 15.1 Where a new electrical supply is required for Velux opening skylights, the installation must be completed by a Registered Electrician in accordance with New Zealand Electrical Code of Practice NZECP 51.
- 15.2 Electrical safety of the electric skylight operator complies with IEC 60335.

Energy Efficiency

- 16.1 Velux Skylights have R-values that satisfy the minimum requirements for skylights, all exceeding R 0.31 m²K/W as specified in NZBC Verification Method H1/VM1 and NZBC Acceptable Solution H1/AS1. Where the total area of skylights exceeds 1.5 m² or 1.5% of the total roof area [whichever is the greater] the calculation or modelling methods of NZS 4218 must be used for building designs.

Installation Information

Installation Skill Level Requirements

- 17.1 The installation of Velux Skylights must be completed by installers trained by Velux New Zealand Ltd or by competent, experienced tradespersons with an understanding of roof window installation and weathertightness details.

System Installation

- 18.1 Installation must be completed in accordance with instructions given in the Velux Skylights Technical Literature and this Appraisal.

Health and Safety

- 19.1 There are no particular health and safety issues relating to the installation or use of Velux Skylights. Installers must however observe safe working practices for working on roofs and at heights.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

20.1 Velux Skylights have been subjected to dynamic weather resistance testing by a NATA (National Association of Testing Authorities) registered laboratory in Australia. Velux Skylights have also been subjected to dynamic weather resistance testing by BRANZ.

Investigations

21.1 Velux Skylights have been assessed for resistance to impact loads, snow loads and resistance to wind pressures (non-cyclonic regions). These assessments have been reviewed by BRANZ and were found to be satisfactory.

21.2 An assessment was made of the durability of Velux Skylights by BRANZ.

21.3 The window units have been assessed for thermal resistance by BRANZ experts.

21.4 Site visits have been carried out by BRANZ to assess fit for purpose and the practicability of installation, and to assess in service performance.

21.5 Weathertightness detailing of the Velux Skylights has been assessed by BRANZ and found to be satisfactory. Instructions for installation of units and associated flashing components for different roof types have also been reviewed and found to be satisfactory.

21.6 The Technical Literature for Velux Skylights has been examined by BRANZ and found to be satisfactory.

Quality

22.1 The manufacture of Velux Skylights has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of UES (Uniform Evaluation Service) Evaluation Report Number 199 which covers quality aspects associated with Velux Skylights. BRANZ has also taken note of ETA Denmark European Technical Assessment ETA-13/0764 of 14/10/2015 which covers Velux Flashings.

22.2 The quality of materials, components and accessories supplied to the market is the responsibility of Velux New Zealand Ltd.

22.3 Quality of installation on site of Velux Skylight components and accessories is the responsibility of the installer.

22.4 Designers are responsible for building design, and specification of natural lighting and ventilation systems.

22.5 Building owners are responsible for any required maintenance of Velux Skylights in accordance with the advice of Velux New Zealand Ltd.



Sources of Information

- AS 4285: 1995 Skylights.
- AS/NZS 1170.0: 2002 Structural design actions - Permanent, imposed and other actions.
- ANSI Z97.1: 2015 For safety glazing materials used in buildings - safety performance specifications and methods of test.
- IEC 60335 Household and similar electrical appliances - safety.
- NZECP 51: 2004 New Zealand Electrical Code Of Practice For Homeowner/Occupier's Electrical Wiring Work in Domestic Installations, Ministry of Economic Development, 2004.
- NZS 3604: 2011 Timber Framed Buildings.
- NZS 4218: 2009 Thermal Insulation - Housing and small buildings.
- NZS 4223.4: 2016 Code of practice for glazing in buildings - Dead, wind and snow loading.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 [Amendment 7, 01 January 2017].
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



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23 June 2017

VELUX SKYLIGHTS



In the opinion of BRANZ, **Velux Skylights** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Velux New Zealand Ltd**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the Technical Literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Velux New Zealand Ltd:**
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions;
 - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Velux New Zealand Ltd**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Velux New Zealand Ltd** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

23 June 2017