MultiProof

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MultiProof application case study 3: An application with parameter based variations

Applicant C is a group home builder with a range of standard plans that are seldom built without customisation. These customisations can range from dimensional or layout changes to those incorporating additional rooms; and changes to roof forms, windows and claddings. The company has ongoing relationships with suppliers and subcontractors, and there is a large amount of uniformity in the way that the buildings are designed and constructed.

The applicant wishes to obtain a MultiProof for their single level design range without compromising the level of customisation able to be offered. The challenge is how to gain the benefits of MultiProof – to reduce the building consenting costs – and still demonstrate compliance where design specific calculations are required.

The example below is partly based on a pilot trialled in Canterbury to demonstrate how MultiProof may be used by group home builders to incorporate customisation and streamline the consenting process. The following design parameters are intended to cover a relatively low risk home but be broad enough to include a large proportion of group home builder designs.

MultiProof Certificate:	A100ZZ
Design name:	Single Flex Series
Design description:	A range of single storey detached 2 – 4 bed houses, with floor areas of 80m^2 – 250m^2. Designs allow for a range of customisations.

EXAMPLE OF DESIGN AND OPTIONS SUMMARY

The "Single Flex Series" offers a range of two to four bedroom plan options for single storey dwellings designed for use in a range of exposure, wind, earthquake and climate zones. The designs provide for foundation options, area and room variations and additions, roof form options, window and cladding options. With the exception of the roof trusses and the lintels to the double garages which are specifically designed, the structure is designed in accordance with NZS 3604: 2011 Timber-framed buildings. A 'no foundation' option is also included to allow for site specific design. The permitted variations are limited to those that fit within the design parameters, and are defined within the plans and specifications.

EXAMPLE OF DESIGN PARAMETERS

The table below documents the high level parameters proposed by the applicant. Greater detail would be provided within the plans and specifications and the compliance assessment report.

Parameter	Limitation
Classified use	Detached dwelling
Importance level	Importance Level 2
Wind zones	Up to Very high
Earthquake zone	Up to Zone 3
Subsoil categories	Up to Class E – Very soft soil types
Live loads	Up to 2 kPa
Snow loads	Up to 1.0 kPa
Exposure	Up to Zone D except where adverse microclimatic factors e.g. geothermal areas
Climate	Up to Zone 3
No. of storeys	Single storey only
Plan	Maximum length or width of floor of 24.0m including any attached garage Simple plan shapes
Maximum area	xxx m^2
Floor / foundations	Concrete – slab on ground (or site specific design)
Roof form	Simple roof forms, incorporating hips, valleys, gables or mono pitches. Includes chimneys and skylights. Excludes dormers, clerestorey windows, box windows.
Eaves	Minimum 450mm; maximum 750mm.
Roof slope	Between 10° and 35° from the horizontal
Truss span	Maximum 12.0 m
Stud heights	Maximum 2.7 m generally Maximum 4.2 m to gable end walls and walls to mono-pitched roofs
Claddings	Maximum two wall cladding types with additional cladding type allowed for any feature columns in a non-habitable space

The type of information to be provided in the plans and specifications and as supporting information would include:

- Plan, sections and elevations for a reference building, or number of reference buildings -if this makes it easier to cover the range in sizes or building forms. This plan series could include typical foundation, wall framing and bracing plans; typical roof framing plan for different roof forms; typical roof plans; and typical services plans.
- Tables within the drawings or specification scheduling:
  - the framing sizes, timber grades, centres, and treatments for each of the different wind zones
  - fixings, fastenings and materials for the different exposure zones
  - the durability requirements for all other materials, components and construction methods
  - tables scheduling gutters and downpipe sizes for different roof areas.
- A series of standard details for foundations, framing, bracing, wall and roof cladding, window and door installation; interior details; and ancillary details for options such as decks.
- Window/door schedule(s) scoping the window and door range with either rules on the window/door options selections or selection tables to provide the minimum levels for natural light and ventilation.

For example room types and sizes variants may be listed along with minimum window area and vent sizes required to achieve compliance, and of a series of window types listed or rules provided that will provide for compliance.

Room type	Room area	Min. area of natural light	Min. area of ventilation	Window combinations that provide for ≥ minimum.
Bedroom	Up to 10m^2	1m^2	0.5m^2	W5 can only be used in conjunction with another window. Any other window or combination of windows from the bedroom window range.
	Up to 15m^2	1.5m^2	0.75m^2	
	Up to 20m^2	2.0m^2	1m^2	

- A schedule defining a range of minor variations that are allowed if these are not otherwise shown in the plans or able to be covered by selections within the specification.
- A compliance assessment report (similar to the earlier example) which states how compliance will be achieved. For example for bracing "Calculations using the GIB EzyBrace 2011 Software, and plan locating each brace, will be provided for each design".
- Bracing calculations for the reference buildings.
- A comprehensive specification which covers the full range of selections.
- An options selection schedule with references to the relevant drawings or sections of the specification.

Other matters to consider:

- The BCA will check to confirm that the plans and specifications submitted for building consent are for a building that fits within the design parameters, and that the means of achieving compliance are the same as those stated in the approved compliance assessment report.
- The additional checking that may be required by the BCA for building specific design, for example, for bracing calculations.
- The type of information that if provided in the consent documentation will reduce the time it will take the BCA to check the application, for example, providing room, window and ventilation areas on the plans and window schedule.

Note that further guidance is to be developed on MultiProof and parameter based variations. This guidance will include information for BCAs processing building consents which rely on this type of MultiProof, and the results of case studies once the process has been tested.