



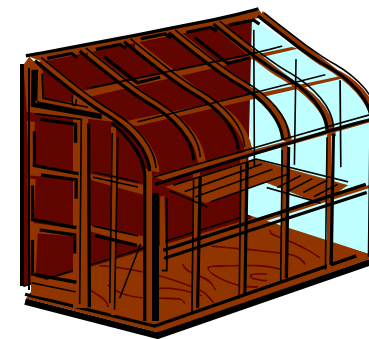
Hurunui District Council

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DESIGNER'S GUIDE TO

DOMESTIC CONSERVATORIES



A guide to assist those intending to install or who are involved in installing conservatories.

Includes information about:

- conservatory and component configurations;
- existing doors/windows;
- foundations; and
- content and quality of documentation required.

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BAM 403
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- BAM 455 **Frequently Ask Questions**
- BAM 456 **Glossary of Terms**

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Useful websites

Certified Builders Association of NZ Inc (CBANZ)
www.certified.co.nz

Registered Master Builders Federation Inc (RMBF)
www.masterbuilder.org.nz

New Zealand Institute of Architects (NZIA)
www.nzia.co.nz

Architectural Designers NZ Inc (ADNZ)
www.adnz.org.nz

Association of Consulting Engineers (ACENZ)
www.acenz.org.nz

BRANZ Ltd
www.branz.co.nz

NZ Institute of Quantity Surveyors Inc (NZIQS)
www.nziqs.co.nz

NZ Institute of Surveyors (NZIS)
www.surveyors.org.nz

Department of Building and Housing (DBH)
www.dbh.govt.nz

Institution of Professional Engineers (IPENZ)
www.ipenz.org.nz

NZ Institute of Building Surveyors Inc (NZIBS)
www.buildingsurveyors.co.nz

Consumers' Institute of New Zealand
www.consumerbuild.org.nz

The purpose of the guide

This guide has been produced to assist those who are intending to install or who are involved in the installation of domestic conservatories by providing guidance on what information is required at the building consent application stage in an effort to reduce the processing time of these consents. It is appreciated that most applicants are not designers or engineers and that in most cases time is of the essence. However, Council must be satisfied on reasonable grounds that any proposed conservatory meets the requirements of the Building Act 2004, the NZ Building Code and relevant NZ Standards.

It is not intended to cover the general information required in the consent application form itself, but more the information that is often overlooked or not understood and therefore subject to a request for further information. The guide concentrates on concrete foundations and floor slabs as the majority of consent applications received are for this type. However, where used, timber floors are to be constructed to NZS 3604:1999.

Please take the time to read through this guide and make use of the information for future conservatory consent applications.

Engineered design

All conservatories fall into the category of specifically designed structures and the build consent application should therefore be submitted with written confirmation from a suitably qualified Chartered Professional Engineer (“Engineer”) that the conservatory design will achieve the requirements of the NZ Building Code and relevant NZ Standards.

When applied for through a manufacturer’s agent, written confirmation shall be provided with the consent application to cover generic or general conservatory designs within the design criteria of their technical manuals. However, where these conservatories fall outside the scope of a manufacturer’s design manual, individual site specific confirmation will be required.

Written confirmation will only be accepted from a suitably-qualified Engineer and for such a statement to be accepted by Council that document must not be dated more than 2 years prior to the building consent application being submitted.

Conservatory configurations

The generic conservatory designs are either:

- a) built into an internal corner formed by an existing building (Figure 1-A);
- b) built out from one exterior wall of an existing building (Figure 1-B); and
- c) some manufacturer’s technical manuals allow for conservatories to be built around an external corner of an existing building, (Figure 1-C).

Designs outside these generic designs (eg. such as D and E in Figure 1) will require an Engineer’s written confirmation specific to the site. In most cases the generic specification will carry a condition such as:

“Conservatories that fall outside the tabulated spans, loading conditions and general configuration must be the subject of a specific structural design and certification.”

Some key requirements to be aware of:

- Completed Building Consent Application form.
- A current copy of the Certificate of Title or Sale and Purchase Agreement for the property.
- A complete Site Plan showing the proposed position of the conservatory in relation to legal boundaries and other buildings on the site.
- A complete Floor Plan showing all room uses, new work and identifying the location of smoke alarms.
- Elevations of the new work clearly identifying window and door openings.
- Details of existing window and door openings. Your documents should show that the adjacent rooms to the conservatory meet the NZ Building Code requirements for Ventilation and Natural Light.
- Cross-section through the conservatory showing the proposed construction including foundation details.
- Construction details showing fixings and flashings.
- Details if wall bracing including calculations.
- Provisions for disposal of storm water and any other drainage work are identified on the documents.
- Written specifications.

Ask your Council for a comprehensive checklist when collecting your Building Consent Application

Standard of documentation

All documentation submitted with your application must be accurately drawn to an appropriate scale for the job, be fully dimensioned and detail all materials to be used.

Specifications for the building work are also required. The specification should further define the building work including details of all materials to be used, finishes, and equipment to be installed. The specification must be specific to the project, it is not acceptable to simply state “installed to manufacturers’ instructions”, as in many cases product manufacturers have several installation options. Likewise it is not acceptable to make statements such as “fixed in accordance with NZS3604” as fixing types vary depending on wind loads and often more than one fixing option is provided in the standard. Also if you intend to use an alternative proprietary fixing which is an alternative solution the Building Consent Authority must know exactly what they are approving so that they can assess your project appropriately.

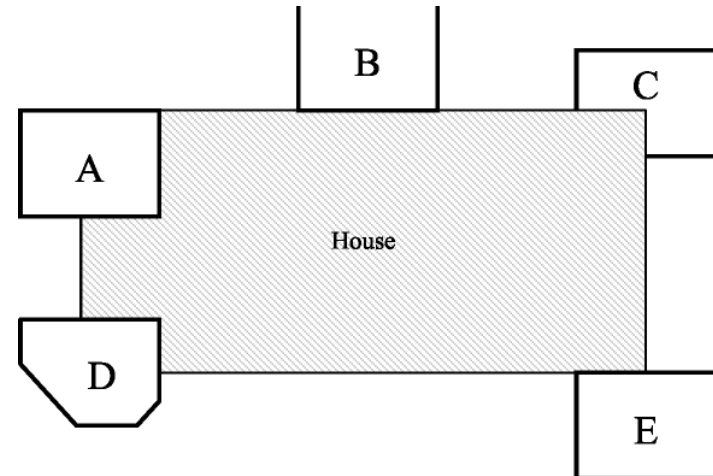


Figure 1 Conservatory configurations (A,B, and C are generic designs)

Manufacturers’ Design Technical Manuals

The Manufacturers’ Design Technical Manuals provide among other things, design tables and component configurations. Council holds a number of these manuals from different manufacturers which are used to **confirm only** that the proposed conservatory is designed within the parameters of the manufacturer’s documentation. They are **NOT** used to design a conservatory when insufficient information is provided.

Wind and snow loadings

LOADINGS

Consideration for wind and snow loading is often overlooked or is not fully understood. The ability of a conservatory structure to resist the loadings of both wind and snow on the structure is allowed for in the components that make up the structure, ie. wall component configurations (glazed panels), lintel and roof mullion sizes, etc. Design tables allow Council to confirm that a proposed design will be capable of resisting wind and snow loading for the specific area where the conservatory is to be installed.

However, where a conservatory is to enclose an existing window, door or ranch slider, consideration must be given for the additional building on the existing opening lintel. Unless the existing lintel still complies with NZS3604 with regard to the additional loads, confirmation from an engineer will be required and possible remedial work to replace the existing lintel.

For generic designs the forces of wind against a conservatory are greatly reduced or easily allowed for because the building provides protection and support via its existing bracing and the generic design tables can be used (Figure 2-A).

Where a conservatory is built out from one wall it is partially protected and benefits from the existing bracing through the existing structure requiring bracing to resist wind loads from the ends only (Figure 2-B).

Where a manufacturer's design manual allows for a conservatory to be built around an external corner of an existing building (ie. design tables are provided), then it is regarded as a generic design (Figure 2-C). As the face wind load on the building increases in both directions, bracing is also required in both directions.

In summary

As can be appreciated, there is a lot to consider before a building consent application should be submitted if delays are to be avoided. If in doubt ask yourself the following questions:

“Is the proposed conservatory a generic design or will I need to seek advice from an Engineer ?”

“Have the bracing requirements been addressed and will the component configurations provide sufficient bracing units to resist the wind loads for the site ?”

“Is the conservatory a habitable space ?”

“Will the existing lintels suffice or do they need replacing ? Do I need to seek advice from an Engineer ?”

“Have I provided enough details on attaching the proposed conservatory to the existing building and floor, foundations, any alterations work required, window and sash sizes, smoke alarms, storm water and drainage ?”

Plumbing and drainage

Details of storm water disposal are usually overlooked or covered with a simple statement such as “to existing soak hole”. This is insufficient information. Down-pipe size and location/s should be shown on the site plan with an indication of where it discharges to (eg. into the existing storm water system or to an existing or new soak hole). Likewise, where drains, gully traps, vents, etc. require relocating then a drainage plan and specification is also required.

Where a project requires plumbing and/or drainage work then full details will be required in the form of a specification and drainage plan stating to which standard work will be installed.

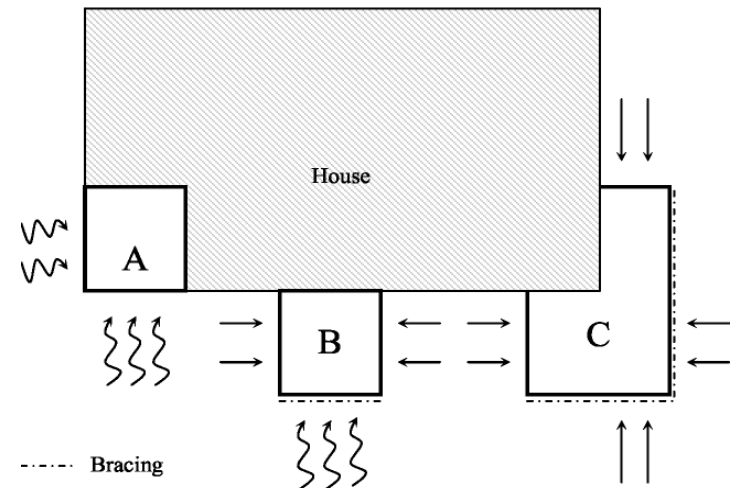


Figure 2. Wind Forces on Generic Designs

As mentioned, any configuration that deviates from the generic design will require an Engineer's written confirmation specific to the site as the allowance for bracing cannot be calculated from the design tables and component configurations.

The bracing requirement calculation is expressed as the amount of bracing units (“BU’s”) required to resist the wind load on the structure. The Design Specification should have a method of calculating the BU’s required in the form of a design table or a calculation sheet.

Bracing design tables give a quick method of determining BU’s (calculation sheets require a more involved use of tables to ascertain bracing requirements). Figures 3a and 3b jointly provide an example for calculating the bracing required for a wall in a generic conservatory.

Figure 3a Simple generic conservatory showing wall requiring bracing

	Conservatory Depth (m)										
Wind Zone	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Low	6	9	12	15	18	21	24	27	30	33	36
Medium	7	11	15	19	23	27	31	35	39	43	47
High	9	14	19	14	29	34	39	44	49	54	59
Very High	12	18	23	31	40	50	61	73	86	100	115

Figure 3b Example of bracing table showing BU's required for wall in Figure 3a

Once the required number of bracing units is known, the proposed component configurations of the conservatory wall can be checked to ensure the overall wall attains the required number of bracing units. If it does not, the component configurations can be changed until the required bracing units are achieved. If they cannot be achieved then the conservatory will have to be redesigned.

Notes:

- 1 Conservatory roofs are not normally designed to provide additional bracing to the conservatory walls.
- 2 If you need clarification of the wind or snow loads for a specific site, contact your Council's Building Control Officer. Please note that specific site details will be required (ie. Valuation No. or Lot No. & DP No, or Rapid No).

Existing doors/windows

Where existing doors or windows are enclosed by the conservatory their lintels must be capable of supporting any additional loads, whether actual or implied.

Likewise, where existing doors or windows are removed and/or the opening is widened to allow for free-flow movement, the lintel/s must still be capable of supporting any additional loads, whether actual or implied. If the existing lintel or any replacement lintel falls outside the scope of NZS 3604 – Section 15, then the services of an Engineer will be required.

Notes:

- a. Consideration must be made where any alteration work affects existing wall bracing.
- b. If the alteration work is outside the scope of NZS3604, confirmation from an Engineer will be required for that work (eg. steel lintels or beams).

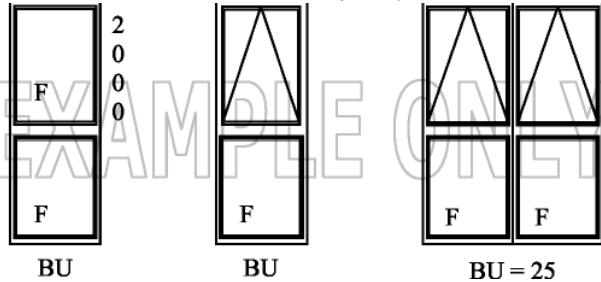
Smoke alarms

All alterations to existing households require the installation of automatic smoke alarms. Therefore a complete floor plan to scale showing the location of existing and/or new smoke alarms will be required. Refer to the attached information sheet for further details.

Ventilation

In accordance with the NZ Building Code G4 – Ventilation, all habitable spaces are required to achieve a minimum of 4% of the floor area in openings to provide fresh air to the space.

For non-habitable conservatories, any adjacent room affected by the



conservatory must achieve or still achieve the minimum 4% in its own right, that is, the adjacent rooms cannot benefit from the conservatory or any other habitable space and vice-versa. This may require an increase in size/s to existing openings.

Where adjacent rooms open directly into a conservatory, the floor area is taken as the combined total floor area. Again, if the 5% threshold is not achieved, additional openings will be required.

To allow confirmation of ventilation complying with NZBC G4 the following details are required.

- a. a complete floor plan to scale of adjacent rooms; and
- b. elevations showing new or existing windows and their sizes, including all opening sashes and their sizes.

Conservatories deemed a habitable space will also require a DPC for new concrete slabs or proof of an existing DPC for existing. If proof of an existing DPC cannot be made without an invasive inspection (core sample) then details of an approved concrete treatment must be provided.

Component configurations

Component configurations are sections or panels that make up the conservatory wall (Figure 4). These may be fixed glass panels, doors, sliding doors, windows, or a combination of these. Each component configuration has a certain bracing value designed into them, expressed as bracing units or BU's, giving the structure its ability to resist wind loads.

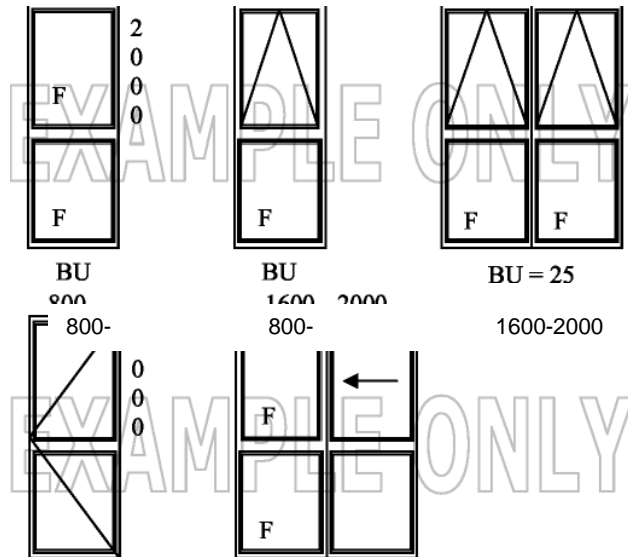


Figure 4 Component configurations

Notes:

- 1 Each manufacturer has different bracing values and conditions, such as doors having no bracing value unless it has a fixed sidelight, etc.
- 2 Angled panels at corners (ie. at 45°) do not benefit from full configuration bracing values (Figure 5).

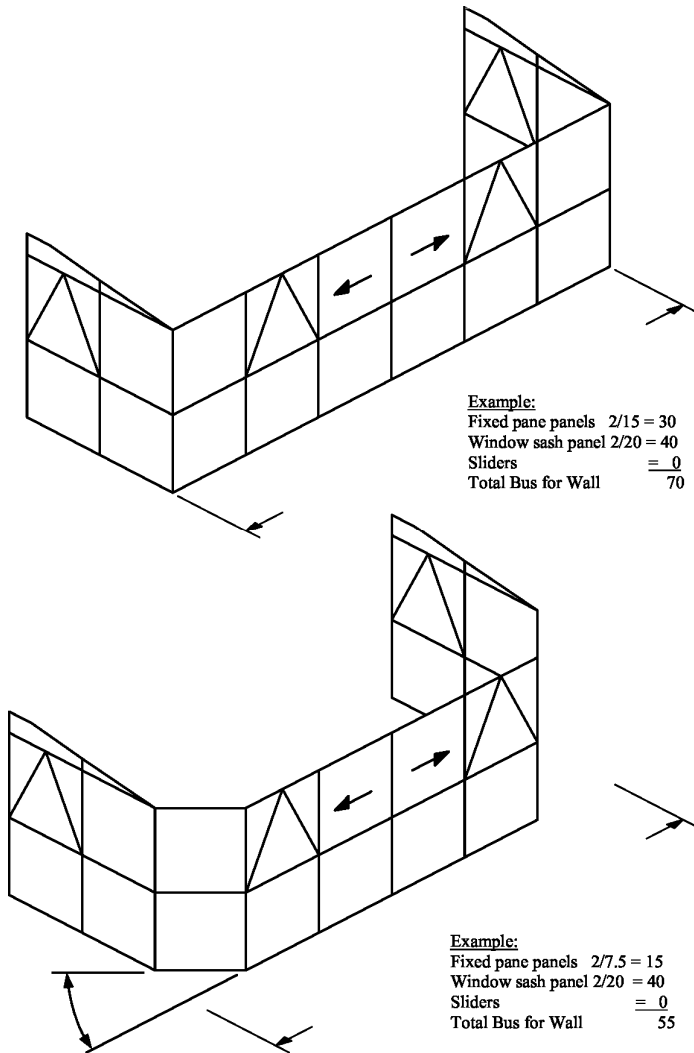


Figure 5 Bracing units for angled corner panels

Connecting to existing foundations

When connecting to existing buildings consideration must be made for the following:

- a **Existing timber floors**
 Maintaining ventilation to the existing sub-floor area, protection of the timber framing, baseboards, etc.
- b **Existing concrete perimeter foundations**
 Connection type, size and spacing, method of fixing to existing foundation, maintaining ventilation to the existing sub-floor area.
- c **Existing concrete floor slabs**
 Connection type, size and spacing, method of fixing to existing slab.

Habitable/Non-Habitable

Conservatories can be deemed as either habitable or non-habitable spaces. Where there is no direct access to the conservatory from the existing building (ie. exterior doors and windows remain in place), the conservatory is deemed to be non-habitable.

Where existing exterior doors and windows are removed to allow for free-flow movement between the existing building and conservatory it is deemed to be a habitable space.

A combination of the above methods can be used as in Figure 7.

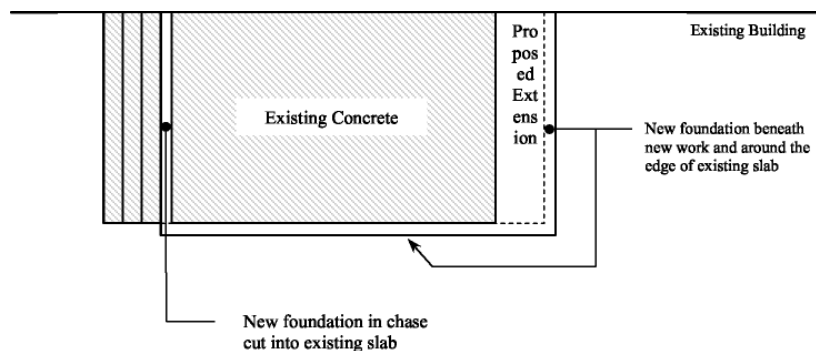


Figure 7 Combined new & existing foundations

- 1 The following considerations must be made:
 - a. Is the existing concrete slab connected to the house foundation or was it poured separately ?
 - c. Do the existing foundations have solid bearing beneath them ?
 - d. Does the existing concrete slab have compacted fill beneath it ?
- 2 For new suspended timber floors, these shall comply with NZS3604.
- 3 Details of how the proposed conservatory structure is to be connected to the existing building are also required and should include:
 - a. floor edge fixing type, size and spacings (concrete or timber floors);
 - b. wall to wall fixings;
 - c. roof to wall, soffit or fascia fixing type, size and spacings;
 - d. waterproofing/flashings details.

Foundations

Where an existing concrete floor slab is to be used the Council may require proof by invasive investigation that there is reinforcing steel in the foundation and that there is a damp proof course beneath the slab.

Consequently, the majority of applications received are for a new concrete “topping” slab and foundation poured over an existing slab, as shown in Figure 6.



Figure 6 New floor & foundation to existing concrete slab

Where a new floor slab is to be provided or a topping paid is to be laid over an existing floor slab it shall be designed to NZS 3604 and the following details will be required:

- a. Floor slab thickness and reinforcing mesh (where applicable)
- b. Foundation depth and width, reinforcing including bar and stirrup size and stirrup spacing.
- c. Connection to the existing concrete slab.
- d. Connection to existing buildings foundation (may require protection if existing foundation is timber.
- e. Damp proof course (DPC) (confirmation required for existing slabs).

At any time, should a new floor slab be required to cover vents providing sub-floor ventilation to an existing suspended timber floor, provision must be made to maintain adequate sub-floor ventilation to the existing floor as required by NZS3604.

Where a conservatory is to be erected on an existing concrete slab of the same dimensions and the foundation design is known, ie. original consented drawings and inspection records are available, the structure may be fixed as per the manufacturers design specification detail to the edge of the slab.

Where details of the existing slab and foundations are unknown a 100mm minimum topping pad is to be poured over the existing slab and the conservatory is then fixed to the topping pad.

As the existing slab thickness cannot be guaranteed there is a possibility that the ties may penetrate through into the underlying fill and become susceptible to moisture from below (a). Therefore, a new foundation is required and this can be achieved by either cutting back the existing slab to maintain the original dimensions (b), or pouring a new foundation around the edge of the existing slab (c).

- | | | |
|-----|---|----|
| (a) | New Topping Pad
Existing Concrete Slab – Thickness Unknown | GL |
|-----|---|----|

Slab tie punches through existing slab into underlying substrate and exposed to moisture.

Note: Reinforcing and DPC not shown for clarity.

- | | | |
|-----|--|----|
| (b) | New Topping Pad and Foundation
Existing Concrete Slab | GL |
|-----|--|----|

Existing slab cut back for foundation to maintain existing slab dimensions.

- | | | |
|-----|--|----|
| (c) | New Topping Pad & Foundation
Existing Concrete Slab | GL |
|-----|--|----|

New foundation poured to edge of existing slab.

Where a conservatory is to be erected over a smaller dimensioned existing concrete slab (d) then a topping pad and new foundations to NZS 3604 are required.

(d)

Where a conservatory is to be erected over a larger existing concrete slab (e), as the thickness, foundation and reinforcing details cannot be guaranteed, a concrete topping pad will be required. In this instance the edge of the topping pad is not directly supported by the existing foundation, then a new footing is to be formed by cutting a 'chase' through the existing slab, through any existing fill and into solid bearing.

Note: Reinforcing & DPC not shown for clarity

New foundation poured through
chase cut in existing slab

