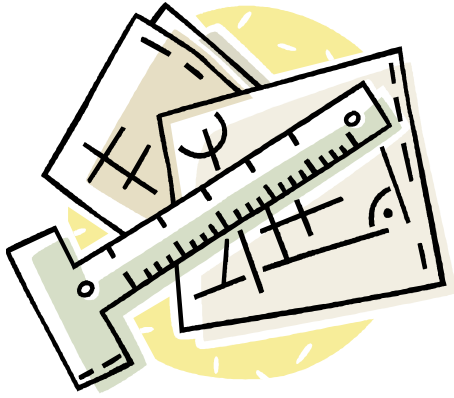


# ASHBURTON DISTRICT COUNCIL

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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.

Including information about:

- Conservatory and component configurations
- Existing doors/windows
- Foundations

### 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 building 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 Chartered Professional 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:

- Built into an internal corner formed by an existing building, *Figure 1-A*.
- Built out from one exterior wall of an existing building, *Figure 1-B*.
- Some manufacturer's technical manuals allow for conservatories to be built around an external corner of an existing building, *Figure 1-C*.
- Designs outside the generic design will require an Engineer's written confirmation specific to the site.

As mentioned, any configuration that deviates from these designs (A, B & C) will require an Engineer's written confirmation specific to the site. See *Figure 1-D & E*.

In most cases the generic specification will carry a condition such as:

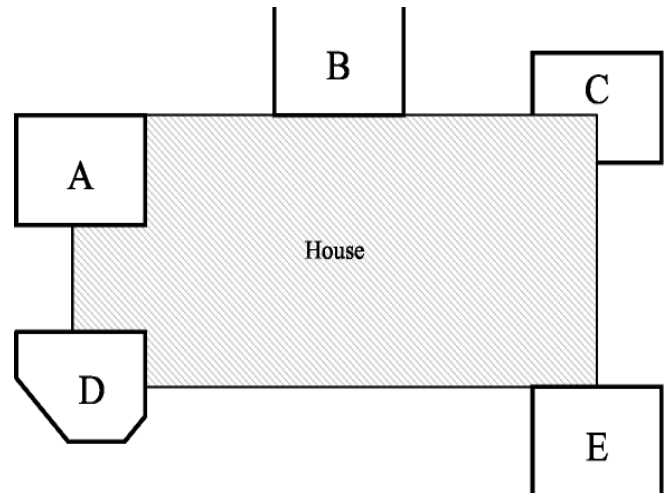
“Conservatories that fall outside the tabulated spans, loading conditions and general configuration must be the subject of a specific structural design and certification”.

### Manufacturers Design Technical Manuals

The manufacturer's 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

Consideration for wind and snow loading is often overlooked or is not fully understood. The ability of a conservatory structure to resist the loading of both wind and snow on the structure is allowed for in the components that make up the structure, i.e. 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.



*Figure 1, Generic Conservatory Configurations*

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 regards 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*.

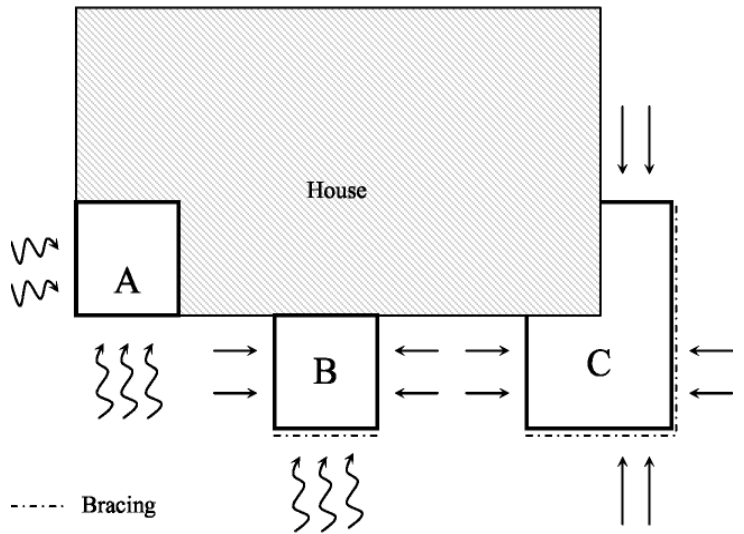
Where a manufacturer's design manual allows for a conservatory to be built around an external corner of an existing building i.e. design tables are provided, then it is regarded as a generic design, *Figure 2-C*. As the face wind load on the building increases in both directions, bracing is also required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

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.

This 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. *Figure 3* provides an example for calculating the bracing required for a simple generic conservatory.

Calculation sheets require a more involved use of table to ascertain bracing requirements.



**Figure 2. Wind Forces on Generic Designs**

number of bracing units, if 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.

**Note**

- Conservatory roofs are not normally designed to provide additional bracing to the conservatory walls.
- 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 (i.e. Valuation number, Lot and/or DP number or Rapid Number).

*Braced Wall (a)*



**Bracing Value Table (Example only)**

Wind Zone	Conservatory Depth (m)										
	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	24	29	34	39	44	49	54	59
Very High	12	18	23	31	40	50	61	73	86	100	115

*Figure 3, Using Bracing Tables*

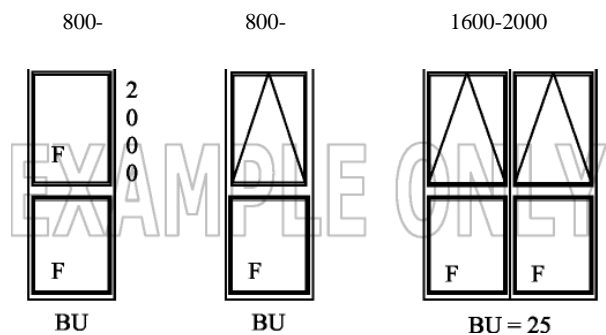
Where the conservatory depth is 2.0m and it is located in a high wind zone, 19 bracing units are required in wall (a).

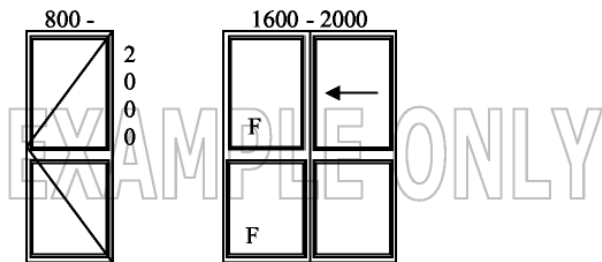
**Using Bracing Tables (Figure 3)**

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

**Component Configurations**

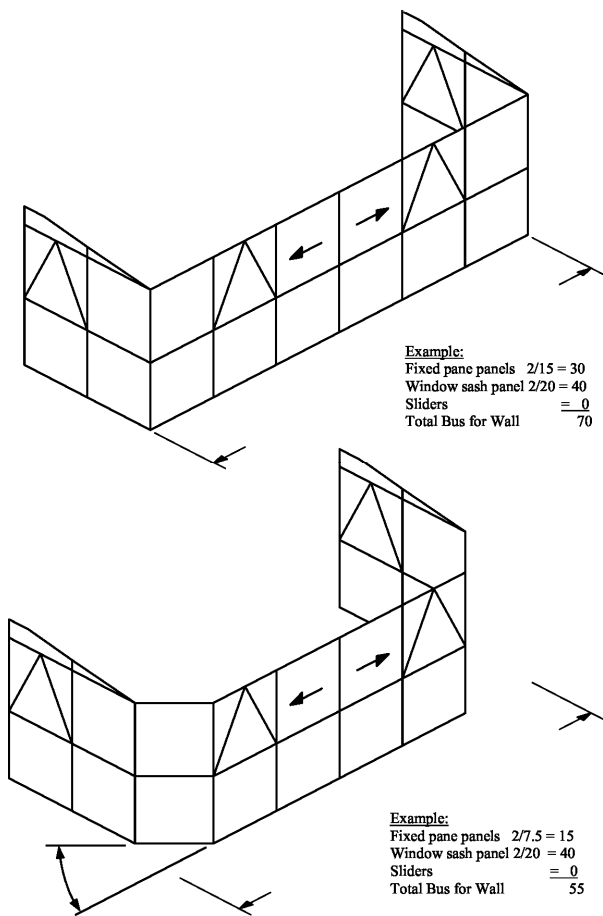
Component configurations are sections or panels that make up the conservatory wall, *Figure 4*. These may be fixed glass panels, doors, sliding doors, windows or a combination of these. Each component configuration has a certain bracing value designed into them, expressed as bracing units or BU's, giving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





### Note

- Each Manufacturer has different bracing value and conditions, such as doors having no bracing value unless it has a fixed sidelight etc.
- Angled panels at corners i.e. at 45degrees do not benefit from full configuration bracing values. See *Figure 5*.



*Figure 5*

### Foundations

Where an existing concrete floor slab is to be used, 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 in *Figure 6*:

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New topping Pad and Foundation DPC  
Existing Concrete Slab GL

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*Figure 6: New Floor and Foundation to Existing Concrete Slab*

Where a new floor slab is to be provided or a topping pad is to be laid over an existing floor slab it shall be designed to NZS3604 and the following details will be required:

- Floor slab thickness and reinforcing mesh (where applicable).
- Foundation depth and width, reinforcing including bar and stirrup size and stirrup spacing.
- Connection to existing concrete slab.
- Connection to existing building foundation (may require protection if existing foundation is timber).
- 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 slab of the same dimensions and the foundation design is known, i.e. 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.*

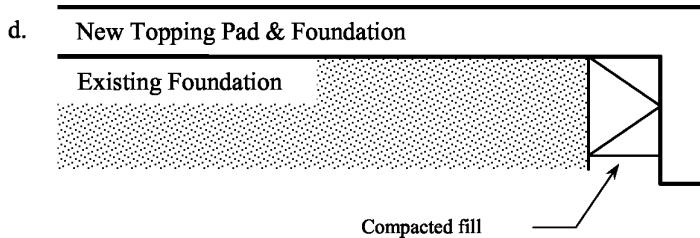
**Note: Reinforcing and DPC not shown for clarity.**

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

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

- 
- (c) New existing Topping Pad and Foundation  
Existing Concrete Slab GL
- 

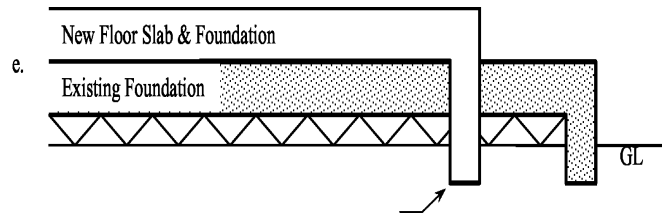
*New foundation poured to edge of existing slab*



Where a conservatory is to be erected over a smaller dimensioned existing concrete slab (d) then a topping pad and new foundation to NZS3604 are required.

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, where 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, then through any existing fill and into solid bearing.



**Note: Reinforcing and DPC not shown for clarity.**

*New foundation poured through chase cut in existing slab.*

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

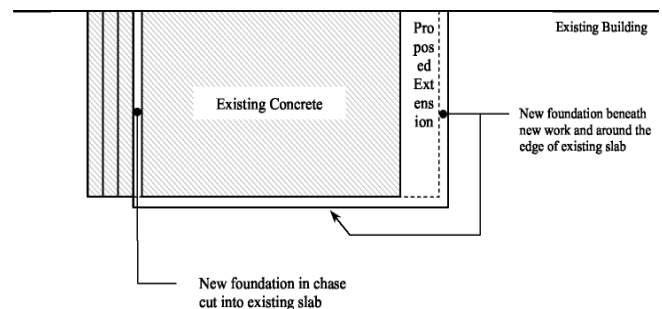


Figure 7 Combined New and Existing Foundations

The following considerations must be made:

- Is the existing concrete slab connected to the house foundation
- Or was it poured separately.
- Do existing foundations have solid bearing beneath them?
- Does the existing concrete slab have compacted fill beneath it.

For new suspended timber floors, these shall comply with NZS3604.

Details of how the proposed conservatory structure is to be connected to the existing building are also required and should include:

- Floor edge fixing type, size and spacing's (concrete or timber floors).
- Wall to wall fixings.
- Roof to wall, soffit or fascia fixing type, size and spacing's.
- Waterproofing/flashing details.

## Connecting to Existing Foundations

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

- **Existing Timber Floors**  
Maintaining ventilation to the existing sub-floor area, protection of the timber framing, baseboards etc.
- **Existing Concrete Perimeter Foundations**  
Connection type, size and spacing, method of fixing to existing foundation, maintaining ventilation to the existing sub-floor area.
- **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 i.e. exterior doors and windows remain in place, the conservatory is deemed 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 a habitable space.



## 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 4% threshold is not achieved, additional openings will be required.

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

- A complete floor plan to scale of adjacent rooms.
- 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.

## 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 window 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 NZS3604, Section 15, then the services of a suitable qualified engineer will be required.

## Note

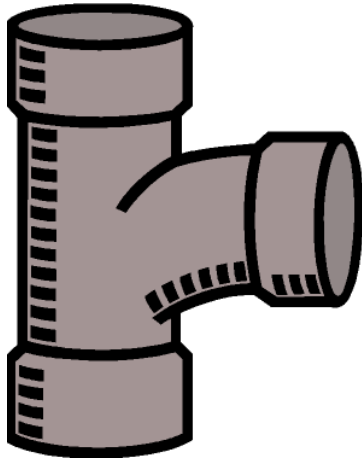
- Consideration must be made where any alteration work affects existing wall bracing.
- If the alteration work is outside the scope of NZS3604, confirmation from an engineer will be required for that work e.g. steel lintels or beams.

## 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.

## 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 i.e. into the existing storm water system or to an existing or new soak hole. Likewise, where drains, gully traps, vents etc require relocation then a drainage plan and specification is also required.

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

## 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 a suitably qualified Chartered Professional Engineer?”

“Have the bracing requirements been addressed? 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 a suitably qualified Chartered Professional 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?”

## 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.



## 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.
- 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 fixing and flashings.
- Details of wall bracings 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**

## Useful Websites

Certified Builders Association of NZ Inc (CBANZ)

[www.certified.co.nz](http://www.certified.co.nz)

Registered Master Builders Federation Inc (RMBF)

[www.masterbuilder.org.nz](http://www.masterbuilder.org.nz)

New Zealand Institute of Architects (NZIA)

[www.nzia.co.nz](http://www.nzia.co.nz)

Architectural Designers NZ Inc (ADNZ)

[www.adnz.org.nz](http://www.adnz.org.nz)

Association of Consulting Engineers (ACENZ)

[www.acenz.org.nz](http://www.acenz.org.nz)

BRANZ Ltd

[www.branz.co.nz](http://www.branz.co.nz)

NZ Institute of Quantity Surveyors Inc (NZIQS)

[www.nziqs.co.nz](http://www.nziqs.co.nz)

NZ Institute of Surveyors (NZIS)

[www.surveyors.org.nz](http://www.surveyors.org.nz)

Department of Building & Housing (DBH)

[www.dbh.govt.nz](http://www.dbh.govt.nz)

Institution of Professional Engineers (IPENZ)

[www.ipenz.org.nz](http://www.ipenz.org.nz)

NZ Institute of Building Surveyors Inc (NZIBS)

[www.buildingsurveyors.co.nz](http://www.buildingsurveyors.co.nz)

Consumers Institute of New Zealand

[www.consumerbuild.org.nz](http://www.consumerbuild.org.nz)