

THE CHRISTCHURCH CITY BYLAW NO. 105 (1985)BUILDINGSANALYSIS

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CHRISTCHURCH CITY COUNCILTHE CHRISTCHURCH CITY BYLAW NO. 105 (1985)

(Note: Amendments made by Bylaw 105A (1987) are incorporated in this print-out)

BUILDINGS

In pursuance of the powers vested in it by the Local Government Act 1974, the Standards Act 1965 and of all other powers it thereunto enabling the Christchurch City Council, makes and ordains this Bylaw.

Introduction1. SHORT TITLE AND COMMENCEMENT

This Bylaw may be cited as the Christchurch City Bylaw No. 105 (1985) Buildings. This Bylaw shall be read in conjunction with Christchurch City Bylaw No. 101. This Bylaw shall come into force on 1 December 1985.

2. INTERPRETATION

In the interpretation of this Bylaw the following words and phrases shall have the meaning hereby assigned to them, unless there is something in the subject matter or in the context inconsistent with such meaning.

"NZS" and "NZSS" when used herein shall mean a specification which has been declared to be a standard specification pursuant to Section 23 of the Standards Act 1965, and is cited by a title or number given to it by the Standards Council.

3. REPEAL

The Christchurch City Bylaw No. 105 (Building) 1979 and Amendments A, B and C to Bylaw No. 105 (1979) are hereby repealed.

The repeal of the said Bylaws shall not affect any document made, signed or acknowledged or anything done or suffered or any appointment, right of benefit created or conferred under or by virtue of the said Bylaws."

4. THE SUBSTANCE OF THE BYLAW

The Bylaw shall consist of those twelve parts to the Bylaw listed in the first schedule to this Bylaw and which are annexed hereto.

5. ACCEPTANCE MEANS OF COMPLIANCE WITH THE PROVISIONS OF THIS BYLAW

Proof of compliance with the specifications, standards and appendices named in the second schedule of this Bylaw shall be deemed to be in the absence of proof to the contrary, sufficient evidence that the relevant degree of compliance required by this Bylaw is satisfied.

The specifications, standards and appendices named in the second schedule are not part of this Bylaw.

The Resolution to make this Bylaw was passed by the Christchurch City Council at a Meeting of the said Council held on 21 October 1985 which resolution was confirmed at a subsequent meeting held on 18 November 1985

The Common Seal of the)
Christchurch City Council)
was hereto affixed in)
accordance with the)
Special Order made in that)
behalf by the said)
Council on the 1st day)
of December 1985)

.....
Mayor

.....
General Manager & Town Clerk

FIRST SCHEDULE

The Bylaw shall consist of the following twelve parts which are attached hereto:

Part 1	Preliminary
Part 2	Building Permits
Part 3	General Requirements
Part 4	Residential Buildings
Part 5	Design for Fire Safety
Part 6	Timber
Part 7	Masonry
Part 8	Concrete
Part 9	Steel Structures
Part 10	Non Residential Buildings
Part 11	Structural Design and Design Loadings
Part 12	General Structural Design for Security Earthquake Risk Buildings

SECOND SCHEDULE

The Second Schedule details those Standards, Standard Specifications, Codes of Practice and Appendices which detail means by which the requirements of the Bylaw may be complied with. These documents are not part of the Bylaw.

- NZS 6502:1972 Metrication factors and tables for conversion to SI units 1979
- NZS 4211:1979 Specification for the Performance of Windows
- MP 4212:1979 Glossary of building terminology
- NZS 4223:1985 Recommendations for glass and glazing
- NZS 4121:--- Code of practice for design for access by handicapped persons -
 Part 1:1971 Public buildings and facilities
 Part 2:1975 Symbols and signposting
- NZS 4431:1978 Code of practice for earth fill for residential development
- NZS 4214:1977 Methods of Determining the total thermal Resistance of parts of buildings
- NZS 4208:1973 Code of practice for the design of hospitals with respect to fire
- NZS 4216:1983 Code of practice for design of meatworks complexes for fire safety
- NZS 4510:1978 Code of practice for riser mains for fire service use
- NZS 4541P:1972 (FOC Rules, 29th Edition) Rules for automatic fire sprinkler installations
- NZS 6742:1971 Code of practice for emergency lighting in buildings
- AS 1530... Methods for fire tests on building materials and structures
 Part 1-1976 Combustibility tests for materials
 Part 2-1973 Test for flammability of materials
 Part 3-1976 Test for early fire hazard properties of materials
 Part 4-1975 Fire-resistance tests for structures
- BS 476:--- Fire tests on building materials and structures -
 Part 4:1970 Non-combustibility test for materials
 Part 8:1972 Test methods and criteria for the fire resistance of elements of building construction

- ISO 834-1975 Fire resistance tests - Elements of building construction
- NZS 7421:1972 Installation of solid fuel burning and oil burning space heaters
- DZ 4226 Design for Fire Safety
- THE CITY OF CHRISTCHURCH DISTRICT PLANNING SCHEME
- NZS 1900 Chapter 5 1984. Fire Resisting Construction and Means of Egress
- NZS 4503:1974 Hand Operated Fire Fighting Equipment
- NZS 4203:1984 Code of practice for general structural design and design loadings for buildings
- NZS 3101:... The design of concrete structures -
- Part 1:1982 Code of Practice for the design of concrete structures
- Part 2:1982 Commentary on the design of concrete structures
- NZS 3109:1980 Specification for concrete construction
- NZS 3106P:--- Code of practice for concrete structures for the storage of liquids -
- Part 1:1978 Design based on "resistance to cracking" approach
- DZ 3124 Concrete Construction for Work not Requiring Specific Design
- NZS 4441:1972 Code of practice for swimming pools
- NZS 3404:1977 Code of practice of steel structures (with commentary)
- NOTE - must be read in conjunction with AS 1250-1981 SAA steel structures code
- NZS 3602 Code of Practice for Specifying Timber and Wood Based Products for use in Buildings
- NZS 3603:1981 Code of practice for timber design
- NZS 3604:1984 Code of practice for light timber frame buildings not requiring specific design
- NZS 3615:1981 Strength properties and design methods for construction plywood
- NZS 4210P:1981 Code of practice for masonry buildings: Materials and workmanship
- NZS 4230P:1985 Design of masonry structures
- DZ 4229 Technical Recommendations for a Code of Practice for Concrete Masonry Buildings not Requiring Specific Design

PART 1 PRELIMINARY

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PART 1 PRELIMINARY

1.1 INTERPRETATION

1.1.1 In this Bylaw, unless inconsistent with the context:

"Accessory Building" means a building, the use of which is incidental to that of the main building on the land or to the use of that part of the land not built open.

"Accommodation Building" means a residential building in which accommodation is or is intended to be provided for five or more guests, boarders, lodgers, patients or inmates; and includes a boardinghouse, hostel, hotel, hospital, home, orphanage, boarding school, barracks, lodging house, or similar building and where necessary includes a portion of a building or combination of two or more buildings or parts thereof.

"Act" means the Local Government Act 1974.

"Apartment" means a household unit which is not wholly self-contained in that it shares with other household units some of the service features provided for in Part 4 of this Bylaw.

"Apartment Building" means a residential building, or part of a building in which there are three or more apartments.

"Approved" unless otherwise specifically stated, means approved by the Engineer and "Approval" has a corresponding meaning; provided that any person affected thereby may require that any approval or refusal to approve shall, within a reasonable time, be confirmed in writing on behalf of the Council by the registered engineer.

"Building" in addition to its ordinary and usual meaning, means any thing or part of a thing constructed or erected whether temporary or permanent, movable or immovable, but for the purposes of this Bylaw does not include:

- (i) Any scaffolding, falsework, timbering or other temporary construction erected for maintenance work only, or erected under the provisions of the Construction Act 1959 or under the provisions of any act or regulations enacted pursuant to the said Act or any act amending the same or in substitution thereof.
- (ii) Any erection or structure upon, over, or beneath a public place and any extension of any service connection which erection or structure or extension is owned or controlled by any public or local authority or public utility corporation.
- (iii) Any mast or pole that does not exceed 6.0m above adjacent ground level or 2.0m above the point of attachment to the building which supports it.

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- (iv) Any construction or erection that does not exceed 5m² in a horizontal plane and that does not exceed 1.2m in height above the lowest ground level adjoining.
- (v) Any retaining wall that is of a height not exceed 1.2m from the lowest ground level adjoining and which does not support any surcharge and provided that its height does not exceed its horizontal distance from the boundary of any public place.
- (vi) Any wall other than a retaining wall, and any fence or hoarding:
 - (a) Being of concrete or masonry and of a height not exceeding 1.8m from the lowest ground level adjoining, or provided that within 1.2m of the boundary and any public place its height does not exceed 1.2m from the lowest ground level adjoining;
 - (b) Being of material other than concrete or masonry and of a height not exceeding 2.3m from the lowest ground level adjoining;
 - (c) Being a frame work supporting netting of mesh or wire or similar material and of a height not exceeding 3.6m from the lowest ground level adjoining.
- (vii) Any tank or pool for the storage of water including any structural support thereof:
 - (a) Not exceeding 23,000 litres capacity and supported directly by the ground;
 - (b) Not exceeding 2,000 litres capacity and supported not more than 1.8m above the ground;
 - (c) Not exceeding 500 litres capacity and supported not more than 3.6m above the ground.
- (viii) Any tent or marquee not exceeding 28m² in area and remaining in use for not more than one month and any tent or marquee subject to licence.
- (ix) Any platform, walk, paving, or driveway of a height not exceeding 0.6m above the lowest ground level adjoining.
- (x) Any temporary storage stack of goods or materials.
- (xi) Any vehicle and any chattel whether fixed or movable not hereinbefore described or referred to unless such vehicle or chattel shall be used as a place or as part of a place of residence, business or storage.

- (xii) Maintenance work excluding the alteration or replacement of anything contributing to the structural strength, fire resisting properties or other properties of the building that are controlled by this Bylaw.
- (xiii) Any glass-house less than 8m in area and less than 2.2m in height sited in any position other than forward of a residential building.
- (xiv) Any prefabricated garden shed less than 5m² in area and less than 2.2m in height and clad in non-combustible material and sited in any position other than forward of a residential building.
- (xv) A sign of lightweight sheet material fixed to a building in such a way that the sign fixings will not be subject to wind and earthquake loads additional to those for which the building has been designed.
- (xvi) Any conservatory, solarium, porch or similar non-habitable enclosure which is no greater in area than 5m² in area and which is attached to a dwelling.

Note: While a building permit may not be required for a particular structure care should be taken to ensure that it is not a "building" in terms of the District Planning Scheme where "building" is differently defined.

"Building Inspector" means the inspecting officer for the time being appointed by the Council to carry out separately or conjointly with any other duty the duty of inspecting and examining the erection of all new buildings and all alterations, renewals and repairs or additions to existing buildings within the Council district and all work and materials connected therewith respectively for which a permit shall have been granted or for which a permit should have been obtained.

"Building Permit" means a permit issued for the "Erection of a Building" as herein defined, either under this Bylaw alone or in conjunction with any other bylaw in force relating to the erection of buildings.

"Dwelling" means a residential building designed for or occupied exclusively as the house or residence for one household.

"Designer" means that person responsible for determining the proportions of a building or building element.

"Engineer" means the Council's principal Engineer who shall be a Registered Engineer, his deputy or assistant appointed by the Council to control the erection of buildings.

"Erection of a Building" includes the re-erection of a building and the reconditioning of a building, the replacement of shop windows and the making of any alteration, repair or addition to any building theretofore or hereafter erected, and the removal, either in whole or in part, of a building from any place within or without the Council district to any place within such district or from one position to another position on the same lot of land, and "Erect" has a corresponding meaning: Provided that the prefabrication of a building or part of a building at a site where it is not to be used as a place or as part of a place of residence, business or storage shall not be deemed the erection of a building, nor shall the transportation of such prefabricated building or part of a building to the site where it is to be used, be deemed to be the erection of a building and provided further that maintenance work shall not be deemed a repair.

"Fire and Egress Features Summary" means a check list completed by the building designer the purpose of which is to ensure the requirements for fire resisting construction and means of egress of this Bylaw are met.

"Fire-Resistance Rating" (referred to herein as FRR) means the minimum period of time for which all sides of an element of structure, any of which is subject to a standard fire (See Part 5) continues to perform its structural function and does not permit the spread of fire. Where a period of time is used in conjunction with the abbreviation FRR it is required that the element of structure referred to shall have a fire resistance rating of not less than the period stated.

"Garage" means a building or portion of a building used, or which could be used for a housing or care of self-propelled vehicles but does not include "motor repair garage". For the purpose of this Bylaw a "Car-Port" or similar structure is a garage.

"Foundations" means and includes all those portions of a structure in direct contact with and transmitting loads to the ground such as piles, piers, pads, rafts, footings, foundation blocks, foundation walls, foundation beams and any other construction serving a similar purpose.

"Habitable Room" means any room in a residential building or household unit which is used or which in the opinion of the Engineer can be used as a sitting room, a bed sitting room, a living room, a living room bedroom, a living room kitchen, a dining room, a dining room kitchen, a kitchen, a bedroom, a general amusement room and a reception room.

"Household Unit" means a room or rooms contained in one building used or intended for habitation by one household.

"Inspection" means inspection by the Engineer or other person authorised in that behalf by the Council.

"Masonry" means any construction in units of burnt clay, concrete or stone or other approved materials, laid to a bond in and joined together with mortar.

"Multi-Unit Dwelling" means a residential building of two or more storeys in which there are three or more household units.

"Owner" in relation to any property, means the person entitled to receive the rack rent thereof, or who would be so entitled if the property were let to a tenant at a rack rent.

"Place of Assembly" means in addition to a theatre, cinema or public hall, a building or part of a building used or intended to be used as a place of assembly for 100 or more persons, seated or unseated, whether or not the building is required to be licensed under the Act and shall include a concert chamber, school hall, dance hall, church, church hall, chapel, lodge room, auction room, shop, restaurant, show building, skating rink, pavilion, grandstand and any other building of a like nature which in the opinion of the Engineer shall be included.

"Principal Consultant" means the consultant appointed by the owner. The principal consultant is responsible to the owner and all other consultants are responsible to the owner through the principal consultant.

"Public Hall" means a place of assembly, other than a theatre or cinema, capable of seating more than 450 persons and used or intended to be used as a concert hall, dance hall, or similar place of public entertainment but does not include a school hall, gymnasium, agricultural hall, show ground building and other such buildings as may be approved by the Engineer.

"Registered Engineer" means a person who holds a current annual practising certificate issued under the Engineers Registration Act 1924.

"Residential Building" means any building or part of a building occupied or intended to be occupied for human habitation.

"Road" includes any street, private street, footway or private way and has the meaning assigned to it by Section 315 of the Local Government Act.

"Service Room" means any room in a residential building or household unit other than a habitable room.

"Storey" means that portion of a building included between the upper surface of any floor and upper surface of the floor next above, except that the topmost storey shall be that portion of a building included between the upper surface of the topmost floor and the ceiling or roof above.

"Structural Design Features Summary" means a check list completed by the building designer the purpose of which is to ensure that structural design requirements of this Bylaw are met.

1.2 CONTINUANCE OF EXISTING APPROVALS ETC

1.2.1 All approvals, permits and other acts of authority which originated under any bylaw, hereby revoked, and all applications, plans and other acts of parties and generally all documents, matters, acts and things which so originated and are of continuing effect at the commencement of this Bylaw, shall enure for the purpose of this Bylaw as if they had originated under this Bylaw and shall where necessary be deemed to have so originated.

1.3 STATUTORY REQUIREMENTS

1.3.1 In the application of this Bylaw to any building the subject of express statutory enactment, this Bylaw shall not be deemed to require any matter or thing contrary to such enactment or any regulations made thereunder or any requirement lawfully made thereunder; but, except as aforesaid, compliance with any such enactment, regulation or requirement shall not relieve any person from liability to comply with the requirements of this Bylaw.

1.4 PREVIOUS BYLAWS OVER-RIDDEN

1.4.1 All bylaws heretofore in force relating to the erection and use of buildings shall be read subject to this Bylaw, and in the event of conflict between the provisions of any bylaw and the provisions of this Bylaw the provisions of this Bylaw shall prevail.

1.5 GENERAL APPLICATION

1.5.1 Except as hereafter expressly provided, this Bylaw shall apply to the whole of the area from time to time for the time being included within the Christchurch City Council area.

PART 2 BUILDING PERMITS

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- 2.18 PERMIT VOID IF WORK NOT COMMENCED OR COMPLETED
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- 2.22 SCAFFOLDING AND GANTRYs
- 2.23 OVERHEAD OR UNDERGROUND SERVICES
- 2.24 BUILDERS' SHEDS
- 2.25 CONVENIENCE FOR WORKPERSONS

FIRST SCHEDULE

SECOND SCHEDULE

PART 2 BUILDING PERMITS

2.1 OBJECTIVE

The objective of this Part of the Bylaw is to define the obligations of owners and builders with respect to permits for buildings and associated works.

2.2 PERMITS REQUIRED

- 2.2.1 No person shall erect or commence to erect any building without first obtaining a building permit from the Engineer.
- 2.2.2 No person shall cause or permit the commencement of the erection of or the erection of any building if a building permit in that behalf has not first been obtained from the Engineer.
- 2.2.3 No person shall install a solid fuel heater without first obtaining a building permit from the Engineer.
- 2.2.4 No person shall cause, or permit the commencement of, the installation of a solid fuel heater if a building permit in that behalf has not first been obtained from the Engineer.
- 2.2.5 No person shall install a new flue system in association with a solid fuel heater without first obtaining a building permit from the Engineer.
- 2.2.6 No person shall cause, or permit the commencement of the installation of a new flue system in association with a solid fuel heater if a building permit in that behalf has not first been obtained from the Engineer.

2.3 STRUCTURES OTHER THAN BUILDINGS

- 2.3.1 Any person desiring to erect a structure, or to authorise the erection of a structure, which is not a building as defined by this Bylaw must determine that such structure complies with the requirements of relevant acts and regulations.
- 2.3.2 The Engineer and the Council shall, in addition to the power granted by the Act, have the same power to require the removal of any such structure heretofore or hereafter erected as if it were a building if, in the opinion of the Engineer, it constitutes a public danger.

2.4 PERMIT APPLICATION FORMS

- 2.4.1 Any person wishing to obtain a building permit or his agent acting on his behalf, shall make application to the Engineer by completing and signing an application form provided for that purpose.

- 2.4.2 In addition to the application form required under 2.4.1, where the proposed building or part of the building is the subject of specific design, the Engineer may require the applicant's designer to complete and sign additional forms as applicable.

Note: Such forms include a Structural Design Features Summary and a Fire Safety Features Summary.

2.5 CONTENTS OF APPLICATION

- 2.5.1 Every application shall set out:
- (i) The legal description and particulars of the site.
 - (ii) The full names and addresses of the owner of the site, the employer for whom the work is being done, the builder and, where necessary, the designer.
 - (iii) The locality of the proposed work.
 - (iv) The estimated value of the work.
- 2.5.2 Where not clearly shown or stated in the drawings and specifications required under 2.6, the following information shall be given as a signed statement on, or attached to, the application form:
- (i) The proposed use or occupancy of every part of the building.
 - (ii) The nature of the ground on which the building is to be placed and the subjacent strata. Data from investigation and tests shall be sufficient to demonstrate to the Engineer that the strata will support the building without detrimental settlements. For one storey residential buildings the observed behaviour of adjacent similar buildings may be accepted as sufficient demonstration.
- 2.5.3 For buildings for which specific design has been necessary and to assist local authority officers to obtain information, or have queries answered by the appropriate person or persons to speed up the issue of a permit a statement of responsibility for documentation shall be supplied containing the name of the person or organisation directly responsible for each of the following:
- Principal Consultant
 - Architectural Drawings
 - Structural Engineering Design
 - Structural Engineering Drawings
 - Compliance with town planning requirements
 - Compliance with fire safety requirements

- 2.5.4 For a building required by this Bylaw to be the subject of specific design, the applicant may, and if the Engineer so requires the applicant shall, submit a structural design features summary or a fire safety features summary or both.

2.6 PLANS AND SPECIFICATIONS

2.6.1 General

- 2.6.1.1 Together with every application there shall be submitted to the Engineer, in duplicate, detailed plans, elevations, cross-sections, and specifications, which shall together furnish complete details of design, and the qualities and descriptions of construction materials and workmanship, and which shall be of sufficient clarity to show, to the satisfaction of the Engineer, the exact nature and character of the proposed undertaking and the provision made for full compliance with the requirements of this Bylaw and any other relevant bylaw in force at the time of the application.
- 2.6.1.2 In addition to the structural details required, the plans and sections shall show every floor of the proposed building, the dimensions, position and intended use of the rooms, and the situation of the flues, fireplaces, stoves and chimneys. The plans and sections shall further show the levels of all floors and the ground levels, both existing and proposed, adjoining the building, to proposed means of water supply and also the means proposed to deal with all stormwater and drainage.
- 2.6.1.3 All drawings shall be drawn accurately, clearly and indelibly at an appropriate scale with printing of a size appropriate for microfilm copying, and shall be reproduced upon cloth or approved paper.
- 2.6.1.4 When lodged, the application and drawings and other documents accompanying the application shall become the absolute property of the Council.

2.6.2 Structural Details

- 2.6.2.1 For every building, except as set out in 2.7, with a framework or bearing-wall system wholly or partly subject to structural design under this Bylaw, and in every other case where the Engineer may reasonably require it, there shall also be submitted to the Engineer such stress diagrams, computations, and other data as are necessary to show that the design complies with all the requirements of this Bylaw and any other relevant bylaw in force.

- 2.6.2.2 Computations shall be preceded by a brief report describing the bracing system and integration of the structure and the manner in which the designer expects it to function with a clear statement of all assumptions regarding such matters as materials, stresses appropriate to the standard of supervision, and live, wind, and seismic loadings. Computations shall include a summation of dead, live, seismic and other required loadings, floor by floor, and calculation of bents (or the equivalent) in each direction, and of any special features.
- 2.6.2.3 Drawings of all structural components shall be sufficient to show the size, detail and location of the components within the building structure so that they may be supplied, fabricated and erected from such drawings.
- 2.6.3 Locality, Site Plan and Certificate of Title
- 2.6.3.1 The drawings shall be accompanied by a locality plan or a site plan or both, in duplicate, together with a copy of the Certificate(s) of Title(s).
- 2.6.3.2 The locality plan or site plan shall be drawn to scale and shall show the site of the building, together with the land, roads, private streets, public places, easements, private ways, public reserves and buildings immediately surrounding the site, and shall be sufficient to enable the Engineer to locate the precise situation of the site not only relative to the boundaries of its own land, but also relative to any buildings erected upon immediately adjoining lands.
- 2.6.3.3 In rural areas or other situations where it is not feasible to draw locality plans to scale, a plan must be submitted, accurately detailing distances to boundaries and other identifiable features on the property to enable the precise location of the proposed structure to be determined.
- 2.6.3.4 The site plan shall be drawn to a scale of not less than 1:200.
- 2.6.4 Drainage Plan
- 2.6.4.1 A drainage plan showing the position of all closets, urinals, sinks, wash-hand basins, baths, wash-tubs, traps, vents and other appliances connected with the drainage system shall be lodged with the Council, except where a satisfactory drainage plan has already been deposited.

2.7 CALCULATIONS EXEMPTIONS

2.7.1 All buildings shall be the subject of specific structural design including calculations unless otherwise provided by this Bylaw (see Parts 6, 7, 8, 9 and 10).

2.8 DOCUMENTS TO BE SIGNED

2.8.1 All drawings, computations and other data submitted shall be signed by the architect, engineer or designer responsible for their production and shall clearly identify him and his firm or organisation.

2.8.2 Where two or more independent parties are each responsible for the production of part of a set of drawings, each drawing shall identify in a similar manner the party responsible for producing that drawing.

2.8.3 Any structural engineering drawing prepared by one independent party from calculations provided by another independent party shall also include a statement identifying the person responsible for making the calculations and his firm or organisation.

2.9 FEES AND DEPOSIT

2.9.1 Every applicant for a permit under this chapter of this Bylaw shall, at the time of issue of the permit, pay to the Council the following:

- (i) Fees for building permit as specified in the First Schedule.
- (ii) Fees for any plumbing and drainage permit as specified in the Drainage and Plumbing Regulations 1978.
- (iii) Cost of any permanent vehicular access required under any bylaw.
- (iv) Where water from the Council supply is desired to be used for building purposes on property which is not rateable it shall be charged for at a rate determined by the Engineer.
- (v) Deposit for possible damage to roads during building operations. The amount of such deposit, unless prescribed by bylaw, shall in all cases be fixed by the Engineer. The Engineer may accept a signed indemnity as an alternative to a cash deposit.
- (vi) Cost of reinstatement of any stormwater opening to be made in the footway or road as a result of the erection of the building.

- 2.9.2 If the work under the permit is not proceeded with, the Council may cancel the permit and refund up to one-half of the permit fees which have been paid under items (i) and (ii) of subclause 2.9.1 and the whole of the fee paid under items (iii), (iv), (v) and (vi) of subclause 2.9.1.
- 2.9.2.1 Notwithstanding the foregoing provisions of this Clause, no permit fees for building or plumbing and drainage under items (i) and (ii) of subclause 2.9.1 shall be charged on work carried out by or on behalf of the Council where such fees, if paid, would be a charge either directly or indirectly on Council funds.
- 2.9.2.2 In all cases within this subclause the branch or department of the Council controlling the land to which the building operations relate shall be responsible to ensure that a permit for the work is obtained before the work is commenced, and that the cost of any vehicular crossing required and the cost of repairing any damage whatsoever to the street caused by or arising out of the building operations are paid to the Council.
- 2.9.3 For any other duties described in the Second Schedule of this chapter of this Bylaw the prescribed fee as listed in the Schedule shall be paid before the performance of the duty.
- 2.9.4 All the fees required by this Bylaw and referred to in the Schedules to this part of the Bylaw may from time to time be altered or abolished as the Council by resolution decides.

2.10 PERMIT FEE TO COVER COST OF EXAMINATION OF DOCUMENTS AND INSPECTIONS

- 2.10.1 The permit fee set out in the First Schedule shall cover the cost of examination of drawings and specifications and other documents and inspections of works during erection and up to the time of completion, except inspections for which a separate fee is provided in the Second Schedule.
- 2.10.2 Any question as to the estimated value of the work for the purpose of computing a permit fee may be determined in his discretion by the Engineer, and his determinations shall be final.

2.11 RECORD OF DOCUMENTS TO BE KEPT BY ENGINEER

- 2.11.1 The Engineer shall keep a record of drawings and other documents which shall have been submitted to him under this chapter of this Bylaw, and such record shall be prima facie evidence of the truth of the statements made therein.

2.12 DOCUMENTS TO BE RETAINED

2.12.1 After a permit has been issued the record referred to in 2.11.1 shall, on reasonable request, at reasonable times, be available for inspection by:

- (i) The builder or his authorised agent until the final settlement of his contract
- (ii) The employer for whom the work is done or any person duly authorised by him in that behalf
- (iii) The owner of the site for the time being or any person duly authorised by him in that behalf

Provided that, after the completion of the work to which the drawings and other documents refer, there may be payable a search fee determined by the Council.

2.12.2 A second copy of drawings and other documents which are required to be deposited in duplicate under this or any other bylaw in force shall be returned to the applicant or his agent at the time of issue of the permit and shall be kept by the builder on the site of the work during construction.

2.13 WITHHOLDING OF PERMIT

2.13.1 The Engineer may withhold a permit if he considers that deficient information has been supplied relative to the matters herein referred to or required by any other relevant bylaw in force or if he considers that the building does not comply with the requirements of this Bylaw or any other relevant acts, regulations or bylaws in force, or act, and shall in that event give the applicant notice of such withholding and particulars of such deficiency or such non-compliance, and the applicant shall thereupon make good such deficiency, or make such alterations in the documents as shall be necessary to comply with all such requirements.

2.13.2 In the case of an existing building it shall be lawful for the Engineer to refuse a permit for:

- (i) The execution of any repairs or alterations that constitute the "erection of a building" as that term is defined or any addition if he is of the opinion that the age or state or general condition of the building is such that a permit should not be issued.
- (ii) Any alterations or additions if the use or intended use of the building is such that it would not conform with the Bylaw having regard to Part 3 or Part 5 of this Bylaw or with any scheme or proposal under the Town and Country Planning Act 1977 or the Housing Improvement Regulations 1947.

- 2.13.3 The Engineer may refuse to grant a permit under powers granted to the Council under the Local Government Act 1974.

Note: Section 641 of the Local Government Act states circumstances under which the Council may refuse to grant a permit.

2.14 ISSUE OF PERMIT

- 2.14.1 Where the Engineer is satisfied that the drawings and specifications are in accordance with this Bylaw and with other relevant acts, regulations and bylaws and acts and where he has no reason to believe that the builder is not competent to carry out the work the applicant shall be advised that a permit will be issued on the payment of the requisite fees. This advice shall be made within such period of time as provided below:

- (i) Where the estimated value of the work is less than \$4,000 within 10 working days from the date of application.
- (ii) Where the estimated value of the work is \$4,000 or more, within 20 working days from the date of application.
- (iii) Where structural calculations are required such additional time as in the opinion of the Engineer is necessary for the checking of all drawings, calculations and other data connected with the application.

Provided that the Engineer may delay the issue of a permit for a further period, the extent of which he shall be the sole judge if in his opinion some particular grounds exist for such delay, but in such cases he shall, within the periods of time provided, notify the applicant in writing as to the grounds on which the issue of the permit is to be delayed. Provided further that a permit for any work requiring the construction of a vehicular access or crossing to any property shall not be issued until the vehicular access or crossing has been approved.

- 2.14.2 No permit in respect of the work or any part of the work shall be issued until all amounts required by subclause 2.9.1 have been paid.
- 2.14.3 Every permit shall be in writing on a form provided for that purpose and signed by the Engineer.
- 2.14.4 Where a permit is not uplifted within three months of the date of notification the Engineer may cancel the application and dispose of the plans and documents.

2.15 EFFECT OF PERMIT

- 2.15.1 Every permit shall be deemed to operate as a permit to erect on the site shown in the application, a structure as therein described, subject to compliance in every respect with the requirements of this Bylaw.
- 2.15.2 It shall be the duty of the owner of the land upon which any work is being or is proposed to be done and of the employer for whom work is being or is proposed to be done and of the builder, contractor or person in charge who is doing or proposing to do such work, to see that the provisions of this Bylaw are fully complied with in the commencement and execution of such work and all such persons shall be liable for any breach here of.

2.16 DEVIATION FROM PERMIT

- 2.16.1 After a permit has been issued no departure shall be made from any of the particulars supplied upon any plan, drawing, specification, or document deposited with the application upon which the permit was issued, unless amended particulars clearly describing the intended deviation are supplied to the Engineer at his office, and the Engineer shall have given his written approval of the deviation.

2.17 PERMIT NOT TO BE DEEMED TO AUTHORISE OTHERWISE THAN IN ACCORDANCE WITH LAW

- 2.17.1 No permit, permission, certificate or authority expressed or implied, given by the Council or by the Engineer or other officer of the Council, shall authorise any building to be erected otherwise than in accordance with law.

2.18 PERMIT VOID IF WORK NOT COMMENCED OR COMPLETED

- 2.18.1 Any permit issued for building construction shall be deemed to expire and be void if work of construction is not commenced thereunder within the period of six calendar months from the date of issue thereof:

All the works covered by the permit shall be completed within the time stated by the Engineer in such permit.

Provided that the Engineer may from time to time by writing under his hand grant an extension of the aforesaid periods should he consider the cause of delay to warrant such extension, and every such extension shall have the effect of continuing the validity of the permit for the period or until the date set out in the extension, but not in any case for a period exceeding twelve months from the day the extension was granted.

2.19 INSPECTION

- 2.19.1 It shall be a condition of every permit issued under this Bylaw that the Engineer or any Inspector appointed by the Council shall be entitled at all times during the normal working hours or while work is being done, with such assistants as he may think necessary, to enter the premises and inspect the whole or any part of the work.
- 2.19.2 The owner, the employer for whom the work is being done, the builder and every person engaged in the erection of a building, shall give every reasonable facility to an Inspector and his assistants to inspect the whole or any part of the work.
- 2.19.3 The builder shall provide facilities for the inspector to examine the foundation excavations before the placing of any site concrete or of any part of the foundation structure. In addition, the builder shall give the inspector specific notice as defined in 2.19.5 before any structural concrete is placed in the excavation to enable the inspector to examine all reinforcing steel.
- 2.19.4 If the Engineer should require that inspection be made of, or before, other particular operations, for example the placing of concrete in key parts of the structure and the closing in of timber framing, he shall so notify the builder in writing or endorse his requirements on the drawings at the time of issue of the permit. The builder shall give the inspector specific notice of such operations.
- 2.19.5 For the purposes of this Clause, specific notice is defined as being not less than 24 hours notice, which time shall include one complete working day as normally worked by the Council staff.
- 2.19.6 In addition, the Engineer may in relation to any building do anything that he considers reasonably necessary to enable him to determine whether or not the requirements of this Bylaw have been complied with.
- 2.19.7 The Engineer may, if satisfied that any building is being erected in contravention of this Bylaw, by notice in writing:
- (i) given to the builder, require the builder to stop building operations to such extent as the Engineer thinks necessary in each case until the Engineer is satisfied that the builder can and will comply with the provisions of this Bylaw, and/or
 - (ii) given to the owner, require that the owner cause building operations to stop to such extent as the Engineer thinks necessary in each case until the Engineer is satisfied that the builder can and will comply with the provisions of this Bylaw,

(iii) given to the employer for whom work is being done, require that the employer cause building operations to stop to such extent as the Engineer thinks necessary in each case until the Engineer is satisfied that the builder can and will comply with the provisions of this Bylaw,

and every person failing to comply with or observe any such notice shall be guilty of an offence against this Bylaw.

2.19.8 If work is commenced contrary to any provision of this Bylaw the person commencing or doing that work, or the owner or employer authorising the commencement or the carrying out of the work shall, on receipt of notice in writing from the Engineer carry out or cause to be carried out any works as may be required by the Engineer including the removal, alteration or pulling down of the said work. Any person who fails to comply with any such notice shall be guilty of a continuing offence against this Bylaw.

2.20 PERMISSION TO USE ROAD

2.20.1 The applicant for a building permit shall, wherever work is adjacent to a road or public space, also make application to the Engineer for permission to enclose, cover over, or use such portion of the road or public place as may be necessary for the execution of the work or in the interest of public safety.

2.20.2 The application shall be made at the office of the Engineer on a form provided for that purpose. It shall be accompanied by such further particulars as may be required by the Engineer who may in granting approval impose such conditions as he thinks fit, having particular regard to the safety and convenience of the public.

2.20.3 It shall be an offence for any person to erect or authorise the erection of any scaffolding, gantry, hoarding, or barricade on a road or any public place in connection with the erection, alteration, repair, renovation, or demolition of any building or structure unless approval has first been obtained from the Engineer and any deposit or fee required in connection therewith has been paid or agreed to in writing.

2.20.4 Nothing in this Clause shall relieve any person from the responsibility of providing the necessary safeguards to protect the users of any road or public place from danger due to any excavation made or obstacle placed or dropped by him.

2.21 EXCAVATIONS ADJACENT TO ROADS

2.21.1 Where building foundations require an excavation to be made adjacent to the road, the builder shall take such precautions deemed necessary by the Engineer to ensure that the road is maintained in a stable and safe state. The walls of any such excavation shall be supported by a structural system within the property.

2.22 SCAFFOLDING AND GANTRY

- 2.22.1 Where scaffolding is supported on a verandah full details of the loading and distribution of loads shall be submitted together with all available information in regard to such verandah. When required by the Engineer the verandah shall be opened up by the applicant in order that its construction and condition can be ascertained. If any additional support is required on account of the added load from the scaffolding such support shall be provided in a manner satisfactory to the Engineer.
- 2.22.2 When required by the Engineer a gantry so constructed as to prevent the penetration of water, dust, rubbish, or any form of building material, equipment, or tools shall be erected over the footway.
- 2.22.3 When a gantry is not required the portion of the footway open to the public shall be provided with overhead cover sufficient, in the opinion of the Engineer, to prevent dust, water, rubbish, or other material from falling on persons using the footway.

2.23 OVERHEAD OR UNDERGROUND SERVICES

- 2.23.1 No person shall open up or cause to be opened up any road or footway unless he has first ascertained whether there are services located thereunder and, if so, their approximate position. He shall take every precaution to avoid damage to any such installation.
- 2.23.2 Any person erecting or causing scaffolding to be erected over any road or footway shall have due regard to any electrical or telephone wires and shall advise the Department concerned if any interference is likely to take place or if any alteration or adjustment is required.

2.24 BUILDERS' SHEDS

- 2.24.1 With the approval of the Engineer a builder holding a permit for the erection of a building may erect on the site any temporary shed, office, or workshop required in connection with the erection of the building. The shed, office, or work shop shall be removed by the builder from the site upon completion of the building operations without notice being given or earlier if so required by written notice from the Engineer.

2.25 CONVENIENCE FOR WORKPERSONS

- 2.25.1 Every builder erecting a new building or engaged in construction work shall provide in connection therewith approved sanitary conveniences for the use of the employees engaged on or working in or upon the building or works.

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FIRST SCHEDULE

BUILDING PERMIT FEES

The fee shall be calculated on the basis of a basic fee of \$10 plus \$8 per \$1,000 of value, or part thereof for the first \$20,000 of value, plus \$7 per \$1,000 of value or part thereof for the next \$80,000 of value plus \$3 per \$1,000 of value or part thereof for the next \$400,000 of value plus \$1.50 per \$1,000 of value or part thereof for the next \$500,000 of value plus 80c per \$1,000 of value or part thereof for all additional value.

In any dispute the Engineer shall determine the value of work in accordance with Clause 2.12.

SECOND SCHEDULE

FEES PAYABLE FOR SPECIAL DUTIES

<u>Nature of Duty</u>	<u>Rate</u> <u>GST Incl.</u> <u>1.4.88</u>
For inspection required in the case of proposed structural alterations before drawings and other documents are submitted for approval	... \$50.00
For inspecting old timber before re-using the same in a new building	... \$50.00
For any inspection that may be deemed necessary in connection with any building or work in respect of which no fee has otherwise been paid	... \$50.00
For searching drawings and other documents after completion of work	... \$25.00
For inspection of buildings for re-siting within the city area	... \$100.00
Minor Buildings	... \$50.00
(Inspections outside the city area to be at an agreed rate to cover reasonable costs.)	
For the inspection of any factory for the purpose of issuing a Fire Safety Certificate as required by the Factories Amendment Act 1971 where the factory is occupied by less than 30 persons	... \$50.00
For the inspection of any factory for the purpose of issuing a Fire Safety Certificate as required by the Factories Amendment Act 1971 where the factory is occupied by 30 or more persons	... \$100.00
For the issue of a Fire Safety Certificate for any factory	... \$10.00

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For additional inspections required when certification under Section 314 of Local Government Act is requested:

Up to three units	... \$100.00
Additional cost per unit in excess of 3 units	... \$10.00
Builders Street Use Fee per square metre per month	... \$5.00
For searching Certificates of Title prior to the issue of a permit	... \$25.00-
Inspection and Report on installation of chimney for an approved heating appliance	... \$50.00
Sign Permit Fee	... \$40.00

PART 3 GENERAL REQUIREMENTS

- 3.1 OBJECTIVE AND APPLICATION
- 3.2 NEW FORMS OF CONSTRUCTION
- 3.3 STANDARD OF WORK
- 3.4 STORMWATER DISPOSAL
- 3.5 ORNAMENTS TO BE TIED
- 3.6 PARAPETS
- 3.7 PROJECTIONS
- 3.8 VERANDAHS
- 3.9 REMOVAL OF VERANDAHS
- 3.10 REPAIR OF VERANDAHS
- 3.11 CANOPIES, SUN BLINDS AND AWNINGS
- 3.12 CLOCKS AND LAMPS
- 3.13 FLAGPOLES
- 3.14 USE OF GLASS IN BUILDINGS
- 3.15 CHANGE OF USE OR OCCUPANCY OF EXISTING BUILDINGS
- 3.16 ALTERATIONS AND ADDITIONS
- 3.17 RESISTANCE TO SEISMIC FORCES
- 3.18 DEMOLITION
- 3.19 ACCESS FOR THE PHYSICALLY HANDICAPPED
- 3.20 ENTRANCES OF BUILDINGS CONTIGUOUS TO FOOTPATH
- 3.21 ROOF STORAGE
- 3.22 SECONDHAND MATERIALS
- 3.23 CELLARS
- 3.24 SOLID FUEL HEATING APPLIANCES
- 3.25 RELOCATION OF BUILDINGS
- 3.26 RETAINING WALLS
- 3.27 AERIALS AND MASTS
- 3.28 CORNER SET-BACK

PART 3 GENERAL REQUIREMENTS

3.1 OBJECTIVE AND APPLICATION

3.1.1 The objective of this part of the Bylaw is to establish the requirements for matters of general application relating to the erection of buildings which are not fully established by other parts of this Bylaw.

3.2 NEW FORMS OF CONSTRUCTION

3.2.1 Materials, forms of construction, and methods of design not provided for in this Bylaw may be employed only in accordance with prior written approval of the Council and subject to the following conditions:

(i) In every case application for permission to employ such materials, forms of construction, or methods of design shall be made in writing to the Engineer.

(ii) The application shall be accompanied by all particulars necessary to enable the Engineer to consider suitability of the materials, forms of construction, or methods of design which it is desired to use.

(iii) The applicant shall at his own expense in all things have such tests made by an approved testing authority as may be required by the Engineer.

3.2.2 Any material, form of construction, or method of design which has been approved by the Council may be authorised by the Engineer for use in the manner and to the extent so approved.

3.2.3 Notwithstanding the provision of this Clause any material which has a suitable Appraisal Certificate from the Building Research Association of New Zealand may be approved by the Engineer.

3.3 STANDARD OF WORK

3.3.1 On points not covered herein the materials, design, execution of work, and the manner of use of material shall be suitable and adequate for the purpose and function involved and conform to the requirements of this Bylaw and to approved N.Z. Standards (or if no N.Z. Standards exist then approved British or American Standards or Codes of Practice) and in accordance with good trade practice.

3.4 STORMWATER DISPOSAL

Unless otherwise approved all building roofs greater than 10 square metres in area and all sealed yard areas must be provided with an adequate stormwater disposal system connected to the street side channel or other approved outfall. Only stormwater may be discharged into such systems.

3.5 ORNAMENTS TO BE TIED

All veneer-finish, cornices, and ornamental details, whether of the exterior or of the interior of the building, shall be securely and permanently attached to the structure.

3.6 PARAPETS AND ROOF SAFETY

3.6.1 Where external walls of buildings are built adjacent to public roads or public places and no suitable verandah has been provided, the roof shall not slope towards the public road or public place unless the wall is provided with a 300mm parapet. Alternatively, the bottom edge of the roof may discharge into a gutter with a 300mm base width, a 300mm high front edge, designed to support a 100kg person.

3.7 PROJECTIONS

3.7.1 No portion of any building shall project beyond:

- (i) The boundary line of the property except in the case of an approved party wall.
- (ii) The line of the road frontage or building line fixed under the provisions of the Public Works Act 1981* or under any bylaw of the Council except as provided for in this chapter of this Bylaw.

3.7.2 Architectural features at a height of not less than 2.900m above the level of the back of a formed footway or 4.200m where no footway has been formed and constructed in concrete or other approved material of a permanent nature may, with the approval of the Engineer, project beyond the line defined in subclause 3.7.1:

- (i) Cornices, string courses, or other horizontal features to a distance not exceeding 450mm.
- (ii) Bay or oriel windows contained within that portion of the height of a storey measured between 600mm above floor level to ceiling level to a distance not exceeding 450mm.
- (iii) Vertical fins or features to a distance not exceeding 300mm.
- (iv) A feature in the nature of a balcony or pediment with a projection not exceeding 1.1m may be approved by the Engineer subject to the material of construction and design being to his satisfaction.

3.7.3 Balconies, landings, ladders, stairs and other structures serving as means of egress from existing buildings may project to such extent, and with such ground clearance, as is approved by the Engineer.

- 3.7.4 No joist, beam, bracket, or other arrangement or fitting for use in connection with the hoisting of material of any nature, or which in the opinion of the Engineer could be used for this purpose, shall project or be fitted over a public place.
- 3.7.5 No opening portion of a window which opens out beyond the building line shall be less than 2.900m above the back of the footway or road level.
- 3.7.6 No foundation footing shall project beyond the boundary or building line under any public place provided that the Engineer may, if he is of the opinion that a projection would not injuriously prejudice the installation of underground services of any nature, permit where the depth exceeds 0.900m, a projection of 225mm plus 100mm for each 300mm in excess of 0.900m in depth with a maximum projection of 0.900m.

3.8 VERANDAHS

- 3.8.1 No person shall erect or cause to be erected any verandah which encroaches in whole or in part over any public place otherwise than in accordance with the provisions set out hereunder and any further conditions that may be imposed by the Engineer or the Council:
- (i) No verandah shall be erected over any public place which is less than 12.000m in width or in any case where there is no formed footway.
 - (ii) All verandahs shall be of the suspended or cantilever type designed to the approval of the Engineer and shall, as far as is practicable, conform with adjoining verandahs in regard to height, width, and depth of fascia, unless directed or permitted by the Engineer.
 - (iii) Every verandah or part of a verandah shall be erected at a height of not less than 2.900m above the level of the kerb of the footway. It shall extend from the supporting building to a distance of 530mm inside a vertical line drawn from the face of the kerb.
 - (iv) The main supporting members of every verandah shall unless otherwise approved by the Engineer be of steel which, except where embedded in concrete, shall be galvanised or painted with an approved paint or with other approved protection against corrosion before being enclosed in any way.
 - (v) The fascia of every verandah shall be not be less than 300mm nor more than 450mm in depth and shall be of a uniform level unless otherwise approved by the Council.

- (vi) The roof covering shall be of weather resisting material and shall be provided with gutters leading to downpipes. Downpipes shall not project beyond the boundary or building line within a height of 2.400m above footway level.
 - (vii) Ceilings shall be lined with approved material and all parts of a verandah shall be finished and painted to the approval of the Engineer. No glass shall be used in the roof of a verandah without the approval of the Engineer.
 - (viii) The ends of every verandah shall be at an angle of 90 degrees with the road boundary, provided that on a corner or in unusual circumstances the Engineer may direct otherwise. Where a verandah is erected to abut an existing verandah the junction of such verandah shall be made weather-proof to the satisfaction of the Engineer by the owner of the site on which the supporting building is located.
- 3.8.2 In the event that reflected light from the verandah is established as a nuisance it shall be the responsibility of the owner of the site on which the building is erected to abate that nuisance. Failure to abate the nuisance would be considered sufficient reason for the Council to require the removal of the verandah as allowed by Clause 3.9.

3.9 REMOVAL OF VERANDAHS

- 3.9.1 Where the Council considers that the safety or the interests of the public (of which the Council shall be the sole judge) requires the removal of any verandah, the Council may by resolution revoke any permission granted for the erection of the verandah, and require the owner of the site on which the building to which the verandah is annexed or of which it forms a part, to remove the verandah, and that owner shall, within seven days from the receipt of a notice from the Council to that effect, take down and remove the verandah at his expense.
- 3.9.2 If that owner fails to remove the verandah within the time stipulated in the notice the Council may take down and remove the verandah at the expense of the owner, and for that purpose officers of the Council may enter into and upon the building and premises of the owner.
- 3.9.3 Where a verandah is removed pursuant to this Clause the Council shall not be liable for any flashing, making good, or other work which may be rendered necessary or desirable through the removal of the verandah or for any damage caused by or arising out of the removal or to pay any compensation in respect of the revocation or removal.

3.10 REPAIRS OF VERANDAHS

- 3.10.1 No verandah shall be repaired unless the building to which it is attached is in the opinion of the Engineer in a satisfactory condition.
- 3.10.2 No person shall repair any verandah or other projection over a public place, permitted by this chapter of this Bylaw, without first providing such scaffolding or other safeguards as may be necessary (having regard to the nature of the work to be done) to prevent any tool or material used or intended to be used or disturbed in connection with such work from falling on such public place.
- 3.10.3 Any verandah heretofore or hereafter erected shall be maintained by the owner of the site on which the building supporting the verandah is situated in good and substantial repair and condition to the satisfaction of the Council.

3.11 CANOPIES, SUN BLINDS AND AWNINGS

- 3.11.1 Where they project forward of a road boundary, canopies, sun blinds and awnings shall;
- (i) Be fixed in a manner approved by the Engineer.
 - (ii) Have a clearance of 2.600m above the back of the kerb.
 - (iii) Be provided with an approved stormwater disposal system except where on a particular building the area of a canopy, sun blind or awning does not exceed 5m².
 - (iv) Be constructed of non-combustible material except that materials treated against spread of fire to the standard that would be required for lining materials in an exitway shall be acceptable.
 - (v) Have the cladding material replaced every five years.
- 3.11.2 The Engineer may require the removal of any sun blind, canopy or awning that is in his opinion unsightly or dilapidated.

3.12 CLOCKS AND LAMPS

- 3.12.1 No erection in the nature of a clock or lamp or supporting framework shall be erected or placed on or attached to any building or structure so as to project in part or in whole beyond the boundary or building line of any property unless permission has first been obtained from the Engineer who may impose such conditions as to height, size, materials and construction as he thinks fit. This subclause shall not apply to any electrical fittings which in the opinion of the Engineer are for the normal lighting of the premises.

3.12.2 The Council may by resolution revoke any consent given for any clock or lamp which projects beyond the boundary or building line if it is of the opinion that it is unsafe or undesirable for any reason or if being a clock it fails to keep the correct time, and may by notice in writing to the owner of the site on which the building supporting the clock is located require its removal.

3.13 FLAGPOLES

3.13.1 Except with the special approval of the Engineer, no flagpole shall be erected on the outer face of any building so as to stand within 1.500m of any public place.

3.14 USE OF GLASS IN BUILDINGS

3.14.1 The use of glass shall be in accordance with approved practice. The relevant provisions of NZS 4223 shall be deemed to be approved practice for the purpose of this Bylaw.

3.14.2 Where in the opinion of the Engineer the use of glass would create an undue hazard he may require such precautions to be taken as he considers necessary.

3.15 CHANGE OF USE OR OCCUPANCY OF EXISTING BUILDINGS

3.15.1 No person shall without the approval of the Council, use or permit to be used any building hereafter erected, or change or permit to be changed the use of any building heretofore erected, for any purpose or occupancy for which such building or part thereof fails to comply with the requirements of this Bylaw in any of the following:

- (i) Where the floors have not been designed for or are not, in the opinion of the Engineer, capable of safely supporting the loadings prescribed by Part 11 of this Bylaw:

Provided that the Engineer may, if satisfied by tests carried out by and at the expense of the applicant that the floor or floors will carry with an approved factor of safety the required loading, permit the proposed use subject to such conditions as he thinks fit to impose.

- (ii) Where the change of use would require an increase in the seismic coefficient to meet the requirements of Part 11 of this Bylaw.
- (iii) Where the change of use would require additional measures in regard to fire protection and means of egress in order to comply with Part 5 of this Bylaw.

- (iv) Where the change of use to a residential occupancy or from one class to another class of residential occupancy would require additional measures in order to comply with Part 4 of this Bylaw or with the Housing Improvement Regulations 1947, relating in particular to open space, materials of construction, accommodation and facility requirements.
- (v) Where the change of use would require additional measures in order to comply with the licensing requirements of an act, regulation or bylaw relating to the proposed use.

3.15.2 The Council in granting any approval under this Clause may:

- (i) Impose such conditions as it thinks fit, including the limitation of the period of approval, and may require such bond or deposit as it considers advisable to ensure compliance therewith.
- (ii) In the case of premises required to be licensed under any act, regulation or bylaw, refer the application to the Licensing Authority concerned and be guided by any recommendation or information received from such authority.

3.16 ALTERATIONS AND ADDITIONS

Before issuing a permit for any alteration or addition to or reinstatement of any existing building the Engineer shall be satisfied that the proposal complies with the requirements of this Bylaw and any other relevant acts, regulations or bylaws for the use or purpose for which it is intended.

3.17 RESISTANCE TO SEISMIC FORCES

- 3.17.1 In the case of alterations or repairs to existing buildings it shall be sufficient compliance with this Bylaw if the requirements, regarding resistance to seismic forces are observed and complied with so far as is reasonably possible, having regard to the design, construction and materials of the building, and the purpose for which it is used or intended to be used.
- 3.17.2 Where the existing building does not possess resistance to seismic forces of the extent required by this Bylaw then no alteration will be permitted which in the opinion of the Engineer will reduce its strength below that existing.
- 3.17.3 The applicant shall provide and submit to the Engineer full and as far as possible detailed plans and other data in support of any claim that the building has sufficient resistance to seismic forces to comply with the requirements of this Bylaw or that the resistance will not be reduced below that existing at that time.

- 3.17.4 The Engineer shall issue the required permit if he is satisfied, after checking the plans and other data submitted with the application and such other plans and data previously lodged in connection with such building, that the proposal meets the requirements of this Bylaw.
- 3.17.5 Where in the opinion of the Engineer the plans and other data submitted fail to establish that the proposal will comply with the requirements of this Bylaw he may refuse the application or he may under Clause 3.17.1 approve the proposal subject to such conditions as he thinks fit to impose.

3.18 DEMOLITION

- 3.18.1 No person shall demolish or remove any building or any substantial part of a building unless he has first:
- (i) Given seven days written notice to the Engineer of his intention. This notice shall be accompanied by a proposed programme of work which states the method of disposal for the demolition material and the route of travel of Contractor's vehicles and the matters detailed in that Bylaw that have been allowed for.
 - (ii) Given written notice to the Electric Power Supply Authority if such building is connected up to the Authority's supply system.
 - (iii) Employed a licensed plumber to cut off the water as required by the Engineer.
 - (iv) Arranged with the Engineer for the removal and replacement of any parking meter adjacent to the site which could be damaged.
 - (v) Employed a licensed drainlayer to cut off or seal any drains on the site as required by the Engineer.
 - (vi) Erected any scaffolding, gantry, hoarding, or barricade as may be required by the Engineer for the protection of persons using any road, public place or private way and arranged for the area affected to be adequately lighted.
 - (vii) Deposited such sum as the Engineer may require to cover the cost for repairing any damage to the road or footway during demolition and the removal of materials from the site.
- 3.18.2 Every person carrying out the demolition or removal of any building or part of a building shall comply with the following requirements unless otherwise approved:
- (i) He shall demolish or remove one storey only at a time.

- (ii) Given written notice to the Electric Power Supply Authority if such building is connected up to the Authority's supply system.
 - (iii) Employed a licensed plumber to cut off the water as required by the Engineer.
 - (iv) Arrange with the Engineer for the removal and replacement of any parking meter adjacent to the site which could be damaged.
 - (v) Employed a licensed drainlayer to cut off or seal any drains on the site as required by the Engineer.
 - (vi) Erected any scaffolding, gantry, hoarding, or barricade as may be required by the Engineer for the protection of persons using any road, public place or private way and arranged for the area affected to be adequately lighted.
 - (vii) Deposited such sum as the Engineer may require to cover the cost for repairing any damage to the road or footway during demolition and the removal of materials from the site.
- 3.18.3 Every person carrying out the demolition or removal of any building or part of a building shall also comply with any further requirements made by the Engineer in connection with the safety and convenience of the public during the process of the work.

3.19 ACCESS FOR THE PHYSICALLY HANDICAPPED

- 3.19.1 The following buildings shall be so designed and constructed as to be accessible to, and usable by the physically handicapped:
- (i) Passenger transport terminals, and
 - (ii) Public lavatories.
- 3.19.2 For a building other than those listed in Clause 3.19.1, consideration shall be given to the need for making the building accessible to, and usable by the physically handicapped.
- 3.19.3 Buildings complying with NZS 4121* shall be accepted as being accessible to, and usable by the physically handicapped.

Note - Section 25 of the Disabled Persons Community Welfare Act 1975 contains requirements for reasonable and adequate provision to be made for disabled persons in buildings or premises to which the public are to be admitted. That Act provides that any provision that is made in accordance with Part I of NZS 4121 shall for the purposes of Subsection (1) of Section 25 be deemed to be a reasonable and adequate provision. The requirements of that Act prevail over the requirements of this Bylaw.

3.20 ENTRANCES OF BUILDINGS CONTIGUOUS TO FOOTPATH

Where access is required between entrances of buildings and roads contiguous thereto such entrances shall be so constructed as to conform with the level of such roads and with safety requirements at the common boundary line, to the satisfaction of the Engineer.

3.21 ROOF STORAGE

3.21.1 No portion of a roof heretofore or hereafter erected shall be used for storage purposes in such manner as, in the opinion of the Engineer, causes overloading or insecurity with risk of danger to persons or damage to property in the vicinity thereof.

3.22 RECYCLED MATERIALS

3.22.1 No person erecting a building shall use any recycled material unless such material has been approved and unless such material has been thoroughly cleaned and all adhering matter of a deleterious nature removed.

3.23 CELLARS

3.23.1 The construction of any cellar is subject to compliance with the requirements of Section 354 of the Local Government Act 1974*.

3.24 SOLID FUEL HEATING APPLIANCES

The installation of any appliance and flue must be in accordance with NZS 7421* and must also comply with the requirements of the Dangerous Goods Regulations. In certain circumstances the installation will be required to be licenced to comply with the Dangerous Goods Regulations.

3.25 RELOCATION OF BUILDINGS

Buildings may only be relocated with the special consent of the Council and subject to the conditions that:

- (i) The building to be relocated is structurally sound.
- (ii) Borer and termite decay is suitably treated.
- (iii) The age of the building is appropriate to the area in which the building is to be relocated.
- (iv) The required building inspection fee is paid prior to any inspection being made.
- (v) A separate building permit is uplifted to allow the building to be re-erected. Because there is no guarantee that the building complies fully with the bylaws this permit will be the subject of a dispensation from bylaw requirements as allowed by Clause 18 of Bylaw 101 and may be subject to such conditions as the Council deems fit to impose.

3.26 RETAINING WALLS

- 3.26.1 All retaining walls must be designed for the loads specified in NZS 4203.
- 3.26.2 Where a retaining wall supports fill material the height of the wall and any supported buildings shall be such that the requirements of the District Scheme are complied with notwithstanding the fact that the structural design complies with the requirements of NZS 4203.
- 3.26.3 The construction of any retaining wall with a height in excess of 1.2m shall be supervised by a suitably qualified designer who shall certify upon the completion of the wall that the works have been completed in accordance with his design.

3.27 AERIALS AND MASTS

- 3.27.1 All aerials and masts must be designed to withstand the maximum wind gust specified in NZS 4203 for the area.

3.28 CORNER SET-BACK

Where a building is to be erected on a right angled street corner site such site shall be cut-back or rounded-off as herein provided, and thereafter no building for the first 3.0m above ground level shall at any point project into the corner area so cut-back or rounded off. Cut-back shall be to a line joining two points each 3.5m back along each street corner frontage and measured from the point of their intersection.

Round-off shall be to a line made by the arc of a circle having a radius of 5.5m and a centre fixed by radii distances of 5.5m measure perpendicular to the street frontage.

Where the corner is not right angled the cut-back or round-off with height limitation as aforesaid shall be to such line as the Council by Resolution determines is necessary for traffic purposes.

PART 4RESIDENTIAL BUILDINGS4.1 OBJECTIVE AND APPLICATION4.2 MINIMUM CRITERIA FOR HOUSEHOLD UNITS

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PART 4 RESIDENTIAL BUILDINGS

4.1 OBJECTIVE AND APPLICATION

The objective of this part of the Bylaw is to define the minimum requirements for the protection of life, health, property safety and welfare of the general public and occupants of residential buildings.

The provisions of this part of the Bylaw shall apply to all buildings or portions thereof used, or designed or intended to be used for human habitation.

4.2 MINIMUM CRITERIA FOR HOUSEHOLD UNITS

4.2.1 General Requirements

Based on the number of persons it is designed to accommodate, every household unit hereafter erected shall be provided with not less than the accommodation or facilities for the purpose set out hereunder:

- (i) A sitting room
 A dining room
 A kitchen
 A bedroom
 Or such arrangement of these rooms and functions as are provided for in Clause 4.2.2 and Table 1 and also of a size in accordance therewith.
- (ii) A bathroom
 A water closet in an approved position
 A wash-hand basin in an approved position
- (iii) Provision for washing clothes.
- (iv) Approved heating
- (v) Storage accommodation
- (vi) An adequate supply of wholesome water
- (vii) Thermal Insulation
- (viii) Acoustic Insulation
- (ix) Fire Protection
- (x) Structural integrity and weather resistance
- (xi) In addition to or in furtherance of the requirements of (i) to (ix) above, the requirements of the Drainage and Plumbing Regulations 1978 shall apply in all respects where applicable.

4.2.2 Permitted Minimum Combinations of Rooms in a Household Unit

4.2.2.1 Permitted Combinations:

- (a) Sitting room, dining room only, kitchen, bedroom.
- (b) Sitting room, dining-kitchen, bedroom.
- (c) Sitting room, dining recess off sitting room, kitchen, bedroom.
- (d) Living room, kitchen, bedroom.
- (e) Bed-sitting room, dining room only, kitchen.
- (f) Bed-sitting room, dining-kitchen.
- (g) Kitchen, living-room-bedroom.
- (h) Bedroom, living-room-kitchen (permitted subject to the approval of the Engineer as to adequate ventilation).

4.2.2.2 Provided, however, that every room used, intended to be used or which, in the opinion of the Engineer could be used as a habitable room, unless required by Table 1, shall have:

- (i) a minimum area of 6m^2 ; and
- (ii) a minimum width of 1.800m.

Table 1

MINIMUM FLOOR AREA AND DIMENSIONS IN A HOUSEHOLD UNIT*

	Occupants (Based on Bedroom Accommodation)			Minimum Width m
	1	2	+1++	
	m^2	m^2	m^2	
Sitting Room	10	12	1	2.7
Living Room	12	13	1	2.7
Bed-sitting room	12	16	NP	2.7
Dining recess off sitting room+	2	2.5	0.5	1.5
Dining room only	4.5	5.5	1	1.8
Dining-kitchen	6.5	7.5	1	1.5
Kitchen<	2	2	-	0.9
Bedroom single	6	-	-	1.8
Bedroom multiple	-	10	5	2.1
Living-room-bedroom	14	19	NP	2.7
Living-room-kitchen	16	18	2.5	2.7

Note: Minimum width - Measured horizontally between walls, fixed parts of fittings, fixtures or other projections.

- * Unless otherwise provided for in this Bylaw such as in the case of apartments and accommodation dwellings or in temporary or holiday accommodation where approved by the Engineer.
- ++ Area to be added to that in the preceding column for each occupant in excess of two, except where marked NP, which indicates that such a combination of living space is not permitted in a household unit designed to accommodate more than two persons.
- + The depth of the dining recess shall not exceed its width unless it is provided with an independent window as for a habitable room.
- < Clear floor space area provided that the overall floor area of the room including fittings is not less than $4m^2$ provided always that in the case of motels the Engineer may in any particular case waive the requirements for the provision of kitchen and laundry facilities where such facilities are available on a communal basis to the satisfaction of the Engineer.

4.2.3 Kitchen

4.2.3.1 There shall be provided in the kitchen:

- (i) A sink provided with an approved draining board.
- (ii) Adequate means of cooking food both by boiling and baking.
- (iii) Adequate space for the storage of food so placed, fitted and ventilated as to protect the food from flies, dust and other contamination and from the direct rays of the sun. Alternatively a refrigerator may be provided.

4.2.3.2 No household unit shall contain more than one kitchen provided that the Engineer may permit additional kitchen facilities to be installed elsewhere if he is satisfied that special circumstances exist to justify such action.

4.2.3.3 No sink and no cooking appliance shall be installed in any residential building elsewhere than in a kitchen complying with the provisions of this Clause provided that:

- (i) An approved combined cooking and heating appliance may be installed in a ventilated recess in a room intended to be used as a dining room.
- (ii) The Engineer may permit a sink or similar fitting to be installed elsewhere when he is satisfied that such fitting is intended for and will be used for a purpose that will not be contrary to the true intent and meaning of this chapter of this Bylaw.

4.2.4 Bedroom

- 4.2.4.1 Any room which is used as a bedroom, bedsitting room or living room bedroom shall not be used as a kitchen or to house any cooking appliance or for the storage of foodstuffs.
- 4.2.4.2 The floor space occupied by a built-in wardrobe shall not be included in the area of a bedroom, bedsitting room or living room bedroom but the minimum floor area specified in Table 1 may be reduced by 0.3m^2 where a bedroom, bed sitting room or living room bedroom is provided with such a wardrobe.

4.2.5 Bathroom

The bathroom shall contain an approved slipper or shower bath. A water closet, wash-hand basin and laundry facilities may be installed in the bathroom, but in cases where they are required by any act, regulation, or bylaw to be separately located such fittings shall not count in the required number: Provided that any electrical laundry facilities shall comply with the New Zealand Electrical Wiring Regulations 1976.

4.2.6 Water Closet

Every dwelling unit shall be provided with at least one water closet pan. Where a water-borne sewerage system is not available an approved privy shall be provided to the satisfaction of the Engineer.

4.2.7 Laundry Accommodation

- 4.2.7.1 In every household unit a separate laundry with approved laundry facilities shall be provided. The laundry facilities - excepting a washing copper - may be installed in the bathroom or in any screened and separately ventilated position approved in any particular case by the Engineer; the space for such facilities shall not be less than 1.4m^2 and shall not be included in the minimum floor area as specified in Table 1 for any other room in the household unit.
- 4.2.7.2 The area designated as a laundry shall, in the opinion of the Engineer, be capable of being used both for the accommodation of laundry facilities and for the washing of clothes.
- 4.2.7.3 In the case of motels the Engineer may in any particular case waive the requirements for the provision of laundry facilities where such facilities are available on a communal basis to the satisfaction of the Engineer.

4.2.8 Heating

4.2.8.1 Every household unit shall be provided with an approved means of heating. This means of heating shall be situated in, or effectively heat, either the sitting room, bed-sitting room, living room or living room combination referred to in Table 1. An approved appliance is any appliance authorised for use by an Order in Council made under the provisions of the Clean Air Act 1972, Section 12 currently in force in the City. The requirements of this part of this Bylaw shall be deemed to be complied with where the means of heating is manufactured and installed in accordance with the specifications contained in the Appendices to this Bylaw. Such Appendices shall not form part of this Bylaw and may be added to or amended from time to time by the Engineer.

4.2.9 Storage Accommodation

Suitable storage accommodation for coats, linen, brooms etc., shall be provided within the household unit without encroaching on the minimum areas required for other purposes under table 1. Unless otherwise approved it shall have a height of at least 1.950m and a minimum floor area of 1m^2 provided that where a separate laundry of a minimum area of 3.25m^2 is included, within the household unit the above requirements for 1.0m^2 of storage space may be omitted.

4.2.10 Water Supply

4.2.10.1 The water supply shall be piped to all sanitary fittings in accordance with the requirements of good trade practice.

4.2.10.2 Adequate means of heating water shall be provided to the satisfaction of the Engineer and shall be piped to the bath and sink and to a convenient position for use with the means provided for the washing of clothes.

4.2.10.3 Where it is necessary to make provision for rainwater storage such storage shall be of sufficient capacity to ensure a 30-day supply of not less than 90 litres per person per day provided that the daily allowance may be reduced to 60 litres per person when no water closet is installed, but in no case shall the storage capacity be less than 4500 litres unless with the written approval of the Engineer.

4.2.11 Thermal Insulation

Every residential building shall have thermal insulation properties approved as adequate to prevent an excessive requirement for space heating that utilizes energy from a public electricity supply, from any fuel, or from any other depletable energy source.

A residential building that complies with the requirements of NZS 4218P in accordance with NZS 4214 shall be approved as complying with the requirements of this Clause.

4.2.12 Acoustic Insulation

Where acoustic insulation is provided in a residential building it shall be installed in accordance with an acceptable specification.

4.2.13 Fire Protection

Every residential building shall be so designed and constructed that the intent of Part 5 of this Bylaw is complied with.

4.2.14 Structural Integrity and Weather Resistance

Every residential building shall be so designed and constructed that it will be capable of resisting any loads likely to be applied to the structure during its life without being subject to unacceptable deformations. All external features shall be detailed and constructed to prevent the ingress of moisture.

4.2.15 Service and Maintenance Access and Stairways

4.2.15.1 Every residential building shall be provided with access to ceiling and under floor spaces which will allow all services to be maintained. The doors and stairs into and within all units shall be of such dimensions as to allow the movement of domestic chattels within the unit.

4.2.15.2 Treads and risers shall be so proportioned that the product of width of the tread exclusive of the nosing, and the height of riser, both in millimetres shall not be less than 39000 nor more than 52000.

4.2.15.3 Treads and risers between any two floors shall be of uniform width and height respectively. The going horizontally between risers shall not be less than 230mm but not read including nosing shall be less than 250mm wide and risers shall not exceed 200mm in height.

4.2.15.4 No flight of stairs shall rise more than 3.6m between floors or landings and at least one handrail must be continuous between landings.

4.2.15.5 The least dimension of a landings shall be not less than the width of the stair in which it occurs.

4.2.15.6 The radius of a circular stair shall be such that the tread and riser requirements shall comply when measured 300mm in from the centre of the outside handrail.

- 4.2.15.7 All stairways shall be so constructed that there is always a clear distance of 2.0m measured vertically between a line through the nose of the treads and a line parallel thereto.
- 4.2.15.8 Every flight and landing of a stair shall unless protected by an enclosing wall, be protected by guards of a height not less than 900mm, measured vertically from the middle of the tread or from the landing, and so constructed that no opening therein exceeds 0.1m² in area except where at no point its least dimension exceeds 150mm.
- 4.2.15.9 Elevated areas to which access is provided for other than cleaning, repair, erection and demolition work shall, where such area is greater than 2.000m in height above an approved adjacent surface, be provided with approved barriers. Such barriers shall be at least 900mm in height² and shall have no opening therein exceeding 0.1m² except where at no point its least dimension exceeds 150mm.

4.3 HEIGHT, LIGHT AND VENTILATION REQUIREMENTS

4.3.1 Stud Height (habitable rooms)

In every residential building or part thereof hereafter erected, every room used, intended to be used, or which, in the opinion of the Engineer, can be used as a habitable room or kitchen shall measure from the finished floor to the finished ceiling in all parts not less than 2.400m.

Provided that the Engineer may approve of a reduction in the height of a portion of any room under the following conditions:

- (i) Where ceiling joists are omitted and the sloping ceiling of a room is formed by fixing the lining directly to the rafters or where any room is constructed above the main floor rooms, in an attic or roof, such measurement shall not be less than 2.400m over at least half the area of the room, nor shall the average height of the room above floor level be less than 2.100m. No portion of a room under 1.800m in height shall be counted when measuring the floor area of such room.
- (ii) Where an alcove or recess off a room is not included in the required area of such room and does not exceed 20 percent of its area the height may be reduced to not less than 2.100m.
- (iii) In a room with a level ceiling exposed joists or beams spaced at least 1.20m apart may project below the required stud height of 2.400m.

4.3.2 Stud Height (Service Room)

In every residential building every room used or intended to be used as a bathroom toilet, or laundry shall measure from finished floor to finished ceiling in all parts not less than 2.100m. Provided however, that, where there is a sloping ceiling, the Engineer may approve of an average height of 2.100m provided that no portion is less than 1.950m.

4.3.3 Minimum Lighting Requirements

4.3.3.1 Every habitable room or service room shall be provided with a source of illuminations sufficient to ensure that a standard service illuminance of 150 lux is available in the centre of that room.

4.3.3.2 For the purposes of this Bylaw glazing which has an area of one tenth of the floor area of the room and which faces onto an approved open space in such a way as to allow light to enter the room shall be deemed to meet the requirements of Clause 4.3.3.1

4.3.3.3 In circumstances where natural light cannot be provided artificial lighting shall be deemed to comply if it is capable of providing the required lighting intensity.

4.3.4 Minimum Ventilation Requirements

4.3.4.1 Every habitable room or service room shall be provided with a ventilation system capable of changing the air within the room at least ten times per hour.

4.3.4.2 The requirements of Clause 4.3.4.1 shall be deemed to have been complied with where windows, with an area of at least one twentieth of the floor area of the room, open to an approved open space. Glazed doors may be considered as required ventilation only in circumstances where, in the opinion of the Engineer, the open door does not deny security to the occupants of the room.

4.3.5 Approved Open Space

4.3.5.1 For the purposes of this Bylaw an approved open space shall be a space with a minimum dimension of 1.5m measured from the wall of the associated building and connected to another approved open space.

- 4.3.5.2 Part of an approved open space shall not serve:
- (a) Two household units or
 - (b) Any existing household unit and any new household unit.
- 4.3.5.3 Every approved open space shall be unobstructed to the sky from a level not less than 400mm below the bottom of the sash of any window in that room facing directly on to that open space.
- Provided that:
- (i) Eaves or similar building elements may project no more than 600mm into an approved open space or one quarter of the width of that open space.
 - (ii) Outer stairways, platforms, balconies, fire escapes, ventilating shafts, chimneys or similar projections may extend into any approved open space on one side only, to a maximum of 1.200m.
- 4.3.5.4 Where a ventilated open space does not comply fully with the requirements of Clause 4.3.5.1 and 4.3.5.3 a mechanical ventilation system shall be provided.
- 4.3.5.5 Where the requirements of 4.3.4.1 are met by a mechanical ventilation system provisions must be made to allow for an adequate supply of air to habitable rooms in the event of the failure of the mechanical equipment.

4.4 SITE REQUIREMENTS FOR RESIDENTIAL DEVELOPMENT

4.4.1 Site Investigation

- 4.4.1.1 The foundation provisions of this Bylaw shall apply only for building sites such that:
- (a) The safe bearing pressure of the soil supporting the foundations shall be not less than 100 kPa;
 - (b) The general topography of the site when compared with the surrounding area shall show no indications of slope instability.
- 4.4.1.2 The safe bearing pressure of the soil supporting the foundations shall be established by an approved subsoil investigation or alternatively it may be assumed to be not less than 100kPa if at the time when the excavation for the foundation has been completed:

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- (a) Adjacent established buildings of a similar type supported on foundations similar to those required by this Bylaw show no signs of unsatisfactory behaviour attributable to soil conditions;
- (b) Reasonable enquiry shows no evidence of buried services and none are revealed by excavation for foundations;
- (c) Reasonable enquiry shows no indication or records of land slips having occurred in the immediate locality;
- (d) Reasonable enquiry shows no evidence of each fill on the building site and no fill material is revealed by excavation for foundations; Provided that this shall not apply where a certificate of suitability of earth fill for residential development has been issued in terms of NZS 4431 in respect of the building site and any special limitations noted on that certificate are complied with;
- (e) Excavation for foundations does not reveal buried organic topsoil, soft peat, or soft clay.

4.4.2 Bearing Requirements

4.4.3.1 All foundations shall bear upon solid bottom in undisturbed material or upon firm fill where a certificate of suitability has been issued in terms of NZS 4431*.

4.4.3.2 The minimum depths of foundations below the cleared ground level shall be:

- (a) 150mm in firm rock.
- (b) 450mm in expansive clay.
- (c) 300mm in other materials, subject to any special limitations noted on a certificate of suitability issued in terms of NZS 4431* in respect of the building site.

4.4.3 Site Preparation

4.4.3.1 Before a building is erected on any site all rubbish, noxious matter, and organic matter shall be removed from the area to be covered by the building.

In suspended floor construction, firm turf and close-cut grass may remain provided that for the purposes of complying with Clause 4.4.2 cleared ground level shall be taken as the underside of organic matter.

4.4.3.2 Any subsoil drains severed during the excavation process shall be reinstated or diverted and the building area shall be permanently drained to ensure freedom from surface water in the subfloor space.

4.4.4 Prevention of Dampness

4.4.4.1 In respect to every portion of a residential building intended for human habitation here after erected, the following requirements to prevent dampness shall be taken in addition to any other requirements in this or any other bylaw, act, or regulation:

(i) The ground adjacent to any wall shall finish not less than 400mm below floor level for a space of at least 500mm in width measured horizontally at right angles to the wall and such space shall be maintained and be accessible at all times: Provided that-

(a) In the case of a concrete floor, the ground level may be not less than 150mm below floor level.

(b) This requirement shall not apply in the case of a masonry or concrete wall adequately protected by means of a vertical damp course to the satisfaction of the Engineer.

(ii) The finished surface of the ground adjoining or under any such building shall be at levels that will prevent any accumulation of surface water under or adjoining the building.

(iii) On any site where seepage is likely to cause dampness under a building, field drains or other approved means of drainage shall be provided to the satisfaction of the Engineer.

4.4.5 Concrete Floors on the Ground

4.4.5.1 Where in a residential building a concrete or solid floor is laid on the ground, it shall have an approved vapour and moisture proof damp course or barrier incorporated in the construction, provided that the requirements of this Clause shall not apply to any part of a building not intended for human habitation.

4.5 STRUCTURAL REQUIREMENTS

4.5.1 Foundations

4.5.1.1 The foundation and subfloor framing system (except as provided for slab-on-ground concrete floors) shall consist of a system to resist vertical loads, combined with a system to resist horizontal loads.

4.5.1.2 To prevent dampness, not less than 3500mm² of ventilation openings per lm² of floor area shall be uniformly distributed around the entire perimeter of the external walls. Such openings shall be as near as possible to, but shall be below the level of, the plates or bearers directly supporting the ground floor joists.

4.5.2 Floor Systems

4.5.2.1 Any floor system provided shall have horizontal top surfaces capable of supporting appropriate chattels and furniture.

4.5.3 Wall Systems

4.5.3.1 The wall system of each storey shall consist of a system to resist vertical loads combined with a system to resist horizontal loads and any other walls (such as non-loadbearing) walls.

4.5.4 Exterior Wall Claddings

4.5.4.1 Exterior wall covering systems (including sheathing, cladding, building paper, and any other component parts of the covering system) shall provide a suitable surface for the support, application, and attachment of subsequent decorative and weather-resistant finishes if they do not themselves possess such qualities, and have acceptable strength and durability.

4.5.5 Wall Linings

4.5.5.1 All rooms shall have interior wall linings which shall:

- (a) Be supported by framing members;
- (b) Withstand the impacts of normal use;
- (c) Prevent the ingress of dust;
- (d) Provide a suitable surface for the support, application, and attachment of subsequent decorative and wear-resistant finishes if they do not themselves possess such qualities;

(e) Be of acceptable strength and durability.

4.5.5.2 The exposed surfaces of linings in any position where surface water splashing or condensation will normally occur shall be impermeable, or shall be capable of being finished in situ so as to be impermeable, to water.

4.5.6 Windows

4.5.6.1 Windows shall be constructed in compliance with the relevant requirements of NZS 4211 and NZS 3619 or NZS 3504.

4.5.7 Roof Systems

4.5.7.1 The roof system shall consist of a system to resist vertical loads combined with a system to resist horizontal loads.

4.5.8 Roof Coverings

4.5.8.1 Exterior roof covering systems (including sheathing, sarking, cladding, roof underlay, and any other component parts of the system together with all flashings, overflashings soakers used in conjunction with the gutters, sumps, heads and downpipes necessary for the controlled disposal of water from the roof) shall:

(a) Comply with a recognised material standard relating to weather and corrosion resistance, condensation and differential movement.

(b) Be of acceptable strength and durability.

(c) Be resistant to wear and abrasion in any situation where it is likely to be subject to pedestrian traffic.

4.5.9 Ceiling Linings

4.5.9.1 All rooms shall have ceiling linings which shall:

(a) Be supported by framing members;

(b) Prevent the ingress of dust;

(c) Provide a suitable surface for the support, application and attachment of subsequent decorative finishes if necessary;

(d) Be of acceptable strength and durability.

4.5.9.2 The exposed surfaces of linings in any position where surface water splashing or condensation will normally occur shall be impermeable, or shall be capable of being finished in situ so as to be impermeable, to water.

4.6 CRITERIA FOR APARTMENT BUILDINGS AND ACCOMMODATION BUILDINGS

4.6.1 Apartment Buildings

Every household unit in an apartment building hereafter erected shall comply with the accommodation and facility requirements of Clause 4.2 hereof:

Provided that the variations or modifications set out hereunder may be approved by the Engineer.

- (i) A separate kitchen may be omitted from any household unit where:
 - (a) An approved kitchen adequately equipped with all necessary fittings and accessories and a dining room capable of serving at the same time at least 70 percent of the number of residents which the apartment building is designed to accommodate are provided in the building and provision is made for the supply of meals to the extent required by the occupants; or
 - (b) An approved kitchen shared by two units is provided adequately equipped to provide separate cooking facilities and storage space for food and utensils for each household unit; or
 - (c) Each unit is designed to accommodate not more than two persons and an approved common kitchen is provided on each storey adequately equipped to provide separate cooking facilities for each household unit and common dining facilities are also provided in a handy position capable of seating at least 70 per cent of the persons for whom accommodation is provided in the household units to be served thereby.
- (ii) A bathroom, water closet and wash-hand basin as required by Clause 4.2.1 hereof may be omitted from each unit where-
 - (a) A bathroom containing a bath and wash-hand basin and a separate water-closet compartment is provided for common use by two household units where neither unit is designed to house more than two persons.
 - (b) Such facilities are provided in an approved position for common use on each storey in the proportion of one slipper or shower bath and one wash-hand basin in separate compartments to every six persons or portion thereof and one water-closet compartment for every four persons or portion thereof for whom accommodation is provided on such storey: Provided that -

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- (1) Where any storey is intended for occupation by both sexes, each sex shall be provided separately when more than one bath, water closet or wash-hand basin is required and in the same proportion as provided for above or as required by the Engineer.
- (2) Where any storey of an apartment building is intended to accommodate more than four males and urinals are provided, the Engineer may allow a reduction in the number of water closets provided.
- (iii) Every apartment building hereafter erected shall be provided with approved accommodation for a permanent resident caretaker, including the necessary storage space and facilities for the upkeep of the premises.
- (iv) Laundry accommodation as required by Clause 4.2.7 hereof may be omitted from each unit where a communal laundry with adequate mechanical appliances is provided to the satisfaction of the Engineer.

4.6.2 Accommodation Buildings

Every accommodation building hereafter erected shall be provided with the accommodation detailed in Clause 4.2 hereof. Conveniences shall be distributed throughout the building in an approved manner and shall be located in separate compartments on a scale and in accordance with the number of occupants as set out in Table 2:

Provided that -

- (i) Where the occupancy of any storey is in excess of 10 and is not confined to members of one sex, each sex shall be catered for separately on the scale set out in table 2 and in equal proportions unless otherwise approved by the Engineer.
- (ii) Where it is intended that males only shall occupy any storey -
 - (a) The proportion of wash-hand basins shall be increased by one for every seven occupants or part thereof unless approved provision is made for shaving space in such a position that it is not likely to obstruct the free use of wash-hand basins.
 - (b) Where urinal stalls are provided the Engineer may allow a reduction in the number of water-closets required.
- (iii) The provisions of this Clause shall not prevent the installation of any additional water closet or wash-hand basin in a bathroom or of a wash-hand basin in a water-closet compartment.

- (iv) Fittings provided for the exclusive use of rooms or suites shall not be counted in the required number and the room or suites so served shall also be excluded.

Table 2

DISTRIBUTION OF CONVENIENCES

Occupants not exceeding	Number of water closets	Occupants not exceeding	Number of Baths*	Occupants not exceeding	Number of wash-hand basins
6	1	10	1	6	1
14	2	20	2	14	2
24	3	30	3	24	3
36	4	40	4	36	4
48	5	50	5	48	5
60	6	60	6	60	6

and one for each additional 10 persons or fraction of 10 thereof

* At least one bath shall be a slipper bath.

4.6.3 General Requirements

4.6.3.1 Artificial Lighting

In every apartment building and accommodation dwelling hereafter erected there shall be installed to the satisfaction of the Engineer, means for the adequate lighting of all areas as used in common by the occupants. Such lighting shall be independent of any household unit (other than that of the owner, custodian, or other person in charge) and shall be freely and continuously available night or day to any or all of the occupants.

4.6.3.2 Refuse Disposal

- (i) In every apartment building and accommodation dwelling hereafter erected provision shall be made for the storage and reception of refuse from each storey.
- (ii) The design and construction of storage and reception areas shall be to the satisfaction of the Engineer and particular attention shall be paid to access, ventilation and the use of non-corrodible and fire-resistant materials.

4.6.3.3 Completion of Building

Every apartment building and accommodation dwelling shall be completed to comply with Part 5 of this Bylaw in regard to fire protection and means of egress and shall be provided with all necessary fittings and equipment, other than furnishings, to enable it to comply with the requirements of any bylaw of the Council or any act or regulation controlling the erection and licensing of such premises.

PART 5 DESIGN FOR FIRE SAFETY

5.1 FIRE SAFETY OBJECTIVES

5.1.1 Basic Objectives of this Bylaw

5.2 PERFORMANCE CRITERIA FOR FIRE SAFETY

5.2.1 Life Safety

5.2.2 Prevention of conflagrations

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PART 5DESIGN FOR FIRE SAFETY5.1 FIRE SAFETY OBJECTIVES

5.1.1 Basic Objectives of this Bylaw

Every building shall have adequate provisions in its design and construction such that, in the event of fire in that building:

- (a) all occupants are enabled to escape safely once they are aware of fire; and
- (b) the fire is contained within the confines of that building and, with the aid of available fire-fighting services, prevented from spreading to any adjoining or adjacent building; and
- (c) the basic structural fabric of that building is protected against fire, in relation to its size and height and the expected maximum severity of a fire, in a manner that will enable any available fire-fighting services to limit the degree of damage as far as is possible in each circumstance.

5.2 PERFORMANCE CRITERIA FOR FIRE SAFETY

5.2.1 Life Safety

5.2.1.1 Every occupant of every building shall be provided with safe and adequate means of escape from wherever that occupant is, at the time of a fire in that building, to a place of absolute safety from that fire; and

- (a) the position, capacity, length, and degree of protection of that means of escape shall be such as will enable occupants to reach it and use it with confidence, before being endangered by fire, relative to the ability of each occupant to:
 - (i) respond to awareness of fire danger; and
 - (ii) be able to move swiftly enough to escape from fire danger; and
 - (iii) be not constrained, while escaping from fire danger, by other occupants; but
- (b) in any private dwelling unit, the means of escape shall be deemed adequate if, regardless of its length, or its position, or capacity, or the degree of protection it provides, there is at least one point of access from the dwelling unit, to a place of absolute safety from fire.

(c) The requirements of sub-clause (a) will be deemed to be complied with if it can be established to the satisfaction of the Engineer that a person moving at the rate of 20 metres/minute can reach a place of absolute safety within 2 minutes of becoming aware of fire danger.

5.2.1.2 Fire fighting equipment complying with the requirements of NZS 4503:1974 Hand Operated Fire Fighting Equipment shall be provided in:

- (i) All buildings or parts of buildings for which a Fire Safety Certificate as defined in the Local Government Act 1974, is required.
- (ii) Places of Assembly.
- (iii) Apartment Buildings.
- (iv) Accommodation (Buildings).
- (v) Multi-Unit Dwellings of more than two storeys.

5.2.1.3 Fire Alarms complying with the requirements of NZS 4561:1973 Manual Fire Alarm Systems for use in buildings shall be provided in:

- (i) All buildings or parts of buildings for which a Fire Safety Certificate as defined in the Local Government Act 1974, is required if such buildings are occupied by more than 30 people on the ground floor or by more than 10 people on any upper floor.
- (ii) Accommodation Buildings.

5.2.2 Prevention of Conflagrations

Every building shall be so designed and constructed and positioned that:

- (a) the radiation of heat, and the protrusion of flame, from any fire within it, shall be limited to the extent that it should not set fire to the fabric or to the contents of any adjoining or adjacent building; and
- (b) the available fire-fighting facilities, and any automatic fire-suppression system installed, are enabled to prevent the spread of fire to any adjoining or adjacent building; but

- (c) in any private dwelling unit, or commercial or industrial unit owned under cross-lease, company, or unit titles, or similar, where the land underlying the fire compartment containing the units is held under one common title, the requirements of (a) and (b) above shall be deemed adequate if any attached residential unit or commercial unit or industrial unit is protected against spread of fire into it by concrete or masonry construction able to resist fire for at least one and a half hours.
- (d) for the purposes of this part of the Bylaw a residential unit shall include an attached accessory building.

5.2.3 Limitation of Damage by Fire

Every building shall be so designed and constructed and limited in size and height, in relation to the fire-fighting services available, that in the event of fire in that building:

- (a) the collapse of the structure of that building, due to fire, shall not result in collapse of, or damage to the structure of any adjoining or adjacent building; and
- (b) the collapse of the structure of any private dwelling unit, due to fire, shall not result in the collapse of, or damage to, the structure of any adjoining or adjacent dwelling unit, and
- (c) the loss of contents shall be limited, as far as is practicable, to the contents of no more than two storeys, and preferably, if possible in relation to the fire-fighting services available, to the contents of one storey; and
- (d) the irreparable damage to the basic structure and fabric of the building shall be prevented, as far as is practicable, in any building over two storeys, and preferably, if possible in relation to the fire-fighting services available, strictly limited in extent in any two storey building.

5.2.4 Limitation of Size

Every building shall be so limited in extent and height, in relation to the expected maximum severity of fire within it, that:

- (a) within any definable territorial area within which adequate fire-fighting services are deemed by the Engineer to be available, its extent and height are such that those available fire-fighting services should be able, under normal circumstances, to be able to prevent spread of fire to any adjoining or adjacent building, and to limit the extent of damage by fire, in terms of the practicabilities and preferences set out in 5.2.2 and 5.2.3 above; but

- (b) any building outside any such definable area shall be deemed to satisfy the intents of 5.2.2 and 5.2.3 above if its extent is limited to one-half of that permissible within that definable area; but
- (c) when any building is provided with additional fire control measures which can be deemed by the Engineer to enable better control of fire by whatever fire-fighting services are available, then the maximum size and height may be increased in relation to the effectiveness of any type of additional fire control measure provided.

5.3 APPLICATION

5.3.1 Existing Buildings

In every existing building in which full compliance with the requirements of Clauses 5.2.1 to 5.2.4 does not exist then compliance with these requirements shall be provided in the order of priority with which they are set out below to every practical extent if, in the opinion of the Engineer:

- (a) there is a continuation of any use which presents a clear and present danger to any occupant; or
- (b) there is a continuation of any use which presents a clear and present danger to any adjoining or adjacent building or its occupants; or
- (c) there is a change in the nature of any use of any portion of the building which would clearly increase the fire hazards; or
- (d) there is any alteration or addition or renovation which would clearly increase the fire hazard.

5.3.2 Limitation with Respect to Contents and Natural Disasters

None of the requirements set out above in 5.2.1 to 5.3.1 inclusive, need be enforced, for the purposes of this Bylaw, in particular relation to:

- (a) any consideration of the monetary, or social, or personal value of the contents of the building; or
- (b) any consideration of the likely effects of any natural disaster, such as a severe earthquake, or severe wind storm, or bush fire; or
- (c) any fire hazard likely to result directly from the effects of such a natural disaster.

Commentary Note:

It is realised that severe earthquakes are likely to result in fires, but it must be realised that fire-fighting service access to any fire is likely to be prevented by disruption of streets, and that, even if access is obtained, fire-fighting water supplies are also likely to be disrupted. Also, many other fire-fighting facilities, such as lifts reserved for fire service use in multi-storey buildings, are likely to be rendered unsafe in an earthquake, and may take days to repair. Similarly, spread of fire due to a fire storm (such as can result from a scrub fire or a forest fire), or indeed from any source of fire beyond the practicable control of building bylaws, should be regarded as being outside the sensible economic limits of any of these requirements for fire safety in buildings, and should be reserved for control by other measures.

5.4 RESPONSIBILITIES AND OBLIGATIONS**5.4.1 Responsibility of Owner**

- 5.4.1.1 In every circumstance where a building is being newly erected, or is being added to, or altered, or extensively renovated, the owner shall obtain the approval of the Council before any work is commenced.
- 5.4.1.2 When the work is completed, but before any of the area in which work has been done is put to any use the Council shall be notified, in order to enable an authorised officer of the Council to ensure that the work will be adequate for fire safety in terms of the requirements of this Bylaw.
- 5.4.1.3 It shall be the responsibility of the owner, to stipulate in the application for approval the use or uses to which a building, or portion of a building is to be put, or is being put.
- 5.4.1.4 Every owner who intends to change the use of a building, or portion of a building, shall seek the approval of the Council before making such a change of use, in order to enable an authorised officer of the Council to assess whether the change of use will entail any change in the fire hazards in the building, and ensure that if the fire hazards would be altered, the fire safety requirements of the building are made adequate before the change of use is undertaken.

5.5 MEANS OF COMPLIANCE

5.5.1 Interpretation

In Clauses 5.5.1B and 5.5.1C of this Bylaw, unless the context otherwise requires:

'Gross Floor Area' means the superficial area on the plan of a floor of a building measured over its outside dimensions, including walls.

'Height' means that dimension measured from the highest point at which the fire service may enter a building, at street level, to the floor level of the highest storey which can be occupied.

5.5.1A Acceptable Standards

Subject to Clauses 5.5.1B and 5.5.1C, the Council shall be satisfied that the owner of the site on which any building or proposed building is or is to be located, is providing for the requirements of Part 5 of this Bylaw (as set out in 5.2, 5.3 and 5.4 above), if the owner is able to either:

- (a) Demonstrate to the satisfaction of the Engineer, that the building, or the design of the proposed building, complies with all the requirements set out in NZS 1900 Chapter 5:1984 "Fire Resisting Construction and Means of Egress"; or
- (b) Demonstrate to the satisfaction of the Engineer that the building, or the design of the proposed building, complies with the design criteria set out in a Fire Safety Design Code approved by the Engineer and which satisfies all the minimum requirements of this Bylaw.

5.5.1B Multi-Storey Buildings

Notwithstanding any other provisions of this Chapter of this Bylaw or NZS 1900 Chapter 5:1984:

- (a) Where any multi-storey building:
 - (i) does not exceed 13 metres in height; and
 - (ii) does not have a gross floor area greater than 400 square metres,one exitway only may be provided from each floor of the building.
- (b) Where any multi-storey building:
 - (i) does not exceed 13 metres in height; and
 - (ii) has a gross floor area greater than 400 square metres,

a minimum of two separate exitways shall be provided from each floor of the building.

(c) Where any multi-storey building:

- (i) exceeds 13 metres in height but does not exceed 25 metres in height; and
- (ii) does not contain an approved automatic sprinkler system throughout the building,

a minimum of two separate exitways shall be provided from each floor of the building.

(d) Where any multi-storey building:

- (i) exceeds 13 metres in height but does not exceed 25 metres in height; and
- (ii) contains an approved automatic sprinkler system throughout the building,

one exitway only may be provided from each floor of the building.

(e) Every multi-storey building exceeding 25 metres in height shall be provided with a minimum of two separate exitways from each floor of the building.

5.5.1C Automatic Sprinkler Systems

Notwithstanding any other provisions of this Chapter of this Bylaw or of Clause 5.90 of NZS 1900 Chapter 5:1984 an approved automatic sprinkler system shall be installed throughout every multi-storey building which exceeds 25 metres in height.

5.5.2 Fire Risk Areas

Fire risk areas are defined in relation to the areas zoned for various uses as described and detailed in the Christchurch District Planning Scheme.

Provided that where a development is proposed in the Outer B Fire Risk Area and the occupancy classification is or could be of an industrial or commercial nature then the development shall be considered to be constructed in the Outer A Fire Risk Area.

Central Fire Risk Area: The Central Fire Risk Area shall comprise all those areas included in the Commercial 4 Zone and the Commercial 5 Zone as defined in the Christchurch District Planning Scheme and amendments thereto and as amended from time to time.

Outer A Fire Risk Area: The Outer A Fire Risk Area shall comprise all those areas for Industrial and Commercial Use within the City of Christchurch so zoned and defined in the Christchurch District Planning Scheme, and approved amendments and specified departures, which are not included in the Central Fire Risk Area.

Outer B Fire Risk Area: The Outer B Fire Risk Area shall comprise all those areas of the district administered by the Christchurch City Council not included in either the Central Fire Risk Area or the Outer A Fire Risk Area.

5.5.3 Special Buildings

For buildings such as Hospitals, Old Peoples Homes, Licensed Premises and any other buildings for which recognised building codes exist the provisions of those codes shall be deemed to be a requirement of this Bylaw.

"Associated Documents"

NZS 1900 Chapter 5 1984. Fire Resisting Construction and Means of Egress

DZ 4226 Design For Fire Safety

THE CITY OF CHRISTCHURCH DISTRICT PLANNING SCHEME

NZS 4208:1973 Code of practice for the design of hospitals with respect to fire

NZS 4216:1983 Code of practice for design of meatworks complexes for fire safety

NZS 4510: 1978 Code of practice for riser mains for fire service use

NZS 4541P:1972 (FOC Rules, 29th Edition) Rules for automatic fire sprinkler installations

NZS 6742:1971 Code of practice for emergency lighting in buildings

NZS 4503 1974 Hand Operated Fire Fighting Equipment

AS 1530... Methods for fire tests on building materials and structures

Part 1-1976 Combustibility tests for materials

Part 2-1973 Test for flammability of materials

Part 3-1976 Test for early fire hazard properties of materials

Part 4-1975 Fire-resistance tests for structures

BS 476:--- Fire tests on building materials and structures -

Part 4:1970 Non-combustibility test for materials

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Part 8:1972 Test methods and criteria for
the fire resistance of
elements of building
construction

ISO 834-1975 Fire resistance tests - Elements of
building construction

NZS 7421:1972 Installation of solid fuel burning and oil
burning space heaters

PART 6TIMBER6.1 OBJECTIVE AND APPLICATION6.2 GENERAL CRITERIA

- 6.2.1 Design Loads
- 6.2.2 Design Method
- 6.2.3 Ventilation and Condensation Control
- 6.2.4 Design Certification
- 6.2.5 Supervision

6.3 MATERIALS AND WORKMANSHIP

- 6.3.1 Timber Based Products
- 6.3.2 Durability
- 6.3.3 Other Materials and Proprietary Products
- 6.3.4 Fastening and Fabrication
- 6.3.5 Workmanship

6.4 MEANS OF COMPLIANCE

- 6.4.1 Design
- 6.4.2 Materials and Workmanship
- 6.4.3 Light Timber Framed Buildings

PART 6 TIMBER

6.1 OBJECTIVE AND APPLICATION

6.1.1 Objective

This part of the Bylaw sets down the design and construction requirements for buildings or parts of buildings constructed of timber.

6.1.2 Application

Specific calculations to establish that a building or building element complies with the structural design requirements of this Bylaw shall not be required for timber buildings or elements that comply in all respects with a recognised code of practice for such buildings. Such a code of practice shall stipulate limitations to the scope of buildings to which it applies.

6.2 GENERAL CRITERIA

6.2.1 Design Loads

All timber buildings and timber elements within buildings shall be designed to withstand the loads specified in Part 11 of this Bylaw.

6.2.2 Design Method

Detailed structural design of buildings or elements of buildings shall be in accordance with methods that:

- (a) Admit of a rational analysis appropriate to the established properties and behaviour of all the constituent materials and elements, and
- (b) Are approved by the Engineer as being appropriate to achieve adequate strength, serviceability, and where necessary, ductility to sustain the various loading conditions required under Part 11.

6.2.3 Ventilation and Condensation Control

All building materials shall be so built into the structure that they are provided with adequate ventilation and due allowance is made for the control of condensation.

6.2.4 Design Certification

The designer of any timber building or any timber element shall provide calculations which establish that the timber building or timber element has been designed in accordance with the requirements of this Bylaw or alternatively certify in an approved manner that the design method conforms with the requirements of a recognised code of practice.

6.2.5 Supervision

The designer of any timber building shall supervise the construction of that building or arrange to have the work supervised by an agent appointed by him. Supervision in this context means general supervision only and includes such periodic supervision and inspection as may be necessary to ensure that the structural work is executed generally in accordance with the design as distinct from any special supervision that may be required for a particular situation.

6.3 MATERIALS AND WORKMANSHIP

6.3.1 Timber and Wood-Based Products

- 6.3.1.1 The species, grade, sizes and finish, preservative treatment, moisture content, types, methods of manufacture and other relevant characteristics as appropriate of timber and wood-based products shall be approved as suitable for their end use.
- 6.3.1.2 Subject to any specific provision in this Bylaw, timber and wood-based products specified in accordance with NZS 3602* shall be approved as suitable.
- 6.3.1.3 All timber and wood-based products shall be adequately protected against damage, and against unacceptable variations of moisture content, both before and after installation or enclosure as appropriate.
- 6.3.1.4 Framing timbers shall be separated from concrete or masonry by either:
- (a) A free-draining air space of not less than 12mm; or
 - (b) A bituminous damp-proof course or other suitable impervious material overlapping the timber by at least 6mm,
- provided that this Clause need not apply to timber treated to TPA C3 or for internal situations where the concrete or masonry is not subjected to moisture.
- 6.3.1.5 Subject to any specific provision in this Bylaw, timber and wood-based products protected in accordance with NZS 3602* shall be approved as adequately protected.

6.3.2 Durability

- 6.3.2.1 Any material other than timber or wood-based products shall have or shall be protected so as to have an acceptable resistance to corrosion, degradation, or other effects adverse to the durability of the material for its end use.
- 6.3.2.2 Mild Steel structural components including bolts, nuts and washers exposed to the weather or in any position where condensation or dampness will normally occur shall be hot-dip galvanized.
- 6.3.2.3 Structural components fabricated from hot-dip galvanized plain steel sheet may be outside the wall or ceiling lining or in the subfloor space but shall not be exposed to the weather or in any position where condensation or dampness will normally occur.

6.3.3 Other Materials and Proprietary Products

- 6.3.3.1 Materials, components and proprietary products not specifically covered by a document approved as a means of compliance with this Bylaw shall be used only subject to the following conditions. Either:
 - (a) They shall be shown to the satisfaction of the Engineer to have an established record of satisfactory performance over a considerable time; or
 - (b) They shall satisfy the following conditions;
 - (1) The manufacturer has specifically designated them for their intended use.
 - (2) The manufacturer has supplied to their users clearly presented and adequate technical information on their relevant properties, methods of installation, and the like, for their intended use.
 - (3) The manufacturer has provided, to the satisfaction of the Engineer, relevant test information and assessments of their performance in its intended use issued by an approved authority.

6.3.4 Fastening and Fabrication

6.3.4.1 General

- (a) All parts of the building shall be securely fastened so as to resist all forces likely to be encountered during construction or during the expected life of the building and so that the building as a whole acts as a structural entity.

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- (b) All timbers shall be set true to the required lines and levels with all mitres, butts, laps, housings, and the like, cut accurately to provide full and even contact over all bearing surfaces.
- (c) Fastenings and connections shall be as specified in the relevant clause of NZS 3604*, or shall be an alternative fixing of not less than the capacity specified in the relevant clause of that standard.

6.3.4.2 Adhesives

Adhesives for timber or wood-based products shall be a type recommended by a recognized standard and shall be appropriate to the location and use.

6.3.4.3 Nails

- (a) Nails in structural joints shall be fully driven.
- (b) Skew nails shall enter not less than 30mm nor more than 40mm from the joint contact surface and at an angle not less than 35 nor more than 45 to the surface into which they enter.
- (c) Where the nail size specified would cause significant splitting the nail holes shall be pre-drilled to a diameter of 80 percent of the nail diameter.
- (d) In exposed work and in flooring, nails shall be punched to a sufficient depth to allow a reasonable thickness of stopping material unless the drawings and specifications specifically state that stopping is not required.

6.3.4.4 Bolts and Screws

- (a) In bolted joints washers shall be provided at each timber surface under the bolt head or the nut.
- (b) Lead holes for screws shall be drilled so that the diameter of the lead hole for the shank does not exceed the diameter of the shank and the diameter of the lead hole for the thread does not exceed the core diameter of the screw.

6.3.5 Workmanship

"The materials and workmanship employed in the construction of buildings shall be in accordance with Standards approved by the Engineer. They shall be such as to ensure the fulfilment of the intentions of the designer and to provide durability and weatherproofing appropriate to the intended use of the building.

6.4 MEANS OF COMPLIANCE

6.4.1 Design

Timber buildings or timber elements designed in accordance with the requirements of NZS 3603 or a recognised equivalent standard shall be deemed to comply with the requirements of this Bylaw.

6.4.2 Materials and Workmanship

Timber elements erected in accordance with the requirements of NZS 3602 or a recognised equivalent standard shall be deemed to comply with the requirements of this Bylaw.

6.4.3 Minor Building Exemptions

Detached non habitable accessory buildings accessory to residential buildings less than 65m² in area need not comply with the design requirements of this Bylaw if they are erected in accordance with the requirements of a recognised code of practice.

"Associated Documents"

NZS 3602	Code of Practice for Specifying Timber and Wood-based Products for Use in Building
NZS 3603	Code of Practice for Timber Design
NZS 3604	Code of Practice for light timber framed buildings not requiring specific design
NZS 3615	Strength Properties and Design Methods for Construction Plywood

PART 7 MASONRY

7.1 OBJECTIVE AND APPLICATION

- 7.1.1 Objective
- 7.1.2 Application

7.2 GENERAL CRITERIA

- 7.2.1 Design loads
- 7.2.2 Design Method
- 7.2.3 Design Certification
- 7.2.4 Supervision

7.3 MATERIALS AND WORKMANSHIP

- 7.3.1 Design
- 7.3.2 Materials and Workmanship
- 7.3.3 Minor Building Exemptions

PART 7 MASONRY

7.1 OBJECTIVE AND APPLICATION

7.1.1 Objective

This part of the Bylaw sets down the design and construction requirements for buildings or parts of buildings constructed of masonry.

7.1.2 Application

Specific calculations to establish that a building complies with the structural design requirements for this Bylaw shall not be required for masonry buildings that comply in all respects with a recognised code of practice for such buildings. Such a code of practice shall stipulate limitations to the scope of buildings to which it applies.

7.2 GENERAL CRITERIA

7.2.1 Design Loads

All masonry elements shall be designed to resist the loads specified in Part 11 of this Bylaw.

7.2.2 Design Method

"Detailed structural design of buildings or elements of buildings shall be in accordance with methods that:

- (a) Admit of a rational analysis appropriate to the established properties and behaviour of all the constituent materials and elements, and
- (b) Are approved by the Engineer as being appropriate to achieve adequate strength, serviceability, and where necessary, ductility to sustain the various loading conditions required under Part 11.

7.2.3 Design Certification

The designer of any masonry elements shall provide calculations which establish that the masonry element has been designed in accordance with the requirements of this Bylaw or alternatively certify in an approved manner that the design method conforms with the requirements of a recognised code of practice.

7.2.4 Supervision

The designer of any masonry element shall supervise the construction of that element or arrange to have the work supervised by an agent appointed by him. Supervision in this context means general supervision only and includes

such periodic supervision and inspection as may be necessary to ensure that the structural work is executed generally in accordance with the design as distinct from any special supervision that may be required for a particular situation.

7.3 MATERIALS AND WORKMANSHIP

7.3.1 The materials and workmanship employed in the construction of buildings shall be in accordance with Standards approved by the Engineer. They shall be such as to ensure the fulfilment of the intentions of the designer and to provide durability and weatherproofing appropriate to the intended use of the building.

7.4 MEANS OF COMPLIANCE

7.4.1 Design

Masonry elements designed in accordance with the requirements of NZS 4230P or a recognised equivalent standard shall be deemed to comply with the requirements of this Bylaw.

7.4.2 Materials and Workmanship

Masonry elements erected in accordance with the requirements of NZS 4210P or a recognised equivalent standard shall be deemed to comply with the requirements of this Bylaw.

7.4.3 Minor Building Exemptions

Minor buildings built in accordance with "Technical Recommendations for a Code of Practice for Concrete Masonry Buildings not requiring specific design DZ 4229" or a recognised equivalent code of practice shall be deemed to comply with the requirements of this Bylaw.

"Associated Documents"

NZS 4210P	Code of Practice for Masonry Buildings. Materials and Workmanship
NZS 4230P	Design of Masonry Structures
DZ 4229	Technical Recommendations for a Code of Practice for Concrete Masonry Buildings not requiring specific design.

PART 8 CONCRETE

8.1 OBJECTIVE AND APPLICATION

- 8.1.1 Objective
- 8.1.2 Application

8.2 GENERAL CRITERIA

- 8.2.1 Design loads
- 8.2.2 Design Method
- 8.2.3 Serviceability
- 8.2.4 Prestressed Concrete
- 8.2.5 Design Certification
- 8.2.6 Supervision

8.3 MATERIALS AND WORKMANSHIP

- 8.3.1 Materials
- 8.3.2 Workmanship

8.4 MEANS OF COMPLIANCE

- 8.4.1 Design
- 8.4.2 Materials and Workmanship
- 8.4.3 Minor Building Exemptions

PART 8 CONCRETE

8.1 OBJECTIVE AND APPLICATION

8.1.1 Objective

This part of the Bylaw sets down the design and construction requirements for buildings or parts of buildings constructed of concrete.

8.1.2 Application

Specific calculations to establish that a building complies with the structural design requirements for this Bylaw shall not be required for concrete buildings that comply in all respects with a recognised code of practice for such buildings. Such a code of practice shall stipulate limitations to the scope of buildings to which it applies.

8.2 GENERAL CRITERIA

8.2.1 Design Loads

All concrete elements shall be designed to resist the loads specified in Part 11 of this Bylaw.

8.2.2 Design Method

"Detailed structural design of buildings or elements of buildings shall be in accordance with methods that:

- (a) Admit of a rational analysis appropriate to the established properties and behaviour of all the constituent materials and elements, and
- (b) Are approved by the Engineer as being appropriate to achieve adequate strength, serviceability, and where necessary, ductility to sustain the various loading conditions required under Part 11.

8.2.3 Serviceability

8.2.3.1 Deflection

Members subject to flexure shall be designed to have adequate stiffness to limit deflections or any deformations which may adversely effect the serviceability of the structure.

8.2.3.2 Cracking

The cracking of concrete under service load shall be limited so that appearance or durability of the structure is not adversely affected having regard to the requirements of the particular scheme.

8.2.3.3 Creep

Consideration must be given to the long term effects of concrete creep and stress adjustments due to temperature and repetitive loadings.

8.2.4 Prestressed Concrete

8.2.4.1 All structural elements of prestressed concrete shall be designed to comply with the strength and serviceability requirements of this Bylaw. The design shall consider all critical stresses in the structural element from the time of initial stress application to the stresses on the structural element in the final structure.

8.2.4.2 Stress concentrations adjacent to the anchorage elements must be considered at design stage and differential movement between prestressed elements and other structural elements must be allowed for.

8.2.5 Design Certification

The designer of any concrete element shall provide calculations which establish that the concrete element has been designed in accordance with the requirements of this Bylaw or alternatively certify in an approved manner that the design method conforms with the requirements of a recognised code of practice.

8.2.6 Supervision

The designer of any concrete element shall supervise the construction of that element or arrange to have the work supervised by an agent appointed by him. Supervision in this context means general supervision only and includes such periodic supervision and inspection as may be necessary to ensure that the structural work is executed generally in accordance with the design as distinct from any special supervision that may be required for a particular situation.

8.3 MATERIALS AND WORKMANSHIP

8.3.1 Materials

All concrete aggregate, cementitious materials, reinforcement, admixtures and miscellaneous materials used in the construction of concrete elements shall be manufactured in accordance with the requirements of a recognised New Zealand Standard.

8.3.2 Workmanship

The workmanship employed in the construction of concrete elements shall be in accordance with a recognised code of practice which will ensure desirability and weather-proofing appropriate to the intended use of the building.

8.4 MEANS OF COMPLIANCE

8.4.1 Design

Concrete elements designed in accordance with the requirements of NZS 3101 or a recognised equivalent standard shall be deemed to comply with the requirements of this Bylaw.

8.4.2 Workmanship

Concrete elements erected in accordance with the requirements of NZS 3109 or a recognised equivalent standard shall be deemed to comply with the requirements of this Bylaw.

8.4.3 Minor Building Exemptions

Minor buildings built in accordance with the requirements of DZ 3124 or a recognised equivalent code of practice shall be deemed to comply with the requirements of this Bylaw.

"Associated Documents"

NZS 3101	The Design of Concrete Structures
	Part 1. Code of Practice for the Design of Concrete Structures
	Part 2. Commentary on the Design of Concrete Structures
NZS 3109	Specification for Concrete Construction
DZ 3124	Concrete Construction for Work not Requiring Specific Design
NZS 3106P	Code of Practice for Concrete Structures for the storage of liquids
	Part 1. 1978. Design based on "Resistance to Cracking"
NZS 4441 1972	Code of Practice for Swimming Pools
NZS 4203	Code of Practice for general structural Design and Design Loadings for Buildings

PART 9 STEEL STRUCTURES

9.1 OBJECTIVE AND APPLICATION

- 9.1.1 Objective
- 9.1.2 Application

9.2 GENERAL CRITERIA

- 9.2.1 Design Loads
 - 9.2.1.1
- 9.2.2 Design Methods
 - 9.2.2.1 General
 - 9.2.2.2 Strength Method
 - 9.2.2.3 Alternative Design Method
- 9.2.3 Design Certification
- 9.2.4 Supervision
 - 9.2.4.1 General Supervision

9.3 MATERIALS AND WORKMANSHIP

- 9.3.1 Specification
 - 9.3.1.1 Steel Standards
- 9.3.2 Fabrication and Erection
 - 9.3.2.1 Steel Identification
 - 9.3.2.2 Erection Stresses
 - 9.3.2.3 Shearing and Gas Cutting
 - 9.3.2.4 Punching
- 9.3.3 Corrosion Protection
 - 9.3.3.1

9.4 MEANS OF COMPLIANCE

- 9.4.1

PART 9 STEEL STRUCTURES

9.1 OBJECTIVE AND APPLICATION

9.1.1 Objective

This part of the Bylaw sets down the requirements which apply to the use of structural steel members in the construction of a building.

9.1.2 Application

This part of the Bylaw shall apply to all steel members within a structure other than bolts associated with timber construction and steel associated with concrete construction.

9.2 GENERAL CRITERIA

9.2.1 Design Loads

9.2.1.1 All steel elements shall be designed to resist the loads specified in Part 11 of this Bylaw.

9.2.2 Design Methods

9.2.2.1 General

In the design of steel structures the design principles set out in NZS 4203 shall be applied. Steel members shall be proportioned for adequate strength and stiffness in accordance with the provisions of this Bylaw, using either the strength design method or the alternative (working stress) design method.

The plastic method of analysis and design may be used for structures not exceeding two storeys in height.

All structures except small buildings of limited ductility, as defined in NZS 4203, shall be designed taking into account capacity design.

In the design of braced and triangulated frames or trusses, axial forces may be found by assuming that members are pin-jointed. Secondary stresses due to eccentricity or rigidity of joints shall be taken into account where these are significant. Beams which are not part of the primary frame resisting lateral loads may be designed as simply supported where appropriate.

9.2.2.2 Strength Method

The structure and members of a steel building shall be designed for the load combinations specified in NZS 4203. The capacity reduction factor normally used in the strength method of design shall be taken as 1.0 for steel members.

9.2.2.3 Alternative (Working Stress) Design Method

The structure and members of a steel building shall be designed for the load conditions specified in the NZS 4203.

9.2.3 Design Certification

The designer of any structural steel element shall provide calculations which establish that the element has been designed in accordance with the requirements of this Bylaw or alternatively certify in an approved manner that the design method conforms with the requirements of a recognised code of practice.

9.2.4 Supervision

9.2.4.1 General Supervision

All structural steel work, whether on or off the site, shall be supervised by the Design Engineer or by another supervisor approved by him. Supervision in this context means general supervision only and includes such periodic supervision and inspection as may be necessary to ensure that the structural work is being executed generally in accordance with the design, as distinct from any special supervision that may be required by particular clauses of this standard.

9.3 MATERIALS AND WORKMANSHIP

9.3.1 Specification

9.3.1.1 Steel Standards

All structural steel shall, before fabrication, comply with the requirements (a), (b) or (c) below.

- (a) Australian steels shall comply with the requirements of the recognised Australian Standards.
- (b) British steels shall comply with the requirements of the recognised British Standards.

- (c) If structural steels or shapes other than those referred to in (a) and (b) above are used, they shall comply with a standard approved by the Design Engineer. The maximum value of yield stress F_y to be used in the application of this Bylaw shall be 450 MPa. A steel intended to be welded shall be suitable for welding.

9.3.2 Fabrication and Erection

9.3.2.1 Identification

Steel shall at all stages of fabrication be identifiable either by grade or by an appropriate colour marking or other marking, or shall be classed as unidentified steel and only used in accordance with Clause 9.2.3.

9.3.2.2 Erection Stresses

During erection of a structure, steelwork shall be made safe against erection stresses and loading conditions, including those due to erection equipment or its operation, and wind.

Additional member used to facilitate erection shall be approved by the Design Engineer and affixed in a manner which does not weaken permanent steelwork.

9.3.2.3 Shearing and Gas Cutting

In areas subject to plastic deformation, sheared edges in tension are not permitted. Material prepared by shearing shall be sheared oversize and machined to remove all signs of the sheared edge. Gas cut edges which are smooth and free from notches are permitted for steels having a specified minimum yield stress up to 280 MPa, but with steels of yield stress over 280 MPa gas cut edges shall be ground to remove all cutting marks.

9.3.2.4 Punching

In areas subject to plastic deformation, fastener holes shall not be punched full size. If punched, holes shall be punched undersize and reamed or drilled to remove all the sheared surface.

9.3.3 Corrosion Protection

- 9.3.3.1 Where steelwork in a structure is to be exposed to a corrosive environment, the steelwork shall be given adequate protection against corrosion, and the Design Engineer shall specify this protection. The degree of protection to be

employed shall be determined after consideration has been given to use of the structure, climatic or other local conditions, and maintenance provisions.

9.4 MEANS OF COMPLIANCE

9.4.1 Detailed design complying with the following shall be approved as complying with the requirements of this Bylaw: NZS 3404 1977.

"Associated Documents"

NZS 4203	Code of Practice for General Structural Design and Design Loadings for Buildings
NZS 3404	Code of Practice for Steel Structures (with commentary)

Note: This must be read in conjunction with AS 1250 - 1981. SAA Steel Structures Code

PART 10 NON RESIDENTIAL BUILDINGS

SECTION A: COMMERCIAL, INDUSTRIAL AND ASSEMBLY BUILDINGS

10.1 OBJECTIVE AND APPLICATION

10.2 MINIMUM CRITERIA

- 10.2.1 Fire Protection
- 10.2.2 Deflection Design
- 10.2.3 Proportions
- 10.2.4 Weather Resistance
- 10.2.5 Services
- 10.2.6 Light
- 10.2.7 Ventilation
- 10.2.8 Stud Height
- 10.2.9 Wheelchair Access

10.3 COMMERCIAL GLASS-HOUSES

10.4 TEMPORARY SEATING

10.5 STRUCTURES FOR THE STORAGE OF LIQUIDS

10.6 STORAGE TANKS FOR LPG

10.7 SPECIAL USE BUILDINGS

10.8 CHANGES IN USE

10.9 RESPONSIBILITIES AND OBLIGATIONS

SECTION B: ACCESSORY BUILDINGS FOR RESIDENTIAL AND RURAL AREAS

10.10 OBJECTIVE AND APPLICATION

10.11 MINIMUM CRITERIA

- 10.11.1 Siting Requirements
- 10.11.2 Structural Requirements
- 10.11.3 Exemptions from Specific Design

10.12 SPECIAL BUILDINGS

- 10.12.1 Swimming Pools
- 10.12.2 Detached living areas

PART 10 NON RESIDENTIAL BUILDINGS

SECTION A: COMMERCIAL, INDUSTRIAL AND ASSEMBLY BUILDINGS

10.1 OBJECTIVE AND APPLICATION

The objective of Section A of this part of the Bylaw is to define the minimum requirements for the design and construction of buildings used or intended to be used for commercial or industrial purposes.

10.2 MINIMUM CRITERIA

10.2.1 Fire Protection

The design of every building shall be such that the fire protection provided for the occupants and the neighbouring properties shall be in accordance with the requirements of Part 5 of this Bylaw.

10.2.2 Structural Design

The structural design of every building shall be such as to limit the deflection of lining materials when the structure is subjected to the loads specified in Part 11 of this Bylaw.

10.2.3 Proportions

The general proportions of every building shall be such that it is appropriate for the proposed use of the building.

10.2.4 Weather Resistance

The weather resistance incorporated in every building shall be appropriate to the use and proposed life of the building. A 50 year building life is reasonable expectation if individual building elements are accorded proper maintenance.

10.2.5 Services

In every building a sufficient water supply, adequate sanitary fittings, and suitable sewage disposal shall be provided to ensure that the requirements of relevant acts and regulations can be complied with. Provision shall also be made for the disposal of accumulated stormwater.

10.2.6 Light

Every building shall be so designed that all parts of the occupied floor areas receive adequate light. For bylaw purposes adequate shall mean a standard service illuminance of 500 lux at a point 900mm above the floor at each work station.

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(Note: NZS 6703 : 1984 recommends specific illuminances for specific building uses and compliance with that standard would be deemed to be compliance with bylaw requirements.)

10.2.7 Ventilation

Every building shall be so designed that all parts of the occupied floor areas receive adequate ventilation. For bylaw purposes adequate ventilation shall mean a minimum of 10 air changes per hour.

10.2.8 Stud Height

Any room or area that is occupied shall have a minimum stud height of 2.4m.

10.2.9 Wheelchair Access

Provision shall be made in all buildings for access by means of wheelchairs and at least one water closet must be capable of being altered so that it could be used by an employee confined to a wheelchair.

10.3 COMMERCIAL GLASS-HOUSES

Any free standing buildings used solely for the propagation of horticultural products and not exceeding 3.0m in height at the eaves and no closer than 1.5m to a boundary shall be exempt from the requirements of Part 5 of this Bylaw. Boiler-houses, packing sheds and other buildings associated with such buildings shall be considered as industrial buildings and shall comply with the requirements of Part 5.

10.4 TEMPORARY SEATING

Where the highest seat of temporary seating is not more than 2.0m above adjacent ground level, the seating structure shall be exempt from a building permit where a design certificate exists which defines the loads for which the structure has been designed, details the size of all members to be used, specifies the method of erection and certifies that the structure when erected according to specification will be safe when subject to design loads. Where the highest seat is more than 2.0m above adjacent ground level a building permit is required and a certificate is required from a registered Engineer stating that the structure has been erected in accordance with the details and the specifications referred to in the design certificate.

10.5 STRUCTURES FOR THE STORAGE OF LIQUIDS

Structures for the storage of liquids shall be so designed and constructed that adequate provisions are made to meet the following requirements.

(a) Loss of contents through leakage shall be prevented.

- (b) Contamination of the content and corrosion of the structure from external sources shall be prevented, particularly with underground structures.
- (c) Detrimental effects resulting from interaction between the structure and its contents shall be prevented.
- (d) All loads likely to be imposed during the life of the structure shall be sustained with an adequate margin of safety. Loading effects to be considered shall include, where necessary:
 - (1) Loads imposed during construction;
 - (2) Loads imposed during transport;
 - (3) Effects due to temperature, shrinkage and creep;
 - (4) Earthquake induced pressures between the liquid and the structure;
 - (5) Any tank used in an elevated position shall be adequately protected against overturning or shifting on its supports during earthquakes;
 - (6) Soil pressures, including uplift pressures, for both the full and the empty condition;
 - (7) Any superimposed vehicular and other loads;
 - (8) Effects of ultimate settlement and differential settlement.

10.6 STORAGE TANKS FOR LIQUIFIED PETROLEUM GAS

Notwithstanding the size of any LPG Tank the foundation systems for every LPG Tank shall be considered as a building for building permit purposes. The tank and associated pipe work shall be considered as equipment not subject to bylaw control but which must comply with the requirements of all relevant acts and regulations.

10.7 SPECIAL USE BUILDINGS

Where a building is erected to house a specific industrial process the requirements of this Bylaw may be modified where it can be shown that the modifications accord with recognised codes and standards for that industrial process with the provision that employees and neighbours are not subjected to a less safe environment than would have been attained if the Bylaw had been complied with.

10.8 CHANGES OF USE

Where the use of a building is changed the structure of the building shall be altered to create a building which complies fully with the general requirements of this Bylaw as are appropriate for the new use.

10.9 RESPONSIBILITIES AND OBLIGATIONS

It shall be the responsibility of the owner of the site in which any building is located to ensure that the use of the building is appropriate having regard to the structural adequacy of the building and the general criteria of this Bylaw.

SECTION B: ACCESSORY BUILDINGS FOR RESIDENTIAL AND RURAL USES10.10 OBJECTIVE AND APPLICATION

The objective of Section B of this part of the Bylaw is to define the minimum requirements for the design and construction of accessory buildings used for non-residential purposes in residential and rural areas.

The provisions of Section B shall apply to all buildings or portions thereof used or intended to be used for non-residential purposes in residential and rural areas provided that it can be established that the use is not a use that is more appropriate as a commercial or industrial or assembly use.

10.11 MINIMUM CRITERIA10.11.1 Siting and Fire Resistance Rating Requirements

10.11.1.1 Accessory building shall not be erected in any open space required by Part 4 of this Bylaw.

10.11.1.2* Walls of accessory buildings closer than 0.900m to a lot boundary or unit title boundary shall have a minimum fire resistance rating of 1.5 hours.

10.11.1.3* Walls of an accessory building erected in association with a residential building held under composite lease or similar agreements shall have a minimum fire resistance rating of 1 hour if sited closer than 0.900m to the line allocating the extent of the land associated with that lease or agreement.

* Where such walls adjoin common land or rights of way the Engineer may dispense with the 1.5 hours fire resistance rating or determine that a lesser rating would suffice.

10.11.1.4 No combustible construction of an accessory building shall be erected closer than 1.800m to combustible construction on an existing building greater in area than 20m² and erected on land of a separate title from that on which the first mentioned building is to be erected.

10.11.1.5 Where a detached accessory building is divided to serve separate occupancies any wall defining that separation of occupancy must have a minimum fire resistance rating of 1.5 hours, and be constructed of concrete or masonry.

Note: The requirements of Clause 5.2 of Part 5 of this Bylaw must be complied with where applicable.

- 10.11.1.6 Where a garage is attached to a residential building of the same occupancy the following additional requirements shall apply:
- (a) The common wall and ceiling must be lined on the garage side.
 - (b) Where openings are provided self closing devices shall be fitted to the doors.
 - (c) The garage floor must be impervious to petroleum based products and must slope away from the residence or be separated by means of a sill.
 - (d) The garage shall not open onto a bedroom or bed-living room other than through an approved lobby.

10.11.2 Structural Requirements

10.11.2.1 Detached accessory buildings which:

- (a) do not exceed a plan area of 65m^2 ;
- (b) do not contain a wall which exceeds 10.000m in length; and
- (c) contain no internal linings other than those required to comply with fire resistance rating requirements, may be structurally designed to a standard reduced from that required for habitable buildings. In addition to the full dead loads, accessory building structures and each component thereof shall be designed to resist the appropriate live, snow, wind and earthquake loadings as set out in NZS 4203 except as follows:

10.11.2.2 Live, snow and earthquake loadings may each be reduced by 10% from the values given in NZS 4203.

10.11.2.3 Wind loadings may be derived from a wind speed based on the 25 year return period.

10.11.2.4 Design load combinations may be based on the alternative method given in NZS 4203.

10.11.2.5 Deflection or deformation of the structure or components thereof should be computed using the transient loading (i.e. reduced live load, wind or snow) only which produces the greatest effect, and should not exceed $0.006L$, where L is the span between the centres of support.

10.11.2.6 Stresses in the various materials used in the structure should not exceed the maximum values given in the respective specific design codes appropriate to each of the materials.

10.11.3 Exemption From Requirements for Specific Design

10.11.3.1 For detached accessory buildings which

(a) do not exceed a plan area of 65m^2 ;

(b) do not contain a wall which exceeds 10.000m in length; and

(c) contain no internal linings other than those required to comply with fire resistance rating requirements specific calculations to establish compliance with the structural design requirements of this Bylaw shall not be required for light timber frame buildings or small masonry buildings that comply in all respects with an approved code of practice for such buildings.

10.11.3.2 For the purposes of Clause 10.11.3.1 of this Bylaw, Appendix I shall be a recognised code of practice.

10.12 SPECIAL BUILDINGS

10.12.1 Swimming Pools

10.12.1.1 No person shall erect, or permit to be erected, a swimming pool with a capacity of more than 23,000 litres without first obtaining a building permit.

10.12.1.2 Such a pool must be sited far enough away from buildings and boundaries so that no danger is created in excavation or otherwise.

10.12.1.3 Where such a pool is sited forward of a dwelling on a front site or on a corner site adequate safety precautions must be provided to prevent the unauthorised entry of young children.

10.12.2 Detached Living Areas

10.12.2.1 Any living area in a building detached from a house hold unit shall be permitted only with the special consent of the Council and be subject to such conditions as the Council deems to be reasonable.

PART 11 GENERAL STRUCTURAL DESIGN AND DESIGN LOADINGS

11.1 OBJECTIONS AND APPLICATION

11.2 GENERAL DESIGN CRITERIA

- 11.2.1 Methods of Analysis
- 11.2.2 Test Loads
- 11.2.3 Design Methods
- 11.2.4 Design Loads
- 11.2.5 Earthquake Provisions
 - 11.2.5.1 Symmetry
 - 11.2.5.2 Ductility
- 11.2.6 Wind Provisions
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 - 11.2.6.2 General
- 11.2.7 Snow Provisions
- 11.2.8 Building Deformation
- 11.2.9 Temperature Effects
- 11.2.10 Loads During Construction
- 11.2.11 Stormwater Disposal

11.3 EARTHQUAKE LOADS

11.4 SNOW LOADS

11.5 WIND LOADS

- 11.5.1 Wind Speeds
- 11.5.2 Design Wind Loads

11.6 DEAD LOADS

- 11.6.1 General
- 11.6.2 Partitions
- 11.6.3 Earth Pressure

11.7 LIVE LOADS

- 11.7.1 General
- 11.7.2 Ponding
- 11.7.3 Moving Live Loads
 - 11.7.3.1 Dynamic Effects

PART 11GENERAL STRUCTURAL DESIGN AND DESIGN LOADINGS11.1 OBJECTIVE AND APPLICATION

- 11.1.1 This Bylaw sets out requirements for general structural design (as distinct from detailed design appropriate to particular construction materials) and design loadings for buildings.
- 11.1.2 A special study shall be made for any building which, in the opinion of the Engineer, is sufficiently unusual for the provisions of this Bylaw to be appropriate only as a general guide.
- 11.1.3 In this Bylaw the word "shall" indicates a requirement that is to be adopted in order to comply with the Bylaw.
- 11.1.4 Apart from specific provisions within this Bylaw, all buildings shall be designed in accordance with methods of design that are capable of rational analysis in accordance with the established principles of mechanics and of structural design.
- 11.1.5 The general structural design method (as distinct from detailed design appropriate to particular construction materials as required elsewhere in this Bylaw) and the design loadings shall be recognised as appropriate upon achieving the following:
- (a) All loads likely to be sustained during the life of the building shall be sustained with an adequate margin of safety.
 - (b) Deformations of the building shall not exceed acceptable levels.
 - (c) In events that occur occasionally, such as moderate earthquakes and severe winds, structural damage shall be avoided and other damage minimized.
 - (d) In events that seldom occur, such as major earthquakes and extreme winds, collapse and irreparable damage shall be avoided, and the probability of injury to or loss of life of people in and around the building shall be minimised.
- 11.1.6 General structural design and design loadings complying with NZS 4203 shall be approved as complying with the requirements of Clause 11.1.5.

11.2 GENERAL DESIGN CRITERIA11.2.1 Methods of Analysis

- 11.2.1.1 Except as provided by Clause 11.2.2, buildings and parts of buildings shall be designed.

11.2.1.2 When the effect of any element on the structural behaviour of the building cannot be assessed with confidence, then that element shall not be considered as contributing to the basic load-resisting structure of the building, but the effect on the element itself of the design loadings shall be assessed, and allowance shall be made for the effect of the element on the distribution of loads and on building ductility.

11.2.2 Test Loads

Buildings or parts of buildings not fully amenable to analysis and design may be test loaded to demonstrate that the construction is adequate for its intended purpose.

11.2.3 Design Methods

In the design of structures, members shall be proportioned for adequate strength in accordance with the recognised New Zealand standard.

11.2.4 Design Loads

Structures shall be designed to resist all applicable loads as specified in this Bylaw.

11.2.5 Earthquake Provisions

11.2.5.1 Symmetry

The main elements of a building that resist seismic forces shall, as nearly as is practicable, be located symmetrically about the centre of mass of the building.

11.2.5.2 Ductility

- (a) The building as a whole, and all of its elements that resist seismic forces or movements, or that in the case of failure are a risk to life, shall be designed to possess ductility; provided that this shall not apply to small buildings₂ having a total floor area not exceeding 140m² and having a total height not exceeding 9m.
- (b) Structural systems intended to dissipate seismic energy by ductile flexural yielding shall have "adequate ductility".
- (c) "Adequate ductility" in terms of Clause (b) shall be considered to have been provided if all primary elements resisting seismic forces are detailed in accordance with special requirements for ductile detailing in the appropriate material code.

11.2.6 Wind Provisions

11.2.6.1 Scope

This Bylaw includes provisions for slender exposed structural elements such as chimney stacks, observation towers, and the like, but it does not apply to wind loads on buildings of unusual shape or location or which may be subject to wind-induced oscillations or to steady transverse forces; the wind loads on such a building shall be determined by a special study. -

11.2.6.2 General

- (a) The wind load on a building shall be calculated for:
 - (i) The building as a whole; and
 - (ii) Individual structural elements such as roofs and walls; and
 - (iii) Individual cladding units and their fixings.
- (b) Buildings shall be so designed that the risk of wind-induced oscillations of the building as a whole and of individual structural elements and cladding units is negligible or that the consequences are unimportant.
- (c) Buildings shall be designed with due attention to the effects of wind on the comfort of people inside and outside the buildings.

11.2.7 Snow Provisions

The snow load on a building shall be determined in accordance with the requirements of Clause 11.4.

11.2.8 Building Deformation

11.2.8.1 Provision shall be made for the effects of relative movement due to forces, and for the structural effects of differential settlement, creep, vibrations, shrinkage or temperature change on buildings or parts of buildings. Structural members shall be designed for acceptable deflections and vibrations under service loads.

11.2.8.2 Under the most adverse loading conditions, other than earthquakes, the deflections of the structure as a whole, and of any of its parts, shall not be such as to impair the strength or service ability of the structure or part, or lead to damage of other building components, or be unsightly.

11.2.8.3 Buildings that may be subject to oscillation due to wind shall be investigated with regard to the possibility of vibrations at critical frequencies.

11.2.9 Temperature Effects

Consideration shall be given to the effects of temperature changes. The normal atmospheric temperature range to be considered shall be from 0 C to 40 C and consideration shall be given to shading, thermal capacity, contact with the ground, and direct heating by the sun. Expansion joints to minimize temperature loads shall be constructed with due consideration for the temperature at which they are made.

11.2.10 Loads During Construction

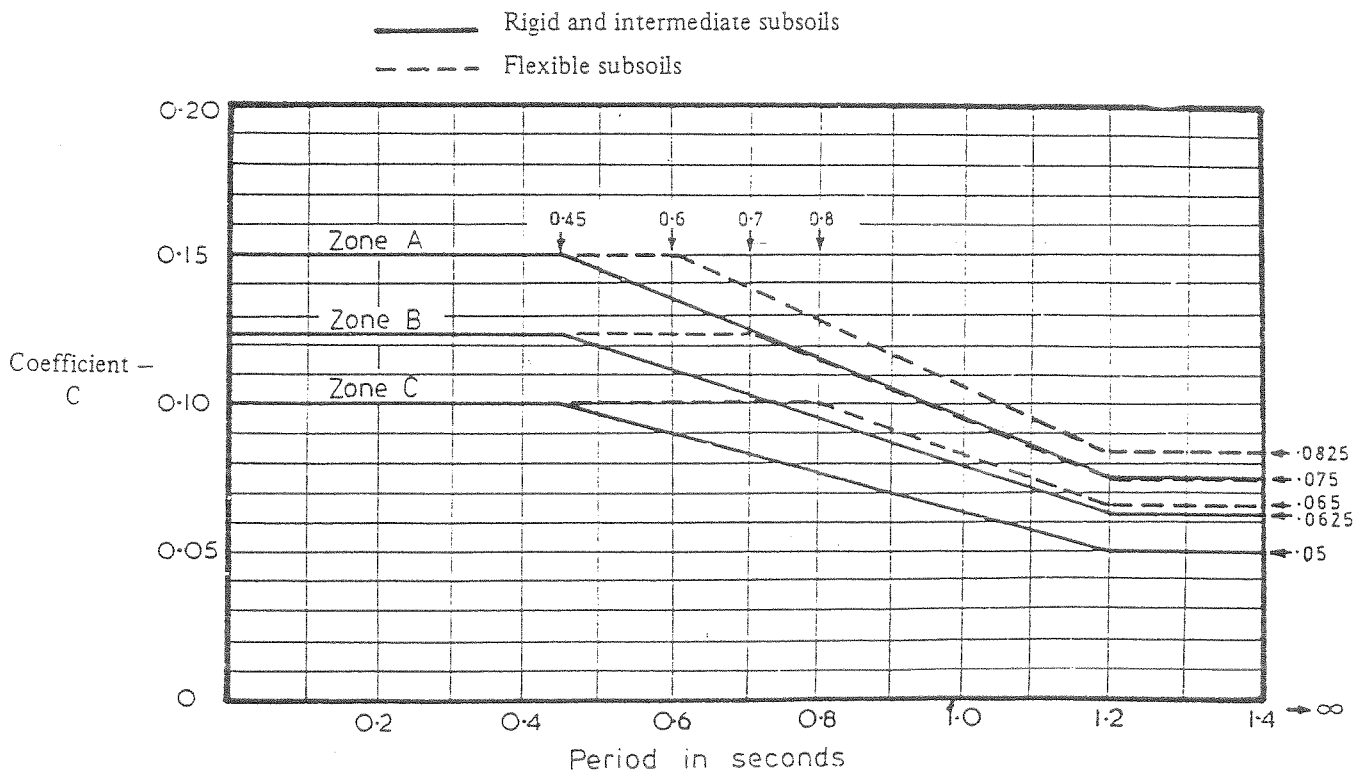
All permanent and temporary structural members of a building shall be protected against loads exceeding the design loads during the construction period except when, as verified by analysis or test, temporary overloading of a structural member would result in no impairment of that member or any other member. In addition, precautions shall be taken during all stages of construction to ensure that the building is not damaged or distorted due to loads applied during construction.

11.2.11 Stormwater Disposal

Consideration shall be given to the effects of stormwater on the building.

11.3 EARTHQUAKE LOADS

Basic seismic loads shall be as for Zone B, detailed in Figure 1. Figure 1 Basic Seismic Co-efficient C



11.4 SNOW LOADS

The basic snow load for the Christchurch City Council area shall be 0.5 kPa.

11.5 WIND LOADS

11.5.1 Wind Speeds

The return period shall correspond to the nature of the buildings as given by Table 1.

Table 1

RETURN PERIOD

Nature of Building	Return Period (years)	Basic Wind Speed in metres/sec	
		Christchurch	Port Hills
Structures used only during construction operations such as formwork and falsework	5	33	40
Buildings representing a low degree of hazard to life and property in the event of failure, such as isolated towers in wooded areas and farm buildings other than residential buildings or residential accessory buildings.	25	38	47
All other buildings	50	40	50

11.5.2 Design Wind Loads

Design wind loads shall be determined according to criteria defined in a recognised Standard such as NZS 4203 and shall be based on the wind speed specified in Clause 11.5.1.

11.6 DEAD LOADS

11.6.1 General

11.6.1.1 The mass of a material may be calculated from data given in the recognised New Zealand Standard.

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11.6.1.2 The dead load in newtons shall be not less than the mass in kilograms multiplied by 9.80665 or as given by NZS 6502.

11.6.2 Partitions

11.6.2.1 The mass of partitions shall be included in the dead load.

11.6.2.2 Movable partitions and future partitions shall be allowed for by an equivalent uniformly distributed mass per square metre of not less than 33 percent of the mass per metre run of the finished partition.

11.6.3 Earth Pressure

The loads caused by retained materials and the effects of ground water pressure and uplift shall be calculated according to accepted methods and to the approval of the Engineer.

11.7 LIVE LOADS

11.7.1 General

Buildings shall be designed for either:

(a) The basic minimum uniformly distributed live load appropriate for the use of the building. Suitable loads are detailed in NZS 4203.

or

(b) The basic minimum concentrated live load appropriate for the use of the building. Suitable loads are detailed in NZS 4203.

11.7.2 Ponding

11.7.2.1 Roofs and verandahs shall be designed with sufficient slope or camber to assure adequate drainage when the long-term deflections from dead load have occurred, or shall be designed to support maximum loads including possible ponding of water due to deflection.

11.7.2.2 Rain intensities of 15mm in 10 minutes, 30mm in 1 hour and 120mm in 24 hours shall be considered.

11.7.3 Moving Live Loads

11.7.3.1 Dynamic Effects

The impact effect on buildings or parts of buildings from moving live loads such as cranes, lifts, or machinery shall be provided by an assumed increase in the live load.

"Associated Documents"

NZS 4203 Code of Practice for General
 Structural Design and Design
 Loadings for Buildings

PART 12 GENERAL STRUCTURAL DESIGN FOR SECURING
 EARTHQUAKE RISK BUILDINGS

12.1 OBJECTIVE

12.2 APPLICATION

12.3 INTERPRETATION

12.4 DESIGN REQUIREMENTS

Note
Attachment

PART 12GENERAL STRUCTURAL DESIGN FOR THE INTERIM SECURING
AND STRENGTHENING OF EARTHQUAKE RISK BUILDINGS12.1 OBJECTIVE

The intent of this Bylaw is to define the extent of interim securing and strengthening required for buildings likely to be dangerous in a moderate earthquake.

Buildings strengthened to comply with this Bylaw shall be deemed to comply with the requirements of Section 624 of the Local Government-Act.

12.2 APPLICATION

This Bylaw shall apply only to buildings erected prior to the enactment of this Bylaw.

12.3 INTERPRETATION

12.3.1 "Building" for the purposes of this part of the Bylaw means a building constructed wholly or substantially of unreinforced concrete or unreinforced masonry; and includes any part of a building so constructed; but does not include any building used wholly or principally as a private dwelling unless the building is two or more storeys and contains three or more residential units or apartments. Where reinforced concrete has not been designed to resist lateral loads it shall be deemed to be unreinforced.

12.3.2 "Design Earthquake" for the purposes of this Bylaw shall be the earthquake which would result in the forces applied to a building being equal to those derived by application of the relevant provisions of NZS 4203 (1984).

12.3.3 "Moderate Earthquake" for the purposes of this Bylaw shall be earthquake which would result in the forces applied to a building being equal to half those derived by application of the relevant provisions of NZS 1900 Chapter 8 (1965). (See attachment to Bylaw).

12.4 DESIGN REQUIREMENTS

12.4.1 The design of all interim securing and strengthening systems for earthquake risk buildings shall be in accordance with methods of design that are in accordance with the established and generally accepted principles of mechanics and of structural design.

12.4.2 The interim securing and strengthening system shall be designed and detailed to achieve the following:

- (i) A building which is licensed as a place of assembly or is required to be serviceable after an earthquake shall be strengthened to the extent that:

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- (a) Collapse and irreparable damage in a design earthquake shall be avoided.
- (b) Structural damage in moderate earthquake shall be avoided and other damage minimised.
- (ii) In the special case of a building with historical or architectural significance it shall be acceptable for the building and its appendages to be secured to the extent that they will not collapse in a moderate earthquake, provided that its function does not require more stringent measures.
- (iii) All other buildings shall be interim secured within a period specified by the Engineer to the extent that the possibility of injury to or loss of life of people in and around the building in the event of an earthquake is minimised. The specified period shall be determined by the Engineer and shall be appropriate to the use and conditions of the building.

Such buildings must subsequently be strengthened within a further period specified by the Engineer to the extent that the structural condition of the building is appropriate to the use and expected economic life of the building.

- 12.4.3 Buildings which have been strengthened in accordance with the requirements of "Recommendations and Guidelines for Classifying, Interim Securing and Strengthening Earthquake Risk Buildings" shall be deemed to comply with the requirements of the Bylaw and Section 624 of the Local Government Act.

"Associated Documents"

NZS 4203 Code of Practice for General Structural
 Design and Design Loadings for Buildings

NOTE:

"Recommendations and Guidelines for Classifying, Interim Securing and Strengthening Earthquake Risk Buildings", is available from:

The New Zealand National Society for Earthquake Engineering,
P.O. Box 243,
WELLINGTON.

APPENDIX 1 (See Clause 10.13)REQUIREMENTS FOR ACCESSORY BUILDINGS1.1 SCOPE

- 1.1.1 This appendix sets down requirements for accessory buildings.
- 1.1.2 This appendix applies only in conjunction with and as a supplement to the rest of these Clauses.
- 1.1.3 The rest of these Clauses shall apply to all matters that are not specifically varied by the provisions of this appendix.

1.2 GENERAL

The materials and workmanship for accessory buildings shall comply with NZS 3604 for light timber frame buildings except as specifically varied by these Clauses and appendix.

1.3 FOUNDATIONS

- 1.3.1 Foundation loads shall be as given in Table A.
- 1.3.2 Table A is based on a minimum soil bearing capacity of 100 kPa.

Table AFOUNDATION LOADS

Accessory Building Construction	Foundation Load (KN/m) For Maximum Span		
	3m	6m	9m
Light roof - light wall	5	6	7
Light roof - heavy wall	10	11	12
Heavy roof - light wall	5	7	9
Heavy roof - heavy wall	10	12	14

- 1.3.3 Foundation widths and reinforcement shall be as given in Table B.
- 1.3.4 The width of foundation beams for accessory buildings shall not be less than 125mm.

Table B

FOUNDATION REQUIREMENTS

Width of Foundation Beam

		125mm			150mm	
V E R T I C A L	R 10 @ 600	-	-	-	-	Two D 16
	R 6 @ 300	-	Two D 10	Two D 12	Four D 10	NA
	R 6 @ 600	Two D 10	NA	NA	NA	NA
		6	8	10	12	14

Foundation Load (KN/m)

(See Table A)

1.4 LINTELS

1.4.1 Lintel sizes shall be as given in Table C.

1.4.2 Table C is based on the following assumed values:

Modulus of elasticity	E = 7 GPa
Maximum bending stress	F _b = 6.9 MPa
Maximum deflection	d ^b = 0.00 6L
Light roof loading	P ₁ = 0.7 kPa
Heavy roof loading	P _h ¹ = 1.1 kPa

Lintel sizes are based on truss loads placed at the centre of the lintel, where truss spacing is assumed to be 2m.

Table C
LINTEL SIZES

Span of Lintel (m)	Max. Span of Roof	Depth of Lintel Where Lintel Thickness is: (mm)					
		Light Roof			Heavy Roof		
		50	75	100	50	75	100
1.2	3.6	125	100	100	150	125	100
	6.0	150	125	100	200	150	150
	9.0	200	150	125	250	200	200
1.8	3.6	150	125	100	200	150	125
	6.0	200	150	125	250	200	200
	9.0	250	200	200	300	250	200
2.4	3.6	200	150	125	200	200	150
	6.0	250	200	150	300	250	200
	9.0	250	250	200	-	300	250
3.0	3.6	200	150	125	250	200	200
	6.0	250	200	200	-	250	250
	9.0	300	250	200	-	300	250
3.6	3.6	200	200	150	250	200	200
	6.0	250	250	200	-	300	250
	9.0	-	250	250	-	-	300
4.2	3.6	250	200	150	300	250	200
	6.0	300	250	200	-	300	250
	9.0	-	300	250	-	-	300
4.8	3.6	250	200	200	300	250	200
	6.0	300	250	250	-	300	300
	9.0	-	300	250	-	-	350

1.5 RAFTERS

1.5.1 Rafter sizes shall be as given in Table D.

1.5.2 Table D is based on the following assumed values:

Modulus of elasticity	E = 7 GPa
Maximum bending stress	$f_b = 6.9$ MPa
Maximum deflection	$d^b = 0.006$ L
Light roof loading	$P_l = 0.7$ kPa
Heavy roof loading	$P_h = 1.1$ kPa

Table D
RAFTER SIZES

Rafter Size (mm)	Span of Rafter Spaced at (mm)					
	Light Roof			Heavy Roof		
	600	900	1200	600	900	1200
75 x 40	2.21	1.81	1.57	1.77	1.45	1.25
100 x 40	2.95	2.42	2.09	2.36	1.93	1.67
125 x 40	3.69	3.02	2.62	2.95	2.41	2.09
150 x 40	4.42	3.63	3.14	3.54	2.89	2.50
75 x 50	2.38	2.03	1.76	1.98	1.62	1.40
100 x 50	3.18	2.70	2.34	2.64	2.16	1.87
125 x 50	3.97	3.38	2.93	3.30	2.69	2.33
150 x 50	4.76	4.05	3.51	3.96	3.23	2.80
200 x 50	6.35	5.40	4.68	5.28	4.31	3.73
250 x 50	7.94	6.76	5.85	6.60	5.39	4.67
300 x 50	9.53	8.11	7.02	7.92	6.47	5.60
100 x 75	3.64	3.18	2.87	3.14	2.64	2.29
125 x 75	4.55	3.97	3.61	3.93	3.30	2.86
150 x 75	5.45	4.76	4.30	4.71	3.96	3.43
200 x 75	7.27	6.35	5.73	6.28	5.28	4.57
250 x 75	9.09	7.94	7.17	7.86	6.60	5.72
300 x 75	10.90	9.23	8.60	9.38	7.92	6.86

1.5.3 Rafter fixings shall be as given in Table E.

Table E
RAFTER FIXINGS

Rafter Span (m)	Rafter Spacing (m)								
	Low Wind			Medium Wind			High Wind		
	0.6	0.9	1.2	0.6	0.9	1.2	0.6	0.9	1.2
3	P	P	Q	Q	Q	Q	Q	Q	Q
4	P	Q	Q	Q	Q	Q	Q	Q	Q
5	Q	Q	Q	Q	Q	Q	Q	R	S
6	Q	Q	Q	Q	Q	R	R	S	T

1.5.4 Table E letter symbols shall refer to the fixings given in Legend 1.

Legend 1 Fixing Details

Symbol	Fixings Required
P	2/100 x 3.75 skew nails
Q	2/100 x 3.75 skew nails + 2 wire dogs
R	2/100 x 3.75 skew nails + 1 framing anchor
S	2/100 x 3.75 skew nails + 2 framing anchors
T	2/100 x 3.75 skew nails + 2 wire dogs + 2 framing anchors

1.6 PURLINS

1.6.1 Purlin sizes shall be as given in Table F.

1.6.2 Table F is based on the following assumed values:

Modulus of elasticity	$E = 7 \text{ GPa}$
Maximum bending stress	$f_b = 6.9 \text{ MPa}$
Maximum deflection	$d^b = 0.006L$
Light roof loading	$P_l = 0.7 \text{ KPa}$
Heavy roof loading	$P_h^1 = 1.1 \text{ Kpa}$

Purlins are required to be continuous over a minimum of 2 spans.

Table F

PURLIN SIZES

Max. Purlin Span (mm)	Max Purlin Spacing (mm)	Purlin Size	
		Light Roof (mm x mm)	Heavy Roof (mm x mm)
600	600	50 x 50	50 x 50
	900	50 x 50	50 x 50
	1,200	50 x 50	50 x 50
900	600	50 x 50	50 x 50
	900	50 x 50	50 x 50
	1,200	50 x 50	50 x 50
1,200	600	75 x 50 on flat	75 x 50 on edge
	900	75 x 50 on flat	75 x 50 on edge
	1,200	75 x 50 on flat	75 x 50 on edge
1,500	600	75 x 50 on edge	75 x 50 on edge
	900	75 x 50 on edge	75 x 50 on edge
	1,200	75 x 50 on edge	75 x 50 on edge
1,800	600	100 x 50 on flat	100 x 50 on flat
	900	100 x 50 on flat	100 x 50 on flat
	1,200	100 x 50 on flat	100 x 50 on flat
2,100	600	100 x 50 on edge	100 x 50 on edge
	900	100 x 50 on edge	100 x 50 on edge
	1,200	100 x 50 on edge	100 x 50 on edge
2,400	600	100 x 50 on edge	100 x 50 on edge
	900	100 x 50 on edge	100 x 50 on edge
	1,200	100 x 50 on edge	100 x 75 on edge

1.6.3 Purlin fixings shall be as given in Table G.

Table G
PURLIN FIXINGS

Wind Area	Maximum Purlin Spacing	Maximum Rafter Spacing	Nail Fixings Required (Length, diameter and type)
Low	1,200	2,100	2/100 x 3.75 skewed + 1 wire dog
	1,200	2,400	2/100 x 3.75 skewed + 1 wire dog
Medium	400	2,400	2/100 x 3.75 skewed + 1 wire dog
	900	2,100	2/100 x 3.75 skewed + 1 wire dog
	900	2,400	2/100 x 3.75 skewed + 1 wire dog
	1,200	1,500	2/100 x 3.75 skewed + 1 wire dog
	1,200	2,400	2/100 x 3.75 skewed + 1 wire dog
High	400	2,400	2/100 x 3.75 skewed + 1 wire dog
	900	1,200	2/100 x 3.75 skewed + 1 wire dog
	900	2,400	2/100 x 3.75 skewed + 1 wire dog
	1,200	900	2/100 x 3.75 skewed + 1 wire dog
	1,200	2,100	2/100 x 3.75 skewed + 1 wire dog
	1,200	2,400	2/100 x 3.75 skewed + 2 wire dog

1.7 ROOF TRUSSES

- 1.7.1 Roof trusses shall be specifically designed in accordance with NZS 3603 (timber design code) or if in steel in accordance with NZS 3404 (steel structures code) and shall be fabricated in controlled factory conditions provided that with the approval of the Engineer they may be assembled on site to the same standards of workmanship and quality control.
- 1.7.2 Roof trusses constructed of timber shall be fixed at each connection as given in Table H, to resist wind uplift forces appropriate to the area.
- 1.7.3 Wind exposure areas shall be taken as follows in determining wind uplift requirements:
- (a) High wind area - All hill areas.
All foreshore areas.
 - (b) Medium wind area - All exposed areas other than (a) above.
 - (c) Low wind area - All other built up areas.

Table H
TRUSS FIXINGS

Truss span (m)	Truss Spacing (m)																										
	Low Wind Area									Medium Wind Area									High Wind Area								
	0.9	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	0.9	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	0.9	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4
	P	P	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	R	Q	Q	Q	Q	Q	S	S	S	S	
1.5	P	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	R	R	Q	Q	Q	Q	S	S	S	S	S	
	Q	Q	Q	Q	Q	Q	Q	Q	R	Q	Q	Q	Q	Q	R	R	S	S	Q	Q	Q	S	S	S	S	T	
1.5	Q	Q	Q	Q	Q	Q	Q	R	R	Q	Q	Q	Q	R	R	S	S	S	Q	Q	R	S	S	S	T	T	
	Q	Q	Q	Q	Q	Q	R	R	S	Q	Q	Q	R	R	S	S	S	S	Q	R	S	S	S	S	T	T	U
1.5	Q	Q	Q	Q	Q	R	R	S	S	Q	Q	Q	R	S	S	S	S	S	R	R	S	S	S	T	T	U	U
	Q	Q	Q	Q	R	R	S	S	S	Q	Q	R	S	S	S	S	S	S	R	S	S	S	T	T	U	U	U
1.5	Q	Q	Q	Q	R	S	S	S	S	Q	Q	R	S	S	S	S	S	T	S	S	S	S	T	T	U	U	U
	Q	Q	Q	R	R	S	S	S	S	Q	Q	R	S	S	S	S	T	T	S	S	S	T	T	U	U	U	U
1.5	Q	Q	R	R	S	S	S	S	S	Q	R	S	S	S	S	T	T	U	S	S	T	T	U	U	U	U	U
	Q	Q	R	S	S	S	S	S	T	R	R	S	S	S	T	T	U	U	S	S	T	T	U	U	U	U	U
1.5	Q	Q	R	S	S	S	S	T	T	R	R	S	S	S	T	T	U	U	S	S	T	U	U	U	U	U	U
	Q	Q	R	S	S	S	S	T	T	R	R	S	S	S	T	T	U	U	S	S	T	U	U	U	U	U	U

1.7.3 Table H letter symbols shall refer to the fixings given in Legend 2.

Legend 2

Fixing Details

Symbol	Fixings Required
P	2/100 x 3.75 skew nails
Q	2/ " " " + 2 wire dogs
R	2/ " " " + 1 framing anchor
S	2/ " " " + 2 " "
T	2/ " " " + 2 wire dogs + 2 framing anchors.
U	Specifically designed bolted connection required.

1.8 TIMBER POLES

- 1.8.1 Embedded timber poles used to frame accessory buildings may be utilized as a system to resist horizontal loads.
- 1.8.1 The rating of bracing units permitted for embedded timber poles shall be as given in Table I, based on a minimum concrete cover of 50mm all round.

Table IPOLE BRACING RATING

Pole Dimension (mm)	Bracing Unit Capacity (BU's)		Embedded Length (metres)
	Square	Round	
100	10	6	0.8
125	19	11	1.0
150	33	19	1.2
175	52	31	1.3
200	78	46	1.4

