Newsletter

Helpful tips when working with the Building Codes to design a residential dwelling

Introduction

This document is an aid to designers and building applicants considering building code elements when putting together a residential building consent application

The following should be considered as prompts only. A useful document to read in conjunction with this document is the MBIE publication-

Guide to applying for a building consent (residential buildings)

In future additions we will look at outbuildings, solar panels and commercial buildings.

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Building Codes

B1 - STRUCTURE

Has there been sufficient geotechnical investigation to establish the suitability of the foundation design?

Have adequate construction details been provided in the plans and specifications of SED structural elements to be satisfied the provisions of the Building Code will be met?

Are there parts of the building work that are designed using other Standards or Approved Documents from B1/AS1 and has adequate construction details been provided?
For example-
- Masonry NZS 4229
- Earth Buildings NZS 4299
- Stucco NZS 4251
- Drains AS/ NZS 2566.1, AS/NZS2566.2, AS/NZS 2032, AS/NZS2033
- Glazing NZS 4223
- Small Chimneys B1/AS3

For alterations to existing buildings has consideration been given to s112 (b) or if a change of use has consideration been given to s115 (a)? Ensure adequate details been provided of connection of new structural elements to existing.

For building work designed to NZS 3604 have the correct design parameters been applied? Corrosion, Wind, Earthquake and Snow load.

NZS 3604 CONSTRUCTION

Is the building within the scope and limitations of NZS 3604 as described in section 1.1.2?

Does the building site meet the requirements of 3.1.2 and has good ground been determined as per 3.1.3?

Have other site requirements been considered?

Do timber and wood based products comply with section 4.3?

Do steel fixings and fastenings comply with section 4.4?

Does concrete and concrete masonry comply with section 4.5?

Have the correct parameters been used for determining bracing demand?

Where applicable does sub-floor bracing design comply with section 5.5?

Does wall-bracing design comply with section 5.4?

Where diaphragms have been used with a brace wall system do they comply with section 5.6?

Where wall-bracing design involves reinforced concrete or concrete masonry walls and/or dragon ties do they comply with section 8.3?

Does the sub-floor system and the set out of the sub-floor system comply with sections 6.2 & 6.3? Consider load paths through the building and spans of bearers and floor joists.

Do the foundation piles comply with section 6.4? Height, materials, footings.

Do the different types of piles comply with the relevant sections 6.5 – 6.9?

Do the different types of piles comply with the relevant sections 6.5 – 6.9?

Do framed sub-floor walls comply with section 6.10?

Do concrete or concrete masonry walls comply with 6.11?

Do bearers comply with section 6.12?

Do stringers comply with section 6.13?

Does the prevention of dampness measures comply with of section 6.14?

Do floor joists comply with section 7.1?

Does the flooring comply with section 7.2?

Do flooring diaphragms comply with section 7.3?

Do timber decks comply with section 7.4?

Where the design of the building includes 3kPa floor loads has the increased requirements of section 14 been met?

Do the size limitations, ground clearances and foundation edge details of concrete floor slabs comply with sections 7.5.1 and 7.5.2?

Do the granular base and DPM to concrete floor slabs comply with sections 7.5.3 – 7.5.7?

Do the thickness, shrinkage control, bearing, support of internal walls and fixing of timber to concrete floor slabs comply with sections 7.5.8 – 7.5.12?

Does the wall framing meet the general requirements of section 8.4 and studs in wall framing comply with section 8.5?

Do lintels, sill and head trimmers comply with section 8.6?

Do top and bottom plates, dwangs and ribbon boards comply with sections 8.7 and 8.8?

Do posts comply with section 9?

Does the roof framing design comply with section 10.1?

Do framed roofs comply with section 10.2.1?

Do eaves and gable verges comply with sections 10.2.1.14 and 10.2.1.15?

Do purlins and tile battens comply with section 10.2.1.16?

Where roof construction is specific design trusses does it comply with section 10.2.2?

Do the roof bracing systems and roof bracing details comply with sections 10.3 and 10.4?

Do ceiling lining supports comply with section 13.2?

Do openings in ceilings and support of water tanks in roof spaces comply with sections 13.3 and 13.4?

Do structural ceiling diaphragms comply with section 13.5?

Have all structural members subject to snow loading of up to 1.5 kPa or up to 2.0 kPa been sized and factored to tables in section 15?

B2 - DURABILITY

Does material compatibility comply with Tables 21 and 22, E2/AS1?

Do wood based building components required to achieve a 50 year durability comply with Table 1 NZS 3602:2003 as modified by B2/AS1?

Do wood based building components required to achieve a 15 year durability comply with Table 2 NZS 3602:2003 as modified by B2/AS1?

Has an adequate coating system been specified for exposed structural steel work?

Can maintenance be carried out as necessary to achieve the required durability of the cladding system?

Are all the products and materials new? If not, how are the requirements of B1, B2, E2 and H1 to be satisfied?

C1 – C6 – PROTECTION FROM FIRE

Clause C2 – Prevention of fire occurring. See Part 7 C/AS1
where the installation of a fixed (heating) appliance is proposed will the installation comply with performances C2.2 and C2.3?
For liquid fuel heaters consider means of compliance for installation to AS1691 as modified by para 7.3.2, C1/AS1. Approved fuel storage tank, tank distance from boundaries and walls, tank containment, tank labelling, shut off valve and HSNO Act requirements
For solid fuel heaters consider means of compliance for installation to AS/NZS 2918 as modified by para 7.1.2, C1/AS1. Manufacturers installation instructions to be tested to AS/NZS 2918 by a recognised testing agency or installation of untested appliances and flues as per general sections of AS/NZS 2918
Other building code clauses to consider: B1 Structure for routing of flue through the building, integrity of existing fire place/chimney and flue stability , B2 Durability for second hand flue and appliances, and compatibility of flue flashing, E2 External moisture for flue flashing, G4 Ventilation for adequate ventilation to the space containing the appliance, G9 Electricity for electrical work , G12 Water supplies for wetback and anti-scald device.

Clause C3 – Fire affecting areas beyond the fire source. See Part 4 & 5, C/AS1
Where a building in a household unit does not meet the required fire separation from a title, cross lease or notional boundary or another household unit has a correctly detailed 30/30/30 two-way FRR wall been provided?

Clause C4 – Movement to places of safety. See Part 2 & 3, C/AS1
Does the escape route length from any part of the house have a maximum dead end length of 25m or total open path of 60m?

Clause C6 – Structural stability
Has consideration been given to collapse of elements having a lesser fire resistance not causing the consequential collapse of elements required to have a higher fire resistance?

FIRE SAFETY – GENERAL INFORMATION

Fire Design Summary?

Engineers Name and Qualifications?

Inspection Procedures indicated if applicable?

Has this fire design been peer reviewed if applicable?

Has the applicant confirmed construction monitoring and PS4 to be provided at end of project?

FIRE - BUILDING ACT

New / S112 / S115?

Proposed subdivision?

363 issues?

Boundary / 77 issues?

Waivers?

Alternative Solutions?

Evacuation Scheme required?

NZ Fire Services Engineering Unit Memorandum received and considered?

FIRE - BUILDING CODE USING ACCEPTABLE SOLUTIONS

Purpose group / Fire Hazard Category?

Number of occupants?

Fire safety precautions?

Means of escape (include signs and locks)?

Internal fire separations?

Shut down of air handling systems?

Interior surface finishes?

Visibility in escape routes (F6)?

Structural fire endurance rating (S)?

External fire separations?

Firefighting features?

D1 – ACCESS ROUTES

Do access routes have adequate activity space, are free from dangerous obstructions, have a safe cross fall, a safe slope in the direction of travel and adequate slip resistant walking surfaces?

Do access routes include stairs to upper floors, have stair treads that provide adequate footing, have an uniform rise, treads that can be easily seen and prevent children becoming trapped and appropriate landings?

Do access routes have adequate handrails to assist movement on stairs and ladders?

D2 – MECHANICAL INSTALLATION FOR ACCESS

Do mechanical installations on an accessible route comply with D2.3.5?
Compliance with D2 - D2/VM1/AS1 Passenger Carrying Lifts, D2/AS2 Domestic and Service Lifts, D2/VM3/AS3 Escalators and Moving Walks
Lift
Escalator
Moving walks
List: Installer / Manufacturer / Model

E1 – SURFACE WATER

Are floor levels above the minimum required by the PIM or Section 2, E1/AS1 to establish compliance with E1.3.2?

Is there an approved storm water outfall identified?

Has a layout of drainage to convey surface water to an appropriate outfall been provided, with sufficient details of pipe sizes, gradients, access points, invert levels and capacity of existing system, to establish compliance with E1.3.3?

Has the implications of trenches close to buildings and drains under buildings been considered?

Have details of sufficient down pipes at an adequate size been provided?

Have the internal and external gutters been adequately sized and is there adequate provision for overflow from internal gutters?

E2 – EXTERNAL MOISTURE

Is the building design within the scope of the acceptable solutions to E2?
List applicable acceptable solutions and provide comment if appropriate
• E2/AS1
• E2/AS2 – Earth buildings
• E2/AS3 - Concrete and concrete masonry buildings

Is the roof cladding system within the limitations of E2/AS1 and does it comply with the relevant section?
List applicable cladding system and provide comment if appropriate
• Masonry tiles (section 8.2)
• Pressed metal tiles (section 8.3)
• Profiled metal roof claddings (section 8.4)
• Membrane roofing (section 8.5)

Is the wall cladding system within the limitations of E2/AS1 and does it comply with the relevant section?
List applicable cladding system and provide comment if appropriate
• Masonry veneer (section 9.2)
• Stucco (section 9.3)
• Timber weatherboard (section 9.4)
• Fibre Cement Weatherboard (section 9.5)
• Profiled Metal Wall Cladding (section 9.6)
• Fibre Cement Sheet (section 9.7)
• Plywood Sheet (section 9.8)
• EIFS (section 9.9)

Are alternative solutions for compliance with E2 being used for roof or wall cladding systems?
List applicable cladding system and provide comment
• Proprietary torch on membranes
• Proprietary lightweight cladding
• Proprietary AAC panel system
• Other

Have details not covered in E2/AS1 been assessed to comply with the performance requirements of E2?
List applicable alternative solution and provide comment
• Junctions between different types of claddings
• Skillion roofs
• Timber framed windows/doors
• Basements (note removed from E2/AS1 amendment 5)
• Other

Is there provision for preventing the ingress of snow melt water?

E2 / AS1

Has a risk matrix score using section 3 been provided for elevations using acceptable solution wall cladding systems?

Do flashings details comply with the general requirements of section 4?

Do roof/wall junction details comply with the general requirements of section 5?

Do parapet details comply with the general requirements of section 6?

Do decks and pergolas attached to the building comply with the general requirements of section 7?

Does the roof underlay comply with the general requirements of section 8.1.5?

Do internal, valley and hidden gutters comply with the general requirements of section 8.1.6 E2/AS1?

Do roof penetration details comply with the general requirements of section 8.1.7, E2/AS1?

Does the bottom of wall cladding comply with the general requirements of section 9.1.3?

Do barriers to airflow, wall openings, air seals and building wrap comply with the general requirements of sections 9.1.4 – 9.1.7?

Do drained cavities comply with the general requirements of section 9.1.8?

Do wall penetrations comply with the general requirements of section 9.1.9?

Do windows and doors comply with the general requirements of section 9.1.10?

Has the potential for unacceptable construction moisture been assessed with section 10?

E3 – INTERNAL MOISTURE

Have details of an adequate combination of thermal resistance, ventilation, and space temperature been provided?

Has provision been made where accidental overflow could damage an adjoining household unit?

Have details been provided for surfaces to be impervious, easily cleaned and will prevent water penetration into concealed spaces where adjacent to sanitary fixtures and appliances or likely to be splashed?

Where level access showers and/or tiled shower enclosures are proposed, have sufficient details of gradients to floor, substrates, surface finishes and tanking membrane been provided?

F1 – HAZARDOUS AGENTS ON SITE

Where contamination of site has been identified has this been covered and details supplied to show compliance with F1?

F2 – HAZARDOUS BUILDING MATERIALS

Has sufficient details been provided to ensure Grade A safety glazing will be used where required by NZS 4223 Part 3 as modified by F2/AS1?

Has an investigation been done and/or a procedure plan been submitted for existing buildings where it is reasonably likely asbestos in a potentially hazardous form will be disturbed by the proposed building work?

F3 – HAZARDOUS SUBSTANCES AND PROCESSES

Liquid fuel burners, consider bunding and location of storage tanks. Installation to AS1691

F4 – SAFETY FROM FALLING

Has a barrier been provided where people could fall 1 metre or more from a floor of a building, from an opening in the external envelope or from a sudden change of level within or associated with a building including roofs with permanent access?

Do the barriers meet all the requirements of F4.3.4?

Where applicable have swimming pool fences been reviewed?

F5 – CONSTRUCTION & DEMOLITION HAZARDS

Have details been provided of barriers for the protecting the public and for restricting access by children to the site that are relevant to the potential work-site hazards?

F7 – WARNING SYSTEMS

Suitable smoke alarms provided?

G1 – PERSONAL HYGIENE

Does the layout show adequate space dimensions and does the location of spaces containing soil fixtures show adequate separation from other spaces and have adequate provision for hand washing?

G2 – LAUNDERING

Have complying laundry facilities and service connections been provided?

G3 – FOOD PREPARATION & PREVENTION OF CONTAMINATION

Does the layout show provision of a sink with waste, hot and cold water supply, pantry or fridge, cooking appliance, hygienic food preparation area and do wall linings adjacent to appliances and facilities have surfaces that can be easily maintained in hygienic condition?

G4 – VENTILATION

Do spaces within buildings have means of ventilation with outdoor air that will provide an adequate number of air changes to maintain air purity?

Do buildings have a means of collecting or otherwise removing moisture and other contaminants from the spaces in which they are generated?

Has consideration been given to providing extra ventilation for gas-fuelled appliances?

G6 – AIRBORNE & IMPACT SOUND

Is the STC rating of common walls, floors and ceilings of habitable spaces in household units between occupancies no less than 55?

Is the IIC rating of the floors to a separate occupancy above the habitable space of a household unit no less than 55?

G7 – NATURAL LIGHT

Are habitable spaces provided with adequate openings for natural light?

Are habitable spaces provided with adequate openings for visual awareness of the outside environment?

G8 – ARTIFICIAL LIGHT

Are spaces used by people, provided with adequate artificial light to enable safe movement in the absence of natural light?

G9 – ELECTRICITY

Has sufficient information been provided that the building work will meet the functional requirement ‘where provided in a building, electrical installations shall be safe for their intended use’?

G10 – PIPED SERVICES & G11 - GAS AS AN ENERGY SOURCE

Is there gas appliances being installed and does documentation nominate compliance with G10/AS1, G11/AS1 and NZS 5601.1?

Does the LPG cylinder location comply with App J, NZS 5601.1?

G12 – WATER SUPPLIES

Is the water supply from a potable source?

Is the potable water supply isolated from non-potable and are non-potable water supply outlets and pipelines identified?

Is the potable water supply being protected from cross connection or backflow with air gap or backflow prevention device?

Does the hot & cold water supply system comply with section 5 & 6, G12/AS1?

Is the storage water heater adequately supported and restrained, and located where it can be accessed for inspection, maintenance and removal?

G13 – FOUL WATER

Has a layout of sanitary plumbing to convey foul water to a drainage system been provided with sufficient details of pipe sizes, gradients and venting to establish compliance with G13.3.1?

Has a layout of drainage to convey foul water to an appropriate outfall been provided with sufficient details of pipe sizes, gradients, access points, ventilation, invert levels, overflow relief and capacity of existing system to establish compliance with G13.3.2?

Has the implications of trenches close to buildings, unstable soils and drains under buildings been considered?

Where a pumped discharge is proposed have sufficient details been provided to establish compliance with G13.3.4

Where an on-site disposal system is being installed has it been adequately designed to comply with the performance clause G13.3.4?

H1 – ENERGY EFFICIENCY

Is the building's thermal envelope to its conditioned space defined and airflow controlled?

Has the method of compliance for adequate thermal resistance of the building's thermal envelope been nominated and shown to comply?
List applicable method of compliance and provide comment if appropriate
Small building envelope
• Schedule method, NZS 4218:2004 as modified by H1/AS1
• Calculation method, NZS 4218:2004 as modified by H1/AS1
• Modelling method, NZS 4218:2004 as modified by H1/VM1
• BPI verification method, e.g. ALF3.2.
• Alternative solution (e.g. Appendix D, NZS 4218:2009 for additions)

Will the construction and insulation specified on the consent drawings achieve the construction R-value stated in the compliance report?