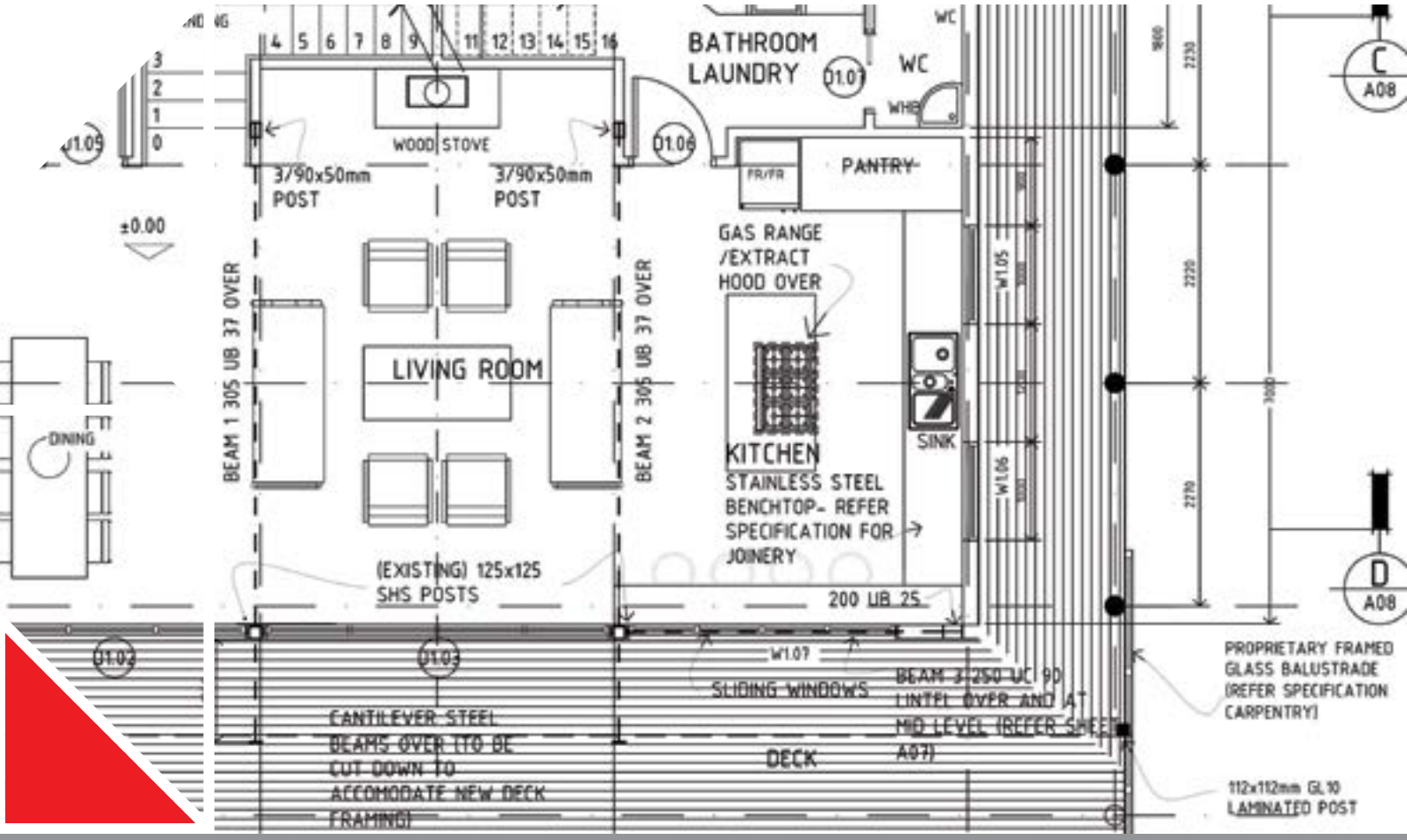
BRANZ

ISSUE 622

BULLETIN



GOOD PLANS AND SPECIFICATIONS

April 2018

- This bulletin defines for designers, builders and building owners the requirements for acceptable documentation for residential and light commercial/industrial construction work.
- The risk of time delays, inaccurate costings, disputes and the need for amendments during construction may be reduced if the parties to the building process insist on good documentation.
- This bulletin updates and replaces Bulletin 505 *Acceptable plans and specifications*.

1. INTRODUCTION

1.0.1 This bulletin defines for designers, builders and building owners the requirements for acceptable documentation for residential and light commercial/industrial construction work.

1.0.2 Problems such as time delays and inaccurate costings may arise from poorly prepared drawings and specifications. These problems can often be avoided if the parties to the building process insist on clear and accurate documentation, including a fair contract that protects both the owner and builder.

1.0.3 This bulletin updates and replaces Bulletin 505 *Acceptable plans and specifications*.

2. WHY PRODUCE PLANS AND SPECIFICATIONS?

2.0.1 Plans (architectural, structural, electrical, plumbing) and specifications together with relevant supporting information (certificates, installation instructions) are the key means of communication between all parties involved in a construction project. They are required to:

- be undertaken by a registered architect or a designer with a relevant and current design licence (LBP Design)
- show compliance with the New Zealand Building Code so that a building consent can be granted
- as sketch plans, form part of a resource consent (planning) application if the proposed building does not comply with the district plan
- obtain other authorisations such as vehicle access approvals and encroachment licences
- allow the work to be accurately priced/estimated
- allow the work to be correctly constructed as envisaged by the designer and building owner
- form part of the contractual agreement between the owner and the builder.

2.0.2 Good documentation can reduce:

- time delays and the potential for requests for information (RFIs) during the consent approval process
- inaccuracies in prices and quotes
- disputes between the builder and the owner/designer
- the need for extras (the cost of carrying out work not originally included is usually greater than that if it had been there at the start)
- the need for amendments during construction.

3. DEFINING GOOD DOCUMENTS

3.0.1 Plans and specifications as described in the Building Act 2004 include:

- the drawings, specification and other documents (see 3.0.2 below) from which the building is to be constructed, altered, demolished or removed
- the proposed procedures for inspection during construction
- the definition of the intended building use
- details of specified systems and procedures for their inspection and maintenance.

3.0.2 A good set of documents:

- accurately represents the extent and content of the project by defining:
  - the scope of work to be done
  - the materials and products to be used by product name and manufacturer identification number or reference
  - acceptable standards of workmanship
  - levels of finish required by the client
- shows sufficient detail so that the main contractor or subtrades do not have to request a clarification or variation on what is required
- is presented:
  - clearly and concisely
  - neatly and legibly
  - in a logical sequence
  - with consistency between drawings and specifications
  - with the drawings of different consultants coordinated to prevent conflicts, ambiguity or contradictions
  - with all dimensions shown and drawn to scale
  - with text of sufficient size and clarity to allow easy reading
- has, where required to demonstrate compliance with the Building Code, supporting information that:
  - is relevant to the project or material being considered
  - has the relevant Building Code clauses clearly stated – for example, a producer statement may just cover the durability of a product or may cover the structural adequacy of a proprietary building system
  - is being used within the limitations of any certificate or certification.

Examples include CodeMark certification, producer statements, manufacturers' literature, BRANZ Appraisal certificates or recommendations/drawings from BRANZ publications.

3.0.3 Producer statements, architectural and structural design certificates, durability assessments, weathertightness opinions, thermal design calculations and specific fire engineering design must:

- confirm that material quality, design standards or construction standards comply with the Building Code
- confirm design assumptions as the work proceeds, where the work is an alteration.
- be made by suitably qualified, independent, competent persons. A building consent authority (BCA) may decline to accept a producer statement if the credibility of the person supplying it cannot be established. Specific structural design can only be submitted from engineers with relevant experience and skills, such as a chartered professional engineer.

3.0.4 These are the typical parts of architectural plans and specifications:

- A **formal contract** outlining the responsibilities of all parties, including health and safety on site (not required for building consent application).
- **Site plan:** boundaries, north point, contours or levels, dimensioned location of the building, location of services, vehicle access, earthworks, any existing buildings and site features (such as protected trees).
- **Foundation plan:** with specific design foundations and

references to detail drawings for:
  - **concrete slab:** dimensions and thickenings, foundation walls, slab cuts, service penetrations, concrete cover, control joints
  - **suspended timber floors and decks:** foundation walls and pile set-out, pile type, subfloor bracing, ventilation, floor framing layout.
- **Floor plans** of every level: floor levels relative to site datum, wall dimensions, bracing layout and type, lintel sizes, window and door locations and swing, sections (and other details) referenced, stair layouts, special wall constructions, outline of roof or floor above, fittings and fixtures, space names or numbers, structural features such as columns. (See Figure 1 for an example.)
- **Framing plans:** floor joist layout for each level and roof framing showing rafter or truss layout.
- **Services plans:** For simple buildings, the information may be shown on site and floor plans:
  - **Plumbing:** location of fittings (bath, shower, laundry cabinet, hand basin), hot water appliances, tanks and wastes.
  - **Electrical:** location of all electrical fittings (lights, socket outlets, switches, heaters and heat pumps, HWC, IT and security, mechanical ventilation) supply route to building, meter and switchboard.
  - **Drainage:** location of downpipes, gullies and terminal vent, drainage runs for stormwater, wastewater and water, network connections or on-site disposal systems.
  - **Gas:** supply route and connection, meter, gas appliances.
- **Elevations:** all external elevations with levels relative to ground and overall height, windows, skylights and doors with openings shown, cladding and roof materials, construction joint locations, details and sections referenced, decks, stairs, balustrades and handrails, downpipes and vents, chimneys and other features.
- **Cross-sections:** levels/heights relative to ground and floor levels, framing height sizes and spacings, wall linings, roof and ceiling pitches, stair set-out, internal balustrades and handrails, positioning of insulation materials, construction details referenced. (See Figure 2 for an example.)
- **Large-scale construction detail drawings** to reflect the complexity of the building design and the risk: joinery and other penetration details, cladding junctions and construction joints, structural elements and points of connection, balustrades and parapets, fire and acoustic rated elements.
- **Other drawings necessary** to accurately explain the project: internal wall elevations, bracing, ceiling and roof plans, joinery elevations, window and door schedules, specified system layouts, fire egress plans.
- **Specification** defining the extent of work, quality of materials, their placement and fixings, specific products for compliance materials and assemblies, acceptable standards of workmanship for each trade or aspect of construction, linings and finishes schedules.
- Copies of **manufacturers' information, Appraisals** and so on.

3.0.5 Documentation supporting the consent should also include:
- the design statement(s) or reports
- a recent certificate of title
- relevant producer statements – for example, for trusses or glass barriers
- completed BCA checklist
- the payment for the consent fees.

3.0.6 The following information should also accompany the building consent application but may not form part of the building contract:
- Wind and exposure zone assessment unless provided by the territorial authority (TA) in the project information memorandum (PIM).
- Weathertightness risk assessment. The risk matrix of Acceptable Solution E2/AS1 is a useful starting point to highlight the risk areas of the design. Further risk analysis may be required where the building is outside the scope of E2/AS1.
- Fire and accessibility reports for commercial/industrial buildings and public buildings.
- Structural design calculations including information on roof trusses and other proprietary systems.
- Bracing and other structural calculations.
- Geotechnical assessment where ground conditions are unknown or poor or the site is steep.
- Details of specified systems and procedures for their inspection and maintenance.
- Site management plan showing how public safety is ensured, particularly for larger projects or where the construction site is restricted.
- Engineer's reports and design.
- Soil tests results.
- Maintenance schedule as per B2/AS1 clause 2.0 [2.1.2] to be delivered to the client on completion.

4. COMMON OMISSIONS

4.0.1 Documentation forwarded to BCAs often lacks certain pieces of information, particularly on matters relating to Building Code compliance.

4.0.2 Some sets of drawings show the easy, straightforward aspects of construction (which both the designer and builder could reasonably be expected to know) and do not include the complicated or non-standard parts of the building. Where a particular construction detail is required, it must be shown in sufficient detail so the builder (and where subject to Building Code compliance, the BCA) can understand what is intended.

4.0.3 Areas where information/details can be lacking:
- Identification of proposed alternative methods (and the supply of relevant supporting evidence to show Code compliance).
- Appropriate referencing of current standards and Acceptable Solutions.
- Correct specification for concrete durability to comply with NZS 3604:2011 *Timber-framed buildings* (section 4.5.2).
- Tanking and membrane details.
- Roof structure and roof and deck falls with adequate drainage.
- Truss design (usually supplied by truss manufacturer): layout plan and fixing details including PS1 producer statement.
- Flashing details, particularly:
  - at the intersection and ends of flashings

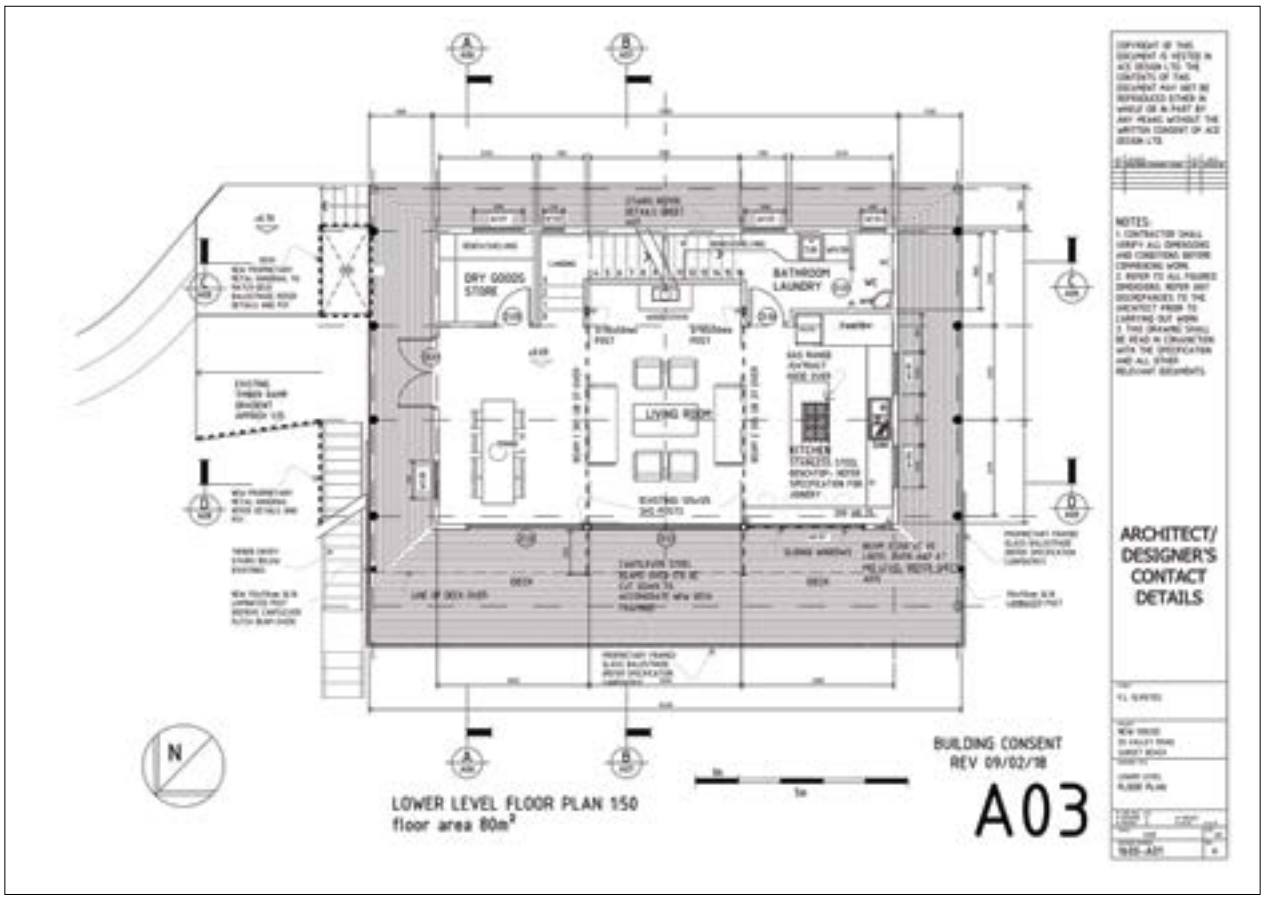


Figure 1. Lower-level floor plan, single dwelling.

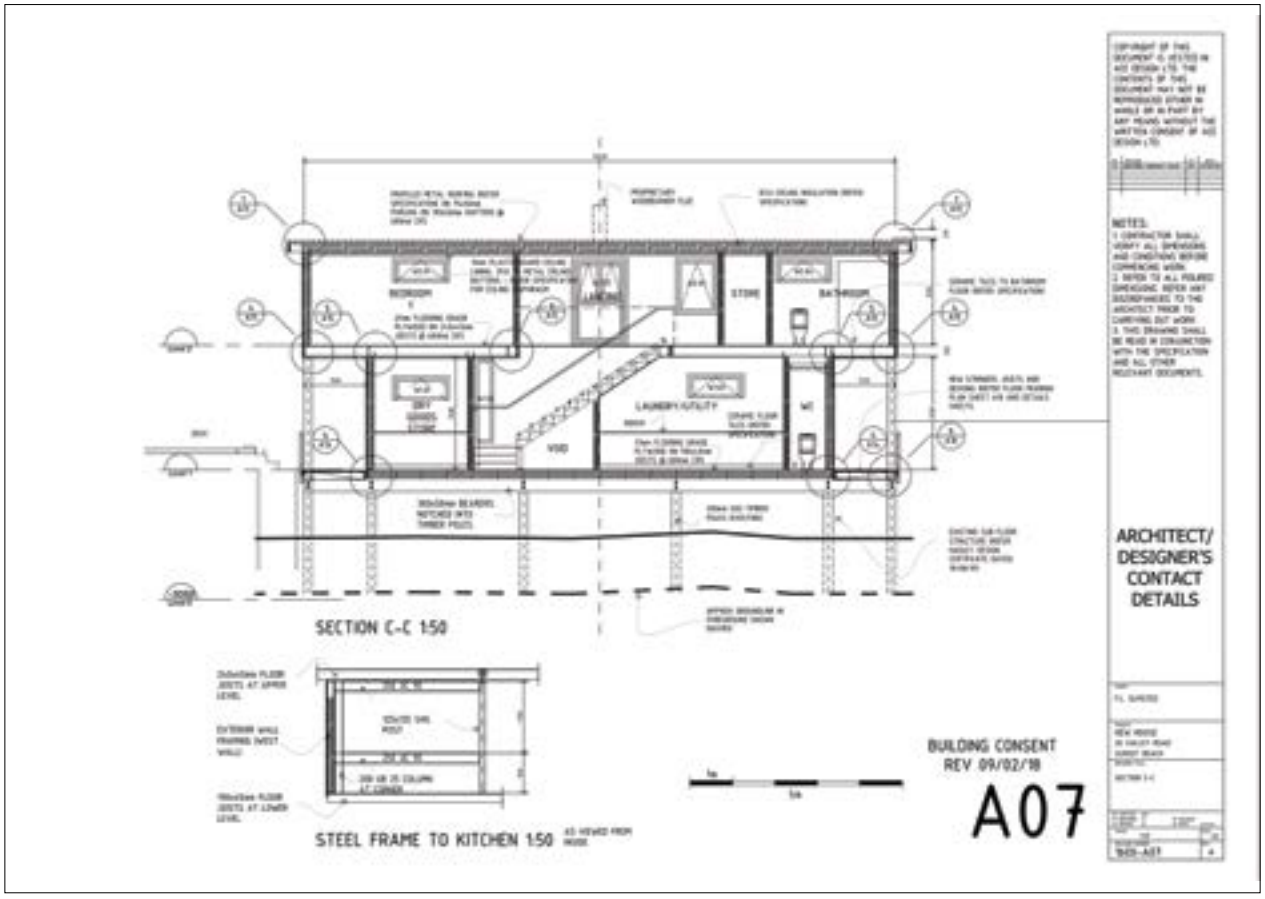


Figure 2. Cross-section, single dwelling.

- miscellaneous penetrations in walls and roofs.
- Cladding junctions and movement control joints.
- Window/door joinery installation including air seals and sill supports.
- Kitchen benchtops to show compliance with Building Code clause G3.
- Provision for service installation and replacement and access for maintenance.
- Soil condition reports.
- Specification of timber grades and treatment for specific building components.
- Identification of safety glass to specific window and door components to comply with NZS 4223 *Glazing in buildings* series (and Building Code clause F2 for bathrooms).
- Fixings with adequate structural strength or durability.
- Fixing details for lintels, top plates and studs, rafters and purlins.
- Holding-down details to beams and posts, bracing.
- Holding-down details to bottom plates on concrete masonry.
- Trade literature specific to the products, materials and construction methods chosen.
- Details that incorporate allowance for construction tolerances.
- Identification of surfaces and finishes that have hygiene requirements.
- Identification of specific materials – for example, where a generic wall underlay is noted rather than identifying the specific product.
- Evidence of H1 compliance – for example, calculations or modelling information.
- Information as to why it is not practicable to achieve full compliance for existing buildings with respect to Building Code performance triggered for upgrade.
- Wind zone assessment where there is no TA assessment or the site has been assessed as specific design. Buildings on a site with wind speeds in excess of 55 m/sec (extra high) will need all structure specifically designed and special consideration of all cladding including the design of window and door joinery. Such buildings fall outside the scope of NZS 3604:2011 and E2/AS1.
- Weathertightness risk assessment. The E2/AS1 risk matrix is only applicable for buildings that are up to 10 m high and on sites with a wind speed of up to 55 m/sec and within the scope of E2/AS1.
- Fire and accessibility reports for commercial/industrial buildings.
- Fire separation junction and penetration details.
- Location of smoke alarms to comply with Building Code clause F7.
- Specific structural design relating to roof trusses and other proprietary systems such as composite joists and lintels or retaining wall systems. Where the selection is made from a table or through a customised computer program, the input data must be stated and justified.
- Seismic restraint of hot water systems where appropriate.
- Producer statements and other information that support a claim for Building Code compliance where there is an alternative method. This is particularly common where the proposal is a variation on an Acceptable Solution detail or the site conditions fall outside the scope of the Acceptable Solutions.
- Geotechnical assessment to justify assumed good ground, site stability or specific design parameters.
- Details and location of specified systems and procedures for their inspection and maintenance.
- Site management plan showing how public safety is ensured with defined work areas and access for material delivery to site, maintaining public access to adjoining sites and public places and silt and sediment control during earthworks.

4.0.4 Other information that may be requested by the BCA (dependent on project type) to be supplied with a consent application may include:

- list of involved professionals
- fire engineering report
- Fire and Emergency New Zealand design review report (commercial developments)
- identification of the specified systems present
- project-specific calculations
- emergency services plan
- certificate for public use (CPU) – required for public buildings before work can start on site
- accessibility plan – access routes, accessible toilets and public counters
- details to show compliance with Building Code clause G4
- details for solid-fuel-burning space heating
- areas of impermeable coverage, building and landscaping shown and calculations provided
- land contours or spot levels
- sediment control plan
- site contamination report
- location of protected trees.

5. PROJECT INFORMATION MEMORANDUM

5.0.1 A PIM must be obtained before or at the same time as making an application for a building consent.

5.0.2 To obtain a PIM, the application form must be accompanied by drawings that show:

- the site including boundaries, contours or levels, north point and any access for vehicles
- the location and external dimensions of the proposed building
- proposal for the disposal of stormwater and wastewater.

5.0.3 The TA may ask for further information. There may be separate approval processes where the building is over or adjacent to any road or public place or the proposed vehicle access crosses in front of a neighbouring property.

5.0.4 The PIM provides information that is likely to be relevant to the proposed building work, including any other authorisations required from the TA such as resource consent.

5.0.5 Building work must comply with both the Building Act and the Resource Management Act. Consent obtained under one Act does not imply consent will be given under the other – they are separate processes. In practice, resource consents can take longer to obtain than building consents, particularly where the resource consent application is publicly notified.

5.0.6 Obtaining a PIM early in the design phase is recommended. It may contain information that needs to be considered in the design of the building and may identify where a resource consent is required.

6. BUILDING CONSENT APPLICATIONS

6.0.1 Consent applications that lack essential information are generally put on hold until the missing information is supplied.

6.0.2 The documents must be specific and not present a range of options or generic descriptions. It is not acceptable to simply reference a standard or Acceptable Solution or cite a manufacturer's recommendations in a non-specific way as all these sources contain options for construction. Specific selection of the option to be used must be made. Quoting a standard or Acceptable Solution or leaving the builder to interpret the requirements (as is often done with NZS 3604:2011) is not acceptable. If the specifier has not read the document, they will not know if the work is in accordance with that document, and any supervision will be inadequate.

6.0.3 The application must state the means of compliance with the Building Code. These are the options:

- Following a deemed-to-comply path – the drawings and specification show full compliance with an Acceptable Solution or Verification Method or fall within the limitations of a CodeMark certification.
- Proposing an alternative method and ensuring the documents and all relevant supporting evidence clearly show how the specific performance requirements of the relevant Code clauses will be met. Supporting evidence might include producer statements, product appraisals, expert opinion or comparison with an Acceptable Solution. Once accepted as Code compliant by the BCA, it is consented as an Alternative Solution.

6.0.4 For example, the documents covering a new stand-alone 2-storey house would need to show how the performance requirements of the following Building Code clauses are to be met:

- B1 *Structure*
- B2 *Durability*
- D1 *Access routes* (to the front door and for stairs)
- E1 *Surface water*
- E2 *External moisture*
- E3 *Internal moisture*
- F2 *Hazardous building materials*
- F4 *Safety from falling*
- F5 *Construction and demolition hazards*
- F9 *Restricted access to swimming pools* (if a pool is incorporated)
- G1 *Personal hygiene*
- G2 *Laundering*
- G3 *Food preparation and prevention of contamination*
- G4 *Ventilation*
- G7 *Natural light*
- G8 *Artificial light*
- G9 *Electricity*
- G11 *Gas as an energy source* (if used)
- G12 *Water supplies*
- G13 *Foul water*
- H1 *Energy efficiency*.

Note that other clauses may also be relevant depending on the project such as C *Protection from fire*, G10 *Piped services* or the Simple House Acceptable Solution.

6.0.5 Where the building work is an alteration to an existing building, any new work must comply with the Building Code. Any changes to the existing building must ensure that the building complies to at least the same extent as it did before the changes. For alterations to commercial buildings, the whole building must be upgraded, as far as it is reasonable and practical, for means of escape from fire and access and facilities for people with disabilities. Generally, the upgrading triggers do not impact on detached dwellings but can have significant implications for multi-unit residential, commercial and industrial buildings. Early discussions with the BCA will help clarify the extent to which upgrading is required.

6.0.6 Change of use (from commercial to residential, for example) will most likely require a resource consent and may also have significant and costly implications for meeting requirements of some sections of the Building Code (particularly with respect to clauses C1–C7). The current use of a building may not necessarily be the same as the lawful classified use, so some research early in the design and documentation process may be required if a change of use is necessary.

6.0.7 Restricted building work can only be carried out or supervised by licensed building practitioners (LBPs). Those designing, constructing or supervising the project will need to be licensed for the class of work being done.

6.0.8 The Building Act requires BCAs to decide that the completed building complies with the building consent documents before a Code Compliance Certificate can be issued. The TA must also keep accurate records of the construction. Both these requirements have implications for the recording and approval of variations from the approved consent documents during construction. Where the change is not significant to compliance with the Building Code, the BCA may be willing to informally record the change on the site records. Otherwise, a formal amendment to the building consent will need to be approved by the BCA.

6.0.9 The need for documentation and the approval process for building consent amendments is the same as for the original consent. Documents should clearly show the scope of the change being applied for. Approval must be given before the work can go ahead.

7. PRICING AND TENDERING

7.0.1 When building work is being priced, the quoted price will be more accurate when the information supplied is comprehensive, accurate and clear.

7.0.2 Leaving it up to the person pricing to make assumptions about materials or finishes can lead to disputes and possible litigation where the contractor's choice is at odds with the designer's unstated vision. However, the contractor should avoid making assumptions and flag any unclear items.

7.0.3 Significant queries can mean providing new details to all the prospective tenderers, and the tender period may need to be extended. It can also result in tagged tenders, slowing the tender acceptance process and making it difficult to compare tender prices.

7.0.4 It is common for work to be tendered at the same time as building consent is applied for. If the BCA requires additional documents, this may impact on the tender documents.

7.0.5 Lack of detail also creates difficulty when finalising the project accounts, particularly for additional materials or variations for work not included in the contract price.

8. FURTHER READING

New Zealand legislation is free to download from www.legislation.govt.nz.

The following documents are published by MBIE and free to download from www.building.govt.nz:

- *New Zealand Building Code Handbook* and the Acceptable Solutions/Verification Methods
- *Guide to applying for a building consent (simple residential buildings)*
- *A beginner's guide to resource and building consent processes*

Local BCA Guides to the consenting process

GLOSSARY

ACCEPTABLE SOLUTION
A means of compliance issued by MBIE. Following an Acceptable Solution is a deemed-to-comply option for achieving the minimum performance requirements of the Building Code.

ALTERNATIVE SOLUTION
A solution to the Building Code that is accepted as being Code compliant by the BCA but does not follow an Acceptable Solution.

BUILDING ACT 2004
The legislation governing building work in New Zealand.

BUILDING CODE
Regulations to the Building Act set up the Building Code that prescribes the minimum performance objectives that building work must meet. Compliance with the Building Code is mandatory to the extent required by the Building Act.

BUILDING CONSENT
Approval given by a building consent authority that the proposed work will be Building Code compliant if the documentation is followed and authorises the undertaking of building work.

BUILDING CONSENT AUTHORITY (BCA)
An organisation empowered to issue building consents, inspect construction and certify completion of building work. All territorial and regional authorities (local councils) are accredited as building consent authorities unless they have transferred their powers. Private companies may also become building consent authorities.

CODE COMPLIANCE CERTIFICATE (CCC)
The certificate obtained from the BCA at the completion of building work. A CCC is required in certain circumstances such as occupation of a public use building or a developer selling a residential property. The CCC gives the building owner, insurers and prospective purchasers assurance that the work complies with the building consent.

MINISTRY OF BUSINESS, INNOVATION AND EMPLOYMENT (MBIE)
The government department responsible for the Building Act and Building Code and associated documentation. Its powers include issuing compliance and guidance documents, determining disputed technical matters and monitoring BCA performance.

DISTRICT PLAN
The rules governing development in the area.

LICENSED BUILDING PRACTITIONER (LBP)
A competent person licensed to undertake certain categories of work. The work that it is to apply to, known as restricted work, is set by regulation.

PROJECT INFORMATION MEMORANDUM (PIM)
A document issued by the territorial authority that records all information relevant to the proposed building project known to the TA. It also advises of other authorisations that the TA may require as part of the proposed project.

PRODUCER STATEMENT
Expert opinion (there is a specific form developed by architects' and engineers' institutes in common usage) often provided in support of alternative methods. The author's expertise and independence needs to be proved. Competence is a mixture of qualifications and experience relevant to the subject of the opinion. The scope and the basis of the opinion must be clearly defined. Producer statements have no status under the Building Act and are accepted only at the BCA's discretion.

RESOURCE CONSENT
Consent under the Resource Management Act 1991 to undertake work outside the rules of the district plan for the area. A resource consent application may be made either before or concurrently with a building consent application.

SPECIFIED SYSTEMS
Systems prescribed in regulations to the Building Act that need to be maintained in good working order to protect occupant safety, health and amenity.

STANDARD
A published technical document describing manufacturing, testing or construction or providing advice. A standard may be cited as a means of compliance by an Acceptable Solution or Verification Method.

TERRITORIAL AUTHORITY
The local council that undertakes building control functions including enforcement. It is also responsible for functions under the Resource Management Act (resource consents) and the Local Government Act (bylaw approvals).

BRANZ

INSPIRING THE INDUSTRY TO PROVIDE BETTER BUILDINGS FOR NEW ZEALANDERS

BRANZ ADVISORY HELP LINES

FOR THE BUILDING INDUSTRY

0800 80 80 85

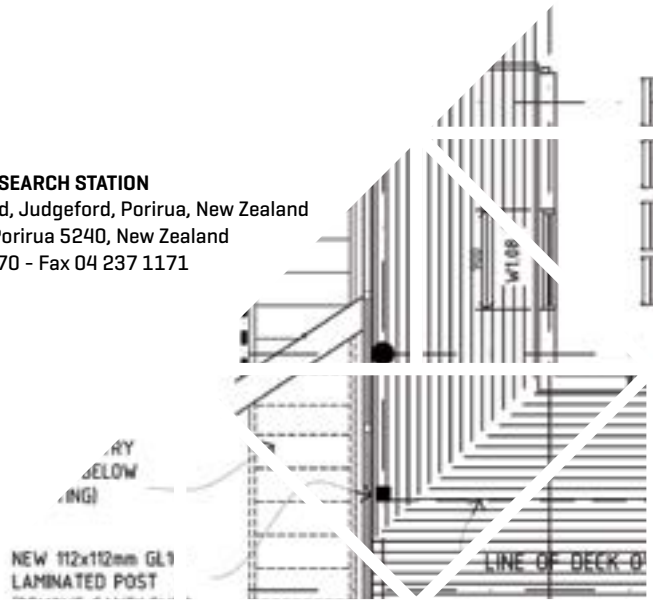
FOR THE HOME OWNER AND PUBLIC ENQUIRIES

0900 5 90 90

Calls cost $1.99 per minute plus GST. Children please ask your parents first.

BRANZ Find www.branzfind.co.nz

HEAD OFFICE AND RESEARCH STATION
1222 Moonshine Road, Judgeford, Porirua, New Zealand
Private Bag 50 908, Porirua 5240, New Zealand
Telephone 04 237 1170 - Fax 04 237 1171
www.branz.nz



Standards referred to in this publication can be purchased from Standards New Zealand by phone 0800 782 632 or by visiting the website: www.standards.co.nz.

Please note, BRANZ books or bulletins mentioned in this publication may be withdrawn at any time. For more information and an up-to-date list, visit BRANZ Shop online: www.branz.nz or phone BRANZ 0800 80 80 85, press 2.

ISSN 1178-4725 (Print) 2537-7310 (Online)