Building Performance Building Performance

Site search

Search Search Building Performa

Search

Popular searches

1. Why contracts are valuable
   Consumer protection measures
2. Use licensed people for restricted building work
   Choosing the right people for your type of building work
3. Work that doesn't require a building consent
   Schedule 1 guidance
4. Post-emergency building assessment
5. Codewords
   Building regulatory news and guidance
6. Determinations
   Rulings on building work disputes
7. E2 External moisture
   Acceptable Solutions and Verification Methods

Menu Search

- Home
- Getting started
  - Building law reform programme
  - Your rights and obligations
  - Stages of the building process
  - How the building system protects you

Rights and obligations in the building process

If you are involved in a building project, it’s important you know who is responsible for each aspect.

- Homeowner rights and obligations
- Builder and designer rights and obligations
- Building owner rights and obligations
- How the building system protects you
- Roles of councils and MBIE

Stages of the building process

Understand project stages, from scoping and design to consents, construction and completion.

- DIY, but build it right
- Renovations differ to new builds
- Understand your land so you design well
- Top tips for a successful build

Building law reform programme

The reforms will speed up consenting and build confidence in the building system.

- Building law reform programme
- Background

See everything in 'Getting started'

- Projects & consents
  - Planning a successful build
  - Why contracts are valuable
  - Apply for building consent
  - Build to the consent
  - Sign-off and maintenance
  - Health and safety on site

Understanding the building consent process

For safe, healthy and durable buildings, all building work in New Zealand must meet certain standards. Find out how to build within the rules.

Health and safety on site

Avoid accidents and make site safety a priority.

1. Planning a successful build

- Check if you need consents
- Choosing the right people for your type of building work
- Why contracts are valuable

2. Getting a consent

- Apply for building consent
- How to support your building consent application
- Understanding the building consent process

3. Building to the consent

- Making changes to your plans
- Typical council inspections of a building project
- Completing your project

4. Sign-off and maintenance

- Get the build signed off
- How to identify defects
- Protecting your investment

See everything in 'Projects & consents'

- Building Code compliance
  - A General provisions
  - B Stability
  - C Protection from fire
  - D Access
  - E Moisture
  - F Safety of users
  - G Services and facilities
  - H Energy efficiency
  - Specific buildings
  - Canterbury rebuild
  - Product assurance & MultiProof
  - Warnings and bans on building products
  - Building Code and handbooks
  - How the Building Code works
  - Geotechnical education
  - Online learning website
  - Introduction to medium-density housing

- Maintaining the Building Code

In this section

- How the Building Code works
- Maintaining the Building Code
- Different ways to comply with the Building Code
- Specific buildings
- Product assurance & MultiProof
- Introduction to medium-density housing
- Online learning website

Find Acceptable Solutions, Verification Methods, updates and technical guidance by Building Code clause.

- a
  General provisions
- b
  Stability
- c
  Protection from fire
- d
  Access
- e
  Moisture
- f
  Safety of users
- g
  Services and facilities
- h
  Energy efficiency

See everything in 'Building Code compliance'

- Managing buildings
  - Managing your BWoF
  - General information on building safety in earthquakes
  - Securing unreinforced masonry building parapets and facades
  - Managing earthquake-prone buildings
  - Managing buildings in an emergency
  - Change of use and alterations

About managing buildings

- Managing your BWoF (for buildings with specified systems)
- General information on building safety in earthquakes
- Managing earthquake-prone buildings
- Securing unreinforced masonry building parapets and facades
- Change of use, alterations and extension of life
- Managing buildings in an emergency

Specified systems and compliance schedules

If you own a building that contains a specified system such as a cable car, you must ensure they are effectively operated for the life of the building and in keeping with the council-issued compliance schedule.

- Inspections and maintenance of specified systems as a building owner
- Fines and penalties for offences relating to compliance schedules
- Compliance schedules

See everything in 'Managing buildings'

- Resolving problems

- Resolution options
- Building consent and sign-off
- Contracts
- Builds
- Designs
- Councils
- Clients

Resolving problems

- Resolution options
- Building consent and sign-off
- Contracts
- Builds
- Designs
- Councils
- Clients

Determinations

A determination is a binding decision made by MBIE providing a way of solving disputes or questions about the rules that apply to buildings, how buildings are used, building accessibility, and health and safety.

- Understanding determinations
- Applying for a determination
- Steps in the determination process
- Previous determinations

Weathertight Services

- Signs of a leaky home
- How to make a Weathertight Claim
- Resolving a Weathertight Claim

See everything in 'Resolving problems'

- COVID-19: Building and construction sector guidance
  - COVID-19 Health and Safety
  - Alert level 1 information for the building and construction sector
  - Alert level 2 information for the building and construction sector
  - Durability of materials on exposed construction sites
  - Inspection and maintenance of specified systems
  - Water system safety in reoccupied buildings
  - Essential business in the building and construction sector
  - Construction and trade sector information
  - Retailer and supplier information
  - Council and Professional Services information
  - Home and building owner and tenant information
  - COVID-19: Building and construction sector guidance

See everything in 'COVID-19: Building and construction sector guidance'

Anchor capacity at concrete slab floor edges

- Save

Care is needed to ensure appropriate anchors are used when they are located close to the edge of slabs, particularly when the edge of the slab is formed by using masonry header blocks.

Designers should check that minimum edge distances required can be achieved and that loads do not exceed the recommendations provided below.

This information was confirmed as current in February 2016. It originally appeared in Codewords newsletters prior to January 2014.

- Published on 1 April 2010
- **Of interest to** Builders, Designers, Building control officers
- 1st edition
- Print
- Share
- Save

This guidance is for professionals involved with drilled-in and cast-in concrete anchor connections between bottom plates of external timber framed walls and concrete slabs-on-ground in construction complying with NZS 3604.

Anchors, boxed concrete edges and masonry header blocks

Anchors are used to fix timber wall bottom plates to concrete floors to resist wall face loads as well as wall in-plane and uplift loads caused by wind and seismic actions (non-bracing applications). Anchors are also provided at the ends of wall bracing elements where they are required to resist in-plane wind and seismic loads by direct shear and tension to prevent wall bracing elements from sliding and over-turning (bracing applications).

Proprietary drilled-in anchors are commonly used in preference to cast-in anchors. Manufacturers of proprietary anchors must provide technical data relative to the intended application. Such data must include shear and tension strength with specified minimum concrete strength, minimum edge distance and minimum embedment of the anchor. The minimum concrete and timber edge distance and durability of the anchor are important factors to consider. For example, some anchors are not able to achieve the 50 year durability requirement when header blocks are used in the sea spray zone due to insufficient cover.

Cast-in and non-expanding drilled-in proprietary anchors can achieve specified characteristic strengths with boxed concrete slab edge construction. However, testing at BRANZ found that the uplift strengths of drilled-in expanding anchors near boxed edges can be up to one fifth lower than what is specified in some proprietary technical literature.

Testing at BRANZ found that the uplift load capacities of both drilled-in and cast-in anchors, when used with concrete masonry header block construction commonly used to form the perimeter of concrete slabs-on-ground, were up to one third lower than those specified in the proprietary technical literature.

Non-bracing applications (Clause 7.5.12 of NZS 3604)

We recommend that unless the manufacturer's specified characteristic strength has been determined by testing and evaluation (see Note 1) of the actual application (for example, at the slab edge with header block or boxed concrete slab edge construction), the spacing of anchors should be reduced from that specified in NZS 3604.

That is, anchors should be selected from proprietary technical literature on the basis that they meet the horizontal face load and uplift load requirements of NZS 3604 Clause 7.5.12.4 for 900mm or 1400mm spacing as appropriate, and be installed at recommended (reduced where appropriate) spacing as indicated in Table 1. We

also recommend that the spacing of cast-in anchors used with header block construction is reduced on a similar basis.

Bracing applications (proprietary system)

Where the specified characteristic strength of a drilled-in anchor has been determined by testing (see Note 1) of the actual application, the anchor strength and design bracing value for the wall bracing element can be used.

Where the characteristic strength of a drilled-in anchor (with both masonry header block and boxed concrete slab edge construction) has not been established by testing (see Note 1) of the actual application (for example, the characteristic strength has been determined by analysis or by test results remote from a concrete edge/masonry header block and analysis to come up with a characteristic (design) strength at a concrete edge), we recommend the anchor characteristic design strength (and hence the wall bracing rating) is down-rated until such time that application-specific supporting anchor test information is available.

Table 1: Suggested Anchor Spacing

Anchor types	NZS 3604 spacing (mm)	Recommended spacing (mm)
All drilled-in (post installed) anchors used with masonry header block construction	900	600
Cast-in anchors (bolts) used with masonry header block construction	1400	1100
R10 steel dowels used with masonry header block construction	900	750
Expanding type drilled-in anchors used with boxed concrete slab edge construction	900	600
Non-expanding type drilled-in anchors and cast-in R10 dowels with boxed concrete slab edge construction	900	900
Cast-in anchors (bolts) with boxed concrete slab edge construction	1400	1400

One way to do this is to down-rate the anchor characteristic strength at the edge of masonry header blocks by one third and at boxed concrete slab edges by one fifth. The down-rated characteristic design strengths (R) are:

R = 0.67.Qk kN (for masonry header blocks)

R = 0.80.Qk kN (for boxed concrete slab edge) (see Notes 2 and 3).

The maximum available wall bracing rating in bracing units per metre (see Note 4) is then determined as the lower of 10.R or the published wall bracing rating.

Notes:

- This means testing and evaluation by a recognised industry authority in accordance with NZS 3604 Clause 2.4.7.
- R is the down-rated anchor strength in kN.
- Qk is the characteristic strength specified in the technical literature for the edge distance intended to be obtained by test and/or analysis.
- As tested in accordance with the BRANZ P21 procedure.

The exception to this is where the wall manufacturer specifies a minimum anchor strength but this cannot be achieved. In this case seek specific advice from the wall bracing manufacturer on whether a down-rated anchor

can be used and, if so, what the amended wall bracing rating needs to be.

For example, consider an external wall bracing element of, say, 120 BUs/m on a masonry header block perimeter foundation. The anchor uplift strength has not been adequately verified for the intended application. The specified characteristic anchor uplift strength taken from the anchor manufacturer's technical literature is 15 kN. The down-rated capacity R = 0.67 x 15 = 10 kN. The available bracing rating is then limited to 10 x 10 = 100 BUs/m.

Another way to determine an anchor characteristic design strength is to calculate R when the anchor has passed the qualification test stipulated in ACI 355.2 (refer to NZS 3101: 2006 Clause 17.5.5). In this case the calculation method for cast-in anchors given in NZS 3101: 2006 Clause 17.5.6 may be used to determine a design value.

Internal bracing walls

Note that the above recommendations do not apply to internal wall anchors that are not in close proximity to a concrete slab edge. However care is required with internal wall anchors to ensure there is sufficient slab thickness to meet anchor embedment, hole depth and cover requirements specified in the technical literature. Slab thickening may be required in some applications.

All guidance related to B2 Durability

- Print

Navigation

- Getting started
- Projects & consents
- Building Code compliance
- Managing buildings
- Resolving problems
- COVID-19: Building and construction sector guidance

What are you looking for?

General

- About Building Performance
- Canterbury rebuild
- Practice Advisories
- Building CodeHub

Building Officials

-
- BCA competencies
-
- BCA register
- Technical reviews

News Updates

- 2020 Building Advisory Panel members announced
- Building for Climate Change programme gets underway
- What to consider when assessing a coastal inundation natural hazard
- See all News and updates

About Us

- Facebook
- LinkedIn
- Twitter

- YouTube
- Subscribe
- Contact us
- 
- 

- Privacy policy
- Disclaimer
- Copyright
-

Top

This information is published by the Ministry of Business, Innovation and Employment's Chief Executive. It is a general guide only and, if used, does not relieve any person of the obligation to consider any matter to which the information relates according to the circumstances of the particular case. Expert advice may be required in specific circumstances. Where this information relates to assisting people:

- with compliance with the Building Act, it is published under section 175 of the Building Act
- with a Weathertight Services claim, it is published under section 12 of the Weathertight Homes Resolution Services Act 2006.