

**Unit Standard 24164** <http://www.nzqa.govt.nz/nqfdocs/units/doc/24164.doc>

Title: **Demonstrate knowledge of the requirements for structural stability and durability in the New Zealand Building Regulations.**

Level **5** Credits **10**

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**Special notes**

- 1 Compliance with the following legislation, regulations, and codes is required:  
Building Act 2004  
The Building Code  
Building (Forms) Regulations 2004.
- 2 The scope of buildings assessed within this unit standard fall generally within the coverage of NZS 3604:1999 Timber Framed Buildings, NZS 4229:1999 Concrete masonry buildings not requiring specific engineering design, and NZS 3109:1997 Concrete construction <http://www.standards.co.nz/default.htm>. Please note other Standards are referenced in the Building Code Handbook available from <http://www.dbh.govt.nz/UserFiles/File/Publications/Building/Compliance-documents/handbook.pdf>.
- 3 Reference documents:  
The Building Code Compliance Documents  
<http://www.dbh.govt.nz/building-code-compliance-documents>;  
Building Officials – Building Act 2004 overview  
<http://www.dbh.govt.nz/bofficials-buiding-act-2004-overview>.
- 4 All activities must comply with: any policies, procedures, business protocols, and requirements of the organisation/s involved; and ethical codes and standards of relevant professional bodies.

## Element 1

Demonstrate knowledge of the objectives, functional requirements and performance measures of Clause B1 – structural stability in the Building Code.

Performance Criteria	Candidate	Assessor
1.1 The objectives of Clause B1 – structural stability are described in terms of the Building Code..	Describe in your own words the objectives and functional requirements of Clause B1 - structural stability in the Building Regulations 1992.	The description includes reference to safeguarding people from injury, loss of amenity and protection of other property from structural failure.
1.2 The functional requirements of Clause B1 – structural stability are described in terms of the Building Code.		
1.3 The performance measures of Clause B1 – structural stability are described in terms of the Building Code and applied to a given scenario.  Range may include but is not limited to – site conditions, geotechnical assessment, hazard zones, bearing capacity, imposed gravity loads, earth pressure, water and liquids, earthquake, wind, fire, differential movement, site vegetation, adverse effects due to insufficient separation from other buildings, creep and shrinkage, building separations, snow loads, roof pitch, imposed gravity loads, temperature, self weight.  <i>Continued on the following page....</i>	For any of the given scenarios:  Describe which acceptable solutions/standards would be applicable to the structural design to meet regulatory requirements and prevent (a) collapse, (b) loss of amenity, and (c) instability.  <b>Then</b>  Describe how you would design against these standards for these conditions. Your answer should include reference to at least eight elements from the performance standards of B1.	Includes description of the combination of loads likely to be experienced for the duration of the life of the building, including alterations.  The description should include reference to 3604 and/or 4229, and describe how they are used to meet the requirements of Clause B1.  Design response answer should include a minimum of eight from B1.3.3: <ul style="list-style-type: none"><li>• Self-weight</li><li>• Imposed gravity loads arising from use</li><li>• Temperature, earth pressure</li><li>• Water and other liquids</li><li>• Earthquake</li><li>• Snow</li><li>• Wind</li><li>• Fire</li><li>• Impact</li><li>• Explosion</li><li>• Reversing or fluctuating effects</li><li>• Differential movement</li><li>• Vegetation</li><li>• Adverse effects due to insufficient separation from other buildings</li><li>• Influence of equipment services, non-structural elements and contents</li><li>• Time dependent effects including creep and shrinkage</li><li>• Removal of support</li></ul>

**Element 1** *Continued from the previous page ....*

Describe the objectives, functional requirements and performance standards of Clause B1 on structural stability in the New Zealand Building Regulations.

Performance Criteria	Candidate	Assessor
	<p>Subsequent site visits reveal the presence of poor ground bearing capacity. Which of the elements from the performance standards of B1 would you need to consider? Include at least three in your answer.</p> <p>Under B1 what allowances should be made to the building design to ensure sound structural design? Your answer should include at least three elements.</p> <p>What needs to be considered in the demolition and the carrying out of site works under the performance standards B1? Your answer should include at least four items.</p>	<p>Poor ground bearing capacity answer to include at least three of the following:</p> <ul style="list-style-type: none"><li>• Self weight</li><li>• Proposed gravity loads</li><li>• Differential movement</li><li>• Earth pressure</li><li>• Earthquake</li></ul> <p>The answer should include three of the five elements from B1.3.4.</p> <ul style="list-style-type: none"><li>• Consequences of failure</li><li>• Intended use of the building</li><li>• Effects of uncertainties resulting from construction activities or the sequence in which construction activities occur</li><li>• Variations in the properties of materials and characteristics of site</li><li>• Accuracy of limitations inherent in the methods used to predict the stability of the building</li></ul> <p>Answer should include at least four elements from B1.3.5, B1.3.6 and B1.3.7:</p> <ul style="list-style-type: none"><li>• Demolition of buildings should be carried out in manner that avoids the likelihood of premature collapse of the building.</li><li>• Stability</li><li>• Effects on other property</li><li>• Changes in ground water level</li><li>• Water, weather and vegetation</li><li>• Ground loss and slumping</li></ul>

## Element 2

Demonstrate knowledge of the objective, functional requirements and performance measures of Clause B2 – structural durability in the Building Code.

Range: durability, hidden and non-hidden elements, linings, protective coatings, fittings.

Performance Criteria	Candidate	Assessor
2.1 The objective of Clause B2 – structural durability is described in terms of the Building Code.	Describe the objectives and functional requirements of Clause B2 - durability in the Building Regulations 1992.	The objective and functional requirement for B2 are described in accordance with the required durability that would be applicable to meet regulatory requirements for different building elements.
2.2 The functional requirements of Clause B2 – structural durability are described in terms of the Building Code.		
2.3 The performance measures relating to Clause B2 – structural durability are described in terms of the Building Code and applied to a given scenario.  Range includes but is not limited to time periods specified for the intended life of – building elements which provide structural stability, hidden and non-hidden elements, linings, protective coatings, fittings.	What is the intended life of the following building elements: <ul style="list-style-type: none"><li>• Structural concrete block wall</li><li>• Surface finish to concrete block wall</li><li>• Structural frame</li><li>• Bracing</li><li>• Exterior cladding</li><li>• Internal plumbing located in walls</li><li>• Internal plumbing located under concrete floors</li><li>• External spouting</li><li>• Solid fuel heater</li><li>• Internal linings</li><li>• Internal fittings</li><li>• Individual flashings</li><li>• Protective coatings</li></ul>	The answer includes 50 year, 15 year and 5 year intended life span for the listed building elements.  Answer should include the lifespan of all of the following building elements: <ul style="list-style-type: none"><li>• Structural concrete block wall</li><li>• Surface finish to concrete block wall</li><li>• Structural frame</li><li>• Bracing</li><li>• Exterior cladding</li><li>• Internal plumbing located in walls</li><li>• Internal plumbing located under concrete floors</li><li>• External spouting</li><li>• Solid fuel heater</li><li>• Internal linings</li><li>• Internal fittings</li><li>• Individual flashings</li><li>• Protective coatings</li></ul>