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**NEW
BUILDING
SERVICES BOARD
SUBSIDENCE
POLICY**

**ADVISORY
GUIDELINES**

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New Building Services Board Subsidence Policy

**ADVISORY GUIDELINES FOR
CONTRACTORS, SITE CLASSIFIERS, ENGINEERS AND
BUILDING CERTIFIERS**

**PART 1: GUIDELINE FOR INFORMATION TO BE PROVIDED BY
THE CONTRACTOR**

1.01 SITE LOCATION AND IDENTIFICATION

As part of the site investigation and the design, the site classifier and/or the engineer must take into consideration all of the following information provided by the contractor as a requirement of the Queensland Building Services Board Policy:

- (i) the property description and site address;
- (ii) plan and/or survey;
- (iii) contours of the site;
- (iv) The location of trees on the site and adjoining sites and any other impediments;
- (v) Location and identification of existing overland flow;
- (vi) The footprint location of the proposed building and indication of platform levels;
- (vii) Location of proposed cut and fill
- (viii) Land searches (where available) to establish impediments to the proper performance or function of the footing or slab system having regard to the site's location and condition. These searches may include flooding, underground infrastructure, easements, subdivisional fill and vegetation protection. The nature of the searches will always be dependent on the site's location and condition.

1.02 Note:

- a) The contractor may require that the site classifier and/or the designer obtain certain information listed above. In such instances, the site classifier and/or the designer must satisfy themselves that they have obtained all the relevant information necessary to complete the design *and* the requirements of the Queensland Building Services Board Policy. The relevant information should be noted in the engineer design certification.
- b) Where the owner has engaged the site classifier and/or engineer, the contractor must ensure that the engineer *certifies* that the information was obtained and taken into account for the purpose of site classification and/or design, in accordance with requirements of the Queensland Building Services Board Policy.



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PART 2: GUIDELINE FOR THE SITE CLASSIFIER

- 2.01 The classifier is the person or organisation responsible for classifying the site. Classification of a site should be carried out by a Registered Professional Engineer (Queensland) (RPEQ) or licensed Soil Tester under the *Queensland Building Services Authority Act 1991*.
- 2.02 As part of the site investigation the classifier must take into consideration the information provided by the contractor as detailed in Part 1. The site classifier shall visit the site and take soil samples for the purpose of laboratory testing where required in accordance with AS2870.

The site investigation and testing shall have regard to the following:

- (i) Sufficient number of exploration positions or bore holes within or in close proximity to the proposed footprint of the building and below final platform level to ensure the testing is representative of the site in accordance with Australian Standard AS2870.
 - (ii) Unless otherwise prescribed under AS2870, undertake a minimum of two exploration positions or bore holes as part of the site investigation and, where necessary, undertake any other additional investigation to determine the characteristics of the site in accordance with AS2870. Bore holes shall extend to a depth to refusal on rock or to the depth of zone of seasonal influence and below final platform level.
 - (iii) For sites containing clay soils, the site classification report shall state the *I_{ss}* (shrink swell index tests results(s) to AS 1289.7.1.1) and calculate the *Y_s* for the site in accordance with AS2870.
 - (iv) The method of testing shall be "shrinkage index tests" (in accordance with AS2870 and AS1289.7.1.1, AS1289.7.1.2 and AS1289.7.1.3) carried out on undisturbed core samples for clay sites rather than plastic index and linear shrinkage tests, unless a reliable correlation exists with shrinkage index.
 - (v) Where **abnormal site conditions** exist (as described in AS2870) on a site the classifier shall classify the site as Class "P" and also take into consideration the expected movement potential depending on the reactive soil characteristics i.e. A, S, M, H & E classifications.
- 2.03 The classification report shall record, or make reference to, all the data that is taken into consideration in determining the site classification. This record of data and data sources shall include the information provided by the contractor or his agent referred to in Part 1.
- 2.04 **Note:**
The contractor may require that the site classifier obtain information noted in Part 1. Where the contractor does not provide the relevant information, the site classifier and/or the designer must satisfy themselves that they have obtained all the relevant information necessary to complete the design and the requirements of the Queensland Building Services Board Policy. The relevant information obtained must be noted in the engineer design certification.



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Part 3: GUIDELINE FOR THE DESIGN ENGINEER

3.01 The designer is the person or organisation responsible for the design of footing systems for Class A, S, M, P, H or E sites associated with *residential building work*. The designer should be a Registered Professional Engineer in Queensland with appropriate experience in the design of footing systems for residential construction.

3.02 As part of the design the engineer must take into consideration;

(i) the information provided by the contractor as detailed in Part 1;

and

(ii) the information provided in the site classifiers report, which should include the site investigation, laboratory test, soil test report and any abnormal site conditions.

The engineer must be satisfied that sufficient investigation has been completed by the site classifier from all the information available. If insufficient information has been provided or the site conditions have altered since the completion of the site classification, the engineer may refer the matter back to the classifier for re-classification.

3.03 The engineer must provide the contractor with a report and design which shall include photographs of the site correctly identifying onsite and adjoining site topography prior to site specific earthworks.

3.04 The engineer is to comply with all the BCA and relevant Australian Standards including AS2870, AS3600 and AS3700.

3.05 Information on drawings shall be documented for reactive sites to include the site classification, selected footing system and any special sitework and site drainage required for the correct performance of the footing and slab system.

The design should typically include but is not limited to:

(i) the selected footing systems;

(ii) the means of diverting surface water away from the slab;

(iii) actual location of control joints in brick and masonry construction;

(iv) location of retaining walls;

(v) general requirements for articulation (flexible joints) in storm water and sanitary drainage depending on soil classification and requirements of AS3500; and

(vi) any site specific work.

Where **abnormal site conditions** exist on a site the engineer shall take into consideration the site conditions and design accordingly as per the requirements of a Class "P" classification and shall also take into consideration the expected movement potential depending on the reactive soil characteristics i.e. A, S, M, H & E classifications. The design of the footing systems on "P" sites shall use conforming engineering principles detailed in AS2780 and AS3600.



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Additional site specific requirements for H & E site classifications pursuant to *Clause 5.5 Additional Requirements for Class H and E Sites AS2870 1996* shall be included on the drawings.

Where a footing system is proposed as an alternative to that described in Part 3.2 of the BCA it must comply with *Performance Requirement 2.1 and Performance Requirement P2.2.3* in section 2 of the BCA. The engineer shall provide written confirmation of the validity of the design using engineering principles conforming to the requirements of the BCA and the relevant Australian Standards.

3.06 On completion of the design the engineer must certify that all of the above requirements have been considered and have been included in the design.

3.07 **Note:**

The contractor may require that the designer obtain certain information not supplied as noted in Part 1. Where the contractor does not provide the relevant information, the site classifier and/or the designer must satisfy themselves that they have obtained all relevant information necessary to complete the design and satisfy the requirements of the Queensland Building Services Board Policy. The relevant information obtained must be noted in the engineer's design certification.

Part 4: INSPECTION AND CERTIFICATION

- 4.01 To comply with the design and relevant standards the contractor must obtain the following certification:
- (i) Certified design drawings and specification obtained from the RPEQ prior to commencing site works and construction;
 - (ii) Certification by RPEQ or Building Certifier that the building platform, site drainage, and any other special site work comply with the certified design;
 - (iii) Certification by RPEQ or Building Certifier that appropriate compaction tests conforming to AS 3798 & AS1289 have been carried out by an RPEQ or licensed Soil Tester under the Queensland Building Services Authority Act 1991;
 - (iv) Certification by RPEQ or Building Certifier that the footings and slab system complies with the certified design and relevant Australian Standards. Certification must include confirmation that the original site classification has not altered. Any altered site conditions or construction requirements not in the certified design must comply with any instruction from the RPEQ or Building Certifier;
 - (v) Certification by RPEQ or Building Certifier and/or approval by a plumbing inspector (i.e. receive/sight plumbing inspectors inspection/design approval) that installed plumbing drainage and stormwater flexibility is in accordance with the relevant site classification, the certified design, and the relevant Australian Standard; and
 - (vi) Certification by RPEQ or Building Certifier that masonry articulation, site drainage requirements, roof storm water, and the location of retaining walls and any other special site work has been completed as specified



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MINIMISING THE RISK OF SUBSIDENCE

A FACT SHEET FOR CONTRACTORS AND HOME OWNERS

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This Fact Sheet provides advice to contractors and home owners about their responsibilities and obligations under the Queensland Building Services Board Policy regarding subsidence. The policy applies to residential construction work performed under contracts (including Preliminary Agreements) entered into from 1 September 2004.

For contractors, meeting these obligations will help protect them from a BSA direction to rectify defective building work and liability under BSA's Home Warranty Insurance Policy. For home owners, compliance with the requirements outlined in this Fact Sheet will help to minimise the risk of footing failure and movement in their home.

NOTE: Failure by contractors to adhere to the minimum requirements of the Queensland Building Services Board Policy may prejudice their ability to claim no fault subsidence under BSA's Home Warranty Insurance Policy. Failure by home owners to meet their responsibility to appropriately maintain foundations and footings may prejudice their ability to make a claim under their Home Warranty Insurance Policy.

THE BUILDING CONTRACTOR'S RESPONSIBILITY:

Before entering the contract

Foundations data

Under the *Domestic Building Contracts Act 2000*, where domestic building work involves the "...construction or alteration of footings, or a concrete slab, for a building", or where the work "...may adversely affect the footings of a building or a concrete slab forming part of a building", the building contractor must obtain and give the home owner a copy of the *foundations data* appropriate for the building site (including, for example, soil tests and contour surveys) before the contract is drawn up and signed. The foundations data must be incorporated in the contract and copies of the relevant documents must be provided by the building contractor to the home owner upon payment of the costs incurred by the building contractor in obtaining the foundations data. The building contractor is exempt from this responsibility to provide the foundations data to the home owner if:

- a) the data is given to the building contractor by the building owner; or
- b) the building contractor reasonably believes the building owner already has a copy of the data.

Note: Where the owner has engaged a site classifier and/or engineer to obtain the foundation data, the contractor must ensure that the engineer certifies that the information was obtained and taken into account for the purpose of site classification and/or design, in accordance with the requirements of the Queensland Building Services Board Policy .



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Site specific requirements

The building contractor shall ensure that all the site specific requirements detailed by the design engineer for the on going site maintenance necessary for the performance of the footing and slab system form part of the contract.

Site specific requirements detailed by the design engineer which may not be covered in the original contract may include such things as retaining walls, concrete paths to narrow boundary clearance, additional site drainage requirements, etc.

Certified design drawings and specification must be obtained from a Registered Professional Engineer in Queensland (RPEQ) prior to commencing site works and construction.

During construction

The contractor must obtain the following certifications during construction:

- Certification by a RPEQ or Building Certifier that the building platform, site drainage, and any other special site work comply with the certified design.
- Certification by a RPEQ or Building Certifier that appropriate compaction tests conforming to AS3798 & AS1289 have been carried out by a RPEQ or Soil Tester licensed under the *Queensland Building Services Authority Act 1991*.
- Certification by a RPEQ or Building Certifier that the footings and slab construction comply with the certified design and relevant Australian Standards. Certification must include confirmation that the original site classification has not altered. Any altered site conditions or construction requirements not in the certified design must comply with any instruction from the RPEQ or Building Certifier.
- Certification by a RPEQ or Building Certifier and/or approved by a plumbing inspector (i.e. receive/sight plumbing inspector's inspection/design approval) that installed plumbing, drainage and stormwater flexibility is in accordance with the relevant site classification, the certified design, and the relevant Australian Standard.
- The contractor must obtain and provide the home owner with certification by a RPEQ or Building Certifier that masonry articulation, site drainage requirements, roof storm water, and the location of retaining walls, together with any other special site work, has been completed as specified.

Note:

There is a general requirement under the *Domestic Building Contracts Act 2000* for a building contractor to provide the home owner with a copy of any *certificates of inspection* as soon as practicable after the building contractor receives the documents. The building contractor is **not** entitled to hold the certificates of inspection and hand them all to the home owner at the one time at the completion of the contracted work (i.e. at handover).

At completion/handover

At handover the building contractor must provide the home owner with documented evidence of the relevant certifications listed above in accordance with the Queensland Building Services Board Policy. The contractor must give copies of the *certificates of inspection* to the home owner as soon as practicable after the contractor receives them.



The building contractor must ensure that on completion the home owner is notified in writing of any additional site specific requirements for on going site maintenance identified during construction. In addition, it is recommended that the contractor also provide the home owner with a copy of the latest edition of the CSIRO Information Sheet **BTF 18 Foundation and Footing Performance: A Home Owner's Guide**.

THE HOME OWNER'S RESPONSIBILITY:

Before entering the contract

Before signing the contract the home owner should ensure that appropriate foundations data has been obtained and copied to them by the contractor for all domestic building work involving the "...construction or alteration of footings, or a concrete slab, for a building", or where the work "...may adversely affect the footings of a building or a concrete slab forming part of a building".

During construction

The home owner should check with the building contractor to ensure that they have received copies of all certificates of inspection issued to the building contractor during construction (**Note:** For the construction of an entire home, these certificates should include those issued by a Building Certifier at the footing, slab, frame and final stages of construction).

At handover and after completion

At handover, the home owner should check to ensure that they have received all necessary certification and details of any site specific requirements not included in the original contract.

It is the responsibility of the home owner to ensure that any additional works carried out *after* the completion of the original contract satisfy the intent of the design engineer's original specifications, including the site specific requirements referred to above. It is *not* the responsibility of the building contractor to specify or supervise any changes to the site after completion and hand over.

After handover, it is the responsibility of the home owner to maintain the site and ensure that they comply with the following minimum requirements necessary for the performance of the building's footing and slab system:

1. Maintain the site drainage at all times.
2. Do not alter the site drainage provided by the builder. However, if changes to the site drainage are required due to additional work after handover (e.g. installation of a swimming pool, pergola, landscaping, etc.), the site drainage should ensure that water will not pond adjacent to the footings and will be directed away from the building. Care should also be taken to avoid directing water flow to adjoining properties.
3. On reactive clay sites (type M, H, E classifications), where possible, avoid placing gardens next to the building or installing garden edging, gravel pavements, etc. which may cause water retention and/or promote higher variable moisture conditions around the building.
4. Avoid installing sprinkler systems next to dwellings on highly and extremely reactive sites (Type H, E Classifications). Adequate and consistent watering is recommended.
Over-watering should be avoided.

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5. Do not plant trees at a distance within their mature height from the building in accordance with the requirements for the relevant site classification. (*Refer to the CSIRO Information Sheet mentioned above*).
6. Maintain the plumbing, drainage and stormwater systems by immediately carrying out repairs to leakages/breakages when observed (usually displayed by seepage and/or greener lawns etc. or when minor damage/cracking up to or exceeding 3-5mm).

By observing these requirements, movement and damage which may be expected in the life of the building can be minimised and maintained within normal performance requirements. (*Acceptable performance criteria are referred to in the CSIRO Information Sheet*).

When undertaking to carry out site work near the house which was not included in the original design, the home owner should contact the original design engineer or an appropriate qualified person to obtain advice regarding the impact of such alterations on the performance of the footing and slab system.

For further information in relation to the Australian Standards for building design and performance, including home owner maintenance requirements for residential homes on reactive clay sites, home owners should **refer to the CSIRO Information Sheet mentioned above and the BSA web site at www.bsa.qld.gov.au**

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