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10 Dec 2007

See **Distribution**

Dear Sir/Madam

AMENDMENTS TO THE BUILDING CONTROL REGULATIONS

The Building Control Regulations is being amended to accommodate changes in the Building Control (Amendment) Act 2007. Key changes in the proposed amendment to the Building Control Regulations are listed in Annex A. The Building and Construction Authority invites you to comment on these key changes.

2 Please return your response as soon as possible, and in any event not later than Sun, 30 Dec 2007, either:

by post to:

Mr Choong Teck Min
Building Engineering Division
Building and Construction Authority
#05-00 Tower Block MND Complex
5 Maxwell Road
Singapore 069110

or by e-mail to:

choong_teck_min@bca.gov.sg

3 I would appreciate it if you could bring the contents of this circular to your members' attention. Thank you.

Yours faithfully,



ONG SEE HO
COMMISSIONER OF BUILDING CONTROL

ANNEX A

KEY CHANGES IN THE PROPOSED BUILDING CONTROL (AMENDMENT) REGULATIONS 2008

Regulation (<i>changes are shown in <u>red+underlined</u></i>)	Explanatory note
<p>Particulars to be shown on detailed structural plans and design calculations</p> <p>9 (1) Without prejudice to regulations 6 and 7, all detailed structural plans shall —</p> <ul style="list-style-type: none">(a) be in accordance with the provisions of the Act and these Regulations and any other requirement of the Commissioner of Building Control;(b) be signed by the qualified person who prepared the detailed structural plans and design calculations, and by an accredited checker unless the building works are of a type in respect of which the certificate of an accredited checker referred to in section <u>5(2)(d)(i)</u> of the Act is not required under regulation 12;(c) bear a certificate from the qualified person who prepared and signed the structural plans on the first and last sheets of the plans stating that he has taken into consideration the loads imposed by all the building works as shown in the building plans or any amendments thereto;(d) bear a certificate by an accredited checker referred to in section <u>5(2)(d)(i)</u> of the Act on the first and last sheets of the plans, unless the building works are of a type in respect of which such a certificate is not required under regulation 12;(e) clearly indicate on the respective area of every floor plan, the imposed load for which the floor system or part thereof has been designed;(f) show the type or types of foundation to be used;(g) contain the specifications of the materials to be used; and(h) indicate the fixing <u>and framing details</u> of <u>external cladding</u> and <u>safety barrier against falling from a height</u> (if applicable). <p>(2) The design calculations shall be prepared in such format and manner as the Commissioner of Building Control may require and shall —</p> <ul style="list-style-type: none">(a) contain a contents page;(b) be signed and endorsed by the qualified person who prepared the detailed structural plans and design calculations, and by an accredited checker, unless the building works are of a type in respect of which the certificate of an accredited checker referred to in	<p>Include fixing details for cladding, and safety barriers, and elements of tunnels and temporary earth retaining structures.</p>

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<p>section <u>5(2)(d)(i)</u> of the Act is not required under regulation 12;</p> <p>(c) bear a certificate by the qualified person who prepared the detailed structural plans and design calculations on the first and last sheets of the calculations stating that, to the best of his knowledge and belief, the design calculations have been prepared in accordance with these Regulations and that he is the person who prepared the design calculations;</p> <p>(d) state on the first page of the certificate of the qualified person referred to in sub-paragraph (c) the number of pages per book and a numbering of every page in the book;</p> <p>(e) contain a Design Information Sheet giving a summary of the design information including, where applicable, the design loads, codes of practice, assumptions, soil investigation report, foundation system, wind load and other information relevant to the design in question;</p> <p>(f) contain a Structural Summary Sheet showing the structural system, the form of the structure, the key structural elements, the provision for overall stability and structural analysis;</p> <p>(g) contain a Grouping of Structural Elements Sheet containing a list of designed structural elements that are similar;</p> <p>(h) contain an Analysis and Design of Structural Elements Sheet showing the detailed design and calculations of —</p> <p>(i) the foundation;</p> <p>(ii) the shearwall, corewall and all structural elements resisting horizontal forces;</p> <p>(iii) the column and all vertical load bearing structural elements;</p> <p>(iv) the transfer beams or plates, cantilevers, prestressed beams and flat slabs;</p> <p>(v) the space truss and portal frame;</p> <p><u>(vi) shaft or tunnel and connections, or cavern structure;</u></p> <p><u>(vii) the retaining walls, and supporting structures;</u> and</p> <p><u>(viii) the overall structural system under wind loads, if applicable.</u></p>	
<p>Particulars to be shown on site formation plans and pile layout plans</p> <p>10 (2) The pile layout plans shall show —</p> <p>(a) the types of piles and the specification of materials to be used;</p> <p>(b) the location of piles and <u>site investigation boreholes;</u></p> <p>(c) the estimated pile penetration depth <u>for each design</u></p>	<p>Include details related to piling works.</p>

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<p style="text-align: center;"><u>zone;</u></p> <p>(d) <u>the minimum embedded pile length into competent stratum, where applicable;</u></p> <p>(e) <u>the unit skin friction and unit end bearing resistance for pile designs;</u></p> <p>(f) the allowable pile bearing capacity before and after deduction of negative skin friction (if applicable) and details of pile joints;</p> <p>(g) <u>the allowable total and differential foundation settlement;</u></p> <p>(h) <u>the allowable vibration limit; and</u></p> <p>(i) the sectional details of piles and number and type of pile load tests <u>and the location of ultimate pile load tests.</u></p>	
<p>21 Permit to carry out structural works</p> <p>(1) An application for a permit to carry out any structural works (including <u>piling or site formation works or</u> the demolition of a building) under section <u>6(1)</u> of the Act shall be in such form as the Commissioner of Building Control may require.</p> <p>(2) Where any part of a building under construction or undergoing alteration is to be demolished, no separate permit for the demolition works shall be required.</p> <p><u>(3) For the purposes of section 6(2)(e) of the Act, an application for a permit to carry out demolition of a building shall be accompanied by –</u></p> <p>(a) <u>a method statement detailing how the demolition works are to be carried out; and</u></p> <p>(b) <u>an impact assessment report on surrounding buildings.</u></p> <p><u>(4) For the purposes of section 6(2)(e) of the Act, an application for a permit to carry out piling or site formation works shall be accompanied by –</u></p> <p>(a) <u>an impact assessment report on surrounding buildings; and</u></p> <p>(b) <u>a notification specifying the date of commencement of piling or site formation works.</u></p>	<p>These are existing guidelines or permit conditions</p>
<p>22 Site records</p> <p>For the purposes of section <u>9(4)(d)</u> of the Act, the qualified person appointed under section <u>8(1)(b) or 11(1)(d)(ii)</u> of the Act to supervise any building works shall keep and maintain at the premises on which the building works are carried out the following books and records:</p> <p>(a) <u>for major building works,</u> a schedule of the structural works to be carried out every 3 months, specifying, in particular, <u>the excavation, installation, testing, removal,</u> construction or fabrication of the key structural elements in the structural</p>	<p>Requirement for the quarterly structural reports will no longer apply to non-AC submissions.</p> <p>New records required in respect of works relating to temporary</p>

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<p>works;</p> <p>(b) a record of attendance of the qualified person and the site supervisor;</p> <p>(c) a site record book;</p> <p>(d) a copy of the approved structural plans including all amendments thereto;</p> <p>(e) a record of all the departures or deviations relating to the structural elements of the building works as provided by the qualified person appointed under section <u>8(1)(a) or 11(1)(d)(i)</u> of the Act;</p> <p>(f) a record of inspection and approval for concreting;</p> <p>(g) a record of repairs to defective structural works;</p> <p>(h) <u>a site investigation</u> report;</p> <p>(i) a record of piles installed;</p> <p>(j) a record of pile load tests;</p> <p>(k) a record of tests on cement, sand and aggregates;</p> <p>(l) a record of concrete cube tests;</p> <p>(m) a record of tests on steel reinforcements;</p> <p>(n) a record of tests on prestressing steel;</p> <p>(o) a record of prestressing works;</p> <p>(p) a record of tests on welding works <u>and welders' certificate;</u></p> <p><u>(q) a record of ground anchor, soil nails or rock bolt tests, and where applicable, stressing loads;</u></p> <p><u>(r) a record of inspection and approval at each excavation, installation, construction and removal stage;</u></p> <p><u>(s) a record of inspection and approval for strut, soil nails, rock bolts, or anchor during installation and removal;</u></p> <p><u>(t) a record of instrumentation and monitoring reports;</u></p> <p><u>(u) a record of actions taken where monitoring results of earth-retaining wall deflection or adjacent ground settlements exceed the allowable limits or where damages occur in the neighbouring properties;</u></p> <p><u>(v) a record and test results of earth or ground improvement or strengthening works;</u></p> <p><u>(w) a record of tests on fixings of external claddings and safety barriers against falling from a height; and</u></p> <p>(x) a record of all other tests of or in connection with the building works.</p>	<p>earth retaining structures, claddings and safety barriers.</p>
<p><u>Site supervisors</u></p> <p><u>24A</u> <u>For the purposes of section 10(3)(b) of the Act, site supervisors shall be accredited by the Joint Accreditation Committee of the Institution of Engineers Singapore (IES) and the Association of Consulting Engineers Singapore (ACES).</u></p>	<p>The accreditation of qualified site supervisors will eventually be carried out by the IES/ACES joint committee.</p>

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<p>31 Site investigation</p> <p>(1) Where foundations, <u>underground building works, site formation</u> or related earthworks <u>including excavation work</u>, are proposed to be constructed or carried out on any premises, <u>the qualified person appointed under section 8(1)(a) or 11(1)(d)(i) of the Act shall carry out or cause to be carried out site investigation including field and laboratory works and tests, in accordance to the codes of practice and standards</u> an investigation of the site in order to <u>acquire knowledge of, and</u> establish the type and character of the ground <u>and groundwater conditions</u> on which the foundation, <u>underground building works, site formation</u> or earthworks are to be constructed or carried out, <u>and that affect the design and construction of such works and changes in the ground conditions</u>.</p> <p>(2) <u>Whenever site investigation is carried out in respect of the building works, the qualified person appointed under section 8(1)(a) or 11(1)(d)(i) of the Act shall submit the site investigation report to the Commissioner of Building Control, and in such form which may be specified by the Commissioner of Building Control.</u></p> <p>(3) <u>All site investigation reports shall contain field and laboratory data and results, and shall be accompanied by a certificate, in a form as the Commissioner of Building Control may require, from an appropriate professional engineer, who has carried out or supervised the site investigation and verified the correctness and accuracy of the data and results for the site investigation undertaken under paragraph (1).</u></p>	<p>New provisions to ensure adequate soil investigation (applicable to all foundations, basements, other substructures, TERS etc).</p>
<p><u>31A Pre-construction survey</u></p> <p>(1) <u>Where demolition of a building, excavation or piling or foundation, tunnelling or site formation works are to be constructed or carried out, the builder shall, before commencing such works, carry out a pre-construction survey to establish the condition of existing buildings and structures adjacent or otherwise in close proximity to the building works.</u></p> <p>(2) <u>Before the building work commences, the builder shall give to each owner a copy of the pre-construction survey report which has been carried out on his property.</u></p> <p>(3) <u>The builder shall keep at the site a complete set of all pre-construction survey reports.</u></p>	<p>New provisions to ensure pre-construction survey is carried out for critical works. This is currently in our conditions of permit.</p>

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<p><u>Impact assessment report</u></p> <p>31B (1) <u>Where demolition of a building, excavation or piling or foundation, tunnelling or site formation works are to be constructed or carried out, impact assessment investigation shall be undertaken by the qualified person appointed under section 8(1)(a) or 11(1)(d)(i) of the Act.</u></p> <p>(2) <u>The report of the impact assessment investigation undertaken under paragraph (1) shall contain investigation results, assessments, and recommendations on the measures to be taken in connection with the construction or carrying out of demolition of a building, excavation or piling or foundation works, tunnelling works, or site formation works so as to prevent any settlement or other movement which may impair the stability of or cause damage to the whole or part of any premises or building adjacent or in otherwise close proximity to the building works.</u></p> <p>(3) <u>Whenever an impact assessment investigation undertaken under paragraph (1) is carried out in respect of the building works, the qualified person appointed under section 8(1)(a) or 11(1)(d)(i) of the Act shall submit such report to the Commissioner of Building Control, and in such form which may be specified by the Commissioner of Building Control.</u></p>	<p>New provision to require impact assessment to be considered as part of the overall site investigation.</p>
<p><u>Formation of new slope or embankment</u></p> <p>33 <u>Where the building works result in the formation of a new slope or embankment, the qualified person appointed under section 8(1)(a) or 11(1)(d)(i) of the Act shall determine and ascertain the integrity and stability of the new slope or embankment; and where appropriate, provide or cause to be provided a retaining wall or other earth-retaining structure, or protective measures to stabilise the new slope or embankment.</u></p>	<p>Redrafting of existing provision to make clearer the requirement.</p>
<p><u>Drainage of excavations</u></p> <p>35 (1) <u>The builder shall provide or cause to be provided, and maintain proper and adequate drainage for all excavations</u> as long as the excavations remain.</p> <p>(2) Where any lowering of the water table is envisaged, the <u>builder</u> shall carry out or cause to be carried out adequate provisions to ensure that the lowering of the water table will not cause <u>any damage to surrounding structures, roads and other properties.</u></p>	<p>Redrafting of existing provision to make clearer the requirement.</p>
<p><u>Protection of foundation or excavations</u></p> <p>36 (1) <u>The builder shall provide or cause to be provided earth-retaining structures to protect the sides of all foundations or excavations for any building works</u> so as to prevent any settlement or other movement which may impair the stability</p>	<p>Redrafting of existing provision to make clearer the requirement.</p>

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<p>of or cause damage to the whole or part of any adjoining premises or building.</p> <p>(2) <u>The qualified person appointed under section 8(1)(b) or 11(1)(d)(ii) of the Act shall inspect regularly the excavations and earth-retaining structures referred to in paragraph (1) and the builder shall maintain their safe condition at all times as long as the excavations remain.</u></p>	
<p>Instrumentation and monitoring results</p> <p>37 (1) <u>Where required,</u> the qualified person appointed under section <u>8(1)(b) or 11(1)(d)(ii)</u> of the Act shall provide to the Commissioner of Building Control <u>the results of any instrumentation monitoring carried out on site.</u></p> <p>(2) <u>The qualified person appointed under section 8(1)(b) or 11(1)(d)(ii) of the Act shall regularly inspect all instrumentation for monitoring, including any settlement or movement or deformation of the ground in relation to which the building works are carried out and the structure of adjacent properties and analyse the results thereof.</u></p> <p>(3) <u>The qualified person appointed under section 8(1)(b) or 11(1)(d)(ii) of the Act shall report to the Commissioner of Building Control periodically the instrumentation monitoring results.</u></p> <p>(4) <u>When any ground movement exceeds the allowable limits, the developer, the qualified person appointed under section 8(1)(b) or 11(1)(d)(ii) and the builder shall notify the Commissioner of Building Control as soon as practicable regarding such movement.</u></p> <p>(5) <u>Where applicable, the builder shall provide or cause to be provided protective measures for the structures of adjacent properties so that their safe condition is maintained at all times as long as the excavations remain.</u></p> <p>(6) <u>The builder shall –</u> (a) <u>put in place protective measures to prevent damage to the instruments, and</u> (b) <u>notify the qualified person appointed under section 8(1)(b) or 11(1)(d)(ii) of the Act of any damaged instruments as soon as practicable.</u></p>	<p>New provisions for QP to report to CBC on instrumentation monitoring results, and for the developer, QP and builder to report to CBC when allowable limits have been breached.</p> <p>Builder has the responsibility to protect instruments and notify QP if they are damaged.</p> <p>These are existing guidelines or permit conditions.</p>
<p>Penalty</p> <p>50 (1) <u>Any qualified person, builder, site supervisor or developer,</u> as the case may be, who contravenes regulation 25, 26, 29 (1) or (2), 30 (1), (2), (3), (4), (5) or (6), 31 (1) or (2), <u>31A (1), (2) or (3), 31B (1), (2) or (3),</u> 32, 33, 35 (1) or (2), 36 (1)</p>	<p>New provision to make any person (besides the QP, builder, site</p>

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<p>or (2), 37 <u>(1), (2), (3), (4), (5) or (6)</u>, 38 (3), 40 (1) or (2), 44, 45 (1) or 46 shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$5,000 or to imprisonment for a term not exceeding 6 months or to both.</p> <p><u>(2) Any person who contravenes or fails to comply with regulation 31(3), 38 (1), or 39 (1) or (2) shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$5,000 or to imprisonment for a term not exceeding 6 months or to both.</u></p>	<p>supervisor or developer) such as professional engineer, concrete supplier (for using prohibited materials) or test laboratory accountable if they do not comply with the requirements.</p>
<p><u>FIRST SCHEDULE</u></p> <p style="text-align: right;"><i>Regulations 3A</i></p> <p>BUILDING WORKS WHICH DO NOT REQUIRE APPROVAL OF PLANS OF BUILDING WORKS OR A PERMIT TO CARRY OUT BUILDING WORKS</p> <p>1. Building works carried out for or in connection with —</p> <p>(a) any retaining wall, or earth retaining structure, with a visible height of not more than 1,000 mm;</p> <p><u>(a1) site formation works involving any excavation or filling not exceeding 1,500mm in depth or height;</u></p> <p><u>(a2) any trenches for the purpose of laying cables or pipes not exceeding 1,500mm in diameter;</u></p>	<p>To make clearer the existing requirement.</p>
<p><u>FOURTH SCHEDULE</u></p> <p style="text-align: right;"><i>Regulation 12</i></p> <p><u>MINOR BUILDING WORKS (NOT REQUIRING CERTIFICATE OF ACCREDITED CHECKER)</u></p> <p><u>1. Building works for or in connection with -</u></p> <p>(a) detached houses, semi-detached houses, terraced or linked houses for residential purposes not exceeding 3 storeys;</p> <p>(b) detached substations not exceeding 2 storeys, detached bin centres, detached guard houses <u>and the like;</u></p> <p>(c) retaining walls <u>and earth stabilising structures</u> not exceeding a visible height of 4m;</p> <p><u>(d) shophouses not exceeding 2 storeys (where attic or basement floor exceeding an area of 100 m² shall be considered as a storey);</u></p> <p><u>(e) single storey buildings, sheds and the like where the span of beams or roof trusses is not more than 6m and the floor area is not more than 150 m²;</u></p> <p><u>(f) underground tank, swimming pool and the like not exceeding a depth of 4m;</u></p> <p><u>(g) single storey covered walkway, car parking shed and the like where the span of the beams or roof trusses is not more than 6m or the span of any cantilever is not more than 3m;</u></p>	<p>To make clear additional items of works that can be considered as minor building works which do not require AC certificate – these are collated from past advice we had given to queries.</p>

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<p>(h) <u>box culverts, canal crossings or link bridges with spans not exceeding 5m;</u></p> <p>(i) <u>chimneys, lighting masts and the like not exceeding 20m in height;</u></p> <p>(j) <u>foundation for above ground tank structure where the length, width or diameter of the foundation does not exceed 6m;</u></p> <p>(k) <u>foundation for gantry cranes with capacity not exceeding 3 tonnes and the span between supports not exceeding 6m in any direction.</u></p>																					
<p><u>FIFTH SCHEDULE</u></p> <p style="text-align: right;"><i>Regulation 24</i></p> <p><u>PART I</u></p> <p><u>SITE SUPERVISOR OR TEAM OF SITE SUPERVISOR REQUIRED FOR FULL-TIME SUPERVISION OF STRUCTURAL WORKS IN LARGE BUILDING WORKS</u></p> <table border="1" data-bbox="300 952 1145 1601"> <thead> <tr> <th><i><u>First column</u></i></th> <th><i><u>Second column</u></i></th> </tr> </thead> <tbody> <tr> <td><i><u>Value of building works</u></i></td> <td><i><u>Minimum number of site supervisors for full-time supervision of structural works</u></i></td> </tr> <tr> <td><u>More than \$5 million but not exceeding \$10 million</u></td> <td><u>One (1) resident technical officer</u></td> </tr> <tr> <td><u>More than \$10 million but not exceeding \$20 million</u></td> <td><u>One (1) resident engineer</u></td> </tr> <tr> <td><u>More than \$20 million but not exceeding \$50 million</u></td> <td><u>One (1) resident engineer and one (1) resident technical officer</u></td> </tr> <tr> <td><u>More than \$50 million but not exceeding \$100 million</u></td> <td><u>One (1) resident engineer and two (2) resident technical officer</u></td> </tr> <tr> <td><u>More than \$100 million</u></td> <td><u>Two (2) resident engineer and three (3) resident technical officer</u></td> </tr> </tbody> </table> <p><u>PART II</u></p> <p><u>SITE SUPERVISOR REQUIRED FOR IMMEDIATE SUPERVISION OF STRUCTURAL WORKS IN SMALL-SCALE BUILDING WORKS</u></p> <table border="1" data-bbox="300 1863 1145 2076"> <thead> <tr> <th><i><u>First column</u></i></th> <th><i><u>Second column</u></i></th> </tr> </thead> <tbody> <tr> <td><i><u>Value of building works</u></i></td> <td><i><u>Site supervisor</u></i></td> </tr> <tr> <td><u>Up to \$5 million</u></td> <td><u>Appropriate qualified person or resident engineer or resident technical.</u></td> </tr> </tbody> </table>	<i><u>First column</u></i>	<i><u>Second column</u></i>	<i><u>Value of building works</u></i>	<i><u>Minimum number of site supervisors for full-time supervision of structural works</u></i>	<u>More than \$5 million but not exceeding \$10 million</u>	<u>One (1) resident technical officer</u>	<u>More than \$10 million but not exceeding \$20 million</u>	<u>One (1) resident engineer</u>	<u>More than \$20 million but not exceeding \$50 million</u>	<u>One (1) resident engineer and one (1) resident technical officer</u>	<u>More than \$50 million but not exceeding \$100 million</u>	<u>One (1) resident engineer and two (2) resident technical officer</u>	<u>More than \$100 million</u>	<u>Two (2) resident engineer and three (3) resident technical officer</u>	<i><u>First column</u></i>	<i><u>Second column</u></i>	<i><u>Value of building works</u></i>	<i><u>Site supervisor</u></i>	<u>Up to \$5 million</u>	<u>Appropriate qualified person or resident engineer or resident technical.</u>	<p>New table to reflect the composition of supervision team.</p>
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<p><u>SEVENTH</u> SCHEDULE</p> <p style="text-align: right;"><i>Regulation 38</i></p> <p>PROHIBITED CONSTRUCTION MATERIALS</p> <p>The following materials shall not be used in any building works:</p> <ul style="list-style-type: none">(a) high alumina cement;(b) aggregates which have potential for alkali-silica <u>or alkali-carbonate</u> reaction for concrete works, including all other volcanic rocks or aggregates deriving from volcanic rocks;(c) admixtures containing calcium chloride; and(d) reflective glass with a daylight reflectance exceeding 20% on any external surface of any window, door, wall or roof of a building.	<p>Inclusion of alkali-carbonate reactive materials as prohibited materials in view of the fact that aggregates may be coming from other distant sources.</p>

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