BCA BC 15.0.3 Vol 11

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14 Jun 02

See Distribution List

Dear Sir,

NEW MINIMUM BUILDABILITY SCORE FROM 1st AUGUST 2002

From 1st August 2002, the minimum buildability score for each category of building/development as set out in the Code of Practice on Buildable Design (December 2000) will be raised. The new minimum buildability scores will apply to all building/development works with gross floor area (GFA) of 5,000 m^2 and above which are submitted to URA for planning approval on or after 1st August 2002 . The new minimum buildability scores are shown in the following table:

Category of Building/Development	**Minimum Buildability Score**	
	5,000 m^2 ≤ GFA < 25,000 m^2	**GFA ≥ 25,000 m^2**
Residential (landed)	54	57
Residential (non-landed)	60	63
Commercial	67	70
Industrial	69	72
Institutional and others	66	69

2 For building/development works which are submitted to URA for planning permission on or after 1st Jan 2001 but before 1st August 2002, the minimum buildability scores stipulated in the Code of Practice on Buildable Design (December 2000) will still apply.

3. In view of the new minimum buildability scores, the standard forms for building and structural plan approvals and application for temporary occupation permit/certificate of statutory completion will be revised. The revised forms can be downloaded from BCA web site www.bca.gov.sg from 1st July 2002. Please use the new forms with effect from 1st August 2002.

4. Apart from the revised buildability scores, some other changes will be made to the Code of Practice on Buildable Design (December 2000). The major changes are highlighted in Annex A. The revised buildability scores and these changes will be incorporated in the next edition of the Code, which will be released in July 2002.

5. Kindly disseminate the content of this circular to your members. Thank you.

Yours faithfully

[signed on original]
YAP GUAN HWA
MANAGER
BUILDING PLAN DEPARTMENT
for COMMISSIONER OF BUIDLING CONTROL

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Annex A

The main changes in the Code of Practice on Buildable Design (June 2002) are highlighted as follows:

1. Structural systems

1.1 A new labour saving index of 0.4 is given for cast in-situ floor areas with transfer beams (please refer to Table 1 attached).

2. Wall systems

2.1 A new labour saving index of 0.75 and 0.55 is given for cast in-situ RC wall with no finishes and skim coat & paint finish respectively (please refer to Table 2 attached)

2.2 The labour saving indices for PC formwork are revised (please refer to Table 2 attached).

3. Other Buildable Design Features

3.1 Buildability points for standard door structural openings (in 2M or 3M) are included (please refer to Table 3 attached).

3.2 Pre-assembled/metal staircase is placed as a separate category from standard precast staircase (please refer to Table 3 attached).

3.3 The percentage of coverage is changed to:

(i) $\geq$ 65% to < 80% instead of >65% to $\leq$ 80%
(ii) $\geq$ 80% instead of > 80%

Please note that the percentage of coverage should be based on total floor area or on total number of components such as columns, beams, doors, windows etc.

Table 1 Structural Systems - Ss Value

Column/beam system \ Slab/beam system		Cast-in-place slab on steel decking	Precast concrete slab	Cast in-situ slab				
				Flat plate	Flat slab	slab/beam[3] > 10		slab/beam ≤ 10
						1-way banded beam	2-way beam	
Steel beam	Steel beam and column sprayed fire proofed	0.95	0.90					
	Steel beam and column encased in concrete	0.85	0.80					
Precast concrete beam	With precast column/wall		1.00					
	With cast in-situ column/wall		0.90					
No internal beam	With precast column/wall			0.95/0.90[1]				
	With cast in-situ column/wall			0.90/0.85[1]	0.85/0.80[1]			
Cast in-situ beam	With cast in-situ column/wall **(without transfer beams)**		0.75/ 0.70[1][2]			0.75/ 0.70[1]	0.70/0.65[1]	0.55/0.50[1]
	With cast in-situ column/wall (with transfer beams)[4]					**0.40**		

[1] The higher index refers to cast in-situ post-tensioned or prestressed slabs/beams.

[2] Both indices will apply where the value of slab area over number of beams is greater than 10. If the value of slab area over number of beams is less than or equal to 10, the index shall be 0.65 for post-tensioned/prestressed and 0.60 for non post-tensioned/prestressed.

[3] Slab/beam refers to the value of slab area over number of beams.

[4] The index of 0.40 is to be applied to the entire cast in-situ floor area with transfer beams, except area with ramp access.

* Indices for other systems not shown in this table shall be determined by BCA on a case by case basis. For such cases, the QPs are advised to seek BCA's comments before proceeding with the designs.

Table 1A Roof Systems - Ss Value

No.	Types of Roof	S_S Value
a.	Integrated metal roof on steel truss	0.90
b.	Metal roof on steel truss	0.85
c.	Tiled roof on steel beam or precast concrete beam or timber beam	0.75
d.	Tiled roof with cast in-situ beam	0.55

Note:

All changes are highlighted in bold.

Table 2 Wall Systems - Sw Value

Wall \ Finishes		No finishes/Pre-finished	Paint finish	Skim coat and paint finish	Plaster and paint finish	Tiled/stone finish	Metal/ Plasterboard Cladding
Curtain wall/full height glass partition		1.00					
Precast concrete panel/wall[1]		0.95	0.85	0.80		0.95[4]	
Dry internal walls[2]		1.00	0.90			0.65	
PC formwork[3]		**0.80**	**0.70**	**0.60**		**0.50**	
Precision block wall				0.60		0.50	0.80
Cast in-situ RC wall		**0.75**	0.65	**0.55**	0.50	0.45	0.70
Brickwall	Brickwall				0.40	0.35	0.50
	Half fair-faced	0.40					
	Full fair-faced/ glass block	0.30					

[1] Precast concrete panel/walls includes nominal weight concrete panels, lightweight concrete panels, autoclaved aerated concrete panels.

[2] Dry internal walls include sandwich panel wall system, stud and sheet partition wall systems, demountable wall systems.

[3] PC formwork refer to precast formwork panel with concrete infill.

[4] Tile/stone is pre-stalled in factory. **For tile/stone installed at site, LSI is 0.60**

* Indices for other systems not shown in this table shall be determined by BCA on a case-by-case basis.
* Index for windows/doors/**prefabricated railings** = 1

Note:

All changes are highlighted in bold.

Table 3: Other Buildable Design Features - N value

		Buildable Features	Module	Unit of coverage	N value	
					Percentage of coverage	
					≥65% to < 80%[4]	**≥80%**
1	Standardisation					
	1.1	Columns (3 most common sizes)	0.5M[2]	no.		2.0
	1.2	Beams (3 most common sizes)	0.5M[2]	no.		2.0
	1.3	(a) Standard door leaf openings (width) (3most common sizes) (see Table 3A)		no.	0.5	1.0
		OR				
		(b) Standard door leaf openings and standard door structural openings (width) (3most common sizes) (see Table 3A)		no.	1.0	2.0
		OR				
		(c) Standard door structural openings (for sizes not within the range stipulated in Table 3A) (3 most common sizes)	**2M or 3M**	**no.**	**0.5**	**1.0**
	1.4	Windows (3most common sizes) [1]	1M/1M[3]	no.	0.5	1.0
2	Grids					
	2.1	Repetition of horizontal grids (between suppports) (3 most common dimensions)	1M	no.	1.0	1.5
			3M	no.	1.5	2.0
	2.2	Repetition of floor-to-floor height	0.5M	no.	1.5	2.0
	2.3	Vertical repetition of structural floor layout		area	1.5	2.0
3	Prefabricated Reinforcement					
	3.1	Floor		area	1.0	1.5
	3.2	Wall		area	1.0	1.5
	3.3	Beam cage		no.	1.5	2.0
	3.4	Column cage		no.	1.5	2.0
4	Prefabricated Components					
	4.1	(a) Partial prefabricated bathroom/toilet complete with piping/wiring: prefabricated wall panels and floor tray separately assembled	0.5M	no.	1.5	2.0
		OR				
		(b) Prefabricated bathroom/toilet complete with piping/wiring: full prefabricated cell completed with finished wall and floor	0.5M	no.	2.0	3.0
	4.2	(a) Standard precast staircase (see Table 3B)		no.		2.0
		OR				
		(b) Pre-assembled/metal staircase		**no.**		**2.0**
	4.3	Prefabricated vertical shafts (e.g. refuse chutes[5])		no.		1.0
	4.4	Multi-tier precast columns		no.		2.0
	4.5	(a) Precast CD Shelters, minimum 2 panels precast	0.5M	no.	1.0	1.5
		OR				
		(b) Precast CD Shelters, full precast cell	0.5M	no.	2.0	3.0
	4.6	Non-screed floor		area		1.0
	4.7	Columns sit directly on top of piles		no.		0.5
	4.8	Ground beams on top of pilecaps		no.		0.5
	4.9	Diaphragm wall construction		area		1.5

Note:

[1] Sizes based on dimensions of frames

[2] The module of 0.5M does not apply to steel structures.

[3] 1M for width and 1M for height

[4] The percentage of coverage is to be based on total floor area or on total number of components such as columns, beams, doors, windows, etc.

[5] Points will be awarded for use of fully precast refuse chutes which have an external dimension of 850mm x 850mm or 1000mm x 1000mm.

Note:

All changes are highlighted in bold.