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Construction Productivity and
Quality Group

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Dear Sir/Madam

ENHANCEMENTS TO CODE OF PRACTICE ON BUILDABILITY TO ACCELERATE ADOPTION OF DESIGN FOR MANUFACTURING AND ASSEMBLY (DfMA) TECHNOLOGIES

Objective

1 This circular informs the industry of the enhancements made to the Code of Practice (“COP”) on Buildability which will take effect on **28 December 2020**. The changes are:

- (A) Revamp of Buildable Design Appraisal System (BDAS) with integration of Design for Manufacturing and Assembly (DfMA) technologies into each work discipline of Structural, Architectural and Mechanical, Electrical and Plumbing (MEP);
- (B) New minimum Buildable Design Scores (B-Scores) for all development types; and
- (C) Extension of outcome-based option to all large development types in lieu of meeting the minimum B-Score.

Background

2 BCA has periodically reviewed the buildability framework and progressively raised the minimum B-Scores. In December 2019, the buildability framework was enhanced to (a) exempt small projects with Gross Floor Area (GFA) < 5,000m², (b) raise the minimum B-Score for larger residential non-landed (RNL) projects with GFA ≥ 25,000m², and (c) encourage innovation and allow outcome-based solutions for larger RNL projects in lieu of meeting the higher minimum B-Score. At the same time, a pilot trial of the buildability framework to be implemented in 2020 which aims to make DfMA the

mainstream way of construction was conducted from end 2019. The objective of the pilot was to allow the industry to conduct walk-through (i.e. trial scoring) and become familiar with the new framework, and for BCA to fine-tune the framework and calibrate the scoring matrix with inputs from the trial.

3 In 2020, the COVID-19 pandemic has disrupted the built environment sector and shown our heavy dependence on manpower. It reaffirms the need for industry transformation through the adoption of technology such as DfMA to reduce our vulnerability to manpower disruptions. DfMA helps to reduce the number of workers on-site, and make on-site segregation of workers easier to adhere to safe management measures. To accelerate the adoption of DfMA technologies, the following changes to the COP on Buildability will be made.

Key Changes

A) Revamp of BDAS with integration of DfMA technologies into each work discipline of Structural, Architectural and Mechanical, Electrical and Plumbing (MEP)

4 The BDAS has been revamped and comprises 4 sections, i.e. Structural, Architectural, MEP and Innovation. To make DfMA an integral part of the way buildings are designed and built, a new DfMA component is included for each discipline of Structural, Architectural and MEP works. A section on Innovation is added to encourage designers to propose innovative ideas to improve site productivity.

B) New minimum B-Scores for all development types

5 In the revamped BDAS, new minimum B-Scores have been set for each development type. The details are provided in [Annex A](#).

C) Extension of 'open' option with productivity outcome to all large development types (GFA \geq 25,000m²) in lieu of meeting the minimum B-Score

6 In 2019, four outcome-based options¹ (three deemed acceptable solutions and one 'open' option) were made available for RNL projects with GFA \geq 25,000m². In the new COP on Buildability, designers will be able to

¹ An outcome-based option refers to any of the deemed acceptable solutions or 'open' option. Designers will be required to submit documents to support their deemed acceptable solution or 'open' option on how their proposal can achieve the stipulated productivity improvement at plan approval stage and upon completion of the project.

choose the 'open' option and submit any proposal which can achieve a minimum 20% productivity improvement (from 2010's level) in lieu of meeting the minimum required B-Score for all projects with GFA \geq 25,000m². Refer to details in Annex B.

Implementation Timeline

7 The changes outlined in paragraphs 4, 5 and 6 apply to projects submitted to the Urban Redevelopment Authority (URA) for Planning Permission on or after 28 December 2020.

Clarification

8 Should you or your members have any queries concerning this circular, please contact Ms Wong Jia Min at 6804 4226 or email: [Wong Jia Min@bca.gov.sg](mailto:Wong_Jia_Min@bca.gov.sg) or Ms Jenny Tan at 6804 4230 or email: [Jenny XY Tan@bca.gov.sg](mailto:Jenny_XY_Tan@bca.gov.sg).

Thank you.

Yours faithfully



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A New Minimum Buildable Design Score for Projects with GFA ≥ 5,000m²

Year	From 28 December 2020*	
CATEGORY OF BUILDING WORK/ DEVELOPMENT	MINIMUM BUILDABLE DESIGN SCORE	
	5,000 m ² ≤ GFA < 25,000 m ²	GFA ≥ 25,000 m ²
Public Residential (non-landed)	68	80
Private Residential (non-landed)	68	80
Commercial	60	63
Industrial	65	68
Institutional, School and Others	60	63
MRT Station	60	

**based on date of planning application made to URA*

B New Outcome-based Options for Projects with GFA ≥ 25,000m²

S/No	CATEGORY OF BUILDING WORK/ DEVELOPMENT	OUTCOME-BASED OPTION
1	Public Residential (non-landed)	a. Min. 50% Prefabrication Level + Min. 70% System Formwork + Min. 50% Prefabricated Mechanical, Electrical and Plumbing (MEP)*
2	Private Residential (non-landed)	b. Min. 65% Prefabrication Level + Min. 70% System Formwork* c. Min. 60% Prefabricated Prefinished Volumetric Construction (PPVC)* d. Min. 50% PPVC (for building with 5 storeys and below only) e. 'Open' option*
3	Commercial, Industrial, Institutional, School and Others, MRT Station	'Open' option (any proposal which can achieve 20% productivity improvement from 2010's level)

*Options a, b, c and e for Residential (non-landed) projects were implemented from 15 December 2019