Hillview Rise GLS Site

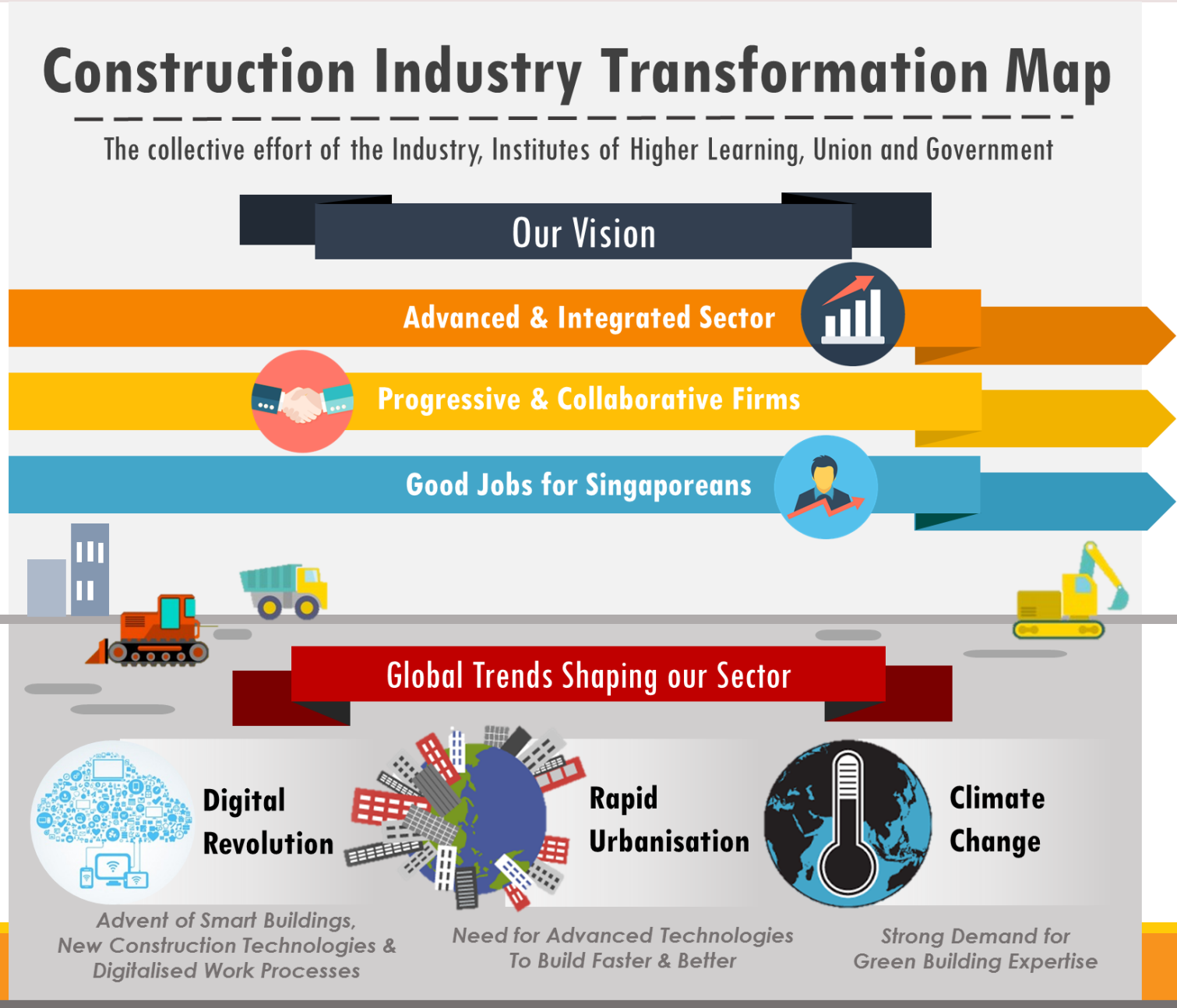
Briefing Session 25 Jan 2018

Note:
For the purpose of fairness and transparency, there will be no Q&A session. You may send in your questions through URA's online feedback and enquiry form. All questions and answers will be consolidated and published at a later date.

Ho Xue Mei
Executive Manager
Construction Productivity and Quality Group
Building and Construction Authority

Construction Industry Transformation Map

- Launched in **October 2017**
- Developed in **close partnership** with industry, trade associations and chambers (TACs), institutes of higher learning (IHLs), unions and government
- Aim to achieve a **future-ready built environment** with smart, green and high quality buildings



Vision – Transforming the BE sector

3 Key Areas to Transform the Sector

Design for Manufacturing & Assembly (DfMA)

Design upfront for ease of manufacturing and assembly

Highly automated offsite production facilities

Efficient and clean on-site installation process

Green Buildings

Design for Green Buildings

Sustainable practices in operations and maintenance

Integrated Digital Delivery (IDD)

Enabled by Building Information Modelling (BIM), IDD fully integrates processes and stakeholders along the value chain through advanced info-communications technology (ICT) and smart technologies.

Vision – Transforming the BE sector

Increase adoption of DfMA and IDD

- Establish **robust DfMA eco-system** to make DfMA price competitive and enable widespread adoption
- Develop IDD shared platforms and standards to support the **adoption of IDD solutions**

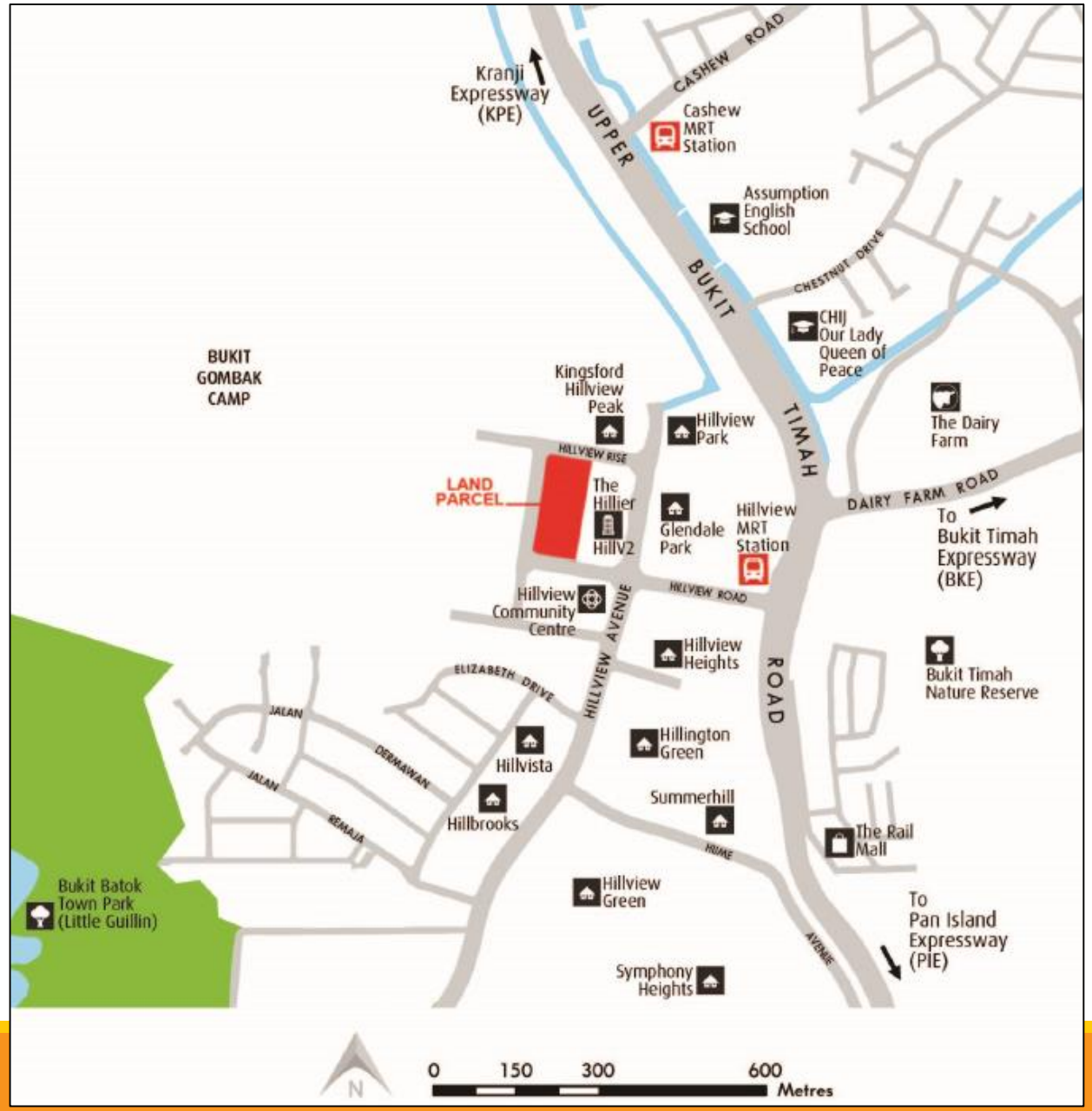
Build strong and capable firms

- Encouraging **greater collaboration** among firms

Hillview Rise GLS Site – Concept and Price

Rationales for piloting at Hillview Rise

- **Sizeable** (535 residential units) site suitable as a pilot site to benchmark productivity outcomes
- Greater scope for **modularization and economies of scale** to optimize productivity gains
- **Purely residential** site - without the complexity of other usage requirements
- Suitable for **piloting new innovative technologies**



Concept and Price Tender

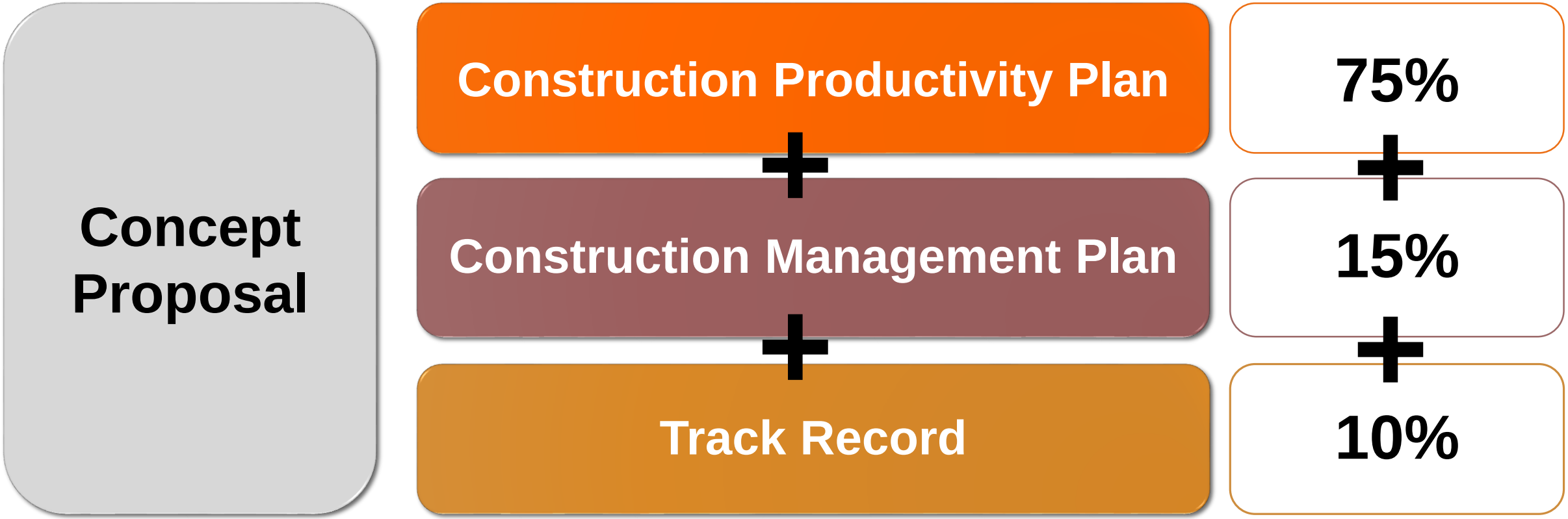
- Tenders will be evaluated based on **concept proposal** and **tendered sale price**.

- Concept Evaluation Committee (CEC), chaired by BCA
  - First evaluate the Concept Proposals
  - **Only Concept Proposals that substantially satisfy the evaluation criteria will be short-listed** for the 2nd stage of the tender evaluation

- Tender Evaluation Committee (TEC)
  - Open the price envelopes of shortlisted tenders
  - **Tender with the highest tendered sale price will be considered for award**

- **After tender award, the concept proposal will still be required to be reviewed by a Construction Productivity Advisory Panel (CPAP).**

Tender Evaluation Criteria



Tender Evaluation Criteria

Construction Productivity Plan — 75%

1	**Overall construction productivity concept**	• Adoption of **Design for Manufacturing and Assembly** (DfMA) concept to achieve the highest productivity outcomes possible. • **Productivity outcomes** should be comparable to or better than the most advanced method of DfMA technologies adopted at GLS sites
2	**Level of prefabrication and integration across architectural, structural, mechanical, electrical and plumbing (MEP) works**	• **Overall building design** (architectural finishing, MEP works) should support the implementation of the proposed advanced construction technologies and support the functional requirements of the building. • **Design and modularisation** of building and floor layouts should achieve **high levels of integration** in the construction of the architectural, structural and MEP works. • **Structural system** should incorporate highly productive construction technologies and demonstrate the **extent of implementation** of the proposed technologies. • **MEP works** should be planned, executed and **integrated upfront** with all other trades in design, prefabrication and installation. • Feature **innovative proposals** to support the Construction Productivity Plan.

Design for Manufacturing and Assembly (DfMA)

Aim

- **Move traditional construction work offsite into controlled factory environment**
- **Move designs upfront for ease of manufacturing and assembly to improve quality and productivity**

Components
Incremental Improvement

Continuum of Prefabrication & DfMA

Integrated Assemblies
Game-Changing Improvement

Prefab components | **Advanced Prefab Systems** | **Integrated Sub-assemblies** | **Fully-integrated Assemblies**

Structural

Precast

Structural Steel / Advanced Precast / Hybrid

Mass Engineered Timber (MET)

Prefabricated Prefinished Volumetric Construction (PPVC)

10% | 20% | 35% | 40%

Manpower Savings [Project Level]

Architectural

On-site Dry Applied Finishes

Prefinished Surfaces

PBUs

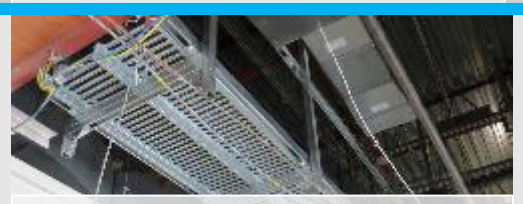
PPVC

30% | 45% | 60% | 70%

MEP

Flexible Water Pipe/ Sprinkler Dropper

Prefab Ceiling Module/ Prefab Plant



Prefab Module with Platform/ Catwalk

Manpower Savings [Trade Level]

PPVC

COMPLETED

Local DfMA Projects

NTU North Hill Hostel

Time savings 2 months
Manpower savings (project level) 17%

Number of Storeys	13 (6 blocks)
Number of Rooms	1580
Number of Modules	1200

Crowne Plaza Extension

Time savings 6 months
Manpower savings (project level) 44%

Number of Storeys	10
Number of Rooms	243
Number of Modules	252

NTU Nanyang Crescent Hostel

Time savings 6 months
Manpower savings (project level) 25%

Number of Storeys	11 to 13 (4 blocks)
Number of Rooms	1527
Number of Modules	784

MOHH Nursing Home

Time savings 3 months
Manpower savings (project level) 24%

Number of Storeys	9
Number of Units	180
Number of Modules	343

Local PPVC Projects

Brownstone EC @ Canberra

Time savings 4 months ***(estimated)***
Manpower savings (project level) 20% ***(estimated)***

Number of Storeys	10/12 (8 blocks)
Number of Units	638
Number of Modules	4384

The Clement Canopy (GLS)

Number of Storeys	40
Number of Units	505
Number of Modules	1866

Ongoing construction
Over 20 storey completed

7 day installation cycle/floor

Tender Evaluation Criteria

Construction Management Plan

15%

3	Effective project **scheduling**, **monitoring** and **productivity tracking** methodologies	• Adopt **Building Information Modelling (BIM) and other methodologies** to track project progress, identify and address potential sources of delay upfront, so as to ensure that the project is on schedule.
4	**Effective project integration** and **collaboration approach**	• Adopt **Virtual Design and Construction (VDC) and other methodologies** to achieve integration across the project value chain from design through manufacturing to construction. • Incorporate an **integrated project delivery approach** such as Design and Build or Design Development and Build. • Feature **innovative proposals** to support the Construction Management Plan.

Integrated Digital Delivery (IDD)

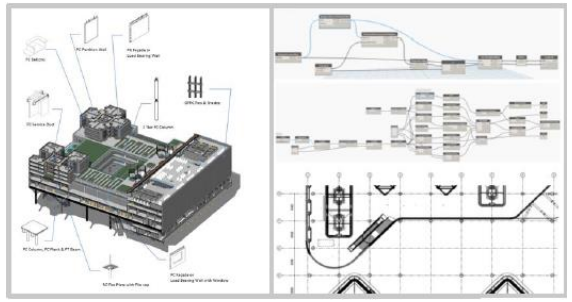
Aim

- **Connect various industry parties involved in building and construction projects through digital information**

Digital Design

e.g. WOHA (Kampung Admiralty)

- ✓ **BIM** to improve constructability
- ✓ Use of **visual scripting** to automate certain mundane tasks (e.g. sheet creation)



Digital Manufacturing and Fabrication (off-site)

e.g. Greyform

- ✓ **BIM-to-Production** methodology translate BIM models into modules to be installed onsite

Digital Construction (on-site)

e.g. Kimly + Pre-caster + NTU

- ✓ Modules are **trackable** at all times
- ✓ **Automatically** stored/ installed
- ✓ Travel via a **'ideal' path** (e.g. least distance)

Digital Asset Delivery and Management

e.g. CCDC (for High Park Residences)

- ✓ **Quality and defects management** system
- ✓ **Handover** asset data through BIM

Enabled by Building Information Modelling and Virtual Design and Construction

Tender Evaluation Criteria

Track Record

10%

5	Track Record	• The tenderer/developer and project teams will be assessed based on their relevant **skills and/or experience in employing advanced construction technologies** for residential developments, with proven track records (which may include **productivity, quality and safety**) both **locally and overseas**. • Tenderers/developer and project teams with only overseas projects may substantiate their track records with relevant **international construction awards or accolades**, where applicable.

Tender Submission Requirements

8 sets
in A3 format

Hardcopy Concept Proposal

- **Construction Productivity Plan (<30 pages)**
- **Construction Management Plan (<5 pages)**
- **Track Record (<5 pages) + Appendix 1 (sample)**

2 sets
in CD/DVD-ROM/USB3.0 or latest format

Soft Copies

- **Concept Proposal (PDF)**
- **Video animation (max. 5 min)**

Tender Evaluation Process

Tender Closing	**3 May 2018 (before 12 noon)** **The URA Centre** **Tender Box, Room 10-1**
Presentation of Concept Proposal to Concept Evaluation Committee (CEC)	**7 and 8 June 2018**

Successful Tenderer

Reflect the Concept Proposal in a
Productivity Concept Implementation Plan (PCIP)

Stage 1
Before submission of development application to URA

Accepted PCIP

Seek in-principle acceptance (IPA) of the PCIP from the
Construction Productivity Advisory Panel (CPAP)

Stage 2
During application for BP and ST clearance to BCA

****Approved PCIP***

Seek approval of the accepted PCIP from the
Commissioner of Building Control

****In accordance to the Building Control (Buildability and Productivity) Regulations 2011.***

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Thank you.

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