



RIDERS DIGEST 2021

SINGAPORE
EDITION

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RIDERS DIGEST

14TH EDITION

2021

Rider's Digest is a yearly publication from RLB's Research & Development department. It is a compendium of cost information and related data on the Singapore construction industry.

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Cost information in this publication is indicative and for general guidance only. All prices and rates are as at December 2020 and expressed in Singapore Dollars unless otherwise stated. References to legislative provisions and regulations are as at First Quarter 2021. Changes after this period will not be reflected.

All figures are rounded and exclude GST.



RafflesHospital

Raffles

Raffles Hospital Extension, Singapore

INTRODUCTION

CONFIDENCE TODAY INSPIRES TOMORROW

With a network that covers the globe and a heritage spanning over two centuries, Rider Levett Bucknall is a leading independent organisation in quantity surveying and advisory services. We have been responsible for the cost management of some of the world's most iconic landmark projects such as the Sydney Opera House, the HSBC Headquarters Building in Hong Kong, the 2012 London Olympic Games and locally, the Marina Bay Sands Integrated Resort in Singapore.

This success is based on our innovative thinking, global reach and flawless execution to push the boundaries, taking ambitious projects from an idea to reality. We are committed to continuing this legacy through our dedication to understanding client needs and providing true value-add.

CREATING A BETTER TOMORROW

The Rider Levett Bucknall vision is to be the global leader in the market, through service excellence, a fresh perspective and independent advice. Our focus is to create value for our customers, through the skills and passion of our people and to nurture strong long-term partnerships.

In present times, the COVID-19 pandemic has not spared our industry – supply chains are disrupted and labour movements worldwide curbed, impacting construction costs. Now, more than ever, reliable and up-to-date cost data and benchmarks are crucial in establishing realistic construction budgets.

We trust that the research data provided herein will assist and empower all our valued partners to bring your projects and imagination to life. We look forward to working together with you to shape the future of the built environment and to create a better tomorrow.

Silas Loh and Colin Kin
Joint Managing Partners
Rider Levett Bucknall LLP

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Rochester Commons, Singapore

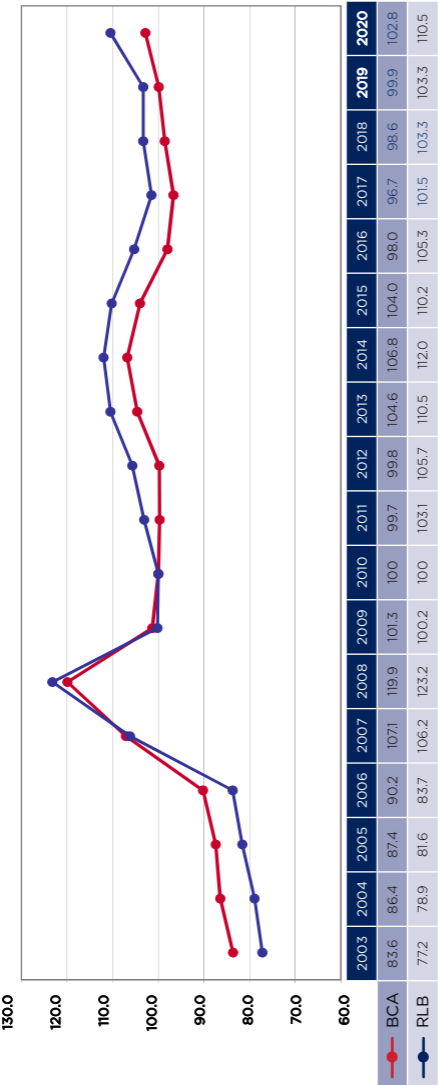
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SINGAPORE CONSTRUCTION TRENDS

TENDER PRICE INDICES (TPI)
(YEAR 2010 = 100)

TPI Trends



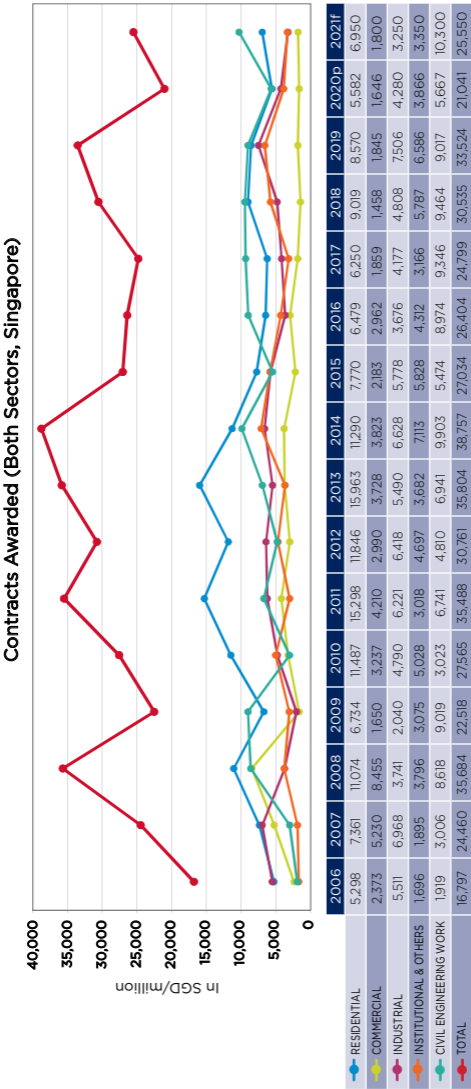
Note 1: Variances between the RLB and the BCA TPI arise from differences in the index derivation methodology, the basket of items and weightages used for each index and the variety of building projects utilised. The index basket here excludes piling works and Mechanical & Electrical services.

Note 2: With effect from the 1st Quarter of 2015, BCA has implemented the new TPI series with Base Year 2010 = 100. The TPI chart shown above has been amended accordingly to reflect the Base Year as Year 2010.

Source: BCA, RLB

SINGAPORE CONSTRUCTION TRENDS

PUBLIC & PRIVATE SECTOR CONTRACTS AWARDED FOR TOTAL WORKS



p: preliminary

f: Average forecast construction demand for 2021 is S\$23 - S\$28 billion

Note: BCA's published information as at 4 February 2021.

Source: BCA

SINGAPORE CONSTRUCTION TRENDS

AVERAGE PRICES¹ OF BASIC CONSTRUCTION MATERIALS

| YEAR | ORDINARY PORTLAND CEMENT (S\$ PER TONNE) | STEEL BARS ¹ (S\$ PER TONNE) | GRANITE ² (20MM AGGREGATE) (S\$ PER TONNE) |
|------|--|---|--|
| 2000 | 71.28 | 458.50 | 12.50 |
| 2001 | 70.04 | 432.81 | 12.67 |
| 2002 | 66.88 | 442.88 | 12.65 |
| 2003 | 71.13 | 583.93 | 12.25 |
| 2004 | 76.76 | 863.40 | 12.57 |
| 2005 | 85.20 | 738.44 | 16.29 |
| 2006 | 88.02 | 731.13 | 16.58 |
| 2007 | 100.85 | 873.19 | 31.74 |
| 2008 | 122.21 | 1,400.64 | 24.71 |
| 2009 | 103.23 | 765.80 | 19.68 |
| 2010 | 89.14 | 833.41 | 19.63 |
| 2011 | 93.78 | 931.26 | 21.58 |
| 2012 | 100.87 | 887.13 | 21.26 |
| 2013 | 100.23 | 766.90 | 20.61 |
| 2014 | 97.93 | 653.90 | 22.45 |
| 2015 | 92.97 | 501.40 | 19.71 |
| 2016 | 82.95 | 500.52 | 15.43 |
| 2017 | 75.91 | 688.83 | 16.07 |
| 2018 | 78.08 | 786.43 | 17.21 |
| 2019 | 82.68 | 741.87 | 18.49 |
| 2020 | 85.85 | 725.45 | 18.44 |

¹ - Market prices of Steel bars (without cut & bend):

Jan 09-Dec 14: Based on fixed price supply contracts with contract period 6 months or less.

Jan 15-Current: Based on fixed price supply contracts with contract period 1 year or less.

Note: Prices of rebar other than 16-32mm dimensions may be subject to surcharge.

² - Market prices excluded local delivery charges to concrete batching plants.

| READY-MIXED CONCRETE (GRADE 30) (\$ PER M ³) | READY-MIXED CONCRETE ³ (GRADE 35/40) (\$ PER M ³) | CONCRETING SAND ² (\$ PER TONNE) |
|---|---|--|
| 71.32 | | |
| 61.40 | - | - |
| 55.40 | - | - |
| 56.75 | - | - |
| 62.50 | - | - |
| 72.09 | - | - |
| 73.99 | - | 14.63 |
| 138.13 | 138.93 | 45.77 |
| - | 125.85 | 36.97 |
| - | 104.73 | 29.95 |
| - | 95.44 | 28.19 |
| - | 108.99 | 25.96 |
| - | 110.23 | 24.10 |
| - | 106.85 | 22.99 |
| - | 111.15 | 23.25 |
| - | 99.47 | 22.68 |
| - | 85.01 | 18.30 |
| - | 81.42 | 17.12 |
| - | 85.15 | 18.59 |
| - | 93.88 | 26.66 |
| - | 94.78 | 24.94 |

³ - Market prices of Ready Mixed Concrete:

Jan 99-Dec 06: Based on Grade 30.

Jan 07-Dec 09: Based on contracts with non-fixed price, fixed price and market retail price for Grade 35 pump.

Jan 10-Current: Based on contracts with non-fixed price, fixed price and market retail price for Grade 40 pump.

Source: BCA



Sports Hub, Singapore

SINGAPORE CONSTRUCTION COST DATA

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SINGAPORE CONSTRUCTION COST DATA

TERMINOLOGY

Central Business District (CBD)

The Central Business District is within the Central Area of Singapore, which consists of eleven urban planning areas - Downtown Core, Marina East, Marina South, Museum, Newton, Orchard, Outram, River Valley, Rochor, Straits View and Singapore River as defined by the Urban Redevelopment Authority (URA). It is the prime area of all the commercial and financial activities in the region.

Construction Floor Area (CFA)

CFA is the area of all building enclosed covered spaces measured to the outside face of the external walls including covered basement and above ground car park areas.

Gross Floor Area (GFA)

GFA is the area of building enclosed covered spaces excluding carpark and driveway areas calculated for purposes of planning submissions (refer to [Page 65 Gross Floor Area](#) for more information).

Net Lettable Area (NLA)

NLA is the total tenancy area designated for rentable purposes, i.e. areas used by tenants where rents are charged.

Building Works

Building Works include substructure (piling, foundation, and basement), super-structure, architectural works, finishes and fittings, external works, site works, preliminaries, attendance and other builder's work in connection with services.

Building Services

Building Services include Mechanical services - air-conditioning and mechanical ventilation, fire protection system, sanitary and plumbing; Electrical services - electrical installations, vertical transportation, building management systems; preliminaries. Exclusions: Special equipment - chutes, incinerators, compactors, pneumatic refuse disposal system, facade maintenance equipment, engineered smoke control system, private telephone system; audio video, IT systems, etc.

Office

Offices within CBD refers to good quality office buildings for the upper range rental market and leading owner occupiers such as headquarter offices for financial institutions and major companies. Office outside CBD refers to medium quality office buildings built for middle range rental market.

Hotel (including FF&E)

Types of hotels listed are based on 'five-star', 'four-star' and 'three-star' international hotel ratings. Costs include furniture, fitment and equipment (FF&E) but exclude hotel equipment and operating supplies.

Retail

Shopping malls with typical amenities and finishes at common spaces. Tenancy fit-outs are typically excluded in construction costs.

Condominium

The quality of finishes required will affect the cost range. Range given is significantly affected by the height, configuration of the building and existing ground conditions. Costs exclude show flats, loose furniture, special light fittings, household electrical appliances, kitchen equipment and building owners' special requirements.

Landed Residential

Landed housings are private low-rise/low density residential developments. The quality of finishes selected will affect the cost range. Costs exclude furniture, household electrical appliances, kitchen equipment and building owners' special requirements.

Institutional

Institutions include tertiary educational schools such as universities, polytechnics and other colleges that require full range of educational facilities and amenities.

Industrial

Quality reflects a simplified type of construction suitable for light or heavy industries. Costs exclude special and operating equipment, processing plant and proprietary systems.

Car Park

Above Grade car parks are multi-storey car park with minimal external walling and exclude mechanical ventilation. Basement car parks are underground car park with diaphragm wall or contiguous bored piles walls with standard mechanical ventilation provisions.

Healthcare

Healthcare developments are institutional buildings with health and medical services, such as hospitals, nursing homes, medical centres and polyclinics and clinics. Costs exclude specialist medical equipment.

SINGAPORE CONSTRUCTION COST DATA

BUILDING CONSTRUCTION PRICES

All construction prices for Singapore stated here are indicative only as at 4th Quarter 2020. Items generally excluded from the order of costs are land costs, legal and professional fees, development charges, authority fees, finance costs, loose furniture, fittings, equipment and works of art (unless otherwise stated), tenancy works such as but not limited to sub-divisional partitions

| Development Type |
|--|
| Range Of Cost Per Construction Floor Area (CFA) |
| OFFICE |
| Standard (outside CBD) |
| Standard (within CBD) |
| Prestige (within CBD) |
| HOTEL (Including FF&E) |
| Serviced Apartment |
| Three Star |
| Four Star |
| Five Star |
| RETAIL |
| Medium Quality |
| Good Quality |
| CONDOMINIUM |
| Medium Quality |
| Good Quality |
| Luxury Quality |
| LANDED RESIDENTIAL |
| Cluster Housing |
| Terrace House |
| Semi-detached House |
| Detached House |
| INSTITUTIONAL |
| Institution of Higher Learning |
| Medical Institution |
| INDUSTRIAL |
| Single Storey Warehouse |
| Light Industrial Building |
| Heavy Industrial Building |
| HEALTHCARE |
| Nursing Home |
| Medical Centre |
| Hospital |
| CAR PARKING |
| Above Grade Car Park |
| Basement Car Park |

in office buildings and shop fit-out in retail spaces, site infrastructure work, diversion of existing services, resident site staff cost, models and prototypes, future cost escalation, show flats / sales office, Green Mark Cost Premiums and Goods & Services Tax. All prices stated below include a general allowance for foundation, car park and external works.

| Building Works | Building Services | Total |
|--------------------------|--------------------------|--------------------------|
| S\$/m² | S\$/m² | S\$/m² |
| 1,510 - 2,520 | 690 - 980 | 2,200 - 3,500 |
| 1,510 - 2,590 | 740 - 1,060 | 2,250 - 3,650 |
| 2,400 - 3,130 | 850 - 1,420 | 3,250 - 4,550 |
| 2,390 - 2,600 | 960 - 1,300 | 3,350 - 3,900 |
| 2,720 - 2,720 | 880 - 1,280 | 3,600 - 4,000 |
| 2,940 - 3,450 | 960 - 1,400 | 3,900 - 4,850 |
| 3,500 - 4,350 | 1,200 - 1,700 | 4,700 - 6,050 |
| 1,360 - 2,080 | 840 - 1,070 | 2,200 - 3,150 |
| 2,190 - 2,440 | 1,060 - 1,260 | 3,250 - 3,700 |
| 1,760 - 2,330 | 390 - 520 | 2,150 - 2,850 |
| 2,330 - 2,800 | 420 - 650 | 2,750 - 3,450 |
| 3,040 - 4,030 | 460 - 770 | 3,500 - 4,800 |
| 2,300 - 2,790 | 350 - 460 | 2,650 - 3,250 |
| 2,090 - 2,410 | 460 - 540 | 2,550 - 2,950 |
| 2,150 - 2,950 | 500 - 650 | 2,650 - 3,600 |
| 3,060 - 5,020 | 690 - 980 | 3,750 - 6,000 |
| 2,310 - 2,770 | 740 - 1,030 | 3,050 - 3,800 |
| 3,540 - 4,740 | 860 - 1,260 | 4,400 - 6,000 |
| 1,010 - 1,480 | 190 - 270 | 1,200 - 1,750 |
| 950 - 1,200 | 350 - 650 | 1,300 - 1,850 |
| 1,240 - 1,610 | 360 - 590 | 1,600 - 2,200 |
| 1,280 - 2,580 | 570 - 870 | 1,850 - 3,450 |
| 2,390 - 2,560 | 810 - 1,090 | 3,200 - 3,650 |
| 2,980 - 3,160 | 870 - 1,240 | 3,850 - 4,400 |
| 650 - 1,230 | 100 - 170 | 750 - 1,400 |
| 1,410 - 1,910 | 240 - 340 | 1,650 - 2,250 |

SINGAPORE CONSTRUCTION COST DATA

CONSTRUCTION ELEMENTS

The following rates are indicative only as at 4th Quarter 2020, unless otherwise stated and include an allowance for profit and overheads but exclude preliminaries.

The rates are for budgetary purposes and are not valid for tendering or pricing of variations.

| Item | 4Q 2020 | 2Q 2021 | Unit |
|--|-----------------|-----------------|--------|
| | S\$ | S\$ | |
| SUB-STRUCTURE | | | |
| Reinforced concrete pad footing (Grade 35) | 490 - 540 | 560 - 630 | m³ |
| 300mm Reinforced concrete slab on ground (Grade 35) | 130 - 150 | 130 - 160 | m² |
| COLUMNS / WALLS | | | |
| Reinforced concrete (600 x 600mm Grade 35) | 380 - 420 | 410 - 520 | m |
| Reinforced concrete (900 x 900mm Grade 35) | 750 - 830 | 820 - 1,050 | m |
| 250mm Reinforced concrete wall (Grade 35) | 220 - 260 | 250 - 270 | m² |
| UPPER FLOORS (Excluding Beams) | | | |
| 150mm Reinforced concrete suspended floor slab (Grade 35) | 110 - 120 | 130 - 140 | m² |
| 120mm Concrete slab on Bondek with structural steel supports and 2-hour fire spray (excluding structural steel beam) | 160 - 200 | 200 - 240 | m² |
| STAIRCASES | | | |
| 1050mm Wide reinforced concrete stairs with painted steel tube balustrade (average rise 3.70m) | 5,000 - 8,000 | 6,000 - 9,000 | flight |
| 2000mm Wide grand public stairs with glass and brass balustrade (4.00m rise) | 60,000 - 87,000 | 66,000 - 95,700 | flight |
| ROOF | | | |
| 120mm RC Slab (Grade 35) graded to fall and built-up roofing membrane | 150 - 180 | 170 - 200 | m² |
| Structural steel, purlins and insulated metal deck roof | 330 - 400 | 360 - 440 | m² |
| EXTERNAL WALLS | | | |
| Single glazed window unit (casement type) | 380 - 550 | N/C. | m² |
| Double glazed window unit (casement type) | 550 - 740 | N/C | m² |
| Unitised double glazed curtain wall system | 670 - 880 | N/C | m² |

| Item | 4Q 2020 | 2Q 2021 | Unit |
|--|---------------|-----------|----------------|
| | S\$ | S\$ | |
| EXTERNAL DOORS (Excluding Ironmongery) | | | |
| Single leaf solid core timber door | 700 - 1,200 | N/C | no. |
| Double leaf glazed glass door | 2,000 - 3,500 | N/C | no. |
| Double leaf auto operating glass door | 5,000 - 7,500 | N/C | no. |
| INTERNAL WALLS | | | |
| 115mm Brick or block wall | 35 - 50 | 50 - 60 | m ² |
| Stud plasterboard partition | 70 - 125 | N/C | m ² |
| 100mm Precast non load bearing wall | 60 - 80 | 85 - 110 | m ² |
| 150mm Precast load bearing wall | 220 - 250 | 290 - 330 | m ² |
| 12mm Laminated glass screen | 310 - 380 | N/C | m ² |
| INTERNAL DOORS (Excluding Ironmongery) | | | |
| Single leaf solid core flush timber door | 650 - 1,000 | N/C | no. |
| Single leaf half hour fire timber door | 700 - 1,300 | N/C | no. |
| Single leaf one hour fire timber door | 1,000 - 1,500 | N/C | no. |
| INTERIOR SCREENS | | | |
| Laminated toilet partition | 600-1,200 | N/C | no. |
| WALL FINISHES | | | |
| Cement and sand plaster and emulsion paint | 30 - 40 | 35 - 45 | m ² |
| Cement render and vinyl fabric | 60 - 80 | 65 - 85 | m ² |
| Cement render and ceramic tile | 90 - 110 | 100 - 120 | m ² |
| Marble wall finish on rendered backing | 250 - 350 | 260 - 360 | m ² |
| Marble wall cladding | 330 - 430 | N/C | m ² |
| CEILING FINISHES | | | |
| Fibrous flush plasterboard ceiling painted | 40 - 50 | N/C | m ² |
| One way exposed grid with mineral fibre board acoustic ceiling | 30 - 35 | N/C | m ² |
| Moulded plasterboard ceiling system | 115 - 150 | N/C | m ² |
| Aluminium louvre ceiling system | 95 - 170 | N/C | m ² |
| FLOOR FINISHES | | | |
| Carpet tile | 60 - 85 | 65 - 90 | m ² |
| Ceramic / homogeneous tile | 80 - 110 | 100 - 120 | m ² |
| Granite tile | 170 - 350 | N/C | m ² |
| Access floors | 70 - 170 | N/C | m ² |

*N/C: no change

Note: Rates as at 2Q 2021 are included in this edition as we noted a significant change in selected construction elements.

SINGAPORE CONSTRUCTION COST DATA

CONSTRUCTION ELEMENTS (Continued from page 14)

| Item | S\$ | Unit |
|--|-------------------|------|
| SPECIALIST SERVICES | | |
| SANITARY AND PLUMBING | | |
| Average cost per plumbing point including fixture, soil waste and vent | 1,210 - 1,500 | no. |
| VERTICAL TRANSPORTATION | | |
| Glass sided escalator (4m rise) | 150,000 - 250,000 | no. |
| 17 Passenger lift serving 17 floors | 220,000 - 300,000 | no. |
| Machine-room-less lift serving 2 floors | 78,500 - 100,000 | no. |

EXTERNAL WORKS

| External Works | S\$ | per |
|--|---------------|----------------|
| LANDSCAPING | | |
| Dense landscaping around buildings including shrubs, plants, topsoil etc. | 80 - 150 | m ² |
| Turfing only to large areas including topsoil, sowing and treating | 20 - 30 | m ² |
| Vertical Greening: Vine screen comprising stainless steel cables with plant climbers | 260 - 500 | m ² |
| CAR PARKS - ON GROUND | | |
| Based on 35m ² overall area per car lot with premix paving including road lines, channels, drainage and kerbs | 4,000 - 4,900 | lot |
| ROADS (Premix finish including kerbs, channels and drainage) | | |
| Residential estate, 6.80m wide excluding foot-paths and nature strips | 950 - 1,330 | m |
| Industrial estate 10.40m wide including minimal to extensive formation | 1,390 - 1,940 | m |

SPORTS FACILITIES

| Facility | S\$ | per |
|---------------------------|-----------------------|-------|
| FOOTBALL FIELD | | |
| Size: 100m x 65m | 520,000 - 960,000 | field |
| SWIMMING POOL | | |
| Half-Olympic Size | 550,000 - 750,000 | pool |
| Olympic Size | 1,200,000 - 1,500,000 | pool |
| TENNIS COURT | | |
| Size: 37m x 18m | 110,000 - 140,000 | court |
| BASKETBALL COURT | | |
| Size: 30m x 19m | 70,000 - 120,000 | court |
| GOLF COURSE | | |
| 18 holes over 60 hectares | 1,000,000 - 1,250,000 | hole |

Air-Conditioning and Mechanical Ventilation (ACMV)

ACMV works include chiller plant, cooling towers, chilled water and condenser water pumps and pipework, air-handling unit systems, fan coil systems, AC ductwork, diffusers, split type air-conditioning units and ductwork, MV fan system, MV ductwork, diffusers and accessories, AC electrical and automatic control works where appropriate.

Sanitary & Plumbing

Sanitary & Plumbing works include water tanks and pumps, hot/cold water distribution piping, installation of water piping to sanitary wares and fittings, installation of waste piping to sanitary wares, aboveground and underground drainage piping system where appropriate.

Fire Protection System

Fire Protection System includes sprinklers, external fire hydrants, hose reels, wet and dry risers, automatic fire alarms and fire extinguishers where appropriate.

Electrical Installations

Electrical Installations include power transformers, sub-station, HV&LV switchgear, distribution/sub-main cables, final sub-circuits, cable support systems and containments, lightning protection system, earthing system, luminaires and lighting control system, standby generators, telecommunication system, public address system, intercom system, MATV/CATV system where appropriate.

Vertical Transportation

Vertical Transportation includes lifts, escalators, travellers, dumbwaiters, etc., where appropriate.

Building Management Systems (BMS)

BMS include Control and Monitoring Systems where appropriate.

Exclusions

Security Systems, IT systems, private telephone system, audio video system, car parking system, compactors, chutes; special equipment such as proprietary systems, medical gases, incinerators, pneumatic refuse disposal system, facade maintenance equipment, engineered smoke control systems, hardened structure requirements, supply of kitchen equipment, sanitary wares and fittings, Green Mark certification, WELL building standard® and other sustainability related certification requirements, etc.

Note:

The order of costs for Building Services provided herein is indicative and based solely on Construction Floor Area (CFA) assumptions.

Detailed requirements and specifications for Building Services need to be considered and provided in conceptual designs to derive cost estimates for specific project budgetary purposes.

SINGAPORE CONSTRUCTION COST DATA

BUILDING SERVICES

| Development Type | ACMV |
|---|--------------------|
| Range of Cost per Construction Floor Area (CFA) | S\$/m ² |
| OFFICE | |
| Standard (outside CBD) | 230 - 320 |
| Standard (within CBD) | 250 - 330 |
| Prestige (within CBD) | 290 - 420 |
| HOTEL (including FF&E) | |
| Serviced Apartment | 280 - 380 |
| Three Star | 250 - 370 |
| Four Star | 270 - 390 |
| Five Star | 330 - 460 |
| RETAIL | |
| Medium Quality | 260 - 320 |
| Good Quality | 340 - 390 |
| CONDOMINIUM | |
| Medium Quality | 120 - 150 |
| Good Quality | 130 - 190 |
| Luxury Quality | 130 - 200 |
| LANDED RESIDENTIAL | |
| Cluster Housing | 90 - 130 |
| Terrace House | 160 - 180 |
| Semi-detached House | 170 - 220 |
| Detached House | 230 - 340 |
| INSTITUTIONAL | |
| Institution of Higher Learning | 240 - 330 |
| Medical Institution | 260 - 380 |
| INDUSTRIAL | |
| Single Storey Warehouse | 60 - 80 |
| Light Industrial Building | 100 - 200 |
| Heavy Industrial Building | 100 - 140 |
| HEALTHCARE | |
| Nursing Home | 200 - 280 |
| Medical Centre | 260 - 340 |
| Hospital | 270 - 370 |
| CAR PARKING | |
| Above Grade Car Park | 30 - 40 |
| Basement Car Park | 80 - 100 |

| Sanitary & Plumbing | Fire Protection | Electrical | Vertical Transport | BMS |
|---------------------|--------------------|--------------------|--------------------|--------------------|
| S\$/m ² | S\$/m ² | S\$/m ² | S\$/m ² | S\$/m ² |
| | | | | |
| 50 - 90 | 50 - 90 | 260 - 330 | 80 - 120 | 20 - 30 |
| 50 - 100 | 60 - 110 | 260 - 340 | 90 - 150 | 30 - 30 |
| 60 - 130 | 80 - 120 | 290 - 480 | 100 - 230 | 30 - 40 |
| | | | | |
| 200 - 230 | 70 - 120 | 310 - 410 | 80 - 130 | 20 - 30 |
| 180 - 220 | 70 - 120 | 290 - 410 | 70 - 130 | 20 - 30 |
| 210 - 260 | 70 - 130 | 300 - 430 | 90 - 150 | 20 - 40 |
| 230 - 310 | 100 - 150 | 410 - 540 | 100 - 200 | 30 - 40 |
| | | | | |
| 90 - 120 | 80 - 90 | 270 - 340 | 120 - 170 | 20 - 30 |
| 120 - 130 | 90 - 100 | 350 - 410 | 140 - 190 | 20 - 40 |
| | | | | |
| 70 - 100 | 20 - 40 | 140 - 170 | 40 - 60 | 0 - 0 |
| 80 - 120 | 20 - 50 | 150 - 210 | 40 - 80 | 0 - 0 |
| 90 - 130 | 30 - 60 | 160 - 230 | 50 - 130 | 0 - 20 |
| | | | | |
| 120 - 150 | 10 - 20 | 130 - 160 | 0 - 0 | 0 - 0 |
| 120 - 150 | 0 - 0 | 180 - 210 | 0 - 0 | 0 - 0 |
| 120 - 170 | 0 - 0 | 210 - 260 | 0 - 0 | 0 - 0 |
| 160 - 210 | 0 - 0 | 300 - 430 | 0 - 0 | 0 - 0 |
| | | | | |
| 90 - 150 | 80 - 110 | 250 - 330 | 60 - 80 | 20 - 30 |
| 170 - 260 | 60 - 100 | 290 - 390 | 60 - 100 | 20 - 30 |
| | | | | |
| 20 - 30 | 20 - 40 | 90 - 120 | 0 - 0 | 0 - 0 |
| 50 - 90 | 40 - 60 | 110 - 180 | 50 - 100 | 0 - 20 |
| 40 - 60 | 40 - 70 | 110 - 200 | 70 - 100 | 0 - 20 |
| | | | | |
| 130 - 190 | 20 - 60 | 220 - 300 | 0 - 40 | 0 - 0 |
| 110 - 170 | 80 - 100 | 270 - 340 | 80 - 120 | 10 - 20 |
| 170 - 260 | 70 - 100 | 290 - 380 | 50 - 100 | 20 - 30 |
| | | | | |
| 10 - 20 | 20 - 30 | 40 - 50 | 0 - 30 | 0 - 0 |
| 40 - 40 | 50 - 70 | 70 - 100 | 0 - 30 | 0 - 0 |

OFFICE FIT-OUT

The following costs that include workstations are an indication of those currently achievable for good quality office accommodation.

| Type Of Tenancy | Open Planned S\$/m ² | Partitioned S\$/m ² |
|----------------------------|------------------------------------|-----------------------------------|
| General Offices | 500 - 1,050 | 950 - 1,400 |
| Major Company Headquarters | 900 - 1,500 | 1,100 - 2,100 |
| Financial Institution | 1,100 - 2,000 | 1,800 - 2,800 |

WORKSTATIONS

3,500mm average length including screens generally 1,220mm high (managerial 1,620mm high), desks, storage cupboards, shelving etc. Supply of chairs is excluded.

| Type of Workstation | S\$/Station |
|---------------------|---------------|
| Secretarial | 1,500 - 4,000 |
| Technical Staff | 1,800 - 4,800 |
| Managerial | 5,500 - 8,500 |

OFFICE REFURBISHMENT

The following refurbishment costs include demolition and removal of partitions and internal finishes, provide new floor, ceiling and wall finishes but exclude fitting-out. The lower end of the range indicates reuse and modification.

| Type of Refurbishment | S\$ | per |
|--|-------------|----------------|
| CBD offices typical floor | 800 - 1,700 | m ² |
| CBD offices core upgrade (excluding lift modernisation) | 700 - 1,500 | m ² |

HOTEL GUESTROOM FIT-OUT AND FF&E

The costs of furniture, fitments and equipment (FF&E) for a typical hotel guest room varies within its wide range and is largely dependent on the quality of FF&E specified for different hotel ratings. Fit-out costs include preliminaries, wall, floor and ceiling finishes. FF&E costs include fitments, sanitary wares and bathroom accessories, mirrors, curtains, blinds, decorative lighting, and loose furniture. Hotel equipment and operating supplies are excluded.

| Type of Hotel | S\$ | per |
|---------------|-----------------|------------|
| Three-Star | 18,000 - 33,000 | Guest room |
| Four-Star | 35,000 - 47,000 | Guest room |
| Five-Star | 48,000 - 70,000 | Guest room |



Parkroyal on Pickering, Singapore

ESTIMATING DATA

| | |
|--|----|
| Reinforcement Ratios | 23 |
| Average Construction Payment Drawdown | 24 |
| Vertical Transport Services | 25 |

ESTIMATING DATA

REINFORCEMENT RATIOS

The following ratios give an indication of the average weight of high tensile rod reinforcement per cubic metre of concrete (Grade 40) for the listed elements. Differing structural systems, ground conditions, height of buildings, load calculations and sizes of individual elements and grid sizes will result in considerable variation to the stated ratios. For project specific ratios, a Civil & Structural Engineer should be consulted.

| Element | Average kg/m ³ |
|---------------------------|---------------------------|
| Pile caps | 115 – 180 |
| Bored Piles (compression) | 25 – 35 |
| Bored Piles (tension) | 100 – 150 |
| Raft Foundation | 150 – 220 |
| RC pad footings | 70 – 100 |
| Ground beams | 200 – 300 |
| BASEMENT | |
| Retaining Wall | 150 – 250 |
| RC Wall | 140 – 180 |
| Slab | 100 – 150 |
| Edge Beams | 220 – 300 |
| ABOVE GROUND | |
| Columns | 250 – 380 |
| Beams | 220 – 350 |
| Slab | 110 – 150 |
| Core Walls / Lift Walls | 160 – 280 |
| Household Shelter | 250 – 350 |
| Stairs | 130 – 160 |

AVERAGE CONSTRUCTION PAYMENT DRAWDOWN

The tabulation below is derived from the statistical average of a series of case histories, which will give an indication of the anticipated rate of expenditure when used for a specific project for preliminary budgetary purposes. Construction periods incorporate various extensions of time, including wet weather, industrial disputes, etc.

All data is related to the date of submission of Contractors' claims to the Client and not actual payment, which is generally one month later.

No adjustment has been made for the retention monies for private sector projects.

The payment of outstanding monies due to the contractor and sub-contractors after the date of practical completion usually takes place at irregular intervals with payments spread out over defects liability period until settlement of final account and issuance of maintenance certificate or equivalent.

| Contract Period % | Contract Expenditure % |
|-------------------|------------------------|
| 5 | 0.75 |
| 10 | 2.70 |
| 15 | 5.71 |
| 20 | 9.65 |
| 25 | 14.40 |
| 30 | 19.80 |
| 35 | 25.73 |
| 40 | 32.06 |
| 45 | 38.65 |
| 50 | 45.40 |
| 55 | 52.85 |
| 60 | 60.15 |
| 65 | 67.15 |
| 70 | 73.68 |
| 75 | 79.60 |
| 80 | 84.79 |
| 85 | 89.07 |
| 90 | 92.29 |
| 95 | 94.32 |
| 100 | 97.50 |

ESTIMATING DATA

VERTICAL TRANSPORT SERVICES

| Application | Lift Type |
|-----------------------------------|--------------------------|
| Office & Residential | Gearless 9 to 13 pax |
| | Gearless 9 to 13 pax |
| | Gearless up to 17 pax |
| | Gearless up to 23 pax |
| | Gearless up to 23 pax |
| | Gearless up to 23 pax |
| | Gearless up to 23 pax |
| | Gearless up to 23 pax |
| | Gearless up to 23 pax |
| | Gearless up to 23 pax |
| Hospital | Gearless 23 pax bed lift |
| | Geared up to 40 pax |
| Large Goods Lift | Geared up to 2,000kg |
| | Geared up to 5,000kg |
| Service Lift (Dumb-Waiter) | Bench Height Unit |
| | Large Unit |
| Escalator | Rise 2.5 to 5.0m |
| Travelator | Distance 1.3 to 5.0m |
| Disabled Platform Lift | To 4.0m |
| | Above 4.0m |

Note:

Costs provided above are indicative and vary depending on the brand name and technical specifications.

| Speed (m/sec) | Base Cost (S\$) | No. of Floors Served | S\$/Floor Additional Floors Served | S\$/Floor By-passed |
|------------------|--------------------|----------------------------|---------------------------------------|------------------------|
| 1.0 | 85,000 - 130,000 | 2 | 7,900 | 5,800 |
| 1.65 - 1.75 | 100,000 - 160,000 | 8 | 7,900 | 5,800 |
| 1.65 - 1.75 | 130,000 - 200,000 | 8 | 7,900 | 5,800 |
| 2.0 - 2.5 | 180,000 - 300,000 | 15 | 8,400 | 6,900 |
| 3.0 - 3.5 | 390,000 | 20 | 9,500 | 7,400 |
| 4.0 | 468,000 | 20 | 10,500 | 7,800 |
| 5.0 | 572,000 | 20 | 10,500 | 7,800 |
| 6.0 | 676,000 | 30 | 10,500 | 7,800 |
| 7.0 | 780,000 | 30 | 10,500 | 7,800 |
| 8.0 | 884,000 | 40 | 10,500 | 7,800 |
| 1.75 | 204,800 | 8 | 8,400 | 6,300 |
| 2.5 | 510,000 | 10 | 14,700 | 9,000 |
| 1.0 | 300,000 | 2 | 15,300 | 9,500 |
| 0.50 | 450,000 | 2 | 18,900 | 11,600 |
| 0.50 | 42,000 | 2 | 5,300 | 3,000 |
| 0.20 | 65,100 | 2 | 6,300 | 3,600 |
| 0.50 | 136,500 - 258,000 | 2 | N.A. | N.A. |
| 0.50 | 78,800 - 310,000 | N.A. | N.A. | N.A. |
| 0.15 | 75,000 | 2 | N.A. | N.A. |
| 0.15 | 90,000 | 3 | N.A. | N.A. |



SOTA, Singapore

INTERNATIONAL CONSTRUCTION

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INTERNATIONAL CONSTRUCTION

BUILDING COSTS

Refer to www.rlbintelligence.com for updates.

The following data represents estimates of current building costs in the respective markets.

Costs may vary due to factors such as site conditions, climatic conditions, standards of specification, market conditions, etc.

Rates are in national currency per square metre of Gross Floor Area (GFA), unless otherwise stated in the facing page. Areas referenced differ due to local market metrics. GFA shall be as defined in each city's local context.

| Location /City | Local Currency | Cost Range Per m ² | | | |
|--------------------|-------------------|-------------------------------|--------|---------|--------|
| | | Office Building | | | |
| | | Premium | | Grade A | |
| | | Low | High | Low | High |
| ASIA @ Q2 2020 | | | | | |
| Beijing | RMB | 8,700 | 14,250 | 8,000 | 12,250 |
| Guangzhou | RMB | 7,700 | 12,250 | 7,100 | 10,750 |
| Ho Chi Minh City | VND ('000) | 25,500 | 35,800 | 21,300 | 26,500 |
| Hong Kong | HKD | 22,500 | 33,500 | 19,250 | 25,750 |
| Jakarta | RP ('000) | 10,150 | 15,900 | 7,500 | 11,550 |
| Kuala Lumpur | MYR | 2,600 | 4,500 | 1,400 | 3,200 |
| Manila | PHP | 37,600 | 55,400 | N/P | N/P |
| Seoul | KRW ('000) | 2,575 | 3,350 | 1,950 | 2,400 |
| Shanghai | RMB | 8,300 | 13,250 | 7,400 | 11,500 |
| Singapore | SGD | 2,900 | 4,950 | 2,050 | 3,950 |
| OCEANIA @Q4 2020 | | | | | |
| Adelaide | AUD | 2,700 | 3,800 | 2,250 | 3,150 |
| Auckland | NZD | 3,700 | 4,900 | 3,100 | 4,650 |
| Brisbane | AUD | 3,000 | 4,400 | 2,500 | 3,800 |
| Canberra | AUD | 3,500 | 5,500 | 2,800 | 4,300 |
| Christchurch | NZD | 3,700 | 4,700 | 2,900 | 4,350 |
| Darwin | AUD | 3,100 | 4,150 | 2,400 | 3,800 |
| Gold Coast | AUD | 2,800 | 4,400 | 2,050 | 3,200 |
| Melbourne | AUD | 3,450 | 4,600 | 2,650 | 3,650 |
| Perth | AUD | 3,000 | 4,700 | 2,400 | 3,750 |
| Sydney | AUD | 3,900 | 5,900 | 2,950 | 4,350 |
| Wellington | NZD | 4,200 | 5,000 | 3,050 | 4,300 |
| AMERICAS @ Q3 2020 | | | | | |
| Boston | USD | 3,765 | 5,920 | 2,420 | 3,500 |
| Chicago | USD | 3,015 | 4,845 | 1,885 | 3,015 |
| Denver | USD | 2,585 | 3,500 | 1,780 | 2,155 |
| Honolulu | USD | 3,230 | 5,865 | 2,745 | 4,415 |
| Las Vegas | USD | 2,155 | 3,765 | 1,455 | 2,045 |
| Los Angeles | USD | 2,585 | 3,875 | 1,940 | 2,850 |
| New York | USD | 3,765 | 8,610 | 2,155 | 5,380 |
| Phoenix | USD | 2,155 | 3,765 | 1,505 | 2,100 |
| Toronto | CAD | 2,475 | 3,335 | 2,155 | 3,070 |

N/P: Not Published

Singapore, Kuala Lumpur, Jakarta and Ho Chi Minh City:

Rates are per square metre of Construction Floor Area (CFA), measured to external face of external walls and inclusive of covered basement and above ground parking areas.

Chinese cities, Hong Kong and Macau: Rates are per square metre of Construction Floor Area (CFA), measured to outer face of external walls.

Singapore, Kuala Lumpur, Chinese cities, Hong Kong and Macau: All hotel rates are inclusive of Furniture, Fittings and Equipment (FF&E).

| Cost Range Per m² | | | | | |
|-------------------|--------|----------------|--------|-----------------------------|--------|
| Retail | | | | Residential Multi Storey | |
| Mall | | Strip Shopping | | | |
| Low | High | Low | High | Low | High |
| | | | | | |
| 9,500 | 14,500 | 8,300 | 13,000 | 4,500 | 9,300 |
| 8,800 | 12,500 | 7,600 | 11,500 | 4,050 | 8,100 |
| 20,775 | 27,650 | N/P | N/P | 15,900 | 24,350 |
| 22,500 | 28,500 | 19,250 | 25,000 | 21,000 | 42,000 |
| 6,525 | 9,000 | N/P | N/P | 6,875 | 16,000 |
| 2,100 | 3,500 | N/P | N/P | 1,900 | 4,500 |
| 38,900 | 60,100 | 50,600 | 67,000 | 31,000 | 72,500 |
| 1,750 | 2,525 | 1,450 | 2,225 | 1,675 | 2,825 |
| 8,700 | 13,750 | 7,700 | 12,500 | 4,050 | 8,300 |
| 1,900 | 3,300 | N/P | N/P | 1,900 | 3,100 |
| | | | | | |
| 1,600 | 3,000 | 1,300 | 1,840 | 2,300 | 3,550 |
| 2,850 | 3,200 | 1,660 | 2,050 | 4,000 | 4,900 |
| 2,200 | 3,600 | 1,400 | 2,000 | 2,400 | 4,400 |
| 2,400 | 4,050 | 1,260 | 2,550 | 2,950 | 5,200 |
| 2,550 | 2,900 | 1,440 | 1,840 | 3,400 | 4,100 |
| 1,760 | 2,650 | 1,260 | 2,150 | 2,050 | 2,650 |
| 2,500 | 3,500 | 1,200 | 1,800 | 1,760 | 4,500 |
| 2,350 | 3,400 | 1,320 | 1,780 | 2,650 | 4,650 |
| 1,900 | 2,900 | 1,000 | 2,500 | 1,900 | 4,100 |
| 2,200 | 4,700 | 1,660 | 2,250 | 2,850 | 6,300 |
| 2,950 | 3,150 | N/P | N/P | 3,900 | 4,800 |
| | | | | | |
| 2,155 | 3,230 | 1,615 | 2,585 | 1,990 | 3,390 |
| 1,990 | 3,120 | 1,455 | 2,370 | 1,775 | 4,305 |
| 1,025 | 1,615 | 860 | 1,885 | 1,345 | 2,690 |
| 2,370 | 5,490 | 1,990 | 4,845 | 2,205 | 4,950 |
| 1,290 | 5,165 | 860 | 1,560 | 1,075 | 4,360 |
| 1,720 | 3,765 | 1,455 | 2,100 | 2,530 | 3,985 |
| 3,230 | 6,460 | 2,045 | 3,765 | 2,315 | 4,360 |
| 1,290 | 2,370 | 970 | 1,615 | 1,075 | 2,690 |
| 2,635 | 3,230 | 1,400 | 1,885 | 2,260 | 2,690 |

N/P: Not Published

INTERNATIONAL CONSTRUCTION

BUILDING COSTS (Continued from page 30)

| Location /City | Local Currency | Cost Range Per m ² | | | |
|------------------------------|----------------|-------------------------------|-------|---------|-------|
| | | Office Building | | | |
| | | Premium | | Grade A | |
| | | Low | High | Low | High |
| EUROPE @ Q2 2020 | | | | | |
| Amsterdam | EUR | 1,400 | 2,000 | 1,160 | 1,560 |
| Birmingham | GBP | 2,050 | 2,900 | 1,660 | 3,050 |
| Bristol | GBP | 2,150 | 3,050 | 1,740 | 3,050 |
| Edinburgh | GBP | 1,880 | 2,650 | 1,640 | 2,650 |
| London | GBP | 3,050 | 3,950 | 2,750 | 3,750 |
| Manchester | GBP | 2,200 | 2,850 | 1,880 | 2,850 |
| Moscow | EUR | 1,360 | 1,860 | 1,200 | 1,460 |
| Oslo | EUR | 2,450 | 3,000 | 1,800 | 2,150 |
| MIDDLE EAST @ Q2 2020 | | | | | |
| Abu Dhabi | AED | 5,700 | 6,800 | 4,600 | 6,400 |
| Dubai | AED | 6,000 | 7,200 | 4,850 | 6,800 |
| Riyadh | SAR | 5,200 | 8,100 | 5,300 | 7,300 |

| Location /City | Local Currency | Cost Range Per m ² | | | |
|---------------------------|----------------|-------------------------------|--------|--------|---------|
| | | Hotels | | | |
| | | 3 Star | | 5 Star | |
| | | Low | High | Low | High |
| ASIA @ Q2 2020 | | | | | |
| Beijing | RMB | 11,000 | 14,000 | 14,750 | 19,500 |
| Guangzhou | RMB | 10,500 | 12,500 | 14,000 | 18,000 |
| Ho Chi Minh City | VND ('000) | 25,175 | 32,550 | 35,850 | 43,000 |
| Hong Kong | HKD | 28,250 | 32,750 | 34,000 | 41,750 |
| Jakarta | RP ('000) | 13,500 | 19,000 | 18,000 | 24,000 |
| Kuala Lumpur | MYR | 2,500 | 3,500 | 5,000 | 7,000 |
| Manila | PHP | 55,700 | 70,200 | 86,000 | 101,200 |
| Seoul | KRW ('000) | 1,900 | 2,650 | 3,500 | 5,200 |
| Shanghai | RMB | 10,500 | 13,500 | 14,250 | 19,000 |
| Singapore | SGD | 3,200 | 3,650 | 4,200 | 4,850 |
| OCEANIA @ Q4 2020 | | | | | |
| Adelaide | AUD | 2,750 | 3,550 | 3,700 | 4,550 |
| Auckland | NZD | 4,200 | 4,750 | 6,500 | 7,200 |
| Brisbane | AUD | 3,000 | 4,200 | 4,200 | 5,700 |
| Canberra | AUD | 3,100 | 5,300 | 4,250 | 6,400 |
| Christchurch | NZD | 4,100 | 4,600 | 5,100 | 6,200 |
| Darwin | AUD | 2,850 | 3,550 | 3,600 | 4,450 |
| Gold Coast | AUD | 2,800 | 4,000 | 4,000 | 5,600 |
| Melbourne | AUD | 3,100 | 4,000 | 4,400 | 5,900 |
| Perth | AUD | 2,600 | 3,600 | 3,600 | 4,800 |
| Sydney | AUD | 3,500 | 4,450 | 4,800 | 6,700 |
| Wellington | NZD | 4,100 | 4,600 | 5,100 | 6,700 |
| AMERICAS @ Q3 2020 | | | | | |
| Boston | USD | 2,960 | 4,200 | 4,305 | 6,245 |
| Chicago | USD | 3,120 | 4,415 | 4,305 | 7,105 |
| Denver | USD | 2,690 | 3,765 | 3,230 | 5,380 |
| Honolulu | USD | 3,605 | 6,030 | 5,705 | 8,290 |
| Las Vegas | USD | 1,615 | 3,230 | 3,765 | 5,920 |
| Los Angeles | USD | 3,070 | 3,930 | 4,090 | 6,030 |
| New York | USD | 3,445 | 4,630 | 4,630 | 6,995 |
| Phoenix | USD | 1,885 | 2,960 | 3,765 | 5,920 |
| Toronto | CAD | 2,370 | 3,015 | 4,575 | 5,705 |

N/P: Not Published

| Cost Range Per m ² | | | | | |
|-------------------------------|-------|----------------|-------|-----------------------------|--------|
| Retail | | | | Residential Multi Storey | |
| Mall | | Strip Shopping | | | |
| Low | High | Low | High | Low | High |
| | | | | | |
| 1,540 | 2,200 | 1,000 | 1,540 | 1,160 | 1,860 |
| 3,050 | 4,250 | 960 | 1,820 | 1,740 | 2,400 |
| 3,000 | 4,200 | 950 | 1,800 | 1,260 | 1,800 |
| 2,900 | 4,050 | 920 | 1,720 | 1,720 | 2,450 |
| 3,650 | 5,200 | 1,180 | 2,200 | 2,600 | 4,500 |
| 3,050 | 4,300 | 980 | 1,840 | 1,820 | 2,650 |
| 1,100 | 1,800 | 1,060 | 1,300 | 650 | 1,200 |
| 2,100 | 2,700 | 1,800 | 2,150 | 1,880 | 1,780 |
| | | | | | |
| 4,000 | 6,300 | N/P | N/P | 4,400 | 6,500 |
| 4,250 | 6,700 | N/P | N/P | 4,650 | 6,900 |
| 3,300 | 6,000 | 3,600 | 5,100 | 3,150 | 13,750 |

| Cost Range Per m² | | | | | |
|-------------------|--------|----------|--------|----------------------|--------|
| Car Parking | | | | Industrial Warehouse | |
| Multi Storey | | Basement | | | |
| Low | High | Low | High | Low | High |
| | | | | | |
| 2,500 | 3,450 | 4,200 | 7,300 | 4,850 | 6,200 |
| 2,250 | 3,200 | 3,950 | 6,900 | 4,450 | 5,500 |
| 9,225 | 13,750 | 18,925 | 25,850 | 6,225 | 9,400 |
| 8,800 | 10,750 | 18,500 | 25,250 | 15,000 | 18,750 |
| 3,500 | 4,500 | 6,000 | 8,000 | 4,800 | 6,100 |
| 800 | 1,200 | 1,400 | 3,400 | 1,000 | 1,800 |
| N/P | N/P | N/P | N/P | 53,300 | 68,100 |
| 730 | 910 | 940 | 1,200 | 1,300 | 1,625 |
| 2,350 | 3,350 | 4,350 | 7,300 | 4,400 | 5,700 |
| 750 | 1,300 | 1,460 | 2,100 | 1,060 | 1,320 |
| | | | | | |
| 680 | 980 | 1,340 | 1,960 | 650 | 1,100 |
| 1,060 | 1,360 | 2,300 | 2,800 | 780 | 1,060 |
| 1,000 | 1,500 | 1,700 | 2,200 | 750 | 1,200 |
| 790 | 1,320 | 1,060 | 1,840 | 740 | 1,400 |
| 970 | 1,400 | 2,050 | 2,250 | 740 | 1,140 |
| 750 | 1,260 | 1,180 | 1,540 | 800 | 1,420 |
| 850 | 1,400 | 1,600 | 2,200 | 750 | 1,200 |
| 860 | 1,360 | 1,360 | 1,880 | 700 | 1,300 |
| 650 | 1,000 | 1,800 | 3,100 | 550 | 1,060 |
| 840 | 1,320 | 1,220 | 2,050 | 800 | 1,320 |
| 1,440 | 1,640 | 2,850 | 3,050 | 1,020 | 1,400 |
| | | | | | |
| 915 | 1,505 | 1,075 | 1,720 | 1,185 | 2,045 |
| 860 | 1,345 | 1,345 | 1,830 | 1,185 | 1,990 |
| 1,075 | 1,345 | 1,455 | 1,885 | 970 | 1,615 |
| 1,130 | 1,615 | 1,560 | 2,960 | 1,615 | 2,585 |
| 540 | 915 | 645 | 1,615 | 755 | 1,075 |
| 1,130 | 1,345 | 1,455 | 2,100 | 1,345 | 2,045 |
| 1,025 | 1,885 | 1,455 | 2,260 | 1,240 | 2,155 |
| 485 | 755 | 755 | 1,185 | 755 | 1,075 |
| 860 | 1,240 | 1,290 | 1,720 | 915 | 1,185 |

N/P: Not Published

INTERNATIONAL CONSTRUCTION

BUILDING COSTS (Continued from page 32)

| Location /City | Local Currency | Cost Range Per m² | | | |
|----------------------|----------------|-------------------|-------|--------|--------|
| | | Hotels | | | |
| | | 3 Star | | 5 Star | |
| | | Low | High | Low | High |
| EUROPE @ Q2 2020 | | | | | |
| Amsterdam | EUR | 1,340 | 1,700 | 1,920 | 2,850 |
| Birmingham | GBP | 1,420 | 2,200 | 2,350 | 3,300 |
| Bristol | GBP | 1,460 | 1,960 | 2,500 | 3,350 |
| Edinburgh | GBP | 1,400 | 2,050 | 2,200 | 3,050 |
| London | GBP | 1,940 | 2,500 | 2,900 | 3,850 |
| Manchester | GBP | 1,580 | 1,960 | 2,350 | 3,200 |
| Moscow | EUR | 1,600 | 2,000 | 2,300 | 2,950 |
| Oslo | EUR | 2,850 | 3,100 | 3,150 | 3,800 |
| MIDDLE EAST @Q2 2020 | | | | | |
| Abu Dhabi | AED | 5,900 | 8,300 | 8,800 | 11,750 |
| Dubai | AED | 6,200 | 9,300 | 9,300 | 14,500 |
| Riyadh | SAR | 6,400 | 8,000 | 17,000 | 20,000 |

N/P: Not Published

| Cost Range Per m² | | | | | |
|-------------------|-------|----------|-------|----------------------|-------|
| Car Parking | | | | Industrial Warehouse | |
| Multi Storey | | Basement | | | |
| Low | High | Low | High | Low | High |
| | | | | | |
| 430 | 650 | 800 | 1,240 | 460 | 820 |
| 400 | 750 | 880 | 1,520 | 450 | 640 |
| 440 | 870 | 1,040 | 1,620 | 440 | 700 |
| 360 | 700 | 870 | 1,500 | 390 | 700 |
| 470 | 930 | 1,240 | 2,000 | 520 | 920 |
| 580 | 740 | 1,100 | 1,600 | 510 | 740 |
| 440 | 560 | 810 | 1,020 | 500 | 700 |
| 480 | 550 | 980 | 1,080 | 1,260 | 1,540 |
| | | | | | |
| 1,760 | 3,500 | 2,800 | 4,400 | 1,460 | 2,650 |
| 2,400 | 3,700 | 3,200 | 4,650 | 1,900 | 3,000 |
| 2,450 | 3,050 | 3,300 | 3,850 | 3,550 | 4,300 |

N/P: Not Published

INTERNATIONAL CONSTRUCTION

SPECIFIC DEFINITIONS FOR INTERNATIONAL CONSTRUCTION COSTS

Office Buildings

Prestige/ Premium Offices are based on landmark office buildings located in major CBD Office Markets, which are built for the premium range of the rental market. These office buildings tend to be trend-setters in establishing rentals and accommodates leading owner-occupiers including headquarters for banks, insurance, multi-national corporations and other major companies.

Grade-A/ Investment Offices are based on high quality buildings which are built for the middle to high range of the rental market.

Hotels

Range of costs generally excludes furniture, fitment and equipment (FF&E), except for Chinese cities, Hong Kong, Kuala Lumpur, Macau and Singapore, where the cost ranges stated include cost allowances for FF&E.

Industrial Buildings

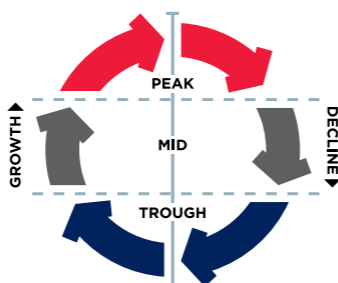
Quality reflects a simplified type of construction suitable for light industry. Exclusions: Hardstanding, roadworks and special equipment.

Residential Buildings

Multi-Storey reflects medium to luxury quality and air-conditioned accommodation.

Note: The comparative ratio of kitchen, laundry and bathroom areas to living areas considerably affects the cost range. Range given is significantly affected by the height and configuration of the building.

Exclusions: Loose furniture, special fittings, washing machines, dryers, refrigerators and tenants' special requirements.



The RLB Construction Sector Activity Cycle represents the construction development activity cycle. Each RLB office highlights the current construction sector activity position within the market activity cycle of those key construction sectors within their region.

Activity within the construction industry traditionally is subject to volatile cyclical fluctuations. The model illustrates the different growth and decline zones in a theoretical construction industry business cycle. Each RLB office highlights the current construction sector activity position within the market activity cycle of those key construction sectors in their region.

Each sector is categorised by three positions within the cycle; Peak, Mid and Trough. Within each position, activity is further defined by either declining or growing inside that sector. The “up” and “down” arrows highlight the current status within the three positions of the cycle by means of the three colours identified in the cycle diagram above.

The tabulation on the following page provides an overview of the relative growth / decline of each development sector in selected Asian cities. Each city has its own industry business cycle in the context of its own economy, and as such the performance of each development sector is not strictly comparable between the cities.

INTERNATIONAL CONSTRUCTION

CONSTRUCTION MARKET ACTIVITY FOR MAJOR ASIAN CITIES

| Location | Houses | Apartments |
|------------------|--------|------------|
| Beijing | ▼ | ▼ |
| Chengdu | ▼ | ▲ |
| Guangzhou | ▼ | ▲ |
| Ho Chi Minh City | ▼ | ▼ |
| Hong Kong | ▼ | ▼ |
| Jakarta | ▼ | ▼ |
| Kuala Lumpur | ▼ | ▼ |
| Macau | ▼ | ▼ |
| Seoul | ▼ | ▼ |
| Shanghai | ▼ | ▼ |
| Shenzhen | ▼ | ▲ |
| Singapore | ▼ | ▼ |

Information as at 2nd Quarter 2020.

| Offices | Industrial | Retail | Hotel | Civil |
|---------|------------|--------|-------|-------|
| ▼ | ▼ | ▲ | ▼ | ▲ |
| ▲ | ▼ | ▼ | ▲ | ▲ |
| ▼ | ▼ | ▼ | ▼ | ▲ |
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| ▼ | ▼ | ▼ | ▼ | ▼ |



Marina Bay Sands, Singapore

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SINGAPORE CONSTRUCTION REGULATIONS

BUILDING CONTROL ACT

The main objective of building control is to ensure building works comply with standards for safety, accessibility, environmental sustainability and buildability as prescribed in the Building Control Act and Building Control Regulations.

All building works, except those that are minor and exempted under the First Schedule of the Building Control Regulations, will require building plan approval from the Commissioner of Building Control (CBC), Building and Construction Authority (BCA).

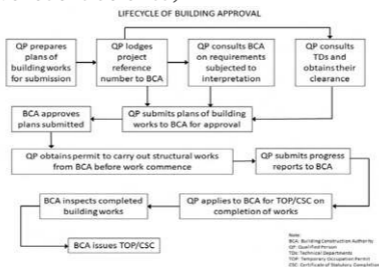
Building works refer to:

- Erection, extension or demolition of a building;
- Alteration, addition or repair of a building;
- Provision, extension or alteration of any air-conditioning service or ventilating system in or in connection with a building

and it includes site formation works connected with or carried out for the purpose of (a), (b) or (c).

As stipulated by the Building Control Act, building plans are to be submitted by a Qualified Person (QP). A QP is a person who is registered as an Architect with the Board of Architects or a Professional Engineer with the Professional Engineers Board. The appropriate QPs for the different types of building works are listed in Third Schedule of the Building Control Regulations. For example, building plans for a warehouse or factory may be submitted by an Architect or a Professional Engineer, but plans for a retaining wall has to be submitted by a Professional Engineer (PE).

The typical process of getting building plan approval is illustrated in the following flow chart. (This is a typical process. Variations do exist.)



The design and construction of a building must comply to performance requirements prescribed in the Building Control Regulations.

Source: [BCA](#) as at Feb 2020

The Licensing of Builders Scheme is part of the Building and Construction Authority's (BCA) long term plan to upgrade the safety and quality standards of the construction sector while raising professionalism by requiring minimum standards of management, safety record and financial solvency.

All builders carrying out building works where plans are required to be approved by the Commissioner of Building Control and builders who work in specialist areas which have a high impact on public safety will require a Builder's Licence from 16 June 2009. The requirement applies to both public and private projects.

Type of Licence

| License Type | Sub-Type | Allowable Projects |
|----------------------------|----------|--|
| General Builder License | Class 1 | Projects of any value |
| | Class 2 | Projects of S\$6 million or less |
| Specialist Builder License | N.A. | <div>Any of the following specialist building works:</div> <ul style="list-style-type: none">• Piling works• Ground support and stabilisation works• Site investigation work• Structural steelwork• Pre-cast concrete work• In-situ post-tensioning work <div>Note: Builders may register in more than one category if qualified.</div> |

SINGAPORE CONSTRUCTION REGULATIONS

LICENSING OF BUILDERS

(Continued from page 42)

Licensing Requirements

The following requirements must be fulfilled to receive a Builder's License.

| Requirement | Details |
|--|---|
| Appoint an Approved Person (AP) | <p>The AP appointed will take charge and direct the management of the business in building works.</p> <p>The AP must be:</p> <ul style="list-style-type: none">• The sole proprietor in a sole proprietorship• One of the partners in a partnership• A director, member of the board of management or an employee (being a person with similar duties and responsibilities of the aforementioned roles) in a corporation <p>The AP must also possess the right qualifications and experience.</p> |
| Appoint a Technical Cotroller (TC) | <p>The TC appointed will oversee the execution and performance of any building works undertaken by the builder.</p> <p>For specialist builders, the TC appointed must possess a civil or structural engineering degree from a recognised institution and have the right qualifications and experience.</p> <p>Resident Engineers must meet acceptable qualifications set by BCA.</p> |
| Meet minimum paid-up capital (for corporations only) | <ul style="list-style-type: none">• Class 1 General Builder: not less than S\$300,000.00• Class 2 General Builder or Specialist Builder: not less than S\$25,000.00 |
| Pay licensing fees Note: Validity of license is up to 3 years. | <ul style="list-style-type: none">• Class 1 General Builder: S\$1,800.00• Class 2 General Builder: S\$1,200.00• Specialist Builder: S\$1,500.00 |

Source: [BCA](#) as at Dec 2019

Construction Registration of Tradesmen Scheme (CoreTrade)

CoreTrade requirements on deployment of registered tradesmen and foremen began in 2009. All Class 1 General Builders undertaking a project of value which is S\$20 million or more will need to deploy a prescribed minimum number of construction personnel who are registered under the CoreTrade. This applies to new building works, addition and alteration works and civil engineering works. The objective of CoreTrade is to build up a core group of local and experienced foreign workers in key construction trades to anchor and lead the workforce.

Details on registration of CoreTrade personnel, deployment requirements and penalties can be found on BCA website.

Source: [BCA](#) as at Dec 2019

SINGAPORE CONSTRUCTION REGULATIONS

BUILDING CONTROL (BUILDABILITY AND PRODUCTIVITY) REGULATIONS 2011

The legislation on buildability has been in effect since 1 January 2001. The Building Control (Buildability and Productivity) Regulations 2011 is an enhanced Buildability framework that came into effect on 15 July 2011. This enhanced legislation tightened the original requirements under the Buildable Design Score (B-Score) and included another component called the Constructability Score (C-Score). The C-Score requires the builders' contributions to buildability through the adoption of more labour-efficient construction methods/ technologies.

While the B-Score focuses on the use of buildable designs by designers during the upstream design process, the C-Score impacts on the construction methods used during the downstream construction phase. Designers and builders should familiarise themselves with the Buildable Design Appraisal System (BDAS) and Constructability Appraisal System (CAS) respectively, to enable them to consider a range of construction systems, methods, technologies, materials and products to meet the scoring requirements.

The types of development which are not subjected to the minimum B-Score and C-Score requirements are:

- Any culvert, bridge, underpass, tunnel, earth retaining or stabilising structure, slipway, dock, wharf or jetty;
- Any theme park;
- Any place of worship;
- Any power station; or
- Any waste processing or treatment plant

Enhancements to Code of Practice (CoP) on Buildability to Accelerate Adoption of Design for Manufacturing and Assembly (DfMA) Technologies

In 2020, the COVID-19 pandemic disrupted the built environment sector and reaffirmed 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 take effect on 28 December 2020:

| Key Changes | Details |
|---|--|
| (A) Revamp of BDAS with integration of DfMA technologies into each work discipline of Structural, Architectural and Mechanical, Electrical and Plumbing (MEP) | 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 | In the revamped BDAS, new minimum B-Scores have been set for each development type. The details are provided in page 47. |
| (C) Extension of 'open' option with productivity outcome to all large development types (GFA \geq 25,000m ²) in lieu of meeting the minimum B-Score | In 2019, four outcome-based options (three deemed acceptable solutions and one 'open' option) were made available for residential non-landed (RNL) projects with GFA \geq 25,000m ² . In the new CoP on Buildability, designers will be able to 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 25,000m ² . Refer to BCA website for details. |

Minimum Buildable Design Score (B-Score)

The minimum B-Score requirements shall apply to new building works with Gross Floor Area (GFA) of 5,000m² or more. The minimum B-Score requirement also applies to building works consisting of repairs, alterations and/or additions (A&A work) to an existing building if the building works involve the construction of new floor and/or reconstruction of existing floor for which their total GFA is 5,000m² or more. The minimum B-Score for a mixed development will be prorated according to the GFA of each type of development.

To accelerate the adoption of DfMA technologies, BCA will raise the minimum B-Scores for all industrial, commercial and institutional building projects with GFA of at least 25,000m² from April 2022.

SINGAPORE CONSTRUCTION REGULATIONS

BUILDING CONTROL (BUILDABILITY AND PRODUCTIVITY) REGULATIONS 2011 (Continued from page 46)

Minimum Buildable Design Score for All New Building Works and A&A Works

| Year | From 28 December 2020* | |
|---|--|----------------------------|
| Category of Building Work / Development | Minimum Buildable Design Score | |
| | 5,000m ² ≤ GFA < 25,000m ² | GFA ≥ 25,000m 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.

Submission of Buildable Design Score (B-Score)

The B-Score will be one of the requirements for Building Plan (BP) approval. The BP will not be approved if the submitted B-Score is lower than the stipulated minimum. The B-Scores are to be submitted by Qualified Persons (QPs) at the following stages:

- BP stage
- ST (Structural plan) stage
- Temporary Occupation Permit (TOP)/ Certificate of Statutory Completion (CSC) stage

Buildable Design Score (B-Score) Requirements

The B-Score of a project is made up of 3 parts:

Part 1 – Structural System (maximum 45 points). Points are awarded for the use of various types of structural system and structural buildable design features.

Part 2 – Wall System (maximum 45 points). Points are awarded for the use of various types of wall system and architectural buildable design features.

Buildable Design Score (B-Score) Requirements (Cont'd)

Part 3 – Design for Manufacturing and Assembly (DfMA) technologies (maximum 20 points). Points are awarded for various technologies along the DfMA continuum and across the structural, architectural and mechanical, electrical & plumbing (MEP) disciplines. These include Prefabricated Prefinished Volumetric Construction (PPVC), mass engineered timber (MET), structural steel, prefabricated bathroom units (PBUs) and prefabricated MEP modules, integrated precast concrete components, etc..

In addition to the above, points for standardisation of components and repetition of layouts/grids are incorporated under Part 1 and Part 2. Part 1 and Part 2 also include points given for the use of productive technologies and other buildable designs such as self-compacting concrete, simple design, dry construction, engineered timber flooring, etc..

The maximum B-Score achievable for a project is capped at 110 points.

SINGAPORE CONSTRUCTION REGULATIONS

BUILDING CONTROL (BUILDABILITY AND PRODUCTIVITY) REGULATIONS 2011 (Continued from page 48)

Minimum Constructability Score (C-Score)

The minimum C-Score requirement shall apply to new building works with GFA of 5,000m² or more. The minimum C-Score requirement also applies to building works consisting of repairs, alterations and/or additions (A&A works) to an existing building if the building works involve the construction of new floor and/or reconstruction of existing floor for which their total gross floor area is 5,000m² or more.

Minimum Constructability Score for All Building Works comprising Buildings more than 6 Storeys

| Category of Building Work / Development | Minimum Constructability Score | |
|---|--|---|
| | 5,000m ² ≤ GFA < 25,000m ² | GFA ≥ 25,000m ² |
| | w.e.f. 1 May 2017 | |
| Residential (landed) | 50 (min. 35 points from Structural System) | 60 (min. 45 points from Structural System) |
| Residential (non-landed) | | |
| Commercial | | |
| Industrial | | |
| School | | |
| Institutional and others | | |

*The minimum scores above are based on date of planning submissions made to URA except for building works built on land sold under the GLS Programme which are based on the date the GLS land is sold

Minimum Constructability Score for All Building Works comprising Buildings of 6 Storeys and below

| Category of Building Work / Development | Minimum Constructability Score | |
|---|--|---|
| | 5,000m ² ≤ GFA < 25,000m ² | GFA ≥ 25,000m ² |
| | w.e.f. 1 May 2017 | |
| Residential (landed) | 50 (min. 32 points from Structural System) | 60 (min. 42 points from Structural System) |
| Residential (non-landed) | | |
| Commercial | | |
| Industrial | | |
| School | | |
| Institutional and others | | |

*The minimum scores above are based on date of planning submissions made to URA except for building works built on land sold under the GLS Programme which are based on the date the GLS land is sold

Submission of Constructability Score (C-Score)

Builders are required to submit the C-Scores which shall not be lower than the stipulated minimum at either one of the following stages:

- At the time of application for permit to carry out structural works (Permit), or
- Within 3 months (for non-Design and Build projects) or 6 months (for Design and Build projects) after the permit has been issued in the event that the builder requires more time to plan for the type of construction methods and technologies to be adopted in the project.

Constructability Score (C-Score) Requirements

The C-Score of a project is made up of 3 parts:

Part A – Structural System (maximum 60 points). Points are awarded for various methods and technologies adopted during the construction of structural works.

Part B – Architectural, Mechanical, Electrical & Plumbing (AMEP) System (maximum 45 points). Points are awarded for various methods and technologies adopted during the construction of AMEP works.

Part C – Good Industry Practices (maximum 15 points). Points are awarded for good industry practices adopted on site to improve productivity.

In addition to the above, points are obtainable in Part A and Part B if a project adopts innovative systems that help to achieve productivity improvement. Innovation points are awarded subjected to BCA's assessment on a case-by-case basis of the impact on labour efficiency of the particular system used.

The total point allocated under the Constructability Assessment Scheme (CAS) is 120 points.

More information on the B-Score and C-Score requirements can be found on the BCA website.

Source: [BCA](#) as at Mar 2021

SINGAPORE CONSTRUCTION REGULATIONS

ACCESSIBILITY FOR THE BUILT ENVIRONMENT

With an ageing population and as the number of people in Singapore with mobility difficulties rise over the years, accessibility in the Built Environment is increasingly gaining importance. The Government introduced the Code on Barrier-Free Accessibility (BFA) to support the upgrading of existing buildings. A S\$40-million Accessibility Fund was set aside to encourage private sector participation, to upgrade buildings built before 1990 which are not BFA compliant and upgrade all key areas and essential facilities in Singapore to provide at least basic accessibility by 2016. The Government aims to have 70% of commercial and institutional buildings in Singapore barrier-free by 2030.

The Building and Construction Authority (BCA) also introduced new mandatory requirements in existing buildings from 2017. Owners of commercial and institutional buildings that are visited frequently by the public must include barrier-free accessibility upgrades when they undergo additions and alterations (A&A) works. The BCA extended the S\$40-million Accessibility Fund to March 2022, expanded its scope and enhanced its eligibility criteria to benefit more building owners. The Fund will cover accessibility features for the visually and hearing impaired and allow up to two applications per building or development.

The Code on Accessibility in the Built Environment 2019 refines existing requirements to allow more equitable access for elders and persons with disabilities. In the latest revision to the Code, requirements are also enhanced to accommodate the new mobility climate resulting from advancement in technology. Apart from addressing the needs of an ageing population, the revised Code introduces more accessibility and universal design features to improve the built environment for all.

New projects and existing buildings undergoing large-scale A&A have to follow the new Code when they are submitted to BCA for regulatory approval from 6 January 2020.

More details on the Code on Accessibility for the Built Environment can be found on the BCA website.

Source: [BCA](#) as at Dec 2019

Universal Design in the broadest term is “design for all people”. It seeks to create an environment addressing the needs of all age groups and people of different abilities including temporary disability. The move towards universal design has developed due to the expanding population of people with varying degree of abilities and advancing years, their demands for recognition and desire for independent living.

To address these needs, the Building and Construction Authority (BCA) introduced a UD Guide in October 2007 that provides a more complete set of guidelines for adoption in all building designs. It has universal design recommendations that are applicable not only to commercial buildings but also a wider range of building types, including residential buildings as well as public and community facilities. The Government also launched a new UD Guide for Public Places in July 2016. The guide covers a comprehensive approach to UD in and around buildings, vehicular environments and sanitary facilities and for different types of public buildings.

An annual UD Award was introduced in 2007 to give recognition to good practices and special efforts taken by building owners and consultants in implementing UD features, over and beyond the mandatory requirements as specified in the Code on Barrier Free Accessibility.

Universal Design Mark

This is a voluntary certification scheme launched in October 2012 to promote UD and encourage the building industry to incorporate the principles in their developments and projects. This initiative accords recognition to developments and stakeholders that adopt a user-centric philosophy in their design, operations and maintenance. It also aims to raise greater public awareness towards user-friendly buildings. The recognition of best practices in enhancing accessibility and user-friendliness within the development provides the following benefits:

1. Improves competitiveness by meeting the varying needs of diverse user groups
2. Increase in the number of potential visitors to the development, thereby, generating greater sales and revenue
3. Generates a positive effect on the corporate image

In July 2015, BCA launched a set of enhanced UD Mark criteria called the UD Mark Version 2.0 (2015), setting higher certification benchmarks and providing an expanded design scope for buildings. This includes the additional criteria of installing assistive hearing facilities for the elderly with hearing difficulties, and design features for persons with visual disability assisted by guide dogs. The enhanced criteria will raise the bar for universal design in Singapore.

The BCA UD Mark Certification Scheme allows assessment of projects at design stage, thereby facilitating the incorporation of UD principles from the onset of project development. Completed built development will be awarded a display plaque indicating one of the four UD Mark ratings: Certified, Gold, Gold^{PLUS} or Platinum.

More details on UD can be found on the BCA website.

Source: [BCA](#) as at Oct 2020

SINGAPORE CONSTRUCTION REGULATIONS

ENVIRONMENTAL SUSTAINABILITY

The Building and Construction Authority (BCA) Green Mark Scheme was launched in January 2005 as an initiative to drive Singapore's construction industry towards more environment-friendly buildings. It is intended to promote sustainability in the built environment and raise environmental awareness among developers, designers and builders when they start project conceptualisation and design, as well as during construction.

BCA has enhanced the Building Control Act and put in place the Building Control (Environmental Sustainability) Regulations, to require a minimum environmental sustainability standard that is equivalent to the Green Mark Certified Level for new buildings and existing ones that undergo major retrofitting. Projects that are submitted for Urban Redevelopment Authority (URA) planning permission on or after 15 April 2008 will be subject to this requirement.

The Building Control (Environmental Sustainability) Regulations 2008 will apply to:

- All new building works with GFA of 2,000m² or more;
- Additions or extensions to existing buildings which involve increasing GFA of the existing buildings by 2,000m² or more;
- Building works which involve major retrofitting to existing buildings with GFA of 2,000m² or more.

Mandatory higher Green Mark Standard for Government

| Selected Strategic Areas¹ |
|--|
| Marina Bay |
| Downtown Core (including areas within the CBD located next to Marina Bay) |
| Jurong Lake District |
| Kallang Riverside |
| Paya Lebar Central |
| Woodlands Regional Centre |
| Punggol Eco-Town |

¹ Refer to the Building Control (Environmental Sustainability) Regulations 2008 for the exact location

Singapore Green Building Masterplan (SGBMP)

The SGBMP is an action plan that sets out Singapore's environmental sustainability efforts for the Built Environment and is part of the Singapore Green Plan 2030. In the fourth edition, the SGBMP aims to deliver three key targets of "80-80-80 in 2030" as follows:

- 80% of buildings by GFA to be green by 2030
- 80% of new developments by GFA to be SLE buildings from 2030
- 80% improvement in energy efficiency for best-in-class green buildings by 2030

As part of the newest edition, the taskforce has proposed to streamline and consolidate the current GM NRB:2015, GM RB:2016 and GM ENRB:2017 into a new all-in-one Green Mark 2021 Framework which is currently ready for pilot. More details on the official launch will be provided by BCA in 3Q 2021.

Land Sales (GLS) Sites in selected strategic areas

| Requirements for building wholly or partly within area that is on land sold under the GLS Programme |
|---|
| Green Mark Platinum Rating (on or after 5 May 2010) |
| Green Mark Gold ^{PLUS} Rating (on or after 5 May 2010) |
| Green Mark Gold ^{PLUS} Rating (on or after 5 May 2010) |
| Green Mark Gold ^{PLUS} Rating (on or after 5 May 2010) |
| Green Mark Gold ^{PLUS} Rating (on or after 5 May 2010) |
| Green Mark Gold ^{PLUS} Rating (on or after 1 September 2014) |
| Green Mark Gold ^{PLUS} Rating (on or after 1 September 2014) |

GreenGov.SG

The public sector is committed to take the lead in environmental sustainability and adopt a long-term view in resource efficiency. Previously known as Public Sector Taking the Lead in Environmental Sustainability (PSTLES), GreenGov.SG will take the lead in driving wider adoption of Super Low Energy (SLE) buildings, provide use cases for the private sector to take reference from, and bring SLE buildings into the mainstream.

Regulatory Requirements for Existing Buildings

To achieve an all-round sustainable built environment, it is important to ensure that existing buildings continue to operate efficiently throughout their life cycle.

PartIIIB – Environmental Sustainability Measures for Existing Buildings in the Building Control Act requires owners of existing buildings to:


- Comply with the minimum environmental sustainability standard (Green Mark Standard)
- Submit periodic energy efficiency audits of the building's cooling systems
- Submit information in respect of energy consumption and other related information as required by the Commissioner of Building Control

Minimum Environmental Sustainability Standard (Green Mark Standard) For Existing Buildings

On and after 2 January 2017, the Building Control (Environmental Sustainability Measures for Existing Building) Regulations 2016 will apply to all buildings with centralised cooling systems and GFA greater than 5,000m², when installing or replacing the building cooling system.

Only the following types of buildings will be excluded from the above requirement:

- Any industrial buildings;
- Any railway premises, port services and facilities or airport services and facilities;
- Any religious buildings;
- Any data centres;
- Any utility buildings; or
- Any residential buildings, excluding serviced apartments.



Building owners are required to submit to BCA for approval:

- A design Green Mark Score for the building, including other specified documents before installing or replacing of chillers (major energy-use change); and
- An as-built Green Mark Score for the building, including other specified documents after completing the installation of chillers.

Mandatory Submission of Periodic Energy Audits

With effect from 1 January 2014, upon notice from the Commissioner of Building Control, building owners are required to engage a Mechanical Engineer (PE(Mech)) or an Energy Auditor registered with BCA to carry out an energy audit on the building cooling system before making the necessary documentary submission to the Commissioner of Building Control.

The Periodic Energy audit will be applicable to the following group of buildings.

For new buildings whose application for planning permission is submitted on or after 1 December 2010, building owners may be issued a notice:

- At any time after the temporary occupation permit (TOP) or certificate of statutory completion (CSC) is issued; and
- At intervals of not less than three years after the date of the last notice served.

For existing buildings which have undergone a major energy-use change on and after 2 January 2014 and are required to meet the prescribed Green Mark Standard for existing building, building owners may be issued a notice:

- Three years after the date of the approved as-built score; and
- At intervals of not less than three years after the date of the last notice served.

BCA Green Mark Assessment Criteria

BCA Green Mark is a green building rating system to evaluate a building for its environmental impact and performance. It provides a comprehensive framework for assessing the overall environmental performance of new and existing buildings to promote sustainable design, construction and operations practices in buildings.

Under the assessment framework for new buildings, developers and design teams are encouraged to design and construct green, sustainable buildings which are more climatic responsive, energy effective, resource efficient, smarter and have healthier indoor environments. As for existing buildings, the building owners and operators are encouraged to meet their sustainable operations goals and to reduce adverse impacts of their buildings on the environment and occupant health over the entire building life cycle. Beside buildings, the assessment criteria evaluate energy efficiency, water efficiency, environment protection, indoor environmental quality and other green/innovative features of districts, parks, infrastructure and building interiors.

BCA Green Mark Award Rating Scores

Depending on the level of building performance and Green Mark Score, the building development will be eligible for certification under one of the ratings, namely BCA Green Mark Gold, Gold^{PLUS} or Platinum. The design of the building development shall also meet all the relevant mandatory requirements regulated under the Building Control Regulations.

The Green Mark Score of the building design is the total of all the numerical scores assigned based on the degree of compliance with the applicable criteria. The following table states the corresponding Green Mark Score to attain the respective Green Mark ratings. Buildings must also fulfil their respective pre-requisite requirements to attain the respective Green Mark rating. The total points scored include the bonus points scored under Advanced Green Efforts.

| Green Mark Rating | Green Mark Score |
|---------------------------------|------------------|
| Green Mark Platinum | 70 And Above |
| Green Mark Gold ^{PLUS} | 60 To < 70 |
| Green Mark Gold | > 50 To < 60 |

Source: [BCA](#) as at Mar 2021

SINGAPORE CONSTRUCTION REGULATIONS

ENVIRONMENTAL SUSTAINABILITY

(Continued from page 58)

Green Mark for Non-Residential Buildings (GM NRB) 2015 Criteria Summary

| | | |
|--|--|------------------|
| Prerequisite Requirements | | |
| Prerequisites P.01 To P.15: Parked Under Main Criteria | | |
| Minimum Points Prerequisites | | |
| Energy Modelling Prerequisite | | |
| Elective Requirements | | |
| Part 1 - Climatic Responsive Design | | 30 points |
| P.1 | Envelope and Roof Thermal Transfer | |
| P.2 | Air Tightness and Leakage | |
| P.3 | Bicycle Parking | |
| 1.1 Leadership | | 10 points |
| 1.1a | Climatic And Contextually Responsive Brief | 1 point |
| 1.1b | Integrative Design Process | 4 points |
| | 4D, 5D & 6D BIM (Advanced Green Efforts) | 3 points |
| 1.1c | Environmental Credentials Of Project Team | 2 points |
| 1.1d | User Engagement | 3 points |
| 1.2 Urban Harmony | | 10 points |
| 1.2a | Sustainable Urbanism | Up to 5 points |
| (i) | Environmental Analysis | 2 points |
| | Creation Of Possible New Ecology and Natural Ecosystems (Advanced Green Efforts) | 1 point |
| (ii) | Response To Site Context | 3 points |
| (iii) | Urban Heat Island (UHI) Mitigation | 1 point |
| (iv) | Green Transport | 2 points |
| 1.2b | Integrated Landscape And Waterscape | Up to 5 points |
| (i) | Green Plot Ratio (GnPR) | 3 points |
| | GnPR \geq 5.0 (Advanced Green Efforts) | 1 point |
| (ii) | Tree Conservation | 1 point |
| (iii) | Sustainable Landscape Management | 1.5 points |
| (iv) | Sustainable Storm Water Management | 1 points |
| 1.3 Tropicallty | | 10 points |
| 1.3a | Tropical Facade Performance | 3 points |
| | Low heat gain Facade (Advance Green Effort) | 1 point |
| | Vertical Greenery On The East and West Facade (Advanced Green Efforts) | 1 point |
| | Thermal Bridging (Advanced Green Efforts) | 1 point |
| 1.3b | Internal Spatial Organisation | 3 points |
| 1.3c | Ventilation Performance | 4 points |
| | Wind Driven Rain Simulation (Advanced Green Efforts) | 1 point |
| Part 2 - Building Energy Performance | | 30 points |
| P.4 | Air Conditioning Total System and Component Efficiency | |
| P.5 | Lighting Efficiency and Controls | |
| P.6 | Vertical Transportation Efficiency | |
| 2.1 Energy Efficiency | | 22 points |
| Option 1: Energy Performance Points Calculator | | |
| 2.1a | Air Conditioning Total System Efficiency | 5 points |

| | | |
|---|--------------------------------|------------------|
| 2.1b | Lighting System Efficiency | 3 points |
| 2.1c | Carpark System Efficiency | 2 points |
| 2.1d | Receptacle Efficiency | 1 point |
| 2.1e | Building Energy | 11 points |
| Further Improvement in Design Energy Consumption (Advanced Green Efforts) | | 2 points |
| Option 2: Performance-Based Computation | | |
| 2.1f | Space Conditioning Performance | 10 points |
| Efficient Space Conditioning Energy Design (Advanced Green Efforts) | | 1 point |
| 2.1g | Lighting System Performance | 6 points |
| Efficient Lighting Design (Advanced Green Efforts) | | 1 point |
| 2.1h | Building System Performance | 6 points |
| Energy Efficient Practices and Features (Advanced Green Efforts) | | 2 points |
| 2.2 Renewable Energy | | 8 points |
| 2.2a | Solar Energy Feasibility Study | 0.5 point |
| 2.2b | Solar Ready Roof | 1.5 points |
| 2.2c | Adoption Of Renewable Energy | 6 points |
| Further Electricity Replacement by Renewables (Advanced Green Efforts) | | 5 points |
| Part 3 - Resource Stewardship | | 30 points |
| P.7 Water Efficient Fittings | | |
| 3.1 Water | | 8 points |
| 3.1a | Water Efficient Systems | 3 points |
| (i) Landscape Irrigation | | 1 point |
| (ii) Water Consumption of Cooling Towers | | 2 points |
| Better Water Efficient Fittings (Advanced Green Efforts) | | 1 point |
| 3.1b | Water Monitoring | 2 points |
| (i) Water Monitoring and Leak Detection | | 1 point |
| (ii) Water Usage Portal and Dashboard | | 1 point |
| 3.1c | Alternative Water Sources | 3 points |
| 3.2 Materials | | 18 points |
| 3.2a | Sustainable Construction | 8 points |
| (i) Conservation And Resource Recovery | | 1 point |
| (ii) Resource Efficient Building Design | | 4 points |
| Use Of BIM to Calculate CUI (Advanced Green Efforts) | | 1 point |
| (iii) Low Carbon Concrete | | Up to 3 points |
| Use of Advanced Green Materials (Advanced Green Efforts) | | 1 point |
| 3.2b | Embodied Carbon | 2 points |
| Provide own Emission Factors with Source Justification (Advanced Green Efforts) | | 1 point |
| Compute the Carbon Footprint of the Entire Development (Advanced Green Efforts) | | 2 points |
| 3.2c | Sustainable Products | Up to 8 points |
| (i) Functional Systems | | 8 points |
| (ii) Singular Sustainable Products (outside of Functional Systems) | | 2 points |
| Sustainable Products with Higher Environmental Credentials (Advanced Green Efforts) | | 2 points |

SINGAPORE CONSTRUCTION REGULATIONS

ENVIRONMENTAL SUSTAINABILITY

(Continued from page 60)

Green Mark for Non-Residential Buildings (GM NRB) 2015 Criteria Summary

| | |
|---|------------------|
| 3.3 Waste | 4 points |
| 3.3a Environmental Construction Management Plan | 1 point |
| 3.3b Operational Waste Management | 3 points |
| Part 4 - Smart & Healthy Building | 30 points |
| P.8 Thermal Comfort | |
| P.9 Minimum Ventilation Rate | |
| P.10 Filtration Media for Times of Pollution | |
| P.11 Low Volatile Organic Compound (VOC) Paints | |
| P.12 Refrigerants | |
| P.13 Sound Level | |
| P.14 Permanent Instrumentation for the Measurement and Verification of Chilled Water Air-Conditioning Systems | |
| P.15 Electrical Sub-Metering & Monitoring | |
| 4.1 Indoor Air Quality | 10 points |
| 4.1a Occupant Comfort | 2 points |
| (i) Indoor Air Quality (IAQ) Surveillance Audit | 1 point |
| (ii) Post Occupancy Evaluation | 0.5 point |
| (iii) Indoor Air Quality Display | 0.5 point |
| Indoor Air Quality Trending (Advanced Green Efforts) | 2 points |
| 4.1b Outdoor Air | 3 points |
| (i) Ventilation Rates | 1.5 points |
| (ii) Enhanced Filtration Media | 1 point |
| (iii) Dedicated Outdoor Air System | 0.5 point |
| 4.1c Indoor Contaminants | 5 points |
| (i) Local Exhaust and Air Purging System | 2 points |
| (ii) Ultraviolet Germicidal Irradiation (UVGI) System | 0.5 point |
| (iii) More Stringent VOC Limits for Interior Fittings and Finishes | 2 points |
| (iv) Use of Persistent Bio-cumulative and Toxic (PBT) Free Lighting | 0.5 point |
| Zero ODP Refrigerants with Low Global Warming Potential (Advanced Green Efforts) | 1 point |
| 4.2 Spatial Quality | 10 points |
| 4.2a Lighting | Up to 6 points |
| (i) Effective Daylighting for Common Areas | 2 points |
| (ii) Effective Daylighting for Occupied Spaces | 4 points |
| (iii) Quality of Artificial Lighting | 1 point |
| 4.2b Acoustics | 2 points |
| (i) Sound Transmission Reduction | 0.5 point |
| (ii) Acoustic Report | 1.5 points |
| 4.2c Wellbeing | Up to 2 points |
| (i) Biophilic Design | 3 points |
| (ii) Universal Design (UD) Mark | 1 point |

| | |
|---|------------------------|
| 4.3 Smart Building Operations | 10 points |
| 4.3a Energy Monitoring | 3 points |
| (i) Energy Portal and Dashboard | 2 points |
| (ii) BAS and Controllers with Open Protocol | 1 point |
| Permanent M&V for VRF Systems (Advance Green Efforts) | 2 point |
| Permanent M&V for Hot Water Systems (Advanced Green Efforts) | 1 point |
| 4.3b Demand Control | 3 points |
| (i) ACMV Demand Control | 2 points |
| (ii) Lighting Demand Control | 1 point |
| (iii) Carpark Guidance System | 0.5 point |
| 4.3c Integration and Analytics | 3 points |
| (i) Basic Integration and Analytics | 0.5 per feature |
| (ii) Advanced Integration and Analytics | 1 per feature |
| (iii) Carpark Guidance System | 0.5 point |
| Additional Advanced Integration and Analytical Features (Advanced Green Effort) | 1 point |
| 4.3d System Handover and Documentation | 1 points |
| Expanded Post Occupancy Performance Verification by a 3rd Party (Advanced Green Effort) | 2 points |
| Energy Performance Contracting (Advanced Green Effort) | 1 point |
| PART 5 - Advanced Green Efforts | 20 points |
| 5.1 Enhanced Performance | Up to 15 points |
| 5.2 Complementary Certifications | 1 point |
| 5.3 Demonstrating Cost Effective Design | 2 point |
| 5.4 Social Benefits | 2 points |
| Annexes for specialised buildings | 10 to 15 points |
| Annex 1: Energy Efficiency Features for Specialised Building [Hawker Centres] | 15 points |
| Annex 2: Energy Efficiency Features for Specialised Building [Healthcare Facilities] | 10 points |
| Annex 3: Energy Efficiency Features for Specialised Building [Laboratory Buildings] | 10 points |
| Annex 4: Energy Efficiency Features for Specialised Building [Schools] | 10 points |

Source: [BCA](#) as at Feb 2020

SINGAPORE CONSTRUCTION REGULATIONS

ENVIRONMENTAL SUSTAINABILITY

(Continued from page 62)

Green Mark for Residential Buildings (GM RB) 2016 Criteria Summary

| Prerequisite Requirements | | |
|--|---|------------|
| Prerequisites P.01 To P.13: Parked Under Main Criteria | | |
| Main Criteria | | |
| Part 1 - Climatic Responsive Design | | 35 points |
| 1.1 Leadership | | 8 points |
| 1.1a | Climatic And Contextually Responsive Brief | 1 point |
| 1.1b | Integrative Design Process | 2 points |
| 1.1c | Environmental Credentials of Project Team | 2 points |
| 1.1d | Building Information Modelling | 2 points |
| 1.1e | User Engagement | 1 point |
| 1.02 Urban Harmony | | 10 points |
| 1.2a | Sustainable Urbanism | 5 points |
| 1.2b | Integrated Landscape and Waterscape | 5 points |
| 1.03 Tropicality | | 17 points |
| 1.3a | Tropical Facade Performance | 5 points |
| 1.3b | Internal Organisation | 2 points |
| 1.3c | Ventilation Performance | 10 points |
| Part 2 - Building Energy Performance | | 25 points |
| 2.1 Energy Efficiency | | 12 points |
| 2.1a | Air Conditioning System Efficiency | 6 points |
| 2.1b | Lighting Efficiency | 4 points |
| 2.1c | Car Park Energy | 2 points |
| 2.2 Energy Effectiveness | | 5 points |
| 2.2a | Energy Efficient Practices, Design and Features | 5 points |
| 2.3 Renewable Energy | | 8 points |
| 2.3a | Feasibility Study | 0.5 points |
| 2.3b | Solar Ready Roof | 1.5 points |
| 2.3c | Replacement Energy | 6 points |
| Part 3 - Resource Stewardship | | 35 points |
| 3.1 Water | | 13 points |
| 3.1a | Water Efficient Systems | 9 points |
| 3.1b | Water Usage Monitoring | 1 point |
| 3.1c | Alternative Water Sources | 3 points |
| 3.2 Materials | | 18 points |
| 3.2a | Sustainable Construction | 8 points |
| 3.2b | Embodied Energy | 2 points |
| 3.2c | Sustainable Products | 8 points |
| 3.3 Waste | | 4 points |
| 3.3a | Environmental Construction Management Plan | 1 point |
| 3.3b | Operational Waste Management | 3 points |

| | |
|--|------------------|
| Part 4 - Smart and Healthy Building | 35 points |
| 4.1 Indoor Air Quality | 8 points |
| 4.1a Occupant Comfort | 2 points |
| 4.1b Contaminants | 6 points |
| 4.2 Spatial Quality | 9 points |
| 4.2a Lighting | 5 points |
| 4.2b Acoustics | 2 points |
| 4.2c Wellbeing | 2 points |
| 4.3 Smart Building Operations | 8 points |
| 4.3a Energy Monitoring | 2 points |
| 4.3b Demand Control | 2 points |
| 4.3c Integration and Analytics | 2 points |
| 4.3d System Handover and Documentation | 2 points |
| Part 5 - Advanced Green Efforts | 20 points |
| 5.1 Enhanced Performance | 15 points |
| 5.2 Demonstrating Cost Effective Design | 2 points |
| 5.3 Complementary Certifications | 1 point |
| 5.4 Social Benefits | 2 points |

More details on the Green Mark Assessment Criteria can be found on the BCA website.

Source: [BCA](#) as at Aug 2019

SINGAPORE CONSTRUCTION REGULATIONS

GROSS FLOOR AREA

Prior to 1989, the intensity of residential development was measured in terms of population density i.e. persons per hectare. For non-residential developments such as industrial and warehouse buildings, institutional buildings, commercial buildings etc., the intensity was measured in terms of plot ratio.

Following the introduction of the new development charge system in 1989, the gross floor area (GFA) concept was adopted by the Urban Redevelopment Authority (URA) to determine the development intensity of a building, thereby standardising the previous methods of calculating development intensity for different types of developments.

Items at a glance on GFA

| Items | Excluded From GFA* |
|--|--------------------|
| Automated Teller Machine and Vending Machine Kiosk | |
| Balconies | |
| Basement Diaphragm Wall | ✓ |
| Bay Windows | |
| Bicycle Parking Space | ✓ |
| Cable Chamber | ✓ |
| Car Parking Lot | ✓ |
| Catwalk | ✓ |
| Communal Roof Terrace | ✓ |
| Covered Communal Ground Gardens | |
| Covered Enclosed Space | |
| Covered Swimming Pool | |
| Covered Water Feature | ✓ |
| Covered Walkway and Linkages | ✓ |
| Curtain Wall | ✓ |
| Driveways | ✓ |
| End of Trip Facilities | ✓ |
| Entrance Canopy | ✓ |
| Floors - Under a Pitch Roof | |
| Floors - Under a Platform | |
| Floors - Intermediate | |
| Floors - Perforated | |
| Guardhouse and Sentry Post | |



Definition of Gross Floor Area

All covered floor areas of a building, except otherwise exempted and uncovered areas for commercial uses are deemed the GFA of the building for purposes of plot ratio control and development charge. The GFA is the total area of the covered floor space measured between the centre line of party walls, including the thickness of external walls but excluding voids. Accessibility and usability are not criteria for exclusion from GFA. URA reserves the right to decide on GFA matters based on the specific design of a development proposal on a case-by-case basis.

Various items and areas that are counted, partially counted or not counted as GFA in a building development are indicated in the following tabulation.

| Partially excluded as GFA* | Included as GFA | GFA over and above Master Plan Control* |
|----------------------------|-----------------|---|
| | ✓ | |
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SINGAPORE CONSTRUCTION REGULATIONS

GROSS FLOOR AREA (Continue from page 66)

Items at a glance on GFA

| Items | Excluded From GFA* |
|---|--------------------|
| Household Shelter | |
| Indoor Recreation Space | |
| Ledge - Air-Conditioner | ✓ |
| Ledge - Firemen's | ✓ |
| Ledge - Sun Shading Purpose | ✓ |
| Letter Boxes | ✓ |
| Lift Lobbies with Car Park Floor | |
| Lift Motor Room | |
| Lift Shaft | |
| Loading and Unloading Bay | ✓ |
| Loading and Unloading Platforms | |
| Metal Ceiling Grid | ✓ |
| M&E Space - With Limited Headroom | ✓ |
| M&E Space - Within Basement Car Park Floor | ✓ |
| M&E Space - Enclosed by Chain Link Fence on Car Park Floor | ✓ |
| Motorcycle Parking Lot | ✓ |
| Open Courtyards and Air Wells (Pre-1960) | |
| Outdoor Refreshment Area | |
| Outdoor Refreshment Kiosk | |
| Pavilions | ✓ |
| Pick-up/ Drop-off Point | ✓ |
| Planter Boxes - Communal | ✓ |
| Planter Boxes - Private | |
| Private Enclosed Space | |
| Private Roof Terrace | |
| Privately Owned Public Space | ✓ |
| Racking System for Storage Purpose | ✓ |
| Recessed Window | |
| Refuse Chamber | ✓ |
| Refuse Chute | ✓ |
| Reinforced Concrete Slabs within Voids | |
| Roof Cover | ✓ |
| Roof Eaves and Building Projections - Below 6th Storey | |
| Roof Eaves and Building Projections - At and Above 6th Storey | ✓ |
| Shadow Area - Elevated Linkway | ✓ |
| Shadow Area - Solar Panel | ✓ |



| Partially excluded as GFA* | Included as GFA | GFA over and above Master Plan Control* |
|-------------------------------|-----------------|--|
| | ✓ | |
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SINGAPORE CONSTRUCTION REGULATIONS

GROSS FLOOR AREA (Continued from page 68)

Items at a glance on GFA

| Items | Excluded From GFA* |
|---|--------------------|
| Service Duct | |
| Sky Terrace | |
| Staircase | |
| Staircase – Intermediate | ✓ |
| Staircase – Scissors | |
| Staircase – Connecting Virtual Floors | |
| Staircase – Uncovered External Perforated Staircase | |
| Staircase – Uncovered Staircase to ESS | ✓ |
| Unenclosed Facade Articulation | |
| Void Deck | |
| Walls and Columns | |
| Water Tanks | ✓ |

*Subject to compliance with requirements and conditions. See details and updates in GFA Handbook available on the URA website..



| Partially excluded as GFA* | Included as GFA | GFA over and above Master Plan Control* |
|-------------------------------|-----------------|--|
| | ✓ | |
| ✓ | | |
| | ✓ | |
| | ✓ | |
| | ✓ | |
| | ✓ | |
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| | ✓ | ✓ |
| | ✓ | |
| | ✓ | |
| | | |

Source: [URA](#) as at Oct 2020

SINGAPORE CONSTRUCTION REGULATIONS

BONUS GROSS FLOOR AREA (GFA) SCHEME

Urban Redevelopment Authority (URA) grants bonus GFA incentives to encourage the provision of specific building features or uses. The GFA of the incentivised features are allowed above the Master Plan Gross Plot Ratio (GPR) control. These bonus GFA incentives are given to help realise various planning objectives for the city.

However, as such bonus GFA are allowed over and above the Master Plan GPR control for a site, they add to the development bulk and intensity beyond what was planned for. As there is a limit to the amount of additional bulk and intensity that can be accommodated for a site and collectively within an area without adversely affecting the effectiveness of GPR and GFA as planning tools, bonus GFA incentives will need to be managed properly. Hence, all bonus GFA incentives are consolidated in a menu of bonus GFA schemes and the usage of the bonus GFA items from the menu will have to observe an overall budget of 10% for additional GFA allowed beyond the Master Plan under bonus GFA schemes for each development site.

Under this framework, for a site that qualifies for multiple bonus GFA incentive schemes, the developers and Qualified Persons (QPs) are free to determine which bonus GFA scheme(s) to adopt and the quantum of bonus GFA to use under each scheme (subject to compliance with the guidelines of the individual schemes), as long as the cumulative bonus GFA is within the overall budget of 10% above the Master Plan GPR. This will allow the developers and QPs the freedom to choose the schemes that best fit their business and operational needs. Please note that all additional GFA granted under the bonus GFA incentive schemes will not form the future development potential of the sites upon redevelopment.

Developments are eligible for the following bonus GFA incentive schemes if they comply with the relevant guidelines:

| Bonus GFA Incentive Schemes | |
|---|---|
| Residential Developments (Flats and Condominiums) | Balcony Incentive Scheme |
| | Conserved Bungalow Scheme |
| | Indoor Recreation Spaces Scheme |
| Non-Residential Development (Commercial) | Community and Sports Facilities Scheme |
| | Rooftop Outdoor Refreshment Areas on Landscaped Roofs |
| Non-Residential Development (Hotel) | Balcony Incentive Scheme |
| | Rooftop Outdoor Refreshment Areas on Landscaped Roofs |

Source: [URA](#) as at Oct 2020

Rejuvenation Incentives for Strategic Areas

URA will be rescinding the Bonus Plot Ratio (BPR) scheme introduced in 1989 in tandem with the gazette of Master Plan 2019 with the introduction of the following rejuvenation incentives:

1. Strategic Development Incentive (SDI) Scheme (with effect from 27 March 2019)
2. CBD Incentive Scheme (with effect from 27 November 2019)

The new package of incentive schemes aims to encourage the rejuvenation of the CBD and other strategic areas to encourage a better mix of uses and enhance urban vibrancy.

Source: [URA](#) as at Mar 2019

SINGAPORE CONSTRUCTION REGULATIONS

CONTRACTORS REGISTRATION SYSTEM (CRS)

The Contractors Registry is administered by the Building and Construction Authority (BCA) to register contractors who provide construction-related goods and services to the public sector. Registration status shall be accorded only to firms which BCA considers as having sufficient resources, experience and technical expertise to undertake contracts of a nature and size as defined by the Registration Head and the grade allocated.

Except for Regulatory Workheads (RW), CRS functions as an administrative body only for the public sector procurement. As such, business entities which are not registered with BCA are not restricted from conducting business as contractors or suppliers outside the public sector. The requirements stated, as set forth shall be taken as defining only the minimum requirements expected of an applicant.

| Construction Workheads (CW01 & CW02) | A1 | A2 |
|--|---------------------|-----------|
| Tendering Limit (S\$m) 1 Jul 2020 to 30 Jun 2021 | Unlimited | 85.0 |
| Tendering Limit (S\$m) 1 Jul 2021 to 30 Jun 2022 | Unlimited | 95.0 |
| Specialist Workheads (CR, ME, FM02-04 & SY) | Single Grade | L6 |
| Tendering Limit (S\$m) 1 Jul 2020 to 30 Jun 2021 | Unlimited | Unlimited |
| Tendering Limit (S\$m) 1 Jul 2021 to 30 Jun 2022 | Unlimited | Unlimited |
| Specialist Workheads (FM01) | M1 | M2 |
| Tendering limit (S\$m) From 1 Apr 2020 | Unlimited | 30.0 |

Scope of Registration

CRS is divided into seven major categories, namely Construction Workheads (CW) that covers general building (CW01) and civil engineering works (CW02), Construction Related Workheads (CR), Mechanical & Electrical Workheads (ME), Facilities Management Workhead (FM), Trade Heads (TR), Supply Heads (SY) and Regulatory Workheads (RW). There are 7 financial grades for CW, 6 financial grades for CR, ME, MW, SY and single grading for CR01, CR03, CR15, CR17, CR18, TR and RW. The detailed requirements can be obtained from the BCA website.

Tendering Limits

The Tender Price Index (TPI) published by BCA every quarter reflects the recent trend in construction costs due to changes in material prices, manpower, plant and machinery, overheads and profits. The Tendering Limit is determined using the TPI to reflect the impact of tender price movements on project value.

The tendering limit for each respective grade may be adjusted every year depending on the economy driving the construction industry in Singapore.

| B1 | B2 | C1 | C2 | C3 |
|------|------|-----|-----|------|
| 40.0 | 13.0 | 4.0 | 1.3 | 0.65 |
| 45.0 | 15.0 | 4.5 | 1.5 | 0.75 |
| L5 | L4 | L3 | L2 | L1 |
| 13.0 | 6.5 | 4.0 | 1.3 | 0.65 |
| 15.0 | 7.5 | 4.5 | 1.5 | 0.75 |
| M3 | M4 | | | |
| 10.0 | 1.0 | | | |

Source: [BCA](#) as at Jun 2021

SINGAPORE CONSTRUCTION REGULATIONS

PRICE QUALITY METHOD (PQM)

The Price Quality Method (PQM) is a tendering framework based on both the price and quality attributes for the evaluation of construction tenders. PQM adopts a range of weightages for evaluation of attributes and formalises the assessment of non-price attributes into quantitative scores. PQM optimises value by awarding the tender to the tenderer with the highest combined PQM score (i.e. best offer) for the project.

The PQM applies to all public sector construction tenders under the BCA Construction Workheads (CW01 & CW02) with Estimated Procurement Value (EPV) of S\$3 million and above.

Key Principles of PQM

Both Price and non-price (i.e. Quality and Productivity) attributes will be given weightages and scored based on the guideline provided. The bid with the highest combined Price-Quality-Productivity score (i.e. PQM score) shall be awarded the project.

The PQM procedures will be as open and transparent as possible. The weightages among Price, Quality and Productivity components, the Quality and Productivity attributes, the number of points assigned to each attribute and the method of scoring will be made known upfront in the tender.

Tenders using the framework should comply with the World Trade Organisation (WTO) regulations such as having non-discriminatory criteria.

All tenderers can request in writing to seek feedback from the respective agency on their individual tender performance after the tender award.

Main Features of PQM

1. Weightages for PQM

The following range of weightages can be considered, depending on project requirements such as the complexity of the project, and the extent of design input required from the tenderers.

| Component | Weightages for Building tenders ¹ | Weightages for Civil Engineering tenders ² |
|--------------|--|---|
| Price | 40% - 60% | 50% - 70% |
| Productivity | 10% | 10% |
| Quality | 50% - 30%, correspondingly | 40% - 20%, correspondingly |

¹ These refer to building projects classified under Contractors Registration System (CRS) Workhead CW01.

² These refer to civil engineering projects classified under CRS Workhead CW02

2. Tender Submissions

The agencies can adopt the one-envelope or the two-envelope system. A one-envelope system can be adopted for projects whereby the scoring of the specified quality attributes is based on quantified templates with no subjective judgment. An example of an objective scoring for quality attributes would be safety performance based on MOM's List of Contractors with Demerit Points. Otherwise, a two-envelope system shall be adopted.

2.1 One-envelope System

Tenderers submit the Price, Quality and Productivity together in one envelope. The Price Quality and Productivity scores shall be computed at the same time.

2.2 Two-envelope System

Tenderers submit the Quality and Productivity envelope separately from the Price envelope. Agencies would open and compute the Quality and Productivity score first, before opening the Price envelope and computing the combined scores. The tenderer with the best combined score will be awarded the contract.

Scoring Methodology

1. "Price" Component

The lowest tender price will be given the maximum Price-score (P-score). Agencies reserve the right not to consider any tender bid that is abnormally low. The Price scores of the other tenderers will be inversely proportional to the lowest tender price. The "Price" Score Computation below shall be used to compute the P-score.

$$\text{Price Score (P-score)} = \frac{\text{Lowest tender price}}{\text{Tenderer's price}} \times \text{Price weightage}$$

If price loading is applicable under Bonus Scheme of Construction Quality (BSCQ), the new price (loaded according to the Total Price Loading Factor) shall be used for computing the P-score.

When computing the P-score, the tenderer's price should not include provisional sums and value of nominated subcontracts.

Any alternative bid, by any of the firm, will be treated as a separate bid and be assessed accordingly, provided alternatives are allowed. Alternative bids are offers which functionally meet the specified technical specifications and/or terms and conditions differing from those set out in the Invitation to Tender.

PRICE QUALITY METHOD (PQM)

(Continued from page 76)

2. “Productivity” Component

Attributes under the Productivity component (10%) will include:

- a) Constructability Score (CS) Index³ (4% to 8%)
- b) Technology Adoption (Construction) (TA(C)) Index (1%)
- c) Workforce Development (Construction) (WD(C)) Index⁴ (1%)
- d) (Optional) Other Productivity attributes specified by agencies (up to 4%)⁵

The indices are published on the BCA website and updated on a quarterly basis⁶.

Where Productivity Attributes are specified by agencies, agencies may decide the attributes and scoring method that are relevant to assess the impact of tenderers’ proposal on project productivity. For example, agencies could evaluate the technical proposal of the tenderers in terms of their potential productivity gains.

For projects where the minimum Constructability Score requirement is applicable, up to 4% could be assigned to project-specific productivity attributes. The total of CS Index and other productivity attributes specified by agencies should make up a total of 8%. For projects that are not subject to the minimum Constructability Score requirements, the CS Index attribute will not be applicable. For such cases:

- a) Up to 8% could be assigned to project-specific productivity attributes (i.e. total PQM score will be between 93 to 100 points); or
- b) The full 8% could be discarded. Score will be based only on the remaining Productivity attributes (i.e. the productivity score weightage shall only be 2%, with the total PQM score at 92 points).

To compute the Productivity-score (PDscore) for a tenderer, the points for each of the Productivity attributes are added up. The “Productivity” Score Computation formula is:

$$\text{Productivity-score (PD-score)} = \frac{\text{Scores from [CS Index + TA(C) Index + WD(C) Index + Other productivity attributes (if any)]}}{\text{Total possible score for Productivity attributes}}$$

- a. Score will be pegged to the tenderer that has the highest CS Index among all tenderers.

$$\text{CS Index Score} = \frac{\text{Tenderer's CS Index}}{\text{Highest Tenderer's CS Index}} \times \text{Weightage}$$

- i) The tenderer with the highest CS Index will obtain full points
- ii) Tenderers with no CS Index will be given the average points across all conforming tenderers
- iii) For cases where less than two (i.e. only one or none) of the tenderers have CS Index, the CS Index attribute will be discarded⁷.

- b. Score will be pegged to the tenderer that has the highest TA(C) Index among all tenderers.

$$\text{TA(C)Index Score} = \frac{\text{Tenderer's TA(C) Index}}{\text{Highest Tenderer's TA(C) Index}} \times \text{Weightage (1\%)}$$

- i) The tenderer with the highest TA(C) Index will obtain full points
 - ii) Tenderers with no TA(C) Index will be scored zero point
- c. Score will be pegged to the tenderer that has the highest WD(C) Index among all tenderers.

$$\text{WD(C)Index Score} = \frac{\text{Tenderer's WD(C) Index}}{\text{Highest Tenderer's WD(C) Index}} \times \text{Weightage (1\%)}$$

- i) The tenderer with the highest WD(C) Index will obtain full points
- ii) Tenderers with no WD(C) Index will be scored zero point

3. "Quality" Component

Attributes under the Quality component could include:

- a) Relevant track records of tenderer or specific competencies that enhances the tenderer's suitability for the project;
- b) Performance in past or ongoing projects in areas such as timeliness, safety and quality. To recognise contractors which have provided quality work in past projects, it is mandatory that past appraisal performance (based on C41 reports and/or agencies' in-house performance assessment system) accounts for at least 15% of the overall quality points;
- c) To give due emphasis to site safety, it is also mandatory that safety performance accounts for at least 15% of the overall Quality points⁸;
- d) Project Specific Proposals including work methods and resources assigned to the project; and
- e) Awards or other attributes, if any.

Agencies shall decide which attributes are relevant for a particular project and assign the maximum points for each quality attribute.

SINGAPORE CONSTRUCTION REGULATIONS

PRICE QUALITY METHOD (PQM)

(Continued from page 78)

Agencies shall set out the scoring method for the specific Quality attribute selected. The scoring method can adopt any of the following approaches:

- a) Benchmark performance method
- b) Ranking method
- c) Banding method
- d) Raw score method

Further explanation on the above four approaches is available on the BCA website.

The tenderer with the highest total raw quality points will be given maximum Quality score. The Quality score of the other tenderers will be calculated proportionally to the highest total Quality points. The formula below shall be used to compute the Quality-score (Q-score).

Quality score (Q- score)

=

Tenderer's total Quality Points

Highest total Quality Points

× Quality Weightage

Agencies may choose to adopt at most one of the following optional requirements:

- a) Set a specific Quality attribute as a minimum qualifying criterion, which must be stipulated upfront in the tender documents so that potential tenderers which do not meet this criterion need not tender. This is to minimise the wastages in the firms' tendering efforts. If any agency intends to specify track record as a minimum qualifying criterion, it should not be overly onerous such that it limits the number of eligible tenderers unnecessarily.
- b) Set a minimum total Quality points for firms to meet. Firms which do not meet the minimum total Quality points will be 'disqualified' and their Price scores will not be computed. If the two-envelope system is used, the Price envelopes from the non-conforming tenders should not be opened.

Information Required in Tender Documents

The following items must be clearly made known at tender stage:

- a) Price-Productivity-Quality weightage
- b) Quality and Productivity attributes applicable and their assigned maximum points
- c) Scoring method for each attribute e.g. benchmark performance method or ranking method, etc. Benchmarks used in the benchmark performance method must be made known, together with how tenderers which perform better or worse than the benchmark will be scored.
- d) (if applicable) Any minimum qualifying criterion for a specific quality attribute, which, if not met, would disqualify the tenderer.
- e) (if applicable) Any minimum total quality points below which tenderers will not be further considered.

More details on PQM can be found on the BCA website.

Source: [BCA](#) as at Jan 2018

3The CS Index of each Contractor is derived by BCA based on their C-Scores (Constructability Score) of the latest 5 completed projects in the last 3 years.

4 TA(C) and WD(C) indices are calculated from the amount of funding disbursed under the Building Information Modelling (BIM) fund, Mechanisation Credit (Mech C) scheme, Productivity Innovation Project (PIP) scheme and the Workforce Training and Upgrading scheme respectively under the Construction Productivity & Capability Fund (CPCF).

5The weightage for this attribute to be carved out from the CS Index attribute, i.e. the total of CS Index and Other productivity attributes specified by agencies would make up a total of 8%. If CS index is not applicable, up to 8% could be assigned to project specific productivity attributes or be discarded totally.

6 Visit the BCA link above for the publication of indices in January, April, July and October. The latest available indices at the tender closing date should be used for tender evaluation. For example, if a tender closes on 2 January 2018, the indices to be used for tender evaluation shall be the indices published on 1 January 2018. If a tender closes on 31 May 2018, the indices to be used shall be the indices published on 1 April 2018.

7 In such cases, the PD-score will be based only on the remaining Productivity attributes.

8 Contractors can view their individual performance score under the electronic Builders and Contractors Registration System (eBACS).

SINGAPORE CONSTRUCTION REGULATIONS

BUILDING AND CONSTRUCTION INDUSTRY SECURITY OF PAYMENT ACT (CHAPTER 30B)

The Security of Payment Act (SOP Act) came into operation on 1 April 2005 after the Building and Construction Industry Security of Payment Bill was implemented in November 2004. The SOP Act seeks to improve cash flow in the construction industry by giving parties the right to seek progress payment for work done, and provide fast and low-cost adjudication to resolve payment disputes.

The SOP Act was enacted to facilitate payments for construction work done or for related goods or services supplied in the building and construction industry, and for matters connected therewith. The SOP Act entitles payments to any person who has carried out any construction work; or has supplied any goods or services under a contract, is entitled to a progress payment. Henceforth, the SOP Act covers a wide spectrum of goods and services in the construction industry relating to construction work, which includes professional consultancy services.

The SOP Act shall apply to any contract that is made in writing on or after 1 April 2005, whether or not the contract is expressed to be governed by the law of Singapore.

However, the SOP Act is not applicable to any contract for the carrying out of construction work, or the supply of goods or services in relation to any residential property defined under the Residential Property Act (Cap. 274), which do not require the approval of the Commissioner of Building Control under the Building Control Act (Cap. 29); or employment contracts; or contracts that deal with construction work carried out outside Singapore, or goods or services supplied to construction work carried out outside Singapore.

The Building and Construction Industry Security of Payment (Amendment) Bill was passed in Parliament in October 2018 and the Building and Construction Industry Security of Payment (Amendment) Regulations was gazetted on 26 November 2019 and came into operation from 15 December 2019. The key amendments to the Act and/or Regulations include:

- a. Expanding and clarifying the scope of the application of the Act
- b. Enhancing requirements on handling of payment claims and responses
- c. Improving the adjudication processes
- d. Other revisions to improve the operation of the Act and Regulations

The SOP Act:

1. Facilitates progress payments in the entire construction value chain, thereby improving cash flow;
2. Provides the statutory right to progress payments for work done and materials supplied by contractors, even if there is no such provision in their contract;
3. Renders unenforceable 'pay when paid' provision of a contract;
4. Provides a procedure of a quick and less expensive adjudication system to resolve disputes and facilitate cash flow;
5. Provides right of contractor / service provider to suspend work or supply for non-payment after adjudication; and
6. Provides additional remedies when adjudicated amount is not paid.

Period to respond to claims and make payment

Construction contracts:

- a. The respondent must respond to a payment claim by a claimant within a maximum of 21 days.
- b. After serving the payment response, the respondent must make payment within a maximum of 35 days.
- c. If the contract does not stipulate the payment periods, the default period of 14 days for serving payment response will apply.

Supply of goods contracts:

- a. The respondent must make payment within a maximum of 60 days for payment due.
- b. If the contract does not stipulate the payment period, the default period for making payment is 30 days.
- c. The respondent must provide reasons for non payment in writing to the claimant before the due date under the amendment Bill.

Source: [BCA](#) as at Dec 2019

SINGAPORE CONSTRUCTION REGULATIONS

BUILDING AND CONSTRUCTION INDUSTRY SECURITY OF PAYMENT ACT (CHAPTER 30B)

(Continued from page 82)

Relief under COVID-19 (Temporary Measures) Act 2020 (COTMA)

Construction contracts as defined in the SOP Act are covered under Part 8A, 8B and 10A of COTMA ("The Act"). The Act will help parties who are unable to perform their contractual obligations due materially to COVID-19 by giving a moratorium on court or arbitration proceedings. If parties are unable to supply goods or services due to COVID-19, they are entitled to the following relief:

1. The call on a performance bond (or equivalent) by the non-defaulting party will be prohibited during the prescribed period.
2. Any liquidated damages or other damages payable under the contract due to delays sustained during the period starting from 1 February 2020 to 30 September 2021 (as of April 2021) caused materially by COVID-19 are to be disregarded.
3. The fact that a party was unable to perform an obligation to supply goods and materials due materially to COVID-19 is a defence to a claim for a breach of contract.

Parties who are unable to perform their contractual obligations are encouraged to negotiate with the other party to reach a compromise. Failing which, the defaulting party will have to serve a Notification for Relief during the prescribed period.

The Act will work concurrently with the SOP Act to preserve and facilitate cash flow relief in the construction industry. Adjudication proceedings under the SOP Act will remain available to the relevant parties during the prescribed periods.

Source: [BCA](#) as at Apr 2021

In 2015, the Building and Construction Authority (BCA) unveiled the 2nd Construction Productivity Roadmap as a framework to boost the construction industry’s productivity by an average of 2-3% per annum to achieve a highly integrated and technologically advanced construction sector by year 2020.

Vision to Develop Collaborative Platforms and Common Standards



SINGAPORE CONSTRUCTION REGULATIONS

INTEGRATED DIGITAL DELIVERY (IDD)

(Continued from page 84)

Within the Roadmap, Building Information Modelling (BIM) has been identified as a key technology to achieve such aims. BIM can be defined as the object-based digital representation of the physical and functional characteristics of a facility. It goes beyond the creation of 3D models for design and design coordination by creating a common platform for all parties to obtain and input information about a facility and with that provides a reliable basis for decisions during its entire lifecycle.

The Singapore BIM Guide Version 1.0 was launched in May 2012 and an updated Version 2.0 in August 2013. BCA launched a Code of Practice to set out the minimum modelling standards and regulatory information required to be provided in the BIM model. Since 2015, submissions for all new developments plans with GFA larger than 5,000m² are required in BIM file formats.

BCA will accept voluntary BIM e-submissions in Native BIM format with effect from 19 October 2016 (for architectural plans) and 1 October 2017 (for C&S/ MEP Engineering plans). Such submissions should be prepared in accordance with the prevailing Code of Practice.

BIM Deliverables for Different Stages of a Project

| Project Stages |
|--------------------------------|
| Conceptual Design |
| Schematic / Preliminary Design |
| Detailed Design |
| Construction |
| As-Built |
| Facility Management |

In 2018, the BCA launched an IDD plan to encourage more built environment sector firms to go digital. IDD involves firms and professional using ICT technologies, solutions and platforms across the entire building process and builds on BIM and Virtual Design and Construction (VDC). The three focus areas under BCA's Implementation Plan are:

- Raising awareness on the benefits of IDD through demonstration projects
- Developing the IDD ecosystem, with enabling solutions, platforms and standards
- Strengthening the industry's competency in IDD

The Common Data Environment (CDE) Data Standard was published in January 2021 for projects to ensure consistency in information requirements to support the project delivery and life-cycle management of assets. This includes the coordination and review states of the data and information at the shared and published states.

More information on IDD can be found on the BCA website.

Source: [BCA](#) as at Jan 2020

| Milestones | BIM Deliverables |
|--|---|
| <ul style="list-style-type: none"> • Outline Planning Permission • Project feasibility | <ul style="list-style-type: none"> • Site Model • Massing Model |
| <ul style="list-style-type: none"> • Planning Approval • Design & Build Tender Documentation | <ul style="list-style-type: none"> • Architectural, Structural, MEP Models • Schedule And phasing Program |
| <ul style="list-style-type: none"> • Building Plan Approval • Continued Design & Build Tender Documentation; or • Design-Bid-Build Tender Documentation | |
| <ul style="list-style-type: none"> • Constructability • Fabrication | <ul style="list-style-type: none"> • Construction And Fabrication Models • Shop Drawings |
| <ul style="list-style-type: none"> • TOP / CSC • Final Completion | <ul style="list-style-type: none"> • As-Built Model |
| <ul style="list-style-type: none"> • Operation and Management | <ul style="list-style-type: none"> • Data For Facility Management |

SINGAPORE CONSTRUCTION REGULATIONS

MANDATORY ADOPTION OF SPECIFIC PRODUCTIVE TECHNOLOGIES

Mandatory Adoption Of Specific Productive Technologies For New Developments Sold Under The Government Land Sales (GLS) Programme

Developers play a key role in driving productivity improvement; downstream construction will benefit when building designs include high impact productive technologies. The adoption of new technologies is gaining traction among industry players, especially with the tightening of foreign manpower hiring policies.

The Building and Construction Authority (BCA) has unveiled a research and development (R&D) roadmap aimed at raising productivity with the adoption of labour-saving technology. Under the R&D roadmap, 35 technologies under seven clusters have been identified to help contractors change the way they build and sustain productivity improvements in the long term. The clusters include Design for Manufacturing and Assembly (DfMA), robotics and 3D printing. DfMA stresses the importance of design for ease of manufacturing and assembling of components that will form the final product.

The list below outlines some examples of DfMA elements (high impact productive technologies) that are mandated for specific developments sold under the GLS Programme from 1st November 2014:

(a) Prefabricated Bathroom Units (PBU)

A prefabricated bathroom unit refers to a bathroom unit preassembled off-site complete with finishes, sanitary wares, concealed pipes, conduits, ceiling, bathroom cabinets, shower screen and fittings before installing in position. For all residential (non-landed) and residential non-landed component of mixed-use developments on GLS sites, the minimum number of PBUs to be adopted shall be 65% of the total number of bathroom units.

(b) Prefabrication Systems

Prefabrication is used to describe assemblies that are manufactured under factory conditions and then transported to construction sites for incorporation into building and civil engineering works. Prefabrication Systems for industrial developments include structural systems (precast beams and precast slabs) and wall systems (curtain wall, prefabricated railing, drywall etc.). All industrial developments on Industrial GLS sites with Gross Floor Area (GFA) of 5,000m² or more are required to incorporate a minimum level of use of prefabrication for both the structural and wall systems.

(c) Prefabricated Prefinished Volumetric Construction (PPVC)

PPVC is a construction method whereby free-standing volumetric modules (complete with finishes for walls, floors and ceilings) are (a) constructed and assembled or (b) manufactured and assembled, in an accredited fabrication facility, in accordance with any accredited fabrication method, and then installed in a building under building works. The minimum level of use of PPVC shall be 65% of the total super-structural floor of the building or the component of the building that is to be used for residential or private dwelling purposes.

(d) Mass Engineered Timber (MET)

Where building structural components are constructed from and non-structural components are manufactured from wood harvested from sustainably managed forests. Cross Laminated Timber (CLT) is one form of MET which is fabricated by binding layers of timber at 90 degrees with structural adhesives to produce a solid timber panel.

(e) Prefabricated MEP

Mechanical, electrical and plumbing items prefabricated either as linear lengths, flat assemblies or integrated within volumetric modules off-site and then installed on site.

(f) Structural Steel Construction

Steel has high strength to weight ratio and can be prefabricated with highly accurate automation machineries or facilities, minimising the need for rework due to errors. The minimum level of use of structural steel construction for selected land parcels sold under the GLS Programme shall be 80% of the total office floor area of a building.

The Government aims to improve productivity by up to 3 per cent annually until 2020. Besides the R&D roadmap, the Government will also look into stipulating productivity outcomes as a requirement in future tenders of Government Land Sale (GLS) sites, without mandating specific technologies that developers have to use.

More details on Productive Technologies can be found on the BCA website.

Source: [BCA](#) as at Feb 2020

SINGAPORE CONSTRUCTION REGULATIONS

CONSTRUCTION QUALITY ASSESSMENT SYSTEM (CONQUAS®)

CONQUAS® was first introduced in Singapore in 1989 to measure the quality of building projects. CONQUAS® 2019 is the tenth edition of the assessment scheme in 30 years of implementation. The key changes include:

- A streamlined framework with 3 main building categories
- Greater emphasis on architectural quality and water seepage issues
- Introduction of factory checks for projects using prefabricated prefinished volumetric construction (PPVC) methods, which recognises and encourages good practices that are both productive and facilitate high quality achievements

The assessment of CONQUAS® consists of 4 components. Each component is further divided into different items for assessment.

| Components to be Assessed | Category of Development | | |
|--|-------------------------|----------------|-------------|
| | Private Housing | Public Housing | Non-Housing |
| 1. Internal Finishes | 60% | 55% | 50% |
| 2. Installation Methods Verification and Functional Tests | 20% | 25% | 30% |
| 3. External Finishes | 20% | 20% | 20% |
| Sub Total CONQUAS® Score | 100% | 100% | 100% |
| 4. Bonus Points | 8 | 7 | 7 |
| Total CONQUAS® Score | 108 | 107 | 107 |

Note:

(i) For mixed development, the project will take the Category of the development type where the GFA is more than 50% of the total GFA. E.g. Project with 70% private housing and 30% commercial will follow the weightage under the private housing category.

The building is assessed primarily on workmanship standards achieved through factory and site inspection. For projects using Design for Manufacturing and Assembly (DfMA) technologies, assessments will be done throughout the construction process with the Installation Methods Verification and some of the Functional Tests carried out in the factory. To ensure robustness of the CONQUAS® scheme, major defects detected during the internal finish assessment will be taken into consideration. Adverse feedback from end-users on major defects that surface during the defects liability period of a project will also be considered when finalising the CONQUAS® score.

More information on the CONQUAS® 2019 can be found on the BCA website.

Source: [BCA](#) as at Dec 2019.

The Building and Construction Authority (BCA) QM for good workmanship scheme was launched on 1 July 2002 to help developers meet the rising expectation of Singaporeans for better quality homes.

Under the Scheme, BCA will assess every unit of newly completed residential projects. Units that meet the stipulated quality workmanship standard (a minimum CONQUAS® score for internal finishes) will each be issued a QM certificate. The QM certificate certifies the condition of the unit at the time of inspection.

The scope of assessment will be the workmanship standards of the internal finishes of the 6 architectural elements including floor, internal wall, ceiling, door, window, and components (e.g. fixtures such as wardrobe, kitchen cabinet, vanity top, etc.).

The assessment for the 6 architectural elements will cover all locations within the units (i.e. bedrooms, bathrooms, kitchen, living & dining rooms, utility yard, where applicable). In addition, the assessment will include water ponding test for bathrooms. Water-tightness tests on windows are optional. The assessment does not cover quality of material or issues of design or aesthetic preferences.

The Tiered Rating System provides recognition to developers and builders that achieve quality excellence beyond the minimum requirements. As of 1 June 2020, BCA has revised the QM standards to further raise the quality of private residential homes.

More information on QM can be found on the BCA website.

Source: [BCA](#) as at Jan 2021

SINGAPORE CONSTRUCTION REGULATIONS

WORKPLACE SAFETY AND HEALTH (WSH)

Singapore adopts a national, strategic and long-term approach to achieve sustainable, continuous improvement in WSH performance. The WSH 2015 and WSH 2018 National Strategies have brought about significant WSH improvements over the years.

Building on the foundation of WSH 2015 and WSH 2018, the WSH 2028 Tripartite Strategies Committee presented 3 strategies for the next 10 years:

1. Strengthen WSH ownership
2. Enhance focus on workplace health
3. Promote technology-enabled WSH

Workplace Safety and Health Act (WSHA)

The WSHA, which came into effect on 1 March 2006, emphasise the importance of cultivating good safety habits in all individuals so as to engender a strong safety culture in the workplace. It requires stakeholders to take reasonably practicable measures to ensure the safety and health of workers and other people that are affected by the work being carried out.

4 Key Features:

1. It places the responsibility for workplace safety on all stakeholders along lines of control at the workplace.
2. It focuses on workplace safety and health systems and outcomes, rather than merely on compliance.
3. It facilitates effective enforcement through the issuance of remedial orders.
4. It imposes higher penalties for non compliance and risky behaviour.

Launch of CheckSafe

The Ministry of Manpower (MOM) launched CheckSafe on 21 January 2021, which can be used to check and compare construction companies' safety track records. Information available includes injury data (e.g. number of fatal injuries) and enforcement data (e.g. stop work orders, demerit points issued, placement on Business Under Surveillance (BUS) Programme, conviction records).

Liabilities and Penalties

The WSHA states a general maximum penalty for offences. The penalties are shown in the tables below.

| Offence | Maximum Fine | Maximum Imprisonment | Conditions |
|------------------------------------|---|----------------------|----------------|
| Not complying with Remedial Order | S\$50,000 And additional fine of S\$5,000 for each day of continued offence | 12 months | Either or both |
| Not complying with Stop Work Order | S\$500,000 And additional fine of S\$20,000 for each day of continued offence | 12 months | Either or both |

Table 1: Not Complying with a Remedial Order or Stop Work Order

| Offender Category | Maximum Fine | | Maximum Imprisonment | Conditions |
|-------------------|----------------|------------------|----------------------|----------------|
| | 1st conviction | Repeat Offenders | | |
| Individual person | S\$200,000 | S\$400,000 | 2 years | Either or Both |
| Corporate Body | S\$500,000 | S\$1,000,000 | N.A. | N.A. |

Table 2: General Penalties (for offences where no penalty is expressly provided by WSHA)

Note: If the previous offence caused the death of a person, any subsequent offence that causes the death of another person will have a maximum fine that is doubled.

Workplace Safety and Health (Design for Safety) Regulations (DfS)

In 2008, MOM and WSH published the Guidelines on DfS of Buildings and Structures which were adopted on a voluntary basis. To tap on the benefits of DfS to achieve significant and widespread WSH improvement in the building industry, the WSH (Design for Safety) Regulations came into operation on 1 August 2016. The key provisions of the DfS are:

- To place duties on developers and designers
- To require implementation of a DfS review process throughout every phase of the construction project
- To require a DfS register for all construction projects
- To allow developers to appoint a DfS professional
- To mandate it for projects with contract value of S\$10 million and above

Source: [MOM](#) as at Apr 2020

WORK INJURY COMPENSATION ACT (WICA)

The WICA provides injured employees with a low-cost and expeditious alternative to common law to settle compensation claims. To claim under WICA, the employee only needs to prove that he was injured in a work accident or suffered a disease due to work. Engaging a lawyer is not required to file a WICA claim. Under WICA, the employer (or employer’s insurer) is liable to pay the compensation regardless of who caused the accident / disease, and even after the employment has ceased or the Work Pass (of a foreign worker) has been cancelled. The amount of compensation is computed based on a fixed formula and is subject to caps. Dependents of deceased employees are also eligible to claim Work Injury Compensation. An injured employee can claim from either WICA or common law, but not from both.

Coverage

| | |
|-------------|---|
| Covered | 1. All employees engaged under a “contract of service” or “contract of apprenticeship” with an employer, regardless of salary level, age or nationality. |
| Not Covered | 1. Independent contractors and the self-employed 2. Domestic workers 3. Uniformed personnel - members of the Singapore Armed Forces, Singapore Police Force, Singapore Civil Defence Force, Central Narcotics Bureau and Singapore Prison Service |

Compensation

Compensation is payable when an employee:

- 1. Suffered an injury by accident arising out of and in the course of employment¹;
- 2. Suffered an injury while on an overseas assignment;
- 3. Contracted an occupational disease; or
- 4. Contracted a disease due to work-related exposure to biological or chemical agents.

¹: Refers to an accident that: (i) happened during working hours/ overtime or while on official duties (“in the course of employment”) and (ii) happened due to work (“out of employment”)

Three compensation benefits can be claimed:

1. Medical Leave Wages

| | Outpatient medical leave (MC) | Hospitalisation leave |
|----------|--|--|
| Full pay | Up to 14 days | Up to 60 days |
| 2/3 pay | 15th day onwards, up to 1 year from accident | 61st day onwards, up to 1 year from accident |

2. Medical Expenses

Maximum limit for accidents: Up to S\$36,000 or 1 year from date of accident, whichever is reached first.

| Before 1 Jan 2020 | From 1 Jan 2020 |
|---|---|
| Up to maximum of S\$36,000, or up to 1 year from date of accident, whichever comes first. | Up to maximum of S\$45,000, or up to 1 year from date of accident, whichever comes first. |

3. Lump Sum compensation for Permanent Incapacity or Death

| | Permanent Incapacity ² Compensation | | Death Compensation | |
|----------------------|--|---------------------|--------------------------------------|-----------------|
| | From 1 Jan 2016 to before 1 Jan 2020 | From 1 Jan 2020 | From 1 Jan 2016 to before 1 Jan 2020 | From 1 Jan 2020 |
| Minimum | S\$88,000 x (% PI) | S\$97,000 x (% PI) | S\$69,000 | S\$76,000 |
| Maximum ³ | S\$262,000 x (% PI) | S\$289,000 x (% PI) | S\$204,000 | S\$225,000 |

²: Percentage Permanent Incapacity (% PI) is based on doctor's assessment after the employee's medical condition stabilises. Doctor makes the assessment based on a set of guidelines in the "Guide to the Assessment of Traumatic Injuries and Occupational Diseases for Work Injury Compensation".

³: An additional 25% of the compensation amount is awarded if an injured employee suffered total permanent incapacity (i.e. 100% PI).

Currently, employees on light duties due to work injuries are not compensated under WICA. From 1 September 2020, employees on light duties due to work injuries will be compensated for their lost earnings based on their Average Monthly Earnings (AME). Employers must also report all work-related medical leave or light duties to MOM.

More details on the WICA can be found on the MOM website.

Source: [MOM](#) as at Nov 2020

SINGAPORE CONSTRUCTION REGULATIONS

MAN-YEAR ENTITLEMENT (MYE)

The MYE Allocation System is a Work Permit allocation system implemented by the Ministry of Manpower (MOM) to provide entitlements to main contractors (through a prior approval application) to employ foreign workers from the People's Republic of China (PRC) and Non-Traditional Source (NTS) countries including India, Sri Lanka, Thailand, Bangladesh, Myanmar and Philippines.

MYE reflects the total quota of foreign construction workers allocated to a main contractor for a specific construction project. Hence, MYE allocated to a particular project cannot be transferred to another project. Main contractors cannot allocate or sell their MYE to other contractors not involved in the same project. Main contractors which do so will be barred from applying for new Work Permits in future. A main contractor can however request for an increase in MYE if the project value has increased due to additional work or variation orders awarded by the developer.

Computation of MYE for Construction

| Project Value | |
|--|----------------|
| a (i). Building Projects (below S\$10 million) | |
| Less than | S\$0.5 million |
| First | S\$1 million |
| Next | S\$9 million |
| a (ii). Building Projects (at or above S\$10 million) | |
| Less than | S\$0.5 million |
| First | S\$1 million |
| Next | S\$9 million |
| Next | S\$20 million |
| Next | S\$70 million |
| Next | S\$100 million |
| B. Civil Engineering (CE) Projects | |
| Less than | S\$0.5 million |
| First | S\$1 million |
| Next | S\$9 million |
| Next | S\$20 million |
| Remaining balance above | S\$30 million |

MYE:

- Is the total number of Work Permit holders a main contractor is entitled to employ, based on the value of projects/contracts awarded by developers/ owners; and
- Is allocated in the form of the number of "man-years" required to complete a project. (1 man-year = 1-year employment under a Work Permit).

Adjustment to MYE Formula using BCA's Tender Price Index (TPI)

To address the impact of fluctuating tender prices on MYE allocation, BCA worked with MOM to introduce the TPI adjusted MYE allocation formula from 1 July 2013. This is to take into account the effect of fluctuating tender prices.

The MYE formula will be adjusted with the Man-Year Adjustment Factor (MYAF) on 1 January each year for all project categories. The MYAF is computed based on the TPI tabulated for the previous financial year and is reviewed annually.

More details on MYAF can be found on the BCA website.

| NTS Worker Entitlements | |
|--------------------------------------|---|
| | 0 |
| 1.325 man-yrs per S\$100,000 value | |
| 7.950 man-yrs per S\$1 million value | |
| | 0 |
| 1.223 man-yrs per S\$100,000 value | |
| 7.338 man-yrs per S\$1 million value | |
| 4.892 man-yrs per S\$1 million value | |
| 3.261 man-yrs per S\$1 million value | |
| 2.446 man-yrs per S\$1 million value | |
| | 0 |
| 0.543 man-yrs per S\$100,000 value | |
| 3.261 man-yrs per S\$1 million value | |
| 2.174 man-yrs per S\$1 million value | |
| 1.087 man-yrs per S\$1 million value | |

Source: [MOM](#) as at Feb 2020

SINGAPORE CONSTRUCTION REGULATIONS

FOREIGN WORKER LEVY (FWL)

Employers are required to pay a monthly FWL when they employ a foreign worker in Singapore. FWL is a pricing mechanism to regulate the number of foreign workers. The levy liability starts from the day the Temporary Work Permit or Work Permit is issued, whichever is earlier. It ceases upon expiry or cancellation of the Work Permit.

Source Countries

Employers can employ foreign workers from Malaysia, the People's Republic of China (PRC), Non-traditional source (NTS) countries including India, Sri Lanka, Thailand, Bangladesh, Myanmar and Philippines, and North Asian source (NAS) countries including Hong Kong (HKSAR passport), Macau, South Korea and Taiwan.

Maximum period of employment

| Nationality | Type of worker |
|---------------|----------------------------------|
| NTS, PRC | Basic-Skilled ¹ (R2) |
| NTS, PRC | Higher-Skilled ² (R1) |
| NAS, Malaysia | All sectors |

¹ Basic-Skilled workers are workers holding the Skills Evaluation Certificate (SEC) or Skills Evaluation Certificate (Knowledge) (SEC(K)).

² Higher-Skilled workers are workers who have been upgraded through various means including CoreTrade, Multi-Skilling Scheme, Direct R1 Pathway or the Market-Based Skills Recognition Framework (MBF).

Levy Rate

Employers can employ 7 Work Permit holders for every full-time local employee. In addition to quota, NTS and PRC workers are subject to Man-Year Entitlement (MYE) requirements. They may qualify for a waiver if they have at least 3 years of experience in the construction sector. MYE does not apply to Malaysian and NAS workers.

| Tier | Monthly (S\$) | Daily (S\$) |
|--|---------------|-------------|
| Malaysians and NAS - Higher-Skilled | 300 | 9.87 |
| Malaysians and NAS - Basic-Skilled | 700 | 23.02 |
| NTS and PRC - Higher-Skilled, on MYE | 300 | 9.87 |
| NTS and PRC - Basic-Skilled, on MYE | 700 | 23.02 |
| NTS and PRC - Higher-Skilled, MYE waiver | 600 | 19.73 |
| NTS and PRC - Basic-Skilled, MYE waiver | 950 | 31.24 |

Note: The daily levy rate only applies to Work Permit holders who did not work for a full calendar month.

Minimum percentage of Higher-Skilled (R1) workers

From 1 January 2018, at least 10% of the firm's construction Work Permit holders must be Higher-Skilled (R1) before they can hire any new Basic-Skilled (R2) construction workers or renew the Work Permits of existing R2 construction workers.

From 1 January 2019, firms that do not meet the 10% R1 minimum will not be able to hire or renew R2 construction workers and will also have the Work Permits of any excess R2 construction workers revoked.

More details on FWL can be found on the MOM website.

| Maximum period of employment |
|---------------------------------|
| 14 years |
| 26 years |
| No maximum period of employment |

Source: [MOM](#) as at May 2021

SINGAPORE CONSTRUCTION INFORMATION

BUILDSDG TRANSFORMATION FUND (BTF)

To encourage further development in productivity improvements, BCA provided a S\$450 million fund under the second tranche of the Construction Productivity Capability Fund (CPCF) over a three-year period from June 2015 to May 2018 to support workforce development, technology adoption and capability building schemes under the 2nd Construction Productivity Roadmap. This is on top of the S\$350 million allocated under the first CPCF tranche over the last five years. The BIM Fund V2, which is part of the CPCF, was released in July 2015 and will help BIM-ready firms to build up BIM collaboration capability by defraying part of the costs in training, consultancy, software or hardware. The CPCF has been extended to March 2022.

| DfMA and IDD |
|--|
| Productivity Innovation Project (PIP) |
| Offsite Construction Special Scheme (OCSS) |
| Public Sector Construction Productivity Fund (PSCPF) |
| Investment Allowance Scheme (IAS) |
| Productivity Solutions Grant (PSG) |
| Green Buildings |
| Building Retrofit Energy Efficiency Financing (BREEF) Scheme |

The Ministry of National Development announced on 6 March 2019 that existing funding schemes in the areas of Design for Manufacturing and Assembly (DfMA), Integrated Digital Delivery (IDD) and Green Buildings will be consolidated under the BuildSG Transformation Fund (BTF). The various schemes under the BTF amount to about S\$770 million.

The schemes consolidated under the BTF are tabulated below.

| PIP supports Singapore-registered firms to build up their capability in DfMA technologies and IDD and improve site processes in order to achieve higher site productivity. |
|--|
| The OCSS is a voluntary manpower incentive scheme that encourages the shift towards DfMA and more off-site work. The scheme allows eligible DfMA production facilities to employ an allocated number of work permit holders at the lower Man-Year Entitlement levy rates, depending on the facility type and manpower profile. |
| PSCPF supports government agencies to use DfMA technologies for their construction projects. |
| IAS supports the mechanisation efforts of Singapore-registered firms through providing tax incentives for capital investments on productive construction equipment. |
| PSG supports local SMEs in transforming digitally by subsidising the cost of adopting pre-approved digital solutions which enhances productivity under the Construction and Facilities Management Industry Digital Plan (IDP). |
| |
| The BREEF scheme supports building owners in obtaining financing from participating financial institutions to offset upfront costs for energy efficient retrofits of existing buildings and repay the loans through energy savings reaped. |

SINGAPORE CONSTRUCTION INFORMATION

BUILD SG TRANSFORMATION FUND (BTF) (Continued from page 100)

| Workforce Development |
|--|
| iBuildSG Scholarships and Sponsorships |
| iBuildSG Workforce Training and Upgrading |
| SkillsFuture Study Awards for Built Environment Sector |
| Research & Innovation |
| Cities of Tomorrow (CoT) R&D Programme |
| Green Buildings Innovation Cluster (GBIC) |
| Built Environment (BE) Robotics R&D Programme |
| 2-Stage Innovation Grant (iGrant) |

The iBuildSG Scholarship and Sponsorship (in collaboration with industry firms) supports students of high calibre and in-service personnel pursuing full-time and part-time BE-related courses at local universities, polytechnics, ITE or BCA Academy.

Industry firms who are keen to sponsor students or in-service personnel, please click on the programme links to find out more on the iBuildSG Scholarships and Sponsorships.

The iBuildSG Workforce Training and Upgrading supports firms' upgrading of workers' skills via co-funding of selected skills assessment and training courses.

The SkillsFuture Study Awards provides funding support to Singaporeans in the development and deepening of specialist skills in areas of demand in the BE sector.

The CoT R&D programme is a multi-agency effort, led by the Ministry of National Development (MND), to identify challenges that cities face and develop R&D solutions to address the challenges. The key research thrusts that are supported include Advanced Construction, Resilient Infrastructure and Greater Sustainability.

GBIC is a one-stop integrated Research & Innovation hub that seeks to accelerate the adoption of promising building energy efficient technologies and solutions through programmes such as the GBIC Building Energy Efficient Demonstrations Scheme and the Super Low Energy Building Smart Hub.

The BE Robotics R&D programme supports the research, development and deployment of innovative robotics with practical implementation and commercialisation potential in areas such as manufacturing, assembly as well as smart and sustainable assets.

iGrant supports the industry in conducting fast track, proof-of-concept type of Research & Innovation in areas such as Advanced Construction and IDD for subsequent quick development.

Source: [BCA](#) as at Mar 2021

The Construction sector is identified as one of the 23 industries that make up over 80% of the Singapore GDP. The Construction ITM envisions an advanced and integrated sector with widespread adoption of leading technologies, led by progressive and collaborative firms and supported by a skilled and competent workforce.

Recognising key global trends which impact the sector such as digital revolution, rapid urbanisation and climate change, the ITM identified the following key transformation areas to address the challenges faced by the sector:

1. Integrated Digital Delivery (IDD)
2. Design for Manufacturing and Assembly (DfMA)
3. Green buildings

By 2025, the ITM targets to have 80,000 personnel trained in DfMA, IDD and green building capabilities.

Integrated Digital Delivery (IDD)

IDD refers to the use of digital technologies to integrate work processes and connect stakeholders working on the same project throughout the construction and building life-cycle. It covers four areas: Digital Design, Digital Fabrication, Digital Construction and Digital Asset Delivery and Management.

Refer to [Page 84: Integrated Digital Delivery \(IDD\)](#) for more information.

Design for Manufacturing and Assembly (DfMA)

DfMA comprises a continuum of various technologies and methodologies that promote offsite fabrication, from prefabricated components to fully integrated assemblies across the structural, architectural and MEP disciplines. Given the strong public sector demand, Government Procurement Entities (GPEs) will continue to scale up adoption of DfMA technologies through the Productivity Gateway Framework (PGF). For the private sector, the Government will continue to roll out Government Land Sales (GLS) with appropriate DfMA conditions (refer to [Page 87 Mandatory Adoption of Specific Productive Technologies](#) for more information). Refer to [Page 45 Building Control \(Buildability and Productivity\) Regulations 2011](#) for more information on the integration of DfMA into the buildability framework.

Green Buildings

Refer to [Page 53: Environmental Sustainability](#) for more information.

Source: [BCA](#) as at Jan 2020

SINGAPORE CONSTRUCTION INFORMATION

GOVERNMENT LAND SALES (GLS) PROGRAMME

The Singapore Government releases land regularly through land sales programme for private sector development. Each programme is planned for and announced every 6 months. The GLS sites are released through two main systems - the Reserve List and the Confirmed List.

Under the Reserve List, the Government will release a site for sale if:

- An interested party submits an application for the site to be put up for tender with an offer of a minimum purchase price that is acceptable to the Government; or
- There is sufficient market interest in the form of more than one unrelated party applications that are close to the Government's Reserve Price for the site within a reasonable period.

Available land sites under the First Half 2021 GLS Programme

A. Confirmed List

| S/N | Location | Site Area (ha) | Gross Plot Ratio | Sales Agent | Estimated Launch Date |
|--------------------------|------------------------------------|----------------|------------------|-------------|-----------------------|
| Residential Sites | | | | | |
| 1 | Tampines Street 62 (Parcel A) (EC) | 2.37 | 2.5 | HDB | Apr-21 |
| 2 | Lentor Central | 1.72 | 3.5 | URA | Apr-21 |
| 3 | Slim Barracks Rise (Parcel A) | 0.79 | 3.0 | URA | Jun-21 |
| 4 | Slim Barracks Rise (Parcel B) | 0.59 | 2.1 | URA | Jun-21 |

B. Reserved list

| S/N | Location | Site Area (ha) | Gross Plot Ratio | Sales Agent | Estimated Launch Date |
|--------------------------|------------------------------------|----------------|------------------|-------------|-----------------------|
| Residential Sites | | | | | |
| 1 | Dairy Farm Walk | 1.57 | 2.1 | URA | Available |
| 2 | Dunman Road | 2.52 | 3.5 | URA | Available |
| 3 | Hillview Rise | 1.04 | 2.8 | URA | Available |
| 4 | Jalan Tembusu | 1.95 | 2.8 | URA | May-21 |
| 5 | Tampines Street 62 (Parcel B) (EC) | 2.8 | 2.5 | HDB | May-21 |
| White Sites | | | | | |
| 6 | Marina View | 0.78 | 13.0 | URA | Available |
| 7 | Woodlands Avenue 2 | 2.75 | 4.2 | URA | Available |
| 8 | Kampong Bugis^ | 8.29 | - | URA | Available |
| Hotel Sites | | | | | |
| 9 | River Valley Road | 1.02 | 2.8 | URA | Available |

More details on the available land sites under the GLS Programme are found on the URA website.

Qualifying Certificate (QC)

Under the Residential Property Act (RPA), any housing developer that is not considered a Singapore company has to apply for a QC when it purchases residential land for development, other than from the Government. A Singapore company is defined in the RPA as one that is incorporated in Singapore and all its directors and shareholders are Singapore citizens or Singapore companies. This definition means that publicly listed housing developers will not be considered a Singapore company.

With effect from 6 February 2020, the Ministry of Law will allow publicly listed housing developers with a substantial connection to Singapore to be treated as a Singapore company within the meaning of the RPA when they acquire residential land for development. Publicly listed housing developers with a substantial connection to Singapore can apply for exemption from the QC regime and applications will be assessed by reference to a set of criteria made available on the Singapore Land Authority's (SLA) website.

Sources: [URA](#), [SLA](#) as at Dec 2020

COVID-19 (Temporary Measures) Act 2020 (COTMA)

The COTMA came into effect on 30 November 2020, of which Part 8A and Part 8B under the Act support stakeholders in the built environment sector affected by disruptions to construction timelines resulting from the COVID-19 pandemic. It ensures no single stakeholder bears an undue share of the burden imposed by COVID-19.

Part 8A provides a universal Extension of Time (“EOT”) of 122 days to address delays that arose during the period between 7 April 2020 and 6 August 2020 (both dates inclusive) for construction contracts.

Part 8B requires the co-sharing of additional non-manpower-related qualifying costs between contracting parties due to delays caused by COVID-19 during the period between 7 April 2020 and 30 September 2021 (both dates inclusive). This is subject to any extension of the prescribed period.

Refer to BCA’s COVID-19 (Temporary Measures) Act 2020 – Part 8A & 8B Guide to facilitate in understanding the reliefs and processes of the Act.

A relief framework to allow parties to apply to adjust the contract sum for their projects, to address foreign manpower cost increases in respect of Work Permit Holders (WPHs) due to the pandemic, was passed by the Parliament on 11 May 2021 under Part 10A of COTMA. The relief period for this Part 10A will be from 1 October 2020 to 30 September 2021 (or any extended date as prescribed).

Refer to BCA’s website for the commencement date of the legislative relief and further details.

Additional Measures to Support the Sector

The authorities continue to provide support measures to help the construction sector mitigate the impact as the pandemic develops. Additional measures include:

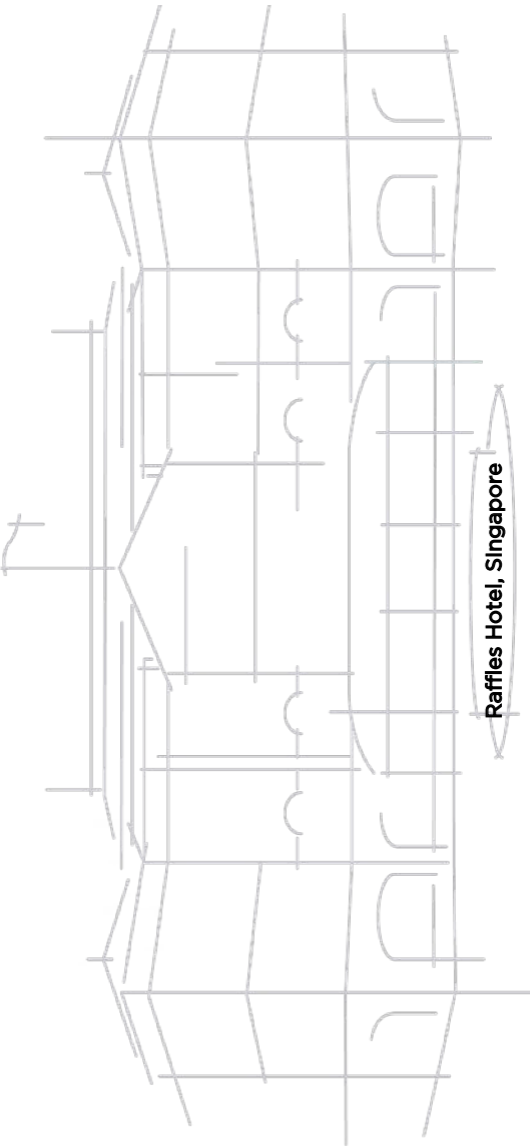
From 7 May 2021, BCA and MOM will introduce a temporary scheme for six months to allow new PRC WPHs to obtain their skills certification in Singapore, in view of the further tightening of border measures with India.

To help ease contractors' cash flow and relieve anxiety on being unable to meet project timelines, government agencies will be granting a 49-day EOT to eligible public sector construction contracts that are delayed due to loss of productivity for the period from 7 August 2020 to 31 December 2020.

To facilitate quicker disbursement of cost sharing of non-manpower-related costs increase under Part 8B of COTMA for eligible contracts up to awarded contract sum of S\$100 million, the public sector will provide 0.1% of the awarded contract sum for every month of delay as payment for qualifying costs.

Refer to BCA's website for the latest COVID-19 support measures and information.

Sources: [BCA](#) as at May 2021





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