

COSTBOOK 2022

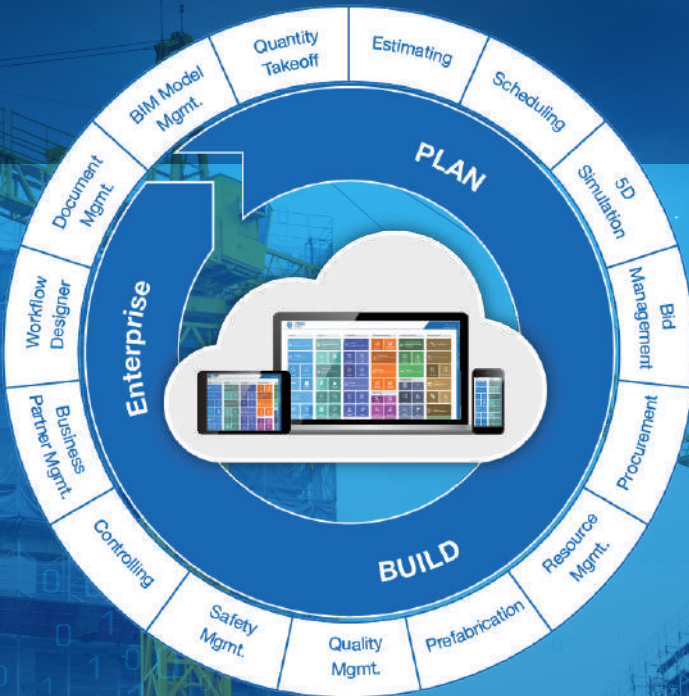
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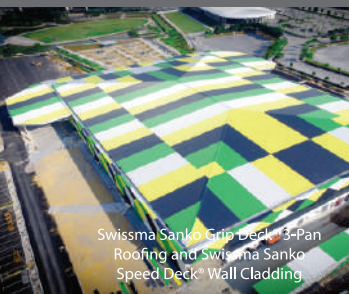
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1.0

INTRODUCTION



The construction industry in Malaysia is faced with lack of access, accuracy, width and depth of industry data. Information is an important element in the decision-making process. Although cost information on the Malaysian construction industry is available through various organisations, most of it is available for that organisations' usage only but not easily accessible by third parties.

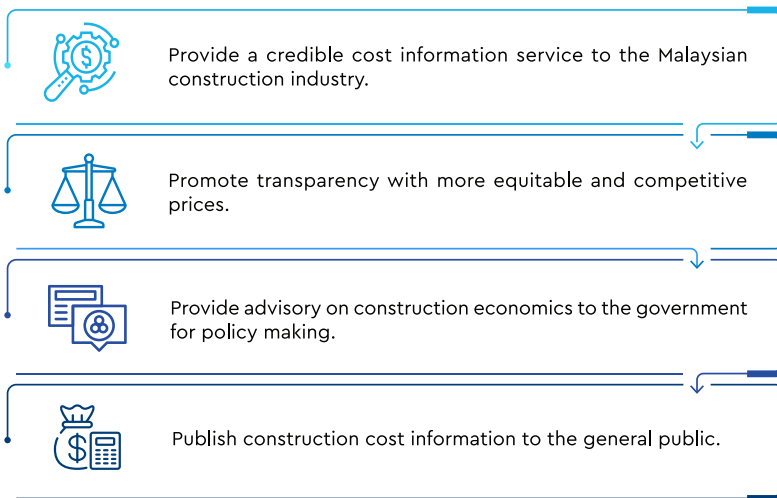
The Building Cost Information Services Malaysia (BCISM Sdn Bhd) was formed in July 2019. It is a collaborative effort between the Malaysian Construction Industry Development Board (CIDB) and Royal Institution of Surveyors Malaysia (RISM).

BCISM is entrusted to operate the National Construction Cost Centre (N3C) portal on behalf of CIDB to provide a centralised data bank for construction cost.

OUR VISION



OUR MISSION



OUR PRODUCTS



Building Material Prices



Labour Wage Rates



Machinery Hire Rates
and Equipment
Purchase Prices



Material Cost Index



Labour Cost Index



Machinery and
Equipment Cost Index



Building Cost Index



Tender Price Index



Construction Costbook



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An aerial photograph of a coastal city. In the foreground, there are several white, multi-story apartment buildings with red-tiled roofs. Behind them, a dense area of green trees separates the residential zone from a cluster of taller, modern high-rise buildings. One of these high-rises is under construction, covered in green safety netting, with two construction cranes visible on top. To the right, a large body of water (likely a bay or harbor) stretches towards the horizon, with a distant city skyline visible across the water. The sky is blue with some light clouds.

2.0

CONSTRUCTION
COST DATA

2.1 INTRODUCTION AND SCOPE

BCISM Costbook 2022 is a compilation of useful construction related cost and project information in a condensed format to serve as a compact quick-reference guide. Unless otherwise stated, costs reflected in this costbook are Malaysian costs at 1st quarter 2022.

All data are derived by BCISM from actual data collected. For more details, subscribe to CIDB National Construction Cost Centre (n3c.cidb.gov.my).

The construction costs for a variety of building types are given in unit area (square metre) of the built-up floor area of the building in Ringgit Malaysia and have been based on analysis of the contract bills of quantities submitted by contractors to CIDB. The Gross Floor Area (GFA) is used for the built-up floor area.

GFA is the total of all enclosed spaces fulfilling the functional requirements of the building measured to the internal face of enclosing walls (or columns, doors, and the like). It includes:

- Area occupied by partitions, columns, internal structural or party walls, stairwells, lift wells and the like.
- Lifts, plant and tank rooms and the like above main roof slab.
- Sloping surfaces such as staircases and the like but measured flat on plan.



2.2 BUILDING PRICE SPECIFICATIONS

Type Of Buildings	Building Categories	Brief Specifications
Industrial Buildings	Light duty factories	Steel structure and roof with light weight concrete roof including M&E services.
	Warehouses	Steel structure with metal deck roofing including M&E services.
Office Buildings	3-storey offices, owner operated	RC structure, structural steel roof with metal decking including M&E services. Office fit-out excluded from the cost.
	Shop offices	RC structure, lightweight steel roof truss system with painting and tiling works for finishes, including M&E services. Office fit-out excluded from the cost.
Refreshment, Entertainment, and Recreational Buildings	Restaurants	RC frame with tiling and painting works for finishes, including M&E services.
	Multi-purpose halls	RC frame with tiling and painting works for finishes, including M&E services.
Religious Buildings	Mosques	RC structure including tiling, decorative motifs, dome roof, painting, and carpet. M&E services included.
Residential Buildings	2-storey bungalows	Houses with prefabricated roof trusses and roof tiles as covering. Tiling and painting works as its finishes. Fittings and furnishings are excluded.
	2-storey terrace houses	Houses without fit out but including sanitary appliances and M&E services. Tiling and painting works as its finishes.
	Luxury apartments	Apartments with built-in fitments excluding loose furniture, M&E are included.
Buildings, Spaces in General	Elevated car parks	RC structure with M&E that includes electrical, fire protection and lift installations.

NOTES:

- All buildings are assumed to have no basements and no piling (except otherwise stated) and are built on flat ground, with normal soil and site conditions. The costs exclude site information works, external works, professional fees, finance, legal expenses, contingencies and land costs.

2.3 AVERAGE BUILDING PRICES

No.	Building Categories	RM/ m ² GFA
A	Industrial Buildings	
1	Light duty factories	1,560–1,720
2	Warehouses	1,860–2,010
B	Office Buildings	
3	3-storey offices, owner operated	1,600–2,020
4	Shop offices	1,410–1,940
C	Refreshment, Entertainment, and Recreational Buildings	
5	Restaurants	2,130–2,250
6	Multi-purpose halls	2,280–2,720
D	Religious Buildings	
7	Mosques	2,430–3,900
E	Residential Buildings	
8	2-storey bungalows	3,320–3,500
9	2-storey terrace houses	1,330–1,480
10	Luxury apartments	3,200–3,660
F	Buildings, Spaces in General	
11	Elevated car parks	790–900

NOTES:

- Source : CIDB Cost Benchmark.
- Cost data predominantly extracted from projects in West Malaysia.
- Cost including preliminaries (10%).
- The figures shown are for budgetary guidance only, it must be understood that the actual cost of a building will depend upon the design and many other factors and may vary from the figures shown.
- Prices are at 4th quarter 2021.

2.4 AVERAGE MECHANICAL AND ELECTRICAL PRICES

No.	Building Categories	RM/ m² GFA				
		Electrical	Plumbing	A/C	Fire Services	Lift & Escalators
A	Industrial Buildings					
1	Light duty factories	110–140	40–60	0	90–110	0
2	Warehouses	100–210	10–20	100–110	100–200	0
B	Office Buildings					
3	3-storey offices, owner operated	140–160	4–20	0	20–60	90–100
4	Shop offices	90–280	60–70	40	20–60	0
C	Refreshment, Entertainment, and Recreational Buildings					
5	Restaurants	70–110	70–90	0	20–60	0
6	Multi-purpose halls	340–420	50–60	160–210	40–90	0
D	Religious Buildings					
7	Mosques	1,000–1,100	50–60	620–670	40–90	0
E	Residential Buildings					
8	2-storey bungalows	70–100	150–160	30–40	0	0
9	2-storey terrace houses	40–70	90–100	0	0	0
10	Luxury apartments	360–470	130–140	220–240	70–90	70–140
F	Buildings, Spaces in General					
11	Elevated car parks	150–170	0	0	40–60	30–40

NOTES:

- Source : CIDB Cost Benchmark.
- Cost data predominantly extracted from projects in West Malaysia.
- Cost including preliminaries (10%).
- The figures shown are for budgetary guidance only, it must be understood that the actual cost of a building will depend upon the design and many other factors and may vary from the figures shown.
- Prices are at 4th quarter 2021.

2.5 MAJOR UNIT RATES

No.	Items	Unit	RM
1	Excavation (Up to 1.50m deep)	m ³	18.80
2	Hardcore bed; average 150mm thick	m ³	104.80
3	Lean concrete Grade 15	m ³	303.90
4	Vibrated reinforced concrete Grade 30	m ³	324.90
5	Mild steel/ high tensile bar reinforcement	kg	4.10
6	Sawn formwork to vertical/ horizontal surfaces	m ²	39.80
7	Half brick wall bedded & jointed in cement mortar	m ²	44.00
8	Metal deck roofing; 0.48mm thick c/ w all accessories	m ²	64.90
9	Aluminium composite casement windows	m ²	364.00
10	Timber flush door (hollow core); single leaf excluding ironmongeries	No.	303.90
11	One hour fire rated door; single leaf including ironmongeries	No.	733.70
12	Structural steelwork in column and the like	kg	12.50
13	20mm thick cement and sand (1:6) plaster to wall	m ²	20.90
14	25mm thick cement and sand (1:3) paving to floor	m ²	18.80
15	300mm x 300mm homogeneous tiles (include floor screed)	m ²	83.80
16	4mm thick plainface plaster skim coat	m ²	8.30
17	Aluminium strip ceiling	m ²	227.50
18	9mm thick fibrous plaster ceiling	m ²	41.90
19	Painting to plastered surfaces; one coat sealer and two coats of emulsion paint; internally	m ²	6.20

NOTES:

- Cost data extracted from projects in West Malaysia.
- Measurement is based on SMM2.

2.6 MAJOR MATERIAL PRICES

No.	Material	Unit	Price (RM)				
			Selangor	Penang	Johor	Kota Kinabalu	Kuching
1	Ordinary Portland cement, 50 kg bag	Bag	16.55	16.31	17.04	18.61	20.81
2	Granite aggregate 3/4"	MT	41.00	67.00	39.00	39.50	40.00
3	Normal river sand	MT	38.00	47.77	38.00	54.29	58.41
4	Mild steel round bar R10, MS146	MT	3,580.00	3,580.00	3,580.00	3,469.12	3,548.06
5	High tensile deformed bar Y12, MS146	MT	3,480.00	3,480.00	3,480.00	3,257.79	3,338.06
6	Ready mix concrete, normal mix, granite – Grade 30	m ³	228.00	217.72	325.48	265.38	275.66
7	Cement sand bricks	Piece	0.27	0.27	0.28	0.35	0.40
8	Bitumen 60/70 Penetration Grade	MT	2,600.00	2,536.59	2,473.17	2,504.87	2,536.59

NOTES:

- Price is at May 2022.
- Price is the transaction price for bulk purchase between contractors and suppliers under 60 days delivery credit terms.

2.7 LABOUR WAGE RATES

No.	Labour	Specification	Wage Rate (RM/ day)				
			Selangor	Penang	Johor	Kota Kinabalu	Kuching
1	General construction worker	Semi-skilled	100.00	100.00	100.00	100.00	100.00
2	Concretor	Skilled	160.00	120.00	140.00	140.00	120.00
3	Bricklayer	Skilled	170.00	120.00	130.00	130.00	130.00
4	Plasterer	Skilled	170.00	150.00	170.00	140.00	130.00
5	Barbender	Skilled	160.00	150.00	180.00	150.00	130.00
6	Steel structure fabricator	Skilled	180.00	160.00	200.00	160.00	140.00
7	Plumber – building & sanitary	Skilled	200.00	150.00	190.00	140.00	130.00
8	Painter	Skilled	160.00	140.00	160.00	130.00	130.00
9	Excavator operator	Skilled	200.00	150.00	200.00	120.00	120.00
10	IBS precast concrete installer	Skilled	200.00	150.00	200.00	230.00	210.00

NOTES:

- Rate for local workers average 8 hours/ day excluding overtime.

2.8 MACHINERY HIRE RATES AND EQUIPMENT PURCHASE PRICES

No.	Machinery	Specification	Hire Rate (RM/ day)				
			Selangor	Penang	Johor	Kota Kinabalu	Kuching
1	Mini hydraulic excavator	Operating weight 6,000kg	370-560	380-570	380-570	380-570	400-590
2	Bulldozer	CAT D4 or equivalent	540-550	540-560	540-560	540-560	580-600
3	Vibratory soil compactor	Operating weight 10,000kg	420-610	420-620	420-620	420-620	450-660
4	Motor grader	3.7m/ 12ft Blade	720-750	730-770	730-770	730-770	770-800
5	Dump truck	Operating weight 10,000kg/ six wheels	360-410	370-420	370-420	370-420	390-440
6	Lorry	BTM 3,000kg	220-310	220-310	230-320	230-320	260-320
7	Mobile crane	Operating weight 20,000kg	510-700	520-720	520-720	520-720	560-750
8	Backhoe	Loader bucket breakout 6,000kg	380-430	390-440	390-440	390-440	410-470

No.	Equipment	Specification	Purchase Price (RM)				
			Selangor	Penang	Johor	Kota Kinabalu	Kuching
1	Diesel generator set	Max output 25KVA	43,170-44,630	44,030-45,530	44,030-45,530	46,620-48,200	46,620-48,200
2	Piston air compressor	Capacity of 5HP	5,180-5,420	5,290-5,530	5,290-5,530	5,600-5,850	5,600-5,850

NOTES:

- Machinery hire rate includes operator.
- Equipment purchase price is the transaction price between contractors and suppliers under normal credit terms.

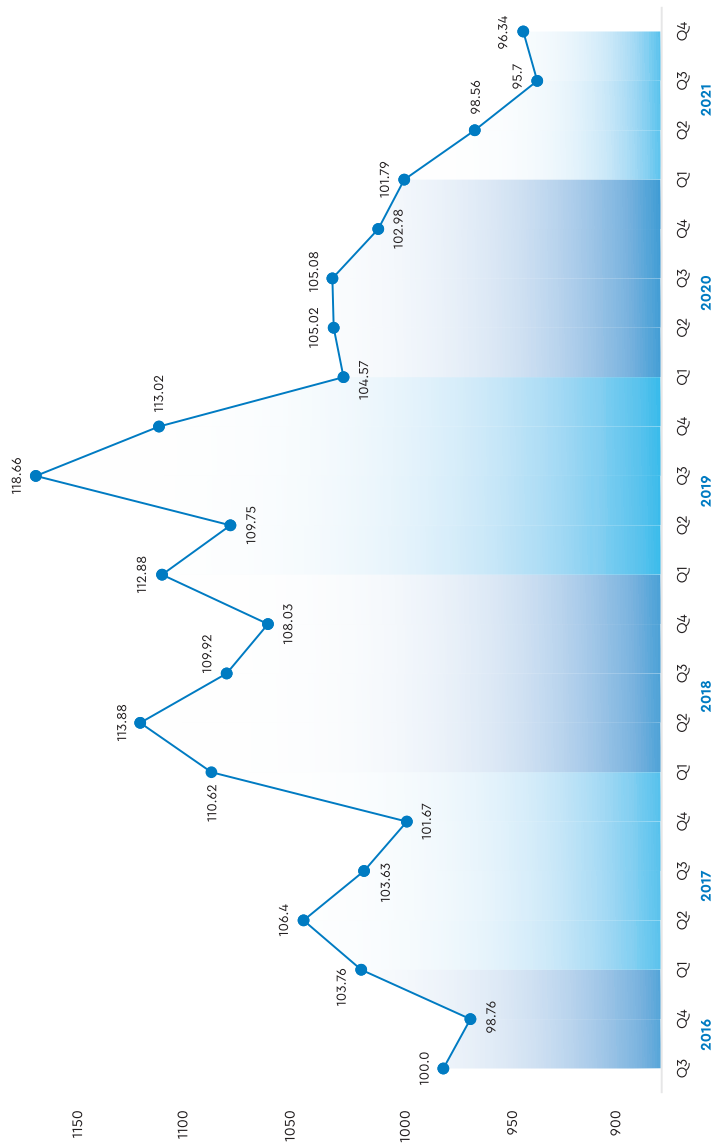
2.9 BUILDING MATERIAL COST INDEX CHANGES

Month	Percentage Change (year-on-year)			
	Cement	Ready Mixed Concrete	Sand	Steel Reinforcement
Apr 2021	-17%	0%	5%	28%
May 2021	-21%	0%	4%	47%
Jun 2021	-7%	0%	4%	51%
Jul 2021	-3%	0%	5%	51%
Aug 2021	-4%	0%	5%	50%
Sep 2021	-6%	0%	-1%	47%
Oct 2021	0%	0%	-2%	44%
Nov 2021	9%	0%	-2%	39%
Dec 2021	10%	5%	-2%	13%
Jan 2022	18%	5%	-3%	12%
Feb 2022	5%	5%	-3%	18%
Mar 2022	7%	14%	-4%	19%

NOTES:

- Table is derived from N3C Building Material Price Index.

2.10 MARKET CONDITIONS INDEX



NOTES:

- The graph is derived from N3C Tender Price Index and Building Cost Index.
- Base year 2016.

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3.0

LABOUR AND
PLANT
CONSTANTS

3.1 INTRODUCTION

All data were collected between March 2018 to March 2019 and computed from field surveys on selected active building sites of private and public sector projects located in Selangor, Kuala Lumpur, Penang, Pahang, Negeri Sembilan and Johor. All respondents are active contractors registered under Grade G7 with CIDB.

The figures are presented in the form of productivity by speed which is the amount of output produced over a given period namely one man-hour and one plant-hour, respectively.

The computed labour constant and plant constant had included the time spend on tea break, moving of material within site, idling time, minor down time occurred within process of activities recorded.

The source is CIDB Labour Constant and Plant Constant for Building Construction Works 2019.



3.2 LABOUR CONSTANTS

No.	Trade	Work done per man-hour
1	Concrete: place only including preparatory works	
	Ready mixed concrete including vibrating and trowelling smooth to uniform level in upper floor slab and beam.	1.41m ³ / man-hr
2	Reinforcement: fabrication and fixing only	
	6mm, 10mm, 12mm, 16mm, 20mm, 25mm and 32mm rods, BRC A7 & A8 on upper floor slab and beam.	44.84kg/ man-hr
3	Formwork: fix and dismantle only	
	System formwork (aluminium) to sides and soffit of upper floor slab and beam.	3.72m ² / man-hr
4	Brickworks: lay only	
	100mm thick cement sand brick wall bedded and jointed in cement & sand mortar (1:3) reinforced with and including "exmet" reinforcement at every fourth course.	1.38m ² / man-hr
5	Wall plaster: labour only	
	20mm thick internal plaster consist of 2 coats of cement & sand (1:3) finished with steel float including raking out joints of brickwall or hacking concrete surface for key on sides of brickwall and associated column and beam.	1.08m ² / man-hr
6	Wall tiling: labour only	
	600mm x 300mm wall tiles with cement & sand (1:3) backing screed, adhesive mortar and pointed in coloured cement to match.	0.84m ² / man-hr
7	Paving: labour only	
	25mm thick cement and sand (1:3) paving trowelled with a steel float to a smooth and level surface.	2.87m ² / man-hr
8	Floor tiling: labour only	
	600mm x 300mm floor tiles with cement & sand (1:3) floor base screed, adhesive mortar and pointed in coloured cement to match.	1.29m ² / man-hr
9	Painting: labour only	
	Prepare and apply one (1) primer coat and two (2) finishing coats internally on surfaces of plastered sides of wall and associated column and beams.	10.40m ² / man-hr

NOTES:

- The above output doesn't take into account the COVID-19 standard operating procedures.

3.3 PLANT CONSTANTS

No.	Plant	Work done per plant-hour
1	Piling driving	
	Drive only 400mm x 400mm precast concrete pile/ 400mm diameter precast spun pile with jack-in pile rig. (non adverse ground and weather conditions)	14.29m/ hour
2	Excavator 20–30 tonnes operating weight	
	Excavation to foundation/ basement. (non adverse ground and weather conditions)	72.15m ³ / hour
3	Dump truck 10 wheels	
	Disposal of excavated earth off site to dumping tip within 30km distance with dumping truck.	7.96m ³ / hour
4	Asphalt paver 10–20 tonnes operating weight	
	Paving of 50mm to 75mm thick binder/ wearing course with asphalt paver.	330.88m ² / hour
5	Road roller tandem compactor 6,500kg operating weight	
	Compaction of 50mm to 75mm thick binder/ wearing course with road roller tandem compactor.	457.43m ² / hour
6	Tower crane 1–2 tonnes operating weight	
	Hoisting of building materials 10–20 storeys height using 1–2 tonne operating weight.	12.07trip/ hour
7	Mobile crane 20–30 tonnes operating weight	
	Hoisting of building materials up to 10 storeys high using 20–30 tonnes mobile crane operating weight.	10.55trip/ hour

NOTES:

- The above output doesn't take into account the COVID-19 standard operating procedures.



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4.0

DATA
APPLICATION



4.1 SIMPLIFIED FEASIBILITY STUDY

To estimate the viability for development of high rise apartment project in Bangi.

SCENARIO



1	Estimated cost for buildings*	
a)	2 blocks of 38-storey high rise apartment (95,000m ² GFA)	RM1,500.00/ m ² GFA
b)	1 floor of facility area on podium carpark (8,900 m ² GFA)	RM1,230.00/ m ² GFA
c)	8-storey podium carpark (71,000m ² GFA)	RM740.00/ m ² GFA
2	Allowances for piling cost (non adverse ground and weather conditions)**	RM180.00/ m ² GFA
3	Allowances for external works (5.34 acres land)**	8% of building cost
4	Allowances for predevelopment cost**	25% of total construction cost
5	Allowances for contingencies**	5% of total construction cost
6	No. of unit (average size 84m ² / unit)	904 units
7	Estimated value (RM5,200/ m ²)**	RM436,800.00/ unit
8	Buildings are assumed to have 100% occupancy	

NOTES:

- Predevelopment cost includes **land cost**, soil investigation, surveying fees, **plan** and submission fees, contribution to agencies, CIDB levy, professional fees, management fees, **legal fees**, advertisement fees.
- *Source: CIDB Cost Benchmark.
- **The above figures are examples and for guidance purposes only.

4.1 SIMPLIFIED FEASIBILITY STUDY (cont'd)

CALCULATION

GROSS DEVELOPMENT COST (GDC)

Piling Cost

$$\text{Piling works} = 174,900.00\text{m}^2 \text{ GFA} \times \text{RM}180.00/\text{m}^2 \text{ GFA} = \text{RM}31,482,000.00$$

Building Cost

$$\text{High-rise apartment} = 95,000.00\text{m}^2 \text{ GFA} \times \text{RM}1,500.00/\text{m}^2 \text{ GFA} = \text{RM}142,500,000.00$$

$$\text{Facility area} = 8,900.00\text{m}^2 \text{ GFA} \times \text{RM}1,230.00/\text{m}^2 \text{ GFA} = \text{RM}10,947,000.00$$

$$\text{Podium carpark} = 71,000.00\text{m}^2 \text{ GFA} \times \text{RM}740.00/\text{m}^2 \text{ GFA} = \text{RM}52,540,000.00$$

$$\text{Total Building Cost} = \text{RM}237,469,000.00$$

$$\text{External works (8\%)} = \text{RM}18,997,520.00$$

$$\text{Total Construction Cost} = \text{RM}256,466,520.00$$

$$\text{Pre-development Cost (25\%)} = \text{RM}64,116,630.00$$

$$\text{Contingencies (5\%)} = \text{RM}12,823,326.00$$

$$\text{Total GDC} = \text{RM}333,406,476.00$$

GROSS DEVELOPMENT VALUE (GDV)

$$\text{Serviced apartment (84m}^2\text{)} = 904 \text{ units} \times \text{RM}436,800.00/\text{unit} = \text{RM}394,867,200.00$$

$$\text{DEVELOPER'S PROFIT} = \text{GDV} - \text{GDC} = \text{RM}61,460,724.00$$

$$= \underline{\underline{18.43\%}}$$

NOTES:

- Buildings are assumed to have 100% occupancy.
- The above figure does not include financing costs.

4.2 COMPUTATION FOR CAPITAL ALLOWANCES

To calculate the capital allowances for business income tax

SCENARIO

1	Equipment	Diesel generator set, max output 25KVA
2	Purchase price*	RM43,170.00
3	Installation cost	RM3,000.00
4	Initial allowances (IA)**	20%
5	Annual allowances (AA)**	14%

CALCULATION

Description	Amount
Year of Assessment 2021	
Qualifying Expenditure (purchase and installation)	RM46,170.00
Deduct. IA ($RM45,000 \times 20\%$)	-RM9,234.00
Deduct. AA ($RM45,000 \times 14\%$)	-RM6,463.80
Residual Expenditure	RM30,472.20
Year of Assessment 2022–2024	
Deduct. AA ($RM45,000 \times 14\%$) – $RM6,300.00 \times 3$ years	-RM19,391.40
Residual Expenditure	RM11,080.80
Year of Assessment 2025	
AA (restricted to)	-RM11,080.80
Residual Expenditure	RM0.00

NOTES:

- *Source : N3C Building Material Prices.
- **Source : LHDN Public Ruling No.12/ 2014.
- "Qualifying Expenditure" means capital expenditure incurred on the provision, construction or purchase of plant or machinery. Refer LHDN Public Ruling No.12/ 2014.

4.3 BUILT-UP RATE CALCULATION

To calculate rate for 12mm diameter high tensile steel reinforcement in straight and bent bars in column.

BUILT-UP OF RATE

1	Price for 12mm dia H.T. reinf.*	RM3,480.00/ tonne
2	Barbender**	RM160.00/ day
3	General Construction Worker-Helper**	RM100.00/ day
4	Labour constant	0.070 tonne/ man-hour
5	Profit and overhead***	10% of total cost

CALCULATION

Material Cost

12mm dia H.T steel reinf.	=	RM3,480.00
Spacer block and wastage	= 5% of material cost	= RM174.00

Labour Cost

General construction worker	=	$\frac{\text{RM100.00/ day}}{8 \text{ hours}}$	x	$\frac{1 \text{ man-hour}}{0.070 \text{ tonne}}$	=	RM178.57
Barbender	=	$\frac{\text{RM160.00/ day}}{8 \text{ hours}}$	x	$\frac{1 \text{ man-hour}}{0.070 \text{ tonne}}$	=	RM285.71

Total cost	=	RM4,118.29
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Profit & Overhead (10%)	=	RM411.83
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Cost/ tonne	=	RM4,530.11
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Cost/ kg	=	<u><u>RM4.53</u></u>
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NOTES:

- *Source: N3C Building Material Prices.
- **Source: N3C Labour Wage Rates.
- ***The above figures are examples and for guidance purposes only.

4.3 BUILT-UP RATE CALCULATION (cont'd)

To calculate rate to excavate trench to receive foundations starting from reduced level maximum depth not exceeding 1m.

BUILT-UP OF RATE

1	Rental rate for mini hydraulic excavator with 6,000kg operating weight*	RM370.00/ day
2	General construction Worker-Helper**	RM100.00/ day
3	Plant constant	4.00m ³ / hour
4	Labour constant	5.00m ³ / hour
5	Operational cost***	20% of machinery rate
6	Profit and overhead***	15% of total cost

CALCULATION

Machinery Cost

$$\text{Mini hydraulic excavator} = \frac{\text{RM370.00/ day}}{8 \text{ hours}} \times \frac{1 \text{ hour}}{4.00\text{m}^3} = \text{RM11.56}$$

$$\text{Operational cost (20\%)} = \text{RM2.31}$$

Labour Cost

$$\text{General construction worker} = \frac{\text{RM100.00/ day}}{8 \text{ hours}} \times \frac{1 \text{ hour}}{5.00\text{m}^3} = \text{RM2.50}$$

$$\text{Total cost} = \text{RM16.38}$$

$$\text{Profit \& Overhead (15\%)} = \text{RM2.46}$$

$$\text{Cost/ m}^3 = \underline{\underline{\text{RM18.83}}}$$

NOTES:

- *Source: N3C Machinery Hire Rates and Equipment Purchase Prices.
- **Source: N3C Labour Wage Rates.
- ***The above figures are examples and for guidance purposes only.

4.4 VARIATION OF PRICE CALCULATION

To calculate material price variation for building works between the award date and current date.

SCENARIO

1	Building category	Commercial
2	Region	Selangor
3	BMCI awarded month (Jan 2020)*	103.0
4	BMCI current month (Jan 2022)*	129.5
5	Value of work done	RM2,500,000.00
6	Material weightage**	0.7

CALCULATION

$$\begin{aligned}
 \text{Material VOP} &= \text{Material weightage} \times \left(\frac{\text{Current BMCI} - \text{Previous BMCI}}{\text{Previous BMCI}} \right) \times \text{Value of work done} \\
 &= 0.70 \times \left(\frac{129.50 - 103.00}{103.00} \right) \times \text{RM2,500,000.00} \\
 &= \underline{\underline{\text{RM450,242.72}}}
 \end{aligned}$$

NOTES:

- *Source : N3C Building Material Cost Index (BMCI).
- **The above figures are example and for guidance purpose only.

4.4 VARIATION OF PRICE CALCULATION (cont'd)

To calculate price variation for reinforcement bar between the award date and current date.

SCENARIO

1	Material category	Steel reinforcement
2	Region	Selangor
3	BMCI awarded month (Jan 2020)*	107.1
4	BMCI current month (Jan 2022)*	140.3
5	Sales price for rebar high tensile Y10 on awarded month	RM2,466.67/ tonne

CALCULATION

$$\begin{aligned}
 \text{Material VOP} &= \left(\frac{\text{Current BMCI} - \text{Previous BMCI}}{\text{Previous BMCI}} \right) \times \text{Sales price on awarded month} \\
 &= \left(\frac{140.30 - 107.00}{107.10} \right) \times \text{RM2,466.67/ tonne} \\
 &= \underline{\underline{\text{RM764.64/ tonne}}}
 \end{aligned}$$

NOTES:

- *Source : N3C Building Material Cost Index (BMCI).
- **The above figures are example and for guidance purpose only.

4.5 RECOMMENDED FIRE INSURANCE VALUATION

To calculate recommended value for fire insurance of building.

SCENARIO

1	Base building cost	RM75,000,000.00
2	Building category	Office
3	Region	Selangor
4	Base BCI in Dec 2020*	109.5
5	Current BCI in Dec 2021*	120.5
6	f% (other development cost & profit)**	20.0%

CALCULATION

$$\begin{aligned}
 \text{Building insurance} &= \text{Base building cost} \times \left(\frac{\text{Current Index}}{\text{Base Index}} \right) \times (1.0 + f\%) \\
 &= \text{RM75,000,000.00} \times \left(\frac{120.50}{109.50} \right) \times (1.0 + 0.2) \\
 &= \text{RM99,041,095.89} \\
 &\approx \underline{\underline{\text{RM100,000,000.00}}}
 \end{aligned}$$

NOTES:

- *Source : N3C Building Material Cost Index (BMCI).
- **The above figures are example and for guidance purpose only.
- Excludes renovation and fit out works.

4.6 LABOUR PRODUCTIVITY CALCULATION

To estimate time needed for labour to complete internal wall plastering work.

SCENARIO

1	Total wall area internally for plastering works	1,000m ²
2	Labour constant	1.08m ² / man-hour
3	Number of workers available	9 workers
4	Working time	8 hours/ day

CALCULATION

$$\begin{aligned}
 \text{Time needed} &= \text{Total wall area internally} \div \left(\text{Labour constant} \times \text{Number of worker} \right) \div \text{Working time} \\
 &= 1,000\text{m}^2 \div \left(1.08\text{m}^2/\text{hr} \times 9 \text{ workers} \right) \div 8 \text{ hours} \\
 &= \underline{\underline{12.86 \text{ days}}}
 \end{aligned}$$

NOTES:

- Assuming there is no disturbance or interruptions that may affect the speed or continuation of work for whatever reason including bad weather etc.

4.7 PLANT PRODUCTIVITY CALCULATION

To estimate plant time to complete basement excavation work.

SCENARIO

1	Total volume of excavated soil	6,500.00m ³
2	Plant constant	72.15m ³ / plant-hour
3	Number of plant available	2 excavators
4	Working time	8 hours/ day

CALCULATION

$$\begin{aligned}
 \text{Time needed} &= \text{Total volume of excavated soil} \div \left(\text{Plant constant} \times \text{Number of plant} \right) \div \text{Working time} \\
 &= 6,500.00\text{m}^3 \div \left(72.15\text{m}^3/\text{hour} \times 2 \text{ excavators} \right) \div 8 \text{ hours} \\
 &= \underline{\underline{5.63 \text{ days}}}
 \end{aligned}$$

NOTES:

- Assuming there is no disturbance or interruptions that may affect the speed or continuation of work for whatever reason including bad weather etc.

**cype**

Your BIM-based cost estimation solution



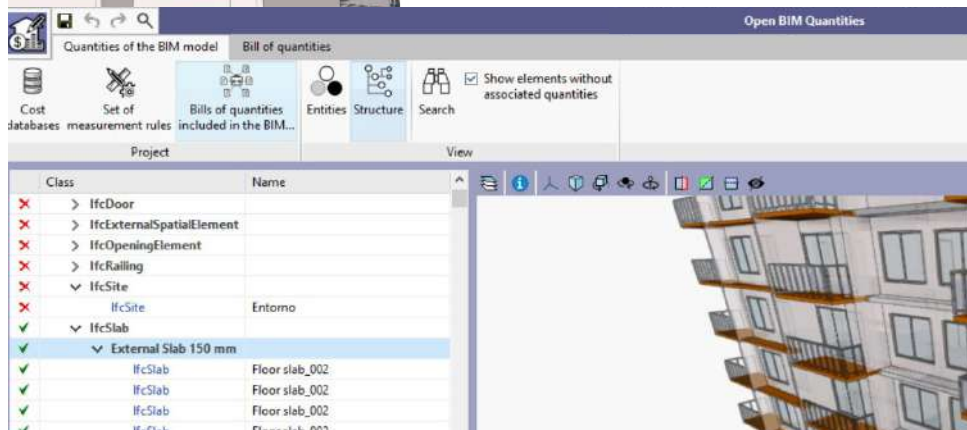
Open BIM Cost Estimator

Automatically estimates the execution cost of a construction project during its preliminary phases.



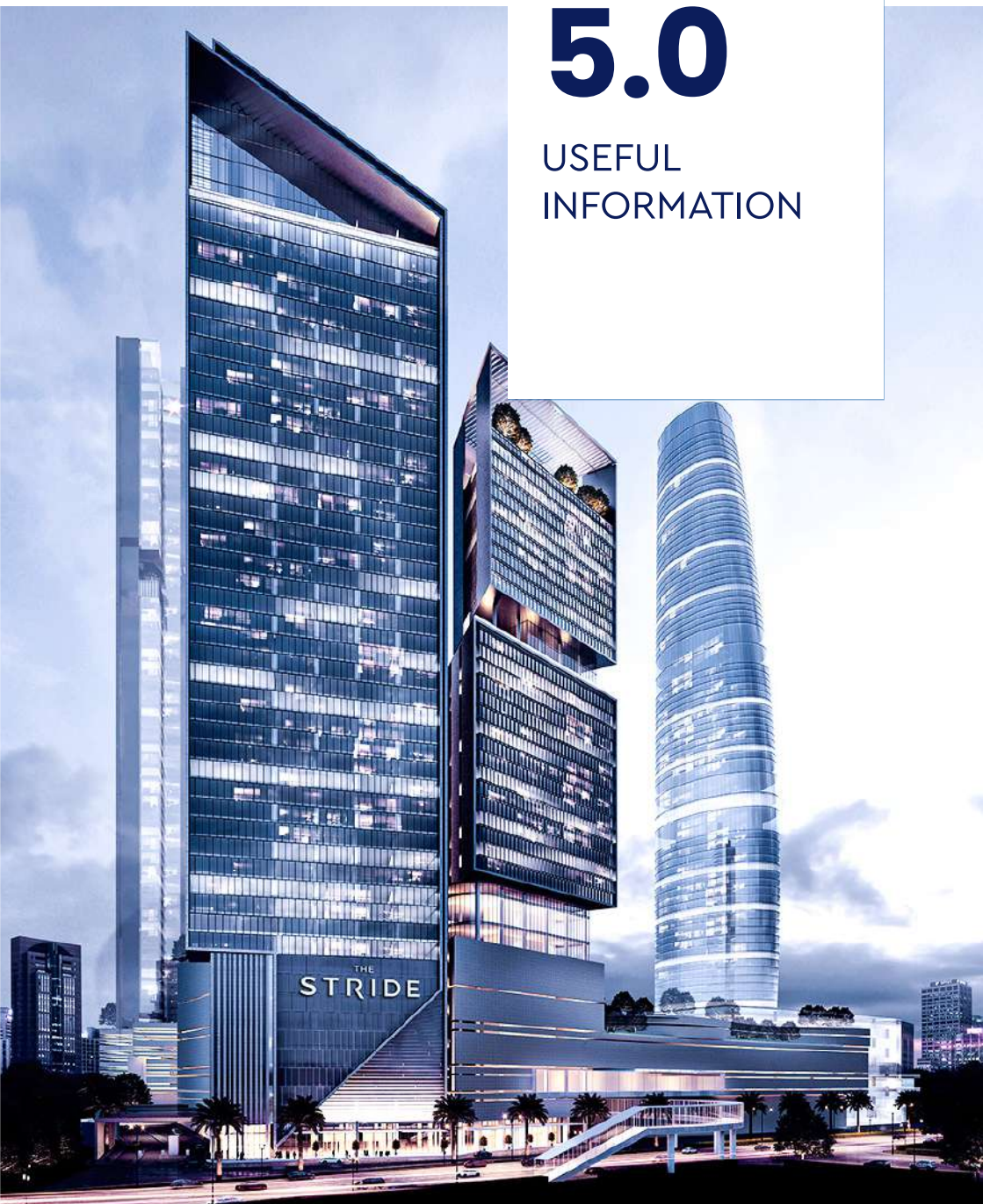
Open BIM Quantities

Generates the bills of quantities of BIM models generated in IFC format.



5.0

USEFUL
INFORMATION



5.1 ESTIMATING RULES OF THUMB

PERCENTAGE OF ELEMENT IN A BUILDING

Building Category	Substructure (%)	Superstructure (%)	Architectural (%)	Fittings (%)	M&E (%)
Low-rise residential	5	15	70	0	10
High-rise residential	5	20	45	5	25
Low-rise shops	3	15	67	0	15
Low-rise office	5	18	54	8	15
Mid-rise office	5	20	45	5	25
High-rise office	5	15	40	5	35
Hotels	5	15	25	15	40

EXTERNAL WALL/ FLOOR RATIO

Building	Ratio
Residential apartments	1.0m ² / m ²
Office, hotel	0.4m ² / m ²

INTERNAL WALL/ FLOOR RATIO

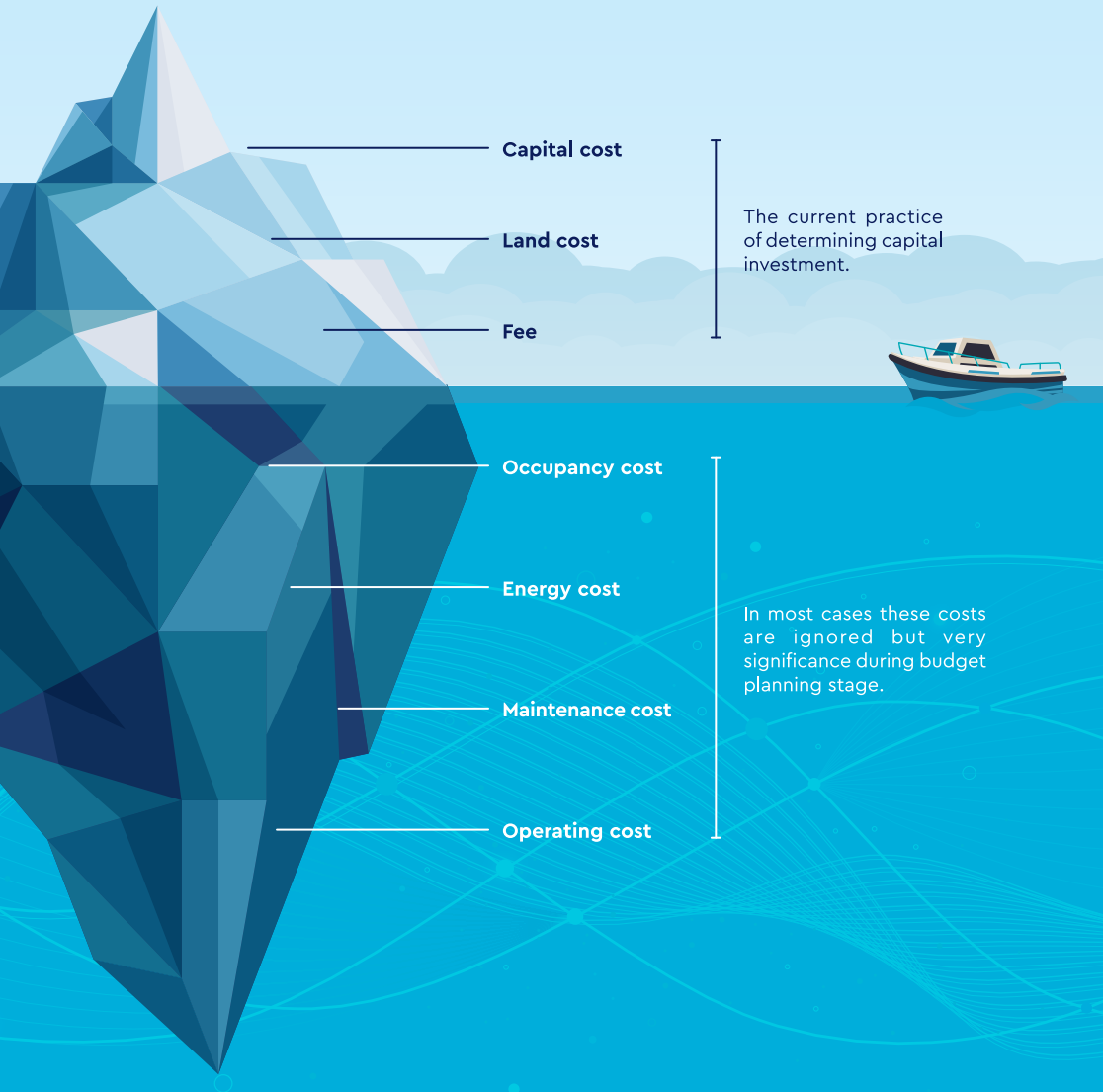
Building	Ratio
Residential apartments	1.0m ² / m ²
Office, hotel	0.5m ² / m ²

5.2 LIFE CYCLE COSTING

Life Cycle Costing (LCC) is the overall cost of an asset across its operating life, including capital and future running costs.

The LCC strategy stresses future cost flow and the benefits acquired throughout the life of the building. Using discounting procedures, future costs and benefits are converted to present values. Therefore, an economic valuation of a proposal can be created.

These are the elements for LCC:



INTRODUCTION

The benchmarking analysis has been prepared following submission of target construction project data to the Building Cost Information Services Malaysia (BCISM) and has been arranged by analysing target project to similar projects in the BCISM database.

BENCHMARKING ANALYSIS REPORT

PROJECT DETAILS

Location

Petaling Jaya, Selangor, Malaysia

Cost

RM3,000,000.00

Building Function

Commercial – Office Building
(low rise)

GFA: 940m²

Base Date: Q4/ 2022

Headlines

Based on RM3,191/ m², the target project is 36% more expensive compared to sampled buildings

Submitting More Data

By submitting your project to BCISM, you will receive a complimentary benchmarking analysis report, in addition you also contribute to raising the quality of benchmark data in the construction sector and eventually support the industry drive for efficiency.

All the data provided are confidential, none of which will be published without your own or the client's concern.

BCISM Benchmarking Analysis Report

Benchmarking allows you to compare the performance of your project against other similar projects which facilitates strategic decisions and continual improvement.

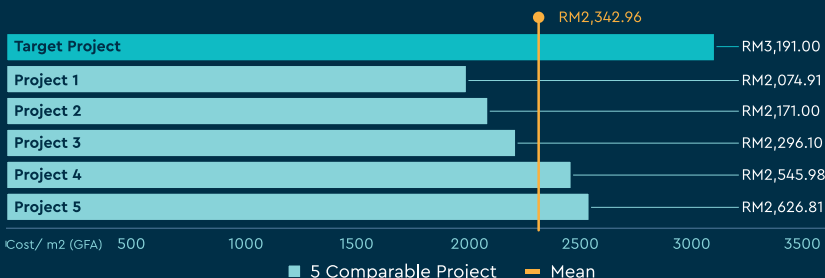
All the submitted projects will be analysed to produce Cost/ m². The costs of the projects with the same function and specification will be updated to reflect the costs at the same date and location as your project before producing a benchmark.

HOW DO WE ANALYSE YOUR PROJECT?

All the projects are analysed using the BCISM standard benchmark and a summary for submitted project will be included in this report. Project with the same function have been converted to a cost per square metre and updated to reflect costs at the same date and location as the submitted project.

The submitted project has been compared with a sample of 5 similar projects and functions. The building cost for submitted project is RM3,191/ m² compared to average cost of RM2,343/ m² for similar projects. The results are summarized in the graphs and tables below.

Please note that the targeted project is excluded from the comparison sample.



Element	Submitted Project (RM/ m ²)	Mean of sampled projects (RM/ m ²)	% above sampled projects
Substructure	245.00	179.22	+36% ↑
Superstructure	1,204.00	916.71	+31% ↑
Finishes	542.00	261.45	+107% ↑
Fittings and furnishings	0	0	0% ■
Services	1,200.00	985.58	+21% ↑

↓ Lower than mean ↑ Higher than mean ■ Equal mean

The element showing largest cost difference is services element which is 107% higher than the mean of similar projects.

The differences between the submitted project with sampled projects is shown by line graph below



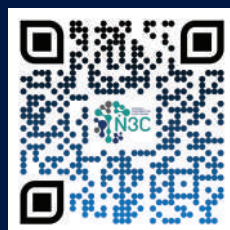
Point of Interest

N3C Website

Other than doing benchmarking analysis for you project, you may also have a look on the materials cost, labors cost, machinery cost, etc. for your project.

For more information and data, you can subscribe at www.n3c.cidb.gov.my

SCAN HERE



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The information contained herein should be regarded as indicative and for general guidance only. Whilst every effort has been made to ensure accuracy, no responsibility can be accepted for errors and omissions, however caused.

Unless otherwise stated, costs reflected in this costbook are Malaysian cost at 1st quarter 2022.

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