



HC Precast System

(100 % Malaysia Technology With 6 IPs')

Economical . Eco Friendly . Quality

Industrialized Building System (IBS)

Advantage



In the construction of a building, there are always 4 types of joint namely

“ L-shape ” “ T-shape ” “ Cross shape ” “ Straight joint ”

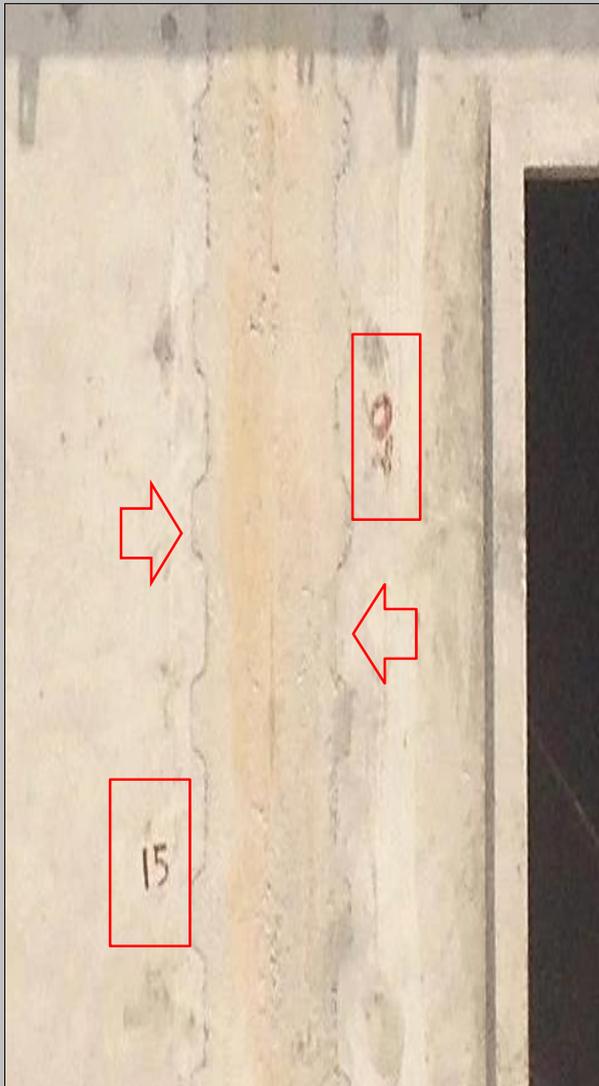
Modular shear keys (wet joint) No leaking & No crack

COMMERCIAL ADVANTAGES

- 1. Industrialized building system (IBS) superstructure in Malaysia 3 in 1**
- 2. Customized & flexibility to suit all architectural demands**
- 3. Lowering house price**
- 4. Minimizing outflow currency by reduction of foreign workers 40%**
- 5. IBS is cheaper than conventional method**
- 6. Propose to government and private developer**
- 7. No variation order**
- 8. Reduce financing, overhead & earlier occupation of house due to shorter construction period**

1. Industrialized Building System (IBS) Superstructure In Malaysia 3 in 1

Modular shear keys (wet joint)



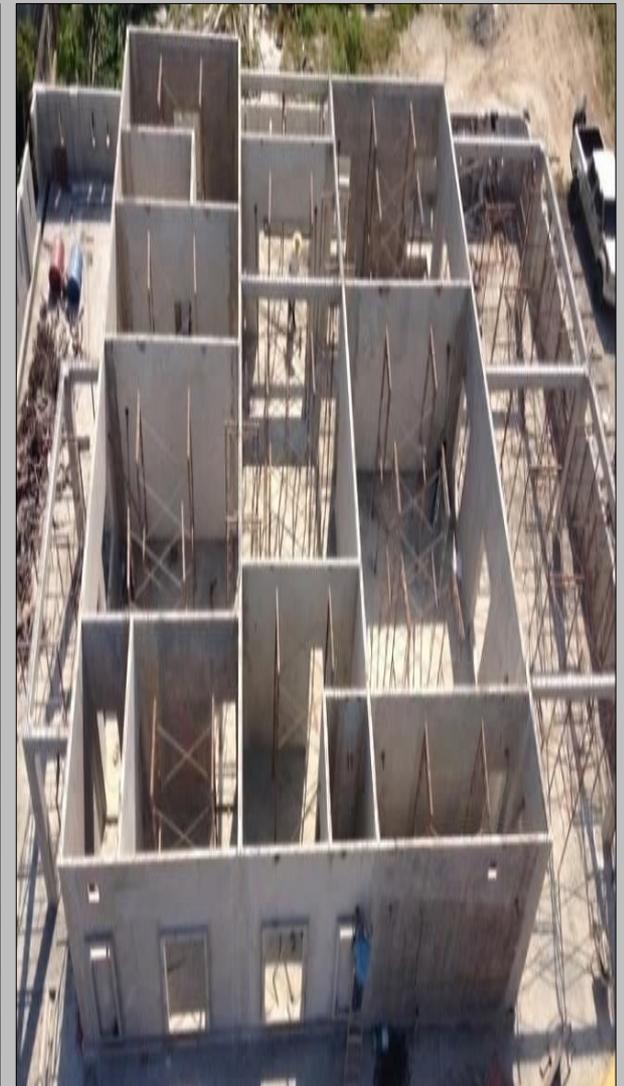
No leaking & crack

Load bearing wall



Comply to the code (BSI)

Box system

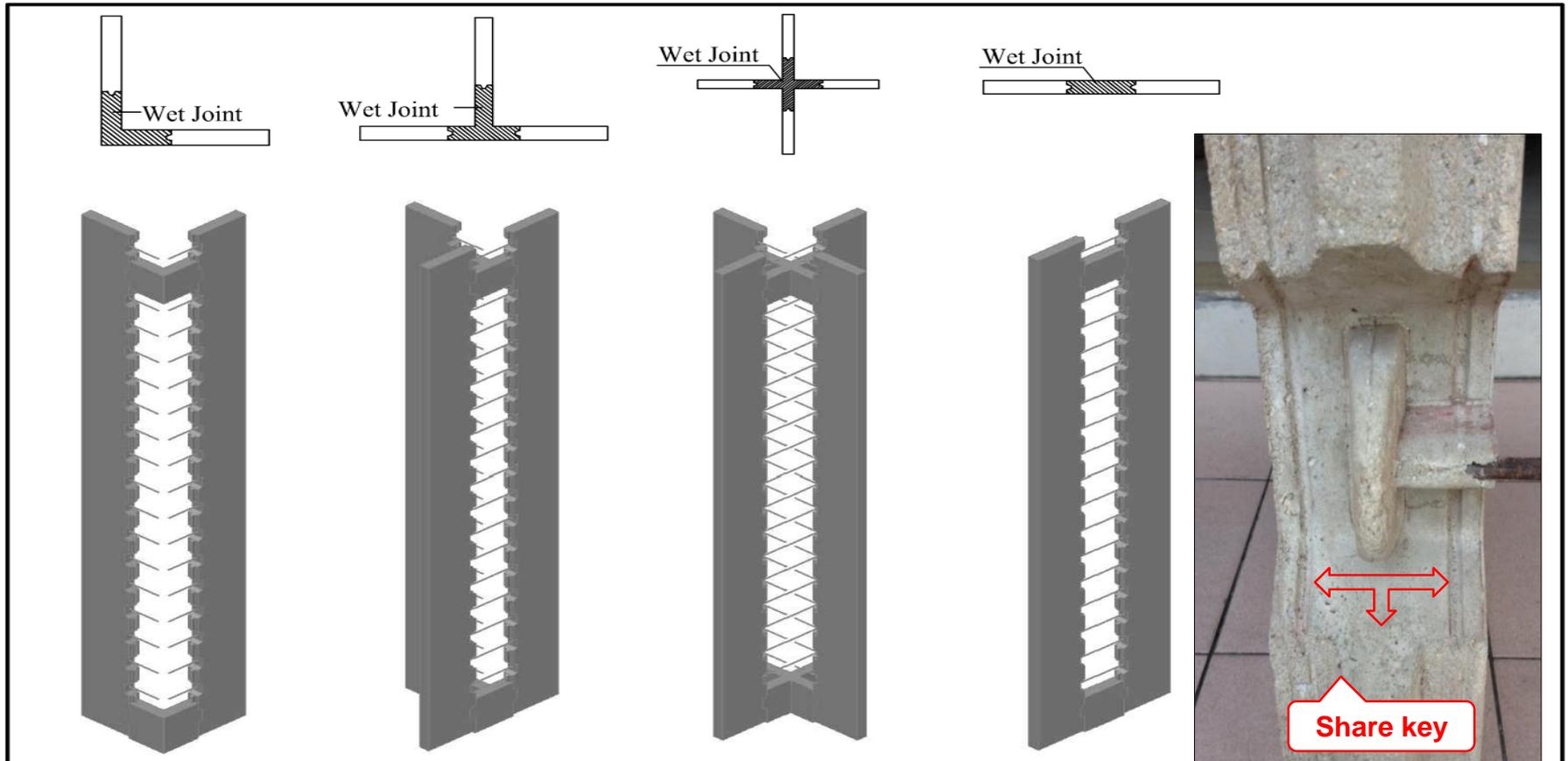


Comply building by law

2. Customized & flexibility to Suit all architectural demands

In the construction of a building, there are always 4 types of joint namely

“ L-shape ” “ T-shape ” “ Cross shape ” “ Straight joint ”



SYSTEM PROVIDER
IPC PRECAST SYSTEM SDN. BHD. (086097-10)

 No.228, Jalan Seri Sunway, 208/KS2, Taman Seri Andalan,
 41200 Klang, Selangor D.E. Tel:03-3323 3963 Fax:03-3324 3963
 e-mail: marketing@iprecast.com, www.iprecast.com

MANUFACTURER
IPC MANUFACTURING SDN. BHD. (585570-1)
 No.22-1, Jalan Seri Sunway, 208/KS2, Taman Seri Andalan,
 41200 Klang, Selangor D.E.
 Tel:03-3323 3963 Fax:03-3324 3963

DRAWN :	DL
CHECKED :	AME 2016
DESIGNED :	ME
APPROVED :	ME
SCALE :	1:1

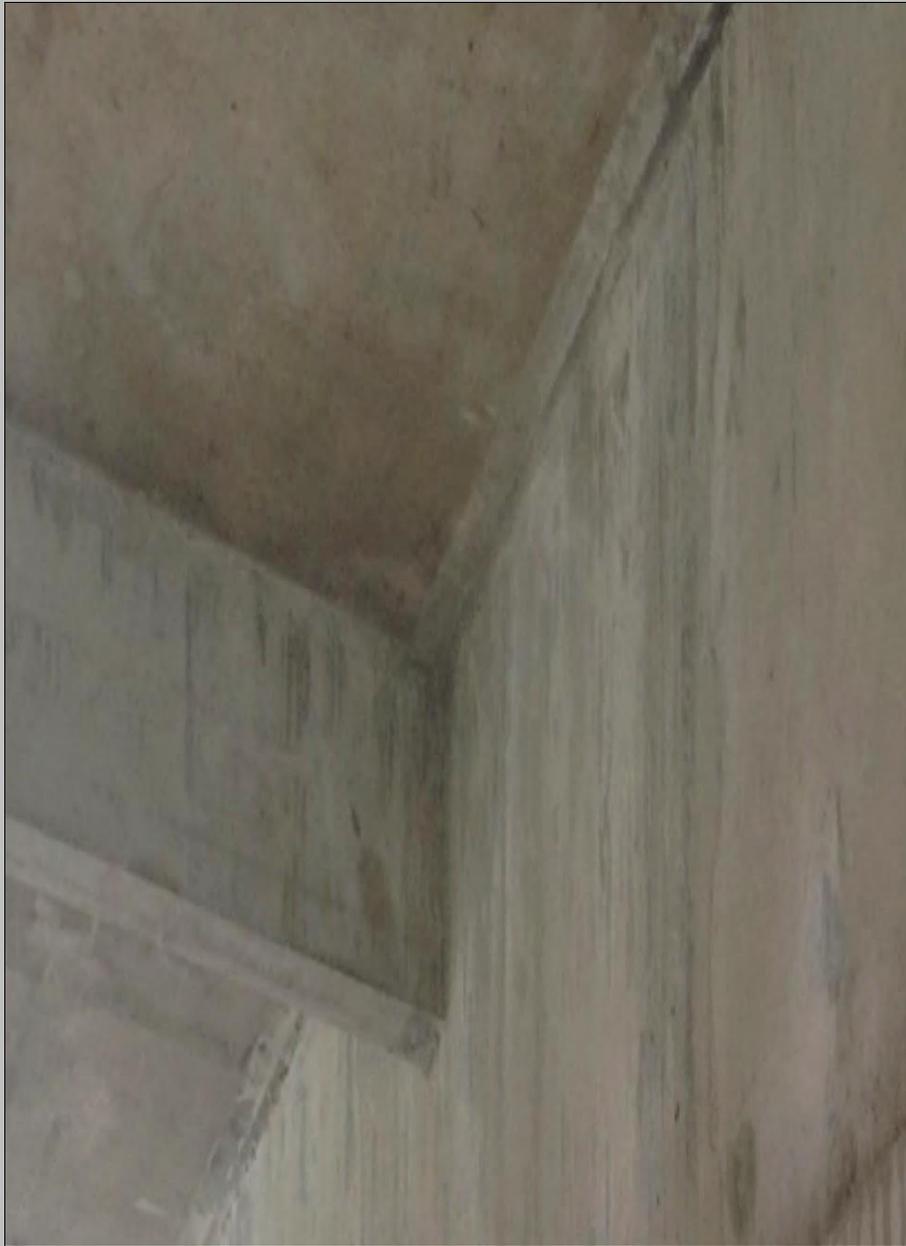
DRAWING TITLE :	
PROJECT NO. :	HC/MP
REVISION :	

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3. Lowering House Price

- **No preliminaries item**
- **Smooth and even surface to received skimcoat**
- **No primary undercoat for painting due to smooth skimcoat surface**
- **No rubbish cleaning**
- **Shorter construction period**
- **Reduce overhead due to shorter construction period**
- **Reduce the quantity of cement and screed to receive tiling work**
- **M & E shop drawing produce by HC Precast System without any extra charges**
- **No hacking for electrical and plumbing work**
- **No maintenance and no leaking & crack**

- Smooth and even surface to received skimcoat



- No primary undercoat for painting due to smooth skimcoat surface



- No primary undercoat for painting due to smooth skimcoat surface



- No rubbish cleaning



- **Construction period - Reduce overhead due to shorter construction period**

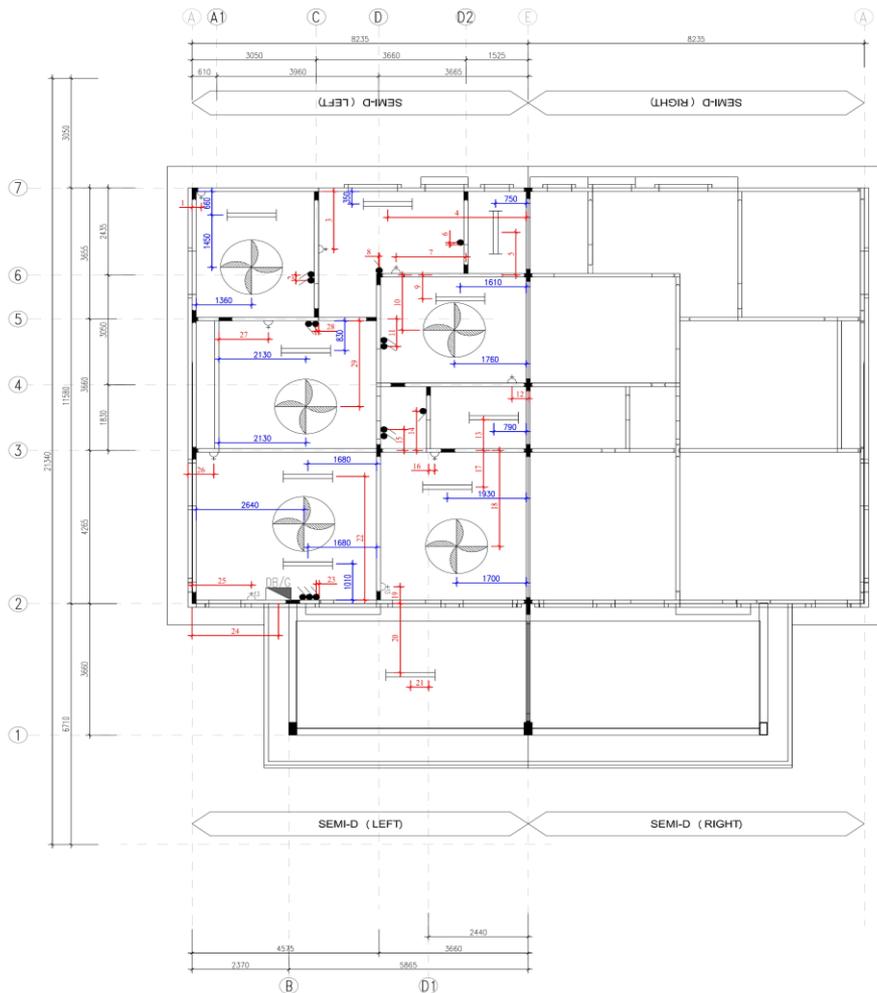


7 days completed with 6 workers superstructure (Frame & Wall)

- Reduce the quantity of cement and screed to receive tiling work



• M & E shop drawing produce by HC Precast System without any extra charges



POSITION OF ELECTRICAL POINTS
(FROM STRUCTURAL LEVEL)

Distance of Point (mm)	Height of Point (mm)	Confirmation by M&E Consultant
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		

Notes:
 1) Distance of Point has been scaled from M&E Consultant drawing.
 2) Height of Point from schedule provided by M&E Consultant drawing.
 3) M&E Consultant to fill in dimension not stated (?mm)

Confirmed by M&E Consultant
 Signature :
 Name :
 Date :

Dimension for :
1. Light & Fan point
2. Power point
3. Switch point
4. Tel & MATV point
to be fill & confirm by consultant

SYSTEM PROVIDER

HC PRECAST SYSTEM SDN. BHD. (586697-M)
 No.235, Jalan Seri Sarawak 208/KS2, Taman Seri Andalas,
 41200 Klang, Selangor D.E. Tel:03-3323 5999 Fax:03-3323 8993
 e-mail:enquiry@hccprecast.com.my, Http://www.hccprecast.com.my
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MANUFACTURER
HC MANUFACTURING SDN. BHD. (585570-T)
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 41200 Klang, Selangor D.E. Tel:03-3323 7999 Fax:03-3323 8993

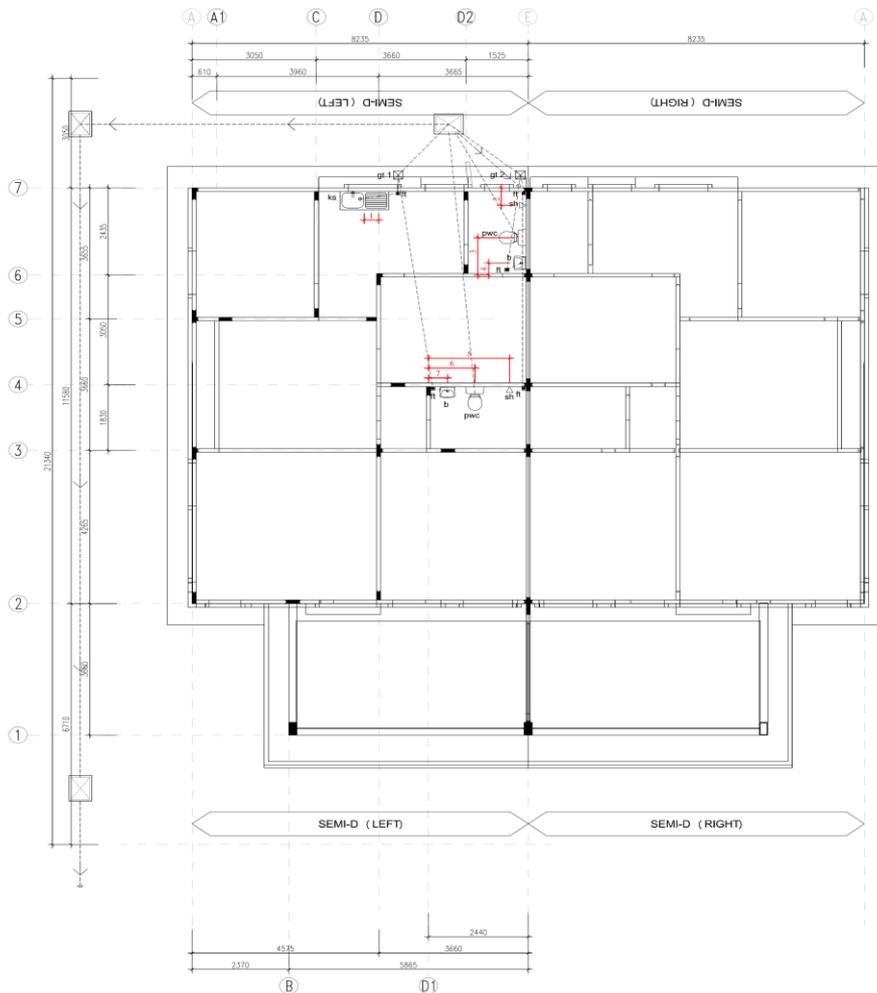
DRAWN : **KC**
 DATE : **FEB 2018**
 CHECKED : **3983**
 DRAWN : **3983**
 APPROV : **3983**
 SCALE : **NTS**

CADANGAN SKIM PERUMAHAN RAKYAT 1 MALAYSIA (PRIMA) BAGI RUMAH BERKEMBAR 1 TINGKAT
 DI ATAS TANAH KERAJAAN DI PAMAH KASIH, CHARUK PUTING, MUKIM PERAK, DAERAH TEMERLOH, PAHANG.
 UNTUK TETUAN:
 BERGAMO DESIGN (M) SDN. BHD.

DRAWING TITLE
 SINGLE STOREY SEMI-D (LEFT UNIT)
 SETTING OUT OF ELECTRICAL FIXTURES
 DRAWING NO : **HC/BB/SD/EL-01** REV :
 SCALE : **-** REV :

M&E IBS system shop drawing (Subject to client / consultant confirmation)

• M & E shop drawing produce by HC Precast System without any extra charges



POSITION OF FITTINGS
(FROM STRUCTURAL LEVEL)

Distance of fitting (mm)	Height of fitting (mm)	Confirmation by M&E Consultant
1		
2		
3		
4		
5		
6		
7		

- Notes:
- 1) Distance of fitting has been scaled from M&E Consultant drawing.
 - 2) Height of fitting from schedule provided by M&E Consultant drawing.
 - 3) M&E Consultant to fill in dimension not stated (?mm)

Confirmed by M&E Consultant

Signature :

Name :

Date :

Dimension for :
1. Sanitary fitting & plumbing
to be fill & confirm by consultant

SYSTEM PROVIDER

HC PRECAST SYSTEM SDN. BHD. (586697-M)
 No.235, Jalan Seri Sarawak 208/KS2, Taman Seri Andalas,
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MANUFACTURER
HC MANUFACTURING SDN. BHD. (585570-T)
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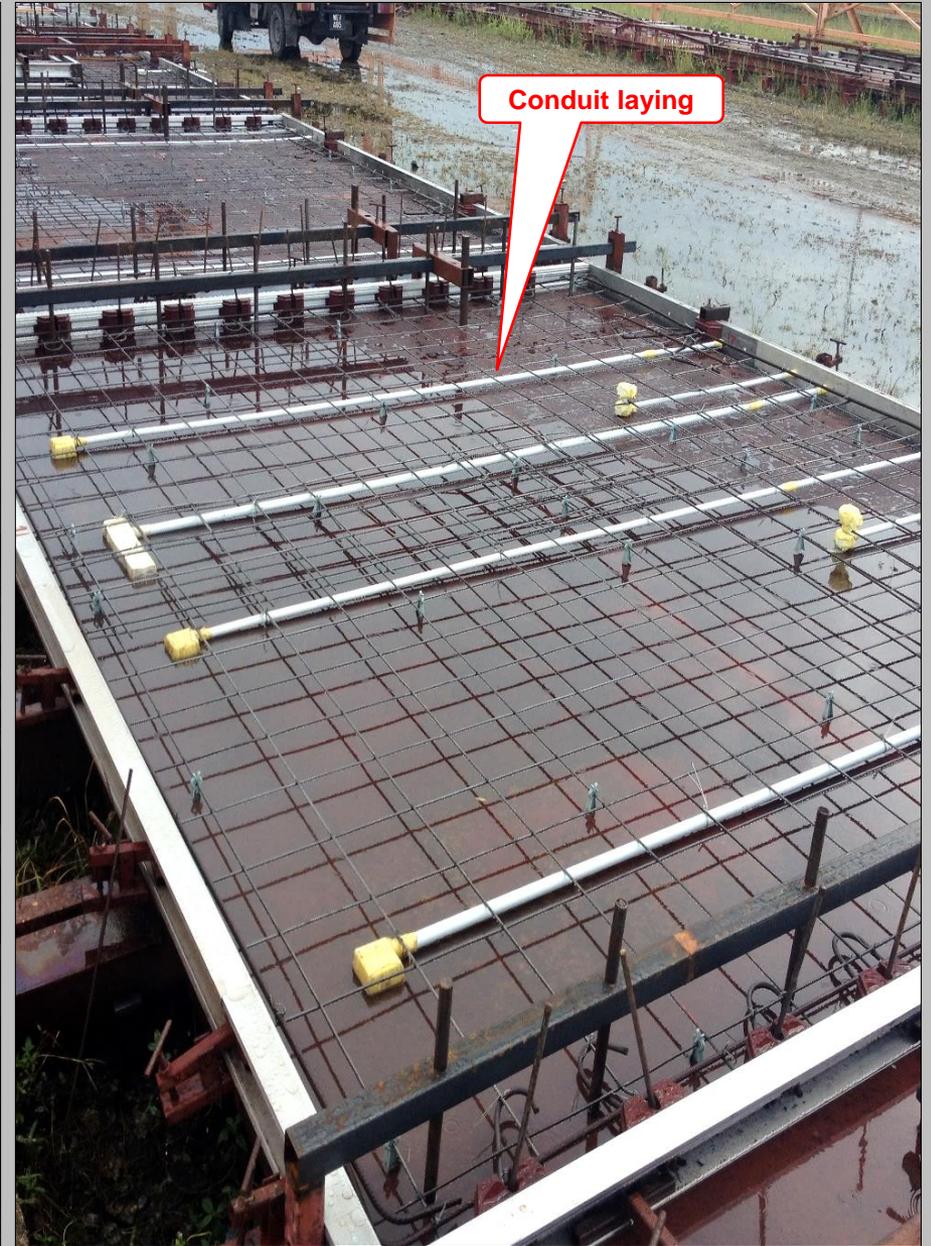
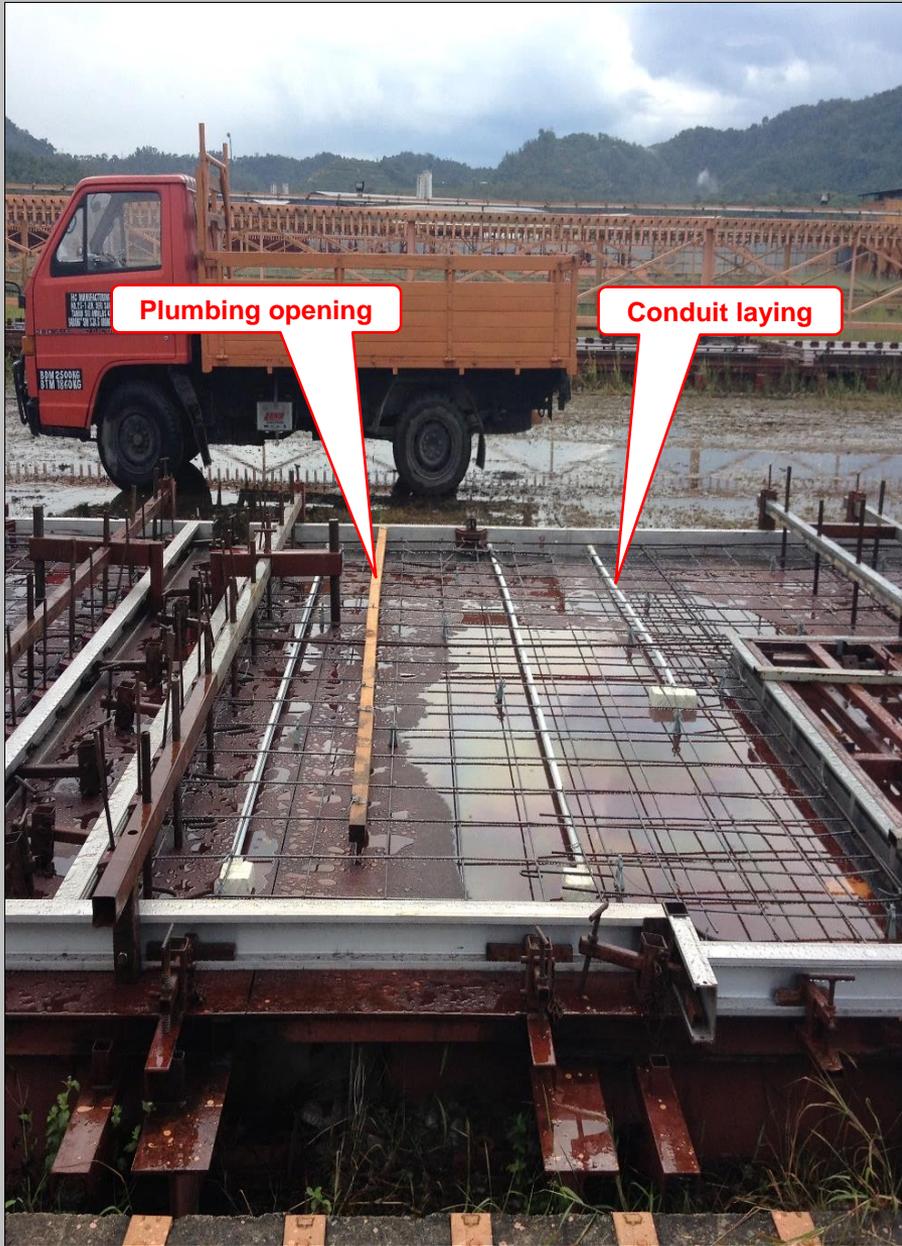
DRAWN : **KC**
 DATE : **FEB 2018**
 CHECKED : **2983**
 DRAWN : **2983**
 APPROVED : **2983**
 SCALE : **NTS**

CADANGAN SKIM PERUMAHAN RAKYAT 1 MALAYSIA
 (PRIMA) BAGI RUMAH BERKEMBAR 1 TINGKAT
 DI ATAS TANAH KERAJAAN DI PAMAH KASIH,
 CHARUK PUTING, MUKIM PERAK, DAERAH TEMERLOH,
 PAHANG.
 UNTUK TETUAN:
 BERGAMO DESIGN (M) SDN. BHD.

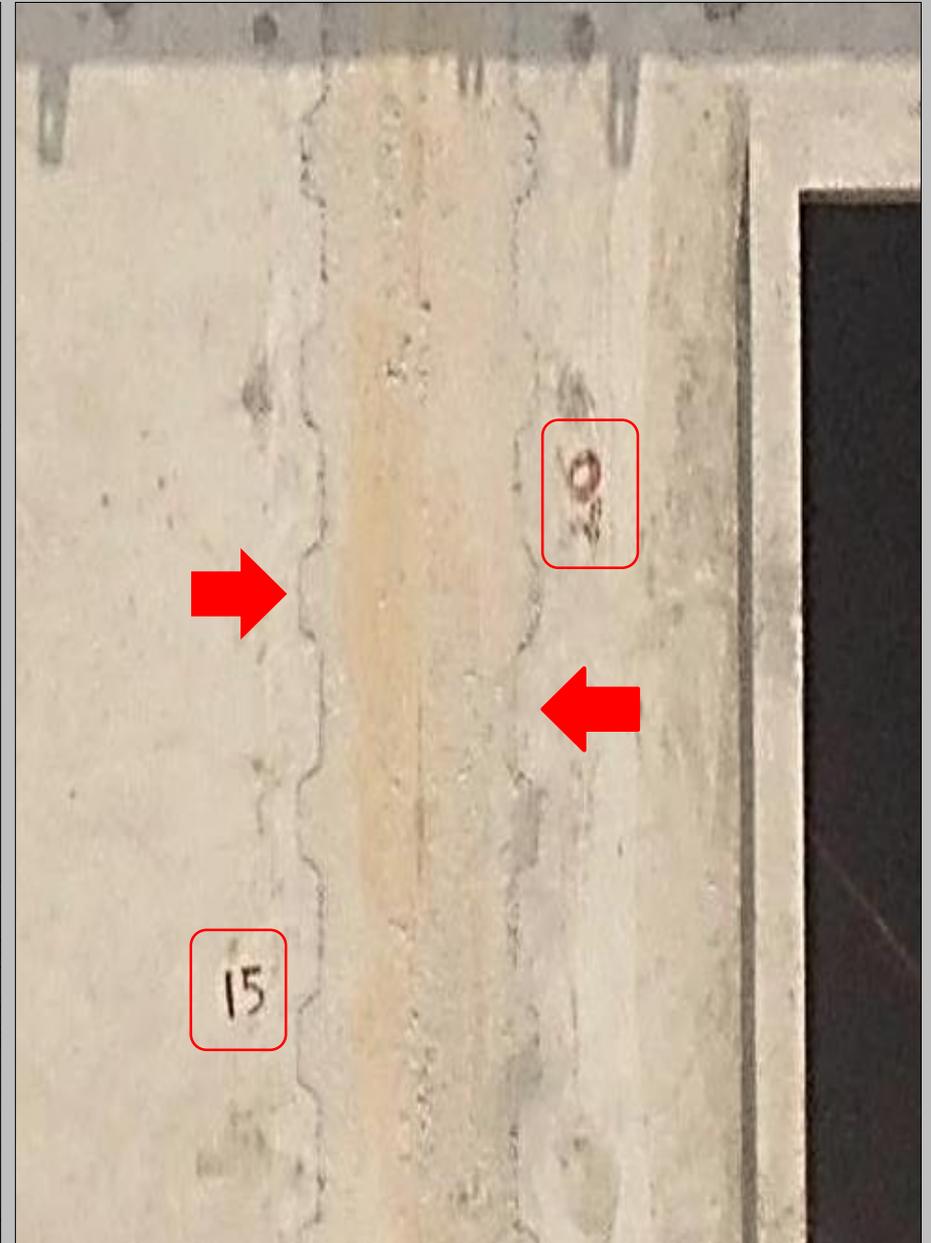
DRAWING TITLE
**SINGLE STOREY SEMI-D (LEFT UNIT)
 SETTING OUT OF SANITARY FITTINGS**
 DRAWING NO : **HC/BB/SD/SP-01** REV :
 SCALE : **-** REV : **-**

M&E IBS system shop drawing (Subject to client / consultant confirmation)

- No hacking for electrical and plumbing work



- No maintenance and no leaking & crack



4. Minimizing Outflow Currency by reduction of foreign workers 40%

HC Precast System :

Precast wall panels
precast beams,
In-situ beams & wet joints.

6 workers x 7 days x RM 100 per day
= RM 4,200 / unit

80% outflow currency
= RM 3,360

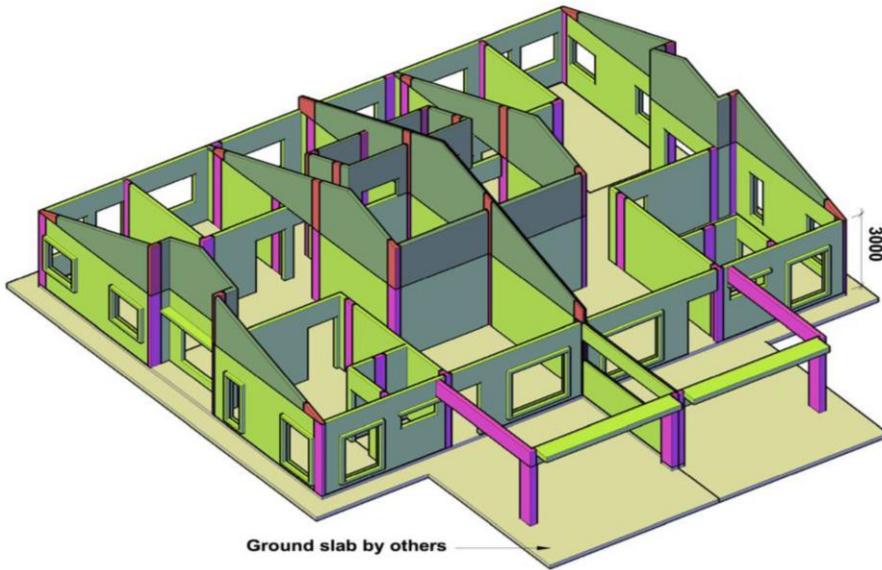
Vs

Conventional methods & Competitors :

Ground floor columns, roof beams & brickworks
(Reinforcement, formwork, concreting, brick wall,
coping, DPM & plastering)

= RM 10,000 / unit

80% outflow currency
= RM 8,000



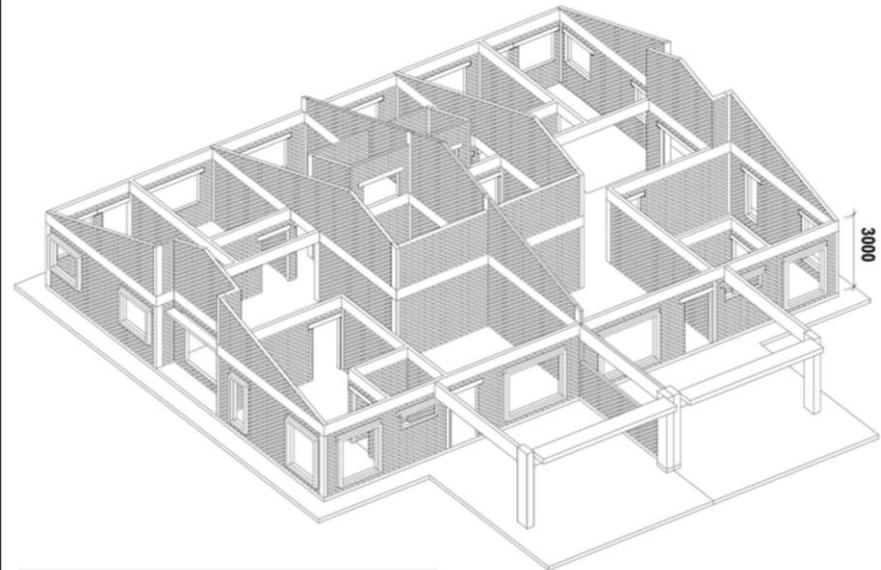
NOTE:
THICKNESS OF ALL WALLS & COMMON
PARTY WALLS = 100mm

WALL HEIGHT = 3000mm

VOLUME & PERIMETER GIVEN IN THIS DRAWING
ARE MEANT FOR 2 UNITS OF SEMI-D

TOTAL WALL AREA = 478.80m²

3D VIEW - FRONT (LEFT SIDE)



NOTE:
THICKNESS OF ALL WALLS & COMMON
PARTY WALLS = 115mm

WALL HEIGHT = 3000mm

VOLUME & PERIMETER GIVEN IN THIS DRAWING
ARE MEANT FOR 2 UNITS OF SEMI-D

3D VIEW - FRONT (LEFT SIDE)

Labour Cost of Superstructure (Frame & Walls)

5. IBS is cheaper than conventional Method

Single Storey Semi-D : 1,297 sqft

Current material rate 2017

Summary : Cost per sqft GFA for Superstructure (Frame & Wall)

HC Precast System Vs Conventional Method

Item	Description	A) Wall Height - 3.71m				B) Wall Height - 3.30m				C) Wall Height - 3.00m			
		Conventional		HC Precast System		Conventional		HC Precast System		Conventional		HC Precast System	
		Page Ref	Amount (RM)	Page Ref	Amount (RM)	Page Ref	Amount (RM)	Page Ref	Amount (RM)	Page Ref	Amount (RM)	Page Ref	Amount (RM)
A	Superstructure & Wall	A2	47,485.61	A3	37,205.37	B2	43,081.78	B3	33,427.12	C2	39,496.20	C3	30,664.87
	(Excluding Carporch Column, Beam, Wall & Coping)												
	Amount of Different (RM)				10,280.24				9,654.66				8,831.33
	Percentage of Different (%)				21.65%				22.41%				22.36%
	Gross Floor Area (sqft)				1,297.00				1,297.00				1,297.00
	Cost / sqft GFA (RM/sqft)		36.61		28.69		33.22		25.77		30.45		23.64
B	Carporch Column, Beam, Wall & Coping	A4	4,902.01	A4	3,061.40	B4	4,902.01	B4	3,061.40	C4	4,902.01	C4	3,061.40
	Amount of Different (RM)				1,840.61				1,840.61				1,840.61
	Percentage of Different (%)				37.55%				37.55%				37.55%
	Gross Floor Area (sqft)				1,297.00				1,297.00				1,297.00
	Cost / sqft GFA (RM/sqft)		3.78		2.36		3.78		2.36		3.78		2.36
C	Total (A + B)		52,387.62		40,266.77		47,983.79		36,488.52		44,398.21		33,726.27
	Amount of Different (RM)				12,120.85				11,495.27				10,671.94
	Percentage of Different (%)				23.14%				23.96%				24.04%
	Gross Floor Area (sqft)				1,297.00				1,297.00				1,297.00
	Cost / sqft GFA (RM/sqft)		40.39		31.05		37.00		28.13		34.23		26.00

5. IBS is cheaper than conventional Method : Schedule of Rate per sqft GFA

Supply & install : Superstructure (frame & wall)

Schedule of Rate : Gross Floor Area (GFA) - per sqft

Item	Description	Unit	Estimate Qty	Ex-Factory			Logistic (Logistic Rate : RM 200 - RM 400 / m3)			Total (Ex-factory + Logistic)	
				Rate / m3	Amount	Rate / ft2	Rate / m3	Amount	Rate / ft2	Amount	Rate / ft2
A	<u>Double Storey Terrace House</u>										
	1) Intermediate Unit 1,600 ft2	m3	51 - 55	900.00	45,900.00 - 49,500.00	28.69 - 30.94	* 300.00	15,300.00 - 16,500.00	9.56 - 10.31	61,200.00 - 66,000.00	38.25 - 41.25
B	<u>Single Storey Terrace House</u>										
	1) Intermediate Unit 1,000 ft2	m3	17 - 20	900.00	15,300.00 - 18,000.00	15.30 - 18.00	* 300.00	5,100.00 - 6,000.00	5.10 - 6.00	20,400.00 - 24,000.00	20.40 - 24.00
C	<u>Single Storey Semi - D House</u>										
	1) End Left Unit 1,150 ft2	m3	21 - 23	900.00	18,900.00 - 20,700.00	16.43 - 18.00	* 300.00	6,300.00 - 6,900.00	5.48 - 6.00	25,200.00 - 27,600.00	21.91 - 24.00
D	<u>Double Storey Shop Lot</u>										
	1) Intermediate Unit 2,750 ft2	m3	70 - 75	900.00	63,000.00 - 67,500.00	22.91 - 24.55	* 300.00	21,000.00 - 22,500.00	7.64 - 8.18	84,000.00 - 90,000.00	30.55 - 32.73

Notes :

* Logistic Average Rate : RM 300.00 / m3

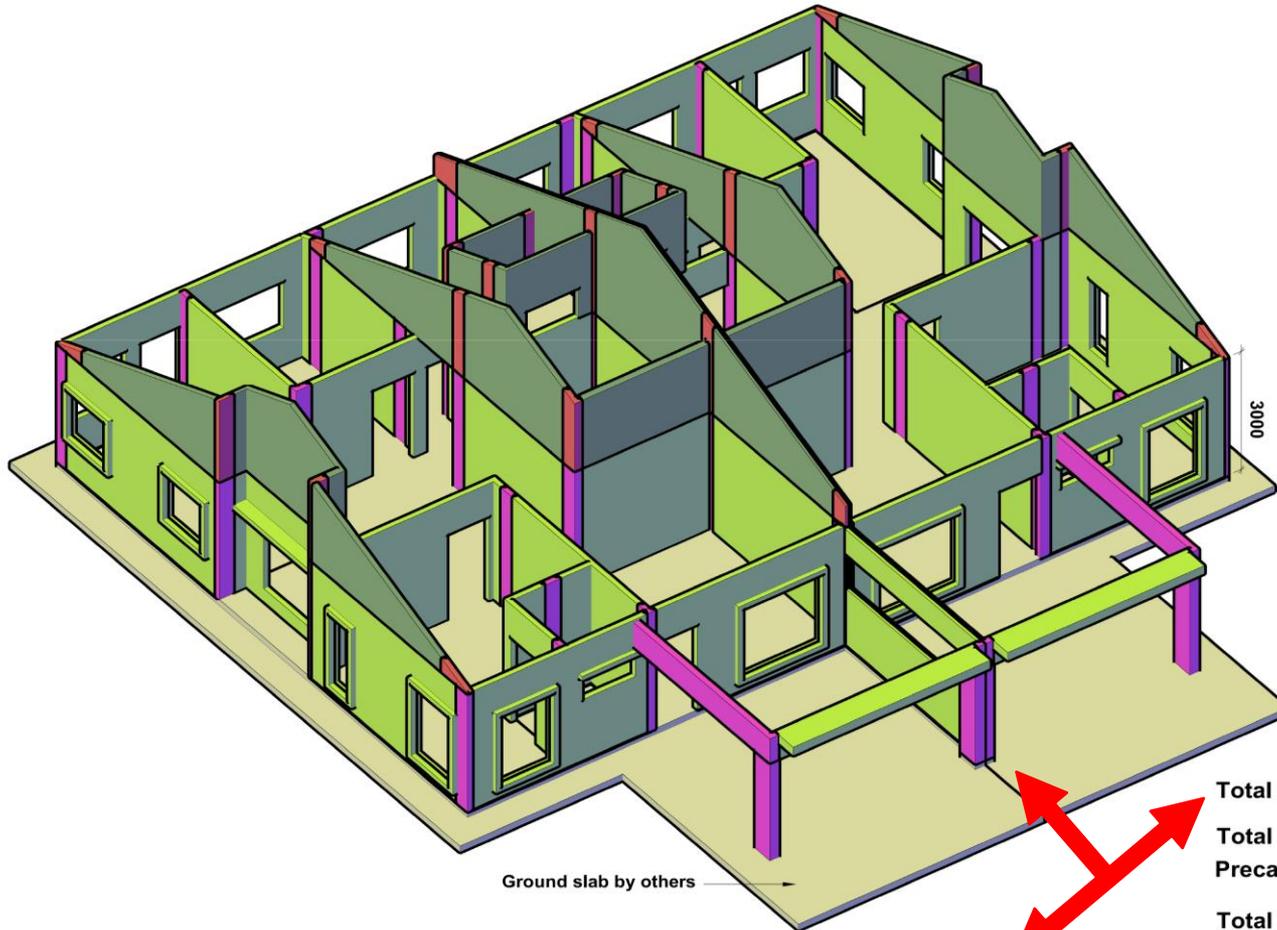
6. Propose to Government and Private Developer

Invite industrialized building system provider with manufacturing facility (flexibility to suit all architectural demands) to participate to built the show unit with work below and superstructure without finishing for the Government & Private Developer to identify the system in terms of green, environment, quality and speed for supply in Its development.

1. Architect

- **Appointed by the Government & Private Developer .**
 - **Design of single storey bungalow of 1,000 ft² (affordable home), up to superstructure without finishing.**
 - **With M&E requirement.**
 - **Wall finishing with plaster or skim coat only.**
 - **Door and window frame opening.**
 - **Ground floor without tiling.**
- 2. Industrialized building system manufacturer have formed their BQ for superstructure (in terms of wall area) and to submit work program with sequence of work for record purposes.**
 - 3. Proper record by the Government & Private representative during construction, in terms of labour and machinery involved per day up to completion (superstructure only).**
 - 4. Cost Comparison for each Industrialized Building System Manufacturer by the Government & Private Developer (for superstructure only). Cost will be fixed for the selected manufacturer and supply to its development .**

7. No Variation Order



1 UNIT SEMI-D

Precast wall panels	: 27 nos.
Precast party walls	: 7 nos.
Precast beams	: 2 nos.
Cast in-situ RC water tank slab	: 1 no.
Cast in-situ wet joints	: 34 nos.
Cast in-situ columns	: 2 nos.
Cast in-situ beam	: 1 no.

Total Concrete Volume = 26.60m³

Total Concrete Volume for Precast Elements (Off-site) = 22.81m³ (86%)

Total Concrete Volume for Cast In-situ Elements (On-Site) = 3.79m³ (14%)

Accurate quantity of elements calculated by 3D AutoCAD software, compared to manual taking off using 2D drawing

3D VIEW - FRONT (LEFT SIDE)

SYSTEM PROVIDER
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 41200 Klang, Selangor D.E.
 Tel:03-3323 7999 Fax:03-3323 8993

DATE:	HC	CADANGAN SKIM PERUMAHAN YANG MENDUNDIRI
CHECKED:	NOV 2017	-18 UNIT RUMAH BERKEMBAR 1 TINGKAT JENIS RBI
DRAWN:	3993	DI ATAS LOT 26114 (PM 4401) & LOT 15331 (PM 1868),
APPROVED:	3993	MUKIM JENDERAK, DAERAH TEMERLOH,
SCALE:	NIS	PAHANG DARUL MAKMUR.
		UNTUK TETAPAN:
		KIAN MEGAH DEVELOPMENT SDN. BHD.

DRAWING TITLE	SINGLE STOREY SEMI DETACHED HC PRECAST CONSTRUCTION 3D DRAWING
DRAWING NO :	HC/KM/SD/3D-01K
REV :	-
SYSTEM :	-
REV :	-

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8. Reduce financing, overhead & earlier occupation of house due to shorter construction period



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8. Reduce financing, overhead & earlier occupation of house due to shorter construction period



TECHNICAL ADVANTAGES

- 1. Earthquake resistance test and certified by Universiti Teknologi Malaysia (UTM)**
- 2. Conquas or Q-Lassic should be carried-out upon the completion of the superstructure works (frame & wall) instead of upon completion of finishing work**
- 3. System provider / manufacturer should provide Installer of the building precast elements :**
 - Precast elements must not involve many different manufactured components**
- 4. Speed decided by client**
- 5. Quality consistent to low cost or high end residential**
- 6. No leaking & no crack**
- 7. Precast element comply to the code & Building By Law**
- 8. Industrialized Building System function as a system not a component or machine**
 - Open system and proprietary system is a technology**

1. Earthquake resistance test and certified by Universiti Teknologi Malaysia (UTM) :

- 8 Different real earthquake in the world



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

e-SEER
Engineering Seismology and
Earthquake Engineering Research



HC PRECAST SYSTEM SDN. BHD.

Earthquake Resistance System
Tested on
18 August 2011
@ Laboratory of Shake Table Testing
Faculty of Civil Engineering
Universiti Teknologi Malaysia
81310 Skudai, Johor



Earthquake Resistance Test of Scaled-Down Double Storey Building of **HC PRECAST SYSTEM SDN. BHD.**

Under 8 different real earthquake time histories over the world as follow:

Earthquake	Year	Scaled PGA (g)	Magnitude	Result
El-Centro, California	1940	0.96	7.1	
Tabas, Iran	1978	0.114	7.4	
Irpinia, Italy	1980	0.606	6.5	
Kobe, Japan	1995	1.035	6.9	
New Zealand	1987	0.165	5.6	
Taiwan SMART1	1983	0.117	6.8	
Duzce, Turkey	1999	0.075	7.1	
Malaysia Artificial	-	0.606	-	

*The **HC PRECAST SYSTEM** performed extremely well throughout all the earthquake tests without any visible cracks or damages*

Dr Azlan Adnan
Professor of Structural Earthquake Engineering
Faculty of Civil Engineering, Universiti Teknologi Malaysia

2. Conquas or Q-Lassic should be carried-out upon the completion of the superstructure works (frame & wall) instead of upon completion of finishing work



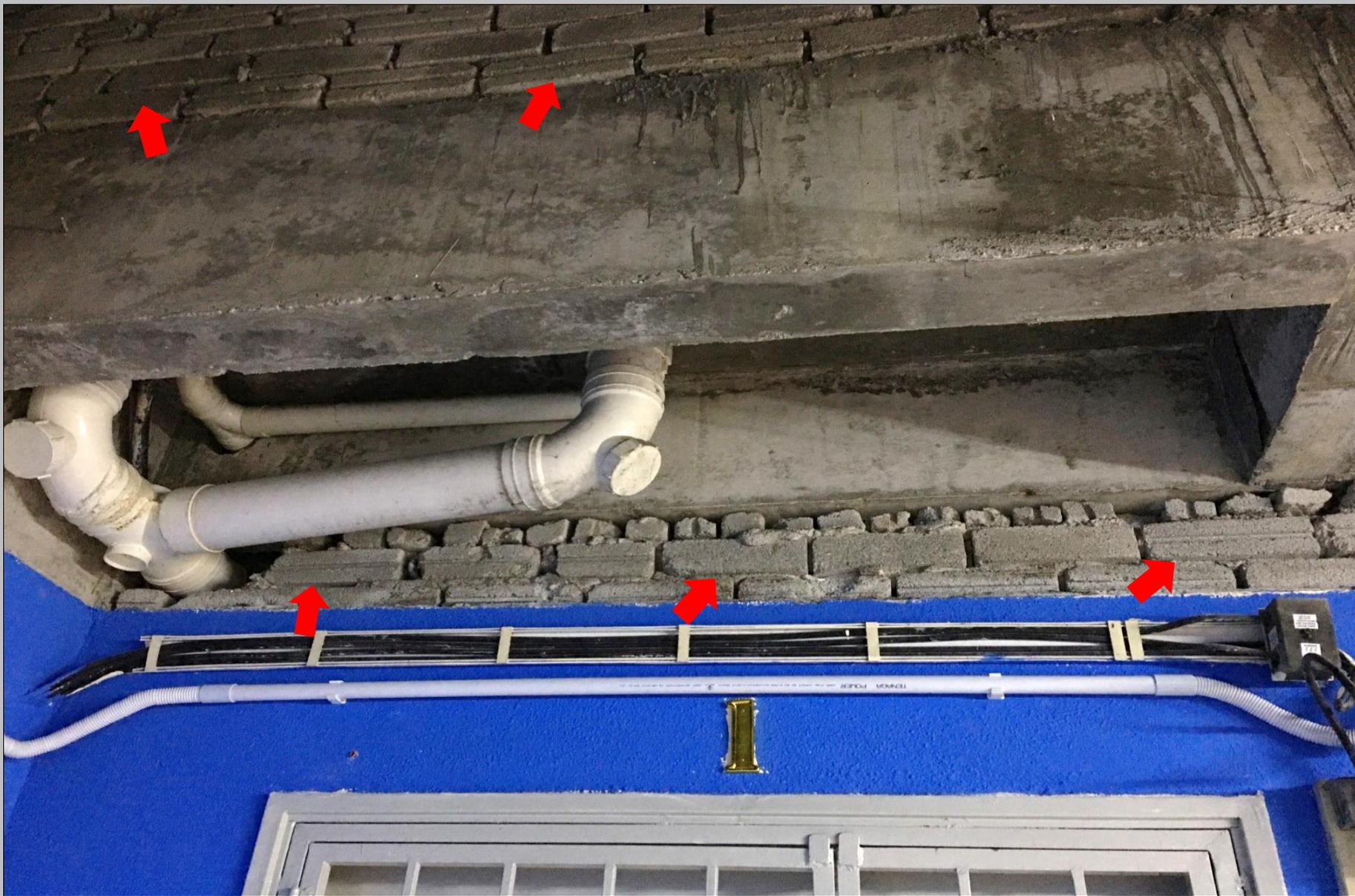
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2. Conquas or Q-Lassic should be carried-out upon the completion of the superstructure works (frame & wall) instead of upon completion of finishing work



3. System provider or manufacturer should provide installer of the building precast elements
- Precast elements must not involve many different manufactured components



HC Precast System : Supply & Install superstructure (frame & wall)

4. Speed decided by client



Future development 13 acres : 2,500 to 3,500 units of single storey (1000 ft2) per year

Existing production 8 acres : 1,800 to 2,500 units of single storey (1000 ft2) per year

5. Quality consistent to low cost or high end residential



Low Cost Residential



High End Residential

6. No leaking & No crack : A 10-year old 2 storey building (without maintenance & touch up) built by precast system and exposed to weather



7. IBS comply to the code & Building By Law

HC Precast System

(100 % Malaysia Technology With 6 Ips')

IBS Superstructure In Malaysia 3 in 1

- Load bearing wall

- Modular shear keys (wet joint)

- Box system

Customized & Flexibility To Suit All Architectural Demands

The system is a proprietary technology that has been established in accordance to British Standards (BSI) and is also a patented technology.

The main design of the connection system has also been subjected to detail checking by an Independent Checker.

Hence, the specifications are not to be altered without proper engineering study to ensure the safety and integrity of the precast system.

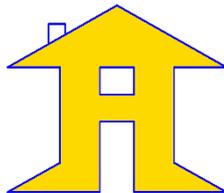


Table 6.2 — Minimum period before striking formwork (concrete made with Portland cement 42.5 to BS 12:1991 or sulfate-resisting Portland cement 42.5 to BS 4027:1991)

Type of framework	Minimum period before striking	
	Surface temperature of concrete	
	16 °C and above	t °C (any temperature between 0 °C and 16 °C)
Vertical formwork to columns, walls and large beams	12 h	$\frac{300}{t+10}$ h
Soffit formwork to slabs	4 days	$\frac{100}{t+10}$ days
Soffitt formwork to beams and props to slabs	10 days	$\frac{250}{t+10}$ days
Props to beams	14 days	$\frac{360}{t+10}$ days

NOTE This table can be applied to PC and SRPC of higher cement strength classes.

7. IBS comply to the code & Building By Law



Every truck



Rebound hammer test



Vertical curing 7 days



6.2 – Minimum period

LAWS OF MALAYSIA

UNIFORM BUILDING BY-LAWS

All amendments up to May, 2006

ACT 133

Head Office:

MDC Building, 2717 & 2718,
Jalan Permatang Empat, Taman Permatang,
Ulu Kelang, 53300 Kuala Lumpur.
Tel: 03-41086600 Fax: 03-41081506
E-mail: inquiries@mdcp.com.my
Website: http://www.mdcpd.com.my

Compiled by: MDC Legal Advisers

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PRICE: RM 18.00

2006

[Section 84 – 86]

(3) Every brick or masonry wall of a building founded on strip footings shall be provided with a damp proof course which shall be—

- (a) at a height of not less than 150 millimetres above the surface of the ground adjoining the wall; and
- (b) beneath the level of the underside of the lowest timbers of the ground floor resting on the wall, or where the ground floor is a solid floor, not higher than the level of the upper surface of the concrete or other similar solid material forming the structure of the floor.

(4) Where any part of a floor of the lowest or only storey of a building is below the surface of the adjoining ground and a wall or part of a wall of the storey is in contact with the ground—

- (a) the wall or part of the wall shall be constructed or provided with a vertical damp proof course so as to be impervious to moisture from its base to a height of not less than 150 millimetres above the surface of the ground; and
- (b) an additional damp proof course shall be inserted in the wall or part of the wall at its base.

(5) Where the floor or any part of the walls of a building is subject to water pressure, that portion of the floor or wall below ground level shall be waterproof.

85. For the purposes of this Part wherever references are made to the thickness of any brick wall, the maximum or minimum thickness of such wall shall not exceed the nominal thickness plus or minus the maximum tolerance permissible under any standard specification.

Nominal thickness of walls.

86. (1) All party walls shall generally be of not less than 200 millimetres total thickness of solid masonry or *insitu* concrete which may be made up of two separate skins each of not less than 100 millimetres thickness if constructed at different times:

Party walls.

Provided that in multi-storeyed flats and terrace houses of reinforced concrete or of protected steel framed construction having floors and roofs constructed to the requirements of these By-laws, the party wall thereof shall not be less than 100 millimetres total thickness.

(2) Party walls in single storeyed houses may be in load-bearing 100 millimetres solid masonry or *insitu* concrete provided the requirements of Part V, VI and VII of these By-laws are complied with.

(3) All party walls shall be carried above the upper surface of the roof to a distance of not less than 230 millimetres at right angles to such upper surface.

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THANK YOU

