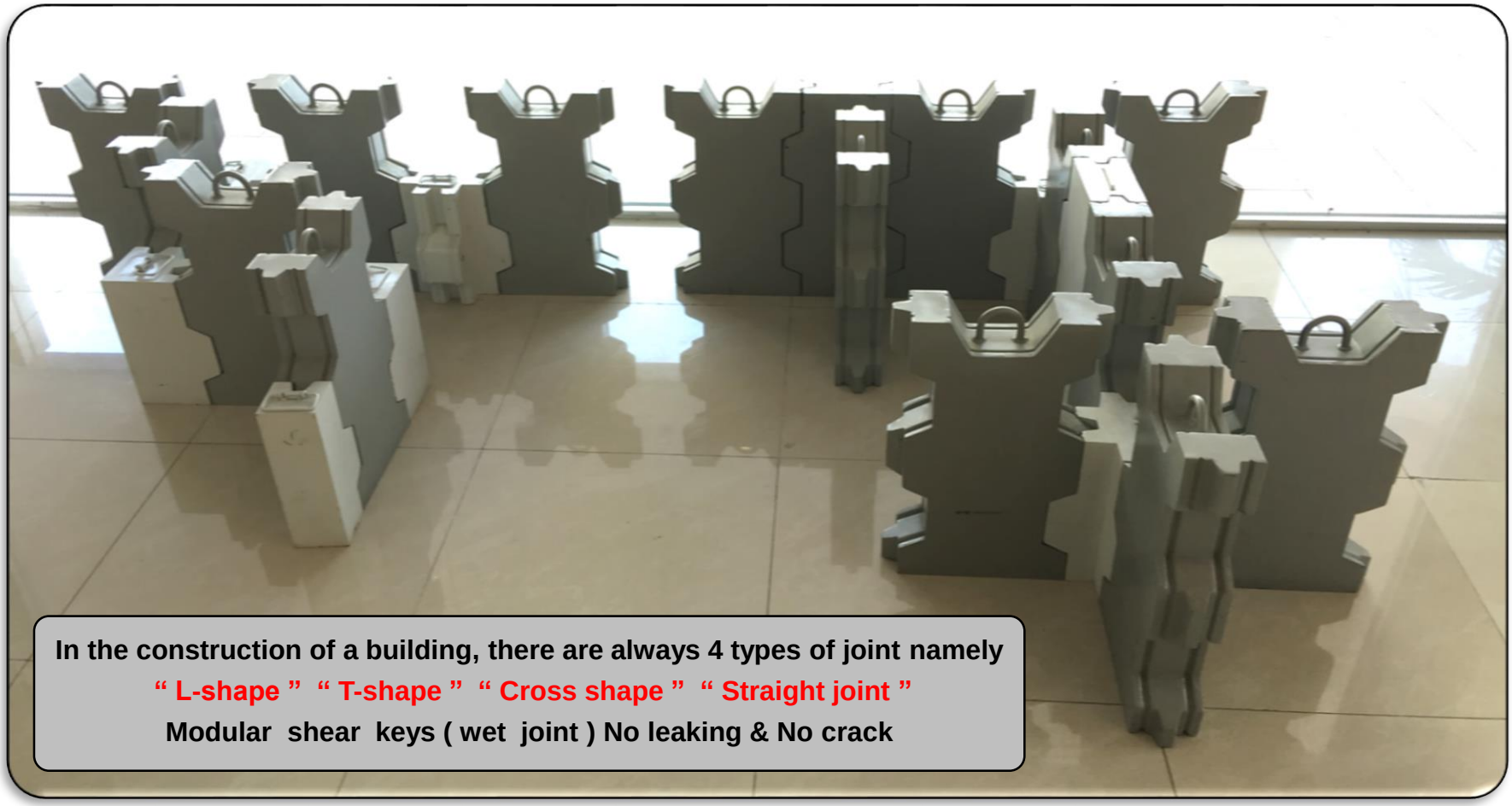
HC Precast System

(100 % Malaysia Technology With 6 IPs')

Economical . Eco Friendly . Quality

Construction Method



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

HC Precast System : Industrial Building System or Component?

Tiong, P.L.Y. and Teow, B.H.

What are the important elements required to complete a building to perform its function? Buildings, as we know require few basic structural components to form an integral system to contain its occupants to protect them from weather and external hazards. These components, as we know are beam, column, staircase and wall.

To speed up construction as well as decreasing dependant on heavy site works, the government are encouraging a relatively new-method of construction, termed as Industrialized Building System (IBS). However, what does IBS truly mean? Many precast manufacturers turn to use limited types of precast element in order to satisfy the minimum percentage of prefabricated materials in order to qualify for government projects. For example, by resorting to only precast beam and column (i.e. precast skeletal system), large amount of brick-wall assembling work is still required when the frame is in place. The same goes for concreting of staircase. Some may say, why don't we use precast wall together with precast frame? Okay, while this problem does not occur in countries like the U.S. or European, we have to accept the fact that the construction tolerance of local builders is a serious issue. The precast wall is unable to sit in place if the frame system beneath or above the wall does not form the exact angle as required.

Hence, in HC Precast System, we have come up with a complete precast building system where the level of site grouting work is kept to minimum. Only casting of connection between the precast elements is required. The complete system, consisting of precast beam, load-bearing wall, and staircase are able to provide the whole precast system rather

Construction Method : Quality Control & Safety Measures on site

- Proper storage
- Setting out
- One time adjustment (25 mm tolerant)
- Panel guide
- Panel installation
- Wall prop installation
- Vertical adjust
- Filling expending cement motar
- Expending cement motar
- Corkjoint for split level
- Rebar installation (modular shear keys, wet joint, no leaking & no crack)
- Modular mould installation
- Wet joint casting
- Modular mould dismantling
- RC flat roof half slab installation
- RC flat roof cantilever corridor mould installation
- RC Ffat roof rebar installation
- RC flat roof casting
- No debris clearing
- Over view
- Customized panel
- Up-stand beam, half slab, System formwork & in-situ work

- **Proper storage**

- **Setting out**

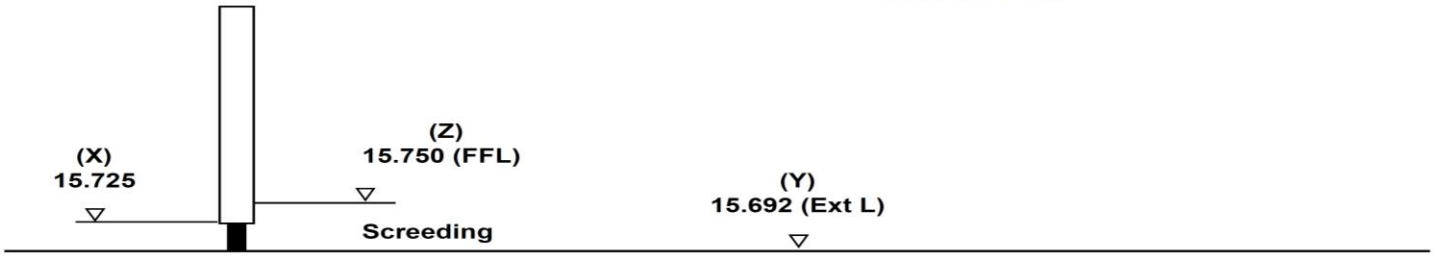
- **One time adjustment (25 mm tolerant)**

SETTING OUT AND LEVEL CHECK LIST

	Panel	FF Level	Existing Level		Proposed Plastic Pad Level	Proposed FFL	Plastic Pad Height (min=15mm, max=35mm)	
*	56 Lgr	15.750	15.692	15.704	15.725	15.750	0.033	0.021
	57 Lgr	15.750	15.699	15.690	15.725	15.750	0.026	0.035
	58 Lgr	15.750	15.690	15.692	15.725	15.750	0.035	0.033
	59 Lgr	15.750	15.691	15.690	15.725	15.750	0.034	0.035
	60 Lgr	15.750	15.688	15.697	15.725	15.750	0.037	0.028
	61 Lgr	15.750	15.688	15.695	15.725	15.750	0.037	0.030
	62 Lgr	15.750	15.706	15.702	15.725	15.750	0.019	0.023
	63 Lgr	15.750	15.701	15.693	15.725	15.750	0.024	0.032
	64 Lgr	15.750	15.690	15.700	15.725	15.750	0.035	0.025
	65 Lgr	15.750	15.709	15.706	15.725	15.750	0.016	0.019
	66 Lgr	15.750	15.694	15.691	15.725	15.750	0.031	0.034
	67 Lgr	15.750	15.709	15.698	15.725	15.750	0.016	0.027
	68 Lgr	15.750	15.697	15.694	15.725	15.750	0.028	0.031
	69 Lgr	15.750	15.689	15.707	15.725	15.750	0.036	0.018
	70 Lgr	15.750	15.673	15.678	15.725	15.750	0.052	0.047
	71 Lgr	15.750	15.697	15.705	15.725	15.750	0.028	0.020
	72 Lgr	15.750	15.710	15.711	15.725	15.750	0.015	0.014
	73 Lgr	15.750	15.673	15.668	15.725	15.750	0.052	0.057
	74 Lgr	15.750	15.683	15.685	15.725	15.750	0.042	0.040
	75 Lgr	15.750	15.675	15.682	15.725	15.750	0.050	0.043

The level are not as specification.
Needed to be ...../.....

* Panel 56 LGR



Z = Y + (X - Y) + 25mm
15.750 = 15.692 + (15.725 - 15.692) + 0.025

- **Panel guide**

- **Panel installation**

- **Wall prop installation**

- **Vertical adjust**

- **Vertical adjust**

- **Expending cement motar (min 15 mm & max 35 mm)**

- **Expending cement motar (min 15 mm & max 35 mm)**

Cebex 100

constructive solutions

Plasticized Expanding Grout Admixture

Uses

Cebex 100 is an admixture for cementitous grouts where a reduced water/cement ratio and positive expansion is required. Applications include bed grouting, duct grouting, non-shrink infilling and jointing.

Advantages

- Gaseous expansion system compensates for plastic shrinkage and settlement in properly designed cementitous grout.
- Reduced water/cement ratio mixes in the grout mix ensures low permeability and long term durability in service.
- Gives high grout fluidity with low water/cement ratio, thus making placement or injection of the grout easy.
- No metallic iron content to corrode and cause staining or deterioration due to rust expansion in the grout.
- Composition allows high early strength development in grouts, without the use of chlorides.

Standards Compliance

Cebex 100 is a suitable pre-stressing grout admixture when complying with BS 8110 Part 1, 1985, section 8.9.4.6.

Description

Cebex 100 is supplied as a powder admixture. The material is a combination of a plasticizing agent and a gas producing expansion medium. The plasticizing agent allows the use of a reduced water/cement ratio with consequent increased strengths and durability. The expansive medium counteracts the natural settlement and plastic shrinkage of the grout and aids stability and cohesion.

Sufficient restrained expansion is developed to ensure a high degree of interfacial contact.

Specification

Performance Specification

All grouting (specify details and areas of application) must be carried out with a cement based grout incorporating a plasticized, expanding powder admixture. The admixture must be iron-free and chloride-free and shall be added to the grout in the proportions 225 g of admixture per 50 kg of cement. The admixture shall provide an expansion of up to 4% in the plastic grout, by means of a gaseous system.

Supplier Specification

All grouting (specify details and areas of application) must be carried out using a cement based grout, incorporating Cebex 100 manufactured by Fosroc and applied strictly in accordance with the manufacturer's technical data sheet.

Properties

Chloride content	Nil to BS5075
Compressive strength	The plasticizing action of Cebex 100 allows reduction of the water/cement ratio of grouts while maintaining flow properties. This gives improvement strength and long term durability when cured under restraint
Setting times	Cebex 100 does not significantly affect the setting times of cement based grouts
Expansion characteristics	The controlled positive expansion in unset grouts incorporating Cebex 100 overcomes plastic settlement when measured in accordance with ASTM C827. An unrestrained expansion of 4% is typical.
Time for Expansion	15 mins – 2 hrs @ 20^0C
Compatibility	Cebex 100 is compatible with all types of Portland cement. Cebex 100 may be used in mixes containing certain other Fosroc Admixtures

Cebex 100

Instructions for Use

Mixing

For best results Fosroc MR3 mixer must be used. For quantities up to 50 kg a slow speed drill fitted with a high shear paddle is suitable. Larger quantities will require a high shear vane mixer.

It is essential that machine mixing capacity and labour availability is adequate to enable the grouting operation to be carried out continuously. This may require the use of a holding tank with provision for gentle agitation to maintain fluidity.

The selected water content should be accurately measured into the mixer. Slowly add the cement (and sand if required) and Cebex 100. Mix continuously for 5 minutes, making sure that a smooth even consistency is obtained.

Application

Areas to be grouted should be prepared to ensure substrates are clean, sound, and then pre-wetted. The unrestrained surface area of the grout must be kept to a minimum. Place the grout within 20 minutes of mixing to gain the full benefit of the expansion process. Adopt usual placing or pumping procedures ensuring a continuous operation.

Curing

On completion of the grouting operation, any exposed areas which are not to be cut back should be thoroughly cured by means of water application, Concure curing membrane or wet hessian.

Cleaning

Grouts mixed with Cebex 100 should be removed from tools and equipment with clean water immediately after use. Remove cured material mechanically or with Fosroc Acid Etch.

Limitations

Cebex 100 is not compatible with High Alumina Cement.

Estimating

Supply

Cebex 100	:	227g sachets or 20 kg drum

Dosage

OPC	Concreting Sand	Water	Cebex 100	Approx. Yield
50 kg	-	20-22 ltrs	225g	36 ltrs
50 kg	50 kg	22-24 ltrs	225g	57 ltrs

Note: For grout, mortar or concrete mixes with an aggregate/ cement ratio more than 1, use 4 x 227g units or 900g of Cebex 100 per 100 kg of cement.

Effects of overdosing

Overdosing of Cebex 100 increases expansion and may cause frothing.

Shelf Life

Cebex 100 has a shelf life of 12 months if kept in a dry store in its original packaging. High temperature and humidity storage may reduce this period.

Precautions

Health and Safety

Cebex 100 is of low hazard.

Contact with the skin and eyes, or inhalation of dust should be avoided. Wear suitable protective clothing, gloves, eye/ face protection and dust mask. After contact with skin, wash off with clean water. In case of contact with eyes, rinse immediately with plenty of water and seek medical attention.

For further information see Product Material Safety Data sheet.

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MAL/0401/05/A

- **Corkjoint for split level & specification**

CORKJOINT
THE FORCE IN JOINTING SOLUTIONS

SUPERSWELL 47B

HYDROPHILIC BUTYL RUBBER WATERSTOP

PRODUCT DESCRIPTION

CORKJOINT Superswell 47B Waterstop is a unique sealing compound which expands in a controlled fashion when exposed to moisture, forming a compression seal in concrete joints. Superswell 47B waterstop is ideal for use in horizontal and vertical construction joints for cast in-situ concrete structures.

Superswell 47B Waterstop is manufactured utilising a specialised mixing process which encapsulates hydrophilic materials into a rubber base creating a controlled, moisture-activated seal. This product has the structural integrity of a rubber-based sealant, the features of a butyl sealant, as well as the ability to expand to create a SELF-HEALING JOINT MATERIAL.

Unlike many of the traditional clay-based products, Superswell 47B Waterstop, bring hydrophilic polymer based, will not expand to a point that the hydration process itself leads to the possible "disintegration" of the waterstop.

This can be an important issue when engineers are looking for a seal in vertical construction joints where the joint could open up due to excessive shrinkage in the concrete. In-field experience has proven that products which continually expand, may lose their structural integrity and begin to wash away from the joint when subjected to a constant flow of water.

Total Days of Exposure in Potable Water	
7 Days	*118% movement*
14 Days	*131% expansion*
28 Days	*142% expansion*
56 Days	*177% expansion*

**Note: 100% indicates original size*

The material does not expand prematurely, does not absorb water from the fresh concrete poured against it, and helps minimize any pre-expansion if the joint becomes ponded with water.

Superswell 47B Waterstop has been tested to withstand a 60 metre head of water pressure and because of its butyl rubber properties it may actually bond to both concrete surfaces, creating a gasket seal when used in conjunction with Superswell CJ-100 adhesive.

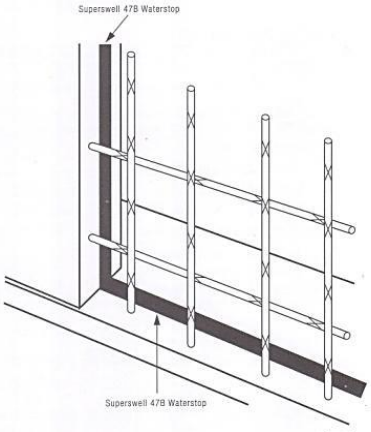


Figure 1

1/4

2/4

ADVANTAGES

- Excellent for application to rough concrete surfaces
- Limited loss of integrity of waterstop
- Allows concrete to gain strength before expansion
- For use in horizontal and vertical construction joints
- Excellent adhesion to CJ-100 Adhesive
- Can be bedded into wet concrete
- No compaction or displacement problems
- Unaffected by repeated wet and dry cycles
- Has the ability to bond to both concrete surfaces
- No on-site welding required as with PVC Waterstops
- Very easy to handle and install
- No split forming required
- Non toxic and requires no special handling

AREAS OF APPLICATION

Typical applications for Superswell 47B Waterstop includes:

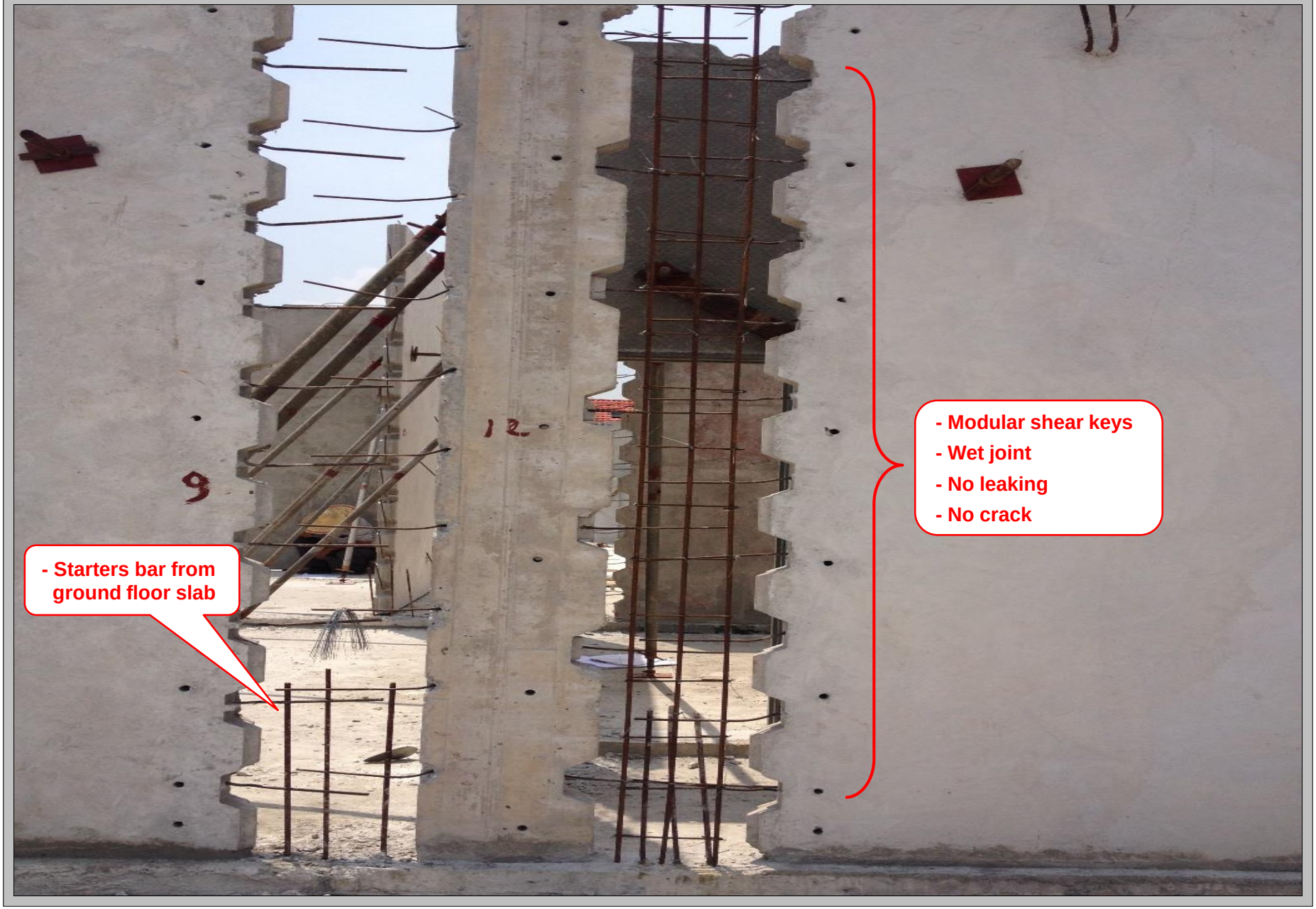
- Tunnels
- Pits
- Retaining walls
- Manholes
- Basements
- Underground structures
- Box culverts
- New to old concrete
- Poured in-situ construction joints
- Above & below grade precast panels

NOTE: Areas of application should be verified and approved by the consulting engineer who is satisfied with the suitability of the product for its intended use.

PHYSICAL PROPERTIES

DESCRIPTION	TEST METHOD	RESULT
Colour		Black
Size (mm)		25 x 19
Specific Gravity	ASTM D-71	1.40 / 1.45
Hydrocarbon Content (%)	ASTM D-297	47 min.
Volatile Matter (%)	ASTM D-6	1 max.
Penetration, cone @ 77F, 150gm, 5 sec	ASTM D-217	40±5
Head Pressure		Tested to 60m
Application Temperature (°C)		-22 to +52
Service Temperature Range (°C)		-34 to +82

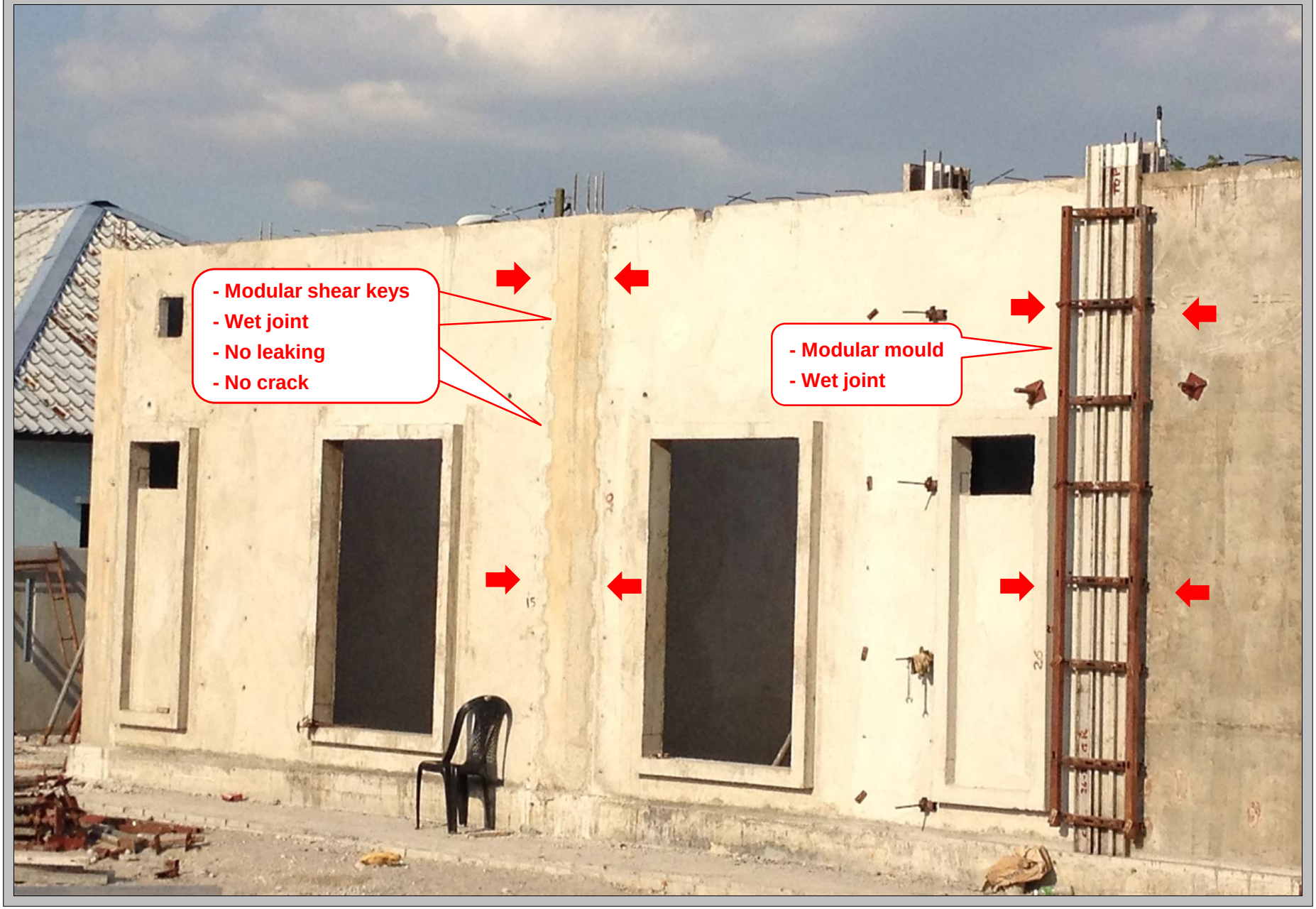
- **Rebar installation**



- **Modular mould installation**

- **Wet joint casting**

- **Modular mould dismantling**



- **Modular mould dismantling**

- **RC flat roof half slab installation**

- **RC flat roof half slab installation**

- **RC flat roof cantilever corridor mould installation**

- **RC flat roof rebar installation**

- **RC flat roof casting**

- **No debris clearing & Over view**

- **Customized panel**

Item	Panel wall thickness (mm)	Panel wall height (m)
1.	100	3 - 4
2.	120	4 - 4.5
3.	150 / 160	4.5 - 5.5

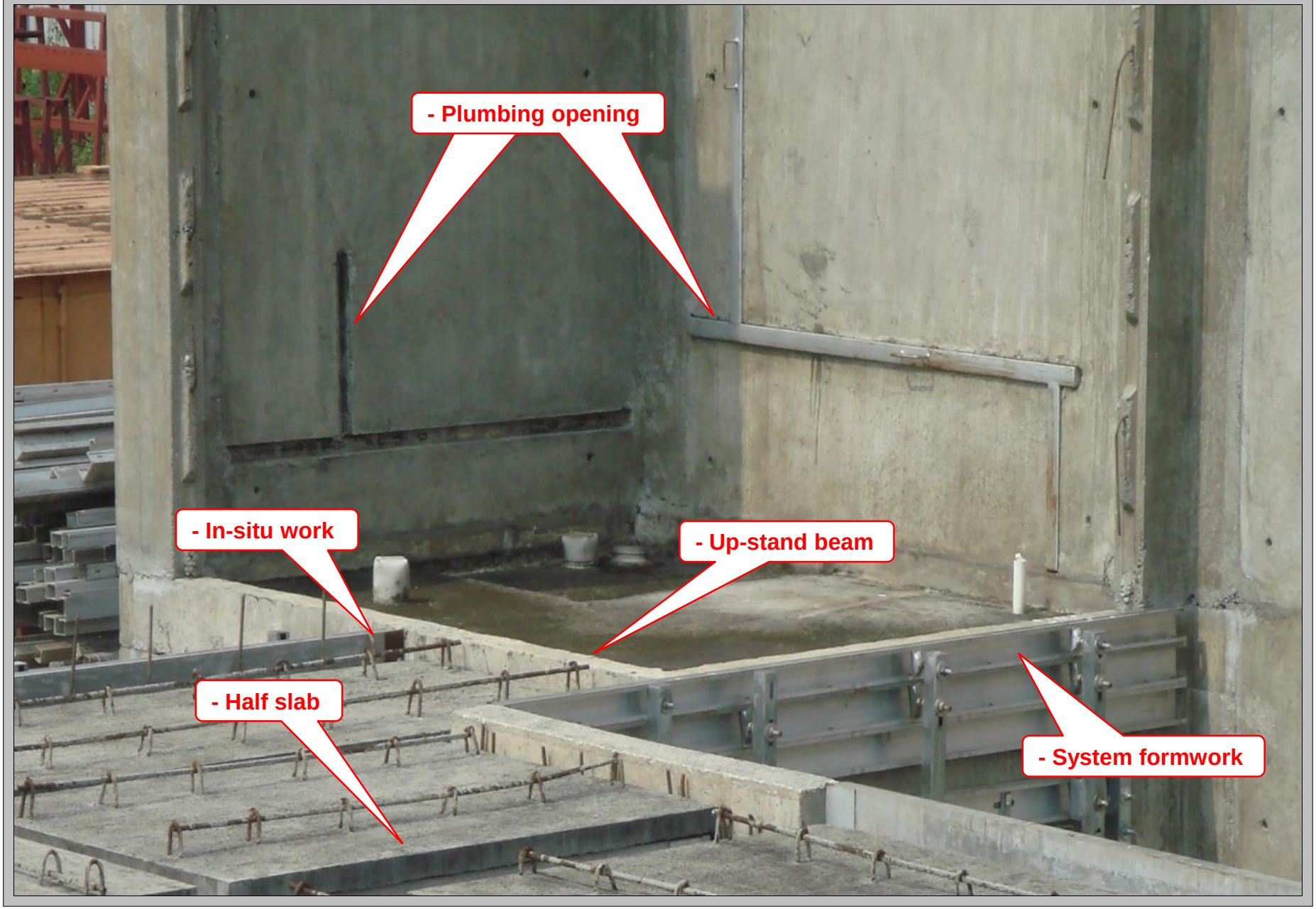
Noted :

Thickness and height can be varied to suit requirements

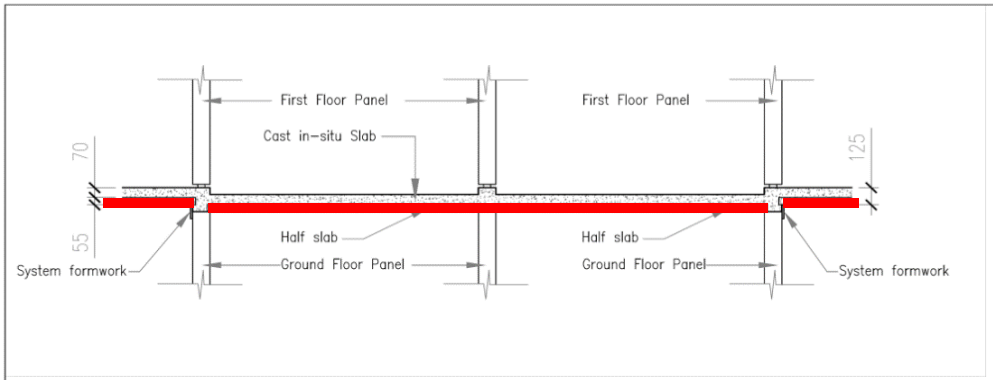
- item 3 JKR requirement

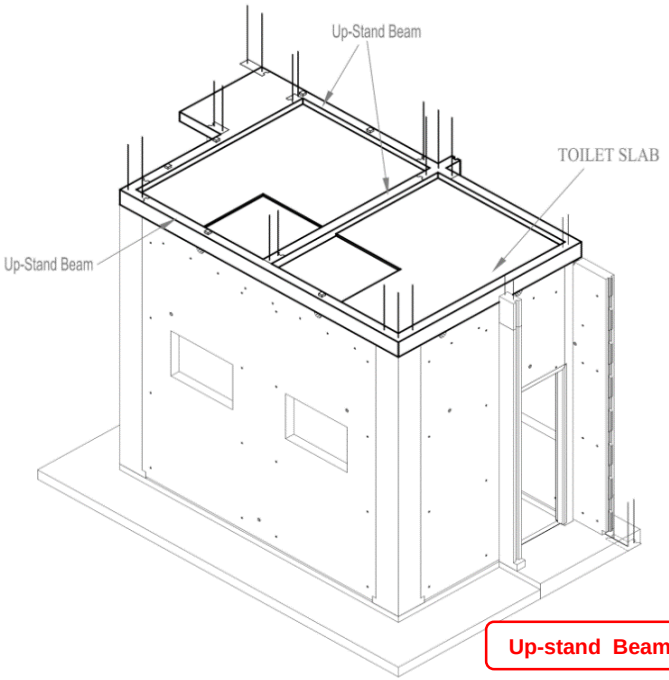
- 6m (w) x 6m (h)

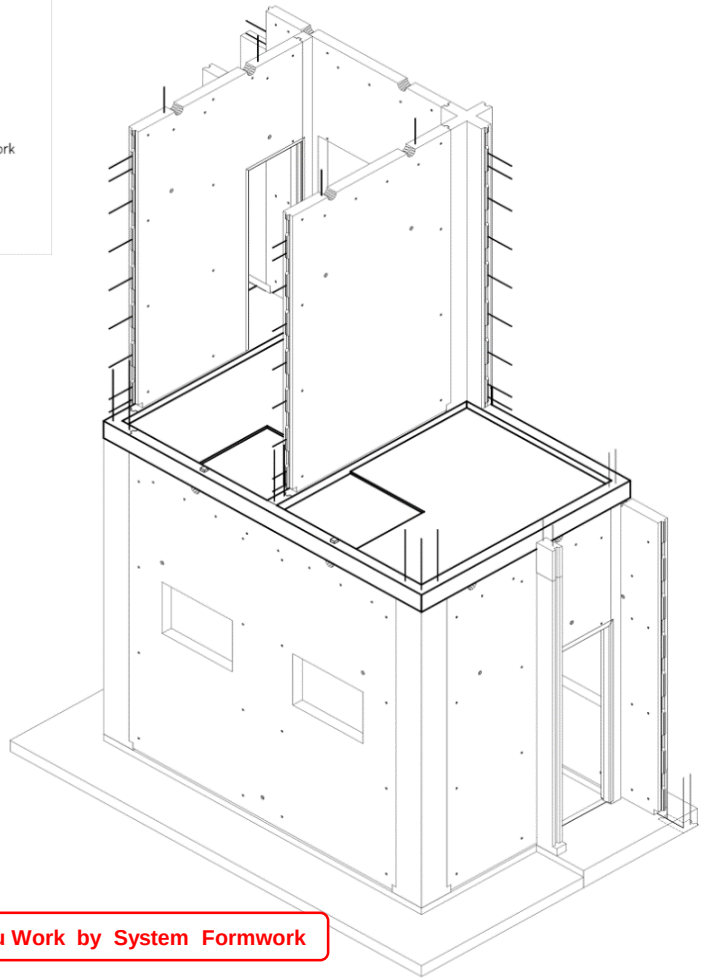
- **Up-stand beam, half slab, System formwork & in-situu work**



- **Up-stand beam, half slab, System formwork & in-situ work**







Up-stand Beam , Half Slab & In-situ Work by System Formwork

SYSTEM PROVIDER

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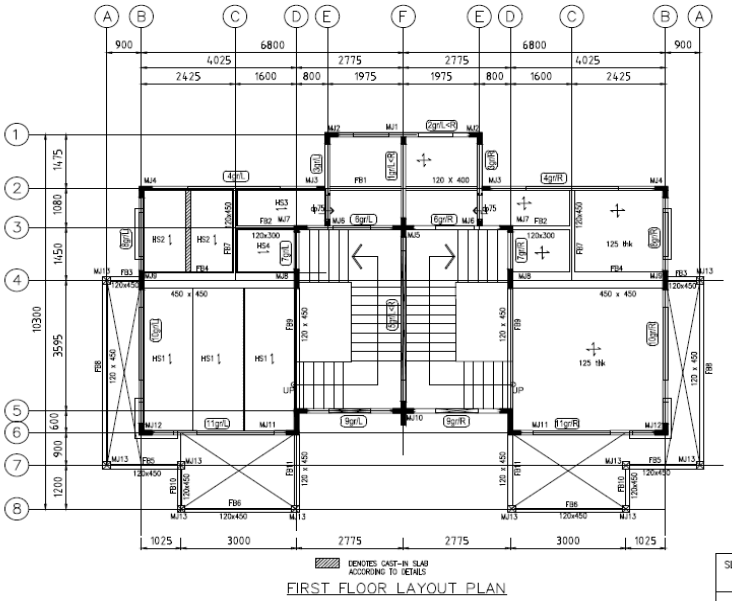
No.23-1, Jalan Seri Sarawak 20B/KS2, Taman Seri Andalas,
41200 Klang, Selangor D.E.
Tel:03-3323 7999 Fax:03-3323 8993

DRAWN :	KC
DATE :	OCT 2017
CHECKED :	3993
EXAMD :	3993
APPVD :	3993
SCALE :	NTS

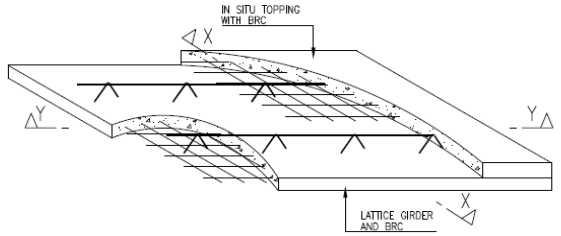
DRAWING TITLE :
TOILET SLAB
-

DRAWING NO : –
REV : –
SYSTEM : –
REV : –

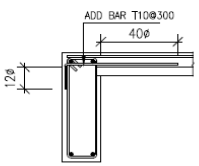
- **Up-stand beam, half slab, System formwork & in-situ work**



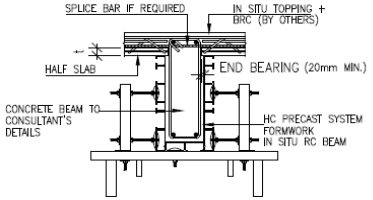
FIRST FLOOR LAYOUT PLAN



3D VIEW OF HALF SLAB SYSTEM
N.T.S.

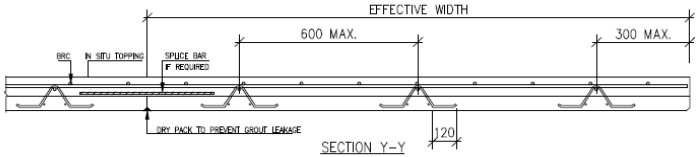


TYPICAL DETAIL AT END SUPPORT
N.T.S.

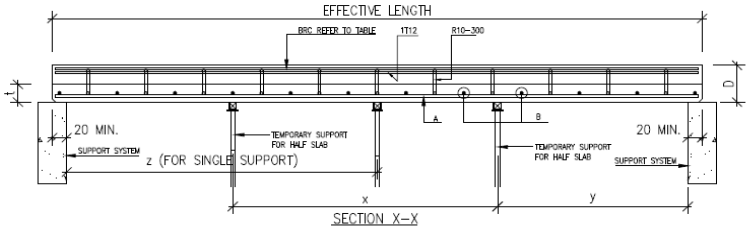


TYPICAL DETAIL AT INTERMEDIATE BEAM
N.T.S.

SLAB MARK	PRECAST UNIT THICKNESS (t) mm	OVERALL THICKNESS (D) mm	EFFECTIVE WIDTH (mm)	EFFECTIVE LENGTH (mm)	BOTTOM REINFORCEMENT (A)	BOTTOM REINFORCEMENT (B)	x (mm)	y (mm)	z (mm)
HS1	65	175	1300	3960	T10-200	T10-300	1500	1150	
HS2	55	150	1100	2295	T10-300	T10-300	850	723	
HS3	55	150	1010	2330	T10-300	T10-300	850	740	
HS4	55	150	1215	1530	T10-300	T10-300			765



SECTION Y-Y
N.T.S.



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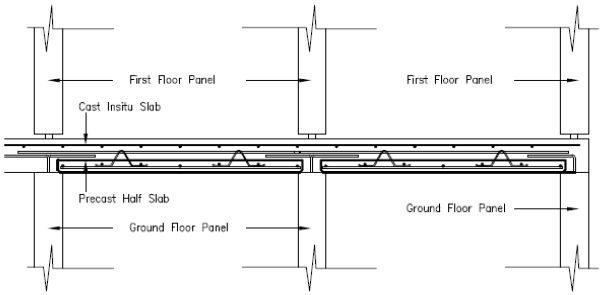

Up-stand Beam , Half Slab & In-situ Work by System Formwork

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DRAWN :	ZUL
DATE :	JAN 2015
CHECKED :	LEE
EXAM'D :	WNG
APPR'D :	WNG
SCALE :	NTS

DRAWING TITLE : Example 4

DRAWING NO : – REV : –

SYSTEM : – REV : –

THANK YOU