SEMINAR CHANGE TO IBS – A MUST !

Tajuk Ceramah:

PENGELUARAN KOMPONEN IBS

Disampaikan oleh:

En. Fakhrul Nazhi bin Hanaffi

Dari:

TERAJU PRECAST SERVICES SDN BHD (872362-W)

ABOUT COMPANY

- **TERAJU PRECAST SERVICES SDN. BHD**. ("THE Company") was established to undertake design, I.B.S Consultations and I.B.S supply and installation of pre-cast concrete building components.

- Board members of the Company possess the required experience in the execution of any construction works to be carried out in the form of IBS. Each member is specialized in the respective scope of works involved in pre-cast system construction.

- The Company provides the following services:-

1. Design of building structures in IBS.
2. Production of the required IBS components according to the structural engineers' design.
3. Installation of IBS components including jointing.
4. Advise clients on economical design in the usage of IBS.

TERAJU PRECAST SERVICES SDN BHD (872362-W)

TERAJU PRECAST PRODUCTION FACILITIES

FACTORY 1 - BANTING

Address:
Lot3232, Jalan Banting/Dengkil,
Batu 35 kg Bukit Changgang,
42700 Banting Selangor Darul Ehsan.

Capacity:
60m3 per day

FACTORY 2 - GAMBANG

Address:
Batu 12, Jalan Gambang / Kuantan.
25200, Kuantan,
Pahang Darul Makmur.

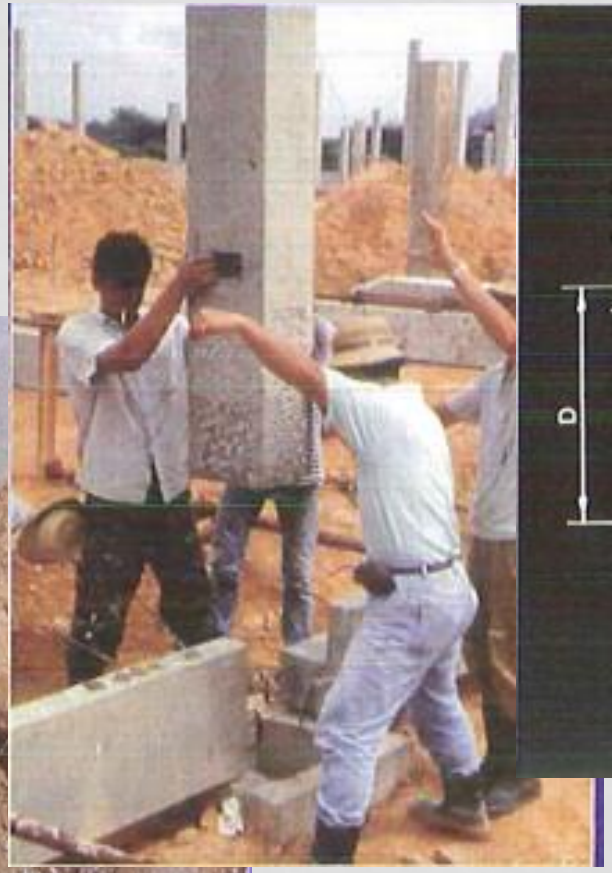
Capacity:
80m3 per day

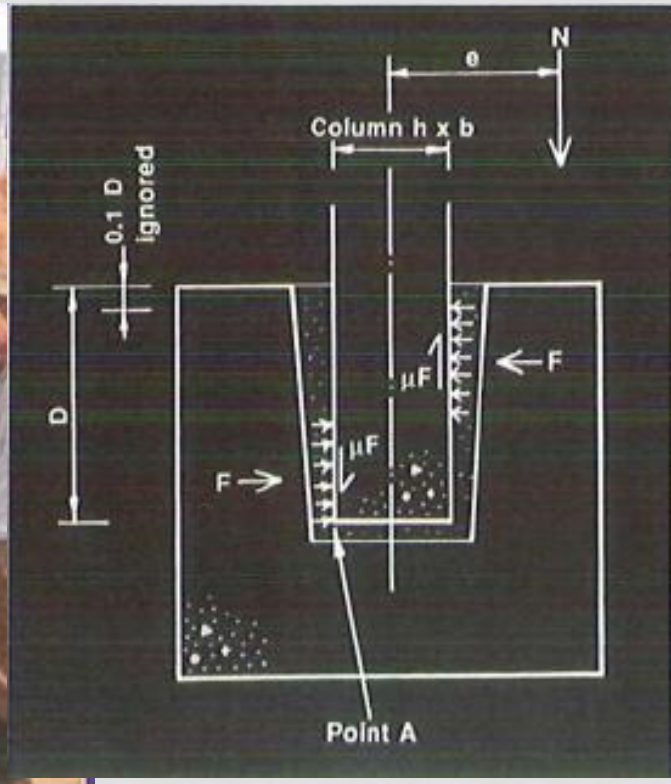
TERAJU PRECAST SERVICES SDN BHD (872362-W)

COLUMNS CONNECTION



POCKET





- Roughened column surface

Column into pockets / pilecap
- By HUME, EPM

PRECAST POCKET

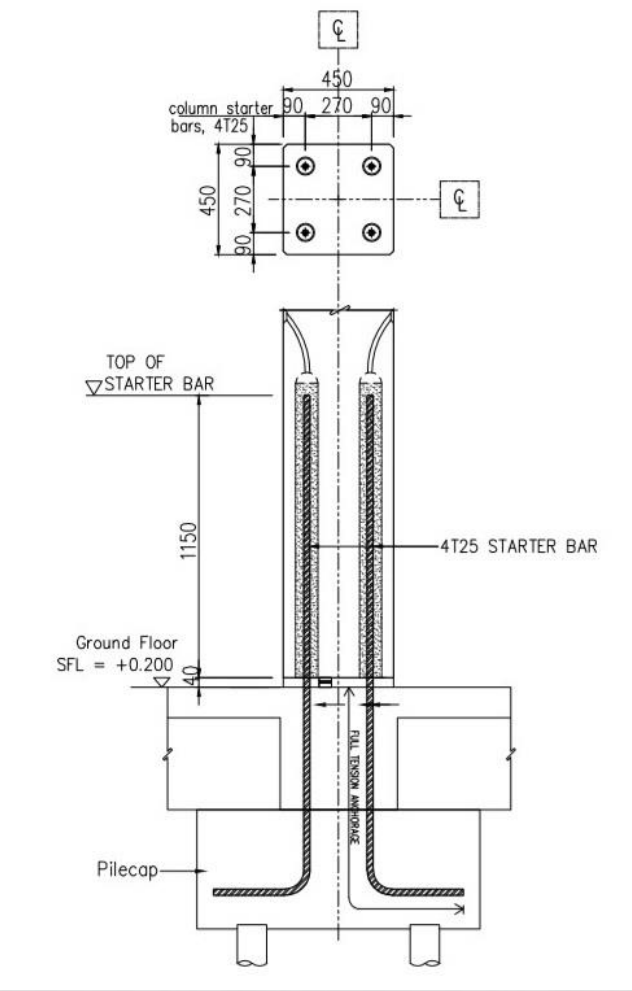
- Precast Pocket with side castellation.

- Castellations reduce penetration depth D=H.

PRECAST COLUMN WITH CORRUGATED SLEEVE

- Column starter bars slotted into sleeves & grouted.

TYPICAL SECTION



Column Starter Bar Detail

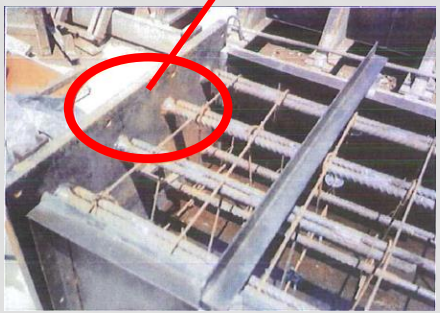
BASE PLATE

- Column with Base Plate
- Rapid fixing, similar as steel column connection

- Cast in item - Steel Plate with HT starter bars

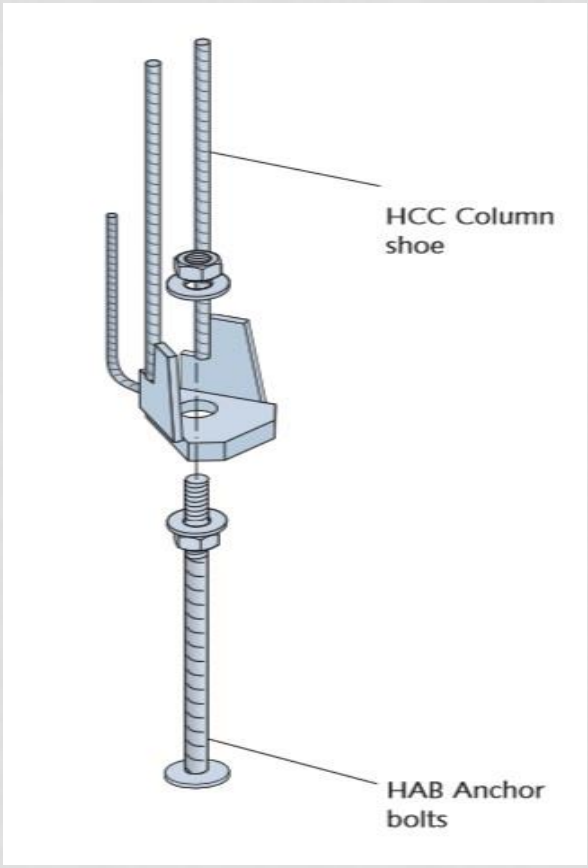
DISADVANTAGE

Wastage material



COLUMN SHOE

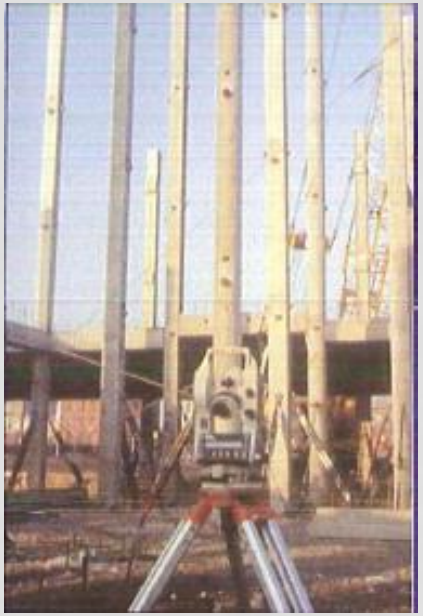
- The anchor bolt cast in into the foundation using a fitting template

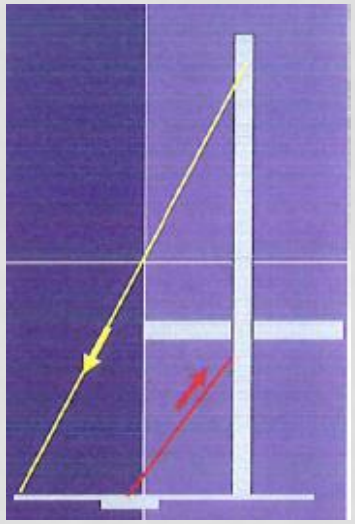


- Column shoe - cast in item
- Fast and no propping required

TEMPORARY ASSEMBLY BRACE

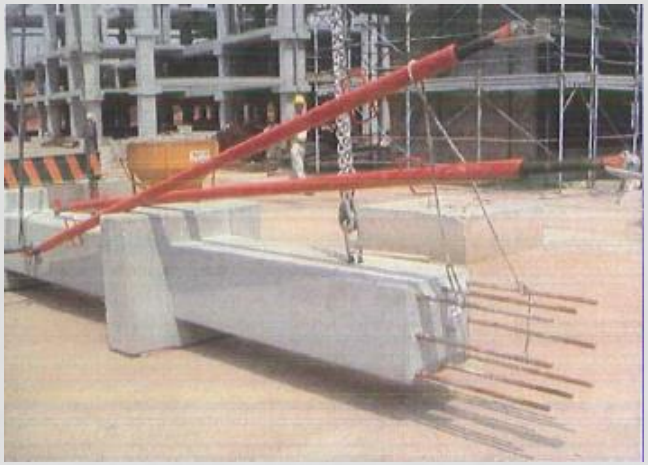
- Check prop load
- Basically vertical load direct transfer to foundation
- Function of props just for holding the column & adjust for alignment verticality





- Ensure verticality using device such a Theodolite

TENSION PROPS FOR TEMPORARY STABILITY



- Step no.1

- Step no.2

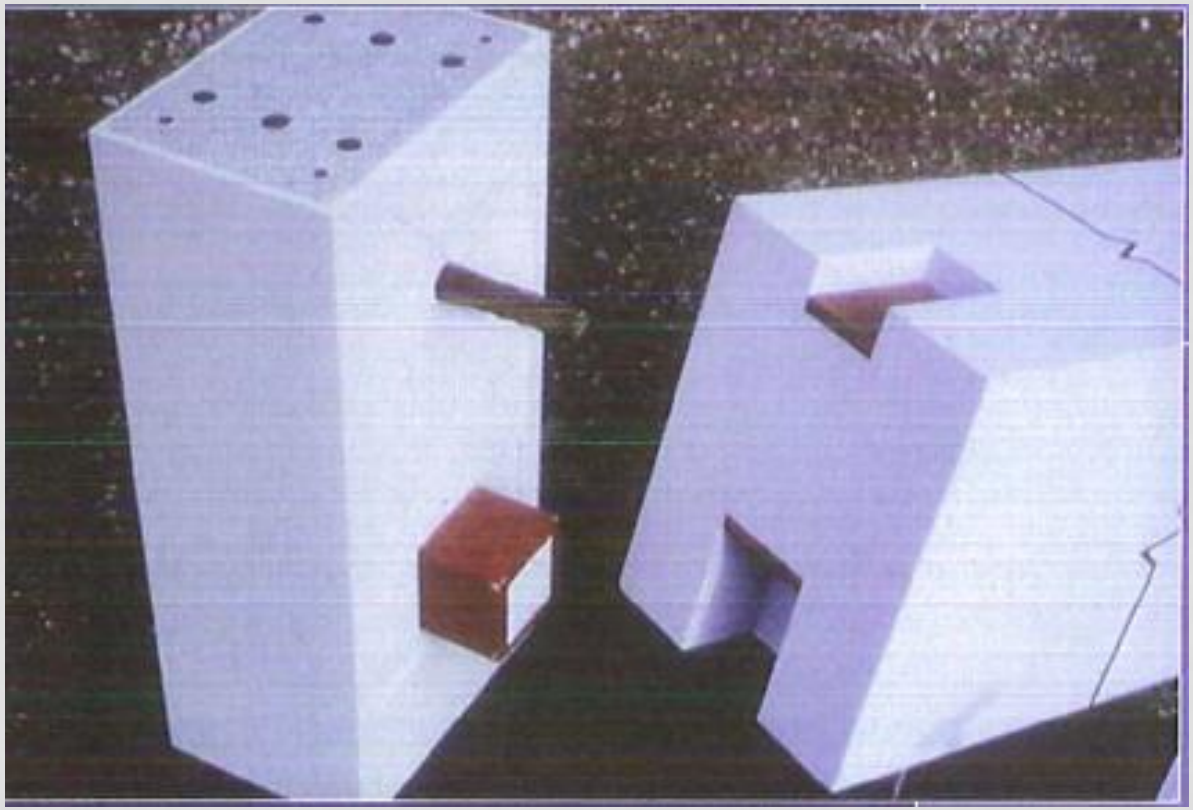
- Step no.3

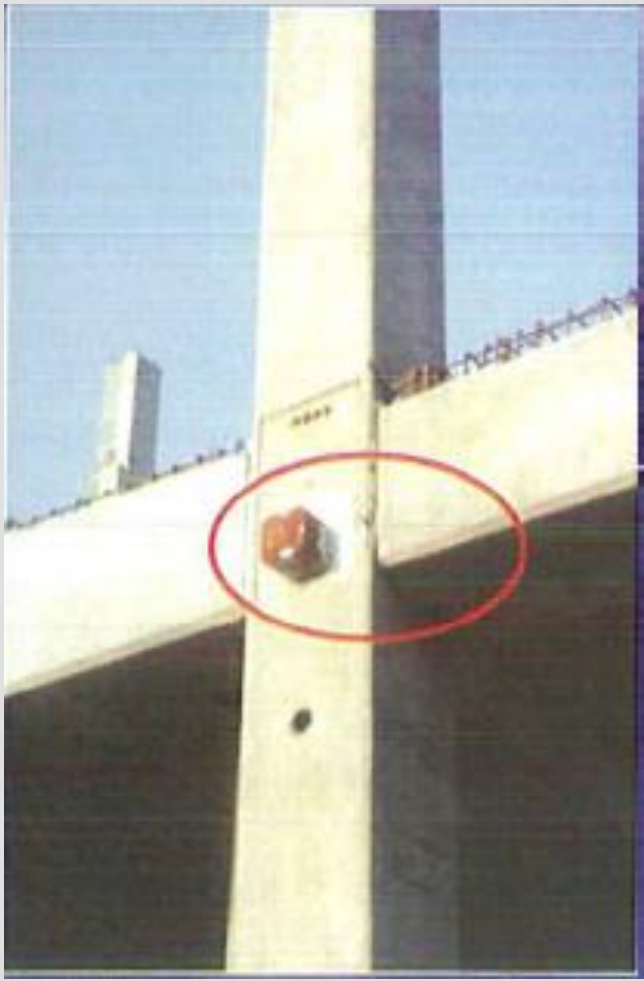
TERAJU PRECAST SERVICES SDN BHD (872362-W)

COLUMN & BEAM CONNECTION

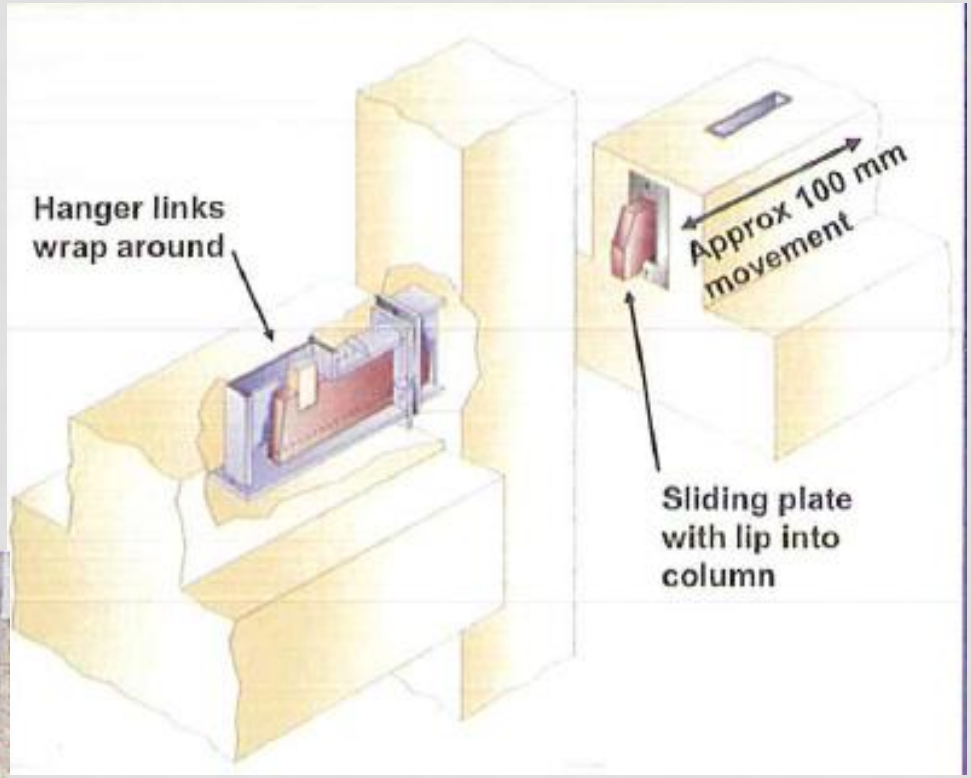
OPEN CORBEL

STEEL BILLETS



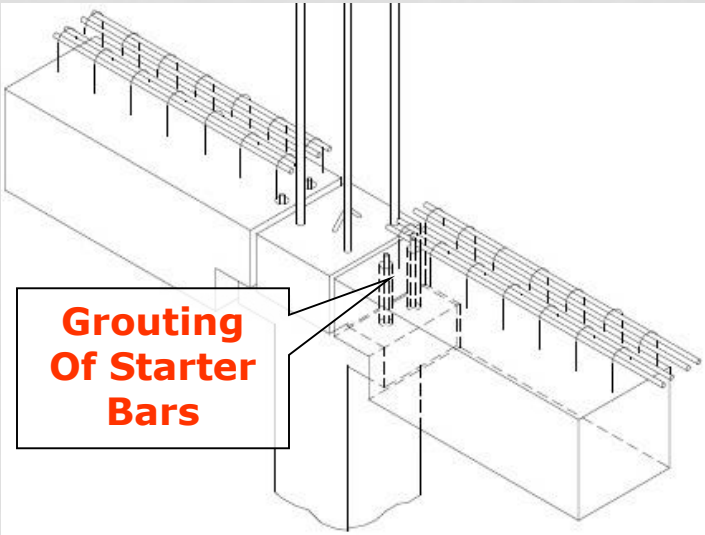


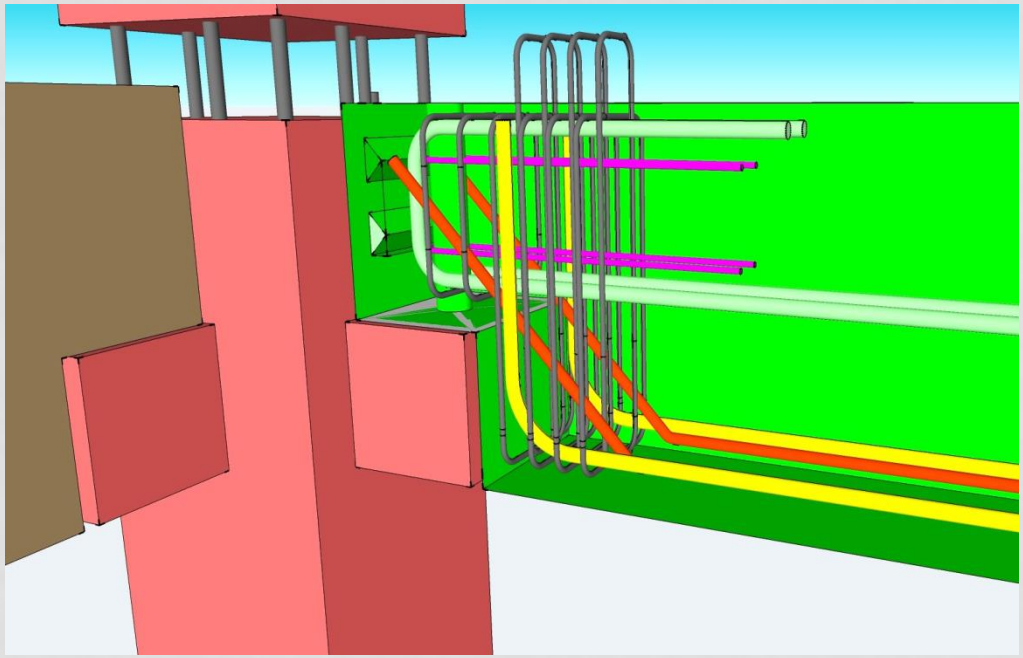
BSF – SLIDING PLATE

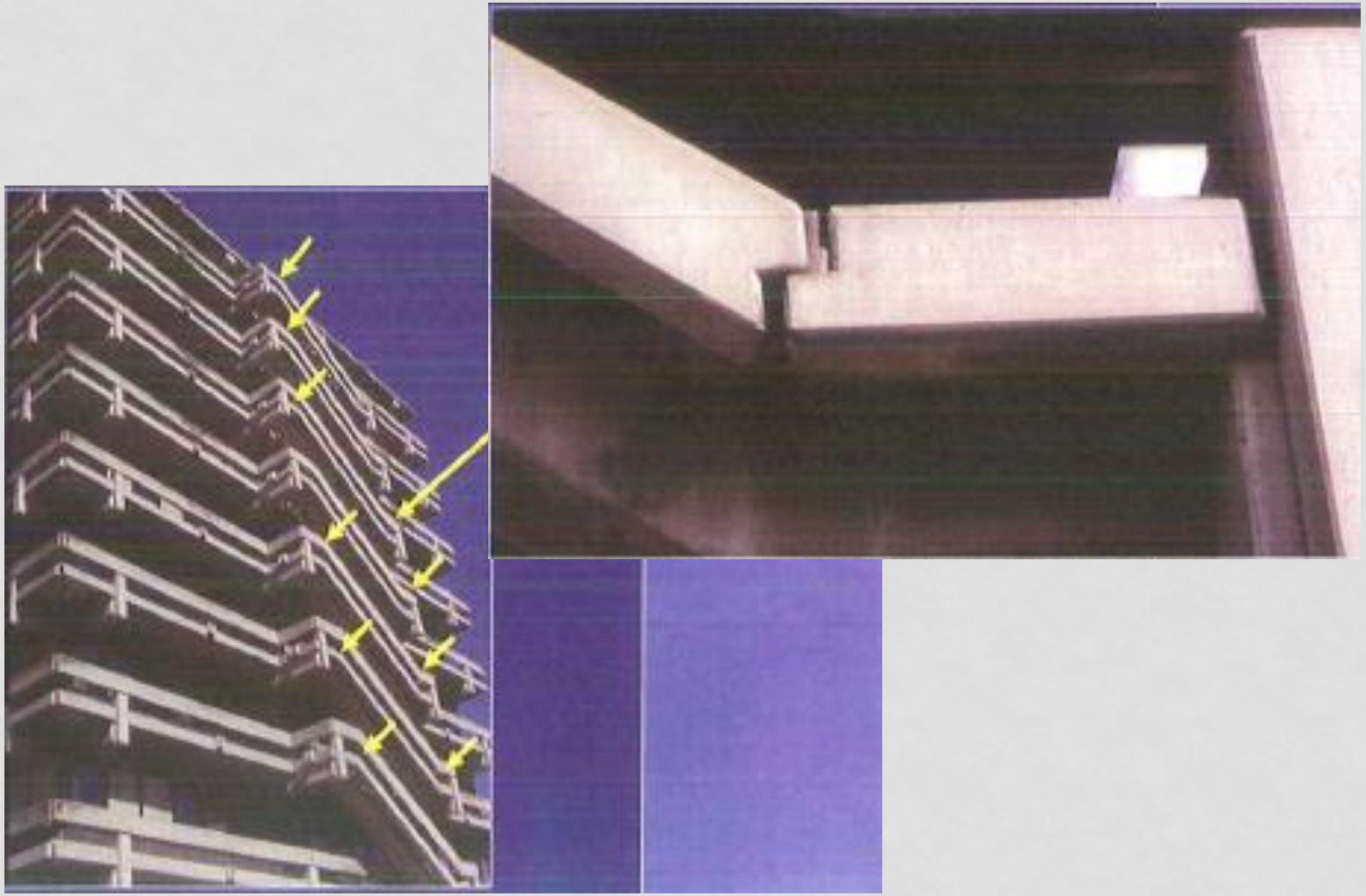


- Sliding component is cast inside the beam, then pushed out on site to engage the lite

HALF JOINT (HIDDEN CORBEL)

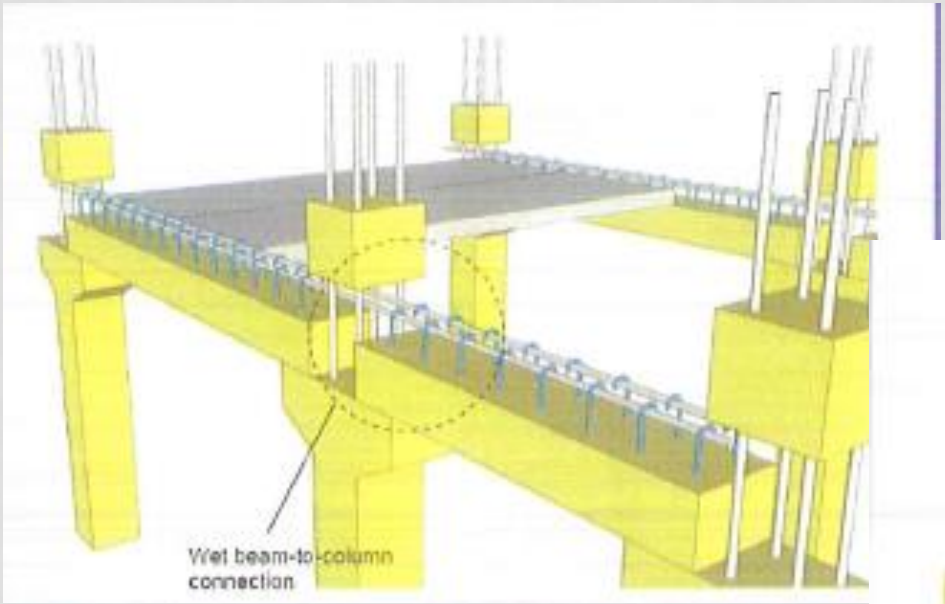




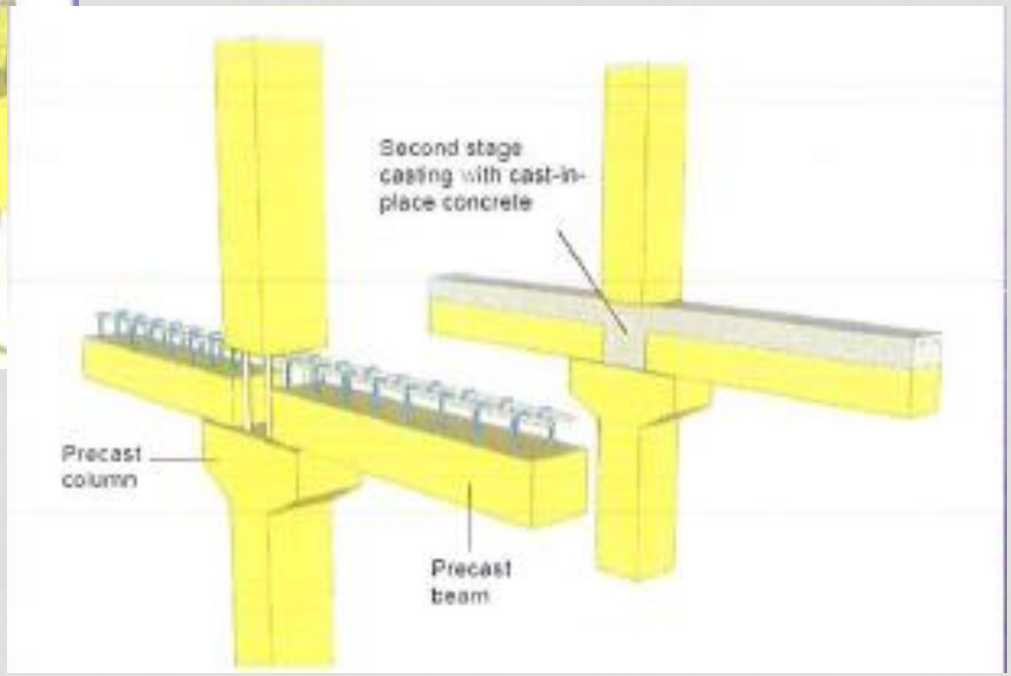


- possible to meet architecture’s demand

BEAM TO COLUMN CONNECTION



- Cast In Situ Wet Connection



- Before and after wet connection

TERAJU PRECAST SERVICES SDN BHD (872362-W)

MANUFACTURING PROCESS - RC PRODUCTS

TERAJU PRECAST SERVICES SDN BHD (872362-W)

IBS COMPONENTS MANUFACTURED

- Column

- Beam

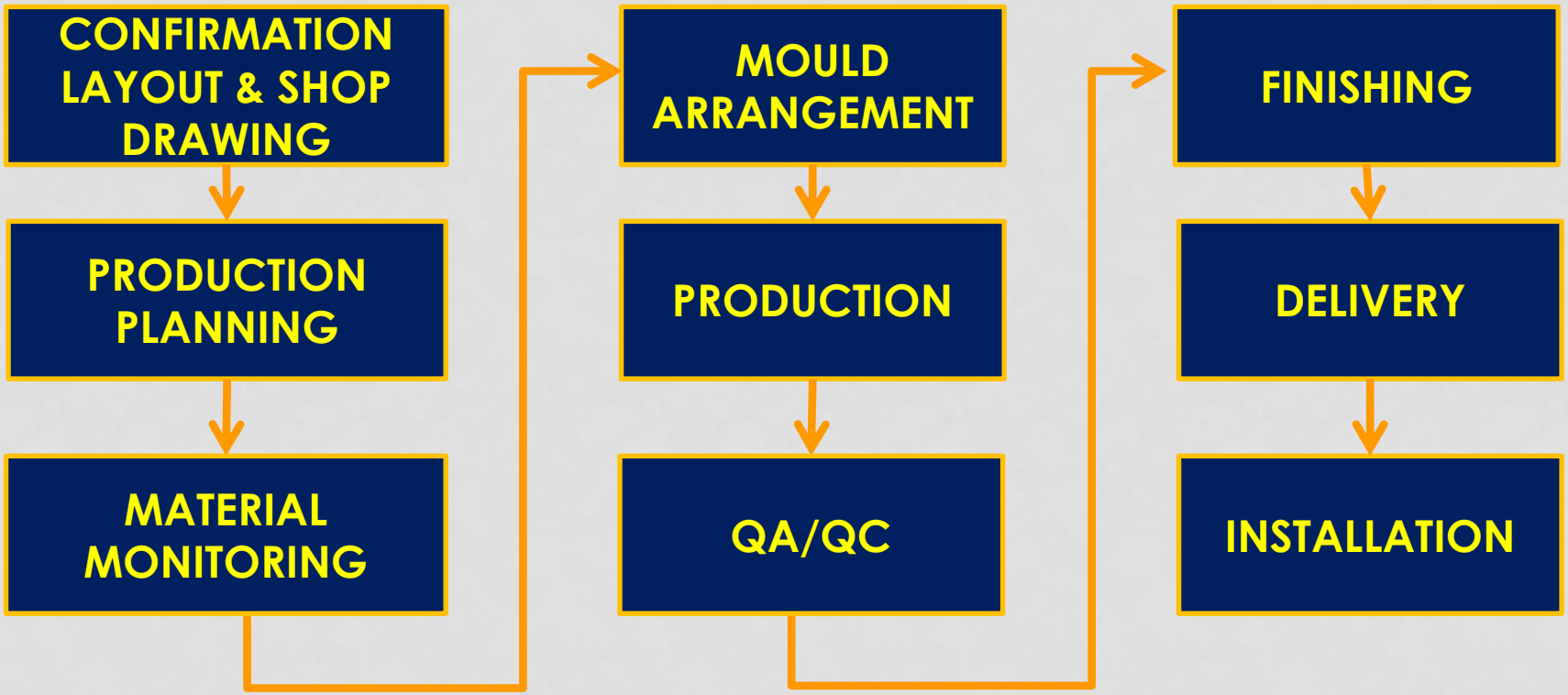
- Planks

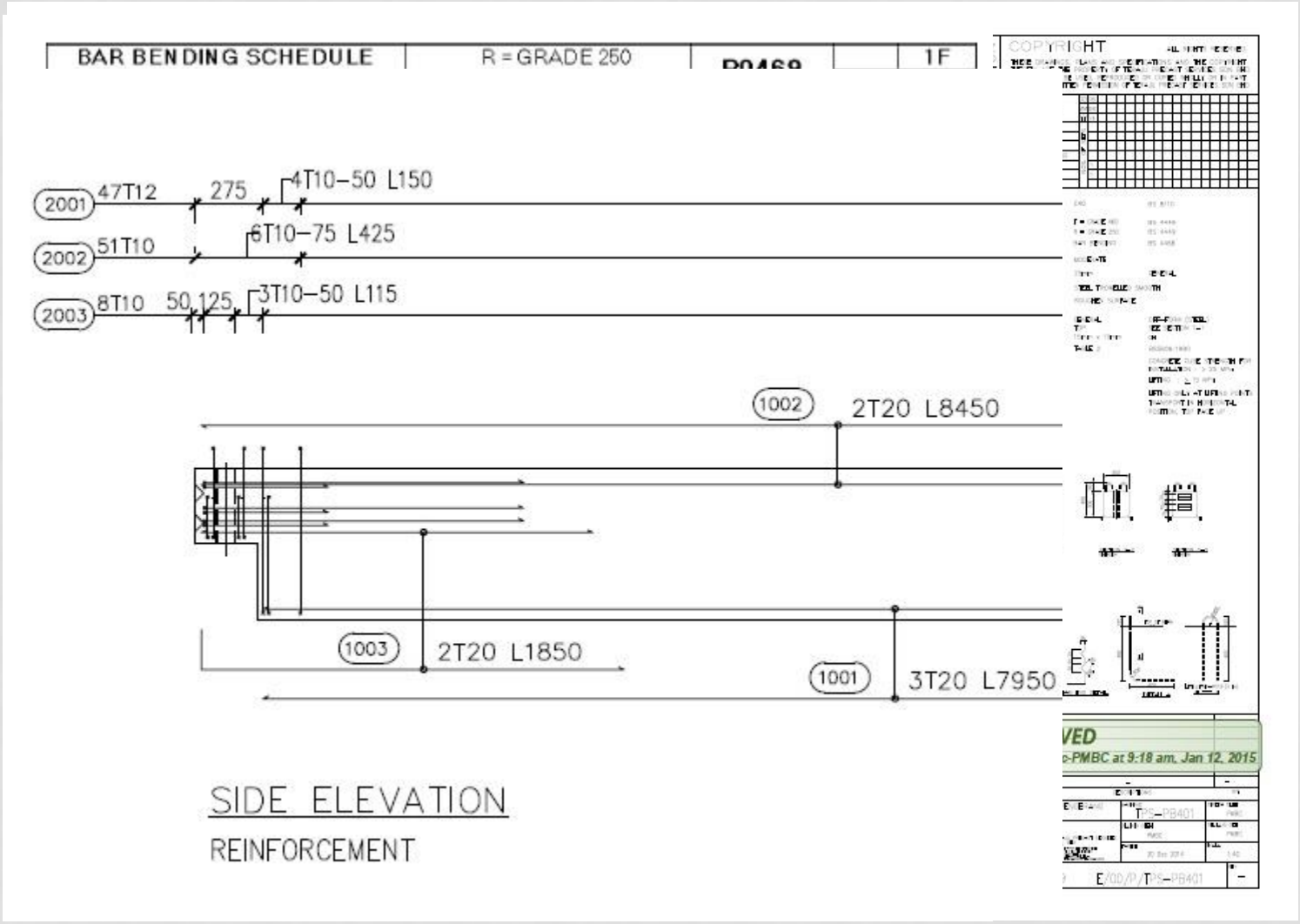
- Staircase

- Shear Wall

- Parapet Wall

PRODUCTION PROCESS FLOW





- Shop Drawing / Bar Bending Schedule

1. BAR CUTTING

- Refer to BBS (Bar Bending Schedule) on the shop drawing
- Cut the rebar using cutting machine

2. BAR BENDING

- Use the right diameter of deformer to get the exact size
- Bend the bar using bar bending machine.

3. TYING REBAR

- Tie the rebar as cage

4. CAGE INSPECTION

- Performed by a QC Inspector/ Production Supervisor).
- Ensure the main bar size, quantity, dimension and spacing are correct.

5. MOULD SETTING

- Mould maker to set up the mould according to the production drawing.
- Check the levelling by using dumpy level, sprit level or theodolite.

6. CLEANING MOULD AND OILING

- Use cup brush or steel scraper to remove the concrete debris.
- Ensure the mould is cleaned up properly.
- Apply specified mould oil using sprayer or sponge. Extra oil must be wiped off.

7. PUT IN CAGES

8. FIX SIDE FORMS

- Ensure the bottom rubber gasket is in good condition.
- Fix the side forms to the mould and tight it using tie rod, bracket pin or bolt and nut which are needed.

9. CAST IN ITEMS

- Cast In Item such as Corrugated Sleeve, Dowel bar, Steel Connector.
- Ensure the items are covered properly to avoid any concrete laitance from going in.
- Ties it to the cages and sufficiently support it using tie wire or wastage steel bar.

10. CONCRETE PLACING

- Discharge the concrete into the mould in each layer approximately 500mm.
- Vibrate the concrete using mechanical poker or external vibrator.
- Finish the top surface as required with trowel and level it properly.
- If rough surface is required, rough the surface using wire brush

11. FINISHING

- Bagging the pin hole using Ordinary Portland Cement and white cement.
- For the bagging purpose, apply Render Mix at the surface area before proceeding with the bagging works.

12. POST POUR INSPECTION

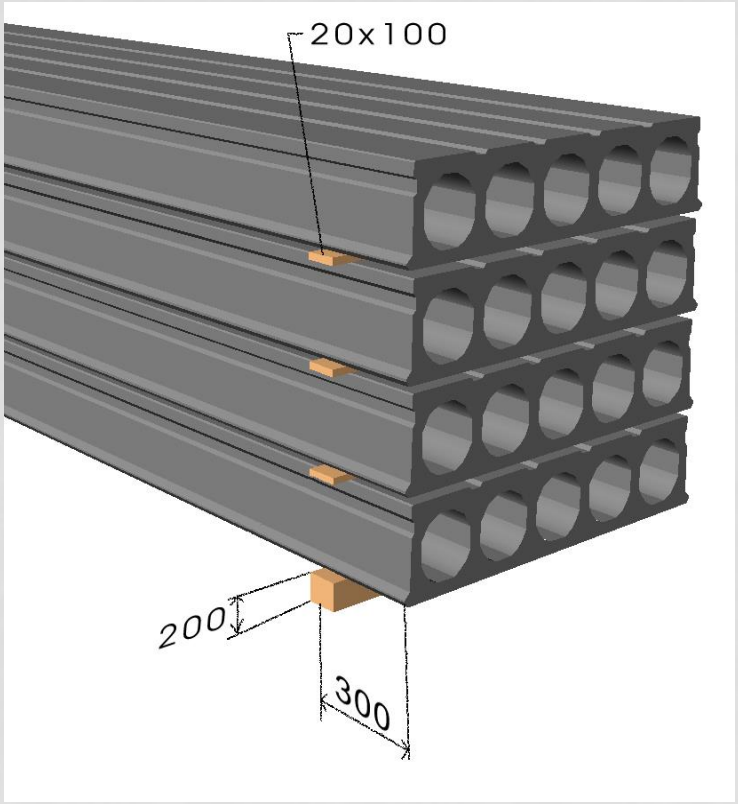
- After demoulding inspection performed by QC Inspector/QC Supervisor
- Only elements that have green dot can be transferred to stock yard.
- To provide spacer timber in between stacked elements

13. METHOD OF STORAGE

- Temporary storage area must be barricaded to prevent unauthorized person from entering the area.
  Proper planning for stacking to maximize the area used.
  Barricade to be placed after the activity.

- Elements must be properly stacked on site to avoid blocking/disturbing crane access

- Proper material staking.
- For hcs and plank, timber positioning is very important. The timber should be in a vertical line (distance timber from edge components is 300-500mm)



- Do not stand between elements during handling / unloading in progress
- Timber to be placed in proper position prior to the stacking.

- No ground contact during stacking to prevent damage on elements
- Timber to be placed in proper position prior to the stacking.

14. DELIVERY OF GOODS

- Delivered to the site using cargo or pole trailer.
- Ensure the timber stacked underneath the elements is in good condition to avoid any damage.
- Products need to be tied properly to the lorry to ensure stability.

15. QUALITY CONTROL

Process control plan

- Process contral plan – rc elements
- Process control plan – hcs/prestressed plank production

Inspection & test plan

- Inspection and test plan – rc elements
- Inspection and test plan – hcs/prestressed plank
- Checklist for precasting works in factory
- Concrete test cubes submission form
- Non-confirmance report
- QUALITY INSPECTION CARD (prestressed plank & hollow core slab)
- Cube test record
- STRAND STRESSING CHECKIST (bundle jack)
- NON-CONFIRMANCE REPORT – hollow core slab

15. QUALITY CONTROL

NON-CONFORMANCE REPORT

Attachment 7

QA-F19

TERAJU PRECAST SERVICES SDN. BHD.

Teraju Precast Services Sdn Bhd

No. A00001

NON-CONFORMANCE REPORT

INTERNAL :

EXTERNAL :

Project :

Delivery Order No :

Precast Ref. No. :

Delivery Date :

Casting Date :

Supplier :

Precast Dimensions :

Transport No :

HCS :

- Strand Position
- Stress :
- Strand Size :

NATURE OF NON-CONFORMITY

REPORTED BY : .....

DATE : .....

REPORTED TO : .....
PRODUCTION/ PURCHASING

DATE : .....

ACTION TAKEN

- ☐ Repair
- ☐ Replace
- ☐ Request for concession
- ☐ Reject/ Dispose *
- ☐ Keep as stock for future use
- ☐ Others (Please specify)

.....

.....

For Raw Material Non-Conformance

ACKNOWLEDGED BY:

.....
SUB-CONTRACTOR/ REPRESENTATIVE

DATE : .....

APPROVED BY:

.....
PRODUCTION/ PURCHASING

DATE : .....

.....
QAQC

DATE : .....

Extend copy to Planner

QA-F15

Bhd

TRENGTH (N/mm²)	AVERAGE (N/mm²)	CONCRETE SPVR	BATCHER	TESTED BY

VERIFIED BY:

QA/QC Technician/ Supervisor

TERAJU PRECAST SERVICES SDN BHD (872362-W)

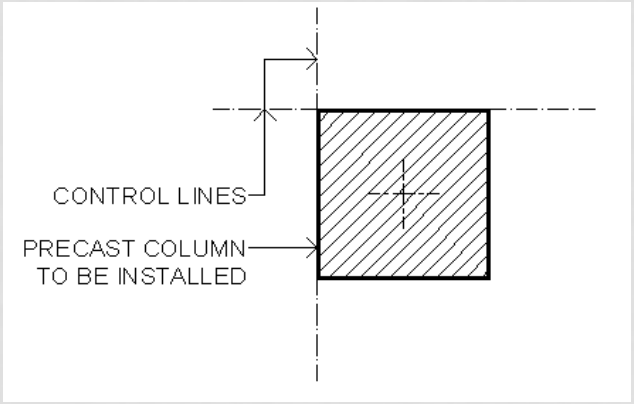
CONSTRUCTION METHOD STATEMENT

PRECAST BUILDING SYSTEM
Structure Frame System

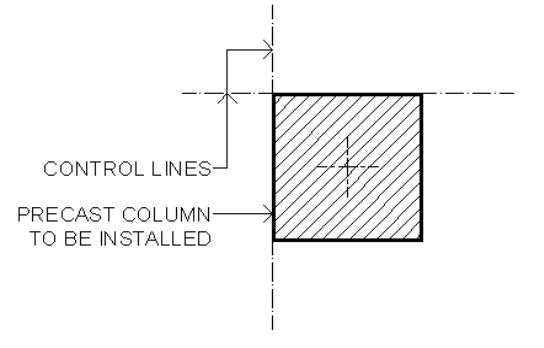
GROUND FLOOR PREPARATION

STEP 1

- Preparation of foundation.
- Casting of In-situ column stumps / ground beams with protruding starter bars ready to receive Precast Columns.
- Before starting the precast column installation, installer will mark the control line for precast column

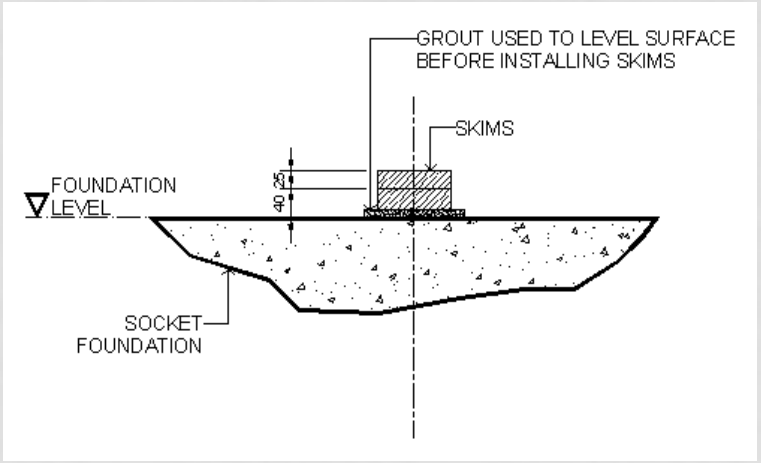


COLUMN INSTALLATION



STEP 2

- Before starting the precast column installation, the installer will mark control line for precast column.
- To provide required numbers of shim to make sure bottom of column level is correct.

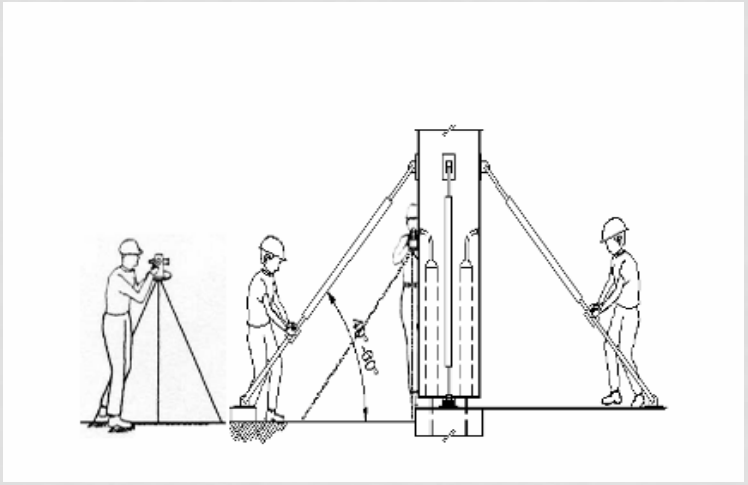


COLUMN INSTALLATION

- To provide required numbers of shim to make sure bottom of column level is correct.
- Precast column is slotted into protruding starter bar

COLUMN INSTALLATION

- To provide required numbers of shim to make sure bottom of column level is correct.
- Precast column is slotted into protruding starter bar
- Column is propped to the required level and verticality
- Column is to be secured with props

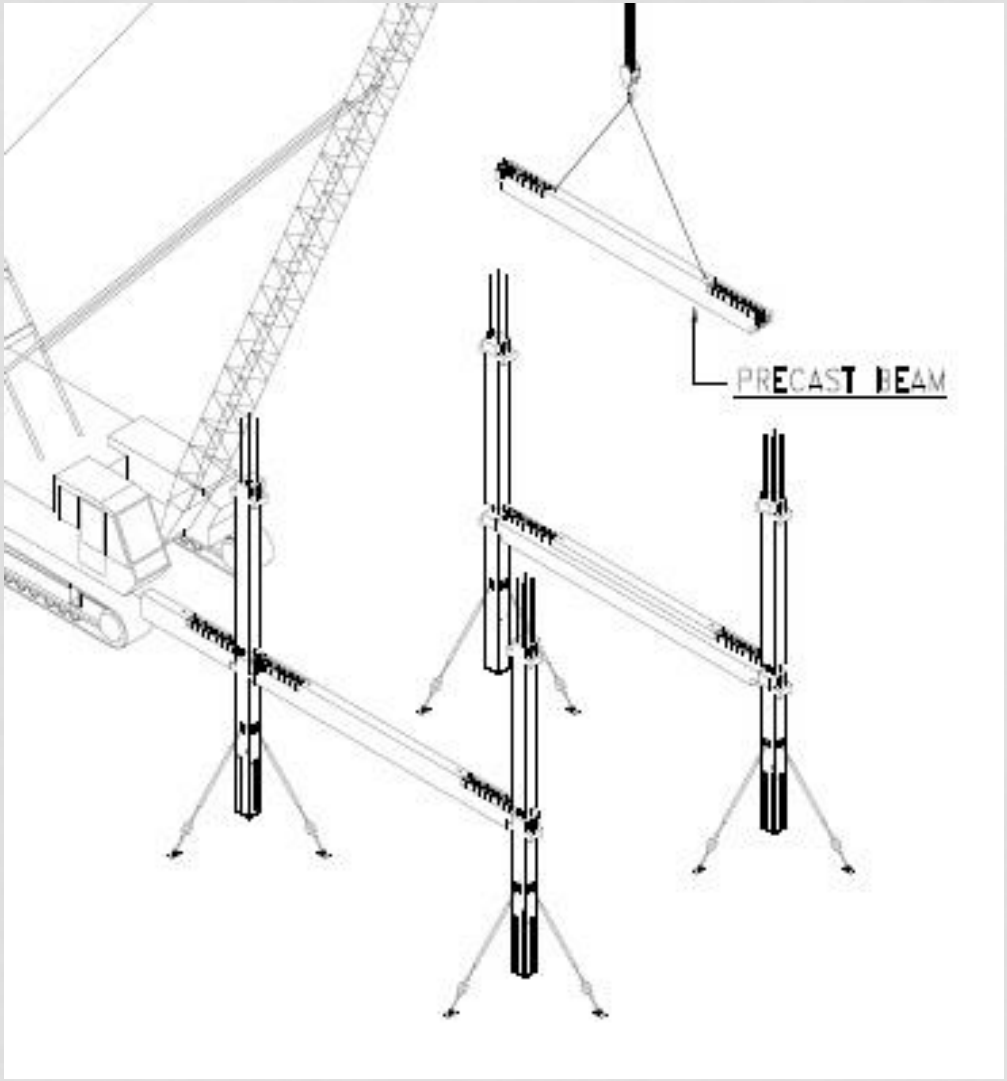


COLUMN INSTALLATION

- To provide required numbers of shim to make sure bottom of column level is correct.
- Precast column is slotted into protruding starter bar
- Column is propped to the required level and verticality
- Column is propped to the required level and verticality
- Column is grouted with high strength non-shrink grout

- C60 (Sto-crete)

BEAM INSTALLATION



STEP 3

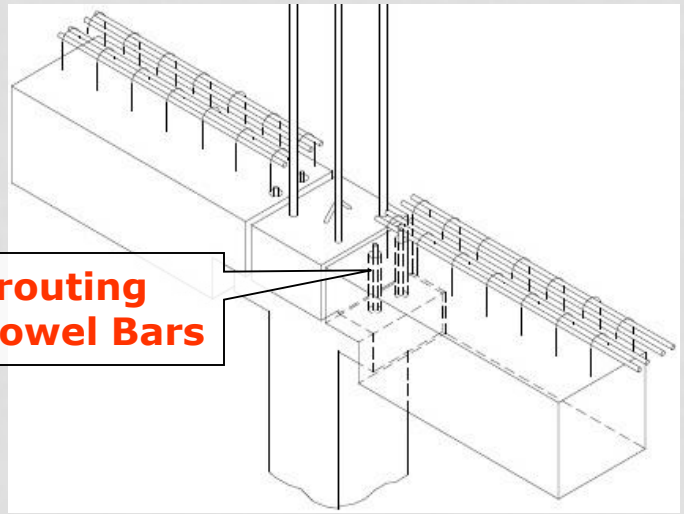
- Precast beam is lifted into position

BEAM INSTALLATION

Precast beam is lifted into position

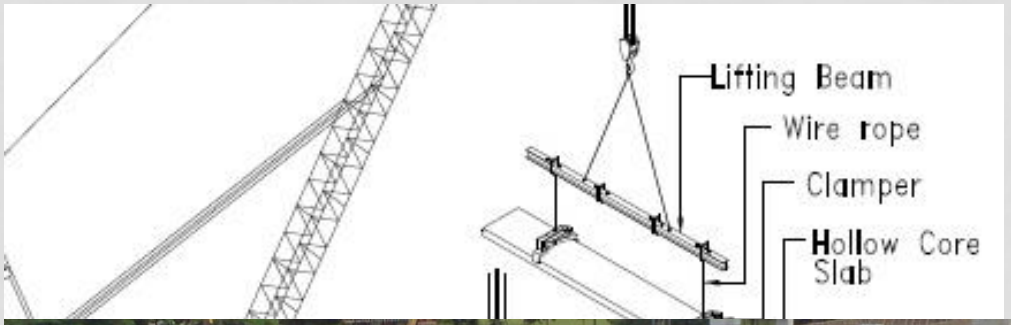
- Corbel connection
- Grouting corrugated sleeve

- Bolt & Nut Method



- Grouting Method

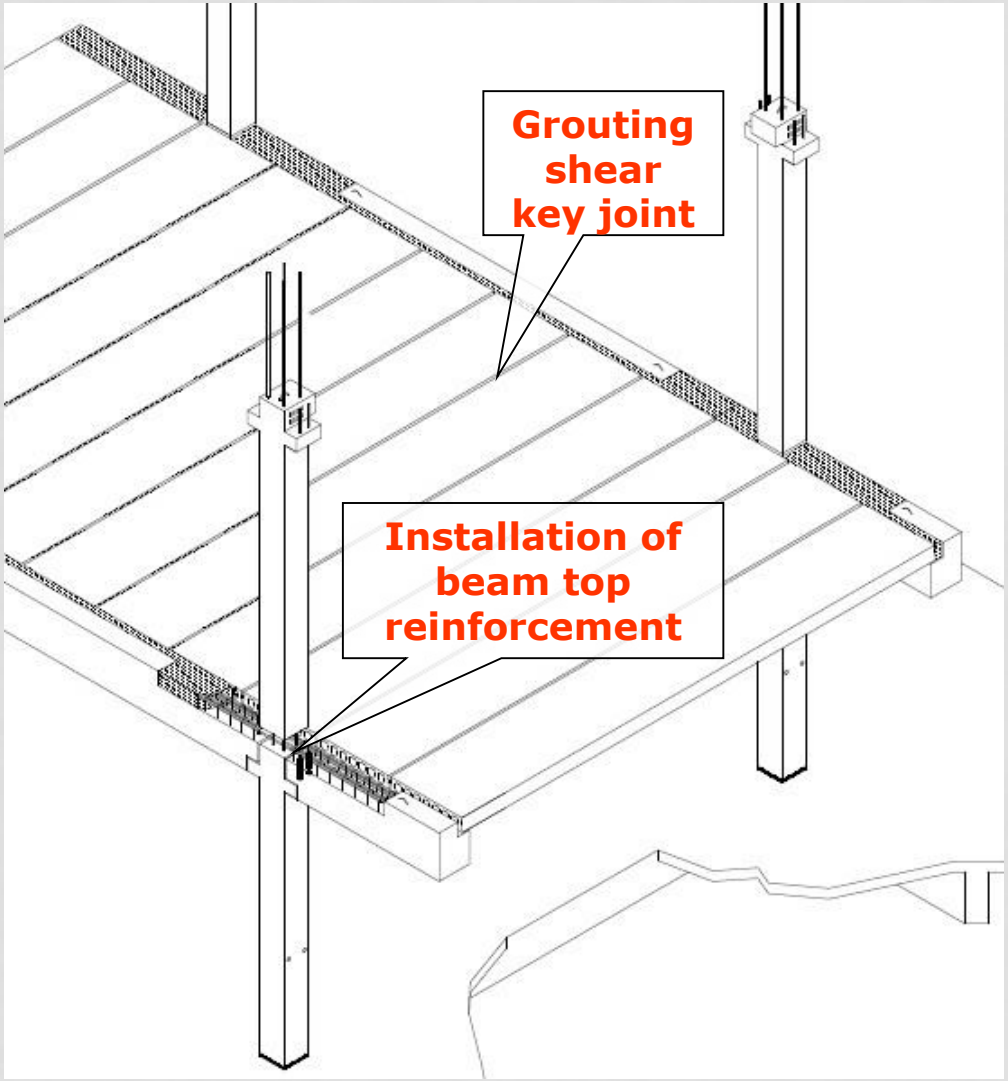
SLAB INSTALLATION



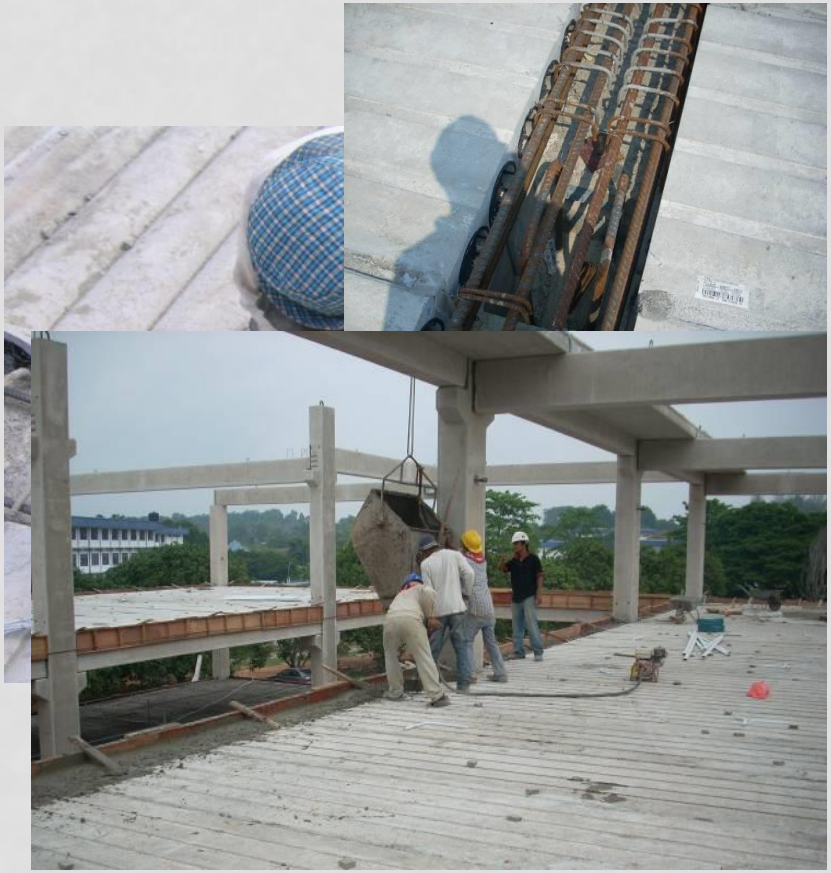
STEP 4

- Precast Hollow Core Slab or Precast Planks was lifted onto position by using clamper or lifting belt

OTHER ASSOCIATED WORKS..



- Grouting Shear key joint
- Installation of beam top rebar
- Beam top concrete casting

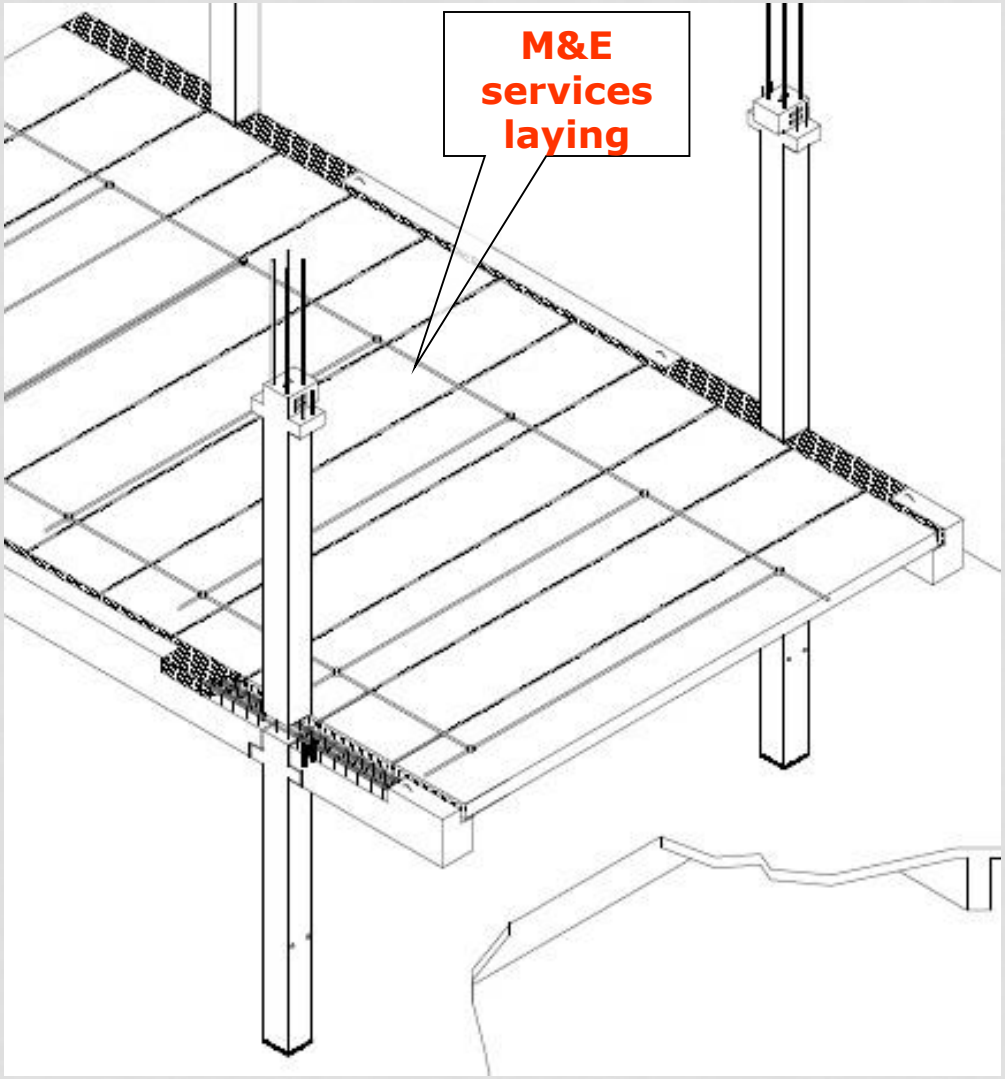


OTHER ASSOCIATED WORKS..

STEP 5

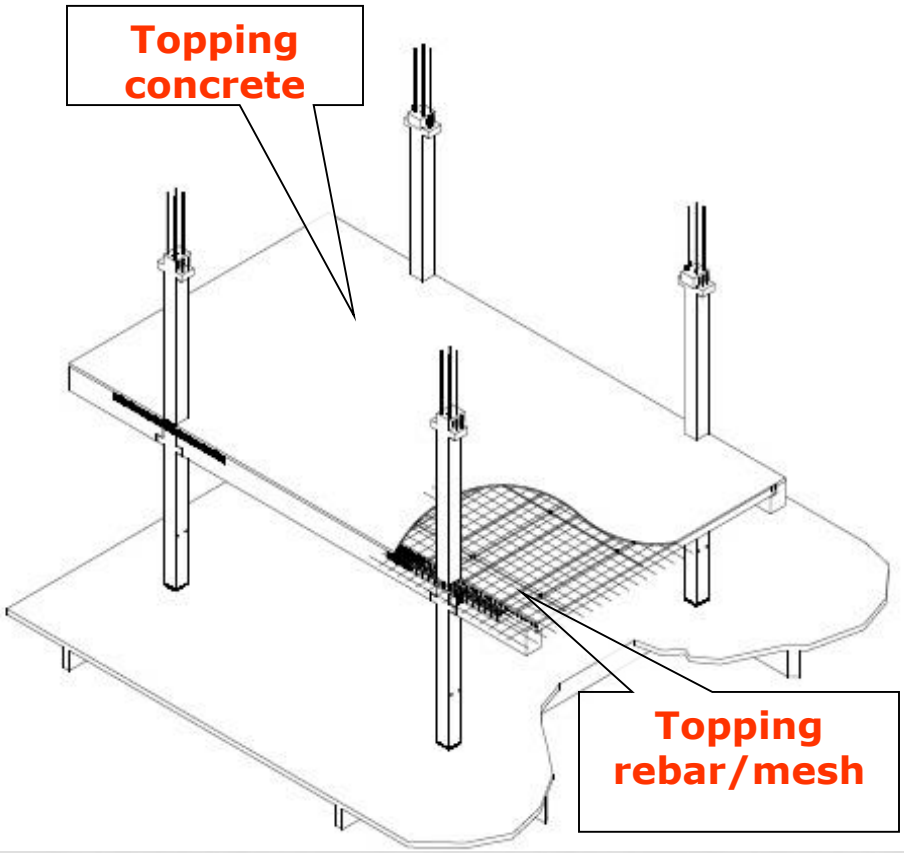
- Grouting Shear key joint

OTHER ASSOCIATED WORKS..



- Shear key joint is grouted
- Installation of beam top rebar
- Beam top concrete casting
- Laying the trunking

CASTING STRUCTURAL TOPPING



STEP 6:

- Placing of hollow core slab topping reinforcement/wire mesh.
- Casting of topping concrete

OTHER ASSOCIATED WORKS..

- M&E services installation underneath of precast slab

OPENING ON PRECAST SLAB

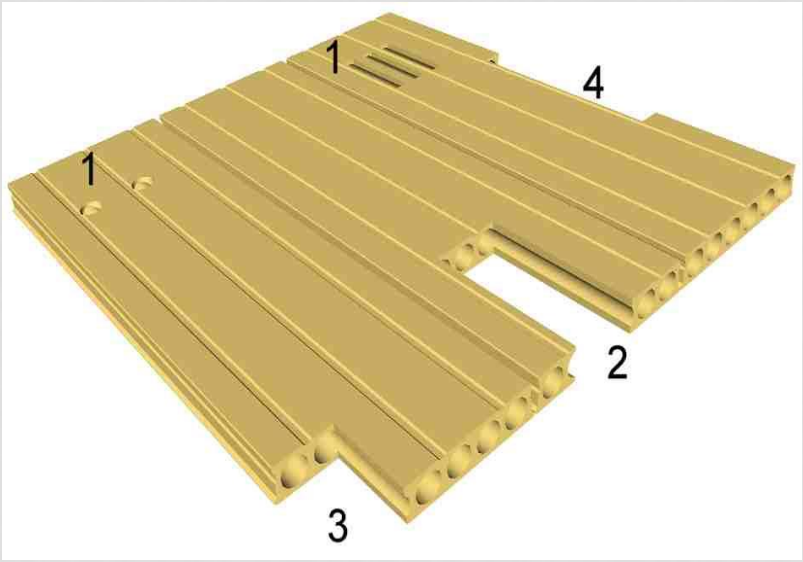
Opening type:

Circle – 200 diameter and below size, to core at site

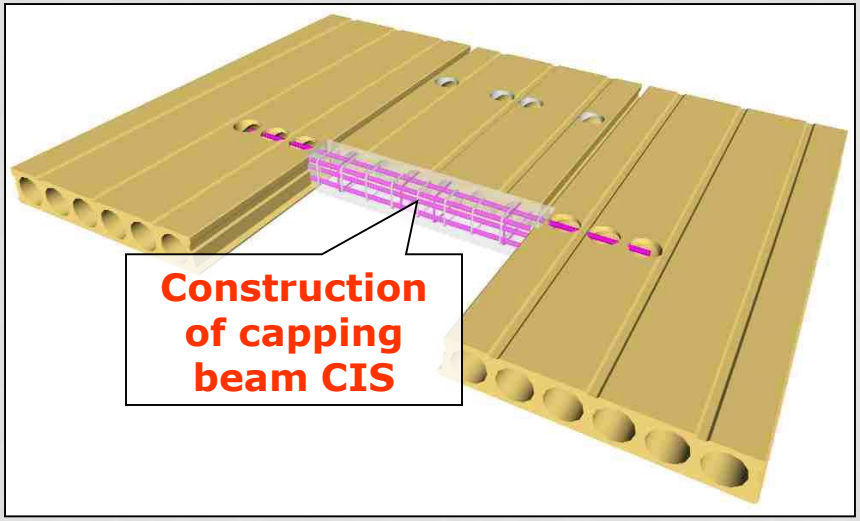
Rectangular shape – large opening to be done at factory.

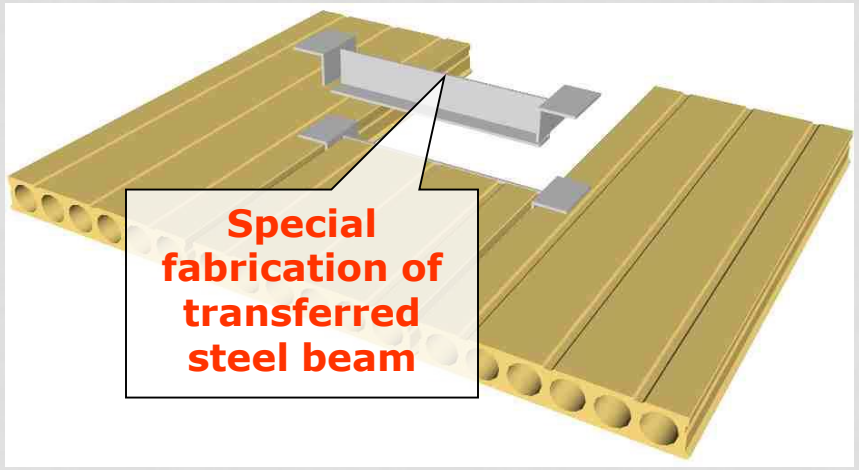
OPENING ON HOLLOW CORE SLAB

l /b	Hollow Core Slab			
	150-165	200-215	265	325-500
1 Center -round hole -square opening (maximum 3 voids in the same cross section)	Ø 87 87x1000	Ø 100 87x1000	Ø 125 87x1000	Ø 135 87x1000
2 Front	500x0.2l	450x0.2l	550x0.2l	410x0.2l
3 Corner	390x0.2l	370x0.2l	400x0.2l	500x0.2l
4 Edges	225	180	200	245



OPENING ON HOLLOW CORE SLAB





FLEXIBILITY OF PRECAST SYSTEM

- Fixing of M&E Services onto Precast Elements

FLEXIBILITY OF PRECAST SYSTEM

- Precast Beam and Cast In Situ Beam Connection
- Cast In Situ Slab beside precast beam

THANK YOU

TERAJU PRECAST SERVICES SDN BHD (872362-W)