

kneSt

ALUFORM & VERTICALS



BUILDER
RAM HOUSING
CHENNAI

PROPOSED VIEW OF PRECAST VILLA

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Under construction work photos









Actual site photo







About Us

- Knest Aluform Solutions LLP was established in the year 2014.
- The promoters of the company having a wide range of experience in various other industries started research & development on aluminum formwork by assembling a team of technical experts with years of experience in aluminum formwork.
- Modular Aluminum Formwork is prefabricated aluminum extrusion formwork panels customized to suit the requirement of the project as per GFC Architectural & Structural Drawings. It facilitates faster monolithic construction.
- Basic element of Modular Aluminum Formwork is a panel which is a framework of extruded aluminum sections welded to an aluminum sheet.
- It is a lightweight panel with an excellent stiffness to weight ratio, yielding minimal deflections under concrete loading.

Material Required Quantity

Sr. No.	Accessory Name	Unit	Quantity
1	Round Pin & Wedges(70 X 3 MM)	Nos.	12 Numbers /Square Meters Typical One Floor + Extra 10%
2	Long Pin	Nos.	Typical One Floor (As per design)
3	Reusable Wall Tie (3MM Thickness)	Nos.	Typical One Floor (As per design)
4	Reusable PVC Sleeve (Supplies to be made in form of Corrugated Polypropylene Sheet)	Nos.	Typical One Floor (As per design) + Extra 10%
5	Polythene Roll	Nos.	Typical One Floor (As per design) + Extra 10%
6	Kicker Bolt	Nos.	Typical One Floor (As per design)

Note : Above mentioned quantities are for reference, actual material will be supplied as per PO terms & conditions

Material Required Quantity

Sr. No.	Accessory Name	Unit	Quantity
7	Kicker Nut (GI Coated)	Nos.	Typical One Floor (As per Design)
8	RK Nut (GI Coated)	Nos.	Typical One Floor (As per Design)
9	RK Bolt (GI Coated)	Nos.	Typical One Floor (As per Design)
10	Adjustable Waler Bracket	Nos.	Typical One Floor (One Level)
11	Alignment Waler (Square Tube)	Nos.	Typical One Floor (As per design)
12	Kicker Soldier	Nos.	Typical One Floor (As per design) (One Level)
13	Wall Tie Puller	Nos.	1 Piece/ 400 Square meter
14	Panel Puller	Nos.	1 Piece/ 400 Square meter
15	Hole Bari	Nos.	1 Piece/ 400 Square Meter.

Note : Above mentioned quantities are for reference, actual material will be supplied as per PO terms & conditions

Material Required Quantity

Sr. No.	Accessory Name	Unit	Quantity
16	Slab Transfer Box	Nos.	1 Piece/ Flat
17	Adjustable MS Prop	Nos.	Typical Two Floor (As per Design)
18	Push Pull Prop	Nos.	1 Piece/ 10 Square Meters
19	External Bracket	Nos.	Typical two Floor (As per Design)

Aluform sequence

1. Initial preparation from jobsite
2. Setting drawing
3. Man power analysis
4. Monolithic Construction
5. Sequence of Activities on Site
6. Checklist before concrete casting
7. Concrete pouring
8. Dismantling
9. Do's & Don'ts
10. Some common workmanship issues

Preparation , Material & Division of labor

Preparation	Materials Verification	Division of labor
<ol style="list-style-type: none">1. Setting out drawings2. Packing list3. Setting of nearest Aluform Materials4. Setting Do' & Don't order5. Fixing & removing Tools6. Consumables7. Form oil user manual8. Cover Blocks9. Checklist before & After concrete casting10. Concrete pouring	<p>✓ Checklist</p> <ol style="list-style-type: none">1. Accessories2. Corners (I/C, hunch)3. EC, ECH, ECX4. Standard wall panels5. Non-standard wall panels6. Deck panel7. Beam panel8. SC,SCE9. EB, MB, CC10. Plate Covers (SBE, PCE)11. Stoppers (WXSE, WRB)12. Standard slab panels13. Non-standard slab panels	<ol style="list-style-type: none">1. Erection team2. Dismantling team3. Flat-tie puller team4. Formwork lifting team5. Panel oiling application team6. Collector , House Keeper

Setting Drawing Layouts

Aluform formwork system usage at site with Setting drawing layout

- RK Layout
- W Layout
- T Layout
- WX Layout
- IC Layout
- EC Layout
- Deck Layout
- B Layout
- BB Layout
- PC Layout
- Chajja Top Layout
- LS Layout
- SX Layout
- SL Layout
- Kicker Layout
- Special IC Layout
- Special SX layout
- Special PC Layout
- STR Layouts

Manpower Analysis



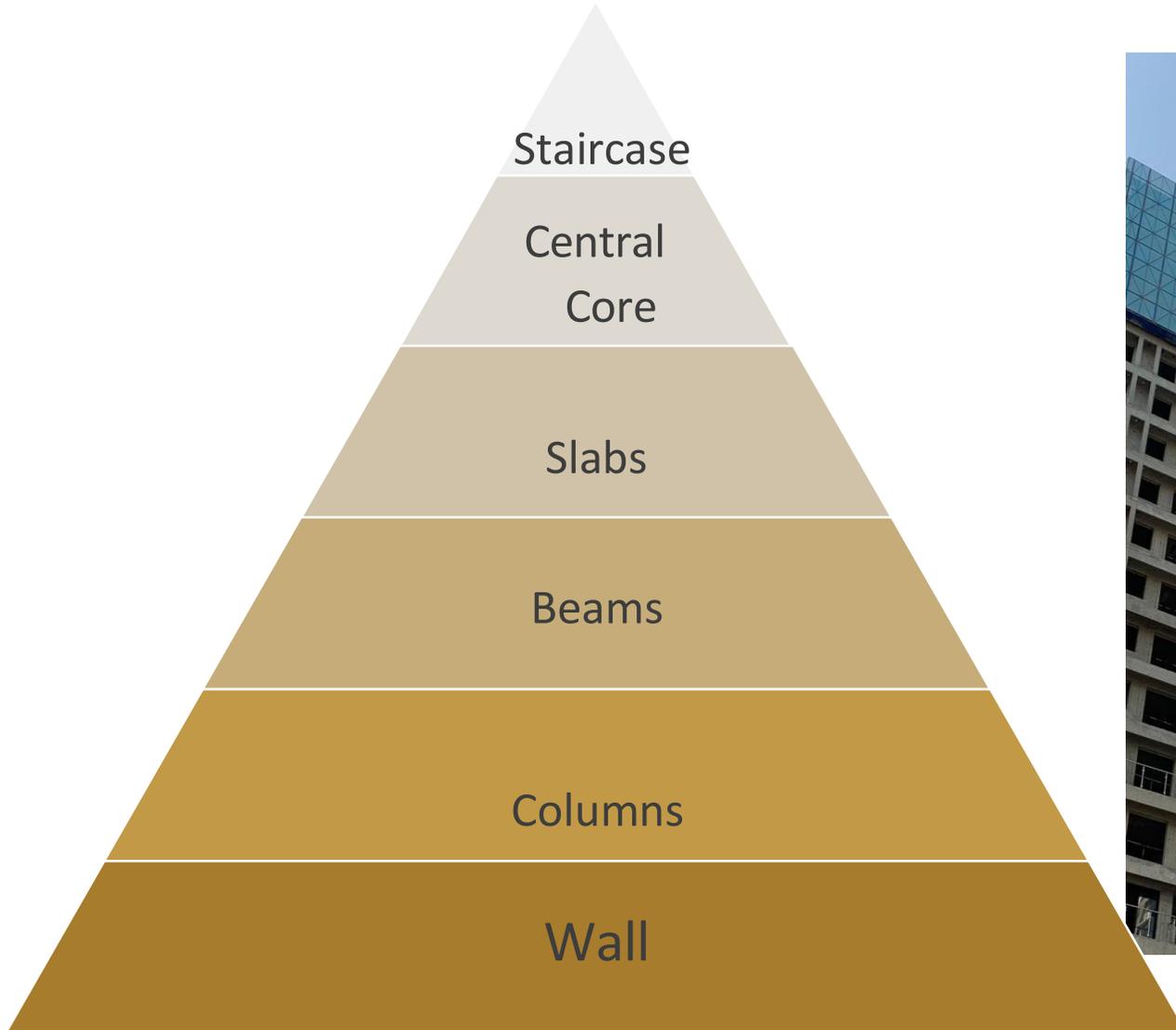
Aluform System

Productivity per Man Day – 8 Sq. m / For 1st slab Productivity per Man Day - 4 Sqm

Rebar fabrication manpower

Productivity per Man Day – 80 Kg

Monolithic Construction



Sequence of Activities

1. Stacking the material
2. Marking of wall lines.
3. Tying of Wall Rebar
4. Cover Blocks
5. Form Oil User Manual
6. Fixing of Electrical conduit
 - a) Door / Window openings at wall
7. Fixing of Plumbing Grooves
8. Fixing of internal wall form
9. Correcting Levels of Wall Panels & Maintaining Plumb
10. Guidelines for fixing Pin-Wedges
11. Erection of T- Panels
12. Erection of slab formwork
13. Fixing of external wall form
14. Erection of Lift Formwork
15. Erection of Staircase Formwork
16. Tying of Slab rebar
17. Fixing of Conduits at slab
 - a) Sunken, Transfer box out in position & Cutouts
18. Final Aligning & checking & Fixing of Push Pull Prop

Stacking the Material

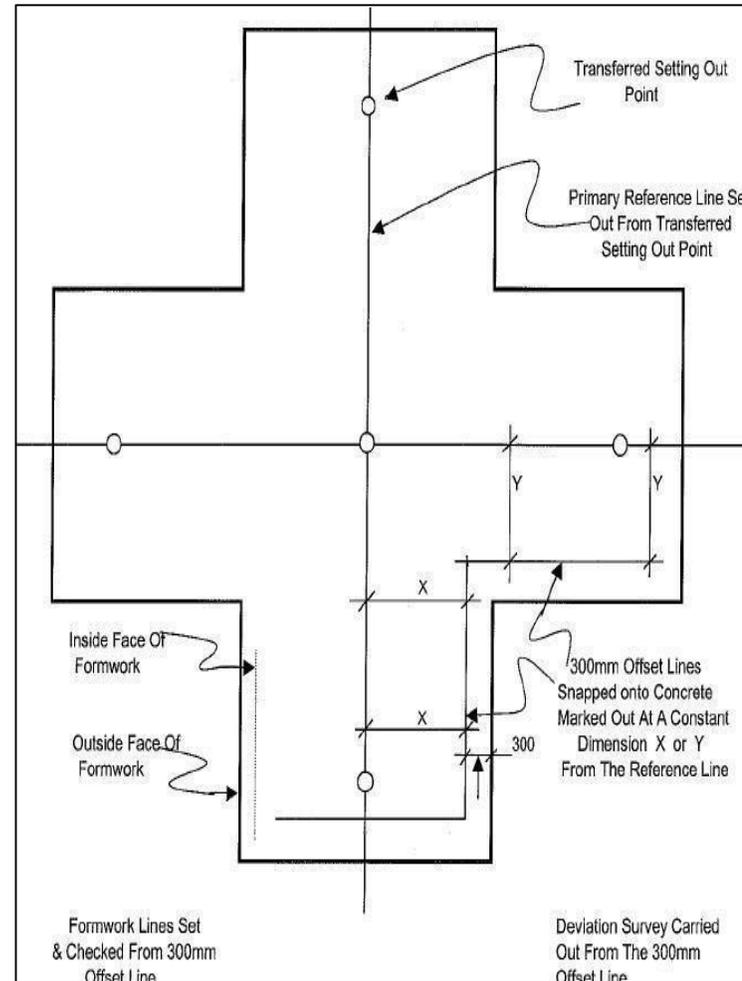


- Joint verification & Item wise Segregation of all Pallets
- While stacking the material, ensure that the concrete surface is not directly in contact with the ground. (Usage of Wooden packing is suggested)

Marking of Wall Lines

➤ Levelling Activities

1. Setting out line and Slab level / kicker level survey.
2. Adjustment if any and Theci (Timber stay/ Wooden support) fixing along the setting out line.
3. Theci must be provided on both sides in case of internal walls.
4. In case of external wall, Theci must be provided on the inner wall.
5. The distance between 2 consecutive Theci must be less than 1000mm.
6. Nails must be fitted on both ends of the theci for best support fix nails diagonally on the theci.



Tying Of Wall Rebar tying



Cover Blocks

➤ Cover block spacing requirement

Sr. No.	Member	Requirement	Remarks
1	Slab	Min 2 Nos. / Sq. m.	
2	Wall	4 Nos. / Sq. m.	
3	Column	4 Nos. @every 1.0 m c/c	
4	Beam	Min 3 Nos. @every 1.50 m c/c	Nos. Depends upon the beam Size



Column Reinforcement



Slab
Reinforcement



Wall
Reinforcement

Form Oil User Manual



➤ Recommended Shuttering oil

✓ Reebol

A coverage between **40 to 60 m²** per liter is possible depending upon application.

✓ Sika[®]-form oil

The coverage rate for Sika-Form oil is **40 to 50m²** per liter depending upon application.

✓ Rheofinish[®] 202



The coverage rate for RHEOFINISH 202 is **30 to 70m²** per liter depending upon application.

✓ SETRELEASE RTU Mould release agent

The coverage rate for SETRELEASE RTU covers **22 to 30 m²** per liter depending upon application.

Form Oil User Manual

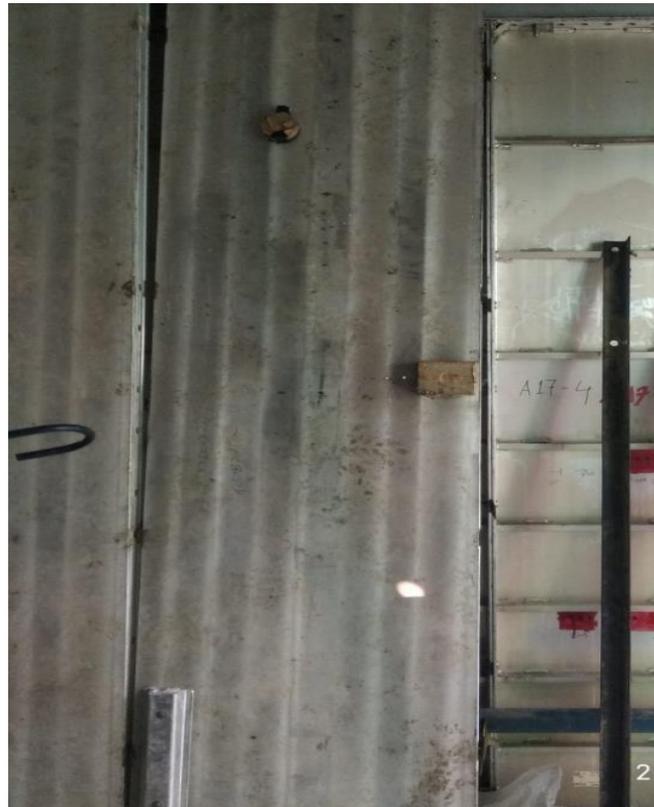


➤ Notes on Application/Limitations

- The molds should be dry and clean.
- Any residues of rust and concrete must be removed.
- Form oil is applied in thin layers, covering the complete surface (a second application may be necessary in case of highly absorbent formwork).
- We recommend the use of a special spray gun with an operating pressure of 3-6 bar and a flat spraying nozzle.
- After application the concrete can be placed immediately without any waiting time.
- Before concreting preliminary tests are recommended to optimize the procedure for each project.

Fixing of Electrical Conduit

- M&E Fixed & Door / Window openings in Wall Formwork with the Reinforcement



Fixing of Plumbing Grooves & Sleeves

➤ Plumbing grooves & plumbing sleeves fixing



Fixing Of Internal Wall Form

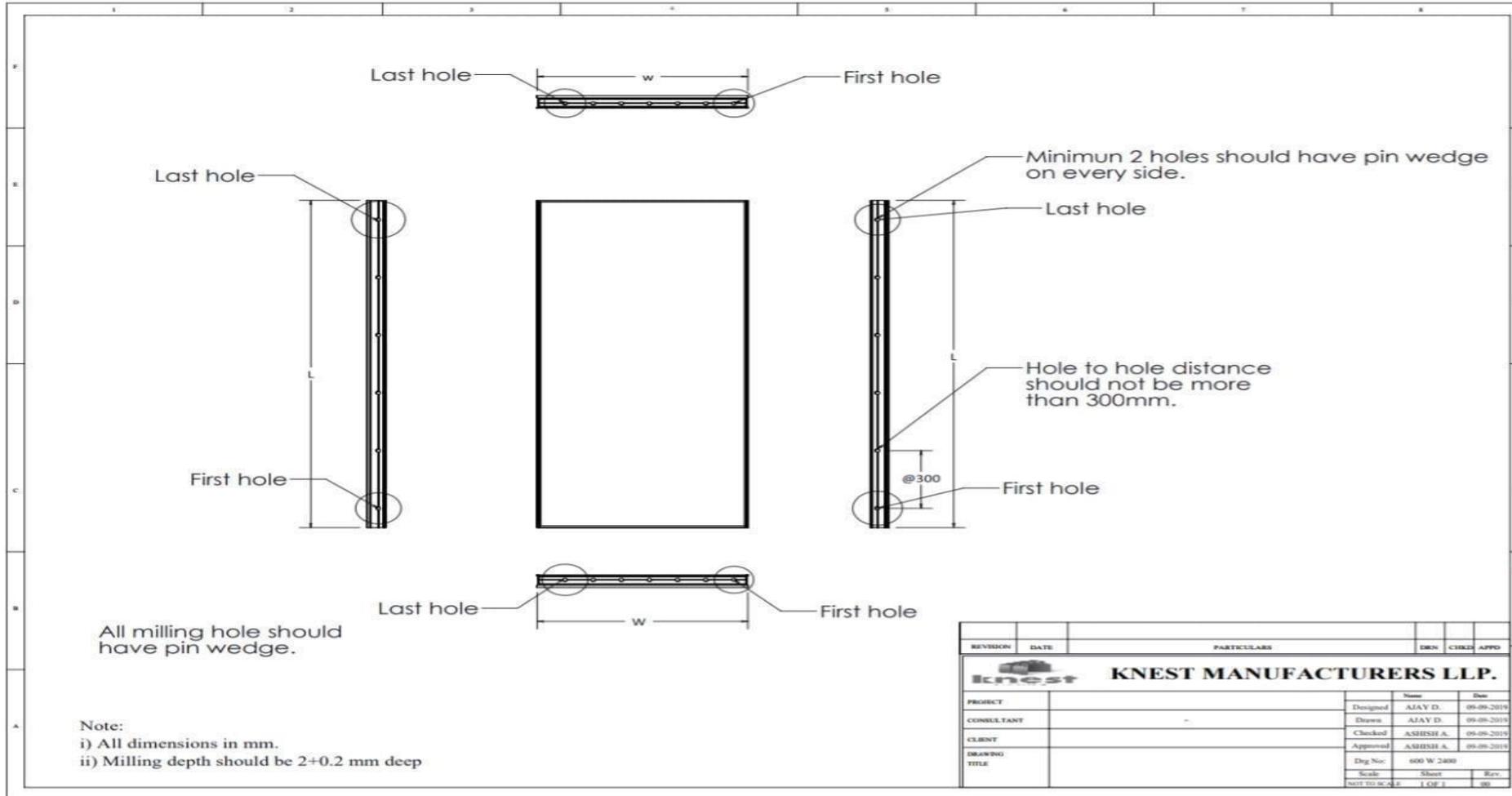
- Ensure that Wooden Stopper is provided at 1000 mm C/C spacing in start - up level .
- Internal wall erection to be start first as per the scheme drawings & level must be maintained. (Before erection make sure all panels are properly oiled with approved shuttering oil)



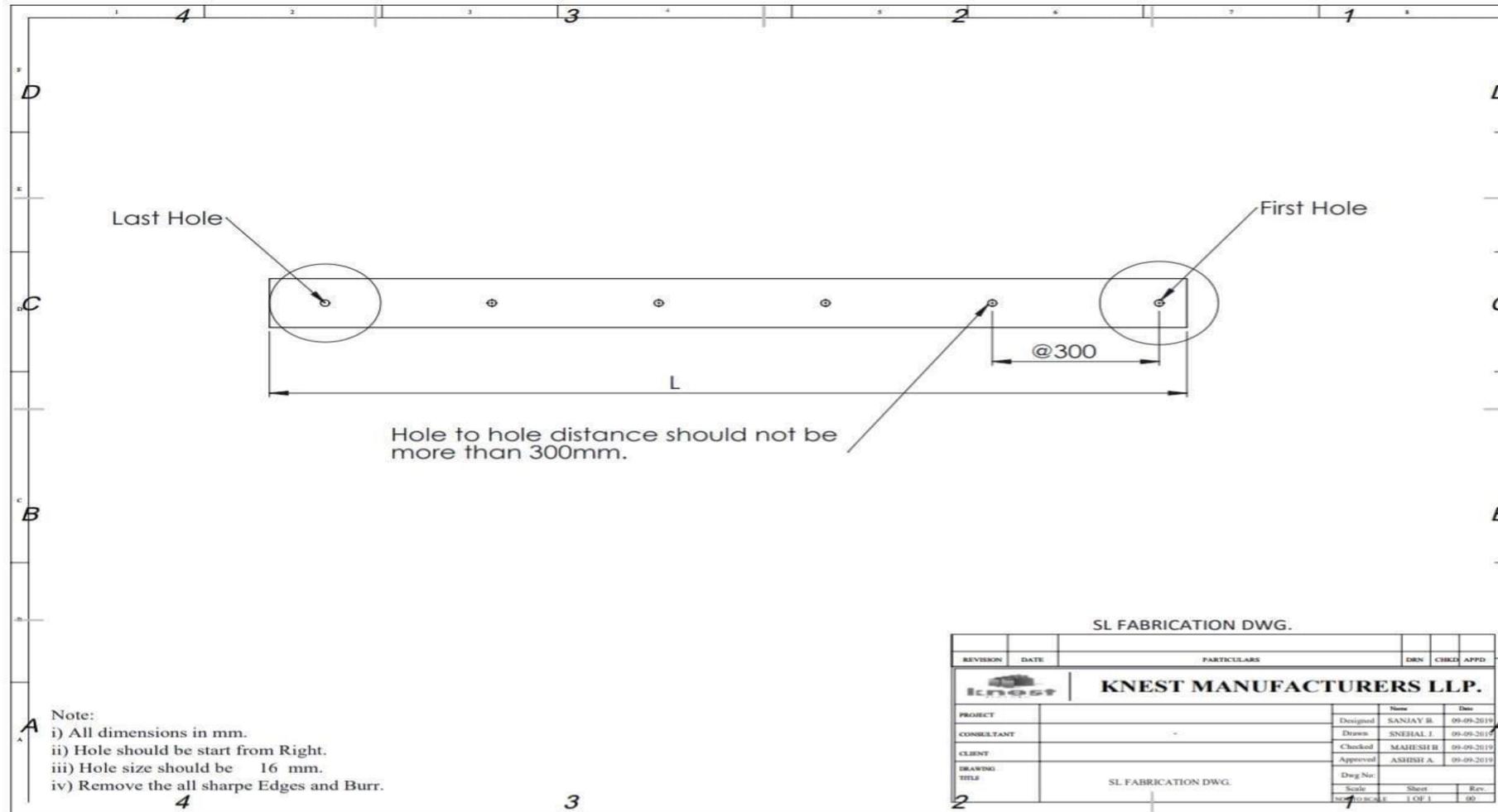
Correcting Levels of Wall Panels & Maintaining Plumb



Guidelines for Fixing Pin-Wedges

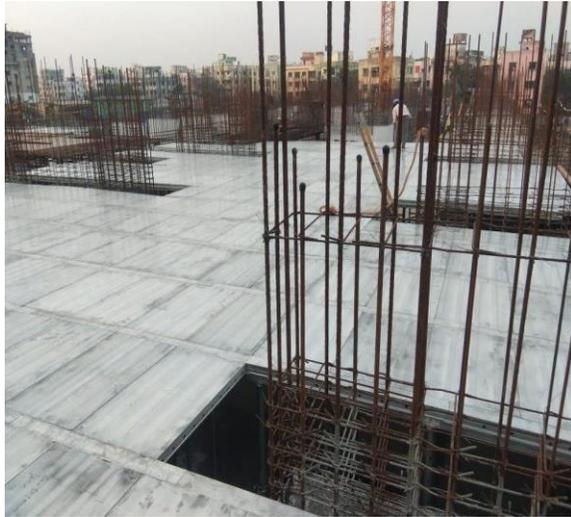


Guidelines for Fixing Pin-Wedges



Erection of slab formwork

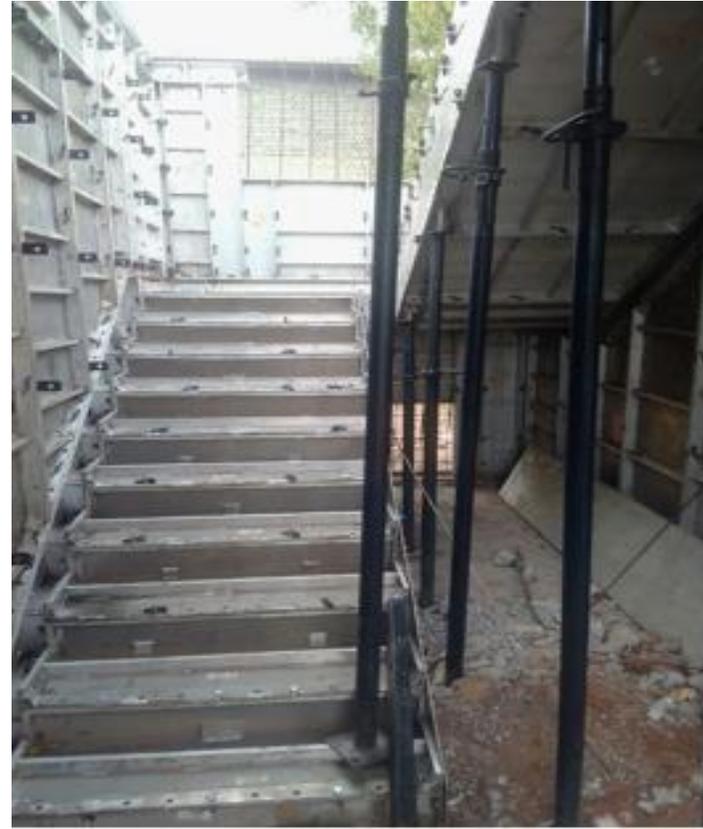
- Erect the deck panels with proper accessories and alu-span as per the scheme drawings



Erection of lift formwork

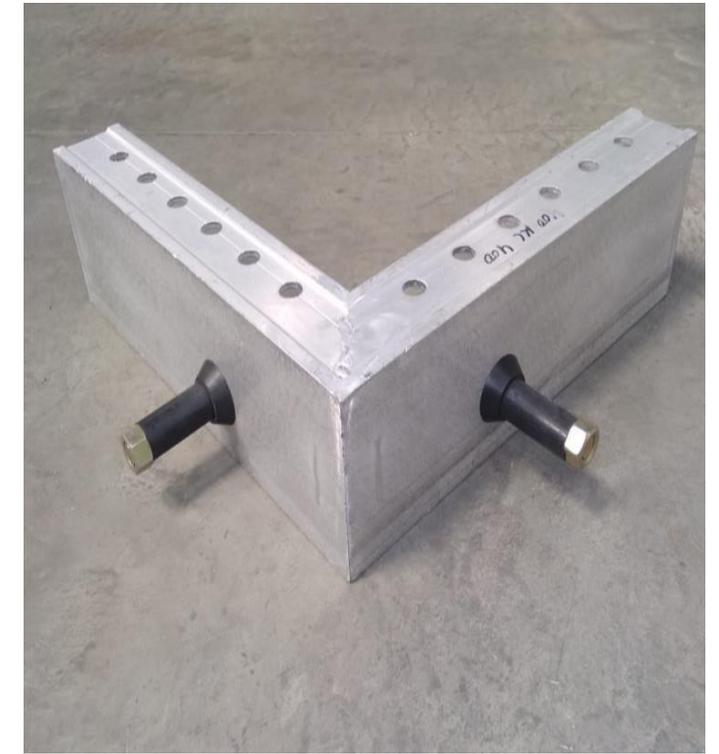


Erection of Staircase formwork



Fixing of external wall form

- Timber Stay to be provided for periphery in start-up level.
- Kicker nut bolts be touching the top of the slot.



Fixing Of External Wall Form

- External Wall erection to be done as per the scheme drawing (including VS Tubes etc.)

Wingnuts must be fixed (On the outer side for VS Tube & On the inner Concrete surface while fixing for bracket) using Adjustable spanner/ Ring Spanner.



Tying of Slab Rebar



Fixing of Conduits at slab

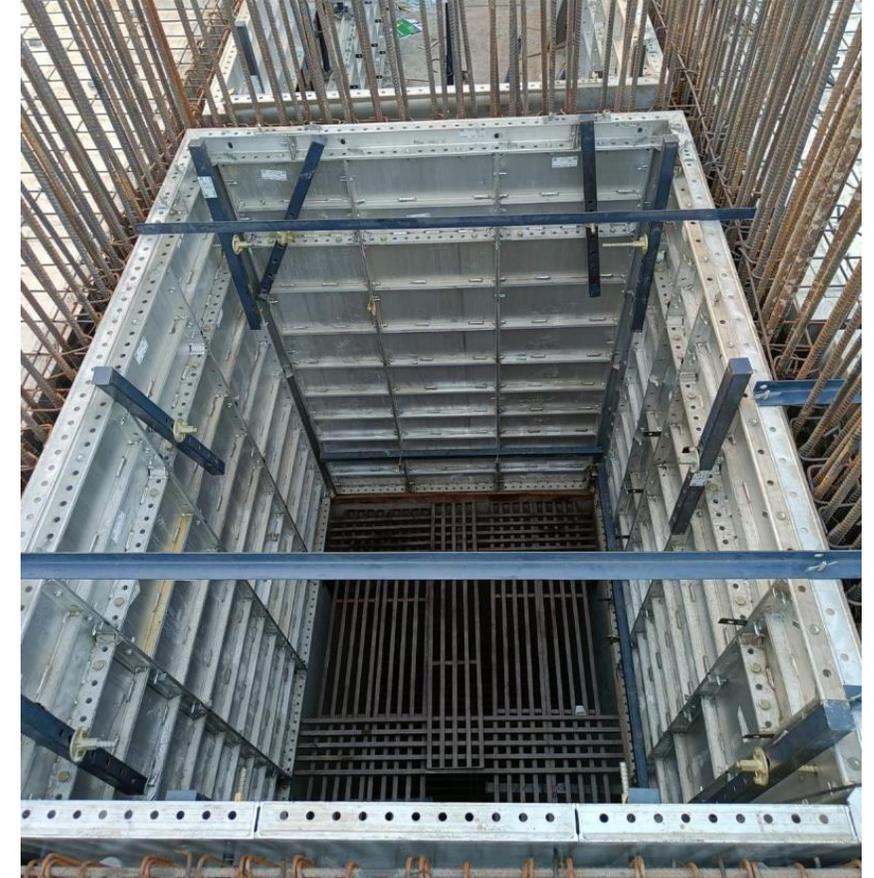


Fixing of Conduits & Sunken, Transfer box out in position & Cutouts in slab

- Check the Sunken assembly in position

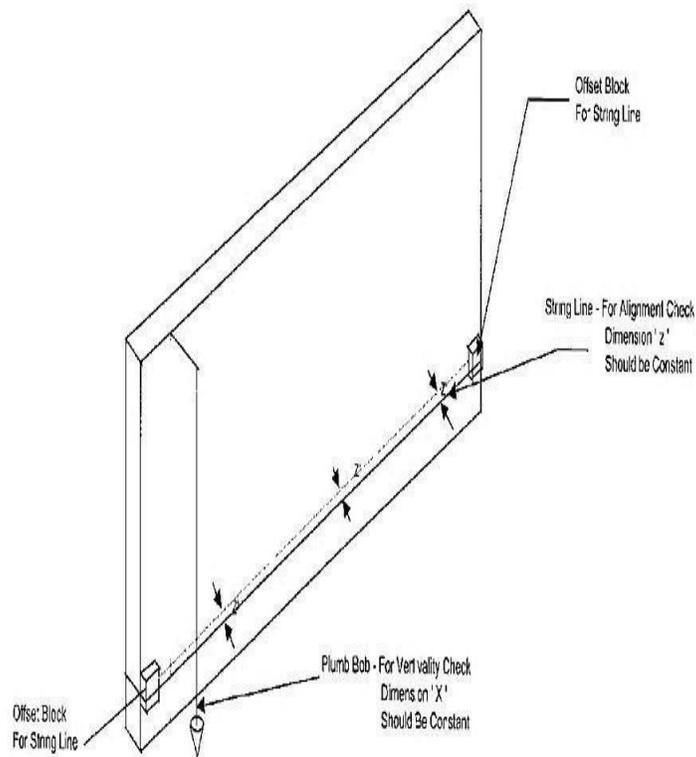


- Check the transfer box in position & cutouts in slab



Final Aligning & checking

- Check the Vertical alignment plumb for both internal and external walls



Final Alignment & Push Pull Prop Fixing

➤ Push Pull Prop Fixing

1. Wooden stopper must be there on both sides.
2. Plywood patti must be provided while fixing the Push Pull Prop with Nails on ground as shown in the picture.
3. Alignment Waller must be fixed as per design.
4. Push Pull Jack should be fixed at the ends of Alignment Waller & in between the span of fixed Alignment Waller where the Waller is not touching the Rail of Panels.
5. Push pull props are to be used for minor adjustments up to 5 mm & not more than that.



Checklist before Concrete Casting

- Before pouring concrete ,Ensure that the Jobsite Engineer & Foremen will apply following checks :
- ✓ 1. Check for straightness and verticality of the wall.
 - ✓ 2. Check for Wedge-pin and Wall-ties has been installed correctly.
 - ✓ 3. Check for external working platforms as per the formwork layout.
 - ✓ 4. Check for shuttering oil has been applied on the slab panels.
 - ✓ 5. Check for interlocking with all components.
 - ✓ 6. Check for all Wooden Stopper, Door Spacers, Sunk Angle, Kicker Spacers, alignment Waller whether fixed as per accessories layout.
 - ✓ 7. Check for BKS Patti, Kicker Nut Bolts, Prop Spacing VS Tube whether fixed as per accessories layout.

Checklist While Pouring Concrete

➤ When pouring concrete :

- ✓ Vertical rate of rise of concrete should not exceed 1.8 m/hr (height of liquid concrete in any wall should not exceed 1.8 metre at any given point of time – so if wall is of 3 metre height – 1.5 metre to be poured first – then after it hardens, remaining 1.5 metre to be poured)
- ✓ Start pouring of concrete from Centre.
- ✓ Don't dump or heap of concrete at one area.
- ✓ In order to avoid honeycombing on the concrete surface give gentle blows with Rubber mallet.
- ✓ Monitoring with skilled person while pouring the concrete.
- ✓ We recommend the use of Self Compacting Concrete(SCC) on site for best results.

Concreting

➤ Monolithic Concrete placement for different elements



Panel cleaning

- Before re-installing the panels, the panels must be cleaned:
- ✓ Use Jet Spray to keep panels clean while concreting.
- ✓ After removing concrete scraps, apply form oil on the panels using a Spray/ roller, gently remove the smaller concrete blocks.



Dismantling Process

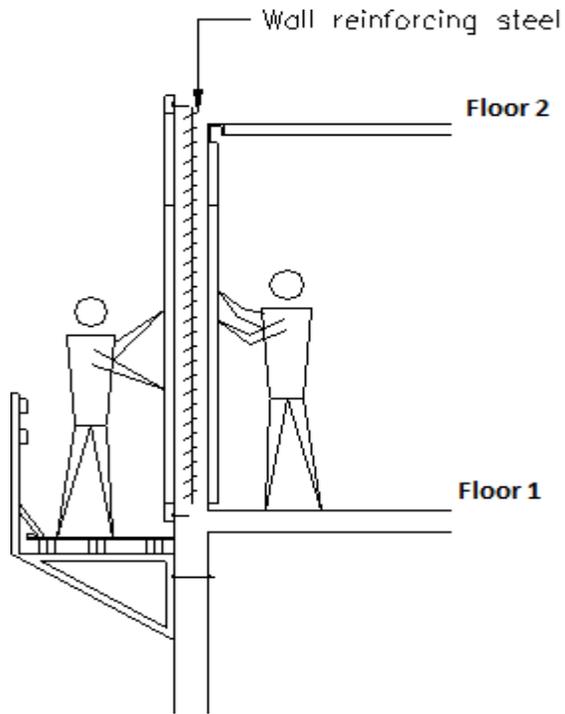


➤ Simple Interlocking removing system

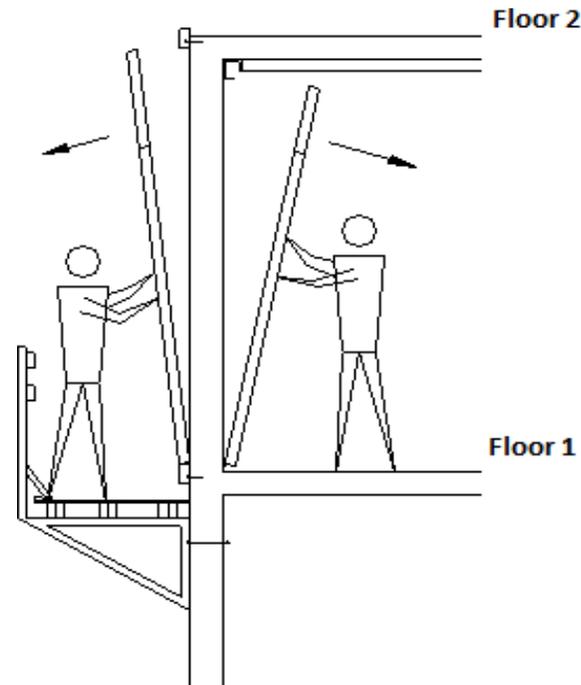
1. Dismantling of inside wall, column ,beam & slab formwork.
2. Dismantling of outside wall.
3. Removal of flat wall tie, wall tie sleeve/Cover & grouting

Dismantling Process

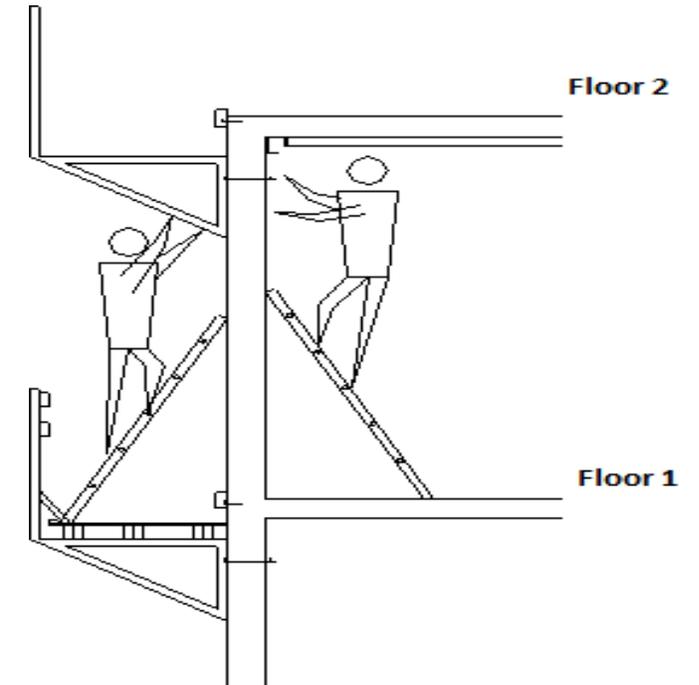
➤ Dismantling of outside wall & Fixing of external working platform.



Erect the formwork for the floor



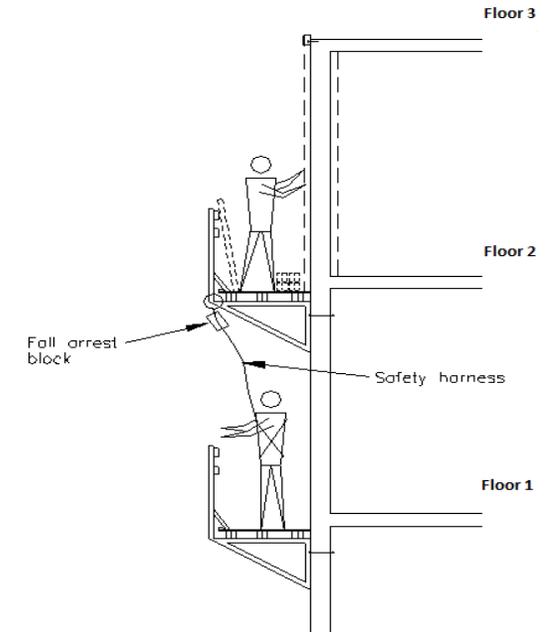
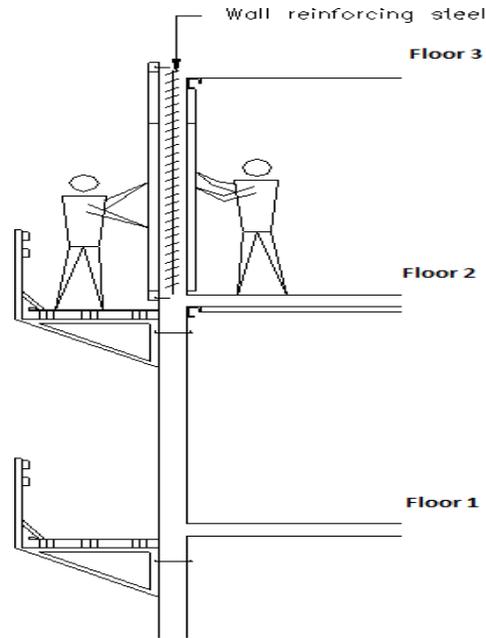
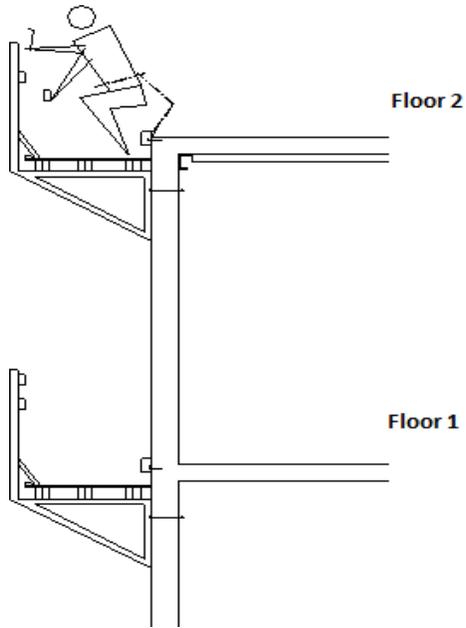
Removal of Wall formwork
(Next day of pouring of Concrete



Place the working platform bracket on the Floor 2 and tighten the nuts on the tie-rod from the inside of the building .

Dismantling Process

- Dismantling of outside wall & Fixing of external working platform.



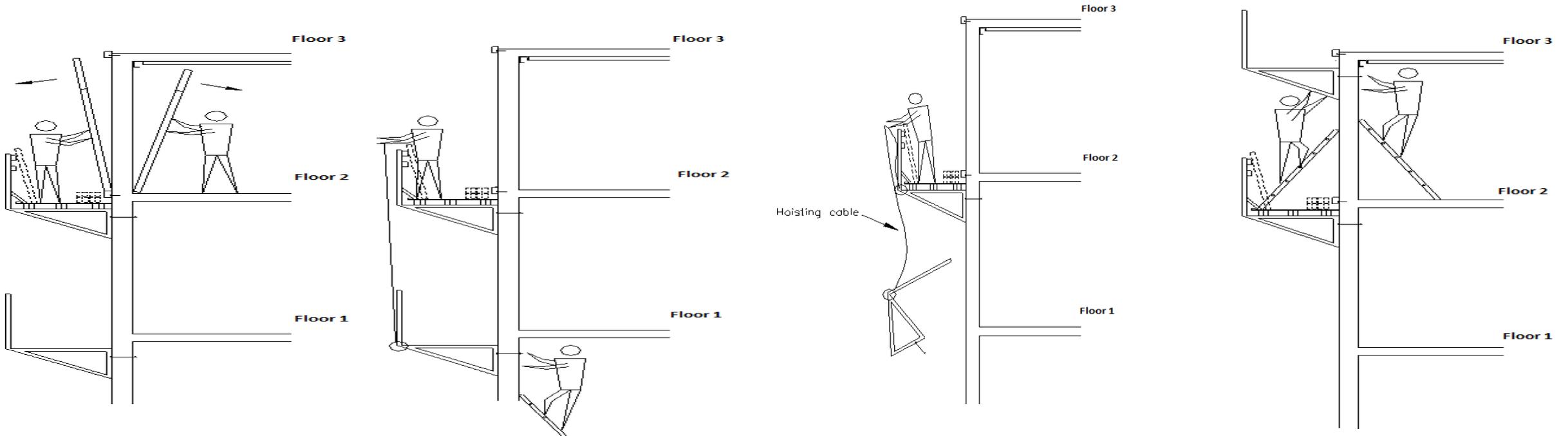
Fix the plywood/ walkway Jali, railings, toe boards on the platform to make it workable. Safety should be paramount throughout the operation and hence it is mandatory to use required safety gears like safety belt during the process.

Strike the kicker form Floor 1 and erect the formwork on Floor 2

Remove the plywood/ walkway jali/ timber plank, side rails, toe boars from the platform on floor 1 and shift the same to floor 2. This exercise is to be carried our during the day of concreting of walls of floor 2 and slab of floor 3.

Dismantling Process

➤ Dismantling of outside wall & Fixing of external working platform.



De shuttering the formwork on Floor 2. (Concreting was done on the previous day)

Remove the nuts from the tie rods from the Floor 1 working platform. This is to be done from inside of the building.

Remove the plywood/ walkway Jali/ timber plank, side rails, toe boards from the platform on floor 1 and shift the same to floor 2. This exercise is to be carried out during the day of concreting of walls of floor 2 and slab of floor 3.

Erect the working platform bracket on Floor 3 and tighten the nuts from inside of the building.

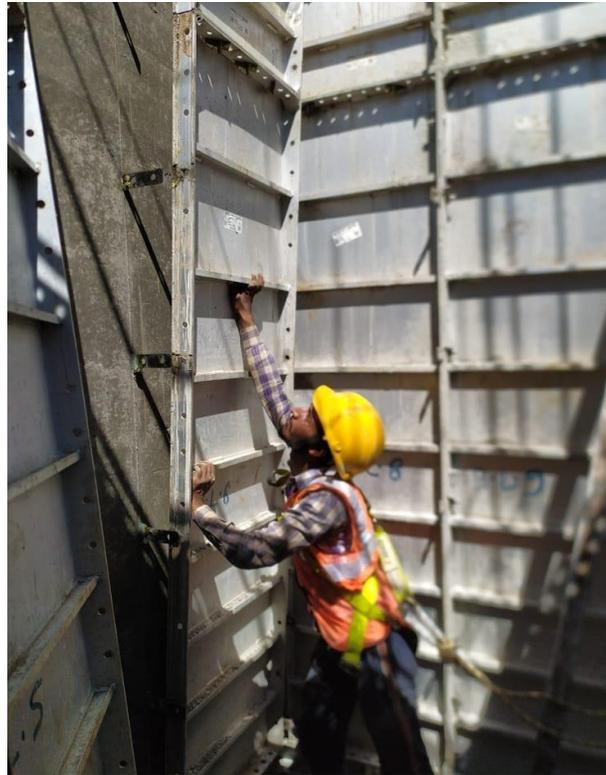
Bracket Fixing

1. The Bracket fixing methodology is already explained in the previous slide.
2. We provide a C-Channel for maintaining the stability of the Brackets.
3. Kindly note these C-Channels must be only used for fixing Brackets & not for fixing VS Tubes.
4. Knest bracket system is designed for a maximum load of 300 kg/Sq.m.
(Subject to fixing of brackets as per Knest design)



Easy removing & Stripping

➤ Lifting of Wall Panels to the Next Floor



Stripping of wall form

➤ Easy Handling



Stripping of wall form

- Simple Interlocking removing system
- ✓ Consult with consultancy before removal of any element after casting.
- ✓ Easy wall tie & wall tie pvc sleeve removing



Wall Tie Remover



Nose Plier

www.knestaluform.com (remover)

Do's & Don'ts (For Casting)

➤ Do's

- Fix nails on wooden stopper diagonally opposite to each other.
- Spacing between wooden stopper must be less than 1000mm c/c.
- Wooden Packing must be provided for fixing Push pull prop on ground.
- Wingnuts must be tightened using spanner.
- Concrete surface of aluminum panels must not be in direct contact with ground.
- Shuttering oil must be applied properly on panels.
- Usage of Self compacting concrete/ Free flow concrete is recommended.
- Proper Layer wise concrete pouring & placement.
- Start pouring of concrete from Centre.
- Rubber malting during concrete operation.
- For props above height of 3m, bracing must be provided.
- Use props as per props layout.
- Kicker Nut bolts to be placed at top of slot.

Do's & Don'ts (For Casting)

➤ Don'ts

- Fixing Wooden stopper using Single Nail.
- Directly fixing push pull prop on the ground.
- Usage of Hammer for tightening wingnuts.
- Directly keeping aluminium concrete surface on ground.
- Pouring concrete in a single pour.
- Usage of Vibrator.
- Usage of Prop for removing wall tie.
- Usage of props at other than as specified in the Prop.
- Kicker Nut bolts should not be fixed at bottom of slot hole.

Quality Concrete Finish



Lifting to the Next Level



Integrated Scaffolding System



Some common Workmanship issues on various sites

- 1) While casting, the slurry leakage is possible from the bottom.
 - RK gets jammed in concrete, if that slurry/concrete is not removed immediately. While breaking the concrete there is a possibility of rail welding breakage.



Some common Workmanship issues on various sites

2) Slurry cleaning at Rail.

- If the slurry is not cleaned on rail properly also possible. Because when the slurry is not cleaned properly it increases in length of the wall, resulting in opening material getting fitted forcefully, and after concreting, it requires additional force to remove it.



Some common Workmanship issues on various sites

3) Rail/RK might get broken due to alignment work issues.

➤ For. Ex –

While alignment, If somewhere dimension increases then somewhere (Opposite side) it will decrease. When removing the beam bottom dimension where the dimension is less(decreased due to alignment) additional force is applied for de shuttering, in this case also possible to break rail welding.



Some common Workmanship issues on various sites

4) Lacquer Coating might get damaged.

- After applying shuttering oil on the deck panels, casting must be done within next 2-3 days otherwise the affect of shuttering oil fades away & dust particles get settled over the shuttering which will directly affect our lacquer coating & thus our concrete finishing.





Thank You.



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