



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited "A" Grade by NAAC | 12B Status by UGC | Approved by AICTE

www.sathyabama.ac.in

**SCHOOL OF BUILDING AND ENVIRONMENT
DEPARTMENT OF ARCHITECTURE
M. Arch (Building management)**

**PROFESSIONAL TRAINING (S84APT)
DEC 2021 - JAN 2022**

Name of the Student : Monisha Martin

Semester : III

Reg No. : 40840009

Batch : 2020-2022



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DEPARTMENT OF ARCHITECTURE

M. Arch (Building management)

VIVA-VOCE EXAMINATION

This is to certify that the Professional Training Report (S84APT) is the work of **MONISHA MARTIN (40840009)** had undergone training in **CBRE SOUTH ASIA PVT. LTD.** and has been monitored by the continuous assessment during Nov 2021 to Jan 2022.

Dr. Devyani Gangopadhyay
HOD AND DEAN

Submitted for Viva voce Examination held on 1st February, 2022

Internal Examiner

(Ar. SUKIRTHA SURESH)

External Examiner

(Ar. HENA DAMODHARAN)



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DECLARATION

I **MONISHA MARTIN** hereby declare that this Professional Training Report for the period of **35 days from 23rd Nov, 2021 to 8th Jan, 2022** done by me under the guidance of **Mr. Karthick. T.K** is submitted in partial fulfillment of the requirements for the completion of practical training session.

DATE : 1st February, 2022

PLACE : Chennai

A handwritten signature in blue ink, appearing to read 'Monisha', is written over the signature line.

SIGNATURE OF CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to Board of Management of **SATHYABAMA INSTITUTE OF SCIENCE & TECHNOLOGY** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. Devyani Gangopadhyay Dean, School of building and Environment**, for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to **Mr. Karthick. T.K (Asst. General Manager), CBRE South Asia Pacific Pvt. Ltd.** for his valuable guidance, suggestions and constant encouragement paved way for the successful completion of my Training.

I would also like to express my sincere thanks to Ar. Sukirtha Suresh (Internal Co-Ordinator) for her valuable guidance, during the entire Professional Training period.

I wish to express my thanks to all Teaching and Non-teaching staff members of the Department of Architecture who were helpful in many ways for the completion of the project.

I also thank **Mr. Sivaji Gandham (Director) & Mr. Amit Shah (Associate Director), CBRE South Asia Pacific Pvt. Ltd.**, Block A, SP Infocity, Perungudi, Chennai – 96

CONFIRMATION LETTER & CONSOLIDATED CERTIFICATE (Experience)

CBRE

CBRE South Asia Pvt. Ltd.
7th Floor, DLF Square,
M Block, Jacaranda Marg,
DLF City Phase II,
Gurgaon - 122002.
T: 91 124 465 9700
F: 91 124 465 9800
www.cbre.co.in
newdelhi@cbre.co.in
CIN - U74140DL1999PTC100244

08-Nov-21

To

Monisha Martin
Address : 3/115A, Kumaran Kudil Main Road, Oggiam Thuraipakkam, Chennai – 600097
College : Sathybhama Institute of Science & Technology

Letter of Intent for Internship

We are pleased to select you for Internship on a project based in **Chennai** with our **PJM Advisory Occupier** team starting from 24-Nov-21 to 03-Jan-22.

Please note that company shall not be liable for any expenses incurred by you during the course of the internship project. You will be expected to submit your project report at the end of the project duration or as required by your supervisor.

We appreciate your time and wish you a great learning experience at CBRE.

For CBRE South Asia Pvt. Ltd.

Bhupendar Uniyal
Sr. General Manager – Human Resources

Regd. Office : PTI Building, Ground Floor, 4, Parliament Street, New Delhi – 110 001, India T: 91 11 4239 0200 F: 91 11 2331 7670

CBRE

CBRE South Asia Pvt. Ltd.
7th Floor, DLF Square,
M Block, Jacaranda Marg,
DLF City Phase II,
Gurgaon - 122002.
T: 91 124 465 9700
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www.cbre.co.in
newdelhi@cbre.co.in
CIN - U74140DL1999PTC100244

17-Jan-22

Monisha Martin
3/115A, Kumaran Kudil Main Road, Oggiam Thuraipakkam, Chennai – 600097

INTERNSHIP COMPLETION CERTIFICATE

This is to certify that Ms. **Monisha Martin** from Sathybhama Institute of Science & Technology has successfully completed her internship tenure with the Company as an Intern from 24-Nov-21 to 03-Jan-22.

She was associated with **PJM Advisory Occupier** department at CBRE, Chennai. During the period of internship program we found her punctual, dedicated and she had been exposed to different processes.

We wish her a bright future and best of luck for all her future endeavors.

For CBRE South Asia Pvt. Ltd.

Bhupendar Uniyal
Sr. General Manager – Human Resources

Regd. Office : PTI Building, Ground Floor, 4, Parliament Street, New Delhi – 110 001, India T: 91 11 4239 0200 F: 91 11 2331 7670

MONTHLY REPORT



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SCHOOL OF BUILDING & ENVIRONMENT, DEPARTMENT OF ARCHITECTURE
M. Arch (Building management) Batch 2020-2022
Continuous Assessment Report for Professional training

(Continuous progress report of the trainee architect/Project Manager for the period of 15 working days in the office to be submitted to HOD)

1. Name of the office / organization :	CBRE SOUTH ASIA PVT. LTD.
2. Address & Contact Number :	SP INFOCITY, PERUNGUDI; 044-66807000
3. Name of the student :	MONISHA MARTIN
4. Duration :	From 23 RD NOV, 2021 To 8 TH JAN, 2022
5. Total No. of days :	35 days
6. Evaluation of Performance criteria shall be on	

* Note: Kindly grade the student as per his/her overall performance in the office during the assessment month;

Description of works	Excellent	Good	Fair	Poor	NA
Understanding of office culture	✓				
Skillsets related to project management	✓				
Design Management		✓			
Understanding the Triple Constraints		✓			
Observation during Site Visits	✓				
Understanding of construction details	✓				
Understanding of Construction sequences	✓				
Site Supervision / Discussion with clients					✓
Adherence to Time schedule		✓			
Quantitative aptitude	✓				
Documentation skills	✓				
Coordination with other consultants					✓

Overall Grading*	EXCELLENT
------------------	-----------

(A – 8.0, B – 7.0, C – 6.0, D – 5.5, E – 5.0, F – <5)

7. Any other Remarks :

8. Signature of the
Head of the Office /
Organization (With Seal)

KARTHIUK

WORK DIARY

DAY	PROJECT NAME	WORK DONE	DAY	PROJECT NAME	WORK DONE
1	IT Park, Pallikarnai	Basic project details	14	IT Park, Pallikarnai	MIR, labour details
2	IT Park, Pallikarnai	Site visit	15	IT Park, Pallikarnai	Site visit- Reinforcement checking, cube test
3	IT Park, Pallikarnai	Toilet BOQ	16	IT Park, Pallikarnai	Batching plant, Dates Excel
4	IT Park, Pallikarnai	Toilet Scheduling	17	IT Park, Pallikarnai	DBR, Technical specification
5	IT Park, Pallikarnai	Toilet BOQ updated, Site visit	18	IT Park, Pallikarnai	Quality inspection on site
6	IT Park, Pallikarnai	Toilet scheduling, QA/QC – Fly ash testing	19	IT Park, Pallikarnai	Weekly report - safety
7	IT Park, Pallikarnai	Method statement, Cube testing	20	IT Park, Pallikarnai	Slab tracking
8	IT Park, Pallikarnai	MBBR septic tank quantity checking	21	IT Park, Pallikarnai	Drawing details – structural Pt etc.
9	IT Park, Pallikarnai	MBR quantity checking	22	IT Park, Pallikarnai	Site visit – quality checking
10	IT Park, Pallikarnai	Quality Management & safety plan	23	IT Park, Pallikarnai	MSP – Master schedule tracking
11	IT Park, Pallikarnai	Cube testing, MIR, Aggregate testing	24	IT Park, Pallikarnai	Site Document details
12	IT Park, Pallikarnai	Project risk, HIRA etc.	25	IT Park, Pallikarnai	Weekly report - Quality
13	IT Park, Pallikarnai	Weekly Report - progress	26	IT Park, Pallikarnai	Slab tracking, site visit

Chief Architect Signature:



KARTHIK

WORK DIARY

DAY	PROJECT NAME	WORK DONE
27	IT Park, Pallikarnai	Method statement – waterproofing etc.
28	IT Park, Pallikarnai	Site visit – waterproofing inspection
29	IT Park, Pallikarnai	MSP – master schedule tracking
30	IT Park, Pallikarnai	Slab tracking
31	IT Park, Pallikarnai	Site visit – progress update
32	IT Park, Pallikarnai	Weekly report - Progress
33	IT Park, Pallikarnai	Site visit – Quality inspection
34	IT Park, Pallikarnai	MSP – master schedule tracking
35	IT Park, Pallikarnai	Slab tracking, site visit

Chief Architect Signature:



KARTHIK

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	• Work method statement • Checklists • Quality testing plan • ITP • NCN	
16.	PLANNING	20
	• Typical cycle time	

	• Master schedule • Toilet zone BOQ – blockwork. Plastering, waterproofing • Toilet scheduling • Slab tracker • Labour details	
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1. GENERAL

I chose this firm since they have been established for many years and are known in the field of PMC. They have successfully dealt with many large-scale projects. This firm will help me understand the various aspects of PMC effectively & holistically. It guarantees an opportunity to touch upon different phases i.e. from project initiation to its closeout along with the time, cost, quality & safety parameters.

2. FIRM DETAILS

About the firm

- CBRE Group, Inc. is an American commercial real estate services.
- CBRE stands for Coldwell Banker Richard Ellis.
- It is the largest commercial real estate services company in the world.
- Provide the following services: Invest, Finance & Value, Plan, Lease & Occupy, Design & Build, Manage Properties & Portfolios, Transform Business Outcomes

History of the firm

India is CBRE's strategic regional hub with more than 10,000 professionals working together to provide our clients the best and most informed real estate solutions. As the world's largest commercial real estate services company, CBRE leverages our global perspectives and 27 years of experience in India to serve our local audience and help them achieve their real estate goals.

Mission Statement

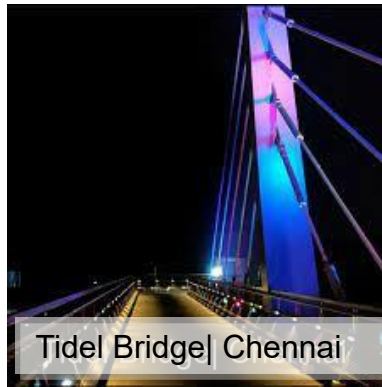
Leading full-service real estate services and investment organization in the world.

Vision Statement

Deliver superior outcomes for occupiers, residents and the communities in which we build. Deliver market-leading financial returns to our investment partners. Attract and retain top talent by upholding an entrepreneurial and rewarding work environment.

Highlight projects





Tidel Bridge| Chennai



Ramanujan IT Park| Chennai



SSN College| Chennai

Services include:

- Consulting
- Enterprise Facilities Management
- Leasing & Advisory
- Portfolio Services
- Project Management
- Transaction Management
- Valuation & Advisory Services

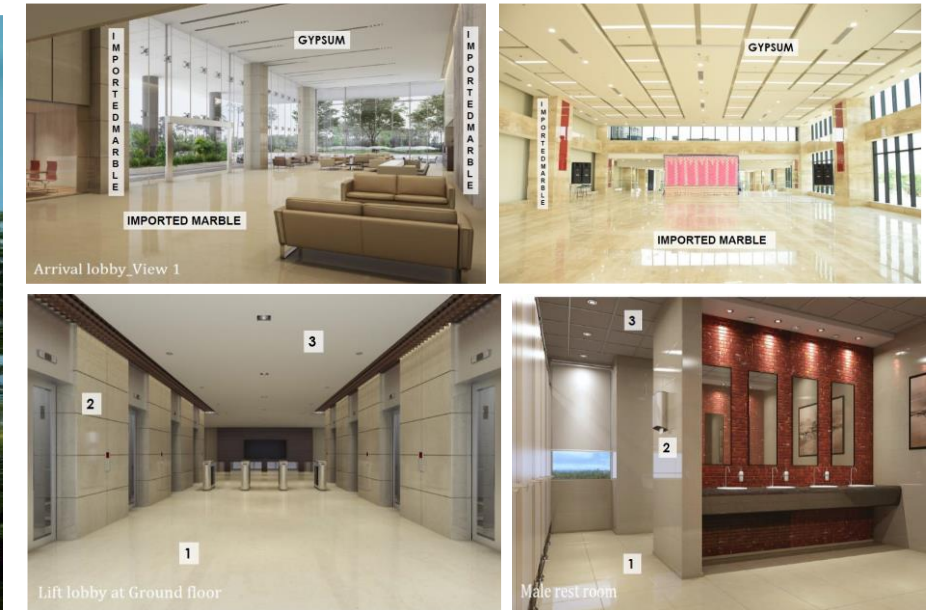
Milestones

- Fortune 500 company since 2008; ranked #122 in 2021
- Named one of the best large employers in America and one of the World's Best Employers. Also, a best employer for women and new graduates, and one of the top companies for diversity by Forbes

Achievements

- Best "Social Media Strategy" - Asia Pacific Association of Communications Directors (APACD)
- "Best Property Consultancy" - Asia Pacific Property Awards 2015
- Only commercial real estate services and investment company among the Most Admired for three consecutive years" - Fortune World's most Admired Companies 2015

3. PROJECT DETAILS



IT PARK | Chennai

LOCATION: Pallikarnai, Chennai

TYPE: Greenfield development – IT Park

CLIENT: K. Raheja Corp.

PMC: CBRE South Asia Pvt. Ltd

CONTRACTOR: SPCL (Shapoorji Pallonji & Company Private Limited)

DESIGN CONSULTANT: SPCL (Shapoorji Pallonji & Company Private Limited)

PEER REVIEW CONSULTANT: Design Tree Service Consultants, Bengaluru

SCOPE OF WORK: Civil, Structure & finishes, MEP/ common area services, external development & road work

Key site points

- Location: The proposed site is located near Velachery Main Road-Pallikaranai Road Junction adjacent to CTS & opposite to Dr. Kamachi Memorial hospital.
- Accessibility: Site is well connected to Velachery Main Road & Road-Pallikaranai Road. Also connected from another Public road access on the rear side of the Property. The Site area has heavy vehicles restrictions which are permitted only during night time.



Total plot area: 536224 sq. ft. (12.31 acres)

Total nos. of blocks: 3

Block 1

- 2 Basement + Stilt + Upper stilt 1, 2 & 3. (Parking space) +13 Upper Floors (Office Space)
- Floor to floor height (office): 3.90m
- Overall height: 68.80m (till terrace)

Blocks 2 & 3

- 3 Basement + Stilt + Upper stilt 1, 2 & 3 (Parking space) + 13 Upper Floors (Office Space)
- Floor to floor height (office): 3.90m
- Overall height: 68.80m (till terrace)

Parking details

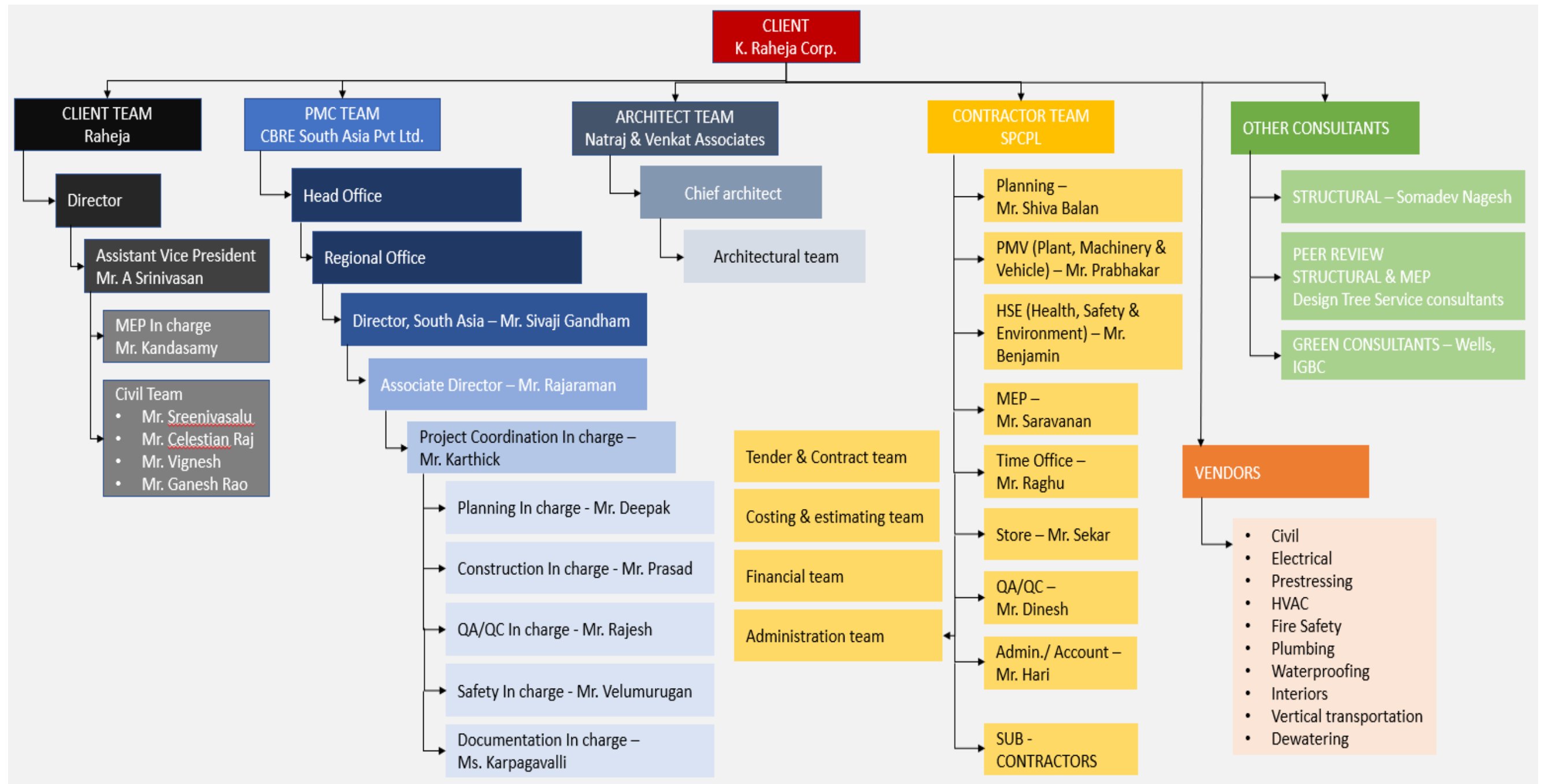
- Block 3 – 33 (Puzzle parking)
- Block 2 – 99 (Puzzle parking)
- Block 1 – 508 (314 stack + 194 Puzzle parking)

Intent:

- Efficient floor layouts, contemporary façade for the buildings, comply with all applicable statutory norms.
- Design to be universal design/accessible design friendly.
- Occupant load at 75 sq. Ft./person in the Super Built-up Area
- To utilize available FSI to the maximum (3.75)
- Rear portion –with exclusive access/frontage from Main Road -to be considered for SEZ development
- Target built-up area (BUA) to be 1 million sq. ft. (SEZ)
- Front Portion: Two independent buildings
- Parking: Mechanical parking –to be limited to meet statutory parking requirements.
- Iconic building(s) with extent of glazing (performance glass) limited to 30-35%
- Flood mitigation/preventive measures to be considered/incorporated.
- Overall design outcome shall meet industry standards for a Grade 'A' office building.



4.PROJECT TEAM ORGANIZATIONAL CHART

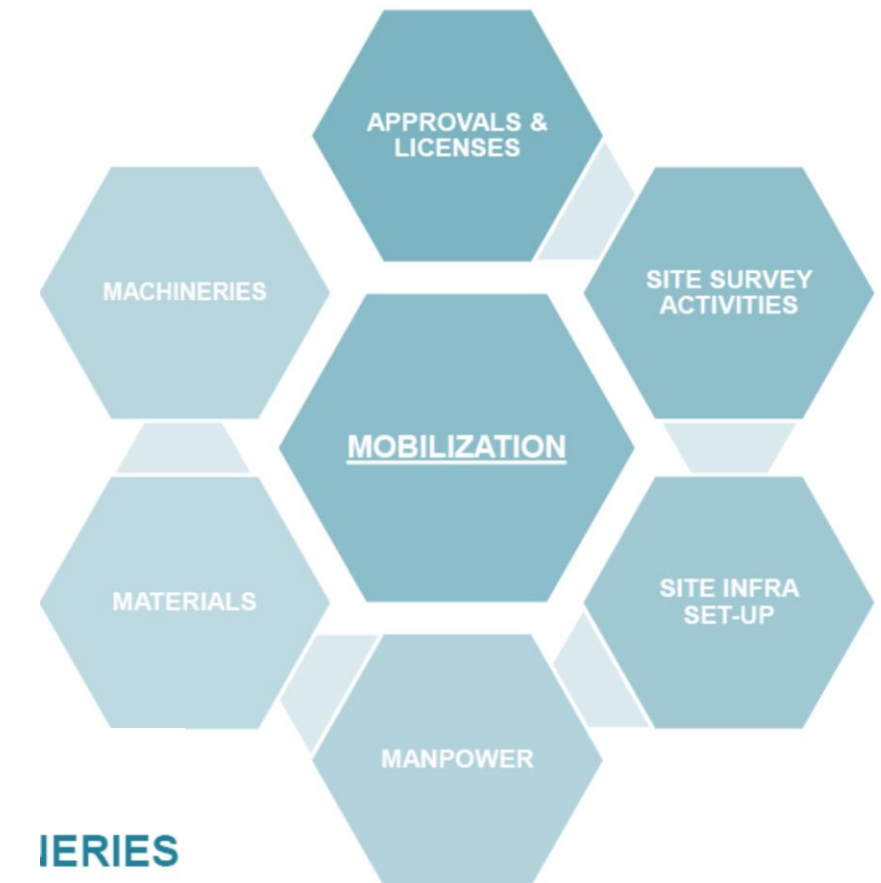


5.MOBILIZATION PLAN

Includes the following activities:

- Labour license
- Car policy
- Survey activities
- Site office set up
- Site area lighting
- QA/ QC lab set up
- Mobilization of staff
- Batching plant set up
- Labour colony set up
- Mobilization of labour
- Mobilization of formwork
- Mobilization of plant & machineries

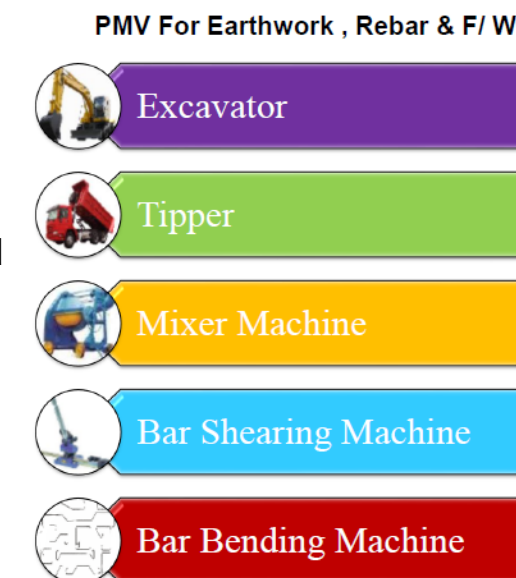
Block	Built-Up Area (SFT)	Carpet Area (SFT)	Leasable Area (SFT)
Block - 1 (2B + S + 3US + 13)	15,44,677	8,70,065	11,15,468
BASEMENT 02	1,10,255.65	-	-
BASEMENT 01	80,170.27	-	-
STILT	80,191.80	-	-
UPPER STILT - 1	71,182.33	-	-
UPPER STILT - 2	80,191.80	-	-
UPPER STILT - 3	80,191.80	-	-
TYPICAL LEVELS - 4F to 16F	10,42,493.40	8,70,064.91	11,15,467.86
Block - 2 (3B + S + 3P + 13)	9,68,689	5,15,542	6,60,951
BASEMENT 03	62,032.93	-	-
BASEMENT 02	60,386.04	-	-
BASEMENT 01	46,769.58	-	-
STILT	46,887.98	-	-
PARKING LEVELS - 1F	42,829.96	-	-
PARKING LEVELS - 2F	47,092.50	-	-
PARKING LEVELS - 3F	47,092.50	-	-
TYPICAL LEVELS - 4F TO 16F	6,15,700.80	5,15,541.78	6,60,950.94
Block - 3 (3B + S + 3P + 13)	9,59,621	5,12,270	6,56,756
BASEMENT 03	60,525.97	-	-
BASEMENT 02	60,525.97	-	-
BASEMENT 01	46,500.48	-	-
STILT	46,640.41	-	-
PARKING LEVELS - 1F	42,916.07	-	-
PARKING LEVELS - 2F	46,834.16	-	-
PARKING LEVELS - 3F	46,834.16	-	-
TYPICAL LEVELS - 4F TO 16F	6,08,844.13	5,12,269.55	6,56,755.84
Total Structure	34,72,988	18,97,876	24,33,175



Key challenges:

- Logistic Plan due to traffic restricted area
- Material, Labour & other resources movement plan
- Managing and maintaining the human resources for a longer duration (two shift basis) of time including staff and labour.
- Managing the sub-vendors for earthwork, PT works and waterproofing works
- Proposer method adopted for excavation & dewatering
- Outside disposal to be planned at night time only.

Area details



Other Equipment's



Mobilization plan – resources

Mobilization plan - key activities

S. No	Description	Nos
1	Construction Manager	01
2	Planning engineer	01
3	QA/QC Engineer	01
4	Safety Engineer	01
5	Foremen / supervisor	02
6	Admin/accounts	01
7	Store keeper	01
	Labor – All Category	50

Mobilization plan - PMV

Mobilization plan – Infrastructure
(Day 1 -Day 60)



Site Office



QA & QC Lab



Labour Camp



PMV and Formwork yard



Steel Yard



Stores and Godowns

6. SITE LOGISTICS PLANNING

To be planned based on the proper consideration of area required and location for the following:

- Site office
- Stores
- Batching plant
- Formwork yard
- Reinforcement yard
- Labour colony
- QA/QC lab / safety room
- Entry gate etc.,

Plant & machinery plan (during peak period):

Concreting:

- Concrete Batching Plant: 60m³/Hr.
- Static boom Placer: 01
- Transit Mixer: 06
- Tower Crane: 02
- Builder Hoist: 02
- Passenger Hoist: 02
- JCB: 01
- Curing: Pneumatic system

Reinforcement

- Bar Shearing Machine: 03
- Bar Bending Machine: 03
- Stirrups making machine: 01
- Wood cutting & planner: 02



ZONE-1: Phasing considered basement & Block 3.
ZONE 2: Phasing considered basement & Block
ZONE 3: Block 1 area.

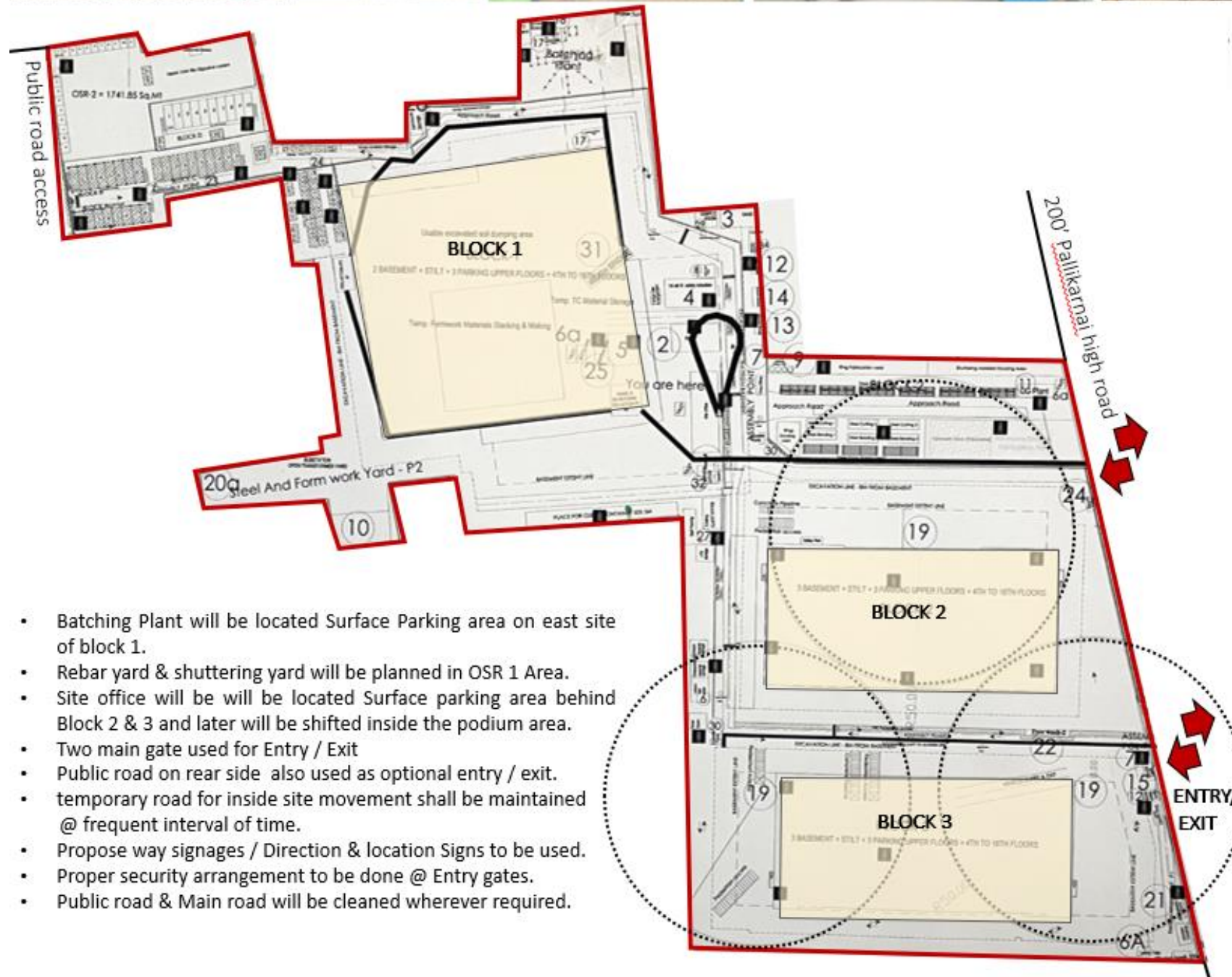


Construction power

- EB Power Max 750 KVA
- DG

Others

- Lab Equipment: Lot
- LCV: 03



- Batching Plant will be located Surface Parking area on east site of block 1.
- Rebar yard & shuttering yard will be planned in OSR 1 Area.
- Site office will be located Surface parking area behind Block 2 & 3 and later will be shifted inside the podium area.
- Two main gate used for Entry / Exit
- Public road on rear side also used as optional entry / exit.
- temporary road for inside site movement shall be maintained @ frequent interval of time.
- Propose way signages / Direction & location Signs to be used.
- Proper security arrangement to be done @ Entry gates.
- Public road & Main road will be cleaned wherever required.

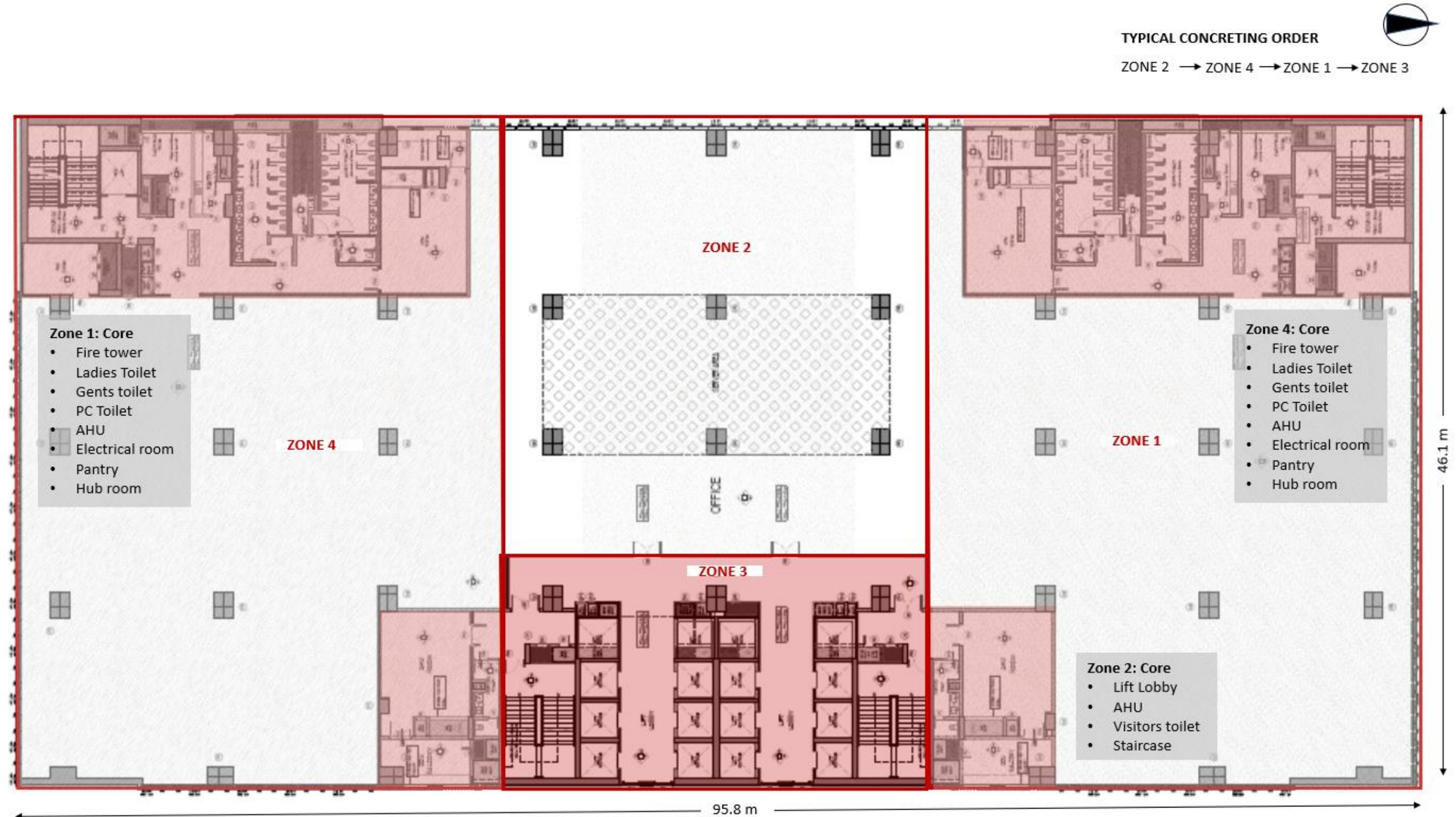
LEGEND

1. Site office
2. Store
3. QA/QC
4. 1st Aid & induction room
5. P&M/ workshop
6. Labour rest room
7. Assembly point
8. Ambulance parking
9. Drinking water
10. Construction waste yard
11. DG room
12. Diesel storage
13. Chemical storage
14. Cement godown
15. Admin
16. Visitor parkin
17. Sedimentation tank
18. Batching plant
19. Tower crane
20. Form work yard
21. Scrap yard for reinforcement
22. Steel yard
23. Tyre wash
24. Labour camp
25. Security
26. Hazardous waste
27. Fire points
28. Temp. tower crane materials storage
29. Staff parking
30. Admixture storage
31. Sample room
32. Concrete pump
33. Weigh bridge
34. Owners office
35. Aluminium welding shed
36. Cylinder storage



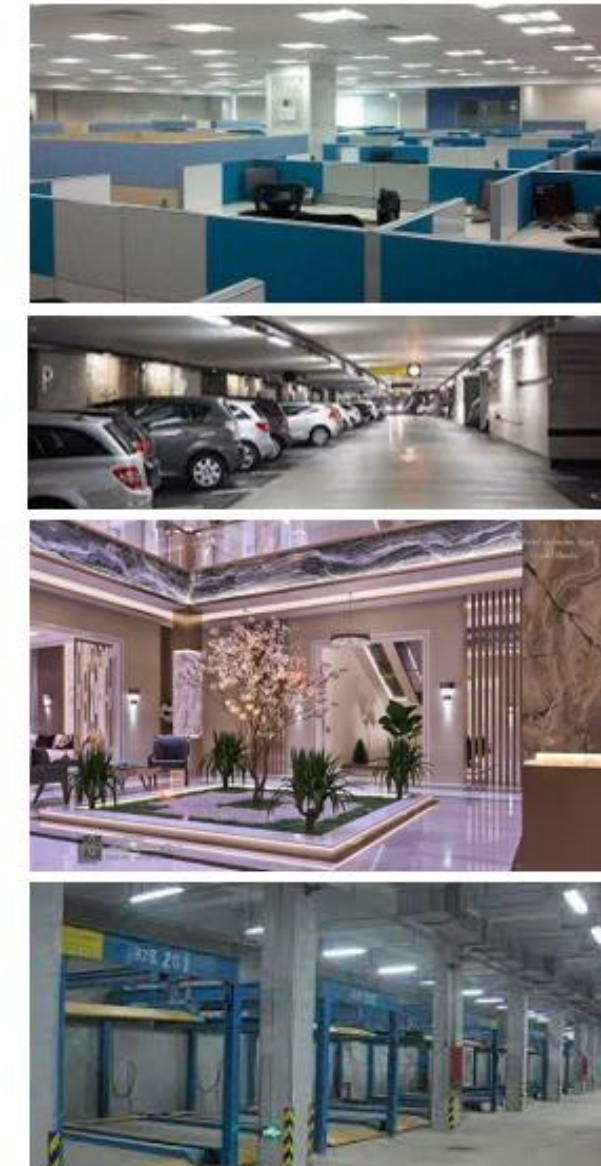
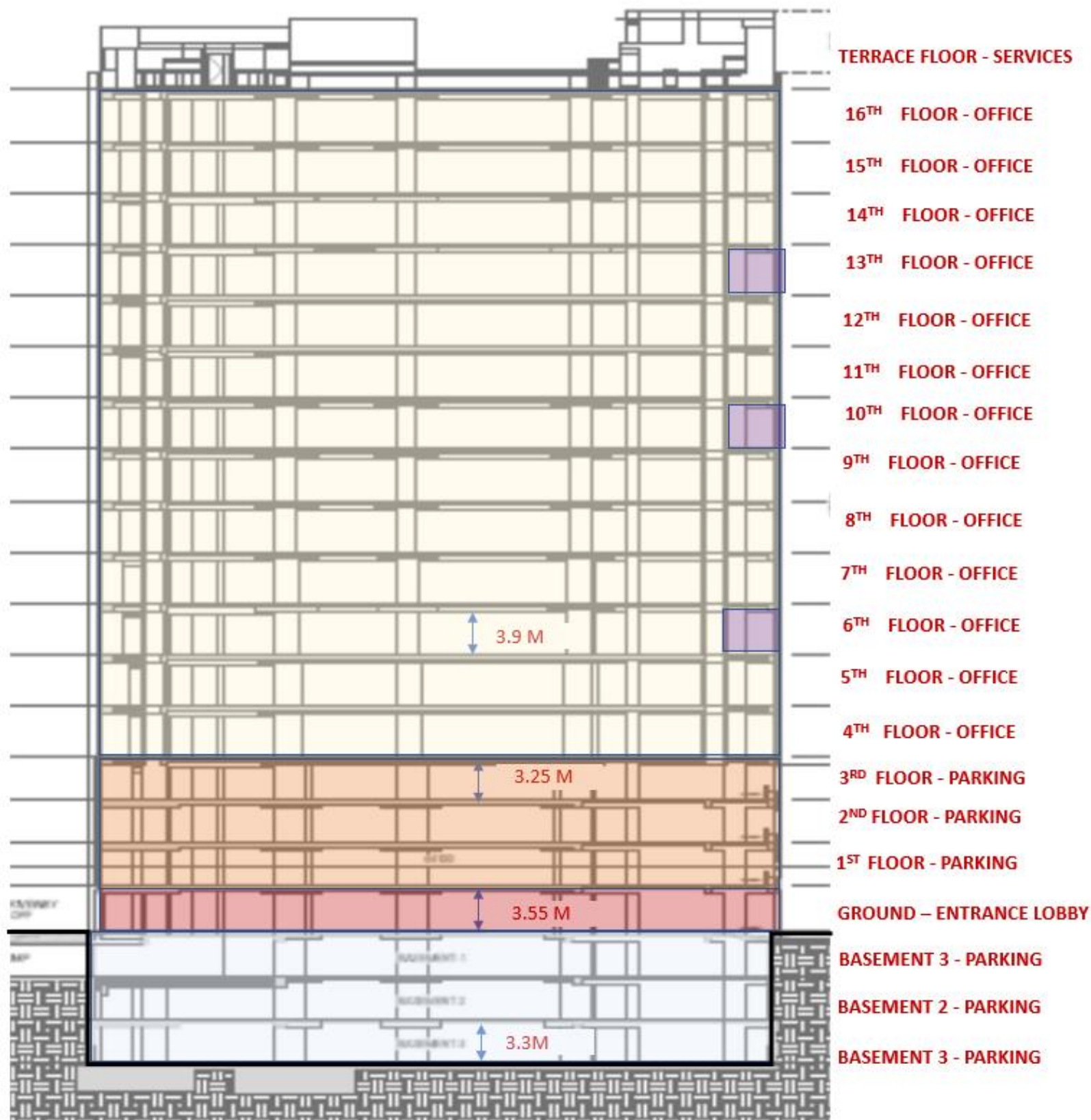
Site logistic plan

7. TYPICAL FLOOR PLAN



Typical floor plan

8. CONCEPTUAL SECTION



LEGEND

	Refuge area
	Office area
	Parking area
	Entrance lobby area
	Puzzle basement Parking area

9. ESSENTIAL DOCUMENTS & DETAILS

 1. PROJECT INITIATION • Email – LOI • PO • Agreement • Execution plan • Schedule	 5. COST MANGEMENT • Cost plan – budget • BOQ • Pre – tender estimate • Technical specifications	 9. CONTRACT MANAGEMENT • Statutory documents managed by client appointed agency • Advance bank guarantee • Performance retention • Vendor payment tracker • Change control management • Contractual notices • Extension of time	
 2. CLIENT DOCUMENTS • Client approvals • Client deliverables	 6. PROCUREMENT MANAGEMENT • Vendor shortlisting • Approved GCC • Tender documents • Bid receipt • Negotiation & comparatives • Final recommendations • LOI – PO Contract agreement	 10. POST CONSTRUCTION • Completion Certificates • Snag list • AMC Contracts • Attic list • As built drawings • Asset list • HOTO (Handing Over & Taking Over) certificate • FM training	 12. REPORTS • Project status report • Other reports
 3. AGENDA & MOM • General • Procurement • Design coordination • Progress review client • Progress review vendor • OHSE review	 7. SITE MAMANGEMENT • GFC drawings • Shop drawings • RFI • Progress management • Quality management • OHSE management	 11. PROJECT CLOSEOUTS • Project closeout report • Final document transmittal • Lessons learnt • Value additions • Case study	 13. AUDITS • BSI • internal • Corporate compliance
 4. DESIGN MANAGEMENT • Design preliminaries • Tender drawings • Detailed drawings • Consultant deliverables tracker	 8. TESTING & COMMISSIONING REPORTS		 14. INVOICE MANGEMENT • Monthly payments • Milestone Payments

10. STATUTORY APPROVALS & REQUIREMENTS

Statutory approvals

- CTE (Concern to Establish)
- Fire NOC & License
- Electrical license
- Pollution control board license
- Mining permit
- CMDA approval
- CPO (Concern to Operate)

Statutory requirements for workers at site

- Statutory compliance
 - CLA (Contractor Labour Licence & Act, 1970)
 - ISMA (Inter State Migrant Workman Act, 1979)
- BOCW (Building & other Construction Work Act, 2019)
- WCP (Workman Compensation Policy)
- CAR (Contractor All Risk Policy)
- Marine Cargo Policy
- 3rd party Liability
- PF (Provident Fund) / ESI (Employee State Insurance)

Detail	Grade of concrete
Footing & raft slab	M 35
Retaining wall	M 30
Column grade – B3 to 1 st	M 60
Column grade – 2 nd to 6 th	M 55
Column grade – 7 th to 11 th	M 50
Column grade – 12 th to Terrace	M 45
Slab & beam	M 35
Staircase	M 30
Raft & RCC Wall	M 30
Auxiliary Building	M 25
Grade slab	M 20
PCC	M 10

11. DETAILS AT A GLANCE

Technical specifications

- Civil & finishing works
- Façade
- Electrical works
- Diesel generator
- IBMS
- PHE works
- Fire protection system
- Fire detection system
- HVAC system
- Basement ventilation

DBR (Design Brief Report)

- Structural – RCC
- Structural – PT Works
- Architectural
- Facade

Finishing details

- Toilets: Vitrified tiles
- Lift Lobby floors: Marble
- Lift Lobby walls: Vitrified tiles
- Lift jambs & wall strips: Marble

Façade details (Major glazed area)

- Typical floor façade: Unitized curtain wall system
- Aluminum louvers: Z type louver
- Spider glazing: Point support with glass fin
- Cladding: ACP, granite, Texture paint

12. ESSENTIAL DRAWINGS & DETAILS

Architectural drawings

1. Schematic drawings
2. Approval drawing
3. Tender drawings
4. Setting out drawing
5. Working drawings
 - Site plan
 - Floor plans
 - Elevations
 - Sections
 - Detail drawings
 - Schedule of joinery
 - Finishing schedule
 - Façade details
 - Toilet details
 - Lift lobby details etc.
6. Service details – OHT, STP etc.

External development Drawings

1. Compound wall details
2. DG details – block wise
3. Transformer details – block wise

Structural drawings – RCC

1. DBR (Design Basis Report)
2. General notes
3. Foundation
 - Layout & RCC Details of foundation
 - Typical section details
 - Layout of shear reinforcement
 - Layout of retaining wall
 - RCC Details of Retaining wall
4. Layout of shear walls – floor wise
5. Column layouts – floor wise
6. Layout & RCC details of Ramps, staircase
7. RCC details of beams – floor wise
8. RCC details of slabs – floor wise
9. Layout & RCC details of OHT
10. Layout & RCC details of UG Tank
11. Layout & RCC details of STP
12. Layout & details of canopy

MEP drawings

1. Shop drawings
2. Material TDS (Technical Data Sheet)
3. Coordination drawings - floor wise
4. GFC Drawings - floor wise

Structural drawings – PT

1. Prestressing general Notes
2. Floor wise details
 - Floor layout
 - Floor reinforcement detail
 - Floor reinforcement & section detail
 - Tendon layout
 - Tendon profiles

PMC details

1. Master schedule
2. Project tracking
3. Cash flow details
4. Concrete consumption report
5. Tender & contract details
6. Resource schedule
 - Labour
 - Equipment
7. Project status report – weekly, monthly progress reports, MOM
8. List of drawings
9. Billing
10. Quality
 - Method statement
 - Quality Assurance plan
 - Inspection testing plan
 - Material inspection & testing plan
 - Material test certificates (MTC)
 - NCN
 - Site Notice
11. Safety
 - Project safety plan
 - Aspect impact analysis
 - Emergency preparedness plan
 - Pre-task analysis
 - NCN

13. SITE MANAGEMENT

Effective site management

1. Be an early beginner
2. Stop, think & proceed
3. Organize yourself – site office & the site
4. Issue minutes & reports on time
5. Check quality
6. Check safety
7. Communication with stakeholders
8. Make & track project schedule in MSP
9. Design issues
10. Ethics & compliance

Safety rules for following:

1. Access the risk & protect yourself before you begin work
2. Before lifting & handling
3. Before starting “live” electrical works
4. When you work at height
5. Before commencing hot works
6. Before working in confined space
7. When driving
8. Lock out/ tag out (LOTO) before working on energized systems

Mock up list

- Layout with spec.
- Mock up area to be clean, well lit & clear access
- All MEP services required for mock up to be installed
- Should not have any incomplete works
- Should represent best workmanship
- Set of drawings to be available
- Important parts/ spec. to be suitable labelled
- Alternate makes to be available for comparison
- Adequate refreshments etc. to be available for long duration inspections

Site visit guidelines

1. Pre-planning before visit

- Ensure approval from authorized clients
- Confirm following information:
 - PMC team accompanying visitors
 - If formal project update required
 - Mock up review required

2. Organize

- Identify & assign roles & responsibility for:
 - Presentation of meeting
 - PMC team participants
 - Site tour
 - Walkthrough path
 - OHSE & Induction
 - Restriction of site works & labour movement during walkthrough
 - Latest & complete set of drawings, schedule, Cost updates etc.

3. Infrastructural requirement

- Identify & assign roles & responsibility for:
 - Presentation of meeting
 - PMC team participants
 - Site tour
 - Walkthrough path
 - OHSE & Induction
 - Restriction of site works & labour movement during walkthrough
 - Latest & complete set of drawings, schedule, Cost updates etc.

4. Site safety induction

- Project & scope of works
- OHSE (Occupational Health, Safety & Environment) Statistical update
- PMC Environmental & safety policy brief
- Potential risk in working areas
- Precautions to be taken
- First Aid arrangement
- Fire escape arrangements & safe assembly area

5. Security requirements

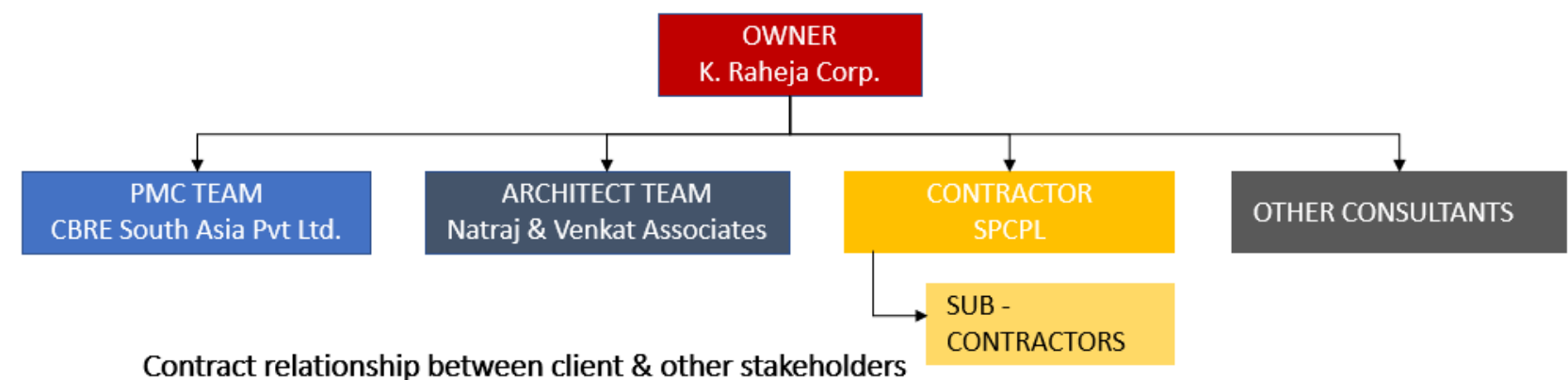
- Main security area
- Issue of temporary pass
- Site induction room
- Issue of personal protection equipment
- Security of VIP belongings

6. Dry run

- Conduct dry run to check site condition minimum 3 hrs. prior VIP insuring:
 - Who receives the guest
 - Infrastructure availability & in usable condition
 - Person to accompany VIP on site walk
 - OHSE & site induction
 - Refer Mock up list

14. CONTRACT DETAILS

- **Type:** Design Built contract
- **Duration:** 2 years
- **Actuals:** Cement & Steel
- **Penalties:** Time delay, NCR
- **Block- 2 budget:** 250 crores approx.



Design Built contract:

A legal contract where the contractor is responsible for design as well as construction of the project.

Design vetted by Client & 3rd party consultant to ensure all codal requirements are met

- **Client:** Only interested in the output of the project,
Gives the necessary inputs & requirements for the project
All approvals are their responsibilities
- **Contractor:** Full responsibility of delivering such type of contract lies with the contractor
Develops detailed design & get client approval
Costing for materials, equipments, labour etc to be considered for the entire project duration
All IS codes & statutory norms to be followed
- **Peer Review:** To verify the contractor's design etc

Disadvantages

- Conflict of interest
- Challenging to adapt to new changes
- Dependency with single vendor

Advantages

- No item wise/ piece rate work
- Compliance to latest codes
- Optimum design
- Transparent & clean process
- Lesser supervision required

15. QUALITY MANAGEMENT PLAN**WORK METHOD STATEMENT**

for some of the activities:

- Light weight block masonry
- Crack treatment on RCC slab
- Tremix (VDF – Vacuum Dewatered Flooring) flooring
- Whitewash
- Excavation
- Anti-Termite treatment
- Formwork
- Reinforcement
- PCC
- Pour card
- After concreting
- Block masonry
- External plastering
- Internal plastering
- Tiling
- Backfilling
- Toilet waterproofing etc

WORK METHOD STATEMENT FOR WHITEWASH WORK

- **Scope**
 - Detailed & clear procedure to understand & implement by all concerned Employees & sub - contractors
- **References**
 - Technical Specifications
 - Relevant GFC drawings
 - Relevant IS Standards
 - Relevant HSEM procedures
 - Site work activity checklist
- **Control measures**
 - HSE Procedures
 - Use of PPE's
 - General Housekeeping
- **Work Methodology**
 - Before application steps
 - During application steps
- **Inspection procedure**
 - Check for latest GFC
 - Check for availability of material required for whitewashing
 - Check for availability of tools, tackles & machinery for white wash
 - Check for PT tendon Low profile marking with red paint
 - Check for second coat
 - Check for MEP services completion

- **Resources available – Material/ Plant & Equipment**

- Roller or Brush
- Lime powder for white wash
- Cleaning tools

- **Health & safety hazard assessment**

Identified possible hazards are as follows:

- Lack of Attentiveness, knowledge & fitness

- Fall of materials or person

All HSE requirements are followed in accordance with safety plan & policies:

- Signages & barricades requirements are identified and implemented
- Area lighting will be provided for night works
- First Aid box will be provided at the site office
- Good housekeeping shall be ensured

Checklists for:

- Light weight block masonry
- Crack treatment on RCC slab
- Tremix (VDF – vacuum dewatered flooring) flooring
- Whitewash
- Excavation
- Anti-Termite treatment
- Formwork
- Reinforcement
- PCC
- Pour card
- After concreting
- Block masonry
- External plastering
- Internal plastering
- Tiling
- Backfilling
- Toilet waterproofing etc

Checklist for whitewash

S.No	Description	YES	NO	NA	Date	Contractor	PMC/ Client	Remarks
	Referred to approved work method statement for painting							
1	Are all the safety norms being covered as per HSEM process							
2	Is the mock up approved							
3	Is the white wash area free from dead mortar, dirt, dust, algae, grease etc (masking tapes at joints/ corners)							
4	Check for rectifications of surface defects if any							
5	Is the PT Low Profile tendon marks identified							
6	Check for application of first coat & evenness/ uniformity of the first coat							
7	Check for PT Low Profile Tendon marking completion for the planned area							
8	Check for Application of second coat & evenness/ uniformity of the second coat							
9	Check for MEP work clearance for final coat							
10	Check for application of Final coat & evenness/ uniformity of the final coat							

MIR (Material Inspection Report)

DATE	MIR NO	DESCRIPTION	SUPPLIER	QUANTITY (Nos.)	ACCEPTED/ REJECTED/ HOLD
24.11.21	1426	Solid Block 8"	Sri Sabari Fabs	600	Accepted
26.11.21	1431	Solid Block 150mm	Sri Sabari Fabs	500	Accepted
26.11.21	1432	AAC Block 150mm	The Metal Powder Company Ltd.	800	Accepted
23.11.21	1429	AAC Block 150mm	The Metal Powder Company Ltd.	800	Accepted

Quality testing plan

For the following:

- Water
- Cement OPC 53 grade
- Cement PPC
- Fly ash
- M Sand
- Coarse Aggregate
- Chemical admixtures
- Hardened & fresh concrete
- Reinforcement Steel
- Soil (Backfilling, subgrade & Embankment)
- Plywood for shuttering
- Concrete blocks
- AAC blocks
- Tiles
- Paver blocks
- Glass
- Waterproofing material
- Expansion joint material
- Granites & marble
- Façade etc

Few TESTS on site



20 mm Coarse Aggregate testing Dry Sieve test analysis – 20mm, 10mm, 4.75mm



Fly ash | Wet 45 micron sieve analysis test



Cube test | 6 cubes/ element @ 7 days (2/3rd strength) & 28 days (100% strength)



Few tests conducted on site

S.NO.	MATERIAL	APPROVED MAKES	TYPE OF TEST	TEST REQUIRED	SPECIFICATION	ACCEPTANCE CRITERIA	FORMAT OF RECORDS	TESTING FREQUENCY		RESPONSIBILITY	
								IN HOUSE LAB TEST	3 RD PARTY LAB TEST	CONTRACTOR	PMC
1.	Coarse aggregate	-	Physical test	Sieve analysis	IS 383 IS 2386 (PART 1)	As per IS 383, table 7	Internal lab test report & 3 rd party test report	Weekly once	Once initial per source	check	Random
				Water absorption	IS 383 IS 23866 (PART 3)	As per IS 383, 2016, table 3		Monthly once			
				Specific gravity	IS 383 2386 (PART 3)	As per IS 383, 2016, table 3					
				Bulk density	IS 383 2386 (PART 3)	As actual					
				Moisture content	IS 383 2386 (PART 3)	As actual		Daily basis			
				Flakiness& elongation index	IS 383 2386 (PART 1)	As per IS 383, 2016, not exceed 40%		Monthly once	N/A		
				Soundness test	IS 383 2386 (PART 5)	Aggregate value shall not exceed 12%		N/A	Once initial per source	Review	review
				Aggregate Impact value	IS 383 2386 (PART 4)	Aggregate impact value shall not exceed 45%		Monthly once		Check	random

ITP (Inspection & Testing Plan)

S.No	Activity	Inspections & tests to be conducted	Mode	Site Engineer/ in charge	QC Engineer	PMC	Acceptance criteria	Record
1	Survey works	a. Survey instrument calibration	Site inspection	M	M	M	To be calibrated	Report
		b. Boundary & building setting out i) Benchmarks, reference pillars, Closing of traverse, Coordination		M	M	M	As per drgs.	Checklist
		c. Alignment, levels		M	M	M		

NOTE: All finishing activity mock-up will be done & same get approval from PMC before proceeding the activity

Legend: M - Mandatory, R - Random, W - Witness

INSPECTION & TESTING PLAN for:

- Survey works
- Excavation
- Rock Anchoring
- Anti – termite Treatment
- PCC
- Water proofing
- Backfilling
- Raft, Slab, Wall, Column
- Post tensioning works
- Curing
- Block work masonry
- Plastering
- Painting
- Tiling
- Granite works



Photo of the NC

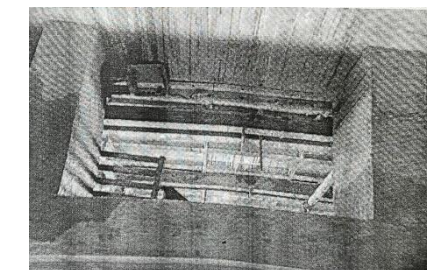


Photo after corrective action

NCN closed after reviewing the corrective action

NCN (Non-Conformance Notice)

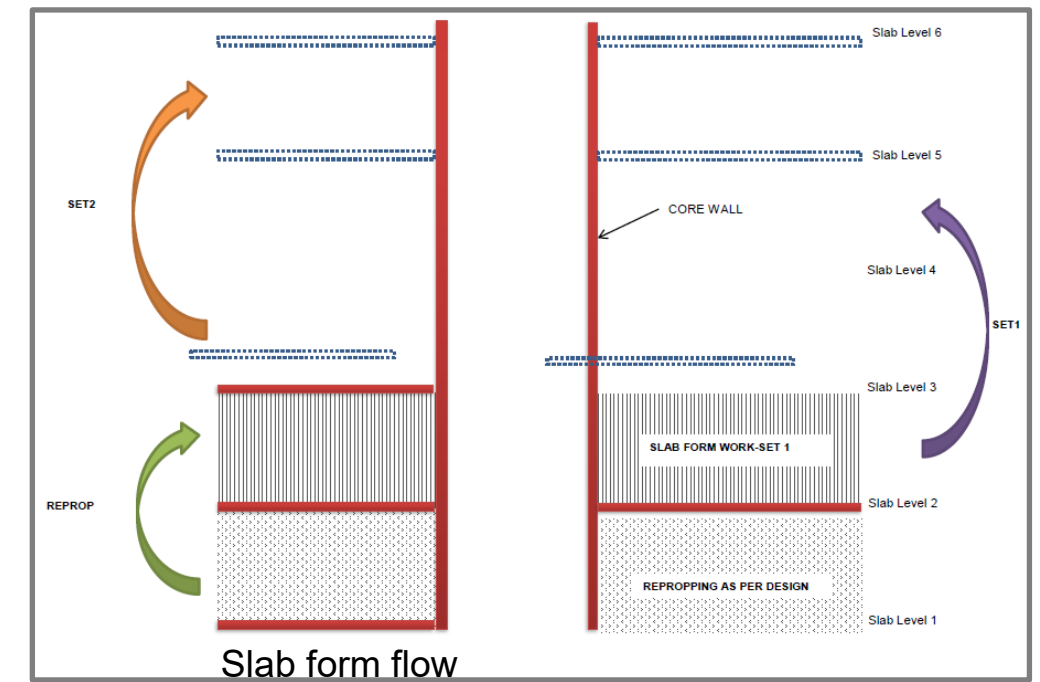
- Following item(s) is/ are in non – compliance with the Contract Documents.
- Corrective action is to taken immediately.
- If applicable, until the corrective action is completed, no monies may be paid for the item(s) and the cost of all corrective action shall be borne by the Contractor as per the provisions of the Contract.
- Attachments:
 - Photographs
 - Site Notes
 - MOM's
 - Other references

Block: Block 2	Level: 6 th floor	Grid: Grid between 40 – 27 & L to P
Drawing Ref:		Specification Ref:
NC Description: Soffit beam noticed with very poor finish, more honeycomb, no proper alignment, shuttering sheets are stuck inside concrete. This needs to be rectified properly.		
PMC Suggestion: Rectification to be done at the earliest as per approved methodology.		
CONTRACTOR'S CORRECTIVE ACTION PROPOSAL: 1. Honeycombing rectified as per our methodology 2. Will ensure cleaning of shuttering boards & proper compaction of concrete & regular toolbox to be given to work force.		

16. PLANNING & PROGRESS

Cycle time for basement slab pour

BASEMENT SLAB - -25 DAYS TYPICAL POUR CYCLE FOR EACH FLOOR WITH PT SLAB SYSTEM																											
Sr.No.	Activity	Days																									
		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	
	First Slab																										
1	SURVEYING																										
2	COLUMN STATER																										
	COLUMN REBAR																										
	COLUMN SHUTTERING																										
	CONCRETE																										
3	BEAM BOTTOM STAGING																										
	BEAM BOTTOM/SIDES REBAR																										
4	SLAB SHUTTERING																										
	SLAB REBAR																										
5	PT TENDONS LAYING																										
8	INSPECTION																										
9	CONCRETE																										



Cycle time for typical floor -slab pour (typical)

TYPICAL FLOOR SLAB- -17 DAYS TYPICAL POUR CYCLE FOR EACH FLOOR WITH PT SLAB SYSTEM																	
ACTIVITY	No of Days																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Typical Slab -Pour Cycle time																	
COLUMN																	
Concrete																	
SLAB																	
Staging Erection																	
Decking Of Slab																	
Inside Beam Side Fixing																	
Reinforcement Of Beams & Slabs																	
Checking and Concrete																	

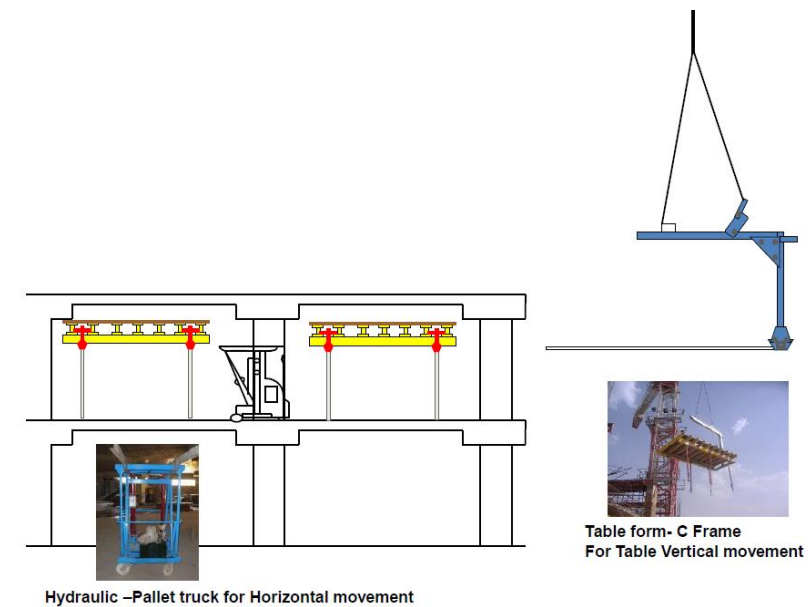


Table movement using C – frame

Master schedule

	Task Mode ▾	Task Name ▾	Duration ▾	Start ▾	Finish ▾	% Comple ▾
1	👉	Commerzone IT Park, Pallikaranai	1230.2 days	Mon 17-06-19	Sat 01-10-22	48%
2	👉	Project Dates	1230.2 days	Mon 17-06-19	Sat 01-10-22	0%
6	👉	Engineering works	945.44 days	Mon 17-06-19	Tue 28-12-21	99%
795	👉	Agency Finalization/Major SD's	974.4 days	Mon 17-06-19	Tue 25-01-22	86%
828	👉	Procurement	1131.4 days	Thu 04-07-19	Thu 14-07-22	14%
1314	👉	Construction Phase	1220.4 days	Mon 17-06-19	Wed 21-09-22	26%
3676	👉	Testing and Commissioning	37.8 days	Thu 25-08-22	Sat 01-10-22	0%
3696	👉	Snagging & Desnagging	30 days	Tue 30-08-22	Wed 28-09-22	0%
3699	👉	Statutory Approvals	35 days	Mon 29-08-22	Sat 01-10-22	0%

Floor wise slab casting dates

S.NO.	Floor	Description	RCC (Completion dates)				
			Slab casting				
			Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
1	Basement 3	Parking Space	06.02.20	25.01.20	06.02.20		
2	Basement 2	Parking Space	12.03.20	14.02.20	18.03.20	20.03.20	21.03.20
3	Basement 1	Parking Space	08.08.20	08.03.20	13.08.20	06.07.20	28.09.20
4	Stilt	Parking Space	22.01.21	09.09.20	11.12.20	11.10.20	02.11.20
5	1st floor	Parking Space	28.02.21	18.01.21	23.02.21	29.12.20	
6	2nd floor	Parking Space	13.04.21	29.01.21	31.03.21	30.01.21	
7	3rd floor	Parking Space	26.05.21	19.02.21	06.05.21	27.02.21	
8	4th floor	Office Space	23.06.21	22.05.21	26.06.21	22.03.21	
9	5th floor	Office Space	22.07.21	05.07.21	04.08.21	27.04.21	
10	6th floor	Office Space	20.08.21	29.07.21	25.08.21	06.08.21	
11	7th floor	Office Space	17.09.21	23.08.21	25.09.21	07.09.21	
12	8th floor	Office Space	15.10.21	18.09.21	29.10.21	02.10.21	
13	9th floor	Office Space	01.12.21	17.11.21	03.12.21	22.11.21	
14	10th floor	Office Space	18.12.21	08.12.21	21.12.21	14.12.21	
15	11th floor	Office Space	05.01.22	25.12.21	07.01.22	31.12.21	
16	12th floor	Office Space	22.01.22	12.01.22	25.01.22	18.01.22	
17	13th floor	Office Space	09.02.22	29.01.22	11.02.22	04.02.22	
18	14th floor	Office Space	26.02.22	16.02.22	01.03.22	22.02.22	
19	15th floor	Office Space	16.03.22	05.03.22	18.03.22	11.03.22	
20	16th floor	Office Space	02.04.22	23.03.22	05.04.22	29.03.22	
21	Terrace floor		20.04.22	09.04.22	22.04.22	15.04.22	

4th floor toilet blockwork quantity

SI No.	Description of work	Unit	Quantity						
			L (m)	Beam depth (m)	Floor to floor height (m)	H (m)	Area (sqm)	Deletion (sqm)	Total Area (sqm)
1	ZONE 1								
1.1	Gents Toilet								
	200mm thk - North	Sqm	6.05	0.70	3.90	3.20	19.36		19.36
	West	Sqm	4.075	0.95	3.90	2.95	12.02125		12.02
	South	Sqm	4.325	0.60	3.90	3.30	14.2725		14.27
	150 mm thk - South	Sqm	4.75	0.60	3.90	3.30	15.675		15.68
	East	Sqm	4.36	0.70	3.90	3.20	13.952	3.00	10.95
	North	Sqm	1.95	0.00	3.90	3.90	7.605	3.00	4.61
	West	Sqm	2.315	0.00	3.90	3.90	9.0285		9.03
	Ledge wall 150 mm thk, 1.2m ht	Sqm	10.7			1.20	12.84		12.84
	Ledge wall 75 mm thk, 1.2m ht	Sqm	4.975			1.20	5.97		5.97
1.2	Janitor								
	150mm thk - East	Sqm	1.455	0.00	3.90	3.90	5.6745	1.8	3.87
	South	Sqm	2.95	0.60	3.90	3.30	9.735		9.74
	West	Sqm	1.55	0.45	3.90	3.45	5.3475	1.872	3.48
1.3	Ladies Toilet								
	200mm thk - North	Sqm	4.4	0.60	3.90	3.30	14.52		14.52
	West	Sqm	4.2	0.95	3.90	2.95	12.39		12.39
	South	Sqm	5.6	0.70	3.90	3.20	17.92		17.92
	150 mm thk - West	Sqm	1.455	0.00	3.90	3.90	5.6745		5.67
	East	Sqm	6.525	0.00	3.90	3.90	25.4475		25.45
	North	Sqm	1.45	0.00	3.90	3.90	5.655	3	2.66
	Ledge wall 150 mm thk, 1.2m ht	Sqm	8.675			1.20	10.41		10.41
	Ledge wall 75 mm thk, 1.2m ht	Sqm	3.55			1.20	4.26		4.26
1.4	PC Toilet								
	200mm thk - South	Sqm	1.95	0.70	3.90	3.20	6.24		6.24
	East	Sqm	2.65	0.70	3.90	3.20	8.48		8.48
	North	Sqm	1.775	0.00	3.90	3.90	6.9225	2.52	4.40
	Ledge wall 150 mm thk, 1.2m ht	Sqm	1.785	0.00	3.90	1.20	2.142		2.142
2	ZONE 2								
2.1	Visitor's toilet 1								
	200mm thk - North	Sqm	4.05	0.60	3.90	3.30	13.365		13.37
	East	Sqm	1.8	0.60	3.90	3.30	5.94		5.94
	100mm thk - East	Sqm	1.8	0.00	3.90	3.90	7.02	1.8	5.22
	West	Sqm	1.8	0.60	3.90	3.30	5.94	2.34	3.6
	North	Sqm	2.4	0.00	3.90	3.90	9.36		9.36

2.2	Ledge wall 150 mm thk, 1.2m ht	Sqm	1.2			1.20	1.44		1.44
	Ledge wall 75 mm thk, 1.2m ht	Sqm	1.8			1.20	2.16		2.16
	Visitor's toilet 2								
	200mm thk - South	Sqm	4.05	0.60	3.90	3.30	13.365		13.37
	West	Sqm	1.8	0.60	3.90	3.30	5.94		5.94
	100mm thk - West	Sqm	1.8	0.00	3.90	3.90	7.02	1.8	5.22
	East	Sqm	1.8	0.60	3.90	3.30	5.94	2.34	3.6
	South	Sqm	2.4	0.00	3.90	3.90	9.36		9.36
	Ledge wall 150 mm thk, 1.2m ht	Sqm	1.2			1.20	1.44		1.44
	Ledge wall 75 mm thk, 1.2m ht	Sqm	1.8			1.20	2.16		2.16
3	ZONE 4								
3.1	Gents Toilet								
	200mm thk - South	Sqm	6.05	0.70	3.90	3.20	19.36		19.36
	East	Sqm	4.075	0.95	3.90	2.95	12.02125		12.02
	North	Sqm	4.325	0.60	3.90	3.30	14.2725		14.27
	150 mm thk - North	Sqm	4.75	0.60	3.90	3.30	15.675		15.68
	West	Sqm	4.36	0.70	3.90	3.20	13.952	3.00	10.95
	South	Sqm	1.95	0.00	3.90	3.90	7.605	3.00	4.61
	East	Sqm	2.315	0.00	3.90	3.90	9.0285		9.03
	Ledge wall 150 mm thk, 1.2m ht	Sqm	10.7			1.20	12.84		12.84
	Ledge wall 75 mm thk, 1.2m ht	Sqm	4.975			1.20	5.97		5.97
3.2	Janitor								
	150mm thk - West	Sqm	1.455	0.00	3.90	3.90	5.6745	1.8	3.87
	North	Sqm	2.95	0.60	3.90	3.30	9.735		9.74
	East	Sqm	1.55	0.45	3.90	3.45	5.3475	1.872	3.48
3.3	Ladies Toilet								
	200mm thk - South	Sqm	4.4	0.60	3.90	3.30	14.52		14.52
	East	Sqm	4.2	0.95	3.90	2.95	12.39		12.39
	North	Sqm	5.6	0.70	3.90	3.20	17.92		17.92
	150 mm thk - East	Sqm	1.455	0.00	3.90	3.90	5.6745		5.67
	West	Sqm	6.525	0.00	3.90	3.90	25.4475		25.45
	South	Sqm	1.45	0.00	3.90	3.90	5.655	3	2.66
	Ledge wall 150 mm thk, 1.2m ht	Sqm	8.675			1.20	10.41		10.41
	Ledge wall 75 mm thk, 1.2m ht	Sqm	3.55			1.20	4.26		4.26
3.4	PC Toilet								
	200mm thk - North	Sqm	1.95	0.70	3.90	3.20	6.24		6.24
	West	Sqm	2.65	0.70	3.90	3.20	8.48		8.48
	South	Sqm	1.775	0.00	3.90	3.90	6.9225	2.52	4.40
	Ledge wall 150 mm thk, 1.2m ht	Sqm	1.785	0.00	3.90	1.20	2.142		2.14
	TOTAL								554.87

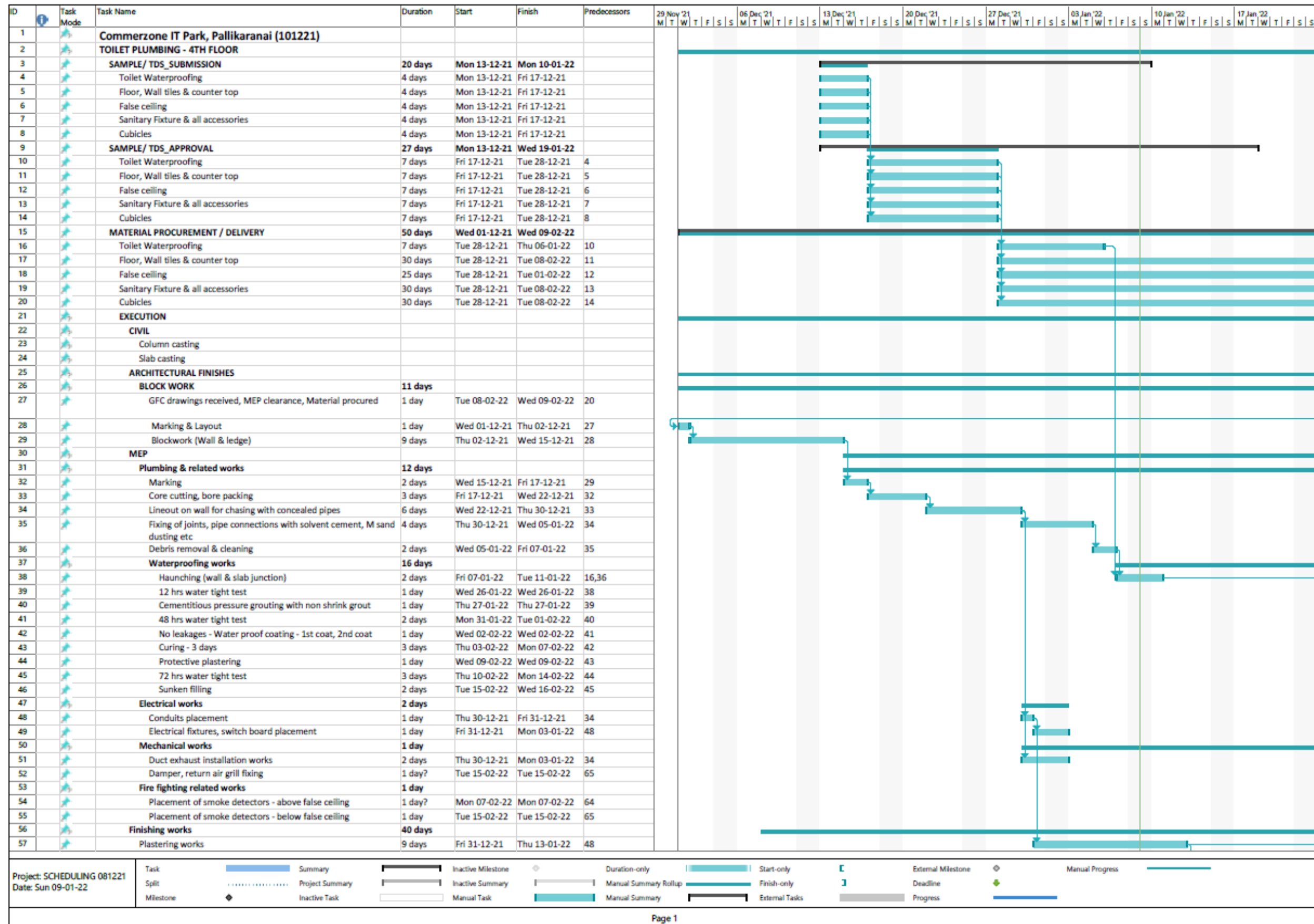
4th floor toilet plastering quantity

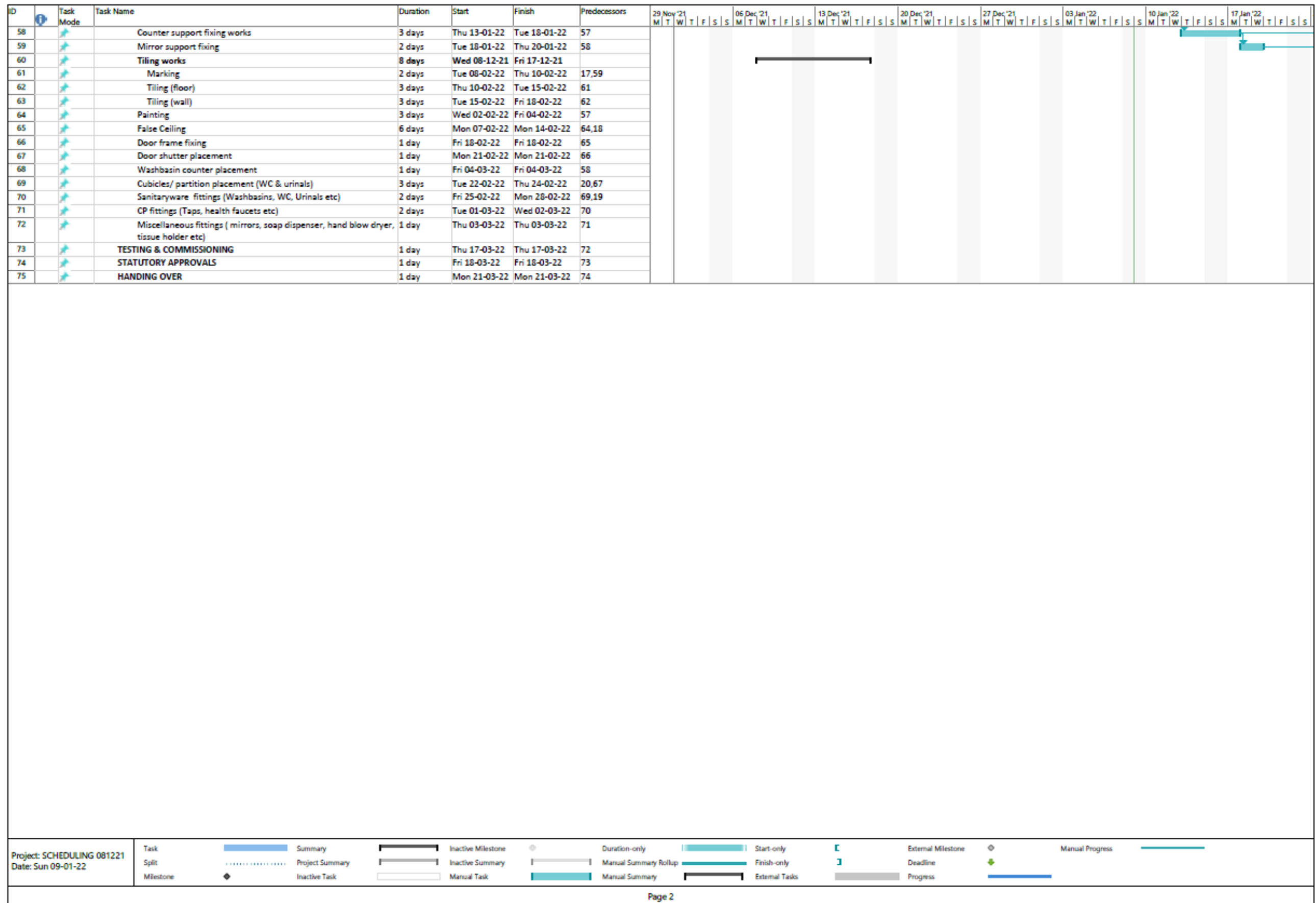
SI No.	Description of work	Unit	Quantity						
			L (m)	Slab depth (m)	Floor to floor height (m)	H (m)	Area (sqm)	Deletion (sqm)	Total Area (sqm)
1	ZONE 1								
1.1	Gents Toilet	Sqm	34.51	0.15	3.9	3.75	129.4125	9.24	120.17
1.2	Janitor	Sqm	8.8	0.15	3.9	3.75	33	3.744	29.26
1.3	Ladies Toilet	Sqm	32.5	0.15	3.9	3.75	121.875	9.12	112.76
1.4	PC Toilet	Sqm	9.2	0.15	3.9	3.75	34.5	2.52	31.98
2	Zone 3								
2.1	Visitor's toilet 1	Sqm	19.6	0.15	3.9	3.75	73.5	6.06	67.44
2.2	Visitor's toilet 2	Sqm	19.6	0.15	3.9	3.75	73.5	6.06	67.44
3	Zone 4								
1.1	Gents Toilet	Sqm	34.51	0.15	3.9	3.75	129.4125	9.24	120.17
1.2	Janitor	Sqm	8.8	0.15	3.9	3.75	33	3.744	29.26
1.3	Ladies Toilet	Sqm	32.5	0.15	3.9	3.75	121.875	9.12	112.76
1.4	PC Toilet	Sqm	9.2	0.15	3.9	3.75	34.5	2.52	31.98
	TOTAL								723.21

4th floor toilet waterproofing quantity

S.NO	Description of work	Unit	Quantity				Rate (Rs)	Total Amount (Rs)
			L (m)	H (m)	Area (sqm)			
						Total Area (sqm)		
1	ZONE 1							
1.1	Gents Toilet							
	Sunken wall - 1000mm ht	Sqm	34.51	1	34.51	34.51		0
	Sunken Floor area	Sqm				35.2		0
1.2	Janitor							
	Sunken wall - 1000mm ht	Sqm	8.8	1	8.8	8.8		0
	Sunken Floor area					3.5		0
1.3	Ladies Toilet							
	Sunken wall - 1000mm ht	Sqm	32.5	1	32.5	32.5		0
	Sunken Floor area	Sqm				30		0
1.4	PC Toilet							
	Sunken wall - 1000mm ht	Sqm	9.2	1	9.2	9.2		0
	Sunken Floor area	Sqm				4.9		0
2	ZONE 3							
2.1	Visitor's Toilet 1							
		Sqm	19.6	1	19.6	19.6		0
		Sqm				8.8		0
2.2	Visitor's Toilet 2							
		Sqm	19.6	1	19.6	19.6		0
		Sqm				8.8		0
3	ZONE 4							
3.1	Gents Toilet							
	Sunken wall - 1000mm ht	Sqm	34.51	1	34.51	34.51		0
	Sunken Floor area	Sqm				35.2		0
3.2	Janitor							
	Sunken wall - 1000mm ht	Sqm	8.8	1	8.8	8.8		0
	Sunken Floor area					3.5		0
3.3	Ladies Toilet							
	Sunken wall - 1000mm ht	Sqm	32.5	1	32.5	32.5		0
	Sunken Floor area	Sqm				30		0
3.4	PC Toilet							
	Sunken wall - 1000mm ht	Sqm	9.2	1	9.2	9.2		0
	Sunken Floor area	Sqm				4.9		0
	TOTAL					374.02		

4th floor toilet Scheduling





Site progress photos



Slab tracker – Zone 3

S. No	ACTIVITIES	TOTAL		D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21	D22	D23	D24
				04-12-2021 SAT	05-12-2021 SUN	06-12-2021 MON	07-12-2021 TUE	08-12-2021 WED	09-12-2021 THU	10-12-2021 FRI	11-12-2021 SAT	12-12-2021 SUN	13-12-2021 MON	14-12-2021 TUE	15-12-2021 WED	16-12-2021 THU	17-12-2021 FRI	18-12-2021 SAT	19-12-2021 SUN	20-12-2021 MON	21-12-2021 TUE	22-12-2021 WED	23-12-2021 THU	24-12-2021 FRI	25-12-2021 SAT	26-12-2021 SUN	27-12-2021 MON
1	COL-STARTER	18 No's	PL																								
			AC		8/18		14/18	18/18																			
2	COL-REINFORCEM	18 No's	PL																								
			AC		6/18	15/18	18/18	17/18																			
3	COL-FORMWORK	18 No's	PL																								
			AC			8/18	14/18	18/18																			
4	COL-CONCRETE	18 No's	PL																								
			AC			4/18	9/18	14/18	18/18																		
5	SW-STARTER	10 No's	PL																								
			AC					7/10	10/10																		
6	SW-REINFORCEM	14 No's	PL																								
			AC		4/14			12/14					14/14														
7	SW-FORMWORK	14 No's	PL																								
			AC					3/14		6/14		12/14				14/14											
8	SW-CONCRETE	14 No's	PL																								
			AC							3/14		6/14		12/14					14/14								
9	SLAB SHUTTERING		PL																								
			AC																								
10	SLAB BOT REINFORCEM		PL																								
			AC																								
11	SLAB PT WORKS		PL																								
			AC																								
12	SLAB TOP REINFORCEM		PL																								
			AC																								
13	BEAM SIDE & ADD		PL																								
			AC																								
14	SLAB CONCRETE		PL																								
			AC																								

S. No	ACTIVITIES	TOTAL		D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	D21	D22	D23	D24	D25	D26	D27	D28	No of Delay
				09-12-2021 THU	10-12-2021 FRI	11-12-2021 SAT	12-12-2021 SUN	13-12-2021 MON	14-12-2021 TUE	15-12-2021 WED	16-12-2021 THU	17-12-2021 FRI	18-12-2021 SAT	19-12-2021 SUN	20-12-2021 MON	21-12-2021 TUE	22-12-2021 WED	23-12-2021 THU	24-12-2021 FRI	25-12-2021 SAT	26-12-2021 SUN	27-12-2021 MON	28-12-2021 TUE	29-12-2021 WED	30-12-2021 THU	***** FRI	
1	COL-STARTER	18 No's	PL																								
			AC																								
2	COL-REINFORCEM	18 No's	PL																								
			AC																								
3	COL-FORMWORK	18 No's	PL																								
			AC																								
4	COL-CONCRETE	18 No's	PL																								01 DAY
			AC	18/18																							
5	SW-STARTER	10 No's	PL																								03 DAYS
			AC	10/10																							
6	SW-REINFORCEM	14 No's	PL																								04 DAYS
			AC							14/14																	
7	SW-FORMWORK	14 No's	PL																								04 DAYS
			AC		6/14		12/14				14/14																
8	SW-CONCRETE	14 No's	PL																								06 DAYS
			AC		3/14		6/14		12/14					14/14													
9	SLAB SHUTTERING		PL																								04 DAYS
			AC							12 Tables	34 Tables	51 Tables	73 Tables	92 Tables													
10	SLAB BOT REINFORCEM		PL																								13 DAYS
			AC																								
11	SLAB PT WORKS		PL																								
			AC																								
12	SLAB TOP REINFORCEM		PL																								
			AC																								
13	BEAM SIDE & ADD		PL																								
			AC																								
14	SLAB CONCRETE		PL																								
			AC																								

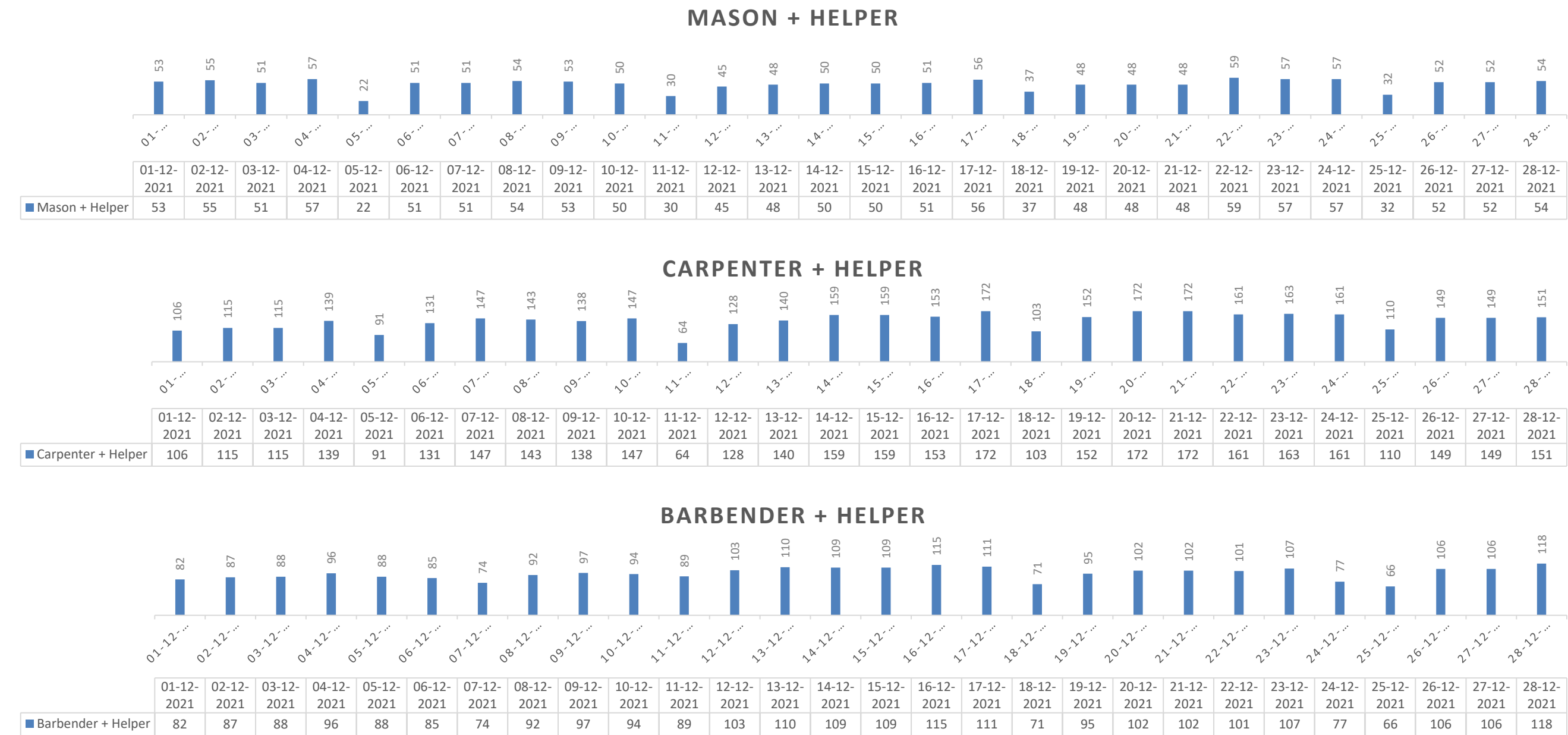
Slab tracker Zone - 2

17 DAYS SLAB CYCLE - PROGRAM (10th to 11th Floor - Zone 2)																						
S. No	ACTIVITIES	TOTAL		D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	No of Delay
				MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	
				13-12-2021	14-12-2021	15-12-2021	16-12-2021	17-12-2021	18-12-2021	19-12-2021	20-12-2021	21-12-2021	22-12-2021	23-12-2021	24-12-2021	25-12-2021	26-12-2021	27-12-2021	28-12-2021	29-12-2021	30-12-2021	
1	COL-STARTER	12 NOS	PL																			
			AC	6/12	12/12																	
2	COL-REINFORCEMENT	12 No's	PL																			
			AC		6/12	12/12																
3	COL-FORMWORK	12 No's	PL																			07 DAYS
			AC			4/12								10/12		12/12						
4	COL-CONCRETE	12 No's	PL																			08 DAYS
			AC				4/12								11/12		12/12					
5	SW-STARTER 43, 44	02 No's	PL																			08 DAYS
			AC										2/2									
6	SW-REINFORCEMENT	02 No's	PL																			05 DAYS
			AC										2/2									
7	SW-FORMWORK	02 No's	PL																			06 DAYS
			AC													2/2						
8	SW-CONCRETE	02 No's	PL																			07 DAYS
			AC														2/2					
9	SLAB SHUTTERING		PL																			06 DAYS
			AC													24 Tables		66 Tables	96 Tables	107 Tables		
10	SLAB BOT REINFORCEMENT		PL																			
			AC																			
11	SLAB PT WORKS		PL																			
			AC																			
12	SLAB TOP REINFORCEMENT		PL																			
			AC																			
13	BEAM SIDE & ADD SUPPORTS		PL																			
			AC																			
14	SLAB CONCRETE		PL																			
			AC																			

Slab tracker Zone - 4

17 DAYS SLAB CYCLE - PROGRAM (10th to 11th Floor - Zone 4)																				
ACTIVITIES	TOTAL		D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	No of Days Delay
			FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	
			24-12-2021	25-12-2021	26-12-2021	27-12-2021	28-12-2021	29-12-2021	30-12-2021	31-12-2021	01-01-2022	02-01-2022	03-01-2022	04-01-2022	05-01-2022	06-01-2022	07-01-2022	08-01-2022	09-01-2022	
COL-STARTER	18 No's	PL																		02 DAYS
		AC	10/18	13/18			18/18													
COL-REINFORCEMENT	18 No's	PL																		
		AC		5/18		11/18	18/18													
COL-FORMWORK	18 No's	PL																		
		AC		5/18	6/18	9/18	16/18													
COL-CONCRETE	18 No's	PL																		
		AC			5/18		9/18	16/18												
SW-STARTER	10 No's	PL																		01 DAY
		AC	1/10				4/10					10/10								
SW-REINFORCEMENT	14 No's	PL																		
		AC				1/14	4/14													
SW-FORMWORK	14 No's	PL																		
		AC					1/14													
SW-CONCRETE	14 No's	PL																		
		AC						1/14												
SLAB SHUTTERING		PL																		
		AC																		
SLAB BOT REINFORCEMENT		PL																		
		AC																		
SLAB PT WORKS		PL																		
		AC																		
SLAB TOP REINFORCEMENT		PL																		
		AC																		
BEAM SIDE & ADD SUPPORTS		PL																		
		AC																		
SLAB CONCRETE		PL																		
		AC																		

Labour details for December



17. SAFETY MANAGEMENT

Safety protocol followed at site

- **For employees, visitors etc.**
 -
 - Self declaration form
 - Temperature checking
 - PPE kits (helmet, visitor induction card)
- **For workers**
 - Screening form (Biodata) at time office
 - ID proof government certified with signature
 - RTPCR test, vaccination etc.
 - Form II (X1) – BOCW etc.
 - Induction program
 - Issue PPE (based on task etc.)
 - Biometric attendance

Labour welfare facilities (work timing 8.30 am –

- All legal norms
- All covid related norms
- Drinking water
- Rest room
- Toilets
- Nilavembu kashayam
- Medical camp
- Vaccination
- Training
- Multilanguage Signages

Pre - task analysis

For compound wall piling activities

Project step	Potential hazards	Control measures	Responsible person
Area preparation	Slip, trip, fall	Ensure proper access & PPE	
	Snake bites	Wear gumboot	
	Hit by vehicle	Signalmen with vehicles during operation	

- **PPE & special equipment requirements:** Gumboots etc
- **Notifications & emergency Response**

Notifications	Emergency plan / Communication
Who should be notified & after the task – list names & contact number	Who should be notified – list names & contact numbers
PRE:	
POST:	

Project manager:
Safety / SME (Subject matter Expert):

Name & Signature:
Name & Signature:

Date:
Date:

Health and safety

- Field Audit

Name & Signature	Date	Time	Comments

- Post Job checklist & notes

Any lessons learnt?	Y/N	Restores to safe operating condition	Y/N
Specify:		All tools/ equipments/ personnel accounted safe	Y/N

- PMC Comments

Pile drawings to be added in this PTA
Update the sketch in case of any changes

Emergency response plan

- Purpose
- Review & revision Record
- Review Record

Hazard identification, risk assessment & control measures

- Risk assessment for temporary electrification

Activity	Hazard identification					Residual risk assessment				Is risk level acceptable (Yes/ No)	Input of controls	Control measures
				Conditions		Risk priority number		Total = L*S	Risk Prioritization			
	Type of hazard	Category of hazard	Type of risk	D/I	R/NR	Likelihood (L)	Severity (S)					
DG Operation/ EB Power Supply	Electrocution, fire	accidental	Fatal burn/ major injury	D	R	4	5	20	Intolerable	N	LC, DC	Deploy competent Electrician for operating DG & provide drip tray or spill kid. Suitable fire extinguisher placed at DG or panel room. All electrical panel install with ELCB or MCB. To use industrial socket. Don't reuse industrial socket. Implement lock out/ tag out system. Use rubber mats near the panel & use ear plugs/ muff
	Explosive/ burst			D	R	4	5	20	Intolerable	N	LC, DC	
	Influence of human behaviour – lack of knowledge etc			D	R	4	5	20	Intolerable	N	LC, DC	

Few possible risks identified in the project

S.NO.	BROAD CATEGORIES	RISKS	CONTROL MEASURES
1	COST OVERRUN		
		Delay	Real time tracking
		Material price escalation	Proper SCM
		Inflation	Stock possible materials
		Design changes & not planning change orders	Proper planning of change orders
		Non-performance of subcontractors	Impose penalties
		Conflict between stakeholders	Proper contract clauses/ arbitration
		Low skilled manpower	Conduct workshops/ training
		Incorrect evaluation of project time & cost	Practical scheduling with enough buffers
		Unforeseeable risks & uncertainties'	Proper risk mitigation planning
		Serious design errors	Remedial measures/ removal of the element
		Poor site management	Efficient PM
		Increased wastage on site	Lean tools to be implemented
		Poorly defined scope	Initial meetings to discuss scope clearly
2	TIME OVERRUN		

		Inaccurate estimates & impractical scheduling	Proper scheduling with holidays, weather conditions & buffer
		Poor planning & design	Proper work flow
		Inefficient workforce	Proper supervision & task delegation
		Failing to adapt quickly, improper uncertainty management	Sound risk mitigation plan
		Poor on site management/ execution	Proper checkpoints, real time tracking, use of technology
		Quality & safety issues	Sound quality & safety plan & implementation
		Financial issues faced by contractor/ delayed payments	Check credibility on the onset
		Weather impact	Risk mitigations for severe conditions
		Improper work flow methodologies	Automation
		Poor stakeholder coordination & communication	Proper task delegation & overview, use of technology
		Material / machinery procurement delay	Proper supply chain management
		Decision making/ approval delay	Automation & proper tracking
		Unanticipated site conditions	Proper risk mitigation plan
		Frequent design changes/ reworks	Freeze delay causing decisions initially
		Poorly drafted contract	Sound contract with no loopholes
		Final drawings not followed on site	Final drawings etc. to be uploaded on cloud for remote access
		Poorly defined scope	Initial meetings to discuss scope clearly
		Inefficient project tracking	Real time tracking using technology & remote mapping
		Permit/ approval related issues	Proper initial planning
3	QUALITY ISSUES		
		Low material quality	Supplier test results on delivery, physical tests on site
		Improper supervision	Use of real time tracking, use of technology
		Unskilled labour	Workshops & training programs
		Inexperienced contractor	
		Inefficient quality management	Sound quality management & tracking, remote access
		Lack of proper auditing	Use of quality tools for evaluation
		Design complexity	Proper understanding of workforce to be ensured
		Stakeholder conflicts	Proper contract clauses/ arbitration
		Updated drawings not followed	BIM library/ cloud storage/ remote access
		NCR cause delays etc	Proper pre-activity planning, execution & supervision
		Visual defects of structures, errors etc.	Remedial measures & reworks
		Inefficient handling of checklists, ITP, Method statements etc.	Strict supervision & NCR when required, penalties
		Improper documentation	Efficient data controller team
		Uncomprehensive quality management plan	Sound quality management & tracking, remote access by in charge
4	LABOUR RELATED		
		Unavailability of skilled labour/ shortage	Training & workshops
		Lower productivity/ Idle time	Proper daily work schedule & supervision

		Inefficient work schedule/ delegation	Proper daily work schedule & supervision
		Lack of supervision	Proper tracking
		Delayed payment / strikes/ OT related	On time payment, amicable discussions, proper time office management
		Health issues/ absenteeism/ improper work conditions	Hygienic living & work conditions, safety gears etc
		Ignore safety precautions	Checkpoints & tracking
		Lack of awareness	Training & workshops
		Poor conditions of machinery	Proper AMC etc
		Cultural issues	Supervisor to know background & attend issues amicably
		Communication issues	Medium of instruction to be effective
		Quitting without prior notice	Proper tracking & consultants
		Lack of motivation	Rewards & recognition
5	MACHINERY/ PLANT/ EQUIPMENT RELATED		
		Non-Availability of required equipments/ machineries	Efficient Pre-task requirements
		Breakdown/ repairs/ defects	Regulated servicing, AMC etc
		Lapse of insurance	Automatic alert before lapse
		Improper maintenance & planning	Proper planning
		Improper record keeping	Efficient data controller system
		Lack of spare parts	Inventory with important/ imported items spares etc
		Unskilled labour/ improper work methodology	Training & workshops
		Inappropriate equipment selection	Study to be done, experience required

18. OTHERS

Report

- **Monthly report**
- **Weekly report**
- **Monday:** Progress, Quality, Safety
(Stakeholders – Client, PMC, Contractor)
- **Wednesday:** Design Review meeting
(Stakeholders – Client, PMC, Contractor, Other Consultants)
- **Thursday:** Finishes & MEP
(Stakeholders – Client, PMC, Contractor, MEP consultants)
- **Site inspection with client**
- **Concrete consumption report**

Weekly Report – Quality

WEEKLY QUALITY REPORT – 1/12/21

Issues



- Many rectification works are pending on east side of the building

- In Steel yard – Steel in contact with soil and getting rusted
- Proper steel stacking required



1. NC Status:

S. No	Description	NC No	NC issued on	No of days open	Status
1	Cracks - stilt floor (Non Tower area)	48	23-11-2020	352	Open
2	Water entering in to basement (Block 3)	103	21-08-2021	81	Closed

2: Site Note:

Open Site Notes					
S.No	Description	Site note No	SN issued on	No of days open	Site Note status
1	De shuttering not completely done	111	01-06-2021	127	Open

Weekly Report – Safety

WEEKLY SAFETY REPORT – 1/12/21

1. NC Status:

Total	Closed	Open
81 Nos	80 Nos	01

2. Site Note:

Total	Closed	Open
384 Nos	370 Nos	14Nos

Issues

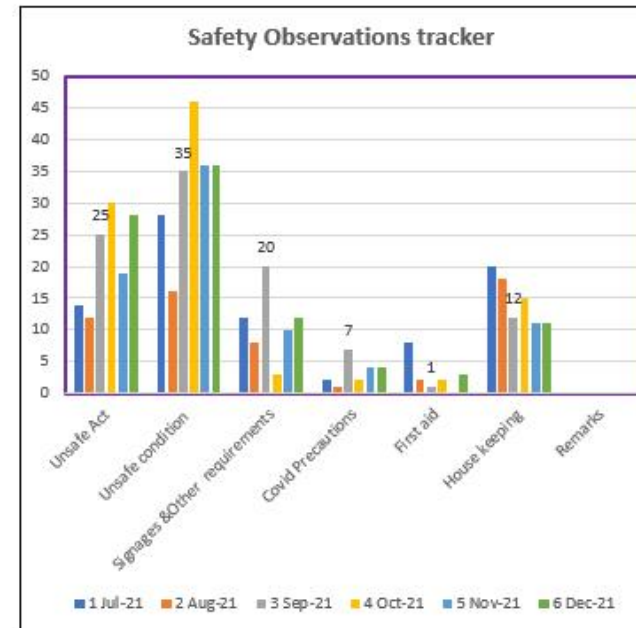
Critical observations:

It is observed that Projection of reinforcement, wall rod, tie rods and poor cleaning at ST03 Staircase on 7th Floor.

Block 2: 7th Floor To 8th Floor Mid way staircase at ST03



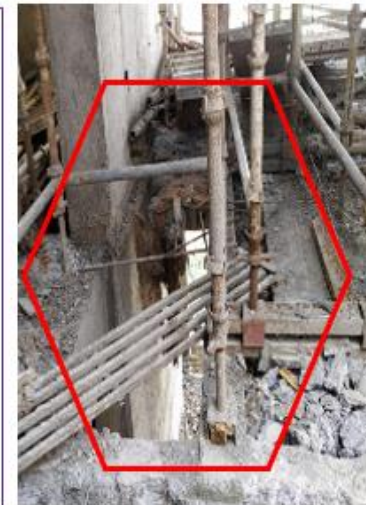
Block 2: 7th Floor To 8th Floor Mid way staircase at ST04.



NC Status & Details

Total	Closed	Open
81 Nos	80 No's	01 No's

NC 81: It is observed that shaft barricade & protection for few of the cut-out opening is not found in place. Which would be leading to falling of Man and materials falling hazard. The fall protection measures are not meet safety requirement and needs suggestion with improvement.
Location; Block 2: 9TH FLOOR ZONE 4.



Warm up health & safety training



Awards & recognition

Weekly report – Progress

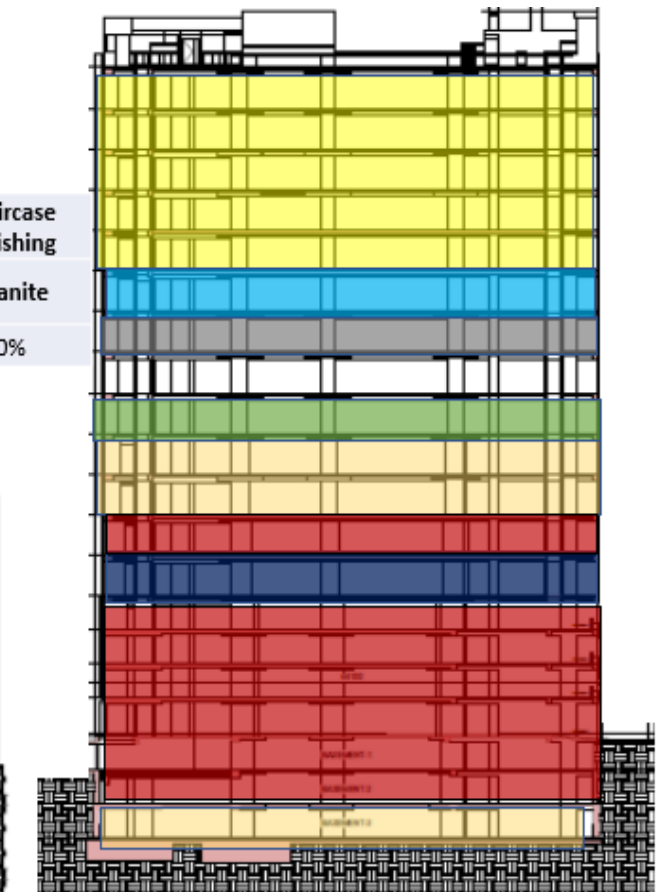
WEEKLY PROGRESS REPORT – 1/12/21

4TH FLOOR

LEGEND

- BLOCKWORK
- PLASTERING
- SCREED
- WATERPROOF

Floor	Block work in Sqm	Plastering in Sqm	Ceiling White wash	Pardi Wall in Rmt (UPSTRANDS)	Screed flooring in Sqm	Toilet water proofing Nos	Toilet Plumbing works 1 st fix	Joinery fixing	Staircase Finishing Grinding / Putty	Staircase Finishing Handrail fixing	Staircase Finishing Granite
4 th Floor	90%	85%	0%	50%	0%	85%	0%	0%	0%	0%	0%



LEGEND

- Blockworks + Plastering
- Blockworks
- 4th Floor – MEP works done , Blockworks &Plastering done
- 8th Floor – De shuttering Activities in Progress
- 10th Floor – Zone 3 Shear wall (Reinforcement works)
- 11th Floor – Zone 2 in progress
- 12th – 16th Floor

19. CRITICAL OVERVIEW

LEARNING

- *Learnt various aspects of PMC*
- *Study included following :*
 - Planning
 - Quality
 - Safety
- *Internship was a holistic learning experience in a live project*
- *Many take ways in terms of PMC*

ISSUES IN THE PROJECT

Project line extended
Contract end : June 2020

- Force majeure: covid lockdown (wave 1 & wave 2)
- Nivar cyclone – 2020
- Heavy rainfall – Nov, Dec 2020
- Abnormal price increase of materials due to covid

Other issues:

- Labour shortage
- Lack of skilled labour
- Material shortage
- Client approval delay
- Material selection delay

RECOMMENDATIONS

- *LPS – for planning & executing*
- *JIT – for inventory management*
- *Digitising quality & safety management – for real time remote tracking etc*



The **Last Planner System (LPS)** is a workflow method developed by the Lean Construction Institute to increase worker productivity and accountability through tight scheduling and detailed group planning.

Last Planner® System Overview



Advantages

- Deliver projects safer, faster & at reduced costs
- Builds a more predictable program
- Reduces burden on project management team
- Improves overall production process



Figure 1: Sample Master Schedule Alignment Deliverable

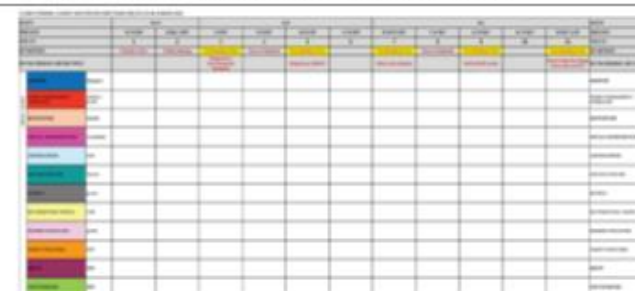


Figure 2: Sample Phase Pull Planning Template Board

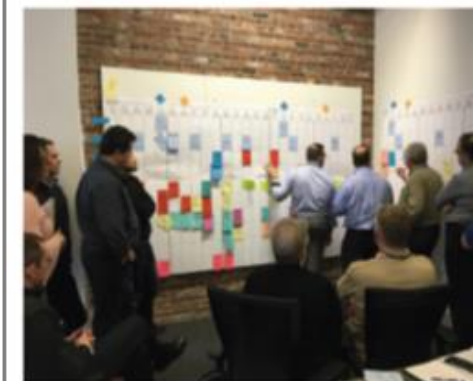


Figure 3: Phase Pull Planning Session in Progress



Figure 4: Phase Pull Production in Web-Based Software

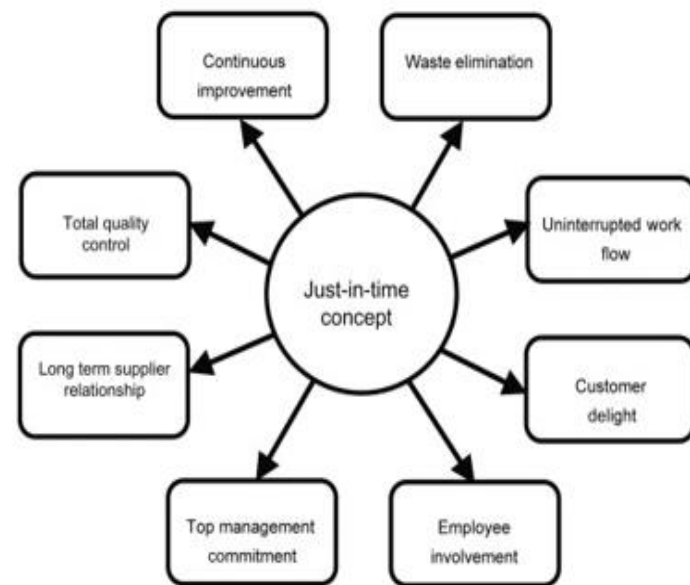
10-Feb	WSP - 100%	Submit Preliminary Values for Terminal C, DMC for Elevator Study	ON TRACK
21-Feb	GENSLER	Prop Agenda and Review for 2/22 Pull Plan	ON TRACK
22-Feb	WSP	Submit Scope and Fee Proposal for TNC Garage Changes	ON TRACK
22-Feb	WSP - 100%	Prop Materials for 1/4 Plumbing Inspector Meeting	ON TRACK
22-Feb	GENSLER	Request and Secure TYPs for Unit Roller Site Visit	ON TRACK
22-Feb	GENSLER	Prop for Weekly Meeting	ON TRACK
22-Feb	WSP - 100%	1/4 Meeting w/ MPA for West & Central Garage	ON TRACK
22-Feb	MPA	Progress Meeting with HS	ON TRACK

Figure 5: Phase Pull Production Plan in Excel

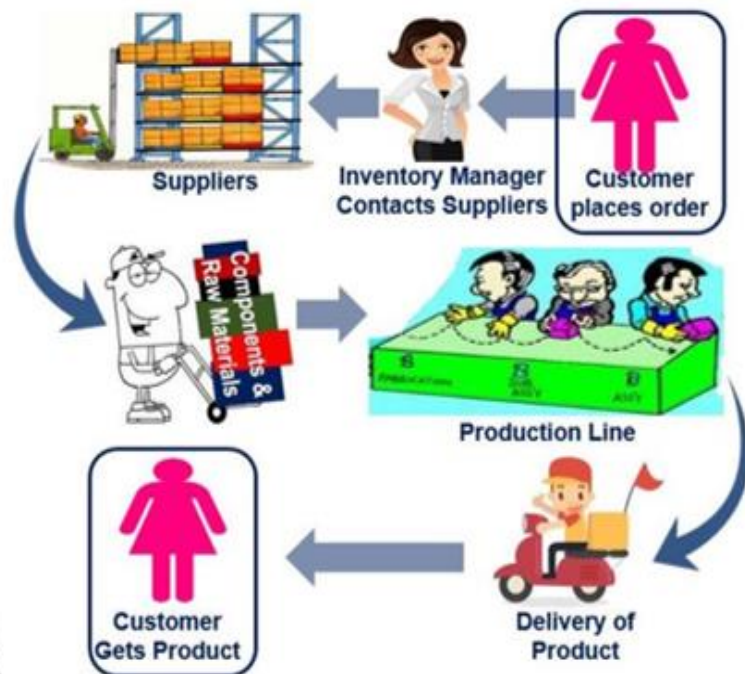
18-Dec	MPA	Meeting w/ IT to Review Terms, Trackers	YES
18-Dec	MPA	PM Web Meeting for Team w/ Items	YES
18-Dec	GENSLER	Perform 90% QA/QC Review and Provide Comments to Consultants	YES
18-Dec	GENSLER	Update Site Furniture Plan and Send to Stantec	YES
19-Dec	TEAM	ePlanner Production Plan Meeting	YES
19-Dec	BSU	Deliver Survey/CAD Files - Addition	YES
19-Dec	STANTEC	Office Trailer Crane Permit Info to Greg	NO
20-Dec	GENSLER	Review 90% Set from Consultants	YES
20-Dec	GENSLER	Perform Garage Site Visit and Prep Restroom Layout	YES
20-Dec	GENSLER	Update Work Order 02 - Amendment 01	YES
20-Dec	GENSLER	Develop ETT1 Off Site Mockup Drawing and Spec	YES
21-Dec	JACOBS	Provide Sketches for Precast Plank in lieu of CIP Roadway Decking	YES
21-Dec	MPA	Review Trailer Layout with MPA Firm/BSU	YES
21-Dec	MPA	Feedback from BSU & HS about Lean Scope	YES
21-Dec	GENSLER	90% Elevator & Canopy Documents to MPA and WSP-Cost	YES
21-Dec	STANTEC	File FAA 7460 Permit	NO

$$\text{Weekly PPC} = \frac{\# \text{ Completed Activities}}{\# \text{ Planned Activities}} = \frac{14}{16} = 87.5\%$$

Figure 7: Weekly Percent Plan Complete (PPC) Example



The **Just-in-time (JIT)** is a framework that delivers the necessary thing at the opportune time and in the correct amounts required. Without a moment to spare idea is to lessen or at last destroy variety and waste.



Use of **digital technologies** in construction will be able to stay ahead in the race by improving quality, focusing on safety, reducing costs, increasing profits & allows real time tracking & no paperwork.

