

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“JNANASANGAMA” BELAGAVI - 590 018

KARNATAKA



REPORT OF INTERNSHIP/PROFESSIONAL PRACTICE

Carried out in

HABITAT VENTURES PVT LIM



SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE OF

BACHELOR OF ENGINEERING

IN

CIVIL ENGINEERING

Submitted by:

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(Affiliated to VTU, Belgaum & Approved by AICTE, New Delhi)

(NAAC Accredited & ISO 9001:2015 Certified Institution)

NH 206 (B.H. Road), Gubbi, Tumkur – 572216. Karnataka



DEPARTMENT OF **CIVIL ENGINEERING**

2020-2021



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2020-2021

UNDERTAKING

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DEPARTMENT OF CIVIL ENGINEERING

2020-21

BONAFIDE CERTIFICATE

This is to certify that the Internship carried out in **HABITAT VENTURES PVT LTD, BASAVANGUDI** is a bonafide work of **BHOOMIKA S 1CG17CV005** student of **VIII** semester **B.E. CIVIL ENGINEERING** from **Channabasaveshwara Institute of Technology, Gubbi, Tumkur**, in partial fulfillment of the requirements for the award of degree **B.E.**, in **CIVIL ENGINEERING** of **Visvesvaraya Technological University, Belgaum** during the academic year 2019-2020. It is certified that the Internship work carried out was under my supervision and guidance.

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2020-2021

CERTIFICATE

This is to certify that the Internship seminar entitled “**INTERNSHIP PROGRAM**” has been carried out by **BHOOMIKA S , 1CG17CV005** bonafide student of **CHANNABASAVESHWARA INSTITUTE OF TECHNOLOGY, GUBBI, TUMKUR**, in partial fulfillment of the requirement for the award of the degree **Bachelor of Engineering** in **CIVIL ENGINEERING** from the **Visvesvaraya Technological University, Belagavi** during the year **2020-2021**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report. The Internship report has been approved as it satisfies the academic requirements in respect of Internship/Professional practice prescribed for the said degree.

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ACKNOWLEDGEMENT

Several special people have contributed significantly to this effort. First of all, I am grateful to my institution, **Channabasaveshwara Institute of Technology, Gubbi**, which provides me an opportunity in fulfilling my most cherished desire of reaching my goal.

I, acknowledge and express my sincere thanks to our beloved Director & Principal, **Dr. Suresh D S**, for his many valuable suggestion and continued encouragement by supporting me in mt academic endeavors.

I, express my sincere gratitude to **Dr SUDHIKUMAR G S, Professor and Head, Department of Civil Engineering**, for providing her constructive criticisms and suggestions.

I, extend my gratitude to my internship guide **Mr. VINAYAK RAO S R, Assistant Professor, Department of Civil Engineering**, for her guidance, support and suggestions throughout the period of this Internship.

I express my deep sense of gratitude to **HABITAT VENTURES PVT LTD, BASAVANGUDI** for giving such an opportunity to carry out the internship in their esteemed industry/organization.

I sincerely thank **Mr.GURUPRASAD, Executive Director** for exemplary guidance and supervision.

Finally, I would like to thank all the individuals who supported me directly and indirectly for the successful completion of this internship work.

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CHAPTER-1**ABOUT THE COMPANY****1.1 COMPANY PROFILE**

Habitat Ventures Pvt Ltd. is an architect developer company, established in the year of 2004. The company consist team of collaborative, committed young professionals in an ethical pursuit of excellence in the real estate & architectural construction domain. The company has delivered 2.5 million square feet across 15 projects in past 14 years and 1+ million square feet under construction.



Figure 1.1 Corporate office

Vision

"To emerge as the real estate developer of choice in southern India by building quality relationships through a work culture and promotes integrity respect and loyalty".

Mission

"To provide our client and costumers exemplary service in a professional and transparent environment and make the entire experience of dealing with habitat ventures pleasant & personal".

1.2 ORGANIZATION CHART

Habitat ventures have well defined organization structure where, the structure works functionally at top level and below which authority flows in line with staff assistance. Hence the organization structure can be classified under Staff and Line Organization. In this company each leadership team member has 2+ decades of relevant experience. The organization structure of the Habitat Ventures is as follows.

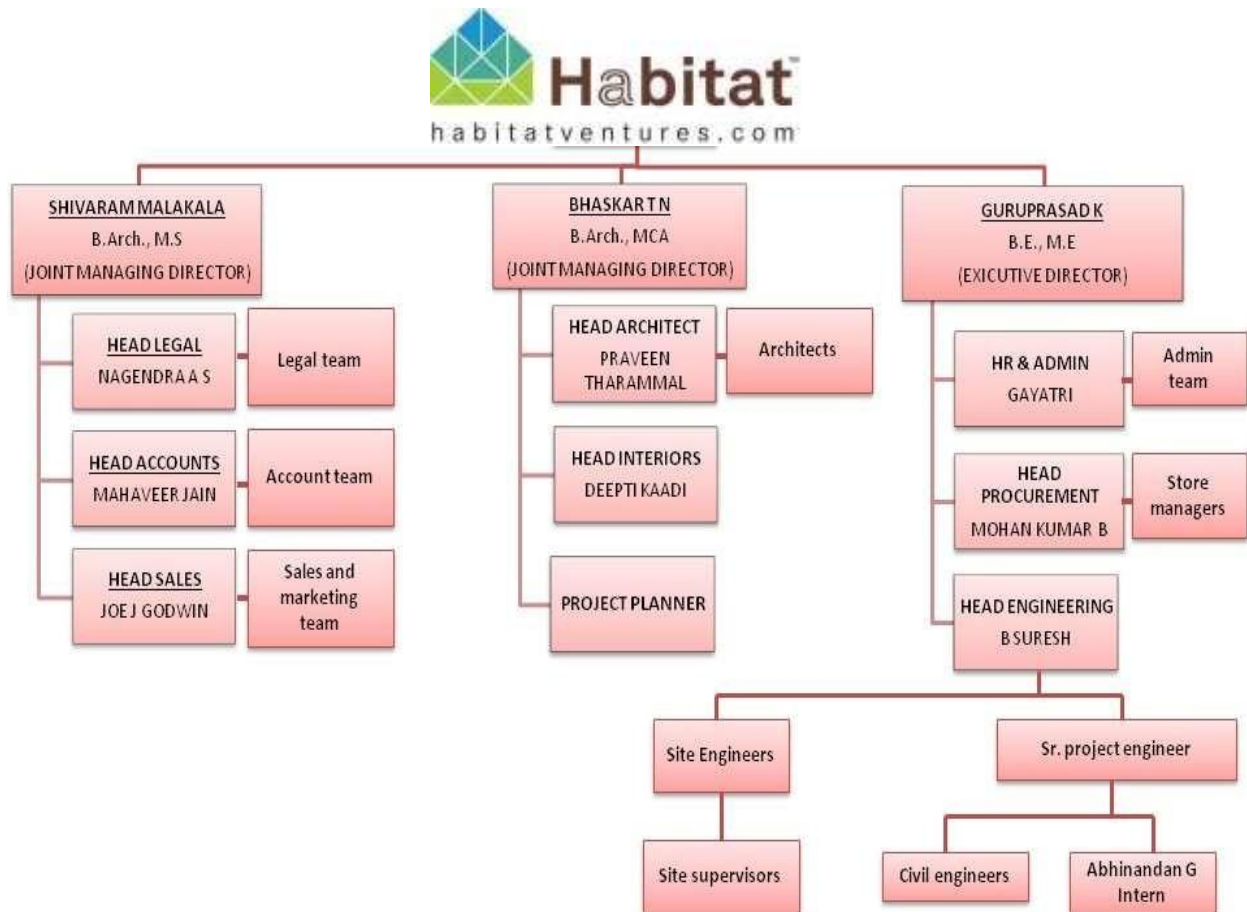


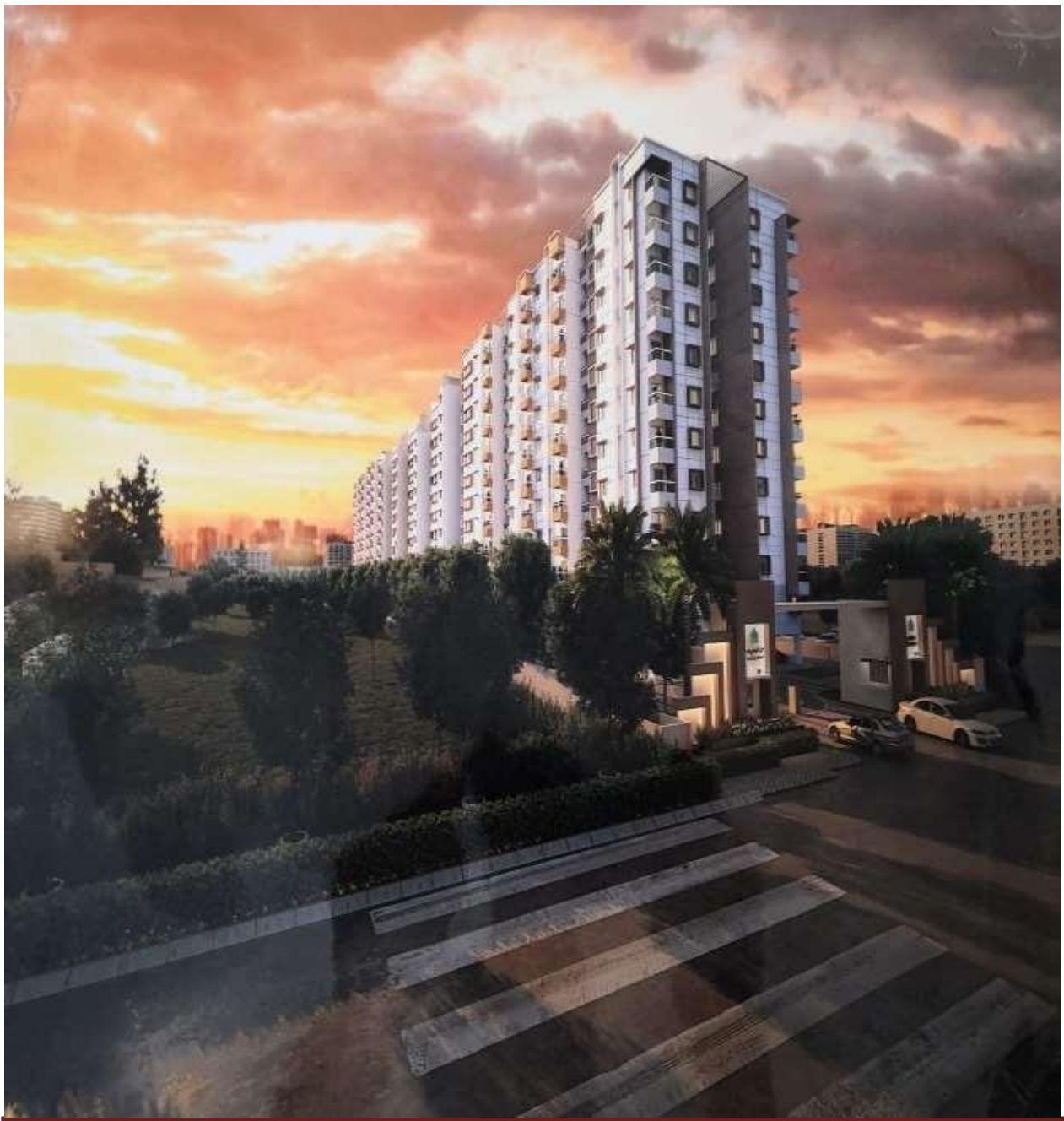
Fig 1.2 Organization Chart

1.3 MANAGEMENT TEAM

Joint Managing Directors of the company Mr. Bhaskar T N. and Mr. Shivaram K M. are only the Founder of Habitat Ventures Pvt Ltd. Mr. Guruprasad K. as an initial member at Habitat, is company's Executive Director. Company is in its predefined path under the Leadership of three extremely energetic and positive minded Directors. Directors of company themselves have given respective working role under their specialization.

CHAPTER-2**HABITAT ILUMINAR PROJECT**

The proposed residential project “Habitat Iluminar” at Mysore Road, Bengaluru, is coming up with 7no’s High rise Towers with Basement+GF+11 upper floors & 3 no’s High-rise Tower with Basement+GF+10 upper floors with a Total 412 Deluxe Apartment and also having the amenities like, Club house, Swimming pool, Tennis court, open air theatre, basketball court, Badminton court, Cricket pitch Children’s play area etc.



2.1 SALIENT FEATURES OF THE PROJECT

1. Project name - HABITAT ILUMINAR.
 2. Type - Residential apartment.
 3. Categories as per NBC - Group A - Sub -division- A-4
 4. Max. Height of Tower - 37.1 m
 5. Total no of towers - 10.
 6. Total site area - 212276.07sqft.
 7. Total built-up area - 652534.6sqft.
 8. Total no of flats - 412.
 9. Tower no - 1,2,3,7,8,9,10 - G+11.
 10. Tower no - 4,5,6 - G+10.
 11. Tower 1 to 6 - 2 BHK.
 12. Tower 7 - 2.5 BHK.
 13. Tower 8 to10 - 3 BHK.
 14. 1 floor - 4 flats.
 15. 5&6 tower up to 4 floor - 2 flats.
 16. 2 BHK - 1031sqft - 148 flats.
 17. 2.5 BHK - 1252sqf - 44flats.
 18. 3 BHK - 12985sqft - 220flats.
-
- i. CLIENT: HVPL - Habitat ventures private ltd.
 - ii. PMC: ANPC - AN Prakash consultancy.
 - iii. CONTRACTOR: TCIPL - Technicon information limited.

2.2 LOCATION

Habitat Illuminar project is located in Mylasandra village, Kengeri Hobli, Bengaluru. This is near to kengeri bus terminal. Advantage of location is that, it is just off the Bengaluru-Mysore Highway (SH-17).

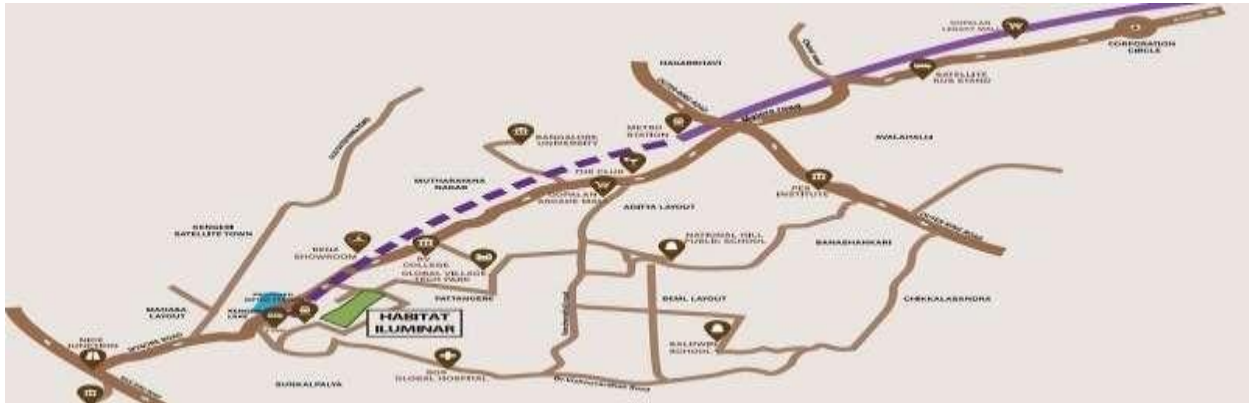


Fig 2.1 Location

2.3 AREA

This project has total plot area of 4 Acres 38 Guntas (19939.4 Sq.m) out of which 14,541.4 sq.m is the build up area.

2.4 MASTER PLANNING

According to the byelaw table, depending upon the adjacent road width and plot area, build up area will be finalized. Following figure and table represent the master plan and apartment schedule of the project.



Fig 2.2 Master Plan

2.5 ARCHITECTURAL INPUTS

- i. The design is a combination of 2BHK, 2.5BHK and 3BHK apartments 10 towers. Tower 1,2,8,9 and 10 are of 3BHK.
Tower 7 is of 2.5BHK.
Tower 3, 4, 5 and 6 are of 2BHK.
Tower 5 and 6 combined for club house up to level 4.
- ii. All the homes are Vaastu compliant with sufficient lighting and ventilation for all units.
- iii. Amenities include –in home –reticulated gas supply, water treatment plant and laundromat.
Common use –paved jogging track, visitor’s car park, putting greens, gazebos, senior citizens park, herbal garden, children’s play area, open air theatre, floodlit tennis and basketball court, cricket practice pitches, club house with games room, gym, indoor shuttle court, multipurpose hall and guest ROOMS
- iv. Site measures approximately 19939.4 Sq.m. It consist of 10 towers are grouped into 5 Blocks with expansion joint. The proposed Multistoried Apartment towers are B+G+11 upper floors +terrace floor only. The floor height of basement is 3.6m; Ground floor is 3.4m and typical floor height 3.05m respectively as per architectural drawings. Basements and Ground floor consists of parking, from 1st to 11th floor is utilized for residential purposes.
- v. Height is restricted for 37.1m.



Fig 2.3 Aerial view of the project

2.6 STRUCTURAL PLANNING, DESIGN AND CONSIDERATION

Reinforced cement concrete framed structure with columns beams and slabs, having regard to safety & durability.

2.6.1 ANALYSIS METHOD

- i. Each of Blocks is analyzed using principles of FEM by using ETABS.
- ii. Appropriate loads and its combinations as per relevant clauses as per IS codes, for most unfavorable effects are chosen for design.

2.6.2 FOUNDATION

As per the recommendations from Soil report N0 GF010781 the foundation system will be isolated/combined footing. Allowable Bearing Pressures in KN/m² for a minimum footing width of 1 m are mention below.

BLOCK ID	DEPTH BELOW 3.0 M FROM NGL SBC IN KN/M2	DEPTH OF FOUNDATION BELOW BASEMENT
B-1	600	1.5 M
B-2	600	1.5 M
B-3	600	3.6 M
B-4	800	1.5 M
B-5	800	2.55 M
B-6	800	3.05 M

Table 1 Foundation Bearing Pressures

2.6.3 LOAD CONSIDERATION

- i. Dead load: Weight of materials shall be calculated on the basis of unit weights given in IS: 875 (part1)-1987.
- ii. Imposed Dead Loads:
Imposed Loads, Finishes and Partition /Ledge wall load
- iii. Live Loads: The imposed load or otherwise live loads are assessed based on the occupancy classifications as per IS: 875(Part-2)-1987.

- iv. Wind Load: Bangalore is in the South of India basically having winds with a high wind speed of 33 m/s.
- v. Wind loads and pressures are calculated based on the static design wind pressure. This pressure has been considered for the load analysis and applied.
- vi. Earthquake load: The loading due to earthquake is assessed based on the provisions of IS:1893-2002.
Seismic zone = II Zone factor = 0.10
Response reduction factor = 3 Importance factor = 1.0

2.6.4 DESIGN LIFE

The design life of the structure is assumed as 50 years. This requirement is not applicable to replaceable materials.

2.6.5 DESIGN METHODOLOGY

All RCC structures shall be designed according to the Limit state method as specified in IS: 456-2000 and detailing shall be done according to SP: 34 (S&T)-1987. Water retaining structures will be designed as per IS: 3370-2007.

2.6.6 RETAINING WALLS

- i. Retaining walls are the structures used to support earth which would not be able to stand vertically unsupported. The retaining walls shall be designed for soil pressure. Following parameters considered for design:
- ii. Angle of internal friction of backfill = 30°
- iii. Saturated density of back fill = 20 kN/m^3
- iv. Friction coefficient between soil and concrete = 0.57

2.6.7 COVER TO REINFORCEMENT

- i. Raft/Footings - 50mm.
- ii. Columns - 40mm.
- iii. Retaining walls- 25mm.
- iv. Lift shear walls- 25mm.
- v. Beams - 30mm
- vi. Slabs - 25mm.

CHAPTER-3**MATERIALS AND EQUIPMENTS USED FOR
CONSTRUCTION****3.1 MATERIALS**

The self-weights of the various elements are computed based on the unit weight of materials as given below.

MATERIALS	Unit weight KN/m³
Steel	78.50
Plain cement concrete	24.00
Reinforced cement concrete	25.00
Porotherm Wall	7.5 (Without Plaster)
Dry Soil	18.00
Saturated Soil	20.00
Water	10.00
Cement concrete screed	24.00
Sand	18.00
Solid concrete block	17.65 (Without Plaster)
Sunk fill material Cinder fill	7.5

ITEM	GRADE OF CONCRETE	GRADE OF STEEL
Foundation	M30	Fe500
Column At all levels	M30	Fe500
Shear Walls At all levels	M30	Fe500
Compound Retaining Walls	M20	Fe500
Building Retaining Walls	M30	Fe500
Beams At all levels	M30	Fe500
Slabs At all levels	M30	Fe500
Over Head Tank	M25	Fe500
Underground sump tank,STP	M25	Fe500

Table 2 Material Details

3.1.1 M SAND

Manufactured sand is a substitute of river sand for concrete construction. Manufactured sand is produced from hard granite stone by crushing. The crushed sand is of cubical shape with grounded edges, washed and graded to as a construction material. The size of manufacture sand is less than 4.75mm.



Fig 3.1 M Sand

3.1.2 POROTHERM BLOCKS

- i. Porotherm blocks are clay bricks used for non-load bearing partition walls or infill masonry.
- ii. Size of blocks used in construction site
 - 1. 400x200x200 mm
 - 2. 400x150x200 mm
 - 3. 400x100x200 mm



Fig 3.2 Porotherm Blocks

3.1.3 SOLID BLOCKS

- i. Concrete blocks, also called cement blocks comes in wide varieties of shapes and sizes. They are made out of Portland cement, sand, gravel and water.
- ii. The weight of block is 35 kg.
- iii. The compressive strength is 5 N/mm².
- iv. Size 400x200x100, 400x200x75.



Fig 3.3 Solid Blocks

3.1.4 REINFORCEMENT

- i. At the site high strength steel bars and T.M.T (Thermo mechanically treated) bars of diameter 6mm, 8mm, 12mm, 16mm, 32mm is used as per requirement of design.
- ii. The bars were of grade Fe500D were used.
- iii. The bars were of brand TATA TISCON.
- iv. The main reason of using steel bars in RCC is that , the coefficient of thermal expansion of steel bars and concrete is of approximately equal value



Fig 3.4 TATA TISCON Fe500D

3.1.5 EXPANSION JOINT

An expansion joint or movement joint is an assembly designed to safely absorb the temperature-induced expansion and contraction of construction materials, to absorb vibration, to hold parts together, or to allow movement due to ground settlement or earthquakes.



Fig 3.5 Expansion Joint

3.2 EQUIPMENTS USED IN THE PROJECT

3.2.1 TOWER CRANE

- i. In high raised buildings, tower crane plays an important role in transportation of construction materials to different levels at site.
- ii. In this project 2 tower cranes are installed at different locations depending on their maximum reach, details of which are as follows.
- iii. Company: ZOOM LION.
- iv. Maximum height: 80m
- v. Maximum reach: 75m.
- vi. Maximum lifting power: 300-350ton-m.
- vii. Counterweights: 20 tons.



Fig 3.6 Tower Crane

3.2.2 HAULING VEHICLE

- i. Hauling vehicles are must in any construction work. These vehicles help in the process of transportation of construction materials from manufacturer to site and from site to dump-yard. Details of different hauling vehicles used in the projects are as fallows.
- ii. TIPPER
 1. Company : TATA
 2. Capacity : 13tons to 45tons
 3. Gradient : 28%
 4. Heap capacity : 16m³



Fig 3.7 Hauling Vehicle

3.2.3 CONCRETE PUMP

- i. In high raised buildings, to cast upper floors concrete pump is must to transport concrete to the different levels. Details of concrete pump used in this project are as fallows.
- ii. Company: SCHWING
- iii. Output : 80-90m³/hour
- iv. Hopper Capacity: 0.6m³
- v. Maximum horizontal distance: 800m
- vi. Maximum vertical distance : 200m



Fig 3.8 Concrete Pump

3.2.4 TRANSIT MIXER

In this project ready mix concrete (RMC) is used for the construction. To transfer concrete from RMC plant to site, transit mixers are used, where concrete will be kept in continuous motion by means of drum rotation. Details of transit mixer are as follows.

- i. Company : TATA
- ii. Capacity : 6cum
- iii. Water tank : 600liters
- iv. Drum angle : 30°



Fig 3.9 Transit Mixer

CHAPTER-4**WORKS INVOLVED DURING INTERNSHIP****4.1 SHUTTERING WORK**

Shuttering work includes both formwork and false work. Formwork is a mold or open box, like container into which fresh concrete is poured and compacted. When the concrete is set, the formwork is removed and a solid mass is produced in the shape of the inner face of the formwork. The top of the formwork is normally left open. False work is the necessary support system that holds the formwork in the correct position.

Generally shuttering involves three major stages, i.e. column shuttering, beam shuttering and slab shuttering. In column shuttering, plywood is used as the molding material. Plywood is made to exact size required for the column set exactly at the position. In beam shuttering, beam bottom has to set for the required levels using plywood and supporting jacks. And then side boards have to be set to complete the beam shuttering. Finally in slab shuttering, metal plates and span are used to prepare the required mold size at particular levels. For false work, metal jacks or bamboos are used. Materials:

- i. Plywood (12mm) - 1.22mX2.44m.
- ii. Runners - 50mmX75mm / 75mmX100mm.
- iii. Mold Sheets - 600mmX1200mm / 600mmX900mm.
- iv. Jacks - 3.5m-4.3m.
- v. Adjustable Spans etc



Fig 4.1 Shuttering

4.2 FLOORING

Flooring is the general term for a permanent covering of a floor, or for the work of installing such a floor covering. Surfaces are ensured for clean, smooth, and dry for best results. Sufficient time is taken to repair, patch, and level any damaged or uneven areas.

Loose tiles are laid along the center lines in both directions, using tile spacers as to go for even, uniform joints. Once reaching the walls, tiles are cut for a proper fit. Now thin set of mortar mix for the fixation of the tile is prepared. This mortar is applied to the floor surface and places the tile as per the dry layout. While placing, odd tiles are cut to the required size. Finally grout is applied in tile joint to ensure compactness of flooring, after which surface is cleaned properly. Lastly, completed work is allowed at least 24 hours to set before walking on it.

- i. Wall tiling of dimension 300x300 mm ,6mm thickness is used in this project.
- ii. Flooring tile - vitrified tiles of 600x600mm , 9mm thickness is used.
- iii. Cement mortar -1:3 screed shall be spread with recommended thickness of mortar should be in range of 20-25 mm.



Fig 4.2 Flooring Work

4.3 PLASTERING

Plastering work is a thin layer of mortar, applied over the masonry and it acts as a damp-proof coat over the brick masonry work. Plastering work also provides a finished surface over the masonry that is firm and smooth hence it enhances the appearance of the building.

Before actual plastering, level pads are marked by using thread. Level pad may be marked by gypsum paste in long strip or in circular patches. Wherever plastering has to be done on the concrete surface, racking has to be done earlier. While plastering, on such surfaces, mortar slurry is applied before plastering, so that proper bonding can be achieved. Now mortar is applied by trowels and then made level by straight edges. Desired surface finish is given by floats and sponges. Minimum of 7 days Curing is must for mortar plastering.

GYPSUM PLASTER is done in areas, where there is no regular water usage, like bedrooms and living rooms. This involves same procedure as mortar plastering, differs only in the mode of application. In gypsum plaster, floating blades and putty mixing machines are used.



Fig 4.3 Plastering Work

4.4 PAINTING

The painting technology is growing more rapidly day-by-day and it has attained a higher position in almost all areas where nothing is said to be complete without painting as far as material world is concerned. Painting of civil engineering structures is required from aesthetic considerations, and as protective coating. Suitable type of paints applied to the surfaces can enhance the life as well as appearance of the structure. Residential painting may include,

- i. **Surface Dryness**-If possible, the plastered surface should be left unpainted for the first few months to allow it to carbonate, harden and dry thoroughly.
- ii. **Cleaning & Treatment**-Before painting, the surface should be thoroughly brushed to remove all dirt and loose or powdered materials. Treatment of the surface with solution of acids or salts is not advisable as efflorescence may be increased.
- iii. **First Primer Coat**-It is applied to provide adhesion between the paint film and the surface. It increases the spreading capacity of the paint.
- iv. **Application of Putty**- This is done to fill the minor cracks and surface imperfections. Drying time for putty is normally 5-6 hrs.
- v. **Second Primer Coat**-This is applied to sandwich putty between two primer coats, since painting directly on putty leads to a patchy appearance.
- vi. **Finish Coat**-Generally two coats must be applied to get the desired finish and color. Each coat must be completely dry before the next one is applied. Drying times for different paints vary due to their composition.



Fig 4.4 Painting Work

4.4.1 Different types of building paints

- i. Interior wall and ceiling- Distemper, Plastic paint, regular emulsion, economy emulsion, premium emulsion.
- ii. Exterior- cement paint, acrylic emulsion, Textured plaster.
- iii. Wood- varnish (Polyurethane and melamine)
- iv. Metal- Enamel, synthetic and premium enamel paints.

4.5 WATERPROOFING

- i. The surface to be waterproofed should be prepared thoroughly by chipping all cement mortar deposits/ loose material, dust etc. using a chisel, wire and coir brush.
- ii. The surface, which is to be waterproofed, should be ponded with water and any dampness / leakage should be marked in the ceiling below the terrace. Wherever leakage persists, 12mm diameter GI nipples should be fixed depending on the depth of dampness, on such weak locations in the ceiling, and is pressure grouted with neat cement slurry admixed with expansive grouting.
- iii. 'V' grooves should be cut along the concrete / brickwork junctions on joints. Surface cracks if any should be filled with polymer modified diluted solution and also in cut-outs, around the sleeves, drain pipe joints and filled with sealant.
- iv. Every upturn and pipe outlet should be reinforced with fibre mat between the two coats.
- v. Two coats of Acrylic polymer based waterproofing system or equivalent should be applied on terrace and parapet walls. One coat of neat cement mixed with polymer additive should be applied as bonding coat.
- vi. A protective screed of 20-25mm thick should be provided with proper slopes. The treated area should be plastered to required slope as per drawing and cured for a minimum of 3-4 days.
- vii. To ensure water tightness, the treated area shall be filled with water and tested.
- viii. Over the treated surface, weathering course tiles should be laid on the terrace maintaining a proper slope.



Fig 4.5 Waterproofing

4.6 MASONRY WORK

Masonry is the structure, from individual units, which are often laid in and bound together by mortar. Masonry is generally a highly durable form of construction. However, the materials used, the quality of the mortar and workmanship, and the pattern in which the units are assembled can substantially affect the durability of the overall masonry construction. In this project combination of concrete solid blocks and porotherm blocks are used. Solid blocks are used at the opening edges such as doors and windows instead of porotherm blocks, so that it will give stiff support to the fixtures. Remaining portion of masonry is done with porotherm blocks, which are thermal and sound resistant and also has effective light weight.

In a frame structure, before actual masonry work, concrete surfaces, which would be the interface within the masonry, are to be raked for the desired binding between concrete and masonry. According to the drawings, base course has laid as the indication of marking. After which layers of masonry units are laid to the height of 3 feet at a run. Only after one day, remaining height of masonry work has to be completed. In the progress of masonry work, a mason has to consider the openings such as door, windows, etc.



Fig 4.6 Masonry Work

4.7 CONCRETING

The term concrete refers to a mixture of aggregates, usually sand, and either gravel or crushed stone, held together by a binder of cementitious paste. The paste is typically made up of Portland cement and water and may also contain supplementary cementing materials such as fly ash or slag cement, and chemical admixtures.

Concreting work includes batching, mixing, placing and compacting. Here each stages are important and have to be performed carefully. Every stage in concreting requires various tools for perfect finish. In batching, designed ratio of concrete has to be considered and respective quantities of ingredients are to be mixed to achieve design strength of concrete. Immediately after the batching, concrete has to be transferred to the casting place, well within the setting time of concrete. While placing the concrete into the molds, care has taken so that segregation and heavy bleeding has not to occur. After placing, controlled compaction is done to achieve desired strength of concrete.

CURING is the process of maintaining satisfactory moisture content and a favorable temperature of concrete during the period immediately after placing and compaction, so that hydration of cement continues until the desired properties develop. Curing of concrete is done 3-4 times a day for at least 7 days.



Fig 4.7 Concreting

4.8 PLUMBING

A fitting is used in pipe systems to connect straight pipe or tubular sections, adapt to different sizes or shapes and for other purposes, such as regulating fluidflow.

The different pipes used for plumbing works are:

- i. PVC- Polyvinyl chloride-which is light weight plastic used in construction it is softer and more flexible. It is used as acid resistant wastepiping .
- ii. UPVC- Un plasticized polyvinyl chloride -It is more hard thanPVC. It is used for cold water and transmit drinking water.
- iii. CPVC- Chlorinated polyvinyl chloride – It is a thermoplastic produced by chlorination of polyvinyl chloride resin, which is significantly more flexible and can withstand higher temp. It include hot and cold waterpipes.
- iv. Diverter, flush, spout, reducer, reducer elbow, collar.
- v. MABT- male adopter brass thread which has threads over it.
- vi. FABT- Female adopter brass thread which has threads on itsinside layer.



Fig 4.8 Internal Plumbing Work

4.9 ELECTRICAL

- i. Carry out the work as per the latest approved drawings confirmed by the concerned Project Engineer. All electrical conductors shall be of sufficient size and current rating for the purposes for which they are to be used.
- ii. Use medium / heavy gauge rigid PVC Conduit: 20 / 25 / 32 mm diameter, 2mm thick black colour and of ISI approved make, as indicated in drawing.
- iii. Conduits should be laid between the reinforcement of slab and properly fastened to the reinforcement with binding wires.
- iv. Vertical conduits in wall chase to be properly fixed in position at the location indicated in the drawing. Horizontal runs of conduits in wall to be avoided as far as possible. In hollow blocks, horizontal chases are not permitted.
- v. Bends in conduit pipes should not be sharp. In embedded Conduiting, bends made with bending spring with large radius should be used. The maximum bending radius allowed in any conduit is 2.5 times the diameter of the conduit. The use of readymade bends should be avoided as far as possible.
- vi. Pass GI pull wires of 16-gauge inside the conduits with additional loop length of 15cm as draw wire.

4.9.1 Design consideration

- i 2BHK flat at 4 KW single phase per flat.
- ii 2.5 BHK flat at 5 KW single phase per flat.
- iii 3 BHK flat at 5 KW single phase per flat.



Fig 4.9 Electrical work

4.10 QUALITY INSPECTION

Tolls to be used for quality inspection.

- i. Measuring tape.
- ii. Spirit levels - 3m.
- iii. Right angle template.
- iv. Related “Good for Construction” drawings.

CHECKLIST FOR ON-SITE INSPECTION ACTIVITY: BLOCKWORK				
Project:		Date:		
Location:				
NOTE:- Please <input type="checkbox"/> appropriate box or enter readings as per requirements				
Sl. No.	ITEM	YES	NA	Remarks / Clarifications
1	Name, date and number of the drawing			
PRE-EXECUTION CHECKS				
2	Are the latest "Good for Construction" drawings available?	<input type="checkbox"/>	<input type="checkbox"/>	
3	Are the required number of blocks available? (both load bearing and non-load bearing)	<input type="checkbox"/>	<input type="checkbox"/>	
4	Surface preparation:			
	Has the hacking at contact surfaces of column & beam been done?	<input type="checkbox"/>	<input type="checkbox"/>	
	Has cement mortar slurry been applied over the hacked surface and cured for 3 days?	<input type="checkbox"/>	<input type="checkbox"/>	
5	Have aluminium templates used for door/window openings?	<input type="checkbox"/>	<input type="checkbox"/>	
6	Are the required tools available?	<input type="checkbox"/>	<input type="checkbox"/>	
7	Are there any specific requirements of the client?	<input type="checkbox"/>	<input type="checkbox"/>	
8	Cement - is it of the approved grade and less than 1 month old?	<input type="checkbox"/>	<input type="checkbox"/>	
9	Sand - is it medium gritty, dean and silt-free (less than 5%)?	<input type="checkbox"/>	<input type="checkbox"/>	
10	Is the finished floor level button marked on structural slab?	<input type="checkbox"/>	<input type="checkbox"/>	
11	Are the markings for reference lines on pillars done?	<input type="checkbox"/>	<input type="checkbox"/>	
12	Have the wall ties been cast into columns at a vertical spacing (< 500mm)?	<input type="checkbox"/>	<input type="checkbox"/>	
CHECKS DURING EXECUTION				
13	Is the blockwork checked in vertical and horizontal directions?	<input type="checkbox"/>	<input type="checkbox"/>	
14	Is the marker / lowest course of hollow blocks filled with concrete 1:3:6 (12mm jelly)?	<input type="checkbox"/>	<input type="checkbox"/>	
15	Is the mortar in proportion 1:5 on MS sheet using farma box?	<input type="checkbox"/>	<input type="checkbox"/>	
16	Has the check for diagonals & dimensions been done?	<input type="checkbox"/>	<input type="checkbox"/>	
17	Has the thickness for joints been checked?	<input type="checkbox"/>	<input type="checkbox"/>	
18	Has raking and pointing of joints been done?	<input type="checkbox"/>	<input type="checkbox"/>	
19	Is the RCC band for 100mm walls done?	<input type="checkbox"/>	<input type="checkbox"/>	
20	Has the procedure of not constructing more than 5 courses a day been followed?	<input type="checkbox"/>	<input type="checkbox"/>	
21	Has the top course been packed below the concrete beam?	<input type="checkbox"/>	<input type="checkbox"/>	
POST-EXECUTION CHECKS				
22	Has the curing of blockwork done for atleast 7 days?	<input type="checkbox"/>	<input type="checkbox"/>	
23	Has care been taken of not entertaining excessive chasing?	<input type="checkbox"/>	<input type="checkbox"/>	
24	Has a nail been driven to test the strength of joint after 7 days of curing?	<input type="checkbox"/>	<input type="checkbox"/>	

Checked by:

Sign

Name

Date

Approved by:

Sign

Name

Date

4.11 SAFETY AT SITE

Occupational accidents cause important social and economic problems by loss of life and physical injuries. In developing countries, construction sector is one of the most important sectors that have a great contribution to economic development with its employment capacity and added-value to the economy. On the other hand, due to the lack of preventive measures, occupational accidents occur, frequently in construction in India.

4.11.1 LABOUR SAFETY

In this project workers below 18 years of age are not allowed to work. When workers on the construction site are exposed to vertical drops of 1.8m or more, fall protection is provided by means of safety belts, safety nets, guardrails etc. Openings in the slab are barricaded / closed at all levels. Working in vertical alignment at edges, stairwell, and lift well or other openings in the slab without close supervision is not allowed. Working platform planks are secured with ropes to the scaffolding. Trenches 1.5m deep or greater are given proper protective system. Adequate artificial lighting wherever natural light is inadequate is provided. Use of face mask, hand gloves & eye protection while handling chemicals is made compulsory. Measures are taken to control the menace of mosquito, flies, rodents, snakes, termites, bees etc. First aid kit is kept in the site for emergencies. Lady workers working in potentially dangerous locations like sloping roofs are avoided.



Fig 4.11 Labour safety at site

4.11.2 BUILDING SAFETY

i. FIRE SAFETY

Appropriate firefighting equipment at potentially hazardous locations is provided with central control system. Public address system is proposed to be integrated with fire alarm system to make announcements during fire emergencies. In this project, for firefighting fire hydrants are provided at every floor. In common areas, which are crowded most of the time, are provided with additional active sensor sprinkler systems. The project has a podium with special design in consideration of fire brigade engine. The podium so designed that, fire brigade engine can easily maneuver around the building. In addition fire door is provided at every floor, separating staircase from the corridor. Process Fire safety equipments are as shown below.



Fig 4.12 Fire safety

ii. ELECTRICAL SAFETY

Flame Retardant Low Smoke (FRLS) multi stranded copper conductor wires are used to minimize the possibility of spread of fire in the unlikely event of fire. Wiring is done in conduits concealed in the slab to prevent possibilities of fire where only slab exists. Electrical safety gadgets like Earth Leakage Circuit Breaker (ELCB)s, Miniature Circuit Breaker (MCB)s, Molded Case Circuit Breaker (MCCB)s, relays are used appropriately to take care of both system and personnel safety.

CHAPTER-5**RMC - READY MIX CONCRETE PLANT VISIT**

Ready mix concrete is a ready to use material with predetermined mixture of cement, sand , aggregates and water. RMC is a type of concrete manufactured in a factory according to specification of the customer, a centrally located batching plant.



Fig 5.1 RMC Plant

5.1 MIXING PLANT



Fig 5.2 Mixing plant

5.2 QUALITY TEST OF CONCRETE

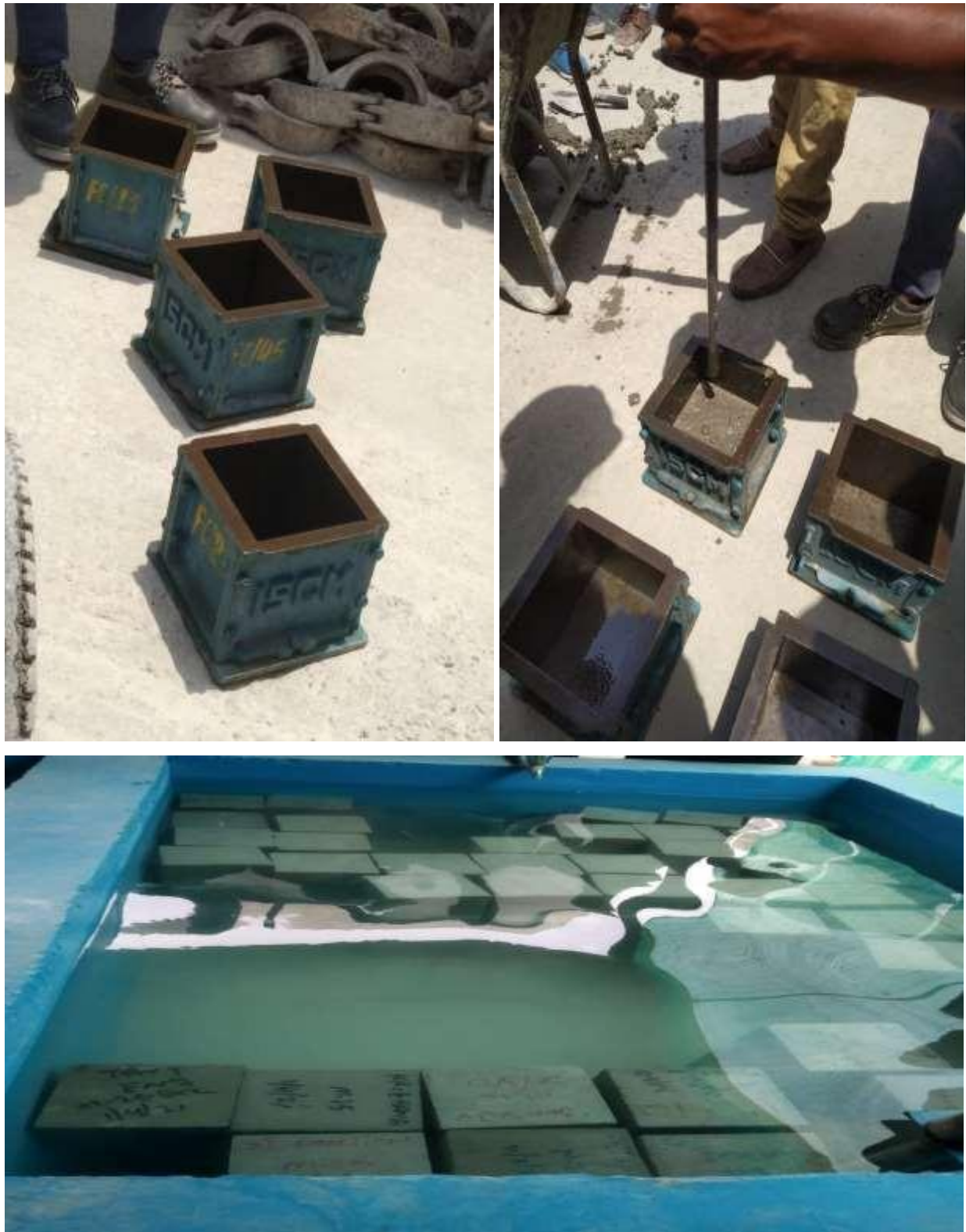


Fig 5.3 Compressive Cube Test (Casting of Cubes)

SELF EVALUTION

5.1 TECHNICAL OUTCOMES

Through this industrial Training, the following aspects of civil engineering can now be understood in a better manner.

- i. Drawing Reading.
- ii. Maintenance Quality at Site.
- iii. Quality Check at the site.
- iv. Basics of Estimations.
- v. Basic Standards in civil industry.
- vi. Construction Tools.
- vii. Execution

5.2 NON-TECHNICAL OUTCOMES

- i. Improved my way of Communication,
- ii. Gained immediate Decision Making Capability.
- iii. Improved my Execution and Management skills.
- iv. Idea about Civil Industry Market and resources.
- v. Learned Material/resource management.
- vi. Improving Practical Knowledge.
- vii. Upgrading Theoretical Knowledge.
- viii. Teamwork.
- ix. Time Management.

REFLECTION NOTES

1. My internship at Habitat Ventures Pvt Ltd. lasted for 24 days, timings was from 10:00 am to 6:00 pm
2. The project has provided a sense of satisfaction because of an excellent opportunity to engage ourselves in understanding each and every construction activity which was in progress during the training period.
3. The study on residential construction tool was the best part of training period which ultimately helped me to know more about the every tool.
4. This study will help deciding the appropriate resources required for the particular task in future as a professional engineer.
5. I learnt how to work in a team and complete.
6. I learnt time management, communication.
7. Internship program acts as a bridge between theoretical and practical knowledge.

