



**MAHALAKSHMI**  
ENGINEERING & CONSTRUCTION PVT. LTD.

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Ref: MECPL/2022-23/193

**TO WHOM SO EVER IT MAY CONCERN**

Dear Sir,

We declare that, our organization is aware of method statement and we are applying procedures for civil work activities.

**For Mahalakshmi Engineering & Construction Pvt. Ltd.**

**Authorised Signatory**

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 02
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Concreting Work	Dt: 15-10-2022

METHOD STATEMENT FOR CONCRETING

**CONTENTS**

Sr. No.	TITLE
1	Introduction
2	Scope of Work
3	Reference & Standard
4	Work Programme
5	Material
6	Temporary services required
7	Storage of Materials
8	Methodology
A	Before Commencement
B	Concreting Procedure
C	Construction Joints
D	Hot Weather Concrete
9	Quality Assurance
10	Tests
11	HSE – Health, Safety & Environment
11.1	Risk Identification
11.2	Risk Management

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 02
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Concreting Work	Dt: 15-10-2022

## Method Statement for Concreting Work

### 1. INTRODUCTION:

This Procedure covers plant and tools, manpower requirements erection/installation works for Substructure and Superstructure. This may also include necessary MEP installations to be incorporated in the structure prior to start of concreting as necessary according to approved Good for Construction drawings and other contractual obligations.

### 2. SCOPE OF WORK:

The scope of work involves the following:

1. Concrete Batching, Mixing & Transporting through transit mixers
2. Concrete Pumping, Laying, Compacting & finishing
3. Curing of concrete

### 3. REFERENCES AND STANDARD:

This document should be read in conjunction with technical specification and GFC drawings issued from Client/PMC for execution of work at site.

Indian standards to be used are IS 456/2000, IS 269, IS 8112, IS 12269, IS 1489, IS 383, IS 9103, IS1786, IS 432, IS 1566, IS 1608, IS 2502, IS 4656, IS 7861(Part I & II).

### 4. WORK PROGRAMME:

The Concrete work shall be carried out in accordance with the approved program by PMC/Client.

### 5. MATERIAL:

Material used for concrete work is:

1. Concrete coming from RMC, conforming to IS 4926.
2. Cement conforming to IS as per the grade with prior approval of engineer.
3. Fine aggregate conforming to IS 383, usually natural source sand shall be clean & free from deleterious material such as oil, acids, alkaline, salts, organics material and other deleterious material.
4. The nominal size of coarse aggregate should be 20 mm for RCC subjected to GFC. It shall conform to IS 383.
5. If required, Chemical admixtures of approved quality shall be mixed in approved proportion with concrete. The admixture shall conform to IS 9103.
6. Construction water should be clean & from a good source as suggested in IS 456/2000.
7. Reinforcement shall be high deformed bars as per IS: 1786. Reinforcement of less than 8 mm rods shall be plain steel grade I as per IS: 432. Wire mesh shall

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 02
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Concreting Work	Dt: 15-10-2022

be in accordance with IS: 1566.

8. Binding wire for fixing reinforcement shall be soft galvanized wire with Gauge mentioned in BOQ, GFC drawing or technical specification.
9. Concrete Cover Blocks.

#### **6. EQUIPMENT USED FOR CONCRETING:**

1. Batching Plant / RMC Supply
2. Transit mixer
3. Concrete Pump & Pipeline
4. Needle Vibrator, wheel borrow, chute, spade
5. Other tools & tackles for finishing purpose

#### **7. STORAGE OF MATERIALS:**

##### **7.1 Cement:**

- Cement shall be stored in weather-tight buildings bins or silos which exclude moisture and contaminants.
- The bag shall be stacked at least 10-20 cm. clear above the floor.
- Cement bags shall be placed close together in the stack to reduce circulation of air as much as possible. Cement bags should not be stacked more than 10 bags high.
- When removing cement bags for use apply "first in, first out" rule that is take the oldest cement out first.

##### **7.2 Coarse & Fine Aggregate:**

- Coarse & Fine aggregates to be stack in such a manner that it should be free from contamination & intermixing.

##### **7.3 Construction Water:**

- Water Storage Tank should be covered & no contamination must take place.

##### **7.4 Chemical Admixture:**

- Chemical Admixture is to be store in a dry place & away from direct sunlight.

#### **8. METHODOLOGY:**

##### **A. Before Commencement:**

1. For Design Mix concrete M25 grade, the mix shall be designed to provide the grade of concrete having the required strength, workability & durability requirements given in IS:456 for each grade of concrete taking into account the type of cement, minimum cement content and maximum W/C ratio confirming

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 02
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Concreting Work	Dt: 15-10-2022

to exposure conditions.

2. Before any concrete is placed the entire placing program consisting of Equipment layout proposed procedure and methods shall be submitted to the engineer in charge for approval.
3. Prior notice shall be given to engineer before start of concreting.

#### **B. Concreting procedure:**

1. Concrete Mix Design for different structure should be as per notes in the specific approved drawing.
2. All raw materials to be measured by weight in weigh batching machines of an approved type. Material shall be weighed within tolerance inclusive of scale and operating errors.
3. Concrete shall be mixed in mechanical mixers of an approved type.
1. The water to be added in concrete shall be adjusted based on moisture contents in fine and coarse aggregates.
2. Concrete receiving surface shall be treated with cement slurry or kept wet prior to starting of concreting.
3. Concreting is to be done by using chute (height not more than 1.5 meters) or by concrete pump. In case chute is not possible then unload the concrete on MS tray / concrete platform.
4. Pour the concrete at desirable speed.
5. The compaction of concrete will be done by immersion type needle vibrator of 40/60mm diameter, which shall be inserted into concrete in vertical position not more than 450mm apart. Vibration will be applied systematically to cover all areas immediately after placing concrete. Required numbers of extra needles and vibrators shall be kept on standby.
6. Concrete shall be consumed within its Initial Setting time & re-dosing of admixture may be done if required up to the maximum dosage of admixture as specified by manufacturer.
7. Continuous concreting shall be done to the full thickness of foundation rafts, slabs, beams & similar members. For placing on slope, concreting will be started at the bottom and moved upwards.
8. Take care of shuttering corners and sides while vibrating.
9. Concrete shall be placed in successive, horizontal of uniform thickness ranging. Care to be taken that no loss of slurry takes place from joints.
10. If breakdown of machinery or concreting equipment occurs during concreting, concrete shall be ordered from approved outside agency.
11. If concreting is done during night, proper lighting arrangement shall be done and night work permit shall be maintained.
12. Final surface shall be raked to final position and level with required finish.

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 02
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Concreting Work	Dt: 15-10-2022

13. Minimum period before striking formwork shall be as per IS 456/2000 and as per specifications.
14. Date of casting on shall be marked on structure.
15. Start the curing of concrete as soon as it becomes tacky dry to avoid shrinkage cracks.
16. Qty of water supplied shall be controlled so as to prevent the erosion of freshly placed concrete.
17. The workability of concrete shall be checked by site supervisor or lab technician.
18. The prepared surface shall be inspected and certified in check list.
19. All blemishes and defect if any shall be rectified immediately after the removal of formwork.

#### **C. Construction Joints:**

1. If stopping of concrete becomes unavoidable anywhere the construction joint shall be made.
2. Bonding keys shall be done in construction joints.
3. In a column, joint shall be formed 75mm below the lowest soffit of the beams connected to it.
4. Concrete in beam shall be placed throughout without a joint but, if the provision of joint is unavoidable the joint shall be vertical.
5. A joint in a slab shall be vertical and parallel to the principal reinforcement.
6. Where it is unavoidable, the joint at right angles to the principal reinforcement shall be vertical and at the middle of the span.
7. Vertical construction joints shall be cleaned.
8. In placing concrete against formed construction joints the surface shall be coated thoroughly with the cement slurry immediately before placing concrete.

#### **D. Hot Weather Concreting:**

Concreting in extreme hot weather shall be avoided. Special care shall be exercised & measures undertaken when temperature on site exceeds 40 C. Such measures shall include:

- a) Providing a shade for the mixing machine.
- b) Depositing the concrete from the machine as quickly as possible.
- c) Adjusting water proportions throughout the day to account for water
- d) Covering the deposited concrete by a membrane as soon after the placing as possible without damaging the fresh concrete.
- e) Wet gunny bags shall be laid immediately after two hours of concreting on the top surfaces of slab and shall be kept wet for curing period.

#### **9. QUALITY ASSURANCE:**

1. Slump for all type of concrete is to be maintained based on the type of the structure, pouring condition, environment conditions etc.

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 02
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Concreting Work	Dt: 15-10-2022

2. Concrete Temperature is to be recorded.
3. All the activities shall be in compliance with approved quality plan.
4. Inspection test report shall be generated prior to commencement of the activity, any shortfall shall be attended at earliest shall be closed.
5. Sampling of concrete cubes will be done as per the frequency given below:

Quantity of Concrete in the ber of SamplesWork, m3	the Num
1 - 5	1
6 - 15	2
16 - 30	3
31 - 50	4
51 and above	4 plus one additional sample for -each additional 50 m3 or part thereof

Note: - The test specimen shall be made from each sample for testing at 28 days. Additional cubes may be required for determining strength of concrete at 7 days. One sample is a set of 03 cubes.

6. For each sample of concrete pour 150mm cubes shall be prepared and cured as per IS 516 & IS 456.
7. Carrying out of concrete work shall be in accordance with the check list.
8. The concrete surface shall be protected against damage until acceptance by the engineer.
9. The surface should be properly cured with water showing no marks of cracks.

#### **10. TESTS:**

Appropriate test which are required for the materials used in construction is to be done as per approved Material Test Plan & as per specified frequency. Test procedures are to be followed as per related Indian Standards.

#### **11. HSE – HEALTH, SAFETY AND ENVIRONMENT:**

All necessary precautions shall be taken in accordance with HSE Plan and checklist shall be maintained.

##### **11.1 RISK IDENTIFICATION:**

During the whole process of work the following risks are foreseen:

1. Chances of fall of material/Personal from Height.

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 02
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Concreting Work	Dt: 15-10-2022

2. Improper support from side may lead to injury.
3. Improper scaffolding leads to injury.
4. Improper platform leads to injury.
5. Improper barricading may lead to injury.
6. Improper Steel shifting & mishandling may result in to shoulder & hand injury.
7. Improper use of electric safety equipment may lead to major injury.
8. Injury during cutting or binding of steel.
9. During concreting proper PPE's required like gum boot, goggles, rubber hand gloves, helmet,etc.
10. Chances of getting injured if housekeeping not done.

### 11.2 RISK MANAGEMENT:

SPCL shall comply with all the necessary mitigation measure as stated in Job safety analysis. The risk management can be separated into general safety consideration and those that are particularly applicable to the actual work at site.

#### a. General Safety Considerations:

The following safety precautions shall be followed during construction.

1. All the workers shall wear proper personal protective equipment.
2. All the workers & staff personals shall be trained well in works to be executed at height & precautionary & corrective measures to be taken for the same.
3. All the workers shall be trained and safety induction shall be imparted to them before the commencement of work at site.
4. Daily tool box talk shall be carried out for mutual understanding of work.
5. Regular or daily check of equipment prior to use shall be carried out.
6. A competent site supervisor shall be present at all times during work.
7. A first aid person shall be present at site and a first aid kit shall be provided in site office.
8. All record of operator and plant certificate shall be kept on site at all the times.
9. Emergency call numbers shall be posted on site for contact in emergency.

#### b. Particular Safety Consideration (Job Hazard Analysis):

1. Approved safety plan procedures shall be strictly followed;
2. All labor shall be using adequate safety tools as per the approved safety plan;
3. Men working inside excavated areas shall be protected against earth slides by having suitable safe slopes;
4. Warning tapes shall be used to prevent workmen walking too close to the edge of excavation;
5. Fencing, guards, lights, warning signs, shall be used when and where necessary for the



<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 02
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Concreting Work	Dt: 15-10-2022

protection of the workers and for the safety and convenience of the public;

6. All necessary emergency procedures shall be complied with;
7. All equipment shall be provided with safety items.

The following safety precautions shall be taken in particular to RCC works:

Item	Potential Hazard	Controls	Person who will Ensure thisHappen.
	What can harm you and others	What are you going to do to make the job as safe as possible	
1	Fall of material /personal	Use safe scaffold with proper guard rails & access ladder. Provide safety net as per requirement.	Site Engineer/ Safety Officer
		Use safety belt & anchor the life line to firm member /structure	Site Engineer
		All materials & tools must be kept away at least 1 m away from edge.	Site Engineer
2	Injury to personnel	Engage trained & experienced personnel for the job	Site Engineer/ Safety Officer
		Use of required PPE's	Site Engineer
		Good housekeeping in working areas	Site Engineer/Safety Officer
		Conduct tool box talk	Site Engineer/ Safety Officer
3	Manual Handling	Engage good physic personnel	Site Engineer
		Do not try to lift alone a heavy load, seek others help	Site Engineer
		Use safety hand gloves, safety helmet, safety shoes & safety belt at 2 m & above height.	Site Engineer/ Safety officer

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 03
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Brick work	Dt: 13-10-2022

## **METHOD STATEMENT FOR BRICK WORK**

### **CONTENTS**

<b>Sr. No.</b>	<b>TITLE</b>
1	INTRODUCTION
2	SCOPE OF WORK
3	REFERENCES AND STANDARD
4	WORK PROGRAMME
5	MATERIAL
6	MACHINERIES & EQUIPMENT
7	TEMPORARY SERVICES
8	METHODOLOGY
8.1	BEFORE COMMENCEMENT
8.2	LAYING OF BRICKS
8.3	MORTAR
8.4	CURING
9	QUALITY ASSURANCE
10	HSE – HEALTH, SAFETY AND ENVIRONMENT
10.1	RISK IDENTIFICATION
10.2	RISK MANGEMENT

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 03
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Brick work	Dt: 13-10-2022

### 1. INTRODUCTION:

This method statement describes the outline procedure to be followed for Fly ash Brick-masonry work.

### 2. SCOPE OF WORK:

The scope of work involves the following:

Providing & lying brick masonry from 150 mm thick as per drawing.

### 3. REFERENCES AND STANDARD:

This document should be read in conjunction with technical specification and GFC drawings issued from Client/ PMC for execution of work at site.

### 4. WORK PROGRAMME:

The Masonry work shall be carried out in accordance with the submitted program to PMC/CLIENT.

### 5. MATERIAL:

1. Fly Ash Bricks as per IS 12894-2002 and tested as per IS 3495 (Part 1 & 2).
2. Cement confirms to IS 12269:1987: OPC 53 or as specified in Technical Specification. Compressive strength, consistency, initial & Final setting time confirms as per IS 4031 (Part: 3,4,5 &6)
3. Fine Aggregate of usually natural source confirms to IS 383.
4. Water confirms to IS 456:2000.

### 6. MACHINERIES & EQUIPMENT:

For Brick Masonry work following equipment are proposed to be used for the given scope of work:

1. Rule line & Plumb
2. Wooden straight edge
3. Masonic Spirit Level
4. Other required tools & tackles
5. Measuring Box

### 7. TEMPORARY SERVICES:

1. Scaffolding will be double or single as per site requirement.
2. All equipment's & materials required for curing.

### 8. METHODOLOGY:

#### 8.1 Before Commencement:

1. Prior to brick work over concrete surfaces the entire surface shall be cleared, chipping to remove all laitance and loose material and made thoroughly cleaned.
2. Get approved layout from client before starting of brick work.

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 03
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Brick work	Dt: 13-10-2022

3. Proper scaffolding should be prepared in case of height more than 1.5 meter.
4. Prepare fix size measurement boxes equivalent to volume of one cement bags for mixing cement mortar.
5. Fly ash Bricks shall be soaked in water before use to penetrate the whole depth of the bricks so that they will be saturated and will not absorb water from the mortar.

### **8.2 Lying of bricks:**

1. Fly ash Bricks shall be laid in English bond unless otherwise specified.
2. Prior to lying bricks, all loose materials, dirt & set lumps of mortar are to be removed & make the surface wet.
3. The bricks shall be laid in mortar to line & shapes shown on the plans slightly pressed & thoroughly bedded in mortar.
4. All joints shall be properly flushed & packed with mortar so that they will be completely filled with mortar and no hollows are left anywhere.
5. Bricks shall be laid with frogs up & the same shall not be raised more than 14 courses per day in any case.
6. The horizontal bed joints & vertical joints shall be an average 10mm to 12mm thick & wide respectively.
7. The joints shall be raked out when the mortar is green so as to provide key to plaster.
8. All courses shall be laid truly horizontal & vertical joints made truly vertical.
9. Vertical joints in one course & the course below shall not come over one another.
10. Walls shall be taken up truly in plumb and alignment.
11. Height of brick course shall be kept uniform.

### **8.3 Mortar:**

1. Mortar for the brick work shall be as instructed 1:4 for both 150mm thick walls or as specified in GFC drawing.
2. Mixing of mortar shall be done manually (hand mix) and it shall be carried out on GI sheet or any impervious platform.
3. It shall be thoroughly mixed by being turned over at least twice dry & twice wet.
4. Water shall be added gradually of the required quantity.
5. Mortar shall be used within thirty minutes after the water is added to the dry mixture.

### **8.4 Curing:**

All brick work shall be kept well-watered for at least 10 days.

### **9. QUALITY ASSURANCE:**

1. All the activities shall be in compliance with approved quality plan.
2. Inspection test report shall be generated prior to commencement of the activity; any short fall shall be attended at earliest.
3. The surface should be properly cured with water showing no marks of cracks.

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 03
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Brick work	Dt: 13-10-2022

## **10. HSE – HEALTH, SAFETY AND ENVIRONMENT:**

All necessary precautions shall be taken in accordance with HSE Plan.

### **10.1 Risk Identification**

During the whole process of work the following risks are foreseen:

1. Chances of fall of material/Personnel from Height.
2. Improper support from side may lead to injury.
3. Improper scaffolding leads to injury.
4. Improper platform leads to injury.
5. Improper barricading may lead to injury.
6. Improper Steel shifting & mishandling may result in to shoulder & hand injury.
7. Improper use of electric safety equipment may lead to major injury.
8. Injury during cutting or binding of steel.
9. During concreting proper PPE's required like gum boot, goggles, rubber hand gloves, helmet, etc.
10. Chances of getting injured if housekeeping not done.

### **10.2 Risk Management:**

We shall comply with all the necessary mitigation measure as stated in Job safety analysis. The risk management can be separated into general safety consideration and those that are particularly applicable to the actual work at site.

#### **a. General Safety Considerations:**

The following safety precautions shall be followed during construction.

1. All the workers shall wear proper personal protective equipment.
2. All the workers & staff personals shall be trained well in works to be executed at height & precautionary & corrective measures to be taken for the same.
3. All the workers shall be trained and safety induction shall be imparted to them before the commencement of work at site.
4. Daily tool box talk shall be carried out for mutual understanding of work.
5. Regular or daily check of equipment prior to use shall be carried out.
6. A competent site supervisor shall be present at all times during work.
7. A first aid person shall be present at site and a first aid kit shall be provided in site office.
8. All record of operator and plant certificate shall be kept on site at all the times.
9. Emergency call numbers shall be posted on site for contact in emergency.

#### **b. Particular Safety Consideration (Job Hazard Analysis):**

The following safety precautions shall be taken in particular to Brick works:

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 03
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Brick work	Dt: 13-10-2022

Item	Potential Hazard	Controls	Person who will Ensure this Happen.
	What can harm you and others	What are you going to do to make the job as safe as possible	
1	Fall of material /Personal	Use safe scaffold with proper guard rails & access ladder. Provide safety net 25 feet height above & to protect personnel/ material falling.	Site Engineer/ Safety Officer
		Use safety belt & anchor the life line to firm member /structure	Site Engineer
		All materials & tools must be kept away atleast 1 m away from edge.	Site Engineer
2	Injury to personnel	Engage trained & experienced personnel for the job	Site Engineer/ Safety Officer
		Use of required PPE's	Site Engineer
		Good housekeeping in working areas	Site Engineer/Safety Officer
		Conduct tool box talk	Site Engineer/ Safety Officer
3	Manual Handling	Engage good physic personnel to avoid problem.	Site Engineer
		Do not try to lift alone a heavy load, seek others help	Site Engineer
		Use safety hand gloves, safety helmet, safety shoes & safety belt at 2 m & above height.	Site Engineer/ Safety officer

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 04
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev.No.:RO
	<b>Method Statement for Membranes Waterproofing</b>	Dt: 8-4-2023

### 1. Scope:

- This procedure provides a method of control for “Membranes Waterproofing of Underground water tank vertical walls” in order to achieve compliance with the specifications and drawings.

### 2. Drawing Reference:

- Elevation / Architectural Drawings.

### 3. Tools required on site

- Measuring tape
- Cutting knife
- Scissors Press rollers & lap rollers
- Brush
- Cotton waste
- Solvent cleaner
- Paint roller/paint brush
- Hand gloves
- Face mask
- Safety goggles

### 4. Tradesman: Applicator & helpers.

### 5. Surface preparation:

The substrate must be free of all dirt, oil grease and loosely adhering particles and made absolutely dry.

Any dew settled or concrete dampness should be thoroughly cleaned using a dry cloth. Honeycomb and spalled concrete is to be repaired and all nail heads and protrusions that are likely to puncture the membranes must be removed. Any new concrete should be cured for a minimum period of 7 days before any water proofing membrane can be laid. However, if any resin based curing compound is to be used then the water proofing membrane application can be carried out immediately.

### 6. Weather Conditions:

Application should be done when the ambient temperature is between 4°C to 45°C. Application of Membrane should be avoided in case of extreme weather conditions like storm, rain, etc.

### 7. Priming:

- All concrete surfaces will then be primed with a solvent based Bitumen Primer Dr. Fixit Torch shield Primer BS 3416 (solvent based bitumen primer) @ 4-6 m<sup>2</sup>/lt. The primer

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 04
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev.No.:RO
	<b>Method Statement for Membranes Waterproofing</b>	Dt: 8-4-2023

has to be touch (a slight tack remains) dry prior to the application of the waterproof membrane.

#### **8. Application:**

Peel off the release film from the self adhesive side and start unrolling the membrane and press it to the surface. Smoothen the membrane from the center to the edges with a wooden press in order to remove entrapped air. Furthermore, an iron roller shall be used for rolling on top of the applied membrane to ensure a proper and strong adhesion of the bitumen compound with the base surface. Side overlaps shall be a minimum of 75 mm on the selvedge and end overlaps 100 mm.

#### **9. Flat Horizontal Surfaces:**

- Unroll only the required length of the membrane and cut the pieces to the desired length and shape.
- Place the membrane pieces on the area to be covered and check whether the pieces match with the profile of the marked substrate.
- Re-roll the membrane for about half the length without changing its orientation. Then slowly unroll the membrane, peel off the release film and carefully place the membrane on the surface.
- Smoothen out any entrapped air by pressing from the center to the sides.
- The subsequent rolls are to be laid in such a fashion that there is a 50 mm side overlap on sides and 100 mm end overlap.

#### **10. Vertical Surfaces**

- Reinforcing strips are to be provided at all corner joints on top of the cement sand fillet (40 mm x 40 mm).
- Dimension of the area, which needs to be waterproofed, is taken and the membrane is aligned accordingly.
- The membranes are then re-rolled and then un-rolled slowly and stuck to the surface by peeling off the silicone release film and exposing the self-adhesive side. Entrapped air is to be smoothened out from the centre to the sides.
- The membrane will be finished on the top by tucking into a groove cut in the concrete and sealed with Dr. Fixit Pidiseal PS 41G sealant or similar.
- The applied membrane is then to be protected from damage by installing Protection board over it.

Note: Due to the absorption of heat in the concrete, the water present will try to come out in the form of vapor, thus creating an upward pressure on the membrane. This leads to the formation of bubbles. In order to minimize the formation of these bubbles it is always recommended to cover up the membranes immediately after application (within 24 hours) with the protection membrane or screed. Bubble formation will not in any way affect the water proofing property of the membrane unless it is physically damaged. However, it is



<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 04
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev.No.:RO
	<b>Method Statement for Membranes Waterproofing</b>	Dt: 8-4-2023

essential that the lap joints are properly sealed and do not open up, as these will be the weak areas for water penetration.

### 11. Product Positioning

- All applications in sub-ground, for external protection such as dry retaining basement walls
- Can be applied on metallic / cement sheet roofs as per specifiers needs (with special finishes);
- Dry basements (under rafts, with Cross Laminated finish-protection against site abuse / RMC Pours, etc.)
- Also applied on Roofs in extremely cold climates in Northern Regions
- W/p Wraps around protrusions and up-stands, pedestals
- Pitched Roofs
- Electrical substations, refineries, oil and gas, petro chem. Industries (where torching is not safe)

### 12. Protection:

The membrane shall be protected immediately after application from damage, due to ongoing site activities or from sharp aggregates during backfilling by a tough, weather, warp and rot proof asphaltic protection board. Alternatively, on horizontal areas the membrane can also be protected by laying a cement sand screed (50 mm).

### 13. Membrane Repair:

There is a chance of the membrane getting punctured due to the ongoing site activities. Minor pinhole of diameters less than 0.5 mm will not affect the waterproofing properties of the system, since the highly elastic SBS compound tends to cover and extend over it and seal the puncture under pressure. However, anything larger than that should be patched with a piece of the same membrane which extends at least 2 inches from all the sides of the puncture. The area to be repaired should be primed with the bitumen primer and allowed to dry before carrying out the patching works.

### 14. Health & Safety:

Dr. Fixit Samshield 1500 contains tacky bitumen compound and can adhere to human skin during application. Bitumen stains can be removed by using a cloth dipped in a solvent. In case the affected area is sensitive one, seek medical assistance immediately.

<b>Position</b>	<b>Responsibilities</b>
<b>Project Manager</b>	Ensure the work is progressing as per the approved Schedule and contractual requirements
<b>Project Engineer/Construction</b>	Responsible for carrying out the work in

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 04
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev.No.:RO
	<b>Method Statement for Membranes Waterproofing</b>	Dt: 8-4-2023

<b>Manager</b>	accordance with Drawings, Approved drawings and project specification
<b>QA/QC Engineer</b>	Ensure the quality requirements as outlined in the quality plan are being achieved
<b>Safety Officer</b>	Study the health & safety aspects of the job, advice Remedial measures and oversee implementation of these
<b>Foreman</b>	Supervise the work as advised by the project engineer
<b>Labors</b>	Carry out the work as advised by the Applicator.

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 01
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Plain Cement Work	Dt: 13-10-2022

## METHOD STATEMENT FOR PLAIN CEMENT CONCRETE

### CONTENTS

Sr. No.	TITLE
1	Introduction
2	Scope of Work
3	Reference & Standard
4	Work Programme
5	Material
6	Temporary services required
7	Storage of Materials
8	Methodology
A	Before Commencement
B	Concreting Procedure
C	Construction Joints
D	Hot Weather Concrete
9	Quality Assurance
10	Tests
11	HSE – Health, Safety & Environment
11.1	Risk Identification
11.2	Risk Management

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 01
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Plain Cement Work	Dt: 13-10-2022

### 1. INTRODUCTION:

This method statement describes the work procedure to be followed for plain cement concrete to be executed.

### 2. SCOPE OF WORK:

The scope of work involves the following:

Laying of required grade of PCC below Pile Cap, as per the issued GFC drawing.

### 3. REFERENCES AND STANDARD:

This document should be read in conjunction with technical specification and GFC drawings issued from client for execution of work at site and relevant IS 383, IS 2386, IS 456, IS 12269.

### 4. WORK PROGRAMME:

The PCC work shall be carried out in accordance with the submitted program to client/PMC.

### 5. MATERIAL:

Material used for PCC is:

1. Concrete coming from RMC shall be conforming to IS 4926.
2. Cement conforming to IS: 8112 (Grade -43) or IS: 12269 (Grade -53) with prior approval of engineer.
3. Fine aggregate conforming to IS 383, usually natural source sand shall be clean & free from deleterious material such as oil, acids, alkaline, salts, organics material and other deleterious material.
4. The nominal size of coarse aggregate should be 20 mm. It shall conform to IS 383.
5. If required, admixtures of approved quality shall be mixed with concrete. The admixtures shall conform to IS 9103.
6. Construction water should be clean & from a good source as suggested in IS 456/2000.

### 6. DETAIL OF TEMPORARY SERVICES:

1. Temporary form work is required for doing PCC.
2. Formwork shall be firmly supported & tied.

### 7. METHODOLOGY:

#### 7.1 BEFORE COMMENCEMENT:

1. Mix design as per the required grade shall be approved with satisfactory test results.
2. The proportions of cement, fine aggregate & water used in the mix design has to be tested for strength & workability under laboratory conditions.
3. If at the time of construction, the sources of cement & aggregate changes further

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 01
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Plain Cement Work	Dt: 13-10-2022

preliminary mixes shall be undertaken.

### **7.2 PREPARATION OF WORK:**

1. The Base/Subgrade shall be levelled & compacted as per the specifications by Client/PMC.
2. The Level & Compaction shall be cross checked before concrete placing.
3. Watering should be done before laying PCC.
4. Ensure that pits are cleaned well for debris and loose material.
5. The insides of the formwork should be checked to ensure whether they have been cleaned and oiled with approved shuttering oil.
6. There shall not be any gap in the form work.
7. Prior to concrete placement, all work shall be inspected & approved by the engineer.

### **7.3 PLAIN CEMENT CONCRETE:**

1. Mark plan dimensions, center line of PCC and make level pad / thickness level for PCC.
2. Confirm delivered concrete is as per the approved design mix and in accordance to the technical specifications for PCC.
3. Make arrangement for PCC like labors, batching plant tools, tackles & keep pit in dewatered condition by pumping / bailing water as required if surface is dry moist the same as standby arrangements.
4. The Slope & Length of Chute, if used, shall be appropriate such that the concrete flows conveniently.
5. Concrete shall be dropped from the height not exceeding 1.5 m.
6. Place the concrete in position within 30 minutes after unloading. Ensure that no segregation should take place.
7. Level the surface to correct horizontal plane taking reference of level pad.
8. Remove wooden battens after final set and carry out Curing.
9. Carry out Curing as per IS 456/2000.

### **8. QUALITY ASSURANCE:**

1. All the activities shall be in compliance with approved quality plan.
2. ITP shall be provided.
3. Inspection test report shall be generated prior to commencement of the activity, any shortfall shall be attended at earliest.
4. Carrying out of PCC shall be in accordance with the check list.
5. The concrete surface shall be protected against damage until accepted by the engineer in charge.
6. The surface should be properly cured with water showing no marks of cracks.
7. Curing period should be as per IS 456/2000.

### **9. HSE – HEALTH, SAFETY AND ENVIRONMENT:**

All necessary precautions shall be taken in accordance with HSE Plan

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 01
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Plain Cement Work	Dt: 13-10-2022

### 9.1 RISK IDENTIFICATION:

During the whole process of work the following risks are foreseen:

1. Chances of getting skin disease by cement.
2. If dry PCC is done, chances of getting air pollution through cement dust.
3. Chances of getting injured if housekeeping not done.

### 9.2 RISK MANAGEMENT

ACCIPL shall comply with all the necessary mitigation measure as stated in HSE Plan. The riskmanagement can be separated into general safety consideration and those that are particularly applicable to the actual work at site.

#### a. General Safety Considerations:

The following safety precautions shall be followed during construction.

1. All the workers shall wear proper personal protective equipment.
2. All the workers & staff personals shall be trained well in works to be executed at height & precautionary & corrective measures to be taken for the same.
3. All the workers shall be trained and safety induction shall be imparted to them before the commencement of work at site.
4. Daily tool box talk shall be carried out for mutual understanding of work.
5. Regular or daily check of equipment prior to use shall be carried out and shall be recorded.
6. A competent site supervisor shall be present at all times during work.
7. A first aid person shall be present at site and a first aid kit shall be provided in site office.
8. All record of operator and plant certificate shall be kept on site at all the times.
9. Emergency call numbers shall be posted on site for contact in emergency.

#### b. Particular Safety Consideration (Job Hazard Analysis)

The following safety precautions shall be taken in particular to PCC works:

Item	Potential Hazard	Controls	Person who will Ensure thisHappen.
	What can harm you and others	What are you going to do to make the jobas safe as possible	
1	Fall of material /Personal	Use safe scaffold with proper guard rails &access ladder.	Site Engineer/ Safety Officer
		All materials & tools must be kept away atleast 1 m away from edge.	Site Engineer

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>		Doc. No.: 01
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd		Rev. No.: R0
	Method Statement for Plain Cement Work		Dt: 13-10-2022

2	Injury to personnel	Engage trained & experienced personnel for the job	Site Engineer/ Safety Officer
		Use of required PPEs.	Site Engineer
		Good housekeeping in working areas	Site Engineer/Safety Officer
		Conduct tool box talk	Site Engineer/ Safety Officer
3	Manual Handling	Engage good physic personnel	Site Engineer
		Do not try to lift alone a heavy load, seek others help	Site Engineer
		Use of required PPEs.	Site Engineer/ Safety Officer

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 03
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Reinforcement Work	Dt: 13-10-2022

## METHOD STATEMENT FOR REINFORCEMENT WORK

### CONTENTS

Sr. No.	TITLE
1	Introduction
2	Scope of Work
3	References & Standards
4	Work Programme
5	Material
6	Temporary services required
7	Methodology
7.1	Handling
7.2	Bar Bending Schedule
7.3	Cutting Bending & Placing
7.4	Tolerance
7.5	Spacing of Reinforcement
7.6	Laps of Reinforcement
8	Quality Assurance
9	HSE – Health, Safety & Environment
9.1	Risk Identification
9.2	Risk Management



<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 03
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	<b>Method Statement for Reinforcement Work</b>	Dt: 13-10-2022

### 1. INTRODUCTION:

This method statement describes the work procedure to be followed for cutting, bending and laying of reinforcement and inspection of works to be executed.

### 2. SCOPE OF WORK:

The scope of work involves the following:

1. Providing & fixing reinforcement for RCC work with approved material & as per the GFC drawing.

### 3. REFERENCES AND STANDARD:

This document should be read in conjunction with technical specification and GFC drawings approved from client/PMC for execution of work at site.

Indian standards to be used are IS 456/2000, IS 1786, IS 9417, IS 2751 IS 2502.

### 4. WORK PROGRAMME:

The RCC work shall be carried out in accordance with the approved program by Client/PMC.

### 5. MATERIAL:

Material used for Reinforcement Work is:

1. Reinforcement shall be high deformed bars as per IS: 1786. Reinforcement of less than 8 mm rods shall be plain steel grade I as per IS: 432. Wire mesh shall be in accordance with IS: 1566.
2. Binding wire for fixing reinforcement shall be soft galvanized wire of gauge as per BOQ or Technical specification.
3. Rebar material shall be as per specification.
4. Manufacture Test Certificate will be provided at the time of inspection.
5. Concrete or PVC Cover Blocks.

### 6. DETAIL OF TEMPORARY SERVICES:

1. Bar Cutting & Bending Machine with required Mandrels
2. Equipment's for lifting & shifting of reinforcement steel
3. Other Equipment's, tools & tackles required for cutting, bending & tying of reinforcement.

### 7. METHODOLOGY:

#### 7.1 Handling:

1. All reinforcement shall be placed above the ground by using wooden sleepers or concrete blocks.
2. Unusable cut rods and scrap reinforcement shall be properly stacked at yard.

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 03
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Reinforcement Work	Dt: 13-10-2022

### 7.2 Bar Bending Schedule:

1. Prepare bar bending schedule based on the latest GFC drawings and to be submitted to Engineer for review.
2. Bar bending schedule shall clearly specify the following:
  - a) Bar diameter
  - b) Numbers
  - c) Cut-lengths
  - d) Shapes

### 7.3 Cutting, Bending & Placing:

1. All reinforcement shall be free from cracks, coats of paints, oil, mud or any other substances which may destroy or reduce bond. Use wire brush to clean the reinforcement if required.
2. All the bars should be bent according to the sizes and shapes shown in the detailed working drawing.
3. Rein shall be bent gradually by machine or other approved means.
4. Bars bent shall not be heated beyond carry red colour after bending shall be allowed to cool slowly without quenching.
5. Place the reinforcement as per GFC drawings ensuring the following aspects properly,
  - a) Type & size of bar.
  - b) Number of bars.
  - c) Location and lengths of laps, splices.
  - d) Curtailment of bars.
  - e) In two-way reinforcement, check the direction of reinforcement in various layers.
  - f) Adequate number of chairs, spacer and cover blocks.
  - g) Size of cover blocks.
  - h) All the bars shall be tied with soft GI binding wire.
6. Reinforcement may be placed with in the following tolerance whenever required:
  - a) For effective depth 200mm or less  $\pm 10$ mm.
  - b) For effective depth more than 200mm  $\pm 15$ mm.
  - c) The cover should suit various cover requirement as per drawing notes.
7. Where reinforcement bars are bent aside at construction joints and afterwards bend back into their original position, care should be taken to ensure that at no time the radius of the bend is less than 4 times the dia. of bar for MS and 6 times the dia. for HYSD bars.
8. Welding, if required, shall be done as per IS: 9417.
9. Welder Qualification is to be done if required.
10. For Welded Lap the type of weld, length of weld, welding procedure, Selection of Material & Equipment will be done as per Client Specifications or IS 9417 & IS 2751 respectively.
11. The sequence of reinforcement shall be correlated with fixing of inserts,

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 03
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	<b>Method Statement for Reinforcement Work</b>	Dt: 13-10-2022

- sleeves, conduits, anchors and formworks.
12. In walls, place accurately bent spacer bars wired to vertical or horizontal bars between successive rows.
  13. Cover blocks will be used as per BOQ or approved GFC drawing or technical specification.
  14. Spacers, chairs and other supports detailed on drawings, together with such other supports as may be necessary, should be used to maintain the specified nominal cover to the steel reinforcement.
  15. Spacers or chairs should be placed as instructed by EIC.
  16. All reinforcement shall be placed and maintained in the positions shown in the drawing by providing proper cover blocks, spacers, supporting bars.
  17. When specified diameter of reinforcement is not available, it may be allowed to replace such diameters with available diameters calculated to provide the equivalent steel area as shown on the drawings and such alterations shall be carried out only after obtaining the written approval of the TML.

#### **7.5 Spacing of Reinforcement:**

Minimum distance between two parallel main reinforcement bars shall usually be not less than the greatest of the following:

- Horizontal distance: i) bar diameter (of larger bar if unequal diameters are used)  
ii) 5 mm. More than nominal size of coarse aggregate
- Vertical distance : i) two thirds the nominal size of coarse aggregate  
ii) maximum bar size  
or iii) 15 mm

#### **7.6 Laps of Reinforcement:**

Where laps and joints are provided in reinforcing bars, they shall be staggered and the following requirements should generally be satisfied:

- a) The Splice & lap length shall be as per the GFC drawings or as per IS 456-2000.
- b) When bars of different diameter of bar are spliced, the lap length shall be calculated considering the dia. of smaller dia. bar.

#### **8. QUALITY ASSURANCE:**

1. All the activities shall be in compliance with approved quality plan.
2. Inspection test report shall be generated prior to commencement of the activity, any shortfall shall be attended at earliest.
3. Carrying out of reinforcement work shall be in accordance with the check list.

#### **9. HSE – HEALTH SAFETY & ENVIRONMENT:**

All necessary precautions shall be taken in accordance with HSE Plan and checklist shall be maintained.

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 03
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Reinforcement Work	Dt: 13-10-2022

### 9.1 RISK IDENTIFICATION:

During the whole process of work the following risks are foreseen:

1. Chances of fall of material/Personal from Height.
2. Improper support from side may lead to injury.
3. Improper scaffolding leads to injury.
4. Improper platform leads to injury.
5. Improper barricading may lead to injury.
6. Improper Steel shifting & mishandling may result in to shoulder & hand injury.
7. Improper use of electric safety equipment may lead to major injury.
8. Injury during cutting or binding of steel.
9. During concreting proper PPEs required like gum boot, goggles, rubber hand gloves, helmet, etc.
10. Chances of getting injured if housekeeping not done.

### 9.2 RISK MANAGEMENT:

SPCL shall comply with all the necessary mitigation measure as stated in Job safety analysis. The risk management can be separated into general safety consideration and those that are particularly applicable to the actual work at site.

#### a. General Safety Considerations:

The following safety precautions shall be followed during construction.

1. All the workers shall wear proper personal protective equipment.
2. All the workers & staff personals shall be trained well in works to be executed at height & precautionary & corrective measures to be taken for the same.
3. All the workers shall be trained and safety induction shall be imparted to them before the commencement of work at site.
4. Daily tool box talk shall be carried out for mutual understanding of work.
5. Regular or daily check of equipment prior to use shall be carried out.
6. A competent site supervisor shall be present at all times during work.
7. A first aid person shall be present at site and a first aid kit shall be provided in site office.
8. All record of operator and plant certificate shall be kept on site at all the times.
9. Emergency call numbers shall be posted on site for contact in emergency.

#### b. Particular Safety Consideration (Job Hazard Analysis):

The following safety precautions shall be taken in particular to RCC works:

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 03
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03)	
	CLIENT: Maharashtra Housing Development Corporation Limited	Rev. No.: R0
	PMC: Urban Pandit Infra Consultants Pvt Ltd	
Method Statement for Reinforcement Work		Dt: 13-10-2022

Item	Potential Hazard	Controls	Person who will Ensure this Happen.
	What can harm you and others	What are you going to do to make the job assafe as possible	
1	Fall of material /Personal	Use safe scaffold with proper guard rails & access ladder. Provide safety net above & to protect personnel/ material falling.	Site Engineer/ Safety Officer
		Use safety belt & anchor the life line to firm member /structure	Site Engineer
		All materials & tools must be kept away at least 1 m away from edge.	Site Engineer
2	Injury to personnel	Engage trained & experienced personnel for the job	Site Engineer/ Safety Officer
		Use of required PPE's	Site Engineer
		Good housekeeping in working areas	Site Engineer/Safety Officer
		Conduct tool box talk	Site Engineer/ Safety Officer
3	Manual Handling	Engage good physic personnel	Site Engineer
		Do not try to lift alone a heavy load, seek others help	Site Engineer
		Use safety hand gloves, safety helmet, safety shoes, solder pad & safety belt at 2 m & above height.	Site Engineer/ Safety officer
4	Shifting of material from steel yard to site.	Materials shift inside the trolley.	Site Engineer/Safety officer
		Engage trained driver.	Site Engineer
		Exceed length material manual shifting. Do not lift a heavy load, seek others help using of proper PPE, using proper access.	Site Engineer/Safety officer
		No reinforcement steel shall be kept outside trolley i.e., suspended from trolley.	Site Engineer

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 01
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Brick work	Dt: 13-10-2022

**METHOD STATEMENT FOR  
FORMWORK  
CONTENTS**

Sr. No.	TITLE
1	Introduction
2	Scope of Work
3	References & Standards
4	Work Programme
5	Material
6	Temporary services required
7	Methodology
7.1	Before Commencement
7.2	Erection of Formwork
7.3	Inspection of Forms before & during Concreting
7.4	Removal of Forms
7.5	Tolerances for Shapes, Line & Dimensions
7.6	Reuse of Forms
8	Quality Assurance
9	HSE – Health, Safety & Environment
9.1	Risk Identification
9.2	Risk Management

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 01
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited PMC: Urban Pandit Infra Consultants Pvt Ltd	Rev. No.: R0
	Method Statement for Brick work	Dt: 13-10-2022

## 1. INTRODUCTION:

This method statement describes the work procedure to be followed for fixing & removal of Formwork & checking of formwork to be executed.

## 2. SCOPE OF WORK:

The scope of work involves the following:

Providing, fabrication & erecting formwork at all levels & places as per GFC Drawing

## 3. REFERENCES AND STANDARD:

This document should be read in conjunction with technical specification and GFC drawings approved from client for execution of work at site.

Indian standards to be used are IS 456/2000, IS 269, IS 8112, IS 12269, IS 1489, IS 383, IS 2116, IS 9103, IS 1786, IS 432, IS 1566, IS 1608, IS 2502, IS 4656, IS 7861 (Part I & II).

## 4. WORK PROGRAMME:

The fixing & removal of formwork shall be carried out in accordance with the approved program by Client/PMC.

## 5. MATERIAL:

Material used for fixing & removal of formwork is:

1. Ply Board with timber battens
2. Adjustable steel props
3. Steel Shutters
4. Bracing & Staging System
5. Adhesive Tape/Masking Tape
6. Demoulding Oil
7. Approved Cover Blocks

## 6. DETAIL OF TEMPORARY SERVICES:

1. Temporary form work is required for doing RCC.
2. Approved formwork shall be firmly supported & adequately strutted, braced & tied.
3. All equipment & material required for cutting, making, fixing & removal of formwork.

## 7. METHODOLOGY:

### 7.1 BEFORE COMMENCEMENT:

1. Formwork is to be carried out as per approved GFC drawings.
2. Formwork shall be made to the exact dimensions within the permissible tolerances.
3. Broken & damaged shuttering shall not be used.
4. Check for formwork capacity such that concrete is properly and thoroughly

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	Method Statement for Brick work	Dt: 13-10-2022

compacted.

## 7.2 ERECTION OF FORMWORK:

1. Form work shall be of timber, plywood, steel or any other materials depending upon the type of finish specified.
2. Erect staging/shuttering as per approved shuttering scheme.
3. Erect staging/shuttering in such a way that de-shuttering can be done easily including provision for re-propping, if planned. Form work shall be capable of being removed without shock or vibration to the concrete.
4. Check the location, line, level, plumb and dimensions of the formwork including MS ties, coverblock (PVC or cement mortar) to ensure that the deviations are within the permissible limits.
5. Provide bracing at proper places & intervals as specified by the manufacturer or as per approved formwork scheme.
6. Formwork should sufficiently rigid and tight to prevent the loss of grout or mortar from the concrete, should be water tight to prevent loss of liquid from the concrete.
7. It should be capable of providing concrete of the correct shape & surface finish within the specified tolerance limits.
8. Apply approved mould releasing oil/other coatings as release agents before reinforcement steel is placed and it shall not get on to the reinforcement.
9. Check all the shutters are properly aligned and fixed firmly with required lateral supports and ties.
10. Check all the spanning members have proper bearing at the supports as per approved drawings.
11. Wedges or jacks shall be secured in position after the final check of alignment.
12. Check all the inserts/embedment and openings are exactly placed as per approved drawings.
13. Forms shall be thoroughly cleaned of all dirt, mortar and other matters such as metals, saw dust and foreign materials before concreting.
14. Check all the gaps & openings are properly closed to avoid leakages by using brown adhesive tape or foam or any appropriate means.

## 7.3 INSPECTION OF FORMS BEFORE & DURING CONCRETING:

In case of leakages, bulging and sagging immediate actions shall be taken by tightening wedges or adjusting by jacks which must be done before the concrete takes its initial set.

## 7.4 REMOVAL OF FORMS:

1. Formwork components shall not be dropped shall be lowered without damage to the components and structures. All the removed formwork materials shall be thoroughly cleaned as soon as possible & stacked properly for reuse.
2. All forms shall be removed after the minimum period stipulated mentioned below without damage to the concrete including removal without shock.



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	Method Statement for Brick work	Dt: 13-10-2022

<b>Formworks:</b>		
a.	Wall, Columns and Vertical faces of all structural members	16 to 24 hours
b.	Soffit formwork to slabs (Props to be re-fixed immediately after removal of formwork)	3 days
c.	Beam soffits (Props to be re-fixed immediately after removal of formwork)	7 days
d.	Suspended slabs soffits (i.e. Cantilever)	Form work shall remain till structures for counter acting or bearing down have erected and have attained sufficient strength (14 days minimum).
<b>Removal of props under slabs:</b>		
e.	Spanning up to 4.5m	7 days
f.	Spanning over 4.5m	14 days
<b>Removal of props under beams:</b>		
g.	Spanning up to 6m	14 days
h.	Spanning over 6m and up to 9m	21 days
i.	Spanning over 9m	28 days

#### 7.4 TOLERANCE ON SHAPES, LINES & DIMENSIONS:

Tolerance for formwork and concrete dimensions shall be as per IS: 456 unless specified otherwise.

#### 7.5 REUSE OF FORMS:

Before reuse all forms shall be thoroughly cleaned, joints examined and when necessary, repaired and the inside retreated to prevent adhesion.

#### 8. QUALITY ASSURANCE:

1. All the activities shall be in compliance with approved quality plan.
2. Inspection test report shall be generated prior to commencement of the activity, any shortfall shall be attended at earliest.
3. Carrying out of work shall be in accordance with the check list.

#### 9. HSE – HEALTH, SAFETY AND ENVIRONMENT:

All necessary precautions shall be taken in accordance with HSE Plan and checklist shall be maintained.

<b>MECPL</b>	<b>Mahalakshmi Engineering &amp; Construction Pvt. Ltd.</b>	Doc. No.: 01
	PROJECT: Construction of affordable Housing Project of 1413 number of EWS dwelling Units and 55 number of shops under PMAY on plot bearing land on S. No 420/A/8 at Kasabe Solapur, Tal- North Solapur Dist.-Solapur Maharashtra (Package 03) CLIENT: Maharashtra Housing Development Corporation Limited	Rev. No.: R0
	PMC: Urban Pandit Infra Consultants Pvt Ltd	Dt: 13-10-2022
<b>Method Statement for Brick work</b>		

### 9.1 RISK IDENTIFICATION:

During the whole process of work the following risks are foreseen:

1. Chances of fall of material/Personal from Height.
2. Improper support from side may lead to injury.
3. Improper scaffolding leads to injury.
4. Improper platform leads to injury.
5. Improper barricading may lead to injury.
6. Improper Steel shifting & mishandling may result in to shoulder & hand injury.
7. Improper use of electric safety equipment may lead to major injury.
8. Injury during cutting or binding of steel.
9. During concreting proper PPE's required like gum boot, goggles, rubber hand gloves, helmet, etc.
10. Chances of getting injured if housekeeping not done.
11. Improper illumination can lead to injury.

### 9.2 RISK MANAGEMENT:

ACCIPL shall comply with all the necessary mitigation measure as stated in Job safety analysis. The risk management can be separated into general safety consideration and those that are particularly applicable to the actual work at site.

#### a. General Safety Considerations:

The following safety precautions shall be followed during construction.

1. All the workers shall wear proper personal protective equipment.
2. All the workers & staff personals shall be trained well in works to be executed at height & precautionary & corrective measures to be taken for the same.
3. All the workers shall be trained and safety induction shall be imparted to them before the commencement of work at site.
4. Daily tool box talk shall be carried out for mutual understanding of work.
5. Regular or daily check of equipment prior to use shall be carried out.
6. A competent site supervisor shall be present at all times during work.
7. A first aid person shall be present at site and a first aid kit shall be provided in site office.
8. All record of operator and plant certificate shall be kept on site at all the times.
9. Emergency call numbers shall be posted on site for contact in emergency.
10. Proper illumination provides on working area.

#### b. Particular Safety Consideration (Job Hazard Analysis)

The following safety precautions shall be taken in particular to RCC works:

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	Method Statement for Brick work	Dt: 13-10-2022

Item	Potential Hazard	Cont rols	Person who will Ensure this Happen.
	What can harm you and others	What are you going to do to make the jobas safe as possible	
1	Fall of material /Personal	Use safe scaffold with proper guard rails & access ladder. Provide safety net above & to protect personnel/ material falling.	Site Engineer/ Safety Officer
		Use safety belt & anchor the life lineto firm member /structure	Site Engineer
		All materials & tools must be keptaway at least 1 m away from edge.	Site Engineer
2	Injury to personnel	Engage trained & experienced personnel for the job	Site Engineer/ Safety Officer
		Use of required PPE's	Site Engineer
		Good housekeeping in working areas	Site Engineer/Safety Officer
		Conduct tool box talk	Site Engineer/ Safety Officer
3	Manual Handling	Engage good physic personnel	Site Engineer
		Do not try to lift alone a heavy load, seek others help	Site Engineer
		Use safety hand gloves, safety helmet, safety shoes & safety belt at 2 m & above height.	Site Engineer/ Safety officer