

**CLIENT**

**CONSULTANT**

**MAIN CONTRACTOR**

**Project Title**

**Method Statement for Construction Of Civil Works**

Rev	Date	Description	Prep.	Chkd.	Appd.	Client

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## 1.0 PURPOSE

To specify the requirements of civil construction including excavation, filling, and allied activities complying with the contract document, specification, and scope of work and approved drawings/documents. It also includes earthworks associated with trenches for pipelines or service ducts.

## 2.0 SCOPE

This Method Statement applies to all the civil works - Excavation including ground preparation, setting out, backfilling, soil compaction, concreting, waterproofing, masonry, plastering, joinery, painting and GRC works - related to the construction of building as per project requirements, referring with approved Civil and MEP drawing.

## 3.0 ROLES & RESPONSIBILITY

The primary responsibility of carrying out all the activities mentioned in this procedure rests with the site- in-charge unless mentioned otherwise.

**Project Leader:** Overall execution and administration of the project as per contract requirements, specifications and the PQP. Liaise with the Head (Quality & HSE) for preparation and updating of PQP. Directly control the Site Engineers and Supervisors. He is responsible to ensure that all the correct procedures are followed and all necessary permits for the works are obtained in advance.

**Site Engineer:** Assess manpower, equipment or other resources required to ensure timely completion of the project. Monitor availability of all materials as per schedule. Inform the Project Leader for any non-availability of materials to take proper action. Carry out receiving inspection in coordination with the QA/QC Engineer. Ensure that the drawings and documents are up to date and the latest drawing is available and is being utilized in the project site works. Filled-up the check-sheet and submit the necessary IR to the QA/QC function when the work is ready for inspection.

**QA/QC Engineer:** Responsible for the monitoring and implementing of quality related matters and ensure the works are being executed with the approved Project Quality Plan and requirements of the Contract Documents, sections 1 part 8 of QCS 2010, approved method statement and ITPs.

**Safety Officer:** Responsible for monitoring and implementation of safety related matters such as work permits, First Aid, PPE, approval of diversions, follow the safety and traffic regulations by all the workmen during the construction, according to the approved project HSE plan. First Aid boxes are readily available with HSE officer and other two numbers at site personnel's vehicles for site requirements.

**Supervisor/Foreman:** Plan and obtain required manpower and resources in coordination with the Site Engineer. Carry out all activities as per the planned schedule to achieve target dates. Coordinate with respective disciplines of work and liaise with the site engineer for day to day activities. Inform Discipline Engineer regarding site inspections when it is ready. Ensure pre task briefing is to be conducted prior to start of work at each session.

**Charge hand:** Works shall be executed as per direction of Supervisors/Foremen for all activities as per the planned schedule to achieve target. Coordinate with respective

disciplines of work and liaise with the Supervisors/Foremen for day to day activities. Ensure pre task briefing is conducted prior to start of work at each session.

#### **4.0 REFERENCE DOCUMENTS**

Contract Document & Bill Of Quantities.  
Civil structural and architectural drawing issued for construction.  
QCS 2010 and Project Specifications.

#### **5.0 ABBREVIATIONS**

Main Contractor	To be filled
Consultant	To be filled
Client or Customer	To be filled
Site-in-charge	For the purpose of this procedure, the term Site-In-charge Shall mean Project/Site Engineer.

#### **6.0 INSPECTION & TESTING**

Site inspection/approval shall be in accordance with the approved Inspection and Test Plan for all activities in addition to the Quality Control Procedure and Project Quality Plan for the Project.

All the required site test shall be conducted as per the Section-21, applicable Parts of QCS 2010.

#### **7.0 WORK PERMITS**

All necessary work permits shall be obtained prior to the commencement of any activity at site and shall remain valid throughout the entire duration of the operation.

Safety Barriers and Site sign boards will be installed prior to the work commencement.

#### **8.0 HEALTH, SAFETY AND ENVIRONMENTAL PROCEDURES**

Requirements of Health, Safety and Environmental for the project shall be in accordance with approved Project HSE Plan, the contract document and Part-15 & 19, section 1 of QCS 2010.

Before commencing of any work, the required and applicable work permits shall be checked and ensure all requirements of WP are complied and they are valid until completion of the activity and as per approved HSE plan.

All personnel accessing their site will wear the mandatory PPE. All workmen and staff shall wear the mandatory and job specific Personnel Protective Equipments. Pre-task briefing shall be conducted on every day before starting the work. Experienced and HSE inducted workmen shall be deployed for the work. All personnel shall be cautioned while working near any live lines such as power cable, water lines, drainage lines, telecom etc.

Prior to commencement of work all workers shall be given pre-task briefing. Hazards identified for the activity shall be disseminated during pre task briefing, especially for underground services, slip & trip, improper access, excavation tools handling, no access or

aggress, vehicle collision, heat exhaustion, which shall be identified and documented separately by permit to work system as per approved HSE plan.

First aid stations complete with all first aid equipments and trained first aiders shall be maintained for the initial care.

Safety and security procedures shall be implemented as a minimal, warning signs and lights, barricades, railing and other safeguards shall be provided as required by the nature and location of the work.

The environmental risk assessment and environmental management plans have been reviewed for the work activities proposed in the method statement and found to be suitable and adequate.

Electrical waste will be segregated at source and transported to dedicated segregated waste storage area and not be allowed to accumulate on site in undesignated areas. Concrete waste will be removed from work areas at regular intervals to designated areas.

Construction waste will be disposed as per local laws & client guidelines by licensed carrier to a licensed facility.

## **9.0 HOUSEKEEPING**

Housekeeping is the act of keeping the working environment clean from all unnecessary waste materials. The equipment/tools/materials required for the work shall be stored /stacked in such a manner so as to give a safe working atmosphere to the workforce at site.

All workplace areas shall be maintained clear of debris, waste and other rubbish, which shall be disposed of in segregated containers for disposal. An adequate number of containers marked appropriate labels for storage and disposal of waste materials shall be strategically placed throughout the construction areas at all time.

Any spillages, such as oil or grease shall be immediately cleaned up, by absorption in inert sand or other suitable materials. The materials for the particular work shall be stored at site so that no obstructions to the work or access to the workforce.

Debris, waste oil containers etc shall be stacked and placed in a barricaded location away from the work areas and access routes. Adequate fire precautions shall be in place. Before leaving the site, it shall be ensured by the responsible person that the site area is cleaned and no obstruction is encountered for next day work.

## **10.0 QUALITY ASSURANCE & CONTROL**

The Quality Assurance and Control for the above mentioned activities shall be exercised and recorded in accordance with the contract documents, applicable section 1, and part 8 of QCS 2010 for Quality Assurance and the approved Project Quality Plan for the project.

The quality assurance shall be ensured for workmanship, equipments and materials conformance to the applicable standards and requirements at every stage of the construction. This shall be monitored by quality control personnel or designated substitute on the site during the production / operation.

Quality assurance requirements shall also be imposed upon sub contractors, suppliers, manufacturers and any other parties associated and involved in the project. Non-conforming materials shall be notified in writing to correct or remove the defective materials from the work site.

All inspections and tests shall be conducted in accordance with written test procedures as detailed in the Project Quality Plan and Inspection and Test Plan approved by the GEIC Engineer.

Applicable documents with latest version such as Inspection & Test Plan, Method Statements shall be readily available and used by inspection and test personnel at the time of inspection as referring documents.

## **11.0 MATERIALS**

Approval shall be obtained for all the materials with reference to Client's preferred vendor list, prior to commencement of activities.

Material Inspection Request (MIR) will be submitted to client upon material arrival to warehouse.

All materials must be stored properly as per the manufacturer's recommendations and QCS.

The Material shelf life will be monitored as per Manufacturer's data sheets.

## **12.0 MANPOWER**

Site Engineer  
Supervisor  
HSE Inspector  
QA/QC Inspector  
Carpenters  
Steel Fixers  
Masons  
Helpers  
Painters  
Operators  
Drivers & Technicians

## **13.0 EQUIPMENT & TOOLS**

The following equipments and tools shall be used for the various activities.

Excavators  
Shovels  
JCB  
Self-Loaders  
Bobcat  
Tipper Trucks / Trailers  
Water Tankers  
Rollers/Compactors  
Transit Mixers  
Concrete pump  
Vibrators

Dewatering pump  
Mobile crane  
Angle Grinders  
Cutters  
Drilling Machines  
Wheel Barrows  
Bagger mixer  
Hand tools

## **14.0 WORK PROCEDURE FOR CONSTRUCTION OF SUBSTATIONS**

### **14.1 Initial Survey & Site Checking**

Upon receipt of Job Instruction / Drawing from Consultant Engineer, an initial site visit to be made along with the consultant representative to confirm the site and demarcations.

Proper Safety Fencing and site sign boards will be installed prior to the construction activities.

### **14.2 Setting Out.**

The foundation location of Substation shall be set out and elevations marked by the Land Surveyor using steel pins and paint markings.

In case of any obstruction or existing services, it shall be intimated to the Consultant and necessary modifications shall be carried out after getting approval from Consultant Engineer.

### **14.3 Excavation for Foundations.**

Prior to commencement of excavation, the location shall be checked to ascertain the type of soil to be excavated and appropriate equipment shall be deployed.

Excavation for structures shall be as per part-2, section-12 of QCS. Excavation for building shall be carried out by using excavator and the excavated soil to be tested for suitability and shall be stock piled at convenient locations at site if suitable for back filling purpose and surplus soil to be loaded in to the tippers and unloaded at designated location later.

Battered excavation slopes greater than 1.5m height shall be supported and all locations where the excavation extends below the ground water table, a dewatering system shall be provided which will lower ambient groundwater levels. The resulting groundwater level shall be at depth which is sufficiently below the excavation level so as to allow the safe and proper execution of the work.

Excavated soil shall be piled at least 2.0m away from all the sides of the excavated area and the area shall be protected by barricading and unauthorized entry shall be restricted. For deep excavations more than 1.50m or average man height depth with loose soil, sides shall be protected by means of temporary shoring and strutting.

Excavation shall be carried out for a width of at least 500 mm beyond the horizontal outside limits of the building. In narrow spaces, due to confined space condition suitable safety measures & ventilation shall be arranged.

On reaching the required level of excavation, the surface shall be leveled and cleaned of all traces of loose material. All excavated areas shall be barricaded and appropriate signs shall be provided as required.

Over excavation should be provided with SRC 20 concrete to the required level.

#### **14.4 Back filling and Compaction.**

Back filling material shall be as per QCS 2002-Section-12-Part 3-Clauses 3.2.2, 3.2.3.

Back filling shall be done in layers of not more than 250mm loose thickness as per QCS 2002-Section-12-Part 3.5 and each layer thoroughly watered and rammed to ensure Minimum Dry Density of 95%. Testing of compaction will be performed as directed by the engineer.

Earth work under substructure shall be provided with anti-termite treatment for the approval of the Engineer.

#### **14.5 Construction of RCC Foundation, Columns, Grade Beam, Roof Beam and Slab**

The bottom of excavation shall be compacted and offered for inspection and testing by the consultant Engineer. Over excavation should be provided with SRC 20 concrete to the required Level.

On approval of above activity, 75mm thick blinding concrete shall be laid to the required levels and size, supplied from approved ready mix plant.

After completing the excavation works, activities for Foundation to be carried out first, followed with columns up to slab height completed later plinth and inside room work to be started.

#### **Reinforcing steel**

Engineer's approval will be obtained for reinforcement before using in permanent works.

All reinforcement will be stored on racks inside the stores. Different types & sizes will be kept separately. All reinforcement will be kept to protect from damage, free from dirt, loose mill scale, rust scale paint, oil, or other foreign substances.

As per the specifications & drawing, the bar bending schedules & bar lists, cutting schedules for each individual structure will be prepared by the contractor and will obtained the approval from the engineer.

Manual cutter or mechanical cutter will be used for cutting of bars & bending machine will be used for bending of bars.

All reinforcement will be cleaned by a wire brush or any other means before placing.

All reinforcement placed should comply with the drawings. Lap length will be taken in to account according to the project specification when binding reinforcement bars.



## **Form work**

All formwork will be made by using plywood sheets, timber or by metal.

Supports and scaffolding will be G I pipes, Arco props, sawn timber or round timber.

All surfaces of formwork will be finished smooth and mortar tight.

The dimensions & position of formwork will be carefully checked after erection.

Oil or grease will be used to avoid adhesion of mortar and to achieve a smooth surface.

Before placing concrete all dirt, wood chips, hardened concrete or mortar and all other foreign matter will be removed from the forms.

Before fixing of form work, detailed drawing will be submitted to the engineer for approval.

Well qualified foremans will be appointed for fixing on formworks & reinforcement work.

## **Placing of concrete**

The method for placing of concrete will be worked out to prevent segregation of the material & Engineer's approval will be taken before concreting begins.

Before placing concrete all formwork therein will be cleaned of all extraneous material and dust and made free of any standing water.

In continuing concrete, fresh concrete will be placed before the already placed concrete is less than 20 minutes.

Concrete of specified grade will be placed & compacted in horizontal layers normally not exceeding 300mm in depth.

Concrete will not be dropped from a height greater than 1.5m to prevent segregation.

Concrete will be free of all rock pockets, honey combs & voids.

Complete Records showing the details of placing concrete in each part of the work will be maintained and will be available for inspection at the site.

## **Compacting / vibrating of concrete**

Mechanical vibrators will be used for compaction. For this stand by units will available in the site during the period of compacting. All operators handling vibrators will be trained in their operation properly.

## **Curing**

Continuous curing will be carried out in a moist atmosphere for a minimum period of 10 days and for a further period required by engineer.

Concrete area will be kept covered with hessian clothes or Polyethylene sheets which will be kept moist throughout the curing period.

### **Construction joints.**

The surface of the hardened concrete will be cleaned and made free from laitance, and will also have an exposed aggregate finish.

The fresh concrete will be placed and compacted so that it bonds properly to the prepared surface of the previously laid concrete.

Laitance on the surface will be completely removed from the concrete in order to achieve a good bond with fresh concrete.

Between one and two hours after placing concrete, water will be sprayed gently and laitance will be removed with two brushes, one with soft and other with hard bristles.

After finishing this operation, just the tips of the aggregate should be showing.

If the laitance has hardened, a wire brush will be used to remove it. Clean water will be rinsed to get rid of the dust.

Water stops in construction joints will be installed & approval for this will be taken from the engineer.

### **Checking water content & slump test**

Frequent slump test will be carried out in accordance with BS 1881 on samples of concrete taken immediately before placing to determine the consistency of concrete.

All the test reports will be maintained in the site office & will be available for the inspection whenever required.

### **Testing of concrete**

All necessary arrangements for the sampling & testing of fresh & harden concrete in accordance with the BS 1881 will be taken.

Crushing test will be carried out on concrete cubes formed in 150mm molds. One set of cubes (2 cubes crushed in 7 days & other in 28days) will be done to maintain the quality of work.

Particular care will be taken to ensure that the test cubes are stored under uniform conditions in the site & during any transit between site & laboratory.

## **14.6 Waterproofing**

Ensure that all preceding activities or activities completed which cannot be accessed after waterproofing works are inspected, released and approved.

Obtain MEP clearance and clearance from other specialist trades which may not be accessible after waterproofing, prior to commencing waterproofing works.

Rectify non-conforming conditions prior to commencing the waterproofing works.

## **Surface Preparation**

All surfaces to receive waterproofing to be clean, dry and free from dirt, dust, oil and grease.

Wall Protrusions that likely to punch through the waterproofing films to be removed either by using a chipping hammer or grinder.

Prepare and level the concrete surfaces for waterproofing either by chipping, hacking or scraping the surface.

Repair the excessive pinholes, and similar imperfections (if any) to eliminate uneven surface.

Barricade the working area as to be a non trafficking passage.

Raise an inspection request for surface preparation (RFI) prior to the waterproofing work commences.

## **Installation of Accessories and marking of Waterproofing Levels**

Immediately after the inspection use Viscose Elastic type adhesive tape at week joints and sharp edges.

Marking of waterproofing application levels can be commenced at this stage.

Levels should be true, square and in plumb at locations as indicated on the approved shop drawings/IFC drawings.

Use suitable fasteners when required.

Install waterproof level pads also to serve as guides in controlling the final thickness of the waterproof and the finished plane of the waterproofed surface, relative to the accessories installed.

## **Application and Protection**

Ensure all other trades in the said location are put on hold during the waterproof application so to protect and avoid any damage to the waterproofing layers.

Apply first coat using a manual brush application uniformly at a workable consistency.

Floor application should continue to the vertical wall face up to a minimum of 150mm as per the project specifications.

Ensure all surfaces to receive waterproofing fluid Application firmly to achieve good adhesion and to be in one continuous operation.

Subsequent coats of waterproof may be commenced immediately after setting of the previous coat approximately 3 to 5 hours and as per the manufactures recommendations.

Second coat should be applied at a right angle to the first coat.

Finish coats to be fairly true to the plane with a homogenous finish.

Approved Bitumen Impregnated Protection Boards should be provided for protection with sufficient lapping as per the manufactures recommendation.

Footings shall be protected by 4mm thick waterproofing membrane sheets laid on concrete surfaces primed with bituthene primer.

Laid sheets shall be protected from Damage by using bituminous protection boards or 40mm SRC screed concrete as horizontal protection.

Vertical faces shall be protected against damage from backfilling by using Servipak6 or equivalent protection boards.

All application shall be according to manufactures instructions only.

Approval shall be obtained from the Engineer prior to commence the backfilling works.

#### **14.7 Masonry**

Block works shall be done as per approved drawings and shall comply with QCS.

All block works executed below ground level built with S.R C cement and shall built in S.R.C mortar. Normal weight Hollow Blocks having a minimum compressive strength of 7.0 N/mm<sup>2</sup> shall be used.

Samples of each type of masonry unit and accessory shall be submitted to consultant for approval.

Marking up of exact location of block walls and openings as per approved shop drawings shall be done before commencing the work.

Block marked areas shall be cleaned and wet before to start with the activity.

Mortar mix shall comply with project specifications and QCS.

One course of block only will be executed for testing and approval by the consultant.

Walls shall be kept level at all times and carried up in a uniform manner. No part being raised more than 1500mm above any adjacent unbuilt course.

Angles & Reveals shall be kept true, square and plumb all the time.

Horizontal joints shall be leveled all the time and vertical joints in alternate courses shall be plumb and line.

Opening frames shall be set and maintained square, plumb, true and furnished with anchors.

Install reinforced concrete block lintels or GI steel lintels over openings as per approved shop drawing or cast in places as per specification.

Top of block partitions and sides will be supported by using galvanized steel anchors/ties as per approved shop drawings and material submittals.

Concrete block walls and partitions shall be reinforced horizontally each second course, last top course, second and third course above lintels and below sills of opening with the required over lap.

After completing of each section of the walls, cleaning shall be done to the down surfaces and curing will start immediately.

Final inspection shall be carried out for the entire work for approval of the engineer.

#### **14.8 Plastering**

Prepare surfaces for the smooth or non-absorbent solid surfaces that do not have the suction capability to receive a solid plaster bases by chipping, wire brushing or sand blasting, as appropriate.

Install beads at their locations plumbed and squared. And it will be best achieved by using galvanized nails or small quantities of mortar and as per manufacturer's recommendations.

Install the corner, control joints and movement beads at locations indicated in the drawings and manufacturer's instructions.

Prepare plaster in a mechanical mixer, using sufficient water to produce a workable consistency and uniform color shall be used to mix a batch containing one bag of Portland cement, 5 parts aggregate, aerating plasticizer as per manufacturer's recommendation for use over Concrete Unit Masonry.

Spray water on the wall surface and throw the spatter dash mix (scratch coat) by using a spatter dash manual machine in a way to form a rough layer 3-5mm thick without any attempt to level or smooth it. The rough surface shall be kept damp with fine water spray or by covering with polyethylene sheet until it sets down.

Apply plaster/render coat after the scratch coat had hardened. Initially, a thin coat is troweled on the scratch coat to ensure a thorough bonding at the surface.

The remainder of the render coat is then built up using wooden float to receive textured finish until the required thickness met.

Apply final thin coat plastering using steel trowel on the interior surface to match with the Architect's sample as specified.

The coating thickness shall not deviate more than +/- (6.4mm in 3m) from the trueness of the plastered finish, as measured with straight edge placed on the surface.

The newly applied external coatings shall be cured and protected against frost, heat, and rain for the first 48 hours using canvass, cloth or sheet, hung clear at the plaster surface. Moist curing by applying a fine fog spray of water, generally twice daily in the morning and evening.

#### **14.9 Joinery**

All the Doors & louvers shall be Galvanized Steel (powder coated) as per approved Drawings and Kahramaa Specifications.

Openings should be complete with the necessary reference layout.

Doors should be distributed according to the layout and door code marking.

Level should be marked using proper level instrument showing clearly the floor finish level.

Lay-out of every floor, all areas to receive flooring. Necessary reference lines and elevation shall be reflected using permanent pen marking.

Ensure the reference labels on delivered doors are correctly reflected from references provided and carefully inspected considering the code/mark per designated location.

The door is then positioned and with the lay-out reference string carefully positioning the door on both its horizontal and vertical alignment with the use of level bar plumbs.

The door frame is then temporarily fixed using clamp and wedge at the top and bottom of the door opening.

Screws are drilled into the edges on locations where the frame will be supported until proper depth into the concrete wall.

With the frame fixed and pinholes or slots drilled into walls, prepare for the setting of the door following the procedure specified in the installation manual supplied by the door manufacturer.

Architrave shall be accurately shaped to fit the contour of the door frame surface.

Clearance around the door shall be  $\pm 3$  mm (unless otherwise specified) in order that door opens and closes without any obstacles by the door frame.

Protecting the door shall be done using proper cover.

Cleaning and removal of excess materials at the work area shall be done prior to the inspection and approval by the consultant.

#### **14.10 Painting**

Samples of all colours/textures and finishes shall be prepared in advance of requirement so as not to delay work and shall be submitted to Engineer for approval before any work is commenced. Any work done without such approval shall be redone to the Engineer's satisfaction, without additional expense to the Employer. Manufacturer's chart showing all the variety of paint/texture coating shall be submitted for colour/texture selection.

The Engineer will furnish a schedule of colour/texture of each area and surface. All colours shall be mixed in accordance with the manufacturer's selection.

Approved quality Weather Shield/Weather Coat paint shall be used for painting the exteriors of the structures or other surfaces where specified on the drawings as directed by the Engineer.

The plastic emulsion paint/vinyl emulsion paint or similar as approved by the Engineer shall be used for interior surfaces.

Textured coating wherever specified shall be acrylic resin based coating composed of acrylic copolymers, natural quartz, natural marble chips, metallic oxide, antibacterial and antifungal

additives, and expanders, foaming and setting agents and shall be applied in accordance with approved manufacturer's recommendations.

All material shall be delivered to site in their original unbroken containers or packages & shall bear the manufacturer's name, label, brand & formula & will be mixed and applied in accordance with his directions.

All oil, grease, dirt, dust, loose mill scale and any other foreign substance shall be removed from the substrate surface to be painted/coated, polished and white washed by the use of a solvent and clean wiping material. Following the solvent cleaning, the surface shall be cleaned by scraping, chipping, blasting, wire brushing or other effective means as approved by the Engineer.

Surfaces of stainless steel, aluminum bronze and machined surfaces adjacent to metal work being cleaned or painted shall be protected by effective masking or other suitable means, during the cleaning and painting operations.

All the surfaces to be painted/coated with approved quality paint/coat shall be free from dust, dirt, fungus, lichen, algae etc. Oil paint, varnish and lime wash should always be removed by scraping and washing.

All paints and coating materials shall be in a thoroughly mixed condition at the time of application. All work shall be done in a workman like manner leaving the finished surface free from drips, ridges, waves, lapse and brush marks. All paint shall be applied under dry and dust free conditions unless approved by the Engineer paint shall not be applied when the temperature of the metal or the surrounding air is below 7 degree centigrade. Surface shall be free from moisture at the time of painting.

All primary paint shall be applied by brushing. The first coat of paint shall be applied immediately after cleaning. When paint is applied by spraying, suitable measures shall be taken to prevent segregation of the paint in the container during painting operation.

Effective means shall be adopted for the removing all free oil and moisture from the air supply lines of the spraying equipment. Each coat of paint shall be allowed to dry or harden thoroughly before the succeeding coat is applied.

Surface to be painted that will be inaccessible after installation shall be completely painted prior to installation

Coats of Weather Shield Coat paint and textured coating shall be applied in accordance with manufacturer's instructions or as directed by the Engineer.

For painting only as much as much material should be mixed as can be used up in one hour. Over-thinning will not be permitted. After the first coat the surface will be soaked evenly four or five times and the second coat shall be applied after leaving for at least overnight.

Where shown on drawings all the exterior finishes shall be painted/coated with Weather Shield/weather coat paint or texture coated in approved colour/textures as per the manufacturer's specifications. The number of coats shall be shown on the drawings or as directed by the Engineer.

Plastic emulsion paint, vinyl emulsion paint or matt enamel paint of the approved make and shade shall be applied to surfaces as shown on drawings as per manufacturer's instructions. The number of coats shall be as indicated on drawings or as directed by the Engineer.

Inspection Request to be submitted for checking and approval of the Engineer.

#### **14.11 GRC works**

Material Samples as per Project specifications/QCS 2010 shall be submitted for the approval of finish, texture, colour and thickness from Engineer.

The GRC panels shall be stored at site in a dry, clean and leveled area properly protected from any accidental damage. Before erection the Site Engineer/Supervisor shall check the panel size as per the approved drawings, the colour and texture with the approved sample and for any damage while loading & unloading. Any major defects, if noted, in any panel will be rejected and sent back to the Factory for replacement.

Prior to the starting of installation, the lifting equipment i.e. crane and the access to the site have to be arranged.

Prior to the starting of installation, co-ordinate with the Engineer and make sure that all levels and reference levels are as per the approved Drawings. Structural frames to be checked for their tolerance level. Any discrepancy beyond tolerance is to be brought to the notice of the Engineer.

Alignment is required for the exterior face of the panel and proper marking with string lines to be done prior to the start of installation.

Based on the confirmation of alignment and marking of fixing points, approved brackets are fixed to the structural frame. The brackets and fixing are to be approved by the Consultant.

Ensure proper access to the fixing area from the storage area. The GRC panels will be lifted with suitable lifting devices at the points provided at the factory. The GRC panels are set level, plump, square and true within the allowable tolerances and fixed to the bracket with suitable approved loose fixings.

After the Engineer checks the finishing of panels, sealant work is carried out according to the project specifications using the approved sealant and backing rod. Utmost care shall be given to apply the joint sealant as to not stain the GRC panels.

Inspections are carried out by Consultant Engineer for approval. The inspection of GRC elements shall carried out-

After fixing of the panel for the alignment, plumpness and squareness (with allowable tolerances).

After finishing the patching works prior to sealing the joints.

After completion of the joint sealants when ready for final hand-over.



## 15.0 HEALTH & SAFETY

Refer to the site safety policy for general safety controls. One of the main aspects of this procedure is Safety and Health Control. This is to control occurrence of injuries as well as damage to equipment and properties during the entire construction period.

Tool Box meetings shall be conducted on every day before the start of the work.

Experienced workmen only shall be deployed for the work.

All personnel shall be cautioned while working near the pipes/ cables.

Hazard identification shall be done during toolbox meetings especially for heat

In order to ensure a safe working environment during the entire construction period, the following safety measures will be implemented.

### **Machinery and Equipment:**

Prior to use any machinery/equipment at site, it shall be inspected and certified by qualified person.

Periodic Preventive Maintenance shall be made on all equipment and machineries.

All operators and driver are to be equipped with valid driver's/operator's license or permit from concerned government agency.

Only authorized drivers or operators will be allowed to operate machineries or equipment.

Only authorized signalman shall be assigned together with the operator or driver.

All lifting equipment as well as its accessories such as sling wire, nylon sling, shackles, chain blocks, crane hook and latch shall be inspected periodically.

### **Personal Protective Equipment:**

PPE shall be issued to all workers such as safety shoes, hard hat, working gloves, ear plugs, safety goggles and safety belt and or safety harness for workers who will be assigned in elevated places.

Wearing of the basic PPE shall be enforced fully.

### **EMERGENCY CONTACTS**

<b>Sl. No.</b>	<b>Position</b>	<b>Name</b>	<b>Contact No.</b>
1	Project Manager		
2	Site Engineer		
3	Safety officer		