

# **Electrical & Pipe works**

## **CHANGI CAG SITE**

### **METHOD OF STATEMENT**

**SAFE WORK PROCEDURE FOR PIPE & ELECTRICAL  
INSTALLATION WORKS**

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## **1. Objectives**

### **1.1 Purpose of this method of statement:**

- a) To define a safe procedure for the installation of electrical work without any compromise to personnel safety or damage to third party properties.
- b) Please note that this method statement is divided into 3 parts:
  - 1. Horizontal pipe installation
  - 2. Vertical Pipe, and equipment's Installation
  - 3. Install DB,

### **1.2 Working Location**

- c) Working location to define based on approved CCS Pipe Chilled Water System shop drawings in conjunction with CSD drawings for reference.

## **2. Material, Equipment and Tools**

### **2.1 Piping Material**

- a) Anchor Bolts
- b) GI Hanger Rods
- c) GI Angle Bar Brackets
- d) GI C-Channel Brackets
- e) GI Pipe Clamps
- f) GI Pipe Saddles
- g) Neoprene Pads
- h) GI pipe, and pump
- i) HDPE Pipe
- j) CS Pipe

### **2.2 Electrical Material**

- a) Hand saw
- b) Trunking fitting
- c) Brackets (Stud Rod)
- d) Conduit pipes and saddles

### **2.3 Piping Equipment & Tools**

- k) Measuring Tape & Spirit Level Rule
- l) Marker
- m) Hand Tools
- n) Anchoring Setting Tool
- o) Pipe Cutter
- p) Hand drill Electrical Tools such as wrench, spanner
- q) Fiber Cutter
- r) Platform Ladder /Mobile Scaffold/Scissor lift
- s) Lifting appliance such as Chain block, lifting belt
- t) Testing equipment's
- u) hydraulic cutter
- v) hand grinder
- w) Arc welding machine, butt welding and electrofusion welding

### **2.4 Electrical Equipment & Tools**

- a) Hand drill
- b) Torch Lamp
- c) Laser spirit level
- d) Ventilation fan
- e) Hand Cutter

### **3. Work Procedures**

#### **3.1 Preparation Works for Horizontal / Vertical electrical Installation work**

- a) RAA-ONE to study and understand the design intent of the Approved shop drawings / construction drawings.
- b) RAA-ONE check and verify that all materials used are according to approved RAM submission.
- c) RAA-ONE to check location, height and clearance to suit the site condition according to approved shop drawing & CSD drawing
- d) RAA-ONE to ensure sufficient materials are stored with proper care, away from rain, water from other construction activities.
- e) Toolbox meeting to conduct by safety supervisor to inform workers of hazards involved in pipe installation. The following shall be strictly adhered to:
  1. Ensure that materials and equipment identified for correct area based on shop drawing.
  2. Ensure proper tools are safe for use.
  3. Ensure work area has barricade and signage.
  4. Ensure all statutory equipment such as scissors lift, chain block and lifting belt adhere strictly to local regulation.
  5. When hydrostatic pressure test is completed insulation material shall be applied if required
  6. Hanger rod supports and brackets to the pipe shall be installed according to the typical details drawing & working drawing.

#### **3.2 Horizontal Installation**

- a) Drill hole on soffit using hand drill.
- b) Install anchor bolt.
- c) Install GI threaded rod into anchor bolt and secure firmly.

- d) Install pipe clamp / angle bar / c-channel onto GI threaded bolt and secure firmly with double washer.
- e) Install tray, pipe, and cable ladder on soffit.
- f) Secure at both ends of with brackets using bold nut
- g) Secure and hook on both sides of the pipe end and make from floor level.
- h) Gradually lift up the pipe by adjusting the rod simultaneously at both objects end until it reaches the level of bracket support.
- i) Rest the objects at the bracket support and immediately secure the pipe or tray with clip.
- j) Repeat above step for other sections.
- k) Supervisor to supervise the installation work and check for any misalignments. Perform rectification works if necessary.
- l) Ensure that sufficient labor allocated to carry the pipe or small for installation for small pipes.
- m) Some location we will use ladder to carry materials tray and pipe.
- n) Use proper supports to hold pipes/equipment from preventing it from falling from height.
- o) Supervisor to ensure proper means of access provided for the work.
- p) Use proper lifting techniques to transfer the materials when installation at height.
- q) Any manual lifting & manual handling it shall adhere to safe work procedure of manual lifting and handling.
- r) Always maintain good working posture while lifting, carrying and installing the electrical work.
- s) Use hand gloves for good grip on the load while transferring the materials use mechanical aids to transport if necessary.

o) Storage yard & working areas must be properly stored or stacked and must not interface with the following: -

- i. Unobstructed use of passageways
- ii. Adequate lighting
- iii. Proper operation of machines or other equipment.

### **3.3 Vertical Installation (RISER as illustration)**

- a) Ensure Task lighting and Mechanical Ventilation are adequate prior to any works within riser shaft.
- b) Ensure that workers secure safety harness to Guardrail of tower scaffold at all times
- c) Erect Tower Scaffold for welding and pipe installation within mechanical shaft to necessary location, which is need to install.
- d) Install cable ladder or pipe onto riser to provide proper lighting.
- e) Secure life line points or anchoring point for safety hardness
- f) Dismantle Tower Scaffold or install scaffold must be qualified person
- g) Install brackets and support system inside riser
- h) proper supervision before start work any riser area
- i) Verify that support Bracket aligned correctly into from level to upper level.
- j) Bottom-up approach starting from level, to use for Riser pipe or installation.
- k) Hoist pipe or tray to require level for Tie-In joint.
- l) Once aligned, install bolt for the bracket to secure pipe in holding position
- m) Perform above steps until all riser pipes installed.



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### **3.4 CABLE AND DB TERMINATION :( if any)**

- a) Safety Supervisor will check on site before start work and before start, work must educate the team and briefing the risk.
- b) Must have proper technician for this high voltage cable installation work,
- c) Mounting of DB or carry up to hang up must have proper labor or equipment's for hoisting
- d) Cutting cables or termination of cables must have proper tools to handle.

### **3.5 Loading and unloading pipes and material use mobile crane (Only qualified operator, lifting supervisor, rigger & signalman to perform lifting operations)**

- a) Lifting supervisor to submit PTW and lifting plan, get approval from safety department before commence work. Also, reserve tower crane slots & mobile lifting platform from the few days in advance.
- b) Lifting supervisor needs to check the ground condition, crane condition, outriggers webbing sling, etc. before start lifting.
- c) All the lifting gears and lifting appliances inspected with the valid certificate and ensure materials / equipment do not exceed the safe weight load of each gears & appliances.
- d) Signalman is to signal properly during lifting of pipes and materials with tower crane operator.
- e) Hoisting the pipes and materials to respective floor and only unload on mobile lifting platform or loading and unloading point by HDGS.
- d) All the documents (lifting certificates) and physical conditions checked by safety supervisor before hoisting and shifting.



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### 3.6 Scissor lift & Scaffold

- a) Any usage of scissor lift it shall according to methods statement of safe use of scissor lift & boom lift.
- b) Any usage of tower scaffold/scaffold it shall be comply to scaffold regulation.
- c) Supervisor submits PTW at height & get approval before commence work.
- d) Supervisor need to check the scissor lift with checklist before commences work.
- e) Check condition and update checklist of scissor lift & scaffold before usage.
- f) Scaffold supervisor need to check the scaffold every 7 days & sign on the scaffold tag.
- g) Trade site supervisor shall ensure scaffold inspected & with scaffold safe to use tag.
- h) No overloading the scaffold is allow; it must comply to scaffold safe working load.

### 3.7 Work at height

- a) Before work commence, work person shall receive sufficient safety briefing to equip them with general knowledge.
- b) Supervisor submits PTW at height & get approval before commence work.
- c) Work at height activities shall supervise by appoints Work at Height Supervisor.
- d) Any usage of portable ladder shall according to SAFE WORK PROCEDURE FOR PORTABLE LADDER, Usage of ladder to lift the pipe prohibited.
- e) Safety harness with double lanyard must use while work person exposure to fall distance of more than 2 meter.
- f) Workers to wear safety harness with double lanyard and anchor the hook / D-ring to secure point at minimum waist level or higher at all times.
- g) Proper access such as ladder or staircase with handrails should provide for height access.



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- h) Proper erected scaffolding or ladder must use for height access.
- i) Ensure that only 2 persons per bay will be allowed to work at any one time at any level on the scaffolding. Do not overload the scaffold.
- j) Any unused materials / tools to remove away from the working platform and housekeeping maintained well always.

### **4. Project Organizations for Health & Safety Control**

- a) Project Organization Chart for Health & Safety Control as per RAA-ONE WSH Plan.
- b) Curriculum vitae for key manager's/supervisors personnel to be update and shall maintained at site office for client/ consultant review if required.

### **5. Health & Safety Risks and Controls**

#### **5.1 Hazard Analysis**

- a) Potential trip or fall hazards from rebar protrusions, uneven floor, uncovered completely etc... when material shifted from loading area / storage area to working area.
- b) Possible ladder, scaffolds failures includes toppled, collapsed due to overload, incorrect unsafe scaffold erections.
- c) Possible lifting equipment failures includes fall of materials due to defect of appliance or overload.
- d) Possible scissor lift failures include toppled off due to improper usage, overloading or wrong workflow when work at the building edges/near to opening.
- e) When cutting / sawing & handling of piping sharp edge may cut and cause injuries.
- f) Laceration risks when working or contact sharp edges from any handling, cutting of materials.



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### **5.2 Safety Precautions**

- a) Exercise due precautions, to be vigilant and safety conscious to observe for any hoisting activities overhead or other working at heights.
- b) Deploy appointed Safety Supervisor to conduct inspections on work installation process & works completion. Rectify any unsafe conditions observed and upkeep housekeeping at all times.
- c) Strictly adhere to PPE compliance. Use suitable PPE e.g hand gloves when handling / cutting / sawing of materials, wear ear protection PPE aid when working in noisy environment. Ensure all PPE are in good conditions, worn off or defective items must need replaced.
- d) Comply to Good Safe Work practices, work on safe platforms of sufficient width, secured all work platforms. No loose material on platforms. Toe boards provisions to be comply.

### **5.3 Risk Assessment for Installation Works**

- a) Health & Safety Risk Assessment Work Sheet
- b) All workers will attend safety induction course prior to any work commencement.
- c) All Health & Safety Risk Assessment to be update and shall maintained at site office for client/consultant review if required.
- d) Approved Risk Assessment must communicated to relevant working parties and all attendance to formulate.

## **6. Safe Work Procedure**

### **6.1 Safe Work Procedure for Installation of Horizontal and vertical work.**

- a) Survey the area of work for electrical horizontal pipe installation.
- b) Check all electrical/portable hand tools & equipment are in good condition & certified by L.E.W
- c) Ensure all electrical/portable hand tools & equipment cabling do not rest on floor to cause tripping hazards.
- d) Ensure PPE e.g. safety helmet, safety harness, safety shoe & safety Google put on all workers at working area.
- e) Ensure hand gloves put on when handing sharp edge material.



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- f) Ensure that chain block and lifting accessories used to lift pipes comes with valid certification document & inspected by authorized examiner / lifting supervisor before start works.
- g) Ensure piping is properly secure onto the bracket support approved by consultant.
- h) Ensure no loose material, fitting / bolts and nuts left on the floor / platform to cause tripping hazard. Loose material fitting to packed in container/ bucket.
- i) Standby fire extinguisher with firewatcher when hot works are involved. Standby fire blanket.
- j) Ensure exhaust ventilation at work place when carry out welding works to remove fumes.
- k) Ensure safety barricade is there when working around the building edge area.
- l) Supervisor must check and ensures housekeeping upon work completion.

.....Work safely .....