QUALITY HANDBOOK

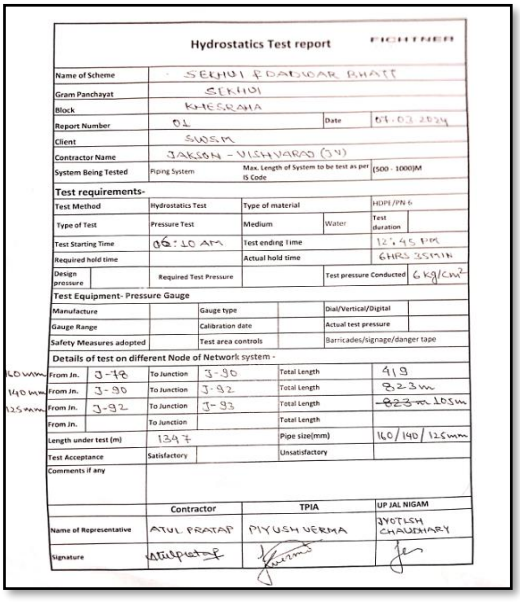
Sigma Rules

JJM PROJECT

HDPE Pipe Laying & Pipe Joints

Reference: Approved Drawing, IS 7634-2

S.N.	Steps	Reference photo	Assurance Points
1	**Excavation**		• Excavation shall be ensured as per approved survey route plan. • Excavation shall be at least 1 meter away from permanent structure. • Excavation depth and width shall be as per specification. • Line straightness, Level and slope shall be maintained as per specification.
2	**Pipe Selection & Pipe Laying**	 	• Visual inspection of pipe shall be carried out for any damages • Size (OD) & Clause of pipe shall be selected as per specification and drawing. • Pipe laying shall be ensured as per route plan. • Pipe fittings shall be used as per specification and drawing. • In case of culvert crossing, Casing of Piping by concrete shall be ensured as applicable • Any open-end pipe shall be protected with end cap or any form of protection.
4	**Pipe Jointing**		• Pipe edge preparation shall be ensured for smooth squared edges and shaved ends. • Alignment of Pipe shall be ensured for Axially aligned and levelled properly • Pipe joint shall be done with Hot Plate Jointing Machine. • Plate temperature, change over time, pressure buildup time, cooling time under pressure, cooling time under pressure relaxation shall be ensured as per IS standard. • Visual inspection of joint for uniform bead formation.
5	**Backfilling and Compaction**		• 300mm layer by layer soil backfilling and compaction to be done

6	**Hydro Test**		• Proper arrangement for Hydro test shall be ensured as per specification. • Pressure gauges used are having valid calibration. • Water filling shall be done gradually and properly vented before pressuring the pipe. • Raise the pressure till the test pressure and hold it for time specified as per specification. • Check for pressure drop, leakages if any.
7	**Documentation**		• Check the step by step activity and fill the factual data in checklist • Checklist shall filled and signed by JL Engineers & Client representative as applicable.

Boundary Wall (BW) Construction

Reference: Approved Drawing, Latest revision of IS 456, IS 1077

S.N.	Steps	Reference photo	Assurance Points
1	**Site Preparation**		• Ensure the site is cleared of debris and levelled. • Verify the boundary limits and layout as per the approved design. • Ensure the soil compaction and stability at site
2	**Excavation**		• Excavation shall be done to dimensions and depth as per design specifications. • Ensure safe excavation practices. • Inspect & ensure the stability of excavated trenches.

3	**Foundation work**		• Ensure the quality and mix ratio of concrete as per design / drawing. • Ensure the reinforcement placement as per design. • Ensure proper curing of foundation concrete.
4	**Masonry work**		• Check & ensure the Quality of Bricks as per standard. • Use approved quality bricks/blocks and mortar mix. • The alignment, plumb, and level of masonry work shall be properly maintained. • Ensure the joint thickness & expansion joints provided as per drawing. • Ensure the proper curing for at least 7 days.
5	**Plastering**		• Ensure the surface is cleaned and prepared before plastering. • The mix ratio and quality of plaster material shall be ensured as per drawing. • Check & ensure for uniformity, thickness, and smoothness of plaster.
6	**Painting/ Finishing**		• Conform the use of approved paint and materials. • Inspect surface preparation before painting. • Ensure uniform application and coverage of paint.
7	**Gate Installation**		• Verify the design and dimensions of the gate. • Ensure proper alignment and secure installation. • Check for smooth operation and locking mechanism.

Elevated Service Reservoir (ESR/0HT) Construction

Reference: Approved Drawing, Latest revision of IS 3370 (Part-1 to 5), IS 456,

S.N.	Steps	Reference photo	Assurance Points
1	**Excavation**		• Ensure site is free from debris and leveled as per design specifications. • Conduct soil tests and confirm suitability. • Check dimensions and depth of excavation. • Verify soil compaction through standard tests.
2	**Foundation / Raft work (Concreting)**		• Ensure the availability of approved / tested construction materials as per specification at site. • Ensure the Cement & Reinforcement steel are from approved sources only. • Ensure the fabrication & placement of reinforcements as per approved BBS & drawing. • Ensure the shuttering is fixed properly and water tight. • Ensure the concrete mix proportions according to Grade of Concrete, water cement ratio as per approved design mix. • Check & ensure the slump cone test done and the result within acceptable limit as per design mix. • Take real time cube samples as per IS 456. • Ensure the concrete compacted properly through proper use of vibrator / pocking rod. • Ensure the de-shuttering done after 16 Hrs to 24 Hrs of concrete. • Check visually for any defects like concrete honeycomb / damages / cracks etc… • Start curing immediately after de-shuttering and ensure the proper curing of structure for at least 7 days.

3	**Column & Beam Construction**		• Erecting columns & beams as per structural design. • Ensure the fabrication & placement of reinforcements as per approved BBS & drawing • Ensure the shuttering size and alignment / Verticality of columns and beams as per drawing. • Refer Sr. No. 2 for concreting process & ensure the same. • Verify the size, alignment & verticality of columns & beams as per drawing after concreting.
4	**Tank Construction & Fabrication**		• Check and ensure the formwork quality and alignment for bottom dome. • Ensure the fabrication & placement of reinforcements as per approved BBS & drawing • Refer Sr. No. 2 for concreting process & ensure the same. • Fabrication of tank body (Aluminum & Zinc)), including walls and roof as per approved drawing. • Conduct water-tightness tests & record the results.
5	**Pipeline Installation**		• Ensure the pipelines for water inlet, outlet, and overflow as laid as per drawing. • Ensure proper material selection and handling. • Check & ensure the alignment and gradient of pipelines. • Test for leaks and pressure stability.
6	**Painting and Finishing**		• Ensure the paints are from approved source and as per approved specification. • Ensure the surface preparation is done properly before painting. • Apply the required number of coating on structure as per specification. • Ensure the paints are applied uniformly and covered completely.

7	**Hydrostatic Testing & Commissioning**		• Ensure the Cleaning and disinfecting the tank before use. • Fill the tank with water as per standard procedure and check the tank for leaks and structural integrity as per approved procedure and standards. • Conduct a comprehensive final inspection. • Verify compliance with all design and quality specifications. • Record all the parameters and submit final QA/QC documentation for approval.

Pump House (PH) Construction

Reference: Approved Drawing, Latest revision of IS 1172, IS 2911, IS 3370, IS 456, IS 2212, IS 1077.

S.N.	Steps	Reference photo	Assurance Points
1	**Site Preparation**		• Ensure the site is cleared of debris and levelled. • Verify & Mark the boundary limits and layout as per the approved design. • Check the excavation dimensions (as applicable) as per drawing • Check & ensure the soil compaction and stability.
2	**Foundation work**		• Ensure all the raw materials are from approved source and tested to meet the specification • Verify the quality and mix ratio of concrete (PCC). • Check foundation work as per design. • Ensure proper curing of DPC & Brickwork.
3	**Masonry work**		• Use approved quality bricks/blocks and mortar mix. • Check & ensure the alignment, plumb, and level of masonry as per drawing & standard. • Ensure the provision of construction joints, joint thickness as per drawing. • Ensure proper curing as per standard.

4	**Roofing**		• Ensure the reinforcement steels and construction raw materials are from approved source. • Ensure the reinforcement placement, formwork, concrete mix, concrete compaction, curing as per standard. (Please refer Sigma Rules -03 Sr. No. 2 for detailed concreting activity) • Ensure proper water-proofing of the roof.
5	**Finishing (Plastering/ Painting)**		• Check & ensure the alignment, plumb, and levels of structural elements are maintained properly as per drawing and standard. • Ensure the surface is cleaned and prepared before plastering. • Ensure Plastering material & mix ratio as per drawing. • Maintain the uniformity, thickness, and smoothness of plaster. • Confirm the use of approved paint and materials. • Inspect surface preparation before painting. • Ensure uniform application and coverage of paint.
6	**Electrification & Equipment Installation**		• Verify & ensure the quality and specifications of electrical and plumbing materials are as per specification • Confirm the specifications and quality of pumps and equipment. • Ensure proper alignment, anchoring, and connections. • Check for operational efficiency and safety measures. • Conduct & ensure proper & successful testing and commissioning.

7	**Final Inspection and Handover**		• Conduct a thorough inspection of all construction elements as per specification. • Ensure all QA points are met and documented. • Obtain necessary certification and approvals. • Handover the completed structures to the concerned authorities.

Solar Panel & Earthing

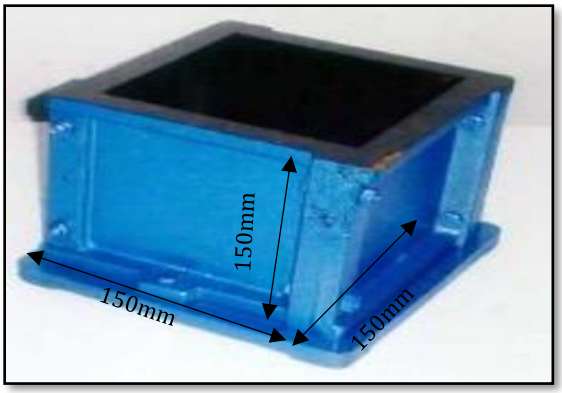
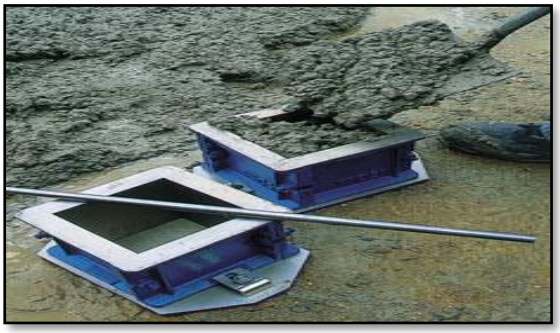
Reference: Approved Drawing, MNRE Guidelines, IS Codes (Latest Revision) IS 16221, IS14286, IS 61730, IS 1893, IS 3043, IS 732, IEC61215, IEC 61730, IS 60364, IEEE80.

S.N.	Steps	Reference photo	Assurance Points
1	**Site Survey & Preparation**		• Conduct a detailed site survey to assess feasibility for solar panel installation and earthing. • Ensure accurate site measurements. • Assess shading and orientation • Document soil resistivity for earthing. • Develop detailed design and plans for solar panel installation and earthing systems. • Clear and level the installation site. • Ensure the excavation & foundation concreting done as per drawing (Please refer Sigma Rules -03 Sr. No.2 for concreting activity) • Ensure proper curing of concrete for at least 7 days. • Prepare trenches for earthing conductors as per drawing.
2	**Installation of Mounting Structures**		• Install mounting structures for solar panels as per drawing. • Ensure proper alignment of structures and ensure proper tightening of fasteners. • Confirm structural integrity and stability. • Check and ensure the solar panels, inverters, mounting structures, and earthing materials are from approved source and as per specification.

3	**Solar Panel Installation**		• Install the solar panels on the mounting structures as per drawing. • Ensure the panel is placed properly and secure connections. • Ensure panels are free from damage and properly oriented.
4	**Electrical Connections**		• Connect solar panels to inverters and other electrical components as per drawing • Ensure all the electrical connections are properly tightened • Ensure proper cable management and protection.
5	**Installation of Earthing System**		• Install earthing rods and conductors to provide a low-resistance path to ground. • Measure soil resistivity and ensure compliance. • Ensure all the connections are properly done as per drawing. • Check the continuity & Earthing Resistance and record the results.
6	**Testing, Commissioning & Handover**	 	• Conduct thorough testing of the solar power system and earthing as per Manual. • Perform insulation resistance / Earthing resistance tests and record the same. • Verify system performance against design specifications. • Record all installation and testing data. • Prepare as-built drawings and maintenance manuals. • Handover the completed system to the client.

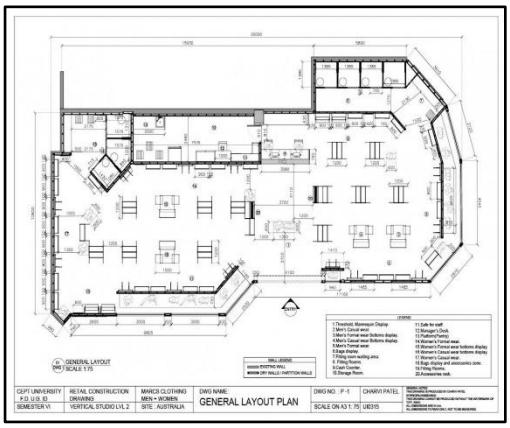
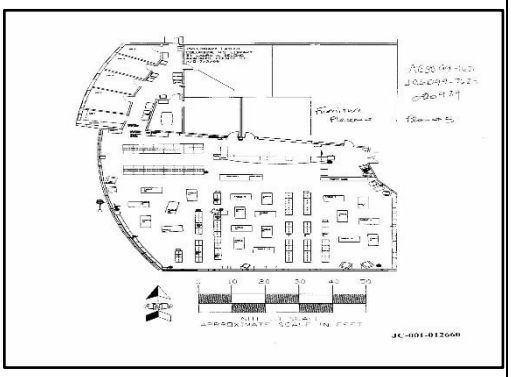
Concrete Cube Sampling & Curing

Reference: IS 516, EN 12350 Part 1 to 3

S.N.	Steps	Reference photo	Assurance Points
1	**Cube Mould size (Ref *IS: 10086*)**		• Size of cube module to be ensured (**150x150x150**) • The moulds should be watertight • Moulds material should be non-absorbent, not readily attacked by cement paste
2	**Cube Mould Preparation**		• Tight the mould properly and ensure it should be watertight. • Apply oil inside the mould
2	**How to fill (*Ref IS : 1199*)**	 	• **Correct mix** ratio be ensured as per mix design. • Concrete should be filled in 3 layers • Each layer must be compacted with tamping rod (600mm long rounded end of 16mm Dia) by 35 strokes per layer. • Where voids are left by tamping rod, sides of the mould shall be tapped to close the voids. • Each layer has to be compacted sufficiently to ensure that cement slurry is seen along all 4 edges of mould as well as on the top surface of concrete. **No CA particles or void must be visible.** • Final levelling and finishing of concrete must be done with mason's float.
3	**When**		• **Real time cube sampling** to be done • Cube samples to be taken during the concrete pouring in the foundation / Structure. (All 3 samples should be taken from same concrete) • Number of cubes as per IS 456

4	**Identification and Record**		• All sampled cube to be **identified as** ▪ Date of casting ▪ Location / Job ▪ Cube number ▪ Samples to be done with embossed marking • Cube register to be maintain, which contain all above details
5	**Handling**		• Cube to be taken out from moulds (de-mould) after 16 hours to 24 hours. • Check visually – No Cracks / Honeycomb. • Immediately after de-mould, all the cubes specimen must be submerged in clean, freshwater until the time of testing.
6	**Storage**	 	• Shift the cubes from site storage to central cube storage tank as early as possible. (Set the timeline i.e., within a week from cube de-mould, the cubes should be shifted to central cube storage tank. • Store the cubes in water for curing until the time of testing (Temp 25° to 30°). Record shall be maintained. • Ensure the Storage tank shall be filled with clean water always. • Storage Tank water should be replaced every fortnightly. Record shall be maintained • Ensure all the cubes specimen shall be submerged in clean water until the time of testing. • Cube shall be tested on 7 Days & (or) 28 days of proper curing.

Store Setup

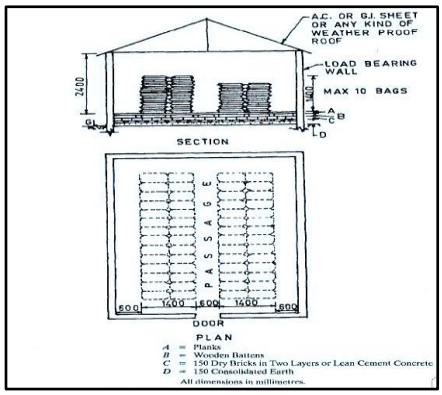
S.No.	Steps	Assurance Points	Reference photo
1	**Store Layout Plan**	• For any store, there should be proper planning of the layout for stacking and storage of different materials, while planning the layout, the requirements of various materials, components and equipment's at different stages of construction shall be considered. • The passage ways for proper access and proper transport of the vehicles carrying the material. shall not become obstructed by storage of tools or accumulated wastage. • Materials stored at site, depending upon the individual characteristics, shall be protected from atmospheric actions, such as rain, sun, winds and moisture, to avoid deterioration.	 
2	**Store Housekeeping & Security**	• Store office should be established in the store premises. • Security arrangement like Security guard, fencing & CCTV cameras etc need to be done at store premises. • Emergency contact list need to be displayed in store office and near security guard cabin.	
3	**Illumination at store yard**	• Illumination /lighting in store should be adequate specially in store fencing area. • Bilateral arrangement for power source like solar system or by using electric generator so that there should not be any failure in supply.	

4	**Documentation at Store**	• Proper store records need to be maintained as per Client's and company's requirement. • Quality, safety and Company's policies should be displayed at the store office. • Following documents need be maintained: 1. *Material receipt register.* 2. *Cement and steel stock register.* 3. *Hardware and accessories stock register.* 4. *Tools and Equipment stock register.* 5. *Store Requisition.* 6. *Issue Challan.* 7. *Internal Requisition slip.* 8. *Monthly stock statement of cement and reinforcement steel.* 9. *T&P Register.* 10. *Return Note.* 11. *Material Check Report.* 12. *Miscellaneous item stock register.* 13. *Other project specific material register.*	  JAKSON JAKSON LIMITED Quality Policy We at Jakson Ltd believes that "Enhance the Quality of life for all stakeholders by creating a sustainable organization" through Sustainable Work Practices and Quality at First Time Right. Jakson Ltd is committed to meet or exceed the expectations of all stakeholders, without compromising on Quality of our products and services. We strive to achieve and sustain excellence in our businesses by continually improving our Quality Management System by creating and leveraging strategic business partnerships to ensure optimum business performance. To achieve these objectives, We shall: - ❖ Develop, implement, and maintain Quality Management System aligned with our sustainable commitments, core values and consistent with industry standards. ❖ Drive continuous improvement in Quality through setting objectives and targets, assessing Quality performance, using appropriate best in class Quality practices and providing appropriate training & resources to employees, contractors' workforce and associates. ❖ Embracing technological advances and continuously upgrading our systems and processes. ❖ Assign, Communicate Quality responsibilities and accountability to Employees, Contractors, Workers, associates, Suppliers and Service Providers towards fulfilling Quality Management System requirements. We shall periodically review this policy for its appropriateness and relevance with Quality Risks and Opportunities. Issue 2: R1 01st July 2024 Place: Noida Raghav Gupta Managing Director
5	**Store Activity**	• Selection & finalizing store. • Preparation of store office, fencing of store premises, leveling and road making & store layout plan. • Receipt of material & unloading of the same. • Verification & stacking of various incoming and outgoing material. • Issue of material & updating the Ledger. • Monthly stock Statement for cement, steel & other material. • Reconciliation of material on monthly basis and physical verification on quarterly basis.	  

6	**Stacking, Handling and Storage of material**	• Materials in stored yard should be stacked in a manner to prevent deterioration and damage to the materials and company's property and natural environment. • Materials shall be stacked on well-drained, flat and unyielding surface to avoid rusting. • Material stacks shall not impose any undue stresses on walls or other structures. • Materials shall be separated according to kind, size and length and placed in neat, allow a required passage way in between for inspection and movement of vehicle such as cranes, trucks etc. for material loading & unloading. • All passage ways shall be kept clear uninterrupted for easy movement of material. • Cement bags and steel shall be stacked off the floor on wooden planks in such a way as to keep about 150 mm to 200 mm clear above the floor and 600 mm minimum shall be left around between the exterior walls as per IS 4082.	    
7	**Demarcation of Material**	• Demarcation is process of setting the boundary limit between the various items in store yard according to its size, shapes, types & use. Also facilitate by proper banners boards showing necessary information about the items placed. **Advantage of Demarcation:** 1. *Proper demarcation provides instant verification of material location in store area.* 2. *Mixing of heavy & light material is not possible and also prevent damage / deterioration due to proper control.* 3. *Provide more passage area between the material for movement of vehicle during material handling & loading.*	 

8	**Cube Curing Tank**	• Curing tank need to be constructed at store premises as per project requirement.	
9	**Scrap Yard**	• Scrap yard need to be established and marked in the store premises for scrap steel, used PPE's etc.	

Stacking of Cement Bags

S.N.	Assurance Points
1	Cement shall be stored at the work site in a building or a shed which is dry, leakproof and as moisture-proof as possible. The building or shed for storage should have minimum number of windows and close-fitting doors.
2	Cement shall be stored and stacked in bags and shall be kept free from the possibility of any dampness or moisture coming in contact with them.
3	Cement bags shall be stacked off the floor on wooden planks in such a way as to keep about 150 mm to 200 mm clear above the floor. The floor may comprise of lean cement concrete or two layers of dry bricks laid on well consolidated earth. A space of 600 mm minimum shall be left around between the exterior walls and the stacks *(see Fig.1)*
4	In the stacks the cement bags shall be kept close together to reduce circulation of air as much as possible.
5	The height of stack shall not be more than 10 bags to prevent the possibility of lumping up under pressure.
6	The width of the stack shall be not more than four bags length or 3 metres. In stacks more than 8 bags high, the cement bags shall be arranged alternately length-wise and cross-wise so as to tie the stacks together and minimize the danger of toppling over.
7	Stacking of cement bags should be systematic to facilitate counting.
8	FIFO (First in First out) method should be used. The material procured first should be used first and similar materials should be stacked side by side.
9.	Shelf life of cement is typically considered to be 90 days from the date of manufacture if it is stored in ideal conditions, i.e., in a dry and moisture-free environment.
	   Fig.1 TYPICAL ARRANGEMENT IN CEMENT GODOWN

JAKSON LIMITED

Quality Policy

We at Jakson Ltd believes that **"Enhance the Quality of life for all stakeholders by creating a sustainable organization"** through Sustainable Work Practices and **Quality at First Time Right**. Jakson Ltd is committed to meet or exceed the expectations of all stakeholders, without compromising on Quality of our products and services.

We strive to achieve and sustain excellence in our businesses by continually improving our Quality Management System by creating and leveraging strategic business partnerships to ensure optimum business performance.

To achieve these objectives, We shall: -

- Develop, implement, and maintain Quality Management System aligned with our sustainable commitments, core values and consistent with industry standards.
- Drive continuous improvement in Quality through setting objectives and targets, assessing Quality performance, using appropriate best in class Quality practices and providing appropriate training & resources to employees, contractors' workforce and associates.
- Embracing technological advances and continuously upgrading our systems and processes.
- Assign, Communicate Quality responsibilities and accountability to Employees, Contractors, Workers, associates, Suppliers and Service Providers towards fulfilling Quality Management System requirements.

We shall periodically review this policy for its appropriateness and relevance with Quality Risks and Opportunities.

Issue 2: R1
01st July 2024
Place: Noida

Raghav Gupta
Managing Director