

## DOMESTIC WATER PIPING SYSTEM

### **1.0 Scope**

The scope of this method statement is to detail the method of installation and hydrostatic pressure testing of Domestic Water Piping System.

### **2.0 Material**

2.1 Copper piping to BSEN 1057 Class X –

2.1.1 Cold water riser piping from the pumps to the roof tanks.

2.1.2 Cold water supply piping from the tank to the individual floors upto the PRV station.

2.1.3 Hot water piping inside the toilets from the water heater to the outlets.

2.2 UPVC piping to BS 3505 class E – Cold water distribution pipes after the PRV.

2.3 Cross-linked Poly-ethylene (PEX) pipes to DIN –16892/16893 – Hot and cold water piping concealed in block wall (wall drops).

### **3.0 Applicable Location**

Towers, East and West Podiums and Villas.

### **4.0 Method**

#### **4.1 Storage**

4.1.1 The pipes and fittings while unloading shall be slowly lowered, not dropped to the ground.

4.1.2 Timber supports of suitable size shall be placed at equal distance below the pipes.

4.1.3 Pipes shall be stacked on a flat surface free from any sharp objects and shall be given adequate supports at all times.

4.1.4 Pipes and fittings shall not be stored under direct sunlight.

4.1.5 While stacking it shall be ensured that pipes of bigger sizes will be placed at the bottom and smaller sizes at top.

4.1.6 Manufacturers instructions shall be followed, for storage, where applicable.

4.1.7 End caps shall be in place for all pipes until taken out for installation.

## 4.2 **Installation**

4.2.1 Ensure only approved drawings are used for installation.

4.2.2 Mark the pipe routing on the soffit of slab or as required, duly coordinated with other services and as per approved layout drawings.

4.2.3 Install hangers and supports with approved material.

4.2.4 The spacing of the supports for the vertical and horizontal pipes shall be in accordance with the approved details drawings and standards as applicable.

4.2.5 The pipes shall be installed at designated levels as per the coordinated layout.

4.2.6 The pipes are cut to required length, and all sharp edges and burrs shall be removed.

4.2.7 Before jointing, the pipes and fittings shall be checked for defects and the jointing surfaces are cleaned thoroughly.

4.2.8 The copper pipes shall be jointed by brazing by suitably qualified and skilled tradesmen.

4.2.9 Manufacturer's installation procedure shall be followed as applicable.

4.2.9.1 Refer Annexure-I (Soldering of Copper pipes)

4.2.9.2 Refer Annexure-II (Brazing of copper pipes)

4.2.9.3 Refer Annexure-III (Solvent cement jointing of UPVC pipes)

4.2.10 Only manufacturer's fittings shall be used for jointing, change in direction, change in sizes etc., as required.

4.2.11 Expansion couplers / bellows shall be installed in the piping, where it crosses the buildings expansion joints.

4.2.12 The entire piping shall be evenly pitched to achieve 0.2 percent slope towards drain valves.

4.2.13 Approved valves shall be installed for all risers and branches as per approved layout drawings.

4.2.14 All valves shall be installed in an easily accessible location and adequate space shall be available for maintenance.

- 4.2.15 PRVs will be installed as per manufacturers instructions at locations approved on layout drawings.
- 4.2.16 All pipe joints shall be left exposed until satisfactory completion of hydrostatic pressure testing.
- 4.2.17 All hot water copper pipes shall be plastic coated.
- 4.2.18 Drain valves shall be installed at all low points.
- 4.2.19 The pipe work, valves etc., shall be identified as per specifications and approved submittals.

### **4.3 Joining Methods**

Five types of joining methods will be followed in this project.

#### **4.3.1 Copper Pipes**

Three types of joining methods will be carried out for copper pipes.

a. **Brazing**

Brazing will be carried out for

- (i) cold water risers from pumps to roof tank and
- (ii) cold water down take riser pipes 66.7mm to 108mm

by experienced and skilled personnel.

b. **Soldering**

Soldering will be carried out for internal hot water piping for washrooms and kitchens.

c. **Victaulic Grooved Joints**

This method will be used for cold water riser pipe work of 159mm dia only.

#### **4.3.2 UPVC Pressure Pipes**

UPVC pressure pipes shall be jointed by solvent cement (Refer Annexure-III)

#### **4.3.3 PEX Pipes**

The vertical dropper pex pipes are connected to the distribution pipes through a male union of approved type.

## **5.0 Hydrostatic Testing**

- 5.1 Upon completion of installation, the open ended pipes shall suitably be plugged or blanked-off.
- 5.2 All the joints shall be left uncovered until satisfactory completion of testing.
- 5.3 Flush the section of the pipe work under test with water.
- 5.4 Connect a calibrated pressure gauge to the pipe work at a suitable location (Refer Annexure-IV for sample calibration certificate copy).
- 5.5 Check and ensure all drain valves are closed and in-line valves are open.
- 5.6 Fill the section of pipe work under test with clean water.
- 5.7 Subject the piping to a static pressure of 350 Kpa above the operating pressure by using a mechanical hand pump.
- 5.8 After pressurising the pipe work to the required pressure, a holding time of 2 hours shall be allowed.
- 5.9 Inspect all joints, valves, fittings etc. for leaks, if there is a drop in pressure.
- 5.10 Repair leaks and defects, if any, with new material as required and retest the pipe work until satisfactory results are obtained. After rectification, the test pressure shall be maintained for a minimum period of 2 hours.
- 5.11 Consultant shall be notified at least 48 hours in advance to witness the test by submission of work inspection request (WIR).
- 5.12 Only calibrated pressure gauge shall be used for pressure testing.

## **6.0 Safety**

- 6.1 All safety precautions shall be followed as per established project safety procedures.
- 6.2 Warning sign shall be placed at required location.
- 6.3 Fire blanket to be kept at the required location.
- 6.4 Fire extinguisher to be placed at the work spot.
- 6.5 Hot work permit to be obtained from the concerned safety officer.

**7.0**    **Records**

- 7.1    Work Inspection request (WIR).
- 7.2    Installation checklist duly signed by QA/QC.
- 7.3    Test certificate duly signed by Consultant.

**8.0**    **Attachments**

- 8.1    Test Format
- 8.2    Annexure-I    Copper pipes Joining (Soldering)
- 8.3    Annexure-II    Copper pipes joining (Brazing)
- 8.4    Annexure-III    UPVC pipes joining (Solvent weld)

## **ELECTRIC WATER HEATERS**

### **1.0 Scope**

1.1 This method statement applies to installation of water heaters as approved.

### **2.0 Purpose**

2.1 Purpose of this method statement is to outline the method of storage, handling and installation of water heaters and pertaining accessories.

### **3.0 Material**

3.1 Ceiling mounted water heaters

3.2 Pressure and temperature relief (P&T) valves

### **4.0 Applicable Location**

4.1 East and West Towers

4.2 Villas & Podium

### **5.0 Method**

#### **5.1 Receiving**

5.1.1 When received at site, heaters shall be checked for quantities, model numbers and physical damages, if any.

5.1.2 P&T Valves shall be checked for size, model and quantity, receiving inspection shall be conducted by the storekeeper, engineer and QC Engineer.

5.1.3 P&T Valves and drain cock shall be segregated as per sizes / models and stored on racks within covered area.

5.1.4 Any items found damaged or not found suitable as per the project requirements shall be quarantined, non-compliant materials shall be clearly marked and stored separately to prevent any inadvertent use until returned to vendor.

#### **5.2 Storage**

5.2.1 Upon completion of receiving QC inspection the heaters will be segregated model / size wise and stored accordingly for easy retrieval.

- 5.2.2 Water heaters shall be stored on a flat surface in ventilated and covered area and protected from dust.
- 5.2.3 Inlet, outlet blanks shall not be removed until ready for connection to pipe work.
- 5.2.4 Manufacturer's instruction shall be strictly followed as applicable.
- 5.2.5 Storekeeper will be responsible for proper storage and maintenance of records, as required.

### **5.3 Preparation**

- 5.3.1 Check and ensure that the shop drawings used are latest and approved for construction.
- 5.3.2 Check coordination with other services prior to the installation.
- 5.3.3 Check the piping supports locations and power supply routing locations in coordination water heater and piping layout and ensure it does not obstruct the space around water heater for removal and maintenance.
- 5.3.4 Ensure easy access and sufficient clearance for servicing and maintenance i.e. for replacement of water heaters, thermostat, heating elements.

### **5.4 Installation**

- 5.4.1 Install the fabricated water heater support.
- 5.4.2 Install the water heater on the support.
- 5.4.3 Complete the piping and valve package installation as per approved drawings. Remove the end caps on the inlet, outlet points.
- 5.4.4 Install the electrical power connections as per approved drawings.
- 5.4.5 Connect the P&T valve.
- 5.4.6 Check and ensure availability of adequate access for removal and maintenance of water heater.
- 5.4.7 Provide grounding wiring as per approved drawings / suppliers instruction.
- 5.4.8 Ensure compliance to the manufacturers instructions while installing the water heaters.

**6.0 Inspection**

- 6.1 After completion of Water heaters and piping connections, the same shall be inspected and certified by QA/QC Engineer.
- 6.2 “Work Inspection Request” shall be raised for Consultants inspection and sign off.

**7.0 Safety**

- 7.1 All safety precautions shall be followed as per established project safety plan and procedure.
- 7.2 Only experienced and skilled technicians shall be engaged for carrying out this work.
- 7.3 The people involved in the installation shall have PPE such as safety helmets, safety shoes, gloves, coverall, goggles, etc. as required.
- 7.4 Safety Officer shall check and ensure that all safety precautions are followed.
- 7.5 Safety Officer shall check and ensure that all scaffolding and ladders used at site are having duly signed tags.

**8.0 Reference**

- 8.1 Manufacturers catalogue
- 8.2 Approved Water heater schedule
- 8.3 Shop drawings

**9.0 Records**

- 9.1 “Work Inspection Request” duly signed by Consultant for installation.
- 9.2 Signed-off water heaters check list

**10.0 Attachment**

- 10.1 Installation check sheet for Water heater



## SANITARY FIXTURES

### **1.0 Scope:**

This procedure covers the installation of sanitary wares as per Specification.

### **2.0 Material:**

- 2.1 Water closet
- 2.2 Wash hand basin
- 2.3 Bath tub
- 2.4 Shower tray
- 2.5 Shower
- 2.6 Kitchen sink,
- 2.7 Urinal

### **3.0 Storage:**

- 3.1 Upon completion of receiving QC inspection, the sanitary ware will be segregated model / size wise and stored accordingly for easy retrieval.
- 3.2 Sanitary ware shall be stored on a flat surface in well-ventilated and covered storage area.
- 3.3 Manufacturer's instructions shall be strictly followed as applicable.
- 3.4 Store Keeper will be responsible for proper storage and maintenance of records, as required.

### **4.0 Installation of Sanitary wares:**

After completion of plumbing & drainage and completion of floor, wall tiles and room doors, we can start to install sanitary ware.

## 4.1 Water Closet

### 4.1.1 Type

Back to wall W.C. pan with horizontal outlet, seat & cover and concealed cistern.

### 4.1.2 Fixing Method

- 4.1.2.1 After getting the civil clearance, the concealed cistern shall be assembled and mounted on the wall as per approved manner as well as manufacturer's recommendations.
- 4.1.2.2 Cistern water inlet and flush outlet connection shall be completed with suitable fittings and same to be tested before closing the panel/duct.
- 4.1.2.3 Drainage pipe (W.C. outlet/branch) shall be positioned properly to receive the W.C. connector.
- 4.1.2.4 Concealed portion like cistern, plumbing pipe works to be covered with panels as per approved manner.
- 4.1.2.5 Cut out/opening for W.C. outlet, flush outlet, cistern knob/actuator are to be marked on the panel and same to be cut as per requirement.
- 4.1.2.6 W.C. pan shall be mounted on floor and mark the location of fixing points (space will be allow for connector).
- 4.1.2.7 Holes to be made on the floor for screwing.
- 4.1.2.8 Ensure that W.C. connector rubber seal is correctly located on rim of connector.
- 4.1.2.9 Lubricate W.C. spigot and rubber seal of connector.
- 4.1.2.10 Insert W.C. spigot into connector and push together.
- 4.1.2.11 W.C. screwed to floor.
- 4.1.2.12 Joint/cap to wall/panel and floor sealed with waterproof sealant after commissioning the system.

## 4.2 Wash Basin

4.2.1 **Type** – Oval under countertop basin with deck mount mixer.

### 4.2.2 Fixing method

4.2.2.1 After getting the civil clearance, the water supply and drainage arrangements shall be made clear and tidy.

4.2.2.2 As per manufacturer's recommendation, using basin as a template to determine proper counter.

4.2.2.3 Counter with marble shall be made perfect and properly leveled.

4.2.2.4 For wooden or similar countertop `fixing clips' shall be used. For marble or similar countertop basin, be supported on a timber framework.

4.2.2.5 After carefully placing the basin, under the rim and joint/cap shall be sealed with waterproof sealant.

4.2.2.6 Mixer location (as per approved) to be marked on the counter and the same to be cut.

4.2.2.7 Then mixer shall be fitted and water supply, drainage connection will be made.

## 4.3 Bath Tub / Shower Tray

### 4.3.1 Type

4.3.1.1 Bath Tub – White acrylic 1700 x 800mm

4.3.1.2 Tray - Built-in shower

### 4.3.2 Fixing Method

4.3.2.1 After getting the civil clearance, the bath tub/tray shall be placed on the approved location and same to be fixed over the block work and leveling the height and slope.

4.3.2.2 Tub/tray drain outlet shall be connected to waste pipe using approved adaptor/bush.

4.3.2.3 Joint/cap an around the tub/tray sealed with waterproof sealant.

4.3.2.4 Shower door/glass framework shall be made by NMX.

#### **4.4 Shower**

4.4.1 **Type** – Built-in shower mixer – Chrome plated with single lever.

Adjustable shower head.

##### **4.4.2 Fixing Method**

4.4.2.1 Before wall tiling work, the mixer approved location shall be marked and hot & cold water points are to be terminated accordingly (should be flushed with wall tiling work)

4.4.2.2 The same above procedure to be followed for the shower head.

4.4.2.3 After the tiling work, the exposed mixer/shower head will be fixed as per manufacturer's recommendation.

#### **4.5 Kitchen Sink**

4.5.1 Water supply and drainage arrangements to be made clear and tidy.

4.5.2 Counter with finish to be made perfect and properly levelled.

4.5.3 Install the kitchen sink in the exact position (as specified in drawing) and bedded on mastic / sealant.

4.5.4 Fix the sink mixer and connect with cold and hot water supply with angle valve.

4.5.5 Fix the waste with 'P' Trap (with strainer) and connect to the drainpipe.

4.5.6 Seal the gap between kitchen sink and marble.

## **4.6 Urinals**

- 4.6.1 Before the tiling work, the urinal outlet point, and water supply feeding point either flush valve/cistern are to be marked as per approved location as well as manufacturer's recommendation and same are to be terminated accordingly (should be flushed with tile wall).
- 4.6.2 After the tiling, the wall urinal shall be fixed using with supplied clips/bracket as per manufacturer's recommendation.
- 4.6.3 Water and drainage connection to be made with approved fittings.
- 4.6.4 Joint/cap an around the urinal sealed with waterproof sealant.

## **5.0 Protection:**

- 5.1.1 Installed sanitary ware will be suitably protected after inspection of installation.

## **5.2 Care & Maintenance**

- 5.2.1 To clean, simply apply a mild liquid detergent or non-abrasive cleaner with soft damp cloth rub gently, rinse and wipe dry.
- 5.2.2 To maintain the smooth and lustrous surface, or to remove marks, scratches, stains, or even burns, simply buff the area with non-abrasive metal polish.
- 5.2.3 Do not use abrasive cleaners or heavy duty scouring pads, nail polish remover, etc.

## **6.0 Safety:**

- 6.1 All safety precautions shall be followed as per established project safety plan and procedures.
- 6.2 Only experienced and skilled Technicians shall be engaged for carrying out sanitary wares installation work.
- 6.3 The people involved in the installation shall use PPE such as Safety Helmets, Safety Shoes, Gloves, etc. as required.

6.4 Safety Officer shall check and ensure that all safety precaution are allowed

**7.0 Attachment:**

7.1 Installation check list

## **DOMESTIC WATER PUMPS**

### **1.0 Scope**

- 1.1 This method statement applies to installation of Domestic Water Pumps as per Specification and manufacturer's instructions.

#### **Note**

A separate method statement will be submitted for Start-up and Commissioning of Domestic Water Pumps.

### **2.0 Purpose**

- 2.1 Purpose of this method statement is to outline the method of storage, handling and installation of Domestic Water Pumps, valve package and controls.

### **3.0 Material**

- 3.1 Transfer pump set.
- 3.2 Booster pump set.
- 3.3 Gate valves, NRV, pressure gauge on discharge manifold and piping accessories as per approved submittals.
- 3.4 Float switches for level control.
- 3.5 Pressure transducer and pressure switch for booster pumps and pressure switch for transfer pumps.
- 3.6 Pump foundation as per approved drawings.
- 3.7 Control Panel including protection starters and controller.
- 3.8 Pressure vessel.

### **4.0 Applicable Location**

- 4.1 Transfer pump set – Tower W2 Basement level & Tower E2 Basement level.
- 4.2 Booster pump set – All towers roof level.

**5.0 Method****5.1 Receiving**

- 5.1.1 When received at site, each pump, valves, control panels, flat switches shall be checked for quantities, Model Nos., physical damages etc. and notify supplier of any discrepancies for suitable rectification or replacement.
- 5.1.2 Valves shall be segregated as per sizes/models and stored on racks within a covered store.
- 5.1.3 Any items found damaged or not found suitable as per the project requirements shall be quarantined. Non-complaint material shall be clearly marked and stored separately to prevent any inadvertent use until returned to vendor.

**5.2 Storage**

- 5.2.1 Pump shall be stored on a flat surface in well ventilated storage area.
- 5.2.2 Inlet and outlet flange blanks shall not be removed until ready for connection to pipe work.
- 5.2.3 Manufacturer's instructions shall be strictly followed as applicable.
- 5.2.4 If the pumps are stored for longer periods the shaft shall be periodically rotated and lubricated, if required.
- 5.2.5 Storekeeper will be responsible for proper storage and maintenance of records, as required.

**5.3 Preparation**

- 5.3.1 The foundations designed to meet the vibration and sound control requirements shall be provided by Civil Contractor.
- 5.3.2 Check and ensure that the shop drawings used are latest and approved for construction.



- 5.3.3 ETA will co-ordinate the location of foundation as per approved shop drawings.
- 5.3.4 The foundation surface shall be flat and level and smoothly finished top surface.
- 5.3.5 Check the piping support locations and cable tray routing locations in co-ordination with pump and piping layout and ensure they are not obstruction the space around pump.
- 5.3.6 Ensure easy access and sufficient clearance for servicing and maintenance i.e. for replacement of pump, motor, pressure vessel.

#### **5.4 Installation Pump Set**

- 5.4.1 Mark the locations of the pump base frame and hole locations.
- 5.4.2 Drill the suitable size holes in the foundations.
- 5.4.3 The pump and the other associated accessories including the piping manifold are pre-assembled on a base frame. Shift the pumps to the place of installation in safe manner. Use hand trolley / folk-lift / crane as applicable / required as per site conditions.
- 5.4.4 Check and ensure free rotation of the shaft.
- 5.4.5 Position the pump frame assembly on the foundation and fix the anchor fasteners.
- 5.4.6 Water level the pump assembly by placing the shim plates below the base frame as required.
- 5.4.7 Position the pressure vessel and do the interconnecting pipe work as per approved drawings for the booster pump.
- 5.4.8 Ensure proper coupling guards are provided.
- 5.4.9 Complete the piping and valve package installation as per approved drawings. Remove the end caps fixed on the inlet flange.
- 5.4.10 Install the electrical control panel and power connections as per approved drawings.

5.4.11 Provide grounding wiring as per approved drawings/manufacturers instruction.

5.4.12 Follow the manufacturer's instructions while installing the pump.

5.4.13 After completion of the installation, the same shall be checked and certified by the supplier/manufacturer.

## **6.0 Inspection**

6.1 After completion and pump installation and piping connections, the same shall be checked and certified by the pump supplier.

6.2 Request for Inspection shall be raised for Consultants inspection.

## **7.0 Safety**

7.1 All safety precautions shall be followed as per established project safety plan and procedure.

7.2 Only experienced and skilled technicians shall be engaged for carrying out pump installation work.

7.3 The people involved in the installation shall use PPE such as safety helmets, safety shoes, harness, gloves, coverall, goggle, etc., as required.

7.4 Safety officer shall check and ensure that all safety precautions are followed.

7.5 Safety officer shall check and ensure that all scaffolding and ladders use at site are having duly signed tags.

## **8.0 References**

8.1 Manufacturer's instructions.

8.2 Approved domestic water pump submittal.

8.3 Approved shop drawings.

**9.0 Records**

- 9.1 Request for Inspection duly signed by the Consultant.
- 9.2 Pump installation checklist.
- 9.3 Installation certificate from Manufacturer / Local Representative.

**10.0 Attachment**

- 10.1. Installation check list reference

## **TESTING & COMMISSIONING OF DOMESTIC WATER PUMPS**

### **1.0 Scope**

The scope of this Method Statement is to define the method of Testing and Commissioning of Domestic Water Pumps installed, in accordance with the manufacturer's instructions attached.

### **2.0 Material**

Refer to Appendix 1 – Schedule of Domestic Water Pumps.

### **3.0 Test Equipment**

3.1 Digital Multimeter

3.2 Clamp Meter

#### **Note**

The calibration certificates of testing instruments shall be verified prior to usage and copies shall be included in the test reports.

### **4.0 Pre-commissioning checks prior to start-up**

#### **4.1 Mechanical**

- 4.1.1 Check and inspect the installation of Domestic Water Pumps is complete, verify the installation as per approved drawings.
- 4.1.2 Verify compliance to the attached manufacturer's installation instructions.
- 4.1.3 Obtain installation certification from manufacturer or their authorized representative.
- 4.1.4 Check and ensure adequate clearance available for service and maintenance of pumps and motors.
- 4.1.5 Check the installation is coordinated with other services.
- 4.1.6 Ensure the shipping bolts / chambers are removed.
- 4.1.7 Check all nuts, bolts, screws, fasteners etc., are fixed and tightened as required.

- 4.1.8 Ensure the piping is pressure tested. Verify test certificates.
- 4.1.9 Check all piping connections are complete at pumps, flow meter and pressure relief line including flexible connections where applicable.
- 4.1.10 Check and ensure the piping is flushed and cleaned.
- 4.1.11 Check the alignment is completed as per manufacturer's instructions.
- 4.1.12 Check and verify the water level in the water tank is full.
- 4.1.13 Check and ensure safety guards are in place and secure.
- 4.1.14 Adjust desired cut-in and cut off pressure as pre requirements.
- 4.1.15 Rotate the pump manually and ensure free and smooth rotation.
- 4.1.16 Ensure the pumps are cleaned prior to start up and all identification labels and tags are in place.

## **4.2 Electrical**

- 4.2.1 Check all power cabling and control wiring is completed and dressed neatly.
- 4.2.2 Check the power isolator is fixed close to the pump motor for emergency stop and power isolation, as per approved drawings/details.
- 4.2.3 Check all terminations are completed and tightened as required.
- 4.2.4 Check the grounding connections are completed and tightened as required.
- 4.2.5 Ensure the overload protections are set correctly as per the pump motor load current.
- 4.2.6 Ensure all identification tags and labeling works are complete.

## **5.0 Start-up and Testing**

- 5.1 Refer enclosed procedure.

## **6.0 Safety**

- 6.1 Only experienced and skilled personnel shall be engaged for start-up and commissioning of domestic water pumps.
- 6.2 Safety guards shall be in place and secured prior to start-up.

- 6.3 Cable test reports shall be verified prior to energisation.
- 6.4 Warning signs and tapes shall be placed during start-up and commissioning as required.
- 6.5 All safety procedures shall be followed in accordance with the project health and safety plan.
- 6.6 Safety Officer shall check and ensure all safety precautions are followed.

## **7.0 Records**

- 7.1 Inspection request (for Witness of start-up and commissioning) duly signed by Consultants
- 7.2 Signed-off pre-commissioning checklists
- 7.3 Commissioning reports (Refer attached format)
- 7.4 Calibration certificates of testing instruments

## **8.0 References**

- 8.1 Specification Sections
- 8.2 Manufacturer's start-up and commissioning instructions.
- 8.3 Approved Domestic Water Pump submittals / drawings.
- 8.4 Approved shop drawings.

## **9.0 Attachments**

- 9.1 Schedule of domestic water pumps
- 9.2 Pre-commissioning checklist
- 9.3 Manufacturer's instructions.

## Test Certificate for Domestic Water Pumps

S. No.	Activities / Items to be Inspected	Verification Sign of Engineer
1.	Check the make, model and type of the installed pump as per approved drawings and submittal.	
2.	Check the location of pumps as per approved drawings.	
3.	Ensure the method statement and test report formats are approved prior to testing and commissioning.	
4.	Check availability for access to all components for testing and commissioning.	
5.	Check shipping bolts/clamps are removed prior to start up.	
6.	Ensure alignment is checked and completed as per manufacturer's instructions.	
7.	Check the provisions for anti-vibration as per approved details and submittals.	
8.	Check all piping connections are complete including flexible connections as per approved details.	
9.	Check all nuts, bolts, screws etc, are secure and tightened as required.	
10.	Rotate the pump shaft manually and ensure it rotates freely.	
11.	Check the emergency manual start.	
12.	Check automatic start and stop.	

13.	Check auxiliary alarm contacts.	
14.	Check identification labels/tags are provided as per approved submittals/details.	
15.	Installation of pump/s certified by manufacturer or their authorised representative.	
16.	On initial start up check for correct direction of rotation.	
17.	Check for any unusual noise and vibration on start up.	
	<b><u>Electrical Checks prior to Start-up</u></b>	
18.	Check all cabling and control wiring is completed and tightened as required.	
19.	Check the provision of grounding as per approved drawings and details.	
20.	Check cables have been tested verify test reports prior to start-up.	
21.	Check the isolator is fixed close to pumps for emergency shutdown and maintenance, as per approved drawings.	
22.	Check the line voltage and phase rotations as per requirement prior to start up.	
23.	Ensure all identification works are complete.	
24.	Check the current drawn by pump motor is normal on initial startup	
25.	Record all test results on approved commissioning format.	



## Installation Check List for Water Heaters

Location / Area :		
S. No.	Activities / Items to be Inspected	Verification Sign of Engineer
1	Check the installed water heaters have approved submittals	
2	Check the location of water heaters as per approved drawings.	
3	Check make, type, size and capacity as per approved submittal and drawings.	
4	Check the water heater is installed straight and leveled properly.	
5	Check the water heater is provided with proper and adequate supports.	
6	Check valves are installed to facilitate isolation of equipment.	
7	Check provision of safety valve, thermostat, overheat protection as per approved drawings/submittals.	
8	Check the electrical connections including grounding are completed and tightened, as required.	
9	Adequate space available for inspection, maintenance and removal water heater/heating elements.	
10	Check and ensure the piping connected to the water heater is tested. Verify test certificates.	
11	Check and ensure identification is completed as per specifications and approved submittals.	

## Installation Check List for Sanitary Fixtures

S. No.	Activities / Items to be Inspected	Verification Sign	
		Engineer	QC
1	Ensure drawings used for installation are latest and approved.		
2	Check all fixtures are new and free from damages.		
3	Check the installation of sanitary ware fixtures as per approved drawings and manufacturer's instructions.		
4	Check the water supply line are connected as required and pressure tested.		
5	Check all drainage works are completed and pressure tested.		
6	Check adequate space is available for fixtures and accessories.		
7	Check the installation of fixture is coordinated with architectural details and other MEP services.		
8	Ensure all fixtures are cleaned.		