

SL NO	Item description	Unit	RECOMMENDED BASE RATES (In Rs.)
	<b>Cast Iron (CI) Ball Valve, 311 type, of 75 mm diameter, pressure rating PN 1.6, ISI marked, conforming to relevant IS standards (such as IS:9890 or as applicable), with cast iron body, stainless steel ball and spindle, PTFE seats, flanged ends as per IS:1538, with suitable operating lever or gearbox, including epoxy coating (internal and external), nuts, bolts, gaskets, washers, and all accessories; complete</b>		0
12.7	50 mm dia	Each	6875
12.8	65 mm dia	Each	13525
12.9	80 mm dia	Each	16838
12.10	100 mm dia	Each	28875
	<b>ISI-marked Butterfly Valves, of specified diameter and pressure rating (PN-1.0 / PN-1.6), suitable for clear water supply system, wafer/lug type, with cast iron , EPDM or Nitrile rubber-lined seat, stainless steel disc and shaft, conforming to IS:13095–1991, with lever or gear operated arrangement,</b>		0
12.11	50 mm dia	Each	3201
12.12	65 mm dia	Each	3573
12.13	80 mm dia	Each	3303
12.14	100 mm dia	Each	4362
12.15	125 mm dia	Each	5921

SL NO	Item description	Unit	RECOMMENDED BASE RATES (In Rs.)
12.16	150 mm dia	Each	7714
	<b>Brass Gate Valve, ISI marked, of specified diameter and pressure rating, conforming to IS:778-1984 (or latest revision), non-rising spindle type, with screwed ends or flanged ends as specified, suitable for potable water applications including rubber gaskets, bolts, nuts, washers, cost of all materials, machining, protective coatings,. The valve body and components shall be manufactured from high-quality forged or cast brass as per applicable IS standards, complete with hand wheel, gland packing, and other operational accessories.</b>		0
12.17	50 mm dia	Each	7364
12.18	65 mm dia	Each	11366
12.19	80 mm dia	Each	16850
12.20	100 mm dia	Each	31806
12.21	150 mm dia	Each	105832
12.22	<b>HDG(Hot Dipped Galvanised) Galvanized Iron (GI)HIGH TENSILE GRADE 8.8 Nuts, Bolts AND Washer with matching GI plain washers of size(M16x50 mm,M20x65 mm,etc), fully threaded or as required for use in fixing MS Staging Bracings, columns, flanged valves, specials, and pipe fittings, with adequate corrosion resistance</b>	Per kg	190





JEEVAN MISSION

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PART

D

## 13. Annexure

### 13.1 Mandatory Safety Measures to be undertaken during repair & replacement

  
**Govt. Of Assam**  
**Office of the Chief Engineer, PHE, Water, Assam**  
**Hengrabari, Guwahati-36**


No. PHE-2164/TB/2021-22 **16384** Date: **10/10/23**

To,  The Executive Engineer (PHE) cum District Mission Director (DMD)  
All PHE Division

**Sub:** - Regarding work place safety and related precautionary measures  
**Ref:** - This office letter No. PHE-2164 / TB / 2021-22 / 7695 Dtd. 12.06.2023

In continuation to this office letter mentioned under reference and the subject cited above, please find herewith a SOP cum Advisory regarding some important safety and precautionary measures to be taken while working in a confined space or at height to avoid any untoward incidents. You are hereby requested to take immediate necessary action for strict compliance of the same by all contractors and field officials / workers engaged in execution of such type of works in your Division. If required, arrange orientation sessions to sensitize them about the importance of compliance of such safety / precautionary measures for the well-being of their and other's lives.


This is for favour your kind information and necessary action.

  
Chief Engineer (PHE) Water, Assam cum  
Add. Mission Director (T), JJM Assam  
Hengerabari, Guwahati - 36

Memo No. PHE-2164/TB/2021-22 Dated:

Copy to:

1. The Mission Director, JJM, Assam for favour of kind information.
2. The Deputy Commissioner cum Chairman DWSM, All District for favour of kind information.
3. The Additional Chief Engineer (All), All Zones for information and necessary action.
4. The Superintending Engineer (All), All Circles for information and necessary action.
5. The P.S. to Addl. Chief Secretary to the Govt. of Assam, PHED for kind appraisal of the Addl. Chief Secretary.

  
Chief Engineer (PHE) Water, Assam cum  
Addl. Mission Director (T), JJM Assam  
Hengerabari, Guwahati - 36

## Work Place Safety and Precautionary Measures

### A. Working in a Confined Space

A confined space is an enclosed area with limited entry and egress and not suitable for human inhabitants. An example is the interior of an underground storage tank where workers enter only during execution or later on for other maintenance works. Confined spaces are significantly more hazardous than normal workplaces, when such spaces are left abandoned for a period of time there starts accumulation of some poisonous gases.

#### Hazards in a confined space

These gases often include harmful, toxic and flammable gases or dust, that could suffocate a person and can be fatal in extreme cases. The gases present is mostly Carbon Dioxide and in some cases Methane, Hydrogen Sulphide, Carbon Monoxide, Nitrogen etc. may also be present. These gases are colourless and some of them namely, Hydrogen Sulphide have foul ("rotten egg" like) smell and are highly inflammable.

Carbon dioxide, Hydrogen sulphide is heavier than air and may accumulate in low-lying and enclosed, poorly-ventilated areas such as basements, manholes, underground tanks etc. While other gases like Methan, Carbon Monoxide though slightly lighter than air or oxygen but in high concentrations these can displace oxygen in the air, making it difficult for a person to breathe.

Air contains 21 percent oxygen and is necessary to sustain life. But in lower concentration of oxygen in air a person will experience respiratory issues, headache and dizziness, nausea, vomiting, loss of consciousness, and even death within 3 minutes in extreme cases.

**Before getting into a confined space, it is important to take several precautions to ensure one's safety. Here are some important steps:**

- 1. Ensure Sufficient Ventilation:** It is necessary to ventilate the space before entering to remove harmful gases or poor air quality. Keep the man hole cover open for minimum 3 to 4 hours before entering. Ventilation can be achieved by using blowers, fans, or natural airflow to exchange air and reduce gas concentrations. Ensure proper ventilation is established and maintained throughout the duration of the entry and operation.

2. **Secure the Area:** Establish a safe work zone around the space to prevent unauthorized access. Keep a **warning sign near the entry** to avoid entering into the space without proper safety measures and as far as possible secure the area to prevent unauthorised access near the space.
3. **Use of ladder:** Always use a ladder placed firmly and securely to get down so that in case of casualty one can evacuate the space as early as possible
4. **Have a Safety Attendant:** It is highly recommended to have a safety attendant present outside the space during the operation. The safety attendant should be equipped with communication devices and be prepared to initiate rescue procedures if needed. **Maintaining a communication with attendants is necessary to enable him to monitor the entrant's status and alert the entrant to evacuate when necessary.**

#### **B. Working at Height or elevated place**

Working at heights presents a unique set of challenges and hazards. In construction, maintenance, where tasks are often performed several feet off the ground, the risk of serious accidents and injuries can be high. So, understanding and mitigating these risks is crucial for maintaining a safe working environment.

#### **Working at Height Hazards**

Working at heights can have numerous risks; therefore, it is important to identify such hazards and take appropriate control measures.

Falls from heights is among the most common causes of fatalities and serious workplace injuries, particularly in construction industry. The circumstances of falls can vary widely such as falling off ladders, scaffolding, roofs, or other elevated work platforms and areas. A fall from a relatively low elevation can even result in serious injuries.

Falling objects or objects dislodged that fall during tasks pose a significant risk to those working at height and people working or passing below. When an object falls from a height it gains considerable speed and momentum, leading to severe injuries or fatalities upon impact.

#### **Common causes:**

Some of the common causes for occurrence of accidents while working at height are stated below,

**1. Scaffolding Collapse:** Scaffolding can collapse when poorly constructed, inadequately maintained, or overloaded, leading to serious injuries or fatalities.

**2. Inadequate Edge Protection:** Edge protection is critical when working at heights, especially near the edges of roofs, platforms, and other elevated work surfaces. Workers might be at risk of falling off the edge, or materials and tools might be knocked off, posing a risk to workers below.

**3. Poor Weather Conditions:** Working at heights becomes particularly hazardous during poor weather conditions. Rain, snow, or ice can make surfaces slippery, while wind can cause instability. Severe hot and cold temperatures can also pose health risks to workers.

**4. Lack of Personal Protective Equipment (PPE):** A worker might fall from an elevated surface if he is not using a **proper harness**. They could also slip and fall if they're not wearing appropriate **non-slip footwear**.

**5. Physical health of workers:** The health condition of workers working at an elevated place is also crucial and they should be physically fit.

### Control Measures

Some control measures for preventing occurrence of any untoward incident while working at a height are,

**1. Guardrails:** Proper guardrails provide a physical barrier that prevents workers from falling from edge of roofs, platforms etc.

**2. Regular Inspections:** Frequent and thorough inspections of working conditions to identify potential hazards before they cause accidents or lead to failure is very crucial. This includes checking for loose materials, wear and tear, structural issues, or stability of working surface.

**3. Weather Condition:** Monitoring and responding to weather conditions is crucial. If surfaces become too dangerous due to rain, snow, or ice, it may be necessary to postpone work until conditions improve.

**4. Maintenance and Repair:** Damaged or defective components should be replaced immediately. Regular maintenance is crucial to ensuring the long-term stability of the scaffold structure.

**5. Proper Foundations:** Scaffolding should always be erected on solid, stable ground.

**6. Safety Briefings:** Conduct a safety briefing before beginning a task at height to remind workers of the hazards and safety measures. ✦

**C. Persons engaged for entering into confined spaces or working at height** should be physically fit and capable of responding quickly to safeguard himself from the eventualities that might happen. Those with the undernoted disabilities shall not be allowed for these types of works:

- a) A history of fits, blackouts or fainting attacks, epilepsy
- b) A history of heart disease or disorder and high blood pressure
- c) Asthma, bronchitis or a shortness of breath on exertion
- d) Person having fear of confined spaces or fear of heights or mental disorder
- e) Back pain or joint trouble, deformity or disease of the lower limbs that would limit mobility

**D. Do's and Don'ts at Construction Site:**

Some Do's and Don'ts at Construction Site, which are to be followed strictly mentioned below,

**Do:**

- Keep a well-stocked first aid kit on-site.
- Administer basic first aid properly while waiting for medical help.
- Remove the person to fresh air as soon as possible in case of casualties while working in a confined space
- Keep the person lying down and wait for an ambulance.
- Call for professional medical help immediately when needed.

**Don't:**

- Attempt to move seriously injured individuals.
- Neglect to report incidents, even minor ones.
- Disregard proper safety protocols.
- Perform tasks one is not trained for.

**GOVERNMENT OF ASSAM  
OFFICE OF THE CHIEF ENGINEER (PHE) WATER, ASSAM  
HENGRABARI, GUWAHATI – 781036.**

No. PHE-2164/TB/2021-22/

7655

Date: 12/06/23

To,


The Executive Engineer (PHE),  
All Divisions.

Sub- Compliance of safety measures in the working sites.

In view of the safety and security of the public/commuters in general as well as the departmental working personnel, it is hereby directed to issue written instructions to the contractors and field officials to maintain all safety measures during the construction works carried out under JJM. All the contractors and the concerned field officials may be alerted for strict compliance of the following points to ensure that no accident occurs due to negligence in safety and security measures during execution of works-

1. In case of failed boring for DTW, the boreholes should immediately be backfilled with soil to avoid any accident due to open borehole. In case, the plot of land needs to be changed due to failure of DTW, the mud pits, drains etc. excavated for the failed DTW must be filled up.
2. The open trenches along/across the road before/after execution of distribution pipeline, valve chamber, road crossing works, etc. should be properly guarded otherwise it may lead to any road accident. All unused holes in the construction sites should be filled up immediately.
3. Proper arrangement of barricading / warning signage with radium reflector etc. in all digging sites/uncovered drains etc. near to roads/ diversions etc. wherever required.
4. At the time of removing of scaffolding/plastering the inside of the UGR/cleaning of the UGR, sufficient ventilation should be ensured to avoid suffocation.
5. All the ladders inside the scheme should ensure provision of hand rails. Also, the area where the transformer is installed should be well barricaded.
6. All the labourers working with bentonite clays should use face masks. Also, at the time of chlorine dosing, necessary protection measures should be adopted by the Jal Mitras.
7. All completed schemes should have a signboard reading "Protected Area". In no case, small children should be allowed to enter the scheme.

This is for your information and necessary action.

  
Chief Engineer (PHE), Water, Assam,  
Hengrabari, Guwahati-36.


Memo No. 2164/TB/2021-22/

7696-700

Date: 12/06/23

Copy to:-

- 1) The MD, JJM, Assam, Hengrabari for favour of kind information.
- 2) The Deputy Commissioners, All Districts for kind information and necessary action.
- 3) The ACE(PHE), All Zones for information and necessary action.
- 4) The SE(PHE), All Circles for information and necessary action.
- 5) The P.S. to the Additional Chief Secretary to the Govt. of Assam, Public Health Engineering Department, Dispur, Guwahati-781006 for kind appraisal of the Addl. Chief Secretary.

  
Chief Engineer (PHE), Water, Assam  
Hengrabari, Guwahati-36.

## 13.2 Do's and Don'ts for Jal Mitra

### Do's

- Ensure daily upload of Bulk Flow Meter reading on Jal Mitra app.
- Check if the voltmeter reading is between 380 to 440 Volts before switching on the pump motor.
- Ensure the valve is open in the delivery pipeline before starting the pump.
- Keep the pump house clean and dry.
- Set fixed water delivery times in the morning and afternoon. (The time should be displayed in the scheme premises)
- Ensure sufficient pressure and residual chlorine at endpoint (last FHTC).
- Backwash the filter bed regularly when the filtration rate drops.
- Keep the scheme campus neat and clean and plant flowers/trees.
- Inspect the distribution pipe network weekly.
- Keep the valve chamber clean, dry, and covered.
- Request the Water User Committee to hold monthly meetings.
- Collect water tariff from all FHTC-covered households.
- Request the 5 Women FTK group to conduct FTK test from 5 HHs/Points before 5th of every month. Also, ensure water sample is sent for testing in DLL/SDLL quarterly.

### Don'ts

- Don't allow visitors to enter the pump house or campus or go near the source (DTW or other) without permission.
- Don't touch the panel board with wet hands or bare feet.
- Don't leave the pump house unattended while the motor is running.
- Don't operate the panel board during thunderstorms, heavy rain, voltage fluctuation, or electrical issues.
- Don't litter or allow algae growth on the filter bed or aeration tray.
- Don't leave the transformer site unprotected without fencing.
- Don't try to fix faults with transformer. Contact WUC/SO/APDCL/Concerned official.
- Don't let water overflow from filters, UGR, or ESR.
- Don't leave manhole covers in UGR open unless opened for cleaning periodically.
- Don't leave the scheme campus without locking the main gate.
- Don't allow any authority to dig the roadside berm where water supply distribution pipeline exists without consulting the SO concerned.
- Don't alter or renovate electro-mechanical parts without consultation with the SO concerned.
- Don't let the wastewater flow directly to the drain or paddy field etc.
- Drain it to a soak pit inside the campus.
- Don't disturb the filter bed with bamboo or sticks during backwash.



## 13.3 Preventive Maintenance Schedule & Checklist

### Pump & Motor set

#### Monthly

Activity	Check (Tick if complete)
Tighten the gland stuffing box and check gland packing	
Apply oil to the gland bolts	
Inspect mechanical seal for wear	
Tighten Foundation bolts	
Check condition of bearing	
Tighten electrical connections incl earthing	

#### Quarterly

Activity	Check (Tick if complete)
Realignment of pump and drive (both shall be decoupled) (pump and motor shafts should be pushed to either side)	
Replenish clean oil or grease to lubricate bearings (Anti friction bearing should have one third to half of its housing as void space to avoid overheating)	
Replace oil or grease in the bearing housing	
Check condition of gland packing and replace	
Tighten cable gland, lugs and connecting bolts	
Tighten foundation bolts	
Inspect for leaks	
Greasing, Lubrication and Replenish Oil	
Clean flow indicators and other instruments/ appurtenances	

*Note: Monthly activities shall be undertaken during quarterly maintenance also.*

#### Annually

Activity	Check (Tick if complete)
Overhauling, if due	
Performance test before Summer	
Clean bearing and lubricate, replace	
Clean bearing housing examine for flaws, e.g. wear, grooving etc.	
Examine shaft sleeves for wear or scour and necessary rectification. If shaft sleeves are not used, shaft at gland packing's should be examined for wear.	
Calibration of all vital instruments i.e. pressure gauge, vacuum gauge, ammeter, voltmeter, Wattmeter, frequency meter, tachometer, flow meter, etc.	
Conduct performance test of the pump for discharge, head efficiency, pressures and power	
Examine earth connections and motor leads	
Restore running clearances through original specifications (adjust ring clearances or install new wear rings)	
Replace the impeller in case of corrosion or excessive wear	
Clean winding, bake and varnish	

*Note: Quarterly activities shall be undertaken during annual maintenance also.*

#### Overhauling of the set

Activity	Check (Tick if complete)
Restoring clearances (incl. clearance between impeller-casing rings, impeller-plates)	
Replacing worn-out/ damaged parts such as impeller, wear rings/ plates, o-rings and packings, drive shaft.	
Cleaning and lubricating bearings	
Replacing corroded parts	
Removal of scaling and leaks	
Recalibration of gauges and instruments	
Testing of reassembled pumps	

## Panels, Circuit Breakers, Starters

### Monthly

Activity	Check (Tick if complete)
Blow the dust and clean internal components in the panel, breaker	
Tighten all connections of cable, wires, jumpers and busbars. All carbon deposits shall be cleaned.	
Adjust relay setting.	
Test spring charging mechanism and manual cranking arrangement.	
Clean all exposed insulators.	
Test functioning of trip circuit and alarm circuit.	
Conduct test for opening & closing timing of breaker.	
Check contact resistance between male & female contacts	

### Quarterly

Activity	Check (Tick if complete)
Clean with smooth polish paper all the fixed and moving contacts	
Replace the oil in oil tank	
Check insulation resistances.	
Check conditions of insulators and replace if necessary	
Tighten all connections in marshalling boxes of breakers and transformer.	
Oil top up in MOCB/LOCB/HT OCB.	
Measure contact resistance and check male & female contacts for any pitting	
Check dielectric strength of oil and replace (HT)	

*Note: Monthly activities shall be undertaken during quarterly maintenance also.*

### Annually

Activity	Check (Tick if complete)
Carry out servicing of all components, thoroughly clean and reassemble.	
Calibrate voltmeter, ammeter, frequency meter etc.	
Replace oil in breaker. (HT)	
Testing of protection relay with D.C. injection.	
Servicing of HT breaker and contactor	

*Note: Quarterly activities shall be undertaken during annual maintenance also.*



## Transformer & Substation

### Monthly

Activity	Check (Tick if complete)
Repair leakages through CT/PT unit, transformer tank and HT/LT bushings.	
Change the silica gel (if pink in colour)	
Top up oil level in transformer tank	
Tighten all connections (relay contacts, cable termination) in marshalling box etc.	
Test AB switch and DO fuse assembly.	
Clean radiators free from dust and scales.	
Pour 3-4 buckets (6 to 8 buckets in summer) of water in earth pit	
Inspect lightning arrestor and HT/LT bushing for cracks and dirt.	

### Quarterly

Activity	Check (Tick if complete)
Change or filter transformer oil in case of dielectric strength is not as desired.	
Check insulation resistance of all equipment's in sub-station, continuity of earthlings and earth leads.	
Test tap changing switch.	
Change or filter oil in CT/PT if dielectric strength is not in desired.	
Tighten contact faces of AB switch and DO/HG fuse; apply petroleum jelly or grease to moving components of AB switch.	

*Note: Monthly activities shall be undertaken during quarterly maintenance also.*

### Annually

Activity	Check (Tick if complete)
Replace Oil after monsoon	
Measure resistance of earth pit. Resistance shall not exceed 1 ohm.	
Tighten bus bar connections, clean contact faces, change rusted nut bolts.	
Calibrate the protection relay for functioning. Correct relay setting if necessary.	
Earth filling and metal spreading to remove water logging	
Test transformer oil for acidity test.	
Check drainage arrangement to prevent water logging	

*Note: Quarterly activities shall be undertaken during annual maintenance also.*

### Long term

Activity	Frequency	Check (Tick if complete)
Painting transformer & steel structure	2 years	
The core of transformer and winding replacement after 5 years for transformer up to 3000 kVA and after 7–10 years for transformers of higher capacity.	5 years	

## Filter Plant & Headwork

### Monthly

Activity	Component	Check (Tick if complete)
Calibrate optimum dosage of coagulant (based on laboratory analysis)	Inlet channel	
Lubricating & oiling all motors & gearbox	Alum dosing	
Clean all electric connections	All units	
Repairing leaks (pressure grouting in civil structures)	All units	
Greasing/ Lubrication of all moving parts of bridge	Clariflocculator	
Repairing leaks in chemical feeder, dosing plumbing, air blower pipes	All units	

### Quarterly

Activity	Component	Check (Tick if complete)
Lubrication and oiling of motors	All units	
Lubricate bearing and gear trains	Alum dosing	
Cleaning all electromechanical components	All units	
Valve/Gate Lubrication and servicing	All units	
Lubrication, oiling, greasing and servicing of backwash pump	Filter gallery	
Cleaning of alum, PAC, chlorine storage rooms	Chemical storage	
Calibrate all dosing equipment	All chemical dosing units	
Replace corroded parts (level indicators, metal parts, ladders etc)	All units	
All signages (repairs, replacement if damaged)	All units	
Replenish safety kits	Chlorine room	
Mock drill	Filter plant	

*Note: Monthly activities shall be undertaken during quarterly maintenance also.*

### Half yearly

Activity	Component	Check (Tick if complete)
Replace lost filter media (as per schedule B)	All units	
Servicing chlorine lifting device	Alum dosing	
Cleaning of reservoirs	All units	

### Annually

Activity	Component	Check (Tick if complete)
Calibration of flow measuring devices, weighing machine, gauges	All units	
Servicing and checking of the valves/ gates	Alum dosing	
Cleaning, plastering and coating of mixing tanks	Flash mixer	
Realignment of the traction wheels of the moving bridge	Clariflocculator	
Replace rubber wheels	Clariflocculator	
Repairing leaks in all pipes, channels, laterals	All units	
Painting all metallic components (valves, handrails, pipes, ladders etc)	All units	

*Note: Quarterly activities shall be undertaken during annual maintenance also.*

### Long term

Activity	Frequency	Check (Tick if complete)
Painting civil structures (external & internal), fixtures (window, doors etc)	2 years	
Repairs and corrective actions for all non-functional components	2 years	

