



**DEDER GENERAL HOSPITAL**




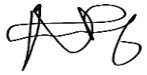
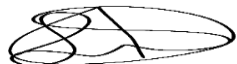


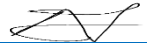
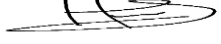








**GENERAL SERVICE EQUIPMENT  
MAINTENANCE PROTOCOL**

**BY: HSQU**

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***Deder, Eastern Ethiopia***

SMT APPROVAL SHEET

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## 1. Introduction

Deder General Hospital provides essential healthcare services to the community and operates a complex facility that includes inpatient wards, outpatient departments, specialized units, and support services. The proper functioning of all **infrastructure, utility systems, and hospital equipment** is critical for ensuring uninterrupted patient care, safety, and comfort.

Hospital facilities and equipment are subjected to frequent use, environmental factors, and wear-and-tear. Poorly maintained infrastructure can lead to operational disruptions, compromised patient safety, increased risk of accidents, and inefficient service delivery. To address these challenges, this **General Maintenance Protocol** establishes clear guidelines for maintaining **electrical, water, sanitation, sewerage, ventilation systems, hospital equipment, and building and compound structures**.

Maintenance is a continuous process that includes **preventive, corrective, predictive, and emergency interventions**, ensuring that all systems are functional, safe, and reliable. This protocol provides a structured framework for the **planning, implementation, monitoring, and documentation** of maintenance activities across the hospital.

## 2. Purpose

The purpose of this protocol is to:

### 1. Ensure Safety and Reliability:

- ✍ Maintain all hospital infrastructure, equipment, and utilities in safe and operational condition.
- ✍ Reduce the risk of accidents, equipment failures, and service interruptions.

## 2. **Provide Structured Maintenance Guidance:**

- ✍ Standardize procedures for preventive, corrective, predictive, and emergency maintenance.
- ✍ Assign clear responsibilities to maintenance personnel, support staff, and contractors.

## 3. **Enhance Hospital Efficiency:**

- ✍ Reduce downtime of critical systems and equipment.
- ✍ Optimize resource utilization through timely inspections, repairs, and replacements.

## 4. **Facilitate Compliance and Accountability:**

- ✍ Ensure adherence to national safety, hygiene, and regulatory standards.
- ✍ Establish clear reporting, monitoring, and documentation practices.

## 5. **Support Long-Term Asset Management:**

- ✍ Extend the life of hospital infrastructure and equipment.
- ✍ Plan for future replacements, upgrades, and capital maintenance efficiently.

## 3. **Scope**

This protocol applies to **all hospital facilities, utility systems, equipment, and structural components** at Deder General Hospital. The scope includes:

### 1. **Maintenance Coverage:**

- ✍ **Electrical Systems:** Wiring, sockets, switches, panels, lighting, generators, UPS, and emergency backup systems.
- ✍ **Water Supply Systems:** Boreholes, pumps, tanks, pipelines, valves, and taps.
- ✍ **Sanitation & Hygiene Facilities:** Toilets, showers, handwashing stations, wash basins, and related fixtures.

- ✎ **Sewerage & Wastewater Systems:** Sewer lines, septic tanks, soak pits, manholes, and drainage channels.
- ✎ **Ventilation & Air Circulation Systems:** Windows, vents, ceiling fans, exhaust fans, AC units, and ducting.
- ✎ **Hospital Equipment (Non-Biomedical):** Beds, stretchers, trolleys, wheelchairs, sterilizers, oxygen cylinders, and movable hospital furniture.
- ✎ **Building and Compound Structures:** Walls, floors, ceilings, roofs, doors, windows, walkways, parking areas, perimeter fencing, and green areas.

## 2. Types of Maintenance Included:

- ✎ **Preventive Maintenance:** Scheduled inspections, cleaning, and servicing to avoid system failures.
- ✎ **Corrective Maintenance:** Immediate repairs for faults or damage.
- ✎ **Predictive Maintenance:** Monitoring system performance to anticipate and prevent failures.
- ✎ **Emergency Maintenance:** Rapid response to restore critical hospital functions.

## 3. Personnel Covered:

- ✎ **Internal Maintenance Staff:** Maintenance Head, Electrician, Plumber, Carpenters & Masons, and Support Staff.
- ✎ **External Contractors:** Specialized service providers engaged for tasks beyond internal capacity, including roofing, major painting, AC servicing, and septic tank desludging.

## 4. Operational Boundaries:

- ✎ Applies to all inpatient, outpatient, administrative, and support service areas.
- ✎ Includes both indoor and outdoor maintenance activities within the hospital compound.
- ✎ Excludes biomedical equipment maintenance (covered under separate protocols).

## 4. General Principles

- ✂ **Safety:** Maintenance activities must only be performed by trained and authorized personnel.
- ✂ **Preventive Priority:** Preventive and predictive maintenance are prioritized over corrective maintenance.
- ✂ **Documentation:** All maintenance activities must be recorded and reported.
- ✂ **Accountability:** Clear roles and responsibilities are defined for all maintenance staff.
- ✂ **Emergency Response:** Urgent faults affecting patient care must be addressed immediately.
- ✂ **Quality:** All work must comply with hospital safety, hygiene, and regulatory standards.

## 5. Types of Maintenance

1. **Preventive Maintenance (PM):** Scheduled inspections, cleaning, and servicing to prevent faults.
2. **Corrective Maintenance (CM):** Repairs conducted after a fault or breakdown occurs.
3. **Predictive Maintenance (PdM):** Monitoring system performance to anticipate issues.
4. **Emergency Maintenance (EM):** Immediate interventions to restore critical services.

## 6. Maintenance Components and Protocols

### 6.1 Electrical Systems

#### Components:

- Wiring, sockets, switches, lighting, distribution panels, circuit breakers, generators, UPS, emergency backup systems, and hospital-specific electrical equipment.

#### Maintenance Types and Procedures:

##### 1. Preventive Maintenance:

- ✍ Conduct daily inspections of lighting, switches, and sockets for visible damage.
- ✍ Test generators and UPS units weekly to ensure readiness.
- ✍ Verify grounding systems and circuit breakers for functionality.
- ✍ Inspect electrical panels monthly for overheating or corrosion.

##### 2. Corrective Maintenance:

- ✍ Repair damaged wiring, faulty sockets, or malfunctioning switches immediately.
- ✍ Replace blown fuses or damaged circuit breakers.
- ✍ Restore power during minor outages caused by internal faults.

##### 3. Predictive Maintenance:

- ✍ Monitor voltage fluctuations and load distribution using testing tools.
- ✍ Assess insulation resistance, and identify weak points to prevent future failures.
- ✍ Recommend upgrades or replacements for aging components.



#### 4. **Emergency Maintenance:**

- ✍ Respond immediately to critical failures affecting operating rooms, ICU, or emergency units.
- ✍ Coordinate with hospital management to safely shut down or reroute power.

**Responsible Personnel:** Electrician under supervision of Maintenance Head.

### 6.2 Water Supply Systems

#### **Components:**

- Boreholes, pumps, overhead tanks, pipelines, valves, taps, and water distribution networks.

#### **Maintenance Types and Procedures:**

##### 1. **Preventive Maintenance:**

- ✍ Inspect pipelines and pumps weekly for leaks or abnormal noises.
- ✍ Flush overhead tanks monthly to remove sediment and prevent contamination.
- ✍ Test water quality at intake points regularly.

##### 2. **Corrective Maintenance:**

- ✍ Repair leaks, damaged pipelines, or malfunctioning pumps immediately.
- ✍ Replace worn-out valves and taps to ensure uninterrupted water flow.

##### 3. **Predictive Maintenance:**

- ✍ Monitor pump performance, water pressure, and tank levels to forecast potential failures.
- ✍ Recommend upgrades or replacements for worn-out pumps or pipelines.

##### 4. **Emergency Maintenance:**

- ✍ Address sudden water shortages or pipeline bursts to prevent disruption in patient care.
- ✍ Coordinate with contractors for immediate remedial action if required.

**Responsible Personnel:** Plumber under supervision of Maintenance Head.

### 6.3 Sanitation & Hygiene Facilities

#### Components:

- Toilets, wash basins, showers, handwashing stations, drainage points.

#### Maintenance Types and Procedures:

##### 1. Preventive Maintenance:

- ✍ Inspect all sanitation facilities weekly to check for leaks, blockages, and water flow.
- ✍ Clean and disinfect toilets, sinks, and showers regularly to maintain hygiene.
- ✍ Ensure proper operation of taps and flush mechanisms.

##### 2. Corrective Maintenance:

- ✍ Unblock clogged drains and toilets promptly.
- ✍ Repair leaking taps, flush systems, and broken basins.
- ✍ Replace worn-out plumbing components.

##### 3. Predictive Maintenance:

- ✍ Monitor usage trends to identify high-risk areas prone to failure.
- ✍ Recommend system improvements such as pipe replacements or additional fixtures.

##### 4. Emergency Maintenance:

- ✍ Respond immediately to sudden overflows, sewage backflow, or facility breakdowns.
- ✍ Coordinate with hospital cleaning teams to ensure minimal disruption.

**Responsible Personnel:** Plumber + Cleaning Supervisor under Maintenance Head oversight.

## 6.4 Sewerage & Wastewater Systems

### Components:

- Sewer lines, septic tanks, soak pits, manholes, drainage systems.

### Maintenance Types and Procedures:

#### 1. Preventive Maintenance:

- ✍ Inspect sewer lines and manholes monthly for blockages or damage.
- ✍ Clean septic tanks and soak pits quarterly to prevent overflow.
- ✍ Check drainage systems to ensure smooth wastewater flow.

#### 2. Corrective Maintenance:

- ✍ Repair damaged sewer pipes or blocked lines immediately.
- ✍ Rebuild or reinforce weakened manholes or drainage channels.

#### 3. Predictive Maintenance:

- ✍ Monitor sludge levels and wastewater flow to anticipate potential issues.
- ✍ Recommend system upgrades for aging or inefficient sections.

#### 4. Emergency Maintenance:

- ✍ Respond to sewer overflows, blockages, or leaks that pose health risks.
- ✍ Engage contractors if specialized intervention is needed.

**Responsible Personnel:** Plumber + External Contractor (as needed) under supervision of Maintenance Head.

## 6.5 Ventilation & Air Circulation Systems

### Components:

- Windows, vents, ceiling fans, exhaust fans, AC units, ducting, and air filters.

### Maintenance Types and Procedures:

#### 1. Preventive Maintenance:

##### 2. Clean vents, fans, and AC filters monthly.

- ✍ Ensure all windows and ventilation openings function properly.
- ✍ Inspect ducting and air circulation paths quarterly.

#### 3. Corrective Maintenance:

- ✍ Repair broken fans, vents, or AC units as needed.
- ✍ Replace damaged filters or malfunctioning parts.

#### 4. Predictive Maintenance:

- ✍ Monitor airflow and indoor air quality to detect potential inefficiencies.
- ✍ Recommend adjustments or upgrades for AC units or ventilation systems.

#### 5. Emergency Maintenance:

- ✍ Respond immediately to failures affecting patient care areas, ICU, OR, or wards.
- ✍ Ensure emergency ventilation or temporary air circulation is available.

**Responsible Personnel:** Electrician + Support Staff under Maintenance Head oversight.

## 6.6 Hospital Equipment (Non-Biomedical)

### Components:

- Movable trolleys, carts, racks, cabinets, office furniture, kitchen equipment (non-patient food storage), ladders, step stools, tool trolleys, and other non-clinical movable hospital equipment.

### Maintenance Types and Procedures:

#### 1. Preventive Maintenance:

- ✎ Inspect movable equipment for structural integrity and mechanical operation.
- ✎ Lubricate wheels, hinges, drawer slides, and other moving parts.
- ✎ Tighten loose screws, bolts, and fasteners.
- ✎ Clean surfaces to remove dust, dirt, or debris.
- ✎ Ensure proper alignment and stability of cabinets, racks, and furniture.
- ✎ Check electrical cords and plugs on non-clinical electrical equipment for damage.
- ✎ Document inspections, cleaning, and minor repairs.

#### 2. Corrective Maintenance:

- ✎ Repair broken or malfunctioning equipment promptly.
- ✎ Replace worn-out or damaged parts to maintain functionality.
- ✎ Restore structural stability for furniture, racks, or movable equipment.

#### 3. Predictive Maintenance:

- ✎ Monitor condition of equipment to anticipate potential failures.
- ✎ Maintain an inventory of spare parts for prompt replacements.
- ✎ Recommend upgrades or replacement of aging equipment before breakdown.

#### 4. **Emergency Maintenance:**

- ✍ Replace critical equipment immediately in case of sudden failure affecting hospital operations.
- ✍ Coordinate rapid response to ensure continuity of non-clinical services.

**Responsible Personnel:** Maintenance Head + Compound and Building Maintenance Technicians

##### 6.7.1. **Water Boilers (Non-Biomedical)**

##### **Components:**

- Electric/gas water boiler units, heating elements, water tanks, safety valves, thermostats, pipelines, insulation.

##### **Maintenance Types and Procedures:**

##### 1. **Preventive Maintenance:**

- ✍ Clean and descale boiler tanks regularly to prevent scaling and mineral buildup.
- ✍ Inspect heating elements for wear, corrosion, or burnout.
- ✍ Check and test safety valves, thermostats, and pressure gauges.
- ✍ Ensure insulation around tanks and pipes is intact.
- ✍ Flush the system periodically to maintain water quality.

##### 2. **Corrective Maintenance:**

- ✍ Repair or replace faulty heating elements, valves, or thermostats.
- ✍ Fix leaks in tanks, pipelines, or joints immediately.
- ✍ Replace damaged insulation materials.

### 3. Predictive Maintenance:

- ✍ Monitor boiler performance through temperature and pressure readings.
- ✍ Use scaling indicators or water hardness levels to predict descaling needs.
- ✍ Plan for replacement of heating elements or tanks based on usage hours and condition.

### 4. Emergency Maintenance:

- ✍ Shut down the boiler immediately in case of overheating, leakage, or electrical failure.
- ✍ Provide emergency repair or replacement to restore water heating supply.
- ✍ Report any major breakdown to Maintenance Head for contractor support if required.

#### Responsible

#### Personnel:

Compound & Building Maintenance Technicians + Electrician/Plumber (depending on issue).

## 6.7 Building and Compound Maintenance

### Components:

- Walls, floors, ceilings, roofs, doors, windows, walkways, parking areas, green areas, perimeter fencing.

### Maintenance Types and Procedures:

#### 1. Preventive Maintenance:

- ✍ Inspect walls, floors, ceilings, and roofs quarterly.
- ✍ Conduct landscaping, lawn trimming, and walkway cleaning weekly.
- ✍ Check structural integrity of fences, gates, and compound areas.

#### 2. Corrective Maintenance:

- ✍ Repair cracks in walls, floors, or ceilings.
- ✍ Fix damaged doors, windows, roofs, and fencing immediately.
- ✍ Repaint or plaster areas showing wear.

### 3. **Predictive Maintenance:**

- ✍ Monitor structural trends such as cracks, water damage, or subsidence.
- ✍ Plan renovation, reinforcement, or replacements as needed.

### 4. **Emergency Maintenance:**

- ✍ Respond to collapse, flooding, storm damage, or other critical structural failures.
- ✍ Coordinate with contractors for urgent building repairs.

**Responsible Personnel:** Carpenters & Masons + External Contractor (as needed) under Maintenance Head supervision.

## 7. **Roles and Responsibilities**

### 5.1 **Maintenance Head**

- ✍ Oversees all maintenance activities.
- ✍ Supervises electricians, plumbers, carpenters/masons, and coordinates with external contractors.
- ✍ Develops maintenance schedules, monitors adherence, ensures compliance with safety and regulatory standards.
- ✍ Reports quarterly to hospital management.
- ✍ Responsible for hospital equipment maintenance and emergency coordination.

### 5.2 **Electrician**

- ✍ Handles all electrical systems and equipment.
- ✍ Performs preventive, corrective, predictive, and emergency maintenance.
- ✍ Maintains electrical maintenance logbooks and reports to Maintenance Head.



### 5.3 Plumber

- ✎ Responsible for water supply, sanitation, and sewerage systems.
- ✎ Conducts preventive, corrective, predictive, and emergency maintenance.
- ✎ Maintains plumbing logbooks and reports to Maintenance Head.

### 5.4 Carpenters & Masons

- ✎ Responsible for building, structural, and minor civil works maintenance.
- ✎ Repairs walls, floors, roofs, doors, windows, furniture, walkways, compound areas.
- ✎ Assist electricians and plumbers during structural work.
- ✎ Conduct preventive inspections, corrective repairs, and emergency interventions.
- ✎ Reports activities to Maintenance Head.

### 5.5 External Contractors

- ✎ Provide specialized services such as roof repairs, major painting, AC servicing, and septic tank desludging.
- ✎ Perform preventive, corrective, and emergency maintenance as needed.
- ✎ Work under the supervision of the Maintenance Head.

## 7. Documentation and Reporting

- ✎ **Daily Logbooks:** Electrician, plumber, carpenters/masons maintain daily activity logs.
- ✎ **Incident Reports:** Completed for all corrective and emergency work.
- ✎ **Monthly Summary:** Submitted by Maintenance Head to hospital management.
- ✎ **Quarterly Reports:** Include preventive, predictive, corrective, and emergency maintenance activities, pending issues, and recommendations.

**Support Staff / Greenery Team:**

- ✂ Responsible for compound cleanliness, landscaping, lawn maintenance, and general upkeep of green areas.
- ✂ Assist other maintenance staff as required.
- ✂ Report hazards or maintenance needs to Maintenance Head.

**8. References**

1. Ethiopian Hospital Infrastructure Guidelines (MoH)
2. WHO Hospital Maintenance Standards
3. Manufacturer manuals for hospital systems
4. National Safety and Health Regulations