

# Facilities Maintenance Management Standards and Skills

JULY 2024

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## Health & Safety Standards

### Standard 1: Safety and Health in a Facilities Maintenance Management Environment

Students will demonstrate the knowledge and skills to ensure the efficient operation of buildings and their components, prioritize emergency and disaster mitigation and response protocols, and manage risks to safeguard people, infrastructure, and technological assets.

* Aligned Industry Recognized Credentials: OSHA 10 – Construction, First Aid/CPR/AED

#### Skills:

1. Identify, describe, and demonstrate the effective use of Safety Data Sheets (SDS) to meet documentation requirements.
2. Locate emergency equipment, first aid kit, and emergency action and response plan, including labels and signage that follow OSHA Hazard Communication Program (HAZCOM).
3. Identify communication systems to relay emergency notifications and updates including emergency notification systems, two-way radios, or mass notification platforms.
4. Demonstrate safety procedures, emergency protocols, proper equipment use, and handling and storage of hazardous and combustible materials in accordance with OSHA and industry standards.
5. Demonstrate proper use of PPE such as helmets, gloves, safety goggles, masks, and appropriate footwear depending on the tasks and hazards present.
6. Establish safe work practices for tasks like lifting heavy objects, working at heights, using machinery, and dealing with potentially hazardous substances.
7. Inspect facilities to ensure they are well-maintained to prevent hazards, such as structural failures, electrical faults, plumbing leaks, and slippery floors.
8. Demonstrate compliance of regulations and codes applicable to facilities, e.g., building codes, environmental regulations, health, and safety standards.
9. Review and update safety procedures regularly based on incidents, technological advancements, and changes in regulations to maintain and improve standards over time.
10. Coordinate with local emergency services (fire department, police, EMS) to ensure an organized response during emergencies, providing facility maps, access points, and other pertinent information.

## Technical & Integrated Academic Standards

### Standard 2: Role of Facilities Maintenance Management Professionals in Society

Students will examine the role of facilities maintenance professionals in society, apply fundamental concepts of facilities maintenance, and analyze the evolution of maintenance practices, technological advances, and environmental awareness.

#### Skills:

1. Discuss the importance of facilities maintenance management in ensuring the safety, efficiency, and functionality of buildings and infrastructure.
2. Explain importance of regulatory compliance in facilities maintenance, including adherence to safety codes, building regulations, and environmental laws.
3. Explain how advances in technology have revolutionized facilities maintenance, with the adoption of computerized maintenance management systems (CMMS), IoT (Internet of Things) sensors for predictive maintenance, automated building systems (like HVAC and lighting), and remote monitoring capabilities.
4. Examine green building certifications (such as LEED), identifying sustainable building design and construction practices, and green building features.

### Standard 3: Technical Drawings and Project Management

Students will be able to interpret architectural drawings, floor plans, electrical layouts, plumbing schematics, and other technical documents enabling them to, plan and execute renovation, coordinate facility maintenance, and guarantee compliance with building codes and safety regulations.

#### Skills:

1. Interpret print terms, abbreviations, symbols, line types, symbols, and notes of technical drawings and blueprints.
2. Explain the basic layout of a set of prints, as well as the importance of the accompanying job specifications documents in determining work requirements.
3. Interpret and follow drawing dimensions using an architect’s scale.
4. Describe how HVAC (Heating, Ventilation, and Air Conditioning), plumbing, electrical, and fire protection systems are integrated and represented on architectural blueprints.
5. Examine building codes, regulations, and safety standards relevant to the facility and how they relate to the information provided in the blueprints.
6. Describe how the Americans with Disabilities Act (ADA) and the Architectural Barriers Act (ABA) impact building plans.
7. Integrate blueprint information into project planning, scheduling, budgeting, and resource allocation.
8. Execute and manage project plans related to facility renovations, installations, upgrades, and routine maintenance by planning, scheduling, and budgeting resources.
9. Analyze project outcomes against initial goals, close contracts, record performance metrics, and evaluate stakeholder satisfaction.

### Standard 4: Operations and Maintenance

Students will demonstrate a working knowledge of building systems and structures, interior and exterior, including maintenance of facilities, equipment, systems, and grounds to ensure optimal functionality, safety, and efficiency.

* Aligned Industry Recognized Credentials: OSHA – Lead Safety in the Workplace, OSHA- Hazards of Asbestos

#### Skills:

1. Demonstrate use of a variety of hand, power, and pneumatic tools, including tool selection, safe use, and maintenance.
2. Manage supply inventory and procurement processes by selecting vendors, evaluating bids, and overseeing supplier relationships to obtain goods and services at competitive prices.
3. Explain the functions and maintenance requirements of various building systems such as HVAC (Heating, Ventilation, and Air Conditioning), plumbing, electrical, fire protection, and building automation systems.
4. Identify the components and explain the operation of water systems within buildings, including supply, distribution, and drainage systems.
5. Examine the components of incandescent and fluorescent lamps, how to use multilevel lighting with fluorescent lamps, and the application of sensors and timers in lighting control systems.
6. Troubleshoot and diagnose malfunctioning building systems and develop effective solutions.
7. Prioritize maintenance needs, conduct regular inspections, servicing, and repairs of building systems to minimize downtime, and effectively manage workloads to meet deadlines and respond promptly to maintenance requests.
8. Identify jobs requiring licensed professionals, e.g., electricians, pipefitters, plumbers, and sheet metalworkers.
9. Develop protocols and procedures for responding to water system emergencies, including leaks, floods, and contamination events, to minimize damage and ensure swift resolution.
10. Monitor indoor air quality, promoting occupant comfort and well-being through proper ventilation and lighting, and minimizing exposure to harmful substances.
11. Demonstrate alteration, preparation, painting, and repair of structures made of wood, plaster, concrete, or brick.
12. Demonstrate floor maintenance procedures, cleaning, restoration, and/or replacement.
13. Demonstrate lawn care, planting, pruning, and general grounds maintenance, including maintenance of irrigation systems and application of pesticide. (Review MA Pesticide Licensing requirements.)
14. Investigate the components of an Environmental Protection Agency (EPA) Integrated Pest Management plan for both interior and exterior structures.
15. Evaluate relevant health, safety, environmental, and building code regulations to ensure facilities comply with legal requirements, including maintaining documentation and implementing corrective actions as needed.

### Standard 5: Environmental Stewardship and Sustainability

Students will demonstrate an understanding of social responsibilities, compliance with laws and regulations, and the protection of the environment and facility users, aiming to optimize organizational effectiveness while minimizing risks and liabilities.

* Aligned Industry Recognized Credentials: OSHA - Certified Environmental Specialists

#### Skills:

1. Apply principles of energy management, water management, materials and consumables management, waste management, and workplace/site management to optimize operational efficiency and sustainability practices.
2. Analyze energy consumption patterns to formulate and implement energy-saving strategies.
3. Examine energy-efficient technologies that reduce environmental impact and operational costs, such as implementing green building initiatives and optimizing energy use.
4. Evaluate maintenance practices of energy-efficient systems (HVAC, lighting, etc.) to optimize operational efficiency and sustainability.
5. Identify environmentally preferable products and materials, evaluate suppliers based on sustainable criteria, and prioritize those promoting the use of recycled or renewable materials.
6. Inspect exterior spaces sustainably, emphasizing landscaping practices that conserve water, promote biodiversity, and minimize environmental impact during site operations.
7. Evaluate current environmental regulations and standards relevant to facilities maintenance, ensuring compliance, and preparing sustainability reports as required.

### Standard 6: Emergency Preparedness and Business Continuity

Students will demonstrate proficiency in implementing strategies to identify potential hazards or threats and selecting mitigation methods to minimize loss, damage, or injury to people, buildings, grounds, technology, and building systems.

* Aligned Industry Recognized Credentials: First Aid/CPR/AED

#### Skills:

1. Assess risks associated with facility operations and maintenance, implement risk mitigation strategies, and maintain a safe working environment for staff and occupants.
2. Maintain emergency response plans tailored to different types of emergencies identified during the risk assessment, including evacuation procedures, communication protocols, emergency contacts, and roles/responsibilities of team members.
3. Develop facility business continuity plans to maintain critical operations during and after emergencies, including identifying essential services, backup power systems, data backup procedures, and alternative work locations, if needed.
4. Manage and schedule regular training sessions and conduct drills to ensure familiarity with emergency procedures, including training on use of emergency equipment (e.g., fire extinguishers, first aid kits) and practicing evacuation routes.
5. Identify security measures to prevent and respond to potential security threats or incidents, including access control systems, surveillance cameras, and security patrols.
6. Maintain security system components for optimal performance, including surveillance cameras, and intrusion detection systems to ensure these systems are compliant with safety regulations.
7. Assess emergency preparedness and response plans for compliance with relevant laws, regulations, and industry standards.
8. Maintain accurate documentation of emergency plans, procedures, training records, drills, and incident reports, including regular review and updates.

## Employability Standards

### Standard 7: Employability Skills

Students will understand and demonstrate the roles of professional communication, critical thinking, problem solving, professionalism, teamwork, and collaboration within the context of facilities maintenance management careers.

#### Skills:

1. Demonstrate effective communication skills to interact with building occupants, stakeholders, and team members.
2. Demonstrate active listening to understand concerns, requests, or issues from building occupants or colleagues.
3. Explain technical issues or maintenance procedures in a way that is understandable to non-technical individuals.
4. Demonstrate quality customer service by responding promptly to maintenance requests and providing updates on progress.
5. Demonstrate working cooperatively with other maintenance staff, contractors, and vendors to achieve maintenance objectives.
6. Demonstrate the ability to effectively identify, address, and resolve conflicts in a manner that promotes both team progress and positive team dynamics.
7. Demonstrate leading teams through organizational changes, technological advancements, or process improvements.

## Entrepreneurship Standards

### Standard 8: Entrepreneurship

Students will be able to describe opportunities for entrepreneurship and be able to evaluate the value proposition of business ownership in the facilities maintenance management field.

#### Skills:

1. Describe the purpose, general responsibilities, and value proposition of a facilities maintenance manager in clear and concise terms.
2. Evaluate the licensing, regulatory, and tax implications of self-employment and business ownership compared to W-2 employment.
3. Analyze facility performance metrics, prepare reports, and use data to drive decision-making and improve operational efficiency.
4. Demonstrate contract negotiations and management, e.g., negotiating, managing, and evaluating contracts with service providers, contractors, and vendors for maintenance and repair services.

## Digital Literacy Standards

### Standard 9: Digital Literacy

Students will demonstrate the ability to plan, implement, and use technologies that support the day-to-day operations of the facility maintenance management and grounds functions.

#### Skills:

1. Demonstrate the ability to collaborate effectively through digital channels, including email, video conferencing, file-sharing platforms, and other messaging applications.
2. Demonstrate use of Computerized Maintenance Management Systems (CMMS) software to manage maintenance activities, work orders, asset tracking, and inventory control.
3. Demonstrate the use of Energy Management Systems (EMS), software and technologies for monitoring energy consumption, optimizing energy use, and identifying opportunities for energy savings.
4. Evaluate the benefits of Internet of Things (IoT) devices and sensors and Smart Building Technologies for monitoring and controlling systems like HVAC, lighting, and security.
5. Understand where to find online resources that support effective facilities maintenance management and how to be a safe and ethical consumer of digital content.
6. Apply strategies for using digital tools and technology to drive business and commerce.