6.3.4 Water-Conscious Building Standards

2023–2024

AASTMT is required to adhere to mandatory building standards established by the Egyptian government as part of the licensing process. Failure to comply with these regulations may lead to penalties, legal action, or the rejection of building permit applications. These standards encompass key measures related to water management, sanitation, and sustainable resources management, ensuring compliance with national guidelines.

1. The Egyptian Code of Sanitary Installations in Buildings: This code provides guidelines for the design, installation, and maintenance of plumbing systems within buildings. This code ensures the safe and efficient distribution of potable water and the proper disposal of wastewater, thereby maintaining hygiene standards and protecting public health.
2. Egyptian regulations for Waste Management (Law No. 202 of 2020): focuses on improving water quality by reducing pollution, minimizing the release of hazardous chemicals, and ensuring safe waste disposal and management.
3. Egyptian Standard of Ministry of Housing, Utilities, and Urban Communities Concerning Liquid Waste Disposal (Resolution No. 44 of 2000): focuses on improving water quality by reducing pollution, eliminating hazardous dumping, and minimizing the release of harmful chemicals.
4. GAHAR compliance: The General Authority for Healthcare Accreditation and Regulation (GAHAR) ensures that healthcare facilities in Egypt meet national standards for quality, safety, and patient-centered care. Its role aligns with the mission of AAST Alamein Hospital by guiding the hospital toward excellence in clinical performance, infection control, and service quality to achieve sustainable accreditation and patient trust.

Besides, the plumbing system design at AASTMT follows best practices to guarantee safe distribution of potable water, effective wastewater disposal, and environmental protection against contamination. Applicable Codes:

- **International Plumbing Code (IPC):** Governs the design and installation of plumbing systems, ensuring safe and sanitary water supply and drainage practices.
- **Uniform Plumbing Code (UPC):** Provides design standards that safeguard public health through sustainable plumbing design and water conservation.

List of upgrades in campus infrastructure carried out in 2023-2024:

Category	Upgrade Description
Water Pumping & Distribution	• Installed new control panels for water pumps in Housing A & B. • Installed control panel for two 3-HP water pumps at the water station. • Installed automatic switching control panel for pumps in Engineering Building G. • Installed corrective-power panels (UPS support) enhancing

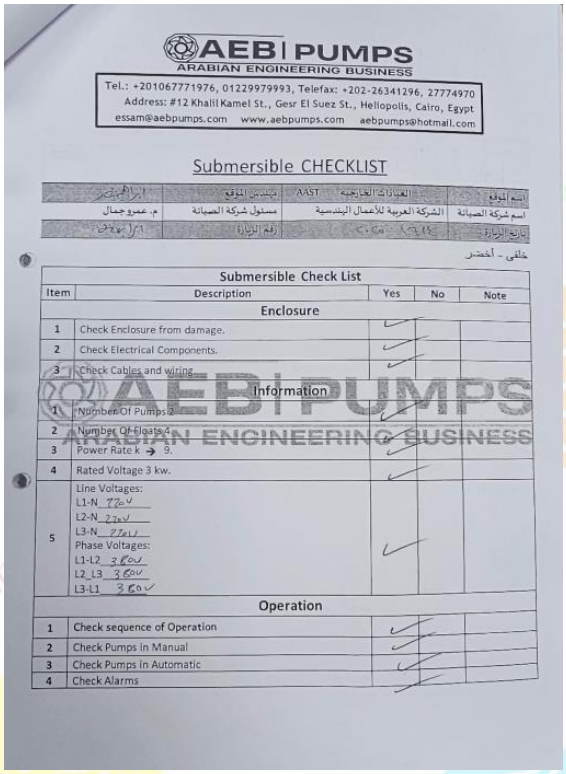
	pump reliability. • Upgraded service panels feeding desalination and water pumping stations.
Water Treatment (Desalination)	• Upgraded two control panels serving the main desalination plant. • Improved electrical safety and efficiency for continuous desalination operation.
Irrigation System Modernization	• Installed seven automated control panels for campus irrigation units. • Improved irrigation scheduling and reduced water losses.
Water Conservation Support Infrastructure	• Campus-wide upgrades to LED lighting reducing indirect cooling-water demand. • Enhanced landscape lighting/control supporting monitoring of irrigation networks.
Swimming Pool Systems Support	• Installed four high-efficiency 200-W LED floodlights at the Marine Safety swimming pool area to support safe operation of pool water systems.
Distribution Boards Supporting Water Assets	• Modernized low-voltage distribution boards serving pumps, irrigation controllers, and desalination systems. • Improved efficiency and reduced downtime risk across water-related infrastructure.

Besides those standards, AASTMT applies general design standards for its buildings and facilities to minimize water usage such as:

- In 2023-2024, adequate water saving faucets for (lavatories - Kitchens and all other Sinks in the project) have been installed with periodic maintenance to all fixtures, pumps and valves to avoid any leakage from it.
- **Wastewater Neutralization Pits:** Chemical waste from laboratories is collected and neutralized before discharge, preventing hazardous pollutants from contaminating the municipal network.
- Dual Water Tanks: Double-compartment tanks ensure uninterrupted safe water supply and controlled water storage for both domestic and firefighting use, supporting water resilience.
- **Condensate Recovery Systems:** Air-conditioning condensate is collected and reused, promoting circular water management practices.
- **Hot Water Optimization:** Energy-efficient solar and boiler systems provide controlled heating and circulation with balancing valves for minimal waste.
- **Sustainable Drainage Design:** UPVC and sealed drainage systems prevent leakage and infiltration, protecting the soil and groundwater from contamination.

- **Installation of Smart Flush and Flow Control Systems:** Integration of modern fittings such as Ideal Standard ProSys dual-flush frames with SmartValve technology ensures controlled refilling and reduces unnecessary water waste.
- In 2022-2023, new meters were added to monitor underground extracted water
- The toilet flush tanks are equipped with a dual-flush system to regulate the amount of water used, reducing excessive water consumption and promoting water saving.
- Conducting regular maintenance and replacing damaged water taps and connections.
- Every campus is furnished with faucets and toilet flushing systems.
- All water closets, drains, and worn-out feeders have been replaced in 2021-2020 with certified, standardized fixtures. Additionally, all faucets have been equipped with water-saving aerators and water-efficient flush tanks.
- Ensuring the availability of spare parts for immediate repairs, contributing to water conservation efforts.
- Consistently monitoring all toilets and water supply points. In the event of repairs or replacements, adherence to water-saving labels is mandatory for the equipment.
- Promptly responding to emergency reports of water leaks and taking necessary measures until repairs are completed.
- Employing efficient lavatory faucets that limit water flow to a maximum of 6 LPM, reducing sink water usage by up to 30% compared to standard faucets without compromising performance.
- Installing effective lavatory faucets that account for 20% of indoor water consumption.
- Measures include installing aerators to conserve water in toilets and placing informative signs across the campus promoting conscious water usage.
- Incorporating efficient water closets, all dual-flush models, using less than 6 LPF, resulting in substantial water savings.
- Recognizing that water closet flush tanks contribute to 25% of indoor water consumption.
- Additionally, the institution opts for hand sanitizers as an alternative to water in certain scenarios, further contributing to their efforts to minimize water usage.
- Implement suitable rainwater harvesting and air conditioning condensate collection systems, aimed at gathering and reusing water for WC flushing instead of relying on drinkable water sources.
- Promoting water-conscious usage on social media and websites with active engagement of students, faculty, and staff.
- **Monitoring Consumption:** Expanding the installation of meters to measure water and energy consumption allows AASTMT to track building performance.

- **Groundwater Utilization:** Deep wells are drilled to use groundwater for irrigating large green areas and filling firefighting water reservoirs.
- **Water Conservation Technology:** New buildings feature leak detection systems, allowing quick identification and repair of leaks to conserve water.
- **Reducing Water Usage for Vehicle Washing:** AASTMT has reduced the frequency of washing its on- and off-campus vehicles, minimizing water consumption.



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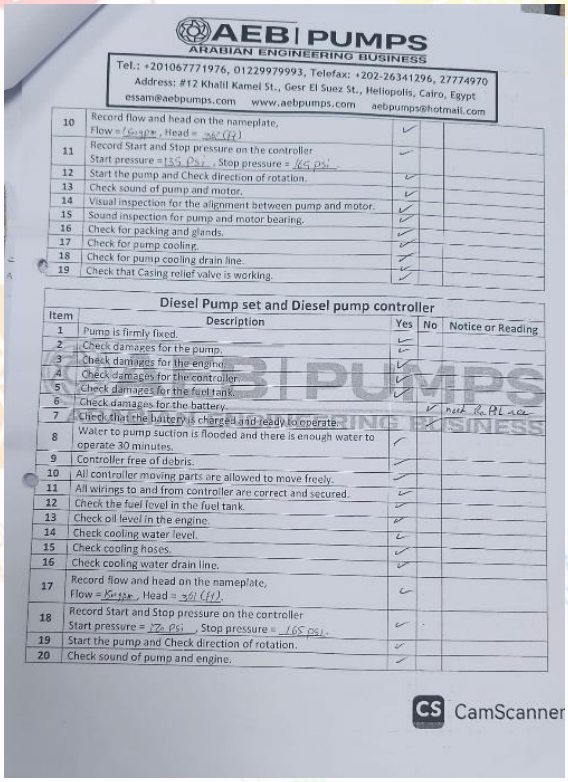
Submersible CHECKLIST

اسم الموقع	العنوان الخارجية	AAST	مندوب الموقع	ارقام الهواتف
اسم شركة الصيانة	الشركة العربية للأعمال الهندسية		مسئول شركة الصيانة	م. عمرو جمال
تاريخ الزيارة	رقم الزيارة			

خلفي - أخضر

Submersible Check List

Item	Description	Yes	No	Note
	Enclosure			
1	Check Enclosure from damage.	✓		
2	Check Electrical Components.	✓		
3	Check Cables and wiring.	✓		
	Information			
1	Number Of Pumps 2	✓		
2	Number Of Floats 4	✓		
3	Power Rate k → 9.			
4	Rated Voltage 3 kw.	✓		
5	Line Voltages: L1-N 226 V, L2-N 226 V, L3-N 226 V, Phase Voltages: L1-L2 380 V, L2-L3 380 V, L3-L1 380 V	✓		
	Operation			
1	Check sequence of Operation	✓		
2	Check Pumps in Manual	✓		
3	Check Pumps in Automatic	✓		
4	Check Alarms	✓		



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10	Record flow and head on the nameplate, Flow = 60 m³/hr, Head = 36 (ft)	✓	
11	Record Start and Stop pressure on the controller Start pressure = 135 PSI, Stop pressure = 165 PSI	✓	
12	Start the pump and Check direction of rotation.	✓	
13	Check sound of pump and motor.	✓	
14	Visual inspection for the alignment between pump and motor.	✓	
15	Sound inspection for pump and motor bearing.	✓	
16	Check for packing and glands.	✓	
17	Check for pump cooling.	✓	
18	Check for pump cooling drain line.	✓	
19	Check that Casing relief valve is working.	✓	

Diesel Pump set and Diesel pump controller

Item	Description	Yes	No	Notice or Reading
1	Pump is firmly fixed.	✓		
2	Check damages for the pump.	✓		
3	Check damages for the engine.	✓		
4	Check damages for the controller.	✓		
5	Check damages for the fuel tank.	✓		
6	Check damages for the battery.	✓		
7	Check that the battery is charged and ready to operate.	✓		
8	Water to pump suction is flooded and there is enough water to operate 30 minutes.	✓		
9	Controller free of debris.	✓		
10	All controller moving parts are allowed to move freely.	✓		
11	All wirings to and from controller are correct and secured.	✓		
12	Check the fuel level in the fuel tank.	✓		
13	Check oil level in the engine.	✓		
14	Check cooling water level.	✓		
15	Check cooling hoses.	✓		
16	Check cooling water drain line.	✓		
17	Record flow and head on the nameplate, Flow = 60 m³/hr, Head = 36 (ft).	✓		
18	Record Start and Stop pressure on the controller Start pressure = 135 PSI, Stop pressure = 165 PSI.	✓		
19	Start the pump and Check direction of rotation.	✓		
20	Check sound of pump and engine.	✓		

CamScanner

Periodic maintenance for pumps

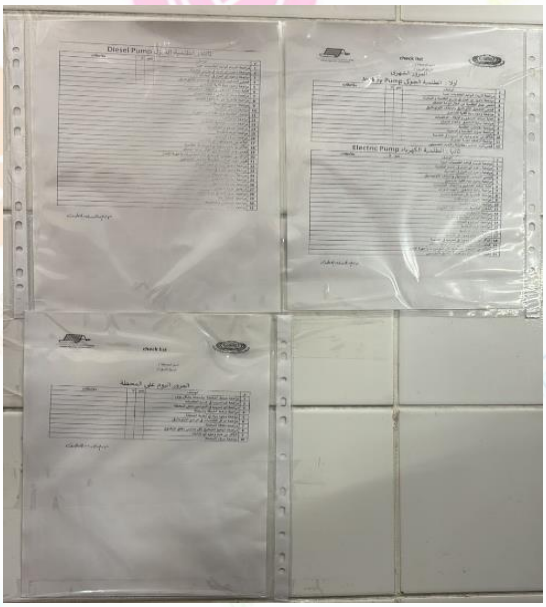
Selected Toilets Model IS ProSys R014367

Installed toilets

Effective lavatory faucets

Using drip irrigation system for all landscaping areas

Dual-flush system



Regular maintenance routine

Toilets

hand soap dispenser

Sanitizers in public areas

Safe disposal of waste following waste disposal routine

Campus upgrades and following building standards AASTMT on AASTMT webpage