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## I. PURPOSE

The purpose of these guidelines is to streamline the building standards applied by Mapua University to minimise water usage in the campus leading to efficiency and conservation.

## II. SCOPE

These guidelines are applicable to all employees, students, tenants and visitors.

## III. DEFINITIONS

**Water reuse** Method of recycling treated wastewater for beneficial purposes, such as landscape and plant irrigation, hand washing and other non-potable use.


**Rainwater harvesting** Process of collecting rainwater from surfaces on which rain falls, filtering it and storing it for multiple uses. Rainwater harvesting helps put the supply of water back to normal levels or merely conserve water coming from water providers such as Maynilad and MWSS. It is the collection and storage of water from surfaces that rain has fallen upon. Taking most advantage of the climate and weather condition of a location.

**Back Washing Method** Cleaning the filter system by reversing the flow of water to remove any debris, build-up, and contaminants and vice versa to clean the pipeline towards the product/treated tank. Before conduct of water station normal operation.

## IV. RESPONSIBILITY AND AUTHORITY

**Water Station Personnel** Responsible for collection of discharged water coming from the backwash collection system at Mineral Water Station.

**Housekeeping Supervisor** Responsible for the recording of the amount of recycled water collected from rainwater harvesting system and backwash collection system.

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Housekeeping Personnel

Responsible for the watering of the landscape areas using the collected recycled water.

CDM Head

Responsible in the preparation and updating of monthly monitoring worksheet on re-use water collected from rainwater harvesting system and backwash collection system.

## V. DETAILS OF REFERENCE GUIDELINES

The University is committed to implement the water conservation practices and guidelines and maximize the water reuse to promote sustainable consumption and utilization of its potable water through the following initiatives:

### 1. Rainwater Harvesting System

The University has installed a Bestank polyethylene water storage tank at the rooftop in one of our buildings in the campus (with a total volume capacity of 1 cubic meter or 1000 liters) to collect rainwater.

Rainwater Harvesting System involves harvesting the rain from the roof. The collected rainwater is filtered with a screen to prevent any contaminant such as leaves to enter the drain pipe. Rainwater passes thru the pipe and enters the collection tank where it will be stored and treated if needed. Finally, the rain water passes through the supply faucet. The rainwater collected from the Harvesting System is used for irrigating the landscape and plants at YIC and South Buildings by the housekeeping personnel.

Housekeeping Supervisor assigned at Main Building checks and record the volume of water collected at the Rain Water Collection Tank every last working day of the week wherein the data will be sent to CDMO Head for updating of monthly monitoring worksheet on reuse water collected.

### 2. Water Station Backwash Collection System

The Bestank Polyethylene Water Storage Tank ( with a total volume capacity of 1 cubic meter or 1,000 liters) was constructed at the exterior side of the existing Mineral Water Station at the Ground Floor West Building to serve as our water station backwash collection tank.

The operation of the Mineral Water Station starts with a pre-operation procedure called backwash treatment. It removes sediments and contaminants gathered in the filtration system before proceeding to normal run of treating raw water to be potable and safe to drink. This is done 2 to 3 times to make sure that water coming out of the system is free from contaminant.





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Before performing back-wash procedure, the initial rinsing of the collection drain pipe shall be performed first before closing the valve located outside the water station and proceed with the back wash waste water collection.

The backwash treatment is scheduled every Monday, Wednesday and Friday before start of each operation. This may vary for best practice depending on the production rate at a basis of for every 150 jugs (5 gallons or 19 liters per jug) or every 750 gallons.

Backwash Collection System process involves bleeding of water going out of the mineral water system and feeding of water through the filtering system and letting it flow for 5 minutes. Then, backwash bleeding is diverted to the collection drain pipe to the collection tank outside the water station and then accessed for use through the supply faucet. The water collected from the Backwash Collection System is used for irrigating the landscape and plants at North Building and near Gymnasium.

Housekeeping Supervisor assigned at West Building checks and record the volume of water collected at the Backwash Collection Tank every last working day of the week, and submit data to CDMO Head for updating of monthly monitoring worksheet on re-use water collected.

### 3. Water Refilling Station and Free Drinking Water for Students and Employees

Installation of water refilling station equipment was done for the following reasons:

- To get enough water every time we need it
- To be assured of clean water from water refilling station
- To filter the water supply needed by the Mapua community
- To help reduce our plastic footprints and the amount making its way into oceans and landfills
- Refilling reusable water bottles at a water dispenser reduces the number of plastic or glass containers thrown in the bin and ending up in landfill
- Water dispensers along the corridors and cafeteria is a cost-effective way to provide a constant clean water supply to students and employees for free

Water dispensers were distributed in all floors including offices, canteen, library, etc. to provide drinking water for free to all students and employees.

### 4. Installation of water efficient plumbing fixtures

Installation of water efficient plumbing fixtures to reduce the amount of water used without compromising the experience at all. Please see below some of the initiatives done by the University:

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- Pressure-Reducing Valves (PRV)– These are valves that were set on our main water line to reduce water pressure. We added water pressure check to regular maintenance checks, and if the PSI that is higher than needed, an PRV is added. This not only cuts water costs but also helps expand the lifespan of pipes.
- High-Efficiency Toilets – the University was able to replace all older models to newer more efficient models such as low-flux faucets and appliances with small economic flush tanks which can reduce the number per flush. This can save thousands of gallons a year compared to older toilets.
- Urinal upgrades – replacement of standard urinals with low flush controls. Ensure the controls can be turned off during out-of-school hours and during holidays.
- Water-Saving faucets - Installation of low flow showerheads, on-off valves on showerheads or hoses, water aerators for all faucets in all common comfort rooms to break up the water flowing through the faucet into several small streams while introducing air into the water flow. The aerator also lowers faucet noise and minimizes splashing. The installation of water aerators will be used to conserve both energy and water, and reduce the amount of splashing water coming from the faucet.
- Replace old showerheads, bidets and faucets with new down-sized models to reduce water use.

## 5. Water audits

The conduct of regular water usage audits has been implemented to eliminate water lost or leaks. Below are the activities being done to monitor water leaks:

- Daily monitoring of water in all comfort rooms (faucets , urinals, bidet and water closet, gate valves); Comfort room checklist is being filled out by the housekeeping personnel per common comfort room.
- Assessment of various water uses to distinguish those that can be fulfilled using raw water (untreated), and those requiring treated water.
- Identify strategies to provide the desired raw water supply using the resources available on site.
- Yearly water leak testing of the water pipelines
- Immediate repair of water leaks (toilet, faucets, etc.)
- Faucets in the gardens



## 6. Water monitoring program

- Shutting the water-cooling systems, if not in use
- Reducing the cooling requirements by adjusting the air temperature regulator
- Monitor the use of airconditioning units
- Regularly check for leakages of water faucets, water closets and dripping regulator or showerhead, etc.
- Observe the faucets and toilets repeatedly
- Isolation valves can be utilized on water pipes to isolate leakages

## 7. Landscape school grounds

Use mulch around plants and trees to reduce evaporation and weeds and preserve existing plants for shade and moisture retention to reduce the need for irrigation. Plant trees, drought-resistant plants and shrubs.

Purchase and replacement of existing plants with a drought-tolerant plants and growing plants that fit into the local environmental system for the low maintenance landscapes which will thrive with little to no watering.

## 8. Drip Irrigation System

Use of rationalization and drip irrigation system to connect the system to the main water source, either a faucet or valve. Study the appropriate times for irrigation to reduce evaporation.

## 9. Waste Water Treatment

For the newly constructed Makati campus, we have a wastewater treatment system to help in removing contaminants and hazardous substances from the water, making it clean and safe to drink and be used for other purposes. We have a separate piping system that flows to the Sequencing Batch Reactor (SBR) sewage treatment plant with a capacity of 150 cubic meter per day. The SBR is a type of wastewater treatment system that offers efficient and effective treatment of wastewater. This technology is used in sewage treatment plants to remove contaminants and produce high-quality effluent. We derive our main water supply from local water provider which is Manila Water Inc. We also have a facility for the reuse of non-potable water from treated water from STP for flushing of water closets and urinals. The building is designed with a 2-pipe system for potable and non-potable water. Potable water is connected to all faucets, shower heads, and bidets.

Since we do not have a wastewater treatment system, the Intramuros campus was granted by Maynilad, water provider of the University, a Certificate of Interconnection. The University has a sewer service connection with Maynilad where our wastewater is conveyed to the Tondo

Sewage Pumping Plant preliminary treatment before it is pumped to a 5.9 km. ocean outfall with diffusers. The said facility is operating with Discharge Permit issued by Laguna Lake Development Authority.

The sewer connection is pursuant to the mandatory connection of buildings to a sewerage system as required by Section 305.1 of the Revised Plumbing Code of the Philippines, Section 74(a) of the Sanitation Code of the Philippines, and Section 8 of the Clean Water Act.

The Intramuros campus was also granted a Certificate of Discharge Permit Exemption. This is pursuant to Section 4(d) of Republic Act 4850 to exempt Mapua University from securing a Discharge Permit for the regulated discharge of liquid waste or wastewater effluent. The certificate issued wherein wastewater generated by Mapua is permitted to be tapped and is verified to be interconnected to the Centralized Wastewater Treatment Plant or Facility of Maynilad Water Services, Inc. – Tondo Sewage Pumping Plant.

#### 10. Awareness campaign regarding water conservation in the University

- Raise awareness of the importance of water by creating posters on water use and water saving through email blast and other social media platforms
- Put signs near the basins to remind students and employees to turn off water as soon as they wash their hands
- Compliance to all applicable legal requirements
- Signs in all comfort rooms to remind all students and employees to avoid flushing the toilet unnecessarily. Dispose of tissues, sanitary napkin, and other similar waste in the dustbins rather than the toilet.
- Encourage students to use refillable water bottle and educate them to pour leftover water onto the garden.
- Encourage continuous improvement in water conservation to implement water efficiency activities
- Yearly reorientation of all housekeeping personnel regarding the proper way of watering of plants, cleaning of comfort rooms, hallways and ground floor; reminding them to use a broom to clean walkways, driveways, and entrances rather than hosing off these areas
- Yearly review of water action plan on how to save water successfully

#### VI. PERFORMANCE INDICATOR

To ensure that the monitoring sheet on reuse water collected from rainwater harvesting system and water station backwash collection system are prepared and updated on time by CDMO Head.

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Timely submission of volume of water collected from rainwater harvesting system and water station backwash collection system by housekeeping supervisors.

### VII. REACTION PLAN

Continue applying building standards in Mapua University by creating more projects to help minimize water use.

### VIII. REPORTORIAL REQUIREMENTS

Report Title	Frequency of Update	Responsible Personnel
Monitoring of Reuse Water Collected.	Monthly	Housekeeping Supervisors / CDMO Head
Checklist of Monitoring of Comfort Rooms		Housekeeping /Maintenance Personnel

### IX. REFERENCE DOCUMENTS

Document Code

Title

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