

RAIN WATER HARVESTING

B.S. Abdur Rahman Crescent Institute of Science and Technology has pioneered on-campus water sustainability through integrated Rain Water Harvesting (RWH) and wastewater reuse, reducing potable water demand for gardening and toilet flushing. The campus-wide RWH network captures roof runoff across blocks, filters it via Dual Intensity Filters, and stores in underground sumps before redistribution to open wells and recharge pits. A parallel Rain Water Harvesting Well Project proposes 82 wells in two stages to maximize aquifer recharge, with capacities ranging from 3'x10' to 30'x25' and a total recharge target of 901,000 liters. The filtration and gravity-driven flow minimize energy use while safeguarding water quality. Ongoing monitoring and data-driven optimization support scalable expansion and enhanced campus resilience.

WATER HARVESTING

- ❖ B.S Abdur Rahman Crescent Institute of Science and Technology is one of the pioneers in implementing solutions to save water.
- ❖ The institute has implemented rain water harvesting system in the campus with a strong desire to utilize the rain water at maximum extent.
- ❖ The Institute has taken tremendous efforts to reduce the water consumption and also to treat the wastewater generated within the campus so that it can be effectively reused for gardening and toilet flushing.
- ❖ In the forefront to save water, our institute of science and technology has initiated and executed the rainwater harvesting in the campus.
- ❖ Rainwater harvesting facility is done in all blocks to collect rainwater from the roof of all buildings.

- ❖ The harvested water is diverted to open wells in institute campus, Men's Hostel and ladies hostel.
- ❖ The placement of rainwater facility within the campus is decided upon by considering the profile of the land so as to drain the maximum amount of water collected with ease.
- ❖ In the buildings, sufficient plumbing connections are provided to trap the rain water from the roof tops.
- ❖ Underground connections are ensured to connect the collected water from the roof top to the rainwater recharge pit.
- ❖ It was also ensured that the rainwater harvesting structures are constructed as per the norms. The recharge pit provided to collect the rain water is series of filter bed.
- ❖ This initiative took shape when the institute faced shortage of water during summer. Cost of buying water was becoming a financial burden. The only alternative to the water crisis was to use the available water more effectively.
- ❖ The features of the recharge pit are described below.
- ❖ A mesh is provided at the inlets of rain water pipes so that solid waste/debris is prevented B.S.Abdur Rahman Crescent Institute of Science and Technology has taken initiatives to install rain water harvesting pits in the campus from entering the pit system.
- ❖ The recharge pits are of size 2m x 2m x 2m is excavated
- ❖ The recharge pit comprises different set of filter media. The filter media comprises of thick layers of boulders at the bottom followed by layers of gravels and coarse sand.
- ❖ This enables the filtration of water and also prevents the deposition of silt on the recharge pit.
- ❖ Access Manhole frames and covers are provided.

- ❖ The rain water is also stored in Underground sumps of Life Science block, Mechanical Science Block and New Staff Quarters.

RAIN WATER HARVESTING STRUCTURES AND UTILIZATION IN THE CAMPUS

B.S. Abdur Rahman Crescent Institute of Science and Technology has taken initiatives to install rain water harvesting pits in the campus.

RAIN WATER HARVESTING

Rainwater harvesting facility is done in all blocks to collect rain water from the terrace. The harvested water is diverted to open wells in institute campus, Men's Hostel and ladies hostel. The rain water is also stored in Underground sumps of Life Science block, Mechanical Science Block and New Staff Quarters. The rain water is stored after passing through the pre-filter as shown in Figure below.

Table VI (5.4) – 2: Block-wise Rainwater Harvesting

S. No	CAMPUS/BLOCKS	Number of Rain Water Harvesting	Quantity of Water Collected(L)
1	College/Life Sciences Block	1	10000 (Approx)
2	New Architecture Block	1	10000 (Approx)
3	Computer Science block	1	10000 (Approx)
4	Pharmacy Block	1	10000 (Approx)

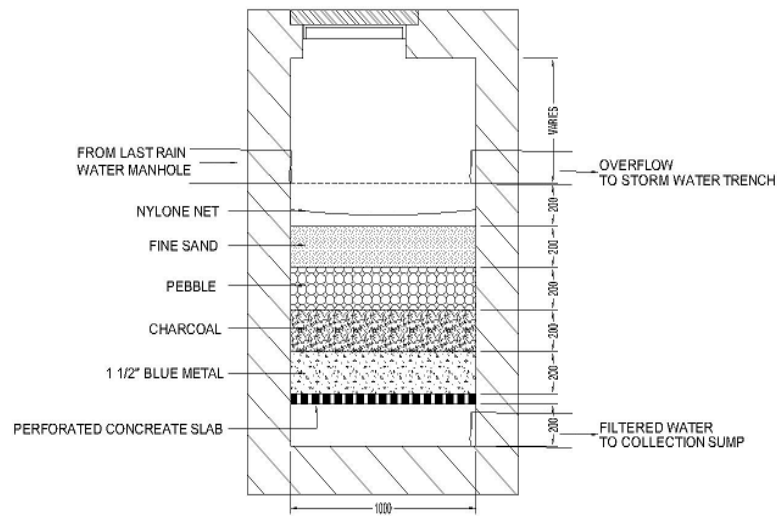


Figure VI (5.4) – 8: Rain Water Harvesting Filter Pit

The special features of the filtration unit connected with the rain water harvesting system is given as follow

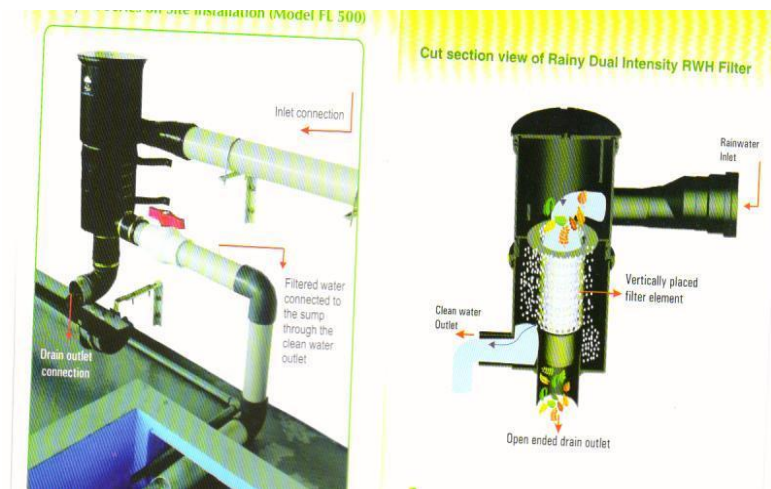


Figure VI (5.4) – 9: Rain water filtered using Dual Intensity filters and stored in underground sumps

Special Features:

- ❖ Dual Intensity Filter works on the principle of cohesive & centrifugal force.
- ❖ Works on Gravitational force (No external energy required)
- ❖ Compact in size and wall mounted
- ❖ Automatic flush out of dirt particles
- ❖ Flexibility in pipe connection to any angle and degree
- ❖ Provision of bypass valve

In our Institute Rainy filter –FL 500 is used as part of the rainwater harvesting system. The technical specifications of Model FL 500 is given below.

Rainy Filter –FL 500:

Table VI (5.4) – 3: Technical Specifications & Parameters of Model FL 500



Suitable up to area:	500 SQMTRS
Max: Intensity of Rainfall:	75 mm/hr
Working Principle :	Cohesive Force & Centrifugal force
Operating Pressure:	Less than 2 feet of head (0.060kg/cm ²)
Capacity:	480 LPM
Filter Element:	SS-304 Screen
Mesh Size:	250 Microns
Inlet:	110 MM
Clean Water Outlet:	90 MM
Drain Outlet:	110 MM
Housing:	High Density Polyethylene
Efficiency of Filter:	Above 90%
Source of Power:	Gravity

The characteristic features of FL Series Dual Intensity RWH Filter are its capacity to take up the load up to 10 to 500 square meters of Roof area with variable intensity of rainfall of 5 to 75 mm/ hour with a discharge capacity of 10 To 480 Liters per minute.

RAIN WATER HARVESTING STRUCTURES IN CAMPUS



Figure VI (5.4) – 10: Rainwater harvesting pit



Figure VI (5.4) – 11: Rainwater collection well



Figure VI (5.4) – 12: Rainwater harvesting pit at life science block



Figure VI (5.4) – 13: Filter unit in rainwater harvesting system (architectural block)



Figure VI (5.4) – 14: Rainwater collection sump (architectural block)



Figure VI (5.4) – 15: Filter unit in rainwater harvesting system (computer science block)

Rainwater harvesting facility is done in all blocks to collect rain water from the terrace. The details are listed below.

Table VI (5.4) – 4: Rain Water Harvesting Details

S. No	Inlet Pit Detail	Area (sq. m)	Rain water filter capacity (Litres)	Location
1	Inlet pit-1	156	200	Mechanical Science Block
	Inlet pit-2	122	200	
	Inlet pit-3	296	300	
	Inlet pit-4	175	200	
	Inlet pit-5	243	300	
2	Inlet pit-1	191	200	Ladies Hostel-New Block
	Inlet pit-2	188	200	
	Inlet pit-3	132	200	
3	Inlet pit-1	68	100	New Staff quarters
	Inlet pit-2	65	100	
	Inlet pit-3	81	100	
	Inlet pit-4	66	100	

	Inlet pit-5	81	100	
	Inlet pit-6	66	100	
4	Inlet pit-1	61	100	Men's Hostel-A&B BLOCK
	Inlet pit-2	71	100	
	Inlet pit-3	43	100	
	Inlet pit-4	132	200	
	Inlet pit-5	132	200	
	Inlet pit-6	43	100	
	Inlet pit-7	71	100	
	Inlet pit-8	61	100	
5	Inlet pit-1	297	300	Men's Hostel -C& D BLOCK
	Inlet pit-2	297	300	
6	Inlet pit-1	71	100	Men's Hostel -PG BLOCK
	Inlet pit-2	71	100	
	Inlet pit-3	71	100	
	Inlet pit-4	71	100	
	Inlet pit-5	71	100	
	Inlet pit-6	71	100	
	Inlet pit-7	71	100	
	Inlet pit-8	71	100	
7	Inlet pit-1	275	300	Pharmacy Block
8	Inlet pit-1	340	300	Library Block

RAIN WATER HARVESTING WELL DETAIL UNDER PROCESS

The project outlines a rain water harvesting initiative involving 82 proposed wells with a total project cost of 1.61 Crores (excluding GST). The work is divided into two stages: Stage 1 covers 35 wells, of which 14 have been completed as of 23.11.2024, with the remaining 21 expected to be finished by 31.12.2025. Stage 2 comprises 47 wells, slated to commence on 30.11.2024 and be completed by May 2025. The wells vary in capacity, contributing to a cumulative ground recharge rain water total of 9,01,000 liters. The distribution includes 9 wells of 4'x15' capacity (46,800 liters), 26 wells of 5'x15' capacity (2,13,200 liters), 47 wells of 3'x10' capacity (1,41,000 liters), and a single large well of 30'x25' capacity (5,00,000 liters).

Sustainable Water Extraction on Campus: In aggregate, these installations are designed to maximize aquifer recharge by capturing and storing rainfall across multiple well configurations, aligning with a total ground recharge target of 9,01,000 liters.

RAIN WATER HARVESTING WELL DETAIL UNDER PROCESS

RAIN WATER HARVESTING WELL DETAIL UNDER PROCESS			
Stage 1 – 35 Nos	↓		Stage 2 – 47 Nos
Till 23.11.2024, 14 Nos completed balance will be completed on 31.12.2025.	<div style="background-color: #005a8c; color: white; padding: 10px; margin-bottom: 5px;"> Project Cost 1.61Crores Excluding GST </div> <div style="background-color: #005a8c; color: white; padding: 10px;"> Proposed well Total 82 Nos </div>		Will be start from 30.11.2024 and complete on May 2025.
S. No	Well Capacity	Number of Wells	Total
1	4'x15' = 5200 Litres	9 Nos	46,800 Litres
2	5'x15' = 8200 Litres	26 Nos	2,13,200 Litres
3	3'x10' = 3000 Litres	47 Nos	1,41,000 Litres
4	30'x25' = 5,00,000 Litres	1 No	5,00,000 Litres
Total Ground Recharge Rain Water			9,01,000 Litres



Figure VI (5.4) – 16: Rain water harvesting well - under process