CASE STUDY - FRANK ANTHONY PUBLIC SCHOOL, BANGALORE

Dug well recharge

Frank Anthony Public School, Bangalore, with a student strength of 2500 children has a large playground, one side of which houses a dug well. The school depends primarily on a dug well and sometimes on a borewell for all its non-potable water needs. A sump is present which gets only municipal water supply, which in turn is supplied to the drinking water points.

The principal of the school was very keen to have a rainwater harvesting system so as to reduce their dependence on the borewell. The following details were provided to design the system.

Catchment details

One half of the roof slopes towards the playground at the back and the other slopes towards the front of the building. Existing downtake pipes on the front side of the building were encased within the building walls and it would damage the aesthetics of the facade if fresh pipes for rwh were drawn on the front side. Therefore only half the rooftop (that sloping towards the rear) was considered for rainwater harvesting.

Rooftop area considered for rainwater harvesting – 464 sq. m
Rooftop type – Flat RCC roof with weather proofing

Since there was an existing storage system in the form of a dug well, the most obvious solution was to divert the harvested rainwater into the dug well so that it may be used for various non-drinking purposes across the school, such as for toilets, landscaping, watering the playground, etc. However, the dug well was in the far end of the playground and an underground sprinkler system was entrenched in a portion of the playground to water the grounds and a cricket pitch. Care had to be taken to ensure that the sprinkler system was not damaged while laying the dugwell recharge pipelines.

Calculations

Rainwater yield:

Yield (lts) = rooftop area (sq mts) * annual rainfall (mms) * runoff coefficient * filter efficiency

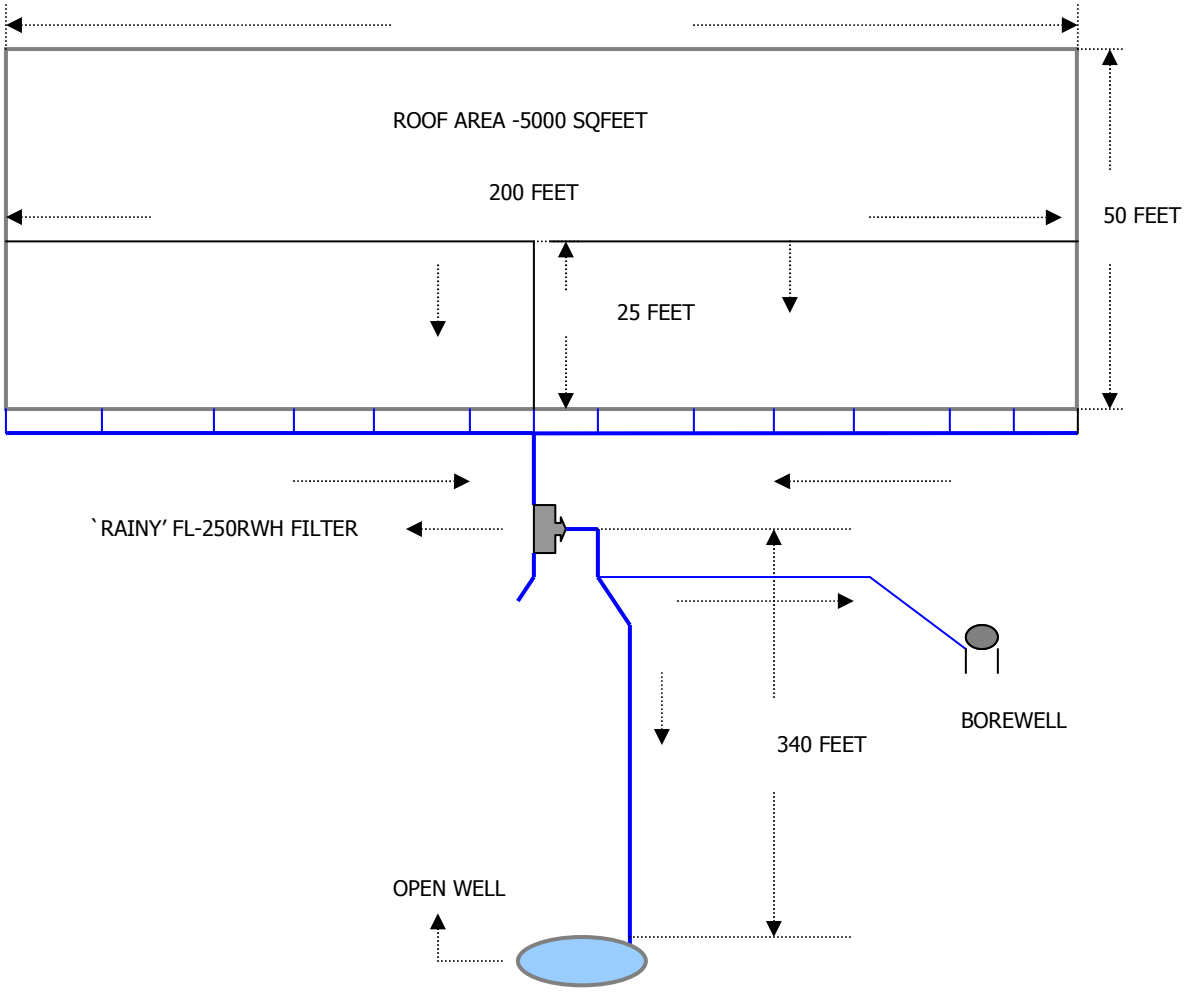
Rainwater yield = 464*970*0.8*0.8 = 288,051 litres

System implementation

The existing cement downtake pipes were cracked in many places, and hence were entirely replaced by PVC. The downtake pipes were connected by T-connectors to a common header and the recommended slope provided. This header pipe was connected to a filter, and from thereon it was taken into a deep trench running under the existing sprinkler system until the dug well.

An option was also provided to recharge the borewell if the rains were exceptionally heavy.

Figure 1 Rainwater harvesting system at a school – Dug well recharge



The total cost of the rainwater harvesting system was approximately Rs. 1,10,000/-. The bill of materials is given in the table-1 below:

Table 1 Bill of material

SN	Description	Qty.
A	***Rainwater harvesting pipes and special fixtures:***	
1	110 mm x 6mtrs RWH pipes PN-4	34
2	110 MM x 6mtrs RWH pipes PN-10	1
3	63mm x 6mtrs RWH Pipes PN-4	12
4	90 mmx 63 mm side tee	1
5	90 mm control valve	1
6	63 mm control valve	1
7	90 MM X6 mtrs RWH Pipes PN-4	16

SN	Description	Qty.
8	110 mm 45 deg bends PN-6	21
9	110 mm Right Angled Adapters	38
10	110 mm RWH Equal Tee	12
11	110 mm RWH Couplers	6
12	110 mm L-Angular Clamps	38
13	110 mm `C' Clamps	78
14	2" Screws , nails and washers one unit	1
15	3/8" x3" Anchor Bolts and Nuts	76
16	Solvent Cement -2 liters	2
B	***RWH FILTER:***	
C	***CIVIL AND MASONRY WORK:***	
1	Fixing the Outlet pipes At Roof Top, Masonry work near the rear wall to protect the pipes	
2	Trenching of pipe line 540 feet at a depth of 2.5 feet and re-filling the same	

Underground pipes take the filtered rainwater to a dug well that is at the far end of the playground