DELHI JAL BOARD: GOVT OF NCT OF DELHI
OFFICE OF THE EXECUTIVE ENGINEER (RWH/GWC)
ROOM No.-11, VARUNALAYA PH-I,
KAROL BAGH, NEW DELHI-110005
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No.DJB/EE (RWH/GWC)/2016/ 631 Dated: 18/3/2016

CIRCULAR

Subject: Guidelines on Rain Water Harvesting, reg. - Amendments in provision for rain water harvesting in Delhi Water & Sewer (Tariff & Metering) Regulations, 2012.

Delhi Jal Board in its 126th meeting held on 1.3.2016 has considered and resolved the proposal of amendment in provision for rain water harvesting in Delhi Water & Sewer (Tariff & Metering) Regulations, 2012 vide Resolution No. 276.

The Board further directed to examine the possibilities of giving more benefits to the consumers so that they may themselves come forward for making operational rain water harvesting system in their premises and also to attract large number of people under the scheme. The Board further suggested that the general public should be encouraged to adopt Rain Water Harvesting. Adequate publicity should be given to ensure that government agencies make arrangements to harvest rain water within their premises.

In view of the above, amended guidelines on rain water harvesting for building premises are enclosed for necessary action in the matter. It is also requested to give adequate publicity so that public at large adopt rain water harvesting systems in their premises.

This circular has the approval of Member (WS).

(B.L. Kuru)
EE (RWH/GWC)

Encl: As above.

1. All Executive Engineers (Civil)
2. All Joint Directors(Revenue)
3. EE (EDP): with the request to upload the guidelines on DJB website and intimate to this office the path domain to access the same. It is suggested to have link for the same on home page itself.
4. Consultant (PR): To publish in leading local newspapers.

Copy for kind information to:-

1. Secretary to CEO
2. Member (WS)/Member(Dr.)/ Member(A)/ Member(Fin.)
3. All Chief Engineers
4. DOR/Dir.(A&P)/ Dir. (F&A)
5. All SE (Civil)/Joint Director (Revenue) HQ
6. O/c

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EE (RWH/GWC)

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RAIN WATER HARVESTING GUIDELINES

OBJECTIVES

To improve the status of ground water in NCT Delhi through Rain Water harvesting for ground water recharge.

REGULATIONS

1. **From Ministry of Urban Development, GOI:**
   Ministry of Urban Development and Poverty Alleviation (Delhi Division), Govt. of India vide its notification dated 28.07.2001 has made modification / additions in the building Bye laws of 1983, making Rain Water Harvesting mandatory in all new buildings on plots of 100sqm and above under clause 22.4.1 (provision to be applicable as per the public notices of CGWA from time to time) and waste water re-cycling system for horticultural purposes in buildings having a minimum discharge of 10,000 liters and above per day under clause 22.4.2.

2. **From Delhi Jal Board:**
   a. DOR vide letter no. DJB/DOR/06/20275 to 80 dated 12.01.2007 instructed that while sanction of individual (8mm) water connection in new house, a certificate is to be given by the concerned ZE, DJB and in case of bulk connections, a similar certificate is to be given by the concerned EE and SE, DJB, to the effect that applicant has provided the requisite systems as provided in the building plans sanctioned by the MCD/DDA/any other land developing authority, in accordance to modification in building bye-lays-1983 under clause 22.4.1 and 22.4.2 vide notification dated 28.7.2001 by MOUD, GOI.

   b. Delhi Water & Sewer Tariff and Metering Regulations 2012 and as amended in 126th meeting of the Delhi Jal Board held on 1.03.2016 vide Resolution No. 276, following provisions on Rain Water Harvesting are to be observed;

      i. Such plots/properties on 500sqm plot area or more and having functional RWH system shall be granted rebate of 10% in the total bill amount. Rebate is 15% if both the systems i.e. RWH and waste water recycling plants are set up and functional.

      ii. If the Rain Water Harvesting system is adopted by a society, the individual member of that society will be entitled to above mentioned rebate in water bill.

      iii. The area Zonal Engineer or such other suitable agency as authorized by the Board will provide a functional certificate in respect of the above systems mentioning therein that substantive portion of the plot/ property has been

covered as far as Rain water Harvesting is concerned. Similarly, he will certify that substantive quantity of the waste water generated has been recycled by the consumer. A certificate in regard to the same will be issued after every six months.

iv. **Mandatory provision on Rain Water Harvesting:** Consumer of Delhi Jal Board having a plot / property of size 500sqm or more shall make provision for rain water harvesting under intimation to the area Zonal Revenue Officer (ZRO). In case, the consumers fail to comply this provision within the time limit, the tariff as applicable for the consumers of respective category will be increased by 1.5 times till the provision on rain water harvesting made and intimated. Mandatory provision for RWH and consequent penal provisions are applicable from 01.07.2016. CEO, DJB is further delegated the power to defer the same and make it applicable from a subsequent date, if required.

v. For provision of RWH systems in the building premises, rain water runoff generated from rooftop areas shall only be considered for the purpose of applicability of penal and rebate provisions contained in the Tariff Regulations, 2012.

vi. RWH through artificial ground water recharge structures is not recommended where post monsoon ground water levels are shallower than 5m. Penalties as per the Delhi Water & Sewer (Tariff & Metering) Regulations, 2012 will not be levied on DJB consumers for non-provision of RWH system in such areas. However, in such areas rain water storage for its use in non-potable purposes after required treatment may be carried out as a voluntary option.

3. **From Department of Environment and forest and Wildlife, GNCTD:**

a. Directions of Hon'ble LG of Delhi under EPA- 1986 have been issued by Department of Environment & Forest and Wildlife, GNCTD vide notification dated 12.07.2010 making prior permission necessary for installation of bore-wells for use of ground water for domestic, industrial and commercial purposes.

b. Notification also provides that if the plot size of the building is more than 200sqm, the permission to draw ground water through bore-well or tube-well shall be subject to installation of rain water harvesting system. Permission for drawl of ground water for commercial and or industrial use is subject to installation of rain water harvesting structures and re-use of the water in horticulture or cooling or toilet flushing etc after proper treatment of waste water or any other suggestion given by the concerned Advisory Committee.

The Guidelines below are to help citizens make appropriate Rain Water Harvesting structures to achieve desired ground water recharge requirement. However, these are not prescriptive and

citizens are free to do Rain Water harvesting using other appropriate technologies that achieve the desired ground water conservation requirements.

GUIDELINES FOR CALCULATING THE CAPACITY OF THE RAIN WATER HARVESTING ARTIFICIAL RECHARGE STRUCTURES FOR GROUND WATER RECHARGE:

1. For the purpose of compliance with DJB Tariff Regulations, recharge structures need to be made only for the Rain Water runoff that comes from the rooftops. The following formulae may be used by citizens to calculate the capacity of the Recharge pits that will need to be made for their establishments:

   Rooftop area (in sqm) X 0.8 (runoff coefficient for roof top/concrete area) X 0.025(average maximum rain fall intensity in meters per day)

Example:

In a plot area of 500sqm, maximum ground coverage is 75% (DDA Master Plan for Delhi-2021), i.e. maximum roof-top area would be 375sqm. Thus, the required total storage capacity (ies) of the recharge structure(s) (can be one or more) would be 375 X 0.8 X 0.025= 7.5cum.

Hence, a recharge chamber/ pit with a length & breadth of 1.8m and depth of 2.3m will be sufficient.

Required Capacities of Rectangular and Circular Recharge Chambers for Roof-Top Rain Water Harvesting for Artificial Recharge to Ground Water and their schematic diagrams are given in Fig.1 & Fig. 2 respectively.

Salient Points on Implementation, Operation and Maintenance of Artificial Recharge Structures for RWH

i. Capacities for recharge structures are based on rain water runoff from roof areas. However citizens are encouraged to make recharge structures of additional capacities that take runoff from other non polluting catchments.

ii. All the dimensions indicated in the above sizes are the inner dimensions and below the inlet pipes. This is to ensure that the full system capacity is utilized for groundwater recharge.

iii. Minimum and maximum depths of recharge structures may not be less than 1.0m and may not be more than 4.0m respectively.

iv. Recharge structures are to be located at a safe distance away from the buildings/foundations. A minimum distance of 1.5m (or 5m for buildings having single basements) or as recommended by the architect/structural engineer depending on the type of buildings, whichever is more may be considered.

v. Sizes of the recharge structures given above are suggestive only and may vary according to site conditions. They may be changed to suit the available space and one or more recharge structures may be provided subject to the condition that the cumulative capacities are not less than the required capacities. It is to be ensured that recharge structures should become integral part of the rain water conveyance system of the premises.

vi. Recharge bores are not proposed in the RWH structures suggested by Delhi Jal Board and are applicable for building premises without basements. However, for building premises with basements and for the purpose of increasing efficiency of recharge to ground water interested citizens and institutions may separately approach Central Ground Water Board for design and drawings of artificial recharge structures having provisions for Recharge wells (bores).

vii. Run-off coefficient for roof top/concrete area is considered as 0.8. Equivalent catchment areas for bituminous roads/paved areas and open/green areas without steep slopes can be worked out by considering their run-off coefficients as 0.6 and 0.1 respectively.

viii. Only non-polluted rain water from the roof tops and other catchment areas has to be diverted to recharge structures through connection of down pipes.

ix. Before the onset of the monsoon all the catchment areas considered for recharge are to be cleaned. The recharge structures are to be in operation during the monsoon season only so as to avoid any contamination.

x. A mesh/Jali should be provided at the mouth of roof rain water pipes and inlets to the recharge structures so that leaves or any other solid waste/debris is prevented from entering the pit. By-pass arrangements may be provided before the recharge chambers to divert the first rain runoff directly into the municipal drains.

xi. An overflow pipe is to be provided in recharge structures, leading/out falling into municipal storm water drains.

xii. Necessary flow checks may be provided within the internal storm water drains (rain water conveyance system) for settling the silt, if felt necessary.

xiii. Recharge structures should be implemented with requisite structural soundness and adhere to all relevant construction and structural norms. The structure should not pose any danger to people and building. The design should be based on the soil type and land use. Thickness of RCC cover slabs and reinforcement shall be dependent on structural loads. Access manhole frame and covers and foot rests to be provided. Thickness of recharge chamber walls/Circular RCC rings shall be dependent on its depth and structural loads.

xiv. It is recommended to provide filter media consisting of brick aggregates (40/50/63 mm size)/charcoal and activated carbon/coarse sand (1.5-2.0mm) /geo textile membrane.

Alternative to suggested filter media may be multiple layers of jute mats in recharge chambers / modular RWH filters in rain water pipes from rooftops with the objective to arrest the silt in the rain runoff generated from the catchments before its percolation into the natural soil strata and thereby minimizing it's clogging. However, simple RWH structures without filter media and recharge bores having adequate capacity depending on the rain water runoff from roof top areas will be considered for exemption from levy of penalties as per the Delhi Water & Sewer (Tariff & Metering) Regulations, 2012 on the consumers of Delhi Jal Board.

xv. RWH through artificial ground water recharge structures is not recommended where post monsoon ground water levels are shallower than 5m. In such areas rain water storage for its use in non-potable purposes after required treatment may be carried out.

xvi. DJB consumers were allowed a rebate of 10% in total bill amount as per Delhi Water & Sewer (Tariff & Metering) Regulations, 2012 in the Plot / Properties of 2000sqm and above, having installed functional RWH System. The rebate has been extended for plots of 500 sqm. and above vide DJB Resolution No. 276 taken in its 126th meeting held on 1.03.2016. **Provision of filter media as indicated in Simple Modular Designs of RWH structures or suitable alternatives to minimize silt in the rain water runoff before its percolation will be necessary for seeking rebate.**

xvii. Recharge structures shall be cleaned before onset of monsoon season every year including removal, washing and relaying with topping of filter media layers, if provided.

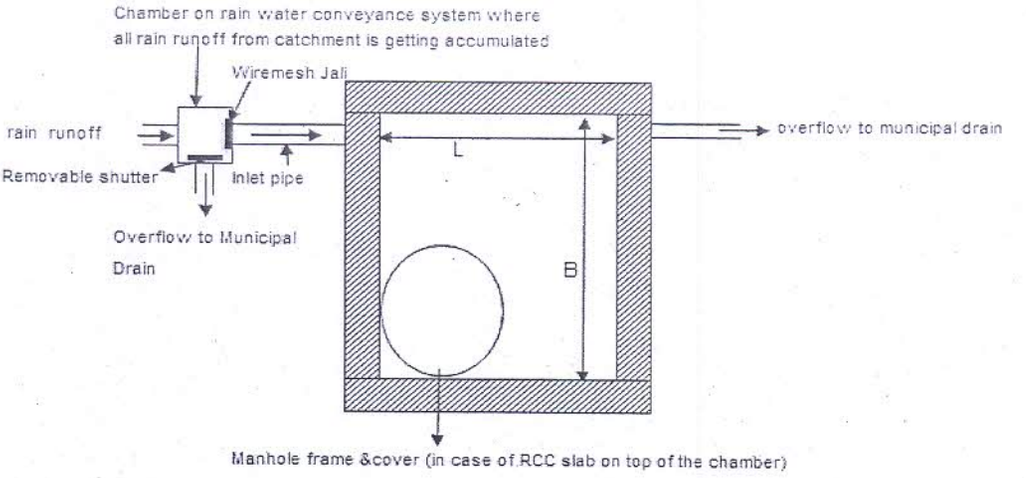
xviii. It is advisable to clean the recharge structures after every 2 rainfalls during the rainy season or more frequently. Recharge structures shall be checked and cleaned at least 7 days interval or more frequently during rainy season.

xix. Post monsoon cleaning and maintenance of recharge chambers shall be carried out. It is again to emphasize that proper & timely maintenance is the key factor for the success of Artificial Recharge structures. Citizens are required not just to make the RWH structures but also to maintain them such that they are efficiently able to function during the monsoons. Following annual maintenance activities shall also need to be done in this regard:

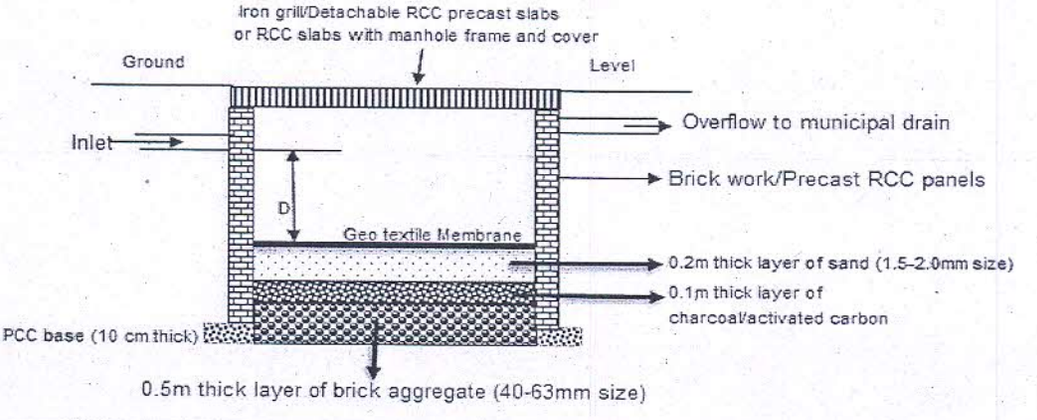
a) De-silting i.e removal of all accumulated debris and silt in the recharge structures and rain water conveyance system.
b) Cleaning of filter media by thoroughly washing it with water/topping/replacement of filter media.
c) Repair for structural damages & system efficiency.
d) Repair / design modifications / diversions to ensure that no contaminated water enters the structures and not to allow any changes in catchment that may prevent Rain Water runoff from reaching the recharge chambers.

EE (RWH/GWC)

Fig. 1 : Rectangular Recharge Chambers for RWH



PLAN

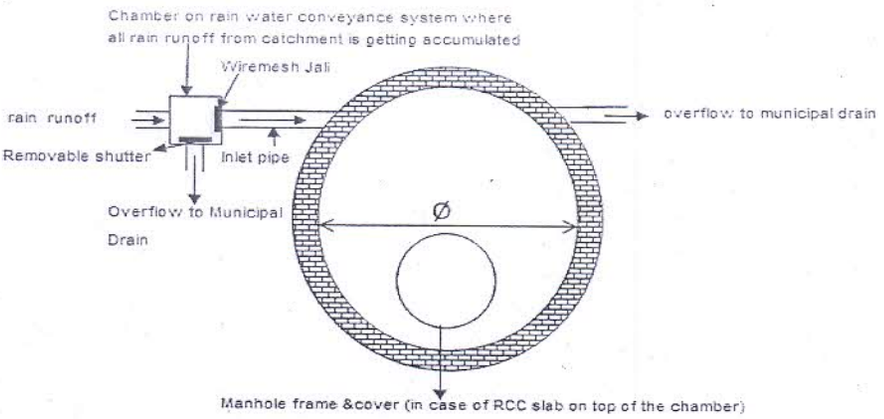


SECTION

S No	Plot Area (sq.m)	Maximum Roof-top area as per DDA MPD-2021 (%)	Roof-Top Area (sqm)	Required Capacity (cum)	Suggestive dimensions of Recharge Chambers/Trenches {length (L) X breadth (B) X depth (D) in meters}
1	100	90	90	1.8	1.2X 1.2 X 1.25
2	200	75	150	3	1.2 X 1.2 X 2.1
3	300	75	225	4.5	1.5 X 1.5 X 2.0
4	400	75	300	6	1.8 X 1.8 X 1.85
5	500	75	375	7.5	1.8 X 1.8 X 2.30

Note: For working out the storage/retention capacities, depths are to be considered below the invert level of the lowest inlets to the recharge chambers/trenches. Alternative to suggested filter media may be multiple layers of jute mats in recharge chambers / modular filters in rain water pipes from rooftops with the objective to arrest the silt in the rain runoff generated from the catchments before its percolation into the natural soil strata. No waste water is allowed to be entered into Recharge Structures. For more details, please contact to the office of EE (RWH/GWC), Delhi Jal Board, Room No. 11, Varunalaya Phase-I, Karol Bagh, New Delhi-110005, Tel No. 011-23558264.

Fig. 2 : Circular Recharge Chambers for RWH



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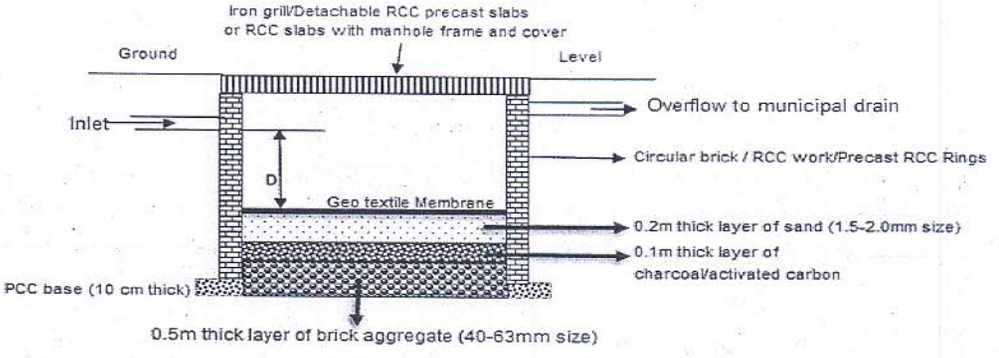

SECTION

S No	Plot Area (sq.m)	Maximum Roof-top area as per DDA MPD-2021 (%)	Roof-Top Area (sqm)	Required Capacity (cum)	Suggestive Diameter (Ø) (internal) of Circular Chambers (mtrs)	Depth (D) of Circular Chambers (mtrs)
1	100	90	90	1.8	1.2m (4 ft)	1.6
2	200	75	150	3	1.5m (5 ft)	1.7
3	300	75	225	4.5	1.5m (5 ft)	2.5
4	400	75	300	6	2 structures of size mentioned in Sl. No. 2	
5	500	75	375	7.5	1 structure of size mentioned in Sl. No. 2 & 1 structure of size mentioned in Sl. No. 3 (i.e. total 2 structures)	

Note: For working out the storage/retention capacities, depths are to be considered below the invert level of the lowest inlets to the recharge chambers/trenches. Alternative to suggested filter media may be multiple layers of jute mats in recharge chambers / modular filters in rain water pipes from rooftops with the objective to arrest the silt in the rain runoff generated from the catchments before its percolation into the natural soil strata. No waste water is allowed to be entered into Recharge Structures. For more details, please contact to the office of EE (RWH/GWC), Delhi Jal Board, Room No. 11, Varunalaya Phase-I, Karol Bagh, New Delhi-110005, Tel No. 011-23558264.