

Guidelines for preparation of water balance for Building, Construction, Township and Area Development Projects

The SEIAA in its 39th meeting held on 04.07.2012 discussed the matter regarding water balance being submitted by the project proponents of building/construction projects and township/area development projects at length because of the fact that water demand for domestic use and its further bifurcation have a lot of variations in the different published documents and so, different project proponents submit water balance statements for building/construction projects and township/area development projects based on different documents due to which there is no uniformity and the Authority has to get these statements amended in most of the cases. The Authority also discussed some of the readily available documents published regarding water demand, which contain the following provisions:

- (i) In IS 1172:1993 (re-affirmed 2002) titled as "Code of Basic Requirements for Water Supply, Drainage and Sanitation" and National Building Code, the water demand for domestic use has been mentioned as under:
- For communities with population 20,000 to 1,00,000 together with full flushing system, the water demand varies from 100 to 150 lpcd.
 - For communities with population above 1,00,000 together with full flushing system, the water demand varies from 150 to 200 lpcd and out of this quantity 45 lpcd may be taken for flushing requirements.
- (ii) In the manual on 'Norms and Standards for Environmental Clearance of Large Construction Projects' published by Ministry of Environment & Forests, the estimation of water use is given as under:

Sr. No.	Category	Consumption (lpcd)	Reduced consumption (lpcd)
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1.	Human consumption	7	7
2.	Bathing	20	20
3.	Flushing	45	21
4.	Washing	40	15
5.	Misc.	23	23
	Total	135	86

(iii) In another manual titled as 'Environmental Impact Assessment Guidance Manual for Building, Construction, Township and Area Development Projects' published by Ministry of Environment & Forests, it has been mentioned that as per BIS for residential buildings with a population of 20,000 – 1,00,000, the per capita consumption is 100-150 lpcd and for those with population above 1,00,000, the consumption is 150-200 lpcd. Out of 150-200 lpcd water consumption rate, 45 lpcd is the flushing requirement and remaining quantity for other domestic purposes.

(iv) In the book titled as 'Water Supply Engineering by S.K. Garg, the average water consumption in Indian city (typical) is as under:

Sr. No.	Use	Consumption (lpcd)
1.	Drinking	5
2.	Cooking	5
3.	Bathing	55
4.	Washing of clothes	20
5.	Washing of utensils	10
6.	Cleaning of houses	10
7.	Flushing purpose	30
	Total	135
8.	Extra for large/metro cities for more institutional needs	15

	Total for Metro Cities	150
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- (v) In the book titled as 'Concise Handbook of Civil Engineering' written by V.N. Vazirani & S.P. Chandola, the consumption of water for domestic use has been mentioned as 135 lpcd, the details of which are as under:

Sr. No.	Use	Consumption (lpcd)
1.	Drinking	5
2.	Cooking	5
3.	Bathing	55
4.	Washing of clothes	20
5.	Washing of utensils	10
6.	Cleaning of houses	10
7.	Flushing purpose	30
	Total	135

Further, the SEIAA discussed the literature regarding use of water for irrigation of green area (lawns) and noted that the average water demand for green area for summer & winter seasons is 5.5 lt/m²/day and 1.8 lt/m²/day, respectively.

The Authority also observed that in light of facts stated above, there is a need to have a uniform standard regarding water demand for domestic use and utilization of treated wastewater. After detailed deliberations in the matter, the Authority finalized the following criteria for assessment of water demand and utilization of treated wastewater for building, construction, township and area development projects:

- 1) **For the communities with population 20,000 to 1,00,000 together with full flushing system.**

Sr No.	Season	Water Demand (lpcd)	Wastewater generation	Utilization of treated wastewater		
				For irrigation of green area	For flushing purpose	Into sewer
1.	Summer	135	80 % of water demand	5.5 lt/m ² /day	35 lpcd	As per requirement
2.	Winter	135	80% of water demand	1.8 lt/m ² /day	35 lpcd	As per requirement
3.	Monsoon	135	80 % of water demand	0.5 lt/m ² /day	35 lpcd	As per requirement

For the communities with population 1,00,000 to 2,00,000 together with full flushing system.

Sr No.	Season	Water Demand (lpcd)	Wastewater generation	Utilization of treated wastewater		
				For irrigation of green area	For flushing purpose	Into sewer
1.	Summer	150	80% of water demand	5.5 lt/m ² /day	40 lpcd	As per requirement
2.	Winter	150	80% of water demand	1.8 lt/m ² /day	40 lpcd	As per requirement
3.	Monsoon	150	80% of water demand	0.5 lt/m ² /day	40 lpcd	As per requirement

For the communities with population 2,00,000 to 5,00,000 together with full flushing system.

Sr No.	Season	Water Demand (lpcd)	Wastewater generation	Utilization of treated wastewater		
				For irrigation of green area	For flushing purpose	Into sewer
1.	Summer	180	80% of water demand	5.5 lt/m ² /day	45 lpcd	As per requirement

2.	Winter	180	80% of water demand	1.8 lt/ m ² /day	45 lpcd	As per requirement
3.	Monsoon	180	80% of water demand	0.5 lt/ m ² /day	45 lpcd	As per requirement

For the communities with population above 5,00,000 together with full flushing system.

Sr No.	Season	Water Demand (lpcd)	Wastewater generation	Utilization of treated wastewater		
				For irrigation of green area	For flushing purpose	Into sewer
1.	Summer	200	80% of water demand	5.5 lt/ m ² /day	45 lpcd	As per requirement
2.	Winter	200	80% of water demand	1.8 lt/ m ² /day	45 lpcd	As per requirement
3.	Monsoon	200	80% of water demand	0.5 lt/ m ² /day	45 lpcd	As per requirement