

OFFICE OF THE EXECUTIVE ENGINEER, WATER RESOURCES
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Memo No./ TS/2022

Betul. Dated

MENDA MEDIUM PROJECT
MUCK MANAGEMENT PLAN

Impact Due to Muck Generation :-

For construction of different components of the project, surface excavation in earth mixed with boulder, hard soil and disintegrated rock and hard rock would be carried out. The excavation shall result in large quantity of excavated material i.e. Muck which shall have to be evacuated, disposed of and roller compacted or laid on mild slope pari passu with the excavation work, to such designated areas where the muck piles do not substantially interfere with either environment / ecology or the river flow regime and cause turbidity impairing the quality of water. The disposal of muck has to be scientifically planned keeping in view the maximum reutilization of muck in construction as this being earthen dam requiring substantial amount of excavated materials in construction. Reutilization would reduce / eliminate the transportation, storage and other pollution load on environment due to substantial amount of muck excavated from foundation and laying of underground pipeline.

The construction of dam and water conductor system for conveyance of water up to farm level would generate substantial amount of muck, as calculated below :-

Muck from Dam's Foundation :-

Muck from dam's foundation has been computed by the design wing of WRD, during the preparation of DPR Quantities received from excavation are given at Table 4.3 below.

A detailed estimate has also been prepared for the material required in construction of the dam, along with the quantity received and requirement of dumping of surplus material or net quantity deficit to be procured / quarried separately and same is give at Table 4.4 below :-

Table 4.3 " Quantities of Excavated Material

S.No.	Particulars	Quantities from Exavation				Total
		Sand	H/S and H/M	Disintegrated and S/R	H/R	
1	2	3	4	5	6	7
1	Stripping	1318.243	3075.9	0	0	4394.143
2	Cut off Trench	0	3216	2814	2010	8040
3	Filter	0	669.421	585.744	0	1255.165
4	Drains	0	1036.047	906.541	0	1942.588
5	Spillway	0	42409.024	37696.9	14136.3	94242.224
	Total :-	1318.243	50406.392	42003.185	16146.300	109874.120

As part of DPR and AA, a detailed estimate has also been prepared for the material required in construction of the dam, along with the quantity received and requirement of dumping of surplus material or net quantity deficit to be procured / quarried separately and same is give at Table 4.4 below

Table 4.4 " Construction Material Requirement and Availability from excavation

S.No.	Particulars	Qty required (Cum)	Material Available from Excavated (Mcm)	Surplus / Deficit (Mcm)
1	2	3	4	5
1	Boulder - HR	5280.58	16146	-1975.869
2	Pitching stone HR	6528.56		
3	Gravel HR	6312.73		
4	Sand	11443.49	1318.243	-10125.250
5	COT Soil	8040	0	-8040.000
6	E/w Soil HS/HM/DIR	200289.79	92409.577	-107880.210
	Total :-	237895.150	109873.820	-128021.329

Muck from Pipeline Rout :-

The Proposed system is a closed conduct system for conveyance of water up to farm level. To understand the impact of muck generation from laying of pipeline, quantification of this impact was carried out by calculating the muck volume which shall be generated from excavation of earth for laying of pipeline, adding a swell factor of 25% to the muck generated and subtracting the quantity of back filling. The resultant quantum is the muck generation requiring disposal.

As the top of the pipe will be laid at least 1m below the surface, for calculation of the trench volume, depth is taken as 2.5 m for rising mains. There are two rising mains proposed – 1.4m dia and 7.7km long and 1.3m dia and 4.6Km long bottom width is taken as 9cm more than the pipe dia on each side and top width is taken as ½ of the trench depth in additional to the bottom width i.e. ¼ depth on each side.

Muck from rising main and gravity main

Pipe dia = 1.4m and 1.3

Trench depth = 2.5m

Bottom width of trench = $1.4/1.3 + 0.09 + 0.09 = 1.58/1.48\text{m}$

Top width of trench = $1.58/1.48 + 2.5/2 = 2.83 / 2.73 \text{ m}$

Total Quantity of muck excavated from RM = 90726.875 Cum

$(7700 \times 2.5 \times (1.58 + 2.83)/2 + 4650 \times 2.5 \times (1.48 + 2.73)/2)$

Total quantity of muck with swell factor of 25% = 113408.60 Cum

Backfill Quantity = 90888.40 Cum

Muck requiring disposal = 22520.20 Cum

In addition, equivalent amount will also be generated from the distribution network, therefore a total of about 45000 Mcm will require disposal.

Muck Management :-


As discussed above, the excavated material from the dam foundation will be fully utilized in dam construction and therefore dumping need will not arise. Muck requiring along the linear route of pipe line is estimated as 45000 Mcm along a pipe network of over 50km in length (RM plus disnet) i.e. per m generation is less than 1mcm. This quantity can also be utilized in dam construction where substantial additional quantity of the order of 1.28 Lakh mcum would still be required.

Alternatively, this surplus soil will be utilized for refilling of the trenches and the approach road proposed to be constructed for carrying the pipes at site and preparation of platform for crane. During excavation, care will be taken that top fertile soil is kept aside and will be used for re-filling the top area after laying pipe line. This top soil will be spread on adjoining farming fields with consent of farmers or alternatively will be used for green belt development.

Balance Muck will be managed by spreading along the route in the low lying areas. As the topography is undulating, such low lying areas are available along the route. Any further surplus muck shall be laid in the community undulating area of the connected villages with the consent of concerning Gram-Panchayat. The muck may also be used by nearby Gram Panchayats for construction of village roads etc.

A lump sum provision of capital expenditure of Rs 100 Lakh has been made for muck disposal.


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