Forest Proposal No: - FP/JK/ROAD/146187/2021

Project: Construction and Upgradation to 2 lane with paved Shoulder of road from design Chainage 31.449 (Khellani, Pariyot) to Km 51.700 (Prem Nagar) (Design length 20.251 Km.) in the Union territory of Jammu and Kashmir Package-1 of NH-244.

UNDERTAKING

It is hereby submitted that Muck generates during the Construction and Upgradation to 2 lane with paved Shoulder of road from design Chainage 31.449 (Khellani, Pariyot) to Km 51.700 (Prem Nagar) (Design length 20.251 Km.) in the Union territory of Jammu and Kashmir Package-1 of NH-244 will be dumped on approved designated muck disposal site. The state land has been designated for muck disposal and it will not affect any forest land.

Once the muck disposal site/land is filled up to brim i.e., the ground level, it will further be used by MoRTH/NHIDCL/Government of India, PSUs as Wayside Amenities/Road Furniture or further it can be used by any of UT/Govt of India for the purpose of public interest.

Divisional Forest Officer, Bhadarwah Seal

Divisional Forest Officer
Forest Division Bhadarwah

20/1/22

Signature of User Agency Office Seal

Range Officer
Kellar Range

Forest Range Officer
Forest Range Chiralla
HQ Thathri

Joint Inspection for Muck Dumping and Wayside Amenities

FOREST PROPOSAL NO. - FP/JK/ROAD/146187/2021

Project: Construction and Upgradation to 2 lanes with paved Shoulder of road from design Chainage 31.449 (Khellani, Pariyot) to Km 51.700 (Prem Nagar) (Design length 20.251 Km.) in the Union territory of Jammu and Kashmir Package-1 of NH-244

Area Proposed for Muck Dumping and Wayside Amenties on State/Government Land

(Non-Forest Land)

Sr. No	Muck Disposal/Wayside Amenities Pocket code	Length(m)	Area in Ha	Area in Kanal (local unit)	Nature of land	Remarks
1	MD-1	780	3.7272	73.6809	State	Width in meter is variable from one location to another location
2	MD-2	560	3.5366	69.9130	State	
3	MD-3	181	0.9664	19.1042	State	
Total			**8.2302**	**162.6982**		

The state land has been designated for muck disposal. All Muck disposal/wayside amenities points fall outside of Forest land and muck management plan of which has been prepared by user agency which stands verified by Under Signed.

Divisional Forest Officer, Bhadarwah Seal

Divisional Forest Officer
Forest Division Bhadarwah

Signature of User Agency Office Seal

20/1/22

Range Officer
Kellar Range

Forest Range Officer
Forest Range Chiralla
HQ Thathri

1. MUCK GENERATION

The project shall generate a total quantum of about **812000 m³** of muck. The details are given in the Table. The excavated rock from the road would be generally moderately hard to very hard; these include Volcanic Traps- basalts, phyllites, limestones and slates etc. Apart from hard component the soft material comprise overburden which is existing as debris upon the slopes on the road alignment. The theoretical excavated estimated quantities are below.

Table: Muck to be generated from Khellani-Chhatru-Khanabal road (Chainage Km 31.449(Khellani) to km. 51.700(Prem Nagar) Pkg-I

Description	Unit	Pkg-I
Road Component	m^3	812000
Total Quantity of Excavation	m^3	**812000**
Consumed Quantity	m^3	71292
Quantity for Muck Disposal	m^3	**740708**

1.1 Monitoring of Muck Disposal

It has already been made eloquent in the relevant muck management plan that the excavated material shall be evacuated from site with suitable usable muck to be utilized in project works by the project proponents and allowed to be used by private users and the non-usable muck is to be disposed off on designated areas so as not be interfere with either environment/ecology or the river flow regime. Thus, these is an imperative need to regularly monitor the quantum of muck generated and its disposal for which purpose the project concessioner shall furnish monthly statement of muck/debris disposal to project proponent (user Agency).

1.2 Sharing of Monitoring Results

The results of monitoring of various environment attributes either during or post construction would be shared by the monitoring agency, with the project proponents and other agencies of the Government as and when required. Monitoring agency may disseminate the results in any other forms.

2. MUCK MANAGEMENT PLAN

2.1 GENERAL

For construction of different components of Khellani-Khanabal-Chattru-Kishtwar Road to be evacuated, disposed of and roller compacted or laid on mild slopes 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 scientifically planned to keep in view the pecuniary aspects necessitating nearness to the generating component of work, which understandably reduce the travel time of dumpers, interference to surface flow and ground water aquifer, and disposition of habitation. In the present case, the total quantity of muck / debris, to be generated due to the project, shall be 8.12 lac cum, out of which 0.71 lac cum shall be consumed on

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Forest Division Bhadarwah

Range Officer
Range

General Manager (P)

Forest Range Officer
Forest Range Chiralla
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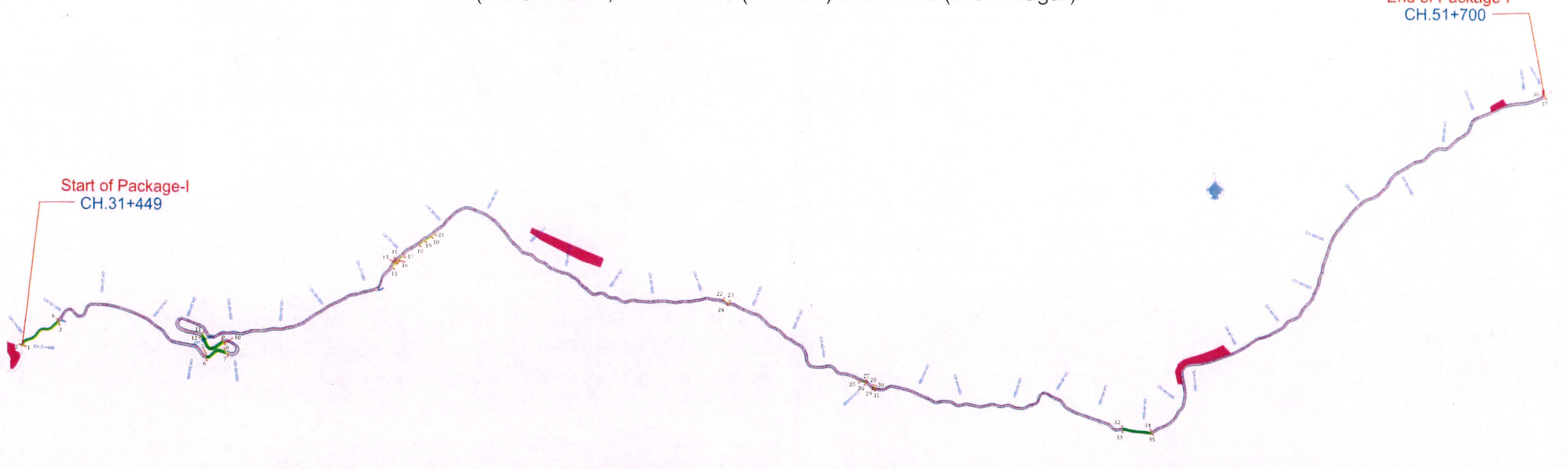
PROJECT LAYOUT PLAN

(PACKAGE-I, Ch:-31+449 (Khellani) to 51+700 (Prem Nagar)



Sr. No	Name of District	Name of Village	Compartment No	Area in Hectare (Ha)	Length	Right of Way	Chainage Details	
							From	To
1	Doda	Paryote	001a/Marmat	0.94805	451	21.0212	31.449	31.900
2	Doda	Jangawar	001a/Marmat	0.11558	50	23.1156	33.700	33.750
3	Doda	Paryote		0.12594	50	25.1874	33.750	33.800
4	Doda	Paryote		0.33125	140	23.6605	33.800	33.940
5	Doda	Paryote		0.3364	120	28.0330	34.260	34.380
6	Doda	Paryote		0.05866	20	29.3275	34.380	34.400
7	Doda	Jangalwar		0.47565	172	27.6540	34.400	34.572
8	Doda	Sohanda	033/Chiralla	0.01985	80	2.4815	37.330	37.410
9	Doda	Sohanda		0.01409	65	2.1669	37.435	37.500
10	Doda	Sohanda		0.035	180	1.9444	37.700	37.880
11	Doda	Kehlote		0.02023	65	3.1129	41.215	41.280
12	Doda	Bhadra	032a/Chiralla	0.0252	65	3.8761	42.900	42.965
13	Doda	Shaja		0.09327	25	37.3060	43.050	43.075
14	Doda	Thalela	030/Chiralla	0.65579	290	22.6133	45.800	46.090
Total Land				3.25494	1773			

Point	UTM Co-Ordinate		Degree, minute and econd	
	Eating	Northing	Latitude	Longitude
1	548376.5337	3666112.009	33º -7' 57.529" S	75º -31' 7.093" W
2	548355.8068	3666115.429	33º -7' 57.643" S	75º -31' 6.293" W
3	548731.3121	3666341.368	33º -8' 4.919" S	75º -31' 20.829" W
4	548715.2215	3666354.754	33º -8' 5.356" S	75º -31' 20.21" W
5	550204.2233	3666003.564	33º -7' 53.708" S	75º -32' 17.608" W
6	550207.9327	3665976.475	33º -7' 52.828" S	75º -32' 17.746" W
7	550415.7654	3666017.71	33º -7' 54.132" S	75º -32' 25.775" W
8	550393.5601	3666055.182	33º -7' 55.353" S	75º -32' 24.926" W
9	550369.1135	3666151.854	33º -7' 58.496" S	75º -32' 24.001" W
10	550383.8427	3666128.221	33º -7' 57.726" S	75º -32' 24.565" W
11	550167.6222	3666220.023	33º -8' 0.743" S	75º -32' 16.238" W
12	550151.9706	3666196.66	33º -7' 59.987" S	75º -32' 15.63" W
13	552078.2873	3666870.887	33º -8' 21.553" S	75º -33' 30.112" W
14	552102.6078	3666921.24	33º -8' 23.184" S	75º -33' 31.061" W
15	552115.7438	3666932.529	33º -8' 23.548" S	75º -33' 31.571" W
16	552132.2371	3666946.305	33º -8' 23.992" S	75º -33' 32.21" W
17	552189.1512	3666986.104	33º -8' 25.275" S	75º -33' 34.415" W
18	552346.5186	3667092.823	33º -8' 28.713" S	75º -33' 40.511" W
19	552400.886	3667134.691	33º -8' 30.063" S	75º -33' 42.618" W
20	552469.4198	3667174.833	33º -8' 31.354" S	75º -33' 45.271" W
21	552499.0245	3667202.637	33º -8' 32.252" S	75º -33' 46.42" W
22	555396.1931	3666544.669	33º -8' 10.368" S	75º -35' 38.099" W
23	555455.1914	3666518.013	33º -8' 9.492" S	75º -35' 40.37" W
24	555438.9574	3666515.532	33º -8' 9.414" S	75º -35' 39.743" W
25	556766.2779	3665745.562	33º -7' 44.165" S	75º -36' 30.798" W

Point	UTM Co-Ordinate		Degree, minute and econd	
	Eating	Northing	Latitude	Longitude
26	556827.6084	3665724.971	33º -7' 43.485" S	75º -36' 33.16" W
27	556829.3143	3665732.01	33º -7' 43.713" S	75º -36' 33.228" W
28	556900.7761	3665687.076	33º -7' 42.241" S	75º -36' 35.975" W
29	556895.2381	3665681.249	33º -7' 42.053" S	75º -36' 35.76" W
30	556924.4122	3665676.745	33º -7' 41.901" S	75º -36' 36.885" W
31	556920.2698	3665667.033	33º -7' 41.586" S	75º -36' 36.723" W
32	559402.3962	3665278.075	33º -7' 28.477" S	75º -38' 12.42" W
33	559404.5682	3665256.169	33º -7' 27.765" S	75º -38' 12.498" W
34	559693.7208	3665242.961	33º -7' 27.279" S	75º -38' 23.653" W
35	559695.103	3665219.747	33º -7' 26.525" S	75º -38' 23.701" W
36	563624.9278	3668575.493	33º -9' 14.683" S	75º -40' 56.192" W
37	563634.6455	3668553.793	33º -9' 13.976" S	75º -40' 56.561" W

Component wise breakup

S.no	Component	Forest Land (Ha.)	Non-Forest Land (Ha.)
1	Road and Protection Works	3.2549356	45.4083
2	Wayside Amenities, Road furniture and Muck disposal	0	8.230004
Total		3.254936	53.638304

LEGENDS

- Forest land
- PROW
- Proposed Centre Line
- GPS Points
- Muck Disposal , Wayside amenties

GOVT. OF INDIA N.H.I.D.C.L.

ISSUE	DATE	AMENDMENT \ ISSUE DESCRIPTION	APPROVAL
R0	April-2021		

CLIENT
NATIONAL HIGHWAY & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
(MINISTRY OF ROAD TRANSPORT & HIGHWAY)
GOVERNMENT OF INDIA
NHIDCL BUILDING INFRASTRUCTURE - BUILDING THE NATION

CONSULTANT
TPF GETINSA EUROESTUDIOS
RAMÓN DE AGUINAGA, 8
28028 MADRID,SPAIN
RODIC CONSULTANTS PVT. LTD. (JV)
1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING
NEW DELHI - 110001 (INDIA)

Designed:
Drawn:
Checked:

PROJECT LAYOUT PLAN
(PACKAGE-I, Ch:-31+449 (Khellani) to 51+700 (Prem Nagar)

Scale - 1:20000

Project: Consultancy Services for Feasibility Study, Preparation of Detailed Project Report and providing pre-construction services for upgradation to 2 lane with paved shoulder from (i) Km44.500 to Km 142.00 of Chattroo Village & (ii) Km 235.00 (Valloo Village) to Km 269.00 (Khanabal) of Khellani- Kishtwar- Chattroo- Khanabal Section of NH 244 in the state of Jammu & Kashmir.

PROJECT LAYOUT PLAN
(PACKAGE-I)

Date	Project No.	Drawing No.	Sheet No
			A3

project work leaving 7.40 lac cum, to be disposed-off away from sites to make available the clear site for construction activities. The muck which is suitable for use as aggregate material for concrete on non-wearing surface, backfill concrete and for widening of the road shall be properly stacked. The muck unsuitable for use in concrete etc. shall be dumped on slopes and treated to mix and match with the surrounding environment with least change in landscape. During construction of the project, huge quantities of excavation will be carried out from the Road and shall be either roller compacted to provide stable terraces for erection of labour camps, job facilities and storage area, or dumped in designated areas to provide stable slopes.

2.2 Muck Disposal and Possible Sites

A huge quantity of muck (about 812000 m^3), which will be generated during the construction work, needs to be disposed off. The dumping of rock spoil can potentially be a cause for environmental problems and land degradation. It would cause landslides and be an aesthetical damage to the natural landscape.

All Highway works in India are to be in accordance with the MORTH specifications and guidelines of Indian Roads Congress (IRC). The MORTH specifications have special provisions towards protection of environment under Clause 501, Annexure A and the contractor is to satisfy these provisions. Apart from this there are provisions for control of erosion, drainage, dust suppression, borrow area and haul road management under relevant sections.

Provisions of clause 501 Annexure A, cover the environmental aspects regarding the disposal of the muck, etc. For example, it is unambiguously clarified that.

a. The contractor shall take all necessary measures and precautions to carry out the work in conformity with the statutory and regulatory environmental requirements.

b. The contractor shall take all measures and precautions to avoid nuisance or disturbance from the work.

c. In the event of any spoil, debris, waste, or any deleterious material from site being deposited on adjacent land, the same shall be removed and affected area shall be restored to its original state.

d. The contractor shall prevent any interference with supply/abstraction of water resources

e. Water used for dust suppression shall be reused after settlement of material in collected water

f. Liquid waste products to be disposed of such that it does not cause pollution

g. No debris is to be deposited or disposed into/adjacent to water courses Substantial quantity of muck can be put to various uses.

Table: Details Regarding the Utility of Muck Generated

Total Muck Generation	**812000 m³**
Re-use of Muck Quantity	71292 **m³**
Balance Muck Requiring Disposal	**740708 m³**

Depending upon the characteristics of the excavated material, it can be used for different purposes after appropriate sorting from the areas where it is dumped. The following can be the chief reuses:

- Producing aggregate for construction purposes. Basalts and limestones can be used. The use as backfill material, material for road, Bridge as well as material for filter and drainage layers is most suitable. If the material has sufficient quality for use as in sub-base layers or as mineral aggregates for concrete must be further investigated.
- Earth filling works. Slope debris material, slates and phyllites can only be used for unloaded/uncharged landfills.

Total Excavation	**Total Disposal**	**Identified Muck disposal (State Barren Land)**
812000 m3	740708 m3	162.6 Kanal
		82300 sq.m.(8.23 Ha)

Muck disposal site identify on Government (State Barren Land) for Muck Disposal of Khellani-Khanabal-Chhatru Road Project Packge-1 (Design Km.31.449 to Km. 51.700) on NH-244.

The muck to be generated shall have to be appropriately dumped in tips at various suitable locations so that it does not degrade the various elements of the natural environment. For final disposal of the material convenient locations have been identified viz-a-viz to environmental aspects. The most suitable locations for dumping the muck that would be generated from the Khellani-Chattru-Khanabal road section.

The details of Muck Disposal plan as **Annexure**

3. STABILIZATION OF DUMPED MUCK

The utilization and management of the remaining muck needs to be planned well in advance. The spoil tips must be built where flatter to moderate spaces is available enabling the tips to maintain an angle of repose. The efforts will be made to relocate and rehabilitate the material within short distances from sites of its generation. For the stabilization of the dumped muck, various engineering measures (construction of wire crate retaining walls, breast walls, sausage walls, gabions etc. wherever needed) and biological measures are recommended. All efforts should be made to find ways to dispose of the material in such a manner that negative impacts on the environment are avoided and it is washing away into the river water.

Spoil tips be spread and levelled. Stabilization of dumped muck through biological measures include adopting measures like turfing, resurfacing, and re-vegetating of exposed areas to grow a plant cover on it. Biotechnological approach is also currently in vogue as a restoration measure for the consolidation of unused dumped material to stabilize the same with vegetation by employing traditional method of

General Manager (P)
N.H.I.D.C.L.
PMU-Doda (J&K)

afforestation supplemented by modern biotechnological approach. The spoil tip areas are treated through turfing and afforestation of suitable plant species, using VAM-Vasicular Arbuscular Mycorrhiza-and nitrogen fixing bacteria. This method be also tried. Under this combined approach the fungi form partnership with plant roots. The fungus grows on and extends the reach of plant roots for water and nutritional requirements. The seedlings inoculated with VAM survive better after transplanting and grow faster in nutrient poor soils.

3.1 Implementation of Engineering & Biological Measures

As already explained engineering measures like providing of GI wire crates Gabion Wall, Retaining Walls and compaction of muck will provide stability to the profile of muck piles.

3.2 Engineering Measures

It has been observed that after excavation the disposal of muck creates problem as it is susceptible to scattering unless the muck disposal yards are supported with engineering measures such as retaining structures, crate walls and gabions. All the dumping sites need proper handling to avoid spilling of muck either on the adjoining and or into the river/stream/nallah water while dumping and in the post dumping stages. The muck disposal sites shall have to be developed from below the ground level by providing retaining wall with height of 4.0m - 6.0m including 0.75 m of buffer to avoid any rollover falling to the riverbed. 8 SWG GI wire crates for side protection with 10 cm x 10 cm mesh and dimension 1.15 m x 1.15 m x 1.15 m in multi tiers will be laid with 0.5 m wide offset, concurrently with the dumping of muck. After preparing the RCC wall at muck disposal site, the muck brought in dumpers shall be dumped and manually spread behind the wall in such a manner that rock mass is properly stacked behind the wall with minimum of voids. The muck pile shall be later rehabilitated by afforestation of herbs and shrubs. Geo-coir textile should also be provided on surface of muck piles where top surface is to be vegetated.

3.3 Biological Measures

Biological measures, however, require special efforts as the muck disposed in disposal yards will in general be devoid of nutrients and soil contents to support vegetation. The selection of soil for spreading over such an area would require nutrient profiling of soil for different base elements. Suitable admixture of nutrients would be done before placing the soil on the top surface of muck disposal areas to have administered growth of forest canopy.

3.4 Plantation Technique

In view of the peculiar site conditions particularly the soil conditions, the planting technique for all the categories of the plants must be very site specific and suited to the stress conditions as anticipated and discussed above. The planting substrates would need to be considerably improved to support the plants in their initial stages of establishment. The moisture retention capability, availability of nutrients and soil aeration, permeability and porosity would require intervention and assistance.

Multistore and multipurpose plantations are proposed to be raised on the muck dumping sites as also in roadside strips using grasses, shrubs and bushes in the under story and trees in the upper story. Nursery raised grass slips, seedlings of shrubs & bushes and tree species would be planted in the area combined with grass sowing in patches. In addition, cuttings of bushes and shrubs can also be planted to supplement the nursery raised stock, but this would substitute requirement of raising the nursery of these species. Intimate mixture of species would be avoided right at the planning stage and would be strictly followed during planting. Each patch should contain maximum of two species. Grasses would be mixed by groups in rows, shrubs, and bushes by group again in rows.

Grass slip planting and grass seed sowing would be done in strips at 0.10 m x 0.10 m spacing in the prepared staggered patches of 1 m x 0.5 m with a depth of 0.30 m. Soil mixture would be used while filling the patches. Balance dug up soil/muck will be stacked along the patch on the downhill side for rainwater tapping and enhanced percolation in the patch. Number of such patches in each hectare is proposed at 500.

Shrubs and bushes would be planted in elongated strips of 1.5 m x 0.5 m with a depth of 0.45m. Soil mixture would be used while filling the patches. Balance dug up soil/muck will be stacked along the patch on the downhill side for water tapping and better percolation in the patch. These would be staggered throughout the area numbering 500 per hectare. Each patch would have two rows of planting with staggered spacing between plants in a row as 15 cm and distance between rows as 15 cm.

Planting of trees would be done in contour staggered pits of 0.45 m x 0.45 m x 0.45 m size numbering 800 per hectare. Out of these 800 plants, about 200 plants per hectare are meant for planting along the periphery of the area. If the periphery gets filled up with lesser numbers, the remainder would be planted in the core/main area. Soil mixture would be used while filling the pits. Balance dug up soil/muck will be stacked on downhill side of the pit for trapping the rainwater and allowing it to percolate in the pit.

It is proposed to use soil mixture in the pits & patches consisting of soil imported from nearby areas mixed with compost or human or vermin-compost or all of these. The ratio for the mix would be 5 parts: Compost/manure 2 parts: Sand 2 part: and humus or vermin-compost 1 part. This will make nutrients available for the plants in the preliminary stages and help increase soil aeration, porosity & permeability and improved moisture available for the plants. The stabilization sites from the time of execution of biological measures would be protected with barbed wire fencing on 2m high RCC posts and provided with inspection paths. Since the muck dumping sites are being provided with either RCC walls or the wire crate (gabion) wall on the valley side (towards river) which is not negotiable by animals and human beings, fencing would not be required along the entire perimeter. Hence, it would be done on the vulnerable sections i.e., towards the hillside only. The proposed costs include nursery costs for initial planting and for mortality replacement. The biological measures shall be taken up towards the end of construction. The plantations would be maintained for a period of 5 years by irrigating the plantation

General Manager (P)
N.H.I.D.C.L.
PMU-Doda (J&K)

during dry seasons, mortality replacement and repair of fencing & inspection paths within the area. The task of irrigation would be performed by the watch & ward (chowkidar / rakha) provided in the cost estimate.

3.5 Species for Plantation

Afforestation with suitable plant species of high ecological and economic value and adaptable to local conditions will be undertaken at the rate of 800 plants per hectare in accordance with canopy cover requirement. The major plant species which can be used in the area shall belong to indigenous species.

4. ESTIMATED COST FOR MUCK MANAGEMENT

The estimated cost of these measures would be Rs. 0.54 Cr. This cost includes the cost of turfing of slopes, preparation of ground, spreading of manure, etc., providing 5 cm of soil cover and transportation and carriage. It also includes the Suitable engineer structure like Breast wall and Gabion Wall, cost of fencing, irrigation, watch and ward, etc.

4.1 Financial Requirement

The estimated cost of the relocation and rehabilitation of excavated material given below Table. The total cost of these measures will be Rs. **54.54 lakhs**.

Financial requirements for implementation of Muck Disposal Plan

S. No.	Item	Pkg-1 (Rs.in lakhs)
1	Engineering measures	37.30
2	Biological measures	17.24
Total		**54.54**

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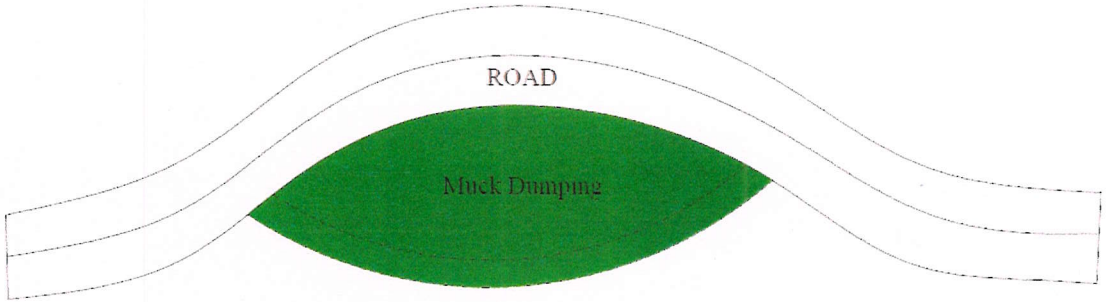
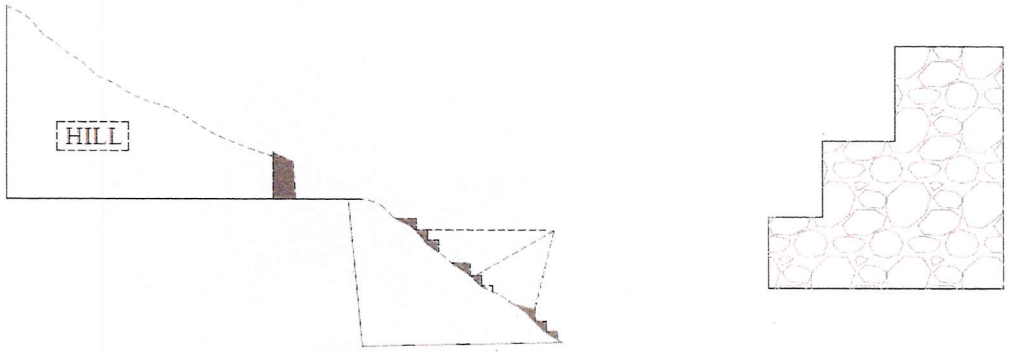
TYPICAL PLAN FOR MUCK DISPOSAL SITE





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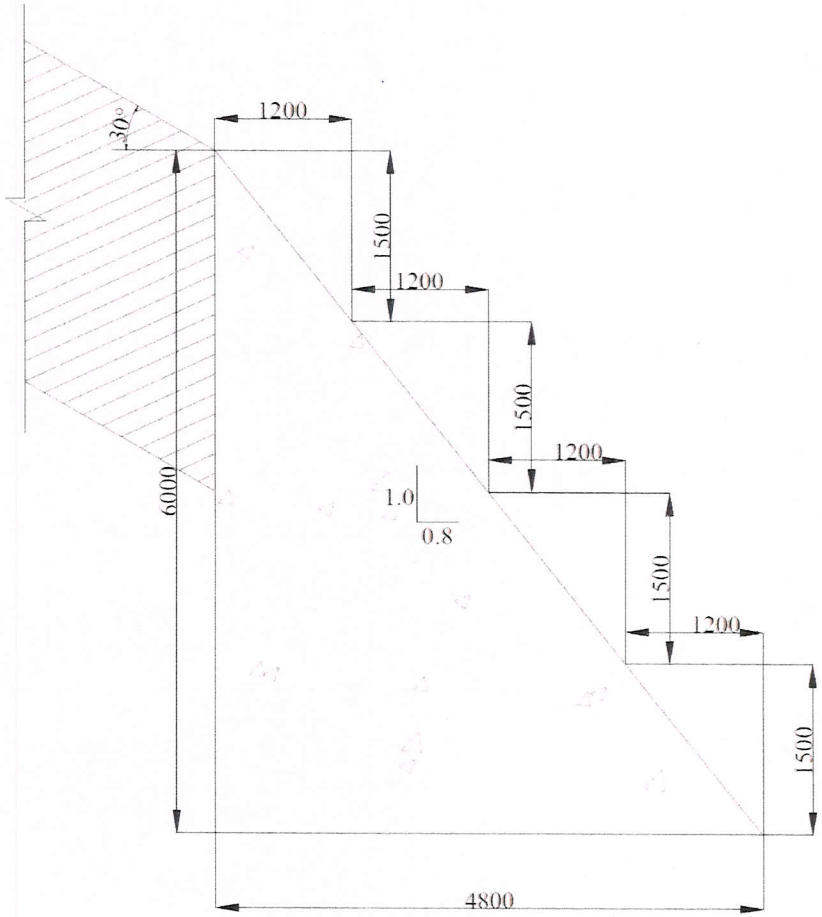
MONARCH

TYPICAL PLAN FOR DEVELOPMENT OF A MUCK DISPOSAL SITE FOR KHELLANI CHHATRU ROAD SECTION



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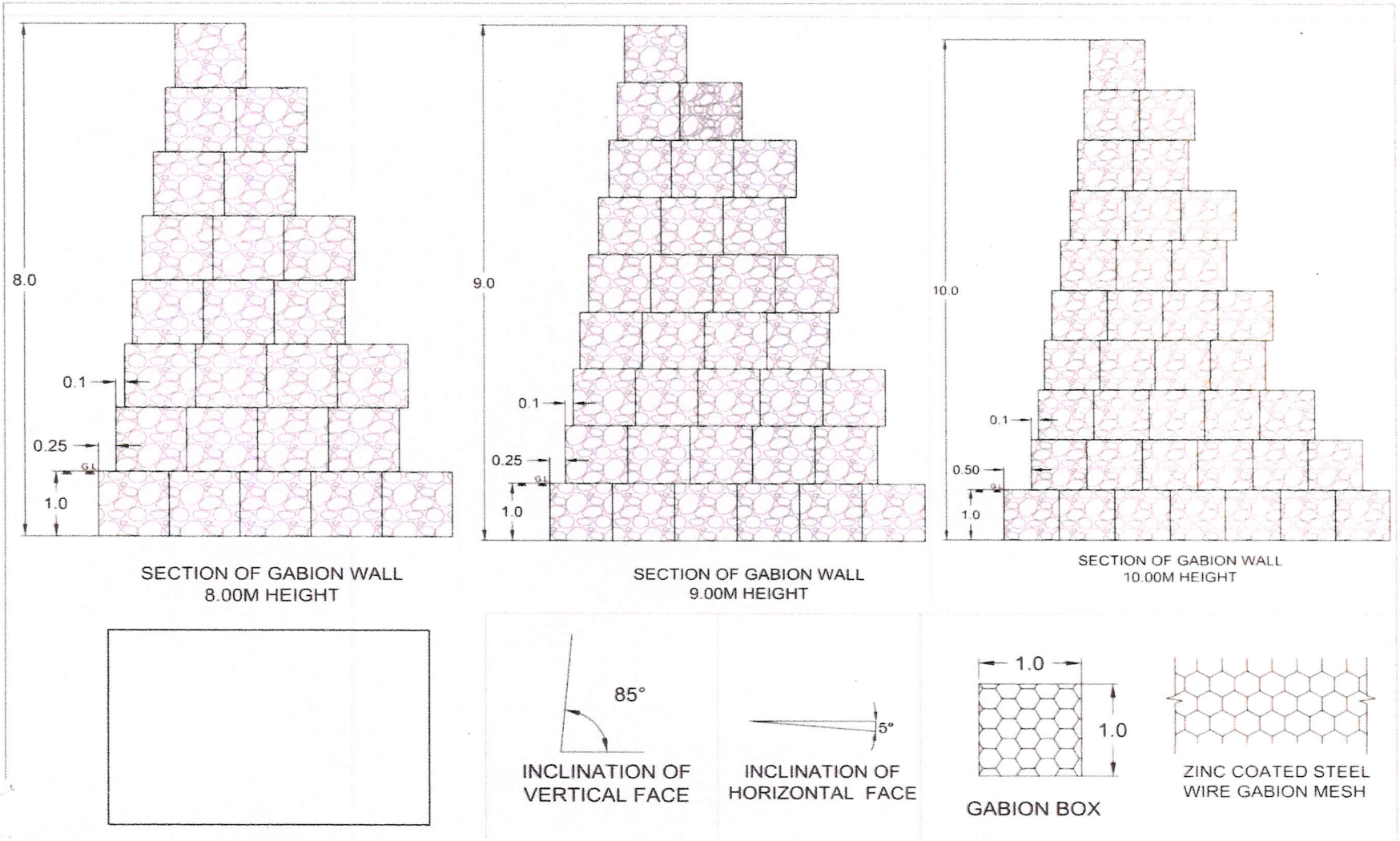

TYPICAL PLAN OF KHELLANI CHATTRU-KHANABAL

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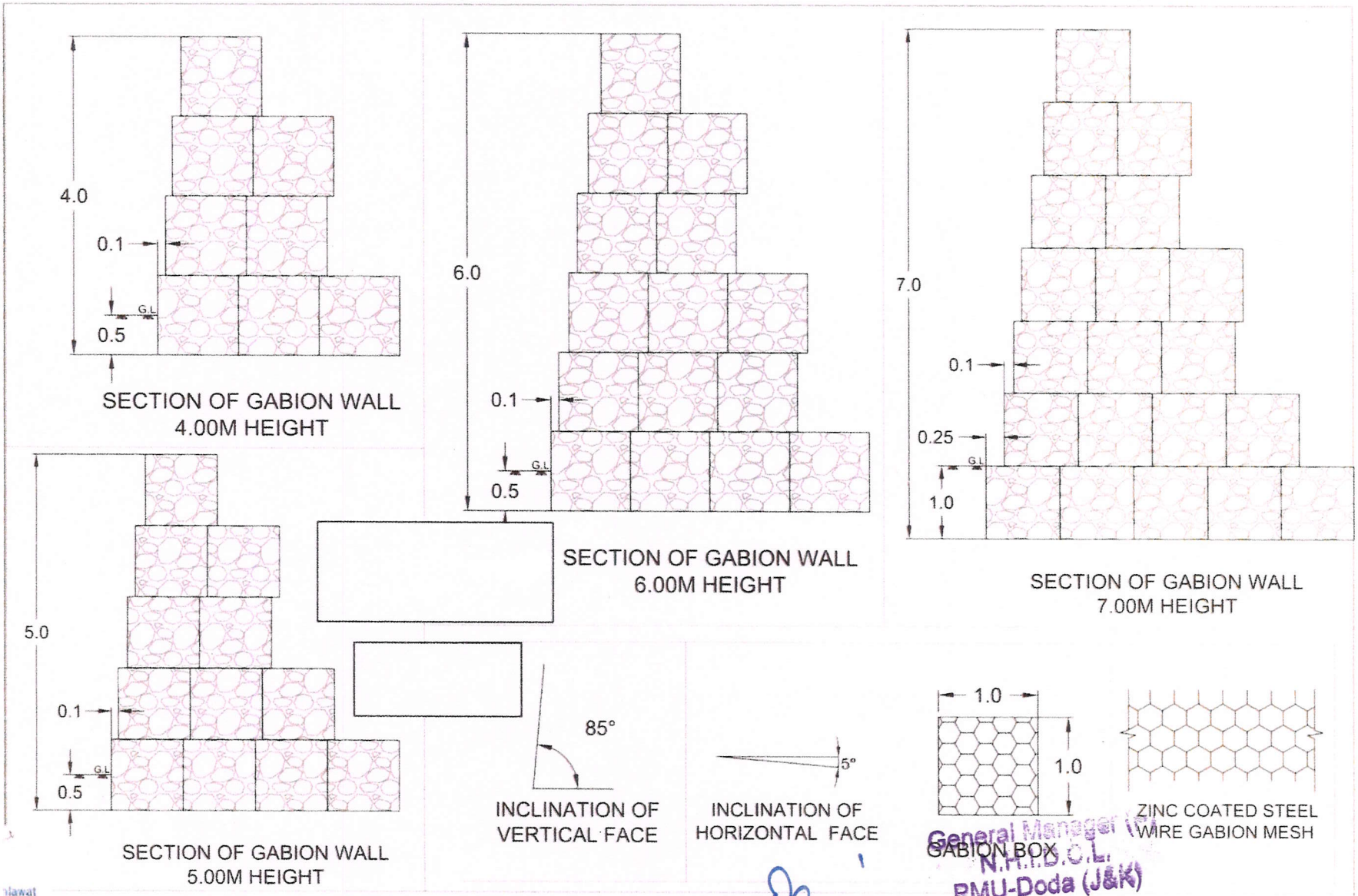

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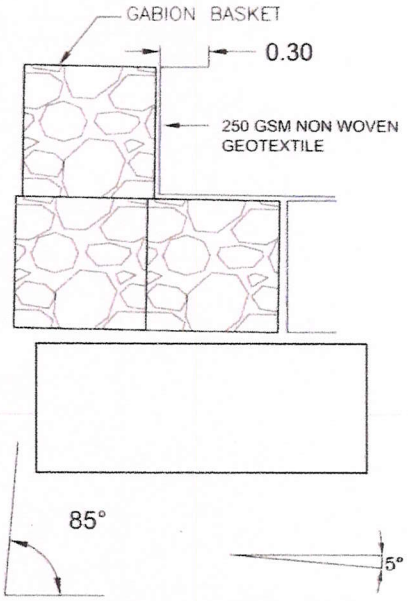
PMU-Doda (J&K)

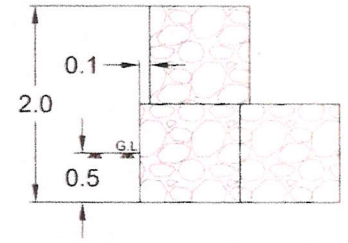
NOTES:

1. ALL DIMENSION ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED. LEVELS IN METERS.
2. MINIMUM DEPTH FOR EMBEDMENT AT BOTTOM SHALL BE 500MM FOR WALL HEIGHT 1 TO 6 M AND 1000MM FOR WALL HEIGHT ABOVE 6M.
3. MINIMUM DENSITY OF STONE (USING FOR GABION FILL) = 2.2 T/M^3
4. MINIMUM AND MAXIMUM SIZE OF STONE IS 1.5 TO 2.5 TIMES OF MESH OPENING.
5. CONSTRUCTION OF GABION WALL SHOULD BE AS PER THE IRC:SP:116-2018 AND MORTH 5TH REVISIONS.
6. BEARING CAPACITY SHOULD BE VERIFY AT FOUNDING LEVEL.
7. FORMATION LEVEL AND GROUND LEVEL SHALL BE VERIFIED AT SITE.
8. FOUNDATION SHALL BE ANCHORED IN FIRM STRATA.

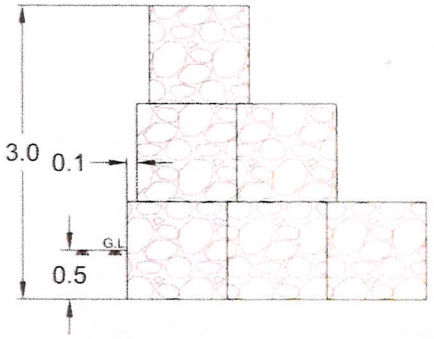


INCLINATION OF VERTICAL FACE

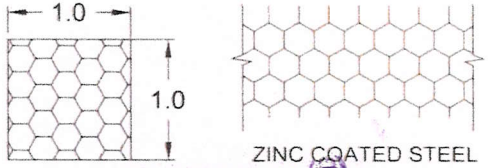
INCLINATION OF HORIZONTAL FACE



SECTION OF GABION WALL
2.00M HEIGHT



SECTION OF GABION WALL
3.00M HEIGHT



GABION BOX

ZINC COATED STEEL WIRE GABION MESH

General Manager (PA)
N.H.I.D.C.L.
PMU-Doda (J&K)