



एनएचपीसी लिमिटेड  
(भारत सरकार का उद्यम)  
**NHPC Limited**  
(A Govt. of India Enterprise)



Uri 1 Power Station,  
Gingle, Baramulla (J&K)  
Phone: 01956-253211  
CIN No.: L4010HR1975GOI032564

NH/UPS/HoP – Sectt/MDC/2022/262

Dated: 15.10.2022

**Undertaking for the PROPOSAL OF MUCK DISPOSAL/DUMPING SITES in  
respect of URI I Stage II HE Project J&K**

The land proposed for dumping sites for the construction of Uri I Stage II HE Project is already available with the Uri Power Project and the land is located at in and around the project area. However, a part of muck generated from the excavation works of the Project shall be utilised for some construction purposes of the Project. It is further to undertake that restoration works such as retaining wall, gabions, drainage works etc shall be provided in the dumping sites. The details of Khasra numbers of the NHPC revenue land available for proposed muck disposal site are attached as Annexure – 1. The google earth/digital map of the proposed muck disposal sites shall be part of EIA/EMP report which is under preparation. The restoration of dumping sites shall be taken up as per the approved Environment Management Plan of the Project.

Signature

Name: Naseer Shafi Bhat  
Uri I Stage II HE Project  
Gingle Baramulla

*Naseer Shafi Bhat*  
Naseer Shafi Bhat  
(Sr.) Manager (E)  
Uri Power Station  
NHPC Ltd. Gingle  
Baramulla (J&K) 191122



## Annexure-11

| Details of Land for proposed Dumping sites/ Facility/ Rock- shoal quarry for Uri stage -II |  |  |                                   |       |                        |                             |
|--|--|--|-----------------------------------|-------|------------------------|-----------------------------|
| Sr. no   | Location   | Purpose  | Area of Land<br>( Karnal - Marla) |       | Area of Land<br>( Sqm) | Area of Land<br>(in hector) |
|  |  |  | Karnal                            | Marla |                        |                             |
| 1  | SHEER1 ( i/c Fateh garh, Jogiyar & mundri nallah Approximately 16 km from Adit-1 ) | Shoal Quarry                                   | 45                                | 8     | 22966                  | 2.2966                      |
| 2  | KHADINVAR  | Facility Area                                  | 161                               | 10.75 | 81715                  | 8.1715                      |
| 3  | Naushera<br>(Approximately 5 km from Adit-1)                                       | Rock Quarry                                    | 117                               | 8     | 59388                  | 5.9388                      |
| 4  | Boniyar<br>(Approximately 1 km from Adit-1)  | Facility Area                                  | 781                               | 5     | 395200                 | 39.52                       |
| 5  | HILLER PEERNIA   | Dumping site area                              | 46                                | 16    | 23674                  | 2.3674                      |
| 6  | Lari   | Dumping site area                              | 16                                | 16    | 8498                   | 0.8498                      |
| 7  | Beia Salamabad   | Facility Area                                  | 22                                | 18    | 11584                  | 1.1584                      |
| 8  | Urabiua Sole area  | Dumping site area                              | 29                                | 15    | 15049                  | 1.5049                      |
| 9  | Mohaurai Mohaura terrace & Colony)   | Dumping site area/<br>Facility area            | 83                                | 17    | 42416                  | 4.2416                      |
| 10   | Banai Colony   | Facility Area                                  | 56                                | 7     | 28505                  | 2.8505                      |
| 11   | TRT Area ( Lagma)  | Facility Area                                  | 57                                | 2     | 39710                  | 3.971                       |
| 12   | Param Pillan   | Dumping site area( under control of Uri-II PS) | 186                               | 14    | 94442                  | 9.4442                      |
| 13   | Jabla Nalliah<br>(Approximately 9 km from Adit-6)                                  | Shoal Quarry                                   | 54                                | 11    | 27594                  | 2.7594                      |
| 14   | Haji Peer<br>(Approximately 8 km from Adit-6)                                      | Rock Quarry                                    |                                   |       |                        |                             |

Area is not Acquired

IS NOT ACQUIRED

Manager (E)  
Power Station  
NIPCC Ltd. Circle  
(H.)  
Date 01/05/2022  
Baranwalda (U.K.)  
Bharat H. S.  
S. P. S.  
S. P. S.

May-2022

Nepal



### 1.10 LAND REQUIREMENT

Total land requirement for Uri I Stage II H.E Project has been assessed 17.00 Ha as detailed in Annexure 19.3 which includes the land for Project components only. All the land required is for the underground component of Hydro – project and no overland / surface land is required to be acquired. All the 17.00 Ha land required are to be transferred from Forest Department. Project has already taken up the matter with Forest Department for transfer of land through Parivesh Portal. Details of Land available with Uri Power station for development of Project is given as below:-

**Details of Land under Uri power Station**

| Sr. no. | Location of Land                           | Kanaal | Marla |
|---------|--|--------|-------|
| 1       | SHEERI                                     | 6      | 3     |
| 2       | FATEHGARH                                  | 12     | 2     |
| 3       | BOGIYAR (For aggregate and sand)           | 27     | 3     |
| 4       | KHADINYAR (For aggregate and sand)         | 161    | 10.75 |
| 5       | KITCHAMA (For Explosive Magazine)          | 125    | 16.33 |
| 6       | GANTAMULLA PAYEEN (For NHPC Shumla Colony) | 8      | 12    |
| 7       | GANTAMULLA BALA (For widening of Road)     | 23     | 8     |
| 8       | CHEHAL (For Crusher plant)                 | 117    | 8     |
| 9       | NOWGRAN (Barrage)                          | 107    | 6     |
| 10      | PRINGLE (Barrage)                          | 61     | 13    |
| 11      | BONIYAR (For Barrage Office)               | 612    | 6     |
| 12      | HILLER PEERNIA                             | 120    | 2     |
| 13      | BELA SALAMABAD (Labor camp Bela)           | 22     | 18    |
| 14      | LARI (For Earthquake Victim)               | 50     | 4     |
| 15      | EHTISHAMPORA (For Parallel Road)           | 38     | 0     |
| 16      | BAGNA NOOR KHAN                            | 62     | 12    |
| 17      | URANBUA (Colony Area)                      | 106    | 15    |
| 18      | AZADPORA                                   | 23     | 5     |
| 19      | KANCHAN (For Parallel Road)                | 20     | 8     |
| 20      | NILOOSA (For Parallel Road)                | 5      | 14    |
| 21      | GINGLE COLONY AREA                         | 271    | 1     |
| 22      | GINGLE PARALLEL ROAD COLONY                | 23     | 11    |



URI I Stage II Hydroelectric Project (240 MW)



|    |                           |               |               |
|----|---------------------------|---------------|---------------|
| 23 | MOHRA                     | 83            | 17            |
| 24 | DAWARAN                   | 80            | 17            |
| 25 | BANDY BREHNA (Part A)     | 146           | 7             |
| 26 | BANDY BREHNA (Part C & D) | 150           | 11            |
| 27 | LAGAMA                    | 78            | 10            |
|    |                           | 2536          | 240           |
|    |                           | 12            |               |
|    | <b>Total</b>              | <b>2548</b>   | <b>Kanaal</b> |
|    |                           | <b>128.89</b> | <b>Ha</b>     |

128.89 Ha

*[Signature]*

श्री. यशवंत (सि.) & Manager (E)  
एन पी पी सी लि पावर स्टेशन  
एन. पी. पी. सी लि लिमिटेड NHPC Ltd. Gurgaon  
बल्लभ (ज. य. क.) Daranulla (G&K) 13312

## Section 10.6

# MUCK MANAGEMENT PLAN

### 10.6 MUCK MANAGEMENT PLAN

The proposed Uri-I Stage-II HE Project (240 MW) is the extension of Uri-I HEP (480 MW). Uri-I HEP is a run-of-river Hydro Electric Project, which was commissioned in 1997 by NHPC Ltd. and has been operating successfully since then. Uri-I Stage-II HEP is planned as per the provision kept in the Detailed Project Report (DPR) of Uri-I HEP. A parallel separate HRT is proposed to be constructed for Uri-I Stage-II HEP along with surge shaft, pressure shafts and a separate underground powerhouse (near the existing underground powerhouse of Uri-I Power Station) and TRT.

Muck generated from excavation of any project component is required to be disposed in a planned manner so that it takes the least possible space and is not hazardous to the environment. An account of the same has been given in the following paragraphs.

#### 10.6.1 Quantity Of Muck To Be Generated

The total quantity of muck expected to be generated has been estimated to be of the order of about **11,58,300 cum** of soil and rock excavation (**Table 10.27**). Total quantity of excavated muck (soil and rock) would have to be disposed in designated muck disposal area.

**Table 10.27: Detail of Muck Generated**

| S. No.   | Location                                   | Quantity (Cum)   |
|----------|--|------------------|
| <b>A</b> | <b>Quantity of Muck excavated</b>          |                  |
| 1        | HRT & Adits                                | 655800           |
| 2        | TRT, Surge Galleries & Adits               | 217500           |
| 3        | MAT and other Adits                        | 49500            |
| 4        | Surge shaft and construction Adits         | 48500            |
| 5        | Pressure Shaft                             | 24400            |
| 6        | Powerhouse Carvens                         | 162600           |
|          | <b>Total</b>                               | <b>11,58,300</b> |
| <b>B</b> | <b>Quantity to be utilized</b>             | <b>2,80,000</b>  |
| <b>C</b> | <b>Quantity of Muck to be Disposed off</b> | <b>8,78,300</b>  |

Source: NHPC Ltd.

#### 10.6.2 Dumping Sites

The identification of muck disposal areas is done in line with the topographic and site-specific conditions. Muck is to be dumped in 5 pre-identified sites (**Refer Figure 10.28**). The total area of these sites is **16.90 ha**.

**Table 10.28: Detail of Muck disposal sites**

| S. No. | Dumping Yard | Location                    | Area (Ha)    | Capacity (Cum) |
|--------|--------------|-----------------------------|--------------|----------------|
| 1      | D1           | Lari dumping site           | 0.85         | 67984          |
| 2      | D2           | Hiller Peernia dumping site | 2.37         | 118370         |
| 3      | D4           | Mohura dumping site         | 4.24         | 508992         |
| 4      | D5           | Param Pillan dumping site   | 9.44         | 1416630        |
|        |              | <b>Total Area</b>           | <b>16.90</b> | <b>2111976</b> |



### **10.6.2.1 Criteria for Selection of Dumping Sites**

Based on the geological nature of the rocks and engineering properties of the soil, a part of the muck can be used as construction material. However, the balance requires being suitably disposed. In the proposed project only **1158300 cum** of muck generated from soil and rock excavation.

Out of 1158300 cum, a total quantity of **878300 cum** is to be disposed at muck disposal sites in a total area of **16.90 ha**. Rest 280000 cum will utilize as construction material.

The following points were considered and followed as guidelines for finalization of the areas to be used as dumping sites:

- i) The dumping sites have been selected as close as possible to the project area to avoid long distance transport of muck.
- ii) The sites are free from active landslides or creep and care has been taken that the sites do not have a possibility of toe erosion and slope instability.
- iii) The dumping sites are either at higher level than the flood level or are away from the river course so that the possibility of muck falling into the river is avoided.
- iv) There is no active channel or stream flowing through the dumping sites.
- v) The sites are far away from human settlement areas.

The selection of muck disposal sites was done based upon site inspections and available best conditions of the land availability, land stability, accessibility from the portals, sloping pattern, minimum vegetative and tree cover, away from any ecological sensitive area, riverbed conditions and away from high flood levels of the Jhelum River and its tributaries. After surveys five suitable sites were identified (shown in **Figure 10.8**). The proposed locations are spread over a land area of **16.90 ha**. The total capacity of muck disposal areas is **21,11,976 cum**, more than the total quantity of unused muck to be disposed. The unused excavated material expected to be comprised of fragmented rock mixed with soil would be piled at an angle of repose around 30° at the proposed dumping sites. This will be done to provide stability to the slopes and also to provide ample space for planting trees, which would further help in holding and consolidation of the material stacked at the proposed dumping sites.

In order to maintain an angle of repose less than 30° at the proposed dumping sites, the slopes at dumping sites would be broken up by creating benches across the slope. This will be done to provide stability to the slopes and to provide ample space for planting trees, which would further help in holding and consolidating the material stacked at different sites. The description regarding the stabilization of the stacked material along the proposed roads has been discussed in the following paragraphs.

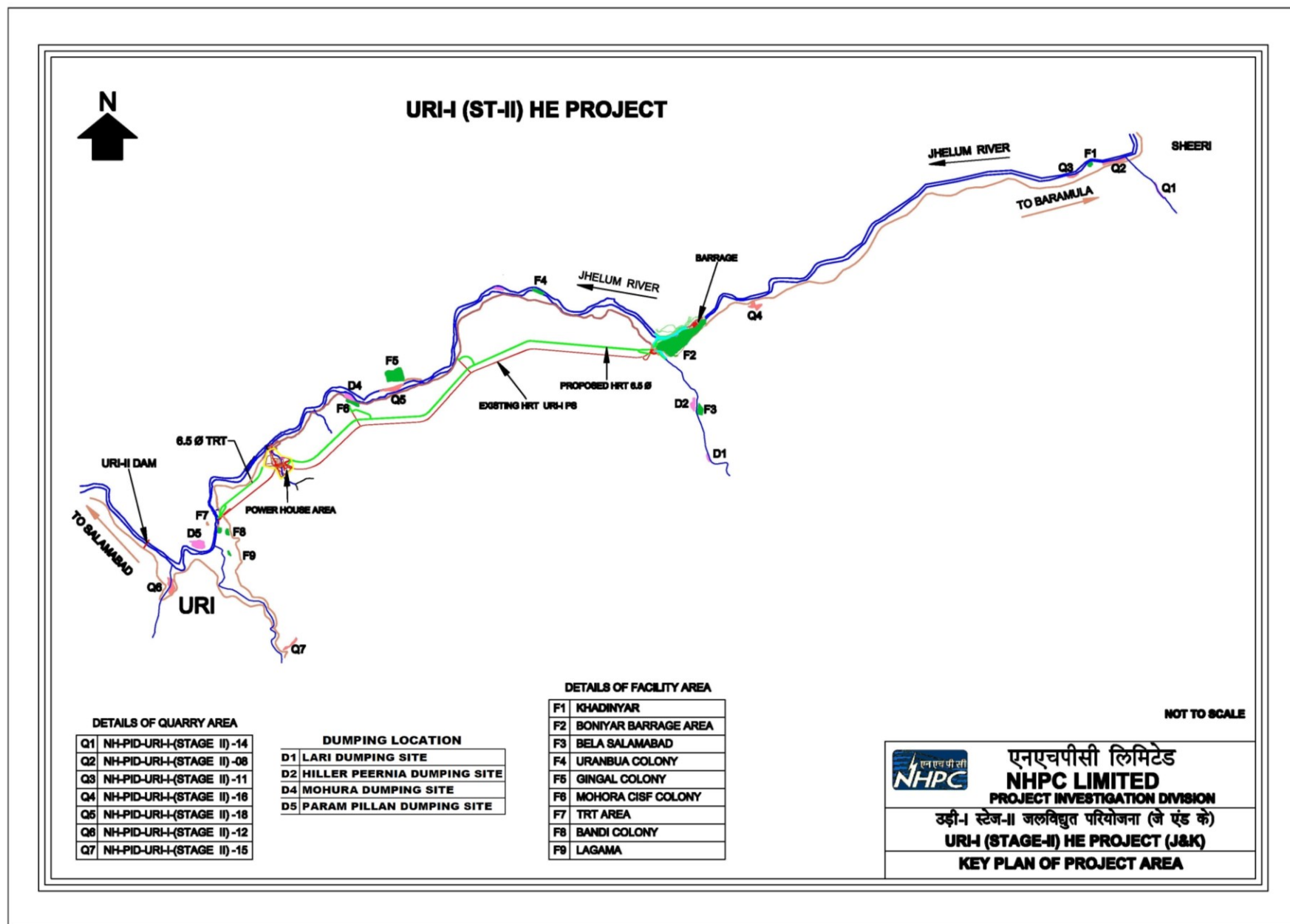


Figure 10.8: Map Showing location Map of Proposed Muck Dumping Sites

The options like dumping muck in stages and allowing it to consolidate/settle through the monsoon, compacting the dumped muck, zoning the dump judiciously to ensure the stability of 30° slope under all superimposed conditions will be utilized. The contour plan of proposed muck dumping sites are given at **Figure 10.9**.

The sites identified for dumping is under possession of NHPC and are utilized earlier for disposal of muck generated during construction of Uri-I Stage-I Projects. All the sites are planned on the banks of the nearest drainage and away from river HFL. The identified area is mostly gradually sloping near the riverbank. The drainage side bank of the area will be properly protected and stabilized with Retaining Walls of suitably designed sections (refer to **Figure 10.10A & 10.10B**).

### **10.6.3 Methodology Of Dumping**

The main objectives of process of muck dumping and restoration of these muck disposal sites are:

- to protect and control soil erosion;
- fencing around the designated muck dumping site;
- to create greenery in the muck disposal areas;
- to improve and develop the sites into recreational sites;
- to ensure maximum utilization of muck for the construction purposes;
- to develop the muck disposal sites/ dumping yards to blend with the surrounding landscape; and
- to minimize damages due to the spoilage of muck in the project area.

In Uri-I Stage-I HEP during identification of the dumping sites above mentioned aspects were kept in mind. All possible alternate sites were inspected and examined before rejecting or selecting any site. All the dumping sites:

- i) have minimum possible vegetation cover,
- ii) the settlement areas are far away from the identified dumping sites so as to have least impact on human life,
- iii) the proposed dumping sites are located at a minimum distance of 30m away from the HFL at these sites as all the dumping sites are at a higher level than the flood level from the river course to provide protection from high flood, and
- iv) the identified muck sites are close to the sites from where muck is to be generated to avoid hazards related to transport of muck to long distances.

#### **10.6.3.1 Dumping Process**

The generated muck will be carried in dumper trucks covered with heavy duty tarpaulin properly tied to the vehicle in accordance with best international practices. All precautionary measures will be followed during the dumping of muck. All dumpers will be well maintained to avoid any chances of loose soil from being falling during transportation. All routes will be periodically wetted with the help of sprinklers prior to the movement of dumper trucks. Dumping would be avoided during the high-speed wind, so that suspended particulate matters (SPM) level could be maintained. Further, dumping will be avoided during heavy traffic. After the dumping the surface of dumps will be sprayed with water with the help of sprinklers and then compacted.



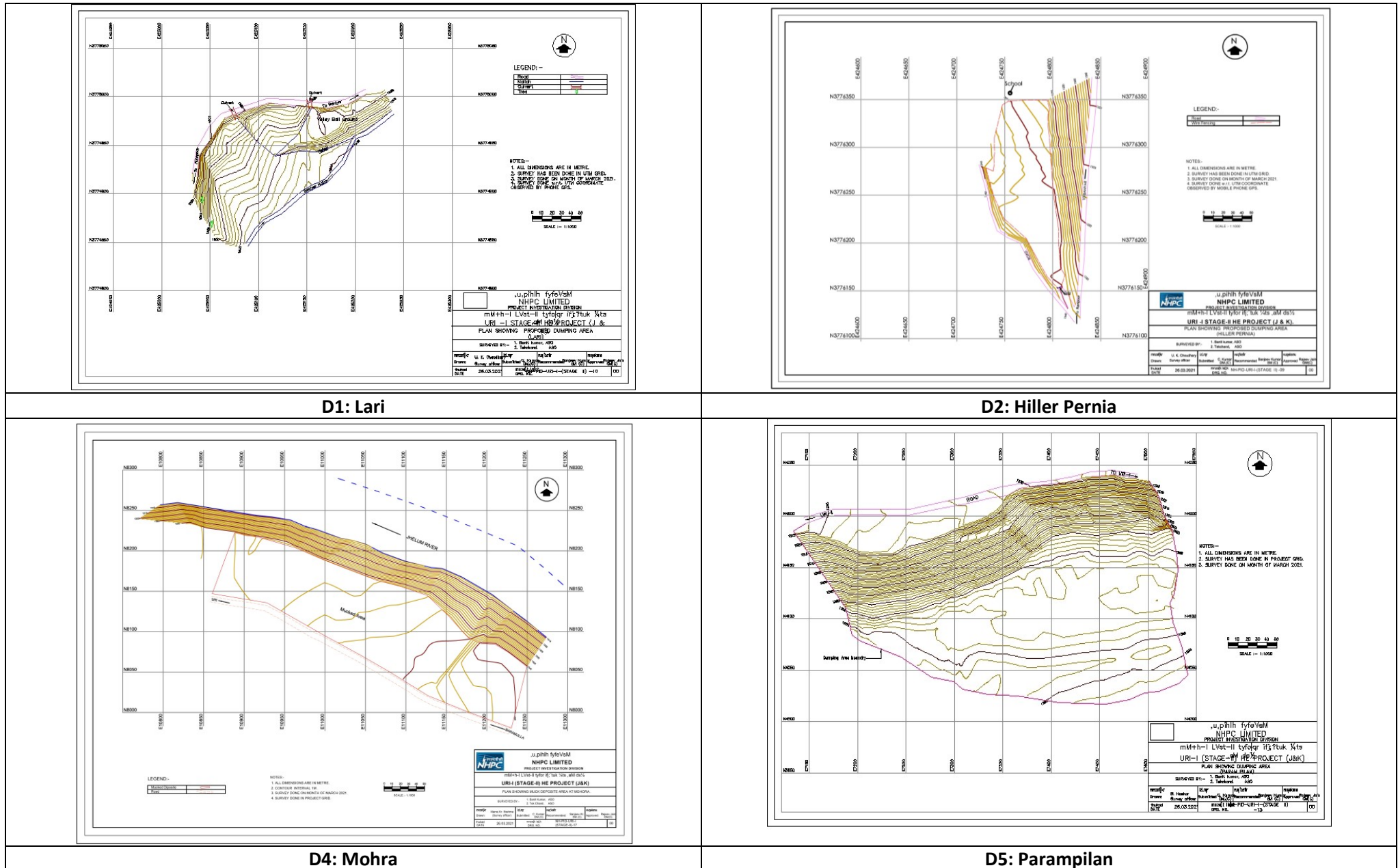


Figure 10.9: Layout of Muck dumping sites



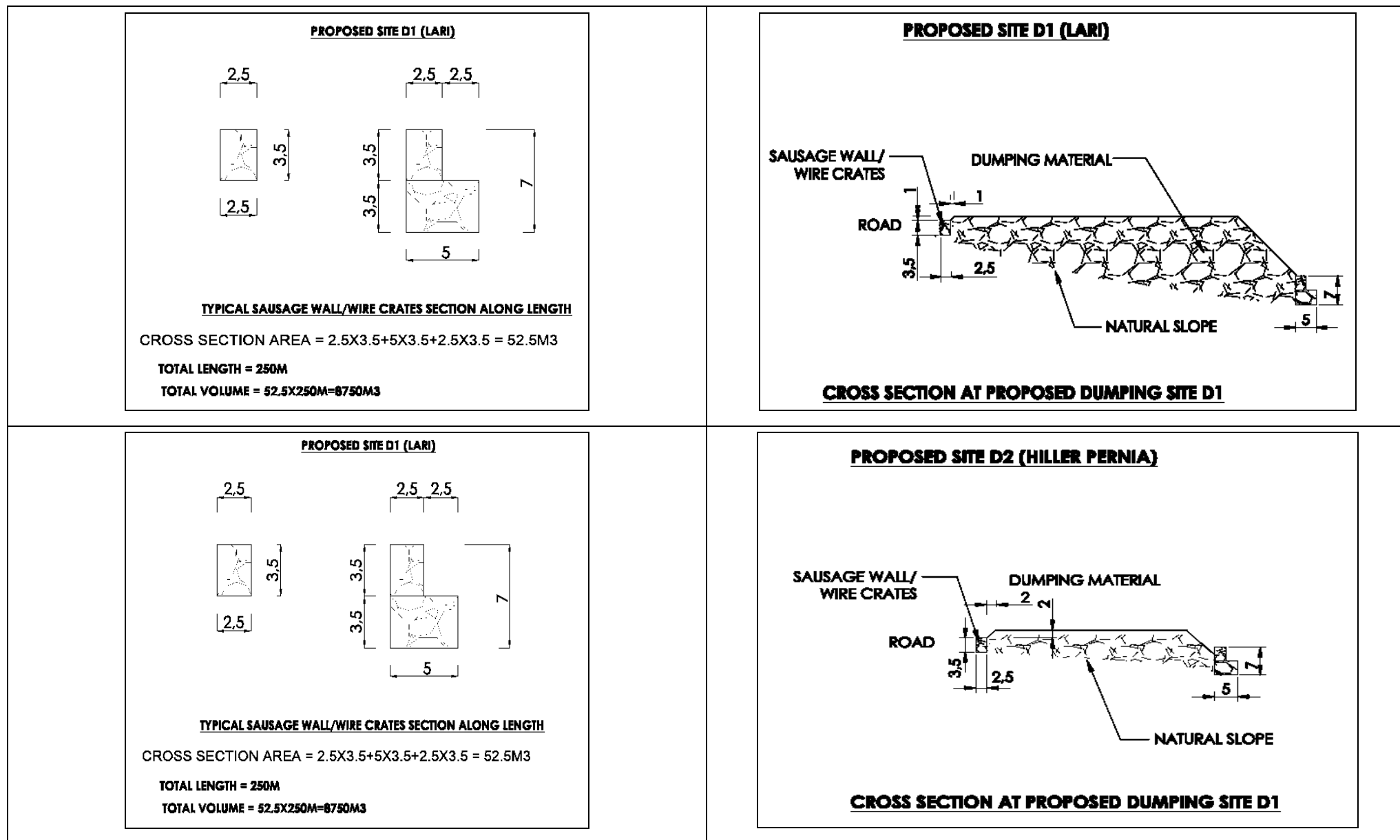


Figure 10.10A: Sections of muck disposal area (D1 & D2)



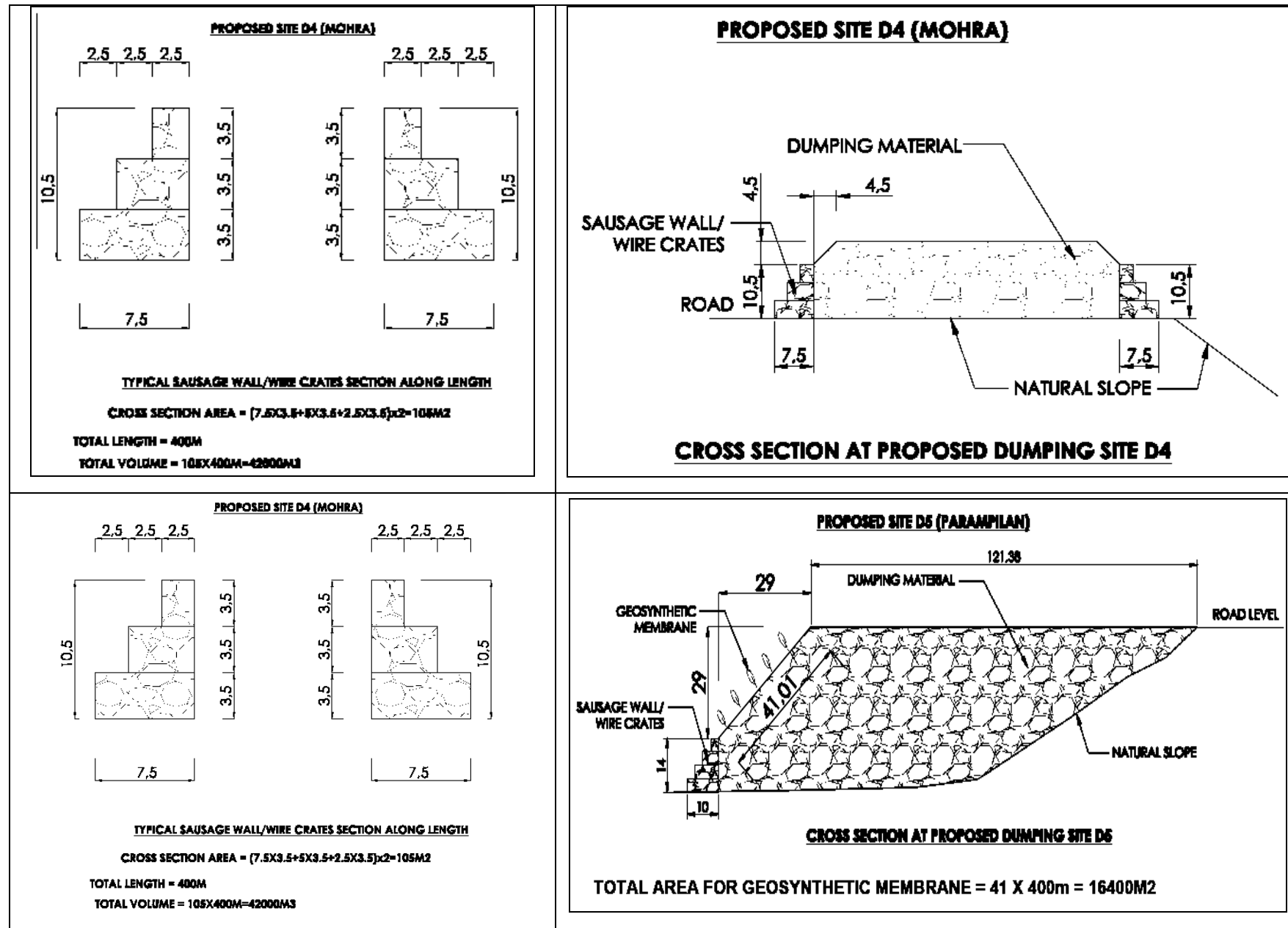


Figure 10.10B: Sections of muck disposal area (D4 & D5)



A retaining wall has been proposed to hold the muck on the lower part of the dumping site and shall be constructed prior to dumping of muck. Loose muck would be compacted layer-wise (**Figure 10.10a & 10.10b**). The height of Gabion Wall is proposed to be 6m on average. The muck brought by dumpers will be spread in layers behind the wire crate walls and then compacted by rollers till the top level is achieved. The retaining wall shall be laid with proper berm and the muck dumped behind it in layers and compacted by rollers. The process shall be repeated up to 50 cm level below the desired height which shall be laid with good soil for providing grass cover. At a regular vertical interval of 1.5 m and 3.0 m c/c masonry drains (catch water drains) shall be provided to drain off the rainwater. Proper fencing of the entire area will be done.

The muck disposal area will ultimately be covered with fertile soil and suitable plants will be planted adopting suitable bio-technological measures. The project authorities would ensure that the dumping yards blend with the natural landscape by developing the site with gentle slope, patches of greenery in and around them. These sites can also be developed later as recreational parks and tourist spots with sufficient greenery by planting trees.

The Rehabilitation plan of muck dumping sites includes engineering and biological measures. Most of the total unused excavated muck would be placed at an angle of repose to avoid any slippage of the muck at the proposed dumping sites. Slopes would be broken up by creating benches across the slope. This will be done to provide stability to the slopes and also to provide ample space for planting trees which would further help in holding and consolidating the material stacked at different sites. As stated earlier, efforts will be made to dispose of the muck within short distances from sites of its generation.

The capacity/volume of the muck dumping sites is more than the volume of the muck to be disposed. All measures would be adopted to ensure that the dumping of muck does not cause injury or inconvenience to the people or the property around the area. The spillage of muck into the river at any site would be prevented by making concrete retaining walls to retain the muck pile. It shall be ensured that dumping is carried out at a minimum distance of 30 m away from the active river bank. The top surface would be leveled and graded after the capacity of any dumping site is exhausted. The top surface will be covered with soil and grass seeding will be ensured to promote vegetation cover.

#### **10.6.3.2      *Rehabilitation Of Dumping Sites***

The project authorities would ensure that the dumping yards blend with the natural landscape to develop the sites with gentle slopes, bunds, terraces, and patches of greenery in and around them. These sites can also be developed later as recreational parks and tourist spots with sufficient greenery by planting ornamental plants. The re-vegetation of dumping yards through 'Integrated Biotechnological Approach' would be undertaken. It may be necessary to inoculate the spoil dumps for the development of landscape as the soils would be poor in nutrients. This can be developed through culture of microorganism or vermiculture practices at the nurseries developed for this purpose.

All the spoiled areas will be developed as per the latest technology of dumping. In addition, sprinkling of water may also be resorted to, if required to avoid or minimize dust pollution. A proper drainage system will be provided to ensure unobstructed flow of runoff. Planting suitable species of trees, shrubs and other biomass will also be initiated.

The following engineering and biological measures have been proposed for the development of spoiled areas.

#### **A. Engineering Measures**

For stacking of dumped material retaining wall is proposed to be built before dumping of any material on to the sites (refer Figure 10.7). In all total length of about 1300 running meters (rmt) of retaining walls (Sausage wall/ wire crates) would be required to be built wall (for details see table below).

| S. No. | Dumping Sites   | Length of Retaining Wall<br>(in Running meters) | Total Volume of Retaining Wall<br>(Cumec) |
|--------|-----------------|---|---|
| 1      | Dumping Site D1 | 250.0   | 8750                                      |
| 2      | Dumping Site D2 | 250.0   | 8750                                      |
| 3      | Dumping Site D4 | 400.0   | 42000                                     |
| 4      | Dumping Site D5 | 400.0   | 35000                                     |

In addition, leveling would also be done after dumping the material on every cycle and simultaneously improving the drainage of the disposal site. All the approach roads to various project structures will be constructed by employing the methodology recommended by National Highway with minimal environmental damage. The methodology consists in developing the formation width is half cutting and half filling, so that the materials obtained from cutting are utilized in filling. The excavation on hill side will be done to get a stable slope for the materials encountered. At places breast wall, gabion walls shall be done in natural slope to retain filled material, particularly where there is problem of retaining the hill slope.

To minimize the environmental damage, construction material like stones, sand, etc., required for the construction of road will be obtained mostly from the excavated material. In the streams, box culverts will be provided to prevent the erosion of nala bed. In addition, stone/concrete work on the downstream area will also be provided at vulnerable places to minimize erosion.

##### **i) Retaining Walls**

Total area for the dumping of muck is **16.90 ha** which can accommodate more than **21.0 lakh cum** whereas the estimated muck to be disposed is about **8.9 lakh cum**. The total length of retaining walls proposed to be constructed along the river at different muck dumping site would be about 2500 m. Total financial outlay for the retaining walls is **Rs. 2100.74 lakh** and details are given in **Table 10.29**.



**ii) Compaction & Levelling**

Compaction is an engineering measure, which would reduce bulk density of the muck thereby optimising the use of muck disposal area and would make it suitable for the plantation and other biological measures. Top surface would be levelled and graded to make the alternative use. The muck will be spread in 50 cm thick layers. Top surface would be levelled and graded to make the alternative use. On top a layer of soil would be spread to make the land suitable for plantation. The total cost for the process of compaction is **Rs. 25.00 lakh**.

**iii) Fencing**

Fencing is a bio-engineering measure. After rehabilitation of muck the dumping areas need protection for some time from disturbing by human and domestic animals. For this reason, fencing over the muck deposits is required. Barbed wire strands with two diagonal strands, clamped to wooden/ concrete posts placed at 3m distance are proposed around the dumping piles. Project authorities will establish temporary wind barriers around 3 sides of dumps in close of settlement area.

The muck is proposed to be filled in layers properly compacted. The cost of the same has been given in **Table 10.29**. In addition, catch water drains are also proposed to be built and levelling of soil would also be done after dumping the material on every cycle and simultaneously improving the drainage of the disposal site. The estimated cost of engineering measures would be **Rs. 2130.74 lakh**.

**Table 10.29: Cost of Engineering Measures**

| S. No.      | Description  | Qty (Cum) | Unit | Rate (Rs) | Amount (Rs in lakh) |
|-------------|--|-----------|------|-----------|---------------------|
| <b>I.</b>   | <b>Construction of Retaining Wall</b>  |           |      |           |                     |
|             | Protection Wall (Sausage Wall/ Wire Crates)  | 94500     | cum  | 2208.0    | 2086.56             |
|             | Geosynthetic membrane at site D5 (Param Pillan)  | 14350     | cum  | 50.0      | 7.18                |
|             | Contingencies and Fencing, etc. @ 0.5% of cost of works                                      |           |      |           | 7.00                |
|             | <b>Sub-total - I</b>   |           |      |           | <b>2100.74</b>      |
| <b>II.</b>  | Site Clearance for dumping area and compaction for different layers and levelling – Lump sum |           |      |           | <b>25.00</b>        |
| <b>III.</b> | Construction of drainages along periphery of muck disposal sites                             |           |      |           | <b>5.00</b>         |
|             | <b>Grand Total (I+II+III)</b>  |           |      |           | <b>2130.74</b>      |

**B. Biological Measures**

Top surfaces and slopes of all dumping areas would be left and will be treated for the purpose of plantation. Vegetation cover controls the hydrological and mechanical effects on soils and slopes. Therefore, biological measures to stabilize the loose slope are essential. In order to implement the biological measures in dumping areas the following activities would be taken into account. The biological measures include the following:

**i) Soil treatment**

Muck dumped at various sites is not considered to be nutrient rich as it is excavated from tunnels and other structures. In order to make it suitable for the plantation it will be provided

bio treatment. The work plan will be formulated for re-vegetation of the dumping sites through Integrated Biotechnological Approach.

## ii) Plantation

After the completion of muck dumping process and compaction the area will be available for the plantation. In order to stabilize the stacked dumped material, vegetation cover would be provided to hold dumped material over a period of time. Following steps are envisaged:

- Plantation of suitable tree species and soil binding using bio-fertilizer technology.
- Turfing of the exposed area and improvement of environment with fast growing and ornamental species.
- Protection with mechanical support.
- Biological fencing.

After consultation with officials of forest department, suitable plant species will be planted to restore the dumping sites. The selected species will be planted after their nurseries have been developed. The dumping areas are very small; therefore, separate nursery would not be required. The temporary nursery developed for the implementation of Greenbelt Development Plan can be used for the rehabilitation of dumping areas. The provision of temporary nursery with financial estimates has been kept under Greenbelt Development Plan (refer section 10.9.7). Nearly 1-2 years old saplings would be used for the plantation. The plantation of suitable plant species of high ecological and aesthetic values which can adapt to local habitat will be undertaken with 800 plants per hectare depending upon the canopy cover required. The plantation can be carried out in lines across the area and slopes along the dumping sites. Grass and herb species would be used in the inter space of tree species. They will help in providing the continuous chain of support in retaining debris, reinforcing soil and increasing the infiltration capacity of the area.

The proposed measures would be carried out on an area of about 15.0 ha. The estimated cost of these measures would be **Rs. 57.42 lakhs**. This cost includes the cost of turfing of slopes, preparation of ground, spreading of manure, etc., providing 5cm of soil cover and transportation and carriage. It also includes the cost of fencing, irrigation, watch and ward, etc. (see Table 10.30).

**Table 10.30: Total financial outlay for the biological measures at dumping sites**

| S. No.       | Particulars                                     | Quantity    | Rate (in Rs.) | Amount (Rs. in lakh) |
|--------------|---|-------------|---------------|----------------------|
| 1            | Rolling of Muck                                 | Lump sum    |               | 20.00                |
| 2            | Pitting (size: 0.45 m x 0.45 m x 0.45 m)        | 14,400 pits | 50.00/pit     | 7.20                 |
| 3            | Manure and soil filling in pits                 | 14,400 pits | 5.00/pit      | 0.72                 |
| 4            | Transportation of plant material from nursery   | Lumpsum     |               | 12.00                |
| 5            | Turfing with grasses                            | 5000 sq. m  | 50.00/sqm     | 2.50                 |
| 5            | Fencing, maintenance, watering, transport, etc. | Lumpsum     |               | 15.00                |
| <b>Total</b> |   |             |               | <b>57.42</b>         |



#### 10.6.4 Monitoring & Compliances

Muck shall be dumped from bottom in layers of 50-70 cm depending on size of boulders.

- i) Each layer shall be rolled compacted.
- ii) A layer of soil shall be spread on top of it to make it suitable for plantation.
- iii) Water testing facilities shall be set up for checking quality parameter of water.
- iv) Soil samples shall be regularly collected and tested for checking the level of contamination.
- v) Prescribed norms and approvals will be sought from APSPCB wherever necessary.
- vi) All norms of related to muck disposal shall be complied with.
- vii) Design consultant shall be engaged for designing of retaining structures.
- viii) Plantation will carry out with consultation of forest department and shall be done on the reclaimed.
- ix) Native species of ecological importance shall be planted.

#### 10.6.5 FINANCIAL REQUIREMENT

The estimated cost of the relocation and rehabilitation of excavated material is given in **Table 10.31**. The total cost of these measures will be **Rs. 2188.16 lakh**.

**Table 10.31: Financial requirements for implementation of Muck Disposal Plan**

| S. No. | Item                 | Amount<br>(Rs.in lakh) |
|--------|----------------------|------------------------|
| 1      | Engineering measures | 2130.74                |
| 2      | Biological measures  | 57.42                  |
|        | <b>Total</b>         | <b>2188.16</b>         |