Annexure 8.6: Guidelines for Siting, Operation & Redevelopment of Borrow Areas

(A) Siting

Specific locations of borrow areas to be used will be identified by contractor based on the recommendations of the EIA report. In case the contractor or the concessionaire wants to open any new borrow areas other than mentioned in this report, then the selection and recommendations for borrow areas will be based on environmental as well as civil engineering considerations. Location of source of supply of material for embankment or sub-grade and the procedure for excavation or transport of material shall be in compliance with the environmental requirements of the MoEF, APRDC and as specified in IRC: 10-1961.

Certain precautions have to be taken to restrict unauthorised borrowing by the contractor and the concessionaire. No borrow area shall be opened without permission of the Engineer. The borrowing shall not be carried out in cultivable lands, unless and until, it shall be agreed upon by the Engineer that there is no suitable uncultivable land in the vicinity for borrowing or private landowners are willing to allow borrowing on their fields.

(B) Operation

To avoid any embankment slippage, the borrow areas will not be dug continuously, and the size and shape of borrow pits will be decided by the Engineer. Redevelopment of the borrow areas to mitigate the impacts will be the responsibility of the contractor. The contractor shall evolve site-specific redevelopment plans for each borrow area location, which shall be implemented after the approval of the Supervision Consultant.

Precautionary measures as the covering of vehicles will be taken to avoid spillage during transport of borrow materials. To ensure that the spills, which might result from the transport of borrow and quarry materials do not impact the settlements, it will be ensured that the excavation and carrying of earth will be done during day-time only. The unpaved surfaces used for the haulage of borrow materials will be maintained properly. Borrowing of earth shall be carried out at locations recommended as follows:

Non-Cultivable Lands: Borrowing of earth will be carried out upto a depth of 2.0 m from the existing ground level. Borrowing of earth shall not be done continuously. Ridges of not less than 8m width shall be left at intervals not exceeding 300 m. Small drains shall be cut through the ridges, if necessary, to facilitate drainage. Borrow pits shall have slopes not steeper than 1 vertical in 4 horizontal.

Productive Lands: Borrowing of earth shall be avoided on productive lands. However, in the event of borrowing from productive lands, under circumstances as described above, topsoil shall be preserved in stockpiles. The conservation of topsoil shall be carried out as described in section of this chapter. At such locations, the depth of borrow pits shall not exceed 45 cm and it may be dug out to a depth of not more than 30 cm after stripping the 15 cm top soil aside.

Elevated Lands: At locations where private owners desire their fields to be leveled, the borrowing shall be done to a depth of not more than 2 m or up to the level of surrounding fields.

Borrow pits along Roadside: Borrow pits shall be located 5m away from the toe of the embankment. Depth of the pit should be such that the bottom of the pit shall not fall within an imaginary line of slope 1 vertical to 4 horizontal projected from the edge of the final section of the bank. Borrow pits should not be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300 m. Small drains should be cut through the ridges to facilitate drainage.

Borrow pits on the riverside: The borrow pit should be located not less than 15m from the toe of the bank, distance depending on the magnitude and duration of flood to be withstood.

Community / Private Ponds: Borrowing can be carried out at locations, where the private owners (or in some cases, the community) desire to develop lands (mostly low-lying areas) for pisciculture purposes and for use as fishponds.

Borrow Areas near Settlements: Borrow pit location shall be located at least 0.8 km from villages and settlements. If unavoidable, they should not be dug for more than 30 cm and should be drained.

Table VI.1 : Probable Borrow Areaa along the Project Corridor

Sample no.	Name of Village	Material type	Site identification			Approximate Quantity (Cum)				Available Land / Terrain	Surrounding Land / Terrain	Remarks
			Nearest Chainage (Km.)	Left / Right	Offset from nearest Chainage (m)	Length (m)	Breadth (m)	Depth (m)	Total (Cum)			

(C) Criteria for Evaluation of Borrow Areas

i. Existing land use (Agricultural / Barren / Scrub / grazing / any other type)
ii. Vegetation / trees to be removed
iii. Erosion/degradation potential
iv. Distance and name of the nearest settlement
v. Distance from the nearest surface water body
vi. Drainage pattern of the area
vii. Distance of the nearest Reserve Forest (if any)
viii. Distance of the nearest Sacred Tree (if any)
ix. Distance from the nearest school / hospital / primary health center
x. Daily / Occasional use of borrow area by the community
xi. Any schemes or avenues for generation of income for adjoining community

(D) Documentation of Borrow Pit

Following checklist provides guidelines in order to ensure that redevelopment of borrow areas must comply with MoSRT&H, Clause 305.2.2.2 and EMP Requirement. The contractor must ensure that following data based must be documented for each identified borrow areas that provide the basis of the redevelopment plan.

- Chainage along with offset distance
- Area (in Sq m)
- Type of Access/width/kutcha/pucca etc from carriageway
- Soil Type
- Slope / Drainage Characteristics
- Water Table of the area or identify from nearest well etc/ask people
- Existing Land-use such as barren/agricultural/grazing land
- Location/Name/Population/Caste of Nearest Settlement/Community & distance from Borrow Area/Type and characteristics of settlement

- Daily / occasional use of the Borrow Area by the community, if any
- Identification of any other community facility in the vicinity of the borrow pit

(E) Guidelines for Stripping, Stocking, Preservation of Top Soil

During the excavation of the borrowing material contractor must ensure that the topsoil from all areas of cutting and all areas to be permanently covered shall be stripped to a specified depth of 150mm and stored in stockpiles. At least 10% of the temporarily acquired area shall be earmarked for storing topsoil. The stockpile shall be designed such that the slope does not exceed 1:2 (vertical to horizontal), and the height of the pile is restricted to 2m. Stockpiled will not be surcharged or otherwise loaded and multiple handing will be kept to a minimum to ensure that no compaction will occur. The stockpiles shall be covered with gunny bags or tarpaulin.

It shall be ensured by the contractor that the topsoil will not be unnecessarily trafficked either before stripping or when in stockpiles. Stockpiled topsoil will be returned to cover the disturbed area and cut slopes. Residual topsoil will be distributed on adjoining/proximate barren/rocky areas as identified by the Engineer in a layer of thickness of 75mm-150mm. Top soil shall also be utilized for redevelopment of borrow areas. Landscaping along slopes, medians, incidental spaces etc.

(F) Guidelines for Enhancement

As far as possible borrow area selected for enhancement shall be on government / community land in the vicinity of settlement. The contractor must ensure that any enhancement design proposed should be workable, maintenance free and preferably worked out in consultation with the community and proposed enhancement materials should be locally available. The borrow area can be developed either of the following:

Vegetative Cover:

- Vegetative cover must be established on all affected land.
- Topsoil must be placed, seeded, and mulched within 30 days of final grading if it is within a current growing season or within 30 days of the start of the next growing season.
- Vegetative material used in reclamation must consist of grasses, legumes, herbaceous, or woody plants or a mixture thereof.
- Plant material must be planted during the first growing season following the reclamation phase.
- Selection and use of vegetative cover must take into account soil and site characteristics such as drainage, pH, nutrient availability, and climate to ensure permanent growth.
- The vegetative cover is acceptable if within one growing season of seeding:
- The planting of trees and shrubs results in a permanent stand, or regeneration and succession rate, sufficient to assure a 75% survival rate;
- The planting results in 90% ground coverage.
- The site shall be inspected when the planting is completed and again at one year to ensure compliance with the reclamation plan.

Certificate of Completion of Reclamation

- Contractors have to obtained certificate of satisfaction from the landowner and submit it to the Engineer before final payment is to done.

(G) Working Plan

The contractor must prepare a working plan before enhancing the identified borrow areas. Following are the inputs that provide the guidelines to the contractor to formulate the working plan:

- Access of Property / width of access / material
- Orientation of property with respect to the road
- Site Slope
- Local Drainage / water logging etc if any
- Location of nearest culvert etc if any to drain water if required
- Any other community resources such as tube well/well etc in vicinity
- Location of trees including Species / girth / foliage spread and afternoon shaded area on ground
- Surrounding land use; nearby settlements (name of structure/pattern of settlement)
- Mark on plan part of the borrow area, most suitable for storing and staking topsoil.

(H) Drawings to be Prepared

- The contractor have to prepared the drawings showing both cross-section as well as plan of the identified borrow areas incorporating following inputs:
- Contours if any, depth if any
- Location of trees, height, foliage spread and afternoon shaded area on ground
- Any other existing details at the road / property interface such as signage/railing/etc.
- Details of immediate surrounding for at least 5m on either sides

(I) Photographs to be Include

The contractor must ensure that photographs are to be taken before and after the excavation of borrow materials and also after the implementation of redevelopment plan, incorporating the following:

- Overall View from access side
- Any other community resource in the vicinity
- All spots to be detailed such as access to borrow pit /cluster of existing trees etc.

(J) OUTPUTS

The contractor must ensure based on the above-mentioned guidelines following outcomes must be evolved:

- Working plan
- Cross Section
- Longitudinal Section/Elevation of Site
- Details of all proposed Enhancements including signage etc.
- BoQ