Full Title of the proposal:- *Construction of **New 2 Lane with Paved Shoulder of Hamirpur Bypass of NH-88 (New NH-103)** (Design Chainage-Km.121+175 to Km.138+295, Design Length-17.120 Km) in the State of Himachal Pradesh under NH (O) on HAM Mode*

File No. : FP/HP/ROAD/151932/2022

Date of Proposal: 2 Feb 2022

DISPOSAL PLAN OF EXCESS EARTH QUANTITY

1. INTRODUCTION

The project envisages construction of new 2 Lane with Paved Shoulder of Hamirpur Bypass of NH-88 (New NH-103). As the project road does not involve any construction of tunnels, the quantity of material generated from construction of project road is not of much concern. As the project road is located in a hilly cum rolling terrain, the excess earth quantity generated from the construction is required to be disposed in a planned manner so that it takes least possible space and is not hazardous to the environment. It is of prime importance that these sites will have to be rehabilitated as soon as the disposal sites are full.

The excess cutting generated, disposal sites and adequate disposal and management guidelines have been discussed in the following sections.

2. EXCESS EARTH QUANTITY GENERATION

In the proposed project, debris generation is expected to be generated as an excess earth quantity left after utilization as filling quantity in the construction of bypass road . The component wise debris generation from the project activity is given in Table-1.

Table-1: Abstract of debris generated from Hamirpur Bypass

S. No.	Component	Road work	Quantity in cum
1.	**Quantity of Debris generated (Cum)**	Rock (10%)	1,09,748
		Soil (90%)	9,87,729
2.	**Quantity of debris due to swell factor (Cum)**	Rock (5%)	1,15,235
		Soil (5%)	1,037,115
3.	**Estimated Quantity of Debris Proposed to be utilized (Cum)**	Rock (39%)	45,122
		Soil (80%)	832,963.20
4.	**Balance quantity of Debris (Cum)**	Rock (61%)	70,113.00
		Soil (20%)	204,151.80
5.	**Effective Earth quantity to be dumped (Cum) with 15% compaction.**	Rock +Soil	**2,33,125**

Source-DPR Study

During construction of the various components of the project road, cutting material is generated from both soil and from rock excavation. Total quantity of debris, generated from the project, shall be 10,97,477 cum which shall amount to 11,52,350 cum with swell factor. Out of the total cutting quantity generated, 8,78,085.20 cum shall be utilized on project work leaving 2,33,125 cum of excess earth quantity to be disposed after rolling at designated area earmarked for

disposal. The debris generated is proposed to be utilized in road activities such as earthwork embankment, subgrade, backfill and pavement layers depending on suitability of the material. The designated disposal area shall also be properly protected and stabilized with retaining walls/gabion walls of suitable designed sections.

3. DISPOSAL SITES

9 disposal sites with total area of 4.0503 Ha have been designated for disposal of excess earth cut quantity after filling from the proposed project. The details of disposal sites along with their capacity are given in **Table-2.**

Table-2: Details of Disposal Sites

Diposal Site No.	Chainage	Village	Plot No.	Forest Area (in Ha.)	Non-Forest Area (in Ha.)	Total Area (In Ha.)	Capacity of Sites in Cum	Volume of debris to be disposed (in Cum)
D1	123+500	Lahar	169/1	0	0.2226	0.2226	9193	233125
D2	123+600	Lahar	168/1	0	0.7614	0.7614	80826	
D3	124+420	Jassaur	269/1	0.6180	0	0.6180	29525	
D4	129+850	Khaggal	799/2	0	0.1175	0.1175	608	
D5	130+100	Khaggal	813/4	0	0.5552	0.5552	30285	
D6	130+180	Khaggal	813/3	0	0.4478	0.4478	12748	
D7	130+000	Khaggal	781/2	1.0196	0	1.0196	86691	
			781/3	0.1148	0	0.1148		
D8	130+020	Khaggal	807/1	0	0.0883	0.0883	2871	
D9	130+680	Baleta Kalan	190/2	0	0.1051	0.1051	608	
				1.7524	**2.2979**	**4.0503**	**2,53,355**	**2,33,125**

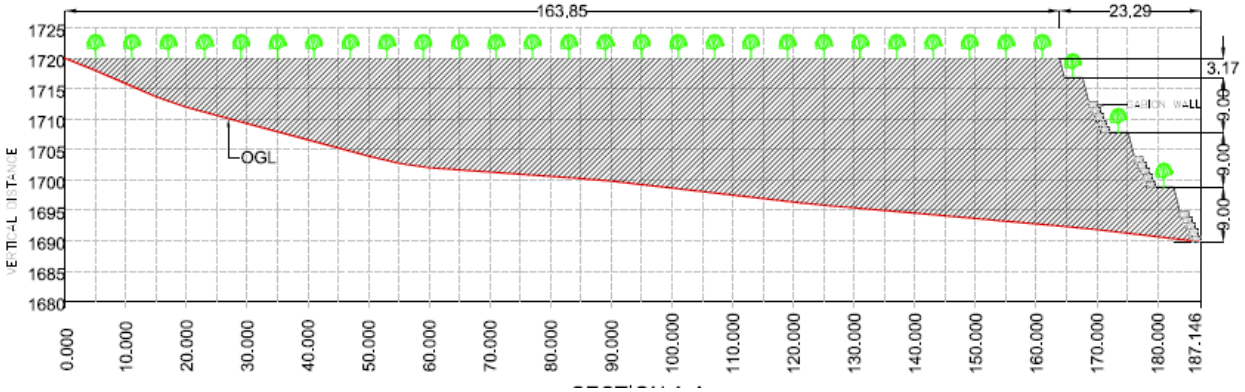
It may be seen from the Table above that the capacity of the area earmarked for disposal is 2.53 lakh cum and the volume of excess earth quantity to be disposed off after utilization is 2.33 lakh cum. This states that the capacity of the disposal sites exceeds the generated volume. All the disposal locations shall be well supported by retaining structures and suitable slope protection measures. The location of the disposal sites marked on SOI Toposheet is enclosed as **Annexure I.**

Stabilization of disposal site

The loosely held debris can lead to the rise in SPM levels and sedimentation load. Therefore, it requires stability with appropriate methods to avoid the subsequent ecological problems. The debris disposal involves both engineering and biological measures that depend on the eco-climatic conditions.

I) Engineering Measures:

The material shall be disposed off in the sites in terraces and the slopes shall be protected with multiple gabion walls of height 5m as per the elevation profile as given in the figure below.



The Disposal Plan of all the sites along with elevation profile and location of gabion walls is enclosed as **Annexure II.**

II)Biological Measures:

Vegetation cover plays a very important role in holding the dumped material over a period of time and controls the hydrological and mechanical effects on the soils and slopes. Special efforts will be required to raise vegetation cover of grasses, shrubs and trees. The local grass sodding should be done on the debris when grass seed will be germinating and the grass will add humus to the dumped material.

Soil conservation and quick growing species to be planted to stabilize the slope - *Agave sislana, Berberis aristata, Bauhinia vahilii, Jasminum humile, Rubus ellipticus, Prinsepia utilis, Justicia adhatoda, Ipomea carnea, Hypericum oblongifolium, Mimosa himalayana, Salix denticulate, woodfordia fruticosa, Alnus nepalensis* etc.

Guidelines on disposal Management

1. Fencing shall be done to prevent human / animal interference
2. Dumping shall not obstruct the natural drainage pattern
3. Trees shall be retained along the contours wherever feasible so as not to disturb the natural slope.
4. Protection walls shall be constructed along the contours prior to dumping
5. Debris shall be carried in dumper trucks covered with heavy duty tarpaulin properly tied to the vehicles
6. Dumping may be avoided during the rainy season, to avoid slipping of debris while dumping
7. Top soil shall be stripped wherever feasible to a specified depth of 150 mm and stored in stockpiles of height not exceeding 2 m in height and used for landscaping.
8. All disposal sites shall be properly landscaped when the disposal gets completed so as to merge it in the natural surroundings.

4. RESTORATION PLAN

Once the dumpsites are filled, these sites shall be rehabilitated by covering it with 15 com fertile top soil and planting local species of trees and shrubs in consultation with the forest department so that the landscape is in harmony with the surrounding environment.

The afforestation with indigenous plant species of high ecological and economic value which

can adapt to local habitat will be undertaken in consultation with the forest department depending upon the canopy cover required. Major tree and shrub species which would be planted are listed in table below.

Botanical Name	**Common Name**
Azadirachta indica	Neem
Bauhinia variegata	Kachnar
Bauhinia purpurea	Kachnar
Delonix regia	Gulmohar
Quercus leucotrichophora	Banjh Oak
Mallotus philippensis	Kumkum
Acacia nilotica	Babul
Terminalia arjuna	Arjun
Cassia fistula	Amaltas
Cedrela toona	Tun
Pinus roxburghi	Chil
Melia azadirachta	Dhek
Terminalia chebula	Harad
Dalbergia sissoo	Indian Rosewood
Ficus rouxburghii	Demur
Alnus nepalensis	Nepal Black Cedar

• • •

End of Project
Km.138+295

D6
X : 639344.518
Y : 3505926.598

D7
X : 639518.136
Y : 3505987.56

D8
X : 639529.664
Y : 3505901.296

D3
X : 644197.825
Y : 3503898.032

D9
X : 637576.116
Y : 3506864.411

D1
X : 645016.474
Y : 3504305.03

D5
X : 639402.835
Y : 3505886.462

D4
X : 639596.719
Y : 3505753.055

D2
X : 644914.589
Y : 3504289.488

Start of Project
Km.121+175

Legend

- Chainage
- Alignment
- PROW
- Mucksite

0 0.4 0.8 1.6 Kilometers

Project :

Construction of New 2 Lane with Paved Shoulder of Hamirpur Bypass of NH-88 (New NH-103 & 03)
(Design Chainage-Km.121+175 to Km.138+295, Design Length-17.120 Km) in the State of Himachal Pradesh

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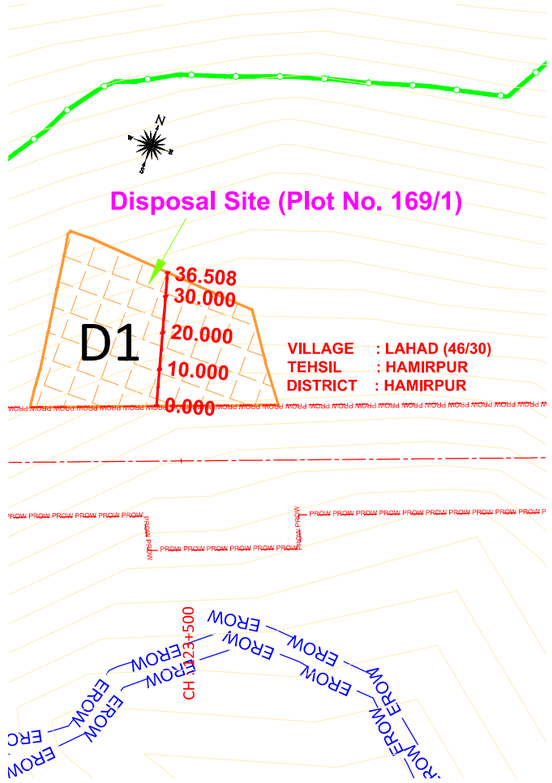

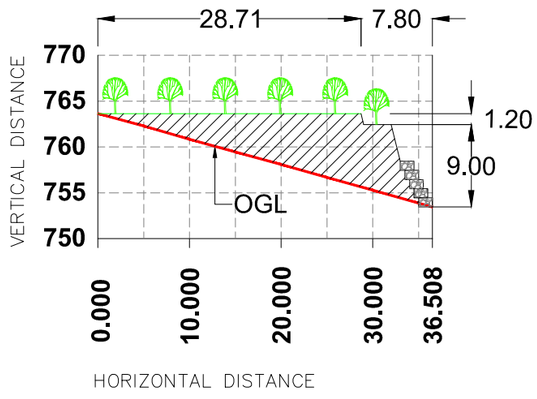

SECTION A-A
LONGITUDINAL PROFILE OF D1
QUANTITY = 9193.11 CUM

NATIONAL HIGHWAYS AUTHORITY OF INDIA	Scale : - N. T. S	Project Title: " Construction of New 2 Lane with Paved Shoulder of Hamirpur Bypass of NH-88 (New NH-103) (Design Chainage Km121+175 to Km.138+295, Design Length-17.120 Km) in the State of Himachal Pradesh under NH (O) on HAM."	Drawing Name: DISPOSAL PLAN OF EXCESS EARTH QUANTITY SITE - D1	Intercontinental Consultants & Technocrats Pvt Ltd, A-8, Green Park, New Delhi - 110016 Ph : 011 4086-3000, Fax 2685-5252	R0	May, 2021	DPR	Checked by
					Revisions	Date	Description	
				Lalit Saini (Prepared by) / K.K.Verma (Designed by) / Neeraj Choudhary (Checked by) / Sandip Bhattacharjee (Approved by)	Revisions			
					DRAWING No:- NHAI/NH-88/SHIMLA - MATAUR/DP/ 01			Rev. R0

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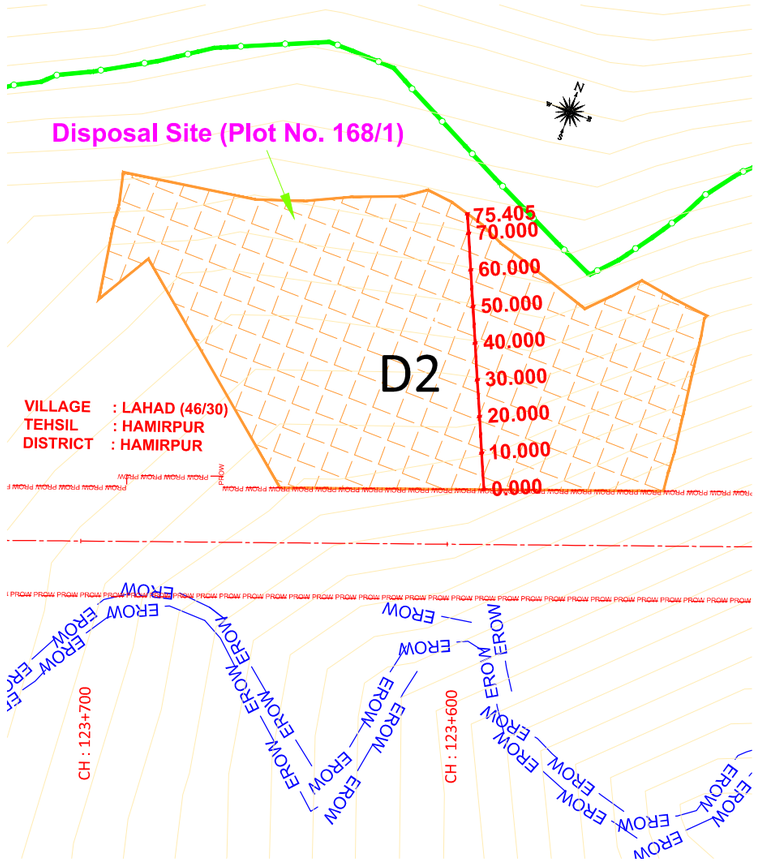

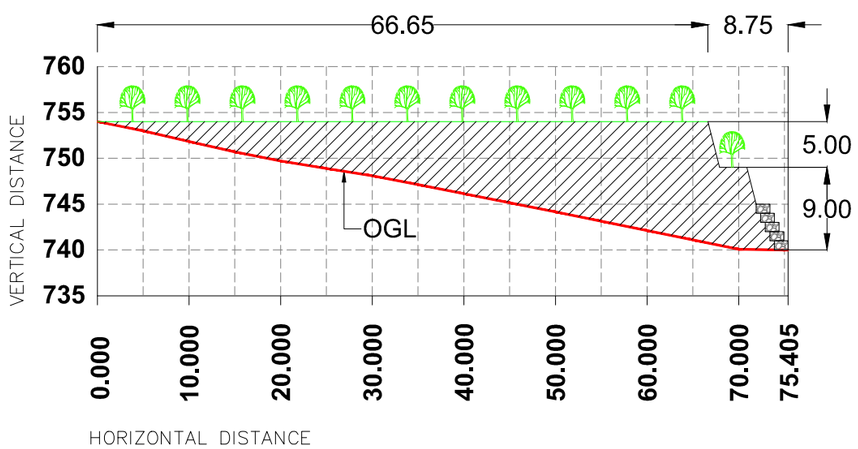

SECTION A-A
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					Revisions | Date | Description
				Lalit Saini (Prepared by) | K.K.Verma (Designed by) | Neeraj Choudhary (Checked by) | Sandip Bhattacharjee (Approved by)	Revisions
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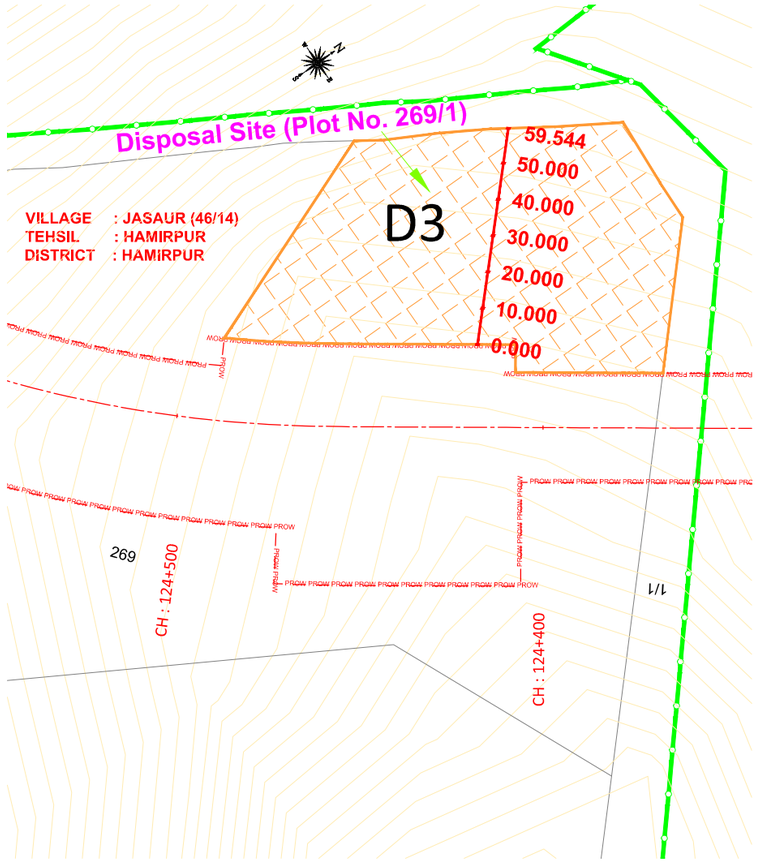

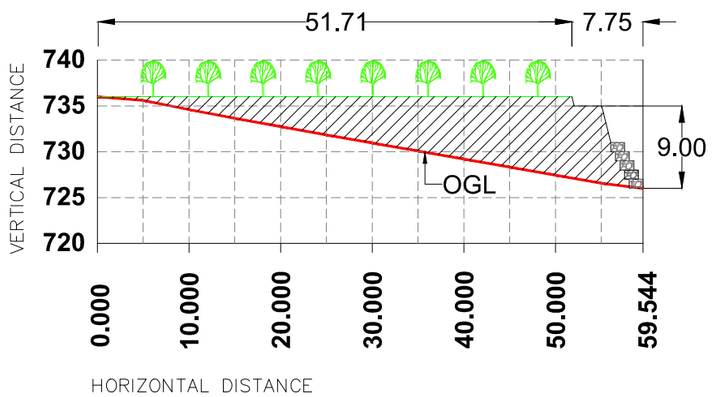

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					Revisions | Date | Description
				Lalit Saini (Prepared by) | K.K.Verma (Designed by) | Neeraj Choudhary (Checked by) | Sandip Bhattacharjee (Approved by)	Revisions
					DRAWING No:- NHAI/NH-88/SHIMLA - MATAUR/DP/ 03 | Rev. R0

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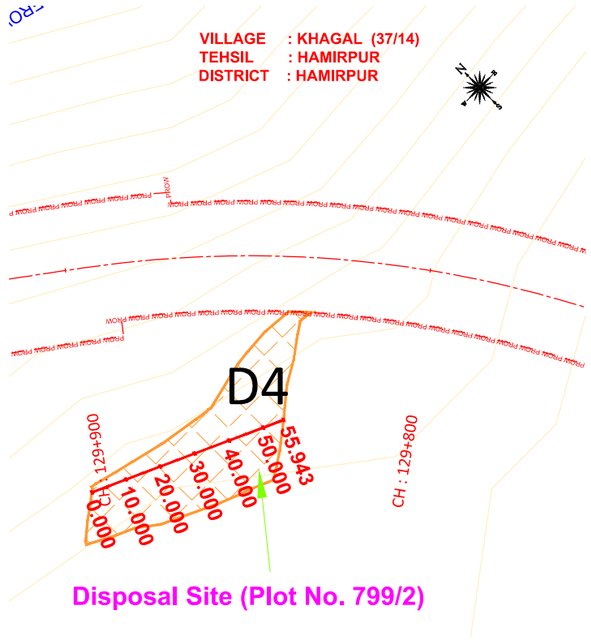

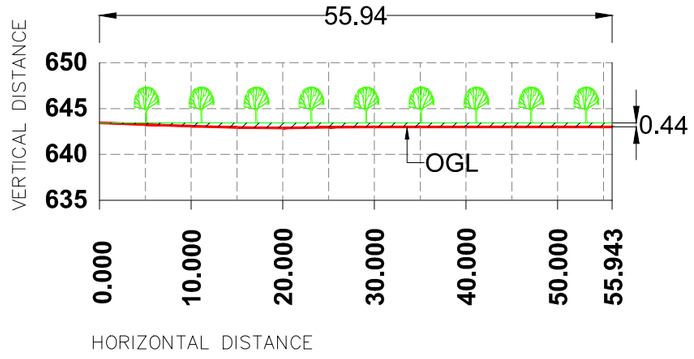

SECTION A-A
LONGITUDINAL PROFILE OF D4
QUANTITY = 607.76 CUM

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					Revisions	Date	Description	
				Lalit Saini (Prepared by) / K.K.Verma (Designed by) / Neeraj Choudhary (Checked by) / Sandip Bhattacharjee (Approved by)	Revisions			
					DRAWING No:- NHAI/NH-88/SHIMLA - MATAUR/DP/ 04			Rev. R0

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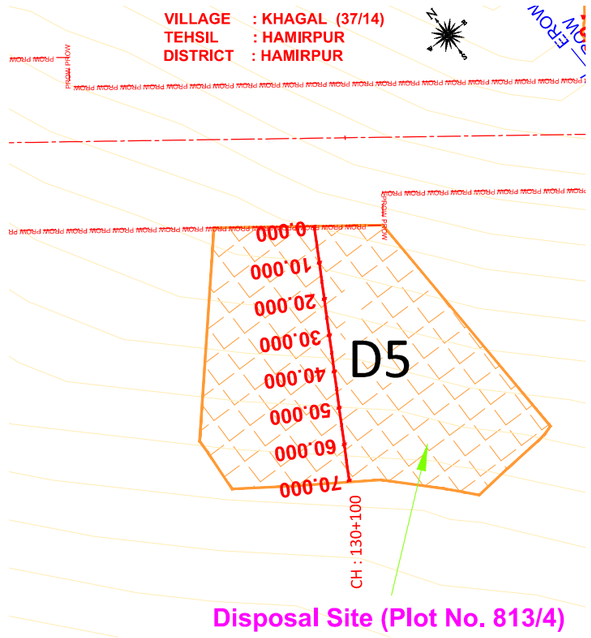
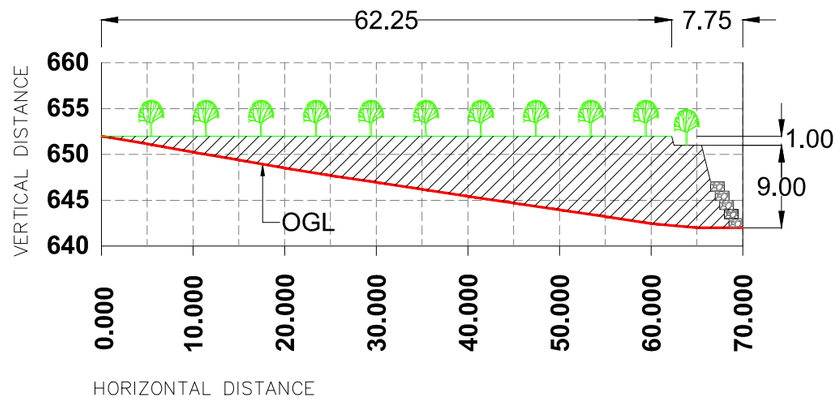
TO MATAUR ►





SECTION A-A
LONGITUDINAL PROFILE OF D5
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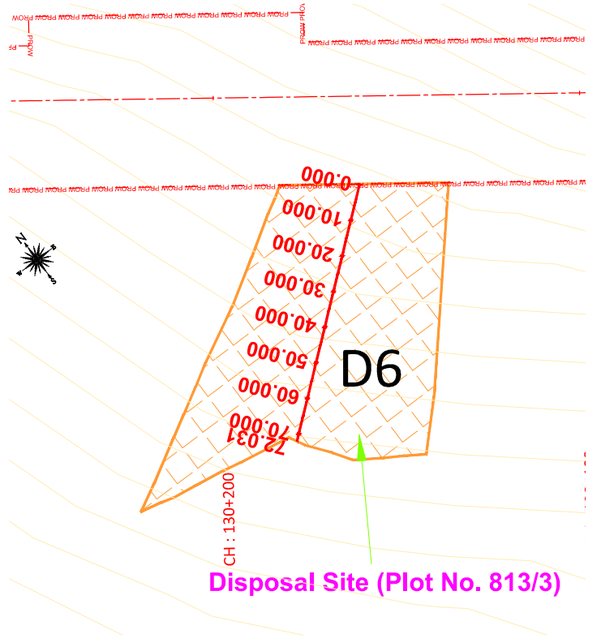
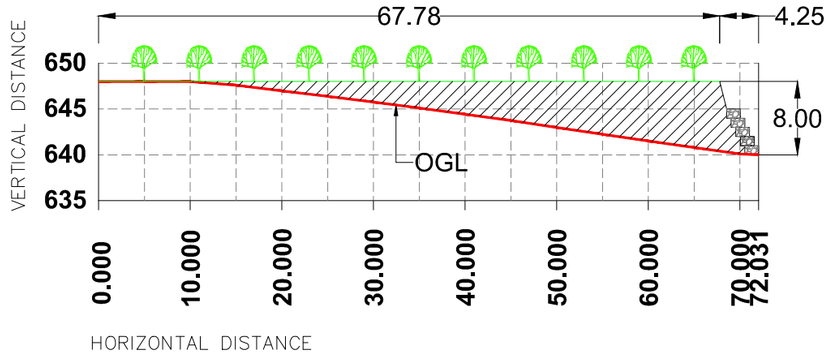
VILLAGE : KHAGAL (37/14)
TEHSIL : HAMIRPUR
DISTRICT : HAMIRPUR





SECTION A-A
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					Revisions	Date	Description	
				Lalit Saini (Prepared by) / K.K.Verma (Designed by) / Neeraj Choudhary (Checked by) / Sandip Bhattacharjee (Approved by)	Revisions			
					DRAWING No:- NHAI/NH-88/SHIMLA - MATAUR/DP/ 06			Rev. R0

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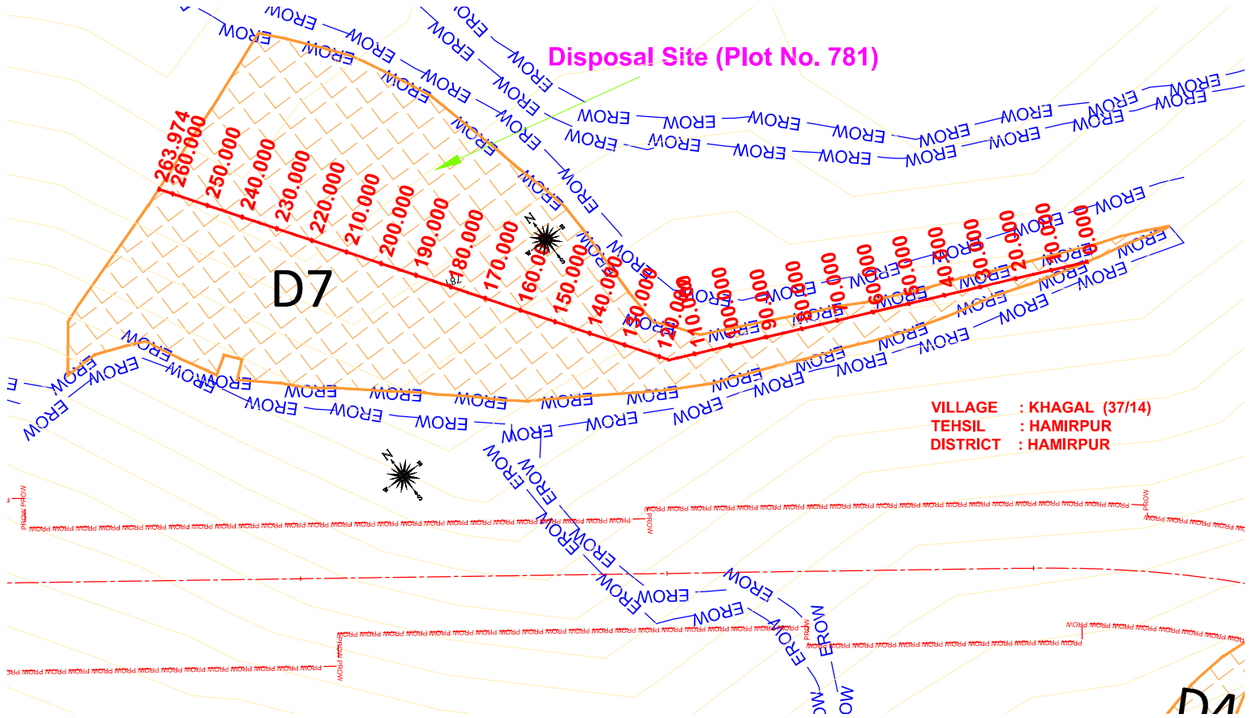

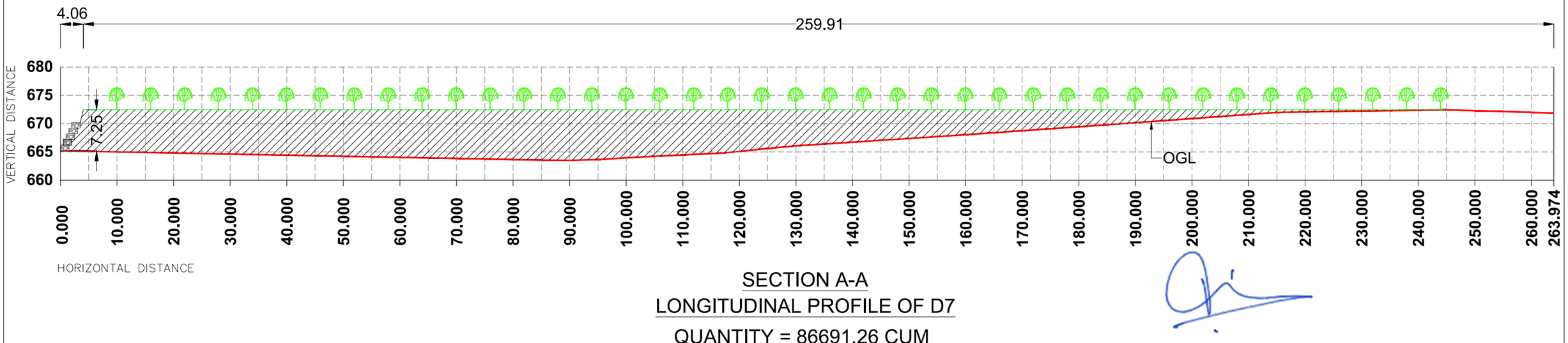

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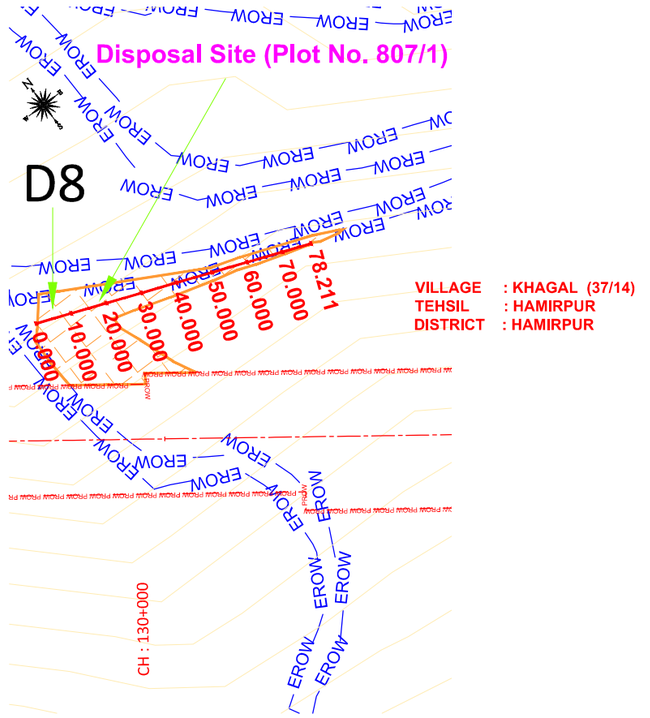
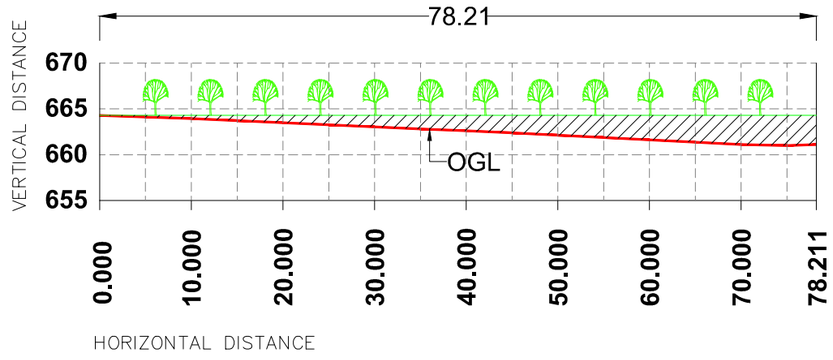


VILLAGE : KHAGAL (37/14)
TEHSIL : HAMIRPUR
DISTRICT : HAMIRPUR



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					Revisions	Date	Description	
				Lalit Saini (Prepared by) / K.K.Verma (Designed by) / Neeraj Choudhary (Checked by) / Sandip Bhattacharjee (Approved by)	Revisions			
					DRAWING No:- NHAI/NH-88/SHIMLA - MATAUR/DP/ 08			Rev. R0

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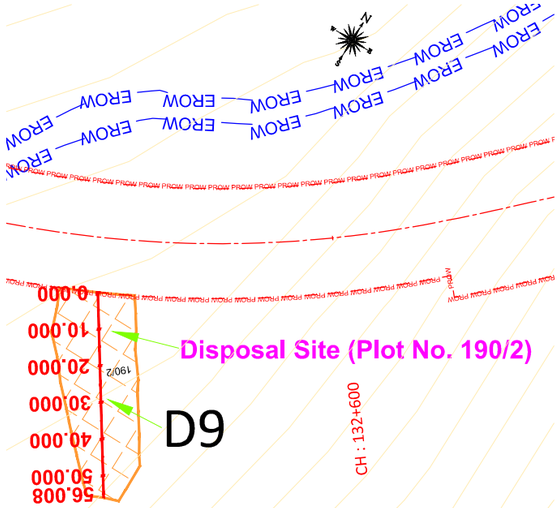
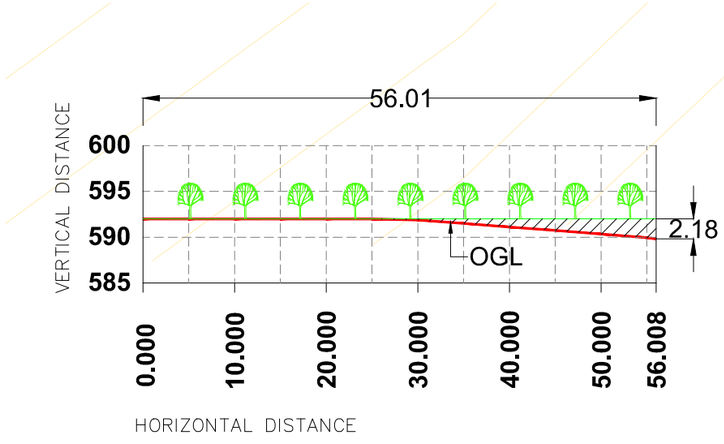
TO MATAUR ►





SECTION A-A
LONGITUDINAL PROFILE OF D9
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					Revisions	Date	Description	
				Lalit Saini (Prepared by) / K.K.Verma (Designed by) / Neeraj Choudhary (Checked by) / Sandip Bhattacharjee (Approved by)	DRAWING No:- NHAI/NH-88/SHIMLA - MATAUR/DP/ 09			Rev. R0