

APPENDIX - IV

Muck Disposal Plan

At the time of Execution, a large volume of muck will be generated and the same will be dumped, levelled and compacted at the proposed location of dumping ground.

In view of above, the project being on the EPC Mode of contract, the actual volume to be generated will be assessed at the time of execution and the same will be approved by the Authority engineers deployed by the user agency i.e. NHIDCL.

Design of the Muck/Spoil Bank at site:

At the disposal site on valley side, the care will taken at the time of selection of site so that there is minimum damage to the flora & fauna and the environmental conditions.

When unsuitable material below sub-grade level in cut or below embankment foundation level is planned to be removed, the soil left in place after the removal of the unsuitable material shall be compacted to a depth of 20 cm and a density of 90 percent of the maximum dry density determined according to the relevant specifications.

Unsuitable Material shall be removed and disposed of in Spoil Banks in such a manner as to have a neat appearance and not to obstruct drainages to the highway and not to cause injury to highway works or property. If it becomes necessary to locate or relocate any Spoil Bank, the Contractor shall obtain prior approval from the Authority Engineer.

The relevant and applicable provisions "Environmental Control and Protection" shall be adhered during planning of muck disposal and its hauling.

The Spoil-Banks shall be design in accordance with the requirements shown in **Table-1** and the typical arrangement shown in **Figure-1**.

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Table-1: Requirements for Design and Construction Spoil Banks

Design Conditions:		
Item	Description	Criteria
- Topography	Depression or hilly	Prevention against disasters due to landslide and collapse
- Ground Inclination	Less than 22°	ditto
- Embankment' Size	Embankment length shall be 30m or less	ditto
- Land's Use	Land is not urbanized	Environmental protection
- Environment	Not considered as environmental nature reservation. Residential areas (if any) shall not be located at downstream of spoil bank.	ditto
Design Requirements:		
Item	Remarks	
- Installation of open drain or canal	Drain is treated from upstream	
- Installation of surface drainage system	Slope feet and berms	
- Installation of underground drainage	Swamps and Valley	
- Installation of internal-horizontal drainage of embankment	Reduction of water filtration in the embankment and prevention against superficial collapse	
- Implementation of the works for Slope Protection	Turfing or Seeding	
- Construction of retaining wall in the lower edge	Prevention against collapse	
- Installation of check dam structure on the upstream inlets	Concrete Wall	
- Implementation of the works for scouring prevention along downstream outlet	Gabion Mat	
Special Provisions on the Specifications:		
Item	Description	Special Provision
- Drainage	Works for channels drainages	50 years return period
	Gutters	25 years return period Minimum 40cm x 40cm
	Horizontal drainage sheet (50cm width, 2m interval)	Every 5m height; L=20m
- French Drain	Large Drain Basin	Perforated pipes of 300mm minimum diameter shall be applied
	Small Drain Basin	Perforated pipes of 100mm minimum diameter shall be applied
- Slope Protection	Sodding	As the standards
- Retaining Wall	Retaining wall by Gabion or Gravity Type	As the standards
- Embankment	Compaction and layer thickness	Compaction of embankment equal or higher than 90% shall be secured. Layer thickness same than road embankment.

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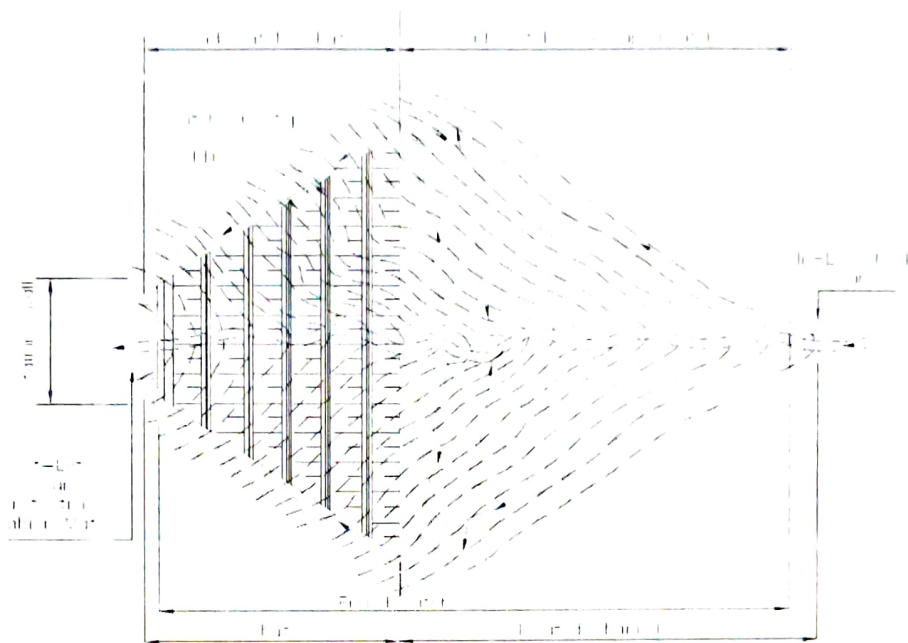


Figure-1(a): Typical Arrangement for Spoil Banks: Plan

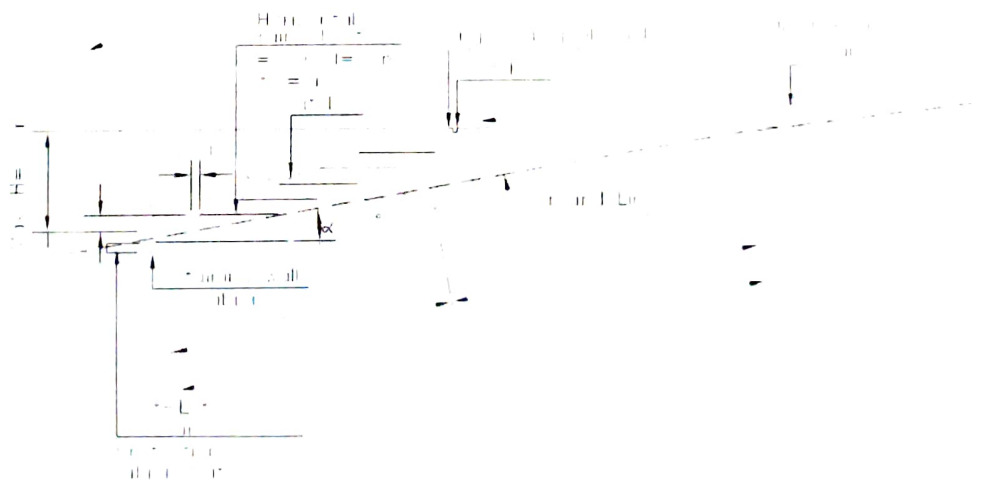
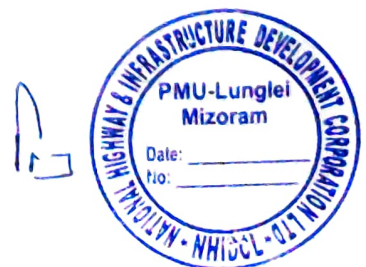


Figure-1(b): Typical Arrangement for Spoil Banks: Profile



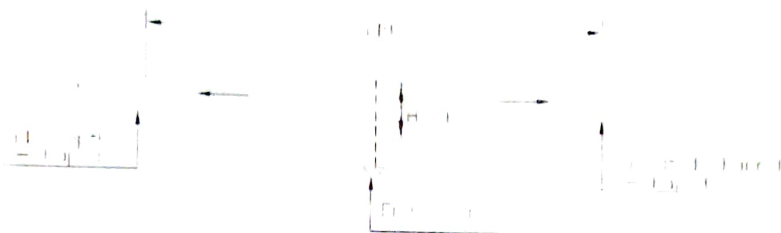


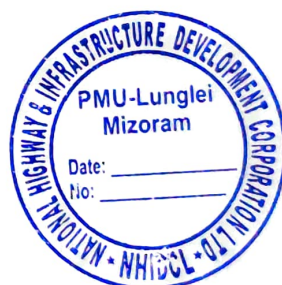
Figure-1(c): Typical Arrangement for Spoil Banks: Cross Section of French Drain

The Gabion wall and retaining wall has been proposed to protect the slope on valley side and the same shall be compacted and levelled properly, so that Playground and other community places can be developed for the public purposes. The details of dumping ground and the GPS Coordinates has been attached at **Enclosure-I**.

The Typical drawing for the construction of Gabion and retaining wall has been attached at **Enclosure-II**.

The Linear Plan of Muck Disposal Site/Spoil Banks has been attached at **Enclosure-III**.

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NH-54 (SECTION-2)

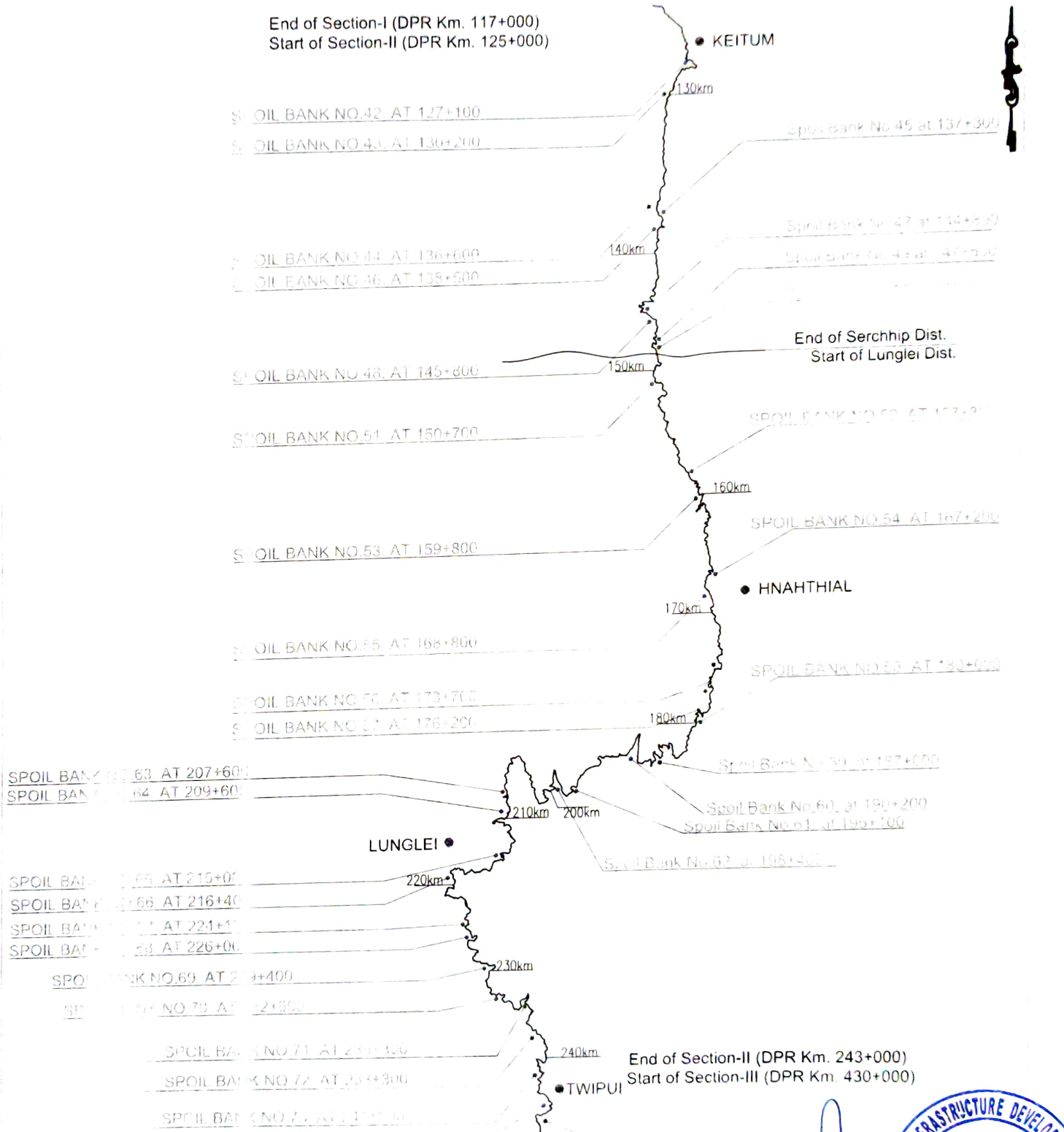
Spoil Bank Location

SN	Spoil Bank	Easting (X)	Northing (Y)	Latitude (DMS System)	Longitude (DMS System)
1	SB-42	491302	2568069	-23° -13' -18.258" S	-92° -54' -53.952" W
2	SB-43	490165	2567039	-23° -12' -44.74" S	-92° -54' -13.97" W
3	SB-44	489520	2560728	-23° -9' -19.494" S	-92° -53' -51.432" W
4	SB-45	489850	2560374	-23° -9' -7.989" S	-92° -54' -3.047" W
5	SB-46	489774	2559886	-23° -8' -52.118" S	-92° -54' -0.386" W
6	SB-47	488935	2556048	-23° -6' -47.288" S	-92° -53' -30.981" W
7	SB-48	489115	2555502	-23° -6' -29.536" S	-92° -53' -37.323" W
8	SB-49	489537	2554438	-23° -5' -54.945" S	-92° -53' -52.185" W
9	SB-50	489490	2553911	-23° -5' -37.806" S	-92° -53' -50.546" W
10	SB-51	489533	2551973	-23° -4' -34.783" S	-92° -53' -52.105" W
11	SB-52	490793	2547660	-23° -2' -14.55" S	-92° -54' -36.485" W
12	SB-53	491781	2545920	-23° -1' -17.984" S	-92° -55' -11.235" W
13	SB-54	492500	2541939	-22° -59' -8.532" S	-92° -55' -36.566" W
14	SB-55	492287	2540514	-22° -58' -22.187" S	-92° -55' -29.11" W
15	SB-56	492836	2536877	-22° -56' -23.919" S	-92° -55' -48.452" W
16	SB-57	492343	2535973	-22° -55' -54.512" S	-92° -55' -31.158" W
17	SB-58	491745	2534422	-22° -55' -4.062" S	-92° -55' -10.191" W
18	SB-59	489584	2532347	-22° -53' -56.538" S	-92° -53' -54.375" W
19	SB-60	488405	2532554	-22° -54' -3.242" S	-92° -53' -12.984" W
20	SB-61	485228	2531024	-22° -53' -13.395" S	-92° -51' -21.516" W
21	SB-62	484281	2530922	-22° -53' -10.047" S	-92° -50' -48.281" W
22	SB-63	481803	2531641	-22° -53' -33.339" S	-92° -49' -21.276" W
23	SB-64	481774	2529757	-22° -52' -32.069" S	-92° -49' -20.337" W
24	SB-65	481518	2527687	-22° -51' -24.741" S	-92° -49' -11.442" W
25	SB-66	478977	2526696	-22° -50' -52.405" S	-92° -47' -42.323" W
26	SB-67	479649	2524372	-22° -49' -36.856" S	-92° -48' -6.012" W
27	SB-68	480222	2523464	-22° -49' -7.352" S	-92° -48' -26.157" W
28	SB-69	481108	2521858	-22° -48' -15.16" S	-92° -48' -57.309" W
29	SB-70	481657	2520381	-22° -47' -27.148" S	-92° -49' -16.63" W
30	SB-71	482786	2520017	-22° -47' -15.353" S	-92° -49' -56.243" W
31	SB-72	483363	2518433	-22° -46' -23.861" S	-92° -50' -16.541" W
32	SB-73	483605	2516259	-22° -45' -13.168" S	-92° -50' -25.11" W



LINEAR PLAN OF NH - 54 (SECTION - II)

End of Section-I (DPR Km. 117+000)
Start of Section-II (DPR Km. 125+000)



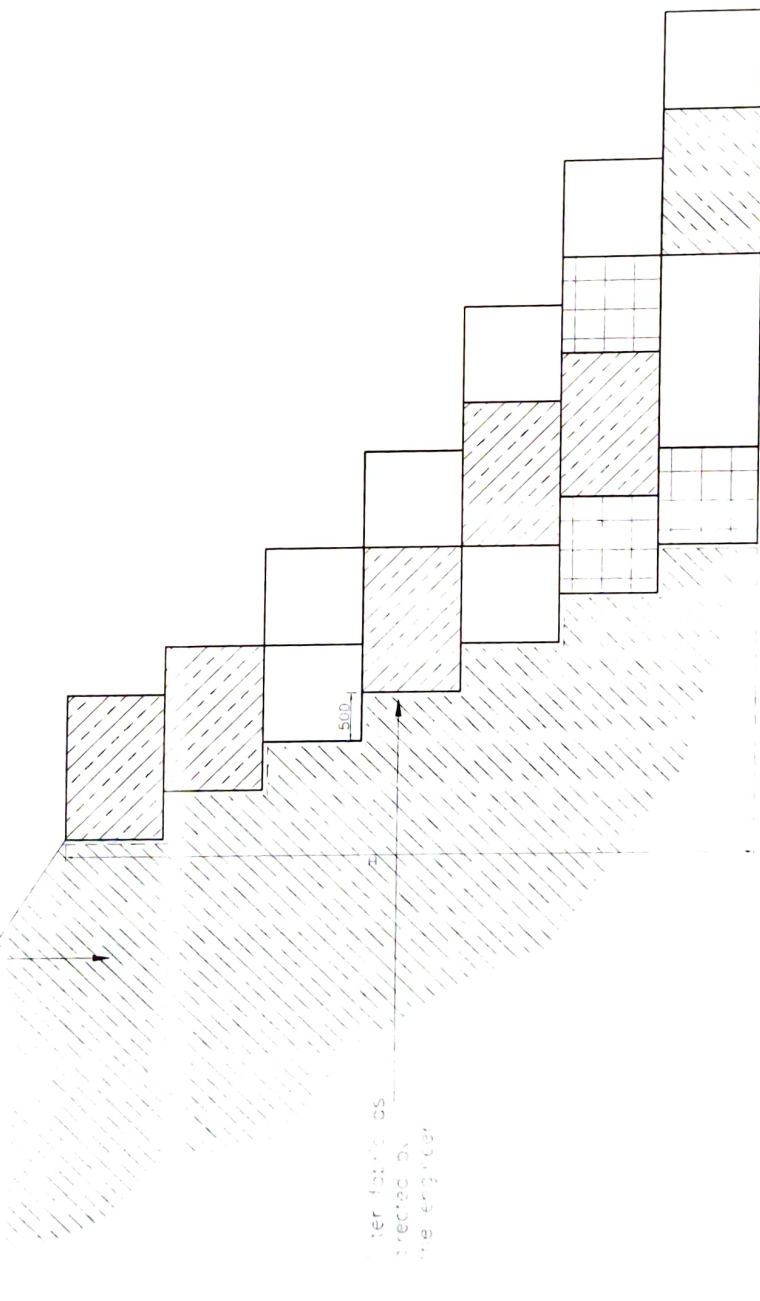
End of Section-II (DPR Km. 243+000)
Start of Section-III (DPR Km. 430+000)

Figure 6 LINEAR PLAN OF SECTION - II

CLIENT National Highways and Infrastructure Development Corporation Ltd. (A Govt. of India Undertaking)	LINEAR PLAN OF NH - 54 (SECTION - II) KEITUM TO TWIPUI SHEET SIZE A4 SHEET NO. 2 of 3 DATE : Feb 2017	CONSULTANT ISAPC CORPORATION OFFICE: CONCEPT BUILDING, PRINCE PARK 514/A/1 KALIKAPUR ROAD, KOLKATA- 99
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ROAD LEVEL

Free draining



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checked by
the engineer

KEY TO GABION SIZES



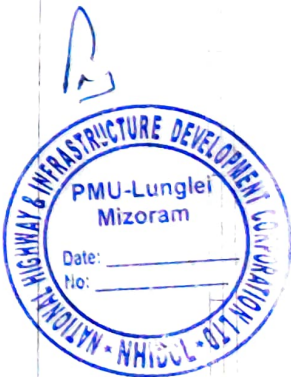
Gabion Retaining Walls

BASE WIDTHS

W. height (H.M)	1	2	3	4	5	6	7
W. width (H.M)	1.0	1.5	2.0	2.5	3.0	3.5	4.0

ADDITIONAL SPECIFICATIONS

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED
2. THE REQUIREMENT OF GREAT WALL IS OTHER AS SHOWN IN THE DIMENSIONS OR AS DIRECTED BY THE INSPECTOR ON SITE
3. THE WALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE CONTRACTOR
4. THE GABION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE CONTRACTOR
5. STONES SHALL BE OF HIGH STRENGTH, DRAINAGE AND RESISTANT TO WEAR. THE DIMENSION OF THE STONES SHALL BE NOT LESS THAN 150 MM TO 250 MM. THE DIMENSION OF THE STONES SHALL BE NOT LESS THAN 150 MM TO 250 MM. THE DIMENSION OF THE STONES SHALL BE NOT LESS THAN 150 MM TO 250 MM.
6. THE CONSTRUCTION SHALL BE DONE IN SUCH A MANNER AS TO BE APPROVED BY THE ENGINEER
7. EROSION PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR. THE EROSION PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR. THE EROSION PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR.
8. FOUNDATION SHALL BE TAKEN DEEP ENOUGH TO REACH TO THE FIRM SUBSTRATE. THE FOUNDATION SHALL BE TAKEN DEEP ENOUGH TO REACH TO THE FIRM SUBSTRATE. THE FOUNDATION SHALL BE TAKEN DEEP ENOUGH TO REACH TO THE FIRM SUBSTRATE.
9. IF ROAD STRATA IS ENCOUNTERED THE ROCK SHALL BE EXCAVATED TO A DEPTH OF 100 MM AND FILL WITH THE REQUIRED LINE. THE ROAD AND FILL SHALL BE REMOVED AND ROCKS AND DEPRESSIONS TO FORMED SHALL BE FILLED UP WITH DRY LEAN CONCRETE OR GRANULAR SUBGRADE MATERIAL AS DIRECTED
10. ERECTION OF RETAINING WALL
11. THE WALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE CONTRACTOR
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20. THE WALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE CONTRACTOR



Welding to : Lane of 104.54 Between Km 43.10 to Km 52.60 in the State of Mizoram

DETAILED PROJECT REPORT

TYPICAL DETAILS OF GABION RETAINING WALL

CMES/MP/WDNH-2/MISC-12

DATE: 12/04/2015

BY: [Signature]

FOR: [Signature]

APPROVED: [Signature]

CLIENT: GOVERNMENT OF MIZORAM
PUBLIC WORKS DEPARTMENT
MINISTRY OF SHIPPING, ROAD TRANSPORT & HIGHWAYS
DEPARTMENT OF ROAD TRANSPORT & HIGHWAYS

CONSULTANT: CM ENGINEERING & SOLUTION
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