

THE DRAWING IS FOR REFERENCE ONLY. CONTRACTOR SHALL SOURCE THE TECHNOLOGY /SYSTEM FROM SPECIALIZED TECHNOLOGY PROVIDER ADOPTING MATERIALS OF GIVEN SPECIFICATION OR HIGHER. CONTRACTOR TO SUBMIT DETAILED WORK METHODOLOGY, SPECIALIZED AGENCY CREDENTIALS FOR NHIDCL APPROVAL PRIOR TO WORK.

THE SUITABILITY, SUSTAINABILITY, AND STABILITY OF THE DESIGN AND STRUCTURES ARE TO BE CERTIFIED BY INDIAN INSTITUTE OF TECHNOLOGY (DELHI/KANPUR/MUMBAI/KHARAGPUR/ROORKEE) BEFORE THE COMMENCEMENT OF WORK.

- GENERAL NOTES :-**
- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS ARE IN METER UNLESS OTHERWISE STATED.
  - DETAILED DESIGN SHALL BE DONE BY CONDUCTING DETAILED SOIL INVESTIGATION AS REQUIRED FOR DESIGN. WHICH SHALL INCLUDE GEOPHYSICAL STUDY AND MINIMUM SIX BORE HOLE INVESTIGATION PER SITE, THREE ON HILL SIDE AND THREE ON INTERMEDIATE LEVEL.
  - THE ANALYSIS SHALL BE DONE CONSIDERING SEISMIC ZONE-**IV**.
  - THE HA POLYMERIC STRAP REINFORCEMENT SHALL BE AS SHOWN IN TABLE NO.1 AND THE GROUTED SOIL NAIL SHALL BE AS SHOWN IN TABLE NO-3.
  - THE PRELIMINARY ANALYSIS SHALL BE DONE CONSIDERING DESIGN BOND STRENGTH OF 60Kpa BETWEEN THE GROUT AND SOIL.
  - THE PULL OUT BOND STRENGTH SHALL BE RE VERIFIED AS SITE BY CONDUCTING IN SITU PULLOUT TEST
  - THE MECHANICALLY STABILIZED REINFORCED EARTH WALL DESIGN ANALYSIS SHALL BE DONE AS PER AFNOR NF.P94-270 JULY 2009 AS CITED IN ANNEXURE A1-1.1 IN **SECTION 3100 OF MORTH-5th REVISION** OR FHWA. THE OVERALL STABILITY ANALYSIS SHALL BE DONE FOR WORKING STRESS ANALYSIS CONSIDERING A FACTOR OF SAFETY OF 1.3 FOR STATIC & 1.1 FOR SEISMIC.
  - ALL DRAINAGE GALLERY SHALL BE AS PER CLASS-II GRADATION OF **MORTH 5TH REV. SPECIFICATION (TABLE NO.-300.3, PAGE-87)**
  - GROUT FILLED FABRIC FORM REVETMENT : THE TOE PROTECTION/BED PROTECTION SHALL BE DONE USING GROUT FILLED MATTRESS AS PER DETAILED SPECIFICATION SHOWN IN TABLE NO.-02
  - THE SEMI PERFORATED PVC PIPE HAS BEEN PROVIDED AS A DRAINAGE OUTLET AT THE TOE OF EACH TIER WALL AS SHOWN IN CROSS SECTION.
  - THE FACING FOR THE MECHANICALLY STABILIZED REINFORCED EARTH WALL ( ON BOTH SIDES-EXPOSED FACE & SLOPED SURFACE) SHALL BE USING HOT DIP GALVANIZED WELDED STEEL MESH OF MINIMUM 8mm DIA BAR@100mm c/c EXCEPT THE HORIZONTAL BARS WHERE THE PRIMARY REINFORCEMENT IS CONNECTED SHALL BE OF MINIMUM 12mm. DIA BAR
  - THE SOIL REINFORCEMENT (HIGH ADHERENCE POLYMERIC STRAP) USED FOR MECHANICALLY STABILIZED REINFORCED EARTH WALL SHALL BE CONNECTED MECHANICALLY WITH THE FACING DIRECTLY USING POSITIVE CONNECTION. NO OVERLAP CONNECTION SHALL BE USED DUE TO HIGH SEISMIC ZONE AS PER 3rd LAST PARAGRAPH OF **ANNEXURE-F (PAGE237) BS-8006:2010**. THE DETAILS FOR THE SOIL REINFORCEMENT (HIGH ADHERENCE POLYMERIC STRAP) IS SHOWN IN TABLE NO-01.
  - THE SOIL REINFORCEMENT (HIGH ADHERENCE POLYMERIC STRAP) USED FOR COMPOSITE REINFORCED SOIL WALL SHALL BE CONNECTED MECHANICALLY WITH THE GROUTED NAIL AND OVERLAPPED WITH THE PRIMARY REINFORCEMENT OF REINFORCED SOIL STRUCTURE TO FORM A COMPOSITE REINFORCED MASS .
  - ALL THE STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED WITH A MINIMUM GALVANIZATION OF 70μ(500gm/Sqm) EXCEPT THE WELDED GRID MESH WHICH SHALL BE MINIMUM OF 86μ (610gm/sqm)
  - FULLY THREADED GALVANIZED HIGH TENSILE IN-SITU SOIL REINFORCEMENT SHOULD HAVE A MINIMUM YIELD STRENGTH OF 670 MPA AND ULTIMATE TENSILE STRENGTH OF 800 MPA. AS PER TABLE NO-3.
- FACING**
- STONE AGGREGATES OF SIZE 125-200mm SHALL BE USED BEHIND THE FACING OF MECHANICALLY STABILIZED REINFORCED EARTH WALL AS SHONE IN DETAIL-Y. BROKEN NATURAL BOULDERS SHALL BE PLACED JUST BEHIND THE STEEL MESH FACING.
  - THE PRE QUALIFICATION REQUIREMENT OF THE SYSTEM/ TECHNOLOGY PROVIDER SHALL PREVAIL AS GIVEN ELSEWHERE REFERRED IN OTHERS DRAWING.

**SOIL REINFORCEMENT (TABLE-1)**

**HIGH ADHERENCE (HA) POLYMERIC STRAP**

THE SOIL REINFORCEMENT SHALL BE HIGH ADHERENCE (HA) POLYMERIC STRAP OF 50MM WIDE WITH LATERAL TEETH ON BOTH SIDE OF THE STRAP TO ENHANCE THE ADHERENCE CAPACITY IN SOIL AS SHOWN IN FIGURE 1 BELOW.

HA STRAP CONSISTS OF DISCRETE CHANNELS OF CLOSELY PACKED HIGH TENACITY POLYESTER FIBRES RESPECTIVELY ENCASED IN A LINEAR LOW DENSITY POLYETHYLENE (LLDPE) SHEATH (FIGURE 1).






FIGURE1:STRAPS TYPICAL CROSS SECTION, PROCESSED BY CO-EXTRUSION

TABLE-1 : HA POLYMERIC STRIP REINFORCEMENT SPECIFICATION						
Propertles	Test Method	Unit	Minimum average roll value			
Ultimate Tensile Strength	ASTM D6637	kN	20	25	37.5	50
Width		mm	49	49	49	49
Long Term Design Strength		kN	11.76	14.70	22.05	29.40

REVISIONS

REV	DATE	DRN	CHK	AMENDMENTS

CLIENT:



National Highways & Infrastructure Development Corporation Ltd.

PROJECT NO. ---

SCALE

SHEET SIZE A3

DRAWN

CHECKED BY: INITIAL FINAL

APPROVED

DATE 28/12/2016

DRAWING NO. NHIDCL/02

SHEET No. 01/02

REV.

DRAWING STATUS: ---

PROJECT: ---

STRUCTURE: ---

TITLE: SIKKIM-RHENOK TO PAKYONG