ANNEX R: Geotechnical Investigation Report

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MCA – NEPAL GEOTECHNICAL INVESTIGATION FOR TRANSMISSION LINE (400kV DC)

GENERAL GEOLOGY AND GEOTECHNICAL SURVEY OF GEOHAZARDS FOR 400kV TRANSMISSION LINE

FINAL REPORT

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1.0 INTRODUCTION TO NEPAL HIMALYA

The Himalayas are the mountain range in Asia separating the plains of the Indian subcontinent from the Tibetan plateau. It is the highest, youngest and a very highly active mountain range. It is bordered on the northwest by Karakoram and Hindu Kush ranges, on the north by the Tibetan plateau, and on the south by largest modern foreland basin. Himalayan range lifted by the subduction of the Indian tectonic plate under the Eurasian plate runs, west-northwest to east-southeast, in an arc 2400 km long. The Indian tectonic plate is still moving continuously and subducting below the Eurasian plate at the rate of 5 cm/year. The desk study is based with reference to the published geological map of Nepal by Department of Mines and Geology (1983, 1987, 1994). The general geology of Nepal is shown in **1**. According to location and lithological properties, the entire Himalaya is divided into 5 different regions from west to east. They are:

- Punjab Himalaya
- Kumaon Himalaya
- Nepal Himalaya
- Sikkim- Bhutan Himalaya
- NEFA (North East Frontier Agency) Himalaya

2.0 PHYSIOGRAPHIC SUB-DIVISION OF NEPAL

From south to north, the physiographic sub-division of Nepal Himalaya are: Terai, Churia Hills (Siwaliks) or Sub-Himalaya, Dun Valleys, Mahabharat Range, Midland, Fore-Himalaya, Higher Himalayan Range, Inner Himalayan Valleys, Tibetan Marginal Range. The physiographic sub-division (**2**) of Nepal and their main geological units are discussed in below:

2.1 Terai (Indo-Gangatic Plain)

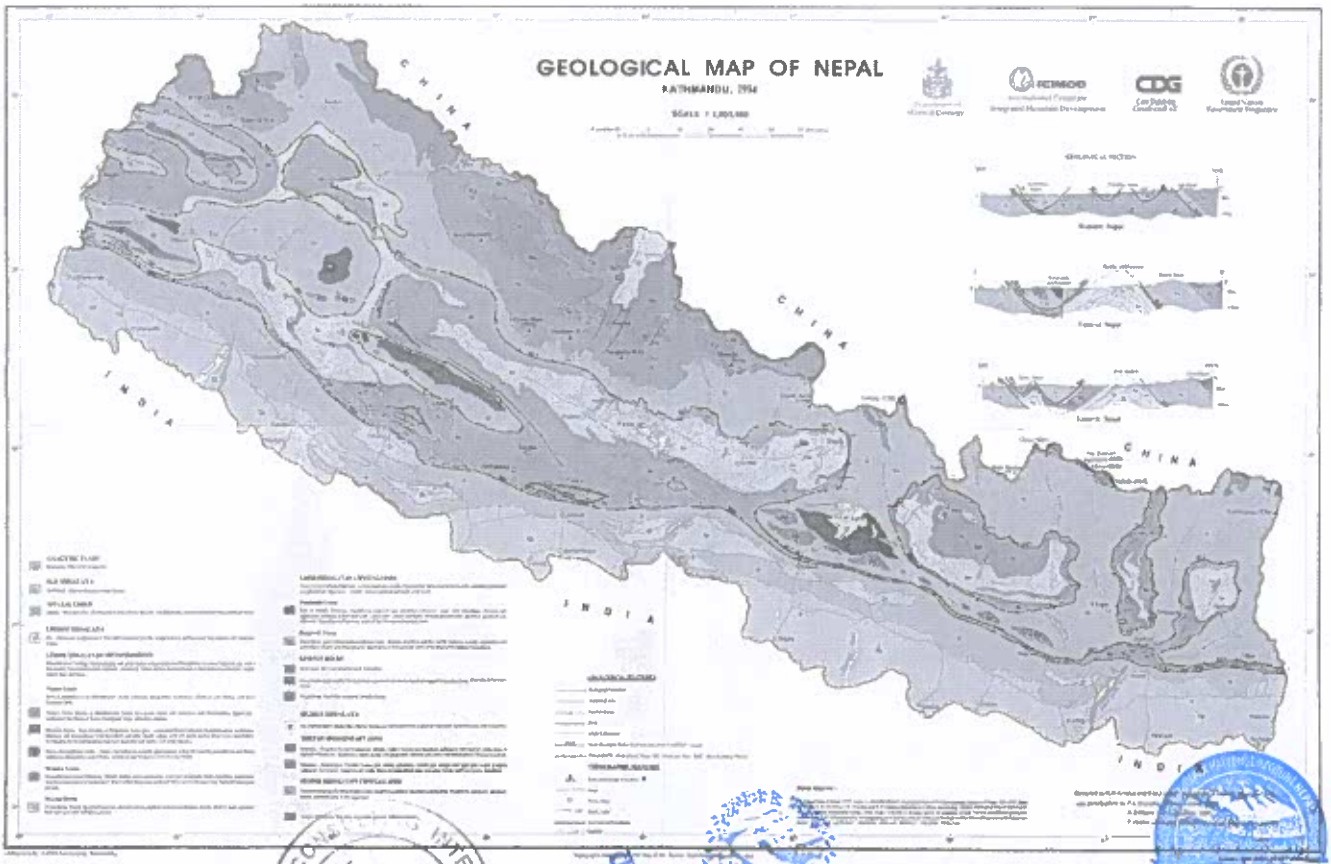

Fig. 1. Geology of Nepal (after DMG, 1994).

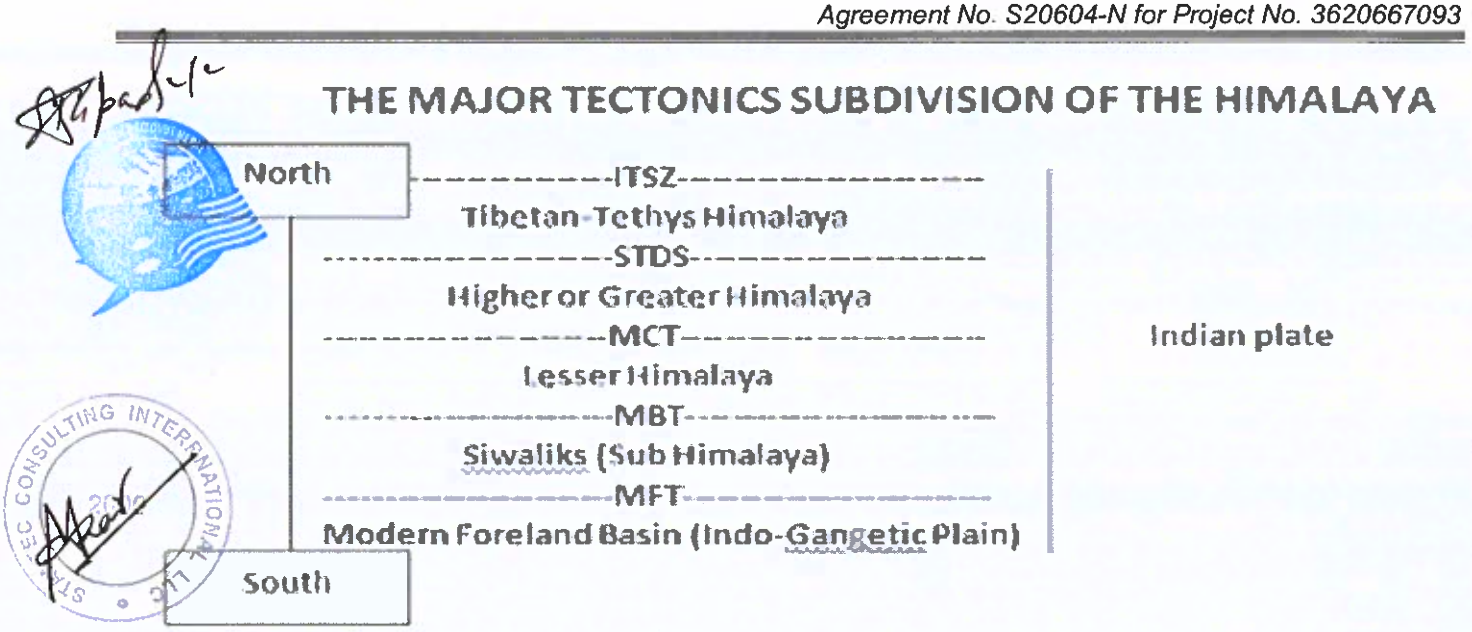

Fig. 2. The tectonic zones of the Himalaya. MFT: Main Frontal Thrust, MBT: Main Boundary Thrust, MCT: Main Central Thrust, STDS: South Tibetan Detachment System, ITSZ: Indus Tsangpo Suture Zone

This zone is the southernmost tectonic division of Nepal and represents the northern edge of Indo–Gangetic alluvial plane and range in elevation from 100 m to 200 m above MSL (Mean Sea Level). The width of Terai varies from 10 km to 50 km. It extends from the indo-Nepal boarder in the south to the base of Churia or Siwaliks hills in the north separated by Main Frontal Thrust (MFT) which is very well exposed at many places at the foot of Siwalik hills. Along this thrust, the Siwalik rock thrust over the alluvial sediments of the Indo-Gangetic plain. The Terai region is generally flat with very minor relief caused by river channel shifting and down warping of the basin. All the rivers emerging from the Nepal Himalaya flow straight to the south until they meet the Ganges River and finally head eastward towards the Bay of Bangal.

Geologically, the Terai plain is composed of Pleistocene to Recent alluvial sediments. Quaternary deposits contain mainly boulders, sand, mud with presence of thickness of alluvium of 1500 m. Coarser Terai sediments lie close to the mountain front, which is known as the Northern Terai zone (Bhabhar zone), where they form large alluvial fans. Finer sediments are found farther to the south and the Recent Terai sediments represent the latest foreland basin deposits of the Himalaya.

2.2 Sub-Himalaya (Siwaliks or Churia zone)

This zone represents the lower hill of the Churia range and is bounded to the north by the Main Boundary Thrust (MBT) and to the south by the Main Frontal Thrust (MFT). Lesser Himalayan metasedimentary rocks have been thrust southward over the Churia rocks along the MBT and large part of the Churia zone rocks must be buried beneath the cover of the over thrust Lesser Himalayan rocks to the north. The Churia Hills abruptly rise from the plains of Terai and forms the southernmost mountain range of the Himalaya. The Siwaliks constitutes the narrow belt of 20 km to 30 km in width 5 km to 6 km in thickness runs east-west. The age range is indicated as Middle Miocene to Early Pleistocene.

The Siwaliks Group in Nepal is composed of three units that are known as lower, middle and upper members. These units can be correlated with the Sub Himalaya of Pakistan and of northern India (Burbank et al. 1996). Sub-Himalaya is composed of fluvial sedimentary rocks of mudstone, sandstone, and conglomerate, shows the coarsening upward succession. Since Middle Miocene (16 Ma -1 Ma) to lower Pleistocene, the sediments are accumulated in the basin due to rapid denudation of the Himalaya

2.3 Lesser Himalayan Zone

The lesser Himalayan Zone lies in south of the Higher Himalaya that is separated by the Main Central

Thrust and north of the Siwalik Range separated by Main Boundary Thrust (MBT). The total width ranges from 60 km - 80 km. From east to west, the Lesser Himalayan geology of Nepal shows much variation in stratigraphy, structures, magmatism and displays relatively subdued and mature geomorphology.

Tectonically, the entire Lesser Himalayas consists of two sequence of rock: allochthonous and autochthonous. The zone is made up of low-grade metamorphic rock units, with over riding crystalline nappes, klippes and tectonic windows. Geologically, the Lesser Himalaya consists of low grade metamorphic rocks like slate, phyllite, schist, quartzite, marble and sedimentary rocks like limestone and dolomite, shale etc. in the south. In some region there is some minor volcanic and some granitic rocks of Proterozoic - Cambrian age (2000 Ma - 500 Ma). The stratigraphic thickness of the rock sequence in this zone is 10 km -20 km. The sedimentary rocks in the Lesser Himalaya barely yield fossil partly because there are much older (dating back to the period when life form were not abundant or diverse) and partly because they have been metamorphosed.

Hagen (1969) and Stocklin & Bhattarai (1977) have divided the Lesser Himalayan zone into two main geological and tectonic units, which are outlined as follows:

- Kathmandu Complex
- Nawakot Complex

2.4 Higher Himalayan Zone

Geologically, the Higher Himalayan Zone includes the rocks lying north of the Main Central Thrust (MCT) and south of normal fault system called as South Tibetan Detachment System (STDS) below the highly fossiliferous Tibetan-Tethys Zone and runs throughout the country. This zone is made up of 10 km - 20 km thick high grade metamorphosed coarse grained rocks (schist and gneiss) and granites situated at altitudes of 3000 m to over 8000 m. These rocks are Proterozoic-Cambrian age (2,000 Ma -500 Ma) and belong to the continental crust of the Indian Plate. In addition, white granites (leucogranites) of Miocene-are (24 Ma - 17 Ma) in upper part of the Higher Himalaya is found. It extends continuously along the entire length of the country as in whole Himalaya, and its width varies from place to place. Vast area of the Higher Himalaya is occupied by the Precambrian rocks. This sequence can be divided into four main units, as kyanite-sillimanite gneiss, pyroxenic marble and gneiss, banded gneiss, and augen gneiss in the ascending order (Bordet et al. 1972). However, later Le Fort (1975) revised this classification and divided into three formations as Formation I, Formation II and Formation III in the ascending order. This zone is characterized by extremely high relief, steep topography, rocky cliff and outcrops with little soil covered terrain.

2.5 Tibetan- Tethys Himalayan Zone

The Tibetan-Tethys Himalayas generally begins from the top of the Higher Himalayan Zone separated by the South Tibetan Detachment System (STDS) and extends to the north in Tibet, represents the deformed remnants of the northern edge of the Indian subcontinent. It has undergone very little metamorphosed rocks except at its base where it is close the Higher Himalayan Crystalline rocks of the Higher Himalayan Zone. This zone is about 40 km wide and consists of Cambrian through Eocene sediments (sandstone, shale and limestone) which were deposited on the continental shelf of the Tethys Ocean. These sedimentary rocks contain many kinds of fossils including the Cretaceous age ammonite fossils ('Shaligramshilla' in Nepalese language). In Nepal these fossiliferous rocks are well developed in Thak Khola (Mustang) Manang and Dolpa area. In eastern part, amount of exposure of the Tibetan Tehys Zone is almost negligible and found only in top of the Mount Everest.

The individual descriptions of power lines are described below based on the geological map as provided by Department of Mines and Geology (1983, 1987).

3.0 GENERAL GEOLOGY OF PROPOSED POWER LINES

The study area lies in the central and west central part of the Nepal Himalaya. The power Lines touches from Indo Gangetic plain to the Lesser Himalayan rocks, separated by the successive thrusts. The Indo-Gangetic plain ranges from Quaternary to recent deposits and lesser Himalayan from Pre Cambrian to Early Paleozoic era. The generalized pre-existing transmission line Map all over the Nepal is in **Fig. 3** below. **Fig. 4** represents the geological map of Western Central Nepal in which power lines lies New Butwal to India Border, Transmission Tower Number 1-23; New Butwal to near Damauli, Transmission Tower Number 1 to 80; and New Butwal Sub-station Tower in this section. Similarly, **Fig. 5** represents geological map of Central Nepal in which power lines lies near Damauli, Transmission Tower Number 81 to 310; Damauli to Ratmate, Transmission Tower Number 1 to 315; Ratmate to Lapsiphedi, Transmission Tower Number 1 to 189; Ratmate to New Hetauda; Transmission Tower Number 1 to 94; Sub-stations of Damauli and Ratmate in this section (after DMG 1983, 1987).

3.1 New Butwal to India Border, 23 km (1 to 53)

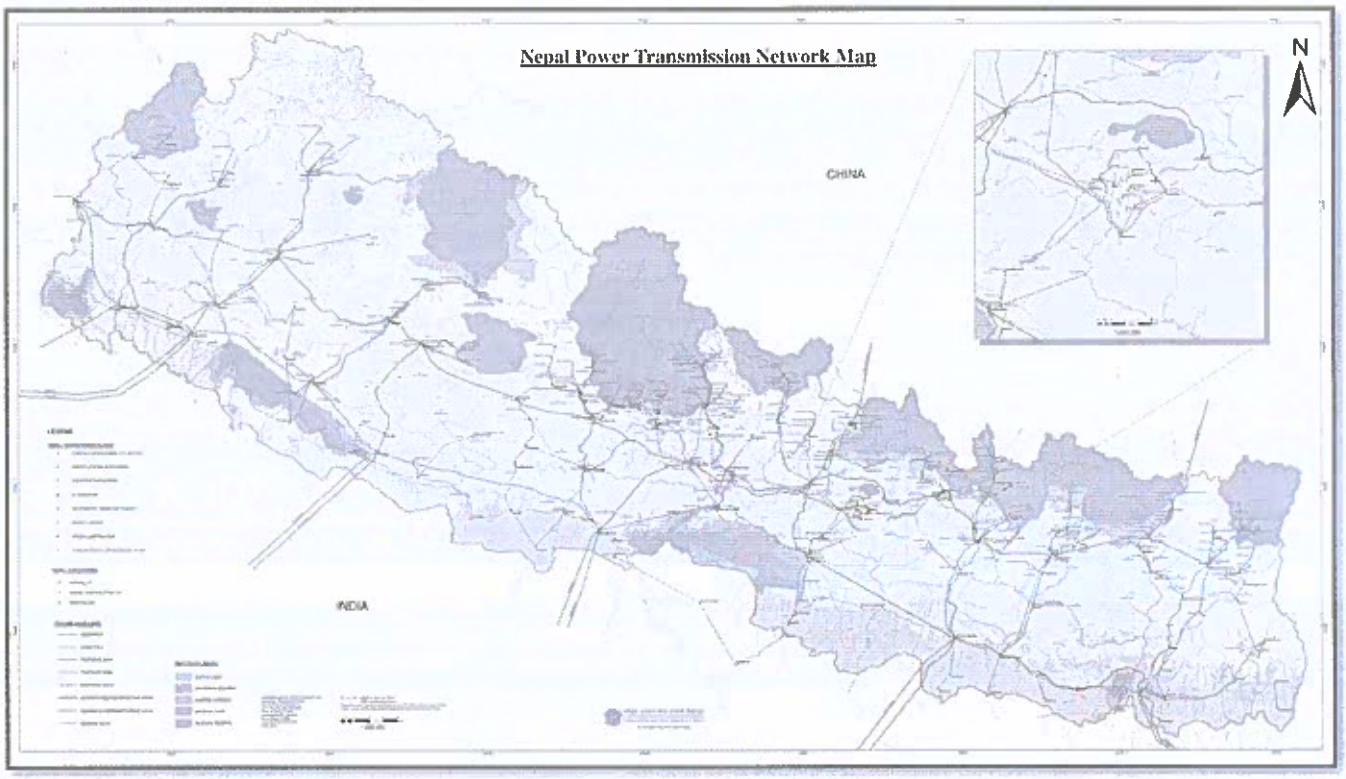

Fig. 3. Nepal Power Transmission Network Map, (after Department of National Parks & Wildlife Conservation, 2016).

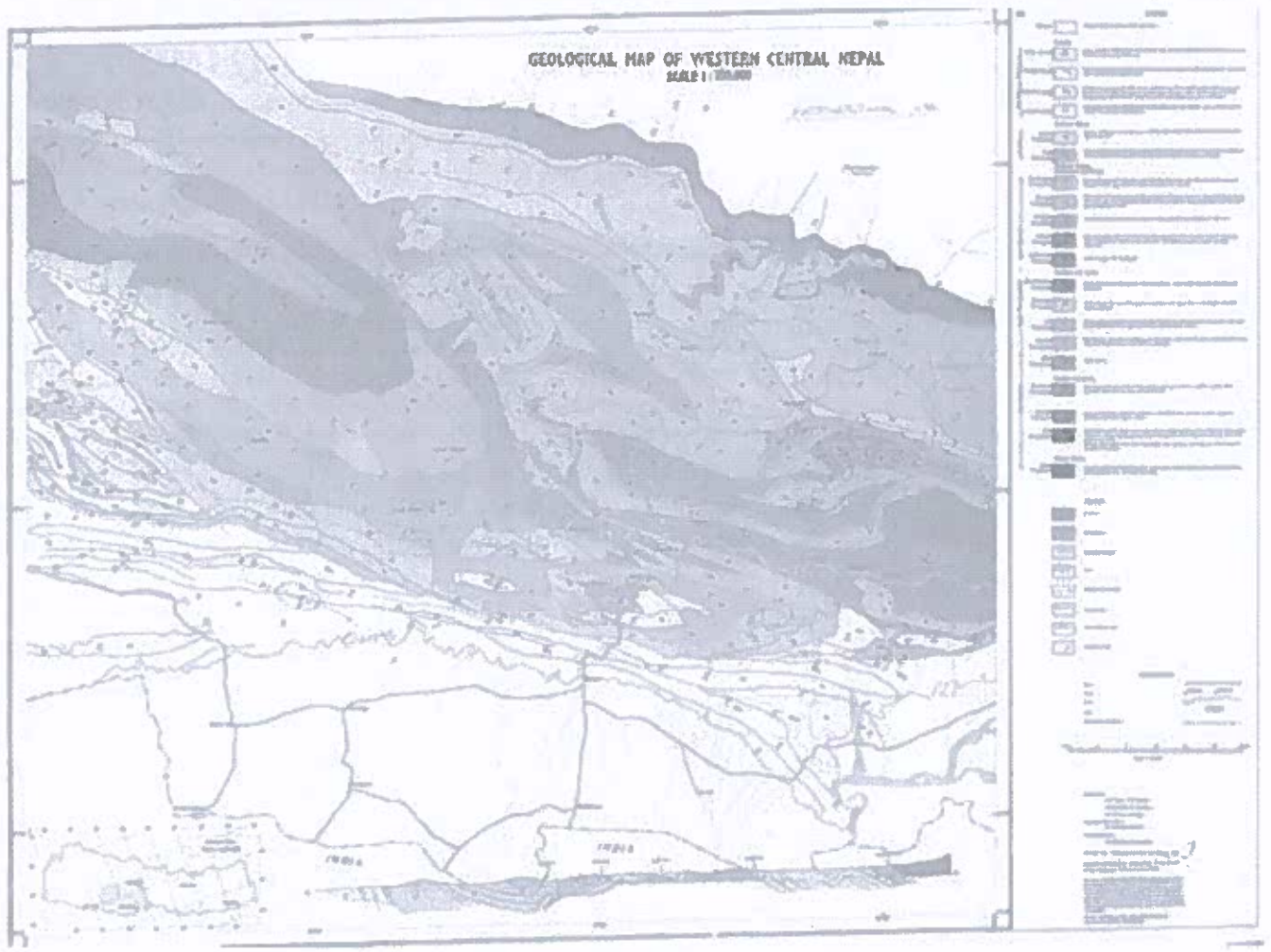

Fig. 4. Geological map of Western Central Nepal representing power lines lies New Butwal to India Border, Transmission Tower Number 1-23; New Butwal to near Damauli, Transmission Tower Number 1 to 80; and New Butwal Sub-station in this section (after DMG 1983,1987).

The Power lines from 1 to 30 have pebble, cobble with sand and fines as alluvial deposits from upper Himalaya succession. This region falls in the lower part of the Bhabar zone in Indo-Gangetic plain from Quaternary to recent (**Fig. 4**). The underground area has water level at the very depth. From beginning to end, the size of the materials deposited varies, from coarse to fine. From 30-53 has medium to coarse grained sand in which water level seems to be in the shallow level in the ground.

3.2 New Butwal to Damauli, 84 km (1 to 310)

Figure 4 represents the general geology map for power lines from stations 1 to 80. Meanwhile, **Fig. 5** represents the geology after Transmission Tower number 80. The power lines from 1 to 18 include boulder, cobble, pebble and little fines in the Indo-Gangetic plain of Quaternary to recent deposits. The water level in this area is at very depth due to dominance of bigger grain size from which the water permeability is high. So, the perennial system of river is here showing very dry condition in autumn and winter. From 13 to 14 has a thrust HFT (Himalayan Frontal Thrust) passing transversely, the actual HFT lies at the 100 m towards Northern Plain from the hill slope.

From 14 to 25 power lines include Lower Siwalik (LS) of Siwalik Group in physiographic sub-division of Nepal. The Lower Siwalik comprise of grey to greenish grey bioturbated mudstone interbeds with grey, greenish grey, very fine to medium grained, calcareous sandstone. This formation is divided into the Lower, Middle and Upper Member based on the lithology change and increasing grain size. Most of the sandstones

are semi consolidated.

From 25 to 36 power lines include the Lower Middle Siwalik (MS1) of Siwalik Group in physiographic sub-division of Nepal from Middle Miocene to Lower Pleistocene. The Lower Middle Siwalik is comprised of medium, fine to medium grained sandstone with interbeds of siltstone and mudstone. Coaly materials and plant fossils are present.

From 36 to 45 power lines comprise of Upper Middle Siwalik (MS2) of Siwalik Group in physiographic sub-division of Nepal from Middle Miocene to Lower Pleistocene. The Upper Middle Siwalik is comprised of medium to coarse-grained sandstone, pebbly sandstone with siltstone and mudstone with relicts of hard sandstone. Turtle limb is present in the sandstone.

From 45-52 has Upper Siwalik (US) of Siwalik Group from Middle Miocene to Lower Pleistocene comprising of boulder, cobble semi consolidated conglomerate with minor yellow, grey mud and silt. Sand bands and lenses in the conglomerates are also present. At 52, Central Churia Thrust (CCT) or Jhumsa Thrust passes transversely to the Powerlines. This region is covered by recent alluvium deposits by Binai Khola, however at significant depth has lithology of Upper Siwalik.

From 52 to 62 has Lower Siwalik (LS1) of Siwalik Group in physiographic sub-division of Nepal. This Formation is again repeated because thrusting has uplifted the younger part again. The Lower Siwalik comprise of grey to greenish grey bioturbated mudstone interbeds with grey to greenish grey, very fine to medium grained, calcareous sandstone. This formation is divided into the Lower, Middle and Upper Member based on the lithology change and increasing grain size. Most of the sandstones are semi consolidated.

From 62 to 76 has Lower Middle Siwalik (MS1) of Siwalik Group in physiographic sub-division of Nepal from Middle Miocene to Lower Pleistocene. The Lower Middle Siwalik is comprised of medium, fine to medium grained sandstone with interbeds of siltstone and mudstone. Coaly materials and plant fossils are present.

From 76 to 80 include Upper Middle Siwalik (MS2) of Siwalik Group in physiographic sub-division of Nepal from Middle Miocene to Lower Pleistocene. The Upper Middle Siwalik is comprised of medium to coarse-grained sandstone, pebbly sandstone with siltstone and mudstone with relicts of hard sandstone. Turtle limb is present in the sandstone. At 80, Main Boundary Thrust passes transversely to the power lines.

After 80, late Paleozoic rocks of Lesser Himalayan are present. At first, Syangja Formation of Lakharpata Sub group of Midland Group exist. This formation includes milky white, pale, orange, pinkish or purplish calcareous quartzites and quartzitic limestones with dark grey and purple shales pinkish calcareous quartzitic beds, grey arkosic sandstones, dark grey and pale green shales.

Under the above Group and Sub-Group, Suntar Formation exists consisting of Fine to medium grained greenish grey Sandstone and purple shales with intercalations of green splintery shales.

Then after this, Galyang Formation (Gl) includes lithology of dark grey shales with black limestones thin calcareous slate and grey dolomitic limestones black carbonaceous slates with thin calcareous sandstone beds, grey to black dolomitic limestones.

3.3 Damauli to Ratmate, 88 km (1 to 315)

Tistung Formation of Kathmandu Group, Phulchoki Sub Group from Pre Cambrian to Devonian, includes dull green grey colored phyllites, pink purplish tinted sandstones with sandy limestones (**Fig. 5**). Ripple marks, clay cracks, worm tracks are abundant pebbly beds near base.

Then the line touches the Markhu Formation, Kathmandu Group and Shimphedi Sub Group, includes

massive coarse to medium grained, crystalline marble changing northward to dark fine biotites schists interbedded with impure marbles and quartzites, stromatolites are also found.

Then the line touches Galyang Formation of Midland Group consisting of dark grey slates intercalated with thin grey calcareous slates and lamellae of carbonates, thick beds of grey silicious dolomites are found at places (Baitadi beds).

Lakharpata Formation of Midland Group includes fine grained, light blue, grey limestones and dolomites with thin intercalations of grey shales, White, pink dolomitic limestones, purple quartzites and green shales at the top. Algal structure and stromatolites are present, Dunga quartzite beds are also present.

The line touches the Syangja Formaion. This formation includes milky white, pale, orange, pinkish or purplish calcareous quartzites and quartzitic limestones with dark grey and purple shales pinkish calcareous quartzitic beds, grey arkosic sandstones, dark grey and pale green shales.
The lines touch the Sangram Formation of Midland Group, which includes lithology of black, dark grey to greenish grey shales with intercalation of limestones and quartzites.

Then the line touches the Naudanda Formation (Nd) of the Midland Group, including Lakharpata subgroup which includes white massive fine to medium grained quartzites with ripple marks interbedded with green phyllites and basic intrusions are also noted at some points.

The power lines alternatively touch the Syangja Formation, Lakharpata Formation, Galyang Formation, Sangram Formation and Naudanda Formation of Lakharpata Subgroup of Midland Group.

3.4 Ratmate to Lapsiphedi, 58 km (1 to 189)

This region of the power lines touches the northern part of the Kathmandu valley, away from Kathmandu sediments, which include entirely of Lesser Himalayan rocks (**Fig. 5**).

At first the power lines pass through the Naudanda Formation of the Lakharpata Sub Group, that includes white massive fine to medium grained quartzites with ripple marks interbedded with green phyllites, also basic intrusions are noted in some part of the region.

Then, Ranimatta Formation of Lakharpata Sub Group of Midland Group which includes grey greenish grey gritty phyllites gritstones with conglomerates and white massive quartzites in the upper parts Basic intrusions are noted.

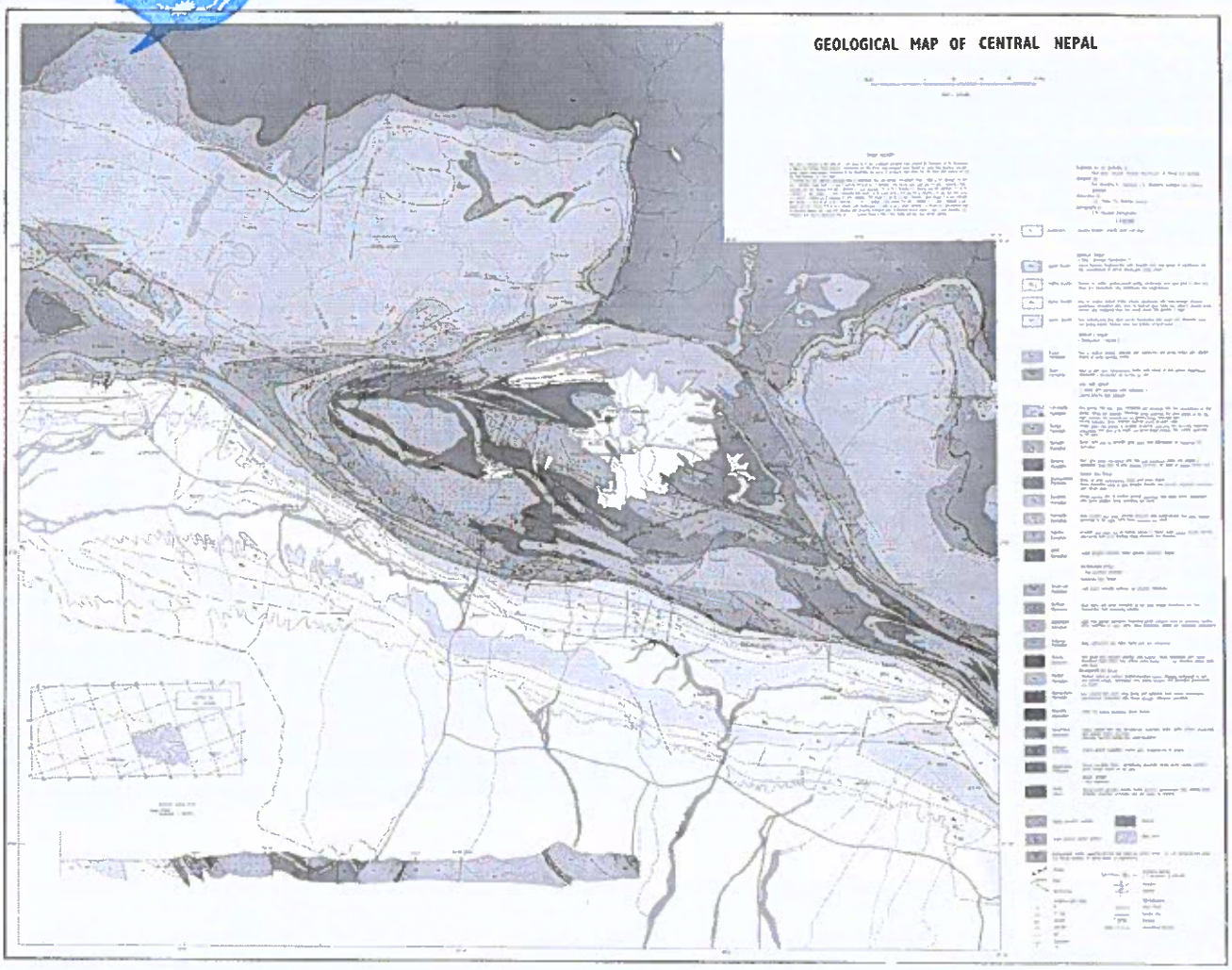

Fig. 5. Geological map of Central Nepal representing power lines lies near Damauli, Station Number 81 to 310; Damauli to Ratmate, Transmission Tower Number 1 to 315; Ratmate to Lapsiphedi, Station Number 1 to 189; Ratmate to New Hetauda; Station Number 1 to 94; Sub-stations of Damauli and Ratmate in this section (after DMG 1983,1987).

Then, Galyang Formation of the Midland Group, consisting of dark grey slates intercalated with thin grey calcareous slates and lamellae of carbonates, Thick beds of grey silicious dolomites are found at places.

Then Tawa Khola Formation of the Phulchoki Sub Group of the Kathmandu Group consisting coarse grained dark grey garnetiferous muscovite biotite quartz schists interbedded with greyish impure quartzites.

Then the undifferentiated schists quartzites gneisses and calcareous silicate rocks (cs) of Bhimphedi sub group and Tistung Formation in various stages of migmatization. The lines encounter the augen gneisses and banded gneisses in the area.

The lines meet at the Chandragiri Formation of the Phulchoki Sub group and Kathmandu Group, which includes light fine grained crystalline limestones partly silicious thick to massively bedded white quartzites in upper parts. Wavy limestones contain late Ordovician schinoderms. Again augen gneiss and banded Gneisses meets at the power lines.

Sarung Khola Formation of Bhimphedi Sub Group includes fine grained dark green grey biotite and quartzitic mica schists occasionally garnetiferous interbedded with impure strongly micaceous quartzites.

Then the line touches the Markhu Formation, Kathmandu Group and Bhimphedi Sub Group, includes massive coarse to medium grained, crystalline marble changing northward to dark fine biotites schists interbedded with impure marbles and quartzites, stromatolites are also found.

Then the line touches the Tistung Formation of the Phulchoki Sub Group that includes dull green grey colored Phyllites pink purplish tinted sandstones with sandy limestones. Ripple marks, clay cracks, worm tracks are abundant pebbly beds near base.

3.5 Ratmate to New Hetauda, 56 km (1 to 194)

This power lines encounter the lithology from lesser Himalayan to Siwalik rocks (**Fig. 5**). Starting from Ratemate sub-station include, Naudanda Formation of Lakharpata sub Group which consists of white massive fine to medium grained quartzites with ripple marks interbedded with green phyllites and basic intrusions are also noted at some points.

Recent deposits of the recent alluvium are seen.

The Galyang Formation of the Lakharpata sub group consists of consisting of dark grey slates intercalated with thin grey calcareous slates and lamellae of carbonates, Thick beds of grey silicious dolomites are found at places.

Then the Robang Formation of the Midland Group includes Green chloritic phyllite layers of basic rocks.

Tawa Khola Formation of the Bhimphedi Sub Group includes coarse grained dark grey garnetiferous muscovite biotite quartz schists interbedded with greyish impure quartzites. Again, the line touches the augen gneisses and banded gneisses.

Then the successive formation of the Sarung Khola Formation, Markhu Formation, Tistung Formation, biotite tourmaline granites, also called the Agra granite, Tawa Khola Formation, also include Pandrang quartzite member which include light green quartzites.

Then the lines encounter Udaypur Formation of Bhimphedi Sub group of Kathmandu Group which consists of coarse grained crystalline marbles with intercalations of schists.

The Shiprin Khola Formation of Bhimphedi Sub Group consists of coarse crystalline highly garnetiferous muscovite biotite quartz schists quartzites green chlorite schists at the base. The power lines are transverse to the Mahabharat Thrust (MT) in the path.

Similarly, after Dunga Quartzite, basic rocks, Galyang Formation are also successively found at the path. And also a Main Boundary Thrust (MBT) passes through transverse of the power lines.

Finally, the Siwalik (Sub Himalayan) rocks are encountered, at first Upper Siwalik of the coarse boulders, conglomerates with irregular beds and lenses of sandstones and thin intercalations of yellow, brown, grey sandy clays are found.
Also, Middle Siwalik and Lesser Himalaya rocks are also seen in the section of the power lines ending terminals.

4.0 GENERAL GEOLOGY OF SUBSTATIONS

4.1 New Butwal Sub-Station North and South

The first starting of the power sub-station includes the Indo-Gangetic plain (**Fig. 4**). The plain is the alluvium deposits from the successive materials from Siwaliks, Lesser Himalayan and Tethys Himalaya. This region has coarser aggregates than southern parts like cobble, pebble and coarse sands. The area is mainly silty and clayey with sand and water table could be observed on the sand dominant depth. This area is prominently used for the cultivation purpose, however there are few trees at the surroundings near the river canal.

4.2 Damauli Sub-station East and West

This is the second sub-station in the Power lines (**Fig. 5**). The sub-station is filled with the vegetation spot; light yellow to reddish soil suggests that it is filled with residual soil. This area includes the Lesser Himalaya rocks and include geological unit Tistung Formation of Kathmandu Group, Phulchoki Sub Group from Pre Cambrian to Devonian, includes dull green grey colored Phyllites pink purplish tinted sandstones with sandy limestones Ripple marks. Clay cracks, worm tracks are abundant pebbly beds near base.

Also it touches the Markhu Formation, Kathmandu Group and Bhimphedi sub Group, which includes massive coarse to medium grained, crystalline marble changing northward to dark fine biotites schists interbedded with impure marbles and quartzites, stromatolites are also found.

The river channel is almost at the level of the borehole location. So during the flooding, the location might be vulnerable. The area lies in the alluvial fan along the eastern part of the borehole location created by a small river flowing from the south to north. So, some engineering structures need to be implemented to reduce the impact of rapid discharge from the flood.

4.3 Ratmate Sub-station North and South and West

The Ratmate sub-station is located at the left bank of the Trishuli River (**Fig. 5**). It has the fertile land with gentle slope and rich in cultivation and vegetation. These areas have the alluvial deposits of the Trishuli River forming terrace. As per the geologic unit, it lies in the Naudanda Formation of Lakharpata Sub Group which consists of white massive fine to medium grained quartzites with ripple marks interbedded with green phyllites and basic intrusions are also noted at some points. Recent deposits from river could be observed on the terrace.

5.0 GEOTECHNICAL FIELD SURVEY AND GEOHAZARDS

Engineering geological Description and in-situ hazard Analysis of transmission aligned area were carried out during geotechnical investigation. Prior to the exploratory drilling, in-situ evaluations of geo-hazard was the one of the objectives of the investigation. Following paragraphs explain the existing hazard conditions of the boreholes and their adjacent areas.

5.1 Borehole: B1

General Geological description: The general geology of this site falls in southern Terai Zone, consisting soil is silty clay (MC).

Hazard Analysis: No any such type of river which can occurs flood. This zone is flood free zone; however, foundation subsidence can occur (**Fig. 6**).

Fig. 6. Representation of hazard around borehole B 1.

Recommendations to Hazard Mitigation: No need of any expensive measures should be employed for mitigation of hazard. This zone is safe for construction of the transmission tower.

5.2 Borehole: B 2 (Harpur, Kancharuwa)

General Geological description: The general geology of this site falls in southern Terai Zone, the consisting soil is silty clay (MC) at the top of the layer.

Hazard Analysis: No any such type of river which can occurs flood. This zone is flood free zone; however, foundation subsidence can occur (**Fig. 7**).

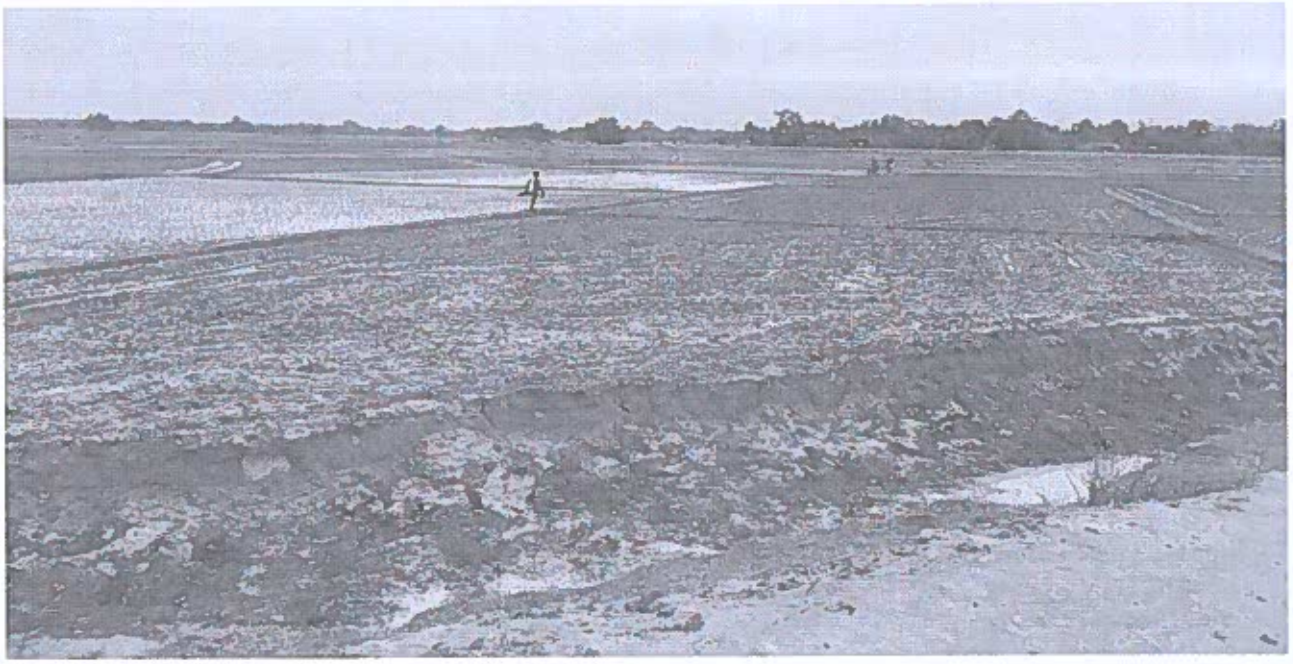

Fig. 7. Representation of hazard around borehole B 2.

5.3 Borehole: B 3 Debghab-9, Pipriyan

General Geological description: The general geology of this site consists of organic peat of about 5 cm thick along with Clay. The flood channel is highest at about 10 m during flooding.

Hazard Analysis: At Jharni Khola there is no any river training structures are employed, every year there is evidence of flash flood.

Recommendations to Hazard Mitigation: Some engineering structures need to be implemented to reduce the impact of rapid discharge from the flood (**Fig. 8**) at about 100 m southwest from the borehole location.

Fig. 8. Representation of hazard around borehole B 3 in Terai region.

5.4 Borehole: B 4 Shisha Khola, Paskhuli, Bazar

General Geological description: This site consists sandy clay having greater than 20% gravel.
Hazard Analysis: This zone is flood prone zone; having repeated flood evidences every year.

Recommendations to Hazard Mitigation: Some engineering structures need to be implemented to reduce the impact of rapid discharge from the flood (**Fig. 8**) at about 100 m southwest from the borehole location (**Fig. 9**).

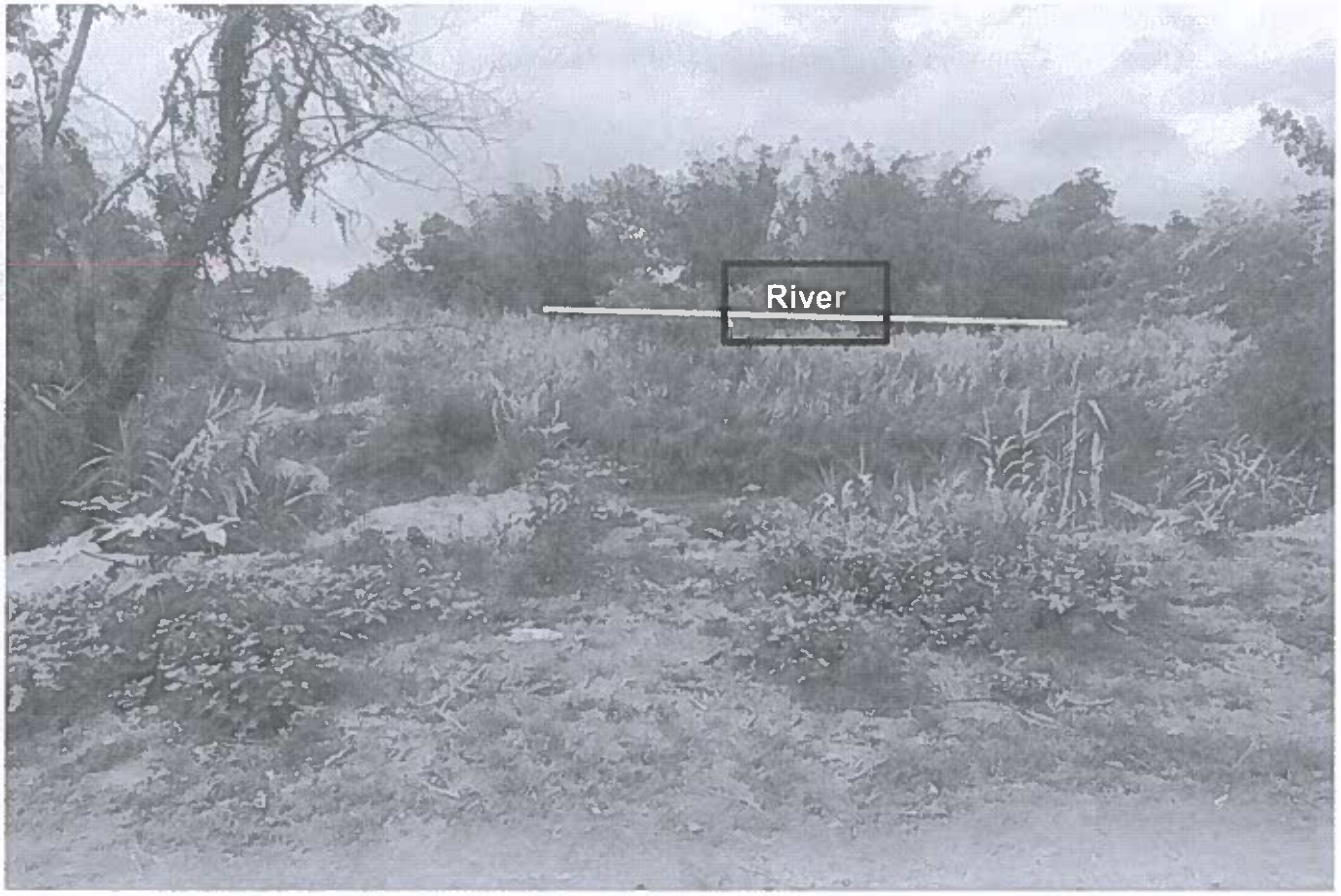

Fig. 9. Representation of hazard around borehole B 4 in Terai region.

5.5 Boreholes: B 6, B 7 & B 8 (Butwal sub-station)

General Geological description: Near to Dhungri Khola at Michiyapur, Kapilbastu. This site consists of silty clay(CM) and organic materials which is Quaternary to recent alluvial deposit from Himalaya.

Hazard Analysis: The transported sediment analysis of this river indicates that there is high probability of flood. And this is a perineal river. The clay having high plasticity leads to subsidence of ground.

Recommendations to Hazard Mitigation: Some engineering structures need to be implemented to reduce the impact of rapid discharge from the flood.

5.6 Location: B 9 Gargara, Keron, Khola

General Geological description: Gravel sand having fines alluvial sediment deposit.

Hazard Analysis: Highly flood prone zone.
Recommendations to Hazard Mitigation: Some engineering structures need to be implemented to reduce

the impact of rapid discharge from the flood.

5.7 Location: B 10 Khumbari, Nawalparashi

General Geological description: This site falls in alluvial fan deposit of the Binaya Khola, consisting river coarse material Boulder, Gravel, sand deposit below the 1.5 m - 2 m silty clay and fine sand deposit. The relative density of this site of is 50-70% (moderately dense).

Hazard Analysis: There is sufficient evidences of flood and site situated above 5 m from river surfaces. The catchment area of flood area is very large and steeper slope may lead to high gradient of river material.
Recommendations to Hazard Mitigation: The detail flood returning period study is recommended. Also, the detailed flood activity in the past, rainfall data, analysis is compulsion (**Fig. 10**).

Fig. 10. Representation of hazard around borehole B 10.

5.8 Location: B 11, Near to Binaya Khola, new bridges

General Geological description: This zone consists sandy gravel, river deposited material by Binay Khola.
Hazard Analysis: The provided borehole location lies near the river channel which is not suitable for the construction of transmission tower.

Recommendations to Hazard Mitigation: Alternative site is advised to be selected at about 20 m - 30 m uphill from Binaya Khola Bridges. Since the slope is stable, the left bank is also suitable for the construction of the transmission tower.

5.9 Borehole: B 12 Jyamire, Palpa

General Geological description: This site lies on the river terrace of the Arun Khola, at Palpa. The river sediments comprise boulder, cobble, gravel and sands.

Hazard Analysis: Since the site has brought boulders of sizes greater than 4 m in diameter, the area is highly vulnerable from the perspectives of sediment disasters.

Recommendations to Hazard Mitigation: Some engineering structures need to be implemented to reduce the impact of sediment disasters.

5.10 Borehole: B 13 Sindure Palpa, Nisti Rural Municipality-7

General Geological description: This area consists of about 10-meter-thick residual soil (MC); however, underlying bedrock is highly deformed intercalation of slate and shale. The attitude of bedrock is N80°E-S80°W/50°SW.

Recommendations to Hazard Mitigation: No need to consider the hazard mitigation structures at the proposed borehole location.

5.11 Borehole: B 14 Beldadada, Wards- 5, Nisdi

General Geological description: This site consists of Laterite (red soil) sandy clay (CS) having some percent of silt and gravel.

Hazard Analysis: This area falls on ridges, there is no instability problem. Little erosion is observed.
Recommendations to Hazard Mitigation: No mitigation required.

5.12 Borehole: B15

Area lies at at Panthe Palpa, about 200 m from the Nisdi Khola, Suspension Bridges.

General Geological description: Thick alluvial deposit, well graded gravel (GW) below the residual soil high plasticity clay (CH).

Hazard Analysis: This area lies on school area and just above the road cut section which may be vulnerable in terms of slope failure.

Recommendations to Hazard Mitigation: Bio-engineering is advised to adopt in order to protect from gully and rill erosions and possible slope failure.

5.13 Borehole: B 16

Area lies at opposite meandering of Kaligandaki of Pattar Bus Park.
General Geological description: This site lies on the river terraces deposit of Kaligandaki classified as Terraces- 3. The alluvial deposit of the Kaligandaki River comprising boulder to fines sediments. The soil is classified as silty sand (SM) having significant gravel and boulders.

Hazard Analysis: This site is stable site, the slope above is gentle slope having angle 25° and the plain has less chances affected by flood.

Recommendations to Hazard Mitigation: Even though, the hydrological data analysis is recommended govern the flood returning period and its affect. The sandy gravel having loose density is highly erodible by water and it should be protected.

5.14 Borehole: B 17 Near to Deurali, Tanahu

General Geological description: The general geology of this zone is highly weathered phyllite-slate. And top layer of residual soil is clayey Silt (CL) with gravel.

Hazard Analysis: There is the possibility of slope failure on the Bedi Highway.

Recommendations to Hazard Mitigation: Bio-engineering is advised to adopt in order to protect from gully

and rill erosions and possible slope failure.

Fig. 11. Representation of hazard around borehole B 17.

5.15 Borehole: B18 Ghiring-3, Tanahu

General Geological description: The bed rock is weathered slate; however, top 1-meter soil is clayey sand (SC) with little fines. The relative density of soil is 50-70% (dense) and site lies on spur while hill slope is 30°.

Hazard Analysis: There is no any landslide hazard is identified but there are high chances of erosion. This is an old landslide mass.

Recommendations to Hazard Mitigation: Erosion should be protected, and drainage management is main concern in this site.

5.16 Borehole: B 19 Dhakredi, Tanahu

General Geological description: The top layer about 2 m consist of silty sand (SM) with gravel. Highly deformed phyllite intercalated with greenish gray slate is observed.

Recommendations to Hazard Mitigation: No need to apply mitigative measures.

5.17 Borehole: B 20 Rishing-8, Tanahu

General Geological description: The existing soil is classified as residual soil more than 10 m thick. The silty clay (CM) is organic soil, the plasticity of soil is low.

Recommendations to Hazard Mitigation: The slope and the top of the ridge are stable.

5.18 Borehole: B 21

Area lies at the left bank of the Madi Khola, Nigureghari, Damauli.
General Geological description: The main geology of this site is intercalation of phyllite and schist having attitude N10°W-S10°E/40° NW. The top layer of the soil about 1 m thick consist of silty clay (CM).
Hazard Analysis: The bed rock is almost fresh to slightly weathered and inclined rock, existing less parallel joints set.

Recommendations to Hazard Mitigation: The site is stable and suitable for the transmission tower.

5.19 Borehole: B 24 Chabbdikhola basin, Byas- 13, Tanahu

General Geological description: This is an alluvial fan deposit of the Chabdi Khola which consists of organic clayey silt at top most layer of soil about 50 cm. Whereas below organic layer alluvial deposit comprising, sand, gravel, and boulder is exist. Hazard Analysis: This zone is appropriate zone, there is no any chances of landslide hazard occur but the Chabdi khola is a seasonal river, the flood mapping is essential.

Recommendations to Hazard Mitigation: This site is also suitable to developed substation and other structures; the area is flat land and the opposite slope is also stable enough.

5.20 Borehole: B 30

Area lies about 50 m NW from Kali Khola Bridges, Narayanghat- Mugling Road.

General Geological description: The sediment analysis shows that the existing mass is a transported colluvium mass from large scale landslide. Highly deformed, 4 set jointed and highly fractured metasandstone intercalated with schist is observed with attitude N60°E-S60°W/70°SE.

Hazard Analysis: The proposed site belongs to very hazardous zone. There is high probability of plane failure and wedges failure. The new road cut section having highly deformed rock and very loose sediments (sandy gravel).

Fig. 12. Representation of hazard around borehole B 30.

Recommendations to Hazard Mitigation: Rock stability measures should be adopted.

5.21 Borehole: B 33, Aandhamara, Benighat-5

General Geological description: Main geology is dolomite and schist. The hill slope is 70°. The weathered dolomite resulted the steep slope unstable.

Hazard Analysis: The rock block slides are observed on the road cut section.
Recommendations to Hazard Mitigation: Proper drainage management is advised.

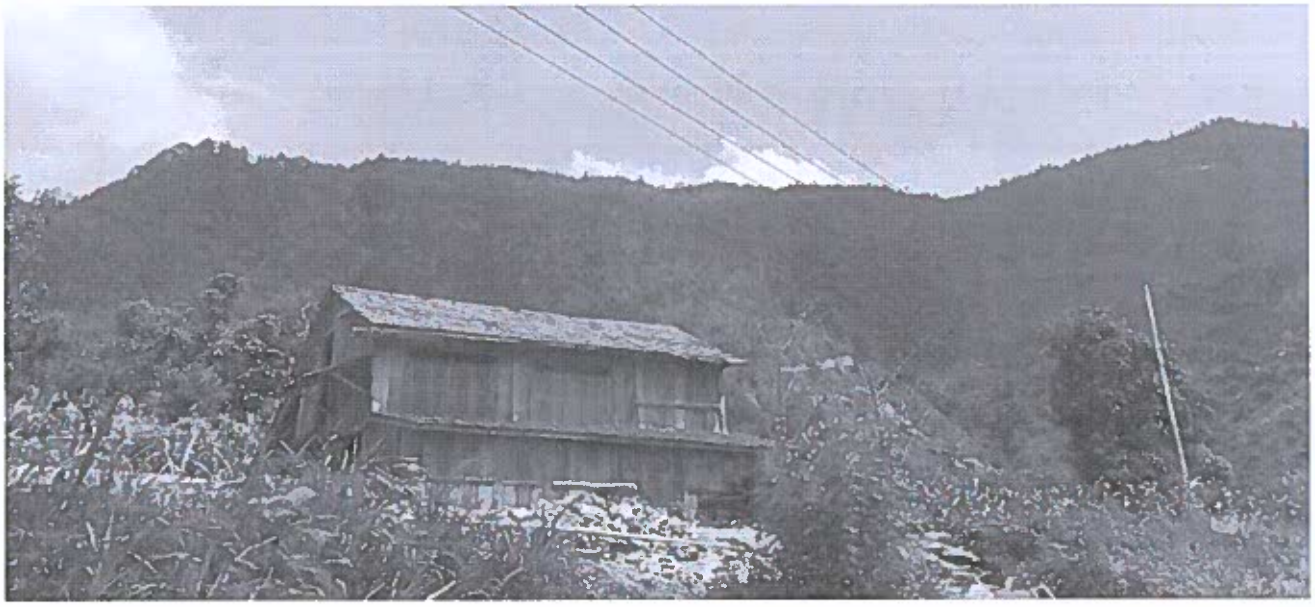

Fig. 13. Representation of hazard around borehole B 33.

5.22 Borehole: B 38-B 39, Ratmate substation, Ratmate-7

General Geological description: This site belongs to the terraces deposit of the Trisuli River at the left bank about 50 m upstream classified as Terrace -3. The basement sediment is the thick layer of river coarse material including boulder, gravel and fines whereas at the top layer consist 5-meter-thick red clay.
Hazard Analysis: The prominent erosion and instability near the cut slope section is major problem of the area. Besides, red clay has been using for the manufacture of bricks which will increase the erosivity of the area (**Fig.14**).

Recommendations to Hazard Mitigation: Proper drainage together with civil retaining structures are advised to protect from erosion and instability.

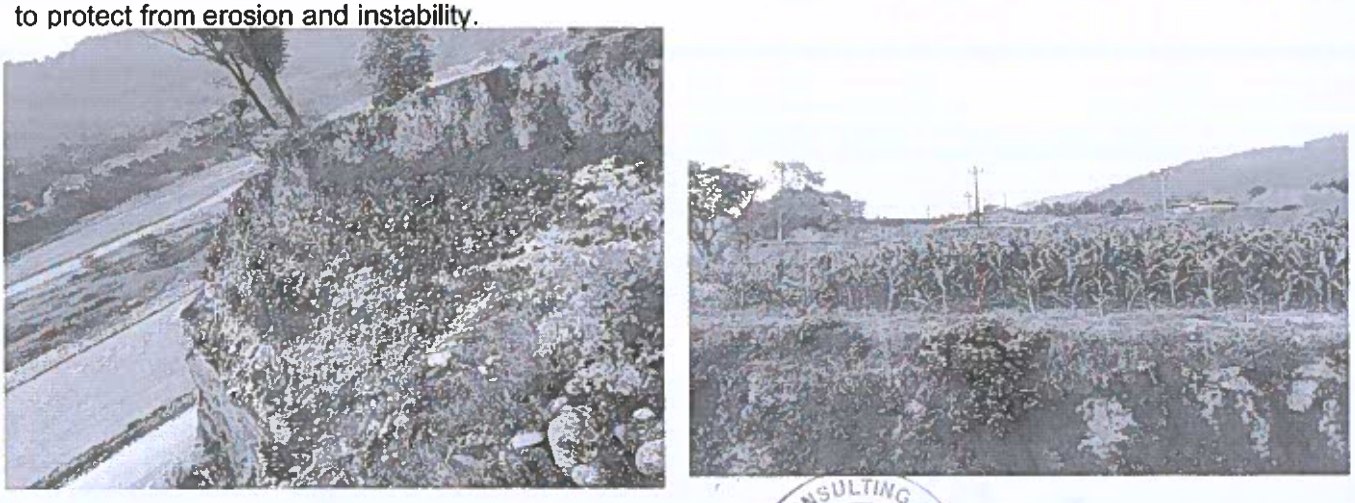

Fig. 14. Representation of hazard around boreholes B 38 & B 39 at Ratmate sub-station.

5.23 Borehole: B 53, Right Bank of the Suli Khola,

General Geological description: This site lies along the bank of the Sulikhola River Valley. main lithology represents the intercalation of quartzite and schist having orientation N20°W-S20°E/80°SW. Clayey silt (CM) with gravel as a colluvium soil is exist on the top 2 m.

Hazard Analysis: There exist rock fall problem, soil erosion, and slope instability with the occurrences of slope of 30°.

Recommendations to Hazard Mitigation: The proper drainage management, rock fall protection and mitigation of slope instability are advised.

5.24 Borehole: B 46, B 47 and B 48

General Description: All three boreholes lie on the Shivapuri Gneiss, an intrusive rock mass on the northern part of Kathmandu Valley.

Hazard Analysis: The borehole B 46 was drilled on south facing slope on the colluvial deposit. The terrain is cultivated and stable with presence of some man made erosional hazards due to road cut.

B 47 was drilled on cultivation terrace on a north facing slope. The heavily cultivated area had both colluvial and residual materials. Some seepages could be observed on the slope. Such that, with boundary between the rock and soil there might be possibility of shallow failure just below the drilled location.

The borehole B 48 was drilled on the top of ridge and on the cultivated land. The land is stable with bed rock exposed on the side of the road cut slope.

Soil is formed due to the weathering of granite and produce highly fertile land with no major instability observed around this zone between all three boreholes.

Recommendations to Hazard Mitigation: Some stability analysis shall be required to protect from the possibility of hazard on B 47 location.

5.25 Borehole: B 59, B 60 Hetauda Sub-station

General Geological description: This site consists of sediments transported from the Himalayas. Mostly, sediments having loose relative density and gravel, sand with significant fines are main existing sediments.

Recommendations to Hazard Mitigation: The variation of sediments may lead to uneven settlements whereas existing sands and gravel results liquefactions during earthquakes.

6.0 SEISMIC HAZARD ANALYSIS

6.1 Background on Nepal Himalaya

Nepal Himalaya was formed by the collision of two massive tectonic plates, the Indian Plate and the Eurasian Plate about 50 ma years ago. The collision of the tectonic plates formed a convergent boundary. After the collision, the Indian plate started sub-ducting beneath the Eurasian Plate, thus forming the Himalaya as we know today. But the movement of the Indian plate did not stop after the collision but is still moving at almost a constant rate of 3 cm per year up to this day.

Geological structures such as the faults, folds and shear zones could be observed on the Himalaya region. The major thrust formed along the subduction boundary, is termed as Main Himalayan Thrust (MHT). And other faults exposed on the surface and parallel to the plate boundary could be observed on the southern portion of the Himalaya. These faults are termed as Imbricate Faults and are subsidiary to the MHT. Folds as large synclinorium, anticlinorium are also formed along with other regional structures as windows, nappes, klippes, etc.

The major thrusts observed or exposed on the surface are Main Central Thrust (MCT), Main Boundary Thrust (MBT), Main Frontal Thrust (MFT). The accumulated energy from the constant movement of the Indian Plate, which is released during the earthquake are found to be released along the above mentioned faults. So, due to the movement along these faults, Nepal Himalaya is constantly hit by numerous earthquakes. The size or magnitude of the earthquake is variable from time to time from a small feeble tremor to devastating earthquakes.

Nepal Himalaya being one of the most susceptible among the countries along the Himalayan range. Nepal has a history of large earthquakes approximately six earthquakes equal to 7.6 or greater than 7.6 (D. R. Thapa, 2018). And the traces of the earthquakes are found along the previously mapped major fault lines.

6.2 Probabilistic Seismic Hazard Mapping

Many geoscientists have studied about the seismicity of Nepal Himalaya for many years. And the researchers have made several maps representing various aspects of the earthquakes.

Several seismic stations are installed around the country and data acquired from that stations are analyzed using software to produce the map showing the different levels of seismicity and level of hazard that the probable earthquake could cause. The recent study or research is concentrated on the possibility of hazard that could happen if an earthquake occurs in near future.

The PSHA (Probabilistic Seismic Hazard Analysis), is conducted to demarcate the different of hazard zones by considering the time and intensity factor by taking the history in to account. The hazard map prepared has different zones in which the possibility of certain level of shaking at certain period of time in near future is shown.

DMG have prepared a PSHA map in 2002 considering seismicity from the historical time. The map is developed using the given five steps:

i. Identify all earthquake sources capable of producing damaging ground motions.

ii. Characterize the distribution of earthquake magnitudes (the rates at which earthquakes of various magnitudes are expected to occur).
iii. Characterize the distribution of source-to-site distances associated with potential earthquakes.
iv. Predict the resulting distribution of ground motion intensity as a function of earthquake magnitude, distance, etc.
v. Combine uncertainties in earthquake size, location and ground motion intensity, using a calculation known as the total probability theorem.

This PSHA map is prepared by contouring different levels of ground motions that will not exceed at the given time frame. As simply, it classifies the map into sections, on which the given level of ground shaking has probability of occurring inside a certain time period. The Peak Ground Acceleration (PGA), which is a short period ground motion parameter of ground shaking is taken into consideration to produce the map. And the map shows peak ground horizontal acceleration contours in bed rock for five hundred years return period. It approximately corresponds to 10% chance of exceedance in fifty years.

6.3 Boreholes and Corresponding Values

The table shows the probable horizontal peak ground acceleration on the borehole locations on active seismic event as per the map as shown in **Fig. 15.**

Since most of the boreholes lies on the Lesser Himalaya Zone and near the seismically active MCT the value for the PGA is greater in that area. But now the new research is pointing that the MBT is getting active and the MCT is becoming dormant so the boreholes or towers on the lower portion of the Himalaya or that lying on the south are more likely in seismically active zone.

Table 1. Effects of Horizontal PGA along the Boreholes.

Horizontal Peak Ground Acceleration (PGA)	Boreholes
100	B 1 to B 5
Increasing from 100 to 50	B 6 to B 12
Increasing from 50 to 200	B 13 to B 15
Increasing from 200 to 250	B 15 to B 18
Increasing from 250 to 300	B 19 to B 21
Around 250	B 22 to B 24
Decreasing from 250 to 50	B 25 to B 27
Around 50	B 28 to B 30
Increasing from 50 to 250	B 31 to B 34
Increasing from 250 to 300	B 35 to B 38
Decreasing from 300 to 250	B 39 to B43
Increasing from 300 to 350	B 45 to B 47
Between 300 and 250	B 48 to B 50
Between 250 and 50	B 51 to B 53
Between 50 and around 100	B 56 and B 60

The **Table 1** shows the probable horizontal peak ground acceleration (PGA) along the borehole locations on active seismic event which is further represented by the map as shown in **Fig. 15.**

Since most of the boreholes lies on the Lesser Himalaya Zone and near the seismically active MCT the value for the PGA is greater in the areas. But now the new research is pointing that the MBT is getting active and the MCT is becoming dormant so the boreholes or towers on the lower portion of the Himalaya or that lying on the south are more likely along the seismically active zones.

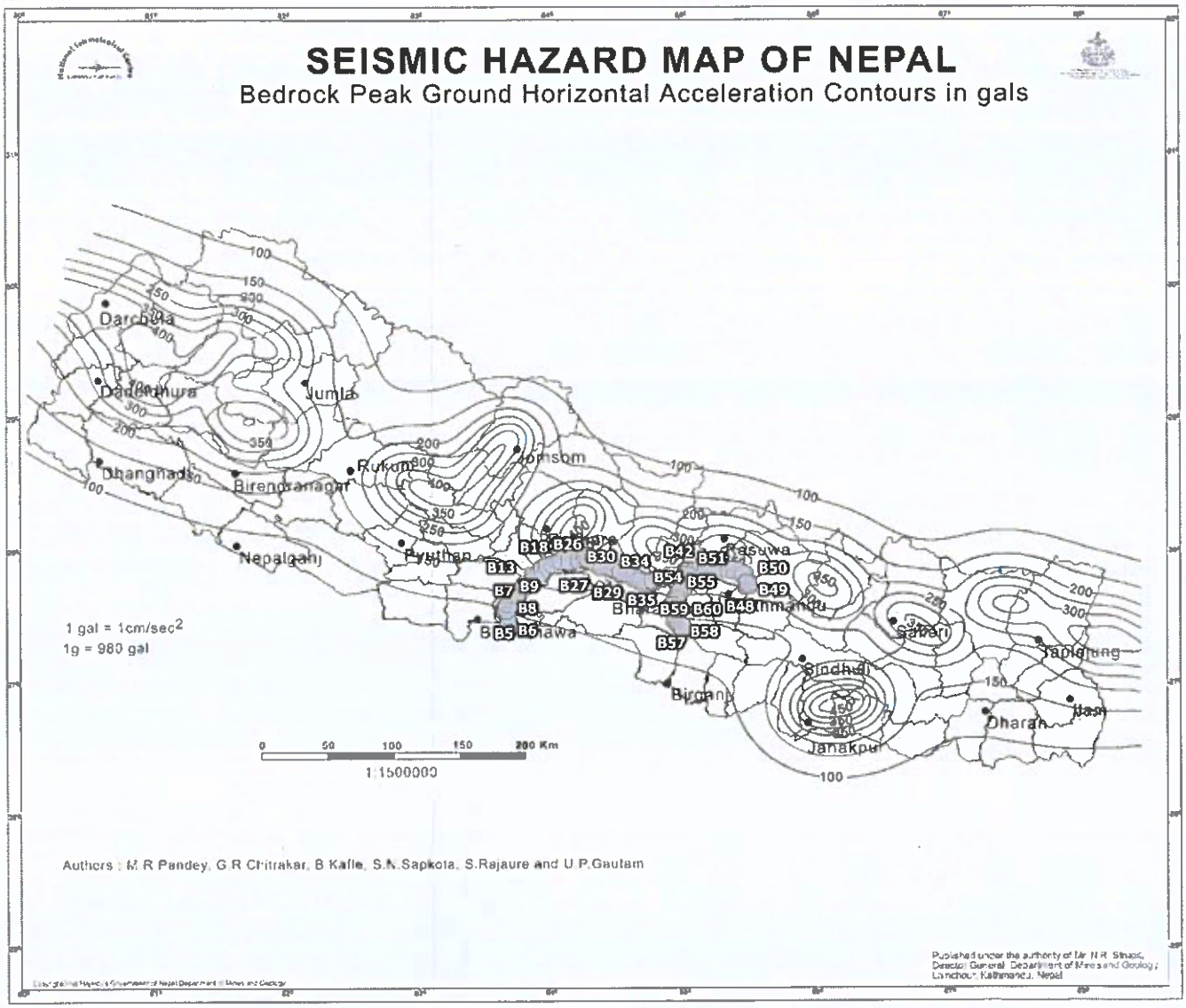

Fig. 15. Seismic Hazard Map of Nepal DMG (2002) and the location of the boreholes.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions can be drawn from the geological desk study and field survey for the evaluation of geohazards of the aligned sites for transmission tower.

a. The entire area passes through all major tectonic divisions of Nepal Himalaya from Gangetic plain (Terai), Sub-himalaya (Siwaliks) and Lesser Himalayan metasedimentary rocks.
b. Since the transmission lines pass through all major geological units from plain Indogangetic alluvial and Quaternary plain to the sedimentary rocks of Siwalks and metasedimentary rocks of Lesser Himalayan rocks, there are different types of hazards can be noticed along the route.
c. Boreholes B 3, B 4, and B 12 lies on alluvial planes of Terai. Therefore, river training structure are necessary.
d. Borehole B 13 area shows the excessive erosion at some parts of the road cut sections. About 100 m NE from the drilling site is recommended for constructing transmission tower.
e. Borehole B 17 area shows probability of slope failure. Therefore, shifting of 820 m at the peak is recommended to construct tower.
f. Borehole B 30 area shows chances of rock plane and/or wedge failure. Therefore, Rock stability measures should be adopted.
g. Borehole B 33 area needs to be treated with proper drainage system.
h. Boreholes B 38 and B 39 areas need to be reinforced with constructing retaining structures and gabion structures together with proper drainage system for long term stability of the area.
i. In borehole B 53 and B 54 locations, the proper drainage management, rock fall protection and mitigation of slope instability are advised.
j. The seismic hazard map shows the towers in the midlands or on the Lesser Himalayan zone which will be mostly affected but the recent study indicates the increase in the seismic activities. And since the seismic activities could also affect the stability of the slope, the zones with steep terrains and fragile landscape will be affected more.

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MCA – NEPAL GEOTECHNICAL INVESTIGATION FOR TRANSMISSION LINE (400kV DC)

GEOTECHNICAL INVESTIGATION FOR 400kV TRANSMISSION LINE

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

FINAL REPORT

Kathmandu, Nepal, October 2019

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Annexes

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Annex - D: Data Sheet of VES and Activity Photographs
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1.0 INTRODUCTION

ICGS Pvt. Ltd., has been assigned to carry out the geotechnical investigation for the proposed 400 kV AC Double Circuit transmission towers along the alignment. The geotechnical investigation includes soil explorations, soil resistivity analysis, laboratory testing and preparation of foundation design recommendations. The soil investigation includes rotary drilling and auger drilling along the routes of New Butwal to India Border, Transmission Tower Number 1-23; New Butwal to near Damauli, Transmission Tower Number 1 to 80; and New Butwal Sub-station Tower, near Damauli, Transmission Tower Number 81 to 310; Damauli to Ratmate, Transmission Tower Number 1 to 315; Ratmate to Lapsiphedi, Transmission Tower Number 1 to 189; Ratmate to New Hetauda; Transmission Tower Number 1 to 94; Sub-stations of Damauli and Ratmate. Approximately 60 boreholes and soil/rock properties are required to obtain with necessary in-situ and laboratory tests. Moreover, soil resistivity of the aligned area needs to be performed at the same locations. In this reference, the work was carried out in accordance with the Agreement No. S20604-N for Project No. 3620667093.

The basis of geotechnical investigation was comprised of geotechnical exploratory drilling boreholes and performing Standard Penetration Test (SPT) to satisfactory depths together with soil resistivity tests. The field program was performed by the technical team of ICGS for Services and Design Company involved in drilling the boreholes and performing the SPT. The laboratory testing was carried out by the technical staff of the soil laboratory of ICGS, Minbhawan, Kathmandu in all locations aligned by Stantec Consulting Limited. In this reference, out of 60 boreholes, 58 boreholes have been accomplished by May 18, 2019. Remaining 2 boreholes could not be carried out at Damauli sub-stations due to problems occurred with the land owner. Finally, these 2 boreholes were terminated with adequate discussions with related parties. This detailed geotechnical report presents the results of the field and laboratory investigation carried out for the proposed 400 kV AC Double Circuit towers of electricity transmission line as contracted with the Stantec Consulting Limited.

1.1 Objective of the Study

The main objectives of this investigation is to explore the subsurface condition of the foundation along with general bearing capacity and to provide necessary design parameters for the foundation of the transmission towers that are in compliance with the requirements specified.

The specific objectives of the investigation are:

a) To prepare general geological, engineering geological and geo-hazards using desk study and verifying through site visit at borehole locations areas.
b) To present geotechnical properties of the subsurface material along the alignments using in situ exploratory tests as drilling and soil resistivity tests.
c) To perform laboratory tests for the index properties of subsurface materials.
d) To provide parameters required for the foundation analysis using in-situ SPT tests
e) To provide recommendations pertaining to bearing capacity.

2.0 PROJECT DESCRIPTION

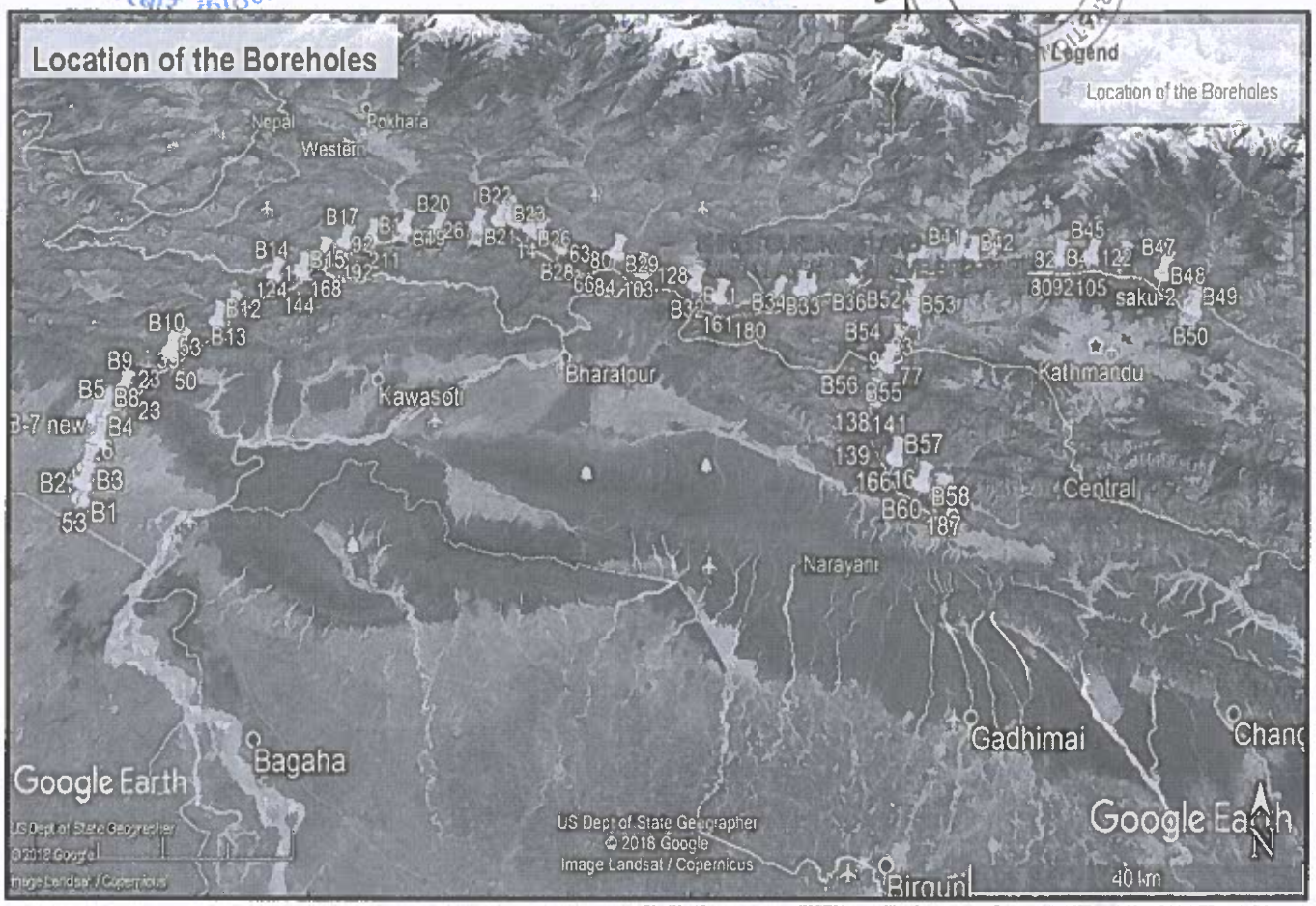

Fig. 1. The site layout the borehole locations along the proposed transmission tower alignment.

In this project, sixty boreholes were required to be drilled at different locations: seven boreholes (B1 to B7) between Butwal Substation to India Border, 16 boreholes at Butwal to Damuli area has, 15 boreholes between Damauli Substation to Ratmate Substation 12 Boreholes at Ratmate to Lapsiphedi area and 10 boreholes between Ratmate Substation to Hetauda Substation. All the bore boreholes were drilled up to 7 m depths. The locations of the bore holes are shown in **Fig. 1**. **Tables 1** and **2** represent the summary of borehole locations, accessibility, land use, drill rig and depth of drilling.

Table 1. Summary of borehole locations (B 1 - B 29) along the proposed transmission tower alignment.

Borehole No.	Northing	Easting	Location	Accessibilty	Land use	Drill Rig	Drill Depth
B1	N: 27° 25' 42.36"	E: 83° 42' 16.44"	Near Butwal	Good	Cultivation	Auger Drill	7 m
B2	N: 27° 27' 10.20"	E: 83° 42' 9.72"	Near Butwal	Good	Cultivation	Auger Drill	7 m
B3	N: 27° 28' 29.46"	E: 83° 42' 31.68"	Near Butwal	Good	Cultivation	Auger Drill	7 m
B4	N: 27° 31' 14.04"	E: 83° 41' 33.90"	Near Butwal	Good	Cultivation	Auger Drill	7 m
B5	N: 27° 33' 19.26"	E: 83° 40' 21.18"	Near Butwal	Good	Cultivation	Auger Drill	7 m
B6	N: 27° 34' 26.22"	E: 83° 41' 10.86"	Near Butwal	Good	Cultivation	Auger Drill	7 m
B7	N: 27° 34' 16.44"	E: 83° 41' 10.38"	Near Butwal	Good	Cultivation	Auger Drill	7 m
B8	N: 27° 34' 28.32"	E: 83° 41' 16.14"	Near Butwal	Good	Cultivation	Auger Drill	7 m
B9	N: 27° 36' 32.18"	E: 83°42'15.63"	Near Butwal	Good	Cultivation	WD 100	7 m
B10	N: 27° 40' 34.84"	E: 84°45'27.28"	Dhurkot	Good	Cultivation	WD 100	7 m
B11	N: 27° 51' 54"	E: 84°30'23"	Dhurkot	Fair	Barren	WD 100	7 m
B12	N: 27° 43' 57.77"	E: 83°49'17.18"	Near Jyamire	Fair	Forest/Cultivation	WD 100	7 m
B13	N: 27° 45' 6.28"	E: 83°50'29.51"	Near Jyamire	Not good	Forest	WD 100	7 m
B14	N: 27° 49' 22.30"	E: 83°53'44.45"	Near Darchha	Fair/Not good	Forest	WD 100	7 m
B15	N: 27° 50' 11.20"	E: 84°14'29.11"	Near Darchha	Fair	Forest/Cultivation	WD 100	7 m
B16	N: 27° 52' 23"	E: 83°58'3.85"	Bhantar	Good	Cultivation	WD 100	7 m
B17	N: 27° 53' 54.05"	E: 84°00'48.89"	Deurali	Fair/Not good	Cultivation	WD 100	7 m

Borehole No.	Northing	Easting	Location	Accessibilty	Land use	Drill Rig	Drill Depth
B18	N: 27° 54' 28.55"	E: 84°3'2.32"	Near Shamung	Fair/Not good	Cultivation	WD 100	7 m
B19	N: 27° 55' 56.66"	E: 84°06'29.32"	Near Shamung	Fair/Not good	Forest	WD 100	7 m
B20	27°55'40.70"N	84°10'6.56"E	Near Ranipokhari	Not good	Cultivation	WD 100	7 m
B21	N: 27° 55' 29.98"	E: 84° 14" 48.89"	Near Ranipokhari	Not good/no access roads	Cultivation	WD 100	7 m
B22	N: 27° 57' 5.17"	E: 84° 16' 51.25"	Byas	Good	Barren	WD 100	7 m
B25	N: 27° 56' 50.50"	E: 84° 18' 46.64"	Byas	Fair	Barren	WD 100	7 m
B26	N: 27° 55' 48.42"	E: 84° 20' 34.05"	Keshavtar	Fair	Barren	WD 100	7 m
B27	N: 27° 55' 05"	E: 84° 21' 33"	Belkana	Good	Cultivation	WD 100	7 m
B28	N: 27° 53' 09.68"	E: 84° 24' 08.13"	Kallery, Tanahu	Not good	Cultivation	WD 100	7 m
B29	N: 27° 51' 54.86"	E: 84° 30' 23.53"	Near Aanbhu Khaireni	Not Good	Barren	WD 100	7 m

Table 2. Summary of borehole locations (B 30 - B 60) along the proposed transmission tower alignment.

Borehole no	Northing	Easting	Location	Accessibility	Land use	Drill Rig	Drill Depth
B30	N: 27° 50' 5.17"	E: 84° 33' 20.8"	Near Chandi Bhanjyang	Good/Mugling Narayanghat section	Barren	WD 100	7 m
B31	N: 27° 48' 1.91"	E: 84° 38' 52.84"	Near Kaule	Not good	Barren	WD 100	7 m
B32	N: 27° 46' 35.1"	E: 84° 41' 31.9"	Near Jogimara	Fair	Barren	WD 100	7 m
B33	N: 27° 46' 56.72"	E: 84° 47' 29.02"	Near Benighat	Fair	Barren	WD 100	7 m
B34	N: 27° 47' 41.5"	E: 84° 50' 13.9"	Near Gajuri	Good/Prithivi Highway	Cultivation	WD 100	7 m
B35	N: 27° 48' 26.1"	E: 84° 41' 31.9"	Near Gajuri	Good/Prithivi Highway	Forest	WD 100	7 m
B36	N: 27° 49' 18.52"	E: 84° 55' 42.76"	Near Kalleri	Fair	Barren	WD 100	7 m
B37	N: 27° 51' 04.1"	E: 85°02'26.2"	Ratmate	Good	Cultivation	WD 100	7 m
B38	N: 27° 51' 6.01"	E: 85°3'5.80"	Ratmate	Good	Cultivation	GXY 150	7 m
B39	27°51'3.94"N	85° 3'8.89"E	Ratmate	Good	Cultivation	GXY 150	7 m
B40	N: 27° 50' 46.2"	E: 85°03'25.3"	Ratmate	Good	Cultivation	WD 100	7 m
B41	N: 27° 51' 01.9"	E: 85°06'33.4"	Near Devghat	Fair	Cultivation	WD 100	7 m
B42	N: 27° 52' 26.38"	E: 85° 9' 24.04"	Near Bidur	Fair	Barren	WD 100	7 m
B43			Near Bidur	fair	Cultivation	WD 100	7 m
B44	N: 27° 36' 42.09"	E: 83°42'28.10"	Jargha, Nawalparasi	Fair	Forest	WD 100	7 m
B45	N: 27° 51' 39.4"	E: 84°18'40.8"	Samundradevi	fair	Forest	WD 100	7 m
B46	N: 27° 51' 07.9"	E: 85° 25' 25.6"	Jyamire	Not good	Forest	WD 100	7 m
B47	N: 27° 49' 20.67"	E: 85° 30' 39.40"	Near Haibung	Fair	Cultivated	WD 100	7 m
B48	N: 27° 49' 20.67"	E: 85° 28' 59.82"	Near Lapsipedhi	Fair	Cultivated	WD 100	7 m
B49	N: 27° 44' 43.65"	E: 85° 30' 18.10"	Jaharsighpauwa	Good	Cultivated	GXY 150	7 m
B50	N: 27° 49' 20.67"	E: 85° 28' 59.82"	Jaharsighpauwa	Good	Cultivated	GXY 150	7 m
B51	N: 27° 49' 6.81"	E: 85° 2' 37.97"	Near Ratmate	Fair	Barren	WD 100	7 m
B52	N: 27° 46' 25.74"	E: 85° 1' 56.43"	Gogan Pani	Good/Near Prithivi highway	Barren	WD 100	7 m
B53	N:27° 44' 3.68"	E: 85° 1' 8.47"	Bhumistan	Not good	Barren	WD 100	7 m
B54	N:27° 40' 25.41"	E: 84° 58' 36.70"	Chhinaghari	Fair	Cultivated	WD 100	7 m
B55	N: 27° 38' 21.32"	E: 84° 57' 36.70"	Chhinaghari	Not good	Cultivated	WD 100	7 m
B56	N: 27° 35' 14.97"	E: 84° 55' 53.93"	kalitar	Not good	Forest	WD 100	7 m
B57	N: 27° 29' 6.12"	E: 84°56'40.12"	Kuwapani, Makwanpur	Not Good	Forest	WD 100	7 m
B58	N: 27° 26' 59.48"	E: 84° 59' 0.57"	Basamadhi	Good	Barren	WD 100	7 m
B59	N: 27° 25' 47.17"	E: 85° 00' 21.29"	Hetauda-sub station	Very good	Acqiured by NEA	WD 100	7 m
B60	N: 27° 25' 47.00"	E: 85° 00' 00"	Hetauda-sub station	Very good	Acquired by NEA	WD 100	7 m

3.0 MATERIALS AND METHODS

3.1 Site Investigation

The diamond core drilling and in situ testing are performed on the basis of well-known standard procedures designated by ASTM based on long span of practical experiences. Cleaning of hole prior to performing the in situ tests like water pressure and SPT were maintained throughout the investigation period. The detail descriptions of site investigation are mentioned in the following subsections.

3.1.1 Core Drilling

Core drilling was carried out with the designated standard procedure of ASTM (D 2113-83) using a conventional drilling rod and rotary core accessory with and without wire line facilities. The drilling had been done using diamond core bits of NX and NQ. Core barrels of triple/double with retractable inner tube were used. Drilling has been carried out telescopically with top part by PX followed by HX and followed by NX size casings. The horizon where massive side fall and core-loss due to fragmented condition prevailed cementing of hole prior to drilling advancement was done to stabilize the borehole wall. Clean water was used as drill fluid.

In total, four drill rigs, two China made WD 100, capable of drilling NX size holes up to 100 m, a GXY 150 capable of drilling up to 150 m and an auger drilling were carried out at the site. A total of 58 borehole drilling (**Fig. 1**) was accomplished with the total depth of 416 m. The summary of boreholes, drill rig and depth of drilling are tabulated in **Tables 1** and **2**. The log details are placed in **Annex A**.

3.1.2 Standard Penetration Test (SPT)

The Standard Penetration Test (SPT) was performed for each borehole at a depth interval of 1 m and soil samples were taken. A split spoon sampler, 50 mm in diameter was driven by the blows of a standard hammer weighing 63.5 kg and falling freely from a height of 760 mm. The number of blows required to give a tube penetration of 300 mm was taken as SPT N-value of the soil tested at a specified borehole depth. The SPT were done according to International Standards. Some of the of the SPT test results are displayed in the summary tables below.

The Standard Penetration Test (SPT) was performed for each borehole at an interval of 1 m and soil samples were carried out. A split spoon sampler, 50 mm in diameter was driven by the blows of a standard hammer weighing 63.5 kg and falling freely from a height of 760 mm. The number of blows required to give a tube penetration of 300 mm was taken as SPT N-value of the soil tested at a specified borehole depth. The SPT were carried out as per ASTM standards. Some of the of the SPT test results are displayed in the summary **Tables 3 and 4** below. Tables show the summary of 44 SPT values.

The recorded SPT values are converted to standardized energy N_{60} as per Skempton (1986):

$$N_{60} = \frac{N_{rec}\eta_H\eta_B\eta_S\eta_R}{60}$$

N_{60} = SPT N value corrected for field procedure

N_{rec} = measured penetration number

η_H = hammer efficiency (%) =0.55 for hand drop hammer

η_B = correction for borehole diameter = 1.0 for 65 mm to 115 mm dia. Borehole

η_S = sampler correction =1.0 for standard sampler

η_R = correction for rod length = 0.7 for rod length 0.0 – 3.0 m
= 0.75 for rod length 3.0 – 4.0 m
= 0.85 for rod length 4.0 – 6.0 m
= 0.95 for rod length 6.0 – 10.0 m
= 1.0 for rod length greater than 10.0 m

Correction for Overburden:

In granular soils, the value of N is affected by the effective overburden pressure. For that reason, the value of N_{60} obtained from field exploration under different effective overburden pressures should be changed to correspond to a standard value. That is, $(N_1)_{60} = C_N N_{60}$

where, $C_N = \sqrt{\frac{100}{\sigma_z'}}$ as per Liao and Whitman 1987. **Table 3** represents the corrected SPT N-value.

Table 3. Summary of corrected SPT N-value (B 1 - B 35) along the proposed transmission tower alignment.

Borehole No.	Depth, m	SPT Blow Number			Borehole No.	Depth, m	SPT Blow Number		
		N1	N2	N3			N1	N2	N3
B 1	1.50	3	5	5	B12	1.00	12	20	30
	3.00	2	2	4		4.00	13	18	30
	4.50	2	5	7		6.00	25	47	45
	6.00	2	3	5		2.00	10	13	18
	7.00	3	4	9	B 15	2.00	10	13	18
B 2	1.50	3	2	2	B 16	1.00	8	7	8
	2.00	3	2	2		3.00	10	8	8
	3.00	2	2	3		5.00	6	8	10
	4.50	2	3	4		6.00	5	12	18
	6.00	3	6	9	B 20	1.00	3	12	16
	7.00	3	6	7		3.00	37	50	
B 3	1.50	3	3	3		5.00	15	19	39
	3.00	3	3	4	B 21	3.00	6	6	10
	4.50	3	6	7		5.00	10	15	15
	6.00	4	5	6	B 22	2.00	13	19	20
	7.00	5	7	8		4.00	50		
B 4	1.50	2	3	4	B 25	1.00	7	19	33
	3.00	5	6	7		3.00	13	15	14
	4.50	2	3	3		4.00	10	15	15
	6.00	5	8	11	B 26	1.00	10	12	15
	7.00	8	13	16		2.00	5	8	10
B 5	1.50	3	2	4		3.00	6	9	10
	3.00	2	3	2		4.00	7	8	10
	4.50	2	1	1		5.00	15	25	30
	6.00	3	4	5		6.00	16	26	33
	7.00	3	5	5	B 27	1.00	1	10	11
B 6	1.50	2	3	3		6.00	5	6	20
	3.00	3	3	4	B 28	2.00	5	7	9
	4.50	2	4	3		4.00	5	7	9
	6.00	4	4	5		5.00	9	16	25
	7.00	3	3	4	B 29	1.00	30	50	
B 7	1.50	1	1	1		3.00	10	50	
	3.00	2	4	3	B 31	1.00	14	28	28
	4.50	2	4	7		3.00	5	10	13
	6.00	2	3	4	B 33	3.00	7	8	10
	7.00	4	7	7	B 35	1.00	7	8	10
B 8	1.50	3	5	5		2.00	5	8	13
	3.00	3	3	5		3.00	10	12	15
	4.50	3	2	4		4.00	10	50	
	6.00	4	3	6					
	7.00	2	5	8					

Table 4. Summary of corrected SPT N-value (B 35 - B 60) along the proposed transmission tower alignment.

Borehole No.	Depth, m	SPT Blow Number			Borehole No.	Depth, m	SPT Blow Number		
		N1	N2	N3			N1	N2	N3
B 37	2.00	6	9	16	B 48	3.00	10	14	25
	3.00	4	2	1		4.00	15	50	
	4.00	2	2	3	B 49	0.00	6	7	8
	5.00	10	17	12		1.00	8	9	11
B 38	1.00	10	17	19		2.00	9	16	16
	2.00	47	50			3.00	25	43	50

Borehole No.	Depth, m	SPT Blow Number			Borehole No.	Depth, m	SPT Blow Number		
		N1	N2	N3			N1	N2	N3
	3.00	45	50			4.00	12	12	15
	4.00	50				5.00	19	23	31
B 39	1.00	5	7	5		6.00	14	26	31
	2.00	9	6	7		7.00	43	50	
	3.00	10	9	43	B 50	1.00	4	6	8
	4.00	14	19	25		2.00	4	12	12
	5.00	14	23	23		3.00	9	20	25
	6.00	14	22	26		4.00	10	19	21
	7.00	19	25	30		5.00	15	32	19
B 40	1.00	20	27	33		6.00	50		
	2.00	17	22	29		7.00	50		
	5.00	19	28	34	B 52	2.00	5	10	18
B 41	2.00	1	4	4	B 53	3.00	5	9	11
	3.00	6	9	12		4.00	8	11	13
	4.00	4	9	12	B 54	0.00	5	5	8
	5.00	8	7	9		1.00	5	8	11
B 43	5.00	18	27	36		2.00	6	9	13
B 44	3.00	8	13	14		3.00	7	10	15
	4.00	8	22	22		4.00	16	19	25
	5.00	50				5.00	19	17	25
B 45	1.00	30	50			6.00	19	21	28
	3.00	10	50		B 55	0.00	5	6	8
B 48	3.00	8	13	4		1.00	5	8	11
	4.00	8	22	22		2.00	6	9	13
B 46	2.00	20	50			3.00	7	10	15
	6.00	5	10	29		4.00	16	19	23
B 47	1.00	5	5	9		5.00	19	17	25
	2.00	6	15	20		6.00	19	21	28
	3.00	10	14	16	B 56	1.00	4	8	6
	4.00	12	14	22		2.00	5	8	11
	5.00	10	13	23		3.00	7	9	13
	6.00	12	12	25	B 57	5.00	12	14	11
B 48	3.00	10	14	25		6.00	10	20	28
	4.00	15	50		B 58	1.00	5	11	13
B 49	0.00	6	7	8		2.00	31		
	1.00	8	9	11		3.00	33		
	2.00	9	16	16		4.00	12	14	18
	3.00	25	43	50		5.00	7	15	20
	4.00	12	12	15		6.00	7	15	20
	5.00	19	23	31		7.00	7	13	23
	6.00	14	26	31					
	7.00	43	50						

3.2 Laboratory Testing

The laboratory program was comprised of performing tests on the disturbed soil samples obtained from the drilling and test pits. The testing procedures followed were in general conformance with those recommended in ASTM standards and the soils were classified according to the Unified System for Classifying Soils (USCS). The laboratory tests performed included the following:

- Natural Moisture Content
- Atterberg Limits tests (Liquid Limit & Plastic Limit)
- Particle Size Analysis
- Specific Gravity Test
- Loose Bulk Density Test and Unit Weight Test
- Proctor Compaction Test
- Organic Content Test
- pH Test
- Water Soluble Sulfate Test

3.2.1 Natural Moisture Content Test

These tests were carried out on representative soil samples either from Boreholes or pit. This method is based on removing soil moisture by oven-drying a soil sample until the weight remains constant. The moisture content

(%) is calculated from the sample weight before and after drying. This method covers the laboratory determination of the moisture content of a soil as a percentage of its oven-dried weight. The method may be applied to fine, medium and coarse grained soils. The test was carried out in accordance with the designation **ASTM D 423-54T**. Natural moisture contents of 93 samples were determined in the laboratory. The summary of the test is shown in **Tables 5** and **6**. The detailed data sheets are arranged in **Annex C**.

3.2.2 Consistency Limits

Consistency limits are a basic measure of the critical water contents of a fine-grained soil, such as its shrinkage limit, plastic limit, and liquid limit. The group performed standard practice in determining the liquid limit, plastic limit, and plasticity index of a soil sample according to **ASTM D 4318-05**. The tests performed were liquid limit (LL) and plastic limit (PL) tests. These tests were carried out on representative SPT soil samples from the required depth and from the adjacent pit samples at the depth of 1.0 m. The consistency limits of 93 samples were determined in the laboratory. The summary of the test is shown in **Tables 5** and **6**. The detailed data sheet are arranged in **Annex C**.

3.2.3 Particle Size Analysis

Particle size analysis of soil particles greater than No. 200 sieve are determined according to **ASTM C136** by oven drying method. For determination of smaller fractions, the wet method is used. These tests are carried out on representative soil samples taken from the required depth of boreholes as well as the samples from the pits. The dry/wet particle size analyses of 93 samples were determined in the laboratory. The summary of the test is shown in **Tables 5** and **6**. The detailed data sheet are arranged in **Annex C**.

The hydrometer analysis is based on Stokes' Law, which gives the relationship among the velocity of fall of spheres in a fluid, the diameter of the sphere, the specific weights of the sphere and of the fluid, and the fluid viscosity. Hydrometer analysis is a widely used method of obtaining an estimation of the distribution of soil particle sizes from 0.075 mm sieve to around 0.01 mm. The data are presented on a semi- log plot of percent finer versus particle diameters and may be combined with the data from a sieve analysis of the material retained (+) on the No. 200 sieve. The principal value of the hydrometer analysis appears to obtain the clay fraction (generally accepted as the percent finer than 0.002 mm). This test is done when more than 30% pass through Sieve No. 200 according to **ASTM D-422**. The hydrometer analyses of 68 samples were determined in the laboratory. The results obtained are listed in the summary **Tables 5** and **6** and detail in **Annex C**.

3.2.4 Specific Gravity Test

The test was carried out from boreholes from the required depth as well as from the pit samples. This laboratory test is performed to determine the specific gravity of soil by using a pycnometer. Specific gravity is the ratio of the mass of unit volume of soil at a stated temperature to the mass of the same volume of gas-free distilled water at a stated temperature. The specific gravity of a soil is used in the phase relationship of air, water, and solids in a given volume of the soil. The test was performed in accordance with the designation **ASTM D 854-83**. The Specific gravity of 93 samples were determined in the laboratory. The summary of the test is shown in **Tables 5** and **6**. The detailed data sheet are arranged in **Annex C**.

3.2.5 Loose Bulk Density Test and Unit Weight Test

Unit weight of a soil can be determined by measuring the weight and volume of the soil sample. Loose bulk density has been determined in accordance with **ASTM D7481-18**. The loose bulk density of 93 samples were determined in the laboratory. Proceeding, unit weight test has been carried out according to **ASTM D7263 - 09(2018) e2**. The unit weight of 41 samples from pit samples were determined in the laboratory. The summary of both loose bulk density and unit weight test are shown in **Tables 5** and **6**. The detailed data sheet are arranged in **Annex C**.

3.2.6 Proctor Compaction Test

The Proctor compaction test is performed in the laboratory for the determination of the optimum moisture content at which the tested soil sample reveals its maximum densification to obtain in the form of maximum dry density. The dry density of a soil for a given compactive effort depends on the amount of water the soil contains during

soil compaction according to **ASTM D1557-78**. These tests were carried out on representative soil samples adjacent to the borehole locations at the depth of 1.0 m. Disturbed soil samples were taken at one meter intervals depths either from adjacent sides of boreholes from the depth of 1.0 m pits. The optimum moisture contents and maximum dry unit weights of 58 samples from pit samples using modified proctor compaction tests were determined in the laboratory. The summary of modified proctor tests is shown in **Tables 5** and **6**. The detailed data sheet are arranged in **Annex C**.

3.2.7 Organic Content Test

The organic content is the ratio, expressed as a percentage, of the mass of organic matter in a given mass of soil to the mass of the dry soil solids. Organic matter influences many of the physical, chemical and biological properties of soils. Some of the properties influenced by organic matter include soil structure, soil compressibility and shear strength. In addition, it also affects the water holding capacity, nutrient contributions, biological activity, and water and air infiltration rates. The test was carried out in accordance with the designation **ASTM D 2974-87**. The test was carried out from samples taken from both boreholes from the required depth as well as from the pit samples. This test was performed to determine the organic content of soils. The organic content analysis of 44 samples from representative SPT and 14 samples, totaling 58 samples were determined in the laboratory. The summary of test results is shown in **Tables 5** and **6**. The detailed data sheet are arranged in **Annex C**.

3.2.8 pH Test

The soil pH regulates the degree of acidity or alkalinity of soils suspended in water and in 0.01Molar (M) calcium chloride solution. The pH meter is calibrated with buffer solutions of known pH prior to the analysis of samples according to **ASTM D4972-95a**. The pH tests were performed on 58 samples and the summary of these tests are shown in **Table 6a** and detail in **Annex C**.

3.2.9 Water Soluble Sulfate Test

Water soluble sulfate test is used to determine water-soluble sulfate in soils in order to know the possibility of adverse reaction with hydraulic cement concrete. The test was developed for concentrations of water-soluble sulfate in soils between 0.02% and 3.33% sulfate by mass. The laboratory test was performed at the designated standard supplied by **ASTM C1580**. The tests were performed on 58 samples and the summary of these tests are shown in **Tables 5** and **6** and detail in **Annex C**.

3.3 Bearing Capacity Evaluation using SPT N-Value

One of most common methods for estimating the allowable soil bearing capacity utilizing standard penetration test (SPT) during exploratory drilling because the SPT N-values are readily received during the in-situ test The equations that are commonly used were proposed by Meyerhof based on one inches of foundation settlement. Bowles revised Meyerhof's equations because he believed that Meyerhof's equation might be conservative.

Meyerhof's equations:

FOR FOOTING WIDTH, 4 FT OR LESS:

$Q_a = (N/4) / K$

For footing width, greater than 4 ft:

$Q_a = (N/6)[(B+1)/B]^2 / K$

Q_a: Allowable soil bearing capacity,

N: SPT numbers below the footing.

B: Footing width, in meter

$K = 1 + 0.33(D/B) * 1.33$

D: Depth from ground level to the bottom of footing, in meter.

For the bearing capacity evaluation, D/B value is incorporated at the ratio of 0.5 and the allowable bearing capacity is computed at the factor of safety of 3.

In geotechnical engineering, bearing capacity is the capacity of soil to support the loads applied to the ground. The bearing capacity of soil is the maximum average contact pressure between the foundation and the soil which should not produce shear failure in the soil. *Ultimate bearing capacity (q_f)* is the theoretical maximum pressure which can be supported without failure; *allowable bearing capacity (q_a)* is the ultimate bearing capacity divided by a factor of safety. Sometimes, on soft soil sites, large settlements may occur under loaded foundations without actual shear failure occurring; in such cases, the allowable bearing capacity is based on the maximum allowable settlement.

4.0 RESULTS OF GEOTECHNICAL EXPLORATORY DRILLING

The geotechnical exploratory drilling was carried out with the help of exploratory rotary drilling as well as auger boring at fifty-eight aligned locations incorporating necessary in-situ Standard Penetration Tests (SPT) where it could be assessed.

4.1 Description of Boreholes

Following subsections deal the general observations during the geotechnical exploratory drilling, core material study and in situ testing following the standard mentioned by ASTM. The description includes the detailed characteristics of soil and rock formations together with its appropriate classifications and available field SPT N-values for the feasibility study of the transmission line project. The classification of soil on the basis of SPT N-value in accordance of Meyerhoff (1956). The detailed borehole logs are present in **Annex A** and core box and site photographs are arranged in **Annexes B** and **F** respectively.

4.1.1 Results of Borehole B 1

Borehole	:	**B 1**
Location/Feature	:	**Ram Puruwa**
Coordinate	:	**N: 27° 25' 42.36", E: 83° 42' 16.44"**
Total Drill Depth	:	**7 m**
Water Table	:	**2.55 m**
Elevation	:	**85 m**

The vertical Auger drilling was carried out using the auger rotary type rig. The drilling was performed on the flat land of Terai near Butwal district.

The auger rotary drilling was incorporated up to the depth of 7 m due to the presence of fine to medium-grained alluvial sediment deposits characterized in the Terai region. The observation is composed of brownish gray to gray colored, fine to medium-grained clayey silt to silty fine sand. The clayey silt is plastic in nature. The borehole encountered the water table at the depth of 2.55 m.

The maximum and minimum field SPT N values recorded at the depths of 7.00 m to 7.45 m and 3.00 m to 3.45 m are 13 and 7respectively.

4.1.2 Results of Borehole B 2

Borehole	:	**B 2**
Location/ Feature	:	**Harpur**
Coordinate	:	**N: 27° 27' 10.20", E: 83° 42' 9.72"**
Total Drill Depth	:	**7 m**
Water Table	:	**4.00 m**
Elevation	:	**84 m**

The vertical Auger drilling was performed using the auger rotary type rig up to the depth of 7 m. The drilling was performed on the flat land of Terai near Butwal district.

The borehole observation shows the presence of brownish gray colored fine-grained sand with presence of silt and clay in the upper section up to the depth of 5 m. Sand is predominant in the lower section. There observed a core loss on the SPT tube at the depth of 1.5 m representing the presence of sand. But sand with silt is dominant for all depths.

The maximum field SPT N values is recorded of 15 at the depth of 6.00 m to 6.45 m while the minimum values are recorded at the depths of 1.50 m to 1.95 m and at 2.00 m to 2.45 m to be 4. which indicates the soil is very loose to compact in nature. The borehole encountered the water table at the depth of 4.00 m.

4.1.3 Results of Borehole B 3

Borehole : B 3
Location/Feature : Kusma
Coordinate : N: 27° 28' 29.46", E: 83° 41' 31.68"
Total Drill Depth : 7 m
Water Table : 6.00 m
Elevation : 87 m

The vertical Auger drilling was performed using the auger rotary type rig up to the depth of 7 m. The drilling was performed on the flat land of at Kusmanear Butwal district.
The borehole observation shows the presence of predominant brownish gray colored clayey silt in the upper section, i.e. up to the depth of 5 m but fine-grained silty sand is generally encountered below 5 m. The borehole encountered the water table at the depth of 6.00 m.

The maximum and minimum field SPT N values are recorded to be 15 and 6 at the depths of 7.00 m to 7.45 m and 1.00 m to 1.45 m respectively which indicates the soil is loose to compact nature.

4.1.4 Results of Borehole B 4

Borehole : B 4
Location/ Feature : Ghanashyam Pur
Coordinate : N: 27° 31' 14.04", E: 83° 41' 33.90"
Total Drill Depth : 7 m
Water Table : None
Elevation : 88 m

The vertical Auger drilling was performed using the auger rotary type rig up to the depth of 7 m. The drilling was performed on the flat land of Ghanashyam Pur at Butwal district.
The borehole is comprised of mainly yellowish and brownish colored clayey silt on the upper part almost up to the depth of 6 m from the ground level followed by gray to light gray colored silty sand up to the depth of 7 m respectively.

The maximum and minimum field SPT N values are recorded to be 29 and 6 at the depths of 7.00 m to 7.45 m and 6 at 4.50 m to 4.95 m which indicates the soil is loose to compact in nature.

4.1.5 Results of Borehole B 5

Borehole : B 5
Location/ Feature : Sanda
Coordinate : N: 27° 33' 19.26", E: 83° 40' 20.18"
Total Drill Depth : 7 m
Water Table : None
Elevation : 98 m

The vertical Auger drilling was performed using the auger rotary type rig up to the depth of 7 m. The drilling was performed on the flat land of Terai near Butwal district.

The borehole is represented by yellowish brown colored, fine-grained silty sand, from ground level to the depth of 1 m which is followed by brownish gray colored to gray colored clayey silt. The observed clayey silt is plastic and slightly moist in nature.

The maximum field SPT N value is 10 at the depth of 7.00 m to 7.45 m and minimum is 2 at 4.50 m to 4.95 m indicates the soil is very loose to loose in nature.

4.1.6 Results of Borehole B 6

Borehole : B 6
Location/ Feature : Bichaiya Pur
Coordinate : N: 27° 34' 26.22", E: 83° 41' 10.86"
Total Drill Depth : 7 m
Water Table : None
Elevation : 122 m

The vertical Auger drilling was performed using the auger rotary type rig up to the depth of 7 m. The drilling was performed on the flat land of Terai at Bichaiya Pur near Butwal district.

The borehole is comprised of predominately yellowish to brown gray colored clayey silt up to the 7 m. The soil is plastic and slightly moist in nature. A small pocket of water was observed at the depth of 5.00 m but disappeared at the depth at the depth of about 5.30 m.

The maximum and minimum field SPT N values recorded at the depths of 6.00 m to 6.45 m and 1.50 m to 1.95 m to be 9 and 6 is respectively which signifies the soil is loose in nature.

4.1.7 Results of Borehole B 7

Borehole : B 7
Location/ Feature : Butwal Sub-station
Coordinate : N: 27° 34' 16.44", E: 83° 41' 10.38"
Total Drill Depth : 7 m
Water Table : 2.30 m
Elevation : 125 m

The vertical Auger drilling was performed using the auger rotary type rig up to the depth of 7 m. The drilling was performed on the flat land of Terai near Butwal district at proposed sub-station.

The borehole is represented by the presence of brownish colored clayey silt is observed throughout the drill depth of 7 m which is plastic in nature. Some organic material was observed at the depth of 6.00 m to 6.50 m. The borehole encountered the water table at the depth of 2.30 m.

The maximum and minimum field SPT N values recorded to be 14 and respectively at the depths of 7.00 to 7.45m and 1.00 m to 1.45 m indicating the soils are of loose to compact in nature.

4.1.8 Results of Borehole B 8

Borehole : B 8
Location/ Feature : Sub-station
Coordinate : N: 27° 34' 28.32", E: 83° 41' 16.14□□"
Total Drill Depth : 7 m
Water Table : 6.75 m
Elevation : 122 m

The drilling was performed vertically using the Auger rotary type rig for seven meters. The drilling was performed on the flat land of Terai on Nawalparasi District.

The borehole is represented by presence of Yellowish brown colored clayey silt from 0.00m to 2.5m. Grey to light grey colored silty clay is observed from 2.5m up to the depth of 7.00m. The clayey silt observed is slightly moist and plastic in nature. Water table was encountered at the depth of 6.75m.

The maximum and minimum field SPT N value recorded is 13 and 6 respectively at the depth of 7.00 to 7. 45 m

and 4.50 to 4.95 m indicating the soils are loose to compact in nature.

4.1.9 Results of Borehole B 9

Borehole : B 9
Location/ Feature : Jargha, Nawalparasi
Coordinate : 27°36'31.95"N, 83°42'15.81"E
Total Drill Depth : 7 m
Water Table : None
Elevation : 146 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m. The drilling was performed on the flat land of Terai at Jargha of Nawalparasi District. Drilling was performed on the first terrace of the river nearby. The hole was shifted around 20 m such that the distance between the river and the drilling point is more than 50 m. Alluvial deposit on the side of the river forms the terrace. The terrace is about 3 m high from the river channel. The site is encountered with the presence of rounded to sub rounded rock fragments with fine to coarse-grained sand.

The drilling log is represented by the presence of light gray colored top clay soil with silt up to the depth of 1 m. It is followed by the presence of pebbles of limestone in sandy matrix. The maximum diameter of the cobble is about 7 cm diameter but mostly the material is pebbly size in sandy matrix.

4.1.10 Results of Borehole B 10

Borehole : B 10
Location/ Feature : Khumbari, Nawalparasi
Coordinate : 27°40'34.68"N, 83°45'27.21"E
Total Drill Depth : 7 m
Water Table : None
Elevation : 252 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m. The drilling was performed on the river terrace (cultivated) at Khumbari of Nawalparasi District. The river terrace is about 30 m in height from the current river channel. The exploratory drilling was conducted on the farm land which is at present barren.

The observations show the presence of dark colored, cohesive, organic rich moist silty clay up to the depth of 1 m. Below the top soil, pebbles and gravels are common throughout the depth of 7 m. During drilling, boulders are observed on the horizon of 2.00 m to 3.00 m depths. The dimension of the boulder is measured up to 19 cm diameter.

4.1.11 Results of Borehole B 11

Borehole : B 11
Location/ Feature : Nawalparasi
Coordinate : 27°41'1.26"N, 83°46'27.03"E
Total Drill Depth : 7 m
Water Table : None
Elevation : 520 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m. The drilling location was shifted to 80 m from the given point (the river channel) at Nawalparasi district. Colluvial and alluvial origin deposits were observed on the terrain. The site was characterized with the presence of boulders up to 30 cm in diameter having rounded to sub rounded, and angular to sub angular shape were observed near the drill location.

The observation is represented with the presence of brown colored, fine-grained, non-cohesive sand with little silt and clay up to the depth of 1.0 m. It is followed by prevalent boulders, cobbles and pebbles throughout the hole up to the depth of 7.00 m. The bluish colored boulders of limestone and schist were predominant at the site which is observed on the materials at the borehole.

4.1.12 Results of Borehole B 12

Borehole : B 12
Location/ Feature : On the right bank of the Arun Khola
Coordinate : 27°43'57.89"N, 83°49'17.01"E
Total Drill Depth : 7 m
Water Table : None
Elevation : 516 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m. The drilling location was carried out on the side of the road at the colluvium terrain on the right bank of the Arun Khola near the boundary of Palpa district and Nawalparahi district.

The slope scree materials are characterized with colluvial angular fragments of sandstone and vegetation. The slope has an inclination of about 20°- 30°.

The borehole represents angular fragments of about 3 cm in diameter until it meets to the rock line. The rock line was established at the depth of 6.00 m. The log shows the bed rock is highly weathered, fine to medium grained, brown colored sandstones with presence of fractures at places. And since the rock is highly weathered it behaves mostly as sand during drilling.

The maximum and minimum field SPT N values recorded at the depths of 6.00 m to 6.45 m and 1.00 to 1.45 m to be 92 and 48 respectively indicating dense to very dense nature.

4.1.13 Results of Borehole B 13

Borehole : B 13
Location/ Feature : Sindhure, Palpa
Coordinate : 27°45'6.32"N, 83°50'29.54"E
Total Drill Depth : 7 m
Water Table : None
Elevation : 1324 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on a school ground on a saddle at Sindhure of Palpa district.

The exploratory drilling was performed at the colluvial material. The observation shows the presence of angular fragments of different rock types. The overall core reveals the pebbly sized fragments having 3 cm - 4 cm of diameter in the matrix. The matrix is composed of clay, silt and sand at different depths.

4.1.14 Results of Borehole B 14

Borehole : B 14
Location/ Feature : Beldada, Rampur
Coordinate : 27°49'22.38"N, 83°53'44.41"E
Total Drill Depth : 7 m
Water Table : None
Elevation : 802 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on a topographical break a spur at Beldada, Rampur of Palpa district. The drilling was commenced on a private land with proper paperwork and after receiving the permission from the land owner.

The site is well exposed on the cut slope and on the ground. The exposed rock is. The drilling was performed at the bed rock and composed of highly weathered, fine-grained, brown colored quartzite. The obtained core is crushed and only sludge is able to collect due to its high grade weathering pattern.

4.1.15 Results of Borehole B 15

Borehole : B 15
Location/ Feature : Panthe, Palpa
Coordinate : 27°50'11.01"N, 27°50'11.01"N
Total Drill Depth : 7 m
Water Table : None
Elevation : 420 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m near to the Nisdhi River at Panthe of Palpa district. The site was represented by the presence of residual soil on top of bed rock.

The soil is reddish brown colored, cohesive and dry which is followed with the increased proportion of rock fragments. The sizes of the fragments are mainly pebbly i.e. up to 5 cm in diameter. The bed rock was exposed on the road cut slope just below the given borehole location. The bed rock is slightly to moderately weathered, gray colored and black pigmented slate. The residual soil is almost 3 m thick and reddish in color.

The field SPT N-value is 31 at the depth of 1.00 m to 1.45 m, which means the soil is dense nature.

4.1.16 Results of Borehole B 16

Borehole : B 16
Location/ Feature : Bhantar, Tanahu
Coordinate : N: 27° 52' 23", E: 83°58'3.85"
Total Drill Depth : 7 m
Water Table : None
Elevation : 309 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m at Bhantar of Tanahu district.

The borehole represents a meter-thick top soil composed of dry silty sand with presence of small rock fragments. The horizon between 1.00 m - 3.00 m, is almost coarse-grained clean sand. Below 3.00 m, the amount of clay increases in sand. From 3.00 m, dark gray colored medium to coarse-grained sand with clay is observed.

The maximum and minimum field SPT N values recorded at the depths of 6.00 m to 6.45 m and is 15 at 1.00 m to 1.45 m to be 30 and 15 respectively which is is compact in nature.

4.1.17 Results of Borehole B 17

Borehole : B 17
Location/ Feature : Deurali, Ghiring
Coordinate : N: 27° 53' 54.05", E: 84°00'48.89"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1055 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m at Deurali, Ghiring of Tanahu district.

The bed rock started almost from the ground level. The borehole represents moderately to highly weathered, foliated, phyllite with brown stains. Since the phyllite rock is soft and weathered, the core recovered is all splitted into smaller pieces to the size of pebbles and cobbles. From 1.00 m to 4.00 m, the phyllite is highly crushed and

the core sample is turned into the size of pebbles. The depth below 4 m alters the core size into cobble and pebble sizes.

4.1.18 Results of Borehole B 18

Borehole : B 18
Location/ Feature : Tanahu
Coordinate : N: 27° 54' 28.55", E: 84°3'2.32"
Total Drill Depth : 7 m
Water Table : None
Elevation : 843 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m at Tanahu District.

The drilling was commenced directly on phyllite bed rock. The bed rock was exposed on the ground surface which highly weathered, foliated, jointed, fine-grained black colored phyllite. The bed rock is highly crushed at the depths of 3.00 m to 7.00 m. Moreover, the sample recovered at the depths from 4.00 m to 5.00 m is almost turned into sand size particles which is crushed during drilling. Quartz vein is abundant on phyllites and could be observed throughout the drill depth.

4.1.19 Results of Borehole B 19

Borehole : B 19
Location/ Feature : Mouriya, Ghiring
Coordinate : N: 27° 55' 56.66", E: 84°06'29.32"
Total Drill Depth : 7 m
Water Table : None
Elevation : 881 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m at Mouriya, Ghiring of Tanahu district.

The observation shows a meter thick fine-grained, non-cohesive dry sand followed by cobble and pebbles of phyllite in silty and clayey matrix at the depths of 2.00 m-3.00 m to reach the bedrock. The rock line was established at 3.00 m which is moderately to highly weathered, thinly foliated dark colored phyllite.

4.1.20 Results of Borehole B 20

Borehole : B 20
Location/ Feature : Rising, Tanahu
Coordinate : 27°55'40.70"N, 84°10'6.56"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1016 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m at Rising of Tanahu district.
The exploratory drilling reveals the presence of the overburden material representing highly crushed pebbles of phyllitic rock up to 2.0 m. The rock line was established at 2.0 m. The bed rock is highly weathered, thinly foliated, light grey colored, weak phyllite.

4.1.21 Results of Borehole B 21

Borehole : B 21
Location/ Feature : Chaswar, Tanahu
Coordinate : N: 27° 55' 29.98", E: 84° 14' 48.89"
Total Drill Depth : 7 m
Water Table : None

Elevation : 1055 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m at Chaswar of Tanahu district.

The borehole represents a meter-thick reddish brown colored, medium to coarse-grained sand with silt and clay as the top soil. The overburden material is composed of cobbles and pebbles of phyllite in silty clayey matrix. The rock line was established at 5.0 m and the rock observed is highly weathered, crushed, thinly foliated dark colored, phyllite.

4.1.22 Results of Borehole B 22

Borehole : B 22
Location/ Feature : Belbas, Tanahu
Coordinate : N: 27° 50' 5.17", E: 84° 33' 20.8"
Total Drill Depth : 7 m
Water Table : None
Elevation : 278 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on the side of a newly cut road section at Belbas of Tanahu district. The slope was gentle near the drill location and bed rock was clearly exposed on the cut slope vegetated above the slope.

The observation shows that huge thickness of overburden materials with the presence of rock fragments of phyllite up to the depth of 5.0 m from the surface of the ground. The rock fragments are of pebbly and cobble size, measured up to 8.0 cm. It is followed by the bed rock from 5.0 m downwards. The observed rock is moderately to highly weathered, fine to medium-grained, foliated and jointed phyllite. As a result, the sample was crushed and collected in the form of sludge.

The maximum and minimum field SPT N values recorded at the depth of 4.00 m to 4.45 m to be more than 50 and at the depth of 2.00 m to 2.45 m to be 49 indicating the overburden material is dense.

4.1.25 Results of Borehole B 25

Borehole : B 25
Location/ Feature : Thokkhola, Byas
Coordinate : N: 27° 56' 50.50", E: 84° 18' 46.64"
Total Drill Depth : 7 m
Water Table : None
Elevation : 793 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on a public land near the roadside. The area is surrounded by cultivation and settlements. The rock exposed on the cut slope of the road was highly weathered, thinly-foliated, weak phyllite.

The observation of borehole reveals the presence of browned colored clay and silt at the top containing small pebbles of phyllite and quartz which is followed by the presence of bed rock at the depth of 1.0 m (rock line). The rock is highly weathered, greenish grey colored, phyllite. The rock horizon encountered at the range of 3.0 m - 4.0 m revealed the completely weathered zone to resemble as soil. After this depth from 4.0 m small pebbles size samples of the phyllite is extracted.

4.1.26 Results of Borehole B 26

Borehole : B 26
Location/ Feature : Kesartar, Tanahu
Coordinate : N: 27° 55' 48.42", E: 84° 20' 34.05"
Total Drill Depth : 7 m

Water Table : None
Elevation : 774 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on the side of the road on a public land at Kesartar of Tanahu district. The land was almost flat and covered with vegetation around it. The area was represented by red colored residual soil around the borehole location. The area is comprised mainly of residual soil on the upper part followed by colluvium.

The borehole observation shows the presence of reddish brown colored clay and silt soil up to the depth of 3.0 m. From 3.0 m to 6.0 m, the obtained sample constitutes few amounts sand with red clay. Fine sand with quartz fragments are observed at the depths of 6.0 m to 7.0 m.

The maximum and minimum field SPT N values at the depth of 6.00 m to 6.45 m and at the 4.00 m to 4.45 m recorded to be 59 and 18 respectively representing the soil is loose to dense nature.

4.1.27 Results of Borehole B 27

Borehole : B 27
Location/ Feature : Sukura, Tanahu
Coordinate : N: 27° 55' 05", E: 84° 21' 33"
Total Drill Depth : 7 m
Water Table : None
Elevation : 532 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on the side of a hill where colluvium material is prevalent at Sukura of Tanahu district. The soil is reddish brown colored and the area is mainly used for cultivation and occupied with the settlement especially on the flat area. Meanwhile, the hill is covered by vegetation and the borehole location falls on the community forest area. No vegetation and forests were affected during the exploratory drilling work.
The borehole observations show dark gray colored, coarse-grained sand with presence of few amounts of rock fragments up to the depth of 1 m. The depth of 1.0 m to 4.0 m reveals reddish brown colored clay dominating over sand with small sized pebbles. Proceeding, pebbles and gravels are observed at the depths of 4.0 m to 5.0 m. Below this depth cobbles, pebbles and gravels are found in medium-grained sand.
The maximum field SPT N value is 26 at the depth of and minimum is 21 at which means the soil is loose in nature. The maximum and minimum field SPT N values at the depth of 6.00 m to 6.45 m recorded to be 26 and at the depth of 1.00 m to 1.45 m recorded to be 21 respectively representing the soil is medium loose nature.

4.1.28 Results of Borehole B 28

Borehole : B 28
Location/ Feature : Kalleri, Tanahu
Coordinate : N: 27° 53' 09.68", E: 84° 24' 08.13"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1077 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on side of a road on hill slope facing south west at Kalleri of Tanahu district. The slope is almost gentle with terraces for cultivation. The borehole exploratory drilling was commenced on the flat land near the slope.

The borehole description shows top soil of reddish brown colored silty clay upto the depth of 0.70 m from ground level. Pebbles of around 3 cm are observed below top soil upto the depth of 1.00 m. From 1.00 m to 3.00 m, small pebbles of about 1.5 cm are observed in clayey silty matrix. The pebbles are angular and the percentage of the matrix is very low. From 3.00 m to 4.00 m, only sludge sample is collected. The sample is coarse-grained, bluish gray colored sand like rock fragments. Furthermore, at the depth of 4.00 m to 7.00 m, pebbles of same

rock fragments are observed whose diameter is measured to be 1.5 cm with presence of little matrix.

The maximum field SPT N value is 41 at the depth of 5.00 to 5.45 m and minimum is 16 at 4.00 to 4.45 m which indicates the soil is compact to dense in nature.

4.1.29 Results of Borehole B 29

Borehole : B 29
Location/ Feature : Labdhi, Tanahu
Coordinate : N: 27° 51' 54.86", E: 84° 30' 23.53"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1520 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on side of the road almost at the top of the ridge at Labdhi of Tanahu district. Bed rock was exposed on the cut slope of the road. The bed rock is composed of highly weathered, thinly foliated, gray colored phyllite/schist. The borehole location was shifted about 20 m - 30 m due to inaccessibility and scarcity of water.

The borehole observation shows the presence of coarse-grained sand with little silt and clay up to the depth of 0.5 m followed by the presence of bed rock which is highly weathered, thinly foliated, light gray colored, fine to medium-grained schist. Due to its highly weathered nature, the rock is crushed into sand size particles and obtained as sludge in the core. At 3.0 m to 4.0 m, highly weathered, fine to medium-grained clay like lumps of rock is obtained. From 4.0 m onwards, schist fragments smaller than 2.0 m in diameter is obtained.

The SPT N values at depths of 1.00 m to 1.45 m and 3.00 m to 3.45 m both exceeded by 50representing the soil formations are of very dense nature.

4.1.30 Results of Borehole B 30

Borehole : B 30
Location/ Feature : Kali Khola, Chitwan
Coordinate : N: 27° 50' 5.17", E: 84° 33' 20.8"
Total Drill Depth : 7 m
Water Table : None
Elevation : 278 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m at Kali Khola, on the side of Narayanghat- Muglin road section of Chitwan district. The area is mainly composed of angular fragments of different rock type such as quartzite and phyllite. And the slope is slightly steep to very steep in nature. The borehole location was performed on the road.

The borehole observation shows the presence of brown colored sediments with presence of very small fragments of around a cm in diameter up to the depth of 0.5 m followed by gray colored cobbles and pebbles of quartzite and metasandstone in sandy clayey matrix. The size of the clast is about 10 cm to 15cm in diameter.

4.1.31 Results of Borehole B 31

Borehole : B 31
Location/ Feature : Chilaune pani, Dhading
Coordinate : N: 27° 48' 1.91", E: 84° 38' 52.84"
Total Drill Depth : 7 m
Water Table : None
Elevation : 79 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on side of the

road, on public land at Chilaune Pani and Dhading district. In order to avoid the fill material, the drilling was conducted on the hill side of the road. The bed rock was exposed on the base of the road and near the drill location. The rock exposed the near the drill locations were highly weathered and highly deformed.

The borehole observation represents the presence of few amounts of rock fragments, pebbles or smaller, in silty clay matrix at the top Followed by greenish brown colored phyllite and quartz fragments at the depths of 1.0 m to 3.0 m having1 cm - 2 cm diameters. From 3.0 m- 4.0 m, green colored small fragments of phyllite with less than a cm in diameter are observed. The SPT sample shows that the lumps of clay like sediment which is highly cohesive in nature. Below this depth, the rock line is established at the depth of 5.0m. The rock is bluish green colored, thinly foliated, phyllite/schist.

The maximum field SPT N value is 56 at the depth of 1.00 m to 1.45 m and minimum is 23 at 3.00 m to 3.45 m.

4.1.32 Results of Borehole B 32

Borehole : B 32
Location/ Feature : Tekbang, Dhading
Coordinate : N: 27° 46' 35.1", E: 84° 41' 31.9"
Total Drill Depth : 7 m
Water Table : None
Elevation : 537 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m at Tekband of Dhading district. The area revealed slightly to moderately weathered, thinly foliated, greenish and bluish gray colored with brownish stains, phyllite/schist along the newly cut road section near the borehole location.

The borehole observation shows the presence of brownish gray colored silty sand with very small pebbles up to the depth of 0.5 m followed by the presence of bedrock. The bed rock is moderately weathered, light gray colored, foliated, fine-grained phyllite. The phyllite is moderately weathered up to the depth of 2.0 m. From 2.0 m - 5.0 m, phyllite is highly to completely weathered. And below 5.0 m depth from the top, the rock is slightly to moderately weathered and fractured at places.

4.1.33 Results of Borehole B 33

Borehole : B 33
Location : Mohoriya, Dhading
Coordinate : N: 27° 46' 56.72", E: 84° 47' 29.02"
Total Drill Depth : 7 m
Water Table : None
Elevation : 915 m

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on the roadside on a public land at Mohoriya of Dhading district. The slope is almost gentle and has reddish brown colored residual soil mixed with colluvial rock fragments in it around the area.

The borehole observation shows dark colored, slightly moist cohesive sand and clay up to the depth of 0.5 m followed by brownish gray colored boulders and cobbles of, limestone was observed at the depth of 7.0 m. The core sample is almost continuous and the rock line is not encountered up to the depth of 7.0 m. The boulders are brownish highly weathered, gray colored, limestone with white lines.

The field SPT value at the depth of 1.00 m recorded to be 18 signifying the soil is compact in nature.

4.1.34 Results of Borehole B 34

Borehole : B 34
Location/ Feature : Charsaya Pata, Dhading

Coordinate : **N: 27° 47' 41.5", E: 84° 50' 13.9"**
Total Drill Depth : **7 m**
Water Table : **None**
Elevation : **384 m**

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on alluvial deposit at Charsaya Pata of Dhading district. The alluvial deposit was mainly represented by rounded cobbles and pebbles in sandy matrix deposited by the Malekhu River.

The borehole observation represents small pebbles of around 1 cm diameter in sandy matrix up to the depth of 5.0 m. Well graded coarse-grained sand is predominant at the depths of 3.0m - 5.0 m. Below this depth, the observation shows cobbles and gravel are in sandy matrix.

The SPTN value at the depth of 4.00 m exceeded 50 while the minimum value is recorded to be 18 at the depth of 1.00 m -1.45 m signifying the soil is very dense to compact in nature at different depths.

4.1.35 Results of Borehole B 35

Borehole : **B 35**
Location/ Feature : **Gajuri, Dhading**
Coordinate : **N: 27° 48' 26.1", E: 84° 41' 31.9"**
Total Drill Depth : **7 m**
Water Table : **None**
Elevation : **358 m**

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on the top of the cut slope just above the highway at Gajuri, of Dhading district. The site was characterized with predominant of presence of red soil was around the borehole location.
The borehole observation shows the presence of red clay was up to the depth of 7.0 m. The samples at the depths of 2 m - 3 m and 3m - 4 m meter were classified as CH and MH respectively. Below this depth, the borehole shows clayey sand.

The maximum field SPT N value is recorded to be 54 at the depth of 1.00 m to 1.45 m and the minimum value is recorded to be 34 at 4.00 m to 4.45 m which signifies the soil is dense to very dense in nature.

4.1.36 Results of Borehole B 36

Borehole : **B 36**
Location/ Feature : **Khahare, Dhading**
Coordinate : **N: 27° 49' 18.52", E: 84° 55' 42.76"**
Total Drill Depth : **7 m**
Water Table : **None**
Elevation : **79 m**

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m at Khahare of Dhading district. The exploratory drilling was performed along the roadside on the public land at the foothill of moderate to steep slope. The rock exposed on the cut slope of the road was thinly foliated, dark colored slate along with the presence of some leaching of calcareous material almost 50 m south of the borehole location.

The borehole observation reveals brown colored, coarse-grained sand with presence of small rock fragments up to the depth of 1.0 m followed by the presence of bedrock. The rock is slightly to moderately weathered, foliated, highly fractured slate with calcareous parting. As a result, sample is obtained in the form of sludge due to crushing from the depth of 1.0 m to 3.0 m. After 3.0 m, pebbly sized cores are recovered as the sample

4.1.37 Results of Borehole B 37

Borehole	:	**B 37**
Location/ Feature	:	**Nuwakot**
Coordinate	:	**N: 27° 51' 04.1", E: 85°02'26.2"**
Total Drill Depth	:	**7 m**
Water Table	:	**None**
Elevation	:	**472 m**

The vertical rotary wash boring was carried out using the rotary type rig up to the depth of 7 m on the cultivated land with proper paperwork and after receiving the permission from the landowner. The location was at top of the river terrace deposit at Nuwakot district about 1 km southwest from the Ratmate substation.

The borehole observation shows the medium-grained, dry, non-cohesive sand mixed with pebbles together with very little silt and clay of up to the depth of 0.50 m followed by the rock line at 0.5 m. The bed rock is gray colored, jointed, medium to coarse-grained schist. Only sludge sample were collected at the depths of 1.00 m to 3.00 m due to crushed of weak schist rock into sand size particles during drilling. From 3.00 m onwards, fragments of schist about 2 cm in diameter is observe throughout the drill depth.

The maximum and minimum field SPT N values recorded at the depths of 6.00 m to 6.45 m and 3.00 m to 3.45 m to be 39 and 3 respectively representing the soil is very loose to dense in nature.

4.1.38 Results of Borehole B 38

Borehole	:	**B 38**
Location	:	**Ratmate, Nuwakot/ Substation**
Coordinate	:	**27° 51' 54", E: 84°30'23"**
Total Drill Depth	:	**7 m**
Water Table	:	**None**
Elevation	:	**487 m**

The exploratory drilling was carried out vertically using the rotary wash boring type rig for 7 m meters at Ratmate of Nuwakot District. The exploratory borehole drilling was performed on top of alluvial terrace of Trishuli River about 200 m from the current river channel. Different levels of fluvial seasonal cycles were clearly visible on the cut slope of the terrace. The rounded boulders up to 40 cm sized diamter were observed on bottom of the fining upward fluvial cycle. On top of the terrace deposit, red clay was abundant which has been utilizing to manufacture bricks.

The borehole observation shows the top soil is cohesive, red clay. The size of the clasts increases with increasing the depth and the matrix also changes from clay rich to sand. The depth of 2.00 m to 3.00 m represents fine to medium-grained, red colored clayey sand followed by rounded to sub-rounded cobbles, pebbles of various rock types mainly in sandy matrix.

The field SPT N values recorded to be 50 at the depths of 2.00 m to 2.45 m, 3.00 m to 3.45 m and 4.00 m to 4.45 m respectively representing very dense soil. On the other hand, the minimum value recorded to be 36 at the depth of 1.00 m to 1.45 m for this borehole indicating dense soil. The overall soil strata at this borehole is recognized as dense to very dense soil.

4.1.39 Results of Borehole B 39

Borehole	:	**B 39**
Location/ Feature	:	**Ratmate, Nuwakot/ Substation**
Coordinate	:	**N: 27° 36' 42.09", E: 83°42'28.10"**
Total Drill Depth	:	**7 m**
Water Table	:	**None**

Elevation : 479 m

The exploratory drilling was carried out vertically using the rotary wash boring type rig for 7 m at Ratmate of Nuwakot district. The borehole was performed on the top of alluvial terrace on the left bank of the Trishuli River. Different levels of various fluvial cycles were clearly visible on the cut slope of the terrace. Diametrically rounded boulders up to 40 cm were observed at the bottom of the fining upward fluvial cycle with red clay at the top. The red clay has been exploiting to manufacture bricks.

The borehole observation shows, red, cohesive clay up to the depth of 2.00 m followed by the presence of small fragments of quartz and phyllite in red clay at the depth of 2.00 m - 4.00 m. Below the depth of 4.00 m to 7.00 m, the red colored, cohesive clay is predominantly observed mixed with small amount of silt.

The maximum field SPT N value at the depth of 7.00 to 7.45 m recorded to be 55 and the minimum value recorded at the depth of 1.00 m to 1.45 m to be 12 indicating the nature of the soil is medium dense to very dens

4.1.40 Results of Borehole B 40

Borehole : B 40
Location/ Feature : Nandutar, Nuwakot
Coordinate : N: 27° 50' 46.2", E: 85°03'25.3"
Total Drill Depth : 7 m
Water Table : None
Elevation : 577 m

The exploratory drilling was carried out vertically using the rotary wash boring type rig for 7 m at Nandutar of Nuwakot district. The area is west facing slope with settlement and cultivation throughout the hill slope. But thinly foliated blackish gray to gray colored, phyllite was exposed on the slope near the drill location. The borehole was performed at the cultivated terrace of the slope where drilling rigs could be set up.
The borehole observation shows, about 50 cm of the top soil, reddish brown colored silty clay along with small pebbly sized rock fragments up to the depth of 0.5 m followed by the rock line at this depth. The bed rock is moderately weathered, thinly foliated, gray colored phyllite. The rock turned into crushed phyllitic materials during the drilling when obtained as sample. At the depth of 2.00 m- 5.00 m, the rock is highly crushed and the sample resembles coarse-grained sand rather than a rock.

The maximum field SPT N value at the depth of 5.00 m to 5.45 m recorded to be 62 and the minimum value at the depth of 2.00 m to 2.45 m recorded to be 51 signifying the nature of the soil as very dense.

4.1.41 Results of Borehole B 41

Borehole : B 41
Location/ Feature : Nuwakot
Coordinate : N: 27° 51' 02", E: 84° 06' 24"
Total Drill Depth : 7 m
Water Table : None
Elevation : 830 m

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m on the cultivated land of Nuwakot district. The land was previously cultivated but at present turned into barren. In order to accomplish the task, the official land agreement was taken from the landowner and accomplished the task. The slope nearby the site is north facing and steep with slope of almost 60° - 70°.

The borehole observation shows the top soil is sand mixed with clay and silt up to the depth of 1.00 m followed by reddish brown colored, coarse-grained sand, with small particles of phyllite up to the depth of 1.00 m to 3.00 m. After this depth, light gray colored, coarse-grained phyllites are observed which are turned into sand sized

particles due to drilling.

The maximum and minimum field SPT N values at the depths of 3.00 m to 3.45 m and 4.00 m to 4.45 m recorded to be 21 8 respectively indicating the nature of the soil is loose to medium loose (compact).

4.1.42 Results of Borehole B 42

Borehole : B 42
Location/ Feature : Madanpur, Nuwakot
Coordinate : N: 27° 52' 26.38", E: 85° 9' 24.04"
Total Drill Depth : 7 m
Elevation : 750 m

The exploratory drilling was carried out vertically using the rotary wash boring type rig for 7 m at Madanpur of Nuwakot district. The drilling was commenced on the side of the road, on a public land directly on the rock exposure.

The borehole observation reveals highly to completely weathered phyllite is to form as soil. Hence formed strata is represented by red colored soil together with undigested rock fragments up to the depth of 7.00 m. As a result, the rock was all crushed during drilling, washed up to the top by water and collected in the form of sludge sample. The collected sludge sample is orange to brown colored, medium to coarse-grained, clayey sand.

4.1.43 Results of Borehole B 43

Borehole : B 43
Location/ Feature : Chiuribote Thali, Nuwakot
Total Drill Depth : 7 m
Water Table : None

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m at Chiuribote Thali of Nuwakot district.

The borehole observation shows the bed rock is almost started from the depth of 0.50 m. The observed rock is highly weathered, foliated, gray colored phyllite with presence of quartz veins. The rock is crushed during the drilling and sample is collected in the form of sludge. The sludge fine to medium-grained sand sized bed rock fragments. There is a core loss at the depth of 2.00 m to 5.0 m. Rock fragments of about 2 cm size phyllitic particles are collected at the depth of 5.00 m to 6.00 m.

4.1.44 Results of Borehole B 44

Borehole : B 44
Location/ Feature : Nawalparasi
Coordinate : N: 27° 36' 42.09", E: 83°42'28.10"
Total Drill Depth : 7 m
Water Table : None
Elevation : 147 m

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m at Jargha of Nawalparasi district. The area is characterized with recent alluvial deposit. The borehole location is about 0.5 m to 1 m above the current river channel.

The borehole observation shows, the top soil is light brown colored, slightly cohesive silty clay followed by dark gray colored, slightly moist and slightly cohesive silty clay at the depth of 1.00 m to 3.00 m. At the depth of the depth of 3.00 m to 5.00 m medium-grained sand is observed mixed with pebbles. The maximum diameter of the pebble is measured to be 2 cm. Proceeding, there is a presence of small pocket of fine silty sand together with

clay in between the depth of 5.00 m to 6.00 m followed by pebbles on sandy matrix.
The maximum and the minimum field SPT N values recorded at the depths of 4.00 m to 4.45 m and 3.00 m to 3.45 m recorded to be 44 and 27 respectively indicating the soil is compact to dense nature.

4.1.45 Results of Borehole B 45

Borehole : B 45
Location/ Feature : Sindhupalchowk
Coordinate : N: 27° 51' 39.4", E: 84°18'40.8"
Total Drill Depth : 7 m
Water Table : None
Elevation : 725 m

The exploratory drilling was carried out vertically using the rotary wash boring type rig for 7 m on side of the road at Sindhupalchowk district. The area is very fragile with almost completely weathered granite which resembles as sand mined directly from the exposure.

The borehole observation shows the borehole was carried out directly on the bed rock. Since the rock is almost completely weathered, it was hard to collect a solid sample. For collecting the sample, SPT tube was hammered in but could not penetrate through hence, mainly sludge sample or washed sample is collected in the core boxes. The sample collected is almost whitish colored, medium to coarse grained, non-cohesive sand.

The N count for SPT in field exceeded 50 blow mark at the depth of 1.00 m to 1.45 m and 3.00 m to 3.45 m, which signifies the soil is very dense in nature.

4.1.46 Results of Borehole B 46

Borehole : B 46
Location/ Feature : Jyamire, Sindhupalchowk
Coordinate : N: 27° 51' 07.9", E: 85° 25' 25.6"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1252 m

The exploratory drilling was carried out vertically using the rotary wash boring type rig for 7 m at Jyamire of Sindhupalchowk district. The borehole area was near to the slope scree material of colluvial nature.

The borehole observation reveals the presence of sandy, silty clayey soil with pebbles and gravel of gneiss and quartzite at the depth of 0.00 m to 0.20 m which is followed by the presence of overburden materials such as boulder, gravel and pebbles in sandy silty matrix with little proportion of clay. The overburden material is not stratified and is medium dense to dense in nature. Total of three SPT tests were conducted at the depth of 1.50 m to 5.00 m. The SPT could not be performed at the depth of 5.00 m to 7.00 m due to presence of boulders in the overburden.

The field SPT N value exceeded by 50 at the depths of 1.50 m to 1.95 m and minimum N value recorded to be 39 at the depth of 4.5 m 4.95 m indicating the nature of soil is dense to very dense.

4.1.47 Results of Borehole B 47

Borehole : B 47
Location/ Feature : Kaule, Sindhupalchowk
Coordinate : N: 27° 49' 20.67", E: 85° 30' 39.40"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1323 m

The exploratory drilling was carried out vertically using the rotary wash boring type rig for 7 m at Kaule of Sindhupalchowk district. The borehole drilling was performed on the cultivated land after receiving the official agreement by the landowner.

The borehole observation shows reddish brown to brown colored sandy silt soil rich in organic content up to the depth of 0.5 m followed by fine to medium-grained, non-cohesive dry sand with presence of little amount of silt and clay.

The maximum and minimum field SPT N values recorded to be 45 and 14 at the depths of 2.00 m to 2.45 m and 1.00 m to 1.45 m respectively indicating the nature of the soil is very loose to dense.

4.1.48 Results of Borehole B 48

Borehole	:	**B 48**
Location/ Feature	:	**Nangle, Kathmandu**
Coordinate	:	**N: 27° 49' 20.67", E: 85° 28' 59.82"**
Total Drill Depth	:	**7 m**
Water Table	:	**None**
Elevation	:	**432 m**

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m at Nangle of Kathmandu district. The terrain is formed by weathering of granitic rock.

The borehole observation reveals fine to medium-grained, light gray colored cultivated soil with small fragments of granite up to the depth of 0.5 m followed by medium to coarse-grained sand up to to the depth of about 5.00 m. The cobble sized granitic fragments are observed from 5.00 m depth onwards.
The field SPT N value exceeded by 50 at the depth of 4.00 m to 4.45 m and the minimum N value recorded to be 39 at the depth of 3.00 m to 3.45 m indicating the nature of the soil is dense to very dense.

4.1.40 Results of Borehole B 49

Borehole	:	**B 49**
Location/ Feature	:	**Jaharsing Pauwa, Kathmandu/ SuBstation**
Coordinate	:	**N: 27° 36' 42.09", E: 83°42'28.10"**
Total Drill Depth	:	**7 m**
Water Table	:	**None**
Elevation	:	**1652 m**

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m on the eastern part of Kathmandu Valley. The area falls on the extension part of Shivapuri Gneiss. So, the sediments resemble the granitic pattern.

The borehole observation shows the poorly graded, intermingled red, black and white colored non-cohesive dry, silty sand throughout the depth. The formation of soil is the byproduct of granitic terrain.

The field SPT N value exceeded by 50 at the depth of 7.00 m to 7.45 m and the minimum N value recorded to be 15 at the depth of 0.00 to 0.45 n resembling the soil is medium dense to very dense nature.

4.1.50 Results of Borehole B 50

Borehole	:	**B 50**
Location/ Feature	:	**Jaharsing Pauwa, Kathmandu/ SuBstation**
Coordinate		**1: N: 27° 36' 42.09", E: 83°42'28.10"**
Total Drill Depth	:	**7 m**
Water Table	:	**None**
Elevation	:	**1659 m**

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m at Jaharsingpauwa of Kathmandu district. The drilling was conducted on cultivation lands, on gentle slopes formed by the weathering of granite.

The borehole observation represents red colored, silty sand with and clay up to the depth of 0.5 m followed by medium to coarse-grained reddish brown colored sand. The remnants of the granitic rock mass are clearly visible. The white minerals of quartz and feldspar are visible with the dark colored minerals of mica. At the depth of 4.00 m to 5.00 m, the boundary between reddish brown and more grayish white colored sand are observed.

The field SPT N value exceeded by 50 at the depth of 6.00 m to 6.45 m and the minimum N value recorded to be 14 at the depth of 1.00 m to 1.5 m representing the nature of the soil is medium dense to very dense.

4.1.51 Results of Borehole B 51

Borehole : B 51
Location/ Feature : Biruwa, Nuwakot
Coordinate : N: 27° 49' 6.81", E: 85° 2' 37.97"
Total Drill Depth : 7 m
Water Table : None
Elevation : 278 m

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m on the side of the road near the Kolpu Khola which separates Dhading and Nuwakot districts. The rock is clearly exposed on the cut slope and on base of the road. The exposed rock is highly weathered and deformed phyllite.

The borehole observation shows highly weathered, deformed phyllite with no sample is recovered in the barrel due to crushing of drilling. As a result, only sludge sample could be collected from returning water which is fine-grained, moist, non-cohesive sand.

4.1.52 Results of Borehole B 52

Borehole : B 52
Location/ Feature : Dhading
Coordinate : N: 27° 46' 25.74", E: 85° 1' 56.43"
Total Drill Depth : 7 m
Water Table : None
Elevation : 525 m

The exploratory drilling was carried out vertically using the rotary wash boring type rig for 7 m along the side of Prithivi Highway near Simle of Dhading district. The land was flat, just on the foot of the hill, which is North facing and has 40-50 degrees' slope. The slope was covered with collouvium and thick vegetation in some parts together with the exposure of rock.

The borehole observation shows brown colored clay with fine-grained sand at the depth 0.00 m-1.00 m which is, very rich in organic content. At the depth of 1.00 m to 2.00 m, boulders, cobbles and pebbles are observed. The horizon 2.00 m -3.00 m had sand dominated layer such that it is washed away and sludge is collected as samples. From 3.00 m onwards, boulders, cobbles and pebbles of several rock types were observed.

4.1.53 Results of Borehole B 53

Borehole : B 53
Location/ Feature : Dhading
Coordinate : N: 27° 44' 3.68", E: 85° 1' 8.47"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1113 m

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m on the side of the hill of Dhading district. The material observed is of colluvial origin. The land around the borehole is mainly cultivated and covered by vegetation partly.

The borehole observation shows dark colored, slightly cohesive silty clay up to the depth of 1.00 m followed by boulders and cobbles at the depth of 1.00 m-3.00 m. Proceeding fine-grained clayey is observed at the depth of 3.00 m - 5.00 m. Pebble in clayey silt matrix is observed between the depth of 5.00 m to 6.00 m. Below the depth of 6.00 m dark colored, slightly moist, fine-grained clayey sand is observed.

The maximum and minimum field SPT N value recorded to be 24 and 20 at the depths of 4.00 m to 4.45 m and 20 at 3.00 m to 3.45 m respectively signifying the soil is of medium dense nature.

4.1.54 Results of Borehole B 54

Borehole : B 54
Location/ Feature : Galchhi, Makwanpur
Coordinate : N: 27° 40' 25.41", E: 84° 58' 36.70"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1826 m

The exploratory drilling was carried out vertically using the rotary wash boring type rig for 7 m on top of a mountain ridge at Galchhi of Makwanpur district. Reddish colored, fine grained sand with clay was abundant around the given location.

The borehole observation shows the first two meter is brownish red colored, slightly cohesive, very fine-grained, dry sand with silt and clay. From 2.00 m - 4.00 m, fine, non-cohesive sand is observed. Proceeding, the depth of 4.00 m - 5.00 m, brownish gray colored, fine-grained, slightly cohesive, almost dry sand with small amount of silt and clay followed by gray colored, fine-grained, slightly cohesive, almost dry sand with silt and clay.

The maximum and the minimum field SPT N values recorded to be 49 and 14 at the depths of 6.00 m to 6.45 m and 1.00 m to 1.45 m respectively representing the soil is medium dense to dense nature.

4.1.55 Results of Borehole B 55

Borehole : B 55
Location/ Feature : Gogane, Makwanpur
Coordinate : N: 27° 38' 21.32", E: 84° 57' 36.70"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1826 m

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m at Gogane of Makwanpur district on the cultivated land. Alluvial boulders of 3 m - 5 m were observed along the side of the borehole location. The rounded boulders were of granitic origin.

The borehole observation shows coarse-grained, brown colored sand up to the depth of 1.00 m. The depth of 1.00 m to 5.00 m reveals boulders, cobbles and pebbles of whitish gray colored granite. The rock line is established at the depth of 5.00 m. Since the dimension of the boulders observed outside the borehole location are of 3 m - 4 m, the rock fragment could not be confirmed as bed rock. The rock is whitish gray colored, strong granite.

4.1.56 Results of Borehole B 56

Borehole : B 56

Location/ Feature : Kherki, Makwanpur
Coordinate : N: 27° 35' 14.97", E: 84° 55' 53.93"
Total Drill Depth : 7 m
Water Table : None
Elevation : 384 m

The exploratory drilling was carried out vertically using the rotary wash boring type rig for 7 ms at Kherki of Makwanpur District on the foot hill of a south facing hill slope. The colluvial material of the hill slope was mostly covered by vegetation.
The borehole obsersvation shows top soil is composed of fine-grained sand, with small amounts of pebbles, silt and clay. The pebbles are of colluvial origin. The depths in between 2.00 m - 3.00 m shows fine-grained silty sand with and clay. Cobbles and pebbles originated from sandstone are observed at the depth of 4.00 m - 5.00 m horizon Followed by mainly of pebbles and gravels of phyllites and sandstones.

The maximum and minimum field SPT N values recorded to be 22 and 14 at the depths of 3.00 m to 3.45 m and 1.00 m to 1.45 m representing the nature of the soil is medium dense.

4.1.57 Results of Borehole B 57

Borehole : B 57
Location/ Feature : Kuwapani, Makwanpur
Coordinate : N: 27° 36' 42.09", E: 83°42'28.10"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1012 m

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m at Kuwapani of Makwanpur district. The bed rock was exposed near the borehole location on the cut slope and on the base of the road. The hill slope material is composed of colluvial material mostly covered with vegetation. The given borehole location was shifted a significant distance because of the condition of the road. The road had small gullies formed due to of rain water and was inaccessible.
The borehole observation shows fine-grained, non-cohesive, dry sand with presence of very little amount of clay and silt up to the depth of 1.0 m. The rock line was established at the depth of 1.0 m. The bed rock is highly weathered, fine-grained, brown to dark gray colored sandstone with presence of small pieces about a cm in diameter. Sludge sample be collected at the depth between 2.00 m to 4.00 m. At the depth of 4.00 m to 6.00 m, small pebbles of sandstone are observed. The sandstone is highly weathered to form in a crumbled state of fine to medium-grained sand at the depth of 6.00 m to 7.00 m.

4.1.58 Results of Borehole B 58

Borehole : B 58
Location/ Feature : Basamadhi, Hetauda
Coordinate : N: 27° 26' 59.48", E: 84° 59' 0.57"
Total Drill Depth : 7 m
Water Table : None
Elevation : 405 m

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m at Basamadhi of Makwanpur district. Drilling was carried out at the previously cultivated land after receiving the verbal consent from the land owner.

The borehole observation reveals the top soil is reddish to reddish brown colored which might be of residual origin. Proceeding, the borehole shows fine-grained, red colored sand with presence of little amount of pebbles, silt and clay up to the depth of 4.00 m. Fine to medium-grained sand with silt and clay is observed at the depth of 4.00 m - 5.00 m followed by the same material throughout the section.

4.1.59 Results of Borehole B 59

Borehole : B 59
Location/ Feature : Hetauda/Substation
Coordinate : N: 27° 25' 47.17", E: 85° 00' 21.29"
Total Drill Depth : 7 m
Water Table : None
Elevation : 432 m

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m on the alluvial terrace, formed by the Rapti River at Hetauta sub-station. The rounded to sub rounded boulders, cobbles and pebbles in sandy matrix forms the terrace.

The collected borehole samples show dense to medium dense, sandy silt with clay soil up to the depth of 0.5 m followed by presence of boulders of quartzite, granite and sandstone in sandy matrix up to the depth of 0.50 m to 2.00 m. At the depth of 2.00 m - 6.00 m, boulders, gravels and cobble are observed, below this depth pebbles are encountered.

4.1.60 Results of Borehole B 60

Borehole : B 60
Location/ Feature : Hetauda/Substation
Coordinate : N: 27° 25' 47.00", E: 85° 00' 00"
Total Drill Depth : 7 m
Water Table : None
Elevation : 432 m

The exploratory drilling was performed vertically using the rotary wash boring type rig for 7 m on the alluvial terrace formed by the Rapti River at Hetauta sub-station.

The borehole observation shows dry to moist, silty sand with clayey soil up to the depth of 0.5 m in which rounded pebbles are observed at the top. Followed by boulder, cobble and pebbles of the various rock types throughout the drill depth. The strata represent rounded to sub rounded alluvial origin sediments in sandy matrix.

5.0 RESULTS OF LABORATORY TESTS

5.1. Results of Natural Moisture Content

Natural moisture contents of 93 samples were conducted in the laboratory that revealed different water contents ranged from 1.58% at B 58 to 29.65% at B 44 of SPT sample. Similarly, minimum water content of 4.42% at B 35 and the maximum value of 27.31% at B 3 of pit samples were determined. The water contents around the Terai region from B 1 to B 8 revealed higher water contents due to presence of near water table and high fluctuation of water level to be seasonally brought by rivers on the flat area. The midlands and hilly terrains also show higher water contents in the areas near to the north facing ridges. The north facing ridges used to retain considerable water contents throughout the year. Similarly, water contents seemed to be higher at cultivated areas as well as cohesive soils which have the ability to hold water in the soil. The summary of the test is shown in **Tables 5** and **6**. The detailed data sheet are arranged in **Annex C**.

5.2. Results of Consistency Limits

Consistency limits of 93 samples were conducted in the laboratory. The summary of the test is shown in **Tables 5** and **6** reveal non-plastic to slightly plastic soils. The detailed data sheet are arranged in **Annex C**.

5.3 Results of Particle Size Analysis

These tests were carried out on representative soil samples taken at one meter intervals depths of the boreholes as well as the samples from the pits also. The wet sieve analysis tests were performed on fifty-nine samples and the summary of these tests are shown in **Tables 5** and **6** and details are shown in **Annex C**.

5.4 Results of Specific Gravity

The specific gravity of 93 samples were determined in the laboratory. The specific values ranged from 2.624 at B 22 to 2.785 at B 8 estimated from representative SPT samples. Similarly, pit sampling determined the lowest specific gravity of 2.501 at B 25 and the maximum value of 2.755 at B 8 respectively. The specific gravity of pit sample at B 25 location contains few organic contents so as to decrease the specific gravity value. The overall range of soil lies in the range of sand, silty sand, clayey silt, clayey silty sand to clay together with minor contents of organic materials in few samples. The summary of the test is shown in **Tables 5** and **6**. The detailed data sheet are arranged in **Annex C**.

5.5 Results of Loose Bulk Density and Unit Weight Test

The loose bulk density governed the maximum values for soil containing considerable amounts of gravels. Higher the percentage of gravels, increases the loose bulk density. The minimum and the maximum bulk densities were determined at B 8 and B 34 locations tested from the representative SPT samples to be 0.776 and 1.671 respectively. Proceeding, the loose bulk densities from pit samplings revealed the minimum and the maximum values to be 1.132 and 1.685 at B 19 and B 52 respectively. On the other hand, the unit weight tested from pit samplings adjacent to borehole locations revealed that the maximum and the minimum values of 1.516 and 2.071 in B 26 and B30 locations respectively. The summary of both loose bulk density and unit weight test are shown in **Tables 5** and **6**. The detailed data sheet are arranged in **Annex C**.

5.6 Results of Proctor Compaction Test

The maximum and minimum values determined by proctor compaction test revealed at B 29 and B 33 in terms of maximum dry density as 2.240 g/cc and 1.683 g/cc respectively. The corresponding optimum moisture contents are respectively 7.25% and 18.50%. Higher the density retains fewer water contents and vice versa. The summary of the test is shown in **Tables 5** and **6**. The detailed data sheet are arranged in **Annex C**.

5.7 Results of Organic Content Test

The organic content analysis tests were performed on 58 of samples of both pit/bulk and representative SPT samples of the required depth respectively. The results show the maximum recorded to be 1.45 adjacent to B51 and B59 locations while the minimum value recorded to be 0.35 adjacent to B 43 location. On the other hand, the minimum of 0.31 value is also recorded at B 4 of SPT sample. This indicates that the organic contents are low at

depths. The summary of these tests are shown in **Tables 5** and **6**.

5.8 Results of pH Test

The pH tests were performed on 58 samples representing from samples taken from SPT tests showed that the values are ranged from 5.25 to 7.86 for all borehole locations. This indicates the soils are nearly neutral to slightly alkaline nature. The summary of these tests are shown in **Tables 6a**.

5.9 Results of Water Soluble Sulfate Test

Water soluble sulfate tests were carried out for both representative SPT and pit/bulk samples. The overall laboratory tests carried out for 58 sample represent very low percentages of sulfates. The summary of these tests are shown in **Tables 5** and **6**.

Table 5. Summary of geotechnical properties of soil taken from SPT sample.

Bore hole No.	Testing Depth (m)	NMC %	Sieve Analysis			Hydrometer Test		Atterberg Limits			Loose Bulk Density gm/cc	Specific Gravity	Organic Content %	Water Soluble Sulphate
			Gravel %	Sand %	Silty/Clay %	Clay %	Silt %	LL %	PL %	PI %				
B 1	3.00-3.45	19.32	0.00	43.45	56.55	11.49	45.06	20.75	17.75	3.00	1.291	2.665	0.66	0.002
B 2	3.00-3.45	25.17	0.13	14.16	85.70	22.85	62.85	26.85	18.52	8.33	1.284	2.722	0.49	0.0025
B 3	3.00-3.45	21.98	0.00	5.62	94.38	31.16	63.22	29.20	20.23	8.97	1.256	2.667	0.59	0.0019
B 4	3.00-3.45	17.76	0.00	26.93	73.07	10.21	62.87	24.25	21.30	2.95	1.274	2.665	0.31	0.0027
B 5	3.00-3.45	20.50	0.00	5.12	94.88	28.31	66.57	25.30	19.94	5.36	0.802	2.781	0.79	0.001
B 6	3.00-3.45	21.77	0.00	0.88	99.12	24.86	74.26	26.00	20.91	5.09	0.787	2.654	0.54	0.002
B 7	3.00-3.45	25.69	0.06	4.13	95.81	25.55	70.26	25.45	18.88	6.57	0.797	2.734	0.39	0.004
B 8	3.00-3.45	20.11	0.17	1.19	98.64	20.04	78.60	27.78	18.49	9.29	0.776	2.686	0.59	0.0037
B 12	4.00-4.45	17.04	38.36	28.96	32.68	9.75	22.93	28.5	23.56	4.94	1.521	2.622	0.36	0.0052
B 13	3.00-3.45	16.87	66.68	19.40	13.92			20.70	NP	20.70	1.608	2.600	0.55	0.0038
B 15	1.00-1.45	11.61	34.65	42.20	23.15			29.4	23.81	5.59	1.449	2.632	1.11	0.0029
B 16	3.00-3.45	11.02	1.79	68.75	29.46	6.10	21.75	22.80	NP	22.80	1.559	2.625	0.85	0.0034
B 20	3.00-3.45	10.02	2.86	26.11	71.04	9.92	61.11	38.80	29.34	9.46	1.303	2.713	0.69	0.0025
B 21	3.00-3.45	15.46	16.43	11.16	72.41	14.71	57.69	33.20	26.93	6.27	1.291	2.705	0.59	0.0023
B 22	2.00-2.45	12.14	38.42	38.01	23.58			21.60	19.50	2.10	1.636	2.624	0.72	0.0027
B 26	3.00-3.45	15.93	2.79	22.60	74.61	28.19	46.42	38.60	34.12	4.48	0.795	2.686	0.73	0.0028
B 27	1.00-1.45	13.62	16.58	45.41	38.01	8.33	29.68	27.30	25.05	2.25	1.491	2.643	0.77	0.005
B 28	4.00-4.45	15.37	17.61	55.99	26.40			22.30	20.54	1.76	1.243	2.652	0.65	0.0035
B 29	3.00-3.45	3.16	16.12	55.59	28.29			26.80	24.35	2.45	1.548	2.634	0.89	0.003
B 31	3.00-3.45	11.06	13.29	38.92	47.79	11.99	35.81	28.80	25.03	3.77	1.551	2.633	0.72	0.001
B 34	3.00-3.45	2.09	49.80	36.90	13.30			25.90	21.17	4.73	1.671	2.656	0.52	0.003
B 35	3.00-3.45	20.25	-	57.83	42.17	19.95	22.22	34.90	31.54	3.36	1.547	2.655	0.53	0.0032
B 37	3.00-3.45	16.47	0.00	81.45	18.55			19.00	NP	19.00	1.517	2.656	0.86	0.0029
B 38	3.00-3.45	19.95	16.65	53.36	29.99	5.14	24.85	23.10	NP	23.10	1.159	2.630	0.85	0.0026
B 39	3.00-3.45	21.46	1.57	24.32	74.10	17.41	56.70	34.00	27.86	6.14	1.268	2.678	0.68	0.0037
B 40	2.00-2.45	14.09	8.99	71.14	19.87			22.60	NP	22.60	1.661	2.621	0.76	0.0018
B 41	3.00-3.45	14.88	7.40	62.51	30.08	5.64	24.45	20.70	18.47	2.23	1.156	2.644	0.66	0.0023
B 44	3.00-3.45	29.65	0.00	23.49	76.51	14.33	62.18	19.18	NP	19.18	1.404	2.693	0.34	0.006
B 49	3.00-3.45	18.76	0.05	98.23	1.72			17.85	NP	17.85	1.570	2.647	0.66	0.0024
B 52	2.00-2.45	21.64	0.89	95.75	3.37			17.30	NP	17.30	1.349	2.649	0.47	0.0023
B 54	3.00-3.45	11.75	15.19	9.22	75.59	20.16	55.43	26.25	23.01	3.24	1.336	2.675	0.66	0.002
B 55	3.00-3.45	6.65	-	13.86	86.14	14.77	71.37	35.60	26.60	9.00	1.304	2.725	0.63	0.003
B-56	3.00-3.45	25.44	44.04	36.55	19.40			23.40	NP	23.40	1.336	2.642	0.6	0.0016
B-57	5.00-5.45	20.07	2.99	57.54	39.46	8.64	30.82	25.20	22.43	2.77	1.455	2.655	0.75	0.0037
B 58	3.00-3.45	1.58	52.05	39.05	8.90			21.10	NP	21.10	1.314	2.672	0.71	0.0024

Table 6. Summary of geotechnical properties of soil taken from Pit/Bulk sample.

Borehole No.	NMC %	Sieve Analysis			Hydrometer Test		Atterberg Limits			Loose Bulk Density gm/cc	Unit Weight g/cc	Specific Gravity	Compaction Test		Organic Content, %	Water Soluble Sulphate, %
		Gravel %	Sand %	Silty/Clay %	Clay %	Silt %	LL %	PL%	PI%				DD gm/cc	OMC %		
B 1	22.26	1.13	74.53	24.16	4.52	19.63	26.2	20.83	5.37	1.291	1.924	2.662	2.050	8.75		
B 2	25.51	0.00	1.23	98.77	29.48	69.3	23.50	21.45	2.05	1.314	1.543	2.714	1.705	17.00		
B 3	27.31	0.05	1.18	98.77	35.75	63.02	30.00	24.62	5.38	1.268	1.782	2.684	1.990	10.00		
B 4	21.03	0.28	35.83	63.89			23.80	19.44	4.36	1.291	1.746	2.748	1.880	13.50		
B 5	18.88	45.00	95.77	3.79			23.00	20.94	2.06	1.381	1.586	2.655	1.772	14.50		
B 6	23.09	2.19	4.32	93.49	27.9	65.59	26.35	19.09	7.26	1.268	1.578	2.706	1.790	14.00		
B 7	18.15	11.33	84.03	4.64			22.60	NP	22.60	1.439	1.565	2.643	1.820	14.00		
B 8	24.11	0.07	69.72	30.2	8.05	22.15	20.80	19.38	1.42	1.291	1.610	2.755	1.735	17.00		
B 9	12.59	0.41	51.36	48.22	12.86	35.36	24.20	21.02	3.18	1.311		2.666	1.785	11.75	1.26	0.0034
B 10	12.24	0.21	40.27	59.52	11.15	48.37	23.50	20.94	2.56	1.314	1.796	2.652	2.012	8 50	1.02	0.0027
B 11	5.27	45.58	38.23	16.19			20.8	NP	20.80	1.676	1.938	2.614	2.150	6.75	1.17	0.001
B 12	10.23	11.38	47.87	40.75	12.68	28.07	20	NP	20.00	1.495	1.748	2.662	1.880	13.50		
B 13	5.27	38.36	44.54	17.09			21.2	19.8	1.40	1.585	1.934	2.632	2.033	9.25		
B 14	8.45	55.73	39.71	4.55			15.2	NP	15.20	1.631	1.776	2.603	1.938	11.25	1.06	<0.001
B 15	16.64	0.12	28.94	70.93	25.67	45.26	24.8	23.14	1.66	1.302	1.721	2.673	1.928	13.00		
B 16	11.80	2.6	78.97	18.43			21.40	NP	21.40	1.483	1.994	2.645	2.117	8.75		
B 17	9.41	48.49	35.07	16.44			22.70	20.92	1.78	1.268	1.843	2.605	1.940	9.75	0 92	<0.001
B 18	15.59	47.21	45.33	7.46			32.50	25.36	7.14	1.475	1.817	2.614	1.946	10.75	0.95	0.0014
B 19	21.86	13.62	7.69	78.69	34.73	43.97	29.60	26.17	3.43	1.132	1.608	2.662	1.774	16.00	0 82	0.0016
B 20	15.67	10.15	18.67	71.18	18.98	52.20	24.20	19.48	4.72	1.291	1.689	2.693	1.812	14.25		
B 21	13.88	27.18	23.32	49.49	7.7	41.79	23.20	22.10	1.10	1.393	1.788	2.665	1.978	11.75		
B 22	11.66	36.86	22.44	40.70	8.27	32.43	29.10	25.83	3.27	1.679	1.996	2.711	2.178	8.00		
B 25	16.42	19.75	22.95	57.30	14.37	39.53	32.10	24.56	7.54	1.449	1.730	2.501	1.889	12.60	0.066	0.0025
B 26	21.50	2.79	22.60	74.61	19.95	59.59	22.00	NP	22.00	1.242	1.516	2.631	1.680	19.50		
B 27	10.55	28.15	33.1	38.75	13.41	25.34	23.70	20.87	2.83	1.449	1.778	2.645	2.040	9.50		
B 28	21.06	17.31	14.13	68.56	17.20	51.37	48.20	40.90	7.30	1.178	1.574	2.656	1.693	19.25	0.85	
B 29	6.57	40.85	35.75	23.4			19.80	NP	19.80	1.631	1.969	2.679	2.240	7.25		
B 30	6.29	48.62	37.69	13.68			23.60	19.77	3.83	1.653	2.071	2.619	2.195	7.00	1.12	0.0011
B 31	9.27	46.68	38.41	14.91			32.37	28.31	4.06	1.668	1.836	2.650	2.110	7.60		
B 32	13.12	19.49	49.73	30.78	10.16	20.62	22.20	20.70	1.50	1.553		2.658	1.883	11.50	0.95	0.0013
B 33	23.49	10.14	39.69	50.17	9.4	40.78	19.50	NP	19.50	1.482		2.721	1.683	18.50	0.66	<0.001
B 34	15.19	5.05	56.43	38.52	17.00	21.52	27.15	22.65	4.50	1.322	1.749	2.621	1.890	12.75		
B 35	4.42	4.90	34.30	60.80	23.93	36.87	19.80	NP	19.80	1.293		2.540	1.860	12.75		
B 36	11.37	25.15	21.02	53.83	11.79	42.04	19.20	16.42	2.78	1.319		2.751	2.180	8.75	1.01	0.0013
B 37	10.47	32.27	55.11	12.620			18.40	NP	18.40	1.561		2.648	1.898	9.80		
B 38	12.58	4.85	13.1	82.05	36.21	45.84	27.6	22.39	5.21	1.336	1.659	2.653	1.890	13.25		
B 39	10.22	0.51	29.94	69.56	22.97	17.41	56.70	21.94	34.76	1.291	1.746	2.678	1.890	11.50		
B 40	16.17	44.4	24.09	31.51	6.40	25.11	27.7	24.24	3.46	1.381	1.793	2.606	1.968	10.60		
B 41	12.63	13.65	50.32	36.03	8.46	27.56	23.20	NP	23.20	1.268	1.798	2.645	1.975	11.00		
B 42	10.62	23.19	31.82	44.99	14.14	30.85	30.50	25.40	5.10	1.621	1.786	2.633	1.955	11.25	1.05	0.0016
B 43	13.89	42.99	21.08	35.93	11.29	24.64	26.50	23.47	3.03	1.631	1.865	2.605	2.080	8.00	0.35	0.0013
B 44	6.62	-	16.17	83.83	11.71	14.33	62.18	18.70	43.48	1.302	1.714	2.672	1.912	11.50		
B 45	10.45	3.69	76.62	19.69			18.00	NP	18.00	1.599	1.810	2.634	1.927	10.50	0.73	0.002
B 46	12.39	43.07	53.14	3.79			21.75	NP	21.75	1.372	1.750	2.622	1.963	11.50	0.78	0.0019
B 47	12.90	23.15	34.63	42.22	13.94	28.28	33.3	28.85	4.45	1.275	1.636	2.604	1.795	16.00	0.58	0.0015
B 48	10.86	10.04	83.97	5.99			27.5	NP	27.50	1.234	1.641	2.634	1.770	16.00	0.77	0.0021
B 49	17.12	0.47	69.27	30.26	13.83	16.43	33.40	29.04	4.36	1.223	1.594	2.643	1.845	15.00		
B 50	19.69	0.45	40.37	59.17	16.72	42.45	34.40	28.96	5.44	1.231	1.618	2.666	1.755	15.00	0.68	0.0024
B 51	8.62	31.22	23.79	44.99	7.00	37.99	22.10	NP	22.10	1.629	1.867	2.645	1.987	7.75	1.45	0.0018
B 52	7.56	56.8	25.20	18.00			17.00	NP	17.00	1.685	1.760	2.658	1.960	11.50		
B 53	24.54	20.85	16.27	62.88	13.77	49.11	27.20	24.32	2.88	1.284	1.724	2.675	1.800	12.00	0.59	0.0013
B 54	17.54	10.36	18.73	70.90	35.41	35.49	29.60	24.41	5.19	1.308	1.734	2.671	1.900	14.75	0.66	
B 55	16.21	60.57	10.16	29.27	6.41	22.86	31.50	26.41	5.10	1.378	1.723	2.632	1.917	13.00		

Borehole No.	NMC %	Sieve Analysis			Hydrometer Test		Atterberg Limits			Loose Bulk Density gm/cc	Unit Weight g/cc	Specific Gravity	Compaction Test		Organic Content, %	Water Soluble Sulphate, %
		Gravel %	Sand %	Silty/Clay %	Clay %	Silt %	LL %	PL%	PI%				DD gm/cc	OMC %		
B 56	15.39	23.69	42.81	33.51	5.74	27.76	27.80	24.58	3.22	1.296	1.655	2.659	1.870	13.00		
B 57	9.92	17.75	52.84	29.41	5.98	23.44	14.50	NP	14.50	1.495	1.860	2.634	2.060	8.50		
B 58	13.52	24.4	12.54	63.06	16.82	46.25	17.00	NP	17.00	1.422	1.752	2.654	1.990	8.75		
B 59	11.20	29.88	37.04	33.08	6.72	26.36	22.50	NP	22.50	1.357	1.772	2.665	2.015	9.50	1.45	0.001
B 60	9.90	28.95	43.47	27.58	3.85	23.73	25.8	21.95	3.85	1.585	1.881	2.634	2.140	7.00	1.32	0.001

Table 6a. Summary of pH of soil taken from Pit/Bulk sample.

Borehole No.	pH value	Borehole No.	pH value	Borehole No.	pH value	Borehole No.	pH value
B1	6.58	B16	6.21	B33	5.92	B48	7.28
B2	6.947	B17	6.13	B34	6.01	B49	7.36
B3	6.42	B18	6.03	B35	6.67	B50	7.06
B4	7.52	B19	6.17	B36	5.59	B51	7.04
B5	7.85	B20	6.21	B37	6.23	B52	7.54
B6	7.28	B21	5.78	B38	6.33	B53	7.21
B7	7.32	B22	5.25	B39	6.87	B54	6.85
B8	7.52	B25	5.57	B40	6.21	B55	6.67
B9	7.15	B26	5.33	B41	6.45	B56	5.51
B10	6.83	B27	5.52	B42	6.28	B57	5.57
B11	6.87	B28	5.53	B43	7.68	B58	6.09
B12	6.81	B29	5.31	B44	7.35	B59	5.28
B13	7.02	B30	5.37	B45	7.63	B60	5.87
B14	7.01	B31	5.41	B46	7.33		
B15	7.52	B32	5.82	B47	7.25		

6.0 RESULTS OF BEARING CAPACITY EVALUATIONS

Following subsections deals the determination of soil bearing capacity of boreholes B1 to B60 at the depths of SPT tests carried out up to the depth of 7.0 m. The SPT N values have been used to determine angle of internal friction using Mayne (2001) and the ultimate and allowable bearing capacities have been evaluated using Meyerhof (1956) at the allowable settlement of 25.4 mm respectively. In this computation, the safety factor has been incorporated to be at 3 for each bearing capacity determinations. Besides, B/D ratio has been incorporated at 0.5 for the analysis.

6.1 Bearing Capacity Results of B 1

Borehole : **B 1**
Location/Feature : **Ram Puruwa**
Coordinate : **N: 27° 25.706', E: 83° 42.274'**
Total Drill Depth : **7 m**
Water Table : **2.55 m**
Elevation : **85 m**

Table 7 reveals the ultimate and allowable bearing capacity evaluations using Meyerhof (1956). In this reference, the SPT N value at 3.0 m reveals very low value which would be susceptible for the generation of liquefaction at this depth. Therefore, it is advised to avoid the foundation at this depth and move for greater depths in order to eliminate possibilities of liquefaction at the time of detailed foundation design to raise the structure for transmission tower.

Table 7. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 1 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30 cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level, m	Meyerhof, 1956	
		15 cm	15 cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B 1	1.5	5	5	10	7	13.17	34.2	1.92	>10	258.4	86.1
	3	2	2	4	2.8	3.73	27.6			206.7	68.9
	4.5	5	7	12	10.2	11.08	33.1			1129.5	376.5
	6	3	5	8	7.6	7.15	30.5			1122.1	374.0
	7	4	9	13	12.35	10.76	30.2			2127.3	709.1

6.2 Bearing Capacity Results of B 2

Borehole : **B 2**
Location/ Feature : **Harpur**
Coordinate : **N: 27° 27.170', E: 83° 42.162'**
Total Drill Depth : **7 m**
Water Table : **4.00 m**
Elevation : **84 m**

Table 8 reveals the ultimate and allowable bearing capacity evaluations using Meyerhof (1956). In this reference, the SPT N values at 1.5 m, 2.0 m and 3.0 m reveal very low values which would be susceptible for the generation of liquefaction at this depth. Therefore, it is advised to avoid the foundation at this depth and move for greater depths in order to eliminate possibilities of liquefaction at the time of detailed foundation design to raise the structure for transmission tower.

Table 8. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 2 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30 cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B 2	1.5	2	2	4	2.8	5.6	29.3	1.54	>10	103.4	34.5
	2	2	2	4	2.8	5.1	28.9			137.8	45.9
	3	2	3	5	3.5	5.2	28.9			258.4	86.1
	4.5	3	4	7	5.95	7.22	30.5			658.9	219.6

Borehole No.	Depth m	No. of blow at last 30 cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
	6	6	7	15	14.26	14.97	35.2			2103.9	701.3
	7	6	7	13	12.35	12.01	33.6			2127.3	709.1

6.3 Bearing Capacity Results of B 3

Borehole : **B 3**
Location/Feature : **Kusma**
Coordinate : **N: 27° 28.491', E: 83° 41.528'**
Total Drill Depth : **7 m**
Water Table : **6.00 m**
Elevation : **87 m**

From the **Table 9**, SPT field value at depths 1.5 m and 3.0 m have very low and the corresponding ultimate bearing capacity and allowable bearing capacity are also low which would be susceptible for the liquefaction at these depths. Therefore, it is advised to avoid the foundation at this depth and move for greater depths in order to eliminate possibilities of liquefaction at the time of detailed foundation design to raise the structure for transmission tower. The computation of settlement has been made for the depth equal to twice the size of foundation. For this purpose, the soil parameters obtained up to drilling depth of 7.0 m have been extrapolated, which may not correctly represent the accurate site conditions and thus may lead to the variation of bearing capacity. From the analysis table shows that there is no potential for liquefaction below the depth of 3.0 m.

Table 9. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 3 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof ,1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B 3	1.5	3	3	6	4.2	8.21	31.2	1.78	>10	155	51.7
	3	3	4	7	4.9	6.77	30.2			361.7	120.6
	4.5	6	7	13	1.01	12.47	33.9			1223.6	407.9
	6	5	6	11	10.45	10.21	32.5			1542.9	514.3
	7	7	8	15	14.25	12.03	34.1			2454.6	818.2

6.4 Bearing Capacity Results of B 4

Borehole : **B 4**
Location/ Feature : **Ghanashyam Pur**
Coordinate : **N: 27° 31.234', E: 83° 41.565'**
Total Drill Depth : **7 m**
Water Table : **None**
Elevation : **88 m**

From the **Table 10**, SPT N value at depths 1.5m and 4.5.0 m have very low and the corresponding ultimate bearing capacity and allowable bearing capacity are also low which would be susceptible for the liquefaction at these depths. Therefore, it is advised to avoid the foundation at this depth and move for greater depths in order to eliminate possibilities of liquefaction at the time of detailed foundation design for transmission tower.

Table 10. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B4 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-4	1.5	3	4	7	4.9	9.27	32.2	1.72	>10	180.9	60.3
	3	6	7	13	9.1	12.8	34			671.8	223.9
	4.5	3	3	6	5.1	5.86	29.5			564.7	188.2
	6	8	11	19	18.01	17.95	36.6			2665	888.3
	7	13	16	29	27.55	25.36	39.8			4745.6	1581.9

6.5 Bearing Capacity Results of B 5

Borehole : **B 5**
Location/ Feature : **Sanda**
Coordinate : **N: 27° 33.321', E: 83° 40.353'**
Total Drill Depth : **7 m**
Water Table : **None**
Elevation : **98 m**

From the **Table 11**, SPT N value at depths 1.5 m to 7.00 m have very low and the corresponding ultimate bearing capacity and allowable bearing capacity are also low which would be susceptible for the liquefaction at these depths. Therefore, it is advised to avoid the foundation at this depth and move for greater depths in order to eliminate possibilities of liquefaction at the time of detailed foundation design for transmission tower.

Table 11. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B5 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-5	1.5	3	4	6	4.2	8.4	31.4	1.57	>10	q_{ult}, kPa	q_a, kPa
	3	3	2	7	4.9	7.21	30.4			361.7	120.6
	4.5	1	1	7	5.95	7.15	30.5			658.9	219.6
	6	4	5	9	8.55	8.9	31.7			1262.4	420.8
	7	5	5	7	6.65	6.41	29.9			1145.5	381.8

6.6 Bearing Capacity Results of B 6

Borehole : **B 6**
Location/ Feature : **Bichaiya Pur**
Coordinate : **N: 27° 34.437', E: 83° 41.181'**
Total Drill Depth : **7 m**
Water Table : **None**
Elevation :

From the **Table 12**, SPT N value at depths 1.5 m to 7.00 m have very low and the corresponding ultimate bearing capacity and allowable bearing capacity are also low which would be susceptible for the liquefaction at this depth. Hence it is advised to go for a foundation both having depth greater than 3.0 m or removal of the soil and apply the ground improvement techniques.

Table 12. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B6 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-6	1.5	3	3	6	4.2	8.4	31.4	1.57	>5.0	155	51.7
	3	3	4	7	4.9	7.21	30.4			361.7	120.6
	4.5	4	3	7	5.95	7.15	30.5			658.9	219.6
	6	4	5	9	8.55	8.9	31.7			1262.4	420.8
	7	3	4	7	6.65	6.41	29.9			1145.5	381.8

A small pocket of water was observed at the depth of 5.00 m but disappeared at the depth of about 5.30 m.

6.7 Bearing Capacity Results of B 7

Borehole : **B 7**
Location/ Feature : **Substation**
Coordinate : **N: 27° 34.274', E: 83° 41.173'**
Total Drill Depth : **7 m**
Water Table : **2.30 m**
Elevation : **95 m**

From **Table 13**, the SPT N value at 1.5 m, 3.0 m and 6.0 m reveal very low values and the corresponding

ultimate bearing capacity and allowable bearing capacity are also low which would be susceptible for the generation of liquefaction at this depth. Therefore, it is advised to avoid the foundation at this depth and move for greater depths in order to eliminate possibilities of liquefaction at the time of detailed foundation design for the transmission tower. The borehole encountered the water table at the depth of 2.30 m.

Table 13. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B7 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-7	1.5	1	1	2	1.4	2.63	26.4	1.92	2.30	51.7	17.2
	3	4	3	7	4.9	6.52	30			361.7	120.6
	4.5	4	7	11	9.35	10.16	32.5			1035.4	345.1
	6	3	4	7	6.65	6.26	29.8			981.8	327.3
	7	7	7	14	13.3	11.59	33.4			2241	763.7

6.8 Bearing Capacity Results of B 8

Borehole : **B 8**
Location/ Feature : **Jargha, Nawalparasi**
Coordinate : **27°36'31.95"N, 83°42'15.81"E**
Total Drill Depth : **7 m**
Water Table : **None**
Elevation : **146 m**

From the **Table 14**, SPT N value at depths 3.0 m, 4.5 m and 6.0 m have very low and the corresponding ultimate bearing capacity and allowable bearing capacity are also low which would be susceptible for the liquefaction at this depth. Hence it is advised to go for a foundation both having depth greater than 3.0 m or removal of the soil and compacting it.

Table 14. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B8 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-8	1.5	5	5	10	7	14	26.4	1.92	>10	258.4	86.1
	3	3	5	8	5.6	8.14	32.4			413.4	137.8
	4.5	2	4	6	5.1	6.05	29.3			564.7	188.2
	6	3	6	9	8.55	8.79	31.2			1262.4	420.8
	7	5	8	13	12.35	10.93	33.0			2127.3	709

6.9 Bearing Capacity Results of B 12

Borehole : **B 12**
Location/ Feature : **on the right bank of the Arun Khola**
Coordinate : **27°43'57.89"N, 83°49'17.01"E**
Total Drill Depth : **7 m**
Water Table : **None**
Elevation : **516 m**

From the **Table 15**, the soil in B12 at the depths of 1.0 m, 4.0 m and 6.0 m, the ultimate and allowable bearing capacities are found to be quite high except at 1.0 m depth. In the case of q_a at 1.0 m, it is advised to go for a foundation either having depth greater than 1.0 m or removal of the soil and fill it with good compaction.

Table 15. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B12 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-12	1	50	0	50	42.5	85	56.6	1.74	>15	9129.3	60.3
	4	18	38	38	26.6	19	41.3			861.3	287.1
	6	47	92	92	87.4	86.36	56.5			12904.2	4301.9

6.10 Bearing Capacity Results of B 15

Borehole : B 15
Location/ Feature : Panthe, Palpa
Coordinate : 27°50'11.01"N, 27°50'11.01"N
Total Drill Depth : 7 m
Water Table : None
Elevation : 420 m

The soil in B15 at the depth of 2.0 m shows quite high ultimate and allowable bearing capacities as shown in **Table 16** and is free to select any other foundation depth depending upon the load of the structure.

Table 16. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 15 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-15	2	15	16	31	21.75	36.13	43.6	1.84	>10	1068.0	256.0

6.11 Bearing Capacity Results of B 16

Borehole : B 16
Location/ Feature : Bhantar, Tanahu
Coordinate : N: 27° 52' 23", E: 83°58'3.85"
Total Drill Depth : 7 m
Water Table : None
Elevation : 309 m

From the **Table 17**, SPT N value at depths 1.0 m, 3.0 m and 5.0 m have medium to low values compared to the value at the depth of 7.0 m. The corresponding ultimate and allowable bearing capacities are also low to medium with compared to the bearing value at the depth of 7.0 m. The overall values resemble that there is no susceptibility of liquefaction potential at the borehole area.

Table 17. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B16 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-16	1	7	8	15	10.5	21	38	1.994	>10	310.1	103.4
	3	8	10	18	12.6	17.3	36.2			620.1	206.7
	5	6	8	14	11.9	12.04	33.6			1464.1	488
	7	12	18	30	28.5	26.31	40.1			4207.9	1402.6

6.12 Bearing Capacity Results of B 20

Borehole : B 20
Location/ Feature : Rising, Tanahu
Coordinate : 27°55'40.70"N, 84°10'6.56"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1016 m

From the **Table 18**, the soil in B20 at the depth of 1.0 m, 2.0m,and 3.0m, the allowable bearing capacity is found to be quite high except at 1.0 m, so that the foundation engineer does not need to strictly follow the depth just in case of greater than 1.0 m and dimension of foundation selected in the bearing capacity analysis during design and is free to select any other foundation depth except at 1.0 m depending upon the load of the structure, in the case of q_a at 1.0 m, it is advised to go for a foundation either having depth greater than 1.0 m or removal of the soil and improve the ground with well compaction.

Table 18. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B20 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-20	1	12	16	28	19.6	29.2	44.6	1.689	>10	482.3	160.8
	3	50		50	42.5	60.3	50.5			3137.5	1045.8
	5	19	39	58	49.3	54.18	48.5			6065.7	2021.9

6.13 Bearing Capacity Results of B 21

Borehole : B 21
Location/ Feature : Chaswar, Tanahu
Coordinate : N: 27° 55' 29.98", E: 84° 14' 48.89"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1055 m

From the **Table 19**, SPT N value at depths 3 m and 5 m have medium values and the corresponding ultimate bearing capacity and allowable bearing capacity are also medium. There is no susceptibility for liquefaction potential at theses depths.

Table 19. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B21 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-21	3	6	10	16	11.2	15.48	35.4	1.78	>10	826.8	275.6
	5	15	15	30	25.5	27.3	40.5			1337.5	1045.8

6.14 Bearing Capacity Results of B 22

Borehole : B 22
Location/ Feature : Belbas, Tanahu
Coordinate : N: 27° 50' 5.17", E: 84° 33' 20.8"
Total Drill Depth : 7 m
Water Table : None
Elevation : 278 m

From the **Table 20**, SPT N value at depths 2.0 m and 4.0 m have higher value and the corresponding ultimate bearing capacity and allowable bearing capacity are also higher. There is no susceptible potential for the liquefaction at this depth.

Table 20. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B22 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER	Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerh of, 1956	Borehole No.	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-22	2	19	20	39	27.3	43.64	45.9	1.996	>10	1343.6	447.9
	4	50	0	50	42.5	48.04	47.2			4183.3	1934.4

6.15 Bearing Capacity Results of B 25

Borehole : B 25
Location/ Feature : Thokkhola, Byas
Coordinate : N: 27° 56' 50.50", E: 84° 18' 46.64"
Total Drill Depth : 7 m
Water Table : None
Elevation : 793 m

From the **Table 21**, the soil in B 25 up to the depth of 1.0 m, 3.0 m and 6.0 m the allowable bearing capacity is found to be quite high to select any other foundation depth depending upon the load of the structure.

Table 21. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B25 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30 cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15 cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-25	1	19	33	52	36.4	72.8	53.5	1.73	>10	8985.7	298.6
	3	15	14	29	20.3	34.86	43.2			999.1	333.0
	4	15	15	30	21	29.44	41.3			1550.3	516.8

6.16 Bearing Capacity Results of B 26

Borehole : B 26
Location/ Feature : Kesartar, Tanahu
Coordinate : N: 27° 55' 48.42", E: 84° 20' 34.05"
Total Drill Depth : 7 m
Water Table : None
Elevation : 774 m

From the **Table 22**, SPT N value at depth 2 m, 3 m and 4 m have medium value and the corresponding ultimate bearing capacity and allowable bearing capacity are also relatively low in comparison to other depths, although there is no susceptible potential for the liquefaction at this depth.

Table 22. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B26 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30 cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15 cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-26	1	12	15	27	18.9	37.8	44.1	1.51	>10	465.1	155
	2	8	10	18	12.6	23.16	38.9			620.1	206.7
	3	9	10	19	13.3	19.6	37.5			981.8	327.3
	4	8	10	18	15.3	19.89	37.5			1506	502
	5	25	30	55	46.75	54.39	48.9			5752	1917.3
	6	26	33	59	56.05	59.48	50.3			8275.5	2758.3

6.17 Bearing Capacity Results of B 27

Borehole : B 27
Location/ Feature : Sukura, Tanahu
Coordinate : N: 27° 55' 05", E: 84° 21' 33"
Total Drill Depth : 7 m
Water Table : None
Elevation : 532 m

From the **Table 23**, the soil in B27 at the depths of 1.0 m and 6.0 m the allowable bearing capacity is found to be quite high except at 1.0 m. In the case of q_a at 1.0 m, it is advised to go for a foundation either having depth greater than 1.0 m or removal of the soil and improve the ground with well compaction.

Table 23. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B27 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15 cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-27	1	10	11	21	14.7	29.4	41.3	1.778	>10	361.7	120.6
	6	6	20	26	24.7	24.15	39.3			3646.8	1215.6

6.18 Bearing Capacity Results of B 28

Borehole : B 28
Location/ Feature : Tanahu
Coordinate : N: 27° 55' 05", E: 84° 21' 33"
Total Drill Depth : 7 m
Water Table : None
Elevation : 532 m

From the **Table 24**, the soil in B28 at the depth of 3.0 m shows the higher allowable bearing capacity in

comparison to depths at 4.0 m and 5.0 m. Therefore, foundation design can be considered at the shallow depth at this location.

Table 24. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B28 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15 cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-28	2	16	25	41	28.7	42.24	45.5	1.57	>50	2118.7	709.2
	4	7	9	16	13.6	17.33	36.3			1338.6	446.2
	5	7	9	16	13.6	15.5	35.5			1673.3	557.8

6.19 Bearing Capacity Results of B 29

Borehole : B 29
Location/ Feature : Labdhi, Tanahu
Coordinate : N: 27° 51' 54.86", E: 84° 30' 23.53"
Total Drill Depth : 7 m
Water Table : None
Elevation : 1520 m

The soil in B29 at the depths of 1.0 m and 3.0 m the allowable bearing capacity is found to be quite high as shown in **Table 25** so that the foundation engineer does not need to strictly follow the depth and dimension of foundation selected in the bearing capacity analysis during design and is free to select any other foundation depth depending upon the load of the structure.

Table 25. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B29 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15 cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-29	1	50		50	35	70	52.8	1.96	>30	861.3	287.1
	3	50		50	35	46.8	46.8			2583.8	861.3

6.20 Bearing Capacity Results of B 31

Borehole : B31
Location/ Feature : Chilaune pani, Dhading
Coordinate : N: 27° 48' 1.91", E: 84° 38' 52.84"
Total Drill Depth : 7 m
Water Table : None
Elevation : 79 m

The soil in B 31 shows the higher allowable bearing capacities at the depths of 1.0 m and 3.0 m as shown by **Table 26** although the SPT shows the lower N-values at the depth of 3.0 m with compared to the value at the depth of 1.0 m.

Table 26. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B31 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15 cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-31	1	28	28	56	39.2	78.4	54.7	1.836	>10	964.6	321.4
	3	10	13	23	16.1	21.91	38.4			1188.5	396.2

6.21 Bearing Capacity Results of B 33

Borehole : B 33
Location : Mohoriya, Dhading
Coordinate : N: 27° 46' 56.72", E: 84° 47' 29.02"
Total Drill Depth : 7 m
Water Table : None
Elevation : 915 m

From the **Table 27**, the field SPT N-values shows at depth 3.0 m have low value and the corresponding ultimate bearing capacity and allowable bearing capacity are relatively low compared to other depth, although there is no potential for the liquefaction at this depth.

Table 27. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B33 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15 cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-33	3	8	10	18	12.6	18.27	36.8	1.76	>30	930.2	310.1

6.22 Bearing Capacity Results of B 34

From the **Table 28**, the field SPT N-values at depths 1.0 m, 2.0 m and 3.0 m have low values in comparison to the value at the depth of 4.0 m. The corresponding ultimate bearing capacity and allowable bearing capacity are relatively low compared to other depth, although there is no potential for the liquefaction at this depth.

Table 28. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 34 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15 cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-34	1	8	10	18	12.6	23.2	39.7	1.749	>10	310.1	103.4
	2	8	13	21	14.7	25.1	39.7			723.5	241.2
	3	12	15	27	19.9	26.35	40.1			1395.2	465.1
	4	50		50	42.5	51.31	18.1			4183.3	1394.4

6.23 Bearing Capacity Results of B 35

Borehole : **B 35**
Location/ Feature : **Gajuri, Dhading**
Coordinate : **N: 27° 48' 26.1", E: 84° 41' 31.9"**
Total Drill Depth : **7 m**
Water Table : **None**
Elevation : **358 m**

The soil in B 35 up to the depth of 7.0 m, the allowable bearing capacity is found to be quite high as shown by **Table 29** so that the foundation engineer does not need to strictly follow the depth and dimension of foundation selected in the bearing capacity analysis during design and is free to select any other foundation depth depending upon the load of the structure.

Table 29. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 35 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15 cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-35	1	25	29	54	37.8	75.6	54.1	1.84	>10	930.2	310.1
	3	18	15	33	23.1	39.18	44.6			1136.9	379
	4	15	20	35	24.5	33.93	42.9			1808.7	602.9
	5	14	20	34	28.9	34.38	43			2844.6	948.2
	6	16	23	39	33.15	35.27	43.3			4078.7	1359.6
	7	20	25	45	42.75	41.52	45.3			6311.8	213.9

6.24 Bearing Capacity Results of B 37

Borehole : **B 37**
Location/ Feature : **Nuwakot**
Coordinate : **N: 27° 51' 04.1", E: 85°02'26.2"**
Total Drill Depth : **7 m**
Water Table : **None**
Elevation : **472 m**

The allowable bearing capacity of the foundation soil in the B 37 is determined at 3.0 m depth is 51.7 kPa which is relatively low as shown by **Table 30**. Further, the SPT N-value is very low at this depth which would be susceptible for the liquefaction. Hence it is advised to go for a foundation both having depth greater than 3.0 m.

Table 30. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 37 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30 cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15 cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-37	2	9	16	25	17.5	28.52	41	1.71	>10	861.3	287.31
	3	2	1	3	2.1	2.79	26.6			155	51.7
	4	2	3	5	4.25	4.9	28.7			418.3	139.4
	5	17	22	39	33.15	34.17	42.9			4078.7	1359.6

The maximum field SPT N value is 39 at the depth of 6.00 to 6.45m and minimum is 3 at 3.00 to 3.45 m which signifies the soil is very loose to dense in nature.

6.25 Bearing Capacity Results of B 38

Borehole : B 38
Location : Ratmate, Nuwakot/ Substation
Coordinate : 27° 51' 54", E: 84°30'23"
Total Drill Depth : 7 m
Elevation : 487 m

From the **Table 31**, it shows that the allowable bearing capacity of the foundation of the soil in B-38 is determined at 1.0 m to be 206.7 kPa which is relatively low. Although, there is no potential for liquefaction. Hence it is advised to go for a foundation having depth greater than 1.0 m.

Table 31. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B38 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30 cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-38	1	17	19	25.2	25.2	50.4	47.9	1.659	>10	620.1	206.7
	2	50		35	35	62.16	50.9			1722.5	574.2
	3	50		35	35	50.76	48			2583.8	861.3
	4	50		42.5	42.5	53.38	48.7			4183.3	1394.4

6.26 Bearing Capacity Results of B 39

Borehole : B 39
Location/ Feature : Ratmate, Nuwakot/ Substation
Coordinate : N: 27° 36' 42.09", E: 83°42'28.10"
Total Drill Depth : 7 m
Elevation : 479 m

From the **Table 32**, it shows that the allowable bearing capacity (q_a) of the foundation of the soil in B 39 was determined at depth 1.0m & 2.0 m are 68.9 kPa and 149.3 kPa respectively which are relatively low. Although, there is no potentiality for liquefaction. Hence it is advised to go for a foundation having depth greater than 2.0 m or apply the ground improvement techniques in the case shallow foundation requires at this depth.

Table 32. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 39 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-39	1	7	5	12	8.4	16.8	36.1	1.746	>10	206.7	68.9
	2	6	7	13	9.1	15.74	35			447.9	149.3
	3	9	43	52	36.4	51.41	48.1			2687.1	895.7
	4	19	25	44	37.4	45.75	16.5			3681.3	1227.1
	5	23	23	46	39.1	42.78	45.7			6732.6	2244.2
	6	22	26	48	45.6	45.54	45.54			6732.6	2244.2
	7	25	30	55	52.25	48.31	47.3			9000.2	3000.1

6.27 Bearing Capacity Results of B 40

Borehole : B 40
Location/ Feature : Nandutar, Nuwakot
Coordinate : N: 27° 50' 46.2", E: 85°03'25.3"

Total Drill Depth : 7 m
Elevation : 577 m

From the **Table 33**, the soil in B 40 the allowable bearing capacity is found to be quite high at the depths of 1.0 m, 2.0 m and 3.0 m respectively so that the foundation engineer does not need to strictly follow the depth and dimension of foundation selected in the bearing capacity analysis during design and is free to select any other foundation depth depending upon the load of the structure.

Table 33. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 40 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q ult ,Kpa	q a, Kpa
B-40	1	27	33	60	42	84	56	1.79	>10	1033.5	344.5
	2	22	29	51	35.7	61.75	50.8			1757	585.7
	3	28	34	62	43.4	60.44	50.5			3203.9	1068

6.28 Bearing Capacity Results of B 41

Borehole : B 41
Location/ Feature : Nuwakot
Coordinate : N: 27° 51' 02", E: 84° 06' 24"
Total Drill Depth : 7 m
Elevation : 830 m

From the **Table 34**, it shows that the allowable bearing capacity of the foundation of the soil in B-38 is determined at 1.0m depth to be 45.9 kPa which is relatively low. However, there is no potential for liquefaction. Hence, it is advised to go for a foundation having depth greater than 1.0 m or apply ground improvement techniques for the foundation to be adopted at this depth.

Table 34. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 41 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-41	2	4	4	8	5.6	11.2	33.1	1.798	>10	137.8	45.9
	3	9	12	21	14.7	25.01	39.6			723.5	241.2
	4	9	12	21	17.25	20.42	37.7			1085.2	361.2
	5	7	9	16	13.6	16.3	35.9			1338.6	446.2

6.29 Bearing Capacity Results of B 43

Borehole : B 43
Location/ Feature : Chiuribote Thali, Nuwakot
Coordinate : N: 27° 51' 54", E: 84°30'23"
Total Drill Depth : 7 m
Elevation :

From the **Table 35**, it shows that the allowable bearing capacity (q_a) of the foundation of the soil in B 43 is determined at the depth 5.0 m to be 2196.2 kPa which is relatively high and there is no potential for liquefaction.

Table 35: Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 43 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-43	5	27	36	63	53.55	56.65	49.5	1.86	>10	6588.7	2196.2

6.30 Bearing Capacity Results of B 44

Borehole : B 44
Location/ Feature : Nawalparasi
Coordinate : N: 27° 36' 42.09", E: 83°42'28.10"
Total Drill Depth : 7 m
Elevation : 147 m

From the **Table 36**, It shows that the allowable bearing capacity (q_a) of the foundation of the soil in B 44 is determined at depths 3.0 m, 4.0 m and 5.0 m are 292.8 kPa, 1227.1 kPa and 1743.0 kPa respectively, which are relatively medium to high value. Meanwhile, there is no liquefaction potential at this location.

Table 36. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 44 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-44	3	13	4	17	11.9	16.96	36.2	1.71	>10	878.5	292.8
	4	22	22	0.44	37.4	46.15	46.7			3681.3	1227.1
	5	50		50	42.5	46.9	46.9			5229.1	1743

6.31 Bearing Capacity Results of B 45

Borehole : B 45
Location/ Feature : Sindhupalchowk
Coordinate : N: 27° 51' 39.4", E: 84°18'40.8"
Total Drill Depth : 7 m
Elevation : 725 m

From the **Table 37**, it shows that the allowable bearing capacity (q_a) of the foundation of the soil in B 44 was determined at depth 1.0 m and 3.0 m are 287.1 kPa, and 861.3 kPa respectively, which are relatively medium to high. In the meantime, there is no for liquefaction potential at this location.

Table 37. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 45 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-45	1	50		50	35	70	52.8	1.96	>10	861.3	287.1
	3	50		50	35	46.8	46.8			2583.8	861.3

6.32 Bearing Capacity Results of B 46

Borehole : B 46
Location/ Feature : Jyamire, Sindhupalchowk
Coordinate : N: 27° 51' 07.9", E: 85° 25' 25.6"
Total Drill Depth : 7 m
Elevation : 1252 m

The soil in B 46 at the depths of 2.0 m, 3.0 m and 4.5 m, the allowable bearing capacities are found to be quite high as shown by **Table 38** so that the foundation engineer does not need to strictly follow the depth and dimension of foundation selected in the bearing capacity analysis during design. Designer is free to select any other foundation dimension and depth depending upon the load of the structure.

Table 38. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 46 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-46	2	50		50	35	70	52.8	1.75	>10	861.3	287.4
	3	20	23	43	30.1	51.41	48.3			1481.4	493.8
	4.5	10	29	39	27.3	38.44	44.3			2015.4	671.8

6.33 Bearing Capacity Results of B 47

Borehole : B 47
Location/ Feature : Kaule, Sindhupalchowk
Coordinate : N: 27° 49' 20.67", E: 85° 30' 39.40"
Total Drill Depth : 7 m
Elevation : 1323 m

The soil in B 47 at the testing depths of 1.0 m, 2.0 m, 3.0 m, 4.0 m, 5.0 m and 6.0 m, the allowable bearing capacities are found to be quite high except at 1.0 m a shown in **Table 39** so that the foundation engineer does

not need to strictly follow the depth and dimension of foundation selected in the bearing capacity analysis during design and is free to select any other foundation depth except at 1.0 m. In the case of q_a at 1.0 m, it is advised to go for a foundation either having depth greater than 1.0 m or apply the ground improvement technique to place the foundation at this depth.

Table 39. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 47 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-47	1	5	9	14	9.8	19.6	37.4	1.75	>10	482.3	160
	2	15	20	35	24.5	43.33	45.8			1205.8	401.9
	3	14	16	30	25.5	45.1	46.4			1255	418.3
	4	14	22	26	30.6	44.19	46.1			2259	753
	5	13	23	26	30.6	38.27	44.3			3012	1004
	6	12	25	37	35.15	35.89	43.5			5189	1729

6.34 Bearing Capacity Results of B 48

Borehole : **B 48**
Location/ Feature : **Nangle, Kathmandu**
Coordinate : **N: 27° 49' 20.67", E: 85° 28' 59.82"**
Total Drill Depth : **7 m**
Elevation : **432 m**

The soil in B 48 at the depth of 3.0 m and 4.0 m, the allowable bearing capacity is found to be quite high as shown in **Table 40** so that the foundation Engineer does not need to strictly follow the depth and dimension of foundation selected in the bearing capacity analysis during design.

Table 40. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 48 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q ult ,Kpa	q a, Kpa
B-48	3	14	25	39	27.3	39.72	44.7	1.64	>10	2015.4	671.8
	4	50		50	42.5	53.54	48.7			4183.3	1394.4

6.35 Bearing Capacity Results of B 49

Borehole : **B 49**
Location/ Feature : **Jaharsing Pauwa, Kathmandu/ SuBstation**
Coordinate : **N: 27° 36' 42.09", E: 83°42'28.10"**
Total Drill Depth : **7 m**
Elevation : **1652 m**

The soil in B 49 at the depths of 1.0 m, 2.0 m and 4.0 m, the allowable bearing capacity is found to be quite low as shown by **Table 41**. On the other hand, the allowable bearing capacities at remaining depths are higher for foundation design.

Table 41. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 49 for a Transmission Tower.

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-49	0	6	7	13	9.1	18.2	36.6	1.71	>10	22.4	7.5
	1	9	13	22	15.4	30.8	41.8			37.9	12.6
	2	16	16	32	22.4	40.38	44.9			1102.4	367.5
	3	43	50	93	64.4	94.78	58.2			4754.2	1584.7
	4	12	15	27	22.95	29.25	41.2			2259	753
	5	19	23	42	35.7	40.7	45			4392.4	1464.1
	6	26	31	57	54.15	56.35	49.5			7995	2665

6.36 Bearing Capacity Results of B 50

Borehole : **B 50**
Location/ Feature : **Jaharsing Pauwa, Kathmandu/ SuBstation**

Coordinate : **N: 27° 36' 42.09", E: 83°42'28.10"**
Total Drill Depth : **7 m**
Elevation : **1659 m**

The soil in B 50 except at the depth of 1.0 m, the allowable bearing capacities in the remaining depths are found to be quite high as shown by **Table 42**. On the other hand, the allowable bearing capacities at remaining depths are higher for foundation design.

Table 42. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 50 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30 cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-50	1	6	8	14	9.8	18.2	37.4	1.618	>10	241.2	80.2
	2	12	12	24	16.8	30.8	41.4			826.8	275.8
	3	20	25	45	31.5	40.38	46.5			2325.4	775.1
	4	19	21	40	34	94.78	45.6			3346.6	1115.5
	5	32	19	51	43.35	29.25	47.4			5333.7	1777.9
	6	50		50	47.5	40.7	47.4			7013.1	2337.7
	7	50		50	47.5	56.35	46.3			8183	2727.3

6.37 Bearing Capacity Results of B 52

Borehole : **B 52**
Location/ Feature : **Dhading**
Coordinate : **N: 27° 46' 25.74", E: 85° 1' 56.43"**
Total Drill Depth : **7 m**
Elevation : **525 m**

The soil in B 52 up to the depth of 2.0 m, the allowable bearing capacity is found to be quite high as shown by **Table 43** so that the foundation engineer does not need to strictly follow the depth and dimension of foundation selected in the bearing capacity analysis during design and is free to select any other foundation depth depending upon the load of the structure.

Table 43. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B52 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-52	2	10	18	28	19.6	33.6	42.7	1.76	>30	964.6	321.5

6.38 Bearing Capacity Results of B 53

Borehole : **B 53**
Location/ Feature : **Dhading**
Coordinate : **N: 27° 44' 3.68", E: 85° 1' 8.47"**
Total Drill Depth : **7 m**
Elevation : **1113 m**

The soil in B 53 at the depth of 3.0 m and 4.0 m, the allowable bearing capacity is found to be quite high depending upon the load of the structure as shown by **Table 44**.

Table 44. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 53 for a Transmission Tower.

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q ult ,Kpa	q a, Kpa
B-53	3	9	11	20	14	20.37	37.7	1.606	>10	1033.5	344.5
	4	11	13	24	20.4	25.71	39.9			1188.5	396.2

6.39 Bearing Capacity Results of B 54

Borehole : **B 54**
Location/ Feature : **Galchhi, Makwanpur**
Coordinate : **N: 27° 40' 25.41", E: 84° 58' 36.70"**

Total Drill Depth : 7 m
Elevation : 1826 m

The soil in B 54 at the depth of 1.0 m, 2.0 m, 3.0 m, 4.0 m, 5.0 m, and 6.0 m, the allowable bearing capacities are found to be quite high except at 1.0 m, and 2.0 m as shown by **Table 45** so that the foundation engineer does not need to strictly follow the depth in case of greater than 2.0 m and dimension of foundation selected in the bearing capacity analysis during design and is free to select any other foundation depth. In the case of q_a at 0.0 m, 1.0 m and 2.0 m, it is advised to go for a foundation either having depth greater than 2.0 m or apply the ground improvement technique to achieve the foundation design at this depth.

Table 45. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 54 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q ult ,Kpa	q a, Kpa
B-54	0	6	8	14	9.8	19.6	37.4	1.901	>50	24.1	8.4
	1	8	11	19	13.3	26.6	40.2			327.3	109.1
	2	9	13	22	15.4	25.25	39.8			757.9	252.6
	3	10	15	25	17.5	23.66	39.1			1291.9	430.6
	4	19	25	44	37.5	43.79	46			3681.3	1227.1
	5	17	25	42	35.7	37.38	44			4392.4	1464.1
	6	21	28	49	26.6	25.48	39.8			3927.4	1309.1

6.40 Bearing Capacity Results of B 55

Borehole : B 55
Location/ Feature : Gogane, Makwanpur
Coordinate : N: 27° 38' 21.32", E: 84° 57' 36.70"
Total Drill Depth : 7 m
Elevation : 1826 m

From the table below, the soil in B 54 up to the depth of 1.0 m, 2.0 m, 3.0 m, 4.0 m, 5.0 m, and 6.0 m, the allowable bearing capacities are found to be quite high except at 1.0 m and 2.0 m. In the case of q_a at 1.0 m, it is advised to go for a foundation either having depth greater than 1.0 m or remove the soil and compact it.

Table 45. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 55 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-55	1	6	8	14	9.8	19.6	37.4	1.723	>10	241.2	80.2
	2	8	11	19	13.3	22.88	38.8			981.8	327.3
	3	9	13	22	15.4	21.63	38.3			1136.9	379
	4	19	23	42	35.7	43.43	45.9			3514	1172.3
	5	17	25	42	35.7	38.85	44.5			4392.4	1464.1
	6	21	18	49	46.55	46.24	46.7			6872.9	2291

6.41 Bearing Capacity Results of B 56

Borehole : B 56
Location/ Feature : Kherki, Makwanpur
Coordinate : N: 27° 35' 14.97", E: 84° 55' 53.93"
Total Drill Depth : 7 m
Elevation : 384 m

From the **Table 46**, the soil in B56, except for the depth of 3.0 m, the allowable bearing capacities are found to be quite low. Therefore, it is advised to select the foundation design at the depth of 3.0 m.

Table 46. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 56 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-56	1	8	6	14	9.8	19.6	37.4	1.655	>10	241.2	80.2
	2	8	11	19	13.3	23.35	39			654.6	218.2
	3	9	13	22	15.4	22.08	38.4			1136.9	379

6.42 Bearing Capacity Results of B 57

Borehole : B 57
Location/ Feature : Kuwapani, Makwanpur
Coordinate : N: 27° 36' 42.09", E: 83°42'28.10"
Total Drill Depth : 7 m
Elevation : 1012 m

In B 57, the SPT N-values at the depths of 5.0 m and 6.0 m are medium to higher as shown in **Table 47**. The allowable bearing capacities at these depths show quite higher values for the foundation design.

Table 47. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 57 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30 cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-57	5	11	11	25	21.25	22.25	38.5	1.86	>50	2614.5	871.5
	6	20	28	48	40.8	39	44.5			6023.9	2008

6.43 Bearing Capacity Results of B 58

Borehole : B 58
Location/ Feature : Basamadhi, Hetauda
Coordinate : N: 27° 26' 59.48", E: 84° 59' 0.57"
Total Drill Depth : 7 m
Elevation : 405 m

The soil in B 58 up to the depth of 1.0 m, 4.0 m, 5.0 m, 6.0 m and 7.0 m, the allowable bearing capacities are found to be quite high except at 1.0 m depth as shown by **Table 48** so that the foundation engineer does not need to strictly follow the depth and dimension of foundation selected in the bearing capacity analysis during design and is free to select any other foundation depth depending upon the load of the structure.

Table 48. Ultimate Bearing Capacity as a Function of SPT N-value of borehole B 58 for a Transmission Tower

Borehole No.	Depth m	No. of blow at last 30cm		SPT field value	SPT N value at 60% ER		Mayne, 2001	Unit Weight gm/cc	GW Level m	Meyerhof, 1956	
		15 cm	15cm		N 60	N1, 60	ϕ, deg			q_{ult}, kPa	q_a, kPa
B-58	1	11	13	24.32	16.8	33.6	42.7	1.752	>10	413.4	137.8
	3										
	4	14	18	32	27.2	32.81	42.5			2677.3	892.4
	5	15	20	35	29.75	32.1	42.2			3660.4	1220.4
	6	15	22	37	35.15	34.62	43.1			5189.7	1729.9
	7	13	23	36	34.2	31.19	41.9			5891	1963.7

7.0 DISCUSSIONS OF GEOTECHNICAL INVESTIGATIONS

The fieldwork was started with drilling boreholes in the area of the proposed substation Lapsiphedi to Ratmate and the towers location at different geomorphological features like peak, saddle, valley, and slope area at cultivated land as well as barren land to have an idea about the subsoil profile and uniformity or not of the soil. It is noteworthy that however the exploratory drilling is located mostly at rugged terrains, drill rigs and necessary accessories have installed at the plain areas of these hilly regions. Disturbed soil samples were obtained at one meter intervals and were taken up to the end of the borehole. These soil samples were kept in plastic bags, labeled and transported to the soil mechanics laboratory. The descriptions of boreholes from log sheets are grouped into similar types of soil formation as follows:

7.1.1 Boreholes from B1-B9

In the section from Butwal sub-stations to India border, boreholes from B 1 to B 9, two layers can be grouped as per the pebble, gravel content during SPT testing. The whole depth of 7.00 m consists of medium dense to dense alluvium soil with increasing amount of sand, pebbles, gravels with depth. Distinctive silty sand representing alluvial deposit is the prominent soil type of the area. From 0.00 m - 0.25 m consists of top soil followed by clayey silt, sandy cohesive soil with weathered gravels and pebbles.

Laboratory tests for both samples taken from SPT and bulk samplings adjacent to borehole locations revealed higher natural moisture contents indicating water tables at shallow depths. All boreholes except B 4, B 5 and B 6, encountered the water table lower than 7.0 m. The entire area is comprised of fluvial sediments brought by rivers. As a result, the fine-grained sediments pass through Sieve No. 200 are higher in percentage ranged between 56.55% to 98.64% for samples taken from SPT. Among them, more than 50% fines belong to silt in comparison to clay fractions obtained by hydrometer analyses representing mostly non-plastic to very low plastic soils. It is noteworthy to mention that values obtained from bulk densities and specific gravity also support the gradation curve together. Similar findings are observed in samples extracted from the pit adjacent to the borehole locations. Increase in coarser soils especially in sand proportion shows the maximum densification of soil at low moisture content such as in B 1 location where optimum moisture content of 8.7% are quite enough to produce the maximum dry density of 2.05 g/cc.

The organic content and water soluble sulfate tests show minor and traces of organic content and sulfate together with pH values show quite suitable for cultivation.

The soil is medium dense to dense in nature as suggested by SPT N-value for all borehole location. However, shallow depths of 1.5 m and/or 3.0 m reveal very low field N-values together with low ultimate and allowable bearing capacities indicating possibilities of liquefaction at these depths. Therefore, either ground improvement techniques or deeper part would be suitable to adopt for the foundation design.

7.1.2 Boreholes from B 10-B 22

In the section from Butwal to Damauli, boreholes from B 10 to B 22, the investigation on these boreholes were carried out up to the depth of 7.00 m along with SPT tests. The material retrieved during drilling suggests essentially colluvial deposit to residual soil. The soil formation is represented by reddish gray colored cohesive clay and silt with weathered gravel and pebbles with increasing amount of sandy portion along with the depth.

Laboratory tests for both samples taken from SPT and bulk samplings adjacent to borehole locations revealed higher natural moisture contents. All pit sampling adjacent to borehole location except for B 11, B 13 and B 14, encountered considerably high moisture contents tested in the laboratory. Proceeding, the fine-grained soils pass through Sieve No. 200 are higher in percentage ranged between 13.92% to 98.64% for samples taken from SPT. Among them, more than 50% fines belong to silt in comparison to clay fractions obtained by hydrometer analyses representing mostly non-plastic to very low to medium plastic soils. The pit samples adjacent to these boreholes reveal non-plastic to slightly plastic soil except for B 18 which has plasticity index of 7.14 representing low plastic soil. It is noteworthy to mention that values obtained from bulk densities and specific gravity also support the gradation curve together. Similar findings are observed in samples extracted from the pit adjacent to the borehole

locations. Increase in coarser soils especially in sand proportion shows the maximum densification of soil at low moisture content such as in B 22 location where optimum moisture content of 8.0% are quite enough to produce the maximum dry density of 2.178 g/cc.

The organic content and water soluble sulfate tests show minor and traces of organic content and sulfate together with pH values show quite suitable for cultivation.

The SPT N-value suggests the strata are medium dense to dense for all borehole locations representing relatively higher ultimate and allowable bearing capacities at shallow depths of 1.5 m and/or 3.0 m.

7.1.3 Boreholes from B 25-B 38

In the section from Damauli to Ratmate, boreholes from B25 to B38, the investigation in this location is done up to the depth of 7.00 m. The material recovered during investigation suggest similar nature of soil as that of Damauli to Ratmate i.e. reddish gray to gray colored, cohesive clay, silt with occasional occurrence of gravel and pebbles of weathered phyllite, slate, quartzite and limestone with increasing amount of compacted silty clay with regolith portion along with the depth.

Laboratory tests for both samples taken from SPT and bulk samplings adjacent to borehole locations revealed higher natural moisture contents except for SPT samples of B 29 and B 34 as well as pit samples of B 29, B 30 and B 35. The fine-grained sediments pass through Sieve No. 200 are higher in percentage ranged in between 13.30% to 74.61% for samples taken from SPT. Among them, more than 50% fines belong to silt in comparison to clay fractions obtained by hydrometer analyses representing mostly non-plastic to slightly plastic soils for both SPT and pit samples. It is noteworthy to mention that values obtained from bulk densities and specific gravity also support the gradation curve together for both SPT and pit samples. Increase in coarser soils especially in sand proportion shows the maximum densification of soil at low moisture content such as in B 29 location where optimum moisture content of 7.25% are quite enough to produce the maximum dry density of 2.24 g/cc.

The organic content and water soluble sulfate tests show minor and traces of organic content and sulfate together with pH values show quite suitable for cultivation.

The soil is medium dense to dense in nature as suggested by SPT N-value for all borehole location representing relatively higher ultimate and allowable bearing capacities at shallow depths of 1.5 m and/or 3.0 m.

7.1.4 Boreholes from B 39-B 50

In the section from Ratmate to Lapsiphedi, boreholes from B39 to B50, the investigation at these locations were accomplished up to the depth of 7.00 m. The materials encountered during drilling are mostly at the terrains of residual to colluvial soils and alluvial soil at the river terraces. The general soil profile around the area consists of reddish to brown colored, slightly cohesive, slightly moist, fine sand with presence of silt and clay as a top soil followed by reddish brown colored highly cohesive, moist, clay with presence of very small rock fragments of quartzite and phyllite. The boreholes drilling at the terrace of the river consists of light brown colored, slightly cohesive, moist to damp, fine to medium-grained sand with clay and silt (Sand dominant) followed by light grey, moist to damp, boulders of phyllite, quartzite, granite and gneiss.

Laboratory tests for both samples taken from SPT and bulk samplings adjacent to borehole locations revealed higher natural moisture contents except for pit sample of B 44. The fine-grained soils pass through Sieve No. 200 are higher in percentage ranged between 1.72% to 76.51% for samples taken from SPT. Among them, more than 50% fines belong to silt in comparison to clay fractions obtained by hydrometer analyses representing mostly non-plastic to slightly plastic soils for both SPT and pit samples. Pit samples adjacent to B 39 and B 44, the soil is highly plastic and their corresponding values are determined to be 34.76% and 43.48% respectively. It is noteworthy to mention that values obtained from bulk densities and specific gravity also support the gradation curve together for both SPT and pit samples. Increase in coarser soils especially in sand proportion shows the maximum densification of soil at low moisture content such as in B 43 location where optimum moisture content of 8.0% are quite enough to produce the maximum dry density of 2.08 g/cc.

The organic content and water soluble sulfate tests show minor and traces of organic content and sulfate together with pH values show quite suitable for cultivation.

The soil is medium dense to dense in nature as suggested by SPT N-value for all borehole location representing relatively higher ultimate and allowable bearing capacities at shallow depths greater than 1.0 m.

7.1.5. Boreholes from B 51-B 60

In the section between Ratmate to New Hetauda, boreholes from B51 to B60, the investigations were carried out up to the depth of 7.00 m along with necessary SPT tests. The soil formations reveal increasing amount of silt and sand along with weathered gravel and pebble with depth. The nature of the soil deposit is residual soil, cohesive in nature and moist to dry.

Laboratory tests for both samples taken from SPT and bulk samplings adjacent to borehole locations revealed higher natural moisture contents except for B 55 and B 58. Similarly pit sample adjacent to B 51, B 52 and B 57 show lower natural moisture content. The fine-grained soils pass through Sieve No. 200 are higher in percentage ranged between 18.0% to 70.9% for samples taken from pit while SPT samples are ranged between 3.37% to 86.1%. Among them, more than 50% fines belong to silt in comparison to clay fractions obtained by hydrometer analyses representing mostly non-plastic to low plastic soils for both SPT and pit samples. It is noteworthy to mention that values obtained from bulk densities and specific gravity also support the gradation curve together for both SPT and pit samples. Increase in coarser soils especially in sand proportion shows the maximum densification of soil at low moisture content such as in B 60 location where optimum moisture content of 7.0% are quite enough to produce the maximum dry density of 2.14 g/cc.

The organic content and water soluble sulfate tests show minor and traces of organic content and sulfate together with pH values show quite suitable for cultivation.

The soil is medium dense to dense in nature as suggested by SPT N-value for all borehole location representing relatively higher ultimate and allowable bearing capacities at shallow depths greater than 1.0 m.

8.0 GEOPHYSICAL EXPLORATORY INVESTIGATION

8.1 Vertical Electrical Sounding

8.1.1 Introduction

Traditionally, electrical and electromagnetic methods are used for mineral exploration and groundwater investigation. Among several electrical and electromagnetic methods, electrical resistivity method is frequently used in the design of grounding of electric installations and machineries in factories, powerhouses, transmission towers and others. For the design of grounding, electrical resistivity of subsurface soil and rock is important to know. Electrical resistivity if applied for geological study is highly interpretation based and careful interpretation is essential by qualified and experienced geophysicist.

The fieldwork was started on April 15, 2019 and completed on April 29, 2019. During the fieldwork, measurement of electric current and primary voltage was carried out to calculate resistivity. Soil resistivity test was conducted at 52 locations and total numbers of tests were 54. Among these, four tests were conducted at Substation near Butwal. The detail of tests and field data and their modeling results are presented in following tables.

8.1.2 Physical and geological basis of electrical resistivity methods

Different response to the applied voltage between two points in the subsurface is responded by the flow of electric current in variable quantities. This is the main basis for the response of the applied voltage by different layers and bodies in the subsurface. The result to applied voltage mainly depends on the capacity to conduct electric current by different materials in the subsurface. In soil resistivity tests, alternating current (AC) of very low frequency is passed through the geological subsurface. The response of current flow on geological formations, such as clay, silt, sand, gravel, boulders, and bedrock are different. By virtue of the different capacity of different materials to conduct electricity it is possible to separate different materials from each other. Electrical resistivity of a material depends both on the matrix (rock and/or granular) and on the salinity of the water and degree of saturation of the pore space. The influence on the current conduction by pore water salinity and its saturation is high in high porosity formations than in low porosity formations.

Geologically the area under investigation lies in Indo-Gangetic Plain, Siwaliks and Lesser Himalaya. Highly variable sediment type, soil type and rock types are present in the area under investigation. Because of presence of highly variable soil and rock type in the study area, highly variable soil resistivity was determined.

8.1.3. Study objectives

The study objectives of soil resistivity tests are:

a. To estimate soil resistivity of shallow subsurface necessary for grounding.
b. To provide some possible geological interpretation

8.1.4. Methodology

8.1.4.1. Data Acquisition

Vertical Electrical Sounding (VES) of Wenner Configuration was carried out to estimate the soil resistivity of the shallow subsurface. Wenner Configuration is a four-point electrode system with equal distances between the electrodes. It is considered to be best electrode system to estimate subsurface soil resistivity. However, its resolution is lower than others where it is used for geological investigation. Data acquisition was started with inter electrode spacing of 1 m and ended with 30 m of inner electrode spacing. Maximum depth of investigation with this arrangement is about 20 m. The details are presented in tabular forms.

Data acquisition was carried out by using equipment known under the brand name SYSCAL PRO SWITCH 48, manufactured by IRIS Instruments, Orleans, France. The equipment is designed to make high precision and high productivity measurement of electrical current and voltages (primary and decay). The electrical voltages are measured during the current pulse transmission. These measured current and voltages are used to calculate soil

resistivity resistivity of subsurface. The equipment has power of 250 Watts, maximum available injection voltage 800 Volts and maximum available injection current 2.5 Amperes. It has power line noise rejection capacity. The input impedance of the receiving channels is 100 MOhm, which allows to make reliable measurement in high contact resistance area. The voltage resolution is 1 μV and the precision of the measurement is 0.2%. The equipment has stacking facility which helps to secure good quality data. Furthermore, the quality control indicator Q (standard deviation) between the successive measurements helps to secure the quality of the data. Stainless steel electrodes were used for both current transmission and voltage receiving.

Field crew

The members of soil resistivity tests were geophysicist and three technical assistants. The main responsibilities lie on the geophysicist who should be involved in all stages starting from planning to report submission. Present field mission was carried out by an experienced geophysicist who was also involved for all stages of soil resistivity tests.

Data inversion code

Soil resistivity data were inverted by using code RESIX-PLUS Ver. 2.26 by Interpex Limited, Golden, Colorado, USA.

8.1.5. Analysis and Interpretation

Modeling of VES data of Wenner Configuration provides subsurface as a layered media. It provides layers parameters such as resistivity and layers thickness. These parameters are presented in corresponding tables. An attempt has been made to provide geological interpretation of the soil resistivity of the layers with reference to surrounding geological information. Since our test areas are located in highly variable geology, interpretation based only on values does not provide meaningful geological information. So, it is necessary to take care of geology of the surroundings of the test area.

Sediment in Indogangetic Plane has low resistivity in general. It indicates predominance of finer material in the subsurface. Usually at depth more than 2 m resistivity rarely exceeds 60 Ohm.m. Variation within the relatively lower resistivity values is the indication of the distribution of different proportion of sand, silt and clay.

In Siwalik area higher resistivity are observed for the deposit that overlies bedrock. Bedrock types are predominated by siltstone and claystone. These types of bedrock have much lower resistivity usually much lower than 200 Ohm.m.

Highly variable resistivity has been obtained for both soil and bedrock in Lesser Himalayas. In General, red soil has resistivity less than 300 Ohm.m. Some alluvial deposit predominated by coarse grained has very high resistivity in unsaturated condition whereas same material under saturation has lower resistivity (less than 300 Ohm.m). Bedrock type such as quartzite (metasandstone) and limestone has high resistivity values, usually more than 3000 Ohm.m. On the other hand, massive phyllite has resistivity between 500 Ohm.m to 1000 Ohm.m. Very low resistivity has been found for carbonaceous phyllite and graphite.

These are general impression of soil resistivity data acquisition and data inversion with reference to surface geological observation. For details of each and every location it is requested to see corresponding **Tables** and **Figures**.

8.2 Electrical Resistivity Test

8.2.1 Introduction

To investigate the subsurface by exploiting variations in its electrical properties using electrical resistivity tomography (ERT) survey was conducted. During the process of data acquisition, the subsurface resistivity distribution was obtained which is apparent resistivity. These obtained apparent resistivity recorded from the fieldwork were later converted to true resistivity using the software RES2DIN Ver.4.8.3. The software gives the

image of the profile and from that obtained profile of true resistivity the geological conditions were evaluated. Boundaries between unconsolidated materials and consolidated materials such as bed rocks, residual soil, colluvium, weathered rock from fresh rock, water table etc. were detected using this profile.

8.2.2 Objectives of the study

The objectives of the geophysical investigation are as followings:

- To differentiated the soil and rocks boundaries in the given profile section.
- To determine the possible existence of depth of bedrock and soil horizon.
- To locate the different resistivity zone for the design of the earthing or grounding of the electricity.

8.2.3 Scope of Work

To fulfil the objectives of the study, the selected site was mapped by 2D ERT profiles. The detailed of studies are described in the given heading. **Figures 2** to **5** show the location of ERT measures.
The depth of profile to be investigated depends upon the spacing between electrodes and length of the profile. To collect information from the depth of about 20 m, an electrode spacing of 2 m is used. The details of the 2D ERT coverage are tabulated in **Table 49**.

Table 49. Table of summary of ERT profile

Location	ERT Profile	Electrode spacing (m)	Start coordinate	End coordinate	Profile Length (m)
Ratemate	ERT-1	2	N 27° 51' 5.71" E 85° 03' 8.24"	N 27° 51' 2.64" E 85° 03' 10.63"	118
	ERT-2	2	N 27° 51' 5.11" E 85° 3' 11.19"	N 27° 51' 3.35" E 85° 3' 7.57"	118
	ERT-3	2	N 27° 51' 5.47" E 85° 3' 3.11"	N 27° 51' 6.80" E 85° 3' 7.27"	118
	ERT-4	2	N 27° 51' 7.64" E 85° 3' 5.88"	N 27° 51' 3.66" E 85° 3' 5.78"	118
Damauli,	ERT-5	2	N 27° 58' 7.42" E 84° 17' 39.41"	N 27° 58' 4.22" E 84° 17' 36.85"	118
	ERT-6	2	N 27° 58' 5.49" E 84° 17' 37.22"	N 27° 58' 4.27" E 84° 17' 41.33"	118
	ERT-7	2	N 27° 58' 4.38" E 84° 17' 30.74"	N 27° 58' 3.26" E 84° 17' 34.53"	118
	ERT-8	2	N 27° 58' 5.32" E 84° 17' 33.39"	N 27° 58' 1.97" E 84° 17' 31.11"	118
Butwal	ERT-9	2	N 27° 58' 1.97" E 84° 17' 31.11"	N 27° 34' 26.37" E 83° 41' 15.35"	118
	ERT-10	2	N 27° 34' 27.06" E 83° 41' 18.04"	N 27° 34' 28.59" E 83° 41' 14.13"	118
	ERT-11	2	N 27° 34' 18.12" E 83° 41' 10.97"	N 27° 34' 14.53" E 83° 41' 19.49"	118
	ERT-12	2	N 27° 34' 15.51" E 83° 41' 12.14"	N 27° 34' 17.20" E 83° 41' 18.32"	118
				Total	**1416**

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नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

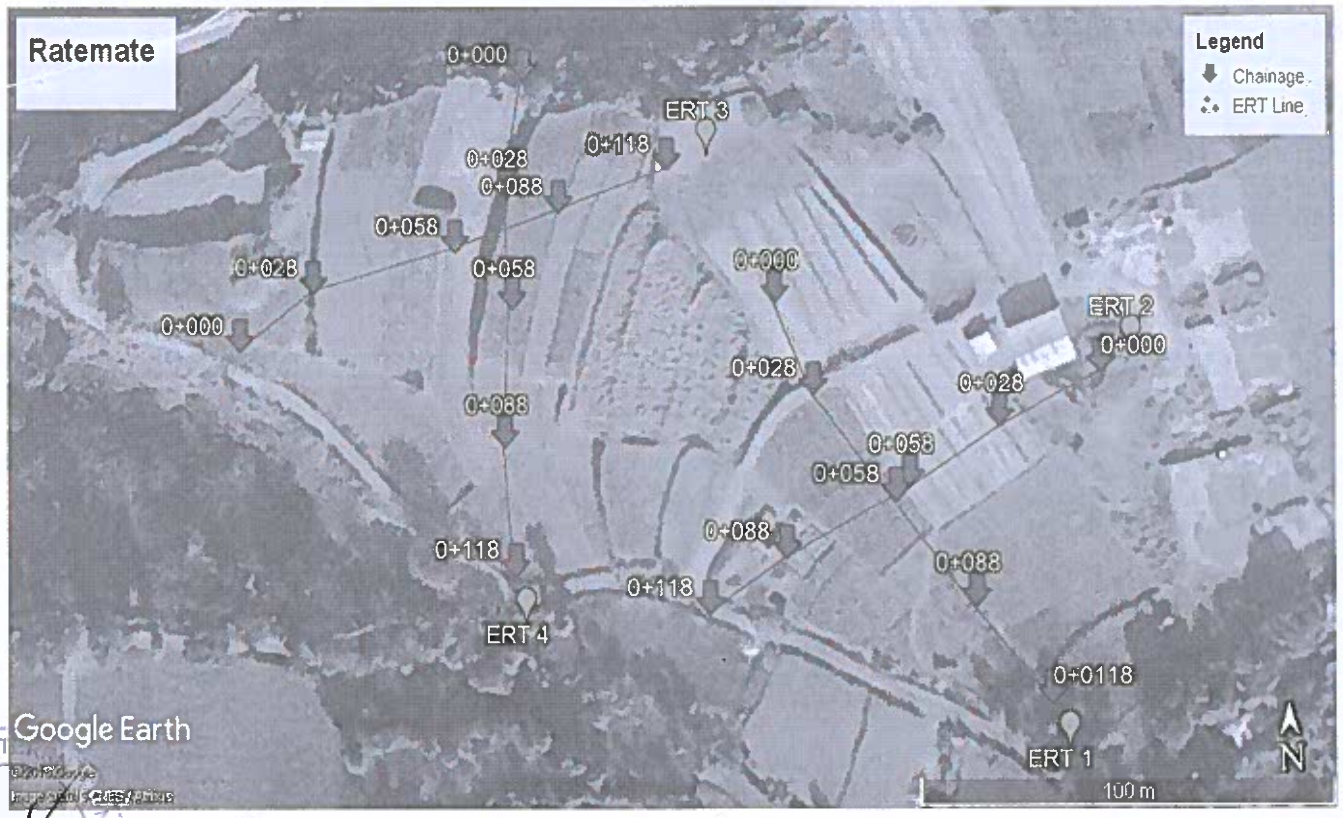

Fig. 2. Google earth image showing the ERT profile lines of Ratemate area from ERT-1 to ERT-4.

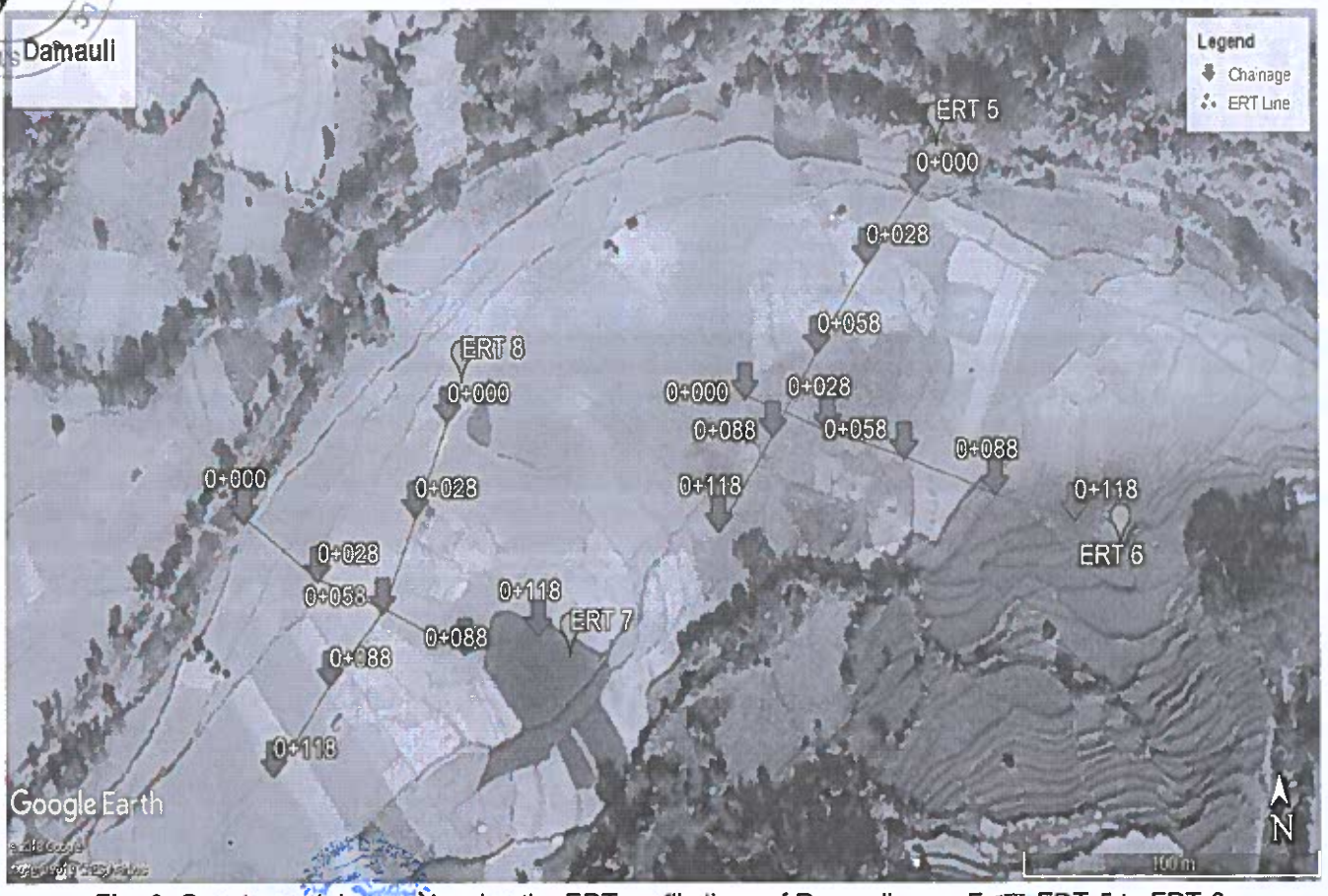

Fig. 3. Google earth image showing the ERT profile lines of Damauli area. From ERT-5 to ERT-8.

Fig. 4. Google earth image showing the ERT profile line of Butwal area. From ERT-9 to ERT-10.

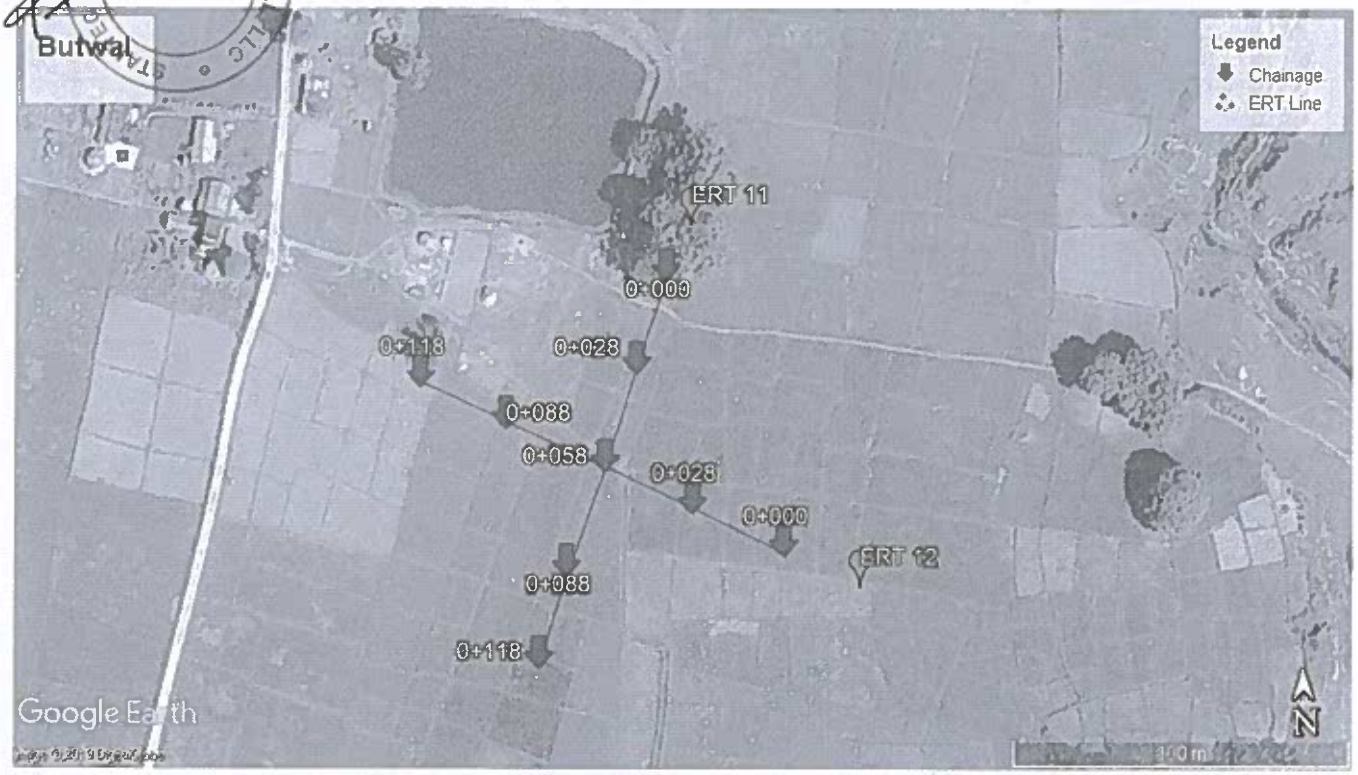

Fig. 5. Google earth image showing the ERT profile line of Butwal area. From ERT-11 to ERT-12.

8.2.4 Methodology

The resistivity method is one of the oldest geophysical techniques, it is basing on passing artificial electrical current in the earth through the ground via a pair of electrodes and a resulting potential difference is measured between a second pair of potential electrodes. This method has been used for many decades in hydrogeological, mining, geotechnical, archaeological, environmental and engineering investigation.

From two electrodes (A and B) the current is flowing in the subsurface earth and the current lines will take semi-circle shapes, while the equipotential lines are perpendicular on it, as shown in **Fig. 2**, so that any changes in the conductivities of the subsurface material lead to change the current flow lines, as result that equipotential lines will be disturbed, because they flow vertically on the current lines. Thus, the measurement values will change on the ground surface. However, the potential difference (ΔV) at any point which is caused by two current electrodes (A and B) measured between the potential electrodes (M and N) is given by:-

$\Delta V = V_M - V_N = \rho I/2\pi\ (1/AM - 1/BM - 1/AN + 1/BN)$.....(1)

Where,

V_M = potential at M due to A and B.

V_N = potential at N due to A and B.

I = Electrical current.

ρ = Resistivity.

AM, BM, AN, BN = Distances between the electrodes.

From equation (1)

$$\rho = \frac{2\pi}{\left(\frac{1}{AM} - \frac{1}{BM} - \frac{1}{AN} + \frac{1}{BN}\right)} \Delta V/I \quad \text{.....(2)}$$

Equation (2) is a fundamental equation in the direct current (dc) method of electrical prospecting.

The factor $\left\{\frac{2\pi}{\left(\frac{1}{AM} - \frac{1}{BM} - \frac{1}{AN} + \frac{1}{BN}\right)}\right\}$ is called the geometric factor of the electrode arrangement and generally is designated by the letter (K).

Therefore,

$\rho = K\ \Delta V/I$ .....(3)

If the measurement of (ρ) is made over semi-infinite space of homogeneous and isotropic material, then this value is called resistivity (ρ) of the material. However, if the medium is inhomogeneous and/or an-isotropic then the resistivity computed from equation (2) is called an apparent resistivity (ρ_a). Then the general equation is:

$\rho_a = K\ R$.....(4)

Where,

R = Resistance of material = $\Delta V/I$

The value of the apparent resistivity is a function of several variables such as, porosity, permeability, water saturation, the concentration of dissolved solids in the pore water, isotropic properties and other characteristics of the subsurface materials, (Keller and Frischknecht, 1966; and Zohdy, 1974).

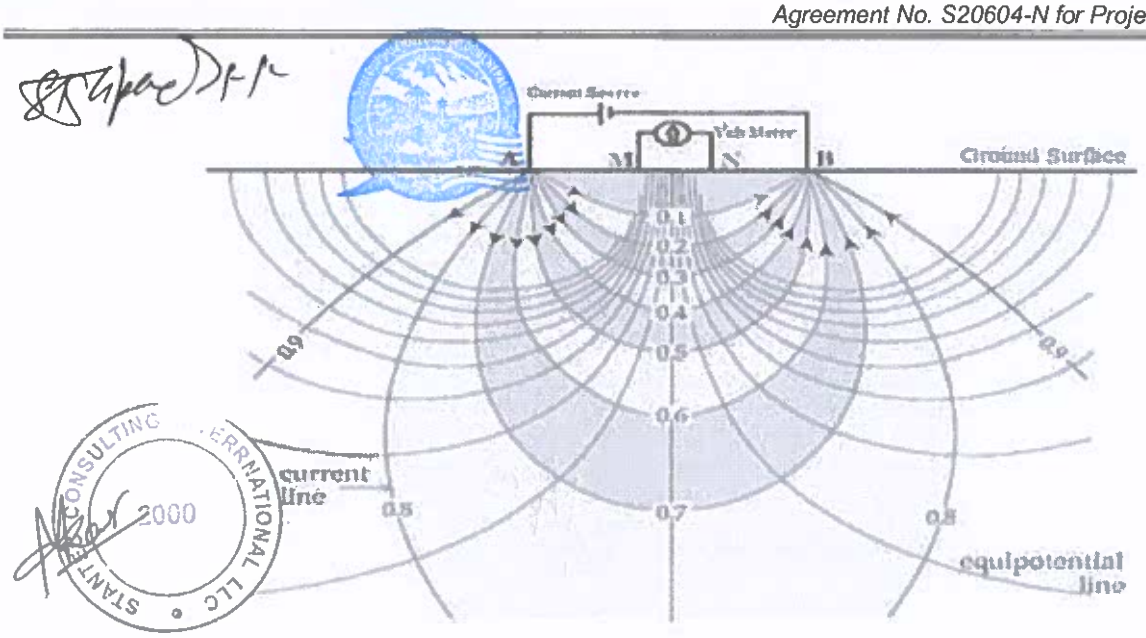

Fig. 6. Schematic illustrating basic concept of electrical resistivity measurement, (Lowrie, 2007).

The electric current flows into the earth by two electrodes depending on two main types of conduction. The first is electronic conduction; the current flows by free electrons, such as in metals. The second is electrolytic conduction where the current flows by the movement of ions in groundwater, (Zohdy, 1974). In the areas where the water table lies near the earth's surface, the electrolytic conduction is probably the more common mechanism. In areas where the water table is deep, the electronic conduction will depend on the conductive minerals present, (Zohdy et al. 1974).

The relation between geology and resistivity depends on the physical and chemical properties of rocks and soils. Therefore, the rocks and soils have a large range of resistivity, (Keller and Frischknecht, 1966). Hard rocks are poor conductors of electricity, but geological processes like weathering, dissolution, hydrothermal alteration; faulting and shearing can alter rock to increase the porosity and permeability of rock and hence decreases resistivity. By comparison, compaction of sedimentary rock and metamorphism of all types may result in lower porosities and permeability. Resistivity is, therefore, a widely varying parameter, which changes not only from lithology to lithology, but also within a particular formation of same lithology (**Fig. 3.**).

Common trade-offs between array types include signal-to-noise ratio, sensitivity variation with depth and sensitivity to horizontal or vertical structures (Telford, 1979).

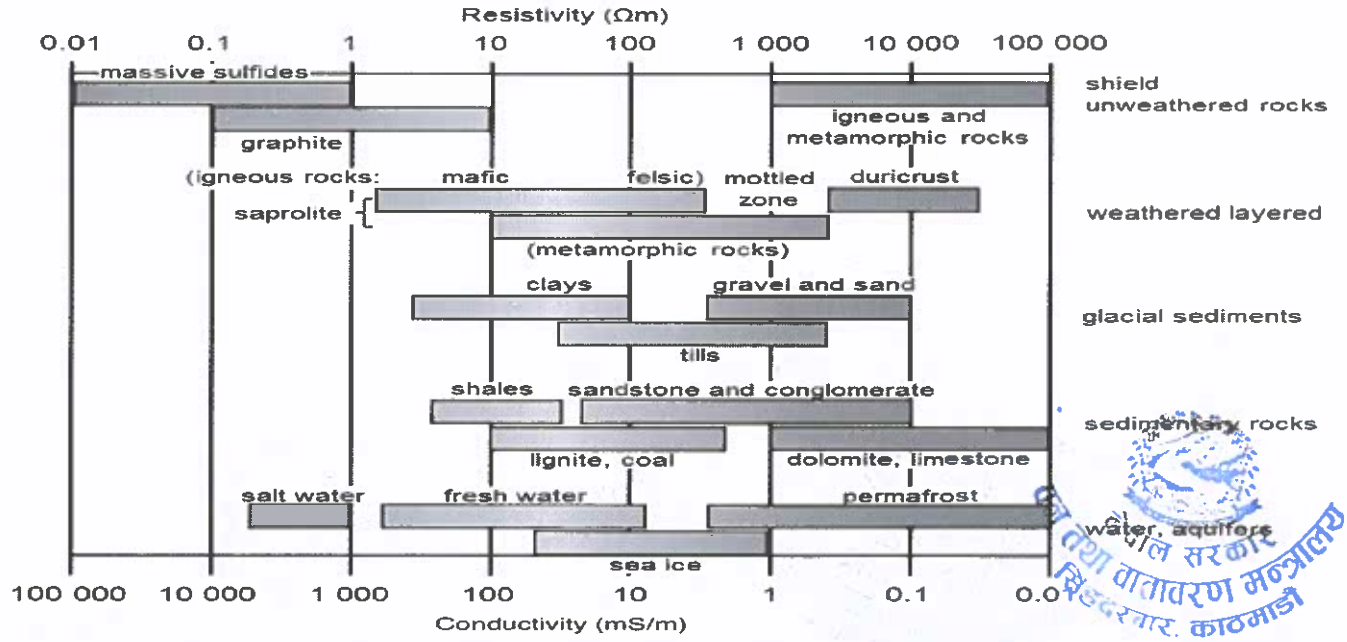

Fig. 7. Conductivities and resistivity of common rocks, soils and ores.

8.2.5 Common four-electrode configurations

The configuration of the electrodes, which describes the ordering of the four electrodes and their respective distances, can be chosen arbitrarily. There are some specific configurations, which are commonly used. These configurations are therefore well known and established. Using these has the advantage of comparability between different measurements. Furthermore, these configurations simplify the calculation of the apparent resistivity, because the distance between the electrodes follows defined schemes.
The most common electrode configurations are namely

- the Dipole-Dipole
- the Wenner
- the Schlumberger and
- the Wenner-Schlumberger configuration

The Wenner configuration,a common array with the four electrodes evenly spaced along the ground surface with the two current electrodes located at the ends is used. This array is known as a Wenner array (**Fig. 4**).

This array is relatively less sensitive to vertical changes in the subsurface resistivity below the centre point of the array, and it is good in resolving horizontal changes in earth layers, especially near the earth surface. Among the common arrays, the Wenner array has the strongest signals strength, so this can be an important factor if the survey is carried in areas with high background noise, (Zohdy. 1974; Loke, 2012). It is the most commonly used in resistivity method.
For a Wenner array, the apparent resistivity ρa can be calculated from a measurement of change in electrical potential $\Delta VMN$with a known current I and electrode spacing a by the equation is
$\rho aWenner=2\pi aI\Delta VMN$

The Schlumberger configurations similar to the Wenner configuration, but it have less restriction to the electrode spacing. Both electrode pairs are required to have a common midpoint, but there is no relation between the offset of the current electrodes and the potential electrodes.
Usually, the current electrode distance is kept much larger than the potential electrode distance. It is a method for investigating resistivity variations in depth. This array is high sensitive to vertical changes in the subsurface resistivity below the center point of the array, and relatively less sensitive to horizontal changes in earth layers.

The Dipole-Dipole array is the most widely used in 2D imaging technique. The arrangement of the electrodes of this array is shown in **Fig. 4** (c). The spacing between the current electrode pair which is the same as the distance between the potential electrode pair, which controls the depth of investigation (Keller and Frischknecht, 1966).

This array is very sensitive to horizontal changes in resistivity, but relatively insensitive to vertical changes, which means it is good in mapping vertical structures, such as faults, but relatively poor in mapping horizontal structures such as sedimentary layers (Loke, 2012).

The Wenner-Schlumberger array is one of the important arrays used in 2D imaging technique. It is a combination of the Wenner and Schlumberger arrays (Pazdirek and Blaha, 1966). The advantage of this array is that it can be used with the electrodes system arranged with a constant spacing, hence it is easier than schlumberger array. The purpose of using this array is that they are moderately sensitive to both horizontal and vertical structures (Loke, 2012).

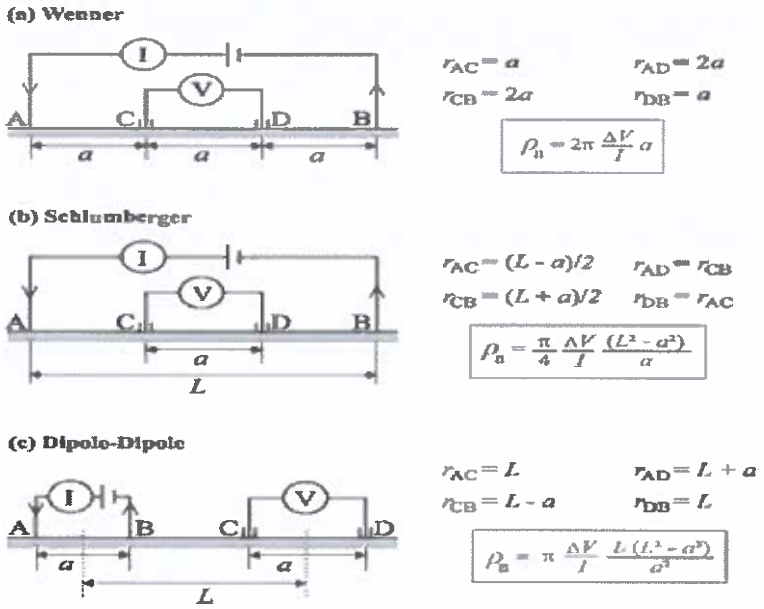

Fig. 8. The different four-electrode configurations. a) Wenner, b) Schlumberger and c) Dipole-Dipole.

Apparent resistivity measurements allow for the estimation of the resistivity structure of the subsurface. Profiling techniques involve traversing an array with fixed electrode separation across a subsurface to detect lateral variations in resistivity at a consistent depth of investigation. Mathematical inversion of the data is performed to obtain possible models of the subsurface resistivity structure that are consistent with the measured data (Loke, 2012). Inversion is an iterative process in which a model is obtained by iteratively attempting to fit the acquired data (Sasaki, 1992). Inversion parameters such as number of model blocks, model block size and inversion smoothness will influence the resulting inversion and must be chosen to best suit the survey type.

With electrical resistivity surveys, compromise must be made when selecting the minimum electrode separation to use for a study. Increasing electrode separation improves sensitivity at greater depths at the cost of resolution (Loke, 2012). Surveys with smaller electrode separations also require an increased number of electrodes to cover a transect of comparable length to larger electrode separations, often resulting in performing roll-along style surveys which are more time intensive.

In our study, sixty electrodes were grounded with electrode spacing of 2 m. All electrodes were connected via multi core cable and the cable is connected to the ERT machine. The machine decides which four of sixty electrodes to use while taking data and regulate the switching of the electrodes. The process of taking data is automatic after giving instruction to the machine (**Fig. 9**).

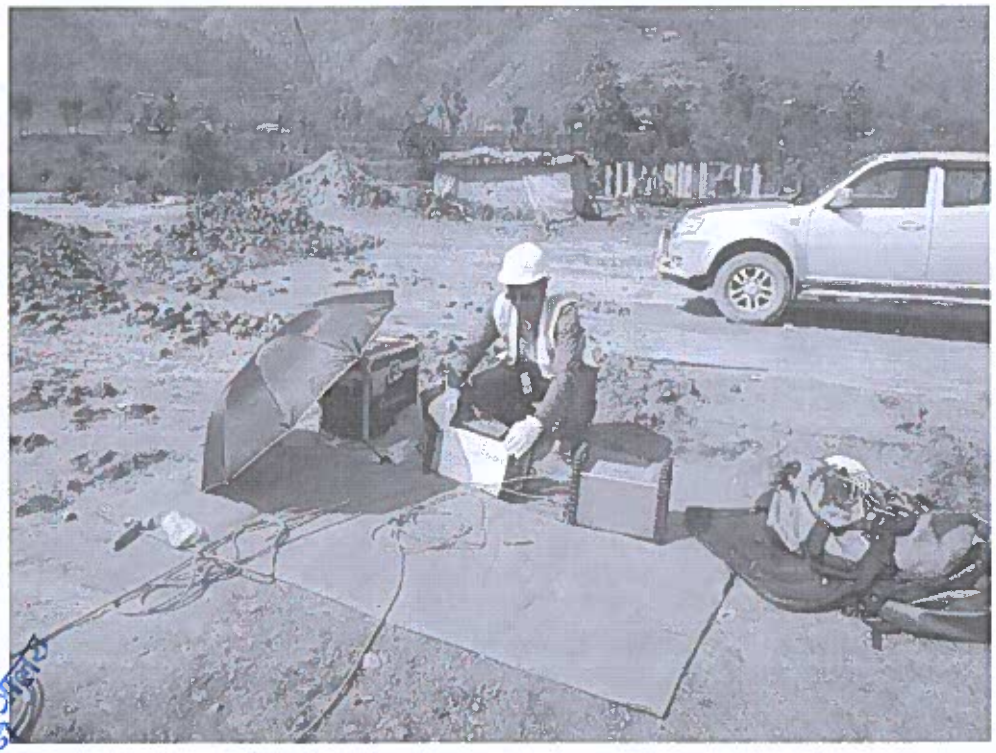

Fig. 9. Image showing the field setup of the ERT equipment at Ratemate area.

8.3 2D Electrical Resistivity Tomography Survey

8.3.1 Introduction

High-resolution electrical resistivity tomography (ERT) surveys were performed at the five sites.The data was collected in the field using a **GD-10 Series Geo-electrical System.GD-10 Advanced 2D Multi-electrode Res Imaging** System is the 2D Electric Resistivity Investigation system with functions of SP survey, 1D Resistivity/IP sounding survey and 2D Resistivity Imaging Survey. The mainframe including GD-10 mainframe and CS-60 multi-electrode switching box, which support max 60 pcs electrodes.

The quality of data acquired in the field not only depends on quality of the equipment and accessories but also depends on the topography, geological setup and density of the measurement. Highly heterogeneous conditions are created by surface topography and geological variation. Planning of the fieldwork and layout of profiles is usually based on topographical map.
At the start of each survey, the electrodes were inserted into the ground to a depth of approximately half of their length (i.e., to a depth of 0.15 meters). When inserting the electrodes into the ground, care was taken to ensure good contact was established between the electrodes and the soil. Ensuring proper contact is especially important during drier conditions when holes formed by the electrodes may not have naturally healed between acquisition days. Grounding check was performed prior to any data acquisition to ensure the system was properly connected and to monitor the level of contact resistance in the survey setup.

8.3.2 Management and Inversion of ERT Data

Following data acquisition, resistivity data were downloaded from the field system to a desktop computer using the software program Geomative studio.
Inversion of the data was performed using the software package RES2DINV version 4.08 (GeotomoSoftware).

The program generates a two-dimensional model of subsurface resistivity by minimizing the root-mean-square (RMS) difference between the predicted apparent electrical resistivity from an inversion model and the values measured in the field. The software inverts the field data and calculates the appropriate model in term of resistivity and provides output in the form of resistivity contours. This inversion data is used to draw up the lithological and geological information. The basic principle behind the relation between resistivity data and lithology/geology are already dealt with in above sections. The inversion results showing resistivity model with

interpretative cross sections of all 12 profiles are presented. Geological/ lithological information is extracted from the ERT result (resistivity contour value) & are marked in the respective ERT sections.

8.3.3 Electrical Resistivity Tomograms and their Interpretation

ERT-1

ERT-1 profile is of length 118 m, where 60 electrodes are arranged in 2m spacing. The Wenner array was used. The Google Earth image of the ERT-1 is shown in **Fig. 2.** The result of the ERT image is shown in **Fig. 10**.

In this profile the resistivity zone of greater than 200 ohm-m and less than 200 ohm-m differentiate silty-clayey soil deposit and sand-gravel-boulder deposit respectively. The top layer consists resistivity value ranging 200 ohm-m to 800 ohm-m and have clay to sand soil. This layer has thickness of 2.5 m to 5 m. The mid layer consists of low resistivity value which is less than 200 ohm-m and has thickness of 5 m to 8 m. This layer is interpreted as clayey soil. The last layer consists of high resistivity value which is greater than 200 ohm-m to 1300 ohm-m. This layer is interpreted as sand-gravel-boulder deposit.

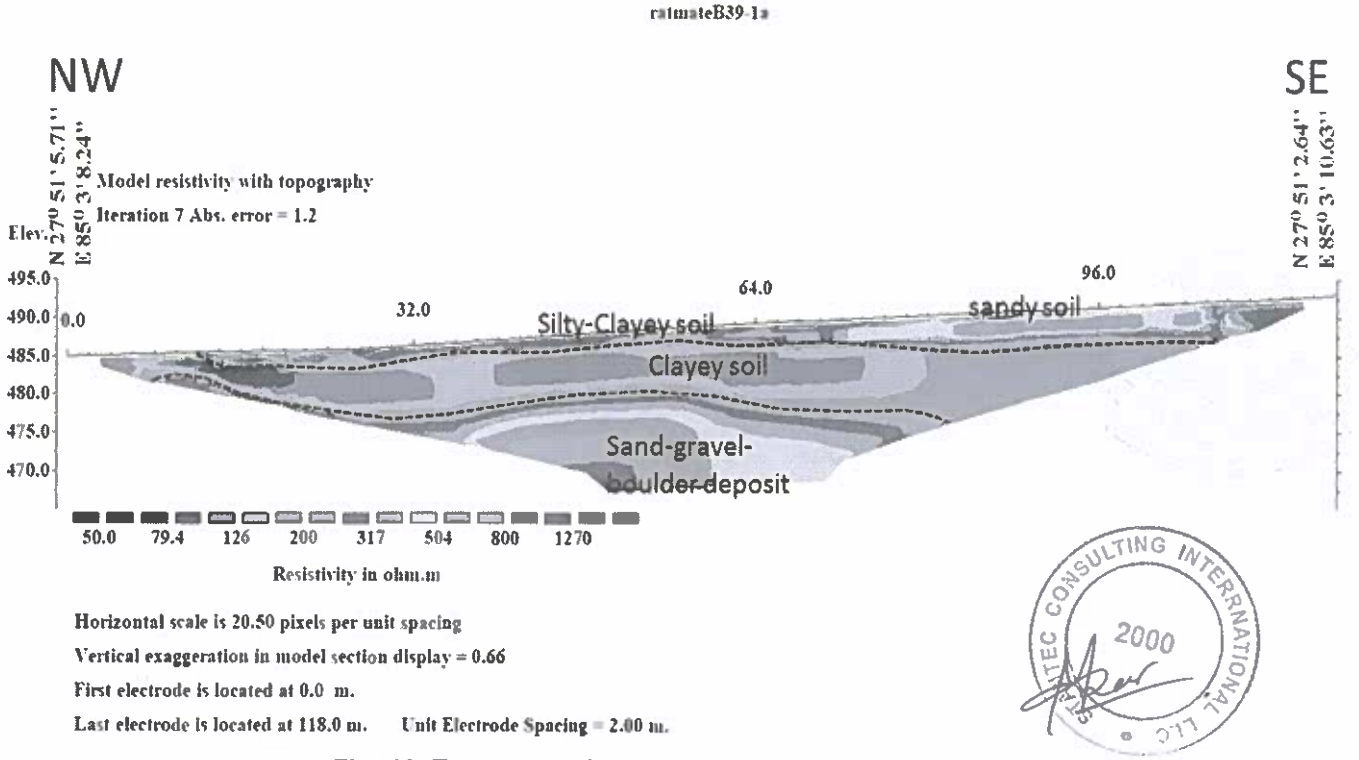

Fig. 10. Tomogram of ERT-1 inversion and interpreted result.

ERT-2

ERT-2 profile is of 118 m length in which 60 electrodes in 2 m spacing was used. The type of array used for the measurement is Wenner array. This profile is carried across the ERT-1. This ERT profile alignment is shown in **Fig. 2**. There is silty-clayey soil and sand present in the field. The result of the ERT image is shown in **Fig. 11**.

Here, two resistivity zone greater than 200 ohm-m and less than 200 ohm-m are present. The low resistivity layer represents the clayey soil. This layer is present at the mid part of the ERT tomogram which has thickness of 5 m to 8 m.

The high resistivity zone which are greater than 200 ohm-m represents sand-gravel-boulder deposits and this layer is shown at the last of the ERT tomogram from the depth of about 8m from the surface. The top layer also consists resistivity value greater than 200 ohm-m which is clay mixed sand soil and has thickness of 2 m to 3 m.

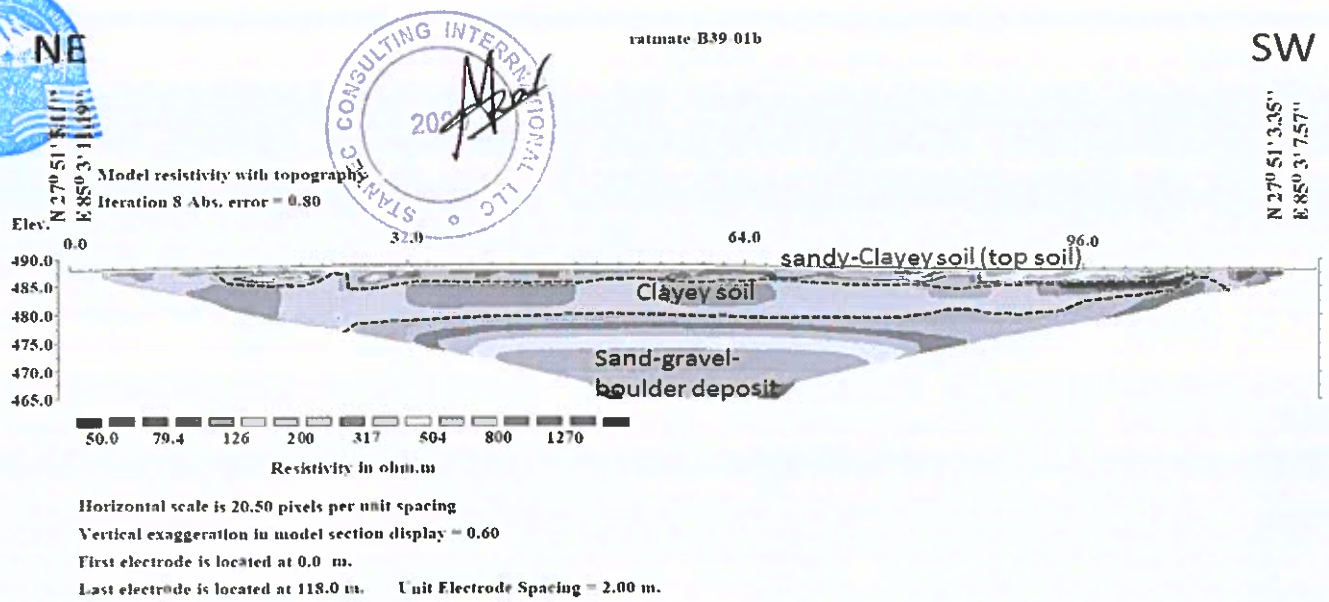

Fig.11. Tomogram of ERT-2 inversions.

ERT-3

ERT-3 profile is of 118 m length having electrode spacing of 2. The type of array used in this profile is Wenner array. This ERT profile alignment is also shown in **Fig. 2**. The result of the ERT image is given in **Fig. 12**.

In this profile, the three resistivity zones are distinct. One having low resistivity less than 200 ohm-m which indicates silty-clayey soil, second having moderate resistivity having resistivity value in between 900 and 1000 ohm-m which indicates sand-gravel deposit and last having high resistivity greater than 1000 ohm-m which indicates sand-gravel-boulder deposit.

The top most layers consist of low resistivity zone with depth less than 2 m to about 4 m. The moderate resistivity zone which represents the sand-gravel deposit is present at the mid portion of the ERT profile from the interval 62 m to 8 6 m. The high resistivity is present at the both flank of the ERT profile which is interpreted as sand-gravel-boulder deposits.

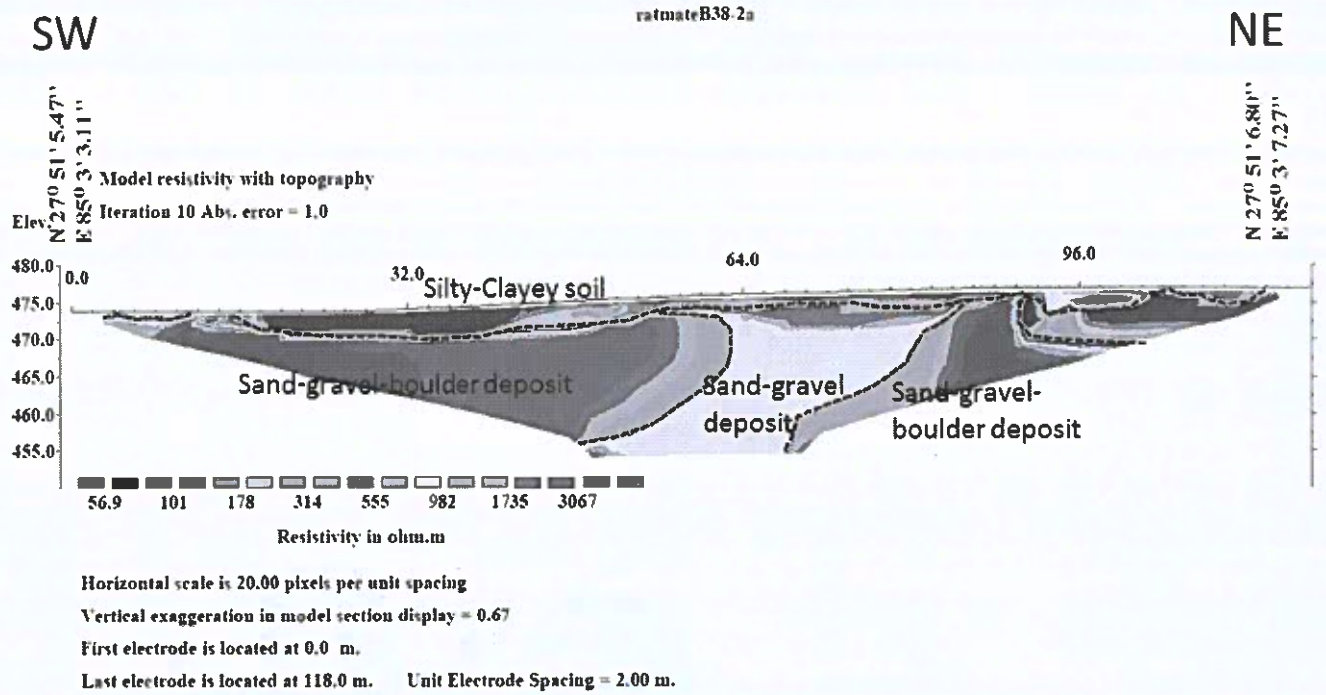

Fig. 12. Tomogram of ERT-3 inversion and interpreted result.

ERT-4

The ERT-4 profile is of 118 m long having electrode spacing of 2 m. The type of array used for the interpretation is Wenner. This ERT profile alignment is also shown in **Fig. 2**. The ERT-4 is aligned across the ERT-3. The result of the ERT image is shown in **Fig. 13**.

In this profile, the three resistivity zones are distinct. One having low resistivity less than 300 ohm-m which indicates silty-clayey soil, second is moderate resistivity having resistivity value in between 800 and 1000 ohm-m which indicates sand-gravel deposit and last having high resistivity greater than 1000 ohm-m which indicates sand-gravel-boulder deposit.

The top most layers consist of low resistivity zone with depth about 5 m. The moderate resistivity zone which represents the sand-gravel deposit is present at the mid portion of the ERT profile from the interval 44 m to 64 m. The high resistivity is present at the both flank of the ERT profile which consists of sand-gravel-boulder deposits.

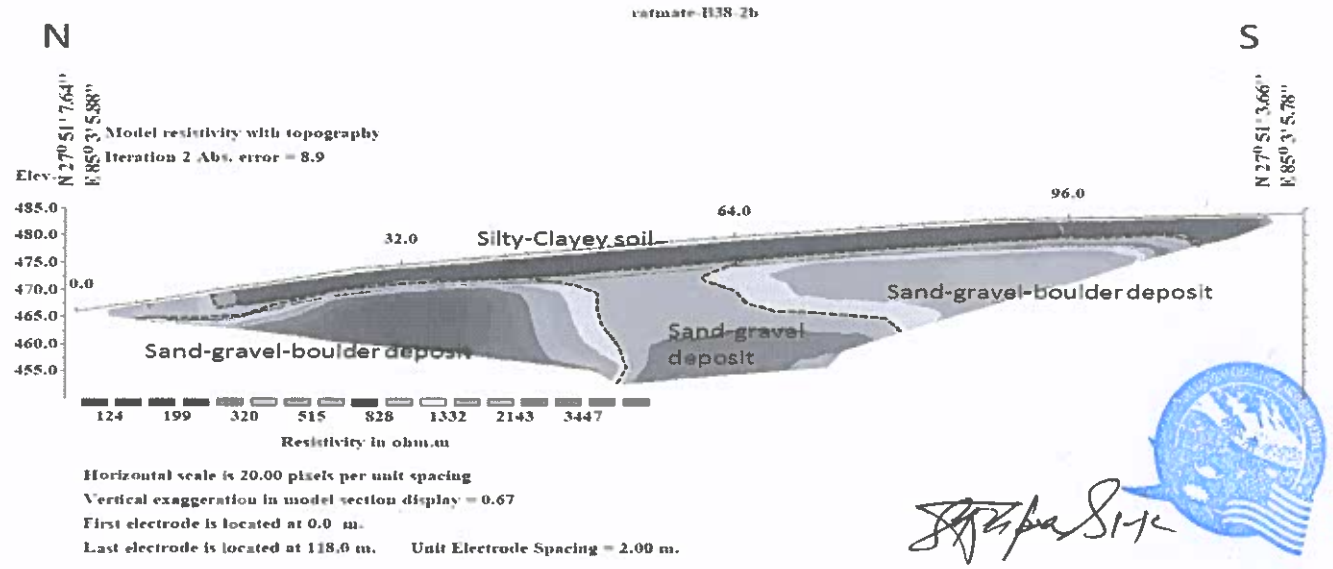

Fig. 13. Tomogram of ERT-4 inversion result.

ERT-5

The ERT-5 profile is of 118 m long having electrode spacing of 2 m and type of array used for the interpretation is Wenner array. The ERT profile is located on the rice cultivated field which consists of clay soil. This ERT profile alignment is shown in **Fig. 3**. The result of the ERT is shown in **Fig. 14**.

In this profile, the low resistivity less than 100 ohm-m indicates clay soil and second having high resistivity greater than 100 ohm-m indicates sand-gravel deposit.

The clay soil is present at the top and has thickness of about 2 m to 5 m. And it is followed by the sand-gravel deposit.

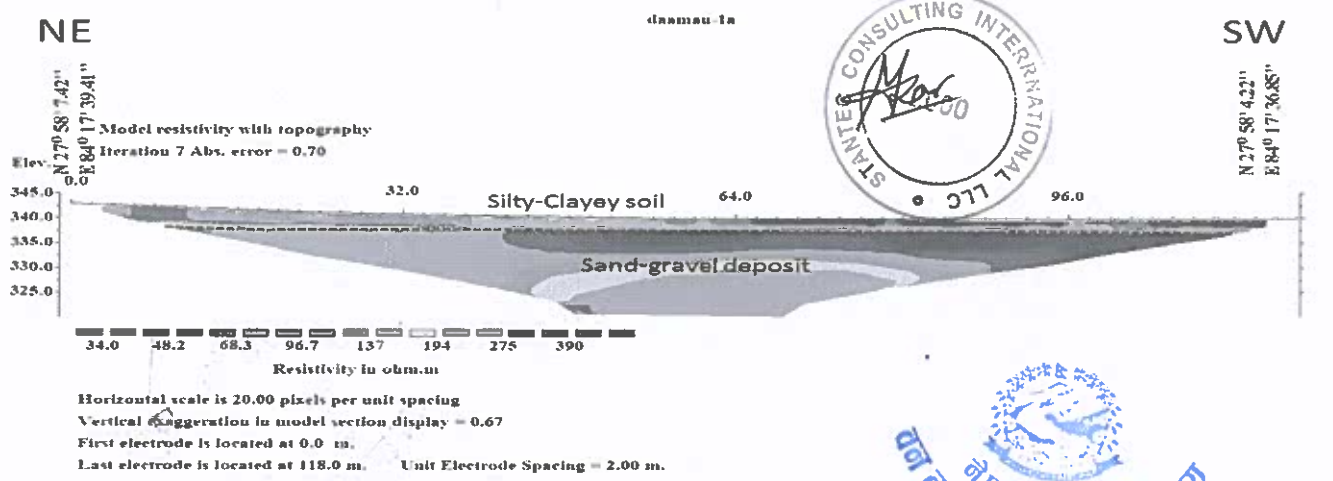

Fig.14. Tomogram of ERT-5 inversion result.

ERT-6

The ERT-6 profile is of 118 m long having electrode spacing of 2 m and type of array used for the interpretation is Wenner array. The ERT profile is located on the rice cultivated field which consists of clay soil. This ERT profile is aligned across the ERT 5. This ERT profile alignment is also shown in **Fig. 3**. The result of the ERT is shown in **Fig. 15**.

In this profile, the low resistivity less than 100 ohm-m indicates clay soil and second having high resistivity greater than 100 ohm-m indicates sand-gravel deposit. The clay soil is present at the top and has thickness of about 2.5 m. And it is followed by the sand-gravel deposit.

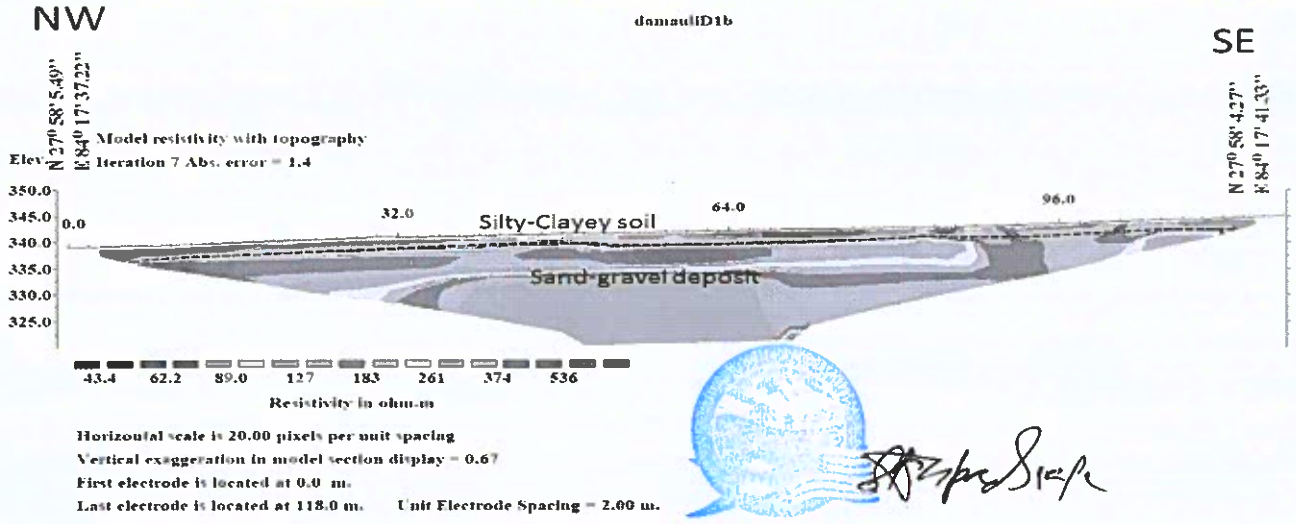

Fig. 15. Tomogram of ERT-6 inversion result.

ERT-7

The ERT-7 profile is of 118 m long having electrode spacing of 2 m and type of array conducted is Wenner array. The ERT profile is located on the rice cultivated field which consists of clay soil. This ERT profile alignment is also shown in **Fig. 3**. The result of the ERT is shown in **Fig. 16**.

In this profile, the low resistivity value less than 200 ohm-m indicates clay soil and second having high resistivity greater than 200 ohm-m indicates sand-gravel deposit. The clay soil is present at the top and has thickness of about 2 m to 3 m. And it is followed by the sand-gravel deposit.

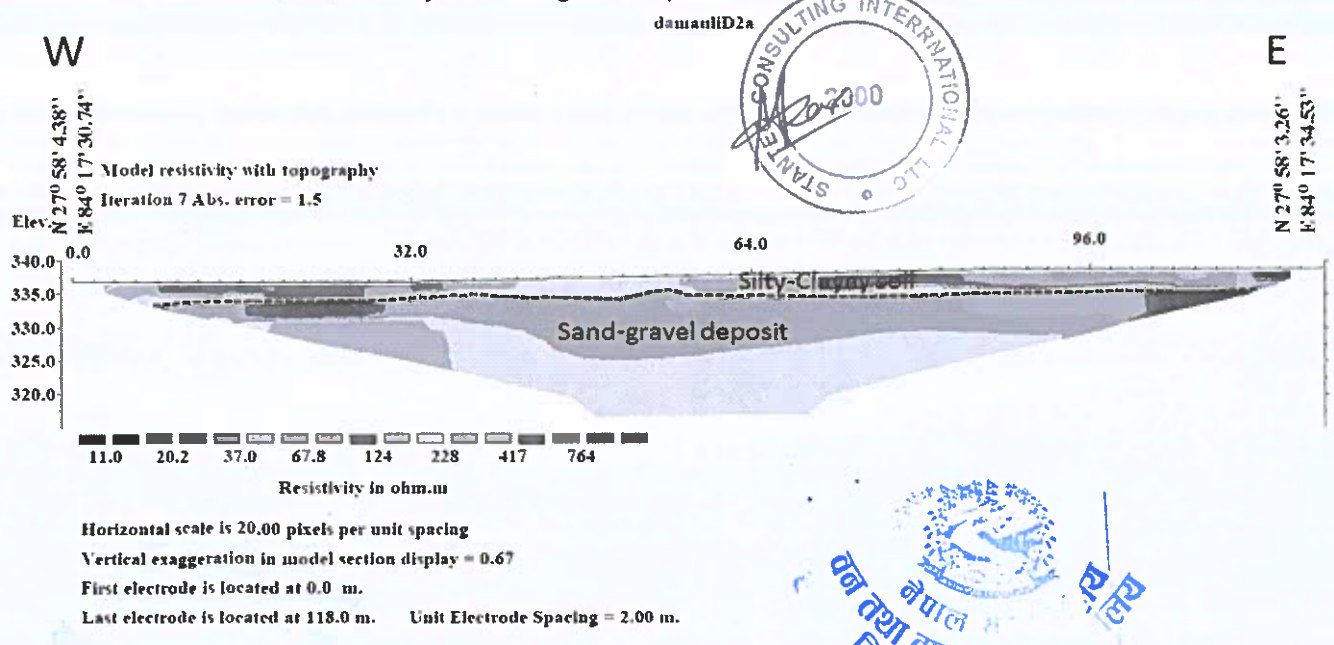

Fig. 16. Tomogram of ERT-7 inversion result.

ERT-8

The ERT-8 profile is of 118 m long having electrode spacing of 2 m and type of array used for the interpretation is Wenner array. The ERT profile is located on the rice cultivated field which consists of clay soil. This ERT profile is aligned across the ERT-7. This ERT profile alignment is also shown in **Fig. 3**. The result of the ERT is shown in **Fig. 17**.

In this profile, the low resistivity less than 200 ohm-m which indicates clay soil and second having high resistivity greater than 200 ohm-m which indicates sand-gravel deposit. The clayey type soil is present at the top and has thickness of about 2 m to 5 m. And it is followed by the sand-gravel deposit.

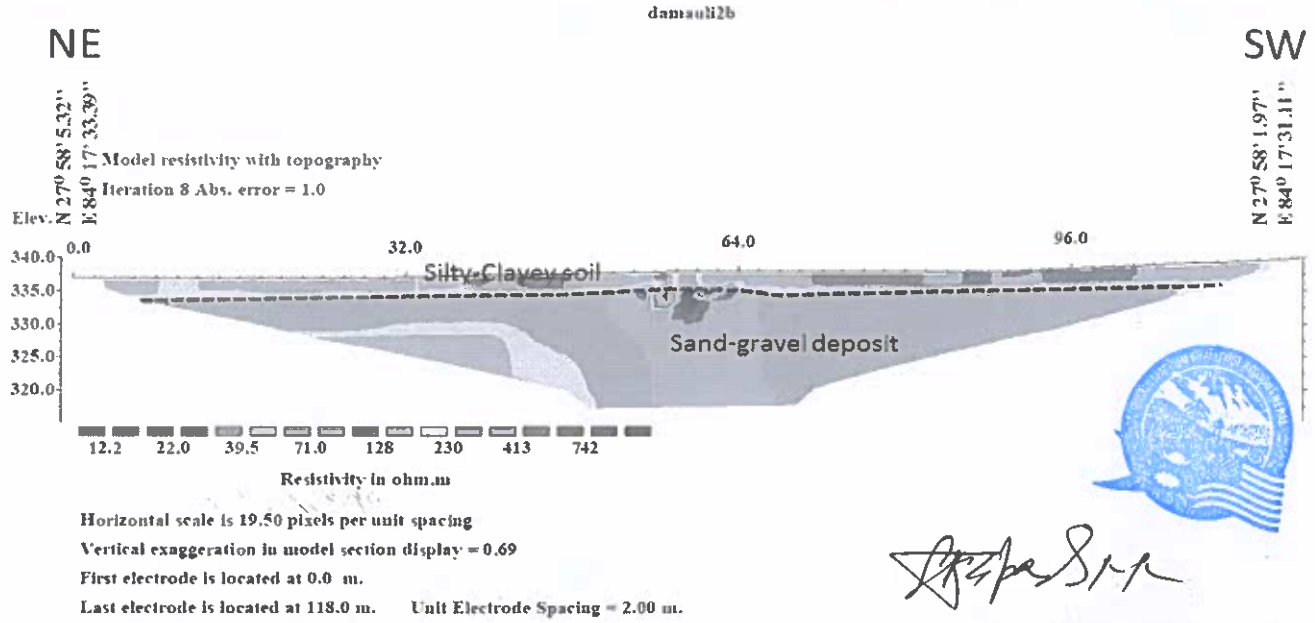

Fig. 17. Tomogram of ERT-8 inversion result.

ERT-9

The ERT- 9 profile is of 118m long having electrode spacing of 2m and type of array used for the interpretation is Wenner array. The ERT profile is located sandy soil area. This ERT profile alignment is shown in **Fig. 4**. The result of the ERT is shown in **Fig. 18**. In this profile, the low resistivity less than 50 ohm-m covers the entire ERT tomogram which indicates clay soil and second having high resistivity greater than 50 ohm-m at the top layer having thickness up to 3 m indicates sand deposit.

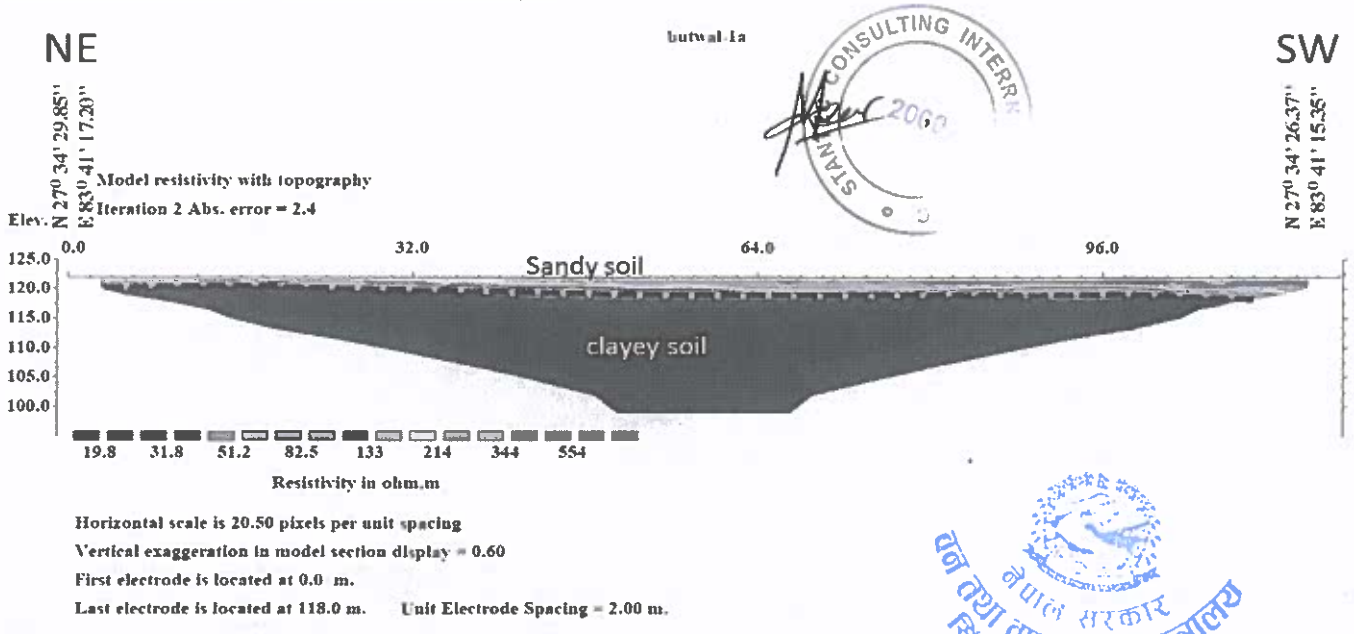

Fig. 19. Tomogram of ERT-9 inversion result.

ERT-10

The ERT- 10 profile is of 118 m long having electrode spacing of 2 m and type of array used for the interpretation is Wenner array. The ERT profile is located sandy soil area. This ERT profile crosses the ERT-9. This ERT profile alignment is also shown in **Fig. 3**. The result of the ERT is shown in **Fig. 20**.

In this profile, the low resistivity less than 50 ohm-m covers the entire ERT tomogram which indicates clay soil and second having high resistivity greater than 50 ohm-m at the top layer having thickness up to 5m indicates sandy soil deposit.

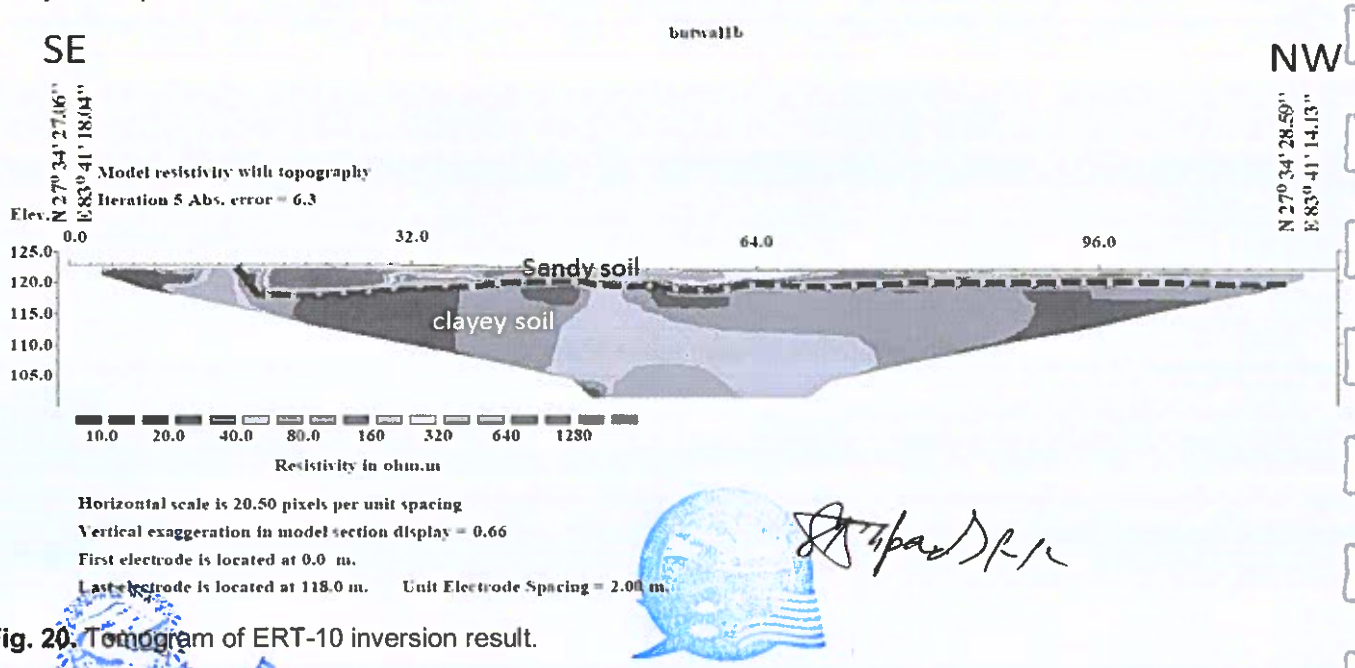

Fig. 20. Tomogram of ERT-10 inversion result.

ERT-11

The ERT- 11 profile is of 118m long having electrode spacing of 2m and type of array used for the interpretation is Wenner array. The ERT profile is located silty-sandy soil area. This ERT profile alignment is shown in **Fig. 5**. The result of the ERT is shown in **Fig. 21**.

In this profile, the low resistivity less than 50 ohm-m covers the entire ERT tomogram which indicates clay soil and second having high resistivity greater than 50 ohm-m at the top layer having thickness up to 2m indicates sandy soil deposit.

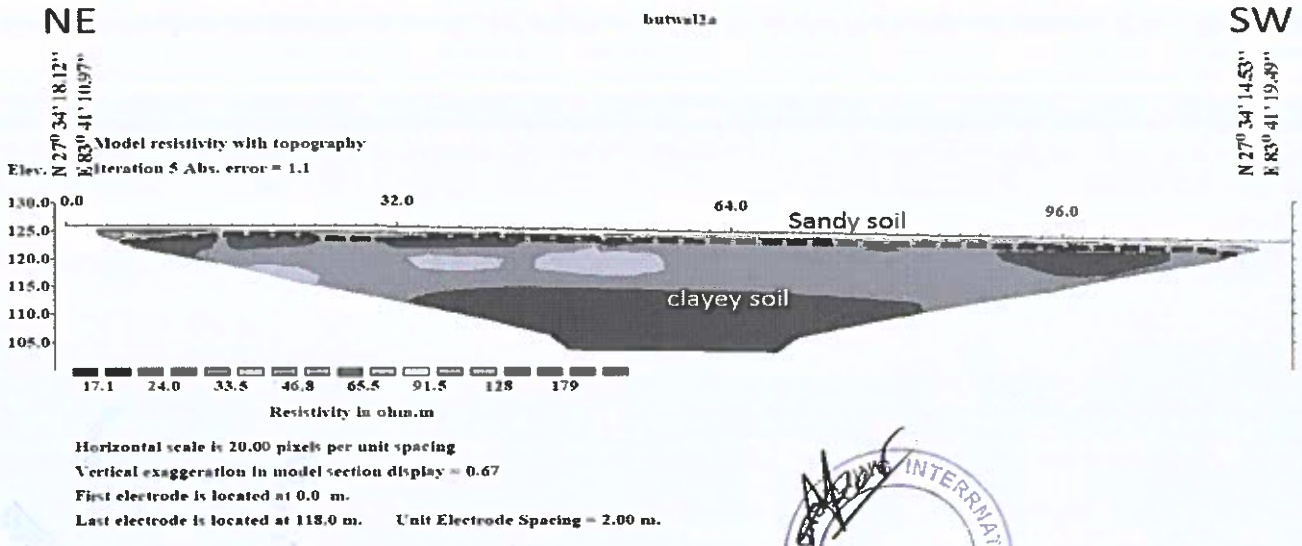

Fig. 21. Tomogram of ERT-11 inversion result.

ERT-12

The ERT- 12 profile is of 118 m long having electrode spacing of 2 m and type of array used for the interpretation is Wenner array. The ERT profile is located silty-sandy soil area. This ERT profile crosses the ERT-11. This ERT profile alignment is shown in **Fig. 5**. The result of the ERT is shown in **Fig. 22**.

In this profile, the low resistivity less than 50 ohm-m covers the entire ERT tomogram which indicates clay soil and second having high resistivity greater than 50 ohm-m at the top layer having thickness up to 2m indicates sandy soil deposit.

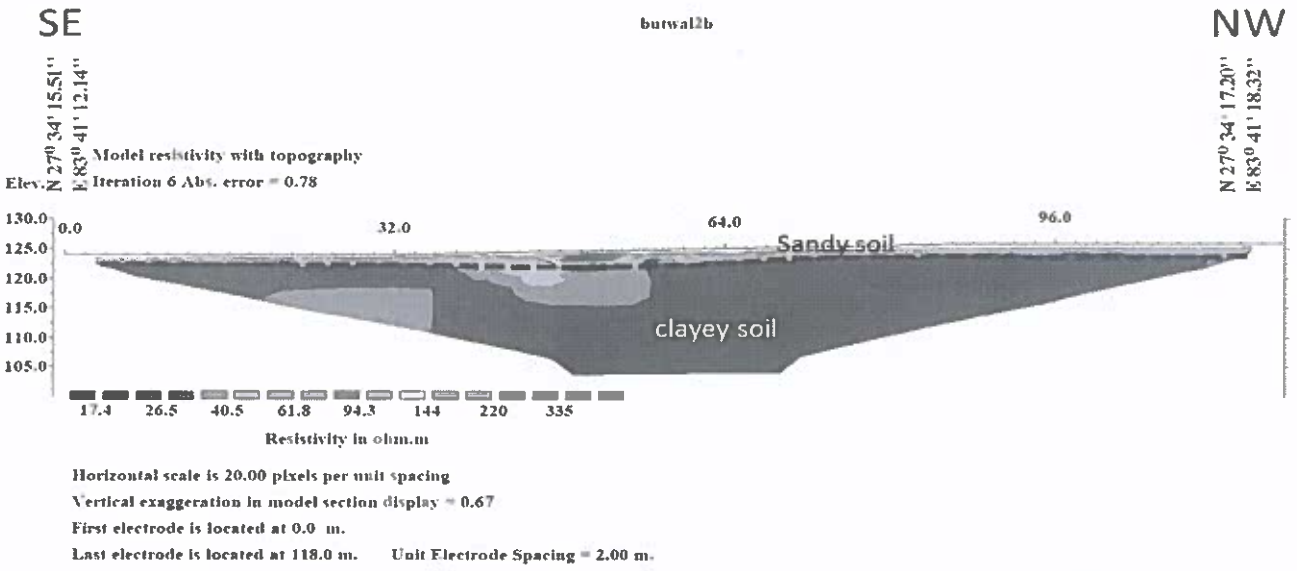

Fig. 22. Tomogram of ERT-12 inversion result.

9.0 CONCLUSIONS

The following conclusions can be drawn from the geotechnical exploratory investigation carried out in accordance with the Agreement No. S20604-N for Project No. 362066709 with the Stantec Company Limited.

a. In the section from Butwal sub-stations to India border, boreholes from B 1 to B 9, two layers can be grouped as per the pebble, gravel content during SPT testing. The whole depth of 7.00 m consists of medium dense to dense alluvium soil with increasing amount of sand, pebbles, gravels with depth.

b. In the section from Butwal to Damauli, boreholes from B 10 to B 22, the material retrieved during drilling suggests essentially colluvial deposit to residual soil. The soil formation is represented by reddish gray colored cohesive clay and silt with weathered gravel and pebbles with increasing amount of sandy portion along with the depth.

c. In the section from Damauli to Ratmate, boreholes from B 25 to B 38, the material recovered during investigation suggest similar nature of soil as that of Damauli to Ratmate i.e. reddish gray to gray colored, cohesive clay, silt with occasional occurrence of gravel and pebbles of weathered phyllite, slate, quartzite and limestone with increasing amount of compacted silty clay with regolith portion along with the depth.

d. In the section from Ratmate to Lapsiphedi, boreholes from B39 to B50, the materials encountered during drilling are mostly at the terrains of residual to colluvial soils and alluvial soil at the river terraces. The general soil profile around the area consists of reddish to brown colored, slightly cohesive, slightly moist, fine sand with presence of silt and clay as a top soil followed by reddish brown colored highly cohesive, moist, clay with presence of very small rock fragments of quartzite and phyllite. The boreholes drilling at the terrace of the river consists of light brown colored, slightly cohesive, moist to damp, fine to medium-grained sand with clay and silt (Sand dominant) followed by light grey, moist to damp, boulders of phyllite, quartzite, granite and gneiss.

e. In the section between Ratmate to New Hetauda, boreholes from B 51 to B 60, the soil formations reveal increasing amount of silt and sand along with weathered gravel and pebble with depth. The nature of the soil deposit is residual soil, cohesive in nature and moist to dry.

f. In Terai region, laboratory tests for both samples taken from SPT and bulk samplings adjacent to borehole locations revealed higher natural moisture contents indicating water tables at shallow depths. All boreholes except B 4, B 5 and B 6, encountered the water table lower than 7.0 m. The entire area is comprised of fluvial sediments brought by rivers. As a result, the fine-grained sediments pass through Sieve No. 200 are higher in percentage ranged between 56.55% to 98.64% for samples taken from SPT. Among them, more than 50% fines belong to silt in comparison to clay fractions obtained by hydrometer analyses representing mostly non-plastic to very low plastic soils. It is noteworthy to mention that values obtained from bulk densities and specific gravity also support the gradation curve together. Similar findings are observed in samples extracted from the pit adjacent to the borehole locations. Increase in coarser soils especially in sand proportion shows the maximum densification of soil at low moisture content such as in B 1 location where optimum moisture content of 8.7% are quite enough to produce the maximum dry density of 2.05 g/cc.

g. Laboratory tests for both samples taken from SPT and bulk samplings adjacent to borehole locations revealed higher natural moisture contents except for SPT samples of B 29 and B 34 as well as pit samples of B 29, B 30 and B 35. The fine-grained sediments pass through Sieve No. 200 are higher in percentage ranged between 13.30% to 74.61% for samples taken from SPT. Among them, more than 50% fines belong to silt in comparison to clay fractions obtained by hydrometer analyses representing mostly non-plastic to slightly plastic soils for both SPT and pit samples. It is noteworthy to mention that values obtained from bulk densities and specific gravity also support the gradation curve together for both SPT and pit samples. Increase in coarser soils especially in sand proportion shows the maximum densification of soil at low moisture content such as in B 29 location where optimum moisture content of 7.25% are quite enough to produce the maximum dry density of 2.24 g/cc.

h. Laboratory tests for both samples taken from SPT and bulk samplings adjacent to borehole locations revealed higher natural moisture contents except for pit sample of B 44. The fine-grained soils pass through Sieve No. 200 are higher in percentage ranged between 1.72% to 76.51% for samples taken from SPT. Among them, more than 50% fines belong to silt in comparison to clay fractions obtained by hydrometer analyses representing mostly non-plastic to slightly plastic soils for both SPT and pit samples.

Pit samples adjacent to B 39 and B 44, the soil is highly plastic and their corresponding values are determined to be 34.76% and 43.48% respectively. It is noteworthy to mention that values obtained from bulk densities and specific gravity also support the gradation curve together for both SPT and pit samples. Increase in coarser soils especially in sand proportion shows the maximum densification of soil at low moisture content such as in B 43 location where optimum moisture content of 8.0% are quite enough to produce the maximum dry density of 2.08 g/cc.

i. Laboratory tests for both samples taken from SPT and bulk samplings adjacent to borehole locations revealed higher natural moisture contents except for B 55 and B 58. Similarly pit sample adjacent to B 51, B 52 and B 57 show lower natural moisture content. The fine-grained soils pass through Sieve No. 200 are higher in percentage ranged between 18.0% to 70.9% for samples taken from pit while SPT samples are ranged between 3.37% to 86.1%. Among them, more than 50% fines belong to silt in comparison to clay fractions obtained by hydrometer analyses representing mostly non-plastic to low plastic soils for both SPT and pit samples. It is noteworthy to mention that values obtained from bulk densities and specific gravity also support the gradation curve together for both SPT and pit samples. Increase in coarser soils especially in sand proportion shows the maximum densification of soil at low moisture content such as in B 60 location where optimum moisture content of 7.0% are quite enough to produce the maximum dry density of 2.14 g/cc.

j. The organic content and water soluble sulfate tests show minor and traces of organic content and sulfate together with pH values show quite suitable for cultivation in the range between 5.25 and 7.86 respectively.

k. In Terai from boreholes B 1 to B 10, the soil is medium dense to dense in nature as suggested by SPT N-value for all borehole location. However, shallow depths of 1.5 m and/or 3.0 m reveal very low field N-values together with low ultimate and allowable bearing capacities indicating possibilities of liquefaction at these depths. Therefore, either ground improvement techniques or deeper part would be suitable to adopt for the foundation design.

l. Remaining boreholes reveal the soil is medium dense to dense in nature as suggested by SPT N-value for all borehole locations representing relatively higher ultimate and allowable bearing capacities at shallow depths of 1.5 m and/or 3.0 m.

m. In Terai, Indogangetic Plane showed low resistivity by VES measurement. At depth more than 2 m resistivity rarely exceeds 60 Ohm.m. Variation within the relatively lower resistivity values is the indication of the distribution of different proportion of sand, silt and clay. In Siwaliks, higher resistivity is observed for the deposit that overlies bedrock predominated by siltstone and claystone, showing resistivity much lower than 200 Ohm.m. Similarly, highly variable resistivity has been obtained for both soil and bedrock in Lesser Himalayas, In General, red soil has resistivity less than 300 Ohm.m. Some alluvial deposit predominated by coarse grained has very high resistivity in unsaturated condition whereas same material under saturation has lower resistivity (less than 300 Ohm.m). Bedrock type such as quartzite (metasandstone) and limestone has high resistivity values, usually more than 3000 Ohm.m. On the other hand, massive phyllite has resistivity between 500 Ohm.m to 1000 Ohm.m. Very low resistivity has been found for carbonaceous phyllite and graphite.

n. The ERT results shows that lower resistivity has been observed at top layer soils up to 5 m and values ranged from 50 ohm-m to maximum of 200 Ohm-m. for all tests in sub-stations. The resistivity increases in gravel and coarser deposits which has incorporated resistivity of more than 1000 ohm-m.

10.0 RECOMMENDATIONS

It is almost impossible to suggest exact type of foundation whether it is required to incorporate shallow foundation or deep foundation without the knowledge of dimensions and load structure. Although, on the basis of geohazard conditions and field surveys, **Table 50** reveals the possible deep foundation requirement for transmission line.

The water table along Terai region of borehole locations of B 1 to B 9 are encountered in shallow depths and with reference to the borehole logs there may be chances of occurring of liquefaction when water table increases during rainy season as well as if tremors occur in the adjacent area. Furthermore, SPT N-values and the ultimate bearing capacities and allowable bearing capacities are also determined to be low. Therefore, it is advisable to either drilling depth should be increased more to confirm the stiff strata or shift the location where flooding will not reach to the place. In the case the locations cannot be altered, the deep foundation need to be incorporated. Following

The borehole locations in the hilly terrain require to be tackled with preventive and mitigative measures to protect from possible sliding. It is noteworthy to understand that there will be residual soil having shallow depth at or near the top of the hilly terrain. In that situation, the foundation can be placed at the bed rock. In the case of colluvial soil deposit, deep foundation can be adopted if the SPT N-values are lower and the ultimate and allowable bearing capacities are lower. **Table 50** shows the possible deep foundation requirement.

Table 50. Recommendation of Deep Foundation based on geohazard conditions.

Borehole No.	Possible hazard	Location	Borehole No.	Possible hazard	Location
B 1	Flood and foundation settlement/Liquefaction	Flat land	**B 10**	Flood and river cutting/Liquefaction	Flat land
B 2	Flood and foundation subsidence/Liquefaction	Flat land	**B 11**	Slope instability	Foothill
B 3	Flood and foundation subsidence/Liquefaction	Flat land	**B 23 & B 24**	Flood and Foundation settlement/Liquefaction	River Terrace
B 4	Flood and foundation subsidence/Liquefaction	Flat land	**B 28**	Slope Instability	West facing Hill slope
B 5	Flood and foundation subsidence/Liquefaction	Flat land	**B 30**	Slope Instability	West facing hill slope
B 6	Flood and foundation subsidence/Liquefaction	Flat land	**B 46**	Slope Instability	South Facing hill slope
B 7	Flood and foundation subsidence/Liquefaction	Flat land	**B 47**	Slope Instability	North facing hill slope
B 8	Flood and foundation subsidence/Liquefaction	Flat land	**B 59**	Liquefaction	On river terrace
B 9	Flood and river cutting/Liquefaction	Flat land	**B 60**	Liquefaction	On river terrace

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Annexes

Annex - A: Log Sheets

Annex - B: Core Photographs

Annex - C: Laboratory Tests

Annex - D: Data Sheet of VES and Activity Photographs

Annex - E: Data Sheet of ERT

Annex - F: Site Photographs of Boreholes

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ANNEX: A

Borehole Log sheets

BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	**B1**	Co-ordinates:	**N: 27° 25.706' E: 83° 42.274'**
Location:	**Ram Puruwa**	Elevation (m):	**85m**
Bearing of Hole:		Water Table (m):	**2.55m**
Drilling Type:	**Auger Drilling**	Total Drilled Depth (m):	**7.50m**
Starting Date:	**24.02.2019**	Completion Date:	**24.02.2019**

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Water Table encountered at 2.55m	0 – 1.5		3	5	5					26	5.4					CL	Brownish grey clayey SILT, Plastic
	1.5 – 3.5	2.55m	2	2	4	19	0	43	57	17	3.4					SM	Brownish grey silty FINE SAND
	3.5 – 5.5		2	5	7											SM	Grey to light grey silty FINE SAND
	5.5 – 6.5		2	3	5											SM	Grey to dark grey silty FINE SAND
	6.5 – 7.5		3	4	9											SM	Grey to dark grey silty FINE SAND

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by:	Logged by: **Naresh Ghimire**	Checked by: **Dr. Suman Manandhar**	**I.C.G.S Pvt. Ltd.**

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B2	Co-ordinates:	N: 27° 27.170' E: 83° 42.162'
Location:	Harpur Ward No.- 2	Elevation (m):	84m
Bearing of Hole:		Water Table (m):	4.00m
Drilling Type:	Auger Drilling	Total Drilled Depth (m):	7.50m
Starting Date:	24.02.2019	Completion Date:	24.02.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5																
	1																
	1.5		3	2	2	26		1.2	99	24	5.4						Core Loss
	2		3	2	2											CL	Brownish grey clayey SILT
Water Table encountered at 4.00m	2.5																
	3		2	2	3	25	0.1	14	86	27	8.3					CL	Grey to light grey clayey SILT, Plastic
	3.5																
	4																
		4.00m															
	4.5		2	3	4											CL	Brownish grey clayey SILT, Plastic
	5																
	5.5																
	6															SM	Brownish grey silty FINE SAND
	6.5		3	6	9												
	7															SM	Brownish grey clayey silty with FINE SAND mixed
	7.5		3	6	7												

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by:	Logged by: Naresh Ghimire	Checked by: Dr. Suman Manandhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B3	Co-ordinates:	N: 27° 28.491' E: 83° 41.528'
Location:	Kusma	Elevation (m):	87m
Bearing of Hole:		Water Table (m):	6.00m
Drilling Type:	Auger Drilling	Total Drilled Depth (m):	7.50m
Starting Date:	23.02.2019	Completion Date:	23.02.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N 1	N 2	N 3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5																
	1																
	1.5		3	3	3	27	0.1	1.2	99	30	18					CL	Brownish grey clayey SILT
	2																
	2.5																
	3		3	3	4	22		5.6	94	29	9					CL	Brownish grey clayey SILT
	3.5																
	4																
	4.5		3	6	7											OH	Brownish grey clayey SILT with some organic material
	5																
Water Table encountered at 6.00m	5.5																
	6	6.00m	4	5	6											SM	Brownish grey clayey SILT with FINE SAND mixed
	6.5																
	7																
	7.5		5	7	8											SM	Brownish grey silty FINE SAND

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by:	Logged by: Naresh Ghimire	Checked by: Dr. Suman Manandhar	I.C.G.S Pvt. Ltd.

BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B4	Co-ordinates:	N: 27° 31.234' E: 83° 41.565'
Location:	Ghanashyam Pur	Elevation (m):	88m
Bearing of Hole:		Water Table (m):	-
Drilling Type:	Auger Drilling	Total Drilled Depth (m):	7.50m
Starting Date:	23.02.2019	Completion Date:	23.02.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0 – 1.5		2	3	4	21				22	2.7					CL	Yellowish brown clayey SILT, Plastic
	1.5 – 3.5		5	6	7	18		27	73	24	3					CL	Brownish grey clayey SILT
	3.5 – 5		2	3	3											CL	Grey to light grey clayey SILT, plastic
	5 – 6.5		5	8	11											CL	Brownish grey clayey SILT,
	6.5 – 7.5		8	13	16											SM	Grey to light grey silty FINE SAND

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by:	Logged by: Naresh Ghimire	Checked by: Dr. Suman Manandhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B5	Co-ordinates:	N: 27° 33.321' E: 83° 40.353'
Location:	Sanda, Ward No. 1	Elevation (m):	98m
Bearing of Hole:		Water Table (m):	-
Drilling Type:	Auger Drilling	Total Drilled Depth (m):	7.50m
Starting Date:	25.02.2019	Completion Date:	25.02.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5																
	1																
	1.5		3	2	4	19				22						CL	Yellowish brown silty FINE SAND
	2																
	2.5																
	3		2	3	2	21				26	14					CL	Brownish grey clayey SILT, Plastic
	3.5																
	4																
	4.5		2	1	1											CL	Grey to light grey clayey SILT, Plastic
	5																
	5.5																
	6		3	4	5											CL	Brownish grey clayey SILT, moist, Plastic
	6.5																
	7		3	5	5											CL	Brownish grey clayey SILT, moist, Plastic
	7.5																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by:	Logged by: Naresh Ghimire	Checked by: Dr. Suman Manandhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B6	Co-ordinates:	N: 27° 34.437' E: 83° 41.181'
Location:	Bichaiya Pur	Elevation (m):	
Bearing of Hole:		Water Table (m):	5.00m
Drilling Type:	Auger Drilling	Total Drilled Depth (m):	7.50m
Starting Date:	22.02.2019	Completion Date:	22.02.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5																
	1																
	1.5																
	2		2	3	3	23	2.2	4.3	93	26	7.3					CL	Yellowish brown clayey SILT
	2.5																
	3																
	3.5		3	3	4	22		0.9	99	26	5.1					CL	Brownish grey clayey SILT, plastic
	4																
	4.5																
	5		2	4	3											CL	Brownish grey clayey SILT, plastic
Small pocket of Water Table encountered at 5.00m and After 5.30m depth water table are disappear	5.5	5.00m															
	6																
	6.5		4	4	5											CL	Brownish grey clayey SILT, plastic
	7																
	7.5		3	3	4											CL	Brownish grey clayey SILT, plastic

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, PI-Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by:	Logged by: Naresh Ghimire	Checked by: Dr. Suman Manandhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B7	Co-ordinates:	N: 27° 34.274' E: 83° 41.173'
Location:	-	Elevation (m):	95m
Bearing of Hole:		Water Table (m):	2.30m
Drilling Type:	Auger Drilling	Total Drilled Depth (m):	7.50m
Starting Date:	25.02.2019	Completion Date:	25.02.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Water Table encountered at 2.30m	0																
	0.5																
	1																
	1.5		1	1	1											CL	Brownish grey clayey SILT
	2																
	2.30m																
	2.5																
	3		2	4	3	26	0.1	4.1	96	25	6.6					CL	Grey to light grey clayey SILT, Plastic
	3.5																
	4																
	4.5		2	4	7											CL	Brownish grey clayey SILT, Plastic
	5																
	5.5																
	6																
	6.5		2	3	4											OH	Brownish grey clayey SILT with some organic material mixed
	7																
	7.5		4	7	7											CL	Brownish grey clayey SILT, Plastic

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by:	Logged by: Naresh Ghimire	Checked by: Dr. Suman Manandhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B8	Co-ordinates:	N: 27° 34.472' E: 83° 41.269'
Location:	-	Elevation (m):	79m
Bearing of Hole:		Water Table (m):	6.75m
Drilling Type:	Auger Drilling	Total Drilled Depth (m):	7.50m
Starting Date:	26.02.2019	Completion Date:	26.02.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Grey to light grey clayey SILT Start	0																
	0.5																
	1																
	1.5		3	5	5	24				21	0.2					CL	Yellowish brown clayey SILT
	2																
	2.5																
	3		3	3	5	20	0.2	1.2	99	28	9.3					CL	Brownish grey clayey SILT, Plastic
	3.5																
	4																
	4.5		3	2	4											CL	Brownish grey clayey SILT, Plastic
	5																
	5.5																
	6																
Water Table encountered at 6.75m	6.5		4	3	6											CL	Grey to light grey clayey SILT, Plastic
	7	6.75m															
	7.5		2	5	8											CL	Grey to light grey clayey SILT, Plastic

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by:	Logged by: Naresh Ghimire	Checked by: Dr. Suman Manandhar	I.C.G.S Pvt. Ltd.

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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B9	Co-ordinates:	N: 27° 36' 32.18'' E: 83°42'15.63''
Location:	-	Elevation (m):	146m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	16.05.2019	Completion Date:	16.05.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth in'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Selve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Alluvial deposit on side of a river, alluvial terrace	0															CL	Top soil : Light grey colored, fine grained, dry, clay with silt
	0.5																
	1															GP	Cobble, pebbles of limestone in sandy matrix Sludge sample: Well graded, fine to medium grain sand
	1.5																
	2															GP	Cobble, pebbles of limestone in sandy matrix Sludge sample: Well graded, fine to medium grain sand
	2.5																
	3																Pebbles of limestone in sandy matrix
	3.5																
	4																Pebbles of sandstone and lime stone in sady matrix
	4.5																
	5																Pebbles of grey colored rocks in sady matrix
	5.5																
	6																Pebbles of grey colored rocks in sady matrix Sludge sample: Well graded, fine to medium grained sand
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI-Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: OM Nepal | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.: B10
Location: -
Bearing of Hole:
Drilling Type: Rotary Wash Boring
Starting Date: 12.05.2019
Co-ordinates: N: 27° 40' 34.84'' E: 84°45'27.28''
Elevation (m): 252m
Water Table (m):
Total Drilled Depth (m): 7.00m
Completion Date: 13.05.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth m	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Alluvial terrace deposit	0					1.2	0.2	40	59.5	16	16					CL	Top soil: Dark colored, rich in organic content, cohesive and slightly moist clay with silt
	0.5																
	1															GP	Gravels and pebbles in sandy clayey matrix
	1.5																
	2															GW	Boluder, cobble pebble in sandy clayey matrix
	2.5																
	3															GW	Pebbles and garvels in silty clayey matrix
	3.5																
	4															GW	Pebbles in sandy silty and clayey matrix
	4.5																
	5															GW	Pebbles in sandy matrix
	5.5																
	6															GW	Small pieces, pebbles of different colored rocks.
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI-PlasticityIndex, D-Dry Density, UC Unconfined Compression

Drilling by: Om Nepal | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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सिंहदरबार, काठमाडौं

BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B11	Co-ordinates:	N: 27° 51' 54'' E: 84°30'23''
Location:	-	Elevation (m):	1520m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	12.05.2019	Completion Date:	12.05.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Strata	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Selve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Thin layer of colluvium material on top of the alluvial deposit	0					5.3	46	38	16	21	21					SM	Light brown colored, fine grained, non cohesive, dry, fine grained sand with silt and clay
	0.6																
	1															GP	Boulders, pebbles of bluesih grey colored rock in sandy clayey matrix
	1.6																
	2															GP	Cobble, pebbles of grey colored rock in sandy silty matrix
	2.6																
	3															GP	Boulders, pebbles of bluesih grey colored rock
	3.6																
	4															GP	Boulders, pebbles of bluesih grey colored rock
	4.6																
	5															GW	Small pieces, smaller than 2cm in diameter of schist
	5.6																
	6															GW	Boulders, cobble, pebbles of bluesih grey colored rock
	6.6																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Paheri | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B12	Coordinates:	N: 27° 43' 57.77'' E: 83°49'17.18''
Location:	-	Elevation (m):	516m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	07.05.2019	Completion Date:	08.05.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Strata	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.6					10	11	48	41	20	20					SM	Light brown colored, non cohesive and dry, fine to medium grained sand and silt with some rock fragments
	1		12	20	30											GW	Small fragments(from 2cm to less than 6 cm) in diameter in sandy silty matrix
	2															SP	Small rock fragments but resembles highly weathered rock, clayey silty and sandy matrix, sand being dominant
	3															GW	Fragments of rock, pebble size, but the rock is highly weathered, the size ranges from less than a cm to 3 cm
	4		13	18	30	17	38	29	33	27	4.9					GW	Fragments of rock, pebble size, but the rock is highly weathered, the size ranges from less than a cm to 5 cm
	5															GW	Fragments of rock, pebble size, but the rock is highly weathered, the size ranges from less than a cm to 5 cm
Bed rock starts from 6m	6		25	47	45												Bed rock:Brown colored, highly weathered, fractured at places, fine to medium grained, sandstone
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI-Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B13	Co-ordinates:	N: 27° 45' 6.28'' E: 83°50'29.51''
Location:	-	Elevation (m):	1324m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	26.04.2019	Completion Date:	27.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0					5.3	38	45	17	21	1.4					SC	Top soil: Light brown in color, fragments of rock less than a cm in diameter, in sandy clayey matrix
	0.6																
	1															CL	Dark colored, slightly cohesive, slightly moist, clay with small fragments of rock
	1.6																
	2																
	2.6																
	3															GW	Small fragments of rock about 1.5cm in diameter, in brown colored, clayey sandy matrix
	3.6																
	4															GW	Pebbles, in light brown colored, slightly cohesive and slightly moist clayey silty matrix
	4.6																
	5															GW	Pebbles, in light brown colored, slightly cohesive and slightly moist clayey silty matrix
	5.6																
	6															GW	Pebbles, in light brown colored, slightly cohesive and slightly moist clayey silty, sandy matrix
	6.6																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Paheri | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No:	B15	Co-ordinates:	N: 27° 50' 11.20'' E: 84° 14' 29.11''
Location:	-	Elevation (m):	420m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	06.05.2019	Completion Date:	06.05.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Selve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.6					17	0.1	29	71	25	1.6					CL	Top soil: Redish colored, cohesive, dry, with some organic content, clay with silt
	1																
	1.5		10	13	18	12	35	42	23	29	5.6					CL	Reddish colored, cohesive clay with small pebble size pieces of rock fragments
	2																
	2.6															SC	Light red colored, cohesive, dry, clay with sand and small pieces of rock fragments
	3																
	3.5																Sludge sample: Cohesive, moist, reddish colored, clay with small amount of silt and sand
	4																
	4.5																Greyish and white colored, angular fragments, pebbles of rock
	5																
	5.5																Sludge sample|Non- Cohesive, moist, reddish colored, fine grained sand with silt and clay
	6																
	6.5																Greyish and white colored, angular fragments, pebbles of rock
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI-Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Pahari | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B14	Co-ordinates:	N: 27° 49' 22.30'' E: 83°53'44.45''
Location:	-	Elevation (m):	802m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	08.05.2019	Completion Date:	09.05.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Bed rock starts almost from ground level	0					8.5	56	40	17	14	0.3						
	0.5																Sludge sample: Light brown color, fine grained, non cohesive, sand formed by crushing of weathered quartzite
The rock is highly weathered quartzite which is crushed during drilling and forms sand	1																
	1.5																Sludge sample: Light brown color, fine grained, non cohesive, sand formed by crushing of weathered quartzite
	2																
	2.5																Sludge sample: Light brown color, fine grained, non cohesive, sand formed by crushing of weathered quartzite
	3																
	3.5																Sludge sample: Light brown color, fine grained, non cohesive, sand formed by crushing of weathered quartzite
	4																
	4.5																Pebbles size pieces of brown colored, crushed like, fine grained quartzite
	5																
	5.5																Cobbles, pebbles size of brown colored, moderately to highly weathered pieces of quartzite
	6																
	6.5																Cobbles, pebbles size of brown colored, moderately to highly weathered pieces of quartzite
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Paharl	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B16	Co-ordinates:	N: 27° 52' 23" E: 83°58'3.85"
Location:	-	Elevation (m):	309m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	29.05.2019	Completion Date:	30.05.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0					12	2.6	79	18	21	21					SM	Top soil of about a meter, almost maroon in color, fine grained, with little and very small framents of rocks, non cohesive, dry silty sand
	0.5																
	1		8	7	8											SW	Coarse grained, well graded, non cohesive, almost dry, sand
	1.5																
	2																
	2.5															SW	Greyish in color, medium to coarse grained, clean, non cohesive and dry sand
	3																
	3.5		10	8	8	11	1.79	68.8	29.5	22.8	22.8					SC	Greyish colored, medium to coarse grained, slightly cohesive and slightly moist, sand with small amount of clay
	4																
	4.5															SC	Greyish colored, medium to coarse grained, slightly cohesive and slightly moist, sand with small amount of clay
	5																
	5.5															SM	Dark brown in color, slightly cohesive and slightly moist, fine gained, sand with significant amount of clay and silt
	6																
	6.5		5	12	18											SM	Dark brown in color, slightly cohesive and slightly moist, fine gained, sand with significant amount of clay and silt
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, Li-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by:	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B17	Co-ordinates:	N: 27° 53' 54.05" E: 84°00'48.89"
Location:	-	Elevation (m):	1055m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	28.04.2019	Completion Date:	29.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Bed rock starts from almost ground level	0					9.4	48	35	16	23	1.8						Bed rock starts from the ground level and is highly weathered, fine grained, brownish grey colored phyllite
	0.5																
	1																Brownish colored, fine grained, highly weathered, small pieces of phyllite
	1.5																
	2																Phyllite grey colored, crushed like pieces, foliated, pebble size pieces
	2.5																
	3																Small pebble size pieces of pyllite, moderately to highly weathered, foliated, phyllite
	3.5																
	4																Small pieces of moderately to highly weathered, foliated, brown stains around the foliation plane, grey colored phyllite
	4.5																
	5																Cobble and pebbles size pieces of moderately to highly weathered, foliated, brown stains around the foliation plane, grey colored phyllite
	5.5																
	6																Grey colored, moderately to highly weathered, foliated, brown stains along the foliation plane, grey colored phyllite
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Paharl	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B18	Co-ordinates:	N: 27° 54' 28.55'' E: 84°3'2.32''
Location:	-	Elevation (m):	843m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	30.04.2019	Completion Date:	01.05.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water T.	USCS	DESCRIPTION OF STRATA
Bed rock from ground level	0					16	47	45	7.5	33	7.1						Very small crushed pieces of black colored with shiny foliation plane phyllite (almost coarse sand)
	0.5																
	1																Black colored, foliated and jointed, highly weathered in places, fine grained, phyllite
	1.5																
	2																Phyllite , blackish in color, with quartz vein, moderately weathered and fine grained
	2.5																
	3																Very small crushed pieces of black colored with shiny foliation plane phyllite (almost coarse sand)
	3.5																
	4																Slightly to moderately weathered, foliated, fine grained, with quartz vein, phyllite
	4.5																
	5																Very small crushed pieces of black colored with shiny foliation plane phyllite (almost coarse sand)
	5.5																
	6																Slightly to moderately weathered, foliated, fine grained, with quartz vein, phyllite
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC-Unconfined Compression

Drilling by:	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B19	Co-ordinates:	N: 27° 55' 56.66" E: 84°06'29.32"
Location:	-	Elevation (m):	881m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	26.04.2019	Completion Date:	27.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5					22	14	7	7	79	30	0.5				SW	Top soil about a meter, fine sand, non cohesive and dry
	1																
	1.5															GM	Cobble and pebble size pieces of highly weathered, phyllite in silty clayey matrix
	2																
	2.5															GM	Cobble of phyllite, highly weathered, almost as mudstone, and small weathhered pieces almost 2cm in daimeters
Bed rock starts from 3m	3																
	3.5																Dark colored , slightly to moderately weathered, fine grained, foliated phyllite
	4																
	4.5																Dark colored small pieces about 6-7cm in diameter of phyllite
	5																
	5.5																Dark colored , slightly to moderately weathered, fine grained, foliated phyllite
	6																
	6.5																Dark colored small pieces of phyllite
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, Pl- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B20	Co-ordinates:	27°55'40.70"N 84°10'6.56"E
Location:	-	Elevation (m):	1016m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	26.04.2019	Completion Date:	27.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Strata	Depth m	Legend	SPT "N" Count N1	N2	N3	Laboratory Test Result NMC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0					16	10	19	71	28	28						Very small pieces (Crushed pieces), highly weahered, light grey phyllite
	0.5																
	1		3	12	16												Light grey to light brown, highly weathered, fine grained, foliated, phyllite
	1.5																
Bed rock starts from 2m	2																Light grey color, moderately to highly weathered, fine grained, weak, phyllite
	2.5																
	3		37	>50		10	2.86	26.1	71	38.8							Dark grey colored, moderately to highly weathered, fine grained, weak, phyllite
	3.5																
	4																Light grey colored, moderately to highly weathered, fine grained, weak, phyllite
	4.5																
	5		15	19	39												Light grey colored, highly weathered, fine grained, weak, phyllite
	5.5																
	6																Brownish grey colored, highly weathered, fine grained, weak, phyllite
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B21	Co-ordinates:	N: 27° 55' 29.98" E: 84° 14" 48.89"
Location:	-	Elevation (m):	1055m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	01.05.2019	Completion Date:	27.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N-1	N-2	N-3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5					14	27	23	49	23	1.1					SM	Top soil: Reddish brown in color, medium to coarse grained sand with silt and clay
	1																
	1.5															GP	Cobble, gravel and pebble of phyllite in silty clayey matrix
	2																
	2.5															GW	Pebbles and small fragments of phyllite
	3		6	6	10	15.5	16.4	11.2	72.4	38.8	9.46					CL	Dark colored phyllite, moderately weathered, pieces of phyllite in brown colored silty clay
	3.5																
	4																
	4.5															CL	Brown colored, cohesive and moist clay in the upper part and dark colored, very small pieces of highly weathered phyllite in the lower section
	5		10	15	15												The bed rock is moderately to highly weathered, dark colored, crushed sample of phyllite
Bed rock starts from 5m	5.5																
	6																
	6.5																The bed rock is moderately to highly weathered, dark colored, crushed sample of phyllite
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by:	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B22	Co-ordinates:	N: 27° 50' 5.17" E: 84° 33' 20.8"
Location:	-	Elevation (m):	278m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.50m
Starting Date:	10.03.2019	Completion Date:	11.03.2019

SPT with Soil Core:

SPT Core Loss:

UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																Top soil (50cm)- Light grey colored fine to coarse grained with very small rock fragments
	0.5					12	37	22	41	29	3.3						Cobbles, pebbles and smaller fragments of of whitish colored rock fragments
	1																
	1.5																
	2		13	19	20		38.4	38	23.6	33.2	6.27						Cobbles and pebbles size pieces of whitish colored rock fragments in clayey silty matrix
	2.5																
	3																
	3.5																Pebbles and smaller fragments of whitish with grey colored rock
	4		>50														
	4.5																Pebbles and gravels size fragments of greyish colored rock in sandy clayey matrix
	5																
	5.5																Sludge sample: Greyish colored, fine to medium grained, slightly cohesive and slightly moist sand
	6																
Bed rock starts from 5m, but is highly weathered and highly foliated phyllite/schist, hence were unable to take sample out and sludge sample is collected	6.5																Sludge sample: Greyish colored, fine to medium grained slightly cohesive and slightly moist sand
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Om Nepal	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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सिंहदरबार, काठमाडौं

BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B25	Co-ordinates:	N: 27° 56' 50.50" E: 84° 18' 46.64"
Location:	-	Elevation (m):	793m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	10.03.2019	Completion Date:	11.03.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water T.	USCS	DESCRIPTION OF STRATA
	0																
	0.5					16				32	7.5					CL	Small pebbles and smaller fragments of phyllite and quartz covered in brown colored clay with some organic compounds
Bed rocks starts from depth of a meter	1		7	19	33												Highly weathered, fine grained, greenish grey colored phyllite boulders
	1.5																
	2																
	2.5																
	3		13	15	14												Small boulders of phyllite but highly weathered, hence resembles soil
	3.5																
	4		10	15	15												Sludge sample: Fine to medium grained grey to greenish grey colored sand SPT sample: Highly weathered, greenish grey colored, fine grained, small pebbles of phyllite
	4.5																
	5																
	5.5																
	6																
	6.5																Sludge sample: Fine to medium grained grey to greenish grey colored sand Barrel sample: Highly weathered, greenish grey colored, fine grained, small fragments of phyllite, with a small pebble of phyllite
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Om Nepal	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B26	Co-ordinates:	N: 27° 34.472' E: 83° 41.269'
Location:	-	Elevation (m):	79m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	27.02.2019	Completion Date:	28.02.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5					22		20	80	25							Top soil: Reddish colored, silty clay with some organic compounds, cohesive and slightly moist
	1		10	12	15												
	1.5																A bit brownish red colored, slightly moist and slightly cohesive silty clay
	2		5	8	10												
	2.5																A bit brownish red colored, slightly moist and slightly cohesive silty clay
	3		6	9	10	15.9	2.79	22.6	74.6	38.6	4.48						
	3.5																A bit brownish red colored, slightly moist and slightly cohesive silty soil with very small amount of fine sand
	4		7	8	10												
	4.5																A bit brownish red colored, slightly moist and slightly cohesive silty soil with very small amount of fine sand
	5		15	25	30												
	5.5																Red colored, with yellow pigments, cohesive and slightly moist reddish to reddish brown colored silty clay and fine sand
	6		16	26	33												
	6.5																Red colored, with yellow pigments, cohesive and slightly moist reddish to reddish brown colored silty clay and fine sand with very small quartz pieces
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, Pl: Plasticity Index, D:Dry Density, UC Unconfined Compression

Drilling by: Om Nepal	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manandhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B27	Co-ordinates:	N: 27° 55' 05" E: 84° 21' 33"
Location:	-	Elevation (m):	532m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	21.04.2019	Completion Date:	22.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Salve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5					11	28	33	39	24	2.8					GP	Dark grey in color with small bits of rocks in soil. The soil is coarse grained, dry and non cohesive in nature with some organic compounds.
	1		10	10	11												
	1.5															GW	Reddish and brown grey in color with pebbles size pieces of rocks in clayey sandy matrix The sand is coarse grained
	2																
	2.5															GM	Cobble, pebble and small fragments of rock in clayey sandy matrix. The colour of the matrix is light brown and is coarse grained.
	3																
	3.5															GC	Reddish brown in color, slightly cohesive, slightly moist, silty clay and sand. Small fragments of rock is present but the clay portion is dominant than others.
	4																
	4.5															GW	Pebbles and gravels size fragments of greyish colored rockfragments(mostly the rock fragments are a cm or less in diameter)
	5																
	5.5															GP	Cobbles, pebbles and gravels of grey colored rock fragments. (The sludge sample is metalic black in color and is medium grained sand)
	6																
	6.5		5	6	20												
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Om Nepal	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B28	Co-ordinates:	N: 27° 53' 09.68" E: 84° 24' 08.13"
Location:	Kallery, Tanahu	Elevation (m):	1077m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	29.04.2019	Completion Date:	30.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5					21	17.31	14.13	68.56	48.2	7.3					CL	Top soil; About 70 cm of reddish brown, silty clay with organic content From 0.70-1.00m: pebbles about 3cm in diameter 5 pieces
	1																
	1.5															GW	Very small angular pebbles less than 1 cm in diameter in silty clayey matrix
	2		5	7	9	15.4	17.61	55.99	26.4	29.2	0.95						
	2.5															GW	Bluish grey colored small fragments, pebbles of rock about 1.5 cm in diameter in sandy clayey matrix
	3																
	3.5																Sludge sample: Blusih brown colored fragments like coarse grained sand
	4		5	7	9												
	4.5															GW	Bluish grey colored small fragments, pebbles of rock about 1.5 cm in diameter
	5		9	16	25												
	5.5																Small fragments bluish grey pebbles in clayey, silty matrix (a bit of sand)
	6																
	6.5															GW	Almost clean small pebbles about 1.5 cm in diameter ,
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Om Nepal	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B29	Co-ordinates:	N: 27° 51' 54" E: 84°30'23"
Location:	-	Elevation (m):	1520m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	26.04.2019	Completion Date:	27.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Bed rock starts from 0.5m the ground level	0					6.6	41	36	23	21	0.7					SM	Very small pieces of rock in coarse and medium grained sand with very little silt and clay. The material is non cohesive and dry.
	0.5																Gravel and pebbles size pieces of the rock fragments
	1		30	>50													Sludge sample: Grey colored, medium to coarse grained clean sand SPTsample : Pebbles or very small pieces of highly foliated, highly jointed, moderately strong to soft schist
	1.5																
	2																
	2.5																Sludge sample: Grey colored, medium to coarse grained clean sand
	3																
	3.5		10	>50		3.16	16.1	55.6	28.3	26.8	2.45						Sludge sample: Grey colored, medium to coarse grained clean sand SPT sample : Light grey colored, slightly cohesive, lumps of very fine to medium grained fines(sand and clay mix), Highly weathered bedrock??
	4																
	4.5																Small pieces, smaller than pebbles of schist Sludge sample: Grey colored, medium to coarse grained clean sand
	5																
	5.5																Small pieces, smaller than 2cm in diameter of schist
	6																
	6.5																Small pieces, smaller than 2cm in diameter of schist
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Om Nepal	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B30	Co-ordinates:	N: 27° 50' 5.17" E: 84° 33' 20.8"
Location:	-	Elevation (m):	278m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.50m
Starting Date:	10.03.2019	Completion Date:	11.02.2019

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	SPT with Soil Core / SPT Core Loss / UD Sample	DESCRIPTION OF STRATA
	0					6.3	49	38	14	23	4.6							Top soil: Brown colored with very small fragments of sediments around a cm in diameter with littles fine
	0.5																	Cobbles and pebbles size pieces of grey colored quartzite and metasandstone
	1																	
	1.5																	Cobbles and pebbles size pieces of grey colored quartzite and metasandstone in sandy clayey matrix
	2																	
	2.5																	
	3																	Cobbles and pebbles size pieces of grey colored quartzite and metasandstone in sandy clayey matrix Sludge sample shows coarse grained sand
	3.5																	
	4																	Gravel, pebbles of grey colored metasandstone in sandy matrix Sludge sample shows medium to coarse grained, non cohesive sand
	4.5																	
	5																	Pebbles of grey grey colored metasandstone in sandy matrix
	5.5																	
	6																	Pebbles of grey grey colored metasandstone in sandy matrix
	6.5																	
	7																	

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, Pl- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: OM Nepal	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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सिंहदरबार, काठमाडौं

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B31	Co-ordinates:	N: 27° 48' 1.91" E: 84° 38' 52.84"
Location:	-	Elevation (m):	79m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.50m
Starting Date:	25.02.2019	Completion Date:	26.02.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth m	Legend	SPT 'N' Count N:1	N:2	N:3	Laboratory Test Result NMC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5					9.3	47	38	15	32	4.1					ML	Top soil:Brown in color, with organic compound, dry, clay with silt and small bits of rock fragments
	1		14	28	28												very small bits of greenish and brown colored highly weathered phyllite pieces
	1.5																
	2																
	2.5																Very small bits around 1-2cm in diameter green colored phyllite with pieces of white colored quartz
	3		5	10	13	11.1	13.3	38.9	47.8	28.8	1.84						Small bits of green colored phyllite less than a cm in diameter SPT sample: Lumps of clay like highy weathered rock, cohesive and slightly moist
	3.5																
	4																Pebbles and smaller pieces of bluish and greenish colored schist and pieces of quartz
	4.5																
Bed rock starts from 5m	5																Moderately to highly weathered, Foliated, jointed and fractured into small pieces of bluish green colored schist with small pieces of quartz
	5.5																
	6																
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Finer, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Om Nepal	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG Sheet::

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: BH-32
Location: Dhading
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 19th February 2019

Co-ordinates: 27° 46' 35.1", 084° 41' 31.9"
Elevation (m): 537
Water Table (m): None
Total Drilled Depth (m): 7.00m
Completion Date: 19th February 2019

SPT core loss: SPT with soil core: UD Sample:

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NWC	Sel-e G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Top soil sandy silty soil																	0.00-0.50, Top soil brownish grey in color, rich in organic compounds, almost dry with small pebbles
Bed rock starts from 0.50m	1																0.50-1.00 Bed Rock: Light grey in color, slightly to moderately weathered, foliated and jointed, fractured at places, fine grained, moderately strong phyllite
	2																1.00-2.00, Highly fractured, very small pieces of phyllite with white bands and darker colored foliation with brown stains
	3																Highly to completely weathered, fine grained, foliated phyllite Highly weathered - (2.50-3.00m)
	4																Highly to completely weathered, fine grained, foliated, soft to moderately strong phyllite
	5																
	6																Slightly to moderaterely weathered, thinly foliated with shiny dark foliation plane with brown stains, fractured, fine grained phyllite
	7																

Bore hole terminated at 7.00m

Legends
Top soil, sandy, silty pebbly soil
Phyllite

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, Pl-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Om Nepal | Logged by : Krishna Pudasaini | Checked by: Dr. Suman Manandhar | I.C.G.S. Pvt. Ltd.

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2000

BOREHOLE LOG Sheet::

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: BH-33
Location: Mohoriya, Dhading
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 6th March 2019

Co-ordinates: 27° 46' 56.54", 084° 47' 29.11"
Elevation (m): 915
Water Table (m): None
Total Drilled Depth (m): 7.00m
Completion Date:7th march 2019

SPT core loss: SPT with soil core:
UD Sample:

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NWC	Sieve G	S	F	Atterberg LL	PI	D	WD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Top soil is 40 cm	1		7	8	10	23.49	0.14	59.69	13.17	17.60	0.52					SM	0.00-0.40cm- Top soil, dark colored , slightly moist, non cohesive, sand and clay 0.40-1.00 Boulder cobbles of brownish colored, highly weathered limestone with white lines
	2															SC	Boulder cobbles of brownish colored, highly weathered limestone with white lines
	3																
The rock could not be conformed as bed rock but is highly weathered	4																Boulder cobbles of brownish colored, highly weathered, highly fractured limestone with white lines
	5																
	6																
	7																Boulders and cobbles of brown colored, highly weathered, fractured, limestone with white lines Good core recovery

Bore hole terminated at 7.00m

Legends
- Top soil, silty clayey sand
- Boulders, cobbles, pebbles of limestone

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Om Nepal | Logged by : Krishna Pudasaini | Checked by: Dr. Suman Manandhar | I.C.G.S. Pvt. Ltd.

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BOREHOLE LOG Sheet::

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: BH-34
Location: Dhading
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 21th February 2019

Co-ordinates: 27° 47' 41.5", 084° 50' 13.9"
Elevation (m): 384
Water Table (m): None
Total Drilled Depth (m): 7.00m
Completion Date:21th February 2019

SPT core loss: ◿ SPT with soil core: ◢
UD Sample: ▮

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NAC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Top soil sandy silty soil	1		7	8	10	15.19	1.05	41.43	41.52	27.15	4.50					SV	0.50-1.00Brownish red colored, coarse grained with small pebbles, slightly moist top soil
	2															SC	1.00-2.00. Brownish grey colored, coarse grained, moist, with a bit of clay sandy soil
	3		5	8	13											SP	Sand with small pebbles of about 1cm in length, the ratio of pebbles and sand is almost equal
	4		10	12	15	2.09	48.80	36.90	13.30	25.30	75.90					SP	Coarse grained sand with little clay and small pebbles in it. The sand is dominant and well graded
	5		10	>50													
	6															SP	Gravel to cobble size pieces in sandy silty matrix. The matrix is sand which is moist and well graded
	7																

Bore hole terminated at 7.00m

Legends
- Top soil, sandy, silty clayey soil
- Sand with pebbles

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, PI-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Om Nepal	Logged by : Krishna Pudasaini	Checked by: Dr. Suman Manandhar	I.C.G.S. Pvt. Ltd.

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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

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BOREHOLE LOG Sheet::

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: BH-35
Location: Dhading
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 16th February 2019

Co-ordinates: 27° 48' 26.1", 084° 51' 16.5"
Elevation (m): 358
Water Table (m): None
Total Drilled Depth (m): 7.00m
Completion Date:16th February 2019

SPT core loss: SPT with soil core:
UD Sample:

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NWC	Sel.e G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
No clear boundary of top soil and sub soil	1					4.42	4.8	34.1	60.8	19.58	6.59					SC	0.00-1.00m Reddish brown colored, dry, non cohesive, coarse garined sand with almost the same percentage of clay
	2		20	25	29											SC	1.00-2.00, Brownish grey colored, coarse grained, moist, with a bit of clay sandy soil
Claydominant with negligible amount of sand in this portion	3		10	18	15											CL	Reddish brown colored, cohesive, little moist, lumb of clay with sand and silt
	4		5	15	20	20.25		17.83	42.17	34.36	3.36						
	5		5	14	20											VH	Clay, reddish brown in color, cohesive, little moist but small visible sand particles
	6		12	16	23											SC	Gravel size pieces of rock in fine grained, semi cohesive, sand and clay mixture
	7		14	20	25											SC	Clay with fine garined sand, grey in color in the upper section (6.00-6.50) and fine to medium grained (poorly graded) sand in the lower portion

Bore hole terminated at 7.00m

Legends
- Clayey sandy soil
- Clayey sand with Gravel

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Om Nepal | Logged by : Krishna Pudasaini | Checked by: Dr. Suman Manandhar | I.C.G.S. Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B36	Co-ordinates:	N: 27° 34.472' E: 83° 41.269'
Location:	"	Elevation (m):	79m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	27.02.2019	Completion Date:	28.02.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Strata	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
The bed rock starts from 1m	0					11	25	21	54	19	2.8					SC	Top soil- Brown colored with medium to coarse grained sand with very small fragments of rocks, and the material is non cohesive and dry
	0.5																
	1																Bed rock: Slightly to moderately weathered, highly foliated and jointed bedrock quartzite with calcareous partings. (But only sludge sample has been collected)
	1.5																
	2																
	2.5																
	3																Pebble size pieces of grey colored, moderately weathered, highly jointed and crushed like with leaching and with infilling, quartzite with calcareous parting
	3.5																
	4																
	4.5																Grey colored, coarse grained sand size pieces of the rock taken from sludge sample
	5																
	5.5																
	6																Small pebbles of the sample along with sludge sample and mentioned above
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Om Nepal	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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सिंहदरबार, काठमाडौं

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No:	B37	Co-ordinates:	N: 27° 51' 04.1" E: 85°02'26.2"
Location:	-	Elevation (m):	472m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	26.04.2019	Completion Date:	27.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Bed rock starts from 0.5m the ground level	0																Very small pieces of rock in coarse and medium grained sand with very little silt and clay. The material is non cohesive and dry.
	0.5																Very small pieces of silver grey colored, seems like a coarse garined sand, but are crushed pieces
	1																
	1.5																Sludge sample: Grey colored, medium to coarse grained clean sand SPTsample : Pebbles or very small pieces of highly foliated, highly jointed, moderately strong to soft schist
	2		6	9	16												
	2.5																Sludge sample: Grey colored, medium to coarse grained clean sand
	3		4	2	1	16.5		81.5	18.6								Sludge sample: Grey colored, medium to coarse grained clean sand SPT sample : Light grey colored, slightly cohesive, lumps of very fine to medium grained fines(sand and clay mix), Highly weathered bedrock??
	3.5																
	4																
	4.5		2	2	3												Small pieces, smaller than pebbles of schist Sludge sample: Grey colored, medium to coarse grained clean sand
	5																
	5.5		10	17	22												Small pieces, smaller than 2cm in diameter of schist
	6																
	6.5																Small pieces, smaller than 2cm in diameter of schist
	7																

Abbreviation: NMC Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Paharl | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B38	Co-ordinates:	N: 27° 51' 6.01" E: 85°3'5.80"
Location:	-	Elevation (m):	487m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	26.04.2019	Completion Date:	27.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Location on top of alluvial terrace	0																
	0.5					13	4.9	13	82	28	13					CL	Top soil: Red colored, cohesive and slightly moist, clay with silt and sand
	1		10	17	19												
	1.5															GW	Cobbles of black and white colored granite in Sandy clayey matrix
	2		47	>50													
	2.5															SC	Reddish colored, slightly cohesive and slightly moist, fine to medium grained sand with clay
	3		45	>50		20	16.7	53.4	30	23.1	23.1					GP	Cobbles and pebbles of rounded and sub rounded, whitecolored granite in sandy clayey matrix
	3.5																
	4		>50														
	4.5															GP	Cobbles and pebbles of rounded and sub rounded, whitecolored granite in sandy clayey matrix
	5																
	5.5															GP	Cobbles and pebbles of rounded and sub rounded, white colored and grey colored, granite and quartzite in sandy matrix
	6																
	6.5															GP	Cobbles and pebbles of rounded and sub rounded, white colored, granite in sandy matrix
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI: Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shyam Bhattarai | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	839	Co-ordinates:	N: 27° 51' 3.94" E: 85°3'8.89"
Location:	-	Elevation (m):	479m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:		Completion Date:	

SPT with Soil Core:

SPT Core Loss:

UD Sample:

General Description of Strata	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterbers LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0					10	0.5	30	70	23	1.3					CL	Dark red in color, fine grained, slightly cohesive and dry, clay with fine sand
	0.5																
	1		5	7	5											CL	Dark red in color, cohesive, moist, clay with silt
	1.5																
	2		9	6	7											CL	Red in color, highly cohesive, moist clay with small fragments of quartz
	2.5																
	3		10	9	43	21.5	1.57	24.4	74.1	34	6.14					CL	Red in color, highly cohesive, moist clay with very small rock fragments mainly of quartz and phyllite
	3.5																
	4															CL	Red in color, cohesive, moist, clay
	4.5																
	5															CL	Red in color, cohesive, moist, clay with very small amount of silt
	5.5																
	6															CL	Red in color, cohesive, moist, clay with very small amount of silt
	6.5																
	7		19	25	30												

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shyam Bhattarai | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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STANDARD GEOTECHNICAL INTERNATIONAL LLC 2000

BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B40	Co-ordinates:	N: 27° 50' 46.2" E: 85°03'25.3"
Location:	-	Elevation (m):	577
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	21.04.2019	Completion Date:	22.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Bedrock strata from 20-25cm, but highly weathered	0					16	44	24	32	28	1.3						About 50 cm of top soil, which is reddish in color with very small rock fragments
	0.5																
	1		20	27	33												Very small size pieces of the rock fragments (almost sand like), bed rock being highly weathered, foliated soft phyllite
	1.5																
	2		17	22	29	14.1	8.99	71.1	19.9	22.6	22.6						Coarse grained sand like, small crushed pieces of highly weatered phyllite
	2.5																
	3																Coarse grained sand like, small crushed pieces of highly weatered phyllite
	3.5																
	4																
	4.5																
	5		19	28	34												Pebbles of greyish colored, highly weathered, foliated, fine grained, soft phyllite
	5.5																
	6																Greyish colored, pebbles size, foliated, jointed, with grey stains in foliation plane with quartz veins phyllite
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC-Unconfined Compression

Drilling by: Shrawan Pahari	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B41	Co-ordinates:	N: 27° 51' 01.9" E: 85°06'33.4"
Location:	-	Elevation (m):	820
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	26.04.2019	Completion Date:	27.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0					13	14	50	36	25	25						Top soil: Light brown in color, fragments of rock less than a cm in diameter, in sandy clayey matrix
	0.5																
	1																Dark colored, slightly cohesive, slightly moist, clay with small fragments of rock
	1.5																
	2																
	2.5																
	3		10	>50		14.9	7.4	62.5	30.1	30.1	14.8						Small fragments of rock about 1.5cm in diameter in brown colored, clayey sandy matrix
	3.5																
	4																Pebbles, in light brown colored, slightly cohesive and slightly moist clayey silty matrix
	4.5																
	5		8	7	9												Pebbles, in light brown colored, slightly cohesive and slightly moist clayey silty matrix
	5.5																
	6																Pebbles, in light brown colored, slightly cohesive and slightly moist clayey silty, sandy matrix
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Pahari	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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STANTEC INTERNATIONAL 2000

BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B42	Co-ordinates:	N: 27° 52' 26.25" E: 85° 09' 24.11"
Location:	-	Elevation (m):	750
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	10.03.2019	Completion Date:	11.02.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Selve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Bed rock starts from 0.00 m but the rock is highly weathered hence the sample is all crushed and collected from sludge	0					11	23	32	45	31	5.1						Reddish colored, medium to coarse grained sand and silty soil
	0.5																
	1																Sludge Sample: Orange to brown colored, with medium to coarse grained, slightly cohesive and slightly moist, sand with small amount of clay Bedrock is weathered, foliated phyllite
	1.5																
	2																
	2.5																
	3																Sludge Sample: Orange to brown colored, with medium to coarse grained, slightly cohesive and slightly moist, sand with small amount of clay
	3.5																
	4																
	4.5																Orange to brown colored, with medium to coarse grained, slightly cohesive and slightly moist, sand with small amount of clay
	5																
	5.5																Orange to brown colored, with medium to coarse grained, slightly cohesive and slightly moist, sand with small amount of clay
	6																
	6.5																Orange to brown colored, with medium to coarse grained, slightly cohesive and slightly moist, sand with small amount of clay
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, Pl- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Pahari	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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सिंहदरबार, काठमाडौं

INTERNATIONAL STANDARDS 2000

BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B43	Co-ordinates:	
Location:	-	Elevation (m):	
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	24.04.2019	Completion Date:	25.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Bed rock starts form 50cm	0					14	43	21	36	27	4						Brown in color, fine grained, dry, non cohesive, sand with clay
	0.5																Bed rock starts, highly weathered, pieces of phyllite
	1																
	1.5																Very small pieces of, highly weathered, fine grained and foliated, phyllite
	2																
	2.5																Sludge Sample: Fine to medium grained, brown colored, sand size pieces of the bed rock
	3																
The rock is highly weathered and has brown colored coating of the fine material formed during the drilling process	3.5																Fragments of the rock about 4cm in diameter, foliated, greyish colored, brown colored coating, quartz veins along the foliation plane, highly weathered phyllite
	4																
	4.5																
	5		18	27	36												
	5.5																Small pieces, smaller than 2cm in diameter of phyllite
	6																
	6.5																
	7																

Abbreviation: NMC Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Pahari	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.: B44
Location: -
Bearing of Hole:
Drilling Type: Rotary Wash Boring
Starting Date: 15.04.2019
Co-ordinates: N: 27° 36' 42.09" E: 83°42'28.10"
Elevation (m): 147m
Water Table (m):
Total Drilled Depth (m): 7.00m
Completion Date: 15.04.2019

SPT with Soil Core:
DCPT:
UD Sample:

General Description of Strata	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5					6.6		16.17	83.83	19.4	0.7					CL	Top soil: Light brown color, slightly cohesive, dry, clay with silt
	1																
	1.5															CL	Dark grey colored, slightly moist and slightly cohesive, with organic compounds, clay with silt
	2																
	2.5															CL	Light brownish colored, moist, cohesive, fine grained, clay with silt
	3																
	3.5		8	13	14	29.7		23.49	76.51	19.18	19.15	0.03				SW	Dark grey colored, slightly moist , non cohesive, medium grained sand with small size pebbles of rock fragments
	4																
	4.5		8	22	22											SW	Dark grey colored, slightly moist , non cohesive, medium grained sand with small size pebbles of rock fragments(dia- less than 2cm)
	5																
	5.5		50/35													CL	Dark grey colored, slightly cohesive and moist, clay with silt and fine sand
	6																
	6.5															GW	Pebbles of grey colored, rounded to subrounded lime stone and sandstone in sandy matrix
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Om Nepal | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B4S	Co-ordinates:	N: 27° 51' 39.4" E: 84°18'40.8"
Location:	-	Elevation (m):	725m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	12.04.2019	Completion Date:	12.04.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Selve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Bed rock starts from 0.5m the ground level	0					10	3.7	77	20								Coarse to medium grained whitish colored black and white mixed sand.
	0.5																White and black colored, highly weathered, coarse grained, massive gneiss
	1		14	>50													White and black colored, highly weathered, coarse grained, massive gneiss
	1.5																
	2																White and black colored, highly weathered, coarse grained, massive gneiss
	2.5																
	3		8	>50													White and black colored, highly weathered, coarse grained, massive gneiss
	3.5																
	4																White and black colored, highly weathered, coarse grained, massive gneiss
	4.5																
	5																White and black colored, highly weathered, coarse grained, massive gneiss
	5.5																
	6																White and black colored, highly weathered, coarse grained, massive gneiss
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Paharl	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

BOREHOLE LOG | Sheet:: 1 of 1

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: BH-46
Location: Jyamire
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 20th January 2019

Co-ordinates: 27° 51' 07.9", 085° 25' 25.6"
Elevation (m): 1252m
Water Table (m):
Total Drilled Depth (m): 7.00m
Completion Date: 29th Jan 2019

SPT core loss: SPT with soil core: UD Sample:

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NWC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Top sil with sandy silty soil with pebbles and boulder in sandy silty clayey matrix with decreasing proportion of fines						2.39		4.83	2.33							SC	0.00-0.25m, Dry medium to loose dense sandy silty clayey soil with occassional pebbles
																GC	0.25 to 1.50m dry medium dense greyish brown sandy, silty clayey soil with boulder, gravel and pebbles in sandy silty clayey matrix.
	2																SPT at 1.50-1.70m N1=20, N2>50, Only 20cm of penetration
Bouldary gravelly layer with sandy silty matrix with domination of boulder gravel and pebbles																SC	1.70-2.50m boulder and gravel in sandy silty matrix, the sludge sample consists of coarse to medium grained sand 2.50-3.00m sandy silty clayey starta with occassional peebles and gravel
	3																
																	3.45m-4.50 m Boulder of genelss in sandy silty matrix
	4															SM	SPT at 4.50-4.95m N1=5, N2=10 N3=29, moist dense, yellowish grey medium to coarse grained sandy silty clayey soil
Bouldary layer with sandy silty matrix																GP	Boulder of gneiss in sandy silty clayey matris, the diameter of boulder ranges up to 25cm. The slope scree material is of colluvial nature
	6																
	7																

Bore hole terminated at 7.00m

Legends
- Top soil, sandy, silty clayey soil with pebbles
- Colluvial boulder gravel pebbles in sandy silty matrix

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, PI-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Om Nepal	Logged by : Krishna Pudasaini	Checked by: Dr. Suman Manandhar	I.C.G.S. Pvt. Ltd.

नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

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BOREHOLE LOG Sheet::

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: BH-47
Location: Salme (Haibung) Sindupalchok
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 2nd February 2019

Co-ordinates: 27° 49' 19.5", 085° 29' 0.80"
Elevation (m): 1323m
Water Table (m): None
Total Drilled Depth (m): 7.00m
Completion Date: 3rd February 2019

SPT core loss: △ SPT with soil core: ◭
UD Sample:

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NWC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Top soil sandy silty soil						12.90	23.15	34.67	42.22	33.3	4.45					SM	0.00-0.50, Top soil brown to reddish cultivated soil
The soil observed resembles residual soil but the affect of successive cultivation could be observed	1		5	5	9											SM	0.50-1.00 Redddish, medium to coarse grained, moist, less cohesive sand with less fines 1.00-2.00, Reddish in color, cohesive, moist soil with little clay
	2 3		6	15	20											SC	Reddish in color, non cohesive, fine to medium grained sand
	4		10	14	16											SC	Reddish in color, non cohesive, fine to medium grained sand with little clay
	5		12	14	22												
	6		10	13	23											SC	Reddish in color, moist and dry, cohesive clay with fine grained sand
	7		12	12	25											SC	13cm- recovery is reddish colored, cohesive, moist to wet clay 30cm- recovery is reddish to brown, non cohesive, moist to dry, silty sand with clay

Bore hole terminated at 7.00m

Legends
Top soil, sandy, silty clayey soil
Fines

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Om Nepal | Logged by : Krishna Pudasaini | Checked by: Dr. Suman Manandhar | I.C.G.S. Pvt. Ltd.

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BOREHOLE LOG Sheet::

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: BH-48
Location: Lapsiphedi
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 6th February 2019

Co-ordinates: 27° 45' 35.9", 085° 30' 47.9"
Elevation (m): 432m
Water Table (m):
Total Drilled Depth (m): 7.00m
Completion Date: 7th February 2019

SPT core loss: SPT with soil core:
UD Sample:

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NWC	Selve G	S	F	Alterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Top soil with sandy silty soil with pebbles	1					10.85	3.04	3.91	5.99	27.5	17.5					SM	0.00-01m, Top cultivated soil, light grey in color fine to medium grained sandy soil with very small fragments of granite
	2															SP	1.20-2.00m Small pebbles of granite in medium to coarse grained sand (the sand particles are almost of same size)
	3															SP	Moist to dry, dark in color, medium to coarse grained sand with very small pebbles of granite(highly weathered)
Gravels and pebbles of granite is dominant in the sediment(sand)	4		10	14	25										NA	SP	3.00-5.00m Moist, non cohesive, medium to coarse grained sand with very small pebbles of granite
	5		15	>50													
The bed rock couldn't be conformed with just 2m depth of drilling	6																Black with white pigments, slightly to moderately weathered, medium to coarse grained, Jointed and fractured, cobble to pebble size pieces of granite (Bed rock??)
	7																

Bore hole terminated at 7.00m

Legends
- Top soil, sandy, silty clayey soil with pebbles
- Colluvial boulder gravel pebbles in sandy silty matrix

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, LH-Liquid Limit, PI-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Om Nepal	Logged by : Krishna Pudasaini	Checked by: Dr. Suman Manandhar	I.C.G.S. Pvt. Ltd.

नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B49	Co-ordinates:	N: 27° 44' 43.65" E: 85°30'18.10"
Location:	-	Elevation (m):	1652m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:		Completion Date:	

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	SPT with Soil Core: / SPT Core Loss: / UD Sample: DESCRIPTION OF STRATA
	0		6	7	8	17	0.5	69	30	33	4.4					SW	Top soil about 1m, soil is dark red in color, slightly cohesive, slightly moist, fine sand with silt and clay
	0.5																
	1		8	9	13											SP	Yellowish brown in color, poorly graded, non cohesive and almost dry, fine to medium grained sand with silt and clay
	1.5																
	2		9	16	18											SW	Dark colored, medium to coarse grained, non cohesive, dry, well graded, clean sand
	2.5																
	3		25	43	>50	18.8	0.05	98.2	1.72							SP	Reddish colored at one end and whitish colored sand in one end, the sand is medium to coarse grained and seems like the remenants of weathered granite
	3.5																
	4		11	12	15											SW	Reddish and dirty brown in color, poorly graded, slightly cohesive and slightly moist, sand with silt and clay
	4.5																
	5		19	23	31											SP	Whitish and black colored, with visible grains of quartz and micas, poorly graded, sand
	5.5																
	6		14	26	31											SP	Whitish and black colored, with visible grains of quartz and micas, poorly graded, sand
	6.5																
	7		43	>50													

Abbreviation: NMC.Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shyam Bhattarai | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.: B50
Location: -
Bearing of Hole:
Drilling Type: Rotary Wash Boring
Starting Date:

Co-ordinates: N: 27° 44' 41.87" E: 85°30'16.08"
Elevation (m): 1659m
Water Table (m):
Total Drilled Depth (m): 7.00m
Completion Date:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	SPT with Soil Core / SPT Core Loss / UD Sample — DESCRIPTION OF STRATA
	0					20	0.5	40	59	34	34					CL	Top soil about 80cm of the first one meter, soil is dark red in color, slightly cohesive, slightly moist, fine sand with silt and clay
	0.5																
	1		4	6	8											SP	Reddish in color, well graded, non cohesive and almost dry, fine to medium grained sand with silt
	1.5																
	2		4	12	12											SP	Reddish in color, well graded, non cohesive and almost dry, medium to coarse grained sand with silt
	2.5																
	3		9	20	25											SP	Reddish in color, well graded, non cohesive and almost dry, medium to coarse grained sand with silt
	3.5																
	4		10	19	21											SW	Reddish colored at one end and whitish colored sand in one end, the sand is medium to coarse grained and seems like the remenants of weathered granite
	4.5																
	5		15	32	19											SW	More whitish than red, visible grains of quartz and micas, coarse grained, well graded sand
	5.5																
	6		>50													SW	More whitish than red, visible grains of quartz and micas, coarse grained, well graded sand
	6.5																
	7		>50														

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shyam Bhatterai | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

नेपाल सरकार
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सिंहदरबार, काठमाडौं

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	51	Co-ordinates:	N: 27° 50' 5.17" E: 84° 33' 20.8"
Location:	-	Elevation (m):	278m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	10.03.2019	Completion Date:	11.02.2019

SPT with Soil Core: ◭ SPT Core Loss: ◿ UD Sample: ▯

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0 – 1					8.6	31	24	45	22	22						Top soil: Ash grey colored, fine to medium grained, non cohesive, dry sand
Bed rock starts from 1m but since the rock is highly weathered and thinly foliated phyllite, the rock is crushed and only obtained as sludge	1 – 3																Sludge Sample: Grey colored fine grained, moist, non cohesive sand But the rock is highly weathered, thinly foliated, grey colored, with shiny foliation plane, phyllite
	3 – 5																Sludge Sample: Grey colored fine grained, moist, non cohesive sand But the rock is highly weathered, thinly foliated, grey colored, with shiny foliation plane, phyllite
	5 – 7																Sludge Sample: Grey colored fine grained, moist, non cohesive sand But the rock is highly weathered, thinly foliated, grey colored, with shiny foliation plane, phyllite

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Pahari | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	852	Co-ordinates:	N: 27° 46' 25.74" E: 85° 1' 56.43"
Location:	-	Elevation (m):	525m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	09.03.2019	Completion Date:	12.03.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0																
	0.5					7.6	57	25	18	17	17					SC	Top soil: Brownish colored, very rich in organic compound, little moist, slightly cohesive, clay with fine sand
	1																
	1.5																Boulders, cobbles and pebbles of whitish colored metasandstone and quartzite
	2																
	2.5		5	10	18	21.6	0.89	95.8	3.37								Sludge sample: White colored, medium to coarse grained sand, with very small amount of clay
	3																
	3.5																Boulders, cobbles and pebbles of whitish colored metasandstone and quartzite
	4																
	4.5																Whitish and dark grey colored, cobbles and pebbles of micaceous metasandstone and quartzite
	5																
	5.5																Small pebbles of grey colored, metasandstone, quartzite and granite
	6																
	6.5																Cobble and pebbles of of grey colored, metasandstone, quartzite and granite
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Paheri	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

CONSULTING INTERNATIONAL LLC 2000

BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	853	Co-ordinates:	N:27° 44' 3.68" E: 85° 1' 8.47"
Location:	-	Elevation (m):	1113m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	06.03.2019	Completion Date:	07.03.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0					25	21	16	63	27	0.4					OH	Top soil: Dark colored,soil, with organic compounds, slightly cohesive, slightly moist clay with silt
	0.5																
	1															GP	Boulder, cobbles of light grey colored, quartzite
	1.5																
	2															GW	Pebbles, and smaller pieces of grey and white quartzite
	2.5																
	3		5	9	11											SC	Dark colored, fine grained, slightly cohesive, slightly moist fine sand with clay
	3.5																
	4		8	11	13											SC	Dark colored, fine grained, slightly cohesive, slightly moist fine sand with clay
	4.5																
	5																Pebbles of quartite in clayey silty matrix
	5.5																
	6															SC	Dark colored, fine grained, slightly cohesive, slightly moist fine sand with clay
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, Pl- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Paheri | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

नेपाल सरकार
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STANDARD ULTIMATE INTERNATIONAL LLC 2000

BOREHOLE LOG Sheet::

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: BH-54
Location: Galchhi, Makwanpur
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 22th February 2019

Co-ordinates: 27° 40' 25.61", 084° 58' 50.71"
Elevation (m): 1826
Water Table (m): None
Total Drilled Depth (m): 7.00m
Completion Date:25th February 2019

SPT core loss: SPT with soil core:
UD Sample:

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NWC	Sieve G	S	F	Afterberg LL	PI	D	I/D	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Top soil is not distinct and is sandy silty soil	1		5	6	8	7.56					5.19					SP	SPT-26cm- Brownish colored, slightly cohesive, dry, very fine grained sand with silt and clay with small pebbles
	2		5	8	11											SV	SPT-19cm- Brownish colored, slightly cohesive, dry, very fine grained sand with silt and clay
	3		8	9	13											SV	SPT-27cm- Grey colored, slightly cohesive, slightly moist, very fine grained, sand
	4		7	10	15											SP	SPT-23cm- Grey colored, slightly cohesive, slightly moist, very fine grained, sand
	5		15	19	25											SV	SPT- 23cm- Brownish grey colored, almost dry, slightly cohesive, fine grained sand with small amount of silt and clay
	6		19	17	25											SV	SPT- 20cm-Grey colored, fine grained,slightly cohesive, almost dry sand, silt and clay mixed.
	7		19	21	28											SV	SPT- 14cm- Grey colored, fine grained,slightly cohesive, almost dry sand, silt and clay mixed.

Bore hole terminated at 7.00m

Legends
Top soil, sandy, silty clayey with pebbles
Sand with small silt and clay

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Shrawan Paharl | Logged by : Krishna Pudasaini | Checked by: Dr. Suman Manandhar | I.C.G.S. Pvt. Ltd.

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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

STANTEC CONSULTING INTERNATIONAL LLC
2000

BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B55	Co-ordinates:	N: 27° 38' 21.32" E: 84° 57' 36.70"
Location:	-	Elevation (m):	1826
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	01.03.2019	Completion Date:	02.03.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
	0		5	6	8	16	61	10	29	32	5.1					SM	Top soil: Fine to coarse grained, brownish colored, dirty sand, non cohesive and dry
	1		5	8	11											GP	Boulders , cobbles and pebbles of whitish colored medium to coarse grained granite
	2		5	8	11												
	3		7	10	15											GP	Boulders, cobbes, pebbles of whitish colored granite and grey colored metasandstone
	4		16	19	23											GP	Boulders , cobbles, pebbles of whitish colored granite
	5		19	17	25											GP	Boulders , cobbles, pebbles of whitish colored granite
	6		29	21	28											GP	Boulders , cobbles, pebbles of whitish colored granite
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Pahari	Logged by: Krishna Pudasaini	Checked by: Dr. Suman Manadhar	I.C.G.S Pvt. Ltd.

नेपाल सरकार
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सिंहदरबार, काठमाडौं

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BOREHOLE LOG Sheet::

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: BH-56
Location: Kalikatar, Makwanpur
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 15th February 2019

Co-ordinates: 27° 35' 14.2", 084° 56' 02.0"
Elevation (m): 384
Water Table (m): None
Total Drilled Depth (m): 7.00m
Completion Date:19th February 2019

SPT core loss: SPT with soil core:
UD Sample:

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NWC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Top soil sandy silty soil	1					15.39	13.89	72.61	13.5	27.80	27.60					SM	Dark colored, slightly moist, non cohesive, fine grained sand with clay silt and very small amount of pebbles
	2		4	6	8											SP	SPT- 33cm- Dark colored, slightly moist, non cohesive, fine grained sand with very small amount of small pebbles
	3		5	8	11											SV	SPT-26 cm- dark colored, non cohesive, slightly moist, fine grained sand with silt and clay
	4		7	9	13	25.44	44.04	35.35	20.61	23.40	23.40					SP	SPT- 16 cm-Dark grey colored, fine grained sand with pebbles with silt and clay
	5																Pebble to cobble size pieces of fine to medium grained, slightly weathered, sandstone
	6																Pebbles to gravel size pieces (mostly pebbles in the later portion) of phyllite and sandstone
	7																

Bore hole terminated at 7.00m

Legends
Pebbles in sandy silty clayey matrix
Cobbles and pebbles

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, Ll-Liquid Limit, PI-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Shrawan Pahari | Logged by : Krishna Pudasaini | Checked by: Dr. Suman Manandhar | I.C.G.S. Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400 KV DC)

Borehole No.:	B57	Co-ordinates:	N: 27° 29' 6.12" E: 84°56'40.12"
Location:	-	Elevation (m):	1012m
Bearing of Hole:		Water Table (m):	
Drilling Type:	Rotary Wash Boring	Total Drilled Depth (m):	7.00m
Starting Date:	18.05.2019	Completion Date:	19.05.2019

SPT with Soil Core:
SPT Core Loss:
UD Sample:

General Description of Starta	Depth 'm'	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NMC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Bed rock strats from a meter	0					9.9	18	53	29	15	15						Top soil about a meter in depth, well graded, fine grained, non cohesive, dry sand with clay and silt
	0.5																
	1																Highly weathered, small pieces of rock about a cm in diameter, dark grey in colorin the upper section, highly weathered, brown colored, fine to medium grained, jointed sandstone
	1.5																
	2																Sludge Sample: Dark brown or grey in colored, well graded, sand formed by crushing of the weathered sandstone during drilling
	2.5																
	3																Sludge Sample: Dark brown or grey in colored, well graded, sand formed by crushing of the weathered sandstone during drilling
	3.5																
	4																Small pieces, smaller than pebbles of schist Sludge sample: Grey colored, medium to coarse grained clean sand with some small pieces of sandstone
	4.5																
	5		12	14	11	20.1	2.99	57.5	39.5								Dark brown or grey in color, highly weathered, pebbles of sandstone, and sand formed from the same sandstone
	5.5																
	6		10	20	28												Light brown colored, highly weathered, almost behaves like sand, fine to medium grained sandstone
	6.5																
	7																

Abbreviation: NMC-Natural moisture Content, G-Gravel, S-Sand, F-Fines, LL-Liquid Limit, PI- Plasticity Index, D-Dry Density, UC Unconfined Compression

Drilling by: Shrawan Paharl | Logged by: Krishna Pudasaini | Checked by: Dr. Suman Manadhar | I.C.G.S Pvt. Ltd.

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BOREHOLE LOG

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: B58
Location: Salme (Basamdi) Hetauda
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 5th February 2019

Co-ordinates: 27° 26' 58.4", 084° 59' 08.60"
Elevation (m): 405 m
Water Table (m): None
Total Drilled Depth (m): 7.00m
Completion Date: 6th February 2019

SPT core loss: / SPT with soil core: / UD Sample:

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NWC	Seive G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Top soil sandy silty and clayey soil						3.52	24.4	12.54	[illegible]	17	[illegible]					SC	0.00-0.40, Top soil brown to reddish cultivated soil
The soil observed resembles residual soil	1		5	11	13											GC	0.50-1.00 Redddish, medium to coarse grained, moist, less cohesive sand with pebbles and less fines
																SC	1.00-2.00, Reddish in color, cohesive, moist soil with little clay and with consists of pebbles
	2		31													GC	9 cm reddish in color, less cohesive, granular, silty clay and sand with pebbles
	3		33			1.58	[illegible]	[illegible]	[illegible]	[illegible]	4.51				NA	GV	Recovery is 10 cm having reddish in color, non cohesive, fine to medium sand with clay with pebbles
	4		12	14	18											SC	Recovery is 44 cm having reddish in color, non cohesive, fine to medium sand with silty clay
	5		7	16	20											SC	39 cm- recovery is reddish colored, cohesive, moist to wet clay Reddish in color, moist and dry, cohesive clay with fine grained sand with pebbles
	6		7	13	23											SC	25 cm- recovery is reddish to brown, non cohesive, moist to dry, silty sand with clay
	7																

Bore hole terminated at 7.00m

Legends
- Top soil, sandy, silty clayey soil
- Fines

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Sharwan Naupane	Logged by : Krishna Pudasaini	Checked by: Dr. Suman Manandhar	I.C.G.S. Pvt. Ltd.

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BOREHOLE LOG Sheet::

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: BH-59
Location: Hetauda
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 26th January 2019

Co-ordinates:
Elevation (m):
Water Table (m): None
Total Drilled Depth (m): 7.00m
Completion Date: 29th January 2019

SPT core loss: ◿ SPT with soil core: ◭
UD Sample: ▮

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NWC	Sieve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Top soil																	0.00-0.20m, Dry to moist, medium dense sandy slitly clayey soil with small pebbles
Gravels and pebbles are dominant	1																1.20-2.00m boulder gravel pebbles of sandstone, quartzite in sandy silty matrix
	2																Boulders of quatzite, granite and sandstone in sandy matrix
	3																Gravels and pebbles of sandstone and quartzite along with some boulders of quartzite
	4																Boulders gravels and pebbles of sandstone and quartzite
	5																Gravel cobble pebbles of different colored sandstone and quartzite
	6																Boulders gravel cobble pebbls of sandstone and quartzite
	7																High concentration of gravels and pebbles size sandstone and quartzite

Bore hole terminated at 7.00m

Legends
- Top soil, sandy, silty clayey soil with pebbles
- Alluvial boulder gravel pebbles in sandy silty matrix

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Om Nepal	Logged by : Krishna Pudasaini	Checked by: Dr. Suman Manandhar	I.C.G.S. Pvt. Ltd.

BOREHOLE LOG Sheet::

MCA-Nepal Soil Investigation for Transmission Line (400KV DC)

Borehole No.: BH-60
Location: Hetauda
Bearing of Hole: Vertical
Drilling Type: Rotory/ Wash boaring
Starting Date: 26th Jan 2019

Co-ordinates: 27° 26' 58.4", 085° 559' 08.6"
Elevation (m): 432m
Water Table (m):
Total Drilled Depth (m): 7.00m
Completion Date: 28th Jan 2019

SPT core loss: ◿ SPT with soil core: ◭
UD Sample: ▮

General Description of starta	Depth (m)	Legend	SPT 'N' Count N1	N2	N3	Laboratory Test Result NWC	Selve G	S	F	Atterberg LL	PI	D	MD	UC	Final Water Table	USCS	DESCRIPTION OF STRATA
Top soil with sandy silty soil with pebbles	1					9.90	23.95	43.42	27.58							GC	0.00-0.18m, Dry to moist, medium dense sandy silty clayey soil with occassional gravel and pebbles top soil
	2															GP	1.20-2.00m boulder gravel pebbles of sandstone, quartzite in sandy silty matrix
	3																
	4															GP	2.00-7.00m boulder gravel pebbles of sandstone, quartzite, gneiss in sandy silty matrix
Gravels and pebbles are dominant	5																
The matrix might be sandy in nature but couldn't be observed	6																
	7															GP	SPT/DCPT was not carried out due to domination of boulder and gravel The overburden material is of river rine origin and is a upper terrace of Rapti River.

Bore hole terminated at 7.00m

Legends
- Top soil, sandy, silty clayey soil with pebbles
- Alluvial boulder gravel pebbles in sandy silty matrix

Abbrivation:NWC-Natural moisture content, G-Gravel, S-Sand, F-Fines, LI-Liquid Limit, PI-Plasticity Index, D-Dry density, UC-Unconfined compression

Drilled by: Om Nepal	Logged by : Krishna Pudasaini	Checked by: Dr. Suman Manandhar	I.C.G.S. Pvt. Ltd.

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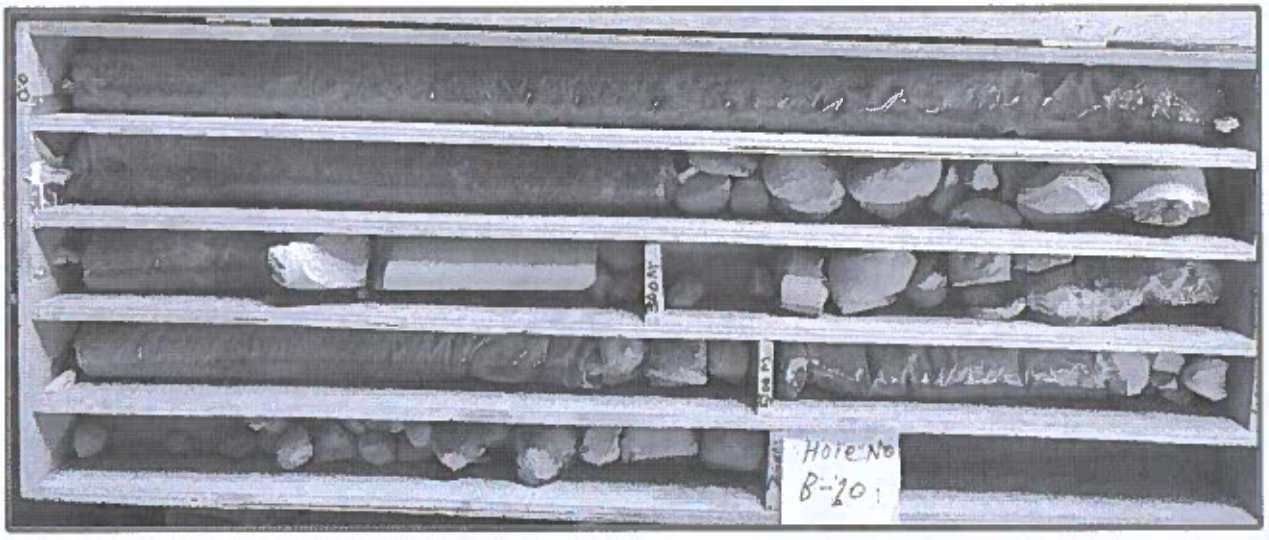
Annex B

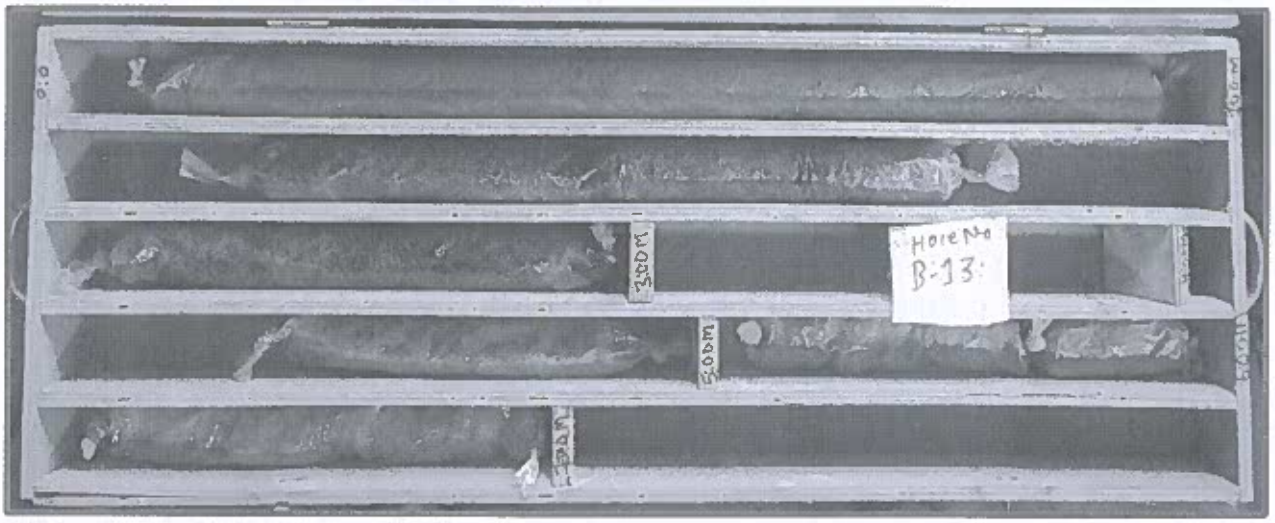
Core Box Photographs

B-9, Box No 1/1, 0.00 m – 7.00m

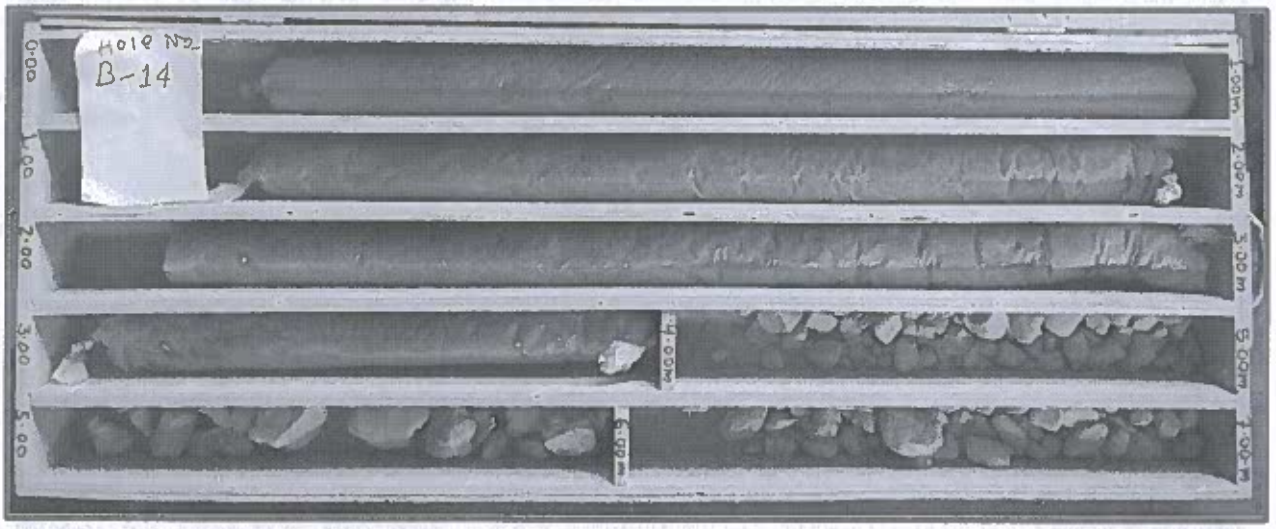


B-10, Box No 1/1, 0.00 m – 7.00m

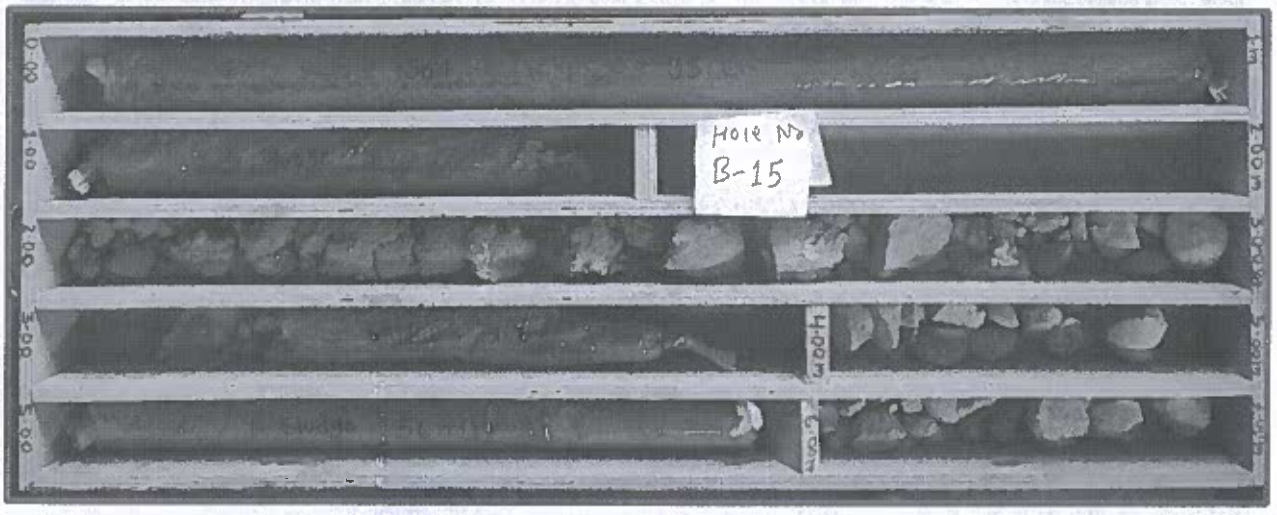
B-12, Box No 1/1, 0.00 m – 7.00m



B-13, Box No 1/1, 0.00 m – 7.00m



B-14, Box No 1/1, 0.00 m – 7.00m



B-15, Box No 1/1, 0.00 m – 7.00m

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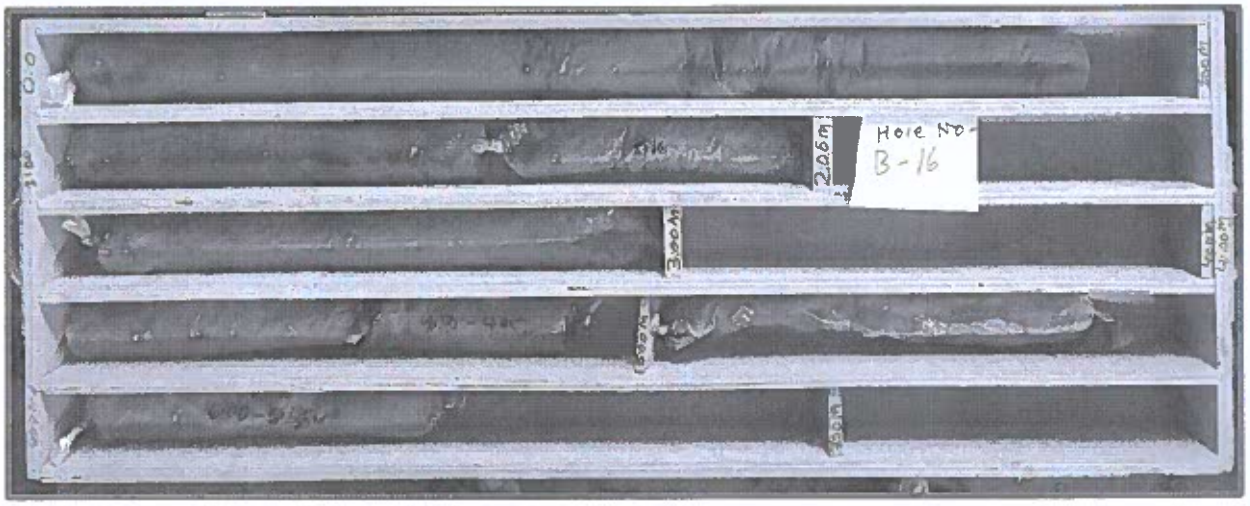
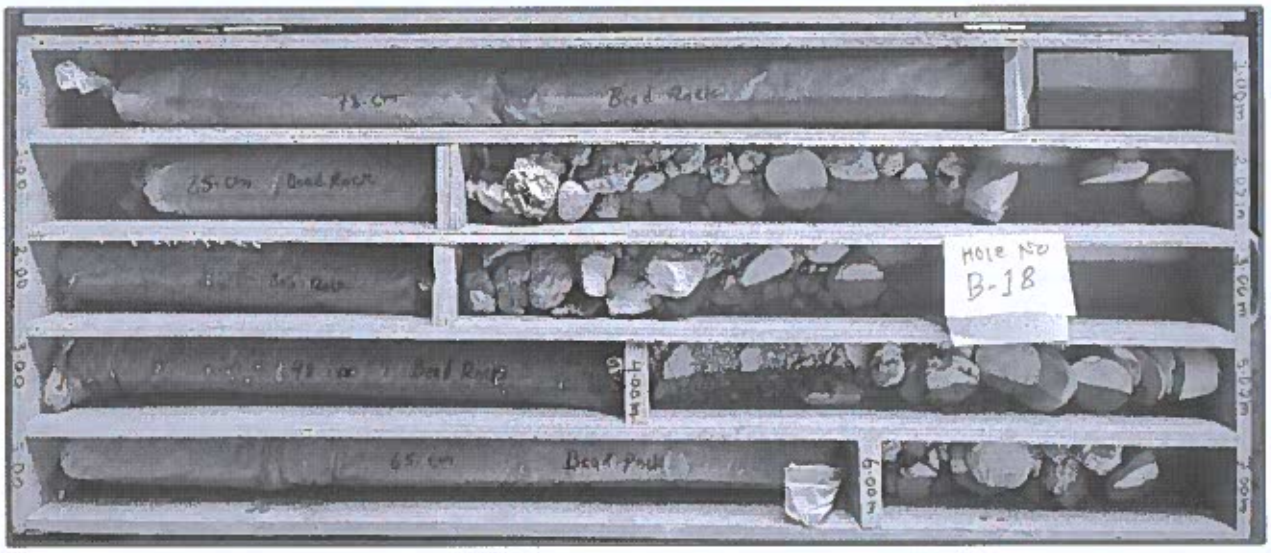


B-16, Box No 1/1, 0.00 m – 7.00m

B-17, Box No 1/1, 0.00 m – 7.00m



B-18, Box No 1/1, 0.00 m – 7.00m

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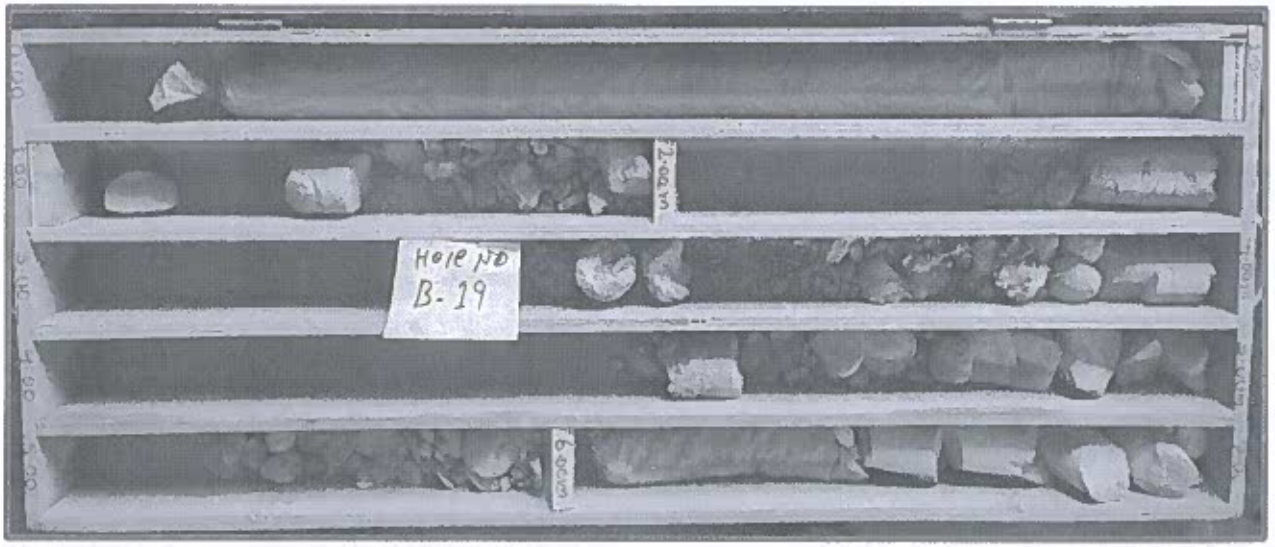
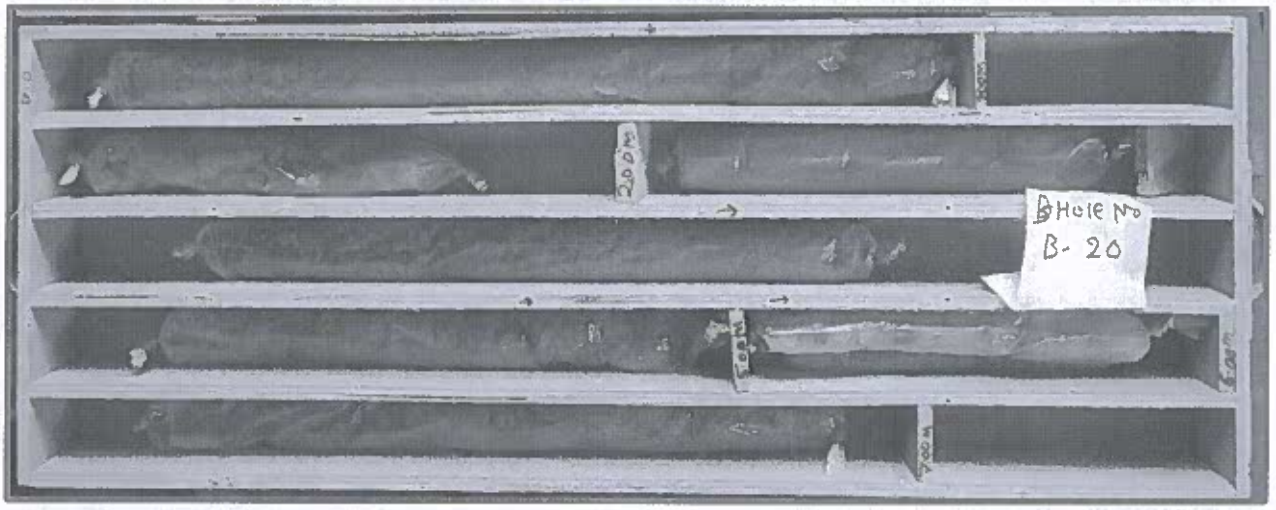
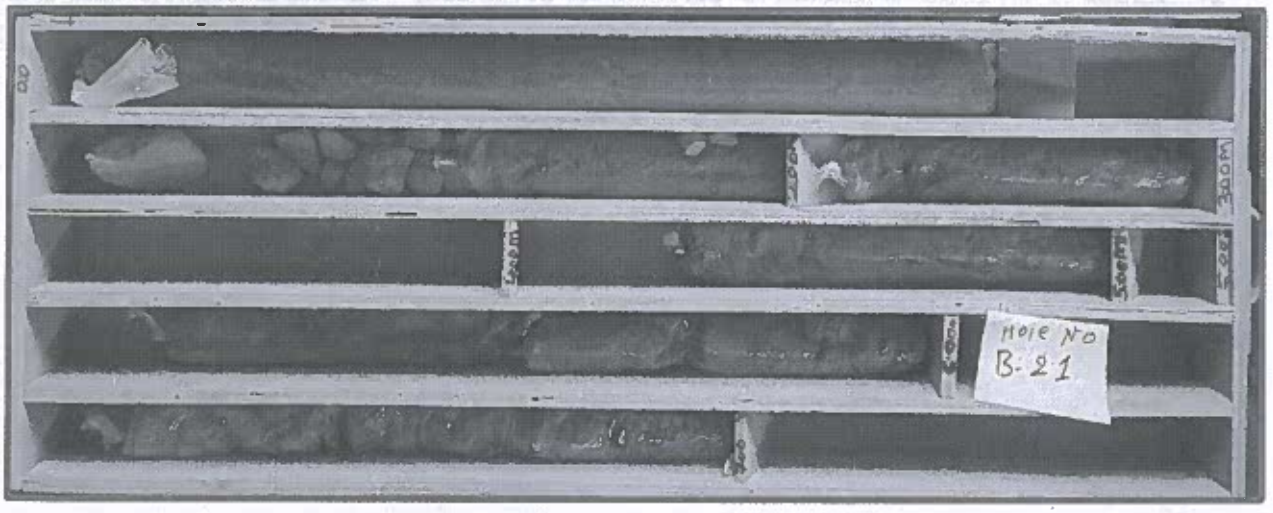


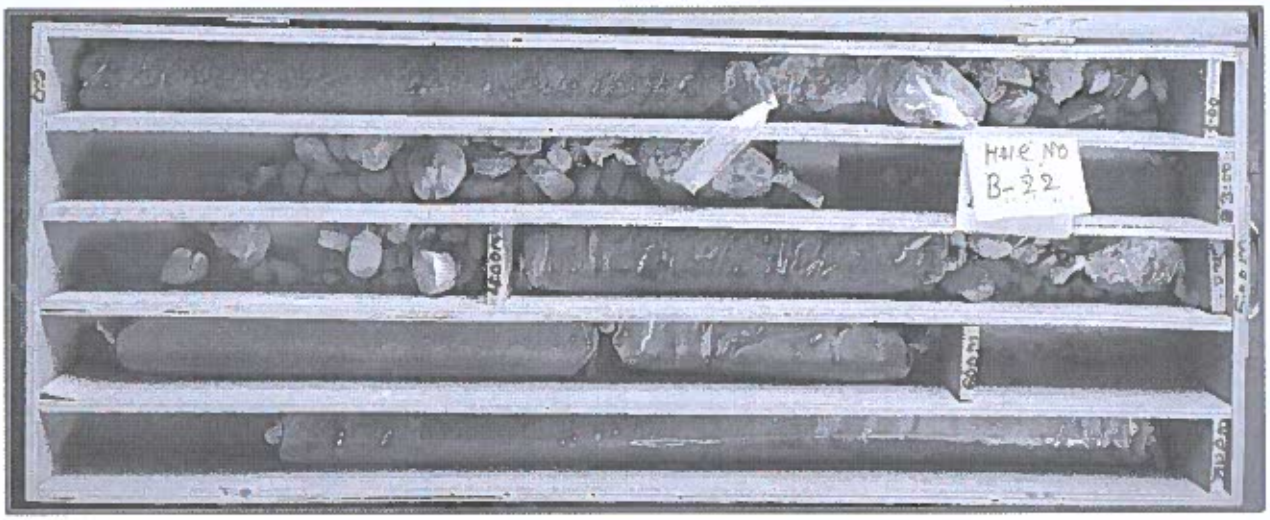
B-19, Box No: 1/1, 0.00 m – 7.00m



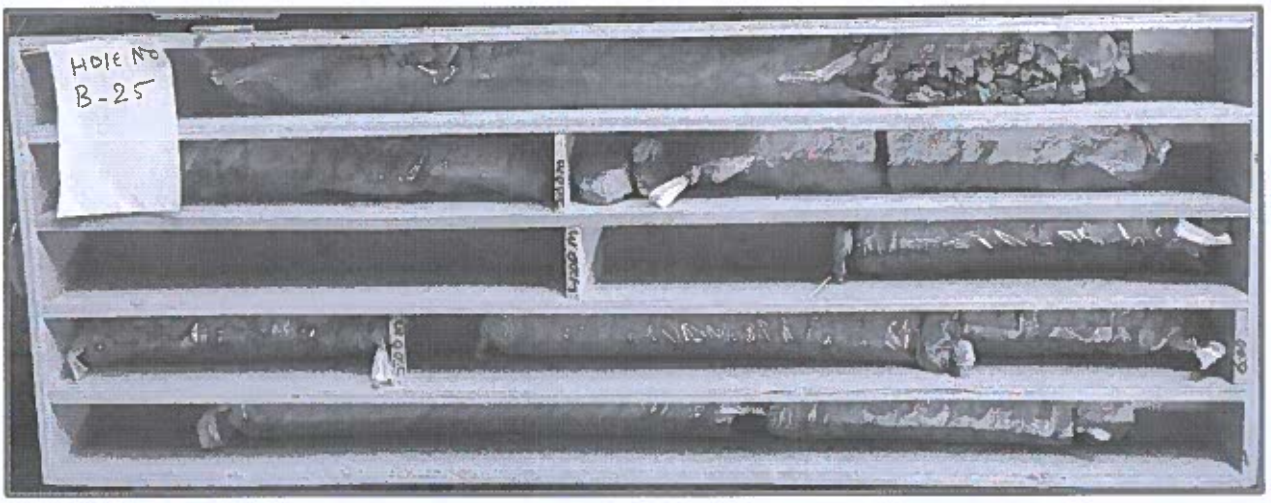
B-20, Box No 1/1, 0.00 m – 7.00m



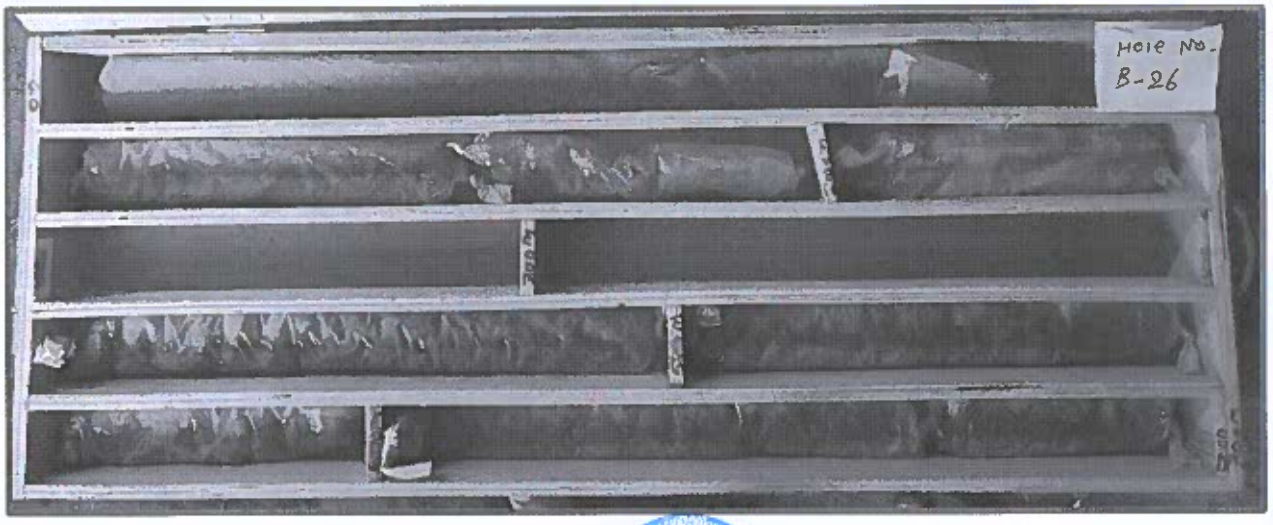
B-21, Box No: 1/1, 0.00 m – 7.00m



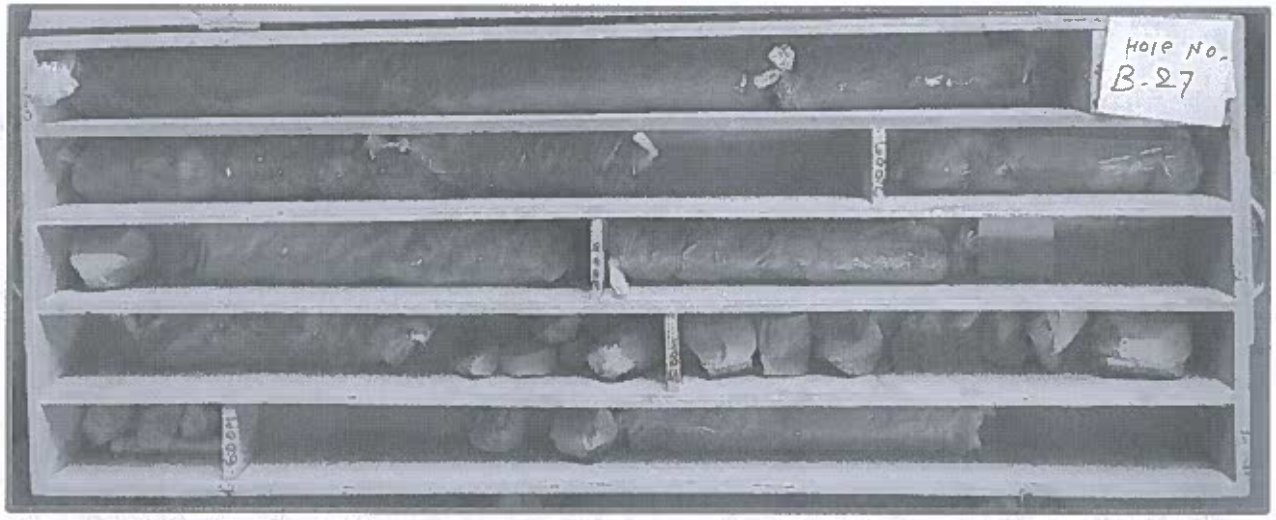
B-22, Box No 1/1, 0.00 m – 7.00m



B-25, Box No 1/1, 0.00 m – 7.00m



B-26, Box No 1/1, 0.00 m – 7.00m



B-27, Box No 1/1, 0.00 m – 7.00m

B-28, Box No 1/1, 0.00 m – 7.00m

B-29, Box No 1/1, 0.00 m – 7.00m

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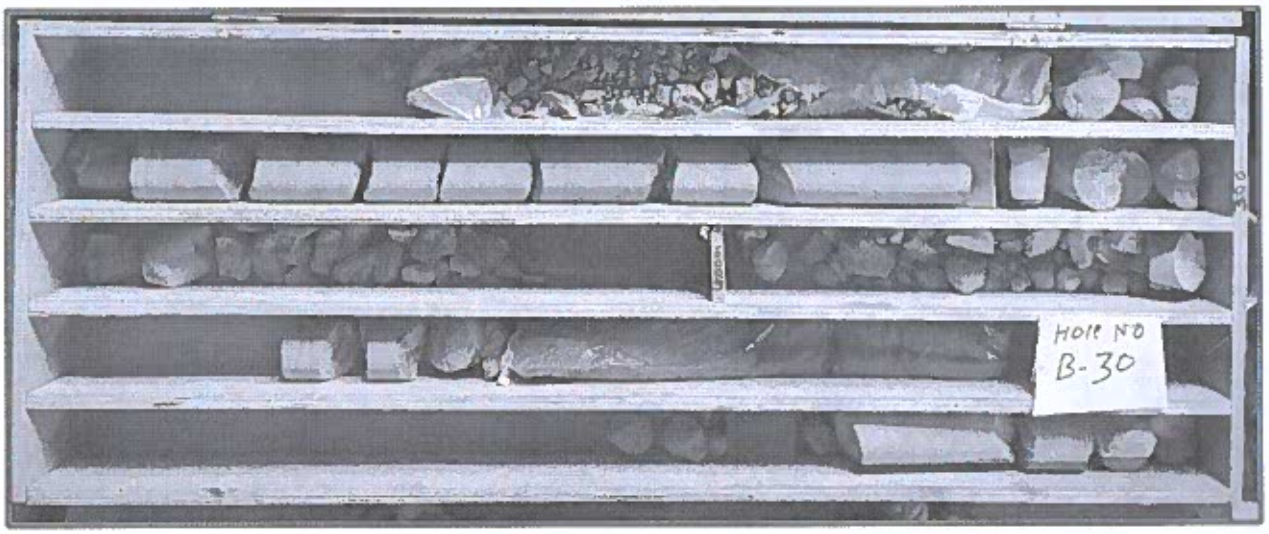
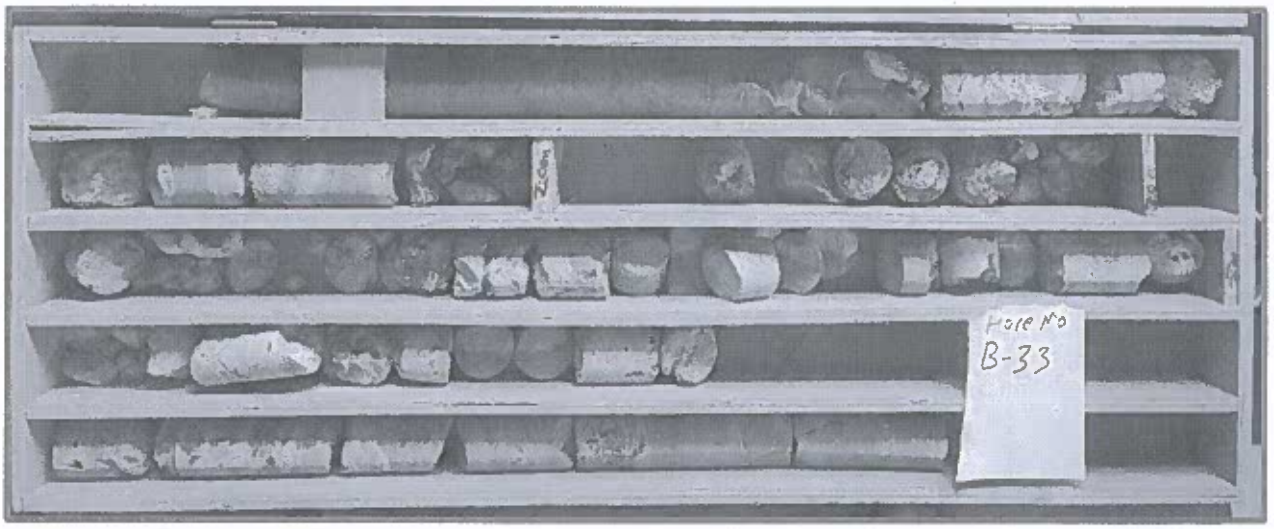


B-30, Box No 1/1, 0.00 m – 7.00m

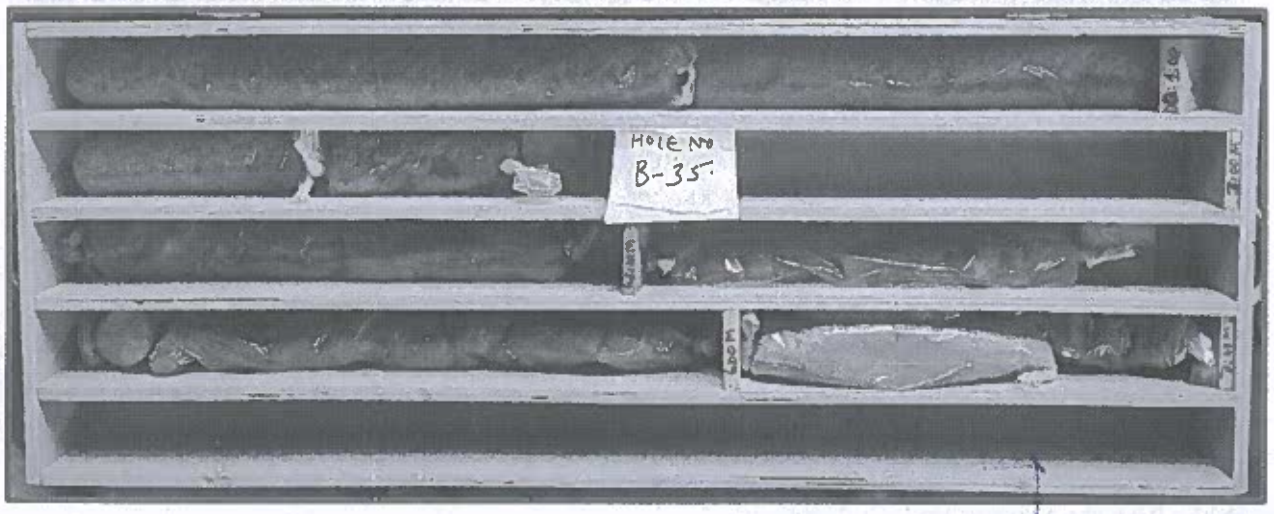
B-31, Box No 1/1, 0.00 m – 7.00m

B-32, Box No 1/1, 0.00 m – 7.00m



B-33, Box No: 1/1, 0.00 m – 7.00m

B-34, Box No: 1/1, 0.00 m – 7.00m



B-35, Box No: 1/1, 0.00 m – 7.00m

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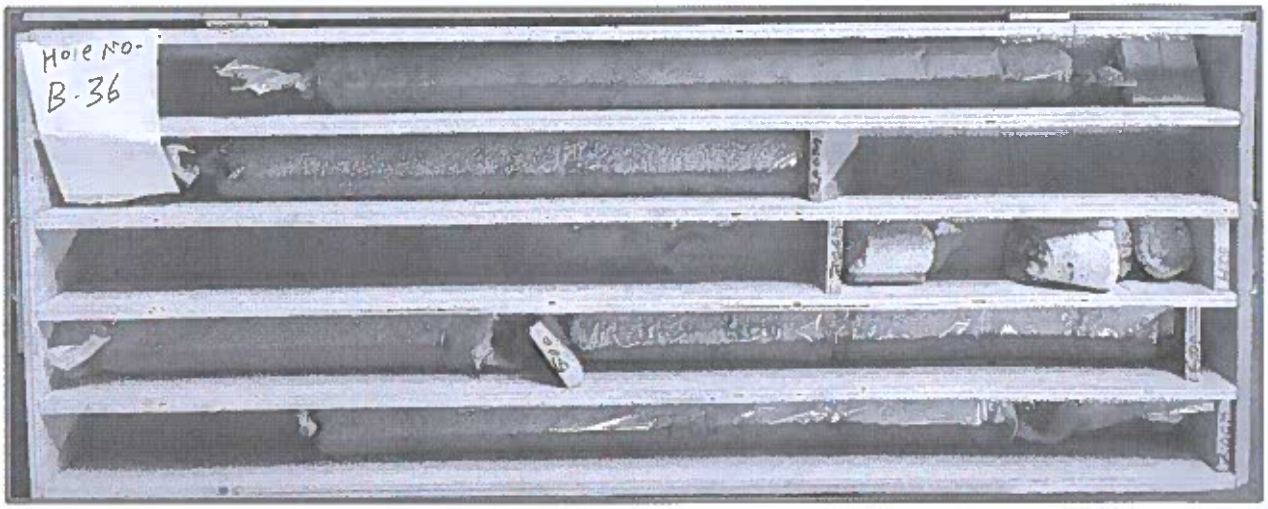
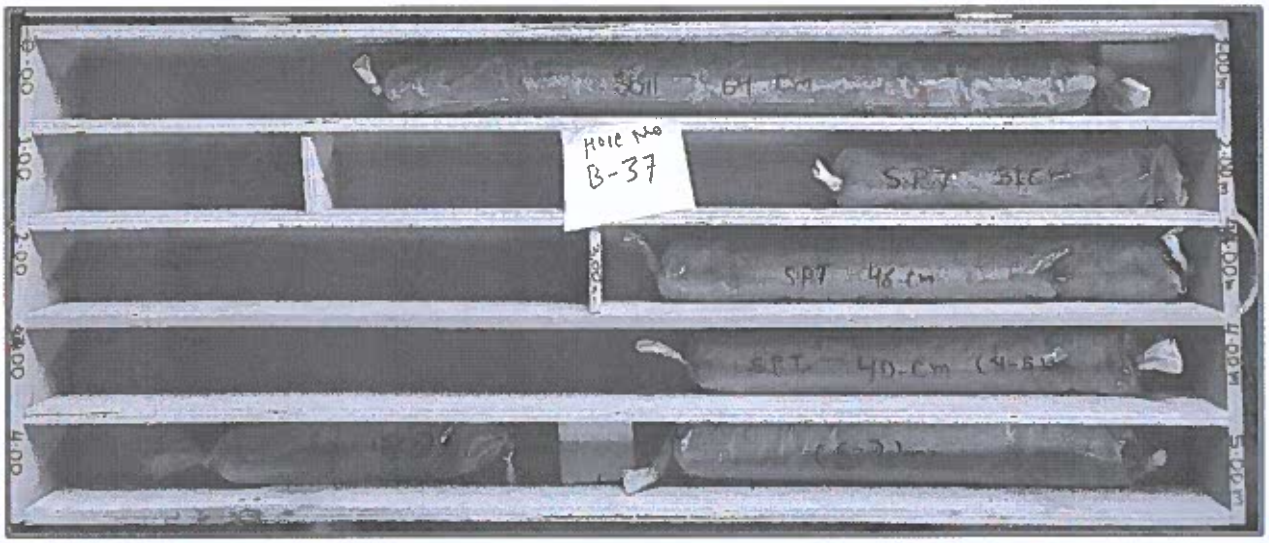
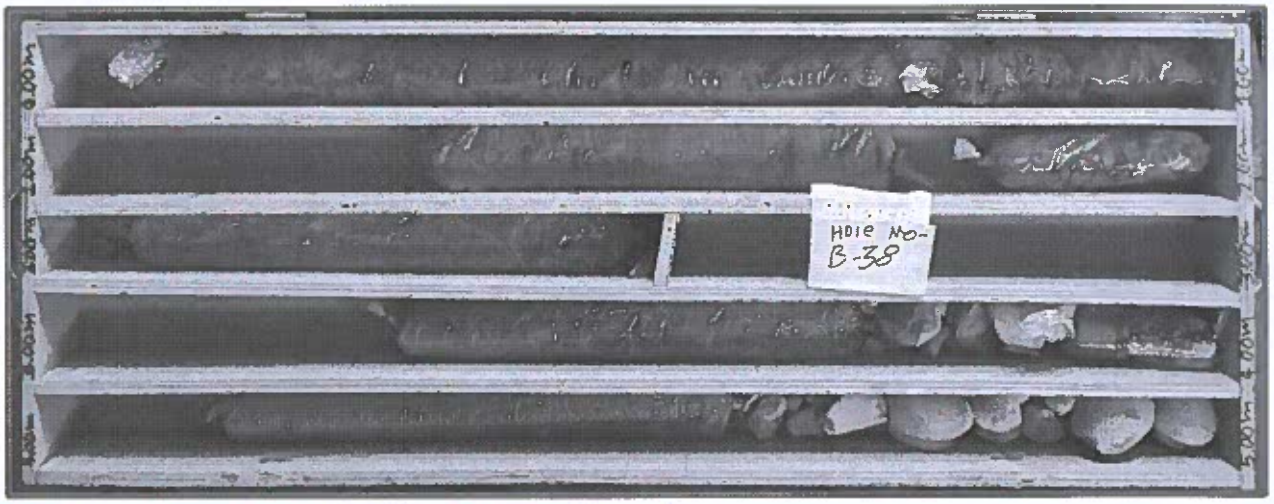


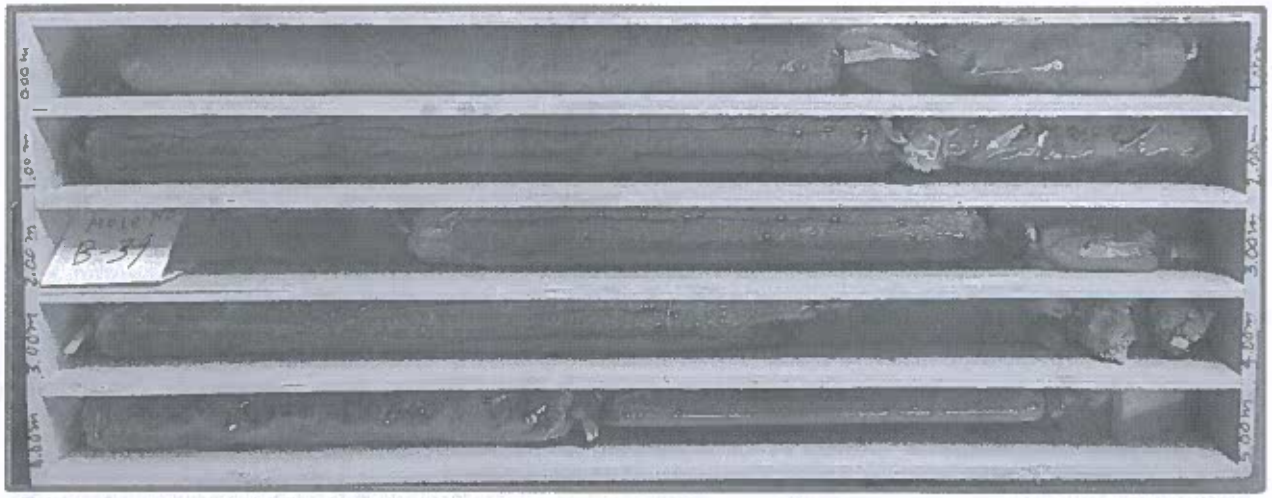
B-36, Box No 1/1, 0.00 m – 7.00m



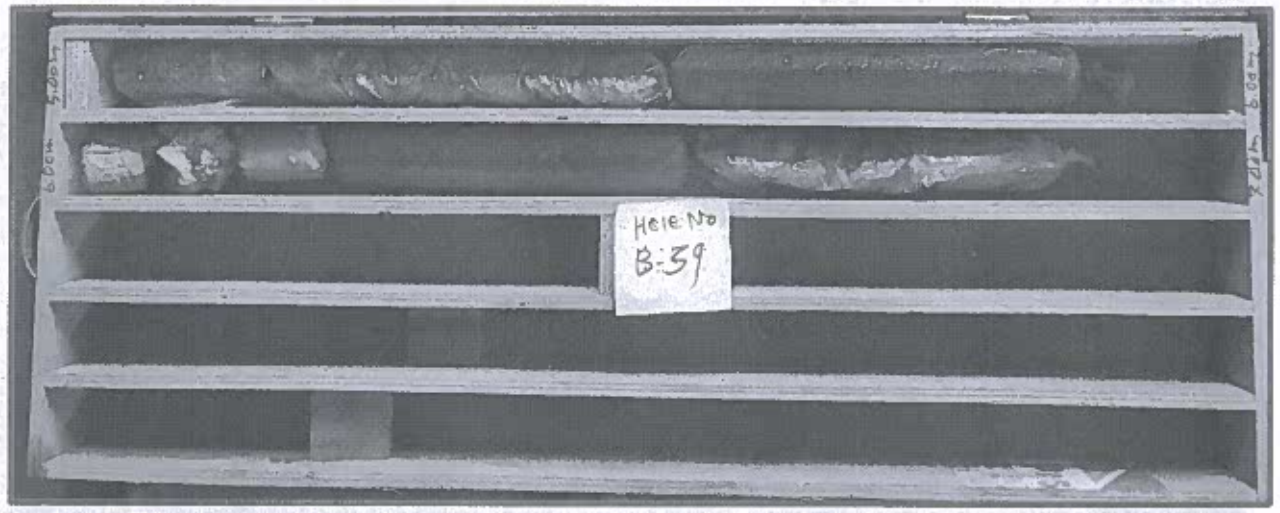
B-37, Box No 1/1, 0.00 m – 7.00m



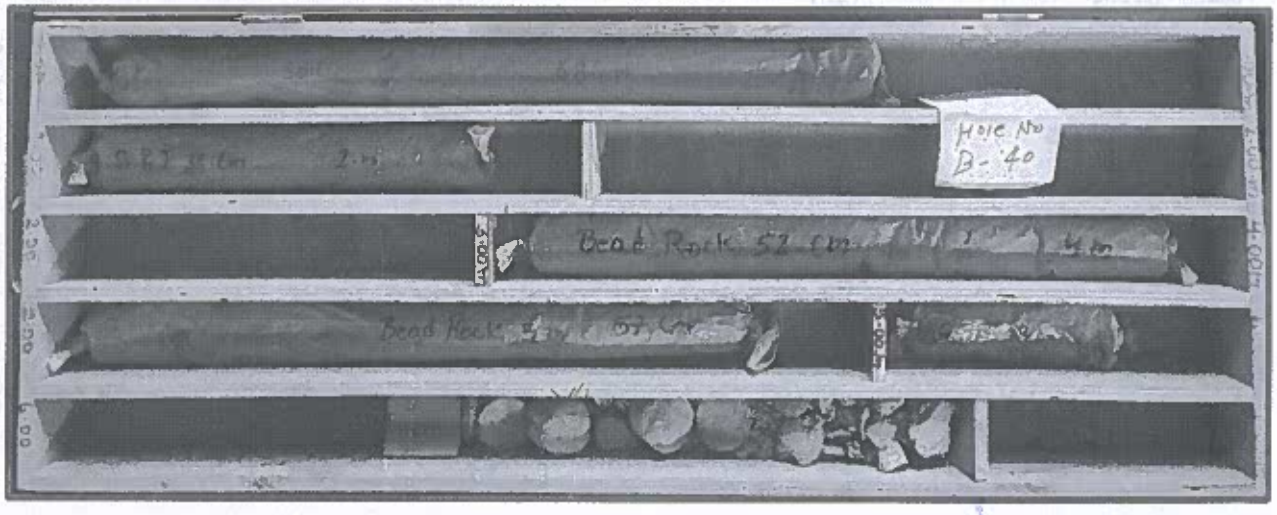
B-38, Box No 1/1, 0.00 m – 7.00m



B-39, Box No 1/2, 0.00 m – 5.00m



B-39, Box No 1/2, 5.00 m – 7.00m



B-40, Box No 1/1, 0.00 m – 7.00m

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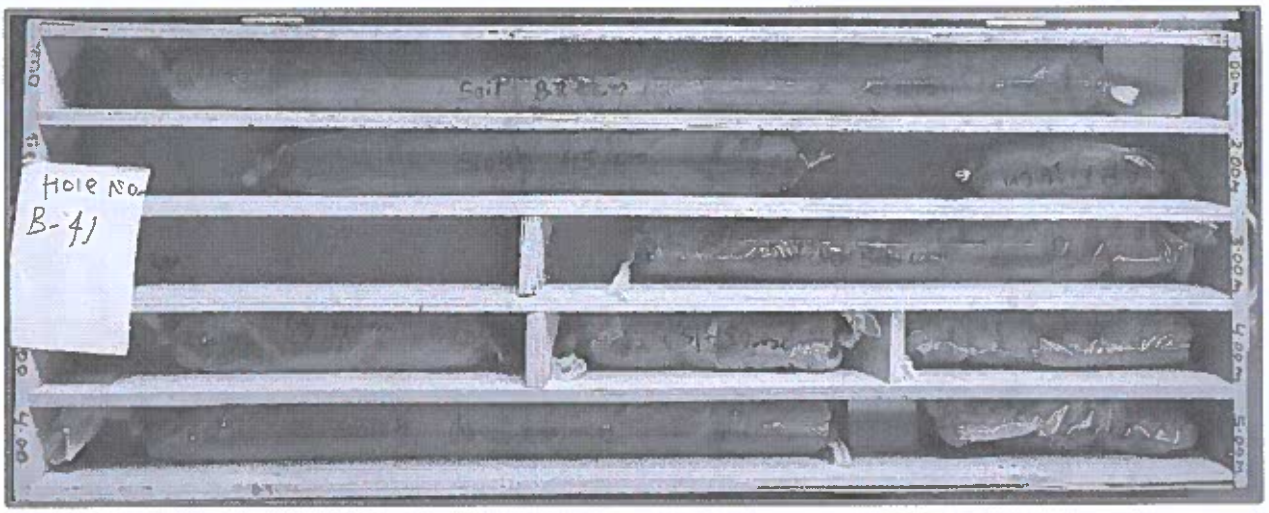

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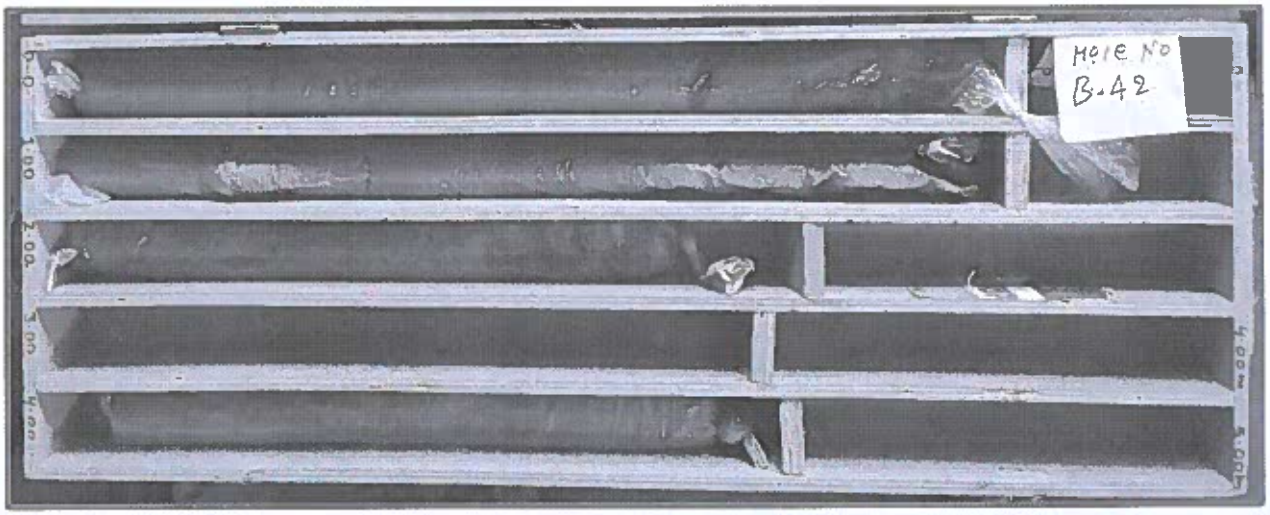
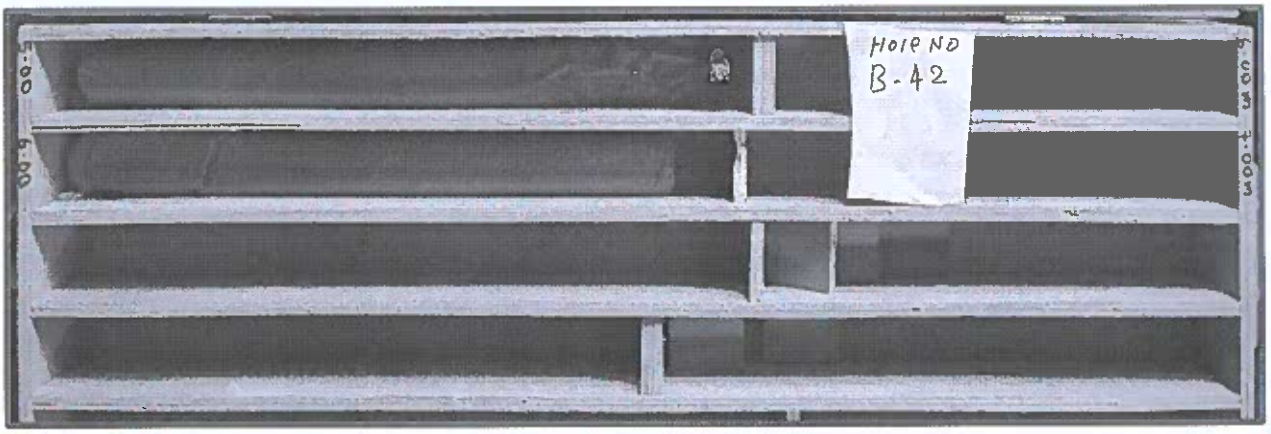


B-42, Box No 1/2, 0.00 m – 5.00m



B-42, Box No 2/2, 5.00 m – 7.00m

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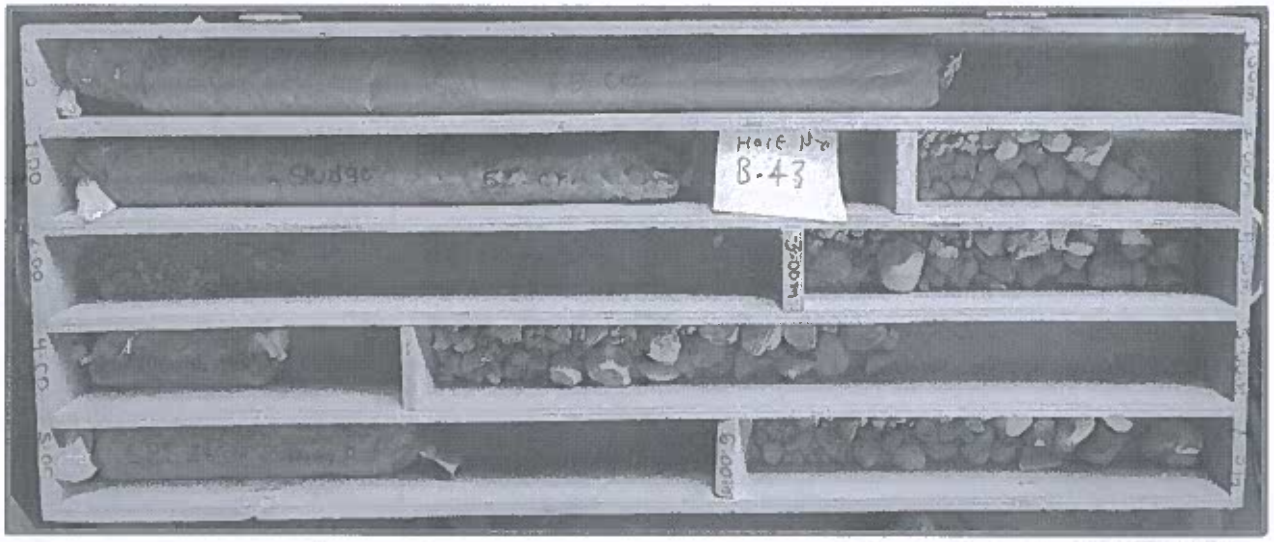
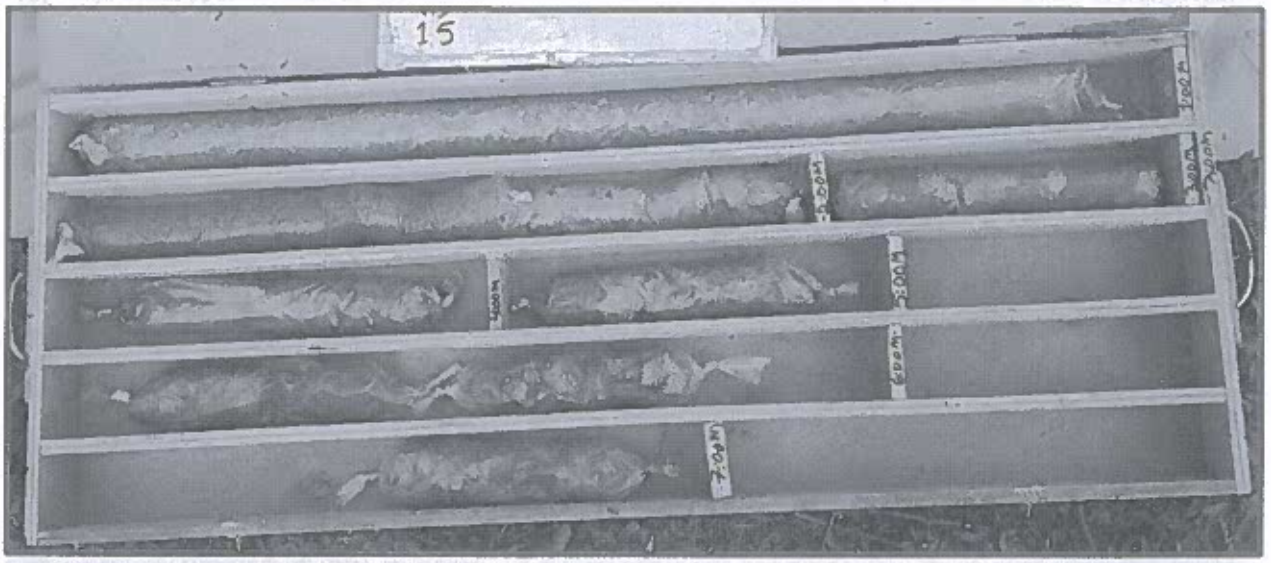
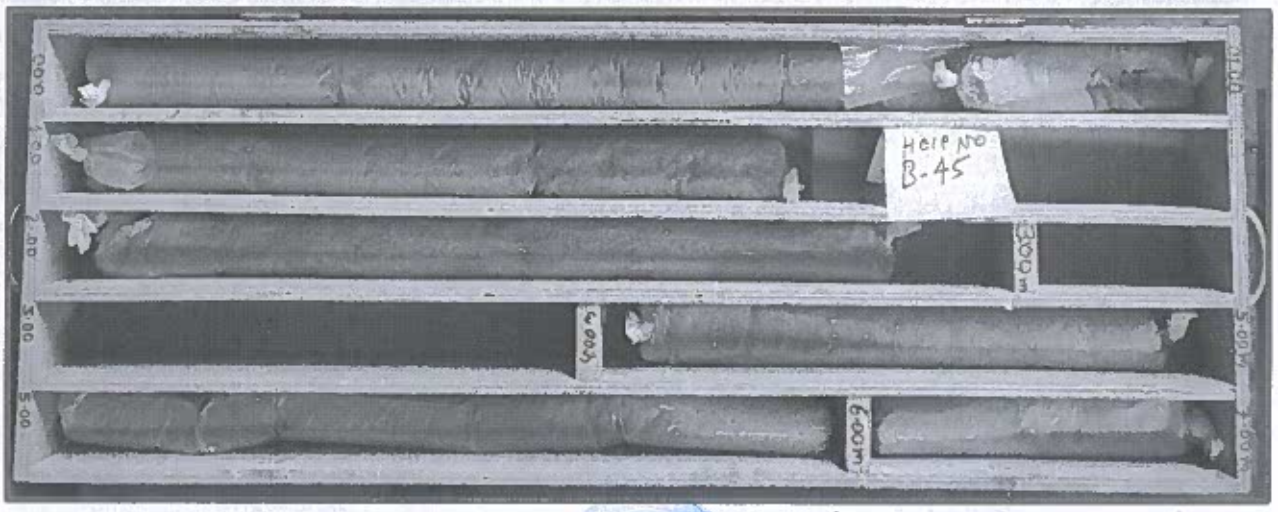


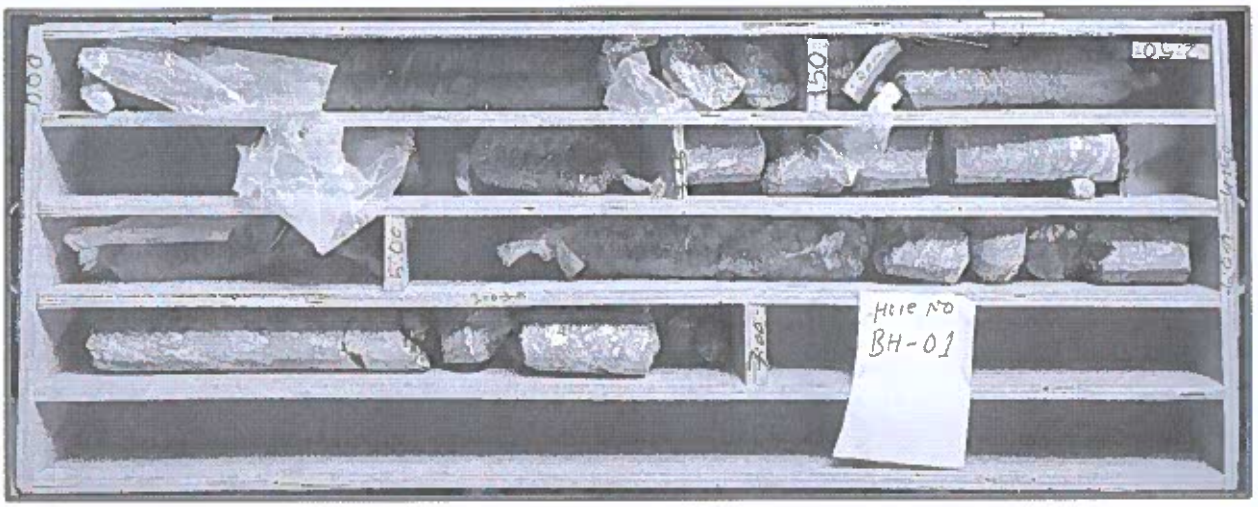
B-43, Box No:1/1, 0.00 m – 7.00m



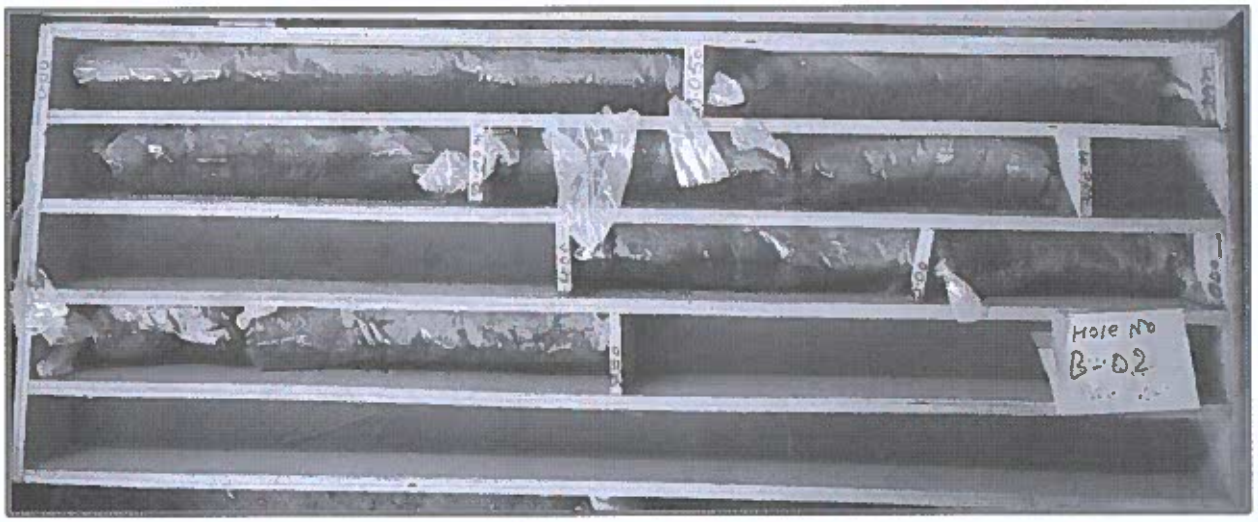
B-44, Box No 1/1, 0.00 m – 7.00m



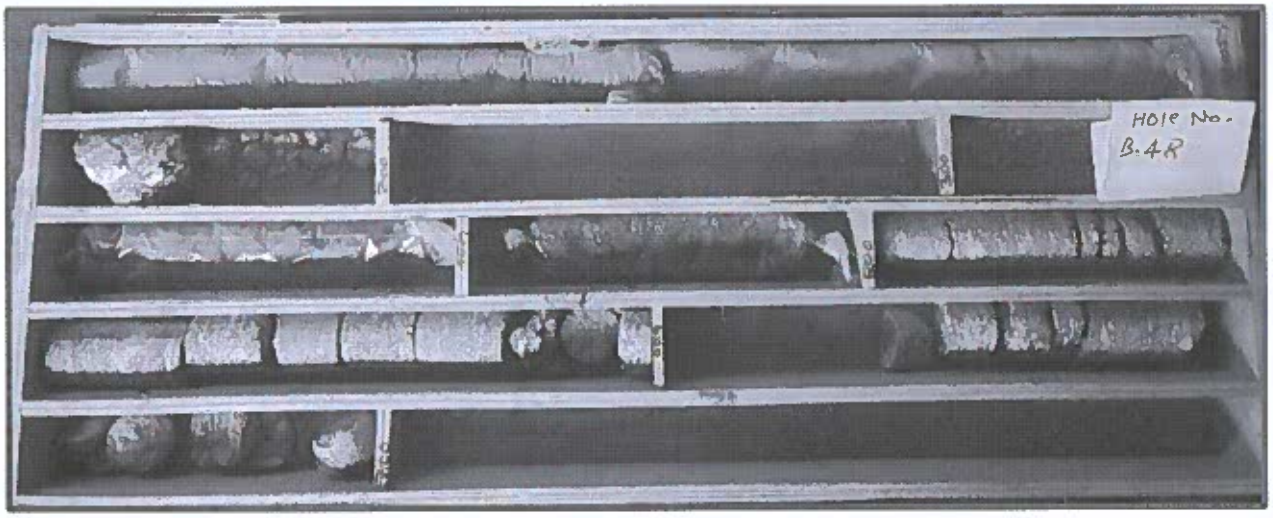
B-45, Box No 1/1, 0.00 m – 7.00m



B-46, Box No 1/1, 0.00 m – 7.00m



B-47, Box No 1/1, 0.00 m – 7.00m



B-48, Box No 1/1, 0.00 m – 7.00m

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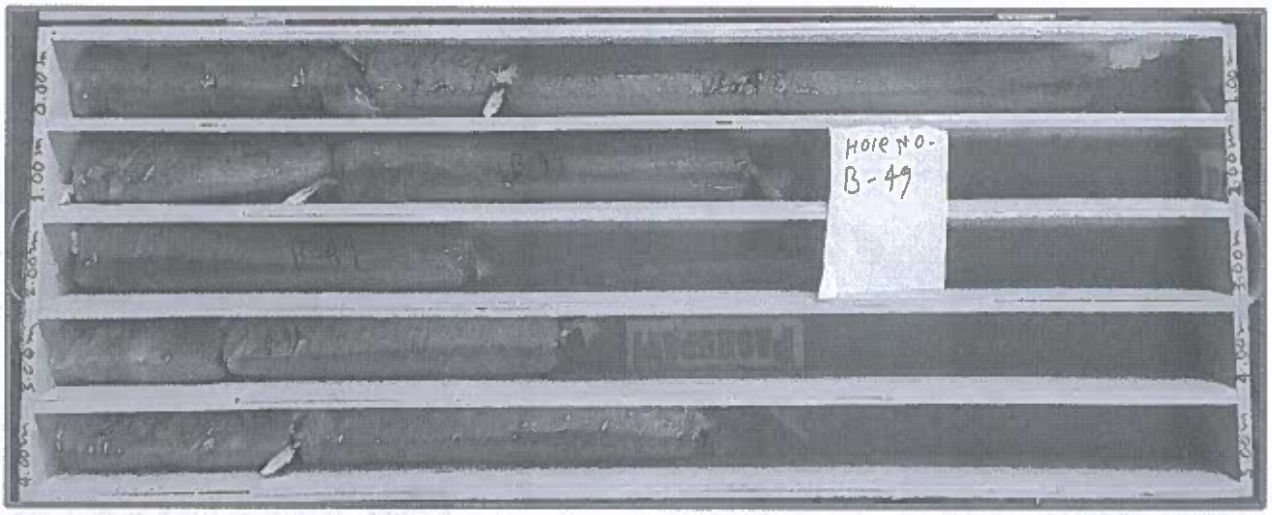

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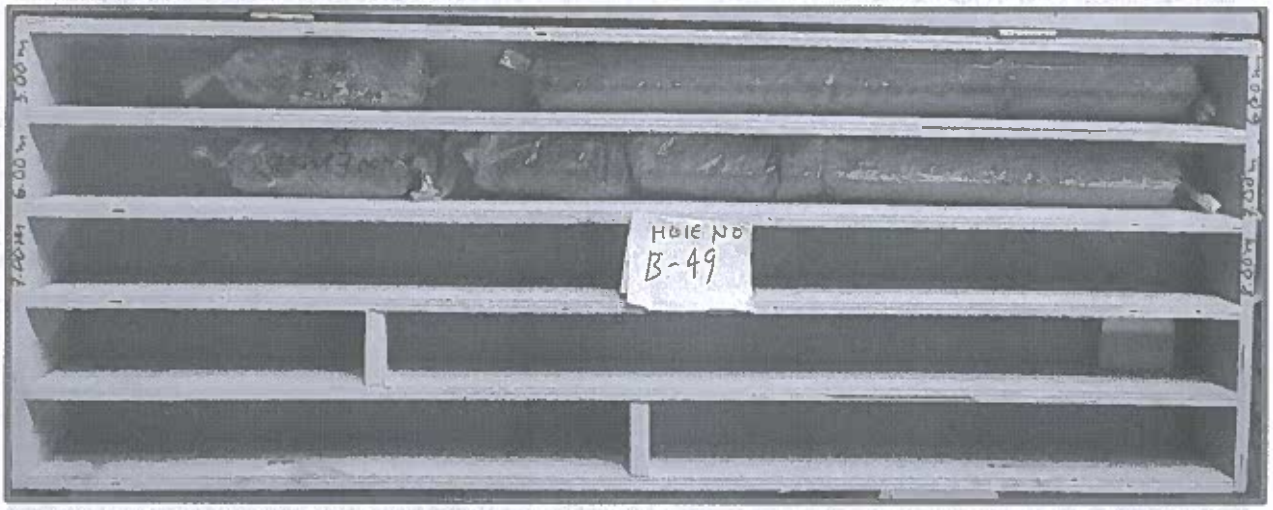
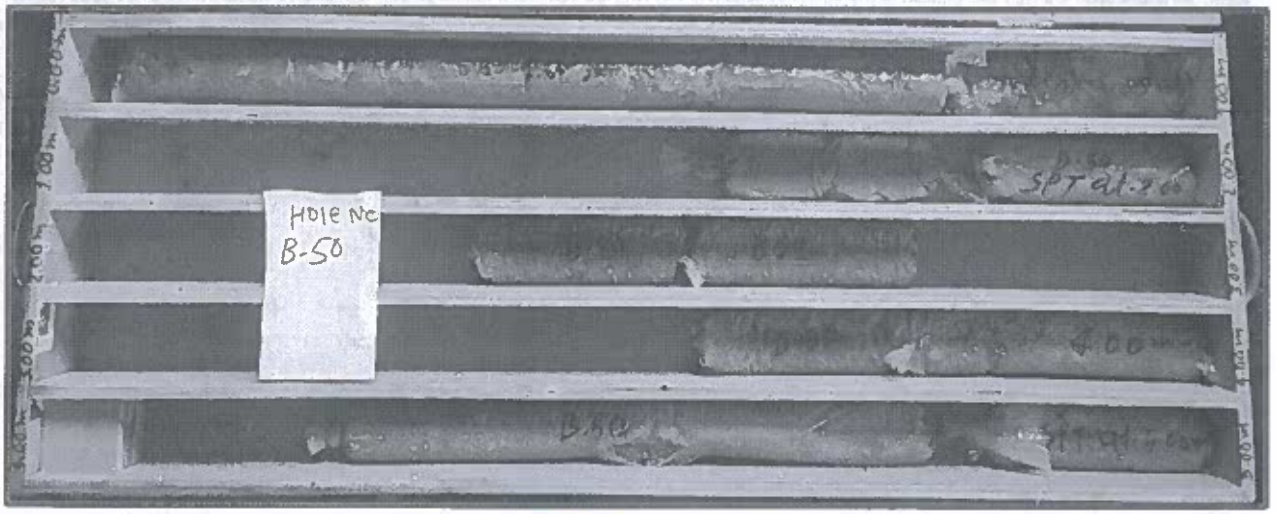


B-49, Box No 2/2, 5.00 m – 7.00m



B-50, Box No 1/1, 0.00 m – 7.00m

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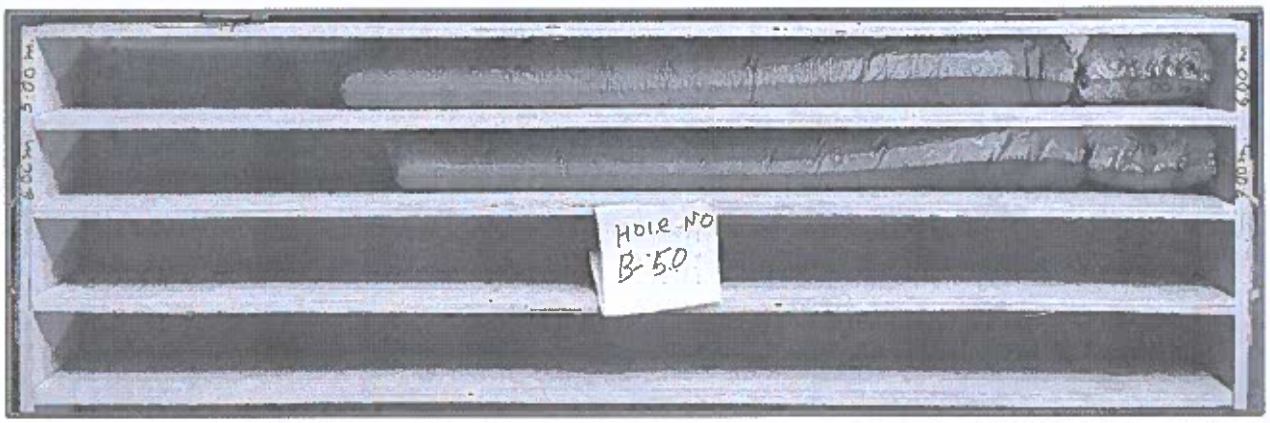

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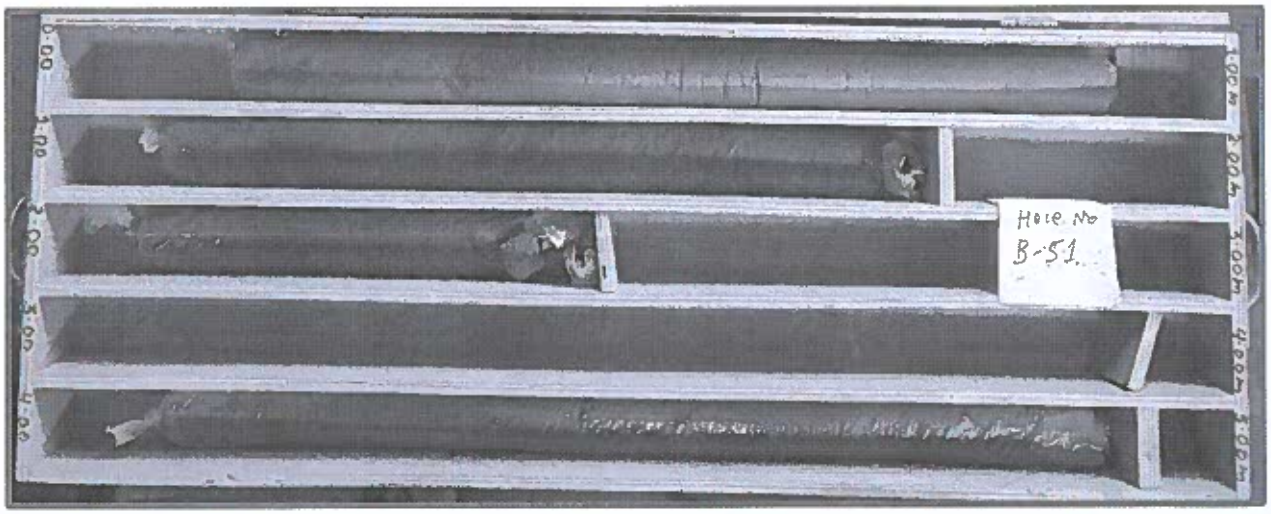

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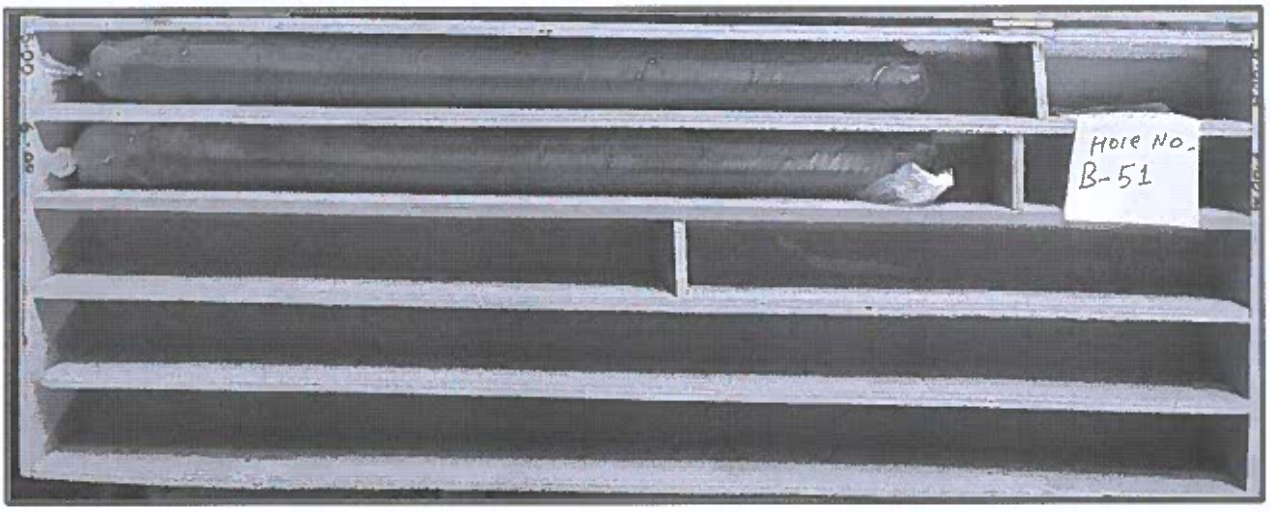

B-51, Box No 1/2, 5.00 m – 7.00m

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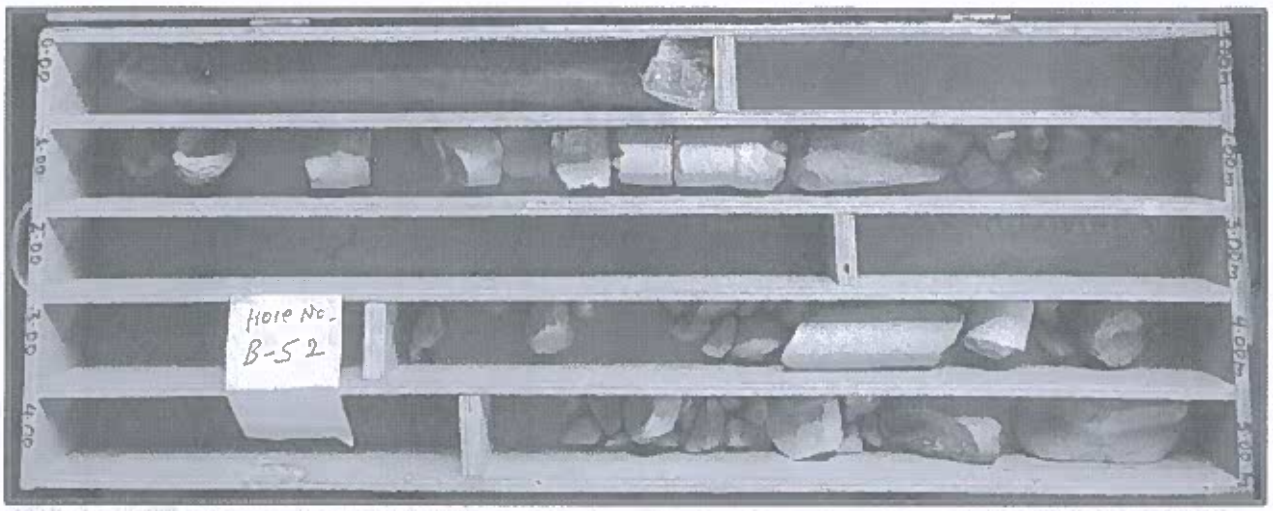
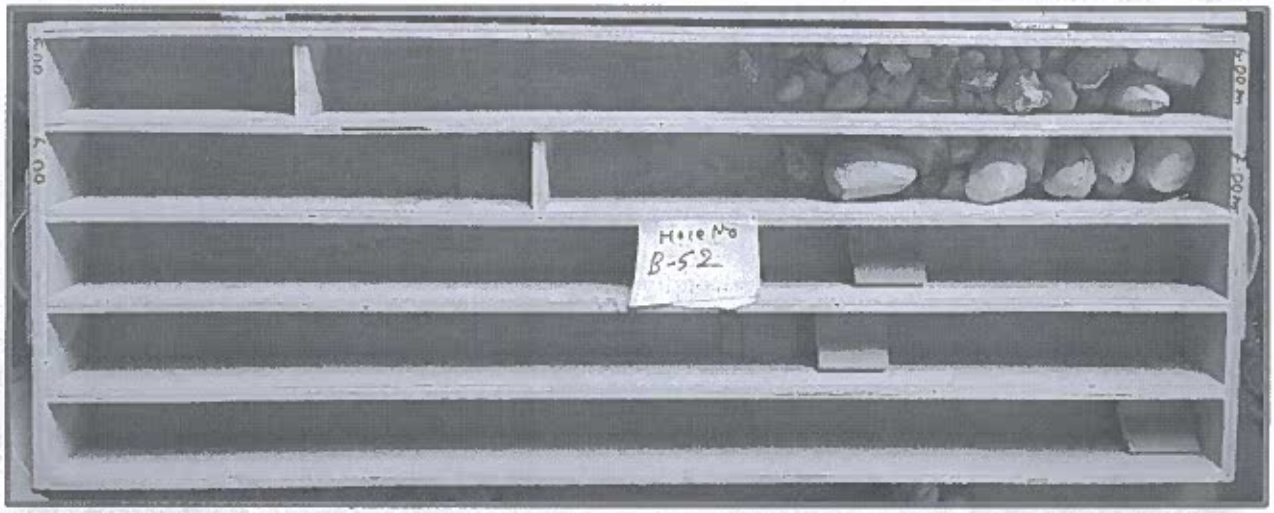


B-52, Box No 1/2, 0.00 m – 5.00m



B-52, Box No 2/2, 5.00 m – 7.00m

B-53, Box No 1/1, 0.00 m – 5.00m

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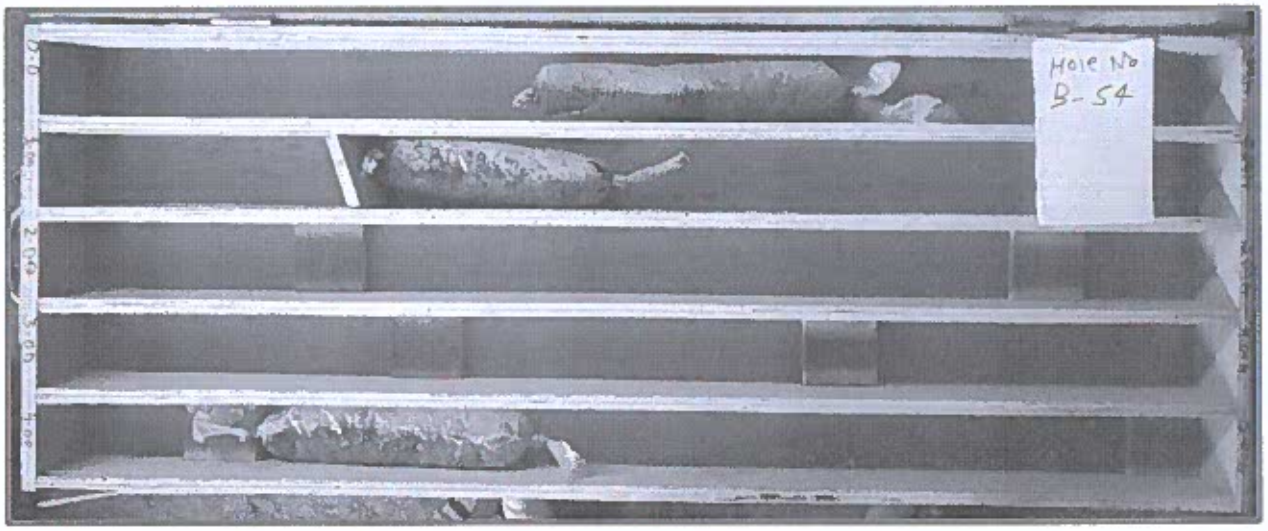
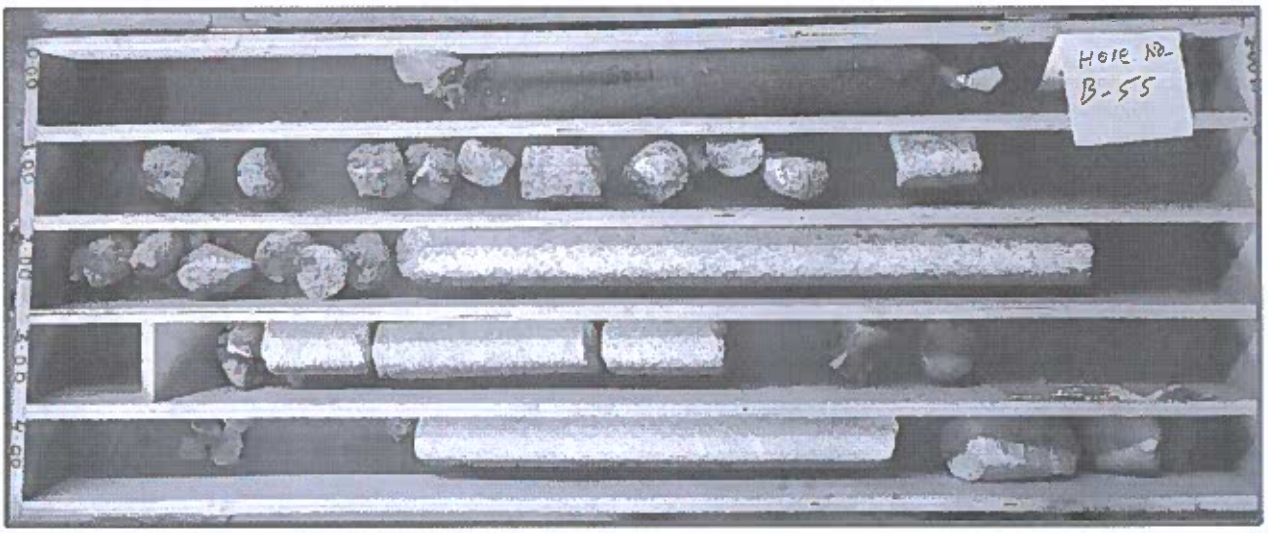


B-54, Box No 1/1, 0.00 m – 5.00m



B-55, Box No 1/2, 0.00 m – 5.00m

B-55, Box No 2/2, 5.00 m – 7.00m

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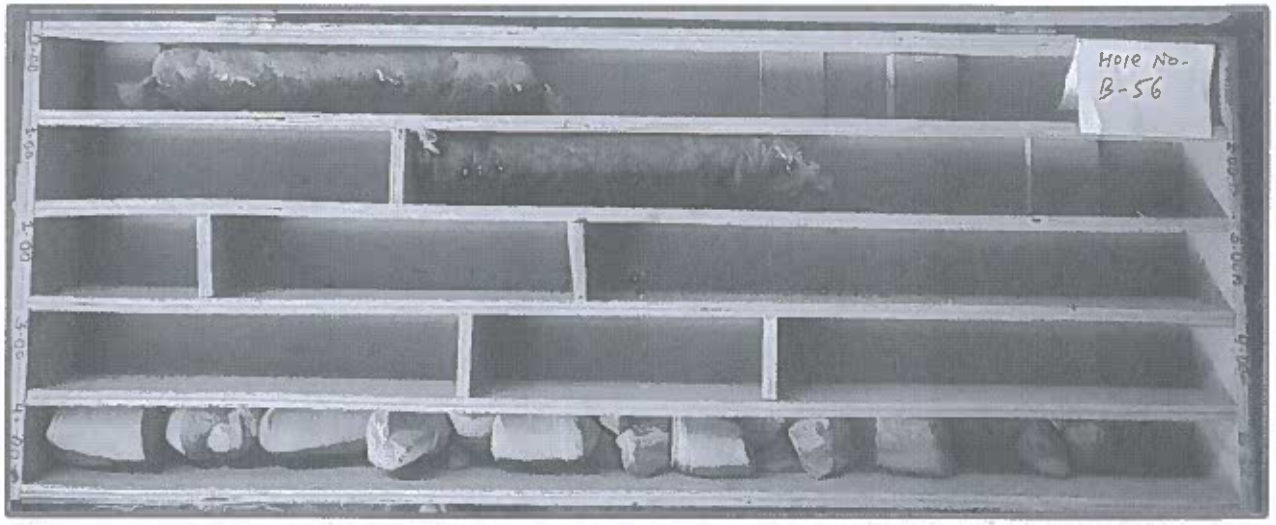
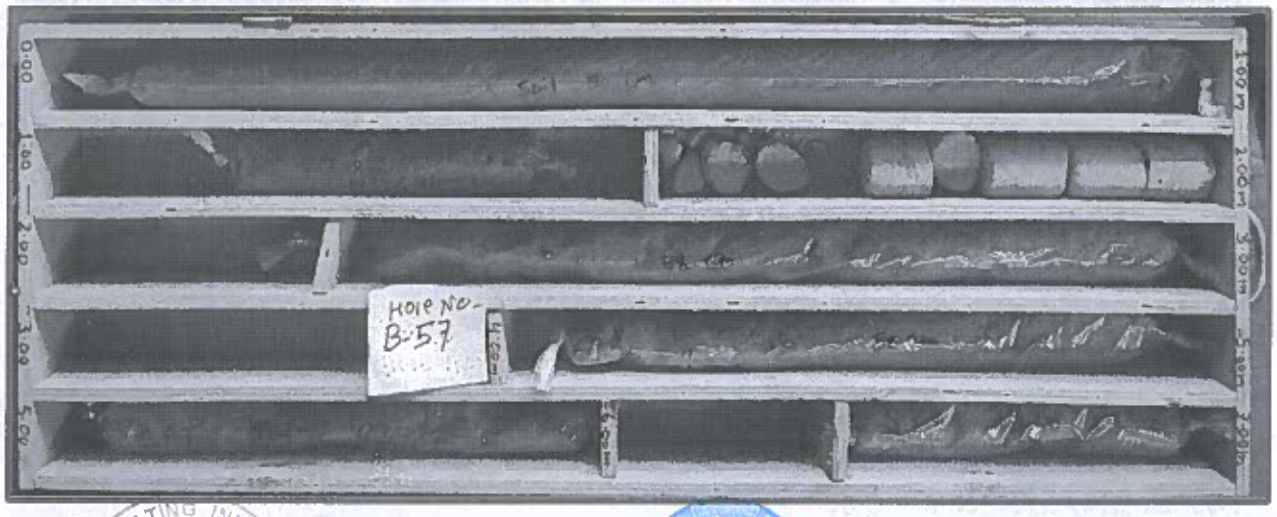


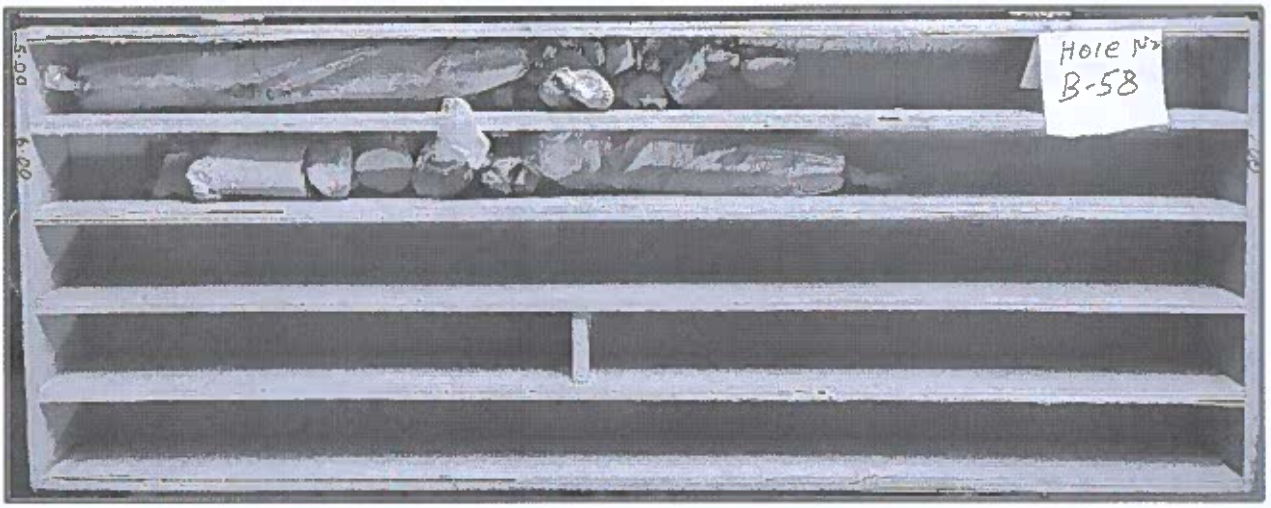
B-55, Box No 1/2, 0.00 m – 5.00m

B-56, Box No 2/2, 5.00 m – 7.00m



B-57, Box No 1/1, 0.00 m – 5.00m

B-58, Box No 1/2, 0.00 m – 5.00m



B-58, Box No 2/2, 5.00 m – 7.00m

B-59, Box No 1/2, 0.00 m – 5.00m

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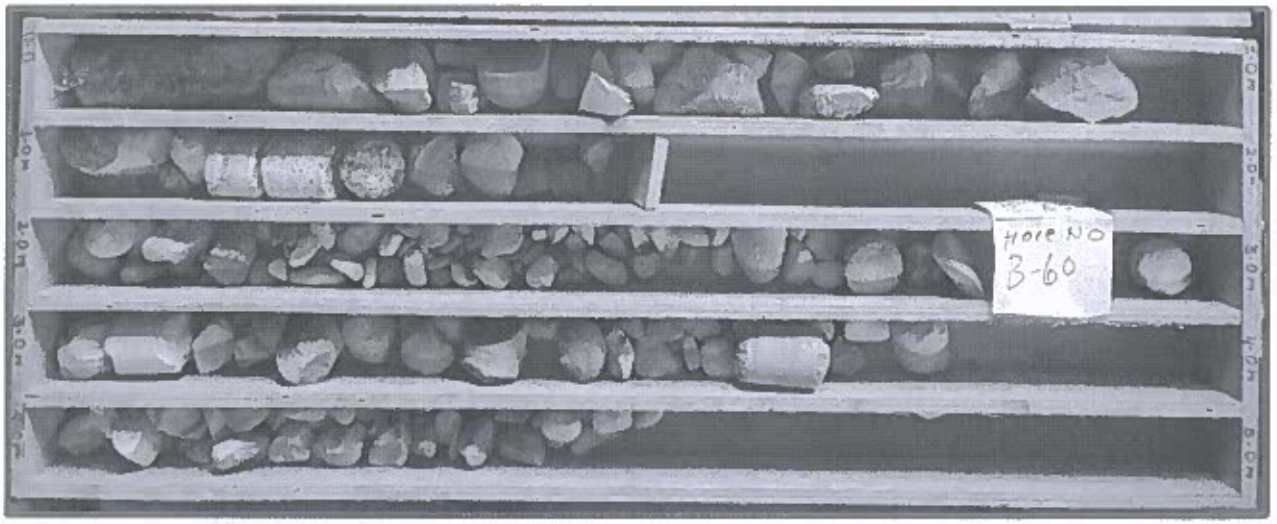
B-59, Box No 2/2, 5.00 m – 7.00m



B-60, Box No 1/2, 0.00 m – 5.00m

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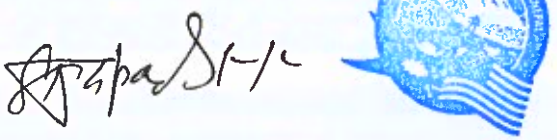
ANNEX C1

Natural Moisture Content



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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 02.04.2019

Location: Borehole No.: B-1 Tested By: Pranita Pun

Co-ordinate Source; SPT Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-1					
Sample No.	No	1	2	3			
Depth	m	3.00-3.45m					
Container No.	No	A-95	A-132	A-67			
Wt. of Container + Wt. of Wet Soil	gm	25.75	24.48	30.13			
Wt. of Container + Wt. of Dry Soil	gm	23.18	22.10	27.95			
Wt. of Water, W_w	gm	2.57	2.38	2.18			
Wt. of Empty Container	gm	9.71	10.10	16.50			
Wt. of Dry Soil, W_d	gm	13.47	12.00	11.45			
Moisture Content, M	%	**19.08**	**19.83**	**19.04**			
Average Moisture Content	%	19.32					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 02.04.2019

Location: Borehole No.: B-2 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-2					
Sample No.	No	1	2	3			
Depth	m	3.00-3.45m					
Container No.	No	A-62	A-78	A-121			
Wt. of Container + Wt. of Wet Soil	gm	46.21	41.53	40.27			
Wt. of Container + Wt. of Dry Soil	gm	40.15	36.42	35.57			
Wt. of Water, W_w	gm	6.06	5.11	4.70			
Wt. of Empty Container	gm	16.12	16.18	16.80			
Wt. of Dry Soil, W_d	gm	24.03	20.24	18.77			
Moisture Content, M	%	25.22	25.25	25.04			
Average Moisture Content	%	25.17					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	05.04.2019
Location:		Borehole No.:	B-3	Tested By:	Pranita Pun
Co-ordinate		Source;	SPT Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-3					
Sample No.	No	1	2	3			
Depth	m	3.00-3.45m					
Container No.	No	A-71	A-81	A-100			
Wt. of Container + Wt. of Wet Soil	gm	51.95	49.39	40.30			
Wt. of Container + Wt. of Dry Soil	gm	45.84	43.57	35.36			
Wt. of Water, W_w	gm	6.11	5.82	4.94			
Wt. of Empty Container	gm	17.18	17.80	12.95			
Wt. of Dry Soil, W_d	gm	28.66	25.77	22.41			
Moisture Content, M	%	21.32	22.58	22.04			
Average Moisture Content	%	21.98					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	05.04.2019
Location:		Borehole No.:	B-4	Tested By:	Pranita Pun
Co-ordinate		Source;	SPT Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-4					
Sample No.	No	1	2	3			
Depth	m	3.00-3.45m					
Container No.	No	A-92	A-97	A-104			
Wt. of Container + Wt. of Wet Soil	gm	24.17	32.05	38.93			
Wt. of Container + Wt. of Dry Soil	gm	21.68	28.65	35.49			
Wt. of Water, W_w	gm	2.49	3.40	3.44			
Wt. of Empty Container	gm	7.78	9.28	16.19			
Wt. of Dry Soil, W_d	gm	13.90	19.37	19.30			
Moisture Content, M	%	17.91	17.55	17.82			
Average Moisture Content	%	17.76					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 05.04.2019

Location: Borehole No.: B-5 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-5					
Sample No.	No	1	2	3			
Depth	m	3.00-3.45m					
Container No.	No	A-83	A-118	A-135			
Wt. of Container + Wt. of Wet Soil	gm	42.66	43.61	47.17			
Wt. of Container + Wt. of Dry Soil	gm	37.26	38.97	40.71			
Wt. of Water, W_w	gm	5.40	4.64	6.46			
Wt. of Empty Container	gm	10.89	16.85	8.96			
Wt. of Dry Soil, W_d	gm	26.37	22.12	31.75			
Moisture Content, M	%	20.48	20.98	20.35			
Average Moisture Content	%	20.60					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	05.04.2019
Location:		Borehole No.:	B-6	Tested By:	Pranita Pun
Co-ordinate		Source;	SPT Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-6					
Sample No.	No	1	2	3			
Depth	m	3.00-3.45m					
Container No.	No	A-76	A-129	A-130			
Wt. of Container + Wt. of Wet Soil	gm	31.03	33.90	34.79			
Wt. of Container + Wt. of Dry Soil	gm	27.01	30.72	31.78			
Wt. of Water, W_w	gm	4.02	3.18	3.01			
Wt. of Empty Container	gm	8.67	16.04	17.92			
Wt. of Dry Soil, W_d	gm	18.34	14.68	13.86			
Moisture Content, M	%	**21.92**	**21.66**	**21.72**			
Average Moisture Content	%	21.77					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 05.04.2019

Location: Borehole No.: B-7 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-7					
Sample No.	No	1	2	3			
Depth	m	3.00-3.45m					
Container No.	No	A-51	A-80	A-131			
Wt. of Container + Wt. of Wet Soil	gm	21.87	23.48	31.96			
Wt. of Container + Wt. of Dry Soil	gm	19.55	20.63	29.04			
Wt. of Water, W_w	gm	2.32	2.85	2.92			
Wt. of Empty Container	gm	10.38	9.65	17.73			
Wt. of Dry Soil, W_d	gm	9.17	10.98	11.31			
Moisture Content, M	%	25.30	25.96	25.82			
Average Moisture Content	%	25.69					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 22.04.2019

Location: Borehole No.: B-8 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-8					
Sample No.	No	1	2	3			
Depth	m	3.00-3.45m					
Container No.	No	A-78	A-111	A-118			
Wt. of Container + Wt. of Wet Soil	gm	30.12	35.71	41.69			
Wt. of Container + Wt. of Dry Soil	gm	27.79	32.42	37.67			
Wt. of Water, W_w	gm	2.33	3.29	4.02			
Wt. of Empty Container	gm	16.15	16.16	17.65			
Wt. of Dry Soil, W_d	gm	11.64	16.26	20.02			
Moisture Content, M	%	20.02	20.23	20.08			
Average Moisture Content	%	20.11					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-12 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-12					
Sample No.	No	1	2	3			
Depth	m	4.00 -4.45 m					
Container No.	No	A-73	A-115	A-134			
Wt. of Container + Wt. of Wet Soil	gm	62.08	71.65	67.05			
Wt. of Container + Wt. of Dry Soil	gm	56.63	65.35	61.22			
Wt. of Water, W_w	gm	5.45	6.30	5.83			
Wt. of Empty Container	gm	8.67	9.89	9.92			
Wt. of Dry Soil, W_d	gm	47.96	55.46	51.30			
Moisture Content, M	%	11.36	11.36	11.36			
Average Moisture Content	%	17.04					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	30.06.2019
Location:		Borehole No.:	B-13	Tested By:	Pranita Pun
Co-ordinate		Source;	SPT Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-13					
Sample No.	No	1	2	3			
Depth	m	3.00 -3.45 m					
Container No.	No	A-02	A-117	A-61			
Wt. of Container + Wt. of Wet Soil	gm	58.72	51.05	59.61			
Wt. of Container + Wt. of Dry Soil	gm	53.79	46.87	54.78			
Wt. of Water, W_w	gm	4.93	4.18	4.83			
Wt. of Empty Container	gm	9.98	9.72	11.82			
Wt. of Dry Soil, W_d	gm	43.81	37.15	42.96			
Moisture Content, M	%	11.25	11.25	11.24			
Average Moisture Content	%	16.87					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-15 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-15					
Sample No.	No	1	2	3			
Depth	m	1.00 -1.45 m					
Container No.	No	A-109	A-68	A-63			
Wt. of Container + Wt. of Wet Soil	gm	51.97	58.94	62.85			
Wt. of Container + Wt. of Dry Soil		47.51	54.62	57.32			
Wt. of Water, W_w	gm	4.46	4.32	5.53			
Wt. of Empty Container	gm	9.10	17.42	9.69			
Wt. of Dry Soil, W_d	gm	38.41	37.20	47.63			
Moisture Content, M	%	11.61	11.61	11.61			
Average Moisture Content	%	11.61					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	20.06.2019
Location:		Borehole No.:	B-16	Tested By:	Pranita Pun
Co-ordinate		Source:	SPT	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-16					
Sample No.	No	1	2				
Depth	m	3.00-3.45m					
Container No.	No	E-32	A-50				
Wt. of Container + Wt. of Wet Soil	gm	403.92	476.74				
Wt. of Container + Wt. of Dry Soil	gm	372.57	439.28				
Wt. of Water, W_w	gm	31.35	37.46				
Wt. of Empty Container	gm	88.02	99.72				
Wt. of Dry Soil, W_d	gm	284.55	339.56				
Moisture Content, M	%	11.02	11.03				
Average Moisture Content	%	11.02					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 20.06.2019

Location: Borehole No.: B-20 Tested By: Pranita Pun

Co-ordinate Source: SPT Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-20					
Sample No.	No	1	2				
Depth	m	3.00-3.45m					
Container No.	No	E-20	E-93				
Wt. of Container + Wt. of Wet Soil	gm	211.55	210.17				
Wt. of Container + Wt. of Dry Soil	gm	201.29	198.45				
Wt. of Water, W_w	gm	10.26	11.72				
Wt. of Empty Container	gm	98.88	81.57				
Wt. of Dry Soil, W_d	gm	102.41	116.88				
Moisture Content, M	%	10.02	10.03				
Average Moisture Content	%	10.02					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	20.06.2019
Location:		Borehole No.:	B-21	Tested By:	Pranita Pun
Co-ordinate		Source:	SPT	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-21					
Sample No.	No	1	2				
Depth	m	3.00-3.45m					
Container No.	No	ICGS-4	E-10				
Wt. of Container + Wt. of Wet Soil	gm	295.12	300.67				
Wt. of Container + Wt. of Dry Soil	gm	270.81	273.94				
Wt. of Water, W_w	gm	24.31	26.73				
Wt. of Empty Container	gm	113.59	101.06				
Wt. of Dry Soil, W_d	gm	157.22	172.88				
Moisture Content, M	%	15.46	15.46				
Average Moisture Content	%	15.46					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	20.06.2019
Location:		Borehole No.:	B-22	Tested By:	Pranita Pun
Co-ordinate		Source:	SPT	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-22					
Sample No.	No	1	2				
Depth	m	2.00-2.45m					
Container No.	No	A - 50	A-67				
Wt. of Container + Wt. of Wet Soil	gm	118.26	137.05				
Wt. of Container + Wt. of Dry Soil	gm	109.49	124.04				
Wt. of Water, W_w	gm	8.77	13.01				
Wt. of Empty Container	gm	37.46	16.50				
Wt. of Dry Soil, W_d	gm	72.03	107.54				
Moisture Content, M	%	12.18	12.10				
Average Moisture Content	%	12.14					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-26 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-26					
Sample No.	No	1	2	3			
Depth	m	3.00 -3.45 m					
Container No.	No	A-51	A-79	A-81			
Wt. of Container + Wt. of Wet Soil	gm	50.07	47.37	42.18			
Wt. of Container + Wt. of Dry Soil		44.61	43.08	38.82			
Wt. of Water, W_w	gm	5.46	4.29	3.36			
Wt. of Empty Container	gm	10.34	16.15	17.73			
Wt. of Dry Soil, W_d	gm	34.27	26.93	21.09			
Moisture Content, M	%	15.93	15.93	15.93			
Average Moisture Content	%	15.93					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	30.06.2019
Location:		Borehole No.:	B-27	Tested By:	Pranita Pun
Co-ordinate		Source;	SPT Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-27					
Sample No.	No	1	2	3			
Depth	m	1.00 -1.45 m					
Container No.	No	A-74	A-85	A-119			
Wt. of Container + Wt. of Wet Soil	gm	56.79	59.23	57.03			
Wt. of Container + Wt. of Dry Soil		51.92	54.21	51.41			
Wt. of Water, W_w	gm	4.87	5.02	5.62			
Wt. of Empty Container	gm	16.16	17.34	10.16			
Wt. of Dry Soil, W_d	gm	35.76	36.87	41.25			
Moisture Content, M	%	13.62	13.62	13.62			
Average Moisture Content	%	13.62					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-28 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-28					
Sample No.	No	1	2	3			
Depth	m	4.00 -4.45 m					
Container No.	No	A-137	A-139	A-112			
Wt. of Container + Wt. of Wet Soil	gm	57.48	56.54	58.72			
Wt. of Container + Wt. of Dry Soil	gm	51.98	51.16	53.25			
Wt. of Water, W_w	gm	5.50	5.38	5.47			
Wt. of Empty Container	gm	16.19	16.16	17.67			
Wt. of Dry Soil, W_d	gm	35.79	35.00	35.58			
Moisture Content, M	%	15.37	15.37	15.37			
Average Moisture Content	%	15.37					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	20.06.2019
Location:		Borehole No.:	B-29	Tested By:	Pranita Pun
Co-ordinate		Source:	SPT	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-29					
Sample No.	No	1	2				
Depth	m	3.00-3.45m					
Container No.	No	ICGS -3	ICGS-5				
Wt. of Container + Wt. of Wet Soil	gm	248.19	239.91				
Wt. of Container + Wt. of Dry Soil	gm	243.31	235.24				
Wt. of Water, W_w	gm	4.88	4.67				
Wt. of Empty Container	gm	88.51	88.01				
Wt. of Dry Soil, W_d	gm	154.80	147.23				
Moisture Content, M	%	3.15	3.17				
Average Moisture Content	%	3.16					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 20.06.2019

Location: Borehole No.: B-31 Tested By: Pranita Pun

Co-ordinate Source: SPT Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-31					
Sample No.	No	1	2				
Depth	m	3.00-3.45m					
Container No.	No	BH-2	B				
Wt. of Container + Wt. of Wet Soil	gm	258.94	188.49				
Wt. of Container + Wt. of Dry Soil	gm	240.98	179.79				
Wt. of Water, W_w	gm	17.96	8.70				
Wt. of Empty Container	gm	78.58	101.10				
Wt. of Dry Soil, W_d	gm	162.40	78.69				
Moisture Content, M	%	11.06	11.06				
Average Moisture Content	%	11.06					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	20.06.2019
Location:		Borehole No.:	B-34	Tested By:	Pranita Pun
Co-ordinate		Source:	SPT	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-34					
Sample No.	No	1	2				
Depth	m	3.00-3.45m					
Container No.	No	A	E-4				
Wt. of Container + Wt. of Wet Soil	gm	217.37	221.62				
Wt. of Container + Wt. of Dry Soil	gm	214.91	219.28				
Wt. of Water, W_w	gm	2.46	2.34				
Wt. of Empty Container	gm	97.44	106.60				
Wt. of Dry Soil, W_d	gm	117.47	112.68				
Moisture Content, M	%	2.09	2.08				
Average Moisture Content	%	2.09					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	20.06.2019
Location:		Borehole No.:	B-35	Tested By:	Pranita Pun
Co-ordinate		Source;	SPT	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-35					
Sample No.	No	1	2				
Depth	m	3.00-3.45m					
Container No.	No	ICGS -1	D				
Wt. of Container + Wt. of Wet Soil	gm	337.49	320.72				
Wt. of Container + Wt. of Dry Soil	gm	296.53	283.92				
Wt. of Water, W_w	gm	40.96	36.80				
Wt. of Empty Container	gm	94.32	102.18				
Wt. of Dry Soil, W_d	gm	202.21	181.74				
Moisture Content, M	%	20.26	20.25				
Average Moisture Content	%	20.25					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	30.06.2019
Location:		Borehole No.:	B-37	Tested By:	Pranita Pun
Co-ordinate		Source;	SPT Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-37					
Sample No.	No	1	2	3			
Depth	m	3.00 -3.45 m					
Container No.	No	A-87	A-133	A-72			
Wt. of Container + Wt. of Wet Soil	gm	51.81	48.55	45.24			
Wt. of Container + Wt. of Dry Soil	gm	45.82	42.91	40.01			
Wt. of Water, W_w	gm	5.99	5.64	5.23			
Wt. of Empty Container	gm	9.45	8.69	8.25			
Wt. of Dry Soil, W_d	gm	36.37	34.22	31.76			
Moisture Content, M	%	16.47	16.48	16.47			
Average Moisture Content	%	16.47					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-38 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-38					
Sample No.	No	1	2	3			
Depth	m	3.00 -3.45 m					
Container No.	No	A-125	A-105	A-92			
Wt. of Container + Wt. of Wet Soil	gm	52.43	48.41	43.88			
Wt. of Container + Wt. of Dry Soil		45.39	43.30	37.90			
Wt. of Water, W_w	gm	7.04	5.11	5.98			
Wt. of Empty Container	gm	10.11	17.68	7.93			
Wt. of Dry Soil, W_d	gm	35.28	25.62	29.97			
Moisture Content, M	%	19.95	19.95	19.95			
Average Moisture Content	%	19.95					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-39 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-39					
Sample No.	No	1	2	3			
Depth	m	3.00-3.45 m					
Container No.	No	A-67	A-66	A-141			
Wt. of Container + Wt. of Wet Soil	gm	61.93	63.98	67.04			
Wt. of Container + Wt. of Dry Soil	gm	53.86	55.79	58.29			
Wt. of Water, W_w	gm	8.07	8.19	8.75			
Wt. of Empty Container	gm	16.25	17.63	17.51			
Wt. of Dry Soil, W_d	gm	37.61	38.16	40.78			
Moisture Content, M	%	21.46	21.46	21.46			
Average Moisture Content	%	21.46					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-40 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-40					
Sample No.	No	1	2	3			
Depth	m	2.00 -2.45 m					
Container No.	No	A-91	A-103	A-86			
Wt. of Container + Wt. of Wet Soil	gm	61.09	58.85	63.84			
Wt. of Container + Wt. of Dry Soil	gm	54.71	52.62	57.25			
Wt. of Water, W_w	gm	6.38	6.23	6.59			
Wt. of Empty Container	gm	9.43	8.39	10.49			
Wt. of Dry Soil, W_d	gm	45.28	44.23	46.76			
Moisture Content, M	%	14.09	14.09	14.09			
Average Moisture Content	%	14.09					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-41 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-41					
Sample No.	No	1	2	3			
Depth	m	3.00 -3.45 m					
Container No.	No	A-123	A-108	A-114			
Wt. of Container + Wt. of Wet Soil	gm	53.76	54.96	46.14			
Wt. of Container + Wt. of Dry Soil	gm	48.89	50.19	42.24			
Wt. of Water, W_w	gm	4.87	4.77	3.90			
Wt. of Empty Container	gm	16.17	18.13	16.03			
Wt. of Dry Soil, W_d	gm	32.72	32.06	26.21			
Moisture Content, M	%	14.88	14.88	14.88			
Average Moisture Content	%	14.88					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-44 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-44					
Sample No.	No	1	2	3			
Depth	m	3.00 -3.45 m					
Container No.	No	A-83	A-95	A-98			
Wt. of Container + Wt. of Wet Soil	gm	52.56	56.38	74.59			
Wt. of Container + Wt. of Dry Soil		43.10	45.66	60.08			
Wt. of Water, W_w	gm	9.46	10.72	14.51			
Wt. of Empty Container	gm	11.19	9.51	11.15			
Wt. of Dry Soil, W_d	gm	31.91	36.15	48.93			
Moisture Content, M	%	29.65	29.65	29.65			
Average Moisture Content	%	29.65					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-49 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-49					
Sample No.	No	1	2	3			
Depth	m	3.00 -3.45 m					
Container No.	No	A-104	A-116	A-140			
Wt. of Container + Wt. of Wet Soil	gm	60.26	71.24	60.62			
Wt. of Container + Wt. of Dry Soil	gm	53.29	62.77	52.58			
Wt. of Water, W_w	gm	6.97	8.47	8.04			
Wt. of Empty Container	gm	16.14	17.62	9.73			
Wt. of Dry Soil, W_d	gm	37.15	45.15	42.85			
Moisture Content, M	%	18.76	18.76	18.76			
Average Moisture Content	%	18.76					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-52 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-52					
Sample No.	No	1	2	3			
Depth	m	2.00 -2.45 m					
Container No.	No	A-70	A-96	A-97			
Wt. of Container + Wt. of Wet Soil	gm	17.90	22.21	24.98			
Wt. of Container + Wt. of Dry Soil		16.33	20.04	22.18			
Wt. of Water, W_w	gm	1.57	2.17	2.80			
Wt. of Empty Container	gm	9.07	10.00	9.26			
Wt. of Dry Soil, W_d	gm	7.26	10.04	12.92			
Moisture Content, M	%	21.63	21.61	21.67			
Average Moisture Content	%	21.64					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	30.06.2019
Location:		Borehole No.:	B-54	Tested By:	Pranita Pun
Co-ordinate		Source;	SPT Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-54					
Sample No.	No	1	2	3			
Depth	m	3.00 -3.45 m					
Container No.	No	A-77	A-51				
Wt. of Container + Wt. of Wet Soil	gm	44.63	41.21				
Wt. of Container + Wt. of Dry Soil	gm	40.93	37.96				
Wt. of Water, W_w	gm	3.70	3.25				
Wt. of Empty Container	gm	9.38	10.34				
Wt. of Dry Soil, W_d	gm	31.55	27.62				
Moisture Content, M	%	11.73	11.77				
Average Moisture Content	%	11.75					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	20.06.2019
Location:		Borehole No.:	B-55	Tested By:	Pranita Pun
Co-ordinate		Source;	SPT	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-55					
Sample No.	No	1	2				
Depth	m	3.00-3.45m					
Container No.	No	E-92	E-33				
Wt. of Container + Wt. of Wet Soil	gm	205.37	211.69				
Wt. of Container + Wt. of Dry Soil	gm	198.92	204.15				
Wt. of Water, W_w	gm	6.45	7.54				
Wt. of Empty Container	gm	102.08	90.60				
Wt. of Dry Soil, W_d	gm	96.84	113.55				
Moisture Content, M	%	6.66	6.64				
Average Moisture Content	%	6.65					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-56 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-56					
Sample No.	No	1	2	3			
Depth	m	3.00 -3.50 m					
Container No.	No	A-46	A-42	A-55			
Wt. of Container + Wt. of Wet Soil	gm	29.05	26.52	29.07			
Wt. of Container + Wt. of Dry Soil		25.30	23.84	26.01			
Wt. of Water, W_w	gm	3.75	2.68	3.06			
Wt. of Empty Container	gm	10.56	13.31	13.98			
Wt. of Dry Soil, W_d	gm	14.74	10.53	12.03			
Moisture Content, M	%	25.44	25.45	25.44			
Average Moisture Content	%	25.44					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 30.06.2019

Location: Borehole No.: B-57 Tested By: Pranita Pun

Co-ordinate Source; SPT Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-57					
Sample No.	No	1	2	3			
Depth	m	5.00 -5.45 m					
Container No.	No	A-65	A-135	A-113			
Wt. of Container + Wt. of Wet Soil	gm	70.69	60.43	67.28			
Wt. of Container + Wt. of Dry Soil	gm	60.82	51.81	57.72			
Wt. of Water, W_w	gm	9.87	8.62	9.56			
Wt. of Empty Container	gm	11.64	8.87	10.09			
Wt. of Dry Soil, W_d	gm	49.18	42.94	47.63			
Moisture Content, M	%	20.07	20.07	20.07			
Average Moisture Content	%	20.07					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	30.06.2019
Location:		Borehole No.:	B-58	Tested By:	Pranita Pun
Co-ordinate		Source;	SPT Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-58					
Sample No.	No	1	2	3			
Depth	m	3.00 -3.45 m					
Container No.	No	A-71	E-14	A-77			
Wt. of Container + Wt. of Wet Soil	gm	62.18	54.11	60.62			
Wt. of Container + Wt. of Dry Soil	gm	59.10	50.97	57.03			
Wt. of Water, W_w	gm	3.08	3.14	3.59			
Wt. of Empty Container	gm	18.17	9.28	9.38			
Wt. of Dry Soil, W_d	gm	40.93	41.69	47.65			
Moisture Content, M	%	7.53	7.53	7.53			
Average Moisture Content	%	7.53					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 22.12.2075

Location: Borehole No.: B-1 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-1					
Sample No.	No	1	2	3			
Depth	m	3.50-4.50m					
Container No.	No	A-82	A-73	A-108			
Wt. of Container + Wt. of Wet Soil	gm	44.76	33.77	45.43			
Wt. of Container + Wt. of Dry Soil	gm	39.80	29.28	40.49			
Wt. of Water, W_w	gm	4.96	4.49	4.94			
Wt. of Empty Container	gm	18.16	8.63	18.15			
Wt. of Dry Soil, W_d	gm	21.64	20.65	22.34			
Moisture Content, M	%	22.92	21.74	22.11			
Average Moisture Content	%	22.26					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 03.04.2019

Location: Borehole No.: B-2 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-2					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-66	A-68	A-114			
Wt. of Container + Wt. of Wet Soil	gm	32.46	49.86	30.02			
Wt. of Container + Wt. of Dry Soil	gm	29.44	43.89	27.07			
Wt. of Water, W_w	gm	3.02	5.97	2.95			
Wt. of Empty Container	gm	17.68	20.25	15.55			
Wt. of Dry Soil, W_d	gm	11.76	23.64	11.52			
Moisture Content, M	%	25.68	25.25	25.61			
Average Moisture Content	%	25.51					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 04.04.2019

Location: Borehole No.: B-3 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-3					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-74	A-101	A-106			
Wt. of Container + Wt. of Wet Soil	gm	32.22	31.86	39.93			
Wt. of Container + Wt. of Dry Soil	gm	28.80	28.49	35.22			
Wt. of Water, W_w	gm	3.42	3.37	4.71			
Wt. of Empty Container	gm	16.17	16.18	18.08			
Wt. of Dry Soil, W_d	gm	12.63	12.31	17.14			
Moisture Content, M	%	27.08	27.38	27.48			
Average Moisture Content	%	27.31					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 22.12.2075

Location: Borehole No.: B-4 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-4					
Sample No.	No	1	2	3			
Depth	m	2.00-3.00m					
Container No.	No	A-129	A-84	A-136			
Wt. of Container + Wt. of Wet Soil	gm	51.71	44.53	51.28			
Wt. of Container + Wt. of Dry Soil	gm	45.13	40.27	44.76			
Wt. of Water, W_w	gm	6.58	4.26	6.52			
Wt. of Empty Container	gm	16.04	16.21	16.12			
Wt. of Dry Soil, W_d	gm	29.09	24.06	28.64			
Moisture Content, M	%	22.62	17.71	22.77			
Average Moisture Content	%	21.03					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 22.12.2075

Location: Borehole No.: B-5 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-5					
Sample No.	No	1	2	3			
Depth	m	3.50-4.50m					
Container No.	No	A-88	A-65	A-93			
Wt. of Container + Wt. of Wet Soil	gm	33.91	20.76	26.14			
Wt. of Container + Wt. of Dry Soil	gm	31.35	19.42	24.30			
Wt. of Water, W_w	gm	2.56	1.34	1.84			
Wt. of Empty Container	gm	16.20	11.64	16.13			
Wt. of Dry Soil, W_d	gm	15.15	7.78	8.17			
Moisture Content, M	%	16.90	17.22	22.52			
Average Moisture Content	%	18.88					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 04.04.2019

Location: Borehole No.: B-6 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-6					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-127	A-128	A-143			
Wt. of Container + Wt. of Wet Soil	gm	31.14	30.84	40.60			
Wt. of Container + Wt. of Dry Soil	gm	28.66	28.45	36.01			
Wt. of Water, W_w	gm	2.48	2.39	4.59			
Wt. of Empty Container	gm	17.89	18.10	16.18			
Wt. of Dry Soil, W_d	gm	10.77	10.35	19.83			
Moisture Content, M	%	23.03	23.09	23.15			
Average Moisture Content	%	23.09					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	04.04.2019
Location:		Borehole No.:	B-7	Tested By:	Pranita Pun
Co-ordinate		Source;	Test Pit Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-7					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-51	A-11	A-20			
Wt. of Container + Wt. of Wet Soil	gm	26.38	42.74	45.93			
Wt. of Container + Wt. of Dry Soil	gm	24.66	41.02	43.67			
Wt. of Water, W_w	gm	1.72	1.72	2.26			
Wt. of Empty Container	gm	15.17	31.54	31.23			
Wt. of Dry Soil, W_d	gm	9.49	9.48	12.44			
Moisture Content, M	%	18.12	18.14	18.17			
Average Moisture Content	%	18.15					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 22.12.2075

Location: Borehole No.: B-8 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-8					
Sample No.	No	1	2	3			
Depth	m	3.50-4.50m					
Container No.	No	A-106	A-112	A-127			
Wt. of Container + Wt. of Wet Soil	gm	51.72	44.54	40.98			
Wt. of Container + Wt. of Dry Soil	gm	44.51	39.13	37.27			
Wt. of Water, W_w	gm	7.21	5.41	3.71			
Wt. of Empty Container	gm	18.09	17.72	18.50			
Wt. of Dry Soil, W_d	gm	26.42	21.41	18.77			
Moisture Content, M	%	27.29	25.27	19.77			
Average Moisture Content	%	24.11					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.05.2019

Location: Borehole No.: B-9 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-9					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-75	A-88				
Wt. of Container + Wt. of Wet Soil	gm	55.24	40.92				
Wt. of Container + Wt. of Dry Soil	gm	50.85	38.16				
Wt. of Water, W_w	gm	4.39	2.76				
Wt. of Empty Container	gm	16.10	16.15				
Wt. of Dry Soil, W_d	gm	34.75	22.01				
Moisture Content, M	%	12.63	12.54				
Average Moisture Content	%	12.59					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-10 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-10					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A106	A-128				
Wt. of Container + Wt. of Wet Soil	gm	49.97	41.87				
Wt. of Container + Wt. of Dry Soil	gm	46.45	39.28				
Wt. of Water, W_w	gm	3.52	2.59				
Wt. of Empty Container	gm	18.07	17.83				
Wt. of Dry Soil, W_d	gm	28.38	21.45				
Moisture Content, M	%	12.40	12.07				
Average Moisture Content	%	12.24					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-11 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-11					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-101	A-118				
Wt. of Container + Wt. of Wet Soil	gm	54.19	59.75				
Wt. of Container + Wt. of Dry Soil	gm	52.33	57.59				
Wt. of Water, W_w	gm	1.86	2.16				
Wt. of Empty Container	gm	16.14	17.59				
Wt. of Dry Soil, W_d	gm	36.19	40.00				
Moisture Content, M	%	5.14	5.40				
Average Moisture Content	%	5.27					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.05.2019

Location: Borehole No.: B-12 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-12					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-81	A-127				
Wt. of Container + Wt. of Wet Soil	gm	74.11	73.04				
Wt. of Container + Wt. of Dry Soil	gm	68.85	68.00				
Wt. of Water, W_w	gm	5.26	5.04				
Wt. of Empty Container	gm	17.70	18.45				
Wt. of Dry Soil, W_d	gm	51.15	49.55				
Moisture Content, M	%	10.28	10.17				
Average Moisture Content	%	10.23					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-13 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-13					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-75	A-141				
Wt. of Container + Wt. of Wet Soil	gm	57.14	66.19				
Wt. of Container + Wt. of Dry Soil	gm	55.05	63.80				
Wt. of Water, W_w	gm	2.09	2.39				
Wt. of Empty Container	gm	16.10	17.54				
Wt. of Dry Soil, W_d	gm	38.95	46.26				
Moisture Content, M	%	5.37	5.17				
Average Moisture Content	%	5.27					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.05.2019

Location: Borehole No.: B-14 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-14					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-86	A-108				
Wt. of Container + Wt. of Wet Soil	gm	48.46	56.53				
Wt. of Container + Wt. of Dry Soil	gm	45.49	53.55				
Wt. of Water, W_w	gm	2.97	2.98				
Wt. of Empty Container	gm	10.48	18.16				
Wt. of Dry Soil, W_d	gm	35.01	35.39				
Moisture Content, M	%	8.48	8.42				
Average Moisture Content	%	8.45					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	23.05.2019
Location:		Borehole No.:	B-15	Tested By:	Pranita Pun
Co-ordinate		Source;	Test Pit Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-15					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-83	A-88				
Wt. of Container + Wt. of Wet Soil	gm	45.69	49.25				
Wt. of Container + Wt. of Dry Soil	gm	40.55	44.53				
Wt. of Water, W_w	gm	5.14	4.72				
Wt. of Empty Container	gm	9.66	16.15				
Wt. of Dry Soil, W_d	gm	30.89	28.38				
Moisture Content, M	%	16.64	16.63				
Average Moisture Content	%	16.64					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 22.05.2019

Location: Borehole No.: B-16 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-16					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-75	A-99				
Wt. of Container + Wt. of Wet Soil	gm	50.68	51.64				
Wt. of Container + Wt. of Dry Soil	gm	47.02	47.25				
Wt. of Water, W_w	gm	3.66	4.39				
Wt. of Empty Container	gm	16.09	9.97				
Wt. of Dry Soil, W_d	gm	30.93	37.28				
Moisture Content, M	%	11.83	11.78				
Average Moisture Content	%	11.80					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 28.05.2019

Location: Borehole No.: B-17 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-17					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-84	A-127				
Wt. of Container + Wt. of Wet Soil	gm	50.55	64.12				
Wt. of Container + Wt. of Dry Soil	gm	47.62	60.16				
Wt. of Water, W_w	gm	2.93	3.96				
Wt. of Empty Container	gm	16.18	18.45				
Wt. of Dry Soil, W_d	gm	31.44	41.71				
Moisture Content, M	%	9.32	9.49				
Average Moisture Content	%	9.41					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.05.2019

Location: Borehole No.: B-18 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-18					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-79	A-124				
Wt. of Container + Wt. of Wet Soil	gm	52.93	51.65				
Wt. of Container + Wt. of Dry Soil	gm	47.92	47.18				
Wt. of Water, W_w	gm	5.01	4.47				
Wt. of Empty Container	gm	16.18	18.16				
Wt. of Dry Soil, W_d	gm	31.74	29.02				
Moisture Content, M	%	15.78	15.40				
Average Moisture Content	%	15.59					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-19 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-19					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-64	A-72				
Wt. of Container + Wt. of Wet Soil	gm	48.27	36.62				
Wt. of Container + Wt. of Dry Soil	gm	42.75	31.53				
Wt. of Water, W_w	gm	5.52	5.09				
Wt. of Empty Container	gm	17.49	8.25				
Wt. of Dry Soil, W_d	gm	25.26	23.28				
Moisture Content, M	%	21.85	21.86				
Average Moisture Content	%	21.86					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-20 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-20					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-78	A-93				
Wt. of Container + Wt. of Wet Soil	gm	50.22	54.70				
Wt. of Container + Wt. of Dry Soil	gm	45.62	49.45				
Wt. of Water, W_w	gm	4.60	5.25				
Wt. of Empty Container	gm	16.12	16.09				
Wt. of Dry Soil, W_d	gm	29.50	33.36				
Moisture Content, M	%	15.59	15.74				
Average Moisture Content	%	15.67					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-21 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-21					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-62	A-115				
Wt. of Container + Wt. of Wet Soil	gm	50.04	49.49				
Wt. of Container + Wt. of Dry Soil	gm	45.89	44.69				
Wt. of Water, W_w	gm	4.15	4.80				
Wt. of Empty Container	gm	16.16	9.92				
Wt. of Dry Soil, W_d	gm	29.73	34.77				
Moisture Content, M	%	13.96	13.81				
Average Moisture Content	%	13.88					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.04.2019

Location: Borehole No.: B-22 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-22					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-84	A-115	A-139			
Wt. of Container + Wt. of Wet Soil	gm	42.35	38.35	43.30			
Wt. of Container + Wt. of Dry Soil	gm	39.71	35.34	40.42			
Wt. of Water, W_w	gm	2.64	3.01	2.88			
Wt. of Empty Container	gm	16.20	9.99	16.15			
Wt. of Dry Soil, W_d	gm	23.51	25.35	24.27			
Moisture Content, M	%	11.23	11.87	11.87			
Average Moisture Content	%	11.66					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.04.2019

Location: Borehole No.: B-25 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-25					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-81	A-112	A-138			
Wt. of Container + Wt. of Wet Soil	gm	32.29	38.96	40.23			
Wt. of Container + Wt. of Dry Soil	gm	30.25	35.95	37.05			
Wt. of Water, W_w	gm	2.04	3.01	3.18			
Wt. of Empty Container	gm	17.71	17.76	17.70			
Wt. of Dry Soil, W_d	gm	12.54	18.19	19.35			
Moisture Content, M	%	16.27	16.55	16.43			
Average Moisture Content	%	16.42					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	23.04.2019
Location:		Borehole No.:	B-26	Tested By:	Pranita Pun
Co-ordinate		Source;	Test Pit Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-26					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-78	A-88	A-136			
Wt. of Container + Wt. of Wet Soil	gm	40.46	29.63	30.49			
Wt. of Container + Wt. of Dry Soil	gm	36.15	27.22	27.97			
Wt. of Water, W_w	gm	4.31	2.41	2.52			
Wt. of Empty Container	gm	16.14	16.15	16.07			
Wt. of Dry Soil, W_d	gm	20.01	11.07	11.90			
Moisture Content, M	%	21.54	21.77	21.18			
Average Moisture Content	%	21.50					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 22.04.2019

Location: Borehole No.: B-27 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-27					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-98	A-129	A-143			
Wt. of Container + Wt. of Wet Soil	gm	39.89	40.59	45.38			
Wt. of Container + Wt. of Dry Soil	gm	37.05	38.28	42.65			
Wt. of Water, W_w	gm	2.84	2.31	2.73			
Wt. of Empty Container	gm	11.20	16.02	16.09			
Wt. of Dry Soil, W_d	gm	25.85	22.26	26.56			
Moisture Content, M	%	10.99	10.38	10.28			
Average Moisture Content	%	10.55					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 22.04.2019

Location: Borehole No.: B-28 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-28					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-85	A-104	A-131			
Wt. of Container + Wt. of Wet Soil	gm	56.21	57.70	50.56			
Wt. of Container + Wt. of Dry Soil	gm	49.45	50.47	43.50			
Wt. of Water, W_w	gm	6.76	7.23	7.06			
Wt. of Empty Container	gm	17.34	16.15	9.96			
Wt. of Dry Soil, W_d	gm	32.11	34.32	33.54			
Moisture Content, M	%	21.05	21.07	21.05			
Average Moisture Content	%	21.06					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.04.2019

Location: Borehole No.: B-29 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-29					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-112	A-134	A-138			
Wt. of Container + Wt. of Wet Soil	gm	42.55	31.82	38.65			
Wt. of Container + Wt. of Dry Soil	gm	40.95	30.57	36.82			
Wt. of Water, W_w	gm	1.60	1.25	1.83			
Wt. of Empty Container	gm	17.75	10.01	9.68			
Wt. of Dry Soil, W_d	gm	23.20	20.56	27.14			
Moisture Content, M	%	6.90	6.08	6.74			
Average Moisture Content	%	6.57					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.04.2019

Location: Borehole No.: B-30 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-30					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-67	A-107	A-118			
Wt. of Container + Wt. of Wet Soil	gm	43.73	36.10	38.38			
Wt. of Container + Wt. of Dry Soil	gm	42.10	35.08	37.13			
Wt. of Water, W_w	gm	1.63	1.02	1.25			
Wt. of Empty Container	gm	16.21	18.59	17.60			
Wt. of Dry Soil, W_d	gm	25.89	16.49	19.53			
Moisture Content, M	%	6.30	6.19	6.40			
Average Moisture Content	%	6.29					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.04.2019

Location: Borehole No.: B-31 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-31					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-81	A-86	A-133			
Wt. of Container + Wt. of Wet Soil	gm	46.82	38.99	44.93			
Wt. of Container + Wt. of Dry Soil	gm	44.41	36.63	41.71			
Wt. of Water, W_w	gm	2.41	2.36	3.22			
Wt. of Empty Container	gm	17.71	10.47	8.70			
Wt. of Dry Soil, W_d	gm	26.70	26.16	33.01			
Moisture Content, M	%	9.03	9.02	9.75			
Average Moisture Content	%	9.27					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-32 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-32					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-62	A-111				
Wt. of Container + Wt. of Wet Soil	gm	38.92	42.66				
Wt. of Container + Wt. of Dry Soil	gm	36.28	39.59				
Wt. of Water, W_w	gm	2.64	3.07				
Wt. of Empty Container	gm	16.14	16.20				
Wt. of Dry Soil, W_d	gm	20.14	23.39				
Moisture Content, M	%	13.11	13.13				
Average Moisture Content	%	13.12					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.04.2019

Location: Borehole No.: B-33 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-33					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-85	A-93	A-111			
Wt. of Container + Wt. of Wet Soil	gm	56.51	46.44	49.07			
Wt. of Container + Wt. of Dry Soil	gm	49.07	40.63	42.85			
Wt. of Water, W_w	gm	7.44	5.81	6.22			
Wt. of Empty Container	gm	17.33	16.12	16.19			
Wt. of Dry Soil, W_d	gm	31.74	24.51	26.66			
Moisture Content, M	%	23.44	23.70	23.33			
Average Moisture Content	%	23.49					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	23.04.2019
Location:		Borehole No.:	B-34	Tested By:	Pranita Pun
Co-ordinate		Source;	Test Pit Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-34					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-78	A-88	A-136			
Wt. of Container + Wt. of Wet Soil	gm	41.45	37.07	46.63			
Wt. of Container + Wt. of Dry Soil	gm	38.06	34.33	42.64			
Wt. of Water, W_w	gm	3.39	2.74	3.99			
Wt. of Empty Container	gm	16.12	16.17	16.09			
Wt. of Dry Soil, W_d	gm	21.94	18.16	26.55			
Moisture Content, M	%	15.45	15.09	15.03			
Average Moisture Content	%	15.19					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.04.2019

Location: Borehole No.: B-35 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-35					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-81	A-86	A-133			
Wt. of Container + Wt. of Wet Soil	gm	30.58	24.88	29.50			
Wt. of Container + Wt. of Dry Soil	gm	30.05	24.22	28.67			
Wt. of Water, W_w	gm	0.53	0.66	0.83			
Wt. of Empty Container	gm	17.72	10.48	8.66			
Wt. of Dry Soil, W_d	gm	12.33	13.74	20.01			
Moisture Content, M	%	4.30	4.80	4.15			
Average Moisture Content	%	4.42					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 28.04.2019

Location: Borehole No.: B-36 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-36					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-93	A-111	A-112			
Wt. of Container + Wt. of Wet Soil	gm	44.27	45.38	44.23			
Wt. of Container + Wt. of Dry Soil	gm	41.45	42.32	41.55			
Wt. of Water, W_w	gm	2.82	3.06	2.68			
Wt. of Empty Container	gm	16.10	16.20	17.75			
Wt. of Dry Soil, W_d	gm	25.35	26.12	23.80			
Moisture Content, M	%	11.12	11.72	11.26			
Average Moisture Content	%	11.37					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-37 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-37					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-88	A-62				
Wt. of Container + Wt. of Wet Soil	gm	49.56	47.15				
Wt. of Container + Wt. of Dry Soil	gm	46.39	44.21				
Wt. of Water, W_w	gm	3.17	2.94				
Wt. of Empty Container	gm	16.10	16.14				
Wt. of Dry Soil, W_d	gm	30.29	28.07				
Moisture Content, M	%	10.47	10.47				
Average Moisture Content	%	10.47					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-38 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-38					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-71	A-81				
Wt. of Container + Wt. of Wet Soil	gm	58.48	55.45				
Wt. of Container + Wt. of Dry Soil	gm	53.96	51.25				
Wt. of Water, W_w	gm	4.52	4.20				
Wt. of Empty Container	gm	18.15	17.73				
Wt. of Dry Soil, W_d	gm	35.81	33.52				
Moisture Content, M	%	12.62	12.53				
Average Moisture Content	%	12.58					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-39 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-39					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-80	A-84				
Wt. of Container + Wt. of Wet Soil	gm	49.07	49.60				
Wt. of Container + Wt. of Dry Soil	gm	45.42	46.50				
Wt. of Water, W_w	gm	3.65	3.10				
Wt. of Empty Container	gm	9.72	16.17				
Wt. of Dry Soil, W_d	gm	35.70	30.33				
Moisture Content, M	%	10.22	10.22				
Average Moisture Content	%	10.22					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.05.2019

Location: Borehole No.: B-40 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-40					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-126	A-142				
Wt. of Container + Wt. of Wet Soil	gm	55.52	47.62				
Wt. of Container + Wt. of Dry Soil	gm	49.02	42.35				
Wt. of Water, W_w	gm	6.50	5.27				
Wt. of Empty Container	gm	8.90	9.71				
Wt. of Dry Soil, W_d	gm	40.12	32.64				
Moisture Content, M	%	16.20	16.15				
Average Moisture Content	%	16.17					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 22.04.2019

Location: Borehole No.: B-41 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-41					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-02	A-62	A-82			
Wt. of Container + Wt. of Wet Soil	gm	30.77	33.99	41.44			
Wt. of Container + Wt. of Dry Soil	gm	28.44	31.98	38.85			
Wt. of Water, W_w	gm	2.33	2.01	2.59			
Wt. of Empty Container	gm	10.02	16.14	18.21			
Wt. of Dry Soil, W_d	gm	18.42	15.84	20.64			
Moisture Content, M	%	12.65	12.69	12.55			
Average Moisture Content	%	12.63					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.04.2019

Location: Borehole No.: B-42 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-42					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-112	A-134	A-138			
Wt. of Container + Wt. of Wet Soil	gm	38.63	32.68	30.61			
Wt. of Container + Wt. of Dry Soil	gm	36.65	30.48	28.60			
Wt. of Water, W_w	gm	1.98	2.20	2.01			
Wt. of Empty Container	gm	17.76	10.02	9.69			
Wt. of Dry Soil, W_d	gm	18.89	20.46	18.91			
Moisture Content, M	%	10.48	10.75	10.63			
Average Moisture Content	%	10.62					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.05.2019

Location: Borehole No.: B-43 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-43					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-80	A-114				
Wt. of Container + Wt. of Wet Soil	gm	53.28	51.79				
Wt. of Container + Wt. of Dry Soil	gm	47.95	47.45				
Wt. of Water, W_w	gm	5.33	4.34				
Wt. of Empty Container	gm	9.75	16.05				
Wt. of Dry Soil, W_d	gm	38.20	31.40				
Moisture Content, M	%	13.95	13.82				
Average Moisture Content	%	13.89					

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Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-44 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-44					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-66	A-85				
Wt. of Container + Wt. of Wet Soil	gm	48.74	48.74				
Wt. of Container + Wt. of Dry Soil	gm	46.81	46.81				
Wt. of Water, W_w	gm	1.93	1.93				
Wt. of Empty Container	gm	17.65	17.65				
Wt. of Dry Soil, W_d	gm	29.16	29.16				
Moisture Content, M	%	6.62	6.62				
Average Moisture Content	%	6.62					

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NATURAL MOISTURE CONTENT

Project:	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)			Date:	22.04.2019
Location:		Borehole No.:	B-45	Tested By:	Pranita Pun
Co-ordinate		Source;	Test Pit Sample	Checked By:	Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-45					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-72	A-88	A-119			
Wt. of Container + Wt. of Wet Soil	gm	41.16	56.92	42.63			
Wt. of Container + Wt. of Dry Soil	gm	38.05	53.08	39.55			
Wt. of Water, W_w	gm	3.11	3.84	3.08			
Wt. of Empty Container	gm	8.28	16.19	10.19			
Wt. of Dry Soil, W_d	gm	29.77	36.89	29.36			
Moisture Content, M	%	10.45	10.41	10.49			
Average Moisture Content	%	10.45					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.03.2019

Location: Borehole No.: B-46 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-46					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-73	A-92				
Wt. of Container + Wt. of Wet Soil	gm	46.22	42.85				
Wt. of Container + Wt. of Dry Soil	gm	42.05	39.02				
Wt. of Water, W_w	gm	4.17	3.83				
Wt. of Empty Container	gm	8.63	7.91				
Wt. of Dry Soil, W_d	gm	33.42	31.11				
Moisture Content, M	%	12.48	12.31				
Average Moisture Content	%	12.39					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.03.2019

Location: Borehole No.: B-47 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-47					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-117	A-140				
Wt. of Container + Wt. of Wet Soil	gm	56.60	49.70				
Wt. of Container + Wt. of Dry Soil	gm	51.23	45.15				
Wt. of Water, W_w	gm	5.37	4.55				
Wt. of Empty Container	gm	9.76	9.72				
Wt. of Dry Soil, W_d	gm	41.47	35.43				
Moisture Content, M	%	12.95	12.84				
Average Moisture Content	%	12.90					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.03.2019

Location: Borehole No.: B-48 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-48					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-84	A-108				
Wt. of Container + Wt. of Wet Soil	gm	42.60	34.82				
Wt. of Container + Wt. of Dry Soil	gm	40.01	33.19				
Wt. of Water, W_w	gm	2.59	1.63				
Wt. of Empty Container	gm	16.21	18.15				
Wt. of Dry Soil, W_d	gm	23.80	15.04				
Moisture Content, M	%	10.88	10.84				
Average Moisture Content	%	10.86					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 22.05.2019

Location: Borehole No.: B-49 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-49					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-85	A-141				
Wt. of Container + Wt. of Wet Soil	gm	51.69	44.84				
Wt. of Container + Wt. of Dry Soil	gm	46.66	40.86				
Wt. of Water, W_w	gm	5.03	3.98				
Wt. of Empty Container	gm	17.36	17.54				
Wt. of Dry Soil, W_d	gm	29.30	23.32				
Moisture Content, M	%	17.17	17.07				
Average Moisture Content	%	17.12					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-50 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-50					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-82	A-130				
Wt. of Container + Wt. of Wet Soil	gm	54.42	50.61				
Wt. of Container + Wt. of Dry Soil	gm	48.43	45.24				
Wt. of Water, W_w	gm	5.99	5.37				
Wt. of Empty Container	gm	18.17	17.81				
Wt. of Dry Soil, W_d	gm	30.26	27.43				
Moisture Content, M	%	19.80	19.58				
Average Moisture Content	%	19.69					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.04.2019

Location: Borehole No.: B-51 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-51					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-84	A-115	A-139			
Wt. of Container + Wt. of Wet Soil	gm	32.82	24.85	31.36			
Wt. of Container + Wt. of Dry Soil	gm	31.45	23.75	30.12			
Wt. of Water, W_w	gm	1.37	1.10	1.24			
Wt. of Empty Container	gm	16.20	10.01	16.16			
Wt. of Dry Soil, W_d	gm	15.25	13.74	13.96			
Moisture Content, M	%	8.98	8.01	8.88			
Average Moisture Content	%	8.62					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.04.2019

Location: Borehole No.: B-52 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-52					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-78	A-88	A-136			
Wt. of Container + Wt. of Wet Soil	gm	29.95	31.28	30.88			
Wt. of Container + Wt. of Dry Soil	gm	28.95	30.26	29.83			
Wt. of Water, W_w	gm	1.00	1.02	1.05			
Wt. of Empty Container	gm	16.12	16.13	16.16			
Wt. of Dry Soil, W_d	gm	12.83	14.13	13.67			
Moisture Content, M	%	7.79	7.22	7.68			
Average Moisture Content	%	7.56					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.06.2019

Location: Borehole No.: B-53 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-53					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-131	A-85	A-121			
Wt. of Container + Wt. of Wet Soil	gm	60.77	56.43	47.55			
Wt. of Container + Wt. of Dry Soil	gm	52.28	48.73	41.34			
Wt. of Water, W_w	gm	8.49	7.70	6.21			
Wt. of Empty Container	gm	17.66	17.35	16.06			
Wt. of Dry Soil, W_d	gm	34.62	31.38	25.28			
Moisture Content, M	%	24.52	24.54	24.56			
Average Moisture Content	%	24.54					

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Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.04.2019

Location: Borehole No.: B-54 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-54					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-93	A-111	A-118			
Wt. of Container + Wt. of Wet Soil	gm	32.68	29.47	36.66			
Wt. of Container + Wt. of Dry Soil	gm	30.24	27.50	33.76			
Wt. of Water, W_w	gm	2.44	1.97	2.90			
Wt. of Empty Container	gm	16.10	16.19	17.60			
Wt. of Dry Soil, W_d	gm	14.14	11.31	16.16			
Moisture Content, M	%	17.26	17.42	17.95			
Average Moisture Content	%	17.54					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.06.2019

Location: Borehole No.: B-55 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-55					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-101	A-118	A-62			
Wt. of Container + Wt. of Wet Soil	gm	56.43	60.96	52.89			
Wt. of Container + Wt. of Dry Soil	gm	50.79	54.91	47.78			
Wt. of Water, W_w	gm	5.64	6.05	5.11			
Wt. of Empty Container	gm	16.14	17.59	16.15			
Wt. of Dry Soil, W_d	gm	34.65	37.32	31.63			
Moisture Content, M	%	16.28	16.21	16.16			
Average Moisture Content	%	16.21					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.06.2019

Location: Borehole No.: B-56 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-56					
Sample No.	No	1	2	3			
Depth	m	0.00-1.00m					
Container No.	No	A-68	A-84	A-124			
Wt. of Container + Wt. of Wet Soil	gm	59.85	51.04	55.96			
Wt. of Container + Wt. of Dry Soil	gm	54.01	46.39	50.93			
Wt. of Water, W_w	gm	5.84	4.65	5.03			
Wt. of Empty Container	gm	16.18	16.18	18.13			
Wt. of Dry Soil, W_d	gm	37.83	30.21	32.80			
Moisture Content, M	%	**15.44**	**15.39**	**15.34**			
Average Moisture Content	%	15.39					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-57 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-57					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-103	A-123				
Wt. of Container + Wt. of Wet Soil	gm	59.70	50.13				
Wt. of Container + Wt. of Dry Soil	gm	55.05	47.08				
Wt. of Water, W_w	gm	4.65	3.05				
Wt. of Empty Container	gm	8.39	16.21				
Wt. of Dry Soil, W_d	gm	46.66	30.87				
Moisture Content, M	%	9.97	9.88				
Average Moisture Content	%	9.92					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 24.05.2019

Location: Borehole No.: B-58 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-58					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-129	A-139				
Wt. of Container + Wt. of Wet Soil	gm	44.45	53.23				
Wt. of Container + Wt. of Dry Soil	gm	41.04	48.85				
Wt. of Water, W_w	gm	3.41	4.38				
Wt. of Empty Container	gm	16.03	16.18				
Wt. of Dry Soil, W_d	gm	25.01	32.67				
Moisture Content, M	%	13.63	13.41				
Average Moisture Content	%	13.52					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 28.05.2019

Location: Borehole No.: B-59 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-59					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-79	A-81				
Wt. of Container + Wt. of Wet Soil	gm	28.06	47.37				
Wt. of Container + Wt. of Dry Soil	gm	26.88	44.34				
Wt. of Water, W_w	gm	1.18	3.03				
Wt. of Empty Container	gm	16.17	17.71				
Wt. of Dry Soil, W_d	gm	10.71	26.63				
Moisture Content, M	%	11.02	11.38				
Average Moisture Content	%	11.20					

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NATURAL MOISTURE CONTENT

Project: MCA Nepal Soil Investigation for Transmission Line (400 KV DC) Date: 23.05.2019

Location: Borehole No.: B-60 Tested By: Pranita Pun

Co-ordinate Source; Test Pit Sample Checked By: Dr. S. Manandhar

Temperature of oven = 105° ± 5° C

Borehole No.		Bore Hole No. B-60					
Sample No.	No	1	2				
Depth	m	0.00-1.00m					
Container No.	No	A-89	A-96				
Wt. of Container + Wt. of Wet Soil	gm	45.10	48.46				
Wt. of Container + Wt. of Dry Soil	gm	41.99	44.99				
Wt. of Water, W_w	gm	3.11	3.47				
Wt. of Empty Container	gm	10.48	10.06				
Wt. of Dry Soil, W_d	gm	31.51	34.93				
Moisture Content, M	%	9.87	9.93				
Average Moisture Content	%	9.90					

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ANNEX C2
Atterberg Limit Test

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigaion for Transmission Line (400kV DC)**

Borehole No. **B1** Date: **15/4/2019**

Source: **SPT** Chainage: Tested By: **Pranita Pun**

Depth: **3.00-3.45m** Checked By: **Dr. S. Manandhar**

Description: Light yellow silty clay Co-ordinate: **N: 27° 25.706'** **E: 83° 42.274'**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		17	24	30	A-68	A-76
Container No		A-130	A-85	A-85		
Weight of Wet Soil + Container	g	41.93	42.66	37.64	22.44	13.28
Weight of Dry Soil + Container	g	37.91	39.02	35.29	21.54	12.58
Weight of Water	g	4.02	3.64	2.35	0.90	0.70
Weight of Container	g	21.05	21.75	23.05	16.45	8.65
Weight of Dry soil	g	16.86	17.27	12.24	5.09	3.93
Water Content, W	%	23.84	21.08	19.20	17.68	17.81
Average	%	23.84	21.08	19.20	17.75	

Liquid Limit, W_L = 20.75

Plastic Limit, W_P = 17.75

Plasticity Index, PI = 3.00

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigaion for Transmission Line (400kV DC)**

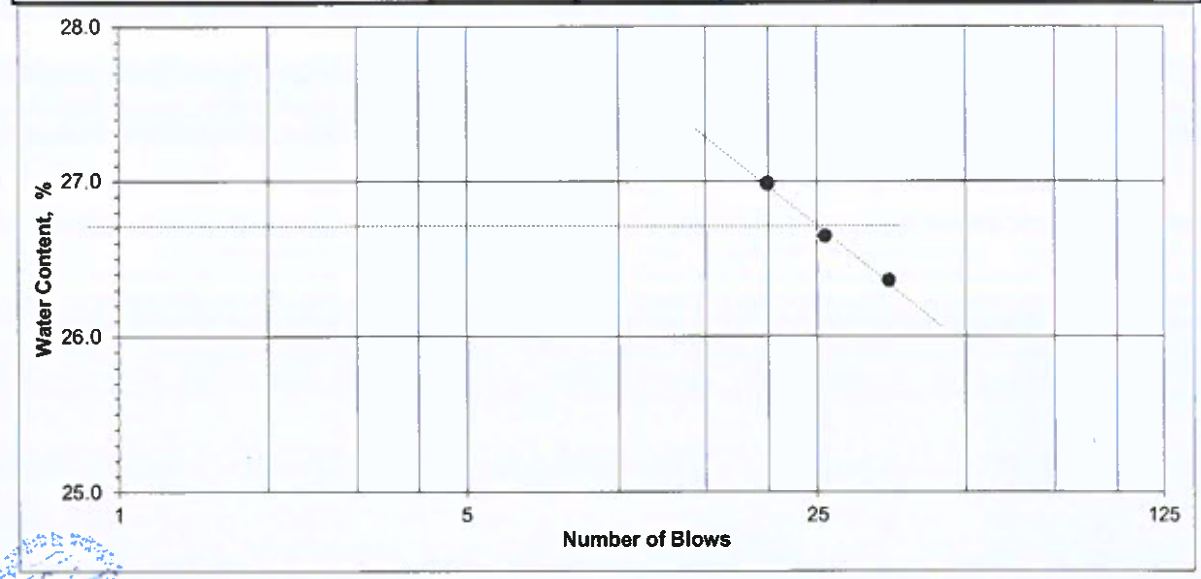
Borehole No. **B2**

Source: **SPT** Date: **16/4/2019**

Depth: **3.00-3.45M** Tested By: **Pranita Pun**

Description: Light yellow silty clay Chainage: **N: 27° 27.17(** Checked By: **Dr. S. Manandhar**

Descriptions		Liquid Limit			Plastic Limit		
Number of Blows		20	26	35	A-96	A-109	A-140
Container No		A-86	A-71	A-127			
Weight of Wet Soil + Container	g	27.58	47.19	42.61	12.96	12.92	13.17
Weight of Dry Soil + Container	g	23.94	44.11	39.99	12.51	12.33	12.60
Weight of Water	g	3.64	3.08	2.62	0.45	0.59	0.57
Weight of Container	g	10.45	32.55	30.05	10.02	9.15	9.59
Weight of Dry soil	g	13.49	11.56	9.94	2.49	3.18	3.01
Water Content, W	%	26.98	26.64	26.36	18.07	18.55	18.94
Average	%	26.98	26.64	26.36	18.52		



Liquid Limit, W_L	=	26.85
Plastic Limit, W_P	=	18.52
Plasticity Index, PI	=	8.33

Remarks:

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Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigaion for Transmission Line (400kV DC)**

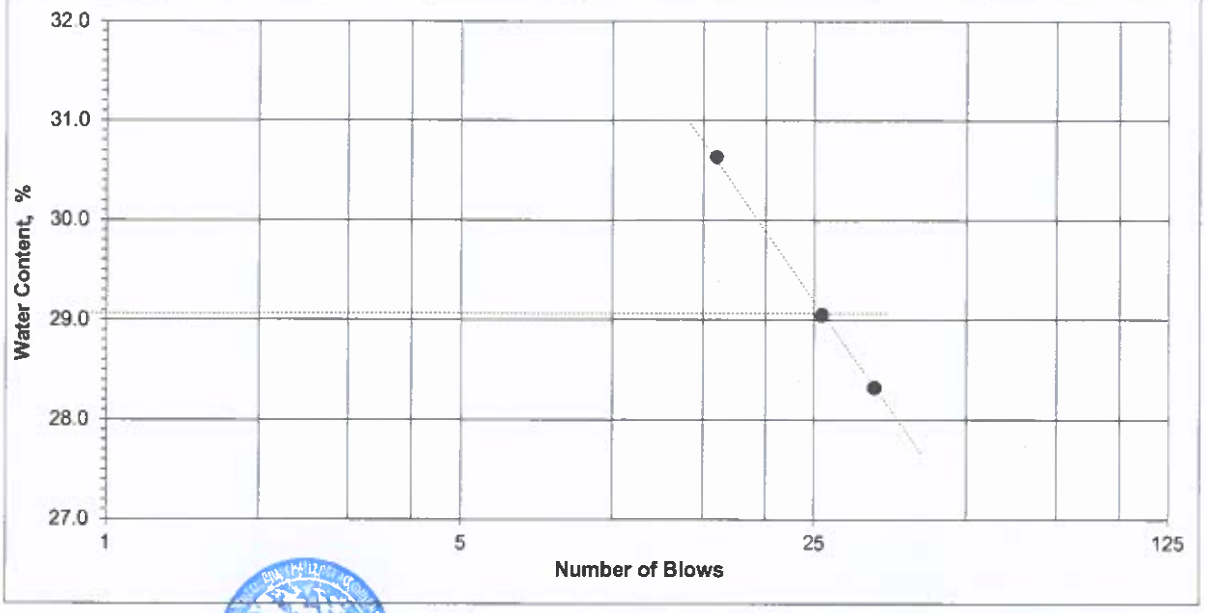
Borehole No. **B3** Date: **10/4/2019**

Source: **SPT** Chainage: Tested By: **Pranita Pun**

Depth: **3.00-3.45m** Checked By: **Dr. S. Manandhar**

Description: Light brown silty clay Co-ordinate: **N: 27° 28.491'** **E: 83° 41.528'**

Descriptions	Liquid Limit			Plastic Limit		
Number of Blows	16	26	33	A-96	A-89	A-135
Container No	A-71	A-117	A-95			
Wet Soil + Container g	32.56	20.85	21.72	12.45	12.78	10.50
Dry Soil + Container g	28.97	17.96	19.03	12.03	12.37	10.24
Water g	3.59	2.89	2.69	0.42	0.41	0.26
Container g	17.25	8.01	9.53	10	10.35	8.92
Dry soil g	11.72	9.95	9.50	2.03	2.02	1.32
ntent, W %	30.63	29.05	28.32	20.69	20.30	19.70
Average %	30.63	29.05	28.32	20.23		



Liquid Limit, W_L = 29.20

Plastic Limit, W_P = 20.23

Plasticity Index, PI = 8.97

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigaion for Transmission Line (400kV DC)**

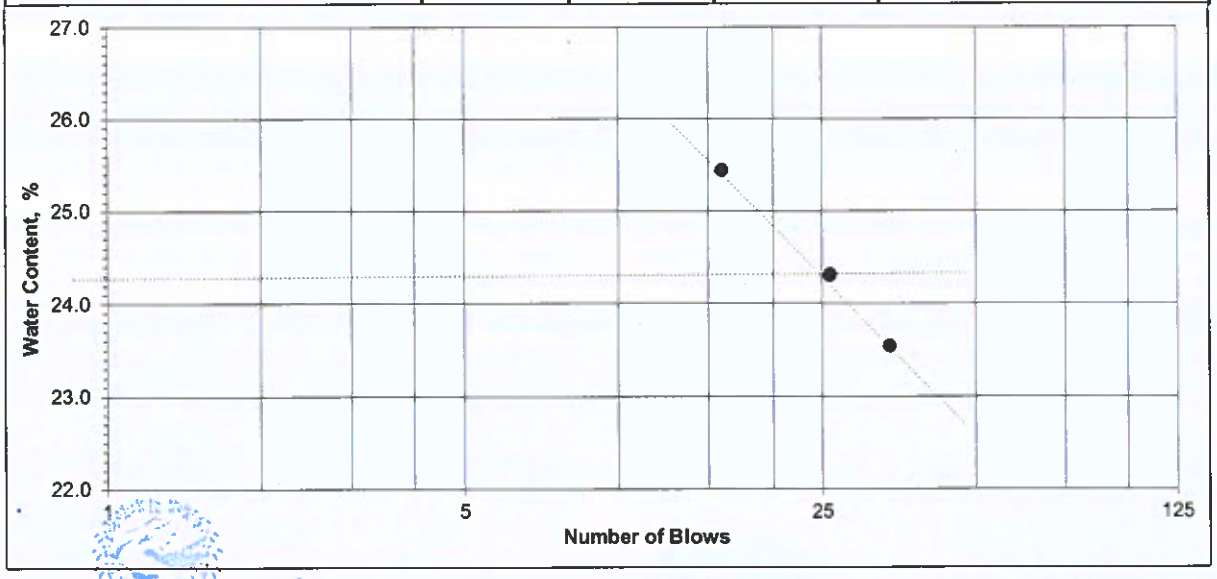
Borehole No. **B4**

Source: **SPT** Date: **16/4/2019**

Depth: **3.00-3.45M** Tested By: **Pranita Pun**

Description: Light yellow silty clay Chainage: **N: 27° 31.23'** Checked By: **Dr. S. Manandhar**

Descriptions		Liquid Limit			Plastic Limit		
Number of Blows		16	26	34	A-62	A-114	A-124
Container No		A-101	A-78	A-144			
Weight of Wet Soil + Container	g	39.81	34.04	32.79	17.76	18.36	20.68
Weight of Dry Soil + Container	g	35.01	30.54	29.95	17.5	17.96	20.25
Weight of Water	g	4.80	3.50	2.84	0.26	0.40	0.43
Weight of Container	g	16.14	16.14	17.88	16.3	16.07	18.21
Weight of Dry soil	g	18.87	14.40	12.07	1.20	1.89	2.04
Water Content, W	%	25.44	24.31	23.53	21.67	21.16	21.08
Average	%	25.44	24.31	23.53	21.30		



Liquid Limit, W_L = **24.25**

Plastic Limit, W_P = **21.30**

Plasticity Index, PI = **2.95**

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigaion for Transmission Line (400kV DC)**

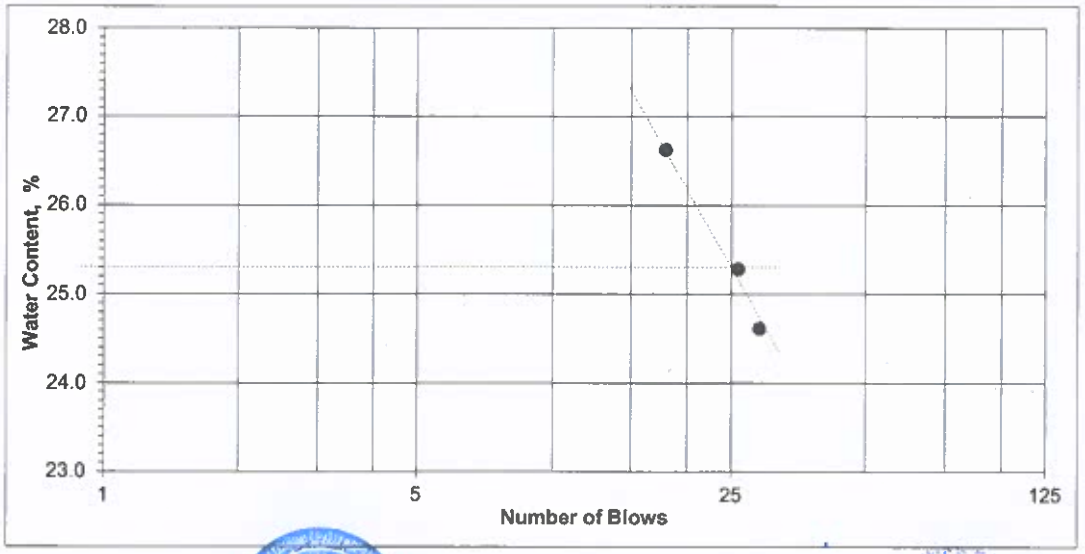
Borehole No. **B5** Date: **18/4/2019**

Source: **SPT** Chainage: Tested By: **Pranita Pun**

Depth: **3.00-3.45m** Checked By: **Dr. S. Manandhar**

Description: Light yellow silty clay Co-ordinate: **N: 27° 25.706'** **E: 83° 42.274'**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		18	26	29	A-76	A-111
Container No		A-143	A-101	A-62		
Weight of Wet Soil + Container	g	34.96	34.32	34.3	19.46	18.84
Weight of Dry Soil + Container	g	31.01	30.65	30.72	19.12	18.40
Weight of Water	g	3.95	3.67	3.58	0.34	0.44
Weight of Container	g	16.17	16.13	16.17	17.41	16.20
Weight of Dry soil	g	14.84	14.52	14.55	1.71	2.20
Water Content, W	%	26.62	25.28	24.60	19.88	20.00
Average	%	26.62	25.28	24.60	19.94	



Liquid Limit, W_L = 25.30

Plastic Limit, W_P = 19.94

Plasticity Index, PI = 5.36

Remarks:

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ATTERBERG LIMITS TEST

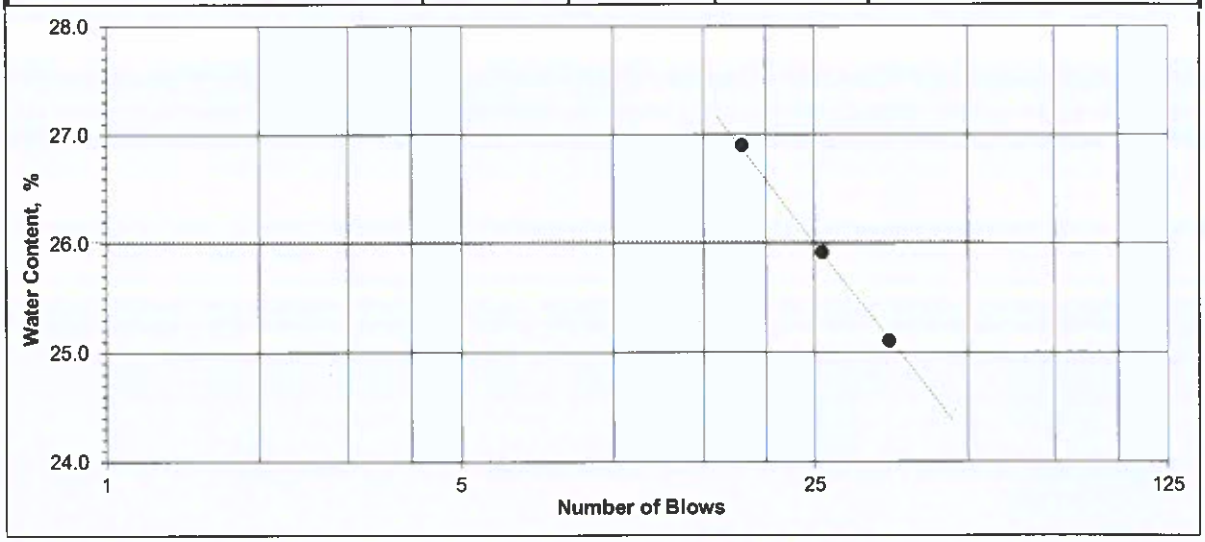
(Method: ASTM D-4318 -05)

MCA Nepal Soil Investigaion for Transmission Line (400kV DC)

Borehole No.	**B6**	Date:	**16/4/2019**
Source:	**SPT**	Tested By:	**Pranita Pun**
Borehole No.	**3.00-3.45m**	Checked By:	**Dr. S. Manandhar**
Depth:	**3.00-3.45M**	Chainage:	**N: 270 34.437'**

Description: Light yellow silty clay

Descriptions		Liquid Limit			Plastic Limit		
Number of Blows		18	26	35	A-130	A-139	A-143
Container No		A-76	A-85	A-107			
Weight of Wet Soil + Container	g	22.87	30.66	32.99	19.79	18.48	18.15
Weight of Dry Soil + Container	g	19.75	27.90	30.5	19.45	18.08	17.82
Weight of Water	g	3.12	2.76	2.49	0.34	0.40	0.33
Weight of Container	g	8.15	17.25	20.58	17.8	16.23	16.21
Weight of Dry soil	g	11.60	10.65	9.92	1.65	1.85	1.61
Water Content, W	%	26.90	25.92	25.10	20.61	21.62	20.50
Average	%	26.90	25.92	25.10	20.91		



Liquid Limit, W_L	=	26.00
Plastic Limit, W_P	=	20.91
Plasticity Index, PI	=	5.09

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project; **MCA Nepal Soil Investigaion for Transmission Line (400kV DC)**

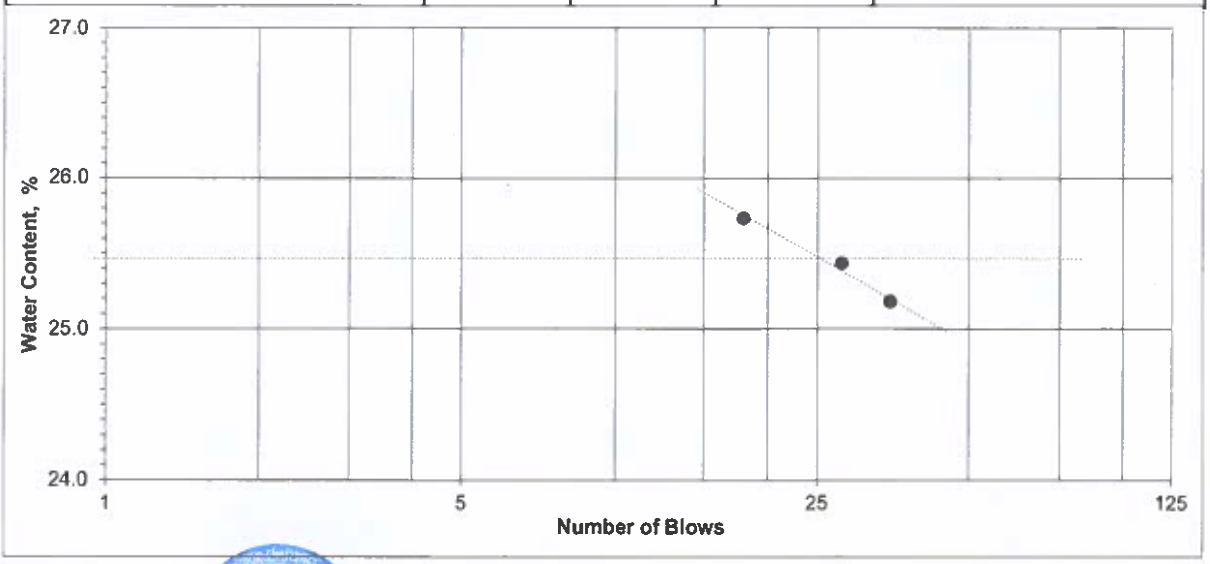
Borehole No. **B7** Date: **16/4/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45m** Checked By: **Dr. S. Manandhar**

Description: **Light grey silty clay** Chainage: **N: 27°34.274'**

Descriptions		Liquid Limit			Plastic Limit		
Number of Blows		18	28	35	A-61	A-97	A-125
Container No		A-104	A-67	A-121			
Weight of Wet Soil + Container	g	41.17	45.27	33.69	14.27	13.24	12.64
Weight of Dry Soil + Container	g	36.05	39.65	30.14	13.89	12.58	12.25
Weight of Water	g	5.12	5.62	3.55	0.38	0.66	0.39
Weight of Container	g	16.15	17.55	16.04	11.84	9.23	10.13
Weight of Dry soil	g	19.90	22.10	14.10	2.05	3.35	2.12
Water Content, W	%	25.73	25.43	25.18	18.54	19.70	18.40
Average	%	25.73	25.43	25.18	18.88		



Liquid Limit, W_L = 25.45

Plastic Limit, W_P = 18.88

Plasticity Index, PI = 6.57

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project **MCA Nepal Soil Investigaion for Transmission Line (400kV DC)**

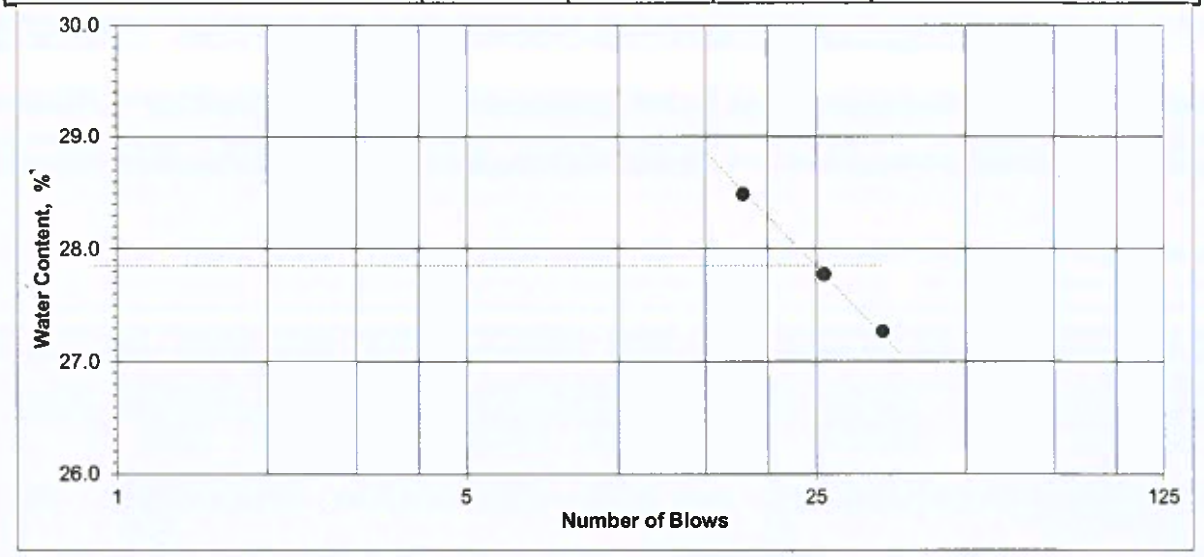
Borehole No. **B8**

Source: **SPT** Date: **22/4/2019**

Depth: **3.00-3.45M** Tested By: **Pranita Pun**

Description: Light brown silty clay Chainage: **N: 27° 34.47;** Checked By: **Dr. S. Manandhar**

Descriptions		Liquid Limit			Plastic Limit		
Number of Blows		18	26	34	A-93	A-88	A-136
Container No		A-78	A-118	A-111			
Weight of Wet Soil + Container	g	35.68	41.11	37.75	17.55	17.42	17.93
Weight of Dry Soil + Container	g	31.10	36.75	33.95	17.36	17.26	17.68
Weight of Water	g	4.58	4.36	3.80	0.19	0.16	0.25
Weight of Container	g	15.02	21.05	20.01	16.32	16.39	16.35
Weight of Dry soil	g	16.08	15.70	13.94	1.04	0.87	1.33
Water Content, W	%	28.48	27.77	27.26	18.27	18.39	18.80
Average	%	28.48	27.77	27.26	18.49		



Liquid Limit, W_L = **27.78**

Plastic Limit, W_P = **18.49**

Plasticity Index, $PI_{(\%)}$ = **9.29**

Remarks:

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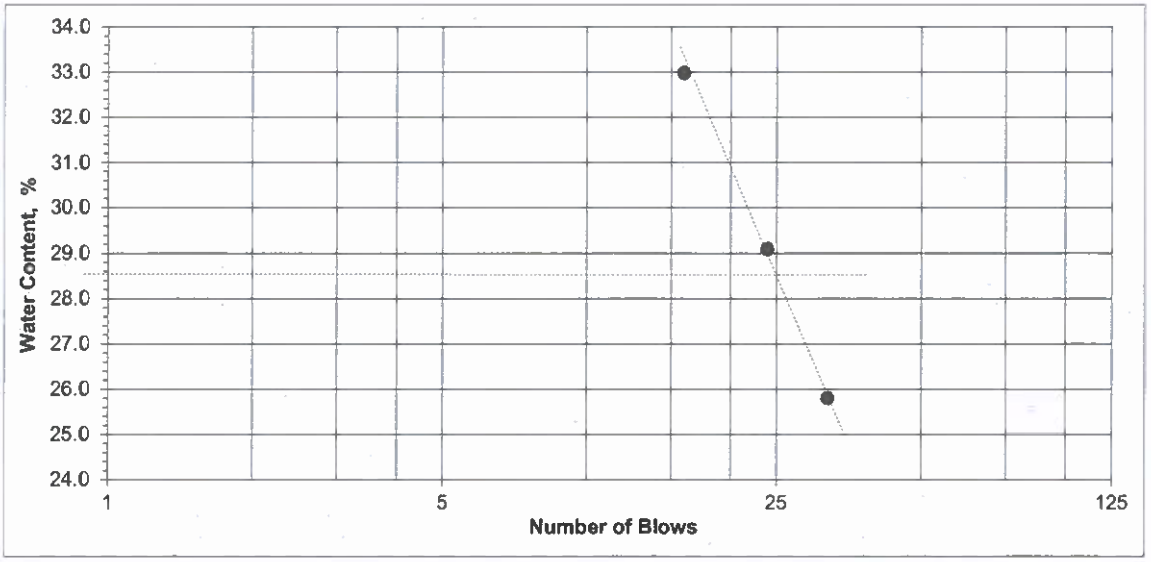
ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-12**			Date:	26/6/2019
Source:	**SPT**			Tested By:	**Pranita Pun**
Depth:	**4.00-4.45 m**	Chainage:		Checked By:	**Dr. S. Manandhar**
Description:	**Light grey**	Co-ordinatge:		**E:**	

Descriptions		Liquid Limit				
Number of Blows		**16**	**24**	**32**	A-132	
Container No		**A-128**	**A-118**	**A-143**		
Weight of Wet Soil + Container	g	**22.67**	**29.42**	**20.57**	**18.59**	
Weight of Dry Soil + Container	g	**21.48**	**26.76**	**19.67**	**16.99**	
Weight of Water	g	1.19	2.66	0.90	1.60	
Weight of Container	g	**17.87**	**17.61**	**16.18**	**10.2**	
Weight of Dry soil	g	3.61	9.15	3.49	6.79	
Water Content, W	%	32.96	29.07	25.79	23.56	
Average	%	**32.96**	**29.07**	**25.79**	**23.56**	



Liquid Limit, W_L	=	**28.50**
Plastic Limit, W_P	=	**23.56**
Plasticity Index, P_I	=	**4.94**

Remarks:

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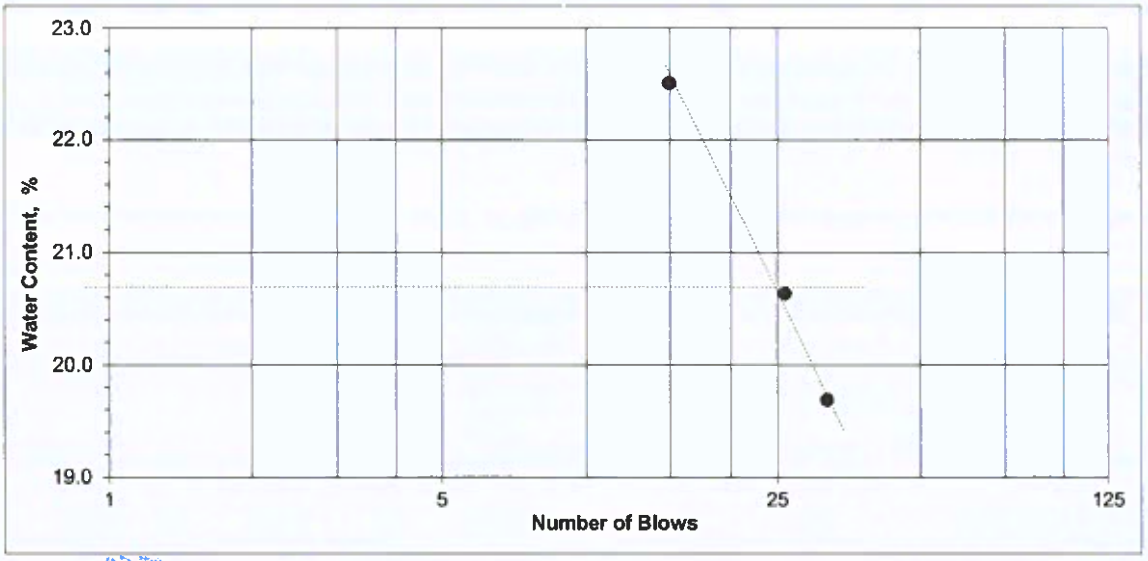
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-13**		Date:	26/6/2019
Source:	**SPT**		Tested By:	**Pranita Pun**
Depth:	**3.00-3.45 m**	Chainage:	Checked By:	**Dr. S. Manandhar**
Description:	**Light grey**	Co-ordinatge:	**E:**	

Descriptions		Liquid Limit				
Number of Blows		**15**	**26**	32		
Container No		**A-113**	**A-98**	A-140		
Weight of Wet Soil + Container	g	**21.63**	**21.94**	21.7		
Weight of Dry Soil + Container	g	**19.51**	**20.10**	19.73		
Weight of Water	g	2.12	1.84	1.97		
Weight of Container	g	**10.09**	**11.18**	9.72		
Weight of Dry soil	g	9.42	8.92	10.01		
Water Content, W	%	22.51	20.63	19.68		
Average	%	**22.51**	**20.63**	**19.68**		



Liquid Limit, W_L	=	**20.70**
Plastic Limit, W_P	=	**NP**
Plasticity Index, PI	=	**20.70**

Remarks:

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Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

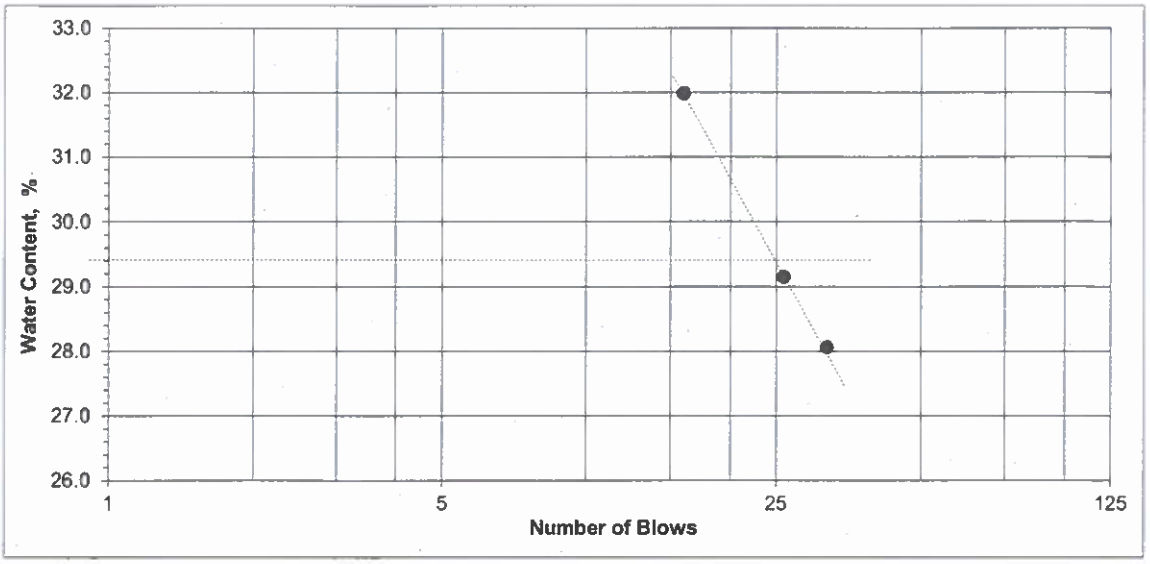
Borehole No. **B-15** Date: 26/6/2019

Source: **SPT** Tested By: **Pranita Pun**

Depth: **1.00-1.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: **Light grey** Co-ordinatge: **E:**

Descriptions		Liquid Limit				
Number of Blows		16	26	32	A-56	
Container No		A-34	A-60	A-53		
Weight of Wet Soil + Container	g	26.92	28.48	22.13	31.76	
Weight of Dry Soil + Container	g	24.09	25.45	20.52	28.52	
Weight of Water	g	2.83	3.03	1.61	3.24	
Weight of Container	g	15.24	15.05	14.78	14.91	
Weight of Dry soil	g	8.85	10.40	5.74	13.61	
Water Content, W	%	31.98	29.13	28.05	23.81	
Average	%	31.98	29.13	28.05	23.81	



Liquid Limit, W_L = 29.40

Plastic Limit, W_P = 23.81

Plasticity Index, PI = 5.59

Remarks:

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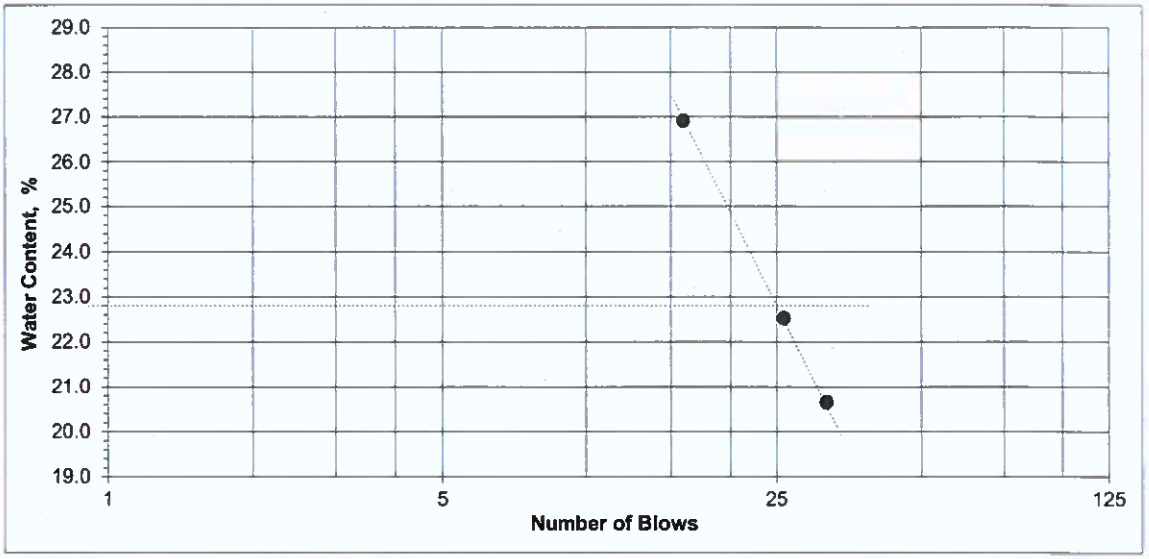
ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-16**		Date:	26/6/2019
Source:	**SPT**		Tested By:	**Pranita Pun**
Depth:	**3.00-3.45 m**	Chainage:	Checked By:	**Dr. S. Manandhar**
Description:	**Light grey**	Co-ordinatge:	**E:**	

Descriptions		Liquid Limit				
Number of Blows		**16**	**26**	**32**		
Container No		**A-104**	**A-138**	**A-86**		
Weight of Wet Soil + Container	g	**41.54**	**37.83**	**38.13**		
Weight of Dry Soil + Container	g	**36.16**	**32.65**	**33.4**		
Weight of Water	g	5.38	5.18	4.73		
Weight of Container	g	**16.16**	**9.63**	**10.48**		
Weight of Dry soil	g	20.00	23.02	22.92		
Water Content, W	%	26.90	22.50	20.64		
Average	%	**26.90**	**22.50**	**20.64**		



Liquid Limit, W_L	=	**22.80**
Plastic Limit, W_P	=	**0.00**
Plasticity Index, PI	=	**22.80**

Remarks:

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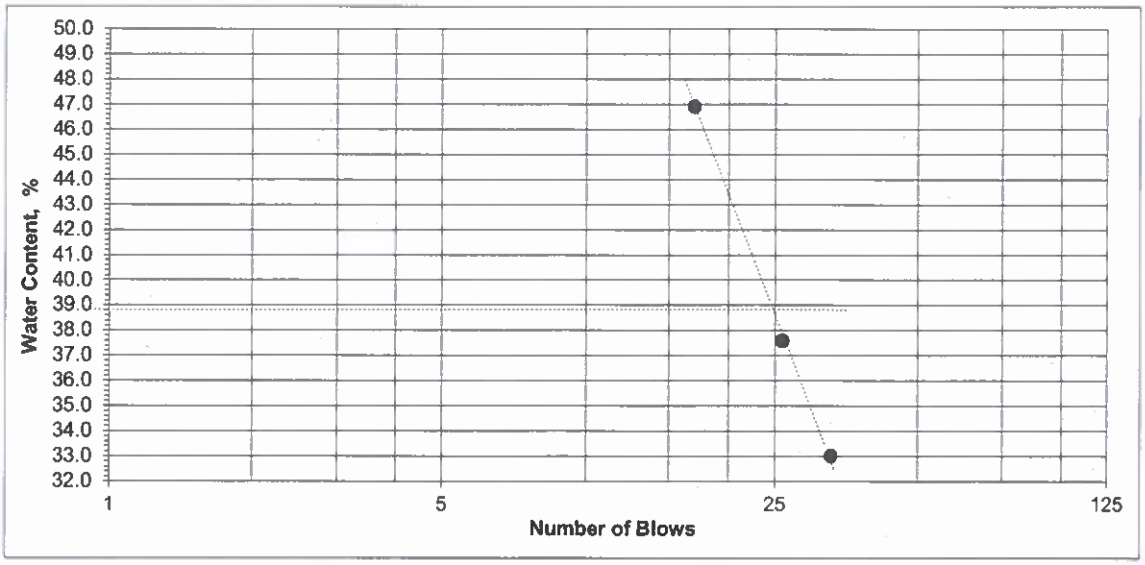
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-20**			Date:	25/6/2019
Source:	**SPT**			Tested By:	**Binita K.C**
Depth:	**3.00-3.45 m**	Chainage:		Checked By:	**Dr. S. Manandhar**
Description:	Light yellow	Co-ordinatge:		**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		17	26	33	A-59	
Container No		A-30	A-50	A-33		
Weight of Wet Soil + Container	g	22.83	24.14	25.48	31.96	
Weight of Dry Soil + Container	g	20.27	21.83	23.26	28.09	
Weight of Water	g	2.56	2.31	2.22	3.87	
Weight of Container	g	14.81	15.68	16.53	14.9	
Weight of Dry soil	g	5.46	6.15	6.73	13.19	
Water Content, W	%	46.89	37.56	32.99	29.34	
Average	%	46.89	37.56	32.99	29.34	



Liquid Limit, W_L = 38.80

Plastic Limit, W_P = 29.34

Plasticity Index, I_P = 9.46

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

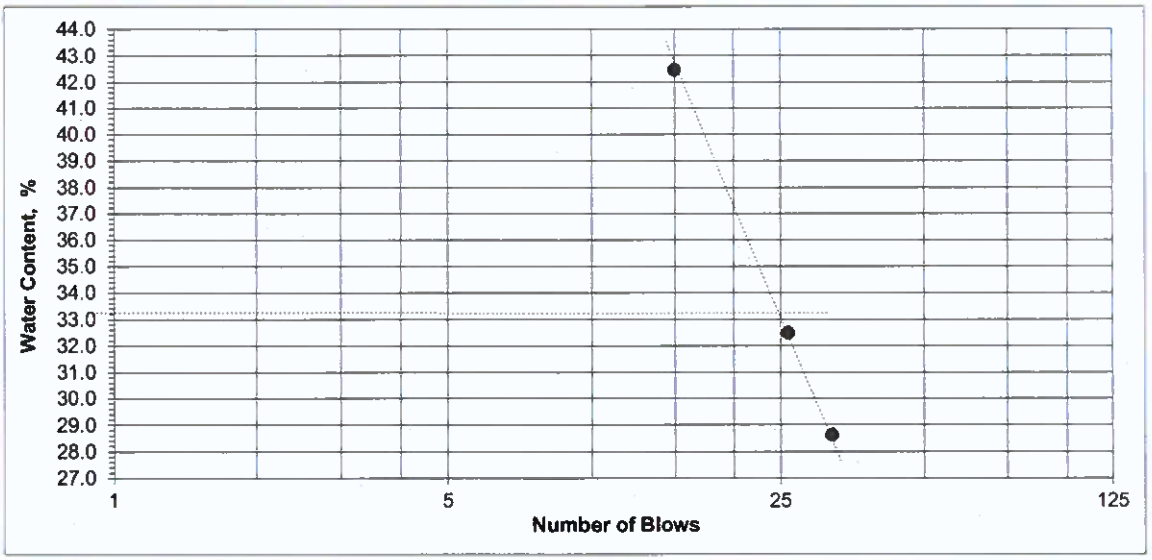
Borehole No. **B-21** Date: 25/6/2019

Source: **SPT** Tested By: **Binita K.C**

Depth: **3.00-3.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Light yellow Co-ordinatge: E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	26	32	A-37	
Container No		A-54	A-53	A-35		
Weight of Wet Soil + Container	g	21.33	23.31	23.19	32.33	
Weight of Dry Soil + Container	g	19.17	21.22	21.18	29.23	
Weight of Water	g	2.16	2.09	2.01	3.10	
Weight of Container	g	14.08	14.78	14.15	17.72	
Weight of Dry soil	g	5.09	6.44	7.03	11.51	
Water Content, W	%	42.44	32.45	28.59	26.93	
Average	%	42.44	32.45	28.59	26.93	



Liquid Limit, W_L = 33.20

Plastic Limit, W_P = 26.93

Plasticity Index, PI = 6.27

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

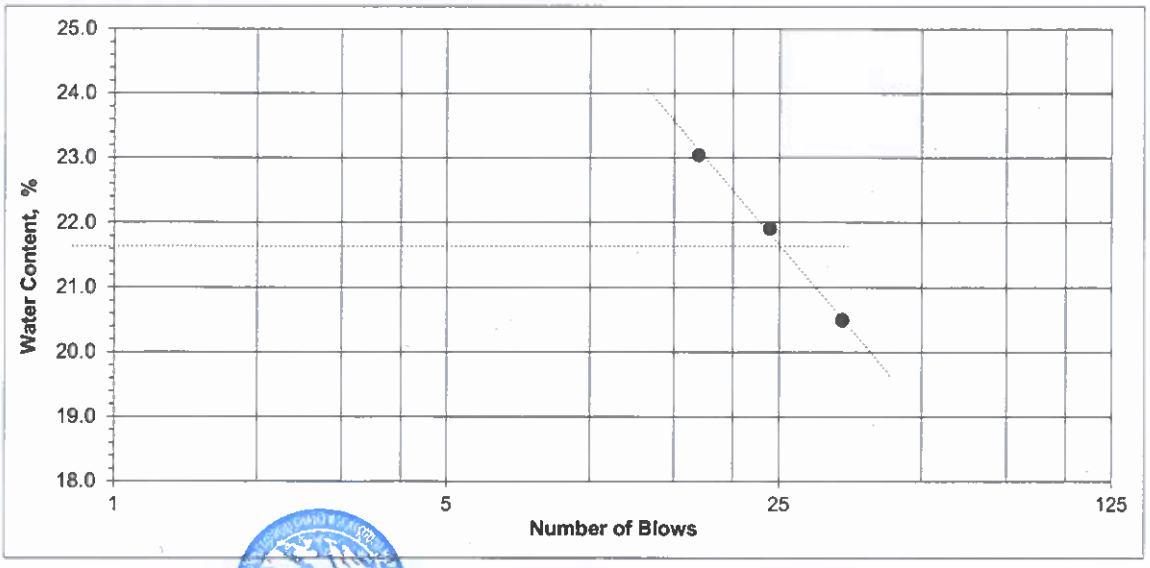
Borehole No. **B-22** Date: 26/6/2019

Source: **SPT** Tested By: **Pranita Pun**

Depth: **2.00-2.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Light grey Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		17	24	34	A-128	
Container No		A-111	A-81	A-86		
Weight of Wet Soil + Container	g	35.14	25.60	38.13	34.11	
Weight of Dry Soil + Container	g	31.59	24.19	33.43	31.46	
Weight of Water	g	3.55	1.41	4.70	2.65	
Weight of Container	g	16.18	17.75	10.48	17.87	
Weight of Dry soil	g	15.41	6.44	22.95	13.59	
Water Content, W	%	23.04	21.89	20.48	19.50	
Average	%	23.04	21.89	20.48	19.50	



Liquid Limit, W_L = 21.60

Plastic Limit, W_P = 19.50

Plasticity Index, I_P = 2.10

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

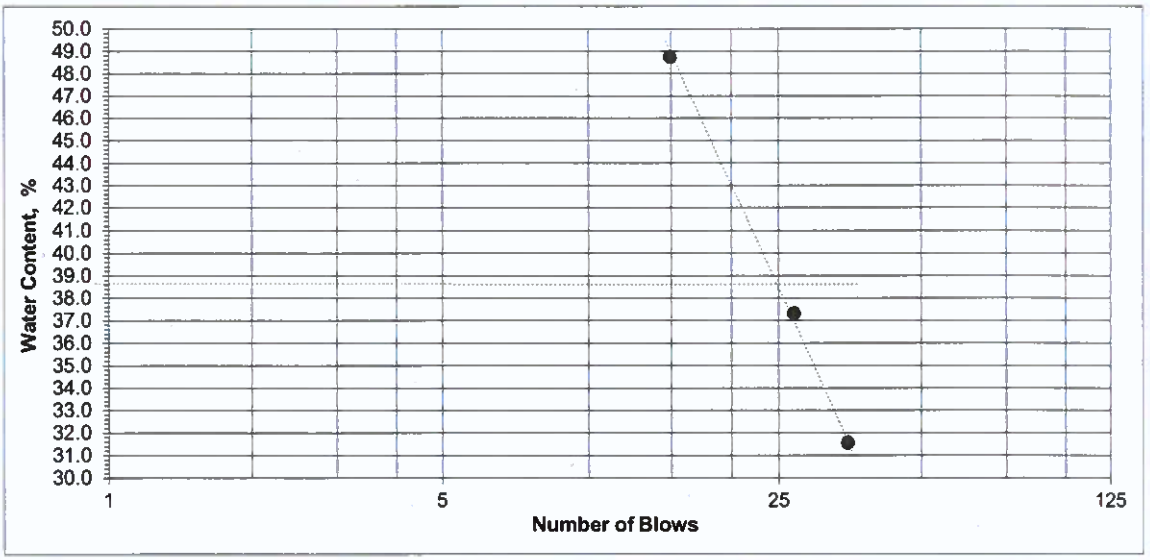
Borehole No. **B-26** Date: 26/6/2019

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Light red Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	27	35	A-51	
Container No		A-99	A-110	A-75		
Weight of Wet Soil + Container	g	25.75	22.13	33.07	24.84	
Weight of Dry Soil + Container	g	20.58	18.03	29.59	22.38	
Weight of Water	g	5.17	4.10	3.48	2.46	
Weight of Container	g	9.97	7.03	18.55	15.17	
Weight of Dry soil	g	10.61	11.00	11.04	7.21	
Water Content, W	%	48.73	37.27	31.52	34.12	
Average	%	48.73	37.27	31.52	34.12	



Liquid Limit, W_L = **38.60**

Plastic Limit, W_P = **34.12**

Plasticity Index, P_I = **4.48**

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

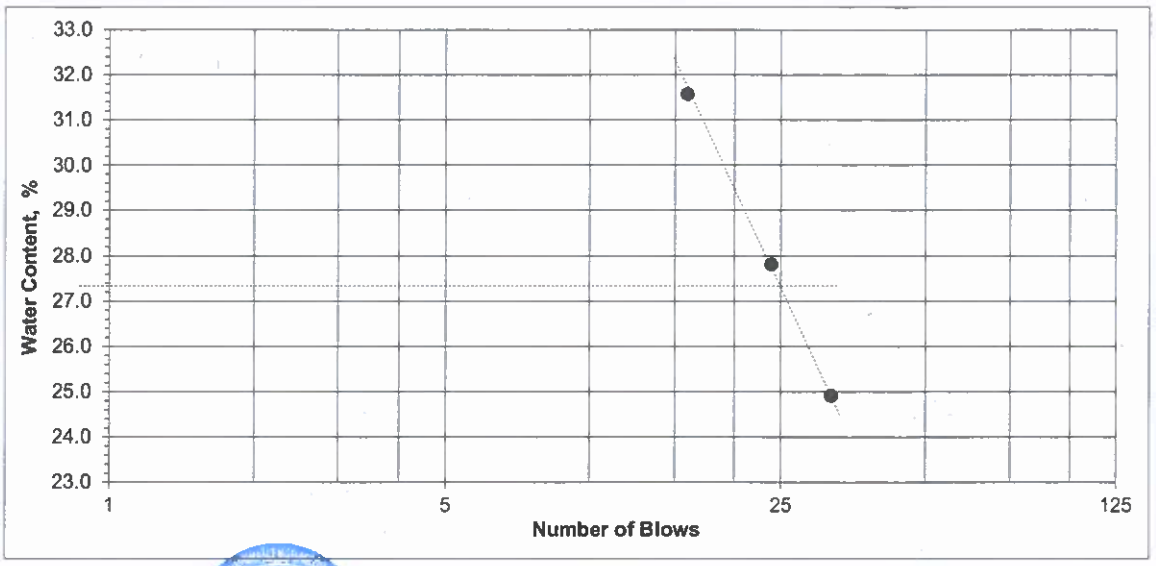
Borehole No. **B-27** Date: 25/6/2019

Source: **SPT** Tested By: **Binita K.C**

Depth: **1.00-1.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Light brown Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**16**	**24**	**32**	A-138	
Container No		**A-91**	**A-43**	**A-112**		
Weight of Wet Soil + Container	g	**19.74**	**24.40**	**23.74**	**16.17**	
Weight of Dry Soil + Container	g	**17.25**	**22.36**	**22.54**	**14.83**	
Weight of Water	g	2.49	2.04	1.20	1.34	
Weight of Container	g	**9.36**	**15.02**	**17.72**	**9.48**	
Weight of Dry soil	g	7.89	7.34	4.82	5.35	
Water Content, W	%	31.56	27.79	24.90	25.05	
Average	%	**31.56**	**27.79**	**24.90**	**25.05**	



Liquid Limit, W_L = **27.30**

Plastic Limit, W_P = **25.05**

Plasticity Index, PI = **2.25**

Remarks:

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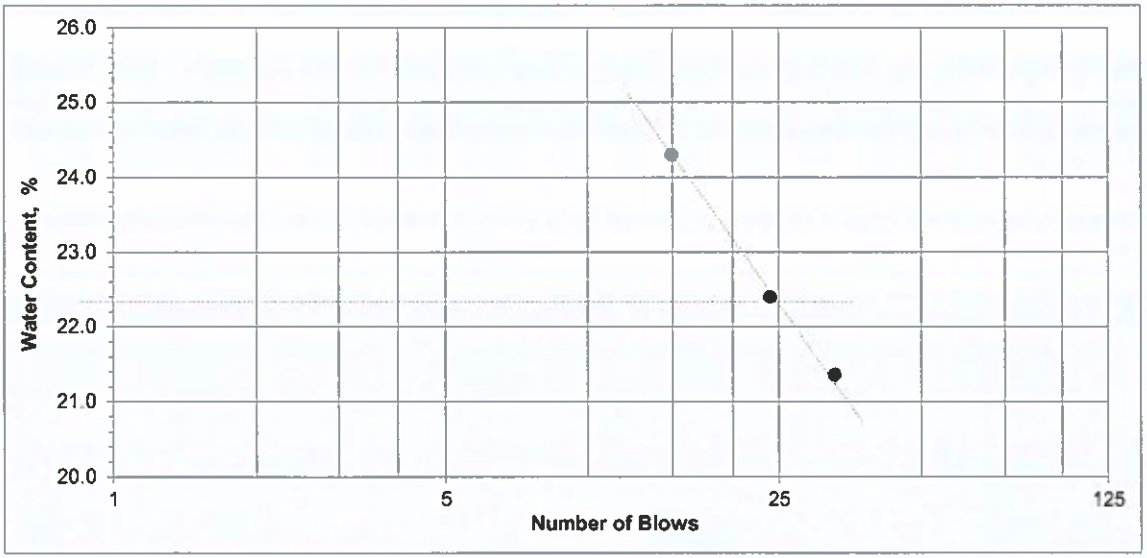
ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-28**			Date:	26/6/2019
Source:	**SPT**			Tested By:	**Pranita Pun**
Depth:	**4.00-4.45 m**	Chainage:		Checked By:	**Dr. S. Manandhar**
Description:	Light grey	Co-ordinatge:		**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**15**	**24**	**33**	A-75	
Container No		**A-89**	**A-82**	**A-58**		
Weight of Wet Soil + Container	g	**25.35**	**28.11**	**26.62**	34.51	
Weight of Dry Soil + Container	g	**22.45**	**26.29**	25.26	31.37	
Weight of Water	g	2.90	1.82	1.36	3.14	
Weight of Container	g	**10.51**	**18.16**	**18.89**	16.08	
Weight of Dry soil	g	11.94	8.13	6.37	15.29	
Water Content, W	%	24.29	22.39	21.35	20.54	
Average	%	**24.29**	**22.39**	**21.35**	**20.54**	



Liquid Limit, W_L = **22.30**
Plastic Limit, W_P = **20.54**
Plasticity Index, PI = **1.76**

Remarks:

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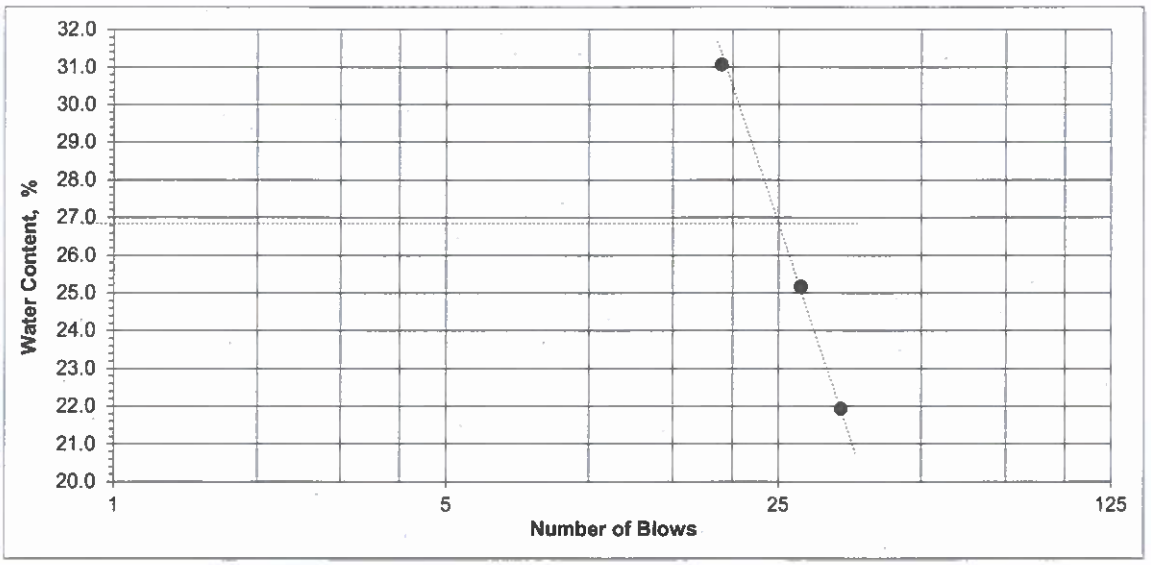
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-29**			Date:	26/6/2019
Source:	**SPT**			Tested By:	**Pranita Pun**
Depth:	**3.00-3.45 m**	Chainage:		Checked By:	**Dr. S. Manandhar**
Description:	Light grey	Co-ordinatge:		**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**19**	**28**	**34**	**A-58**	
Container No		**A-108**	**A-129**	**A-140**		
Weight of Wet Soil + Container	g	**42.00**	**35.02**	**31.97**	**29.44**	
Weight of Dry Soil + Container	g	**36.35**	**30.96**	**27.97**	**27.39**	
Weight of Water	g	5.65	4.06	4.00	2.05	
Weight of Container	g	**18.15**	**14.82**	**9.72**	**18.97**	
Weight of Dry soil	g	18.20	16.14	18.25	8.42	
Water Content, W	%	31.04	25.15	21.92	24.35	
Average	%	**31.04**	**25.15**	**21.92**	**24.35**	



Liquid Limit, W_L	=	**26.80**
Plastic Limit, W_P	=	**24.35**
Plasticity Index, PI	=	**2.45**

Remarks:

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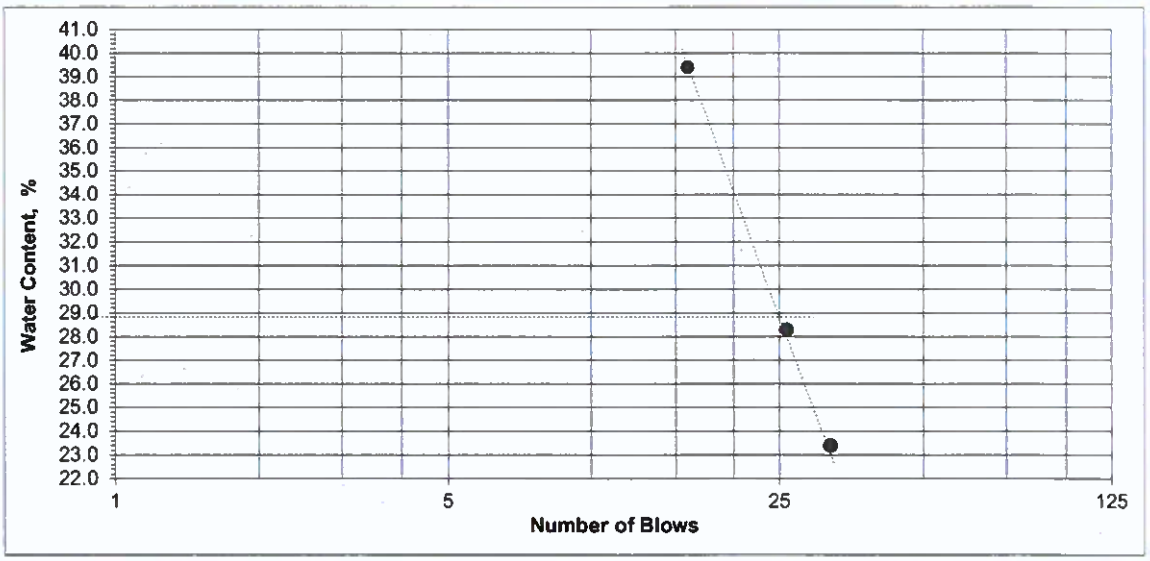
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-31**			Date:	26/6/2019
Source:	**SPT**			Tested By:	**Pranita Pun**
Depth:	**3.00-3.45 m**	Chainage:		Checked By:	**Dr. S. Manandhar**
Description:	Brownish yellow	Co-ordinatge:		**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**16**	**26**	32	A-143	
Container No		**A-127**	**A-97**	A-69		
Weight of Wet Soil + Container	g	**38.42**	**35.95**	39.51	25.20	
Weight of Dry Soil + Container	g	**32.79**	**31.17**	35.08	23.38	
Weight of Water	g	5.63	4.78	4.43	1.82	
Weight of Container	g	**18.49**	**14.25**	16.12	16.11	
Weight of Dry soil	g	14.30	16.92	18.96	7.27	
Water Content, W	%	39.37	28.25	23.36	25.03	
Average	%	**39.37**	**28.25**	**23.36**	**25.03**	



Liquid Limit, W_L = **28.80**
Plastic Limit, W_P = **25.03**
Plasticity Index, PI = **3.77**

Remarks:

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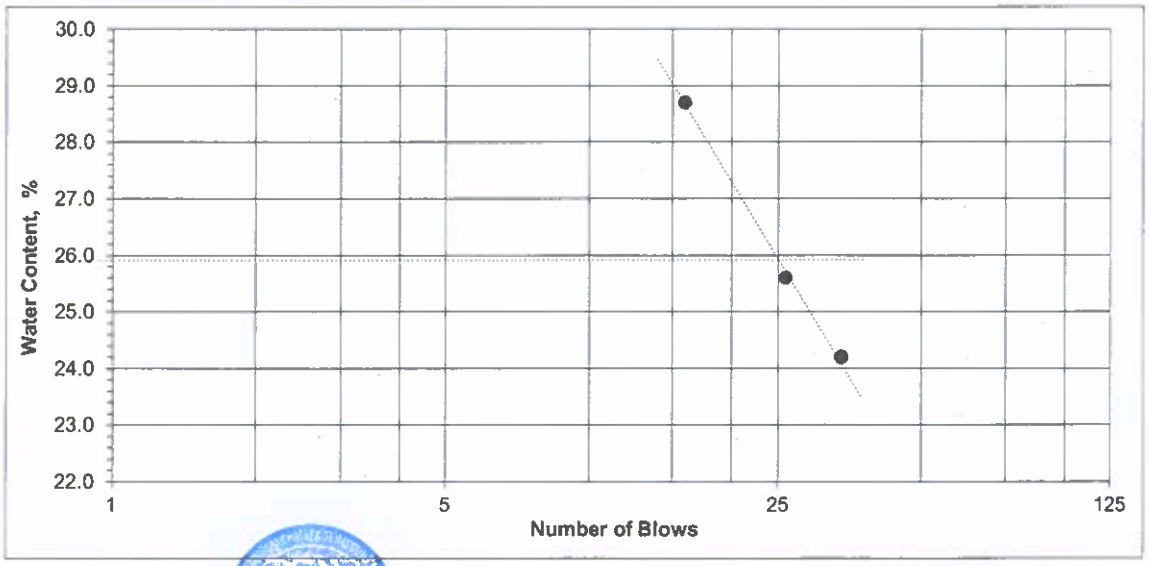
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-34**			Date:	26/6/2019
Source:	**SPT**			Tested By:	**Pranita Pun**
Depth:	**3.00-3.45 m**	Chainage:		Checked By:	**Dr. S. Manandhar**
Description:	Dark brown	Co-ordinatge:		**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**16**	**26**	**34**	**A-86**	
Container No		**A-76**	**A-80**	**A-89**		
Weight of Wet Soil + Container	g	**28.88**	**32.86**	**24.54**	**37.55**	
Weight of Dry Soil + Container	g	**24.37**	**28.15**	**21.8**	**32.82**	
Weight of Water	g	4.51	4.71	2.74	4.73	
Weight of Container	g	**8.65**	**9.74**	**10.47**	**10.48**	
Weight of Dry soil	g	15.72	18.41	11.33	22.34	
Water Content, W	%	28.69	25.58	24.18	21.17	
Average	%	**28.69**	**25.58**	**24.18**	**21.17**	



Liquid Limit, W_L	=	25.90
Plastic Limit, W_P	=	21.17
Plasticity Index, PI	=	4.73

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

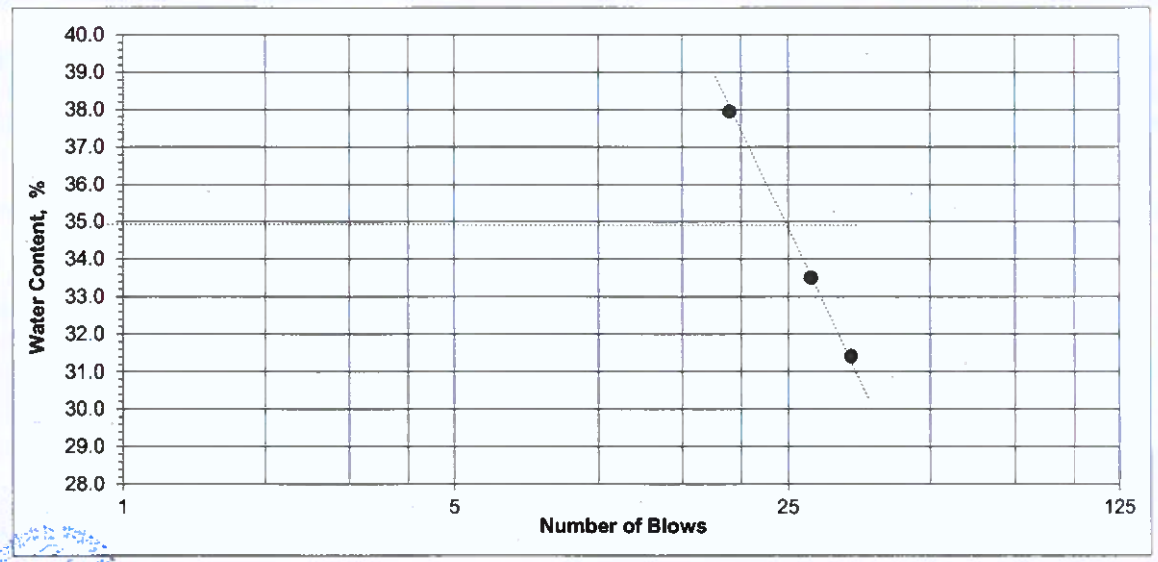
Borehole No. **B-35** Date: 26/6/2019

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: brownish yellow Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**19**	**28**	34	A-44	
Container No		**A-105**	**A-111**	A-130		
Weight of Wet Soil + Container	g	**40.17**	**39.14**	40.21	23.04	
Weight of Dry Soil + Container	g	**33.98**	**33.38**	34.86	21.16	
Weight of Water	g	6.19	5.76	5.35	1.88	
Weight of Container	g	**17.66**	**16.18**	17.82	15.2	
Weight of Dry soil	g	16.32	17.20	17.04	5.96	
Water Content, W	%	37.93	33.49	31.40	31.54	
Average	%	**37.93**	**33.49**	**31.40**	**31.54**	



Liquid Limit, W_L = **34.90**

Plastic Limit, W_P = **31.54**

Plasticity Index, PI = **3.36**

Remarks:

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

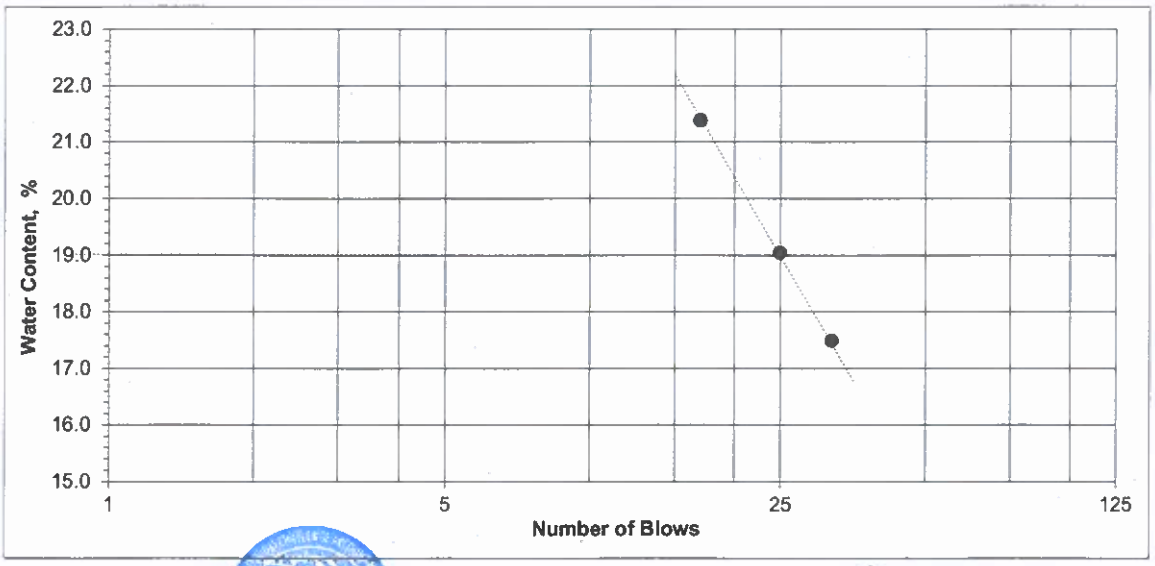
Borehole No. **B-37** Date: 25/6/2019

Source: **SPT** Tested By: **Binita K.C**

Depth: **3.00-3.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Light brown Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**17**	**25**	**32**		
Container No		**A-104**	**A-97**	**A-112**		
Weight of Wet Soil + Container	g	**21.10**	**23.57**	**20.14**		
Weight of Dry Soil + Container	g	**20.23**	**22.08**	**19.78**		
Weight of Water	g	0.87	1.49	0.36		
Weight of Container	g	**16.16**	**14.25**	**17.72**		
Weight of Dry soil	g	4.07	7.83	2.06		
Water Content, W	%	21.38	19.03	17.48		
Average	%	**21.38**	**19.03**	**17.48**		



Liquid Limit, W_L = **19.00**

Plastic Limit, W_P = **NP**

Plasticity Index, PI = **19.00**

Remarks: **2000**

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

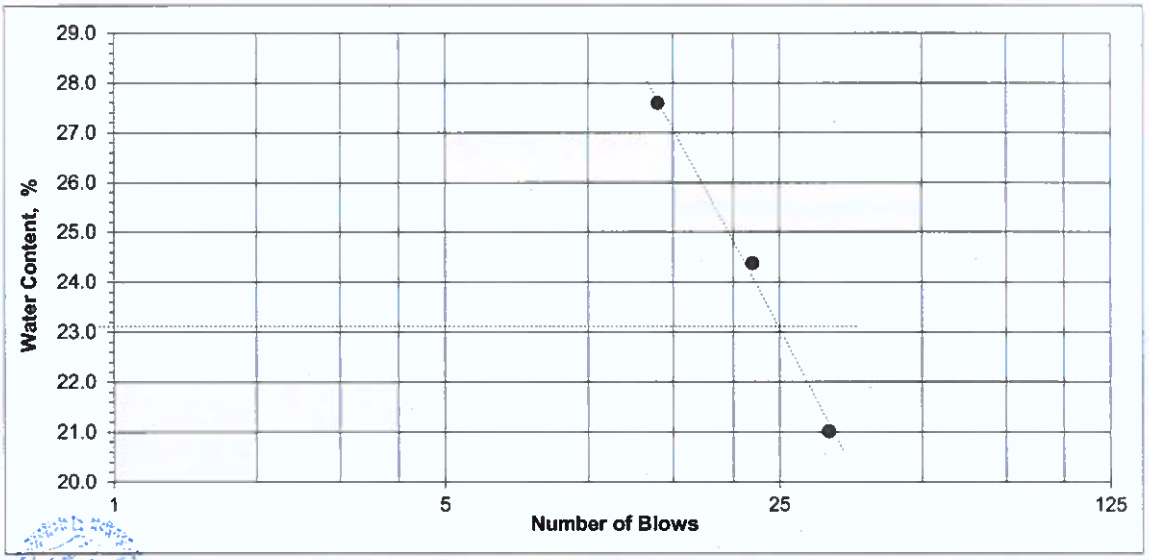
Borehole No. **B-38** Date: 26/6/2019

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Brownish yellow Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		14	22	32		
Container No		A-72	A-130	A-129		
Weight of Wet Soil + Container	g	15.22	25.17	20.88		
Weight of Dry Soil + Container	g	13.72	23.73	20.04		
Weight of Water	g	1.50	1.44	0.84		
Weight of Container	g	8.28	17.82	16.04		
Weight of Dry soil	g	5.44	5.91	4.00		
Water Content, W	%	27.57	24.37	21.00		
Average	%	27.57	24.37	21.00		



Liquid Limit, W_L = **23.10**

Plastic Limit, W_P = **0.00**

Plasticity Index, P_I = **23.10**

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

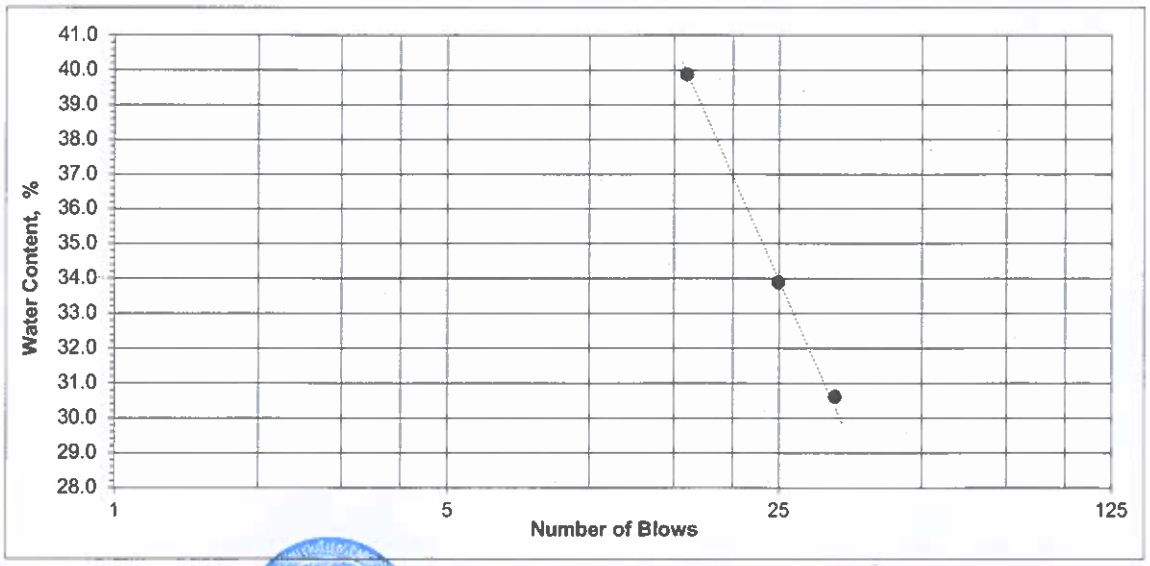
Borehole No. **B-39** Date: 26/6/2019

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Brownish yellow Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		16	25	33	A-101	
Container No		A-144	A-110	A-107		
Weight of Wet Soil + Container	g	27.10	21.33	27.65	31.04	
Weight of Dry Soil + Container	g	24.47	18.03	25.53	27.8	
Weight of Water	g	2.63	3.30	2.12	3.24	
Weight of Container	g	17.87	8.29	18.6	16.17	
Weight of Dry soil	g	6.60	9.74	6.93	11.63	
Water Content, W	%	39.85	33.88	30.59	27.86	
Average	%	39.85	33.88	30.59	27.86	



Liquid Limit, W_L = 34.00

Plastic Limit, W_P = 27.86

Plasticity Index, PI_P = 6.14

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

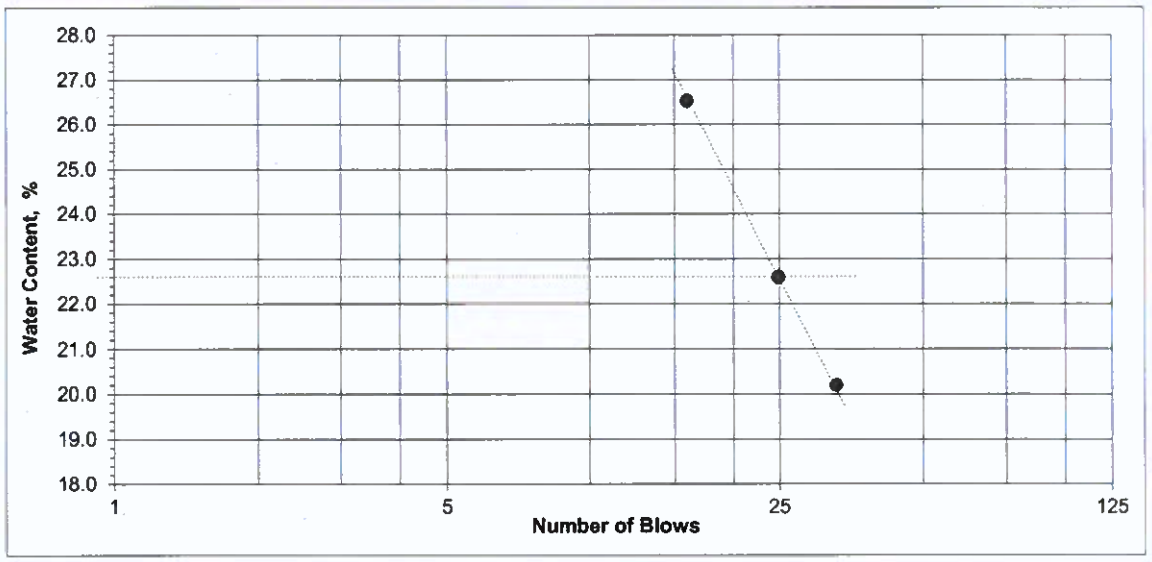
Borehole No. **B-40** Date: 26/6/2019

Source: **SPT** Tested By: **Pranita Pun**

Depth: **2.00-2.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Brownish yellow Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**16**	**25**	33		
Container No		**A-102**	**A-65**	A-103		
Weight of Wet Soil + Container	g	**16.30**	**19.51**	19.09		
Weight of Dry Soil + Container	g	**14.98**	**18.06**	17.28		
Weight of Water	g	1.32	1.45	1.81		
Weight of Container	g	**10.00**	**11.64**	8.31		
Weight of Dry soil	g	4.98	6.42	8.97		
Water Content, W	%	26.51	22.59	20.18		
Average	%	**26.51**	**22.59**	**20.18**		



Liquid Limit, W_L = **22.60**

Plastic Limit, W_P = **NP**

Plasticity Index, PI = **22.60**

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

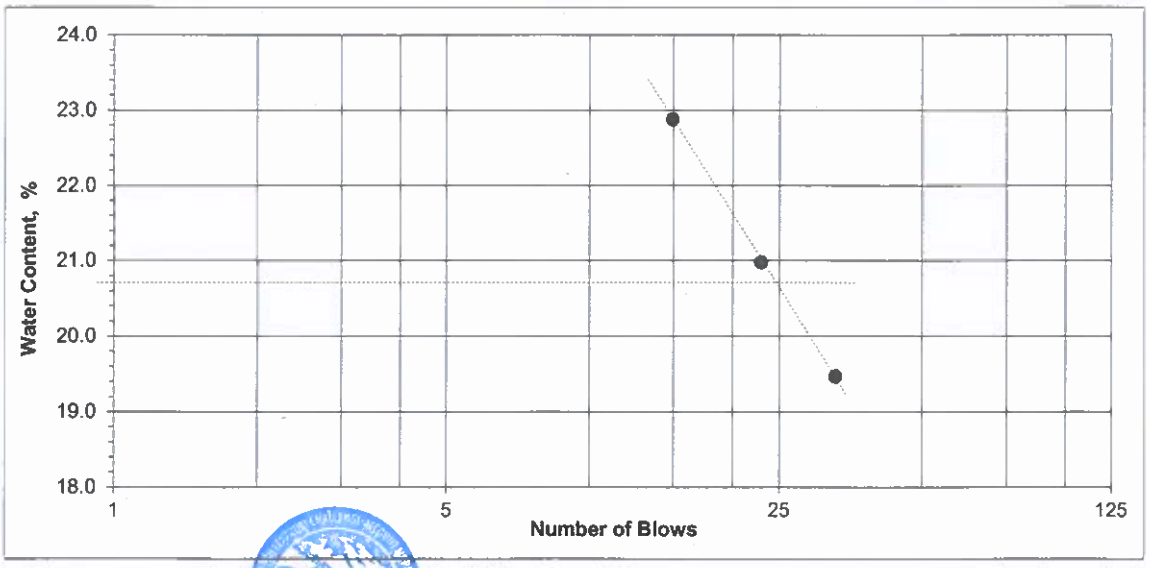
Borehole No. **B-41** Date: 26/6/2019

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Brownish yellow Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	23	33	A-51	
Container No		A-67	A-81	A-68		
Weight of Wet Soil + Container	g	25.59	25.48	25.79	21.58	
Weight of Dry Soil + Container	g	23.85	24.14	24.43	19.82	
Weight of Water	g	1.74	1.34	1.36	1.76	
Weight of Container	g	16.24	17.75	17.44	10.29	
Weight of Dry soil	g	7.61	6.39	6.99	9.53	
Water Content, W	%	22.86	20.97	19.46	18.47	
Average	%	22.86	20.97	19.46	18.47	



Liquid Limit, W_L = 20.70

Plastic Limit, W_P = 18.47

Plasticity Index, P_I = 2.23

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

Borehole No. **B-44** Date: 26/6/2019

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Brownish yellow Co-ordinatge: E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		16	23	34		
Container No		A-52	A-124	A-139		
Weight of Wet Soil + Container	g	26.25	25.6	23.85		
Weight of Dry Soil + Container	g	24.22	24.39	22.68		
Weight of Water	g	2.03	1.21	1.17		
Weight of Container	g	14.40	18.16	16.19		
Weight of Dry soil	g	9.82	6.23	6.49		
Water Content, W	%	20.67	19.42	18.03		
Average	%	20.67	19.42	18.03		

Liquid Limit, W_L = 19.18

Plastic Limit, W_P = NP

Plasticity Index, P_I = 19.18

Remarks:

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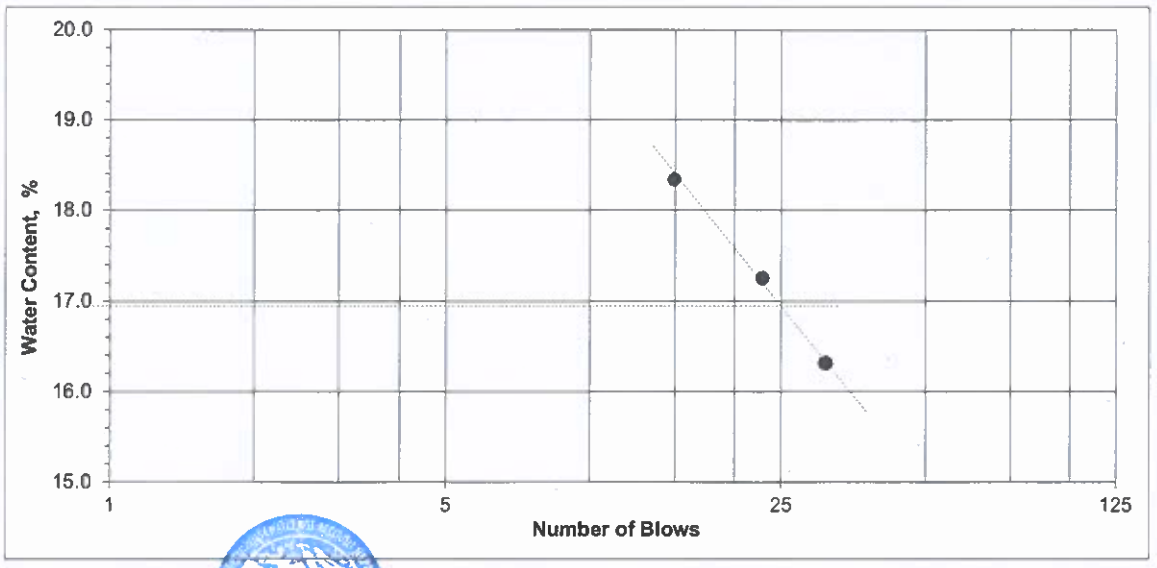
ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**		
Borehole No.	**B-49**	Date:	25/6/2019
Source:	**SPT**	Tested By:	**Binita K.C**
Depth:	**1.00-1.45 m**	Chainage:	Checked By: **Dr. S. Manandhar**
Description:	Light brown	Co-ordinatge:	**E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**15**	**23**	**31**		
Container No		**A-91**	**A-53**	**A-112**		
Weight of Wet Soil + Container	g	**21.30**	**22.87**	**21.50**		
Weight of Dry Soil + Container	g	**19.45**	**21.68**	**20.97**		
Weight of Water	g	1.85	1.19	0.53		
Weight of Container	g	**9.36**	**14.78**	**17.72**		
Weight of Dry soil	g	10.09	6.90	3.25		
Water Content, W	%	18.33	17.25	16.31		
Average	%	**18.33**	**17.25**	**16.31**		



Liquid Limit, W_L	=	17.85
Plastic Limit, W_P	=	NP
Plasticity Index, PI	=	17.85

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

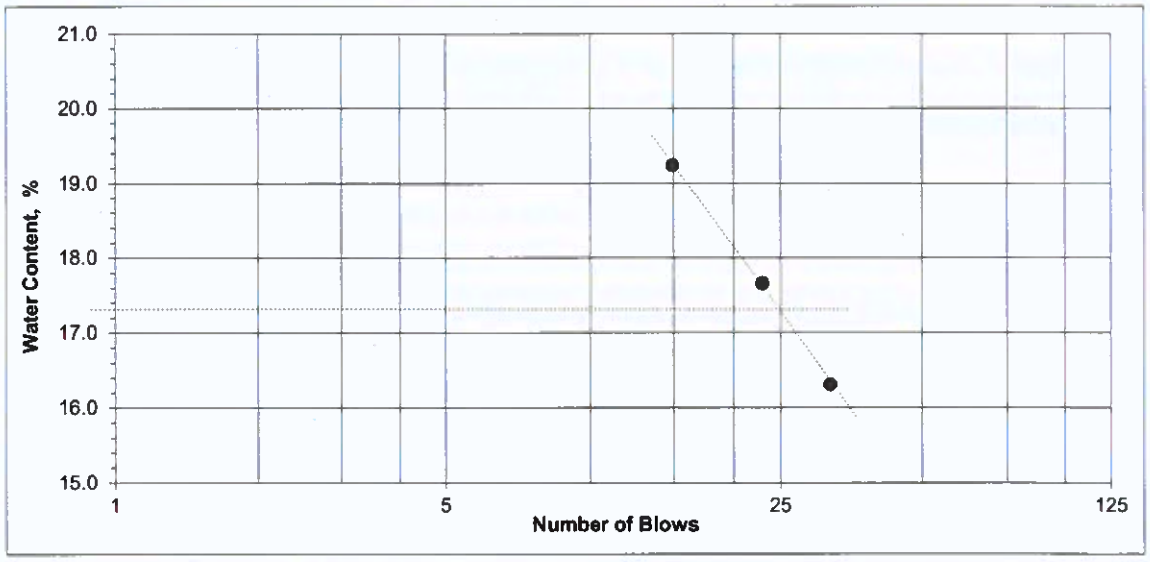
Borehole No. **B-52** Date: 26/6/2019

Source: **SPT** Tested By: **Pranita Pun**

Depth: **2.00-2.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Brownish yellow Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	23	32		
Container No		A-113	A-129	A-143		
Weight of Wet Soil + Container	g	23.11	25.02	25.17		
Weight of Dry Soil + Container	g	21.01	23.49	23.91		
Weight of Water	g	2.10	1.53	1.26		
Weight of Container	g	10.09	14.82	16.18		
Weight of Dry soil	g	10.92	8.67	7.73		
Water Content, W	%	19.23	17.65	16.30		
Average	%	19.23	17.65	16.30		



Liquid Limit, W_L = 17.30

Plastic Limit, W_P = NP

Plasticity Index, PI = 17.30

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

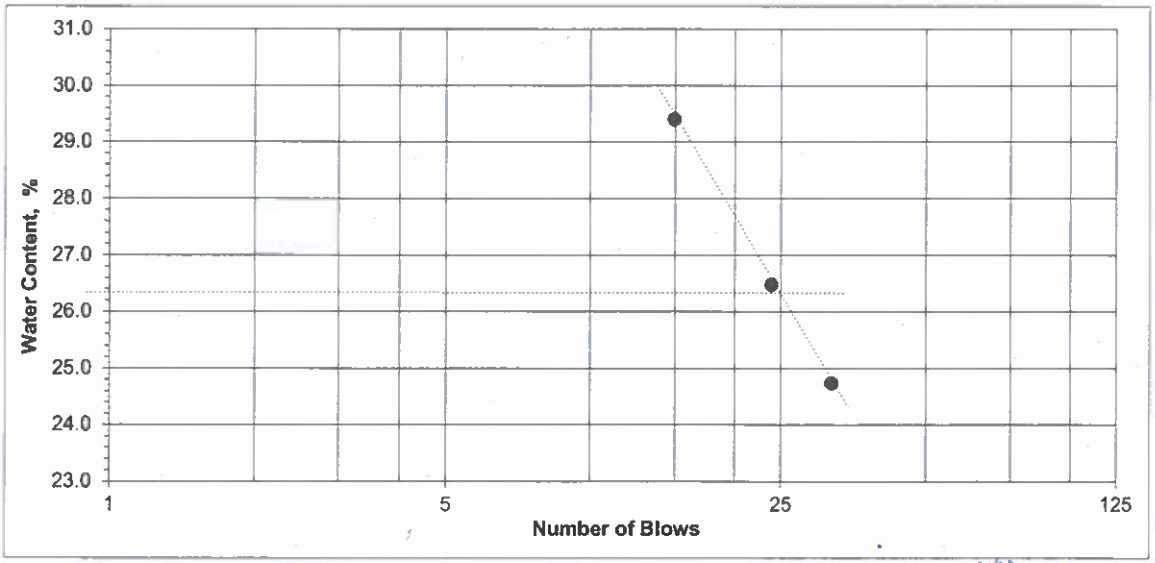
Borehole No. **B-54** Date: 25/6/2019

Source: **SPT** Tested By: **Binita K.C**

Depth: **3.00-3.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Light brown Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**15**	**24**	**32**	A-37	
Container No		**A-42**	**A-45**	**A-135**		
Weight of Wet Soil + Container	g	**21.70**	**21.05**	**18.05**	**25.9**	
Weight of Dry Soil + Container	g	**19.79**	**19.74**	**16.24**	**24.37**	
Weight of Water	g	1.91	1.31	1.81	1.53	
Weight of Container	g	**13.29**	**14.79**	**8.92**	**17.72**	
Weight of Dry soil	g	6.50	4.95	7.32	6.65	
Water Content, W	%	29.38	26.46	24.73	23.01	
Average	%	**29.38**	**26.46**	**24.73**	**23.01**	



Liquid Limit, W_L = **26.25**

Plastic Limit, W_P = **23.01**

Plasticity Index, P_I = **3.24**

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

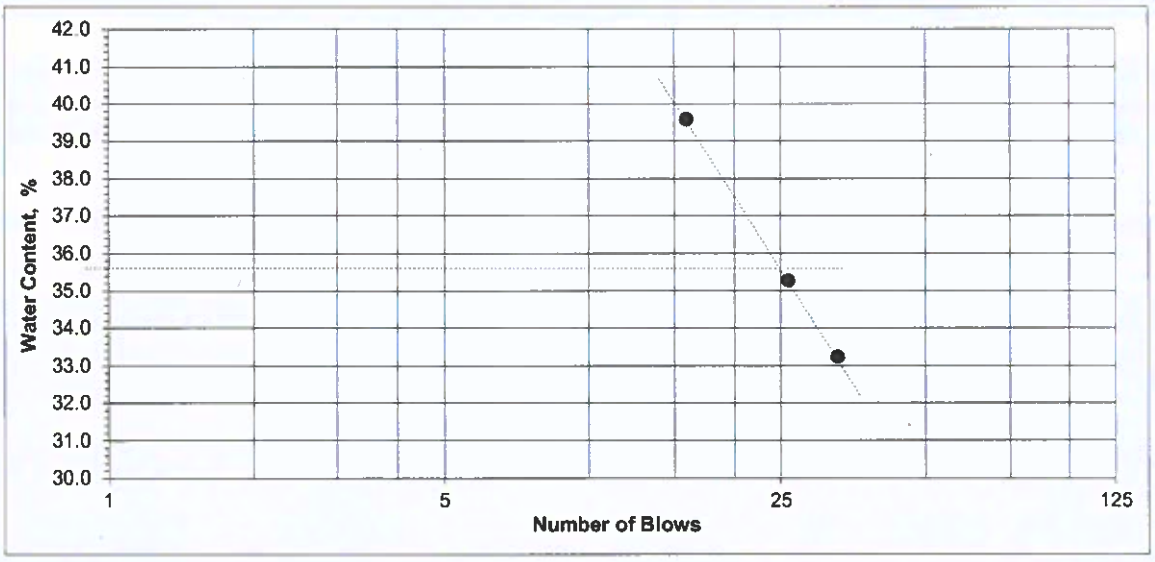
Borehole No. **B-55** Date: 25/6/2019

Source: **SPT** Tested By: **Binita K.C**

Depth: **3.00-3.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Light brown Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		16	26	33	A-56	
Container No		A-34	A-38	A-45		
Weight of Wet Soil + Container	g	26.14	23.25	22.41	26.38	
Weight of Dry Soil + Container	g	23.05	20.68	20.51	23.97	
Weight of Water	g	3.09	2.57	1.90	2.41	
Weight of Container	g	15.24	13.39	14.79	14.91	
Weight of Dry soil	g	7.81	7.29	5.72	9.06	
Water Content, W	%	39.56	35.25	33.22	26.60	
Average	%	39.56	35.25	33.22	26.60	



Liquid Limit, W_L = **35.60**

Plastic Limit, W_P = **26.60**

Plasticity Index, PI = **9.00**

Remarks:

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Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

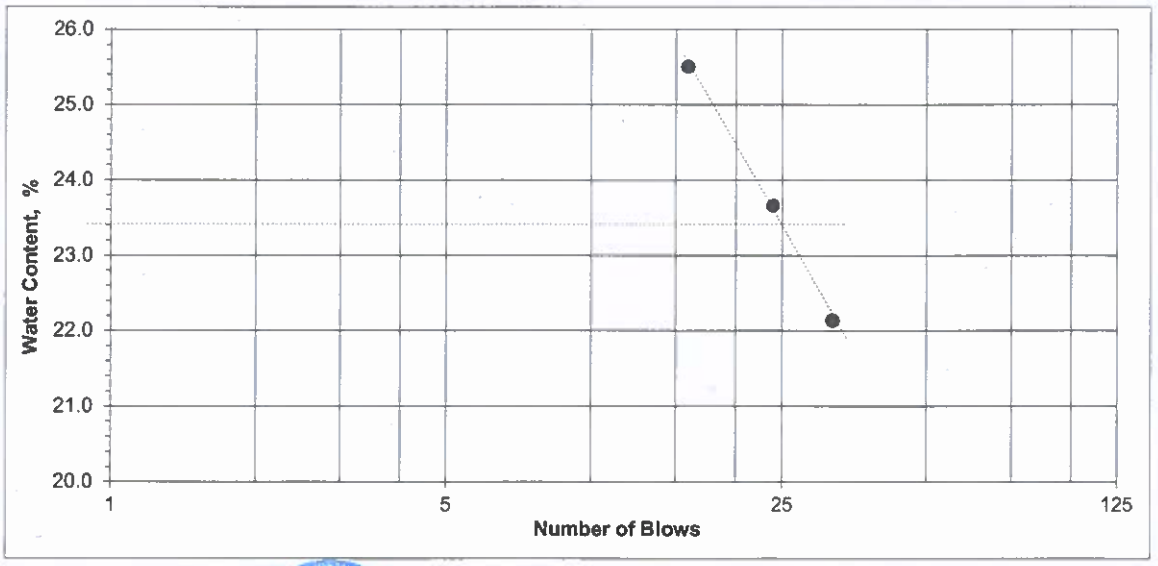
Borehole No. **B-56** Date: 25/6/2019

Source: **SPT** Tested By: **Binita K.C**

Depth: **3.00-3.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Light brown Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**16**	**24**	**32**		
Container No		**A-105**	**A-123**	**A-141**		
Weight of Wet Soil + Container	g	**20.84**	**31.51**	**24.67**		
Weight of Dry Soil + Container	g	**20.20**	**28.58**	**23.38**		
Weight of Water	g	0.64	2.93	1.29		
Weight of Container	g	**17.69**	**16.19**	**17.55**		
Weight of Dry soil	g	2.51	12.39	5.83		
Water Content, W	%	25.50	23.65	22.13		
Average	%	**25.50**	**23.65**	**22.13**		



Liquid Limit, W_L = **23.40**

Plastic Limit, W_P = **NP**

Plasticity Index, PI = **23.40**

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**

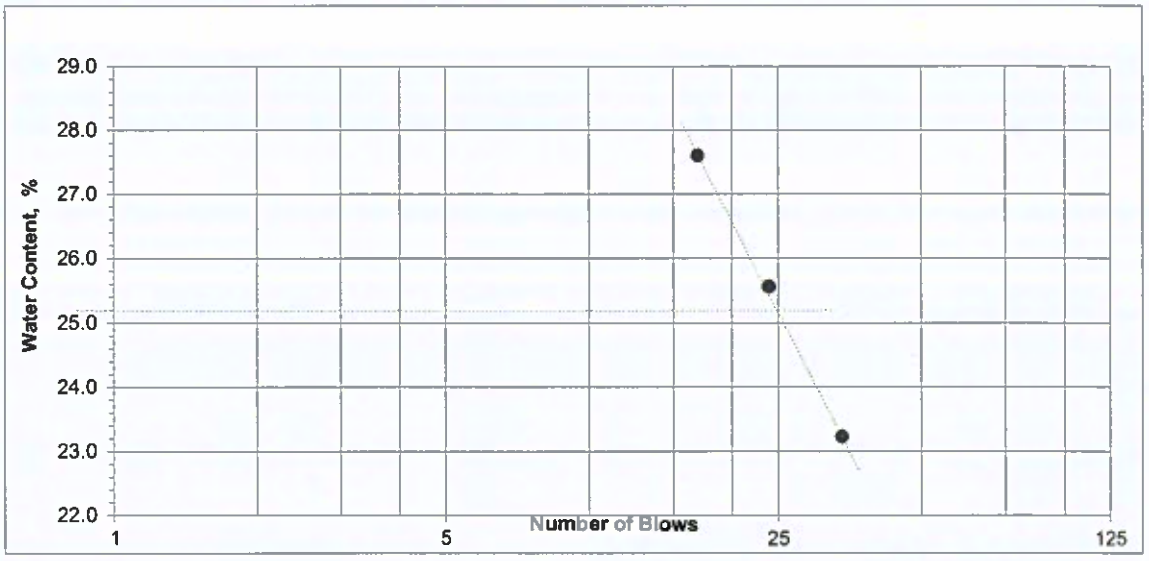
Borehole No. **B-57** Date: 26/6/2019

Source: **SPT** Tested By: **Pranita Pun**

Depth: **5.00-5.45 m** Chainage: Checked By: **Dr. S. Manandhar**

Description: Brownish yellow Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		17	24	34	A-139	
Container No		A-76	A-110	A-35		
Weight of Wet Soil + Container	g	30.93	32.77	30.33	23.45	
Weight of Dry Soil + Container	g	26.11	27.53	27.28	22.12	
Weight of Water	g	4.82	5.24	3.05	1.33	
Weight of Container	g	8.65	7.03	14.15	16.19	
Weight of Dry soil	g	17.46	20.50	13.13	5.93	
Water Content, W	%	27.61	25.56	23.23	22.43	
Average	%	27.61	25.56	23.23	22.43	



Liquid Limit, W_L = **25.20**

Plastic Limit, W_P = **22.43**

Plasticity Index (PI = **2.77**

Remarks:

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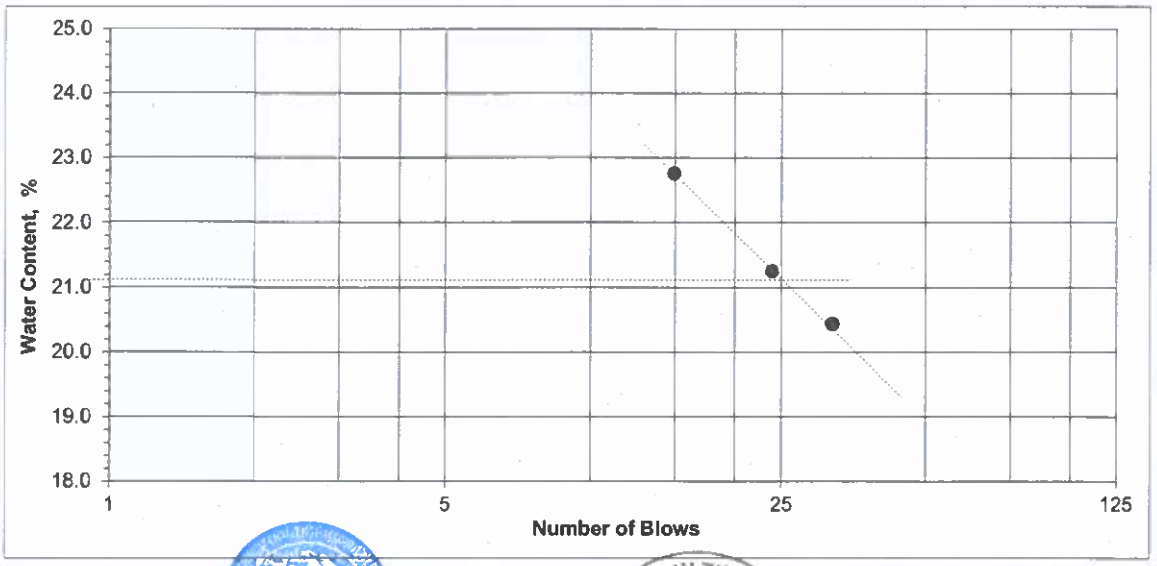
ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Invstigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-58**			Date:	25/6/2019
Source:	**SPT**			Tested By:	**Binita K.C**
Depth:	**3.00-3.45 m**	Chainage:		Checked By:	**Dr. S. Manandhar**
Description:	Light brown	Co-ordinatge:		**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**15**	**24**	**32**		
Container No		**A-111**	**A-131**	**A-84**		
Weight of Wet Soil + Container	g	**29.86**	**28.47**	**31.66**		
Weight of Dry Soil + Container	g	**27.33**	**26.58**	**29.04**		
Weight of Water	g	2.53	1.89	2.62		
Weight of Container	g	**16.21**	**17.68**	**16.21**		
Weight of Dry soil	g	11.12	8.90	12.83		
Water Content, W	%	22.75	21.24	20.42		
Average	%	**22.75**	**21.24**	**20.42**		



Liquid Limit, W_L = **21.10**

Plastic Limit, W_P = **NP**

Plasticity Index, PI = **21.10**

Remarks:

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ICGS Pvt. Ltd.

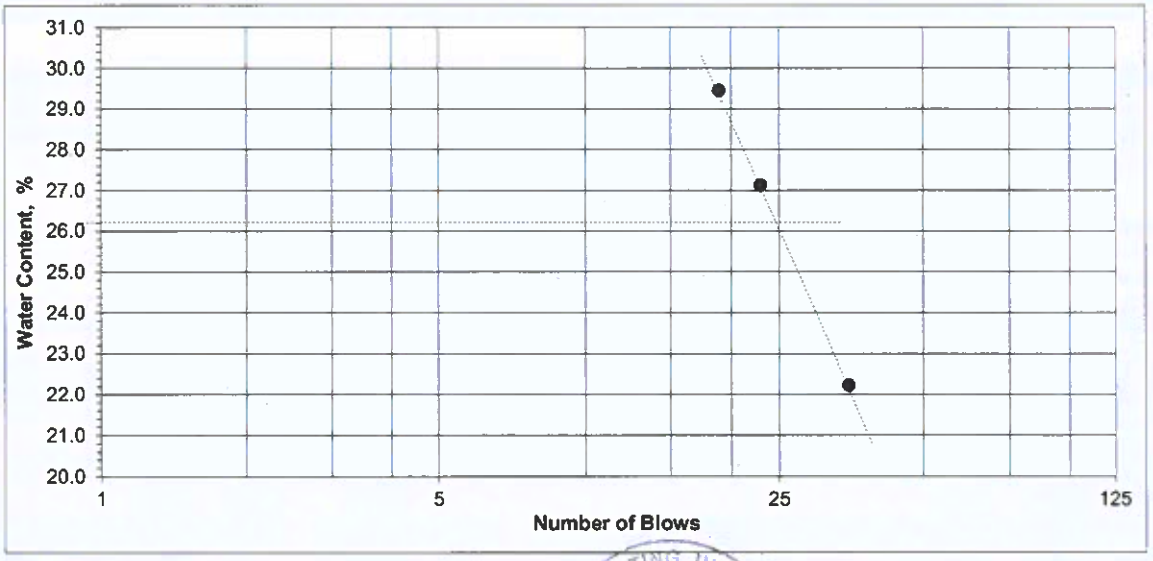
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-1**		Date:	24/12/2075
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**3.50 - 4.50m**	Co-ordinatge:	Checked By:	**Dr. S. Manandhar**
Description:	light red		E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		19	23	35	A111	
Container No		A-74	A-62	A-69		
Weight of Wet Soil + Container	g	29.00	26.95	28.55	17.44	
Weight of Dry Soil + Container	g	26.08	24.67	26.3	17.24	
Weight of Water	g	2.92	2.28	2.25	0.20	
Weight of Container	g	16.16	16.26	16.17	16.28	
Weight of Dry soil	g	9.92	8.41	10.13	0.96	
Water Content, W	%	29.44	27.11	22.21	20.83	
Average	%	29.44	27.11	22.21	20.83	



Liquid Limit, W_L = **26.20**
Plastic Limit, W_P = **20.83**
Plasticity Index, PI = **5.37**

Remarks:

ICGS Pvt. Ltd.

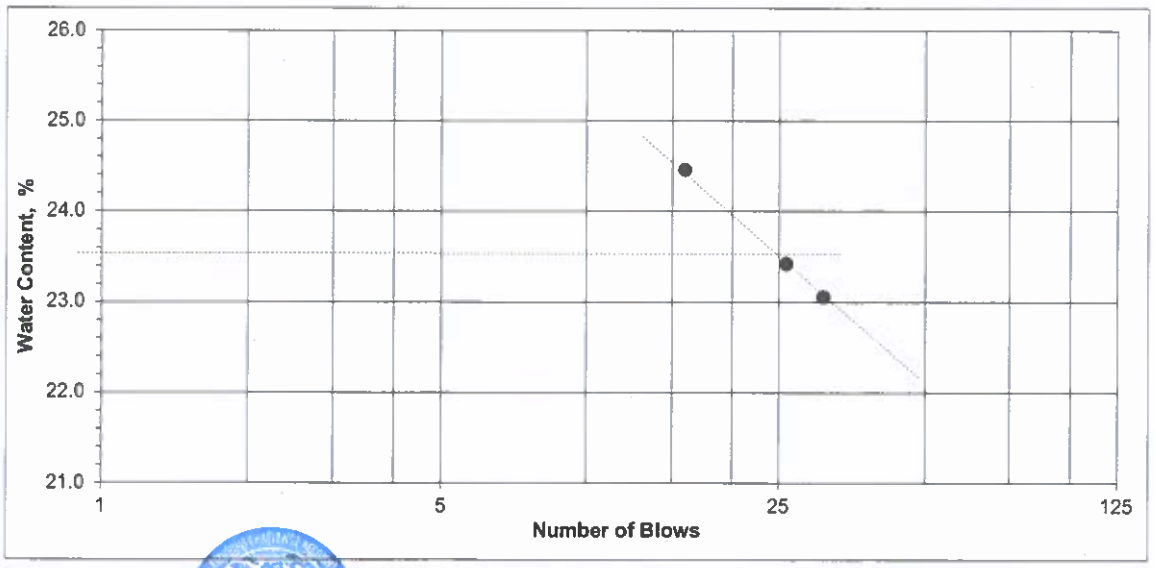
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-2**			Date:	15/04/2019
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Binita K.C**
Depth:	**3.50 - 4.50m**	Co-ordinatge:		Checked By:	**Dr. S. Manandhar**
Description:	light red			E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**16**	**26**	**31**	**A-94**	**A111**
Container No		**A-109**	**A-112**	**A-70**		
Weight of Wet Soil + Container	g	**46.90**	**33.73**	**33.42**	**12.82**	**18.30**
Weight of Dry Soil + Container	g	**41.33**	**30.11**	**31.00**	12.23	**17.94**
Weight of Water	g	5.57	3.62	2.42	**0.59**	**0.36**
Weight of Container	g	**18.55**	**14.65**	**20.5**	9.53	**16.23**
Weight of Dry soil	g	22.78	15.46	10.50	2.70	1.71
Water Content, W	%	24.45	23.42	23.05	**21.85**	**21.05**
Average	%	**24.45**	**23.42**	**23.05**	**21.45**	



Liquid Limit, W_L = **23.50**
Plastic Limit, W_P = **21.45**
Plasticity Index, P_I = **2.05**

Remarks:

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-3**		Date:	15/04/2019
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**3.50 - 4.50m**	Co-ordinatge:	Checked By:	**Dr. S. Manandhar**
Description:	light red		**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**16**	**24**	**33**	**A-02**	**A-95**
Container No		**A-139**	**A-106**	**A-143**		
Weight of Wet Soil + Container	g	**30.87**	**38.29**	**35.92**	**14.06**	**12.57**
Weight of Dry Soil + Container	g	**27.18**	**35.44**	**34.09**	**13.34**	**11.98**
Weight of Water	g	3.69	2.85	1.83	**0.72**	**0.59**
Weight of Container	g	**15.55**	**26.01**	**27.75**	10.42	**9.58**
Weight of Dry soil	g	11.63	9.43	6.34	2.92	2.40
Water Content, W	%	31.73	30.22	28.86	**24.66**	**24.58**
Average	%	**31.73**	**30.22**	**28.86**	**24.62**	

Liquid Limit, W_L = **30.00**
Plastic Limit, W_P = **24.62**
Plasticity Index, PI = **5.38**

Remarks:

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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

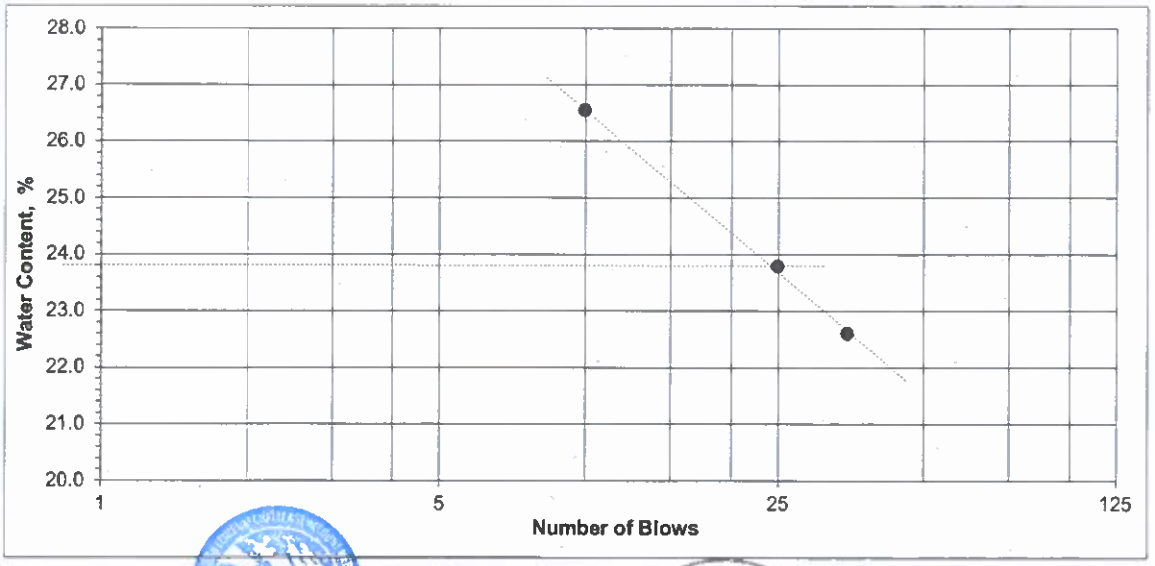
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-4**		Date:	24/12/2075
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**3.50 - 4.50m**	Co-ordinatge:	Checked By:	**Dr. S. Manandhar**
Description:	light red		**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**10**	**25**	**35**	**A-129**	
Container No		**A-76**	**A-127**	**A-112**		
Weight of Wet Soil + Container	g	**24.03**	**31.65**	**32.68**	**16.89**	
Weight of Dry Soil + Container	g	**20.81**	**29.16**	**29.94**	16.75	
Weight of Water	g	3.22	2.49	2.74	**0.14**	
Weight of Container	g	**8.68**	**18.69**	**17.81**	16.03	
Weight of Dry soil	g	12.13	10.47	12.13	0.72	
Water Content, W	%	26.55	23.78	22.59	**19.44**	
Average	%	**26.55**	**23.78**	**22.59**	**19.44**	



Liquid Limit, W_L	=	23.80
Plastic Limit, W_P	=	19.44
Plasticity Index, PI	=	4.36

Remarks:

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ICGS Pvt. Ltd.

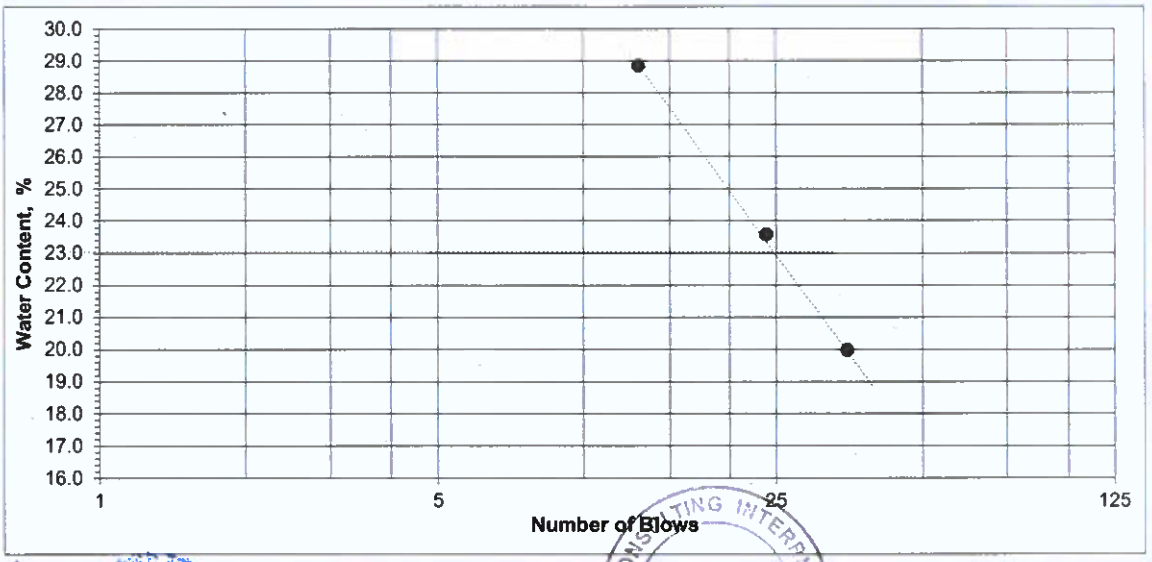
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-5**		Date:	24/12/2075
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**3.50 - 4.50m**	Co-ordinatge:	Checked By:	**Dr. S. Manandhar**
Description:	light red		E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		13	24	35	A-71	
Container No		A-131	A-78	A-106		
Weight of Wet Soil + Container	g	27.42	29.93	31.55	27.55	
Weight of Dry Soil + Container	g	25.25	27.69	29.31	25.58	
Weight of Water	g	2.17	2.24	2.24	1.97	
Weight of Container	g	17.72	18.18	18.09	16.17	
Weight of Dry soil	g	7.53	9.51	11.22	9.41	
Water Content, W	%	28.82	23.55	19.96	20.94	
Average	%	28.82	23.55	19.96	20.94	



Liquid Limit, W_L	=	23.00
Plastic Limit, W_P	=	20.94
Plasticity Index, PI	=	2.06

Remarks:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

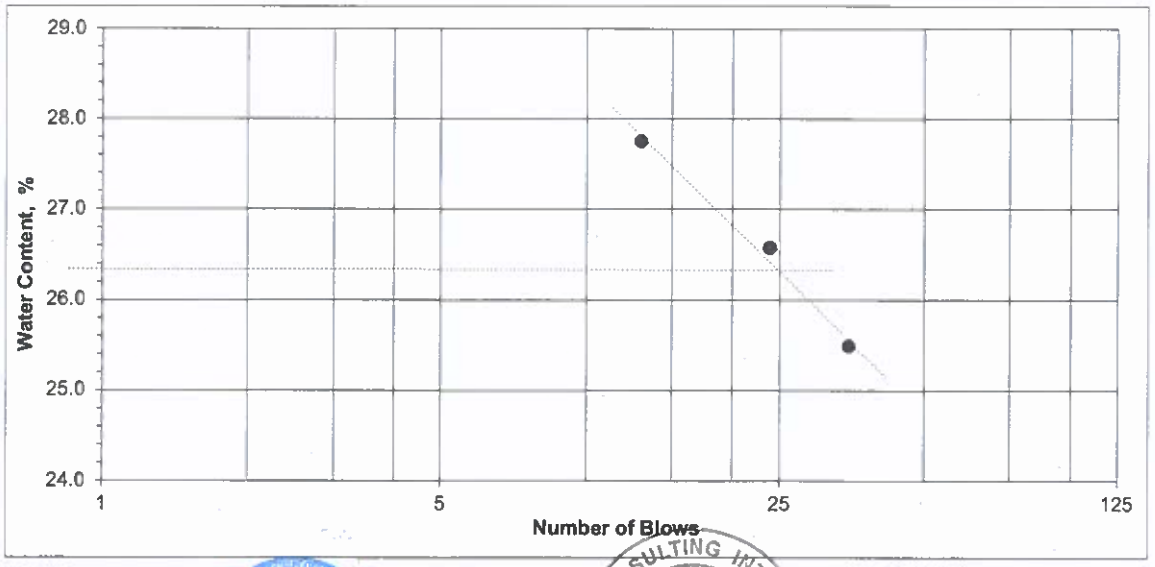
Borehole No. **B-6** Date: 16/04/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **3.50 - 4.50m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: light red E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		13	24	35	A-81	A-112
Container No		A-68	A-105	A-117		
Weight of Wet Soil + Container	g	35.88	37.89	25.89	19.52	19.74
Weight of Dry Soil + Container	g	31.13	33.82	23.12	19.23	19.40
Weight of Water	g	4.75	4.07	2.77	0.29	0.34
Weight of Container	g	14.01	18.50	12.25	17.71	17.62
Weight of Dry soil	g	17.12	15.32	10.87	1.52	1.78
Water Content, W	%	27.75	26.57	25.48	19.08	19.10
Average	%	27.75	26.57	25.48	19.09	



Liquid Limit, W_L = 26.35

Plastic Limit, W_P = 19.09

Plasticity Index, P_I = 7.26

Remarks:

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सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

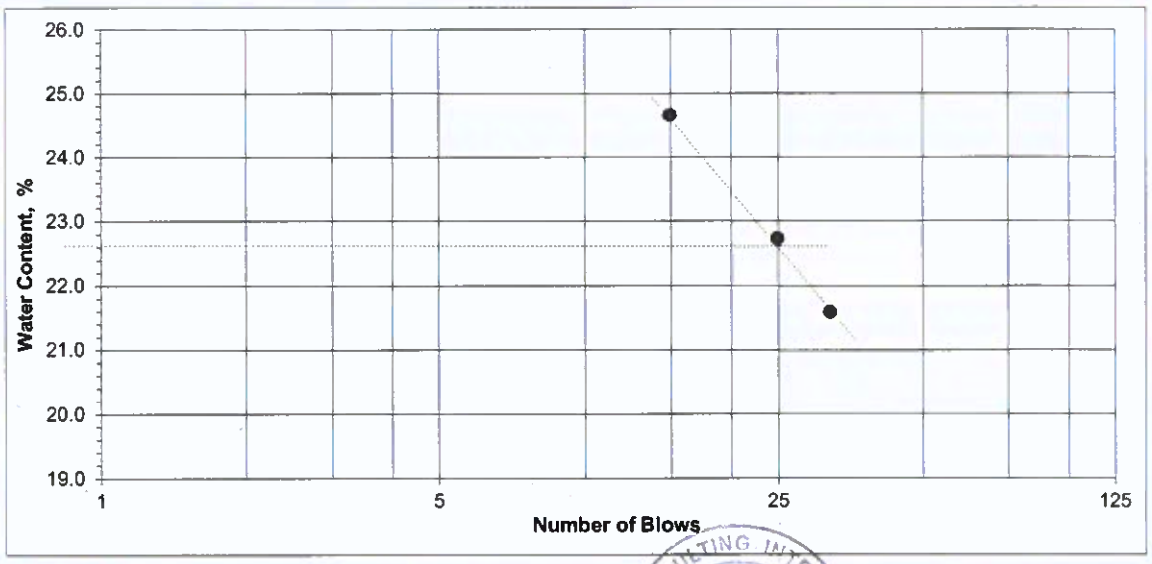
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-7**		Date:	16/04/2019
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**3.50 - 4.50m**	Co-ordinatge:	Checked By:	**Dr. S. Manandhar**
Description:	light red		**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**15**	**25**	**32**		
Container No		**A-50**	**A-26**	**A-54**		
Weight of Wet Soil + Container	g	**20.86**	**46.16**	**23.21**		
Weight of Dry Soil + Container	g	**19.44**	**44.39**	**21.59**		
Weight of Water	g	1.42	1.77	1.62		
Weight of Container	g	**13.68**	**36.60**	**14.08**		
Weight of Dry soil	g	5.76	7.79	7.51		
Water Content, W	%	24.65	22.72	21.57		
Average	%	**24.65**	**22.72**	**21.57**		



Liquid Limit, W_L = **22.60**
Plastic Limit, W_P = **0.00**
Plasticity Index, PI = **22.60**

Remarks:

ICGS Pvt. Ltd.

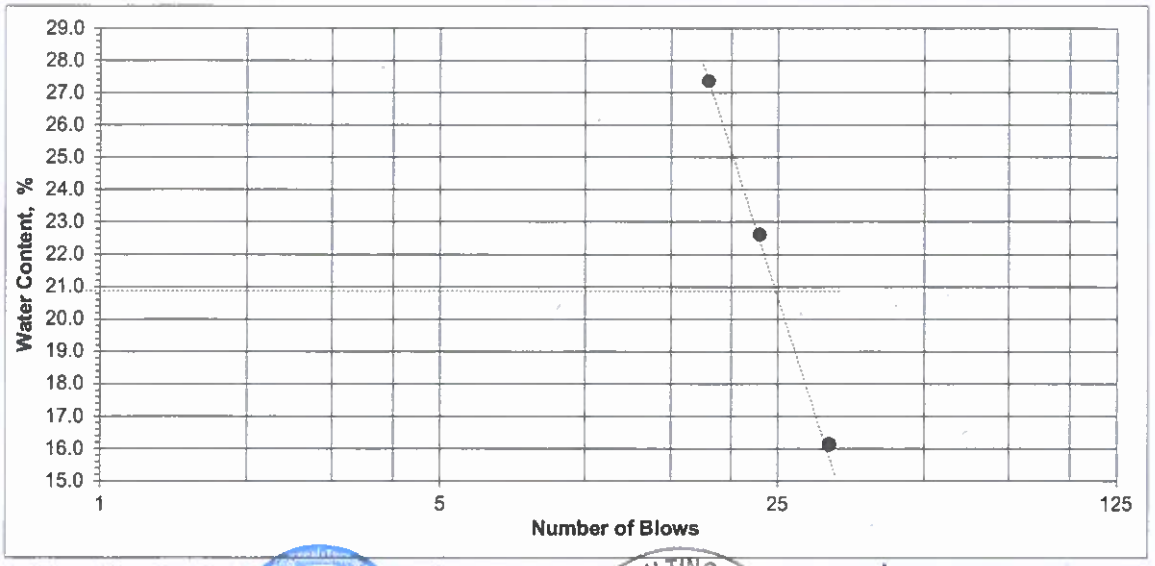
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-8**		Date:	24/12/2075
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**3.50 - 4.50m**	Co-ordinatge:	Checked By:	**Dr. S. Manandhar**
Description:	light red		E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**18**	**23**	**32**	**A-106**	
Container No		**A-68**	**A-127**	**A-62**		
Weight of Wet Soil + Container	g	**26.73**	**26.63**	**26.94**	**25.39**	
Weight of Dry Soil + Container	g	**24.75**	**25.13**	**25.45**	24.21	
Weight of Water	g	1.98	1.50	1.49	**1.18**	
Weight of Container	g	**17.51**	**18.49**	**16.20**	18.12	
Weight of Dry soil	g	7.24	6.64	9.25	6.09	
Water Content, W	%	27.35	22.59	16.11	**19.38**	
Average	%	**27.35**	**22.59**	**16.11**	**19.38**	



Liquid Limit, W = 20.80
Plastic Limit, W = 19.38
Plasticity Index, P = 1.42

Remarks:

ICGS Pvt. Ltd.

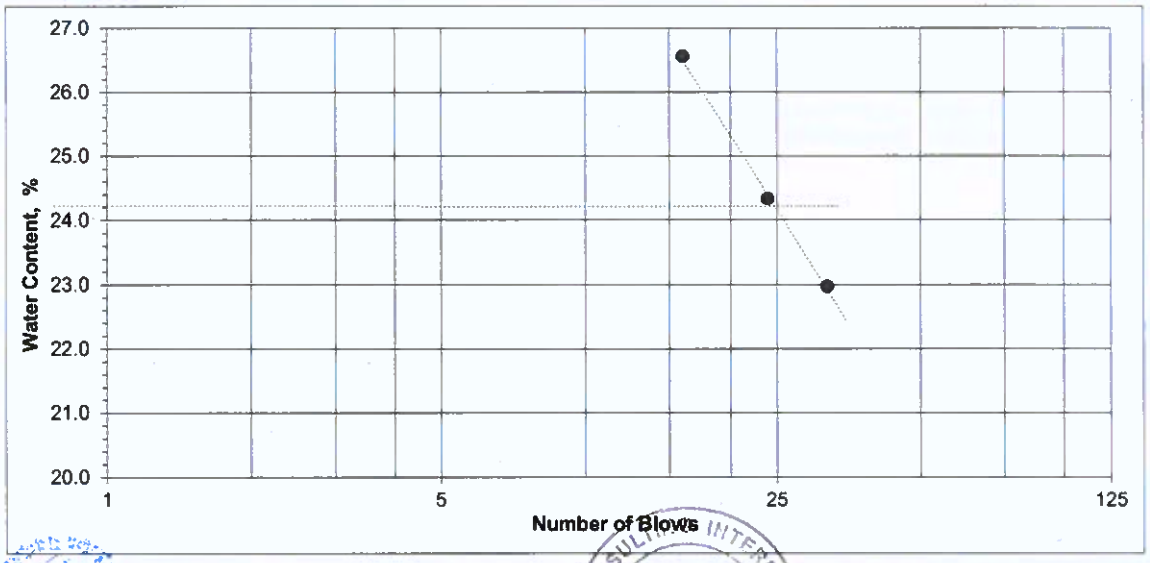
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-9**		Date:	16/6/2019
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**0.00 - 1.00m**	Co-ordinatge:	Checked By:	**Dr. S. Manandhar**
Description:	Dark brown		**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		16	24	32	A-99	
Container No		A-52	A-76	A-2		
Weight of Wet Soil + Container	g	38.29	32.71	40.18	20.41	
Weight of Dry Soil + Container	g	33.33	28.11	37.82	18.59	
Weight of Water	g	4.96	4.60	2.36	1.82	
Weight of Container	g	14.65	9.20	27.54	9.93	
Weight of Dry soil	g	18.68	18.91	10.28	8.66	
Water Content, W	%	26.55	24.33	22.96	21.02	
Average	%	**26.55**	**24.33**	**22.96**	**21.02**	



Liquid Limit, W_L = **24.20**

Plastic Limit, W_P = **21.02**

Plasticity Index, P_I = **3.18**

Remarks:

ICGS Pvt. Ltd.

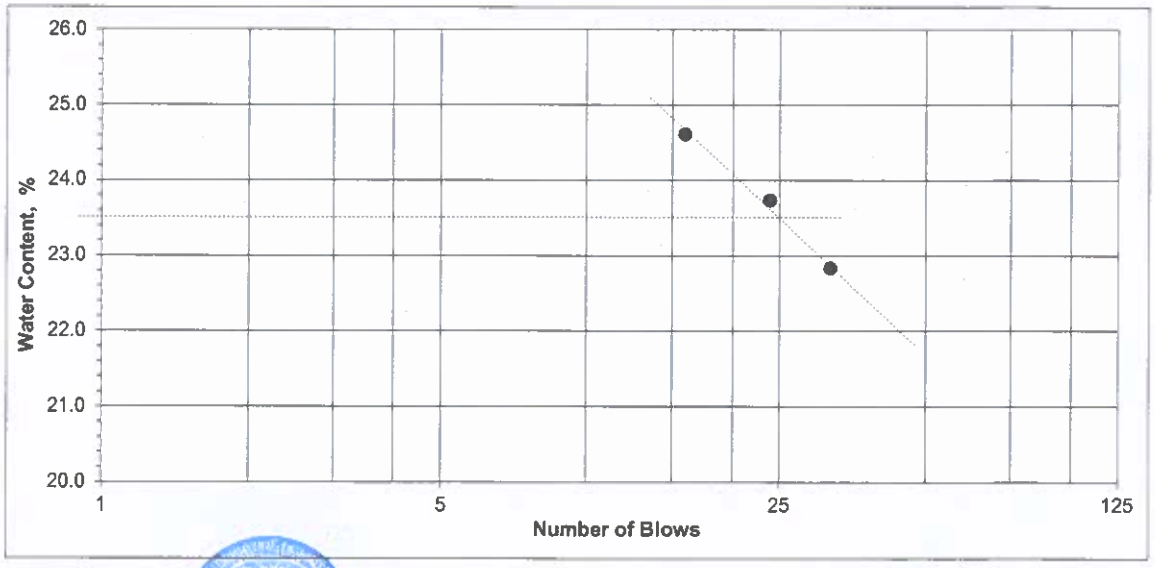
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-10**		Date:	16/6/2019
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**0.00 - 1.00m**	Co-ordinatge:	Checked By:	**Dr. S. Manandhar**
Description:	light red		**E:**	

Descriptions	Liquid Limit			Plastic Limit	
Number of Blows	**16**	**24**	**32**	**A-71**	
Container No	**A-110**	**A-86**	**A-130**		
Weight of Wet Soil + Container g	**22.65**	**22.56**	**34.12**	**27.55**	
Weight of Dry Soil + Container g	**20.21**	**19.67**	**31.29**	25.58	
Weight of Water g	2.44	2.89	2.83	**1.97**	
Weight of Container g	**10.29**	**7.49**	**18.89**	16.17	
Weight of Dry soil g	9.92	12.18	12.40	9.41	
Water Content, W %	24.60	23.73	22.82	20.94	
Average %	**24.60**	**23.73**	**22.82**	**20.94**	



Liquid Limit, W_L = **23.50**

Plastic Limit, W_P = **20.94**

Plasticity Index, PI = **2.56**

Remarks:

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वन तथा वातावरण मन्त्रालय
सिंहदरबार काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-11**		Date:	15/6/2019
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**0.00 - 1.00m**	Co-ordinatge:	Checked By:	**Dr. S. Manandhar**
Description:	Light brown		E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	26	32		
Container No		A-129	A-75	A-138		
Weight of Wet Soil + Container	g	31.61	29.93	22.14		
Weight of Dry Soil + Container	g	28.04	27.90	20.34		
Weight of Water	g	3.57	2.03	1.80		
Weight of Container	g	16.04	17.85	9.48		
Weight of Dry soil	g	12.00	10.05	10.86		
Water Content, W	%	29.75	20.20	16.57		
Average	%	29.75	20.20	16.57		

Liquid Limit, W_L	=	20.80
Plastic Limit, W_P	=	0.00
Plasticity Index, PI	=	20.80

Remarks:

नेपाल सरकार
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सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

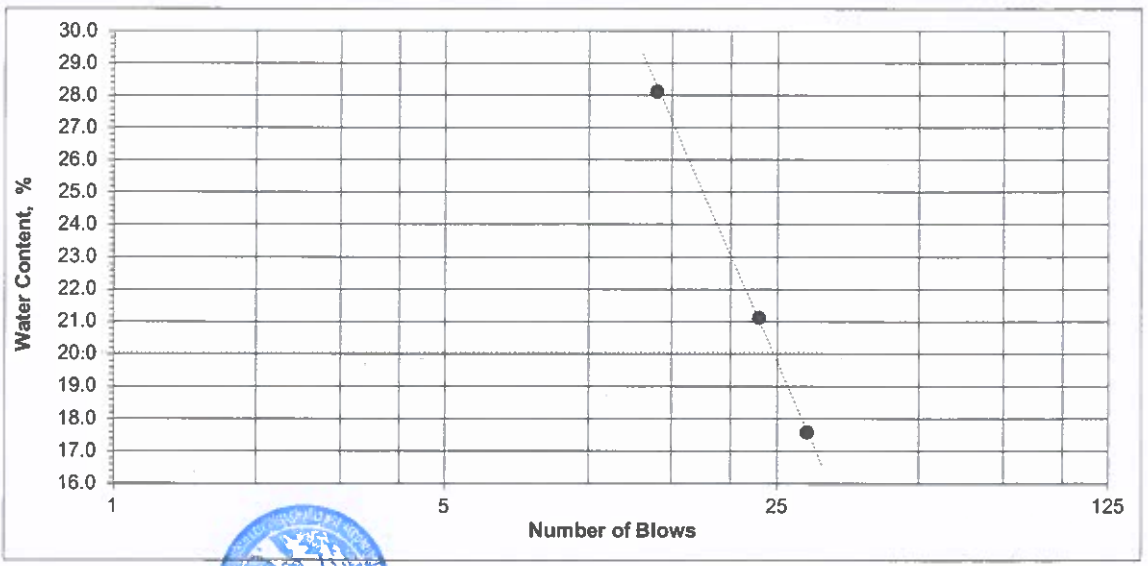
Borehole No. **B-12** Date: 15/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light brown **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**14**	**23**	**29**		
Container No		**A-56**	**A-30**	**A-55**		
Weight of Wet Soil + Container	g	**32.66**	**39.70**	**25.97**		
Weight of Dry Soil + Container	g	**27.89**	**35.99**	**24.18**		
Weight of Water	g	4.77	3.71	1.79		
Weight of Container	g	**10.91**	**18.41**	**13.98**		
Weight of Dry soil	g	16.98	17.58	10.20		
Water Content, W	%	28.09	21.10	17.55		
Average	%	**28.09**	**21.10**	**17.55**		



Liquid Limit, W_L = 20.00

Plastic Limit, W_P 0.00

Plasticity Index, PI 20.00

Remarks:

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ICGS Pvt. Ltd.

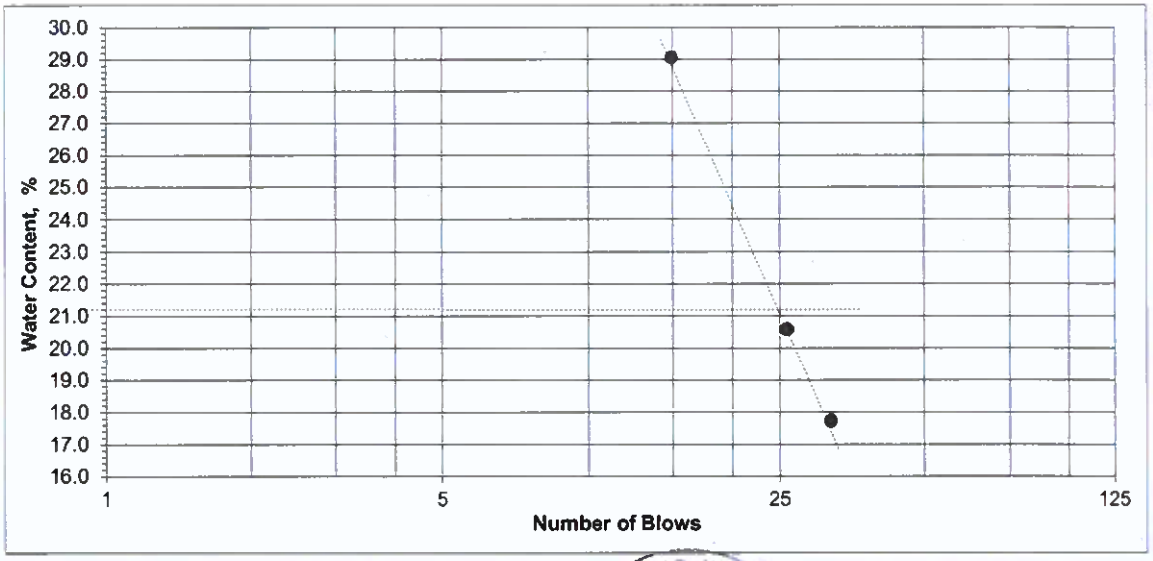
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-13**			Date:	16/6/2019
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Binita K.C**
Depth:	**0.00 - 1.00m**	Co-ordinatge:		Checked By:	**Dr. S. Manandhar**
Description:	Brownish			E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	26	32	A-35	
Container No		A-24	A-60	A-44		
Weight of Wet Soil + Container	g	46.97	33.10	30.81	33.99	
Weight of Dry Soil + Container	g	43.50	29.71	27.7	30.38	
Weight of Water	g	3.47	3.39	3.11	3.61	
Weight of Container	g	31.55	13.22	10.14	12.15	
Weight of Dry soil	g	11.95	16.49	17.56	18.23	
Water Content, W	%	29.04	20.56	17.71	19.80	
Average	%	29.04	20.56	17.71	19.80	



Liquid Limit, W_L = **21.20**

Plastic Limit, W_P = **19.80**

Plasticity Index, P_I = **1.40**

Remarks:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

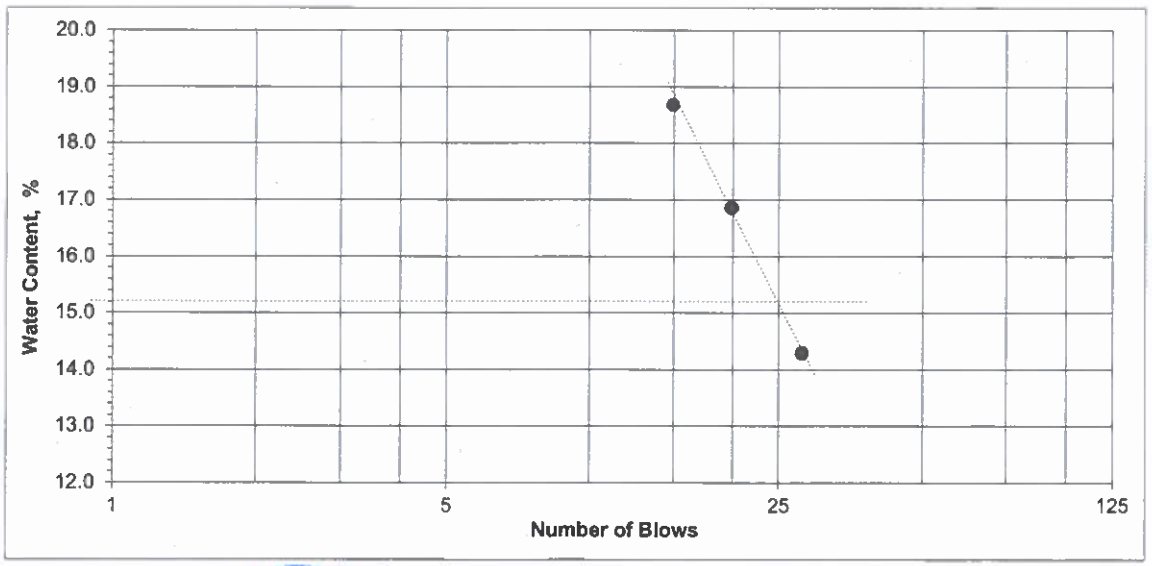
Borehole No. **B-14** Date: 15/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light red E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	20	28		
Container No		A-51	A-58	A-50		
Weight of Wet Soil + Container	g	33.55	37.63	35.17		
Weight of Dry Soil + Container	g	29.86	34.99	32.86		
Weight of Water	g	3.69	2.64	2.31		
Weight of Container	g	10.09	19.32	16.68		
Weight of Dry soil	g	19.77	15.67	16.18		
Water Content, W	%	18.66	16.85	14.28		
Average	%	**18.66**	**16.85**	**14.28**		



Liquid Limit, W_L = 15.20

Plastic Limit, W_P = NP

Plasticity Index, PI = 15.20

Remarks:

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ICGS Pvt. Ltd.

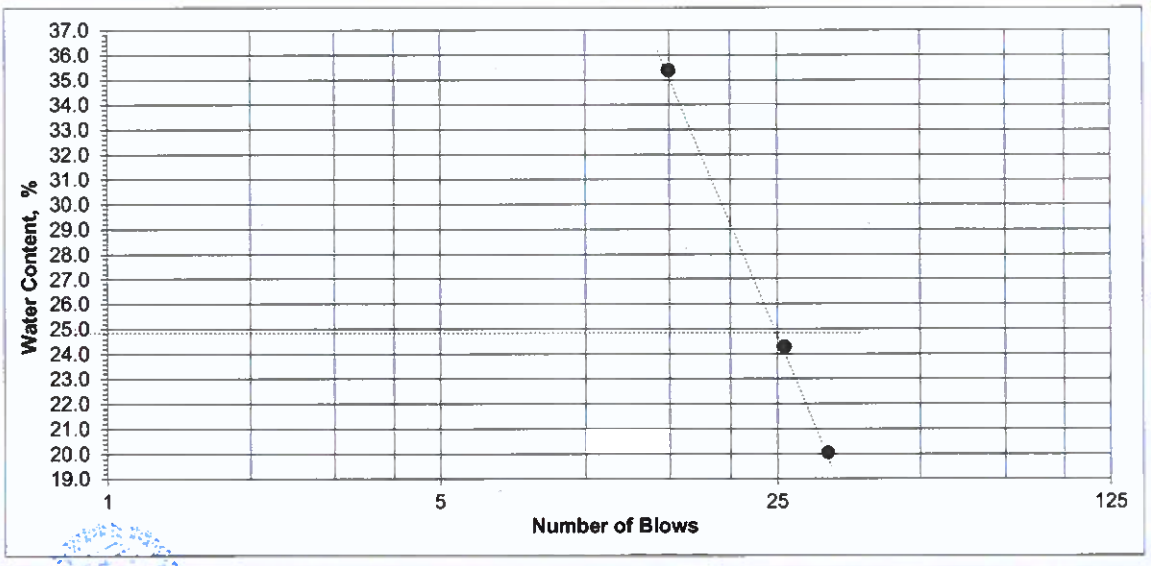
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-15**		Date:	16/6/2019
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**0.00 - 1.00m**	Co-ordinatge:	Checked By:	**Dr. S. Manandhar**
Description:	Dark brown		E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	26	32	A-54	
Container No		A-30	A-51	A-55		
Weight of Wet Soil + Container	g	29.28	30.42	32.08	34.46	
Weight of Dry Soil + Container	g	25.50	26.84	29.06	30.63	
Weight of Water	g	3.78	3.58	3.02	3.83	
Weight of Container	g	14.81	12.09	13.98	14.08	
Weight of Dry soil	g	10.69	14.75	15.08	16.55	
Water Content, W	%	35.36	24.27	20.03	23.14	
Average	%	35.36	24.27	20.03	23.14	



Liquid Limit, W_L = **24.80**
Plastic Limit, W_P = **23.14**
Plasticity Index, I_P = **1.66**

Remarks:

ICGS Pvt. Ltd.

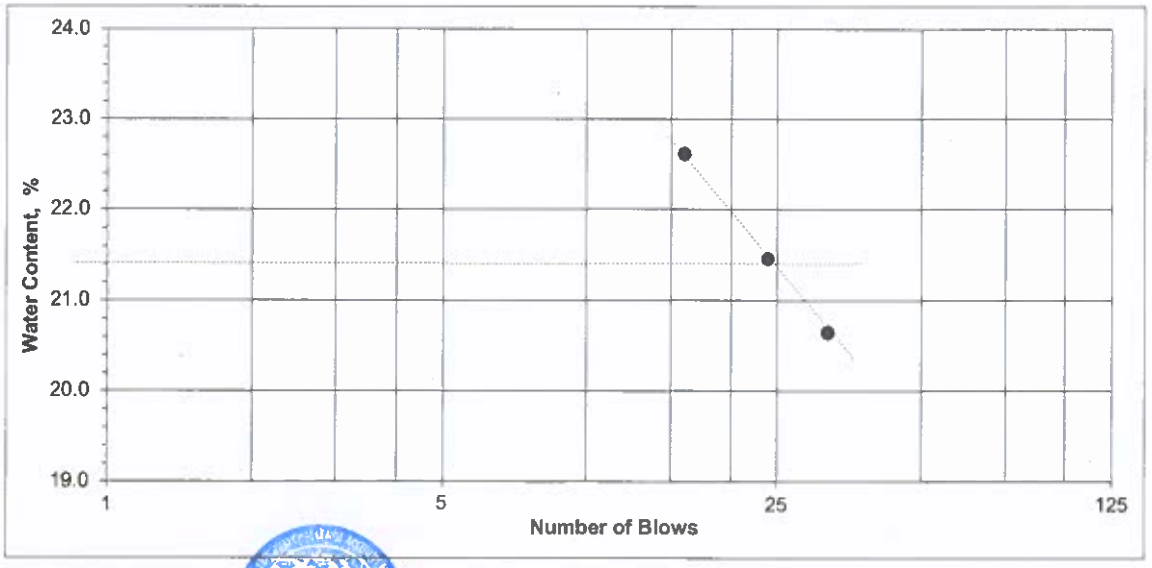
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-16**			Date:	16/6/2019
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Binita K.C**
Depth:	**0.00 - 1.00m**	Co-ordinatge:		Checked By:	**Dr. S. Manandhar**
Description:	Dark brown			E:	

Descriptions	Liquid Limit			Plastic Limit	
Number of Blows	**16**	**24**	**32**		
Container No	**A-104**	**A-138**	**A-86**		
Weight of Wet Soil + Container g	**41.54**	**37.83**	**38.13**		
Weight of Dry Soil + Container g	**36.86**	**32.85**	**33.4**		
Weight of Water g	4.68	4.98	4.73		
Weight of Container g	**16.16**	**9.63**	10.48		
Weight of Dry soil g	20.70	23.22	22.92		
Water Content, W %	22.61	21.45	20.64		
Average %	**22.61**	**21.45**	**20.64**		



Liquid Limit, W_L = **21.40**

Plastic Limit, W_P = **NP**

Plasticity Index, PI = **21.40**

Remarks:

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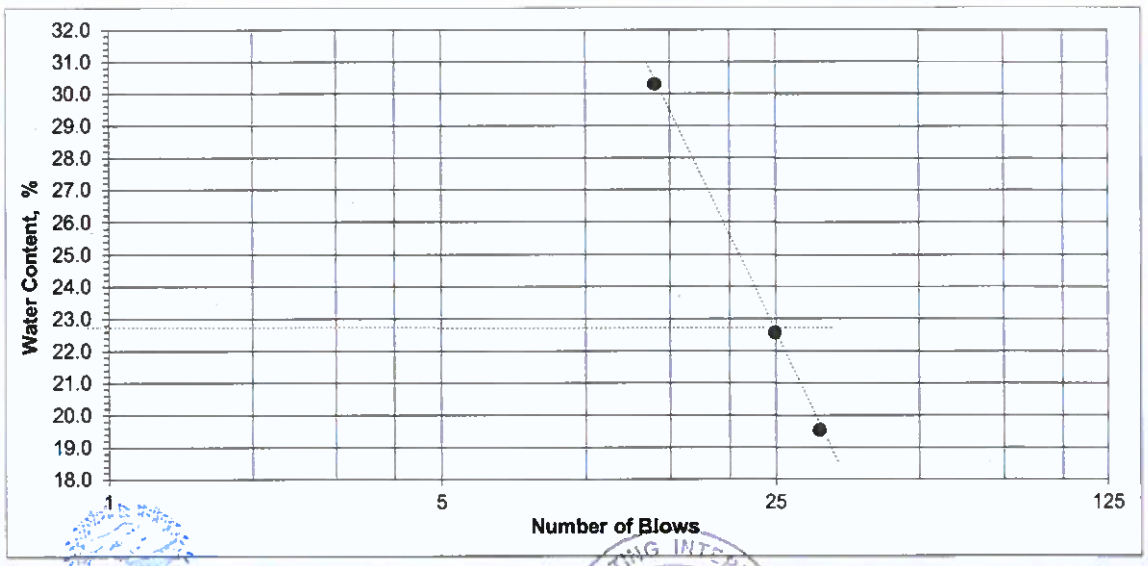
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**			
Borehole No.	**B-17**		Date:	15/6/2019
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**0.00 - 1.00m**	Co-ordinatge:	Checked By:	**Dr. S. Manandhar**
Description:	Light brown		E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		14	25	31	A-54	
Container No		A-53	A-33	A-31		
Weight of Wet Soil + Container	g	28.20	28.18	31.97	35.08	
Weight of Dry Soil + Container	g	24.15	24.79	29.16	30.58	
Weight of Water	g	4.05	3.39	2.81	4.50	
Weight of Container	g	10.78	9.75	14.76	9.07	
Weight of Dry soil	g	13.37	15.04	14.40	21.51	
Water Content, W	%	30.29	22.54	19.51	20.92	
Average	%	30.29	22.54	19.51	20.92	



Liquid Limit, W = 22.70
Plastic Limit, Wp = 20.92
Plasticity Index, PI = 1.78

Remarks:

ICGS Pvt. Ltd.

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Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

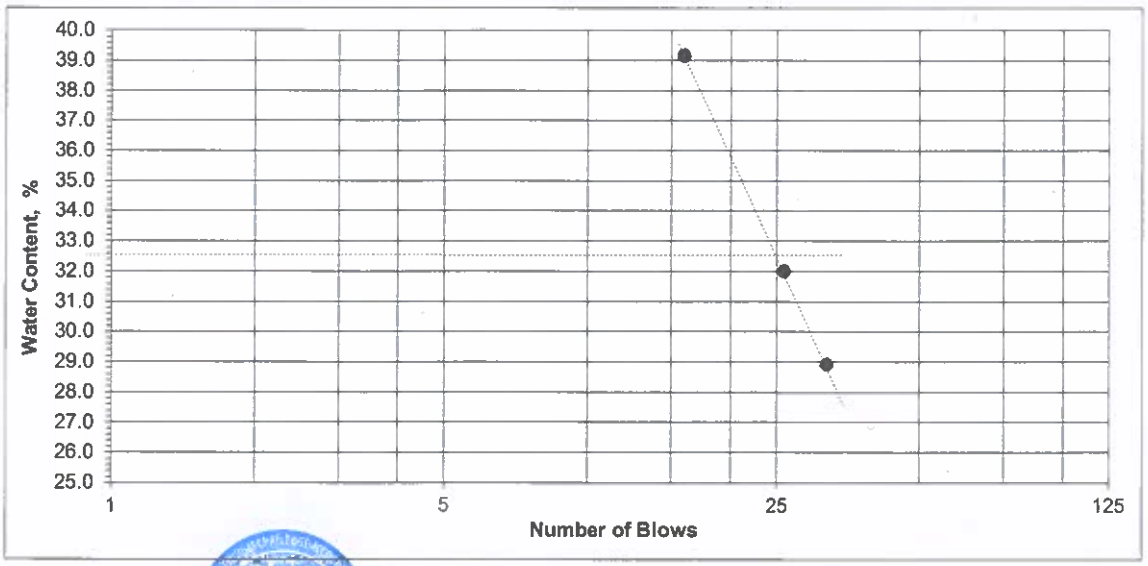
Borehole No. **B-18** Date: 16/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: light red E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		16	26	32	A-99	
Container No		A-118	A-76	A-95		
Weight of Wet Soil + Container	g	31.58	24.72	22.96	27.58	
Weight of Dry Soil + Container	g	27.65	20.96	19.95	24.01	
Weight of Water	g	3.93	3.76	3.01	3.57	
Weight of Container	g	17.61	9.20	9.53	9.93	
Weight of Dry soil	g	10.04	11.76	10.42	14.08	
Water Content, W	%	39.14	31.97	28.89	25.36	
Average	%	39.14	31.97	28.89	25.36	



Liquid Limit, W_L = 32.50

Plastic Limit, W_P = 25.36

Plasticity Index, P_I = 7.14

Remarks:

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सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

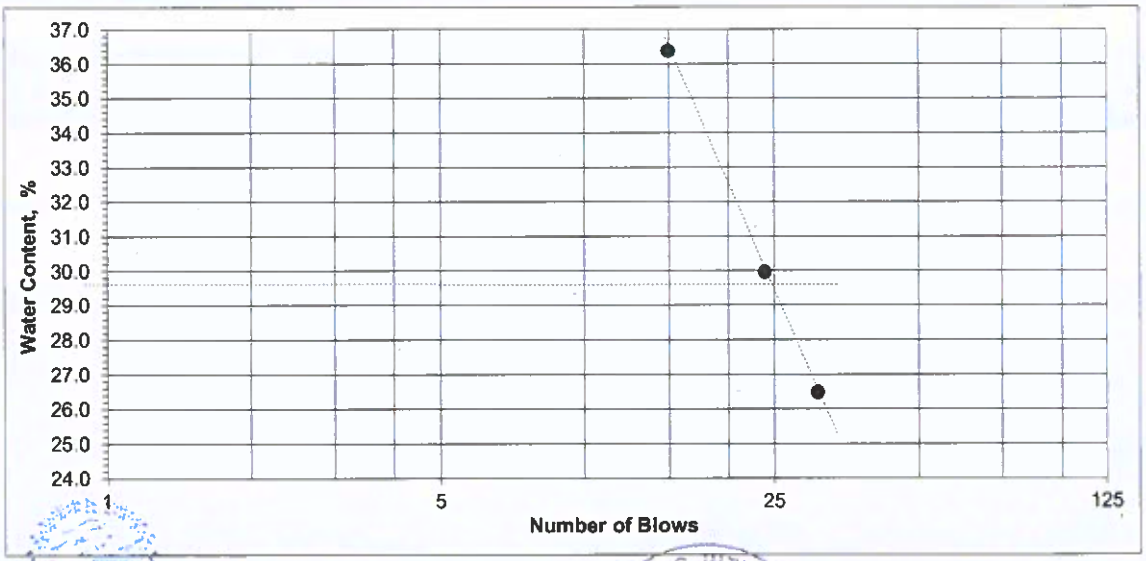
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-19**			Date:	15/6/2019
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Binita K.C**
Depth:	**0.00 - 1.00m**	Co-ordinatge:		Checked By:	**Dr. S. Manandhar**
Description:	Light red			E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	24	31	A-26	
Container No		A-61	A-110	A-2		
Weight of Wet Soil + Container	g	24.27	22.35	43.36	60.05	
Weight of Dry Soil + Container	g	20.42	19.34	40.05	54.66	
Weight of Water	g	3.85	3.01	3.31	5.39	
Weight of Container	g	9.83	9.29	27.54	34.06	
Weight of Dry soil	g	10.59	10.05	12.51	20.60	
Water Content, W	%	36.36	29.95	26.46	26.17	
Average	%	36.36	29.95	26.46	26.17	



Liquid Limit, W_L = **29.60**
Plastic Limit, W_P = **26.17**
Plasticity Index, PI = **3.43**

Remarks:

ICGS Pvt. Ltd.

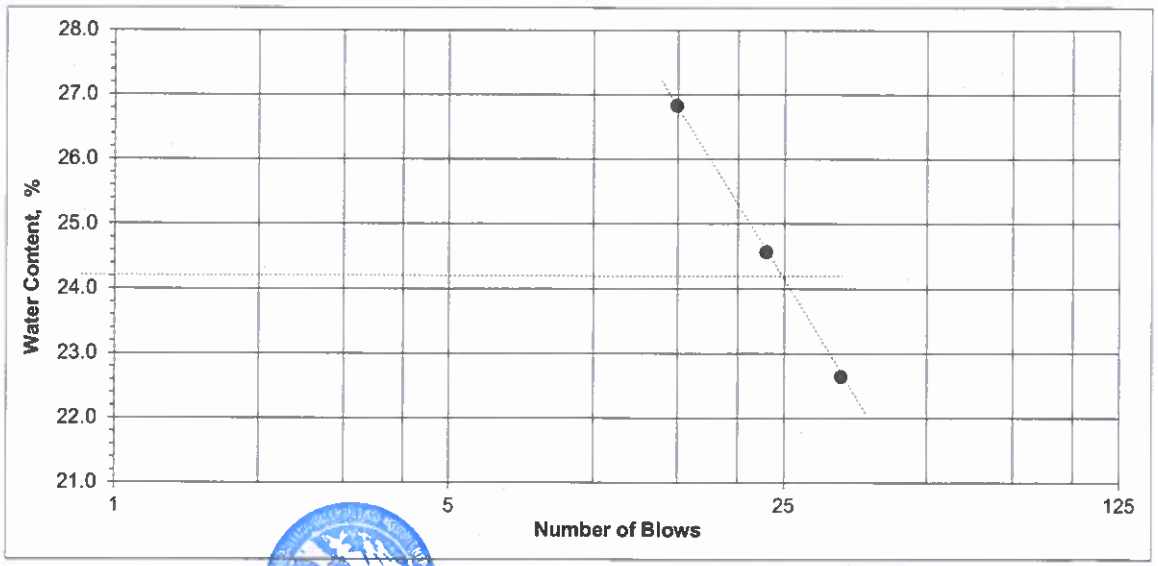
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-20**			Date:	16/6/2019
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Binita K.C**
Depth:	**0.00 - 1.00m**	Co-ordinatge:		Checked By:	**Dr. S. Manandhar**
Description:	light yellow			E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**15**	**23**	**33**	**A-35**	
Container No		**A-56**	**A-31**	**A-58**		
Weight of Wet Soil + Container	g	**25.19**	**26.76**	**30.82**	**23.99**	
Weight of Dry Soil + Container	g	**22.17**	**24.00**	**27.88**	**22.06**	
Weight of Water	g	3.02	2.76	2.94	1.93	
Weight of Container	g	**10.91**	**12.76**	**14.89**	**12.15**	
Weight of Dry soil	g	11.26	11.24	12.99	9.91	
Water Content, W	%	26.82	24.56	22.63	19.48	
Average	%	**26.82**	**24.56**	**22.63**	**19.48**	



Liquid Limit, W_L = **24.20**
Plastic Limit, W_P = **19.48**
Plasticity Index, I_P = **4.72**

Remarks:

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

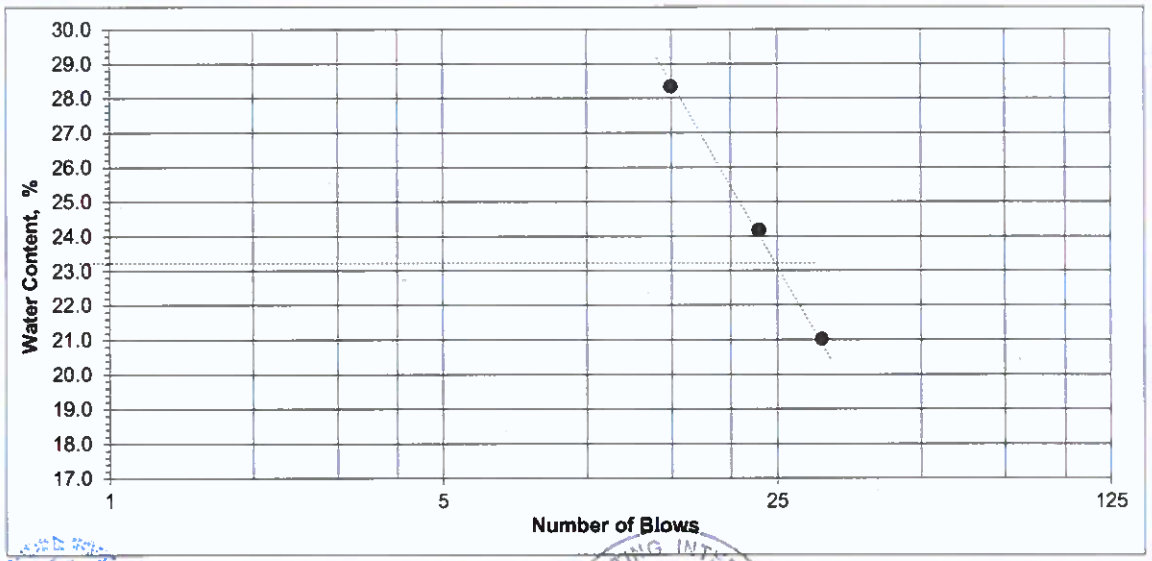
Borehole No. **B-21** Date: 15/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light brown E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**15**	**23**	**31**		
Container No		**A-127**	**A-86**	A-137		
Weight of Wet Soil + Container	g	**38.43**	**25.40**	35.1		
Weight of Dry Soil + Container	g	**33.59**	**22.50**	32.17		
Weight of Water	g	4.84	2.90	2.93		
Weight of Container	g	**16.50**	**10.49**	18.22		
Weight of Dry soil	g	17.09	12.01	13.95		
Water Content, W	%	28.32	24.15	21.00		
Average	%	**28.32**	**24.15**	**21.00**		



Liquid Limit, W_L = **23.20**

Plastic Limit, W_P = **NP**

Plasticity Index, PI = **23.20**

Remarks:

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ICGS Pvt. Ltd.

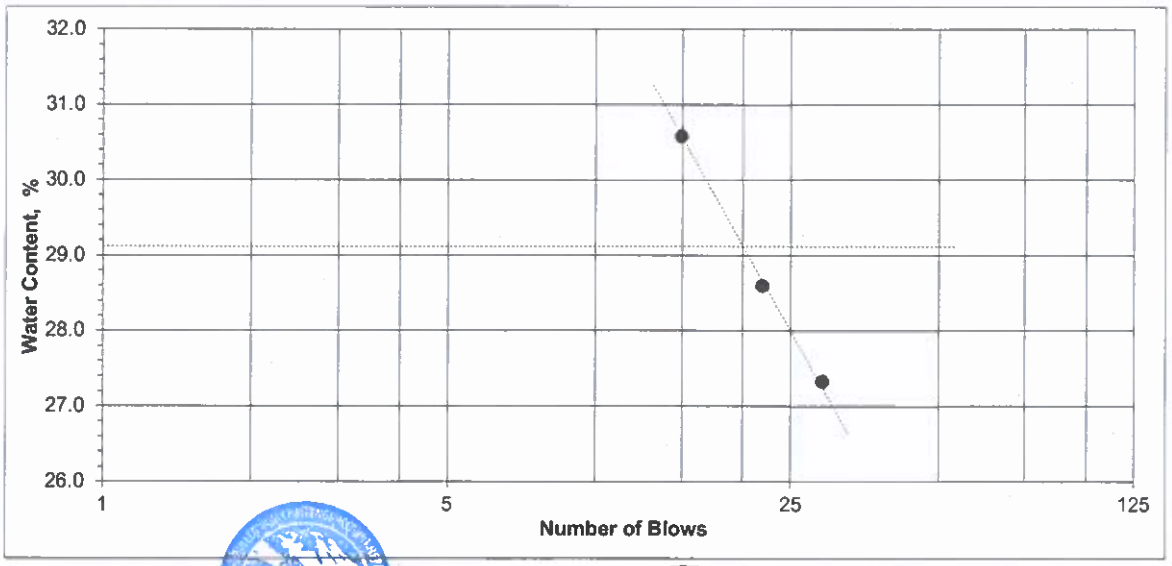
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV DC)**				
Borehole No.	**B-22**			Date:	**2/5/2019**
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Binita K.C**
Depth:	**0.00-1.00m**			Checked By:	**Dr. S. Manandhar**
Description:	**Light brown**	Co-ordinatge:		**E:**	

Descriptions	Liquid Limit			Plastic Limit	
Number of Blows	**15**	**22**	**29**	A-51	
Container No	**A-121**	**A-99**	**A-69**		
Weight of Wet Soil + Container g	**30.45**	**27.56**	**30.64**	**27.45**	
Weight of Dry Soil + Container g	**27.09**	**23.65**	**27.52**	**24.07**	
Weight of Water g	3.36	3.91	3.12	3.38	
Weight of Container g	**16.10**	**9.97**	**16.1**	**10.35**	
Weight of Dry soil g	10.99	13.68	11.42	13.72	
Water Content, W %	30.57	28.58	27.32	24.64	
Average %	**30.57**	**28.58**	**27.32**	**24.64**	



Liquid Limit, W_L = **29.10**
Plastic Limit, W_P = **24.64**
Plasticity Index, PI = **4.46**

Remarks:

STATE CONSULTING INTERNATIONAL LLC 2000

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ICGS Pvt. Ltd.

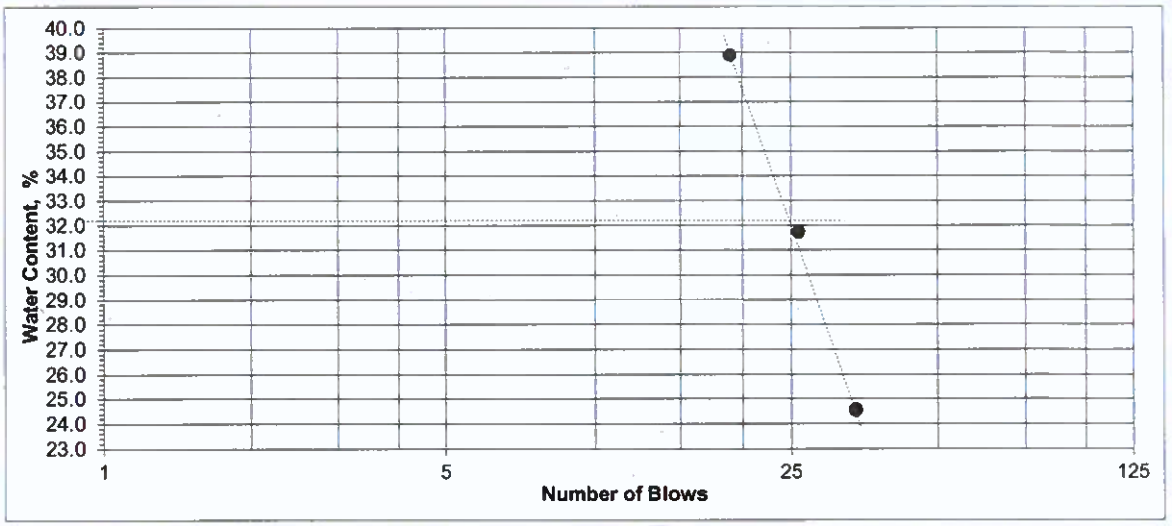
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV DC)**			
Borehole No.	**B-25**		Date:	**2/5/2019**
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Pranita Pun**
Depth:	**0.00-1.00m**		Checked By:	**Dr. S. Manandhar**
Description:	**Reddish clay**	Co-ordinatge:	**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		19	26	34	A-114	
Container No		A-67	A-84	A-104		
Weight of Wet Soil + Container	g	34.34	35.11	41.85	21.01	
Weight of Dry Soil + Container	g	29.25	30.55	37.32	20.03	
Weight of Water	g	5.09	4.56	4.53	0.98	
Weight of Container	g	16.15	16.17	18.85	16.04	
Weight of Dry soil	g	13.10	14.38	18.47	3.99	
Water Content, W	%	38.85	31.71	24.53	24.56	
Average	%	38.85	31.71	24.53	24.56	



Liquid Limit, W_L = **32.10**

Plastic Limit, W_P = **24.56**

Plasticity Index, PI = **7.54**

Remarks:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

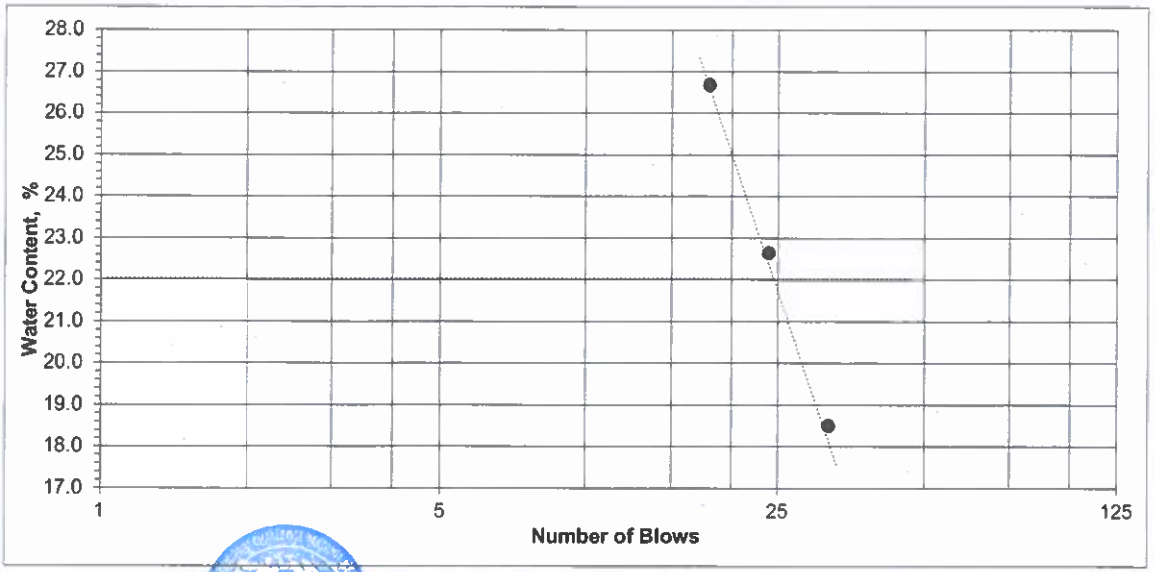
Borehole No. **B-26** Date: **2/5/2019**

Source: **Test Pit Sample** Chainage: Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manar**

Description: **Light yellow** Co-ordinatge: E:

Descriptions	Liquid Limit			Plastic Limit	
Number of Blows	18	24	32		
Container No	A-86	A-112	A-93		
Wet Soil + Container g	24.27	36.15	37.05		
Dry Soil + Container g	21.15	32.75	33.78		
Water g	3.12	3.40	3.27		
Container g	9.45	17.72	16.09		
Dry soil g	11.70	15.03	17.69		
ntent, W %	26.67	22.62	18.49		
Average %	26.67	22.62	18.49		



Liquid Limit, W_L = 22.00

Plastic Limit, W_P = NP

Plasticity Index, I_P = 22.00

Remarks:

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

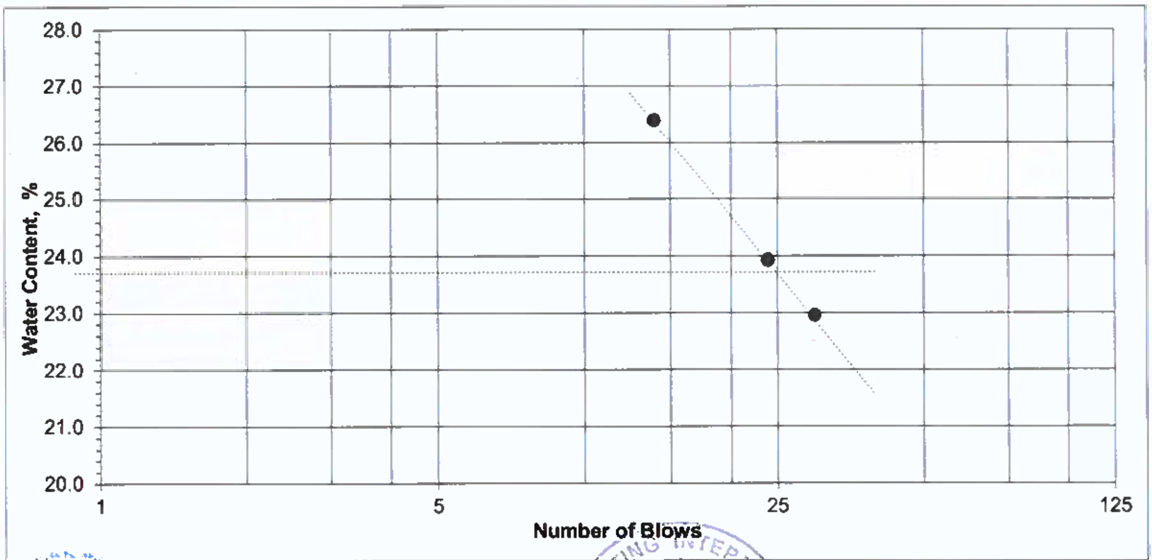
Borehole No. **B-27** Date: **22/5/2019**

Source: **Test Pit Sample** Chainage: Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manar**

Description: **Light yellow** Co-ordinatge: E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		14	24	30	A-66	
Container No		A-114	A-102	A-142		
Wet Soil + Container	g	30.49	24.86	23	27.88	
Dry Soil + Container	g	27.48	21.99	20.52	26.11	
Water	g	3.01	2.87	2.48	1.77	
Container	g	16.07	9.99	9.71	17.63	
Dry soil	g	11.41	12.00	10.81	8.48	
ntent, W	%	26.38	23.92	22.94	20.87	
Average	%	**26.38**	**23.92**	**22.94**	**20.87**	



Liquid Limit, W_L = **23.70**
Plastic Limit, W_P = **20.87**
Plasticity Index, PI = **2.83**

Remarks:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

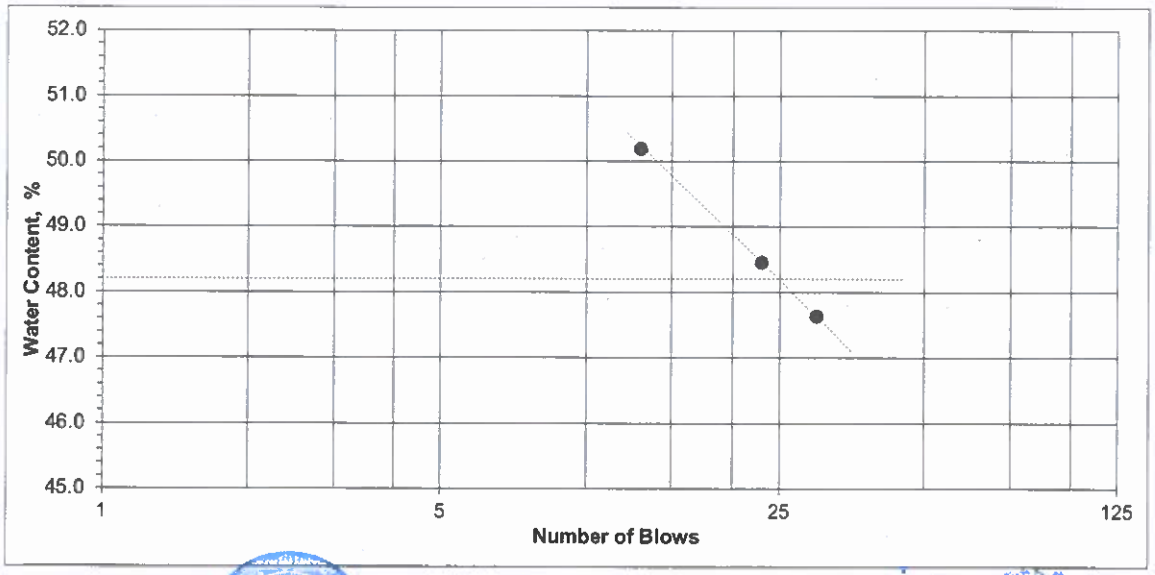
Borehole No. **B-28** Date: **2/5/2019**

Source: **Test Pit Sample** Chainage: Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manar**

Description: **Light yellow** Co-ordinatge: E:

Descriptions	Liquid Limit			Plastic Limit	
Number of Blows	13	23	30	A-89	
Container No	A-32	A-96	A-59		
Wet Soil + Container g	32.05	26.82	31.16	24.98	
Dry Soil + Container g	26.29	21.38	26.06	20.78	
Water g	5.76	5.44	5.10	4.2	
Container g	14.81	10.15	15.35	10.51	
Dry soil g	11.48	11.23	10.71	10.27	
ntent, W %	50.17	48.44	47.62	40.90	
Average %	50.17	48.44	47.62	40.90	



Liquid Limit, W_L = 48.20

Plastic Limit, W_P = 40.90

Plasticity Index, PI = 7.30

Remarks:

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सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

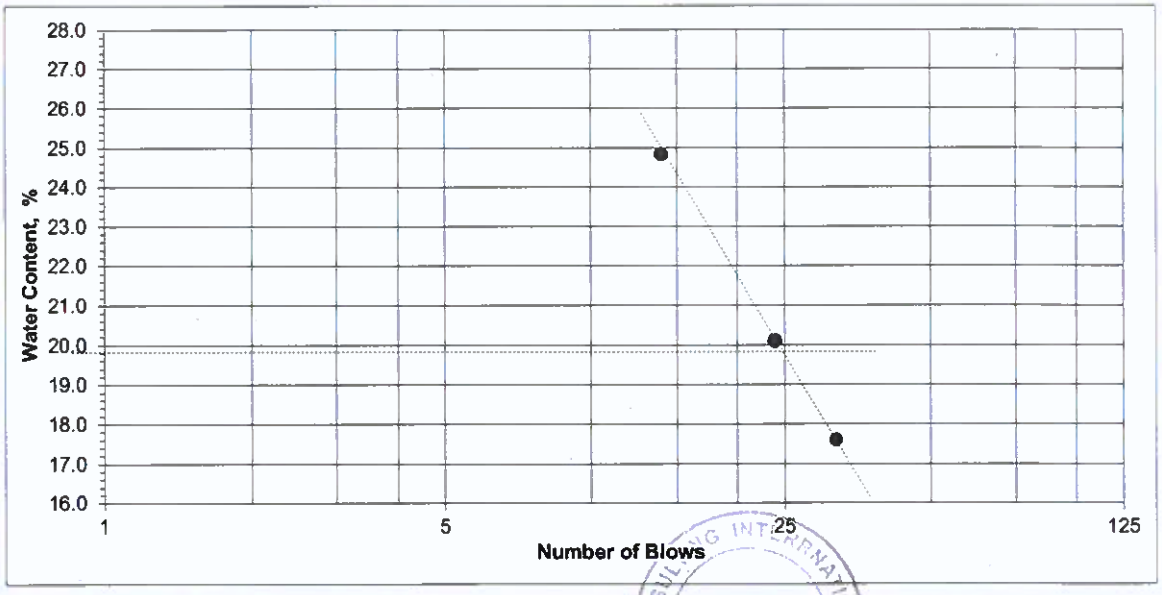
Borehole No. **B-29** Date: **2/5/2019**

Source: **Test Pit Sampel** Chainage: Tested By: **Binita K.C**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manar**

Description: **Light brown** Co-ordinatge: E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		14	24	32		
Container No		A-65	A-76	A-69		
Weight of Wet Soil + Container	g	22.03	25.58	29.94		
Weight of Dry Soil + Container	g	19.35	22.75	27.88		
Weight of Water	g	2.68	2.83	2.06		
Weight of Container	g	8.55	8.66	16.16		
Weight of Dry soil	g	10.80	14.09	11.72		
Water Content, W	%	24.81	20.09	17.58		
Average	%	24.81	20.09	17.58		



Liquid Limit, W_L = 19.80

Plastic Limit, W_P = 0.00

Plasticity Index, PI = 19.80

Remarks:

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

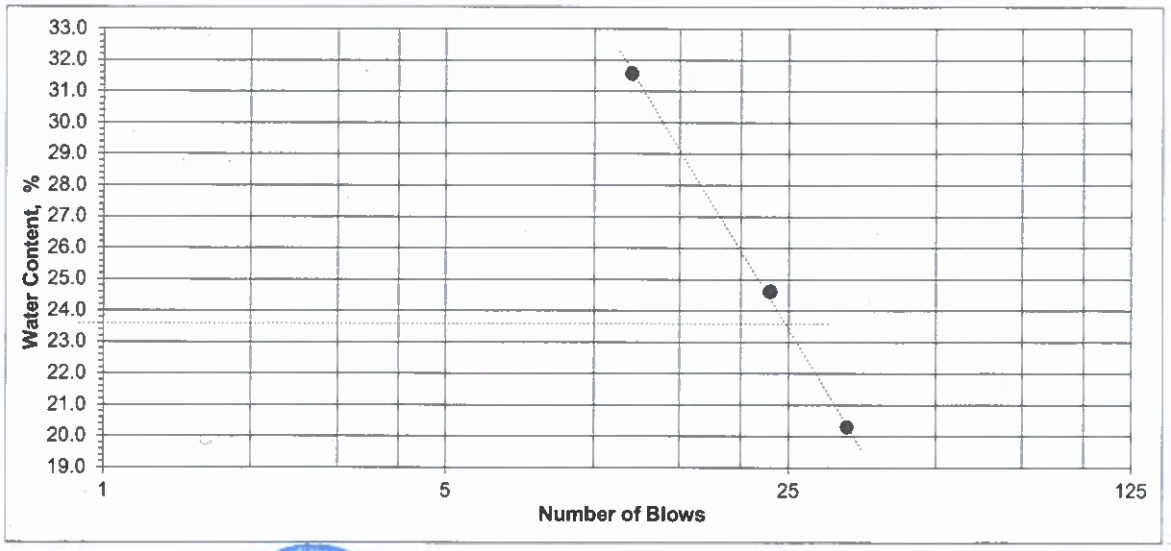
Borehole No. **B-30** Date: **2/5/2019**

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manandhar**

Description: Dark brown Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limits	
Number of Blows		12	23	33	A-122	
Container No		A-75	E-14	A-135		
Weight of Wet Soil + Container	g	27.18	24.28	18.99	21.49	
Weight of Dry Soil + Container	g	24.52	21.57	17.28	19.44	
Weight of Water	g	2.66	2.71	1.71	2.05	
Weight of Container	g	16.09	10.55	8.85	9.07	
Weight of Dry soil	g	8.43	11.02	8.43	10.37	
Water Content, W	%	31.55	24.59	20.28	19.77	
Average	%	31.55	24.59	20.28	19.77	



Liquid Limit, W_L = 23.60

Plastic Limit, W_P = 19.77

Plasticity Index, PI = 3.83

Remarks:

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ICGS Pvt. Ltd.
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Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST
(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

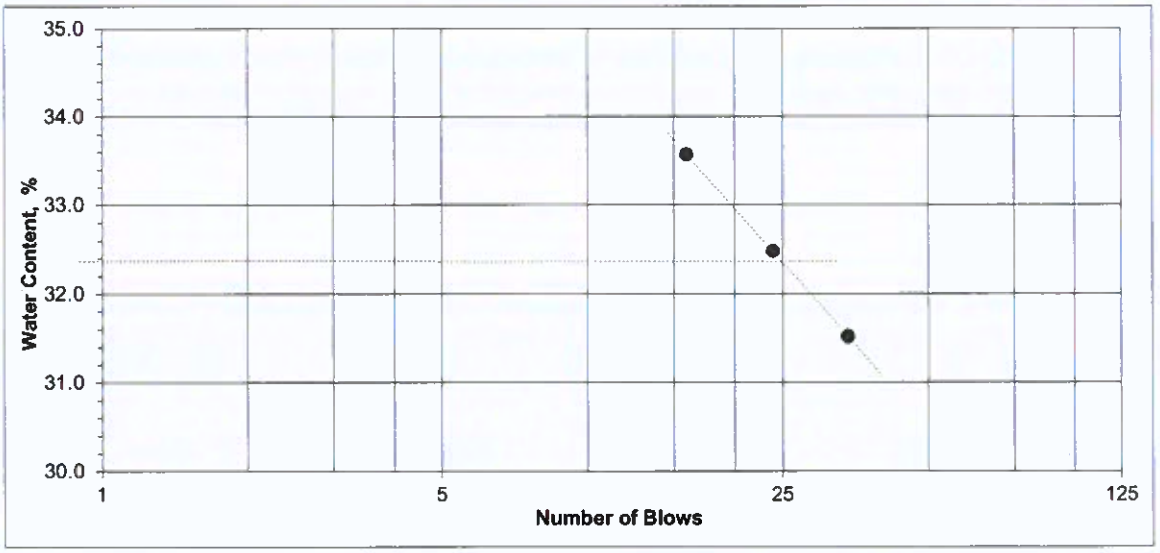
Borehole No. **B-31** Date: **15/4/2019**

Source: **Test Pit Sample** Chainage: Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manar**

Description: Light brown Co-ordinatge: E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		16	24	34	A-78	A-88
Container No		A-124	A-136	A-107		
Weight of Wet Soil + Container	g	35.57	32.54	33.51	17.83	17.72
Weight of Dry Soil + Container	g	31.20	28.51	29.94	17.46	17.38
Weight of Water	g	4.37	4.03	3.57	0.37	0.34
Weight of Container	g	18.18	16.10	18.61	16.14	16.17
Weight of Dry soil	g	13.02	12.41	11.33	1.32	1.21
Water Content, W	%	33.56	32.47	31.51	28.03	28.10
Average	%	33.56	32.47	31.51	28.06	



Liquid Limit, W_L = **32.37**
Plastic Limit, W_P = **28.06**
Plasticity Index, PI = **4.31**

Remarks:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

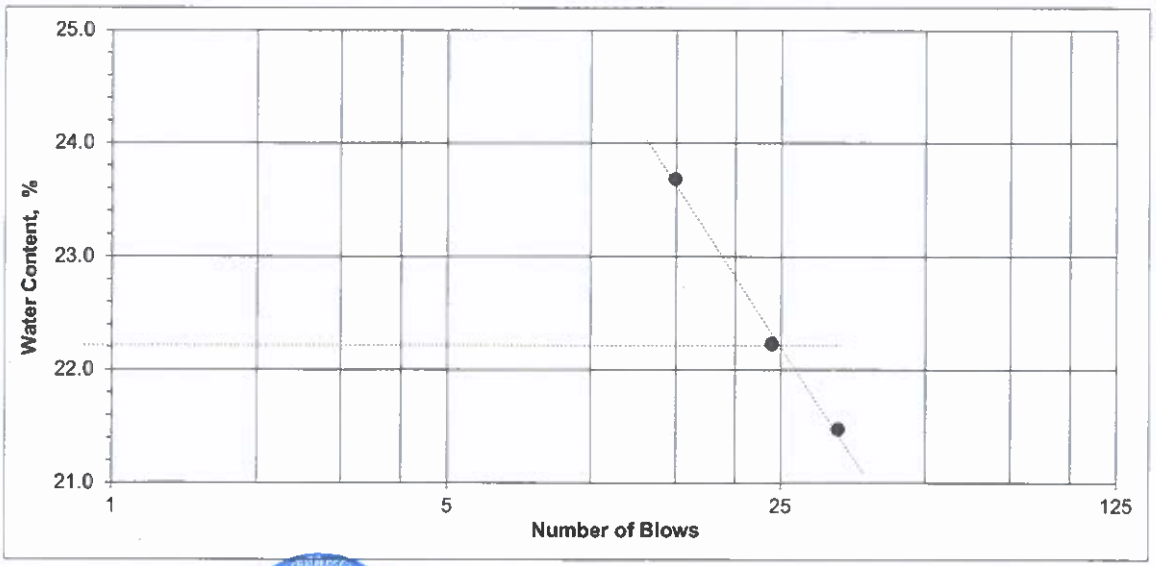
Borehole No. **B-32** Date: 16/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: light yellow E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	24	33	A-110	
Container No		A-52	A-7	A-71		
Weight of Wet Soil + Container	g	32.20	34.77	32.52	22.35	
Weight of Dry Soil + Container	g	28.84	32.73	29.98	20.11	
Weight of Water	g	3.36	2.04	2.54	2.24	
Weight of Container	g	14.65	23.55	18.15	9.29	
Weight of Dry soil	g	14.19	9.18	11.83	10.82	
Water Content, W	%	23.68	22.22	21.47	20.70	
Average	%	23.68	22.22	21.47	20.70	



Liquid Limit, W_L = 22.20

Plastic Limit, W_P = 20.70

Plasticity Index, PI = 1.50

Remarks:

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ICGS Pvt. Ltd.

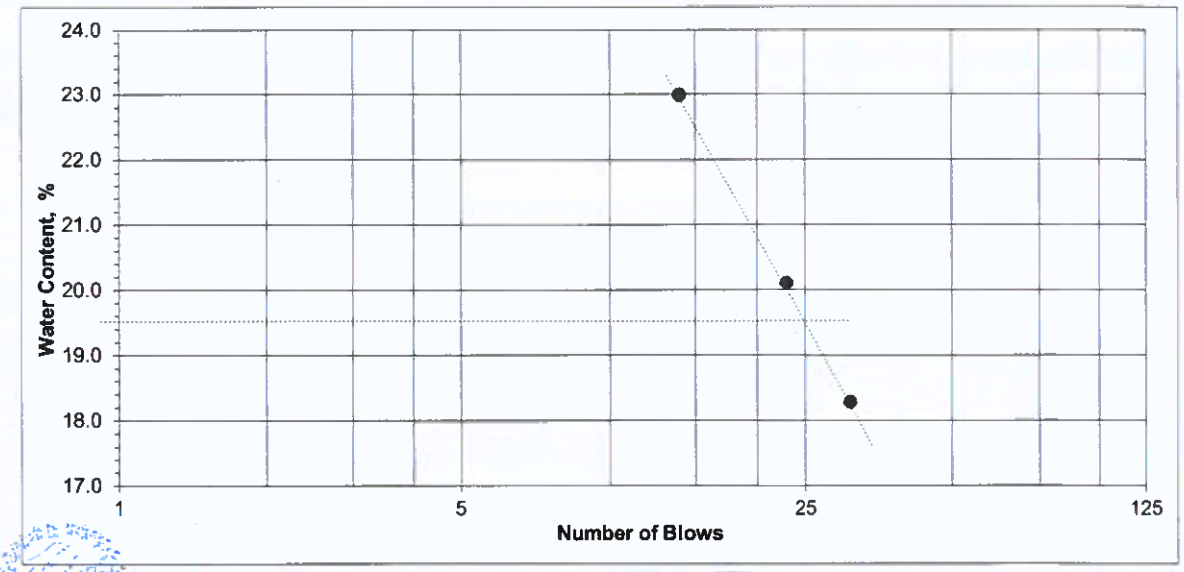
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV DC)**			
Borehole No.	**B-33**		Date:	**16/4/2019**
Source:	**Test Pit Sample**	Chainage:	Tested By:	**Binita K.C**
Depth:	**0.00-1.00m**		Checked By:	**Dr. S. Manandhar**
Description:	Light red	Co-ordinatge:	**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**14**	**23**	**31**		
Container No		**A-97**	**A-82**	**A-128**		
Weight of Wet Soil + Container	g	**22.84**	**36.74**	**35.52**		
Weight of Dry Soil + Container	g	**20.45**	**33.66**	**32.79**		
Weight of Water	g	2.39	3.08	2.73		
Weight of Container	g	**10.05**	**18.33**	**17.85**		
Weight of Dry soil	g	10.40	15.33	14.94		
Water Content, W	%	22.98	20.09	18.27		
Average	%	**22.98**	**20.09**	**18.27**		



Liquid Limit, W_L = **19.50**
Plastic Limit, W_P = **NP**
Plasticity Index, P_I = **19.50**

Remarks:

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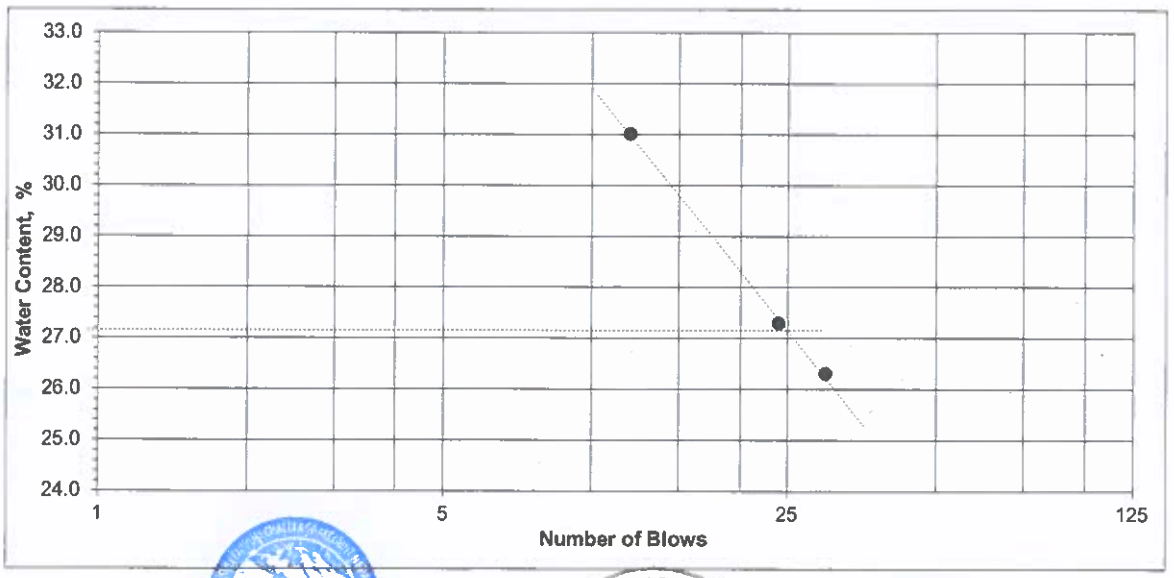
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV DC)**				
Borehole No.	**B-34**			Date:	**2/5/2019**
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Binita K.C**
Depth:	**0.00-1.00m**			Checked By:	**Dr. S. Manandhar**
Description:	**Light brown**	Co-ordinatge:		**E:**	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		12	24	30	A-103	
Container No		A-140	A-144	A-139		
Wet Soil + Container	g	24.72	29.84	25.43	19.26	
Dry Soil + Container	g	21.18	27.27	23.5	17.26	
Water	g	3.54	2.57	1.93	2	
Container	g	9.76	17.85	16.16	8.43	
Dry soil	g	11.42	9.42	7.34	8.83	
ntent, W	%	31.00	27.28	26.29	22.65	
Average	%	31.00	27.28	26.29	22.65	



Liquid Limit, W_L = 27.15
Plastic Limit, W_P = 22.65
Plasticity Index, PI = 4.50

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

Borehole No. **B-35** Date: **2/5/2019**

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manar**

Description: Light red Co-ordinatge: E:

Descriptions	Liquid Limit			Plastic Limits	
Number of Blows	16	23	29		
Container No	A-46	A-30	A-40		
Weight of Wet Soil + Container g	24.59	27.74	26.56		
Weight of Dry Soil + Container g	21.93	25.55	24.91		
Weight of Water g	2.66	2.19	1.65		
Weight of Container g	10.56	14.81	16.04		
Weight of Dry soil g	11.37	10.74	8.87		
Water Content, W %	23.39	20.39	18.60		
Average %	23.39	20.39	18.60		

Liquid Limit, W_L = 19.80

Plastic Limit, W_P = NP

Plasticity Index, PI = 19.80

Remarks:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

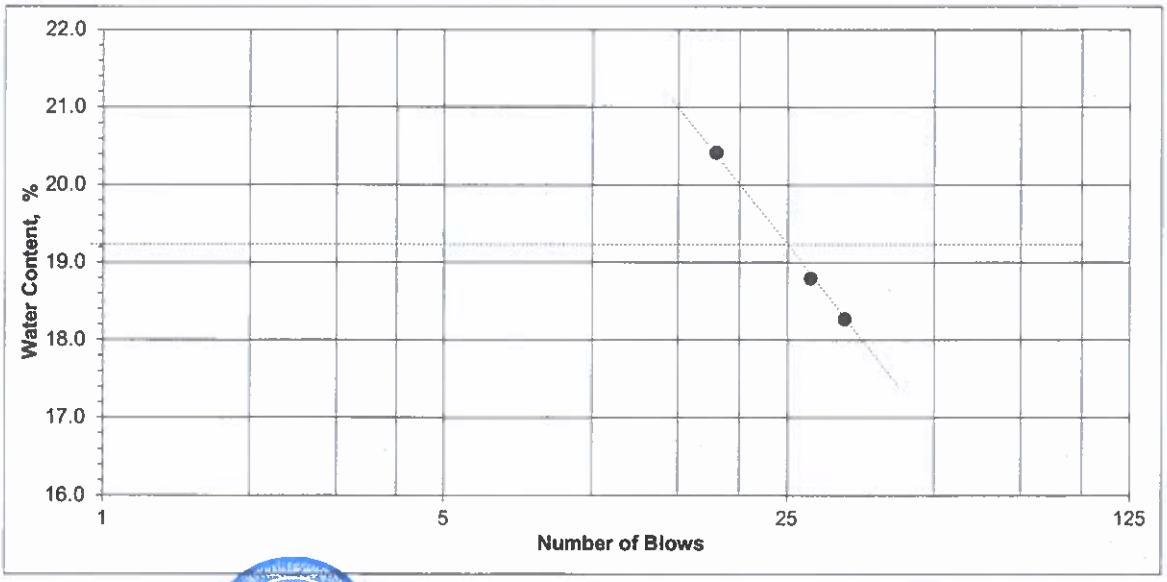
Borehole No. **B-36** Date: **2/5/2019**

Source: **Test pit Sample** Chainage: Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manandhar**

Description: Light yellow clay Co-ordinatge: E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		18	28	33	A-83	A-124
Container No		A-111	A-107	A-136		
Weight of Wet Soil + Container	g	35.71	36.41	31.95	11.89	19.49
Weight of Dry Soil + Container	g	32.40	33.59	29.5	11.58	19.31
Weight of Water	g	3.31	2.82	2.45	0.31	0.18
Weight of Container	g	16.18	18.58	16.08	9.71	18.21
Weight of Dry soil	g	16.22	15.01	13.42	1.87	1.10
Water Content, W	%	20.41	18.79	18.26	16.58	16.36
Average	%	20.41	18.79	18.26	16.47	



Liquid Limit, W_L	=	19.20
Plastic Limit, W_P	=	16.47
Plasticity Index, PI	=	2.73
Remarks		

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Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

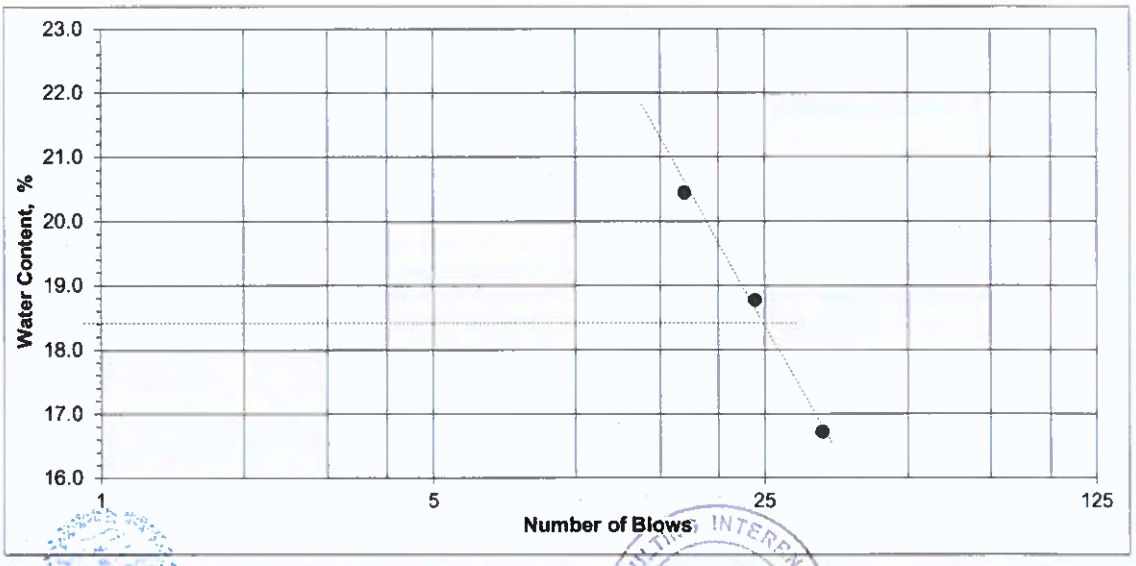
Borehole No. **B-37** Date: 14/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light brown gravel sandy silt E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		17	24	33		
Container No		A-118	A-60	A-73		
Weight of Wet Soil + Container	g	31.58	33.10	26.44		
Weight of Dry Soil + Container	g	29.21	29.96	23.89		
Weight of Water	g	2.37	3.14	2.55		
Weight of Container	g	17.61	13.22	8.63		
Weight of Dry soil	g	11.60	16.74	15.26		
Water Content, W	%	20.43	18.76	16.71		
Average	%	20.43	18.76	16.71		



Liquid Limit, W_L = 18.40

Plastic Limit, W_P = NP

Plasticity Index, PI = 18.40

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

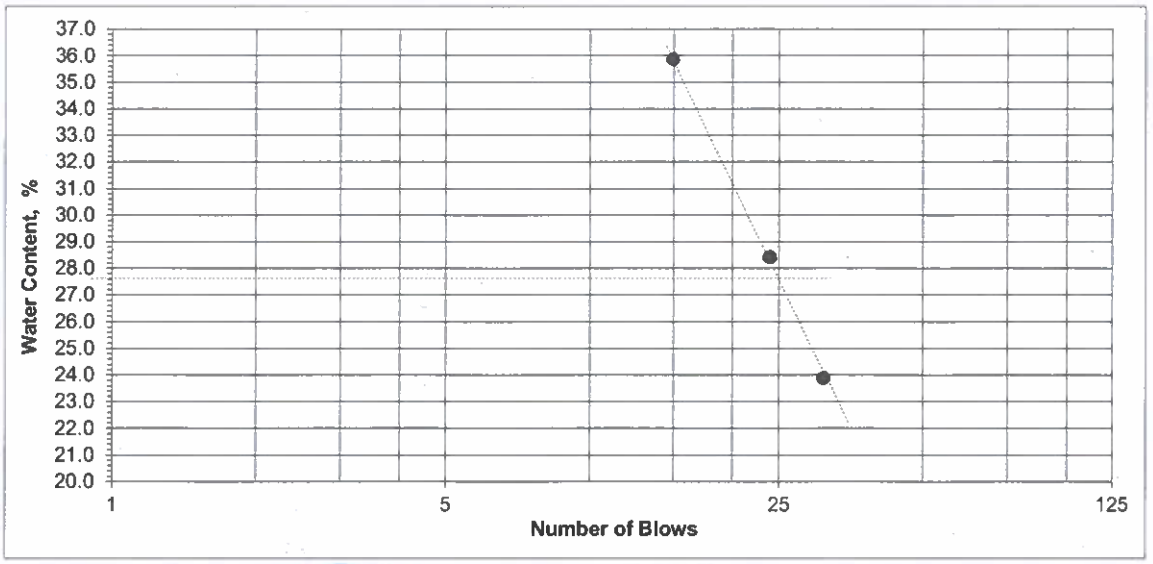
Borehole No. **B-38** Date: 14/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light brown sandy silt **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	24	31	A-5	
Container No		A-8	A-24	A-2		
Weight of Wet Soil + Container	g	47.80	51.45	44.98	53.89	
Weight of Dry Soil + Container	g	42.65	46.93	41.62	49.09	
Weight of Water	g	5.15	4.52	3.36	4.80	
Weight of Container	g	28.28	31.01	27.54	27.65	
Weight of Dry soil	g	14.37	15.92	14.08	21.44	
Water Content, W	%	35.84	28.39	23.86	22.39	
Average	%	35.84	28.39	23.86	22.39	



Liquid Limit, W_L = 27.60

Plastic Limit, W_P = 22.39

Plasticity Index, PI = 5.21

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

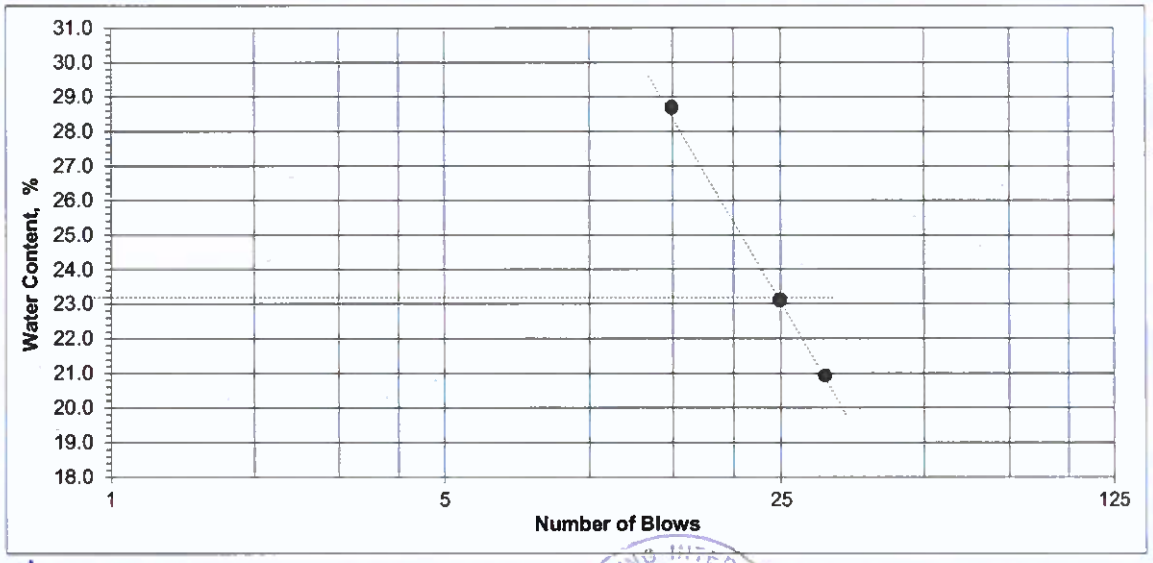
Borehole No. **B-39** Date: 14/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light red gravel sandy silt E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	25	31	A-25	
Container No		A-19	A-27	A-22		
Weight of Wet Soil + Container	g	59.61	56.80	45.71	43.73	
Weight of Dry Soil + Container	g	53.54	51.62	42.66	40.83	
Weight of Water	g	6.07	5.18	3.05	2.90	
Weight of Container	g	32.37	29.19	28.08	27.62	
Weight of Dry soil	g	21.17	22.43	14.58	13.21	
Water Content, W	%	28.67	23.09	20.92	21.95	
Average	%	28.67	23.09	20.92	21.95	



Liquid Limit, W_L = **23.20**

Plastic Limit, W_P = **21.95**

Plasticity Index, P_I = **1.25**

Remarks:

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Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

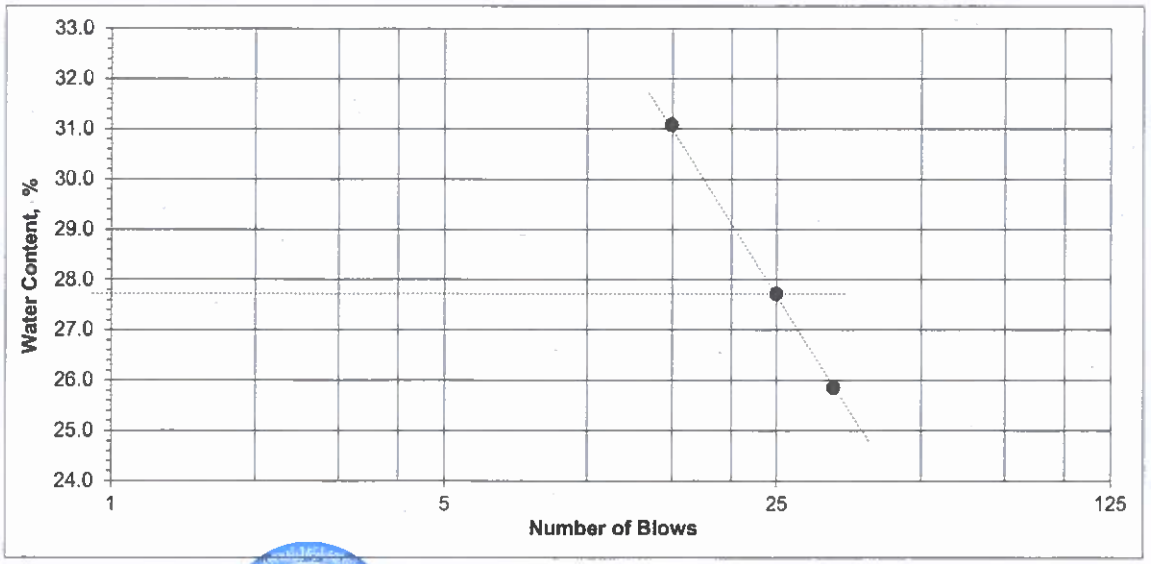
Borehole No. **B-40** Date: 15/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light brown E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	25	33	A-5	
Container No		A-21	A-6	A-15		
Weight of Wet Soil + Container	g	51.32	47.88	43.81	55.91	
Weight of Dry Soil + Container	g	46.14	43.91	40.82	50.28	
Weight of Water	g	5.18	3.97	2.99	5.63	
Weight of Container	g	29.47	29.58	29.25	27.05	
Weight of Dry soil	g	16.67	14.33	11.57	23.23	
Water Content, W	%	31.07	27.70	25.84	24.24	
Average	%	31.07	27.70	25.84	24.24	



Liquid Limit, W_L = 27.70

Plastic Limit, W_P = 24.24

Plasticity Index, PI = 3.46

Remarks:

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New-Baneswor, Kathmandu, Nepal
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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

Borehole No. **B-41** Date: 22/05/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light brown E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		16	23	33		
Container No		A-41	A-126	A-52		
Weight of Wet Soil + Container	g	31.28	23.21	28.00		
Weight of Dry Soil + Container	g	27.93	20.46	25.63		
Weight of Water	g	3.35	2.75	2.37		
Weight of Container	g	14.99	8.92	14.65		
Weight of Dry soil	g	12.94	11.54	10.98		
Water Content, W	%	25.89	23.83	21.58		
Average	%	25.89	23.83	21.58		

Liquid Limit, W = 23.20

Plastic Limit, W = NP

Plasticity Index, PI = 23.20

Remarks:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

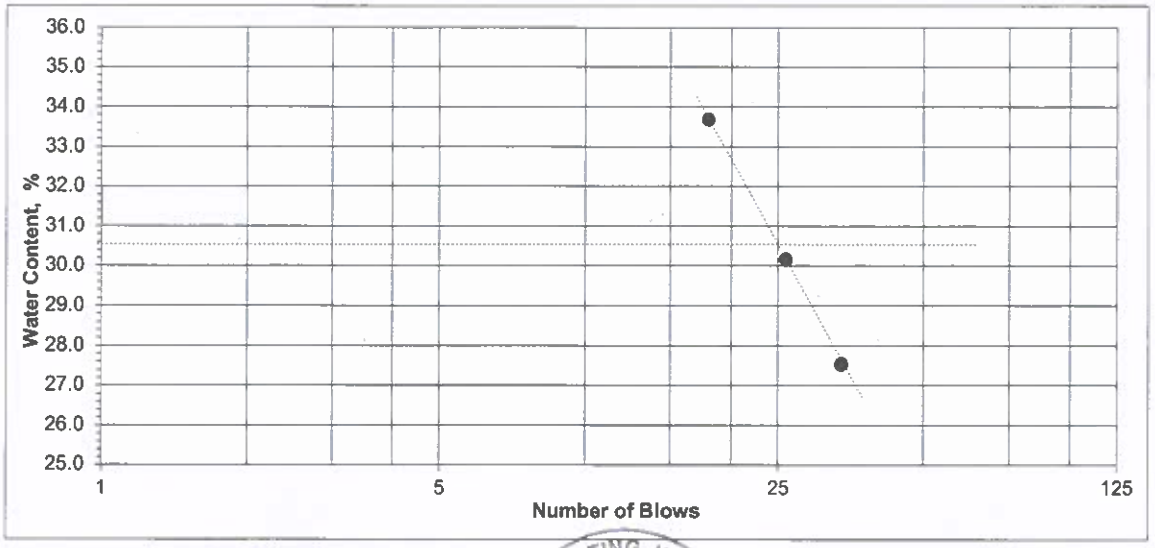
Borehole No. **Madanpur** Date: **16/4/2019**

Source: **B-42** Chainage: Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manandhar**

Description: Light red Co-ordinatge: E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		18	26	34	A-83	A-86
Container No		A-63	A-108	A-115		
Weight of Wet Soil + Container	g	27.36	33.48	26.91	12.43	12.87
Weight of Dry Soil + Container	g	22.91	29.95	23.25	11.87	12.39
Weight of Water	g	4.45	3.53	3.66	0.56	0.48
Weight of Container	g	9.69	18.24	9.95	9.7	10.47
Weight of Dry soil	g	13.22	11.71	13.30	2.17	1.92
Water Content, W	%	33.66	30.15	27.52	25.81	25.00
Average	%	33.66	30.15	27.52	25.40	



Liquid Limit, W_L = 30.50

Plastic Limit, W_P = 25.40

Plasticity Index, PI = 5.10

Remarks:

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

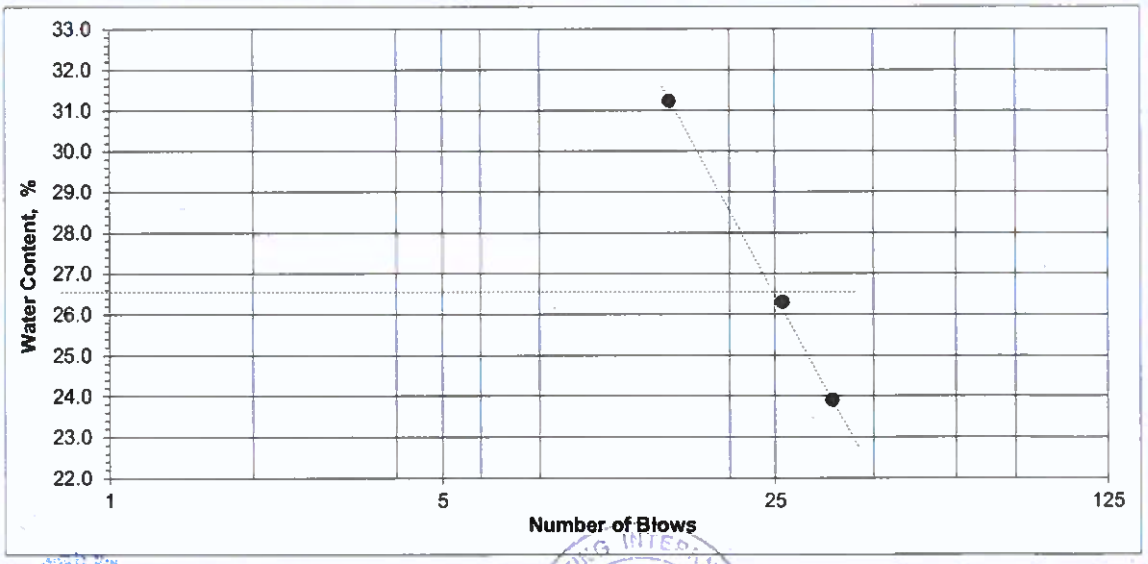
Borehole No. **B-43** Date: 16/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: yellowish E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	26	33	A-111	
Container No		A-7	A-45	A-19		
Weight of Wet Soil + Container	g	39.53	30.31	43.16	33.99	
Weight of Dry Soil + Container	g	36.68	28.12	41.08	30.61	
Weight of Water	g	2.85	2.19	2.08	3.38	
Weight of Container	g	27.55	19.79	32.37	16.21	
Weight of Dry soil	g	9.13	8.33	8.71	14.40	
Water Content, W	%	31.22	26.29	23.88	23.47	
Average	%	31.22	26.29	23.88	23.47	



Liquid Limit, W_L = 26.50

Plastic Limit, W_P = 23.47

Plasticity Index, PI = 3.03

Remarks:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

Borehole No. **B-44** Date: 14/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light brownsandy silt E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**14**	**23**	**31**		
Container No		**A-21**	**A-7**	**A-1**		
Weight of Wet Soil + Container	g	**49.49**	**44.36**	**53.91**		
Weight of Dry Soil + Container	g	**45.67**	**40.71**	**50.21**		
Weight of Water	g	3.82	3.65	3.70		
Weight of Container	g	**29.47**	**23.55**	**31.51**		
Weight of Dry soil	g	16.20	17.16	18.70		
Water Content, W	%	23.58	21.27	19.79		
Average	%	**23.58**	**21.27**	**19.79**		

Liquid Limit, W = **20.80**

Plastic Limit, W = **NP**

Plasticity Index, PI = **20.80**

Remarks:

ICGS Pvt. Ltd.

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Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

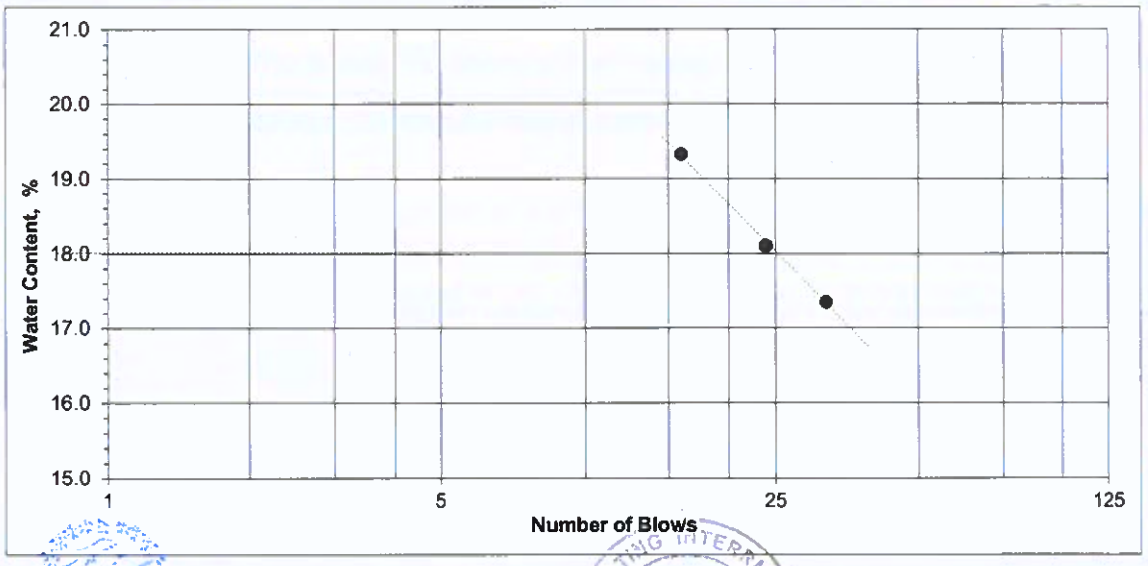
Borehole No. **B-45** Date: 16/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Dark brown E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**16**	**24**	**32**		
Container No		**A-86**	**A-45**	**A-61**		
Weight of Wet Soil + Container	g	**23.40**	**22.22**	**25.11**		
Weight of Dry Soil + Container	g	**21.31**	**20.99**	**23.65**		
Weight of Water	g	2.09	1.23	1.46		
Weight of Container	g	**10.49**	**14.19**	**15.23**		
Weight of Dry soil	g	10.82	6.80	8.42		
Water Content, W	%	19.32	18.09	17.34		
Average	%	**19.32**	**18.09**	**17.34**		



Liquid Limit, W$_L$ = **18.00**

Plastic Limit, W$_P$ = **NP**

Plasticity Index, I$_P$ = **18.00**

Remarks:

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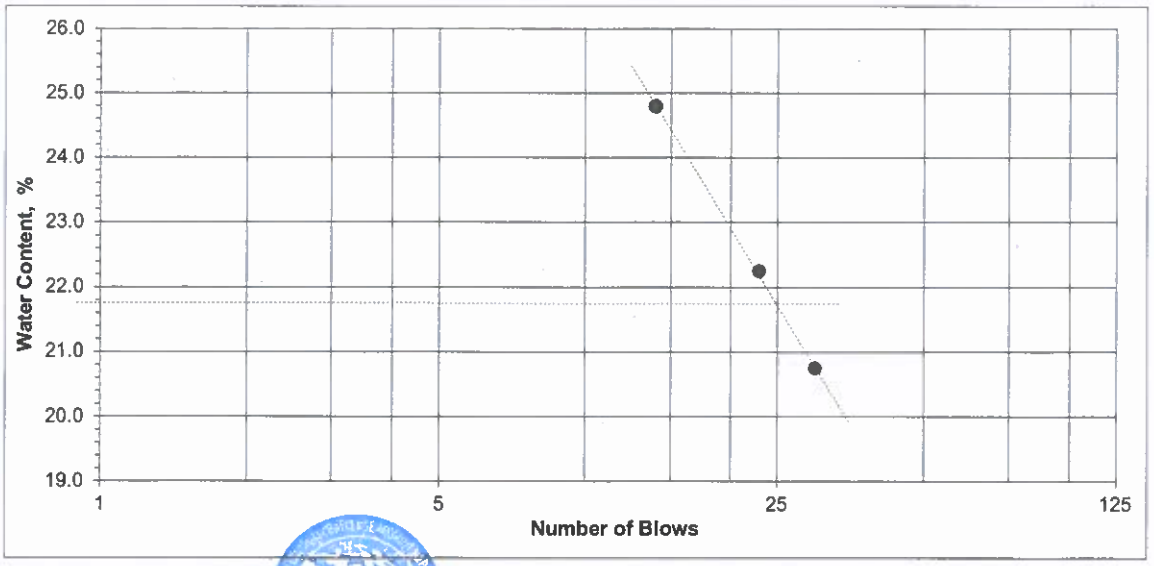
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-46**			Date:	30/11/2075
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Pranita Pun**
Depth:	**0.00 - 1.00m**	Co-ordinatge:		Checked By:	**Dr. S. Manandhar**
Description:	light red			E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**14**	**23**	**30**		
Container No		**A-140**	**A-71**	**A-128**		
Weight of Wet Soil + Container	g	**23.06**	**27.33**	**27.3**		
Weight of Dry Soil + Container	g	**20.41**	**25.66**	**25.68**		
Weight of Water	g	2.65	1.67	1.62		
Weight of Container	g	**9.72**	**18.15**	**17.87**		
Weight of Dry soil	g	10.69	7.51	7.81		
Water Content, W	%	24.79	22.24	20.74		
Average	%	**24.79**	**22.24**	**20.74**		



Liquid Limit, W_L = **21.75**
Plastic Limit, W_P = **0.00**
Plasticity Index, I_P = **21.75**

Remarks:

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-47**			Date:	30/11/2075
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Pranita Pun**
Depth:	**0.00 - 1.00m**	Co-ordinatge:		Checked By:	**Dr. S. Manandhar**
Description:	light red			E:	

Descriptions	Liquid Limit			Plastic Limit	
Number of Blows	15	25	30	A-121	
Container No	A-88	A-62	A-73		
Weight of Wet Soil + Container g	23.48	24.03	16.8	31.40	
Weight of Dry Soil + Container g	21.52	22.06	14.83	27.97	
Weight of Water g	1.96	1.97	1.97	3.43	
Weight of Container g	16.20	16.18	8.63	16.08	
Weight of Dry soil g	5.32	5.88	6.20	11.89	
Water Content, W %	36.84	33.50	31.77	28.85	
Average %	36.84	33.50	31.77	28.85	

Liquid Limit, W_L = **33.30**
Plastic Limit, W_P = **28.85**
Plasticity Index, PI = **4.45**

Remarks:

ICGS Pvt. Ltd.

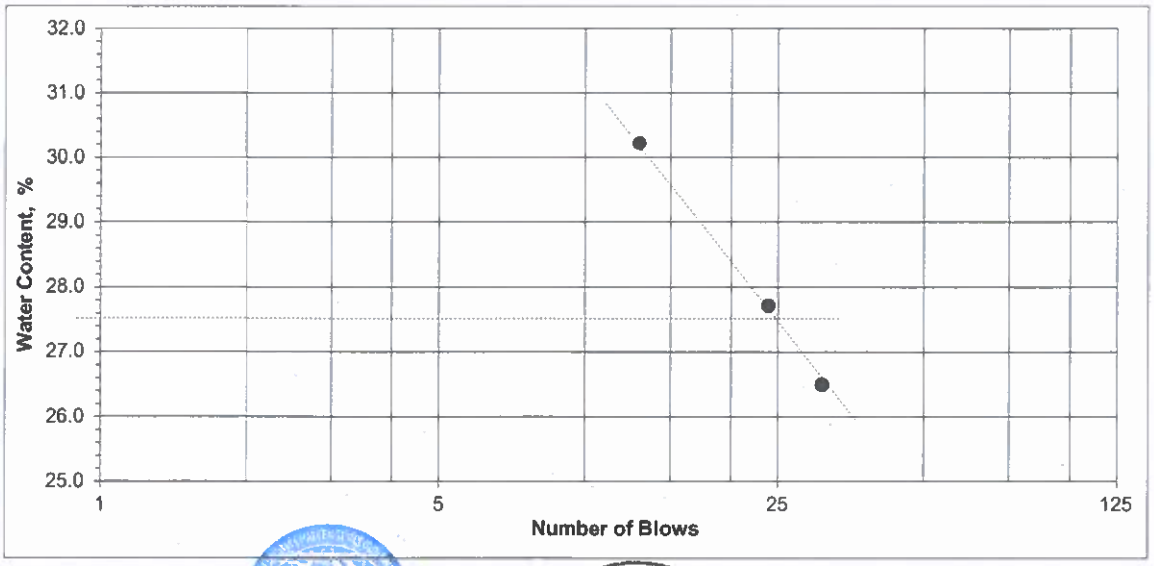
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-48**			Date:	30/11/2075
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Pranita Pun**
Depth:	**0.00 - 1.00m**	Co-ordinatge:		Checked By:	**Dr. S. Manandhar**
Description:	light red			E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		13	24	31		
Container No		A-122	A-131	A-113		
Weight of Wet Soil + Container	g	18.12	26.30	18.4		
Weight of Dry Soil + Container	g	16.02	24.43	16.66		
Weight of Water	g	2.10	1.87	1.74		
Weight of Container	g	9.07	17.68	10.09		
Weight of Dry soil	g	6.95	6.75	6.57		
Water Content, W	%	30.22	27.70	26.48		
Average	%	30.22	27.70	26.48		



Liquid Limit, W_L = 27.50
Plastic Limit, W_P = 0.00
Plasticity Index, PI = 27.50

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

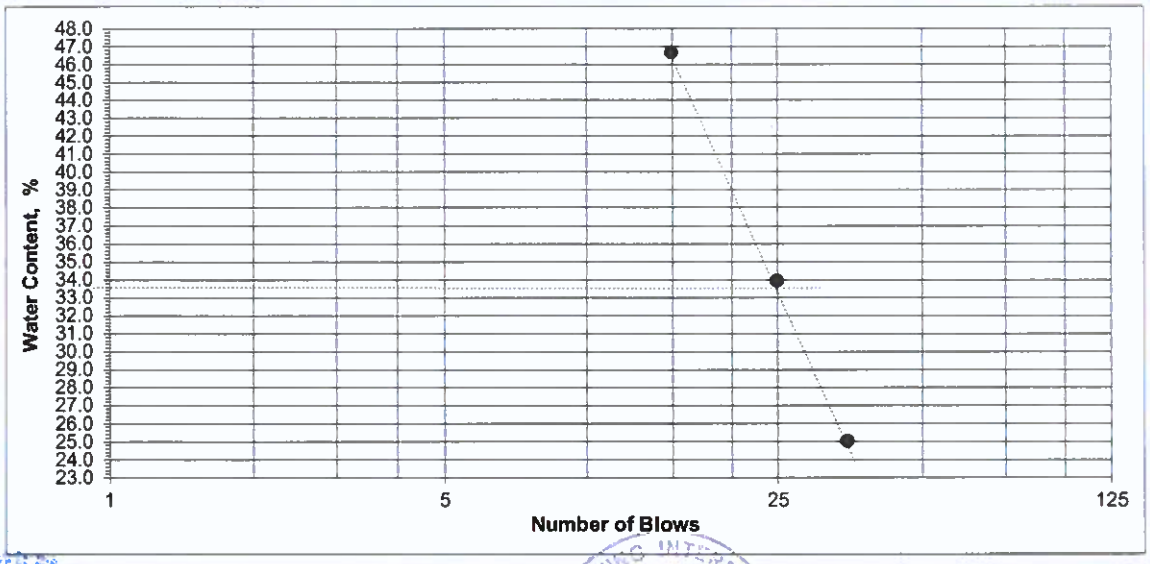
Borehole No. **B-49** Date: 16/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light brown E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	25	35	A-37	
Container No		A-10	A-20	A-2		
Weight of Wet Soil + Container	g	48.81	39.49	48.39	26.83	
Weight of Dry Soil + Container	g	42.54	33.25	42.22	24.78	
Weight of Water	g	6.27	6.24	6.17	2.05	
Weight of Container	g	29.10	14.85	17.54	17.72	
Weight of Dry soil	g	13.44	18.40	24.68	7.06	
Water Content, W	%	46.65	33.91	25.00	29.04	
Average	%	46.65	33.91	25.00	29.04	



Liquid Limit, W = **33.40**

Plastic Limit, W_P = **29.04**

Plasticity Index, PI = **4.36**

Remarks:

ICGS Pvt. Ltd.

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Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

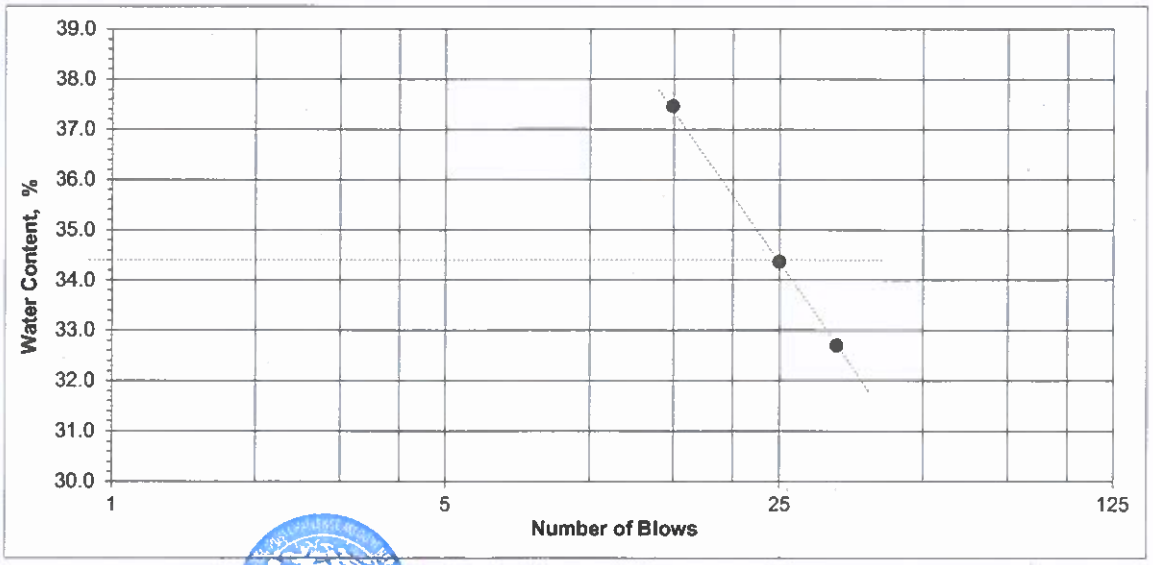
Borehole No. **B-50** Date: 16/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Dark brown E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	25	33	A-121	
Container No		A-75	A-61	A-129		
Weight of Wet Soil + Container	g	30.32	28.37	28.95	30.64	
Weight of Dry Soil + Container	g	26.44	25.01	25.77	27.37	
Weight of Water	g	3.88	3.36	3.18	3.27	
Weight of Container	g	16.08	15.23	16.04	16.08	
Weight of Dry soil	g	10.36	9.78	9.73	11.29	
Water Content, W	%	37.45	34.36	32.68	28.96	
Average	%	37.45	34.36	32.68	28.96	



Liquid Limit, W_L = 34.40

Plastic Limit, W_P = 28.96

Plasticity Index, I_P = 5.44

Remarks:

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ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

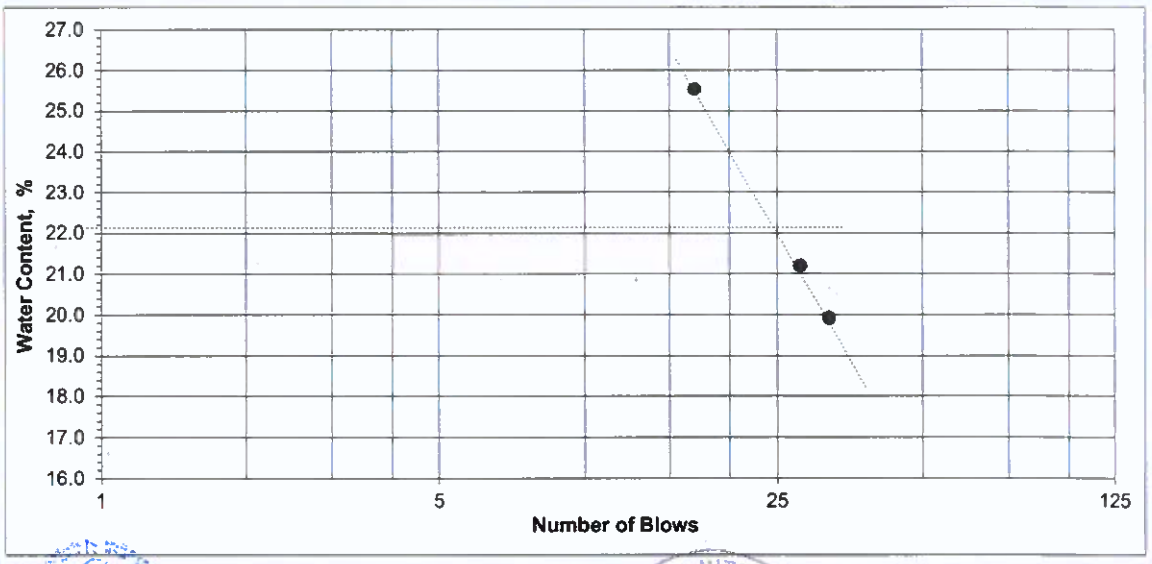
Borehole No. **B-51** Date: **2/5/2019**

Source: **Test Pit Sample** Chainage: Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manar**

Description: Light yellow Co-ordinatge: E:

Descriptions		Liquid Limit				
Number of Blows		17	28	32		
Container No		A-111	A-112	A-93		
Weight of Wet Soil + Container	g	32.89	35.15	35		
Weight of Dry Soil + Container	g	29.50	32.10	31.96		
Weight of Water	g	3.39	3.05	3.04		
Weight of Container	g	16.21	17.70	16.68		
Weight of Dry soil	g	13.29	14.40	15.28		
Water Content, W	%	25.51	21.18	19.90		
Average	%	25.51	21.18	19.90		



Liquid Limit, W_L = 22.10

Plastic Limit, W_P = NP

Plasticity Index, PI = 22.10

Remarks:

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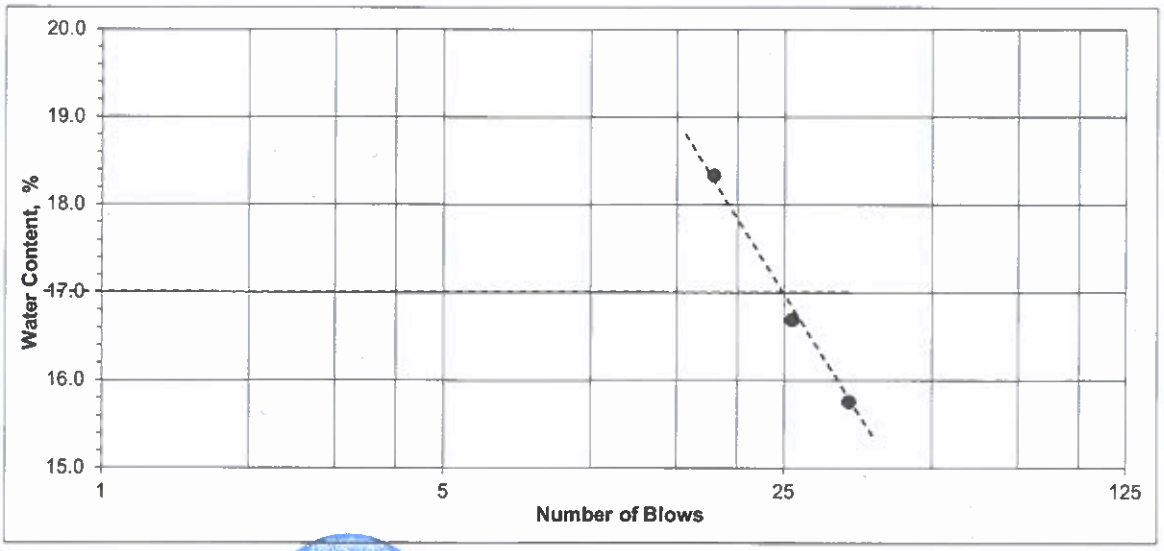
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV DC)**				
Borehole No.	**B-52**			Date:	**2/5/2019**
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Pranita Pun**
Depth:	**0.00-1.00m**			Checked By:	**Dr. S. Manandhar**
Description:	Dark brown	Co-ordinatge:		**E:**	

Descriptions		Liquid Limit				
Number of Blows		**18**	**26**	**34**		
Container No		**A-81**	**A-85**	**A-130**		
Weight of Wet Soil + Container	g	**40.53**	**41.89**	**41.99**		
Weight of Dry Soil + Container	g	**37.00**	**38.38**	**38.7**		
Weight of Water	g	3.53	3.51	3.29		
Weight of Container	g	**17.74**	**17.35**	**17.82**		
Weight of Dry soil	g	19.26	21.03	20.88		
Water Content, W	%	18.33	16.69	15.76		
Average	%	**18.33**	**16.69**	**15.76**		



Liquid Limit, W_L = 17.00
Plastic Limit, W_P = NP
Plasticity Index, PI = 17.00

Remarks:

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

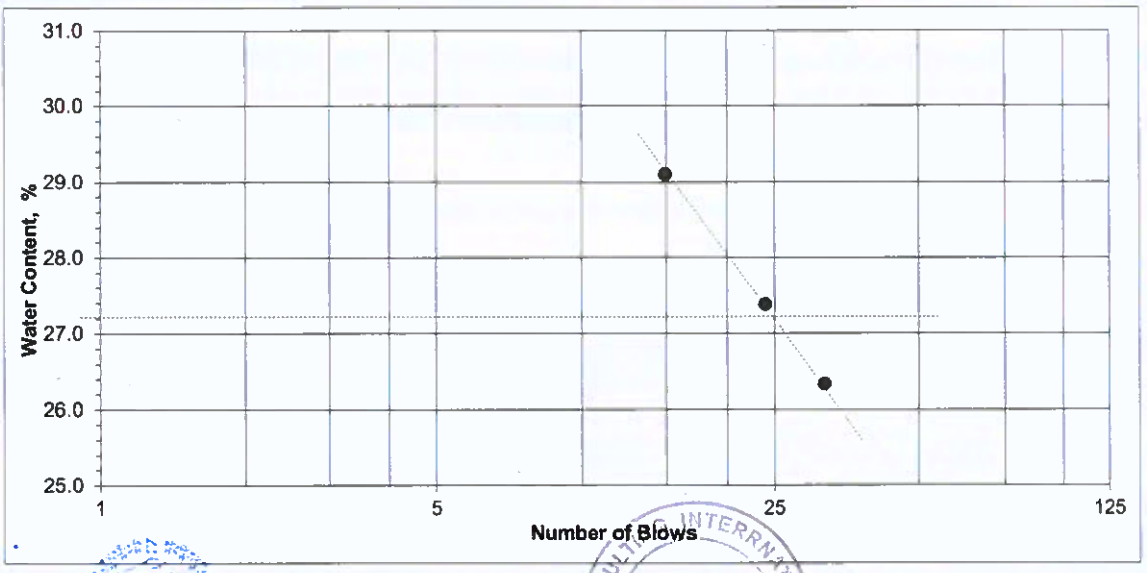
Borehole No. **B-53** Date: **2/5/2019**

Source: **Test Pit Sample** Chainage: Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manandhar**

Description: **Light yellow** Co-ordinatge: **E:**

Descriptions	Liquid Limit			Plastic Limit	
Number of Blows	15	24	32	A-33	
Container No	A-38	A-55	A-57		
Wet Soil + Container g	19.78	23.24	23.63	23.14	
Dry Soil + Container g	18.34	21.25	22.04	21.89	
Water g	1.44	1.99	1.59	1.25	
Container g	13.39	13.98	16.00	16.75	
Dry soil g	4.95	7.27	6.04	5.14	
ntent, W %	29.09	27.37	26.32	24.32	
Average %	29.09	27.37	26.32	24.32	



Liquid Limit, W_L = 27.20

Plastic Limit, W_P = 24.32

Plasticity Index, P_I = 2.88

Remarks:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

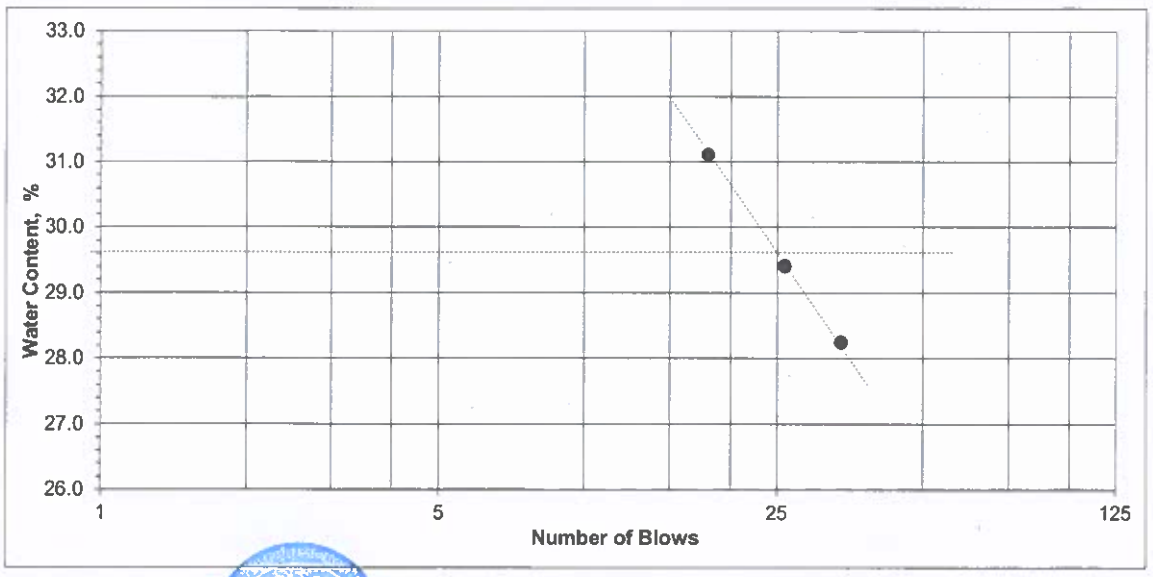
Borehole No. **B-54** Date: **2/5/2019**

Source: **Test Pit Sample** Chainage: Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manandhar**

Description: **Light yellow** Co-ordinatge: E:

Descriptions	Liquid Limit			Plastic Limit	
Number of Blows	18	26	34	A-67	A-85
Container No	A-118	A-93	A-111		
Wet Soil + Container g	37.16	35.14	29.17	18.38	18.95
Dry Soil + Container g	32.52	30.81	26.31	17.95	18.64
Water g	4.64	4.33	2.86	0.43	0.31
Container g	17.60	16.08	16.18	16.2	17.36
Dry soil g	14.92	14.73	10.13	1.75	1.28
ntent, W %	31.10	29.40	28.23	24.57	24.22
Average %	31.10	29.40	28.23	24.40	



Liquid Limit, W_L = 29.60

Plastic Limit, W_P = 24.40

Plasticity Index, PI = 5.20

Remarks:

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Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

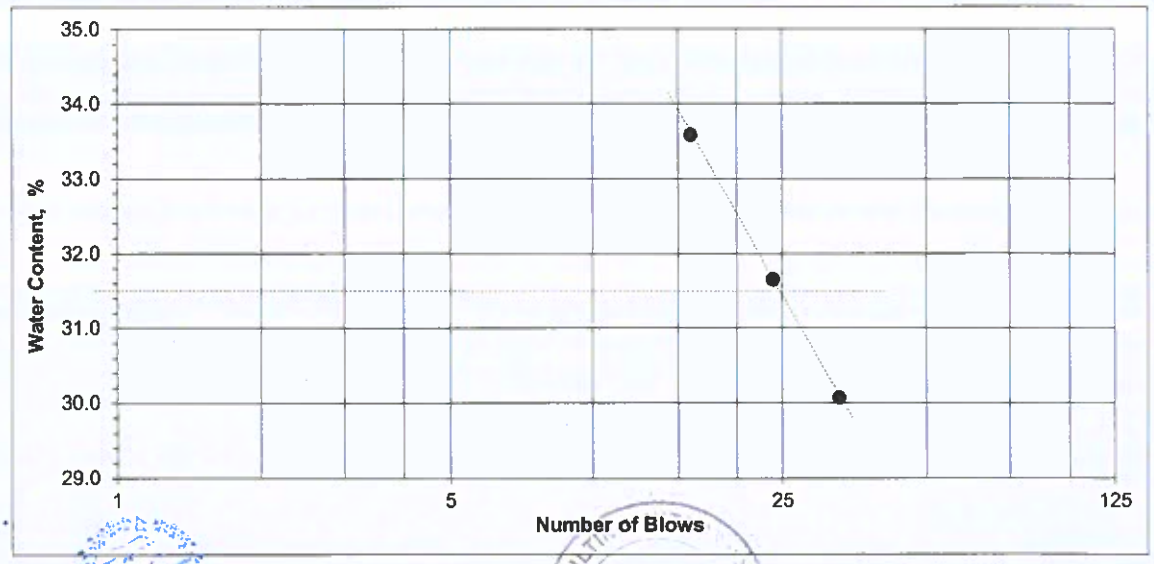
Borehole No. **B-55** Date: 16/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Dark brown E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		16	24	33	A-56	
Container No		A-34	A-38	A-45		
Weight of Wet Soil + Container	g	26.14	23.25	22.41	26.38	
Weight of Dry Soil + Container	g	23.40	20.88	20.51	23.97	
Weight of Water	g	2.74	2.37	1.90	2.41	
Weight of Container	g	15.24	13.39	14.19	14.91	
Weight of Dry soil	g	8.16	7.49	6.32	9.06	
Water Content, W	%	33.58	31.64	30.06	26.60	
Average	%	33.58	31.64	30.06	26.60	



Liquid Limit, W_L = 31.50

Plastic Limit, W_P = 26.60

Plasticity Index, PI = 4.90

Remarks:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**

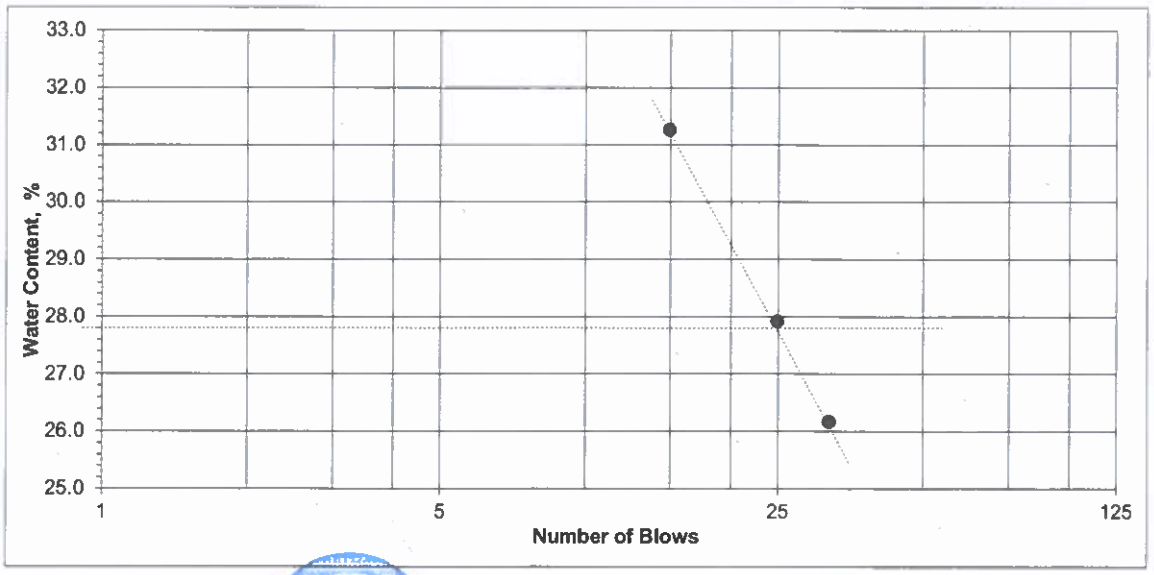
Borehole No. **B-56** Date: **2/5/2019**

Source: **Test Pit Sample** Chainage: Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked By: **Dr. S. Manandhar**

Description: **Light yellow** Co-ordinatge: **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	25	32	A-88	
Container No		A-76	A-99	A-121		
Wet Soil + Container	g	14.13	16.85	25.05	19.11	
Dry Soil + Container	g	12.83	15.34	23.19	18.53	
Water	g	1.30	1.51	1.86	0.58	
Container	g	8.67	9.93	16.08	16.17	
Dry soil	g	4.16	5.41	7.11	2.36	
ntent, W	%	31.25	27.91	26.16	24.58	
Average	%	31.25	27.91	26.16	24.58	



Liquid Limit, W_L = 27.80

Plastic Limit, W_P = 24.58

Plasticity Index, I_P = 3.22

Remarks:

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

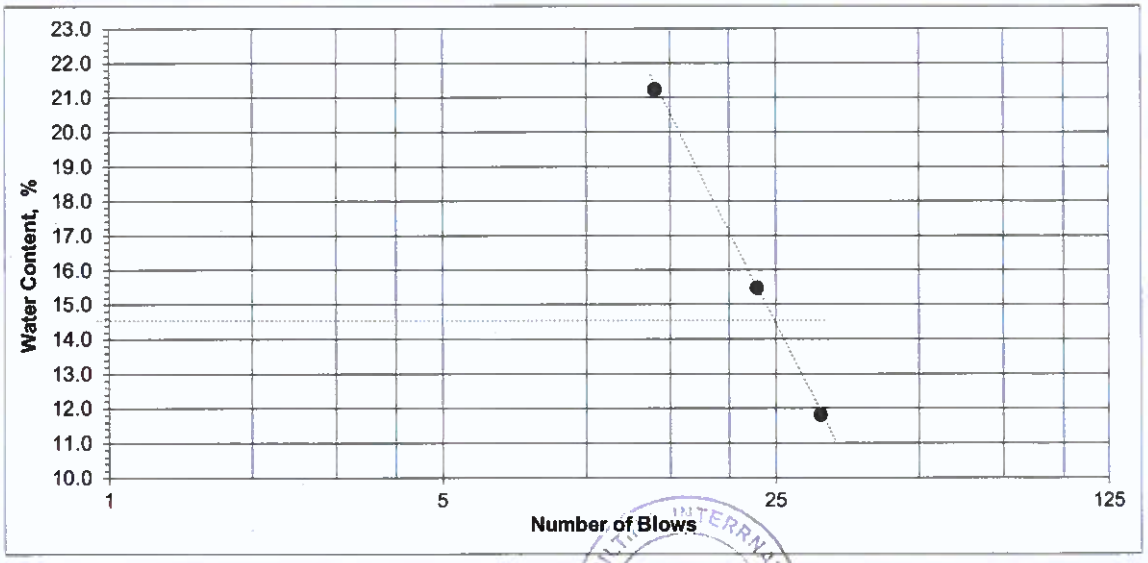
Borehole No. **B-57** Date: 14/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light brown silty sand E:

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		14	23	31		
Container No		A-28	A-6	A-29		
Weight of Wet Soil + Container	g	46.61	44.83	47.12		
Weight of Dry Soil + Container	g	42.98	42.74	45.28		
Weight of Water	g	3.63	2.09	1.84		
Weight of Container	g	25.87	29.22	29.67		
Weight of Dry soil	g	17.11	13.52	15.61		
Water Content, W	%	21.22	15.46	11.79		
Average	%	21.22	15.46	11.79		



Liquid Limit, W_L = 14.50

Plastic Limit, W_P = 0.00

Plasticity Index, P_I = 14.50

Remarks:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

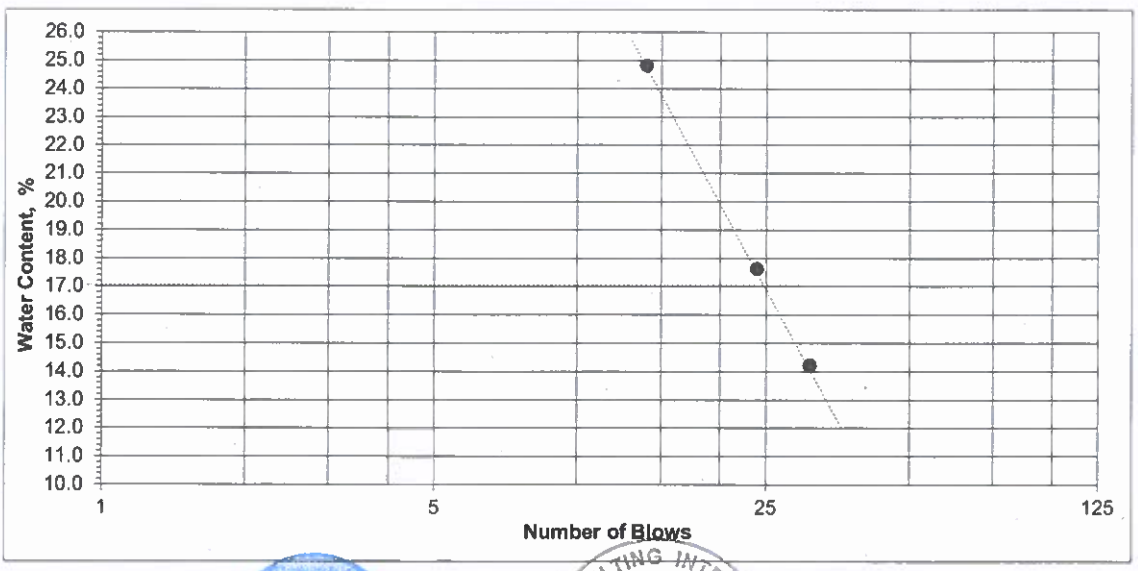
Borehole No. **B-58** Date: 14/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Light brown gravel sandy silt **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		14	24	31		
Container No		A-60	A-45	A-12		
Weight of Wet Soil + Container	g	30.28	34.24	55.1		
Weight of Dry Soil + Container	g	26.26	30.88	52.06		
Weight of Water	g	4.02	3.36	3.04		
Weight of Container	g	10.05	11.79	30.63		
Weight of Dry soil	g	16.21	19.09	21.43		
Water Content, W	%	24.80	17.60	14.19		
Average	%	24.80	17.60	14.19		



Liquid Limit, W = 17.00

Plastic Limit, Wp = NP

Plasticity Index, PI = 17.00

Remarks:

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**

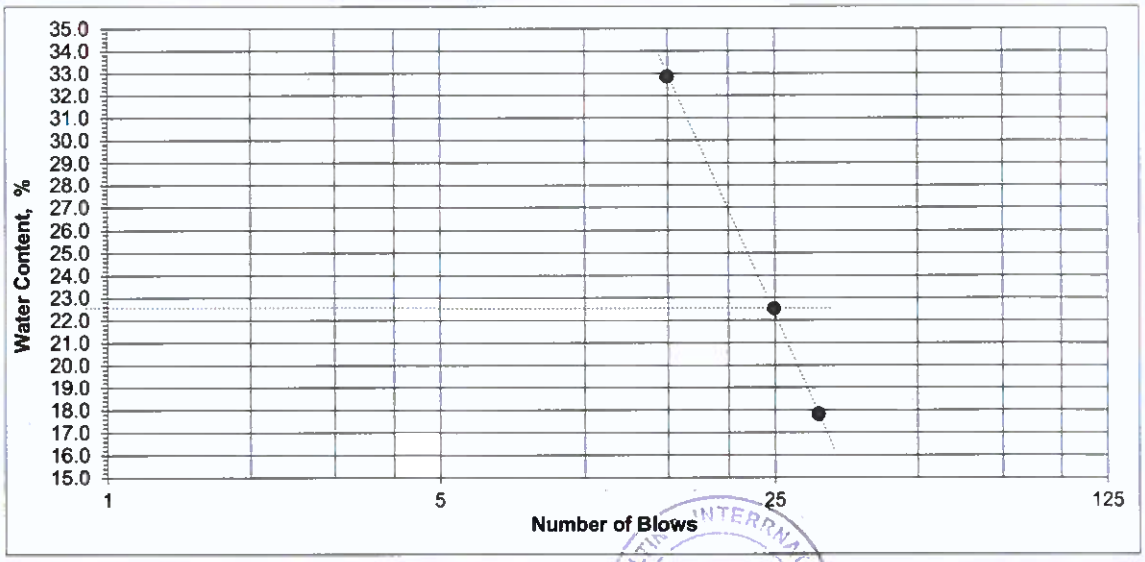
Borehole No. **B-59** Date: 15/6/2019

Source: **Test Pit Sample** Chainage: Tested By: **Binita K.C**

Depth: **0.00 - 1.00m** Co-ordinatge: Checked By: **Dr. S. Manandhar**

Description: Dark brown **E:**

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		15	25	31		
Container No		A-117	A-38	A-130		
Weight of Wet Soil + Container	g	19.90	28.37	32.99		
Weight of Dry Soil + Container	g	16.90	25.75	30.7		
Weight of Water	g	3.00	2.62	2.29		
Weight of Container	g	7.76	14.09	17.82		
Weight of Dry soil	g	9.14	11.66	12.88		
Water Content, W	%	32.82	22.47	17.78		
Average	%	32.82	22.47	17.78		



Liquid Limit, W_L = 22.50

Plastic Limit, W_P = 0.00

Plasticity Index, PI = 22.50

Remarks:

ICGS Pvt. Ltd.

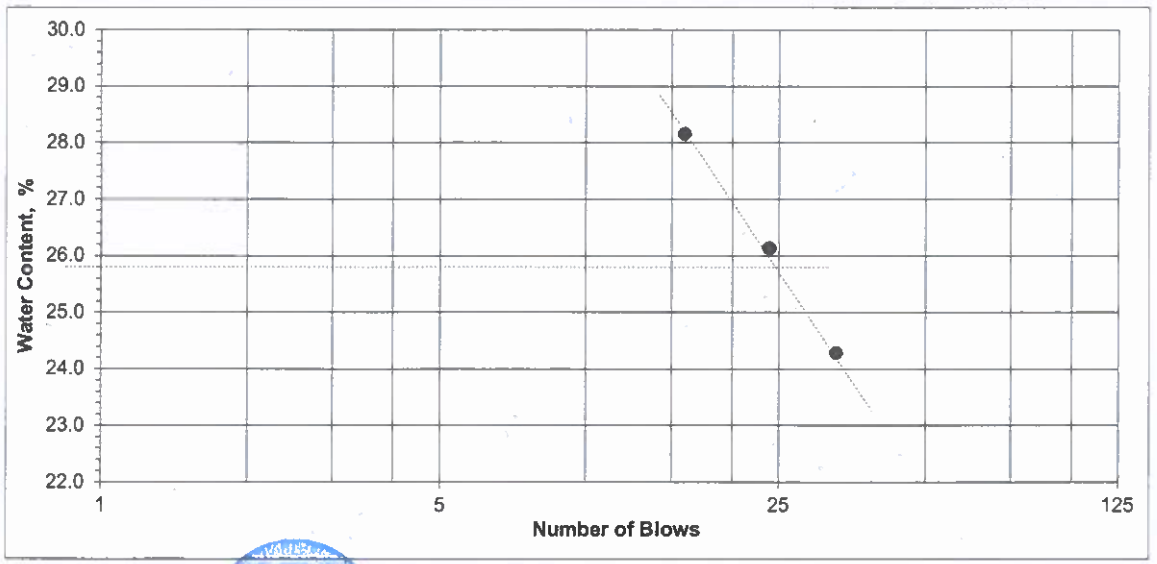
New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

ATTERBERG LIMITS TEST

(Method: ASTM D-4318 -05)

Project:	**MCA Nepal Soil Investigation for Transmission Line (400kV Dc)**				
Borehole No.	**B-60**			Date:	30/11/2075
Source:	**Test Pit Sample**	Chainage:		Tested By:	**Pranita Pun**
Depth:	**0.00 - 1.00m**	Co-ordinatge:		Checked By:	**Dr. S. Manandhar**
Description:	light red			E:	

Descriptions		Liquid Limit			Plastic Limit	
Number of Blows		**16**	**24**	**33**	**A-121**	
Container No		**A-88**	**A-62**	**A-75**		
Weight of Wet Soil + Container	g	**23.80**	**23.39**	**25.32**	**32.19**	
Weight of Dry Soil + Container	g	**22.12**	**21.89**	**22.06**	**29.29**	
Weight of Water	g	1.68	1.50	3.26	**2.90**	
Weight of Container	g	**16.15**	**16.14**	**8.63**	16.08	
Weight of Dry soil	g	5.97	5.75	13.43	13.21	
Water Content, W	%	28.14	26.12	24.27	**21.95**	
Average	%	**28.14**	**26.12**	**24.27**	**21.95**	



Liquid Limit, W_L = **25.80**

Plastic Limit, W_P = **21.95**

Plasticity Index, PI = **3.85**

Remarks:

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ANNEX C3-1
Particle Size Analysis

ICGS (P) LTD.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 1**

Depth (m): **3.00-3.45m**

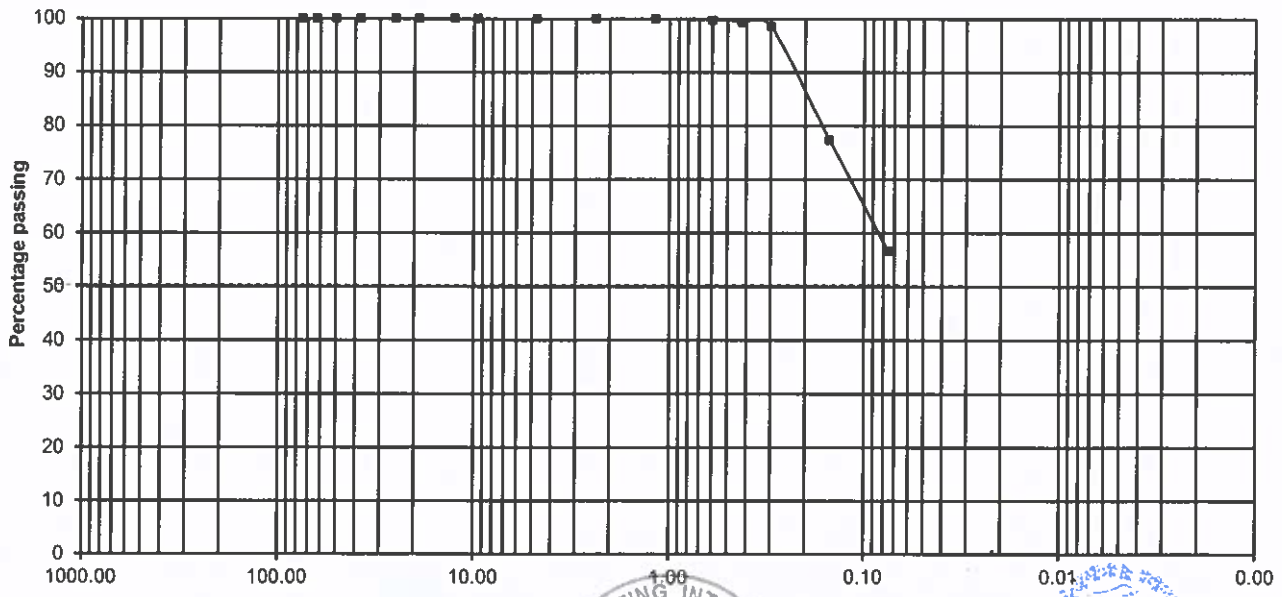
Date Testing: **2019/04/12**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	0.00	0.00	100.00	0.00	0.00
16	1.180 mm	0.24	0.08	99.92	0.24	0.08
30	0.600 mm	0.52	0.17	99.76	0.76	0.24
40	0.425 mm	1.24	0.40	99.36	2.00	0.64
50	0.300 mm	2.31	0.74	98.61	4.31	1.39
100	0.150 mm	66.15	21.28	77.33	70.46	22.67
200	0.075 mm	64.59	20.78	56.55	135.05	43.45
	PAN	175.78	56.55	0.00	310.83	100.00
	Total Weight (gm)	310.83				



Gravel: 0.00 **Sand: 43.45** **Silt/Clay: 56.55** **D-50:**

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 2**

Depth (m): **3.00-3.45m**

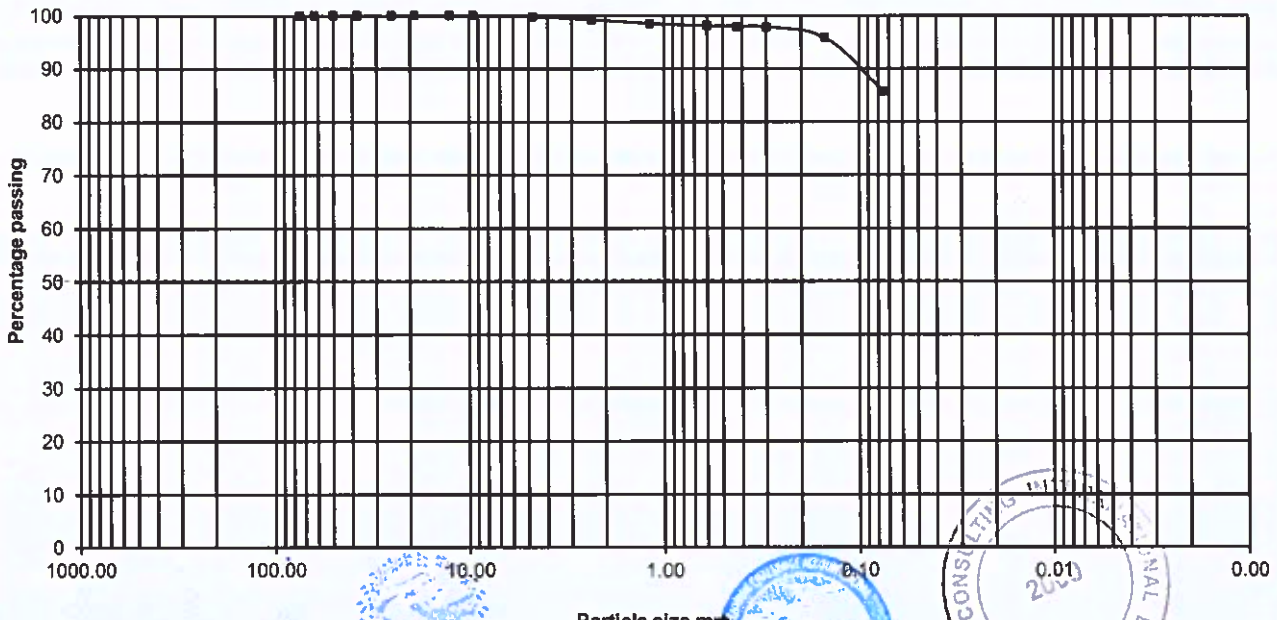
Date Testing: **2019/04/12**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.40	0.13	99.87	0.40	0.13
8	2.360 mm	1.94	0.65	99.22	2.34	0.78
16	1.180 mm	2.27	0.76	98.46	4.61	1.54
30	0.600 mm	1.12	0.37	98.09	5.73	1.91
40	0.425 mm	0.66	0.22	97.87	6.39	2.13
50	0.300 mm	0.21	0.07	97.80	6.60	2.20
100	0.150 mm	6.02	2.01	95.79	12.62	4.21
200	0.075 mm	30.24	10.09	85.70	42.86	14.30
	PAN	256.93	85.70	0.00	299.79	100.00
	Total Weight (gm)	299.79				



Gravel: 0.13 **Sand: 14.16** **Silt/Clay: 85.70** **D-50:**

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 3**

Depth (m): **3.00-3.45m**

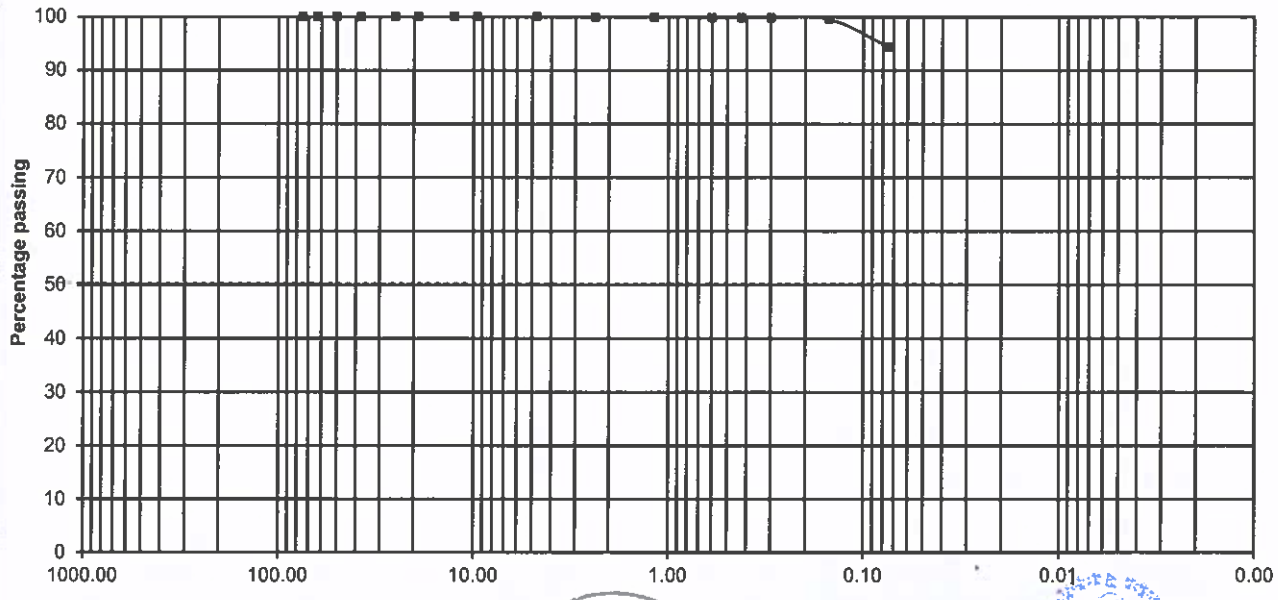
Date Testing: **2019/04/15**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	0.07	0.02	99.98	0.07	0.02
16	1.180 mm	0.22	0.07	99.90	0.29	0.10
30	0.600 mm	0.20	0.07	99.84	0.49	0.16
40	0.425 mm	0.11	0.04	99.80	0.60	0.20
50	0.300 mm	0.00	0.00	99.80	0.60	0.20
100	0.150 mm	0.83	0.28	99.52	1.43	0.48
200	0.075 mm	15.43	5.15	94.38	16.86	5.62
	PAN	282.93	94.38	0.00	**299.79**	100.00
	Total Weight (gm)	**299.79**				



Gravel: 0.00 **Sand: 5.62** **Silt/Clay: 94.38** **D-50:**

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ICGS (P) LTD.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

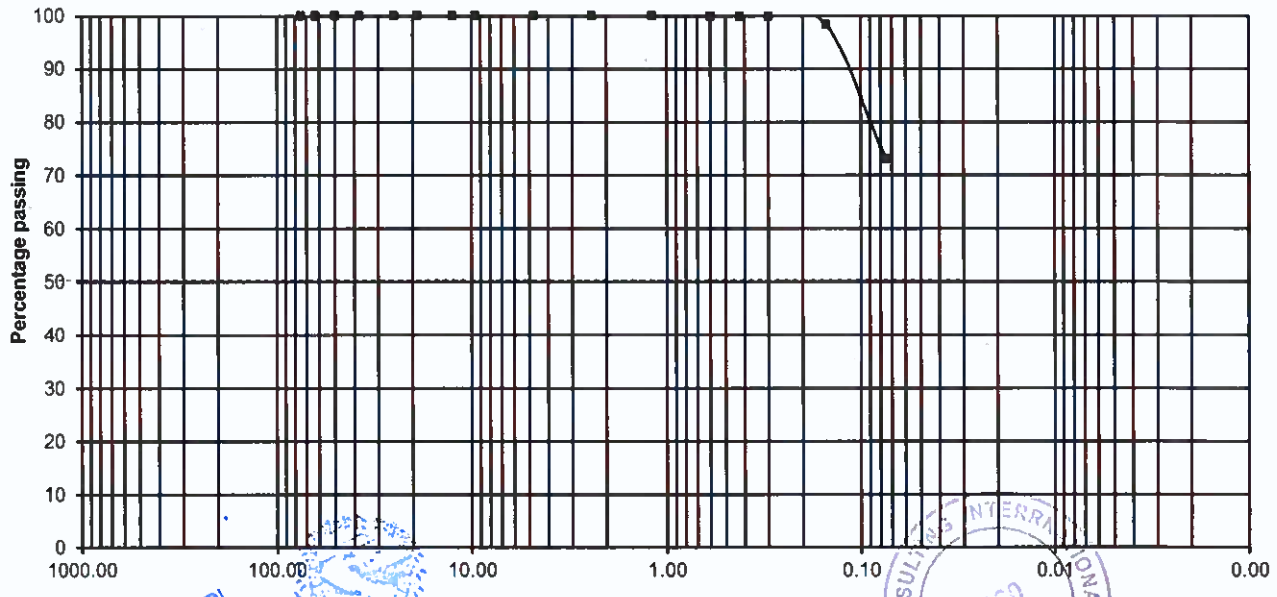
Location: Date Testing: 2019/04/12

Source: SPT Borehole No. B 4 Tested By: Pranita Pun

Co-ordinate: Depth (m): 3.00-3.45m Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	0.00	0.00	100.00	0.00	0.00
16	1.180 mm	0.00	0.00	100.00	0.00	0.00
30	0.600 mm	0.07	0.02	99.98	0.07	0.02
40	0.425 mm	0.14	0.05	99.93	0.21	0.07
50	0.300 mm	0.00	0.00	99.93	0.21	0.07
100	0.150 mm	4.74	1.58	98.35	4.95	1.65
200	0.075 mm	75.68	25.27	73.07	80.63	26.93
	PAN	218.82	73.07	0.00	299.45	100.00
	Total Weight (gm)	299.45				



Gravel: 0.00 **Sand: 26.93** **Silt/Clay: 73.07** **D-50:**

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Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Borehole No. **B 5**

Co-ordinate:

Depth (m): **3.00-3.45m**

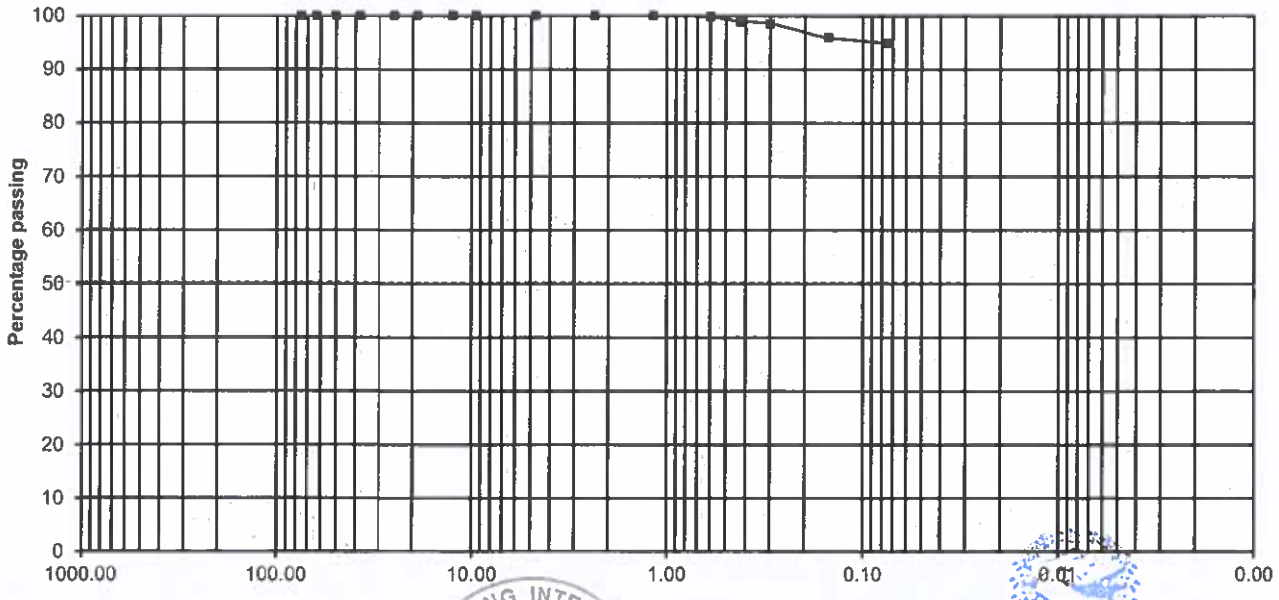
Date Testing: **2019/07/12**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	0.00	0.00	100.00	0.00	0.00
16	1.180 mm	0.00	0.00	100.00	0.00	0.00
30	0.600 mm	0.44	0.22	99.78	0.44	0.22
40	0.425 mm	1.81	0.91	98.87	2.25	1.13
50	0.300 mm	0.66	0.33	98.53	2.91	1.47
100	0.150 mm	5.19	2.62	95.92	8.10	4.08
200	0.075 mm	2.06	1.04	94.88	10.16	5.12
	PAN	188.29	94.88	0.00	**198.45**	100.00
	Total Weight (gm)	**198.45**				



Gravel: 0.00 **Sand: 5.12** **Silt/Clay: 94.88** **D-50:**

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Borehole No. **B 6**

Depth (m): **3.00-3.45m**

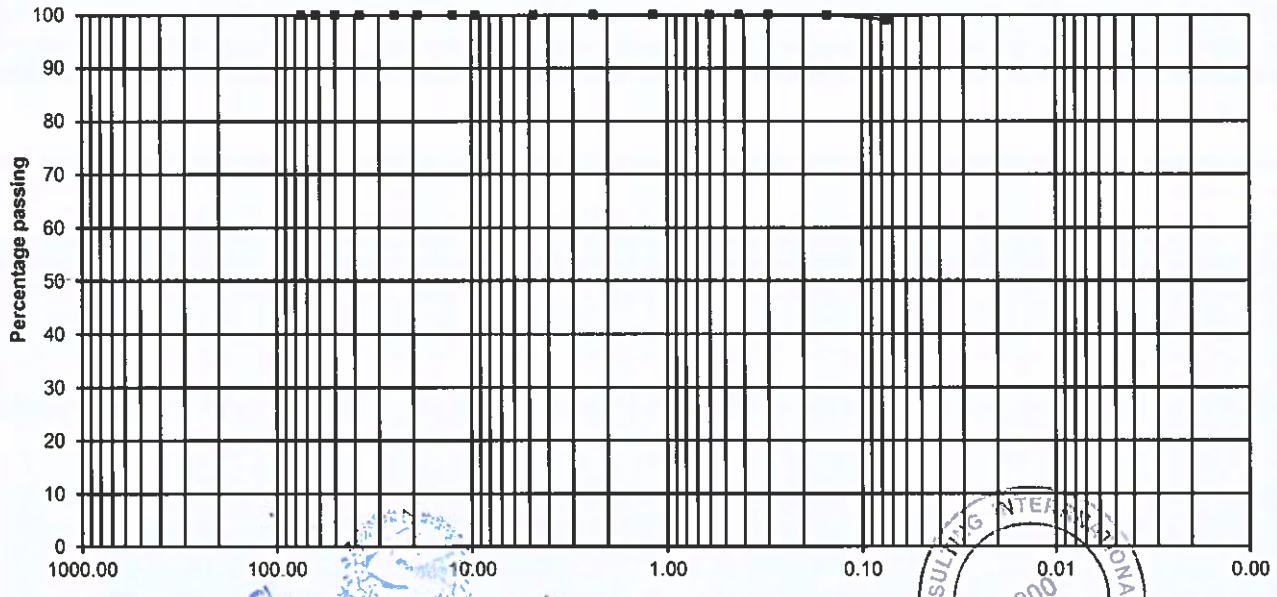
Date Testing: **2019/04/12**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	0.00	0.00	100.00	0.00	0.00
16	1.180 mm	0.00	0.00	100.00	0.00	0.00
30	0.600 mm	0.00	0.00	100.00	0.00	0.00
40	0.425 mm	0.00	0.00	100.00	0.00	0.00
50	0.300 mm	0.00	0.00	100.00	0.00	0.00
100	0.150 mm	0.07	0.03	99.97	0.07	0.03
200	0.075 mm	1.93	0.85	99.12	2.00	0.88
	PAN	225.08	99.12	0.00	227.08	100.00
	Total Weight (gm)	227.08				



Gravel: 0.00 **Sand: 0.88** **Silt/Clay: 99.12** **D-50:**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 7**

Depth (m): **3.00-3.45m**

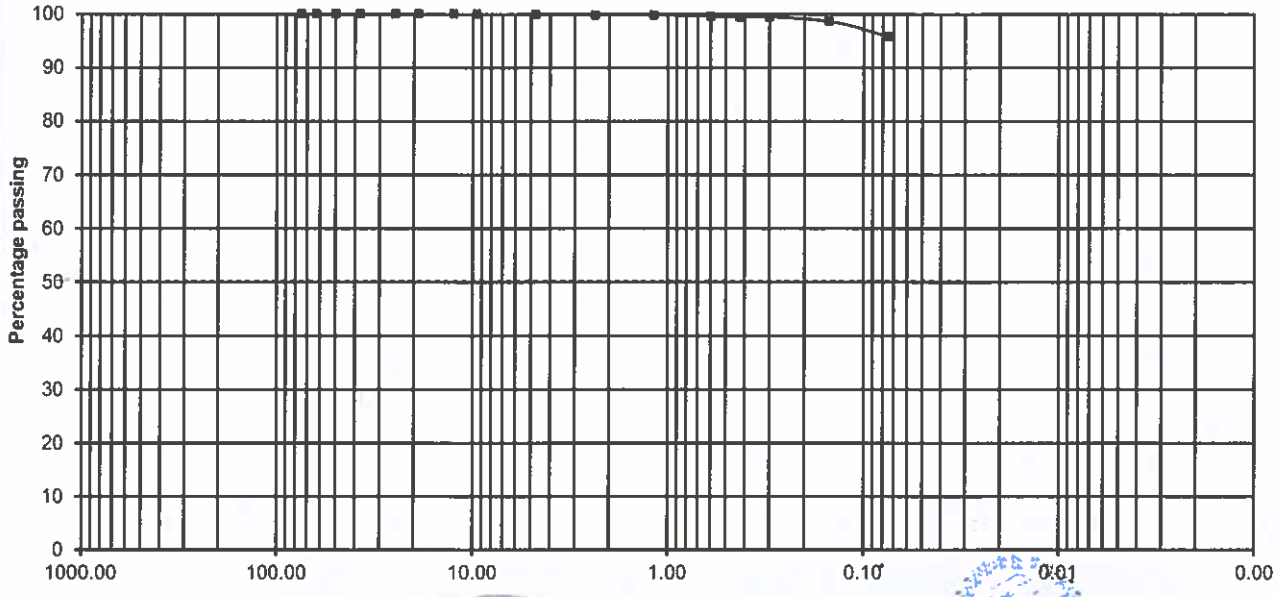
Date Testing: **2019/04/12**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.26	0.06	99.94	0.26	0.06
8	2.360 mm	0.32	0.08	99.86	0.58	0.14
16	1.180 mm	0.28	0.07	99.79	0.86	0.21
30	0.600 mm	0.64	0.15	99.64	1.50	0.36
40	0.425 mm	0.63	0.15	99.49	2.13	0.51
50	0.300 mm	0.23	0.06	99.43	2.36	0.57
100	0.150 mm	3.15	0.76	98.68	5.51	1.32
200	0.075 mm	11.92	2.87	95.81	17.43	4.19
	PAN	398.47	95.81	0.00	415.90	100.00
	Total Weight (gm)	415.90				



Gravel: 0.06 **Sand: 4.13** **Silt/Clay: 95.81** **D-50:**

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Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Borehole No. **B 8**

Co-ordinate:

Depth (m): **3.00-3.45m**

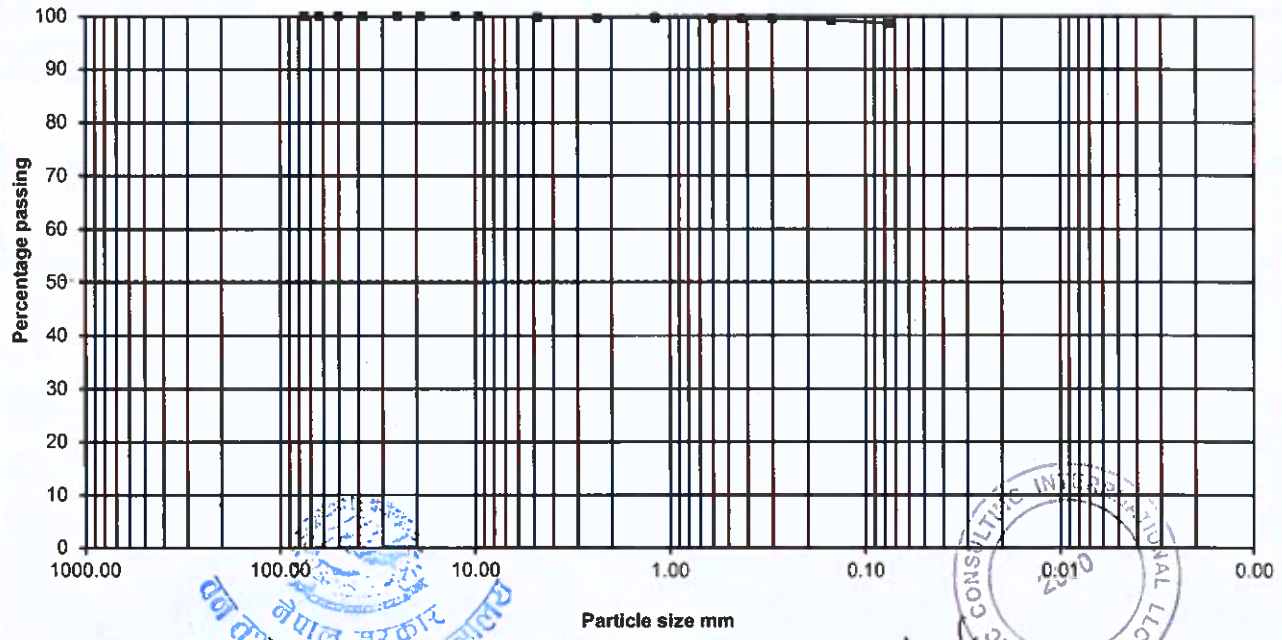
Date Testing: **2019/04/22**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.51	0.17	99.83	0.51	0.17
8	2.360 mm	0.31	0.10	99.73	0.82	0.27
16	1.180 mm	0.15	0.05	99.68	0.97	0.32
30	0.600 mm	0.08	0.03	99.65	1.05	0.35
40	0.425 mm	0.15	0.05	99.60	1.20	0.40
50	0.300 mm	0.07	0.02	99.58	1.27	0.42
100	0.150 mm	0.97	0.32	99.25	2.24	0.75
200	0.075 mm	1.85	0.62	98.64	4.09	1.36
	PAN	296.50	98.64	0.00	**300.59**	100.00
	Total Weight (gm)	**300.59**				



Gravel: 0.17 **Sand: 1.19** **Silt/Clay: 98.64** **D-50:**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: SPT

Co-ordinate:

Borehole No. B 12

Depth (m): 4.00-4.45m

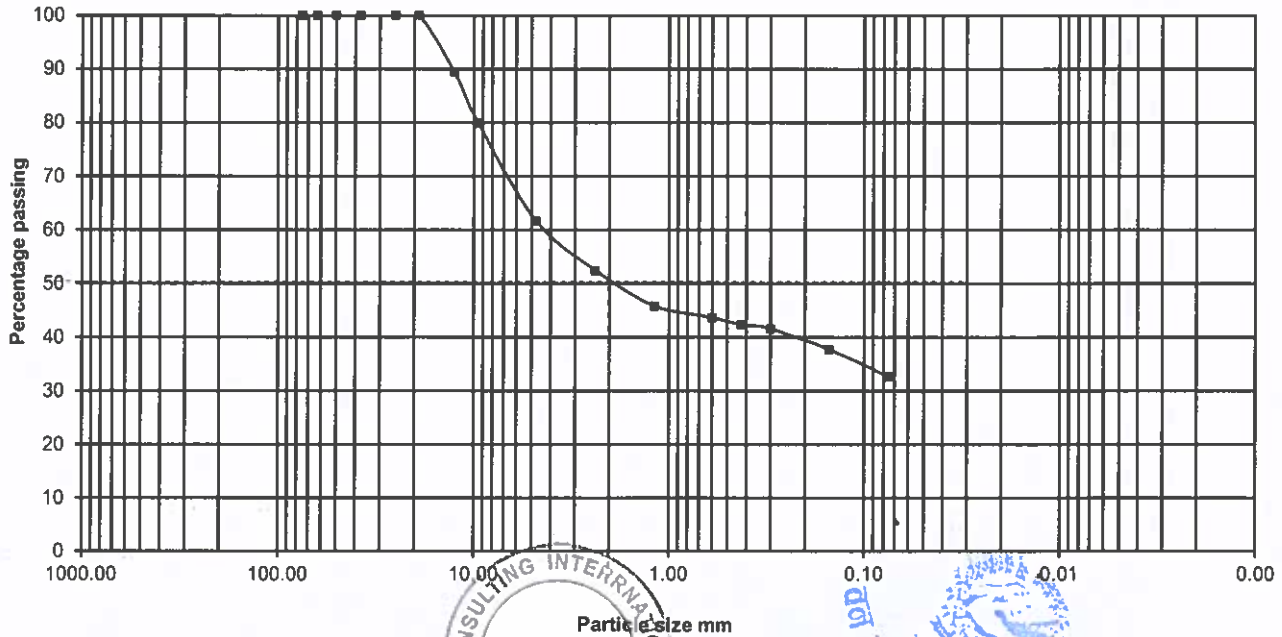
Date Testing: 2019/07/01

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	31.84	10.63	89.37	31.84	10.63
3/8"	9.50 mm	28.54	9.53	79.84	60.38	20.16
4	4.75 mm	54.51	18.20	61.64	114.89	38.36
8	2.360 mm	27.78	9.28	52.36	142.67	47.64
16	1.180 mm	19.78	6.60	45.76	162.45	54.24
30	0.600 mm	6.36	2.12	43.63	168.81	56.37
40	0.425 mm	4.01	1.34	42.29	172.82	57.71
50	0.300 mm	2.22	0.74	41.55	175.04	58.45
100	0.150 mm	11.65	3.89	37.66	186.69	62.34
200	0.075 mm	14.93	4.99	32.68	201.62	67.32
	PAN	97.86	32.68	0.00	299.48	100.00
	Total Weight (gm)	299.48				



Gravel: 38.36 Sand: 28.96 Silt/Clay: 32.68 D-50: 2.00

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सिंहदरबार, काठमाडौं

ICGS (P) LTD.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 13**

Depth (m): **3.00-3.45m**

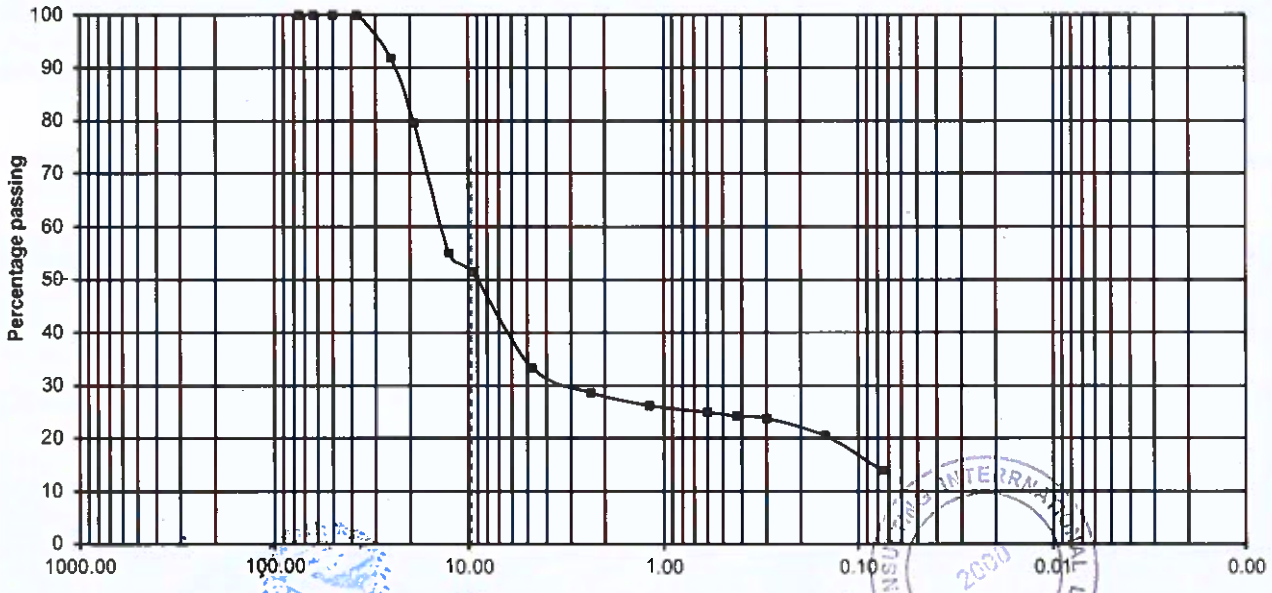
Date Testing: **2019/07/02**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	45.56	8.14	91.86	45.56	8.14
3/4"	19.00 mm	68.94	12.31	79.55	114.50	20.45
1/2"	12.50 mm	137.86	24.62	54.93	252.36	45.07
3/8"	9.50 mm	20.22	3.61	51.32	272.58	48.68
4	4.75 mm	100.79	18.00	33.32	373.37	66.68
8	2.360 mm	26.15	4.67	28.65	399.52	71.35
16	1.180 mm	13.57	2.42	26.22	413.09	73.78
30	0.600 mm	7.18	1.28	24.94	420.27	75.06
40	0.425 mm	4.14	0.74	24.20	424.41	75.80
50	0.300 mm	2.09	0.37	23.83	426.50	76.17
100	0.150 mm	18.86	3.37	20.46	445.36	79.54
200	0.075 mm	36.63	6.54	13.92	481.99	86.08
	PAN	77.93	13.92	0.00	**559.92**	100.00
	Total Weight (gm)	**559.92**				



Gravel: 66.68 **Sand: 19.40** **Silt/Clay: 13.92** **D 50: 9.50**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Borehole No. **B 15**

Co-ordinate:

Depth (m): **1.00-1.45m**

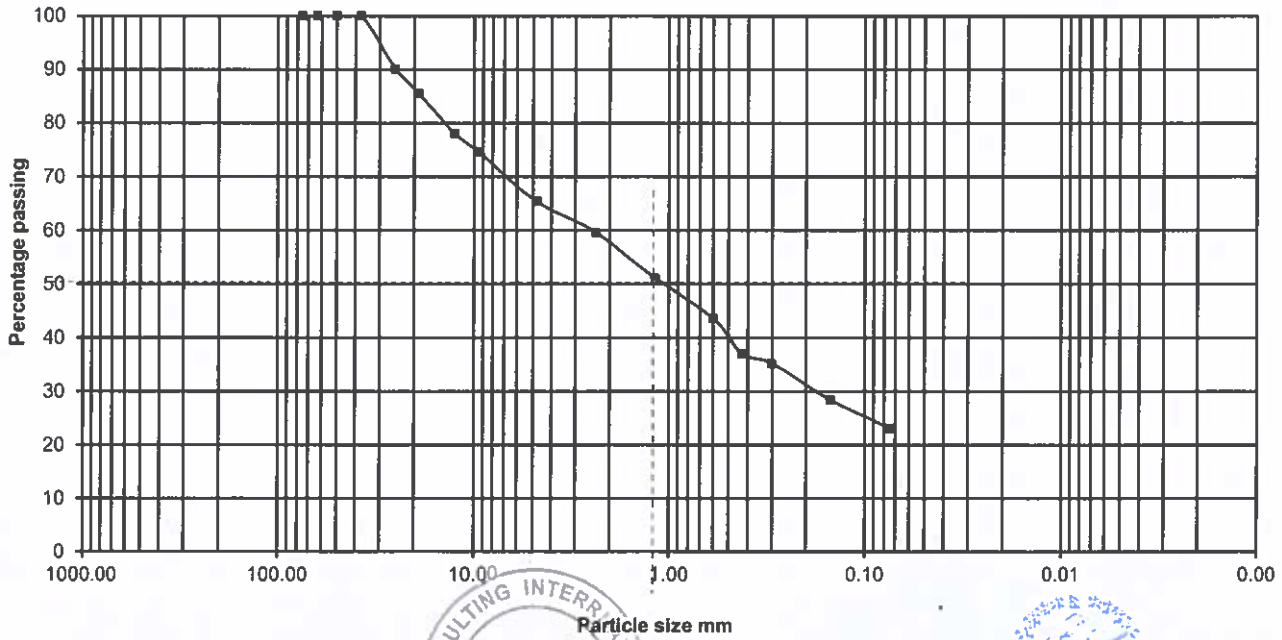
Date Testing: **2019/07/02**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	29.41	9.90	90.10	29.41	9.90
3/4"	19.00 mm	13.64	4.59	85.50	43.05	14.50
1/2"	12.50 mm	22.31	7.51	77.99	65.36	22.01
3/8"	9.50 mm	9.92	3.34	74.65	75.28	25.35
4	4.75 mm	27.62	9.30	65.35	102.90	34.65
8	2.360 mm	17.02	5.73	59.61	119.92	40.39
16	1.180 mm	25.25	8.50	51.11	145.17	48.89
30	0.600 mm	22.11	7.45	43.66	167.28	56.34
40	0.425 mm	19.78	6.66	37.00	187.06	63.00
50	0.300 mm	5.52	1.86	35.14	192.58	64.86
100	0.150 mm	19.74	6.65	28.49	212.32	71.51
200	0.075 mm	15.87	5.34	23.15	228.19	76.85
	PAN	68.74	23.15	0.00	**296.93**	100.00
	Total Weight (gm)	**296.93**				



Gravel: 34.65 **Sand: 42.20** **Silt/Clay: 23.15** **D-50: 1.20**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 16**

Depth (m): **3.00-3.45m**

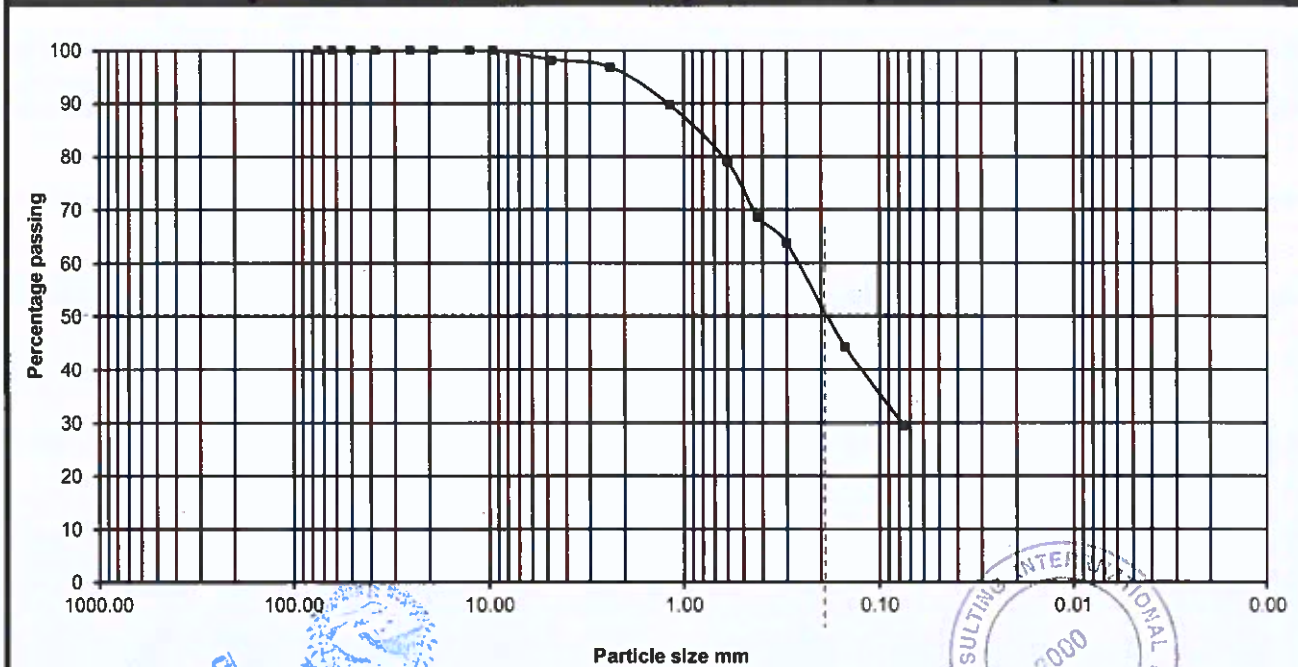
Date Testing: **2019/06/21**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	8.85	1.79	98.21	8.85	1.79
8	2.360 mm	6.87	1.39	96.83	15.72	3.17
16	1.180 mm	35.10	7.08	89.75	50.82	10.25
30	0.600 mm	53.12	10.72	79.03	103.94	20.97
40	0.425 mm	51.19	10.33	68.70	155.13	31.30
50	0.300 mm	24.54	4.95	63.75	179.67	36.25
100	0.150 mm	96.54	19.48	44.27	276.21	55.73
200	0.075 mm	73.39	14.81	29.46	349.60	70.54
	PAN	146.04	29.46	0.00	**495.64**	100.00
	Total Weight (gm)	**495.64**				



Gravel: 1.79 **Sand: 68.75** **Silt/Clay: 29.46** **D-50: 0.195**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 20**

Depth (m): **3.00-3.45m**

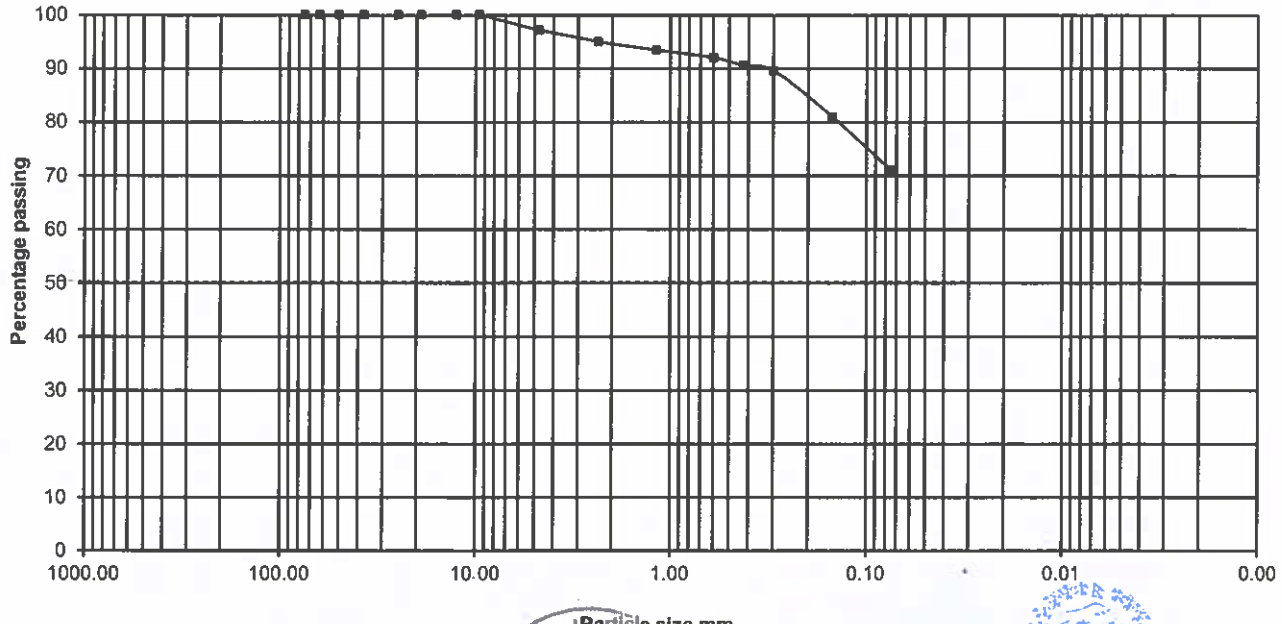
Date Testing: **2019/06/21**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	8.33	2.86	97.14	8.33	2.86
8	2.360 mm	6.31	2.16	94.98	14.64	5.02
16	1.180 mm	4.57	1.57	93.41	19.21	6.59
30	0.600 mm	4.05	1.39	92.02	23.26	7.98
40	0.425 mm	4.17	1.43	90.59	27.43	9.41
50	0.300 mm	2.91	1.00	89.59	30.34	10.41
100	0.150 mm	25.17	8.64	80.95	55.51	19.05
200	0.075 mm	28.91	9.92	71.04	84.42	28.96
	PAN	207.04	71.04	0.00	291.46	100.00
	Total Weight (gm)	291.46				



Gravel: 2.86 **Sand: 26.11** **Silt/Clay: 71.04** **D-50:**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Borehole No. **B 21**

Co-ordinate:

Depth (m): **3.00-3.45m**

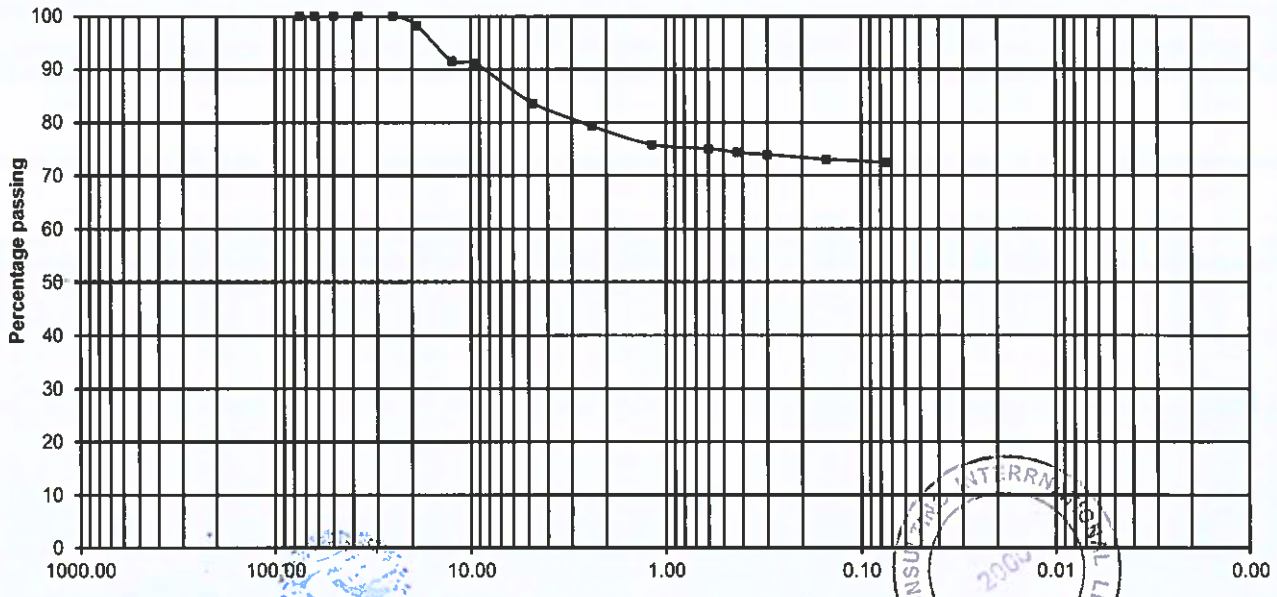
Date Testing: **2019/06/21**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	7.22	1.74	98.26	7.22	1.74
1/2"	12.50 mm	28.02	6.76	91.50	35.24	8.50
3/8"	9.50 mm	1.83	0.44	91.06	37.07	8.94
4	4.75 mm	31.03	7.49	83.57	68.10	16.43
8	2.360 mm	17.73	4.28	79.29	85.83	20.71
16	1.180 mm	14.73	3.55	75.74	100.56	24.26
30	0.600 mm	3.31	0.80	74.94	103.87	25.06
40	0.425 mm	2.78	0.67	74.27	106.65	25.73
50	0.300 mm	1.77	0.43	73.84	108.42	26.16
100	0.150 mm	3.46	0.83	73.01	111.88	26.99
200	0.075 mm	2.49	0.60	72.41	114.37	27.59
	PAN	300.10	72.41	0.00	414.47	100.00
	Total Weight (gm)	414.47				



Gravel: 16.43 **Sand: 11.16** **Silt/Clay: 72.41** **D-50:**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT Sample** Borehole No. **B 22**

Co-ordinate: Depth (m): **2.00-2.45m**

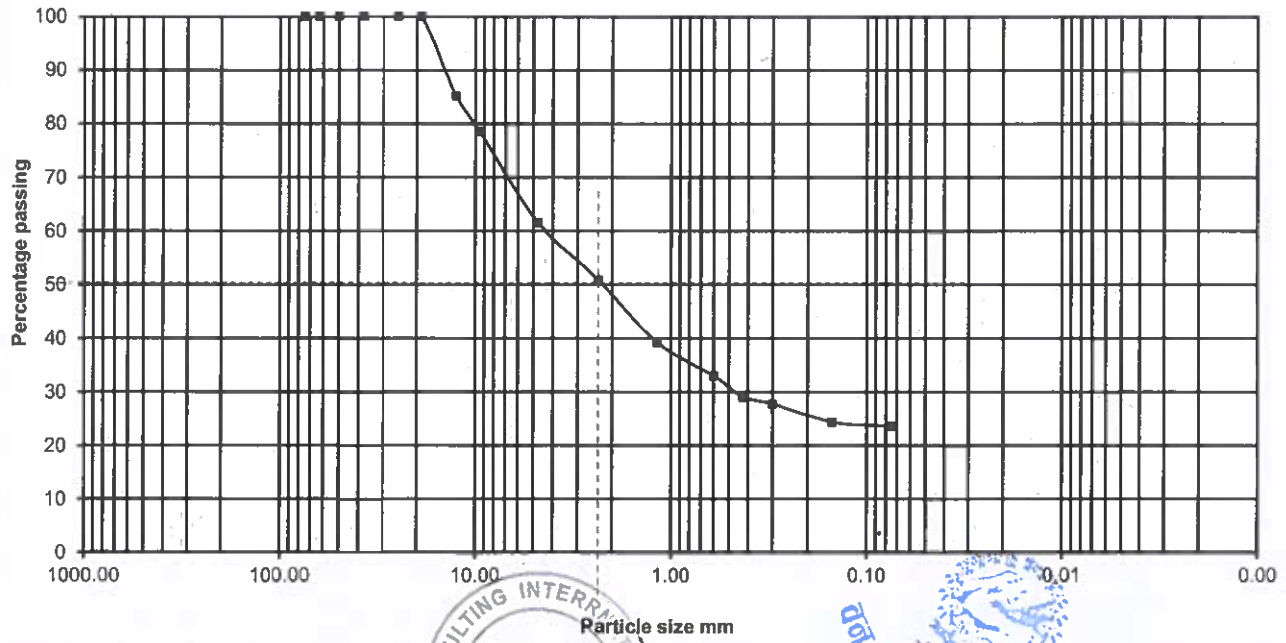
Date Testing: **2019/04/28**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	41.92	14.90	85.10	41.92	14.90
3/8"	9.50 mm	18.41	6.54	78.56	60.33	21.44
4	4.75 mm	47.77	16.98	61.58	108.10	38.42
8	2.360 mm	30.28	10.76	50.82	138.38	49.18
16	1.180 mm	32.60	11.59	39.24	170.98	60.76
30	0.600 mm	17.50	6.22	33.02	188.48	66.98
40	0.425 mm	11.13	3.96	29.06	199.61	70.94
50	0.300 mm	3.66	1.30	27.76	203.27	72.24
100	0.150 mm	9.51	3.38	24.38	212.78	75.62
200	0.075 mm	2.27	0.81	23.58	215.05	76.42
	PAN	66.34	23.58	0.00	281.39	100.00
	Total Weight (gm)	281.39				



Gravel: 38.42 **Sand: 38.01** **Silt/Clay: 23.58** **D-50: 2.30**

ICGS (P) LTD.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: SPT

Co-ordinate:

Borehole No. B 26

Depth (m): 3.00-3.45m

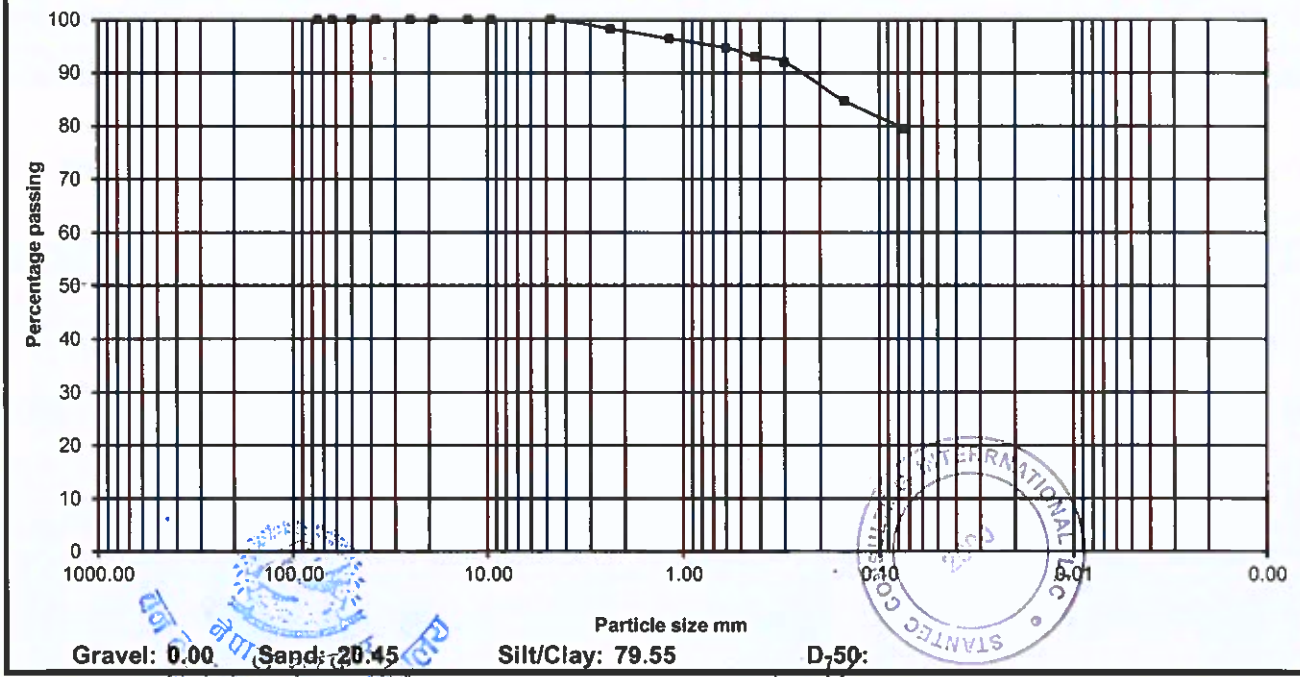
Date Testing: 2019/07/02

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	7.18	1.74	98.26	7.18	1.74
16	1.180 mm	7.24	1.75	96.50	14.42	3.50
30	0.600 mm	7.63	1.85	94.66	22.05	5.34
40	0.425 mm	7.19	1.74	92.91	29.24	7.09
50	0.300 mm	3.72	0.90	92.01	32.96	7.99
100	0.150 mm	30.33	7.35	84.66	63.29	15.34
200	0.075 mm	21.07	5.11	79.55	84.36	20.45
	PAN	328.21	79.55	0.00	412.57	100.00
	Total Weight (gm)	412.57				



Gravel: 0.00 Sand: 20.45 Silt/Clay: 79.55 D-50:

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 27**

Depth (m): **1.00-1.45m**

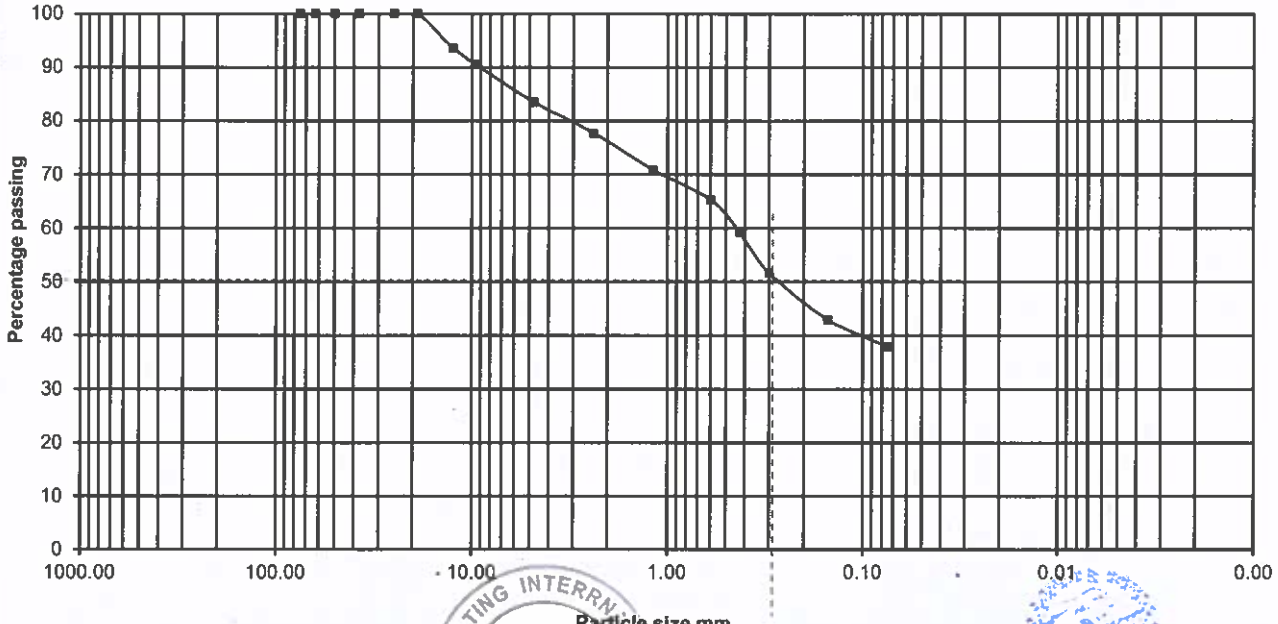
Date Testing: **2019/06/21**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	19.38	6.45	93.55	19.38	6.45
3/8"	9.50 mm	9.26	3.08	90.47	28.64	9.53
4	4.75 mm	21.21	7.05	83.42	49.85	16.58
8	2.360 mm	17.37	5.78	77.64	67.22	22.36
16	1.180 mm	20.65	6.87	70.78	87.87	29.22
30	0.600 mm	16.58	5.51	65.26	104.45	34.74
40	0.425 mm	18.16	6.04	59.22	122.61	40.78
50	0.300 mm	22.66	7.54	51.69	145.27	48.31
100	0.150 mm	26.36	8.77	42.92	171.63	57.08
200	0.075 mm	14.76	4.91	38.01	186.39	61.99
	PAN	114.29	38.01	0.00	300.68	100.00
	Total Weight (gm)	300.68				



Gravel: 16.58 **Sand: 45.41** **Silt/Clay: 38.01** **D-50: 0.29**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

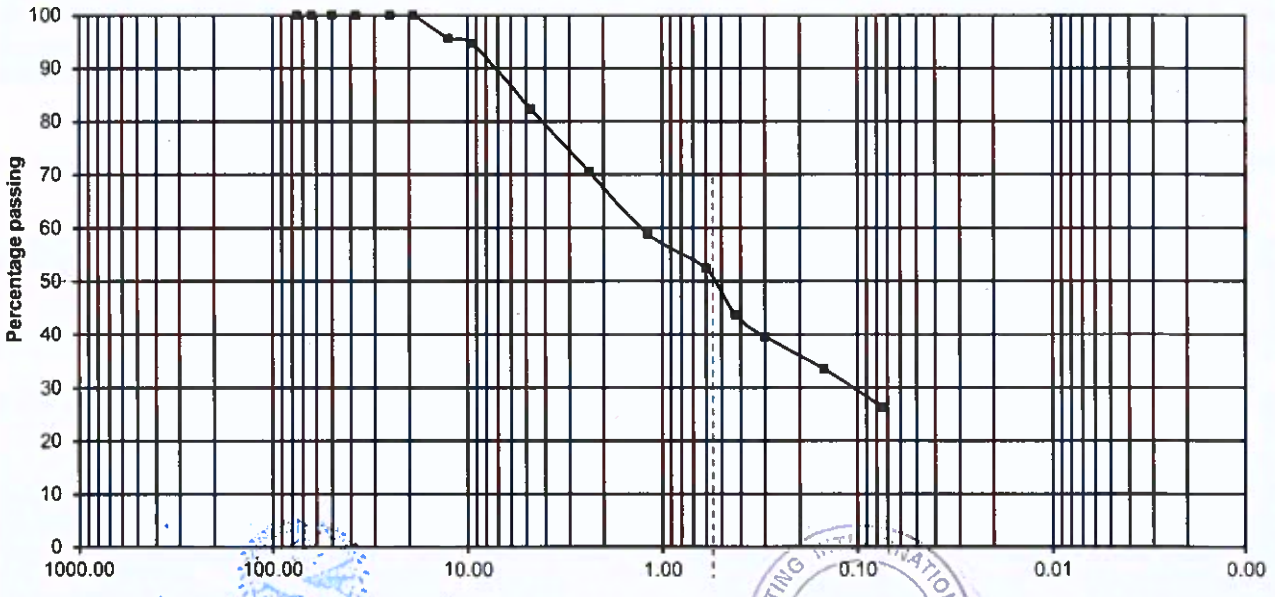
Location: Date Testing: 2019/05/26

Source: SPT Borehole No. B 28 Tested By: Pranita Pun

Co-ordinate: Depth (m): 4.00-4.45m Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	13.23	4.43	95.57	13.23	4.43
3/8"	9.50 mm	2.89	0.97	94.61	16.12	5.39
4	4.75 mm	36.53	12.22	82.39	52.65	17.61
8	2.360 mm	35.80	11.98	70.41	88.45	29.59
16	1.180 mm	34.71	11.61	58.80	123.16	41.20
30	0.600 mm	19.36	6.48	52.32	142.52	47.68
40	0.425 mm	25.84	8.64	43.68	168.36	56.32
50	0.300 mm	12.37	4.14	39.54	180.73	60.46
100	0.150 mm	18.05	6.04	33.50	198.78	66.50
200	0.075 mm	21.23	7.10	26.40	220.01	73.60
	PAN	78.92	26.40	0.00	298.93	100.00
	Total Weight (gm)	298.93				



Gravel: 17.61 Sand: 55.99 Silt/Clay: 26.40 D-50: 0.55

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Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: SPT

Co-ordinate:

Borehole No. B 29

Depth (m): 3.00-3.45m

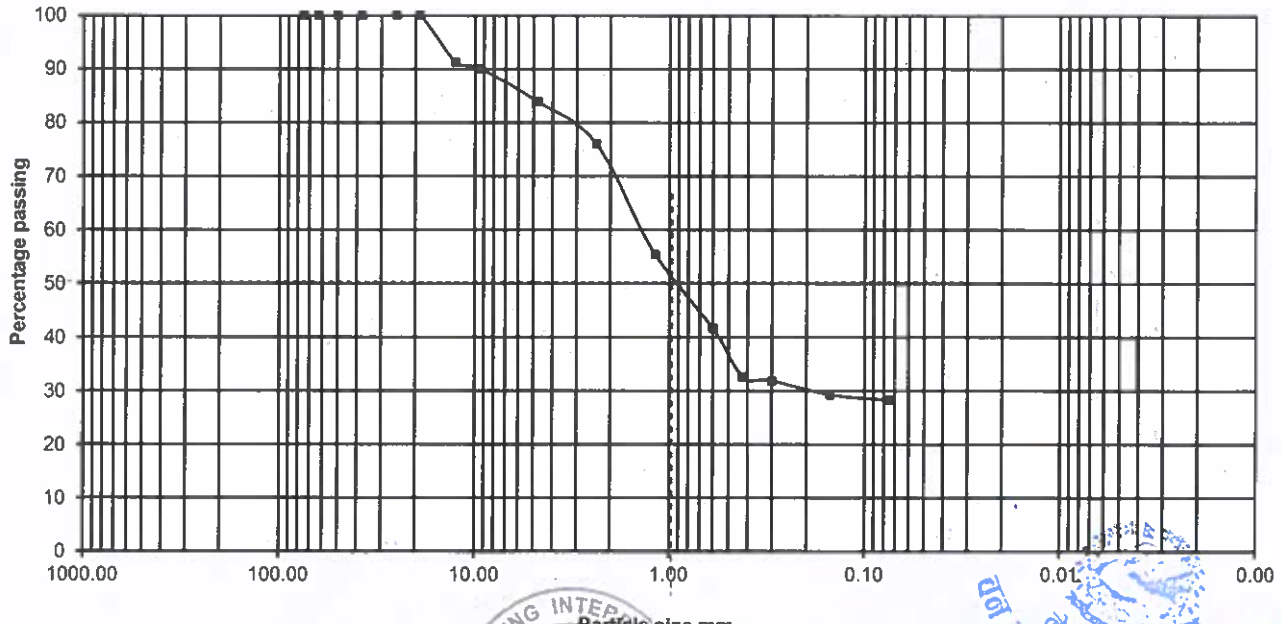
Date Testing: 2019/06/21

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	33.54	8.74	91.26	33.54	8.74
3/8"	9.50 mm	4.57	1.19	90.07	38.11	9.93
4	4.75 mm	23.75	6.19	83.88	61.86	16.12
8	2.360 mm	30.60	7.97	75.91	92.46	24.09
16	1.180 mm	78.48	20.45	55.46	170.94	44.54
30	0.600 mm	53.09	13.83	41.63	224.03	58.37
40	0.425 mm	34.62	9.02	32.61	258.65	67.39
50	0.300 mm	2.97	0.77	31.84	261.62	68.16
100	0.150 mm	9.81	2.56	29.28	271.43	70.72
200	0.075 mm	3.79	0.99	28.29	275.22	71.71
	PAN	108.59	28.29	0.00	383.81	100.00
	Total Weight (gm)	383.81				



Gravel: 16.12 Sand: 55.59 Silt/Clay: 28.29 D-50: 0.950

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 31**

Depth (m): **3.00-3.45m**

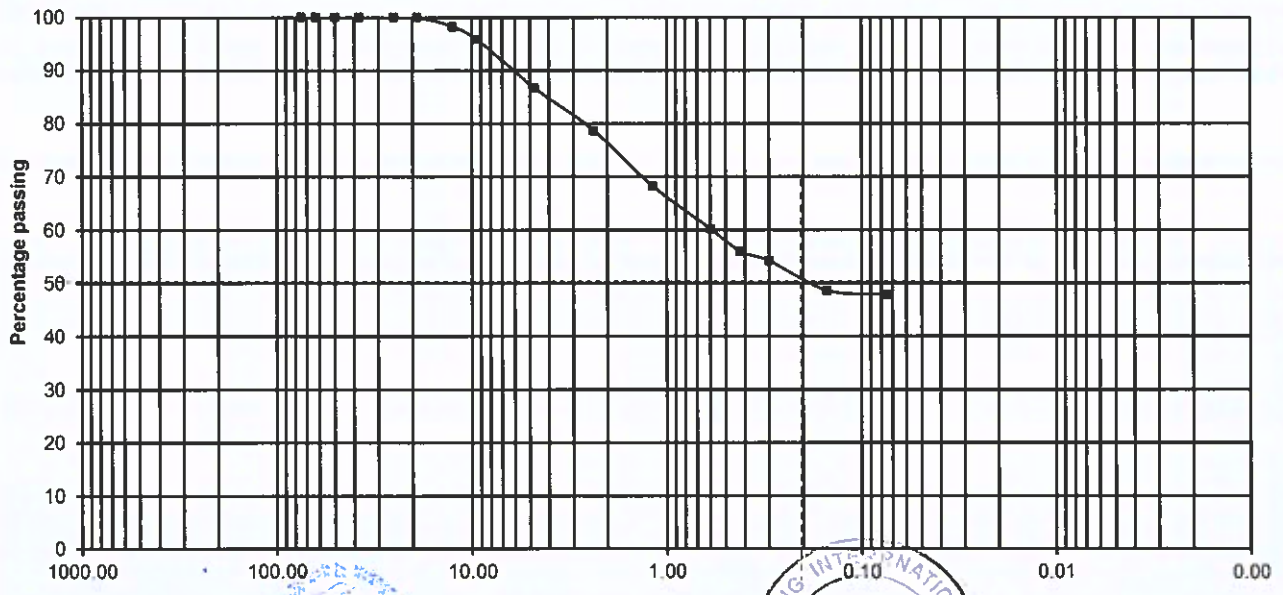
Date Testing: **2019/06/21**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	5.68	1.72	98.28	5.68	1.72
3/8"	9.50 mm	7.93	2.40	95.88	13.61	4.12
4	4.75 mm	30.33	9.17	86.71	43.94	13.29
8	2.360 mm	26.81	8.11	78.60	70.75	21.40
16	1.180 mm	34.52	10.44	68.16	105.27	31.84
30	0.600 mm	26.35	7.97	60.19	131.62	39.81
40	0.425 mm	14.29	4.32	55.87	145.91	44.13
50	0.300 mm	5.66	1.71	54.15	151.57	45.85
100	0.150 mm	18.40	5.57	48.59	169.97	51.41
200	0.075 mm	2.63	0.80	47.79	172.60	52.21
	PAN	158.00	47.79	0.00	330.60	100.00
	Total Weight (gm)	330.60				



Gravel: 13.29 **Sand: 38.92** **Silt/Clay: 47.79** **D-50: 0.20**

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 34**

Depth (m): **3.00-3.45m**

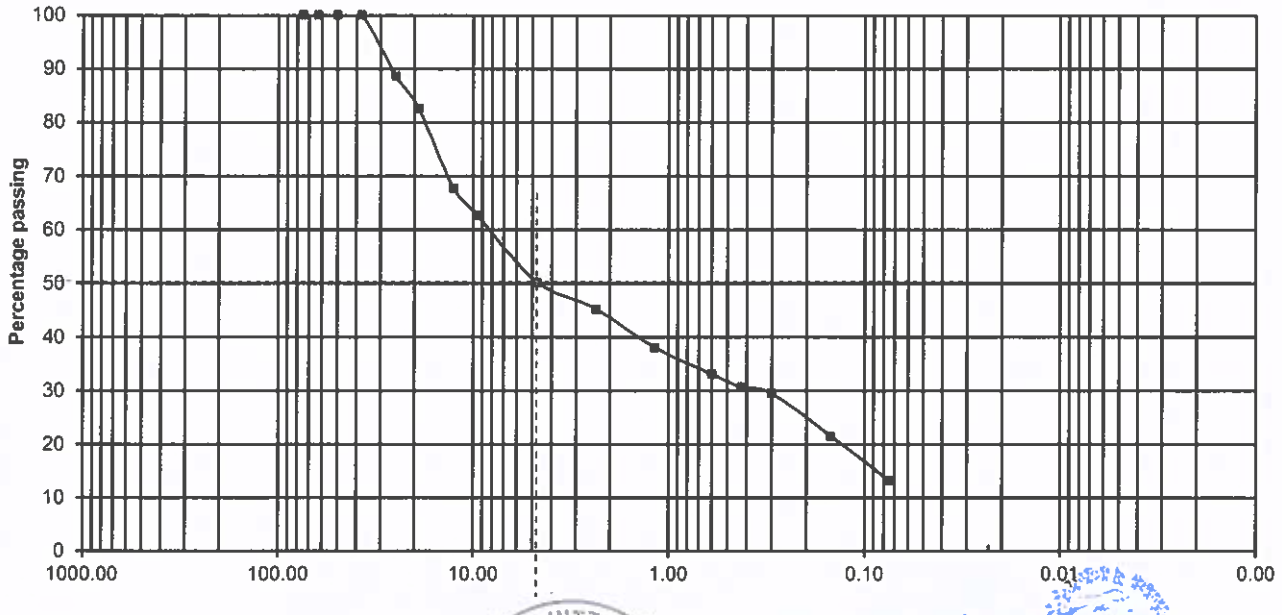
Date Testing: **2019/06/21**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	37.69	11.32	88.68	37.69	11.32
3/4"	19.00 mm	20.39	6.12	82.56	58.08	17.44
1/2"	12.50 mm	49.38	14.83	67.73	107.46	32.27
3/8"	9.50 mm	17.16	5.15	62.58	124.62	37.42
4	4.75 mm	41.21	12.37	50.20	165.83	49.80
8	2.360 mm	16.70	5.01	45.19	182.53	54.81
16	1.180 mm	23.65	7.10	38.09	206.18	61.91
30	0.600 mm	16.58	4.98	33.11	222.76	66.89
40	0.425 mm	8.16	2.45	30.66	230.92	69.34
50	0.300 mm	3.79	1.14	29.52	234.71	70.48
100	0.150 mm	26.36	7.92	21.61	261.07	78.39
200	0.075 mm	27.66	8.31	13.30	288.73	86.70
	PAN	44.29	13.30	0.00	333.02	100.00
	Total Weight (gm)	333.02				



Gravel: 49.80 **Sand: 36.90** **Silt/Clay: 13.30** **D-50: 4.90**

STANTEC CONSULTING INTERNATIONAL LLC 2000

नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS (P) LTD.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 35**

Depth (m): **3.00-3.45m**

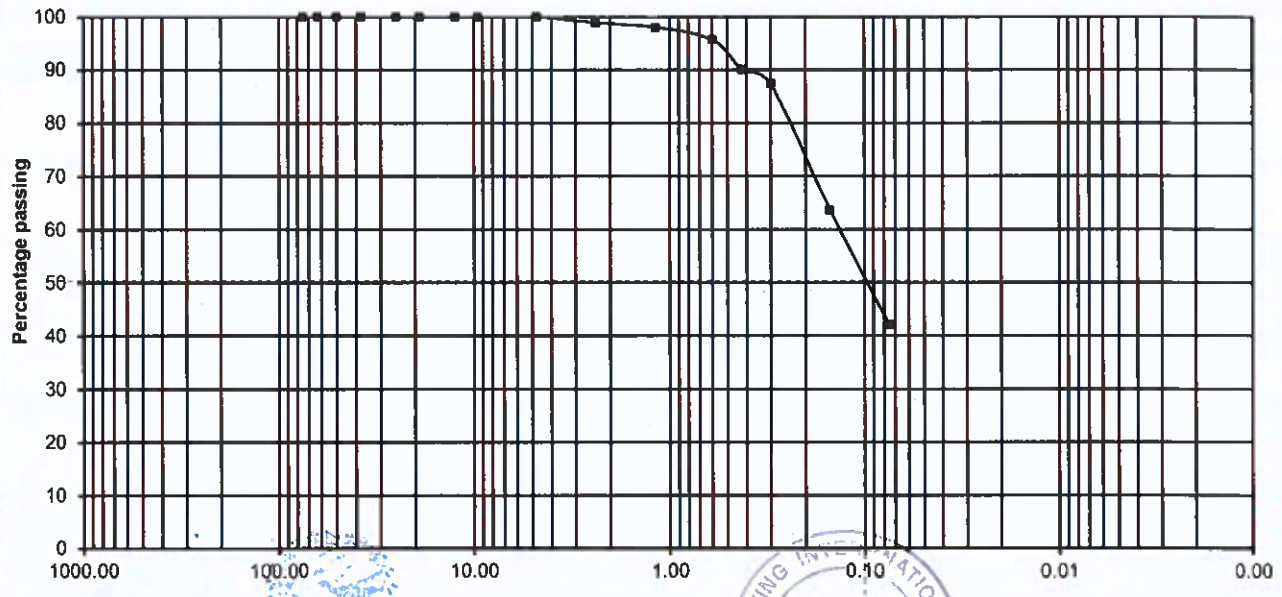
Date Testing: **2019/06/21**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	5.48	1.17	98.83	5.48	1.17
16	1.180 mm	4.02	0.86	97.98	9.50	2.02
30	0.600 mm	10.81	2.30	95.68	20.31	4.32
40	0.425 mm	26.18	5.57	90.10	46.49	9.90
50	0.300 mm	12.77	2.72	87.39	59.26	12.61
100	0.150 mm	111.77	23.79	63.60	171.03	36.40
200	0.075 mm	100.67	21.43	42.17	271.70	57.83
	PAN	198.11	42.17	0.00	**469.81**	100.00
	Total Weight (gm)	**469.81**				



Gravel: 0.00 **Sand: 57.83** **Silt/Clay: 42.17** **D-50: 0.10**

ICGS (P) LTD.

New-Baneswor, Kathmandu, Nepal
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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 37**

Depth (m): **3.00-3.45m**

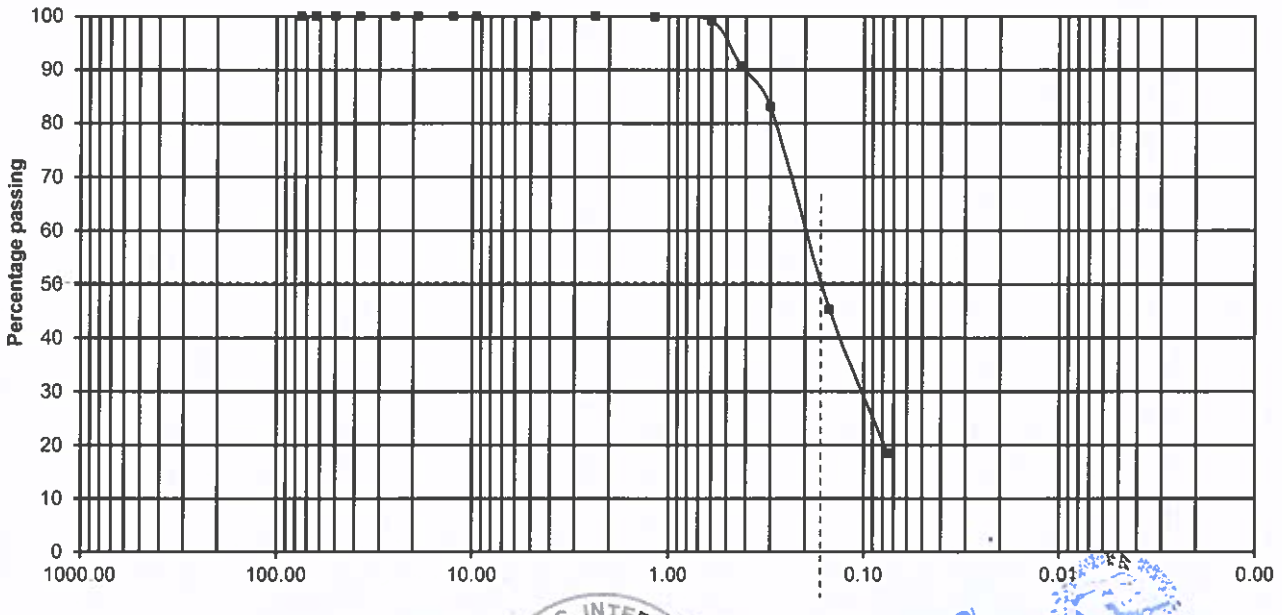
Date Testing: **2019/07/02**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	0.00	0.00	100.00	0.00	0.00
16	1.180 mm	0.07	0.02	99.98	0.07	0.02
30	0.600 mm	2.59	0.87	99.11	2.66	0.89
40	0.425 mm	25.19	8.42	90.70	27.85	9.30
50	0.300 mm	22.58	7.54	83.15	50.43	16.85
100	0.150 mm	113.30	37.85	45.30	163.73	54.70
200	0.075 mm	80.06	26.75	18.55	243.79	81.45
	PAN	55.52	18.55	0.00	299.31	100.00
	Total Weight (gm)	299.31				



Gravel: 0.00 **Sand: 81.45** **Silt/Clay: 18.55** **D-50: 0.107**

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Borehole No. **B 38**

Co-ordinate:

Depth (m): **3.00-3.45m**

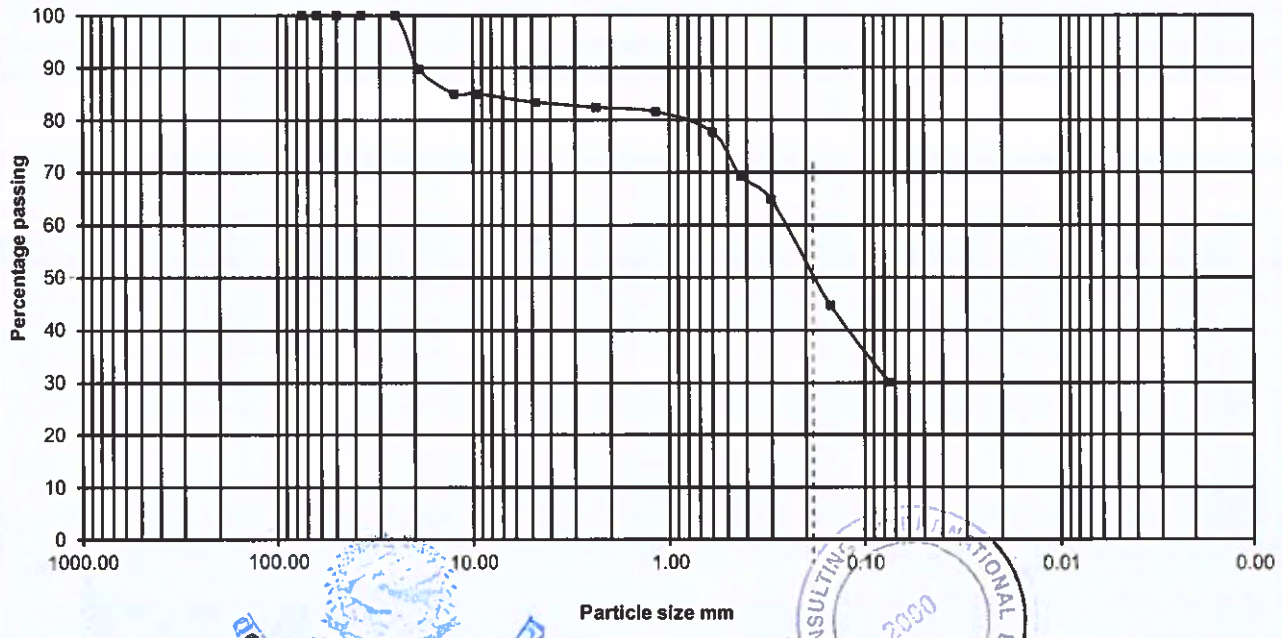
Date Testing: **2019/07/02**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	25.15	10.23	89.77	25.15	10.23
1/2"	12.50 mm	11.74	4.78	84.99	36.89	15.01
3/8"	9.50 mm	0.00	0.00	84.99	36.89	15.01
4	4.75 mm	4.05	1.65	83.35	40.94	16.65
8	2.360 mm	2.35	0.96	82.39	43.29	17.61
16	1.180 mm	1.94	0.79	81.60	45.23	18.40
30	0.600 mm	9.69	3.94	77.66	54.92	22.34
40	0.425 mm	20.92	8.51	69.15	75.84	30.85
50	0.300 mm	10.74	4.37	64.78	86.58	35.22
100	0.150 mm	49.32	20.06	44.72	135.90	55.28
200	0.075 mm	36.20	14.73	29.99	172.10	70.01
	PAN	73.72	29.99	0.00	**245.82**	100.00
	Total Weight (gm)	**245.82**				



Gravel: 16.65 **Sand: 53.36** **Silt/Clay: 29.99** **D-50: 0.109**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 39**

Depth (m): **3.00-3.45m**

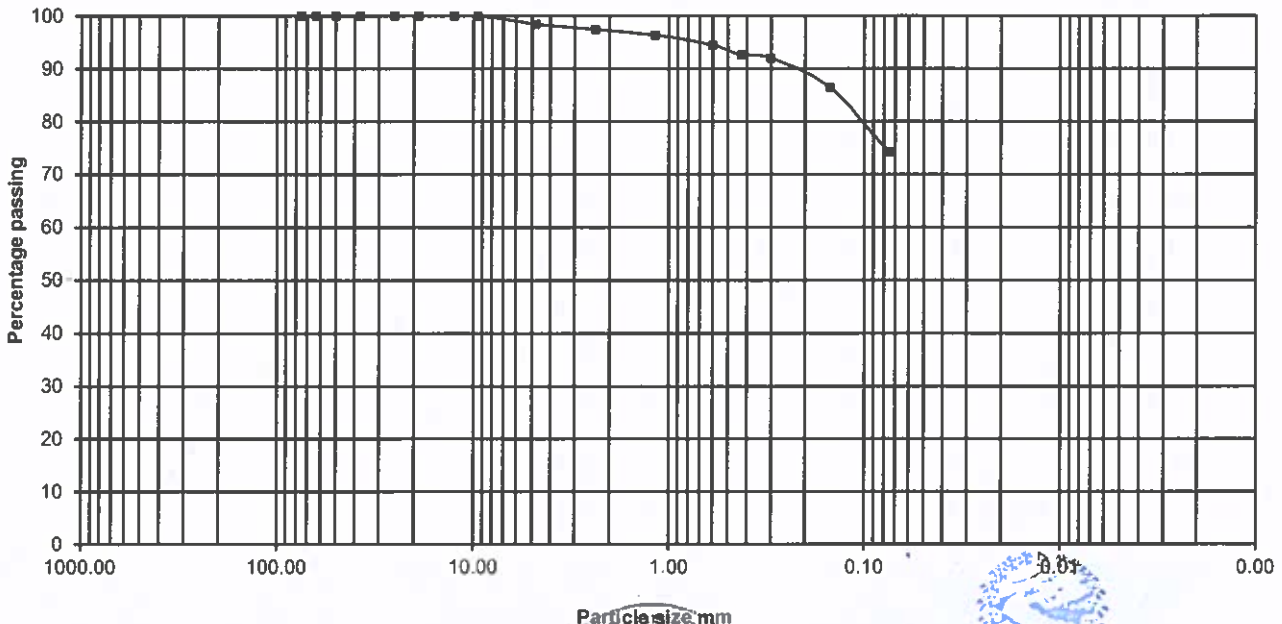
Date Testing: **2019/07/02**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	4.67	1.57	98.43	4.67	1.57
8	2.360 mm	3.04	1.02	97.40	7.71	2.60
16	1.180 mm	3.25	1.09	96.31	10.96	3.69
30	0.600 mm	5.81	1.96	94.35	16.77	5.65
40	0.425 mm	5.39	1.81	92.54	22.16	7.46
50	0.300 mm	1.70	0.57	91.97	23.86	8.03
100	0.150 mm	16.46	5.54	86.43	40.32	13.57
200	0.075 mm	36.61	12.32	74.10	76.93	25.90
	PAN	220.14	74.10	0.00	297.07	100.00
	Total Weight (gm)	297.07				



Gravel: 1.57 **Sand: 24.32** **Silt/Clay: 74.10** **D-50:**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: SPT

Borehole No. B 40

Co-ordinate:

Depth (m): 2.00-2.45m

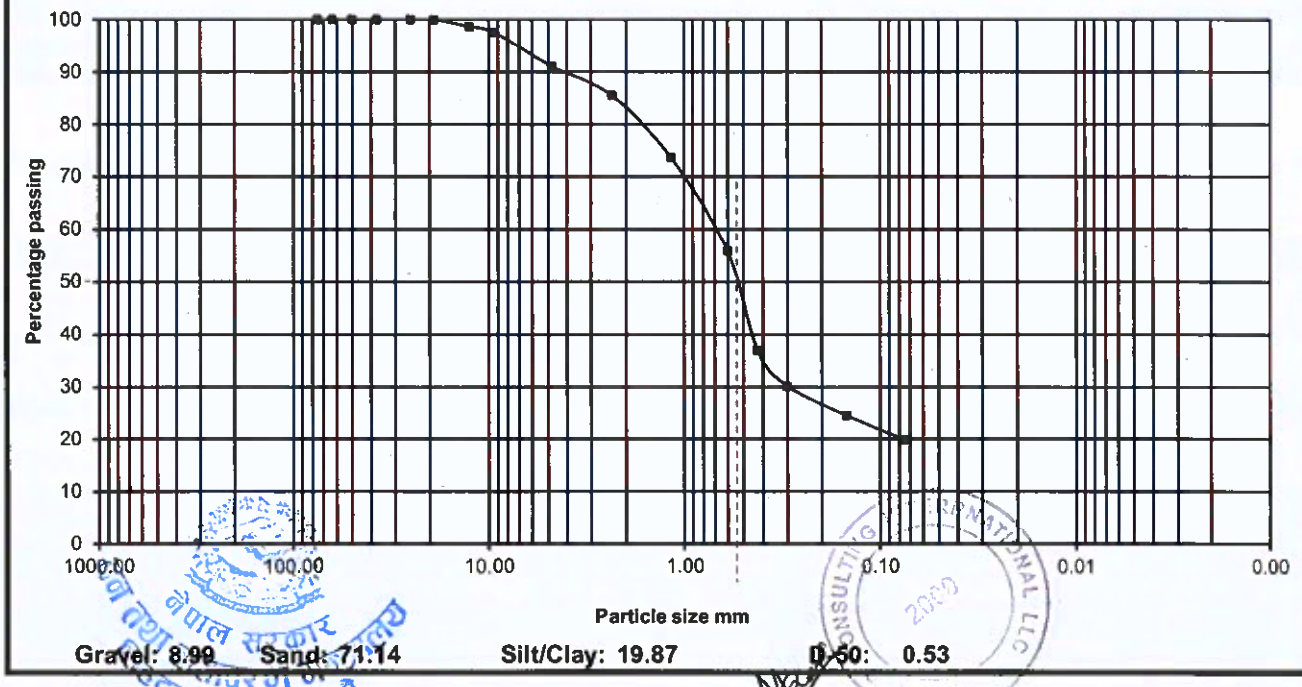
Date Testing: 2019/05/31

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	4.09	1.38	98.62	4.09	1.38
3/8"	9.50 mm	3.15	1.07	97.55	7.24	2.45
4	4.75 mm	19.35	6.54	91.01	26.59	8.99
8	2.360 mm	16.23	5.49	85.52	42.82	14.48
16	1.180 mm	35.10	11.87	73.65	77.92	26.35
30	0.600 mm	52.68	17.82	55.83	130.60	44.17
40	0.425 mm	56.15	18.99	36.84	186.75	63.16
50	0.300 mm	20.09	6.79	30.05	206.84	69.95
100	0.150 mm	16.16	5.47	24.58	223.00	75.42
200	0.075 mm	13.94	4.71	19.87	236.94	80.13
	PAN	58.74	19.87	0.00	295.68	100.00
	Total Weight (gm)	295.68				



Gravel: 8.99 Sand: 71.14 Silt/Clay: 19.87 D-50: 0.53

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: SPT

Co-ordinate:

Borehole No. B 41

Depth (m): 3.00-3.45m

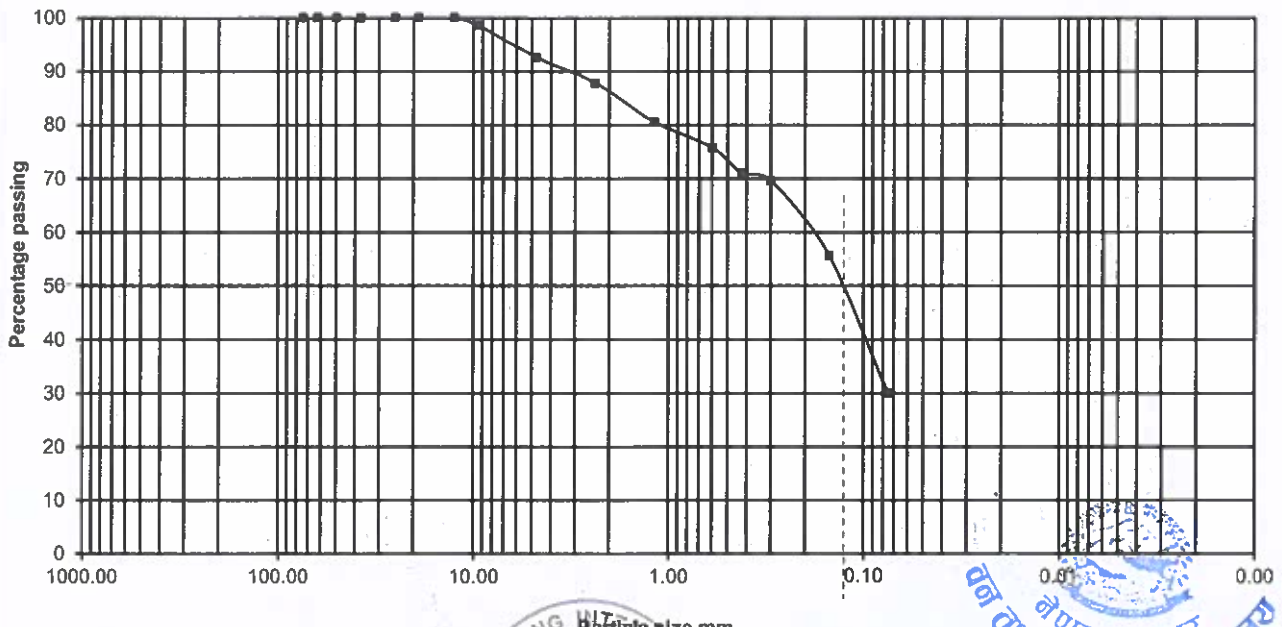
Date Testing: 2019/07/02

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	4.29	1.44	98.56	4.29	1.44
4	4.75 mm	17.71	5.96	92.60	22.00	7.40
8	2.360 mm	14.31	4.82	87.78	36.31	12.22
16	1.180 mm	21.57	7.26	80.52	57.88	19.48
30	0.600 mm	14.21	4.78	75.74	72.09	24.26
40	0.425 mm	14.10	4.74	71.00	86.19	29.00
50	0.300 mm	4.26	1.43	69.56	90.45	30.44
100	0.150 mm	41.45	13.95	55.61	131.90	44.39
200	0.075 mm	75.86	25.53	30.08	207.76	69.92
	PAN	89.40	30.08	0.00	297.16	100.00
	Total Weight (gm)	297.16				



Gravel: 7.40 **Sand: 62.51** **Silt/Clay: 30.08** **D-50: 0.103**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 44**

Depth (m): **3.00-3.45m**

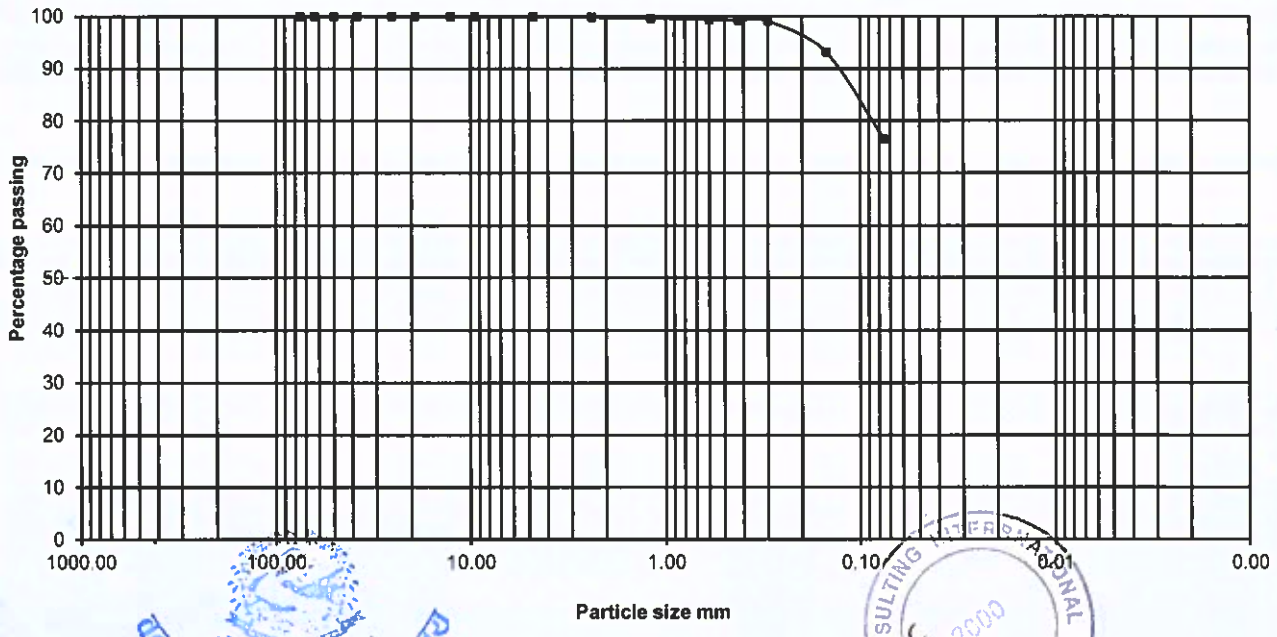
Date Testing: **2019/07/02**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	0.60	0.14	99.86	0.60	0.14
16	1.180 mm	1.02	0.24	99.62	1.62	0.38
30	0.600 mm	1.04	0.24	99.38	2.66	0.62
40	0.425 mm	0.70	0.16	99.22	3.36	0.78
50	0.300 mm	0.59	0.14	99.08	3.95	0.92
100	0.150 mm	25.60	5.93	93.15	29.55	6.85
200	0.075 mm	71.80	16.64	76.51	101.35	23.49
	PAN	330.10	76.51	0.00	431.45	100.00
	Total Weight (gm)	431.45				



Gravel: 0.00 **Sand: 23.49** **Silt/Clay: 76.51** **D-50:**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Borehole No. **B 49**

Co-ordinate:

Depth (m): **3.00-3.45m**

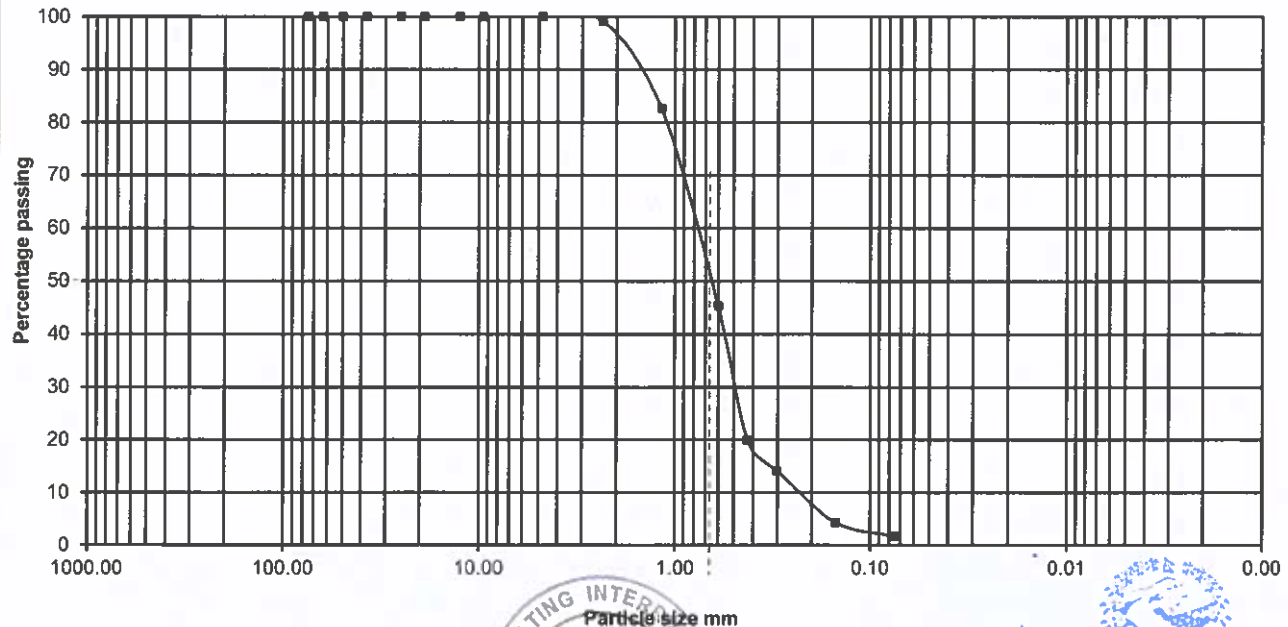
Date Testing: **2019/07/01**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.16	0.05	99.95	0.16	0.05
8	2.360 mm	2.41	0.81	99.14	2.57	0.86
16	1.180 mm	49.14	16.43	82.71	51.71	17.29
30	0.600 mm	111.87	37.40	45.31	163.58	54.69
40	0.425 mm	75.92	25.38	19.92	239.50	80.08
50	0.300 mm	17.60	5.88	14.04	257.10	85.96
100	0.150 mm	29.14	9.74	4.30	286.24	95.70
200	0.075 mm	7.71	2.58	1.72	293.95	98.28
	PAN	5.14	1.72	0.00	299.09	100.00
	Total Weight (gm)	299.09				



Gravel: 0.05 **Sand: 98.23** **Silt/Clay: 1.72** **D-50: 0.650**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: SPT

Co-ordinate:

Borehole No. B 52

Depth (m): 2.00-2.45m

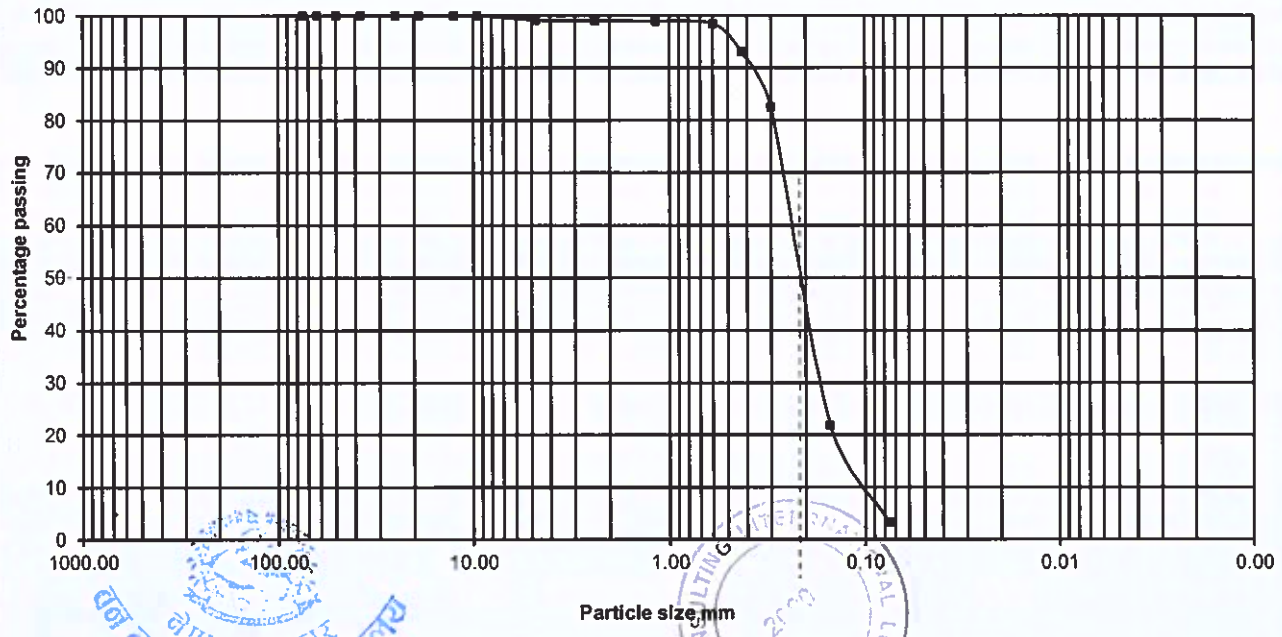
Date Testing: 2019/06/11

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	2.64	0.89	99.11	2.64	0.89
8	2.360 mm	0.42	0.14	98.97	3.06	1.03
16	1.180 mm	0.13	0.04	98.93	3.19	1.07
30	0.600 mm	1.54	0.52	98.41	4.73	1.59
40	0.425 mm	16.20	5.43	92.98	20.93	7.02
50	0.300 mm	31.28	10.49	82.49	52.21	17.51
100	0.150 mm	180.88	60.65	21.84	233.09	78.16
200	0.075 mm	55.10	18.48	3.37	288.19	96.63
	PAN	10.04	3.37	0.00	298.23	100.00
	Total Weight (gm)	298.23				



Gravel: 0.89 Sand: 95.75 Silt/Clay: 3.37 D-50: 0.205

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 54**

Depth (m): **3.00-3.45m**

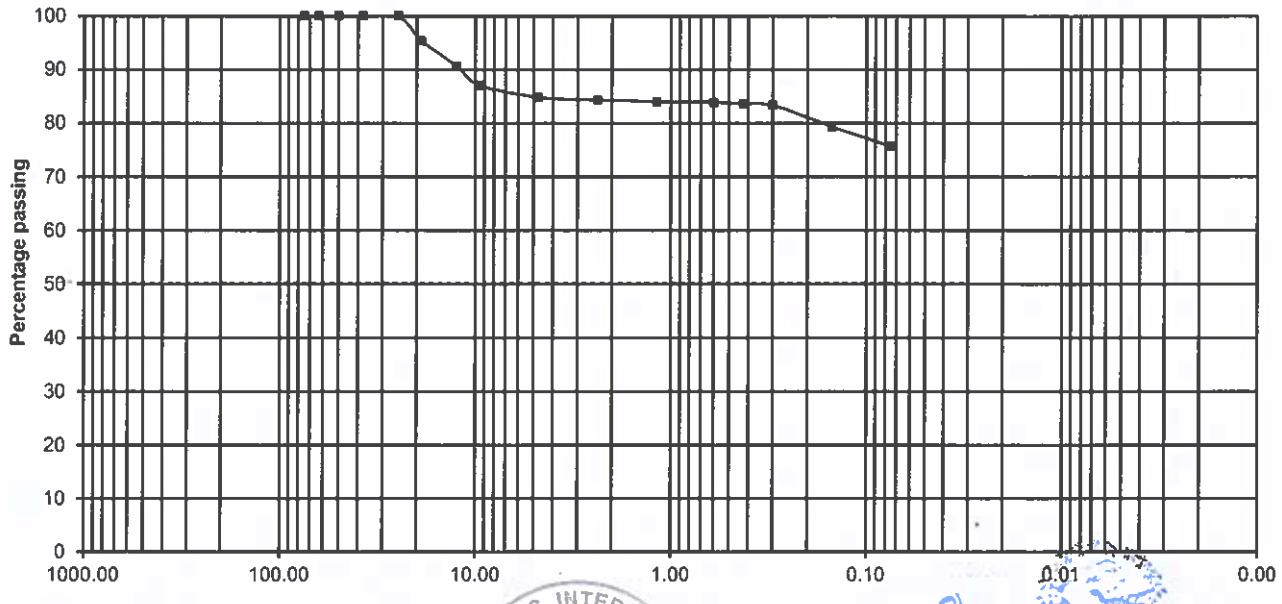
Date Testing: **2019/04/28**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	31.73	4.56	95.44	31.73	4.56
1/2"	12.50 mm	32.82	4.72	90.72	64.55	9.28
3/8"	9.50 mm	25.71	3.69	87.03	90.26	12.97
4	4.75 mm	15.45	2.22	84.81	105.71	15.19
8	2.360 mm	3.63	0.52	84.29	109.34	15.71
16	1.180 mm	2.18	0.31	83.97	111.52	16.03
30	0.600 mm	1.12	0.16	83.81	112.64	16.19
40	0.425 mm	1.74	0.25	83.56	114.38	16.44
50	0.300 mm	1.99	0.29	83.28	116.37	16.72
100	0.150 mm	27.85	4.00	79.27	144.22	20.73
200	0.075 mm	25.65	3.69	75.59	169.87	24.41
	PAN	526.00	75.59	0.00	**695.87**	100.00
	Total Weight (gm)	**695.87**				



Gravel: 15.19 **Sand: 9.22** **Silt/Clay: 75.59** **D-50:**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 55**

Depth (m): **3.00-3.45m**

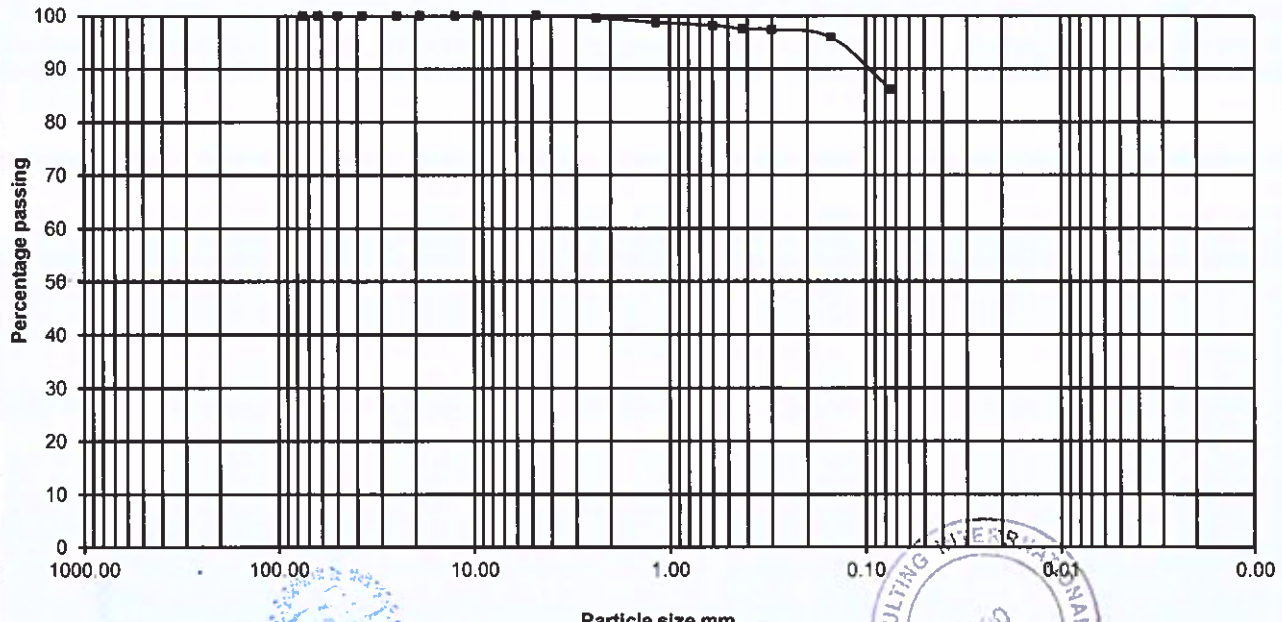
Date Testing: **2019/06/21**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	1.21	0.41	99.59	1.21	0.41
16	1.180 mm	2.51	0.85	98.74	3.72	1.26
30	0.600 mm	1.79	0.61	98.13	5.51	1.87
40	0.425 mm	1.63	0.55	97.57	7.14	2.43
50	0.300 mm	0.62	0.21	97.36	7.76	2.64
100	0.150 mm	4.27	1.45	95.91	12.03	4.09
200	0.075 mm	28.75	9.77	86.14	40.78	13.86
	PAN	253.49	86.14	0.00	**294.27**	100.00
	Total Weight (gm)	**294.27**				



Gravel: 0.00 **Sand: 13.86** **Silt/Clay: 86.14** **D-50:**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT Sample**

Co-ordinate:

Borehole No. **B 56**

Depth (m): **3.00-3.45m**

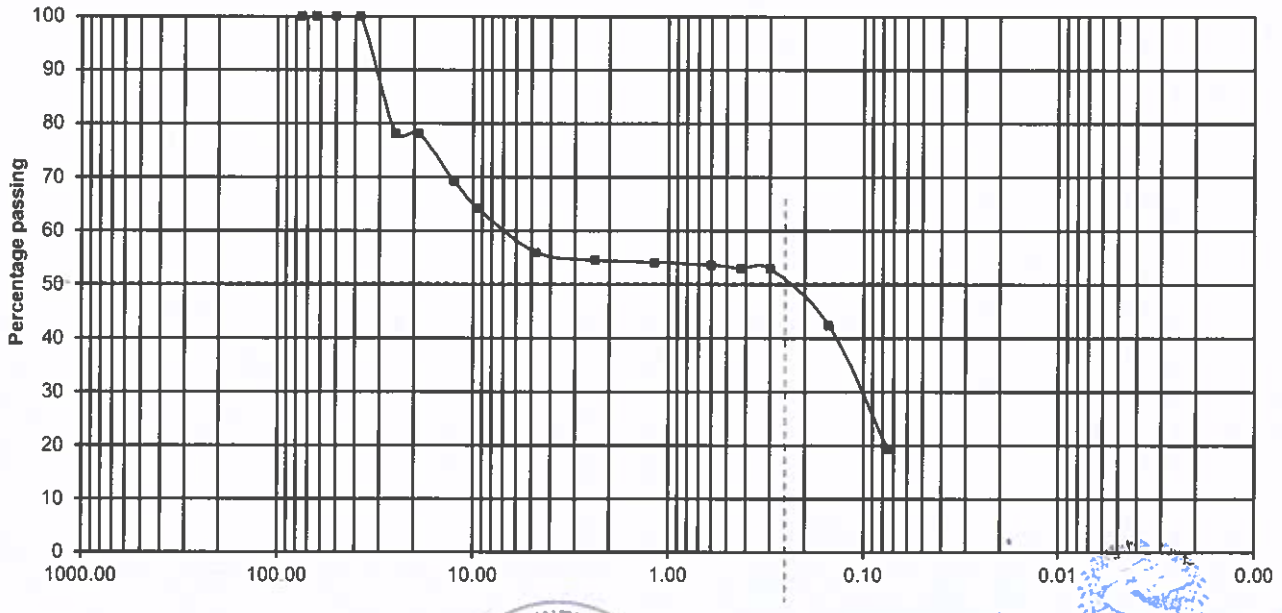
Date Testing: **2019/06/28**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	52.91	21.84	78.16	52.91	21.84
3/4"	19.00 mm	0.00	0.00	78.16	52.91	21.84
1/2"	12.50 mm	21.61	8.92	69.23	74.52	30.77
3/8"	9.50 mm	12.25	5.06	64.18	86.77	35.82
4	4.75 mm	19.91	8.22	55.96	106.68	44.04
8	2.360 mm	3.53	1.46	54.50	110.21	45.50
16	1.180 mm	1.03	0.43	54.07	111.24	45.93
30	0.600 mm	1.23	0.51	53.57	112.47	46.43
40	0.425 mm	1.31	0.54	53.02	113.78	46.98
50	0.300 mm	0.21	0.09	52.94	113.99	47.06
100	0.150 mm	25.55	10.55	42.39	139.54	57.61
200	0.075 mm	55.67	22.98	19.40	195.21	80.60
	PAN	47.00	19.40	0.00	242.21	100.00
	Total Weight (gm)	242.21				



Gravel: 44.04 **Sand: 36.55** **Silt/Clay: 19.40** **D-50: 0.25**

ICGS (P) LTD.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: SPT

Borehole No. B 57

Co-ordinate:

Depth (m): 5.00-5.45m

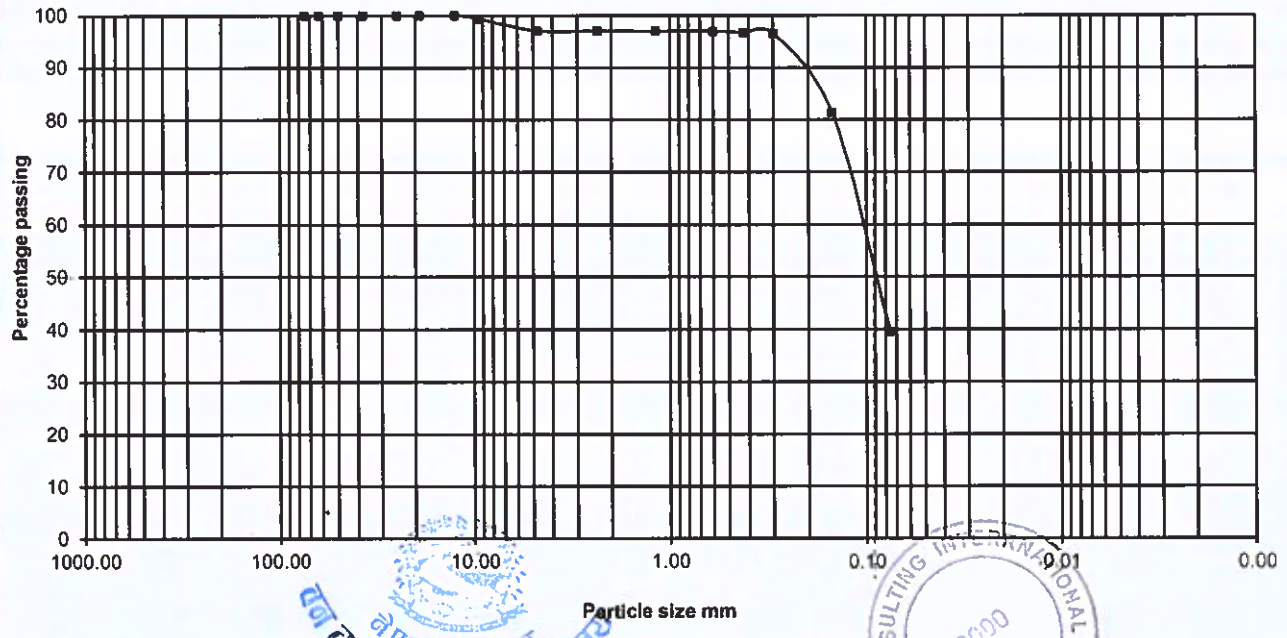
Date Testing: 2019/07/02

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	1.92	0.60	99.40	1.92	0.60
4	4.75 mm	7.58	2.39	97.01	9.50	2.99
8	2.360 mm	0.04	0.01	97.00	9.54	3.00
16	1.180 mm	0.05	0.02	96.98	9.59	3.02
30	0.600 mm	0.06	0.02	96.96	9.65	3.04
40	0.425 mm	0.69	0.22	96.74	10.34	3.26
50	0.300 mm	0.72	0.23	96.52	11.06	3.48
100	0.150 mm	48.07	15.14	81.38	59.13	18.62
200	0.075 mm	133.13	41.92	39.46	192.26	60.54
	PAN	125.34	39.46	0.00	317.60	100.00
	Total Weight (gm)	317.60				



Gravel: 2.99 Sand: 57.54 Silt/Clay: 39.46 D-50: 0.090

ICGS (P) LTD.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **SPT**

Co-ordinate:

Borehole No. **B 58**

Depth (m): **3.00-3.45m**

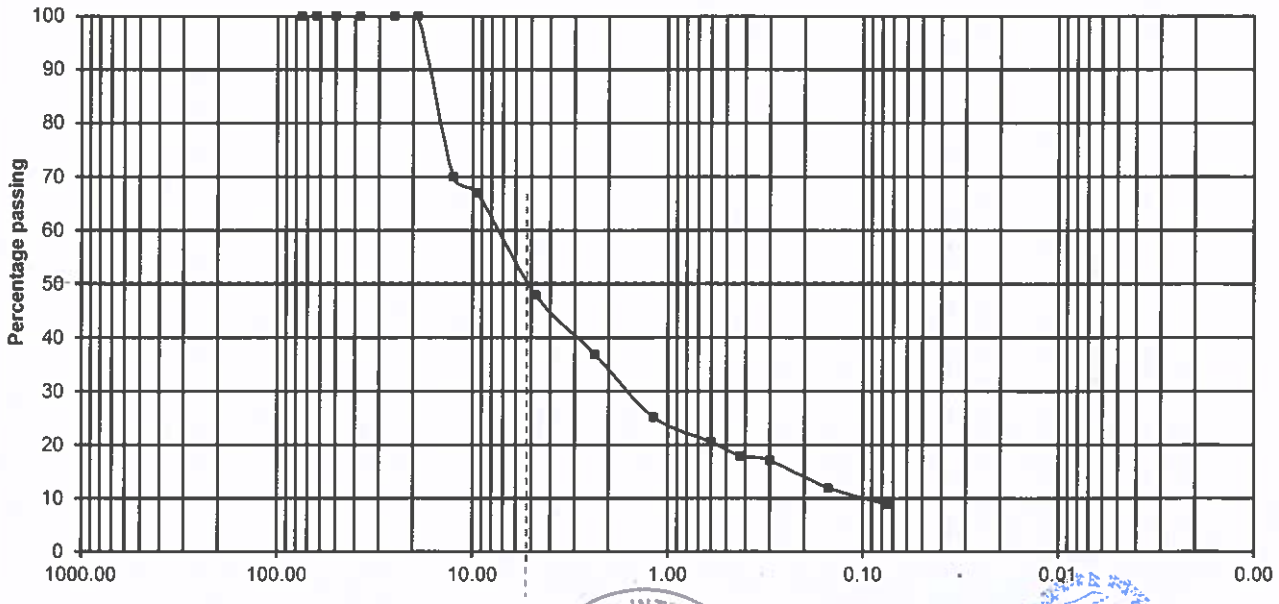
Date Testing: **2019/06/21**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	53.22	30.02	69.98	53.22	30.02
3/8"	9.50 mm	5.36	3.02	66.95	58.58	33.05
4	4.75 mm	33.69	19.01	47.95	92.27	52.05
8	2.360 mm	19.65	11.09	36.86	111.92	63.14
16	1.180 mm	20.63	11.64	25.22	132.55	74.78
30	0.600 mm	8.30	4.68	20.54	140.85	79.46
40	0.425 mm	4.64	2.62	17.92	145.49	82.08
50	0.300 mm	1.49	0.84	17.08	146.98	82.92
100	0.150 mm	9.15	5.16	11.92	156.13	88.08
200	0.075 mm	5.36	3.02	8.90	161.49	91.10
	PAN	15.77	8.90	0.00	177.26	100.00
	Total Weight (gm)	177.26				



Gravel: 52.05 **Sand: 39.05** **Silt/Clay: 8.90** **D-50: 5.10**

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नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 1**

Co-ordinate: Depth (m): **3.50-4.50m**

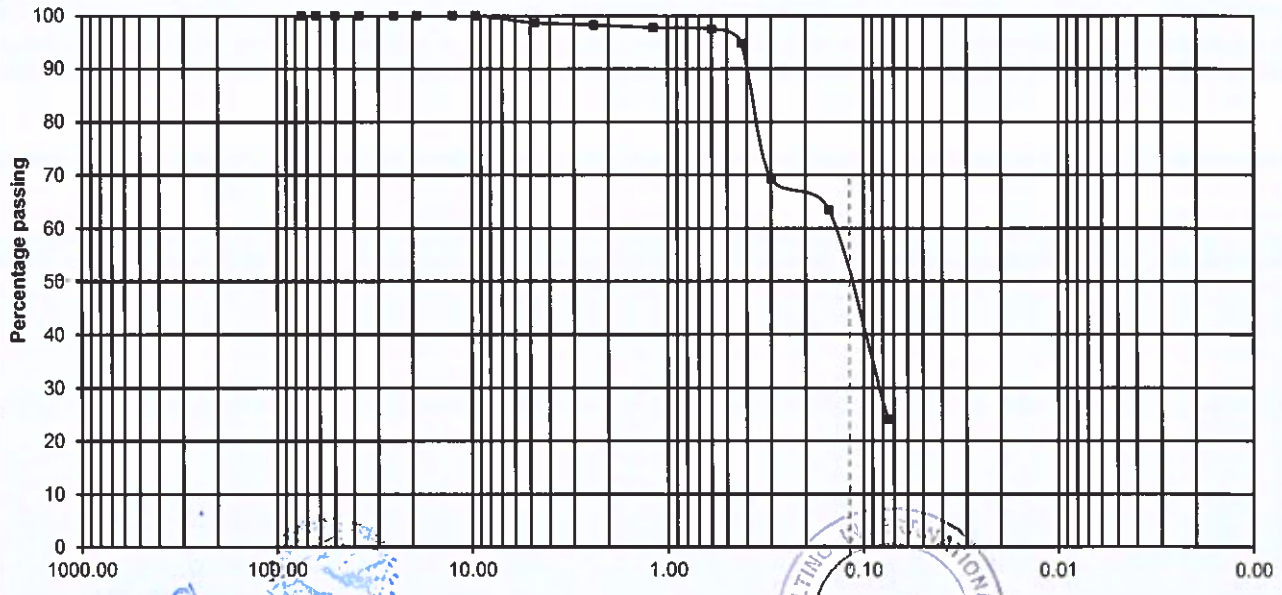
Date Testing: **2075/12/22**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	8.41	1.31	98.69	8.41	1.31
8	2.360 mm	2.89	0.45	98.23	11.30	1.77
16	1.180 mm	3.10	0.48	97.75	14.40	2.25
30	0.600 mm	1.90	0.30	97.45	16.30	2.55
40	0.425 mm	16.75	2.62	94.84	33.05	5.16
50	0.300 mm	163.51	25.55	69.29	196.56	30.71
100	0.150 mm	38.18	5.97	63.32	234.74	36.68
200	0.075 mm	250.69	39.17	24.16	485.43	75.84
	PAN	154.62	24.16	0.00	**640.05**	100.00
	Total Weight (gm)	**640.05**				



Gravel: 1.31 **Sand: 74.53** **Silt/Clay: 24.16** **D-50: 0.125**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 2**

Co-ordinate: Depth (m): **3.50-4.50m**

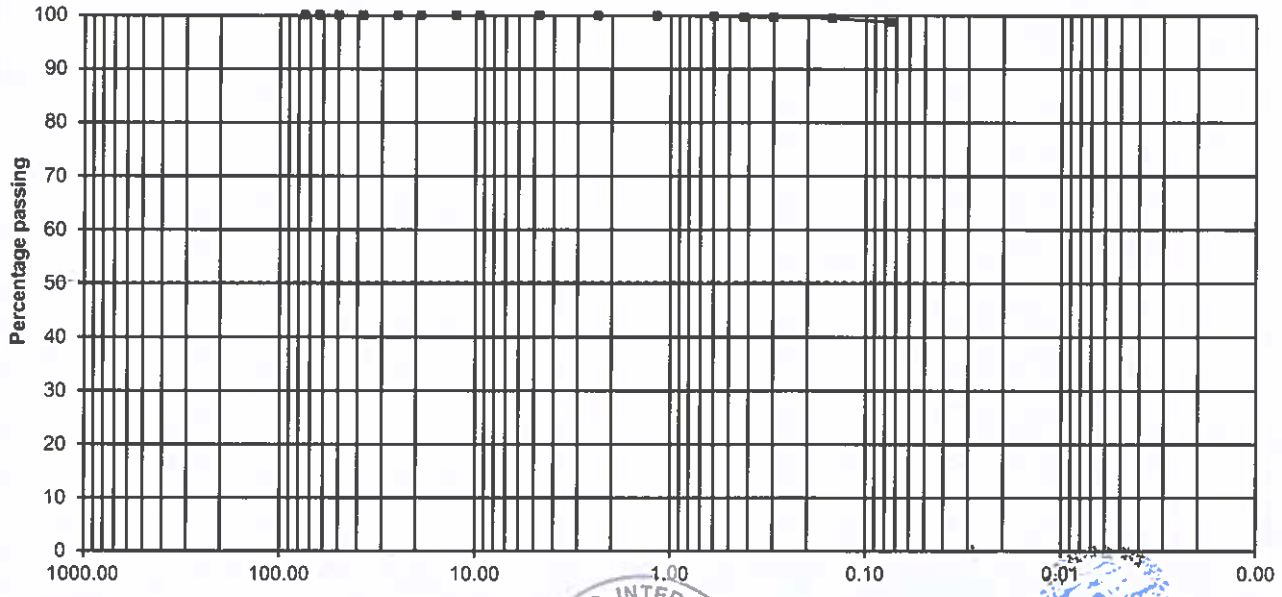
Date Testing: **2019/04/12**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	0.11	0.02	99.98	0.11	0.02
16	1.180 mm	0.37	0.07	99.90	0.48	0.10
30	0.600 mm	0.51	0.10	99.80	0.99	0.20
40	0.425 mm	0.52	0.10	99.70	1.51	0.30
50	0.300 mm	0.13	0.03	99.67	1.64	0.33
100	0.150 mm	1.25	0.25	99.42	2.89	0.58
200	0.075 mm	3.24	0.65	98.77	6.13	1.23
	PAN	493.87	98.77	0.00	**500.00**	100.00
	Total Weight (gm)	**500.00**				



Gravel: 0.00 **Sand: 1.23** **Silt/Clay: 98.77** **D-50:**

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 3**

Co-ordinate: Depth (m): **3.50-4.50m**

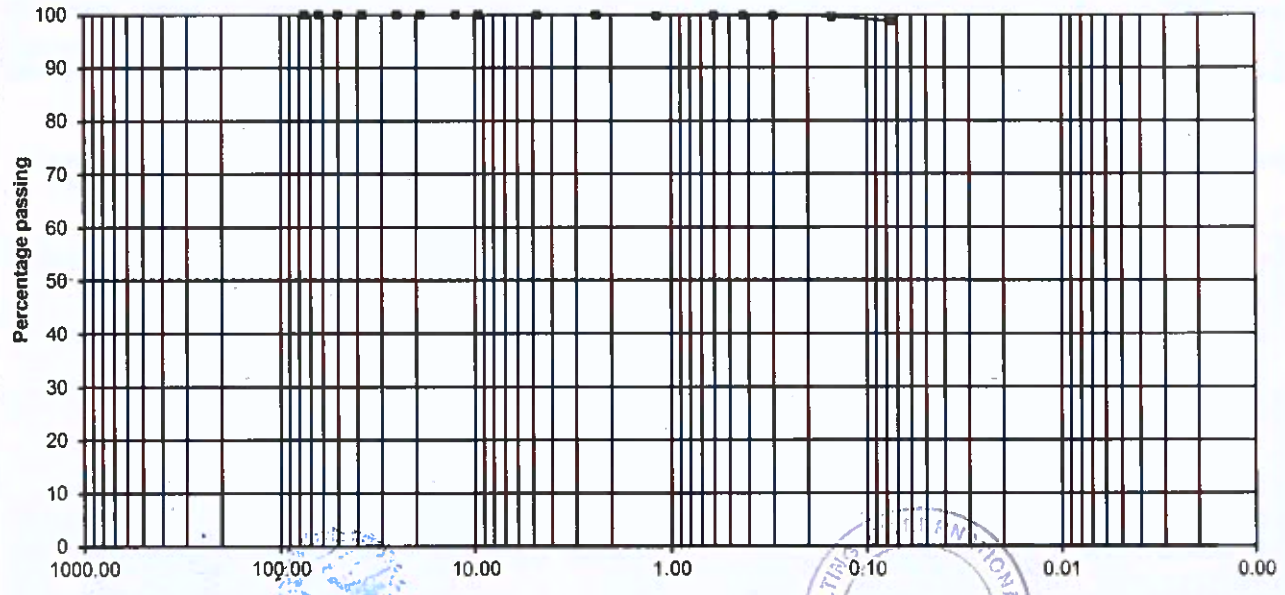
Date Testing: **2019/04/12**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.16	0.05	99.95	0.16	0.05
8	2.360 mm	0.09	0.03	99.92	0.25	0.08
16	1.180 mm	0.12	0.04	99.88	0.37	0.12
30	0.600 mm	0.10	0.03	99.84	0.47	0.16
40	0.425 mm	0.10	0.03	99.81	0.57	0.19
50	0.300 mm	0.00	0.00	99.81	0.57	0.19
100	0.150 mm	0.54	0.18	99.63	1.11	0.37
200	0.075 mm	2.58	0.86	98.77	3.69	1.23
	PAN	296.23	98.77	0.00	299.92	100.00
	Total Weight (gm)	299.92				



Gravel: 0.05 **Sand: 1.18** **Silt/Clay: 98.77** **D-50:**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 4**

Co-ordinate: Depth (m): **3.50-4.50m**

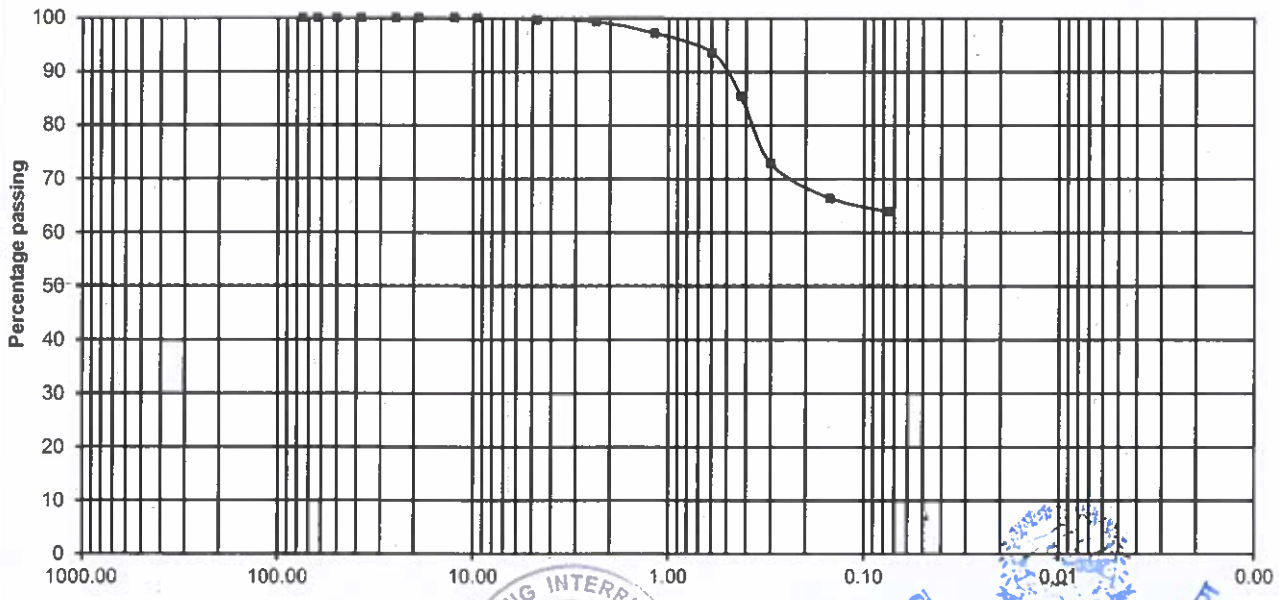
Date Testing: **2075/12/22**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	1.27	0.28	99.72	1.27	0.28
8	2.360 mm	1.86	0.41	99.31	3.13	0.69
16	1.180 mm	9.79	2.14	97.17	12.92	2.83
30	0.600 mm	16.49	3.61	93.56	29.41	6.44
40	0.425 mm	37.26	8.16	85.40	66.67	14.60
50	0.300 mm	57.34	12.56	72.84	124.01	27.16
100	0.150 mm	29.50	6.46	66.37	153.51	33.63
200	0.075 mm	11.32	2.48	63.89	164.83	36.11
	PAN	291.68	63.89	0.00	**456.51**	100.00
	Total Weight (gm)	**456.51**				



Gravel: 0.28 **Sand: 35.83** **Silt/Clay: 63.89** **D-50:**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 5**

Co-ordinate: Depth (m): **3.50-4.50m**

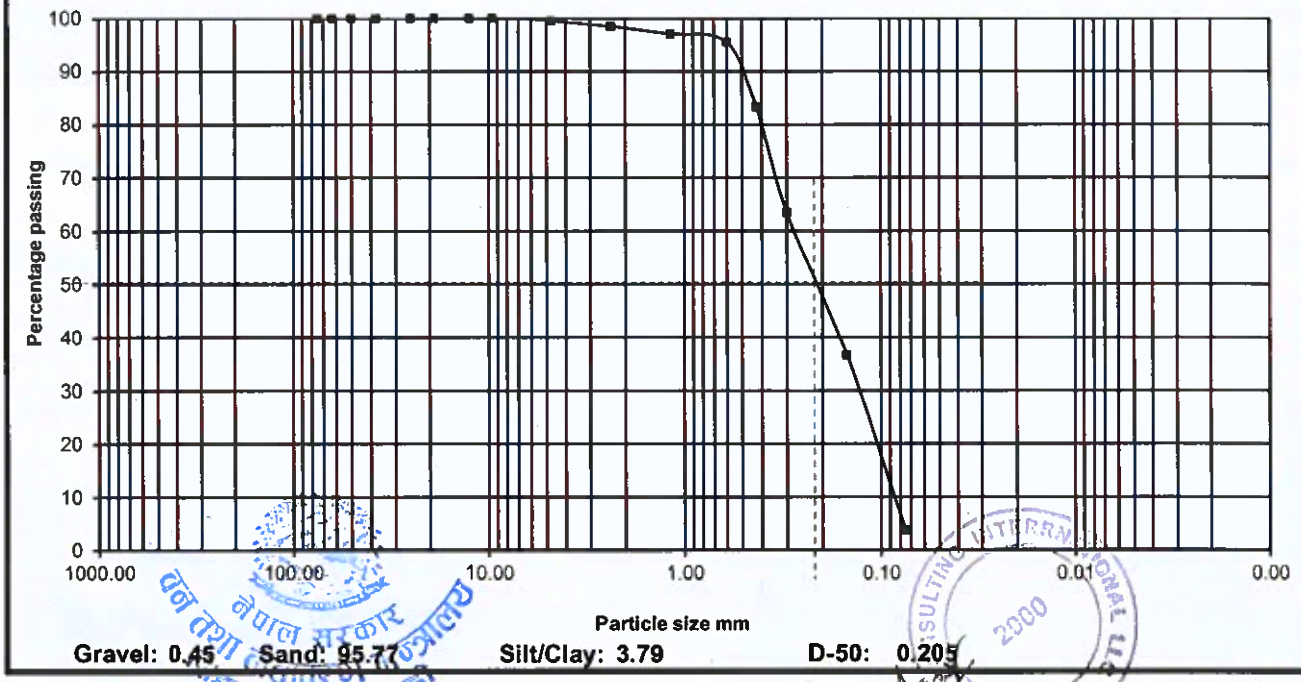
Date Testing: **2075/12/22**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	2.43	0.45	99.55	2.43	0.45
8	2.360 mm	5.89	1.09	98.46	8.32	1.54
16	1.180 mm	7.43	1.37	97.09	15.75	2.91
30	0.600 mm	8.69	1.60	95.49	24.44	4.51
40	0.425 mm	66.08	12.20	83.29	90.52	16.71
50	0.300 mm	107.73	19.89	63.40	198.25	36.60
100	0.150 mm	144.76	26.72	36.68	343.01	63.32
200	0.075 mm	178.17	32.89	3.79	521.18	96.21
	PAN	20.51	3.79	0.00	**541.69**	100.00
	Total Weight (gm)	**541.69**				



Gravel: 0.45 **Sand: 95.77** **Silt/Clay: 3.79** **D-50: 0.205**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 6**

Co-ordinate: Depth (m): **3.50-4.50m**

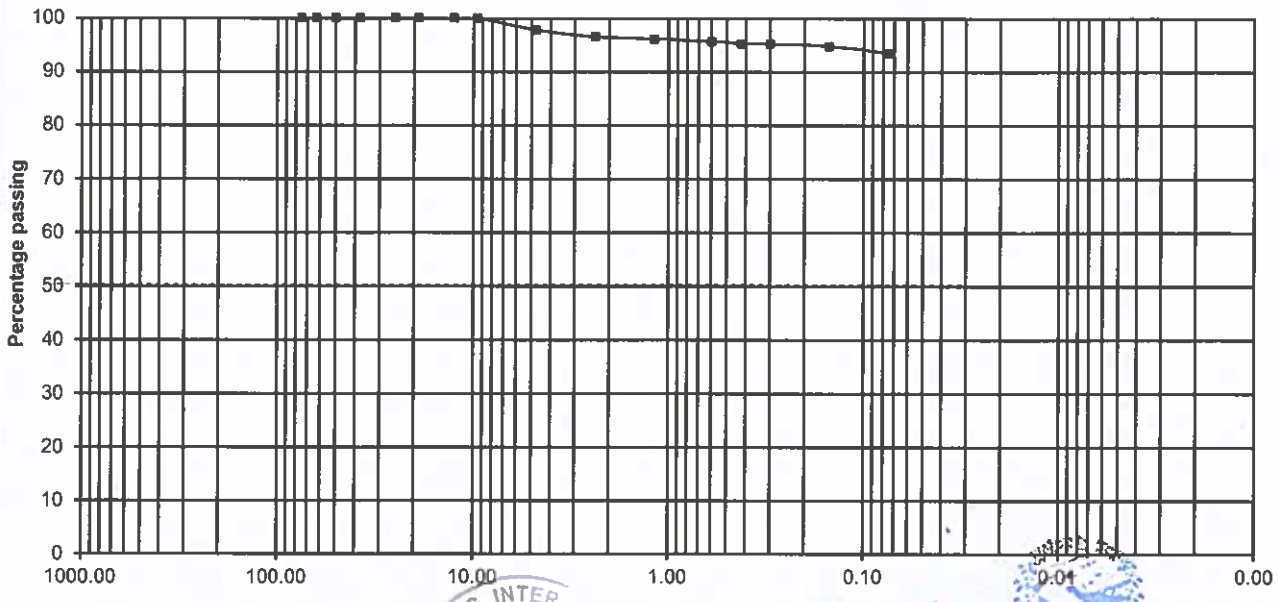
Date Testing: **2019/04/12**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	9.52	2.19	97.81	9.52	2.19
8	2.360 mm	5.70	1.31	96.51	15.22	3.49
16	1.180 mm	1.72	0.39	96.11	16.94	3.89
30	0.600 mm	1.99	0.46	95.65	18.93	4.35
40	0.425 mm	1.66	0.38	95.27	20.59	4.73
50	0.300 mm	0.34	0.08	95.20	20.93	4.80
100	0.150 mm	1.64	0.38	94.82	22.57	5.18
200	0.075 mm	5.77	1.32	93.49	28.34	6.51
	PAN	407.25	93.49	0.00	**435.59**	100.00
	Total Weight (gm)	**435.59**				



Gravel: 2.19 **Sand: 4.32** **Silt/Clay: 93.49** **D-50:**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

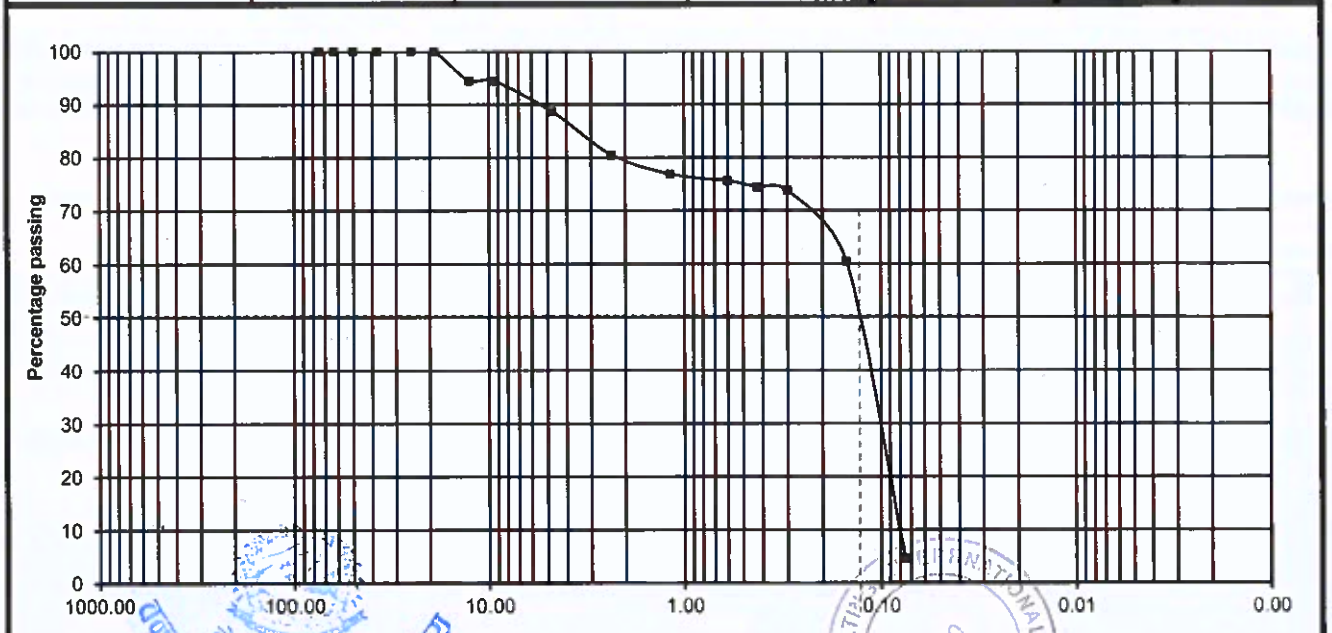
Location: Date Testing: 2019/04/12

Source: Bulk Sample Borehole No. B 7 Tested By: Pranita Pun

Co-ordinate: Depth (m): 3.50-4.50m Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	2.84	5.59	94.41	2.84	5.59
3/8"	9.50 mm	0.00	0.00	94.41	2.84	5.59
4	4.75 mm	2.92	5.74	88.67	5.76	11.33
8	2.360 mm	4.18	8.22	80.44	9.94	19.56
16	1.180 mm	1.82	3.58	76.86	11.76	23.14
30	0.600 mm	0.69	1.36	75.51	12.45	24.49
40	0.425 mm	0.60	1.18	74.33	13.05	25.67
50	0.300 mm	0.32	0.63	73.70	13.37	26.30
100	0.150 mm	6.76	13.30	60.40	20.13	39.60
200	0.075 mm	28.34	55.75	4.64	48.47	95.36
	PAN	2.36	4.64	0.00	50.83	100.00
	Total Weight (gm)	50.83				



Gravel: 11.33 Sand: 84.03 Silt/Clay: 4.64 D-50: 0.140

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 8**

Co-ordinate: Depth (m): **3.50-4.50m**

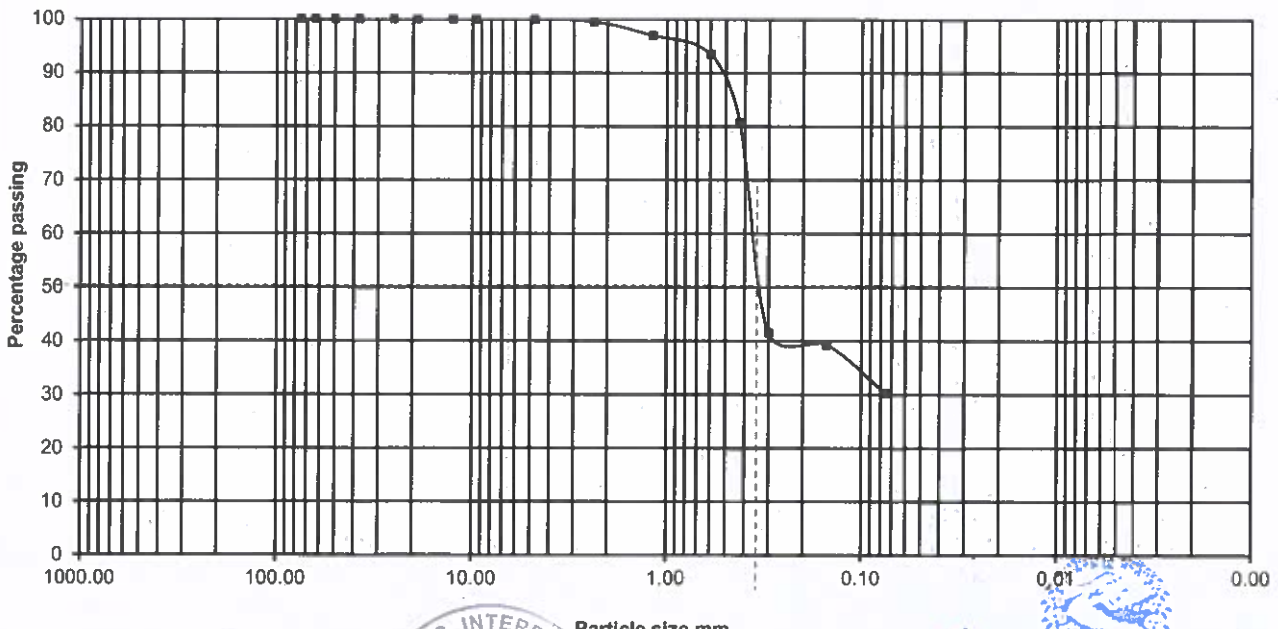
Date Testing: **2075/12/22**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.47	0.07	99.93	0.47	0.07
8	2.360 mm	2.93	0.46	99.47	3.40	0.53
16	1.180 mm	15.80	2.47	97.00	19.20	3.00
30	0.600 mm	22.38	3.50	93.50	41.58	6.50
40	0.425 mm	81.99	12.81	80.69	123.57	19.31
50	0.300 mm	250.07	39.08	41.61	373.64	58.39
100	0.150 mm	14.91	2.33	39.28	388.55	60.72
200	0.075 mm	58.10	9.08	30.20	446.65	69.80
	PAN	193.27	30.20	0.00	**639.92**	100.00
	Total Weight (gm)	**639.92**				



Gravel: 0.07 **Sand: 69.72** **Silt/Clay: 30.20** **D-50: 0.340**

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वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B-9**

Co-ordinate: Depth (m): **0.00-1.00m**

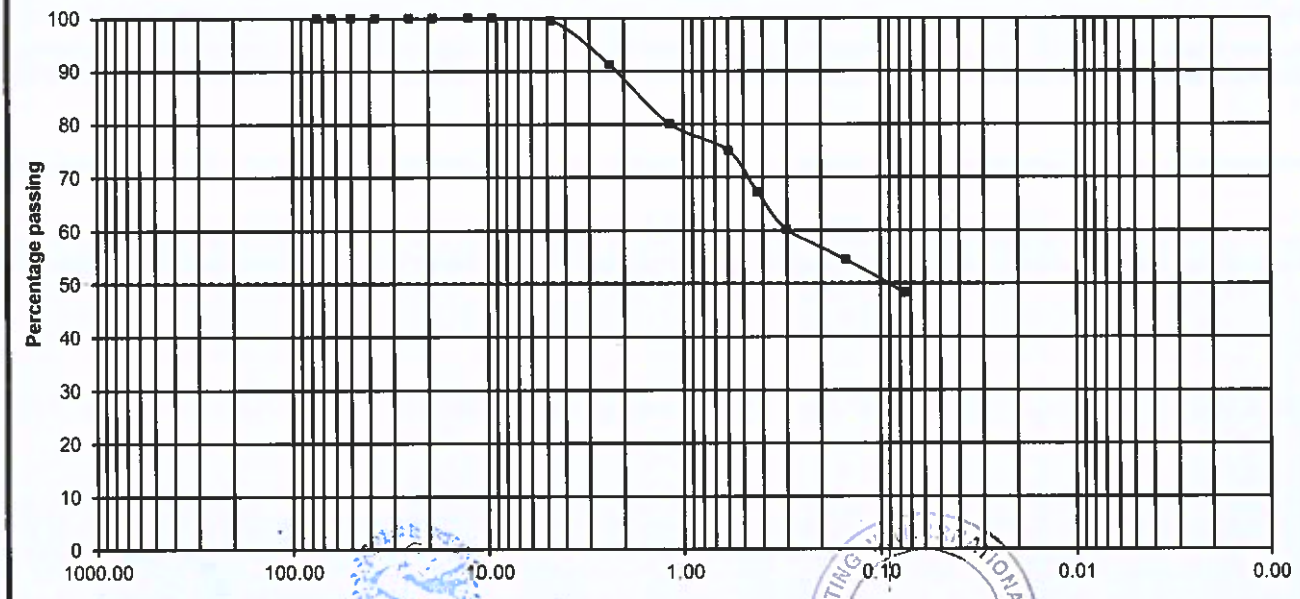
Date Testing: **2019/06/05**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	1.24	0.41	99.59	1.24	0.41
8	2.360 mm	25.21	8.38	91.21	26.45	8.79
16	1.180 mm	33.54	11.15	80.07	59.99	19.93
30	0.600 mm	15.14	5.03	75.03	75.13	24.97
	0.425 mm	23.49	7.81	67.23	98.62	32.77
50	0.300 mm	21.21	7.05	60.18	119.83	39.82
100	0.150 mm	17.11	5.69	54.49	136.94	45.51
200	0.075 mm	18.87	6.27	48.22	155.81	51.78
	PAN	145.12	48.22	0.00	**300.93**	100.00
	Total Weight (gm)	**300.93**				



Gravel: 0.41 **Sand: 51.36** **Silt/Clay: 48.22** **D-50: 0.09**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 10**

Co-ordinate: Depth (m): **0.00-1.00m**

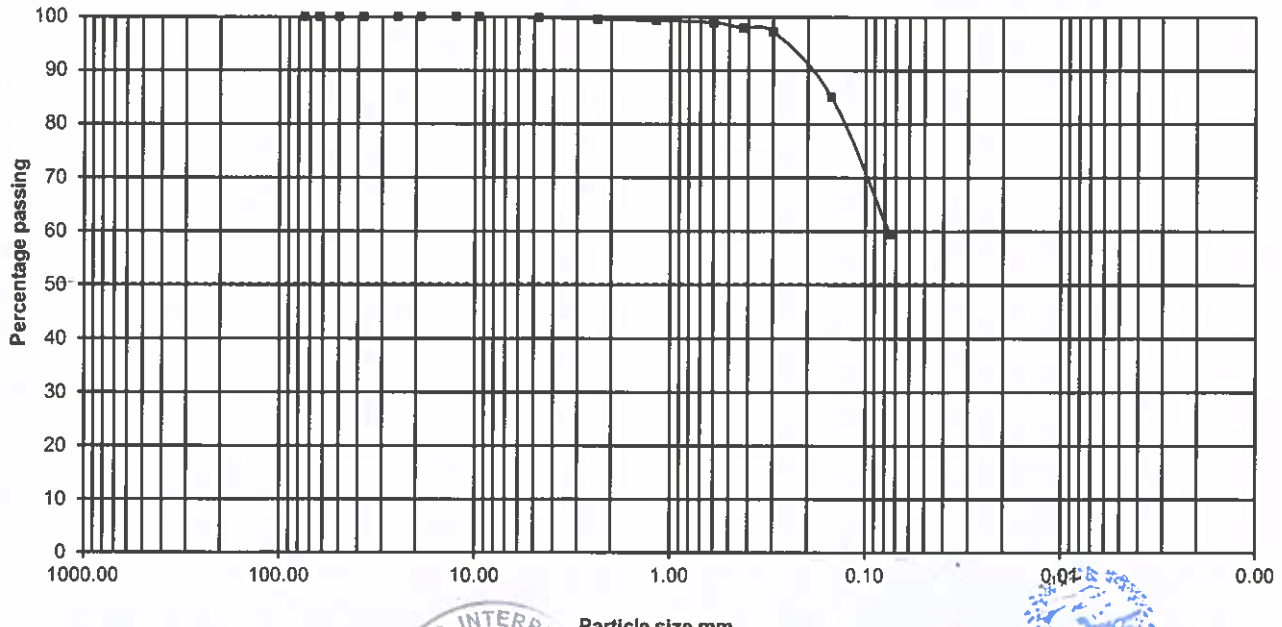
Date Testing: **2019/06/11**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.64	0.21	99.79	0.64	0.21
8	2.360 mm	0.68	0.23	99.56	1.32	0.44
16	1.180 mm	0.70	0.23	99.33	2.02	0.67
30	0.600 mm	1.28	0.43	98.90	3.30	1.10
40	0.425 mm	3.00	1.00	97.90	6.30	2.10
50	0.300 mm	2.21	0.74	97.16	8.51	2.84
100	0.150 mm	36.61	12.20	84.96	45.12	15.04
200	0.075 mm	76.32	25.44	59.52	121.44	40.48
	PAN	178.56	59.52	0.00	300.00	100.00
	Total Weight (gm)	300.00				



Gravel: 0.21 **Sand: 40.27** **Silt/Clay: 59.52** **D-50:**

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B-11**

Co-ordinate: Depth (m): **0.00-1.00m**

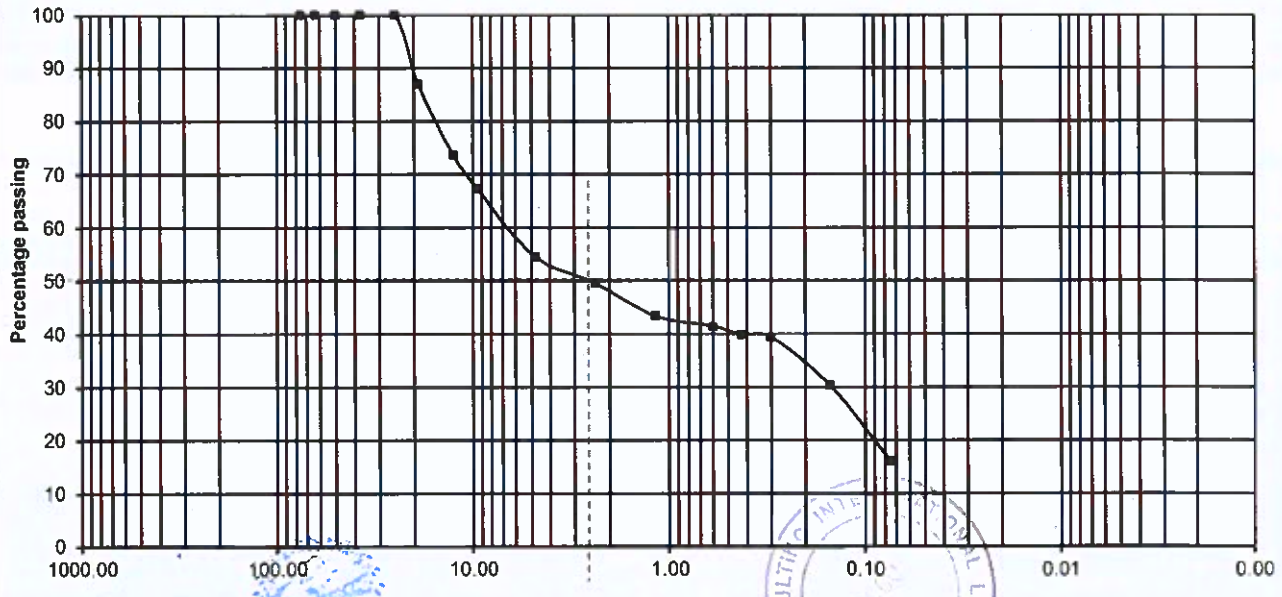
Date Testing: **2019/06/05**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	64.77	13.04	86.96	64.77	13.04
1/2"	12.50 mm	66.57	13.40	73.55	131.34	26.45
3/8"	9.50 mm	30.95	6.23	67.32	162.29	32.68
4	4.75 mm	64.09	12.90	54.42	226.38	45.58
8	2.360 mm	24.07	4.85	49.57	250.45	50.43
16	1.180 mm	30.54	6.15	43.42	280.99	56.58
30	0.600 mm	10.05	2.02	41.40	291.04	58.60
	0.425 mm	7.62	1.53	39.86	298.66	60.14
50	0.300 mm	2.55	0.51	39.35	301.21	60.65
100	0.150 mm	44.82	9.02	30.33	346.03	69.67
200	0.075 mm	70.20	14.13	16.19	416.23	83.81
	PAN	80.41	16.19	0.00	**496.64**	100.00
	Total Weight (gm)	**496.64**				



Gravel: 45.58 **Sand: 38.23** **Silt/Clay: 16.19** **D-50: 2.50**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 12**

Co-ordinate: Depth (m): **0.00-1.00m**

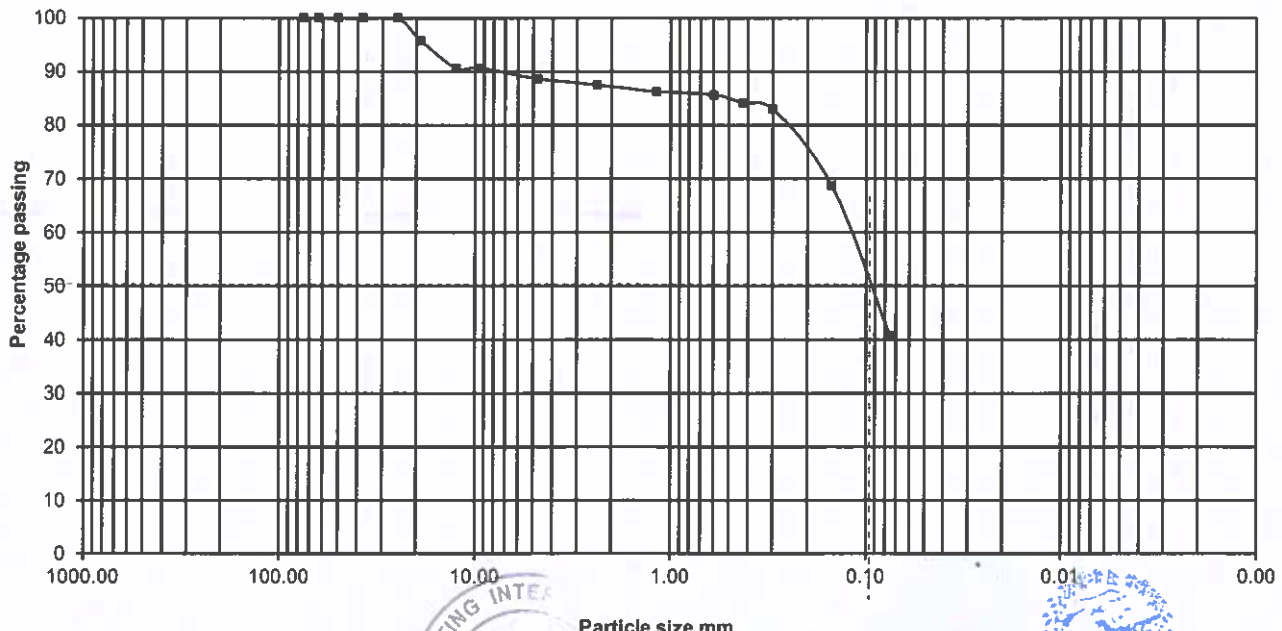
Date Testing: **2019/05/31**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	21.37	4.31	95.69	21.37	4.31
1/2"	12.50 mm	25.18	5.08	90.62	46.55	9.38
3/8"	9.50 mm	0.00	0.00	90.62	46.55	9.38
4	4.75 mm	9.90	2.00	88.62	56.45	11.38
8	2.360 mm	5.78	1.17	87.45	62.23	12.55
16	1.180 mm	6.16	1.24	86.21	68.39	13.79
30	0.600 mm	3.14	0.63	85.58	71.53	14.42
40	0.425 mm	7.35	1.48	84.10	78.88	15.90
50	0.300 mm	5.26	1.06	83.04	84.14	16.96
100	0.150 mm	71.29	14.37	68.66	155.43	31.34
200	0.075 mm	138.48	27.92	40.75	293.91	59.25
	PAN	202.11	40.75	0.00	**496.02**	100.00
	Total Weight (gm)	**496.02**				



Gravel: 11.38 **Sand: 47.87** **Silt/Clay: 40.75** **D-50: 0.094**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 13**

Co-ordinate: Depth (m): **0.00-1.00m**

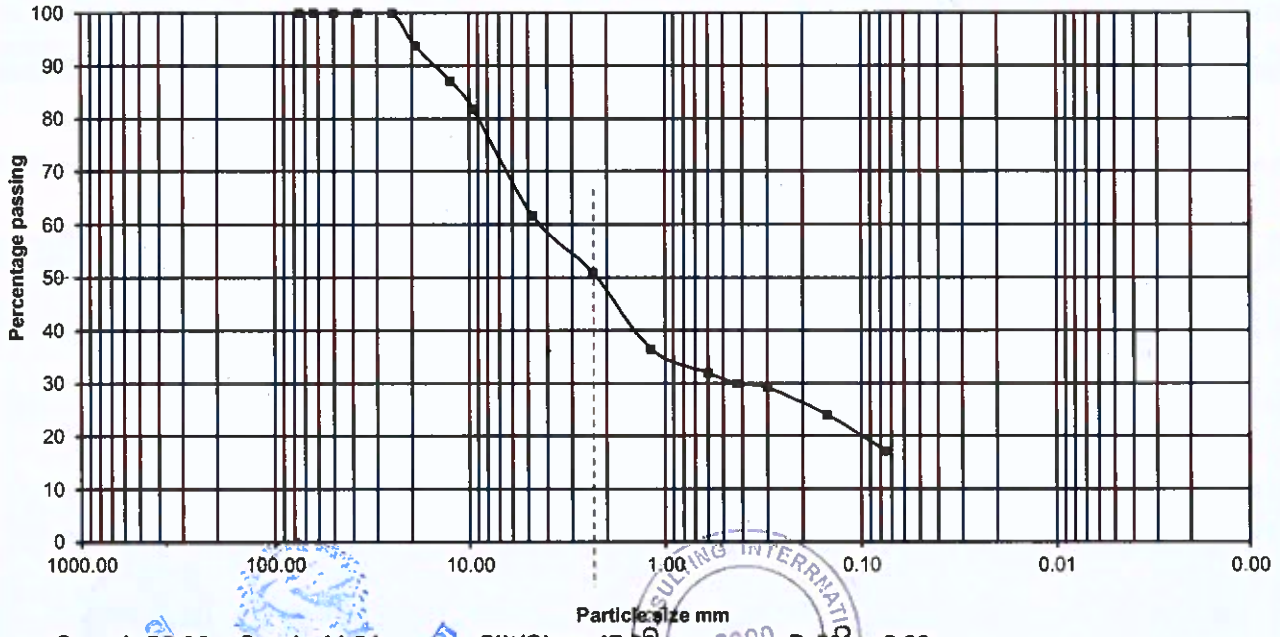
Date Testing: **2019/06/05**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	31.02	6.30	93.70	31.02	6.30
1/2"	12.50 mm	32.43	6.59	87.11	63.45	12.89
3/8"	9.50 mm	26.11	5.31	81.80	89.56	18.20
4	4.75 mm	99.25	20.17	61.64	188.81	38.36
8	2.360 mm	52.54	10.68	50.96	241.35	49.04
16	1.180 mm	71.90	14.61	36.35	313.25	63.65
30	0.600 mm	21.82	4.43	31.92	335.07	68.08
40	0.425 mm	9.96	2.02	29.89	345.03	70.11
50	0.300 mm	3.64	0.74	29.15	348.67	70.85
100	0.150 mm	25.35	5.15	24.00	374.02	76.00
200	0.075 mm	34.00	6.91	17.09	408.02	82.91
	PAN	84.13	17.09	0.00	**492.15**	100.00
	Total Weight (gm)	**492.15**				



Gravel: 38.36 **Sand: 44.54** **Silt/Clay: 17.09** **D-50: 2.30**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 14**

Co-ordinate: Depth (m): **0.00-1.00m**

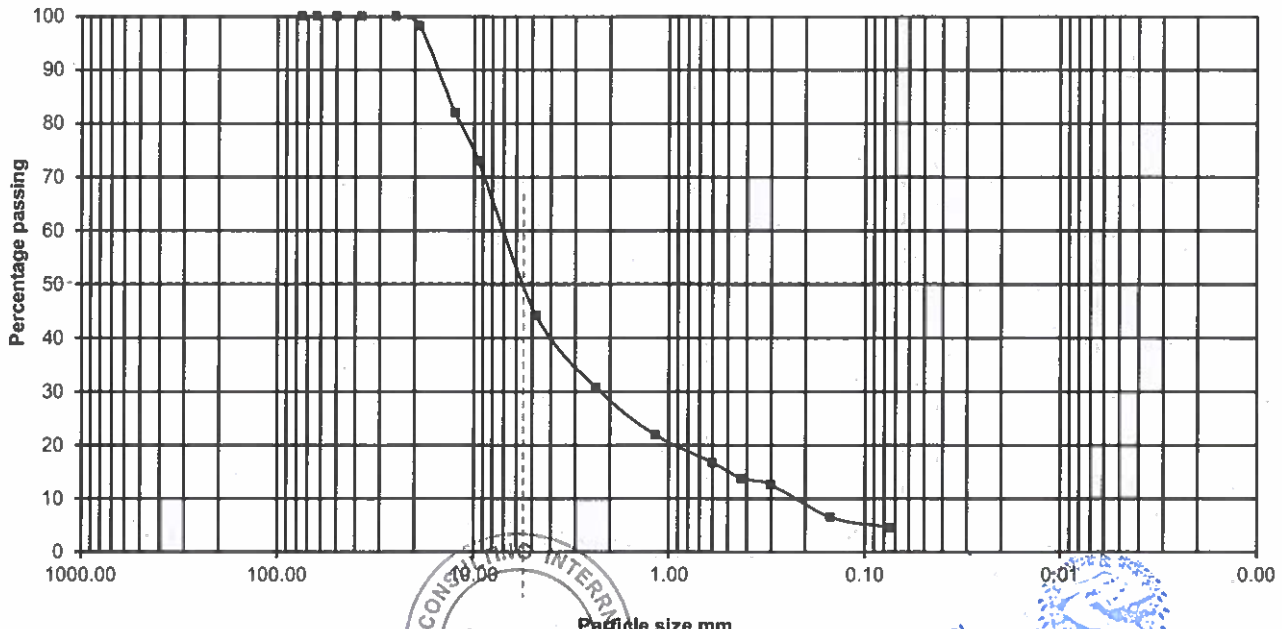
Date Testing: **2019/06/12**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	8.54	1.74	98.26	8.54	1.74
1/2"	12.50 mm	79.86	16.24	82.02	88.40	17.98
3/8"	9.50 mm	44.26	9.00	73.02	132.66	26.98
4	4.75 mm	141.39	28.75	44.27	274.05	55.73
8	2.360 mm	65.85	13.39	30.88	339.90	69.12
16	1.180 mm	44.17	8.98	21.89	384.07	78.11
30	0.600 mm	25.14	5.11	16.78	409.21	83.22
40	0.425 mm	14.56	2.96	13.82	423.77	86.18
50	0.300 mm	5.97	1.21	12.60	429.74	87.40
100	0.150 mm	29.53	6.01	6.60	459.27	93.40
200	0.075 mm	10.06	2.05	4.55	469.33	95.45
	PAN	22.39	4.55	0.00	**491.72**	100.00
	Total Weight (gm)	**491.72**				



Gravel: 55.73 **Sand: 39.71** **Silt/Clay: 4.55** **D-50: 5.50**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 15**

Co-ordinate: Depth (m): **0.00-1.00m**

Date Testing: **2019/06/11**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.37	0.12	99.88	0.37	0.12
8	2.360 mm	8.06	2.69	97.19	8.43	2.81
16	1.180 mm	10.22	3.41	93.78	18.65	6.22
30	0.600 mm	10.26	3.42	90.36	28.91	9.64
40	0.425 mm	8.49	2.83	87.53	37.40	12.47
50	0.300 mm	3.88	1.29	86.24	41.28	13.76
100	0.150 mm	23.85	7.95	78.29	65.13	21.71
200	0.075 mm	22.07	7.36	70.93	87.20	29.07
	PAN	212.80	70.93	0.00	**300.00**	100.00
	Total Weight (gm)	**300.00**				

Gravel: 0.12 **Sand: 28.94** **Silt/Clay: 70.93** **D-50:**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

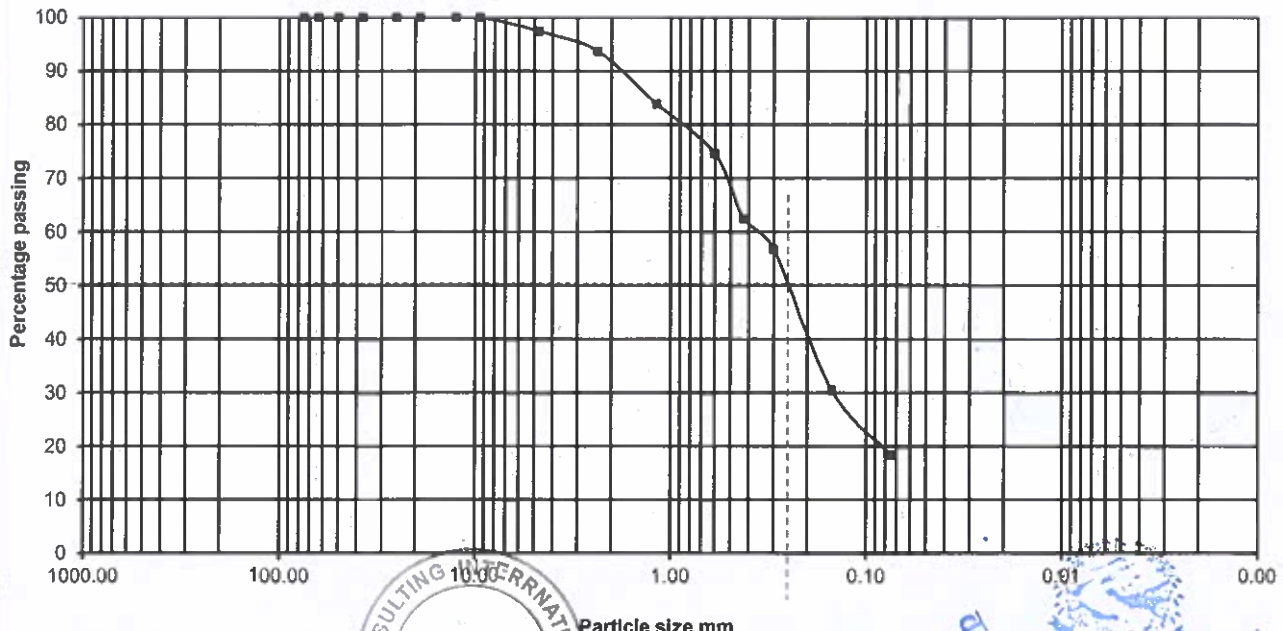
Location: Date Testing: 2019/05/30

Source: Test Pit Sample Borehole No. B 16 Tested By: Pranita Pun

Co-ordinate: Depth (m): 0.00-1.00m Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	12.97	2.60	97.40	12.97	2.60
8	2.360 mm	18.69	3.75	93.65	31.66	6.35
16	1.180 mm	48.94	9.81	83.84	80.60	16.16
30	0.600 mm	46.37	9.29	74.55	126.97	25.45
40	0.425 mm	60.83	12.19	62.36	187.80	37.64
50	0.300 mm	28.03	5.62	56.74	215.83	43.26
100	0.150 mm	131.13	26.28	30.45	346.96	69.55
200	0.075 mm	59.98	12.02	18.43	406.94	81.57
	PAN	91.95	18.43	0.00	498.89	100.00
	Total Weight (gm)	498.89				



Gravel: 2.60 **Sand: 78.97** **Silt/Clay: 18.43** **D-50: 0.25**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 17**

Co-ordinate: Depth (m): **0.00-1.00m**

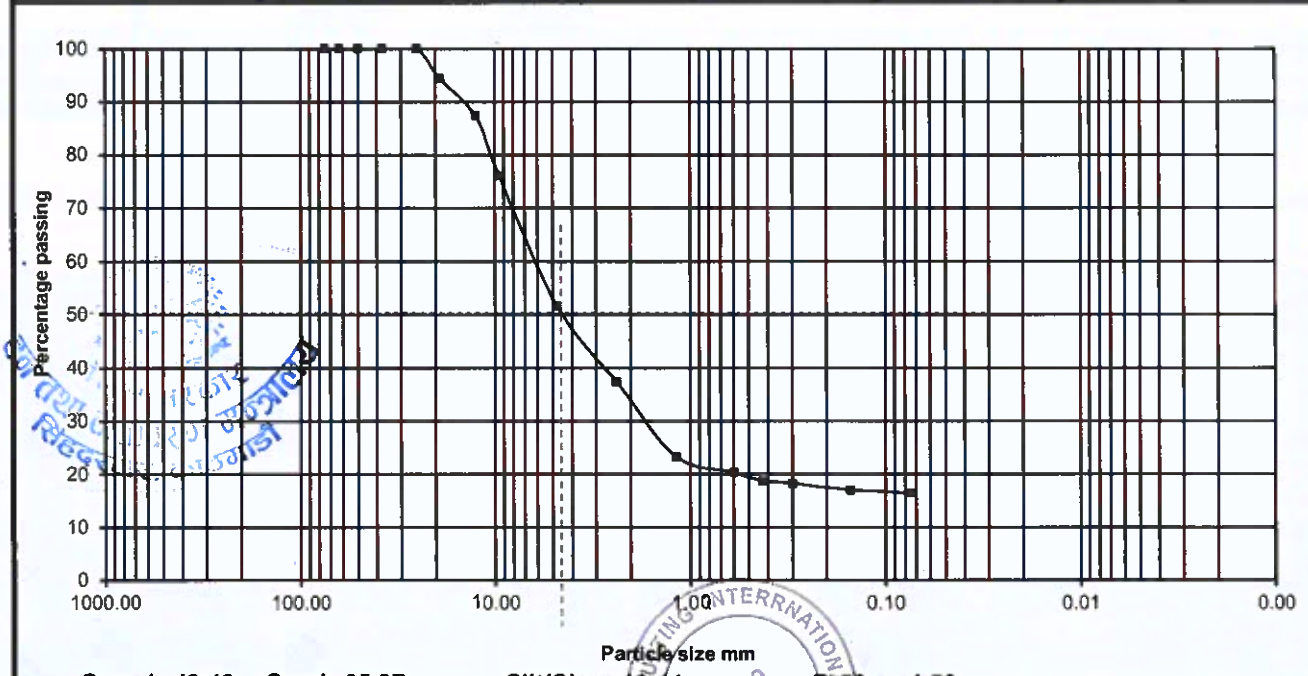
Date Testing: **2019/05/30**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	28.05	5.65	94.35	28.05	5.65
1/2"	12.50 mm	34.54	6.96	87.39	62.59	12.61
3/8"	9.50 mm	55.86	11.25	76.14	118.45	23.86
4	4.75 mm	122.24	24.63	51.51	240.69	48.49
8	2.360 mm	70.17	14.14	37.38	310.86	62.62
16	1.180 mm	69.85	14.07	23.31	380.71	76.69
30	0.600 mm	14.85	2.99	20.31	395.56	79.69
40	0.425 mm	7.80	1.57	18.74	403.36	81.26
50	0.300 mm	2.49	0.50	18.24	405.85	81.76
100	0.150 mm	6.27	1.26	16.98	412.12	83.02
200	0.075 mm	2.68	0.54	16.44	414.80	83.56
	PAN	81.60	16.44	0.00	**496.40**	100.00
	Total Weight (gm)	**496.40**				



Gravel: 48.49 **Sand: 35.07** **Silt/Clay: 16.44** **D-50: 4.50**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 18**

Co-ordinate: Depth (m): **0.00-1.00m**

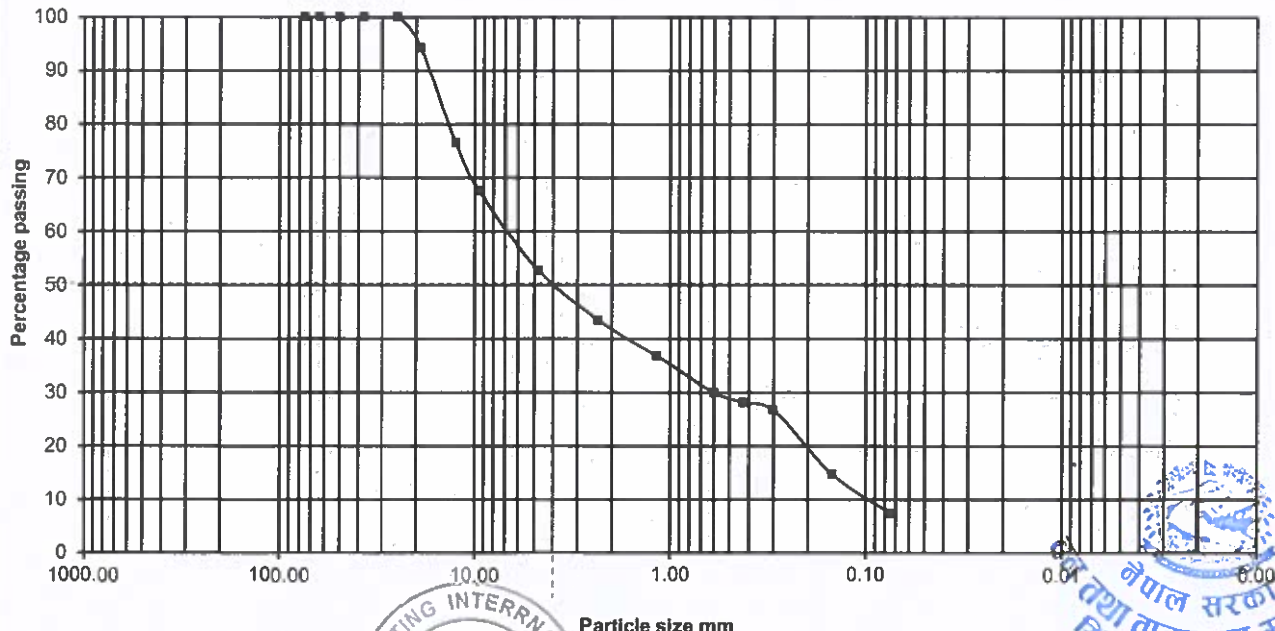
Date Testing: **2019/06/12**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	17.20	5.75	94.25	17.20	5.75
1/2"	12.50 mm	52.91	17.69	76.56	70.11	23.44
3/8"	9.50 mm	26.94	9.01	67.55	97.05	32.45
4	4.75 mm	44.13	14.76	52.79	141.18	47.21
8	2.360 mm	27.70	9.26	43.53	168.88	56.47
16	1.180 mm	19.89	6.65	36.88	188.77	63.12
30	0.600 mm	20.47	6.85	30.03	209.24	69.97
40	0.425 mm	5.71	1.91	28.12	214.95	71.88
50	0.300 mm	4.27	1.43	26.69	219.22	73.31
100	0.150 mm	35.41	11.84	14.85	254.63	85.15
200	0.075 mm	22.12	7.40	7.46	276.75	92.54
	PAN	22.30	7.46	0.00	**299.05**	100.00
	Total Weight (gm)	**299.05**				



Gravel: 47.21 **Sand: 45.33** **Silt/Clay: 7.46** **D-50: 4.00**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 19**

Co-ordinate: Depth (m): **0.00-1.00m**

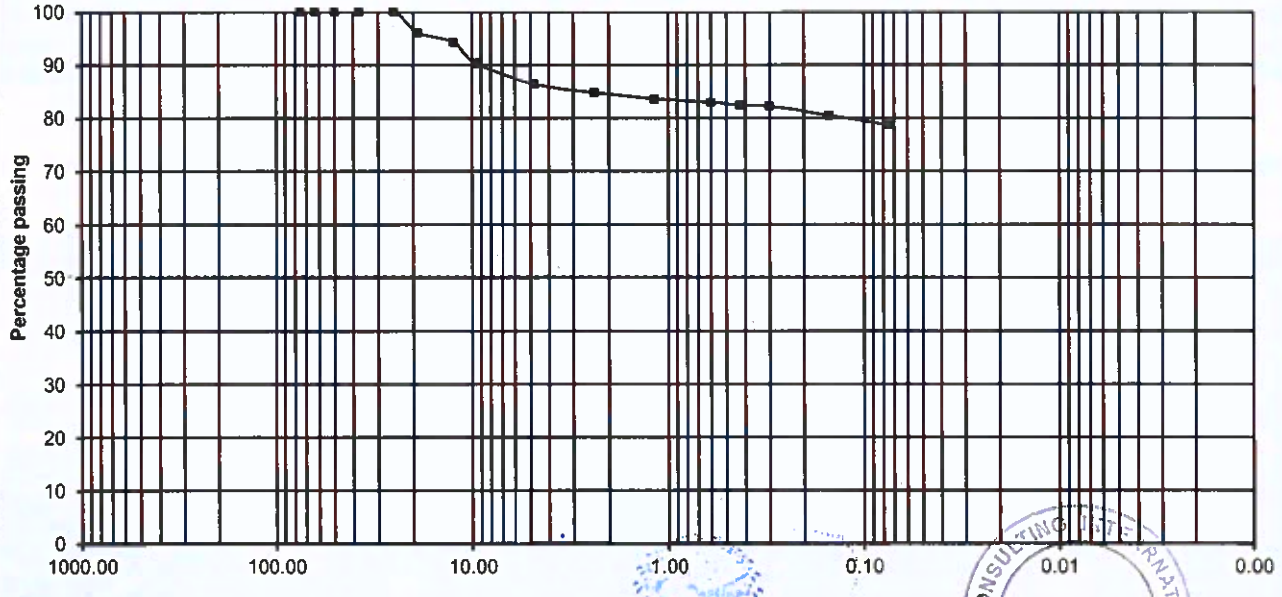
Date Testing: **2019/06/11**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	11.60	3.87	96.13	11.60	3.87
1/2"	12.50 mm	5.55	1.85	94.28	17.15	5.72
3/8"	9.50 mm	12.08	4.03	90.26	29.23	9.74
4	4.75 mm	11.63	3.88	86.38	40.86	13.62
8	2.360 mm	4.93	1.64	84.74	45.79	15.26
16	1.180 mm	3.60	1.20	83.54	49.39	16.46
30	0.600 mm	1.93	0.64	82.89	51.32	17.11
40	0.425 mm	1.39	0.46	82.43	52.71	17.57
50	0.300 mm	0.74	0.25	82.18	53.45	17.82
100	0.150 mm	5.17	1.72	80.46	58.62	19.54
200	0.075 mm	5.30	1.77	78.69	63.92	21.31
	PAN	236.08	78.69	0.00	**300.00**	100.00
	Total Weight (gm)	**300.00**				



Gravel: 13.62 **Sand: 7.69** **Silt/Clay: 78.69** **D-50:**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 20**

Co-ordinate: Depth (m): **0.00-1.00m**

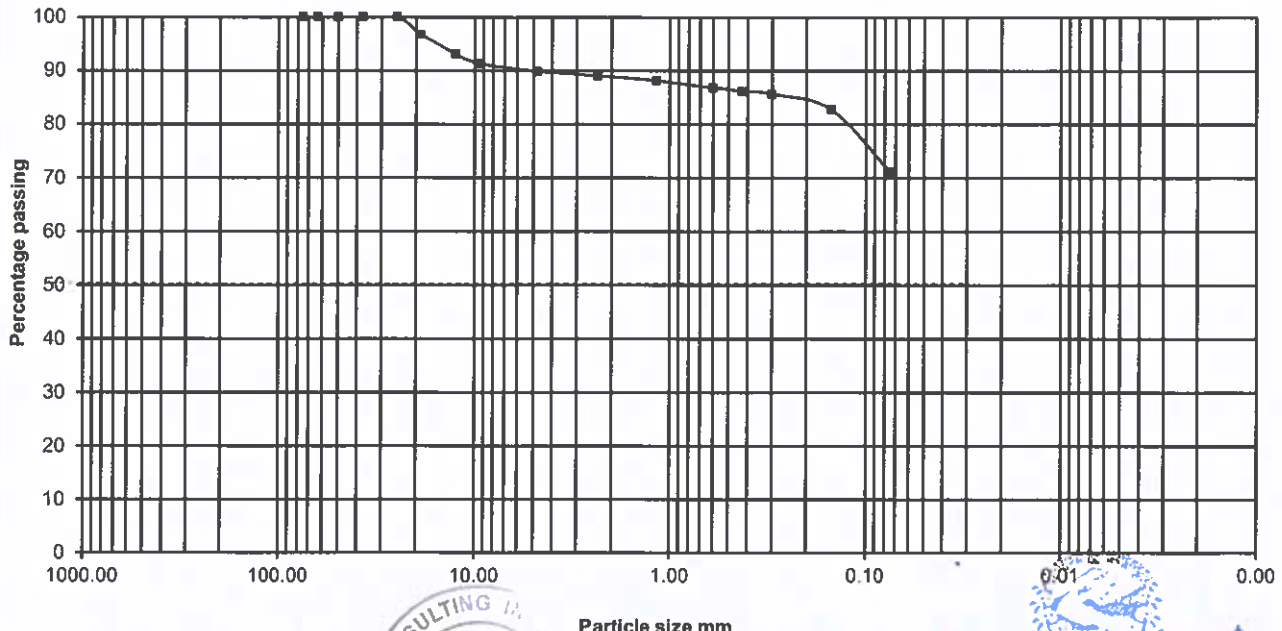
Date Testing: **2019/05/31**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	16.05	3.27	96.73	16.05	3.27
1/2"	12.50 mm	17.82	3.63	93.11	33.87	6.89
3/8"	9.50 mm	9.06	1.84	91.26	42.93	8.74
4	4.75 mm	6.93	1.41	89.85	49.86	10.15
8	2.360 mm	4.10	0.83	89.02	53.96	10.98
16	1.180 mm	4.44	0.90	88.11	58.40	11.89
30	0.600 mm	6.54	1.33	86.78	64.94	13.22
40	0.425 mm	3.14	0.64	86.14	68.08	13.86
50	0.300 mm	2.78	0.57	85.57	70.86	14.43
100	0.150 mm	14.01	2.85	82.72	84.87	17.28
200	0.075 mm	56.71	11.54	71.18	141.58	28.82
	PAN	349.65	71.18	0.00	**491.23**	100.00
	Total Weight (gm)	**491.23**				



Gravel: 10.15 **Sand: 18.67** **Silt/Clay: 71.18** **D-50:**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

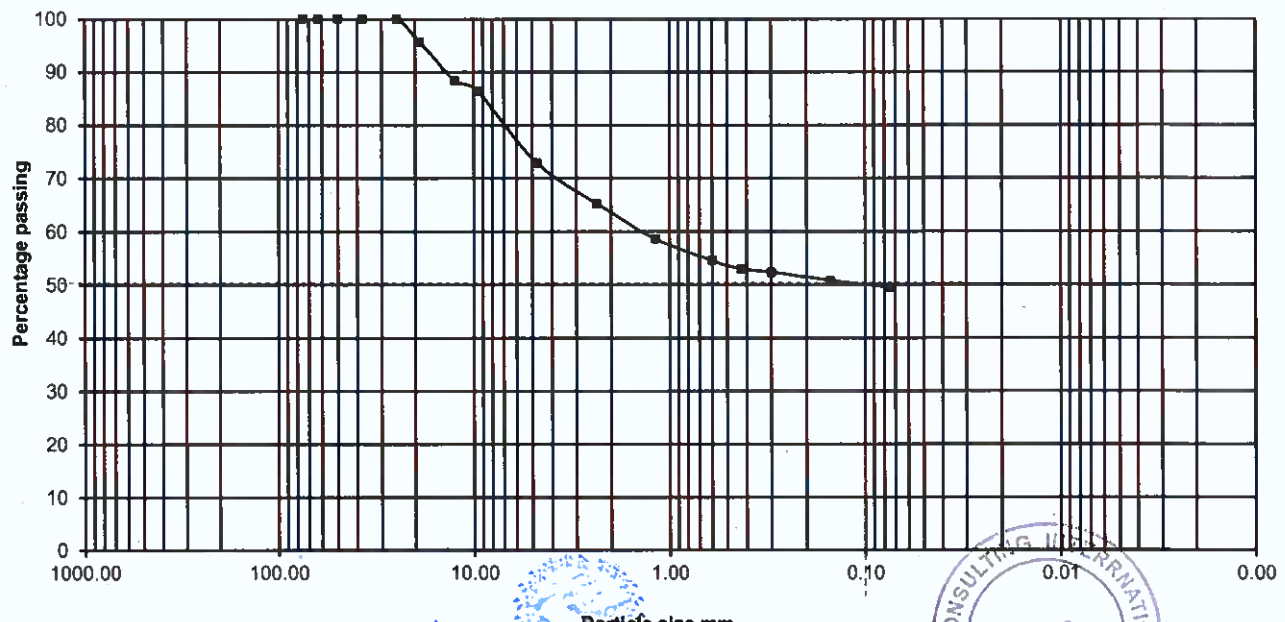
Location: Date Testing: 2019/06/06

Source: Test Pit Sample Borehole No. B 21 Tested By: Pranita Pun

Co-ordinate: Depth (m): 0.00-1.00m Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	12.68	4.24	95.76	12.68	4.24
1/2"	12.50 mm	22.28	7.45	88.31	34.96	11.69
3/8"	9.50 mm	5.88	1.97	86.34	40.84	13.66
4	4.75 mm	40.45	13.53	72.82	81.29	27.18
8	2.360 mm	22.92	7.66	65.15	104.21	34.85
16	1.180 mm	19.65	6.57	58.58	123.86	41.42
30	0.600 mm	12.21	4.08	54.50	136.07	45.50
40	0.425 mm	4.95	1.66	52.84	141.02	47.16
50	0.300 mm	1.79	0.60	52.24	142.81	47.76
100	0.150 mm	4.62	1.54	50.70	147.43	49.30
200	0.075 mm	3.60	1.20	49.49	151.03	50.51
	PAN	148.00	49.49	0.00	299.03	100.00
	Total Weight (gm)	299.03				



Gravel: 27.18 **Sand: 23.32** **Silt/Clay: 49.49** **D-50: 0.10**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 22**

Co-ordinate: Depth (m): **0.00-1.00m**

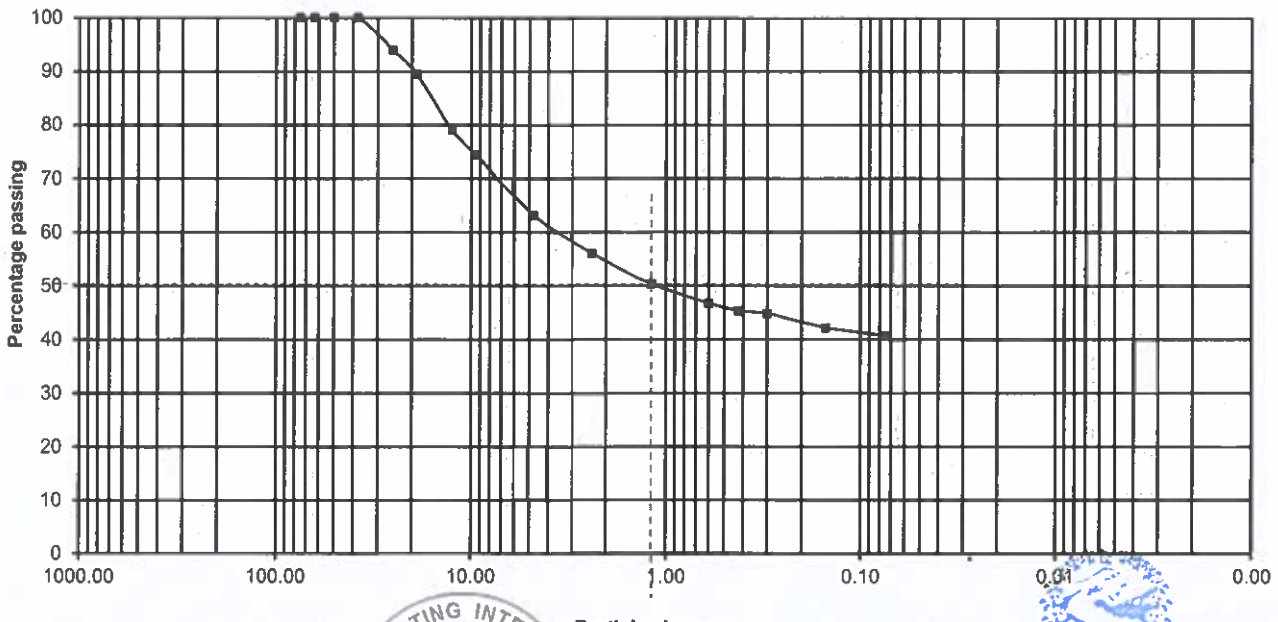
Date Testing: **2019/04/28**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	67.65	6.10	93.90	67.65	6.10
3/4"	19.00 mm	48.90	4.41	89.49	116.55	10.51
1/2"	12.50 mm	116.27	10.48	79.01	232.82	20.99
3/8"	9.50 mm	51.11	4.61	74.40	283.93	25.60
4	4.75 mm	124.87	11.26	63.14	408.80	36.86
8	2.360 mm	78.76	7.10	56.04	487.56	43.96
16	1.180 mm	63.55	5.73	50.31	551.11	49.69
30	0.600 mm	39.84	3.59	46.71	590.95	53.29
40	0.425 mm	15.71	1.42	45.30	606.66	54.70
50	0.300 mm	5.45	0.49	44.81	612.11	55.19
100	0.150 mm	28.62	2.58	42.22	640.73	57.78
200	0.075 mm	16.94	1.53	40.70	657.67	59.30
	PAN	451.33	40.70	0.00	**1109.00**	100.00
	Total Weight (gm)	**1109.00**				



Gravel: 36.86 **Sand: 22.44** **Silt/Clay: 40.70** **D-50: 1.25**

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नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample**

Co-ordinate:

Borehole No. **B 25**

Depth (m): **0.00-1.00m**

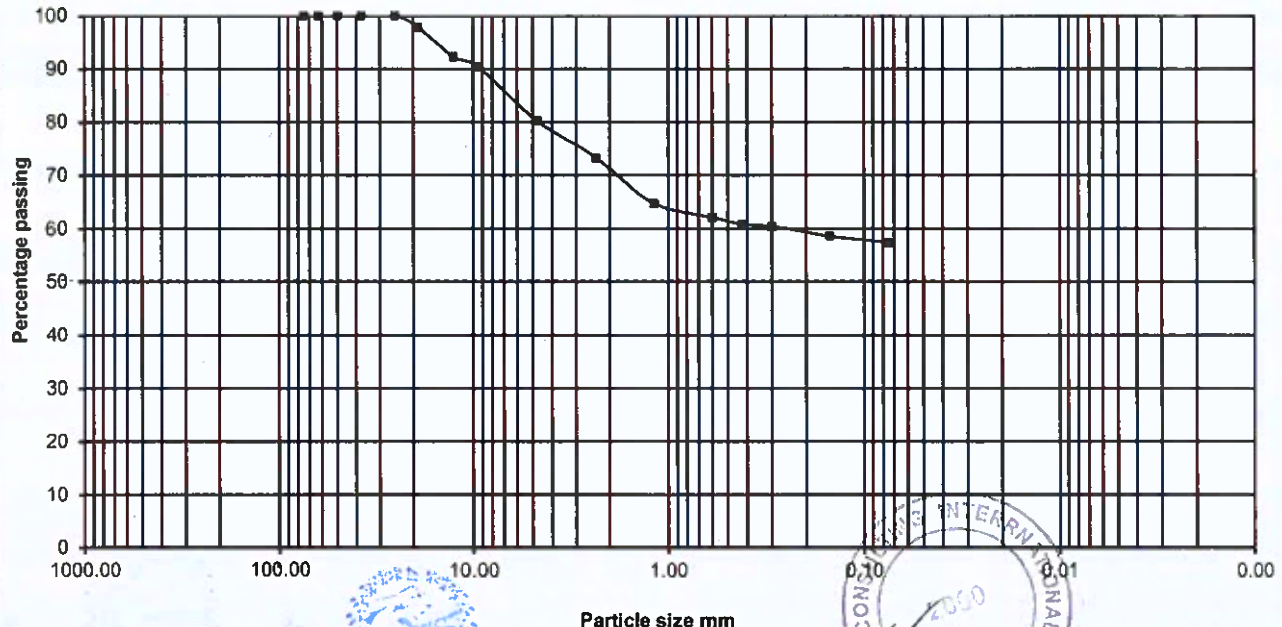
Date Testing: **2076/01/19**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	9.79	2.08	97.92	9.79	2.08
1/2"	12.50 mm	26.96	5.73	92.19	36.75	7.81
3/8"	9.50 mm	8.26	1.76	90.43	45.01	9.57
4	4.75 mm	47.91	10.18	80.25	92.92	19.75
8	2.360 mm	33.25	7.07	73.18	126.17	26.82
16	1.180 mm	40.11	8.53	64.65	166.28	35.35
30	0.600 mm	12.21	2.60	62.06	178.49	37.94
40	0.425 mm	6.05	1.29	60.77	184.54	39.23
50	0.300 mm	2.12	0.45	60.32	186.66	39.68
100	0.150 mm	8.15	1.73	58.59	194.81	41.41
200	0.075 mm	6.07	1.29	57.30	200.88	42.70
	PAN	269.54	57.30	0.00	**470.42**	100.00
	Total Weight (gm)	**470.42**				



Gravel: 19.75 **Sand: 22.95** **Silt/Clay: 57.30** **D-50:**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 26**

Co-ordinate: Depth (m): **0.00-1.00m**

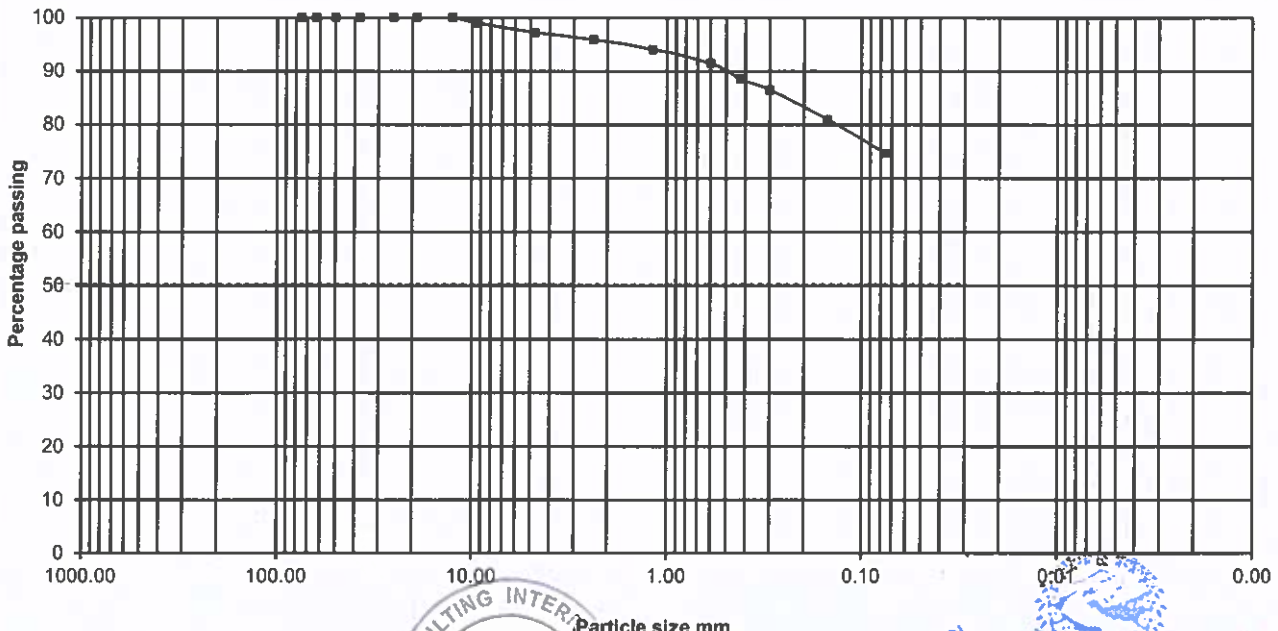
Date Testing: **2019/06/21**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	2.48	1.04	98.96	2.48	1.04
4	4.75 mm	4.18	1.75	97.21	6.66	2.79
8	2.360 mm	3.22	1.35	95.86	9.88	4.14
16	1.180 mm	4.27	1.79	94.07	14.15	5.93
30	0.600 mm	6.22	2.60	91.47	20.37	8.53
40	0.425 mm	7.09	2.97	88.50	27.46	11.50
50	0.300 mm	4.89	2.05	86.45	32.35	13.55
100	0.150 mm	13.17	5.51	80.94	45.52	19.06
200	0.075 mm	15.12	6.33	74.61	60.64	25.39
	PAN	178.17	74.61	0.00	238.81	100.00
	Total Weight (gm)	238.81				



Gravel: 2.79 **Sand: 22.60** **Silt/Clay: 74.61** **D-50:**

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 27**

Co-ordinate: Depth (m): **0.00-1.00m**

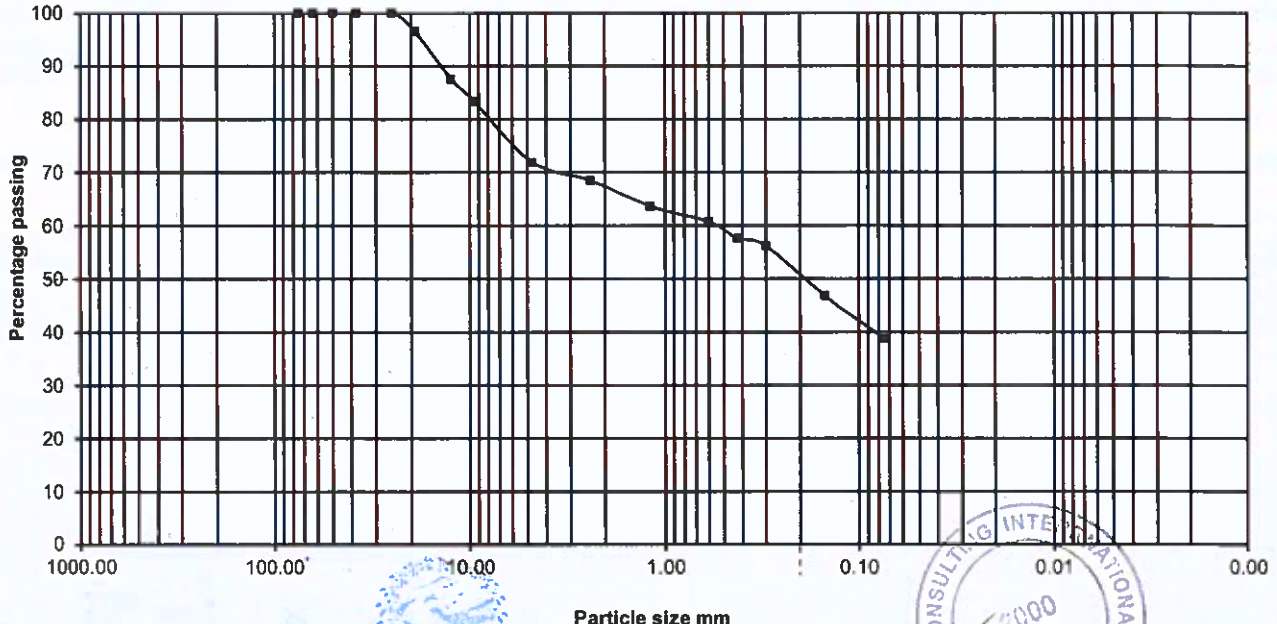
Date Testing: **2019/05/26**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	10.40	3.47	96.53	10.40	3.47
1/2"	12.50 mm	26.87	8.96	87.58	37.27	12.42
3/8"	9.50 mm	12.84	4.28	83.30	50.11	16.70
4	4.75 mm	34.34	11.45	71.85	84.45	28.15
8	2.360 mm	10.41	3.47	68.38	94.86	31.62
16	1.180 mm	14.35	4.78	63.60	109.21	36.40
30	0.600 mm	8.67	2.89	60.71	117.88	39.29
40	0.425 mm	9.26	3.09	57.62	127.14	42.38
50	0.300 mm	4.35	1.45	56.17	131.49	43.83
100	0.150 mm	27.99	9.33	46.84	159.48	53.16
200	0.075 mm	24.27	8.09	38.75	183.75	61.25
	PAN	116.25	38.75	0.00	**300.00**	100.00
	Total Weight (gm)	**300.00**				



Gravel: 28.15 **Sand: 33.10** **Silt/Clay: 38.75** **D-50: 0.11**

ICGS Pvt. Ltd.

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 28**

Co-ordinate: Depth (m): **0.00-1.00m**

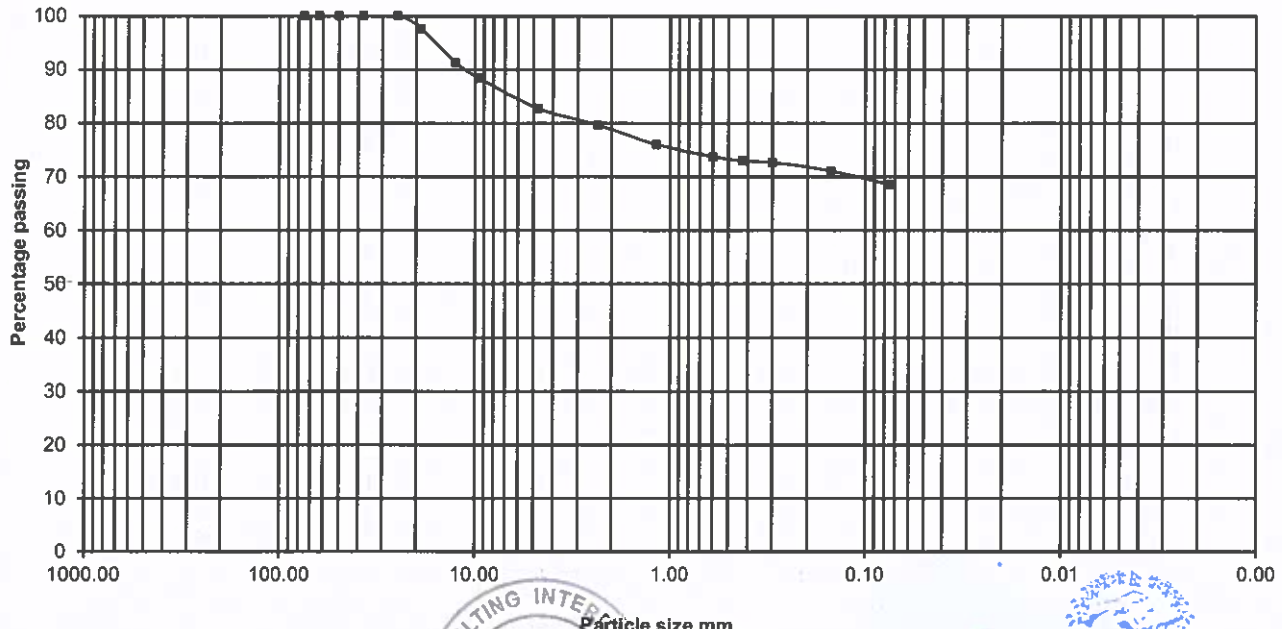
Date Testing: **2019/04/26**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	11.55	2.36	97.64	11.55	2.36
1/2"	12.50 mm	31.21	6.37	91.27	42.76	8.73
3/8"	9.50 mm	14.38	2.93	88.34	57.14	11.66
4	4.75 mm	27.68	5.65	82.69	84.82	17.31
8	2.360 mm	15.28	3.12	79.57	100.10	20.43
16	1.180 mm	17.69	3.61	75.96	117.79	24.04
30	0.600 mm	11.27	2.30	73.66	129.06	26.34
40	0.425 mm	3.45	0.70	72.96	132.51	27.04
50	0.300 mm	1.79	0.37	72.59	134.30	27.41
100	0.150 mm	7.61	1.55	71.04	141.91	28.96
200	0.075 mm	12.14	2.48	68.56	154.05	31.44
	PAN	335.99	68.56	0.00	**490.04**	100.00
	Total Weight (gm)	**490.04**				



Gravel: 17.31 **Sand: 14.13** **Silt/Clay: 68.56** **D-50:**

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नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample**

Co-ordinate:

Borehole No. **B 29**

Depth (m): **0.00-1.00m**

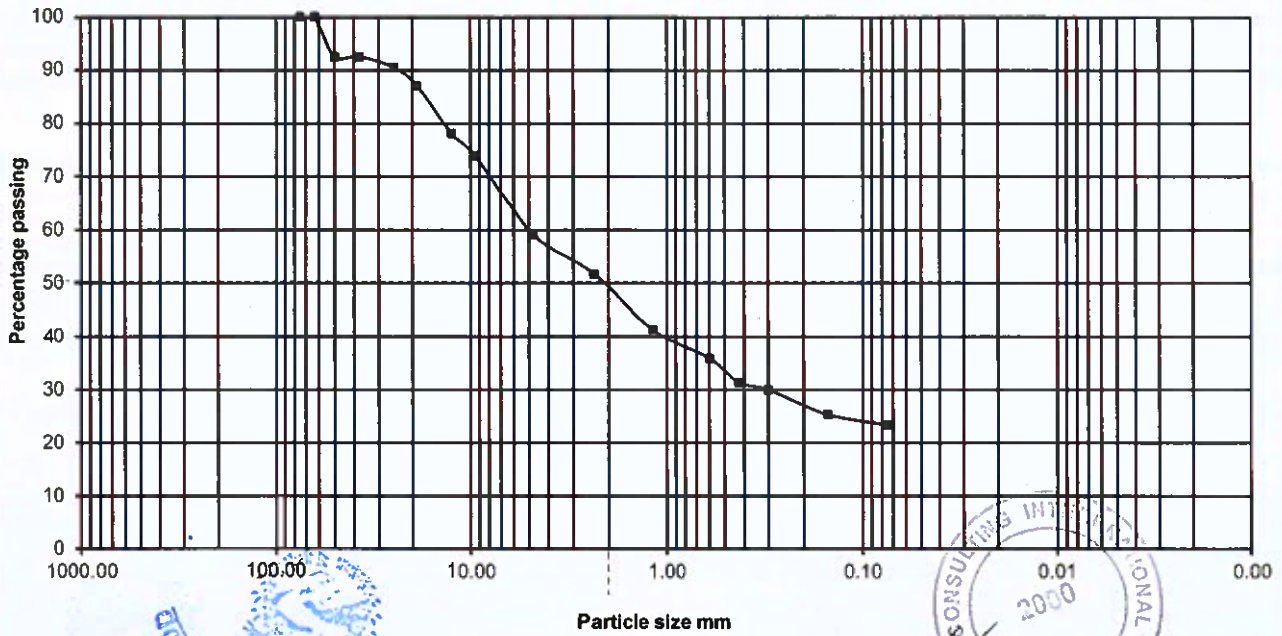
Date Testing: **2019/04/28**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	90.38	7.51	92.49	90.38	7.51
1-1/2"	37.50 mm	0.00	0.00	92.49	90.38	7.51
1"	25.00 mm	23.82	1.98	90.51	114.20	9.49
3/4"	19.00 mm	41.52	3.45	87.06	155.72	12.94
1/2"	12.50 mm	107.42	8.93	78.13	263.14	21.87
3/8"	9.50 mm	50.04	4.16	73.97	313.18	26.03
4	4.75 mm	178.24	14.82	59.15	491.42	40.85
8	2.360 mm	89.76	7.46	51.69	581.18	48.31
16	1.180 mm	125.72	10.45	41.24	706.90	58.76
30	0.600 mm	64.58	5.37	35.87	771.48	64.13
40	0.425 mm	54.62	4.54	31.33	826.10	68.67
50	0.300 mm	16.39	1.36	29.97	842.49	70.03
100	0.150 mm	55.57	4.62	25.35	898.06	74.65
200	0.075 mm	23.43	1.95	23.40	921.49	76.60
	PAN	281.51	23.40	0.00	1203.00	100.00
	Total Weight (gm)	1203.00				



Gravel: 40.85 **Sand: 35.75** **Silt/Clay: 23.40** **D-50: 2.00**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 30**

Co-ordinate: Depth (m): **0.00-1.00m**

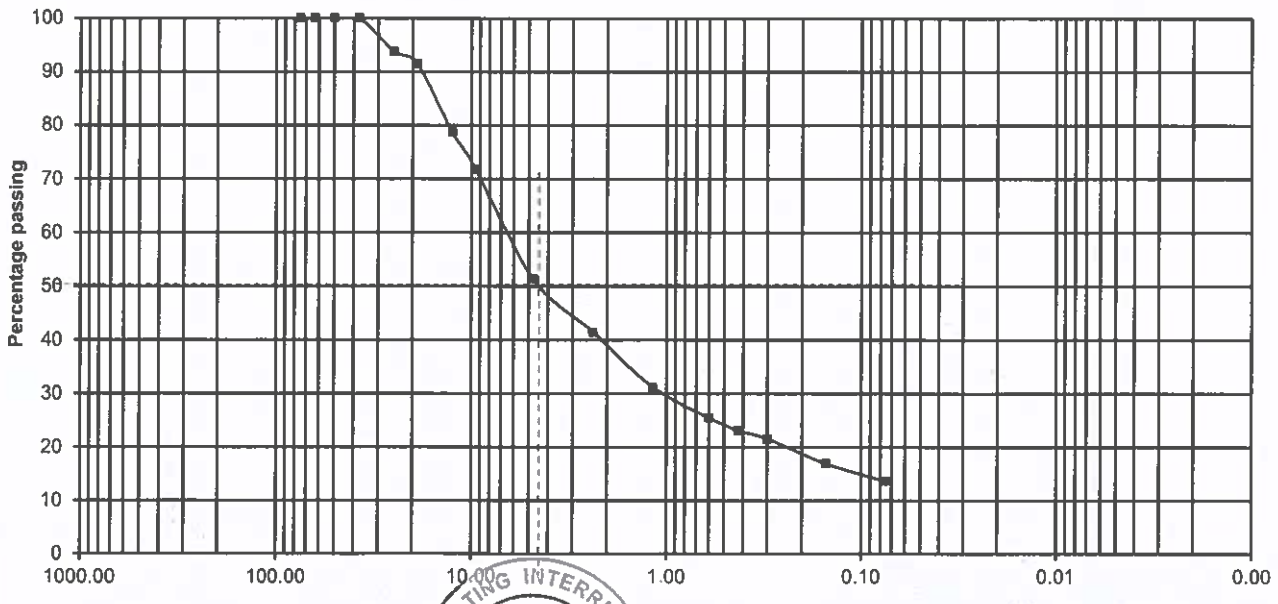
Date Testing: **2019/04/29**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	68.86	6.24	93.76	68.86	6.24
3/4"	19.00 mm	24.36	2.21	91.55	93.22	8.45
1/2"	12.50 mm	141.44	12.82	78.73	234.66	21.27
3/8"	9.50 mm	76.52	6.94	71.79	311.18	28.21
4	4.75 mm	225.13	20.41	51.38	536.31	48.62
8	2.360 mm	110.10	9.98	41.40	646.41	58.60
16	1.180 mm	112.12	10.17	31.23	758.53	68.77
30	0.600 mm	63.60	5.77	25.46	822.13	74.54
40	0.425 mm	25.58	2.32	23.15	847.71	76.85
50	0.300 mm	17.60	1.60	21.55	865.31	78.45
100	0.150 mm	50.98	4.62	16.93	916.29	83.07
200	0.075 mm	35.77	3.24	13.68	952.06	86.32
	PAN	150.94	13.68	0.00	1103.00	100.00
	Total Weight (gm)	1103.00				



Gravel: 48.62 **Sand: 37.69** **Silt/Clay: 13.68** **D-50: 4.50**

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: Test Pit Sample

Borehole No. B 31

Co-ordinate:

Depth (m): 0.00-1.00m

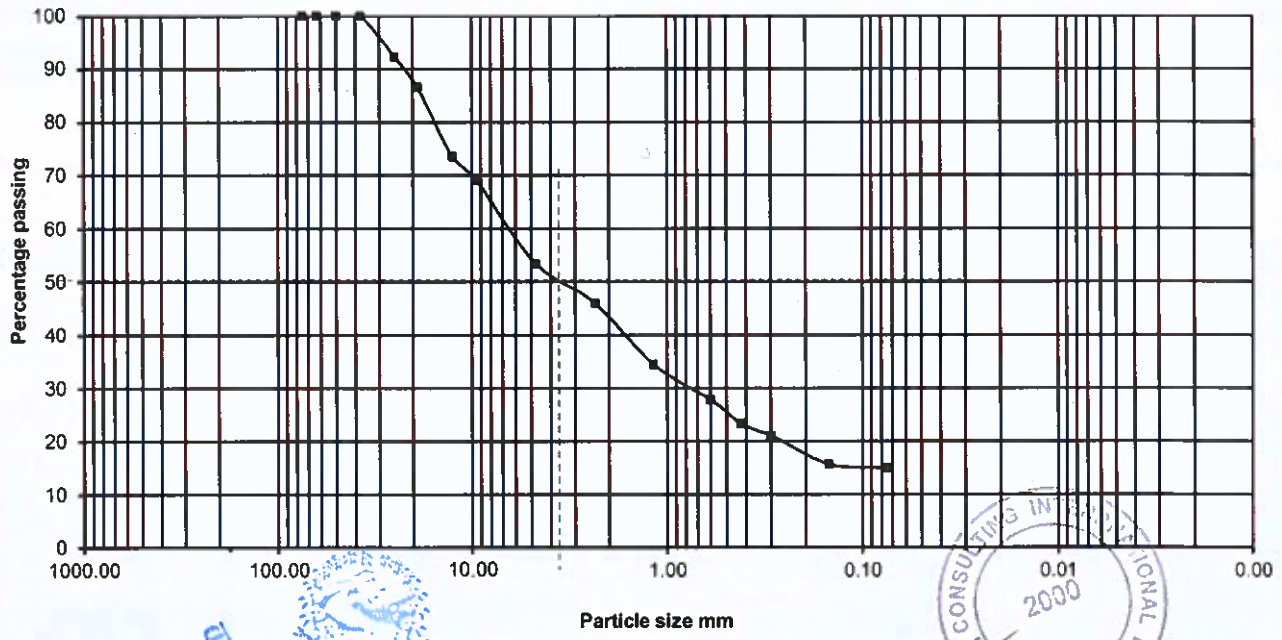
Date Testing: 2019/04/26

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	70.41	7.72	92.28	70.41	7.72
3/4"	19.00 mm	52.37	5.74	86.54	122.78	13.46
1/2"	12.50 mm	119.15	13.07	73.47	241.93	26.53
3/8"	9.50 mm	39.65	4.35	69.12	281.58	30.88
4	4.75 mm	144.09	15.80	53.32	425.67	46.68
8	2.360 mm	67.18	7.37	45.96	492.85	54.04
16	1.180 mm	105.24	11.54	34.42	598.09	65.58
30	0.600 mm	60.16	6.60	27.82	658.25	72.18
40	0.425 mm	40.28	4.42	23.40	698.53	76.60
50	0.300 mm	21.29	2.33	21.07	719.82	78.93
100	0.150 mm	49.71	5.45	15.62	769.53	84.38
200	0.075 mm	6.46	0.71	14.91	775.99	85.09
	PAN	135.96	14.91	0.00	911.95	100.00
	Total Weight (gm)	911.95				



Gravel: 46.68 **Sand: 38.41** **Silt/Clay: 14.91** **D-50: 3.70**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 32**

Co-ordinate: Depth (m): **0.00-1.00m**

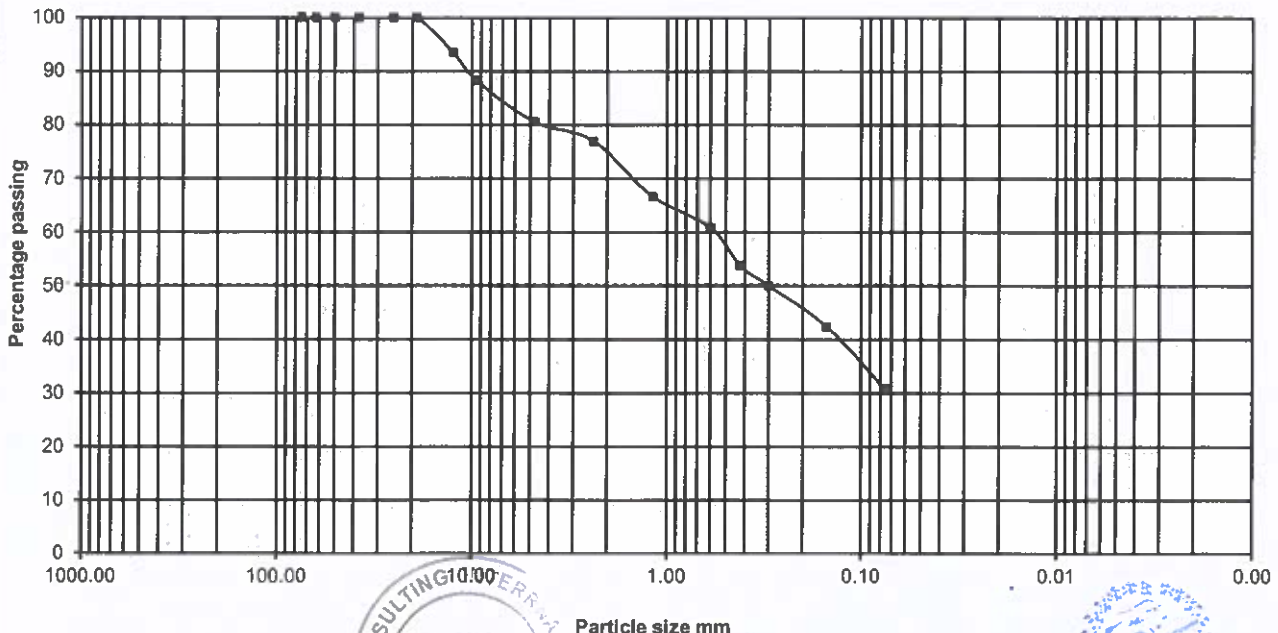
Date Testing: **2076/01/17**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	32.18	6.43	93.57	32.18	6.43
3/8"	9.50 mm	26.72	5.34	88.23	58.90	11.77
4	4.75 mm	38.60	7.72	80.51	97.50	19.49
8	2.360 mm	17.57	3.51	77.00	115.07	23.00
16	1.180 mm	51.96	10.39	66.61	167.03	33.39
30	0.600 mm	28.72	5.74	60.87	195.75	39.13
40	0.425 mm	35.17	7.03	53.84	230.92	46.16
50	0.300 mm	19.28	3.85	49.99	250.20	50.01
100	0.150 mm	37.79	7.55	42.43	287.99	57.57
200	0.075 mm	58.27	11.65	30.78	346.26	69.22
	PAN	154.00	30.78	0.00	**500.26**	100.00
	Total Weight (gm)	**500.26**				



Gravel: 19.49 **Sand: 49.73** **Silt/Clay: 30.78** **D-50: 0.300**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 33**

Co-ordinate: Depth (m): **0.00-1.00m**

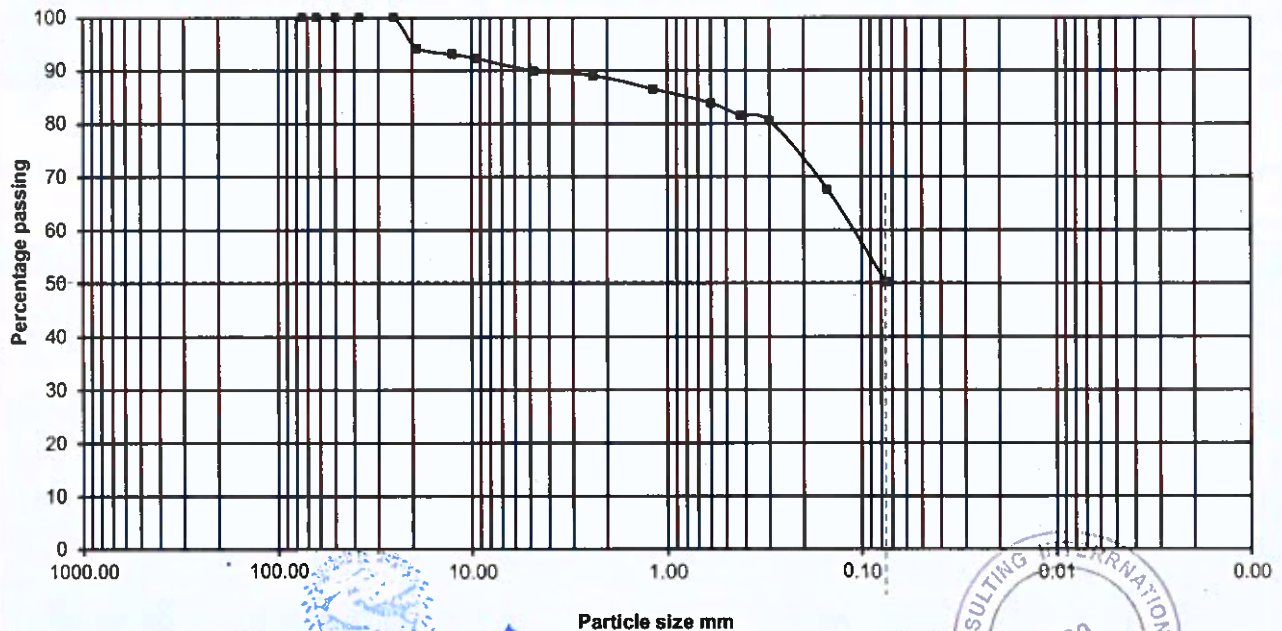
Date Testing: **2076/01/19**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	27.43	5.79	94.21	27.43	5.79
1/2"	12.50 mm	5.61	1.18	93.02	33.04	6.98
3/8"	9.50 mm	3.93	0.83	92.20	36.97	7.80
4	4.75 mm	11.06	2.33	89.86	48.03	10.14
8	2.360 mm	4.30	0.91	88.95	52.33	11.05
16	1.180 mm	11.96	2.52	86.43	64.29	13.57
30	0.600 mm	12.23	2.58	83.85	76.52	16.15
40	0.425 mm	11.03	2.33	81.52	87.55	18.48
50	0.300 mm	4.67	0.99	80.53	92.22	19.47
100	0.150 mm	61.57	13.00	67.53	153.79	32.47
200	0.075 mm	82.23	17.36	50.17	236.02	49.83
	PAN	237.66	50.17	0.00	**473.68**	100.00
	Total Weight (gm)	**473.68**				



Gravel: 10.14 Sand: 39.69 Silt/Clay: 50.17 D-50: 0.075

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample**

Co-ordinate:

Borehole No. **B 34**

Depth (m): **0.00-1.00m**

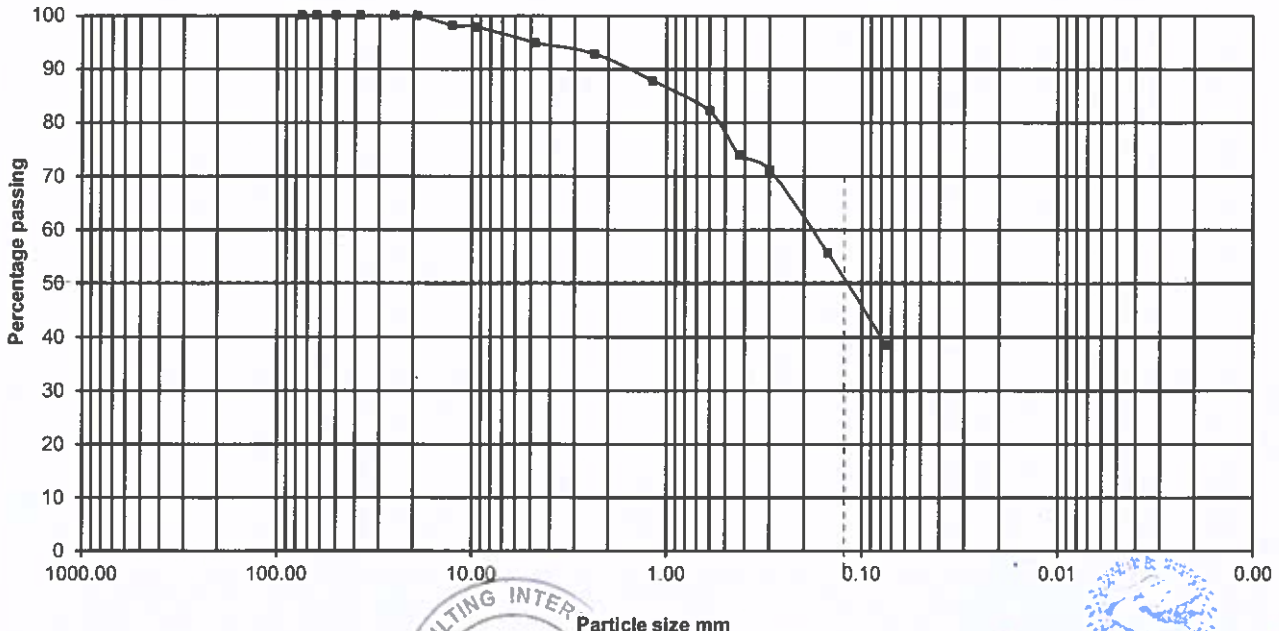
Date Testing: **2019/04/30**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	9.42	1.88	98.12	9.42	1.88
3/8"	9.50 mm	1.26	0.25	97.87	10.68	2.13
4	4.75 mm	14.70	2.93	94.95	25.38	5.05
8	2.360 mm	10.65	2.12	92.83	36.03	7.17
16	1.180 mm	25.19	5.01	87.81	61.22	12.19
30	0.600 mm	28.31	5.64	82.18	89.53	17.82
40	0.425 mm	41.26	8.21	73.96	130.79	26.04
50	0.300 mm	14.05	2.80	71.17	144.84	28.83
100	0.150 mm	77.87	15.50	55.66	222.71	44.34
200	0.075 mm	86.12	17.14	38.52	308.83	61.48
	PAN	193.49	38.52	0.00	**502.32**	100.00
	Total Weight (gm)	**502.32**				



Gravel: 5.05 **Sand: 56.43** **Silt/Clay: 38.52** **D-50: 0.125**

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सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample**

Co-ordinate:

Borehole No. **B 35**

Depth (m): **0.00-1.00m**

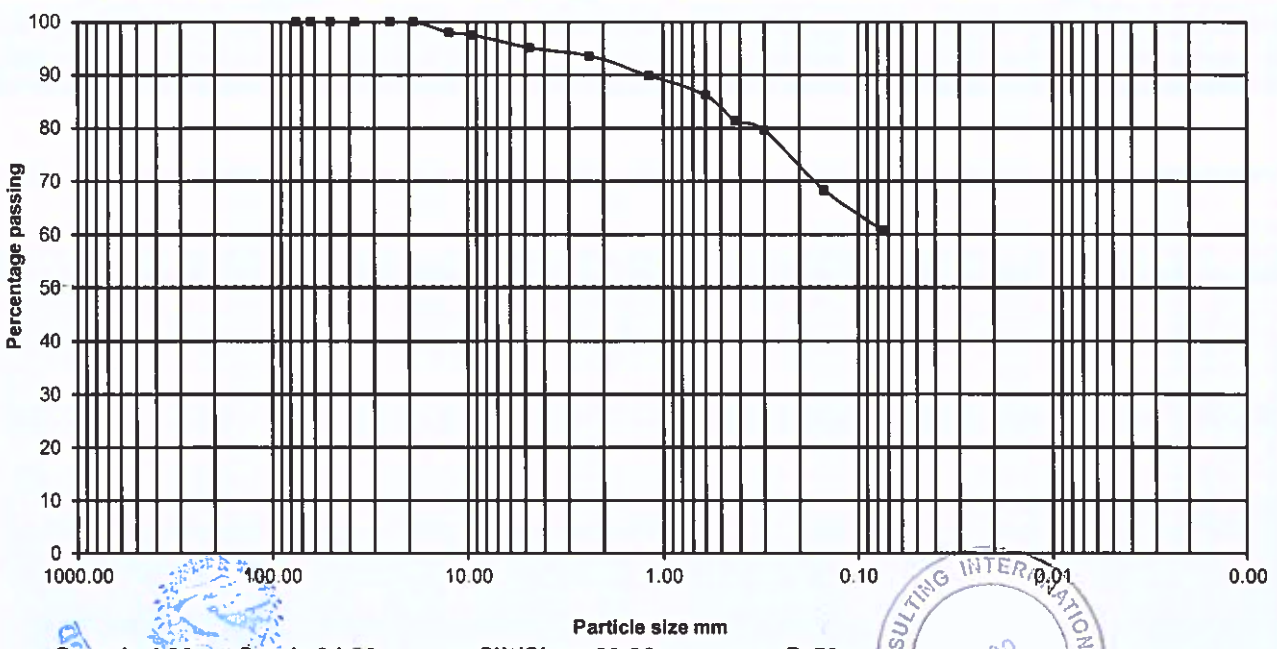
Date Testing: **2076/01/17**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	12.18	2.04	97.96	12.18	2.04
3/8"	9.50 mm	2.49	0.42	97.55	14.67	2.45
4	4.75 mm	14.60	2.44	95.10	29.27	4.90
8	2.360 mm	9.36	1.57	93.54	38.63	6.46
16	1.180 mm	21.90	3.66	89.87	60.53	10.13
30	0.600 mm	22.18	3.71	86.16	82.71	13.84
40	0.425 mm	28.49	4.77	81.39	111.20	18.61
50	0.300 mm	10.86	1.82	79.58	122.06	20.42
100	0.150 mm	67.49	11.29	68.28	189.55	31.72
200	0.075 mm	44.71	7.48	60.80	234.26	39.20
	PAN	363.35	60.80	0.00	**597.61**	100.00
	Total Weight (gm)	**597.61**				



Gravel: 4.90 **Sand: 34.30** **Silt/Clay: 60.80** **D-50:**

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 36**

Co-ordinate: Depth (m): **0.00-1.00m**

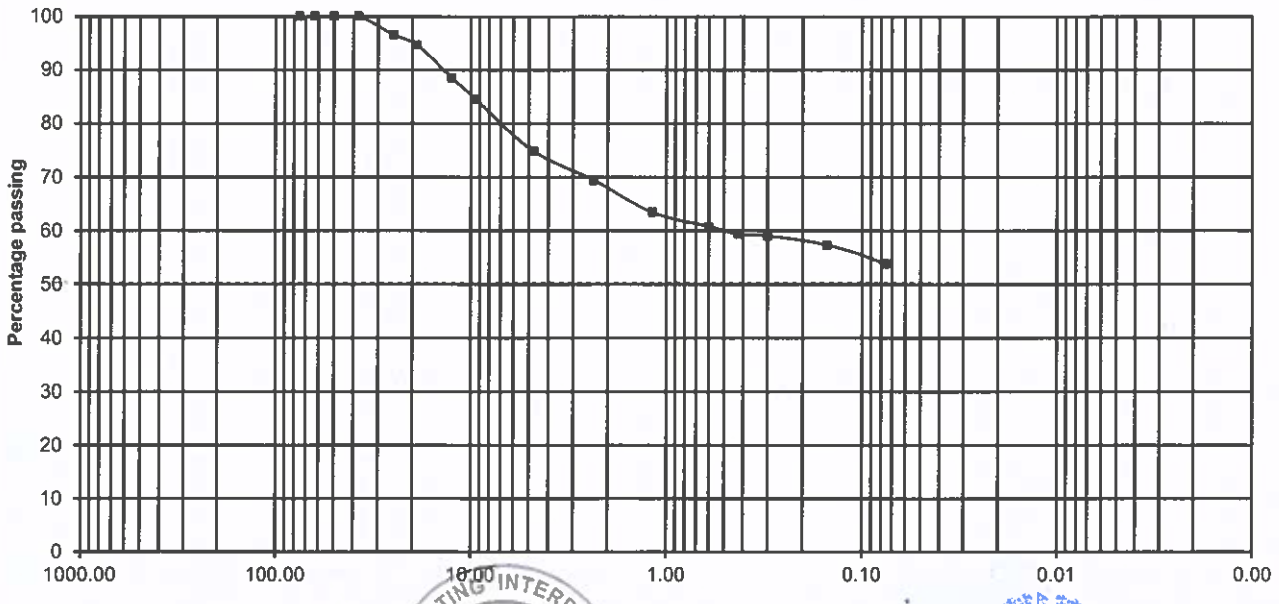
Date Testing: **2019/05/02**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	37.75	3.48	96.52	37.75	3.48
3/4"	19.00 mm	19.89	1.83	94.69	57.64	5.31
1/2"	12.50 mm	66.72	6.15	88.55	124.36	11.45
3/8"	9.50 mm	43.11	3.97	84.58	167.47	15.42
4	4.75 mm	105.58	9.72	74.85	273.05	25.15
8	2.360 mm	59.24	5.46	69.39	332.29	30.61
16	1.180 mm	65.22	6.01	63.39	397.51	36.61
30	0.600 mm	28.74	2.65	60.74	426.25	39.26
40	0.425 mm	14.90	1.37	59.37	441.15	40.63
50	0.300 mm	3.78	0.35	59.02	444.93	40.98
100	0.150 mm	18.49	1.70	57.32	463.42	42.68
200	0.075 mm	37.88	3.49	53.83	501.30	46.17
	PAN	584.42	53.83	0.00	1085.72	100.00
	Total Weight (gm)	1085.72				



Gravel: 25.15 **Sand: 21.02** **Silt/Clay: 53.83** **D-50:**

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सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: Test Pit Sample

Co-ordinate:

Borehole No. B 37

Depth (m): 0.00-1.00m

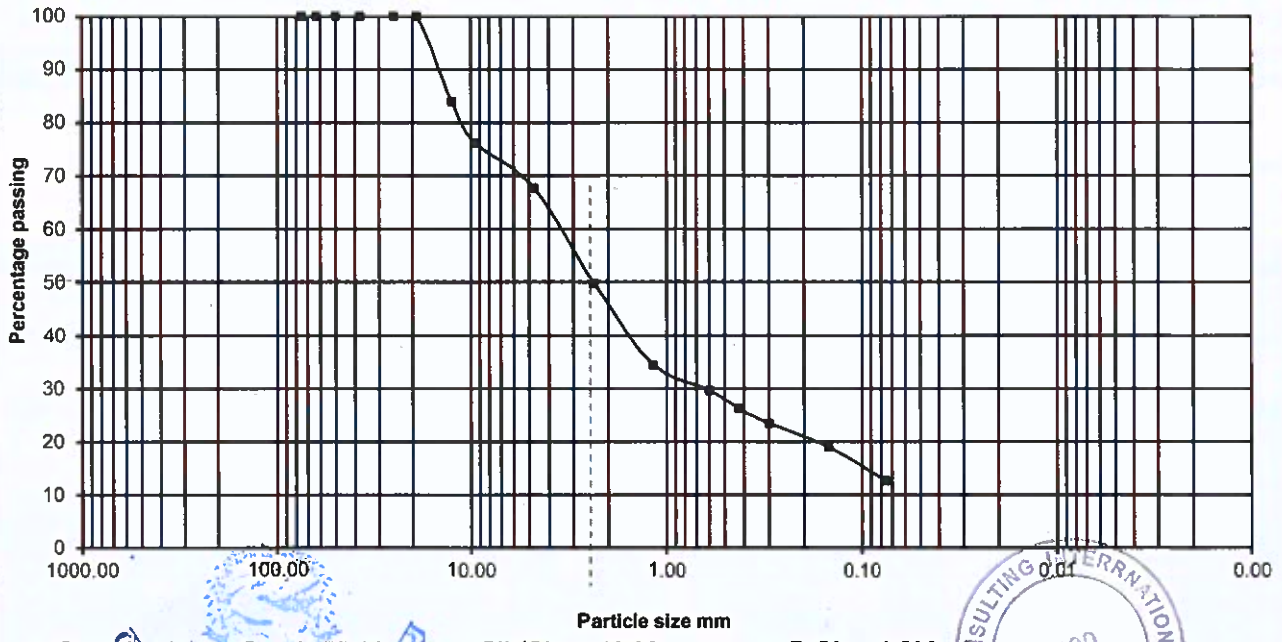
Date Testing: 2019/05/26

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	81.37	16.02	83.98	81.37	16.02
3/8"	9.50 mm	39.84	7.84	76.13	121.21	23.87
4	4.75 mm	42.66	8.40	67.73	163.87	32.27
8	2.360 mm	91.37	17.99	49.74	255.24	50.26
16	1.180 mm	77.26	15.21	34.53	332.50	65.47
30	0.600 mm	24.63	4.85	29.68	357.13	70.32
40	0.425 mm	17.17	3.38	26.30	374.30	73.70
50	0.300 mm	14.00	2.76	23.54	388.30	76.46
100	0.150 mm	23.11	4.55	18.99	411.41	81.01
200	0.075 mm	32.36	6.37	12.62	443.77	87.38
	PAN	64.08	12.62	0.00	507.85	100.00
	Total Weight (gm)	507.85				



Gravel: 32.27 Sand: 55.11 Silt/Clay: 12.62 D-50: 1.500

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 38**

Co-ordinate: Depth (m): **0.00-1.00m**

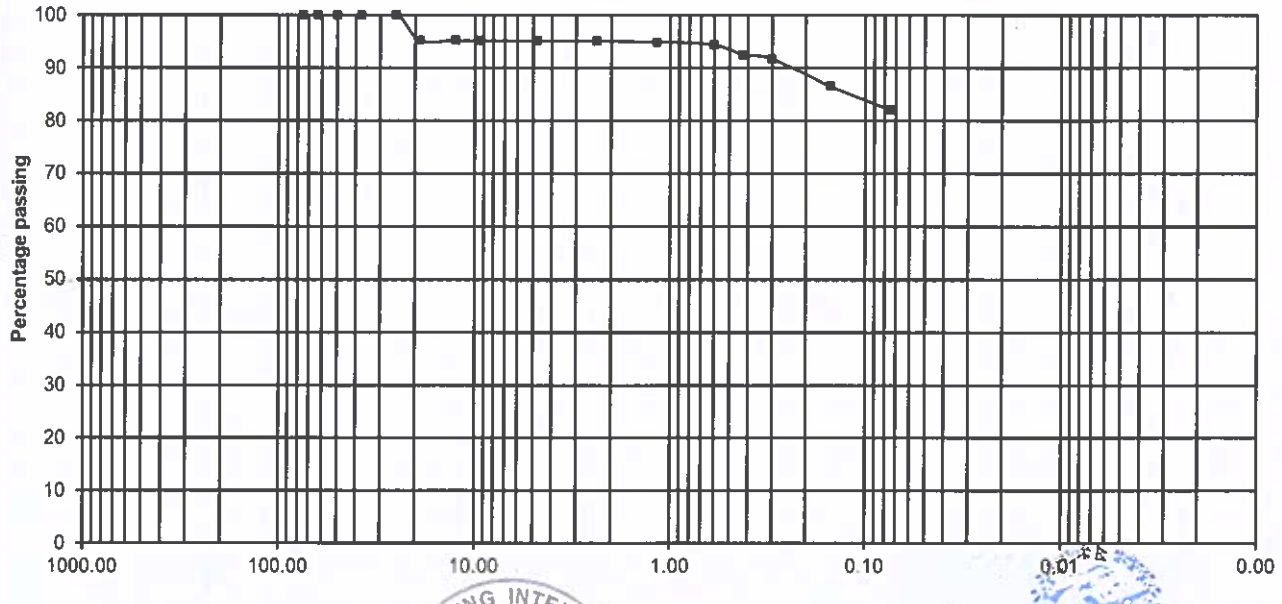
Date Testing: **2019/06/11**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	14.56	4.85	95.15	14.56	4.85
1/2"	12.50 mm	0.00	0.00	95.15	14.56	4.85
3/8"	9.50 mm	0.00	0.00	95.15	14.56	4.85
4	4.75 mm	0.00	0.00	95.15	14.56	4.85
8	2.360 mm	0.21	0.07	95.08	14.77	4.92
16	1.180 mm	0.56	0.19	94.89	15.33	5.11
30	0.600 mm	1.75	0.58	94.31	17.08	5.69
40	0.425 mm	5.44	1.81	92.49	22.52	7.51
50	0.300 mm	2.58	0.86	91.63	25.10	8.37
100	0.150 mm	15.38	5.13	86.51	40.48	13.49
200	0.075 mm	13.38	4.46	82.05	53.86	17.95
	PAN	246.14	82.05	0.00	**300.00**	100.00
	Total Weight (gm)	**300.00**				



Gravel: 4.85 **Sand: 13.10** **Silt/Clay: 82.05** **D-50:**

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नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: Test Pit Sample

Co-ordinate:

Borehole No. B 39

Depth (m): 0.00-1.00m

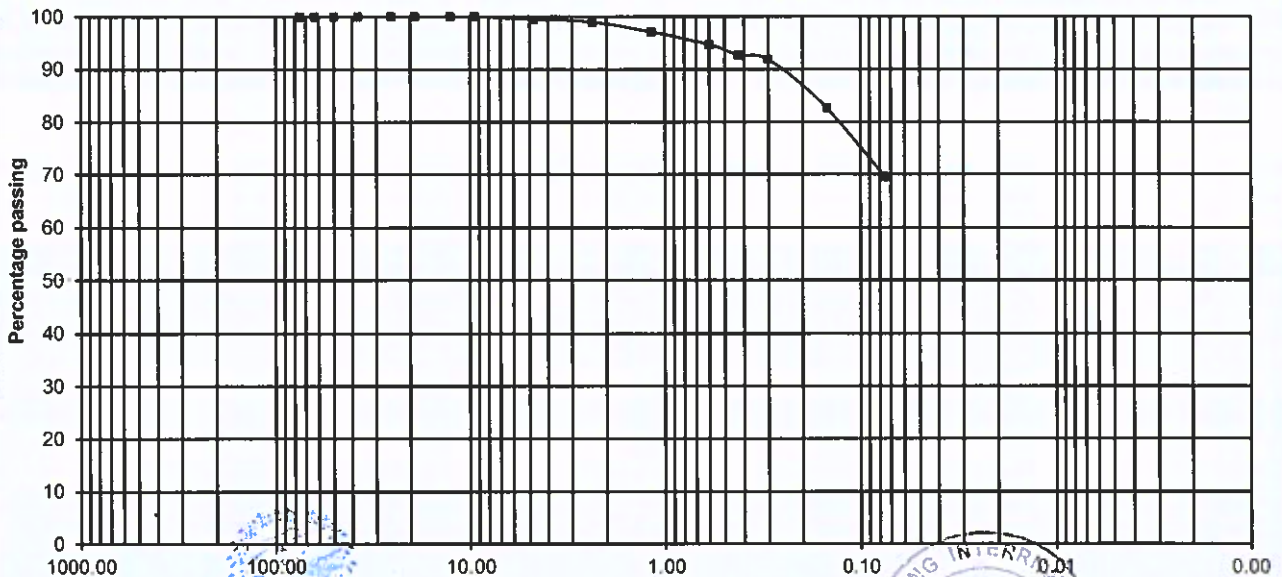
Date Testing: 2019/06/06

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	1.52	0.51	99.49	1.52	0.51
8	2.360 mm	1.56	0.52	98.97	3.08	1.03
16	1.180 mm	5.57	1.86	97.11	8.65	2.89
30	0.600 mm	7.25	2.42	94.70	15.90	5.30
40	0.425 mm	6.25	2.08	92.61	22.15	7.39
50	0.300 mm	2.33	0.78	91.83	24.48	8.17
100	0.150 mm	27.47	9.16	82.67	51.95	17.33
200	0.075 mm	39.32	13.11	69.56	91.27	30.44
	PAN	208.54	69.56	0.00	299.81	100.00
	Total Weight (gm)	299.81				



Gravel: 0.51 Sand: 29.94 Silt/Clay: 69.56 D-50:

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample**

Co-ordinate:

Borehole No. **B 40**

Depth (m): **0.00-1.00m**

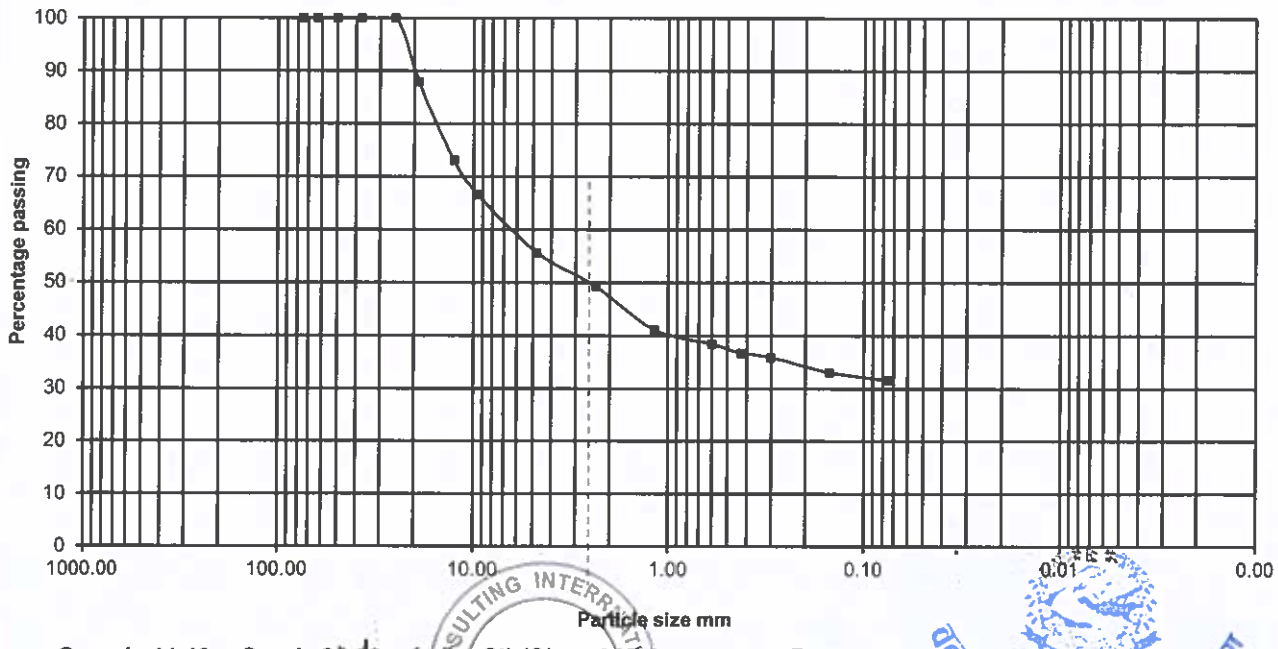
Date Testing: **2019/05/31**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	60.36	12.12	87.88	60.36	12.12
1/2"	12.50 mm	74.01	14.86	73.03	134.37	26.97
3/8"	9.50 mm	32.12	6.45	66.58	166.49	33.42
4	4.75 mm	54.71	10.98	55.60	221.20	44.40
8	2.360 mm	31.97	6.42	49.18	253.17	50.82
16	1.180 mm	40.54	8.14	41.04	293.71	58.96
30	0.600 mm	13.55	2.72	38.32	307.26	61.68
40	0.425 mm	8.31	1.67	36.65	315.57	63.35
50	0.300 mm	4.02	0.81	35.85	319.59	64.15
100	0.150 mm	14.42	2.89	32.95	334.01	67.05
200	0.075 mm	7.18	1.44	31.51	341.19	68.49
	PAN	156.97	31.51	0.00	**498.16**	100.00
	Total Weight (gm)	**498.16**				



Gravel: 44.40 **Sand: 24.09** **Silt/Clay: 31.51** **D-50: 2.50**

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सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: Test Pit Sample

Co-ordinate:

Borehole No. B 41

Depth (m): 0.00-1.00m

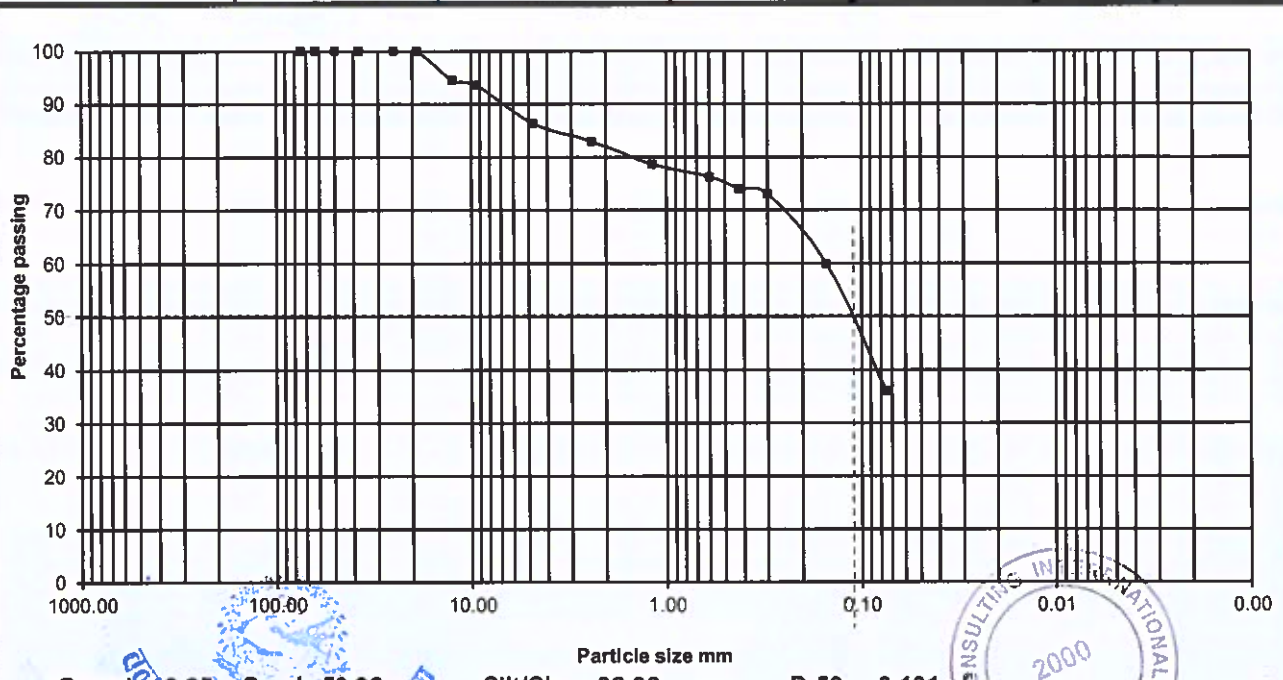
Date Testing: 2019/05/26

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	16.39	5.46	94.54	16.39	5.46
3/8"	9.50 mm	3.02	1.01	93.53	19.41	6.47
4	4.75 mm	21.54	7.18	86.35	40.95	13.65
8	2.360 mm	10.29	3.43	82.92	51.24	17.08
16	1.180 mm	12.75	4.25	78.67	63.99	21.33
30	0.600 mm	7.30	2.43	76.24	71.29	23.76
40	0.425 mm	6.67	2.22	74.01	77.96	25.99
50	0.300 mm	3.16	1.05	72.96	81.12	27.04
100	0.150 mm	39.36	13.12	59.84	120.48	40.16
200	0.075 mm	71.44	23.81	36.03	191.92	63.97
	PAN	108.08	36.03	0.00	300.00	100.00
	Total Weight (gm)	300.00				



Gravel: 13.65 Sand: 50.32 Silt/Clay: 36.03 D-50: 0.101

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 42**

Co-ordinate: Depth (m): **0.00-1.00m**

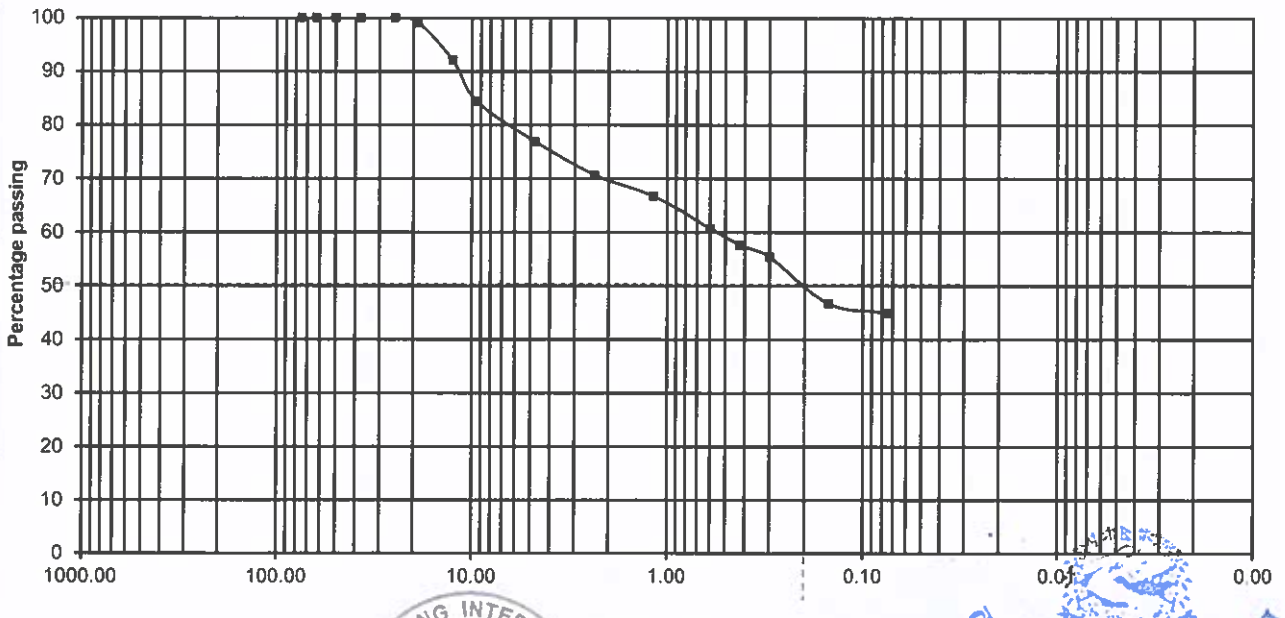
Date Testing: **2019/04/26**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	9.33	0.84	99.16	9.33	0.84
1/2"	12.50 mm	78.36	7.04	92.12	87.69	7.88
3/8"	9.50 mm	85.95	7.72	84.40	173.64	15.60
4	4.75 mm	84.49	7.59	76.81	258.13	23.19
8	2.360 mm	69.52	6.25	70.56	327.65	29.44
16	1.180 mm	43.31	3.89	66.67	370.96	33.33
30	0.600 mm	65.85	5.92	60.76	436.81	39.24
40	0.425 mm	35.04	3.15	57.61	471.85	42.39
50	0.300 mm	25.04	2.25	55.36	496.89	44.64
100	0.150 mm	96.60	8.68	46.68	593.49	53.32
200	0.075 mm	18.82	1.69	44.99	612.31	55.01
	PAN	500.81	44.99	0.00	1113.12	100.00
	Total Weight (gm)	1113.12				



Gravel: 23.19 **Sand: 31.82** **Silt/Clay: 44.99** **D-50: 0.20**

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: Test Pit Sample

Borehole No. B 43

Co-ordinate:

Depth (m): 0.00-1.00m

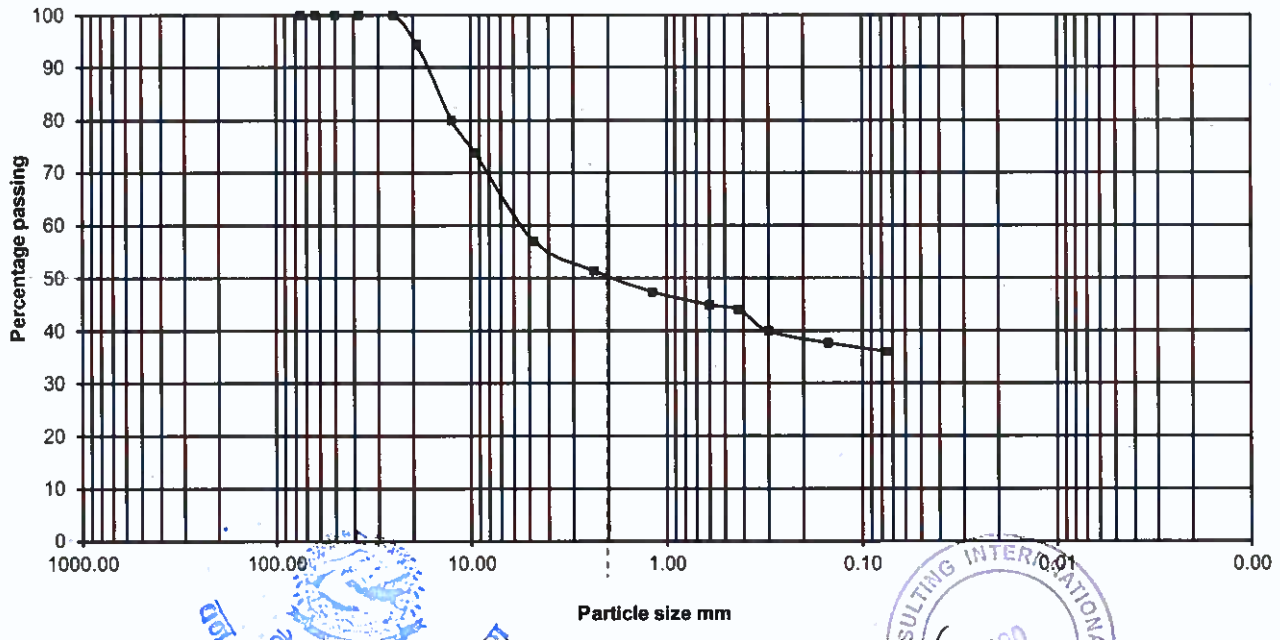
Date Testing: 2019/06/11

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	16.83	5.61	94.39	16.83	5.61
1/2"	12.50 mm	43.24	14.41	79.98	60.07	20.02
3/8"	9.50 mm	18.64	6.21	73.76	78.71	26.24
4	4.75 mm	50.25	16.75	57.01	128.96	42.99
8	2.360 mm	17.15	5.72	51.30	146.11	48.70
16	1.180 mm	11.93	3.98	47.32	158.04	52.68
30	0.600 mm	7.51	2.50	44.82	165.55	55.18
40	0.425 mm	2.47	0.82	43.99	168.02	56.01
50	0.300 mm	12.24	4.08	39.91	180.26	60.09
100	0.150 mm	6.65	2.22	37.70	186.91	62.30
200	0.075 mm	5.30	1.77	35.93	192.21	64.07
	PAN	107.79	35.93	0.00	300.00	100.00
	Total Weight (gm)	300.00				



Gravel: 42.99 **Sand: 21.08** **Silt/Clay: 35.93** **D-50: 2.000**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 44**

Co-ordinate: Depth (m): **0.00-1.00m**

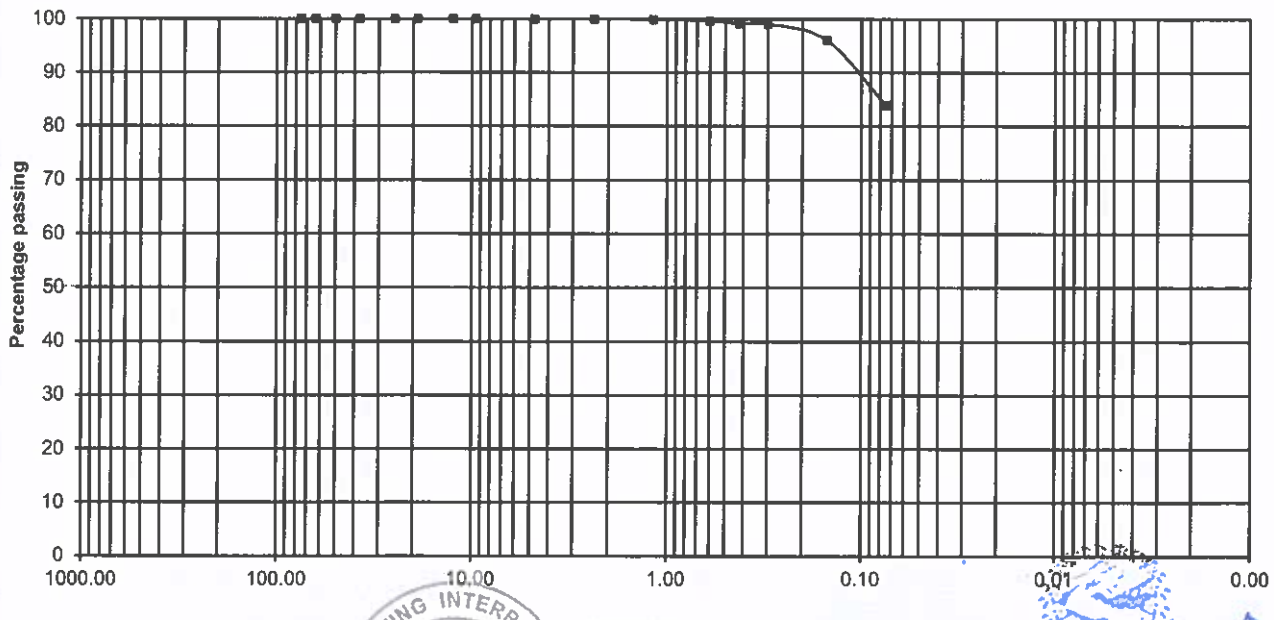
Date Testing: **2019/06/11**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	0.00	0.00	100.00	0.00	0.00
8	2.360 mm	0.09	0.03	99.97	0.09	0.03
16	1.180 mm	0.24	0.08	99.89	0.33	0.11
30	0.600 mm	0.66	0.22	99.67	0.99	0.33
40	0.425 mm	1.57	0.52	99.15	2.56	0.85
50	0.300 mm	0.42	0.14	99.01	2.98	0.99
100	0.150 mm	9.00	3.00	96.01	11.98	3.99
200	0.075 mm	36.54	12.18	83.83	48.52	16.17
	PAN	251.48	83.83	0.00	**300.00**	100.00
	Total Weight (gm)	**300.00**				



Gravel: 0.00 **Sand: 16.17** **Silt/Clay: 83.83** **D-50:**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: Test Pit Sample

Co-ordinate:

Borehole No. B 45

Depth (m): 0.00-1.00m

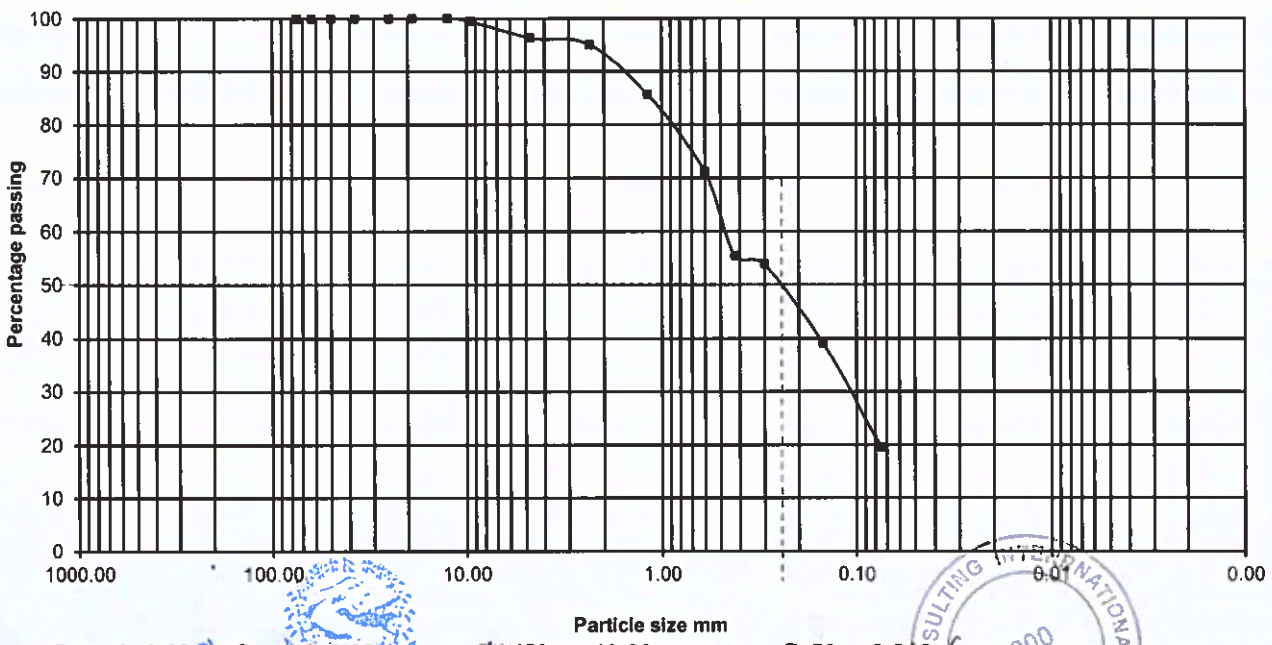
Date Testing: 2019/05/25

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	2.94	0.59	99.41	2.94	0.59
4	4.75 mm	15.42	3.10	96.31	18.36	3.69
8	2.360 mm	6.40	1.29	95.02	24.76	4.98
16	1.180 mm	46.60	9.36	85.66	71.36	14.34
30	0.600 mm	72.38	14.55	71.11	143.74	28.89
40	0.425 mm	78.00	15.67	55.44	221.74	44.56
50	0.300 mm	8.24	1.66	53.78	229.98	46.22
100	0.150 mm	73.12	14.69	39.09	303.10	60.91
200	0.075 mm	96.51	19.39	19.69	399.61	80.31
	PAN	98.00	19.69	0.00	497.61	100.00
	Total Weight (gm)	497.61				



Gravel: 3.69 **Sand: 76.62** **Silt/Clay: 19.69** **D-50: 0.240**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 46**

Co-ordinate: Depth (m): **0.00-1.00m**

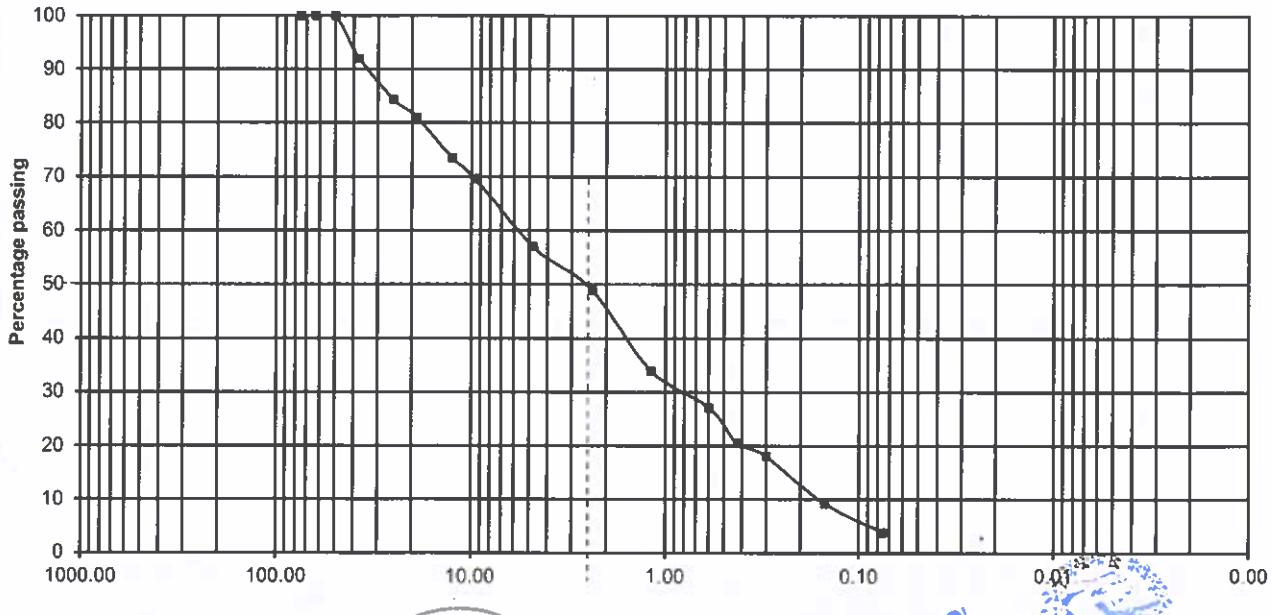
Date Testing: **2075/11/27**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	118.53	8.02	91.98	118.53	8.02
1"	25.00 mm	112.32	7.60	84.38	230.85	15.62
3/4"	19.00 mm	50.59	3.42	80.95	281.44	19.05
1/2"	12.50 mm	110.43	7.47	73.48	391.87	26.52
3/8"	9.50 mm	58.32	3.95	69.53	450.19	30.47
4	4.75 mm	186.27	12.61	56.93	636.46	43.07
8	2.360 mm	117.79	7.97	48.96	754.25	51.04
16	1.180 mm	222.32	15.04	33.91	976.57	66.09
30	0.600 mm	100.37	6.79	27.12	1076.94	72.88
40	0.425 mm	97.52	6.60	20.52	1174.46	79.48
50	0.300 mm	35.66	2.41	18.11	1210.12	81.89
100	0.150 mm	131.75	8.92	9.19	1341.87	90.81
200	0.075 mm	79.83	5.40	3.79	1421.70	96.21
	PAN	56.02	3.79	0.00	**1477.72**	100.00
	Total Weight (gm)	**1477.72**				



Gravel: 43.07 **Sand: 53.14** **Silt/Clay: 3.79** **D-50: 2.50**

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

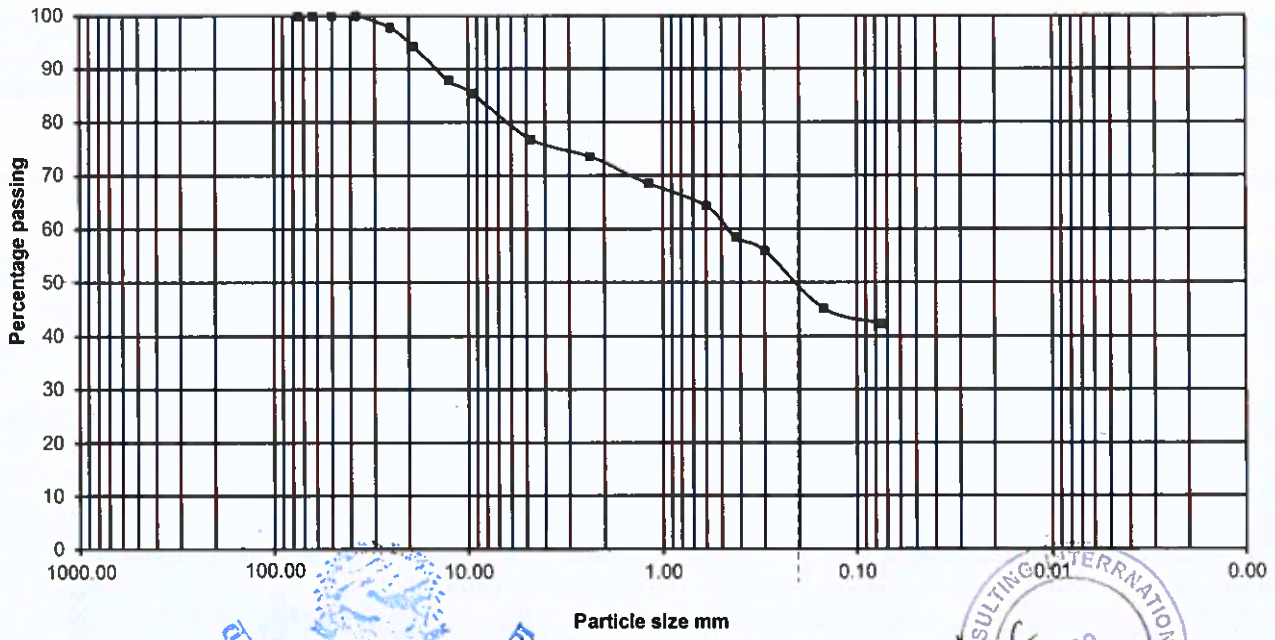
Location: Date Testing: 2075/11/27

Source: Test Pit Sample Borehole No. B 47 Tested By: Pranita Pun

Co-ordinate: Depth (m): 0.00-1.00m Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	52.25	2.15	97.85	52.25	2.15
3/4"	19.00 mm	86.80	3.57	94.28	139.05	5.72
1/2"	12.50 mm	158.70	6.53	87.75	297.75	12.25
3/8"	9.50 mm	57.12	2.35	85.40	354.87	14.60
4	4.75 mm	207.78	8.55	76.85	562.65	23.15
8	2.360 mm	80.73	3.32	73.53	643.38	26.47
16	1.180 mm	123.81	5.09	68.43	767.19	31.57
30	0.600 mm	99.06	4.08	64.36	866.25	35.64
40	0.425 mm	143.89	5.92	58.44	1010.14	41.56
50	0.300 mm	62.61	2.58	55.86	1072.75	44.14
100	0.150 mm	262.37	10.80	45.07	1335.12	54.93
200	0.075 mm	69.26	2.85	42.22	1404.38	57.78
	PAN	1026.00	42.22	0.00	2430.38	100.00
	Total Weight (gm)	2430.38				



Gravel: 23.15 Sand: 34.63 Silt/Clay: 42.22 D-50: 0.20

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 48**

Co-ordinate: Depth (m): **0.00-1.00m**

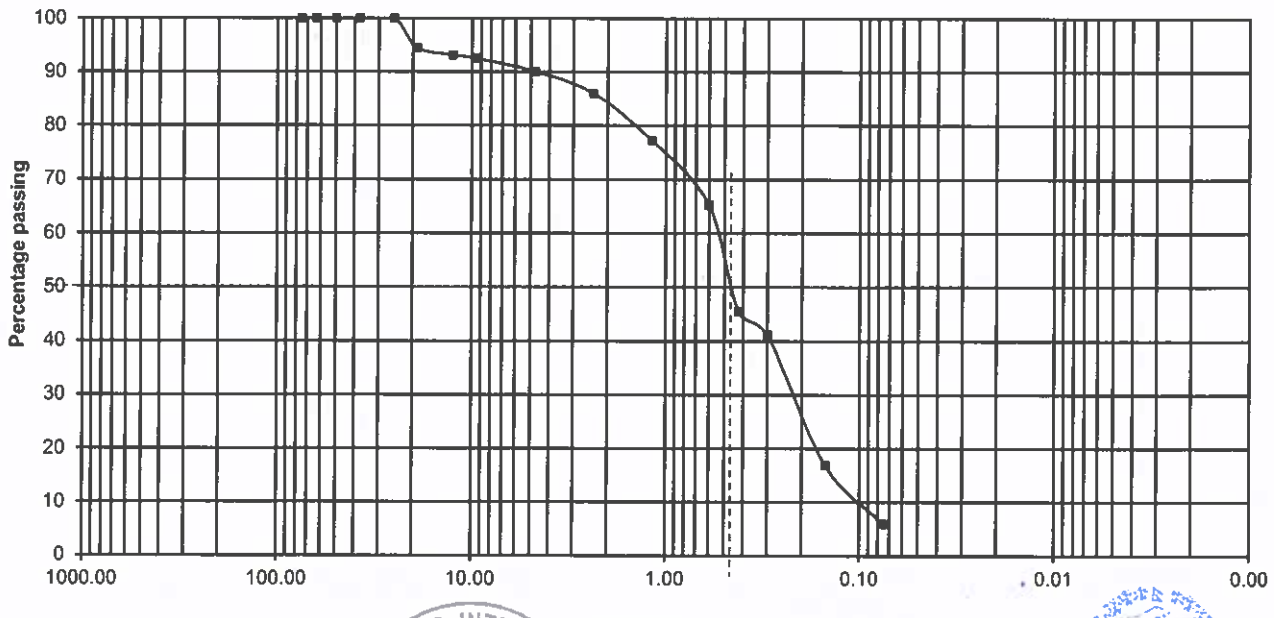
Date Testing: **2075/11/27**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	53.28	5.61	94.39	53.28	5.61
1/2"	12.50 mm	12.04	1.27	93.12	65.32	6.88
3/8"	9.50 mm	5.85	0.62	92.51	71.17	7.49
4	4.75 mm	24.16	2.54	89.96	95.33	10.04
8	2.360 mm	37.87	3.99	85.97	133.20	14.03
16	1.180 mm	82.48	8.68	77.29	215.68	22.71
30	0.600 mm	114.22	12.03	65.26	329.90	34.74
40	0.425 mm	188.14	19.81	45.45	518.04	54.55
50	0.300 mm	41.25	4.34	41.11	559.29	58.89
100	0.150 mm	230.47	24.27	16.84	789.76	83.16
200	0.075 mm	103.07	10.85	5.99	892.83	94.01
	PAN	56.90	5.99	0.00	**949.73**	100.00
	Total Weight (gm)	**949.73**				



Gravel: 10.04 **Sand: 83.97** **Silt/Clay: 5.99** **D-50: 0.46**

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 49**

Co-ordinate: Depth (m): **0.00-1.00m**

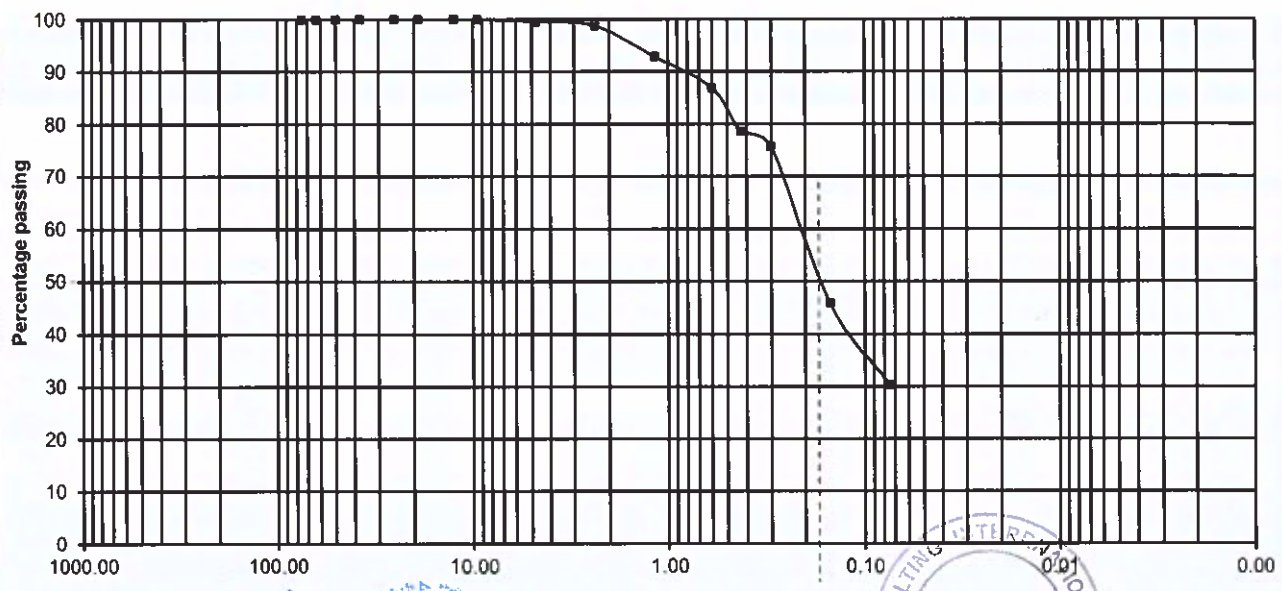
Date Testing: **2019/06/05**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	2.34	0.47	99.53	2.34	0.47
8	2.360 mm	3.62	0.73	98.80	5.96	1.20
16	1.180 mm	29.42	5.94	92.85	35.38	7.15
30	0.600 mm	29.79	6.02	86.84	65.17	13.16
40	0.425 mm	40.64	8.21	78.63	105.81	21.37
50	0.300 mm	14.35	2.90	75.73	120.16	24.27
100	0.150 mm	147.90	29.87	45.86	268.06	54.14
200	0.075 mm	77.22	15.60	30.26	345.28	69.74
	PAN	149.82	30.26	0.00	**495.10**	100.00
	Total Weight (gm)	**495.10**				



Gravel: 0.47 **Sand: 69.27** **Silt/Clay: 30.26** **D-50: 0.175**

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Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

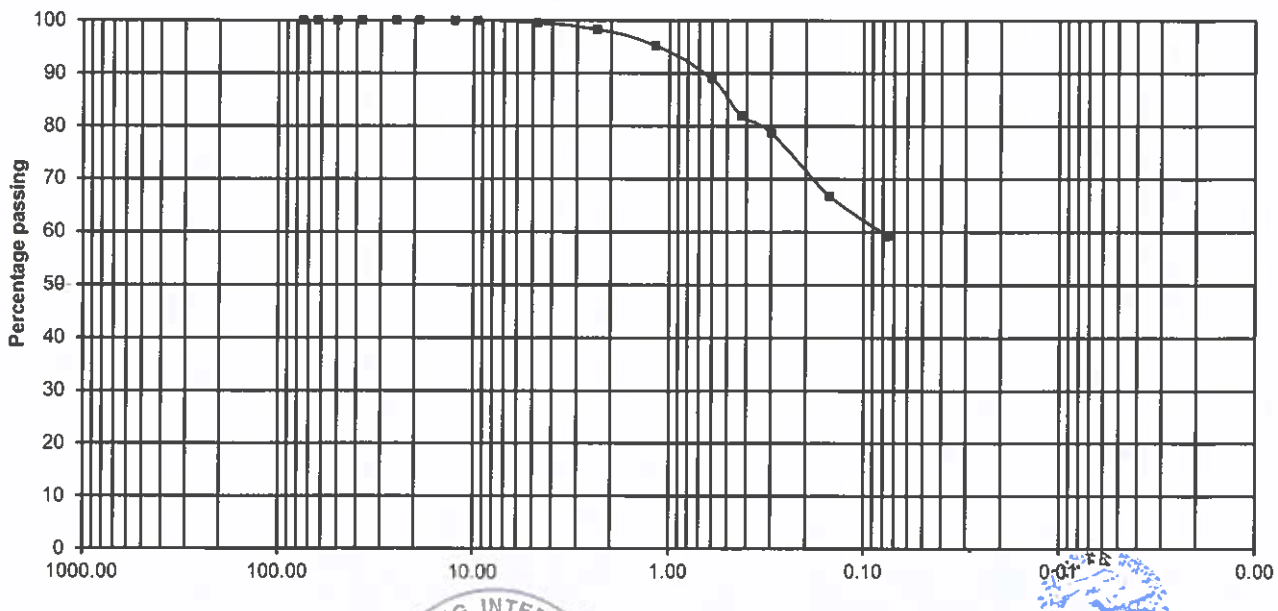
Location: Date Testing: 2019/06/11

Source: Test Pit Sample Borehole No. B 50 Tested By: Pranita Pun

Co-ordinate: Depth (m): 0.00-1.00m Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	0.00	0.00	100.00	0.00	0.00
3/8"	9.50 mm	0.00	0.00	100.00	0.00	0.00
4	4.75 mm	1.36	0.45	99.55	1.36	0.45
8	2.360 mm	3.88	1.29	98.25	5.24	1.75
16	1.180 mm	8.95	2.98	95.27	14.19	4.73
30	0.600 mm	18.95	6.32	88.95	33.14	11.05
40	0.425 mm	21.24	7.08	81.87	54.38	18.13
50	0.300 mm	9.27	3.09	78.78	63.65	21.22
100	0.150 mm	36.20	12.07	66.72	99.85	33.28
200	0.075 mm	22.63	7.54	59.17	122.48	40.83
	PAN	177.52	59.17	0.00	300.00	100.00
	Total Weight (gm)	300.00				



Gravel: 0.45 **Sand: 40.37** **Silt/Clay: 59.17** **D-50:**

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 51**

Co-ordinate: Depth (m): **0.00-1.00m**

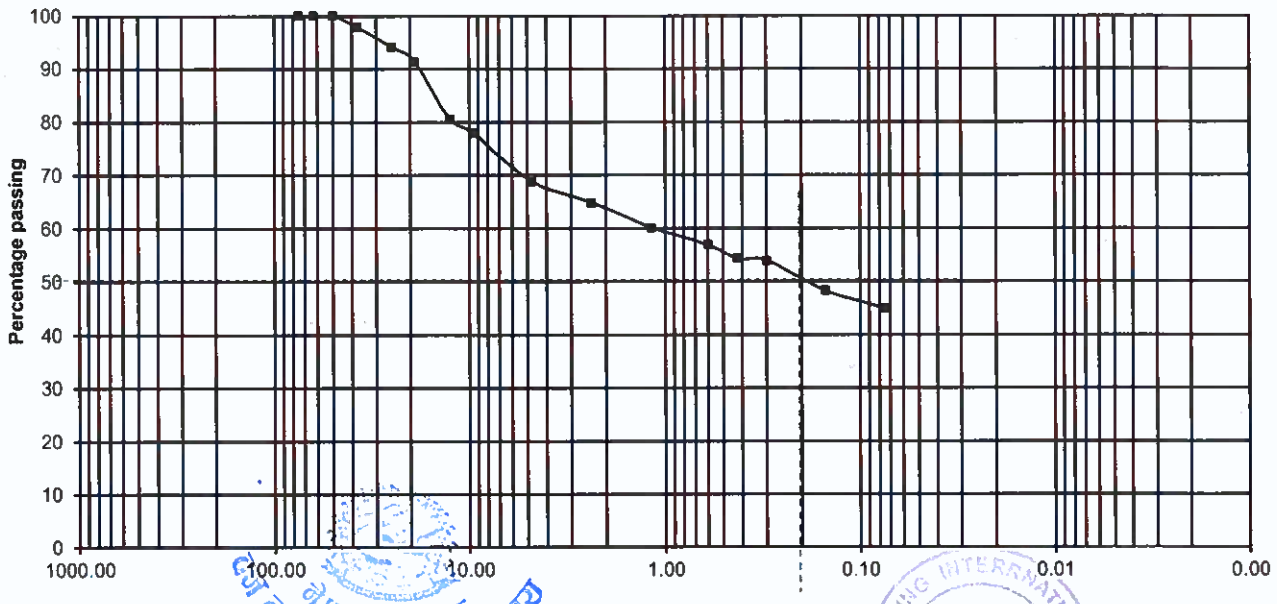
Date Testing: **2019/04/26**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	23.47	2.07	97.93	23.47	2.07
1"	25.00 mm	43.20	3.80	94.13	66.67	5.87
3/4"	19.00 mm	30.85	2.72	91.41	97.52	8.59
1/2"	12.50 mm	123.34	10.86	80.56	220.86	19.44
3/8"	9.50 mm	30.42	2.68	77.88	251.28	22.12
4	4.75 mm	103.33	9.10	68.78	354.61	31.22
8	2.360 mm	45.63	4.02	64.76	400.24	35.24
16	1.180 mm	53.37	4.70	60.06	453.61	39.94
30	0.600 mm	35.80	3.15	56.91	489.41	43.09
40	0.425 mm	30.22	2.66	54.25	519.63	45.75
50	0.300 mm	4.53	0.40	53.85	524.16	46.15
100	0.150 mm	63.67	5.61	48.25	587.83	51.75
200	0.075 mm	36.98	3.26	44.99	624.81	55.01
	PAN	511.04	44.99	0.00	**1135.85**	100.00
	Total Weight (gm)	**1135.85**				



Gravel: 31.22 **Sand: 23.79** **Silt/Clay: 44.99** **D-50: 0.20**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

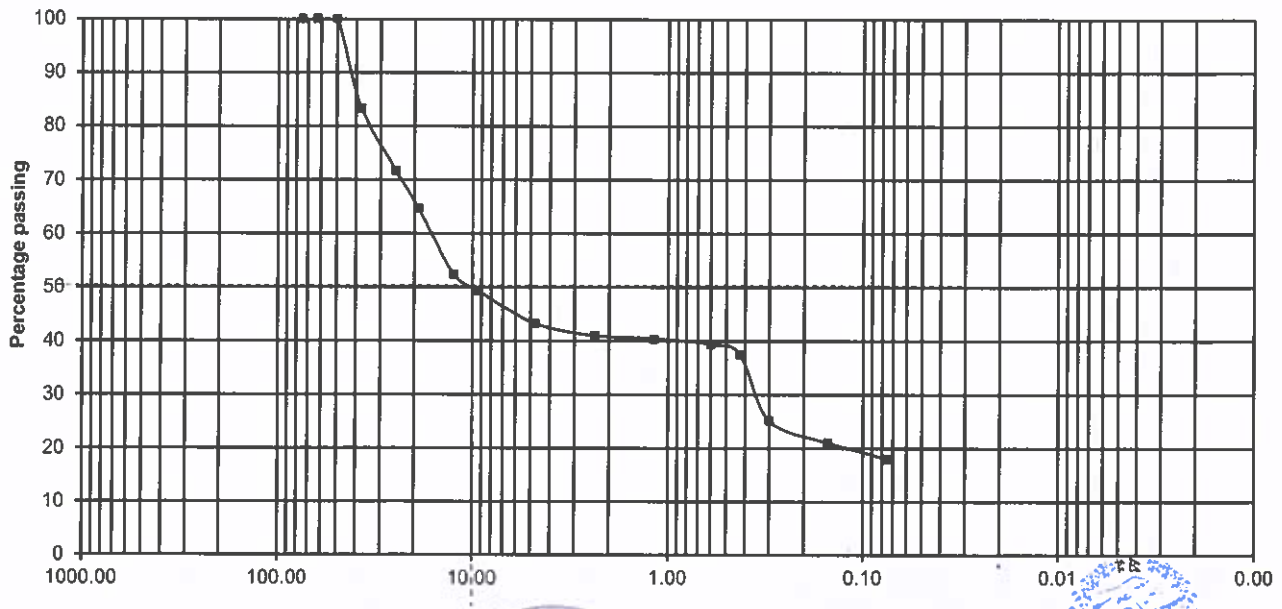
Location: Date Testing: 2019/04/26

Source: Test Pit Sample Borehole No. B 52 Tested By: Pranita Pun

Co-ordinate: Depth (m): 0.00-1.00m Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	141.27	16.66	83.34	141.27	16.66
1"	25.00 mm	99.23	11.70	71.64	240.50	28.36
3/4"	19.00 mm	59.58	7.03	64.61	300.08	35.39
1/2"	12.50 mm	103.60	12.22	52.39	403.68	47.61
3/8"	9.50 mm	25.17	2.97	49.42	428.85	50.58
4	4.75 mm	52.83	6.23	43.19	481.68	56.81
8	2.360 mm	18.59	2.19	41.00	500.27	59.00
16	1.180 mm	5.57	0.66	40.34	505.84	59.66
30	0.600 mm	7.72	0.91	39.43	513.56	60.57
40	0.425 mm	16.90	1.99	37.44	530.46	62.56
50	0.300 mm	103.76	12.24	25.20	634.22	74.80
100	0.150 mm	35.42	4.18	21.03	669.64	78.97
200	0.075 mm	25.69	3.03	18.00	695.33	82.00
	PAN	152.61	18.00	0.00	847.94	100.00
	Total Weight (gm)	847.94				



Gravel: 56.81 Sand: 25.20 Silt/Clay: 18.00 D-50: 10.00

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: Test Pit Sample

Borehole No. B 53

Co-ordinate:

Depth (m): 0.00-1.00m

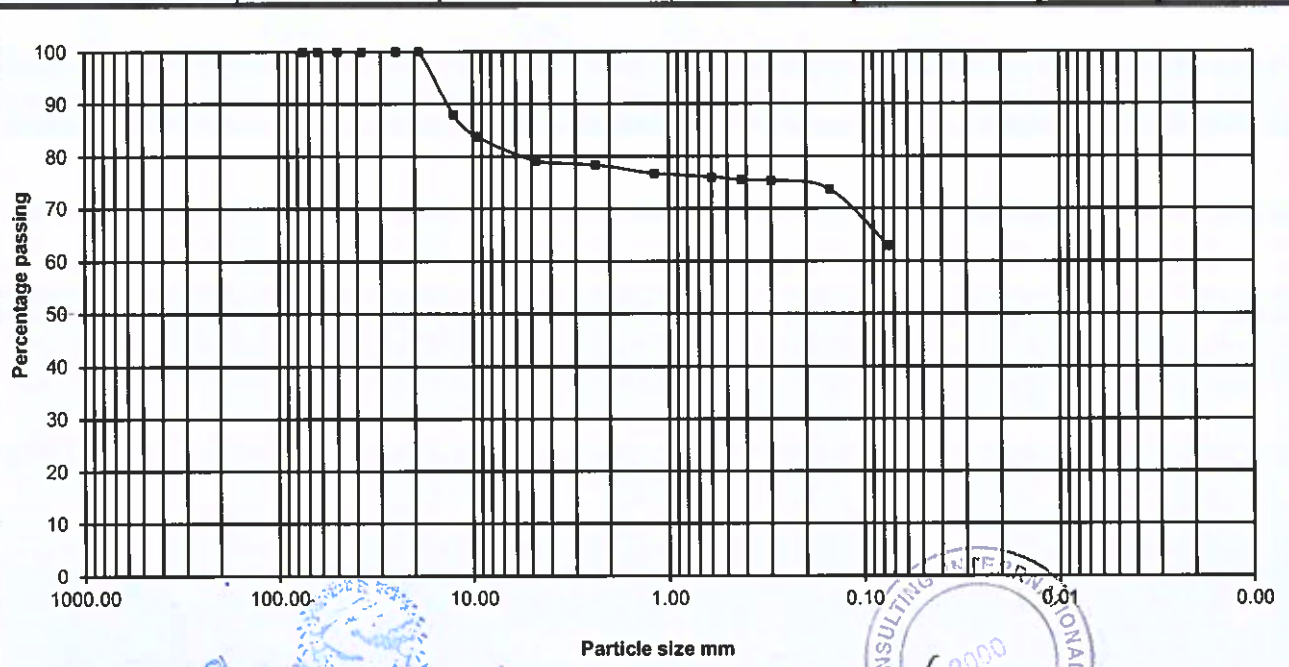
Date Testing: 2019/06/28

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	36.40	12.13	87.87	36.40	12.13
3/8"	9.50 mm	12.40	4.13	83.73	48.80	16.27
4	4.75 mm	13.74	4.58	79.15	62.54	20.85
8	2.360 mm	2.49	0.83	78.32	65.03	21.68
16	1.180 mm	4.88	1.63	76.70	69.91	23.30
30	0.600 mm	2.13	0.71	75.99	72.04	24.01
40	0.425 mm	1.54	0.51	75.47	73.58	24.53
50	0.300 mm	0.37	0.12	75.35	73.95	24.65
100	0.150 mm	5.04	1.68	73.67	78.99	26.33
200	0.075 mm	32.36	10.79	62.88	111.35	37.12
	PAN	188.65	62.88	0.00	300.00	100.00
	Total Weight (gm)	300.00				



Gravel: 20.85 Sand: 16.27 Silt/Clay: 62.88 D-50:

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Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 54**

Co-ordinate: Depth (m): **0.00-1.00m**

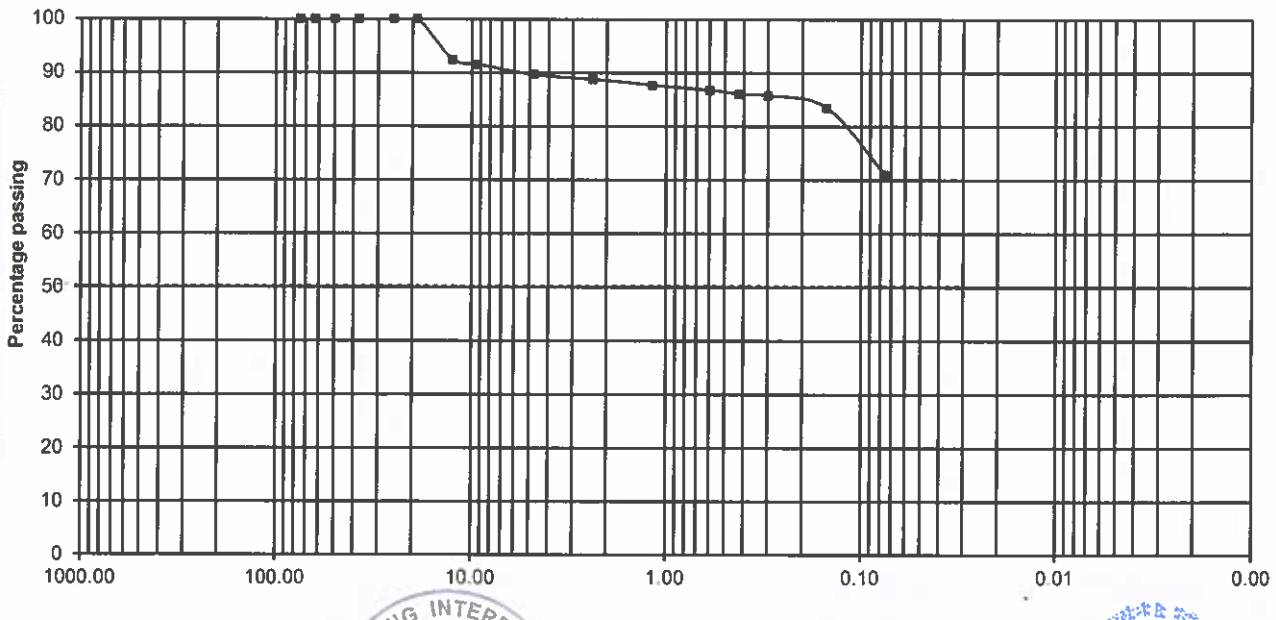
Date Testing: **2019/05/06**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	22.76	7.60	92.40	22.76	7.60
3/8"	9.50 mm	2.72	0.91	91.49	25.48	8.51
4	4.75 mm	5.56	1.86	89.64	31.04	10.36
8	2.360 mm	2.76	0.92	88.72	33.80	11.28
16	1.180 mm	3.18	1.06	87.66	36.98	12.34
30	0.600 mm	2.80	0.93	86.72	39.78	13.28
40	0.425 mm	2.08	0.69	86.03	41.86	13.97
50	0.300 mm	0.87	0.29	85.74	42.73	14.26
100	0.150 mm	6.80	2.27	83.47	49.53	16.53
200	0.075 mm	37.63	12.56	70.90	87.16	29.10
	PAN	212.41	70.90	0.00	299.57	100.00
	Total Weight (gm)	299.57				



Gravel: 10.36 **Sand: 18.73** **Silt/Clay: 70.90** **D-50:**

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location:

Source: Test Pit Sample

Borehole No. B 55

Co-ordinate:

Depth (m): 0.00-1.00m

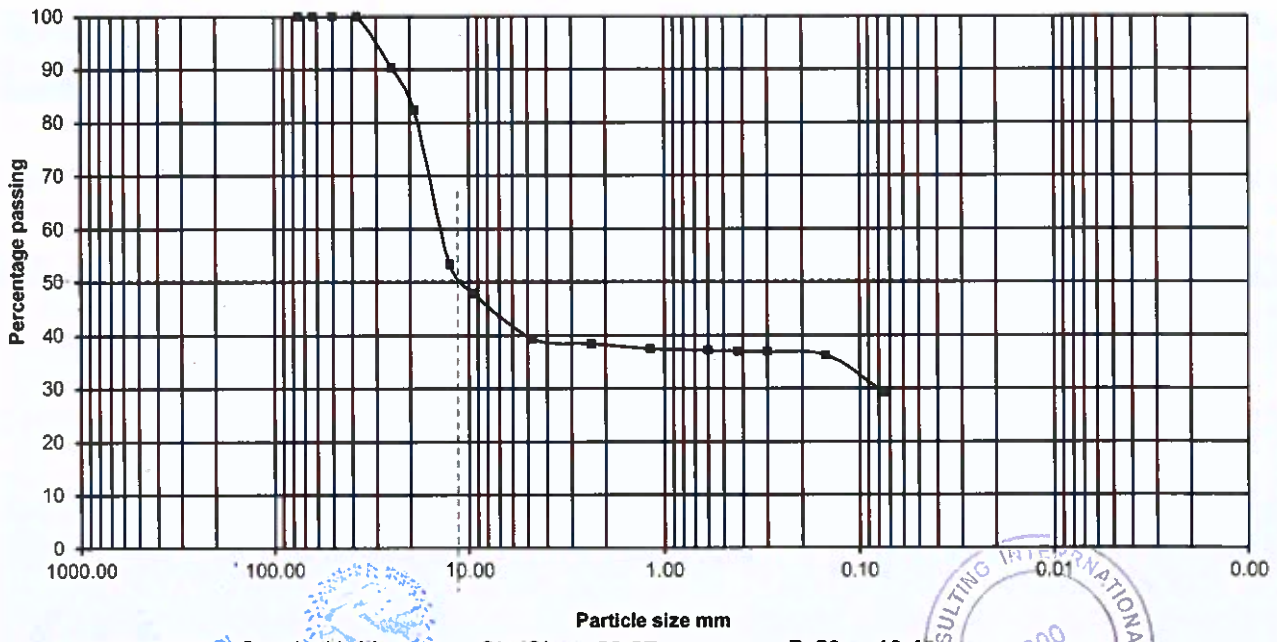
Date Testing: 2019/06/28

Tested By: Pranita Pun

Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	67.04	9.66	90.34	67.04	9.66
3/4"	19.00 mm	55.46	7.99	82.35	122.50	17.65
1/2"	12.50 mm	201.48	29.04	53.31	323.98	46.69
3/8"	9.50 mm	37.63	5.42	47.88	361.61	52.12
4	4.75 mm	58.64	8.45	39.43	420.25	60.57
8	2.360 mm	7.13	1.03	38.41	427.38	61.59
16	1.180 mm	6.29	0.91	37.50	433.67	62.50
30	0.600 mm	2.27	0.33	37.17	435.94	62.83
40	0.425 mm	1.24	0.18	36.99	437.18	63.01
50	0.300 mm	0.51	0.07	36.92	437.69	63.08
100	0.150 mm	5.02	0.72	36.20	442.71	63.80
200	0.075 mm	48.06	6.93	29.27	490.77	70.73
	PAN	203.09	29.27	0.00	693.86	100.00
	Total Weight (gm)	693.86				



Gravel: 60.57 **Sand: 10.16** **Silt/Clay: 29.27** **D-50: 10.10**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 56**

Co-ordinate: Depth (m): **0.00-1.00m**

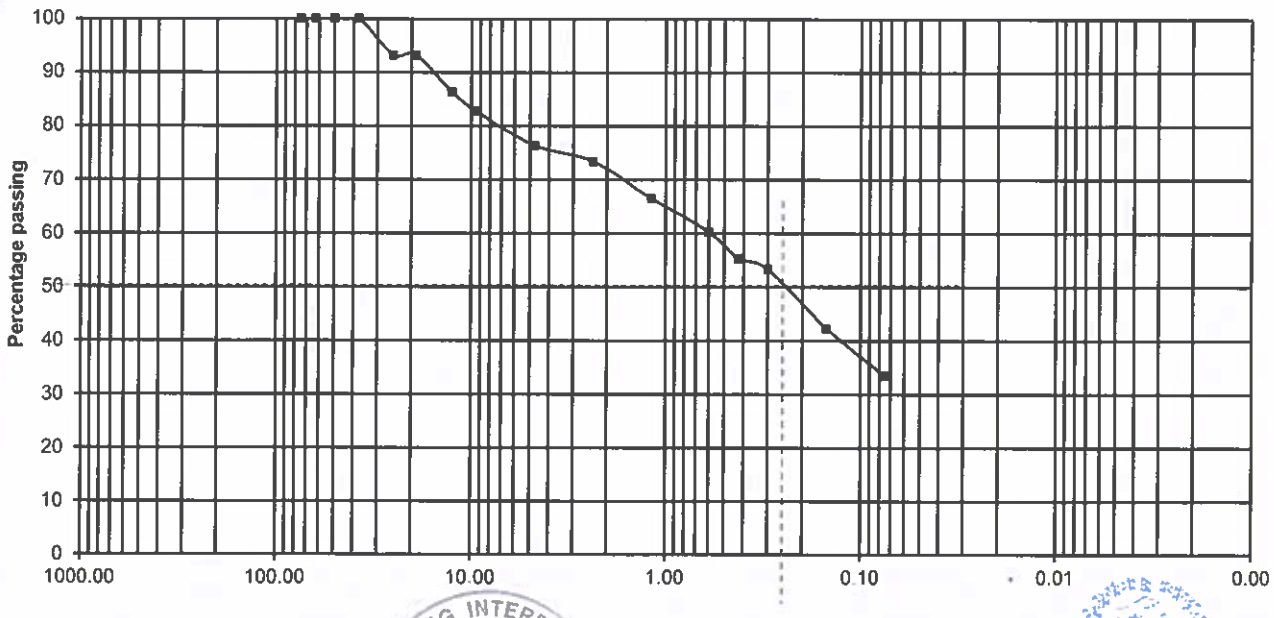
Date Testing: **2019/06/28**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	20.34	6.78	93.22	20.34	6.78
3/4"	19.00 mm	0.00	0.00	93.22	20.34	6.78
1/2"	12.50 mm	20.68	6.89	86.33	41.02	13.67
3/8"	9.50 mm	10.85	3.62	82.71	51.87	17.29
4	4.75 mm	19.19	6.40	76.31	71.06	23.69
8	2.360 mm	8.96	2.99	73.33	80.02	26.67
16	1.180 mm	20.40	6.80	66.53	100.42	33.47
30	0.600 mm	18.96	6.32	60.21	119.38	39.79
40	0.425 mm	14.59	4.86	55.34	133.97	44.66
50	0.300 mm	6.04	2.01	53.33	140.01	46.67
100	0.150 mm	33.06	11.02	42.31	173.07	57.69
200	0.075 mm	26.41	8.80	33.51	199.48	66.49
	PAN	100.52	33.51	0.00	300.00	100.00
	Total Weight (gm)	300.00				



Gravel: 23.69 **Sand: 42.81** **Silt/Clay: 33.51** **D-50: 0.25**

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

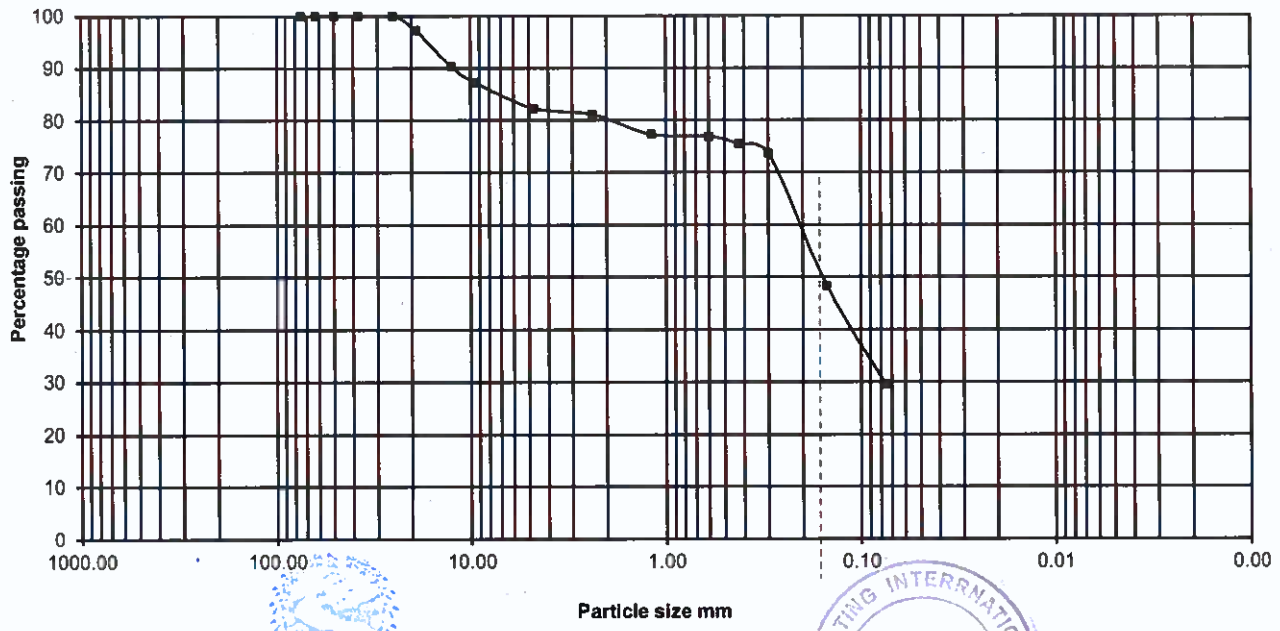
Location: Date Testing: 2019/06/07

Source: Test Pit Sample Borehole No. B 57 Tested By: Pranita Pun

Co-ordinate: Depth (m): 0.00-1.00m Checked By : Dr. S. Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	13.52	2.72	97.28	13.52	2.72
1/2"	12.50 mm	34.98	7.04	90.24	48.50	9.76
3/8"	9.50 mm	15.00	3.02	87.22	63.50	12.78
4	4.75 mm	24.68	4.97	82.25	88.18	17.75
8	2.360 mm	5.90	1.19	81.07	94.08	18.93
16	1.180 mm	18.86	3.80	77.27	112.94	22.73
30	0.600 mm	2.05	0.41	76.86	114.99	23.14
40	0.425 mm	7.06	1.42	75.44	122.05	24.56
50	0.300 mm	8.64	1.74	73.70	130.69	26.30
100	0.150 mm	125.92	25.34	48.36	256.61	51.64
200	0.075 mm	94.14	18.95	29.41	350.75	70.59
	PAN	146.16	29.41	0.00	496.91	100.00
	Total Weight (gm)	496.91				



Gravel: 17.75 Sand: 52.84 Silt/Clay: 29.41 D-50: 0.170

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 58**

Co-ordinate: Depth (m): **0.00-1.00m**

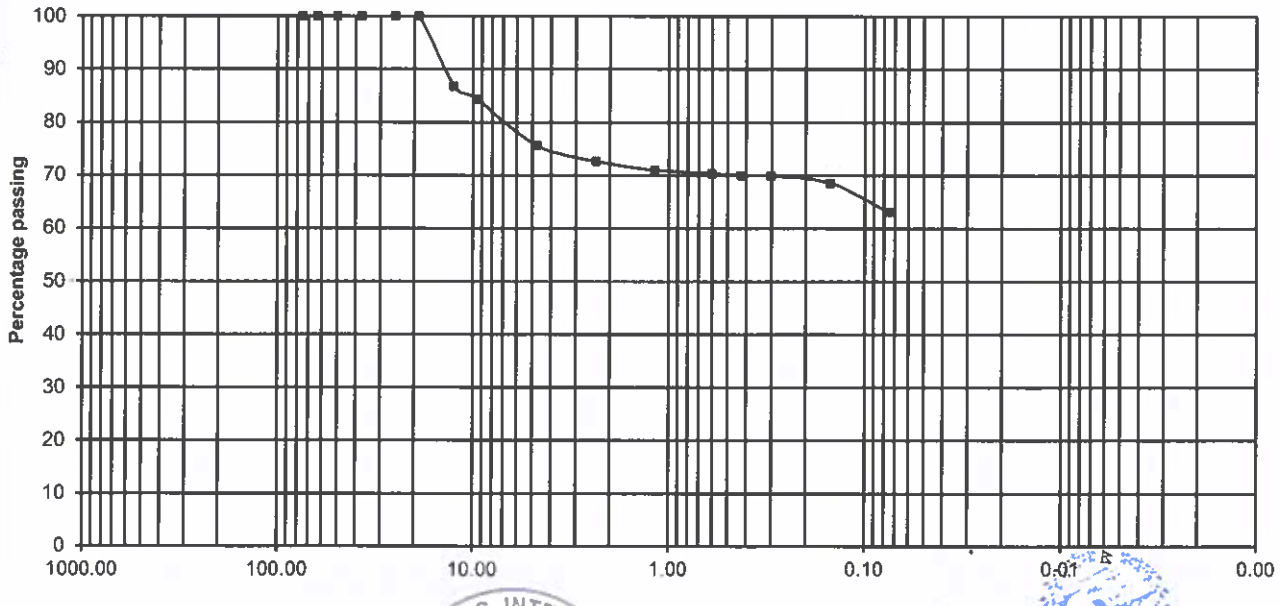
Date Testing: **2019/06/11**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	0.00	0.00	100.00	0.00	0.00
1/2"	12.50 mm	39.75	13.25	86.75	39.75	13.25
3/8"	9.50 mm	7.44	2.48	84.27	47.19	15.73
4	4.75 mm	26.01	8.67	75.60	73.20	24.40
8	2.360 mm	9.04	3.01	72.59	82.24	27.41
16	1.180 mm	5.03	1.68	70.91	87.27	29.09
30	0.600 mm	1.92	0.64	70.27	89.19	29.73
40	0.425 mm	0.93	0.31	69.96	90.12	30.04
50	0.300 mm	0.38	0.13	69.83	90.50	30.17
100	0.150 mm	4.04	1.35	68.49	94.54	31.51
200	0.075 mm	16.27	5.42	63.06	110.81	36.94
	PAN	189.19	63.06	0.00	300.00	100.00
	Total Weight (gm)	300.00				



Gravel: 24.40 **Sand: 12.54** **Silt/Clay: 63.06** **D-50: 0.230**

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample** Borehole No. **B 59**

Co-ordinate: Depth (m): **0.00-1.00m**

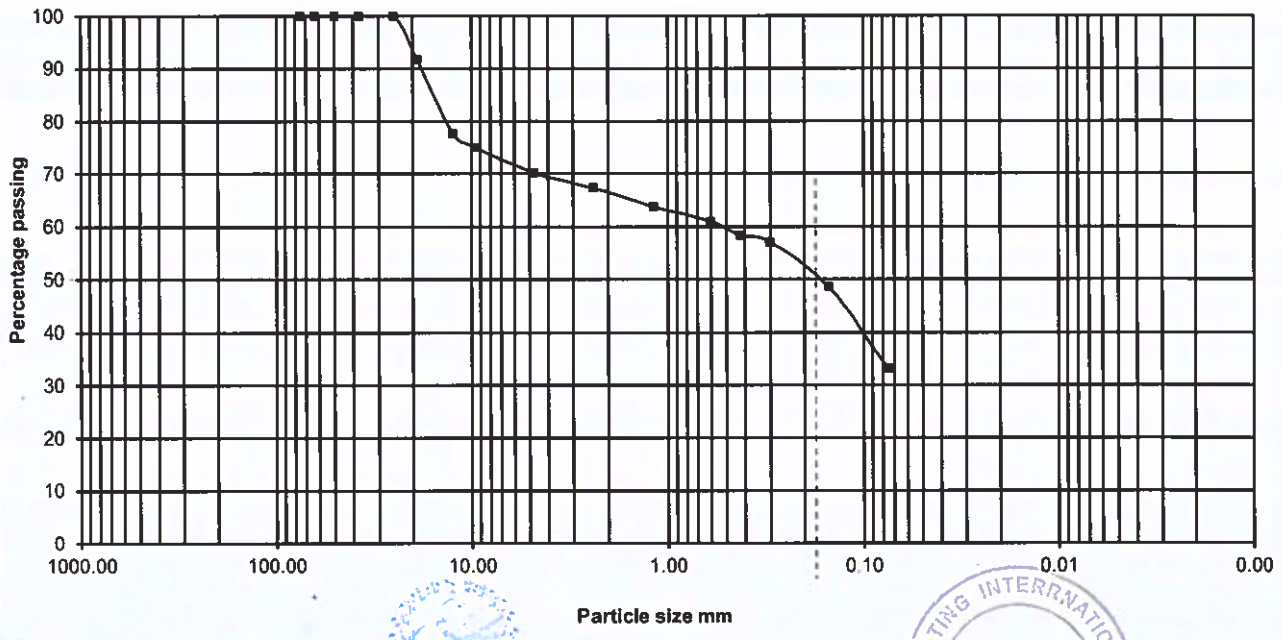
Date Testing: **2019/05/30**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	0.00	0.00	100.00	0.00	0.00
3/4"	19.00 mm	41.38	8.31	91.69	41.38	8.31
1/2"	12.50 mm	69.62	13.98	77.71	111.00	22.29
3/8"	9.50 mm	13.25	2.66	75.05	124.25	24.95
4	4.75 mm	24.53	4.93	70.12	148.78	29.88
8	2.360 mm	14.02	2.82	67.31	162.80	32.69
16	1.180 mm	17.80	3.57	63.73	180.60	36.27
30	0.600 mm	13.76	2.76	60.97	194.36	39.03
40	0.425 mm	13.03	2.62	58.35	207.39	41.65
50	0.300 mm	6.63	1.33	57.02	214.02	42.98
100	0.150 mm	42.60	8.55	48.47	256.62	51.53
200	0.075 mm	76.62	15.39	33.08	333.24	66.92
	PAN	164.72	33.08	0.00	**497.96**	100.00
	Total Weight (gm)	**497.96**				



Gravel: 29.88 **Sand: 37.04** **Silt/Clay: 33.08** **D-50: 0.175**

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

Sieve Analysis of Fine and Coarse Aggregate

Method: ASTM C136

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location:

Source: **Test Pit Sample**

Co-ordinate:

Borehole No. **B 60**

Depth (m): **0.00-1.00m**

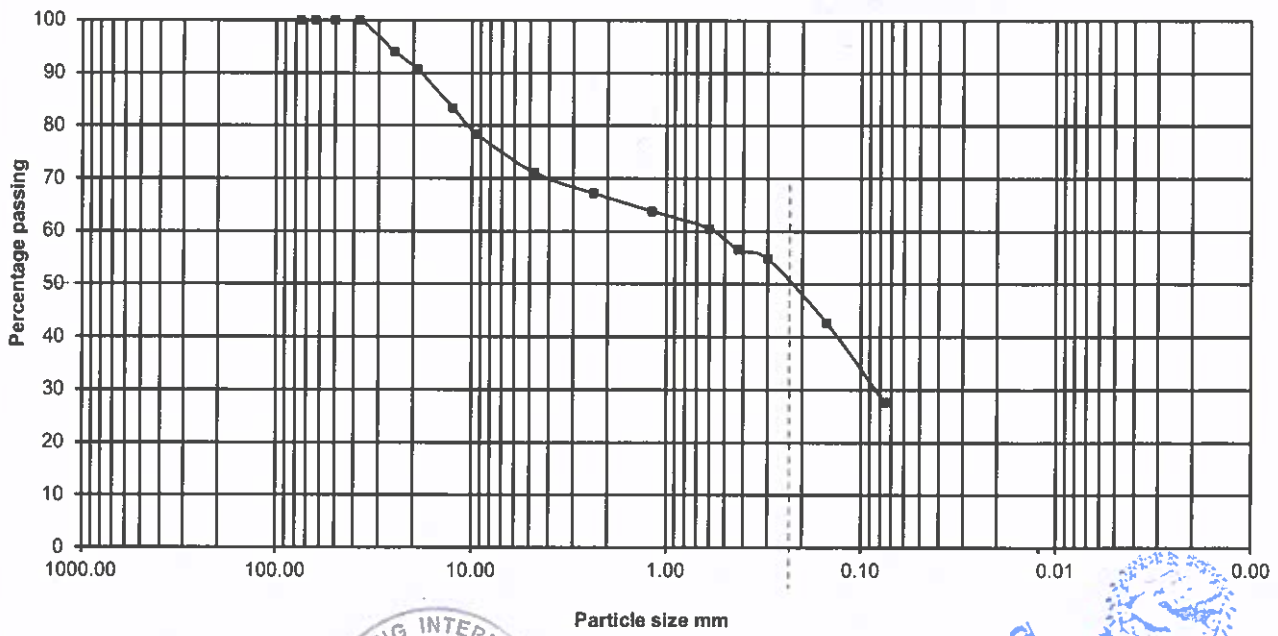
Date Testing: **2019/06/07**

Tested By: **Pranita Pun**

Checked By : **Dr. S. Manandhar**

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained (gm)	% Retained	% Passing	Cum. Wt. Retain	Cum. % Retain
3"	75.00 mm	0.00	0.00	100.00	0.00	0.00
2-1/2"	63.00 mm	0.00	0.00	100.00	0.00	0.00
2"	50.00 mm	0.00	0.00	100.00	0.00	0.00
1-1/2"	37.50 mm	0.00	0.00	100.00	0.00	0.00
1"	25.00 mm	29.67	5.97	94.03	29.67	5.97
3/4"	19.00 mm	16.84	3.39	90.64	46.51	9.36
1/2"	12.50 mm	36.52	7.35	83.29	83.03	16.71
3/8"	9.50 mm	23.80	4.79	78.50	106.83	21.50
4	4.75 mm	36.99	7.45	71.05	143.82	28.95
8	2.360 mm	18.98	3.82	67.23	162.80	32.77
16	1.180 mm	17.41	3.50	63.72	180.21	36.28
30	0.600 mm	16.22	3.27	60.46	196.43	39.54
40	0.425 mm	19.70	3.97	56.49	216.13	43.51
50	0.300 mm	8.21	1.65	54.84	224.34	45.16
100	0.150 mm	60.57	12.19	42.65	284.91	57.35
200	0.075 mm	74.86	15.07	27.58	359.77	72.42
	PAN	137.00	27.58	0.00	496.77	100.00
	Total Weight (gm)	496.77				



Gravel: 28.95 **Sand: 43.47** **Silt/Clay: 27.58** **D-50: 0.230**

ANNEX C3-2
Hydrometer Test

ICGS (P) LTD.

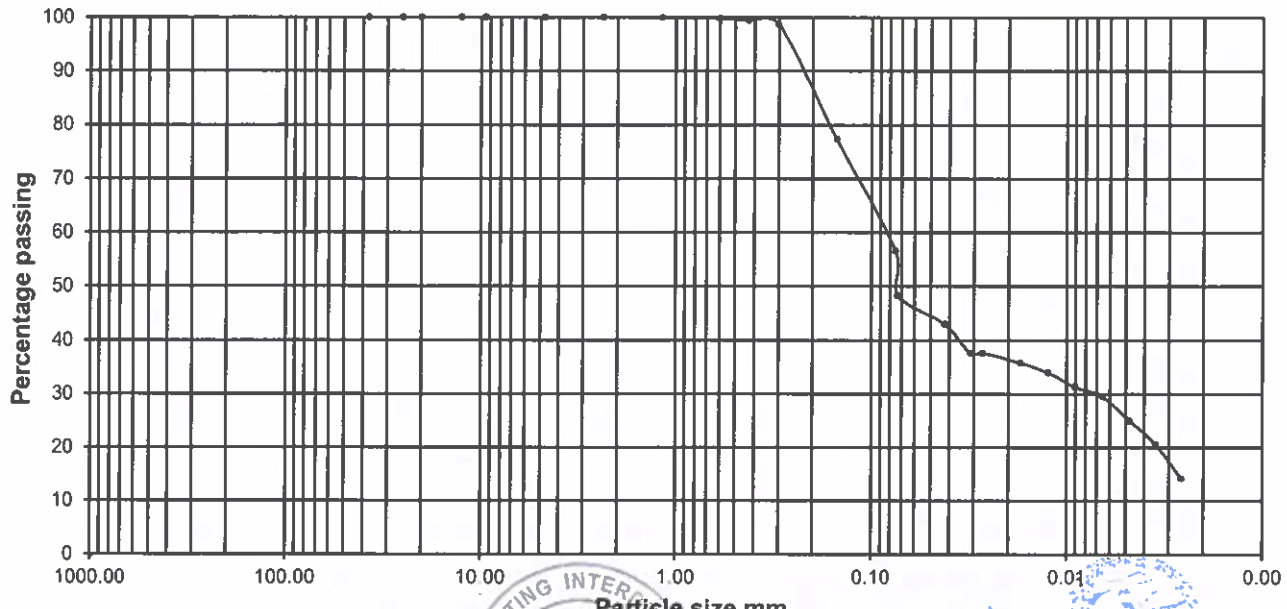
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	1/7/2019
Borehole No.	B-1	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.00	0.000	100.000
	2.36	0.00	0.000	100.000
	1.18	0.24	0.077	99.923
	0.600	0.52	0.167	99.755
	0.425	1.24	0.399	99.357
	0.3	2.31	0.743	98.613
	0.150	66.15	21.282	77.332
	0.075	64.59	20.780	56.552
	PAN	175.78	56.552	0.000
	Total	**310.83**		
Silt % **45.06**				
clay % **11.49**				



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सिंहदरबार काठमाडौं

ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-1**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **1/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **56.552**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
01.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	53.68
		1.02600	0.30	26.00	-0.90	22	26.90	85.40	26.50	10.23	5.839	0.0735	48.29
		1.02300	1.00	23.00	-0.90	22	23.90	75.87	23.50	11.25	3.353	0.0422	42.91
		1.02000	2.00	20.00	-0.90	22	20.90	66.35	20.50	12.26	2.476	0.0311	37.52
		1.02000	2.00	20.00	-0.90	22	20.90	66.35	20.50	9.15	2.139	0.0269	37.52
		1.01900	5.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	1.378	0.0173	35.73
		1.01800	10.00	18.00	-0.90	22	18.90	60.00	18.50	9.83	0.991	0.0125	33.93
		1.01650	20.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.719	0.0090	31.24
		1.01550	40.00	15.50	-0.90	22	16.40	52.06	16.00	10.67	0.517	0.0065	29.44
		1.01300	80.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.379	0.0048	24.95
		1.01050	160.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.278	0.0035	20.47
		1.00700	320.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.206	0.0026	14.18
02.07.2019		1.00550	1440.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.099	0.0012	11.49

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

K_2 = 5.531×10^{-3} $\sqrt{\frac{\mu}{y_s - y_w}}$ = **0.0125786**

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

ICGS (P) LTD.

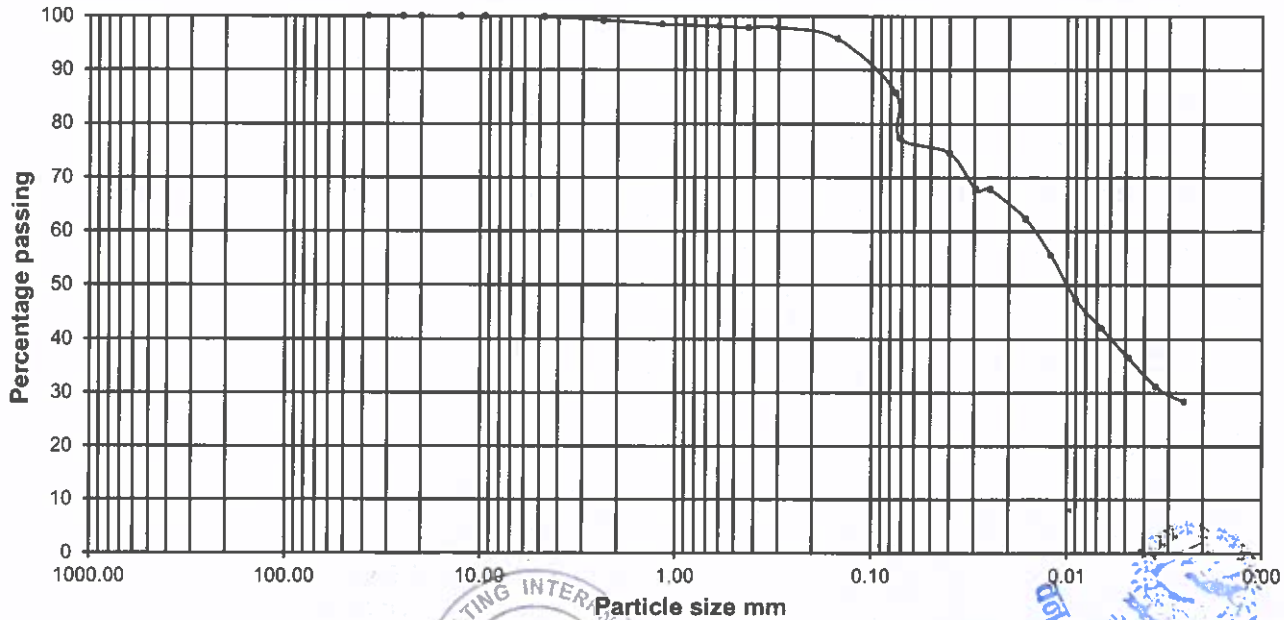
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	9/7/2019
Borehole No.	B-2	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.40	0.133	99.867
	2.36	1.94	0.647	99.219
	1.18	2.27	0.757	98.462
	0.600	1.12	0.374	98.089
	0.425	0.66	0.220	97.869
	0.3	0.21	0.070	97.798
	0.150	6.02	2.008	95.790
	0.075	30.24	10.087	85.703
	PAN	256.93	85.703	0.000
	Total	**299.79**		
Silt % **62.85**				
clay % **22.85**				



ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-2**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **9/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **85.703**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
09.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	81.35
		1.02750	0.30	27.50	-0.90	22	28.40	90.16	28.00	9.72	5.693	0.0716	77.27
		1.02650	1.00	26.50	-0.90	22	27.40	86.99	27.00	10.06	3.172	0.0399	74.55
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	10.91	2.335	0.0294	67.75
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	7.80	1.974	0.0248	67.75
		1.02200	5.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	1.302	0.0164	62.31
		1.01950	10.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	0.965	0.0121	55.50
		1.01650	20.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.719	0.0090	47.34
		1.01450	40.00	14.50	-0.90	22	15.40	48.89	15.00	11.01	0.525	0.0066	41.90
		1.01250	80.00	12.50	-0.90	22	13.40	42.54	13.00	11.69	0.382	0.0048	36.46
		1.01050	160.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.278	0.0035	31.02
		1.00950	320.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.199	0.0025	28.30
10.07.2019		1.00750	1440.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.096	0.0012	22.85

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS INTERNATIONAL LLC

ICGS (P) LTD.

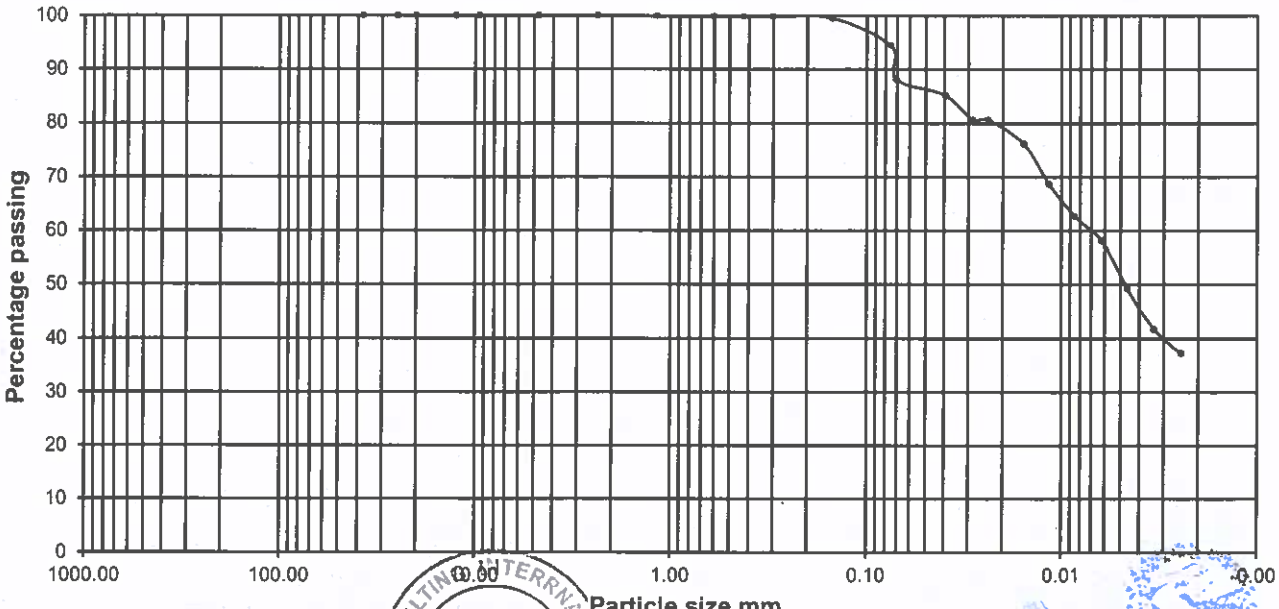
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing	2/7/2019
Borehole No.	B-3	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.00	0.000	100.000
	2.36	0.07	0.023	99.977
	1.18	0.22	0.073	99.903
	0.600	0.20	0.067	99.837
	0.425	0.11	0.037	99.800
	0.3	0.00	0.000	99.800
	0.150	0.83	0.277	99.523
	0.075	15.43	5.147	94.376
	PAN	282.93	94.376	0.000
	Total	**299.79**		
Silt % **63.22**				
clay % **31.16**				



STANTEC CONSULTING INTERNATIONAL LLC

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-3**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **2/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
γ_w = **0.9968**
μ = **8.75**
γ_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **94.376**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(γ_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r}$(cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
02.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	91.08
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	88.09
		1.02750	1.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	3.118	0.0392	85.09
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	2.262	0.0284	80.60
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	7.12	1.887	0.0237	80.60
		1.02450	5.00	24.50	-0.90	22	25.40	80.64	25.00	7.63	1.235	0.0155	76.10
		1.02200	10.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	0.921	0.0116	68.61
		1.02000	20.00	20.00	-0.90	22	20.90	66.35	20.50	9.15	0.676	0.0085	62.62
		1.01850	40.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	0.491	0.0062	58.12
		1.01550	80.00	15.50	-0.90	22	16.40	52.06	16.00	10.67	0.365	0.0046	49.14
		1.01300	160.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.268	0.0034	41.65
		1.01150	320.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.194	0.0024	37.15
03.07.2019		1.00950	1440.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.094	0.0012	31.16

$$K_1 = \frac{\gamma_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-2} \sqrt{\frac{\mu}{\gamma_s - \gamma_w}} = 0.0125786$$

γ_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
γ_s = Unit Wt. of soil grains, g/cm³
γ_w = Unit Wt. of water at the temp.of the test, g/cm³

नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

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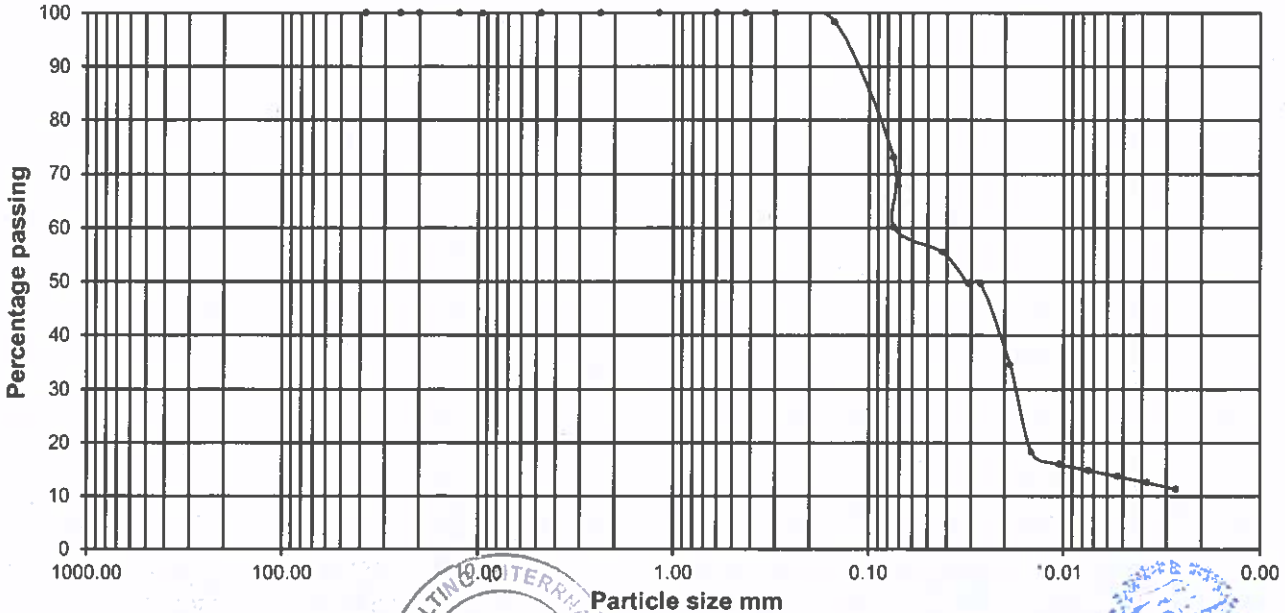
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing	3/7/2019
Borehole No.	B-4	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.00	0.000	100.000
	2.36	0.00	0.000	100.000
	1.18	0.00	0.000	100.000
	0.600	0.07	0.023	99.977
	0.425	0.14	0.047	99.930
	0.3	0.00	0.000	99.930
	0.150	4.74	1.583	98.347
	0.075	75.68	25.273	73.074
	PAN	218.82	73.074	0.000
	Total	**299.45**		
Silt % **62.87**				
clay % **10.21**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-4**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **3/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
γ_w = **0.9968**
μ = **8.75**
γ_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **73.074**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(γ_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
03.07.2019		1.02650	0.15	26.50	-0.90	22	27.40	86.99	27.00	10.06	8.190	0.1030	63.56
		1.02500	0.30	25.00	-0.90	22	25.90	82.22	25.50	10.57	5.935	0.0747	60.08
		1.02300	1.00	23.00	-0.90	22	23.90	75.87	23.50	11.25	3.353	0.0422	55.44
		1.02050	2.00	20.50	-0.90	22	21.40	67.94	21.00	12.09	2.459	0.0309	49.64
		1.02050	2.00	20.50	-0.90	22	21.40	67.94	21.00	8.98	2.119	0.0267	49.64
		1.01400	5.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	1.495	0.0188	34.57
		1.00700	10.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	1.164	0.0146	18.33
		1.00600	20.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.833	0.0105	16.01
		1.00550	40.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.593	0.0075	14.85
		1.00500	80.00	5.00	-0.90	22	5.90	18.73	5.50	14.23	0.422	0.0053	13.69
		1.00450	160.00	4.50	-0.90	22	5.40	17.14	5.00	14.40	0.300	0.0038	12.53
		1.00400	320.00	4.00	-0.90	22	4.90	15.56	4.50	14.57	0.213	0.0027	11.37
04.07.2019		1.00350	1440.00	3.50	-0.90	22	4.40	13.97	4.00	14.74	0.101	0.0013	10.21

$K_1 = \dfrac{\gamma_c \times G_s \times 100}{(G_s - 1) W_s} =$ **3.1746427**

$K_2 = 5.531 \times 10^{-3} \sqrt{\dfrac{\mu}{\gamma_s - \gamma_w}} =$ **0.0125786**

γ_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
γ_s = Unit Wt. of soil grains, g/cm³
γ_w = Unit Wt. of water at the temp.of the test, g/cm³

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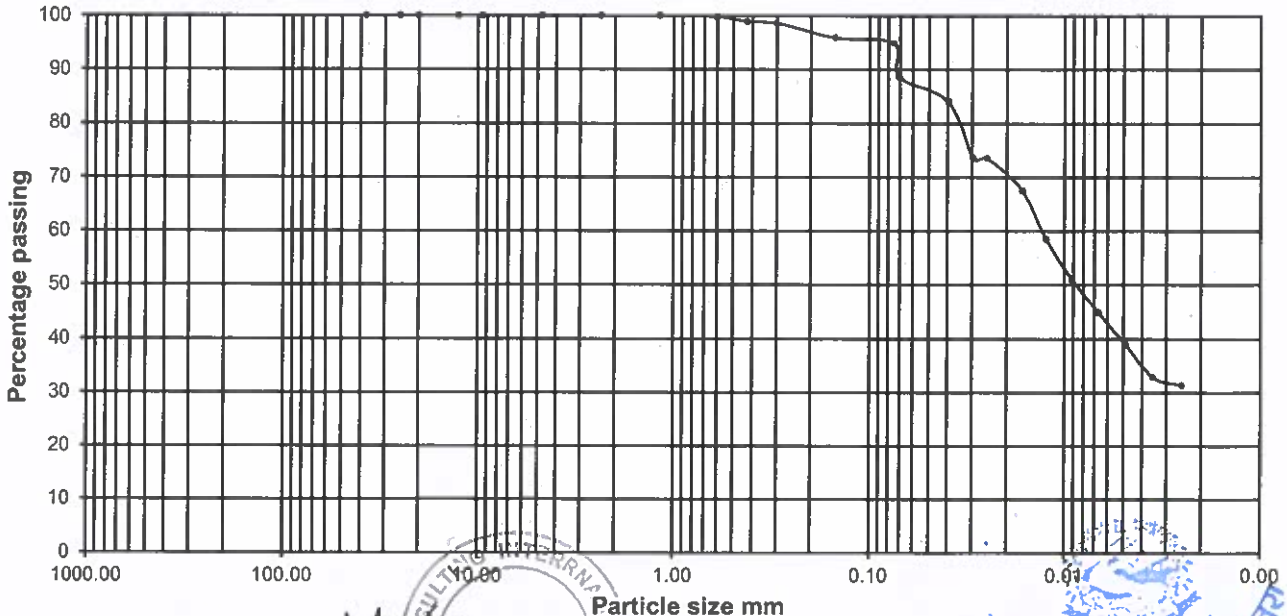
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.95m
Location:		Date of Testing :	4/7/2019
Borehole No.	B-5	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.00	0.000	100.000
	2.36	0.00	0.000	100.000
	1.18	0.00	0.000	100.000
	0.600	0.44	0.222	99.778
	0.425	1.81	0.912	98.866
	0.3	0.66	0.333	98.534
	0.150	5.19	2.615	95.918
	0.075	2.06	1.038	94.880
	PAN	188.29	94.880	0.000
	Total	**198.45**		
Silt % **66.57**				
clay % **28.31**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-5**
Source of Sample **SPT**

Depth: **3.80-3.95m**
Date of Test: **4/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **94.880**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
04.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	91.57
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	88.56
		1.02700	1.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	3.145	0.0396	84.04
		1.02350	2.00	23.50	-0.90	22	24.40	77.46	24.00	11.08	2.353	0.0296	73.50
		1.02350	2.00	23.50	-0.90	22	24.40	77.46	24.00	7.97	1.996	0.0251	73.50
		1.02150	5.00	21.50	-0.90	22	22.40	71.11	22.00	8.64	1.315	0.0165	67.47
		1.01850	10.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	0.983	0.0124	58.43
		1.01600	20.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	0.725	0.0091	50.90
		1.01400	40.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.529	0.0067	44.88
		1.01200	80.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	0.385	0.0048	38.86
		1.01000	160.00	10.00	-0.90	22	10.90	34.60	10.50	12.54	0.280	0.0035	32.83
		1.00950	320.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.199	0.0025	31.33
05.07.2019		1.00850	1440.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.095	0.0012	28.31

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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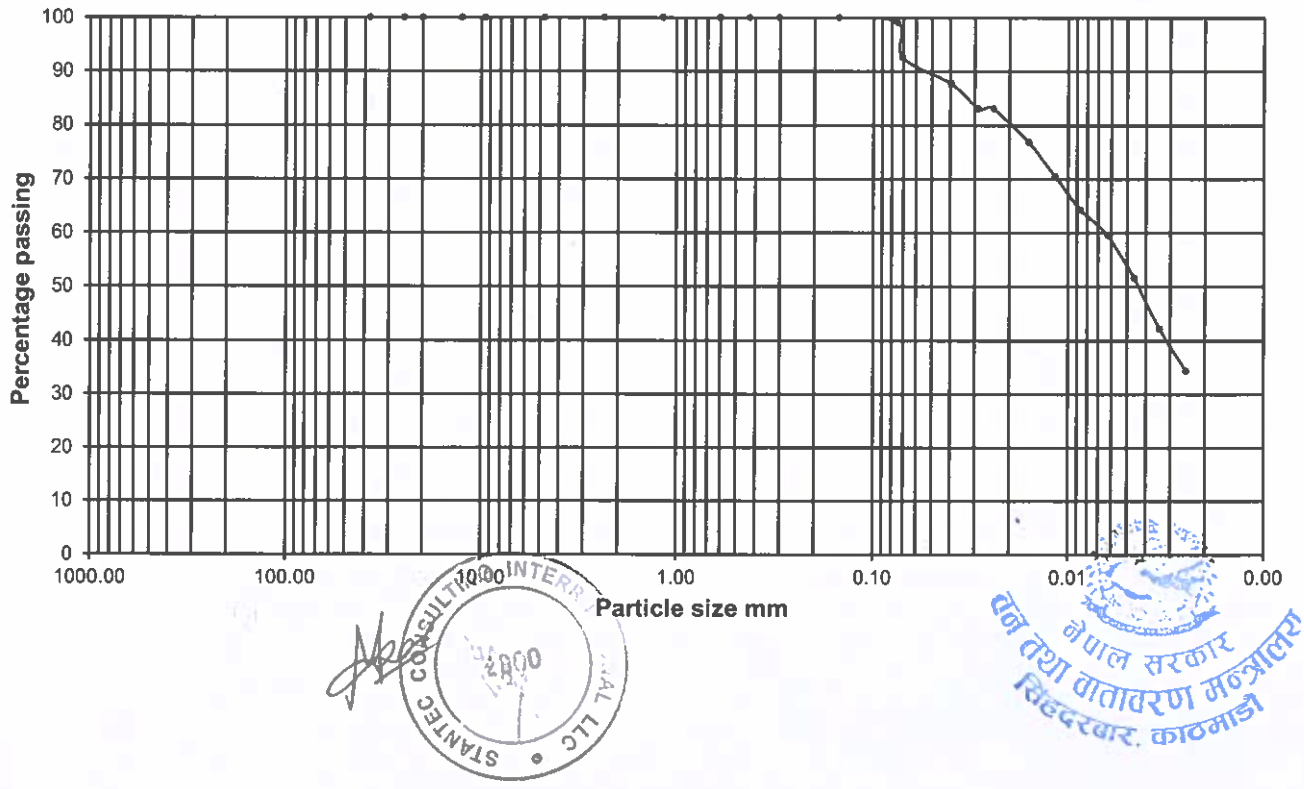
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	4/7/2019
Borehole No.	B-6	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.00	0.000	100.000
	2.36	0.00	0.000	100.000
	1.18	0.00	0.000	100.000
	0.600	0.00	0.000	100.000
	0.425	0.00	0.000	100.000
	0.3	0.00	0.000	100.000
	0.150	0.07	0.031	99.969
	0.075	1.93	0.850	99.119
	PAN	225.08	99.119	0.000
	Total	227.08		
Silt % 74.26				
clay % 24.86				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-6**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **4/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **99.119**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
04.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	94.09
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	92.51
		1.02700	1.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	3.145	0.0396	87.79
		1.02550	2.00	25.50	-0.90	22	26.40	83.81	26.00	10.40	2.280	0.0287	83.07
		1.02550	2.00	25.50	-0.90	22	26.40	83.81	26.00	7.29	1.909	0.0240	83.07
		1.02350	5.00	23.50	-0.90	22	24.40	77.46	24.00	7.97	1.262	0.0159	76.78
		1.02150	10.00	21.50	-0.90	22	22.40	71.11	22.00	8.64	0.930	0.0117	70.49
		1.01950	20.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	0.683	0.0086	64.19
		1.01800	40.00	18.00	-0.90	22	18.90	60.00	18.50	9.83	0.496	0.0062	59.47
		1.01550	80.00	15.50	-0.90	22	16.40	52.06	16.00	10.67	0.365	0.0046	51.61
		1.01250	160.00	12.50	-0.90	22	13.40	42.54	13.00	11.69	0.270	0.0034	42.17
		1.01000	320.00	10.00	-0.90	22	10.90	34.60	10.50	12.54	0.198	0.0025	34.30
05.07.2019		1.00700	1440.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.097	0.0012	24.86

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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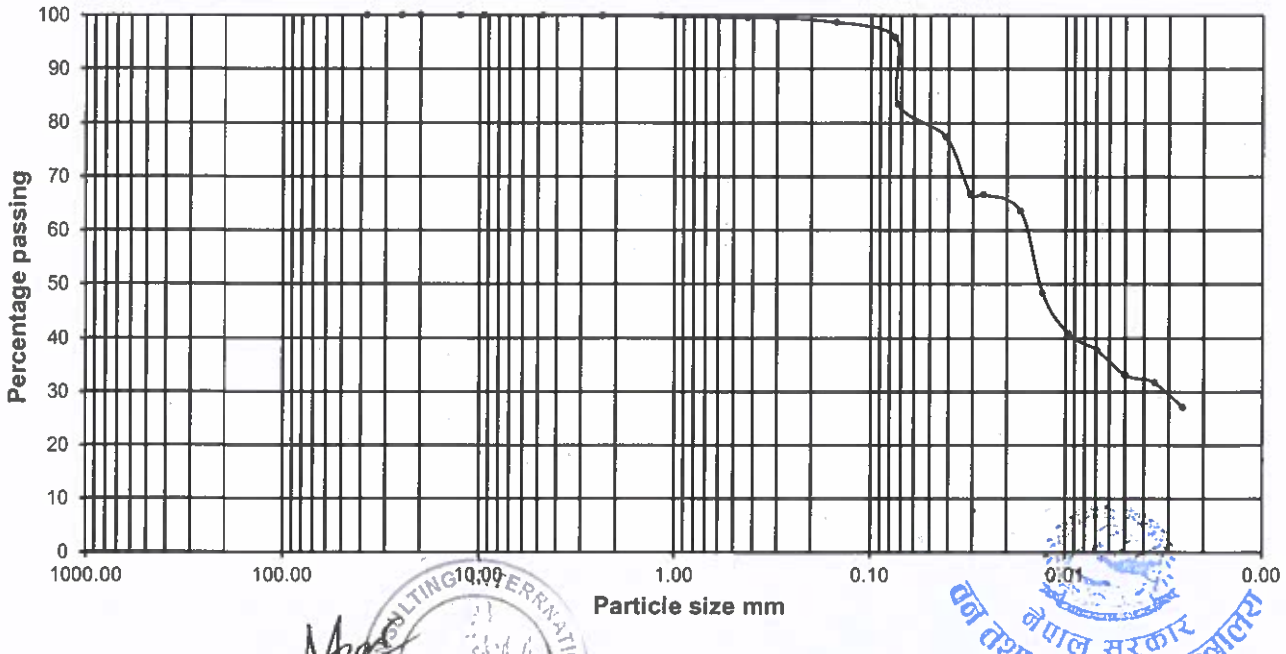
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	1/7/2019
Borehole No.	B-7	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.26	0.063	99.937
	2.36	0.32	0.077	99.861
	1.18	0.28	0.067	99.793
	0.600	0.64	0.154	99.639
	0.425	0.63	0.151	99.488
	0.3	0.23	0.055	99.433
	0.150	3.15	0.757	98.675
	0.075	11.92	2.866	95.809
	PAN	398.47	95.809	0.000
	Total	415.90		
Silt % 70.26				
clay % 25.55				



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New-Baneshwor, Kathmandu, Nepal
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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-7**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **1/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **95.809**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
01.07.2019		1.02800	0.15	28.00	-0.90	22	28.90	91.75	28.50	9.55	7.980	0.1004	87.90
		1.02650	0.30	26.50	-0.90	22	27.40	86.99	27.00	10.06	5.791	0.0728	83.34
		1.02450	1.00	24.50	-0.90	22	25.40	80.64	25.00	10.74	3.277	0.0412	77.26
		1.02100	2.00	21.00	-0.90	22	21.90	69.52	21.50	11.92	2.442	0.0307	66.61
		1.02100	2.00	21.00	-0.90	22	21.90	69.52	21.50	8.81	2.099	0.0264	66.61
		1.02000	5.00	20.00	-0.90	22	20.90	66.35	20.50	9.15	1.353	0.0170	63.57
		1.01500	10.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	1.041	0.0131	48.36
		1.01250	20.00	12.50	-0.90	22	13.40	42.54	13.00	11.69	0.765	0.0096	40.76
		1.01150	40.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.548	0.0069	37.72
		1.01000	80.00	10.00	-0.90	22	10.90	34.60	10.50	12.54	0.396	0.0050	33.15
		1.00950	160.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.282	0.0035	31.63
		1.00800	320.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.203	0.0026	27.07
02.07.2019		1.00750	1440.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.096	0.0012	25.55

$K_1 = \dfrac{y_c \times G_s \times 100}{(G_s - 1) W_s} =$ **3.1746427**

$K_2 = 5.531 \times 10^{-3} \sqrt{\dfrac{\mu}{y_s - y_w}} =$ **0.0125786**

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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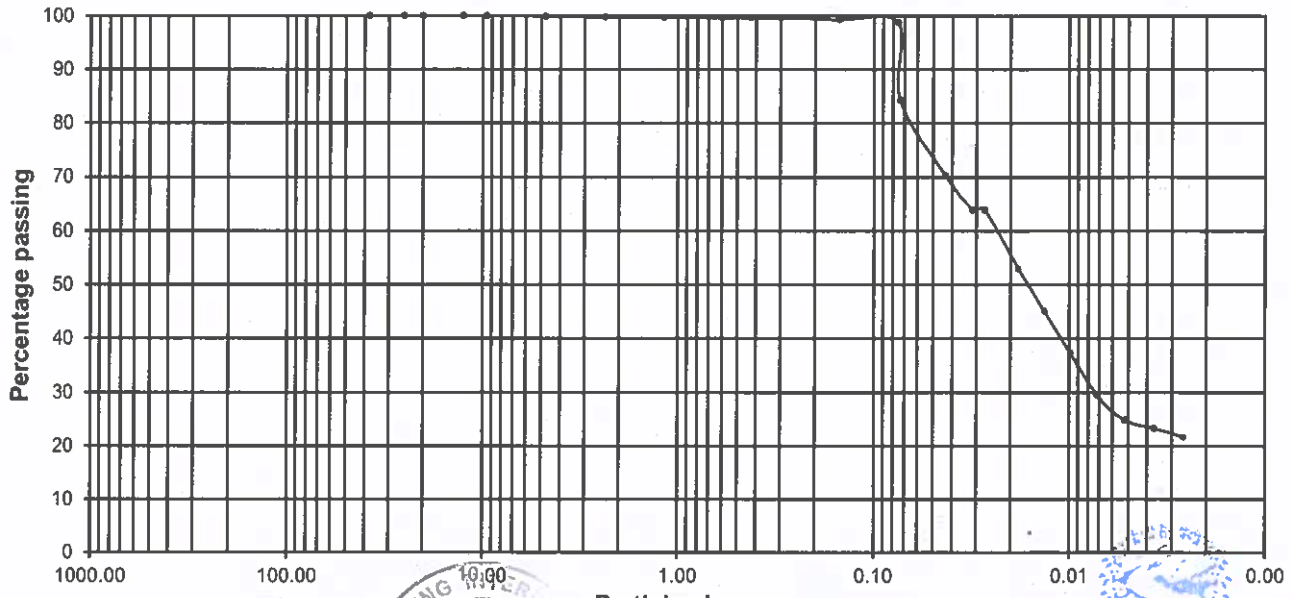
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	3/7/2019
Borehole No.	B-8	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.51	0.170	99.830
	2.36	0.31	0.103	99.727
	1.18	0.15	0.050	99.677
	0.600	0.08	0.027	99.651
	0.425	0.15	0.050	99.601
	0.3	0.07	0.023	99.577
	0.150	0.97	0.323	99.255
	0.075	1.85	0.615	98.639
	PAN	296.50	98.639	0.000
	Total	**300.59**		
Silt % **78.60**				
clay % **20.04**				



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HYDROMETER ANALYSIS

Project : MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)
Location :
Borehole No. B-8
Source of Sample SPT

Depth: 3.00-3.45m
Date of Test: 3/7/2019
Tested by: Pranita Pun
Checked By: Dr. Suman Manandhar

G_s = 2.688
y_w = 0.9968
μ = 8.75
y_c = 0.9968

Hydrometer No : 1
Dispersing Agent : Sodium HM 5%
Amount : 5 g per 100 cc
Meniscus correction x 1,000= 0.50

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= 98.639

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
03.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	93.63
		1.02600	0.30	26.00	-0.90	22	26.90	85.40	26.50	10.23	5.839	0.0735	84.24
		1.02150	1.00	21.50	-0.90	22	22.40	71.11	22.00	11.75	3.428	0.0431	70.14
		1.01950	2.00	19.50	-0.90	22	20.40	64.76	20.00	12.43	2.493	0.0314	63.88
		1.01950	2.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	2.159	0.0272	63.88
		1.01600	5.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	1.449	0.0182	52.92
		1.01350	10.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	1.065	0.0134	45.09
		1.01100	20.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.781	0.0098	37.26
		1.00850	40.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.571	0.0072	29.44
		1.00700	80.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.412	0.0052	24.74
		1.00650	160.00	6.50	-0.90	22	7.40	23.49	7.00	13.72	0.293	0.0037	23.17
		1.00600	320.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.208	0.0026	21.61
04.07.2019		1.00550	1440.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.099	0.0012	20.04

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.o the test, g/cm³

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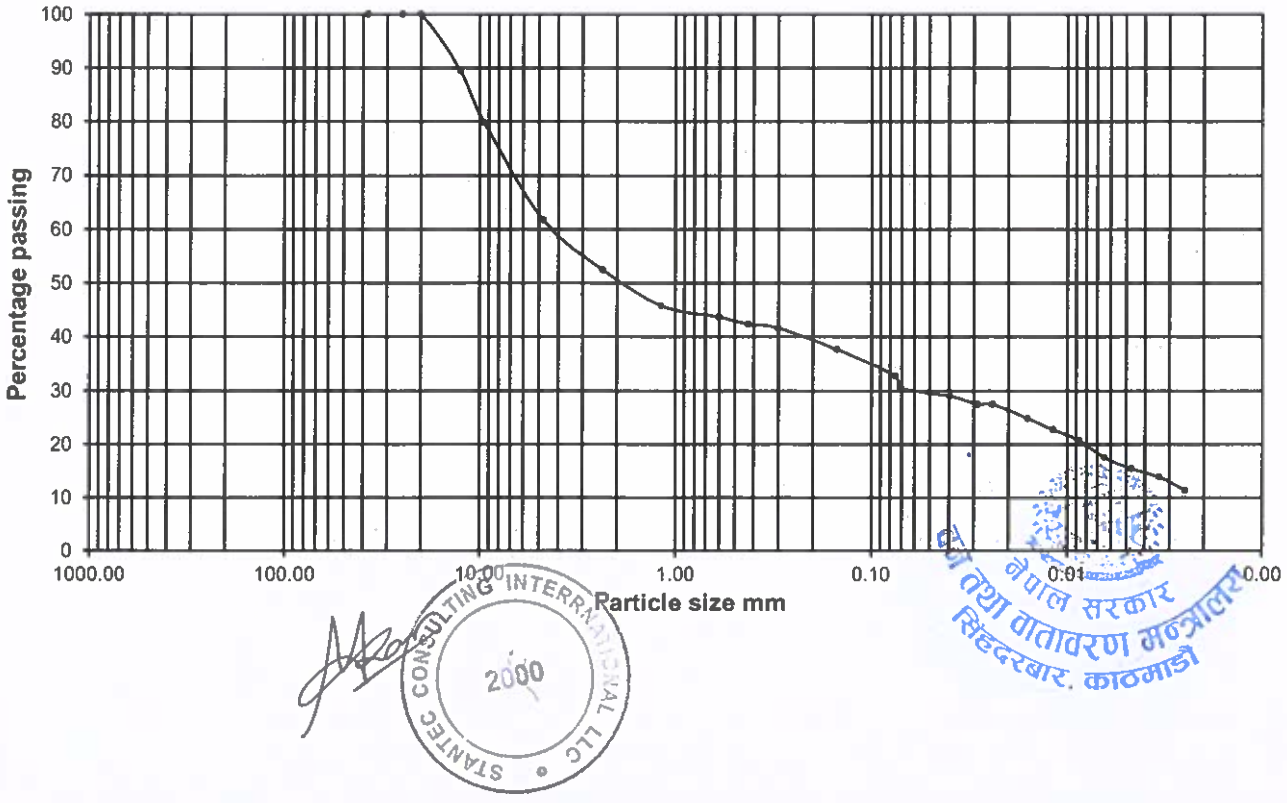
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	4.00-4.45m
Location:		Date of Testing :	7/7/2019
Borehole No.	B-12	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	31.84	10.632	89.368
	9.50	28.54	9.530	79.838
	4.75	54.51	18.202	61.637
	2.36	27.78	9.276	52.361
	1.18	19.78	6.605	45.756
	0.600	6.36	2.124	43.632
	0.425	4.01	1.339	42.293
	0.3	2.22	0.741	41.552
	0.150	11.65	3.890	37.662
	0.075	14.93	4.985	32.677
	PAN	97.86	32.677	0.000
	Total	**299.48**		
Silt % **22.93**				
clay % **9.75**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-12**
Source of Sample **SPT**

Depth: **4.00-4.45m**
Date of Test: **7/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
η = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **32.677**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
07.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	31.54
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	30.50
		1.02700	1.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	3.145	0.0396	28.94
		1.02550	2.00	25.50	-0.90	22	26.40	83.81	26.00	10.40	2.280	0.0287	27.39
		1.02550	2.00	25.50	-0.90	22	26.40	83.81	26.00	7.29	1.909	0.0240	27.39
		1.02300	5.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	1.276	0.0160	24.79
		1.02100	10.00	21.00	-0.90	22	21.90	69.52	21.50	8.81	0.939	0.0118	22.72
		1.01900	20.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	0.689	0.0087	20.64
		1.01600	40.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	0.512	0.0064	17.53
		1.01400	80.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.374	0.0047	15.46
		1.01250	160.00	12.50	-0.90	22	13.40	42.54	13.00	11.69	0.270	0.0034	13.90
		1.01000	320.00	10.00	-0.90	22	10.90	34.60	10.50	12.54	0.198	0.0025	11.31
08.07.2019		1.00850	1440.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.095	0.0012	9.75

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-4} \sqrt{\frac{\eta}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
η = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS (P) LTD.

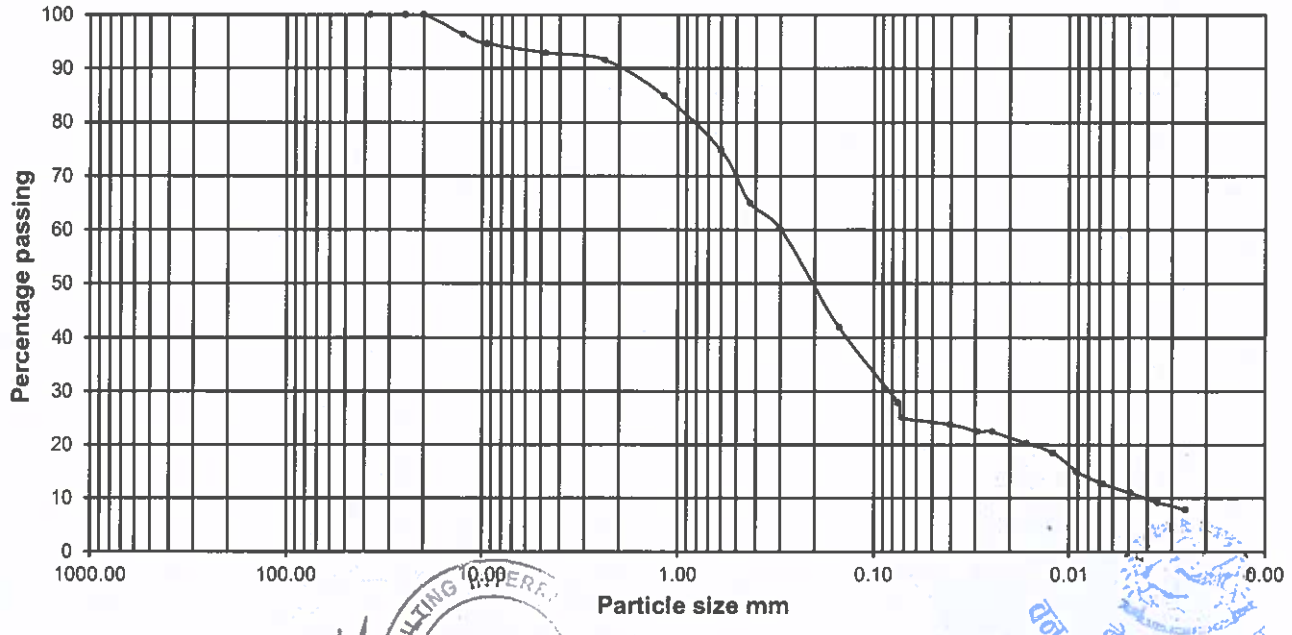
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.95m
Location:		Date of Testing :	3/7/2019
Borehole No.	B-16	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	19.38	3.696	96.304
	9.50	9.26	1.766	94.537
	4.75	8.85	1.688	92.849
	2.36	6.87	1.310	91.539
	1.18	35.10	6.695	84.844
	0.600	53.12	10.132	74.712
	0.425	51.19	9.764	64.948
	0.3	24.54	4.681	60.267
	0.150	96.54	18.414	41.854
	0.075	73.39	13.998	27.855
	PAN	146.04	27.855	0.000
	Total	**524.28**		
Silt % **21.75**				
clay % **6.10**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-16**
Source of Sample **SPT**

Depth: **3.00-3.95m**
Date of Test: **3/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
γ_w = **0.9968**
η = **8.75**
γ_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **27.855**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(γ_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
03.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	26.44
		1.02750	0.30	27.50	-0.90	22	28.40	90.16	28.00	9.72	5.693	0.0716	25.11
		1.02600	1.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	3.198	0.0402	23.79
		1.02450	2.00	24.50	-0.90	22	25.40	80.64	25.00	10.74	2.317	0.0291	22.46
		1.02450	2.00	24.50	-0.90	22	25.40	80.64	25.00	7.63	1.953	0.0246	22.46
		1.02200	5.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	1.302	0.0164	20.25
		1.02000	10.00	20.00	-0.90	22	20.90	66.35	20.50	9.15	0.957	0.0120	18.48
		1.01600	20.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	0.725	0.0091	14.94
		1.01350	40.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	0.533	0.0067	12.73
		1.01150	80.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.388	0.0049	10.97
		1.00950	160.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.282	0.0035	9.20
		1.00800	320.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.203	0.0026	7.87
04.07.2019		1.00600	1440.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.098	0.0012	6.10

$$K_1 = \frac{\gamma_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\eta}{\gamma_s - \gamma_w}} = 0.0125786$$

γ_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
η = Viscosity of water at the temp. of the test, millipoises
γ_s = Unit Wt. of soil grains, g/cm³
γ_w = Unit Wt. of water at the temp.of the test, g/cm³

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ICGS (P) LTD.

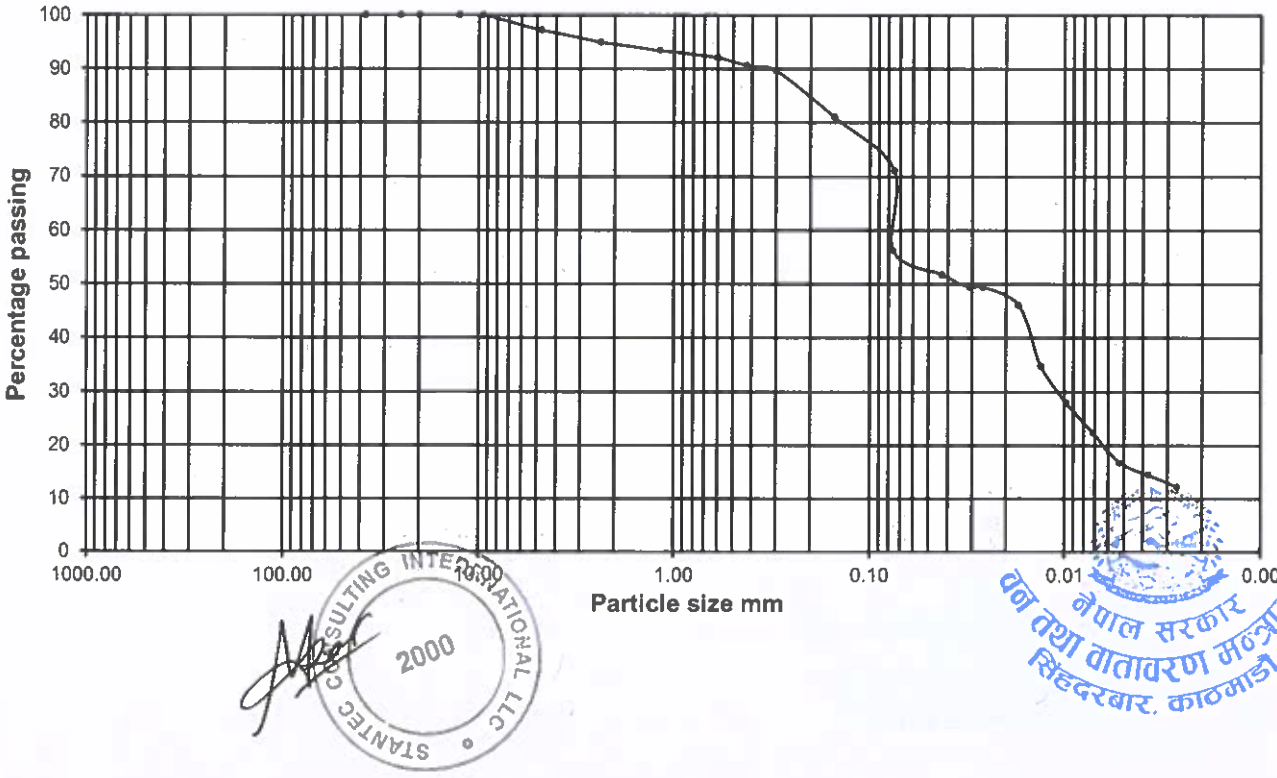
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	8/7/2019
Borehole No.	B-20	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	8.33	2.858	97.142
	2.36	6.31	2.165	94.977
	1.18	4.57	1.568	93.409
	0.600	4.05	1.390	92.019
	0.425	4.17	1.431	90.589
	0.3	2.91	0.998	89.590
	0.150	25.17	8.636	80.955
	0.075	28.91	9.919	71.035
	PAN	207.04	71.035	0.000
	Total	**291.46**		
Silt % **61.11**				
clay % **9.92**				



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Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-20**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **8/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
γ_w = **0.9968**
μ = **8.75**
γ_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **71.035**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(γ_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
08.07.2019		1.02750	0.15	27.50	-0.90	22	28.40	90.16	28.00	9.72	8.051	0.1013	64.05
		1.02400	0.30	24.00	-0.90	22	24.90	79.05	24.50	10.91	6.030	0.0758	56.15
		1.02200	1.00	22.00	-0.90	22	22.90	72.70	22.50	11.58	3.403	0.0428	51.64
		1.02100	2.00	21.00	-0.90	22	21.90	69.52	21.50	11.92	2.442	0.0307	49.39
		1.02100	2.00	21.00	-0.90	22	21.90	69.52	21.50	8.81	2.099	0.0264	49.39
		1.01950	5.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	1.365	0.0172	46.00
		1.01450	10.00	14.50	-0.90	22	15.40	48.89	15.00	11.01	1.049	0.0132	34.73
		1.01150	20.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.775	0.0098	27.96
		1.00900	40.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	0.567	0.0071	22.33
		1.00650	80.00	6.50	-0.90	22	7.40	23.49	7.00	13.72	0.414	0.0052	16.69
		1.00550	160.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.296	0.0037	14.43
		1.00450	320.00	4.50	-0.90	22	5.40	17.14	5.00	14.40	0.212	0.0027	12.18
09.07.2019		1.00350	1440.00	3.50	-0.90	22	4.40	13.97	4.00	14.74	0.101	0.0013	9.92

$$K_1 = \frac{\gamma_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

K_2 = $5.531 \times 10^{-}$ = **0.0125786**

γ_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
γ_s = Unit Wt. of soil grains, g/cm³
γ_w = Unit Wt. of water at the temp.of the test, g/cm³

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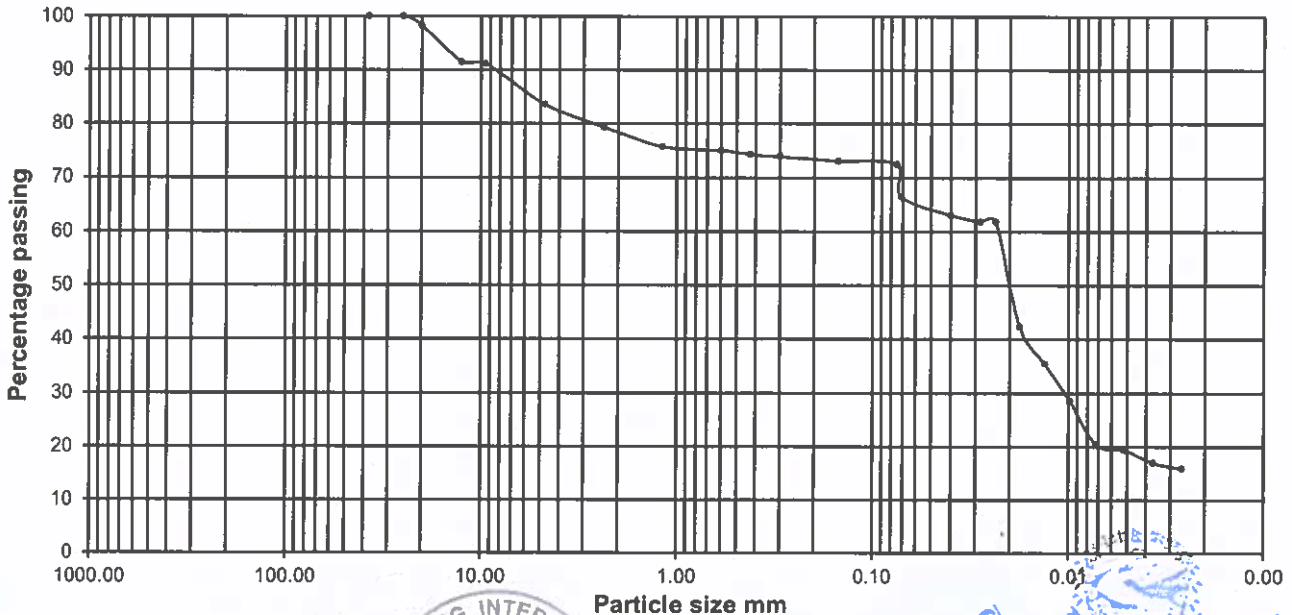
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	8/7/2019
Borehole No.	B-21	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	7.22	1.742	98.258
	12.50	28.02	6.760	91.498
	9.50	1.83	0.442	91.056
	4.75	31.03	7.487	83.569
	2.36	17.73	4.278	79.292
	1.18	14.73	3.554	75.738
	0.600	3.31	0.799	74.939
	0.425	2.78	0.671	74.268
	0.3	1.77	0.427	73.841
	0.150	3.46	0.835	73.006
	0.075	2.49	0.601	72.406
	PAN	300.10	72.406	0.000
	Total	414.47		
Silt % 57.69				
clay % 14.71				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-21**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **8/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
γ_w = **0.9968**
μ = **8.75**
γ_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **72.406**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(γ_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
08.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	68.73
		1.02800	0.30	28.00	-0.90	22	28.90	91.75	28.50	9.55	5.643	0.0710	66.43
		1.02650	1.00	26.50	-0.90	22	27.40	86.99	27.00	10.06	3.172	0.0399	62.98
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	2.262	0.0284	61.83
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	7.12	1.887	0.0237	61.83
		1.01750	5.00	17.50	-0.90	22	18.40	58.41	18.00	10.00	1.414	0.0178	42.29
		1.01450	10.00	14.50	-0.90	22	15.40	48.89	15.00	11.01	1.049	0.0132	35.40
		1.01150	20.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.775	0.0098	28.50
		1.00800	40.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.575	0.0072	20.46
		1.00750	80.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.409	0.0051	19.31
		1.00650	160.00	6.50	-0.90	22	7.40	23.49	7.00	13.72	0.293	0.0037	17.01
		1.00600	320.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.208	0.0026	15.86
09.07.2019		1.00550	1440.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.099	0.0012	14.71

$$K_1 = \frac{\gamma_c \times G_s \times 100}{(G_s - 1) W_s} = \mathbf{3.1746427}$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{\gamma_s - \gamma_w}} = \mathbf{0.0125786}$$

γ_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
γ_s = Unit Wt. of soil grains, g/cm^3
γ_w = Unit Wt. of water at the temp.of the test, g/cm^3

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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

ICGS (P) LTD.

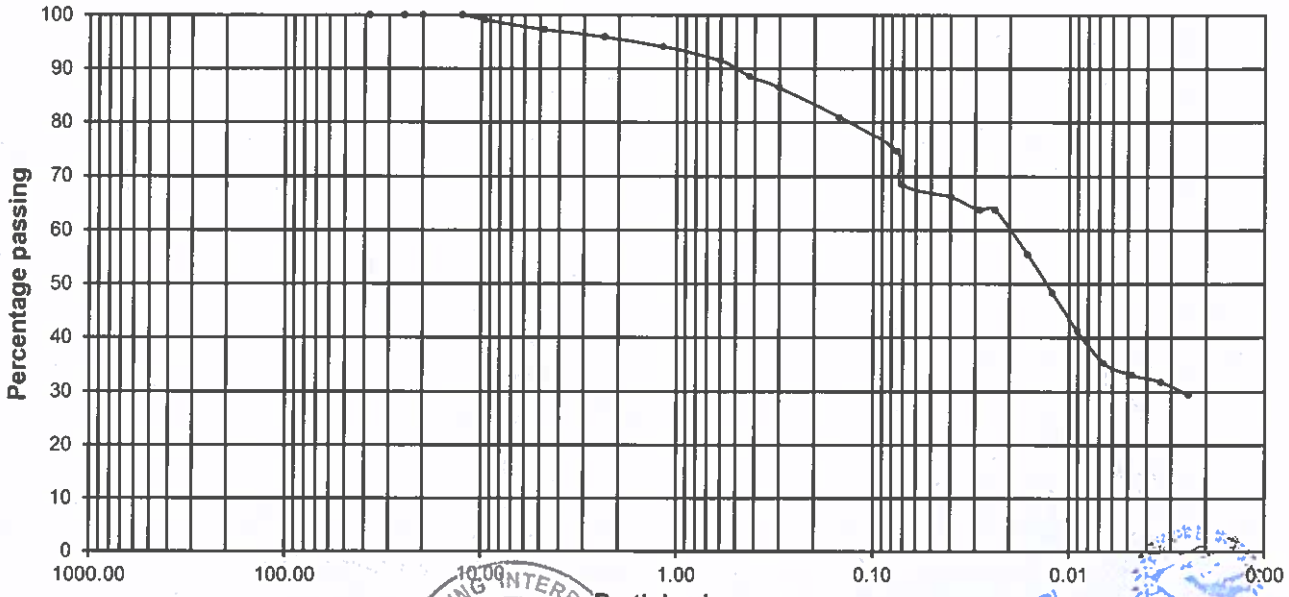
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing	9/7/2019
Borehole No.	B-26	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	2.48	1.038	98.962
	4.75	4.18	1.750	97.211
	2.36	3.22	1.348	95.863
	1.18	4.27	1.788	94.075
	0.600	6.22	2.605	91.470
	0.425	7.09	2.969	88.501
	0.3	4.89	2.048	86.454
	0.150	13.17	5.515	80.939
	0.075	15.12	6.331	74.607
	PAN	178.17	74.607	0.000
	Total	**238.81**		
Silt % **46.42**				
clay % **28.19**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-26**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **9/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
η = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **74.607**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
09.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	72.00
		1.02800	0.30	28.00	-0.90	22	28.90	91.75	28.50	9.55	5.643	0.0710	68.45
		1.02700	1.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	3.145	0.0396	66.08
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	2.262	0.0284	63.71
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	7.12	1.887	0.0237	63.71
		1.02250	5.00	22.50	-0.90	22	23.40	74.29	23.00	8.30	1.289	0.0162	55.42
		1.01950	10.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	0.965	0.0121	48.32
		1.01650	20.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.719	0.0090	41.21
		1.01400	40.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.529	0.0067	35.29
		1.01305	80.00	13.05	-0.90	22	13.95	44.29	13.55	11.50	0.379	0.0048	33.04
		1.01250	160.00	12.50	-0.90	22	13.40	42.54	13.00	11.69	0.270	0.0034	31.74
		1.01150	320.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.194	0.0024	29.37
10.07.2019		1.01100	1440.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.092	0.0012	28.19

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \frac{\eta}{y_s - y_w} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
η = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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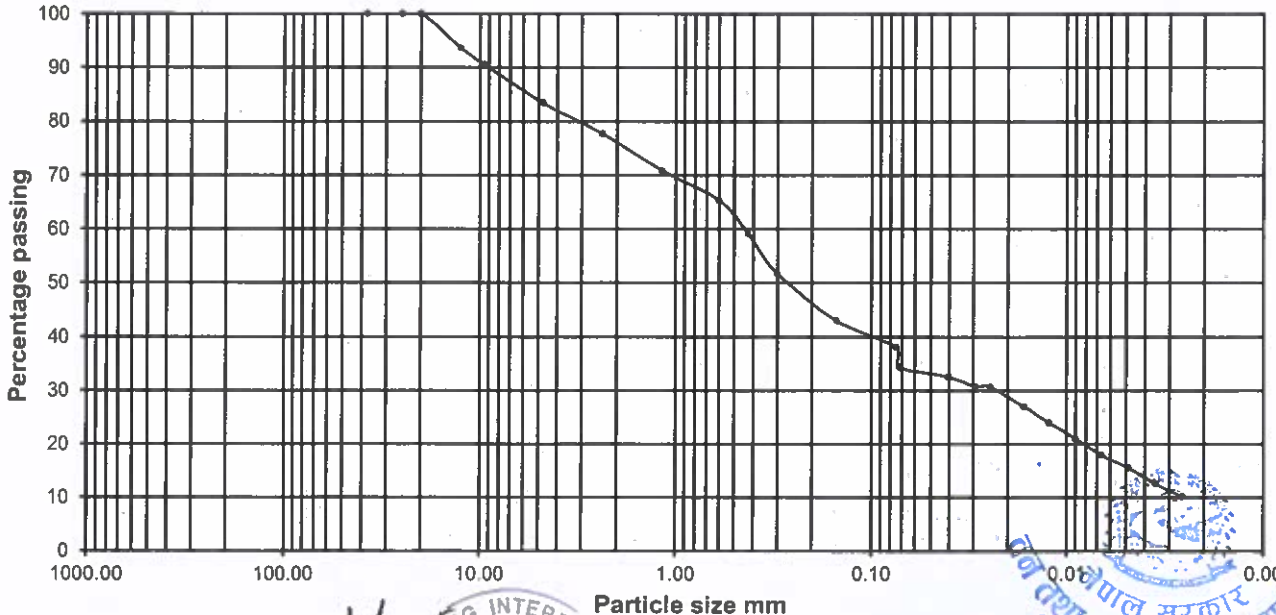
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	1.00-1.45m
Location:		Date of Testing :	7/7/2019
Borehole No.	B-27	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	19.38	6.445	93.555
	9.50	9.26	3.080	90.475
	4.75	21.21	7.054	83.421
	2.36	17.37	5.777	77.644
	1.18	20.65	6.868	70.776
	0.600	16.58	5.514	65.262
	0.425	18.16	6.040	59.222
	0.3	22.66	7.536	51.686
	0.150	26.36	8.767	42.919
	0.075	14.76	4.909	38.011
	PAN	114.29	38.011	0.000
	Total	**300.68**		
Silt % **29.68**				
clay % **8.33**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-27**
Source of Sample **SPT**

Depth: **1.00-1.45m**
Date of Test: **7/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **38.011**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
08.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	36.08
		1.02750	0.30	27.50	-0.90	22	28.40	90.16	28.00	9.72	5.693	0.0716	34.27
		1.02600	1.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	3.198	0.0402	32.46
		1.02450	2.00	24.50	-0.90	22	25.40	80.64	25.00	10.74	2.317	0.0291	30.65
		1.02450	2.00	24.50	-0.90	22	25.40	80.64	25.00	7.63	1.953	0.0246	30.65
		1.02150	5.00	21.50	-0.90	22	22.40	71.11	22.00	8.64	1.315	0.0165	27.03
		1.01900	10.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	0.974	0.0123	24.01
		1.01650	20.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.719	0.0090	21.00
		1.01400	40.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.529	0.0067	17.98
		1.01200	80.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	0.385	0.0048	15.57
		1.00950	160.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.282	0.0035	12.55
		1.00750	320.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.204	0.0026	10.14
08.07.2019		1.00600	1440.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.098	0.0012	8.33

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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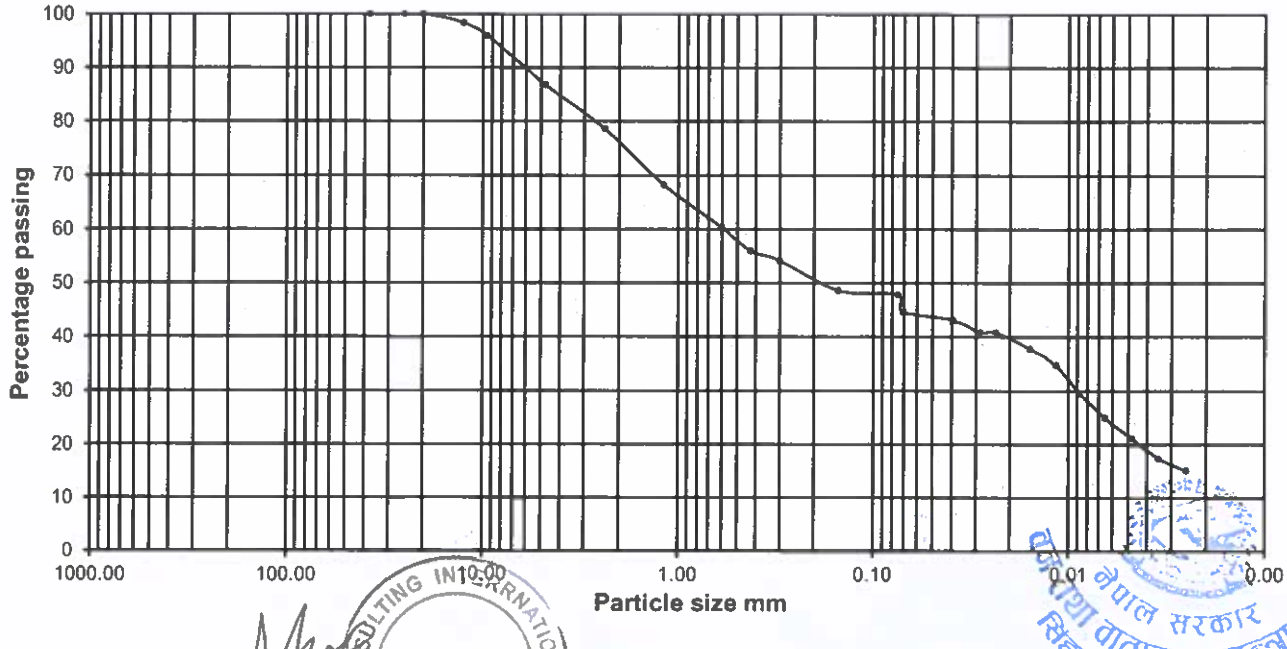
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	8/7/2019
Borehole No.	B-31	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	5.68	1.718	98.282
	9.50	7.93	2.399	95.883
	4.75	30.33	9.174	86.709
	2.36	26.81	8.109	78.600
	1.18	34.52	10.442	68.158
	0.600	26.35	7.970	60.188
	0.425	14.29	4.322	55.865
	0.3	5.66	1.712	54.153
	0.150	18.40	5.566	48.587
	0.075	2.63	0.796	47.792
	PAN	158.00	47.792	0.000
	Total	**330.60**		
Silt % **35.81**				
clay % **11.99**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-31**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **8/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **47.792**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
08.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	46.12
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	44.61
		1.02750	1.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	3.118	0.0392	43.09
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	2.262	0.0284	40.81
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	7.12	1.887	0.0237	40.81
		1.02400	5.00	24.00	-0.90	22	24.90	79.05	24.50	7.80	1.249	0.0157	37.78
		1.02200	10.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	0.921	0.0116	34.74
		1.01850	20.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	0.695	0.0087	29.43
		1.01550	40.00	15.50	-0.90	22	16.40	52.06	16.00	10.67	0.517	0.0065	24.88
		1.01300	80.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.379	0.0048	21.09
		1.01050	160.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.278	0.0035	17.30
		1.00900	320.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	0.201	0.0025	15.02
09.07.2019		1.00700	1440.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.097	0.0012	11.99

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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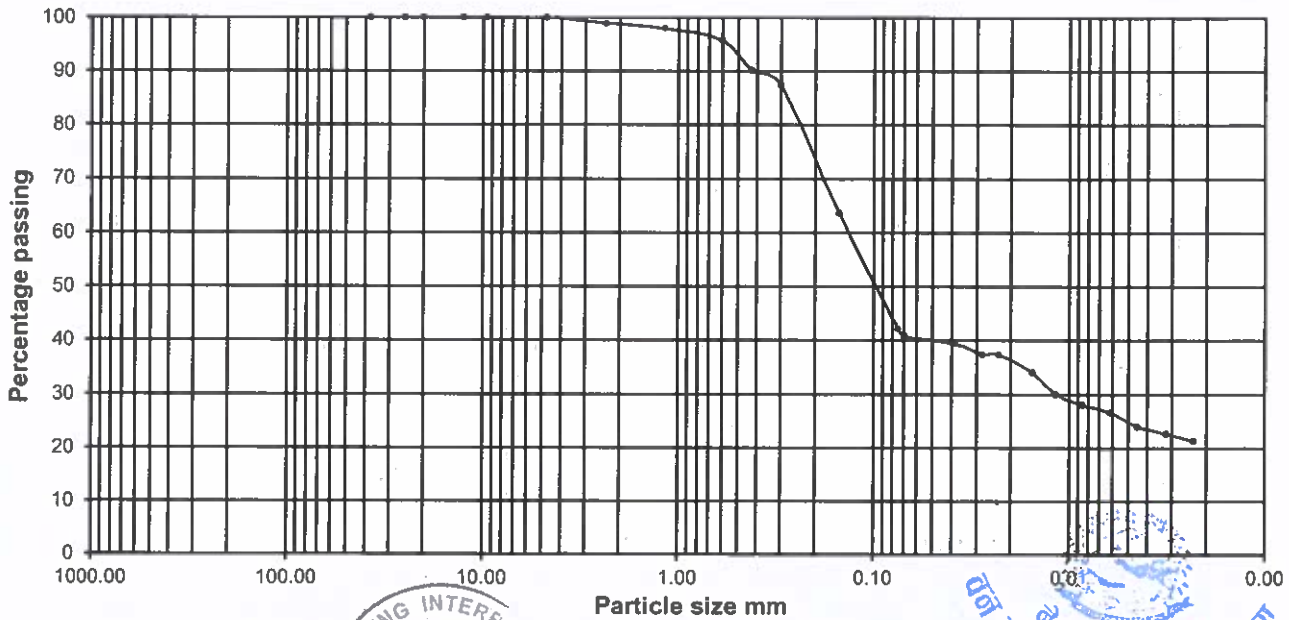
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	10/7/2019
Borehole No.	B-35	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.00	0.000	100.000
	2.36	5.48	1.166	98.834
	1.18	4.02	0.856	97.978
	0.600	10.81	2.301	95.677
	0.425	26.18	5.572	90.105
	0.3	12.77	2.718	87.386
	0.150	111.77	23.790	63.596
	0.075	100.67	21.428	42.168
	PAN	198.11	42.168	0.000
	Total	**469.81**		
Silt % **22.22**				
clay % **19.95**				



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ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-35**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **10/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **42.168**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
10.07.2019		1.03000	0.15	30.00	-0.90	22	30.90	98.10	30.50	8.88	7.692	0.0968	41.37
		1.02950	0.30	29.50	-0.90	22	30.40	96.51	30.00	9.04	5.491	0.0691	40.70
		1.02850	1.00	28.50	-0.90	22	29.40	93.33	29.00	9.38	3.063	0.0385	39.36
		1.02700	2.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	2.224	0.0280	37.35
		1.02700	2.00	27.00	-0.90	22	27.90	88.57	27.50	6.78	1.841	0.0232	37.35
		1.02450	5.00	24.50	-0.90	22	25.40	80.64	25.00	7.63	1.235	0.0155	34.00
		1.02150	10.00	21.50	-0.90	22	22.40	71.11	22.00	8.64	0.930	0.0117	29.99
		1.02000	20.00	20.00	-0.90	22	20.90	66.35	20.50	9.15	0.676	0.0085	27.98
		1.01900	40.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	0.487	0.0061	26.64
		1.01700	80.00	17.00	-0.90	22	17.90	56.83	17.50	10.17	0.356	0.0045	23.96
		1.01600	160.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	0.256	0.0032	22.62
		1.01500	320.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	0.184	0.0023	21.29
11.07.2019		1.01400	1440.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.088	0.0011	19.95

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = \mathbf{3.1746427}$$

$$K_2 = 5.531 \times 10^{-2} \sqrt{\frac{\mu}{y_s - y_w}} = \mathbf{0.0125786}$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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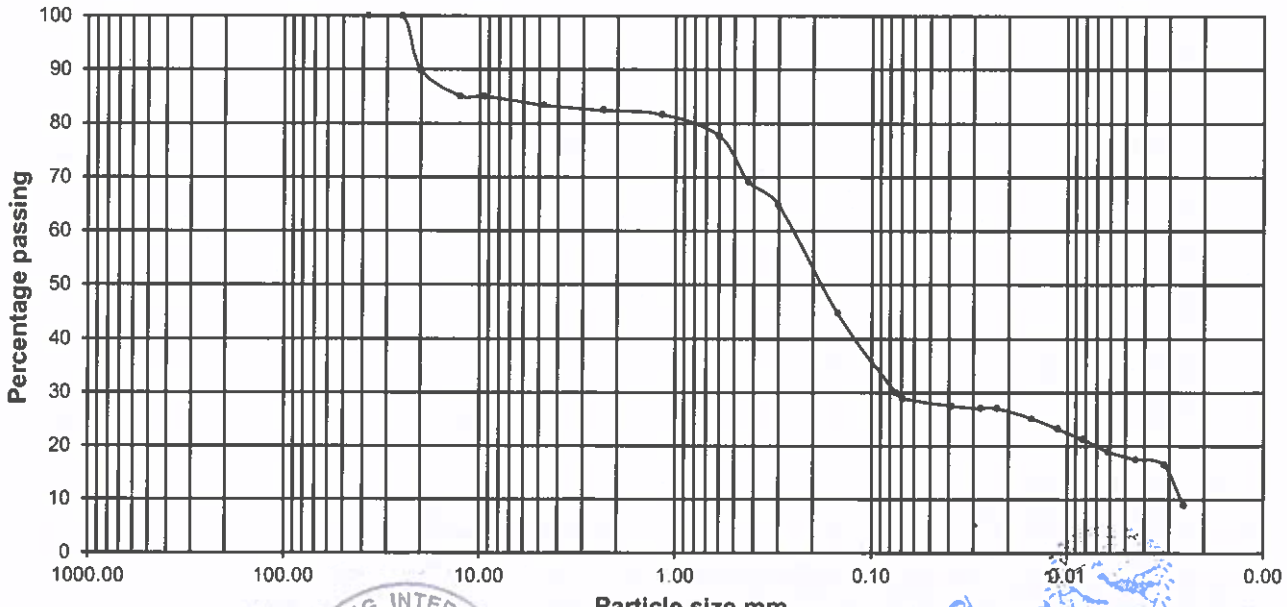
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	10/7/2019
Borehole No.	B-38	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	25.15	10.231	89.769
	12.50	11.74	4.776	84.993
	9.50	0.00	0.000	84.993
	4.75	4.05	1.648	83.346
	2.36	2.35	0.956	82.390
	1.18	1.94	0.789	81.600
	0.600	9.69	3.942	77.658
	0.425	20.92	8.510	69.148
	0.3	10.74	4.369	64.779
	0.150	49.32	20.063	44.716
	0.075	36.20	14.726	29.989
	PAN	73.72	29.989	0.000
	Total	**245.82**		
Silt % **24.85**				
clay % **5.14**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-38**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **10/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **29.989**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
10.07.2019		1.03000	0.15	30.00	-0.90	22	30.90	98.10	30.50	8.88	7.692	0.0968	29.42
		1.02950	0.30	29.50	-0.90	22	30.40	96.51	30.00	9.04	5.491	0.0691	28.94
		1.02800	1.00	28.00	-0.90	22	28.90	91.75	28.50	9.55	3.091	0.0389	27.51
		1.02750	2.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	2.205	0.0277	27.04
		1.02750	2.00	27.50	-0.90	22	28.40	90.16	28.00	6.61	1.818	0.0229	27.04
		1.02550	5.00	25.50	-0.90	22	26.40	83.81	26.00	7.29	1.207	0.0152	25.13
		1.02350	10.00	23.50	-0.90	22	24.40	77.46	24.00	7.97	0.893	0.0112	23.23
		1.02150	20.00	21.50	-0.90	22	22.40	71.11	22.00	8.64	0.657	0.0083	21.33
		1.01900	40.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	0.487	0.0061	18.95
		1.01750	80.00	17.50	-0.90	22	18.40	58.41	18.00	10.00	0.354	0.0044	17.52
		1.01650	160.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.254	0.0032	16.57
		1.00850	320.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.202	0.0025	8.95
11.07.2019		1.00450	1440.00	4.50	-0.90	22	5.40	17.14	5.00	14.40	0.100	0.0013	5.14

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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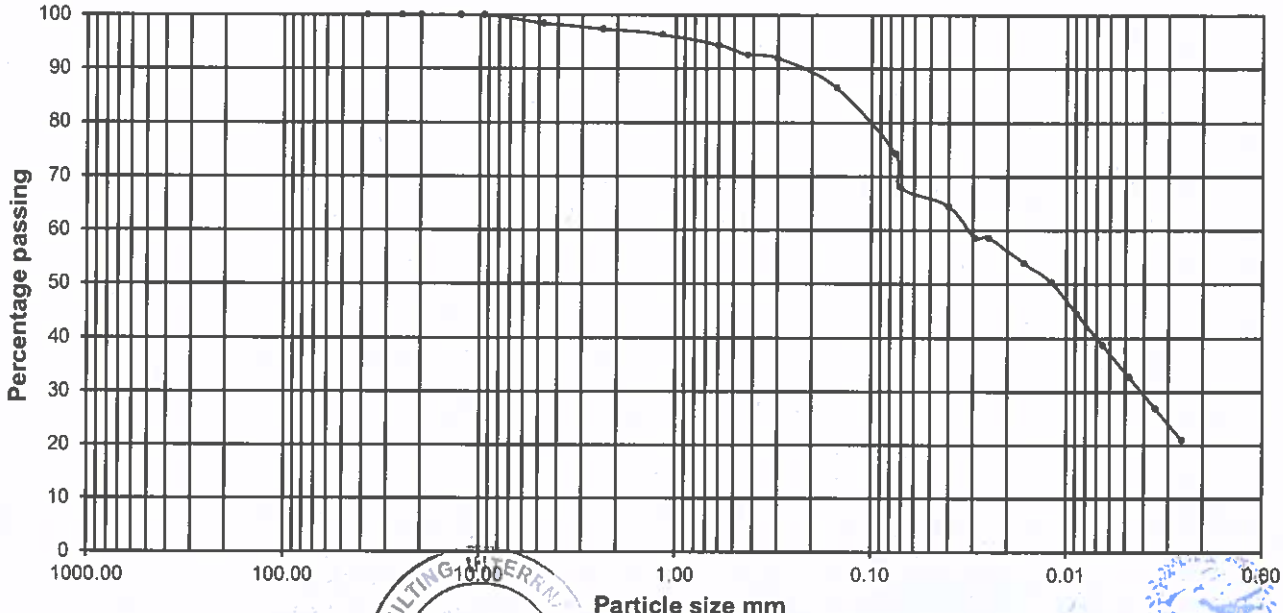
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.95m
Location:		Date of Testing :	6/7/2019
Borehole No.	B-39	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	4.67	1.572	98.428
	2.36	3.04	1.023	97.405
	1.18	3.25	1.094	96.311
	0.600	5.81	1.956	94.355
	0.425	5.39	1.814	92.540
	0.3	1.70	0.572	91.968
	0.150	16.46	5.541	86.427
	0.075	36.61	12.324	74.104
	PAN	220.14	74.104	0.000
	Total	**297.07**		
Silt %	**56.70**			
clay %	**17.41**			



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-39**
Source of Sample **SPT**

Depth: **3.00-3.95m**
Date of Test: **6/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
η_c = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **74.104**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
06.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	70.34
		1.02800	0.30	28.00	-0.90	22	28.90	91.75	28.50	9.55	5.643	0.0710	67.99
		1.02650	1.00	26.50	-0.90	22	27.40	86.99	27.00	10.06	3.172	0.0399	64.46
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	10.91	2.335	0.0294	58.58
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	7.80	1.974	0.0248	58.58
		1.02200	5.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	1.302	0.0164	53.87
		1.02050	10.00	20.50	-0.90	22	21.40	67.94	21.00	8.98	0.948	0.0119	50.34
		1.01800	20.00	18.00	-0.90	22	18.90	60.00	18.50	9.83	0.701	0.0088	44.46
		1.01550	40.00	15.50	-0.90	22	16.40	52.06	16.00	10.67	0.517	0.0065	38.58
		1.01300	80.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.379	0.0048	32.70
		1.01050	160.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.278	0.0035	26.82
		1.00800	320.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.203	0.0026	20.94
07.07.2019		1.00650	1440.00	6.50	-0.90	22	7.40	23.49	7.00	13.72	0.098	0.0012	17.41

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\eta_c}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
η_c = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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सिंहदरबार, काठमाडौं

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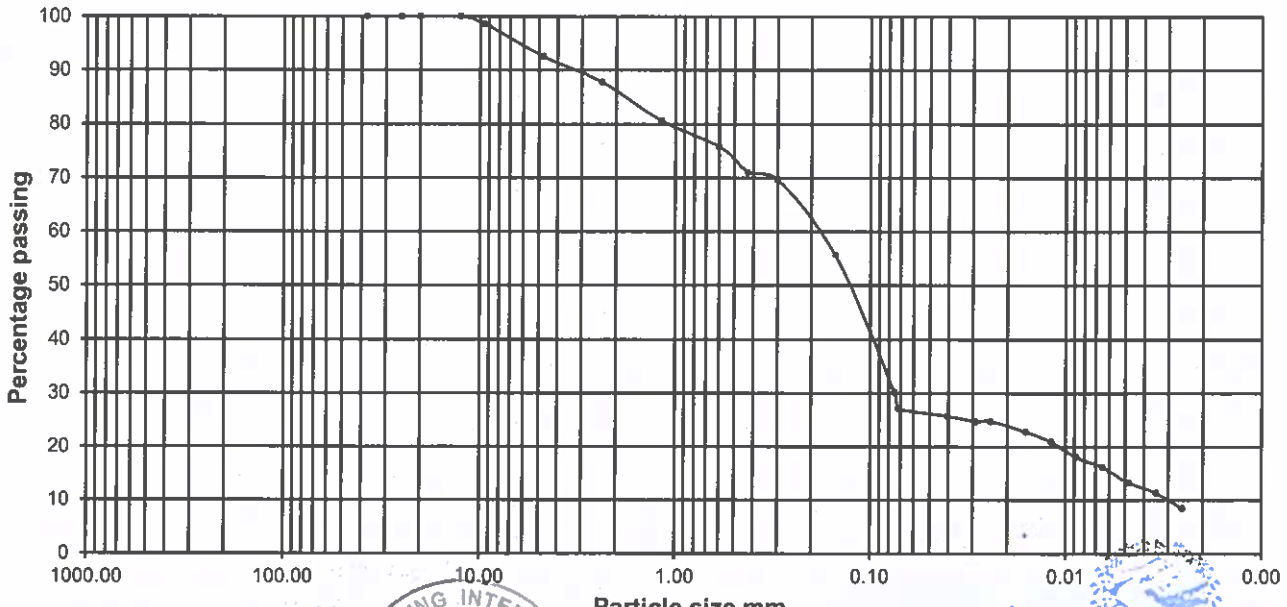
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	10/7/2019
Borehole No.	B-41	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	4.29	1.444	98.556
	4.75	17.71	5.960	92.597
	2.36	14.31	4.816	87.781
	1.18	21.57	7.259	80.522
	0.600	14.21	4.782	75.740
	0.425	14.10	4.745	70.995
	0.3	4.26	1.434	69.562
	0.150	41.45	13.949	55.613
	0.075	75.86	25.528	30.085
	PAN	89.40	30.085	0.000
	Total	**297.16**		
Silt % **24.45**				
clay % **5.64**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-41**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **10/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **30.085**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
10.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	29.03
		1.02750	0.30	27.50	-0.90	22	28.40	90.16	28.00	9.72	5.693	0.0716	27.12
		1.02600	1.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	3.198	0.0402	25.69
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	2.299	0.0289	24.74
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	7.46	1.931	0.0243	24.74
		1.02300	5.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	1.276	0.0160	22.83
		1.02100	10.00	21.00	-0.90	22	21.90	69.52	21.50	8.81	0.939	0.0118	20.92
		1.01800	20.00	18.00	-0.90	22	18.90	60.00	18.50	9.83	0.701	0.0088	18.05
		1.01600	40.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	0.512	0.0064	16.14
		1.01300	80.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.379	0.0048	13.28
		1.01100	160.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.276	0.0035	11.37
		1.00800	320.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.203	0.0026	8.50
11.07.2019		1.00500	1440.00	5.00	-0.90	22	5.90	18.73	5.50	14.23	0.099	0.0013	5.64

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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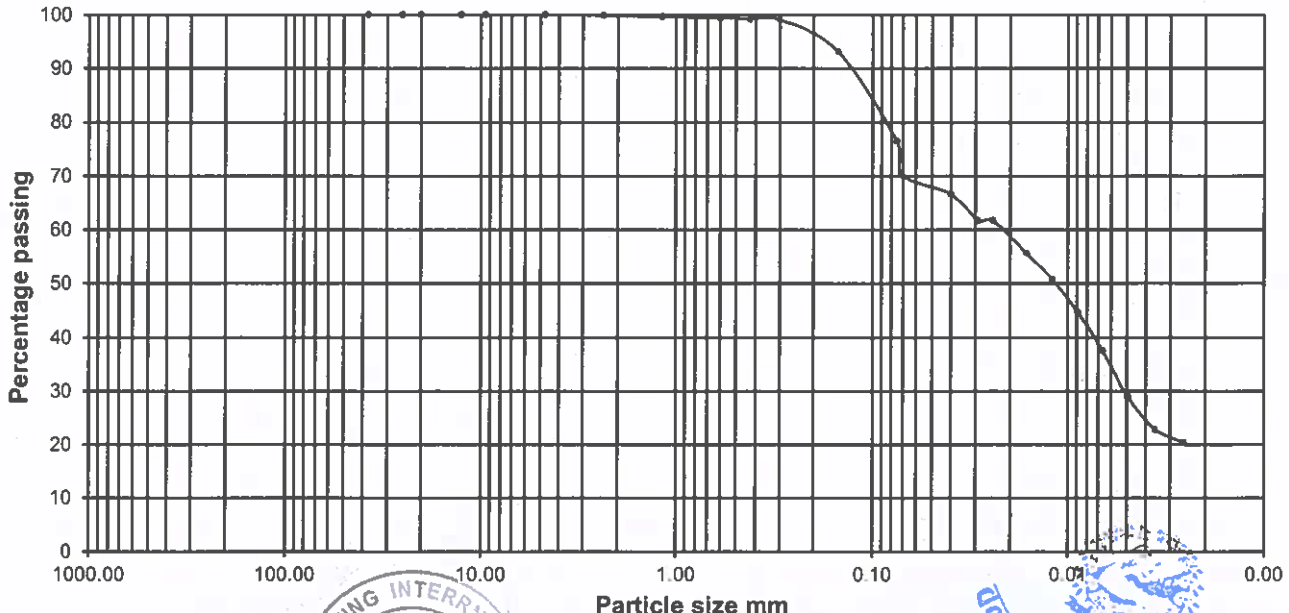
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	2/7/2019
Borehole No.	B-44	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.00	0.000	100.000
	2.36	0.60	0.139	99.861
	1.18	1.02	0.236	99.625
	0.600	1.04	0.241	99.383
	0.425	0.70	0.162	99.221
	0.3	0.59	0.137	99.084
	0.150	25.60	5.933	93.151
	0.075	71.80	16.642	76.509
	PAN	330.10	76.509	0.000
	Total	**431.45**		
Silt % **62.18**				
clay % **14.33**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-44**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **2/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **76.509**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
02.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	73.84
		1.02800	0.30	28.00	-0.90	22	28.90	91.75	28.50	9.55	5.643	0.0710	70.20
		1.02650	1.00	26.50	-0.90	22	27.40	86.99	27.00	10.06	3.172	0.0399	66.55
		1.02450	2.00	24.50	-0.90	22	25.40	80.64	25.00	10.74	2.317	0.0291	61.69
		1.02450	2.00	24.50	-0.90	22	25.40	80.64	25.00	7.63	1.953	0.0246	61.69
		1.02200	5.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	1.302	0.0164	55.62
		1.02000	10.00	20.00	-0.90	22	20.90	66.35	20.50	9.15	0.957	0.0120	50.76
		1.01750	20.00	17.50	-0.90	22	18.40	58.41	18.00	10.00	0.707	0.0089	44.69
		1.01450	40.00	14.50	-0.90	22	15.40	48.89	15.00	11.01	0.525	0.0066	37.41
		1.01100	80.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.390	0.0049	28.90
		1.00850	160.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.286	0.0036	22.83
		1.00750	320.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.204	0.0026	20.40
03.07.2019		1.00500	1440.00	5.00	-0.90	22	5.90	18.73	5.50	14.23	0.099	0.0013	14.33

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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ICGS (P) LTD.

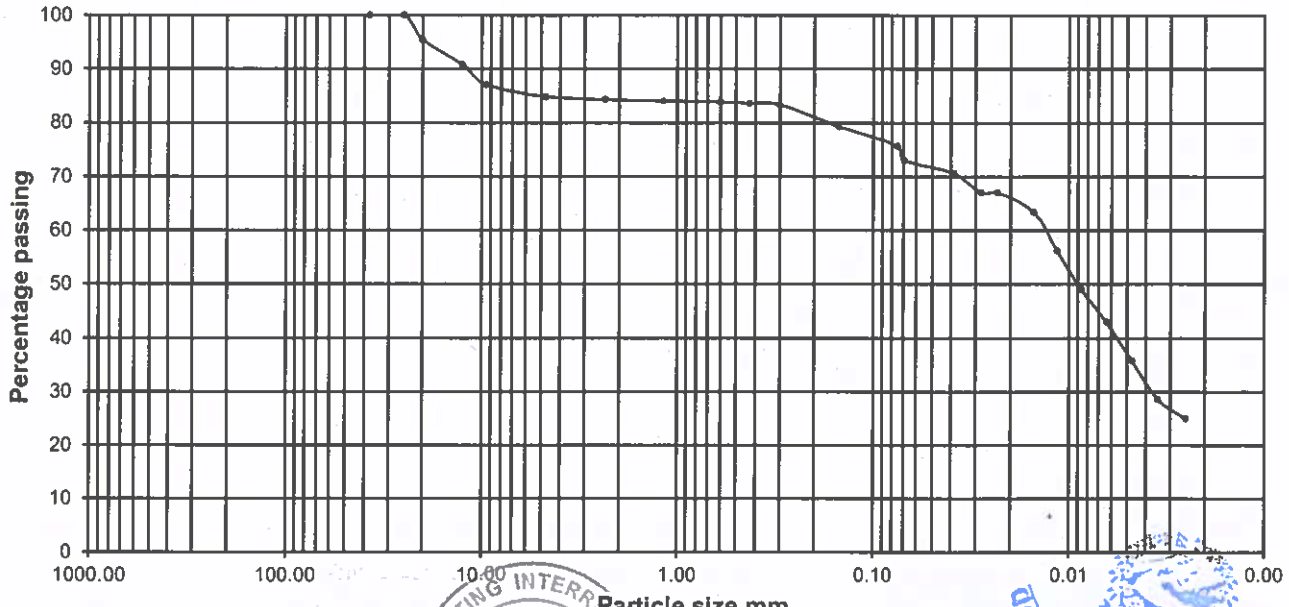
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	2/7/2019
Borehole No.	B-54	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	31.73	4.560	95.440
	12.50	32.82	4.716	90.724
	9.50	25.71	3.695	87.029
	4.75	15.45	2.220	84.809
	2.36	3.63	0.522	84.287
	1.18	2.18	0.313	83.974
	0.600	1.12	0.161	83.813
	0.425	1.74	0.250	83.563
	0.3	1.99	0.286	83.277
	0.150	27.85	4.002	79.275
	0.075	25.65	3.686	75.589
	PAN	526.00	75.589	0.000
	Total	**695.87**		
Silt % **55.43**				
clay % **20.16**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-54**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **2/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ_t = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **75.589**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
02.07.2019		1.03000	0.15	30.00	-0.90	22	30.90	98.10	30.50	8.88	7.692	0.0968	74.15
		1.02950	0.30	29.50	-0.90	22	30.40	96.51	30.00	9.04	5.491	0.0691	72.95
		1.02850	1.00	28.50	-0.90	22	29.40	93.33	29.00	9.38	3.063	0.0385	70.55
		1.02700	2.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	2.224	0.0280	66.95
		1.02700	2.00	27.00	-0.90	22	27.90	88.57	27.50	6.78	1.841	0.0232	66.95
		1.02550	5.00	25.50	-0.90	22	26.40	83.81	26.00	7.29	1.207	0.0152	63.35
		1.02250	10.00	22.50	-0.90	22	23.40	74.29	23.00	8.30	0.911	0.0115	56.15
		1.01950	20.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	0.683	0.0086	48.95
		1.01700	40.00	17.00	-0.90	22	17.90	56.83	17.50	10.17	0.504	0.0063	42.95
		1.01400	80.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.374	0.0047	35.76
		1.01100	160.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.276	0.0035	28.56
		1.00950	320.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.199	0.0025	24.96
03.07.2019		1.00750	1440.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.096	0.0012	20.16

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu_t}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ_t = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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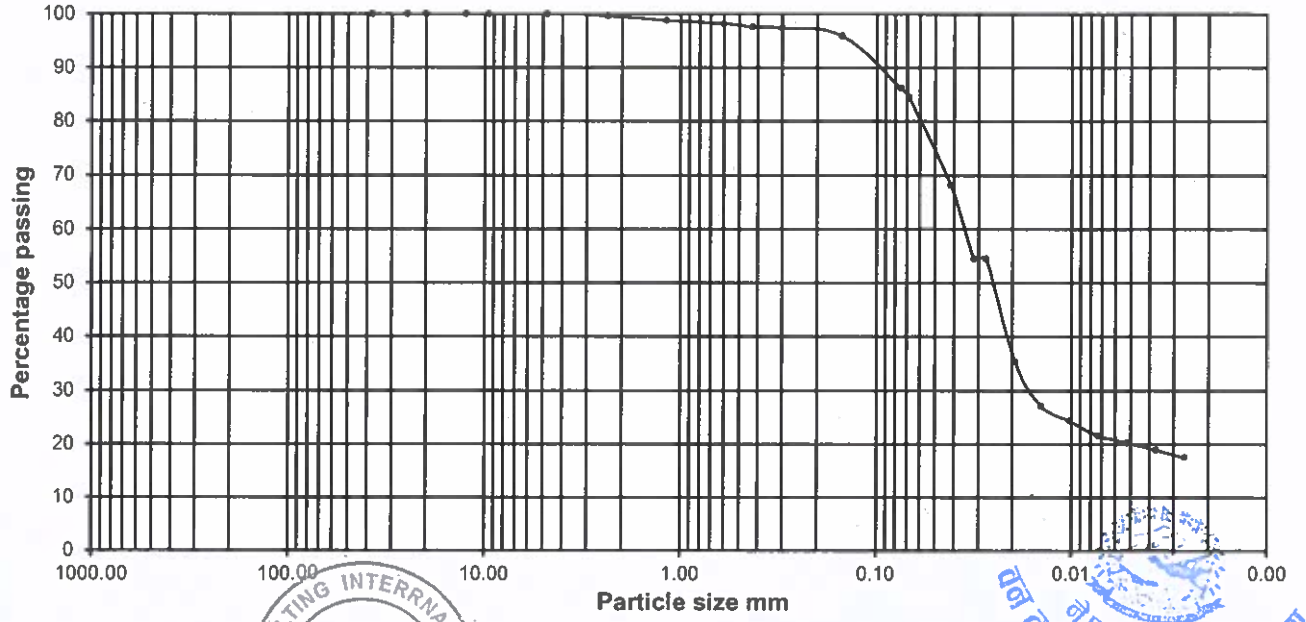
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	10/7/2019
Borehole No.	B-55	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.00	0.000	100.000
	2.36	1.21	0.411	99.589
	1.18	2.51	0.853	98.736
	0.600	1.79	0.608	98.128
	0.425	1.63	0.554	97.574
	0.3	0.62	0.211	97.363
	0.150	4.27	1.451	95.912
	0.075	28.75	9.770	86.142
	PAN	253.49	86.142	0.000
	Total	**294.27**		
Silt % **71.37**				
clay % **14.77**				



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New-Baneshwor, Kathmandu, Nepal
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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-55**
Source of Sample **SPT**

Depth: **3.00-3.45m**
Date of Test: **10/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	
Fraction Finer No. 200 Sieve=		86.142	

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
10.07.2019		1.03000	0.15	30.00	-0.90	22	30.90	98.10	30.50	8.88	7.692	0.0968	84.50
		1.03000	0.30	30.00	-0.90	22	30.90	98.10	30.50	8.88	5.439	0.0684	84.50
		1.02400	1.00	24.00	-0.90	22	24.90	79.05	24.50	10.91	3.303	0.0415	68.09
		1.01900	2.00	19.00	-0.90	22	19.90	63.18	19.50	12.60	2.510	0.0316	54.42
		1.01900	2.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	2.178	0.0274	54.42
		1.01200	5.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	1.540	0.0194	35.28
		1.00900	10.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	1.135	0.0143	27.07
		1.00800	20.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.813	0.0102	24.34
		1.00700	40.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.582	0.0073	21.60
		1.00650	80.00	6.50	-0.90	22	7.40	23.49	7.00	13.72	0.414	0.0052	20.24
		1.00600	160.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.295	0.0037	18.87
		1.00550	320.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.210	0.0026	17.50
11.07.2019		1.00450	1440.00	4.50	-0.90	22	5.40	17.14	5.00	14.40	0.100	0.0013	14.77

$K_1 = \dfrac{y_c \times G_s \times 100}{(G_s - 1) W_s} =$ **3.1746427**

$K_2 = 5.531 \times 10^{-3} \sqrt{\dfrac{\mu}{y_s - y_w}} =$ **0.0125786**

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

ICGS (P) LTD.

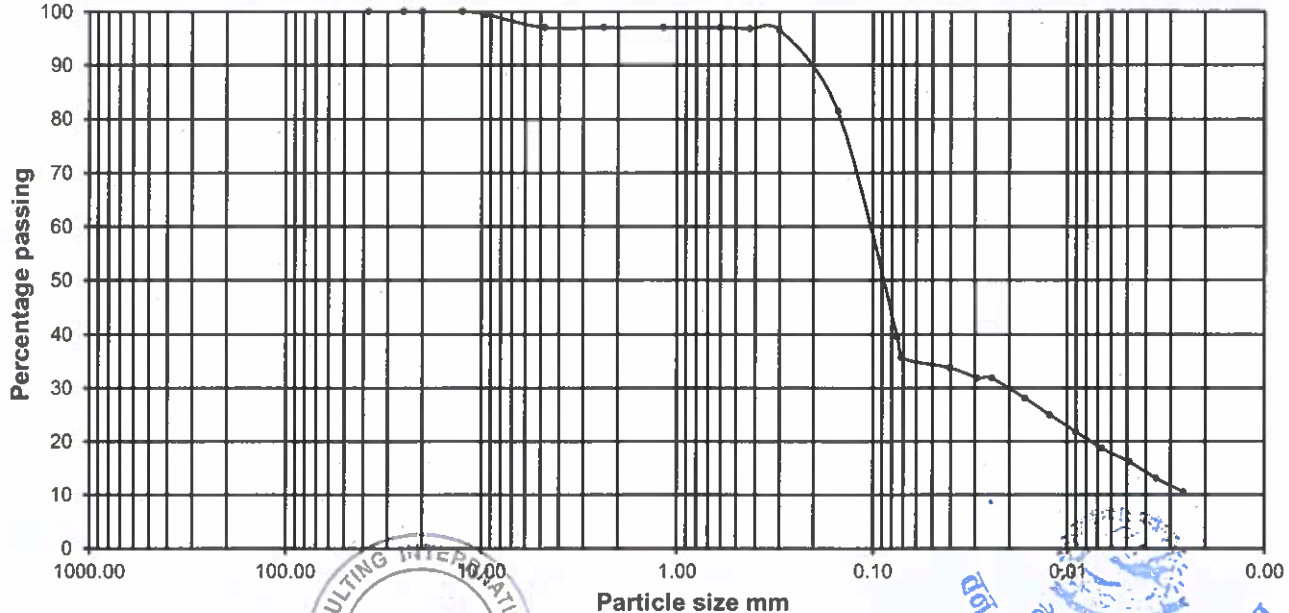
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	5.00-5.45m
Location:		Date of Testing :	7/7/2019
Borehole No.	B-57	Tested by:	Pranita Pun
Source of Sample	SPT	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	1.92	0.605	99.395
	4.75	7.58	2.387	97.009
	2.36	0.04	0.013	96.996
	1.18	0.05	0.016	96.980
	0.600	0.06	0.019	96.962
	0.425	0.69	0.217	96.744
	0.3	0.72	0.227	96.518
	0.150	48.07	15.135	81.382
	0.075	133.13	41.918	39.465
	PAN	125.34	39.465	0.000
	Total	**317.60**		
Silt % **30.82**				
clay % **8.64**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-57**
Source of Sample **SPT**

Depth: **5.00-5.45m**
Date of Test: **7/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **39.465**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
08.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	37.46
		1.02750	0.30	27.50	-0.90	22	28.40	90.16	28.00	9.72	5.693	0.0716	35.58
		1.02600	1.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	3.198	0.0402	33.70
		1.02450	2.00	24.50	-0.90	22	25.40	80.64	25.00	10.74	2.317	0.0291	31.82
		1.02450	2.00	24.50	-0.90	22	25.40	80.64	25.00	7.63	1.953	0.0246	31.82
		1.02150	5.00	21.50	-0.90	22	22.40	71.11	22.00	8.64	1.315	0.0165	28.06
		1.01900	10.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	0.974	0.0123	24.93
		1.01650	20.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.719	0.0090	21.80
		1.01400	40.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.529	0.0067	18.67
		1.01200	80.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	0.385	0.0048	16.16
		1.00950	160.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.282	0.0035	13.03
		1.00750	320.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.204	0.0026	10.52
08.07.2019		1.00600	1440.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.098	0.0012	8.64

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-2} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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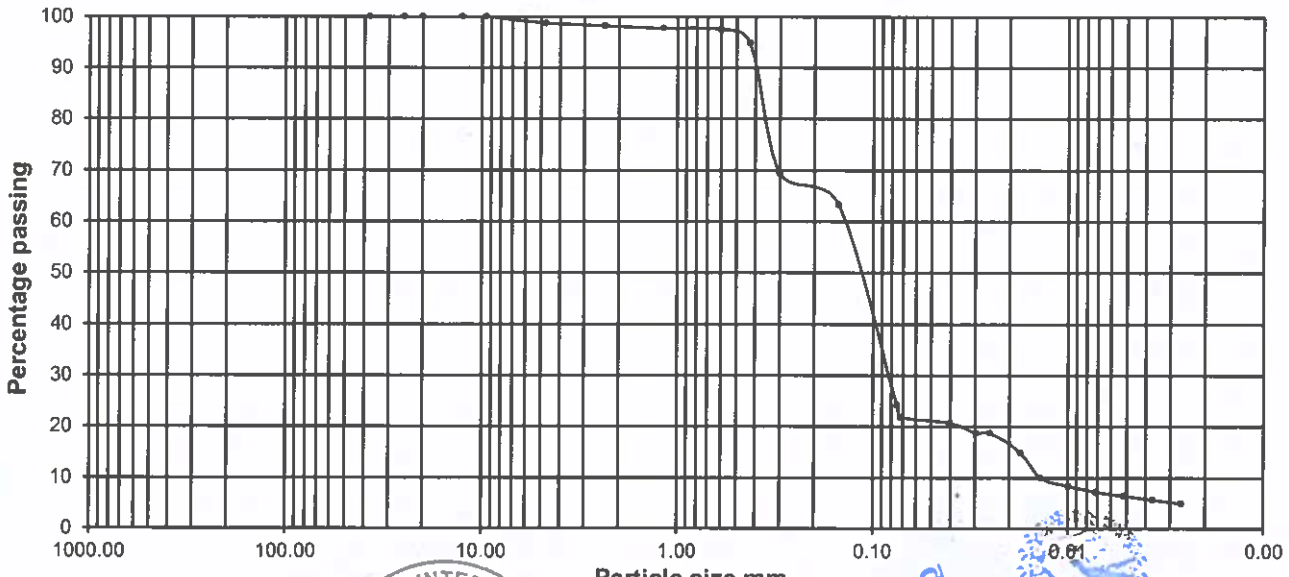
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.50-4.50m
Location:		Date of Testing	2/7/2019
Borehole No.	B-1	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	8.41	1.314	98.686
	2.36	2.89	0.452	98.235
	1.18	3.10	0.484	97.750
	0.600	1.90	0.297	97.453
	0.425	16.75	2.617	94.836
	0.3	163.51	25.546	69.290
	0.150	38.18	5.965	63.325
	0.075	250.69	39.167	24.157
	PAN	154.62	24.157	0.000
	Total	**640.05**		
Silt % **19.63**				
clay % **4.52**				



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ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-1**
Source of Sample **Test Pit Sample**

Depth: **3.50-4.50m**
Date of Test: **2/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
γ_w = **0.9968**
μ = **8.75**
γ_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **24.157**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(γ_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
02.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	22.93
		1.02750	0.30	27.50	-0.90	22	28.40	90.16	28.00	9.72	5.693	0.0716	21.78
		1.02600	1.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	3.198	0.0402	20.63
		1.02350	2.00	23.50	-0.90	22	24.40	77.46	24.00	11.08	2.353	0.0296	18.71
		1.02350	2.00	23.50	-0.90	22	24.40	77.46	24.00	7.97	1.996	0.0251	18.71
		1.01850	5.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	1.390	0.0175	14.88
		1.01200	10.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	1.089	0.0137	9.89
		1.01000	20.00	10.00	-0.90	22	10.90	34.60	10.50	12.54	0.792	0.0100	8.36
		1.00850	40.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.571	0.0072	7.21
		1.00750	80.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.409	0.0051	6.44
		1.00650	160.00	6.50	-0.90	22	7.40	23.49	7.00	13.72	0.293	0.0037	5.68
		1.00550	320.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.210	0.0026	4.91
03.07.2019		1.00500	1373.00	5.00	-0.90	22	5.90	18.73	5.50	14.23	0.102	0.0013	4.52

$$K_1 = \frac{\gamma_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

K_2 = 5.531×10^{-3} $\sqrt{\frac{\mu}{\gamma_s - \gamma_w}}$ = **0.0125786**

γ_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
γ_s = Unit Wt. of soil grains, g/cm^3
γ_w = Unit Wt. of water at the temp.of the test, g/cm^3

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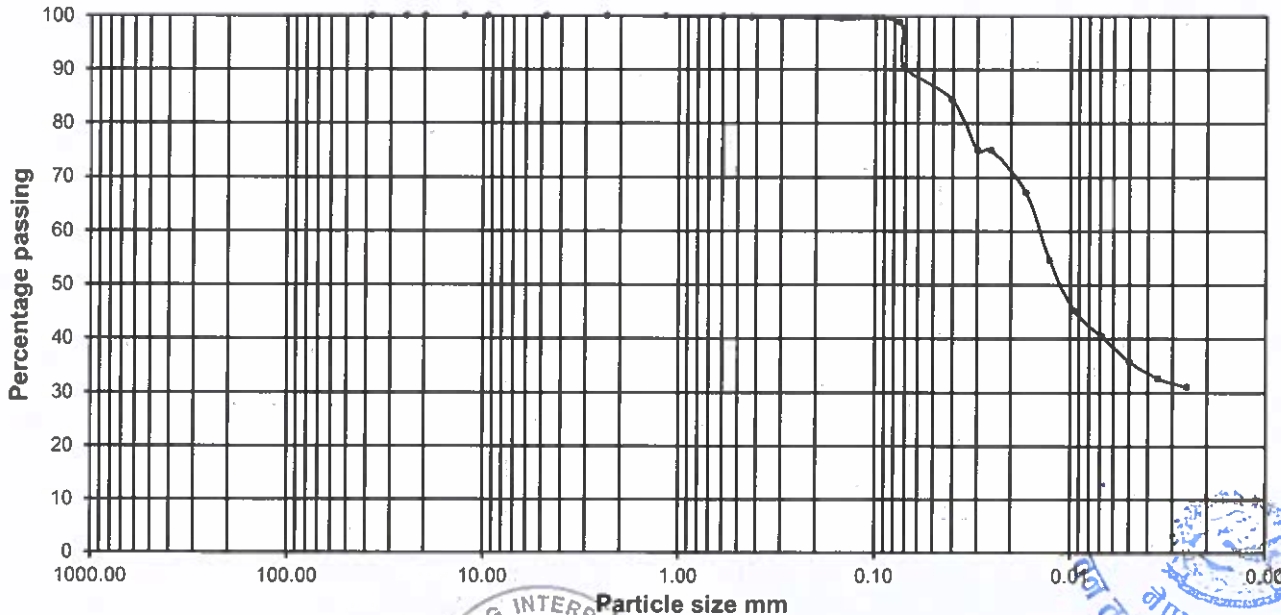
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.00-3.45m
Location:		Date of Testing :	1/7/2019
Borehole No.	B-2	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.00	0.000	100.000
	2.36	0.11	0.022	99.978
	1.18	0.37	0.074	99.904
	0.600	0.51	0.102	99.802
	0.425	0.52	0.104	99.698
	0.3	0.13	0.026	99.672
	0.150	1.25	0.250	99.422
	0.075	3.24	0.648	98.774
	PAN	493.87	98.774	0.000
	Total	**500.00**		
Silt % **69.30**				
clay % **29.48**				



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New-Baneshwor, Kathmandu, Nepal

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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**

Location :

Borehole No. **B-2**

Source of Sample **Test Pit Sample**

Depth: **3.00-3.45m**

Date of Test: **1/7/2019**

Tested by: **Pranita Pun**

Checked By: **Dr. Suman Manandhar**

G_s = **2.688**

y_w = **0.9968**

μ = **8.75**

y_c = **0.9968**

Hydrometer No : **1**

Dispersing Agent : **Sodium HM 5%**

Amount : **5 g per 100 cc**

Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **98.774**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r\text{(cm)} / t\text{ (min)}}$	D = $K_2\sqrt{Z_r/t}$	N' %
01.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	93.76
		1.02800	0.30	28.00	-0.90	22	28.90	91.75	28.50	9.55	5.643	0.0710	90.62
		1.02600	1.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	3.198	0.0402	84.35
		1.02300	2.00	23.00	-0.90	22	23.90	75.87	23.50	11.25	2.371	0.0298	74.94
		1.02300	2.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	2.017	0.0254	74.94
		1.02050	5.00	20.50	-0.90	22	21.40	67.94	21.00	8.98	1.340	0.0169	67.10
		1.01650	10.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	1.017	0.0128	54.56
		1.01350	20.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	0.753	0.0095	45.15
		1.01200	40.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	0.544	0.0068	40.45
		1.01050	80.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.393	0.0049	35.75
		1.00950	160.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.282	0.0035	32.61
		1.00900	320.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	0.201	0.0025	31.04
02.07.2019		1.00850	1440.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.095	0.0012	29.48

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1)\, W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \cdot \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³

G_s = Specific gravity of solids

W_s = Wt. Of dry soil, g

μ = Viscosity of water at the temp. of the test, millipoises

y_s = Unit Wt. of soil grains, g/cm³

y_w = Unit Wt. of water at the temp.of the test, g/cm³

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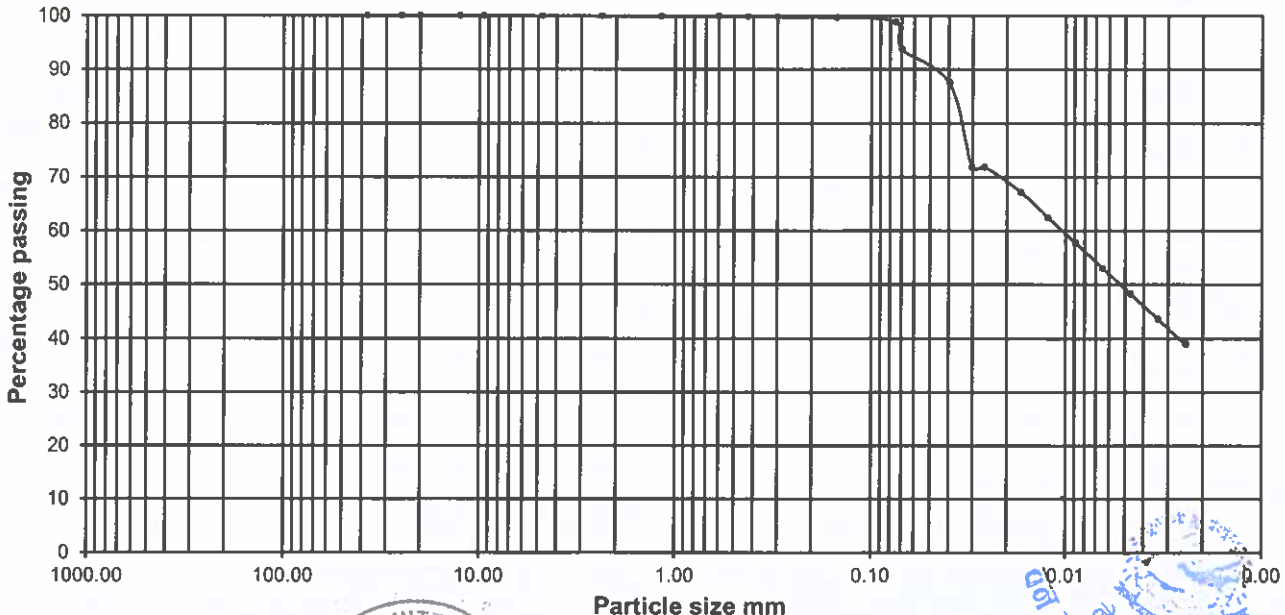
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	9/6/2019
Borehole No.	B-3	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.16	0.053	99.947
	2.36	0.09	0.030	99.917
	1.18	0.12	0.040	99.877
	0.600	0.10	0.033	99.843
	0.425	0.10	0.033	99.810
	0.3	0.00	0.000	99.810
	0.150	0.54	0.180	99.630
	0.075	2.58	0.860	98.770
	PAN	296.23	98.770	0.000
	Total	**299.92**		
Silt % **63.02**				
clay % **35.75**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-3**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **9/6/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **98.770**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r (cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
09.06.2019		1.03000	0.15	30.00	-0.90	22	30.90	98.10	30.50	8.88	7.692	0.0968	96.89
		1.02900	0.30	29.00	-0.90	22	29.90	94.92	29.50	9.21	5.542	0.0697	93.75
		1.02700	1.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	3.145	0.0396	87.48
		1.02200	2.00	22.00	-0.90	22	22.90	72.70	22.50	11.58	2.407	0.0303	71.80
		1.02200	2.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	2.058	0.0259	71.80
		1.02050	5.00	20.50	-0.90	22	21.40	67.94	21.00	8.98	1.340	0.0169	67.10
		1.01900	10.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	0.974	0.0123	62.40
		1.01750	20.00	17.50	-0.90	22	18.40	58.41	18.00	10.00	0.707	0.0089	57.69
		1.01600	40.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	0.512	0.0064	52.99
		1.01450	80.00	14.50	-0.90	22	15.40	48.89	15.00	11.01	0.371	0.0047	48.29
		1.01300	160.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.268	0.0034	43.58
		1.01150	320.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.194	0.0024	38.88
10.06.2019		1.01050	1440.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.093	0.0012	35.75

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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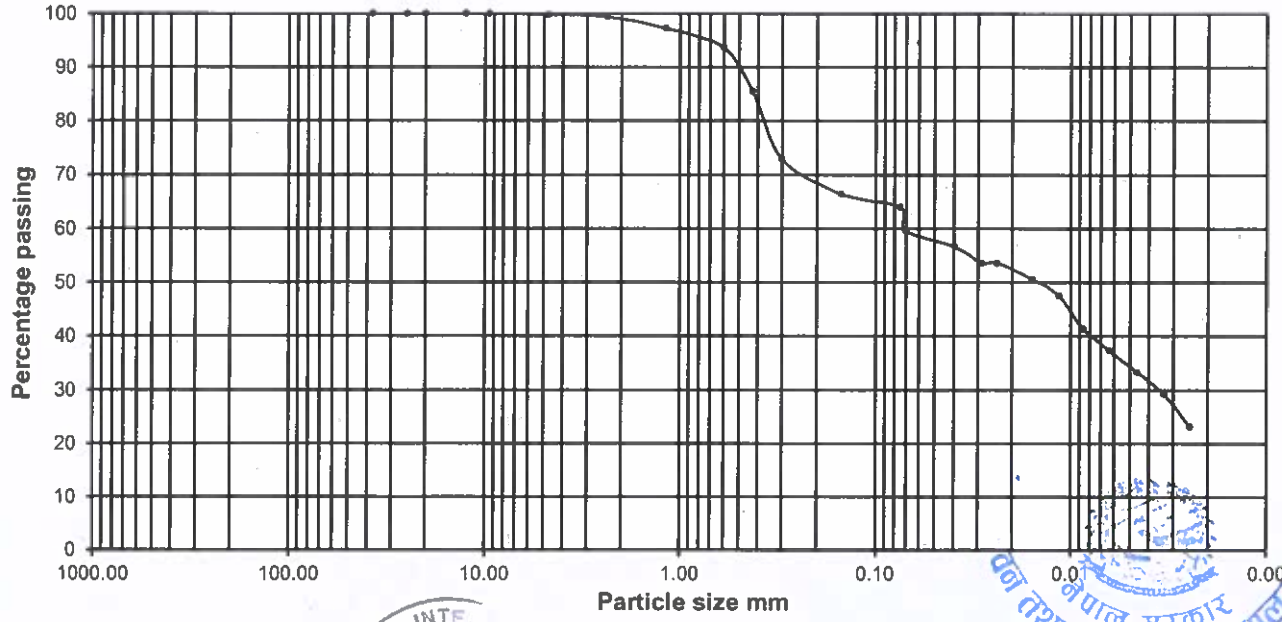
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	25/6/2019
Borehole No.	B-4	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	1.27	0.278	99.722
	2.36	1.86	0.407	99.314
	1.18	9.79	2.145	97.170
	0.600	16.49	3.612	93.558
	0.425	37.26	8.162	85.396
	0.3	57.34	12.561	72.835
	0.150	29.50	6.462	66.373
	0.075	11.32	2.480	63.893
	PAN	291.68	63.893	0.000
	Total	**456.51**		
Silt % **46.85**				
clay % **17.04**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-4**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **25/6/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **63.893**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r(cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
25.06.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	61.66
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	59.63
		1.02700	1.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	3.145	0.0396	56.59
		1.02550	2.00	25.50	-0.90	22	26.40	83.81	26.00	10.40	2.280	0.0287	53.55
		1.02550	2.00	25.50	-0.90	22	26.40	83.81	26.00	7.29	1.909	0.0240	53.55
		1.02400	5.00	24.00	-0.90	22	24.90	79.05	24.50	7.80	1.249	0.0157	50.51
		1.02250	10.00	22.50	-0.90	22	23.40	74.29	23.00	8.30	0.911	0.0115	47.46
		1.01950	20.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	0.683	0.0086	41.38
		1.01750	40.00	17.50	-0.90	22	18.40	58.41	18.00	10.00	0.500	0.0063	37.32
		1.01550	80.00	15.50	-0.90	22	16.40	52.06	16.00	10.67	0.365	0.0046	33.27
		1.01350	160.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	0.266	0.0034	29.21
		1.01050	320.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.197	0.0025	23.12
26.06.2019		1.00750	1440.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.096	0.0012	17.04
.													

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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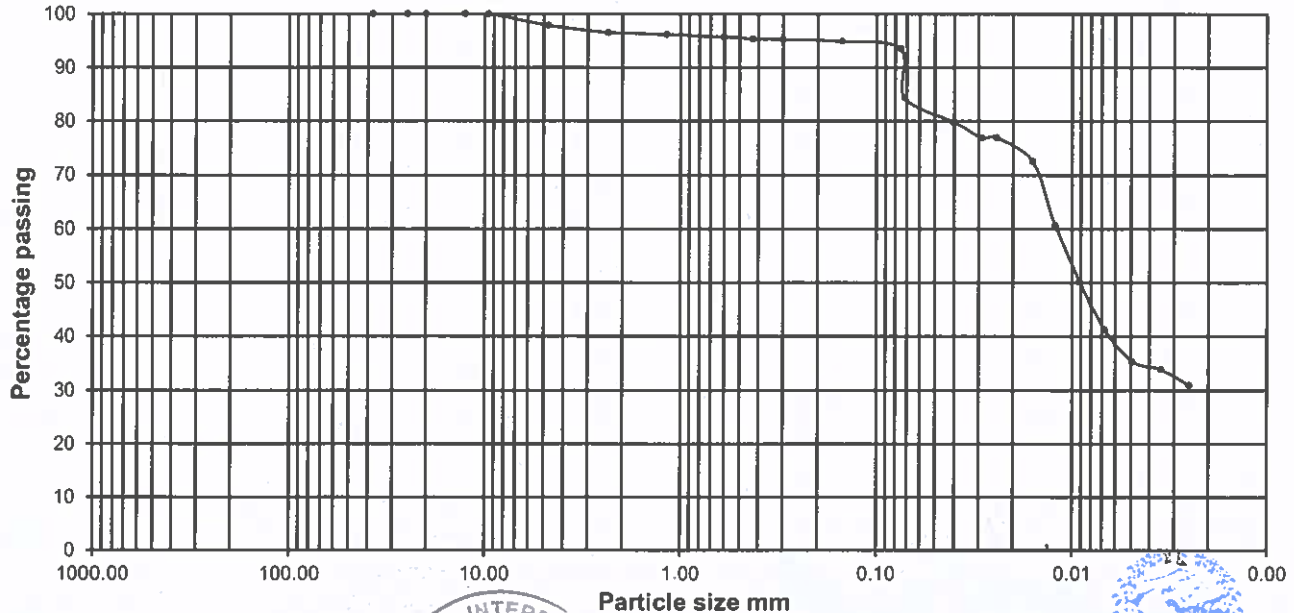
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.50-4.50m
Location:		Date of Testing :	2/7/2019
Borehole No.	B-6	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	9.52	2.186	97.814
	2.36	5.70	1.309	96.506
	1.18	1.72	0.395	96.111
	0.600	1.99	0.457	95.654
	0.425	1.66	0.381	95.273
	0.3	0.34	0.078	95.195
	0.150	1.64	0.377	94.819
	0.075	5.77	1.325	93.494
	PAN	407.25	93.494	0.000
	Total	**435.59**		
Silt % **65.59**				
clay % **27.90**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-6**
Source of Sample **Test Pit Sample**

Depth: **3.50-4.50m**
Date of Test: **2/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **93.494**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
02.07.2019		1.02850	0.15	28.50	-0.90	22	29.40	93.33	29.00	9.38	7.909	0.0995	87.26
		1.02750	0.30	27.50	-0.90	22	28.40	90.16	28.00	9.72	5.693	0.0716	84.29
		1.02600	1.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	3.198	0.0402	79.84
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	2.299	0.0289	76.87
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	7.46	1.931	0.0243	76.87
		1.02350	5.00	23.50	-0.90	22	24.40	77.46	24.00	7.97	1.262	0.0159	72.42
		1.01950	10.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	0.965	0.0121	60.55
		1.01600	20.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	0.725	0.0091	50.16
		1.01300	40.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.537	0.0068	41.26
		1.01100	80.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.390	0.0049	35.32
		1.01050	160.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.278	0.0035	33.84
		1.00950	320.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.199	0.0025	30.87
03.07.2019		1.00850	1440.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.095	0.0012	27.90

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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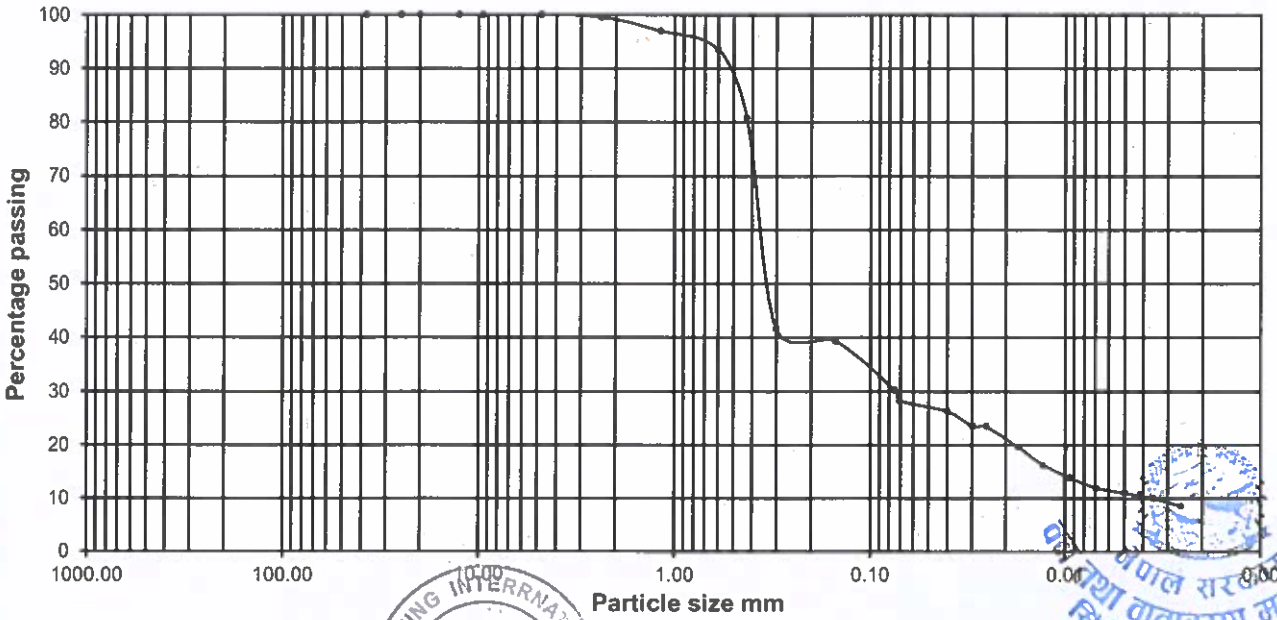
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	3.50-3.45m
Location:		Date of Testing :	10/7/2019
Borehole No.	B-8	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.47	0.073	99.927
	2.36	2.93	0.458	99.469
	1.18	15.80	2.469	97.000
	0.600	22.38	3.497	93.502
	0.425	81.99	12.813	80.690
	0.3	250.07	39.078	41.611
	0.150	14.91	2.330	39.281
	0.075	58.10	9.079	30.202
	PAN	193.27	30.202	0.000
	Total	**639.92**		
Silt % **22.15**				
clay % **8.05**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-8**
Source of Sample **Test Pit Sample**

Depth: **3.50-3.45m**
Date of Test: **10/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **30.202**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r(cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
10.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	29.15
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	28.19
		1.02650	1.00	26.50	-0.90	22	27.40	86.99	27.00	10.06	3.172	0.0399	26.27
		1.02350	2.00	23.50	-0.90	22	24.40	77.46	24.00	11.08	2.353	0.0296	23.40
		1.02350	2.00	23.50	-0.90	22	24.40	77.46	24.00	7.97	1.996	0.0251	23.40
		1.01950	5.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	1.365	0.0172	19.56
		1.01600	10.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	1.025	0.0129	16.20
		1.01350	20.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	0.753	0.0095	13.81
		1.01150	40.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.548	0.0069	11.89
		1.01050	80.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.393	0.0049	10.93
		1.00950	160.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.282	0.0035	9.97
		1.00800	320.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.203	0.0026	8.53
11.07.2019		1.00750	1440.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.096	0.0012	8.05

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-4} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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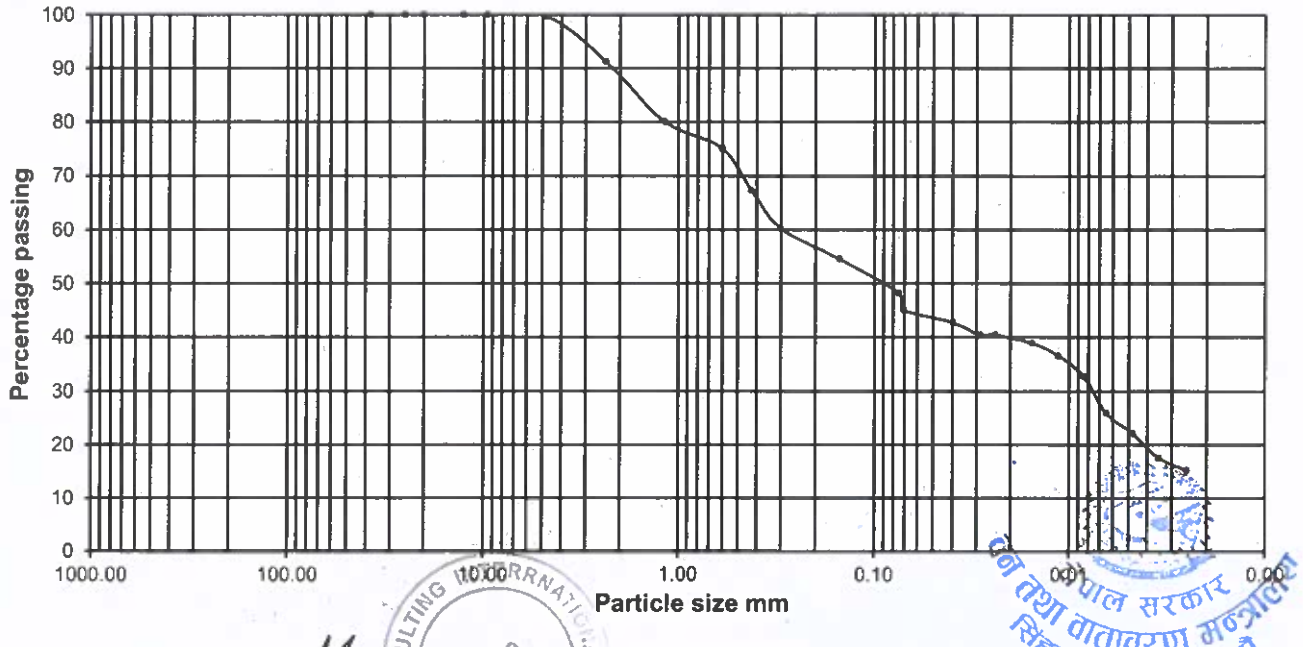
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing	28/6/2019
Borehole No.	B-9	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	1.24	0.412	99.588
	2.36	25.21	8.377	91.211
	1.18	33.54	11.145	80.065
	0.600	15.14	5.031	75.034
	0.425	23.49	7.806	67.228
	0.3	21.21	7.048	60.180
	0.150	17.11	5.686	54.494
	0.075	18.87	6.271	48.224
	PAN	145.12	48.224	0.000
	Total	**300.93**		
Silt % **35.36**				
clay % **12.86**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-9**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **28/6/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **48.224**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\frac{Z_r(cm)}{t(min)}$	D = $K_2\sqrt{\frac{Z_r}{t}}$	N' %
28.06.2019		1.03000	0.15	30.00	-0.90	22	30.90	98.10	30.50	8.88	7.692	0.0968	47.31
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	45.01
		1.02700	1.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	3.145	0.0396	42.71
		1.02550	2.00	25.50	-0.90	22	26.40	83.81	26.00	10.40	2.280	0.0287	40.42
		1.02550	2.00	25.50	-0.90	22	26.40	83.81	26.00	7.29	1.909	0.0240	40.42
		1.02450	5.00	24.50	-0.90	22	25.40	80.64	25.00	7.63	1.235	0.0155	38.89
		1.02300	10.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	0.902	0.0113	36.59
		1.02050	20.00	20.50	-0.90	22	21.40	67.94	21.00	8.98	0.670	0.0084	32.76
		1.01600	40.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	0.512	0.0064	25.87
		1.01350	80.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	0.377	0.0047	22.05
		1.01050	160.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.278	0.0035	17.45
		1.00900	320.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	0.201	0.0025	15.16
29.06.2019		1.00750	1440.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.096	0.0012	12.86

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{y_s - y_w}{\mu}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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सिंहदरबार, काठमाडौं

CONSULTING ENGINEERS INTERNATIONAL LLC

ICGS (P) LTD.

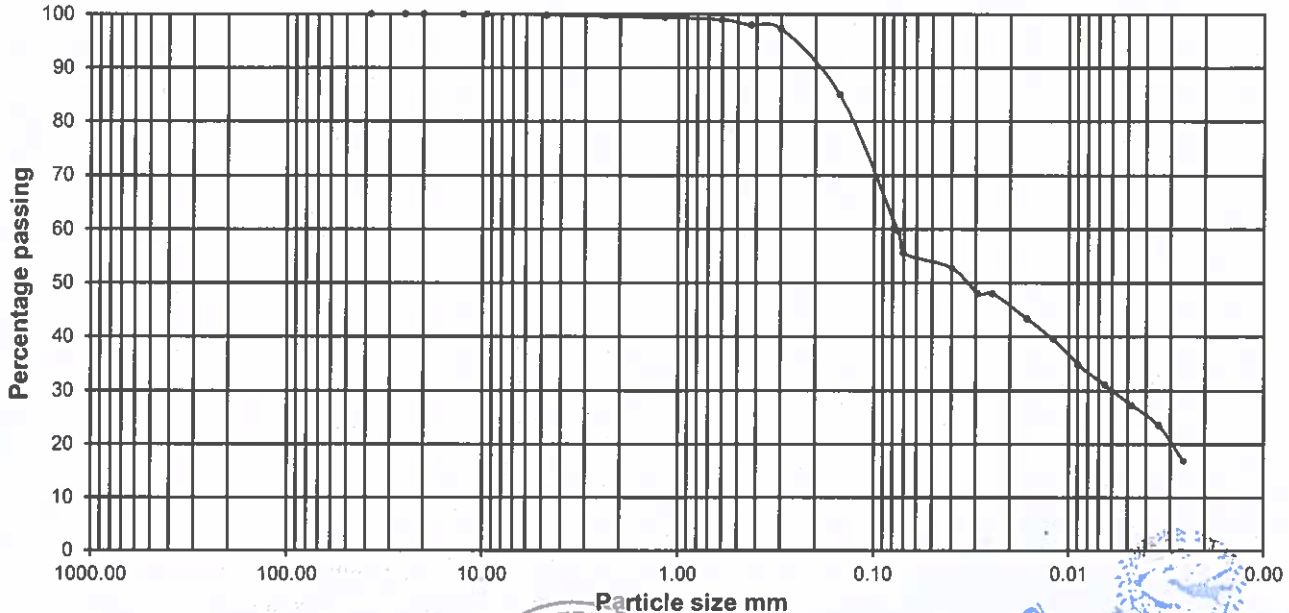
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	26/06/2019
Borehole No.	B-10	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.64	0.213	99.787
	2.36	0.68	0.227	99.560
	1.18	0.70	0.233	99.327
	0.600	1.28	0.427	98.900
	0.425	3.00	1.000	97.900
	0.3	2.21	0.737	97.163
	0.150	36.61	12.203	84.960
	0.075	76.32	25.440	59.520
	PAN	178.56	59.520	0.000
	Total	**300.00**		
Silt % **48.37**				
clay % **11.15**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-10**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **26/06/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
γ_w = **0.9968**
μ = **8.75**
γ_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **59.520**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(γ_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r (cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
26.06.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	57.44
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	55.55
		1.02700	1.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	3.145	0.0396	52.72
		1.02450	2.00	24.50	-0.90	22	25.40	80.64	25.00	10.74	2.317	0.0291	47.99
		1.02450	2.00	24.50	-0.90	22	25.40	80.64	25.00	7.63	1.953	0.0246	47.99
		1.02200	5.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	1.302	0.0164	43.27
		1.02000	10.00	20.00	-0.90	22	20.90	66.35	20.50	9.15	0.957	0.0120	39.49
		1.01750	20.00	17.50	-0.90	22	18.40	58.41	18.00	10.00	0.707	0.0089	34.77
		1.01550	40.00	15.50	-0.90	22	16.40	52.06	16.00	10.67	0.517	0.0065	30.99
		1.01350	80.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	0.377	0.0047	27.21
		1.01150	160.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.274	0.0034	23.43
		1.00800	320.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.203	0.0026	16.82
27.06.2019		1.00500	1440.00	5.00	-0.90	22	5.90	18.73	5.50	14.23	0.099	0.0013	11.15

$$K_1 = \frac{\gamma_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{\gamma_s - \gamma_w}} = 0.0125786$$

γ_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
γ_s = Unit Wt. of soil grains, g/cm³
γ_w = Unit Wt. of water at the temp.of the test, g/cm³

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ICGS (P) LTD.

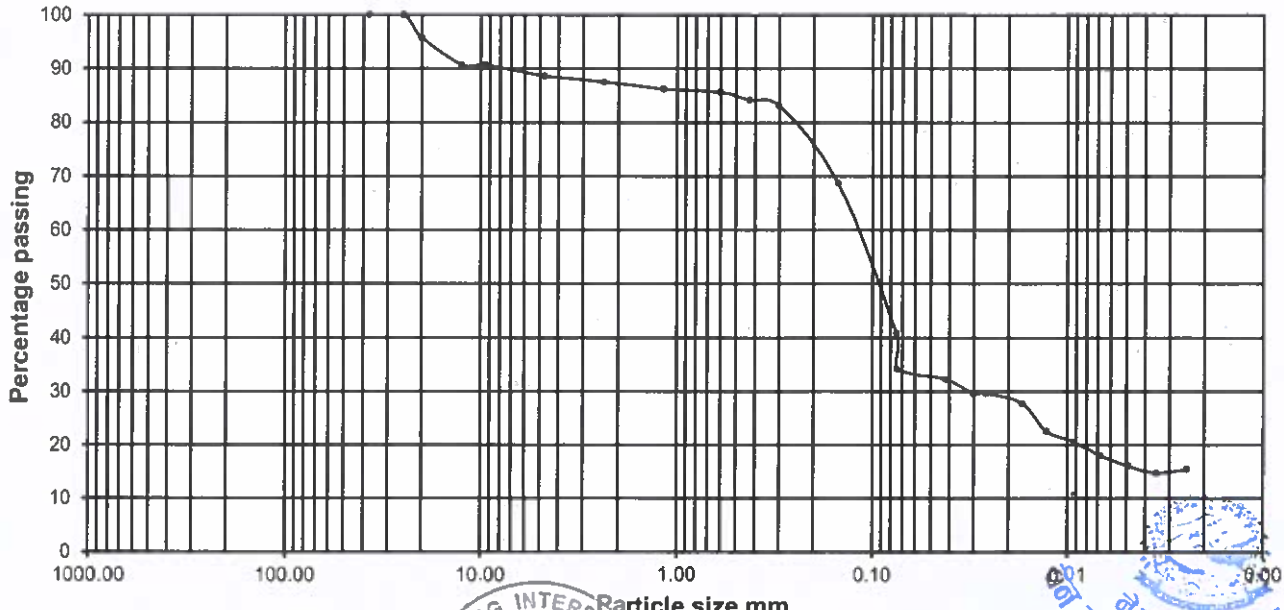
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	5/7/2019
Borehole No.	B-12	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	21.37	4.308	95.692
	12.50	25.18	5.076	90.615
	9.50	0.00	0.000	90.615
	4.75	9.90	1.996	88.619
	2.36	5.78	1.165	87.454
	1.18	6.16	1.242	86.212
	0.600	3.14	0.633	85.579
	0.425	7.35	1.482	84.097
	0.3	5.26	1.060	83.037
	0.150	71.29	14.372	68.665
	0.075	138.48	27.918	40.746
	PAN	202.11	40.746	0.000
	Total	**496.02**		
Silt % **28.07**				
clay % **12.68**				



STANTEC CONSULTING INTERNATIONAL LLC 2000

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-12**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **5/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **40.746**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r (cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
05.07.2019		1.02700	0.15	27.00	-0.90	22	27.90	88.57	27.50	9.89	8.120	0.1021	36.09
		1.02550	0.30	25.50	-0.90	22	26.40	83.81	26.00	10.40	5.888	0.0741	34.15
		1.02400	1.00	24.00	-0.90	22	24.90	79.05	24.50	10.91	3.303	0.0415	32.21
		1.02200	2.00	22.00	-0.90	22	22.90	72.70	22.50	11.58	2.407	0.0303	29.62
		1.02200	2.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	2.058	0.0259	29.62
		1.02050	5.00	20.50	-0.90	22	21.40	67.94	21.00	8.98	1.340	0.0169	27.68
		1.01650	10.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	1.017	0.0128	22.51
		1.01500	20.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	0.736	0.0093	20.57
		1.01300	40.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.537	0.0068	17.98
		1.01150	80.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.388	0.0049	16.04
		1.01050	160.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.278	0.0035	14.75
		1.01100	320.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.195	0.0025	15.39
06.07.2019		1.00890	1440.00	8.90	-0.90	22	9.80	31.11	9.40	12.91	0.095	0.0012	12.68

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp. of the test, g/cm³

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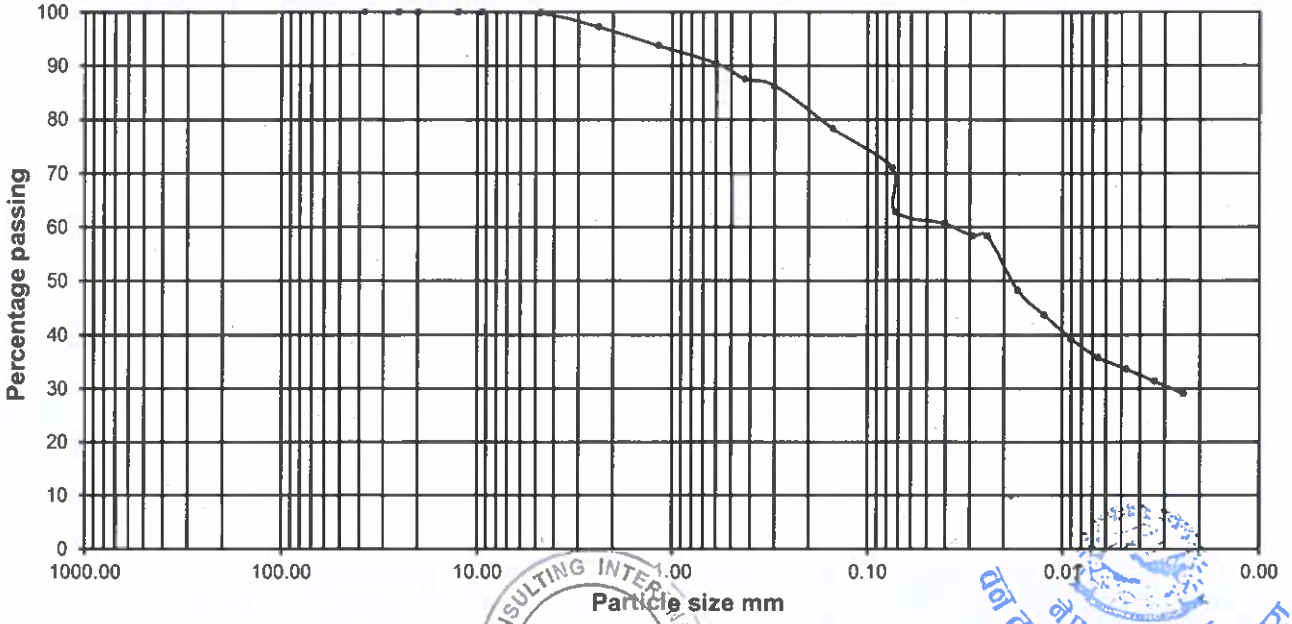
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	9/7/2019
Borehole No.	B-15	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.37	0.123	99.877
	2.36	8.06	2.687	97.190
	1.18	10.22	3.407	93.783
	0.600	10.26	3.420	90.363
	0.425	8.49	2.830	87.533
	0.3	3.88	1.293	86.240
	0.150	23.85	7.950	78.290
	0.075	22.07	7.357	70.933
	PAN	212.80	70.933	0.000
	Total	**300.00**		
Silt % **45.26**				
clay % **25.67**				



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नेपाल सरकार
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सिंहदरबार, काठमाडौं

ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-15**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **9/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
η = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **70.933**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r(cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
09.07.2019		1.02850	0.15	28.50	-0.90	22	29.40	93.33	29.00	9.38	7.909	0.0995	66.21
		1.02700	0.30	27.00	-0.90	22	27.90	88.57	27.50	9.89	5.742	0.0722	62.83
		1.02600	1.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	3.198	0.0402	60.58
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	2.299	0.0289	58.32
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	7.46	1.931	0.0243	58.32
		1.02050	5.00	20.50	-0.90	22	21.40	67.94	21.00	8.98	1.340	0.0169	48.19
		1.01850	10.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	0.983	0.0124	43.69
		1.01650	20.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.719	0.0090	39.18
		1.01500	40.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	0.521	0.0065	35.80
		1.01400	80.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.374	0.0047	33.55
		1.01300	160.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.268	0.0034	31.30
		1.01200	320.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	0.193	0.0024	29.05
10.07.2019		1.01050	1440.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.093	0.0012	25.67

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\eta}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
η = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp of the test, g/cm³

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ICGS (P) LTD.

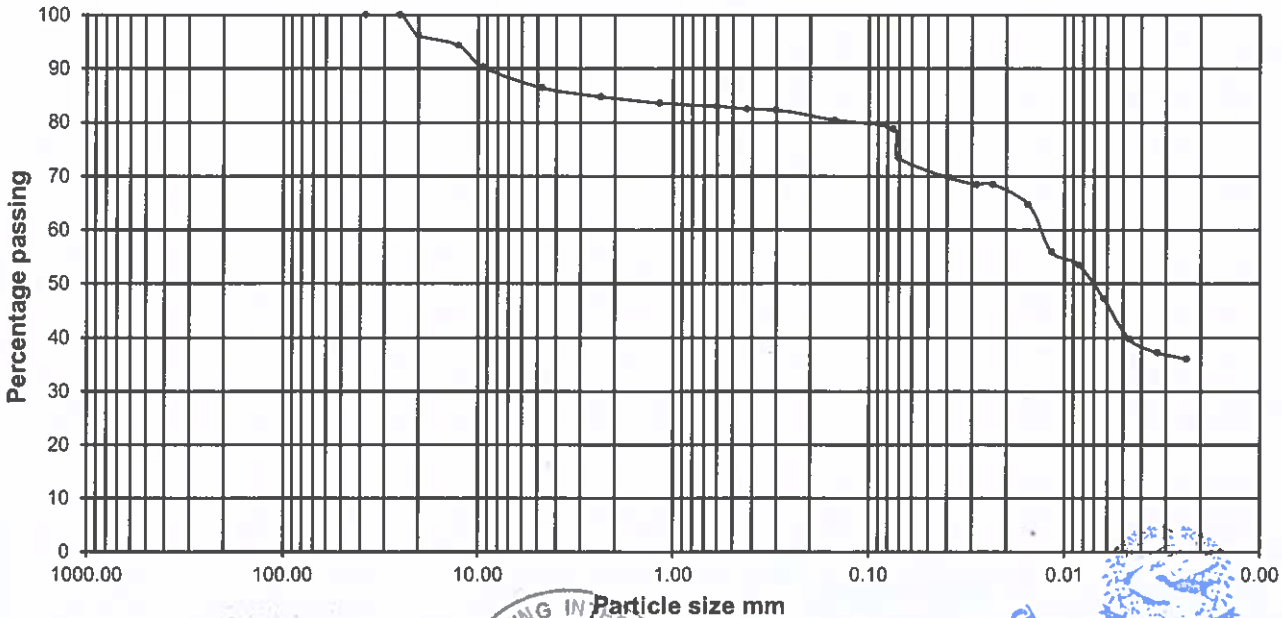
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	9/6/2019
Borehole No.	B-19	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	11.60	3.867	96.133
	12.50	5.55	1.850	94.283
	9.50	12.08	4.027	90.257
	4.75	11.63	3.877	86.380
	2.36	4.93	1.643	84.737
	1.18	3.60	1.200	83.537
	0.600	1.93	0.643	82.893
	0.425	1.39	0.463	82.430
	0.3	0.74	0.247	82.183
	0.150	5.17	1.723	80.460
	0.075	5.30	1.767	78.693
	PAN	236.08	78.693	0.000
	Total	**300.00**		
Silt % **43.97**				
clay % **34.73**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-19**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **9/6/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
η = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **78.693**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
09.06.2019		1.02800	0.15	28.00	-0.90	22	28.90	91.75	28.50	9.55	7.980	0.1004	72.20
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	73.45
		1.02700	1.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	3.145	0.0396	69.70
		1.02650	2.00	26.50	-0.90	22	27.40	86.99	27.00	10.06	2.243	0.0282	68.45
		1.02650	2.00	26.50	-0.90	22	27.40	86.99	27.00	6.95	1.864	0.0234	68.45
		1.02500	5.00	25.00	-0.90	22	25.90	82.22	25.50	7.46	1.221	0.0154	64.70
		1.02150	10.00	21.50	-0.90	22	22.40	71.11	22.00	8.64	0.930	0.0117	55.96
		1.02050	20.00	20.50	-0.90	22	21.40	67.94	21.00	8.98	0.670	0.0084	53.46
		1.01800	40.00	18.00	-0.90	22	18.90	60.00	18.50	9.83	0.496	0.0062	47.22
		1.01500	80.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	0.368	0.0046	39.72
		1.01400	160.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.264	0.0033	37.22
		1.01350	320.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	0.188	0.0024	35.97
10.06.2019		1.01300	1440.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.089	0.0011	34.73

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\eta}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
η = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

ICGS (P) LTD.

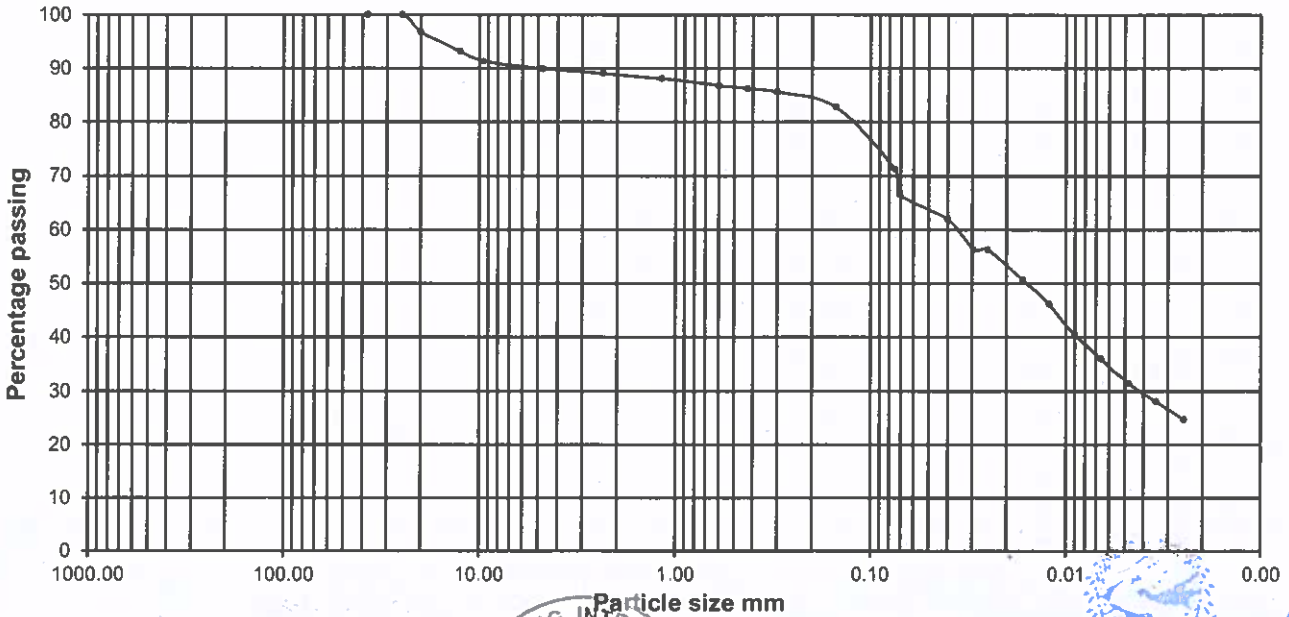
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	9/7/2019
Borehole No.	B-20	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	16.05	3.267	96.733
	12.50	17.82	3.628	93.105
	9.50	9.06	1.844	91.261
	4.75	6.93	1.411	89.850
	2.36	4.10	0.835	89.015
	1.18	4.44	0.904	88.111
	0.600	6.54	1.331	86.780
	0.425	3.14	0.639	86.141
	0.3	2.78	0.566	85.575
	0.150	14.01	2.852	82.723
	0.075	56.71	11.544	71.178
	PAN	349.65	71.178	0.000
	Total	**491.23**		
Silt % **52.20**				
clay % **18.98**				



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नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-20**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **9/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **71.178**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r(cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
09.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	68.69
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	66.43
		1.02650	1.00	26.50	-0.90	22	27.40	86.99	27.00	10.06	3.172	0.0399	61.91
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	10.91	2.335	0.0294	56.27
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	7.80	1.974	0.0248	56.27
		1.02150	5.00	21.50	-0.90	22	22.40	71.11	22.00	8.64	1.315	0.0165	50.62
		1.01950	10.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	0.965	0.0121	46.10
		1.01700	20.00	17.00	-0.90	22	17.90	56.83	17.50	10.17	0.713	0.0090	40.45
		1.01500	40.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	0.521	0.0065	35.93
		1.01300	80.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.379	0.0048	31.41
		1.01150	160.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.274	0.0034	28.02
		1.01000	320.00	10.00	-0.90	22	10.90	34.60	10.50	12.54	0.198	0.0025	24.63
10.07.2019		1.00750	1440.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.096	0.0012	18.98

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

ICGS (P) LTD.

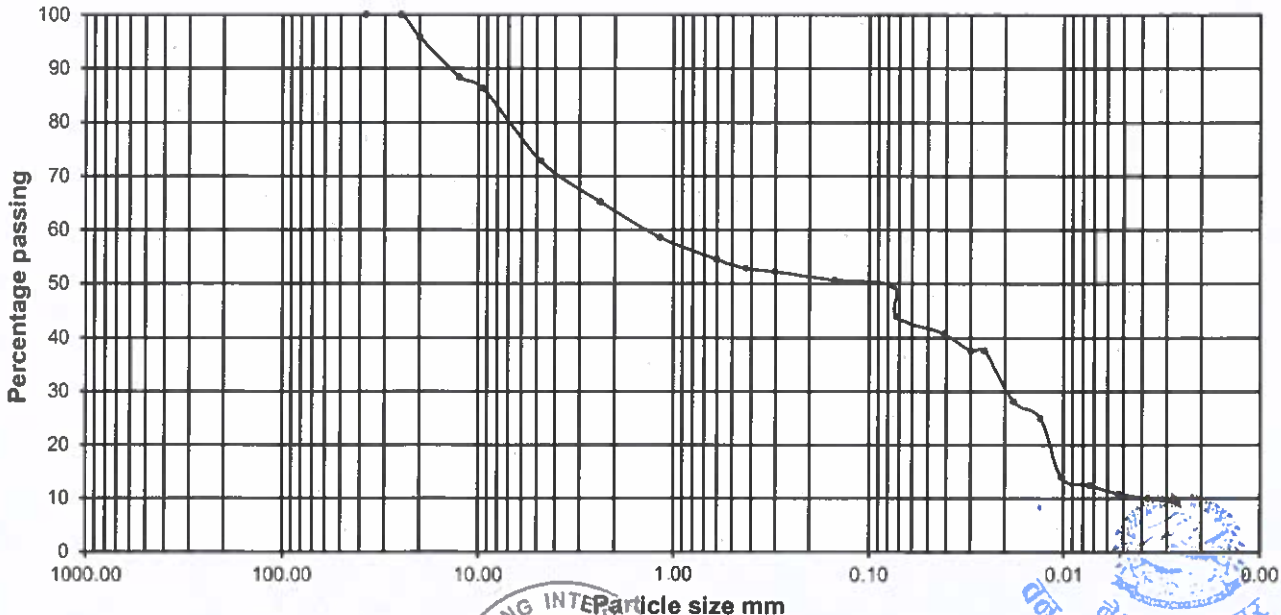
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	9/6/2019
Borehole No.	B-21	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	12.68	4.240	95.760
	12.50	22.28	7.451	88.309
	9.50	5.88	1.966	86.343
	4.75	40.45	13.527	72.815
	2.36	22.92	7.665	65.151
	1.18	19.65	6.571	58.579
	0.600	12.21	4.083	54.496
	0.425	4.95	1.655	52.841
	0.3	1.79	0.599	52.242
	0.150	4.62	1.545	50.697
	0.075	3.60	1.204	49.493
	PAN	148.00	49.493	0.000
	Total	**299.03**		
Silt % **41.79**				
clay % **7.70**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-21**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **9/6/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **49.493**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
09.06.2019		1.02800	0.15	28.00	-0.90	22	28.90	91.75	28.50	9.55	7.980	0.1004	45.41
		1.02700	0.30	27.00	-0.90	22	27.90	88.57	27.50	9.89	5.742	0.0722	43.84
		1.02500	1.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	3.251	0.0409	40.70
		1.02300	2.00	23.00	-0.90	22	23.90	75.87	23.50	11.25	2.371	0.0298	37.55
		1.02300	2.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	2.017	0.0254	37.55
		1.01700	5.00	17.00	-0.90	22	17.90	56.83	17.50	10.17	1.426	0.0179	28.13
		1.01500	10.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	1.041	0.0131	24.98
		1.00800	20.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.813	0.0102	13.98
		1.00700	40.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.582	0.0073	12.41
		1.00600	80.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.417	0.0052	10.84
		1.00550	160.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.296	0.0037	10.06
		1.00500	320.00	5.00	-0.90	22	5.90	18.73	5.50	14.23	0.211	0.0027	9.27
10.06.2019		1.00400	1440.00	4.00	-0.90	22	4.90	15.56	4.50	14.57	0.101	0.0013	7.70

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

K_2 = $5.531 \times 10^{-}$ $\sqrt{\frac{\mu}{y_s - y_w}}$ = **0.0125786**

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS (P) LTD.

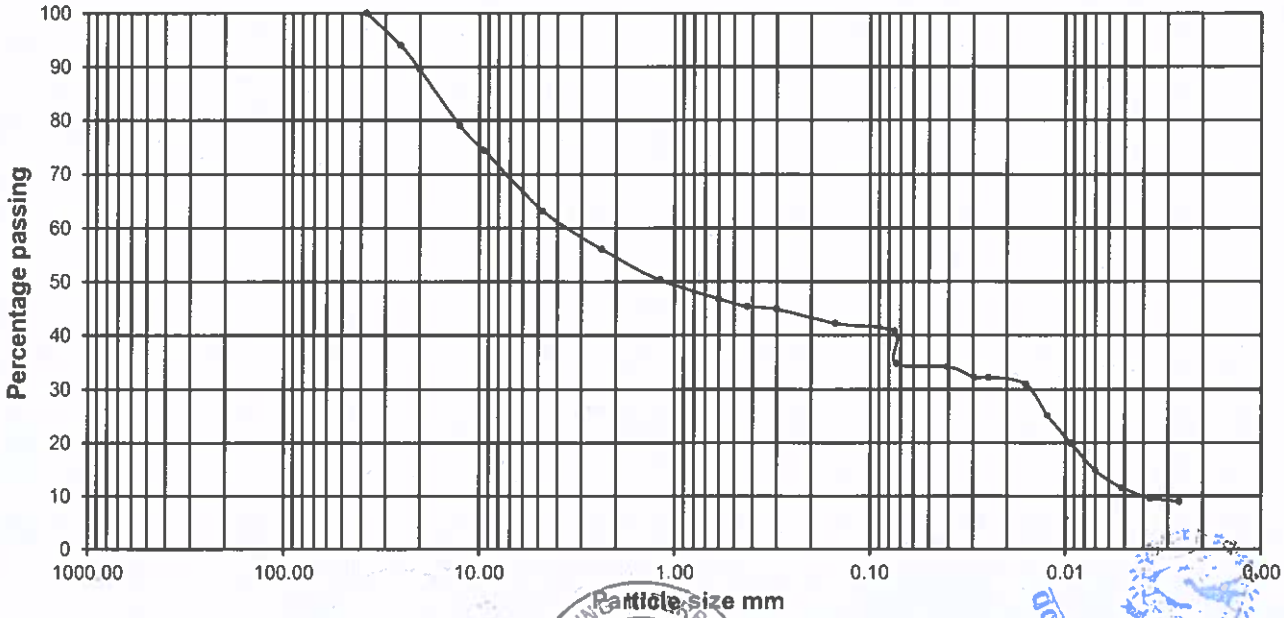
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	7/7/2019
Borehole No.	B-22	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	67.65	6.100	93.900
	20.00	48.90	4.409	89.491
	12.50	116.27	10.484	79.006
	9.50	51.11	4.609	74.398
	4.75	124.87	11.260	63.138
	2.36	78.76	7.102	56.036
	1.18	63.55	5.730	50.306
	0.600	39.84	3.592	46.713
	0.425	15.71	1.417	45.297
	0.3	5.45	0.491	44.805
	0.150	28.62	2.581	42.225
	0.075	16.94	1.528	40.697
	PAN	451.33	40.697	0.000
	Total	**1109.00**		
Silt % **32.43**				
clay % **8.27**				



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नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-22**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **7/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **40.697**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r (cm)/t (min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
07.07.2019		1.02700	0.15	27.00	-0.90	22	27.90	88.57	27.50	9.89	8.120	0.1021	36.05
		1.02600	0.30	26.00	-0.90	22	26.90	85.40	26.50	10.23	5.839	0.0735	34.75
		1.02550	1.00	25.50	-0.90	22	26.40	83.81	26.00	10.40	3.225	0.0406	34.11
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	10.91	2.335	0.0294	32.17
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	7.80	1.974	0.0248	32.17
		1.02300	5.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	1.276	0.0160	30.88
		1.01850	10.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	0.983	0.0124	25.06
		1.01450	20.00	14.50	-0.90	22	15.40	48.89	15.00	11.01	0.742	0.0093	19.90
		1.01050	40.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.556	0.0070	14.73
		1.00800	80.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.406	0.0051	11.50
		1.00650	160.00	6.50	-0.90	22	7.40	23.49	7.00	13.72	0.293	0.0037	9.56
		1.00600	320.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.208	0.0026	8.91
08.07.2019		1.00550	1440.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.099	0.0012	8.27

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

ICGS (P) LTD.

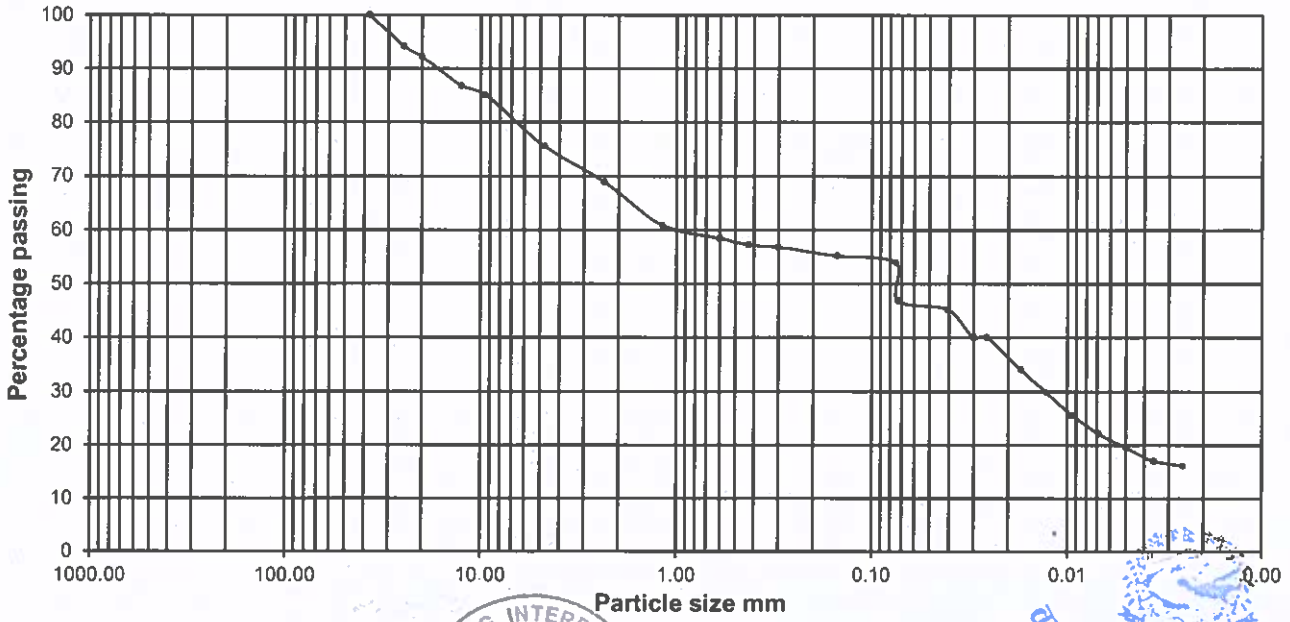
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	7/7/2019
Borehole No.	B-25	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	29.67	5.933	94.067
	20.00	9.79	1.958	92.109
	12.50	26.96	5.391	86.718
	9.50	8.26	1.652	85.067
	4.75	47.91	9.580	75.486
	2.36	33.25	6.649	68.838
	1.18	40.11	8.021	60.817
	0.600	12.21	2.442	58.375
	0.425	6.05	1.210	57.166
	0.3	2.12	0.424	56.742
	0.150	8.15	1.630	55.112
	0.075	6.07	1.214	53.898
	PAN	269.54	53.898	0.000
	Total	**500.09**		
Silt % **39.53**				
clay % **14.37**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-25**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **7/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
η = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **53.898**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r (cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
07.07.2019		1.02800	0.15	28.00	-0.90	22	28.90	91.75	28.50	9.55	7.980	0.1004	49.45
		1.02650	0.30	26.50	-0.90	22	27.40	86.99	27.00	10.06	5.791	0.0728	46.88
		1.02550	1.00	25.50	-0.90	22	26.40	83.81	26.00	10.40	3.225	0.0406	45.17
		1.02250	2.00	22.50	-0.90	22	23.40	74.29	23.00	11.41	2.389	0.0301	40.04
		1.02250	2.00	22.50	-0.90	22	23.40	74.29	23.00	8.30	2.038	0.0256	40.04
		1.01900	5.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	1.378	0.0173	34.05
		1.01650	10.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	1.017	0.0128	29.77
		1.01400	20.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.748	0.0094	25.50
		1.01200	40.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	0.544	0.0068	22.07
		1.01050	80.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.393	0.0049	19.51
		1.00900	160.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	0.284	0.0036	16.94
		1.00850	320.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.202	0.0025	16.08
08.07.2019		1.00750	1440.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.096	0.0012	14.37

$K_1 = \dfrac{y_c \times G_s \times 100}{(G_s - 1)\, W_s}$ = **3.1746427**

K_2 = 5.531×10^{-3} $\sqrt{\dfrac{\eta}{y_s - y_w}}$ = **0.0125786**

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
η = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

ICGS (P) LTD.

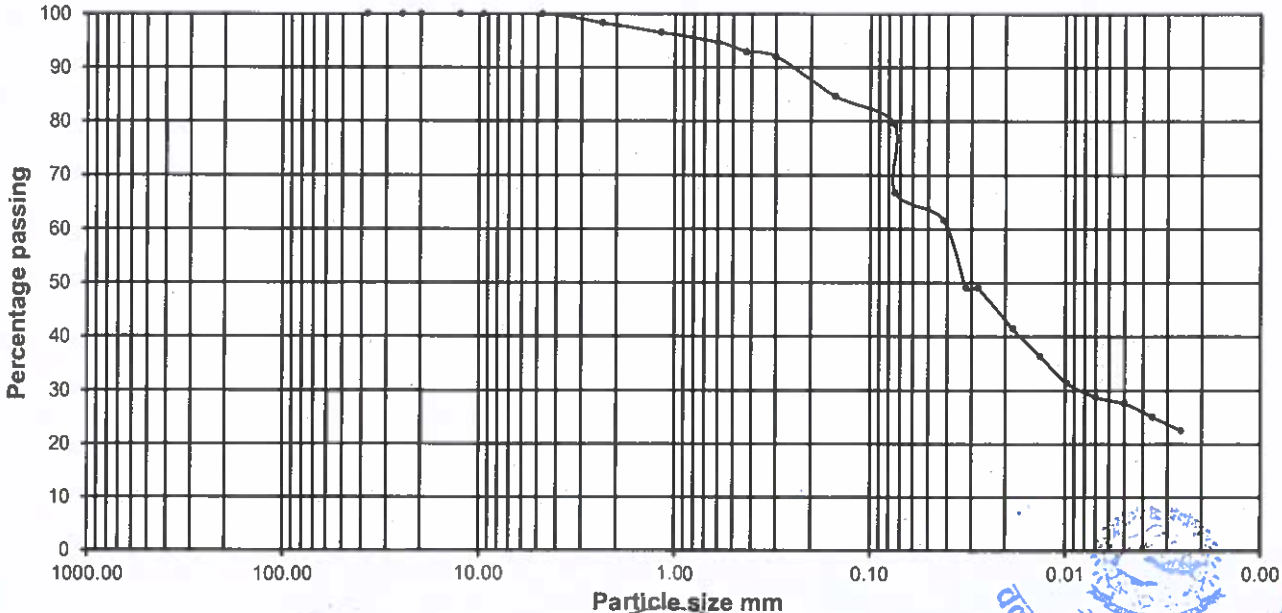
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	7/7/2019
Borehole No.	B 26	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.00	0.000	100.000
	2.36	7.18	1.740	98.260
	1.18	7.34	1.779	96.481
	0.600	7.63	1.849	94.633
	0.425	7.19	1.742	92.890
	0.3	3.72	0.901	91.989
	0.150	30.33	7.350	84.639
	0.075	21.07	5.106	79.533
	PAN	328.21	79.533	0.000
	Total	**412.67**		
Silt % **59.59**				
clay % **19.95**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B 26**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **7/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **79.533**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r (cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
07.07.2019		1.02700	0.15	27.00	-0.90	22	27.90	88.57	27.50	9.89	8.120	0.1021	70.44
		1.02550	0.30	25.50	-0.90	22	26.40	83.81	26.00	10.40	5.888	0.0741	66.66
		1.02350	1.00	23.50	-0.90	22	24.40	77.46	24.00	11.08	3.328	0.0419	61.61
		1.01850	2.00	18.50	-0.90	22	19.40	61.59	19.00	12.77	2.527	0.0318	48.98
		1.01850	2.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	2.198	0.0276	48.98
		1.01550	5.00	15.50	-0.90	22	16.40	52.06	16.00	10.67	1.461	0.0184	41.41
		1.01350	10.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	1.065	0.0134	36.36
		1.01150	20.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.775	0.0098	31.31
		1.01050	40.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.556	0.0070	28.78
		1.01000	80.00	10.00	-0.90	22	10.90	34.60	10.50	12.54	0.396	0.0050	27.52
		1.00900	160.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	0.284	0.0036	25.00
		1.00800	320.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.203	0.0026	22.47
08.07.2019		1.00700	1440.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.097	0.0012	19.95

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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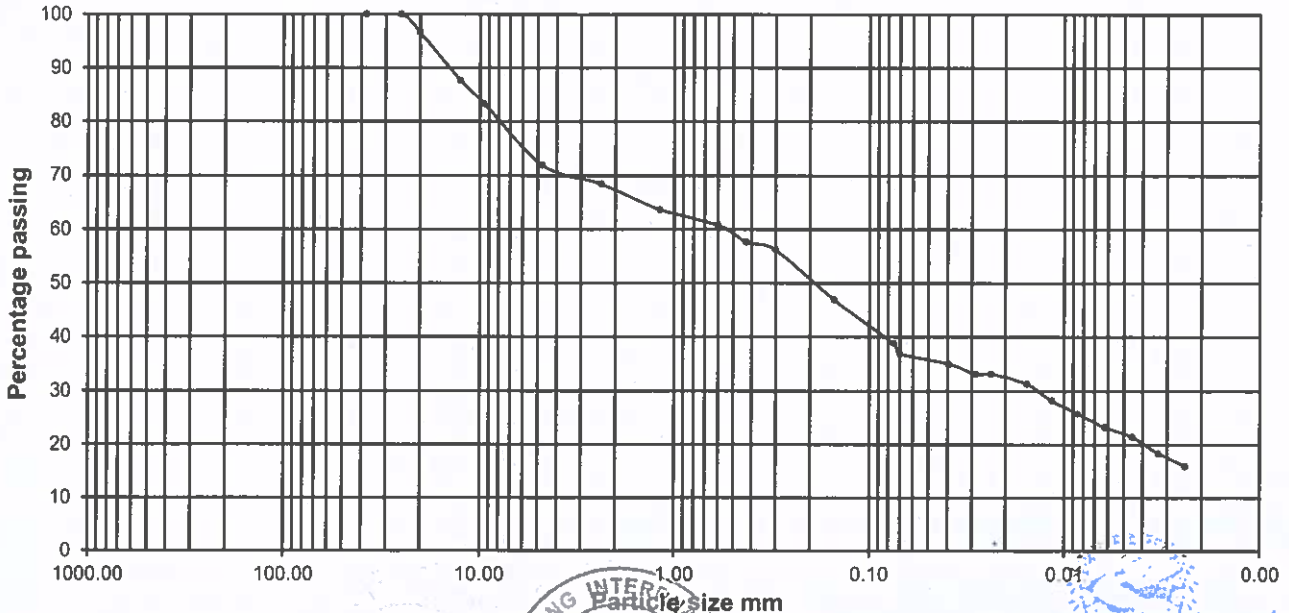
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing	27/6/2019
Borehole No.	B-32	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	10.40	3.467	96.533
	12.50	26.87	8.957	87.577
	9.50	12.84	4.280	83.297
	4.75	34.34	11.447	71.850
	2.36	10.41	3.470	68.380
	1.18	14.35	4.783	63.597
	0.600	8.67	2.890	60.707
	0.425	9.26	3.087	57.620
	0.3	4.35	1.450	56.170
	0.150	27.99	9.330	46.840
	0.075	24.27	8.090	38.750
	PAN	116.25	38.750	0.000
	Total	**300.00**		
Silt % **25.34**				
clay % **13.41**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-32**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **27/6/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **38.750**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r (cm) / t (min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
27.06.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	37.40
		1.02900	0.30	29.00	-0.90	22	29.90	94.92	29.50	9.21	5.542	0.0697	36.78
		1.02750	1.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	3.118	0.0392	34.94
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	2.262	0.0284	33.09
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	7.12	1.887	0.0237	33.09
		1.02450	5.00	24.50	-0.90	22	25.40	80.64	25.00	7.63	1.235	0.0155	31.25
		1.02200	10.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	0.921	0.0116	28.17
		1.02000	20.00	20.00	-0.90	22	20.90	66.35	20.50	9.15	0.676	0.0085	25.71
		1.01800	40.00	18.00	-0.90	22	18.90	60.00	18.50	9.83	0.496	0.0062	23.25
		1.01650	80.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.359	0.0045	21.41
		1.01400	160.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.264	0.0033	18.33
		1.01200	320.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	0.193	0.0024	15.87
28.06.2019		1.01000	1440.00	10.00	-0.90	22	10.90	34.60	10.50	12.54	0.093	0.0012	13.41

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp. of the test, g/cm³

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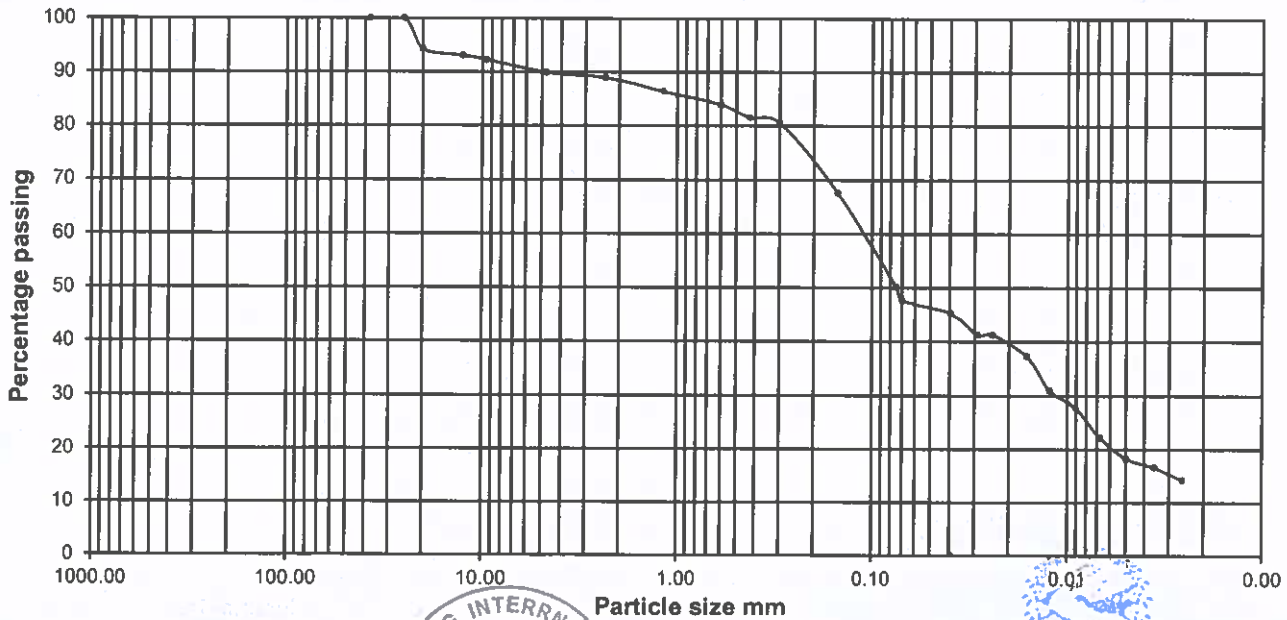
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	24/6/2019
Borehole No.	B-33	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	27.43	5.791	94.209
	12.50	5.61	1.184	93.025
	9.50	3.93	0.830	92.195
	4.75	11.06	2.335	89.860
	2.36	4.30	0.908	88.952
	1.18	11.96	2.525	86.428
	0.600	12.23	2.582	83.846
	0.425	11.03	2.329	81.517
	0.3	4.67	0.986	80.531
	0.150	61.57	12.998	67.533
	0.075	82.23	17.360	50.173
	PAN	237.66	50.173	0.000
	Total	**473.68**		
Silt % **40.78**				
clay % **9.40**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-33**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **24/6/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ_t = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **50.173**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r(cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
24.06.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	48.42
		1.02900	0.30	29.00	-0.90	22	29.90	94.92	29.50	9.21	5.542	0.0697	47.63
		1.02750	1.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	3.118	0.0392	45.24
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	2.299	0.0289	41.25
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	7.46	1.931	0.0243	41.25
		1.02250	5.00	22.50	-0.90	22	23.40	74.29	23.00	8.30	1.289	0.0162	37.27
		1.01850	10.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	0.983	0.0124	30.90
		1.01650	20.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.719	0.0090	27.72
		1.01300	40.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.537	0.0068	22.14
		1.01050	80.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.393	0.0049	18.16
		1.00950	160.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.282	0.0035	16.57
		1.00800	320.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.203	0.0026	14.18
25.06.2019		1.00500	1440.00	5.00	-0.90	22	5.90	18.73	5.50	14.23	0.099	0.0013	9.40

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu_t}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ_t = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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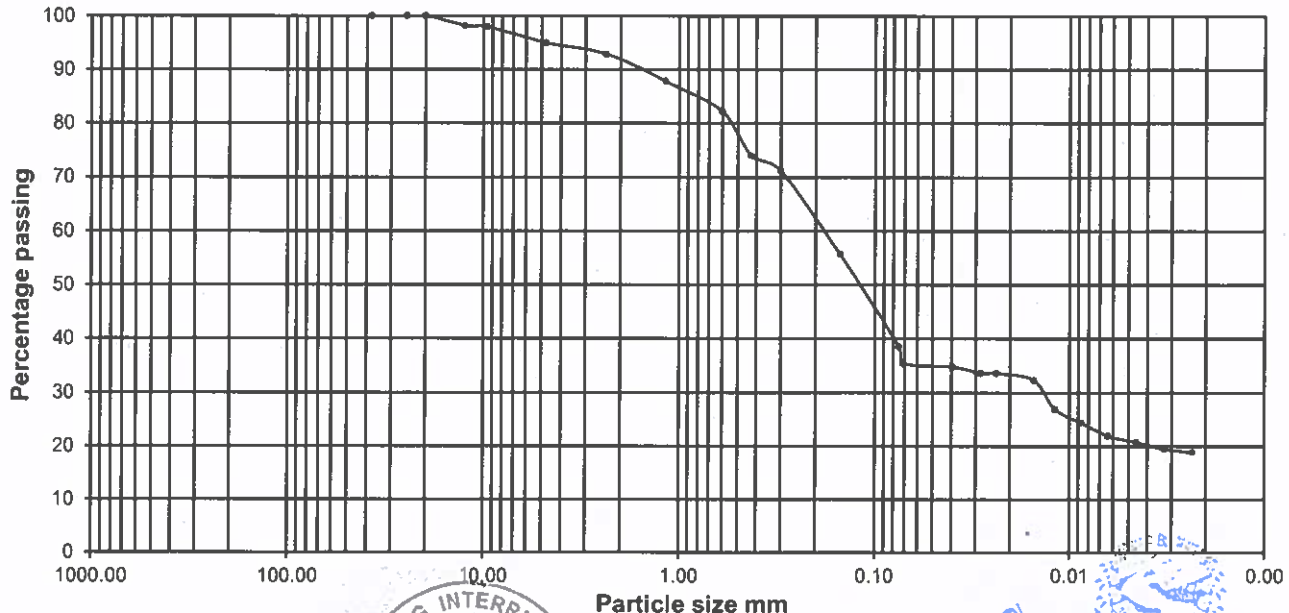
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	9/7/2019
Borehole No.	B-34	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	9.42	1.875	98.125
	9.50	1.26	0.251	97.874
	4.75	14.70	2.926	94.947
	2.36	10.65	2.120	92.827
	1.18	25.19	5.015	87.813
	0.600	28.31	5.636	82.177
	0.425	41.26	8.214	73.963
	0.3	14.05	2.797	71.166
	0.150	77.87	15.502	55.664
	0.075	86.12	17.144	38.519
	PAN	193.49	38.519	0.000
	Total	**502.32**		
Silt % **21.52**				
clay % **17.00**				



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सिंहदरबार, काठमाडौं

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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-34**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **9/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ_s = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **38.519**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r (cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
09.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	36.56
		1.02800	0.30	28.00	-0.90	22	28.90	91.75	28.50	9.55	5.643	0.0710	35.34
		1.02750	1.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	3.118	0.0392	34.73
		1.02650	2.00	26.50	-0.90	22	27.40	86.99	27.00	10.06	2.243	0.0282	33.51
		1.02650	2.00	26.50	-0.90	22	27.40	86.99	27.00	6.95	1.864	0.0234	33.51
		1.02550	5.00	25.50	-0.90	22	26.40	83.81	26.00	7.29	1.207	0.0152	32.28
		1.02100	10.00	21.00	-0.90	22	21.90	69.52	21.50	8.81	0.939	0.0118	26.78
		1.01900	20.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	0.689	0.0087	24.33
		1.01700	40.00	17.00	-0.90	22	17.90	56.83	17.50	10.17	0.504	0.0063	21.89
		1.01600	80.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	0.362	0.0046	20.67
		1.01500	160.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	0.260	0.0033	19.44
		1.01450	320.00	14.50	-0.90	22	15.40	48.89	15.00	11.01	0.186	0.0023	18.83
10.07.2019		1.01300	1440.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.089	0.0011	17.00

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu_s}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ_s = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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सिंहदरबार, काठमाडौं

ICGS (P) LTD.

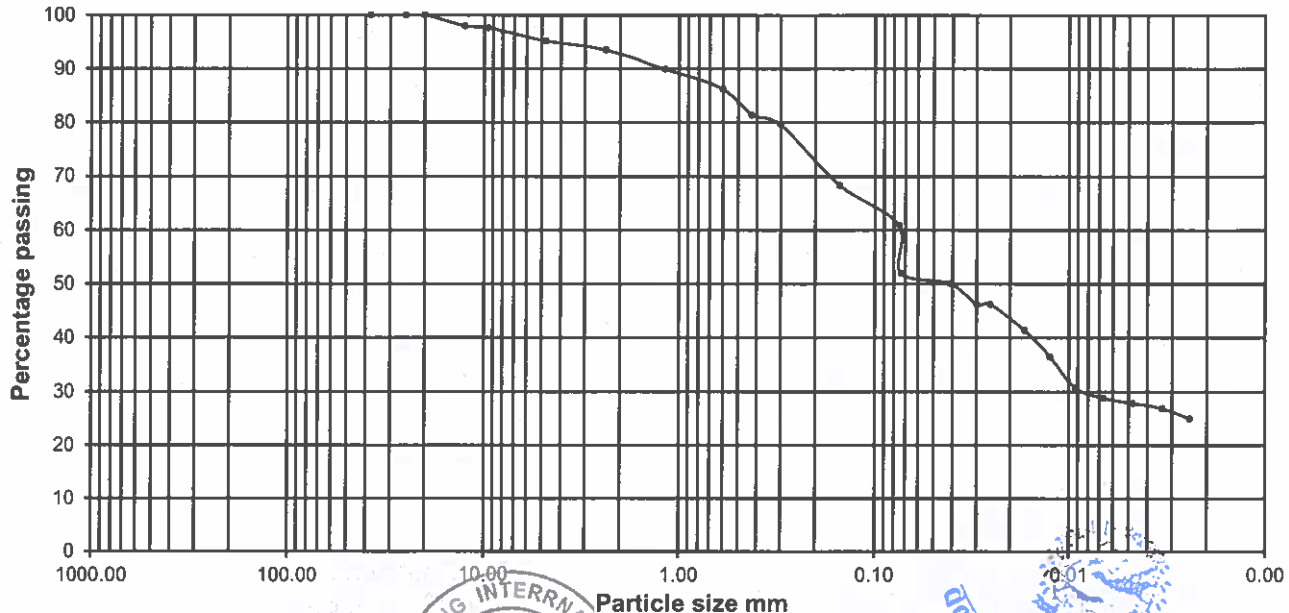
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	7/7/2019
Borehole No.	B-35	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	12.18	2.038	97.962
	9.50	2.49	0.417	97.545
	4.75	14.60	2.443	95.102
	2.36	9.36	1.566	93.536
	1.18	21.90	3.665	89.871
	0.600	22.18	3.711	86.160
	0.425	28.49	4.767	81.393
	0.3	10.86	1.817	79.575
	0.150	67.49	11.293	68.282
	0.075	44.71	7.481	60.801
	PAN	363.35	60.801	0.000
	Total	**597.61**		
Silt % **36.87**				
clay % **23.93**				



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ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-35**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **7/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
γ_w = **0.9968**
η = **8.75**
γ_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

		SOIL SAMPLE WEIGHT	
		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **60.801**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(γ_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
07.07.2019		1.02700	0.15	27.00	-0.90	22	27.90	88.57	27.50	9.89	8.120	0.1021	53.85
		1.02600	0.30	26.00	-0.90	22	26.90	85.40	26.50	10.23	5.839	0.0735	51.92
		1.02500	1.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	3.251	0.0409	49.99
		1.02300	2.00	23.00	-0.90	22	23.90	75.87	23.50	11.25	2.371	0.0298	46.13
		1.02300	2.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	2.017	0.0254	46.13
		1.02050	5.00	20.50	-0.90	22	21.40	67.94	21.00	8.98	1.340	0.0169	41.31
		1.01800	10.00	18.00	-0.90	22	18.90	60.00	18.50	9.83	0.991	0.0125	36.48
		1.01500	20.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	0.736	0.0093	30.69
		1.01400	40.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.529	0.0067	28.76
		1.01350	80.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	0.377	0.0047	27.79
		1.01300	160.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.268	0.0034	26.83
		1.01200	320.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	0.193	0.0024	24.90
08.07.2019		1.01150	1440.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.091	0.0011	23.93

$$K_1 = \frac{\gamma_c \times G_s \times 100}{(G_s - 1) W_s} = \textbf{3.1746427}$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\eta}{\gamma_s - \gamma_w}} = \textbf{0.0125786}$$

γ_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
η = Viscosity of water at the temp. of the test, millipoises
γ_s = Unit Wt. of soil grains, g/cm^3
γ_w = Unit Wt. of water at the temp.of the test, g/cm^3

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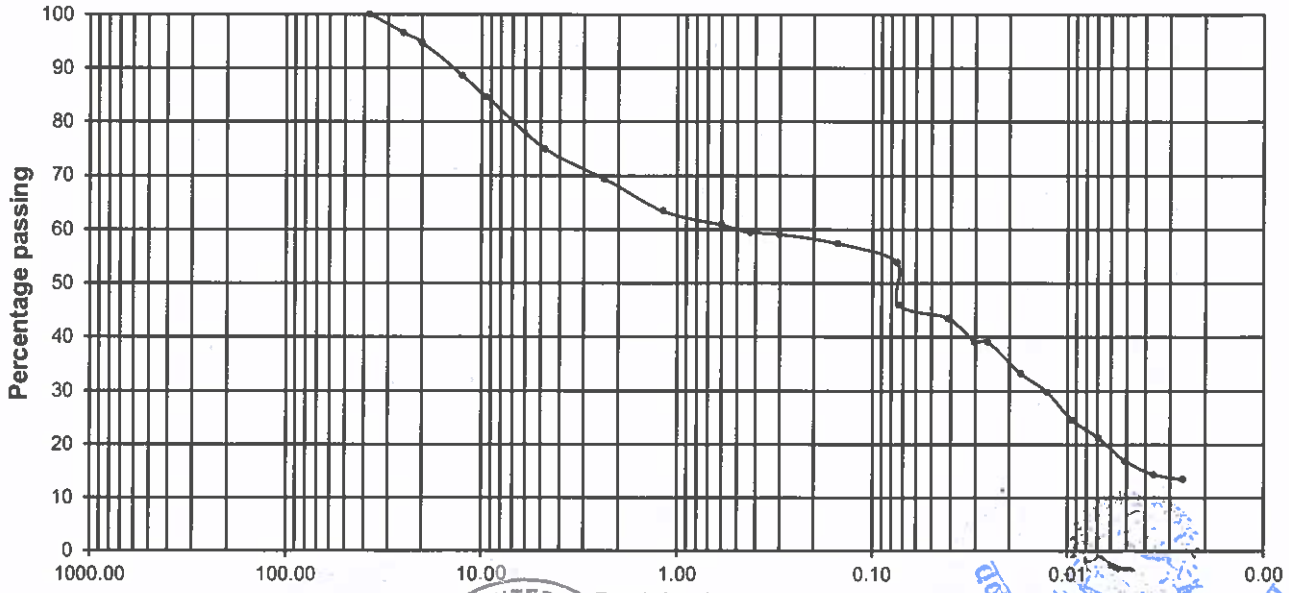
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing	7/7/2019
Borehole No.	B 36	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	37.75	3.477	96.523
	20.00	19.89	1.832	94.691
	12.50	66.72	6.145	88.546
	9.50	43.11	3.971	84.575
	4.75	105.58	9.724	74.851
	2.36	59.24	5.456	69.395
	1.18	65.22	6.007	63.387
	0.600	28.74	2.647	60.740
	0.425	14.90	1.372	59.368
	0.3	3.78	0.348	59.020
	0.150	18.49	1.703	57.317
	0.075	37.88	3.489	53.828
	PAN	584.42	53.828	0.000
	Total	1085.72		
Silt % 42.04				
clay % 11.79				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B 36**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **7/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
γ_w = **0.9968**
μ = **8.75**
γ_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **53.828**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(γ_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
07.07.2019		1.02850	0.15	28.50	-0.90	22	29.40	93.33	29.00	9.38	7.909	0.0995	50.24
		1.02600	0.30	26.00	-0.90	22	26.90	85.40	26.50	10.23	5.839	0.0735	45.97
		1.02450	1.00	24.50	-0.90	22	25.40	80.64	25.00	10.74	3.277	0.0412	43.40
		1.02200	2.00	22.00	-0.90	22	22.90	72.70	22.50	11.58	2.407	0.0303	39.13
		1.02200	2.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	2.058	0.0259	39.13
		1.01850	5.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	1.390	0.0175	33.15
		1.01650	10.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	1.017	0.0128	29.73
		1.01350	20.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	0.753	0.0095	24.61
		1.01150	40.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.548	0.0069	21.19
		1.00900	80.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	0.401	0.0050	16.92
		1.00750	160.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.289	0.0036	14.35
		1.00700	320.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.206	0.0026	13.50
08.07.2019		1.00600	1440.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.098	0.0012	11.79

$$K_1 = \frac{\gamma_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{\gamma_s - \gamma_w}} = 0.0125786$$

γ_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
γ_s = Unit Wt. of soil grains, g/cm³
γ_w = Unit Wt. of water at the temp.of the test, g/cm³

नेपाल सरकार वन तथा वातावरण मन्त्रालय सिद्धरबार, काठमाडौं

CONSULTING INTERNATIONAL 2000 STANTEC

ICGS (P) LTD.

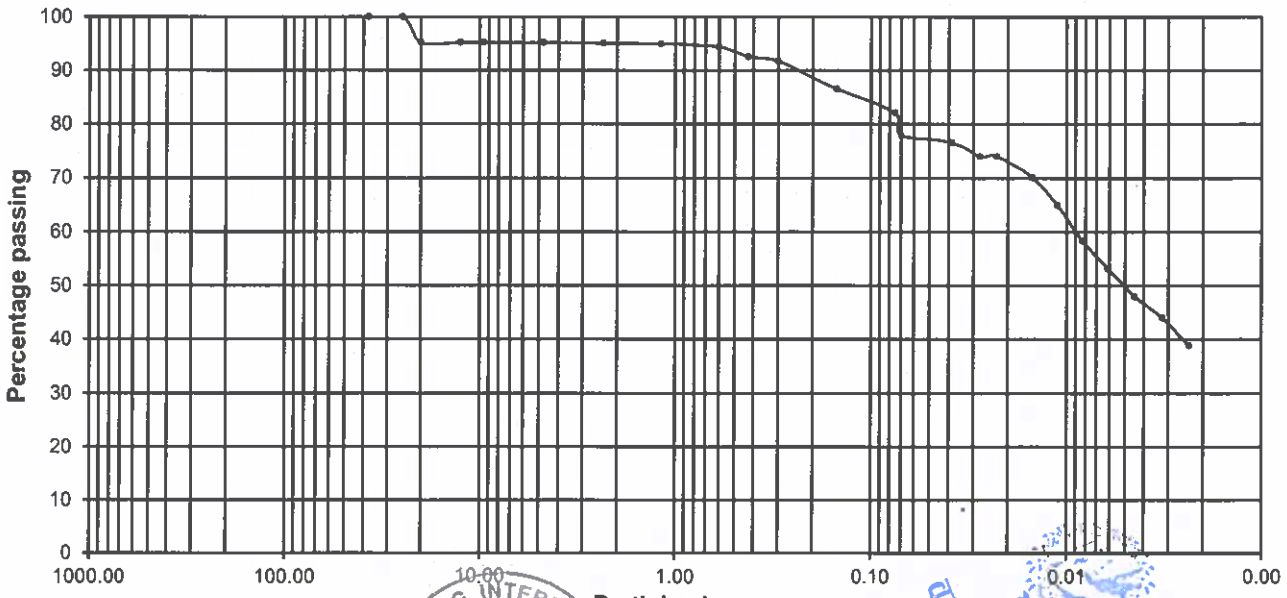
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	4/7/2019
Borehole No.	B 38	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	14.56	4.853	95.147
	12.50	0.00	0.000	95.147
	9.50	0.00	0.000	95.147
	4.75	0.00	0.000	95.147
	2.36	0.21	0.070	95.077
	1.18	0.56	0.187	94.890
	0.600	1.75	0.583	94.307
	0.425	5.44	1.813	92.493
	0.3	2.58	0.860	91.633
	0.150	15.38	5.127	86.507
	0.075	13.38	4.460	82.047
	PAN	246.14	82.047	0.000
	Total	**300.00**		
Silt % **45.84**				
clay % **36.21**				



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ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B 38**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **4/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **82.047**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r(cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
04.07.2019		1.03000	0.15	30.00	-0.90	22	30.90	98.10	30.50	8.88	7.692	0.0968	80.48
		1.02900	0.30	29.00	-0.90	22	29.90	94.92	29.50	9.21	5.542	0.0697	77.88
		1.02850	1.00	28.50	-0.90	22	29.40	93.33	29.00	9.38	3.063	0.0385	76.58
		1.02750	2.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	2.205	0.0277	73.97
		1.02750	2.00	27.50	-0.90	22	28.40	90.16	28.00	6.61	1.818	0.0229	73.97
		1.02600	5.00	26.00	-0.90	22	26.90	85.40	26.50	7.12	1.193	0.0150	70.07
		1.02400	10.00	24.00	-0.90	22	24.90	79.05	24.50	7.80	0.883	0.0111	64.86
		1.02150	20.00	21.50	-0.90	22	22.40	71.11	22.00	8.64	0.657	0.0083	58.35
		1.01950	40.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	0.483	0.0061	53.14
		1.01750	80.00	17.50	-0.90	22	18.40	58.41	18.00	10.00	0.354	0.0044	47.93
		1.01600	160.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	0.256	0.0032	44.02
		1.01400	320.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.187	0.0024	38.81
05.07.2019		1.01300	1440.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.089	0.0011	36.21

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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ICGS (P) LTD.

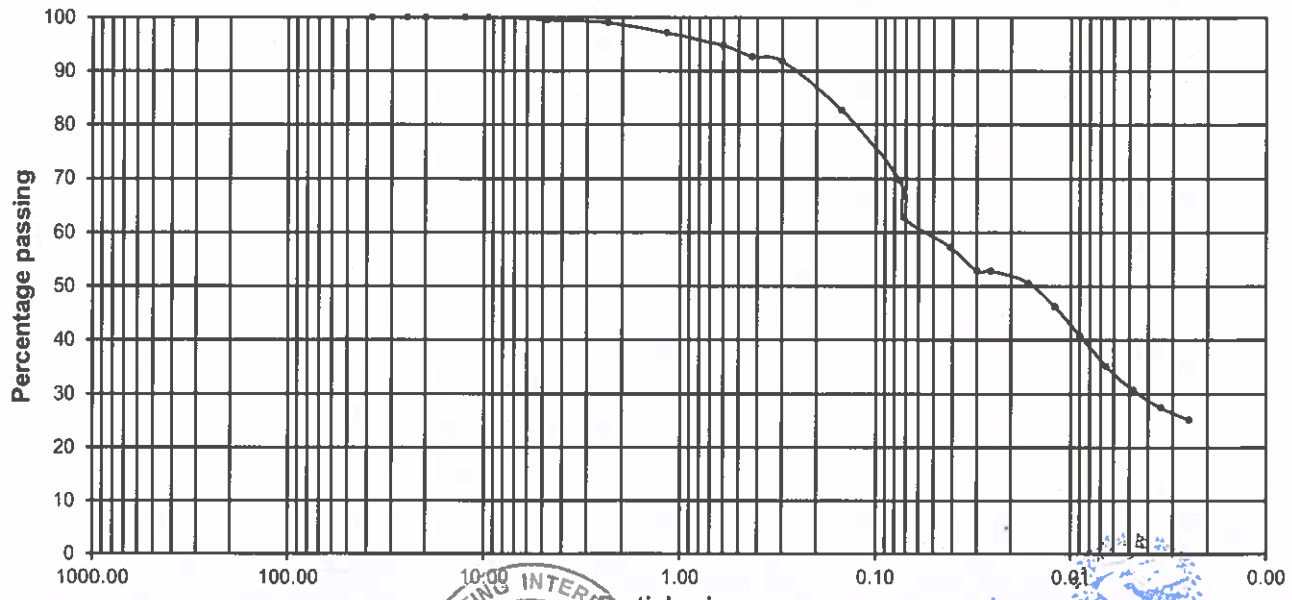
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	1/7/2019
Borehole No.	B-39	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	1.52	0.507	99.493
	2.36	1.56	0.520	98.973
	1.18	5.57	1.858	97.115
	0.600	7.25	2.418	94.697
	0.425	6.25	2.085	92.612
	0.3	2.33	0.777	91.835
	0.150	27.47	9.162	82.672
	0.075	39.32	13.115	69.557
	PAN	208.54	69.557	0.000
	Total	**299.81**		
Silt % **46.59**				
clay % **22.97**				



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ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-39**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **1/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **69.557**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r(cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
01.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	67.13
		1.02750	0.30	27.50	-0.90	22	28.40	90.16	28.00	9.72	5.693	0.0716	62.71
		1.02500	1.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	3.251	0.0409	57.19
		1.02300	2.00	23.00	-0.90	22	23.90	75.87	23.50	11.25	2.371	0.0298	52.78
		1.02300	2.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	2.017	0.0254	52.78
		1.02200	5.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	1.302	0.0164	50.57
		1.02000	10.00	20.00	-0.90	22	20.90	66.35	20.50	9.15	0.957	0.0120	46.15
		1.01750	20.00	17.50	-0.90	22	18.40	58.41	18.00	10.00	0.707	0.0089	40.63
		1.01500	40.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	0.521	0.0065	35.11
		1.01300	80.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.379	0.0048	30.69
		1.01150	160.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.274	0.0034	27.38
		1.01050	320.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.197	0.0025	25.17
02.07.2019		1.00950	1440.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.094	0.0012	22.97

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

ICGS (P) LTD.

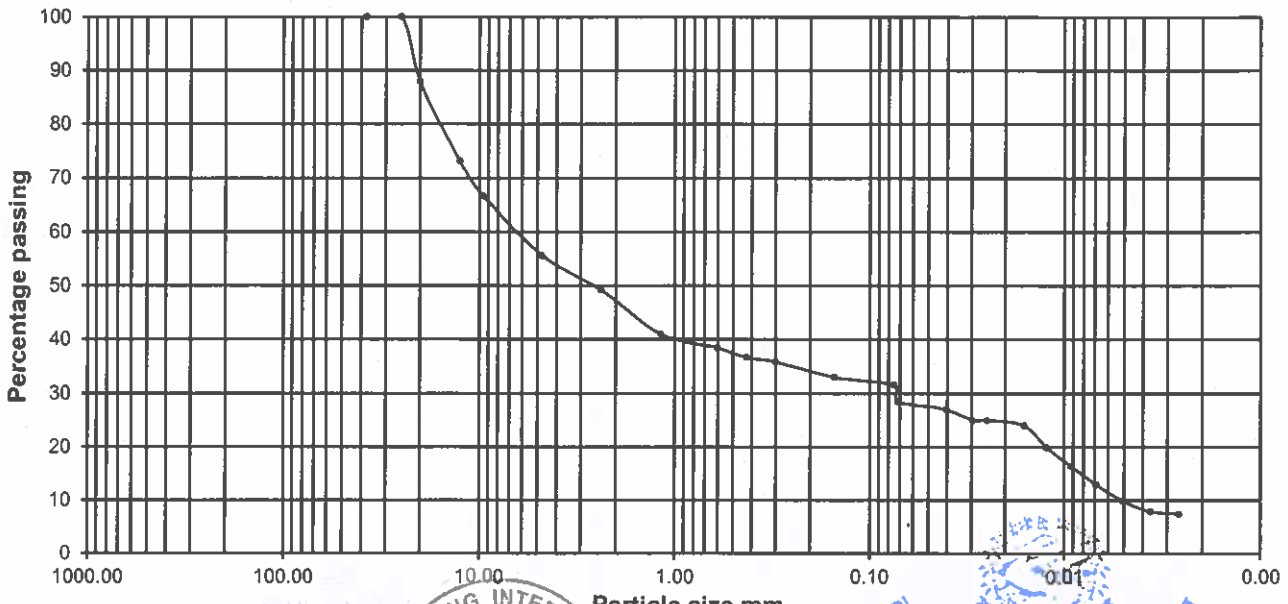
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	4/7/2019
Borehole No.	B 40	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	60.36	12.117	87.883
	12.50	74.01	14.857	73.027
	9.50	32.12	6.448	66.579
	4.75	54.71	10.982	55.597
	2.36	31.97	6.418	49.179
	1.18	40.54	8.138	41.041
	0.600	13.55	2.720	38.321
	0.425	8.31	1.668	36.653
	0.3	4.02	0.807	35.846
	0.150	14.42	2.895	32.951
	0.075	7.18	1.441	31.510
	PAN	156.97	31.510	0.000
	Total	**498.16**		
Silt % **25.11**				
clay % **6.40**				



ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B 40**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **4/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **31.510**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
04.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	30.41
		1.02750	0.30	27.50	-0.90	22	28.40	90.16	28.00	9.72	5.693	0.0716	28.41
		1.02600	1.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	3.198	0.0402	26.91
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	10.91	2.335	0.0294	24.91
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	7.80	1.974	0.0248	24.91
		1.02300	5.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	1.276	0.0160	23.91
		1.01900	10.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	0.974	0.0123	19.91
		1.01550	20.00	15.50	-0.90	22	16.40	52.06	16.00	10.67	0.731	0.0092	16.41
		1.01200	40.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	0.544	0.0068	12.90
		1.00900	80.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	0.401	0.0050	9.90
		1.00700	160.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.291	0.0037	7.90
		1.00650	320.00	6.50	-0.90	22	7.40	23.49	7.00	13.72	0.207	0.0026	7.40
05.07.2019		1.00550	1440.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.099	0.0012	6.40

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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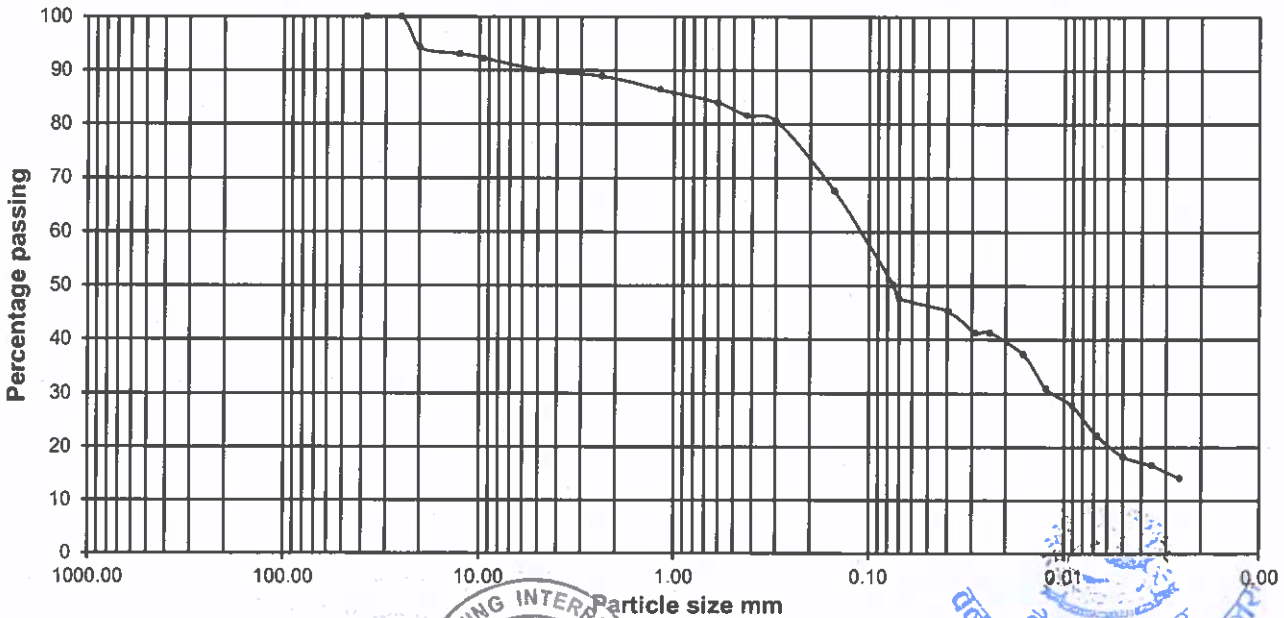
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	24/6/2019
Borehole No.	B-41	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	27.43	5.791	94.209
	12.50	5.61	1.184	93.025
	9.50	3.93	0.830	92.195
	4.75	11.06	2.335	89.860
	2.36	4.30	0.908	88.952
	1.18	11.96	2.525	86.428
	0.600	12.23	2.582	83.846
	0.425	11.03	2.329	81.517
	0.3	4.67	0.986	80.531
	0.150	61.57	12.998	67.533
	0.075	82.23	17.360	50.173
	PAN	237.66	50.173	0.000
	Total	**473.68**		
Silt % **40.78**				
clay % **9.40**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-41**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **24/6/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ_s = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **50.173**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
24.06.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	48.42
		1.02900	0.30	29.00	-0.90	22	29.90	94.92	29.50	9.21	5.542	0.0697	47.63
		1.02750	1.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	3.118	0.0392	45.24
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	2.299	0.0289	41.25
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	7.46	1.931	0.0243	41.25
		1.02250	5.00	22.50	-0.90	22	23.40	74.29	23.00	8.30	1.289	0.0162	37.27
		1.01850	10.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	0.983	0.0124	30.90
		1.01650	20.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.719	0.0090	27.72
		1.01300	40.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.537	0.0068	22.14
		1.01050	80.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.393	0.0049	18.16
		1.00950	160.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.282	0.0035	16.57
		1.00800	320.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.203	0.0026	14.18
25.06.2019		1.00500	1440.00	5.00	-0.90	22	5.90	18.73	5.50	14.23	0.099	0.0013	9.40

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu_s}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ_s = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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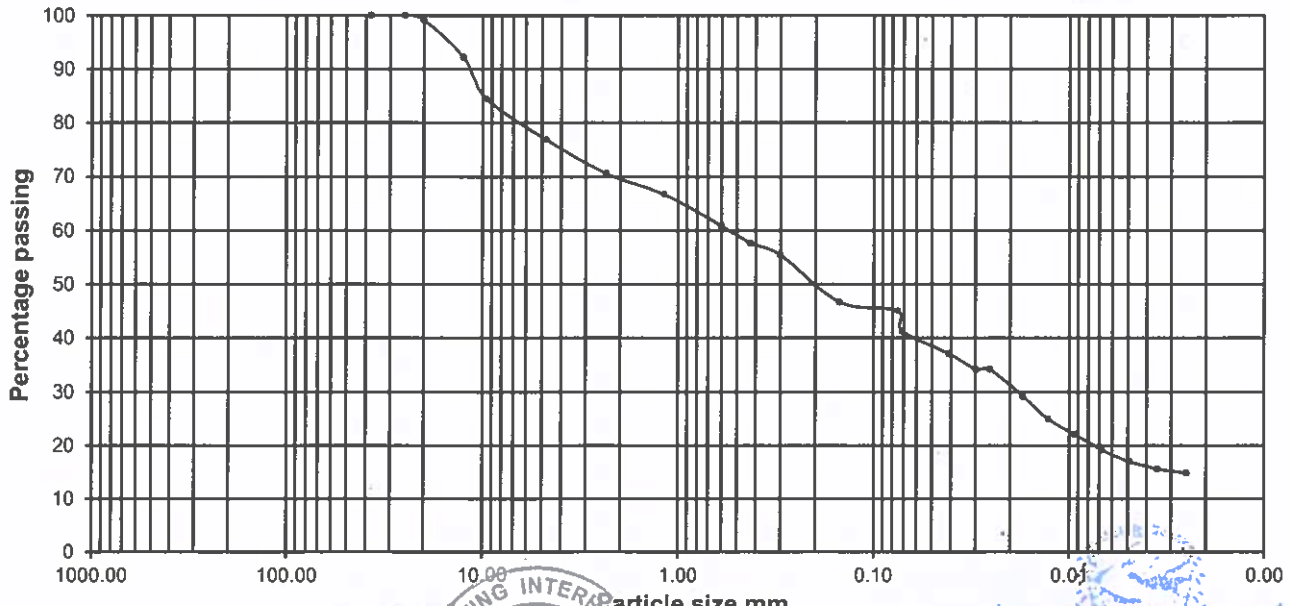
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	8/7/2019
Borehole No.	B 42	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	9.33	0.838	99.162
	12.50	78.36	7.040	92.122
	9.50	85.95	7.722	84.401
	4.75	84.49	7.590	76.810
	2.36	69.52	6.246	70.565
	1.18	43.31	3.891	66.674
	0.600	65.85	5.916	60.758
	0.425	35.04	3.148	57.610
	0.3	25.04	2.250	55.361
	0.150	96.60	8.678	46.682
	0.075	18.82	1.691	44.992
	PAN	500.81	44.992	0.000
	Total	1113.12		
Silt % 30.85				
clay % 14.14				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B 42**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **8/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
γ_w = **0.9968**
μ = **8.75**
γ_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **44.992**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(γ_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r}$ (cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
08.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	43.42
		1.02800	0.30	28.00	-0.90	22	28.90	91.75	28.50	9.55	5.643	0.0710	41.28
		1.02500	1.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	3.251	0.0409	36.99
		1.02300	2.00	23.00	-0.90	22	23.90	75.87	23.50	11.25	2.371	0.0298	34.14
		1.02300	2.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	2.017	0.0254	34.14
		1.01950	5.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	1.365	0.0172	29.14
		1.01650	10.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	1.017	0.0128	24.85
		1.01450	20.00	14.50	-0.90	22	15.40	48.89	15.00	11.01	0.742	0.0093	22.00
		1.01250	40.00	12.50	-0.90	22	13.40	42.54	13.00	11.69	0.541	0.0068	19.14
		1.01100	80.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.390	0.0049	17.00
		1.01000	160.00	10.00	-0.90	22	10.90	34.60	10.50	12.54	0.280	0.0035	15.57
		1.00950	320.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.199	0.0025	14.85
09.07.2019		1.00900	1440.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	0.095	0.0012	14.14

$$K_1 = \frac{\gamma_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{\gamma_s - \gamma_w}} = 0.0125786$$

γ_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
γ_s = Unit Wt. of soil grains, g/cm³
γ_w = Unit Wt. of water at the temp.of the test, g/cm³

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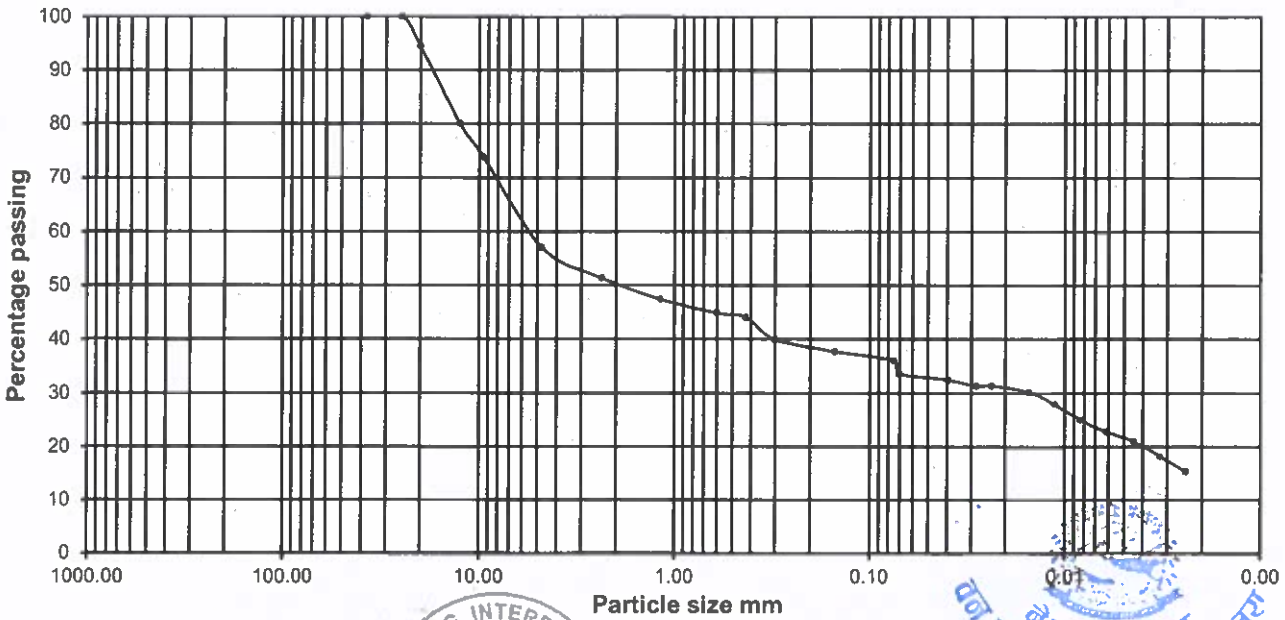
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing	22/6/2019
Borehole No.	B-43	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	16.83	5.610	94.390
	12.50	43.24	14.413	79.977
	9.50	18.64	6.213	73.763
	4.75	50.25	16.750	57.013
	2.36	17.15	5.717	51.297
	1.18	11.93	3.977	47.320
	0.600	7.51	2.503	44.817
	0.425	2.47	0.823	43.993
	0.3	12.24	4.080	39.913
	0.150	6.65	2.217	37.697
	0.075	5.30	1.767	35.930
	PAN	107.79	35.930	0.000
	Total	**300.00**		
Silt % **24.64**				
clay % **11.29**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-43**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **22/6/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
η = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **35.930**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
22.06.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	34.68
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	33.54
		1.02750	1.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	3.118	0.0392	32.39
		1.02650	2.00	26.50	-0.90	22	27.40	86.99	27.00	10.06	2.243	0.0282	31.25
		1.02650	2.00	26.50	-0.90	22	27.40	86.99	27.00	6.95	1.864	0.0234	31.25
		1.02550	5.00	25.50	-0.90	22	26.40	83.81	26.00	7.29	1.207	0.0152	30.11
		1.02350	10.00	23.50	-0.90	22	24.40	77.46	24.00	7.97	0.893	0.0112	27.83
		1.02100	20.00	21.00	-0.90	22	21.90	69.52	21.50	8.81	0.664	0.0083	24.98
		1.01900	40.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	0.487	0.0061	22.70
		1.01750	80.00	17.50	-0.90	22	18.40	58.41	18.00	10.00	0.354	0.0044	20.99
		1.01500	160.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	0.260	0.0033	18.14
		1.01250	320.00	12.50	-0.90	22	13.40	42.54	13.00	11.69	0.191	0.0024	15.28
22.06.2019		1.00900	1440.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	0.095	0.0012	11.29

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1)\, W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
η = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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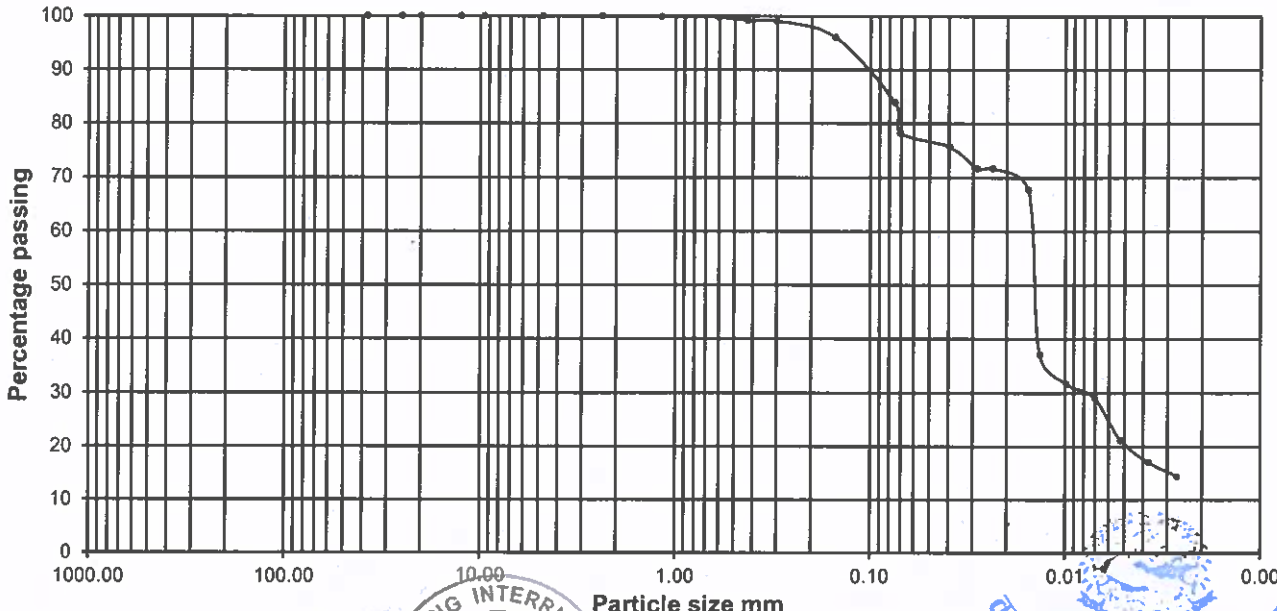
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	4/7/2019
Borehole No.	B 40	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	0.00	0.000	100.000
	2.36	0.09	0.030	99.970
	1.18	0.24	0.080	99.890
	0.600	0.66	0.220	99.670
	0.425	1.57	0.523	99.147
	0.3	0.42	0.140	99.007
	0.150	9.00	3.000	96.007
	0.075	36.54	12.180	83.827
	PAN	251.48	83.827	0.000
	Total	**300.00**		
Silt % **72.12**				
clay % **11.71**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B 40**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **4/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **83.827**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r (cm)/t (min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
04.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	80.90
		1.02850	0.30	28.50	-0.90	22	29.40	93.33	29.00	9.38	5.593	0.0703	78.24
		1.02750	1.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	3.118	0.0392	75.58
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	10.23	2.262	0.0284	71.59
		1.02600	2.00	26.00	-0.90	22	26.90	85.40	26.50	7.12	1.887	0.0237	71.59
		1.02450	5.00	24.50	-0.90	22	25.40	80.64	25.00	7.63	1.235	0.0155	67.59
		1.01300	10.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	1.073	0.0135	36.99
		1.01100	20.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.781	0.0098	31.67
		1.01000	40.00	10.00	-0.90	22	10.90	34.60	10.50	12.54	0.560	0.0070	29.01
		1.00700	80.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.412	0.0052	21.02
		1.00550	160.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.296	0.0037	17.03
		1.00450	320.00	4.50	-0.90	22	5.40	17.14	5.00	14.40	0.212	0.0027	14.37
05.07.2019		1.00350	1440.00	3.50	-0.90	22	4.40	13.97	4.00	14.74	0.101	0.0013	11.71

$K_1 = \dfrac{y_c \times G_s \times 100}{(G_s - 1) W_s} =$ **3.1746427**

$K_2 = 5.531 \times 10^{-} \sqrt{\dfrac{\mu}{y_s - y_w}} =$ **0.0125786**

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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ICGS (P) LTD.

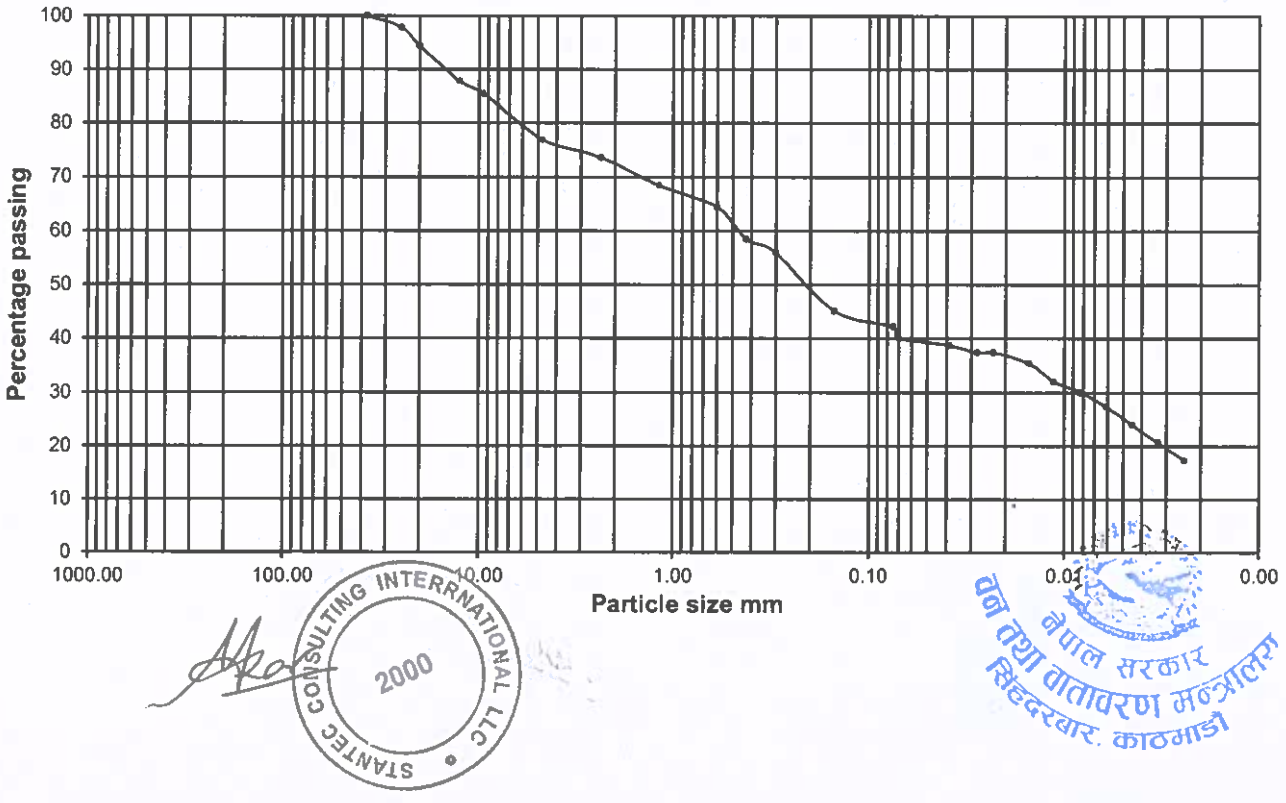
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	25/6/2019
Borehole No.	B-47	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	52.25	2.150	97.850
	20.00	86.80	3.571	94.279
	12.50	158.70	6.530	87.749
	9.50	57.12	2.350	85.399
	4.75	207.78	8.549	76.849
	2.36	80.73	3.322	73.528
	1.18	123.81	5.094	68.433
	0.600	99.06	4.076	64.357
	0.425	143.89	5.920	58.437
	0.3	62.61	2.576	55.861
	0.150	262.37	10.795	45.065
	0.075	69.26	2.850	42.216
	PAN	1026.00	42.216	0.000
	Total	**2430.38**		
Silt % **28.28**				
clay % **13.94**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-47**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **25/6/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **42.216**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
25.06.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	40.74
		1.02900	0.30	29.00	-0.90	22	29.90	94.92	29.50	9.21	5.542	0.0697	40.07
		1.02800	1.00	28.00	-0.90	22	28.90	91.75	28.50	9.55	3.091	0.0389	38.73
		1.02700	2.00	27.00	-0.90	22	27.90	88.57	27.50	9.89	2.224	0.0280	37.39
		1.02700	2.00	27.00	-0.90	22	27.90	88.57	27.50	6.78	1.841	0.0232	37.39
		1.02550	5.00	25.50	-0.90	22	26.40	83.81	26.00	7.29	1.207	0.0152	35.38
		1.02300	10.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	0.902	0.0113	32.03
		1.02150	20.00	21.50	-0.90	22	22.40	71.11	22.00	8.64	0.657	0.0083	30.02
		1.01950	40.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	0.483	0.0061	27.34
		1.01700	80.00	17.00	-0.90	22	17.90	56.83	17.50	10.17	0.356	0.0045	23.99
		1.01450	160.00	14.50	-0.90	22	15.40	48.89	15.00	11.01	0.262	0.0033	20.64
		1.01200	320.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	0.193	0.0024	17.29
26.06.2019		1.00950	1440.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.094	0.0012	13.94

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = \mathbf{3.1746427}$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = \mathbf{0.0125786}$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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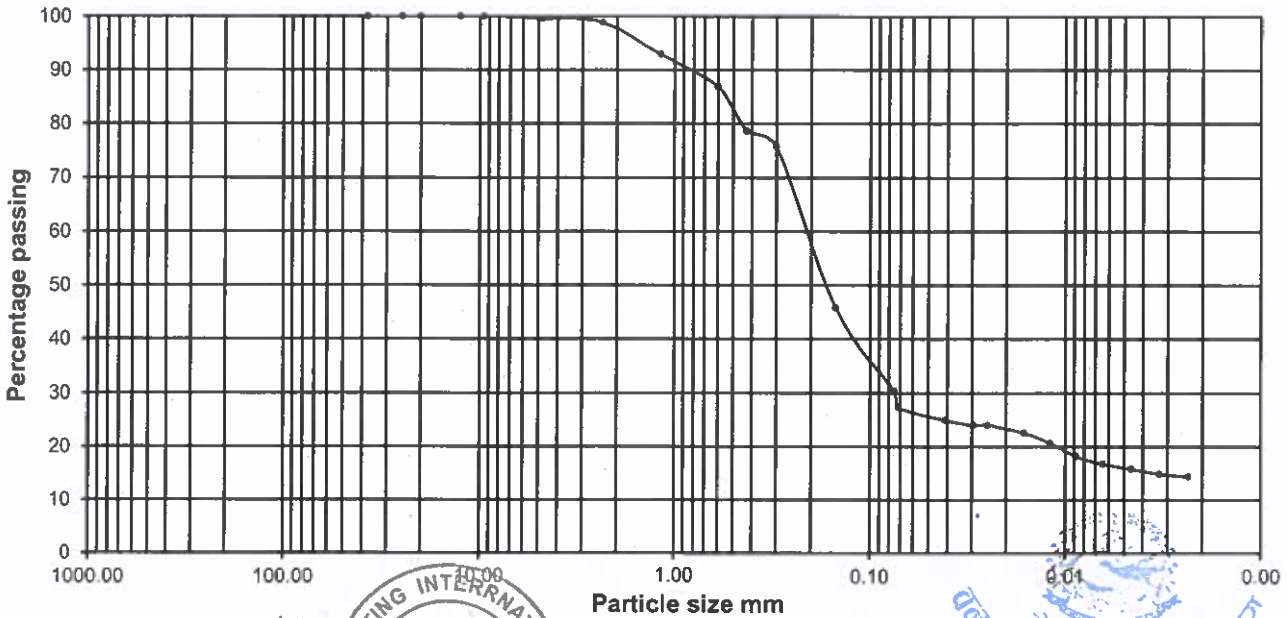
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	1/7/2019
Borehole No.	B-49	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	2.34	0.473	99.527
	2.36	3.62	0.731	98.796
	1.18	29.42	5.942	92.854
	0.600	29.79	6.017	86.837
	0.425	40.64	8.208	78.629
	0.3	14.35	2.898	75.730
	0.150	147.90	29.873	45.857
	0.075	77.22	15.597	30.261
	PAN	149.82	30.261	0.000
	Total	495.10		
Silt % 16.43				
clay % 13.83				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-49**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **1/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
η = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **30.261**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r (cm) / t (min)}$	D = $K_2\sqrt{Z_r / t}$	N' %
01.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	28.72
		1.02750	0.30	27.50	-0.90	22	28.40	90.16	28.00	9.72	5.693	0.0716	27.28
		1.02500	1.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	3.251	0.0409	24.88
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	10.91	2.335	0.0294	23.92
		1.02400	2.00	24.00	-0.90	22	24.90	79.05	24.50	7.80	1.974	0.0248	23.92
		1.02250	5.00	22.50	-0.90	22	23.40	74.29	23.00	8.30	1.289	0.0162	22.48
		1.02050	10.00	20.50	-0.90	22	21.40	67.94	21.00	8.98	0.948	0.0119	20.56
		1.01800	20.00	18.00	-0.90	22	18.90	60.00	18.50	9.83	0.701	0.0088	18.16
		1.01650	40.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.508	0.0064	16.72
		1.01550	80.00	15.50	-0.90	22	16.40	52.06	16.00	10.67	0.365	0.0046	15.75
		1.01450	160.00	14.50	-0.90	22	15.40	48.89	15.00	11.01	0.262	0.0033	14.79
		1.01400	320.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.187	0.0024	14.31
02.07.2019		1.01350	1440.00	13.50	-0.90	22	14.40	45.71	14.00	11.35	0.089	0.0011	13.83

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = \mathbf{3.1746427}$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\eta}{y_s - y_w}} = \mathbf{0.0125786}$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
η = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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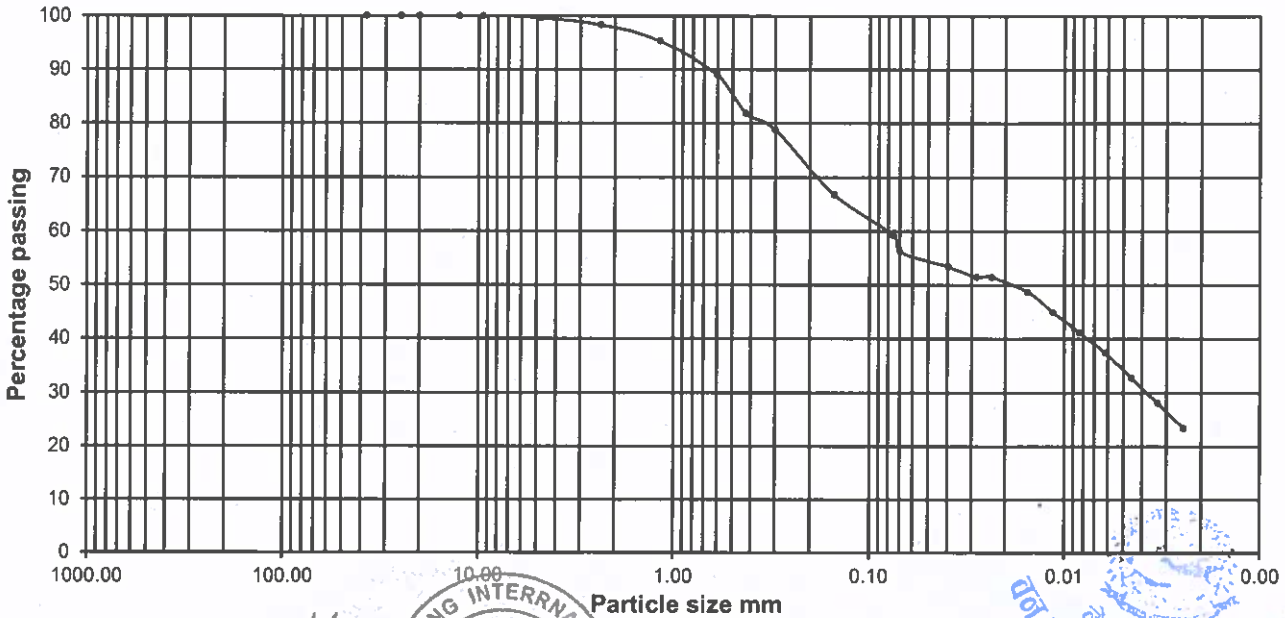
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	1/7/2019
Borehole No.	B-50	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	0.00	0.000	100.000
	9.50	0.00	0.000	100.000
	4.75	1.36	0.453	99.547
	2.36	3.88	1.293	98.253
	1.18	8.95	2.983	95.270
	0.600	18.95	6.317	88.953
	0.425	21.24	7.080	81.873
	0.3	9.27	3.090	78.783
	0.150	36.20	12.067	66.717
	0.075	22.63	7.543	59.173
	PAN	177.52	59.173	0.000
	Total	**300.00**		
Silt % **42.45**				
clay % **16.72**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-50**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **1/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **59.173**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r(cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
01.07.2019		1.03000	0.15	30.00	-0.90	22	30.90	98.10	30.50	8.88	7.692	0.0968	58.05
		1.02900	0.30	29.00	-0.90	22	29.90	94.92	29.50	9.21	5.542	0.0697	56.17
		1.02750	1.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	3.118	0.0392	53.35
		1.02650	2.00	26.50	-0.90	22	27.40	86.99	27.00	10.06	2.243	0.0282	51.47
		1.02650	2.00	26.50	-0.90	22	27.40	86.99	27.00	6.95	1.864	0.0234	51.47
		1.02500	5.00	25.00	-0.90	22	25.90	82.22	25.50	7.46	1.221	0.0154	48.65
		1.02300	10.00	23.00	-0.90	22	23.90	75.87	23.50	8.14	0.902	0.0113	44.90
		1.02100	20.00	21.00	-0.90	22	21.90	69.52	21.50	8.81	0.664	0.0083	41.14
		1.01900	40.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	0.487	0.0061	37.38
		1.01650	80.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	0.359	0.0045	32.69
		1.01400	160.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.264	0.0033	27.99
		1.01150	320.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	0.194	0.0024	23.29
02.07.2019		1.00800	1440.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.096	0.0012	16.72

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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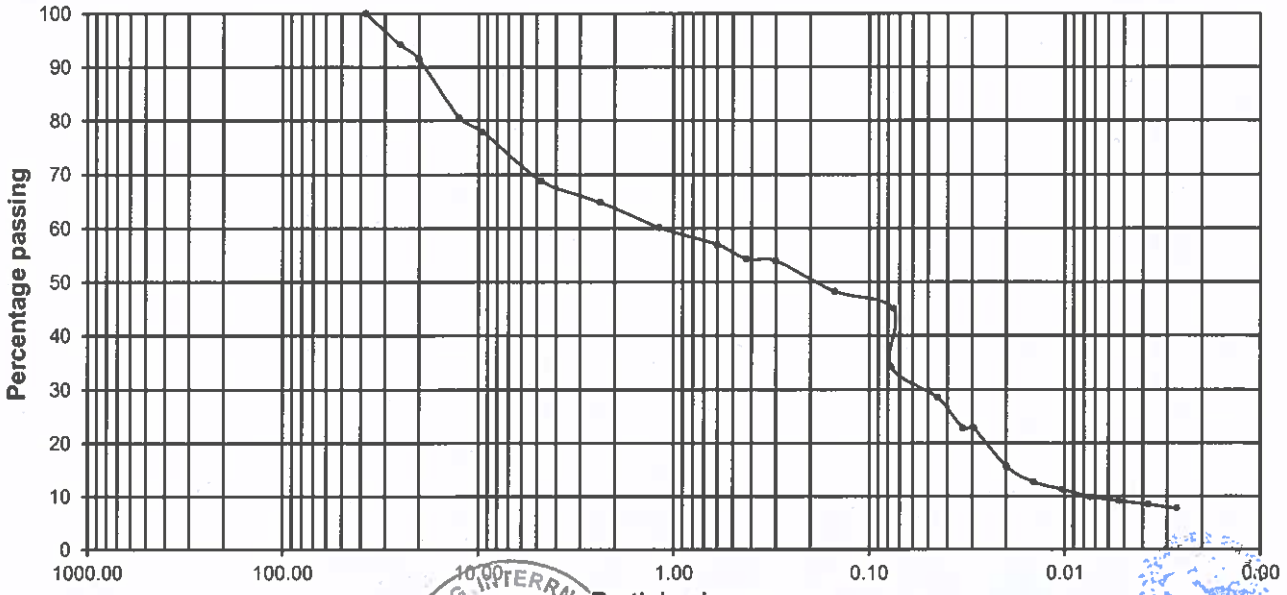
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	10/7/2019
Borehole No.	B-51	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	66.67	5.870	94.130
	20.00	30.85	2.716	91.414
	12.50	123.34	10.859	80.556
	9.50	30.42	2.678	77.877
	4.75	103.33	9.097	68.780
	2.36	45.63	4.017	64.763
	1.18	53.37	4.699	60.064
	0.600	35.80	3.152	56.912
	0.425	30.22	2.661	54.252
	0.3	4.53	0.399	53.853
	0.150	63.67	5.605	48.248
	0.075	36.98	3.256	44.992
	PAN	511.04	44.992	0.000
	Total	**1135.85**		
Silt % **37.99**				
clay % **7.00**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-51**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **10/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **44.992**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
10.07.2019		1.02600	0.15	26.00	-0.90	22	26.90	85.40	26.50	10.23	8.258	0.1039	38.42
		1.02300	0.30	23.00	-0.90	22	23.90	75.87	23.50	11.25	6.122	0.0770	34.14
		1.01900	1.00	19.00	-0.90	22	19.90	63.18	19.50	12.60	3.550	0.0446	28.42
		1.01500	2.00	15.00	-0.90	22	15.90	50.48	15.50	13.95	2.641	0.0332	22.71
		1.01500	2.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	2.328	0.0293	22.71
		1.01000	5.00	10.00	-0.90	22	10.90	34.60	10.50	12.54	1.583	0.0199	15.57
		1.00800	10.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	1.149	0.0145	12.71
		1.00700	20.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.823	0.0104	11.28
		1.00600	40.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.589	0.0074	9.86
		1.00550	80.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.419	0.0053	9.14
		1.00500	160.00	5.00	-0.90	22	5.90	18.73	5.50	14.23	0.298	0.0038	8.43
		1.00450	320.00	4.50	-0.90	22	5.40	17.14	5.00	14.40	0.212	0.0027	7.71
11.07.2019		1.00400	1440.00	4.00	-0.90	22	4.90	15.56	4.50	14.57	0.101	0.0013	7.00

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-3} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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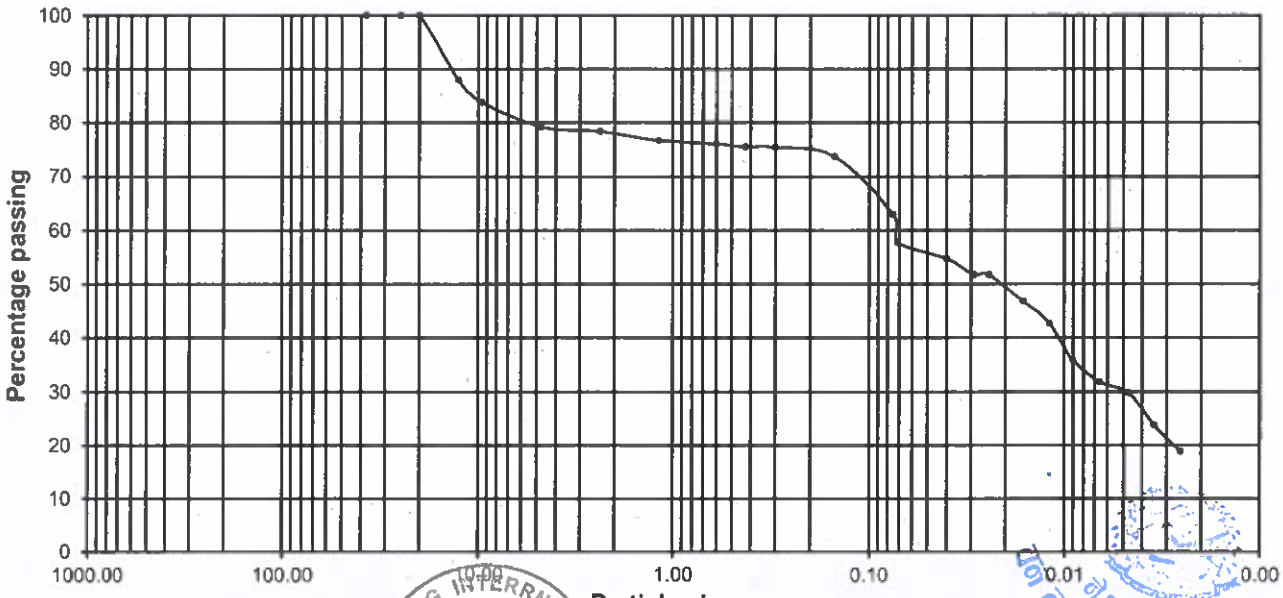
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing	28/06/2019
Borehole No.	B-53	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	36.40	12.133	87.867
	9.50	12.40	4.133	83.733
	4.75	13.74	4.580	79.153
	2.36	2.49	0.830	78.323
	1.18	4.88	1.627	76.697
	0.600	2.13	0.710	75.987
	0.425	1.54	0.513	75.473
	0.3	0.37	0.123	75.350
	0.150	5.04	1.680	73.670
	0.075	32.36	10.787	62.883
	PAN	188.65	62.883	0.000
	Total	**300.00**		
Silt % **49.11**				
clay % **13.77**				



STANTEC CONSULTING INTERNATIONAL LLC 2000

नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-53**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **28/06/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **62.883**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
28.06.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	60.69
		1.02800	0.30	28.00	-0.90	22	28.90	91.75	28.50	9.55	5.643	0.0710	57.69
		1.02650	1.00	26.50	-0.90	22	27.40	86.99	27.00	10.06	3.172	0.0399	54.70
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	2.299	0.0289	51.70
		1.02500	2.00	25.00	-0.90	22	25.90	82.22	25.50	7.46	1.931	0.0243	51.70
		1.02250	5.00	22.50	-0.90	22	23.40	74.29	23.00	8.30	1.289	0.0162	46.71
		1.02050	10.00	20.50	-0.90	22	21.40	67.94	21.00	8.98	0.948	0.0119	42.72
		1.01700	20.00	17.00	-0.90	22	17.90	56.83	17.50	10.17	0.713	0.0090	35.73
		1.01500	40.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	0.521	0.0065	31.74
		1.01400	80.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.374	0.0047	29.75
		1.01100	160.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.276	0.0035	23.76
		1.00850	320.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.202	0.0025	18.77
29.06.2019		1.00600	1440.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.098	0.0012	13.77

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = \textbf{3.1746427}$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = \textbf{0.0125786}$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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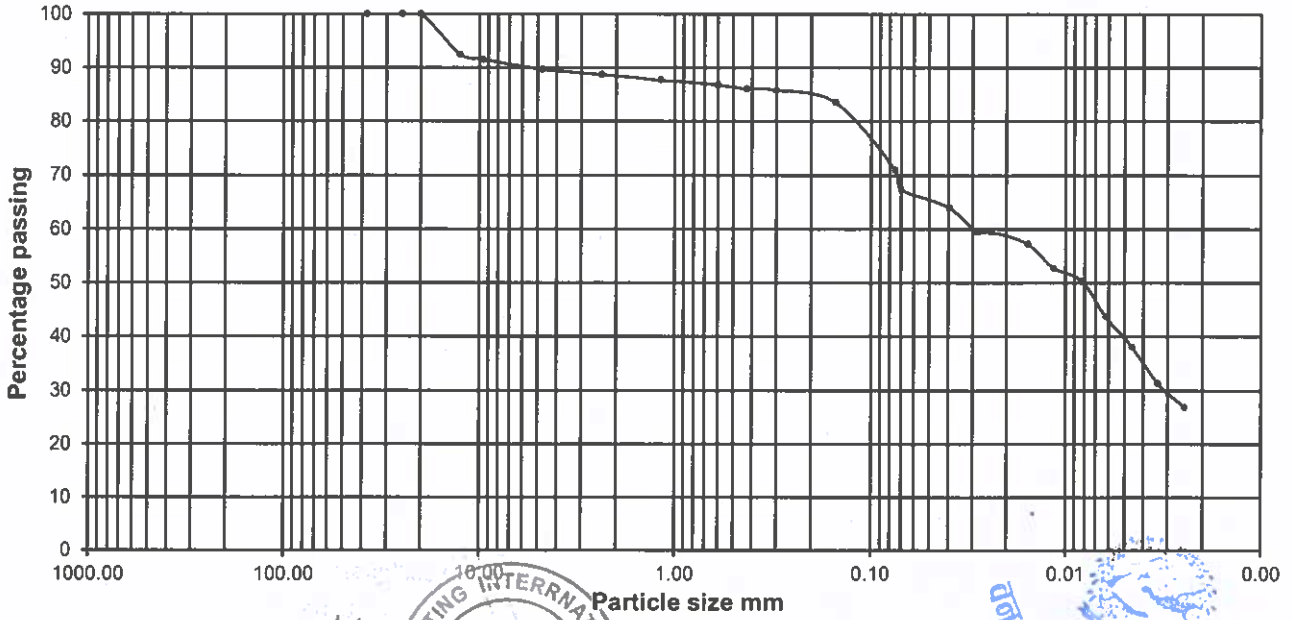
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing	28/06/2019
Borehole No.	B-54	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	22.76	7.598	92.402
	9.50	2.72	0.908	91.494
	4.75	5.56	1.856	89.638
	2.36	2.76	0.921	88.717
	1.18	3.18	1.062	87.656
	0.600	2.80	0.935	86.721
	0.425	2.08	0.694	86.027
	0.3	0.87	0.290	85.736
	0.150	6.80	2.270	83.466
	0.075	37.63	12.561	70.905
	PAN	212.41	70.905	0.000
	Total	**299.57**		
Silt % **47.49**				
clay % **23.41**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-54**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **28/06/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **70.905**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
28.06.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	68.43
		1.02900	0.30	29.00	-0.90	22	29.90	94.92	29.50	9.21	5.542	0.0697	67.30
		1.02750	1.00	27.50	-0.90	22	28.40	90.16	28.00	9.72	3.118	0.0392	63.93
		1.02550	2.00	25.50	-0.90	22	26.40	83.81	26.00	10.40	2.280	0.0287	59.43
		1.02550	2.00	25.50	-0.90	22	26.40	83.81	26.00	7.29	1.909	0.0240	59.43
		1.02450	5.00	24.50	-0.90	22	25.40	80.64	25.00	7.63	1.235	0.0155	57.17
		1.02250	10.00	22.50	-0.90	22	23.40	74.29	23.00	8.30	0.911	0.0115	52.67
		1.02150	20.00	21.50	-0.90	22	22.40	71.11	22.00	8.64	0.657	0.0083	50.42
		1.01850	40.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	0.491	0.0062	43.67
		1.01600	80.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	0.362	0.0046	38.04
		1.01300	160.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.268	0.0034	31.29
		1.01100	320.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.195	0.0025	26.79
29.06.2019		1.00950	1440.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.094	0.0012	23.41

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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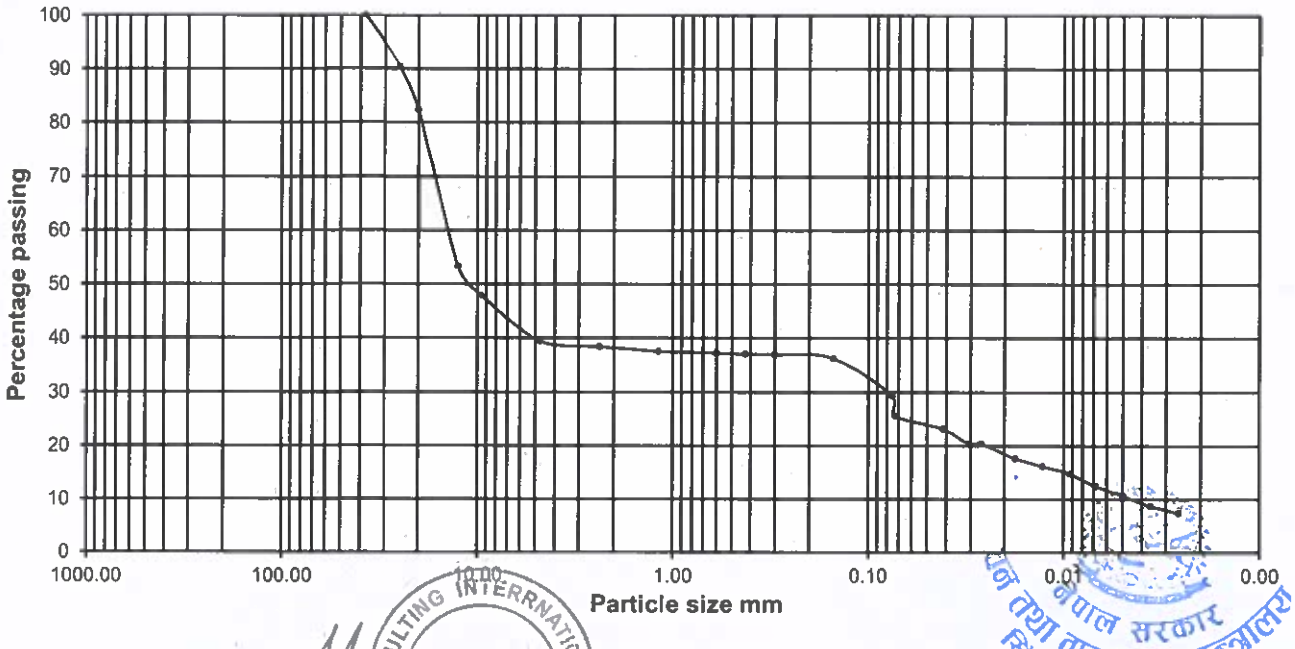
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	9/7/2019
Borehole No.	B-55	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	67.04	9.662	90.338
	20.00	55.46	7.993	82.345
	12.50	201.48	29.038	53.308
	9.50	37.63	5.423	47.884
	4.75	58.64	8.451	39.433
	2.36	7.13	1.028	38.405
	1.18	6.29	0.907	37.499
	0.600	2.27	0.327	37.172
	0.425	1.24	0.179	36.993
	0.3	0.51	0.074	36.920
	0.150	5.02	0.723	36.196
	0.075	48.06	6.926	29.270
	PAN	203.09	29.270	0.000
	Total	**693.86**		
Silt % **22.86**				
clay % **6.41**				



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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-55**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **9/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **29.270**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r(cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
09.07.2019		1.02900	0.15	29.00	-0.90	22	29.90	94.92	29.50	9.21	7.838	0.0986	27.78
		1.02650	0.30	26.50	-0.90	22	27.40	86.99	27.00	10.06	5.791	0.0728	25.46
		1.02400	1.00	24.00	-0.90	22	24.90	79.05	24.50	10.91	3.303	0.0415	23.14
		1.02100	2.00	21.00	-0.90	22	21.90	69.52	21.50	11.92	2.442	0.0307	20.35
		1.02100	2.00	21.00	-0.90	22	21.90	69.52	21.50	8.81	2.099	0.0264	20.35
		1.01800	5.00	18.00	-0.90	22	18.90	60.00	18.50	9.83	1.402	0.0176	17.56
		1.01650	10.00	16.50	-0.90	22	17.40	55.24	17.00	10.34	1.017	0.0128	16.17
		1.01500	20.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	0.736	0.0093	14.77
		1.01250	40.00	12.50	-0.90	22	13.40	42.54	13.00	11.69	0.541	0.0068	12.45
		1.01050	80.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.393	0.0049	10.59
		1.00850	160.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.286	0.0036	8.73
		1.00700	320.00	7.00	-0.90	22	7.90	25.08	7.50	13.55	0.206	0.0026	7.34
10.07.2019		1.00600	1440.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.098	0.0012	6.41

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1)\, W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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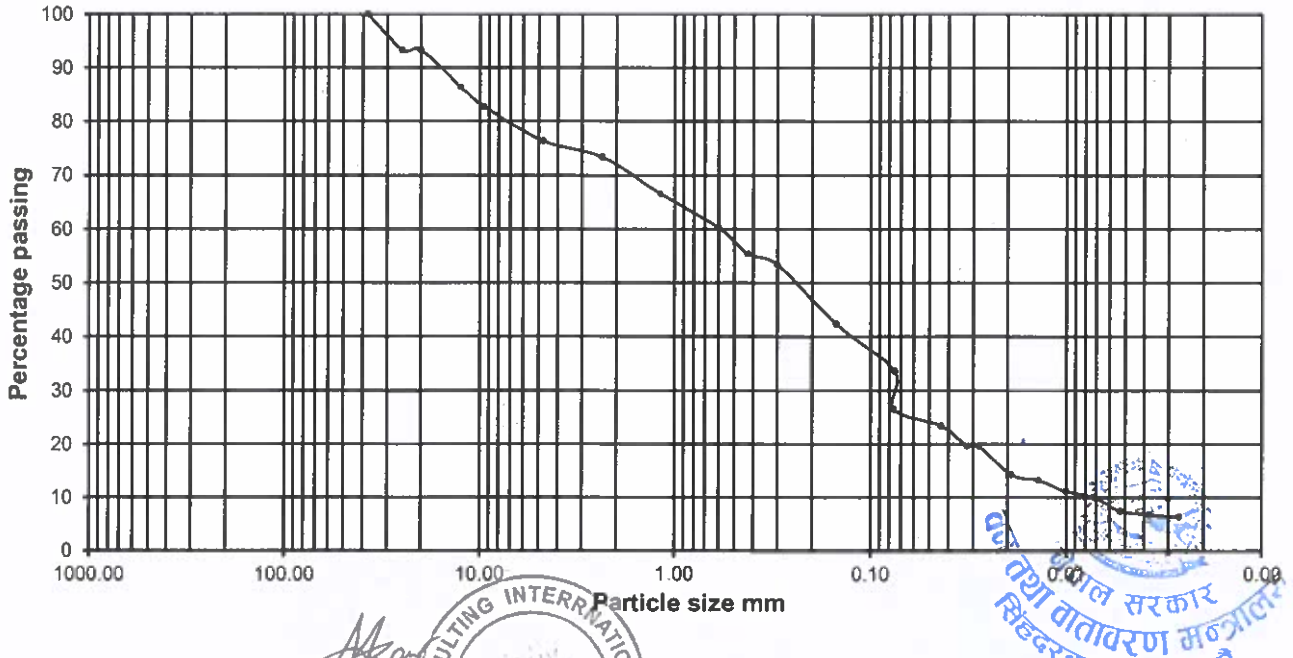
SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	9/7/2019
Borehole No.	B-56	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	20.34	6.780	93.220
	20.00	0.00	0.000	93.220
	12.50	20.68	6.893	86.327
	9.50	10.85	3.617	82.710
	4.75	19.19	6.397	76.313
	2.36	8.96	2.987	73.327
	1.18	20.40	6.800	66.527
	0.600	18.96	6.320	60.207
	0.425	14.59	4.863	55.343
	0.3	6.04	2.013	53.330
	0.150	33.06	11.020	42.310
	0.075	26.41	8.803	33.507
	PAN	100.52	33.507	0.000
	Total	**300.00**		
Silt % **27.76**				
clay % **5.74**				



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New-Baneshwor, Kathmandu, Nepal
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HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-56**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **9/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

	Tested Sample	Poured off
Container No.	B-21	
Weight of Container + Dry Soil g	126.1	
Weight of Container g	76.1	
Weight of Dry Soil, Ws g	50	
Total Weight Dry Soil g	50	

Fraction Finer No. 200 Sieve= **33.507**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
09.07.2019		1.02600	0.15	26.00	-0.90	22	26.90	85.40	26.50	10.23	8.258	0.1039	28.61
		1.02400	0.30	24.00	-0.90	22	24.90	79.05	24.50	10.91	6.030	0.0758	26.49
		1.02100	1.00	21.00	-0.90	22	21.90	69.52	21.50	11.92	3.453	0.0434	23.30
		1.01750	2.00	17.50	-0.90	22	18.40	58.41	18.00	13.11	2.560	0.0322	19.57
		1.01750	2.00	17.50	-0.90	22	18.40	58.41	18.00	10.00	2.236	0.0281	19.57
		1.01250	5.00	12.50	-0.90	22	13.40	42.54	13.00	11.69	1.529	0.0192	14.25
		1.01150	10.00	11.50	-0.90	22	12.40	39.37	12.00	12.03	1.097	0.0138	13.19
		1.00950	20.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.797	0.0100	11.06
		1.00850	40.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.571	0.0072	10.00
		1.00600	80.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.417	0.0052	7.34
		1.00550	160.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.296	0.0037	6.81
		1.00500	320.00	5.00	-0.90	22	5.90	18.73	5.50	14.23	0.211	0.0027	6.28
10.07.2019		1.00450	1440.00	4.50	-0.90	22	5.40	17.14	5.00	14.40	0.100	0.0013	5.74

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

ICGS (P) LTD.

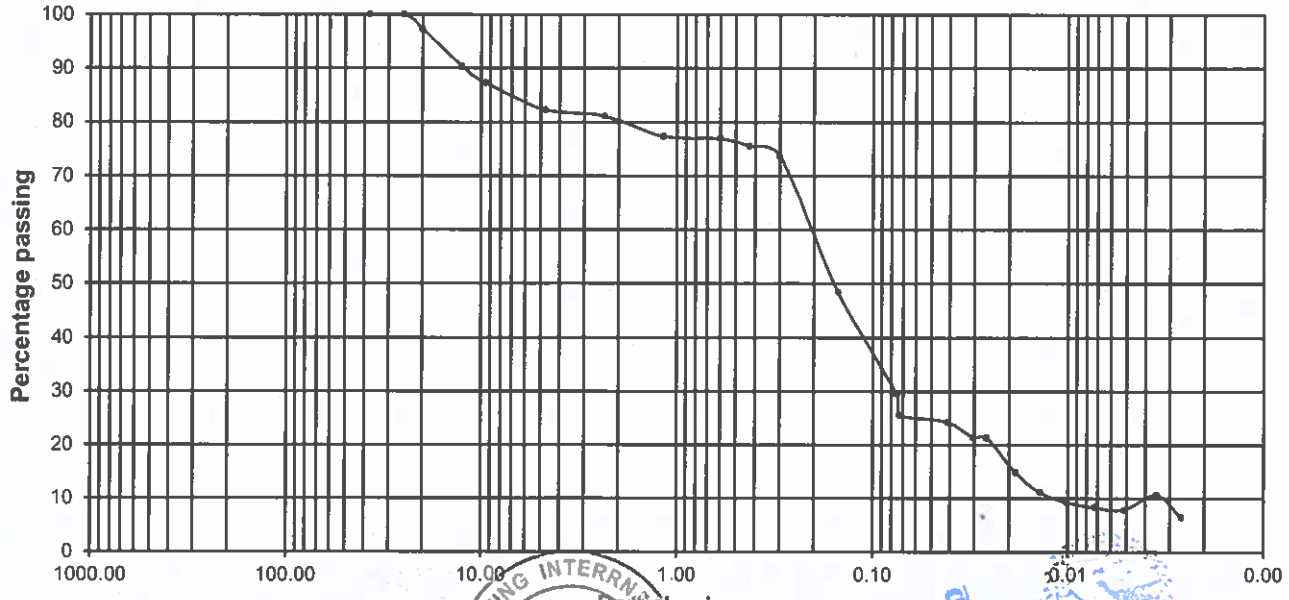
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	5/7/2019
Borehole No.	B-57	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	13.52	2.721	97.279
	12.50	34.98	7.040	90.240
	9.50	15.00	3.019	87.221
	4.75	24.68	4.967	82.254
	2.36	5.90	1.187	81.067
	1.18	18.86	3.795	77.272
	0.600	2.05	0.413	76.859
	0.425	7.06	1.421	75.438
	0.3	8.64	1.739	73.699
	0.150	125.92	25.341	48.359
	0.075	94.14	18.945	29.414
	PAN	146.16	29.414	0.000
	Total	**496.91**		
Silt % **23.44**				
clay % **5.98**				



STANTEC CONSULTING INTERNATIONAL LLC 2000

नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-57**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **5/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

		SOIL SAMPLE WEIGHT	
		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **29.414**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
05.07.2019		1.02800	0.15	28.00	-0.90	22	28.90	91.75	28.50	9.55	7.980	0.1004	26.99
		1.02650	0.30	26.50	-0.90	22	27.40	86.99	27.00	10.06	5.791	0.0728	25.59
		1.02500	1.00	25.00	-0.90	22	25.90	82.22	25.50	10.57	3.251	0.0409	24.18
		1.02200	2.00	22.00	-0.90	22	22.90	72.70	22.50	11.58	2.407	0.0303	21.38
		1.02200	2.00	22.00	-0.90	22	22.90	72.70	22.50	8.47	2.058	0.0259	21.38
		1.01500	5.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	1.473	0.0185	14.85
		1.01100	10.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	1.104	0.0139	11.11
		1.00900	20.00	9.00	-0.90	22	9.90	31.43	9.50	12.87	0.802	0.0101	9.24
		1.00800	40.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.575	0.0072	8.31
		1.00750	80.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.409	0.0051	7.84
		1.01050	160.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.278	0.0035	10.65
		1.00600	320.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.208	0.0026	6.44
06.07.2019		1.00550	1440.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.099	0.0012	5.98

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

FEC CONSULTING INTERNATIONAL LLC 2000

ICGS (P) LTD.

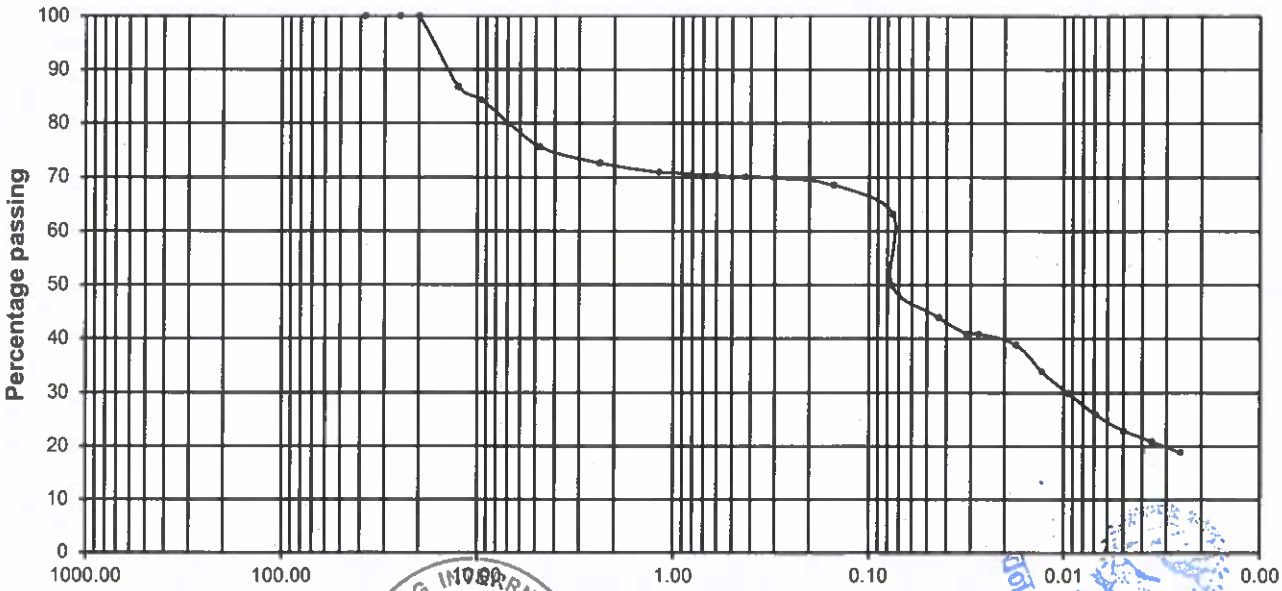
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	9/7/2019
Borehole No.	B-58	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	0.00	0.000	100.000
	12.50	39.75	13.250	86.750
	9.50	7.44	2.480	84.270
	4.75	26.01	8.670	75.600
	2.36	9.04	3.013	72.587
	1.18	5.03	1.677	70.910
	0.600	1.92	0.640	70.270
	0.425	0.93	0.310	69.960
	0.3	0.38	0.127	69.833
	0.150	4.04	1.347	68.487
	0.075	16.27	5.423	63.063
	PAN	189.19	63.063	0.000
	Total	**300.00**		
Silt % **46.25**				
clay % **16.82**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-58**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **9/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **63.063**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	Z_r(cm) / t (min)	D = $K_2\sqrt{Z_r/t}$	N' %
09.07.2019		1.02750	0.15	27.50	-0.90	22	28.40	90.16	28.00	9.72	8.051	0.1013	56.86
		1.02400	0.30	24.00	-0.90	22	24.90	79.05	24.50	10.91	6.030	0.0758	49.85
		1.02100	1.00	21.00	-0.90	22	21.90	69.52	21.50	11.92	3.453	0.0434	43.84
		1.01950	2.00	19.50	-0.90	22	20.40	64.76	20.00	12.43	2.493	0.0314	40.84
		1.01950	2.00	19.50	-0.90	22	20.40	64.76	20.00	9.32	2.159	0.0272	40.84
		1.01850	5.00	18.50	-0.90	22	19.40	61.59	19.00	9.66	1.390	0.0175	38.84
		1.01600	10.00	16.00	-0.90	22	16.90	53.65	16.50	10.50	1.025	0.0129	33.83
		1.01400	20.00	14.00	-0.90	22	14.90	47.30	14.50	11.18	0.748	0.0094	29.83
		1.01200	40.00	12.00	-0.90	22	12.90	40.95	12.50	11.86	0.544	0.0068	25.83
		1.01050	80.00	10.50	-0.90	22	11.40	36.19	11.00	12.37	0.393	0.0049	22.82
		1.00950	160.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.282	0.0035	20.82
		1.00850	320.00	8.50	-0.90	22	9.40	29.84	9.00	13.04	0.202	0.0025	18.82
10.07.2019		1.00750	1440.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.096	0.0012	16.82

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1)\, W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

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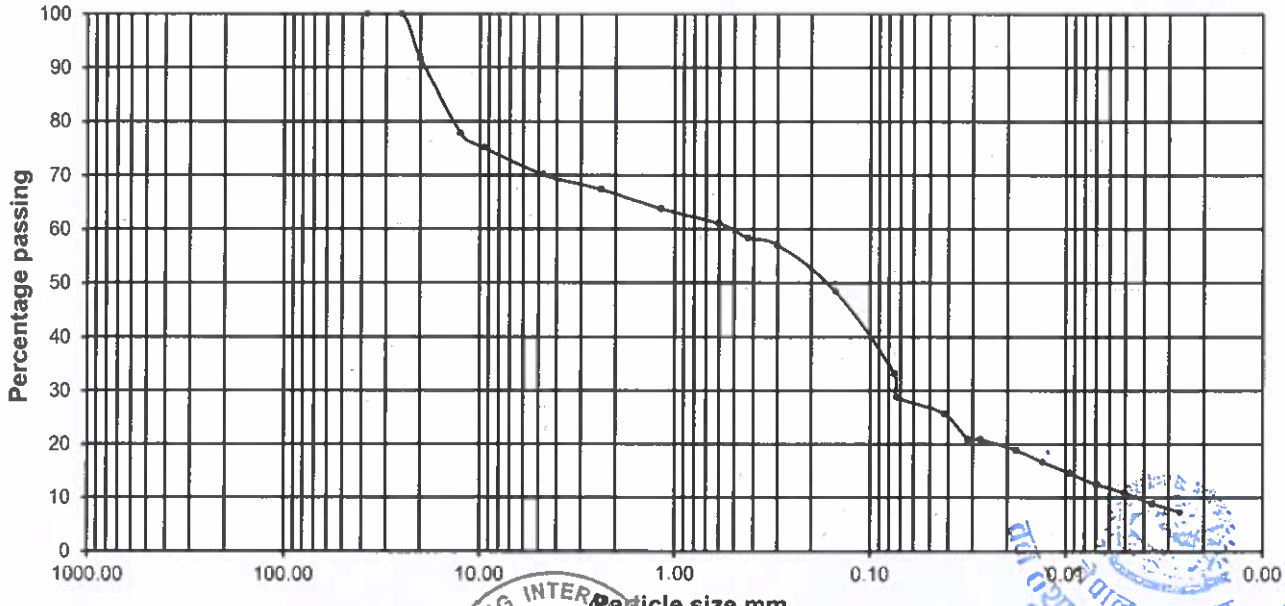
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	9/6/2019
Borehole No.	B-59	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	0.00	0.000	100.000
	20.00	41.38	8.310	91.690
	12.50	69.62	13.981	77.709
	9.50	13.25	2.661	75.048
	4.75	24.53	4.926	70.122
	2.36	14.02	2.815	67.307
	1.18	17.80	3.575	63.732
	0.600	13.76	2.763	60.969
	0.425	13.03	2.617	58.352
	0.3	6.63	1.331	57.021
	0.150	42.60	8.555	48.466
	0.075	76.62	15.387	33.079
	PAN	164.72	33.079	0.000
	Total	**497.96**		
Silt % **26.36**				
clay % **6.72**				



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New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-59**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **9/6/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **33.079**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °C	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
09.06.2019		1.02800	0.15	28.00	-0.90	22	28.90	91.75	28.50	9.55	7.980	0.1004	30.35
		1.02650	0.30	26.50	-0.90	22	27.40	86.99	27.00	10.06	5.791	0.0728	28.77
		1.02350	1.00	23.50	-0.90	22	24.40	77.46	24.00	11.08	3.328	0.0419	25.62
		1.01900	2.00	19.00	-0.90	22	19.90	63.18	19.50	12.60	2.510	0.0316	20.90
		1.01900	2.00	19.00	-0.90	22	19.90	63.18	19.50	9.49	2.178	0.0274	20.90
		1.01700	5.00	17.00	-0.90	22	17.90	56.83	17.50	10.17	1.426	0.0179	18.80
		1.01500	10.00	15.00	-0.90	22	15.90	50.48	15.50	10.84	1.041	0.0131	16.70
		1.01300	20.00	13.00	-0.90	22	13.90	44.13	13.50	11.52	0.759	0.0095	14.60
		1.01100	40.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	0.552	0.0069	12.50
		1.00950	80.00	9.50	-0.90	22	10.40	33.02	10.00	12.71	0.399	0.0050	10.92
		1.00750	160.00	7.50	-0.90	22	8.40	26.67	8.00	13.38	0.289	0.0036	8.82
		1.00600	320.00	6.00	-0.90	22	6.90	21.91	6.50	13.89	0.208	0.0026	7.25
10.06.2019		1.00550	1440.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.099	0.0012	6.72

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm³
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm³
y_w = Unit Wt. of water at the temp.of the test, g/cm³

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

GIANTEC CONSULTING INTERNATIONAL LLC 2060

ICGS (P) LTD.

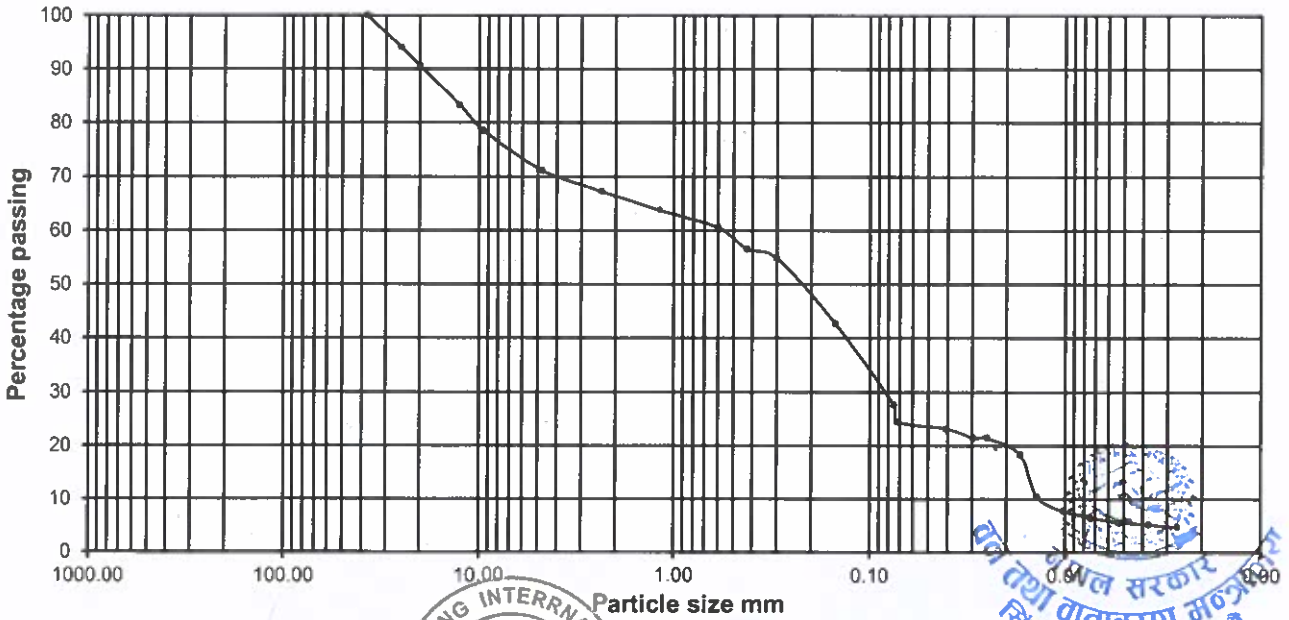
New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

SIEVE ANALYSIS

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)	Depth:	0.00-1.00m
Location:		Date of Testing :	2/7/2019
Borehole No.	B-60	Tested by:	Pranita Pun
Source of Sample	Test Pit Sample	Checked by:	Dr. Suman Manandhar

Sieve Analysis and Grain Shape

Sieve No.	Diam. (mm)	Wt. retained	% retained	% passing
	37.50	0.00	0.000	100.000
	25.00	29.67	5.973	94.027
	20.00	16.84	3.390	90.638
	12.50	36.52	7.351	83.286
	9.50	23.80	4.791	78.495
	4.75	36.99	7.446	71.049
	2.36	18.98	3.821	67.228
	1.18	17.41	3.505	63.724
	0.600	16.22	3.265	60.459
	0.425	19.70	3.966	56.493
	0.3	8.21	1.653	54.840
	0.150	60.57	12.193	42.648
	0.075	74.86	15.069	27.578
	PAN	137.00	27.578	0.000
	Total	**496.77**		
Silt % **23.73**				
clay % **3.85**				



ICGS (P) LTD.

New-Baneshwor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

HYDROMETER ANALYSIS

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV Dc)**
Location :
Borehole No. **B-60**
Source of Sample **Test Pit Sample**

Depth: **0.00-1.00m**
Date of Test: **2/7/2019**
Tested by: **Pranita Pun**
Checked By: **Dr. Suman Manandhar**

G_s = **2.688**
y_w = **0.9968**
μ = **8.75**
y_c = **0.9968**

Hydrometer No : **1**
Dispersing Agent : **Sodium HM 5%**
Amount : **5 g per 100 cc**
Meniscus correction x 1,000= **0.50**

SOIL SAMPLE WEIGHT

		Tested Sample	Poured off
Container No.		B-21	
Weight of Container + Dry Soil	g	126.1	
Weight of Container	g	76.1	
Weight of Dry Soil, Ws	g	50	
Total Weight Dry Soil	g	50	

Fraction Finer No. 200 Sieve= **27.578**

Date	Time	Hyd. Reading	Elapsed Time, t min	R = 1000 (r-1)	R_w = 1000(y_w-1)	Temp. °c	R-R_w	N= K_1(R-R_w) %	R_c	Z_r cm.	$\sqrt{Z_r(cm)/t(min)}$	D = $K_2\sqrt{Z_r/t}$	N' %
02.07.2019		1.02950	0.15	29.50	-0.90	22	30.40	96.51	30.00	9.04	7.765	0.0977	26.62
		1.02700	0.30	27.00	-0.90	22	27.90	88.57	27.50	9.89	5.742	0.0722	24.43
		1.02550	1.00	25.50	-0.90	22	26.40	83.81	26.00	10.40	3.225	0.0406	23.11
		1.02350	2.00	23.50	-0.90	22	24.40	77.46	24.00	11.08	2.353	0.0296	21.36
		1.02350	2.00	23.50	-0.90	22	24.40	77.46	24.00	7.97	1.996	0.0251	21.36
		1.02000	5.00	20.00	-0.90	22	20.90	66.35	20.50	9.15	1.353	0.0170	18.30
		1.01100	10.00	11.00	-0.90	22	11.90	37.78	11.50	12.20	1.104	0.0139	10.42
		1.00800	20.00	8.00	-0.90	22	8.90	28.25	8.50	13.21	0.813	0.0102	7.79
		1.00650	40.00	6.50	-0.90	22	7.40	23.49	7.00	13.72	0.586	0.0074	6.48
		1.00550	80.00	5.50	-0.90	22	6.40	20.32	6.00	14.06	0.419	0.0053	5.60
		1.00500	160.00	5.00	-0.90	22	5.90	18.73	5.50	14.23	0.298	0.0038	5.17
		1.00450	320.00	4.50	-0.90	22	5.40	17.14	5.00	14.40	0.212	0.0027	4.73
03.07.2019		1.00350	1440.00	3.50	-0.90	22	4.40	13.97	4.00	14.74	0.101	0.0013	3.85

$$K_1 = \frac{y_c \times G_s \times 100}{(G_s - 1) W_s} = 3.1746427$$

$$K_2 = 5.531 \times 10^{-} \sqrt{\frac{\mu}{y_s - y_w}} = 0.0125786$$

y_c = Unit Wt. of water at the temp.of hydrometer calibration, g/cm^3
G_s = Specific gravity of solids
W_s = Wt. Of dry soil, g
μ = Viscosity of water at the temp. of the test, millipoises
y_s = Unit Wt. of soil grains, g/cm^3
y_w = Unit Wt. of water at the temp.of the test, g/cm^3

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ANNEX C4
Specific Gravity Test

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-1** Date: **04/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **3.50-4.50m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	185.94	190.33			
Wt. FLASK+WATER (W2)	GMS	430.12	441.33			
TEMPERATURE (TW)	0C	23.6	23.6			
Wt. FLASK+ WATER + SOIL (WI)	GMS	493.11	503.97			
TEMPERATURE (TS)	0C	24	24			
Wt. DISH+OVEN DRY SOIL		153.71	153.21			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.71**	**100.21**			
G OF WATER AT TS (GW)		0.9974	0.9974			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.663	2.660			
Average		**2.662**				

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-2** Date: **03/04/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **3.50-4.50m** Checked by: **Dr. S. Manandhar**

TEST NO.		4	5	6		
FLASK NO/VOLUME	CCS	30.61	30.24	33.79		
Wt. FLASK+WATER (W2)	GMS	82.21	80.80	83.53		
TEMPERATURE (TW)	0C	21.3	21.3	21.3		
Wt. FLASK+ WATER + SOIL (WI)	GMS	84.29	82.69	86.04		
TEMPERATURE (TS)	0C	22.2	22.2	22.2		
Wt. DISH+OVEN DRY SOIL		56.3	55.994	56.97		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**3.30**	**2.994**	**3.972**		
G OF WATER AT TS (GW)		0.99792	0.99792	0.99792		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.708	2.716	2.719		
Average			**2.714**			

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New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-3** Date: **03/04/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **3.50-4.50m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	31.45	33.18	30.40		
Wt. FLASK+WATER (W2)	GMS	82.994	83.00	83.16		
TEMPERATURE (TW)	0C	21	21	21		
Wt. FLASK+ WATER + SOIL (WI)	GMS	86.70	87.58	88.39		
TEMPERATURE (TS)	0C	21.1	21.1	21.1		
Wt. DISH+OVEN DRY SOIL		58.895	60.300	61.305		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**5.895**	**7.300**	**8.305**		
G OF WATER AT TS (GW)		0.99792	0.99792	0.99792		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.687	2.674	2.690		
Average			**2.684**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-4** Date: **07/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	31.05	32.84	30.14		
Wt. FLASK+WATER (W2)	GMS	82.97	82.836	83.156		
TEMPERATURE (TW)	0C	20.8	20.8	20.8		
Wt. FLASK+ WATER + SOIL (WI)	GMS	89.32	89.18	89.49		
TEMPERATURE (TS)	0C	23.1	23.1	23.1		
Wt. DISH+OVEN DRY SOIL		62.95	63.050	62.910		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**9.950**	**10.050**	**9.910**		
G OF WATER AT TS (GW)		0.99805	0.99805	0.99805		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.765	2.709	2.769		
Average			**2.748**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-5** Date: **08/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	131.95	141.35			
Wt. FLASK+WATER (W2)	GMS	374.06	376.57			
TEMPERATURE (TW)	0C	22.5	22.5			
Wt. FLASK+ WATER + SOIL (WI)	GMS	437.07	439.21			
TEMPERATURE (TS)	0C	24	24			
Wt. DISH+OVEN DRY SOIL		153.91	153.37			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.91**	**100.37**			
G OF WATER AT TS (GW)		0.9977	0.9977			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.656	2.654			
Average		**2.655**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-6** Date: **03/04/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **3.50-4.50m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	30.71	30.28	29.81		
Wt. FLASK+WATER (W2)	GMS	81.080	82.160	80.830		
TEMPERATURE (TW)	0C	21	21	21		
Wt. FLASK+ WATER + SOIL (WI)	GMS	82.38	83.38	82.12		
TEMPERATURE (TS)	0C	24.3	24.3	24.3		
Wt. DISH+OVEN DRY SOIL		55.05	54.930	55.040		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**2.050**	**1.930**	**2.040**		
G OF WATER AT TS (GW)		0.99792	0.99792	0.99792		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.720	2.697	2.700		
Average			**2.706**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-7** Date: **03/04/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **3.50-4.50m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	115.79	145.51			
Wt. FLASK+WATER (W2)	GMS	376.060	404.250			
TEMPERATURE (TW)	0C	24.3	24.3			
Wt. FLASK+ WATER + SOIL (WI)	GMS	407.20	435.92			
TEMPERATURE (TS)	0C	24.4	25.4			
Wt. DISH+OVEN DRY SOIL		103.14	103.730			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**50.140**	**50.730**			
G OF WATER AT TS (GW)		0.99722	0.99722			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.632	2.654			
Average			**2.643**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-8** Date: **07/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		3	4	5		
FLASK NO/VOLUME	CCS	30.14	30.48	30.09		
Wt. FLASK+WATER (W2)	GMS	83.160	82.140	80.460		
TEMPERATURE (TW)	0C	21.3	21.3	21.3		
Wt. FLASK+ WATER + SOIL (WI)	GMS	86.87	86.85	85.78		
TEMPERATURE (TS)	0C	23.8	23.8	23.8		
Wt. DISH+OVEN DRY SOIL		58.8	60.390	61.360		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**5.800**	**7.390**	**8.360**		
G OF WATER AT TS (GW)		0.99805	0.99805	0.99805		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.770	2.752	2.745		
Average			**2.755**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-9** Date: **08/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	128.34	125.97			
Wt. FLASK+WATER (W2)	GMS	351.25	344.63			
TEMPERATURE (TW)	0C	22.8	22.8			
Wt. FLASK+ WATER + SOIL (WI)	GMS	414.22	407.42			
TEMPERATURE (TS)	0C	23	23			
Wt. DISH+OVEN DRY SOIL		153.64	153.31			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.64**	**100.31**			
G OF WATER AT TS (GW)		0.9976	0.9976			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.665	2.667			
Average		**2.666**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-10** Date: **04/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	183.14	204.27	190.30		
Wt. FLASK+WATER (W2)	GMS	733.74	743.78	738.75		
TEMPERATURE (TW)	0C	25.8	26.1	26.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	796.52	806.37	801.49		
TEMPERATURE (TS)	0C	29.1	29.2	29.1		
Wt. DISH+OVEN DRY SOIL		153.62	153.24	153.50		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.62**	**100.24**	**100.5**		
G OF WATER AT TS (GW)		0.9968	0.9968	0.9967		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.651	2.654	2.653		
Average			**2.652**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-11** Date: **04/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	187.05	201.83	195.99		
Wt. FLASK+WATER (W2)	GMS	732.87	738.53	738.14		
TEMPERATURE (TW)	0C	26.3	26.9	26.4		
Wt. FLASK+ WATER + SOIL (WI)	GMS	794.80	800.55	800.53		
TEMPERATURE (TS)	0C	28.4	28.2	28.1		
Wt. DISH+OVEN DRY SOIL		153.05	153.24	153.85		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.05**	**100.24**	**100.85**		
G OF WATER AT TS (GW)		0.9967	0.9965	0.9967		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.616	2.614	2.613		
Average			**2.614**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-12** Date: **05/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	188.70	198.72	195.95		
Wt. FLASK+WATER (W2)	GMS	733.06	735.08	736.72		
TEMPERATURE (TW)	0C	25.5	25.3	25.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	795.67	797.89	799.79		
TEMPERATURE (TS)	0C	26.9	27.1	27.3		
Wt. DISH+OVEN DRY SOIL		153.15	153.34	153.84		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.15**	**100.34**	**100.84**		
G OF WATER AT TS (GW)		0.9969	0.9970	0.9970		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.660	2.665	2.662		
Average			**2.662**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-13** Date: **04/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	200.15	190.08	200.71		
Wt. FLASK+WATER (W2)	GMS	736.65	710.88	750.63		
TEMPERATURE (TW)	0C	26.9	26.5	25.4		
Wt. FLASK+ WATER + SOIL (WI)	GMS	799.05	773.40	813.09		
TEMPERATURE (TS)	0C	28.1	29.2	29.5		
Wt. DISH+OVEN DRY SOIL		153.41	153.67	153.47		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.41**	**100.67**	**100.47**		
G OF WATER AT TS (GW)		0.9965	0.9966	0.9967		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.633	2.630	2.634		
Average			**2.632**			

ICGS Pvt. Ltd.

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-14** Date: **09/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	184.00	205.33	193.49		
Wt. FLASK+WATER (W2)	GMS	733.43	743.65	742.79		
TEMPERATURE (TW)	0C	27.6	27.6	27.3		
Wt. FLASK+ WATER + SOIL (WI)	GMS	795.52	805.71	804.65		
TEMPERATURE (TS)	0C	30.2	29.8	29.9		
Wt. DISH+OVEN DRY SOIL		153.65	153.55	153.15		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.65**	**100.55**	**100.15**		
G OF WATER AT TS (GW)		0.9963	0.9963	0.9964		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.601	2.603	2.606		
Average			**2.603**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-15** Date: **08/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	118.77	119.37	115.72		
Wt. FLASK+WATER (W2)	GMS	374.06	376.57	374.15		
TEMPERATURE (TW)	0C	27.1	27.3	27.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	405.47	408.21	405.62		
TEMPERATURE (TS)	0C	28.3	27.3	28.4		
Wt. DISH+OVEN DRY SOIL		103.11	103.45	103.15		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.11**	**50.45**	**50.15**		
G OF WATER AT TS (GW)		0.9965	0.9964	0.9965		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.670	2.673	2.675		
Average			**2.673**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-16** Date: **09/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	145.33	130.83	139.52		
Wt. FLASK+WATER (W2)	GMS	404.04	371.77	399.22		
TEMPERATURE (TW)	0C	28.3	28.1	28.1		
Wt. FLASK+ WATER + SOIL (WI)	GMS	435.67	403.05	430.83		
TEMPERATURE (TS)	0C	28.6	29.1	29.3		
Wt. DISH+OVEN DRY SOIL		103.74	103.20	103.68		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.74**	**50.2**	**50.68**		
G OF WATER AT TS (GW)		0.9961	0.9962	0.9962		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.645	2.643	2.647		
Average			**2.645**			

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-17** Date: **09/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	187.45	197.69	194.90		
Wt. FLASK+WATER (W2)	GMS	733.03	734.99	736.55		
TEMPERATURE (TW)	0C	25.9	26.5	26.6		
Wt. FLASK+ WATER + SOIL (WI)	GMS	794.82	797.05	798.75		
TEMPERATURE (TS)	0C	29.3	29.5	29.5		
Wt. DISH+OVEN DRY SOIL		153.15	153.46	153.71		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.15**	**100.46**	**100.71**		
G OF WATER AT TS (GW)		0.9968	0.9966	0.9966		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.602	2.607	2.606		
Average			**2.605**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-18** Date: **09/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	200.52	190.26	198.90		
Wt. FLASK+WATER (W2)	GMS	736.6	710.89	747.72		
TEMPERATURE (TW)	0C	28.2	28.2	28.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	798.48	773.26	809.88		
TEMPERATURE (TS)	0C	29.1	29.1	29.1		
Wt. DISH+OVEN DRY SOIL		153.07	153.79	153.31		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.07**	**100.79**	**100.31**		
G OF WATER AT TS (GW)		0.9962	0.9962	0.9962		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.610	2.613	2.619		
Average			**2.614**			

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New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-19** Date: **06/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	145.75	131.08	140.31		
Wt. FLASK+WATER (W2)	GMS	404.19	371.97	399.52		
TEMPERATURE (TW)	0C	25.2	25.5	25.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	435.55	403.48	430.90		
TEMPERATURE (TS)	0C	27.1	27.3	27.1		
Wt. DISH+OVEN DRY SOIL		103.11	103.37	103.19		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.11**	**50.37**	**50.19**		
G OF WATER AT TS (GW)		0.9970	0.9969	0.9970		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.664	2.662	2.660		
Average			**2.662**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-20** Date: **05/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	119.27	120.08	115.83		
Wt. FLASK+WATER (W2)	GMS	375.73	378.37	375.99		
TEMPERATURE (TW)	0C	25.3	25.4	25.3		
Wt. FLASK+ WATER + SOIL (WI)	GMS	407.15	409.83	407.64		
TEMPERATURE (TS)	0C	26.7	26.7	26.6		
Wt. DISH+OVEN DRY SOIL		103.03	103.03	103.03		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.03**	**50.03**	**50.03**		
G OF WATER AT TS (GW)		0.9970	0.9969	0.9970		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.680	2.686	2.714		
Average			**2.693**			

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Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-21** Date: **06/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	183.99	205.01	194.30		
Wt. FLASK+WATER (W2)	GMS	733.76	743.99	743.15		
TEMPERATURE (TW)	0C	24.8	24.7	25.1		
Wt. FLASK+ WATER + SOIL (WI)	GMS	796.82	807.01	805.85		
TEMPERATURE (TS)	0C	26.8	26.6	26.8		
Wt. DISH+OVEN DRY SOIL		153.88	153.67	153.10		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.88**	**100.67**	**100.1**		
G OF WATER AT TS (GW)		0.9971	0.9971	0.9970		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.660	2.666	2.668		
Average			**2.665**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-22** Date: **09/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	118.71	119.05			
Wt. FLASK+WATER (W2)	GMS	375.6	378.2			
TEMPERATURE (TW)	0C	26.2	26.2			
Wt. FLASK+ WATER + SOIL (WI)	GMS	407.76	410.05			
TEMPERATURE (TS)	0C	27.1	27.1			
Wt. DISH+OVEN DRY SOIL		103.79	103.43			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**50.79**	**50.43**			
G OF WATER AT TS (GW)		0.9968	0.9967			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.718	2.705			
Average		**2.711**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-25** Date: **09/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	115.70	145.54			
Wt. FLASK+WATER (W2)	GMS	375.85	404.15			
TEMPERATURE (TW)	0C	26.9	26.9			
Wt. FLASK+ WATER + SOIL (WI)	GMS	406.35	434.81			
TEMPERATURE (TS)	0C	27.6	27.6			
Wt. DISH+OVEN DRY SOIL		103.71	103.95			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**50.71**	**50.95**			
G OF WATER AT TS (GW)		0.9965	0.9965			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.500	2.502			
Average		**2.501**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-26** Date: **09/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	166.11	165.54			
Wt. FLASK+WATER (W2)	GMS	437.68	441.24			
TEMPERATURE (TW)	0C	23.6	23.6			
Wt. FLASK+ WATER + SOIL (WI)	GMS	499.91	503.45			
TEMPERATURE (TS)	0C	24	24			
Wt. DISH+OVEN DRY SOIL		153.19	153.21			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.19**	**100.21**			
G OF WATER AT TS (GW)		0.9974	0.9974			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.632	2.630			
Average		**2.631**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-27** Date: **26/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	118.91	119.40	118.66		
Wt. FLASK+WATER (W2)	GMS	375	377.82	375.01		
TEMPERATURE (TW)	0C	27.8	27.8	27.8		
Wt. FLASK+ WATER + SOIL (WI)	GMS	406.16	409.54	406.24		
TEMPERATURE (TS)	0C	28.9	28.9	28.9		
Wt. DISH+OVEN DRY SOIL		103.04	103.87	103.06		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.04**	**50.87**	**50.06**		
G OF WATER AT TS (GW)		0.9963	0.9963	0.9963		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.641	2.647	2.649		
Average			**2.645**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-28** Date: **26/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	186.64	200.73	195.52		
Wt. FLASK+WATER (W2)	GMS	727.85	733.59	732.82		
TEMPERATURE (TW)	0C	28.3	28.3	28.3		
Wt. FLASK+ WATER + SOIL (WI)	GMS	790.65	796.49	795.90		
TEMPERATURE (TS)	0C	28.9	28.9	28.9		
Wt. DISH+OVEN DRY SOIL		153.55	153.64	153.9		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.55**	**100.64**	**100.9**		
G OF WATER AT TS (GW)		0.9961	0.9961	0.9961		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.653	2.656	2.658		
Average			**2.656**			

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New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-29** Date: **08/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	115.70	145.54			
Wt. FLASK+WATER (W2)	GMS	375.85	404.04			
TEMPERATURE (TW)	0C	26.6	26.6			
Wt. FLASK+ WATER + SOIL (WI)	GMS	407.58	436.05			
TEMPERATURE (TS)	0C	28.1	28.1			
Wt. DISH+OVEN DRY SOIL		103.54	103.94			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**50.54**	**50.94**			
G OF WATER AT TS (GW)		0.9962	0.9962			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.677	2.681			
Average			**2.679**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-30** Date: **10/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	115.69	145.50			
Wt. FLASK+WATER (W2)	GMS	375.55	404			
TEMPERATURE (TW)	0C	26.6	26.6			
Wt. FLASK+ WATER + SOIL (WI)	GMS	407.05	434.85			
TEMPERATURE (TS)	0C	28.9	28.9			
Wt. DISH+OVEN DRY SOIL		103.61	103.00			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**50.61**	**50**			
G OF WATER AT TS (GW)		0.9960	0.9960			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.638	2.601			
Average			**2.619**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-31** Date: **10/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	124.63	125.63			
Wt. FLASK+WATER (W2)	GMS	440.55	448.33			
TEMPERATURE (TW)	0C	25.9	25.9			
Wt. FLASK+ WATER + SOIL (WI)	GMS	520.87	529.25			
TEMPERATURE (TS)	0C	26.3	26.3			
Wt. DISH+OVEN DRY SOIL		181.66	182.79			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**128.66**	**129.79**			
G OF WATER AT TS (GW)		0.9968	0.9968			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.653	2.647			
Average		**2.650**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-32** Date: **05/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	146.34	145.00			
Wt. FLASK+WATER (W2)	GMS	339.12	335.88			
TEMPERATURE (TW)	0C	24.5	24.3			
Wt. FLASK+ WATER + SOIL (WI)	GMS	402.02	398.86			
TEMPERATURE (TS)	0C	25	25			
Wt. DISH+OVEN DRY SOIL		153.63	153.81			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.63**	**100.81**			
G OF WATER AT TS (GW)		0.9972	0.9972			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.660	2.657			
Average		**2.658**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-33** Date: **09/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	125.28	125.91			
Wt. FLASK+WATER (W2)	GMS	438.25	448.36			
TEMPERATURE (TW)	0C	24.8	24.8			
Wt. FLASK+ WATER + SOIL (WI)	GMS	470.11	480.50			
TEMPERATURE (TS)	0C	28.1	28.7			
Wt. DISH+OVEN DRY SOIL		103.33	103.69			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**50.33**	**50.69**			
G OF WATER AT TS (GW)		0.9971	0.9971			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.717	2.725			
Average			**2.721**			

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ANNEX O: List of Community Forest/Leasehold Forest within the ETP Footprint

Annex O Table of Contents

ATTACHMENT	NAME
O-1	List of Community Forest/Leasehold Forest within the ETP Footprint

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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-34** Date: **10/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	119.04	119.56			
Wt. FLASK+WATER (W2)	GMS	375.52	378.09			
TEMPERATURE (TW)	0C	28.6	28.6			
Wt. FLASK+ WATER + SOIL (WI)	GMS	407.11	409.65			
TEMPERATURE (TS)	0C	28.9	28.9			
Wt. DISH+OVEN DRY SOIL		103.99	103.88			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**50.99**	**50.88**			
G OF WATER AT TS (GW)		0.9961	0.9961			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.618	2.623			
Average			**2.621**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-35** Date: **07/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	124.87	126.47			
Wt. FLASK+WATER (W2)	GMS	436.43	446.69			
TEMPERATURE (TW)	0C	27.8	27.8			
Wt. FLASK+ WATER + SOIL (WI)	GMS	504.55	510.05			
TEMPERATURE (TS)	0C	28.3	28.3			
Wt. DISH+OVEN DRY SOIL		165.03	157.31			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**112.03**	**104.31**			
G OF WATER AT TS (GW)		0.9963	0.9963			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.542	2.538			
Average			**2.540**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-36** Date: **10/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	124.81	126.06			
Wt. FLASK+WATER (W2)	GMS	439.31	449.52			
TEMPERATURE (TW)	0C	27.2	27.2			
Wt. FLASK+ WATER + SOIL (WI)	GMS	471.73	481.59			
TEMPERATURE (TS)	0C	28.8	28.8			
Wt. DISH+OVEN DRY SOIL		103.8	103.32			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**50.80**	**50.32**			
G OF WATER AT TS (GW)		0.9965	0.9965			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.754	2.748			
Average			**2.751**			

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Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-38** Date: **07/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	183.81	204.73	193.81		
Wt. FLASK+WATER (W2)	GMS	733.17	743.43	742.85		
TEMPERATURE (TW)	0C	27.5	27.8	26.6		
Wt. FLASK+ WATER + SOIL (WI)	GMS	796.01	805.90	805.25		
TEMPERATURE (TS)	0C	29.6	28.8	29		
Wt. DISH+OVEN DRY SOIL		153.58	153.02	153.01		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.58**	**100.02**	**100.01**		
G OF WATER AT TS (GW)		0.9964	0.9963	0.9966		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.655	2.654	2.650		
Average			**2.653**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-37** Date: **26/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	130.64	130.19			
Wt. FLASK+WATER (W2)	GMS	355.37	358.12			
TEMPERATURE (TW)	0C	22.6	22.6			
Wt. FLASK+ WATER + SOIL (WI)	GMS	417.84	420.81			
TEMPERATURE (TS)	0C	24.3	24.3			
Wt. DISH+OVEN DRY SOIL		153.22	153.59			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.22**	**100.59**			
G OF WATER AT TS (GW)		0.9976	0.9976			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.649	2.648			
Average		**2.648**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-39** Date: **06/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	119.06	119.81	115.82		
Wt. FLASK+WATER (W2)	GMS	375.68	378.25	375.94		
TEMPERATURE (TW)	0C	26.2	26.2	26.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	407.50	409.89	407.70		
TEMPERATURE (TS)	0C	27.6	27.1	27.3		
Wt. DISH+OVEN DRY SOIL		103.60	103.54	103.55		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.60**	**50.54**	**50.55**		
G OF WATER AT TS (GW)		0.9969	0.9969	0.9969		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.686	2.666	2.682		
Average			**2.678**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-40** Date: **07/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	187.36	197.94	194.50		
Wt. FLASK+WATER (W2)	GMS	732.79	735.16	736.93		
TEMPERATURE (TW)	0C	28.2	26.4	26.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	794.85	797.09	798.89		
TEMPERATURE (TS)	0C	31	29.9	30.8		
Wt. DISH+OVEN DRY SOIL		153.48	153.41	153.18		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.48**	**100.41**	**100.18**		
G OF WATER AT TS (GW)		0.9962	0.9967	0.9967		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.605	2.601	2.613		
Average			**2.606**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-41** Date: **26/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	196.16	189.30	200.09		
Wt. FLASK+WATER (W2)	GMS	732.85	710.76	750.05		
TEMPERATURE (TW)	0C	28.2	28.2	28.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	795.33	773.39	812.78		
TEMPERATURE (TS)	0C	29.6	29.6	29.6		
Wt. DISH+OVEN DRY SOIL		153.13	153.55	153.64		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.13**	**100.55**	**100.64**		
G OF WATER AT TS (GW)		0.9961	0.9961	0.9961		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.649	2.641	2.644		
Average			**2.645**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-42** Date: **06/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	115.35	145.14			
Wt. FLASK+WATER (W2)	GMS	375.75	404.12			
TEMPERATURE (TW)	0C	27.5	27.5			
Wt. FLASK+ WATER + SOIL (WI)	GMS	447.35	476.15			
TEMPERATURE (TS)	0C	28.5	28.5			
Wt. DISH+OVEN DRY SOIL		168.11	168.91			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**115.11**	**115.91**			
G OF WATER AT TS (GW)		0.9961	0.9961			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.635	2.631			
Average			**2.633**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-43** Date: **08/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	188.91	199.40	195.93		
Wt. FLASK+WATER (W2)	GMS	732.99	734.98	736.85		
TEMPERATURE (TW)	0C	26.2	27	27		
Wt. FLASK+ WATER + SOIL (WI)	GMS	795.26	796.95	799.01		
TEMPERATURE (TS)	0C	28.8	29	28.9		
Wt. DISH+OVEN DRY SOIL		153.86	153.40	153.60		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.86**	**100.40**	**100.60**		
G OF WATER AT TS (GW)		0.9967	0.9965	0.9965		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.605	2.603	2.608		
Average			**2.605**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-44** Date: **08/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	184.14	205.14	193.83		
Wt. FLASK+WATER (W2)	GMS	733.44	743.85	742.88		
TEMPERATURE (TW)	0C	27.2	27	27.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	796.23	806.69	806.18		
TEMPERATURE (TS)	0C	27.9	27.8	27.9		
Wt. DISH+OVEN DRY SOIL		153.14	153.18	153.97		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.14**	**100.18**	**100.97**		
G OF WATER AT TS (GW)		0.9965	0.9965	0.9965		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.672	2.674	2.671		
Average			**2.672**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-45** Date: **26/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	182.79	204.03	189.17		
Wt. FLASK+WATER (W2)	GMS	733.02	743.20	738.25		
TEMPERATURE (TW)	0C	27.3	27.3	27.3		
Wt. FLASK+ WATER + SOIL (WI)	GMS	795.32	805.87	800.97		
TEMPERATURE (TS)	0C	29.3	29.3	29.3		
Wt. DISH+OVEN DRY SOIL		153.27	153.88	153.76		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.27**	**100.88**	**100.76**		
G OF WATER AT TS (GW)		0.9964	0.9964	0.9964		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.631	2.631	2.639		
Average			**2.634**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-46** Date: **08/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	184.14	183.22			
Wt. FLASK+WATER (W2)	GMS	360.00	358.24			
TEMPERATURE (TW)	0C	20	20			
Wt. FLASK+ WATER + SOIL (WI)	GMS	400.05	399.84			
TEMPERATURE (TS)	0C	20	20			
Wt. DISH+OVEN DRY SOIL		117.59	120.15			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**64.59**	**67.15**			
G OF WATER AT TS (GW)		0.9968	0.9968			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.624	2.620			
Average			**2.622**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-47** Date: **08/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	184.14	183.22			
Wt. FLASK+WATER (W2)	GMS	360.00	358.24			
TEMPERATURE (TW)	0C	20	20			
Wt. FLASK+ WATER + SOIL (WI)	GMS	395.87	392.61			
TEMPERATURE (TS)	0C	20	20			
Wt. DISH+OVEN DRY SOIL		111.14	108.67			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**58.14**	**55.67**			
G OF WATER AT TS (GW)		0.9968	0.9968			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.602	2.605			
Average			**2.604**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-48** Date: **08/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	184.14	183.22			
Wt. FLASK+WATER (W2)	GMS	360.00	358.24			
TEMPERATURE (TW)	0C	20	20			
Wt. FLASK+ WATER + SOIL (WI)	GMS	400.03	392.87			
TEMPERATURE (TS)	0C	20	20			
Wt. DISH+OVEN DRY SOIL		117.45	108.67			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**64.45**	**55.67**			
G OF WATER AT TS (GW)		0.9968	0.9968			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.631	2.637			
Average			**2.634**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-49(Jarsing Pauwa)** Date: **05/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	145.66	130.47	139.09		
Wt. FLASK+WATER (W2)	GMS	404.16	371.95	399.45		
TEMPERATURE (TW)	0C	26.3	26.3	26.4		
Wt. FLASK+ WATER + SOIL (WI)	GMS	435.66	403.21	430.59		
TEMPERATURE (TS)	0C	26.6	27	26.8		
Wt. DISH+OVEN DRY SOIL		103.51	103.20	103.03		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.51**	**50.20**	**50.03**		
G OF WATER AT TS (GW)		0.9967	0.9967	0.9967		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.648	2.642	2.640		
Average			**2.643**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-50** Date: **0706/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	200.62	190.84	198.86		
Wt. FLASK+WATER (W2)	GMS	736.57	710.73	747.55		
TEMPERATURE (TW)	0C	28.2	28.3	28.4		
Wt. FLASK+ WATER + SOIL (WI)	GMS	799.25	773.76	810.40		
TEMPERATURE (TS)	0C	29.2	30.3	30.2		
Wt. DISH+OVEN DRY SOIL		153.11	153.64	153.32		
Wt. DISH		53	53	53		
Wt. OVEN DRY SOIL (WS)		**100.11**	**100.64**	**100.32**		
G OF WATER AT TS (GW)		0.9962	0.9961	0.9961		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.664	2.666	2.667		
Average			**2.666**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-51** Date: **08/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	118.53	118.99			
Wt. FLASK+WATER (W2)	GMS	375.6	378.31			
TEMPERATURE (TW)	0C	25.6	27.5			
Wt. FLASK+ WATER + SOIL (WI)	GMS	447.15	449.63			
TEMPERATURE (TS)	0C	27.8	27.8			
Wt. DISH+OVEN DRY SOIL		167.75	167.53			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**114.75**	**114.53**			
G OF WATER AT TS (GW)		0.9969	0.9969			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.648	2.642			
Average			**2.645**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-52** Date: **06/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	118.46	118.72			
Wt. FLASK+WATER (W2)	GMS	375.47	377.99			
TEMPERATURE (TW)	0C	28.3	28.3			
Wt. FLASK+ WATER + SOIL (WI)	GMS	407.10	409.62			
TEMPERATURE (TS)	0C	29.3	29.3			
Wt. DISH+OVEN DRY SOIL		103.55	103.60			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**50.55**	**50.60**			
G OF WATER AT TS (GW)		0.9958	0.9958			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.661	2.656			
Average			**2.658**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-53** Date: **27/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	113.69	116.08	117.33		
Wt. FLASK+WATER (W2)	GMS	377.06	374.56	379.78		
TEMPERATURE (TW)	0C	27.2	27.2	27.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	408.66	406.20	411.67		
TEMPERATURE (TS)	0C	29.6	29.6	29.6		
Wt. DISH+OVEN DRY SOIL		103.35	103.48	103.78		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.35**	**50.48**	**50.78**		
G OF WATER AT TS (GW)		0.9965	0.9965	0.9965		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.676	2.670	2.679		
Average		**2.675**				

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-54** Date: **08/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	124.86	126.39			
Wt. FLASK+WATER (W2)	GMS	438.1	448.61			
TEMPERATURE (TW)	0C	27.1	27.1			
Wt. FLASK+ WATER + SOIL (WI)	GMS	505.70	516.10			
TEMPERATURE (TS)	0C	29.3	28.3			
Wt. DISH+OVEN DRY SOIL		160.79	160.67			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**107.79**	**107.67**			
G OF WATER AT TS (GW)		0.9965	0.9965			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.673	2.670			
Average			**2.671**			

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-55** Date: **09/05/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	133.86	129.61			
Wt. FLASK+WATER (W2)	GMS	375.85	374.92			
TEMPERATURE (TW)	0C	23.2	23.2			
Wt. FLASK+ WATER + SOIL (WI)	GMS	438.12	437.24			
TEMPERATURE (TS)	0C	27.6	27.6			
Wt. DISH+OVEN DRY SOIL		153.22	153.41			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.22**	**100.41**			
G OF WATER AT TS (GW)		0.9975	0.9975			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.634	2.630			
Average		**2.632**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-56** Date: **08/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	170.64	169.43			
Wt. FLASK+WATER (W2)	GMS	352.37	353.11			
TEMPERATURE (TW)	0C	22.3	22.3			
Wt. FLASK+ WATER + SOIL (WI)	GMS	415.12	415.84			
TEMPERATURE (TS)	0C	23.1	23.1			
Wt. DISH+OVEN DRY SOIL		153.44	153.39			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.44**	**100.39**			
G OF WATER AT TS (GW)		0.9977	0.9977			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.659	2.660			
Average		**2.659**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-57** Date: **04/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	196.43	189.45	200.47		
Wt. FLASK+WATER (W2)	GMS	733.59	711.27	750.63		
TEMPERATURE (TW)	0C	24.6	24.8	25.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	795.91	773.63	813.02		
TEMPERATURE (TS)	0C	29.8	29.9	30.2		
Wt. DISH+OVEN DRY SOIL		153.37	153.22	153.44		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.37**	**100.22**	**100.44**		
G OF WATER AT TS (GW)		0.9971	0.9971	0.9970		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.630	2.639	2.632		
Average			**2.634**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-58** Date: **09/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	200.63	189.96	199.03		
Wt. FLASK+WATER (W2)	GMS	**736.71**	**710.91**	**747.27**		
TEMPERATURE (TW)	0C	26.8	27.2	27.3		
Wt. FLASK+ WATER + SOIL (WI)	GMS	**799.50**	**773.50**	**810.15**		
TEMPERATURE (TS)	0C	27	27.2	26.9		
Wt. DISH+OVEN DRY SOIL		153.49	153.24	153.69		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.49**	**100.24**	**100.69**		
G OF WATER AT TS (GW)		0.9966	0.9965	0.9964		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.656	2.653	2.654		
Average			**2.654**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-59** Date: **04/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	183.80	205.58	194.27		
Wt. FLASK+WATER (W2)	GMS	733.01	743.25	742.2		
TEMPERATURE (TW)	0C	27.5	27.9	27.3		
Wt. FLASK+ WATER + SOIL (WI)	GMS	795.68	806.32	805.10		
TEMPERATURE (TS)	0C	29.8	29.6	29.9		
Wt. DISH+OVEN DRY SOIL		153.14	153.76	153.39		
Wt. DISH		53	53	53		
Wt. OVEN DRY SOIL (WS)		**100.14**	**100.76**	**100.39**		
G OF WATER AT TS (GW)		0.9964	0.9963	0.9964		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.663	2.663	2.668		
Average		**2.665**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-60** Date: **05/06/2019**

Source: Test Pit Sample Tested By: **Pranita Pun**

Depth: **0.00-1.00m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	200.88	190.24	199.22		
Wt. FLASK+WATER (W2)	GMS	**736.82**	**711.06**	**747.88**		
TEMPERATURE (TW)	0C	25.4	25.4	25.6		
Wt. FLASK+ WATER + SOIL (WI)	GMS	**799.30**	**773.37**	**810.22**		
TEMPERATURE (TS)	0C	27.6	28.1	27.9		
Wt. DISH+OVEN DRY SOIL		153.5	153.25	153.32		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**100.50**	**100.25**	**100.32**		
G OF WATER AT TS (GW)		0.9969	0.9969	0.9969		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.635	2.634	2.633		
Average			**2.634**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-1** Date: **03/04/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00- 3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		7	8	9		
FLASK NO/VOLUME	CCS	30.79	30.33	29.74		
Wt. FLASK+WATER (W2)	GMS	81.18	82.12	80.83		
TEMPERATURE (TW)	0C	24.3	24.3	24.3		
Wt. FLASK+ WATER + SOIL (WI)	GMS	83.04	84.24	83.08		
TEMPERATURE (TS)	0C	23	23	23		
Wt. DISH+OVEN DRY SOIL		55.97	56.39	56.59		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**2.97**	**3.39**	**3.59**		
G OF WATER AT TS (GW)		0.9972	0.9972	0.9972		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.668	2.653	2.674		
Average		**2.665**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-2** Date: **27/6/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00- 3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		7	8	9		
FLASK NO/VOLUME	CCS	31.34	32.89	30.36		
Wt. FLASK+WATER (W2)	GMS	83.04	83.08	83.1		
TEMPERATURE (TW)	0C	24.2	24.2	24.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	84.95	85.36	85.65		
TEMPERATURE (TS)	0C	20.7	20.7	20.7		
Wt. DISH+OVEN DRY SOIL		56.02	56.60	57.02		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**3.020**	**3.598**	**4.020**		
G OF WATER AT TS (GW)		0.9972	0.9972	0.9972		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.713	2.722	2.729		
Average			**2.722**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-3** Date: **05/04/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00- 3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	31.36	32.89	30.44		
Wt. FLASK+WATER (W2)	GMS	82.97	82.92	83.18		
TEMPERATURE (TW)	0C	20.8	20.8	20.8		
Wt. FLASK+ WATER + SOIL (WI)	GMS	84.71	84.64	84.96		
TEMPERATURE (TS)	0C	22.6	22.6	22.6		
Wt. DISH+OVEN DRY SOIL		55.78	55.75	55.85		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**2.780**	**2.750**	**2.850**		
G OF WATER AT TS (GW)		0.9980	0.9980	0.9980		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.668	2.665	2.668		
Average		**2.667**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-4** Date: **05/04/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00- 3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		4	5	6		
FLASK NO/VOLUME	CCS	30.64	30.30	33.65		
Wt. FLASK+WATER (W2)	GMS	82.27	80.49	83.52		
TEMPERATURE (TW)	0C	19.6	19.6	19.6		
Wt. FLASK+ WATER + SOIL (WI)	GMS	83.98	82.93	85.58		
TEMPERATURE (TS)	0C	20.1	20.1	20.1		
Wt. DISH+OVEN DRY SOIL		55.725	56.91	56.305		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**2.725**	**3.910**	**3.305**		
G OF WATER AT TS (GW)		0.9983	0.9983	0.9983		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.688	2.657	2.650		
Average		**2.665**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-5** Date: **05/04/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00- 3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		4	5	6		
FLASK NO/VOLUME	CCS	25.41	31.41	17.32		
Wt. FLASK+WATER (W2)	GMS	84.54	82.31	43.99		
TEMPERATURE (TW)	0C	21.1	21.1	21.1		
Wt. FLASK+ WATER + SOIL (WI)	GMS	86.33	84.01	45.12		
TEMPERATURE (TS)	0C	21.4	21.4	21.4		
Wt. DISH+OVEN DRY SOIL		55.78	55.65	54.759		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**2.780**	**2.650**	**1.759**		
G OF WATER AT TS (GW)		0.9983	0.9983	0.9983		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.789	2.785	2.770		
Average			**2.781**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-6** Date: **05/04/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00- 3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		7	8	9		
FLASK NO/VOLUME	CCS	30.80	30.37	29.71		
Wt. FLASK+WATER (W2)	GMS	81.11	82.14	80.814		
TEMPERATURE (TW)	0C	20.3	20.3	20.3		
Wt. FLASK+ WATER + SOIL (WI)	GMS	82.82	83.88	82.47		
TEMPERATURE (TS)	0C	20.7	20.7	20.7		
Wt. DISH+OVEN DRY SOIL		55.716	55.726	55.709		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**2.716**	**2.726**	**2.709**		
G OF WATER AT TS (GW)		0.9981	0.9981	0.9981		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.671	2.735	2.556		
Average		**2.654**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-7** Date: **06/04/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00- 3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		4	5	6		
FLASK NO/VOLUME	CCS	30.69	30.26	33.82		
Wt. FLASK+WATER (W2)	GMS	82.10	80.44	83.564		
TEMPERATURE (TW)	0C	20.9	20.9	20.9		
Wt. FLASK+ WATER + SOIL (WI)	GMS	83.58	82.20	84.94		
TEMPERATURE (TS)	0C	24.2	24.2	24.2		
Wt. DISH+OVEN DRY SOIL		55.320	55.770	55.168		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**2.320**	**2.770**	**2.168**		
G OF WATER AT TS (GW)		0.9981	0.9981	0.9981		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.744	2.727	2.732		
Average		**2.734**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-8** Date: **06/04/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00- 3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	31.29	32.90	30.30		
Wt. FLASK+WATER (W2)	GMS	82.96	82.92	83.14		
TEMPERATURE (TW)	0C	27.80	27.80	27.80		
Wt. FLASK+ WATER + SOIL (WI)	GMS	89.21	89.21	89.46		
TEMPERATURE (TS)	0C	28.70	28.70	28.70		
Wt. DISH+OVEN DRY SOIL		62.930	63.000	63.05		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**9.930**	**10.000**	**10.050**		
G OF WATER AT TS (GW)		0.9963	0.9963	0.9963		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.688	2.685	2.684		
Average		**2.686**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-12** Date: **10/07/2019**

Source **SPT** Tested By: **Pranita Pun**

Depth: **4.00- 4.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	200.68	190.15			
Wt. FLASK+WATER (W2)	GMS	737.23	711.32			
TEMPERATURE (TW)	0C	24.3	24.3			
Wt. FLASK+ WATER + SOIL (WI)	GMS	799.30	773.66			
TEMPERATURE (TS)	0C	25.3	25.3			
Wt. DISH+OVEN DRY SOIL		153.11	153.67			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.11**	**100.67**			
G OF WATER AT TS (GW)		0.9972	0.9972			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.624	2.619			
Average		**2.622**				

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INTERRNATIONAL 2000

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-13** Date: **28/6/2019**

Sample: **SPT Sample** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	118.89	119.30			
Wt. FLASK+WATER (W2)	GMS	375.16	378.16			
TEMPERATURE (TW)	0C	28.9	28.9			
Wt. FLASK+ WATER + SOIL (WI)	GMS	437.34	440.38			
TEMPERATURE (TS)	0C	29.3	29.3			
Wt. DISH+OVEN DRY SOIL		153.76	153.91			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.76**	**100.91**			
G OF WATER AT TS (GW)		0.9960	0.9960			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.601	2.598			
Average		**2.600**				

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New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-15** Date: **10/07/2019**

Source **SPT** Tested By: **Pranita Pun**

Depth: **1.00- 1.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	119.14	119.77			
Wt. FLASK+WATER (W2)	GMS	375.75	378.38			
TEMPERATURE (TW)	0C	24.3	24.3			
Wt. FLASK+ WATER + SOIL (Wl)	GMS	438.14	441.02			
TEMPERATURE (TS)	0C	25.4	25.4			
Wt. DISH+OVEN DRY SOIL		153.42	153.87			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.42**	**100.87**			
G OF WATER AT TS (GW)		0.9972	0.9972			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.633	2.631			
Average		**2.632**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-16** Date: **27/6/2019**

Source **SPT** Tested By: **Pranita Pun**

Depth: **3.00- 3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		10	11	12		
FLASK NO/VOLUME	CCS	112.06	118.25	117.20		
Wt. FLASK+WATER (W2)	GMS	374.55	375.25	379.82		
TEMPERATURE (TW)	0C	28.2	28.2	28.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	405.77	406.48	411.32		
TEMPERATURE (TS)	0C	29.7	29.8	29.7		
Wt. DISH+OVEN DRY SOIL		103.32	103.30	103.79		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.32**	**50.30**	**50.79**		
G OF WATER AT TS (GW)		0.9962	0.9962	0.9962		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.624	2.628	2.623		
Average		**2.625**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-20** Date: **28/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	118.89	119.30	115.43		
Wt. FLASK+WATER (W2)	GMS	375.55	378.16	375.89		
TEMPERATURE (TW)	0C	28.9	28.9	28.9		
Wt. FLASK+ WATER + SOIL (WI)	GMS	407.59	409.84	407.89		
TEMPERATURE (TS)	0C	29.3	29.2	29.1		
Wt. DISH+OVEN DRY SOIL		103.65	103.01	103.59		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.65**	**50.01**	**50.59**		
G OF WATER AT TS (GW)		0.9960	0.9960	0.9960		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.711	2.717	2.710		
Average		**2.713**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-21** Date: **28/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		4	5	6		
FLASK NO/VOLUME	CCS	145.38	130.58	139.58		
Wt. FLASK+WATER (W2)	GMS	403.87	371.66	399.18		
TEMPERATURE (TW)	0C	28.9	28.9	28.9		
Wt. FLASK+ WATER + SOIL (WI)	GMS	435.99	403.68	430.93		
TEMPERATURE (TS)	0C	31.8	31.8	31.8		
Wt. DISH+OVEN DRY SOIL		103.8	103.72	103.25		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.80**	**50.72**	**50.25**		
G OF WATER AT TS (GW)		0.9960	0.9960	0.9960		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.709	2.701	2.705		
Average		**2.705**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-22** Date: **25/6/2019**

Source **SPT** Tested By: **Pranita Pun**

Depth: **2.00- 2.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		10	11			
FLASK NO/VOLUME	CCS	112.06	118.25			
Wt. FLASK+WATER (W2)	GMS	374.55	375.25			
TEMPERATURE (TW)	0C	28.2	28.2			
Wt. FLASK+ WATER + SOIL (WI)	GMS	436.76	437.51			
TEMPERATURE (TS)	0C	29.7	29.8			
Wt. DISH+OVEN DRY SOIL		153.32	153.30			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.32**	**100.30**			
G OF WATER AT TS (GW)		0.9962	0.9962			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.622	2.627			
Average		**2.624**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-26** Date: **29/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		10	11	12		
FLASK NO/VOLUME	CCS	111.94	117.91	117.04		
Wt. FLASK+WATER (W2)	GMS	374.44	375.15	379.71		
TEMPERATURE (TW)	0C	29.7	29.7	29.7		
Wt. FLASK+ WATER + SOIL (WI)	GMS	406.07	407.09	411.36		
TEMPERATURE (TS)	0C	30.2	30.2	30		
Wt. DISH+OVEN DRY SOIL		103.30	103.72	103.30		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.30**	**50.72**	**50.30**		
G OF WATER AT TS (GW)		0.9957	0.9957	0.9957		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.683	2.689	2.686		
Average			**2.686**			

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-27** Date: **10/07/2019**

Source **SPT** Tested By: **Pranita Pun**

Depth: **1.00- 1.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	200.68	190.15			
Wt. FLASK+WATER (W2)	GMS	721.86	734.57			
TEMPERATURE (TW)	0C	24.3	24.3			
Wt. FLASK+ WATER + SOIL (WI)	GMS	784.72	797.06			
TEMPERATURE (TS)	0C	25.3	25.3			
Wt. DISH+OVEN DRY SOIL		153.95	153.34			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.95**	**100.34**			
G OF WATER AT TS (GW)		0.9972	0.9972			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.643	2.644			
Average		**2.643**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-28** Date: **10/07/2019**

Source **SPT** Tested By: **Pranita Pun**

Depth: **4.00- 4.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	119.14	119.77			
Wt. FLASK+WATER (W2)	GMS	375.75	378.38			
TEMPERATURE (TW)	0C	24.3	24.3			
Wt. FLASK+ WATER + SOIL (WI)	GMS	438.79	441.05			
TEMPERATURE (TS)	0C	25.4	25.4			
Wt. DISH+OVEN DRY SOIL		153.99	153.46			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.99**	**100.46**			
G OF WATER AT TS (GW)		0.9972	0.9972			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.654	2.651			
Average		**2.652**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-29** Date: **29/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		4	5	6		
FLASK NO/VOLUME	CCS	145.75	130.55	139.60		
Wt. FLASK+WATER (W2)	GMS	404.06	371.85	399.34		
TEMPERATURE (TW)	0C	28.2	28.2	28.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	435.45	403.42	430.69		
TEMPERATURE (TS)	0C	30.8	30.7	30.8		
Wt. DISH+OVEN DRY SOIL		103.43	103.81	103.42		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.43**	**50.81**	**50.42**		
G OF WATER AT TS (GW)		0.9962	0.9962	0.9962		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.639	2.631	2.634		
Average		**2.634**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-31** Date: **27/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		7	8	9		
FLASK NO/VOLUME	CCS	113.61	116.06	117.27		
Wt. FLASK+WATER (W2)	GMS	377	374.44	379.69		
TEMPERATURE (TW)	0C	28.2	28.2	28.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	408.25	405.67	410.91		
TEMPERATURE (TS)	0C	29.7	29.8	29.7		
Wt. DISH+OVEN DRY SOIL		103.29	103.23	103.22		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**50.29**	**50.23**	**50.22**		
G OF WATER AT TS (GW)		0.9962	0.9962	0.9962		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.631	2.634	2.633		
Average		**2.633**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-34** Date: **29/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	115.65	113.79			
Wt. FLASK+WATER (W2)	GMS	373.77	375.58			
TEMPERATURE (TW)	0C	24.1	24.1			
Wt. FLASK+ WATER + SOIL (WI)	GMS	436.37	438.11			
TEMPERATURE (TS)	0C	31.7	31.7			
Wt. DISH+OVEN DRY SOIL		153.26	153.11			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		100.26	100.11			
G OF WATER AT TS (GW)		0.9973	0.9973			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.655	2.657			
Average		**2.656**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-35** Date: **27/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	113.61	116.06			
Wt. FLASK+WATER (W2)	GMS	375.37	372.11			
TEMPERATURE (TW)	0C	23.5	23.2			
Wt. FLASK+ WATER + SOIL (WI)	GMS	438.18	435.07			
TEMPERATURE (TS)	0C	25.1	25.1			
Wt. DISH+OVEN DRY SOIL		153.64	153.79			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.64**	**100.79**			
G OF WATER AT TS (GW)		0.9974	0.9974			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.653	2.657			
Average		**2.655**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-37** Date: **27/6/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	119.39	119.73			
Wt. FLASK+WATER (W2)	GMS	377.09	378.21			
TEMPERATURE (TW)	0C	22.6	22.6			
Wt. FLASK+ WATER + SOIL (WI)	GMS	440.08	441.00			
TEMPERATURE (TS)	0C	30.1	30.1			
Wt. DISH+OVEN DRY SOIL		153.91	153.55			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.91**	**100.55**			
G OF WATER AT TS (GW)		0.9976	0.9976			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.655	2.657			
Average		**2.656**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-38** Date: **10/07/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depath **3.00- 3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		3	4			
FLASK NO/VOLUME	CCS	119.14	119.77			
Wt. FLASK+WATER (W2)	GMS	375.75	378.38			
TEMPERATURE (TW)	0C	24.3	24.3			
Wt. FLASK+ WATER + SOIL (WI)	GMS	406.79	409.55			
TEMPERATURE (TS)	0C	25.4	25.4			
Wt. DISH+OVEN DRY SOIL		103.03	103.17			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**50.03**	**50.17**			
G OF WATER AT TS (GW)		0.9972	0.9972			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.627	2.633			
Average		**2.630**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-39** Date: **29/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		10	11			
FLASK NO/VOLUME	CCS	141.32	135.24			
Wt. FLASK+WATER (W2)	GMS	379.44	383.15			
TEMPERATURE (TW)	0C	29.7	29.7			
Wt. FLASK+ WATER + SOIL (WI)	GMS	442.45	446.25			
TEMPERATURE (TS)	0C	30.2	30.2			
Wt. DISH+OVEN DRY SOIL		153.24	153.44			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.24**	**100.44**			
G OF WATER AT TS (GW)		0.9957	0.9957			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.681	2.678			
Average		**2.680**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-40** Date: **29/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 2.00-2.45 Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	131.19	128.27			
Wt. FLASK+WATER (W2)	GMS	371.77	373.64			
TEMPERATURE (TW)	0C	29.7	29.7			
Wt. FLASK+ WATER + SOIL (WI)	GMS	434.37	436.09			
TEMPERATURE (TS)	0C	30.2	30.2			
Wt. DISH+OVEN DRY SOIL		153.95	153.73			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.95**	**100.73**			
G OF WATER AT TS (GW)		0.9957	0.9957			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.621	2.620			
Average		**2.621**				

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-41** Date: **10/07/2019**

Sample **SPT** Tested By: **Pranita Pun**

Depath **3.00- 3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	204.54	203.74			
Wt. FLASK+WATER (W2)	GMS	737.23	731.32			
TEMPERATURE (TW)	0C	24.3	24.3			
Wt. FLASK+ WATER + SOIL (WI)	GMS	800.03	793.74			
TEMPERATURE (TS)	0C	25.3	25.3			
Wt. DISH+OVEN DRY SOIL		153.86	153.22			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.86**	**100.22**			
G OF WATER AT TS (GW)		0.9972	0.9972			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.643	2.644			
Average		**2.643**				

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-44** Date: **28/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	158.34	148.38			
Wt. FLASK+WATER (W2)	GMS	422.12	419.66			
TEMPERATURE (TW)	0C	24.2	24.2			
Wt. FLASK+ WATER + SOIL (WI)	GMS	485.54	482.68			
TEMPERATURE (TS)	0C	31.8	31.8			
Wt. DISH+OVEN DRY SOIL		153.67	153.11			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.67**	**100.11**			
G OF WATER AT TS (GW)		0.9972	0.9972			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.695	2.692			
Average		**2.693**				

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-49** Date: **29/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	145.61	143.78			
Wt. FLASK+WATER (W2)	GMS	404.06	403.85			
TEMPERATURE (TW)	0C	23.2	23.2			
Wt. FLASK+ WATER + SOIL (WI)	GMS	466.71	466.42			
TEMPERATURE (TS)	0C	25.1	25.1			
Wt. DISH+OVEN DRY SOIL		153.57	153.39			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.57**	**100.39**			
G OF WATER AT TS (GW)		0.9975	0.9975			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.646	2.648			
Average		**2.647**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-52** Date: **27/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 2.00-2.45m Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	145.12	148.73			
Wt. FLASK+WATER (W2)	GMS	382.66	385.94			
TEMPERATURE (TW)	0C	23.3	23.3			
Wt. FLASK+ WATER + SOIL (WI)	GMS	445.54	448.68			
TEMPERATURE (TS)	0C	23.8	23.8			
Wt. DISH+OVEN DRY SOIL		153.88	153.61			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.88**	**100.61**			
G OF WATER AT TS (GW)		0.9975	0.9975			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.648	2.650			
Average		**2.649**				

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Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-54** Date: **29/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: **3.00-3.45m** Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	137.11	132.52			
Wt. FLASK+WATER (W2)	GMS	371.45	370.49			
TEMPERATURE (TW)	0C	22.9	22.9			
Wt. FLASK+ WATER + SOIL (WI)	GMS	434.36	433.64			
TEMPERATURE (TS)	0C	31.7	31.7			
Wt. DISH+OVEN DRY SOIL		153.36	153.67			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		100.36	100.67			
G OF WATER AT TS (GW)		0.9976	0.9976			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.673	2.677			
Average		**2.675**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-55** Date: **29/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		7	8	9		
FLASK NO/VOLUME	CCS	115.65	113.79	117.35		
Wt. FLASK+WATER (W2)	GMS	373.92	377.06	379.47		
TEMPERATURE (TW)	0C	28.9	28.9	28.9		
Wt. FLASK+ WATER + SOIL (WI)	GMS	405.70	408.93	411.26		
TEMPERATURE (TS)	0C	31.7	31.7	31.7		
Wt. DISH+OVEN DRY SOIL		103.08	103.25	103.08		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		50.08	50.25	50.08		
G OF WATER AT TS (GW)		0.9960	0.9960	0.9960		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.726	2.723	2.727		
Average		**2.725**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-56** Date: **27/6/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	131.55	131.12			
Wt. FLASK+WATER (W2)	GMS	358.10	362.34			
TEMPERATURE (TW)	0C	22.2	22.2			
Wt. FLASK+ WATER + SOIL (WI)	GMS	420.79	424.69			
TEMPERATURE (TS)	0C	33.1	23.1			
Wt. DISH+OVEN DRY SOIL		153.69	153.23			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.69**	**100.23**			
G OF WATER AT TS (GW)		0.9977	0.9977			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.644	2.640			
Average		**2.642**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-57** Date: **29/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 5.00-5.45m Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	135.66	138.19			
Wt. FLASK+WATER (W2)	GMS	360.59	363.33			
TEMPERATURE (TW)	0C	24.1	24.1			
Wt. FLASK+ WATER + SOIL (WI)	GMS	423.62	426.24			
TEMPERATURE (TS)	0C	25.7	25.7			
Wt. DISH+OVEN DRY SOIL		153.94	153.76			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		100.94	100.76			
G OF WATER AT TS (GW)		0.9973	0.9973			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.655	2.655			
Average		**2.655**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-58** Date: **27/6/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	119.39	119.73	116.19		
Wt. FLASK+WATER (W2)	GMS	375.66	378.29	375.97		
TEMPERATURE (TW)	0C	28.2	28.2	28.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	394.74	397.44	395.18		
TEMPERATURE (TS)	0C	30.1	30.1	30.2		
Wt. DISH+OVEN DRY SOIL		83.40	83.54	83.64		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**30.40**	**30.54**	**30.64**		
G OF WATER AT TS (GW)		0.9962	0.9962	0.9962		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.675	2.671	2.670		
Average		**2.672**				

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-55** Date: **29/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

B. FINE AGGREGATE AND FINE SOIL (SAMPLE SIZE OF 125 GMS< NO. 4 FOR 500 C.C. FLASK)

TEST NO.		7	8	9		
FLASK NO/VOLUME	CCS	115.65	113.79	117.35		
Wt. FLASK+WATER (W2)	GMS	373.92	377.06	379.47		
TEMPERATURE (TW)	0C	28.9	28.9	28.9		
Wt. FLASK+ WATER + SOIL (WI)	GMS	405.70	408.93	411.26		
TEMPERATURE (TS)	0C	31.7	31.7	31.7		
Wt. DISH+OVEN DRY SOIL		103.08	103.25	103.08		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		50.08	50.25	50.08		
G OF WATER AT TS (GW)		0.9960	0.9960	0.9960		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.726	2.723	2.727		
Average		**2.725**				

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SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-56** Date: **27/6/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	131.55	131.12			
Wt. FLASK+WATER (W2)	GMS	358.10	362.34			
TEMPERATURE (TW)	0C	22.2	22.2			
Wt. FLASK+ WATER + SOIL (WI)	GMS	420.79	424.69			
TEMPERATURE (TS)	0C	33.1	23.1			
Wt. DISH+OVEN DRY SOIL		153.69	153.23			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		**100.69**	**100.23**			
G OF WATER AT TS (GW)		0.9977	0.9977			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.644	2.640			
Average		**2.642**				

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-57** Date: **29/6/2019**

Sample: **SPT** Tested By: **Pranita Pun**

Depth: 5.00-5.45m Checked by: **Dr. S. Manandhar**

TEST NO.		1	2			
FLASK NO/VOLUME	CCS	135.66	138.19			
Wt. FLASK+WATER (W2)	GMS	360.59	363.33			
TEMPERATURE (TW)	0C	24.1	24.1			
Wt. FLASK+ WATER + SOIL (WI)	GMS	423.62	426.24			
TEMPERATURE (TS)	0C	25.7	25.7			
Wt. DISH+OVEN DRY SOIL		153.94	153.76			
Wt. DISH		53.00	53.00			
Wt. OVEN DRY SOIL (WS)		100.94	100.76			
G OF WATER AT TS (GW)		0.9973	0.9973			
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.655	2.655			
Average		**2.655**				

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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

SPECIFIC GRAVITY

Project : **MCA Nepal Soil Investigation forTransmission Line (400KV DC)**

Borehole No. **B-58** Date: **27/6/2019**

Source: **SPT** Tested By: **Pranita Pun**

Depth: 3.00-3.45m Checked by: **Dr. S. Manandhar**

TEST NO.		1	2	3		
FLASK NO/VOLUME	CCS	119.39	119.73	116.19		
Wt. FLASK+WATER (W2)	GMS	375.66	378.29	375.97		
TEMPERATURE (TW)	0C	28.2	28.2	28.2		
Wt. FLASK+ WATER + SOIL (WI)	GMS	394.74	397.44	395.18		
TEMPERATURE (TS)	0C	30.1	30.1	30.2		
Wt. DISH+OVEN DRY SOIL		83.40	83.54	83.64		
Wt. DISH		53.00	53.00	53.00		
Wt. OVEN DRY SOIL (WS)		**30.40**	**30.54**	**30.64**		
G OF WATER AT TS (GW)		0.9962	0.9962	0.9962		
BULK G (OVEN DRY)=GW WS/(WS-W1+W2)		2.675	2.671	2.670		
Average			**2.672**			

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ANNEX C5
Loose Bulk Density Test

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676, 4106966

LOOSE BULK DENSITY TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-1** Date: **31/05/2019**

Depth : **3.00 - 3.45m** Tested By: **Pranita Pun**

Source: **SPT** Checked By: Dr. Suman Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	940	920
Wt. OF MOULD	GMS	645	645
WT. OF LOOSE SAMPLE	GMS	295	275
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.336	1.246
Average		1.291	

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New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676, 4106966

LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-2	Date:	31/05/2019
Depth :	3.00 - 3.45m	Tested By:	Pranita Pun
Source:	SPT	Checked By:	Dr. Suman Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	927.99	929.14
Wt. OF MOULD	GMS	645	645
WT. OF LOOSE SAMPLE	GMS	282.99	284.14
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.282	1.287
Average		1.284	

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676, 4106966

LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-3 Date: 31/05/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. Suman Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	921.54	923.17
Wt. OF MOULD	GMS	645	645
WT. OF LOOSE SAMPLE	GMS	276.54	278.17
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.253	1.260
Average	1.256		

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676, 4106966

LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-4	Date:	31/05/2019
Depth :	3.00 - 3.45m	Tested By:	Pranita Pun
Source:	SPT	Checked By:	Dr. Suman Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	927.33	925.03
Wt. OF MOULD	GMS	645	645
WT. OF LOOSE SAMPLE	GMS	282.33	280.03
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.279	1.268
Average		1.274	

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New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676, 4106966

LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-5	Date:	31/05/2019
Depth :	3.00 - 3.45m	Tested By:	Pranita Pun
Source:	SPT	Checked By:	Dr. Suman Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	821.87	822.25
Wt. OF MOULD	GMS	645	645
WT. OF LOOSE SAMPLE	GMS	176.87	177.25
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	0.801	0.803
Average		0.802	

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Tel.: 977-01- 4106676, 4106966

LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-6	Date:	31/05/2019
Depth :	3.00 - 3.45m	Tested By:	Pranita Pun
Source:	SPT	Checked By:	Dr. Suman Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	817.55	820.10
Wt. OF MOULD	GMS	645	645
WT. OF LOOSE SAMPLE	GMS	172.55	175.1
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	0.782	0.793
Average		0.787	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-7	Date:	31/05/2019
Depth :	3.00 - 3.45m	Tested By:	Pranita Pun
Source:	SPT	Checked By:	Dr. Suman Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	821.55	820.34
Wt. OF MOULD	GMS	645	645
WT. OF LOOSE SAMPLE	GMS	176.55	175.34
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	0.800	0.794
Average		0.797	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-8	Date:	31/05/2019
Depth :	3.00 - 3.45m	Tested By:	Pranita Pun
Source:	SPT	Checked By:	Dr. Suman Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	816.67	815.94
Wt. OF MOULD	GMS	645	645
WT. OF LOOSE SAMPLE	GMS	171.67	170.94
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	0.778	0.774
Average		0.776	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-12 Date: 23/06/2019

Depth : 4.00 - 4.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	986.08	975.62	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	341.08	330.62	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.545	1.498	
Average		1.521		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-13 Date: 15/06/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	1010.00	990.00	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	365.00	345.00	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.653	1.563	
Average		1.608		

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LOOSE BULK DENSITY TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-15** Date: **1/7/2019**

Depth : **1.00 - 1.45m** Tested By: **Pranita Pun**

Source: **SPT** Checked By: **Dr. S. Manandhar**

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	970.00	960.00	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	325.00	315.00	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.472	1.427	
Average		1.449		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-16 Date: 29/06/2019

Depth : 5.00 - 5.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	988.34	990.27	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	343.34	345.27	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.555	1.564	
Average		1.559		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-20 Date: 25/06/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	932.55	932.60	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	287.55	287.60	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.302	1.303	
Average			1.303	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-21 Date: 3/7/2019

Depth : 4.00 - 4.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	928.67	931.33	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	283.67	286.33	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.285	1.297	
Average		1.291		

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LOOSE BULK DENSITY TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-22** Date: **31/05/2019**

Depth : **2.00 - 2.45m** Tested By: **Pranita Pun**

Source: **SPT** Checked By: Dr. Suman Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	1004.63	1007.90
Wt. OF MOULD	GMS	645	645
WT. OF LOOSE SAMPLE	GMS	359.63	362.9
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.629	1.644
Average		1.636	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-26 Date: 2/7/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	818.89	822.26	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	173.89	177.26	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	0.788	0.803	
Average		0.795		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-31 Date: 4/7/2019

Depth : 4.00 - 4.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	975.29	973.23	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	330.29	328.23	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.496	1.487	
Average	1.491			

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-28 Date: 1/7/2019

Depth : 4.00 - 4.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	924.33	914.37	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	279.33	269.37	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.265	1.220	
Average		1.243		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-29 Date: 3/7/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	987.00	986.40	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	342.00	341.40	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.549	1.546	
Average		1.548		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-31 Date: 1/7/2019

Depth : 4.00 - 4.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	989.02	985.97	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	344.02	340.97	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.558	1.544	
Average		1.551		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-34 Date: 22/6/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	1012.26	1015.54	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	367.26	370.54	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.663	1.678	
Average		1.671		

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LOOSE BULK DENSITY TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-35** Date: **3/7/2019**

Depth : **3.00 - 3.45m** Tested By: **Pranita Pun**

Source: **SPT** Checked By: **Dr. S. Manandhar**

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	988.64	984.66	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	343.64	339.66	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.556	1.538	
Average		1.547		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-37 Date: 28/6/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	980.00	980.00	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	335.00	335.00	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.517	1.517	
Average			1.517	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-38 Date: 5/7/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	905.50	896.33	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	260.50	251.33	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.180	1.138	
Average			1.159	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-39 Date: 5/7/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	930.00	920.00	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	285.00	275.00	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.291	1.246	
Average		1.268		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-40 Date: 27/6/2019

Depth : 2.00 - 2.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	1003.48	1020.00	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	358.48	375.00	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.624	1.699	
Average		1.661		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-41 Date: 5/7/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	895.27	905.22	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	250.27	260.22	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.134	1.179	
Average		1.156		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-44 Date: 3/7/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	950.00	960.00	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	305.00	315.00	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.381	1.427	
Average		1.404		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-49 Date: 4/7/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	988.05	995.21	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	343.05	350.21	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.554	1.586	
Average		1.570		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-41 Date: 1/7/2019

Depth : 2.00 - 2.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	948.31	937.46	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	303.31	292.46	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.374	1.325	
Average		1.349		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-41 Date: 7/7/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	938.52	941.59	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	293.52	296.59	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.329	1.343	
Average		1.336		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-55 Date: 4/7/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	934.63	931.12	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	289.63	286.12	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.312	1.296	
Average		1.304		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-56 Date: 2/7/2019

Depth : 3.00 - 3.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	940.00	940.00	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	295.00	295.00	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.336	1.336	
Average		1.336		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-57 Date: 1/7/2019

Depth : 5.00 - 5.45m Tested By: Pranita Pun

Source: SPT Checked By: Dr. S. Manandhar

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	962.09	970.17	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	317.09	325.17	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.436	1.473	
Average		1.455		

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LOOSE BULK DENSITY TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 KV DC)**

Location: **B-58** Date: **3/7/2019**

Depth : **3.00 - 3.45m** Tested By: **Pranita Pun**

Source: **SPT** Checked By: **Dr. S. Manandhar**

TEST NO.	UNITS	1	2	
Wt. OF MOULD + LOOSE SAMPLE	GMS	930.00	940.00	
Wt. OF MOULD	GMS	645.00	645.00	
WT. OF LOOSE SAMPLE	GMS	285.00	295.00	
VOLUME OF MOULD	CC	220.78	220.78	
LOOSE BULK DENSITY	GMS/CC	1.291	1.336	
Average		1.314		

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-1	Date:	31/05/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	940.00	920.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	295.00	275.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.336	1.246
Average		1.291	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-2 Date: 17/02/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	930.00	940.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	285.00	295.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.291	1.336
Average	1.314		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-3 Date: 31/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	940.00	910.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	295.00	265.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.336	1.200
Average		1.268	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-4 Date: 31/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	940.00	920.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	295.00	275.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.336	1.246
Average		1.291	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-5 Date: 31/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	950.00	950.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	305.00	305.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.381	1.381
Average	1.381		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-6 Date: 31/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	920.00	930.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	275.00	285.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.246	1.291
Average	1.268		

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-7	Date:	28/06/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	959.75	965.48
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	314.75	320.48
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.426	1.452
Average		1.439	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-8 Date: 28/06/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	930.00	930.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	285.00	285.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.291	1.291
Average	1.291		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-9 Date: 30/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	932.67	936.22
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	287.67	291.22
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.303	1.319
Average	1.311		

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-10	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	930.00	940.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	285.00	295.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.291	1.336
Average		1.314	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-11	Date:	31/05/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	1010.00	1020.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	365.00	375.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.653	1.699
Average		1.676	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-12 Date: 31/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	970.00	980.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	325.00	335.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.472	1.517
Average	1.495		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-13 Date: 31/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	980.00	1010.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	335.00	365.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.517	1.653
Average	1.585		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-14 Date: 6/6/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	1000.00	1010.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	355.00	365.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.608	1.653
Average		1.631	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-15	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	930.00	935.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	285.00	290.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.291	1.314
Average		1.302	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-16 Date: 30/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	970.00	975.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	325.00	330.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.472	1.495
Average		1.483	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-17	Date:	30/05/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	920.00	930.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	275.00	285.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.246	1.291
Average		1.268	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-18 Date: 30/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	970.00	971.24
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	325.00	326.24
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.472	1.478
Average	1.475		

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-19	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	890.00	900.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	245.00	255.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.110	1.155
Average	1.132		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-20 Date: 31/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	930.00	930.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	285.00	285.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.291	1.291
Average		1.291	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-21	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	950.00	955.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	305.00	310.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.381	1.404
Average	1.393		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-22 Date: 6/6/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	1018.87	1012.33
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	373.87	367.33
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.693	1.664
Average		1.679	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-25	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	967.12	962.49
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	322.12	317.49
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.459	1.438
Average	1.449		

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-26	Date:	30/05/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	922.81	915.62
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	277.81	270.62
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.258	1.226
Average		1.242	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-27	Date:	30/05/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	980.00	950.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	335.00	305.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.517	1.381
Average		1.449	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-28 Date: 30/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	900.00	910.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	255.00	265.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.155	1.200
Average		1.178	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-29 Date: 14/5/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	1003.73	1006.34
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	358.73	361.34
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.625	1.637
Average	1.631		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-30 Date: 28/6/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	1010.07	1009.76
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	365.07	364.76
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.654	1.652
Average		1.653	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-31	Date:	31/05/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	1014.74	1011.96
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	369.74	366.96
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.675	1.662
Average		1.668	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-32 Date: 30/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	988.54	987.32
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	343.54	342.32
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.556	1.551
Average		1.553	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-33	Date:	30/05/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	971.24	973.33
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	326.24	328.33
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.478	1.487
Average		1.482	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-34	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	938.33	935.21
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	293.33	290.21
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.329	1.314
Average		1.322	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-35 Date: 026/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	929.63	931.25
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	284.63	286.25
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.289	1.297
Average	1.293		

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-36	Date:	30/05/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	936.92	935.65
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	291.92	290.65
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.322	1.316
Average		1.319	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-37 Date: 5/6/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	991.13	988.34
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	346.13	343.34
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.568	1.555
Average	1.561		

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-38	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	930.00	950.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	285.00	305.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.291	1.381
Average		1.336	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-39	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	930.00	930.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	285.00	285.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.291	1.291
Average		1.291	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-40 Date: 31/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	940.00	960.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	295.00	315.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.336	1.427
Average		1.381	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-41	Date:	31/05/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	920.00	930.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	275.00	285.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.246	1.291
Average		1.268	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-42 Date: 31/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	1001.94	1003.62
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	356.94	358.62
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.617	1.624
Average		1.621	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-43	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	1000.00	1010.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	355.00	365.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.608	1.653
Average		1.631	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-44	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	930.00	935.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	285.00	290.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.291	1.314
Average		1.302	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-45	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	998.52	997.39
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	353.52	352.39
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.601	1.596
Average	1.599		

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-46	Date:	5/3/2075
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	946.00	950.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	301.00	305.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.363	1.381
Average		1.372	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-47 Date: 15/6/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	930.00	923.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	285.00	278.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.291	1.259
Average	1.275		

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-48	Date:	17/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	920.00	915.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	275.00	270.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.246	1.223
Average		1.234	

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Tel.: 977-01- 4106676, 4106966

LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-49	Date:	31/05/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	910.00	920.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	265.00	275.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.200	1.246
Average	1.223		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-50 Date: 31/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	924.80	908.73
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	279.80	263.73
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.267	1.195
Average	1.231		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-51 Date: 25/6/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	1004.11	1005.23
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	359.11	360.23
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.627	1.632
Average	1.629		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-52 Date: 6/6/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	1014.37	1019.56
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	369.37	374.56
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.673	1.697
Average		1.685	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-53	Date:	30/06/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	914.51	942.34
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	269.51	297.34
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.221	1.347
Average		1.284	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-54 Date: 30/06/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	933.87	932.69
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	288.87	287.69
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.308	1.303
Average		1.306	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-55	Date:	30/06/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	943.44	954.82
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	298.44	309.82
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.352	1.403
Average	1.378		

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-56 Date: 26/06/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	918.33	944.53
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	273.33	299.53
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.238	1.357
Average		1.297	

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LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-57 Date: 6/6/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	970.00	980.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	325.00	335.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.472	1.517
Average	1.495		

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Tel.: 977-01- 4106676, 4106966

LOOSE BULK DENSITY TEST

Project : MCA Nepal Soil Investigation for Transmission Line (400 KV DC)

Location: B-58 Date: 31/05/2019

Depth : 0.00 - 1.00m Tested By: Pranita Pun

Source: Test Pit Sample Checked by: Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	958.68	959.32
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	313.68	314.32
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.421	1.424
Average		1.422	

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-59	Date:	30/05/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	940.00	949.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	295.00	304.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.336	1.377
Average	1.357		

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LOOSE BULK DENSITY TEST

Project :	MCA Nepal Soil Investigation for Transmission Line (400 KV DC)		
Location:	B-60	Date:	6/6/2019
Depth :	0.00 - 1.00m	Tested By:	Pranita Pun
Source:	Test Pit Sample	Checked by:	Dr. S. Manandhar

TEST NO.	UNITS	1	2
Wt. OF MOULD + LOOSE SAMPLE	GMS	980.00	1010.00
Wt. OF MOULD	GMS	645.00	645.00
WT. OF LOOSE SAMPLE	GMS	335.00	365.00
VOLUME OF MOULD	CC	220.78	220.78
LOOSE BULK DENSITY	GMS/CC	1.517	1.653
Average		1.585	

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ANNEX C5-2
Unit Weight

ICGS PVT. LTD.

New Baneshwor, Kathmandu, Nepal
Tel.: 4106676, 4106966

WET & DRY UNIT WEIGHT TEST

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**
Source: **Bulk Sampling** Date: **17.06.2019**
Tested by: **N. Ghimire** Checked by: **Dr. S. Manandhar**

Borehole No.		B01	B02	B03	B04	B05	B06
Depth:	m	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00
Wt. of wet sample + Tray	gm	214.50	190.08	210.93	208.88	299.37	329.12
Wt. of Tray	gm	84.35	85.95	84.42	88.80	87.84	110.83
Wt. of wet sample	gm	130.15	104.13	126.51	120.08	211.53	218.29
Volume of mould	cc	67.657	67.499	71.012	68.766	133.354	138.354
Unit Weight	**gm/cc**	**1.924**	**1.543**	**1.782**	**1.746**	**1.586**	**1.578**

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New Baneshwor, Kathmandu, Nepal
Tel.: 4106676, 4106966

WET & DRY UNIT WEIGHT TEST

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**
Source: **Bulk Sampling** Date: **17.06.2019**
Tested by: **N. Ghimire** Checked by: **Dr. S. Manandhar**

Borehole No.		B07	B08	B10	B11	B12	B13
Depth:	m	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00
Wt. of wet sample + Tray	gm	191.51	203.71	219.79	227.57	203.02	355.09
Wt. of Tray	gm	86.23	94.97	99.41	95.79	85.30	93.85
Wt. of wet sample	gm	105.279	108.74	120.38	131.78	117.72	261.24
Volume of mould	cc	67.278	67.527	67.012	67.983	67.357	135.092
Unit Weight	**gm/cc**	**1.565**	**1.610**	**1.796**	**1.938**	**1.748**	**1.934**

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New Baneshwor, Kathmandu, Nepal
Tel.: 4106676, 4106966

UNIT WEIGHT TEST

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**
Source: **Bulk Sampling** Date: **17.06.2019**
Tested by: **N. Ghimire** Checked by: **Dr. S. Manandhar**

Borehole No.		B14	B15	B16	B17	B18	B19
Depth:	m	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00
Wt. of wet sample + Tray	gm	205.65	202.78	370.76	365.55	215.80	202.32
Wt. of Tray	gm	86.01	86.85	90.84	106.83	93.55	94.07
Wt. of wet sample	gm	119.64	115.93	279.92	258.72	122.25	108.25
Volume of mould	cc	67.357	67.357	140.354	140.354	67.278	67.307
Unit Weight	**gm/cc**	**1.776**	**1.721**	**1.994**	**1.843**	**1.817**	**1.608**

ICGS PVT. LTD.

New Baneshwor, Kathmandu, Nepal
Tel.: 4106676, 4106966

UNIT WEIGHT TEST

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**
Source: **Bulk Sampling** Date: **17.06.2019**
Tested by: **N. Ghimire** Checked by: **Dr. S. Manandhar**

Borehole No.		B20	B21	B22	B25	B26	B27
Depth:	m	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00
Wt. of wet sample + Tray	gm	208.91	224.42	221.77	207.51	200.50	339.89
Wt. of Tray	gm	95.05	102.76	88.04	90.98	98.53	90.32
Wt. of wet sample	gm	113.86	121.66	133.73	116.53	101.97	249.57
Volume of mould	cc	67.412	68.045	67.007	67.367	67.255	140.354
Unit Weight	**gm/cc**	**1.689**	**1.788**	**1.996**	**1.730**	**1.516**	**1.778**

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UNIT WEIGHT TEST

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**
Source: **Bulk Sampling** Date: **18.06.2019**
Tested by: **N. Ghimire** Checked by: **Dr. S. Manandhar**

Borehole No.		B28	B29	B30	B31	B34	B38
Depth:	m	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00
Wt. of wet sample + Tray	gm	315.20	366.78	381.63	358.05	337.80	201.81
Wt. of Tray	gm	94.37	90.20	90.20	100.31	92.10	90.47
Wt. of wet sample	gm	220.83	276.58	291.43	257.74	245.7	111.34
Volume of mould	cc	140.258	140.455	140.691	140.35	140.473	67.103
Unit Weight	**gm/cc**	**1.574**	**1.969**	**2.071**	**1.836**	**1.749**	**1.659**

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UNIT WEIGHT TEST

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**
Source: **Bulk Sampling** Date: **19.06.2019**
Tested by: **N. Ghimire** Checked by: **Dr. S. Manandhar**

Borehole No.		B39	B40	B41	B42	B43	B44
Depth:	m	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00
Wt. of wet sample + Tray	gm	205.01	222.79	234.66	217.01	226.09	200.06
Wt. of Tray	gm	87.31	100.99	113.96	97.32	100.11	84.34
Wt. of wet sample	gm	117.7	121.8	120.7	119.69	125.98	115.72
Volume of mould	cc	67.401	67.945	67.117	67.023	67.555	67.502
Unit Weight	**gm/cc**	**1.746**	**1.793**	**1.798**	**1.786**	**1.865**	**1.714**

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UNIT WEIGHT TEST

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**
Source: **Bulk Sampling** Date: **19.06.2019**
Tested by: **N. Ghimire** Checked by: **Dr. S. Manandhar**

Borehole No.		B45	B46	B47	B48	B49	B50
Depth:	m	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00
Wt. of wet sample + Tray	gm	209.91	206.48	197.27	323.01	322.45	325.62
Wt. of Tray	gm	88.63	88.58	86.92	99.34	102.34	95.24
Wt. of wet sample	gm	121.28	117.9	110.35	223.67	220.11	230.38
Volume of mould	cc	67.021	67.357	67.438	136.306	138.103	142.358
Unit Weight	**gm/cc**	**1.810**	**1.750**	**1.636**	**1.641**	**1.594**	**1.618**

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New Baneshwor, Kathmandu, Nepal
Tel.: 4106676, 4106966

UNIT WEIGHT TEST

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**
Source: **Bulk Sampling** Date: **20.06.2019**
Tested by: **N. Ghimire** Checked by: **Dr. S. Manandhar**

Borehole No.		B51	B52	B53	B54	B55	B56
Depth:	m	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00
Wt. of wet sample + Tray	gm	353.94	342.60	334.86	342.63	344.36	195.83
Wt. of Tray	gm	92.33	94.01	90.01	95.82	98.50	84.13
Wt. of wet sample	gm	261.61	248.59	244.85	246.81	245.86	111.7
Volume of mould	cc	140.13	141.205	142.006	142.341	142.698	67.501
Unit Weight	**gm/cc**	**1.867**	**1.760**	**1.724**	**1.734**	**1.723**	**1.655**

GEOTECHNICAL CHALLENGE ACCOMPLISHED

GEOTECH CONSULTING INTERNATIONAL LLC 2000

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Tel.: 4106676, 4106966

UNIT WEIGHT TEST

Project: **MCA Nepal Soil Investigation for Transmission Line (400kV DC)**
Source: **Bulk Sampling** Date: **21.06.2019**
Tested by: **N. Ghimire** Checked by **Dr. S. Manandhar**

Borehole No.		B56	B57	B58	B59	B60
Depth:	m	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00	0.00-1.00
Wt. of wet sample + Tray	gm	195.83	212.02	205.85	207.45	216.39
Wt. of Tray	gm	84.13	86.07	87.85	87.33	88.91
Wt. of wet sample	gm	111.7	125.95	118	120.12	127.48
Volume of mould	cc	67.501	67.712	67.357	67.775	67.761
Unit Weight	**gm/cc**	**1.655**	**1.860**	**1.752**	**1.772**	**1.881**

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ANNEX C6
Proctor Compaction Test

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-1** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **3.50 - 4.50m** Date: **30/05/204/19** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	16%	
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11990	12410	12640	12550	12460
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4220	4640	4870	4780	4690
Wet Density, γ_T=W/V,	gm/cc	1.942	2.136	2.241	2.200	2.159
Dry Density, γ_d=100γ_T.(100+w),	gm/cc	1.884	2.009	2.050	1.978	1.924

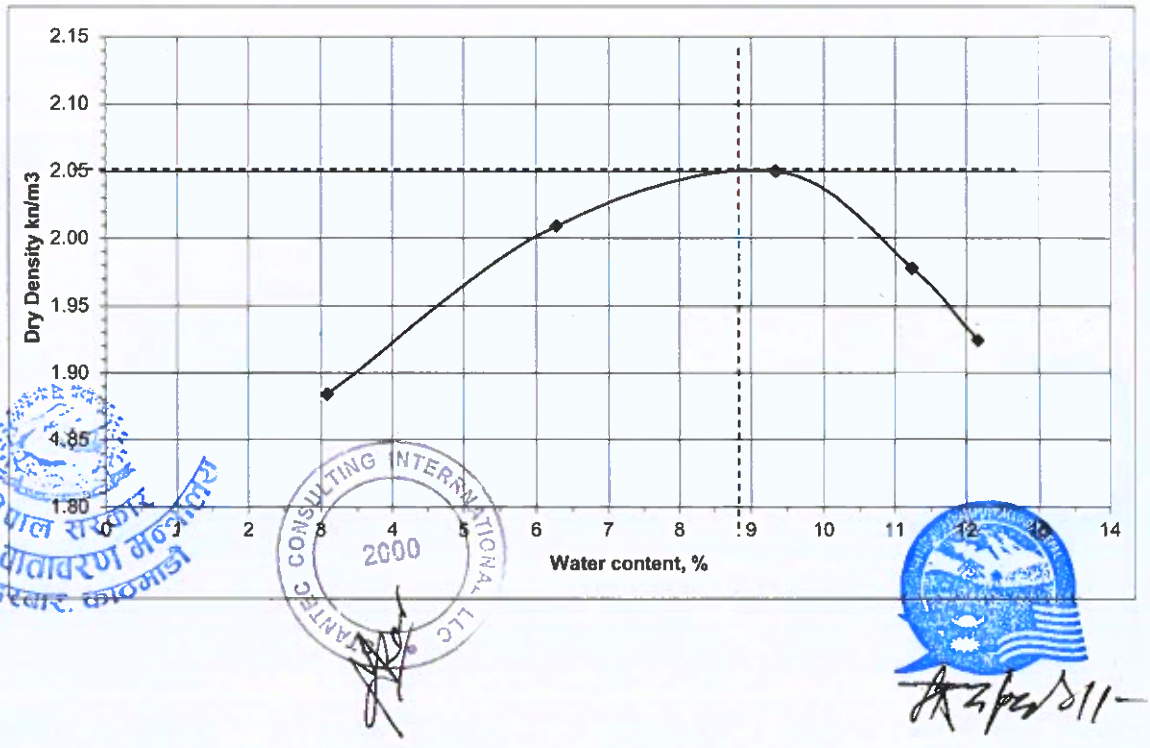
MOISTURE CONTENT

Container No.		A-65	A-68	A-136	A-95	A-67
Wt. of Wet Soil + Container,	g	23.02	26.92	27.32	20.30	29.10
Wt. of Dry Soil + Container,	g	22.68	26.36	26.36	19.21	27.70
Wt. of Water,	g	0.34	0.56	0.96	1.09	1.40
Wt. of Container,	g	11.70	17.45	16.09	9.52	16.20
Wt. of Dry Soil ,	g	10.98	8.91	10.27	9.69	11.50
Moisture Content, w,	%	3.10	6.29	9.35	11.25	12.17
Average Moisture Content,	%	3.10	6.29	9.35	11.25	12.17

Test No.	1	2	3	4	5
Water content, %	3.10	6.29	9.35	11.25	12.17
Dry Density, gm/cc	1.884	2.009	2.050	1.978	1.924

γdmax (gm/cc) : **2.050**

OMC (%) : **8.75**



ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-2** Tested By : **Pranita Pun** Volume of Mould,V : **980.71**

Depth: **3.50 - 4.50m** Date: **30/05/204/19** Mould Size : **D=9.8, H=13**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	16%	27%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	**5510**	**5620**	**5680**	**5650**	**5610**
Wt. of Mould,	g	3690	3690	3690	3690	3690
Wt. of Wet Soil, W	g	1820	1930	1990	1960	1920
Wet Density, y_T=W/V,	gm/cc	1.856	1.968	2.029	1.999	1.958
Dry Density, y_d=100y_T.(100+w),	gm/cc	1.666	1.701	1.697	1.630	1.543

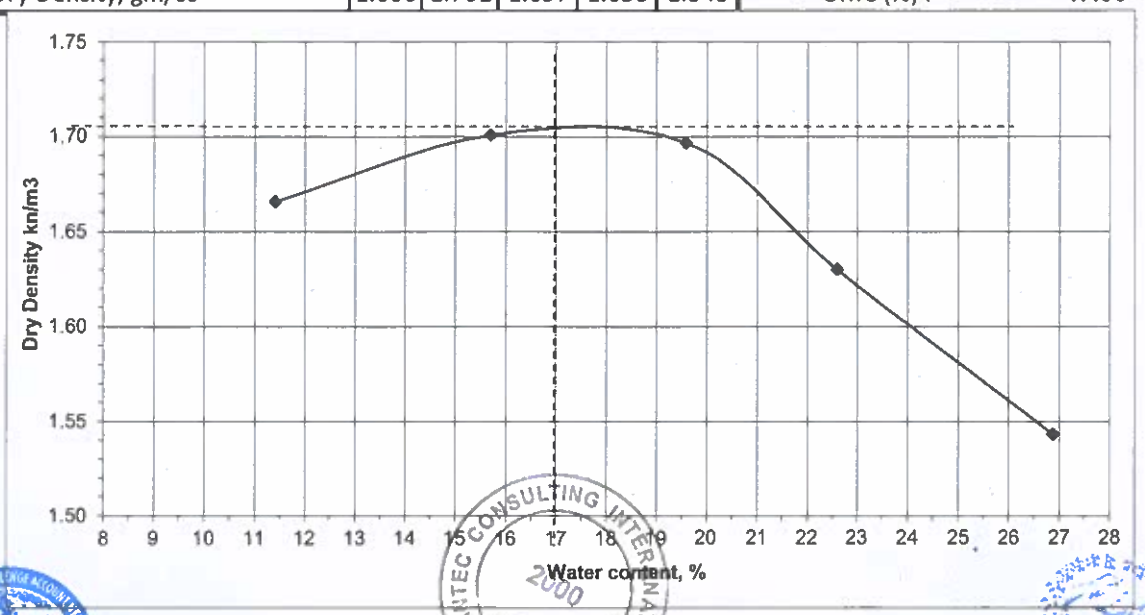
MOISTURE CONTENT

Container No.		**A-92**	**A-112**	**A-99**	**A-140**	**A-111**
Wt. of Wet Soil + Container,	g	**15.55**	**26.95**	**22.42**	**22.30**	**27.95**
Wt. of Dry Soil + Container,	g	**14.77**	**25.69**	**20.38**	**19.98**	**25.46**
Wt. of Water,	g	0.78	1.26	2.04	2.32	2.49
Wt. of Container,	g	**7.94**	**17.67**	**9.97**	**9.72**	**16.20**
Wt. of Dry Soil ,	g	6.83	8.02	10.41	10.26	9.26
Moisture Content, w,	%	11.42	15.71	19.60	22.61	26.89
Average Moisture Content,	%	11.42	15.71	19.60	22.61	26.89

Test No.	1	2	3	4	5
Water content, %	11.42	15.71	19.60	22.61	26.89
Dry Density, gm/cc	1.666	1.701	1.697	1.630	1.543

γdmax (gm/cc) : **1.705**

OMC (%) : **17.00**



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नेपाल सरकार वन तथा वातावरण मन्त्रालय सिंहदरबार, काठमाडौं

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-3** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **3.50 - 4.50m** Date: **30/05/204/19** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.	1	2	3	4	5
Assumed Water Content, %	5%	10%	14%	16%	
Wt. of Air Dry Soil Used, g	7000	7000	7000	7000	
Water Content of Air Dry Soil, %					
Amount of Water Added, cc					
Wt.of Wet Soil + Mould, g	12060	12450	12580	12530	12370
Wt. of Mould, g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W g	4290	4680	4810	4760	4600
Wet Density, γ_T=W/V, gm/cc	1.975	2.154	2.214	2.191	2.117
Dry Density, γ_d=100γ_T/(100+w), gm/cc	1.888	1.982	1.967	1.892	1.782

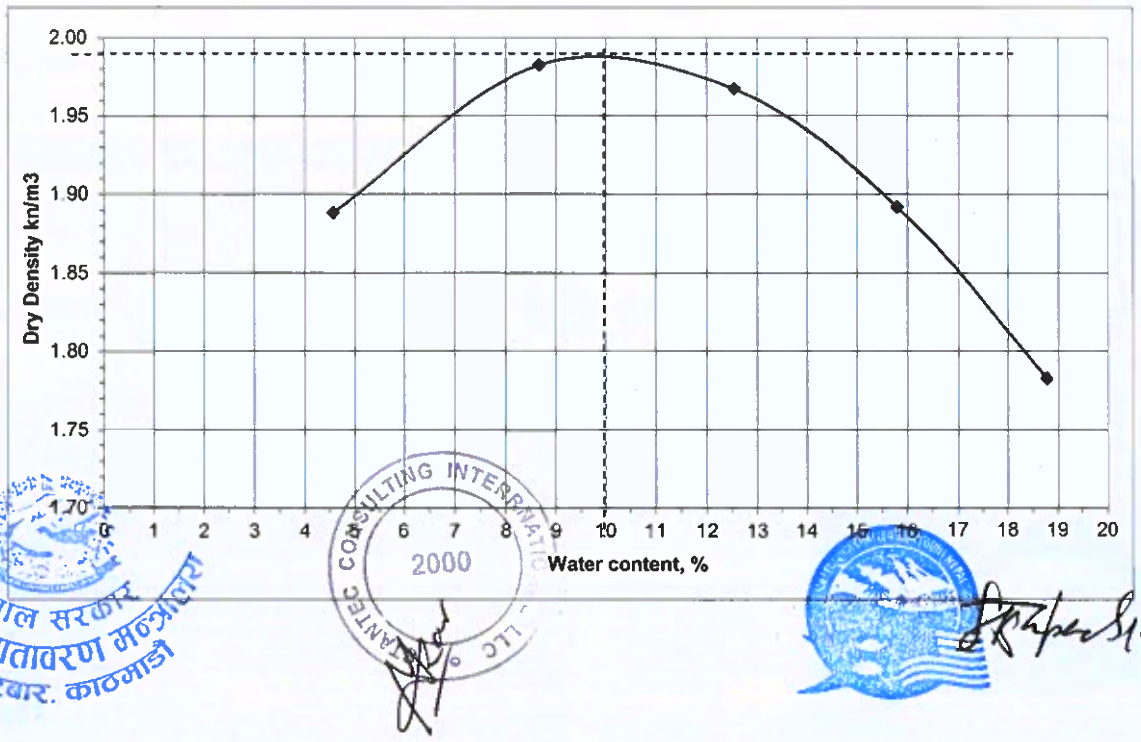
MOISTURE CONTENT

Container No.	A-87	A-70	A-131	A-74	A-114
Wt. of Wet Soil + Container, g	27.28	22.23	34.57	28.56	31.12
Wt. of Dry Soil + Container, g	26.50	21.18	32.69	26.87	28.74
Wt. of Water, g	0.78	1.05	1.88	1.69	2.38
Wt. of Container, g	9.48	9.08	17.72	16.18	16.07
Wt. of Dry Soil , g	17.02	12.10	14.97	10.69	12.67
Moisture Content, w, %	4.58	8.68	12.56	15.81	18.78
Average Moisture Content, %	4.58	8.68	12.56	15.81	18.78

Test No.	1	2	3	4	5
Water content, %	4.58	8.68	12.56	15.81	18.78
Dry Density, gm/cc	1.888	1.982	1.967	1.892	1.782

γdmax (gm/cc) : **1.990**

OMC (%) : **10.00**



ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-4** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **3.50 - 4.50m** Date: **30/05/204/19** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	16%	
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11730	12170	12420	12350	12300
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3960	4400	4650	4580	4530
Wet Density, γ_T=W/V,	gm/cc	1.823	2.025	2.140	2.108	2.085
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.743	1.829	1.879	1.793	1.726

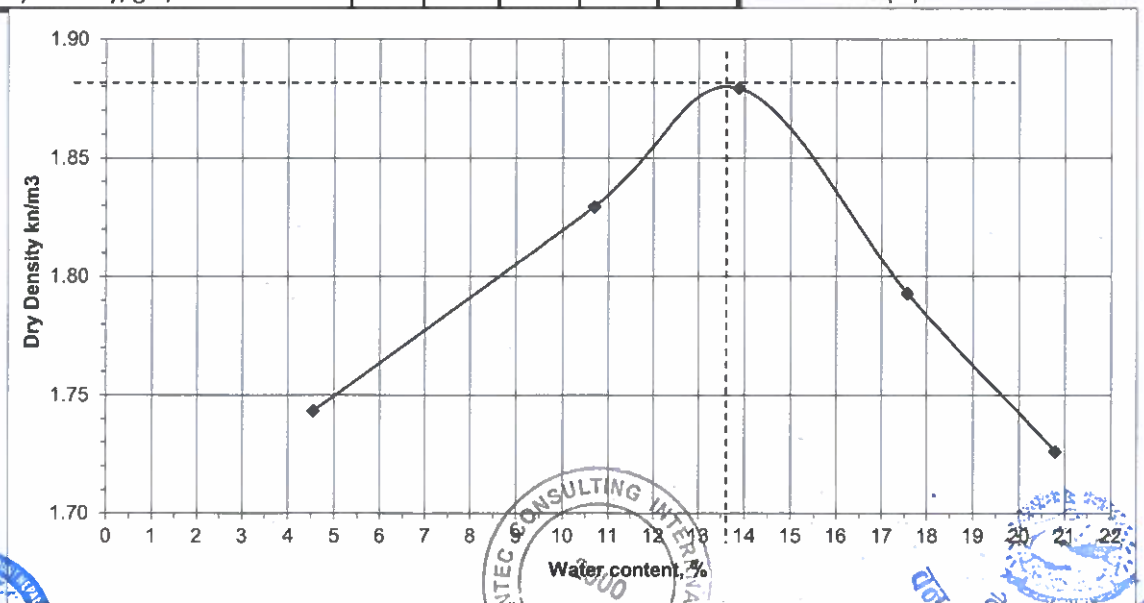
MOISTURE CONTENT

Container No.		A-126	A-69	A-89	A-125	A-78
Wt. of Wet Soil + Container,	g	18.55	26.08	22.87	24.63	33.84
Wt. of Dry Soil + Container,	g	18.13	25.12	21.45	22.46	30.79
Wt. of Water,	g	0.42	0.96	1.42	2.17	3.05
Wt. of Container,	g	8.92	16.16	11.23	10.12	16.13
Wt. of Dry Soil ,	g	9.21	8.96	10.22	12.34	14.66
Moisture Content, w,	%	4.56	10.71	13.89	17.59	20.80
Average Moisture Content,	%	4.56	10.71	13.89	17.59	20.80

Test No.	1	2	3	4	5
Water content, %	4.56	10.71	13.89	17.59	20.80
Dry Density, gm/cc	1.743	1.829	1.879	1.793	1.726

γdmax (gm/cc) : **1.880**

OMC (%) : **13.50**



ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-5** Tested By : **Pranita Pun** Volume of Mould,V : **980.71**

Depth: **3.50 - 4.50m** Date: **30/05/204/19** Mould Size : **D=9.8, H=13**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	16%	27%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	5410	5550	5690	5710	5630
Wt. of Mould,	g	3690	3690	3690	3690	3690
Wt. of Wet Soil, W	g	1720	1860	2000	2020	1940
Wet Density, γ_T=W/V,	gm/cc	1.754	1.897	2.039	2.060	1.978
Dry Density, γ_d=100γ_T÷(100+w),	gm/cc	1.675	1.730	1.774	1.720	1.586

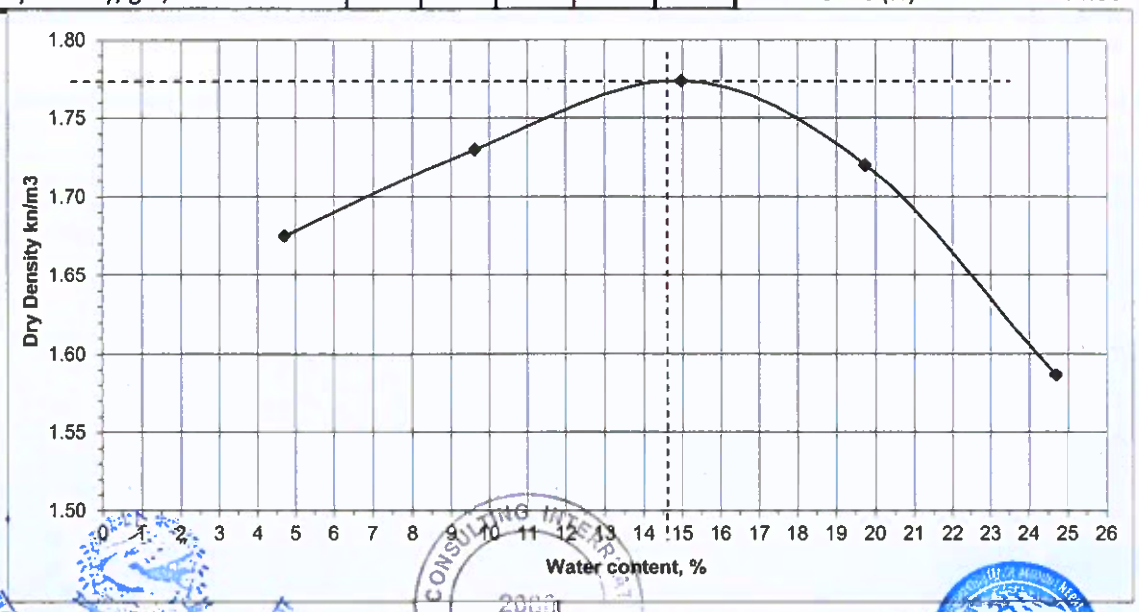
MOISTURE CONTENT

Container No.		A-104	A-141	A-63	A-71	A-129
Wt. of Wet Soil + Container,	g	27.00	30.73	22.68	34.22	30.89
Wt. of Dry Soil + Container,	g	26.51	29.57	20.99	31.57	27.94
Wt. of Water,	g	0.49	1.16	1.69	2.65	2.95
Wt. of Container,	g	16.14	17.54	9.71	18.15	16.00
Wt. of Dry Soil ,	g	10.37	12.03	11.28	13.42	11.94
Moisture Content, w,	%	4.73	9.64	14.98	19.75	24.71
Average Moisture Content,	%	4.73	9.64	14.98	19.75	24.71

Test No.	1	2	3	4	5
Water content, %	4.73	9.64	14.98	19.75	24.71
Dry Density, gm/cc	1.675	1.730	1.774	1.720	1.586

γdmax (gm/cc) : **1.772**

OMC (%) : **14.50**



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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-6** Tested By : **Pranita Pun** Volume of Mould,V : **980.71**

Depth: **3.50 - 4.50m** Date: **30/05/204/19** Mould Size : **D=9.8, H=13**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	16%	27%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	**5410**	**5550**	**5700**	**5670**	**5620**
Wt. of Mould,	g	3690	3690	3690	3690	3690
Wt. of Wet Soil, W	g	1720	1860	2010	1980	1930
Wet Density, y_T=W/V,	gm/cc	1.754	1.897	2.050	2.019	1.968
Dry Density, y_d=100y_T,(100+w),	gm/cc	1.675	1.730	1.790	1.686	1.578

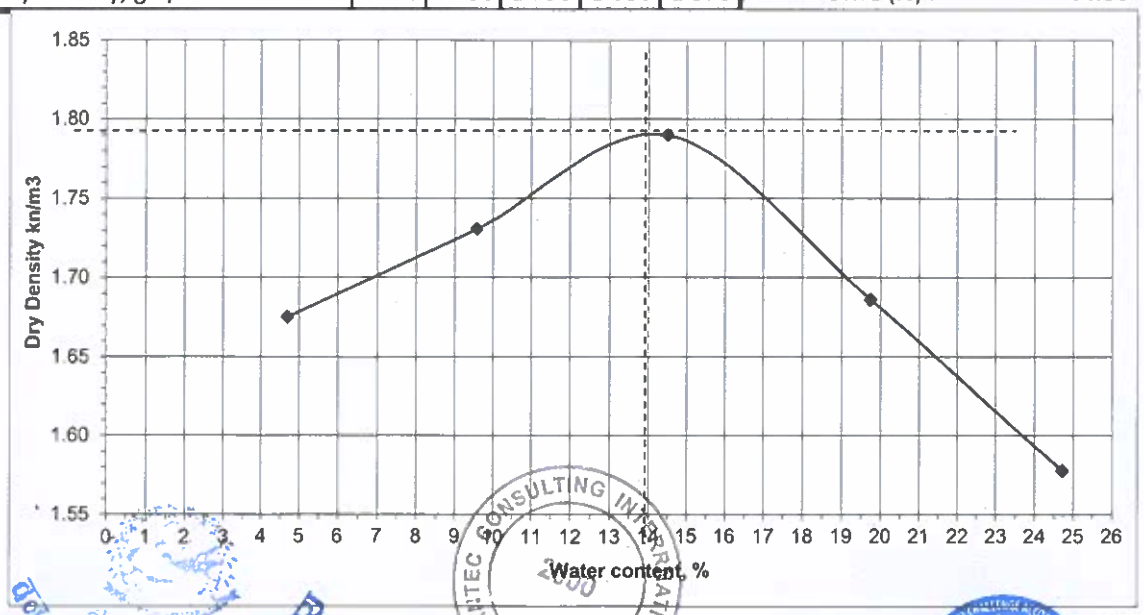
MOISTURE CONTENT

Container No.		**A-79**	**A-75**	**A-130**	**A-84**	**A-123**
Wt. of Wet Soil + Container,	g	**31.22**	**25.90**	**25.62**	**38.22**	**31.95**
Wt. of Dry Soil + Container,	g	**30.54**	**25.04**	**24.63**	**34.58**	**28.82**
Wt. of Water,	g	0.68	0.86	0.99	3.64	3.13
Wt. of Container,	g	**16.12**	**16.08**	**17.81**	**16.16**	**16.17**
Wt. of Dry Soil ,	g	14.42	8.96	6.82	18.42	12.65
Moisture Content, w,	%	4.72	9.60	14.52	19.76	24.74
Average Moisture Content,	%	4.72	9.60	14.52	19.76	24.74

Test No.	1	2	3	4	5
Water content, %	4.72	9.60	14.52	19.76	24.74
Dry Density, gm/cc	1.675	1.730	1.790	1.686	1.578

γdmax (gm/cc) : **1.790**

OMC (%) : **14.00**



ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-7** Tested By : **Pranita Pun** Volume of Mould,V : **980.71**

Depth: **3.50 - 4.50m** Date: **28/06/204/19** Mould Size : **D=9.8, H=13**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	16%	27%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	5440	5650	5740	5600	5580
Wt. of Mould,	g	3690	3690	3690	3690	3690
Wt. of Wet Soil, W	g	1750	1960	2050	1910	1890
Wet Density, γ_T=W/V,	gm/cc	1.784	1.999	2.090	1.948	1.927
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.691	1.797	1.802	1.591	1.565

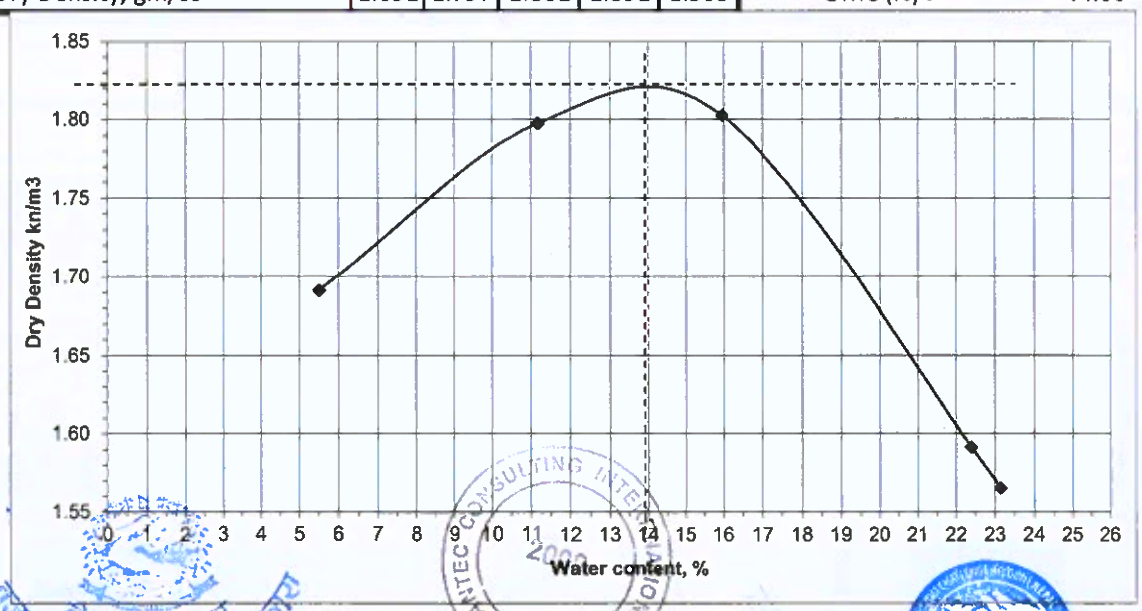
MOISTURE CONTENT

Container No.		A-25	A-5	A-10	A-15	A-3
Wt. of Wet Soil + Container,	g	165.87	159.13	156.03	217.89	166.97
Wt. of Dry Soil + Container,	g	158.63	146.05	138.43	183.53	140.91
Wt. of Water,	g	7.24	13.08	17.6	34.36	26.06
Wt. of Container,	g	27.65	29.23	28.30	30.18	28.42
Wt. of Dry Soil ,	g	130.98	116.82	110.13	153.35	112.49
Moisture Content, w,	%	5.53	11.20	15.98	22.41	23.17
Average Moisture Content,	%	5.53	11.20	15.98	22.41	23.17

Test No.	1	2	3	4	5
Water content, %	5.53	11.20	15.98	22.41	23.17
Dry Density, gm/cc	1.691	1.797	1.802	1.591	1.565

γdmax (gm/cc) : **1.820**

OMC (%) : **14.00**



ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-8** Tested By : **Pranita Pun** Volume of Mould,V : **980.71**

Depth: **3.50 - 4.50m** Date: **30/05/204/19** Mould Size : **D=9.8, H=13**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	16%	27%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	**5470**	**5590**	**5690**	**5700**	**5650**
Wt. of Mould,	g	3690	3690	3690	3690	3690
Wt. of Wet Soil, W	g	1780	1900	2000	2010	1960
Wet Density, y_T=W/V,	gm/cc	1.815	1.937	2.039	2.050	1.999
Dry Density, y_d=100y_T÷(100+w),	gm/cc	1.658	1.712	1.733	1.694	1.610

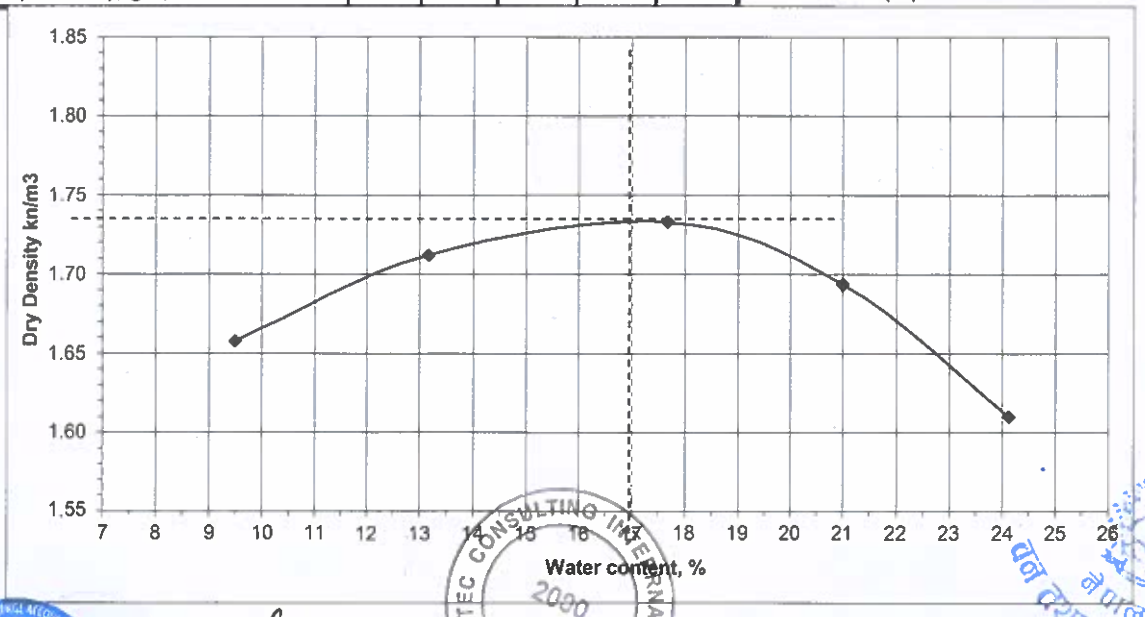
MOISTURE CONTENT

Container No.		**A-139**	**A-85**	**A-86**	**A-142**	**A-68**
Wt. of Wet Soil + Container,	g	**26.65**	**24.93**	**20.70**	**21.64**	**26.75**
Wt. of Dry Soil + Container,	g	**25.74**	**24.05**	**19.16**	**19.57**	**24.94**
Wt. of Water,	g	0.91	0.88	1.54	2.07	1.81
Wt. of Container,	g	**16.16**	**17.37**	**10.45**	**9.72**	**17.44**
Wt. of Dry Soil ,	g	9.58	6.68	8.71	9.85	7.50
Moisture Content, w,	%	9.50	13.17	17.68	21.02	24.13
Average Moisture Content,	%	9.50	13.17	17.68	21.02	24.13

Test No.	1	2	3	4	5
Water content, %	9.50	13.17	17.68	21.02	24.13
Dry Density, gm/cc	1.658	1.712	1.733	1.694	1.610

γdmax (gm/cc) : **1.735**

OMC (%) : **17.00**



ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-9** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **#####** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	12%	16%	20%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11476	11810	12105	12085	12010
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3706	4040	4335	4315	4240
Wet Density, γ_T=W/V,	gm/cc	1.706	1.859	1.995	1.986	1.952
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.643	1.723	1.784	1.713	1.627

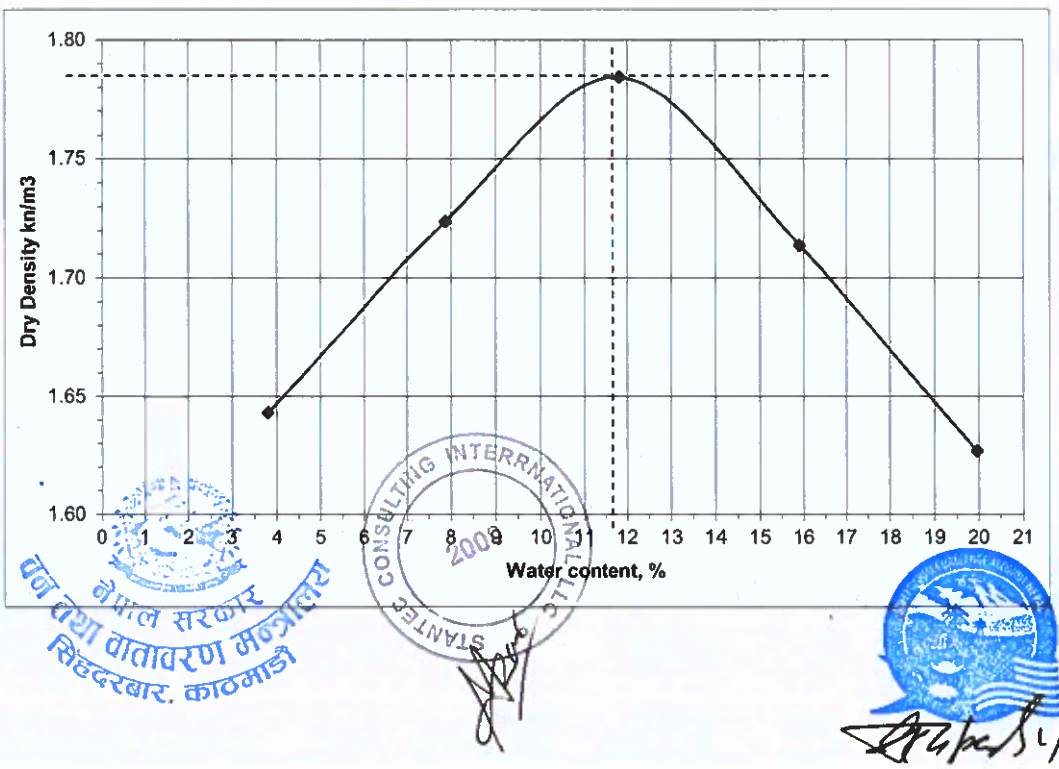
MOISTURE CONTENT

Container No.		A-22	A-16	A-1	A-24	A-85
Wt. of Wet Soil + Container,	g	51.22	54.76	55.33	55.67	51.29
Wt. of Dry Soil + Container,	g	50.48	52.96	52.85	52.19	45.64
Wt. of Water,	g	0.74	1.80	2.48	3.48	5.65
Wt. of Container,	g	31.10	30.15	31.9	30.34	17.35
Wt. of Dry Soil ,	g	19.38	22.81	20.95	21.85	28.29
Moisture Content, w,	%	3.82	7.89	11.84	15.93	19.97
Average Moisture Content,	%	3.82	7.89	11.84	15.93	19.97

Test No.	1	2	3	4	5
Water content, %	3.82	7.89	11.84	15.93	19.97
Dry Density, gm/cc	1.643	1.723	1.784	1.713	1.627

γdmax (gm/cc) : **1.785**

OMC (%) : **11.75**



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Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-10** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **3.50 - 4.50m** Date: **03/06/204/19** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	16%	
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	**11970**	**12450**	**12560**	**12350**	**12300**
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4200	4680	4790	4580	4530
Wet Density, γ_T=W/V,	gm/cc	1.933	2.154	2.205	2.108	2.085
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.856	2.004	1.977	1.830	1.796

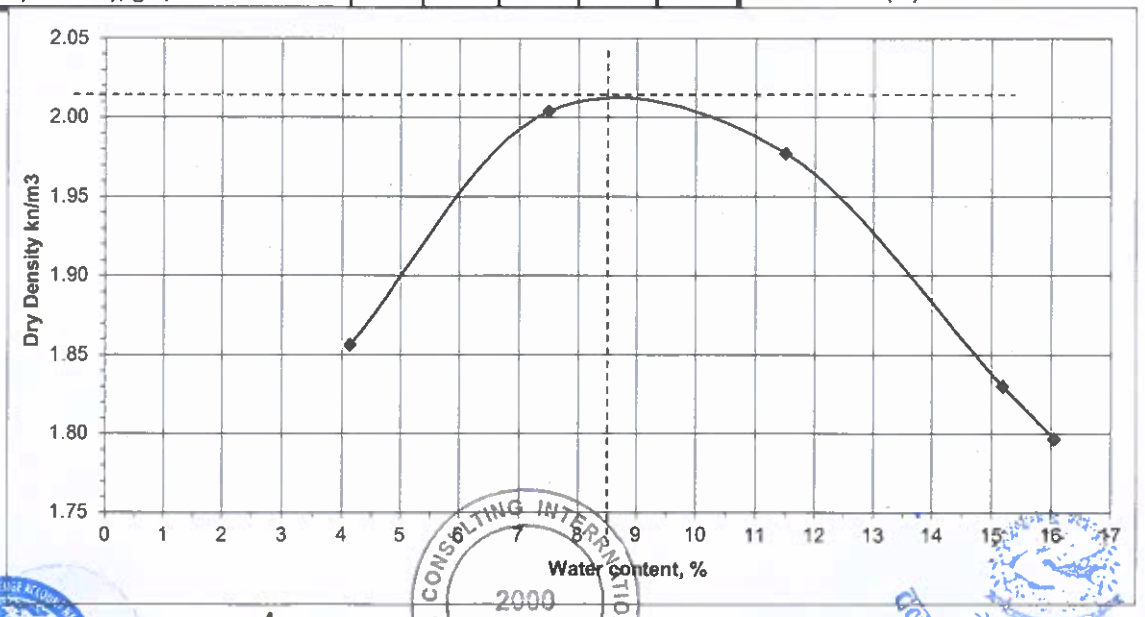
MOISTURE CONTENT

Container No.		**A-97**	**A-83**	**A-135**	**A-84**	**A-89**
Wt. of Wet Soil + Container,	g	**21.05**	**19.99**	**17.89**	**28.46**	**17.84**
Wt. of Dry Soil + Container,	g	**20.58**	**19.27**	**16.96**	**26.84**	**16.82**
Wt. of Water,	g	0.47	0.72	0.93	1.62	1.02
Wt. of Container,	g	**9.26**	**9.68**	**8.89**	**16.18**	**10.47**
Wt. of Dry Soil ,	g	11.32	9.59	8.07	10.66	6.35
Moisture Content, w,	%	4.15	7.51	11.52	15.20	16.06
Average Moisture Content,	%	4.15	7.51	11.52	15.20	16.06

Test No.	1	2	3	4	5
Water content, %	4.15	7.51	11.52	15.20	16.06
Dry Density, gm/cc	1.856	2.004	1.977	1.830	1.796

γdmax (gm/cc) : **2.012**

OMC (%) : **8.50**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-11** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **3.50 - 4.50m** Date: **31/05/204/19** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	1%	4%	8%	12%	14%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11990	12430	12790	12630	12560
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4220	4660	5020	4860	4790
Wet Density, γ_T=W/V,	gm/cc	1.942	2.145	2.311	2.237	2.205
Dry Density, γ_d=100γ_T÷(100+w),	gm/cc	1.924	2.071	2.151	2.007	1.938

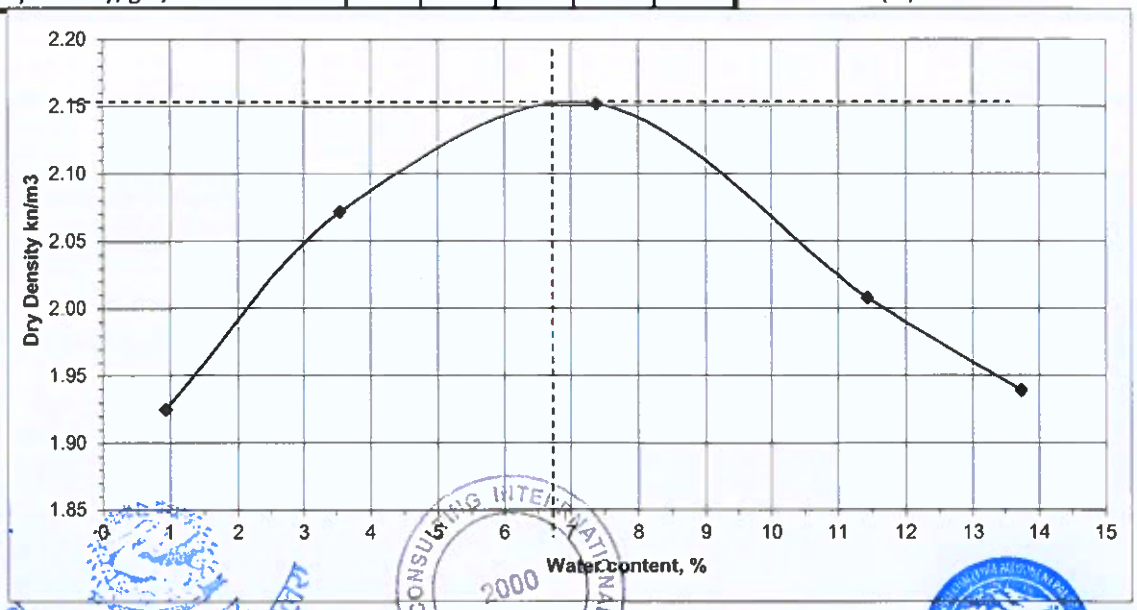
MOISTURE CONTENT

Container No.		A-97	A-135	A-131	A-62	A-105
Wt. of Wet Soil + Container,	g	23.12	26.06	28.26	43.99	34.45
Wt. of Dry Soil + Container,	g	22.99	25.47	27.53	41.13	32.42
Wt. of Water,	g	0.13	0.59	0.73	2.86	2.03
Wt. of Container,	g	9.26	8.91	17.66	16.15	17.65
Wt. of Dry Soil ,	g	13.73	16.56	9.87	24.98	14.77
Moisture Content, w,	%	0.95	3.56	7.40	11.45	13.74
Average Moisture Content,	%	0.95	3.56	7.40	11.45	13.74

Test No.	1	2	3	4	5
Water content, %	0.95	3.56	7.40	11.45	13.74
Dry Density, gm/cc	1.924	2.071	2.151	2.007	1.938

γdmax (gm/cc) : **2.150**

OMC (%) : **6.75**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-12** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **4/6/204/19** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	16%	
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11550	11980	12400	12170	
Wt. of Mould,	g	7770	7770	7770	7770	
Wt. of Wet Soil, W	g	3780	4210	4630	4400	
Wet Density, γ_T=W/V,	gm/cc	1.740	1.938	2.131	2.025	
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.658	1.768	1.878	1.748	

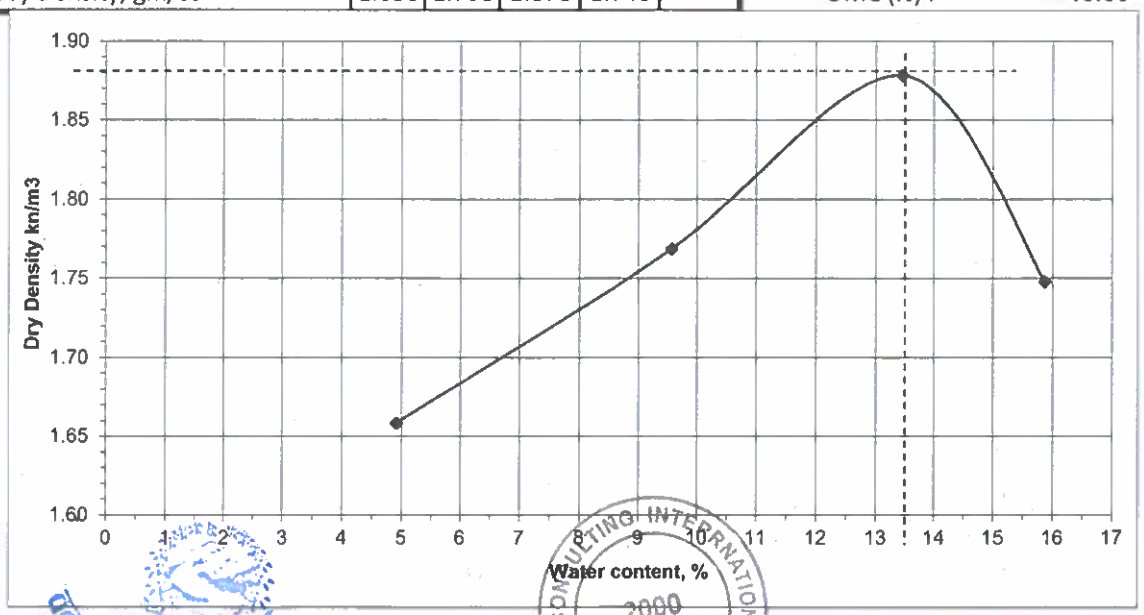
MOISTURE CONTENT

Container No.		A-81	A-83	A-89	A-118	
Wt. of Wet Soil + Container,	g	26.65	40.78	50.32	47.56	
Wt. of Dry Soil + Container,	g	26.23	38.06	45.59	43.45	
Wt. of Water,	g	0.42	2.72	4.73	4.11	
Wt. of Container,	g	17.71	9.67	10.49	17.58	
Wt. of Dry Soil ,	g	8.52	28.39	35.1	25.87	
Moisture Content, w,	%	4.93	9.58	13.48	15.89	
Average Moisture Content,	%	4.93	9.58	13.48	15.89	

Test No.	1	2	3	4	5
Water content, %	4.93	9.58	13.48	15.89	
Dry Density, gm/cc	1.658	1.768	1.878	1.748	

γdmax (gm/cc) : **1.880**

OMC (%) : **13.50**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-13** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **3/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	7%	10%	13%	15%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12160	12370	12600	12580	12540
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4390	4600	4830	4810	4770
Wet Density, γ_T=W/V,	gm/cc	2.021	2.117	2.223	2.214	2.195
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.958	1.991	2.032	1.974	1.934

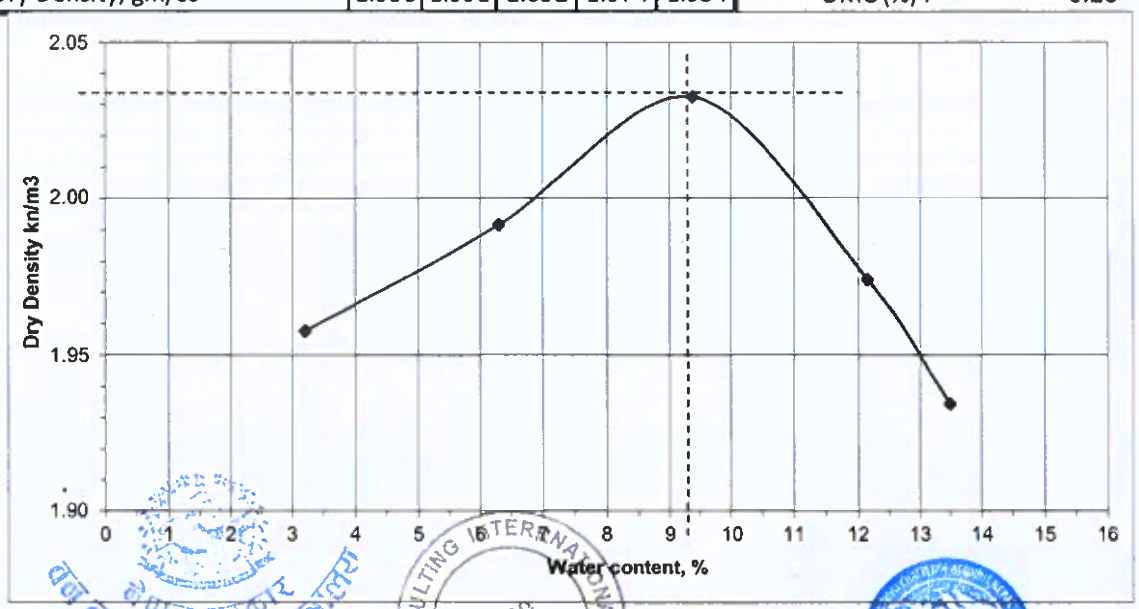
MOISTURE CONTENT

Container No.		A-130	A-72	A-127	A-123	A-86
Wt. of Wet Soil + Container,	g	29.99	18.20	30.00	26.57	24.18
Wt. of Dry Soil + Container,	g	29.61	17.61	29.01	25.44	22.55
Wt. of Water,	g	0.38	0.59	0.99	1.13	1.63
Wt. of Container,	g	17.80	8.27	18.47	16.15	10.48
Wt. of Dry Soil ,	g	11.81	9.34	10.54	9.29	12.07
Moisture Content, w,	%	3.22	6.32	9.39	12.16	13.50
Average Moisture Content,	%	3.22	6.32	9.39	12.16	13.50

Test No.	1	2	3	4	5
Water content, %	3.22	6.32	9.39	12.16	13.50
Dry Density, gm/cc	1.958	1.991	2.032	1.974	1.934

γdmax (gm/cc) : **2.033**

OMC (%) : **9.25**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-14** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **11/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	12%	16%	19%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	**11720**	**12120**	**12460**	**12390**	**12340**
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3950	4350	4690	4620	4570
Wet Density, y_T=W/V,	gm/cc	1.818	2.002	2.159	2.126	2.103
Dry Density, y_d=100y_T,(100+w),	gm/cc	1.754	1.857	1.936	1.837	1.776

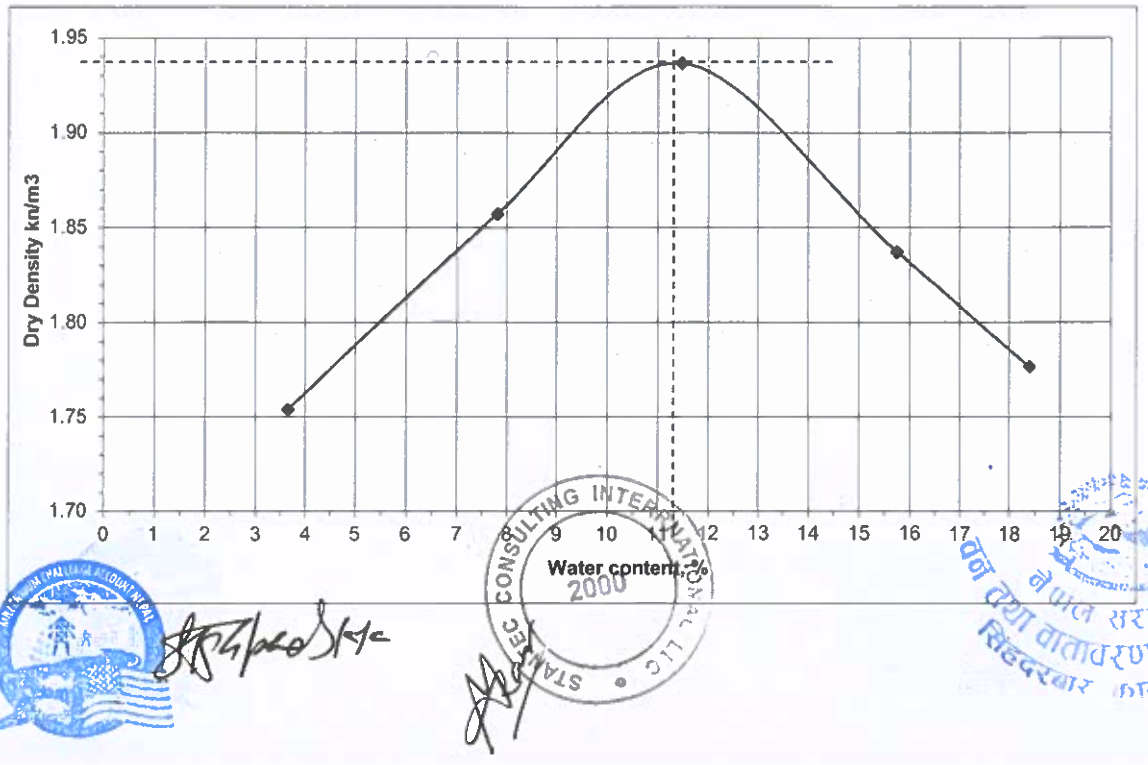
MOISTURE CONTENT

Container No.		**A-15**	**A-4**	**A-24**	**A-21**	**A-42**
Wt. of Wet Soil + Container,	g	**167.24**	**166.53**	**169.88**	**183.77**	**99.83**
Wt. of Dry Soil + Container,	g	**162.39**	**156.65**	**155.67**	**162.78**	**86.39**
Wt. of Water,	g	4.85	9.88	14.21	20.99	13.44
Wt. of Container,	g	**30.15**	**30.34**	**31.94**	**29.63**	**13.39**
Wt. of Dry Soil ,	g	132.24	126.31	123.73	133.15	73.00
Moisture Content, w,	%	3.67	7.82	11.48	15.76	18.41
Average Moisture Content,	%	3.67	7.82	11.48	15.76	18.41

Test No.	1	2	3	4	5
Water content, %	3.67	7.82	11.48	15.76	18.41
Dry Density, gm/cc	1.754	1.857	1.936	1.837	1.776

γdmax (gm/cc) : **1.938**

OMC (%) : **11.25**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-15** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **11/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	6%	11%	16%	19%	
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11920	12500	12350	12250	
Wt. of Mould,	g	7770	7770	7770	7770	
Wt. of Wet Soil, W	g	4150	4730	4580	4480	
Wet Density, γ_T=W/V,	gm/cc	1.910	2.177	2.108	2.062	
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.772	1.927	1.790	1.721	

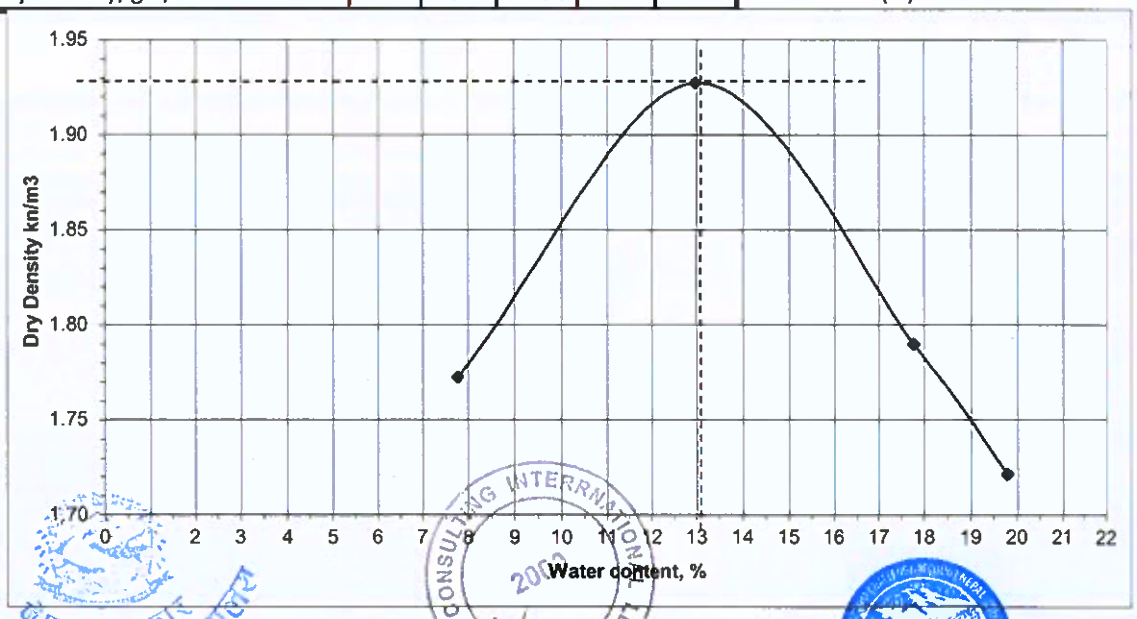
MOISTURE CONTENT

Container No.		A-29	A-3	A-28	A-11	
Wt. of Wet Soil + Container,	g	185.50	168.89	144.22	207.12	
Wt. of Dry Soil + Container,	g	174.11	152.75	126.82	178.12	
Wt. of Water,	g	11.39	16.14	17.4	29.00	
Wt. of Container,	g	27.76	28.39	28.97	31.65	
Wt. of Dry Soil	g	146.35	124.36	97.85	146.47	
Moisture Content, w,	%	7.78	12.98	17.78	19.80	
Average Moisture Content,	%	7.78	12.98	17.78	19.80	

Test No.	1	2	3	4	5
Water content, %	7.78	12.98	17.78	19.80	
Dry Density, gm/cc	1.772	1.927	1.790	1.721	

γdmax (gm/cc) : **1.928**

OMC (%) : **13.00**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-16** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **10/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	11%	14%	15%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12280	12650	12790	12660	12620
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4510	4880	5020	4890	4850
Wet Density, y_T=W/V,	gm/cc	2.076	2.246	2.311	2.251	2.232
Dry Density, y_d=100y_T.(100+w),	gm/cc	2.001	2.090	2.111	1.984	1.944

MOISTURE CONTENT

Container No.		A-82	A-88	A-84	A-69	A-65
Wt. of Wet Soil + Container,	g	48.66	40.41	48.50	43.82	48.85
Wt. of Dry Soil + Container,	g	47.56	38.72	45.71	40.54	44.05
Wt. of Water,	g	1.10	1.69	2.79	3.28	4.80
Wt. of Container,	g	18.17	16.17	16.17	16.13	11.70
Wt. of Dry Soil ,	g	29.39	22.55	29.54	24.41	32.35
Moisture Content, w,	%	3.74	7.49	9.44	13.44	14.84
Average Moisture Content,	%	3.74	7.49	9.44	13.44	14.84

Test No.	1	2	3	4	5
Water content, %	3.74	7.49	9.44	13.44	14.84
Dry Density, gm/cc	2.001	2.090	2.111	1.984	1.944

γdmax (gm/cc) : **2.117**

OMC (%) : **8.75**

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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-17** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **#####** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	11%	14%	17%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11850	12240	12430	12480	12430
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4080	4470	4660	4710	4660
Wet Density, γ_T=W/V,	gm/cc	1.878	2.057	2.145	2.168	2.145
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.808	1.915	1.937	1.909	1.843

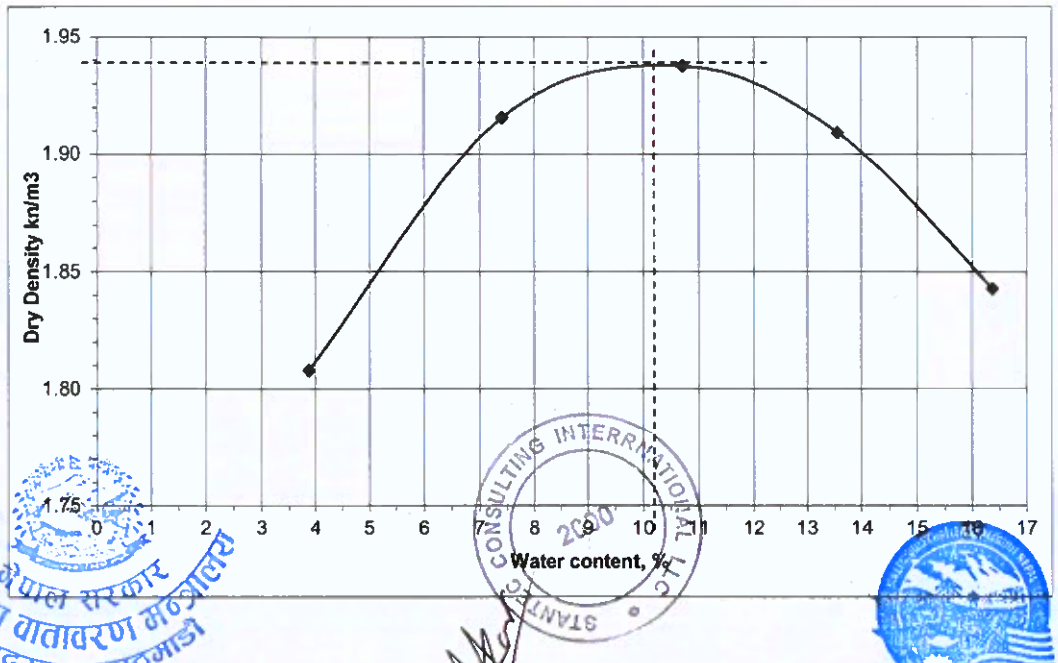
MOISTURE CONTENT

Container No.		A-8	A-1	A-5	A-12	A-22
Wt. of Wet Soil + Container,	g	190.01	192.73	195.87	198.59	179.96
Wt. of Dry Soil + Container,	g	183.99	181.62	179.59	178.52	158.99
Wt. of Water,	g	6.02	11.11	16.28	20.07	20.97
Wt. of Container,	g	29.26	31.90	27.68	30.60	31.10
Wt. of Dry Soil ,	g	154.73	149.72	151.91	147.92	127.89
Moisture Content, w,	%	3.89	7.42	10.72	13.57	16.40
Average Moisture Content,	%	3.89	7.42	10.72	13.57	16.40

Test No.	1	2	3	4	5
Water content, %	3.89	7.42	10.72	13.57	16.40
Dry Density, gm/cc	1.808	1.915	1.937	1.909	1.843

γdmax (gm/cc) : **1.940**

OMC (%) : **9.75**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-18** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **11/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	12%	16%	18%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12060	12310	12600	12460	12370
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4290	4540	4830	4690	4600
Wet Density, γ_T=W/V,	gm/cc	1.975	2.090	2.223	2.159	2.117
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.902	1.948	1.993	1.875	1.817

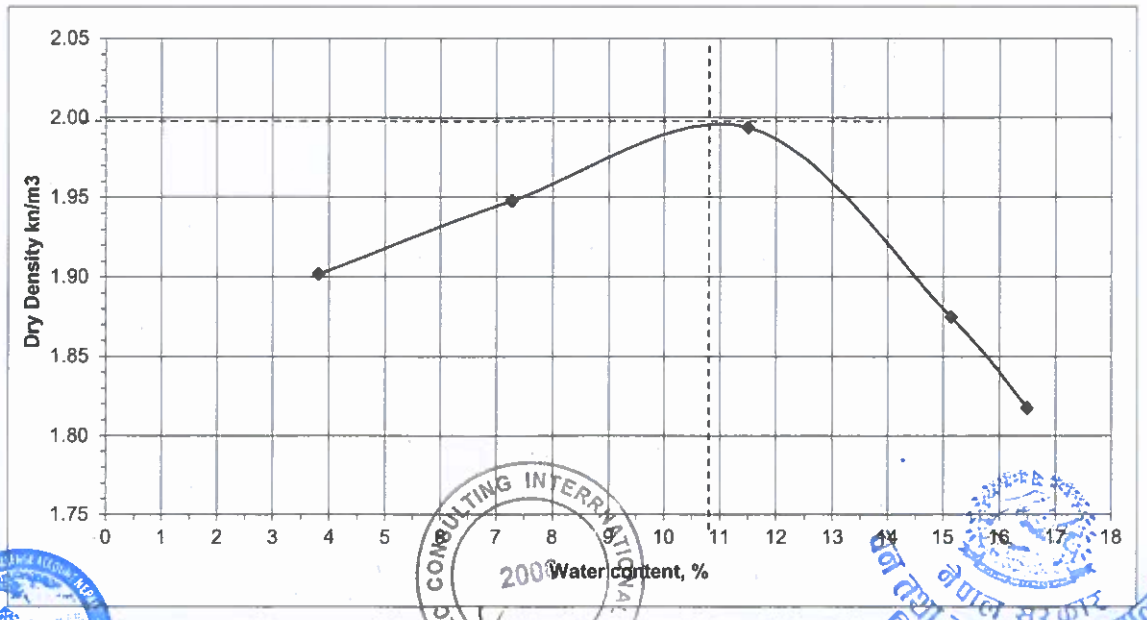
MOISTURE CONTENT

Container No.		A-10	A-2	A-11	A-8	A-22
Wt. of Wet Soil + Container,	g	247.62	203.69	176.29	169.71	210.52
Wt. of Dry Soil + Container,	g	239.55	191.72	161.34	151.23	185.10
Wt. of Water,	g	8.07	11.97	14.95	18.48	25.42
Wt. of Container,	g	29.13	27.56	31.54	29.26	31.07
Wt. of Dry Soil ,	g	210.42	164.16	129.8	121.97	154.03
Moisture Content, w,	%	3.84	7.29	11.52	15.15	16.50
Average Moisture Content,	%	3.84	7.29	11.52	15.15	16.50

Test No.	1	2	3	4	5
Water content, %	3.84	7.29	11.52	15.15	16.50
Dry Density, gm/cc	1.902	1.948	1.993	1.875	1.817

γdmax (gm/cc) : **1.946**

OMC (%) : **10.75**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-19** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **#####** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	6%	11%	16%	21%	26%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11380	11780	12230	12280	12160
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3610	4010	4460	4510	4390
Wet Density, γ_T=W/V,	gm/cc	1.662	1.846	2.053	2.076	2.021
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.575	1.668	1.772	1.725	1.608

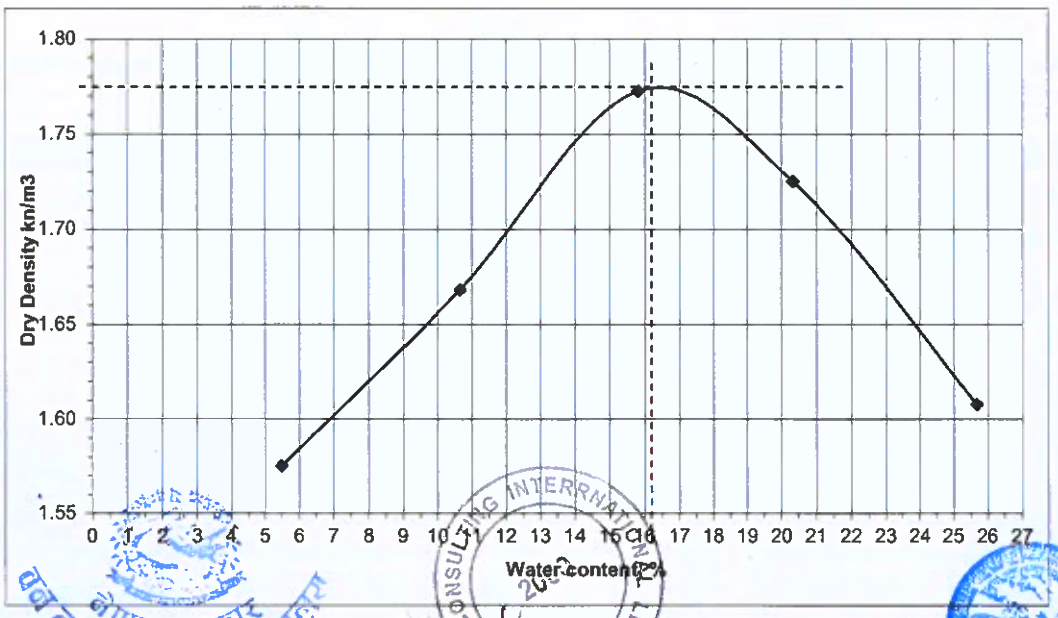
MOISTURE CONTENT

Container No.		A-69	A-85	A-99	A-101	A-103
Wt. of Wet Soil + Container,	g	25.74	27.62	22.64	28.37	21.09
Wt. of Dry Soil + Container,	g	25.24	26.63	20.91	26.30	18.49
Wt. of Water,	g	0.50	0.99	1.73	2.07	2.60
Wt. of Container,	g	16.15	17.35	9.98	16.13	8.37
Wt. of Dry Soil ,	g	9.09	9.28	10.93	10.17	10.12
Moisture Content, w,	%	5.50	10.67	15.83	20.35	25.69
Average Moisture Content,	%	5.50	10.67	15.83	20.35	25.69

Test No.	1	2	3	4	5
Water content, %	5.50	10.67	15.83	20.35	25.69
Dry Density, gm/cc	1.575	1.668	1.772	1.725	1.608

γdmax (gm/cc) : **1.774**

OMC (%) : **16.00**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-20** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **######** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11670	11930	12190	12320	12210
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3900	4160	4420	4550	4440
Wet Density, y_T=W/V,	gm/cc	1.795	1.915	2.034	2.094	2.044
Dry Density, y_d=100y_T÷(100+w),	gm/cc	1.718	1.769	1.806	1.796	1.689

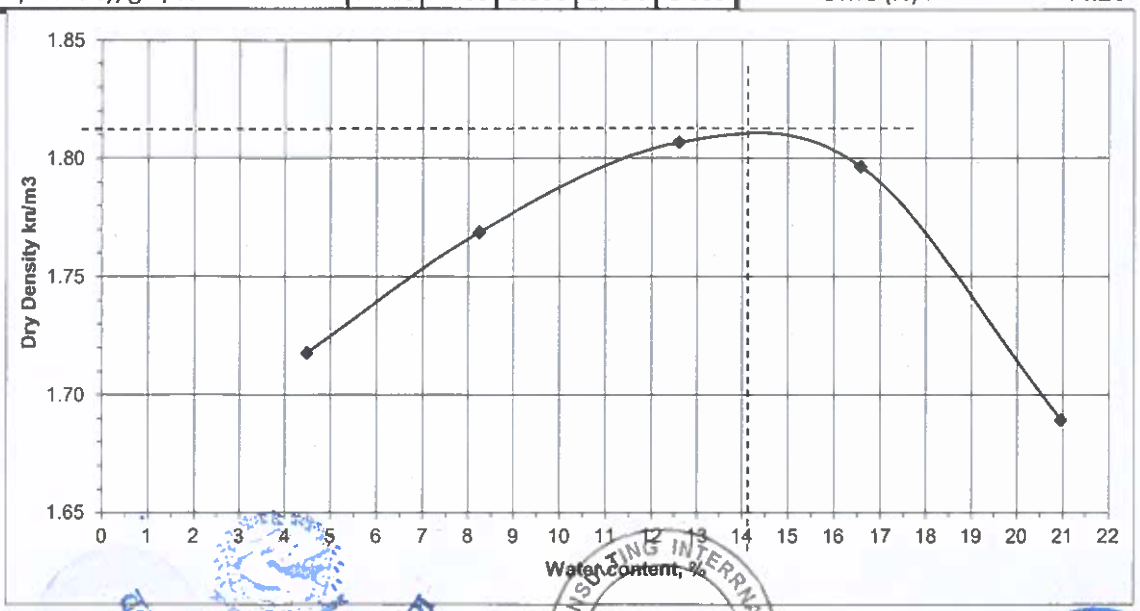
MOISTURE CONTENT

Container No.		A-66	A-71	A-87	A-135	A-97
Wt. of Wet Soil + Container,	g	28.78	26.64	30.07	18.95	19.19
Wt. of Dry Soil + Container,	g	28.30	25.99	27.76	17.52	17.47
Wt. of Water,	g	0.48	0.65	2.31	1.43	1.72
Wt. of Container,	g	17.65	18.12	9.46	8.90	9.27
Wt. of Dry Soil ,	g	10.65	7.87	18.3	8.62	8.20
Moisture Content, w,	%	4.51	8.26	12.62	16.59	20.98
Average Moisture Content,	%	4.51	8.26	12.62	16.59	20.98

Test No.	1	2	3	4	5
Water content, %	4.51	8.26	12.62	16.59	20.98
Dry Density, gm/cc	1.718	1.769	1.806	1.796	1.689

γdmax (gm/cc) : **1.812**

OMC (%) : **14.25**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-21** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **######** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	12%	16%	19%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11710	12180	12570	12480	12380
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3940	4410	4800	4710	4610
Wet Density, y_T=W/V,	gm/cc	1.813	2.030	2.209	2.168	2.122
Dry Density, y_d=100y_T÷(100+w),	gm/cc	1.753	1.885	1.977	1.876	1.788

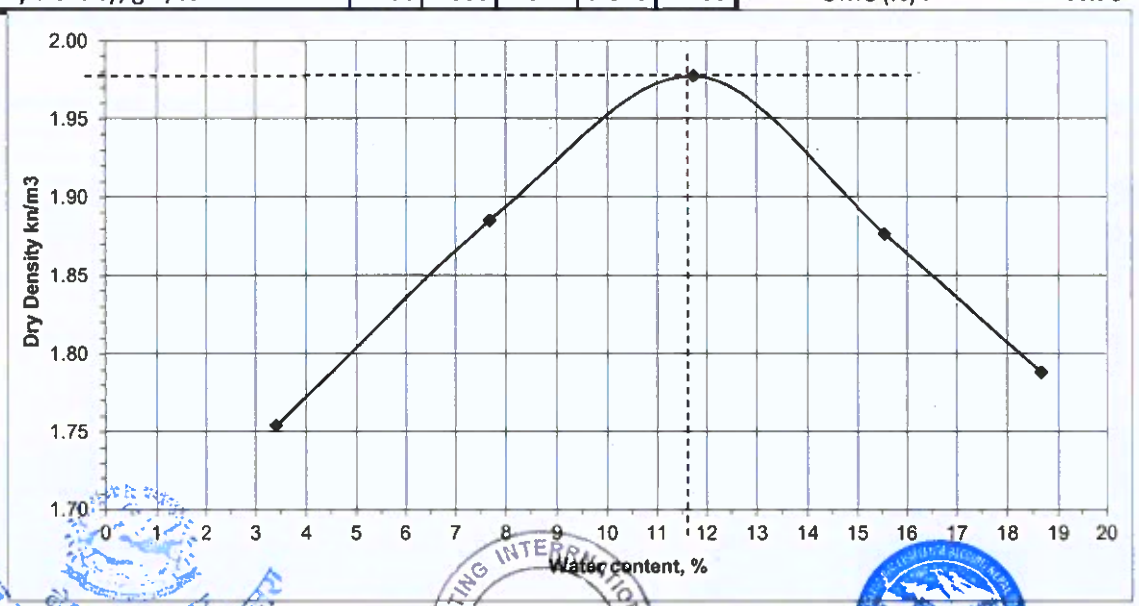
MOISTURE CONTENT

Container No.		A-112	A-108	A-86	A-132	A-85
Wt. of Wet Soil + Container,	g	26.45	31.85	30.25	18.50	33.15
Wt. of Dry Soil + Container,	g	26.16	30.87	28.17	17.38	30.66
Wt. of Water,	g	0.29	0.98	2.08	1.12	2.49
Wt. of Container,	g	17.68	18.15	10.47	10.18	17.33
Wt. of Dry Soil ,	g	8.48	12.72	17.7	7.20	13.33
Moisture Content, w,	%	3.42	7.70	11.75	15.56	18.68
Average Moisture Content,	%	3.42	7.70	11.75	15.56	18.68

Test No.	1	2	3	4	5
Water content, %	3.42	7.70	11.75	15.56	18.68
Dry Density, gm/cc	1.753	1.885	1.977	1.876	1.788

γdmax (gm/cc) : **1.978**

OMC (%) : **11.75**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-22** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **24/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12470	12730	12900	12780	12730
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4700	4960	5130	5010	4960
Wet Density, y_T=W/V,	gm/cc	2.163	2.283	2.361	2.306	2.283
Dry Density, y_d=100y_T/(100+w),	gm/cc	2.090	2.154	2.170	2.053	1.996

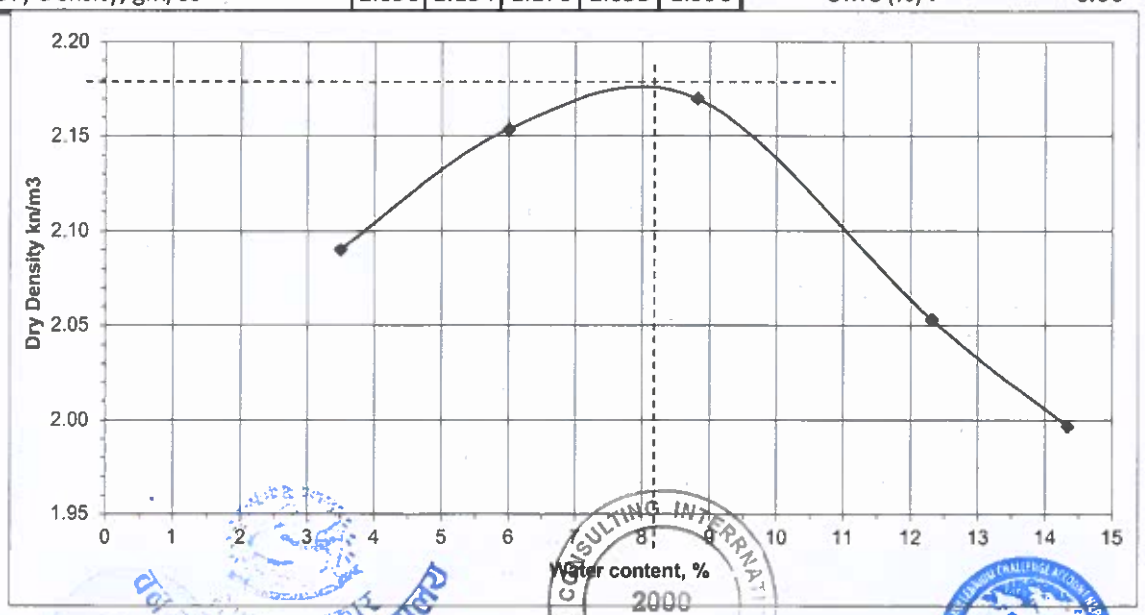
MOISTURE CONTENT

Container No.		A-129	A-68	A-101	A-134	A-103
Wt. of Wet Soil + Container,	g	29.30	32.59	26.97	18.99	22.72
Wt. of Dry Soil + Container,	g	28.85	31.73	26.09	18.00	20.92
Wt. of Water,	g	0.45	0.86	0.88	0.99	1.80
Wt. of Container,	g	16.02	17.42	16.12	9.97	8.38
Wt. of Dry Soil ,	g	12.83	14.31	9.97	8.03	12.54
Moisture Content, w,	%	3.51	6.01	8.83	12.33	14.35
Average Moisture Content,	%	3.51	6.01	8.83	12.33	14.35

Test No.	1	2	3	4	5
Water content, %	3.51	6.01	8.83	12.33	14.35
Dry Density, gm/cc	2.090	2.154	2.170	2.053	1.996

γdmax (gm/cc) : **2.178**

OMC (%) : **8.00**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-25** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **26/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11620	12040	12390	12430	12320
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3850	4270	4620	4660	4550
Wet Density, γ_T=W/V,	gm/cc	1.772	1.965	2.126	2.145	2.094
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.692	1.806	1.887	1.830	1.730

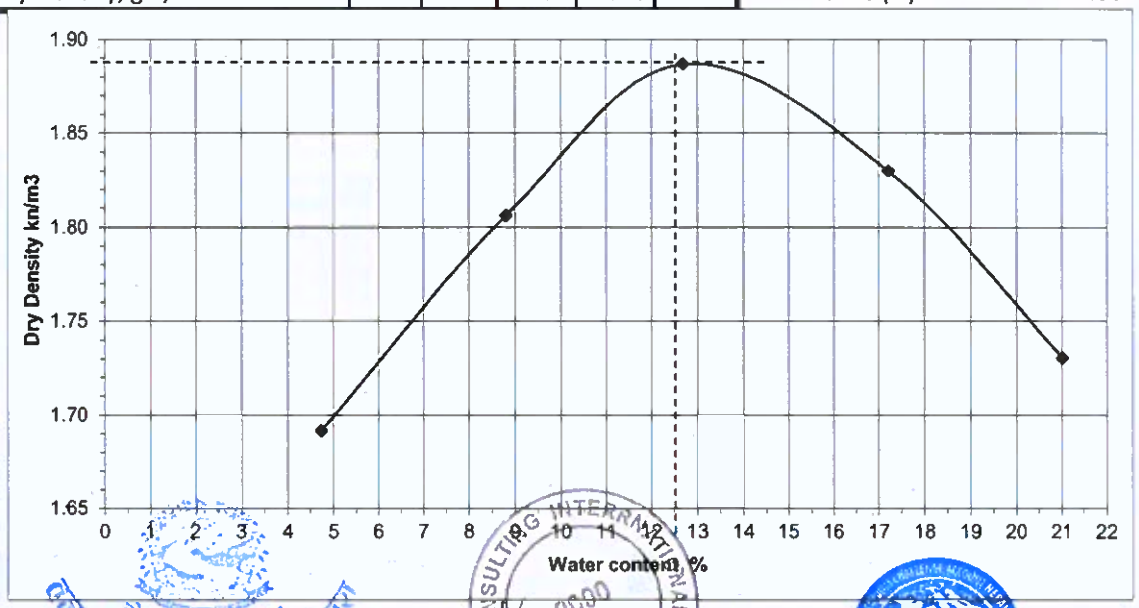
MOISTURE CONTENT

Container No.		A-103	A-101	A-143	A-104	A-197
Wt. of Wet Soil + Container,	g	17.39	22.30	29.79	24.92	22.23
Wt. of Dry Soil + Container,	g	16.98	21.80	28.25	23.63	19.98
Wt. of Water,	g	0.41	0.50	1.54	1.29	2.25
Wt. of Container,	g	8.36	16.13	16.13	16.14	9.28
Wt. of Dry Soil ,	g	8.62	5.67	12.12	7.49	10.70
Moisture Content, w,	%	4.76	8.82	12.71	17.22	21.03
Average Moisture Content,	%	4.76	8.82	12.71	17.22	21.03

Test No.	1	2	3	4	5
Water content, %	4.76	8.82	12.71	17.22	21.03
Dry Density, gm/cc	1.692	1.806	1.887	1.830	1.730

γdmax (gm/cc) : **1.889**

OMC (%) : **12.60**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-26** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **22/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	**11720**	**12020**	**12170**	**12080**	**12000**
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3950	4250	4400	4310	4230
Wet Density, γ_T=W/V,	gm/cc	1.818	1.956	2.025	1.984	1.947
Dry Density, γ_d=100γ_T÷(100+w),	gm/cc	1.605	1.667	1.671	1.579	1.516

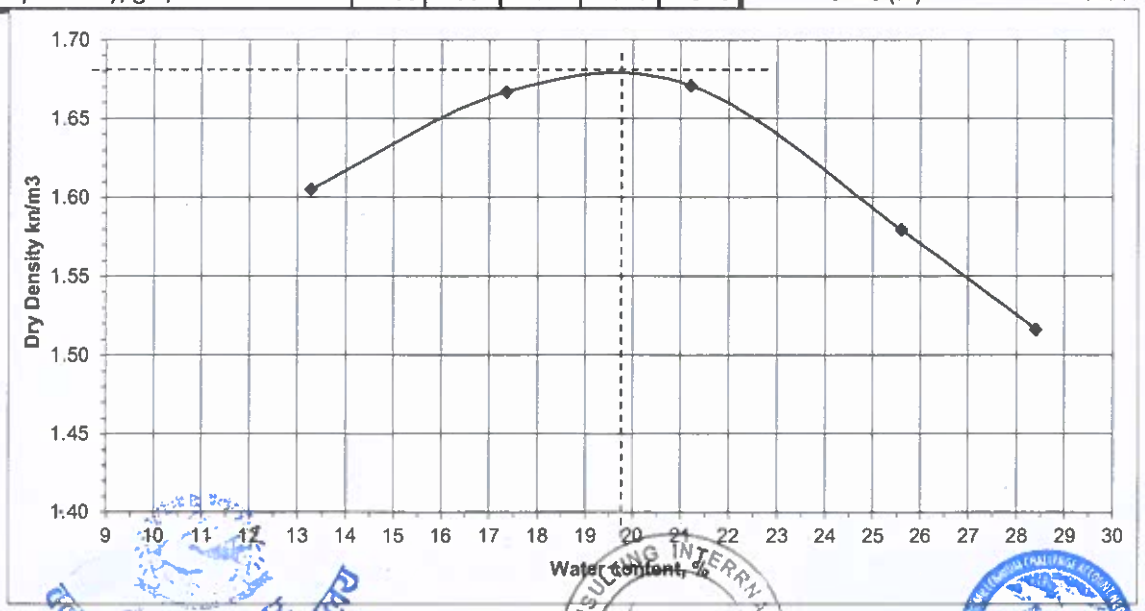
MOISTURE CONTENT

Container No.		**A-126**	**A-143**	**A-117**	**A-66**	**A-72**
Wt. of Wet Soil + Container,	g	**17.03**	**26.77**	**17.46**	**28.89**	**21.36**
Wt. of Dry Soil + Container,	g	**16.08**	**25.20**	**16.11**	**26.60**	**18.47**
Wt. of Water,	g	0.95	1.57	1.35	2.29	2.89
Wt. of Container,	g	**8.93**	**16.16**	**9.75**	**17.66**	**8.30**
Wt. of Dry Soil ,	g	7.15	9.04	6.36	8.94	10.17
Moisture Content, w,	%	13.29	17.37	21.23	25.62	28.42
Average Moisture Content,	%	13.29	17.37	21.23	25.62	28.42

Test No.	1	2	3	4	5
Water content, %	13.29	17.37	21.23	25.62	28.42
Dry Density, gm/cc	1.605	1.667	1.671	1.579	1.516

γdmax (gm/cc) : **1.680**

OMC (%) : **19.50**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-27** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **29/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12080	12560	12660	12530	12390
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4310	4790	4890	4760	4620
Wet Density, y_T=W/V,	gm/cc	1.984	2.205	2.251	2.191	2.126
Dry Density, y_d=100y_T/(100+w), gm/cc		1.892	2.030	2.004	1.880	1.778

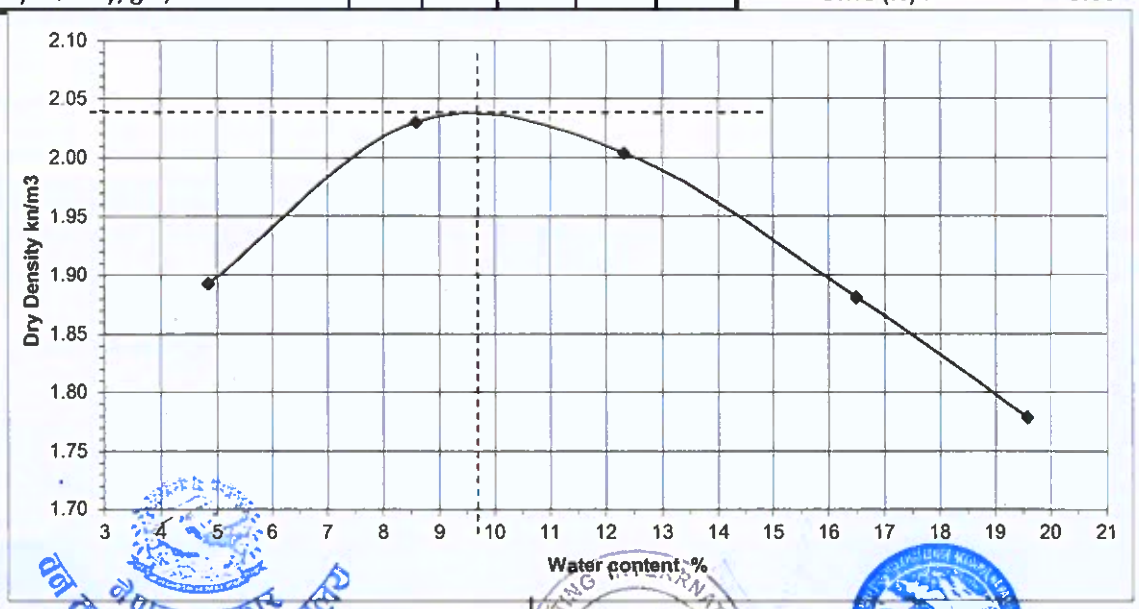
MOISTURE CONTENT

Container No.		A-125	A-94	A-97	A-103	A-86
Wt. of Wet Soil + Container,	g	18.78	14.79	17.91	23.25	26.60
Wt. of Dry Soil + Container,	g	18.38	14.37	16.96	21.14	23.96
Wt. of Water,	g	0.40	0.42	0.95	2.11	2.64
Wt. of Container,	g	10.13	9.49	9.26	8.36	10.48
Wt. of Dry Soil ,	g	8.25	4.88	7.7	12.78	13.48
Moisture Content, w,	%	4.85	8.61	12.34	16.51	19.58
Average Moisture Content,	%	4.85	8.61	12.34	16.51	19.58

Test No.	1	2	3	4	5
Water content, %	4.85	8.61	12.34	16.51	19.58
Dry Density, gm/cc	1.892	2.030	2.004	1.880	1.778

γdmax (gm/cc) : **2.040**

OMC (%) : **9.50**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-28** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **26/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11460	11750	12030	12180	12040
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3690	3980	4260	4410	4270
Wet Density, γ_T=W/V,	gm/cc	1.698	1.832	1.961	2.030	1.965
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.565	1.627	1.678	1.684	1.574

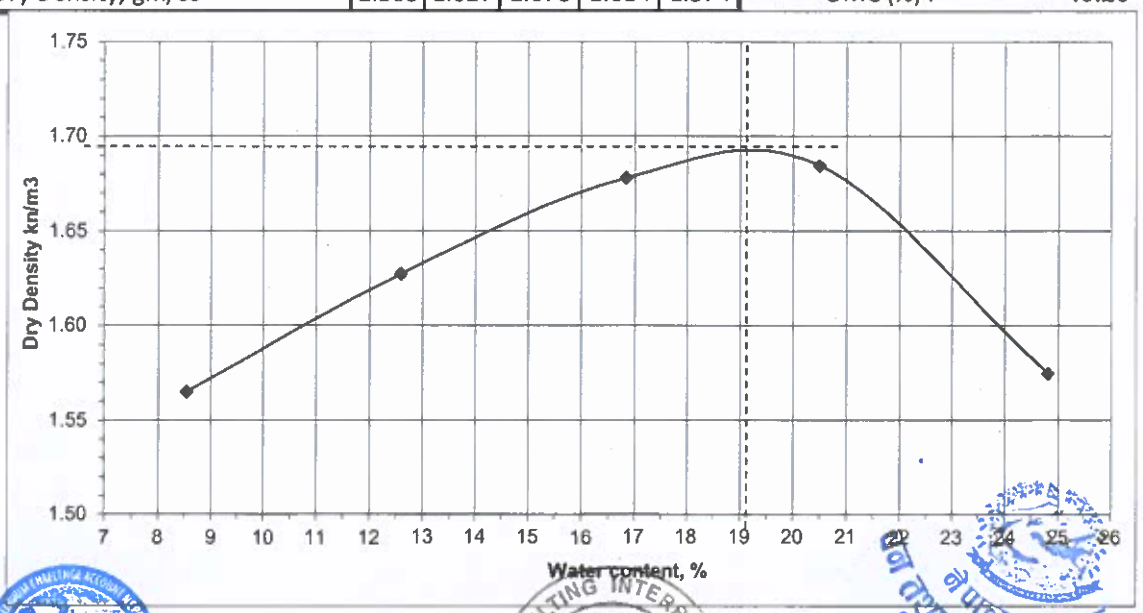
MOISTURE CONTENT

Container No.		A-75	A-118	A-128	A-112	A-119
Wt. of Wet Soil + Container,	g	23.59	26.80	27.36	25.81	18.99
Wt. of Dry Soil + Container,	g	23.00	25.77	25.99	24.43	17.23
Wt. of Water,	g	0.59	1.03	1.37	1.38	1.76
Wt. of Container,	g	16.10	17.59	17.86	17.70	10.14
Wt. of Dry Soil ,	g	6.90	8.18	8.13	6.73	7.09
Moisture Content, w,	%	8.55	12.59	16.85	20.51	24.82
Average Moisture Content,	%	8.55	12.59	16.85	20.51	24.82

Test No.	1	2	3	4	5
Water content, %	8.55	12.59	16.85	20.51	24.82
Dry Density, gm/cc	1.565	1.627	1.678	1.684	1.574

γdmax (gm/cc) : **1.693**

OMC (%) : **19.25**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-29** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **22/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12210	12580	12980	12860	12680
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4440	4810	5210	5090	4910
Wet Density, γ_T=W/V,	gm/cc	2.044	2.214	2.398	2.343	2.260
Dry Density, γ_d=100γ_T.(100+w),	gm/cc	2.006	2.130	2.231	2.098	1.969

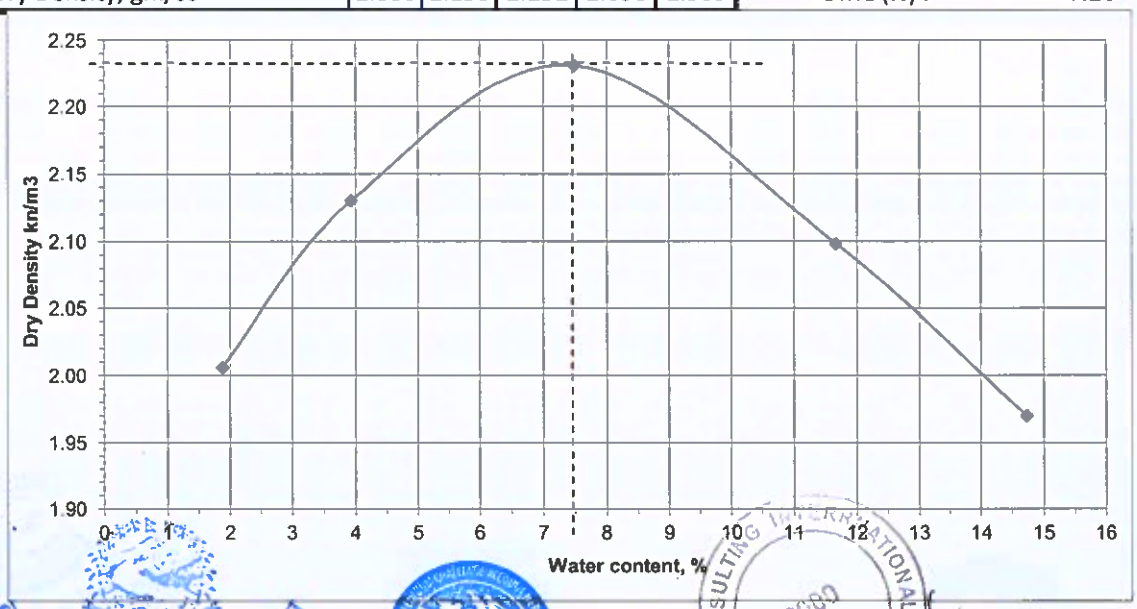
MOISTURE CONTENT

Container No.		A-126	A-103	A-96	A-126	A-66
Wt. of Wet Soil + Container,	g	17.03	23.09	20.26	25.05	33.65
Wt. of Dry Soil + Container,	g	16.88	22.53	19.55	23.37	31.59
Wt. of Water,	g	0.15	0.56	0.71	1.68	2.06
Wt. of Container,	g	8.93	8.35	10.09	8.98	17.62
Wt. of Dry Soil ,	g	7.95	14.18	9.46	14.39	13.97
Moisture Content, w,	%	1.89	3.95	7.51	11.67	14.75
Average Moisture Content,	%	1.89	3.95	7.51	11.67	14.75

Test No.	1	2	3	4	5
Water content, %	1.89	3.95	7.51	11.67	14.75
Dry Density, gm/cc	2.006	2.130	2.231	2.098	1.969

γdmax (gm/cc) : **2.240**

OMC (%) : **7.25**



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New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-30** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **24/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12230	12460	12870	12860	12800
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4460	4690	5100	5090	5030
Wet Density, y_T=W/V,	gm/cc	2.053	2.159	2.347	2.343	2.315
Dry Density, y_d=100y_T.(100+w),	gm/cc	2.021	2.088	2.196	2.130	2.071

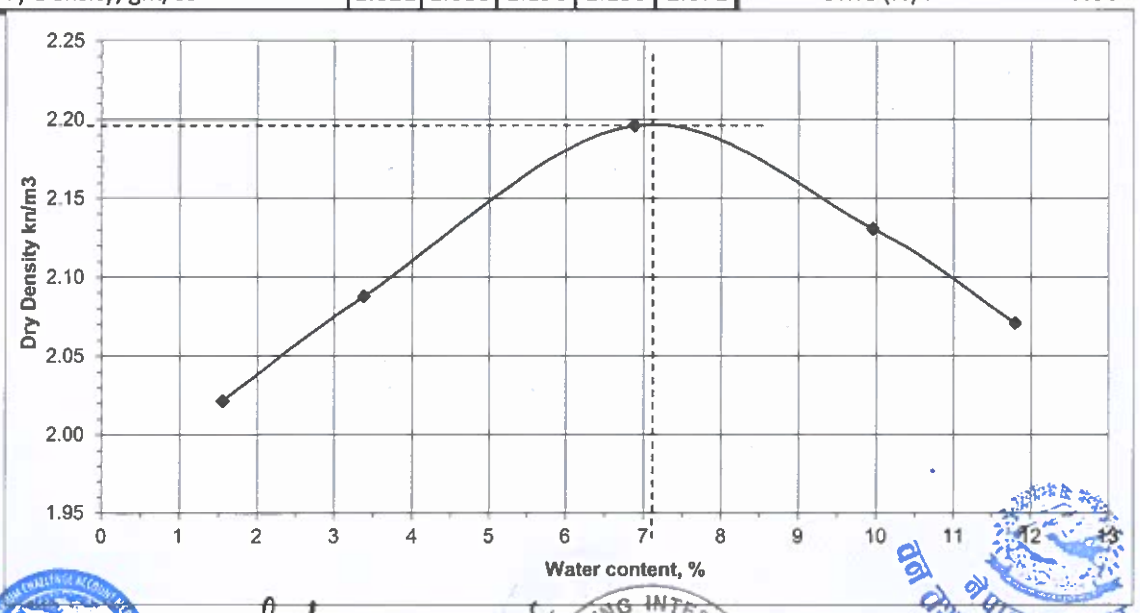
MOISTURE CONTENT

Container No.		A-126	A-112	A-62	A-114	A-127
Wt. of Wet Soil + Container,	g	17.38	29.88	27.80	26.09	29.35
Wt. of Dry Soil + Container,	g	17.25	29.48	27.05	25.18	28.20
Wt. of Water,	g	0.13	0.40	0.75	0.91	1.15
Wt. of Container,	g	8.93	17.69	16.17	16.05	18.46
Wt. of Dry Soil ,	g	8.32	11.79	10.88	9.13	9.74
Moisture Content, w,	%	1.56	3.39	6.89	9.97	11.81
Average Moisture Content,	%	1.56	3.39	6.89	9.97	11.81

Test No.	1	2	3	4	5
Water content, %	1.56	3.39	6.89	9.97	11.81
Dry Density, gm/cc	2.021	2.088	2.196	2.130	2.071

γdmax (gm/cc) : **2.195**

OMC (%) : **7.00**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-31** Date: **22/05/2019** Mould Size : **D=14.7, H=12.80**

Depth: **0.00 - 1.00m**

Description: Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Checked by: **Dr. S.** ASTM: D-1557 Modified Proctor

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12180	12430	12710	12780	12640
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4410	4660	4940	5010	4870
Wet Density, γ_T=W/V,	gm/cc	2.030	2.145	2.274	2.306	2.241
Dry Density, γ_d=100γ_T.(100+w),	gm/cc	2.004	2.068	2.111	2.064	1.836

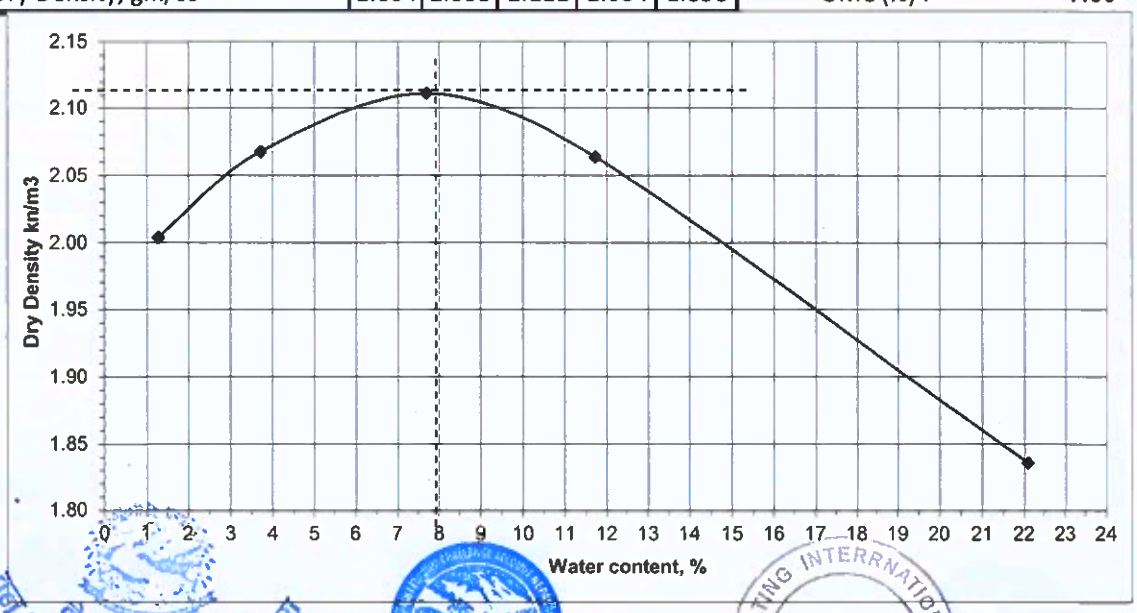
MOISTURE CONTENT

Container No.		A-134	A-142	A-142	A-101	A-92
Wt. of Wet Soil + Container,	g	23.15	24.13	15.41	22.80	19.48
Wt. of Dry Soil + Container,	g	22.98	23.89	15.00	22.10	17.39
Wt. of Water,	g	0.17	0.24	0.41	0.70	2.09
Wt. of Container,	g	9.95	17.47	9.69	16.14	7.96
Wt. of Dry Soil ,	g	13.03	6.42	5.31	5.96	9.43
Moisture Content, w,	%	1.30	3.74	7.72	11.74	22.11
Average Moisture Content,	%	1.30	3.74	7.72	11.74	22.11

Test No.	1	2	3	4	5
Water content, %	1.30	3.74	7.72	11.74	22.11
Dry Density, gm/cc	2.004	2.068	2.111	2.064	1.836

γdmax (gm/cc) : **2.110**

OMC (%) : **7.60**



नेपाल सरकार
ऊर्जा तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

STANTEC CONSULTING INTERNATIONAL 2000

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-32** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **23/06/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	12%	16%	20%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11570	12000	12350	12220	12100
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3800	4230	4580	4450	4330
Wet Density, γ_T=W/V,	gm/cc	1.749	1.947	2.108	2.048	1.993
Dry Density, γ_d=100γ_T.(100+w),	gm/cc	1.683	1.804	1.883	1.766	1.662

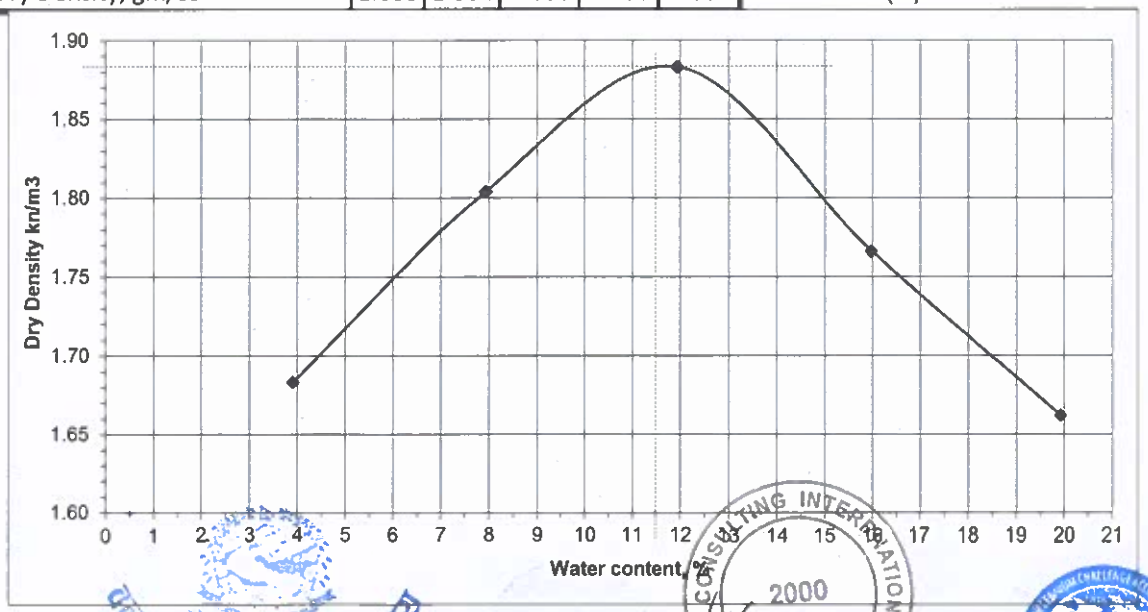
MOISTURE CONTENT

Container No.		A-101	A-94	A-66	A-97	A-72
Wt. of Wet Soil + Container,	g	33.97	35.18	25.15	29.28	28.09
Wt. of Dry Soil + Container,	g	33.30	33.29	24.35	26.52	24.80
Wt. of Water,	g	0.67	1.89	0.8	2.76	3.29
Wt. of Container,	g	16.22	9.49	17.66	9.26	8.30
Wt. of Dry Soil ,	g	17.08	23.80	6.69	17.26	16.50
Moisture Content, w,	%	3.92	7.94	11.96	15.99	19.94
Average Moisture Content,	%	3.92	7.94	11.96	15.99	19.94

Test No.	1	2	3	4	5
Water content, %	3.92	7.94	11.96	15.99	19.94
Dry Density, gm/cc	1.683	1.804	1.883	1.766	1.662

γdmax (gm/cc) : **1.883**

OMC (%) : **11.50**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-33** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **22/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.	1	2	3	4	5
Assumed Water Content, %	14%	18%	22%	26%	29%
Wt. of Air Dry Soil Used, g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil, %					
Amount of Water Added, cc					
Wt.of Wet Soil + Mould, g	11720	12020	12170	12080	12000
Wt. of Mould, g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W g	3950	4250	4400	4310	4230
Wet Density, γ_T=W/V, gm/cc	1.818	1.956	2.025	1.984	1.947
Dry Density, γ_d=100γ_T/(100+w), gm/cc	1.596	1.674	1.671	1.586	1.516

MOISTURE CONTENT

Container No.	A-126	A-143	A-117	A-66	A-72
Wt. of Wet Soil + Container, g	17.03	26.77	17.46	28.29	21.36
Wt. of Dry Soil + Container, g	16.04	25.24	16.11	26.16	18.47
Wt. of Water, g	0.99	1.53	1.35	2.13	2.89
Wt. of Container, g	8.93	16.16	9.75	17.66	8.30
Wt. of Dry Soil , g	7.11	9.08	6.36	8.50	10.17
Moisture Content, w, %	13.92	16.85	21.23	25.06	28.42
Average Moisture Content, %	13.92	16.85	21.23	25.06	28.42

Test No.	1	2	3	4	5
Water content, %	13.92	16.85	21.23	25.06	28.42
Dry Density, gm/cc	1.596	1.674	1.671	1.586	1.516

γdmax (gm/cc) : **1.683**

OMC (%) : **18.50**

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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-34** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **26/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	**11620**	**12040**	**12390**	**12430**	**12320**
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3850	4270	4620	4660	4550
Wet Density, γ_T=W/V,	gm/cc	1.772	1.965	2.126	2.145	2.094
Dry Density, γ_d=100γ_T÷(100+w),	gm/cc	1.696	1.807	1.887	1.839	1.749

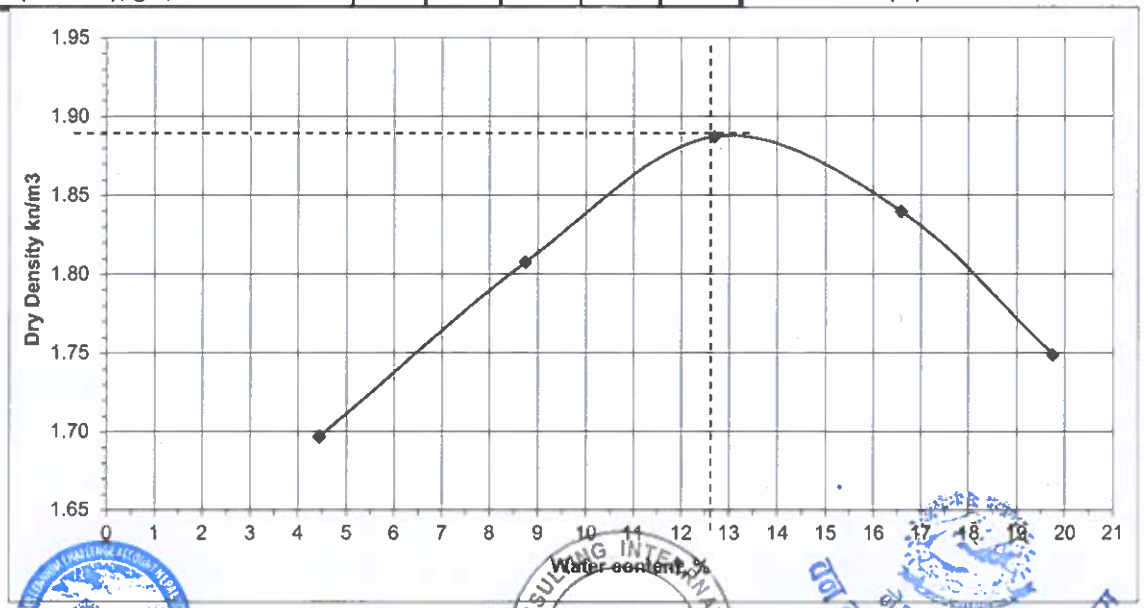
MOISTURE CONTENT

Container No.		**A-139**	**A-88**	**A-85**	**A-129**	**A-127**
Wt. of Wet Soil + Container,	g	**24.62**	**28.33**	**26.84**	**28.39**	**31.62**
Wt. of Dry Soil + Container,	g	**24.26**	**27.35**	**25.77**	**26.63**	**29.45**
Wt. of Water,	g	0.36	0.98	1.07	1.76	2.17
Wt. of Container,	g	**16.18**	**16.16**	**17.35**	**16.03**	**18.47**
Wt. of Dry Soil ,	g	8.08	11.19	8.42	10.60	10.98
Moisture Content, w,	%	4.46	8.76	12.71	16.60	19.76
Average Moisture Content,	%	4.46	8.76	12.71	16.60	19.76

Test No.	1	2	3	4	5
Water content, %	4.46	8.76	12.71	16.60	19.76
Dry Density, gm/cc	1.696	1.807	1.887	1.839	1.749

γdmax (gm/cc) : **1.890**

OMC (%) : **12.75**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-35** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **10/2/2076** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	10%	12%	15%	18%	24%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11790	12260	12350	12250	12150
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4020	4490	4580	4480	4380
Wet Density, y_T=W/V,	gm/cc	1.850	2.067	2.108	2.062	2.016
Dry Density, y_d=100y_T-(100+w),	gm/cc	1.690	1.845	1.838	1.751	1.669

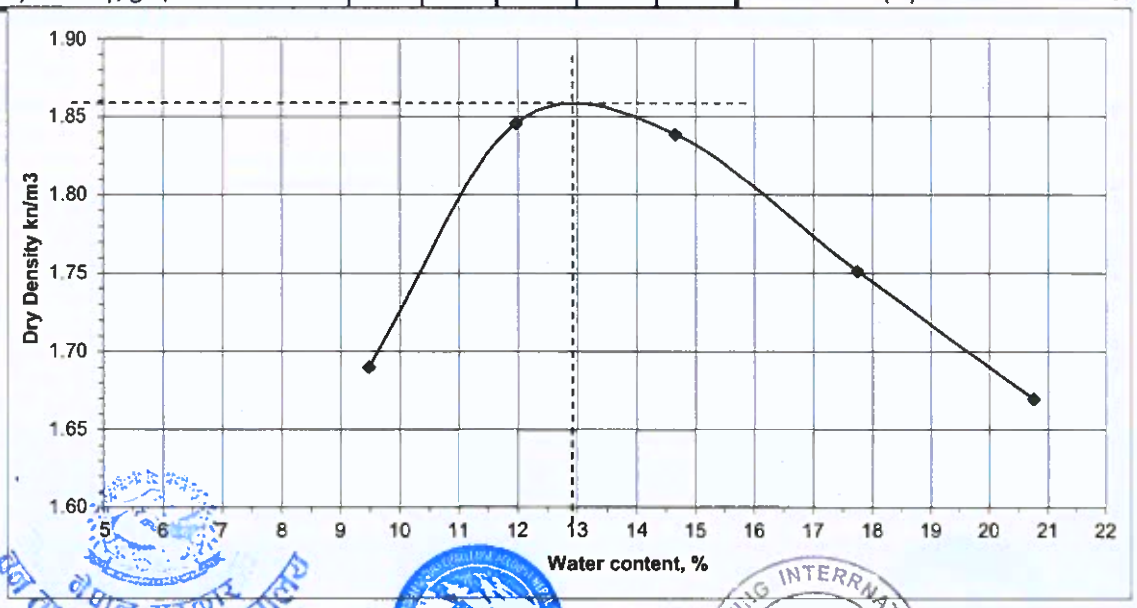
MOISTURE CONTENT

Container No.		A-129	A-127	A-108	A-62	A-66
Wt. of Wet Soil + Container,	g	26.16	27.72	28.40	28.22	28.05
Wt. of Dry Soil + Container,	g	25.28	26.73	27.09	26.40	26.26
Wt. of Water,	g	0.88	0.99	1.31	1.82	1.79
Wt. of Container,	g	16.01	18.47	18.16	16.15	17.64
Wt. of Dry Soil ,	g	9.27	8.26	8.93	10.25	8.62
Moisture Content, w,	%	9.49	11.99	14.67	17.76	20.77
Average Moisture Content,	%	9.49	11.99	14.67	17.76	20.77

Test No.	1	2	3	4	5
Water content, %	9.49	11.99	14.67	17.76	20.77
Dry Density, gm/cc	1.690	1.845	1.838	1.751	1.669

γdmax (gm/cc) : **1.860**

OMC (%) : **12.75**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-36** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **10/2/2076** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	3%	7%	10%	11%	14%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	**12090**	**12670**	**12930**	**12810**	**12610**
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4320	4900	5160	5040	4840
Wet Density, γ_T=W/V,	gm/cc	1.988	2.255	2.375	2.320	2.228
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.955	2.123	2.178	2.095	1.968

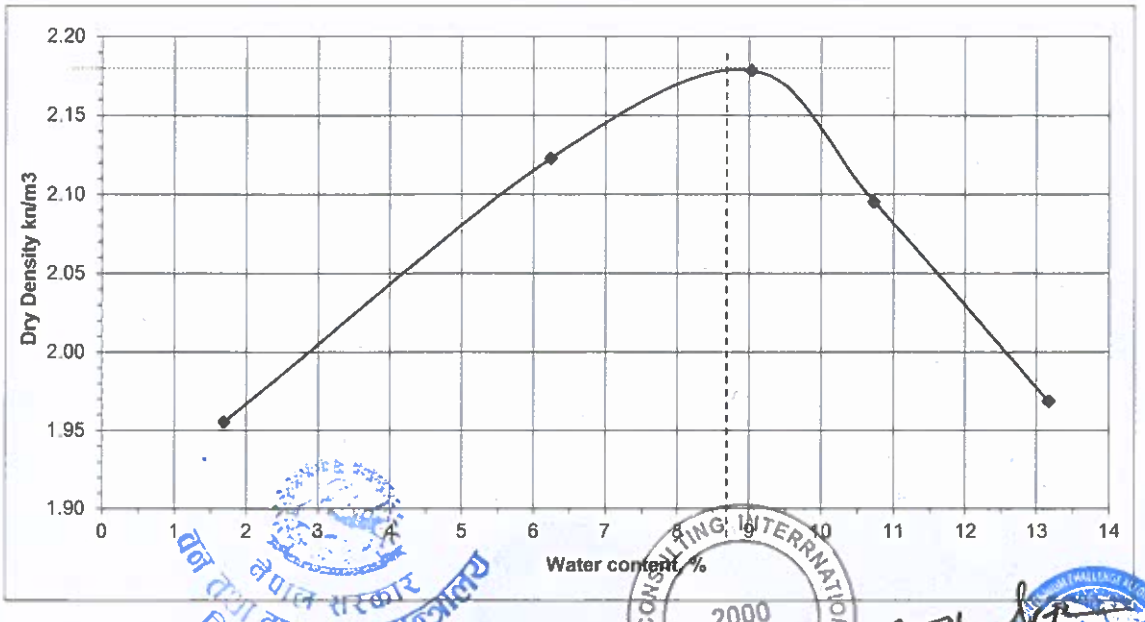
MOISTURE CONTENT

Container No.		**A-117**	**A-143**	**A-103**	**A-114**	**A-61**
Wt. of Wet Soil + Container,	g	**22.29**	**27.34**	**16.34**	**26.36**	**24.38**
Wt. of Dry Soil + Container,	g	**22.08**	**26.68**	**15.68**	**25.36**	**22.92**
Wt. of Water,	g	0.21	0.66	0.66	1.00	1.46
Wt. of Container,	g	**9.74**	**16.13**	**8.38**	**16.05**	**11.84**
Wt. of Dry Soil ,	g	12.34	10.55	7.3	9.31	11.08
Moisture Content, w,	%	1.70	6.26	9.04	10.74	13.18
Average Moisture Content,	%	1.70	6.26	9.04	10.74	13.18

Test No.	1	2	3	4	5
Water content, %	1.70	6.26	9.04	10.74	13.18
Dry Density, gm/cc	1.955	2.123	2.178	2.095	1.968

γdmax (gm/cc) : **2.180**

OMC (%) : **8.75**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-37** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **29/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	3%	6%	10%	12%	14%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11530	11830	12290	12195	12005
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3760	4060	4520	4425	4235
Wet Density, γ_T=W/V,	gm/cc	1.731	1.869	2.080	2.037	1.949
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.664	1.763	1.897	1.819	1.710

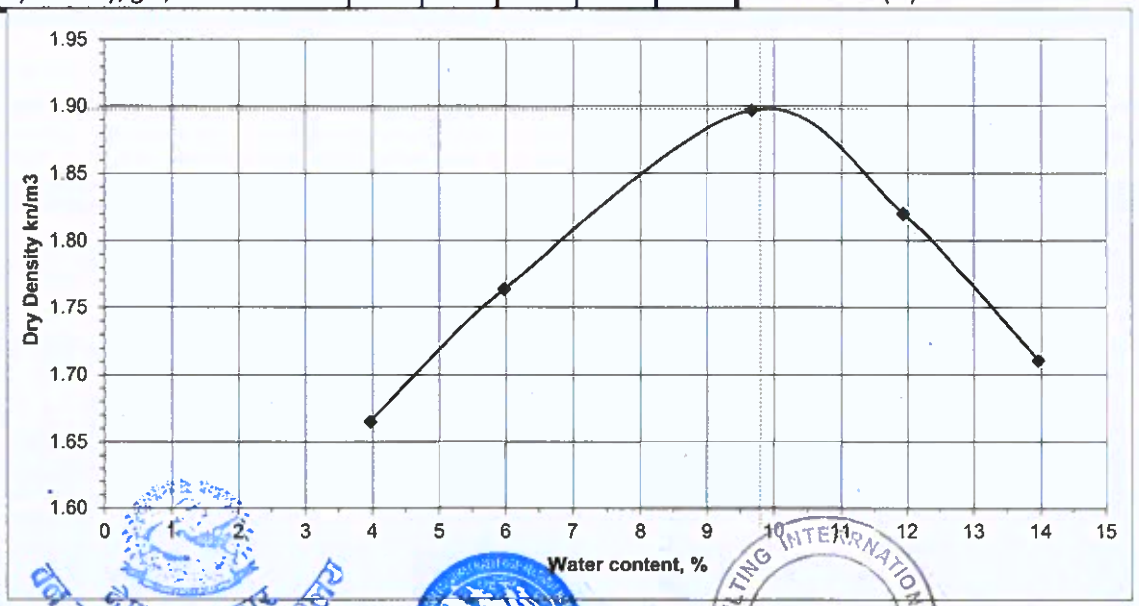
MOISTURE CONTENT

Container No.		A-128	A-144	A-129	A-101	A-43
Wt. of Wet Soil + Container,	g	38.78	40.03	35.28	39.27	33.18
Wt. of Dry Soil + Container,	g	37.98	38.78	33.58	36.80	31.09
Wt. of Water,	g	0.80	1.25	1.7	2.47	2.09
Wt. of Container,	g	17.86	17.88	16.02	16.12	16.13
Wt. of Dry Soil ,	g	20.12	20.90	17.56	20.68	14.96
Moisture Content, w,	%	3.98	5.98	9.68	11.94	13.97
Average Moisture Content,	%	3.98	5.98	9.68	11.94	13.97

Test No.	1	2	3	4	5
Water content, %	3.98	5.98	9.68	11.94	13.97
Dry Density, gm/cc	1.664	1.763	1.897	1.819	1.710

γdmax (gm/cc) : **1.898**

OMC (%) : **9.80**



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Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-38** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **4/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	6%	11%	16%	21%	23%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11790	12240	12490	12280	12200
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4020	4470	4720	4510	4430
Wet Density, γ_T=W/V,	gm/cc	1.850	2.057	2.172	2.076	2.039
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.758	1.868	1.880	1.717	1.659

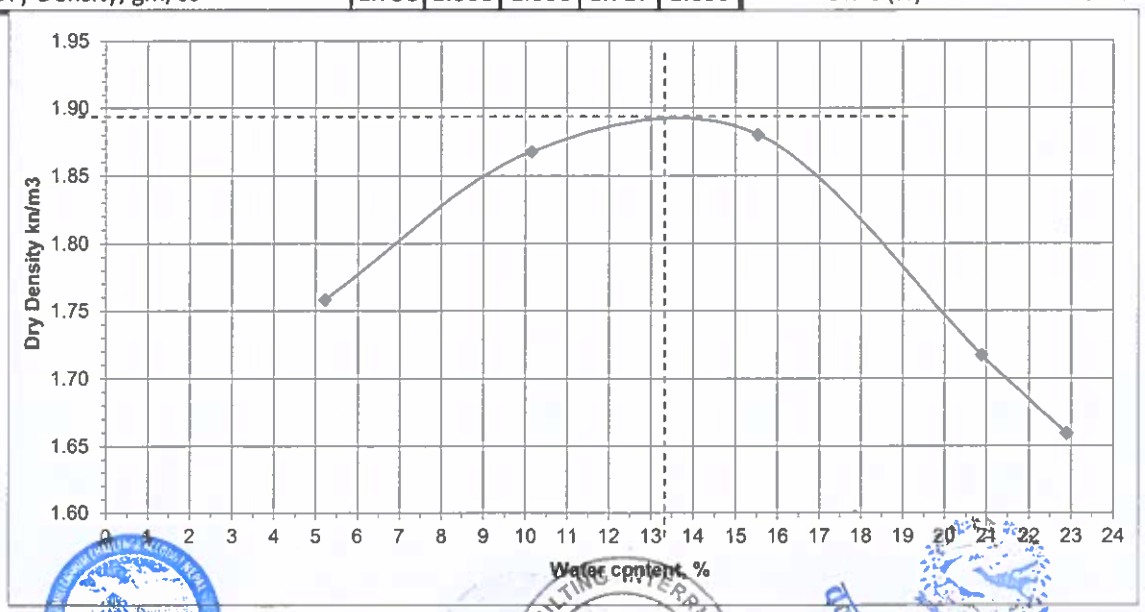
MOISTURE CONTENT

Container No.		A-132	A-124	A-141	A-68	A-139
Wt. of Wet Soil + Container,	g	43.51	45.80	44.42	39.58	38.17
Wt. of Dry Soil + Container,	g	41.85	43.25	40.80	35.75	34.07
Wt. of Water,	g	1.66	2.55	3.62	3.83	4.10
Wt. of Container,	g	10.18	18.16	17.53	17.43	16.18
Wt. of Dry Soil ,	g	31.67	25.09	23.27	18.32	17.89
Moisture Content, w,	%	5.24	10.16	15.56	20.91	22.92
Average Moisture Content,	%	5.24	10.16	15.56	20.91	22.92

Test No.	1	2	3	4	5
Water content, %	5.24	10.16	15.56	20.91	22.92
Dry Density, gm/cc	1.758	1.868	1.880	1.717	1.659

γdmax (gm/cc) : **1.890**

OMC (%) : **13.25**



ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-39** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **4/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	6%	11%	16%	21%	23%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11580	12200	12410	12390	12340
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3810	4430	4640	4620	4570
Wet Density, γ_T=W/V,	gm/cc	1.754	2.039	2.136	2.126	2.103
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.670	1.863	1.879	1.805	1.746

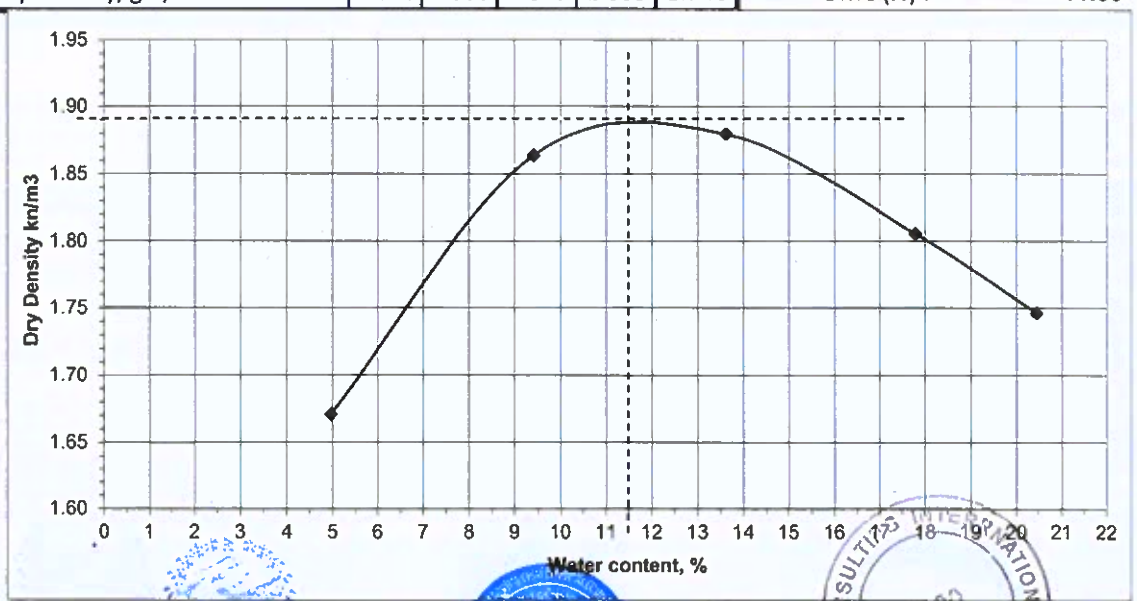
MOISTURE CONTENT

Container No.		A-102	A-80	A-78	A-81	A-69
Wt. of Wet Soil + Container,	g	24.10	20.05	40.85	28.95	28.55
Wt. of Dry Soil + Container,	g	23.43	19.16	37.88	27.25	26.44
Wt. of Water,	g	0.67	0.89	2.97	1.70	2.11
Wt. of Container,	g	9.98	9.72	16.1	17.70	16.13
Wt. of Dry Soil ,	g	13.45	9.44	21.78	9.55	10.31
Moisture Content, w,	%	4.98	9.43	13.64	17.80	20.47
Average Moisture Content,	%	4.98	9.43	13.64	17.80	20.47

Test No.	1	2	3	4	5
Water content, %	4.98	9.43	13.64	17.80	20.47
Dry Density, gm/cc	1.670	1.863	1.879	1.805	1.746

γdmax (gm/cc) : **1.890**

OMC (%) : **11.50**



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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

STANTEC CONSULTING INTERNATIONAL LLC
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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-40** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **4/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	20%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12190	12440	12630	12540	12420
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4420	4670	4860	4770	4650
Wet Density, y_T=W/V,	gm/cc	2.034	2.149	2.237	2.195	2.140
Dry Density, y_d=100y_T÷(100+w),	gm/cc	1.949	1.988	1.991	1.899	1.793

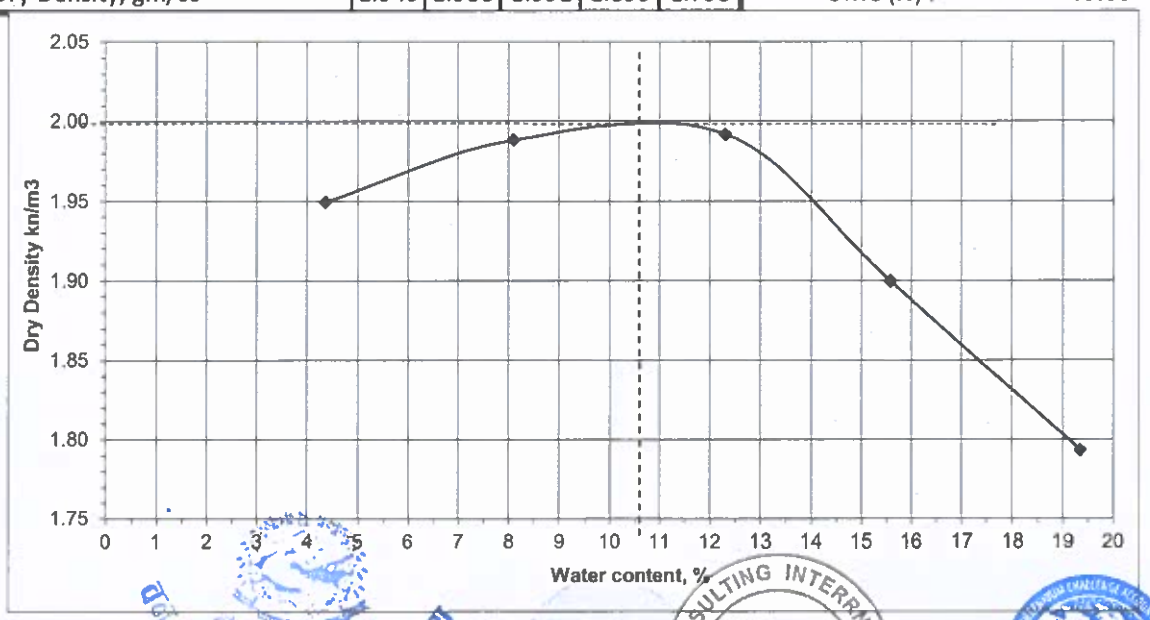
MOISTURE CONTENT

Container No.		A-144	A-128	A-140	A-62	A-78
Wt. of Wet Soil + Container,	g	51.98	47.04	34.53	43.14	45.16
Wt. of Dry Soil + Container,	g	50.55	44.85	31.81	39.50	40.45
Wt. of Water,	g	1.43	2.19	2.72	3.64	4.71
Wt. of Container,	g	17.88	17.86	9.74	16.15	16.13
Wt. of Dry Soil ,	g	32.67	26.99	22.07	23.35	24.32
Moisture Content, w,	%	4.38	8.11	12.32	15.59	19.37
Average Moisture Content,	%	4.38	8.11	12.32	15.59	19.37

Test No.	1	2	3	4	5
Water content, %	4.38	8.11	12.32	15.59	19.37
Dry Density, gm/cc	1.949	1.988	1.991	1.899	1.793

γdmax (gm/cc) : **1.968**

OMC (%) : **10.60**



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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-41** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **28/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	12%	16%	18%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11770	12230	12550	12430	12360
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4000	4460	4780	4660	4590
Wet Density, y_T=W/V,	gm/cc	1.841	2.053	2.200	2.145	2.113
Dry Density, y_d=100y_T/(100+w),	gm/cc	1.776	1.909	1.970	1.841	1.798

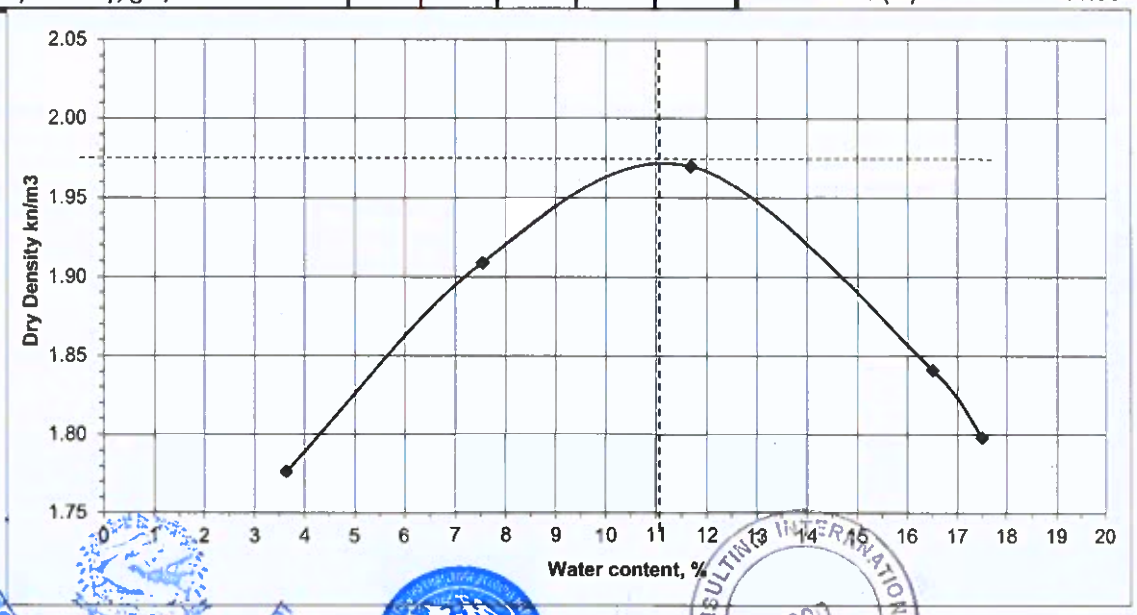
MOISTURE CONTENT

Container No.		A-141	A-99	A-101	A-115	A-66
Wt. of Wet Soil + Container,	g	28.03	18.28	24.34	20.23	29.05
Wt. of Dry Soil + Container,	g	27.66	17.70	23.48	18.77	27.35
Wt. of Water,	g	0.37	0.58	0.86	1.46	1.70
Wt. of Container,	g	17.52	10.02	16.13	9.93	17.64
Wt. of Dry Soil ,	g	10.14	7.68	7.35	8.84	9.71
Moisture Content, w,	%	3.65	7.55	11.70	16.52	17.51
Average Moisture Content,	%	3.65	7.55	11.70	16.52	17.51

Test No.	1	2	3	4	5
Water content, %	3.65	7.55	11.70	16.52	17.51
Dry Density, gm/cc	1.776	1.909	1.970	1.841	1.798

γdmax (gm/cc) : **1.975**

OMC (%) : **11.00**



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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-42** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **23/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	17%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11920	12190	12510	12560	12420
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4150	4420	4740	4790	4650
Wet Density, γ_T=W/V,	gm/cc	1.910	2.034	2.182	2.205	2.140
Dry Density, γ_d=100γ_T÷(100+w),	gm/cc	1.848	1.908	1.954	1.914	1.786

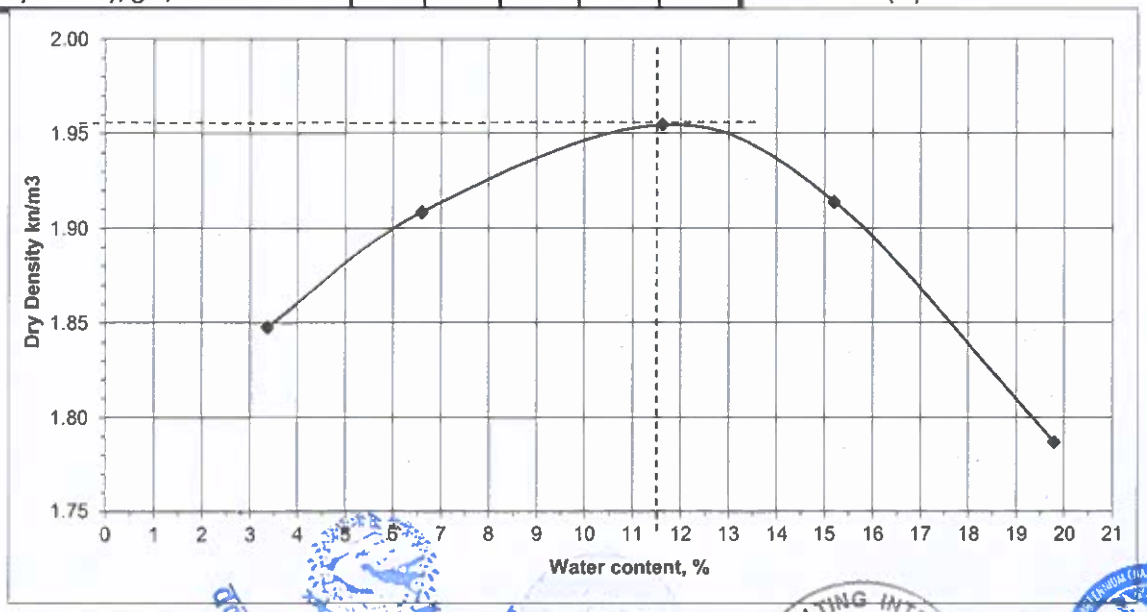
MOISTURE CONTENT

Container No.		A-64	A-143	A-88	A-117	A-72
Wt. of Wet Soil + Container,	g	27.95	23.55	25.97	17.52	19.11
Wt. of Dry Soil + Container,	g	27.61	23.09	24.95	16.49	17.32
Wt. of Water,	g	0.34	0.46	1.02	1.03	1.79
Wt. of Container,	g	17.54	16.14	16.18	9.72	8.28
Wt. of Dry Soil ,	g	10.07	6.95	8.77	6.77	9.04
Moisture Content, w,	%	3.38	6.62	11.63	15.21	19.80
Average Moisture Content,	%	3.38	6.62	11.63	15.21	19.80

Test No.	1	2	3	4	5
Water content, %	3.38	6.62	11.63	15.21	19.80
Dry Density, gm/cc	1.848	1.908	1.954	1.914	1.786

γdmax (gm/cc) : **1.955**

OMC (%) : **11.25**



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2000

ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-43** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **10/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	16%	
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12400	12660	12630	12450	
Wt. of Mould,	g	7770	7770	7770	7770	
Wt. of Wet Soil, W	g	4630	4890	4860	4680	
Wet Density, γ_T=W/V,	gm/cc	2.131	2.251	2.237	2.154	
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	2.032	2.078	1.990	1.865	

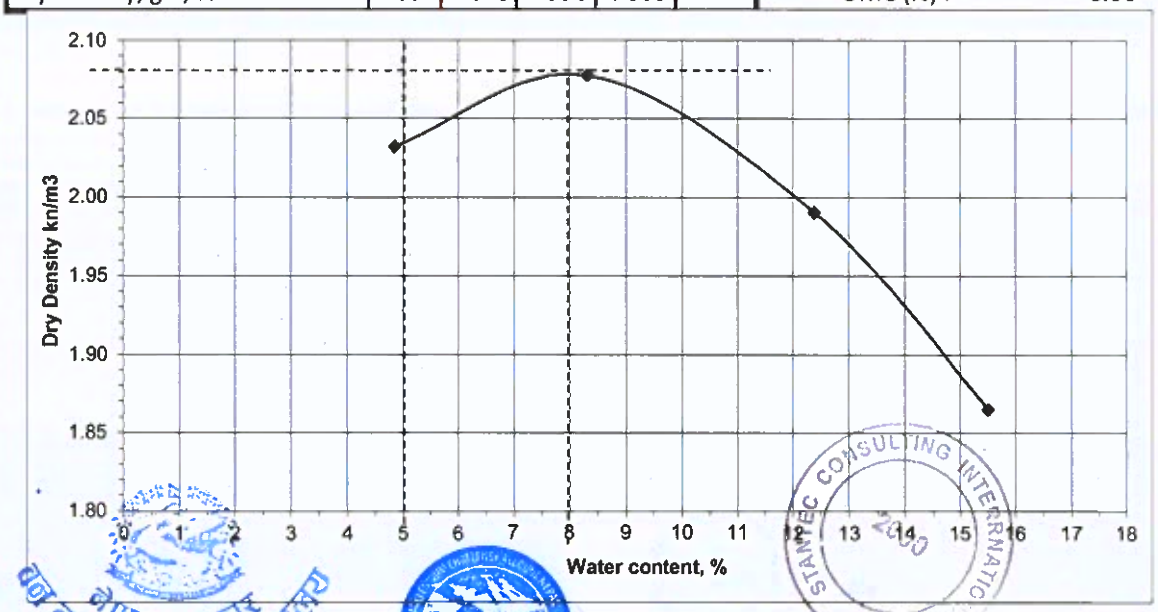
MOISTURE CONTENT

Container No.		A-10	A-2	A-16	A-14	
Wt. of Wet Soil + Container,	g	151.35	148.80	146.55	168.81	
Wt. of Dry Soil + Container,	g	145.68	139.48	133.51	149.97	
Wt. of Water,	g	5.67	9.32	13.04	18.84	
Wt. of Container,	g	29.19	27.60	28.32	28.55	
Wt. of Dry Soil ,	g	116.49	111.88	105.19	121.42	
Moisture Content, w,	%	4.87	8.33	12.40	15.52	
Average Moisture Content,	%	4.87	8.33	12.40	15.52	

Test No.	1	2	3	4	5
Water content, %	4.87	8.33	12.40	15.52	
Dry Density, gm/cc	2.032	2.078	1.990	1.865	

γdmax (gm/cc) : **2.080**

OMC (%) : **8.00**



ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-44** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **10/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	18%	20%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11820	12330	12430	12270	12220
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4050	4560	4660	4500	4450
Wet Density, γ_T=W/V,	gm/cc	1.864	2.099	2.145	2.071	2.048
Dry Density, γ_d=100γ_T÷(100+w),	gm/cc	1.782	1.903	1.888	1.758	1.714

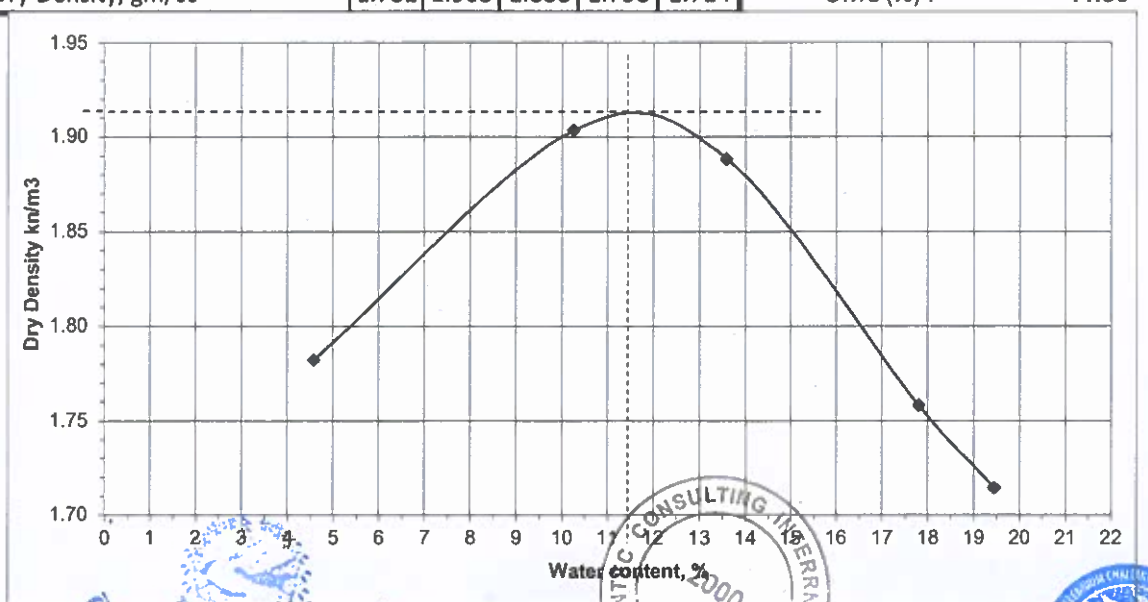
MOISTURE CONTENT

Container No.		A-81	A-20	A-13	A-9	A-18
Wt. of Wet Soil + Container,	g	42.02	118.00	153.17	167.08	208.53
Wt. of Dry Soil + Container,	g	40.95	109.92	138.29	146.73	179.28
Wt. of Water,	g	1.07	8.08	14.88	20.35	29.25
Wt. of Container,	g	17.70	31.26	28.89	32.49	29.09
Wt. of Dry Soil ,	g	23.25	78.66	109.4	114.24	150.19
Moisture Content, w,	%	4.60	10.27	13.60	17.81	19.48
Average Moisture Content,	%	4.60	10.27	13.60	17.81	19.48

Test No.	1	2	3	4	5
Water content, %	4.60	10.27	13.60	17.81	19.48
Dry Density, gm/cc	1.782	1.903	1.888	1.758	1.714

γdmax (gm/cc) : **1.912**

OMC (%) : **11.50**



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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-45** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **26/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	18%	20%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12080	12230	12420	12400	12350
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4310	4460	4650	4630	4580
Wet Density, γ_T=W/V,	gm/cc	1.984	2.053	2.140	2.131	2.108
Dry Density, γ_d=100γ_T/(100+w), gm/cc		1.875	1.906	1.924	1.870	1.810

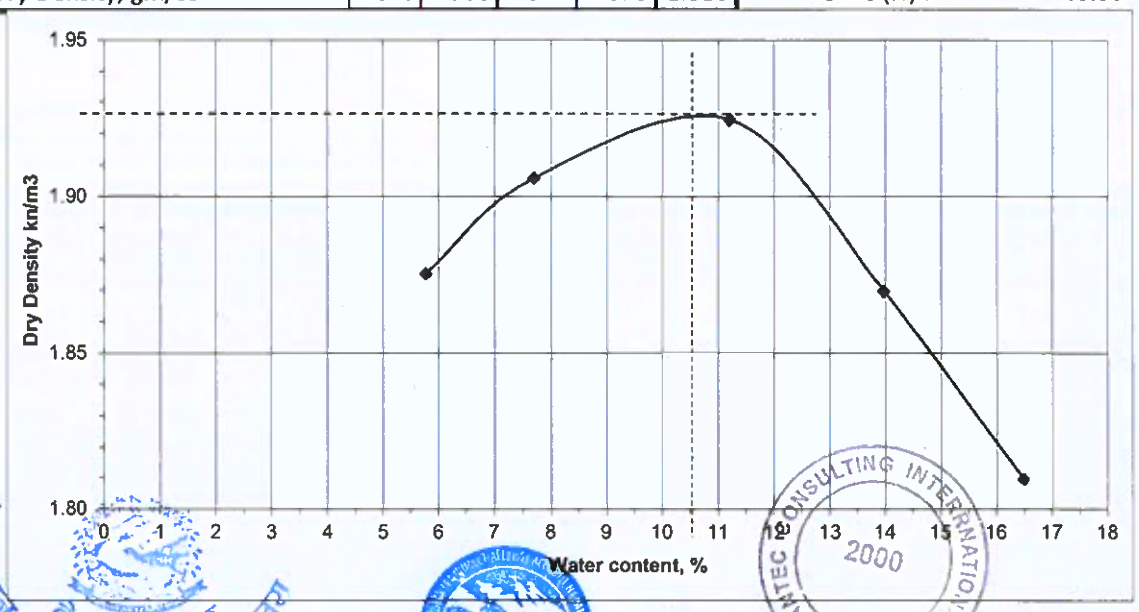
MOISTURE CONTENT

Container No.		A-134	A-92	A-119	A-62	A-91
Wt. of Wet Soil + Container,	g	19.48	16.49	19.38	23.09	19.56
Wt. of Dry Soil + Container,	g	18.96	15.88	18.45	22.24	18.13
Wt. of Water,	g	0.52	0.61	0.93	0.85	1.43
Wt. of Container,	g	9.97	7.97	10.16	16.16	9.46
Wt. of Dry Soil ,	g	8.99	7.91	8.29	6.08	8.67
Moisture Content, w,	%	5.78	7.71	11.22	13.98	16.49
Average Moisture Content,	%	5.78	7.71	11.22	13.98	16.49

Test No.	1	2	3	4	5
Water content, %	5.78	7.71	11.22	13.98	16.49
Dry Density, gm/cc	1.875	1.906	1.924	1.870	1.810

γdmax (gm/cc) : **1.927**

OMC (%) : **10.50**



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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-46** Tested By : **Pranita Pun** Volume of Mould,V : **980.71**

Depth: **0.00 - 1.00m** Date: **10/6/2019** Mould Size : **D=9.8, H=13.00**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	18%	20%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	5557	5703	5845	5803	5748
Wt. of Mould,	g	3690	3690	3690	3690	3690
Wt. of Wet Soil, W	g	1867	2013	2155	2113	2058
Wet Density, γ_T=W/V,	gm/cc	1.904	2.053	2.197	2.155	2.098
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.830	1.904	1.963	1.857	1.750

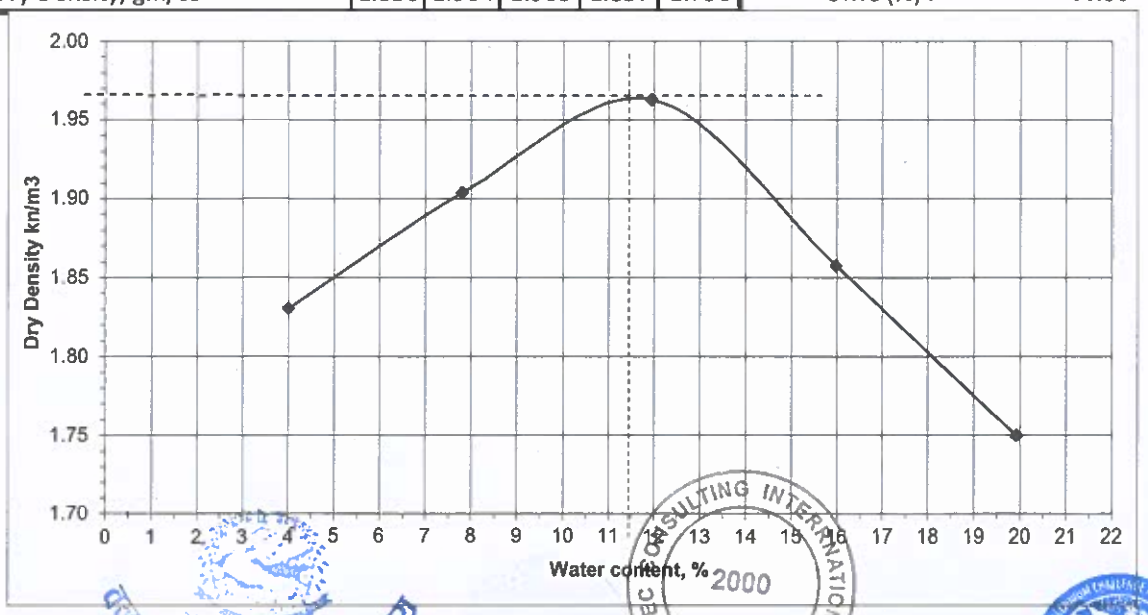
MOISTURE CONTENT

Container No.		A-96	A-139	A-100	A-82	A-119
Wt. of Wet Soil + Container,	g	13.88	22.67	18.19	25.63	21.05
Wt. of Dry Soil + Container,	g	13.73	22.20	17.36	24.60	19.22
Wt. of Water,	g	0.15	0.47	0.83	1.03	1.83
Wt. of Container,	g	10.00	16.19	10.42	18.16	10.04
Wt. of Dry Soil ,	g	3.73	6.01	6.94	6.44	9.18
Moisture Content, w,	%	4.02	7.82	11.96	15.99	19.93
Average Moisture Content,	%	4.02	7.82	11.96	15.99	19.93

Test No.	1	2	3	4	5
Water content, %	4.02	7.82	11.96	15.99	19.93
Dry Density, gm/cc	1.830	1.904	1.963	1.857	1.750

γdmax (gm/cc) : **1.963**

OMC (%) : **11.50**



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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-47** Tested By : **Pranita Pun** Volume of Mould,V : **980.71**

Depth: **0.00 - 1.00m** Date: **10/6/2019** Mould Size : **D=9.8, H=13.00**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	18%	20%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	5417	5568	5732	5709	5645
Wt. of Mould,	g	3690	3690	3690	3690	3690
Wt. of Wet Soil, W	g	1727	1878	2042	2019	1955
Wet Density, γ_T=W/V,	gm/cc	1.761	1.915	2.082	2.059	1.993
Dry Density, γ_d=100γ_T÷(100+w), gm/cc		1.633	1.713	1.796	1.717	1.636

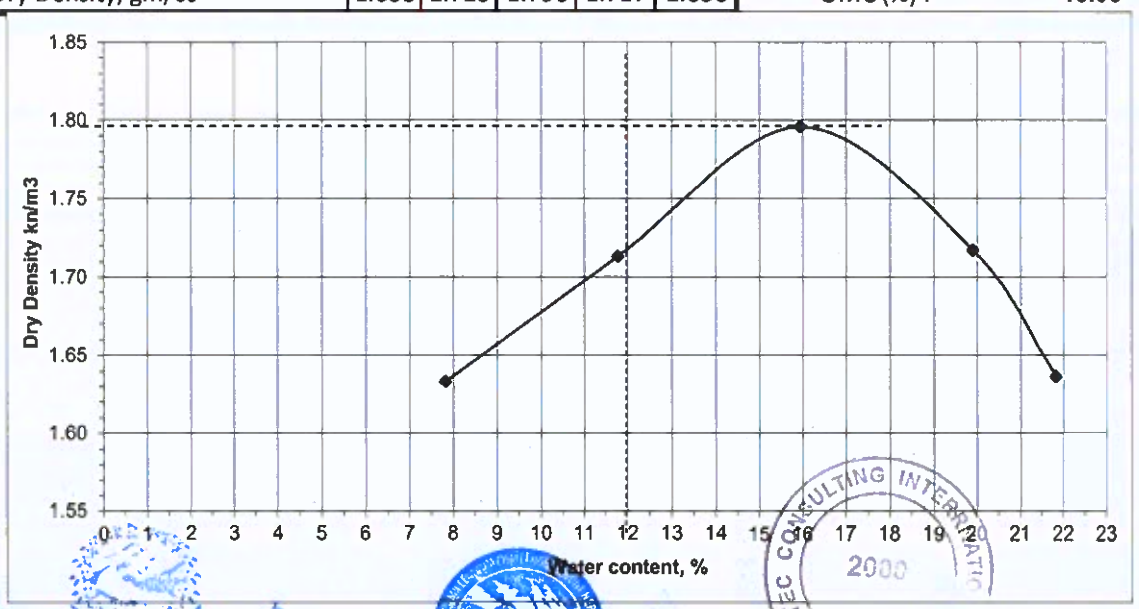
MOISTURE CONTENT

Container No.		A-38	A-58	A-55	A-98	A-65
Wt. of Wet Soil + Container,	g	18.48	22.87	19.72	20.33	20.12
Wt. of Dry Soil + Container,	g	18.11	22.45	18.93	18.81	18.60
Wt. of Water,	g	0.37	0.42	0.79	1.52	1.52
Wt. of Container,	g	13.39	18.89	13.98	11.18	11.64
Wt. of Dry Soil ,	g	4.72	3.56	4.95	7.63	6.96
Moisture Content, w,	%	7.84	11.80	15.96	19.92	21.84
Average Moisture Content,	%	7.84	11.80	15.96	19.92	21.84

Test No.	1	2	3	4	5
Water content, %	7.84	11.80	15.96	19.92	21.84
Dry Density, gm/cc	1.633	1.713	1.796	1.717	1.636

γdmax (gm/cc) : **1.795**

OMC (%) : **16.00**



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सिंहदरबार, काठमाडौं

STANTEC CONSULTING INTERNATIONAL
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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-48** Tested By : **Pranita Pun** Volume of Mould,V : **980.71**

Depth: **0.00 - 1.00m** Date: **10/6/2019** Mould Size : **D=9.8, H=13.00**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	18%	20%
Wt. of Air Dry Soil Used,	g	3000	3000	3000	3000	3000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	5398	5566	5702	5708	5653
Wt. of Mould,	g	3690	3690	3690	3690	3690
Wt. of Wet Soil, W	g	1708	1876	2012	2018	1963
Wet Density, y_T=W/V,	gm/cc	1.742	1.913	2.052	2.058	2.002
Dry Density, y_d=100y_T÷(100+w),	gm/cc	1.616	1.709	1.769	1.717	1.641

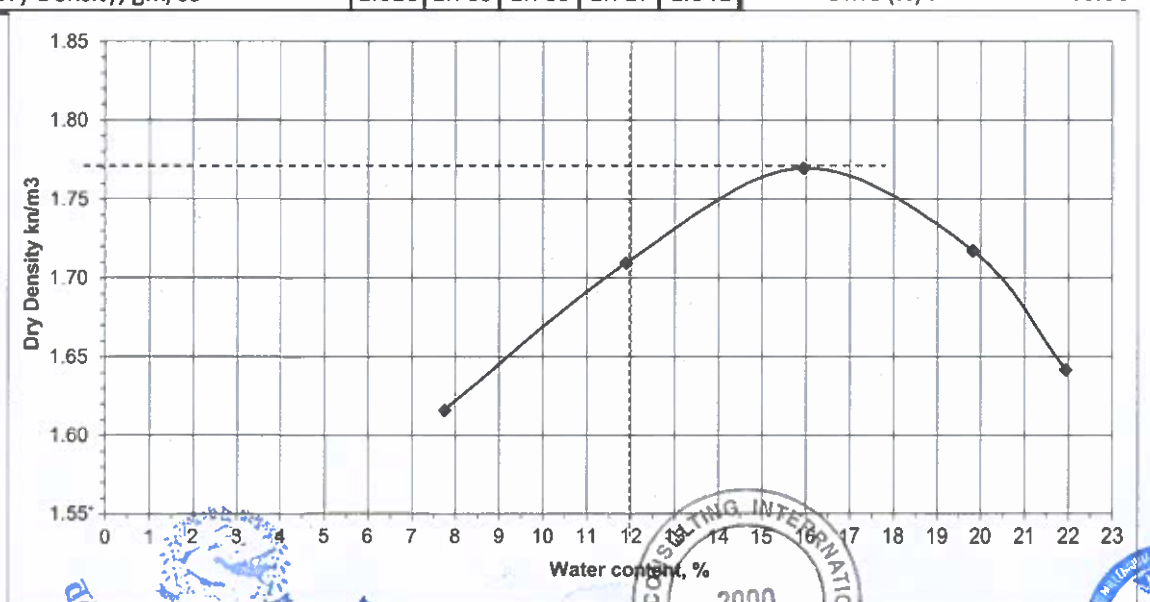
MOISTURE CONTENT

Container No.		A-80	A-111	A-106	A-76	A-138
Wt. of Wet Soil + Container,	g	13.65	27.67	28.77	20.99	27.81
Wt. of Dry Soil + Container,	g	13.37	26.45	27.30	18.95	24.51
Wt. of Water,	g	0.28	1.22	1.47	2.04	3.30
Wt. of Container,	g	9.77	16.21	18.09	8.67	9.48
Wt. of Dry Soil ,	g	3.60	10.24	9.21	10.28	15.03
Moisture Content, w,	%	7.78	11.91	15.96	19.84	21.96
Average Moisture Content,	%	7.78	11.91	15.96	19.84	21.96

Test No.	1	2	3	4	5
Water content, %	7.78	11.91	15.96	19.84	21.96
Dry Density, gm/cc	1.616	1.709	1.769	1.717	1.641

γdmax (gm/cc) : **1.770**

OMC (%) : **16.00**



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New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-49** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **03/06/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	6%	11%	16%	21%	24%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11550	11930	12400	12170	12050
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3780	4160	4630	4400	4280
Wet Density, γ_T=W/V,	gm/cc	1.740	1.915	2.131	2.025	1.970
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.647	1.733	1.845	1.684	1.594

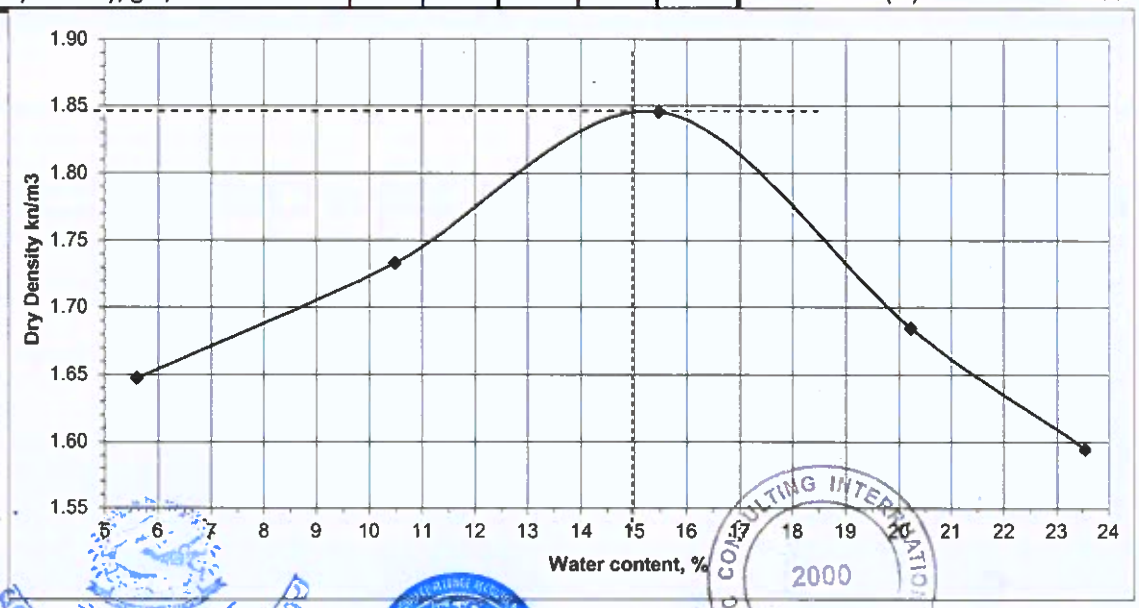
MOISTURE CONTENT

Container No.		A-129	A-111	A-65	A-80	A-108
Wt. of Wet Soil + Container,	g	46.85	45.58	38.55	38.55	44.01
Wt. of Dry Soil + Container,	g	45.21	42.79	34.96	33.70	39.08
Wt. of Water,	g	1.64	2.79	3.59	4.85	4.93
Wt. of Container,	g	16.02	16.20	11.77	9.73	18.16
Wt. of Dry Soil ,	g	29.19	26.59	23.19	23.97	20.92
Moisture Content, w,	%	5.62	10.49	15.48	20.23	23.57
Average Moisture Content,	%	5.62	10.49	15.48	20.23	23.57

Test No.	1	2	3	4	5
Water content, %	5.62	10.49	15.48	20.23	23.57
Dry Density, gm/cc	1.647	1.733	1.845	1.684	1.594

γdmax (gm/cc) : **1.845**

OMC (%) : **15.00**



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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-50** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **02/06/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	6%	11%	16%	21%	24%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11370	11730	12120	12180	12080
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3600	3960	4350	4410	4310
Wet Density, γ_T=W/V,	gm/cc	1.657	1.823	2.002	2.030	1.984
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.579	1.660	1.750	1.716	1.618

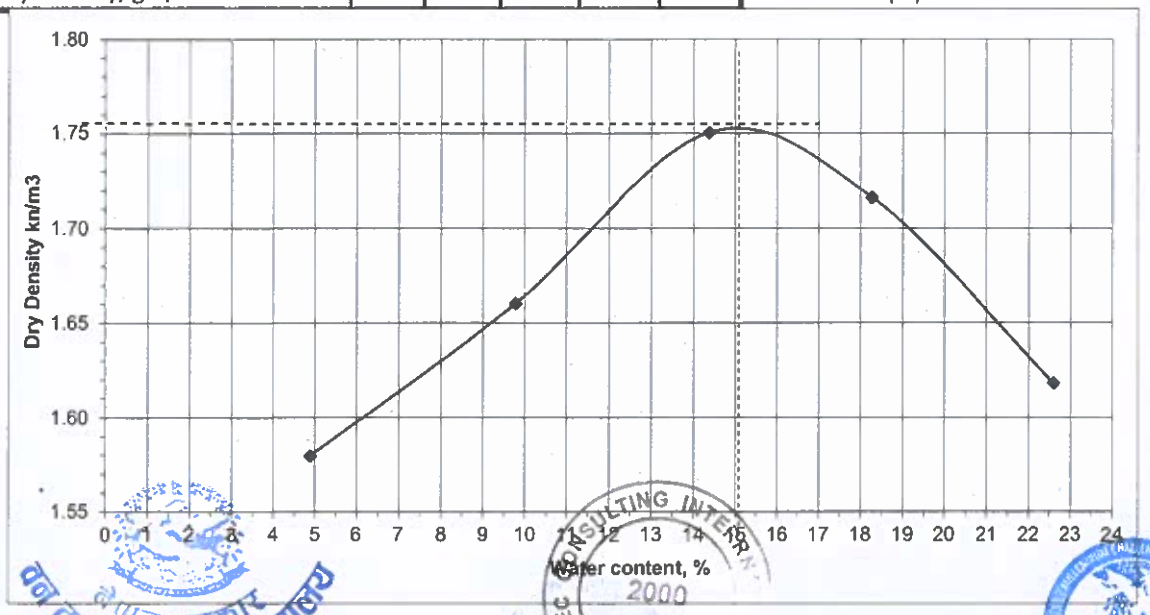
MOISTURE CONTENT

Container No.		A-127	A-131	A-89	A-62	A-123
Wt. of Wet Soil + Container,	g	32.15	30.00	21.70	28.18	25.45
Wt. of Dry Soil + Container,	g	31.51	28.90	20.29	26.32	23.74
Wt. of Water,	g	0.64	1.10	1.41	1.86	1.71
Wt. of Container,	g	18.47	17.67	10.49	16.15	16.18
Wt. of Dry Soil ,	g	13.04	11.23	9.8	10.17	7.56
Moisture Content, w,	%	4.91	9.80	14.39	18.29	22.62
Average Moisture Content,	%	4.91	9.80	14.39	18.29	22.62

Test No.	1	2	3	4	5
Water content, %	4.91	9.80	14.39	18.29	22.62
Dry Density, gm/cc	1.579	1.660	1.750	1.716	1.618

γdmax (gm/cc) : **1.755**

OMC (%) : **15.00**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-51** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **23/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	12%	16%	19%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11820	12100	12410	12490	12450
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4050	4330	4640	4720	4680
Wet Density, γ_T=W/V,	gm/cc	1.864	1.993	2.136	2.172	2.154
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.845	1.925	1.984	1.955	1.867

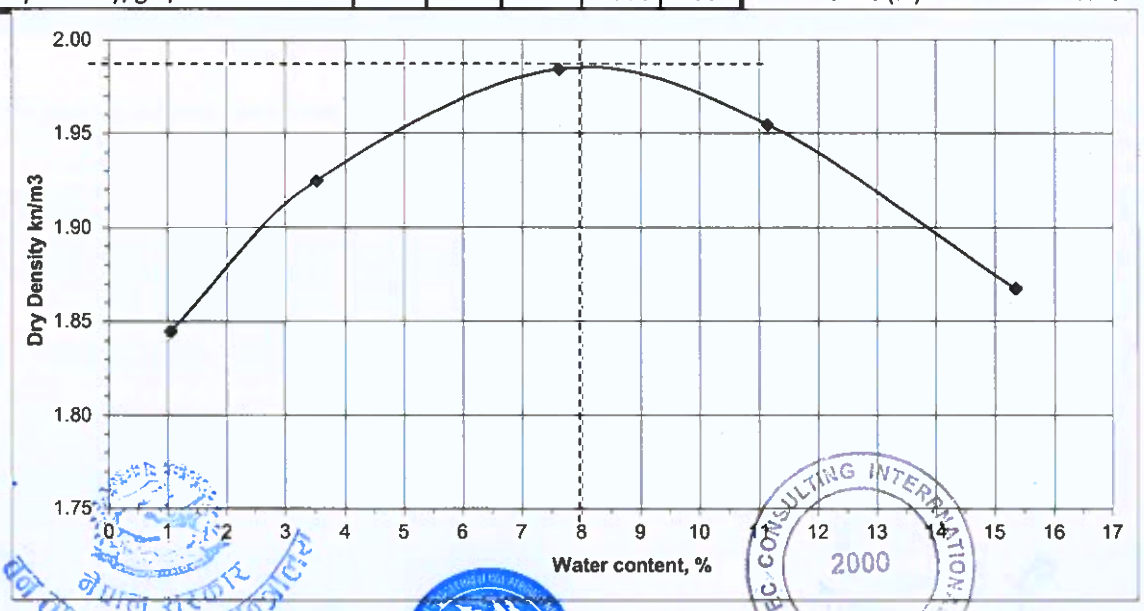
MOISTURE CONTENT

Container No.		A-126	A-125	A-66	A-101	A-96
Wt. of Wet Soil + Container,	g	19.40	19.78	29.20	22.30	20.66
Wt. of Dry Soil + Container,	g	19.29	19.45	28.38	21.68	19.25
Wt. of Water,	g	0.11	0.33	0.82	0.62	1.41
Wt. of Container,	g	8.92	10.13	17.64	16.12	10.07
Wt. of Dry Soil ,	g	10.37	9.32	10.74	5.56	9.18
Moisture Content, w,	%	1.06	3.54	7.64	11.15	15.36
Average Moisture Content,	%	1.06	3.54	7.64	11.15	15.36

Test No.	1	2	3	4	5
Water content, %	1.06	3.54	7.64	11.15	15.36
Dry Density, gm/cc	1.845	1.925	1.984	1.955	1.867

γdmax (gm/cc) : **1.987**

OMC (%) : **7.75**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-52** Tested By : **Pranita Pun** Volume of Mould,V : **980.71**

Depth: **0.00 - 1.00m** Date: **22/05/2019** Mould Size : **D=9.8, H=13.00**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	18%	20%
Wt. of Air Dry Soil Used,	g	3000	3000	3000	3000	3000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	**5510**	**5670**	**5840**	**5770**	**5740**
Wt. of Mould,	g	3690	3690	3690	3690	3690
Wt. of Wet Soil, W	g	1820	1980	2150	2080	2050
Wet Density, γ_T=W/V,	gm/cc	1.856	2.019	2.192	2.121	2.090
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.785	1.873	1.961	1.831	1.760

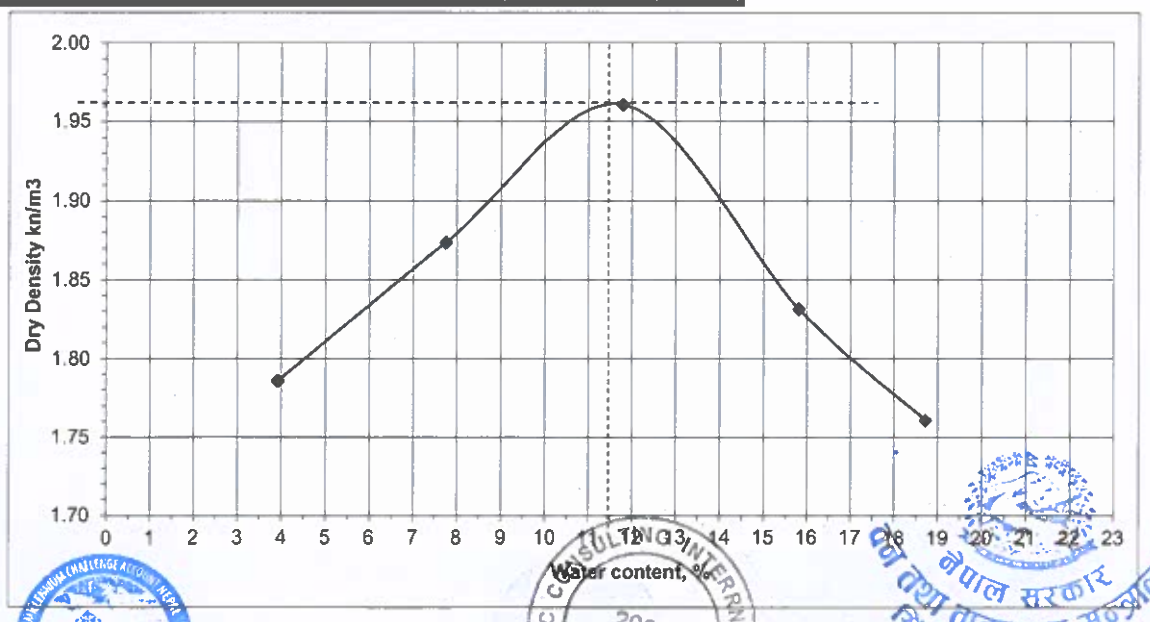
MOISTURE CONTENT

Container No.		**A-114**	**A-64**	**A-127**	**A-61**	**A-112**
Wt. of Wet Soil + Container,	g	**24.20**	**22.37**	**26.00**	**18.76**	**27.65**
Wt. of Dry Soil + Container,	g	**23.89**	**22.02**	**25.20**	**17.81**	**25.05**
Wt. of Water,	g	0.31	0.35	0.8	0.95	2.60
Wt. of Container,	g	**16.02**	**17.52**	**18.43**	**11.81**	**11.18**
Wt. of Dry Soil ,	g	7.87	4.50	6.77	6.00	13.87
Moisture Content, w,	%	3.94	7.78	11.82	15.83	18.75
Average Moisture Content,	%	3.94	7.78	11.82	15.83	18.75

Test No.	1	2	3	4	5
Water content, %	3.94	7.78	11.82	15.83	18.75
Dry Density, gm/cc	1.785	1.873	1.961	1.831	1.760

γdmax (gm/cc) : **1.960**

OMC (%) : **11.50**



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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-53** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **30/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	15%	20%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11410	11680	12120	12230	12030
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3640	3910	4350	4460	4260
Wet Density, γ_T=W/V,	gm/cc	1.675	1.800	2.002	2.053	1.961
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.598	1.679	1.795	1.751	1.606

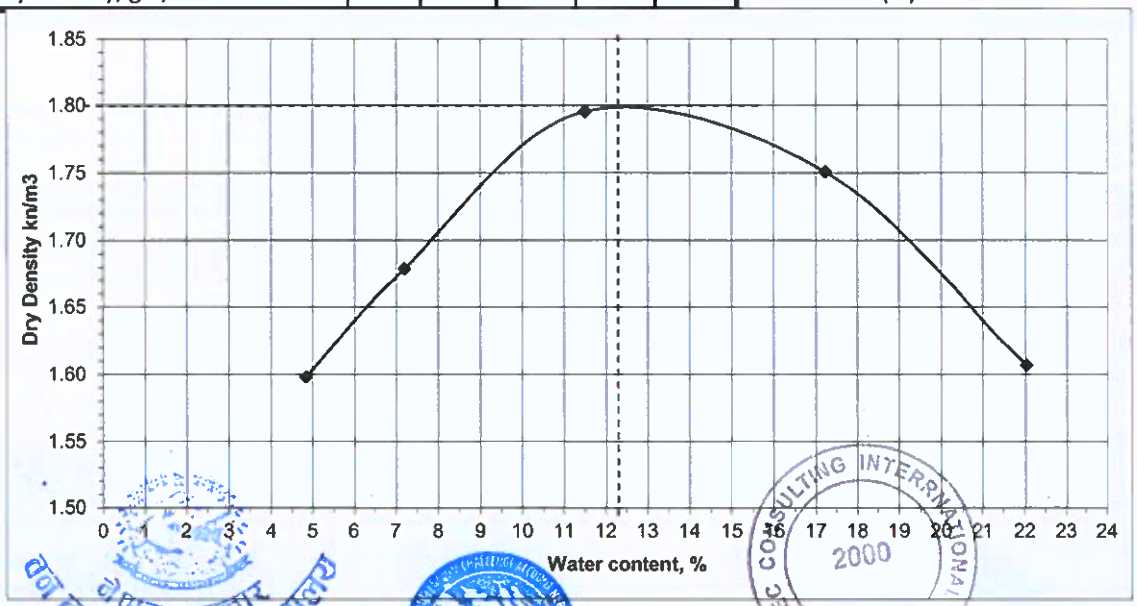
MOISTURE CONTENT

Container No.		A-19	A-4	A-17	A-24	A-18
Wt. of Wet Soil + Container,	g	233.52	176.68	200.19	205.81	209.23
Wt. of Dry Soil + Container,	g	224.21	166.83	182.77	180.16	176.68
Wt. of Water,	g	9.31	9.85	17.42	25.65	32.55
Wt. of Container,	g	32.49	30.32	31.52	31.52	29.11
Wt. of Dry Soil ,	g	191.72	136.51	151.25	148.64	147.57
Moisture Content, w,	%	4.86	7.22	11.52	17.26	22.06
Average Moisture Content,	%	4.86	7.22	11.52	17.26	22.06

Test No.	1	2	3	4	5
Water content, %	4.86	7.22	11.52	17.26	22.06
Dry Density, gm/cc	1.598	1.679	1.795	1.751	1.606

γdmax (gm/cc) : **1.800**

OMC (%) : **12.00**



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Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-51** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **22/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	12%	16%	19%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11540	11910	12290	12530	12290
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3770	4140	4520	4760	4520
Wet Density, γ_T=W/V,	gm/cc	1.735	1.906	2.080	2.191	2.080
Dry Density, γ_d=100γ_T÷(100+w),	gm/cc	1.672	1.770	1.860	1.892	1.734

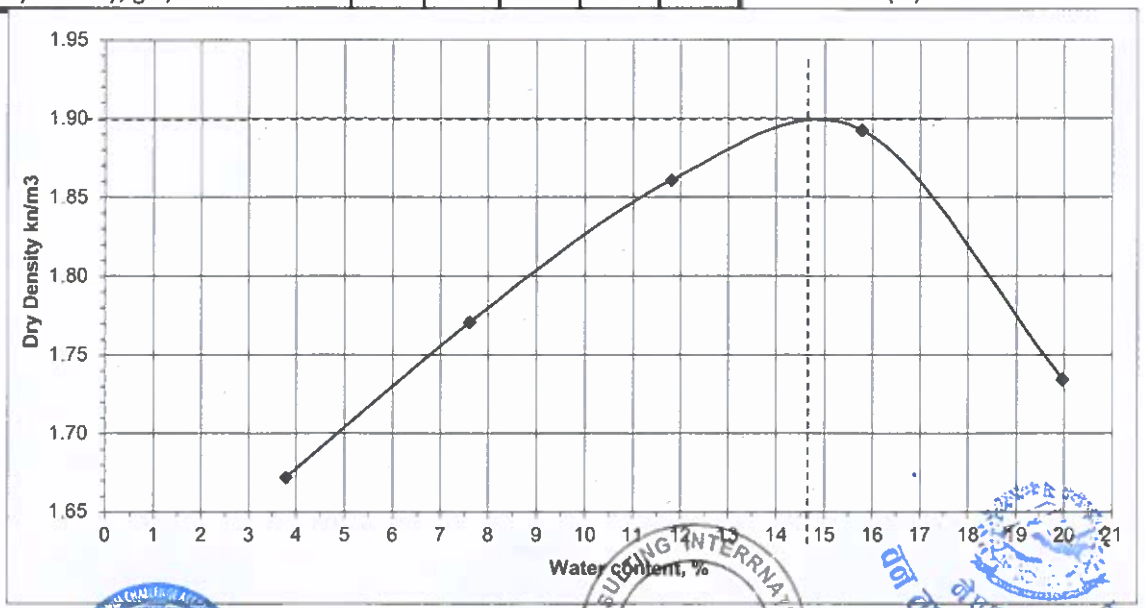
MOISTURE CONTENT

Container No.		A-117	A-122	A-108	A-79	A-123
Wt. of Wet Soil + Container,	g	17.10	18.24	24.79	25.55	26.56
Wt. of Dry Soil + Container,	g	16.83	17.59	24.09	23.46	24.84
Wt. of Water,	g	0.27	0.65	0.7	2.09	1.72
Wt. of Container,	g	9.73	9.07	18.17	10.23	16.23
Wt. of Dry Soil ,	g	7.10	8.52	5.92	13.23	8.61
Moisture Content, w,	%	3.80	7.63	11.82	15.80	19.98
Average Moisture Content,	%	3.80	7.63	11.82	15.80	19.98

Test No.	1	2	3	4	5
Water content, %	3.80	7.63	11.82	15.80	19.98
Dry Density, gm/cc	1.672	1.770	1.860	1.892	1.734

γdmax (gm/cc) : **1.900**

OMC (%) : **14.75**



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COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-55** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **28/06/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	14%	18%	20%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11760	12240	12490	12330	12230
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3990	4470	4720	4560	4460
Wet Density, γ_T=W/V,	gm/cc	1.836	2.057	2.172	2.099	2.053
Dry Density, γ_d=100γ_T.(100+w),	gm/cc	1.748	1.871	1.911	1.788	1.723

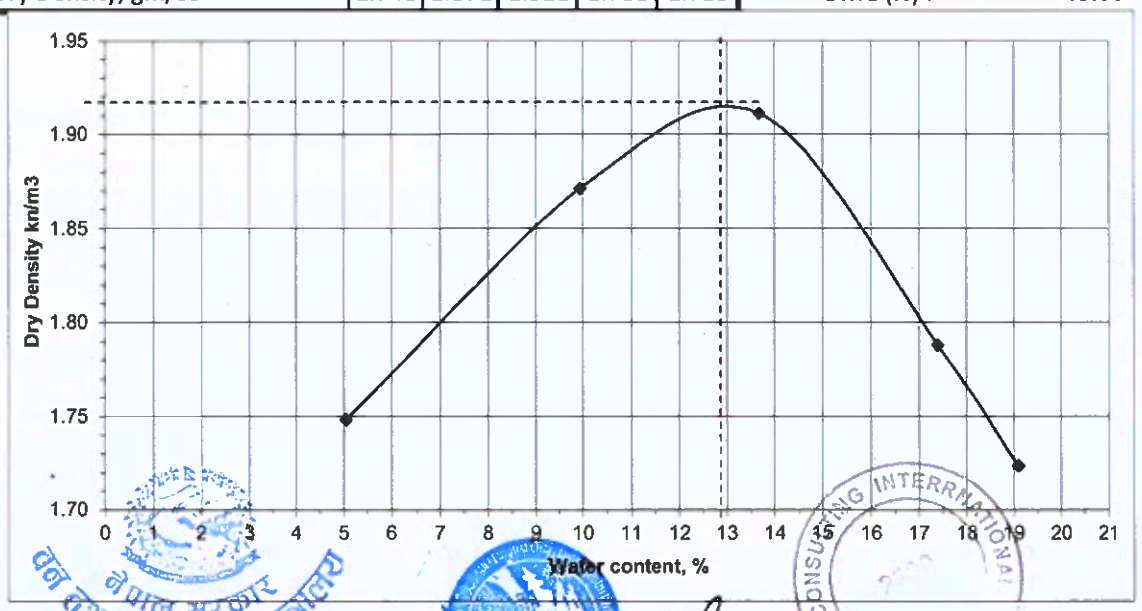
MOISTURE CONTENT

Container No.		A-22	A-21	A-14	A-26	A-10
Wt. of Wet Soil + Container,	g	205.52	168.69	184.53	212.58	192.68
Wt. of Dry Soil + Container,	g	197.11	156.09	165.74	186.50	166.44
Wt. of Water,	g	8.41	12.60	18.79	26.08	26.24
Wt. of Container,	g	31.07	29.56	28.51	36.68	29.14
Wt. of Dry Soil ,	g	166.04	126.53	137.23	149.82	137.30
Moisture Content, w,	%	5.07	9.96	13.69	17.41	19.11
Average Moisture Content,	%	5.07	9.96	13.69	17.41	19.11

Test No.	1	2	3	4	5
Water content, %	5.07	9.96	13.69	17.41	19.11
Dry Density, gm/cc	1.748	1.871	1.911	1.788	1.723

γdmax (gm/cc) : **1.917**

OMC (%) : **13.00**



ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-53** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **26/06/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	10%	15%	20%	21%
Wt. of Air Dry Soil Used,	g	7000	7000	7000	7000	7000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	11660	12160	12390	12240	12130
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	3890	4390	4620	4470	4360
Wet Density, γ_T=W/V,	gm/cc	1.790	2.021	2.126	2.057	2.007
Dry Density, γ_d=100γ_T*(100+w),	gm/cc	1.707	1.834	1.862	1.715	1.655

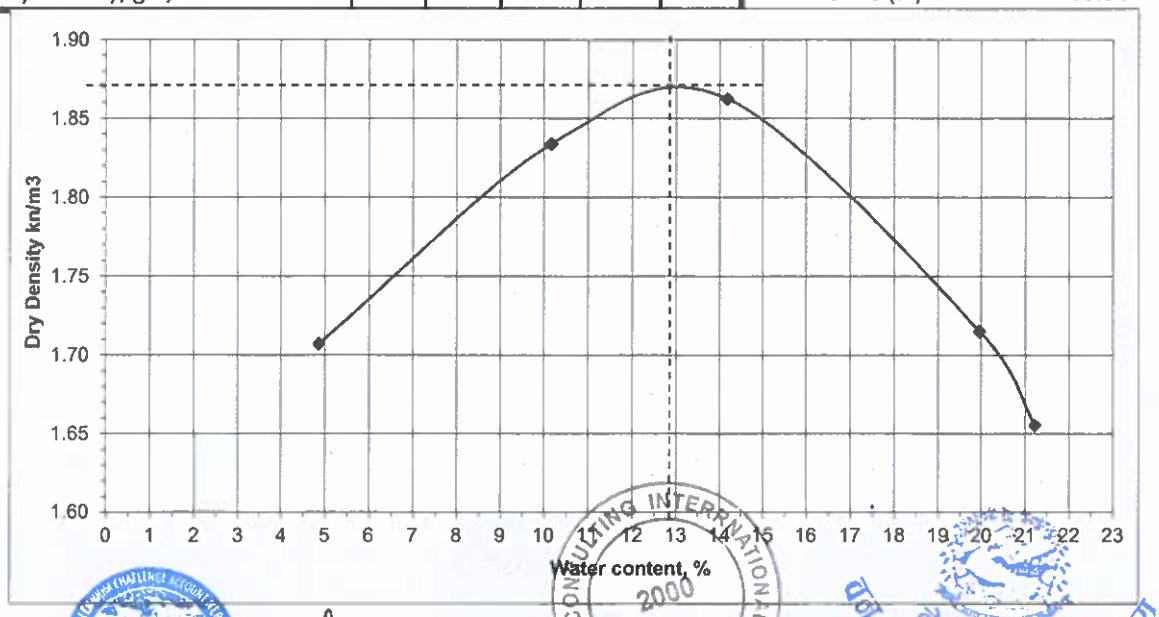
MOISTURE CONTENT

Container No.		A-22	A-21	A-25	A-24	A-26
Wt. of Wet Soil + Container,	g	207.50	202.89	202.90	205.40	240.63
Wt. of Dry Soil + Container,	g	199.28	186.85	181.11	176.45	204.89
Wt. of Water,	g	8.22	16.04	21.79	28.95	35.74
Wt. of Container,	g	31.10	29.55	27.63	31.54	36.65
Wt. of Dry Soil ,	g	168.18	157.30	153.48	144.91	168.24
Moisture Content, w,	%	4.89	10.20	14.20	19.98	21.24
Average Moisture Content,	%	4.89	10.20	14.20	19.98	21.24

Test No.	1	2	3	4	5
Water content, %	4.89	10.20	14.20	19.98	21.24
Dry Density, gm/cc	1.707	1.834	1.862	1.715	1.655

γdmax (gm/cc) : **1.870**

OMC (%) : **13.00**



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New-Baneswor, Kathmandu, Nepal
Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-57** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **12/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	5%	9%	13%	16%	
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt of Wet Soil + Mould,	g	12200	12620	12550	12430	
Wt. of Mould,	g	7770	7770	7770	7770	
Wt. of Wet Soil, W	g	4430	4850	4780	4660	
Wet Density, y_T=W/V,	gm/cc	2.039	2.232	2.200	2.145	
Dry Density, y_d=100y_T.(100+w),	gm/cc	1.948	2.057	1.954	1.860	

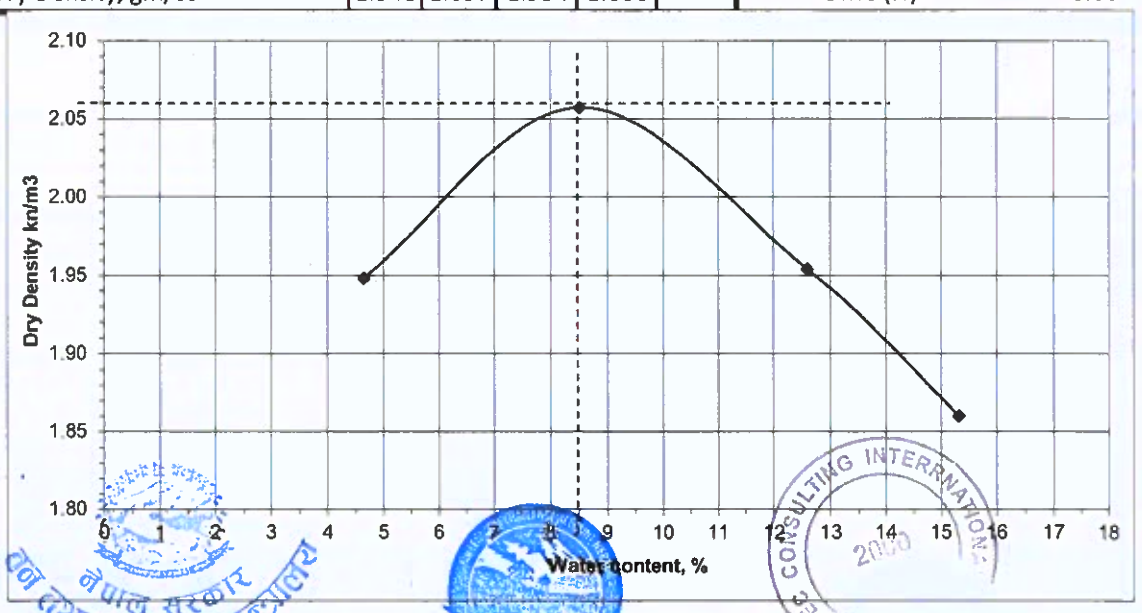
MOISTURE CONTENT

Container No.		A-50	A-30	A-51	A-47	
Wt. of Wet Soil + Container,	g	123.79	108.78	106.30	105.95	
Wt. of Dry Soil + Container,	g	118.89	101.40	96.10	93.83	
Wt. of Water,	g	4.90	7.38	10.2	12.12	
Wt. of Container,	g	13.76	14.86	15.17	14.79	
Wt. of Dry Soil ,	g	105.13	86.54	80.93	79.04	
Moisture Content, w,	%	4.66	8.53	12.60	15.33	
Average Moisture Content,	%	4.66	8.53	12.60	15.33	

Test No.	1	2	3	4	5
Water content, %	4.66	8.53	12.60	15.33	
Dry Density, gm/cc	1.948	2.057	1.954	1.860	

γdmax (gm/cc) : **2.060**

OMC (%) : **8.50**



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Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-58** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **11/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	12%	16%	18%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12020	12400	12510	12320	12240
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4250	4630	4740	4550	4470
Wet Density, γ_T=W/V,	gm/cc	1.956	2.131	2.182	2.094	2.057
Dry Density, γ_d=100γ_T÷(100+w),	gm/cc	1.883	1.983	1.961	1.813	1.752

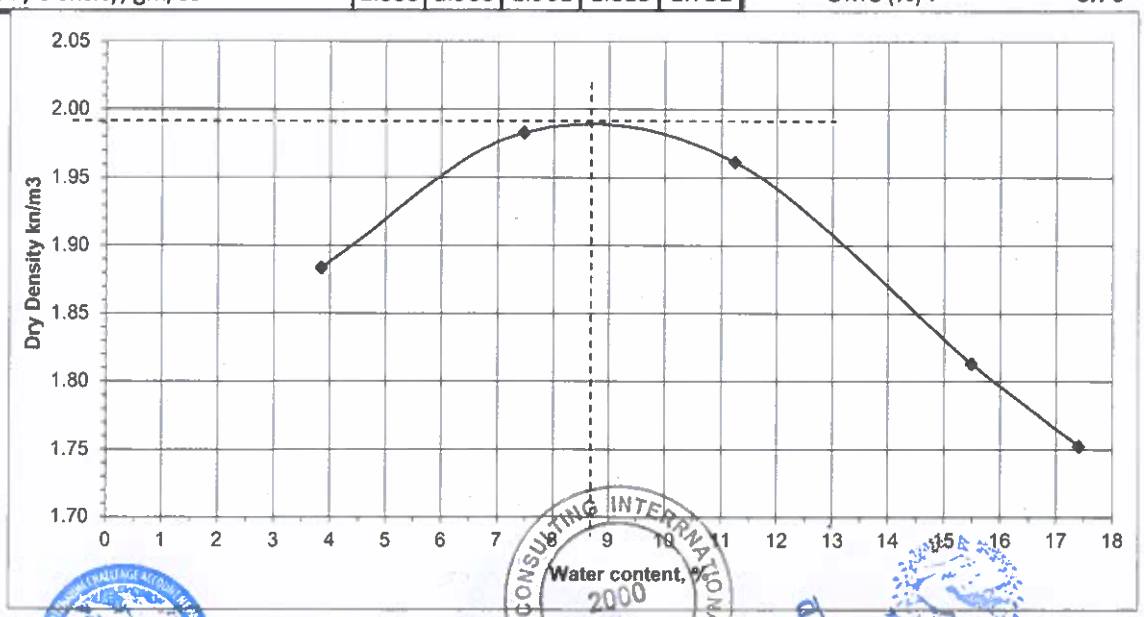
MOISTURE CONTENT

Container No.		A-14	A-20	A-9	A-3	A-17
Wt. of Wet Soil + Container,	g	181.47	204.30	198.88	182.56	174.96
Wt. of Dry Soil + Container,	g	175.79	192.25	182.04	161.86	153.35
Wt. of Water,	g	5.69	12.05	16.84	20.70	21.61
Wt. of Container,	g	28.56	31.23	32.47	28.36	29.26
Wt. of Dry Soil ,	g	147.23	161.02	149.57	133.50	124.09
Moisture Content, w,	%	3.86	7.48	11.26	15.51	17.41
Average Moisture Content,	%	3.86	7.48	11.26	15.51	17.41

Test No.	1	2	3	4	5
Water content, %	3.86	7.48	11.26	15.51	17.41
Dry Density, gm/cc	1.883	1.983	1.961	1.813	1.752

γdmax (gm/cc) : **1.990**

OMC (%) : **8.75**



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ICGS Pvt. Ltd.

New-Baneswor, Kathmandu, Nepal

Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-59** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **31/05/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	12%	16%	18%
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	6000
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12050	12460	12600	12390	12310
Wt. of Mould,	g	7770	7770	7770	7770	7770
Wt. of Wet Soil, W	g	4280	4690	4830	4620	4540
Wet Density, γ_T=W/V,	gm/cc	1.970	2.159	2.223	2.126	2.090
Dry Density, γ_d=100γ_T/(100+w),	gm/cc	1.901	2.002	1.993	1.836	1.772

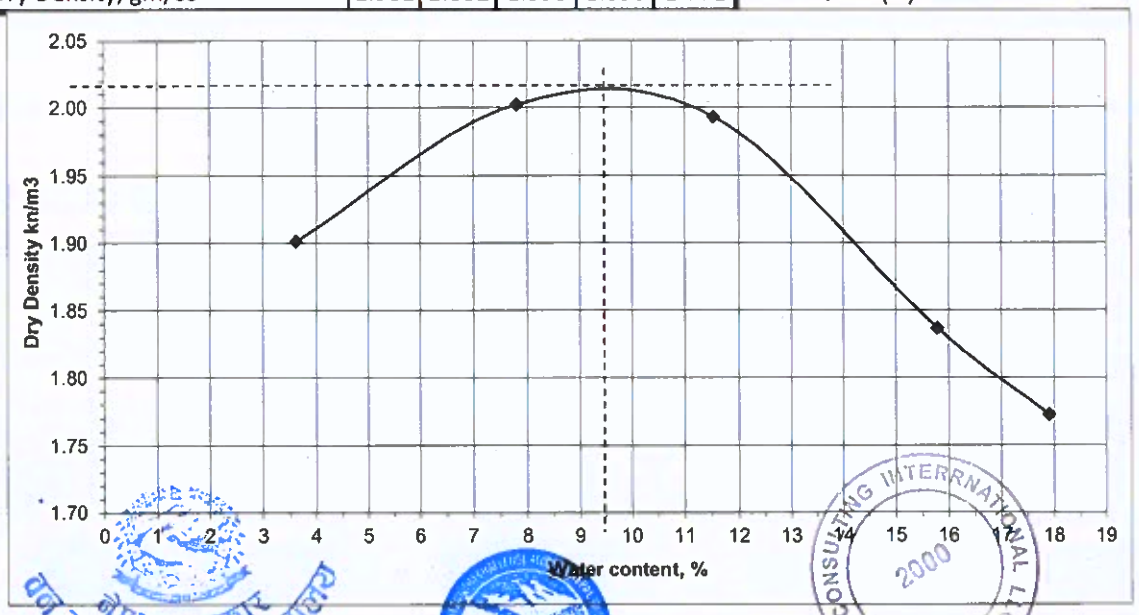
MOISTURE CONTENT

Container No.		A-83	A-89	A-97	A-141	A-142
Wt. of Wet Soil + Container,	g	17.37	26.36	18.62	26.40	28.20
Wt. of Dry Soil + Container,	g	17.10	25.21	17.65	25.19	25.39
Wt. of Water,	g	0.27	1.15	0.97	1.21	2.81
Wt. of Container,	g	9.67	10.50	9.25	17.53	9.71
Wt. of Dry Soil ,	g	7.43	14.71	8.4	7.66	15.68
Moisture Content, w,	%	3.63	7.82	11.55	15.80	17.92
Average Moisture Content,	%	3.63	7.82	11.55	15.80	17.92

Test No.	1	2	3	4	5
Water content, %	3.63	7.82	11.55	15.80	17.92
Dry Density, gm/cc	1.901	2.002	1.993	1.836	1.772

γdmax (gm/cc) : **2.015**

OMC (%) : **9.50**



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Tel.: 977-01- 4106676

COMPACTION TEST

Project : **MCA Nepal Soil Investigation for Transmission Line (400 kV DC)**

Borehole No. **B-60** Tested By : **Pranita Pun** Volume of Mould,V : **2172.66**

Depth: **0.00 - 1.00m** Date: **9/6/2019** Mould Size : **D=14.7, H=12.80**

Description: Checked by: **Dr. S. Manandhar**

Compaction Method : **ASTM: D-1557 Modified Proctor**

COMPACTION

Test No.		1	2	3	4	5
Assumed Water Content,	%	4%	8%	12%	15%	
Wt. of Air Dry Soil Used,	g	6000	6000	6000	6000	
Water Content of Air Dry Soil,	%					
Amount of Water Added,	cc					
Wt.of Wet Soil + Mould,	g	12280	12750	12610	12460	
Wt. of Mould,	g	7770	7770	7770	7770	
Wt. of Wet Soil, W	g	4510	4980	4840	4690	
Wet Density, γ_T=W/V,	gm/cc	2.076	2.292	2.228	2.159	
Dry Density, γ_d=100γ_T÷(100+w),	gm/cc	2.000	2.140	1.991	1.881	

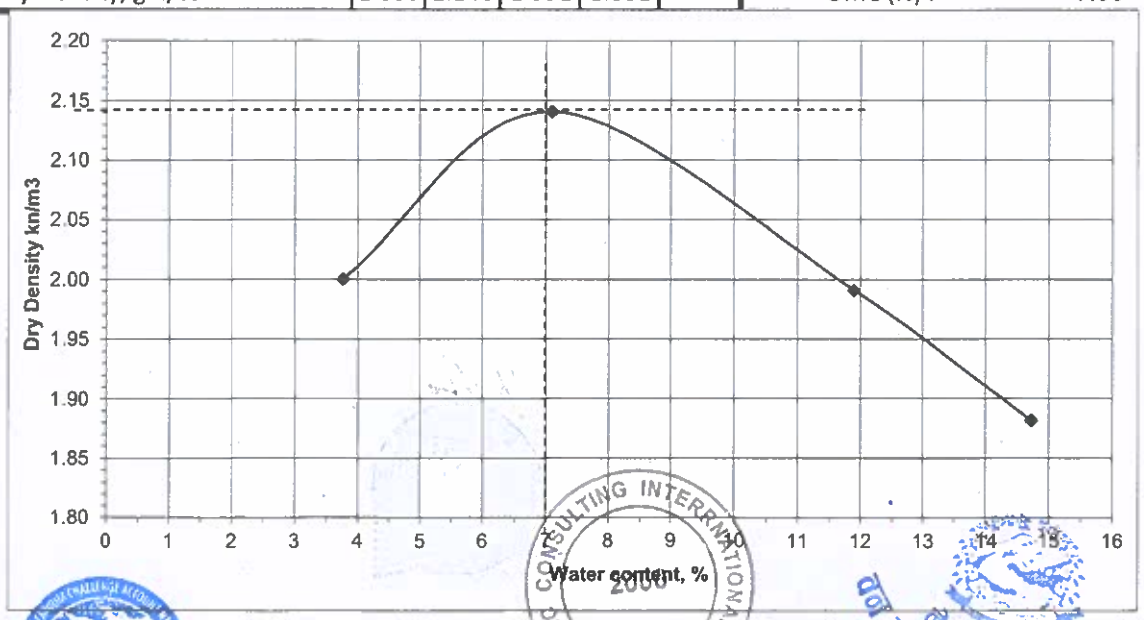
MOISTURE CONTENT

Container No.		A-26	A-25	A-17	A-27	
Wt. of Wet Soil + Container,	g	200.42	163.66	181.40	196.00	
Wt. of Dry Soil + Container,	g	194.45	154.64	165.21	175.01	
Wt. of Water,	g	5.97	9.02	16.19	20.99	
Wt. of Container,	g	36.69	27.65	29.26	32.55	
Wt. of Dry Soil ,	g	157.76	126.99	135.95	142.46	
Moisture Content, w,	%	3.78	7.10	11.91	14.73	
Average Moisture Content,	%	3.78	7.10	11.91	14.73	

Test No.	1	2	3	4	5
Water content, %	3.78	7.10	11.91	14.73	
Dry Density, gm/cc	2.000	2.140	1.991	1.881	

γdmax (gm/cc) : **2.140**

OMC (%) : **7.00**



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सिंहदरबार, काठमाडौं

ANNEX C7
Organic Content Test

ICGS Pvt. Ltd.

New Baneshwor, Kathmandu

Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-1**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.25**	**200.28**
Wt. of Organic Content	1.23	1.41
Percentage of Organic content	0.61	0.70
Averge Percentage of Organic Content %	**0.66**	

Note :-

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सिंहदरबार, काठमाडौं

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ICGS Pvt. Ltd.

New Baneshwor, Kathmandu

Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-2**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.67**	**200.42**
Wt. of Organic Content	0.93	1.02
Percentage of Organic content	0.46	0.51
Averge Percentage of Organic Content %	**0.49**	

Note :-

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सिंहदरबार, काठमाडौं

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ICGS Pvt. Ltd.

New Baneshwor, Kathmandu
Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-3**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.33**	**200.51**
Wt. of Organic Content	1.23	1.15
Percentage of Organic content	0.61	0.57
Averge Percentage of Organic Content %	**0.59**	

Note :-

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ICGS Pvt. Ltd.

New Baneshwor, Kathmandu
Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-4**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**158**	**158.21**
Wt. of Organic Content	0.48	0.51
Percentage of Organic content	0.30	0.32
Averge Percentage of Organic Content %	**0.31**	

Note :-

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Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-5**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250**	**250**
Wt. of Organic Content	1.84	2.10
Percentage of Organic content	0.74	0.84
Averge Percentage of Organic Content %	**0.79**	

Note :-

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Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-6**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.31**	**250.25**
Wt. of Organic Content	1.29	1.42
Percentage of Organic content	0.52	0.57
Averge Percentage of Organic Content %	**0.54**	

Note :-

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Determination of Organic Content Test

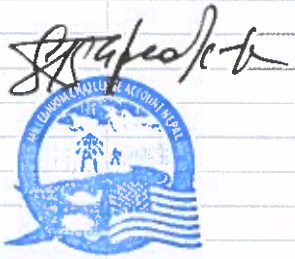
Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-7**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.64**	**250.12**
Wt. of Organic Content	0.93	1.02
Percentage of Organic content	0.37	0.41
Averge Percentage of Organic Content %	**0.39**	

Note :-



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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-8**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.33**	**200.51**
Wt. of Organic Content	1.23	1.15
Percentage of Organic content	0.61	0.57
Averge Percentage of Organic Content %	**0.59**	

Note :-

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Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-9**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.25**	**200.28**
Wt. of Organic Content	2.56	2.49
Percentage of Organic content	1.28	1.24
Averge Percentage of Organic Content %	**1.26**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-10**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.35**	**200.42**
Wt. of Organic Content	2.13	1.96
Percentage of Organic content	1.06	0.98
Averge Percentage of Organic Content %	**1.02**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-11**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.22**	**200.27**
Wt. of Organic Content	2.51	2.16
Percentage of Organic content	1.25	1.08
Averge Percentage of Organic Content %	**1.17**	

Note :-

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Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-12**	Date:	**12/07/2019**
Source :	**SPT sample**	Tested By:	**Pranita Pun**
Depth:	**4.00-4.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.48**	**200.42**
Wt. of Organic Content	0.65	0.79
Percentage of Organic content	0.32	0.39
Averge Percentage of Organic Content %	**0.36**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-13**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.31**	**200.47**
Wt. of Organic Content	2.32	2.26
Percentage of Organic content	1.16	1.13
Averge Percentage of Organic Content %	**1.14**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-14**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**200.25**	**200.28**
Wt. of Organic Content		2.09	2.16
Percentage of Organic content		1.04	1.08
Averge Percentage of Organic Content	%	1.06	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-15**	Date:	**12/07/2019**
Source :	**SPT sample**	Tested By:	**Pranita Pun**
Depth:	**1.00-1.45**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**200.67**	**200.42**
Wt. of Organic Content		1.96	2.50
Percentage of Organic content		0.98	1.25
Averge Percentage of Organic Content	%	**1.11**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-16**	Date:	**12/07/2019**
Source :	**SPT sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.35**	**250.96**
Wt. of Organic Content	1.91	2.35
Percentage of Organic content	0.76	0.94
Averge Percentage of Organic Content %	**0.85**	

Note :-

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Determination of Organic Content Test

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV AC)		
Borehole No.	B-17	Date:	12/07/2019
Source :	Test Pit Sample	Tested By:	Pranita Pun
Depth:	Below 1.00m	Checked by:	Dr. Suman manandhar

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.31**	**250.23**
Wt. of Organic Content	2.12	2.50
Percentage of Organic content	0.85	1.00
Averge Percentage of Organic Content %	**0.92**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-18**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.32**	**250.41**
Wt. of Organic Content	2.52	2.26
Percentage of Organic content	1.01	0.90
Averge Percentage of Organic Content %	**0.95**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-19**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.14**	**250.46**
Wt. of Organic Content	2.23	1.86
Percentage of Organic content	0.89	0.74
Averge Percentage of Organic Content %	**0.82**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-20**	Date:	**12/07/2019**
Source :	**SPT sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.42**	**250.19**
Wt. of Organic Content	1.61	1.84
Percentage of Organic content	0.64	0.74
Averge Percentage of Organic Content %	**0.69**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-21**	Date:	**12/07/2019**
Source :	**SPT sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**200.33**	**200.51**
Wt. of Organic Content		1.23	1.15
Percentage of Organic content		0.61	0.57
Averge Percentage of Organic Content	%	**0.59**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-22**	Date:	**12/07/2019**
Source :	**SPT sample**	Tested By:	**Pranita Pun**
Depth:	**2.00 - 2.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**240.56**	**250.42**
Wt. of Organic Content		1.84	1.69
Percentage of Organic content		0.76	0.67
Averge Percentage of Organic Content	%	**0.72**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B25**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.25**	**200.28**
Wt. of Organic Content	1.23	1.41
Percentage of Organic content	0.61	0.70
Averge Percentage of Organic Content %	**0.66**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-26**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.12**	**250.28**
Wt. of Organic Content	1.89	1.75
Percentage of Organic content	0.76	0.70
Averge Percentage of Organic Content %	**0.73**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-27**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**1.00-1.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.16**	**250.28**
Wt. of Organic Content	1.95	1.92
Percentage of Organic content	0.78	0.77
Averge Percentage of Organic Content %	**0.77**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-28**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**4.00-4.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.41**	**250.34**
Wt. of Organic Content	2.32	1.95
Percentage of Organic content	0.93	0.78
Averge Percentage of Organic Content %	**0.85**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-29**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.45**	**250.25**
Wt. of Organic Content	2.15	2.29
Percentage of Organic content	0.86	0.92
Averge Percentage of Organic Content %	**0.89**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B30**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.45**	**250.24**
Wt. of Organic Content	2.68	2.95
Percentage of Organic content	1.07	1.18
Averge Percentage of Organic Content %	**1.12**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-31**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.84**	**250.62**
Wt. of Organic Content	1.85	1.74
Percentage of Organic content	0.74	0.69
Averge Percentage of Organic Content %	**0.72**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-32**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.32**	**250.36**
Wt. of Organic Content	2.45	2.29
Percentage of Organic content	0.98	0.91
Averge Percentage of Organic Content %	**0.95**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-33**	Date:	**12/07/2019**
Source :	**SPT sample**	Tested By:	**Pranita Pun**
Depth:	**.00 - 1.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.25**	**200.28**
Wt. of Organic Content	1.23	1.41
Percentage of Organic content	0.61	0.70
Averge Percentage of Organic Content %	**0.66**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-34**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.51**	**200.32**
Wt. of Organic Content	1.05	1.02
Percentage of Organic content	0.52	0.51
Averge Percentage of Organic Content %	**0.52**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-35**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.22**	**200.31**
Wt. of Organic Content	0.98	1.23
Percentage of Organic content	0.49	0.61
Averge Percentage of Organic Content %	**0.55**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B36**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**160.23**	**160.35**
Wt. of Organic Content	1.72	1.53
Percentage of Organic content	1.07	0.95
Averge Percentage of Organic Content %	**1.01**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-37**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**160.35**	**160.45**
Wt. of Organic Content	1.24	1.52
Percentage of Organic content	0.77	0.95
Averge Percentage of Organic Content %	**0.86**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-38**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**160.35**	**160.24**
Wt. of Organic Content	1.34	1.38
Percentage of Organic content	0.84	0.86
Averge Percentage of Organic Content %	**0.85**	

Note :-

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Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	MCA Nepal Soil Investigation for Transmission Line (400 kV AC)		
Borehole No.	B-39	Date:	12/07/2019
Source :	SPT Sample	Tested By:	Pranita Pun
Depth:	3.00 - 3.45m	Checked by:	Dr. Suman manandhar

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	160.35	160.42
Wt. of Organic Content	0.98	1.20
Percentage of Organic content	0.61	0.75
Averge Percentage of Organic Content %	**0.68**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-40**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**2.00 - 2.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**200.28**	**200.36**
Wt. of Organic Content		1.56	1.49
Percentage of Organic content		0.78	0.74
Averge Percentage of Organic Content	%	**0.76**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-41**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**200.25**	**200.28**
Wt. of Organic Content		1.23	1.41
Percentage of Organic content		0.61	0.70
Averge Percentage of Organic Content	%	**0.66**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B42**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.31**	**200.35**
Wt. of Organic Content	2.12	2.10
Percentage of Organic content	1.06	1.05
Averge Percentage of Organic Content %	**1.05**	

Note :-

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Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-43**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**200.21**	**200.34**
Wt. of Organic Content		0.69	0.73
Percentage of Organic content		0.34	0.36
Averge Percentage of Organic Content	%	**0.35**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-44**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200**	**200**
Wt. of Organic Content	0.63	0.71
Percentage of Organic content	0.32	0.36
Averge Percentage of Organic Content %	**0.34**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-45**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**200.25**	**200.25**
Wt. of Organic Content		1.54	1.39
Percentage of Organic content		0.77	0.69
Averge Percentage of Organic Content	%	**0.73**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-46**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.32**	**200.25**
Wt. of Organic Content	1.51	1.63
Percentage of Organic content	0.75	0.81
Averge Percentage of Organic Content %	**0.78**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-47**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.19**	**200.23**
Wt. of Organic Content	1.25	1.08
Percentage of Organic content	0.62	0.54
Averge Percentage of Organic Content %	**0.58**	

Note :-

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Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-48**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.25**	**250.25**
Wt. of Organic Content	1.95	1.88
Percentage of Organic content	0.78	0.75
Averge Percentage of Organic Content %	**0.77**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-49**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.0m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.25**	**200.28**
Wt. of Organic Content	1.23	1.41
Percentage of Organic content	0.61	0.70
Averge Percentage of Organic Content %	**0.66**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-50**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.21**	**200.25**
Wt. of Organic Content	1.3	1.42
Percentage of Organic content	0.65	0.71
Averge Percentage of Organic Content %	**0.68**	

Note :-

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New Baneshwor, Kathmandu
Tel.: 977-01-4106676

Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-51**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**250.45**	**250.5**
Wt. of Organic Content		3.54	3.71
Percentage of Organic content		1.41	1.48
Averge Percentage of Organic Content	%	**1.45**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-52**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**2.00 - 2.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**200.15**	**200.33**
Wt. of Organic Content		0.84	1.05
Percentage of Organic content		0.42	0.52
Averge Percentage of Organic Content	%	**0.47**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-53**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.33**	**200.51**
Wt. of Organic Content	1.23	1.15
Percentage of Organic content	0.61	0.57
Averge Percentage of Organic Content %	**0.59**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-54**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**200.25**	**200.28**
Wt. of Organic Content		1.23	1.41
Percentage of Organic content		0.61	0.70
Averge Percentage of Organic Content	%	**0.66**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-55**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200.21**	**200.12**
Wt. of Organic Content	1.25	1.29
Percentage of Organic content	0.62	0.64
Averge Percentage of Organic Content %	**0.63**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-56**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**200.33**	**200.51**
Wt. of Organic Content		1.32	1.10
Percentage of Organic content		0.66	0.55
Averge Percentage of Organic Content	%	**0.60**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-57**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**5.00 - 5.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**200**	**200**
Wt. of Organic Content	1.56	1.45
Percentage of Organic content	0.78	0.73
Averge Percentage of Organic Content %	**0.75**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-58**	Date:	**12/07/2019**
Source :	**SPT Sample**	Tested By:	**Pranita Pun**
Depth:	**3.00 - 3.45m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**200.3**	**200.35**
Wt. of Organic Content		1.49	1.36
Percentage of Organic content		0.74	0.68
Averge Percentage of Organic Content	%	**0.71**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-59**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.		1	2
Wt. of Total Sample		**250.62**	**250.23**
Wt. of Organic Content		3.58	3.69
Percentage of Organic content		1.43	1.47
Averge Percentage of Organic Content	%	**1.45**	

Note :-

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Determination of Organic Content Test

Project:	**MCA Nepal Soil Investigation for Transmission Line (400 kV AC)**		
Borehole No.	**B-60**	Date:	**12/07/2019**
Source :	**Test Pit Sample**	Tested By:	**Pranita Pun**
Depth:	**Below 1.00m**	Checked by:	**Dr. Suman manandhar**

Standard: ASTM D2974-87

TEST BY BURNING METHOD AND CHEMICAL METHOD.

Test No.	1	2
Wt. of Total Sample	**250.12**	**250.6**
Wt. of Organic Content	3.24	3.35
Percentage of Organic content	1.30	1.34
Averge Percentage of Organic Content %	**1.32**	

Note :-

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ANNEX D

Data Sheet of VES and Activity Photographs

Table 1. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.429944
83.710579

Location: Chotki Sunari

Test No: B1

Azimuth 310

Weather: Sunny

Date: 28.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1316.915	34.335	240.86868	Private land
2	3	1	12.56	445.788	21.422	261.37136	
3	4.5	1.5	18.84	192.254	19.628	184.53563	
4	6	2	25.12	83.64	20.029	104.89974	
5	7.5	2.5	31.4	93.024	43.628	66.951352	
6	9	3	37.68	78.666	64.025	46.296523	
8	12	4	50.24	49.071	67.626	36.455314	
10	15	5	62.8	33.08	54.638	38.021597	
12	18	6	75.36	18.864	36.237	39.230373	
15	22.5	7.5	94.2	16.64	36.512	42.930762	
18	27	9	113.04	10.081	25.919	43.966057	
24	36	12	150.72	22.97	89.549	38.660827	
30	45	15	188.4	24.44	126.858	36.296457	

a- Inter electrode spacing in meter

A and B- current electrode; M and N- potential electrode

K- geometrical coefficient; ΔV- potential difference between M and N

I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivit	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	317.27	0-2.06	Silt and fine sand (unsaturated)
2	13.9	2.06-4.45	Predominantly clay
3	69.01	4.45-15.9	predominantly fine to coarse sand
4	17.02	>15.96	predominantly silt and clay

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Table 2. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.455256
83.705213

Location: Harpur-2

Test No: B2

Azimuth 220

Weather: Sunny

Date: 28.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	4550.792	220.17	129.8041	Private land
2	3	1	12.56	278.871	46.54	75.26042	
3	4.5	1.5	18.84	266.241	102.625	48.87679	
4	6	2	25.12	119.593	68.108	44.10901	
5	7.5	2.5	31.4	114.8	84.06	42.8827	
6	9	3	37.68	115.851	95.876	45.53033	
8	12	4	50.24	88.862	89.236	50.02944	
10	15	5	62.8	64.479	78.109	51.84142	
12	18	6	75.36	71.878	99.418	54.48436	
15	22.5	7.5	94.2	51.973	87.144	56.18122	
18	27	9	113.04	114.562	235.754	54.93051	
24	36	12	150.72	130.123	362.094	54.16311	
30	45	15	188.4	97.95	354.855	52.00372	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	172	0-0.97	Silt and sand (unsaturated)
2	32.6	0.97-4.9	Predominantly silt & clay
3	92.74	4.9-11.32	predominantly medium to coarse sand
4	43.17	>11.32	predominantly silt and fine sand

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Table 3. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.48009
83.697893

Location: Piparainha

Test No: B3

Azimuth 300

Weather: Sunny

Date: 28.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	555.596	133.133	26.20795	Private land
2	3	1	12.56	152.778	97.742	19.63221	
3	4.5	1.5	18.84	111.068	96.81	21.61472	
4	6	2	25.12	81.243	107.769	18.93702	
5	7.5	2.5	31.4	60.861	103.477	18.46821	
6	9	3	37.68	51.916	99.284	19.70302	
8	12	4	50.24	180.148	423.285	21.3819	
10	15	5	62.8	136.891	353.017	24.35224	
12	18	6	75.36	147.011	431.515	25.67408	
15	22.5	7.5	94.2	126.266	418.899	28.39409	
18	27	9	113.04	117.874	440.692	30.23535	
24	36	12	150.72	131.708	611.351	32.47076	
30	45	15	188.4	84.776	476.459	33.52187	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	34.7	0-0.6	Silt and fine sand (unsaturated)
2	17.9	0.6-7.9	Predominantly clay
3	53.17	7.9-17.95	predominantly medium to coarse sand
4	35.66	>17.95	predominantly silt and fine sand

Table 4. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.523843
83.69809

Location: Ghanshyampur

Test No: B4

Azimuth 280

Weather: Sunny

Date: 28.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	402.637	32.766	77.17025	Private land
2	3	1	12.56	235.205	63.441	46.5657	
3	4.5	1.5	18.84	108.585	53.038	38.57124	
4	6	2	25.12	92.251	67.908	34.12477	
5	7.5	2.5	31.4	66.007	64.19	32.28883	
6	9	3	37.68	44.736	52.671	32.00343	
8	12	4	50.24	212.837	345.468	30.95202	
10	15	5	62.8	103.841	210.081	31.04143	
12	18	6	75.36	55.591	129.861	32.26017	
15	22.5	7.5	94.2	60.374	173.55	32.76998	
18	27	9	113.04	53.825	194.45	31.29019	
24	36	12	150.72	28.669	148.605	29.07703	
30	45	15	188.4	25.92	169.946	28.73459	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	101.5	0-0.84	Silt and sand (unsaturated)
2	30.8	0.84-8.95	Predominantly silt & fine sand
3	39.86	8.95-17.43	predominantly fine to medium sand
4	21.24	>17.43	predominantly silt and fine sand

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Table 5. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.560544
83.677797

Location: Ghiudalla, Sunwal

Test No: B5

Azimuth 300

Weather: Sunny

Date: 28.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	773.005	70.649	68.71253	Private land
2	3	1	12.56	89.874	29.487	38.28187	
3	4.5	1.5	18.84	72.833	45.002	30.49139	
4	6	2	25.12	35.581	32.365	27.61609	
5	7.5	2.5	31.4	153.408	169.489	28.42079	
6	9	3	37.68	126.677	175.557	27.18883	
8	12	4	50.24	188.76	337.605	28.08993	
10	15	5	62.8	98.37	206.078	29.97717	
12	18	6	75.36	148.31	362.122	30.8643	
15	22.5	7.5	94.2	101.524	309.608	30.88926	
18	27	9	113.04	109.531	408.856	30.283	
24	36	12	150.72	44.88	247.705	27.30794	
30	45	15	188.4	60.89	442.342	25.93395	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	73.28	0-1.3	Silt and sand (unsaturated)
2	15.23	1.3-4.24	Predominantly silt & clay
3	58.48	4.24-12.25	predominantly medium to coarse sand
4	14.3	>12.25	predominantly clay

Table 6. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.578882
83.688318

Location: 200 m east from Milanchowk

Test No: B6

Azimuth 295

Weather: Sunny

Date: 28.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1096.298	129.482	53.17149	Private land
2	3	1	12.56	507.69	119.271	53.46301	
3	4.5	1.5	18.84	471.765	157.183	56.54589	
4	6	2	25.12	217.982	102.183	53.58727	
5	7.5	2.5	31.4	234.097	149.239	49.25419	
6	9	3	37.68	262.604	203.686	48.57928	
8	12	4	50.24	157.217	182.137	43.36616	
10	15	5	62.8	95.22	150.059	39.84977	
12	18	6	75.36	25.824	51.318	37.9223	
15	22.5	7.5	94.2	289.918	767.623	35.57772	
18	27	9	113.04	212.922	689.9	34.88723	
24	36	12	150.72	116.433	522.348	33.59596	
30	45	15	188.4	106.351	617.808	32.43164	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	51.96	0-1.1	Silt and silty clay (unsaturated)
2	61.06	1.1-4.2	Predominantly medium ti coarse sand
3	31.63	>4.2	predominantly silt and fine sand

Table 7A. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.574318
83.688775

Location: New Butwal Substation

Test No: 7A

Azimuth 300

Weather: Sunny

Date: 15.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	860.196	13.475	400.8928	NEA Land
2	3	1	12.56	230.851	8.146	355.9402	
3	4.5	1.5	18.84	70.56	6.034	220.31	
4	6	2	25.12	79.487	13.932	143.3185	
5	7.5	2.5	31.4	60.422	20.998	90.35388	
6	9	3	37.68	35.046	20.496	64.42883	
8	12	4	50.24	18.483	18.442	50.35169	
10	15	5	62.8	35.19	47.933	46.1046	
12	18	6	75.36	37.338	65.163	43.18082	
15	22.5	7.5	94.2	28.029	74.537	35.4231	
18	27	9	113.04	36.201	136.106	30.06599	
24	36	12	150.72	41.576	227.29	27.56978	
30	45	15	188.4	28.698	220.371	24.53455	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	469.5	0-1.9	Silt and sand (unsaturated)
2	27.85	1.9-4.03	Predominantly silt & clay
3	60.92	4.03-9.67	predominantly medium to coarse sand
4	19.06	>9.67	predominantly clay

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Table 7B. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.574318
83.688775

Location: Substation Near Butwal

Test No: B7B

Azimuth 30

Weather: Sunny

Date: 15.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	844.348	14.144	374.8943	NEA land
2	3	1	12.56	336.563	12.505	338.0433	
3	4.5	1.5	18.84	204.78	16.46	234.3897	
4	6	2	25.12	191.662	28.252	170.4145	
5	7.5	2.5	31.4	96.07	26.118	115.4988	
6	9	3	37.68	42.712	21.054	76.44097	
8	12	4	50.24	26.34	32.05	41.28929	
10	15	5	62.8	53.539	88.358	38.05257	
12	18	6	75.36	43.218	92.437	35.23382	
15	22.5	7.5	94.2	31.791	89.703	33.38475	
18	27	9	113.04	21.585	75.732	32.21846	
24	36	12	150.72	34.731	170.482	30.70504	
30	45	15	188.4	21.566	139.253	29.17736	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	400.86	0-2.3	Silt and sand (unsaturated)
2	25.46	2.3-7.7	Predominantly silt & clay
3	62.7	7.7-11.9	predominantly medium to coarse sand
4	23	>11.9	predominantly clay

Table 8A. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.573297
83.688735

Location: NEA Substation Near Butwal

Test No: B8A

Azimuth 275

Weather: Sunny

Date: 15.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	580.045	57.992	62.81354	NEA Land
2	3	1	12.56	245.792	57.087	54.07794	
3	4.5	1.5	18.84	121.025	53.182	42.87374	
4	6	2	25.12	74.083	49.71	37.43643	
5	7.5	2.5	31.4	57.567	54.328	33.27205	
6	9	3	37.68	34.34	41.242	31.37411	
8	12	4	50.24	52.317	92.316	28.47184	
10	15	5	62.8	46.254	102.888	28.23217	
12	18	6	75.36	35.266	96.145	27.64206	
15	22.5	7.5	94.2	80.518	273.49	27.73336	
18	27	9	113.04	58.293	239.762	27.48326	
24	36	12	150.72	36.061	203.388	26.72288	
30	45	15	188.4	22.32	149.109	28.20144	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	65.01	0-2.11	Silt and finesand (unsaturated)
2	20.3	2.11-6.86	Predominantly silt & clay
3	40.24	6.86-13.9	predominantly medium sand
4	22	>13.9	predominantly clay

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Table 8B. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.573297
83.688735

Location: NEA Substation Near Butwal

Test No: B8B

Azimuth 5

Weather: Sunny

Date: 15.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	299.436	27.179	69.18791	NEA land
2	3	1	12.56	129.913	29.896	54.57945	
3	4.5	1.5	18.84	57.586	25.47	42.596	
4	6	2	25.12	77.94	54.523	35.90875	
5	7.5	2.5	31.4	65.892	63.281	32.69558	
6	9	3	37.68	47.448	58.892	30.35795	
8	12	4	50.24	83.678	137.363	30.60491	
10	15	5	62.8	43.495	92.53	29.52	
12	18	6	75.36	54.799	152.075	27.15537	
15	22.5	7.5	94.2	30.034	109.393	25.86274	
18	27	9	113.04	18.244	83.619	24.66308	
24	36	12	150.72	32.917	200.824	24.70447	
30	45	15	188.4	27.485	203.725	25.41747	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	67.73	0-1.85	Silt and fine sand (unsaturated)
2	22.73	1.85-6.65	Predominantly silt & clay
3	40.19	6.65-13.17	predominantly medium sand
4	17.7	>13.17	predominantly clay

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Table 9. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.608978
83.704742

Location: Bardagoria Dham, Kerbani

Test No: B9

Azimuth 195

Weather: Partially cloudy

Date: 29.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	160.491	1.952	516.3338	Public land
2	3	1	12.56	563.29	19.695	359.2243	
3	4.5	1.5	18.84	564.445	36.893	288.2429	
4	6	2	25.12	124.175	16.146	193.1919	
5	7.5	2.5	31.4	71.897	15.743	143.4012	
6	9	3	37.68	106.714	35.389	113.6224	
8	12	4	50.24	34.54	18.465	93.97723	
10	15	5	62.8	44.221	35.266	78.74663	
12	18	6	75.36	46.264	46.646	74.74285	
15	22.5	7.5	94.2	182.325	246.852	69.57616	
18	27	9	113.04	182.124	308.843	66.65943	
24	36	12	150.72	142.543	392.226	54.77475	
30	45	15	188.4	89.272	303.18	55.47478	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	527.26	0-1.92	Unsaturated coarse-grained material
2	77.26	1.92-14.86	Silt, sand & gravel (partially to full sat.)
3	41.26	>14.86	Claystone and siltstone

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Table 10. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.677442
83.757908

Location: Khumbari

Test No: B10

Azimuth 105

Weather: Partially cloudy

Date: 29.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	297.039	5.86	318.3285	Private land
2	3	1	12.56	599.979	21.54	349.8485	
3	4.5	1.5	18.84	498.41	29.917	313.8699	
4	6	2	25.12	543.252	47.245	288.8452	
5	7.5	2.5	31.4	296.428	35.94	258.9827	
6	9	3	37.68	169.952	28.847	221.9916	
8	12	4	50.24	130.323	41.227	158.8141	
10	15	5	62.8	43.448	19.609	139.147	
12	18	6	75.36	170.315	123.354	104.0496	
15	22.5	7.5	94.2	159.289	186.271	80.5548	
18	27	9	113.04	21.471	32.727	74.16145	
24	36	12	150.72	51.62	112.042	69.43973	
30	45	15	188.4	47.018	135.777	65.24073	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	327.01	0-1.21	Unsaturated silt and fine sand
2	402.74	1.21-2.73	Sand & gravel (partially to full saturated)
3	236.22	2.73-5.52	sand & gravel (fully saturated)
4	52.34	5.52-15.62	Claystone
5	70.25	>15.62	Claystone & siltstone

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Table 11. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.684012
83.773419

Location: Deurali

Test No: B11

Azimuth 365

Weather: Sunny

Date: 29.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1009.25	41.17	153.94923	Public land
2	3	1	12.56	314.711	20.65	191.41744	
3	4.5	1.5	18.84	178.564	15.051	223.51643	
4	6	2	25.12	348.907	36.973	237.05255	
5	7.5	2.5	31.4	56.145	7.411	237.88328	
6	9	3	37.68	497.15	91.082	205.66755	
8	12	4	50.24	702.33	185.917	189.78931	
10	15	5	62.8	278.5	107.659	162.45553	
12	18	6	75.36	223.978	122.199	138.12701	
15	22.5	7.5	94.2	168.683	156.089	101.8005	
18	27	9	113.04	139.565	176.586	89.341327	
24	36	12	150.72	64.384	144.239	67.276926	
30	45	15	188.4	84.231	243.655	65.129467	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	132.1	0-1.04	Unsaturated silt and fine sand
2	336.03	1.04-5.6	Sand & gravel (partially to fully saturated)
3	44.42	5.6-20.24	Claystone
4	76.85	>20.24	Claystone & siltstone

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Table 12. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.732464
83.821372

Location: Kallabari

Test No: B12

Azimuth 175

Weather: sunny

Date: 15.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	747.983	13.55	346.66666	Public land (?)
2	3	1	12.56	334.988	7.49	561.74223	
3	4.5	1.5	18.84	196.989	6.636	559.26353	
4	6	2	25.12	163.184	7.625	537.59765	
5	7.5	2.5	31.4	570.766	39.424	454.59751	
6	9	3	37.68	316.524	28.991	411.39058	
8	12	4	50.24	30.378	7.537	202.49313	
10	15	5	62.8	98.752	48.959	126.66978	
12	18	6	75.36	44.354	28.569	116.99806	
15	22.5	7.5	94.2	206.612	211.64	91.96206	
18	27	9	113.04	74.484	93.671	89.885571	
24	36	12	150.72	141.78	212.059	100.76951	
30	45	15	188.4	45.214	115.471	73.77019	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	104.57	0-0.26	Weathered soil of slope
2	2112.47	0.26-1.3	Deformed portion of bedrock slope
3	72.22	>1.3	Claystone and siltstone

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Table 13. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.752407
83.840513

Location: Shindhure, Paplpa, Nisti-7

Test No: B13

Azimuth 315

Weather: Partially Cloudy

Date: 16.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	703.38	28.955	152.5549	Profile along
2	3	1	12.56	279.254	18.281	191.8621	the road
3	4.5	1.5	18.84	235.128	21.08	210.1429	
4	6	2	25.12	301.689	32.878	230.5015	
5	7.5	2.5	31.4	146.458	17.867	257.3897	
6	9	3	37.68	335.007	44.737	282.1616	
8	12	4	50.24	110.982	19.193	290.5088	
10	15	5	62.8	151.298	33.039	287.5848	
12	18	6	75.36	145.226	38.175	286.6858	
15	22.5	7.5	94.2	99.249	37.052	252.328	
18	27	9	113.04	86.246	42.9	227.2552	
24	36	12	150.72	52.221	39.087	201.3649	
30	45	15	188.4	55.734	50.039	209.842	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	149.59	0-1.8	Soil
2	407.5	1.8-9.0	Deformed portion of bedrock
3	134.98	>9.0	Predominantly red shale

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Table 14. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.823396
83.895408

Location: Beldanda, On the way to Rampur

Test No: B14

Azimuth 175

Weather: Sunny

Date: 16.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1174.716	6.589	1119.626	Private land
2	3	1	12.56	443.705	4.405	1265.138	
3	4.5	1.5	18.84	247.329	3.864	1205.921	
4	6	2	25.12	409.654	7.63	1348.69	
5	7.5	2.5	31.4	289.812	5.719	1591.204	
6	9	3	37.68	608.046	13.113	1747.211	
8	12	4	50.24	811.918	20.003	2039.232	
10	15	5	62.8	983.092	28.768	2146.071	
12	18	6	75.36	137.741	5.619	1847.333	
15	22.5	7.5	94.2	1088.059	53.707	1908.413	
18	27	9	113.04	757.759	41.813	2048.575	
24	36	12	150.72	766.37	52.545	2198.255	
30	45	15	188.4	363.896	32.362	2118.472	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	1101.45	0.2.9	Soil
2	2856.4	2.9-8.01	Fractured bedrock
3	2013.5	>8.01	Bedrock (quarzite & phyllite)

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Table 15. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.836602
83.941556

Location: Panthe, Rampur-1

Test No: B15

Azimuth 45

Weather: Sunny

Date: 16.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	2228.168	28.641	488.5617	Public land (?)
2	3	1	12.56	1759.926	31.246	707.44	
3	4.5	1.5	18.84	1371.552	31.587	818.0593	
4	6	2	25.12	981.746	26.866	917.9431	
5	7.5	2.5	31.4	598.404	18.661	1006.907	
6	9	3	37.68	521.092	20.596	953.3281	
8	12	4	50.24	491.613	26.106	946.0904	
10	15	5	62.8	543.586	34.469	990.374	
12	18	6	75.36	598.069	40.889	1102.264	
15	22.5	7.5	94.2	311.321	26.356	1112.704	
18	27	9	113.04	210.774	21.243	1121.588	
24	36	12	150.72	182.821	31.025	888.1477	
30	45	15	188.4	42.235	10.213	779.1123	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	522.63	0-1.95	Soil
2	1589.06	1.95-12.75	Weathered bedrock (unsaturated)
3	412	>12.74	Weathered Bedrock (phyllite)

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Table 16. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.873183
83.968299

Location: Bhantar

Test No: B16

Azimuth 335

Weather: Partially cloudy

Date: 16.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1671.312	10.782	973.4594	Public land (?)
2	3	1	12.56	744.298	9.244	1011.292	
3	4.5	1.5	18.84	480.873	9.157	989.3685	
4	6	2	25.12	266.232	7.456	896.9619	
5	7.5	2.5	31.4	445.072	17.506	798.3126	
6	9	3	37.68	303.923	16.294	702.8243	
8	12	4	50.24	213.954	18.041	595.8123	
10	15	5	62.8	155.756	17.444	560.7359	
12	18	6	75.36	141.875	18.954	564.0867	
15	22.5	7.5	94.2	165.456	27.612	564.4631	
18	27	9	113.04	222.708	43.288	581.5679	
24	36	12	150.72	131.612	36.779	539.3448	
30	45	15	188.4	121.903	42.691	537.9711	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	911.72	0-1.03	Silt and fine sand, unsaturated
2	1442.9	1.03-3.0	Sand & gravel (unsaturated)
3	231.46	3.0-5.9	Silt and fine sand (unsaturated)
4	856.13	5.9-18.79	Coarse sand and boulders (unsaturated)
5	322.75	>18.79	Coarse sand and boulders (saturated)

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Table 17. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.898383
84.003698

Location: Deurali

Test No: B17

Azimuth 95

Weather: Foggy and cloudy

Date: 17.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1725.433	6.005	1804.449	Public land
2	3	1	12.56	1166.725	5.674	2582.669	
3	4.5	1.5	18.84	789.454	5.846	2544.186	
4	6	2	25.12	924.122	7.943	2922.566	
5	7.5	2.5	31.4	720.03	8.305	2722.329	
6	9	3	37.68	808.557	11.409	2670.385	
8	12	4	50.24	195.929	4.588	2145.482	
10	15	5	62.8	266.098	9.315	1793.983	
12	18	6	75.36	217.734	10.893	1506.328	
15	22.5	7.5	94.2	136.405	8.93	1438.897	
18	27	9	113.04	69.549	5.94	1323.539	
24	36	12	150.72	319.684	37.281	1292.422	
30	45	15	188.4	204.865	31.249	1235.13	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	1539.55	0-1.01	Soil
2	4752	1.01-3.39	Highly fractured bedrock
3	1171.7	>3.39	Bedrock (phyllite & quartzite)

Table 18. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.908547
84.050535

Location: Dandathock-Kobdi

Test No: B18

Azimuth 200

Weather: Partially cloudy

Date: 17.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	5099.886	20.089	1594.27	Private-bari land
2	3	1	12.56	2079.219	9.409	2775.533	
3	4.5	1.5	18.84	710.053	5.098	2624.048	
4	6	2	25.12	1056.135	12.264	2163.251	
5	7.5	2.5	31.4	1234.04	15.565	2489.486	
6	9	3	37.68	795.635	11.202	2676.266	
8	12	4	50.24	570.699	18.659	1536.627	
10	15	5	62.8	540.216	21.253	1596.272	
12	18	6	75.36	524.244	25.6	1543.243	
15	22.5	7.5	94.2	407.429	26.779	1433.206	
18	27	9	113.04	168.215	15.552	1222.674	
24	36	12	150.72	63.773	10.705	897.8857	
30	45	15	188.4	95.344	19.227	934.2492	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	1407.83	0-0.9	Soil
2	3650	0.9-4.6	Highly fractured bedrock?
3	870.7	>4.6	Bedrock (Predominantly phyllite)

Table 19. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.932253
84.108214

Location: Mohoriya Bhanjyang

Test No: B19

Azimuth 20

Weather: Cloudy

Date: 17.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	4025.412	5.159	4900.09447	Public land
2	3	1	12.56	2318.309	4.541	6412.23542	
3	4.5	1.5	18.84	1106.704	3.391	6148.71818	
4	6	2	25.12	710.483	3.072	5809.6787	
5	7.5	2.5	31.4	492.911	3.244	4771.08674	
6	9	3	37.68	426.15	3.737	4296.85095	
8	12	4	50.24	734.102	10.687	3451.04187	
10	15	5	62.8	642.567	13.712	2942.91187	
12	18	6	75.36	381.137	10.347	2775.92387	
15	22.5	7.5	94.2	814.753	25.069	3061.53946	
18	27	9	113.04	767.554	27.212	3188.45745	
24	36	12	150.72	309.622	14.675	3179.98145	
30	45	15	188.4	491.546	31.128	2975.04711	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	2260	0-0.39	Soil
2	12176	0.39-1.9	Fragments of rocks (colluvium or eluvium)
3	2083	1.9-8.11	weathered and fractured bedrock
4	3484	>8.11	Bedrock (phyllite and quartzite)

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Table 20. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.927888
84.168431

Location: Likindi

Test No: B20

Azimuth 180

Weather: Partially Cloudy

Date: 17.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1302.891	2.353	3477.3291	Profile on the side of road
2	3	1	12.56	1219.318	3.527	4342.1134	
3	4.5	1.5	18.84	658.167	2.512	4936.2525	
4	6	2	25.12	789.252	4.291	4620.3706	
5	7.5	2.5	31.4	538.23	3.373	5010.5016	
6	9	3	37.68	723.381	5.501	4954.9166	
8	12	4	50.24	431.879	5.023	4319.6498	
10	15	5	62.8	581.735	8.015	4558.0734	
12	18	6	75.36	800.624	13.223	4562.8847	
15	22.5	7.5	94.2	319.656	7.08	4253.0502	
18	27	9	113.04	631.025	16.863	4230.0342	
24	36	12	150.72	422.99	14.858	4290.8233	
30	45	15	188.4	87.124	4.391	3738.1375	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	3003	0-0.86	Soil
2	5953	0.86-4.043	Fragments of rocks (colluvium or eluvium)
3	3920	>4.043	Bedrock (phyllite and quartzite)

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Table 21. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.937131
84.241262

Location: Ribu

Test No: B21

Azimuth 175

Weather: Sunny

Date: 18.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	2240.302	44.225	318.1254	Private land
2	3	1	12.56	1673.002	46.981	447.2639	
3	4.5	1.5	18.84	1498.083	50.463	559.2986	
4	6	2	25.12	899.949	31.009	729.0373	
5	7.5	2.5	31.4	385.08	19.956	605.9086	
6	9	3	37.68	606.346	40.333	566.4621	
8	12	4	50.24	536.702	42.05	641.2344	
10	15	5	62.8	451.125	39.281	721.2304	
12	18	6	75.36	412.661	40.744	763.2567	
15	22.5	7.5	94.2	121.77	10.604	1081.737	
18	27	9	113.04	637.297	69.206	1040.951	
24	36	12	150.72	737.481	105.402	1054.564	
30	45	15	188.4	340.773	67.412	952.3769	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Note: site is located at 30 minutes walk from vehicular road

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	204.64	0-0.73	Soil
2	2001.4	0.73-1.48	Eluvium (with fragment of rocks)
3	218.28	1.48-3.5	Highly weathered rock (saprolite)
4	1824.43	>3.5	Bedrock (phyllite and quartzite)

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Table 22. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.951212
84.280072

Location: Pokhari Bhanjyang

Test No: B22

Azimuth 245

Weather: Sunny

Date: 18.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	3615.195	10.758	2110.376	Public land
2	3	1	12.56	1500.081	6.557	2873.42	
3	4.5	1.5	18.84	844.062	5.495	2893.927	
4	6	2	25.12	171.356	1.672	2574.439	
5	7.5	2.5	31.4	570.489	7.393	2423.016	
6	9	3	37.68	510.391	8.505	2261.203	
8	12	4	50.24	269.373	5.961	2270.307	
10	15	5	62.8	534.831	15.064	2229.646	
12	18	6	75.36	278.366	9.274	2261.986	
15	22.5	7.5	94.2	148.787	6.467	2167.27	
18	27	9	113.04	165.838	8.998	2083.388	
24	36	12	150.72	203.443	14.488	2116.436	
30	45	15	188.4	161.217	14.009	2168.126	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	917.63	0-0.34	Soil
2	5472.6	0.34-1.16	Fragments of rocks (colluvium or eluvium)
3	2097.9	>1.16	Bedrock (phyllite and quartzite)

Table 23. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.947367
84.313017

Location: Hundi

Test No: B25

Azimuth 310

Weather: Sunny

Date: 19.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1779.449	14.709	759.7348	Profile along road
2	3	1	12.56	643.983	12.985	622.9054	Center at borehole
3	4.5	1.5	18.84	357.413	12.65	532.3052	
4	6	2	25.12	195.137	10.668	459.4902	
5	7.5	2.5	31.4	165.733	11.26	462.1684	
6	9	3	37.68	149.589	12.273	459.2613	
8	12	4	50.24	170.277	19.467	439.4471	
10	15	5	62.8	85.406	11.312	474.1422	
12	18	6	75.36	348.707	51.239	512.8625	
15	22.5	7.5	94.2	192.502	32.671	555.0393	
18	27	9	113.04	137.398	26.336	589.7429	
24	36	12	150.72	111.889	24.759	681.1224	
30	45	15	188.4	96.423	25.614	709.2252	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	806.55	0-1.3	Soil
2	389.96	1.3-9.86	highly deformed & weathered bedrock
3	969.3	>9.86	Bedrock (predominantly phyllite)

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Table 24. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.930024
84.34281

Location: Keshavtar

Test No: B26

Azimuth 330

Weather: Sunny

Date: 19.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1893.38	7.686	1547.024	Public land
2	3	1	12.56	1212.397	7.947	1916.158	Forest below the road
3	4.5	1.5	18.84	1105.32	9.829	2118.652	Borehole is offset
4	6	2	25.12	1030.988	12.725	2035.239	about 30 m
5	7.5	2.5	31.4	827.88	12.55	2071.349	
6	9	3	37.68	596.017	9.998	2246.241	
8	12	4	50.24	333.317	9.138	1832.55	
10	15	5	62.8	224.866	9.195	1535.79	
12	18	6	75.36	119.803	7.661	1178.482	
15	22.5	7.5	94.2	119.259	12.478	900.3204	
18	27	9	113.04	99.125	21.543	520.1267	
24	36	12	150.72	33.738	10.767	472.2756	
30	45	15	188.4	52.24	17.7	556.0461	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	1449	0-1.52	Soil
2	4185	1.52-5.0	Eluvium (with fragment of rocks)
3	130	5.0-13.26	Highly weathered rock (saprolite)
4	1710.6	>13.26	Bedrock (phyllite and quartzite)

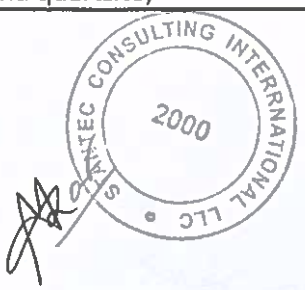

Table 25. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.917295
84.360344

Location: Bhaheri

Test No: B27

Azimuth 285

Weather: Sunny

Date: 19.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	738.637	47.539	97.57547	Private land
2	3	1	12.56	258.203	49.324	65.74953	
3	4.5	1.5	18.84	104.671	38.85	50.75937	
4	6	2	25.12	124.538	78.401	39.90248	
5	7.5	2.5	31.4	87.84	79.914	34.5143	
6	9	3	37.68	56.021	68.935	30.62118	
8	12	4	50.24	45.519	83.155	27.50135	
10	15	5	62.8	115.45	283.492	25.57483	
12	18	6	75.36	58.923	182.394	24.3453	
15	22.5	7.5	94.2	180.607	646.839	26.30203	
18	27	9	113.04	184.378	745.53	27.95607	
24	36	12	150.72	42.789	197.743	32.61384	
30	45	15	188.4	118.237	581.655	38.29736	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	97	0-1.72	Soil
2	22.99	1.72-21.6	Predominantly clay and silt
3	114.9	>21.6	Highly weathered bedrock (phyllite)

Table 26. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.88616
84.402544

Location: Kalleri

Test No: B28

Azimuth 75

Weather: Sunny

Date: 19.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	2465.282	6.651	2327.766	Along road corner
2	3	1	12.56	1476.128	7.421	2498.338	Test is offset about
3	4.5	1.5	18.84	630.338	4.747	2501.7	30 m from borehole
4	6	2	25.12	476.72	5.551	2157.306	
5	7.5	2.5	31.4	260.303	4.463	1831.395	
6	9	3	37.68	208.846	4.809	1636.373	
8	12	4	50.24	483.231	15.497	1566.595	
10	15	5	62.8	393.586	17.85	1384.717	
12	18	6	75.36	535.738	25.147	1605.488	
15	22.5	7.5	94.2	729.157	37.996	1807.732	
18	27	9	113.04	590.919	37.357	1788.085	
24	36	12	150.72	600.399	54.047	1674.323	
30	45	15	188.4	407.973	49.529	1551.861	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	1654	0-0.72	Soil
2	5810	0.72-1.86	Colluvium (with fragment of rocks)
3	850.4	1.86-8.4	Highly weathered bedrok rock?
4	2942.77	>8.4	Bedrock (phyllite and quartzite)

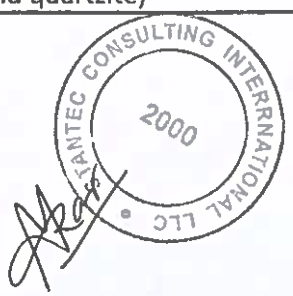

Table 27. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.865295
84.506534

Location: Labbdi

Test No: B29

Azimuth 155

Weather: Sunny

Date: 20.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	876.149	2.063	2667.094	Along road
2	3	1	12.56	485.952	5.456	1118.687	Test center is
3	4.5	1.5	18.84	521.084	8.033	1222.112	near borehole
4	6	2	25.12	367.819	5.71	1618.146	
5	7.5	2.5	31.4	816.701	12.472	2056.159	
6	9	3	37.68	916.083	14.211	2428.964	
8	12	4	50.24	952.752	16.299	2936.761	
10	15	5	62.8	231.692	5.417	2686.036	
12	18	6	75.36	122.447	3.934	2345.604	
15	22.5	7.5	94.2	131.393	7.331	1688.34	
18	27	9	113.04	134.896	11.871	1284.529	
24	36	12	150.72	43.113	7.624	852.3074	
30	45	15	188.4	23.141	8.082	539.4413	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	21189	0-0.4	Soil (with fragments of rocks)
2	376.4	0.4-1.12	Soil predominantly fine grained
3	5060	1.12-2.07	Highly fractured bedrock
4	10264	2.07-4.47	Highly fractured bedrock
5	347	4.47-7.03	Graphitic phyllite?
6	95.74	>7.03	Influence of graphite beds?

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Table 28. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.833404
84.554054

Location: Kalikhola

Test No: B30

Azimuth 130

Weather: Sunny

Date: 19.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	5179.392	4.334	7504.97964	Public land
2	3	1	12.56	1401.462	2.389	7368.088204	Along the road
3	4.5	1.5	18.84	2613.811	7.414	6642.055468	Test center is offset
4	6	2	25.12	2378.377	11.36	5259.228014	38 m towards uphillside
5	7.5	2.5	31.4	698.893	6.709	3271.015084	from borehole
6	9	3	37.68	474.19	7.025	2543.413409	
8	12	4	50.24	230.66	6.164	1880.00623	
10	15	5	62.8	109.702	4.099	1680.723494	
12	18	6	75.36	280.418	13.681	1544.645894	
15	22.5	7.5	94.2	3259.813	195.153	1573.505837	
18	27	9	113.04	443.917	52.606	953.8907668	
24	36	12	150.72	834.009	111.285	1129.548784	
30	45	15	188.4	424.48	78.464	1019.219413	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	8983	0-1.8	Talus
2	3435	1.8-4.6	Talus with higher degree of moisture content
3	1095.6	>4.6	Highly fractured bedrock (metasandstone)

Table 29. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.800426
84.64847

Location: Nangedanda, Chilenpani Village

Test No: B31

Azimuth 105

Weather: Clear

Date: 20.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	2353.413	8.389	1761.76346	Profile along road
2	3	1	12.56	876.216	4.089	2691.43384	
3	4.5	1.5	18.84	1009.079	6.139	3096.76631	
4	6	2	25.12	685.012	5.376	3200.80012	
5	7.5	2.5	31.4	458.858	4.48	3216.10295	
6	9	3	37.68	542.135	6.207	3291.06602	
8	12	4	50.24	285.536	5.409	2652.12214	
10	15	5	62.8	317.632	9.097	2192.73273	
12	18	6	75.36	183.652	8.489	1630.34689	
15	22.5	7.5	94.2	131.545	7.912	1566.17025	
18	27	9	113.04	51.811	7.062	829.328156	
24	36	12	150.72	45.767	11.415	604.292794	
30	45	15	188.4	25.815	14.38	338.215994	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	1227.5	0-0.7	Soil with fragments of rocks
2	4573.3	0.7-6.4	Colluvial deposit
3	239.8	>6.4	Bedrock (graphitic schist?)

Table 30. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.776662
84.690067

Location: Tekbang

Test No: B32

Azimuth 45

Weather: Sunny

Date: 19.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1899.634	11.24	1061.361	Profile along road
2	3	1	12.56	956.676	12.229	982.5702	
3	4.5	1.5	18.84	364.507	6.579	1043.823	
4	6	2	25.12	244.847	5.218	1178.719	
5	7.5	2.5	31.4	367.504	8.92	1293.68	
6	9	3	37.68	383.591	11.339	1274.69	
8	12	4	50.24	241.162	8.977	1349.669	
10	15	5	62.8	359.838	16.365	1380.863	
12	18	6	75.36	247.816	15.531	1202.46	
15	22.5	7.5	94.2	241.725	18.706	1217.283	
18	27	9	113.04	86.647	9.92	987.3565	
24	36	12	150.72	91.668	57.593	239.8938	
30	45	15	188.4	22.445	274.384	15.41139	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	1000	0-2.42	highly fractured bedrock overlain by soil
2	2231.62	2.42-9.04	Highly fractured bedrock
3	42.65	>9.04	Bedrock (influence of graphite bed)

Table 31. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.782185
84.791776

Location: Mohoriya Gaun

Test No: B33

Azimuth 305

Weather: Sunny

Date: 21.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	738.703	13.88	334.2259	Profile along road
2	3	1	12.56	293.813	9.395	392.7931	
3	4.5	1.5	18.84	368.345	15.024	461.9023	
4	6	2	25.12	203.738	10.315	496.1608	
5	7.5	2.5	31.4	267.778	15.266	550.7814	
6	9	3	37.68	119.175	8.028	559.3565	
8	12	4	50.24	180.301	15.339	590.5419	
10	15	5	62.8	134.295	12.435	678.2248	
12	18	6	75.36	74.389	8.012	699.6948	
15	22.5	7.5	94.2	135.307	16.085	792.4103	
18	27	9	113.04	196.979	25.85	861.3735	
24	36	12	150.72	194.249	26.948	1086.433	
30	45	15	188.4	208.092	27.604	1420.248	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	303.67	0-1.19	Red soil
2	608	1.19-15.19	Highly weathered & fractured bedrock
3	8192	>15.19	Bedrock (massive limestone)

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Table 32. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.794998
84.834983

Location: Ambhanjyang

Test No: B34

Azimuth 325

Weather: Sunny

Date: 21.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1452.442	49.684	183.587	Private Land
2	3	1	12.56	258.661	11.124	292.0516	
3	4.5	1.5	18.84	169.933	8.116	394.4724	
4	6	2	25.12	138.448	7.544	461.0039	
5	7.5	2.5	31.4	758.284	46.845	508.2745	
6	9	3	37.68	1530.869	96.641	596.8807	
8	12	4	50.24	253.296	18.55	686.0157	
10	15	5	62.8	2002.711	153.815	817.6722	
12	18	6	75.36	1833.875	145.205	951.7635	
15	22.5	7.5	94.2	1339.723	113.75	1109.467	
18	27	9	113.04	558.374	56.111	1124.888	
24	36	12	150.72	119.727	21.083	855.9149	
30	45	15	188.4	101.817	32.112	597.3568	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	144.8	0-0.9	Fine grained alluvial soil
2	445.15	0.9-2.5	coarser grained alluvial deposit
3	2294.17	2.5-4.8	Coarse sand & boulder (unsaturated)
4	4200	4.8-9.00	Coarse sand & boulder (unsaturated)
5	57.67	>9.00	Fine sand and silt deposit?

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Table 33. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.807143
84.852268

Location: Bihani Pump

Test No: B35

Azimuth 205

Weather: Sunny

Date: 21.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	514.43	44.558	72.50371	Private land?
2	3	1	12.56	208.044	33.341	78.37295	
3	4.5	1.5	18.84	146.839	29.975	92.2918	
4	6	2	25.12	112.891	24.141	117.4691	
5	7.5	2.5	31.4	151.231	35.444	133.9762	
6	9	3	37.68	92.995	21.947	159.6597	
8	12	4	50.24	161.007	38.484	210.191	
10	15	5	62.8	177.847	40.874	273.2493	
12	18	6	75.36	142.458	31.681	338.8667	
15	22.5	7.5	94.2	175.251	40.77	404.9214	
18	27	9	113.04	142.954	36.116	447.4338	
24	36	12	150.72	111.316	29.923	560.6907	
30	45	15	188.4	60.861	16.8	682.5126	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	69.07	0-3.3	Predominantly clayey soil
2	3000	>3.3	Predominantly sand & gravel (unsaturated)

Table 34. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.821794
84.928523

Locatior Pahare

Test No: B36

Azimuth 175

Weather: Partially cloudy

Date: 21.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	2706.384	42.276	402.027	Profile along the road
2	3	1	12.56	1600.642	37.171	540.8534	center at borehole
3	4.5	1.5	18.84	956.275	25.485	706.9343	
4	6	2	25.12	438.134	15.324	718.215	
5	7.5	2.5	31.4	539.75	26.446	640.8587	
6	9	3	37.68	299.314	20.175	559.0162	
8	12	4	50.24	163.565	17.258	476.1563	
10	15	5	62.8	42.975	5.959	452.8998	
12	18	6	75.36	284.836	52.407	409.5873	
15	22.5	7.5	94.2	267.831	71.82	351.2905	
18	27	9	113.04	245.241	86.103	321.9637	
24	36	12	150.72	154.121	89.929	258.3051	
30	45	15	188.4	39.259	31.413	235.4565	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer N	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	261.09	0-0.63	Soil with fragments of rocks
2	997.9	0.63-4.09	Highly weathered bedrock
3	233.97	>4.09	Highly weathered bedrock with zone of moisture circulation

Table 35. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.851499
85.038448

Location: Ratmate

Test No: B37

Azimuth 75

Weather: Sunny

Date: 22.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	2192.833	26.14	526.8168	Private land
2	3	1	12.56	1566.796	21.028	935.8454	
3	4.5	1.5	18.84	1108.728	15.284	1366.686	
4	6	2	25.12	1221.092	18.085	1696.092	
5	7.5	2.5	31.4	914.947	15.002	1915.034	
6	9	3	37.68	1050.18	19.516	2027.607	
8	12	4	50.24	1384.113	33.89	2051.869	
10	15	5	62.8	1047.617	31.42	2093.9	
12	18	6	75.36	889.708	34.104	1965.998	
15	22.5	7.5	94.2	467.519	23.921	1841.072	
18	27	9	113.04	486.286	31.701	1734.007	
24	36	12	150.72	401.804	39.167	1546.197	
30	45	15	188.4	228.472	35.561	1210.431	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	321.25	0-0.7	Red soil
2	3086.9	0.7-1.16	Coarse sand & gravel (unsaturated)
3	4173.73	1.16-7.73	Coarse sand & gravel (unsaturated)
4	611.81	>7.73	Medium to coarse grained sand?

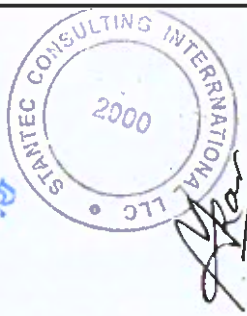

Table 36. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.846232
85.054744

Locatior Nandutar

Test No: B40

Azimuth 70

Weather: Sunny

Date: 22.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1635.072	16.056	639.527414	Profile along the road
2	3	1	12.56	527.347	8.507	778.59155	
3	4.5	1.5	18.84	217.171	5.613	728.933127	
4	6	2	25.12	281.736	9.64	734.150241	
5	7.5	2.5	31.4	212.168	8.571	777.280971	
6	9	3	37.68	200.55	9.259	816.149044	
8	12	4	50.24	281.421	15.735	898.544076	
10	15	5	62.8	242.26	15.915	955.948979	
12	18	6	75.36	102.676	7.806	991.245626	
15	22.5	7.5	94.2	235.262	22.837	970.428708	
18	27	9	113.04	181.055	24.297	842.34503	
24	36	12	150.72	140.796	36.896	575.151049	
30	45	15	188.4	103.44	47.031	414.367035	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer N	Resistivit	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	421.4	0-0.5	Soil with fragments of rocks
2	1284.1	0.5-1.32	Soil with fragments of rocks
3	329	1.32-3.03	Highly weathered bedrock (saprilite)
4	3556.6	3.03-7.4	Highly fractured bedrock
5	184.3	7.4-12.2	Highly fractured bedrock(schist?)
6	35.75	>12.2	Graphitic schist or graphitic phyllite

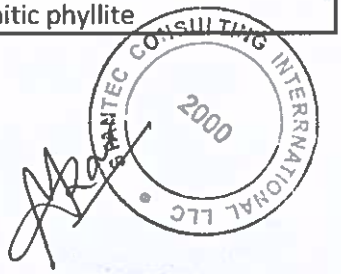

Table 37. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.85079
85.106831

Location: Archalbot, Swanra

Test No: B41

Azimuth 285

Weather: Sunny

Date: 25.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	708.497	22.494	197.8021	Private land
2	3	1	12.56	588.112	26.512	278.6167	
3	4.5	1.5	18.84	556.331	33.721	310.8234	
4	6	2	25.12	383.982	28.094	343.3341	
5	7.5	2.5	31.4	317.871	27.951	357.0945	
6	9	3	37.68	305.011	30.425	377.7425	
8	12	4	50.24	277.211	29.484	472.3606	
10	15	5	62.8	243.1	31.075	491.285	
12	18	6	75.36	171.346	27.479	469.9092	
15	22.5	7.5	94.2	147.937	28.297	492.4785	
18	27	9	113.04	101.817	20.808	553.1235	
24	36	12	150.72	57.854	13.821	630.9062	
30	45	15	188.4	63.276	17.975	663.2099	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	159.36	0-0.9	Red soil
2	437.55	0.9-9.6	Highly weathered & fractured bedrock
3	863	>9.6	Bedrock (predominantly phyllite)

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Table 38. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.874059
85.156943

Location: Madannpur

Test No: B42

Azimuth 265

Weather: Sunny

Date: 25.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1185.484	3.612	2061.141	Profile along road
2	3	1	12.56	304.782	2.204	1736.87	
3	4.5	1.5	18.84	208.884	2.051	1918.759	
4	6	2	25.12	309.231	4.935	1574.039	
5	7.5	2.5	31.4	201.743	4.068	1557.21	
6	9	3	37.68	233.429	5.852	1503.008	
8	12	4	50.24	425.005	12.575	1697.992	
10	15	5	62.8	321.699	11.16	1810.278	
12	18	6	75.36	429.778	16.748	1933.847	
15	22.5	7.5	94.2	347.657	16.289	2010.516	
18	27	9	113.04	292.323	15.641	2112.665	
24	36	12	150.72	303.264	20.172	2265.911	
30	45	15	188.4	142.219	11.191	2394.251	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	2063	0-2.1	Jointed bedrock
2	1071	2.1-5.4	Fractured and jointed bedrock
3	2684	>5.4	Bedrock (phyllite and quartzite)

Table 39. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.889591
85.194327

Location: Thuldanda

Test No: B43

Azimuth 255

Weather: Sunny

Date: 25.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	640.62	4.54	886.144	Profile along road
2	3	1	12.56	693.748	5.101	1708.19	Forested area
3	4.5	1.5	18.84	735.095	5.818	2380.404	
4	6	2	25.12	735.352	6.924	2667.828	
5	7.5	2.5	31.4	657.269	7.409	2785.564	
6	9	3	37.68	645.116	8.727	2785.375	
8	12	4	50.24	564.961	11.389	2492.198	
10	15	5	62.8	531.948	14.293	2337.251	
12	18	6	75.36	379.505	13.14	2176.522	
15	22.5	7.5	94.2	107.001	5.787	1741.748	
18	27	9	113.04	250.069	19.213	1471.285	
24	36	12	150.72	134.896	19.168	1060.701	
30	45	15	188.4	54.818	13.673	755.3362	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	322.75	0-0.41	Red Soil
2	9094	0.41-3.14	Fractured and jointed bedrock
3	562	>3.14	Bedrock (phyllite)

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Table 40. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.861462
85.309759

Location: Sunkhani

Test No: B44

Azimuth 30

Weather: Cloudy

Date: 25.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	326.606	4.123	497.4741	Profile along the road
2	3	1	12.56	132.004	3.229	513.4624	
3	4.5	1.5	18.84	246.079	10.658	434.9905	
4	6	2	25.12	379.409	29.264	325.6819	
5	7.5	2.5	31.4	205.801	19.183	336.8687	
6	9	3	37.68	224.78	25.338	334.2691	
8	12	4	50.24	139.278	21.145	330.9211	
10	15	5	62.8	106.218	21.386	311.9092	
12	18	6	75.36	238.766	57.714	311.7685	
15	22.5	7.5	94.2	76.317	26.896	267.2911	
18	27	9	113.04	70.169	27.335	290.1739	
24	36	12	150.72	197.399	102.647	289.8475	
30	45	15	188.4	67.945	46.587	274.7727	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	362.26	0-0.32	Thin soil
2	657	0.32-1.43	Alluvial deposit (unsaturated)
3	286.8	>1.43	Alluvial deposit (unsaturated)

Table 41. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.863869
85.368821

Location: Shilame

Test No: B45

Azimuth 350

Weather: Sunny

Date: 26.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1051.992	1.447	4565.66	
2	3	1	12.56	378.455	3.503	1356.95	
3	4.5	1.5	18.84	192.54	2.452	1479.386	
4	6	2	25.12	117.111	2.063	1425.995	
5	7.5	2.5	31.4	62.847	1.721	1146.656	
6	9	3	37.68	126.715	5.479	871.4403	
8	12	4	50.24	168.893	11.449	741.1289	
10	15	5	62.8	182.592	18.461	621.1352	
12	18	6	75.36	106.046	13.567	589.0489	
15	22.5	7.5	94.2	430.456	68.603	591.0668	
18	27	9	113.04	295.178	54.776	609.1522	
24	36	12	150.72	140.997	34.412	617.5482	
30	45	15	188.4	72.193	21.608	629.4503	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	8311	0-0.6	Highly weathered bedrock (gneiss)
2	2109	0.6-2.73	Highly weathered bedrock (gneiss)
3	580.5	>2.73	Highly weathered bedrock (gneiss) with higher degree of moisture content

Table 42. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.852564
85.421516

Location: Pipaldanda, Jyamire

Test No: B46

Azimuth 260

Weather: Cloudy

Date: 26.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	2948.57	13.554	1366.166416	Propfile along trail
2	3	1	12.56	1587.768	13.96	1428.536252	
3	4.5	1.5	18.84	1431.153	17.125	1574.477227	
4	6	2	25.12	452.442	7.318	1553.066827	
5	7.5	2.5	31.4	309.442	8.329	1166.58408	
6	9	3	37.68	238.241	8.541	1051.038623	
8	12	4	50.24	382.894	19.199	1001.958152	
10	15	5	62.8	336.029	19.022	1109.379729	
12	18	6	75.36	129.426	11.723	832.0006278	
15	22.5	7.5	94.2	706.597	74.102	898.2407681	
18	27	9	113.04	121.76	19.043	722.7721683	
24	36	12	150.72	151.594	42.789	533.9747991	
30	45	15	188.4	66.331	23.261	537.2408925	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	1403.7	0-7.5	Colluvial deposit predominated by boulders
2	466.8	>7.5	Colluvial deposit with inclusin of fines

Table 43. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.822477
85.484221

Location: Kauledovan

Test No: B47

Azimuth 205

Weather: Sunny

Date: 26.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	2173.302	23.172	589.0012	Profole along road
2	3	1	12.56	1457.044	21.102	867.2388	
3	4.5	1.5	18.84	789.197	15.486	960.1234	
4	6	2	25.12	615.464	14.607	1058.428	
5	7.5	2.5	31.4	542.192	14.571	1168.405	
6	9	3	37.68	539.662	16.647	1221.509	
8	12	4	50.24	352.42	14.753	1200.134	
10	15	5	62.8	318.883	16.926	1183.141	
12	18	6	75.36	167.241	10.425	1208.948	
15	22.5	7.5	94.2	315.971	27.221	1093.438	
18	27	9	113.04	211.901	21.465	1115.923	
24	36	12	150.72	452.834	57.881	1179.163	
30	45	15	188.4	251.778	33.623	1410.789	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity Ohm.m	Depth Range, m	Geological Interpretation
1	513	0-1.0	Soil
2	1610	1.0-7.0	Highly weathered bedrock
3	486.5	7.0-15.0	weathered bedrock with moisture content
4	3757	>15.0	Fresh bedrock (gneiss)

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Table 44. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.760283
85.510914

Location: Nangle

Test No: B48

Azimuth 100

Weather: Sunny

Date: 26.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1009.518	9.98	635.2478	Private land
2	3	1	12.56	2307.826	16.74	1731.559	
3	4.5	1.5	18.84	4054.94	23.565	3241.887	
4	6	2	25.12	3162.638	23.88	3326.862	
5	7.5	2.5	31.4	2282.843	22.08	3246.434	
6	9	3	37.68	1891.748	21.943	3248.465	
8	12	4	50.24	930.107	17.348	2693.6	
10	15	5	62.8	244.933	7.272	2115.208	
12	18	6	75.36	260.418	11.184	1754.748	
15	22.5	7.5	94.2	182.65	11.232	1531.84	
18	27	9	113.04	251.329	24.743	1148.213	
24	36	12	150.72	48.784	6.825	1077.322	
30	45	15	188.4	299.035	69.055	815.8453	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	440	0-0.33	Soil
2	16691	0.33-1.5	soil with low moisture content
3	804	>1.5	Highly weathered bedrock (gneiss)

Table 45. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.818951
85.043715

Location: Biruwa

Test No: B51

Azimuth 15

Weather: Sunny

Date: 22.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1350.873	3.569	2376.991	Public
2	3	1	12.56	688.726	3.636	2379.098	Profile along the road
3	4.5	1.5	18.84	122.237	1.673	1376.536	
4	6	2	25.12	554.087	15.058	924.3369	
5	7.5	2.5	31.4	535.681	23.21	724.7042	
6	9	3	37.68	228.493	14.518	593.0305	
8	12	4	50.24	164.854	17.358	477.144	
10	15	5	62.8	165.236	27.369	379.145	
12	18	6	75.36	120.128	26.772	338.1461	
15	22.5	7.5	94.2	70.513	22.261	298.3839	
18	27	9	113.04	60.584	25.333	270.3357	
24	36	12	150.72	105.559	66.012	241.0146	
30	45	15	188.4	90.857	70.881	241.4957	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	2843.66	0-1.73	Soil
2	521.74	1.73-6.6	Colluvium with fragments of bedrock
3	226.9	>6.6	Highly weathered bedrock (saprilite)

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Table 46. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.773796
85.032094

Location: Khaherghari

Test No: B52

Azimuth 75

Weather: Clear

Date: 22.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	407.954	3.239	790.96978	Private land
2	3	1	12.56	123.354	2.437	635.75143	
3	4.5	1.5	18.84	556.923	13.249	791.94123	
4	6	2	25.12	1269.716	35.653	894.60258	
5	7.5	2.5	31.4	968.591	30.772	988.35816	
6	9	3	37.68	808.777	30.97	984.00766	
8	12	4	50.24	422.752	18.406	1153.9205	
10	15	5	62.8	581.735	29.061	1257.1129	
12	18	6	75.36	495.164	28.92	1290.3029	
15	22.5	7.5	94.2	315.503	23.046	1289.6113	
18	27	9	113.04	268.599	23.132	1312.5727	
24	36	12	150.72	525.37	63.104	1254.8137	
30	45	15	188.4	470.037	81.411	1087.7519	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	869.5	0-0.99	Soil
2	447.9	0.99-2.6	Colluvium with fragments of bedrock
3	2821.11	2.6-14.22	Colluvium or highly fractured bedrock
4	529.07	>14.22	Highly fracture bedrock with moisture content

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Table 47. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.734597
85.019238

Location: Sulikhola

Test No: B53

Azimuth 25

Weather: Windy

Date: 22.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1678.981	40.77	258.621552	Profile along road
2	3	1	12.56	767.413	32.128	300.009564	
3	4.5	1.5	18.84	719.175	39.313	344.650803	
4	6	2	25.12	897.011	56.163	401.205711	
5	7.5	2.5	31.4	625.836	46.083	426.431665	
6	9	3	37.68	321.99	32.303	375.586887	
8	12	4	50.24	133.257	21.442	312.229814	
10	15	5	62.8	64.083	14.72	273.397582	
12	18	6	75.36	73.821	25.484	218.299739	
15	22.5	7.5	94.2	39.538	19.07	195.305695	
18	27	9	113.04	64.484	38.606	188.811878	
24	36	12	150.72	176.676	126.559	210.404687	
30	45	15	188.4	192.056	135.408	267.217228	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	227.68	0-1.5	Soil
2	1436.5	1.5-3.03	Colluvium with fragments of bedrock
3	50.95	3.03-8.84	Colluvium with greater degree of fine content
4	656	>8.84	Bedrock (fractured metasandstone?)

Table 48. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.67375
84.980848

Location: Buddhachowk (Sunkali)

Test No: B54

Azimuth 345

Weather: Cloudy

Date: 23.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	773.96	3.739	1299.9382	Public?
2	3	1	12.56	639.111	3.766	2131.5014	Profile along the road
3	4.5	1.5	18.84	527.518	3.603	2758.3789	
4	6	2	25.12	1162.295	11.752	2484.4155	
5	7.5	2.5	31.4	960.724	11.718	2574.3927	
6	9	3	37.68	339.78	5.085	2517.7798	
8	12	4	50.24	122.104	3.037	2019.9226	
10	15	5	62.8	163.336	6.601	1553.9313	
12	18	6	75.36	98.303	5.672	1306.085	
15	22.5	7.5	94.2	95.936	7.739	1167.744	
18	27	9	113.04	336	30.577	1242.1572	
24	36	12	150.72	227.071	23.874	1433.5319	
30	45	15	188.4	76.346	10.114	1422.1462	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	586.86	0-0.5	Soil
2	8800	0.5-2.19	Eluvium with fragments of bedrock
3	248	2.19-6.4	Eluvium with greater degree of fine content
4	3489	>6.4	Bedrock (metasandstone?)

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Table 49. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.639251
84.959903

Location: Chaukitar, Gogane

Test No: B55

Azimuth 90

Weather: Partially cloudy

Date: 23.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1826.877	19.783	579.9316363	Private land
2	3	1	12.56	723.094	7.611	1193.280862	
3	4.5	1.5	18.84	434.389	4.873	1679.435411	
4	6	2	25.12	379.218	4.675	2037.637681	
5	7.5	2.5	31.4	643.875	8.274	2443.518854	
6	9	3	37.68	516.465	6.534	2978.328926	
8	12	4	50.24	580.895	7.822	3731.036154	
10	15	5	62.8	325.088	4.519	4517.708874	
12	18	6	75.36	567.119	9.046	4724.528835	
15	22.5	7.5	94.2	406.77	7.296	5251.882401	
18	27	9	113.04	462.132	10.629	4914.799255	
24	36	12	150.72	1395.591	52.216	4028.333758	
30	45	15	188.4	1638.92	56.673	5448.318035	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	155.38	0-0.3	Soil
2	10064	0.3-16.12	predominantly boulders (unsaturated)
3	2847.97	>16.12	Bedrock (metasandstone?)

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Table 50. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.587658
84.931411

Location: Dirki, Near Kalikatar

Test No: B56

Azimuth 280

Weather: Clear

Date: 24.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1058.712	3.769	1764.052	Profile along the road
2	3	1	12.56	982.004	5.477	2251.957	
3	4.5	1.5	18.84	455.937	4.069	2111.048	
4	6	2	25.12	406.121	5.386	1894.125	
5	7.5	2.5	31.4	205.826	3.738	1728.982	
6	9	3	37.68	469.646	11.359	1557.907	
8	12	4	50.24	393.434	14.446	1368.277	
10	15	5	62.8	161.055	8.675	1165.908	
12	18	6	75.36	193.686	14.99	973.7276	
15	22.5	7.5	94.2	115.669	13.3	819.2496	
18	27	9	113.04	181.771	27.137	757.1726	
24	36	12	150.72	68.04	15.094	679.4083	
30	45	15	188.4	31.485	8.326	712.4398	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	1190.27	0-0.4	Soil
2	2432.7	0.4-4.2	Colluvial deposit (unsaturated)
3	657.22	>4.2	Bedrock (fractured metasandstone?)

Table 51. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.485891
84.948239

Location: Kuwapani, Forest Area

Test No: B57

Azimuth 290

Weather: Clear

Date: 24.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1115.421	2.629	2664.452	Profile along the road
2	3	1	12.56	647.312	3.306	2459.237	on the ridge forest area
3	4.5	1.5	18.84	402.484	3.613	2098.754	
4	6	2	25.12	274.289	4.483	1536.948	
5	7.5	2.5	31.4	302.701	7.394	1285.476	
6	9	3	37.68	249.659	8.85	1062.955	
8	12	4	50.24	60.928	4.063	753.3898	
10	15	5	62.8	178.392	15.936	703.0006	
12	18	6	75.36	112.805	14.796	574.5461	
15	22.5	7.5	94.2	38.798	8.371	436.5992	
18	27	9	113.04	34.75	10.609	370.2649	
24	36	12	150.72	67	27.494	367.2889	
30	45	15	188.4	44.335	27.762	300.8686	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	2691	0-2.8	Soil
2	519	2.8-15.44	Highly weathered bedrock
3	202.2	>15.44	Bedrock (siltstone & clay stone)

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Table 52. Field data and modelling results of soil resistivity test

VERTICAL ELECTRICAL SOUNDING
(Wenner Configuration)

Project: Nepal 400KV DC TLP

Test Coordinates: 27.449789
84.983505

Location: Basamari

Test No: B58

Azimuth 145

Weather: Clear

Date: 24.04.2019

Equipment: SYSCAL PRO

a m	AB/2	MN/2	K	ΔV mV	I mA	ρ Ohm.m	Remarks
1	1.5	0.5	6.28	1439.554	18.437	490.34	Private land
2	3	1	12.56	360.363	14.692	308.0696	
3	4.5	1.5	18.84	220.083	18.594	222.9947	
4	6	2	25.12	119.717	16.878	178.1782	
5	7.5	2.5	31.4	108.729	20.348	167.7851	
6	9	3	37.68	95.85	22.648	159.4679	
8	12	4	50.24	66.465	22.228	150.225	
10	15	5	62.8	64.527	29.259	138.4974	
12	18	6	75.36	53.796	31.307	129.4939	
15	22.5	7.5	94.2	64.345	53.562	113.1642	
18	27	9	113.04	69.768	70.08	112.5367	
24	36	12	150.72	157.112	202.635	116.86	
30	45	15	188.4	85.874	143.92	112.4143	

a- Inter electrode spacing in meter
A and B- current electrode; M and N- potential electrode
K- geometrical coefficient; ΔV- potential difference between M and N
I- Injected current between electrodes A and B; ρ- resistivity

Modeling (inversion) results :

Layer No.	Resistivity	Depth	Geological Interpretation
	Ohm.m	Range, m	
1	616.8	0-0.98	Soil
2	167.1	0.98-5.75	Bedrock? (siltstone & clay stone)
3	106.9	>5.75	Bedrock?(claystone)

Figure 1. Modeling Results of Soil Resistivity Test (B1, Chotki Sunari)

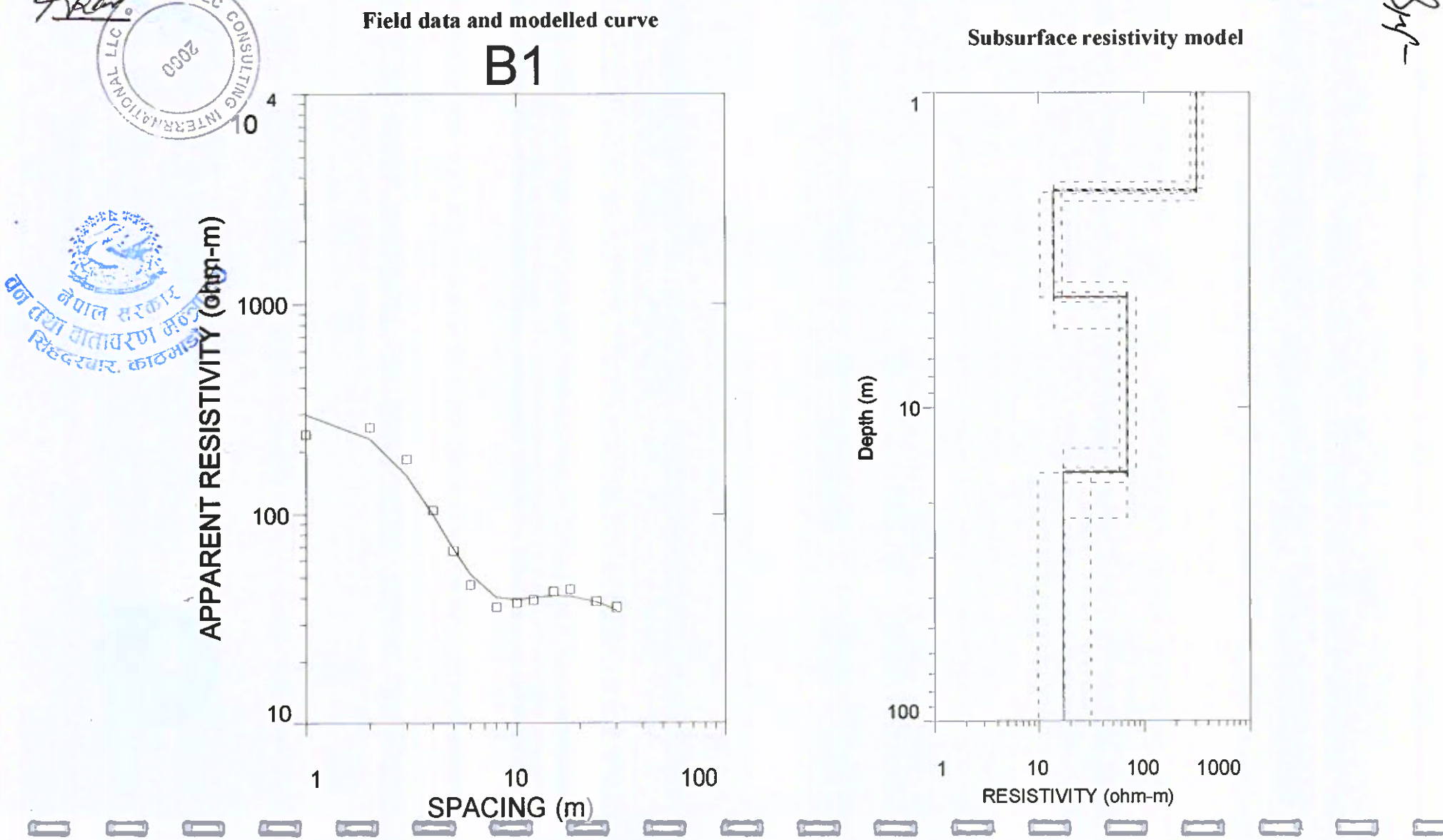
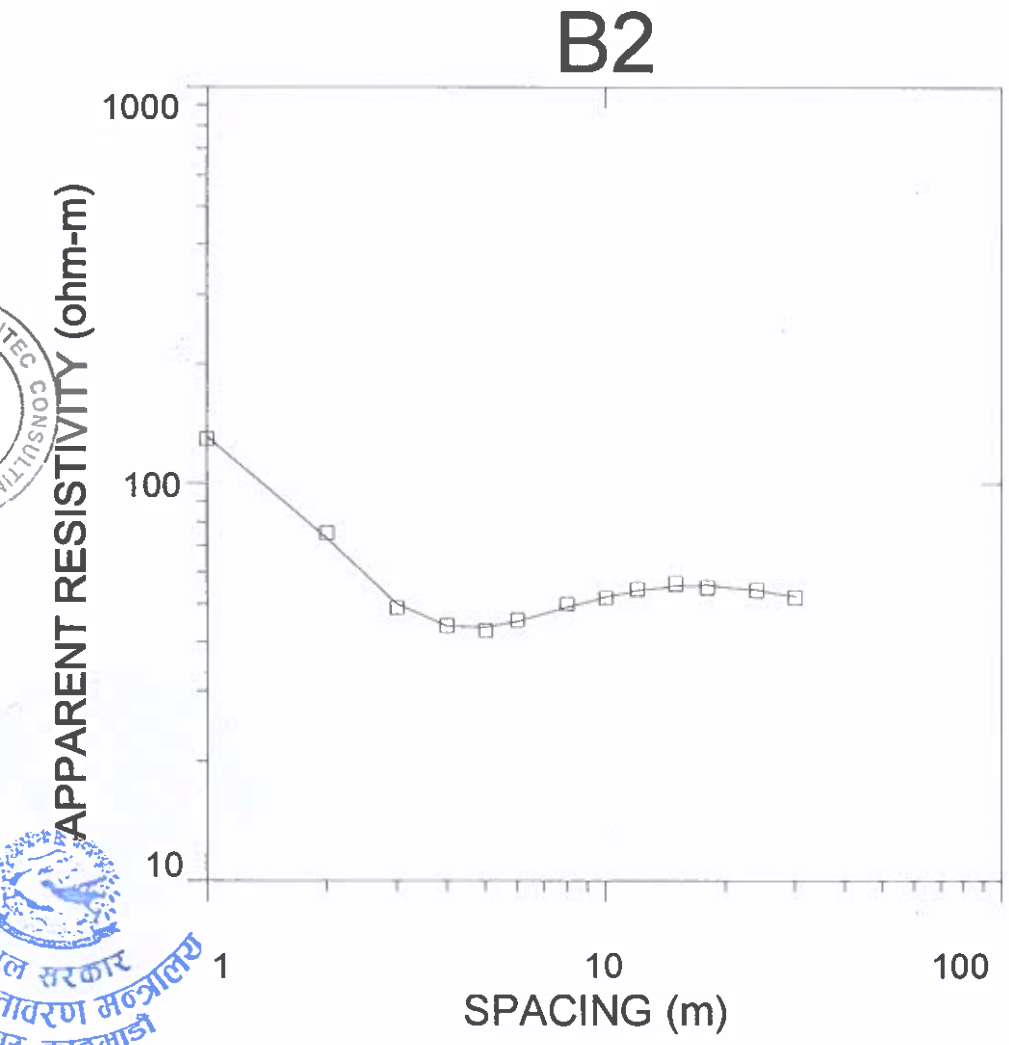


Figure 2. Modeling Results of Soil Resistivity Test (B2, Harpur-2)

Field data and modelled curve



Subsurface resistivity model

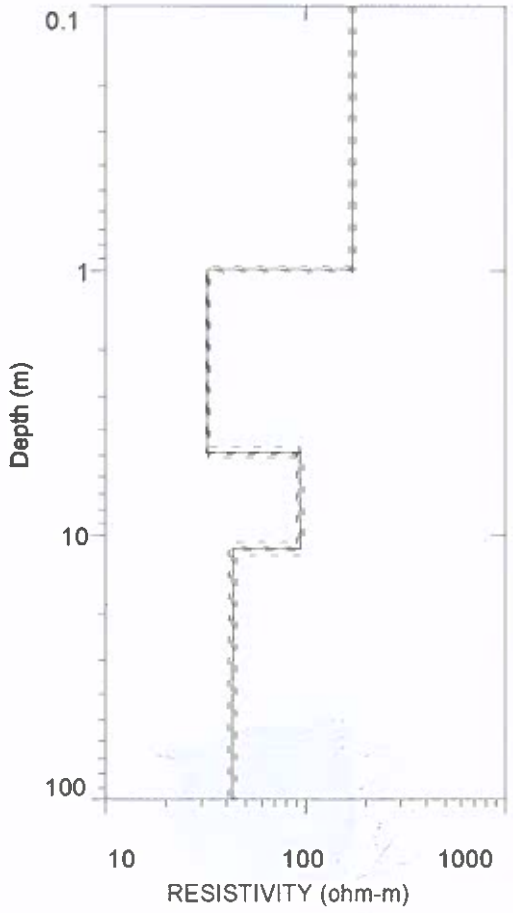
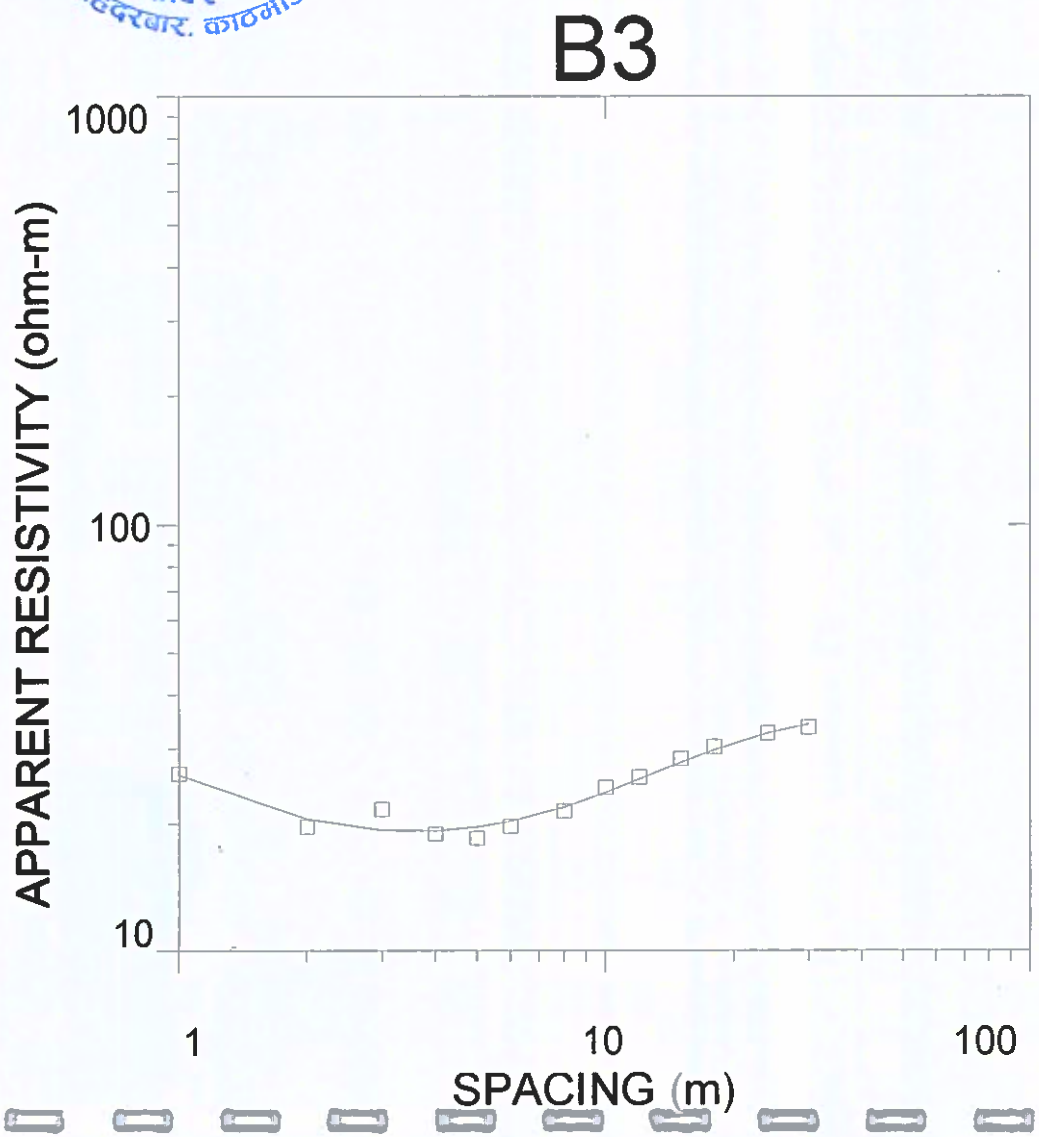


Figure 3. Modeling Results of Soil Resistivity Test (B3, Piparainha)

Field data and modelled curve



Subsurface resistivity model

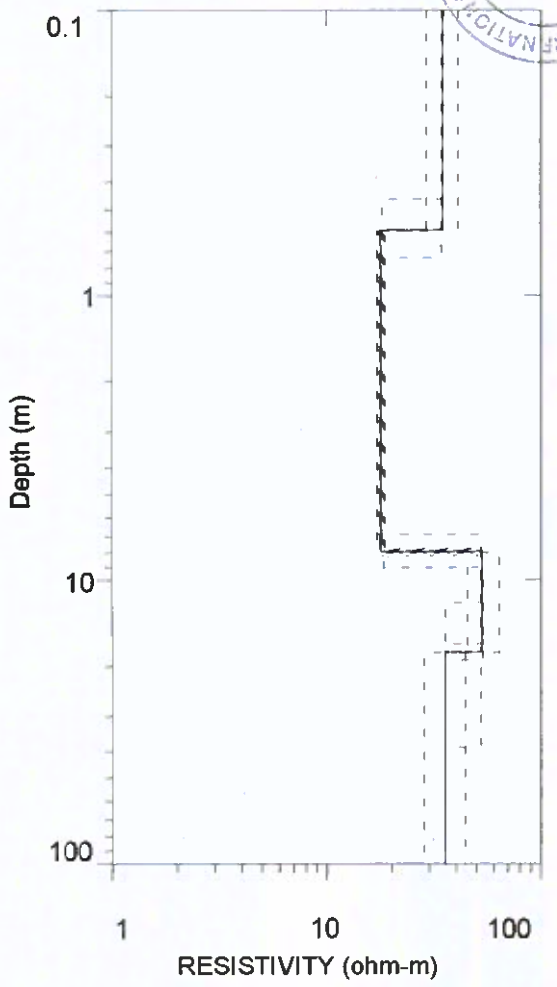
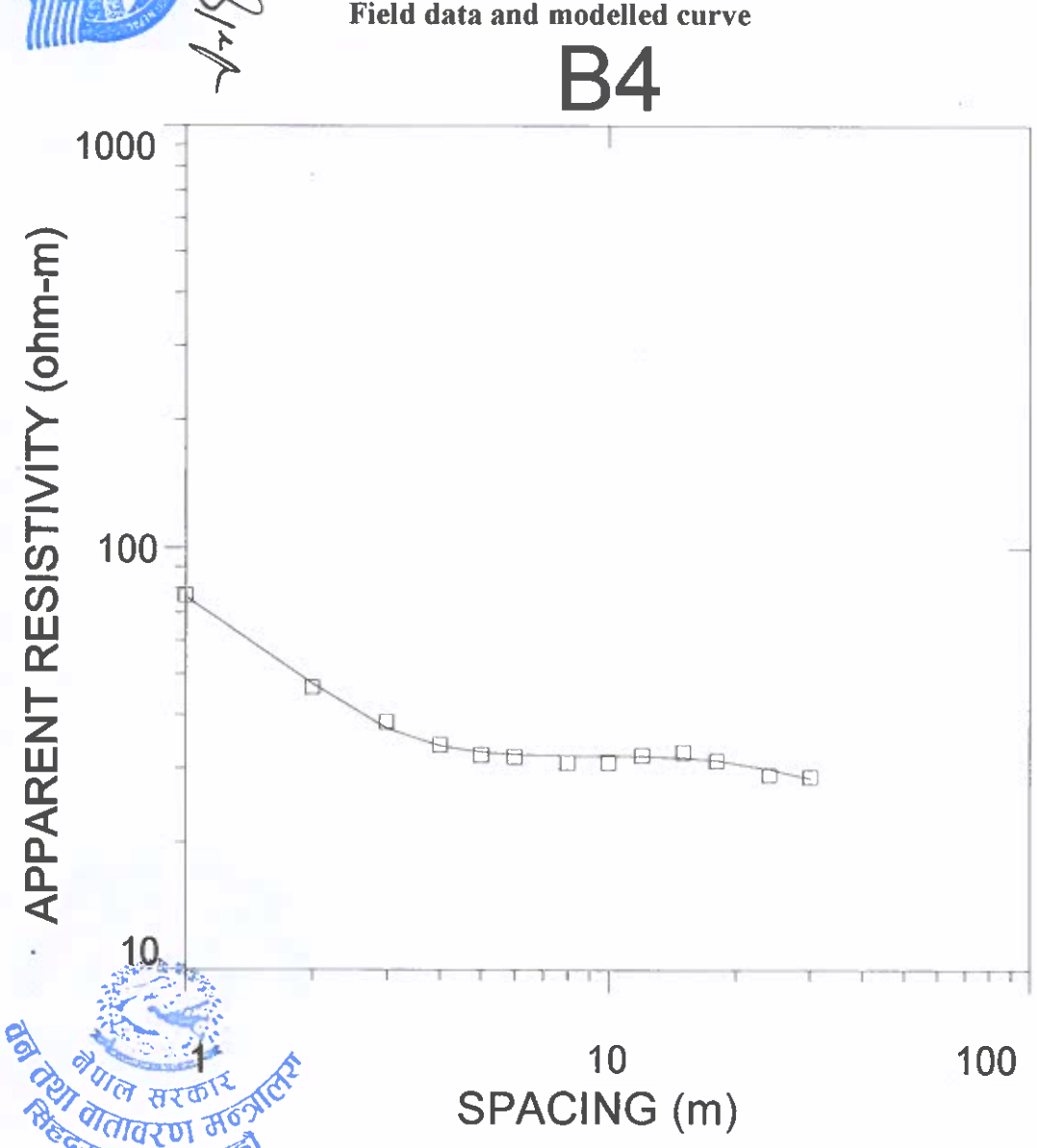


Figure 4. Modeling Results of Soil Resistivity Test (B4, Ghanshyampur)



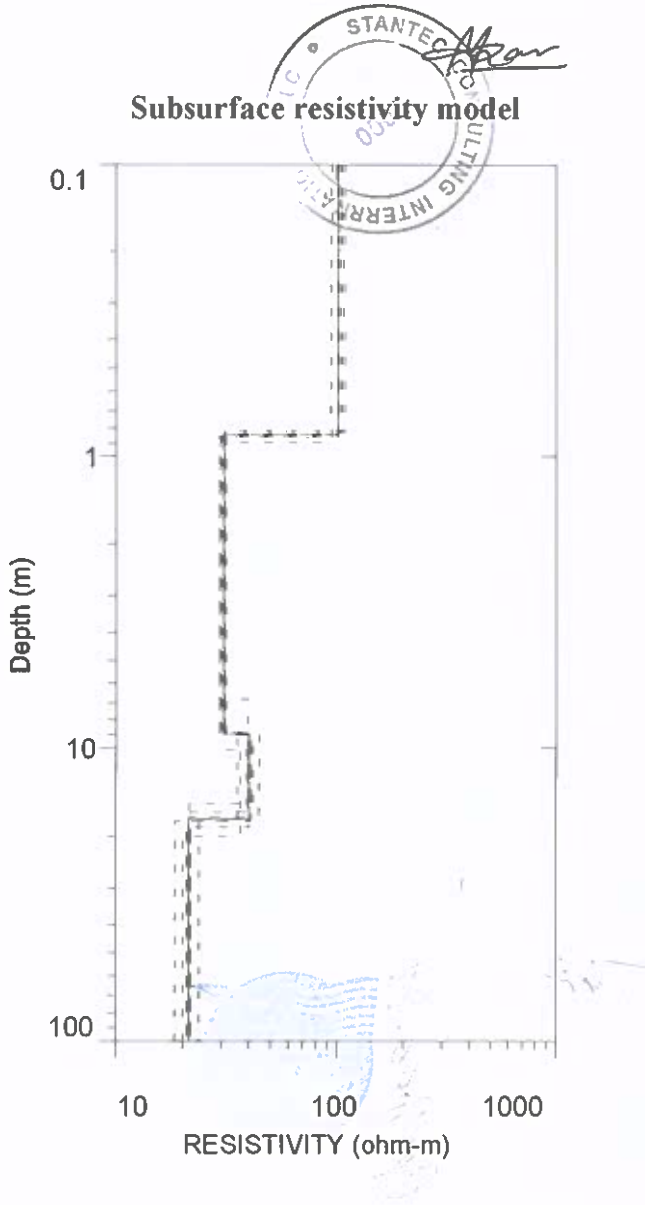
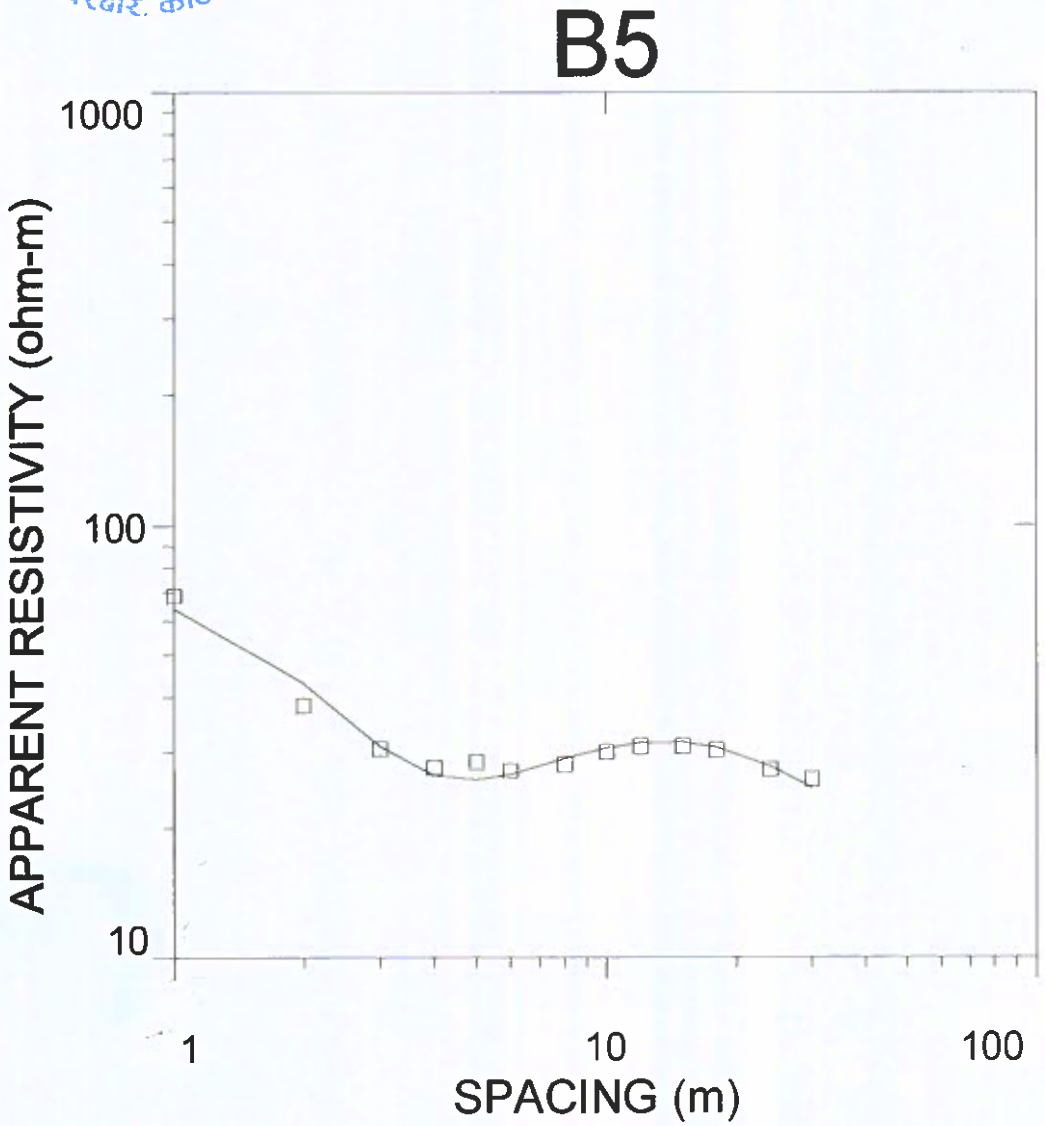


Figure 5. Modeling Results of Soil Resistivity Test (B5, Ghieudalla, Sunwal)

Field data and modelled curve



Subsurface resistivity model

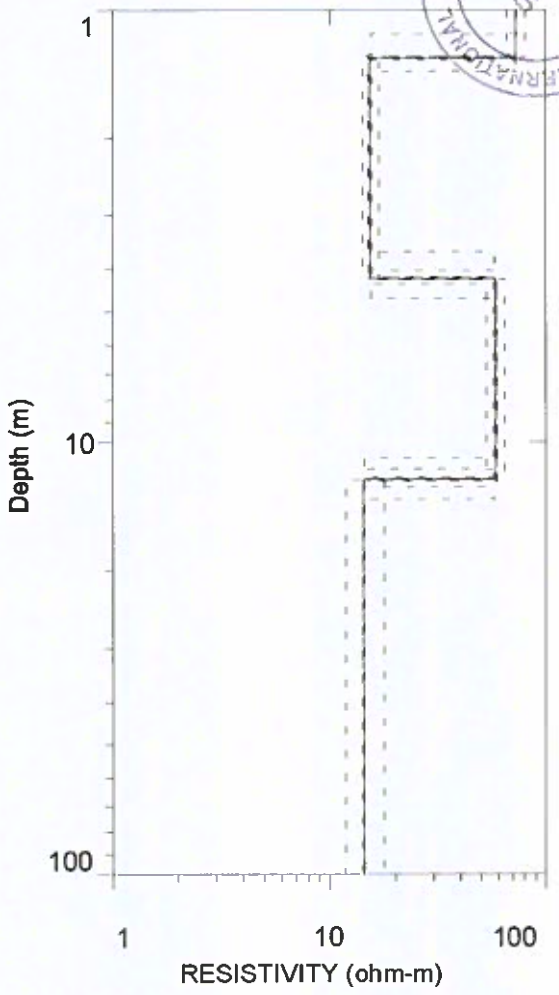
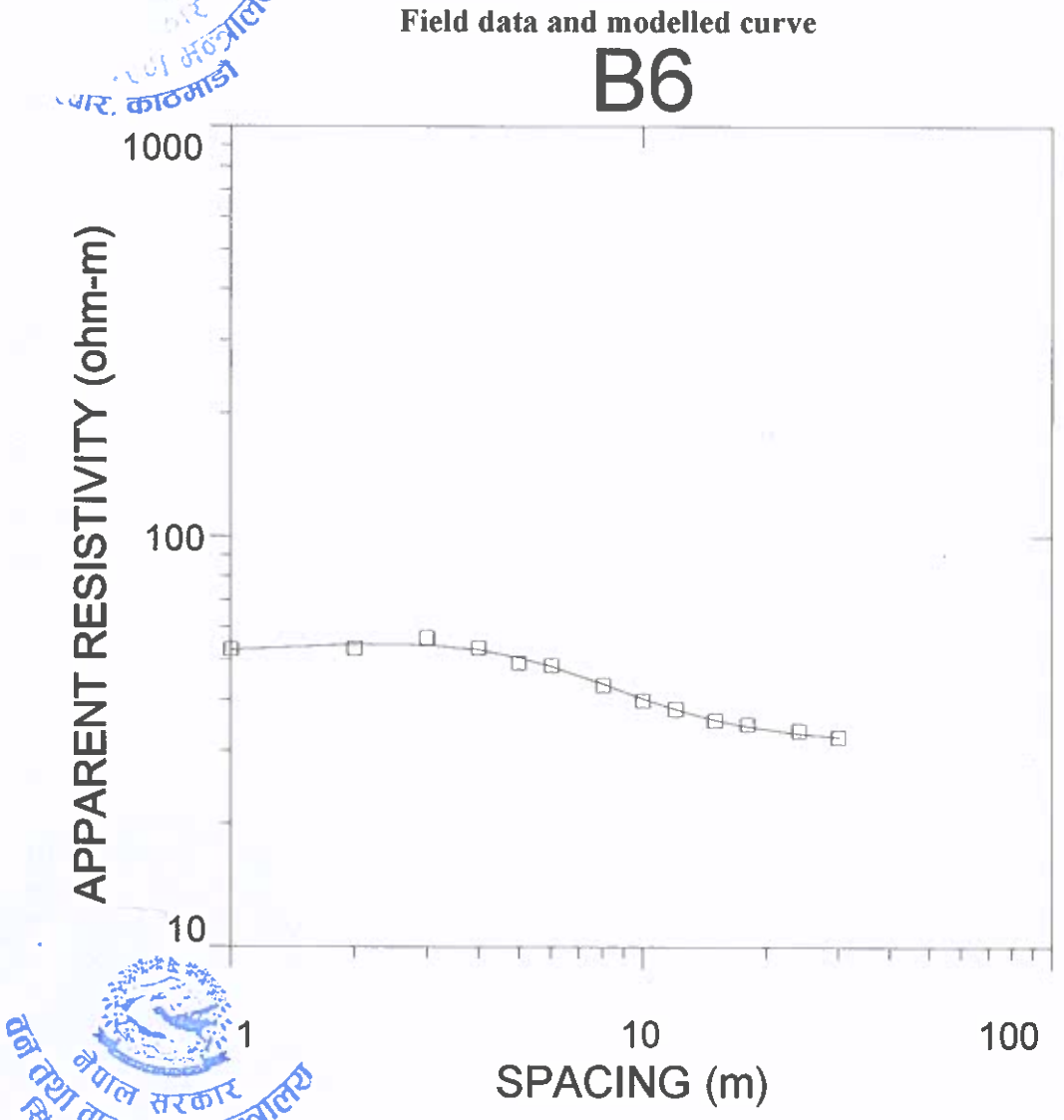


Figure 6. Modeling Results of Soil Resistivity Test (B6, 200 m East From Milanchowk)



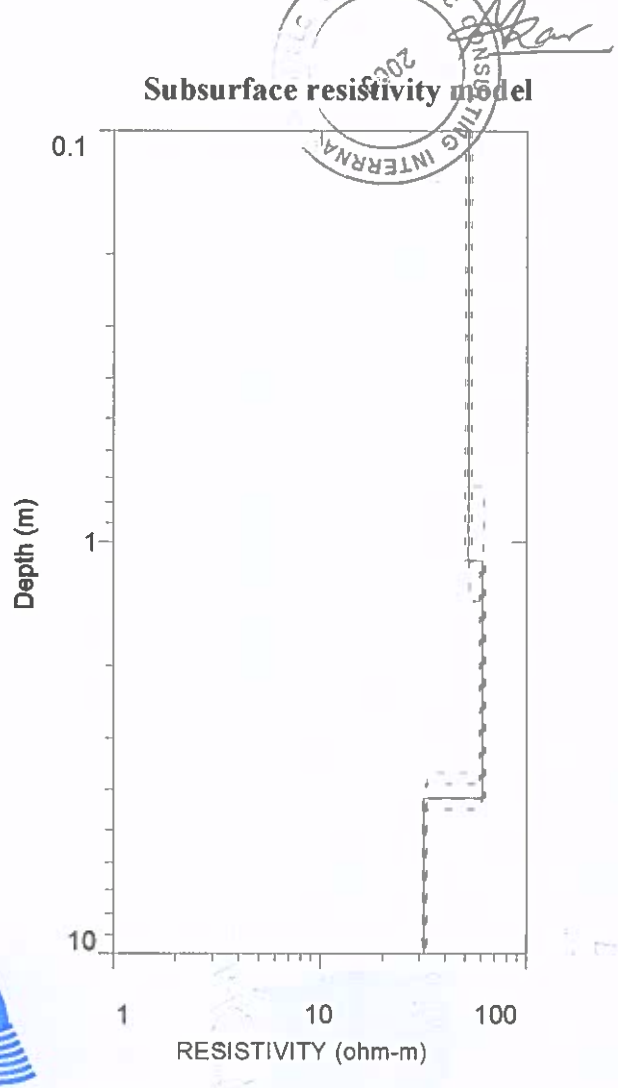
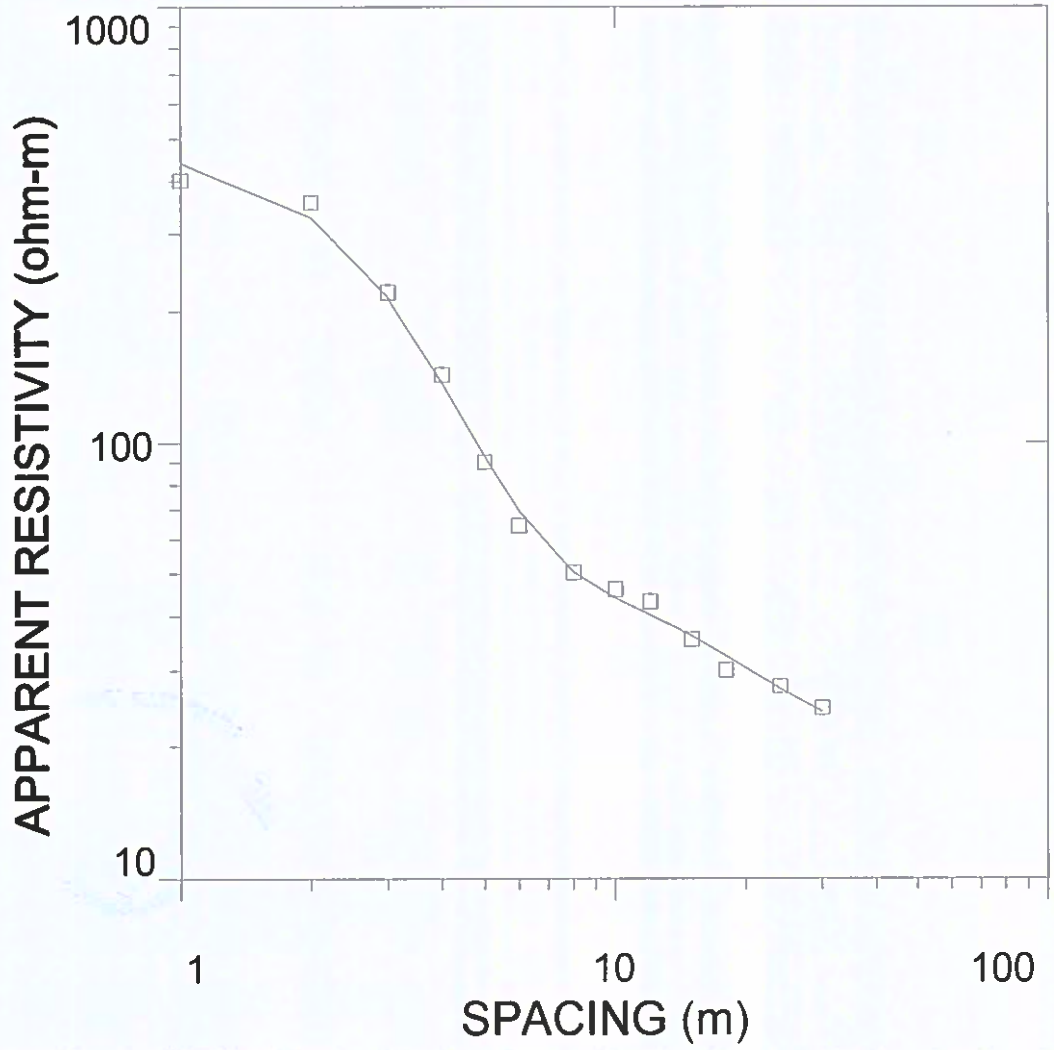


Figure 7A. Modeling Results of Soil Resistivity Test (B7A, New Butwal Substation)

Field data and modelled curve



Subsurface resistivity model

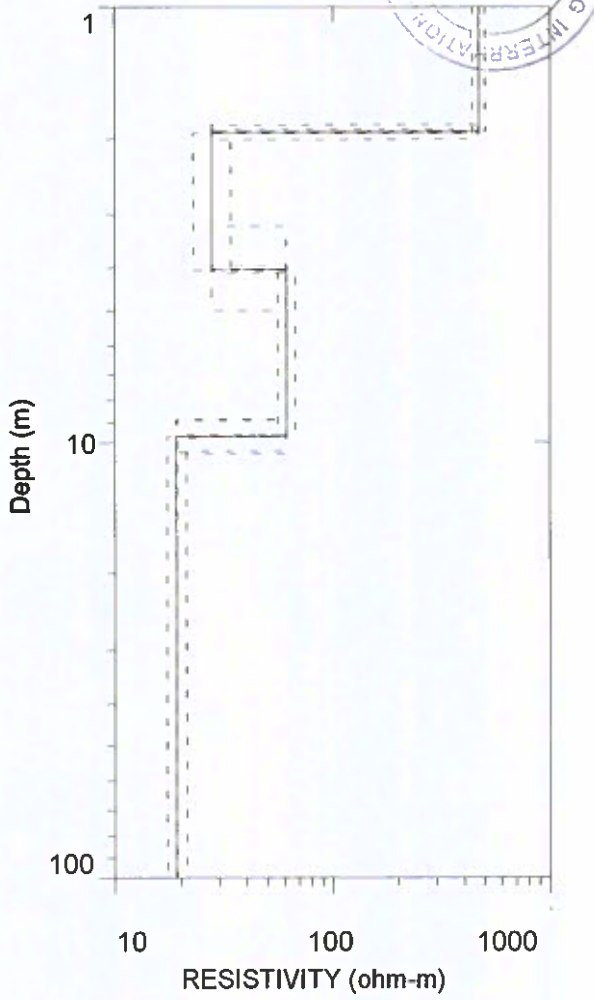


Figure 7B. Modeling Results of Soil Resistivity Test
(B7B, New Butwal Substation)

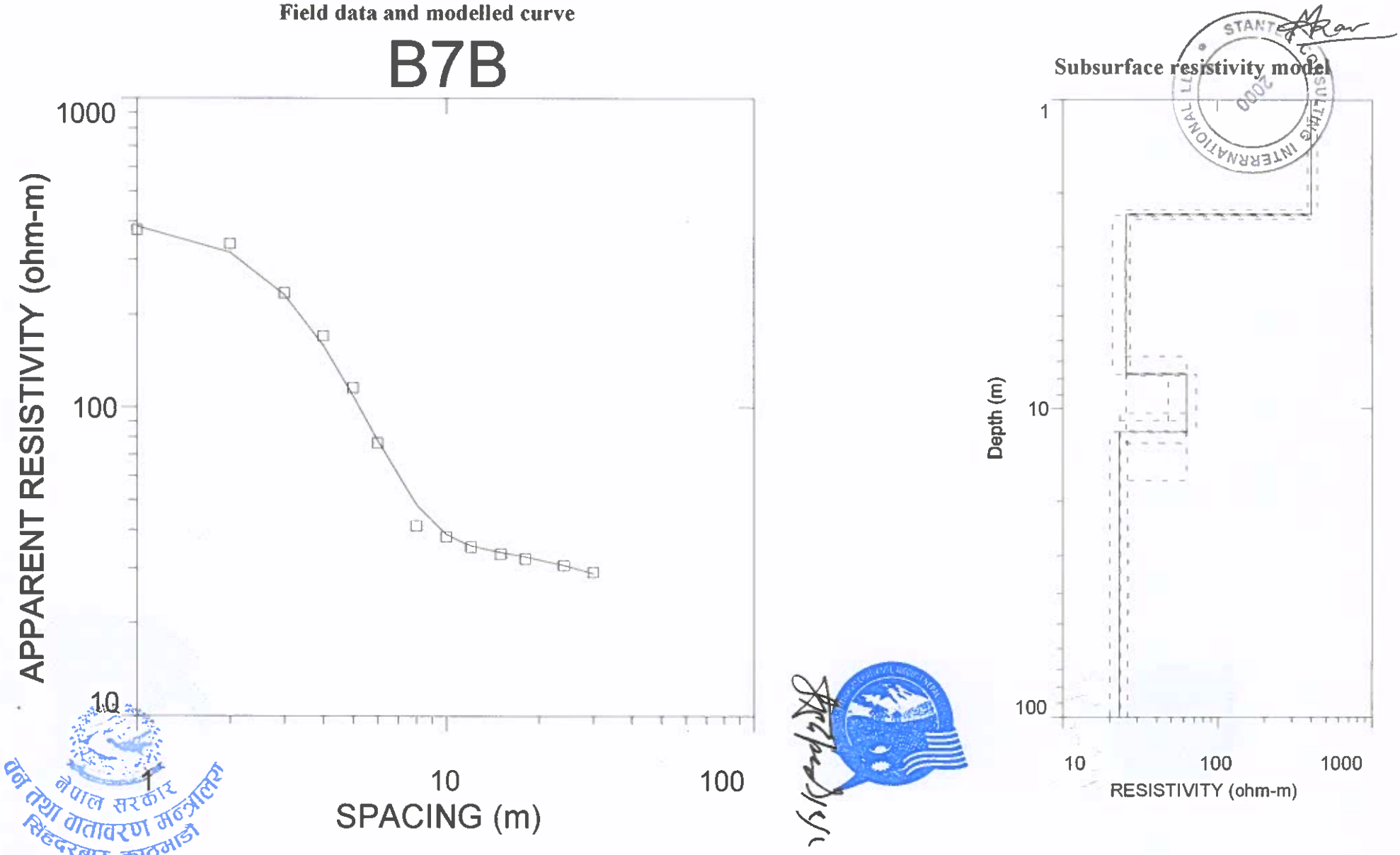
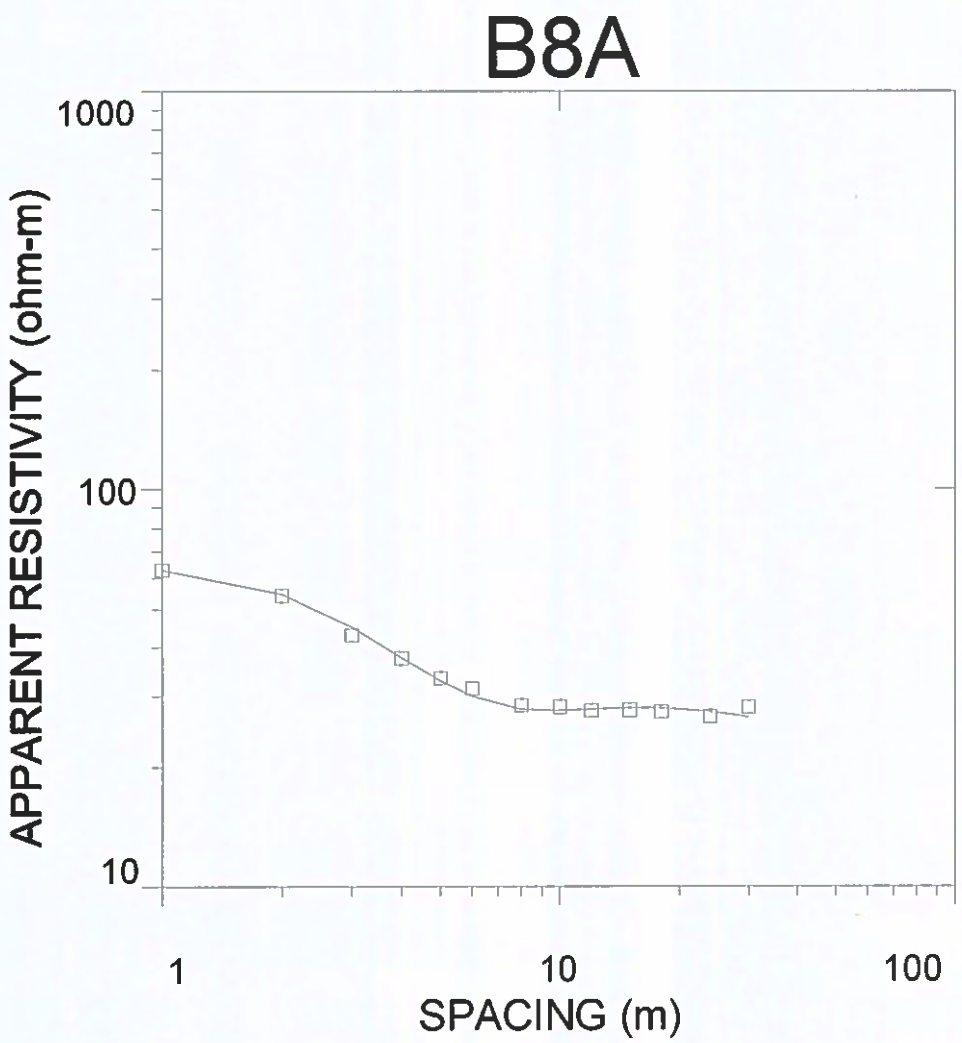


Figure 8A. Modeling Results of Soil Resistivity Test (B8A, New Butwal Substation)

Field data and modelled curve



Subsurface resistivity model

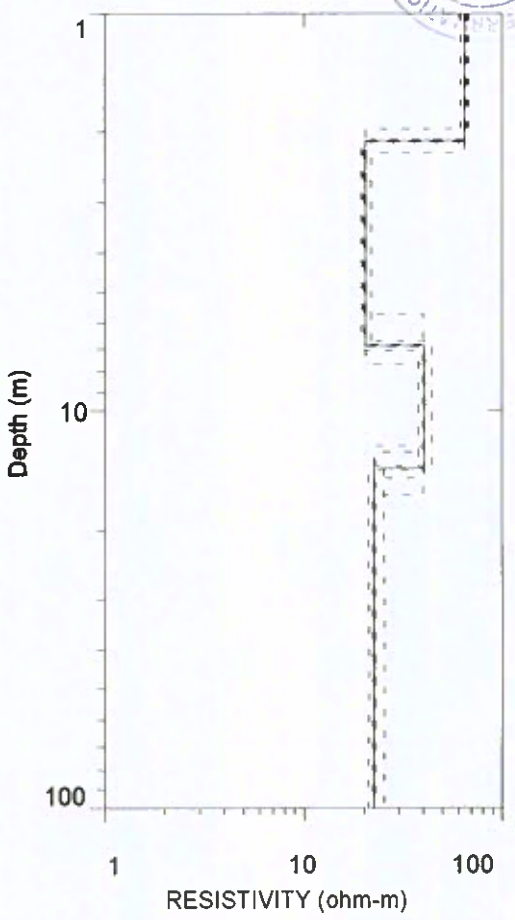


Figure 8B. Modeling Results of Soil Resistivity Test (B8B, New Butwal Substation)

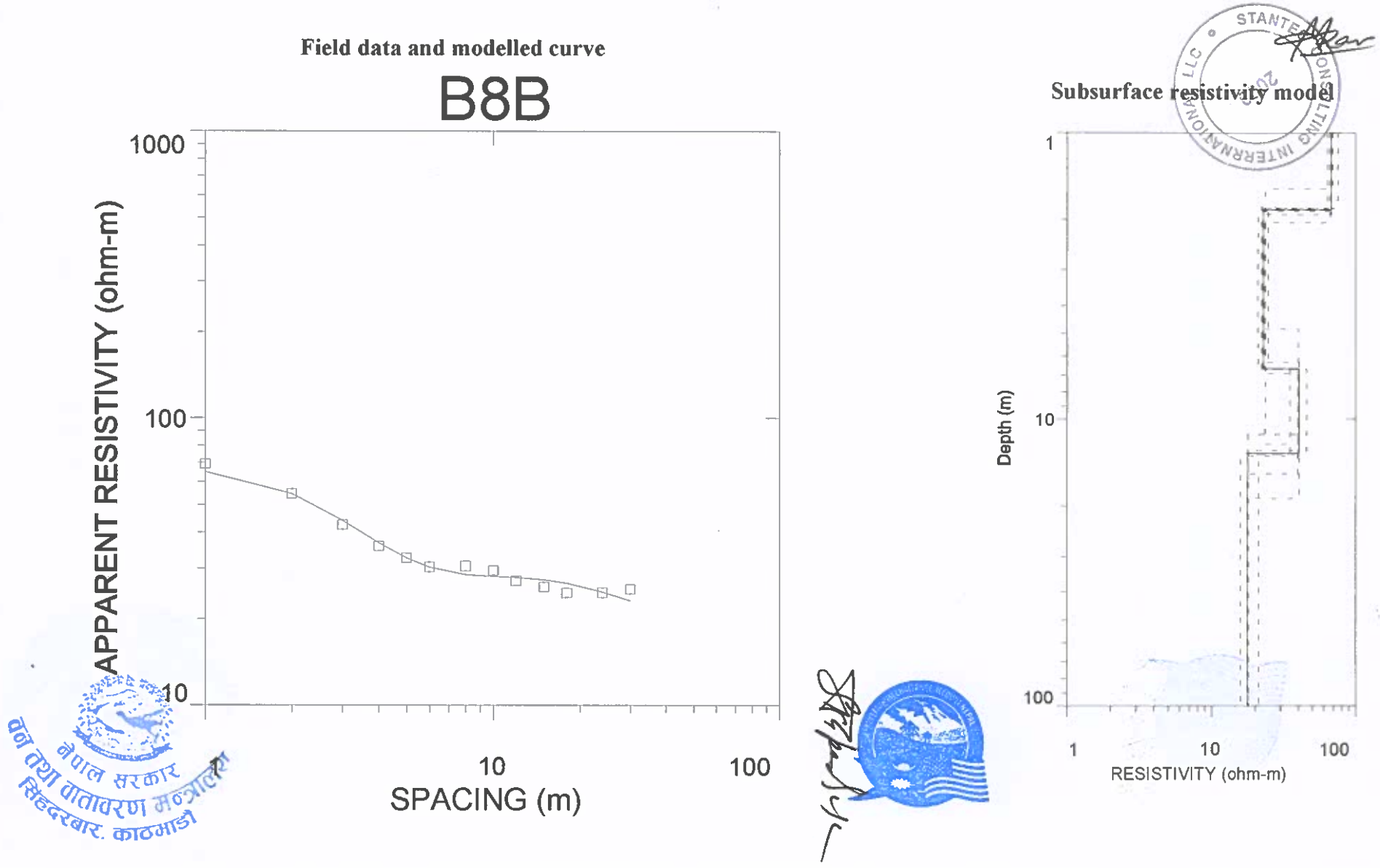


Figure 9. Modeling Results of Soil Resistivity Test (B9, Bardagoria Dham, Kerabari)

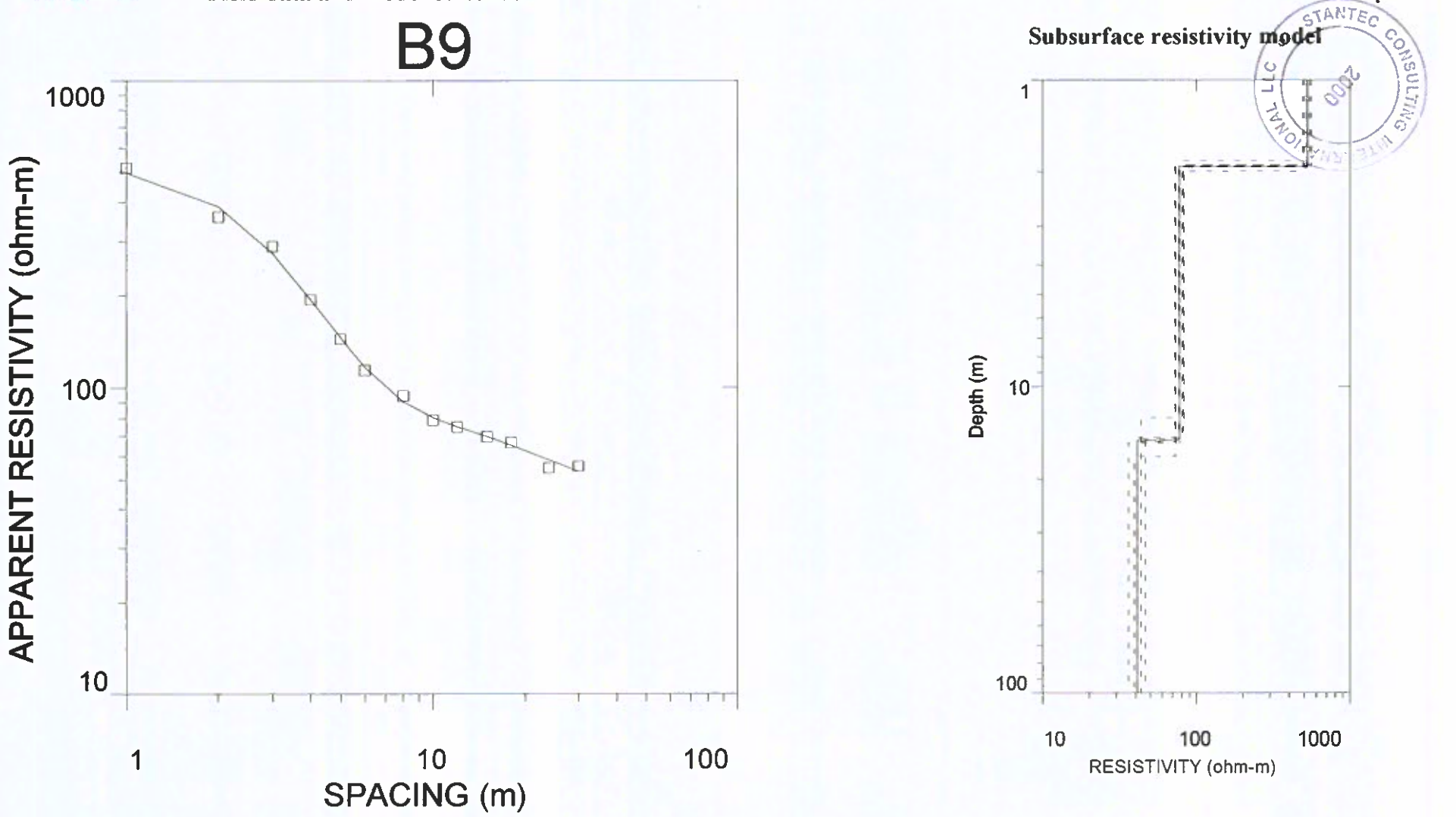


Figure 10. Modeling Results of Soil Resistivity Test (B10, Khumbari)

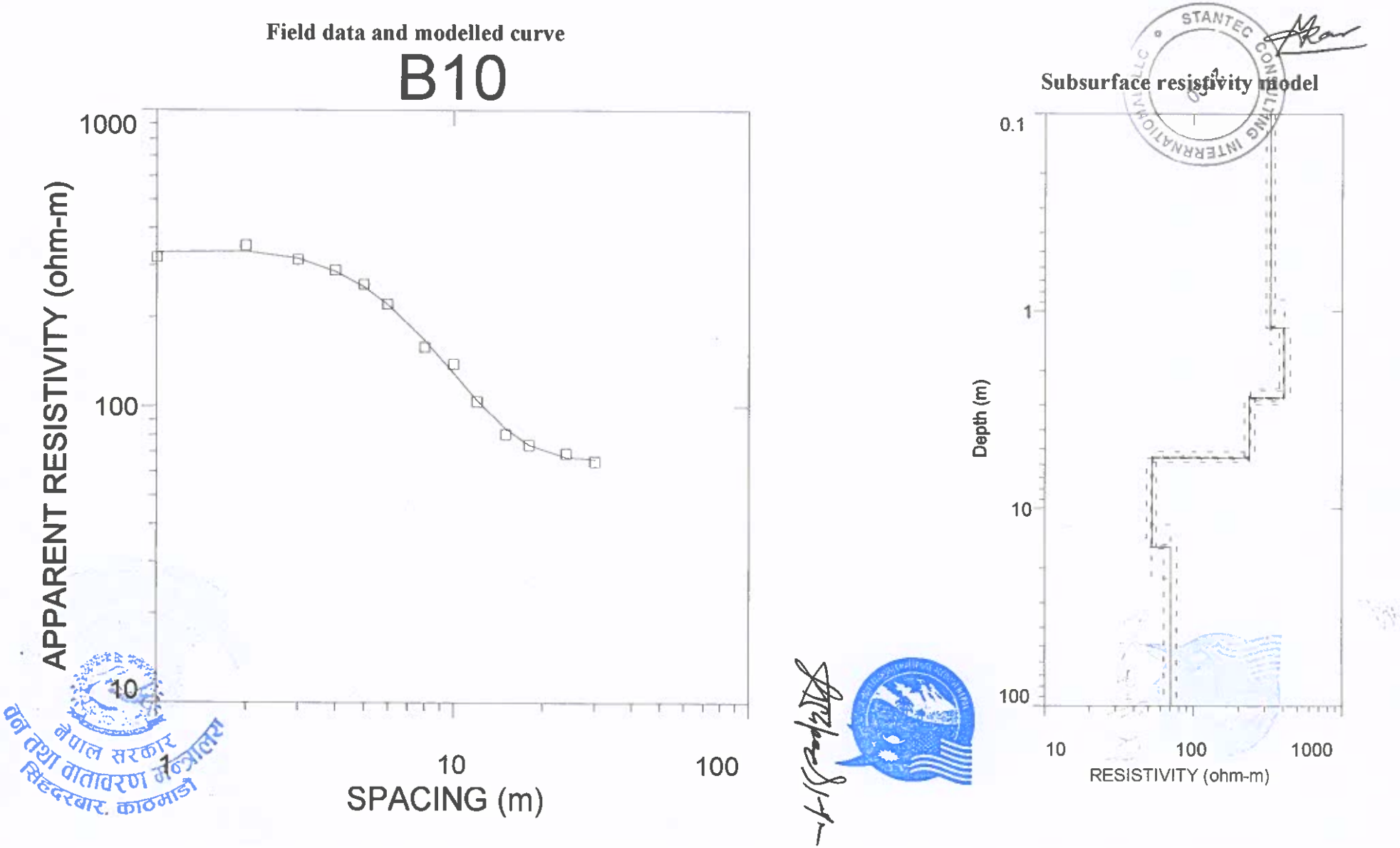
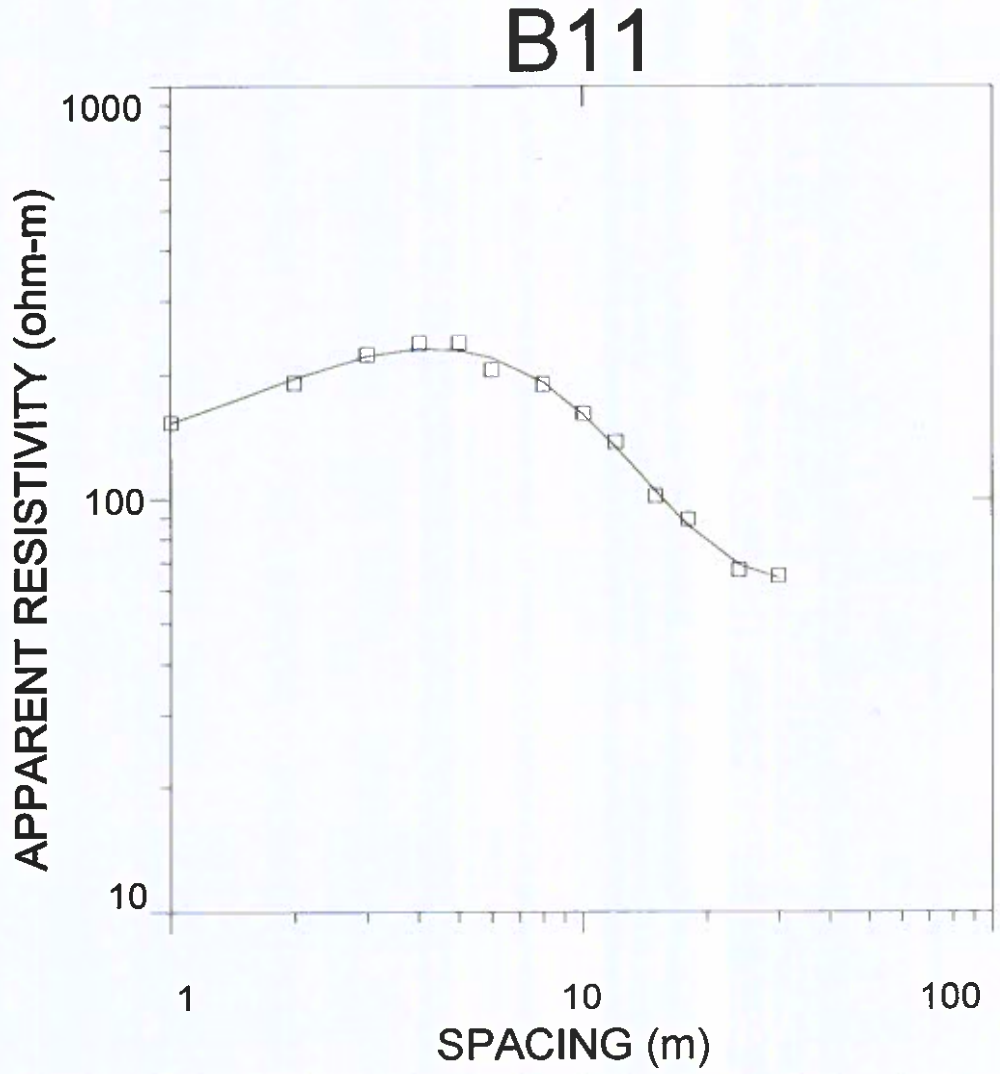


Figure 11. Modeling Results of Soil Resistivity Test (B11, Deurali)

Field data and modelled curve



Subsurface resistivity model

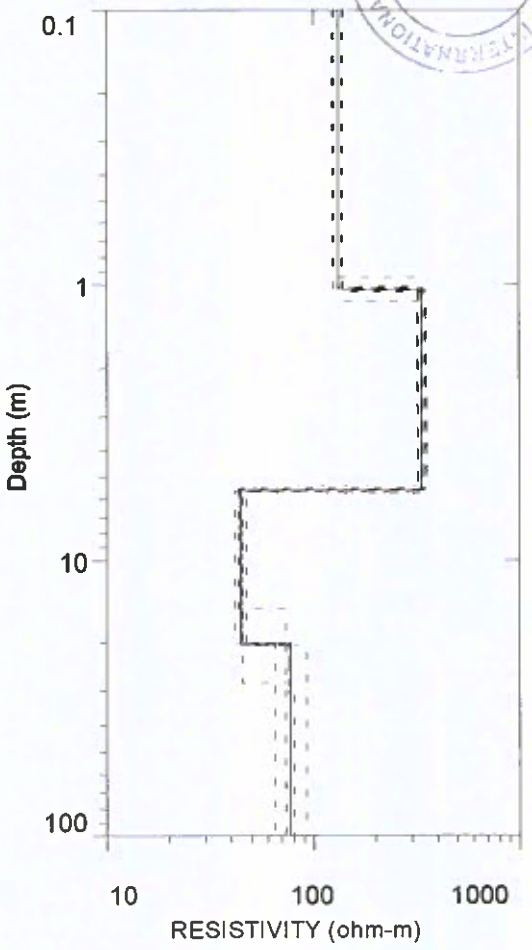


Figure 12. Modeling Results of Soil Resistivity Test (B12, Kallabari)

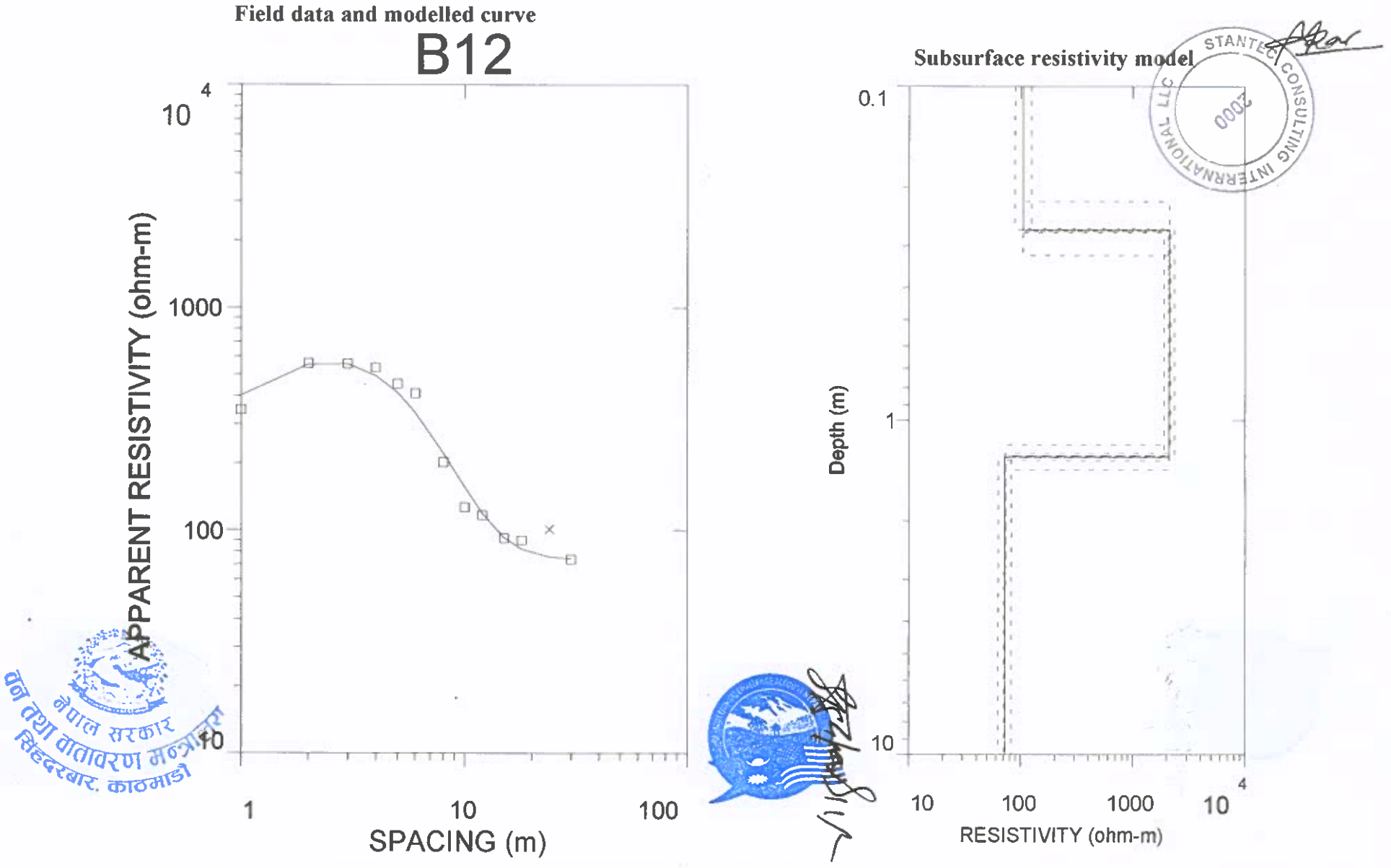
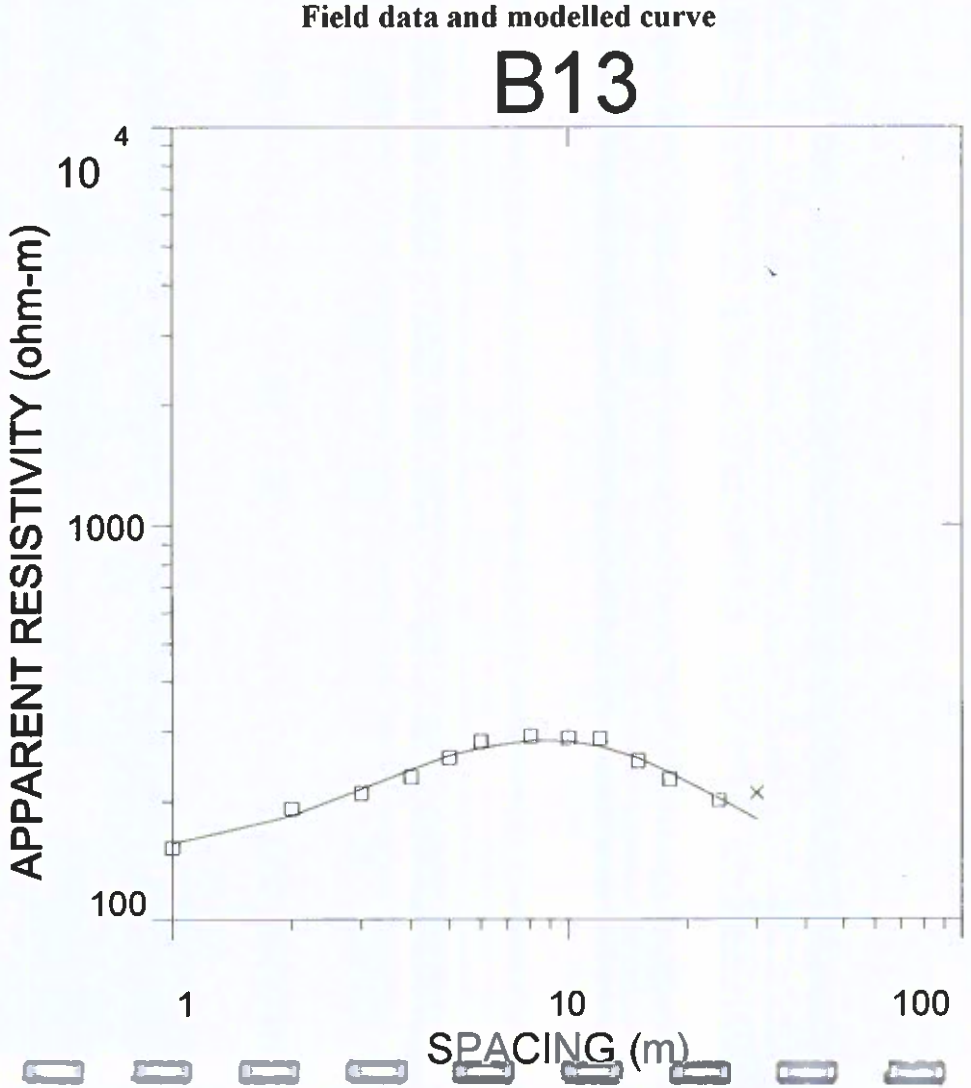


Figure 13. Modeling Results of Soil Resistivity Test (B13, Sindhure)



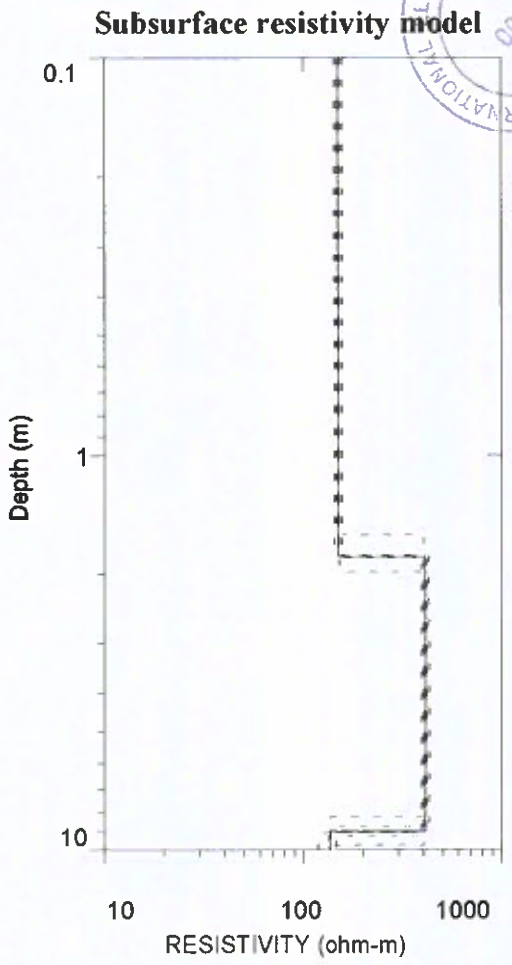


Figure 14. Modeling Results of Soil Resistivity Test (B14, Beldanda)

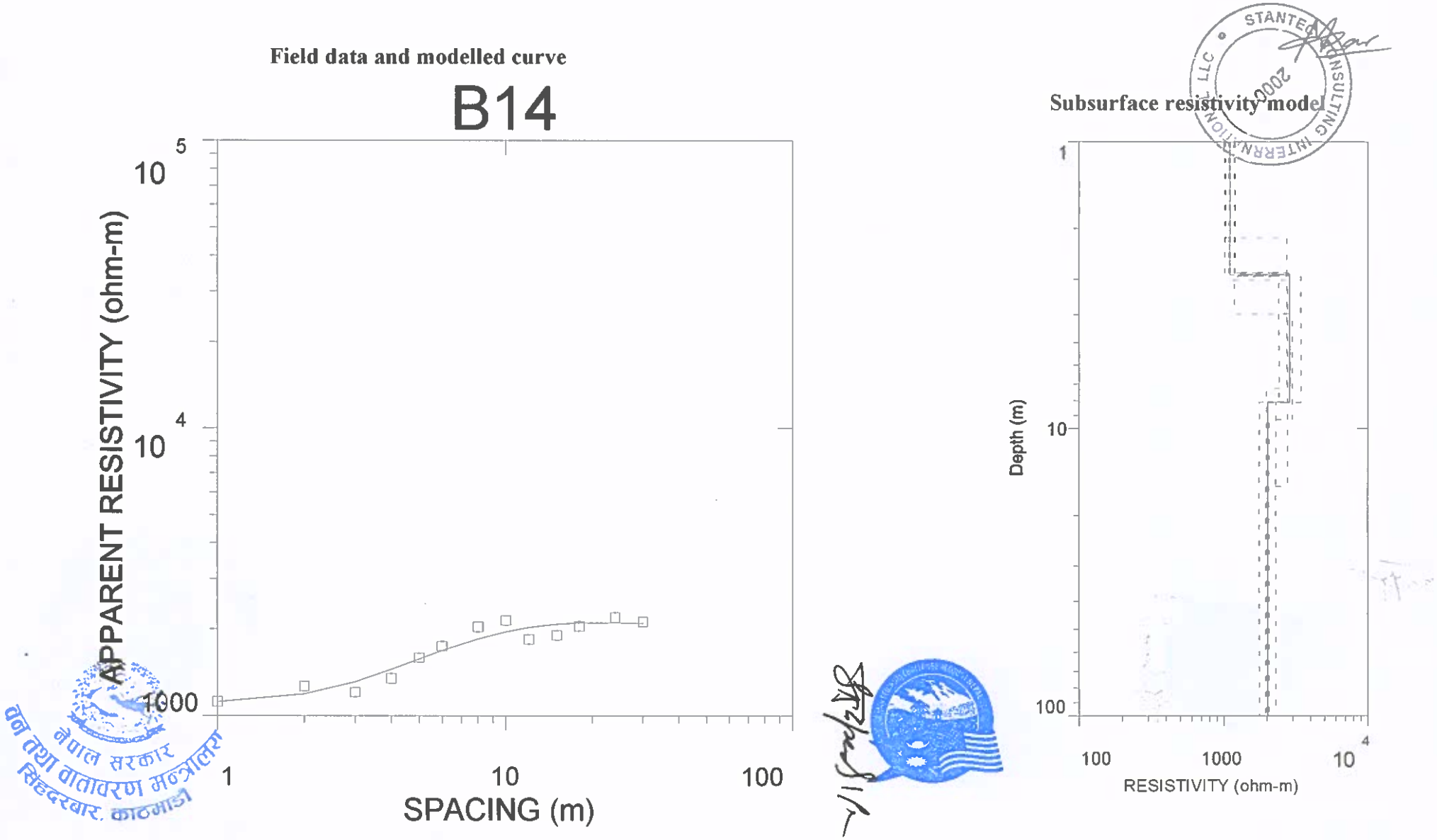
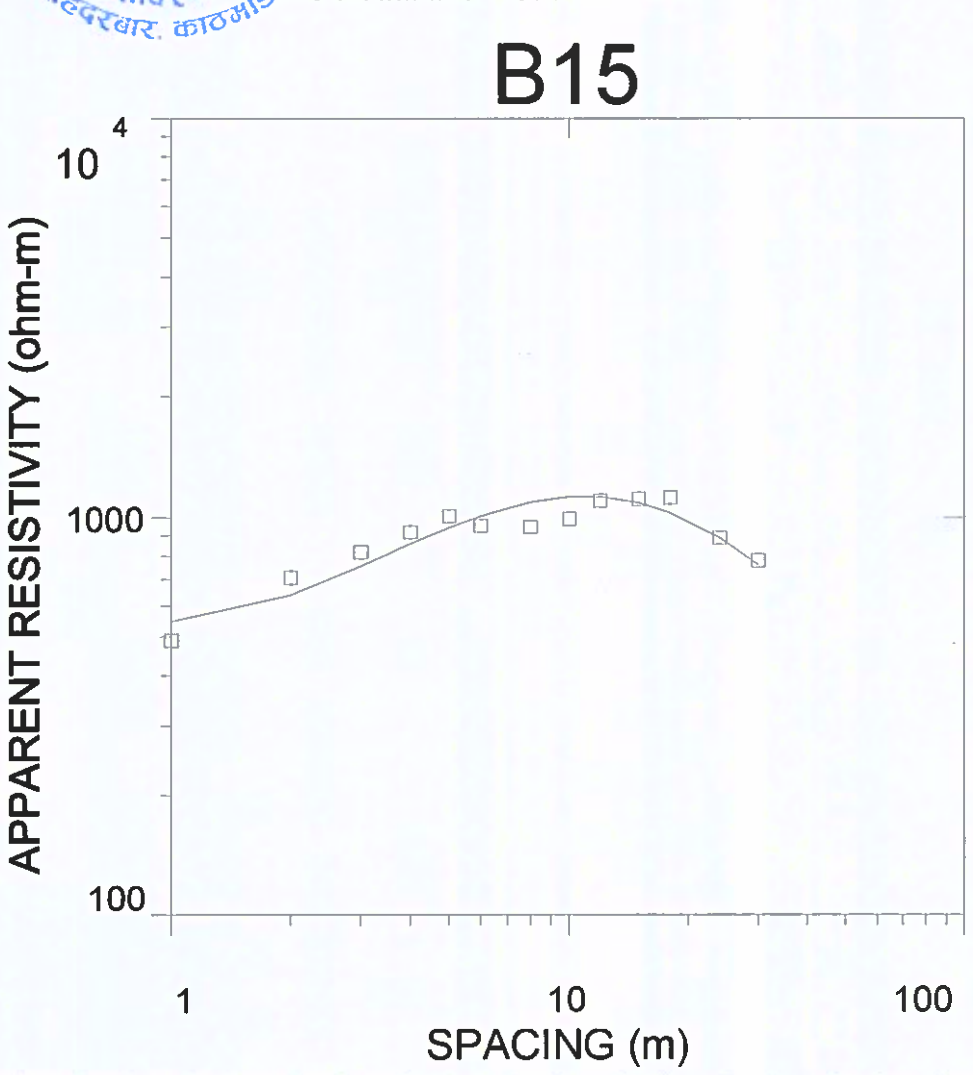


Figure 15. Modeling Results of Soil Resistivity Test (B15, Panthe)



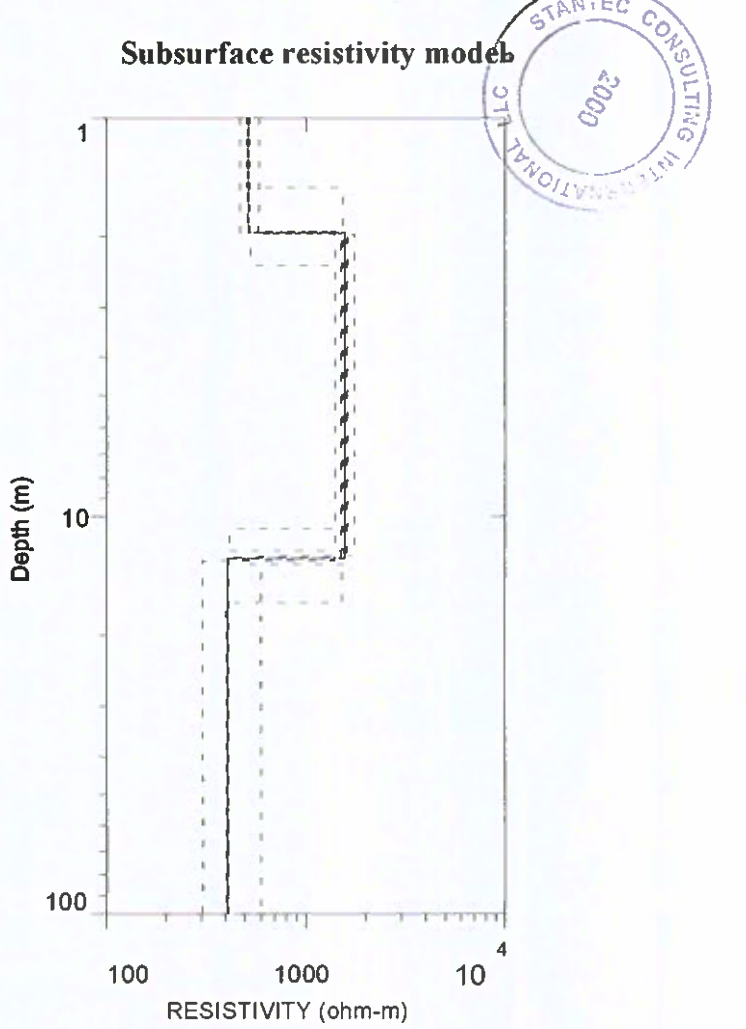


Figure 16. Modeling Results of Soil Resistivity Test (B16, Bhantar)

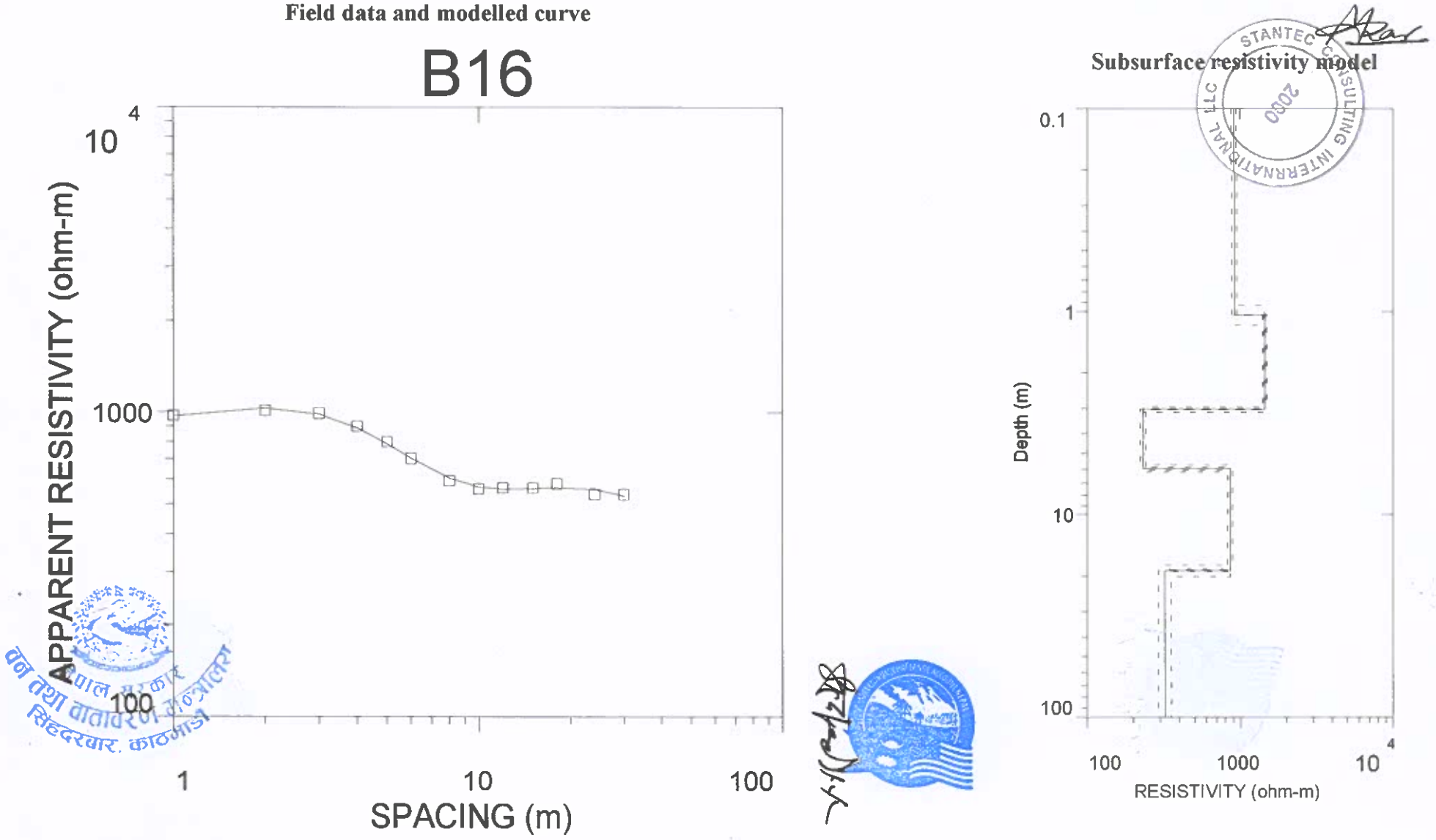
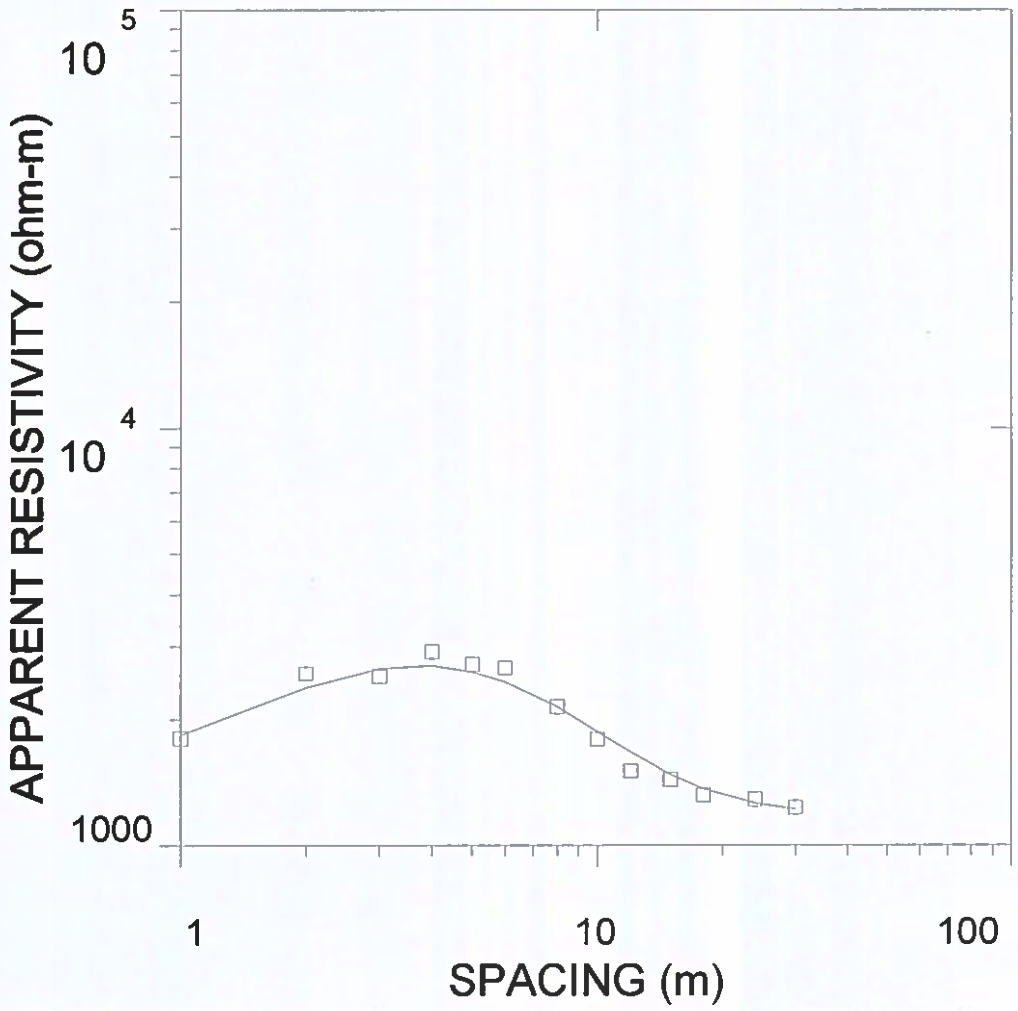


Figure 17. Modeling Results of Soil Resistivity Test (B17, Deurali)



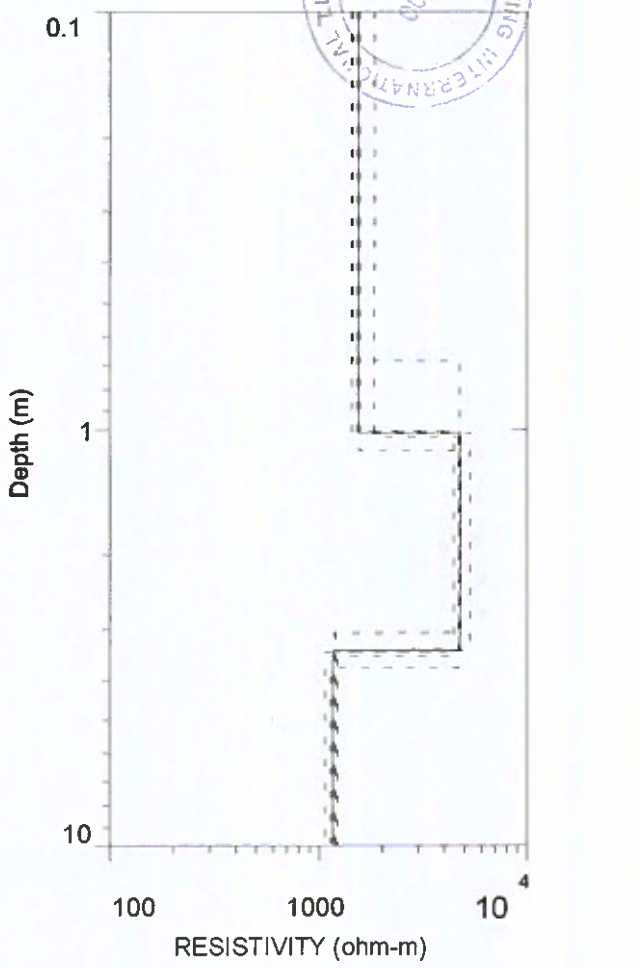


Figure 18. Modeling Results of Soil Resistivity Test (B18, Dandathok-Kobdi)

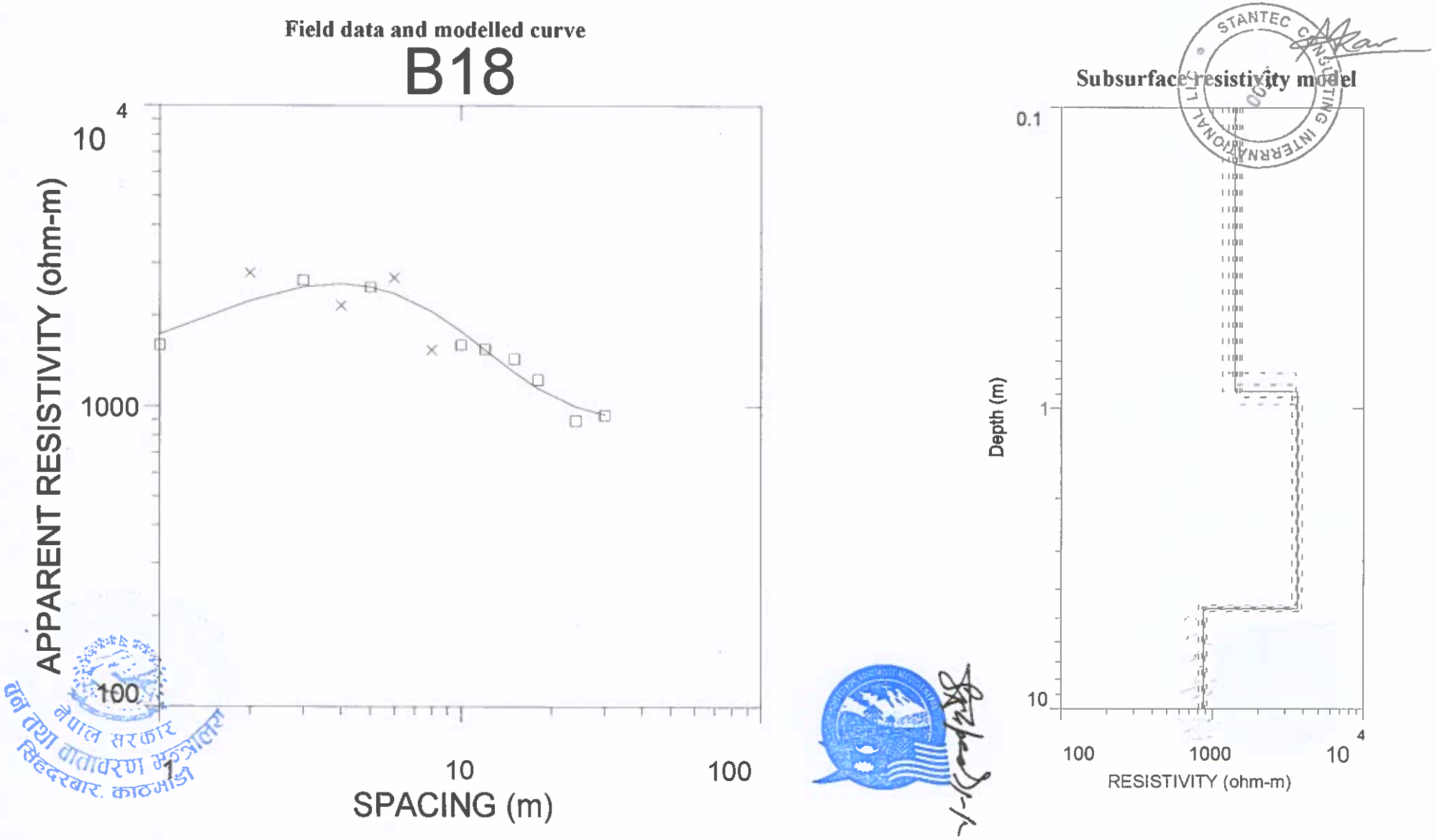
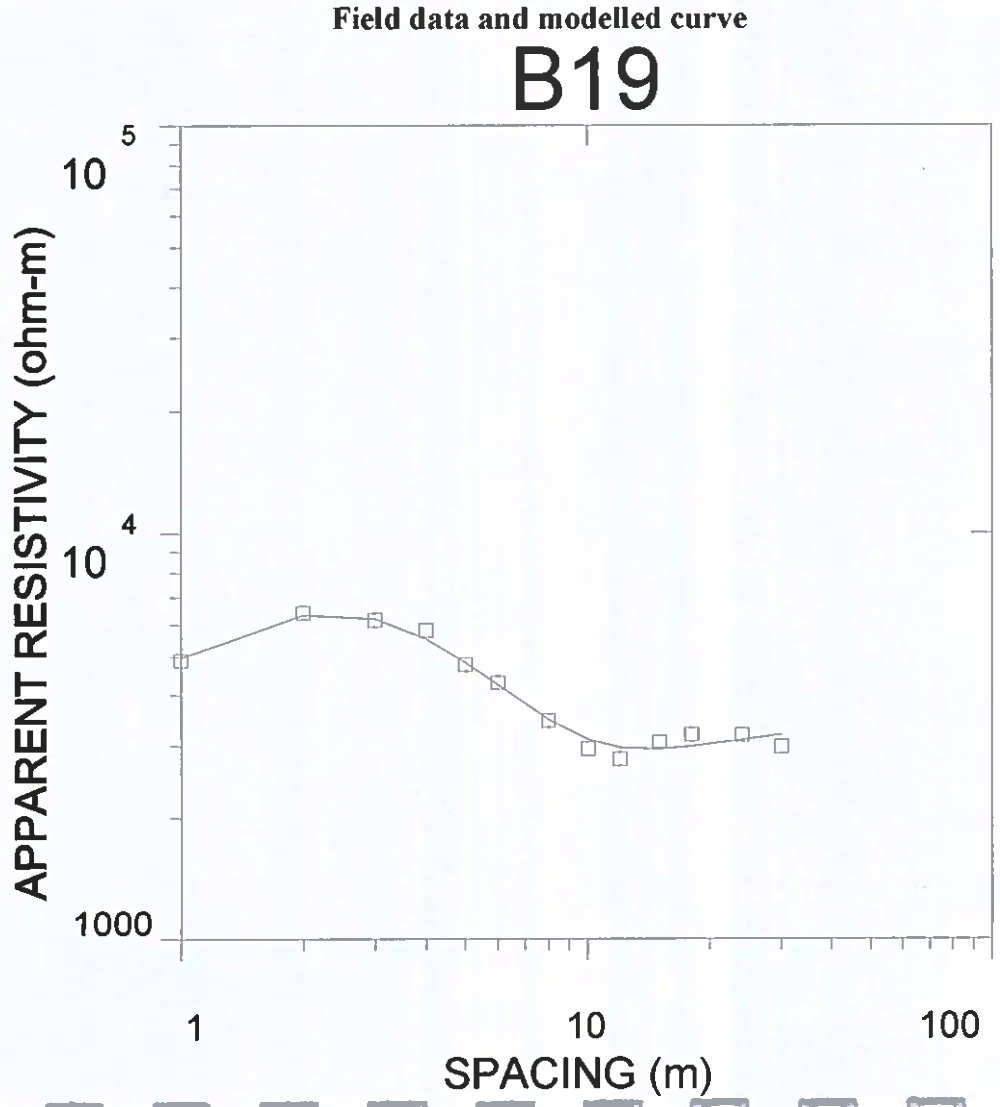


Figure 19. Modeling Results of Soil Resistivity Test (B19, Mohoriya Bhanjyang)



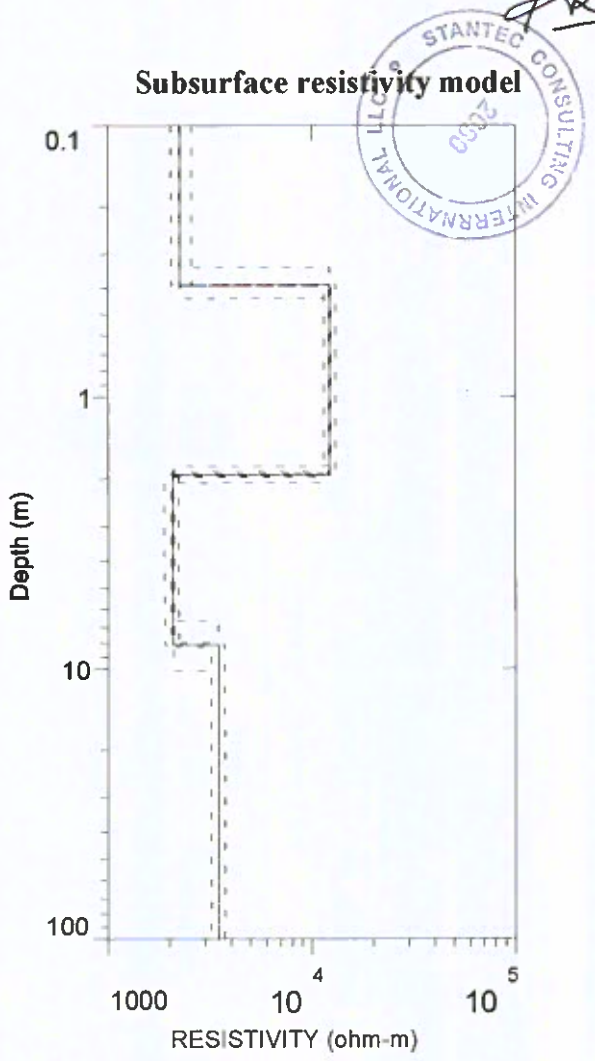


Figure 20. Modeling Results of Soil Resistivity Test (B20, Likindi)

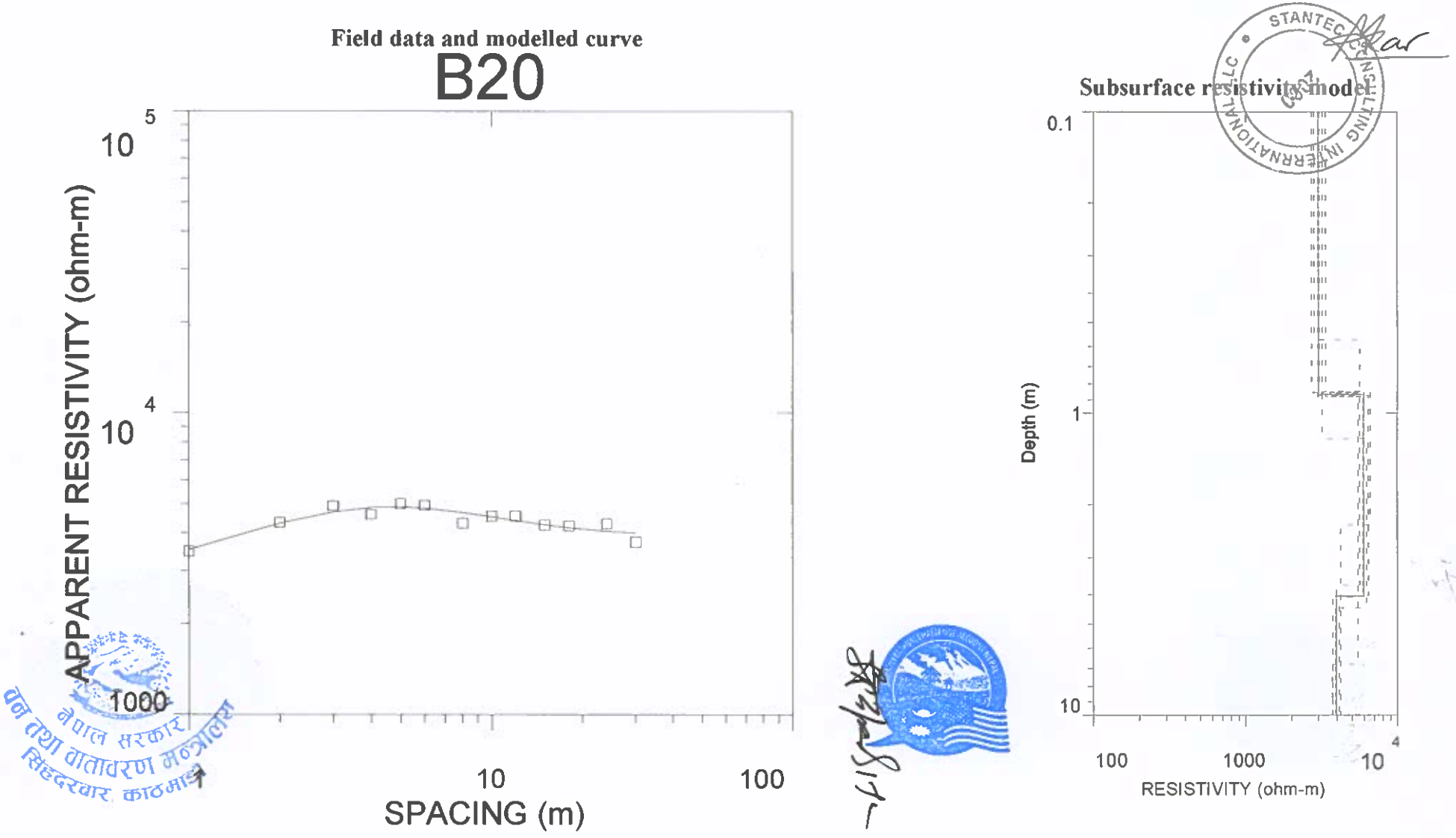


Figure 21. Modeling Results of Soil Resistivity Test (B21, Ribu)

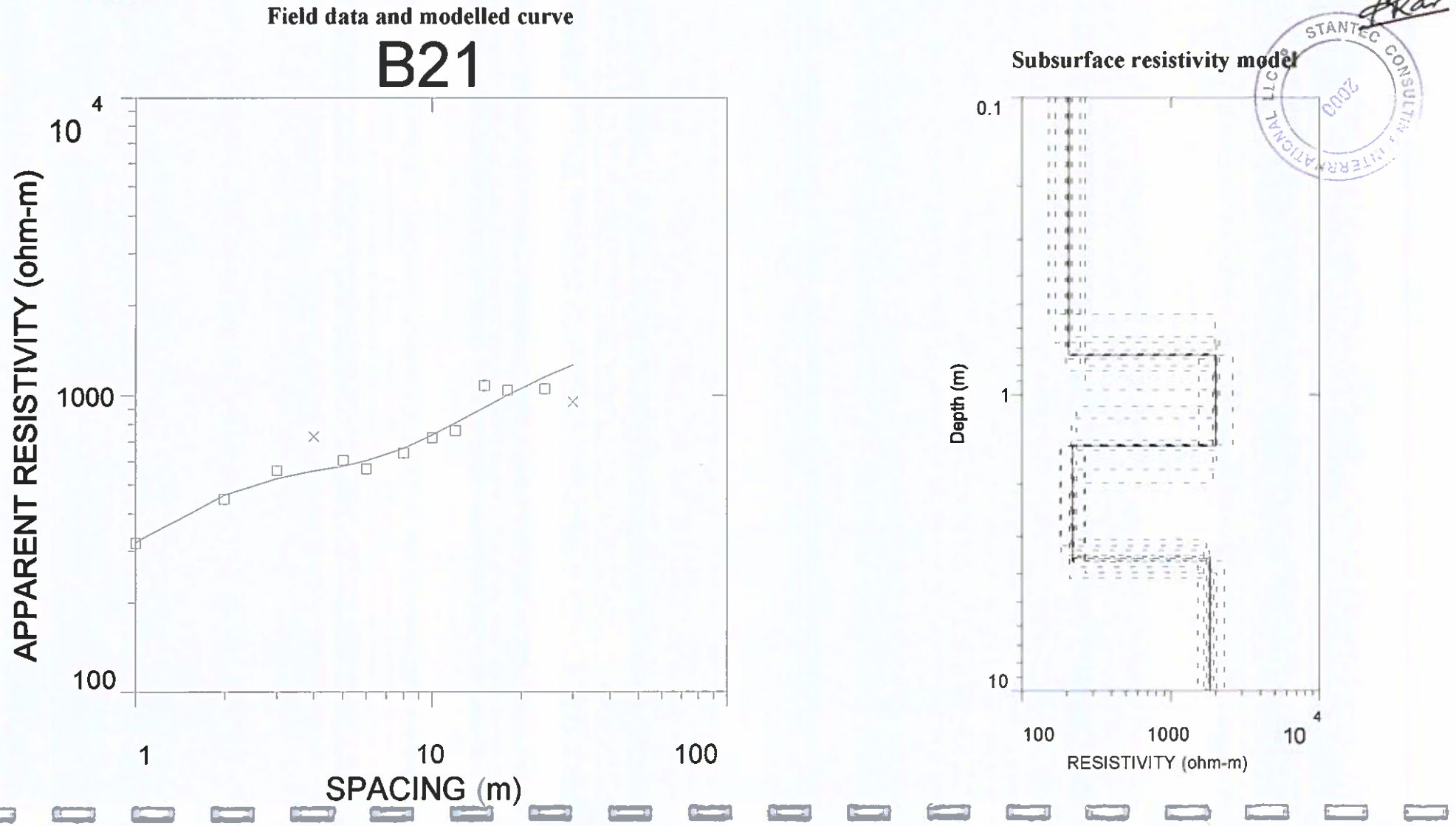


Figure 22. Modeling Results of Soil Resistivity Test (B22, Pokhari Bhanjyang)

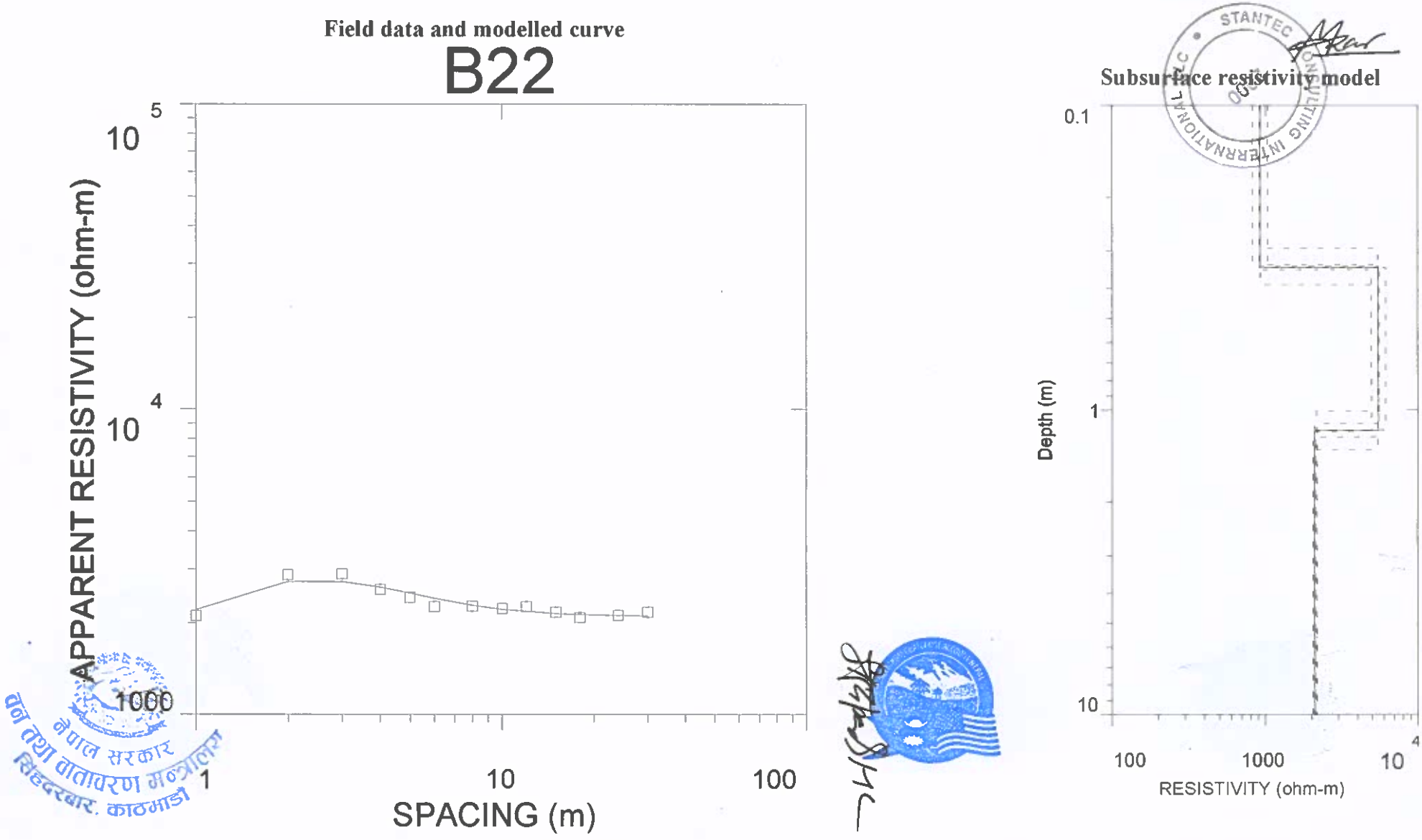


Figure 23. Modeling Results of Soil Resistivity Test (B25, Hundi)

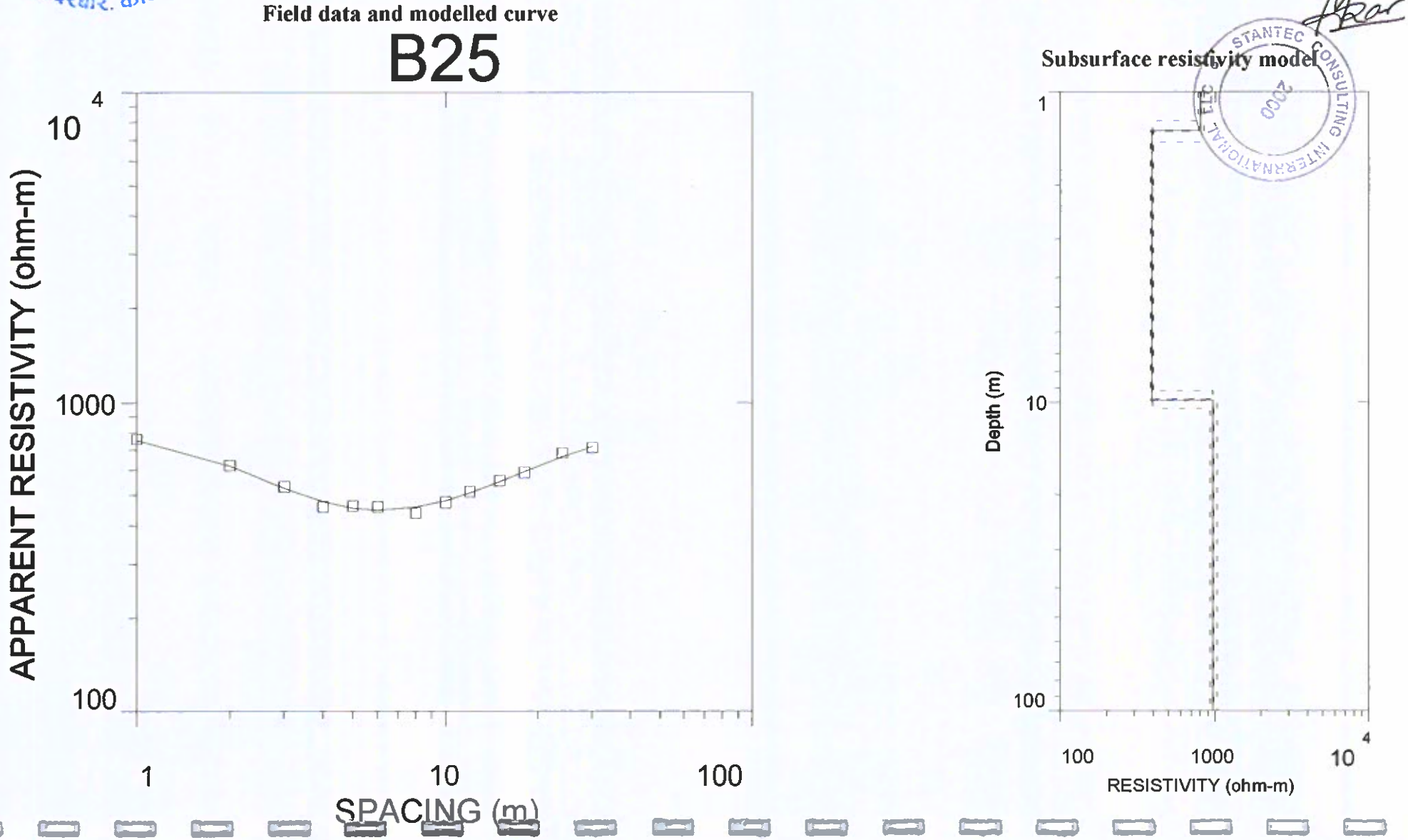


Figure 24. Modeling Results of Soil Resistivity Test (B26, Keshavtar)

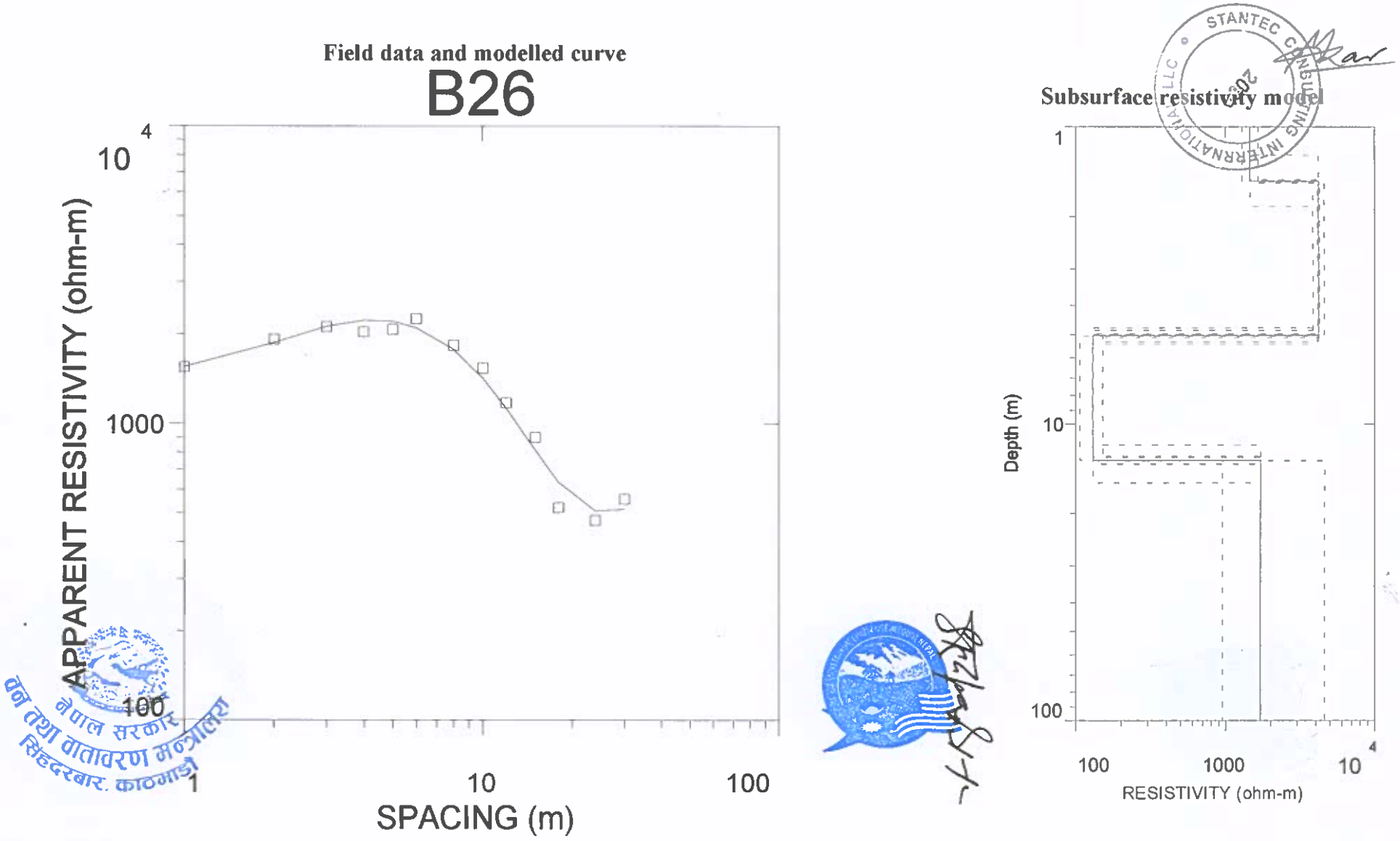


Figure 25. Modeling Results of Soil Resistivity Test (B27, Bhaheri)

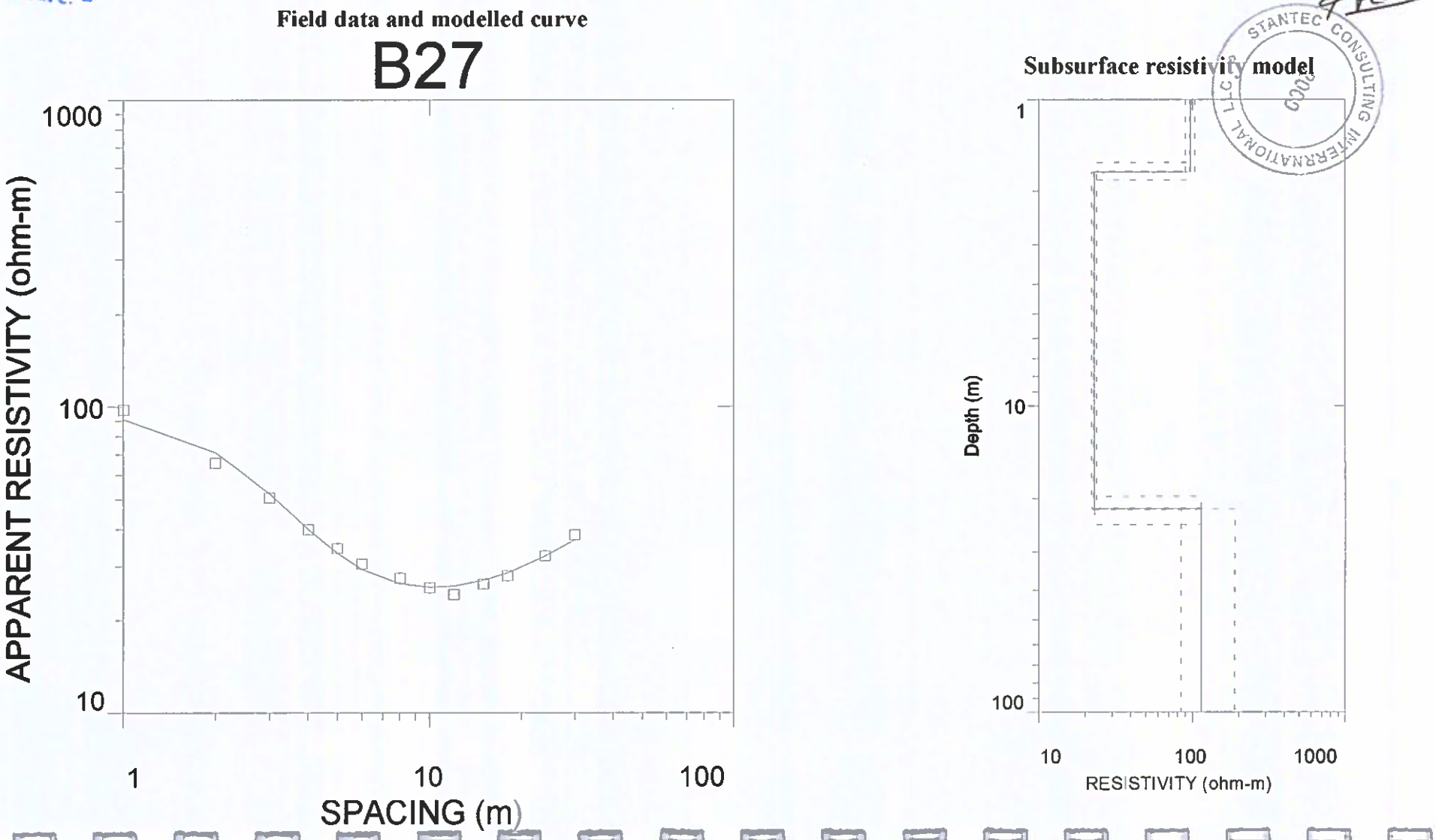


Figure 26. Modeling Results of Soil Resistivity Test (B28, Kalleri)

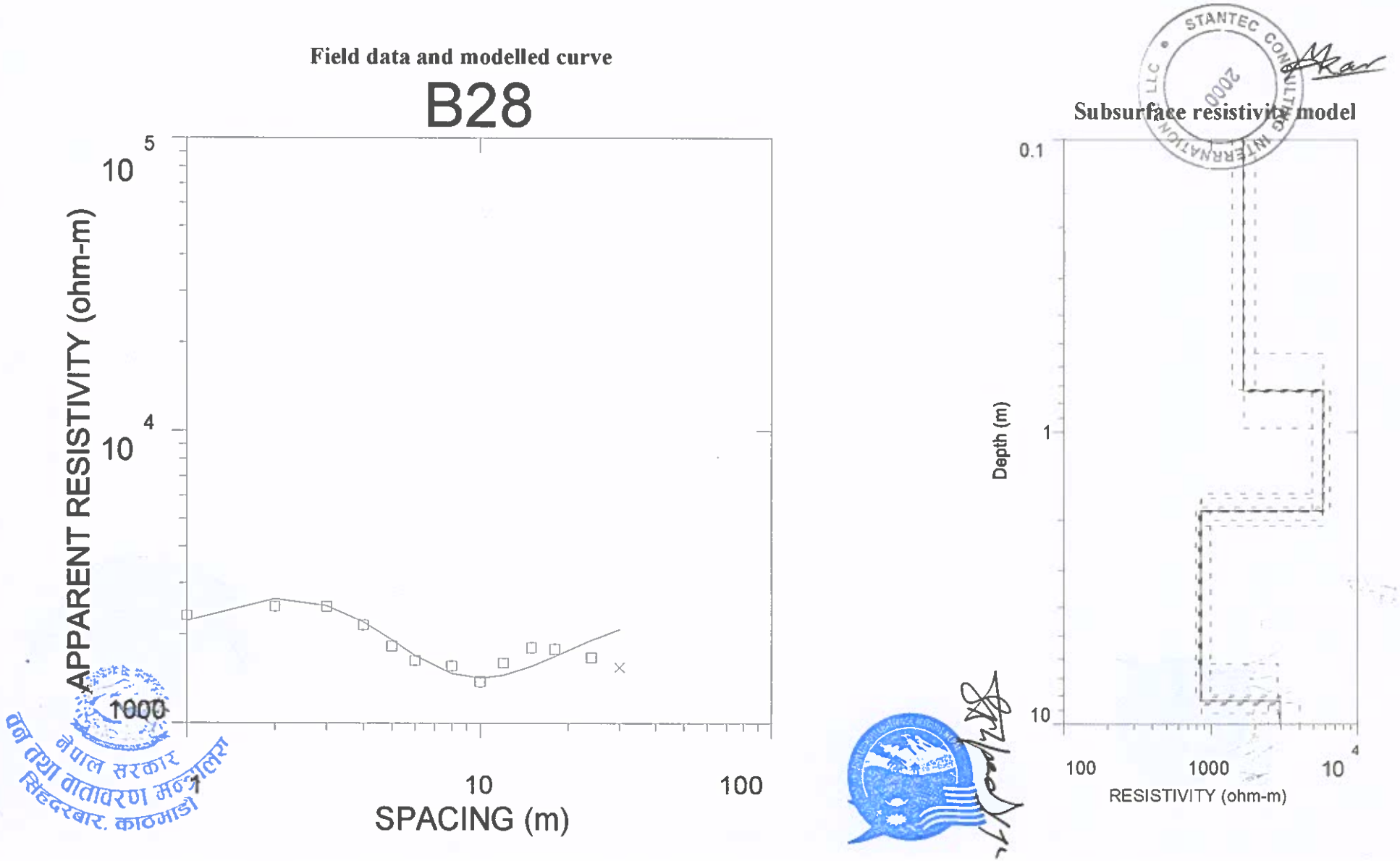


Figure 27. Modeling Results of Soil Resistivity Test (B29, Labbdi)

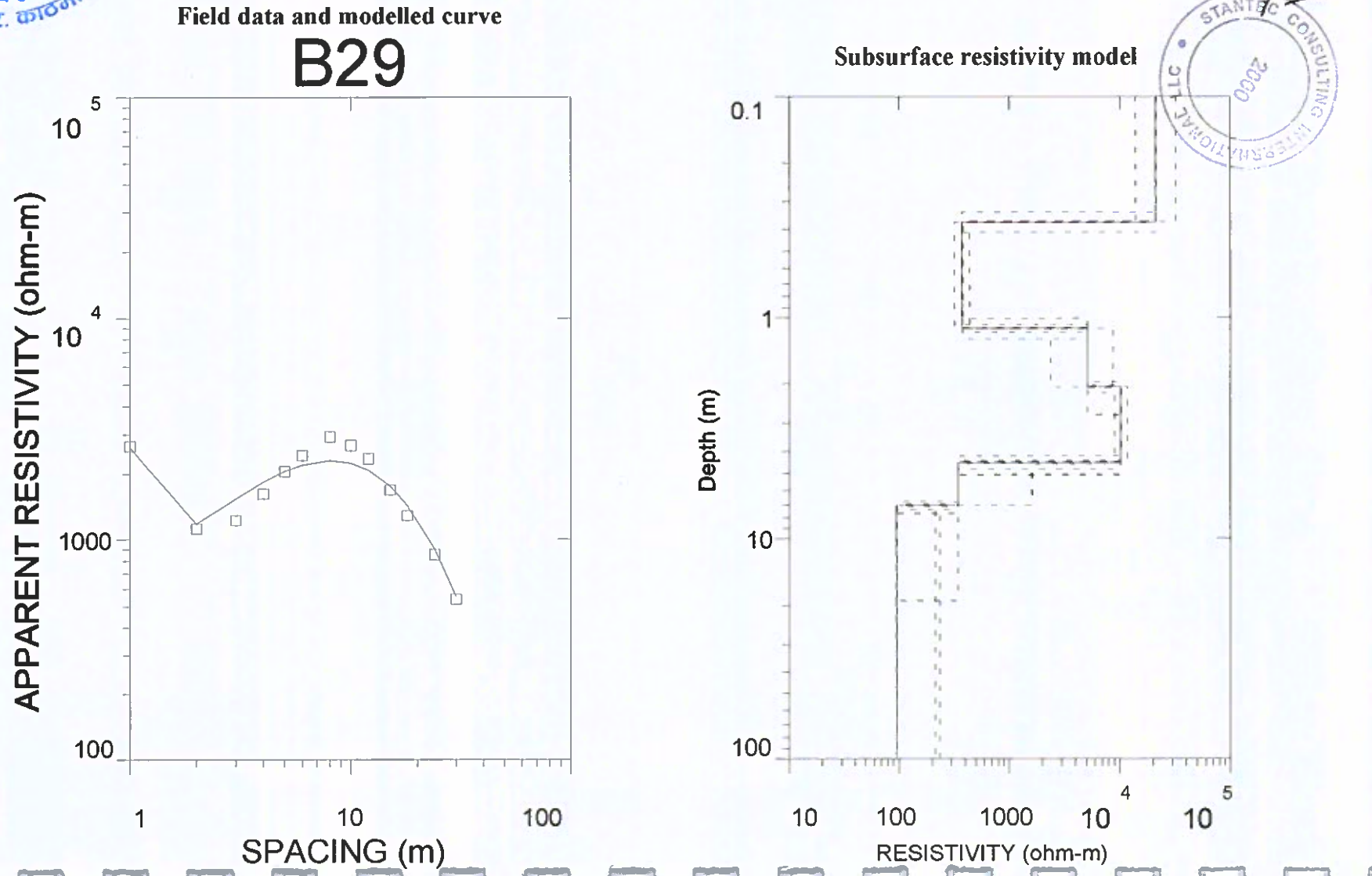


Figure 28. Modeling Results of Soil Resistivity Test (B30, Kalikhola)

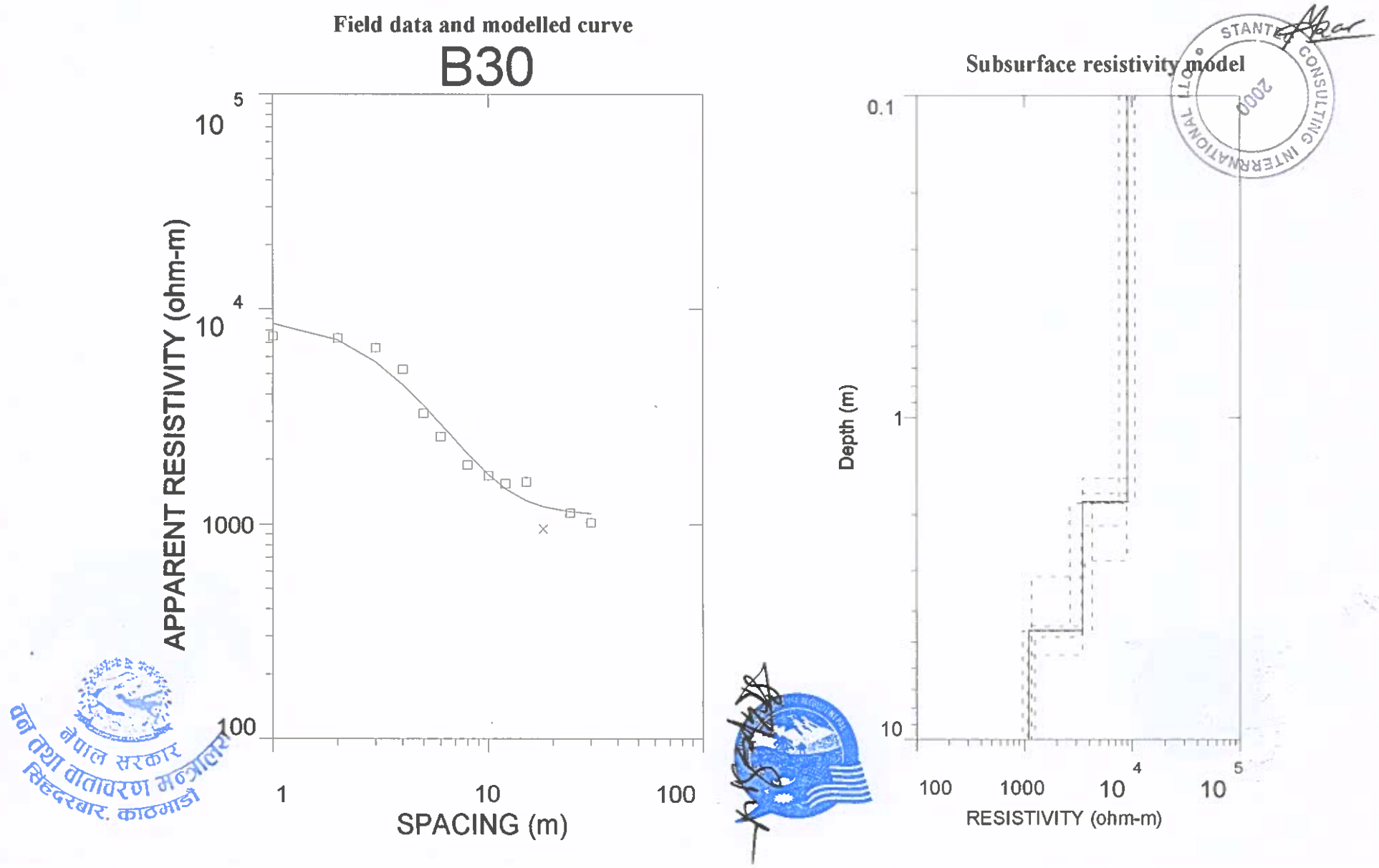
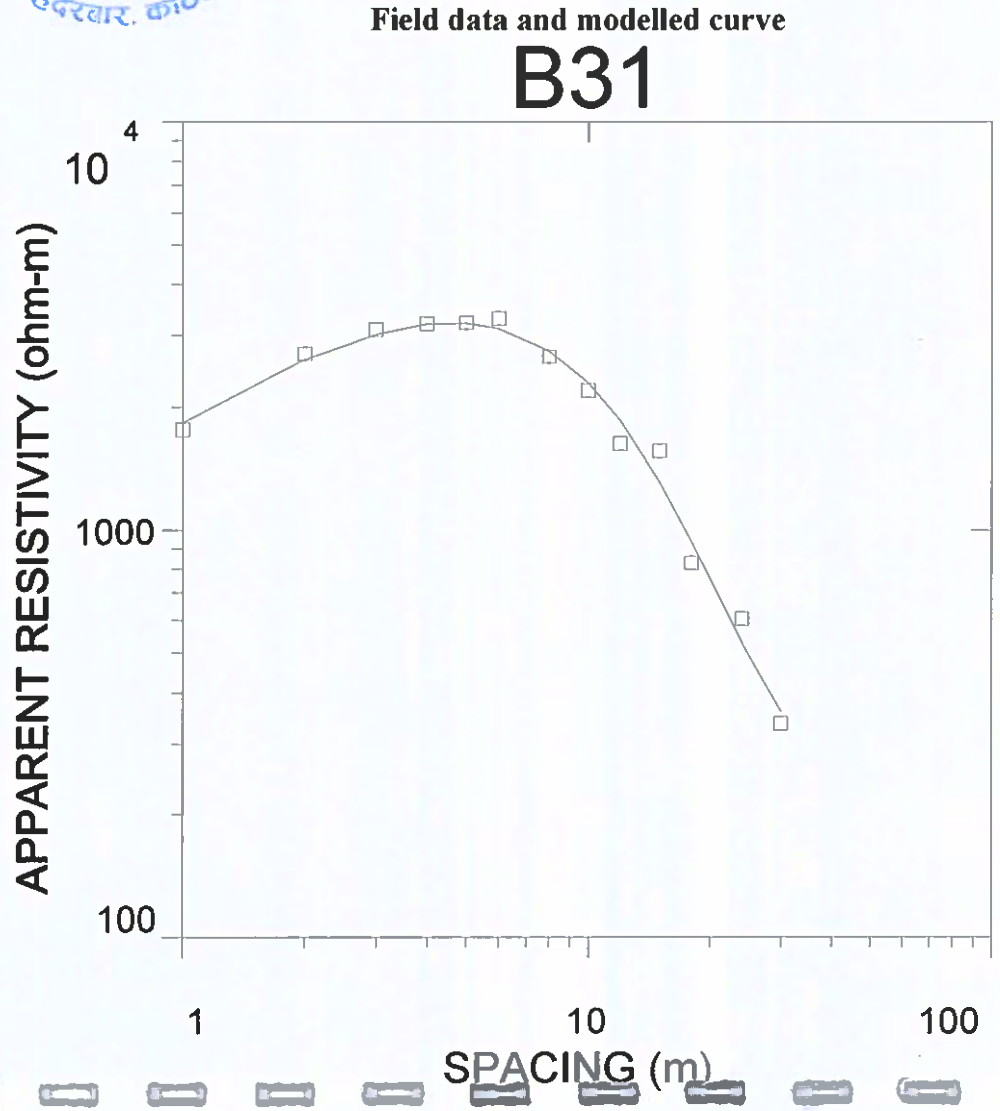


Figure 29. Modeling Results of Soil Resistivity Test (B31, Nangedanda)



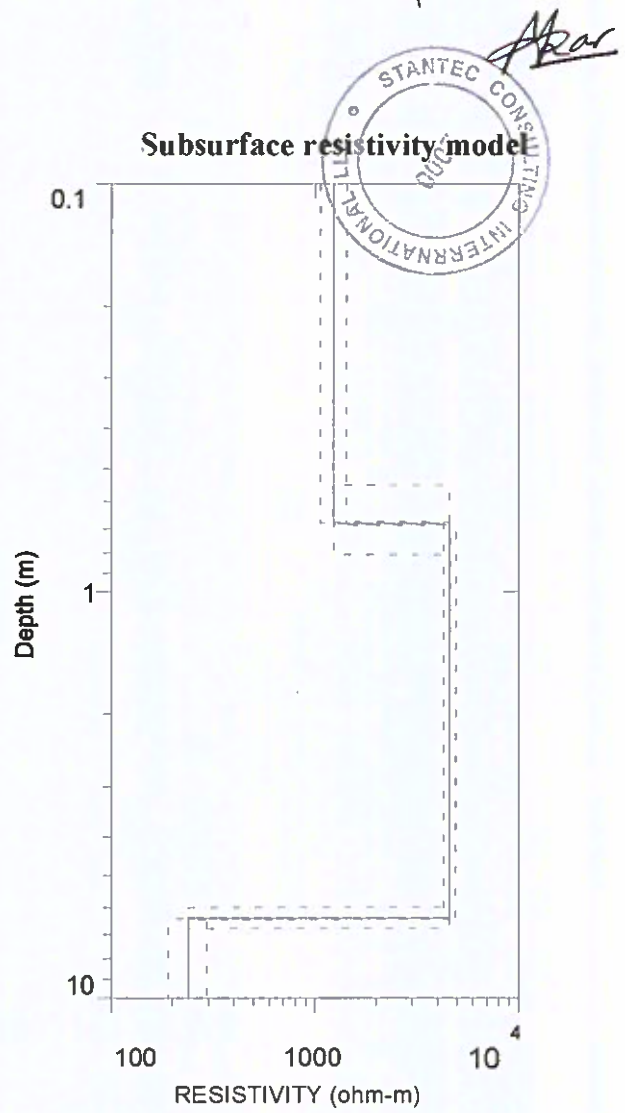


Figure 30. Modeling Results of Soil Resistivity Test (B32, Tekbang)

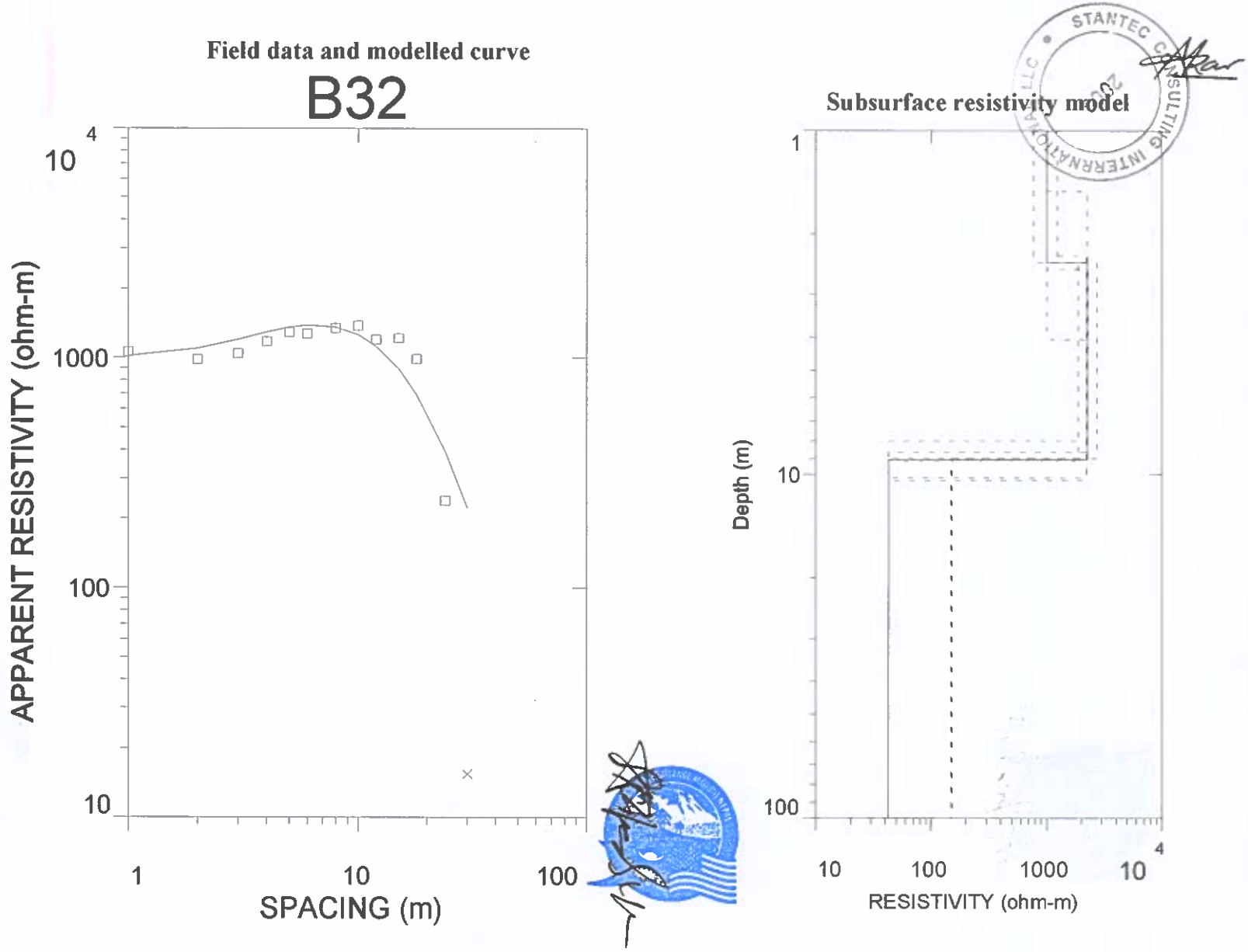


Figure 31. Modeling Results of Soil Resistivity Test (B33, Mohoriyagaun)

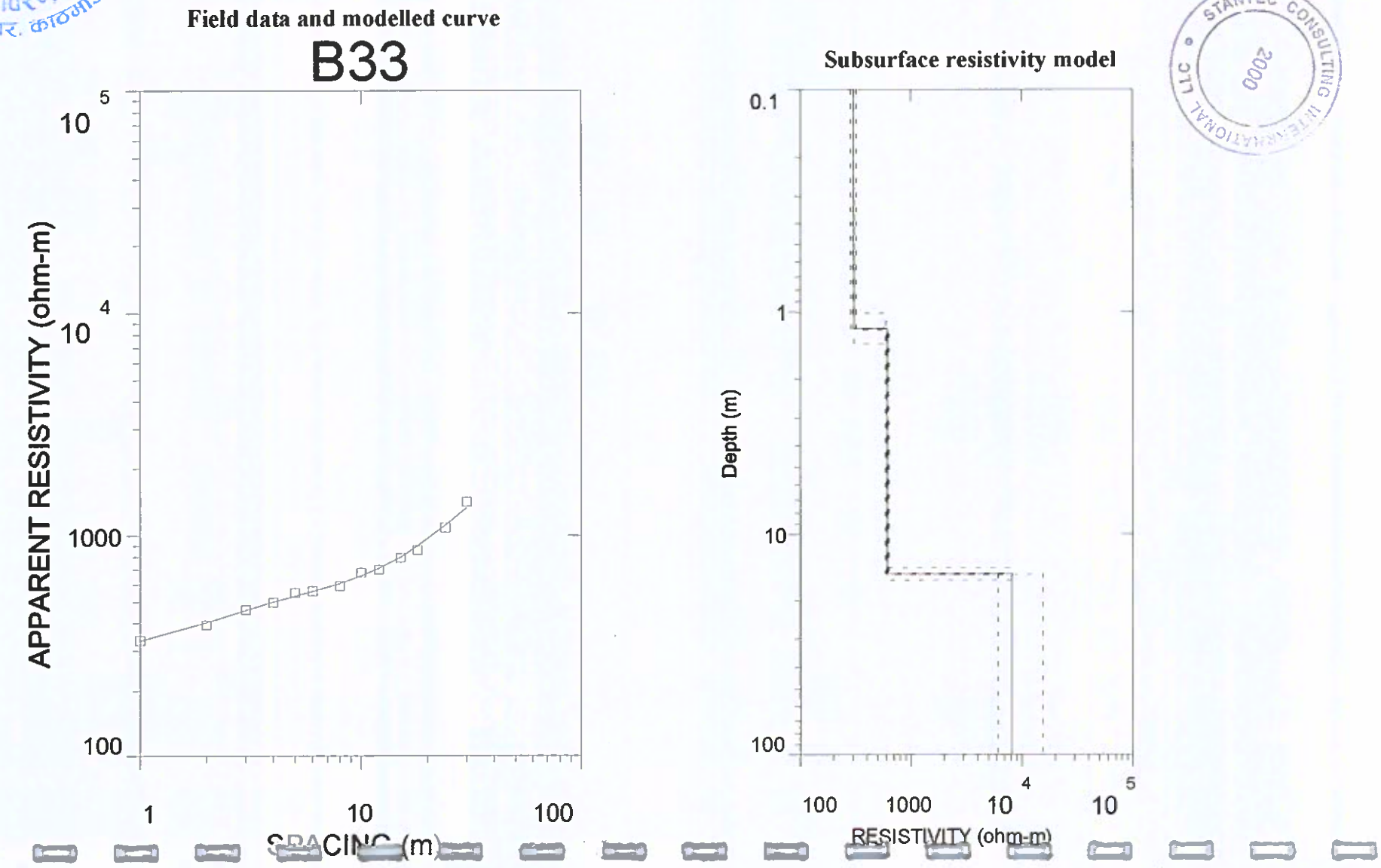


Figure 32. Modeling Results of Soil Resistivity Test (B34, Ambhanjyang)

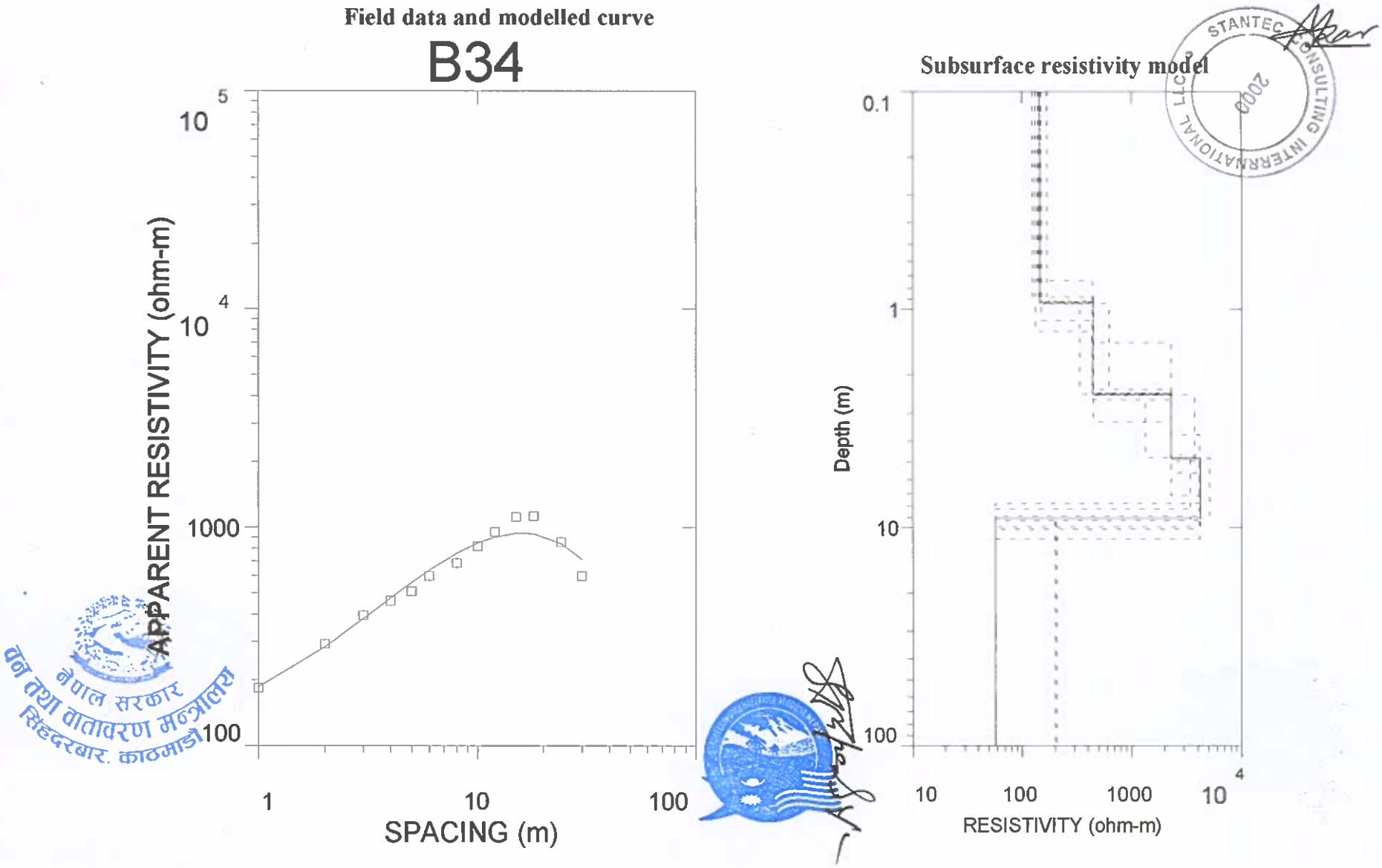


Figure 33. Modeling Results of Soil Resistivity Test (B35, Bihani Pump)

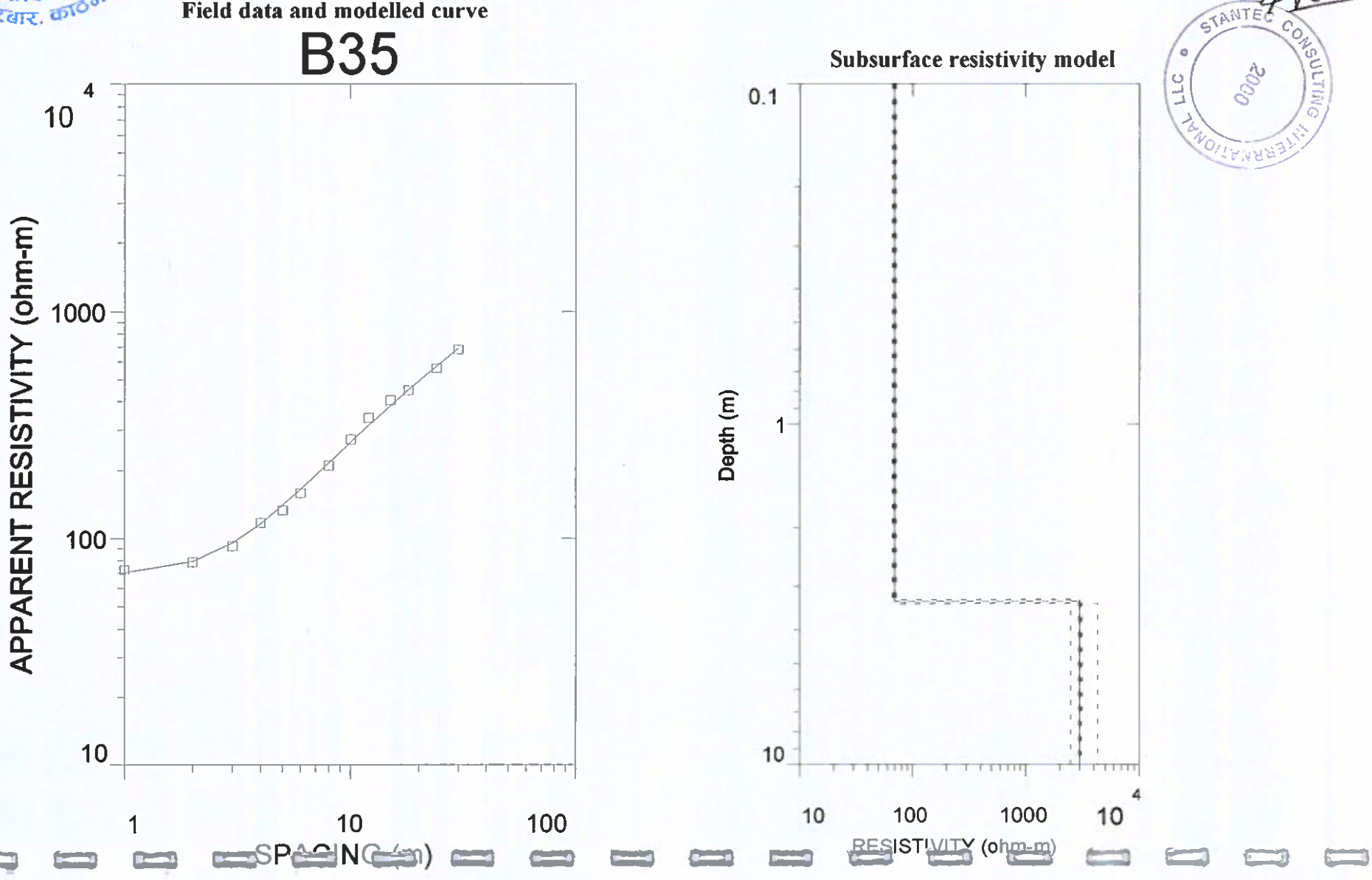


Figure 34. Modeling Results of Soil Resistivity Test (B36, Pahare)

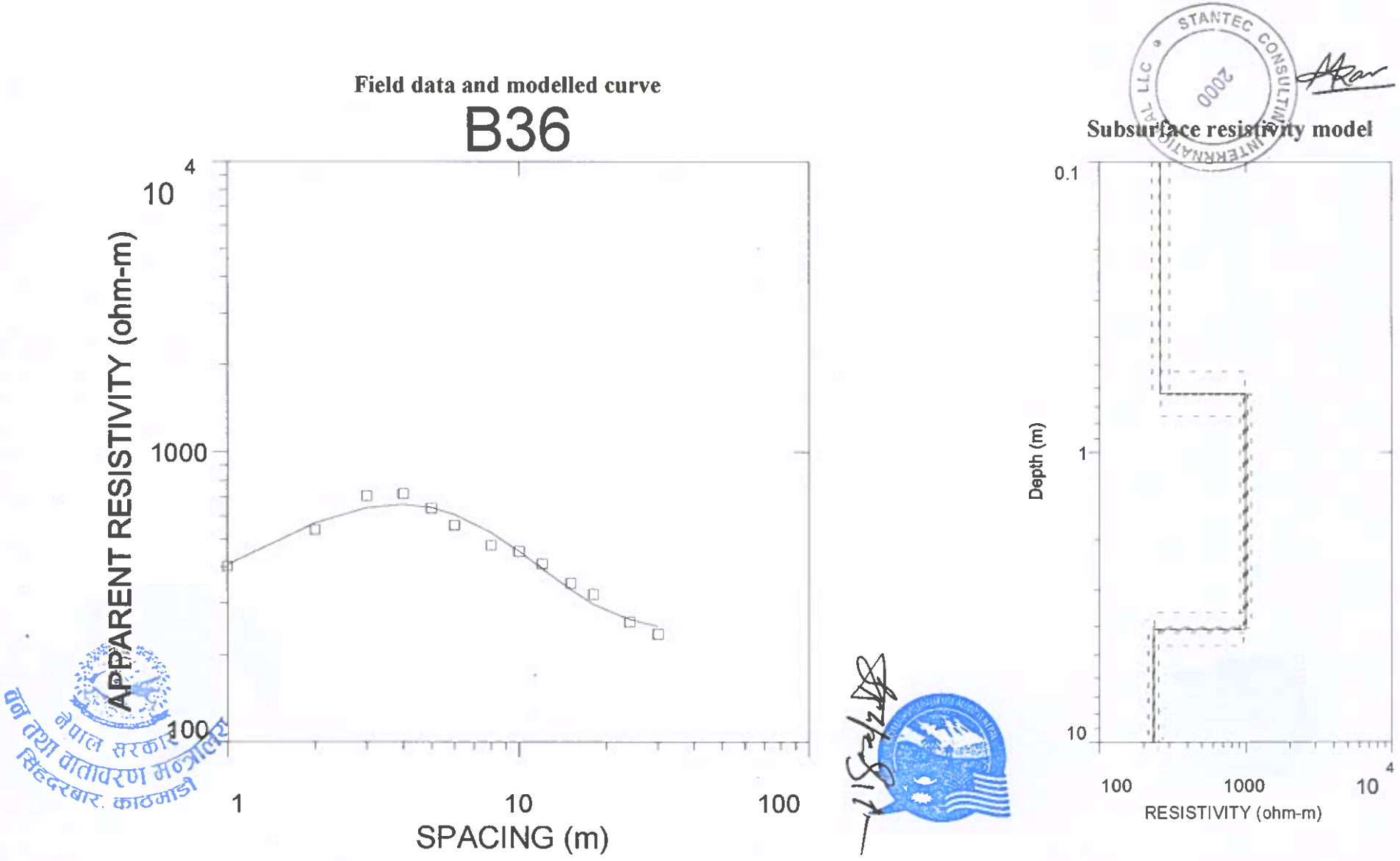
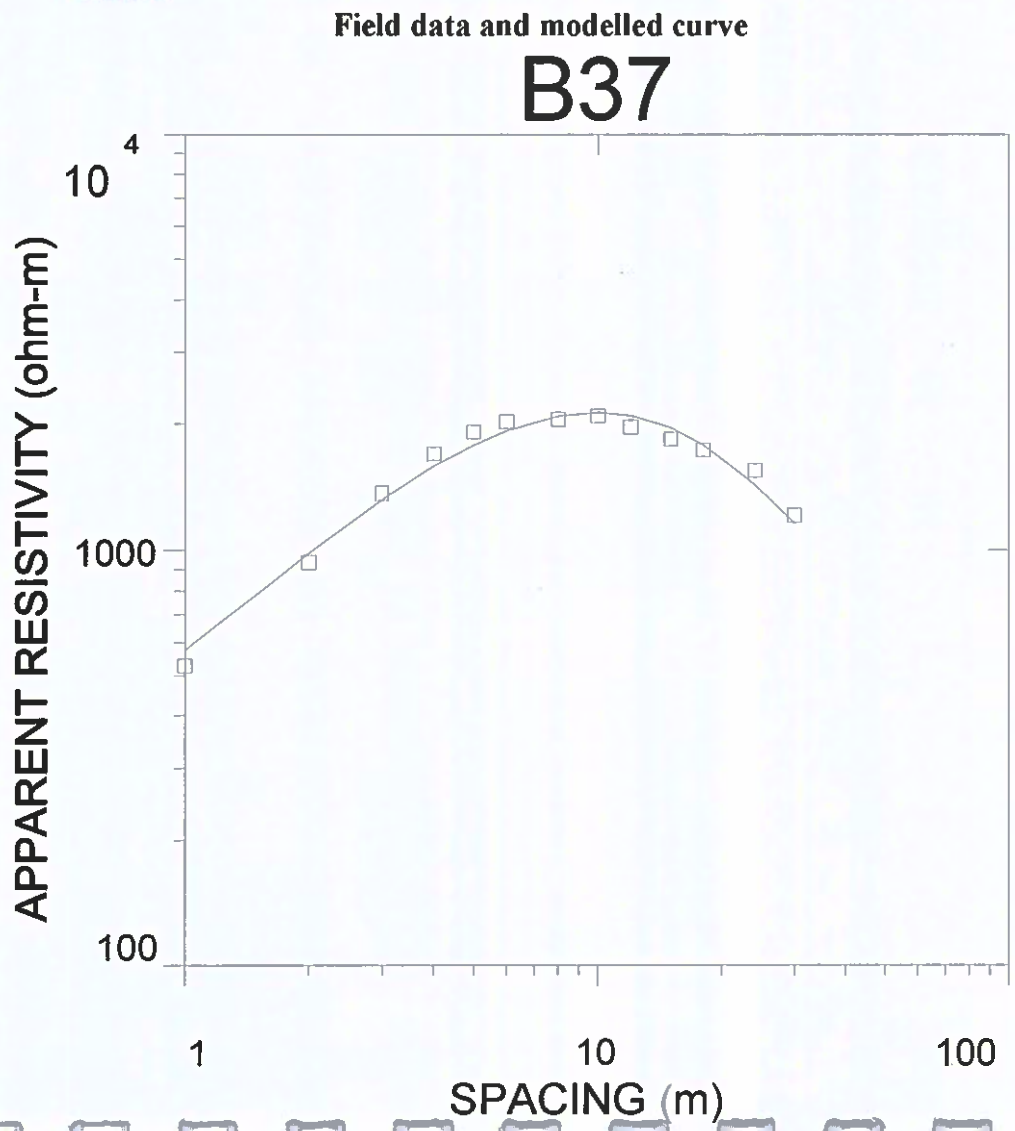


Figure 35. Modeling Results of Soil Resistivity Test (B37, Ratmate)



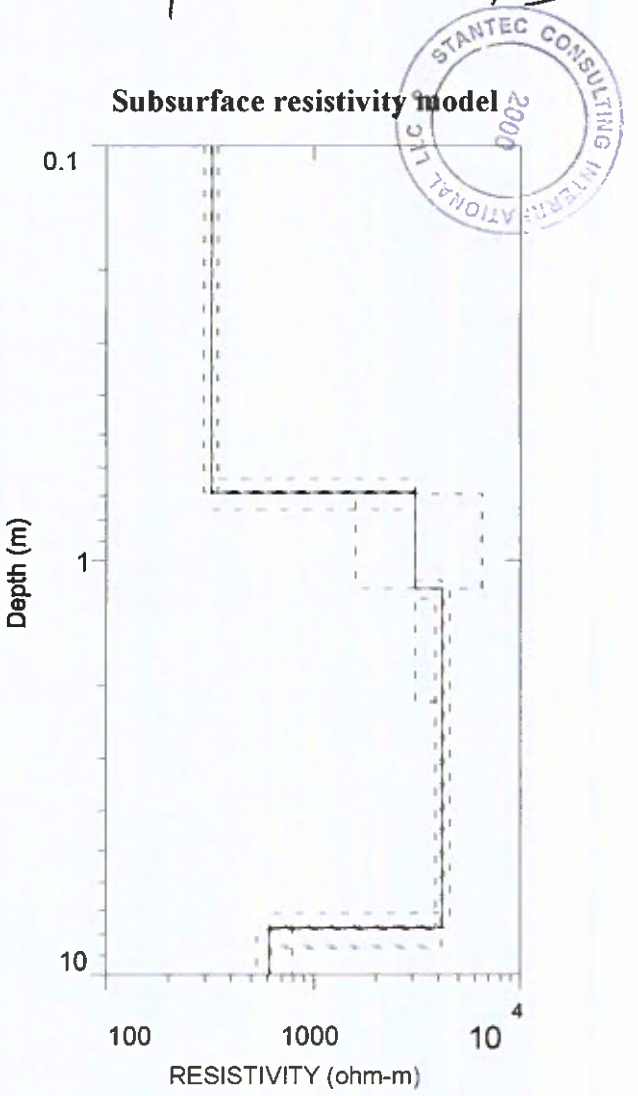


Figure 36. Modeling Results of Soil Resistivity Test (B40, Nandutar)

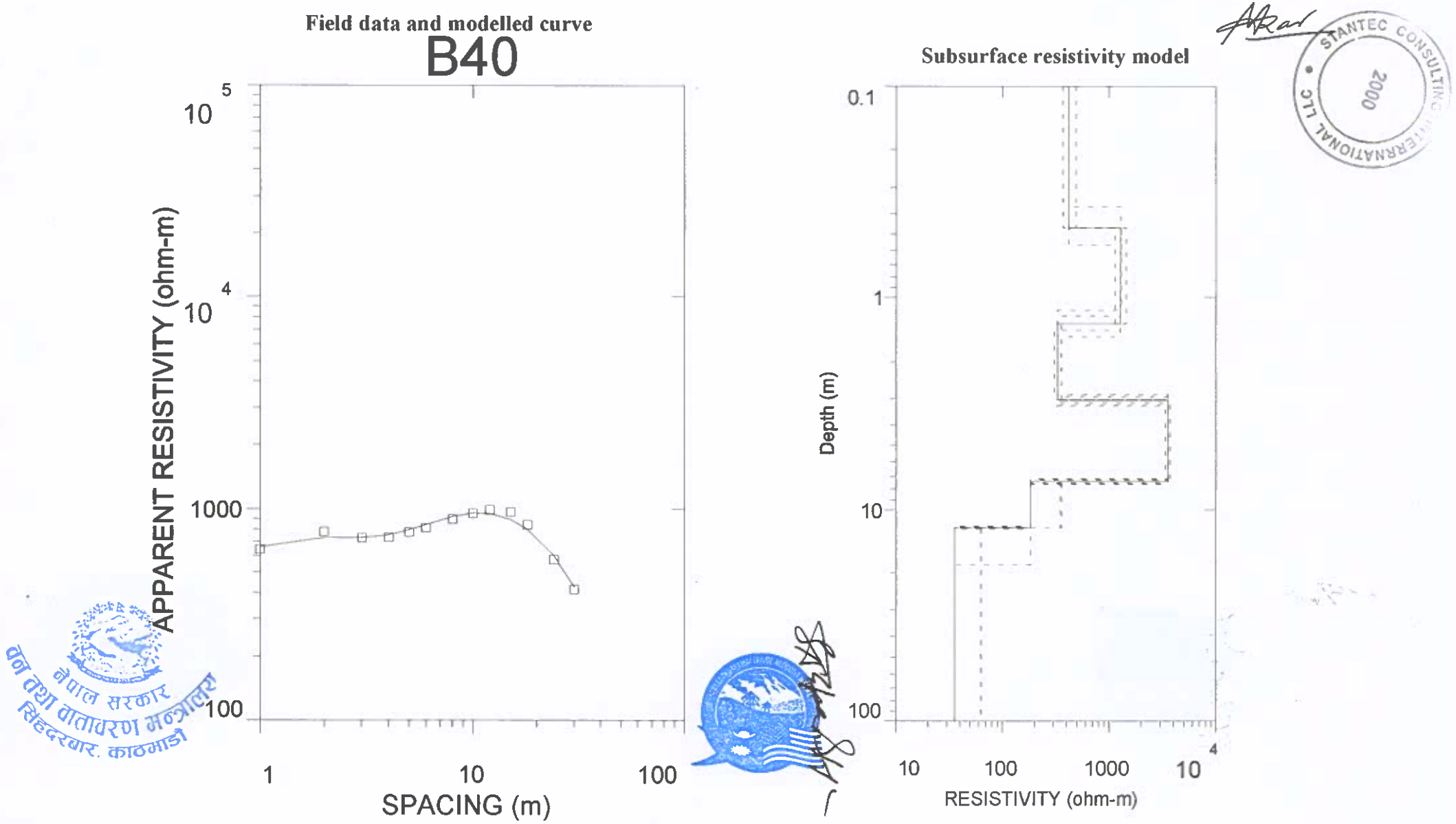


Figure 37. Modeling Results of Soil Resistivity Test
(B41, Archlebot, Swanra)

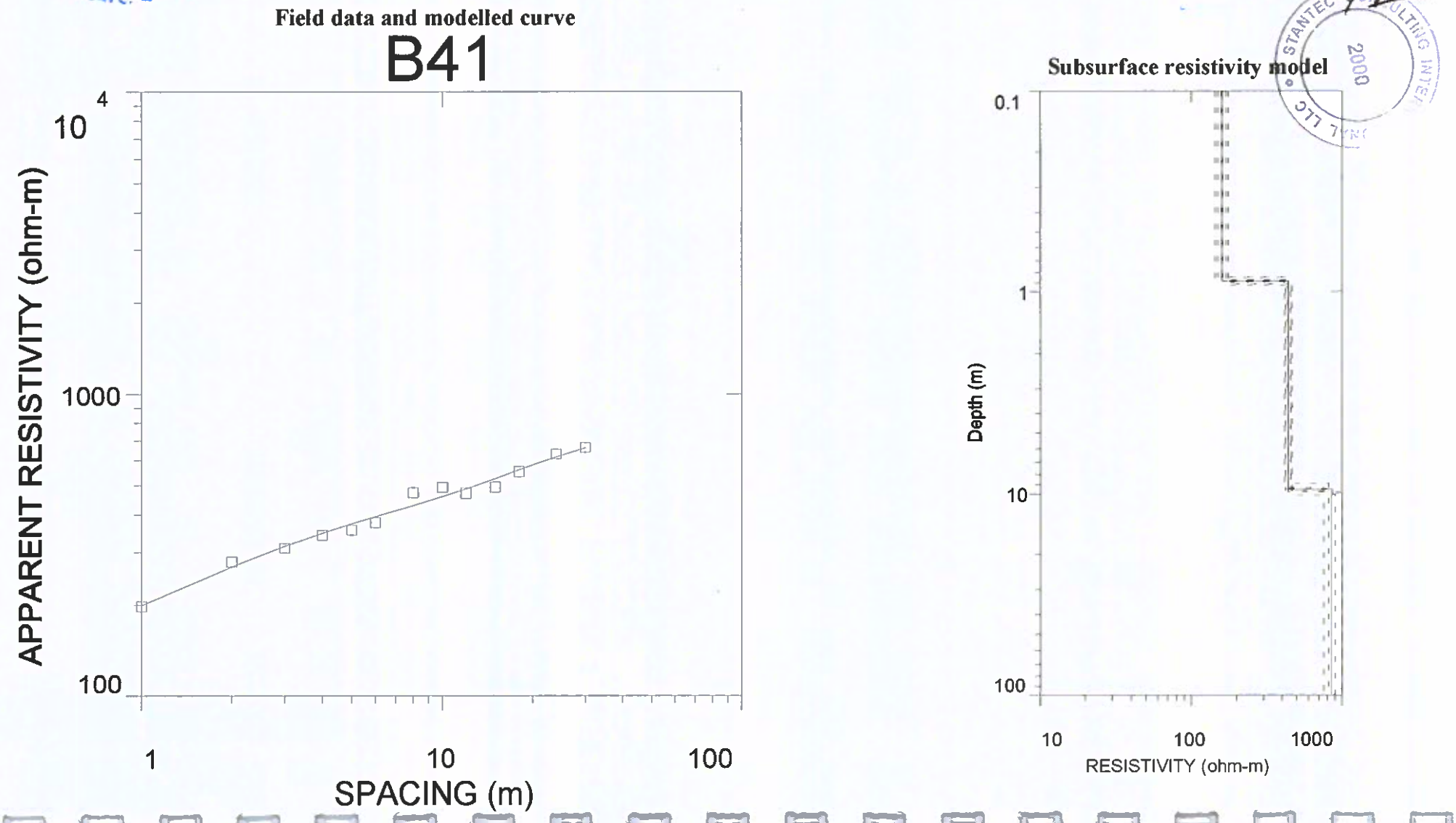


Figure 38. Modeling Results of Soil Resistivity Test (B42, Madanpur)

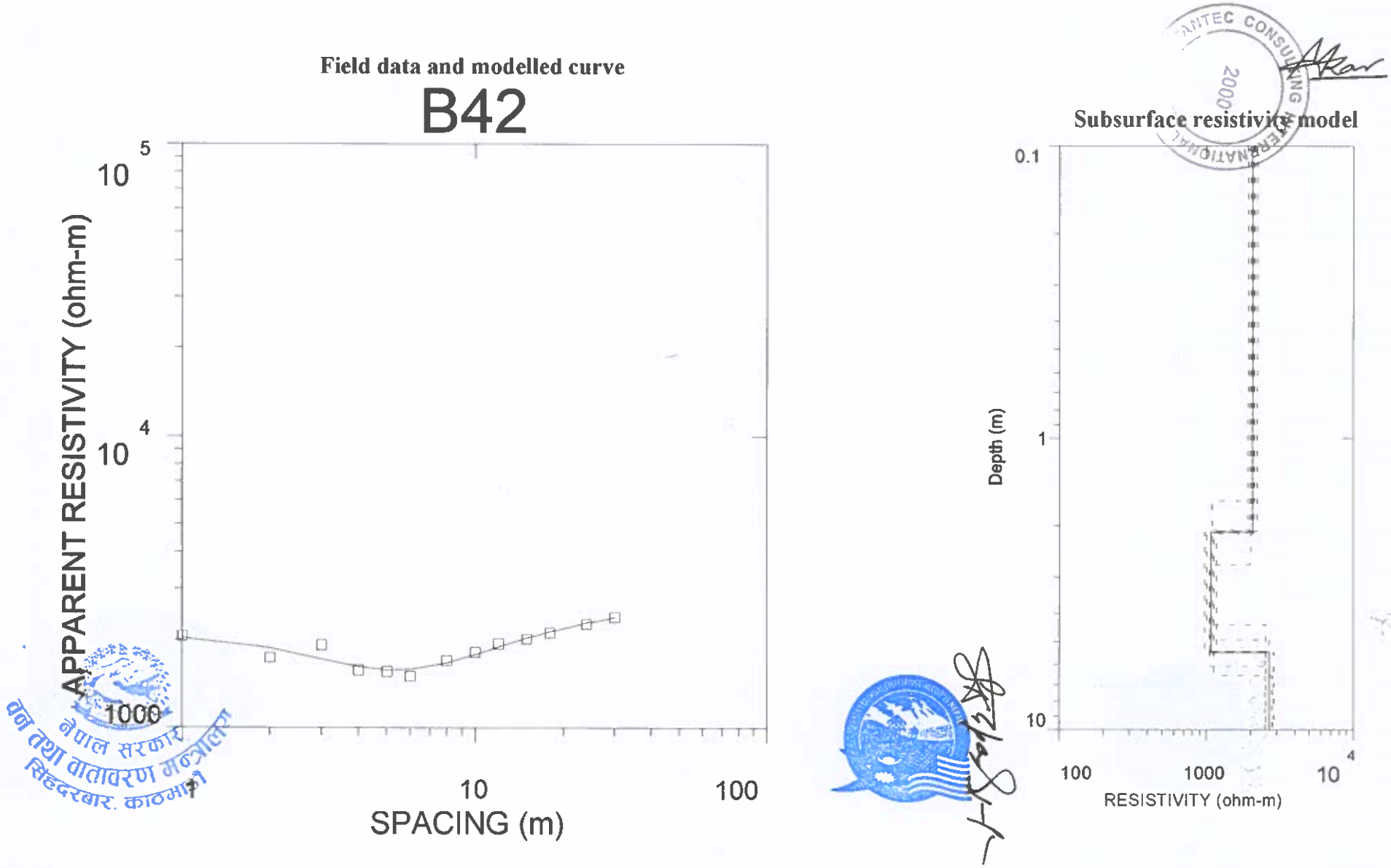


Figure 39. Modeling Results of Soil Resistivity Test (B43, Thuldanda)

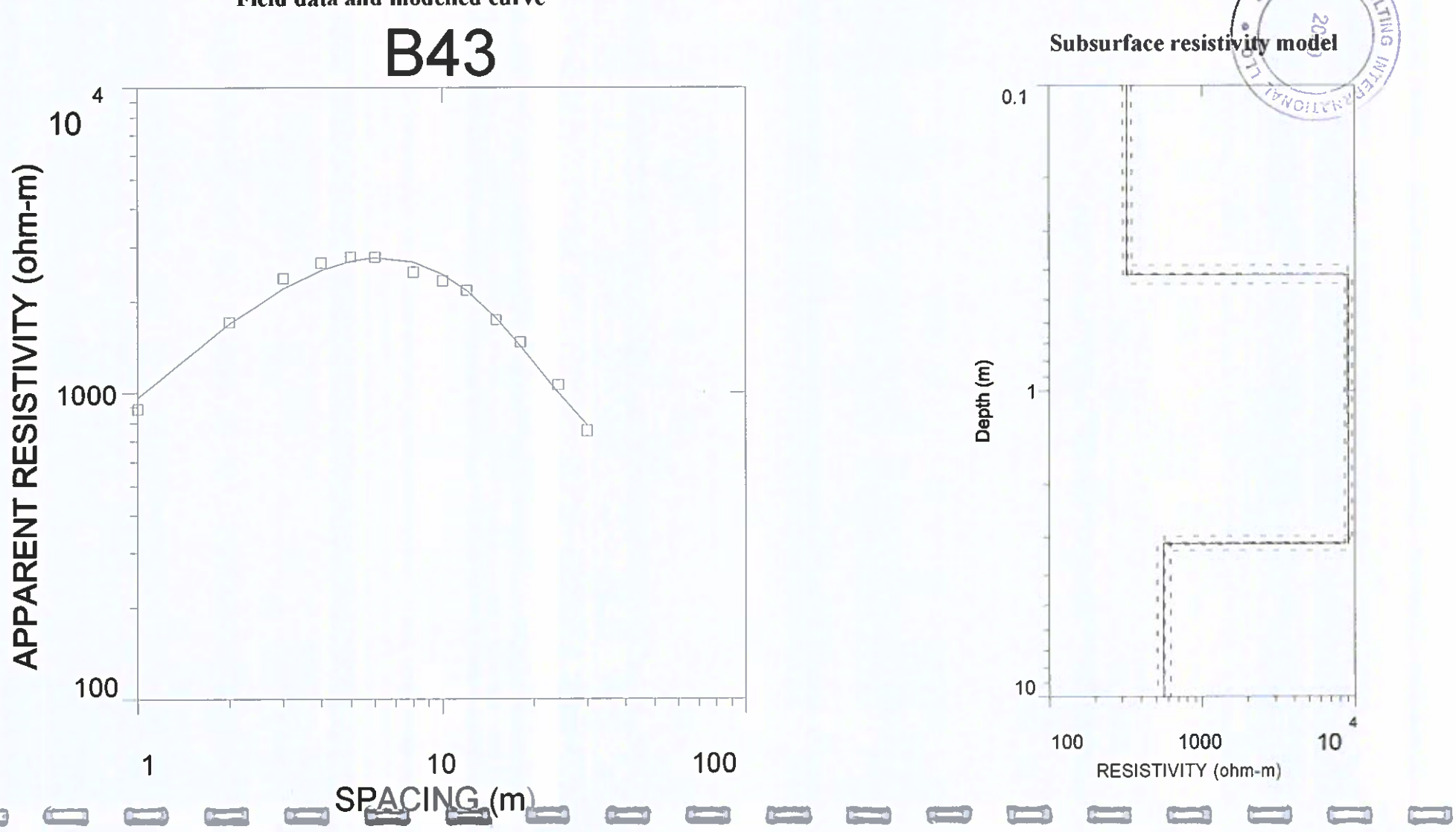


Figure 40. Modeling Results of Soil Resistivity Test (B44, Sunkhani)

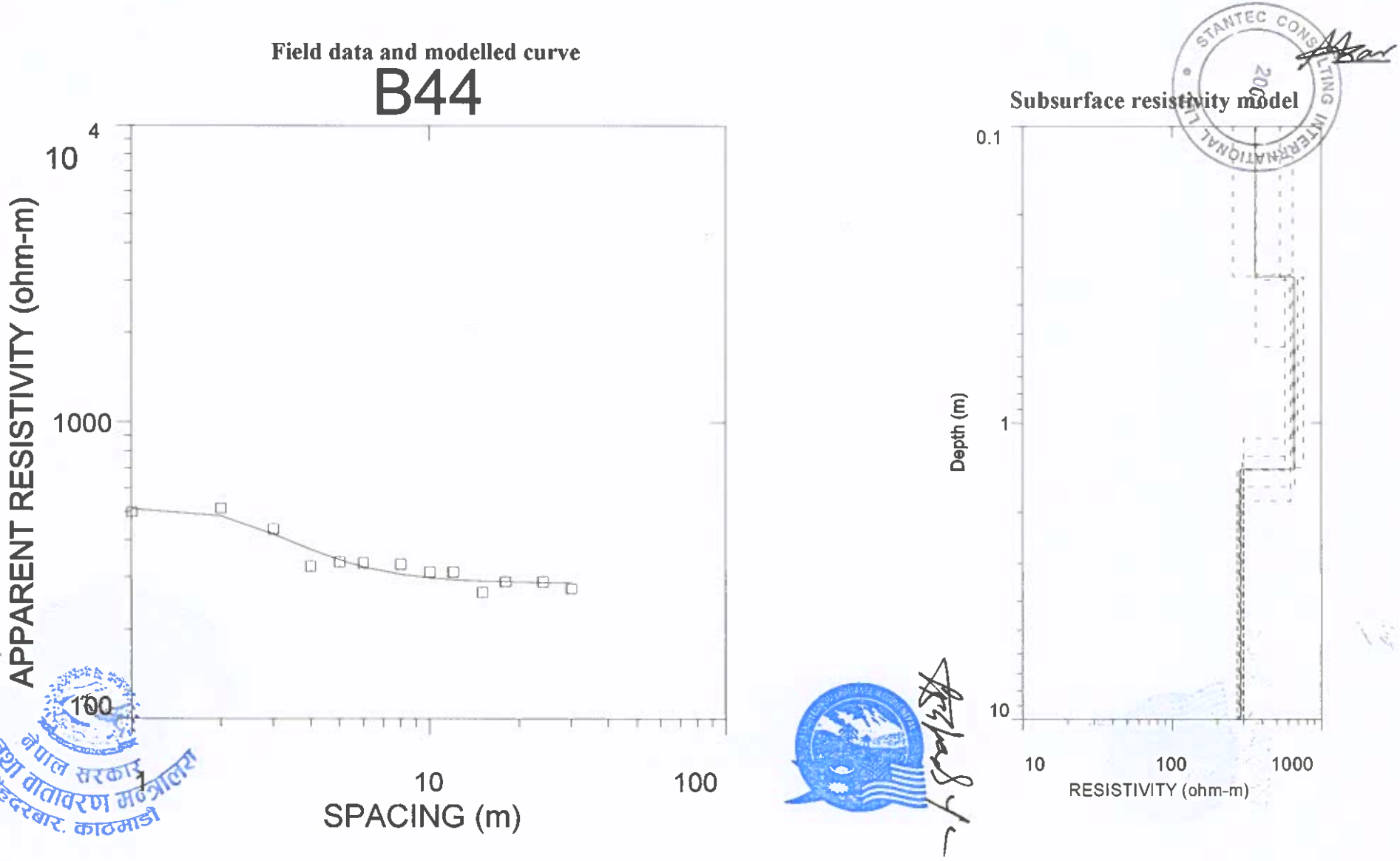


Figure 41. Modeling Results of Soil Resistivity Test (B45, Shilame)

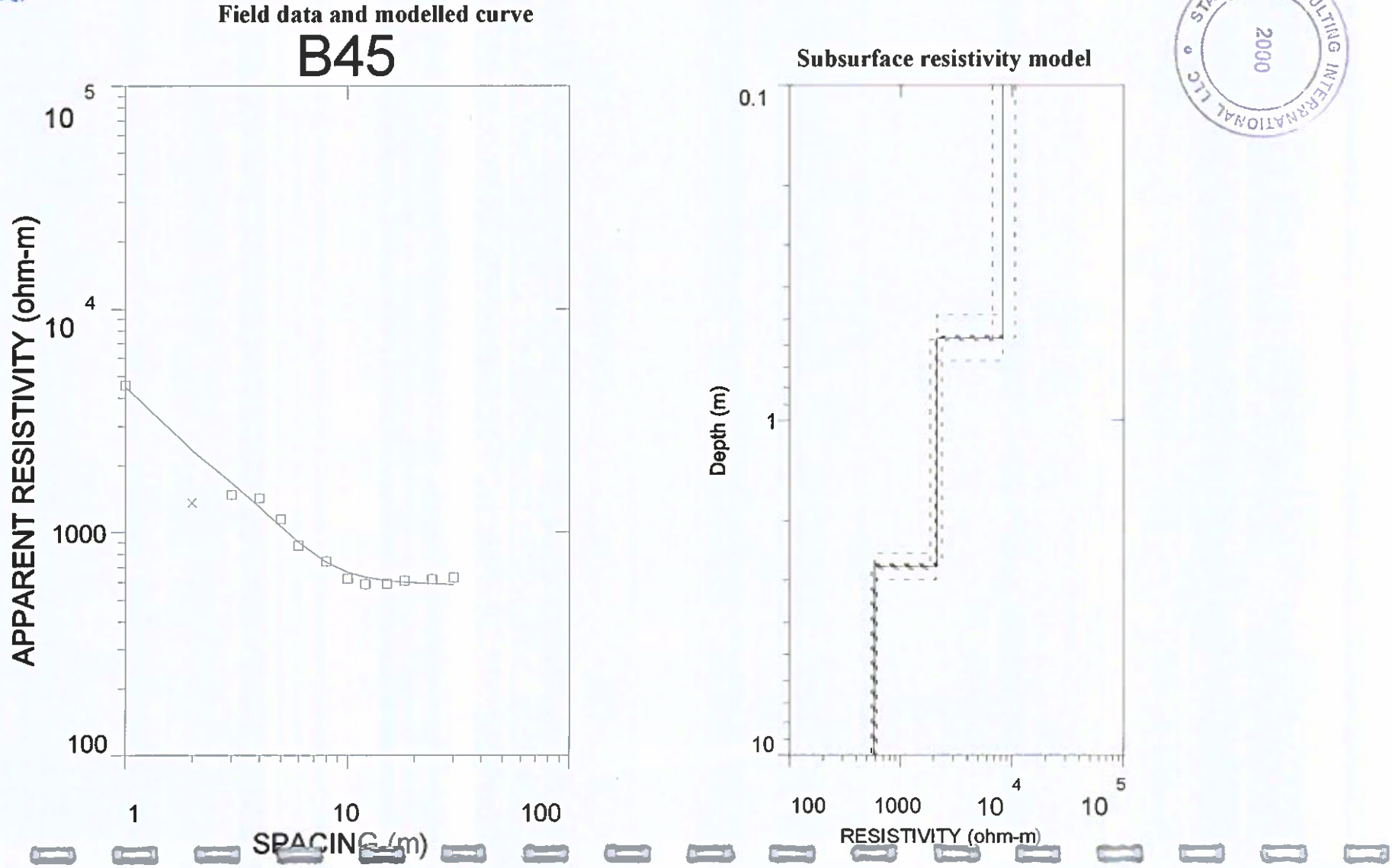


Figure 42. Modeling Results of Soil Resistivity Test (B46, Pipaldanda, Jyamire)

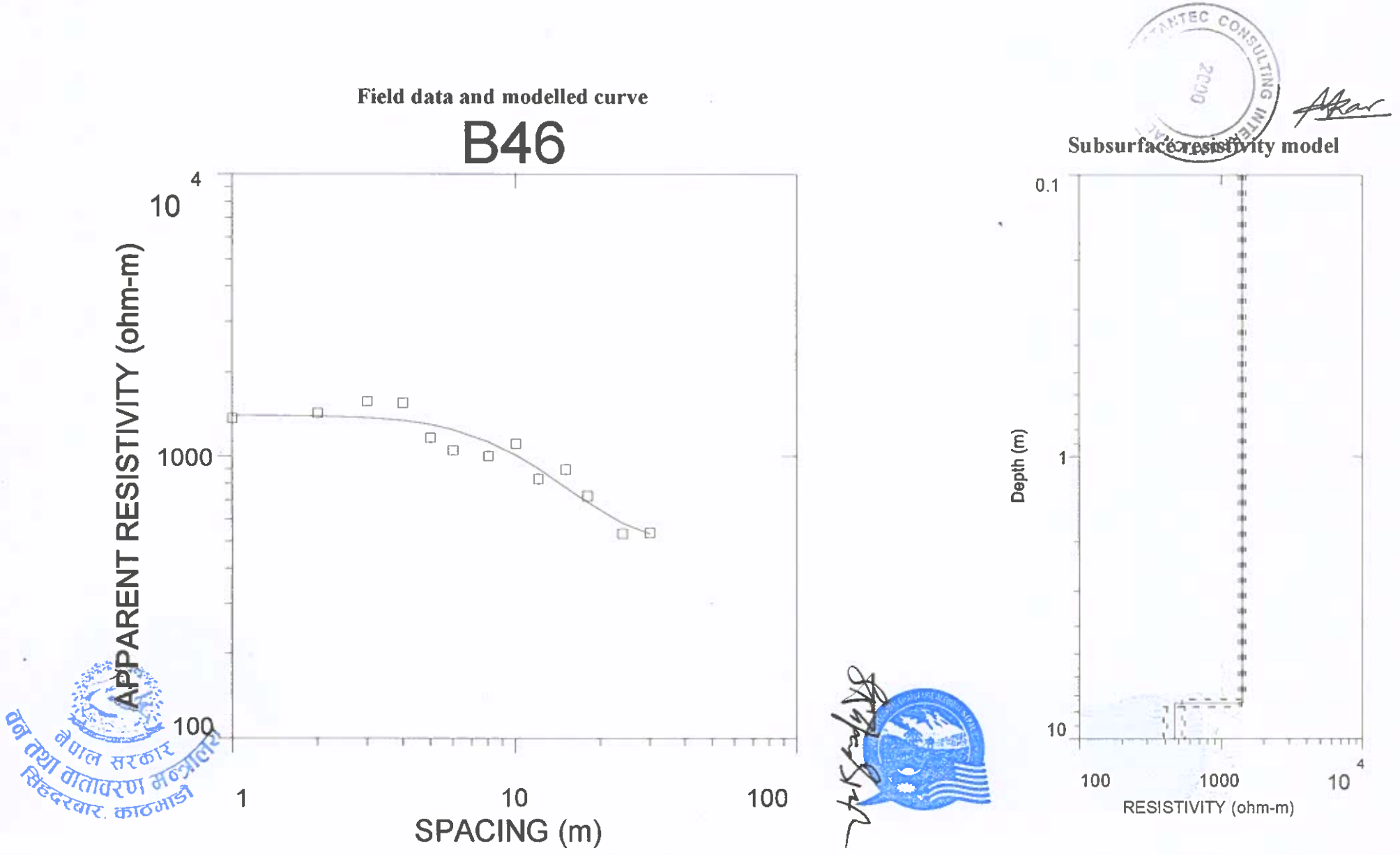


Figure 43. Modeling Results of Soil Resistivity Test (B47, Kauledovan)

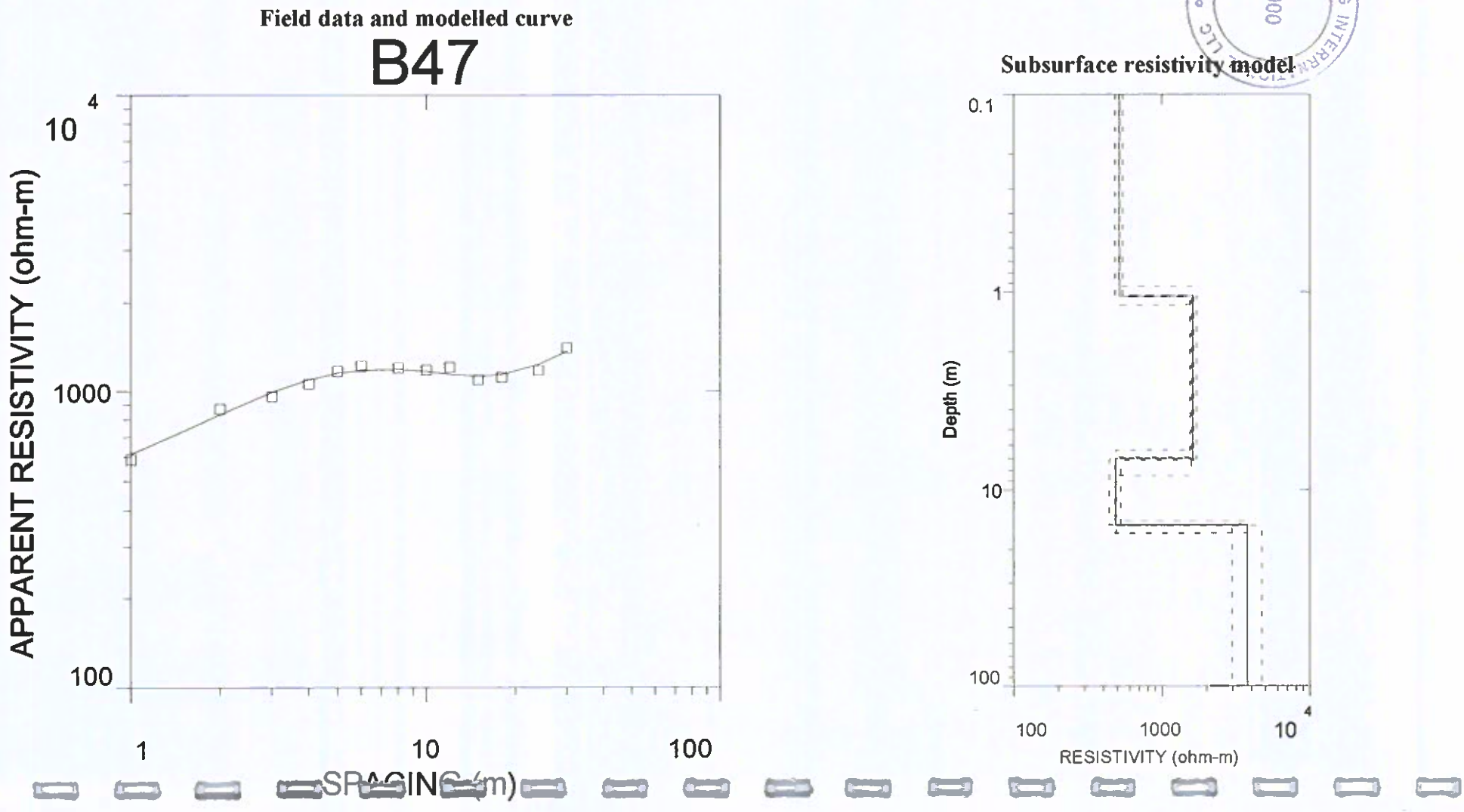


Figure 44. Modeling Results of Soil Resistivity Test (B48, Nangle)

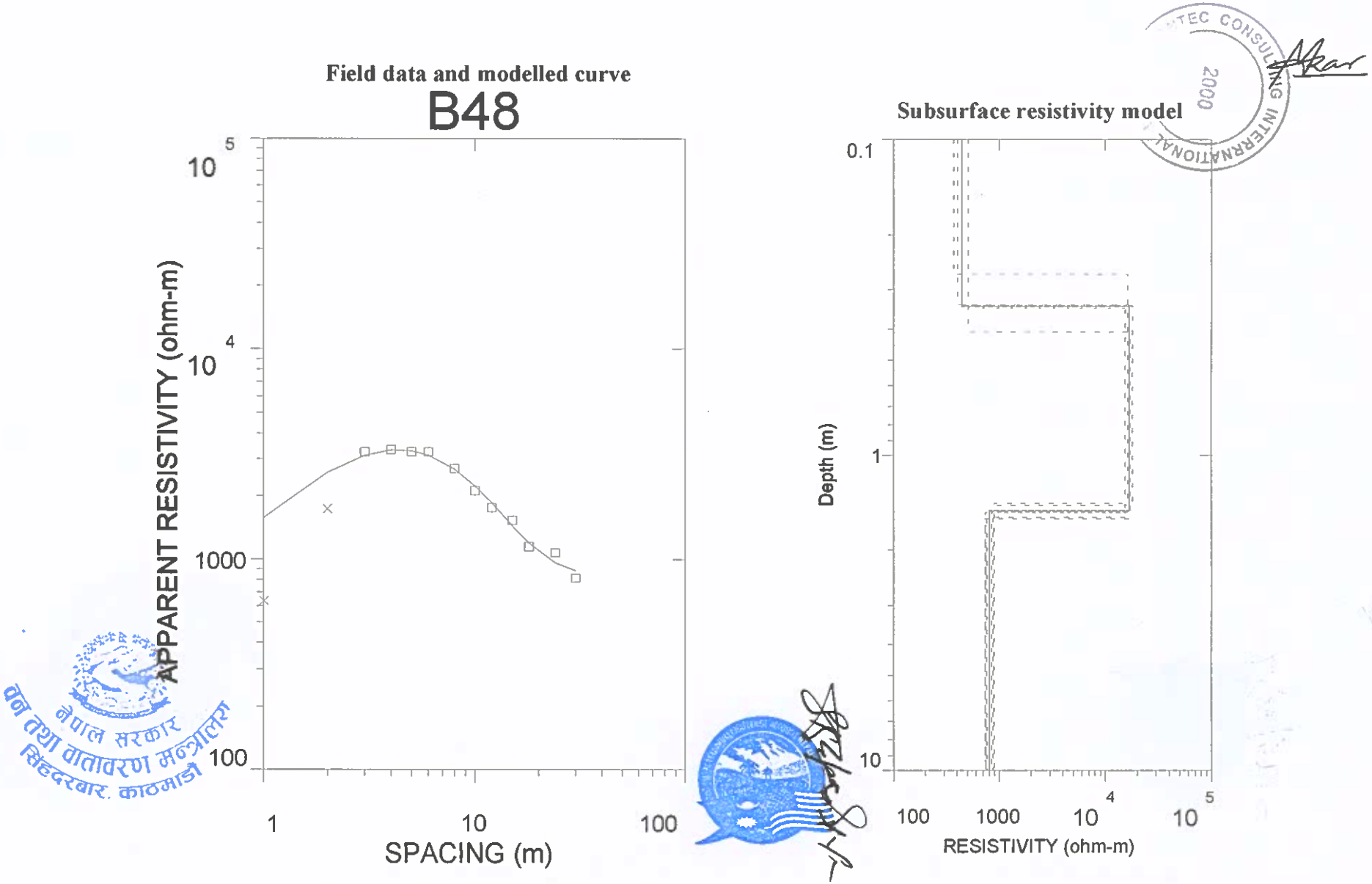
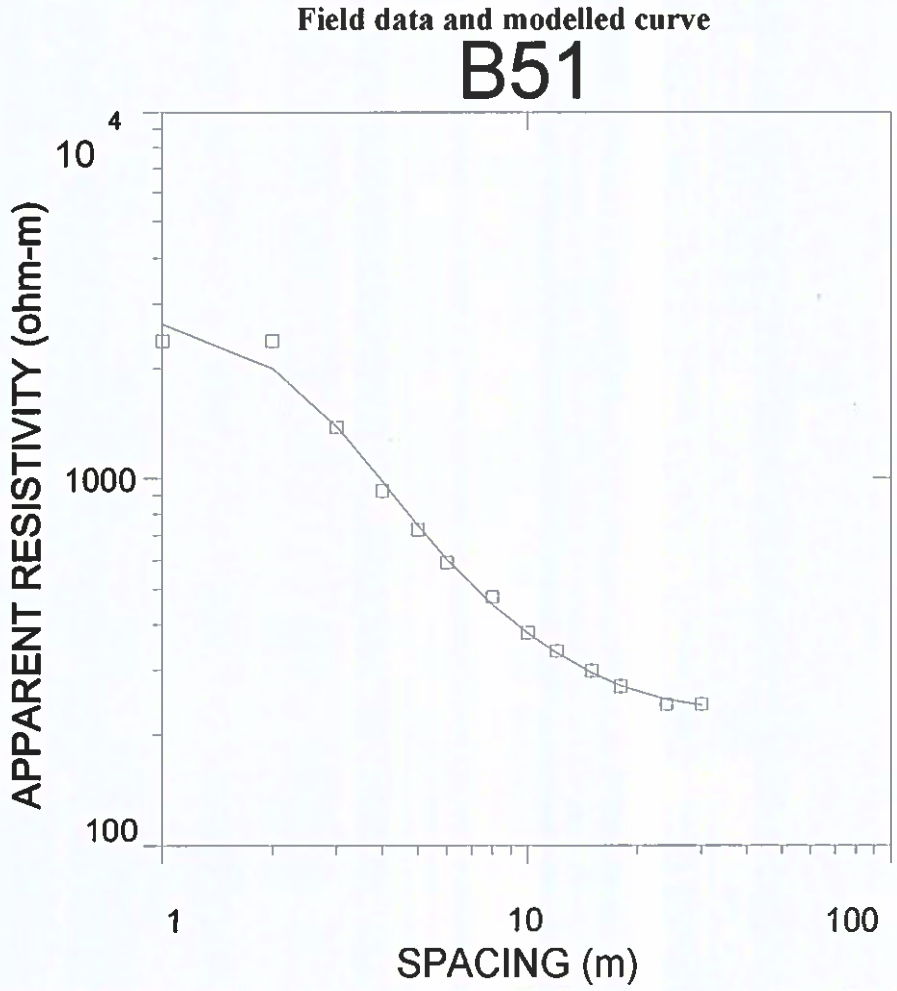


Figure 45. Modeling Results of Soil Resistivity Test (B51, Biruwa)



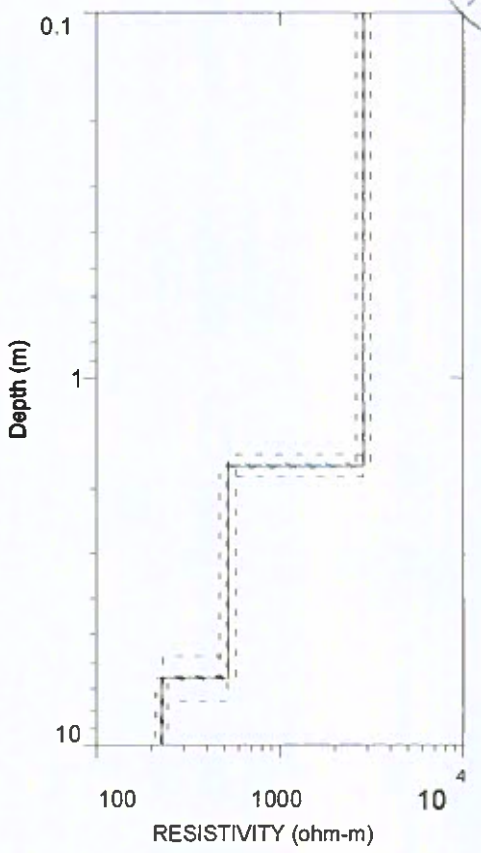


Figure 46. Modeling Results of Soil Resistivity Test (B52, Khaherghari)

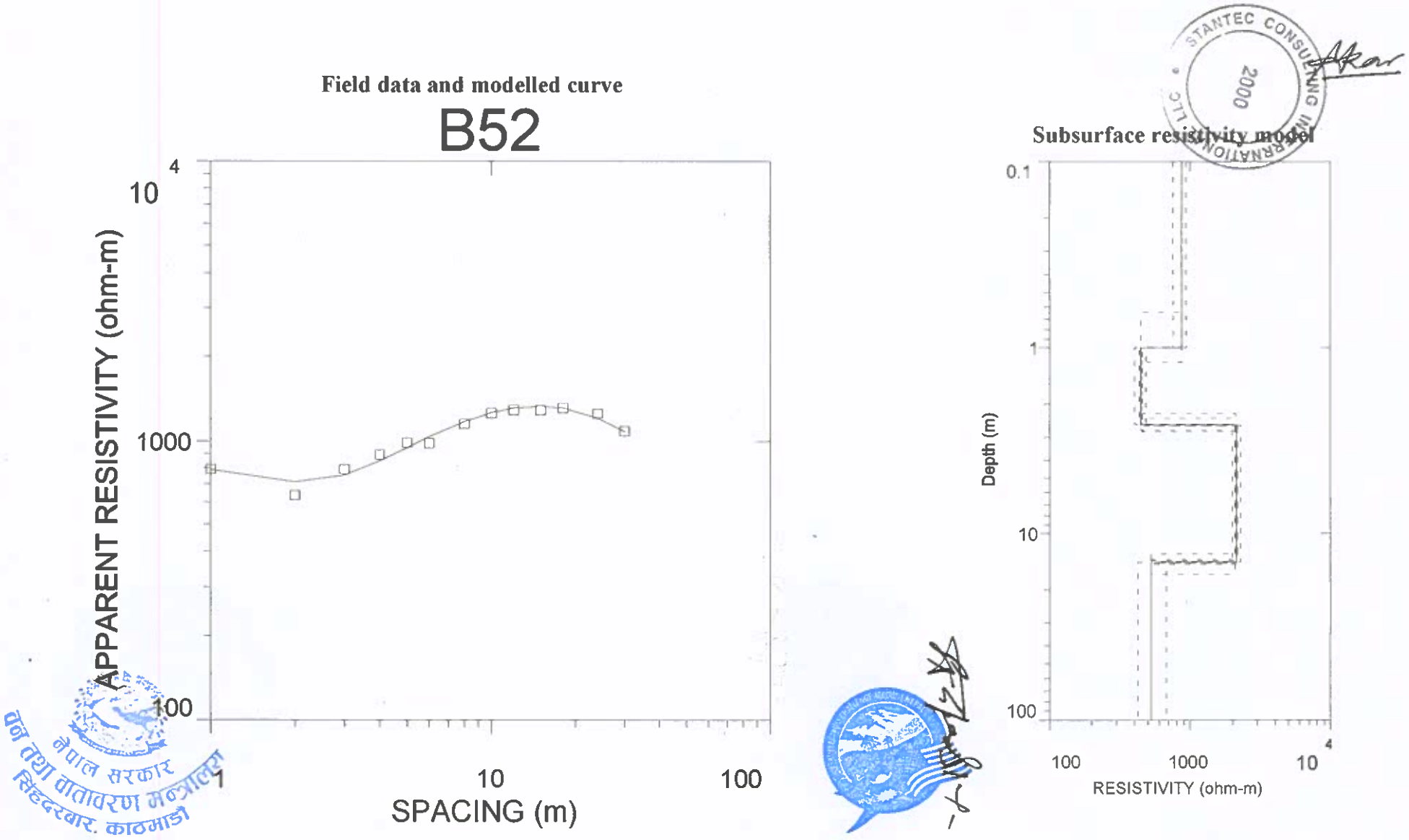


Figure 47. Modeling Results of Soil Resistivity Test (B53, Sulikhola)

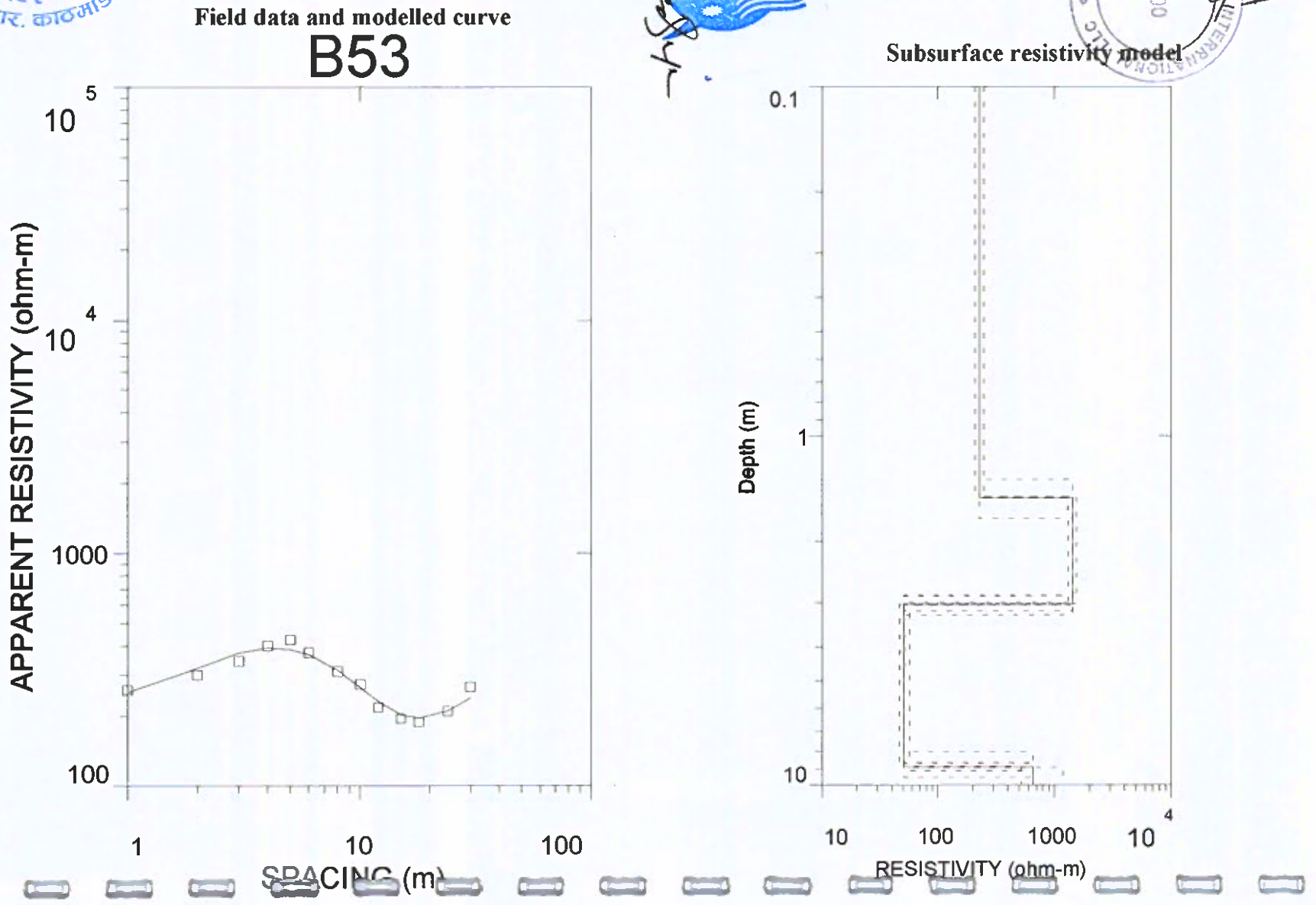


Figure 48. Modeling Results of Soil Resistivity Test (B54, Buddhachowk, Sunkali)

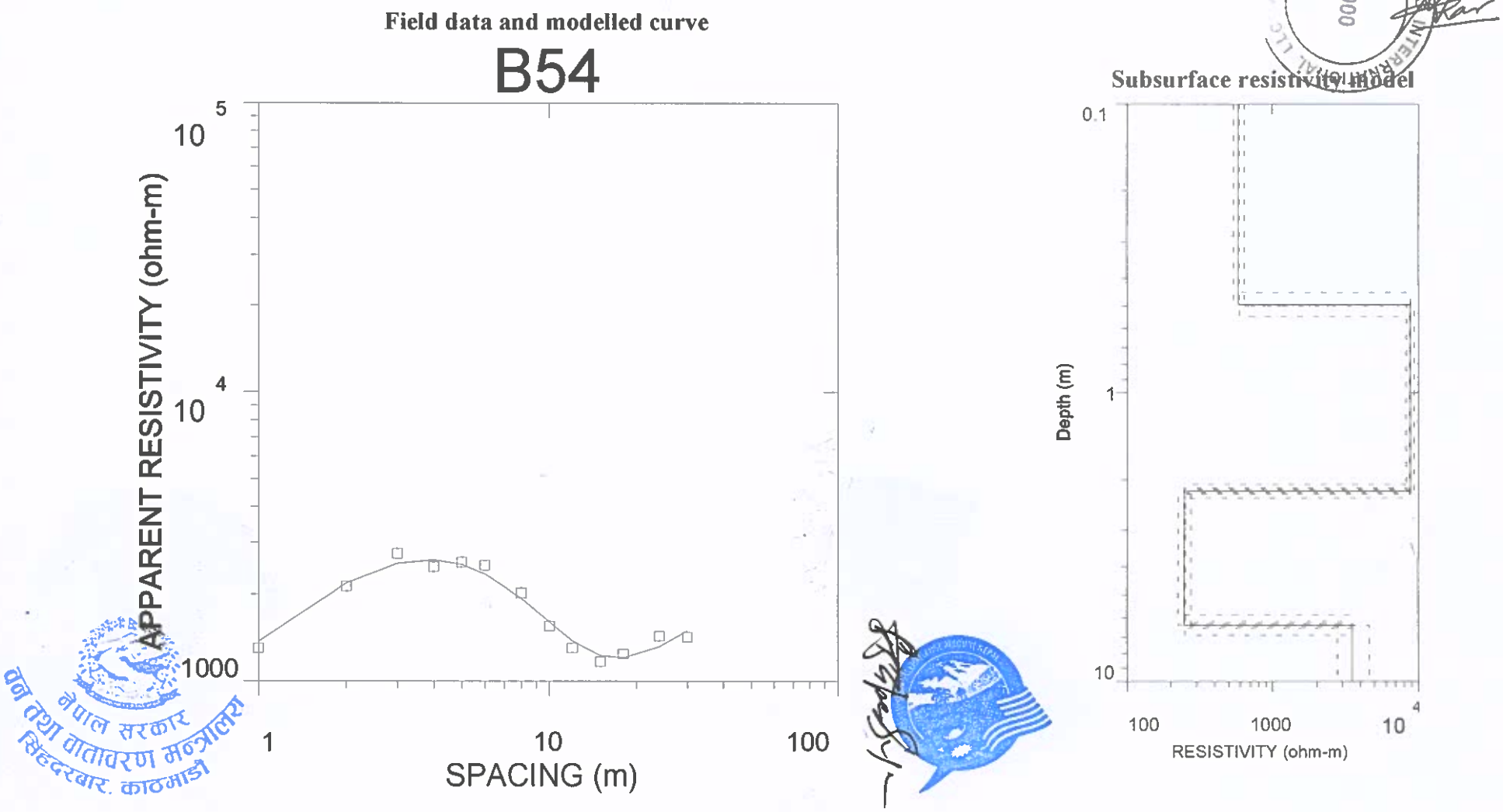


Figure 49. Modeling Results of Soil Resistivity Test (B55, Chaukitar, Gogane)

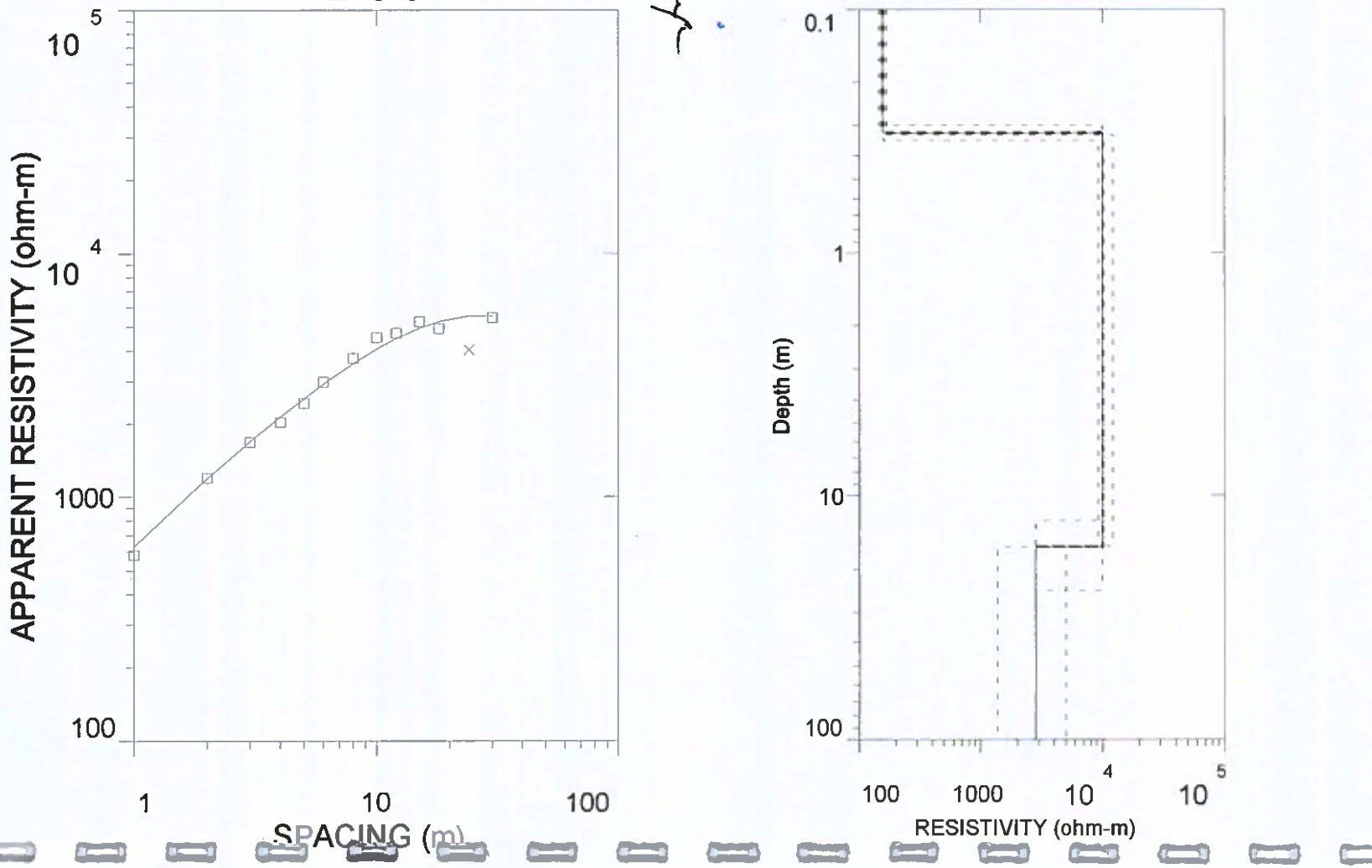


Figure 50. Modeling Results of Soil Resistivity Test (B56, Dirki, Near Kalikatar)

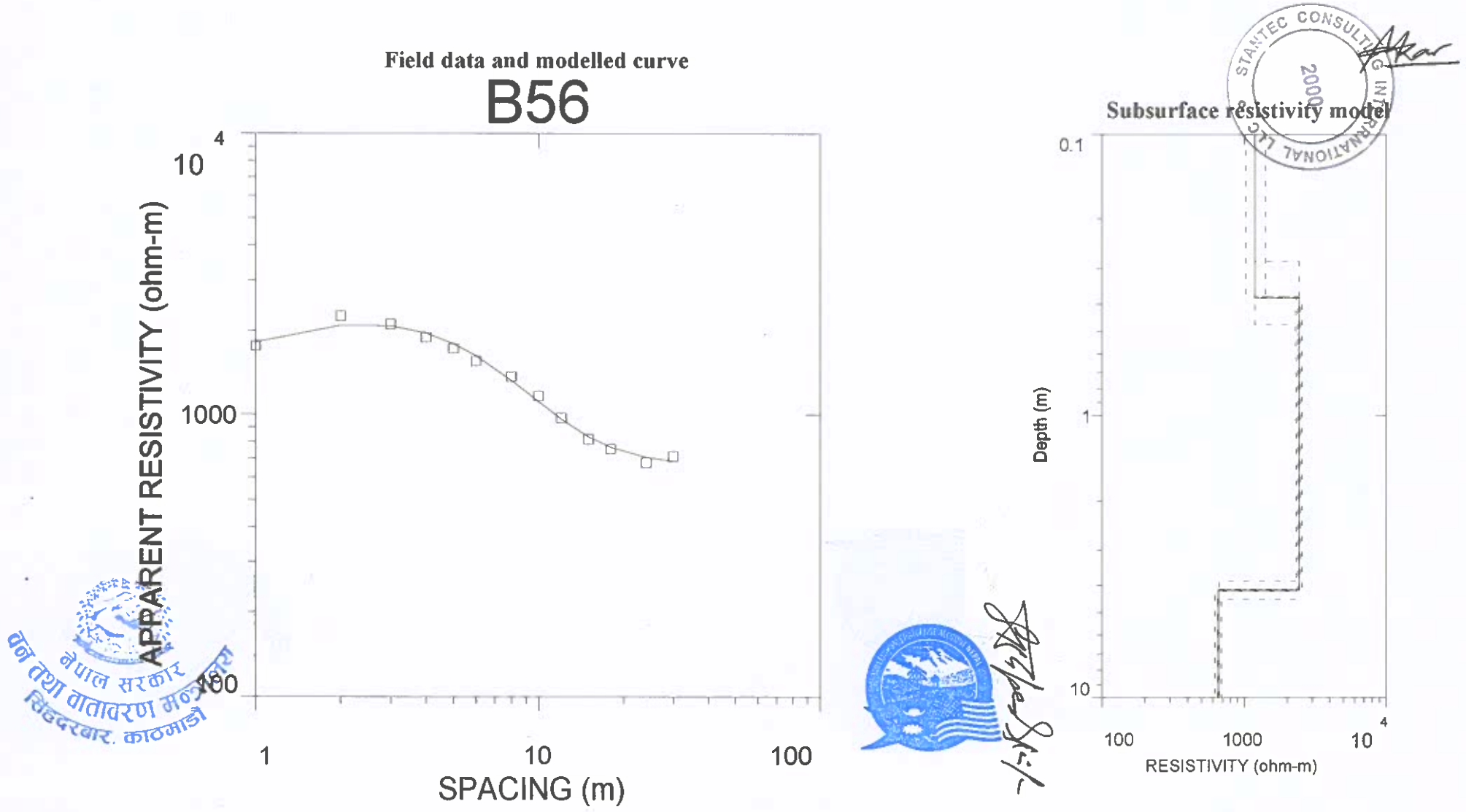


Figure 51. Modeling Results of Soil Resistivity Test (B57, Kuwapani, Forest Area)

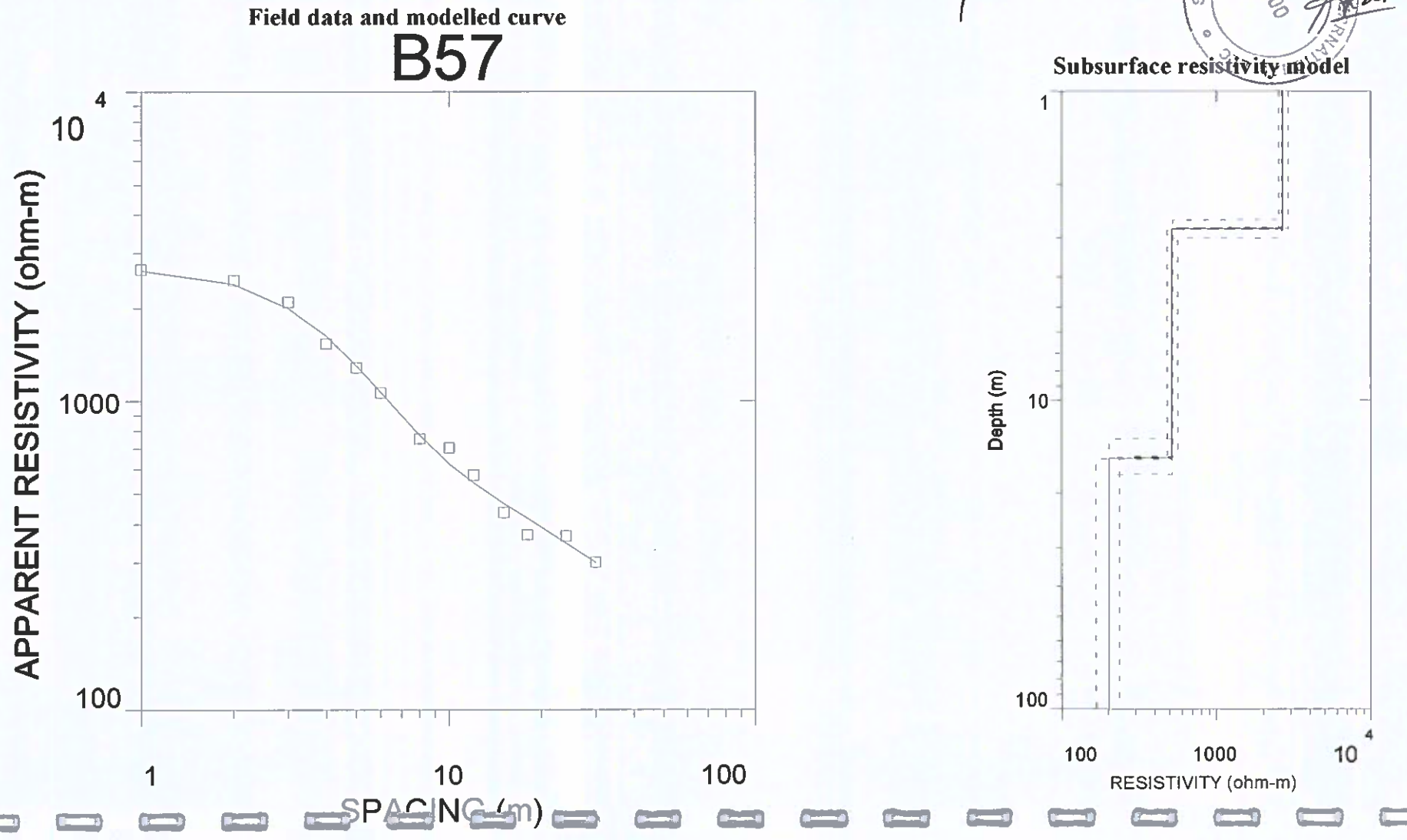
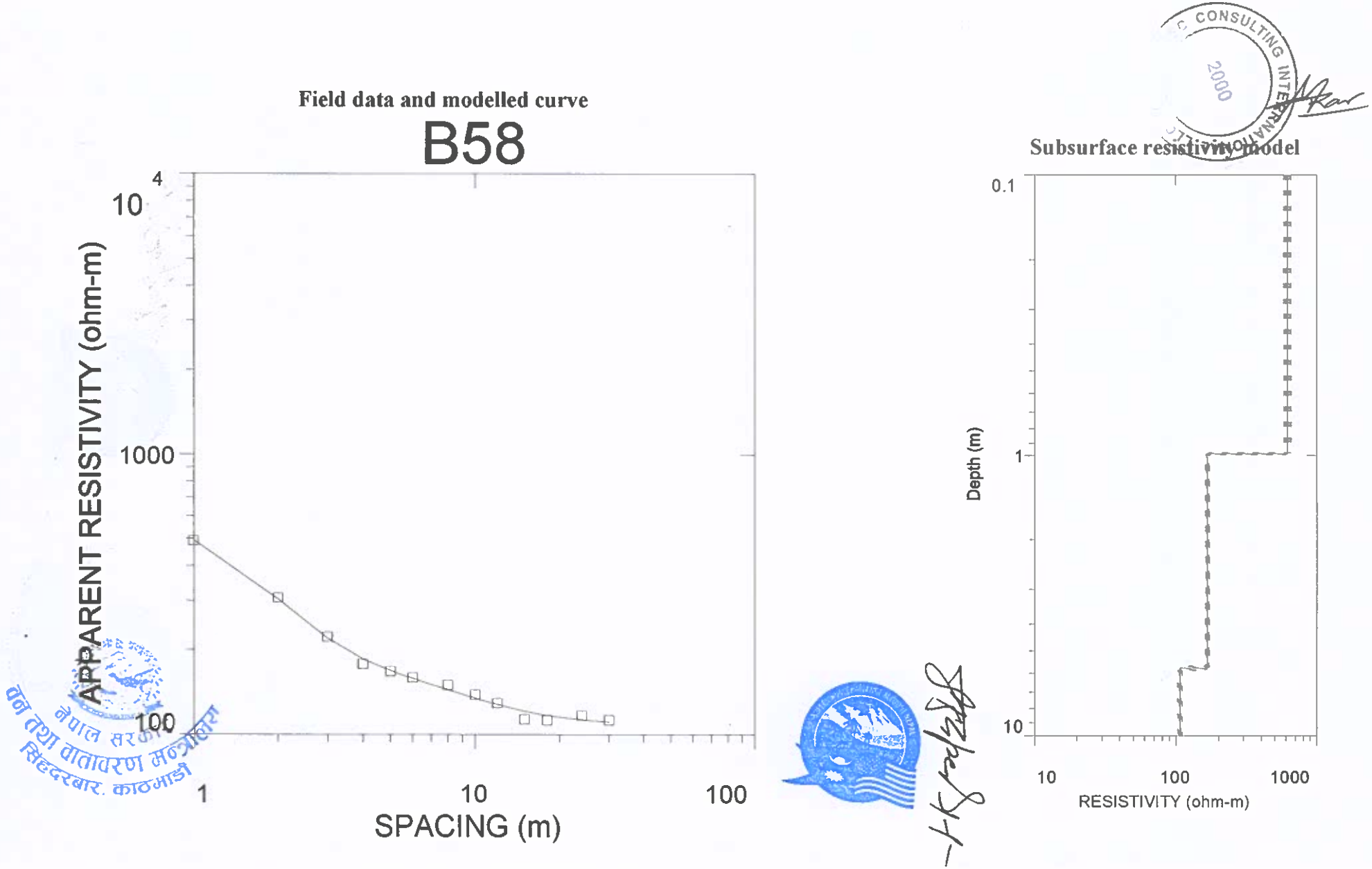


Figure 52. Modeling Results of Soil Resistivity Test (B58, Basamari)



Appendix C (Activity Photographs)

Preparation of profile for soil resistivity test at B1

Data acquisition in site B1

Dismantling of measurement setup in B1

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

STANTEC CONSULTING INTERNATIONAL LLC
2000

Preparation of profile for soil resistivity test at B2

Data acquisition in site B2

Dismantling of measurement setup in B2

STANTEC CONSULTING INTERNATIONAL LLC 2000

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

Preparation of profile for soil resistivity test at B3

Data acquisition in site B3

Dismantling of measurement setup in B3

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

STANTEC CONSULTING INTERNATIONAL LLC
2000

Preparation of profile for soil resistivity test at B4

Data acquisition in site B4

Dismantling of measurement setup in B4

STRATEC CONSULTING INTERNATIONAL LLC 2000

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

Preparation of profile for soil resistivity test at B5

Data acquisition in site B5

Dismantling of measurement setup in B5

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

STANTEC CONSULTING INTERNATIONAL LLC
2000

Preparation of profile for soil resistivity test at B6

Data acquisition in site B6

Dismantling of measurement setup in B6

STANTEC CONSULTING INTERNATIONAL LLC 2000

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

Preparation of profile for soil resistivity test at B7A

Data acquisition in site B7A

Dismantling of measurement setup in B7A

Preparation of profile for soil resistivity test at B7B

Data acquisition in site B7B

Dismantling of measurement setup in B7B

Preparation of profile for soil resistivity test at B8A

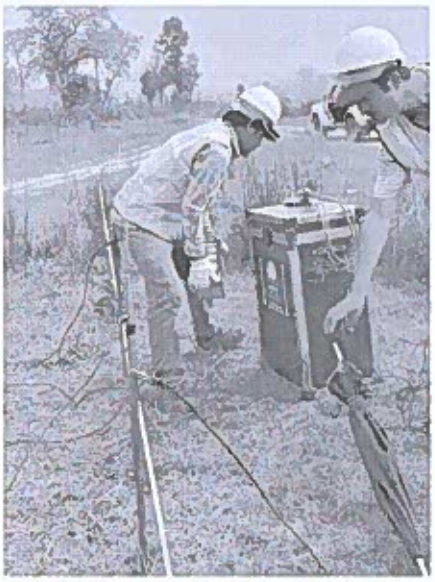
Data acquisition in site B8A

Dismantling of measurement setup in B8A

Preparation of profile for soil resistivity test at B8B

Data acquisition in site B8B

Dismantling of measurement setup in B8B



Preparation of profile for soil resistivity test at B9

Data acquisition in site B9

Dismantling of measurement setup in B9

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सिंहदरबार, काठमाडौं

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Preparation of profile for soil resistivity test at B10

Data acquisition in site B10

Dismantling of measurement setup in B10

Preparation of profile for soil resistivity test at B11

Data acquisition in site B11

Dismantling of measurement setup in B11

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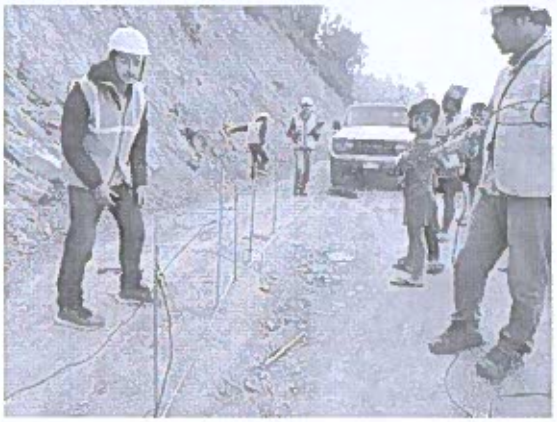
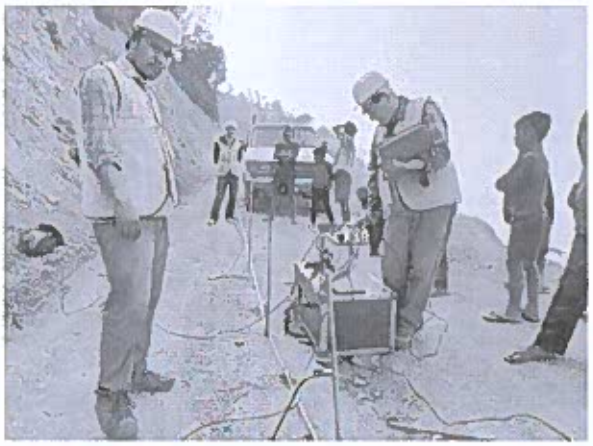
Preparation of profile for soil resistivity test at B12

Data acquisition in site B12

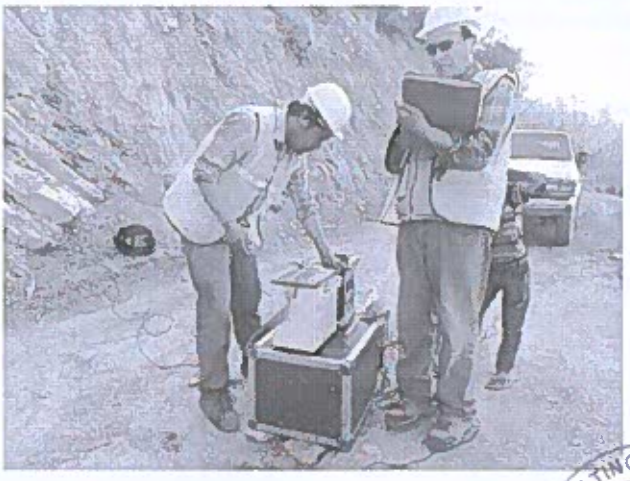
Dismantling of measurement setup in B12



Preparation of profile for soil resistivity test at B13



Data acquisition in site B13



Dismantling of measurement setup in B13

Preparation of profile for soil resistivity test at B14

Data acquisition in site B14

Dismantling of measurement setup in B14

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Preparation of profile for soil resistivity test at B15

Data acquisition in site B15

Dismantling of measurement setup in B15

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सिंहदरबार, काठमाडौं

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Preparation of profile for soil resistivity test at B16

Data acquisition in site B16

Dismantling of measurement setup in B16

Preparation of profile for soil resistivity test at B17

Data acquisition in site B17

Dismantling of measurement setup in B17

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सिंहदरबार, काठमाडौं

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2000

Preparation of profile for soil resistivity test at B18

Data acquisition in site B18

Dismantling of measurement setup in B18

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

Preparation of profile for soil resistivity test at B19

Data acquisition in site B19

Dismantling of measurement setup in B19

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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

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Preparation of profile for soil resistivity test at B20

Data acquisition in site B20

Dismantling of measurement setup in B20

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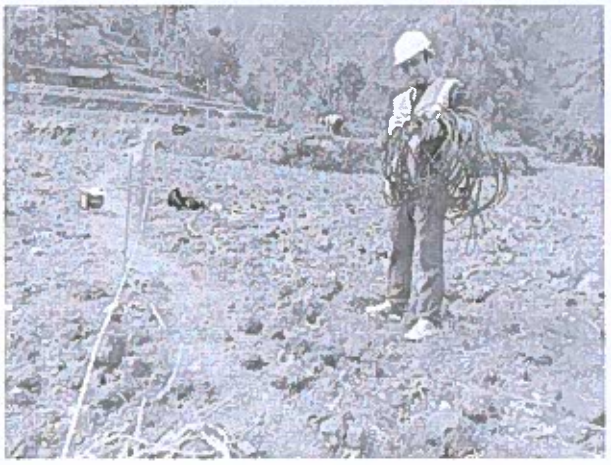
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं



Preparation of profile for soil resistivity test at B21

Data acquisition in site B21

Dismantling of measurement setup in B21

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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

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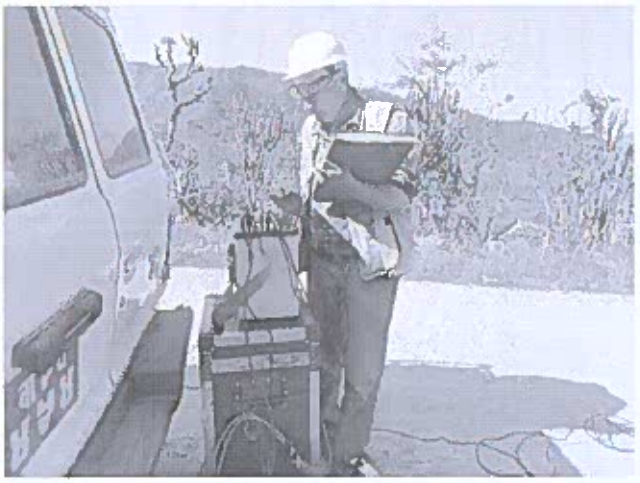
Preparation of profile for soil resistivity test at B22

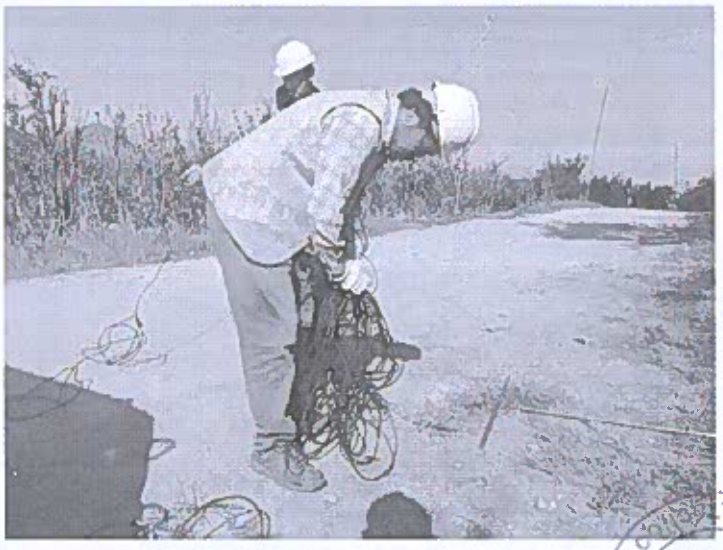
Data acquisition in site B22

Dismantling of measurement setup in B22

Preparation of profile for soil resistivity test at B25



Data acquisition in site B25



Dismantling of measurement setup in B25

Preparation of profile for soil resistivity test at B26

Data acquisition in site B26

Dismantling of measurement setup in B26

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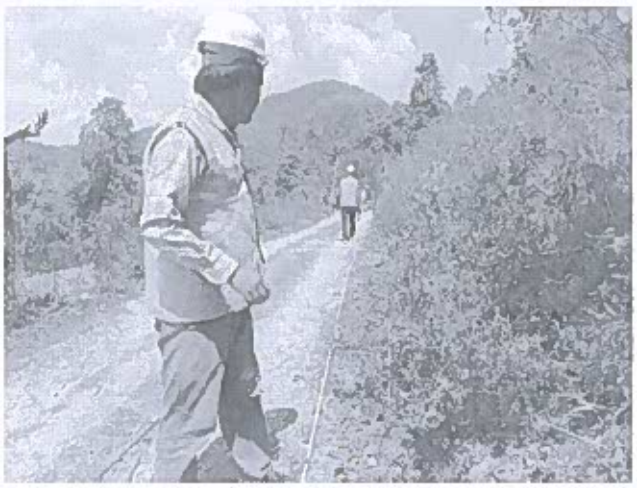
Preparation of profile for soil resistivity test at B27

Data acquisition in site B27

Dismantling of measurement setup in B27

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

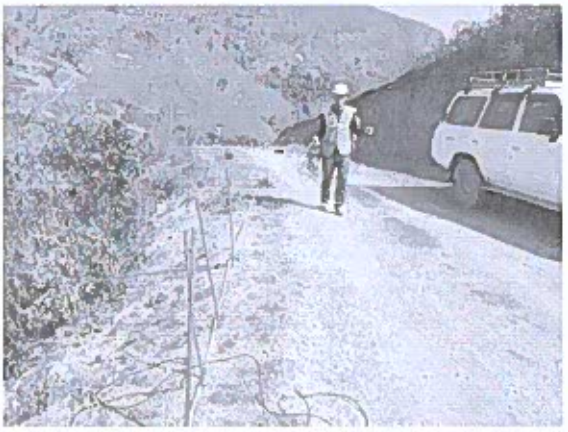
STANTEC CONSULTING INTERNATIONAL
2000



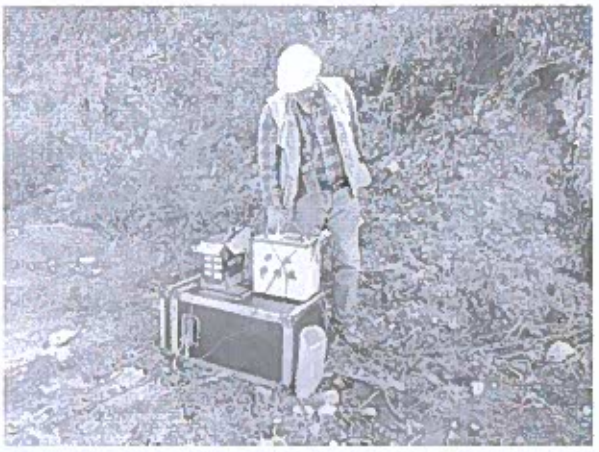
Preparation of profile for soil resistivity test at B28

Data acquisition in site B28

Dismantling of measurement setup in B28



Preparation of profile for soil resistivity test at B29



Data acquisition in site B29

Dismantling of measurement setup in B29

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सिंहदरबार, काठमाडौं

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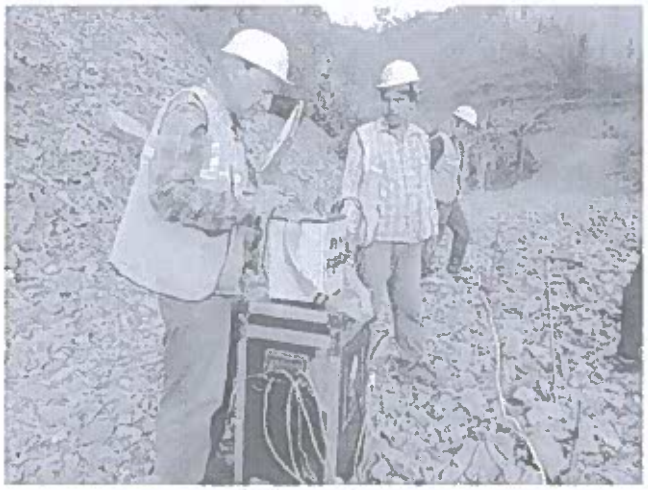
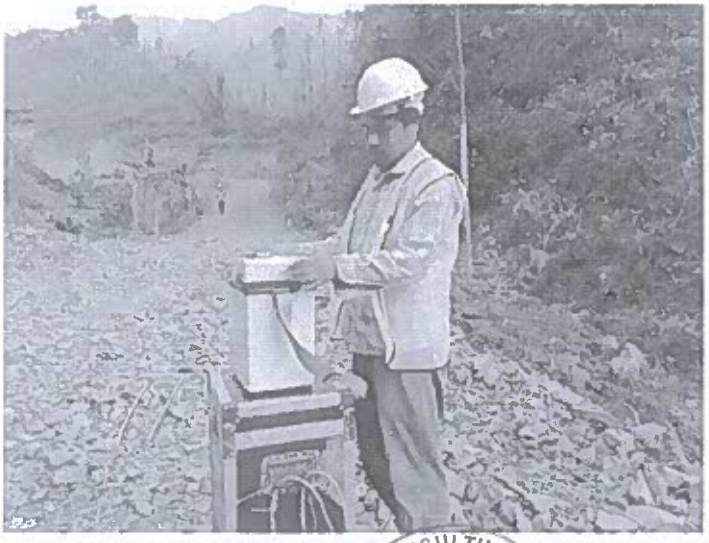
Preparation of profile for soil resistivity test at B30

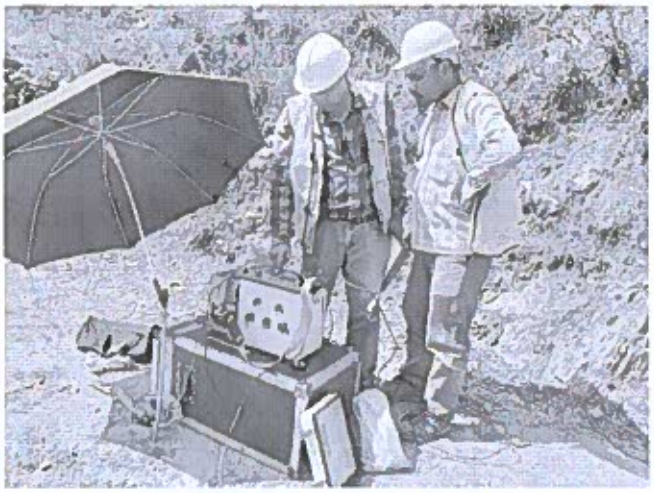


Data acquisition in site B30

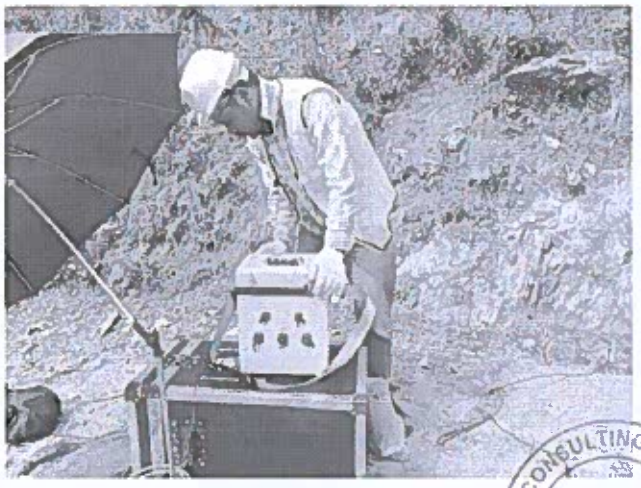


Dismantling of measurement setup in B30

Preparation of profile for soil resistivity test at B31



Data acquisition in site B31



Dismantling of measurement setup in B31

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सिंहदरबार, काठमाडौं

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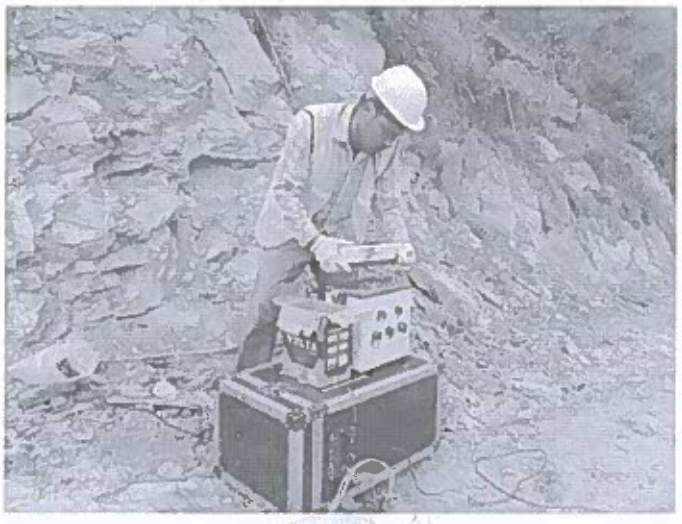
Preparation of profile for soil resistivity test at B32

Data acquisition in site B32



Dismantling of measurements setup in B32

Preparation of profile for soil resistivity test at B33

Data acquisition in site B33

Dismantling of measurement setup in B33

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सिंहदरबार, काठमाडौं

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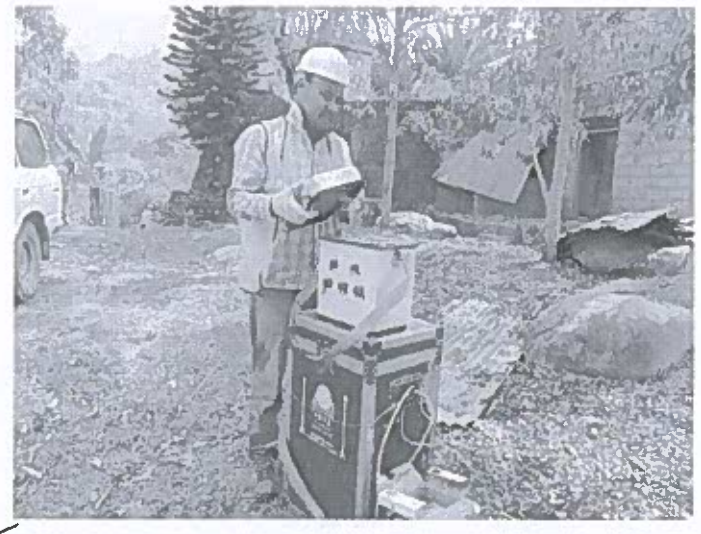
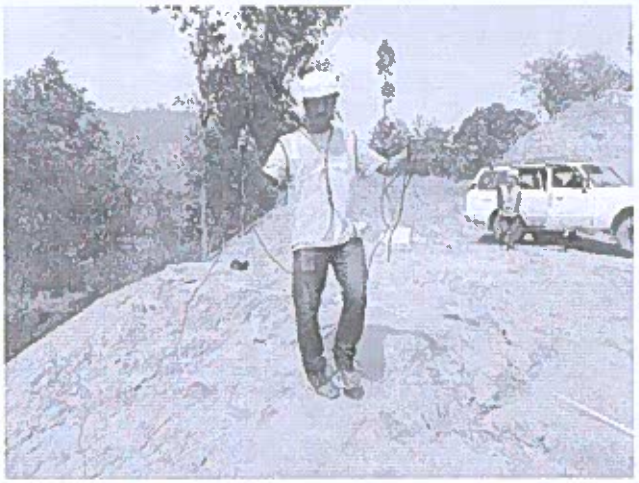
Preparation of profile for soil resistivity test at B34

Data acquisition in site B34

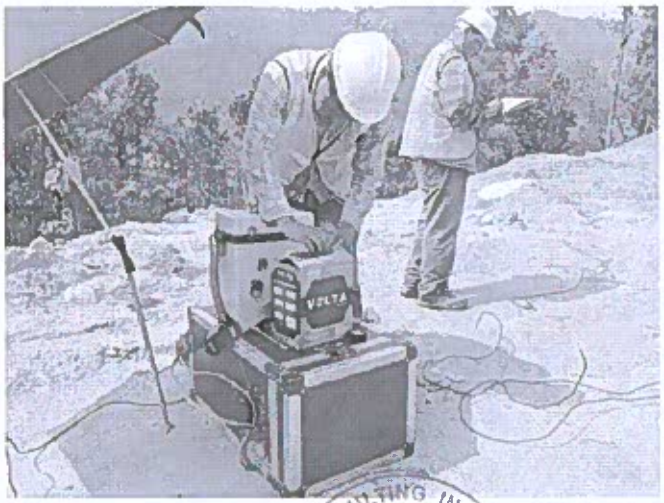


Dismantling of measurement setup in B34



Preparation of profile for soil resistivity test at B35

Data acquisition in site B35



Dismantling of measurement setup in B35

Preparation of profile for soil resistivity test at B36

Data acquisition in site B36

Dismantling of measurement setup in B36

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सिंहदरबार, काठमाडौं

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Preparation of profile for soil resistivity test at B37

Data acquisition in site B37

Dismantling of measurement setup in B37

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सिंहदरबार, काठमाडौं

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Preparation of profile for soil resistivity test at B40

Data acquisition in site B40

Dismantling of measurement setup in B40

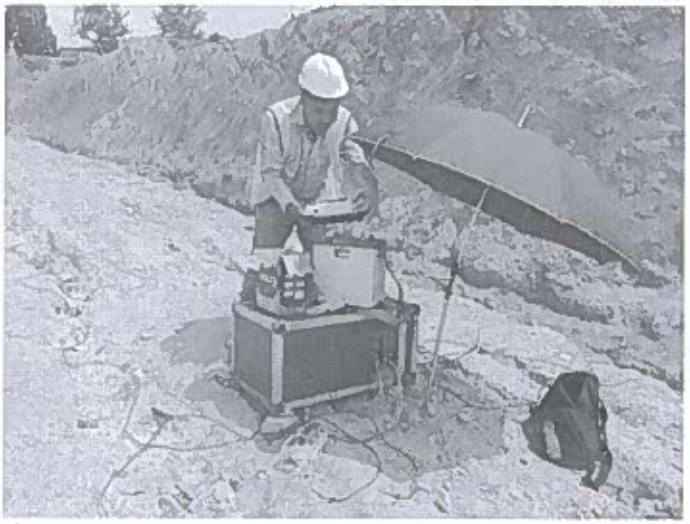
Preparation of profile for soil resistivity test at B41

Data acquisition in site B41

Dismantling of measurement setup in B41

Preparation of profile for soil resistivity test at B42

Data acquisition in site B42



Dismantling of measurement setup in B42

Preparation of profile for soil resistivity test at B43

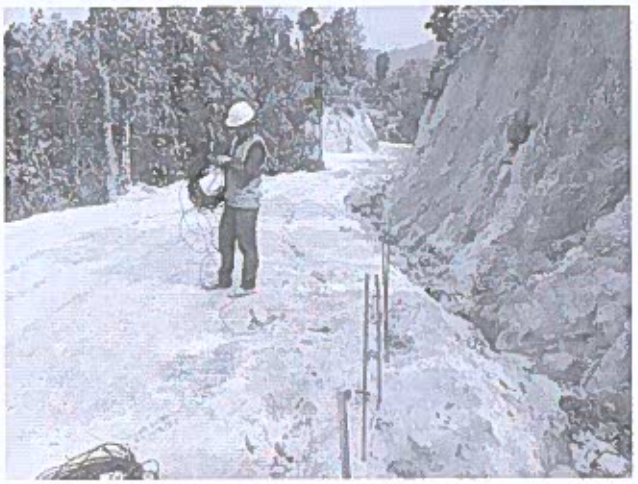
Data acquisition in site B43

Dismantling of measurement setup in B43

Preparation of profile for soil resistivity test at 44

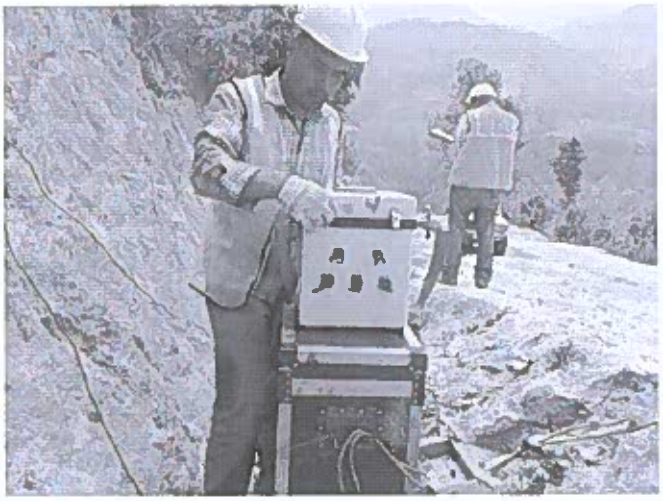
Data acquisition in site B44

Dismantling of measurement setup in B44



Preparation of profile for soil resistivity test at B45

Data acquisition in site B45



Dismantling of measurement setup in B45

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सिंहदरबार, काठमाडौं

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Preparation of profile for soil resistivity test at B46

Data acquisition in site B46

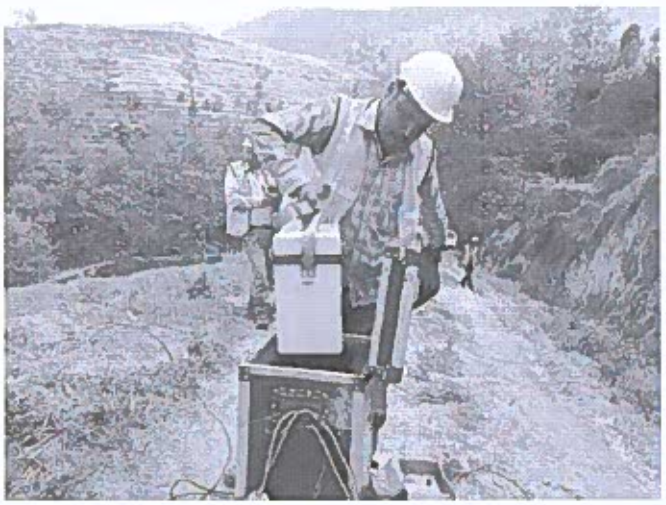
Dismantling of measurement setup in B46

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

STATTEC CONSULTING INTERNATIONAL LLC
2000

Preparation of profile for soil resistivity test at B47

Data acquisition in site B47



Dismantling of measurement setup in B47

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सिंहदरबार, काठमाडौं

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Preparation of profile for soil resistivity test at B48

Data acquisition in site B48

Dismantling of measurement setup in B48

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

SINTEC CONSULTING INTERNATIONAL LLC
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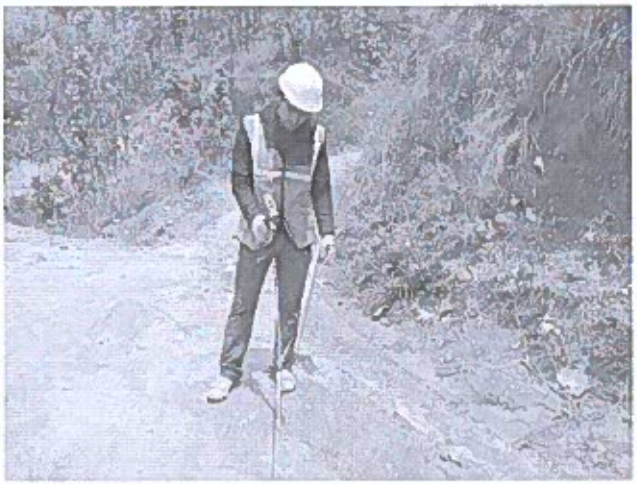
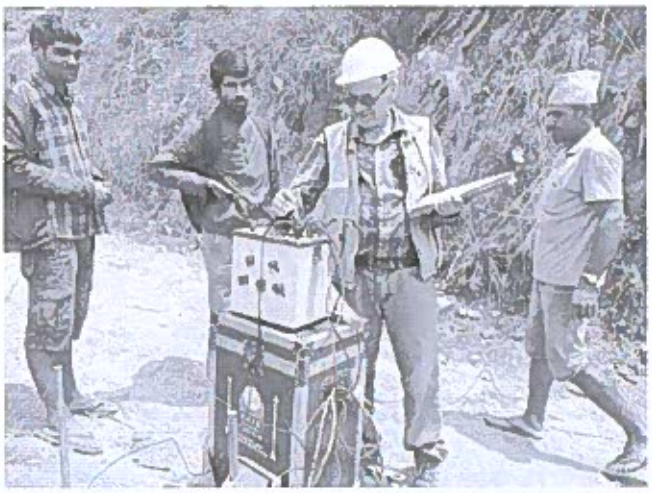
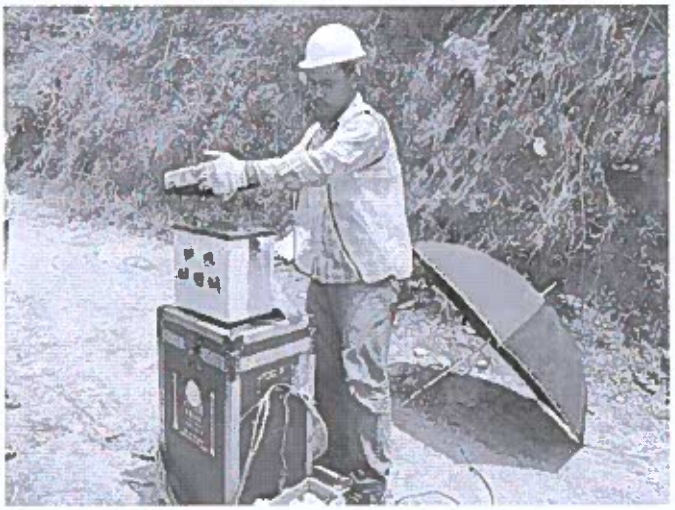


Preparation of profile for soil resistivity test at B51



Data acquisition in site B51



Dismantling of measurement setup in B51

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

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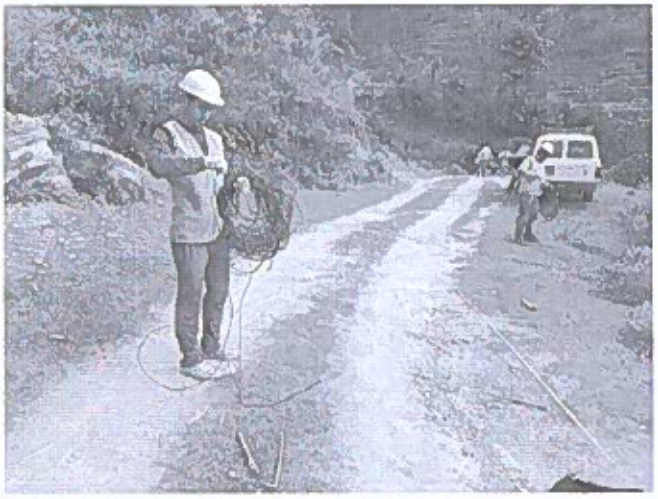
Preparation of profile for soil resistivity test at B52

Data acquisition in site B52

Dismantling of measurement setup in B52

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

STUP CONSULTING INTERNATIONAL LLC
2000



Preparation of profile for soil resistivity test at B53

Data acquisition in site B53

Dismantling of measurement setup in B53

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

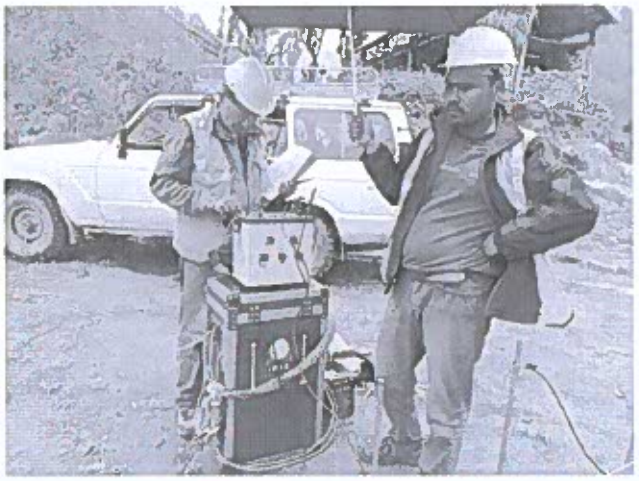
STANTEC CONSULTING INTERNATIONAL LLC
2000

Preparation of profile for soil resistivity test at B54

Data acquisition in site B54

Dismantling of measurement setup in B54

Preparation of profile for soil resistivity test at B55



Data acquisition in site B55

Dismantling of measurement setup in B55

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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

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2000

Preparation of profile for soil resistivity test at B56

Data acquisition in site B56

Dismantling of measurement setup in B56

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वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

ANTEC CONSULTING INTERNATIONAL LLC
2000

Preparation of profile for soil resistivity test at B57

Data acquisition in site B57

Dismantling of measurement setup in B57

Preparation of profile for soil resistivity test at B58

Data acquisition in site B58

Dismantling of measurement setup in B58

ANNEX E

Data Sheet of ERT and Activity Photographs

Table. Resistivity values after inversion of ERT-1

Distance	Elevation	Resistivity	Conductivity
3	484.643	122.76	0.008146
5	484.734	116.85	0.008558
7	484.824	137.6	0.007267
9	484.912	146.69	0.006817
11	484.998	141.02	0.007091
13	485.083	315.03	0.003174
15	485.167	188.45	0.005306
17	485.25	67.727	0.0148
19	485.332	94.841	0.0105
21	485.413	92.248	0.0108
23	485.493	150.06	0.006664
25	485.573	151.7	0.006592
27	485.652	281.85	0.003548
29	485.788	242.43	0.004125
31	485.98	316.94	0.003155
33	486.172	343.86	0.002908
35	486.363	381.33	0.002622
37	486.553	383.75	0.002606
39	486.742	346.87	0.002883
41	486.931	299.96	0.003334
43	487.118	285.79	0.003499
45	487.304	242.12	0.00413
47	487.489	224.65	0.004451
49	487.673	286.55	0.00349
51	487.854	261.03	0.003831
53	488.034	263.27	0.003798
55	488.211	251.74	0.003972
57	488.386	245.91	0.004067
59	488.54	261.89	0.003818
61	488.674	299.79	0.003336
63	488.808	275.65	0.003628
65	488.943	372.27	0.002686
67	489.077	179.63	0.005567
69	489.211	143.04	0.006991
71	489.346	225.75	0.00443
73	489.48	208.69	0.004792
75	489.614	288.26	0.003469
77	489.749	327.67	0.003052
79	489.883	364.23	0.002746
81	490.017	399.66	0.002502
83	490.152	340.36	0.002938
85	490.286	286.94	0.003485
87	490.42	213.61	0.004681
89	490.554	321.99	0.003106
91	490.689	345.61	0.002893
93	490.823	401.33	0.002492
95	490.957	419.2	0.002385
97	491.092	433.05	0.002309
99	491.226	410.36	0.002437
101	491.36	400.68	0.002496

Distance	Elevation	Resistivity	Conductivity
103	491.494	485.44	0.00206
105	491.629	423.4	0.002362
107	491.763	259.55	0.003853
109	491.897	158.96	0.006291
111	492.031	156.15	0.006404
113	492.166	195.87	0.005105
115	492.3	207.7	0.004815
3	483.675	116.27	0.008601
5	483.786	117.1	0.00854
7	483.894	137.22	0.007288
9	484	107	0.009346
11	484.104	72.681	0.0138
13	484.206	79.731	0.0125
15	484.307	819.49	0.00122
17	484.405	3053.2	0.000328
19	484.502	367.45	0.002721
21	484.597	325.94	0.003068
23	484.692	334.93	0.002986
25	484.785	200.99	0.004975
27	484.876	246.89	0.00405
29	485.012	294.76	0.003393
31	485.192	253.16	0.00395
33	485.37	232.25	0.004306
35	485.547	232.31	0.004305
37	485.723	196.22	0.005096
39	485.897	194.06	0.005153
41	486.07	277.22	0.003607
43	486.241	285.35	0.003504
45	486.41	286.34	0.003492
47	486.577	280.62	0.003564
49	486.742	277.99	0.003597
51	486.905	208.05	0.004807
53	487.065	199.61	0.00501
55	487.222	201.07	0.004973
57	487.377	207.68	0.004815
59	487.521	240.03	0.004166
61	487.656	331.83	0.003014
63	487.791	345.96	0.002891
65	487.926	349.9	0.002858
67	488.061	327.31	0.003055
69	488.196	323.02	0.003096
71	488.331	309.3	0.003233
73	488.466	434.98	0.002299
75	488.601	438.41	0.002281
77	488.736	444.45	0.00225
79	488.871	442.65	0.002259
81	489.006	428.22	0.002335
83	489.141	546.67	0.001829
85	489.276	720.2	0.001389
87	489.411	599.44	0.001668
89	489.546	529.12	0.00189

Distance	Elevation	Resistivity	Conductivity
91	489.681	531.53	0.001881
93	489.816	541.77	0.001846
95	489.951	545.46	0.001833
97	490.086	583.49	0.001714
99	490.221	591.15	0.001692
101	490.356	412.08	0.002427
103	490.491	511.92	0.001953
105	490.626	557.56	0.001794
107	490.761	227.6	0.004394
109	490.896	820.87	0.001218
111	491.031	1530.4	0.000653
113	491.166	1334.1	0.00075
115	491.301	858.52	0.001165
5	482.766	104.76	0.009546
7	482.886	174.82	0.00572
9	483.004	180.06	0.005554
11	483.12	144.75	0.006908
13	483.235	55.005	0.0182
15	483.347	30.046	0.0333
17	483.457	56.321	0.0178
19	483.566	100.61	0.009939
21	483.673	150.9	0.006627
23	483.779	223.4	0.004476
25	483.883	210.48	0.004751
27	483.986	218.89	0.004569
29	484.122	231.83	0.004314
31	484.29	183.07	0.005462
33	484.457	169.83	0.005888
35	484.623	169.29	0.005907
37	484.787	152.83	0.006543
39	484.949	141.62	0.007061
41	485.11	138.51	0.00722
43	485.269	134.1	0.007457
45	485.426	132.71	0.007535
47	485.581	130.89	0.00764
49	485.734	130.29	0.007675
51	485.884	130.89	0.00764
53	486.033	135.94	0.007356
55	486.18	150.51	0.006644
57	486.324	157.85	0.006335
59	486.463	159.37	0.006275
61	486.598	172.64	0.005792
63	486.733	182.08	0.005492
65	486.869	232.93	0.004293
67	487.004	325.37	0.003073
69	487.14	323.02	0.003096
71	487.275	310.3	0.003223
73	487.41	433.82	0.002305
75	487.546	437.81	0.002284
77	487.681	442.93	0.002258
79	487.817	441.64	0.002264

Distance	Elevation	Resistivity	Conductivity
81	487.952	431.21	0.002319
83	488.087	547.1	0.001828
85	488.223	717.65	0.001393
87	488.358	599.35	0.001668
89	488.493	528.67	0.001892
91	488.629	530.04	0.001887
93	488.764	540.2	0.001851
95	488.9	544.72	0.001836
97	489.035	581.48	0.00172
99	489.17	586.69	0.001704
101	489.306	419.82	0.002382
103	489.441	519.12	0.001926
105	489.576	556.51	0.001797
107	489.712	310.71	0.003218
109	489.847	675.57	0.00148
111	489.982	1506	0.000664
113	490.118	1273.8	0.000785
7	481.756	168.02	0.005952
9	481.882	280.16	0.003569
11	482.006	285.43	0.003503
13	482.129	189.6	0.005274
15	482.25	50.626	0.0198
17	482.37	61.054	0.0164
19	482.488	90.849	0.011
21	482.604	101	0.009901
23	482.719	109.14	0.009163
25	482.833	114.53	0.008731
27	482.945	121.37	0.008239
29	483.081	124.38	0.00804
31	483.24	125.99	0.007937
33	483.397	128.36	0.007791
35	483.553	129.81	0.007704
37	483.708	130.17	0.007682
39	483.861	127.39	0.00785
41	484.013	117.95	0.008478
43	484.163	108.55	0.009212
45	484.311	107.44	0.009308
47	484.458	107.22	0.009327
49	484.603	108.21	0.009241
51	484.747	114.57	0.008728
53	484.889	122.07	0.008192
55	485.029	122.7	0.00815
57	485.169	122.21	0.008183
59	485.306	117.77	0.008491
61	485.441	114.96	0.008699
63	485.577	114.62	0.008724
65	485.712	116.62	0.008575
67	485.848	140.2	0.007133
69	485.983	156.72	0.006381
71	486.119	157.73	0.00634
73	486.254	162.64	0.006149

Distance	Elevation	Resistivity	Conductivity
75	486.39	177.85	0.005623
77	486.525	202.03	0.00495
79	486.661	234.1	0.004272
81	486.797	259.58	0.003852
83	486.932	272.98	0.003663
85	487.068	272.86	0.003665
87	487.203	262.55	0.003809
89	487.339	242.88	0.004117
91	487.474	240.26	0.004162
93	487.61	240.46	0.004159
95	487.745	242.9	0.004117
97	487.881	252.26	0.003964
99	488.016	263.77	0.003791
101	488.152	272.81	0.003666
103	488.287	325.68	0.00307
105	488.423	325.13	0.003076
107	488.558	312.13	0.003204
109	488.694	357.11	0.0028
111	488.829	1256.1	0.000796
11	480.76	288.47	0.003467
13	480.889	320.84	0.003117
15	481.016	135.65	0.007372
17	481.142	94.338	0.0106
19	481.266	92.636	0.0108
21	481.39	101.56	0.009846
23	481.512	108.68	0.009201
25	481.633	113.24	0.008831
27	481.753	117.06	0.008543
29	481.889	120.12	0.008325
31	482.04	122.21	0.008183
33	482.19	125.42	0.007973
35	482.339	127.83	0.007823
37	482.487	128.55	0.007779
39	482.633	126.84	0.007884
41	482.778	117.74	0.008493
43	482.922	108.53	0.009214
45	483.065	107.43	0.009308
47	483.207	107.27	0.009322
49	483.347	108.3	0.009234
51	483.487	114.67	0.008721
53	483.625	122.11	0.008189
55	483.763	122.67	0.008152
57	483.9	122.14	0.008187
59	484.036	117.64	0.008501
61	484.172	114.9	0.008703
63	484.307	114.66	0.008721
65	484.443	115.45	0.008662
67	484.578	119.2	0.008389
69	484.714	121.24	0.008248
71	484.85	122.07	0.008192
73	484.985	123.75	0.008081

Distance	Elevation	Resistivity	Conductivity
75	485.121	129.19	0.007741
77	485.256	140.6	0.007112
79	485.392	156.44	0.006392
81	485.528	167.17	0.005982
83	485.663	168.67	0.005929
85	485.799	168.77	0.005925
87	485.934	167.76	0.005961
89	486.07	165.98	0.006025
91	486.206	164.97	0.006062
93	486.341	164.67	0.006073
95	486.477	164.95	0.006062
97	486.612	166.63	0.006001
99	486.748	170.44	0.005867
101	486.884	175.54	0.005697
103	487.019	181.92	0.005497
105	487.155	193.5	0.005168
107	487.29	305.37	0.003275
15	479.64	355.45	0.002813
17	479.77	191.43	0.005224
19	479.9	108.9	0.009183
21	480.028	108.07	0.009253
23	480.155	108.95	0.009179
25	480.282	113.33	0.008824
27	480.407	117.18	0.008534
29	480.543	120.16	0.008322
31	480.689	122.07	0.008192
33	480.833	125.06	0.007996
35	480.977	127.59	0.007838
37	481.12	128.26	0.007797
39	481.262	126.81	0.007886
41	481.403	119.74	0.008351
43	481.543	117.11	0.008539
45	481.682	116.89	0.008555
47	481.821	117.29	0.008526
49	481.959	119.11	0.008396
51	482.096	123.57	0.008093
53	482.233	124.96	0.008003
55	482.369	124.93	0.008004
57	482.505	123.64	0.008088
59	482.641	118.12	0.008466
61	482.777	115.43	0.008663
63	482.912	115.25	0.008677
65	483.048	115.86	0.008631
67	483.184	119.19	0.00839
69	483.319	121.13	0.008256
71	483.455	122	0.008197
73	483.59	123.78	0.008079
75	483.726	129.31	0.007733
77	483.861	140.62	0.007111
79	483.997	156.22	0.006401
81	484.133	166.34	0.006012

Distance	Elevation	Resistivity	Conductivity
83	484.268	167.81	0.005959
85	484.404	168	0.005952
87	484.54	167.41	0.005973
89	484.675	166.07	0.006022
91	484.811	165.12	0.006056
93	484.947	164.71	0.006071
95	485.082	164.57	0.006076
97	485.218	164.91	0.006064
99	485.353	165.62	0.006038
101	485.489	166.48	0.006007
103	485.625	168.27	0.005943
19	478.381	395.32	0.00253
21	478.513	165.77	0.006032
23	478.644	131.3	0.007616
25	478.774	122.99	0.008131
27	478.903	121.16	0.008254
29	479.039	120.99	0.008265
31	479.181	122.33	0.008175
33	479.321	125.35	0.007978
35	479.462	130.51	0.007662
37	479.601	138.89	0.0072
39	479.74	147.35	0.006787
41	479.879	153.95	0.006496
43	480.016	160.96	0.006213
45	480.154	168.84	0.005923
47	480.291	176.86	0.005654
49	480.427	182.59	0.005477
51	480.564	185.16	0.005401
53	480.7	185.9	0.005379
55	480.836	185.65	0.005386
57	480.971	171.4	0.005834
59	481.107	138.26	0.007233
61	481.243	123.61	0.00809
63	481.378	121.44	0.008235
65	481.514	121.17	0.008253
67	481.649	121.34	0.008241
69	481.785	121.83	0.008208
71	481.921	122.68	0.008151
73	482.056	125.03	0.007998
75	482.192	131.11	0.007627
77	482.328	142.13	0.007036
79	482.463	156.83	0.006376
81	482.599	166.61	0.006002
83	482.734	168.1	0.005949
85	482.87	168.31	0.005941
87	483.006	167.9	0.005956
89	483.141	166.88	0.005992
91	483.277	166.08	0.006021
93	483.413	165.49	0.006043
95	483.548	164.68	0.006072
97	483.684	164.74	0.00607

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Distance	Elevation	Resistivity	Conductivity
99	483.819	164.82	0.006067
24	476.968	392.54	0.002548
26	477.101	200.47	0.004988
28	477.233	177.84	0.005623
30	477.369	172.79	0.005787
32	477.508	169.8	0.005889
34	477.646	169.59	0.005897
36	477.784	173.67	0.005758
38	477.922	197.65	0.005059
40	478.059	235.82	0.004241
42	478.196	272.87	0.003665
44	478.333	295.23	0.003387
46	478.469	306.56	0.003262
48	478.605	314.21	0.003183
50	478.741	318.26	0.003142
52	478.877	320.01	0.003125
54	479.013	320.53	0.00312
55	479.149	318.74	0.003137
57	479.284	289.88	0.00345
59	479.42	224.5	0.004454
61	479.555	178.23	0.005611
63	479.691	156.79	0.006378
65	479.827	147.84	0.006764
67	479.962	144.27	0.006931
69	480.098	142.95	0.006995
71	480.233	142.14	0.007035
73	480.369	141.8	0.007052
75	480.505	141.99	0.007043
77	480.64	151.93	0.006582
79	480.776	165.12	0.006056
81	480.912	169.4	0.005903
83	481.047	169.9	0.005886
85	481.183	169.91	0.005885
87	481.318	169.44	0.005902
89	481.454	168.05	0.005951
91	481.59	167.5	0.00597
93	481.725	167.01	0.005988
95	481.861	164.65	0.006073
30	475.522	315.64	0.003168
32	475.66	303.73	0.003292
34	475.797	299.15	0.003343
36	475.933	298.91	0.003345
38	476.07	336.32	0.002973
40	476.206	401.45	0.002491
42	476.342	449.53	0.002225
44	476.479	479.01	0.002088
46	476.614	487.04	0.002053
48	476.75	491.08	0.002036
50	476.886	493.27	0.002027
52	477.021	494.17	0.002024
54	477.157	493.99	0.002024

Distance	Elevation	Resistivity	Conductivity
56	477.293	483.11	0.00207
58	477.428	434.66	0.002301
60	477.564	356.56	0.002805
62	477.699	292.45	0.003419
64	477.835	253.62	0.003943
66	477.971	226.81	0.004409
68	478.106	208.44	0.004798
70	478.242	196.28	0.005095
72	478.378	189.97	0.005264
74	478.513	187.19	0.005342
76	478.649	184.64	0.005416
78	478.784	182.35	0.005484
80	478.92	180.52	0.00554
82	479.056	178.82	0.005592
84	479.191	177.23	0.005642
86	479.327	176.03	0.005681
88	479.463	174.49	0.005731
90	479.598	168.24	0.005944
36	473.894	345.79	0.002892
38	474.03	504.41	0.001983
40	474.166	583.28	0.001714
42	474.302	615.88	0.001624
44	474.438	634.1	0.001577
46	474.573	637.86	0.001568
48	474.709	639.63	0.001563
50	474.844	640.16	0.001562
52	474.98	639.52	0.001564
54	475.116	632.03	0.001582
56	475.251	585.69	0.001707
58	475.387	517.89	0.001931
60	475.522	456.11	0.002192
62	475.658	402.84	0.002482
64	475.794	368.1	0.002717
66	475.929	341.83	0.002925
68	476.065	318.47	0.00314
70	476.201	292.22	0.003422
72	476.336	271.32	0.003686
74	476.472	251.83	0.003971
76	476.607	235.2	0.004252
78	476.743	220.71	0.004531
80	476.879	208.72	0.004791
82	477.014	198.33	0.005042
84	477.15	180.25	0.005548
42	472.057	702.74	0.001423
44	472.192	735.52	0.00136
46	472.328	738.64	0.001354
48	472.463	739.79	0.001352
50	472.599	739.57	0.001352
52	472.735	736.82	0.001357
54	472.87	689.33	0.001451
56	473.006	604.69	0.001654

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Distance	Elevation	Resistivity	Conductivity
58	473.141	535.24	0.001868
60	473.277	491.79	0.002033
62	473.412	464.21	0.002154
64	473.548	444.97	0.002247
66	473.684	431.42	0.002318
68	473.819	415.61	0.002406
70	473.955	393.51	0.002541
72	474.091	369.61	0.002706
74	474.226	345.78	0.002892
76	474.362	312.85	0.003196
78	474.497	251.32	0.003979
48	469.993	848.72	0.001178
50	470.129	848.21	0.001179
52	470.264	821.55	0.001217
54	470.4	696.76	0.001435
56	470.535	605.91	0.00165
58	470.671	536.22	0.001865
60	470.807	495.81	0.002017
62	470.942	478.8	0.002089
64	471.078	471.46	0.002121
66	471.214	467.1	0.002141
68	471.349	464	0.002155
70	471.485	456.14	0.002192
72	471.62	434.78	0.0023
50	467.412	1616.8	0.000619
52	467.547	850.48	0.001176
54	467.683	697.68	0.001433
56	467.818	606.32	0.001649
58	467.954	536.41	0.001864
60	468.09	495.93	0.002016
62	468.225	479.68	0.002085
64	468.361	475.97	0.002101
66	468.496	473.99	0.00211
68	468.632	472.76	0.002115
70	468.768	472.04	0.002118

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Table A-2: Resistivity values after inversion of ERT-2

Distance	Elevation	Resistivity	Conductivity
3	487.583	172.32	0.005803
5	487.638	107.52	0.009301
7	487.691	106.09	0.009426
9	487.742	143.69	0.006959
11	487.791	121.15	0.008254
13	487.838	112.9	0.008857
15	487.884	85.637	0.0117
17	487.926	76.835	0.013
19	487.965	109.57	0.009127
21	488.002	87.072	0.0115
23	488.034	181.31	0.005515
25	488.061	192.31	0.0052
27	488.083	222.72	0.00449
29	488.093	211.89	0.004719
31	488.093	225.9	0.004427
33	488.093	254.49	0.003929
35	488.093	217.69	0.004594
37	488.093	281.22	0.003556
39	488.093	263.78	0.003791
41	488.093	258.04	0.003875
43	488.093	296.1	0.003377
45	488.093	277.86	0.003599
47	488.093	247.7	0.004037
49	488.093	259.12	0.003859
51	488.093	280.98	0.003559
53	488.093	290.8	0.003439
55	488.093	313.68	0.003188
57	488.093	185.18	0.0054
59	488.084	210.6	0.004748
61	488.064	283.8	0.003524
63	488.039	309.21	0.003234
65	488.009	346.29	0.002888
67	487.977	380.81	0.002626
69	487.941	396.7	0.002521
71	487.902	380.35	0.002629
73	487.861	402.63	0.002484
75	487.818	361.06	0.00277
77	487.773	376.42	0.002657
79	487.726	274.69	0.00364
81	487.678	341.61	0.002927
83	487.629	721.85	0.001385
85	487.578	517.61	0.001932
87	487.526	522.68	0.001913
89	487.5	539.69	0.001853
91	487.5	457.45	0.002186
93	487.5	420.03	0.002381
95	487.5	560.98	0.001783
97	487.5	442.75	0.002259
99	487.5	413.47	0.002419
101	487.5	326.09	0.003067

Distance	Elevation	Resistivity	Conductivity
103	487.5	223.37	0.004477
105	487.5	1370.2	0.00073
107	487.5	200.01	0.005
109	487.5	150.82	0.00663
111	487.5	93.014	0.0108
113	487.5	101.56	0.009846
115	487.5	71.708	0.0139
3	486.504	135.73	0.007368
5	486.538	135.71	0.007369
7	486.57	119.62	0.00836
9	486.599	130.58	0.007658
11	486.626	127.8	0.007825
13	486.65	151.65	0.006594
15	486.671	228.23	0.004382
17	486.688	378.39	0.002643
19	486.702	531.46	0.001882
21	486.712	1016.3	0.000984
23	486.718	302.86	0.003302
25	486.719	137.2	0.007289
27	486.716	225.18	0.004441
29	486.713	445.52	0.002245
31	486.713	254.15	0.003935
33	486.713	255.11	0.00392
35	486.713	225.81	0.004429
37	486.713	226.87	0.004408
39	486.713	261.61	0.003822
41	486.713	211.77	0.004722
43	486.713	213.18	0.004691
45	486.713	261.57	0.003823
47	486.713	246.61	0.004055
49	486.713	233.03	0.004291
51	486.713	167.13	0.005983
53	486.713	150.41	0.006648
55	486.713	147.76	0.006768
57	486.713	332.78	0.003005
59	486.716	252.53	0.00396
61	486.719	233.65	0.00428
63	486.719	209.68	0.004769
65	486.714	210.62	0.004748
67	486.706	308.41	0.003242
69	486.694	308.81	0.003238
71	486.679	232.29	0.004305
73	486.661	314.65	0.003178
75	486.64	361.44	0.002767
77	486.617	402.43	0.002485
79	486.591	410.22	0.002438
81	486.563	556.49	0.001797
83	486.533	218.92	0.004568
85	486.501	224.04	0.004463
87	486.467	494.9	0.002021
89	486.45	421.94	0.00237

Distance	Elevation	Resistivity	Conductivity
91	486.45	555.9	0.001799
93	486.45	562.94	0.001776
95	486.45	450.72	0.002219
97	486.45	550.96	0.001815
99	486.45	566.95	0.001764
101	486.45	774.38	0.001291
103	486.45	2227.5	0.000449
105	486.45	74.451	0.0134
107	486.45	168.69	0.005928
109	486.45	154.51	0.006472
111	486.45	93.627	0.0107
113	486.45	107.96	0.009263
115	486.45	162.31	0.006161
5	485.349	135.46	0.007382
7	485.367	130.86	0.007642
9	485.383	130.5	0.007663
11	485.396	127.6	0.007837
13	485.407	126.84	0.007884
15	485.415	120.34	0.00831
17	485.421	118.97	0.008405
19	485.423	121.39	0.008238
21	485.423	133.83	0.007472
23	485.421	137.87	0.007253
25	485.415	138.07	0.007243
27	485.407	219.4	0.004558
29	485.402	221.07	0.004523
31	485.402	140.6	0.007112
33	485.402	108.36	0.009228
35	485.402	108.58	0.00921
37	485.402	111.73	0.00895
39	485.402	115.14	0.008685
41	485.402	114.79	0.008712
43	485.402	113.8	0.008787
45	485.402	113.29	0.008827
47	485.402	113.87	0.008782
49	485.402	139.62	0.007162
51	485.402	144.16	0.006937
53	485.402	144.13	0.006938
55	485.402	135.57	0.007376
57	485.402	116.17	0.008608
59	485.407	100.96	0.009905
61	485.415	100.24	0.009976
63	485.42	100.76	0.009925
65	485.423	109.54	0.009129
67	485.424	134.16	0.007454
69	485.422	134.68	0.007425
71	485.418	134.55	0.007432
73	485.411	134.16	0.007454
75	485.403	129.37	0.00773
77	485.392	127.5	0.007843
79	485.379	127.53	0.007841

Distance	Elevation	Resistivity	Conductivity
81	485.363	217.97	0.004588
83	485.346	218.47	0.004577
85	485.327	221.06	0.004524
87	485.306	221.17	0.004521
89	485.295	145.52	0.006872
91	485.295	130.64	0.007655
93	485.295	115.19	0.008681
95	485.295	77.656	0.0129
97	485.295	74.934	0.0133
99	485.295	59.577	0.0168
101	485.295	52.093	0.0192
103	485.295	39.829	0.0251
105	485.295	74.158	0.0135
107	485.295	280.05	0.003571
109	485.295	201.41	0.004965
111	485.295	133.6	0.007485
113	485.295	97.73	0.0102
9	484.073	130.81	0.007645
11	484.079	125.57	0.007964
13	484.084	122.82	0.008142
15	484.086	120.08	0.008328
17	484.087	119.55	0.008365
19	484.086	120.43	0.008304
21	484.083	130.58	0.007658
23	484.079	137.28	0.007284
25	484.074	139.95	0.007145
27	484.068	149.69	0.00668
29	484.065	149.16	0.006704
31	484.065	139.92	0.007147
33	484.065	108.54	0.009213
35	484.065	108.75	0.009195
37	484.065	111.58	0.008962
39	484.065	114.39	0.008742
41	484.065	114.38	0.008743
43	484.065	113.7	0.008795
45	484.065	113.27	0.008828
47	484.065	113.98	0.008773
49	484.065	139.46	0.007171
51	484.065	143.73	0.006957
53	484.065	143.78	0.006955
55	484.065	136.12	0.007346
57	484.065	116.55	0.00858
59	484.068	101.15	0.009886
61	484.073	100.5	0.00995
63	484.078	100.91	0.00991
65	484.082	109.37	0.009143
67	484.085	127.11	0.007867
69	484.086	127.98	0.007814
71	484.086	128.3	0.007794
73	484.085	128.24	0.007798
75	484.082	127.67	0.007833

Distance	Elevation	Resistivity	Conductivity
77	484.077	127.06	0.00787
79	484.071	127.23	0.00786
81	484.064	157.13	0.006364
83	484.054	164.81	0.006068
85	484.044	165.16	0.006055
87	484.031	162.37	0.006159
89	484.025	144.08	0.006941
91	484.025	131.1	0.007628
93	484.025	117.18	0.008534
95	484.025	110.87	0.00902
97	484.025	111.91	0.008936
99	484.025	116.7	0.008569
101	484.025	124.11	0.008057
103	484.025	152.55	0.006555
105	484.025	272.14	0.003675
107	484.025	276.6	0.003615
109	484.025	196.99	0.005076
13	482.656	122.77	0.008145
15	482.656	120.55	0.008295
17	482.656	120.17	0.008322
19	482.654	120.73	0.008283
21	482.652	130.72	0.00765
23	482.649	137.47	0.007274
25	482.646	140.6	0.007112
27	482.642	148.93	0.006715
29	482.641	148.48	0.006735
31	482.641	140.54	0.007115
33	482.641	110.49	0.009051
35	482.641	110.45	0.009054
37	482.641	111.97	0.008931
39	482.641	114.39	0.008742
41	482.641	114.51	0.008733
43	482.641	114.09	0.008765
45	482.641	113.85	0.008783
47	482.641	115.12	0.008687
49	482.641	139.91	0.007147
51	482.641	143.87	0.006951
53	482.641	143.93	0.006948
55	482.641	138.04	0.007244
57	482.641	118.22	0.008459
59	482.642	102.61	0.009746
61	482.645	102.31	0.009774
63	482.648	102.62	0.009745
65	482.651	109.73	0.009113
67	482.653	127.16	0.007864
69	482.655	128	0.007813
71	482.656	128.26	0.007797
73	482.656	128.16	0.007803
75	482.656	127.66	0.007833
77	482.654	127.22	0.00786
79	482.652	127.43	0.007847

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Distance	Elevation	Resistivity	Conductivity
81	482.648	155.91	0.006414
83	482.644	158.48	0.00631
85	482.638	158.73	0.0063
87	482.631	157.87	0.006334
89	482.627	144.41	0.006925
91	482.627	132.97	0.00752
93	482.627	130.49	0.007663
95	482.627	139.56	0.007165
97	482.627	161.97	0.006174
99	482.627	190.32	0.005254
101	482.627	240.42	0.004159
103	482.627	266.77	0.003749
105	482.627	269.52	0.00371
15	481.103	121.17	0.008253
17	481.102	120.94	0.008269
19	481.101	121.26	0.008247
21	481.099	132.46	0.007549
23	481.098	138.06	0.007243
25	481.096	141.01	0.007092
27	481.095	149.19	0.006703
29	481.094	148.76	0.006722
31	481.094	142.7	0.007008
33	481.094	128.97	0.007754
35	481.094	128.36	0.007791
37	481.094	128.26	0.007797
39	481.094	128.42	0.007787
41	481.094	128.65	0.007773
43	481.094	128.99	0.007753
45	481.094	129.81	0.007704
47	481.094	133.51	0.00749
49	481.094	144.01	0.006944
51	481.094	146.61	0.006821
53	481.094	146.9	0.006807
55	481.094	146.16	0.006842
57	481.094	139.59	0.007164
59	481.094	134.49	0.007435
61	481.096	133.32	0.007501
63	481.097	132.59	0.007542
65	481.099	132.14	0.007568
67	481.1	131.85	0.007584
69	481.101	131.53	0.007603
71	481.102	131.18	0.007623
73	481.103	130.81	0.007645
75	481.103	130.52	0.007662
77	481.103	130.51	0.007662
79	481.102	131.1	0.007628
81	481.1	155.97	0.006411
83	481.098	158.36	0.006315
85	481.095	158.6	0.006305
87	481.092	157.81	0.006337
89	481.09	145.72	0.006862

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Distance	Elevation	Resistivity	Conductivity
91	481.09	143.33	0.006977
93	481.09	147.05	0.0068
95	481.09	167.31	0.005977
97	481.09	204.77	0.004884
99	481.09	238.51	0.004193
101	481.09	257.07	0.00389
103	481.09	261.61	0.003822
19	479.403	121.55	0.008227
21	479.402	135.27	0.007393
23	479.401	139.19	0.007184
25	479.401	141.21	0.007082
27	479.4	155.05	0.00645
29	479.4	158.22	0.00632
31	479.4	160.6	0.006227
33	479.4	164.17	0.006091
35	479.4	168.05	0.005951
37	479.4	173.73	0.005756
39	479.4	178.38	0.005606
41	479.4	182.26	0.005487
43	479.4	186.15	0.005372
45	479.4	190.8	0.005241
47	479.4	196.46	0.00509
49	479.4	200.67	0.004983
51	479.4	202.72	0.004933
53	479.4	203.49	0.004914
55	479.4	203.58	0.004912
57	479.4	203.09	0.004924
59	479.4	201.93	0.004952
61	479.4	200.01	0.005
63	479.401	197.47	0.005064
65	479.402	194.3	0.005147
67	479.402	190.36	0.005253
69	479.403	185.39	0.005394
71	479.404	179.09	0.005584
73	479.404	171.76	0.005822
75	479.404	165.29	0.00605
77	479.405	162.23	0.006164
79	479.404	161.69	0.006185
81	479.404	161.87	0.006178
83	479.403	162.28	0.006162
85	479.401	162.83	0.006141
87	479.4	163.52	0.006115
89	479.399	164.44	0.006081
91	479.399	169.57	0.005897
93	479.399	198.31	0.005043
95	479.399	212.09	0.004715
97	479.399	232.16	0.004307
99	479.399	255.27	0.003917
25	477.539	140.78	0.007103
27	477.539	169.33	0.005906
29	477.539	176.74	0.005658

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Distance	Elevation	Resistivity	Conductivity
31	477.539	180.54	0.005539
33	477.539	223.77	0.004469
35	477.539	248.09	0.004031
37	477.539	265.8	0.003762
39	477.539	282.55	0.003539
41	477.539	292.17	0.003423
43	477.539	300.1	0.003332
45	477.539	305.48	0.003274
47	477.539	309.35	0.003233
49	477.539	311.88	0.003206
51	477.539	313.36	0.003191
53	477.539	314.14	0.003183
55	477.539	314.35	0.003181
57	477.539	314.01	0.003185
59	477.539	313.07	0.003194
61	477.539	311.36	0.003212
63	477.539	308.52	0.003241
65	477.539	304.11	0.003288
67	477.54	297.66	0.00336
69	477.54	288.67	0.003464
71	477.54	276.25	0.00362
73	477.541	260.6	0.003837
75	477.541	244.11	0.004097
77	477.541	230.46	0.004339
79	477.541	221.56	0.004513
81	477.541	216.75	0.004614
83	477.54	214.91	0.004653
85	477.54	214.59	0.00466
87	477.539	214.74	0.004657
89	477.538	215.39	0.004643
91	477.538	216.79	0.004613
93	477.538	231.39	0.004322
31	475.492	182.15	0.00549
33	475.492	279.62	0.003576
35	475.492	320.96	0.003116
37	475.492	344.62	0.002902
39	475.492	386.72	0.002586
41	475.492	413.5	0.002418
43	475.492	426.52	0.002345
45	475.492	433.5	0.002307
47	475.492	436.58	0.002291
49	475.492	438.46	0.002281
51	475.492	439.68	0.002274
53	475.492	440.35	0.002271
55	475.492	440.51	0.00227
57	475.492	440.15	0.002272
59	475.492	439.2	0.002277
61	475.492	437.49	0.002286
63	475.493	434.71	0.0023
65	475.493	430.35	0.002324
67	475.493	423.79	0.00236

Distance	Elevation	Resistivity	Conductivity
69	475.493	414.54	0.002412
71	475.493	402.06	0.002487
73	475.493	386.48	0.002587
75	475.493	367.63	0.00272
77	475.493	343.27	0.002913
79	475.493	310.23	0.003223
81	475.493	276.73	0.003614
83	475.493	262.65	0.003807
85	475.493	250.83	0.003987
87	475.493	231.2	0.004325
37	473.242	360.25	0.002776
39	473.242	470.15	0.002127
41	473.242	512.41	0.001952
43	473.242	527.14	0.001897
45	473.242	534.22	0.001872
47	473.242	537.12	0.001862
49	473.242	538.81	0.001856
51	473.242	539.95	0.001852
53	473.242	540.6	0.00185
55	473.242	540.78	0.001849
57	473.242	540.49	0.00185
59	473.242	539.67	0.001853
61	473.242	538.24	0.001858
63	473.242	536.03	0.001866
65	473.242	532.76	0.001877
67	473.242	528.07	0.001894
69	473.242	521.48	0.001918
71	473.242	512.49	0.001951
73	473.242	499.96	0.002
75	473.242	480.4	0.002082
77	473.242	455.34	0.002196
79	473.242	410.65	0.002435
81	473.242	299.43	0.00334
43	470.766	583.41	0.001714
45	470.766	602.83	0.001659
47	470.766	608.63	0.001643
49	470.766	610.73	0.001637
51	470.766	612.14	0.001634
53	470.766	613.05	0.001631
55	470.766	613.5	0.00163
57	470.766	613.49	0.00163
59	470.766	613.05	0.001631
61	470.766	612.13	0.001634
63	470.766	610.67	0.001638
65	470.766	608.54	0.001643
67	470.766	605.49	0.001652
69	470.766	601.16	0.001663
71	470.766	594.87	0.001681
73	470.766	583.46	0.001714
75	470.766	531.03	0.001883
49	468.042	681.11	0.001468

Distance	Elevation	Resistivity	Conductivity
51	468.042	682.05	0.001466
53	468.042	682.51	0.001465
55	468.042	682.86	0.001464
57	468.042	682.96	0.001464
59	468.042	682.94	0.001464
61	468.042	682.8	0.001465
63	468.042	682.53	0.001465
65	468.042	682.04	0.001466
67	468.042	681.35	0.001468
69	468.042	679.5	0.001472
51	465.047	945.8	0.001057
53	465.047	718.83	0.001391
55	465.047	707.19	0.001414
57	465.047	705.85	0.001417
59	465.047	705.5	0.001417
61	465.047	706.11	0.001416
63	465.047	707.9	0.001413
65	465.047	737.23	0.001356
67	465.047	1646.3	0.000607

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Table A-3: Resistivity values after inversion of ERT-3

Distance	Elevation	Resistivity	Conductivity
3	473.514	192.63	0.005191
5	473.522	392.68	0.002547
7	473.53	201.09	0.004973
9	473.538	223.37	0.004477
11	473.545	323.77	0.003089
13	473.552	810.82	0.001233
15	473.559	480.03	0.002083
17	473.566	226.77	0.00441
19	473.572	98.973	0.0101
21	473.578	93.257	0.0107
23	473.584	97.695	0.0102
25	473.59	93.66	0.0107
27	473.595	88.355	0.0113
29	473.66	81.691	0.0122
31	473.785	91.941	0.0109
33	473.908	102.11	0.009793
35	474.031	84.276	0.0119
37	474.154	76.69	0.013
39	474.276	83.814	0.0119
41	474.396	113.09	0.008843
43	474.516	136.92	0.007304
45	474.635	120.78	0.00828
47	474.753	142.76	0.007005
49	474.87	121.87	0.008205
51	474.985	107.04	0.009342
53	475.098	163.24	0.006126
55	475.21	117.27	0.008527
57	475.32	112.83	0.008863
59	475.405	109.51	0.009132
61	475.466	117.82	0.008488
63	475.528	125.9	0.007943
65	475.589	158.2	0.006321
67	475.65	100.28	0.009972
69	475.712	87.764	0.0114
71	475.773	77.27	0.0129
73	475.834	87.079	0.0115
75	475.895	100.85	0.009916
77	475.955	109.66	0.009119
79	476.016	110.29	0.009067
81	476.077	109.45	0.009137
83	476.137	94.561	0.0106
85	476.197	79.107	0.0126
87	476.258	72.656	0.0138
89	476.298	95.889	0.0104
91	476.318	472.55	0.002116
93	476.337	902.91	0.001108
95	476.354	670.83	0.001491
97	476.371	623.19	0.001605
99	476.387	471.48	0.002121
101	476.402	388.55	0.002574

Distance	Elevation	Resistivity	Conductivity
103	476.416	138.26	0.007233
105	476.429	221.13	0.004522
107	476.441	667.11	0.001499
109	476.453	520.09	0.001923
111	476.465	461.5	0.002167
113	476.475	324.05	0.003086
115	476.486	194.31	0.005146
3	472.531	1150.2	0.000869
5	472.551	1134.1	0.000882
7	472.57	893.53	0.001119
9	472.589	611.12	0.001636
11	472.606	2395.4	0.000417
13	472.624	71.32	0.014
15	472.64	472.28	0.002117
17	472.656	224.2	0.00446
19	472.672	104	0.009615
21	472.687	97.791	0.0102
23	472.702	95.776	0.0104
25	472.716	77.139	0.013
27	472.73	53.916	0.0185
29	472.792	63.562	0.0157
31	472.903	78.801	0.0127
33	473.012	82.597	0.0121
35	473.12	84.157	0.0119
37	473.227	81.272	0.0123
39	473.332	83.966	0.0119
41	473.436	112.24	0.008909
43	473.538	137.38	0.007279
45	473.638	176.86	0.005654
47	473.736	213.35	0.004687
49	473.832	294.82	0.003392
51	473.926	393.68	0.00254
53	474.017	167.26	0.005979
55	474.105	160.94	0.006213
57	474.19	516.93	0.001934
59	474.26	512.9	0.00195
61	474.317	510.76	0.001958
63	474.373	278.3	0.003593
65	474.43	279.1	0.003583
67	474.486	427.92	0.002337
69	474.542	424.33	0.002357
71	474.598	422.86	0.002365
73	474.654	417.98	0.002392
75	474.709	302.63	0.003304
77	474.765	220.29	0.004539
79	474.82	219.55	0.004555
81	474.875	206.94	0.004832
83	474.931	185.29	0.005397
85	474.985	882.02	0.001134
87	475.04	920.74	0.001086
89	475.086	3169.4	0.000316

Distance	Elevation	Resistivity	Conductivity
91	475.124	77.401	0.0129
93	475.159	906	0.001104
95	475.194	916.07	0.001092
97	475.226	6251.8	0.00016
99	475.258	6221.9	0.000161
101	475.288	1826.5	0.000547
103	475.317	83.67	0.012
105	475.344	92.086	0.0109
107	475.371	111.67	0.008955
109	475.397	427.94	0.002337
111	475.421	417.32	0.002396
113	475.445	149.41	0.006693
115	475.468	91.101	0.011
5	471.523	1145.6	0.000873
7	471.551	1339.5	0.000747
9	471.578	1969.5	0.000508
11	471.604	3276.3	0.000305
13	471.63	1226.2	0.000816
15	471.654	1132.1	0.000883
17	471.678	744.78	0.001343
19	471.702	103.74	0.009639
21	471.725	73.19	0.0137
23	471.747	73.015	0.0137
25	471.768	77.024	0.013
27	471.79	77.513	0.0129
29	471.85	80.098	0.0125
31	471.948	79.687	0.0125
33	472.045	80.792	0.0124
35	472.141	81.632	0.0123
37	472.234	81.411	0.0123
39	472.326	84.287	0.0119
41	472.416	123.38	0.008105
43	472.504	201.16	0.004971
45	472.59	202.46	0.004939
47	472.674	203.01	0.004926
49	472.755	169.25	0.005908
51	472.833	168	0.005952
53	472.909	191.94	0.00521
55	472.982	1829.9	0.000546
57	473.052	1828.8	0.000547
59	473.113	1360.1	0.000735
61	473.166	1110.8	0.0009
63	473.22	832.53	0.001201
65	473.273	556.44	0.001797
67	473.327	435.55	0.002296
69	473.38	424.43	0.002356
71	473.433	422.8	0.002365
73	473.486	420.01	0.002381
75	473.539	424.1	0.002358
77	473.591	442.78	0.002258
79	473.644	456.94	0.002188

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Distance	Elevation	Resistivity	Conductivity
81	473.696	456.47	0.002191
83	473.749	454.32	0.002201
85	473.801	1899	0.000527
87	473.853	2796.1	0.000358
89	473.902	3397.8	0.000294
91	473.948	49.343	0.0203
93	473.993	866.07	0.001155
95	474.037	290.96	0.003437
97	474.079	105.04	0.00952
99	474.12	101.94	0.00981
101	474.159	87.954	0.0114
103	474.197	88.208	0.0113
105	474.235	92.174	0.0108
107	474.271	107.43	0.009308
109	474.306	104.94	0.009529
111	474.34	104.92	0.009531
113	474.372	109.4	0.009141
7	470.42	1342.8	0.000745
9	470.454	3147	0.000318
11	470.487	3241.9	0.000308
13	470.519	3254.2	0.000307
15	470.55	3349.7	0.000299
17	470.581	3390.5	0.000295
19	470.611	3184.5	0.000314
21	470.641	428	0.002336
23	470.67	416.32	0.002402
25	470.698	415.76	0.002405
27	470.725	415.64	0.002406
29	470.783	414.33	0.002414
31	470.871	257.17	0.003888
33	470.958	97.664	0.0102
35	471.042	95.683	0.0105
37	471.125	96.084	0.0104
39	471.206	123.46	0.0081
41	471.285	250.7	0.003989
43	471.362	358.86	0.002787
45	471.437	365.49	0.002736
47	471.509	368.92	0.002711
49	471.58	594.73	0.001681
51	471.648	2354.2	0.000425
53	471.713	2463.4	0.000406
55	471.776	2464.8	0.000406
57	471.836	1950.4	0.000513
59	471.892	1366.1	0.000732
61	471.944	1112.6	0.000899
63	471.996	970.49	0.00103
65	472.048	930.32	0.001075
67	472.1	710.99	0.001406
69	472.151	467.3	0.00214
71	472.203	457.27	0.002187
73	472.255	459.51	0.002176

Distance	Elevation	Resistivity	Conductivity
75	472.306	475.99	0.002101
77	472.357	577.45	0.001732
79	472.409	667.24	0.001499
81	472.46	722.8	0.001384
83	472.511	1020.9	0.00098
85	472.562	2429.2	0.000412
87	472.612	3457.4	0.000289
89	472.663	3467.7	0.000288
91	472.713	49.534	0.0202
93	472.763	325.43	0.003073
95	472.811	297.37	0.003363
97	472.858	114.94	0.0087
99	472.905	107.49	0.009303
101	472.95	106.05	0.00943
103	472.994	108.37	0.009228
105	473.037	109.04	0.009171
107	473.08	109.12	0.009164
109	473.121	109.12	0.009164
111	473.162	115.71	0.008642
11	469.245	3188.5	0.000314
13	469.283	3316.4	0.000302
15	469.32	3357.8	0.000298
17	469.356	3478.5	0.000287
19	469.392	3478.2	0.000288
21	469.427	3453.2	0.00029
23	469.461	3364	0.000297
25	469.495	3161.4	0.000316
27	469.528	2859.7	0.00035
29	469.584	2495.1	0.000401
31	469.663	2022.2	0.000495
33	469.74	1893.2	0.000528
35	469.816	1876.2	0.000533
37	469.89	1871.3	0.000534
39	469.962	1870	0.000535
41	470.033	1872.6	0.000534
43	470.101	1895.7	0.000528
45	470.168	2083.1	0.00048
47	470.233	2407.3	0.000415
49	470.296	2476.7	0.000404
51	470.356	2483.2	0.000403
53	470.415	2479.9	0.000403
55	470.472	2461.5	0.000406
57	470.527	1945.9	0.000514
59	470.58	1363.3	0.000734
61	470.631	1109.7	0.000901
63	470.682	972.45	0.001028
65	470.734	942.01	0.001062
67	470.785	913.49	0.001095
69	470.836	834.22	0.001199
71	470.887	820.57	0.001219
73	470.937	819.32	0.001221

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Distance	Elevation	Resistivity	Conductivity
75	470.988	821.25	0.001218
77	471.039	825.49	0.001211
79	471.09	845.56	0.001183
81	471.14	930.62	0.001075
83	471.191	1329.4	0.000752
85	471.241	2673.9	0.000374
87	471.292	3488.5	0.000287
89	471.343	3503.1	0.000285
91	471.395	178.29	0.005609
93	471.446	311.89	0.003206
95	471.496	300.11	0.003332
97	471.546	176.03	0.005681
99	471.595	154.22	0.006484
101	471.644	153.7	0.006506
103	471.692	153.54	0.006513
105	471.739	153.24	0.006526
107	471.785	152.51	0.006557
15	467.952	3312.6	0.000302
17	467.993	3478.5	0.000287
19	468.033	3478	0.000288
21	468.072	3455.4	0.000289
23	468.111	3376.2	0.000296
25	468.15	3289.7	0.000304
27	468.187	3188.5	0.000314
29	468.242	3156.1	0.000317
31	468.314	3080.1	0.000325
33	468.384	3024.7	0.000331
35	468.452	2975.9	0.000336
37	468.519	2914.4	0.000343
39	468.584	2850.7	0.000351
41	468.648	2812	0.000356
43	468.711	2775.4	0.00036
45	468.771	2722.7	0.000367
47	468.831	2661.4	0.000376
49	468.889	2560.9	0.00039
51	468.945	2490.8	0.000401
53	469	2476.2	0.000404
55	469.054	2438	0.00041
57	469.106	1922.1	0.00052
59	469.157	1351	0.00074
61	469.208	1096.1	0.000912
63	469.259	971.77	0.001029
65	469.31	945.46	0.001058
67	469.361	940.52	0.001063
69	469.412	936.58	0.001068
71	469.462	933.08	0.001072
73	469.513	930.34	0.001075
75	469.564	928.58	0.001077
77	469.614	928.23	0.001077
79	469.665	935.23	0.001069
81	469.715	1015.4	0.000985

Distance	Elevation	Resistivity	Conductivity
83	469.766	1355.7	0.000738
85	469.816	3011.7	0.000332
87	469.867	3507.9	0.000285
89	469.918	3534.1	0.000283
91	469.97	383.11	0.00261
93	470.022	324.66	0.00308
95	470.073	302.53	0.003305
97	470.124	276.45	0.003617
99	470.174	271.61	0.003682
101	470.224	270.14	0.003702
103	470.274	269.14	0.003716
19	466.524	3283.5	0.000305
21	466.567	3365.1	0.000297
23	466.609	3356.4	0.000298
25	466.651	3293.3	0.000304
27	466.693	3195.4	0.000313
29	466.747	3165.2	0.000316
31	466.812	3097.5	0.000323
33	466.876	3062.9	0.000326
35	466.939	3030.1	0.00033
37	467.001	2996	0.000334
39	467.061	2954.7	0.000338
41	467.12	2921.2	0.000342
43	467.178	2872.1	0.000348
45	467.235	2764	0.000362
47	467.291	2665.5	0.000375
49	467.346	2563.2	0.00039
51	467.4	2487.7	0.000402
53	467.452	2457.3	0.000407
55	467.504	2319.6	0.000431
57	467.555	1786.2	0.00056
59	467.606	1305.6	0.000766
61	467.657	1072.4	0.000932
63	467.708	968.92	0.001032
65	467.759	947.22	0.001056
67	467.809	944.24	0.001059
69	467.86	942.87	0.001061
71	467.911	942.24	0.001061
73	467.961	942.19	0.001061
75	468.012	943.94	0.001059
77	468.063	949.92	0.001053
79	468.113	965.55	0.001036
81	468.164	1031.9	0.000969
83	468.215	1480.2	0.000676
85	468.265	3230.1	0.00031
87	468.316	3518.8	0.000284
89	468.367	3565.6	0.00028
91	468.419	2381.2	0.00042
93	468.47	1211.9	0.000825
95	468.521	898.36	0.001113
97	468.573	723.12	0.001383

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Distance	Elevation	Resistivity	Conductivity
99	468.624	685.57	0.001459
23	464.944	3245.3	0.000308
25	464.989	3222.3	0.00031
27	465.033	3195.9	0.000313
29	465.086	3169.2	0.000316
31	465.147	3101.4	0.000322
33	465.206	3066.2	0.000326
35	465.265	3034.1	0.00033
37	465.323	3001.5	0.000333
39	465.38	2961.2	0.000338
41	465.436	2929.7	0.000341
43	465.491	2881.6	0.000347
45	465.545	2768.9	0.000361
47	465.599	2665.1	0.000375
49	465.652	2559.4	0.000391
51	465.704	2472.5	0.000404
53	465.755	2322.3	0.000431
55	465.807	1978.1	0.000506
57	465.857	1467.8	0.000681
59	465.908	1149.7	0.00087
61	465.959	1023.7	0.000977
63	466.01	960.02	0.001042
65	466.06	947.86	0.001055
67	466.111	946.01	0.001057
69	466.162	946.07	0.001057
71	466.213	947.22	0.001056
73	466.263	950.24	0.001052
75	466.314	955.88	0.001046
77	466.365	964.83	0.001036
79	466.415	987.57	0.001013
81	466.466	1054.7	0.000948
83	466.517	1757.8	0.000569
85	466.568	3307.7	0.000302
87	466.618	3523.7	0.000284
89	466.669	3609.7	0.000277
91	466.721	3616.1	0.000277
93	466.772	3578.9	0.000279
95	466.823	3644.5	0.000274
29	463.247	3164.8	0.000316
31	463.304	3099.8	0.000323
33	463.361	3062.2	0.000327
35	463.417	3031.9	0.00033
37	463.472	3000.6	0.000333
39	463.526	2962.8	0.000338
41	463.58	2934.7	0.000341
43	463.633	2886.4	0.000346
45	463.686	2769.4	0.000361
47	463.738	2660.6	0.000376
49	463.79	2548.1	0.000392
51	463.841	2378.3	0.00042
53	463.892	1964.1	0.000509

Distance	Elevation	Resistivity	Conductivity
55	463.943	1547.3	0.000646
57	463.994	1208.8	0.000827
59	464.045	1047.5	0.000955
61	464.096	982.31	0.001018
63	464.146	951.99	0.00105
65	464.197	947.22	0.001056
67	464.248	946.38	0.001057
69	464.299	948.4	0.001054
71	464.349	951.73	0.001051
73	464.4	961.1	0.00104
75	464.451	969.19	0.001032
77	464.502	984.03	0.001016
79	464.553	1017.4	0.000983
81	464.603	1077.2	0.000928
83	464.654	2451.2	0.000408
85	464.705	3379.2	0.000296
87	464.756	3517.8	0.000284
89	464.807	3683.8	0.000271
35	461.378	3010.1	0.000332
37	461.431	2984.1	0.000335
39	461.484	2959.4	0.000338
41	461.537	2936.9	0.00034
43	461.589	2886.9	0.000346
45	461.64	2765.3	0.000362
47	461.692	2645	0.000378
49	461.743	2418.4	0.000413
51	461.794	2109.8	0.000474
53	461.845	1543.3	0.000648
55	461.896	1216.9	0.000822
57	461.947	1033.9	0.000967
59	461.998	974.63	0.001026
61	462.048	952.37	0.00105
63	462.099	946.09	0.001057
65	462.15	944.3	0.001059
67	462.201	944.57	0.001059
69	462.252	951.19	0.001051
71	462.302	964.4	0.001037
73	462.353	977.38	0.001023
75	462.404	991.85	0.001008
77	462.455	1020.1	0.00098
79	462.506	1042.8	0.000959
81	462.557	1089.3	0.000918
83	462.607	3514	0.000285
41	459.288	2936.1	0.000341
43	459.339	2881.9	0.000347
45	459.391	2743.3	0.000365
47	459.442	2603.8	0.000384
49	459.493	1684.6	0.000594
51	459.543	1359.6	0.000736
53	459.594	1165.8	0.000858
55	459.645	1025	0.000976

Distance	Elevation	Resistivity	Conductivity
57	459.696	955.61	0.001046
59	459.747	939.79	0.001064
61	459.798	935.77	0.001069
63	459.848	934.25	0.00107
65	459.899	934.1	0.001071
67	459.95	935.29	0.001069
69	460.001	966.68	0.001034
71	460.052	996.49	0.001004
73	460.103	1017.1	0.000983
75	460.154	1035	0.000966
77	460.204	1092.4	0.000915
47	456.966	2570.7	0.000389
49	457.017	1312.5	0.000762
51	457.068	1118.4	0.000894
53	457.119	978.53	0.001022
55	457.17	917.02	0.00109
57	457.221	897.18	0.001115
59	457.271	894.26	0.001118
61	457.322	893.29	0.001119
63	457.373	893.45	0.001119
65	457.424	894.75	0.001118
67	457.475	906.82	0.001103
69	457.526	1085.5	0.000921
71	457.577	1090.5	0.000917
49	454.295	410.01	0.002439
51	454.346	677.5	0.001476
53	454.396	791.86	0.001263
55	454.447	818.79	0.001221
57	454.498	825.4	0.001212
59	454.549	831.74	0.001202
61	454.6	837.49	0.001194
63	454.65	842.55	0.001187
65	454.701	847.46	0.00118
67	454.752	875.85	0.001142
69	454.803	2301.9	0.000434

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Table A-4: Resistivity values after inversion of ERT-4

Distance	Elevation	Resistivity	Conductivity
3	466.343	520.83	0.00192
5	466.901	461.08	0.002169
7	467.457	675.79	0.00148
9	468.012	463.88	0.002156
11	468.565	461.98	0.002165
13	469.117	321.19	0.003113
14	469.668	273.66	0.003654
16	470.216	177.64	0.005629
18	470.762	180.87	0.005529
20	471.306	171.83	0.00582
22	471.846	167.54	0.005969
24	472.384	179.94	0.005557
26	472.917	164.04	0.006096
28	473.347	179.86	0.00556
30	473.676	182.06	0.005493
32	474.005	195.55	0.005114
34	474.334	176.13	0.005678
36	474.662	169.88	0.005887
38	474.991	161.25	0.006202
40	475.32	153.21	0.006527
42	475.648	124.89	0.008007
44	475.977	113.86	0.008783
46	476.306	109.76	0.009111
48	476.634	112.6	0.008881
50	476.962	121.34	0.008241
52	477.291	138.48	0.007221
54	477.619	137.45	0.007275
56	477.947	143.42	0.006973
58	478.248	143.16	0.006985
60	478.522	141.86	0.007049
62	478.796	140.05	0.00714
63	479.07	137.91	0.007251
65	479.344	138.12	0.00724
67	479.618	151.53	0.006599
69	479.891	159.94	0.006252
71	480.165	164.96	0.006062
73	480.438	158.8	0.006297
75	480.711	157.91	0.006333
77	480.984	156.09	0.006407
79	481.257	162.25	0.006163
81	481.53	162.8	0.006143
83	481.803	156.47	0.006391
85	482.075	179.66	0.005566
87	482.261	164.01	0.006097
89	482.36	190.8	0.005241
91	482.455	182.56	0.005478
93	482.548	259.78	0.003849
95	482.639	174.83	0.00572
97	482.728	190.2	0.005258
99	482.814	198.37	0.005041

Distance	Elevation	Resistivity	Conductivity
101	482.9	214.43	0.004664
103	482.984	201.63	0.00496
105	483.067	205.91	0.004856
107	483.149	212.39	0.004708
109	483.23	214.18	0.004669
111	483.309	219.48	0.004556
113	483.389	331.36	0.003018
3	465.321	543.88	0.001839
5	465.853	488.06	0.002049
7	466.383	651.84	0.001534
9	466.91	467.19	0.00214
11	467.434	457.2	0.002187
13	467.953	317.07	0.003154
15	468.469	272.15	0.003674
17	468.981	180.22	0.005549
19	469.487	181.53	0.005509
20	469.987	178.58	0.0056
22	470.48	178.35	0.005607
24	470.966	191.96	0.005209
26	471.443	188.41	0.005308
28	471.84	203.72	0.004909
30	472.163	209.02	0.004784
32	472.485	215.29	0.004645
34	472.808	200.73	0.004982
36	473.13	191.57	0.00522
38	473.452	180.48	0.005541
40	473.774	167.58	0.005967
42	474.096	139.24	0.007182
44	474.418	126.64	0.007896
46	474.74	124.11	0.008057
48	475.061	126.25	0.007921
50	475.383	135.95	0.007356
52	475.704	153.61	0.00651
54	476.025	157.01	0.006369
56	476.346	161.63	0.006187
58	476.649	161.32	0.006199
60	476.934	160.04	0.006248
62	477.218	157.71	0.006341
64	477.502	155.73	0.006421
66	477.786	155.14	0.006446
68	478.069	165.13	0.006056
70	478.352	172.79	0.005787
72	478.635	175.33	0.005704
74	478.918	170.96	0.005849
76	479.201	168.14	0.005947
78	479.483	165.73	0.006034
80	479.765	166.94	0.00599
82	480.047	166.59	0.006003
84	480.328	164	0.006098
86	480.609	177.38	0.005638
87	480.824	173.4	0.005767

Distance	Elevation	Resistivity	Conductivity
89	480.97	187.16	0.005343
91	481.109	187.91	0.005322
93	481.243	257.32	0.003886
95	481.371	180.82	0.00553
97	481.495	192.05	0.005207
99	481.615	195.57	0.005113
101	481.731	214.2	0.004669
103	481.844	201.91	0.004953
105	481.954	204.62	0.004887
107	482.062	210.54	0.00475
109	482.167	212.48	0.004706
111	482.269	222.32	0.004498
113	482.37	311.12	0.003214
5	464.759	588.3	0.0017
7	465.264	624.67	0.001601
9	465.765	455.96	0.002193
11	466.261	440.25	0.002271
13	466.751	307.1	0.003256
15	467.235	264.04	0.003787
17	467.713	192.44	0.005196
19	468.183	199.93	0.005002
21	468.645	207.78	0.004813
23	469.097	228.81	0.00437
25	469.539	271.44	0.003684
26	469.968	276.57	0.003616
28	470.339	310.51	0.003221
30	470.656	317.9	0.003146
32	470.973	316.92	0.003155
34	471.291	292.41	0.00342
36	471.608	270.94	0.003691
38	471.924	247.59	0.004039
40	472.241	222.2	0.0045
42	472.558	183.45	0.005451
44	472.874	164.87	0.006065
46	473.19	161.67	0.006185
48	473.506	163.54	0.006115
50	473.822	174.52	0.00573
52	474.138	196.48	0.00509
54	474.453	204.04	0.004901
56	474.768	210.45	0.004752
58	475.073	210.73	0.004745
60	475.366	209.69	0.004769
62	475.658	206.89	0.004833
64	475.95	204.75	0.004884
66	476.242	204.05	0.004901
68	476.534	213.65	0.004681
70	476.825	221.61	0.004512
72	477.116	222	0.004505
74	477.406	216.19	0.004626
76	477.696	208.11	0.004805
78	477.986	199.66	0.005009

Distance	Elevation	Resistivity	Conductivity
80	478.275	197.81	0.005055
82	478.564	195.16	0.005124
84	478.853	190.27	0.005256
86	479.142	192.13	0.005205
88	479.381	190.5	0.005249
90	479.567	196.8	0.005081
92	479.744	198.75	0.005031
94	479.913	248.61	0.004022
96	480.075	195.46	0.005116
98	480.23	201.8	0.004955
100	480.38	205.48	0.004867
102	480.524	217.08	0.004607
104	480.664	203.16	0.004922
106	480.799	204.91	0.00488
108	480.93	208.66	0.004792
110	481.058	211.49	0.004728
112	481.182	237.3	0.004214
7	464.043	1491.8	0.00067
9	464.518	614.54	0.001627
11	464.987	450.6	0.002219
13	465.449	359.93	0.002778
15	465.904	403.96	0.002475
17	466.351	536.07	0.001865
19	466.788	672.54	0.001487
21	467.215	1006.5	0.000994
23	467.631	1553.9	0.000644
25	468.035	2411.2	0.000415
27	468.424	2992.9	0.000334
29	468.771	3468	0.000288
31	469.084	3547	0.000282
33	469.397	3524.1	0.000284
35	469.71	3212	0.000311
37	470.023	2759.8	0.000362
39	470.335	2217.1	0.000451
41	470.648	1714	0.000583
42	470.96	1246.9	0.000802
44	471.272	992.62	0.001007
46	471.584	871.41	0.001148
48	471.895	847.3	0.00118
50	472.207	841.95	0.001188
52	472.518	862.24	0.00116
54	472.829	891.62	0.001122
56	473.139	937.09	0.001067
58	473.445	972.52	0.001028
60	473.744	1005.8	0.000994
62	474.044	1042.6	0.000959
64	474.342	1085.5	0.000921
66	474.641	1148.2	0.000871
68	474.939	1241.1	0.000806
70	475.236	1285.6	0.000778
72	475.533	1286.3	0.000777

Distance	Elevation	Resistivity	Conductivity
74	475.83	1258.2	0.000795
76	476.126	1191.8	0.000839
78	476.422	1098.2	0.000911
80	476.718	1054.1	0.000949
82	477.013	1035.2	0.000966
84	477.308	1019.5	0.000981
86	477.603	923.68	0.001083
88	477.863	876.54	0.001141
90	478.084	839.17	0.001192
92	478.294	823.59	0.001214
94	478.494	795.48	0.001257
96	478.687	716.5	0.001396
98	478.871	660.93	0.001513
100	479.048	584.4	0.001711
102	479.219	490.38	0.002039
104	479.383	355.26	0.002815
106	479.543	238.07	0.0042
108	479.697	226.24	0.00442
110	479.846	219.09	0.004564
11	463.604	1488.1	0.000672
13	464.04	924.56	0.001082
15	464.468	984.52	0.001016
17	464.886	1265.8	0.00079
19	465.294	1428.1	0.0007
21	465.691	1931.3	0.000518
23	466.075	2840.7	0.000352
25	466.446	3990.9	0.000251
27	466.802	4849.5	0.000206
29	467.132	5350	0.000187
31	467.441	5412.8	0.000185
33	467.751	5378.1	0.000186
35	468.061	4980.6	0.000201
37	468.37	4291.8	0.000233
39	468.679	3476.8	0.000288
41	468.988	2629.7	0.00038
43	469.297	1945	0.000514
45	469.605	1457.8	0.000686
47	469.913	1181.6	0.000846
49	470.222	1043.7	0.000958
51	470.529	997.31	0.001003
53	470.837	989.63	0.00101
55	471.145	989.49	0.001011
57	471.452	1004.7	0.000995
59	471.758	1032.9	0.000968
61	472.063	1082.4	0.000924
63	472.367	1157.6	0.000864
64	472.671	1259.1	0.000794
66	472.974	1388.6	0.00072
68	473.277	1521	0.000657
70	473.58	1617.5	0.000618
72	473.882	1655.3	0.000604

Distance	Elevation	Resistivity	Conductivity
74	474.184	1665.2	0.000601
76	474.485	1668.5	0.000599
78	474.786	1669.4	0.000599
80	475.086	1668.3	0.000599
82	475.387	1668.4	0.000599
84	475.687	1669	0.000599
86	475.986	1643.7	0.000608
88	476.263	1614.1	0.00062
90	476.513	1559.2	0.000641
92	476.751	1540.8	0.000649
94	476.979	1523.9	0.000656
96	477.198	1386.2	0.000721
98	477.409	1253.7	0.000798
100	477.611	1053.8	0.000949
102	477.806	768.42	0.001301
104	477.994	590.43	0.001694
106	478.176	286.78	0.003487
16	462.917	2119.5	0.000472
17	463.31	2639	0.000379
19	463.692	2717.5	0.000368
21	464.063	3040.5	0.000329
23	464.421	3765.7	0.000266
25	464.766	4576.6	0.000219
27	465.096	5207.7	0.000192
29	465.411	5509.1	0.000182
31	465.718	5520.8	0.000181
33	466.026	5463.5	0.000183
35	466.332	5082.3	0.000197
37	466.639	4361.5	0.000229
39	466.946	3553.4	0.000281
41	467.252	2745.6	0.000364
43	467.558	2070.9	0.000483
45	467.864	1571.9	0.000636
47	468.17	1243.5	0.000804
49	468.476	1072.9	0.000932
51	468.782	980.19	0.00102
53	469.087	948.68	0.001054
55	469.392	939.53	0.001064
57	469.697	937.56	0.001067
59	470.004	938.94	0.001065
61	470.312	973.22	0.001028
63	470.62	1050.8	0.000952
65	470.927	1157.6	0.000864
67	471.234	1287	0.000777
69	471.54	1424.3	0.000702
71	471.847	1528	0.000654
73	472.152	1575.1	0.000635
75	472.458	1600.6	0.000625
77	472.763	1613.4	0.00062
79	473.068	1626.7	0.000615
81	473.372	1649.8	0.000606

Distance	Elevation	Resistivity	Conductivity
83	473.676	1712	0.000584
85	473.98	1775.7	0.000563
86	474.283	1827.8	0.000547
88	474.574	1866.1	0.000536
90	474.846	1874.4	0.000534
92	475.108	1859.4	0.000538
94	475.36	1847.7	0.000541
96	475.601	1755.8	0.00057
98	475.834	1590.9	0.000629
100	476.059	1380.8	0.000724
102	476.276	857.39	0.001166
20	461.972	4639.7	0.000216
22	462.321	4832.2	0.000207
24	462.658	4951.9	0.000202
26	462.983	5072.3	0.000197
27	463.294	5288.2	0.000189
29	463.599	5458.7	0.000183
31	463.904	5441.4	0.000184
33	464.209	5322.5	0.000188
35	464.515	4939.2	0.000202
37	464.82	4205.5	0.000238
39	465.125	3419.3	0.000292
41	465.429	2692.6	0.000371
43	465.734	2050.9	0.000488
45	466.038	1572.2	0.000636
47	466.343	1251.2	0.000799
49	466.647	1060.3	0.000943
51	466.951	961.33	0.00104
53	467.255	912.96	0.001095
55	467.558	903.05	0.001107
57	467.862	912.3	0.001096
59	468.169	920.64	0.001086
61	468.479	959.3	0.001042
63	468.789	1040.1	0.000961
65	469.099	1143.2	0.000875
67	469.408	1258	0.000795
69	469.717	1385.4	0.000722
71	470.025	1445.3	0.000692
73	470.334	1527.5	0.000655
75	470.642	1541	0.000649
77	470.949	1585.1	0.000631
79	471.257	1612.6	0.00062
81	471.564	1627.3	0.000615
83	471.87	1687.6	0.000593
85	472.177	1747.6	0.000572
87	472.483	1823.7	0.000548
89	472.784	1891.9	0.000529
91	473.074	1904.6	0.000525
93	473.354	1899.1	0.000527
95	473.625	1865.4	0.000536
97	473.886	1825.5	0.000548

Distance	Elevation	Resistivity	Conductivity
99	474.138	1668.7	0.000599
24	460.775	6244.6	0.00016
26	461.084	5719.6	0.000175
28	461.382	5673.5	0.000176
30	461.68	5625.6	0.000178
32	461.984	5406.1	0.000185
34	462.289	5169.7	0.000193
36	462.593	4807.5	0.000208
38	462.897	3994.7	0.00025
40	463.201	3285.2	0.000304
42	463.505	2648.8	0.000378
44	463.808	2032.6	0.000492
46	464.112	1570.4	0.000637
48	464.415	1263	0.000792
50	464.718	1054.1	0.000949
51	465.022	943.24	0.00106
53	465.325	885.33	0.00113
55	465.628	864.44	0.001157
57	465.93	873.69	0.001145
59	466.237	900.63	0.00111
61	466.549	943.25	0.00106
63	466.86	1013.9	0.000986
65	467.171	1067	0.000937
67	467.481	1172.1	0.000853
69	467.792	1200.1	0.000833
71	468.102	1296.1	0.000772
73	468.411	1331.1	0.000751
75	468.721	1386.1	0.000721
77	469.03	1447.8	0.000691
79	469.339	1494.5	0.000669
81	469.648	1568.9	0.000637
83	469.956	1649.1	0.000606
85	470.264	1727.2	0.000579
87	470.572	1796.5	0.000557
89	470.88	1892.9	0.000528
91	471.183	1892.8	0.000528
93	471.477	1890.1	0.000529
95	471.762	1845.9	0.000542
30	459.639	6026.2	0.000166
32	459.942	5277.5	0.000189
34	460.246	5092.3	0.000196
36	460.55	4757	0.00021
38	460.853	3769.2	0.000265
40	461.157	3183.7	0.000314
42	461.46	2633.4	0.00038
44	461.764	2041.3	0.00049
46	462.067	1587.8	0.00063
48	462.37	1277.7	0.000783
50	462.673	1064	0.00094
52	462.976	935.33	0.001069
54	463.279	875.83	0.001142

Distance	Elevation	Resistivity	Conductivity
56	463.581	858.21	0.001165
58	463.884	859.17	0.001164
60	464.191	870.63	0.001149
62	464.503	877.79	0.001139
64	464.814	889.07	0.001125
66	465.125	948.29	0.001055
68	465.436	963.22	0.001038
70	465.747	1022.3	0.000978
72	466.058	1077.3	0.000928
74	466.368	1116.8	0.000895
76	466.678	1187.5	0.000842
77	466.988	1243.7	0.000804
79	467.298	1328	0.000753
81	467.608	1418.8	0.000705
83	467.917	1592.7	0.000628
85	468.226	1653.4	0.000605
87	468.535	1749.3	0.000572
89	468.847	1882.5	0.000531
36	458.366	5179.2	0.000193
38	458.669	3322.4	0.000301
40	458.973	3089.1	0.000324
42	459.276	2691.7	0.000372
44	459.579	2093.8	0.000478
46	459.883	1639.7	0.00061
48	460.186	1327.7	0.000753
50	460.489	1098.5	0.00091
52	460.792	928.31	0.001077
54	461.095	851.85	0.001174
56	461.398	829.09	0.001206
58	461.701	837.64	0.001194
60	462.008	837.18	0.001194
62	462.319	807.81	0.001238
64	462.631	798.8	0.001252
66	462.941	816.08	0.001225
68	463.252	831.58	0.001203
70	463.563	869.93	0.00115
72	463.874	883.88	0.001131
74	464.184	934.98	0.00107
76	464.494	982.27	0.001018
78	464.804	1095.1	0.000913
80	465.114	1158.7	0.000863
82	465.424	1288.6	0.000776
84	465.734	1582.9	0.000632
43	456.928	3225	0.00031
45	457.232	2237.7	0.000447
47	457.536	1821.9	0.000549
49	457.839	1532.3	0.000653
51	458.143	1209.6	0.000827
53	458.446	944.08	0.001059
54	458.75	805.41	0.001242
56	459.053	759.43	0.001317

Distance	Elevation	Resistivity	Conductivity
58	459.357	755.49	0.001324
60	459.664	771.21	0.001297
62	459.974	753.91	0.001326
64	460.284	773.28	0.001293
66	460.595	762.69	0.001311
68	460.905	770.84	0.001297
70	461.215	783.17	0.001277
72	461.526	796.12	0.001256
74	461.836	807.88	0.001238
76	462.145	883.11	0.001132
78	462.455	1042.6	0.000959
49	455.279	2224	0.00045
51	455.583	1517.5	0.000659
53	455.888	935.8	0.001069
55	456.192	736.35	0.001358
57	456.496	685.86	0.001458
59	456.8	689.86	0.00145
61	457.107	699.4	0.00143
63	457.416	726.23	0.001377
65	457.726	738.44	0.001354
67	458.035	717.23	0.001394
69	458.344	684.82	0.00146
71	458.653	690.18	0.001449
73	458.962	695.38	0.001438
51	452.839	1080.3	0.000926
53	453.143	757.06	0.001321
55	453.448	652.86	0.001532
57	453.753	640.12	0.001562
59	454.058	662.6	0.001509
61	454.365	693.51	0.001442
63	454.673	718.17	0.001392
65	454.981	717.27	0.001394
67	455.29	653.99	0.001529
69	455.598	566.77	0.001764
71	455.907	403.67	0.002477

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

TEC CONSULTING INTERNATIONAL LLC
2000

Table A-5: Resistivity values after inversion of ERT-5

Distance	Elevation	Resistivity	Conductivity
3	342.32	104.82	0.00954
5	342.197	111.8	0.008945
7	342.072	120.06	0.008329
9	341.945	115.72	0.008642
11	341.816	116.06	0.008616
13	341.687	90.76	0.011
15	341.556	102.83	0.009725
17	341.424	95.092	0.0105
19	341.292	89.54	0.0112
21	341.158	90.458	0.0111
23	341.024	104.99	0.009525
25	340.889	97.606	0.0102
27	340.754	91.596	0.0109
29	340.653	89.532	0.0112
31	340.588	87.255	0.0115
33	340.522	86.881	0.0115
35	340.457	77.749	0.0129
37	340.391	99.67	0.01
39	340.326	76.57	0.0131
41	340.26	70.084	0.0143
43	340.195	73.652	0.0136
45	340.129	71.995	0.0139
47	340.064	79.607	0.0126
49	339.998	73.758	0.0136
51	339.932	76.756	0.013
53	339.867	74.093	0.0135
55	339.801	68.393	0.0146
57	339.735	68.491	0.0146
59	339.701	64.53	0.0155
61	339.698	69.986	0.0143
63	339.694	61.796	0.0162
65	339.691	59.495	0.0168
67	339.687	51.05	0.0196
69	339.683	52.719	0.019
71	339.679	51.884	0.0193
73	339.674	50.876	0.0197
75	339.67	57.668	0.0173
77	339.665	45.002	0.0222
79	339.661	64.188	0.0156
81	339.656	41.937	0.0238
83	339.651	53.117	0.0188
85	339.645	46.188	0.0217
87	339.639	49.189	0.0203
89	339.633	48.026	0.0208
91	339.627	39.256	0.0255
93	339.621	59.07	0.0169
95	339.614	49.808	0.0201
97	339.606	89.826	0.0111
99	339.599	31.176	0.0321
101	339.591	56.64	0.0177

Distance	Elevation	Resistivity	Conductivity
103	339.582	58.836	0.017
105	339.573	53.608	0.0187
107	339.564	49.31	0.0203
109	339.554	45.247	0.0221
111	339.543	42.575	0.0235
113	339.532	52.085	0.0192
115	339.52	42.835	0.0233
3	341.358	105.06	0.009518
5	341.258	111.78	0.008946
7	341.156	120.02	0.008332
9	341.05	115.78	0.008637
11	340.942	115.96	0.008624
13	340.831	91.714	0.0109
15	340.719	102.73	0.009734
17	340.604	95.053	0.0105
19	340.488	89.61	0.0112
21	340.369	90.451	0.0111
23	340.25	104.95	0.009528
25	340.129	97.557	0.0103
27	340.007	91.561	0.0109
29	339.914	89.555	0.0112
31	339.85	87.297	0.0115
33	339.787	86.886	0.0115
35	339.724	82.311	0.0121
37	339.66	99.331	0.0101
39	339.597	76.564	0.0131
41	339.533	70.122	0.0143
43	339.47	73.629	0.0136
45	339.406	72.057	0.0139
47	339.343	79.598	0.0126
49	339.279	74.132	0.0135
51	339.215	76.748	0.013
53	339.152	74.11	0.0135
55	339.088	68.468	0.0146
57	339.024	68.502	0.0146
59	338.988	65.995	0.0152
61	338.978	69.997	0.0143
63	338.968	61.815	0.0162
65	338.958	59.511	0.0168
67	338.947	51.306	0.0195
69	338.936	52.732	0.019
71	338.925	51.936	0.0193
73	338.913	50.968	0.0196
75	338.901	57.665	0.0173
77	338.889	45.499	0.022
79	338.876	64.192	0.0156
81	338.863	52.691	0.019
83	338.849	53.138	0.0188
85	338.835	48.217	0.0207
87	338.82	49.216	0.0203
89	338.805	48.127	0.0208

Distance	Elevation	Resistivity	Conductivity
91	338.789	40.635	0.0246
93	338.773	59.089	0.0169
95	338.756	49.809	0.0201
97	338.738	89.787	0.0111
99	338.72	71.721	0.0139
101	338.7	57.305	0.0175
103	338.68	58.868	0.017
105	338.66	54.569	0.0183
107	338.638	49.342	0.0203
109	338.615	45.611	0.0219
111	338.592	45.591	0.0219
113	338.567	52.121	0.0192
115	338.541	47.739	0.0209
5	340.251	111.76	0.008948
7	340.165	120.07	0.008328
9	340.076	115.89	0.008629
11	339.983	115.93	0.008626
13	339.888	91.78	0.0109
15	339.791	102.66	0.009741
17	339.691	95.007	0.0105
19	339.588	89.656	0.0112
21	339.484	90.496	0.0111
23	339.378	105.01	0.009523
25	339.27	97.597	0.0102
27	339.16	91.579	0.0109
29	339.074	89.586	0.0112
31	339.013	87.3	0.0115
33	338.951	86.827	0.0115
35	338.89	82.414	0.0121
37	338.828	99.234	0.0101
39	338.767	76.615	0.0131
41	338.705	71.736	0.0139
43	338.644	74.161	0.0135
45	338.582	73.659	0.0136
47	338.521	79.839	0.0125
49	338.459	77.678	0.0129
51	338.397	77.951	0.0128
53	338.336	75.047	0.0133
55	338.274	70.742	0.0141
57	338.212	71.295	0.014
59	338.173	72.875	0.0137
61	338.157	86.985	0.0115
63	338.141	89.151	0.0112
65	338.124	92.764	0.0108
67	338.107	96.233	0.0104
69	338.09	119.15	0.008393
71	338.072	119.12	0.008395
73	338.053	117.68	0.008498
75	338.034	117.4	0.008518
77	338.015	99.375	0.0101
79	337.994	97.495	0.0103

Distance	Elevation	Resistivity	Conductivity
81	337.974	96.175	0.0104
83	337.952	92.229	0.0108
85	337.93	91.972	0.0109
87	337.908	121.25	0.008247
89	337.885	129.28	0.007735
91	337.861	131.88	0.007583
93	337.836	134.55	0.007432
95	337.81	80.729	0.0124
97	337.784	89.893	0.0111
99	337.757	80.953	0.0124
101	337.729	61.326	0.0163
103	337.7	63.1	0.0158
105	337.67	73.964	0.0135
107	337.639	102.56	0.00975
109	337.608	110.41	0.009057
111	337.575	110.56	0.009045
113	337.541	98.695	0.0101
7	339.051	177.66	0.005629
9	338.975	175.29	0.005705
11	338.895	163.22	0.006127
13	338.813	147.46	0.006781
15	338.728	146.24	0.006838
17	338.64	146.29	0.006836
19	338.55	148.97	0.006713
21	338.458	165.45	0.006044
23	338.364	176.85	0.005655
25	338.268	177.14	0.005645
27	338.17	177.61	0.00563
29	338.091	178.45	0.005604
31	338.032	179.13	0.005583
33	337.972	180.48	0.005541
35	337.913	188.11	0.005316
37	337.853	192.26	0.005201
39	337.794	231.26	0.004324
41	337.734	270.52	0.003697
43	337.674	278.33	0.003593
45	337.615	285.38	0.003504
47	337.555	312.3	0.003202
49	337.495	345.78	0.002892
51	337.435	382.76	0.002613
53	337.376	422.42	0.002367
55	337.316	455.16	0.002197
57	337.256	460.22	0.002173
59	337.215	460.38	0.002172
61	337.193	451.13	0.002217
63	337.171	423.77	0.00236
65	337.148	402.19	0.002486
67	337.124	385.31	0.002595
69	337.1	376.52	0.002656
71	337.076	372.75	0.002683
73	337.051	371.53	0.002692

Distance	Elevation	Resistivity	Conductivity
75	337.025	372.2	0.002687
77	336.999	389.28	0.002569
79	336.972	514.61	0.001943
81	336.945	572.9	0.001746
83	336.917	575.44	0.001738
85	336.888	574.24	0.001741
87	336.858	561.82	0.00178
89	336.828	501.22	0.001995
91	336.797	429.32	0.002329
93	336.765	397.87	0.002513
95	336.733	396.18	0.002524
97	336.699	416.46	0.002401
99	336.665	601.65	0.001662
101	336.63	602.68	0.001659
103	336.595	595.81	0.001678
105	336.558	591.04	0.001692
107	336.52	585.92	0.001707
109	336.482	583.08	0.001715
111	336.442	575.33	0.001738
11	337.671	213.98	0.004673
13	337.599	216.3	0.004623
15	337.524	218.69	0.004573
17	337.447	222.26	0.004499
19	337.368	228.48	0.004377
21	337.287	237.67	0.004208
23	337.203	242.27	0.004128
25	337.118	244.32	0.004093
27	337.03	248.23	0.004029
29	336.957	254.11	0.003935
31	336.9	259.14	0.003859
33	336.842	262.62	0.003808
35	336.784	264.48	0.003781
37	336.727	265.6	0.003765
39	336.669	268.07	0.00373
41	336.611	273.45	0.003657
43	336.553	278.58	0.00359
45	336.495	285.67	0.003501
47	336.437	312.26	0.003202
49	336.379	345.58	0.002894
51	336.321	382.56	0.002614
53	336.263	422.1	0.002369
55	336.205	454.4	0.002201
57	336.147	458.84	0.002179
59	336.104	458.68	0.00218
61	336.077	450.63	0.002219
63	336.048	423.62	0.002361
65	336.02	401.74	0.002489
67	335.991	384.87	0.002598
69	335.961	376.04	0.002659
71	335.93	372.37	0.002686
73	335.9	371.22	0.002694

Distance	Elevation	Resistivity	Conductivity
75	335.868	371.84	0.002689
77	335.836	389.06	0.00257
79	335.803	511.47	0.001955
81	335.77	569.02	0.001757
83	335.736	571.48	0.00175
85	335.701	570.46	0.001753
87	335.666	551.19	0.001814
89	335.63	496.04	0.002016
91	335.593	428.27	0.002335
93	335.556	397.68	0.002515
95	335.517	396.48	0.002522
97	335.479	415.67	0.002406
99	335.439	585.44	0.001708
101	335.399	597.53	0.001674
103	335.358	594.09	0.001683
105	335.316	590.46	0.001694
107	335.273	585.58	0.001708
15	336.173	242.24	0.004128
17	336.105	246.2	0.004062
19	336.034	248.28	0.004028
21	335.961	249.92	0.004001
23	335.887	251.03	0.003984
25	335.81	252.55	0.00396
27	335.732	254.54	0.003929
29	335.665	257.39	0.003885
31	335.609	260.84	0.003834
33	335.553	263.53	0.003795
35	335.497	265.18	0.003771
37	335.441	266.42	0.003753
39	335.385	268.46	0.003725
41	335.328	273.04	0.003662
43	335.272	277.68	0.003601
45	335.216	284.73	0.003512
47	335.16	310.15	0.003224
49	335.103	340.73	0.002935
51	335.047	372.96	0.002681
53	334.99	398.14	0.002512
55	334.934	405.56	0.002466
57	334.877	406.87	0.002458
59	334.833	406.26	0.002461
61	334.8	399.22	0.002505
63	334.766	375.5	0.002663
65	334.733	351.08	0.002848
67	334.698	335.67	0.002979
69	334.663	330.4	0.003027
71	334.628	328.79	0.003041
73	334.592	328.55	0.003044
75	334.555	330.45	0.003026
77	334.518	350.54	0.002853
79	334.48	444.4	0.00225
81	334.442	506.69	0.001974

Distance	Elevation	Resistivity	Conductivity
83	334.403	509.29	0.001964
85	334.364	508.71	0.001966
87	334.324	500.37	0.001999
89	334.283	464.93	0.002151
91	334.242	401.55	0.00249
93	334.2	390.11	0.002563
95	334.158	389.53	0.002567
97	334.115	410.97	0.002433
99	334.071	552.49	0.00181
101	334.027	568.57	0.001759
103	333.982	588.4	0.0017
19	334.541	249.74	0.004004
21	334.475	251.13	0.003982
23	334.408	251.94	0.003969
25	334.339	253.61	0.003943
27	334.268	255.29	0.003917
29	334.206	257.69	0.003881
31	334.151	260.9	0.003833
33	334.096	263.45	0.003796
35	334.042	265.04	0.003773
37	333.987	266.22	0.003756
39	333.932	267.88	0.003733
41	333.877	270.2	0.003701
43	333.823	272.11	0.003675
45	333.768	274.51	0.003643
47	333.713	281.65	0.003551
49	333.658	288.99	0.00346
51	333.603	292.44	0.00342
53	333.548	293.29	0.00341
55	333.493	293.49	0.003407
57	333.438	293.07	0.003412
59	333.391	291.43	0.003431
61	333.354	284.34	0.003517
63	333.316	268.09	0.00373
65	333.278	250.74	0.003988
67	333.239	241.16	0.004147
69	333.2	237.86	0.004204
71	333.16	237.04	0.004219
73	333.12	236.9	0.004221
75	333.079	237.33	0.004214
77	333.038	240.44	0.004159
79	332.996	261.45	0.003825
81	332.954	282.64	0.003538
83	332.911	297.51	0.003361
85	332.868	301.19	0.00332
87	332.824	302.23	0.003309
89	332.78	302.54	0.003305
91	332.736	303.19	0.003298
93	332.69	310.74	0.003218
95	332.645	382.32	0.002616
97	332.599	392.44	0.002548

Distance	Elevation	Resistivity	Conductivity
99	332.552	546.82	0.001829
23	332.757	252.13	0.003966
25	332.694	254.25	0.003933
27	332.629	255.43	0.003915
29	332.57	257.26	0.003887
31	332.517	260.24	0.003843
33	332.463	262.58	0.003808
35	332.41	264.01	0.003788
37	332.356	264.81	0.003776
39	332.303	265.06	0.003773
41	332.249	264.53	0.00378
43	332.195	262.77	0.003806
45	332.142	259.11	0.003859
47	332.088	253.77	0.003941
49	332.034	248.16	0.00403
51	331.98	243.04	0.004115
53	331.926	238.61	0.004191
55	331.872	234.24	0.004269
57	331.818	228.85	0.00437
59	331.771	220.84	0.004528
61	331.73	210.6	0.004748
63	331.688	201.03	0.004974
65	331.646	195.47	0.005116
67	331.604	193.67	0.005163
69	331.561	193.31	0.005173
71	331.518	193.33	0.005173
73	331.474	193.74	0.005162
75	331.43	196.02	0.005102
77	331.386	208.32	0.0048
79	331.341	230.58	0.004337
81	331.296	248.25	0.004028
83	331.25	258.51	0.003868
85	331.204	262.47	0.00381
87	331.158	265.33	0.003769
89	331.111	280.49	0.003565
91	331.064	282.49	0.00354
93	331.017	284.71	0.003512
95	330.969	379.07	0.002638
29	330.748	255.03	0.003921
31	330.696	257.99	0.003876
33	330.643	259.18	0.003858
35	330.59	259.59	0.003852
37	330.538	259.46	0.003854
39	330.485	258.13	0.003874
41	330.432	252.25	0.003964
43	330.38	240.85	0.004152
45	330.327	228.01	0.004386
47	330.274	216.77	0.004613
49	330.221	207.28	0.004824
51	330.168	198.61	0.005035
53	330.115	190.93	0.005238

Distance	Elevation	Resistivity	Conductivity
55	330.062	183.79	0.005441
57	330.009	176.93	0.005652
59	329.961	171.19	0.005841
61	329.916	166.83	0.005994
63	329.872	164.04	0.006096
65	329.827	162.79	0.006143
67	329.782	162.35	0.00616
69	329.736	162.2	0.006165
71	329.691	162.25	0.006163
73	329.644	162.49	0.006154
75	329.598	163.01	0.006135
77	329.551	166.27	0.006014
79	329.504	175.71	0.005691
81	329.457	191.7	0.005216
83	329.409	222.37	0.004497
85	329.361	228.56	0.004375
87	329.313	240.13	0.004164
89	329.265	275.83	0.003625
35	328.571	255.55	0.003913
37	328.519	254.52	0.003929
39	328.467	251.21	0.003981
41	328.415	244.73	0.004086
43	328.363	222.77	0.004489
45	328.311	203.97	0.004903
47	328.259	190.84	0.00524
49	328.206	182.43	0.005482
51	328.154	175.42	0.005701
53	328.102	169.48	0.0059
55	328.05	164.04	0.006096
57	327.998	160.19	0.006243
59	327.948	157.37	0.006354
61	327.902	155.55	0.006429
63	327.855	154.5	0.006472
65	327.808	153.96	0.006495
67	327.761	153.7	0.006506
69	327.713	153.59	0.006511
71	327.666	153.61	0.00651
73	327.618	153.76	0.006504
75	327.569	154.05	0.006491
77	327.521	155.21	0.006443
79	327.472	158.92	0.006292
81	327.424	169.9	0.005886
83	327.375	219.28	0.00456
41	326.183	241.22	0.004146
43	326.131	209.19	0.00478
45	326.079	190.33	0.005254
47	326.028	180.08	0.005553
49	325.976	168.58	0.005932
51	325.924	163.92	0.006101
53	325.873	160.11	0.006246
55	325.821	157.08	0.006366

Distance	Elevation	Resistivity	Conductivity
57	325.769	154.75	0.006462
59	325.719	153.27	0.006524
61	325.671	152.26	0.006568
63	325.623	151.63	0.006595
65	325.574	151.26	0.006611
67	325.526	151.05	0.00662
69	325.477	150.97	0.006624
71	325.428	151.01	0.006622
73	325.379	151.15	0.006616
75	325.329	151.42	0.006604
77	325.28	152.88	0.006541
46	323.567	175.22	0.005707
48	323.515	158.04	0.006328
50	323.464	156.33	0.006397
52	323.413	153.78	0.006503
54	323.362	152	0.006579
56	323.31	151.06	0.00662
58	323.26	150.48	0.006645
60	323.21	150.05	0.006664
62	323.161	149.68	0.006681
64	323.111	149.36	0.006695
66	323.061	149.08	0.006708
68	323.011	148.95	0.006714
70	322.961	149.05	0.006709
48	320.798	97.537	0.0103
50	320.747	143.54	0.006967
52	320.696	148.51	0.006734
54	320.645	149.11	0.006706
56	320.594	149.34	0.006696
58	320.543	149.37	0.006695
60	320.493	149.26	0.0067
62	320.443	149.01	0.006711
64	320.393	148.64	0.006728
66	320.342	147.97	0.006758
68	320.292	145.77	0.00686

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

STANTEC CONSULTING INTERNATIONAL LLC
2000

Table A-6: Resistivity values after inversion of ERT-6

Distance	Elevation	Resistivity	Conductivity
3	338.699	48.007	0.0208
5	338.83	48.032	0.0208
7	338.961	59.103	0.0169
9	339.091	39.679	0.0252
11	339.22	47.556	0.021
13	339.348	51.279	0.0195
15	339.476	57.852	0.0173
17	339.603	64.035	0.0156
19	339.728	71.237	0.014
21	339.853	77.491	0.0129
23	339.976	60.299	0.0166
25	340.098	66.191	0.0151
27	340.219	73.914	0.0135
29	340.322	56.123	0.0178
31	340.408	67.273	0.0149
33	340.493	68.414	0.0146
35	340.576	74.547	0.0134
37	340.659	82.966	0.0121
39	340.741	87.948	0.0114
41	340.822	102.98	0.009711
43	340.903	111.5	0.008969
45	340.983	85.476	0.0117
47	341.062	92.27	0.0108
49	341.14	95.155	0.0105
51	341.218	94.84	0.0105
53	341.296	91.299	0.011
55	341.373	70.985	0.0141
57	341.449	81.81	0.0122
59	341.525	88.773	0.0113
61	341.601	83.773	0.0119
63	341.676	71.103	0.0141
65	341.751	68.882	0.0145
67	341.826	75.544	0.0132
69	341.9	65.93	0.0152
71	341.974	65.821	0.0152
73	342.048	59.279	0.0169
75	342.121	66.346	0.0151
77	342.195	72.605	0.0138
79	342.267	77.624	0.0129
81	342.34	77.293	0.0129
83	342.413	95.738	0.0104
85	342.485	57.994	0.0172
87	342.557	90.46	0.0111
89	342.657	109.85	0.009103
91	342.786	201.08	0.004973
93	342.914	97.034	0.0103
95	343.042	118.79	0.008418
97	343.17	134.27	0.007448
99	343.298	154.92	0.006455
101	343.425	220.47	0.004536

Distance	Elevation	Resistivity	Conductivity
103	343.553	145.1	0.006892
105	343.68	123.3	0.00811
107	343.807	93.742	0.0107
109	343.934	78.375	0.0128
111	344.06	77.603	0.0129
113	344.186	76.449	0.0131
115	344.312	77.618	0.0129
3	337.683	49.583	0.0202
5	337.802	49.348	0.0203
7	337.92	59.151	0.0169
9	338.038	52.088	0.0192
11	338.154	53.487	0.0187
13	338.27	65.875	0.0152
15	338.385	72.623	0.0138
17	338.498	84.261	0.0119
19	338.61	94.603	0.0106
21	338.721	94.966	0.0105
23	338.83	94.955	0.0105
25	338.939	94.892	0.0105
27	339.045	94.643	0.0106
29	339.147	94.55	0.0106
31	339.245	94.673	0.0106
33	339.341	97.523	0.0103
35	339.437	103.22	0.009688
37	339.532	106.16	0.00942
39	339.625	107.5	0.009302
41	339.718	117.29	0.008526
43	339.81	120.66	0.008288
45	339.901	121.31	0.008243
47	339.991	121.39	0.008238
49	340.08	121.07	0.00826
51	340.169	103.34	0.009677
53	340.257	92.58	0.0108
55	340.345	90.085	0.0111
57	340.431	90.342	0.0111
59	340.517	90.749	0.011
61	340.603	87.405	0.0114
63	340.688	77.868	0.0128
65	340.772	75.48	0.0132
67	340.856	75.625	0.0132
69	340.939	68.602	0.0146
71	341.022	66.197	0.0151
73	341.104	63.574	0.0157
75	341.186	67.41	0.0148
77	341.268	75.377	0.0133
79	341.349	77.908	0.0128
81	341.43	77.702	0.0129
83	341.51	95.856	0.0104
85	341.59	59.998	0.0167
87	341.67	90.457	0.0111
89	341.77	109.86	0.009102

Distance	Elevation	Resistivity	Conductivity
91	341.892	166.51	0.006006
93	342.013	212.2	0.004713
95	342.135	198.03	0.00505
97	342.255	192.76	0.005188
99	342.376	190.37	0.005253
101	342.496	190.33	0.005254
103	342.616	141.47	0.007069
105	342.735	123.23	0.008115
107	342.854	94.192	0.0106
109	342.973	78.868	0.0127
111	343.091	78.297	0.0128
113	343.209	77.069	0.013
115	343.327	77.58	0.0129
5	336.734	61.509	0.0163
7	336.845	136.67	0.007317
9	336.956	143.62	0.006963
11	337.065	177.03	0.005649
13	337.173	213.28	0.004689
15	337.281	228.74	0.004372
17	337.388	260.91	0.003833
19	337.493	280.43	0.003566
21	337.598	281.38	0.003554
23	337.702	280.25	0.003568
25	337.804	276.66	0.003615
27	337.906	270.35	0.003699
29	338.008	264.77	0.003777
31	338.11	265.19	0.003771
33	338.211	267.63	0.003737
35	338.311	274.4	0.003644
37	338.411	276.61	0.003615
39	338.51	277.59	0.003602
41	338.608	294.71	0.003393
43	338.705	333.98	0.002994
45	338.802	366.45	0.002729
47	338.898	368.16	0.002716
49	338.994	360.11	0.002777
51	339.089	216.51	0.004619
53	339.183	185.41	0.005393
55	339.277	185.16	0.005401
57	339.37	185.2	0.0054
59	339.463	184.22	0.005428
61	339.554	178.6	0.005599
63	339.646	177.66	0.005629
65	339.737	177.83	0.005623
67	339.827	186.24	0.005369
69	339.917	192.85	0.005185
71	340.006	195.32	0.00512
73	340.095	196.64	0.005085
75	340.183	206.72	0.004837
77	340.271	206.62	0.00484
79	340.358	201.86	0.004954

Distance	Elevation	Resistivity	Conductivity
81	340.445	197.87	0.005054
83	340.531	274.55	0.003642
85	340.617	167.22	0.00598
87	340.703	112.17	0.008915
89	340.804	109.94	0.009096
91	340.92	149.2	0.006702
93	341.036	203.91	0.004904
95	341.152	197.05	0.005075
97	341.267	192.57	0.005193
99	341.382	190.03	0.005262
101	341.496	175.99	0.005682
103	341.61	141.15	0.007085
105	341.724	152.72	0.006548
107	341.837	217.63	0.004595
109	341.95	218.17	0.004584
111	342.063	221.09	0.004523
113	342.175	77.611	0.0129
7	335.676	839.61	0.001191
9	335.782	777.6	0.001286
11	335.887	751.71	0.00133
13	335.991	467.59	0.002139
15	336.096	459.52	0.002176
17	336.199	430.8	0.002321
19	336.302	430.25	0.002324
21	336.404	430.15	0.002325
23	336.506	429.81	0.002327
25	336.607	429.16	0.00233
27	336.707	428.56	0.002333
29	336.809	428.4	0.002334
31	336.912	428.34	0.002335
33	337.014	427.49	0.002339
35	337.116	418.7	0.002388
37	337.217	382.85	0.002612
39	337.319	363.73	0.002749
41	337.419	363.19	0.002753
43	337.52	374.17	0.002673
45	337.619	419.98	0.002381
47	337.719	437.27	0.002287
49	337.818	439.45	0.002276
51	337.916	441.24	0.002266
53	338.014	467.48	0.002139
55	338.111	561.89	0.00178
57	338.208	598.6	0.001671
59	338.305	601.04	0.001664
61	338.401	599.82	0.001667
63	338.497	580.97	0.001721
65	338.592	496.16	0.002015
67	338.687	395.91	0.002526
69	338.781	347.96	0.002874
71	338.875	329.38	0.003036
73	338.968	319.15	0.003133

Distance	Elevation	Resistivity	Conductivity
75	339.061	305.08	0.003278
77	339.153	291.66	0.003429
79	339.245	286.86	0.003486
81	339.337	286.35	0.003492
83	339.428	336.31	0.002973
85	339.519	334.81	0.002987
87	339.61	250.73	0.003988
89	339.711	149.77	0.006677
91	339.823	148.41	0.006738
93	339.934	175.6	0.005695
95	340.045	187.29	0.005339
97	340.156	185.81	0.005382
99	340.267	183.21	0.005458
101	340.377	171.52	0.00583
103	340.487	158.17	0.006322
105	340.597	281.65	0.003551
107	340.706	292.34	0.003421
109	340.815	291.65	0.003429
111	340.923	260.66	0.003836
11	334.604	790.08	0.001266
13	334.707	467.1	0.002141
15	334.809	460.08	0.002174
17	334.911	428.59	0.002333
19	335.013	428.22	0.002335
21	335.115	428.44	0.002334
23	335.216	428.51	0.002334
25	335.317	428.22	0.002335
27	335.418	427.82	0.002337
29	335.519	427.64	0.002338
31	335.622	427.36	0.00234
33	335.724	426.18	0.002346
35	335.826	413.85	0.002416
37	335.928	370.03	0.002702
39	336.03	344.1	0.002906
41	336.132	338.84	0.002951
43	336.233	339.28	0.002947
45	336.334	342.09	0.002923
47	336.435	346.68	0.002885
49	336.536	354.07	0.002824
51	336.636	383.96	0.002604
53	336.736	454.37	0.002201
55	336.835	547.21	0.001827
57	336.935	578.4	0.001729
59	337.034	581.18	0.001721
61	337.132	580.05	0.001724
63	337.231	570.22	0.001754
65	337.329	491.25	0.002036
67	337.426	393.37	0.002542
69	337.524	346.58	0.002885
71	337.621	328.48	0.003044
73	337.717	318.03	0.003144

Distance	Elevation	Resistivity	Conductivity
75	337.813	304.08	0.003289
77	337.909	290.36	0.003444
79	338.005	286.14	0.003495
81	338.1	286.13	0.003495
83	338.195	324.66	0.00308
85	338.289	333.12	0.003002
87	338.383	252.98	0.003953
89	338.485	167.38	0.005974
91	338.593	164.29	0.006087
93	338.701	174.66	0.005725
95	338.809	185.56	0.005389
97	338.917	187.52	0.005333
99	339.025	192.32	0.0052
101	339.132	195.44	0.005117
103	339.239	225.53	0.004434
105	339.345	282.36	0.003542
107	339.451	282.45	0.00354
15	333.405	460.63	0.002171
17	333.507	372.2	0.002687
19	333.608	354.68	0.002819
21	333.709	348.44	0.00287
23	333.811	341.61	0.002927
25	333.912	336.16	0.002975
27	334.013	331.32	0.003018
29	334.115	326.29	0.003065
31	334.217	321.85	0.003107
33	334.319	317.88	0.003146
35	334.421	310.79	0.003218
37	334.523	300.56	0.003327
39	334.625	296.56	0.003372
41	334.727	294.78	0.003392
43	334.828	294.21	0.003399
45	334.93	294.8	0.003392
47	335.032	296.19	0.003376
49	335.133	297.35	0.003363
51	335.234	298.46	0.003351
53	335.335	300.1	0.003332
55	335.436	301.21	0.00332
57	335.536	301.26	0.003319
59	335.637	300.59	0.003327
61	335.737	298.92	0.003345
63	335.837	286.56	0.00349
65	335.936	266.05	0.003759
67	336.036	254.95	0.003922
69	336.135	253.25	0.003949
71	336.234	252.91	0.003954
73	336.333	251.83	0.003971
75	336.431	249.06	0.004015
77	336.529	245.94	0.004066
79	336.627	244.52	0.00409
81	336.725	245.04	0.004081

Distance	Elevation	Resistivity	Conductivity
83	336.822	257.46	0.003884
85	336.919	265.34	0.003769
87	337.016	251.22	0.003981
89	337.118	179.65	0.005566
91	337.224	176.78	0.005657
93	337.33	176.24	0.005674
95	337.435	185.77	0.005383
97	337.541	190.05	0.005262
99	337.646	203.33	0.004918
101	337.751	205.58	0.004864
103	337.856	250.32	0.003995
19	332.069	343.94	0.002907
21	332.17	309.14	0.003235
23	332.271	297.77	0.003358
25	332.373	296.83	0.003369
27	332.474	294.7	0.003393
29	332.576	290.26	0.003445
31	332.678	284.48	0.003515
33	332.78	253.13	0.003951
35	332.882	211.65	0.004725
37	332.984	182.56	0.005478
39	333.086	159.82	0.006257
41	333.187	147.93	0.00676
43	333.289	143.66	0.006961
45	333.391	141.99	0.007043
47	333.492	141	0.007092
49	333.594	140.47	0.007119
51	333.695	140.3	0.007128
53	333.797	140.59	0.007113
55	333.898	142.23	0.007031
57	333.999	145.46	0.006875
59	334.101	149.81	0.006675
61	334.201	154.42	0.006476
63	334.302	159.24	0.00628
65	334.403	165.83	0.00603
67	334.504	175.78	0.005689
69	334.604	187	0.005348
71	334.704	194.42	0.005144
73	334.804	197.26	0.005069
75	334.904	197.79	0.005056
77	335.004	197.63	0.00506
79	335.103	197.51	0.005063
81	335.203	198.27	0.005044
83	335.302	203.71	0.004909
85	335.401	212.01	0.004717
87	335.499	216.13	0.004627
89	335.601	180.04	0.005554
91	335.705	177.83	0.005623
93	335.81	177.35	0.005639
95	335.914	186.7	0.005356
97	336.018	191	0.005236

Distance	Elevation	Resistivity	Conductivity
99	336.121	206.15	0.004851
23	330.581	275.23	0.003633
25	330.683	259.5	0.003854
27	330.784	250.6	0.00399
29	330.886	239.29	0.004179
31	330.988	214.46	0.004663
33	331.09	186.07	0.005374
35	331.191	164.06	0.006095
37	331.293	139.97	0.007144
39	331.395	127.53	0.007841
41	331.497	121.47	0.008232
43	331.598	118.4	0.008446
45	331.7	116.6	0.008576
47	331.802	115.38	0.008667
49	331.904	114.46	0.008737
51	332.005	113.84	0.008784
53	332.107	113.5	0.008811
55	332.208	113.41	0.008818
57	332.31	113.55	0.008807
59	332.411	114.12	0.008763
61	332.513	115.61	0.00865
63	332.614	119.26	0.008385
65	332.715	127.45	0.007846
67	332.816	143	0.006993
69	332.917	158.53	0.006308
71	333.018	166.03	0.006023
73	333.119	167.38	0.005974
75	333.22	167.19	0.005981
77	333.32	166.49	0.006006
79	333.421	165.56	0.00604
81	333.521	165.01	0.00606
83	333.622	165.19	0.006054
85	333.722	166.18	0.006018
87	333.822	167.88	0.005957
89	333.923	169.03	0.005916
91	334.027	169.75	0.005891
93	334.13	170.73	0.005857
95	334.233	187.32	0.005338
30	329.028	229.2	0.004363
32	329.13	185.77	0.005383
34	329.231	166.15	0.006019
36	329.333	155.78	0.006419
38	329.435	132.55	0.007544
40	329.537	122.92	0.008135
42	329.638	119.93	0.008338
44	329.74	117.74	0.008493
46	329.842	116.27	0.008601
48	329.943	115.14	0.008685
50	330.045	114.12	0.008763
52	330.147	113.29	0.008827
54	330.249	112.78	0.008867

Distance	Elevation	Resistivity	Conductivity
56	330.35	112.51	0.008888
57	330.452	112.43	0.008894
59	330.553	112.55	0.008885
61	330.655	113.02	0.008848
63	330.756	114.79	0.008712
65	330.858	120.46	0.008302
67	330.959	134.98	0.007409
69	331.061	146.1	0.006845
71	331.162	149.42	0.006693
73	331.263	149.63	0.006683
75	331.365	149.09	0.006707
77	331.466	147.42	0.006783
79	331.567	144.14	0.006938
81	331.668	139.97	0.007144
83	331.769	136.67	0.007317
85	331.87	134.83	0.007417
87	331.97	133.74	0.007477
89	332.072	133.18	0.007509
36	327.289	155.3	0.006439
38	327.391	127.45	0.007846
40	327.493	121.4	0.008237
42	327.595	119.84	0.008344
44	327.696	117.57	0.008506
46	327.798	116.24	0.008603
48	327.9	115.23	0.008678
50	328.001	114.18	0.008758
52	328.103	113.25	0.00883
54	328.205	112.67	0.008875
56	328.307	112.36	0.0089
58	328.408	112.24	0.008909
60	328.51	112.29	0.008906
62	328.611	112.52	0.008887
64	328.713	113.33	0.008824
66	328.815	118	0.008475
68	328.916	132.68	0.007537
70	329.018	143.4	0.006974
72	329.119	144.35	0.006928
74	329.221	144.31	0.00693
76	329.322	143.43	0.006972
78	329.424	139.96	0.007145
80	329.525	135.1	0.007402
82	329.627	128.63	0.007774
84	329.728	118.31	0.008452
42	325.347	119.99	0.008334
44	325.448	117.21	0.008532
46	325.55	116.2	0.008606
48	325.652	115.47	0.00866
50	325.753	114.36	0.008744
52	325.855	113.24	0.008831
54	325.957	112.59	0.008882
56	326.059	112.2	0.008913

नेपाल सरकार
वन तथा वातावरण मन्त्रालय
सिंहदरबार, काठमाडौं

STANTEC CONSULTING INTERNATIONAL LLC
2000

Distance	Elevation	Resistivity	Conductivity
58	326.16	112.01	0.008928
60	326.262	111.99	0.008929
62	326.364	112.14	0.008917
64	326.465	112.7	0.008873
66	326.567	116.59	0.008577
68	326.669	130.52	0.007662
70	326.77	140.71	0.007107
72	326.872	141.26	0.007079
74	326.974	141.15	0.007085
76	327.075	138.89	0.0072
78	327.177	122.68	0.008151
48	323.179	115.99	0.008621
50	323.281	114.61	0.008725
52	323.382	113.15	0.008838
54	323.484	112.43	0.008894
56	323.586	111.96	0.008932
58	323.688	111.67	0.008955
60	323.789	111.54	0.008965
62	323.891	111.58	0.008962
64	323.993	111.84	0.008941
66	324.094	114.34	0.008746
68	324.196	126.49	0.007906
70	324.298	137.24	0.007287
72	324.399	135.86	0.007361
50	320.561	114.78	0.008712
52	320.663	112.94	0.008854
54	320.764	112.2	0.008913
56	320.866	111.61	0.00896
58	320.968	111.18	0.008994
60	321.069	110.88	0.009019
62	321.171	110.72	0.009032
64	321.273	110.71	0.009033
66	321.374	111.85	0.008941
68	321.476	120.17	0.008322
70	321.578	437.19	0.002287

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Table A-7: Resistivity values after inversion of ERT-7			
Distance	**Elevation**	**Resistivity**	**Conductivity**
3	336.514	324.28	0.003084
5	336.522	123.55	0.008094
7	336.53	146.8	0.006812
9	336.538	105.64	0.009466
11	336.546	105.59	0.009471
13	336.553	110.22	0.009073
15	336.56	111.96	0.008932
17	336.567	102.39	0.009767
19	336.573	79.139	0.0126
21	336.579	110.53	0.009047
23	336.585	101.74	0.009829
25	336.591	122.48	0.008165
27	336.596	114.34	0.008746
29	336.63	135.4	0.007386
31	336.691	135.69	0.00737
33	336.752	112.67	0.008875
35	336.813	122.87	0.008139
37	336.874	158.79	0.006298
39	336.934	141.86	0.007049
41	336.995	147.82	0.006765
43	337.055	180.45	0.005542
45	337.115	180.41	0.005543
47	337.174	174.92	0.005717
49	337.233	175.36	0.005703
51	337.292	190.49	0.00525
53	337.351	220.45	0.004536
55	337.409	174.3	0.005737
57	337.467	171.06	0.005846
59	337.524	139.42	0.007173
61	337.581	149.89	0.006672
63	337.638	162.73	0.006145
65	337.694	162.31	0.006161
67	337.749	128.2	0.0078
69	337.804	136.85	0.007307
71	337.859	118.99	0.008404
73	337.913	117.27	0.008527
75	337.966	112.53	0.008887
77	338.018	104.56	0.009564
79	338.07	116.67	0.008571
81	338.121	110.81	0.009024
83	338.171	94.409	0.0106
85	338.22	87.223	0.0115
87	338.268	63.262	0.0158
89	338.302	60.483	0.0165
91	338.321	80.263	0.0125
93	338.339	58.556	0.0171
95	338.356	55.3	0.0181
97	338.372	57.522	0.0174
99	338.388	59.331	0.0169
101	338.402	55.486	0.018

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Distance	Elevation	Resistivity	Conductivity
103	338.416	51.992	0.0192
105	338.429	47.86	0.0209
107	338.441	48.818	0.0205
109	338.453	55.59	0.018
111	338.464	42.675	0.0234
113	338.475	9.48	0.1055
115	338.485	27.144	0.0368
3	335.528	151.43	0.006604
5	335.546	153.89	0.006498
7	335.564	149.17	0.006704
9	335.58	109.04	0.009171
11	335.597	107.42	0.009309
13	335.613	110.2	0.009074
15	335.628	111.91	0.008936
17	335.643	103.17	0.009693
19	335.658	89.623	0.0112
21	335.672	110.2	0.009074
23	335.686	109.9	0.009099
25	335.699	122.31	0.008176
27	335.713	119.66	0.008357
29	335.746	135.44	0.007383
31	335.8	135.62	0.007374
33	335.854	114.89	0.008704
35	335.907	124.23	0.00805
37	335.96	158.88	0.006294
39	336.013	158.75	0.006299
41	336.065	158.99	0.00629
43	336.117	180.59	0.005537
45	336.168	180.55	0.005539
47	336.219	175.09	0.005711
49	336.27	175.55	0.005696
51	336.32	190.69	0.005244
53	336.369	220.19	0.004542
55	336.418	182.91	0.005467
57	336.466	172.38	0.005801
59	336.514	139.7	0.007158
61	336.562	149.92	0.00667
63	336.608	162.63	0.006149
65	336.655	162.18	0.006166
67	336.7	155.36	0.006437
69	336.745	137.44	0.007276
71	336.789	119.17	0.008391
73	336.832	117.34	0.008522
75	336.875	112.64	0.008878
77	336.916	111.63	0.008958
79	336.957	116.69	0.00857
81	336.998	112.03	0.008926
83	337.037	96.241	0.0104
85	337.075	89.397	0.0112
87	337.112	75.636	0.0132
89	337.146	75.564	0.0132

Distance	Elevation	Resistivity	Conductivity
91	337.177	80.244	0.0125
93	337.206	64.669	0.0155
95	337.234	64.396	0.0155
97	337.261	64.585	0.0155
99	337.288	68.949	0.0145
101	337.314	68.796	0.0145
103	337.338	56.146	0.0178
105	337.362	49.23	0.0203
107	337.385	50.571	0.0198
109	337.408	55.607	0.018
111	337.429	42.712	0.0234
113	337.45	26.196	0.0382
115	337.471	27.176	0.0368
5	334.512	153.81	0.006502
7	334.535	191.51	0.005222
9	334.559	181.62	0.005506
11	334.581	162.55	0.006152
13	334.603	149.8	0.006676
15	334.625	170.95	0.00585
17	334.646	179.56	0.005569
19	334.667	96.798	0.0103
21	334.687	106.01	0.009433
23	334.707	107.11	0.009336
25	334.727	118.03	0.008472
27	334.746	119.6	0.008361
29	334.779	136.28	0.007338
31	334.827	142.35	0.007025
33	334.875	172.47	0.005798
35	334.923	219.1	0.004564
37	334.97	217.03	0.004608
39	335.017	217.05	0.004607
41	335.063	216.66	0.004616
43	335.109	208.94	0.004786
45	335.154	204.77	0.004884
47	335.199	202.32	0.004943
49	335.244	203.03	0.004925
51	335.288	201.44	0.004964
53	335.331	220.6	0.004533
55	335.374	243.02	0.004115
57	335.417	258.2	0.003873
59	335.458	167.4	0.005974
61	335.5	162.06	0.006171
63	335.541	162.66	0.006148
65	335.581	161.99	0.006173
67	335.621	155.19	0.006444
69	335.66	136.68	0.007316
71	335.699	119	0.008403
73	335.737	117.54	0.008508
75	335.774	127.82	0.007824
77	335.811	173.06	0.005778
79	335.847	180.31	0.005546

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81	335.883	178.64	0.005598
83	335.918	168.77	0.005925
85	335.952	164.87	0.006065
87	335.986	115.3	0.008673
89	336.02	106.01	0.009433
91	336.054	105.12	0.009513
93	336.087	117	0.008547
95	336.12	125.36	0.007977
97	336.152	159.28	0.006278
99	336.183	220.75	0.00453
101	336.214	221.62	0.004512
103	336.244	211.84	0.004721
105	336.274	65.805	0.0152
107	336.302	55.609	0.018
109	336.331	55.691	0.018
111	336.358	44.601	0.0224
113	336.385	64.048	0.0156
7	333.395	220.67	0.004532
9	333.422	259.88	0.003848
11	333.449	257.19	0.003888
13	333.476	237.54	0.00421
15	333.502	261.79	0.00382
17	333.528	505.69	0.001977
19	333.553	741.02	0.001349
21	333.578	817.9	0.001223
23	333.602	867.89	0.001152
25	333.626	872.18	0.001147
27	333.65	839.69	0.001191
29	333.684	446.5	0.00224
31	333.728	317.78	0.003147
33	333.771	317.15	0.003153
35	333.814	316	0.003165
37	333.857	309.39	0.003232
39	333.899	302.08	0.00331
41	333.941	292.74	0.003416
43	333.982	274.78	0.003639
45	334.023	264.37	0.003783
47	334.064	261.34	0.003826
49	334.105	260.21	0.003843
51	334.144	258.46	0.003869
53	334.184	258.35	0.003871
55	334.223	297.47	0.003362
57	334.262	318.9	0.003136
59	334.3	312.52	0.0032
61	334.338	251.84	0.003971
63	334.375	247.86	0.004035
65	334.412	248.96	0.004017
67	334.449	270.54	0.003696
69	334.485	284.63	0.003513
71	334.521	289.05	0.00346
73	334.556	288.55	0.003466

Distance	Elevation	Resistivity	Conductivity
75	334.592	283.17	0.003531
77	334.626	267.05	0.003745
79	334.661	251.26	0.00398
81	334.695	249.99	0.004
83	334.728	252.92	0.003954
85	334.762	365.5	0.002736
87	334.795	388.78	0.002572
89	334.829	388.78	0.002572
91	334.864	380.78	0.002626
93	334.898	368.6	0.002713
95	334.932	350.27	0.002855
97	334.966	345.43	0.002895
99	334.999	335.88	0.002977
101	335.032	358.54	0.002789
103	335.065	868.84	0.001151
105	335.097	1048.2	0.000954
107	335.128	1389.8	0.00072
109	335.16	1519	0.000658
111	335.191	1519	0.000658
11	332.193	250.12	0.003998
13	332.223	237.72	0.004207
15	332.252	260.93	0.003832
17	332.281	500.32	0.001999
19	332.309	720.56	0.001388
21	332.338	821.31	0.001218
23	332.366	865.15	0.001156
25	332.393	867.59	0.001153
27	332.42	813.49	0.001229
29	332.454	442.5	0.00226
31	332.495	314.76	0.003177
33	332.535	311.69	0.003208
35	332.574	308.63	0.00324
37	332.614	303.51	0.003295
39	332.653	297.71	0.003359
41	332.692	290.07	0.003447
43	332.73	273.88	0.003651
45	332.768	263.65	0.003793
47	332.806	260.57	0.003838
49	332.844	259.46	0.003854
51	332.881	258.22	0.003873
53	332.918	258.56	0.003868
55	332.955	296.81	0.003369
57	332.991	316.53	0.003159
59	333.027	312.4	0.003201
61	333.063	253.25	0.003949
63	333.099	249.36	0.00401
65	333.134	250.1	0.003998
67	333.169	265.49	0.003767
69	333.204	277.87	0.003599
71	333.239	280.78	0.003562
73	333.273	280.51	0.003565

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Distance	Elevation	Resistivity	Conductivity
75	333.307	276.56	0.003616
77	333.341	264.55	0.00378
79	333.375	251.23	0.00398
81	333.409	250	0.004
83	333.442	252.82	0.003955
85	333.476	360.58	0.002773
87	333.509	385.98	0.002591
89	333.543	386.35	0.002588
91	333.577	378.64	0.002641
93	333.612	368.63	0.002713
95	333.646	347.19	0.00288
97	333.68	344.5	0.002903
99	333.714	334.98	0.002985
101	333.748	355.43	0.002813
103	333.781	926.96	0.001079
105	333.815	1046.7	0.000955
107	333.848	1628	0.000614
15	330.867	200.61	0.004985
17	330.898	183.19	0.005459
19	330.929	168.31	0.005941
21	330.959	158.41	0.006313
23	330.99	152.68	0.00655
25	331.02	150.47	0.006646
27	331.049	150.57	0.006641
29	331.083	152.2	0.00657
31	331.121	156.38	0.006395
33	331.159	166.68	0.006
35	331.196	199.79	0.005005
37	331.234	235.12	0.004253
39	331.271	242.13	0.00413
41	331.307	245.68	0.00407
43	331.344	248.42	0.004025
45	331.38	251.31	0.003979
47	331.416	254.1	0.003935
49	331.452	255.59	0.003913
51	331.488	256.2	0.003903
53	331.523	257.87	0.003878
55	331.559	287.92	0.003473
57	331.594	294.25	0.003398
59	331.629	294.36	0.003397
61	331.664	253.78	0.00394
63	331.698	249.95	0.004001
65	331.733	250.54	0.003991
67	331.767	257.96	0.003877
69	331.801	263.47	0.003795
71	331.836	264.9	0.003775
73	331.869	264.42	0.003782
75	331.903	260.68	0.003836
77	331.937	251.88	0.00397
79	331.971	247.74	0.004036
81	332.005	247.18	0.004046

Distance	Elevation	Resistivity	Conductivity
83	332.038	250.78	0.003988
85	332.072	293.76	0.003404
87	332.106	314.12	0.003183
89	332.139	317.56	0.003149
91	332.174	318.3	0.003142
93	332.208	316.48	0.00316
95	332.242	312.92	0.003196
97	332.276	310.55	0.00322
99	332.31	332.59	0.003007
101	332.344	340.52	0.002937
103	332.378	1042.6	0.000959
19	329.402	161.04	0.00621
21	329.434	143.06	0.00699
23	329.466	139.22	0.007183
25	329.497	138.17	0.007237
27	329.529	138.31	0.00723
29	329.563	139.69	0.007159
31	329.599	145.71	0.006863
33	329.635	154.56	0.00647
35	329.671	168.49	0.005935
37	329.707	194.69	0.005136
39	329.742	210.86	0.004742
41	329.778	221.06	0.004524
43	329.813	229.25	0.004362
45	329.848	235.57	0.004245
47	329.883	240.22	0.004163
49	329.918	243.48	0.004107
51	329.953	246.33	0.00406
53	329.988	250.42	0.003993
55	330.022	258.92	0.003862
57	330.057	261.01	0.003831
59	330.091	260.98	0.003832
61	330.125	253.35	0.003947
63	330.16	249.53	0.004008
65	330.194	249.52	0.004008
67	330.228	250.41	0.003993
69	330.262	250.82	0.003987
71	330.296	250.23	0.003996
73	330.33	247.8	0.004036
75	330.364	243.83	0.004101
77	330.397	239.5	0.004175
79	330.431	237.42	0.004212
81	330.465	237.32	0.004214
83	330.499	238.86	0.004187
85	330.533	243.51	0.004107
87	330.566	247.6	0.004039
89	330.6	255.15	0.003919
91	330.634	256.36	0.003901
93	330.668	259.32	0.003856
95	330.702	259.45	0.003854
97	330.736	259.83	0.003849

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Distance	Elevation	Resistivity	Conductivity
99	330.77	330.74	0.003024
23	327.782	140.42	0.007121
25	327.815	139.58	0.007164
27	327.848	139.42	0.007173
29	327.881	139.83	0.007152
31	327.917	146.84	0.00681
33	327.952	155	0.006452
35	327.987	163.49	0.006117
37	328.022	191.61	0.005219
39	328.056	203.78	0.004907
41	328.091	213.68	0.00468
43	328.126	223.08	0.004483
45	328.16	228.45	0.004377
47	328.195	231.88	0.004313
49	328.229	234.24	0.004269
51	328.263	236.09	0.004236
53	328.298	237.91	0.004203
55	328.332	239.46	0.004176
57	328.366	240.3	0.004161
59	328.4	240.61	0.004156
61	328.434	240.38	0.00416
63	328.468	239.63	0.004173
65	328.502	238.22	0.004198
67	328.536	236.54	0.004228
69	328.57	234.44	0.004265
71	328.604	231.47	0.00432
73	328.638	226.8	0.004409
75	328.672	220.64	0.004532
77	328.706	216.51	0.004619
79	328.739	215.64	0.004637
81	328.773	215.5	0.00464
83	328.807	216.03	0.004629
85	328.841	217.56	0.004596
87	328.875	221.24	0.00452
89	328.909	223.31	0.004478
91	328.943	224.54	0.004454
93	328.977	225.68	0.004431
95	329.011	236.46	0.004229
29	326.027	139.97	0.007144
31	326.061	148.33	0.006742
33	326.096	155.86	0.006416
35	326.13	161.87	0.006178
37	326.165	192.37	0.005198
39	326.199	202.98	0.004927
41	326.233	211.21	0.004735
43	326.268	222.21	0.0045
45	326.302	226.1	0.004423
47	326.336	227.81	0.00439
49	326.37	228.59	0.004375
51	326.404	228.94	0.004368
53	326.438	229.09	0.004365

Distance	Elevation	Resistivity	Conductivity
55	326.472	229.08	0.004365
57	326.506	228.87	0.004369
59	326.54	228.37	0.004379
61	326.574	227.4	0.004398
63	326.608	225.75	0.00443
65	326.642	223.29	0.004478
67	326.676	219.98	0.004546
69	326.71	215.9	0.004632
71	326.744	211.95	0.004718
73	326.778	208.28	0.004801
75	326.811	205.14	0.004875
77	326.845	203.3	0.004919
79	326.879	202.62	0.004935
81	326.913	202.36	0.004942
83	326.947	202.46	0.004939
85	326.981	202.89	0.004929
87	327.015	204.08	0.0049
89	327.049	209.12	0.004782
35	324.086	157.16	0.006363
37	324.12	194.58	0.005139
39	324.154	203.07	0.004924
41	324.188	209.34	0.004777
43	324.223	222.12	0.004502
45	324.257	225.12	0.004442
47	324.291	225.79	0.004429
49	324.325	225.88	0.004427
51	324.358	225.82	0.004428
53	324.392	225.64	0.004432
55	324.426	225.31	0.004438
57	324.46	224.81	0.004448
59	324.494	224.09	0.004462
61	324.528	223.01	0.004484
63	324.562	221.26	0.00452
65	324.596	218.62	0.004574
67	324.63	214.93	0.004653
69	324.664	209.8	0.004766
71	324.698	205.97	0.004855
73	324.732	202.15	0.004947
75	324.765	199.38	0.005016
77	324.799	197.69	0.005058
79	324.833	196.97	0.005077
81	324.867	196.46	0.00509
83	324.901	196.21	0.005097
41	321.938	203.6	0.004912
43	321.972	222.27	0.004499
45	322.006	224.35	0.004457
47	322.04	224.6	0.004452
49	322.074	224.52	0.004454
51	322.108	224.33	0.004458
53	322.142	224.05	0.004463
55	322.176	223.66	0.004471

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Distance	Elevation	Resistivity	Conductivity
57	322.21	223.09	0.004482
59	322.244	222.31	0.004498
61	322.278	221.26	0.00452
63	322.312	219.5	0.004556
65	322.345	216.75	0.004614
67	322.379	212.73	0.004701
69	322.413	204.33	0.004894
71	322.447	200.46	0.004989
73	322.481	197.97	0.005051
75	322.515	195.96	0.005103
77	322.549	194.93	0.00513
47	319.565	223.78	0.004469
49	319.599	223.4	0.004476
51	319.633	223.16	0.004481
53	319.667	222.91	0.004486
55	319.701	222.54	0.004494
57	319.734	221.97	0.004505
59	319.768	221.15	0.004522
61	319.802	220.07	0.004544
63	319.836	218.27	0.004581
65	319.87	215.36	0.004643
67	319.904	210.98	0.00474
69	319.938	194.49	0.005142
71	319.972	192.48	0.005195
49	316.876	221.84	0.004508
51	316.91	222.14	0.004502
53	316.944	222.12	0.004502
55	316.977	221.85	0.004508
57	317.011	221.32	0.004518
59	317.045	220.48	0.004536
61	317.079	219.38	0.004558
63	317.113	217.53	0.004597
65	317.147	214.58	0.00466
67	317.181	209.9	0.004764
69	317.215	172.19	0.005808

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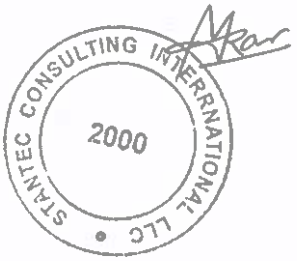
Table A-8: Resistivity values after inversion of ERT-8			
Distance	**Elevation**	**Resistivity**	**Conductivity**
3	336.524	159.44	0.006272
5	336.538	159.41	0.006273
7	336.552	133.89	0.007469
9	336.564	186.48	0.005363
11	336.576	181.24	0.005518
13	336.587	160.56	0.006228
15	336.597	160.81	0.006219
17	336.607	162.33	0.00616
19	336.616	146.14	0.006843
21	336.624	155.36	0.006437
23	336.632	150.98	0.006623
25	336.64	119.68	0.008356
27	336.647	163.66	0.00611
29	336.682	148.91	0.006715
31	336.747	130.43	0.007667
33	336.811	173.18	0.005774
35	336.876	141.15	0.007085
37	336.94	142.12	0.007036
39	337.005	103.4	0.009671
41	337.069	145.47	0.006874
43	337.133	122.8	0.008143
45	337.198	121.64	0.008221
47	337.262	101.27	0.009875
49	337.326	170.29	0.005872
51	337.39	153.87	0.006499
53	337.454	127.92	0.007817
55	337.518	130.56	0.007659
57	337.582	124.13	0.008056
59	337.618	338.29	0.002956
61	337.627	131.54	0.007602
63	337.635	130.79	0.007646
65	337.642	133.48	0.007492
67	337.649	168.24	0.005944
69	337.656	150.12	0.006661
71	337.662	127.41	0.007849
73	337.668	115.35	0.008669
75	337.673	115.58	0.008652
77	337.679	126.57	0.007901
79	337.684	103.96	0.009619
81	337.689	100.77	0.009924
83	337.693	84.415	0.0118
85	337.698	89.303	0.0112
87	337.702	116.86	0.008557
89	337.767	133.83	0.007472
91	337.894	93.483	0.0107
93	338.019	127.74	0.007828
95	338.144	123.55	0.008094
97	338.269	121.37	0.008239
99	338.392	125.68	0.007957
101	338.515	112.36	0.0089

Distance	Elevation	Resistivity	Conductivity
103	338.637	134.76	0.007421
105	338.758	143.26	0.00698
107	338.877	138.22	0.007235
109	338.995	142.27	0.007029
111	339.111	153.97	0.006495
113	339.225	151.93	0.006582
115	339.337	183.2	0.005459
3	335.547	159.51	0.006269
5	335.576	159.43	0.006272
7	335.604	147.76	0.006768
9	335.631	186.51	0.005362
11	335.656	181.28	0.005516
13	335.68	160.67	0.006224
15	335.703	160.84	0.006217
17	335.725	162.22	0.006164
19	335.746	146.28	0.006836
21	335.767	155.42	0.006434
23	335.786	152.32	0.006565
25	335.804	165.31	0.006049
27	335.822	163.72	0.006108
29	335.861	148.97	0.006713
31	335.923	132.18	0.007565
33	335.984	172.48	0.005798
35	336.045	141.28	0.007078
37	336.106	142.08	0.007038
39	336.167	107.2	0.009328
41	336.228	145.46	0.006875
43	336.289	123.4	0.008104
45	336.35	121.85	0.008207
47	336.411	121.02	0.008263
49	336.471	169.76	0.005891
51	336.532	153.97	0.006495
53	336.592	129.29	0.007735
55	336.653	131.77	0.007589
57	336.713	124.37	0.008041
59	336.753	333.74	0.002996
61	336.773	131.68	0.007594
63	336.792	134.72	0.007423
65	336.81	134.19	0.007452
67	336.828	168.19	0.005946
69	336.845	150.12	0.006661
71	336.861	127.35	0.007852
73	336.876	117.33	0.008523
75	336.891	117.3	0.008525
77	336.906	126.58	0.0079
79	336.919	104.1	0.009606
81	336.933	100.77	0.009924
83	336.946	84.398	0.0118
85	336.958	89.251	0.0112
87	336.97	116.87	0.008557
89	337.033	133.61	0.007484

Distance	Elevation	Resistivity	Conductivity
91	337.146	129.79	0.007705
93	337.259	127.88	0.00782
95	337.37	123.62	0.008089
97	337.479	121.41	0.008237
99	337.587	123.98	0.008066
101	337.694	112.42	0.008895
103	337.798	134.7	0.007424
105	337.901	143.32	0.006977
107	338.001	142.44	0.00702
109	338.099	142.36	0.007024
111	338.194	154.07	0.006491
113	338.286	157.4	0.006353
115	338.374	182.97	0.005465
5	334.55	159.6	0.006266
7	334.587	152.44	0.00656
9	334.623	186.84	0.005352
11	334.658	183.99	0.005435
13	334.691	179.12	0.005583
15	334.724	178.07	0.005616
17	334.755	168.57	0.005932
19	334.785	154.35	0.006479
21	334.815	155.61	0.006426
23	334.843	152.44	0.00656
25	334.871	165.2	0.006053
27	334.897	163.5	0.006116
29	334.939	148.96	0.006713
31	334.998	137.31	0.007283
33	335.056	172.76	0.005788
35	335.115	178.74	0.005595
37	335.173	185.74	0.005384
39	335.232	159.45	0.006272
41	335.29	146.96	0.006805
43	335.348	128.52	0.007781
45	335.406	126.6	0.007899
47	335.464	124.67	0.008021
49	335.522	169.48	0.0059
51	335.579	153.9	0.006498
53	335.637	151.46	0.006602
55	335.695	322.2	0.003104
57	335.752	123.7	0.008084
59	335.795	372.14	0.002687
61	335.824	133.44	0.007494
63	335.852	280.42	0.003566
65	335.88	145.69	0.006864
67	335.906	168.12	0.005948
69	335.931	150.15	0.00666
71	335.956	127.36	0.007852
73	335.98	117.48	0.008512
75	336.003	117.35	0.008522
77	336.025	126.61	0.007898
79	336.047	104.25	0.009592



Distance	Elevation	Resistivity	Conductivity
81	336.068	100.91	0.00991
83	336.088	85.039	0.0118
85	336.108	89.543	0.0112
87	336.128	116.97	0.008549
89	336.188	133.33	0.0075
91	336.29	129.76	0.007707
93	336.39	127.86	0.007821
95	336.488	123.65	0.008087
97	336.584	121.52	0.008229
99	336.679	124.02	0.008063
101	336.771	122.73	0.008148
103	336.861	135.3	0.007391
105	336.949	144.82	0.006905
107	337.034	144.74	0.006909
109	337.117	142.79	0.007003
111	337.197	154.61	0.006468
113	337.273	180.96	0.005526
7	333.452	276.97	0.00361
9	333.494	277.1	0.003609
11	333.535	277.2	0.003608
13	333.575	277.86	0.003599
15	333.615	279.25	0.003581
17	333.653	281.46	0.003553
19	333.691	289.03	0.00346
21	333.727	297.36	0.003363
23	333.763	297.99	0.003356
25	333.797	294.4	0.003397
27	333.831	280.87	0.00356
29	333.876	277.64	0.003602
31	333.932	277.29	0.003606
33	333.988	278.27	0.003594
35	334.045	283.61	0.003526
37	334.101	288.2	0.00347
39	334.157	289.66	0.003452
41	334.213	291.77	0.003427
43	334.269	295.87	0.00338
45	334.324	296.64	0.003371
47	334.38	293.28	0.00341
49	334.436	289.37	0.003456
51	334.491	292.96	0.003413
53	334.547	338.68	0.002953
55	334.602	470.64	0.002125
57	334.657	20.734	0.0482
59	334.703	1545	0.000647
61	334.739	10.556	0.0947
63	334.774	458.16	0.002183
65	334.809	350.21	0.002855
67	334.842	225.45	0.004436
69	334.875	227.83	0.004389
71	334.907	252.5	0.00396
73	334.938	262.74	0.003806

Distance	Elevation	Resistivity	Conductivity
75	334.968	267.13	0.003743
77	334.998	269.63	0.003709
79	335.026	271.68	0.003681
81	335.055	271.67	0.003681
83	335.082	269.83	0.003706
85	335.109	266.73	0.003749
87	335.135	255.57	0.003913
89	335.193	241.82	0.004135
91	335.284	243.08	0.004114
93	335.372	245.76	0.004069
95	335.459	248.41	0.004026
97	335.544	249.6	0.004006
99	335.627	250.55	0.003991
101	335.707	253.54	0.003944
103	335.786	256.47	0.003899
105	335.862	257.3	0.003887
107	335.936	200.18	0.004996
109	336.007	198.45	0.005039
111	336.076	181.73	0.005503
11	332.284	277.27	0.003607
13	332.329	277.65	0.003602
15	332.373	278.88	0.003586
17	332.416	281.21	0.003556
19	332.459	288.9	0.003461
21	332.501	296.85	0.003369
23	332.542	297.47	0.003362
25	332.582	294.37	0.003397
27	332.621	281.87	0.003548
29	332.668	278.04	0.003597
31	332.723	277.26	0.003607
33	332.777	278.17	0.003595
35	332.832	283.31	0.00353
37	332.886	287.45	0.003479
39	332.94	289.22	0.003458
41	332.994	291.49	0.003431
43	333.048	295.8	0.003381
45	333.103	296.43	0.003373
47	333.157	293.78	0.003404
49	333.21	291.71	0.003428
51	333.264	295.57	0.003383
53	333.318	338.73	0.002952
55	333.372	407.15	0.002456
57	333.425	28.809	0.0347
59	333.473	1545.8	0.000647
61	333.515	405.31	0.002467
63	333.555	410.07	0.002439
65	333.595	351.06	0.002849
67	333.634	250.74	0.003988
69	333.673	251.2	0.003981
71	333.711	253.6	0.003943
73	333.748	262.72	0.003806

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Distance	Elevation	Resistivity	Conductivity
75	333.784	267.3	0.003741
77	333.819	270.02	0.003703
79	333.854	272.44	0.003671
81	333.889	272.79	0.003666
83	333.922	271.71	0.00368
85	333.955	269	0.003717
87	333.987	260	0.003846
89	334.044	257.71	0.00388
91	334.124	257.89	0.003878
93	334.203	260.55	0.003838
95	334.28	262.35	0.003812
97	334.355	262.8	0.003805
99	334.428	262.49	0.00381
101	334.499	261.89	0.003818
103	334.568	260.83	0.003834
105	334.636	260.35	0.003841
107	334.701	199.64	0.005009
15	330.993	275.94	0.003624
17	331.039	278.09	0.003596
19	331.085	286.43	0.003491
21	331.13	294.38	0.003397
23	331.175	295.43	0.003385
25	331.22	293.45	0.003408
27	331.263	282.24	0.003543
29	331.312	277.63	0.003602
31	331.365	273.75	0.003653
33	331.418	271.05	0.003689
35	331.471	270.35	0.003699
37	331.524	270.61	0.003695
39	331.577	272.05	0.003676
41	331.63	276.85	0.003612
43	331.683	288.47	0.003467
45	331.736	293.24	0.00341
47	331.789	293.14	0.003411
49	331.841	292.98	0.003413
51	331.894	298.31	0.003352
53	331.947	326.08	0.003067
55	331.999	332.88	0.003004
57	332.052	219.75	0.004551
59	332.101	1292.4	0.000774
61	332.146	404.44	0.002473
63	332.19	402.19	0.002486
65	332.234	345.37	0.002895
67	332.278	261.69	0.003821
69	332.321	253.54	0.003944
71	332.363	254.41	0.003931
73	332.405	261.25	0.003828
75	332.446	265.75	0.003763
77	332.486	269.42	0.003712
79	332.526	272	0.003676
81	332.565	272.4	0.003671

Distance	Elevation	Resistivity	Conductivity
83	332.604	271.57	0.003682
85	332.642	269.09	0.003716
87	332.679	262.69	0.003807
89	332.734	261.1	0.00383
91	332.806	260.96	0.003832
93	332.876	262.03	0.003816
95	332.945	263.04	0.003802
97	333.013	263.29	0.003798
99	333.078	262.81	0.003805
101	333.142	262.19	0.003814
103	333.205	260.55	0.003838
19	329.562	263.99	0.003788
21	329.609	271.11	0.003689
23	329.657	274.43	0.003644
25	329.704	274.88	0.003638
27	329.75	269.86	0.003706
29	329.8	244.13	0.004096
31	329.852	219.89	0.004548
33	329.904	213.82	0.004677
35	329.957	212.84	0.004698
37	330.009	212.72	0.004701
39	330.061	213.39	0.004686
41	330.113	219.07	0.004565
43	330.165	259.15	0.003859
45	330.217	283.16	0.003532
47	330.269	289.68	0.003452
49	330.321	293.26	0.00341
51	330.373	300.2	0.003331
53	330.425	312.78	0.003197
55	330.476	315.95	0.003165
57	330.528	312.19	0.003203
59	330.578	444.71	0.002249
61	330.626	398.65	0.002508
63	330.673	369.49	0.002706
65	330.72	332.17	0.003011
67	330.766	276.95	0.003611
69	330.812	255.09	0.00392
71	330.858	255.02	0.003921
73	330.903	257.04	0.00389
75	330.947	261.78	0.00382
77	330.991	264.78	0.003777
79	331.035	266.47	0.003753
81	331.078	267.31	0.003741
83	331.121	267.22	0.003742
85	331.163	266.13	0.003758
87	331.204	263.16	0.0038
89	331.258	261.8	0.00382
91	331.323	261.7	0.003821
93	331.387	262.38	0.003811
95	331.45	262.94	0.003803
97	331.511	262.95	0.003803

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Distance	Elevation	Resistivity	Conductivity
99	331.572	262.05	0.003816
23	327.977	171.39	0.005835
25	328.025	170.68	0.005859
27	328.074	166.73	0.005998
29	328.124	163.6	0.006112
31	328.176	163.43	0.006119
33	328.227	163.69	0.006109
35	328.279	164.31	0.006086
37	328.33	165.22	0.006053
39	328.382	166.49	0.006006
41	328.433	174.56	0.005729
43	328.485	221.05	0.004524
45	328.536	256.14	0.003904
47	328.588	278.87	0.003586
49	328.639	289.22	0.003458
51	328.691	299.07	0.003344
53	328.742	306.96	0.003258
55	328.793	312.42	0.003201
57	328.845	313.62	0.003189
59	328.895	338.84	0.002951
61	328.944	339.38	0.002947
63	328.993	336.91	0.002968
65	329.042	327.01	0.003058
67	329.09	283.07	0.003533
69	329.138	256.9	0.003893
71	329.186	254.42	0.003931
73	329.233	254.89	0.003923
75	329.28	255.91	0.003908
77	329.327	257.13	0.003889
79	329.373	258.38	0.00387
81	329.419	259.47	0.003854
83	329.465	260.27	0.003842
85	329.51	260.71	0.003836
87	329.555	260.84	0.003834
89	329.608	261.12	0.00383
91	329.668	261.51	0.003824
93	329.727	262.03	0.003816
95	329.785	262.16	0.003814
29	326.272	149.17	0.006704
31	326.324	150.13	0.006661
33	326.375	150.92	0.006626
35	326.426	151.83	0.006586
37	326.477	152.98	0.006537
39	326.529	154.42	0.006476
41	326.58	160.74	0.006221
43	326.631	203.75	0.004908
45	326.682	224.63	0.004452
47	326.733	243.7	0.004103
49	326.784	266.07	0.003758
51	326.836	290.1	0.003447
53	326.887	303.19	0.003298

Distance	Elevation	Resistivity	Conductivity
55	326.938	310.02	0.003226
57	326.989	313.51	0.00319
59	327.039	326	0.003067
61	327.089	326.15	0.003066
63	327.139	325.44	0.003073
65	327.189	318.87	0.003136
67	327.239	286.95	0.003485
69	327.288	261.18	0.003829
71	327.337	252.53	0.00396
73	327.386	251.72	0.003973
75	327.435	251.75	0.003972
77	327.483	252.08	0.003967
79	327.531	252.63	0.003958
81	327.579	253.31	0.003948
83	327.627	254.04	0.003936
85	327.674	254.84	0.003924
87	327.721	256.02	0.003906
89	327.773	259.91	0.003847
35	324.384	149	0.006711
37	324.435	150.59	0.006641
39	324.486	151.54	0.006599
41	324.537	155.62	0.006426
43	324.588	202.37	0.004941
45	324.639	209.93	0.004763
47	324.69	220.88	0.004527
49	324.741	242.77	0.004119
51	324.792	284.64	0.003513
53	324.843	300.32	0.00333
55	324.894	308.21	0.003245
57	324.945	313.27	0.003192
59	324.996	320.16	0.003123
61	325.046	320.11	0.003124
63	325.097	319.52	0.00313
65	325.147	315.95	0.003165
67	325.197	296.83	0.003369
69	325.247	266.51	0.003752
71	325.297	251.36	0.003978
73	325.347	249.11	0.004014
75	325.397	248.42	0.004025
77	325.446	248.23	0.004029
79	325.496	248.23	0.004029
81	325.545	248.38	0.004026
83	325.594	248.65	0.004022
41	322.288	150.46	0.006646
43	322.339	202.22	0.004945
45	322.39	204.84	0.004882
47	322.441	211.59	0.004726
49	322.492	232.97	0.004292
51	322.543	277.66	0.003602
53	322.594	299.33	0.003341
55	322.645	307.37	0.003253

Distance	Elevation	Resistivity	Conductivity
57	322.696	313.15	0.003193
59	322.746	317.83	0.003146
61	322.797	317.71	0.003148
63	322.848	316.93	0.003155
65	322.898	314.22	0.003182
67	322.949	300.89	0.003323
69	323	276.62	0.003615
71	323.05	250.47	0.003992
73	323.1	247.56	0.004039
75	323.151	246.63	0.004055
77	323.201	245.5	0.004073
47	319.967	202.72	0.004933
49	320.017	228.09	0.004384
51	320.068	275.78	0.003626
53	320.119	298.93	0.003345
55	320.17	306.99	0.003257
57	320.221	313.34	0.003191
59	320.272	316.75	0.003157
61	320.323	316.56	0.003159
63	320.373	315.66	0.003168
65	320.424	313.37	0.003191
67	320.475	306.98	0.003258
69	320.526	279.34	0.00358
71	320.576	245.85	0.004068
50	317.295	203.67	0.00491
52	317.346	275.41	0.003631
54	317.397	298.98	0.003345
56	317.448	307.09	0.003256
58	317.499	313.83	0.003186
60	317.549	316.64	0.003158
62	317.6	316.38	0.003161
64	317.651	315.41	0.00317
66	317.702	313.33	0.003192
67	317.753	310.42	0.003221
69	317.803	279.5	0.003578

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Table A-9: Resistivity values after inversion of ERT-9

Distance	Elevation	Resistivity	Conductivity
3	121.5	91.21	0.011
5	121.5	83.386	0.012
7	121.5	85.996	0.0116
9	121.5	88.83	0.0113
11	121.5	91.863	0.0109
13	121.5	133.37	0.007498
15	121.5	114	0.008772
17	121.5	111.39	0.008977
19	121.5	179.48	0.005572
21	121.5	102.75	0.009732
23	121.5	129.96	0.007695
25	121.5	121.93	0.008201
27	121.5	94.05	0.0106
29	121.5	173.56	0.005762
31	121.5	176.62	0.005662
33	121.5	167.89	0.005956
35	121.5	226.29	0.004419
37	121.5	184	0.005435
39	121.5	194.83	0.005133
41	121.5	243.11	0.004113
43	121.5	236.62	0.004226
45	121.5	244.13	0.004096
47	121.5	278.87	0.003586
49	121.5	396.33	0.002523
51	121.5	264.37	0.003783
53	121.5	330.39	0.003027
55	121.5	329.78	0.003032
57	121.5	265.58	0.003765
59	121.5	269.22	0.003714
61	121.5	277.46	0.003604
63	121.5	317.06	0.003154
65	121.5	323.54	0.003091
67	121.5	384.06	0.002604
69	121.5	307.37	0.003253
71	121.5	346.65	0.002885
73	121.5	323.66	0.00309
75	121.5	369.51	0.002706
77	121.5	317.35	0.003151
79	121.5	376	0.00266
81	121.5	558.5	0.001791
83	121.5	531.23	0.001882
85	121.5	480.89	0.002079
87	121.5	396.1	0.002525
89	121.5	413.8	0.002417
91	121.5	391.56	0.002554
93	121.5	509.36	0.001963
95	121.5	468.57	0.002134
97	121.5	658.05	0.00152
99	121.5	956.38	0.001046
101	121.5	1005.3	0.000995

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Distance	Elevation	Resistivity	Conductivity
103	121.5	396.42	0.002523
105	121.5	350.03	0.002857
107	121.5	240.66	0.004155
109	121.5	397.54	0.002515
111	121.5	425.19	0.002352
113	121.5	635.51	0.001574
115	121.5	549.26	0.001821
3	120.45	48.663	0.0205
5	120.45	47.545	0.021
7	120.45	46.797	0.0214
9	120.45	42.922	0.0233
11	120.45	38.462	0.026
13	120.45	36.047	0.0277
15	120.45	35.96	0.0278
17	120.45	35.793	0.0279
19	120.45	39.956	0.025
21	120.45	41.185	0.0243
23	120.45	41.366	0.0242
25	120.45	58.436	0.0171
27	120.45	63.684	0.0157
29	120.45	71.691	0.0139
31	120.45	76.394	0.0131
33	120.45	91.601	0.0109
35	120.45	106.09	0.009426
37	120.45	109.8	0.009107
39	120.45	126.57	0.007901
41	120.45	132.06	0.007572
43	120.45	131.48	0.007606
45	120.45	129.68	0.007711
47	120.45	126.65	0.007896
49	120.45	140.34	0.007126
51	120.45	158.91	0.006293
53	120.45	186.22	0.00537
55	120.45	185.24	0.005398
57	120.45	171.75	0.005822
59	120.45	187.03	0.005347
61	120.45	207.25	0.004825
63	120.45	278.91	0.003585
65	120.45	298.76	0.003347
67	120.45	323.83	0.003088
69	120.45	336.64	0.002971
71	120.45	330.41	0.003027
73	120.45	309.42	0.003232
75	120.45	317.91	0.003146
77	120.45	282.51	0.00354
79	120.45	275.47	0.00363
81	120.45	238.78	0.004188
83	120.45	212.97	0.004695
85	120.45	198.8	0.00503
87	120.45	196.26	0.005095
89	120.45	135.09	0.007402

Distance	Elevation	Resistivity	Conductivity
91	120.45	116.83	0.008559
93	120.45	121.29	0.008245
95	120.45	118.65	0.008428
97	120.45	117.44	0.008515
99	120.45	139.5	0.007168
101	120.45	170.52	0.005864
103	120.45	308.7	0.003239
105	120.45	427.34	0.00234
107	120.45	398.79	0.002508
109	120.45	325.2	0.003075
111	120.45	323.68	0.003089
113	120.45	291.02	0.003436
115	120.45	292.07	0.003424
5	119.295	30.157	0.0332
7	119.295	26.108	0.0383
9	119.295	24.958	0.0401
11	119.295	25.248	0.0396
13	119.295	26.336	0.038
15	119.295	26.802	0.0373
17	119.295	27.607	0.0362
19	119.295	28.769	0.0348
21	119.295	27.873	0.0359
23	119.295	27.607	0.0362
25	119.295	28.594	0.035
27	119.295	29.654	0.0337
29	119.295	28.77	0.0348
31	119.295	29.087	0.0344
33	119.295	30.985	0.0323
35	119.295	34.071	0.0294
37	119.295	36.521	0.0274
39	119.295	42.083	0.0238
41	119.295	47.968	0.0208
43	119.295	49.576	0.0202
45	119.295	49.901	0.02
47	119.295	50.617	0.0198
49	119.295	55.104	0.0181
51	119.295	60.692	0.0165
53	119.295	67.49	0.0148
55	119.295	67.868	0.0147
57	119.295	68.306	0.0146
59	119.295	71.127	0.0141
61	119.295	77.172	0.013
63	119.295	88.52	0.0113
65	119.295	90.792	0.011
67	119.295	92.253	0.0108
69	119.295	92.628	0.0108
71	119.295	88.184	0.0113
73	119.295	82.612	0.0121
75	119.295	81.34	0.0123
77	119.295	71.104	0.0141
79	119.295	62.791	0.0159

Distance	Elevation	Resistivity	Conductivity
81	119.295	58.954	0.017
83	119.295	52.025	0.0192
85	119.295	50.587	0.0198
87	119.295	50.545	0.0198
89	119.295	46.64	0.0214
91	119.295	48.258	0.0207
93	119.295	51.737	0.0193
95	119.295	52.628	0.019
97	119.295	52.781	0.0189
99	119.295	50.879	0.0197
101	119.295	51.243	0.0195
103	119.295	52.689	0.019
105	119.295	65.296	0.0153
107	119.295	69.765	0.0143
109	119.295	83.983	0.0119
111	119.295	100.05	0.009995
113	119.295	161.1	0.006207
9	118.024	25.457	0.0393
11	118.024	27.374	0.0365
13	118.024	27.901	0.0358
15	118.024	29.738	0.0336
17	118.024	30.853	0.0324
19	118.024	31.055	0.0322
21	118.024	30.24	0.0331
23	118.024	29.345	0.0341
25	118.024	28.969	0.0345
27	118.024	28.034	0.0357
29	118.024	27.366	0.0365
31	118.024	26.47	0.0378
33	118.024	26.357	0.0379
35	118.024	26.521	0.0377
37	118.024	27.258	0.0367
39	118.024	29.073	0.0344
41	118.024	31.516	0.0317
43	118.024	32.89	0.0304
45	118.024	33.502	0.0298
47	118.024	34.336	0.0291
49	118.024	35.911	0.0278
51	118.024	37.432	0.0267
53	118.024	38.103	0.0262
55	118.024	37.914	0.0264
57	118.024	37.383	0.0268
59	118.024	37.33	0.0268
61	118.024	37.304	0.0268
63	118.024	37.165	0.0269
65	118.024	36.875	0.0271
67	118.024	36.411	0.0275
69	118.024	35.248	0.0284
71	118.024	33.544	0.0298
73	118.024	32.58	0.0307
75	118.024	32.415	0.0308

Distance	Elevation	Resistivity	Conductivity
77	118.024	32.001	0.0312
79	118.024	31.589	0.0317
81	118.024	31.63	0.0316
83	118.024	32.092	0.0312
85	118.024	32.846	0.0304
87	118.024	34.045	0.0294
89	118.024	36.644	0.0273
91	118.024	39.192	0.0255
93	118.024	40.017	0.025
95	118.024	40.327	0.0248
97	118.024	37.123	0.0269
99	118.024	31.842	0.0314
101	118.024	30.295	0.033
103	118.024	28.048	0.0357
105	118.024	24.497	0.0408
107	118.024	26.798	0.0373
109	118.024	61.897	0.0162
13	116.627	28.227	0.0354
15	116.627	30.294	0.033
17	116.627	31.146	0.0321
19	116.627	31.24	0.032
21	116.627	30.587	0.0327
23	116.627	29.671	0.0337
25	116.627	29.154	0.0343
27	116.627	28.697	0.0348
29	116.627	28.085	0.0356
31	116.627	27.523	0.0363
33	116.627	27.626	0.0362
35	116.627	27.877	0.0359
37	116.627	28.301	0.0353
39	116.627	29.271	0.0342
41	116.627	30.165	0.0332
43	116.627	30.907	0.0324
45	116.627	31.375	0.0319
47	116.627	31.852	0.0314
49	116.627	32.435	0.0308
51	116.627	32.709	0.0306
53	116.627	32.519	0.0308
55	116.627	32.303	0.031
57	116.627	31.419	0.0318
59	116.627	30.6	0.0327
61	116.627	29.927	0.0334
63	116.627	29.343	0.0341
65	116.627	28.643	0.0349
67	116.627	27.96	0.0358
69	116.627	27.374	0.0365
71	116.627	26.982	0.0371
73	116.627	26.941	0.0371
75	116.627	27.188	0.0368
77	116.627	27.585	0.0363
79	116.627	28.189	0.0355

Distance	Elevation	Resistivity	Conductivity
81	116.627	29.323	0.0341
83	116.627	31.494	0.0318
85	116.627	34.407	0.0291
87	116.627	35.772	0.028
89	116.627	36.826	0.0272
91	116.627	38.622	0.0259
93	116.627	39.371	0.0254
95	116.627	38.825	0.0258
97	116.627	34.024	0.0294
99	116.627	26.451	0.0378
101	116.627	23.894	0.0419
103	116.627	21.691	0.0461
105	116.627	17.537	0.057
15	115.09	31.63	0.0316
17	115.09	32.409	0.0309
19	115.09	32.457	0.0308
21	115.09	32.195	0.0311
23	115.09	31.784	0.0315
25	115.09	31.354	0.0319
27	115.09	30.716	0.0326
29	115.09	29.862	0.0335
31	115.09	29.21	0.0342
33	115.09	28.908	0.0346
35	115.09	28.937	0.0346
37	115.09	29.209	0.0342
39	115.09	29.575	0.0338
41	115.09	30.183	0.0331
43	115.09	30.728	0.0325
45	115.09	31.166	0.0321
47	115.09	31.495	0.0318
49	115.09	31.759	0.0315
51	115.09	31.792	0.0315
53	115.09	31.685	0.0316
55	115.09	31.455	0.0318
57	115.09	30.869	0.0324
59	115.09	30.107	0.0332
61	115.09	29.348	0.0341
63	115.09	28.669	0.0349
65	115.09	28.098	0.0356
67	115.09	27.637	0.0362
69	115.09	27.389	0.0365
71	115.09	27.284	0.0367
73	115.09	27.292	0.0366
75	115.09	27.486	0.0364
77	115.09	27.912	0.0358
79	115.09	28.636	0.0349
81	115.09	29.874	0.0335
83	115.09	31.934	0.0313
85	115.09	34.527	0.029
87	115.09	36.152	0.0277
89	115.09	36.777	0.0272

Distance	Elevation	Resistivity	Conductivity
91	115.09	38.499	0.026
93	115.09	39.223	0.0255
95	115.09	38.649	0.0259
97	115.09	33.831	0.0296
99	115.09	25.166	0.0397
101	115.09	23.095	0.0433
103	115.09	19.884	0.0503
19	113.399	33.633	0.0297
21	113.399	32.96	0.0303
23	113.399	32.778	0.0305
25	113.399	32.548	0.0307
27	113.399	32.267	0.031
29	113.399	31.748	0.0315
31	113.399	31.251	0.032
33	113.399	30.786	0.0325
35	113.399	30.519	0.0328
37	113.399	30.459	0.0328
39	113.399	30.578	0.0327
41	113.399	30.796	0.0325
43	113.399	31.089	0.0322
45	113.399	31.305	0.0319
47	113.399	31.458	0.0318
49	113.399	31.586	0.0317
51	113.399	31.653	0.0316
53	113.399	31.621	0.0316
55	113.399	31.413	0.0318
57	113.399	30.874	0.0324
59	113.399	30.142	0.0332
61	113.399	29.404	0.034
63	113.399	28.742	0.0348
65	113.399	28.217	0.0354
67	113.399	27.843	0.0359
69	113.399	27.713	0.0361
71	113.399	27.72	0.0361
73	113.399	27.758	0.036
75	113.399	27.97	0.0358
77	113.399	28.64	0.0349
79	113.399	29.673	0.0337
81	113.399	31.227	0.032
83	113.399	33.16	0.0302
85	113.399	35.116	0.0285
87	113.399	36.504	0.0274
89	113.399	36.928	0.0271
91	113.399	38.079	0.0263
93	113.399	38.744	0.0258
95	113.399	38.185	0.0262
97	113.399	34.729	0.0288
99	113.399	24.525	0.0408
25	111.538	33.22	0.0301
27	111.538	32.935	0.0304
29	111.538	32.724	0.0306

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Distance	Elevation	Resistivity	Conductivity
31	111.538	32.297	0.031
33	111.538	31.867	0.0314
35	111.538	31.529	0.0317
37	111.538	31.32	0.0319
39	111.538	31.138	0.0321
41	111.538	31.077	0.0322
43	111.538	31.108	0.0321
45	111.538	31.189	0.0321
47	111.538	31.235	0.032
49	111.538	31.275	0.032
51	111.538	31.296	0.032
53	111.538	31.282	0.032
55	111.538	31.199	0.0321
57	111.538	31.009	0.0322
59	111.538	30.687	0.0326
61	111.538	30.28	0.033
63	111.538	29.887	0.0335
65	111.538	29.583	0.0338
67	111.538	29.38	0.034
69	111.538	29.331	0.0341
71	111.538	29.345	0.0341
73	111.538	29.424	0.034
75	111.538	29.82	0.0335
77	111.538	30.529	0.0328
79	111.538	31.5	0.0317
81	111.538	32.9	0.0304
83	111.538	34.013	0.0294
85	111.538	35.236	0.0284
87	111.538	35.845	0.0279
89	111.538	36.042	0.0277
91	111.538	36.919	0.0271
93	111.538	38.521	0.026
31	109.492	32.538	0.0307
33	109.492	32.164	0.0311
35	109.492	31.943	0.0313
37	109.492	31.639	0.0316
39	109.492	31.23	0.032
41	109.492	30.992	0.0323
43	109.492	30.897	0.0324
45	109.492	30.827	0.0324
47	109.492	30.808	0.0325
49	109.492	30.82	0.0324
51	109.492	30.866	0.0324
53	109.492	30.927	0.0323
55	109.492	30.974	0.0323
57	109.492	31.008	0.0322
59	109.492	31.028	0.0322
61	109.492	31.016	0.0322
63	109.492	30.995	0.0323
65	109.492	31.006	0.0323
67	109.492	31.037	0.0322

Distance	Elevation	Resistivity	Conductivity
69	109.492	31.058	0.0322
71	109.492	31.101	0.0322
73	109.492	31.293	0.032
75	109.492	31.751	0.0315
77	109.492	32.052	0.0312
79	109.492	32.661	0.0306
81	109.492	33.713	0.0297
83	109.492	34.34	0.0291
85	109.492	35.012	0.0286
87	109.492	35.859	0.0279
37	107.242	32.224	0.031
39	107.242	30.977	0.0323
41	107.242	30.816	0.0325
43	107.242	30.653	0.0326
45	107.242	30.503	0.0328
47	107.242	30.466	0.0328
49	107.242	30.485	0.0328
51	107.242	30.564	0.0327
53	107.242	30.679	0.0326
55	107.242	30.999	0.0323
57	107.242	31.121	0.0321
59	107.242	31.257	0.032
61	107.242	31.393	0.0319
63	107.242	31.495	0.0318
65	107.242	31.694	0.0316
67	107.242	31.782	0.0315
69	107.242	31.936	0.0313
71	107.242	31.984	0.0313
73	107.242	32.1	0.0312
75	107.242	32.464	0.0308
77	107.242	32.752	0.0305
79	107.242	33.068	0.0302
81	107.242	33.465	0.0299
43	104.766	30.822	0.0324
45	104.766	30.318	0.033
47	104.766	30.292	0.033
49	104.766	30.304	0.033
51	104.766	30.38	0.0329
53	104.766	30.54	0.0327
55	104.766	30.835	0.0324
57	104.766	31.16	0.0321
59	104.766	31.263	0.032
61	104.766	31.426	0.0318
63	104.766	31.508	0.0317
65	104.766	31.598	0.0316
67	104.766	31.661	0.0316
69	104.766	31.866	0.0314
71	104.766	31.993	0.0313
73	104.766	32.135	0.0311
75	104.766	32.96	0.0303
49	102.042	28.937	0.0346

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Distance	Elevation	Resistivity	Conductivity
51	102.042	28.7	0.0348
53	102.042	29.038	0.0344
55	102.042	29.851	0.0335
57	102.042	30.736	0.0325
59	102.042	31.194	0.0321
61	102.042	31.25	0.032
63	102.042	31.352	0.0319
65	102.042	31.4	0.0318
67	102.042	31.485	0.0318
69	102.042	31.76	0.0315
51	99.047	19.331	0.0517
53	99.047	24.94	0.0401
55	99.047	28.356	0.0353
57	99.047	29.934	0.0334
59	99.047	30.434	0.0329
61	99.047	30.478	0.0328
63	99.047	30.351	0.0329
65	99.047	29.451	0.034
67	99.047	27.421	0.0365

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Table A-10: Resistivity values after inversion of ERT-10			
Distance	**Elevation**	**Resistivity**	**Conductivity**
3	122.489	864.06	0.001157
5	122.482	79.15	0.0126
7	122.474	46.295	0.0216
9	122.466	377.49	0.002649
11	122.458	198.87	0.005028
13	122.45	50.423	0.0198
15	122.441	96.678	0.0103
17	122.432	470.69	0.002125
19	122.423	597.03	0.001675
21	122.413	1063.7	0.00094
23	122.403	601.02	0.001664
25	122.393	620.01	0.001613
27	122.382	446.92	0.002238
29	122.359	375.27	0.002665
31	122.322	564.49	0.001772
33	122.282	1020.5	0.00098
35	122.239	731.91	0.001366
37	122.194	649.91	0.001539
39	122.147	577.67	0.001731
41	122.099	829.37	0.001206
43	122.049	683.8	0.001462
45	121.998	479.73	0.002085
47	121.945	413.43	0.002419
49	121.892	409.88	0.00244
51	121.837	387.5	0.002581
53	121.782	382.88	0.002612
55	121.726	357.08	0.0028
57	121.669	391.97	0.002551
59	121.639	326.38	0.003064
61	121.635	314.09	0.003184
63	121.632	262.14	0.003815
65	121.629	257.34	0.003886
67	121.625	270.88	0.003692
69	121.622	223.34	0.004477
71	121.618	173.7	0.005757
73	121.615	134.7	0.007424
75	121.611	112.74	0.00887
77	121.607	105.22	0.009504
79	121.603	120.34	0.00831
81	121.599	101.84	0.009819
83	121.595	92.141	0.0109
85	121.591	104.36	0.009582
87	121.586	95.824	0.0104
89	121.582	115.39	0.008666
91	121.577	104.3	0.009588
93	121.572	91.561	0.0109
95	121.567	89.489	0.0112
97	121.562	137.99	0.007247
99	121.557	121.6	0.008224
101	121.552	116.97	0.008549

Distance	Elevation	Resistivity	Conductivity
103	121.546	150.55	0.006642
105	121.541	139.21	0.007183
107	121.535	100.75	0.009926
109	121.529	97.576	0.0102
111	121.523	78.62	0.0127
113	121.517	99.439	0.0101
115	121.51	110.77	0.009028
3	121.481	4.364	0.2291
5	121.469	2.095	0.4774
7	121.456	1.887	0.53
9	121.442	22.236	0.045
11	121.429	20.825	0.048
13	121.415	55.564	0.018
15	121.401	68.51	0.0146
17	121.387	9.861	0.1014
19	121.372	1403.6	0.000712
21	121.358	1452.7	0.000688
23	121.343	2287.1	0.000437
25	121.327	1314.5	0.000761
27	121.312	1338.9	0.000747
29	121.293	908.84	0.0011
31	121.271	87.461	0.0114
33	121.246	193.61	0.005165
35	121.219	248.53	0.004024
37	121.19	232.77	0.004296
39	121.159	944.46	0.001059
41	121.126	425.75	0.002349
43	121.092	402.46	0.002485
45	121.055	430.41	0.002323
47	121.018	390.08	0.002564
49	120.978	460.02	0.002174
51	120.938	470.25	0.002127
53	120.896	636.11	0.001572
55	120.853	501.47	0.001994
57	120.809	373.61	0.002677
59	120.783	403.51	0.002478
61	120.775	320.55	0.00312
63	120.768	225.07	0.004443
65	120.76	228.25	0.004381
67	120.752	199.87	0.005003
69	120.744	154.34	0.006479
71	120.736	149.68	0.006681
73	120.728	134.66	0.007426
75	120.72	148.37	0.00674
77	120.711	139.32	0.007178
79	120.703	121.76	0.008213
81	120.694	113.85	0.008783
83	120.685	122.52	0.008162
85	120.676	93.689	0.0107
87	120.667	103.82	0.009632
89	120.657	104.33	0.009585

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Distance	Elevation	Resistivity	Conductivity
91	120.648	104.32	0.009586
93	120.638	100.76	0.009925
95	120.628	98.276	0.0102
97	120.618	88.271	0.0113
99	120.608	75.8	0.0132
101	120.597	66.344	0.0151
103	120.586	57.575	0.0174
105	120.576	55.585	0.018
107	120.564	74.178	0.0135
109	120.553	84.951	0.0118
111	120.542	80.667	0.0124
113	120.53	99.35	0.0101
115	120.518	54.366	0.0184
5	120.412	1.799	0.5557
7	120.397	1.973	0.5069
9	120.381	22.524	0.0444
11	120.366	23.732	0.0421
13	120.35	62.189	0.0161
15	120.334	66.123	0.0151
17	120.318	15.504	0.0645
19	120.301	1381.2	0.000724
21	120.285	1724.2	0.00058
23	120.269	2018.2	0.000495
25	120.252	1459	0.000685
27	120.235	1461.8	0.000684
29	120.218	1037	0.000964
31	120.2	104.29	0.009589
33	120.18	88.082	0.0114
35	120.16	78.593	0.0127
37	120.138	70.944	0.0141
39	120.115	70.042	0.0143
41	120.09	33.798	0.0296
43	120.064	34.759	0.0288
45	120.037	35.326	0.0283
47	120.008	32.867	0.0304
49	119.979	92.442	0.0108
51	119.947	85.929	0.0116
53	119.915	80.01	0.0125
55	119.882	79.018	0.0127
57	119.847	228.95	0.004368
59	119.824	306.94	0.003258
61	119.813	169.07	0.005915
63	119.803	82.546	0.0121
65	119.792	84.045	0.0119
67	119.781	83.836	0.0119
69	119.769	71.767	0.0139
71	119.758	63.291	0.0158
73	119.747	56.747	0.0176
75	119.735	56.527	0.0177
77	119.723	36.035	0.0278
79	119.712	35.603	0.0281

Distance	Elevation	Resistivity	Conductivity
81	119.7	36.85	0.0271
83	119.687	39.208	0.0255
85	119.675	31.749	0.0315
87	119.663	31.568	0.0317
89	119.65	31.483	0.0318
91	119.637	32.306	0.031
93	119.624	33.21	0.0301
95	119.611	34.257	0.0292
97	119.598	38.716	0.0258
99	119.585	41.802	0.0239
101	119.571	42.465	0.0235
103	119.557	42.504	0.0235
105	119.544	38.182	0.0262
107	119.53	37.031	0.027
109	119.516	35.811	0.0279
111	119.501	35.162	0.0284
113	119.487	37.117	0.0269
7	119.238	1.96	0.5103
9	119.222	60.245	0.0166
11	119.205	63.405	0.0158
13	119.188	69.415	0.0144
15	119.172	68.872	0.0145
17	119.155	23.677	0.0422
19	119.138	470.65	0.002125
21	119.121	516.9	0.001935
23	119.104	518.87	0.001927
25	119.087	509.43	0.001963
27	119.07	336.9	0.002968
29	119.054	74.779	0.0134
31	119.036	32.707	0.0306
33	119.019	26.175	0.0382
35	119.001	26.005	0.0385
37	118.982	31.427	0.0318
39	118.963	32.195	0.0311
41	118.942	31.629	0.0316
43	118.921	25.808	0.0387
45	118.899	24.376	0.041
47	118.876	22.339	0.0448
49	118.852	44.154	0.0226
51	118.827	43.952	0.0228
53	118.801	30.118	0.0332
55	118.774	25.462	0.0393
57	118.747	33.167	0.0302
59	118.726	35.751	0.028
61	118.713	34.346	0.0291
63	118.7	34.027	0.0294
65	118.687	34.033	0.0294
67	118.673	33.982	0.0294
69	118.66	33.988	0.0294
71	118.646	33.918	0.0295
73	118.632	32.208	0.031

Distance	Elevation	Resistivity	Conductivity
75	118.619	30.189	0.0331
77	118.605	27.89	0.0359
79	118.591	27.931	0.0358
81	118.576	30.387	0.0329
83	118.562	31.929	0.0313
85	118.548	31.622	0.0316
87	118.533	29.832	0.0335
89	118.519	28.065	0.0356
91	118.504	27.432	0.0365
93	118.489	27.167	0.0368
95	118.474	27.486	0.0364
97	118.459	33.613	0.0298
99	118.444	33.795	0.0296
101	118.429	33.764	0.0296
103	118.413	33.658	0.0297
105	118.398	32.503	0.0308
107	118.382	31.195	0.0321
109	118.367	30.563	0.0327
111	118.351	30.387	0.0329
11	117.933	76.446	0.0131
13	117.916	73.328	0.0136
15	117.899	72.083	0.0139
17	117.882	31.746	0.0315
19	117.865	31.654	0.0316
21	117.848	31.535	0.0317
23	117.831	23.163	0.0432
25	117.814	17.189	0.0582
27	117.797	15.955	0.0627
29	117.78	15.921	0.0628
31	117.763	18.489	0.0541
33	117.746	19.995	0.05
35	117.729	21.504	0.0465
37	117.711	31.759	0.0315
39	117.693	32.932	0.0304
41	117.675	31.979	0.0313
43	117.656	26.859	0.0372
45	117.637	25.437	0.0393
47	117.617	23.422	0.0427
49	117.597	44.051	0.0227
51	117.575	43.629	0.0229
53	117.554	33.926	0.0295
55	117.531	25.728	0.0389
57	117.508	27.03	0.037
59	117.489	27.571	0.0363
61	117.474	28.08	0.0356
63	117.459	28.922	0.0346
65	117.445	29.489	0.0339
67	117.43	30.802	0.0325
69	117.415	32.168	0.0311
71	117.4	32.394	0.0309
73	117.384	32.264	0.031

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Distance	Elevation	Resistivity	Conductivity
75	117.369	30.385	0.0329
77	117.354	29.23	0.0342
79	117.339	29.338	0.0341
81	117.323	31.016	0.0322
83	117.308	32.047	0.0312
85	117.292	31.899	0.0313
87	117.276	30.563	0.0327
89	117.26	28.395	0.0352
91	117.245	27.439	0.0364
93	117.229	27.09	0.0369
95	117.213	27.259	0.0367
97	117.197	28.354	0.0353
99	117.181	28.303	0.0353
101	117.164	28.275	0.0354
103	117.148	28.397	0.0352
105	117.132	28.614	0.0349
107	117.115	28.926	0.0346
15	116.5	75.751	0.0132
17	116.483	38.48	0.026
19	116.466	33.056	0.0303
21	116.449	28.313	0.0353
23	116.433	21.307	0.0469
25	116.416	16.6	0.0602
27	116.399	16.062	0.0623
29	116.382	16.052	0.0623
31	116.365	18.612	0.0537
33	116.348	19.981	0.05
35	116.331	21.608	0.0463
37	116.314	31.965	0.0313
39	116.296	34.188	0.0293
41	116.279	33.388	0.03
43	116.261	32.058	0.0312
45	116.243	28.183	0.0355
47	116.225	28.718	0.0348
49	116.206	46.623	0.0214
51	116.187	46.742	0.0214
53	116.168	41.739	0.024
55	116.148	27.482	0.0364
57	116.128	27.148	0.0368
59	116.11	27.553	0.0363
61	116.094	28.078	0.0356
63	116.078	28.916	0.0346
65	116.063	29.483	0.0339
67	116.047	30.815	0.0325
69	116.031	32.173	0.0311
71	116.015	32.403	0.0309
73	115.999	32.331	0.0309
75	115.983	30.624	0.0327
77	115.967	30.001	0.0333
79	115.95	30.109	0.0332
81	115.934	31.389	0.0319

Distance	Elevation	Resistivity	Conductivity
83	115.918	32.26	0.031
85	115.902	32.238	0.031
87	115.885	30.998	0.0323
89	115.869	29.256	0.0342
91	115.852	27.244	0.0367
93	115.836	26.054	0.0384
95	115.819	25.265	0.0396
97	115.803	24.652	0.0406
99	115.786	24.117	0.0415
101	115.77	23.854	0.0419
103	115.753	23.844	0.0419
19	114.929	39.741	0.0252
21	114.912	26.954	0.0371
23	114.895	21.395	0.0467
25	114.878	18.009	0.0555
27	114.861	17.551	0.057
29	114.844	17.805	0.0562
31	114.827	19.238	0.052
33	114.81	20.379	0.0491
35	114.793	22.278	0.0449
37	114.776	33.435	0.0299
39	114.759	35.876	0.0279
41	114.742	35.863	0.0279
43	114.725	35.697	0.028
45	114.708	35.421	0.0282
47	114.69	39.589	0.0253
49	114.672	50.772	0.0197
51	114.655	51.044	0.0196
53	114.637	49.399	0.0202
55	114.618	41.494	0.0241
57	114.6	32	0.0313
59	114.582	30.071	0.0333
61	114.566	30.111	0.0332
63	114.549	30.315	0.033
65	114.533	30.697	0.0326
67	114.517	31.54	0.0317
69	114.5	32.382	0.0309
71	114.484	32.703	0.0306
73	114.467	32.751	0.0305
75	114.451	32.651	0.0306
77	114.434	32.582	0.0307
79	114.417	32.647	0.0306
81	114.401	32.791	0.0305
83	114.384	32.856	0.0304
85	114.367	32.417	0.0308
87	114.351	31.127	0.0321
89	114.334	29.428	0.034
91	114.317	26.525	0.0377
93	114.301	22.93	0.0436
95	114.284	21.076	0.0474
97	114.267	19.975	0.0501

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Distance	Elevation	Resistivity	Conductivity
99	114.25	18.779	0.0533
23	113.204	25.224	0.0396
25	113.187	20.791	0.0481
27	113.17	20.618	0.0485
29	113.153	20.618	0.0485
31	113.136	20.711	0.0483
33	113.119	21.04	0.0475
35	113.102	22.342	0.0448
37	113.085	34.252	0.0292
39	113.068	36.65	0.0273
41	113.051	37.075	0.027
43	113.034	37.118	0.0269
45	113.017	38.003	0.0263
47	113	42.391	0.0236
49	112.983	51.04	0.0196
51	112.966	52.517	0.019
53	112.948	52.391	0.0191
55	112.931	50.048	0.02
57	112.913	44.786	0.0223
59	112.896	39.025	0.0256
61	112.879	36.89	0.0271
63	112.862	36.541	0.0274
65	112.846	36.411	0.0275
67	112.829	36.328	0.0275
69	112.812	36.255	0.0276
71	112.796	36.154	0.0277
73	112.779	35.951	0.0278
75	112.762	35.324	0.0283
77	112.745	33.576	0.0298
79	112.728	33.134	0.0302
81	112.712	32.932	0.0304
83	112.695	32.814	0.0305
85	112.678	31.95	0.0313
87	112.661	30.792	0.0325
89	112.644	28.609	0.035
91	112.627	23.579	0.0424
93	112.61	20.498	0.0488
95	112.594	18.233	0.0548
29	111.293	20.92	0.0478
31	111.276	21.299	0.047
33	111.259	21.461	0.0466
35	111.242	22.273	0.0449
37	111.225	34.601	0.0289
39	111.208	37.053	0.027
41	111.191	37.61	0.0266
43	111.174	37.92	0.0264
45	111.157	38.615	0.0259
47	111.14	42.693	0.0234
49	111.123	50.968	0.0196
51	111.106	53.61	0.0187
53	111.089	53.6	0.0187

Distance	Elevation	Resistivity	Conductivity
55	111.072	53.074	0.0188
57	111.055	51.474	0.0194
59	111.038	49.201	0.0203
61	111.021	46.323	0.0216
63	111.004	44.893	0.0223
65	110.987	43.986	0.0227
67	110.97	43.295	0.0231
69	110.953	42.651	0.0234
71	110.937	41.749	0.024
73	110.92	40.829	0.0245
75	110.903	37.794	0.0265
77	110.886	33.505	0.0298
79	110.869	33.008	0.0303
81	110.852	32.74	0.0305
83	110.835	32.455	0.0308
85	110.818	30.253	0.0331
87	110.801	28.996	0.0345
89	110.784	18.678	0.0535
35	109.196	21.602	0.0463
37	109.179	35.013	0.0286
39	109.162	37.44	0.0267
41	109.145	37.806	0.0265
43	109.128	38.742	0.0258
45	109.111	39.396	0.0254
47	109.094	42.696	0.0234
49	109.077	50.743	0.0197
51	109.06	54.032	0.0185
53	109.043	54.942	0.0182
55	109.026	54.995	0.0182
57	109.009	54.64	0.0183
59	108.992	53.779	0.0186
61	108.975	51.964	0.0192
63	108.959	50.388	0.0198
65	108.942	48.956	0.0204
67	108.925	47.519	0.021
69	108.908	45.944	0.0218
71	108.891	44.529	0.0225
73	108.874	43.18	0.0232
75	108.857	40.381	0.0248
77	108.84	33.058	0.0302
79	108.823	32.498	0.0308
81	108.806	32.229	0.031
83	108.789	27.768	0.036
41	106.895	38.168	0.0262
43	106.878	39.725	0.0252
45	106.861	39.965	0.025
47	106.844	42.547	0.0235
49	106.827	47.973	0.0208
51	106.81	54.438	0.0184
53	106.793	56.447	0.0177
55	106.776	56.534	0.0177

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Distance	Elevation	Resistivity	Conductivity
57	106.759	56.509	0.0177
59	106.742	56.248	0.0178
61	106.725	54.759	0.0183
63	106.708	52.902	0.0189
65	106.691	50.831	0.0197
67	106.674	48.816	0.0205
69	106.657	46.482	0.0215
71	106.64	44.597	0.0224
73	106.623	44.04	0.0227
75	106.607	41.958	0.0238
77	106.59	31.833	0.0314
47	104.368	40.534	0.0247
49	104.351	40.926	0.0244
51	104.334	55.828	0.0179
53	104.317	59.343	0.0169
55	104.3	59.383	0.0168
57	104.283	59.081	0.0169
59	104.266	58.224	0.0172
61	104.249	56.273	0.0178
63	104.232	53.956	0.0185
65	104.216	51.873	0.0193
67	104.199	49.752	0.0201
69	104.182	46.729	0.0214
71	104.165	44.273	0.0226
49	101.628	18.841	0.0531
51	101.611	65.036	0.0154
53	101.594	64.787	0.0154
55	101.577	63.999	0.0156
57	101.56	63.475	0.0158
59	101.543	61.557	0.0162
61	101.526	58.562	0.0171
63	101.509	56.269	0.0178
65	101.492	54.31	0.0184
67	101.475	52.269	0.0191
69	101.458	46.927	0.0213

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Table A-11: Resistivity values after inversion of ERT-11			
Distance	**Elevation**	**Resistivity**	**Conductivity**
3	125.477	238.67	0.00419
5	125.46	272.05	0.003676
7	125.442	185.49	0.005391
9	125.422	209.59	0.004771
11	125.4	164.3	0.006086
13	125.377	225.48	0.004435
15	125.352	125.63	0.00796
17	125.324	127.11	0.007867
19	125.294	102.37	0.009768
21	125.261	73.369	0.0136
23	125.225	74.804	0.0134
25	125.185	66.521	0.015
27	125.141	59.088	0.0169
29	125.092	69.881	0.0143
31	125.04	54.537	0.0183
33	124.987	86.309	0.0116
35	124.934	71.308	0.014
37	124.881	66.191	0.0151
39	124.827	50.022	0.02
41	124.773	49.04	0.0204
43	124.719	57.715	0.0173
45	124.664	70.443	0.0142
47	124.609	73.146	0.0137
49	124.553	78.812	0.0127
51	124.498	72.19	0.0139
53	124.441	180.24	0.005548
55	124.385	126.96	0.007876
57	124.328	86.232	0.0116
59	124.271	79.077	0.0126
61	124.214	118.78	0.008419
63	124.156	89.452	0.0112
65	124.099	114.24	0.008754
67	124.041	91.475	0.0109
69	123.982	90.323	0.0111
71	123.924	90.838	0.011
73	123.865	92.345	0.0108
75	123.806	97.673	0.0102
77	123.747	96.292	0.0104
79	123.688	116.2	0.008606
81	123.628	113.64	0.0088
83	123.568	76.684	0.013
85	123.509	120.55	0.008295
87	123.449	109.37	0.009143
89	123.388	102.81	0.009727
91	123.328	110.9	0.009017
93	123.268	90.445	0.0111
95	123.207	105.18	0.009508
97	123.146	131.05	0.007631
99	123.085	151.86	0.006585
101	123.024	93.45	0.0107

Distance	Elevation	Resistivity	Conductivity
103	122.963	90.022	0.0111
105	122.902	97.514	0.0103
107	122.84	107.14	0.009334
109	122.779	102.3	0.009775
111	122.717	99.353	0.0101
113	122.655	76.403	0.0131
115	122.593	96.644	0.0103
3	124.454	62.001	0.0161
5	124.422	44.296	0.0226
7	124.387	124.35	0.008042
9	124.351	117.98	0.008476
11	124.314	44.552	0.0224
13	124.274	25.82	0.0387
15	124.232	29.08	0.0344
17	124.188	26.718	0.0374
19	124.141	25.767	0.0388
21	124.093	26.138	0.0383
23	124.041	26.183	0.0382
25	123.987	29.393	0.034
27	123.931	32.091	0.0312
29	123.878	31.169	0.0321
31	123.829	27.586	0.0363
33	123.781	15.758	0.0635
35	123.732	23.364	0.0428
37	123.682	22.487	0.0445
39	123.633	25.349	0.0394
41	123.583	19.643	0.0509
43	123.533	24.632	0.0406
45	123.482	30.693	0.0326
47	123.432	27.943	0.0358
49	123.381	25.637	0.039
51	123.33	33.845	0.0295
53	123.279	18.254	0.0548
55	123.227	27.266	0.0367
57	123.175	28.899	0.0346
59	123.123	29.852	0.0335
61	123.071	28.736	0.0348
63	123.019	34.506	0.029
65	122.966	29.932	0.0334
67	122.913	30.749	0.0325
69	122.86	32.026	0.0312
71	122.807	32.196	0.0311
73	122.753	28.781	0.0347
75	122.7	28.534	0.035
77	122.646	28.863	0.0346
79	122.592	27.781	0.036
81	122.537	28.96	0.0345
83	122.483	34.951	0.0286
85	122.428	29.703	0.0337
87	122.373	30.976	0.0323
89	122.318	30.568	0.0327

Distance	Elevation	Resistivity	Conductivity
91	122.263	29.428	0.034
93	122.207	39.048	0.0256
95	122.152	36.842	0.0271
97	122.096	26.999	0.037
99	122.04	34.048	0.0294
101	121.984	41.163	0.0243
103	121.927	38.197	0.0262
105	121.871	36.925	0.0271
107	121.814	36.574	0.0273
109	121.758	31.208	0.032
111	121.701	31.279	0.032
113	121.644	50.874	0.0197
115	121.587	57.428	0.0174
5	123.35	70.421	0.0142
7	123.307	16.784	0.0596
9	123.262	16.569	0.0604
11	123.217	21.316	0.0469
13	123.17	25.925	0.0386
15	123.121	28.897	0.0346
17	123.071	26.89	0.0372
19	123.02	25.919	0.0386
21	122.967	26.177	0.0382
23	122.914	26.582	0.0376
25	122.859	29.83	0.0335
27	122.803	32.099	0.0312
29	122.751	31.898	0.0313
31	122.701	28.154	0.0355
33	122.652	23.547	0.0425
35	122.603	24.177	0.0414
37	122.553	24.62	0.0406
39	122.504	26.543	0.0377
41	122.454	26.87	0.0372
43	122.405	27.302	0.0366
45	122.355	31.115	0.0321
47	122.305	30.812	0.0325
49	122.255	30.671	0.0326
51	122.205	33.589	0.0298
53	122.155	30.249	0.0331
55	122.104	29.916	0.0334
57	122.054	29.603	0.0338
59	122.003	29.66	0.0337
61	121.953	29.18	0.0343
63	121.902	30.547	0.0327
65	121.851	30.229	0.0331
67	121.8	30.789	0.0325
69	121.749	31.566	0.0317
71	121.697	31.446	0.0318
73	121.646	28.724	0.0348
75	121.594	28.363	0.0353
77	121.542	28.263	0.0354
79	121.49	27.863	0.0359

Distance	Elevation	Resistivity	Conductivity
81	121.438	28.494	0.0351
83	121.386	29.173	0.0343
85	121.334	28.782	0.0347
87	121.281	28.813	0.0347
89	121.229	28.499	0.0351
91	121.176	28.009	0.0357
93	121.123	28.058	0.0356
95	121.07	28.014	0.0357
97	121.017	27.06	0.037
99	120.964	27.115	0.0369
101	120.91	27.115	0.0369
103	120.857	27.074	0.0369
105	120.803	27.357	0.0366
107	120.749	28.684	0.0349
109	120.695	28.99	0.0345
111	120.641	29.416	0.034
113	120.587	36.634	0.0273
7	122.135	19.33	0.0517
9	122.087	19.761	0.0506
11	122.037	21.255	0.047
13	121.988	27.243	0.0367
15	121.937	29.073	0.0344
17	121.885	27.985	0.0357
19	121.833	28.654	0.0349
21	121.781	29.907	0.0334
23	121.728	31.435	0.0318
25	121.675	32.06	0.0312
27	121.621	32.307	0.031
29	121.57	32.464	0.0308
31	121.52	32.759	0.0305
33	121.47	32.92	0.0304
35	121.419	33.008	0.0303
37	121.369	32.888	0.0304
39	121.319	32.616	0.0307
41	121.269	32.12	0.0311
43	121.219	31.898	0.0313
45	121.169	33.184	0.0301
47	121.119	33.536	0.0298
49	121.069	34.098	0.0293
51	121.018	35.072	0.0285
53	120.968	35.294	0.0283
55	120.918	35.071	0.0285
57	120.867	33.573	0.0298
59	120.817	32.29	0.031
61	120.766	31.541	0.0317
63	120.716	31.169	0.0321
65	120.665	30.957	0.0323
67	120.615	31.022	0.0322
69	120.564	31.35	0.0319
71	120.513	31.282	0.032
73	120.462	30.556	0.0327

Distance	Elevation	Resistivity	Conductivity
75	120.411	30.285	0.033
77	120.36	29.853	0.0335
79	120.309	29.244	0.0342
81	120.258	29.055	0.0344
83	120.207	29.07	0.0344
85	120.156	28.809	0.0347
87	120.104	28.779	0.0347
89	120.053	28.522	0.0351
91	120.001	28.16	0.0355
93	119.95	28.081	0.0356
95	119.898	27.986	0.0357
97	119.846	27.161	0.0368
99	119.794	27.113	0.0369
101	119.742	27.099	0.0369
103	119.69	27.115	0.0369
105	119.638	27.454	0.0364
107	119.585	28.694	0.0349
109	119.533	29.083	0.0344
111	119.481	29.487	0.0339
11	120.755	21.299	0.047
13	120.705	30.326	0.033
15	120.653	30.515	0.0328
17	120.602	30.389	0.0329
19	120.55	31.01	0.0322
21	120.498	31.399	0.0318
23	120.447	31.886	0.0314
25	120.395	32.136	0.0311
27	120.343	32.269	0.031
29	120.292	32.483	0.0308
31	120.241	32.9	0.0304
33	120.191	33.476	0.0299
35	120.14	33.91	0.0295
37	120.089	34.018	0.0294
39	120.039	33.884	0.0295
41	119.988	33.6	0.0298
43	119.938	33.405	0.0299
45	119.887	33.434	0.0299
47	119.837	33.762	0.0296
49	119.786	34.358	0.0291
51	119.736	35.136	0.0285
53	119.685	35.348	0.0283
55	119.635	35.179	0.0284
57	119.584	33.886	0.0295
59	119.534	32.711	0.0306
61	119.483	31.926	0.0313
63	119.432	31.424	0.0318
65	119.382	31.167	0.0321
67	119.331	31.131	0.0321
69	119.28	31.252	0.032
71	119.23	31.208	0.032
73	119.179	30.905	0.0324

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Distance	Elevation	Resistivity	Conductivity
75	119.128	30.717	0.0326
77	119.077	30.364	0.0329
79	119.027	29.823	0.0335
81	118.976	29.383	0.034
83	118.925	29.134	0.0343
85	118.874	28.913	0.0346
87	118.823	28.826	0.0347
89	118.772	28.659	0.0349
91	118.721	28.436	0.0352
93	118.67	28.268	0.0354
95	118.619	28.071	0.0356
97	118.567	27.646	0.0362
99	118.516	27.553	0.0363
101	118.465	27.622	0.0362
103	118.413	28.005	0.0357
105	118.362	28.537	0.035
107	118.31	29.318	0.0341
15	119.251	33.804	0.0296
17	119.2	32.558	0.0307
19	119.148	32.754	0.0305
21	119.097	32.72	0.0306
23	119.046	32.497	0.0308
25	118.995	32.135	0.0311
27	118.943	32.144	0.0311
29	118.892	32.332	0.0309
31	118.842	32.721	0.0306
33	118.791	33.247	0.0301
35	118.74	33.703	0.0297
37	118.689	33.862	0.0295
39	118.639	33.785	0.0296
41	118.588	33.558	0.0298
43	118.537	33.402	0.0299
45	118.486	33.438	0.0299
47	118.436	33.751	0.0296
49	118.385	34.345	0.0291
51	118.334	35.011	0.0286
53	118.284	35.194	0.0284
55	118.233	35.072	0.0285
57	118.182	33.886	0.0295
59	118.131	32.742	0.0305
61	118.081	31.965	0.0313
63	118.03	31.466	0.0318
65	117.979	31.204	0.032
67	117.929	31.135	0.0321
69	117.878	31.162	0.0321
71	117.827	31.127	0.0321
73	117.776	30.948	0.0323
75	117.726	30.77	0.0325
77	117.675	30.455	0.0328
79	117.624	29.974	0.0334
81	117.573	29.509	0.0339

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Distance	Elevation	Resistivity	Conductivity
83	117.522	29.192	0.0343
85	117.472	28.979	0.0345
87	117.421	28.87	0.0346
89	117.37	28.762	0.0348
91	117.319	28.635	0.0349
93	117.268	28.498	0.0351
95	117.217	28.327	0.0353
97	117.166	28.171	0.0355
99	117.115	28.148	0.0355
101	117.064	28.31	0.0353
103	117.013	29.18	0.0343
19	117.61	39.061	0.0256
21	117.559	35.697	0.028
23	117.508	34.107	0.0293
25	117.457	32.02	0.0312
27	117.406	31.911	0.0313
29	117.355	31.961	0.0313
31	117.304	32.149	0.0311
33	117.254	32.477	0.0308
35	117.203	32.764	0.0305
37	117.152	32.859	0.0304
39	117.101	32.758	0.0305
41	117.05	32.464	0.0308
43	116.999	32.263	0.031
45	116.949	32.228	0.031
47	116.898	32.302	0.031
49	116.847	32.464	0.0308
51	116.796	32.642	0.0306
53	116.745	32.731	0.0306
55	116.695	32.71	0.0306
57	116.644	32.513	0.0308
59	116.593	32.059	0.0312
61	116.542	31.534	0.0317
63	116.491	31.116	0.0321
65	116.441	30.861	0.0324
67	116.39	30.741	0.0325
69	116.339	30.701	0.0326
71	116.288	30.696	0.0326
73	116.237	30.675	0.0326
75	116.187	30.597	0.0327
77	116.136	30.376	0.0329
79	116.085	29.953	0.0334
81	116.034	29.502	0.0339
83	115.983	29.176	0.0343
85	115.932	28.97	0.0345
87	115.882	28.861	0.0346
89	115.831	28.788	0.0347
91	115.78	28.719	0.0348
93	115.729	28.676	0.0349
95	115.678	28.685	0.0349
97	115.627	28.75	0.0348

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Distance	Elevation	Resistivity	Conductivity
99	115.576	29.096	0.0344
23	115.817	38.146	0.0262
25	115.766	31.86	0.0314
27	115.715	31.713	0.0315
29	115.665	31.635	0.0316
31	115.614	29.998	0.0333
33	115.563	29.768	0.0336
35	115.512	29.61	0.0338
37	115.461	29.362	0.0341
39	115.41	29.034	0.0344
41	115.359	28.713	0.0348
43	115.309	28.516	0.0351
45	115.258	28.435	0.0352
47	115.207	28.426	0.0352
49	115.156	28.465	0.0351
51	115.105	28.54	0.035
53	115.055	28.631	0.0349
55	115.004	28.709	0.0348
57	114.953	28.754	0.0348
59	114.902	28.761	0.0348
61	114.851	28.741	0.0348
63	114.8	28.722	0.0348
65	114.75	28.728	0.0348
67	114.699	28.775	0.0348
69	114.648	28.875	0.0346
71	114.597	29.026	0.0345
73	114.546	29.186	0.0343
75	114.495	29.285	0.0341
77	114.444	29.301	0.0341
79	114.394	29.236	0.0342
81	114.343	29.105	0.0344
83	114.292	28.96	0.0345
85	114.241	28.849	0.0347
87	114.19	28.789	0.0347
89	114.139	28.78	0.0347
91	114.089	28.758	0.0348
93	114.038	28.766	0.0348
95	113.987	29.021	0.0345
29	113.805	31.657	0.0316
31	113.754	28.84	0.0347
33	113.703	28.521	0.0351
35	113.652	28.334	0.0353
37	113.602	27.551	0.0363
39	113.551	27.167	0.0368
41	113.5	27.007	0.037
43	113.449	26.978	0.0371
45	113.398	26.974	0.0371
47	113.347	26.971	0.0371
49	113.297	26.961	0.0371
51	113.246	26.936	0.0371
53	113.195	26.896	0.0372

Distance	Elevation	Resistivity	Conductivity
55	113.144	26.856	0.0372
57	113.093	26.841	0.0373
59	113.042	26.854	0.0372
61	112.991	26.894	0.0372
63	112.941	26.963	0.0371
65	112.89	27.07	0.0369
67	112.839	27.225	0.0367
69	112.788	27.419	0.0365
71	112.737	27.624	0.0362
73	112.686	27.816	0.036
75	112.636	27.996	0.0357
77	112.585	28.151	0.0355
79	112.534	28.277	0.0354
81	112.483	28.389	0.0352
83	112.432	28.511	0.0351
85	112.381	28.56	0.035
87	112.331	28.61	0.035
89	112.28	28.786	0.0347
35	111.607	28	0.0357
37	111.556	26.357	0.0379
39	111.505	25.874	0.0386
41	111.454	25.691	0.0389
43	111.404	25.609	0.039
45	111.353	25.584	0.0391
47	111.302	25.591	0.0391
49	111.251	25.619	0.039
51	111.2	25.67	0.039
53	111.149	25.742	0.0388
55	111.098	25.829	0.0387
57	111.048	25.917	0.0386
59	110.997	26.003	0.0385
61	110.946	26.091	0.0383
63	110.895	26.186	0.0382
65	110.844	26.296	0.038
67	110.793	26.424	0.0378
69	110.743	26.579	0.0376
71	110.692	26.766	0.0374
73	110.641	26.985	0.0371
75	110.59	27.205	0.0368
77	110.539	27.427	0.0365
79	110.488	27.589	0.0362
81	110.437	27.777	0.036
83	110.387	28.391	0.0352
41	109.204	24.941	0.0401
43	109.154	24.812	0.0403
45	109.103	24.787	0.0403
47	109.052	24.794	0.0403
49	109.001	24.82	0.0403
51	108.95	24.857	0.0402
53	108.899	24.903	0.0402
55	108.848	24.96	0.0401

Distance	Elevation	Resistivity	Conductivity
57	108.798	25.028	0.04
59	108.747	25.105	0.0398
61	108.696	25.192	0.0397
63	108.645	25.287	0.0395
65	108.594	25.395	0.0394
67	108.543	25.52	0.0392
69	108.492	25.663	0.039
71	108.442	25.827	0.0387
73	108.391	26.048	0.0384
75	108.34	26.395	0.0379
77	108.289	27.191	0.0368
47	106.577	24.433	0.0409
49	106.526	24.573	0.0407
51	106.475	24.622	0.0406
53	106.424	24.637	0.0406
55	106.373	24.657	0.0406
57	106.323	24.688	0.0405
59	106.272	24.732	0.0404
61	106.221	24.79	0.0403
63	106.17	24.862	0.0402
65	106.119	24.951	0.0401
67	106.068	25.053	0.0399
69	106.017	25.149	0.0398
71	105.967	25.193	0.0397
48	103.803	24.877	0.0402
50	103.753	24.681	0.0405
52	103.702	24.621	0.0406
54	103.651	24.615	0.0406
56	103.6	24.631	0.0406
58	103.549	24.665	0.0405
60	103.498	24.714	0.0405
62	103.447	24.781	0.0404
64	103.397	24.87	0.0402
66	103.346	24.99	0.04
68	103.295	25.162	0.0397

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Table A-12: Resistivity values after inversion of ERT-12

Distance	Elevation	Resistivity	Conductivity
3	123.514	55.148	0.0181
5	123.522	70.983	0.0141
7	123.53	71.404	0.014
9	123.538	72.883	0.0137
11	123.546	68.64	0.0146
13	123.553	68.758	0.0145
15	123.56	65.491	0.0153
17	123.567	87.746	0.0114
19	123.573	103.95	0.00962
21	123.579	132.48	0.007548
23	123.585	46.758	0.0214
25	123.591	74.454	0.0134
27	123.596	81.435	0.0123
29	123.63	89.354	0.0112
31	123.691	86.649	0.0115
33	123.752	89.829	0.0111
35	123.813	84.687	0.0118
37	123.874	76.824	0.013
39	123.934	80.79	0.0124
41	123.995	63.736	0.0157
43	124.055	101.58	0.009844
45	124.114	204.74	0.004884
47	124.174	288.67	0.003464
49	124.233	249.53	0.004008
51	124.292	251.99	0.003968
53	124.351	279.21	0.003582
55	124.409	196.4	0.005092
57	124.467	102.17	0.009788
59	124.524	87.318	0.0115
61	124.581	78.257	0.0128
63	124.637	118.33	0.008451
65	124.694	146.84	0.00681
67	124.749	65.158	0.0153
69	124.804	76.271	0.0131
71	124.859	78.659	0.0127
73	124.913	81.827	0.0122
75	124.966	95.673	0.0105
77	125.018	76.924	0.013
79	125.07	72.834	0.0137
81	125.121	78.788	0.0127
83	125.171	66.993	0.0149
85	125.22	71.567	0.014
87	125.268	70.516	0.0142
89	125.302	75.777	0.0132
91	125.321	65.945	0.0152
93	125.339	60.04	0.0167
95	125.356	63.674	0.0157
97	125.372	69.673	0.0144
99	125.388	60.713	0.0165
101	125.402	71.648	0.014

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Distance	Elevation	Resistivity	Conductivity
103	125.416	63.493	0.0157
105	125.429	72.547	0.0138
107	125.441	76.68	0.013
109	125.453	71.774	0.0139
111	125.464	62.905	0.0159
113	125.475	69.906	0.0143
115	125.485	81.463	0.0123
3	122.528	30.369	0.0329
5	122.546	26.543	0.0377
7	122.564	26.869	0.0372
9	122.58	27.547	0.0363
11	122.597	28.154	0.0355
13	122.613	28.468	0.0351
15	122.628	28.881	0.0346
17	122.643	27.24	0.0367
19	122.658	27.732	0.0361
21	122.672	26.175	0.0382
23	122.686	68.266	0.0146
25	122.699	62.091	0.0161
27	122.713	65.48	0.0153
29	122.746	44.358	0.0225
31	122.8	37.159	0.0269
33	122.854	37.28	0.0268
35	122.907	55.269	0.0181
37	122.96	69.085	0.0145
39	123.013	68.186	0.0147
41	123.065	56.33	0.0178
43	123.117	51.981	0.0192
45	123.168	40.717	0.0246
47	123.219	96.25	0.0104
49	123.269	512.17	0.001952
51	123.319	569.05	0.001757
53	123.369	270.83	0.003692
55	123.418	80.748	0.0124
57	123.466	30.732	0.0325
59	123.514	38.668	0.0259
61	123.562	64.245	0.0156
63	123.608	39.675	0.0252
65	123.655	42.891	0.0233
67	123.7	81.695	0.0122
69	123.745	46.677	0.0214
71	123.789	47.731	0.021
73	123.832	33.788	0.0296
75	123.875	29.68	0.0337
77	123.916	30.097	0.0332
79	123.957	30.021	0.0333
81	123.998	31.039	0.0322
83	124.037	36.918	0.0271
85	124.075	26.853	0.0372
87	124.112	26.297	0.038
89	124.146	23.01	0.0435

Distance	Elevation	Resistivity	Conductivity
91	124.177	27.384	0.0365
93	124.206	34.29	0.0292
95	124.234	35.168	0.0284
97	124.261	24.826	0.0403
99	124.288	27.559	0.0363
101	124.314	28.952	0.0345
103	124.338	33.849	0.0295
105	124.362	33.807	0.0296
107	124.385	34.043	0.0294
109	124.408	36.454	0.0274
111	124.429	36.677	0.0273
113	124.45	37.186	0.0269
115	124.471	37.131	0.0269
5	121.512	25.262	0.0396
7	121.535	24.079	0.0415
9	121.559	23.959	0.0417
11	121.581	24.378	0.041
13	121.603	27.126	0.0369
15	121.625	28.287	0.0354
17	121.646	27.747	0.036
19	121.667	27.78	0.036
21	121.687	23.896	0.0418
23	121.707	20.541	0.0487
25	121.727	15.619	0.064
27	121.746	17.052	0.0586
29	121.779	20.851	0.048
31	121.827	23.135	0.0432
33	121.875	23.048	0.0434
35	121.923	22.819	0.0438
37	121.97	25.381	0.0394
39	122.017	39.996	0.025
41	122.063	44.146	0.0227
43	122.109	44.205	0.0226
45	122.154	43.266	0.0231
47	122.199	48.241	0.0207
49	122.244	25.156	0.0398
51	122.288	25.478	0.0392
53	122.331	26.709	0.0374
55	122.374	35.425	0.0282
57	122.417	31.131	0.0321
59	122.458	30.946	0.0323
61	122.5	30.37	0.0329
63	122.541	25.687	0.0389
65	122.581	23.212	0.0431
67	122.621	22.902	0.0437
69	122.66	23.272	0.043
71	122.699	25.344	0.0395
73	122.737	26.124	0.0383
75	122.774	26.36	0.0379
77	122.811	26.376	0.0379
79	122.847	25.008	0.04

Distance	Elevation	Resistivity	Conductivity
81	122.883	24.387	0.041
83	122.918	24.33	0.0411
85	122.952	24.234	0.0413
87	122.986	23.988	0.0417
89	123.02	23.014	0.0435
91	123.054	23.083	0.0433
93	123.087	23.271	0.043
95	123.12	23.642	0.0423
97	123.152	23.904	0.0418
99	123.183	25.003	0.04
101	123.214	25.289	0.0395
103	123.244	25.25	0.0396
105	123.274	24.94	0.0401
107	123.302	24.797	0.0403
109	123.331	25.462	0.0393
111	123.358	33.394	0.0299
113	123.385	36.939	0.0271
7	120.395	25.137	0.0398
9	120.422	24.33	0.0411
11	120.449	24.549	0.0407
13	120.476	27.302	0.0366
15	120.502	28.674	0.0349
17	120.528	28.745	0.0348
19	120.553	28.782	0.0347
21	120.578	26.607	0.0376
23	120.602	22.144	0.0452
25	120.626	21.151	0.0473
27	120.65	21.246	0.0471
29	120.684	23.32	0.0429
31	120.728	24.172	0.0414
33	120.771	24.014	0.0416
35	120.814	23.43	0.0427
37	120.857	25.727	0.0389
39	120.899	33.126	0.0302
41	120.941	37.75	0.0265
43	120.982	40.858	0.0245
45	121.023	44.284	0.0226
47	121.064	48.123	0.0208
49	121.105	34.449	0.029
51	121.144	34.013	0.0294
53	121.184	34.701	0.0288
55	121.223	35.365	0.0283
57	121.262	31.922	0.0313
59	121.3	30.925	0.0323
61	121.338	29.446	0.034
63	121.375	26.682	0.0375
65	121.412	25.45	0.0393
67	121.449	25.126	0.0398
69	121.485	25.217	0.0397
71	121.521	25.817	0.0387
73	121.556	26.21	0.0382

Distance	Elevation	Resistivity	Conductivity
75	121.592	26.377	0.0379
77	121.626	26.313	0.038
79	121.661	24.992	0.04
81	121.695	24.395	0.041
83	121.728	24.32	0.0411
85	121.762	24.239	0.0413
87	121.795	23.969	0.0417
89	121.829	23.307	0.0429
91	121.864	23.212	0.0431
93	121.898	23.316	0.0429
95	121.932	23.647	0.0423
97	121.966	23.945	0.0418
99	121.999	24.922	0.0401
101	122.032	25.249	0.0396
103	122.065	25.215	0.0397
105	122.097	24.968	0.0401
107	122.128	24.915	0.0401
109	122.16	26.267	0.0381
111	122.191	34.421	0.0291
11	119.193	27.328	0.0366
13	119.223	29.029	0.0344
15	119.252	29.498	0.0339
17	119.281	29.566	0.0338
19	119.309	29.64	0.0337
21	119.338	29.148	0.0343
23	119.366	26.71	0.0374
25	119.393	26.375	0.0379
27	119.42	26.383	0.0379
29	119.454	26.872	0.0372
31	119.494	27.126	0.0369
33	119.535	27.197	0.0368
35	119.574	27.364	0.0365
37	119.614	28.569	0.035
39	119.653	31.049	0.0322
41	119.692	32.784	0.0305
43	119.73	34.915	0.0286
45	119.768	44.006	0.0227
47	119.806	45.349	0.0221
49	119.844	37.832	0.0264
51	119.881	36.712	0.0272
53	119.918	36.132	0.0277
55	119.955	35.352	0.0283
57	119.991	32.26	0.031
59	120.027	30.955	0.0323
61	120.063	29.475	0.0339
63	120.099	28.231	0.0354
65	120.134	27.89	0.0359
67	120.169	27.659	0.0362
69	120.204	27.446	0.0364
71	120.239	27.214	0.0367
73	120.273	26.939	0.0371

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Distance	Elevation	Resistivity	Conductivity
75	120.307	26.666	0.0375
77	120.341	26.369	0.0379
79	120.375	25.125	0.0398
81	120.409	24.598	0.0407
83	120.442	24.481	0.0408
85	120.476	24.408	0.041
87	120.509	24.208	0.0413
89	120.543	23.941	0.0418
91	120.577	23.824	0.042
93	120.612	23.804	0.042
95	120.646	23.961	0.0417
97	120.68	24.274	0.0412
99	120.714	24.965	0.0401
101	120.748	25.481	0.0392
103	120.781	25.907	0.0386
105	120.815	26.211	0.0382
107	120.848	27.72	0.0361
15	117.867	30.131	0.0332
17	117.898	31.029	0.0322
19	117.929	31.764	0.0315
21	117.959	32.757	0.0305
23	117.99	33.761	0.0296
25	118.02	34.599	0.0289
27	118.049	35.02	0.0286
29	118.083	35.148	0.0285
31	118.121	35.128	0.0285
33	118.159	34.743	0.0288
35	118.196	33.474	0.0299
37	118.234	30.777	0.0325
39	118.271	30.766	0.0325
41	118.307	30.987	0.0323
43	118.344	31.889	0.0314
45	118.38	37.501	0.0267
47	118.416	38.149	0.0262
49	118.452	37.729	0.0265
51	118.488	36.685	0.0273
53	118.524	36.086	0.0277
55	118.559	35.169	0.0284
57	118.594	32.352	0.0309
59	118.629	30.979	0.0323
61	118.664	29.517	0.0339
63	118.698	28.78	0.0347
65	118.733	28.637	0.0349
67	118.767	28.484	0.0351
69	118.801	28.261	0.0354
71	118.836	27.949	0.0358
73	118.869	27.565	0.0363
75	118.903	27.129	0.0369
77	118.937	26.673	0.0375
79	118.971	26.111	0.0383
81	119.005	25.871	0.0387

Distance	Elevation	Resistivity	Conductivity
83	119.038	25.805	0.0388
85	119.072	25.792	0.0388
87	119.106	25.775	0.0388
89	119.139	25.714	0.0389
91	119.174	25.635	0.039
93	119.208	25.575	0.0391
95	119.242	25.56	0.0391
97	119.276	25.623	0.039
99	119.31	25.88	0.0386
101	119.344	26.4	0.0379
103	119.378	27.687	0.0361
19	116.402	32.906	0.0304
21	116.434	33.459	0.0299
23	116.466	33.905	0.0295
25	116.497	34.539	0.029
27	116.529	34.945	0.0286
29	116.563	35.1	0.0285
31	116.599	35.095	0.0285
33	116.635	34.736	0.0288
35	116.671	33.602	0.0298
37	116.707	30.706	0.0326
39	116.742	30.512	0.0328
41	116.778	30.373	0.0329
43	116.813	30.715	0.0326
45	116.848	34.059	0.0294
47	116.883	35.764	0.028
49	116.918	36.115	0.0277
51	116.953	36.175	0.0276
53	116.988	35.544	0.0281
55	117.022	34.389	0.0291
57	117.057	32.323	0.0309
59	117.091	30.926	0.0323
61	117.125	29.499	0.0339
63	117.16	28.828	0.0347
65	117.194	28.672	0.0349
67	117.228	28.514	0.0351
69	117.262	28.297	0.0353
71	117.296	28.002	0.0357
73	117.33	27.643	0.0362
75	117.364	27.269	0.0367
77	117.397	26.956	0.0371
79	117.431	26.743	0.0374
81	117.465	26.664	0.0375
83	117.499	26.655	0.0375
85	117.533	26.685	0.0375
87	117.566	26.728	0.0374
89	117.6	26.769	0.0374
91	117.634	26.807	0.0373
93	117.668	26.86	0.0372
95	117.702	26.958	0.0371
97	117.736	27.131	0.0369

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Distance	Elevation	Resistivity	Conductivity
99	117.77	27.651	0.0362
23	114.782	33.838	0.0296
25	114.815	34.382	0.0291
27	114.848	34.664	0.0288
29	114.881	34.789	0.0287
31	114.917	34.807	0.0287
33	114.952	34.538	0.029
35	114.987	33.584	0.0298
37	115.022	30.402	0.0329
39	115.056	29.82	0.0335
41	115.091	29.584	0.0338
43	115.126	29.555	0.0338
45	115.16	30.082	0.0332
47	115.195	31.062	0.0322
49	115.229	31.733	0.0315
51	115.263	32.135	0.0311
53	115.298	32.27	0.031
55	115.332	32.238	0.031
57	115.366	31.566	0.0317
59	115.4	30.427	0.0329
61	115.434	29.34	0.0341
63	115.468	28.742	0.0348
65	115.502	28.578	0.035
67	115.536	28.421	0.0352
69	115.57	28.217	0.0354
71	115.604	27.948	0.0358
73	115.638	27.628	0.0362
75	115.672	27.309	0.0366
77	115.706	27.065	0.0369
79	115.739	26.933	0.0371
81	115.773	26.886	0.0372
83	115.807	26.888	0.0372
85	115.841	26.923	0.0371
87	115.875	26.986	0.0371
89	115.909	27.074	0.0369
91	115.943	27.143	0.0368
93	115.977	27.231	0.0367
95	116.011	27.546	0.0363
29	113.027	34.266	0.0292
31	113.061	34.274	0.0292
33	113.096	34.083	0.0293
35	113.13	33.529	0.0298
37	113.165	29.687	0.0337
39	113.199	28.545	0.035
41	113.233	28.189	0.0355
43	113.268	28.072	0.0356
45	113.302	28.079	0.0356
47	113.336	28.172	0.0355
49	113.37	28.325	0.0353
51	113.404	28.485	0.0351
53	113.438	28.609	0.035

Distance	Elevation	Resistivity	Conductivity
55	113.472	28.693	0.0349
57	113.506	28.736	0.0348
59	113.54	28.736	0.0348
61	113.574	28.646	0.0349
63	113.608	28.462	0.0351
65	113.642	28.328	0.0353
67	113.676	28.192	0.0355
69	113.71	28.021	0.0357
71	113.744	27.801	0.036
73	113.778	27.545	0.0363
75	113.811	27.297	0.0366
77	113.845	27.116	0.0369
79	113.879	27.025	0.037
81	113.913	26.994	0.037
83	113.947	27.003	0.037
85	113.981	27.03	0.037
87	114.015	27.085	0.0369
89	114.049	27.267	0.0367
35	111.086	33.502	0.0298
37	111.12	28.748	0.0348
39	111.154	27.768	0.036
41	111.188	27.511	0.0363
43	111.223	27.026	0.037
45	111.257	26.973	0.0371
47	111.291	26.983	0.0371
49	111.325	27.041	0.037
51	111.358	27.14	0.0368
53	111.392	27.268	0.0367
55	111.426	27.406	0.0365
57	111.46	27.541	0.0363
59	111.494	27.667	0.0361
61	111.528	27.774	0.036
63	111.562	27.847	0.0359
65	111.596	27.862	0.0359
67	111.63	27.816	0.036
69	111.664	27.717	0.0361
71	111.698	27.574	0.0363
73	111.732	27.406	0.0365
75	111.765	27.243	0.0367
77	111.799	27.124	0.0369
79	111.833	27.073	0.0369
81	111.867	27.065	0.0369
83	111.901	27.099	0.0369
41	108.938	27.326	0.0366
43	108.972	26.729	0.0374
45	109.006	26.662	0.0375
47	109.04	26.659	0.0375
49	109.074	26.702	0.0375
51	109.108	26.789	0.0373
53	109.142	26.907	0.0372
55	109.176	27.033	0.037

Distance	Elevation	Resistivity	Conductivity
57	109.21	27.154	0.0368
59	109.244	27.262	0.0367
61	109.278	27.351	0.0366
63	109.312	27.414	0.0365
65	109.345	27.444	0.0364
67	109.379	27.439	0.0364
69	109.413	27.396	0.0365
71	109.447	27.326	0.0366
73	109.481	27.243	0.0367
75	109.515	27.162	0.0368
77	109.549	27.092	0.0369
47	106.565	26.074	0.0384
49	106.599	26.183	0.0382
51	106.633	26.379	0.0379
53	106.667	26.617	0.0376
55	106.701	26.808	0.0373
57	106.734	26.947	0.0371
59	106.768	27.05	0.037
61	106.802	27.122	0.0369
63	106.836	27.164	0.0368
65	106.87	27.179	0.0368
67	106.904	27.168	0.0368
69	106.938	27.134	0.0369
71	106.972	27.105	0.0369
49	103.876	22.789	0.0439
51	103.91	25.877	0.0386
53	103.944	26.535	0.0377
55	103.977	26.746	0.0374
57	104.011	26.871	0.0372
59	104.045	26.967	0.0371
61	104.079	27.032	0.037
63	104.113	27.067	0.0369
65	104.147	27.07	0.0369
67	104.181	27.037	0.037
69	104.215	26.945	0.0371

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ANNEX: F

Site Photographs

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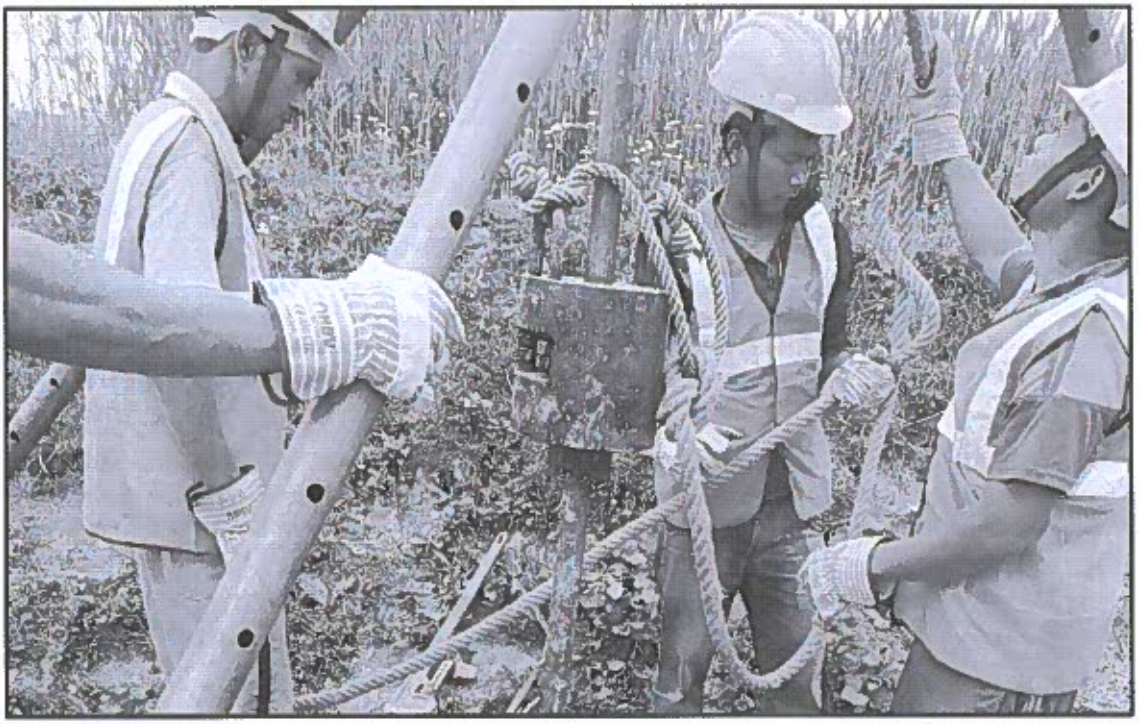
Photographhgraph: Preparatory setup for the SPT test at B1 Hole



Photograph: Performing SPT test at B1 Hole

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Photograph: SPT sample in SPT barrel at B-2 Hole

Photograph: SPT sample in SPT barrel at B-3 Hole

MC CONSULTING INTERNATIONAL LLC 2000

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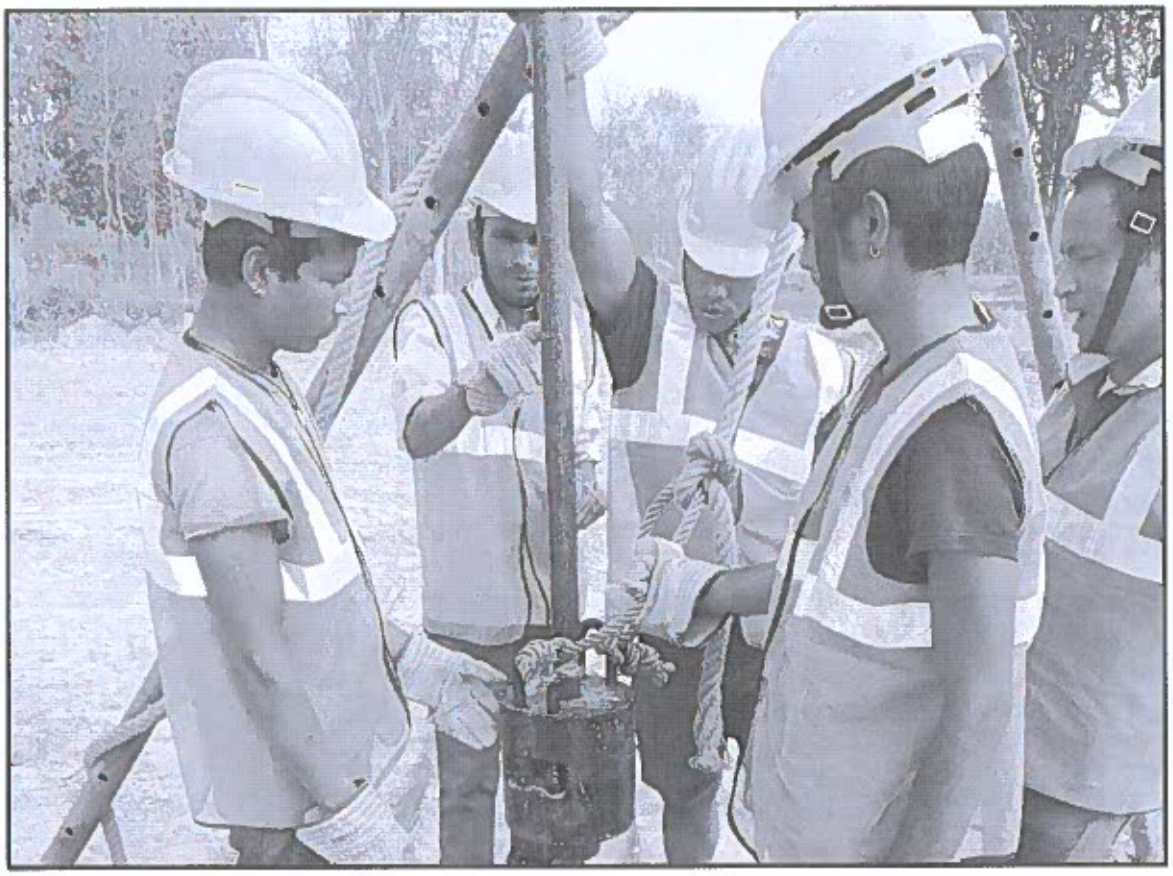
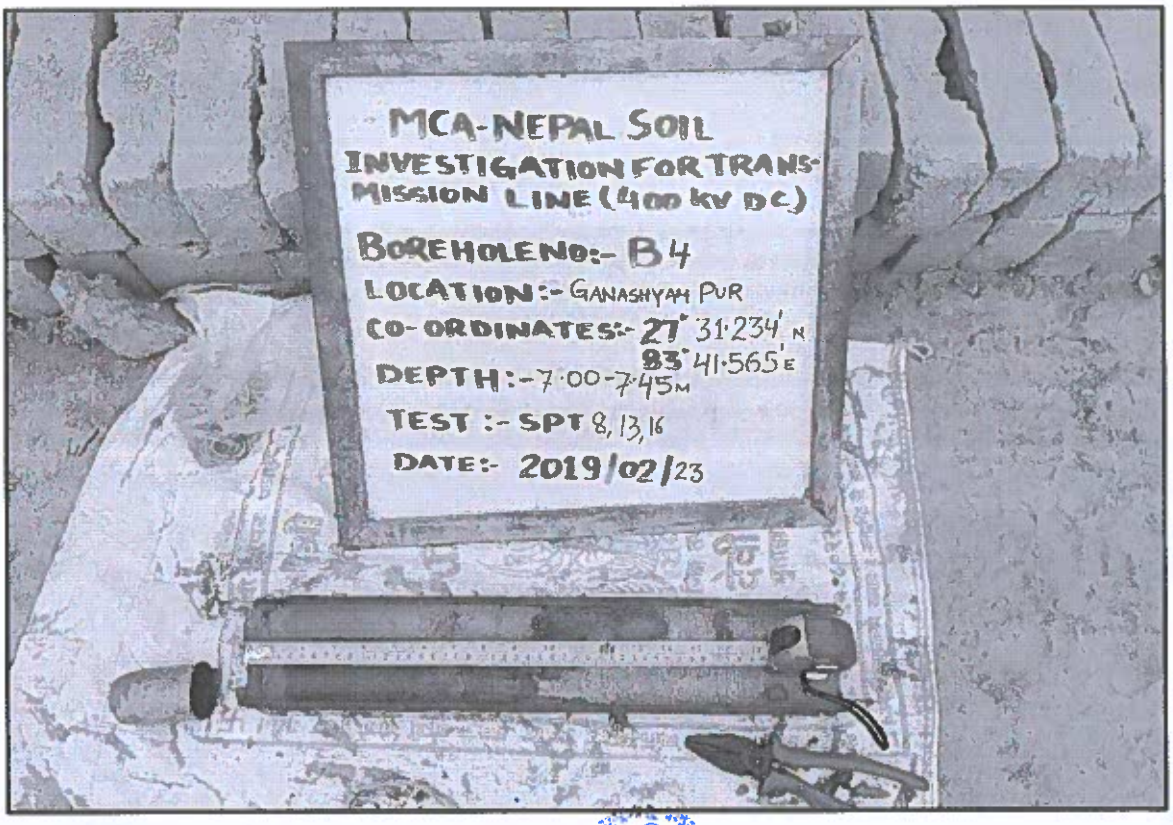


Photograph: Performing SPT test at B3Hole



Photograph: SPT sample in SPT barrel at B-4 Hole

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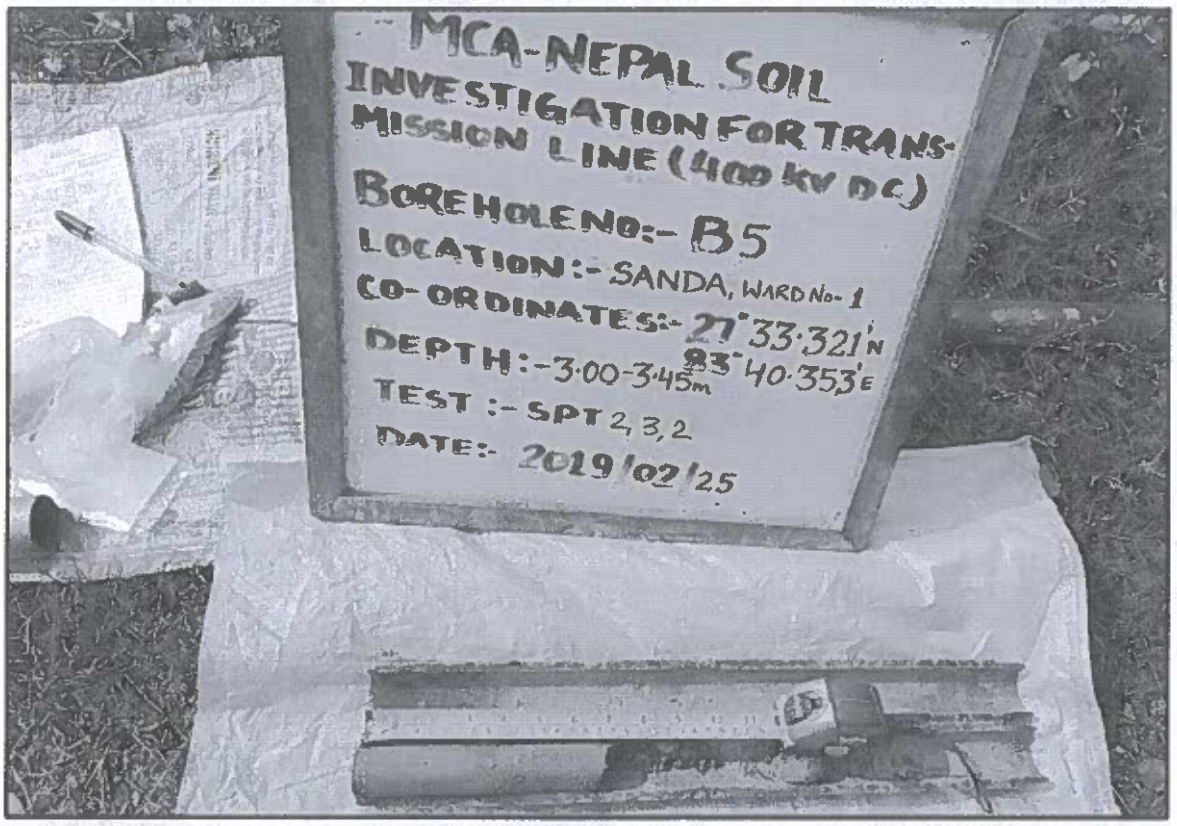
Photograph: Performing SPT test at B4Hole



Photograph: SPT sample in SPT barrel at B-5 Hole

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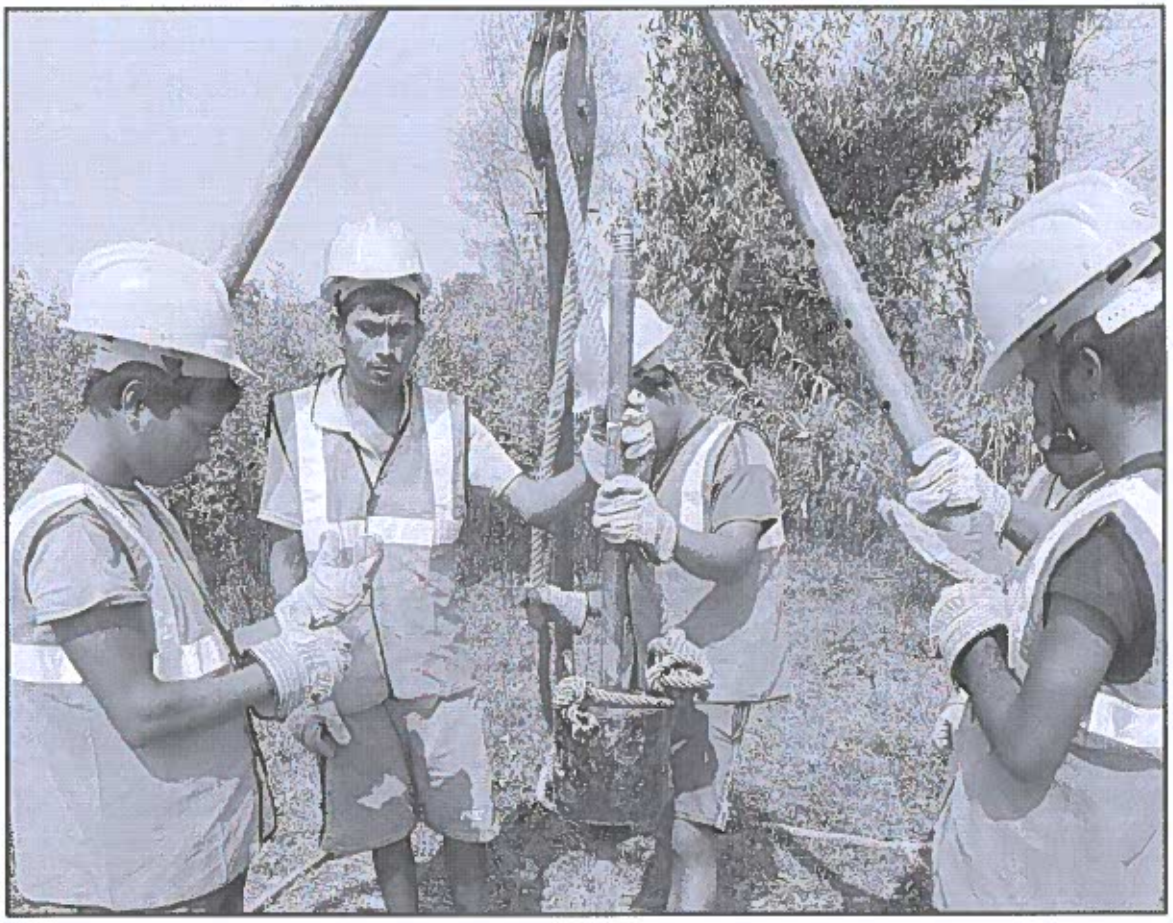
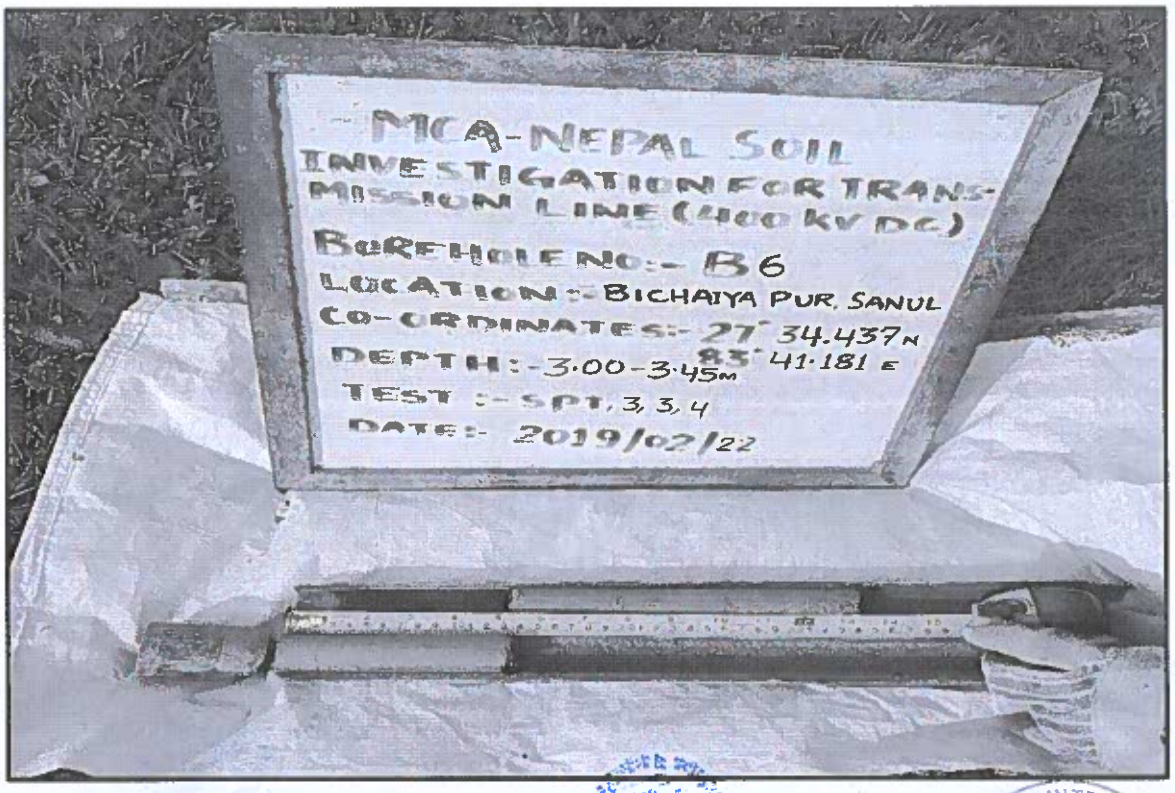


Photograph: Preparatory setup for the SPT test at B5 Hole



Photograph: SPT sample in barrel at B-6 Hole

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Photograph: Preparatory setup for the SPT test at B6 Hole

Photograph: Preparatory setup for the SPT test at B7 Hole

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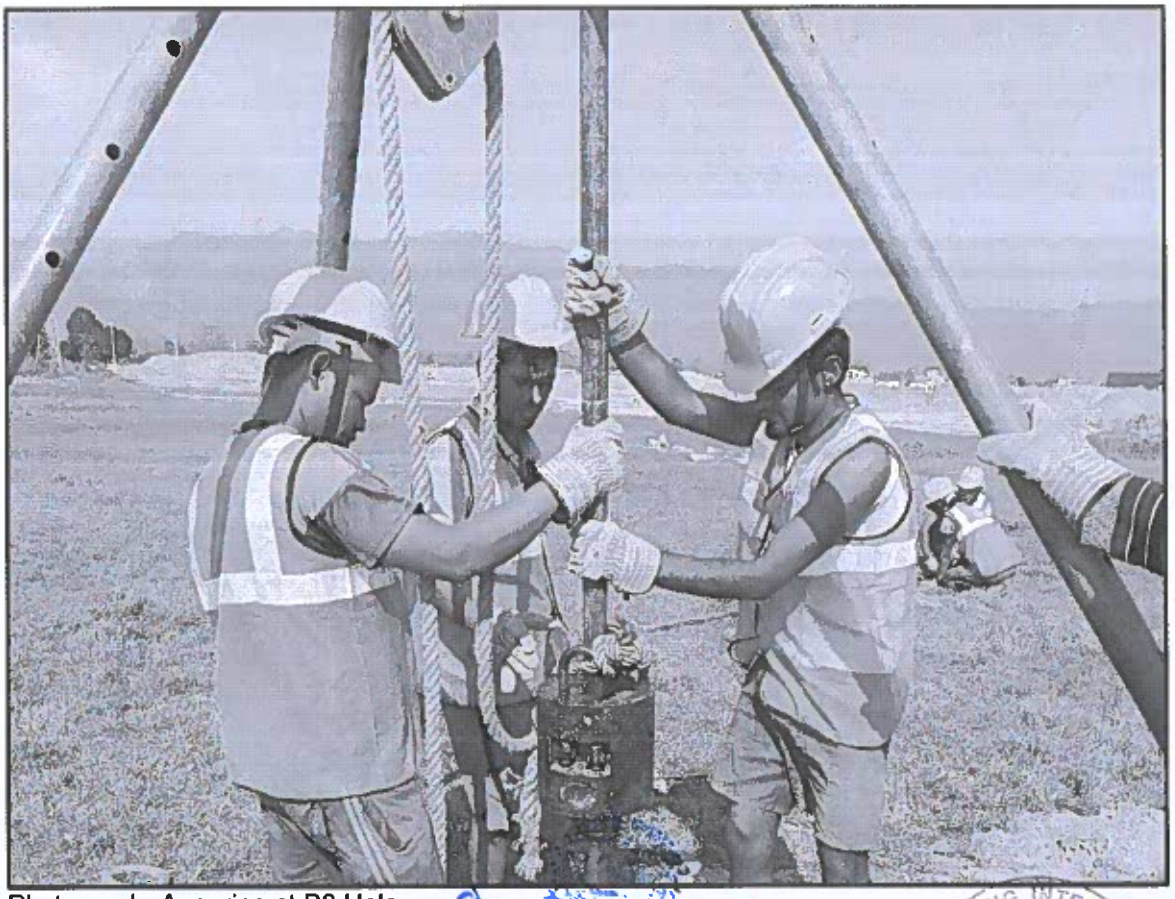
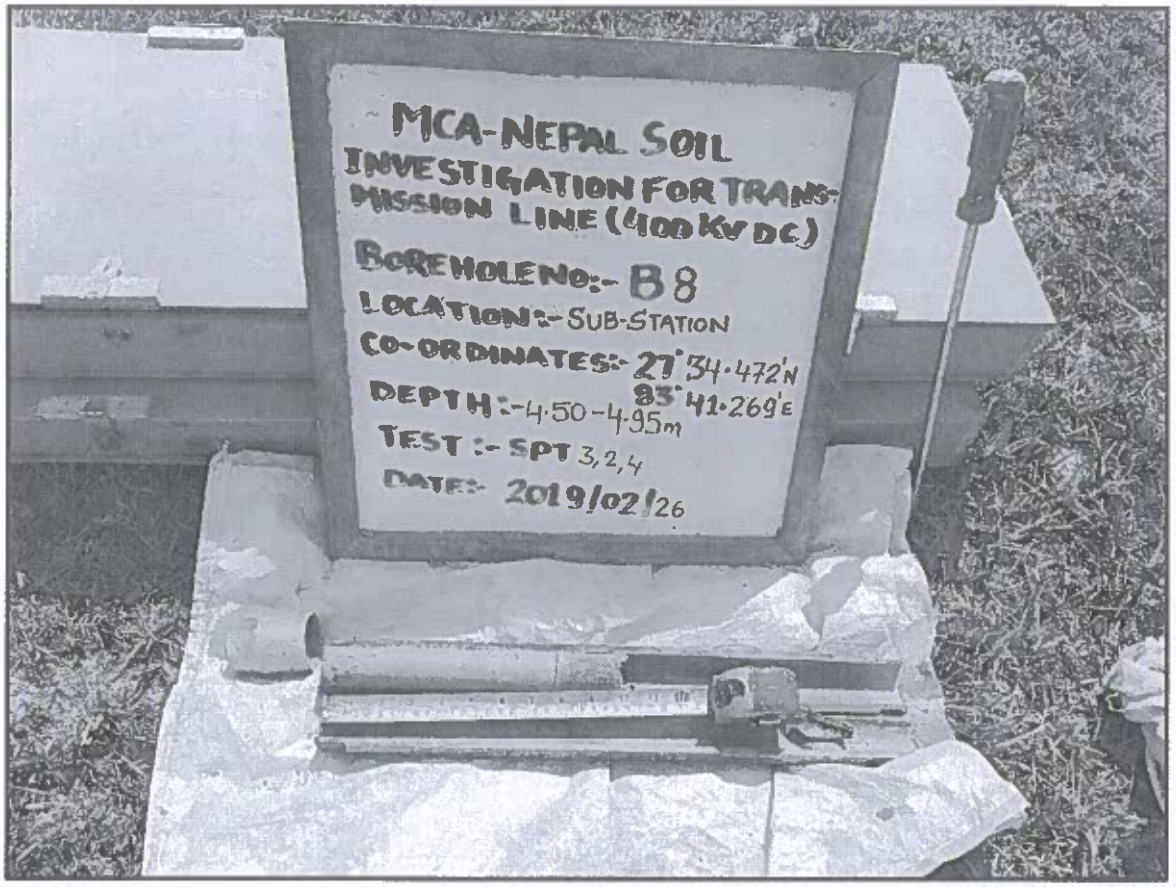
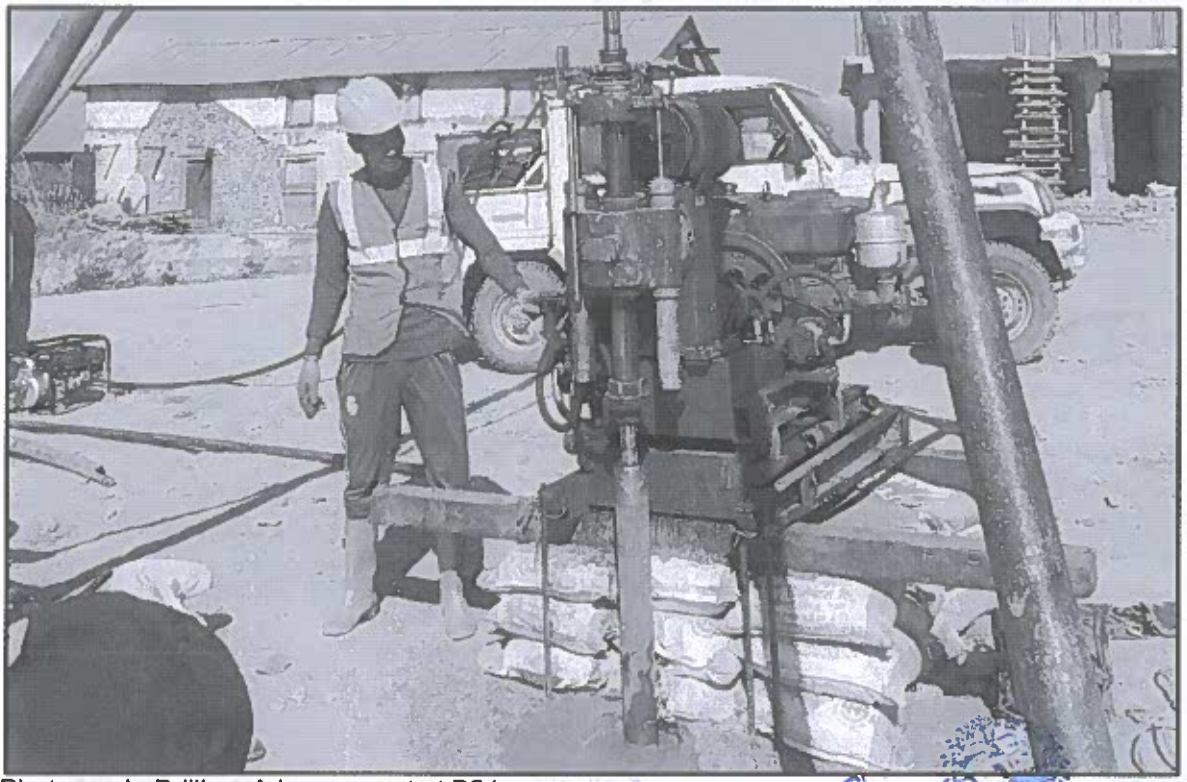
Photograph: SPT sample in barrel at B-7 Hole



Photograph: Auguring at B8 Hole



Photograph: SPT sample in barrel at B-7 HolePhotograph: SPT sample in barrel at B-7 Hole



Photograph: Drilling Advancement at B54

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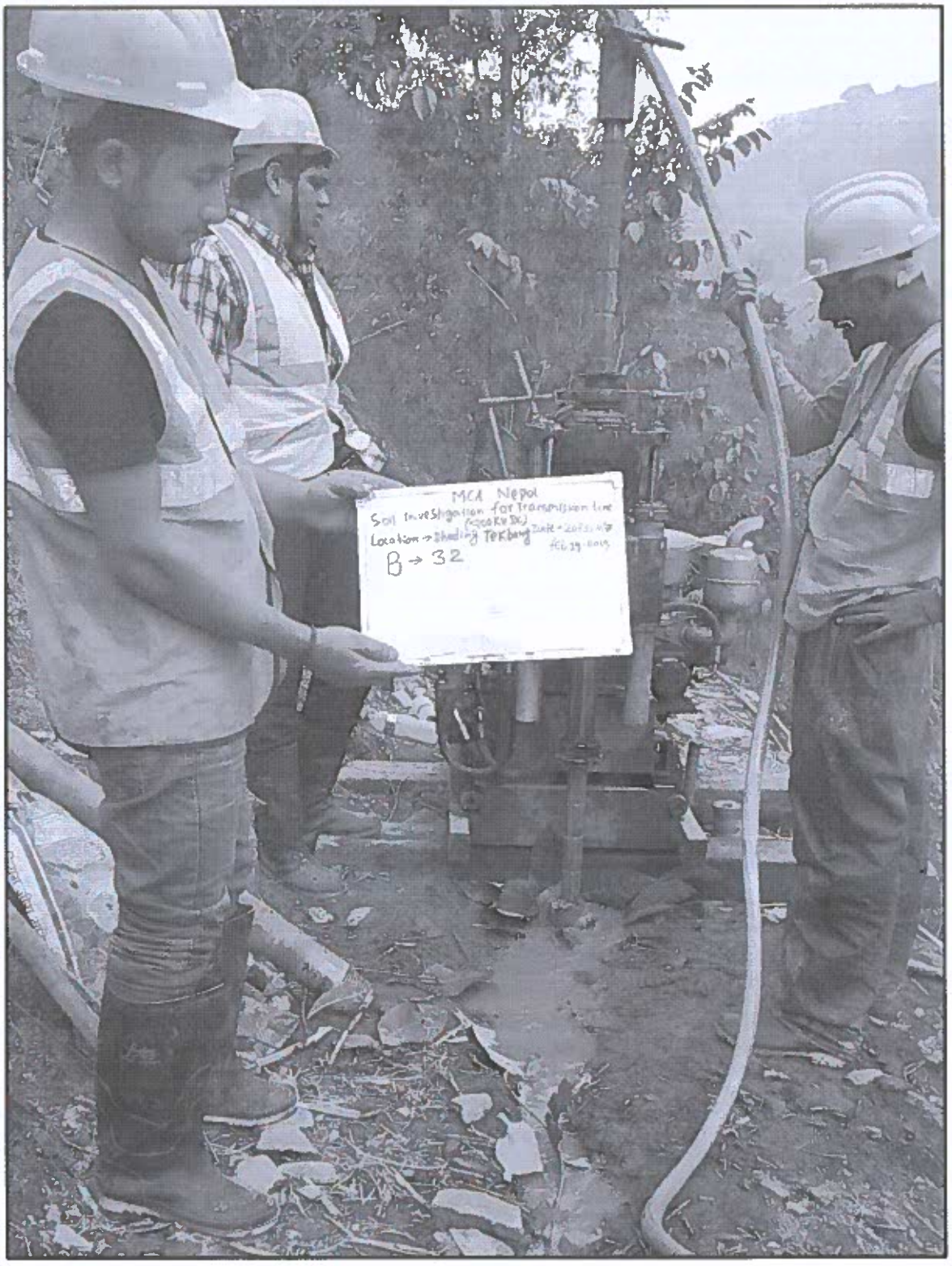

Photograph: Drilling advancement at B32

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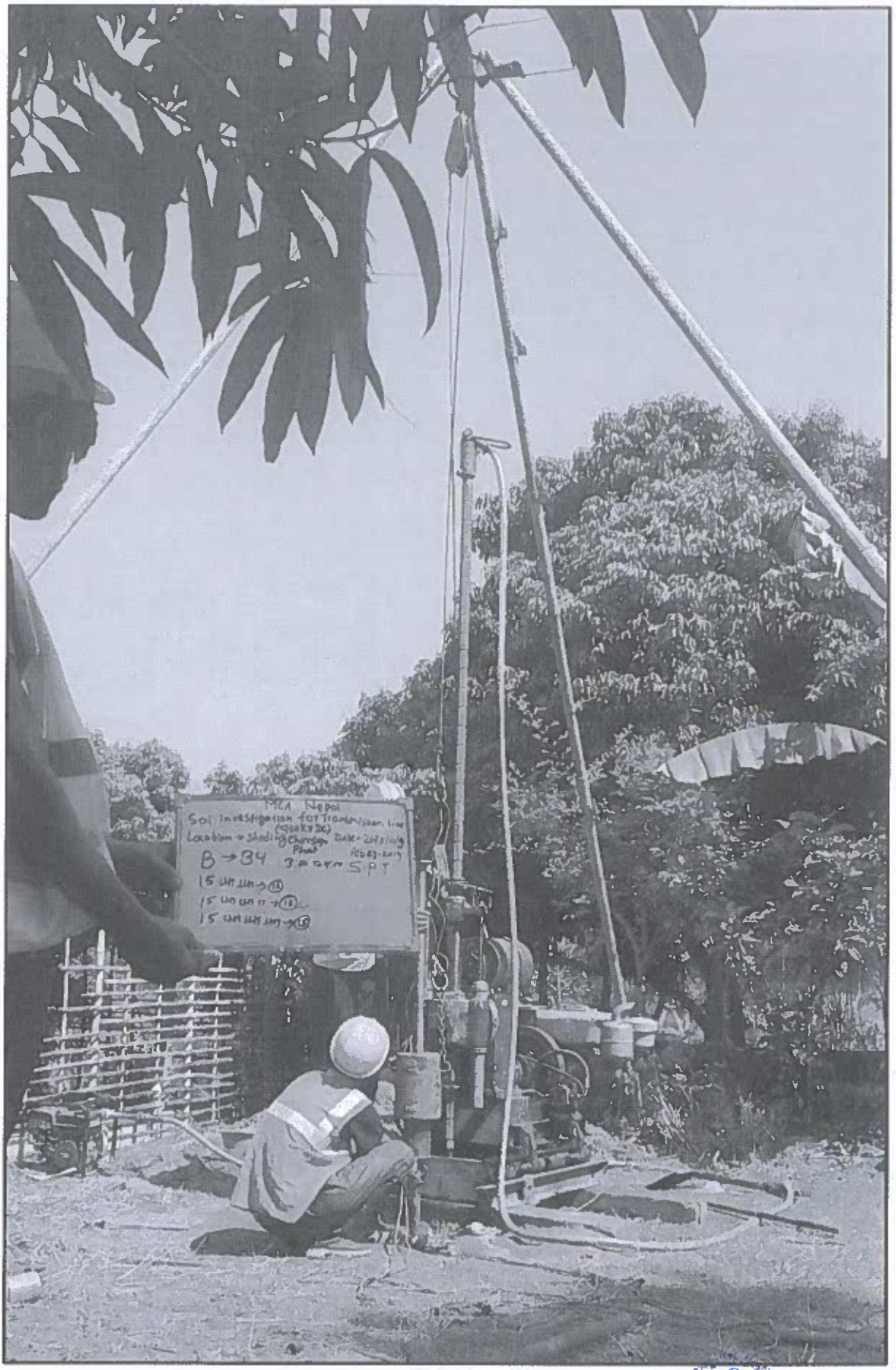
Photograph: Machine run with waterreturn at B34

Photograph: Performing SPT test at B34



Photograph: Performing SPT test at B34

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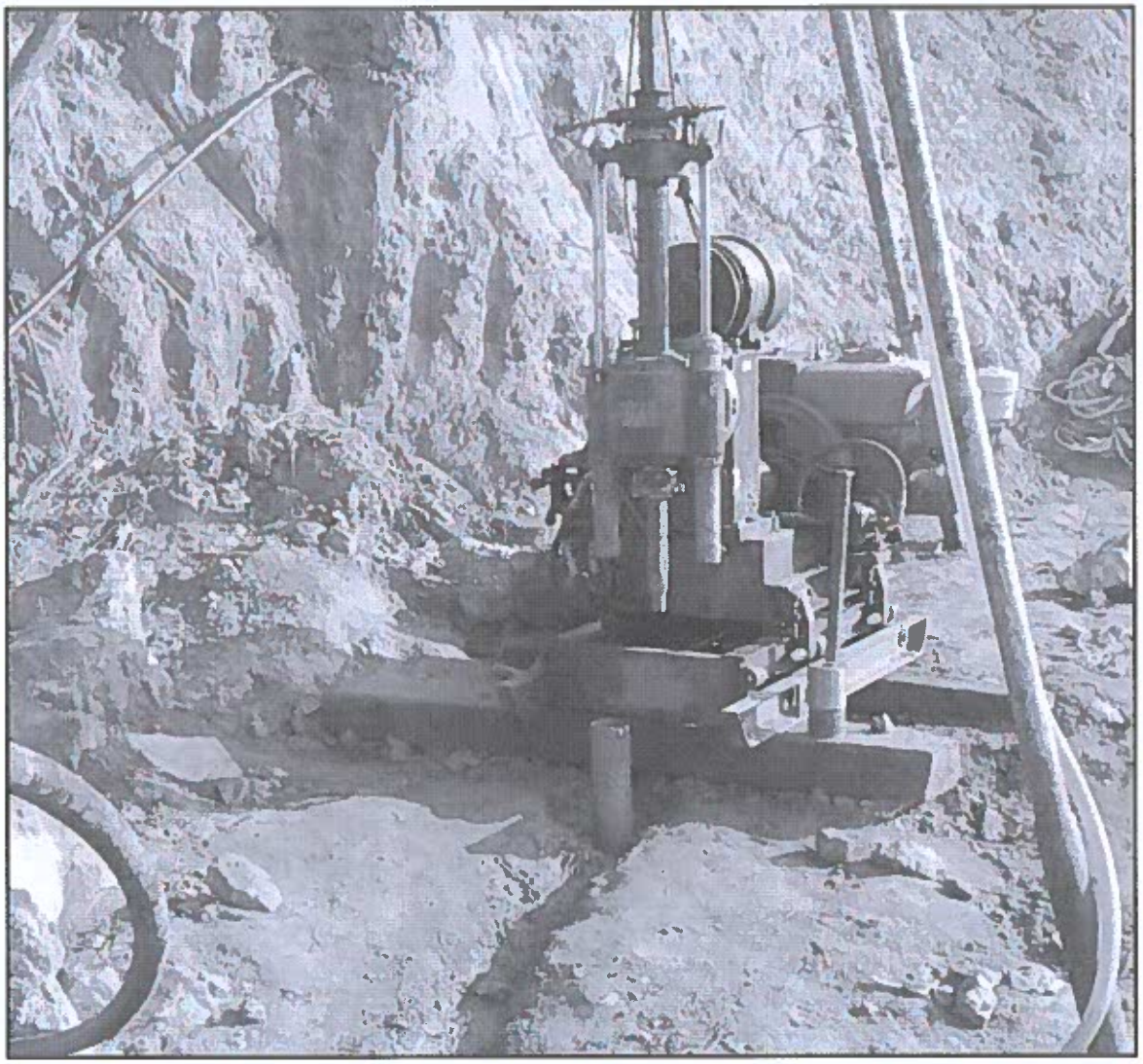

Photograph: Machine is being on rest after completion the hole

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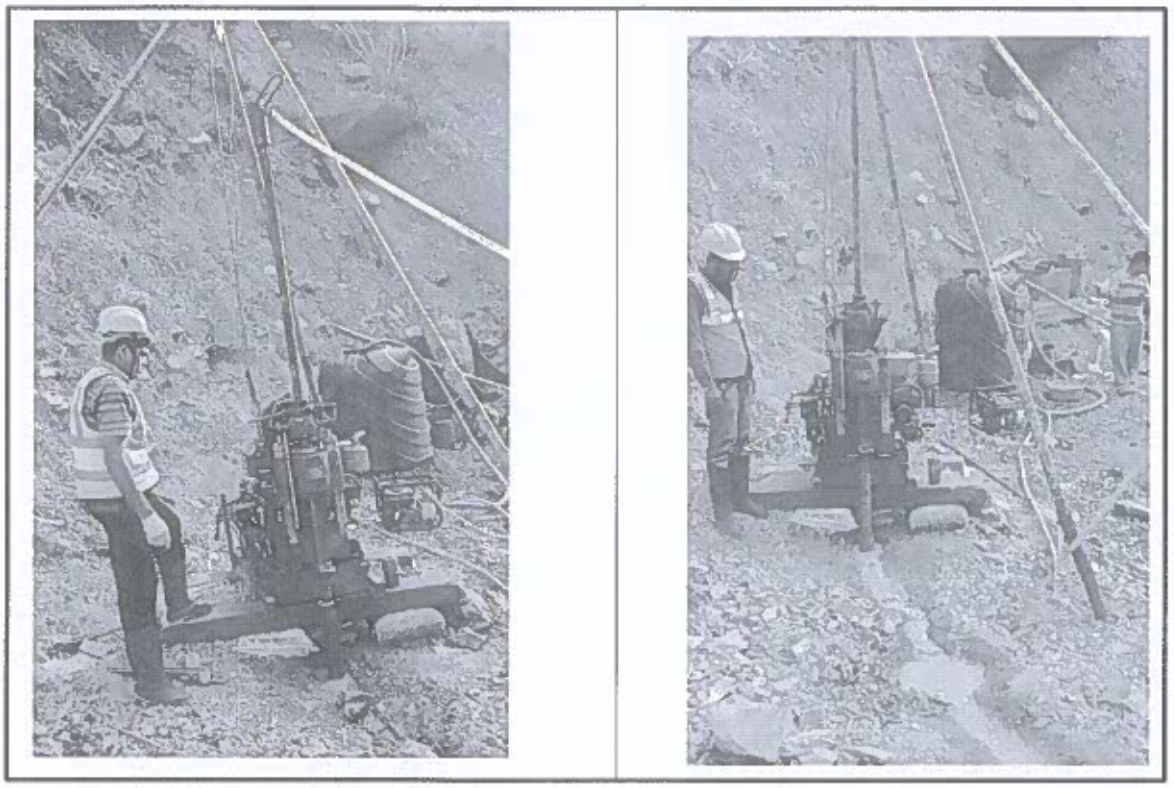
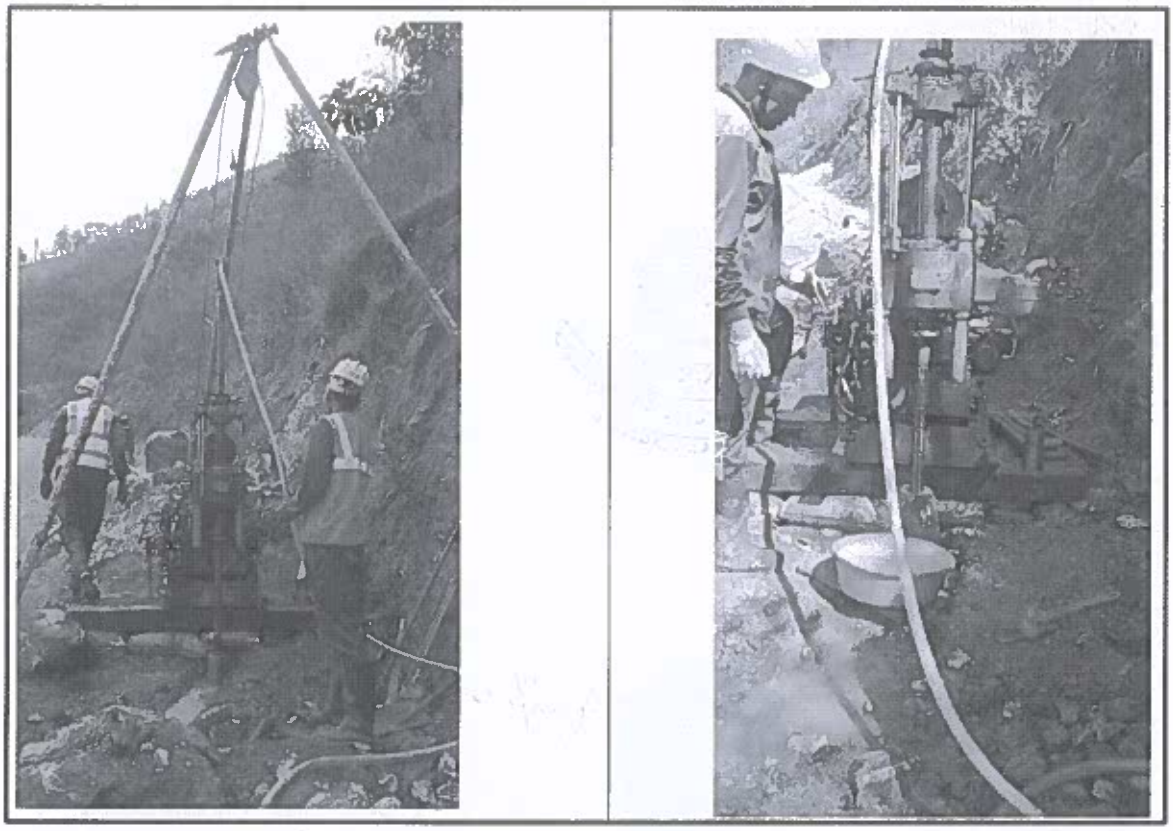


Photograph: Drilling works is progressing with the water return from the Borehole B31



Photograph: Drilling advancement showing at left and water return testing by field geologist at B27

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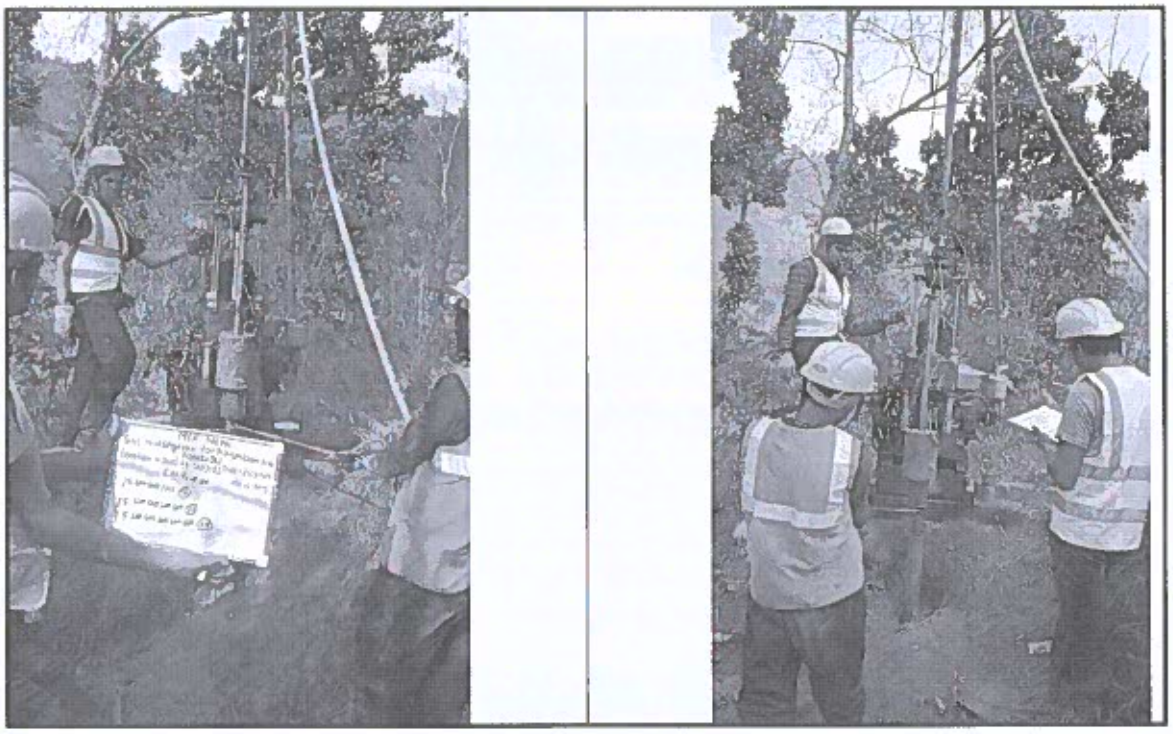

Photograph: Performing SPT test at B22

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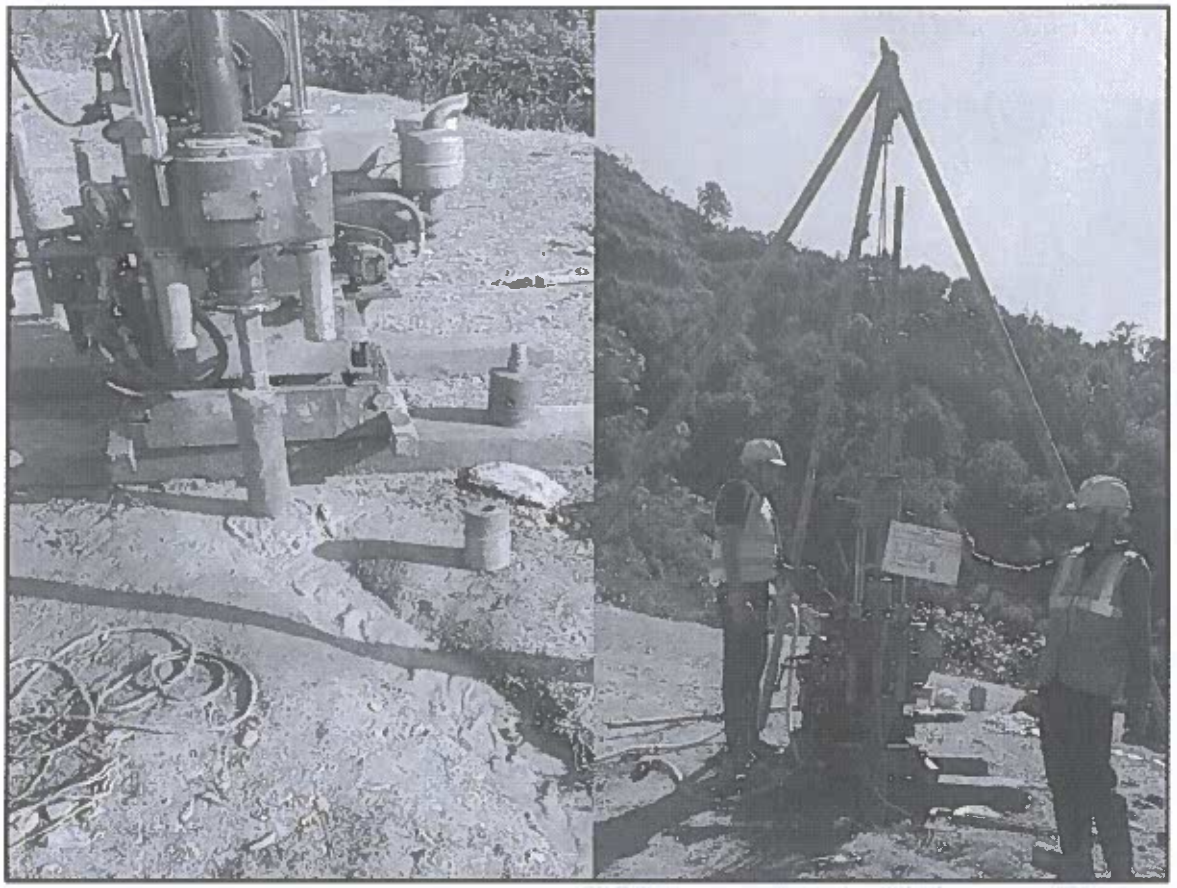
Photograph: Site conditions before Drilling at Left and Pit advancement with Completion drill hole at right at B-27



Photograph: Drilling advancement at B31 at Left and the Performing SPT test at right

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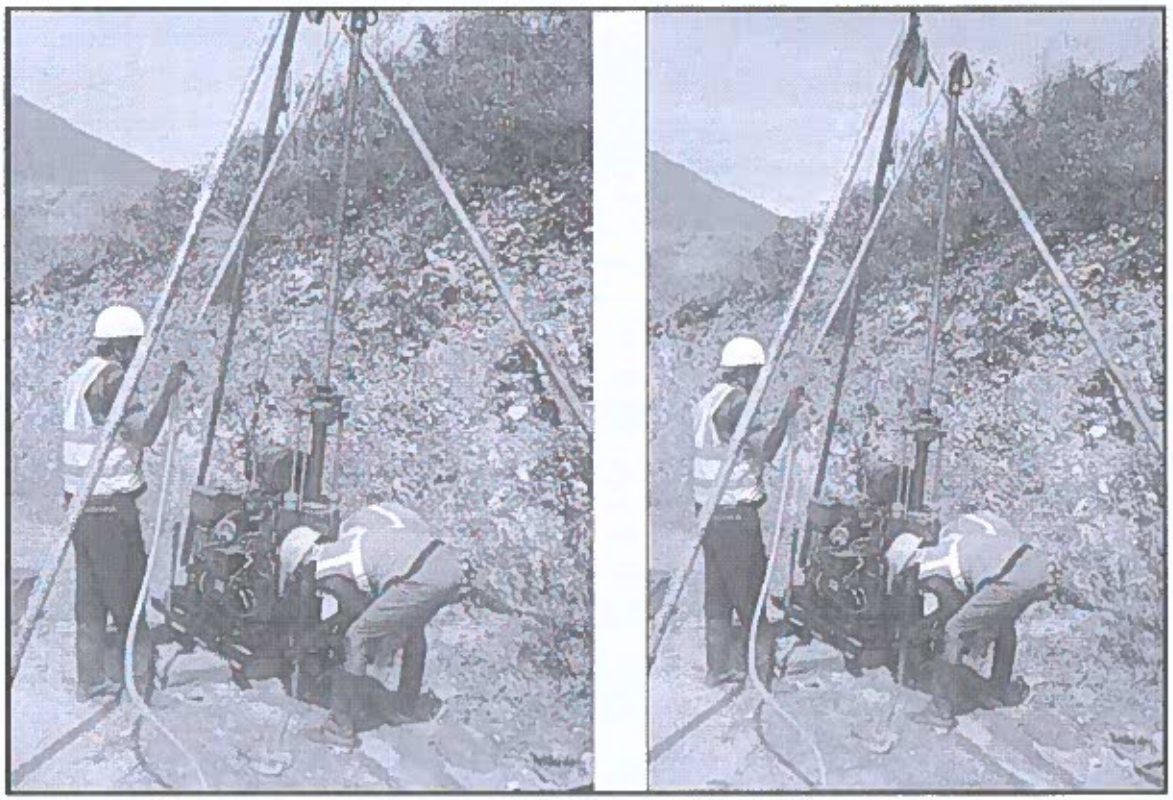
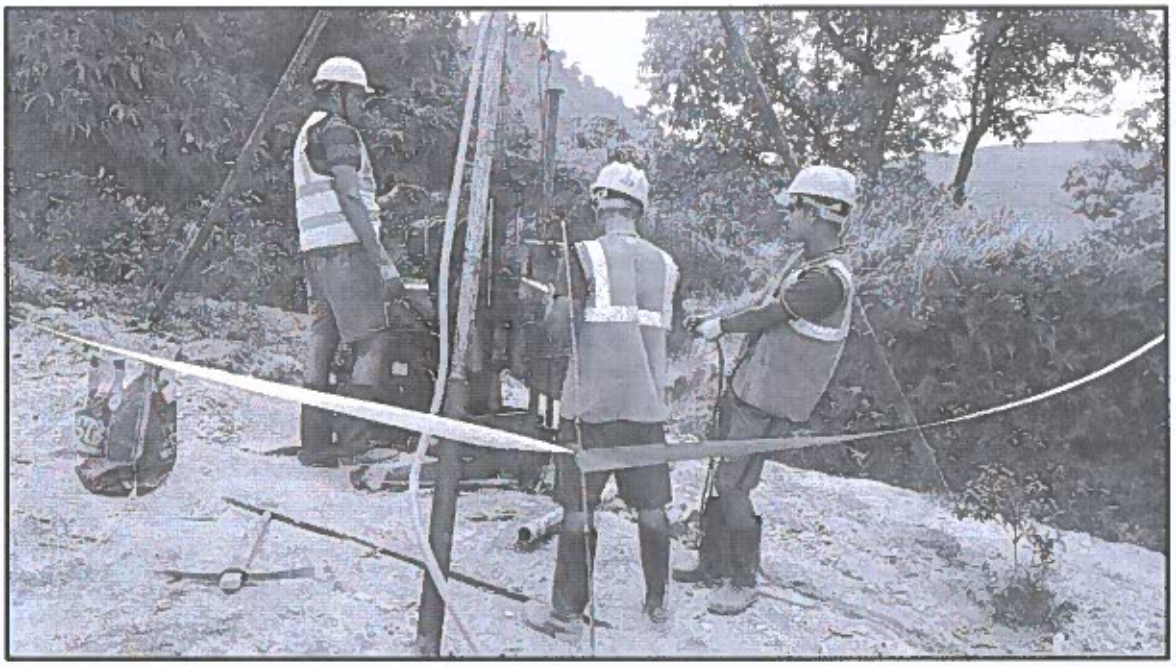


Photograph: Loosening rods by the wrench to carried out the core from the barrel at B29



Photograph: Performing SPT test at B16

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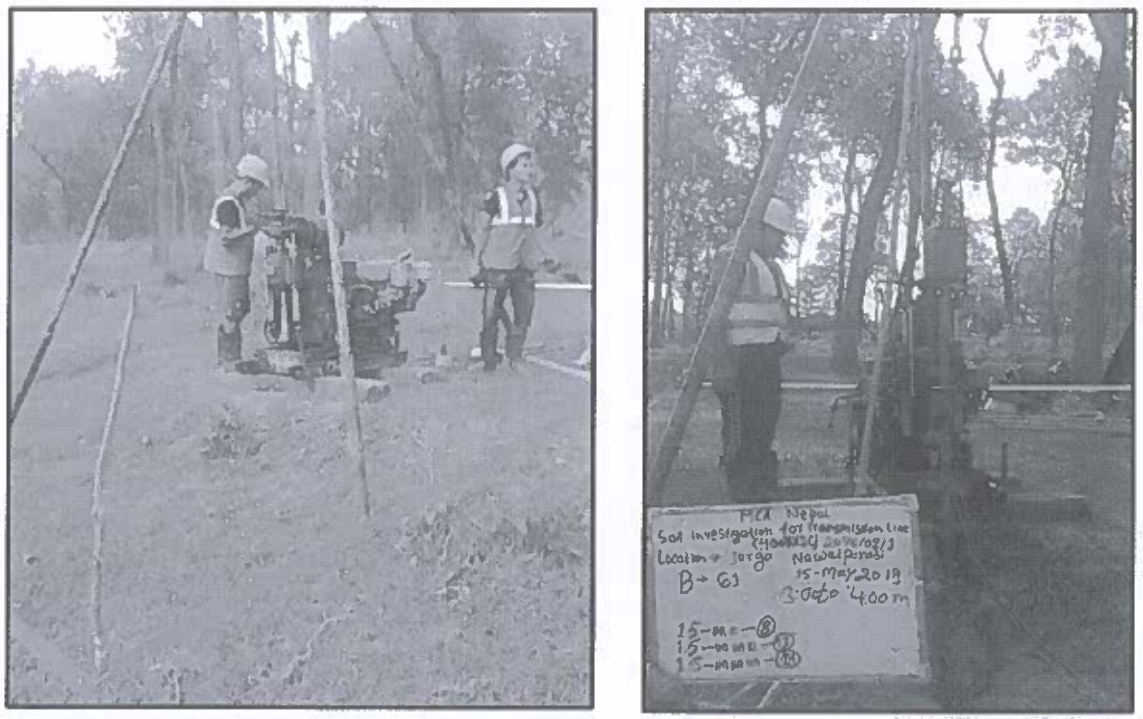
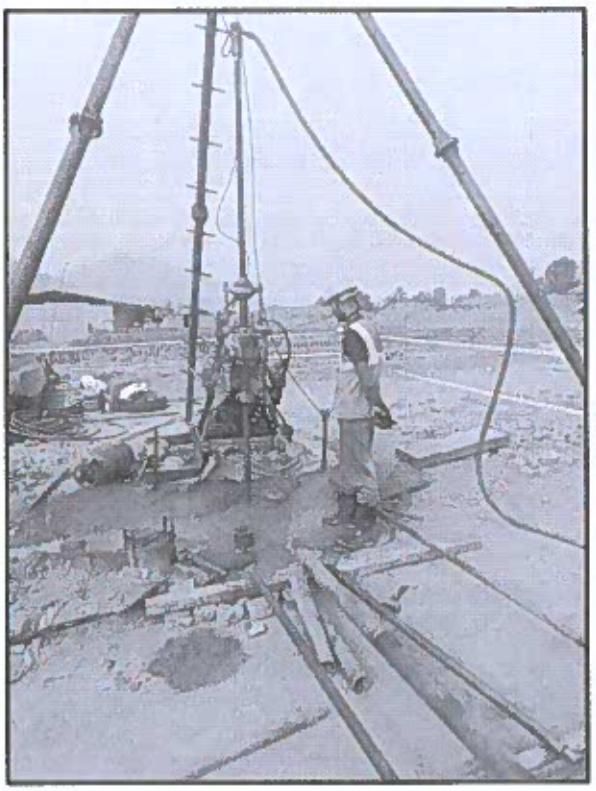
Photographs: Land restored after completion of drilling work



Photographs: Drilling on B44



Photographs: Drilling works on B38 and B39 at Ratamate

Photographs: Restored land after completion of drilling at B37 and B38

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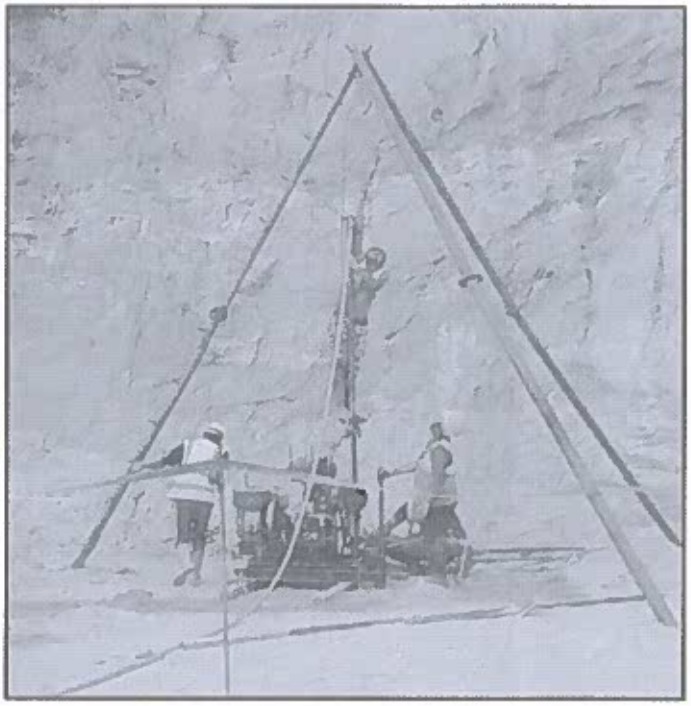
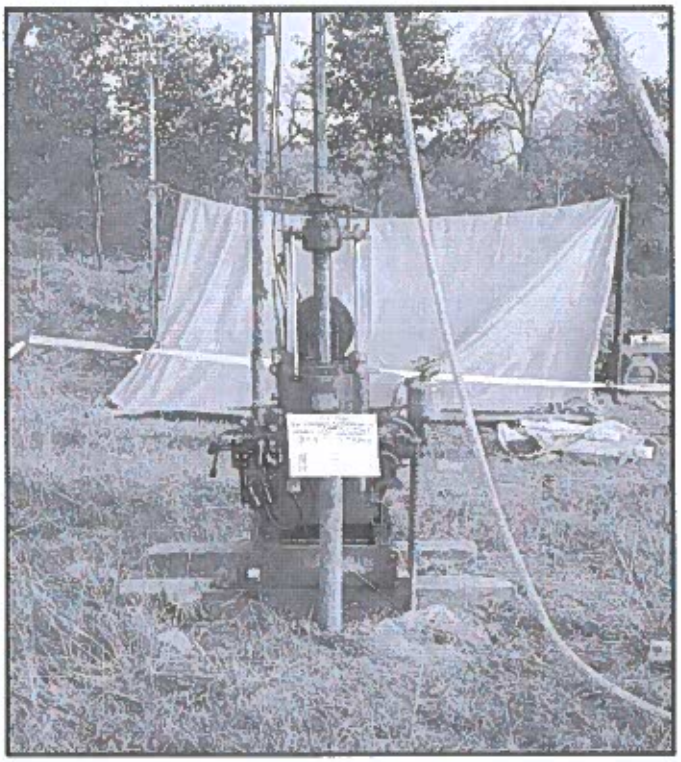
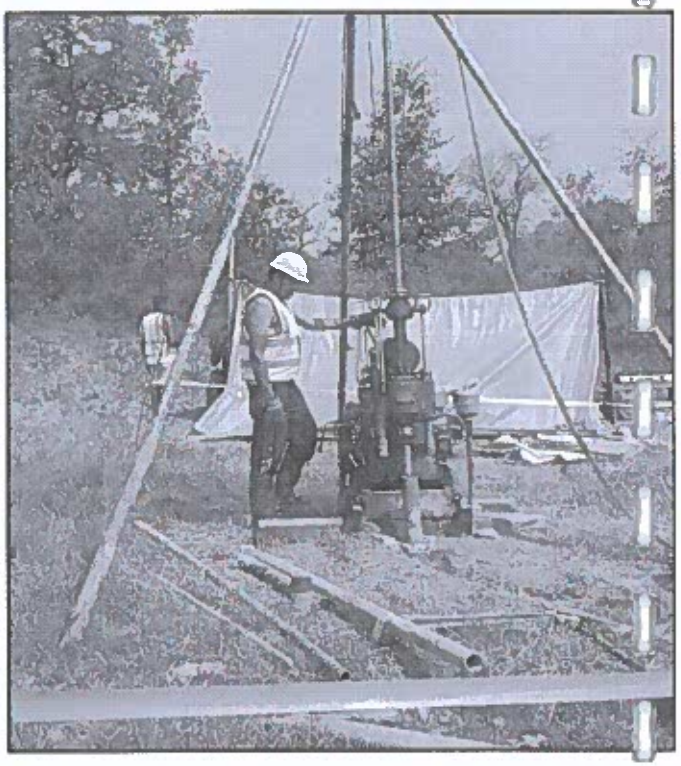
2009



Photographs: Drilling work and Land restoration after completion at B45

Photographs: Drilling on B13





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Photographs: Showing Rig before drilling, during drilling and restoring land after drilling at B9

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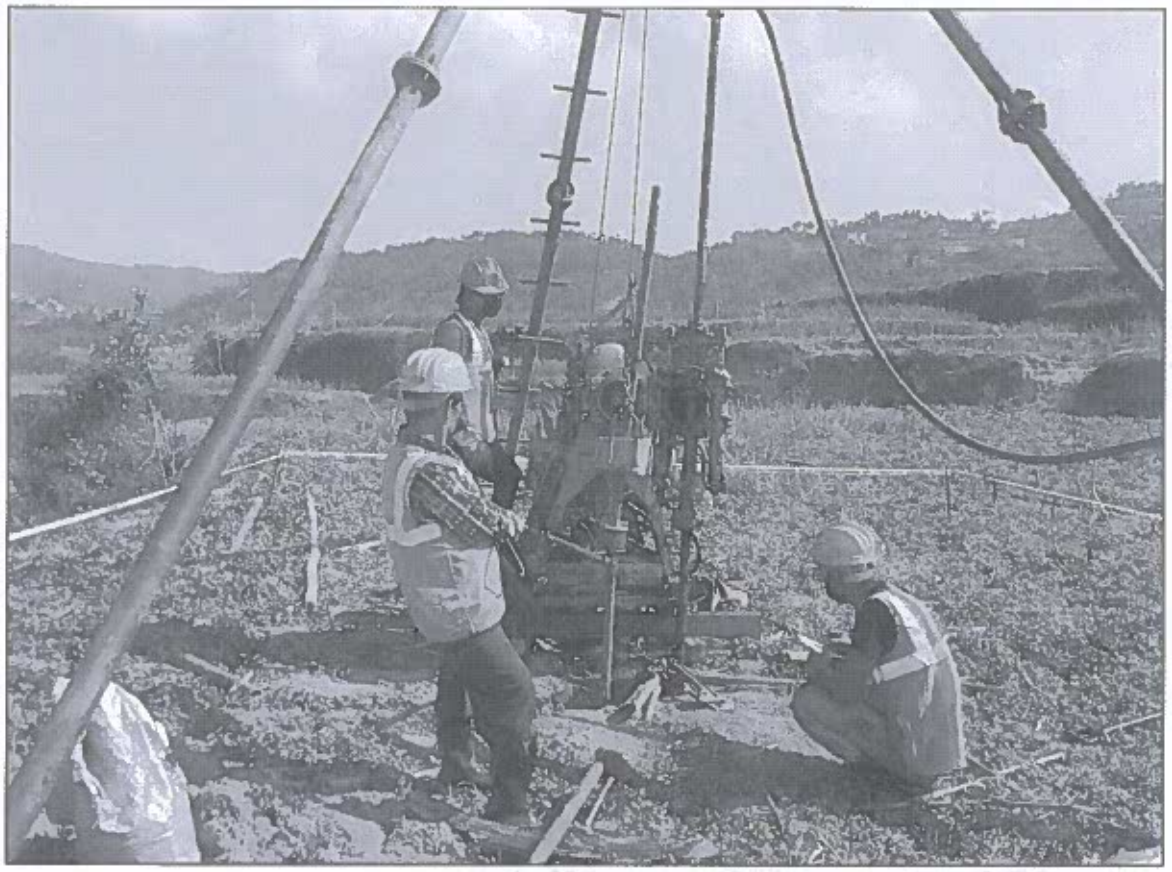

Photograph: Drillers performing SPT test at B49

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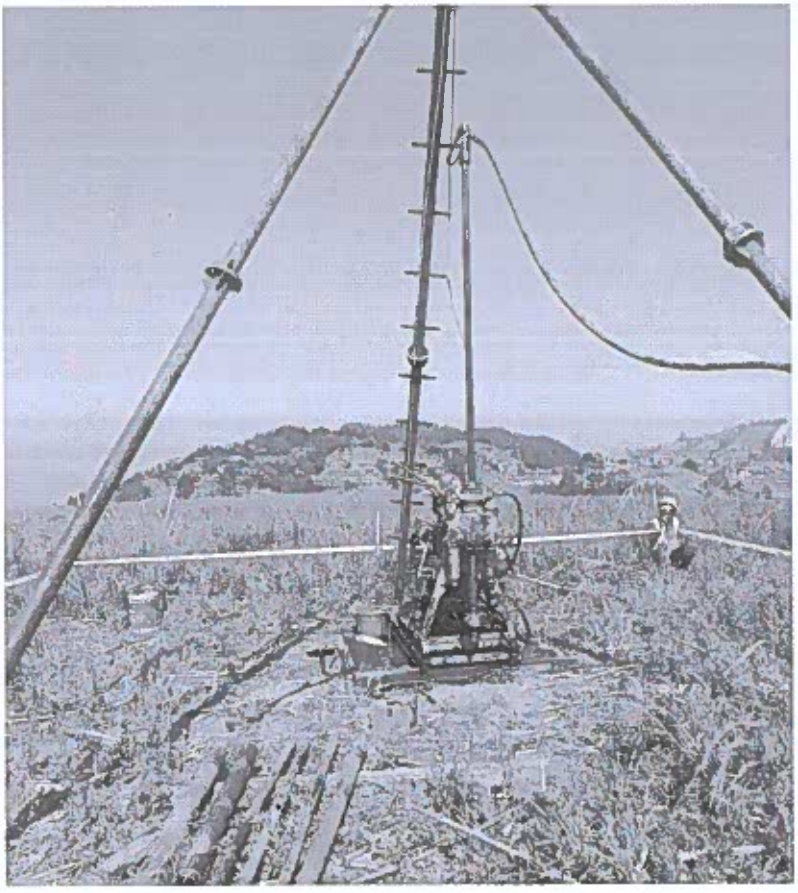

Photographs: Drill rig at B50

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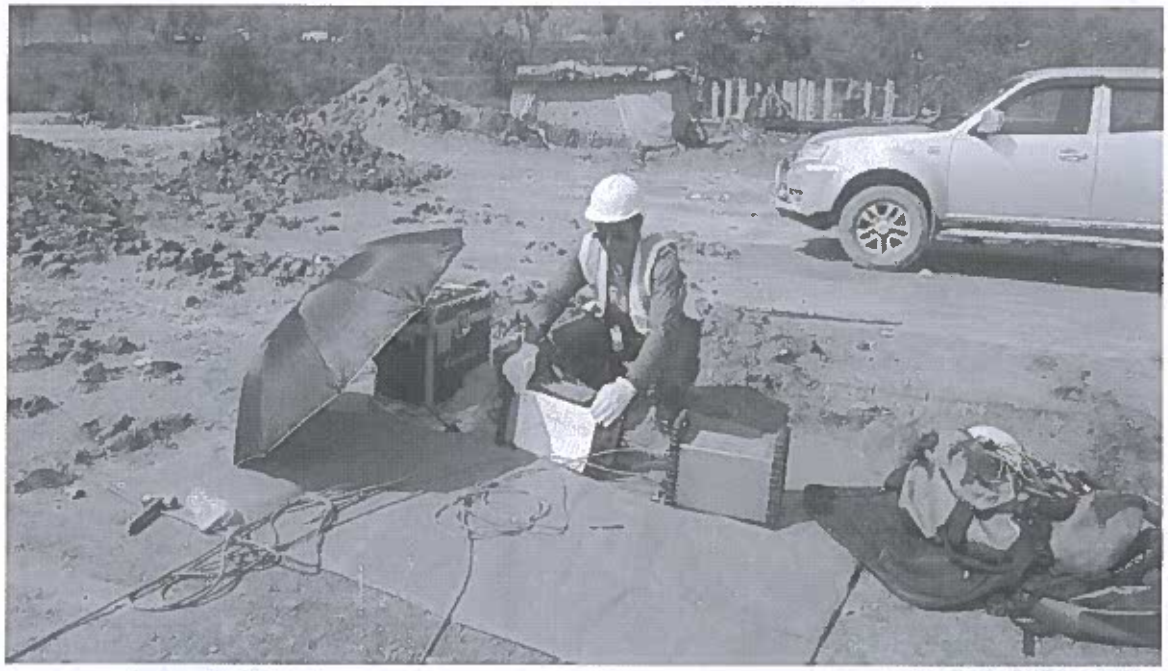
Photograph: Drilling progess work is running with greyish water return at B55



Photograph: Image showing the field setup of the ERT equipment at Ratemate area

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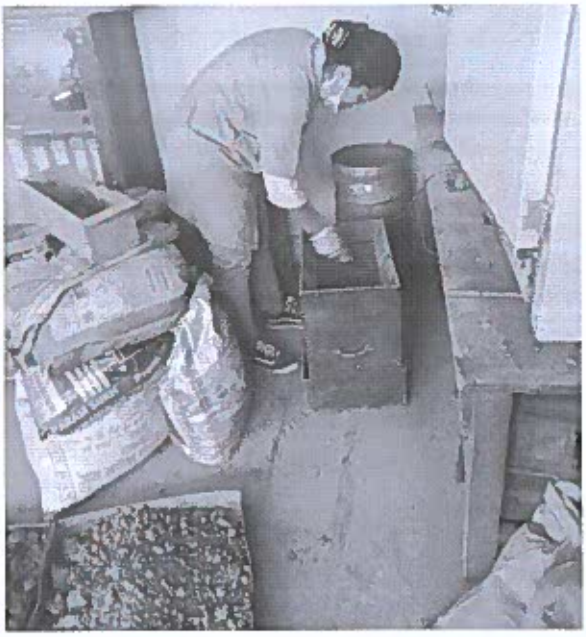
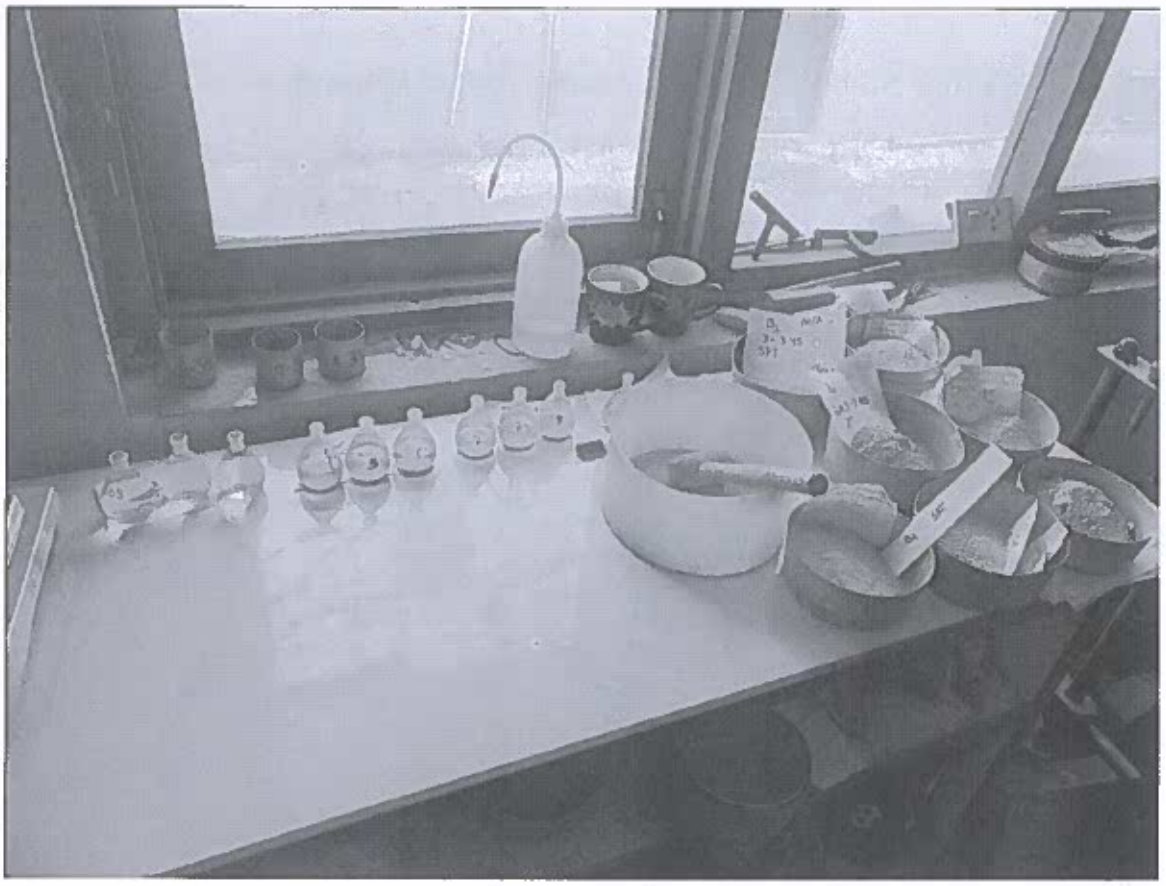
Photograph: Sample separation after Oven dry at ICGS Lab



Photograph: Sample separation for the laboratory test at ICGS lab



Photograph: Progressing Specific Gravity test at ICGS lab

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