

資料 5 討議議事錄(M/D)（基本設計概要說明時）

Minutes of Discussions
on the Basic Design Study
on the Project for the Construction of New Kawasoti Substation
in the Kingdom of Nepal
(Explanation on Draft Report)

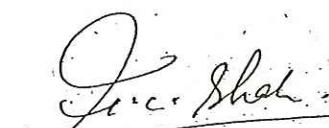
In November 2005, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for Construction of New Kawasoti Substation (hereinafter referred to as "the Project") to the Kingdom of Nepal (hereinafter referred to as "Nepal"), and through discussions, field survey and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult with the concerned officials of the Government of Nepal on the contents of the draft report, JICA sent to Nepal the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Yoshio Fukuda, Deputy Resident Representative, JICA Nepal Office, from March 25 to 29, 2006.

As a result of discussions, both sides confirmed the main items described in the attached sheets.

Kathmandu, March 28, 2006


Yoshio Fukuda
Leader
Draft Report Explanation Team
Japan International Cooperation Agency


Harish Chandra Shah
Managing Director
Nepal Electricity Authority

ATTACHMENT

1. Components of the Draft Report

The Nepalese side agreed and accepted in principle the contents of the draft report and draft detailed specification explained by the Team.

2. Japan's Grant Aid Scheme

The Nepalese side reconfirmed the Japan's Grant Aid scheme and the necessary measures to be taken by the Nepalese side as explained by the Basic Design Study Team and described in the Annex-4 and Annex-5 of the Minutes of Discussions signed by both sides on November 17, 2005.

3. Schedule of the Study

JICA will complete the Final Report in accordance with the confirmed items and send it to the Nepalese side by the end of May 2006.

4. Other Relevant Issues

4-1. The Team handed one copy of the draft detailed specifications of the scheduled substation equipment to Mr. Bishnu P. Upadhyay, Project Manager of Nepal Electricity Authority. Both sides agreed that these draft specifications were confidential and should not be duplicated or released to any outside parties.

4-2. Regarding the Environmental Impact Assessment (EIA) for the Project;

- (1) The Nepalese side explained that EIA for the Project was now on progress based on the tentative schedule attached as Annex-1.
- (2) Both sides confirmed that the Nepalese side has submitted the draft report to JICA Nepal Office on March 27, 2006.
- (3) The Nepalese side explained that there were no outstanding issues of environmental and social considerations during the EIA study.
- (4) Both sides confirmed that the Nepalese side should prepare the final draft report of EIA, and submit it to JICA Nepal Office by the end of April, 2006.

4-3. Both sides confirmed that the Nepalese side should secure the land necessary for the New Kawasoti Substation, including temporary yard if necessary, by the end of April, 2006, at its expenses.

4-4. The Nepalese side confirmed that the following undertakings should be taken by the Nepalese side at the Nepalese expenses.

- (1) Improvement and/or repairing of existing transmission and distribution lines, if necessary,
- (2) Clearance of the land necessary for New Kawasoti substation (including temporary yard, if necessary),
- (3) Obtaining the construction license for the Project by commencement of the Project,
- (4) Securing enough budget and personnel necessary for the operation and maintenance of the facilities implemented by the Project, including the periodical maintenance work after the completion of the Project, and
- (5) Installing of additional 33/11kV transformer in the system according to expansion of electric power demand.

4-5. The Nepalese side shall make proper arrangements for holding the Board Meeting of Nepal Electricity Authority (NEA) for smooth implementation of the Project.

KAWASOTI 132/33/11 KV SUBSTATION PROJECT
ENVIRONMENTAL IMPACT ASSESSMENT STUDY SCHEDULE

No.	Activities	Schedule in Months											
		2005			2006								
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.
1	Scoping and ToR Stage												
1.1	Literature Collection and Review												
1.2	Preparatory Work & Publication of Scoping Notice												
1.3	Field Visit for Scoping and ToR												
1.4	Collection of Muchulka and Concerns of VDC												
1.5	Preparation & Submission of Scoping and ToR Report												
1.6	Approval of Scoping Report & ToR												
2	EIA Stage												
2.1	Desk Study and Preparatory Work												
2.2	Field Investigation												
2.3	Data Encoding and Analysis												
2.4	Draft Report Preparation												
2.5	Preparation & Implementation of Public Hearing Program												
2.6	Collection of Recommendation of VDCs												
2.7	EIA Report Preparation and Submission												
2.8	Report Approval												

主管部長	文書管理課長	主管課長	情報管理課長	図書資料室受付印

収集資料リスト

平成17年12月8日 作成

地域	アジア	調査団	新カワソティ変電所建設計画 等名称	調査の種類	基本設計調査	作成部課	
国名	ネパール	等名称		現地調査期間	2005年11月9日～2005年12月6日	担当者氏名	

番号	資料の名称	形態	版型	ページ	オリジナルコピーの別	部数	収集先名称又は発行機関	寄贈・購入(価格)の	取扱区分	利用表示	利用者所属氏名	納入予定日	納入確認欄
1	10th 5-year Development Plan	ホッチキス留め	A4	11	コピー	1	Nepal Electricity Authority	寄贈					
2	Electricity Regulation (1993)	ホッチキス留め	A4	28	コピー	1	Nepal Electricity Authority	寄贈					
3	11kV Single Line Diagram	模写	A4	1	コピー	1	Kawasoti Branch Office	寄贈					
4	Nepal Electricity Authority Annual Report Fiscal Year 2004/05	製本	A4	1	オリジナル	1	Nepal Electricity Authority	寄贈					
5	Labor Act	ホッチキス留め	A4	38	コピー	1	Regmi Research (P) Ltd.	購入					
6	Labor Rules	ホッチキス留め	A4	30	コピー	1	Regmi Research (P) Ltd.	購入					
7	Wage and Bonus	ホッチキス留め	A4	26	コピー	1	Regmi Research (P) Ltd.	購入					
8	List of Public Holiday	-	A4	2	コピー	1	Regmi Research (P) Ltd.	購入					
9	Record of Temperature and Humidity at Rampur (2000-2004)	電子データ	-	-	コピー	1	Department of Hydrology & Meteorology	購入					
10	Record of Rainfall at Rampur (2000-2004)	電子データ	-	-	コピー	1	Department of Hydrology & Meteorology	購入					
11	Record of Wind Speed at Rampur (1991-1998)	電子データ	-	-	コピー	1	Department of Hydrology & Meteorology	購入					

事業事前計画表（基本設計時）

1. 協力対象事業名
ネパール王国 新カワソティ変電所建設計画
2. 要請の背景(協力の必要性・位置付け)
<p>ネパール王国(以下「ネ」国)政府は政治・経済面において地方の発展を促進することで、都市部と地方間の経済格差および地方での貧困を削減することを最重要目標の一つとしている。本プロジェクトの対象地域であるカワソティは、首都カトマンズから 120 km ほど西南西に位置する。カワソティ地区が位置するテライは、肥沃で広大な平野であり収穫可能な農産物が豊富である。近年、特にカワソティ地区は通商相手国となるインドに近いといった地の利をうけ、民間企業が集中し経済発展が進行中である。一方、電力供給設備の整備が急増する需要に追いついておらず、カワソティ地区の順当な経済発展を妨げている。</p> <p>既設 33kV 送電線はネパールの規定である 5% をはるかに超える過大な電圧降下を引き起こし、また既設変電所変圧器の容量も、近い将来に不足することが予想される。</p> <p>このような状況から、2004年6月、ネパール国政府はわが国に対して無償資金協力による当該地区での変電所の建設を要請した。本プロジェクトは、カワソティ地区に 132/33/11 kV、30 MVA 新カワソティ変電所を建設することにより、既設カワソティ変電所の変圧器容量を補填し、現在 33/11 kV 既設カワソティ変電所から供給されている需要地域の分割を行い、更に、信頼度の高い 132 kV 基幹送電線を 33 kV 副送電線と連系させることにより、当該地区の大幅な電圧降下の改善(電気の質の改善)、停電の減少(供給信頼度の改善)、電力供給能力の向上、また送電損失の低減を目的とする。</p>
3. プロジェクト全体計画概要
<p>(1) プロジェクト全体計画の目標(裨益対象の範囲および規模)</p> <p>① カワソティを中心とした地方部において安定した電力が供給される。</p> <p>裨益対象:カワソティが所属するナフルパラン郡東部の住民 裨益人口:約 19 万人</p> <p>(2) プロジェクト全体計画の成果</p> <p>① カワソティ地区の電力供給設備容量が増加する。 ② カワソティ地区需要家における過大な電圧降下が回避される。 ③ カワソティ地区における送電損失の軽減により、運営・維持管理コストが低減される。</p> <p>(3) プロジェクト全体計画の主要活動</p> <p>① <u>30 MVA, 132/33 kV 主変圧器 1 台, 8MVA, 33/11 kV 変圧器 1 台</u>、ならびに必要な変電機器を備えた新カワソティ変電所を建設する。 ② 上記設備の運営・維持管理を実施する。</p> <p>(4) 投入(インプット)</p> <p>ア. 日本側(=本案件):無償資金協力 8.46 億円 イ. 相手国側:</p> <ol style="list-style-type: none"> 1) 用地確保 2) 変電所付属設備(壆・運転員宿舎および電話接続等) 3) 11 kV 配電線拡張のための資器材 4) 設備の運営・維持管理に必要な人員及び経費の確保 <p>(5) 実施体制</p> <p>実施機関:ネパール電力公社 (NEA: Nepal Electricity Authority) 主管官庁:水資源省</p>

4. 無償資金協力案件の内容

- (1) サイト
「ネ」国・ナフルパラシ郡・カワソティ地区
- (2) 概要
カワソティ地区における変電施設の建設
- (3) 相手国側負担事項
 - ① 建設用地の確保
 - ② 変電所付属設備
- (4) 概算事業費
概算総事業費 9.22 億円(無償資金協力 8.46 億円、ネパール国側負担 0.76 億円)
- (5) 工期
詳細設計・入札期間を含め約 19 ヶ月を予定
- (6) 貧困、ジェンダー、環境及び社会面の配慮
特になし。

5. 外部要因リスク(プロジェクト全体計画の目標の達成に関するもの)

対象サイトの治安状況が悪化しない。

6. 過去の類似案件からの教訓の活用

特になし。

7. プロジェクト全体計画の事後評価に係る提案

- (1) プロジェクト全体計画の事後評価に係る成果指標

① 電力供給能力の増加 (MVA)

	現状 (2006 年)	プロジェクト実施後 (2008 年)
設備容量	8 MVA	38 MVA

② 送電損失の低減 (バルデガット変電所～バラトプール変電所～カワソティ変電所までの理論値)

	現状 (2006 年)	プロジェクト実施後 (2008 年)
送電損失	297 MWh	7 MWh

③ 停電時間の低減 (バルデガット変電所～バラトプール変電所～カワソティ変電所までの送電線事故を原因とする停電時間)

事故停電時間は 2006 年で 25 時間／年であるが、プロジェクト実施後(2008 年)には短縮される。

- (2) その他の成果指標

特になし。

- (3) 評価のタイミング

2009 年以降 (プロジェクト終了後)

資料 8 地質調査結果（現地再委託による）

Legend

Road



High way



132 kv TL Tower



33kv Pole



132 kv Transmission Line



33kv Transmission Line



House



Tree



Major Contour



Minor Contour



Driplling Points

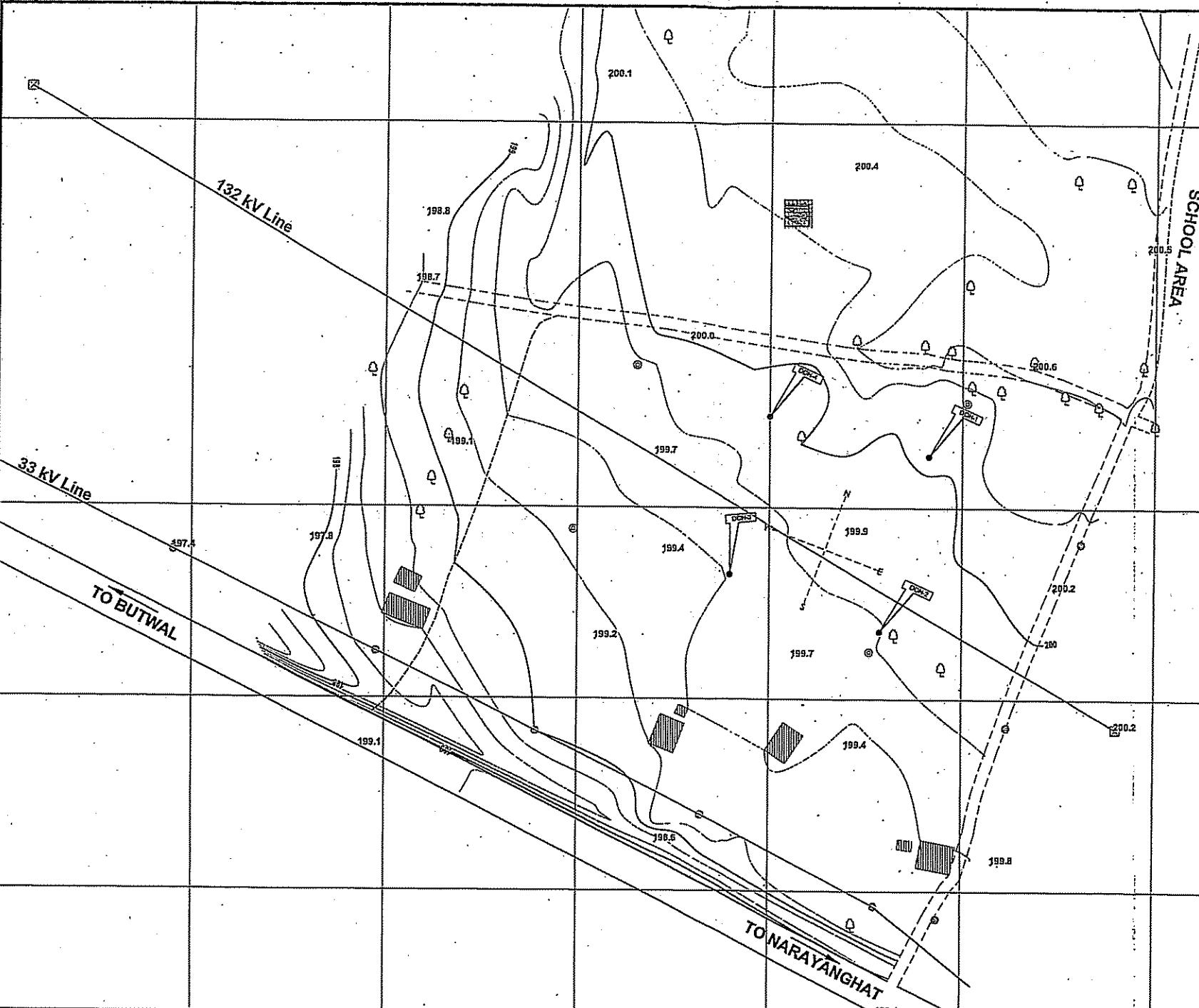


Earth Resistivity Profile



Note:

The survey was carried out from Arbitracy Bench Mark and contour interval is 25cm

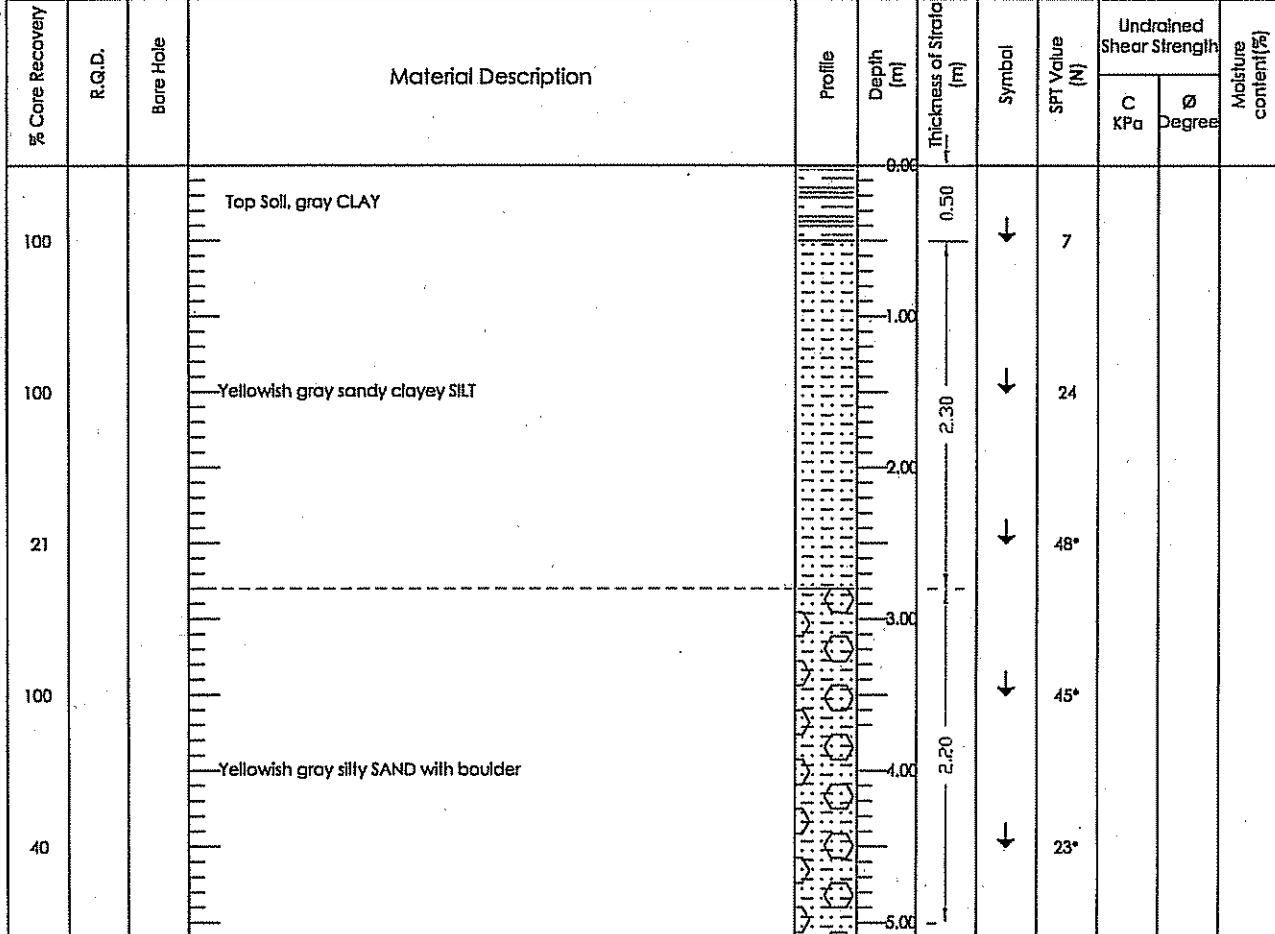


DRILLING RECORD
New Kawasoti Sub station Project

Pragati Nagar, Nawal Parasi, Nepal

Drill and Casing Type	Size	Metres
Steel Casting(Hw)	110mm	5.00
Steel Casing (Nx)	89mm	0.00
...
...

Project : New Kawasoti Sub Station Project		
Site :	Pragati Nagar	
Hole No. :	DDH-1	Elevation :200.05
Depth to Water Table :	12.70m	Started Date : December 29,2005
Diller :	Srendra Raj Baracharya	Logged by : Ravi Aryal



LEGEND

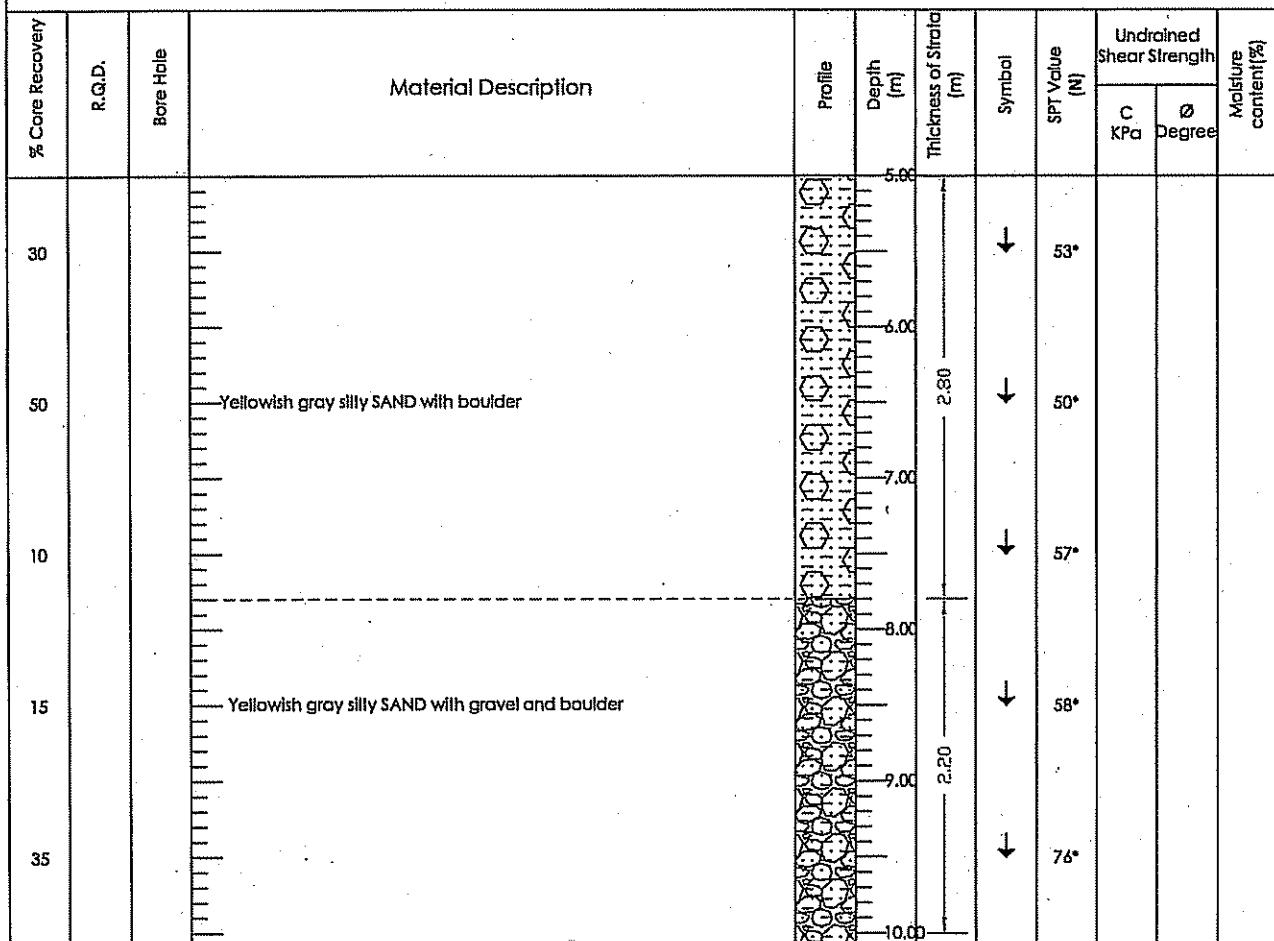
- Approximate Material Boarder
- R. Q. D. Rock mass Quality Designation
- Disturbed Soil Sample
- Core Sample
- Core Sample Lost
- DCPT Carried out
- ↓ Standard Penetration Test
- ▼ Water Table
- N No of Blows / 30cm Penetration
- Bulk Sample

 Contractor Hydro Engineering & Development Co. (P) Ltd. <small>ENGINEERING PROJECT MANAGEMENT, CONSTRUCTION & DEVELOPMENT</small> <small>P.O. Box : 7025</small> <small>Nepalgunj, Nawalparasi, Kathmandu.</small>	Employer Nippon Koei Co., Ltd <small>Consulting Engineers</small> <small>Tokyo, Japan.</small>	Title CORE LOGGING New Kawasoti Sub Station Project <small>Pragati Nagar, Nawalparasi, Nepal.</small>	SHEET NO : DDH-1 <small>1/4</small>
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DRILLING RECORD
New Kawasoti Sub station Project
 Pragati Nagar, Nawal Parasi, Nepal

Drill and Casing Type	Size	Meters
Steel Casing (Hw)	110mm	1.00
Steel Casing(Nx)	89mm	4.00
.....
.....

Project : New Kawasoti Sub Station Project	
Site : Pragati Nagar	Elevation : 200.05
Hole No. : DDH-1	Started Date : December 29,2005
Depth to Water Table : 12.70m	Logged by : Ravi Aryal
Driller : Sumitra Raj Bajracharya	



LEGEND

- Approximate Material Boarder
- R. Q. D. Rock mass Quality Designation
- Disturbed Soil Sample
- Core Sample
- Core Sample Lost
- DCPT Carried out
- ↓ Standard Penetration Test
- ↖ Water Table
- N No of Blows / 30cm Penetration
- ◆ Bulk Sample

DRILLING RECORD
New Kawasoti Sub station Project

Pragati Nagar, Nawal Parasi, Nepal

Drill and Casing Type	Size	Metres
Steel Casing (Hw)	110mm	0.00
Steel Casing (Nx)	89mm	5.00
...
...

Project : New Kawasoti Sub Station Project

Site : Pragati Nagar

Hole No. : DDH-1

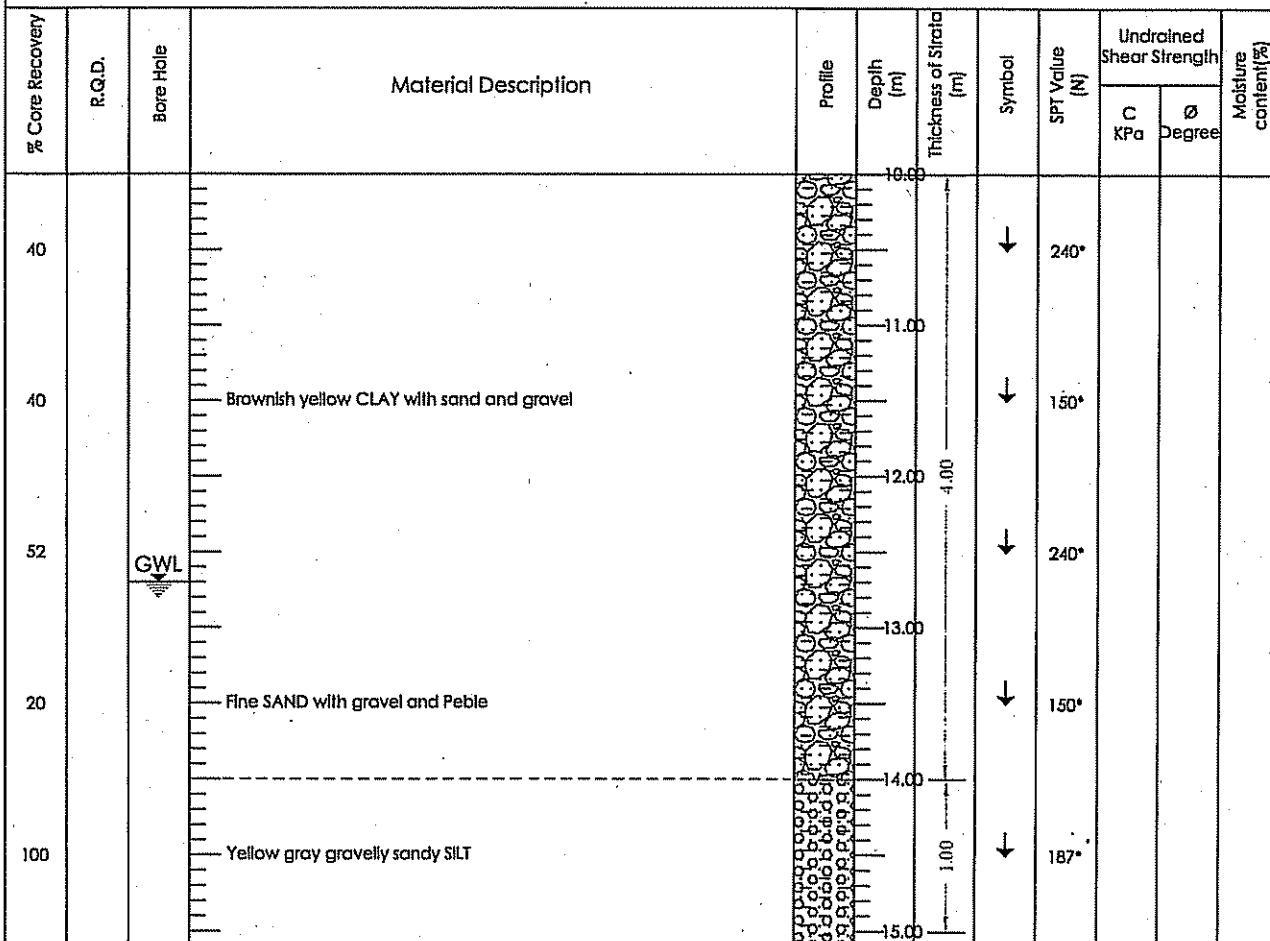
Elevation : 200.05

Depth to Water Table : 12.7m

Started Date : December 29, 2005

Driller : Surendra Raj Bajracharya

Logged by : Ravi Aryal



LEGEND

----- Approximate Material Boundary

R. Q. D. Rock mass Quality Designation

● Disturbed Soil Sample

■ Core Sample

□ Core Sample Lost

• DCPT Carried out

↓ Standard Penetration Test

▽ Water Table

N No of Blows / 30cm Penetration

● Bulk Sample



Contractor:
Hydro Engineering & Development Co. (P) Ltd.
ENGINEERING PROJECT MANAGEMENT/CONSTRUCTION & DEVELOPMENT
 P. O. Box: 71025
 Negrakot, Itahari, Kathmandu.

Employer
Nippon Kei Co., Ltd
Consulting Engineers
 Tokyo, Japan.

Title
CORE LOGGING
New Kawasoti Sub Station Project
Pragati Nagar, Nawal Parasi
 Nepal.

SHEET NO : DDH-1
3/4

DRILLING RECORD
New Kawasoti Sub station Project
 Pragati Nagar, Nawal Parasi, Nepal

Drill and Casing Type	Size	Metres
Steel Casing (Hw)	110mm	0.00...
Steel Casing (Nx)	89mm	5.00
...
...

Project : New Kawasoti Sub Station Project

Site : Pragati Nagar

Hole No. : DDH-I

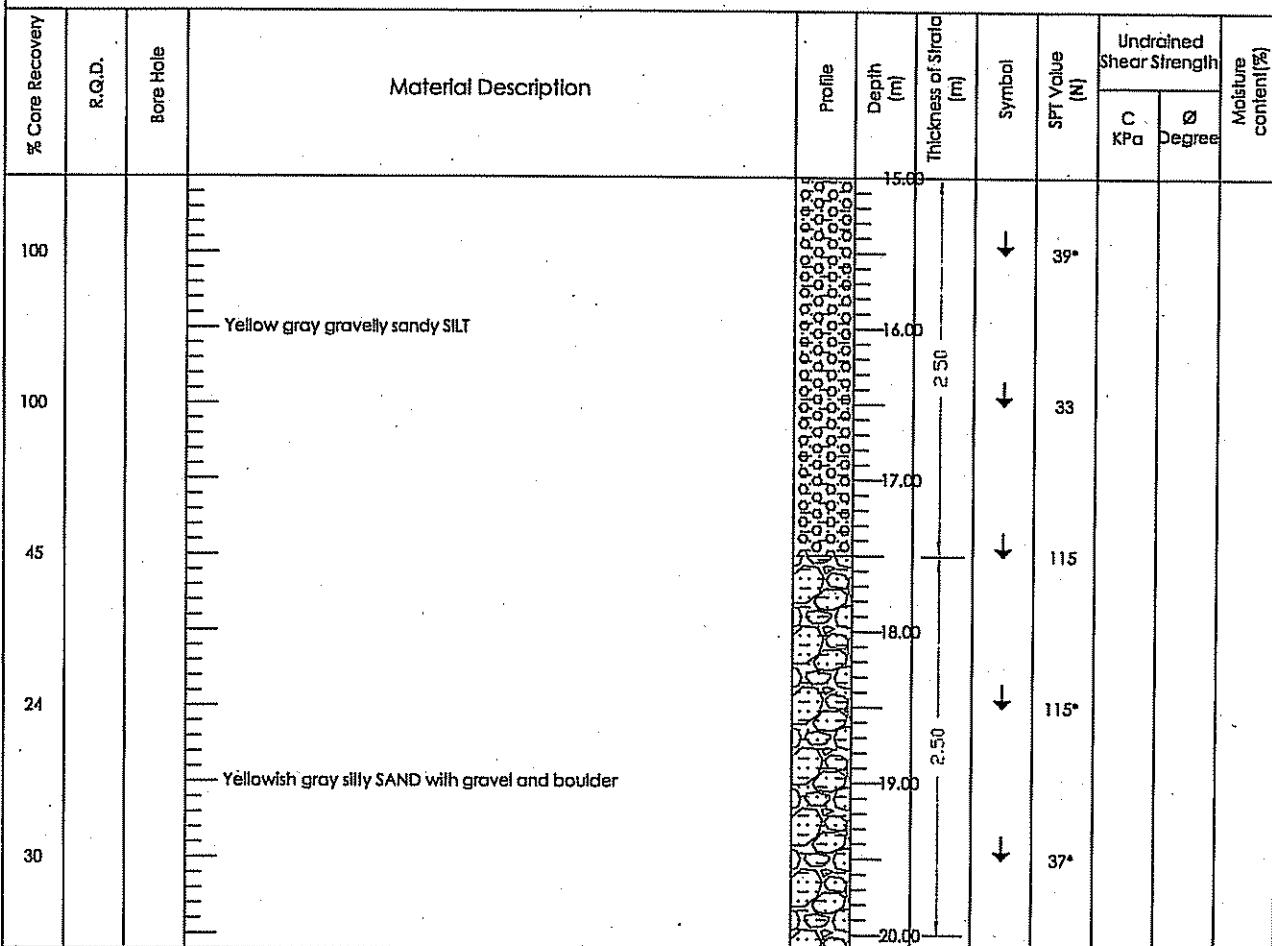
Elevation : 200.05

Depth to Water Table : 12.70m

Started Date : December 29, 2005

Driller : Surendra Raj Bajracharya

Logged by : Ravi Aryal



LEGEND

Approximate Material Boundary

R. Q. D. Rock mass Quality Designation

- Disturbed Soil Sample

- Core Sample

- Core Sample Lost

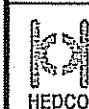
- DCPT Carried out

- ↓ Standard Penetration Test

- ▽ Water Table

- N No of Blows / 30cm Penetration

- Bulk Sample



Contractor
Hydro Engineering & Development Co. (P) Ltd .
ENGINEERING PROJECT MANAGEMENT CONSTRUCTION & DEVELOPMENT
 P. O. Box : 7025
 Nagarkot, Nawal Kothmandu

Employer
Nippon Kei Co., Ltd
Consulting Engineers
 Tokyo, Japan.

Title
CORE LOGGING
 New Kawasoti Sub Station Project
 Pragati Nagar, Nawal Parasi
 Nepal.

SHEET NO : DDH-1
 4/4

DRILLING RECORD
New Kawasoti Sub station Project

Pragati Nagar, Nawal Parasi, Nepal

Drill and Casing Type	Size	Metres
Steel Casing(Hw)	110mm	5.00
Steel Casing (Nx)	89mm...	0.00
...
...

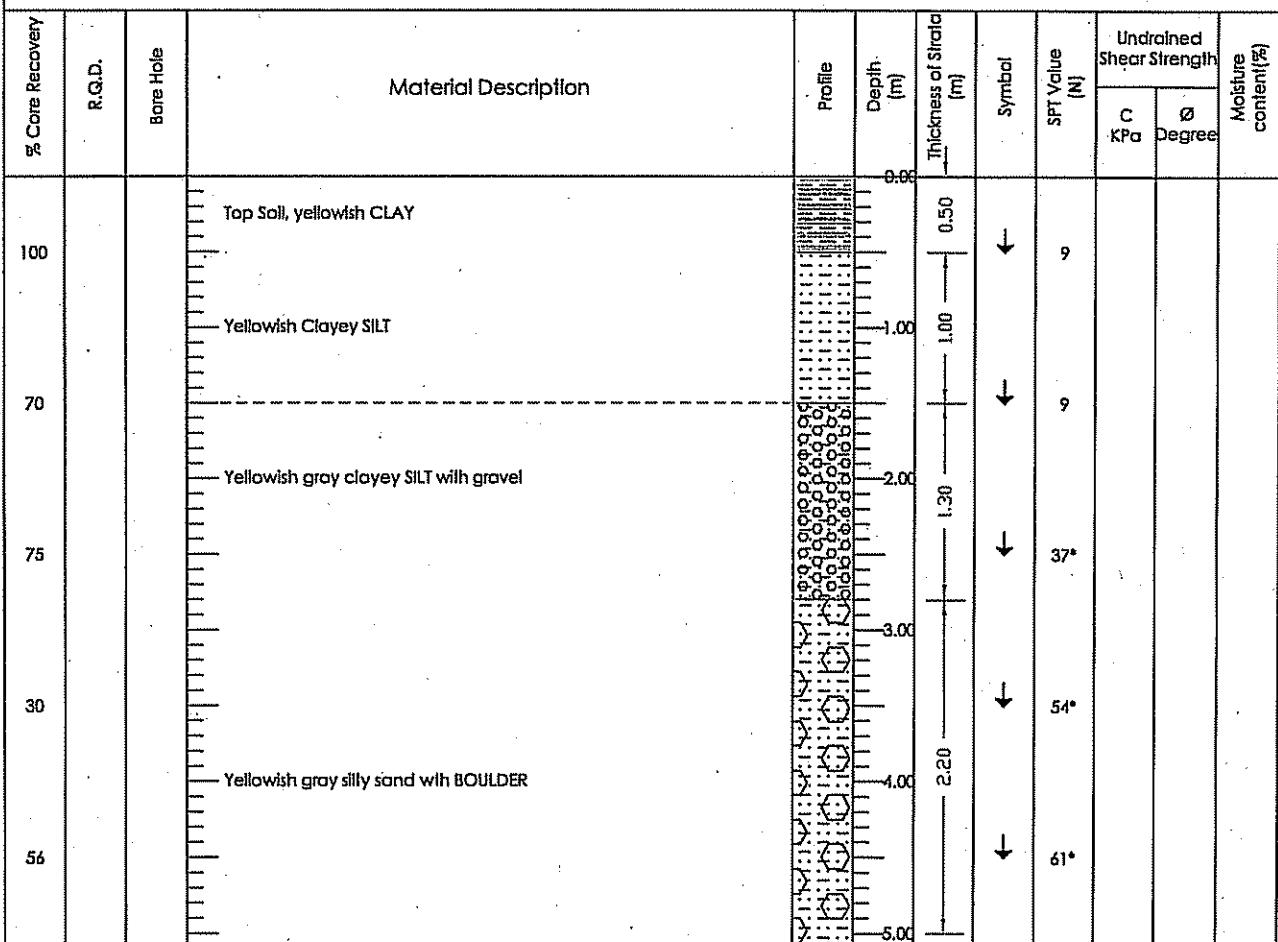
Project : New Kawasoti Sub Station Project

Site : Pragati Nagar

Hole No. : DDH-2 Elevation : 199.75

Depth to Water Table : 12.50m Started Date : January 9,2006

Driller : Surendra Raj Bajracharya Logged by :Ravi Aryal



LEGEND

Approximate Material Boarder

R. Q. D. Rock mass Quality Designation

- Disturbed Soil Sample
- Core Sample
- Core Sample Lost

- * DCPT Carried out
- ↓ Standard Penetration Test
- ↖ Water Table
- N No of Blows / 30cm Penetration
- Bulk Sample



Contractor
Hydro Engineering & Development Co. (P) Ltd .
 HYDRO ENGINEERING & DEVELOPMENT
 P. O. Box 1705
 Kathmandu, Nepal, Kathmandu.

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Nippon Koei Co., Ltd
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 Tokyo, Japan

Title
CORE LOGGING
 New Kawasoti Sub Station Project
 Pragati Nagar, Nawal Parasi
 Nepal

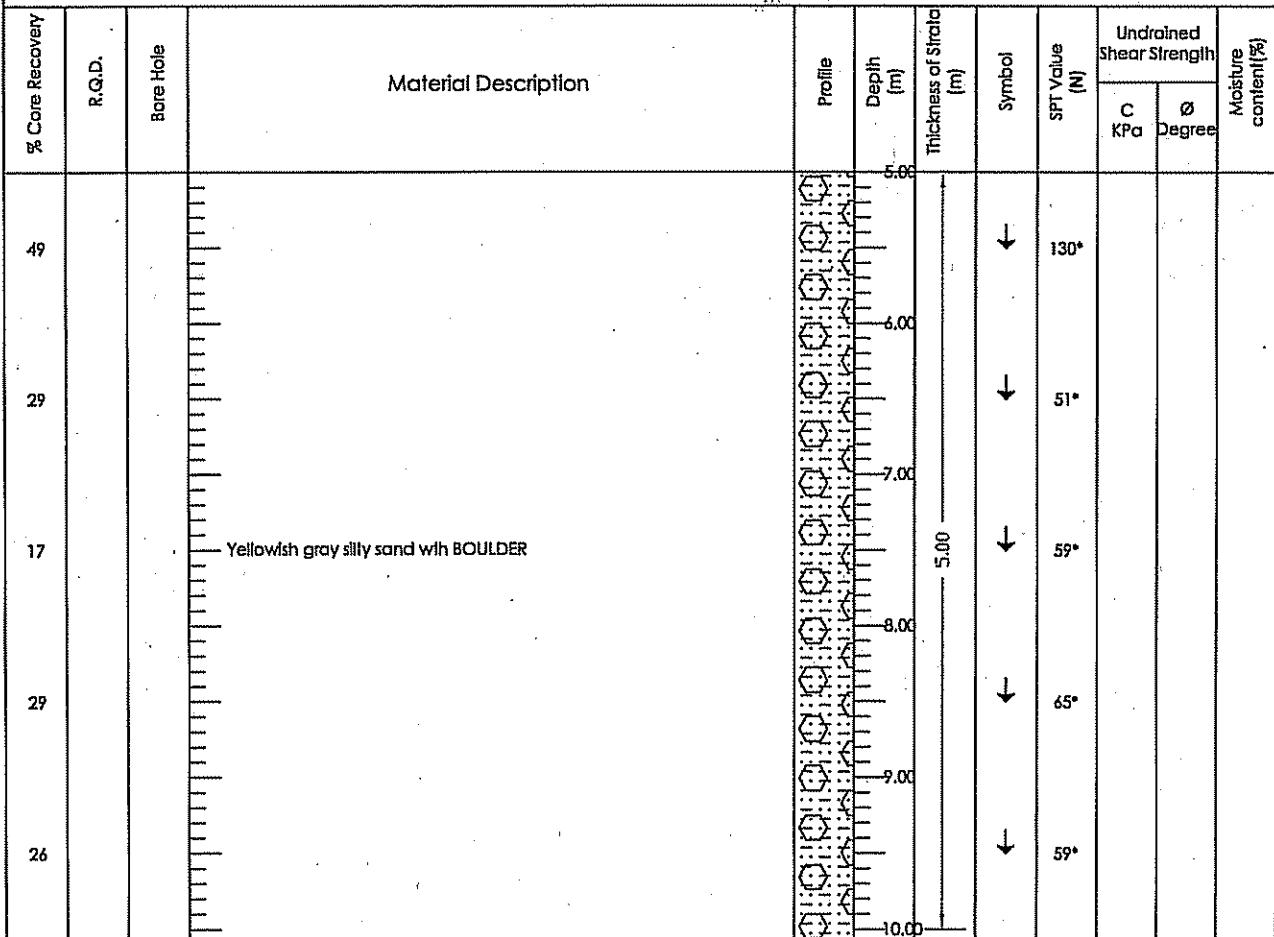
SHEET NO : DDH-2
 1/4

DRILLING RECORD
New Kawasoti Sub station Project

Pragati Nagar, Nawal Parasi, Nepal

Drill and Casing Type	Size	Metres
Steel Casing(Hw)	110mm	0.00
Steel Casing (Nx)	89mm...	5.00
...
...

Project : New Kawasoti Sub Station Project		
Site : Pragati Nagar		
Hole No. : DDH-2	Elevation : 199.75	
Depth to Water Table : 12.50m	Started Date : January 9, 2006	
Driller : Surendra Raj Bajracharya	Logged by : Ravi Aryal	



LEGEND

Approximate Material Boarder

R. Q. D. Rock mass Quality Designation

- Disturbed Soil Sample
- Core Sample
- Core Sample Lost

- DCPT Carried out
- ↓ Standard Penetration Test
- Water Table
- N No of Blows / 30cm Penetration
- Bulk Sample

 Hydro Engineering & Development Co. (P) Ltd . <small>(Engineering, Construction, Consulting & Development)</small> P. O. Box : 7025 Nagarkot, Nepal, Kathmandu	Employer Nippon Koei Co., Ltd <small>Consulting Engineers</small> Tokyo, Japan	Title CORE LOGGING New Kawasoti Sub Station Project Pragati Nagar, Nawal Parasi Nepal	SHEET NO : DDH-2 2/4
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DRILLING RECORD

New Kawasoti Sub station Project

Pragati Nagar, Nawal Parasi, Nepal

Drill and Casing Type	Size	Metres
Steel Casing(Hw)	110mm	0.00
Steel Casing (Nx)	89mm	5.00
...
...

Project : New Kawasoti Sub Station Project

Site : Pragati Nagar

Elevation : 199.75

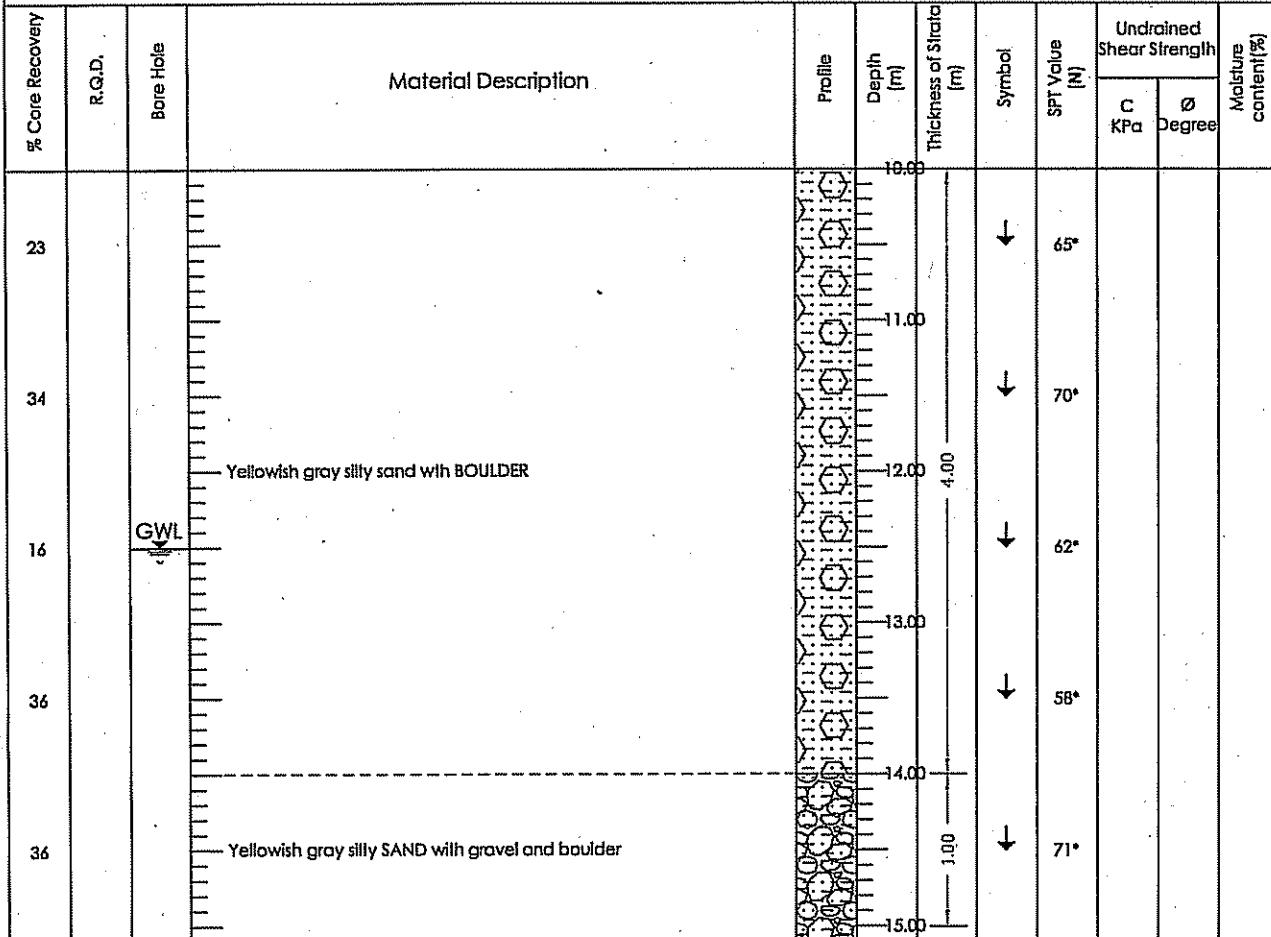
Hole No. : DDH-2

Started Date : January 9, 2006

Depth to Water Table : 12.50m

Driller : Surendra Raj Bajracharya

Logged by :



LEGEND

- Approximate Material Boundary
- R. Q. D. Rock mass Quality Designation
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- Core Sample Lost
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- Water Table
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Employer
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 Tokyo, Japan

Title
CORE LOGGING
 New Kawasoti Sub Station Project
 Pragati Nagar, Nawalparasi
 Nepal

SHEET NO : DDH-2
 3/4

DRILLING RECORD
New Kawasoti Sub station Project

Pragati Nagar, Nawal Parasi, Nepal

Drill and Casing Type	Size	Metres
Steel Casing(Hw)	110mm	0.00
Steel Casing (Nx)	89mm	5.00
...
...

Project : New Kawasoti Sub Station Project

Site : Pragati Nagar

Hole No. : DDH-2

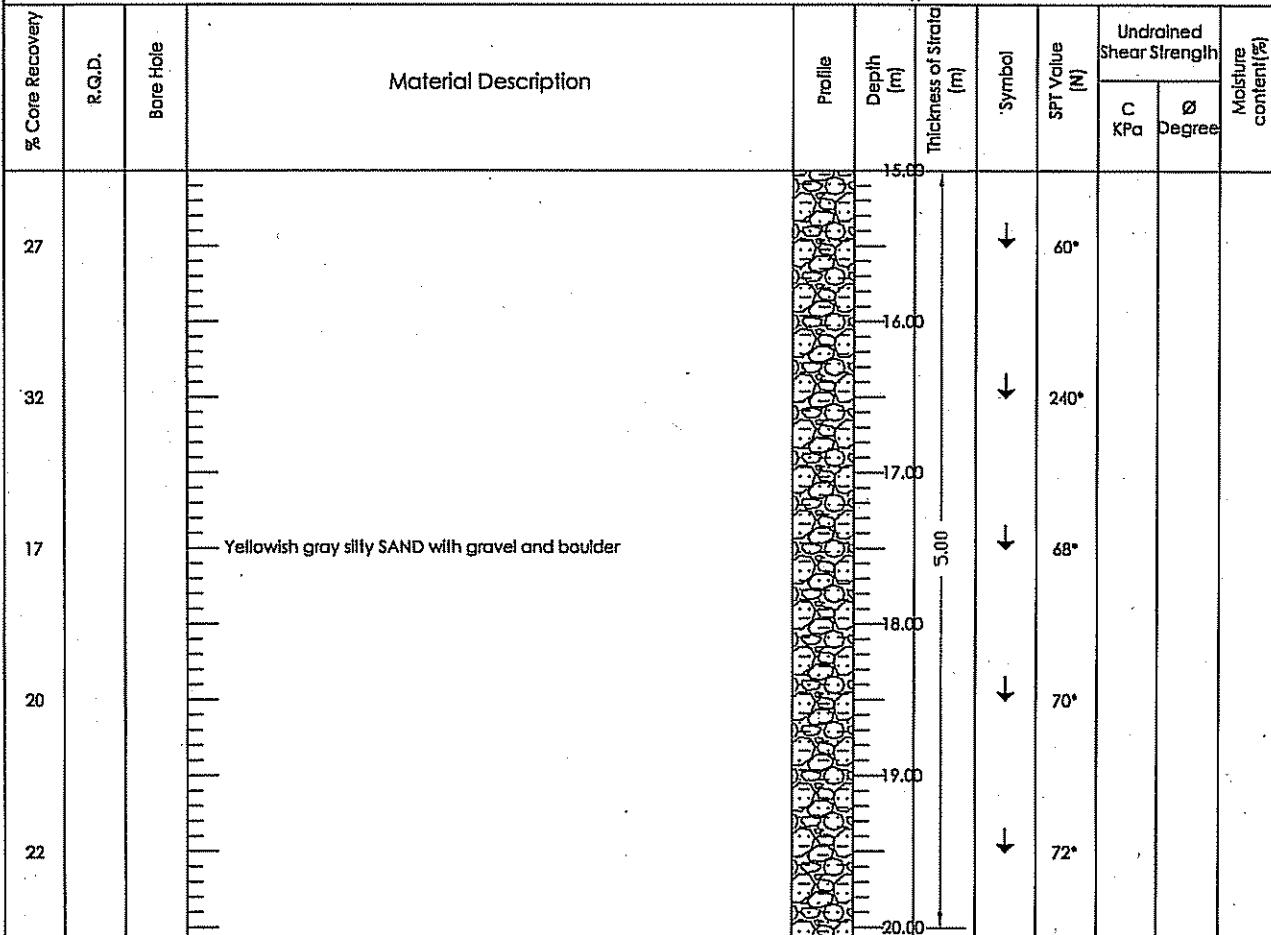
Depth to Water Table : 12.50m

Elevation : 199.75

Started Date : January 9, 2006

Driller : Surendra Raj Bajracharya

Logged by : Ravi Aryal



LEGEND

----- Approximate Material Boarder

R. Q. D. Rock mass Quality Designation

● Disturbed Soil Sample

■ Core Sample

□ Core Sample Lost

● DCPT Carried out

↓ Standard Penetration Test

~~~~ Water Table

N No of Blows / 30cm Penetration

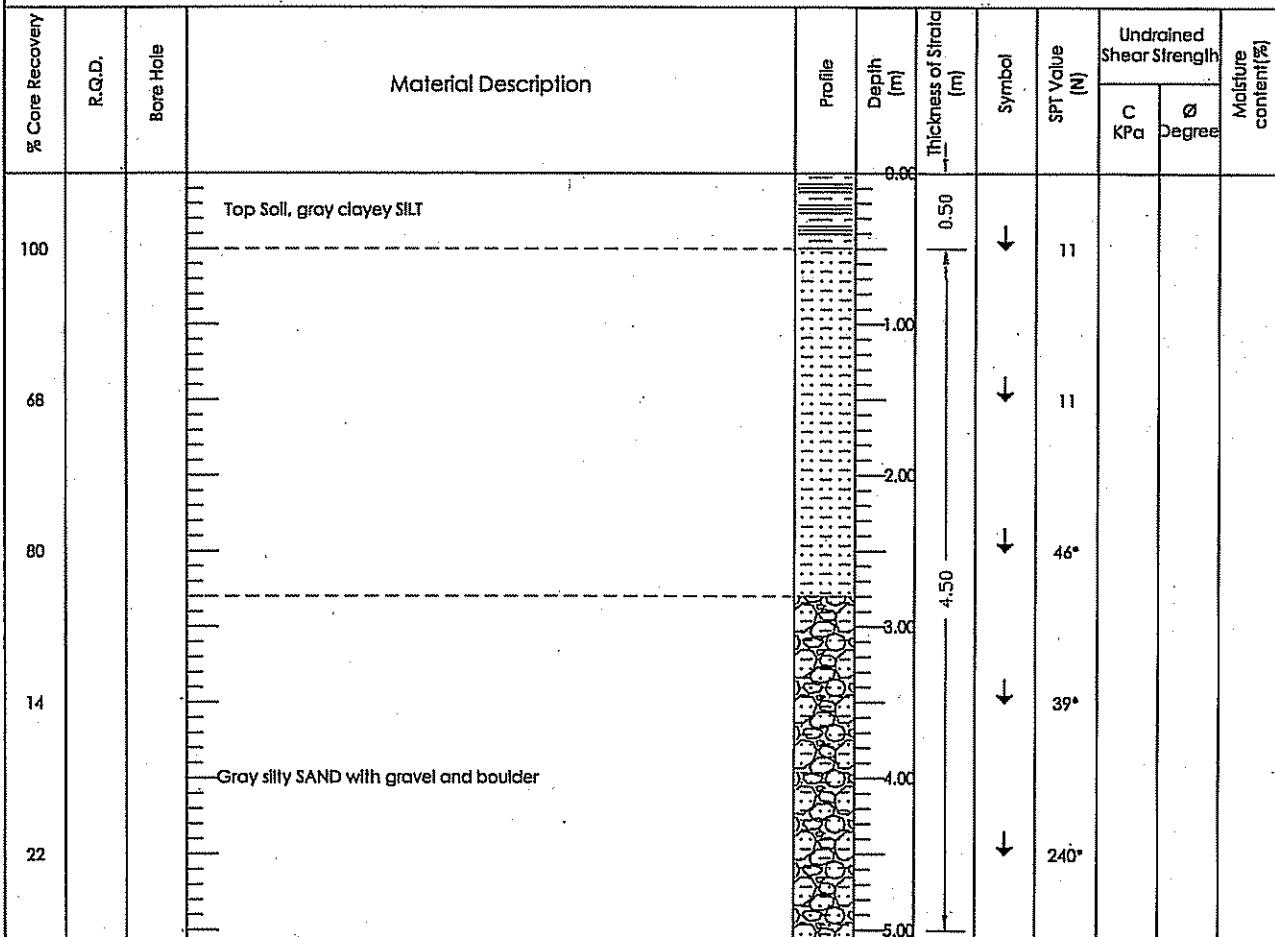
● Bulk Sample

|                                                                                                                                                                                                                                                                                                                                       |                                                                                                                      |                                                                                                                                        |                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| <br><b>Contractor</b><br><b>Hydro Engineering &amp; Development Co. (P) Ltd.</b><br><small>(Engineering, Water Treatment, Construction &amp; Development)</small><br><small>P. O. Box: 7025</small><br><small>Nepalrait, Nasal, Kathmandu.</small> | <b>Employer</b><br><b>Nippon Koei Co., Ltd</b><br><small>Consulting Engineers</small><br><small>Tokyo, Japan</small> | <b>Title</b><br><b>CORE LOGGING</b><br><b>New Kawasoti Sub Station Project</b><br><small>Pragati Nagar, Nawal Parasi<br/>Kepal</small> | <b>SHEET NO : DDH-2</b><br><small>4/4</small> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|

**DRILLING RECORD**  
**New Kawasoti Sub station Project**  
 Pragati Nagar, Nawal Parasi, Nepal

| Drill and Casing Type | Size  | Metres |
|-----------------------|-------|--------|
| Steel Casing(Hw)      | 110mm | 5.00   |
| Steel Casing (Nx)     | 89mm  | 0.00   |
| ...                   | ...   | ...    |
| ...                   | ...   | ...    |

|                                            |                                |
|--------------------------------------------|--------------------------------|
| Project : New Kawasoti Sub Station Project |                                |
| Site : Pragali Nagar                       | Elevation : 199.45             |
| Hole No. : DDH-3                           | Started Date : January 17,2006 |
| Depth to Water Table : 17.50m              | Logged by : Ravi Aryal         |
| Driller : Surendra Raj Bajracharya         |                                |



LEGEND

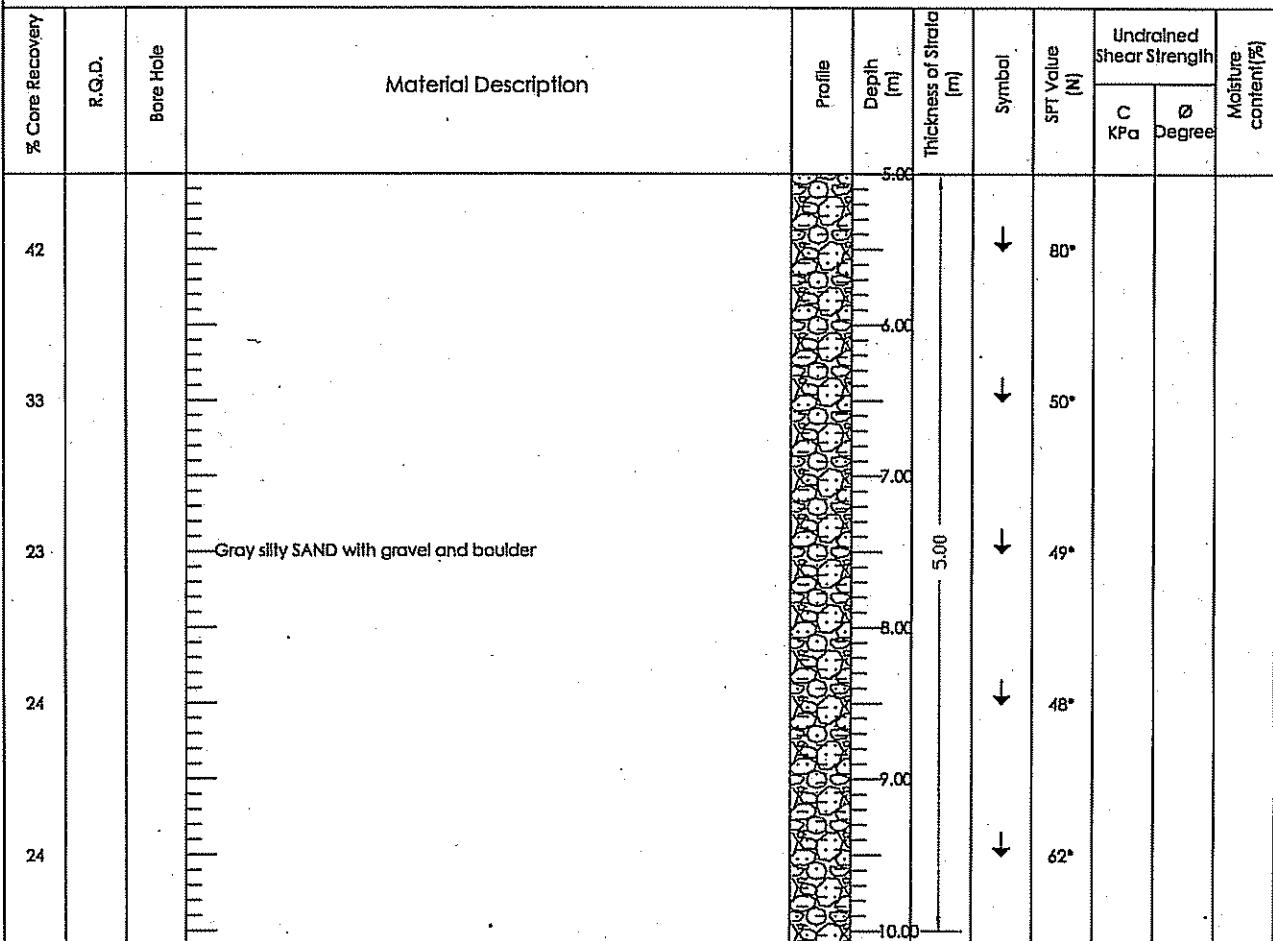
- — — Approximate Material Boarder
- R. Q. D. Rock mass Quality Designation
- Disturbed Soil Sample
- Core Sample
- Core Sample Lost
- \* DCPT Carried out
- ↓ Standard Penetration Test
- ↖ Water Table
- N No of Blows / 30cm Penetration
- Bulk Sample

| Contractor                                                                                                                                                                                                                                                    | Employer                                                                           | Title                                                                                           | SHEET NO : DDH-3 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------|
| <br><b>Hydro Engineering &amp; Development Co. (P) Ltd .</b><br><small>ENGINEERING PROJECT MANAGEMENT CONSULTANTS &amp; DEVELOPMENT<br/>P. O. Box : 7025<br/>Nepal</small> | <b>Nippon Kei Co., Ltd</b><br><small>Consulting Engineers<br/>Tokyo, Japan</small> | <b>CORE LOGGING</b><br>New Kawasoti Sub Station Project<br>Pragati Nagar, Nawal Parasi<br>Nepal | 1/4              |

**DRILLING RECORD**  
**New Kawasoti Sub station Project**  
 Pragati Nagar, Nawal Parasi, Nepal

| Drill and Casing Type | Size  | Meters |
|-----------------------|-------|--------|
| Steel Casing(Hw)      | 110mm | 0.00   |
| Steel Casing (Nx)     | 49mm  | 5.00   |
| ...                   | ...   | ...    |
| ...                   | ...   | ...    |

|                                             |                                |
|---------------------------------------------|--------------------------------|
| Project : New Kawasoti Sub Station Project' |                                |
| Site : Pragati Nagar                        |                                |
| Hole No. : DDH-3                            | Elevation : 199.45             |
| Depth to Water Table : 17.50m               | Started Date : January 17,2006 |
| Driller : Surendra Raj Bajracharya          | Logged by : Ravi Aryal         |



LEGEND

Approximate Material Boarder

R. Q. D. Rock mass Quality Designation

- Disturbed Soil Sample
- Core Sample
- Core Sample Lost

♦ DCPT Carried out

↓ Standard Penetration Test

▽ Water Table

N No of Blows / 30cm Penetration

● Bulk Sample



Contractor  
**Hydro Engineering & Development Co. (P) Ltd .**  
CONTRACTOR FOR EARTHWORKS, CONCRETE CONSTRUCTION & DEVELOPMENT  
 P. O. Box : 7623  
 Kathmandu, Nepal, Kathmandu

Employer  
**Nippon Kei Co., Ltd**  
Consulting Engineers  
 Tokyo, Japan.

Tilt  
**CORE LOGGING**  
 New Kawasoti Sub Station Project  
 Pragati Nagar, Nawal Parasi  
 Nepal

**SHEET NO :DDH-3**  
 2/4

**DRILLING RECORD**  
**New Kawasoti Sub station Project**

Pragati Nagar, Nawal Parasi, Nepal

| Drill and Casing Type | Size  | Metres |
|-----------------------|-------|--------|
| Steel Casing (Hw)     | 110mm | 0.00   |
| Steel Casing (Nx)     | 89mm  | 5.00   |
| ...                   | ...   | ...    |
| ...                   | ...   | ...    |

Project : New Kawasoti Sub Station Project

Site : Pragati Nagar

Hole No. : DDH-3

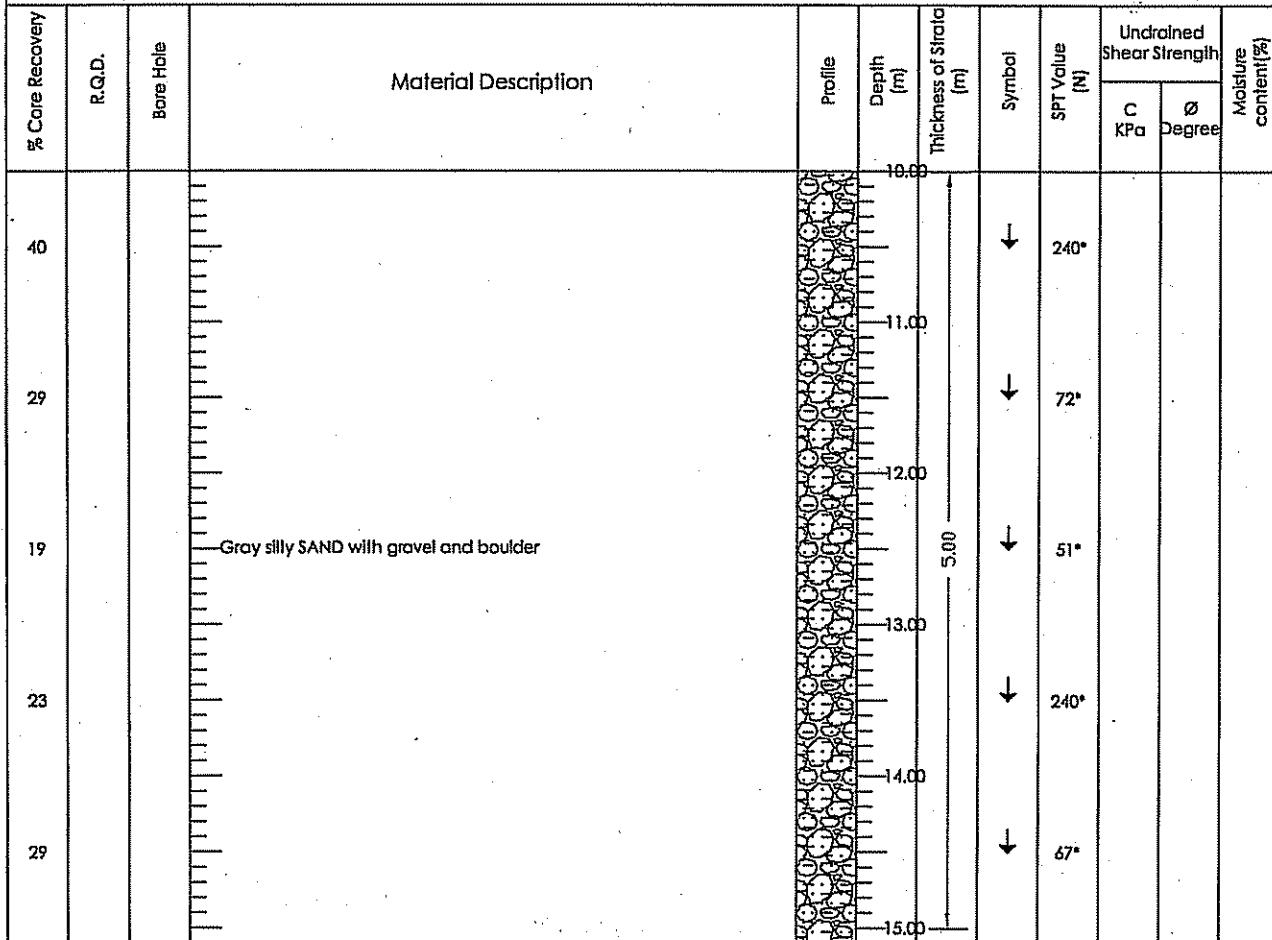
Elevation : 199.45

Depth to Water Table : 17.50m

Started Date : January 17, 2006

Driller : Surendra Raj Bajracharya

Logged by : Ravi Aiyal



LEGEND

— — — Approximate Material Boundary

• DCPT Carried out

R. Q. D. Rock mass Quality Designation

↓ Standard Penetration Test

● Disturbed Soil Sample

— Water Table

■ Core Sample

N No of Blows / 30cm Penetration

□ Core Sample Lost

● Bulk Sample



Contractor  
**Hydro Engineering & Development Co. (P) Ltd.**  
 HYDRO ENGINEERING & DEVELOPMENT CONSTRUCTION & DEVELOPMENT  
 P. O. Box : 7025  
 Nagarkot, Kathmandu.

Employer  
**Nippon Koei Co., Ltd**  
 Consulting Engineers  
 Tokyo, Japan.

Title  
**CORE LOGGING**  
 New Kawasoti Sub Station Project  
 Pragati Nagar, Nawal Parasi  
 Nepal.

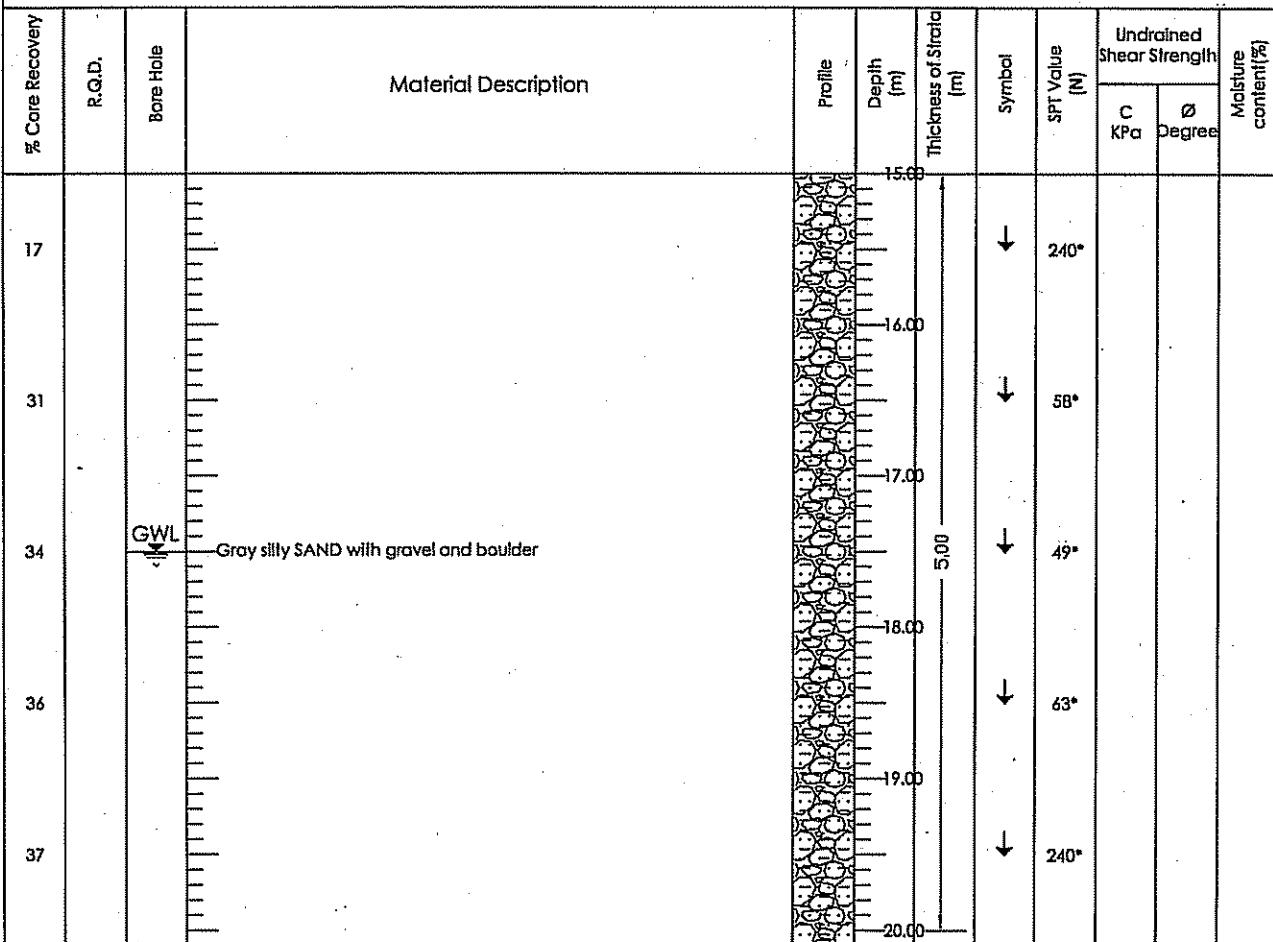
SHEET NO : DDH-3  
 3/4

**DRILLING RECORD**  
**New Kawasoti Sub station Project**

Pragati Nagar, Nawal Parasi, Nepal

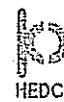
| Drill and Casing Type | Size | Metres |
|-----------------------|------|--------|
| Steel Casing (Hw)     | 66mm | 0.00   |
| Steel Casing (Nx)     | ...  | 5.00   |
| ...                   | ...  | ...    |
| ...                   | ...  | ...    |

|                                            |                                 |  |
|--------------------------------------------|---------------------------------|--|
| Project : New Kawasoti Sub Station Project |                                 |  |
| Site : Pragati Nagar                       |                                 |  |
| Hole No. : DDH-3                           | Elevation : 199.45              |  |
| Depth to Water Table : 17.50m              | Started Date : January 17, 2006 |  |
| Driller : Kiran Shahi                      | Logged by :                     |  |



LEGEND

- — — Approximate Material Boarder
- R. Q. D. Rock mass Quality Designation
  - Disturbed Soil Sample
  - Core Sample
  - Core Sample Lost
- ↓ DCPT Carried out
- ↓ Standard Penetration Test
- ~~~~ Water Table
- N No of Blows / 30cm Penetration
- Bulk Sample

|                                                                                                                                                                                                                                                                                                            |                                                                                                                   |                                                                                                                                                      |                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
|  <p><b>Contractor</b><br/> <b>Hydro Engineering &amp; Development Co. (P) Ltd.</b><br/> <small>Engineering Project Management Construction Development<br/> P.O. Box: 7025<br/> Nagarkot, Nepal, Kathmandu.</small></p> | <p><b>Employer</b><br/> <b>Nippon Kei Co., Ltd</b><br/> <small>Consulting Engineers<br/> Tokyo, Japan</small></p> | <p><b>Title</b><br/> <b>CORE LOGGING</b><br/> <b>New Kawasoti Sub Station Project</b><br/> <small>Pragati Nagar, Nawalparasi<br/> Nepal.</small></p> | <p><b>SHEET NO : DDH-3</b><br/> <small>4/4</small></p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|

**DRILLING RECORD**  
**New Kawasoti Sub station Project**

Pragati Nagar, Nawal Parasi, Nepal

| Drill and Casing Type | Size  | Metres |
|-----------------------|-------|--------|
| Steel Casing(Hw)      | 110mm | 5.00   |
| Steel Casing (Nx)     | 89mm  | 0.00   |
| ...                   | ...   | ...    |
| ...                   | ...   | ...    |

Project : New Kawasoti Sub Station Project

Site : Pragati Nagar

Hole No. : DDH-4

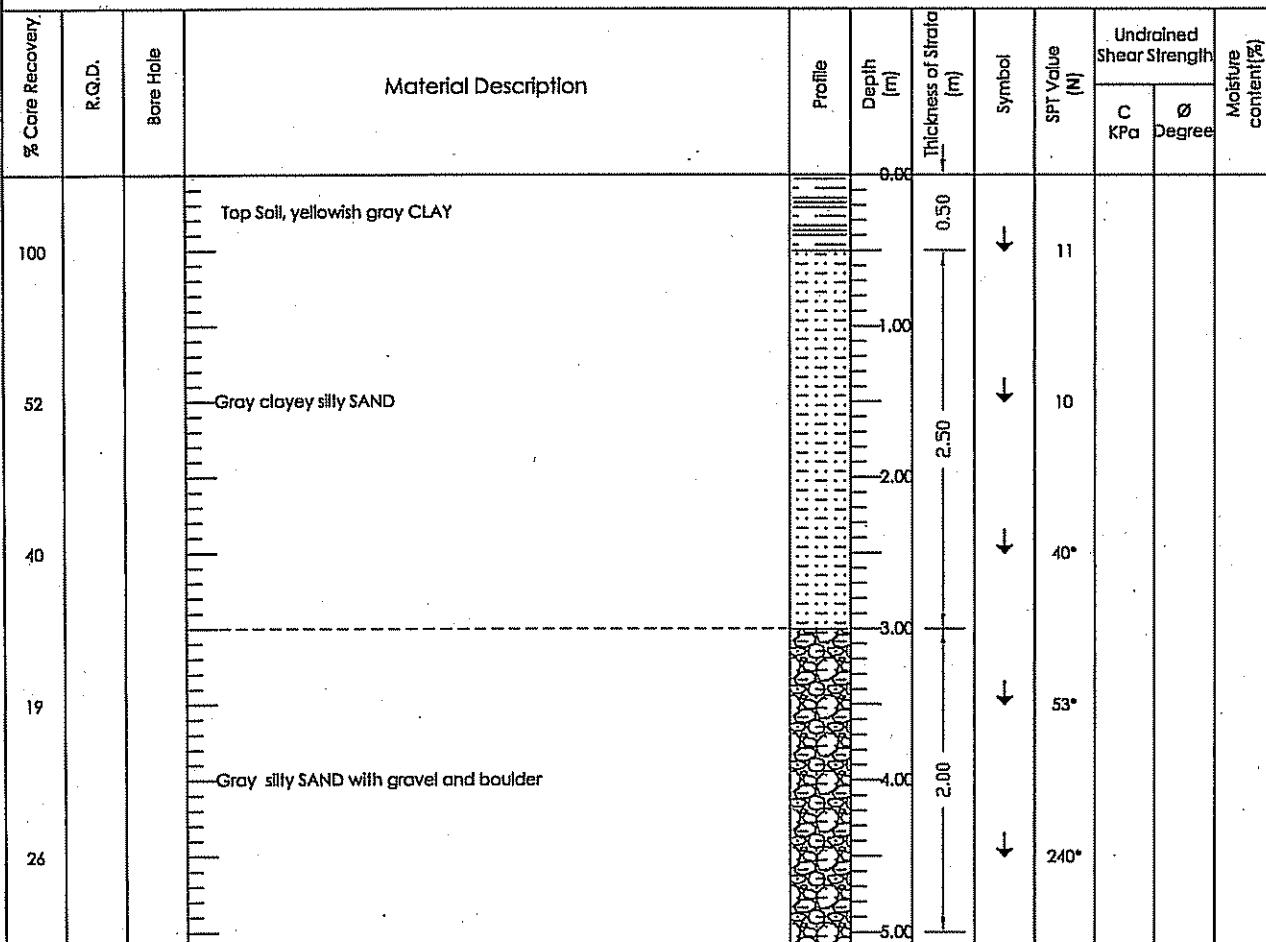
Elevation : 199.90

Depth to Water Table : 16.30m

Started Date : January 24, 2006

Driller : Surendra Raj Baracharya

Logged by : Ravi Aryal



**LEGEND**

Approximate Material Boundary

R. Q. D. Rock mass Quality Designation

● Disturbed Soil Sample

■ Core Sample

□ Core Sample Lost

● DCPT Carried out

↓ Standard Penetration Test

— Water Table

N No of Blows / 30cm Penetration

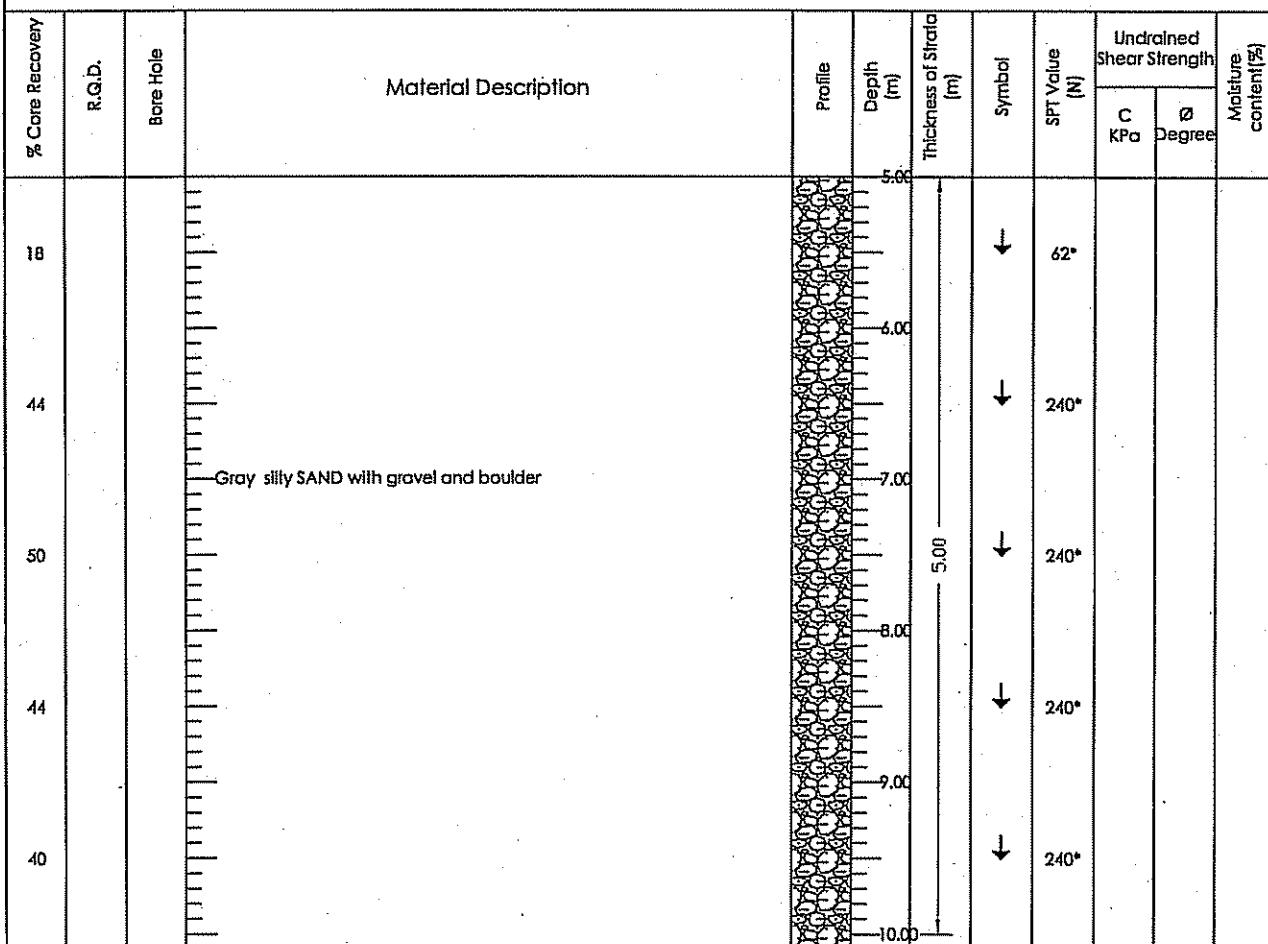
● Bulk Sample

|                                                                                                                                                                                                                                       |                                                                                                        |                                                                                                                       |                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| <br><b>Contractor</b><br><b>Hydro Engineering &amp; Development Co. (P) Ltd.</b><br><small>P.O. Box: 7025<br/>Nepalgunj, Harsl, Kathmandu.</small> | <b>Employer</b><br><b>Nippon Koei Co., Ltd</b><br><small>Consulting Engineers<br/>Tokyo, Japan</small> | <b>Title</b><br><b>CORE LOGGING</b><br><b>New Kawasoti Sub Station Project</b><br><small>Pragati Nagar, Nepal</small> | <b>SHEET NO :</b> DDH-4<br><small>1/4</small> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|

**DRILLING RECORD**  
**New Kawasoti Sub station Project**  
Pragati Nagar, Nawal Parasi, Nepal

| Drill and Casing Type | Size  | Metres |
|-----------------------|-------|--------|
| Steel Casing(Hw)      | 110mm | 0.00   |
| Steel Casing (Nx)     | 89mm  | 5.00   |
| ...                   | ...   | ...    |
| ...                   | ...   | ...    |

|                                            |                                |  |
|--------------------------------------------|--------------------------------|--|
| Project : New Kawasoti Sub Station Project |                                |  |
| Site : Pragati Nagar                       |                                |  |
| Hole No. : DDH-4                           | Elevation : 199.90             |  |
| Depth to Water Table : 16.30m              | Started Date : January 24,2006 |  |
| Driller : Surendra Raj Baracharya          | Logged by : Ravi Aryal         |  |



LEGEND

- Approximate Material Boundary
- R. Q. D. Rock mass Quality Designation
- Disturbed Soil Sample
- Core Sample
- Core Sample Lost

- DCPT Carried out
- ↓ Standard Penetration Test
- ▬ Water Table
- N No of Blows / 30cm Penetration
- Bulk Sample

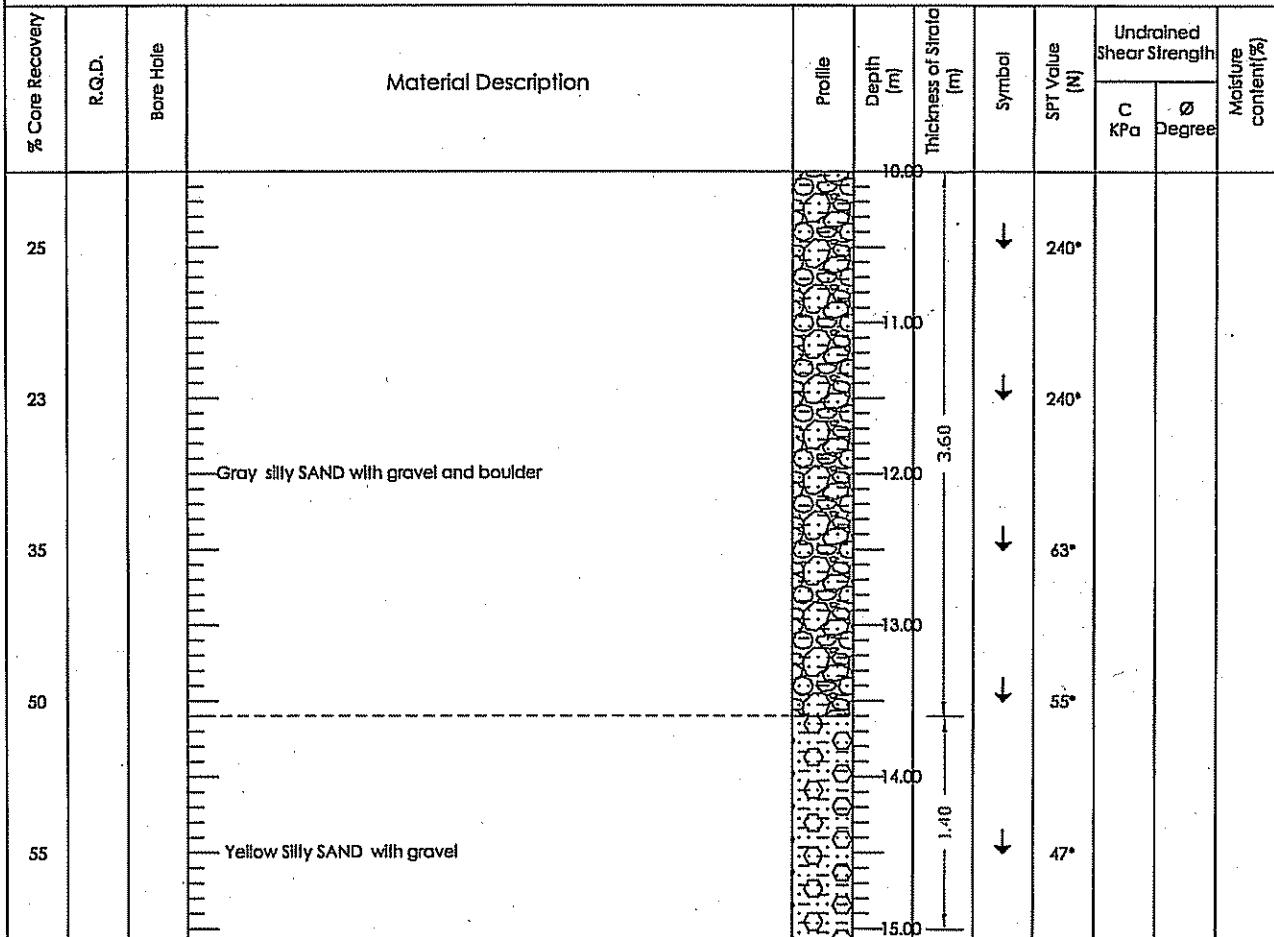
|                                                                                                                                                                                                                                                                                                          |                                                                                  |                                                                                                                  |                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <br><b>Contractor</b><br><b>Hydro Engineering &amp; Development Co. (P) Ltd.</b><br><small>(HEADQUARTERS FOR HYDRO POWER CONSTRUCTION &amp; DEVELOPMENT)<br/> P.O. Box 7025<br/> Nepalgunj, Nepal, Kathmandu.</small> | <b>Employer</b><br>Nippon Koei Co., Ltd<br>Consulting Engineers<br>Tokyo, Japan. | <b>Title</b><br><b>CORE LOGGING</b><br>New Kawasoti Sub Station Project<br>Pragati Nagar, Nawal Parasi<br>Nepal. | <b>SHEET NO :</b> DDH-4<br>2/4 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------|

**DRILLING RECORD**  
**New Kawasoti Sub station Project**

Pragati Nagar, Nawal Parasi, Nepal

| Drill and Casing Type | Size  | Metres |
|-----------------------|-------|--------|
| Steel Casing(Hw)      | 110mm | 0.00   |
| Steel Casing (Nk)     | 89mm  | 5.00   |
| ...                   | ...   | ...    |
| ...                   | ...   | ...    |

| Project : New Kawasoti Sub Station Project |                                |  |
|--------------------------------------------|--------------------------------|--|
| Site : Pragati Nagar                       |                                |  |
| Hole No. : DDH-4                           | Elevation : 199.90             |  |
| Depth to Water Table : 16.30m              | Started Date : January 24,2006 |  |
| Driller : Surendra Raj Bajracharya         | Logged by : Ravi Aryal         |  |



LEGEND

----- Approximate Material Boundary

R. Q. D. Rock mass Quality Designation

● Disturbed Soil Sample

■ Core Sample

□ Core Sample Lost

• DCPT Carried out

↓ Standard Penetration Test

===== Water Table

N No of Blows / 30cm Penetration

● Bulk Sample



**Contractor**  
**Hydro Engineering & Development Co. (P) Ltd .**  
 P.O. Box : 7025  
 Nagarkot, Nawal Kharanewa.

**Employer**  
**Nippon Kei Co., Ltd**  
 Consulting Engineers  
 Tokyo, Japan.

**Title**  
**CORE LOGGING**  
**New Kawasoti Sub Station Project**  
 Pragati Nagar, Nawal Parasi  
 Nepal.

**SHEET NO : DDH-4**  
 3/4

**DRILLING RECORD**  
**New Kawasoti Sub station Project**

Pragati Nagar, Nawal Parasi, Nepal

| Drill and Casing Type | Size  | Metres |
|-----------------------|-------|--------|
| Steel Casing(Hw)      | 110mm | 0.00   |
| Steel Casing (Nx)     | 89mm  | 5.00   |
| ...                   | ...   | ...    |
| ...                   | ...   | ...    |

Project : New Kawasoti Sub Station Project

Site : Pragati Nagar

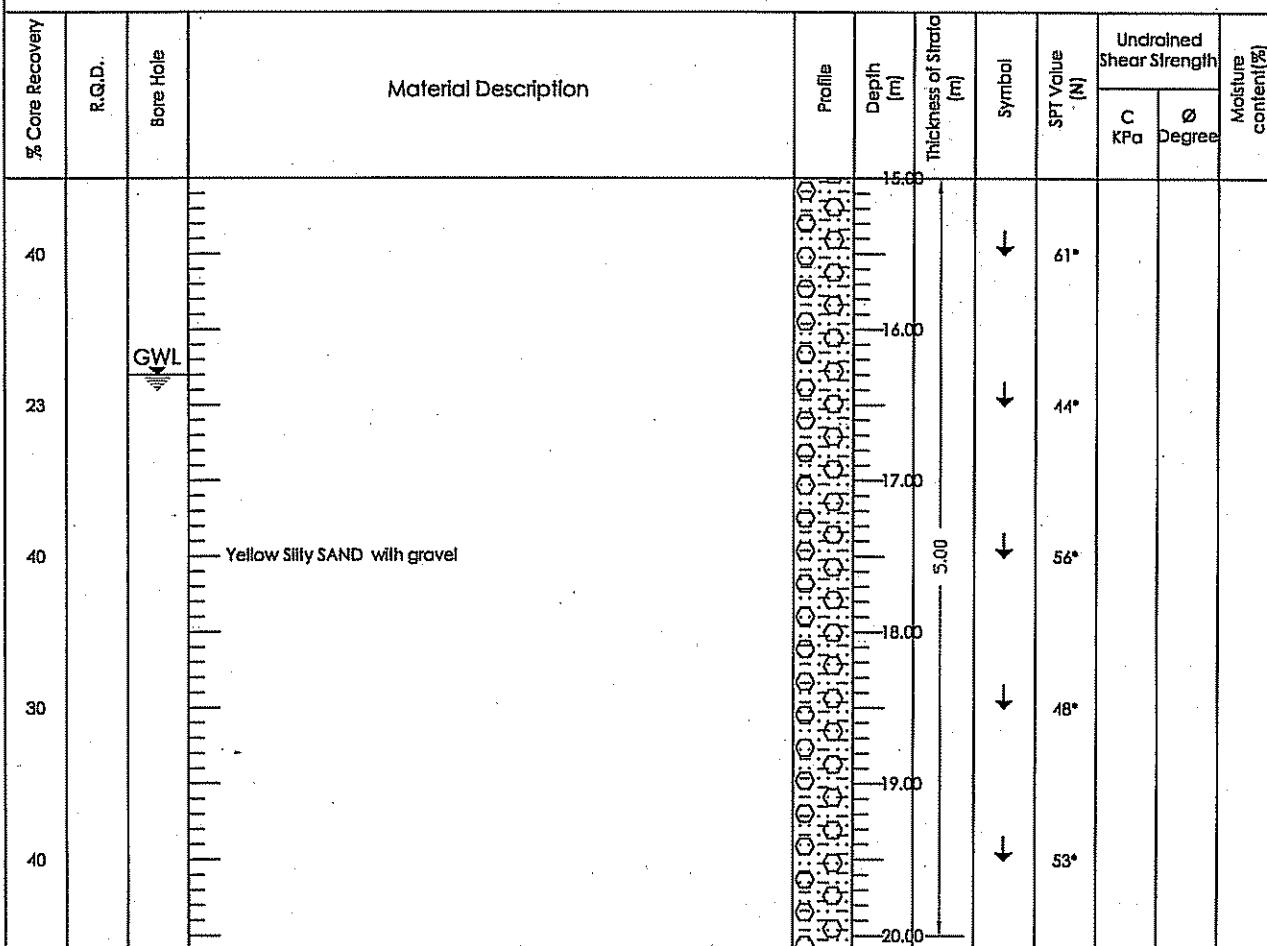
Elevation : 199.90

Hole No. : DDH-4

Started Date : January 24, 2006

Driller : Surendra Raj Bajracharya

Logged by : Ravi Aryal



LEGEND

Approximate Material Boarder

R. Q. D. Rock mass Quality Designation

● Disturbed Soil Sample

■ Core Sample

□ Core Sample Lost

● DCPT Carried out

↓ Standard Penetration Test

▽ Water Table

N No of Blows / 30cm Penetration

● Bulk Sample



**Contractor**  
**Hydro Engineering & Development Co. (P) Ltd.**  
 HYDRO ENGINEERING PROJECT MANAGEMENT, CONSTRUCTION & DEVELOPMENT  
 P. O. Box : 7025  
 Kathmandu, Nepal, Kathmandu.

**Employer**  
**Nippon Koei Co., Ltd**  
 Consulting Engineers  
 Tokyo, Japan

**Title**  
**CORE LOGGING**  
 New Kawasoti Sub Station Project  
 Pragati Nagar, Nawal Parasi  
 Nepal

**SHEET NO: DDH-4**  
 4/4

# EMES Pvt. Ltd.

P.O.BOX 1192, Satdobato, Lalitpur, Nepal  
PHONE NO : 5-520242.  
FAX NO. 977-1-5538325.

Date : 10.2.2006

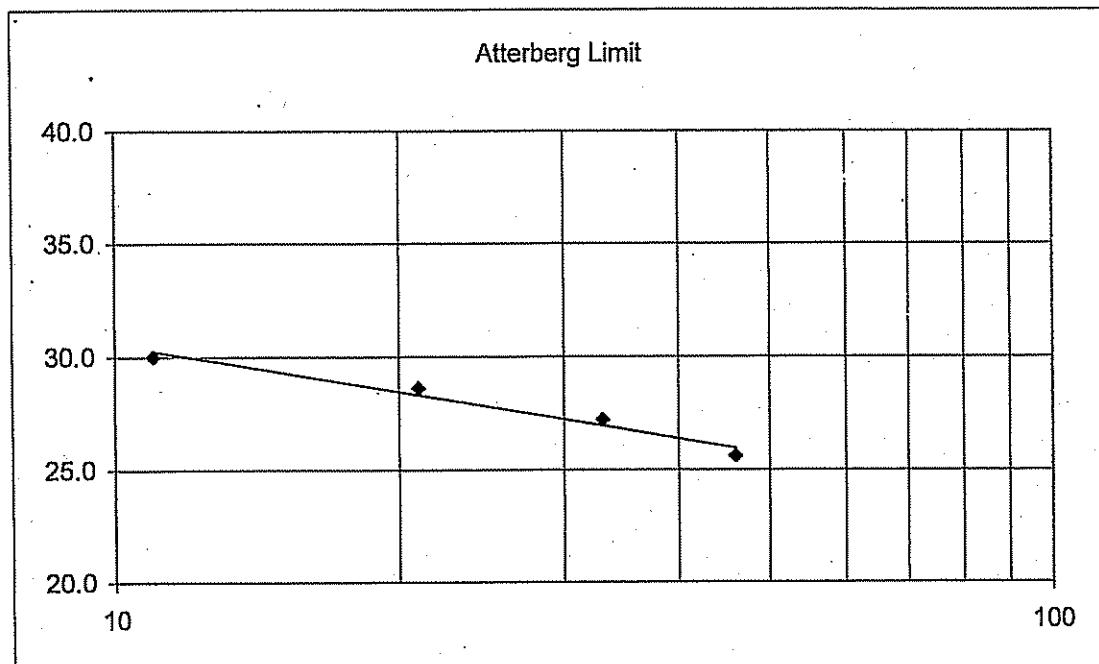
Sample No.:

Standard : AASHTO T 89 - 81 & T 90 - 81  
Lab. Ref. : EMES #

Project :- Sub-station  
Location :- Pragati nagar  
Bore hole No. :- DDH - 1  
Depth(m) :- 1.00 - 1.50 (DS-1)

## Atterberg Limit Test Results

|                 |       |       |       |       |
|-----------------|-------|-------|-------|-------|
| Number of blows | 11    | 21    | 33    | 46    |
| Water content % | 30.00 | 28.61 | 27.20 | 25.60 |

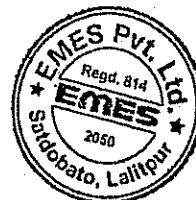


LIQUID LIMIT(LL) = 28 %

PLASTIC LIMIT(PL) = 21 %

PLASTICITY INDEX (PI) = 7 %

Tested by



Checked by :

# EMES Pvt. Ltd.

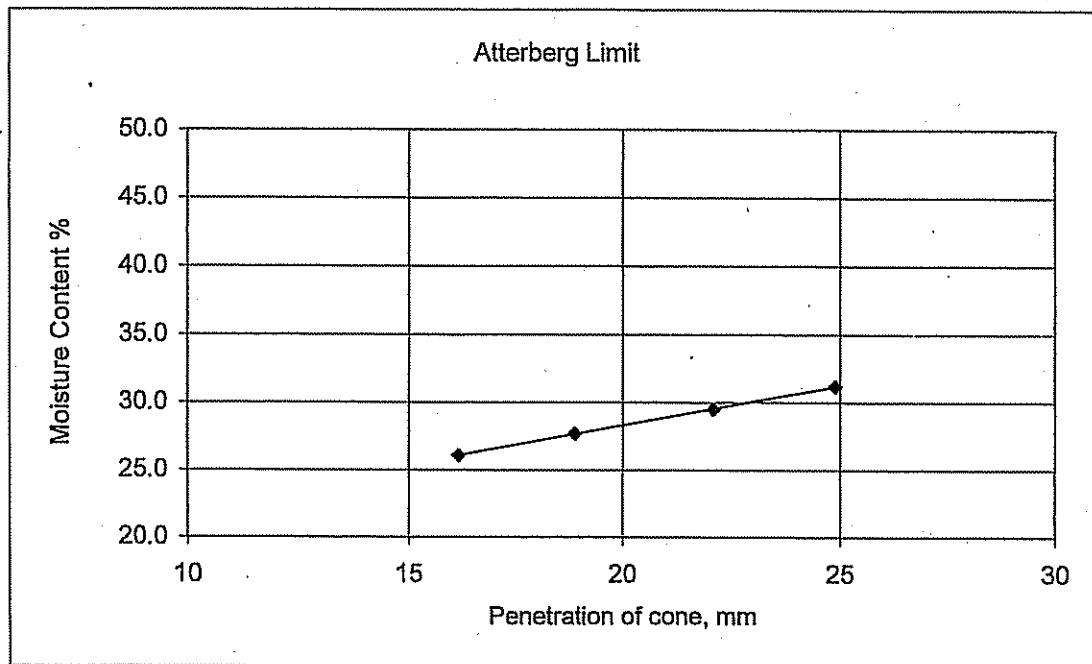
P.O.BOX 1192, Satdobato, Lalitpur, Nepal  
PHONE NO : 5-520242.  
FAX NO. 977-1-5538325.

Date : 10.2.2006  
Sample No.:  
Standard : BS 1377: 1975, Test 2(A) & Test 3  
Ref. EMES #

Project:- Sub-station  
Location:- Pragati nagar  
Bore Hole No.:- DDH - 1  
Depth(m):- 2.00 - 2.50(DS-2)

## Atterberg Limit Test Results

|                         |       |       |       |       |
|-------------------------|-------|-------|-------|-------|
| Penetration of cone, mm | 16.2  | 18.9  | 22.1  | 24.9  |
| Water content %         | 26.09 | 27.69 | 29.49 | 31.19 |



LIQUID LIMIT(LL) = 28 %

PLASTIC LIMIT(PL) = NP

PLASTICITY INDEX (PI) = NP

Tested by :



Checked by :

# EMES Pvt. Ltd.

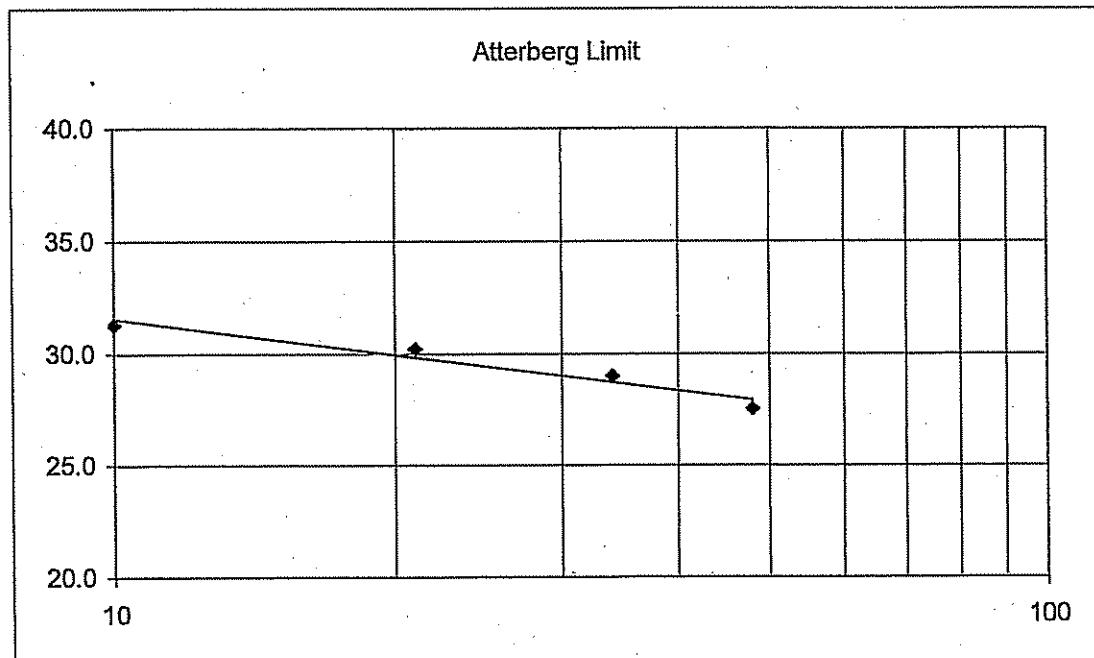
P.O.BOX 1192, Satdobato, Lalitpur, Nepal  
PHONE NO : 5-520242.  
FAX NO. 977-1-5538325.

Date : 10.2.2006  
Sample No.:  
Standard : AASHTO T 89 - 81 & T 90 - 81  
Lab. Ref. : EMES #

Project :- Sub-station  
Location :- Pragati nagar  
Bore hole No. :- DDH - 2  
Depth(m) :- 1.50 - 2.00 (DS-1)

## Atterberg Limit Test Results

| Number of blows | 10    | 21    | 34    | 48    |
|-----------------|-------|-------|-------|-------|
| Water content % | 31.28 | 30.21 | 28.99 | 27.51 |

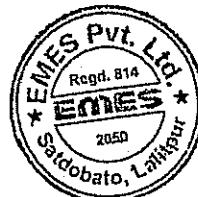


LIQUID LIMIT(LL) = 29 %

PLASTIC LIMIT(PL) = 21

PLASTICITY INDEX (PI) = 8 %

Tested by : *[Signature]*



*Sunil*

Checked by :

# EMES Pvt. Ltd.

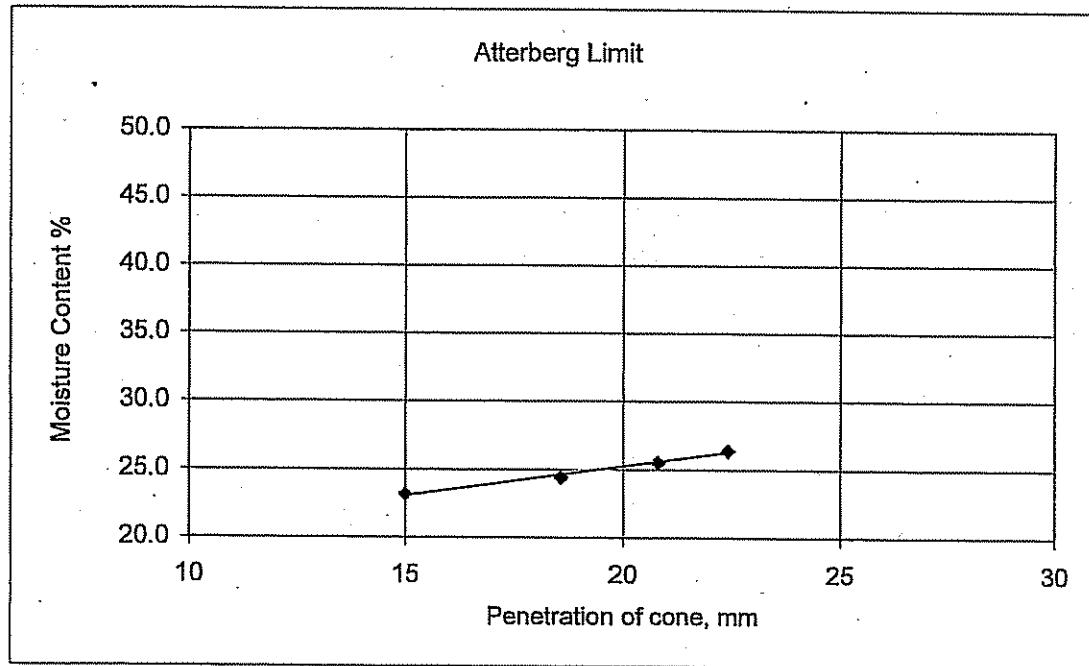
P.O.BOX 1192, Saldobato, Lalitpur, Nepal  
PHONE NO : 5-520242.  
FAX NO. 977-1-5538325.

Date : 9.2.2006  
Sample No.:  
Standard : BS 1377: 1975, Test 2(A) & Test 3  
Ref. EMES #

Project:- Building Complex  
Location:- New Baneshwor, Kathmandu  
Bore Hole No.: DDH - 2  
Depth(m):- 3.00 - 3.50(DS-2)

## Atterberg Limit Test Results

|                         |       |       |       |       |
|-------------------------|-------|-------|-------|-------|
| Penetration of cone, mm | 15.0  | 18.6  | 20.8  | 22.4  |
| Water content %         | 23.16 | 24.41 | 25.52 | 26.39 |



LIQUID LIMIT(LL) = 25 %

PLASTIC LIMIT(PL) = NP

PLASTICITY INDEX (PI) = NP

Tested by : *Kirat*



*S. Anjel*  
Checked by :

# EMES Pvt. Ltd.

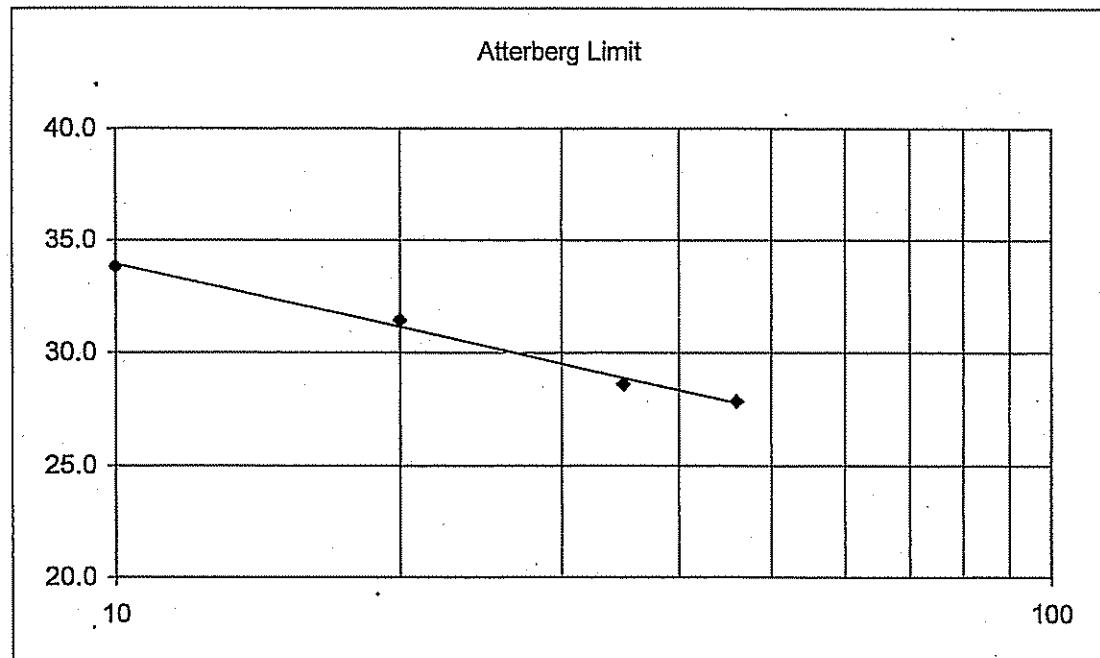
P.O.BOX 1192, Satdobato, Lalitpur, Nepal  
PHONE NO : 5-520242.  
FAX NO. 977-1-5538325.

Date : 9.2.2006  
Sample No.:  
Standard : AASHTO T 89 - 81 & T 90 - 81  
Lab. Ref. : EMES #

Project :- Sub-station  
Location :- Pragati nagar  
Bore hole No. :- DDH - 3  
Depth(m) :- 2.00 - 2.50 (DS-1)

## Atterberg Limit Test Results

| Number of blows | 10    | 20    | 35    | 46    |
|-----------------|-------|-------|-------|-------|
| Water content % | 33.81 | 31.42 | 28.61 | 27.85 |



LIQUID LIMIT(LL) = 30 %

PLASTIC LIMIT(PL) = 20 %

PLASTICITY INDEX (PI) = 10 %

Tested by:



Checked by:

# EMES Pvt. Ltd.

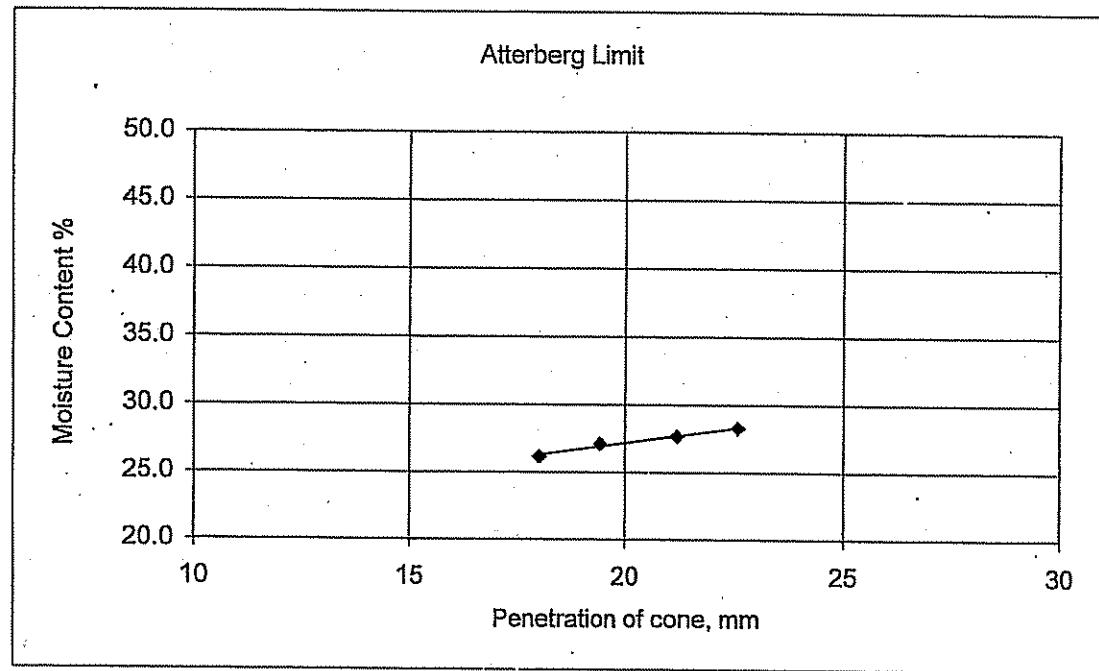
P.O.BOX 1192, Satdobato, Lalitpur, Nepal  
PHONE NO : 5-520242.  
FAX NO. 977-1-5538325.

Date : 9.2.2006  
Sample No.:  
Standard : BS 1377: 1975, Test 2(A) & Test 3  
Ref. EMES #

Project:- Building Complex  
Location:- New Baneshwor, Kathmandu  
Bore Hole No.:- DDH - 3  
Depth(m):- 3.25 - 3.75(DS-2)

## Atterberg Limit Test Results

|                         |       |       |       |       |
|-------------------------|-------|-------|-------|-------|
| Penetration of cone, mm | 18.0  | 19.4  | 21.2  | 22.6  |
| Water content %         | 26.16 | 27.10 | 27.67 | 28.27 |



LIQUID LIMIT(LL) = 27 %

PLASTIC LIMIT(PL) = NP

PLASTICITY INDEX (PI) = NP

Tested by :



Checked by :

# EMES Pvt. Ltd.

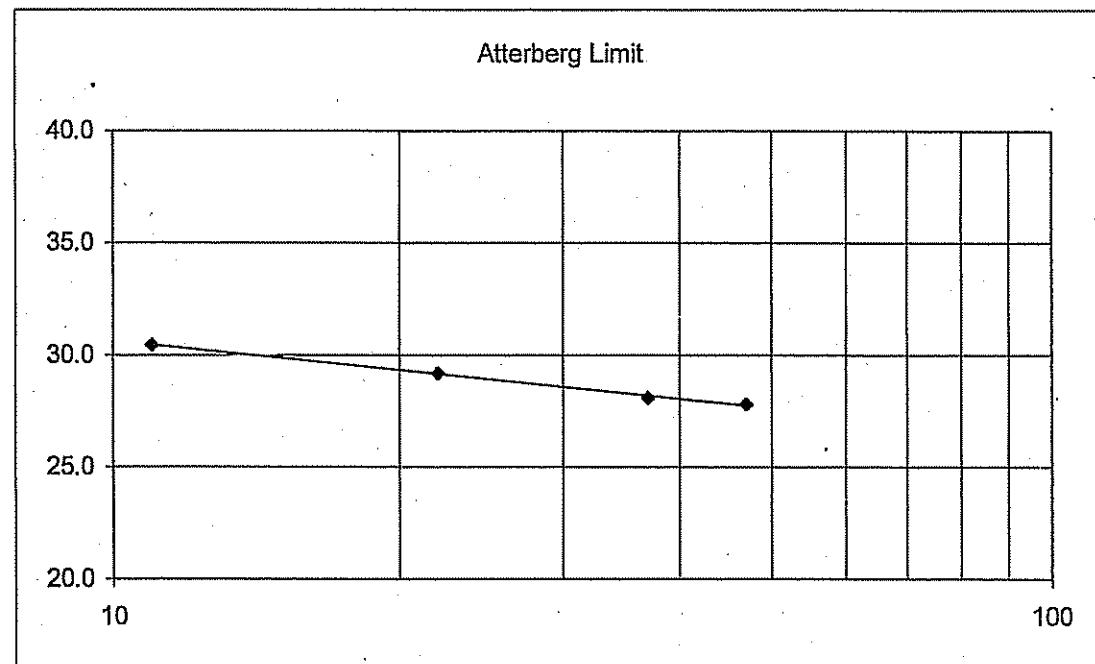
P.O.BOX 1192, Satdobato, Lalitpur, Nepal  
PHONE NO : 5-520242.  
FAX NO. 977-1-5538325.

Date : 9.2.2006  
Sample No.:  
Standard : AASHTO T 89 - 81 & T 90 - 81  
Lab. Ref. : EMES #

Project :- Sub-station  
Location :- Pragati nagar  
Bore hole No. :- DDH - 4  
Depth(m) :- 1.50 - 2.00 (DS-1)

## Atterberg Limit Test Results

| Number of blows | 11    | 22    | 37    | 47    |
|-----------------|-------|-------|-------|-------|
| Water content % | 30.44 | 29.18 | 28.08 | 27.79 |



LIQUID LIMIT(LL) = 29 %

PLASTIC LIMIT(PL) = 19 %

PLASTICITY INDEX (PI) = 10 %

Tested by :

Checked by :

# EMES Pvt. Ltd.

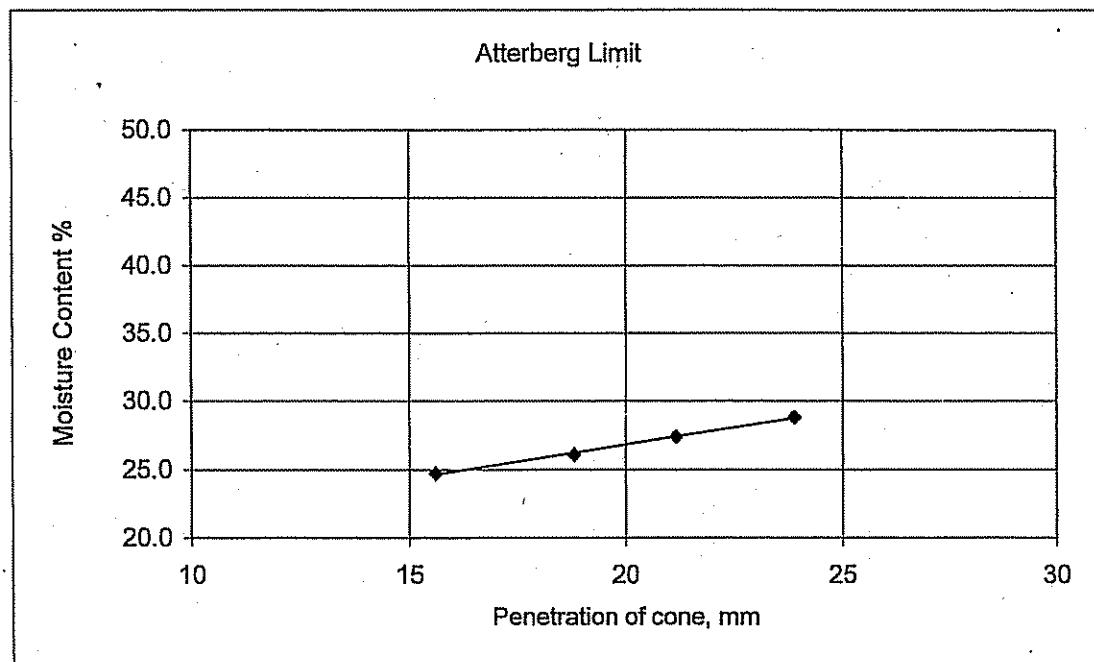
P.O.BOX 1192, Satdobato, Lalitpur, Nepal  
PHONE NO : 5-520242.  
FAX NO. 977-1-5538325.

Date : 10.2.2006  
Sample No.:  
Standard : BS 1377: 1975, Test 2(A) & Test 3  
Ref. EMES #

Project:- Building Complex  
Location:- New Baneshwor, Kathmandu  
Bore Hole No.:- DDH - 4  
Depth(m):- 3.00 - 3.50(DS-2)

## Atterberg Limit Test Results

|                         |       |       |       |       |
|-------------------------|-------|-------|-------|-------|
| Penetration of cone, mm | 15.6  | 18.8  | 21.2  | 23.9  |
| Water content %         | 24.71 | 26.09 | 27.39 | 28.79 |



LIQUID LIMIT(LL) = 27 %

PLASTIC LIMIT(PL) = NP

PLASTICITY INDEX (PI) = NP

Tested by :



Checked by :