

Gas Processing, LPG Recovery Plant and Allied Facilities at Nashpa Field

Geotechnical investigation (Report)

Geotechnical Investigation & Survey of Gas
Processing, LPG Recovery Plant and Allied
Facilities at NASHPA Oil Field

April 2016



Zealcon Engineering (Pvt) Ltd.



Zealcon Engineering Pvt. Ltd

NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

GEOTECHNICAL INVESTIGATIONS REPORT

Table of Contents

Chapter	Description	Page No.
1.	INTRODUCTION	1
1.1	Objectives of Investigations	1
1.2	Scope of Work	2
1.3	Geology of the Project Area	2
1.4	Seismicity of the Project Area	3
2	FIELD WORK	4
2.1	Drilling of Boreholes	4
2.2	Excavation of Testpits	4
2.3	Standard Penetration Tests	4
2.4	Field Density Test	5
2.5	Soil/Rock Sampling	5
2.6	Earth Resistivity Survey	5
2.7	Field Permeability Test	5
3	LABORATORY TESTING	6
3.1	Discussion of Results	6
4	SITE GEOTECHNICS	8
4.1	Lithology & Stratigraphy	8
4.2	In-Situ Compactness	8
4.3	Shear Strength	9
4.4	Compressive Strength	9
4.5	Compressibility	9
4.6	Chemical Testing	9
5	CONSIDERATION FOR FOUNDATION DESIGN & CONSTRUCTION	10
5.1	General	10
5.2	Design Criteria	10
5.3	Soil Parameters	10
5.4	Foundation Type	11
5.5	Foundation Depth	11
5.6	Net Allowable Bearing Pressures	11
5.7	Excavations	14
5.8	Damp Proofing Measures	14
5.9	Cement & Construction Materials	14
5.10	Coefficient of Static Lateral Earth Pressure	14
5.11	Modulus of Sub-Grade Reaction	15
6	CONSIDERATION FOR ROADWAY DESIGN & CONSTRUCTION	16
6.1	General	16
6.2	Design Recommendations	16
7	CONCLUSION AND RECOMMENDATIONS	16





Zealcon Engineering Pvt. Ltd

APPENDICES

APPENDIX-A

GEOTECHNICAL INVESTIGATION PLAN

APPENDIX-B:

BOREHOLE AND TESTPIT LOGS

ENGINEERING PROFILE

APPENDIX-C:

LABORATORY TEST RESULTS

APPENDIX-D

BEARING CAPACITY CURVES





Zealcon Engineering Pvt. Ltd

NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

GEOTECHNICAL INVESTIGATIONS REPORT

1. INTRODUCTION

Oil and Gas Development Company Limited (OGDCL) intends to undertake Installation of LPG Recovery Plant, Compressors and Allied Facilities at Nashpa Field. The project site is located in Khyber Pakhtunkhwa. The objective of the PROJECT is to construct a gas processing facility at NASHPA to process raw gas of NASHPA and separator gas from MELA Field.

In the light of the project requirements, geotechnical investigations were planned to check the sub-surface soil conditions. The work of geotechnical investigations has been awarded to M/s ZEALCON ENGINEERING, Lahore by M/S HBP.

This report provides an account of the objective of geotechnical investigations carried out at the project site, general characteristics of the sub-surface soils, details of field & laboratory works and recommendations for design & constructions of foundations for buildings and roads.

1.1 Objectives of Investigations

The geotechnical investigations were undertaken to meet the following objectives:

- i. To delineate the major subsoil types spread over the site area.
- ii. To evolve parameters for the design of foundations of the structure & internal road.
- iii. To spell-out the geotechnical considerations for the construction of foundations and roads.



Zealcon Engineering Pvt. Ltd

1.2 Scope of Work

Following geotechnical investigations were planned to full-fill the structural requirements:

- i. Drilling of forty five (45) boreholes, through straight rotary drilling method down to a depth of 5.0 – 40 meter below NSL.
- ii. Carrying out Standard Penetration Tests (SPTs) in the Boreholes generally at 1.0 meter depth interval, where possible.
- iii. Collection of undisturbed and disturbed soil samples from each Borehole.
- iv. Continuous core drilling in bed rock including collection and preservation of rock core samples.
- v. Excavation of test pits along with performance of field density tests (FDTs) in test pits.
- vi. Collection of bulk soil samples from test pits.
- vii. Performance of earth resistivity survey for shallow depth
- viii. Performance of Down Hole survey in 30 m deep boreholes.
- ix. Performance of Soil Thermal Resistivity Survey.
- x. Laboratory testing of selected soil/rock samples for the evaluation of classification, moisture, hydrometer/ sieve analysis, density, unconfined compression, atterberg limits, compaction/CBR values and chemical analysis of soil/water.
- xi. Development of subsoil borehole & testpit logs.
- xii. Development of subsoil engineering profile.
- xiii. Analyses of field and laboratory data and determination of safe bearing pressure of soil.
- xiv. Recommendations for foundation and road network.

1.3 Geology of the Project Area

The Kohat quadrangle (Geological Survey of Pakistan topographic sheet 38-O) is an area of approximately 4,000 square miles where sedimentary rocks have a total stratigraphic thickness of more than 7,772 meters. The oldest rocks, which crop out in the northeastern and northwestern parts of the quadrangle, are slate, slaty shale, and sandstone of Precambrian or early Paleozoic age. Jurassic, Cretaceous, Paleocene, Eocene, Miocene,





Zealcon Engineering Pvt. Ltd

and Pliocene sedimentary formations are also found in the Kohat quadrangle. Pleistocene sedimentary rocks may be present but were not recognized.

The Jurassic System consists mostly of limestone; two subdivisions have been recognized. The lower half of the Cretaceous System is mostly marine sandstone; the upper half is mostly marine limestone. The Paleocene Series, which includes three formations, consists mostly of carbonate rocks but also contains some sandstone and shale. Of the Eocene Series, only rocks of early Eocene age are present in the Kohat quadrangle; they contain extensive deposits of gypsum, rock salt, marine limestone, and shale. A relatively thin section of the Murree Formation of Miocene age unconformably overlies lower Eocene rocks. It, in turn, is overlain by more than 19,000 feet of strata which make up the upper formation of the Miocene Rawalpindi Group.

1.4 Seismicity of the Project Area

The project area is located in the western part of Pakistan where the Indian plate is colliding with the Eurasian plate. Due to its proximity to the collisional zone between the two tectonic plates, the project area is seismically active. The recorded seismicity during the past century shows a large number of small to moderate earthquakes originating in this region. The active tectonic features of the project area are Main Boundary Thrust (MBT) passes at a distance of 2 km north and Khairabad fault passes 29 km north to Project area.

Probabilistic seismic hazard assessment carried out as part of the revision of the Building Code of Pakistan Seismic Provisions (2007) shows that the project area falls in Zone-2B.

It is therefore recommended that the project structures should be designed to cater the requirements of Zone 2B with Peak Ground Acceleration (PGA) of 0.16 as per Building Code of Pakistan Seismic Provisions (2007) after giving due consideration to the soil profile of the sites area.





Zealcon Engineering Pvt. Ltd

2. FIELD WORK

In order to find out the subsoil conditions and to evaluate the foundation conditions at the site, following field investigations were planned & executed.

2.1 Drilling of Boreholes

Forty five (45) boreholes of depth ranging from 5 m to 40 m below NSL were executed at site. Rotary drilling method with bentonite slurry as drilling fluid was used for drilling of boreholes. The diameter of the boreholes was 125 mm. The location of all the boreholes was fixed in such a manner to cover the entire project area. The location of all the boreholes is marked on geotechnical investigation plan attached with the report as Fig. A-1 (Appendix A).

Field borehole logs developed on the basis of material encountered at site and were later corrected on the basis of laboratory test results are appended with the report as Appendix B.

2.2 Excavation of Testpits

Eleven (11) test pits of depth 1 m below NSL were excavated at site at road location. These pits were excavated using manual digging tools. The location of all the test pits is marked on geotechnical investigation plan attached with the report as Fig. A-1 (Appendix A).

Field test pit logs developed on the basis of material encountered at site and were later corrected on the basis of laboratory test results are appended with the report as Appendix B.

2.3 Standard Penetration Tests (SPTs)

Standard Penetration Tests (SPTs) were performed in the Boreholes according to latest ASTM D-1586, at 1.0 meter depth interval, where possible. The data obtained from these tests was utilized to assess the in-situ denseness of the subsurface materials. The SPT





Zealcon Engineering Pvt. Ltd

blow counts were recorded for 45 cm total penetration of split barrel sampler. The number of blows required to drive the sampler through the last 30 cm viz. 'N' values have been shown on the respective borehole log. (Appendix B).

2.4 Field Density Tests (FDTs)

To evaluate the in-situ density of the subsurface soils, density tests were performed in the testpits at selected horizons below NSL. Sand replacement method was used to perform the density tests according to the latest ASTM D 1556. The results of these density tests are shown on the individual test pit logs (Appendix-B).

2.5 Soil/Rock Sampling

The sampling, preservation and transportation of all the samples were carried out according to the latest ASTM standards.

The soil samples collected from the split spoon sampler during the SPTs, carried out in the boreholes & the bulk soil samples collected from test pits were labeled and preserved as disturbed samples. The undisturbed soil samples & rock core samples extracted from boreholes were properly waxed and labeled before transportation to the laboratory for testing.

2.6 Earth Resistivity Survey

The objective of Electrical Resistivity Tomography is to explore and interpret the anomalies related to subsurface cavities or voids and depth of bedrock & water within the project area. The field measurements in this regard were recorded by utilizing electrodes spacing 5m interval.

2.7 Field Permeability Tests

Field permeability tests were performed in both cohesive and non-cohesive/friable sand stone stratum. The tests indicated co-efficient of permeability (K) for cohesive soils as 10^{-6} to 10^{-7} cm/sec. However, for non-cohesive stratum the permeability co-efficient (K) varies from 10^{-1} to 10^{-3} cm/sec. The results are attached as Table - C-4 (Appendix-C)



3. LABORATORY TESTING

Samples collected from the boreholes & test pits were subjected to some or all of the following tests as per latest ASTM, BS or equivalent standards:

- Classification
- Shear strength of soil /Rock
- Moisture-density relationship
- Compressibility characteristics
- Chemical characteristics
- Other relevant engineering characteristics

The laboratory test results of the soil/rock samples are attached as Table C-1, C-2 & C-3 (Appendix C).

3.1 Discussion of Results

Classification Tests (ASTM D – 421, 422 & BS 1377 Part 2)

Forty four (44) soil samples were tested for the determination of gradation and indicated the presence of silty clay (CL-ML), Lean Clay (CL) and Silty Sand (SM) as major soil groups as per Unified Soil Classification System (USCS).

Atterberg Limit Test (ASTM D – 4318 & BS 1377 Part 2)

Atterberg limit test performed on twenty seven (27) soil samples indicate Liquid Limit (LL) 23 to 42, Plastic Limit (PL) 18 to 28 and the Plasticity Index (PI) of 4 to 20.

Unconfined Compression Test (ASTM D – 2166)

Four (04) unconfined compression tests were performed on undisturbed cohesive soil samples obtained from the boreholes. The result indicated compressive strength 60 to 263 kPa and a failure strain of 0.23 to 0.35 %.

More than forty five (45) unconfined compression tests were also performed on rock cores obtained from the boreholes. The result indicated compressive strength of 830 to 1450 kPa.





Zealcon Engineering Pvt. Ltd

Consolidation Test (ASTM D – 2435)

Consolidation tests were performed on four (04) undisturbed cohesive soil samples obtained from the boreholes. The result indicated that compression index (C_c) ranging from 0.04 to 0.08 and the initial void ratio of 0.45 to 0.55.

Direct Shear Test (ASTM D – 3080)

Direct shear tests were performed on three (03) non-cohesive soil samples obtained from the boreholes. The result indicated that angle of internal friction (ϕ) ranging from 29° to 31° and the cohesion as 0.9 to 1.5 kPa.

Modified AASHTO Compaction Test (AASHTO T-180)

Eleven (11) samples were subjected to compaction test. The test results indicated maximum dry density as 1.81 g/cc to 2.2 g/cc. The optimum moisture content ranges from 7.5 % to 14.5 %.

3-Point Soaked CBR Test (AASHTO T-193)

Eleven (11) samples were subjected to CBR testing. The test results indicated CBR value of 9 to 26.5 % at 95% modified dry density is available.

Chemical Analysis of Soil (BS 1377 Part 3)

Six (06) soil samples were subjected to chemical testing. The results indicated that sulphate contents are in the range of 0.03 to 0.05 %, chloride contents are 0.01 to 0.03 % and the organic matter contents are in the range of 0.5 to 0.9 %.



4. SITE GEOTECHNICS

4.1 Lithology & Stratigraphy

On the basis of geotechnical investigations carried out on the project site, the project area may be divided into following zones.

Reference Boreholes	ZONE	Depth Below NSL (m)	Soil Profile Type	Description
BH-1,BH-3,BH-4, BH-6,BH-8,BH-11, BH-12,BH-17, BH-19,BH-20, BH-25,BH-28, BH-29,BH-31, BH-36,BH-40, BH-41	A	0.0 – 40	S_C	Grey, Fractured Sand Stone, Slightly weathered
BH-2, BH-5, BH-7, BH-9, BH-10, BH-13, BH-14, BH-15, BH-16, BH-18, BH-21, BH-22, BH-23, BH-24, BH-26, BH-27, BH-30, BH-32, BH-33, BH-34, BH-35, BH-37, BH-38, BH-39, BH-42, BH-43, BH-44, BH-45	B	0.0– 4.0	S_D	Brown, Hard, Lean Clay
		4.0 - 15	S_C	Grey, Fractured Sand Stone, Slightly weathered

4.2 In-Situ Compactness

The SPT N blows in overburden soils are usually in the form of refusal. This trend indicates that the overburden soils have very high in-situ compactness.





Zealcon Engineering Pvt. Ltd

4.3 Shear Strength

Three (03) direct shear tests carried out on granular soil samples indicated the drained angle of internal friction in a range of 29° to 31° . These results reveal that the in-situ soils have medium shearing strength.

4.4 Compressive Strength

Four (04) unconfined compressive strength tests carried out on cohesive soil samples indicated compressive strength as 60 to 263 kPa. The results indicated the on-site cohesive soil has medium to high compressive strength.

More than forty five (45) unconfined compression tests were also performed on rock cores obtained from the boreholes. The result indicated compressive strength of 830 to 1450 kPa. The results indicated the on-site friable sand stone has medium to high compressive strength.

4.5 Compressibility

Four (04) consolidation tests were performed on cohesive soil samples obtained from the boreholes. The result indicated that compression index (C_c) ranging from 0.04 to 0.08 and the initial void ratio of 0.45 to 0.55. The trend indicates that the on-site cohesive soil has low settlement potential.

4.6 Chemical Testing

Six (06) soil samples were subjected to chemical testing. The chemical test results indicating that the in-situ soil has negligible proportion of harmful salts as per ACI-318 Building Code Requirement.



5. CONSIDERATION FOR FOUNDATION DESIGN & CONSTRUCTION

5.1 General

The considerations for the foundation design have been made keeping in view the topography of the area, type of structure anticipated at this stage and the subsoil characteristics. A safe and an economical design of foundations of the structures have to be ensured. The following sections provide guidelines regarding the geotechnical design criteria, soil parameters, selection of foundation type and depth of placement, allowable pressures and settlements.

5.2 Design Criteria

The foundation of any structure should meet the following minimum design criteria:

- i. These should be safe against shear failure of the supporting ground. A factor of safety of 3 is adopted for this purpose.
- ii. These should not settle excessively under the service loads. A limit of 25 mm (1 in.) has been put on the total settlement of isolated square/strip foundations and 50 mm (2 in.) for mat foundations.

5.3 Soil Parameters

The soil parameters for the design of foundations for different lithological units encountered at site have been adopted based on field and laboratory geotechnical investigation data. The soil parameters are as under:

For Zone A:

Depth (meter)	Material Description	Design parameters
0.0 – 40	Fractured Sand Stone, Slightly weathered	$\gamma_b = 20 \text{ kN/m}^3$ $\Phi = 38^\circ$ $E_s = 75 \text{ Mpa}$ $\mu = 0.4$ $G_s = 25 \text{ Mpa}$

For Zone B:

Depth (meter)	Material Description	Design parameters
0.0 – 4.0	Hard, Lean Clay	$\gamma_b = 20 \text{ kN/m}^3$ $C = 100 \text{ kPa}$ $E_s = 40 \text{ Mpa}$ $\mu = 0.3$ $G_s = 15 \text{ Mpa}$
4.0 - 15	Fractured Sand Stone, Slightly weathered	$\gamma_b = 20 \text{ kN/m}^3$ $\phi = 38^\circ$ $E_s = 75 \text{ Mpa}$ $\mu = 0.4$ $G_s = 25 \text{ Mpa}$

γ_b = Bulk unit Weight,
 C = Cohesion,
 E_s = Modulus of Elasticity,
 μ = Poisson's Ratio,
 G_s = Shear Modulus

5.4 Foundation Type

Generally, subsurface of adequate strength is available at the site. The isolated square/ strip foundations and mat foundations in order to transfer the loads of the structure to the underneath soil safely will be adequate.

5.5 Foundation Depth

The isolated square/ strip foundation & mat foundation are evaluated for 0.6 m, 1.0 m & 1.5 meter depth below NSL.

5.6 Net Allowable Bearing Pressure

The evaluations of net allowable bearing pressures have been made for isolated square/strip foundations and mat foundations, against tolerable settlements. Terzaghi bearing capacity approach has been used for the evaluation of bearing capacity in shear and one dimensional consolidation theory has been used for settlement evaluation of cohesive strata. The net allowable bearing pressure curves are attached to this report as

FIG. D-1 to D-12 (Appendix D). For recommended values see below mentioned tables.
(D-1 & D-2)

Any soft soil encountered at the excavation base of the foundation should be completely removed and backfilled with suitable granular material in a proper compaction.

Table D-1: Recommended Bearing Pressures

ZONE	FOUNDATION TYPE	DEPTH (m)	RECOMMENDED BEARING PRESSURE (kPa)
A	Strip / Square	0.6	100
		1.0	125
		1.5	150
	Mat	0.6	160
		1.0	200
		1.5	250
B	Strip / Square	0.6	175
		1.0	225
		1.5	275
	Mat	0.6	225
		1.0	300
		1.5	475

Table D-2: Location of Structures

Sr. #	STRUCTURE	ZONE
1	New Process Facilities Area	B
2	Slug Catcher	
3	PIG Receiver & Gathering Manifold	
4	Power Generator Building	
5	Diesel Storage Tank	
6	LPG Storage Bullets	
7	Water Treatment Shed	
8	Treated Water Storage Tank	
9	New Flare Stack	
10	Existing Flare Header	
11	Central Control Room (CCR)	A
12	Laboratory	
13	Fire Station	
14	Fire Fighting Shed	
15	Raw Water Tank	
16	Produced Water Treatment System	
17	Frie Water Storage Tank	
18	LPG Gantry	
19	Electrical Building	

5.7 Excavations

Generally excavations for foundations would be made in the overburden soil comprising lean clay/ silty clay/ fractured sand tone. Moderately mild temporary excavations with light/manual equipment would be possible in the overburden soils.

For guidance, the temporary excavation lines may be kept at a slope of 2V:1H or as determined by trials at site. The excavations may preferably not be done during rainy season or otherwise some special precautions may become necessary to ensure drainage of the excavations.

5.8 Damp-Proofing Measures

Proper damp-proofing of the foundations should be provided like use of water-proofing admixtures, use of rich mix and low water cement ratio in particular for the structures located near/along the nullah side.

5.9 Cement & Construction Materials

Ordinary Portland Cement (OPC) should be used for construction works. However, material from Margala should be used for aggregate materials.

5.10 Coefficient of Static Lateral Earth Pressure

It is recommended to use granular material as the backfill material behind the retaining walls. The backfill should be compacted to around 70 % relative density.

The static lateral earth pressure coefficients for active (K_a), at rest (K_o) and passive (K_p) conditions, using granular backfill, are recommended as follows:

$$\begin{aligned} K_a &= 0.33 \\ K_o &= 0.50 \\ K_p &= 3.00 \end{aligned}$$

For evaluation of earth pressure under earthquake conditions, the equations proposed by Mononobe-Okabe are recommended to be used.

5.11 Modulus of Sub-Grade Reaction

Modulus of sub-grade reaction (K_s) to be used in computer model for structural analysis can be evaluated from the basic definition of (K_s) by using the evaluated net allowable bearing pressure which causes the settlement under the maximum structural pressure and is follows:

For Strip & Square Foundations:

$$K_s \text{ (kN/m}^3\text{)} = \frac{\text{Net Allowable Bearing Pressure} \times \text{F.O.S}}{\text{Settlement (25 mm) under maximum structural pressure}}$$

For Mat Foundations:

$$K_s \text{ (kN/m}^3\text{)} = \frac{\text{Net Allowable Bearing Pressure} \times \text{F.O.S}}{\text{Settlement (50 mm) under maximum structural pressure}}$$

Following values of modulus of sub-grade reaction (K_s) may be used in the structural design of foundations:

Sr. #	Zone	Foundation Type	Modulus of Sub-Grade Reaction, K_s (kN/m ³)
1.	A	Strip/Square	30, 000
2.		Mat	25, 000
3.	B	Strip/Square	20, 000
4.		Mat	18, 000





Zealcon Engineering Pvt. Ltd

6. CONSIDERATION FOR ROADWAY DESIGN & CONSTRUCTION

6.1 General

For roadway design, testpits of 1 m depth were excavated. Samples collected from these testpits were subjected to AASHTO compaction and CBR test.

Summary of the test results is attached in Appendix C.

6.2 Design Recommendations

The CBR test results indicate that CBR value of 9 to 26.5 % at 95% modified dry density is available. Therefore, CBR value of 10 may be used for design of subgrade/embankment. Using Co-relation formula's, a value of modulus of subgrade reaction = 50,000 KN/m³ is proposed against CBR value of 10.





Zealcon Engineering Pvt. Ltd

7. CONCLUSION AND RECOMMENDATIONS

- (a) The project area may be divided into two zones on the basis of sub-surface soil conditions. The detail of both the zones is given in Section 4.1.
- (b) Net allowable bearing pressure curves recommended for the design of isolated square /strip foundation and mat foundation have been appended to this report as Fig. D-1, D-2, D-3 & D-4. The foundation should be placed at 1.5 meter depth below NSL.
- (c) Aggregate for concrete may be obtained from the Margalla subject to meeting the project specifications
- (d) Proper damp-proofing of the foundations should be provided like use of water-proofing admixtures, use of rich mix and low water cement ratio.
- (e) Appropriate drainage of the site area shall be ensured to prevent the accumulation of water from any source.
- (f) Any soft soil encountered at the excavation base of the foundation should be completely removed and backfilled with suitable granular material in a proper compaction.



APPENDICES

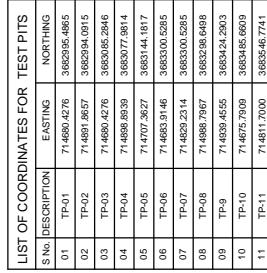
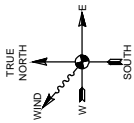
- **APPENDIX-A**
GEOTECHNICAL INVESTIGATION PLAN
- **APPENDIX-B:**
BOREHOLE AND TESTPIT LOGS
- **APPENDIX-C:**
LABORATORY TEST RESULTS
- **APPENDIX-D:**
BEARING CAPACITY CURVES



APPENDIX-A

GEOTECHNICAL INVESTIGATION PLAN





LIST OF COORDINATES FOR ERS		EASTING		NORTHING	
S/N	DESCRIPTION				
01	ERS-01	714756.1066	3683040.763		
02	ERS-02	714832.8971	3683055.596		
03	ERS-03	714750.0421	3683029.785		
04	ERS-04	714800.000	3683231.478		
05	ERS-05	714859.842	3683385.113		
06	ERS-06	714760.662	3683453.143		
07	ERS-07	714760.662	3683453.143		

LIST OF COORDINATES FOR BOR HOLES			
S. NO.	DESCRIPTION	EASTING	NORTHING
1	BH-01	714803.14	368330.241
2	BH-02	714803.716	368330.916
3	BH-03	714803.716	368330.916
4	BH-04	714803.542	368330.559
5	BH-05	714803.542	368330.559
6	BH-06	714803.542	368330.559
7	BH-07	714803.542	368330.559
8	BH-08	714803.542	368330.559
9	BH-09	714803.542	368330.559
10	BH-10	714803.542	368330.559
11	BH-11	714803.542	368330.559
12	BH-12	714803.542	368330.559
13	BH-13	714803.542	368330.559
14	BH-14	714803.542	368330.559
15	BH-15	714803.542	368330.559
16	BH-16	714803.542	368330.559
17	BH-17	714803.542	368330.559
18	BH-18	714803.542	368330.559
19	BH-19	714803.542	368330.559
20	BH-20	714803.542	368330.559
21	BH-21	714803.542	368330.559
22	BH-22	714803.542	368330.559
23	BH-23	714803.542	368330.559
24	BH-24	714803.542	368330.559
25	BH-25	714803.542	368330.559
26	BH-26	714803.542	368330.559
27	BH-27	714803.542	368330.559
28	BH-28	714803.542	368330.559
29	BH-29	714803.542	368330.559
30	BH-30	714803.542	368330.559
31	BH-31	714803.542	368330.559
32	BH-32	714803.542	368330.559
33	BH-33	714803.542	368330.559
34	BH-34	714803.542	368330.559
35	BH-35	714803.542	368330.559
36	BH-36	714803.542	368330.559
37	BH-37	714803.542	368330.559
38	BH-38	714803.542	368330.559
39	BH-39	714803.542	368330.559
40	BH-40	714803.542	368330.559
41	BH-41	714803.542	368330.559
42	BH-42	714803.542	368330.559
43	BH-43	714803.542	368330.559
44	BH-44	714803.542	368330.559
45	BH-45	714803.542	368330.559

APPENDIX-B

BOREHOLE AND TESTPIT LOGS



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No.	BH-1
----------------------	------

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

Logged by: _____

Drop Height: 30"

N: **E:**

Ground Elevation:

[illegible]

BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-2

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd


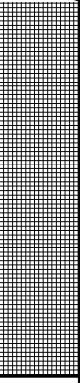
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--01	6"		CL	Brown, Hard, Lean Clay with concretion, Plastic	SPT-1				R	
--02					SPT-2				R	
--03					SPT-3				R	
--04			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-4				R	
--05					SPT-5				R	35
--06					SPT-6				R	40
--07				Bottom of Borehole						
--08										



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-3

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

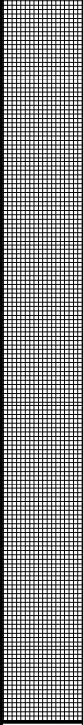
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
-- --01 -- -- --	6"		Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-1				R	
--02 -- --					SPT-2				R	30
--03 -- --					SPT-3				R	
--04 -- --					SPT-4				R	45
--05 -- --					SPT-5				R	35
--06 -- --					SPT-6				R	40
--07 -- --08				Bottom of Borehole						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No.	BH-4
----------------------	------

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

Logged by: _____

Drop Height: 30"

N:	E:
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

Ground Elevation:

[illegible]

BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-5

Sheet 02 of 04

Type of Drilling: Rotary Method

Ground water table: Not Encountered

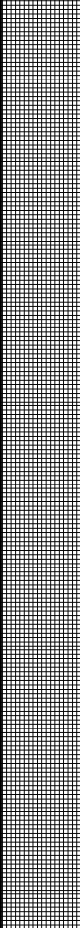
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- -- --09 -- -- -- -- --10 -- -- -- -- --11 -- -- -- --12 -- -- -- --13 -- -- -- --14 -- -- -- --15 -- -- -- --16	6"			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-9				R	50
						SPT-10				R	45
						SPT-11				R	40
						SPT-12				R	40
						SPT-13				R	45
						SPT-14				R	40
						SPT-15				R	50
						SPT-16				R	45



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-5

Sheet 03 of 04

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

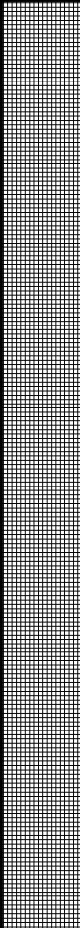
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
--	6"			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-17				R	50
--17						SPT-18				R	40
--18						SPT-19				R	40
--19						SPT-20				R	40
--20						SPT-21				R	40
--21						SPT-22				R	45
--22						SPT-23				R	45
--23						SPT-24				R	50
--24											



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT	Location:
---	------------------

Bore Hole No.	BH-5	Sheet 04 of 04
----------------------	------	-----------------------

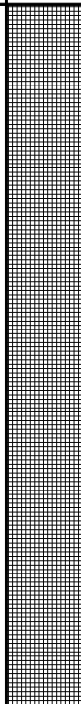
Type of Drilling: Rotary Method	Ground water table: Not Encounterd
--	---

Logged by:	Drop Height: 30"
-------------------	-------------------------

N:	E:	Ground Elevation:
-----------	-----------	--------------------------


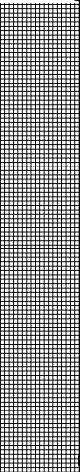
N:	E:	Ground Elevation:
-----------	-----------	--------------------------

N:	E:	Ground Elevation:
-----------	-----------	--------------------------

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- -- --25	6"			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-25				R	55
--26						SPT-26				R	50
--27						SPT-27				R	50
--28						SPT-28				R	53
--29						SPT-29				R	55
--30						SPT-30				R	50
					BOTTOM OF BOREHOLES						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT							Location:				
Bore Hole No. BH-7							Sheet 01 of 01				
Type of Drilling: Rotary Method							Ground water table: Not Encounterd				
Logged by:							Drop Height: 30"				
N: E:							Ground Elevation:				
Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
--01	6"			CL	Brown, Hard, Lean Clay with concreton, Plastic	SPT-1	2	2	2	4	
--02						SPT-2	3	3	5	8	
--03						SPT-3	6	7	8	15	
--04						SPT-4	6	7	9	16	
--05				Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-5				R	40
--06						SPT-6				R	40
--07						SPT-6				R	40
--08						SPT-6				R	45
Bottom of Borehole											



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT	Location:
---	------------------

Sheet 01 of 01

Type of Drilling: Rotary Method	Ground water table: Not Encounterd
--	---

Drop Height: 30"

N:	E:	Ground Elevation:
----	----	-------------------

SPT (inches)	N Value	
--------------	---------	--

			USCS Soil Classification	Sample no.	SPT (inches)	N Value	
--	--	--	--------------------------	------------	--------------	---------	--

[illegible]

BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-9

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd


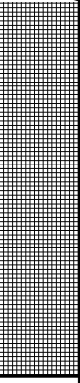
Logged by:

Drop Height: 30"

N:


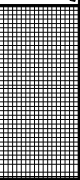
E:

Ground Elevation:

Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
-01	6"		CL	Brown, Hard, Lean Clay with concretion, Plastic	SPT-1				R	
-02					SPT-2				R	
-03					SPT-3				R	
-04			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-4				R	30
-05					SPT-5				R	40
-06					SPT-6				R	40
-07				Bottom of Borehole						
-08										



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-10						Sheet 01 of 01				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
01	6"		CL	Brown to Dark Brown, Soft to Stiff, Sandy Lean Clay, Low Plastic	SPT-1	20	25	14	39	
SPT-2					25	28	19	47		
SPT-3					30	45	25	70		
SPT-4								R		
SPT-5					R	50				
SPT-6					R	40				
05			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places						
06				End of Borehole						
07										
08										



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT							Location:			
Bore Hole No. BH-11							Sheet 01 of 01			
Type of Drilling: Rotary Method							Ground water table: Not Encountered			
Logged by:							Drop Height: 30"			
N:							E:			
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--01	6"	[Pattern]	Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-1				R	40
--02					SPT-2				R	
--03					SPT-3				R	
--04					SPT-4				R	
--05					SPT-5				R	
--06					SPT-6				R	
--07				BOTTOM OF BOREHOLE						
--08										

BOTTOM OF BOREHOLE



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-12

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

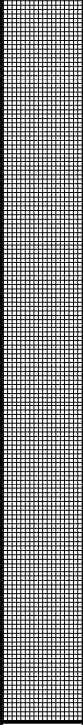
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- -- --01 -- -- -- -- --02 -- -- -- -- --03 -- -- -- -- --04 -- -- -- -- --05 -- -- -- -- --06 -- -- -- -- --07 -- -- --08	6"			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-1				R	25
						SPT-2				R	30
						SPT-3				R	28
						SPT-4				R	35
						SPT-5				R	35
						SPT-6				R	30
					Bottom of Borehole						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No.	BH-13
----------------------	-------

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

Logged by:

Drop Height: 30"

N:	E:
-----------	-----------

Ground Elevation:

[illegible]

BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-14

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encountered


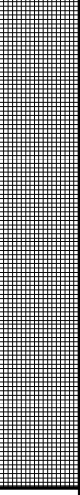
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--01	6"		CL	Brown to Dark Brown, hard, Lean Clay, Low Plastic	SPT-1				R	25
--02					SPT-2				R	
--03			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-3				R	
--04					SPT-4				R	
--05					SPT-5				R	
--06					SPT-6				R	
--07				End of Borehole						
--08										



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-15

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encountered


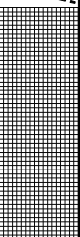
Logged by:

Drop Height: 30"

N:

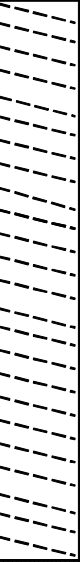
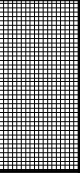
E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-01	6"			CL	Brown to Dark Brown, Soft to Stiff, Sandy Lean Clay, Low Plastic	SPT-1				R	
-02						SPT-2				R	
-03						SPT-3				R	
-04						SPT-4				R	
-05				Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-5				R	50
-06						SPT-5				R	45
-07					End of Borehole						
-08											



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT						Location:				
Bore Hole No. BH-16						Sheet 01 of 01				
Type of Drilling: Rotary Method						Ground water table: Not Encounterd				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
01	6"		CL	Brown to Dark Brown, Soft to Stiff, Sandy Lean Clay, Low Plastic	SPT-1	20	25	14	39	30
02					UDS-1					
03					SPT-2				R	
04					SPT-3				R	
05			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-4				R	
06										
07					End of Borehole					
08										



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-17

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

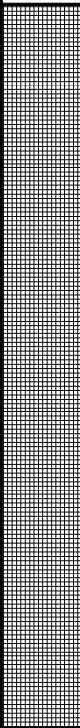
Logged by:

Drop Height: 30"

N:


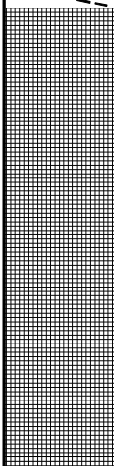
E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- -- --01 -- -- -- -- --02 -- -- -- -- --03 -- -- -- -- --04 -- -- -- -- --05 -- -- -- -- --06 -- -- -- -- --07 -- -- --08	6"			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-1				R	25
						SPT-2				R	25
						SPT-3				R	25
						SPT-4				R	30
						SPT-5				R	35
						SPT-6				R	30
					End of Borehole						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT							Location:					
Bore Hole No. BH-18							Sheet 01 of 01					
Type of Drilling: Rotary Method							Ground water table: Not Encounterd					
Logged by:							Drop Height: 30"					
N: E:							Ground Elevation:					
Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)	
				Symbol	Description		6	6	6			
01	6"			CL	Brown, very hard, lean clay with sand.	SPT-1	UDS-1			R		
02												
03				Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-2				R		50
04						SPT-3				R		
05						SPT-4				R		45
06					SPT-5	R						
07				BOTTOM OF BOREHOLE								
08												

BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-19

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

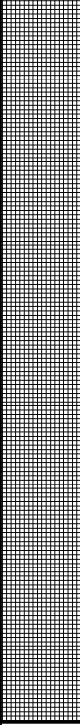
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- -- --01 -- -- -- -- --02 -- -- -- -- --03 -- -- -- -- --04 -- -- -- -- --05 -- -- -- -- --06 -- -- -- -- --07 -- -- --08	6"			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-1				R	
						SPT-2				R	35
						SPT-3				R	35
						SPT-4				R	35
						SPT-5				R	32
						SPT-6				R	30
					Bottom of Borehole						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-20

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

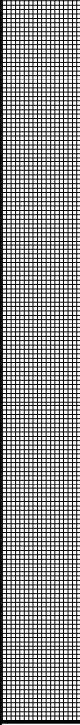
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- --01 -- -- -- --02 -- -- -- --03 -- -- --04 -- -- --05 -- -- --06 -- -- --07 -- --08	6"			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-1				R	
						SPT-2				R	23
						SPT-3				R	
						SPT-4				R	30
						SPT-5				R	
						SPT-6				R	25
					End of Borehole						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT	Location:
---	------------------

Sheet 01 of 01

Ground water table: Not Encounterd

Drop Height: 30"

Ground Elevation:

Ground Elevation:

[illegible]

BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-22

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

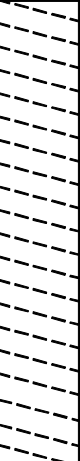
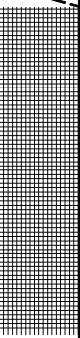
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--01	6"		CL	Brown, Hard, Lean Clay with concretion, Plastic	SPT-1					
--02					SPT-2				R	
--03					SPT-3				R	
--04					SPT-4				R	
--05			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-5				R	50
--06					SPT-6				R	45
--07				Bottom of Borehole						
--08										



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-23

Sheet 01 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encounterd


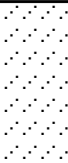

Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
--01	6"			CL	Brown to Dark Brown, Soft to Stiff, Sandy Lean Clay, Low Plastic	SPT-1	7	10	8	18	
--02						SPT-2	5	8	7	15	
--03						UDS-1					
--04						SPT-3	8	4	5	9	
--05				SM	Grey, Medium Dense to Very Dense, Fine to Medium Grian, Silty Sand, Trace Mica	SPT-4	6	9	13	22	
--06						SPT-5	30	35	39	74	
--07				CL	Dark Brown, very hard, Sandy Lean Clay, Low Plastic	SPT-6				R	
--08											



BORE HOLE LOG

Bore Hole No.	BH-23
----------------------	-------

Sheet 02 of 02

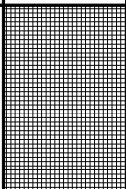
Logged by:

Drop Height: 30"

N:	E:
-----------	-----------

SPT (inches)	N Value	ROR (%)
--------------	---------	---------

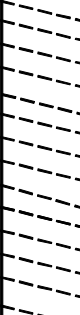
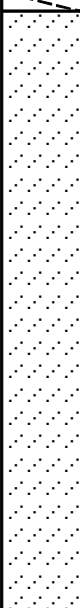
Depth (m)	Diameter (mm)	Length (mm)	USCS Soil Classification	Sample no.
-----------	---------------	-------------	--------------------------	------------

Depth (m)	Dia of Hole	Legend	Symbol	Description		6	6	6	Corrected	RQD (%)
--09	6"		Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-8				R	10
--10					SPT-9				R	10
--11					SPT-10				R	
--12					SPT-11				R	25
--13					SPT-12				R	
--14					SPT-13				R	20
--15					SPT-14				R	30

BOTTOM OF BOREHOLE



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT							Location:				
Bore Hole No. BH-24							Sheet 01 of 02				
Type of Drilling: Rotary Method							Ground water table: Not Encountered				
Logged by:							Drop Height: 30"				
N:							E:				
Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-01	6"			CL	Dark Brown, Stiff to very Stiff, Lean Clay	SPT-1	5	12	12	24	
-02						SPT-2	4	7	6	13	
-03		SM	Grey to Dark Grey, Very Dense, Fine to Medium Grain, Silty Sand, Trace Mica	SPT-3				R			
-04				SPT-4				R			
-05				SPT-5				R			
-06				SPT-6				R			
-07				SPT-7				R			
-08				SPT-8				R			

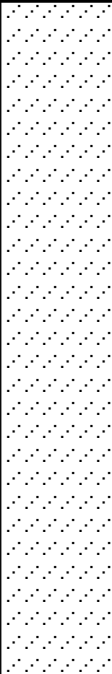


BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT							Location:			
Bore Hole No. BH-24							Sheet 02 of 02			
Type of Drilling: Rotary Method							Ground water table: Not Encounterd			
Logged by:							Drop Height: 30"			
N:							E:			
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
-09	6"		Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-9				R	
-10					SPT-10				R	35
-11					SPT-11				R	
-12					SPT-12				R	30
-13					SPT-13				R	20
-14					SPT-14				R	30
-15					SPT-15				R	30
				BOTTOM OF BOREHOLE						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT							Location:					
Bore Hole No. BH-25							Sheet 01 of 02					
Type of Drilling: Rotary Method							Ground water table: Not Encounterd					
Logged by:							Drop Height: 30"					
N: E:							Ground Elevation:					
Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)	
				Symbol	Description		6	6	6			
--01	6"			SM	Grey, Dense to Medium Dense, Fine Grianed, Sandy Silt / Silty Sand, Trace Mica	SPT-1	3	7	6	16		
--02						UDS-1						
--03						SPT-2	3	5	8	13		
--04						SPT-3	3	7	8	15		
--05						SPT-4	8	15	16	31		
--06						SPT-5				R		
--07						SPT-6				R		
--08					SM	Grey,Very Dense, Fine to Medium Grian, Silty Sand, Trace Mica	SPT-7				R	



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-25

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encountered

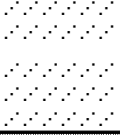
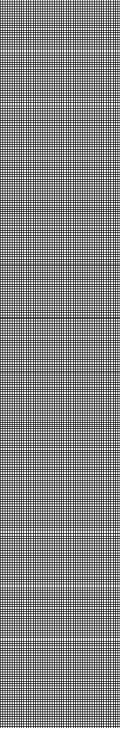
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD(%)
			Symbol	Description		6	6	6		
-09	6"		SM	Grey, Very Dense, Fine to Medium Grained, Silty Sand, Trace Mica	SPT-8				R	40
-10			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-9				R	
-11					SPT-10				R	
-12					SPT-11				R	
-13					SPT-12				R	
-14					SPT-13				R	35
-15					SPT-14				R	

BOTTOM OF BOREHOLE



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-26

Sheet 01 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

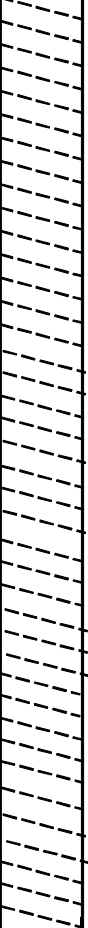
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- -- --01 -- -- -- -- --02 -- -- -- -- --03 -- -- -- -- --04 -- -- -- -- --05 -- -- -- -- --06 -- -- -- -- --07 -- -- -- -- --08	6"			CL	Brown, Hard, Lean Clay with concretion, Plastic	SPT-1	3	3	4	7	
						SPT-2	3	4	3	7	
						SPT-3	4	6	8	14	
						SPT-4	5	7	8	15	
						SPT-5				R	35
						SPT-6				R	40
						SPT-7				R	40
						SPT-8				R	45



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-26

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

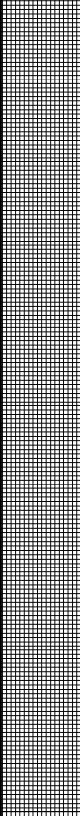
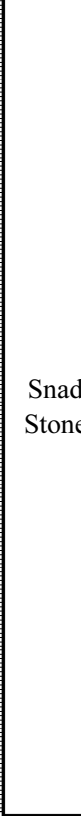
Logged by:

Drop Height: 30"

N:


E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- -- --09 -- -- -- -- --10 -- -- -- -- --11 -- -- -- -- --12 -- -- -- -- --13 -- -- -- -- --14 -- -- -- -- --15 -- -- -- --	6"				Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-9				R	40
						SPT-10				R	33
						SPT-11				R	30
						SPT-12				R	35
						SPT-13				R	30
						SPT-14				R	40
					Bottom of Borehole	SPT-5				R	38

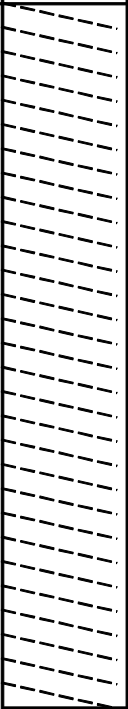
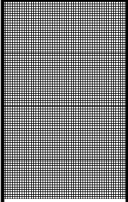


BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT							Location:				
Bore Hole No. BH-27							Sheet 01 of 02				
Type of Drilling: Rotary Method							Ground water table: Not Encounterd				
Logged by:							Drop Height: 30"				
N: E:							Ground Elevation:				
Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- --01 -- -- -- --02 -- -- -- --03 -- -- -- --04 -- -- -- --05 -- -- -- --06 -- -- -- --07 -- -- -- --08	6"			CL	Brown to Dark Brown, Stiff to very hard, Sandy Lean Clay, Low Plastic	SPT-1	2	2	3	5	
						SPT-2	2	3	4	7	
						SPT-3	3	4	4	8	
						SPT-4				R	
						SPT-5				R	
						SPT-6				R	
						SPT-7				R	
						SPT-8				R	

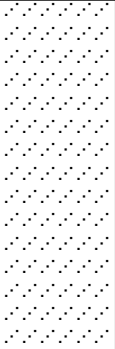
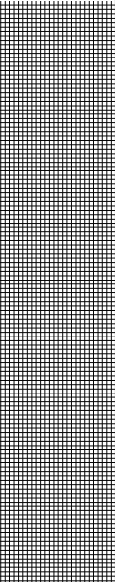


BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT							Location:				
Bore Hole No. BH-27							Sheet 02 of 02				
Type of Drilling: Rotary Method							Ground water table: Not Encountered				
Logged by:							Drop Height: 30"				
N:							E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD(%)	
			Symbol	Description		6	6	6			
-09	6"		CL	Brown to Dark Brown, Stiff to very hard, Sandy Lean Clay, Low Plastic	SPT-9				R	30	
-10					SPT-10				R		
-11					SPT-11				R		
-12					SPT-12				R		
-13					SPT-13				R		
-14					SPT-14				R		
-15					SPT-15				R		
			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places					35		
				BOTTOM OF BOREHOLE							



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-28						Sheet 01 of 02				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						Ground Elevation:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
-- -- -- -- --01 -- -- -- -- --02 -- -- -- -- --03 -- -- -- -- --04 -- -- --05 -- --06 -- -- --07 -- --08	6"		SM	Brown to Dark Brown, Stiff to very hard, Sandy Lean Clay, Low Plastic	SPT-1	2	2	3	5	
					SPT-2	2	3	4	7	
					SPT-3	3	4	4	8	
			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-4				R	
					SPT-5				R	30
					SPT-6				R	35
					SPT-7				R	
					SPT-8				R	25



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Sheet 02 of 02

Bore Hole No.	BH-28
----------------------	-------

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

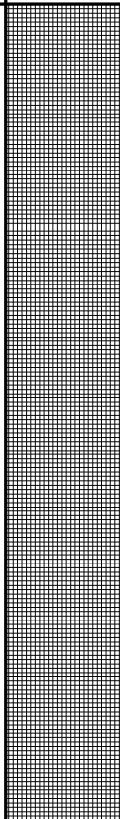
Logged by: _____

Drop Height: 30"

N:		E:		
				Sample no.

		Sample no.
--	--	------------

Ground Elevation:		
SPT (inches)		

Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--09	6"		Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-9				R	35
--10					SPT-10				R	38
--11					SPT-11				R	38
--12					SPT-12				R	35
--13					SPT-13				R	40
--14					SPT-14				R	45
--15					SPT-15				R	40
--16				BOTTOM OF BOREHOLE						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT	Location:
---	------------------

Bore Hole No.	BH-29	Sheet 01 of 02
----------------------	-------	------------------------------

Type of Drilling: Rotary Method	Ground water table: Not Encounterd
--	---

Logged by:	Drop Height: 30"
------------	------------------

N:	E:	Ground Elevation:
----	----	-------------------

			USCS Soil Classification	Sample no.	SPT (inches)	N Value	
--	--	--	--------------------------	------------	--------------	---------	--

Depth (m)	Dia of Hole	Legend				Corrected	RQD (%)
			Symbol	Description	6		

[illegible]

BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-29

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

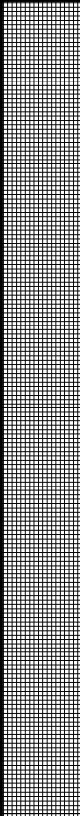
Logged by:

Drop Height: 30"

N:

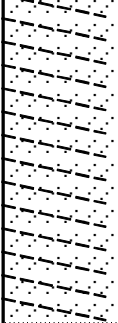
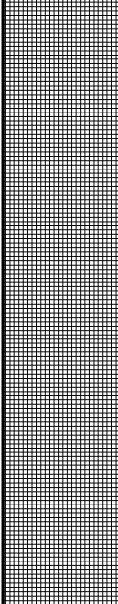
E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- -- --9 -- -- -- -- --10 -- -- -- --11 -- -- -- -- --12 -- -- -- --13 -- -- -- -- --14 -- -- -- -- --15 -- -- -- --16	6"			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-9				R	40



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-30						Sheet 01 of 05				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--01	6"		SC	Brown, Very Dense, Clayey Sand.	SPT-1	7	20	29	49	
--02					SPT-2				R	
--03					SPT-3				R	
--04			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-4				R	
--05					SPT-5				R	25
--06					SPT-6				R	25
--07					SPT-7				R	28
--08					SPT-8				R	30



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-30						Sheet 02 of 05				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
-- -- -- -- --09 -- -- -- -- --10 -- -- -- --11 -- -- -- --12 -- -- -- --13 -- -- -- --14 -- -- -- --15 -- -- -- --16	6"				SPT-9				R	30
					SPT-10				R	30
					SPT-11				R	25
					SPT-12				R	30
					SPT-13				R	35
					SPT-14				R	30
					SPT-15				R	30
					SPT-16				R	35

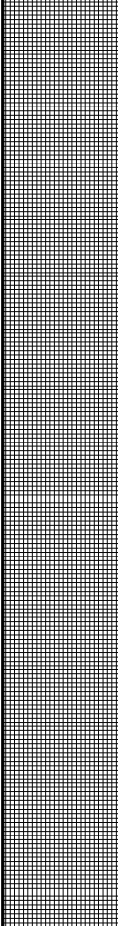
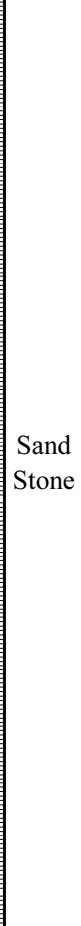


BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-30						Sheet 03 of 05				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
-- -- -- -- --17 -- -- -- --18 -- -- -- --19 -- -- -- --20 -- -- --21 -- -- --22 -- -- --23 -- -- --24	6"				SPT-17				R	
					SPT-18				R	35
					SPT-19				R	
					SPT-20				R	35
					SPT-21				R	36
					SPT-22				R	
					SPT-23				R	40
					SPT-24				R	



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-30						Sheet 04 of 05				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--25	6"			Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-25				R	40
--26					SPT-26				R	40
--27					SPT-27				R	45
--28					SPT-28				R	
--29					SPT-29				R	50
--30					SPT-30				R	
--31					SPT-31				R	35
--32					SPT-32				R	



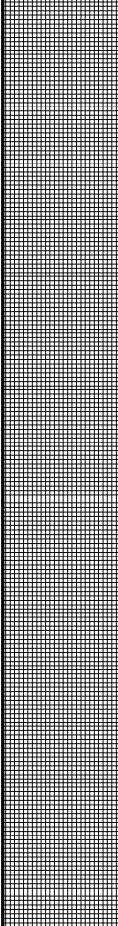
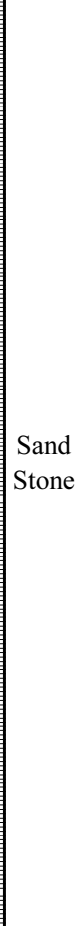
BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-30						Sheet 05 of 05				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--										
--										
--										
--										
--33					SPT-33				R	33
--										
--										
--										
--34					SPT-34				R	
--										
--										
--										
--35					SPT-35				R	65
--										
--										
--36					SPT-36				R	
--										
--										
--37					SPT-37				R	40
--										
--										
--38					SPT-38				R	
--										
--										
--39					SPT-39				R	45
--										
--										
--40					SPT-40				R	

BOTTOM OF BOREHOLE

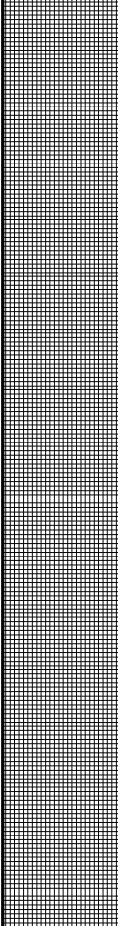
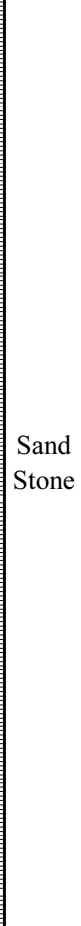


BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-31						Sheet 01 of 05				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--01	6"			Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-1				R	25
--02					SPT-2				R	28
--03					SPT-3				R	
--04					SPT-4				R	
--05					SPT-5				R	23
--06					SPT-6				R	23
--07					SPT-7				R	25
--08					SPT-8				R	



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-31						Sheet 02 of 05				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--09	6"			Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-9				R	30
--10					SPT-10				R	
--11					SPT-11				R	30
--12					SPT-12				R	32
--13					SPT-13				R	30
--14					SPT-14				R	
--15					SPT-15				R	
--16					SPT-16				R	35

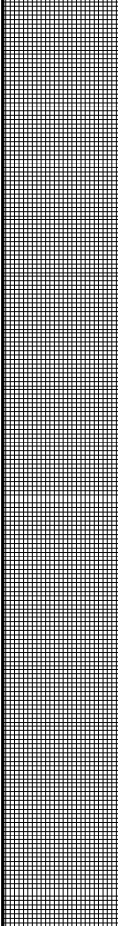
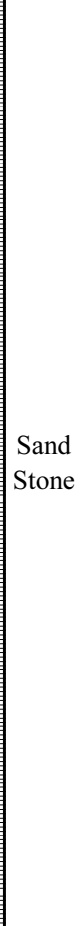


BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-31						Sheet 03 of 05				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
-- -- -- -- --17 -- -- -- --18 -- -- -- --19 -- -- -- --20 -- -- --21 -- -- --22 -- -- --23 -- -- --24	6"				SPT-17				R	
					SPT-18				R	40
					SPT-19				R	
					SPT-20				R	40
					SPT-21				R	
					SPT-22				R	35
					SPT-23				R	40
					SPT-24				R	

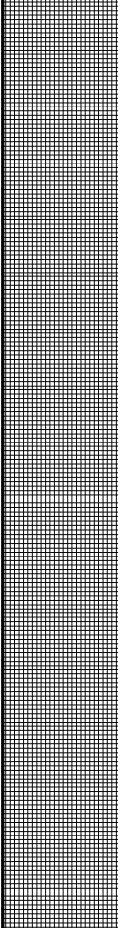
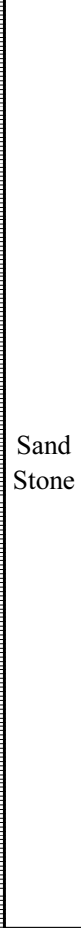


BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-31						Sheet 04 of 05				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						Ground Elevation:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--25	6"			Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-25				R	
--26					SPT-26				R	
--27					SPT-27				R	28
--28					SPT-28				R	
--29					SPT-29				R	35
--30					SPT-30				R	35
--31					SPT-31				R	
--32					SPT-32				R	45



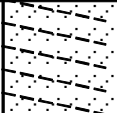
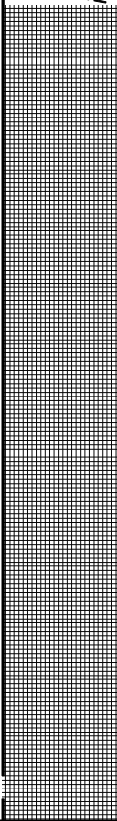
BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-31						Sheet 05 of 05				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--33	6"			Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-33				R	50
--34					SPT-34				R	
--35					SPT-35				R	45
--36					SPT-36				R	
--37					SPT-37				R	
--38					SPT-38				R	55
--39					SPT-39				R	
--40					SPT-40				R	60

BOTTOM OF BOREHOLE



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-32						Sheet 01 of 01				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--01	6"		CL	Brown to Dark Brown, Stiff to very hard, Sandy Lean Clay, Low Plastic	SPT-1				R	
--02			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-2				R	20
--03					SPT-3				R	20
--04					SPT-4				R	30
--05					SPT-5				R	25
--06					SPT-6				R	30
--07					SPT-7				R	30
--08					SPT-8				R	30

BOTTOM OF BOREHOLE



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No.	BH-33
----------------------	-------

Sheet 01 of 02

Type of Drilling: Rotary Method

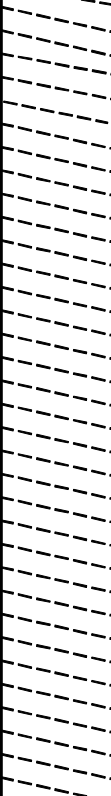
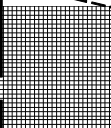
Ground water table: Not Encounterd

Logged by: _____

Drop Height: 30"

N:	E:
-----------	-----------

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
--01	6"			CL	Brown to Dark Brown, Stiff to very hard, Sandy Lean Clay, Low Plastic	SPT-1	4	5	5	10	
--02						SPT-2	8	13	14	27	
--03						SPT-3				R	
--04						SPT-4				R	
--05						SPT-5				R	
--06						SPT-6				R	
--07						SPT-7				R	
--08					Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-8				



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-33

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encountered

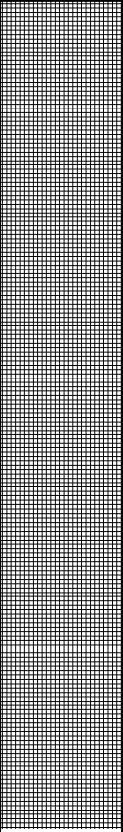

Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD(%)
				Symbol	Description		6	6	6		
-- -- -- -- --09 -- -- -- -- --10 -- -- -- -- --11 -- -- -- -- --12 -- -- -- -- --13 -- -- -- -- --14 -- -- -- --15 -- -- -- -- --	6"				Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-9				R	30
						SPT-10				R	30
						SPT-11				R	40
						SPT-12				R	25
						SPT-13				R	35
						SPT-14				R	30
						SPT-15				R	20
					BOTTOM OF BOREHOLE						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No.	BH-34
----------------------	-------

Sheet 01 of 02

Type of Drilling: Rotary Method

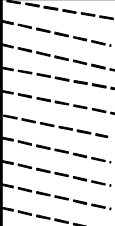
Ground water table: Not Encounterd

Logged by: _____

Drop Height: 30"

N: **E:**

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
--01	6"		CL	Dark Brown,Very Hard, Lean Clay, Plastic	SPT-1	7	18	30	48		
--02					SPT-2	10	20	29	49		
--03			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-3				R		
--04					SPT-4				R		
--05					SPT-5				R		
--06					SPT-6				R		
--07					SPT-7				R		
--08					SPT-8				R		



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-34

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encountered

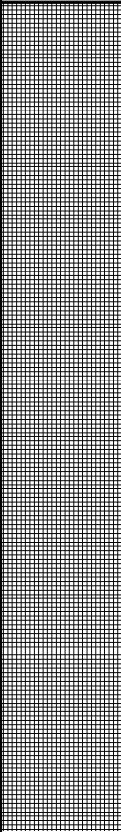
Logged by:

Drop Height: 30"

N:


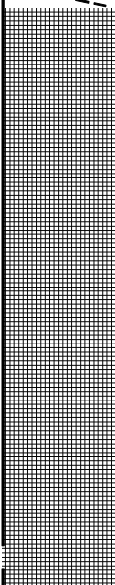
E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD(%)
				Symbol	Description		6	6	6		
-- --09 -- --10 --11 --12 -- --13 -- --14 --15 -- --	6"			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-9				R	30
SPT-10						R					
SPT-11						R					
SPT-12						R					
SPT-13						R					
SPT-14						R					
SPT-15						R					



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-35						Sheet 01 of 02				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						Ground Elevation:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--01	6"			Brown, very hard, lean clay with sand.	SPT-1	5	6	6	12	
--02					SPT-2	5	4	4	8	
--03					SPT-3				R	
--04			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-4				R	25
--05					SPT-5				R	20
--06					SPT-6				R	30
--07					SPT-7				R	30
--08					SPT-8				R	25



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-35

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encountered

Logged by:

Drop Height: 30"

N:

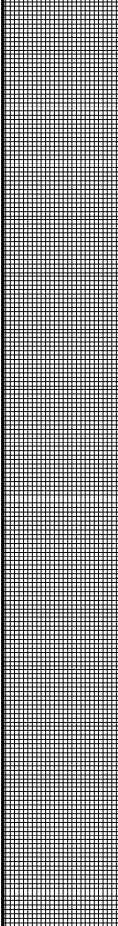
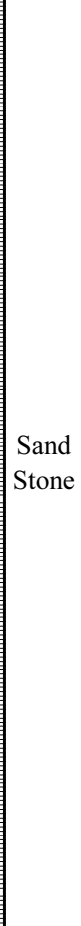
E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD(%)
				Symbol	Description		6	6	6		
-- --											



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-36						Sheet 01 of 02				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						E:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--01	6"			Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-1				R	36
--02					SPT-2				R	
--03					SPT-3				R	30
--04					SPT-4				R	
--05					SPT-5				R	30
--06					SPT-6				R	
--07					SPT-7				R	35
--08					SPT-8				R	35

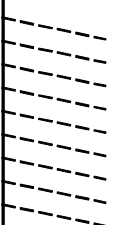
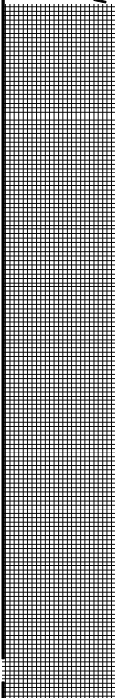


BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT							Location:			
Bore Hole No. BH-36							Sheet 02 of 02			
Type of Drilling: Rotary Method							Ground water table: Not Encountered			
Logged by:							Drop Height: 30"			
N:							Ground Elevation:			
E:										
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
--	6"	[Pattern]	Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-9				R	
--09										
--10					SPT-10				R	40
--11					SPT-11				R	
--12					SPT-12				R	40
--13					SPT-13				R	
--14					SPT-14				R	45
--15					SPT-15				R	48
--16					BOTTOM OF BOREHOLE					



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT						Location:				
Bore Hole No. BH-37						Sheet 01 of 04				
Type of Drilling: Rotary Method						Ground water table: Not Encountered				
Logged by:						Drop Height: 30"				
N:						Ground Elevation:				
Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
-- -- -- -- --01 -- -- -- -- --02 -- -- -- -- --03 -- -- -- --04 -- --05 -- --06 -- --07 -- --08	6"		CL	Brown, very hard, lean clay with sand.	SPT-1 SPT-2				R R	
			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-3 SPT-4 SPT-5 SPT-6 SPT-7 SPT-8				R R R R R	15 15 20



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No.	BH-37
----------------------	-------

Sheet 02 of 04

Type of Drilling: Rotary Method
--

Ground water table: Not Encounterd

Logged by:

Drop Height: 30"

N:	E:
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD(%)
				Symbol	Description		6	6	6		
--											
--09						SPT-9				R	32
--10		6"				SPT-10				R	
--11						SPT-11				R	
--12				Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-12				R	45
--13						SPT-13				R	
--14						SPT-14				R	40
--15						SPT-15				R	40
--16						SPT-16					



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-37

Sheet 03 of 04

Type of Drilling: Rotary Method

Ground water table: Not Encountered

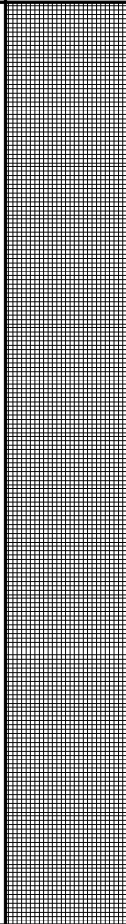
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD(%)
				Symbol	Description		6	6	6		
--	6"			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-17				R	30
--17						SPT-18				R	
--18						SPT-19				R	30
--19						SPT-20				R	
--20						SPT-21				R	
--21						SPT-22				R	
--22						SPT-23				R	40
--23						SPT-24				R	
--24											



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-37

Sheet 04 of 04

Type of Drilling: Rotary Method

Ground water table: Not Encountered

Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD(%)
				Symbol	Description		6	6	6		
--											
--											
--											
--25						SPT-25				R	
--											
--											
--26						SPT-26				R	50
--											
--											
--27						SPT-27				R	
--											
--											
--28						SPT-28				R	50
--											
--											
--29						SPT-29				R	
--											
--											
--30						SPT-30				R	
--											
--											
--31						SPT-31				R	40
--											
--32						SPT-32				R	

BOTTOM OF BOREHOLE



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-38

Sheet 01 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

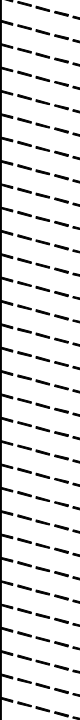
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
--01	6"			CL	Brown, Hard, Lean Clay with concretion, Plastic	SPT-1				R	
--02						SPT-2				R	
--03						SPT-3				R	
--04						SPT-4				R	
--05						SPT-5				R	
--06						SPT-6				R	
--07						SPT-7				R	
--08						SPT-8				R	



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No.	BH-38
----------------------	-------

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encounterd


Logged by: _____

Drop Height: 30"

N: **E:**

N: **E:**

Ground Elevation:

Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
09	6"		CL	Brown, Hard, Lean Clay with concretion, Plastic	SPT-1				R	
10				Bottom of Borehole	SPT-2				R	



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT	Location:
---	------------------

Bore Hole No.	BH-39	Sheet 01 of 02
----------------------	-------	------------------------------


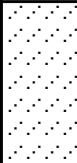
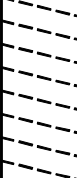
Type of Drilling: Rotary Method	Ground water table: Not Encounterd
--	---

Logged by:	Drop Height: 30"
------------	------------------

N:	E:	Ground Elevation:
----	----	-------------------

N:	E:	Ground Elevation:
----	----	-------------------

N:	E:	Ground Elevation:
----	----	-------------------

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
--01	6"			CL	Brown to Dark Brown, Soft to Stiff, Sandy Lean Clay, Low Plastic	SPT-1	2	5	3	8	
--02						UDS-1					
--03						SPT-2	1	1	1	2	
--04						SPT-3				R	
--05				SM	Grey, Medium Dense to Very Dense, Fine to Medium Grian, Silty Sand, Trace Mica	SPT-4				R	
--06						SPT-5				R	
--07				CL	Dark Brown, very hard, Sandy Lean Clay, Low Plastic	SPT-6				R	
--08						SPT-7				R	



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-39

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encountered

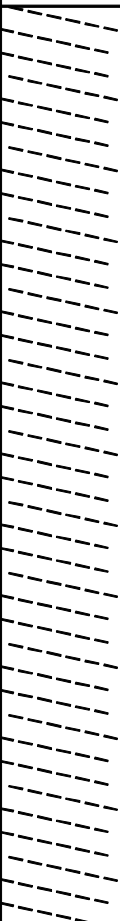
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)	
				Symbol	Description		6	6	6			
--	6"			CL	Dark Brown, very hard, Sandy Lean Clay, Low Plastic	SPT-8				R		
--09						SPT-9						R
--10						SPT-10						R
--11						SPT-11						R
--12						SPT-12						R
--13						SPT-13						R
--14						SPT-14						R
--15												
BOTTOM OF BOREHOLE												



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No.	BH-40
----------------------	-------

Sheet 01 of 02

Type of Drilling: Rotary Method

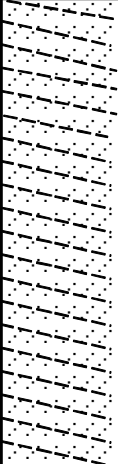
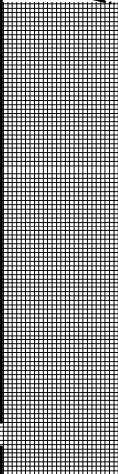
Ground water table: Not Encounterd

Logged by: _____

Drop Height: 30"

N:	E:
----	----

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
--01	6"		SC	Dark Brown, medium dense, Clayey Sand	SPT-1	4	5	4	9	30	
--02					UDS-1						
--03					SPT-2			R			
--04			SPT-3			R					
--05			SPT-4			R					
--06			SPT-5			R					
--07			SPT-6			R					
--08			SPT-7			R	30				
			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places							



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-40

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encountered

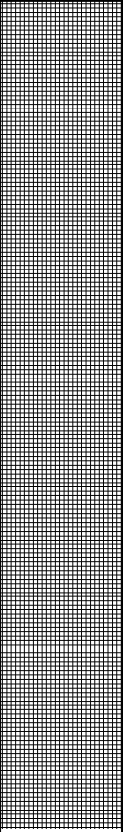

Logged by:

Drop Height: 30"

N:

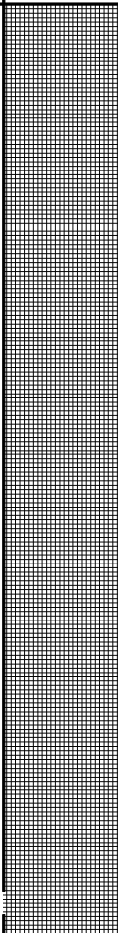
E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD(%)
				Symbol	Description		6	6	6		
-- -- -- -- --09 -- -- -- -- --10 -- -- -- --11 -- -- -- --12 -- -- --13 -- --14 -- --15 -- -- --	6"				Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-8				R	
						SPT-9				R	30
						SPT-10				R	
						SPT-11				R	
						SPT-12				R	40
						SPT-13				R	
						SPT-14				R	
					BOTTOM OF BOREHOLE						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT							Location:				
Bore Hole No. BH-41							Sheet 01 of 02				
Type of Drilling: Rotary Method							Ground water table: Not Encounterd				
Logged by:							Drop Height: 30"				
N: E:							Ground Elevation:				
Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- --01 -- -- -- -- --02 -- -- -- -- --03 -- -- -- -- --04 -- -- -- -- --05 -- -- -- -- --06 -- -- -- -- --07 -- -- -- -- --08	6"			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-1				R	25
						SPT-2				R	25
						SPT-3				R	30
						SPT-4				R	20
						SPT-5				R	25
						SPT-6				R	25
						SPT-7				R	25
						SPT-8				R	20



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-41

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

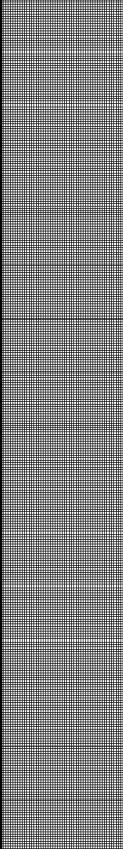
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD(%)
				Symbol	Description		6	6	6		
0	6"			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-8				R	30
0.5						SPT-9				R	
1						SPT-10				R	45
1.5						SPT-11				R	40
2						SPT-12				R	
2.5						SPT-13				R	40
3						SPT-14				R	
3.5											
4											
4.5											
BOTTOM OF BOREHOLE											



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-42

Sheet 02 of 02

Type of Drilling: Rotary Method

Ground water table: Not Encounterd

Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD(%)
				Symbol	Description		6	6	6		
-09	6"			Sand Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-8				R	
-10						SPT-9				R	
-11						SPT-10				R	40
-12						SPT-11				R	
-13						SPT-12				R	45
-14						SPT-13				R	
-15						SPT-14				R	50
					BOTTOM OF BOREHOLE						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-43

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encountered


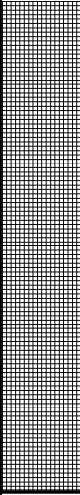
Logged by:

Drop Height: 30"

N:

E:

Ground Elevation:

Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
-01	6"		CL	Brown, Hard, Lean Clay with concretion, Plastic	SPT-1				R	
-02			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-2				R	
-03					SPT-3				R	30
-04					SPT-4				R	30
-05					SPT-5				R	35
-06					SPT-6				R	30
-07				Bottom of Borehole						
-08										



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVERY PLANT

Location:

Bore Hole No. BH-44

Sheet 01 of 01

Type of Drilling: Rotary Method

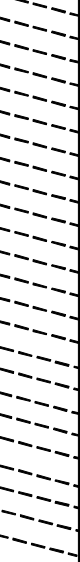
Ground water table: Not Encountered

Logged by:

Drop Height: 30"

N: **E:**

Ground Elevation:

Depth (m)	Dia of Hole		Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
				Symbol	Description		6	6	6		
-- -- -- --01 -- -- -- --02 -- -- -- --03 -- -- -- --04 -- -- -- --05 -- -- -- --06 -- -- -- --07 -- -- -- --08	6"			CL	Brown, Hard, Lean Clay with concretion, Plastic	SPT-1					
						SPT-2					
						SPT-3					25
						SPT-4					25
						SPT-5					20
					BOTTOM OF BOREHOLE						



BORE HOLE LOG

Project: NASHPA GAS PROCESSING AND LPG RECOVEREY PLANT

Location:

Bore Hole No. BH-45

Sheet 01 of 01

Type of Drilling: Rotary Method

Ground water table: Not Encounterd


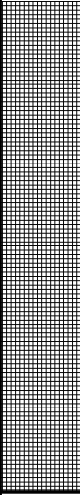
Logged by:

Drop Height: 30"

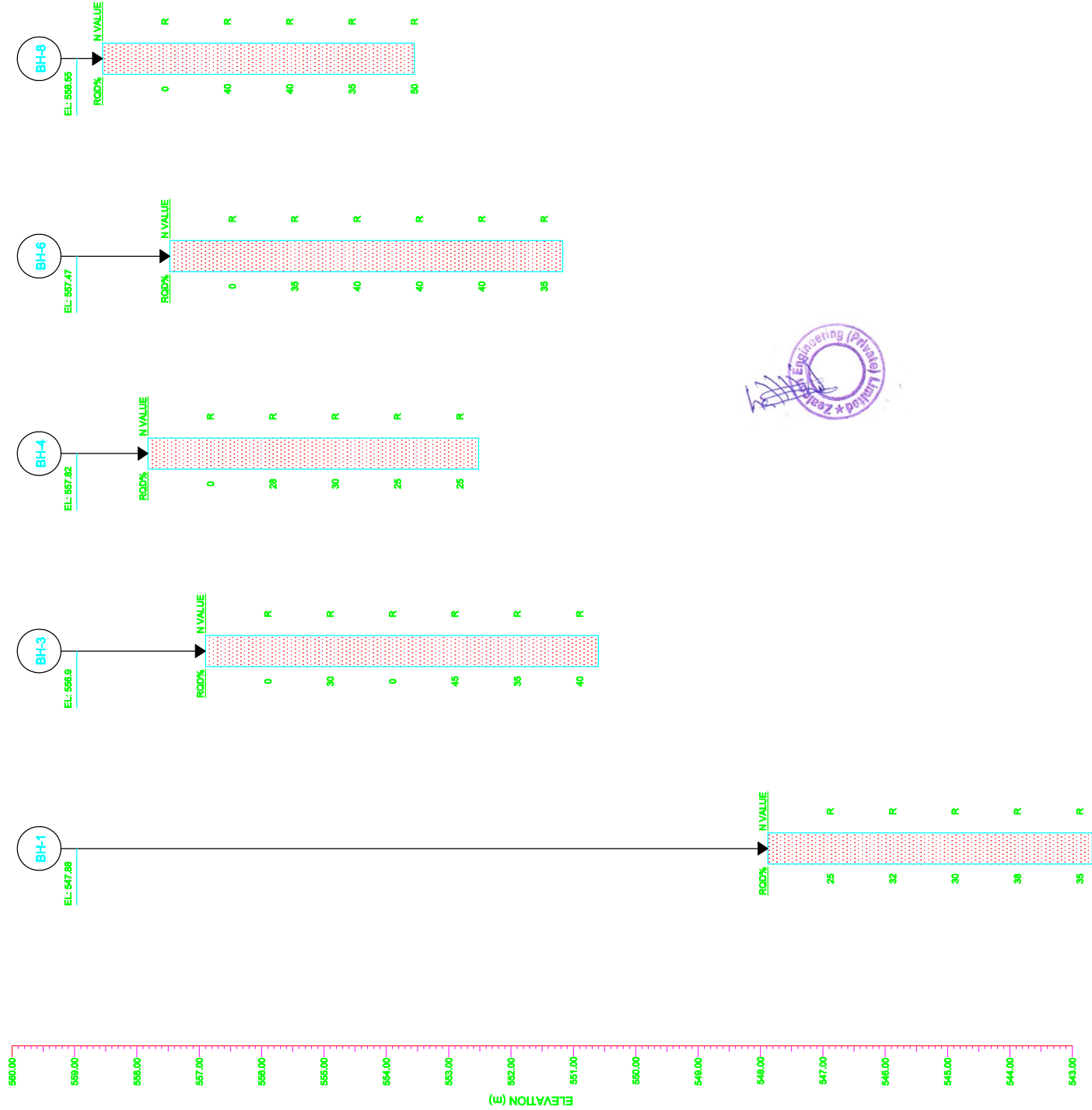
N:

E:

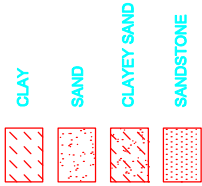
Ground Elevation:

Depth (m)	Dia of Hole	Legend	USCS Soil Classification		Sample no.	SPT (inches)			N Value Corrected	RQD (%)
			Symbol	Description		6	6	6		
-01	6"		CL	Brown, Hard, Lean Clay with concretion, Plastic	SPT-1					
-02			Snad Stone	Friable Sand Stone: Grey to Dark Grey, Fine Grained, Slightly weathered, Fractured at places	SPT-2				R	
-03					SPT-3				R	
-04					SPT-4				R	
-05					SPT-5				R	32
-06					SPT-6				R	45
-07				Bottom of Borehole						
-08										





LEGEND



NOTES:

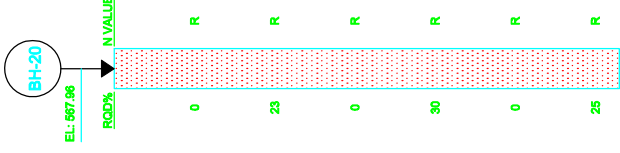
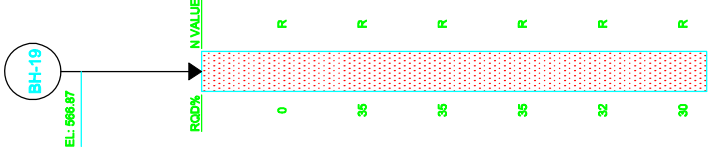
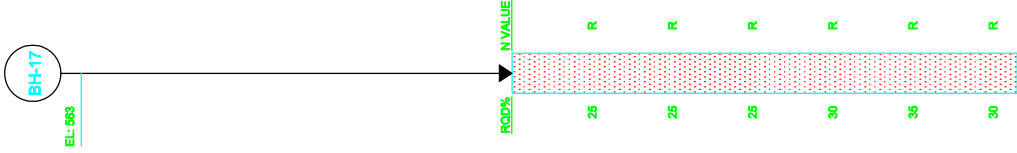
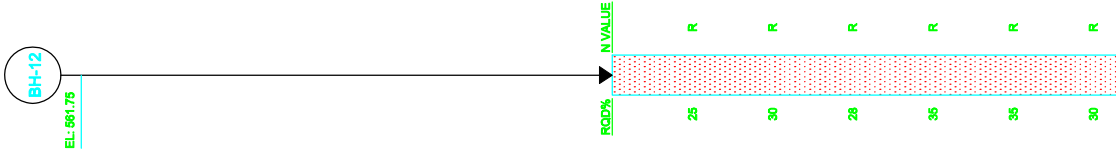
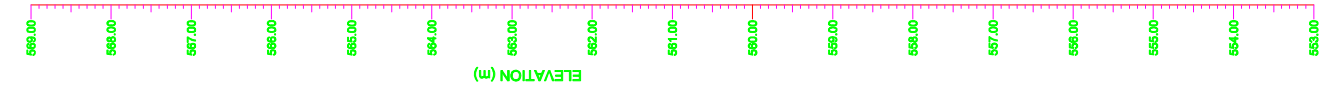
1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE NOTED.
2. THE WIDTH OF BOREHOLE IS NOT TO SCALE.



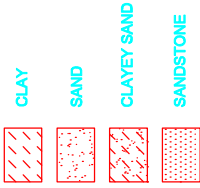
SCALE: [HOR. NTS] [VER. AS SHOWN]

GEOTECHNICAL INVESTIGATION OF
NASHPA GAS PROCESSING AND LPG RECOVERY PLANT
(ZONE A)

SUBSURFACE SOIL PROFILE



LEGEND



NOTES:

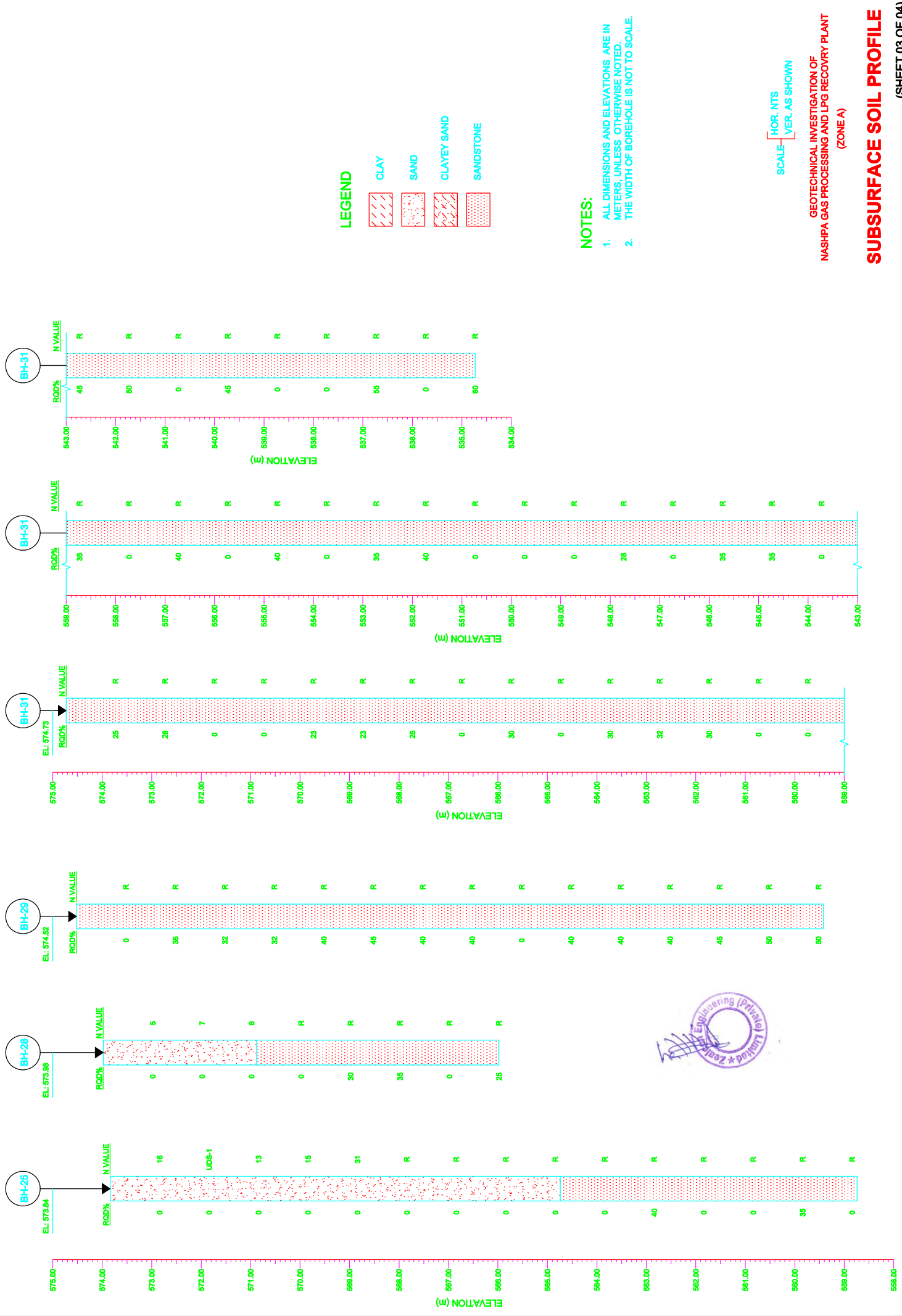
1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE NOTED.
2. THE WIDTH OF BOREHOLE IS NOT TO SCALE.



SCALE: [HOR. NTS] [VER. AS SHOWN]

GEOTECHNICAL INVESTIGATION OF
NASHPA GAS PROCESSING AND LPG RECOVERY PLANT
(ZONE A)

SUBSURFACE SOIL PROFILE

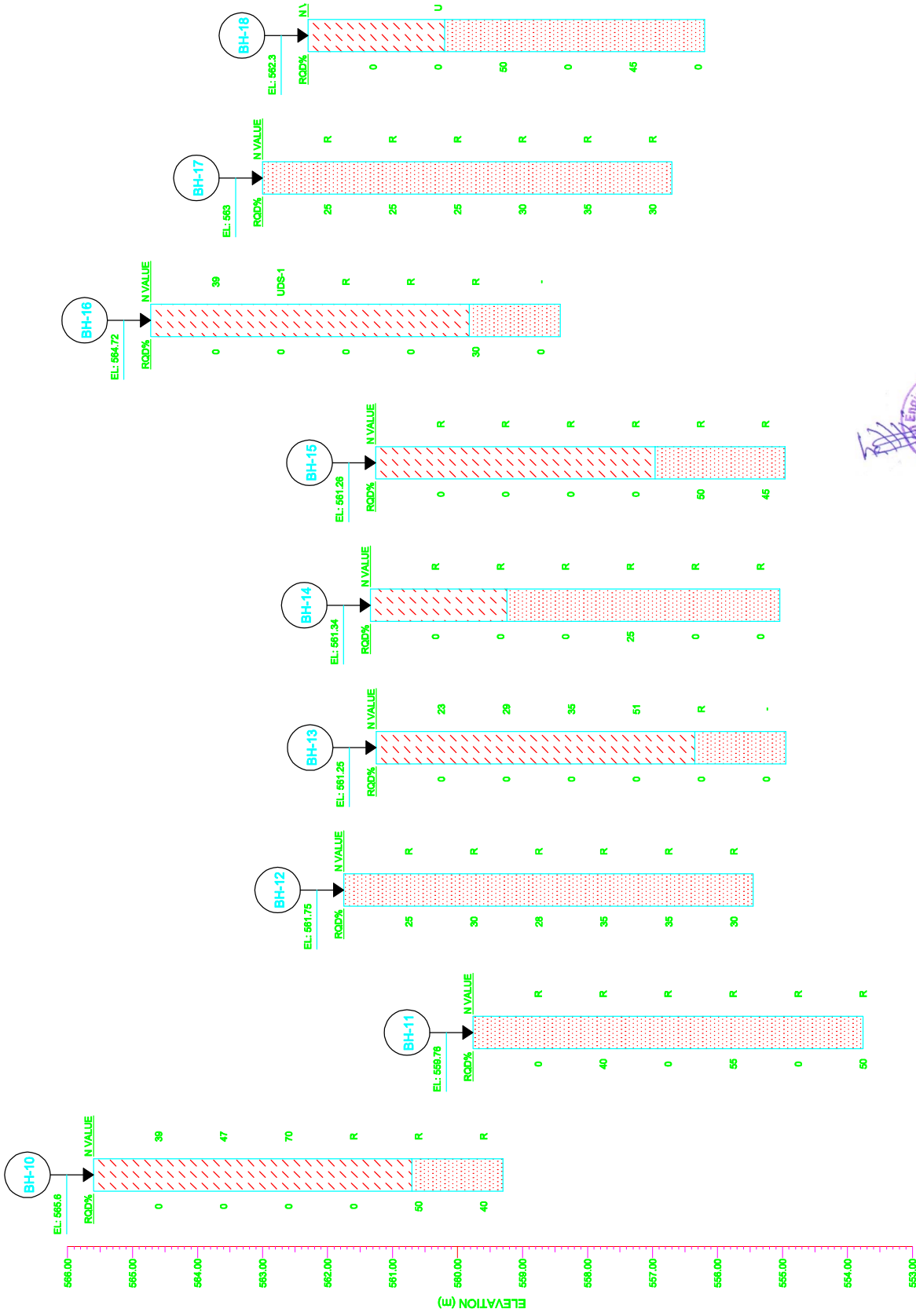




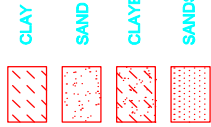


GEOTECHNICAL INVESTIGATION OF NASHPA GAS PROCESSING AND LPG RECOVERY PLANT (ZONE B)

SHEET 1 OF 8



LEGEND



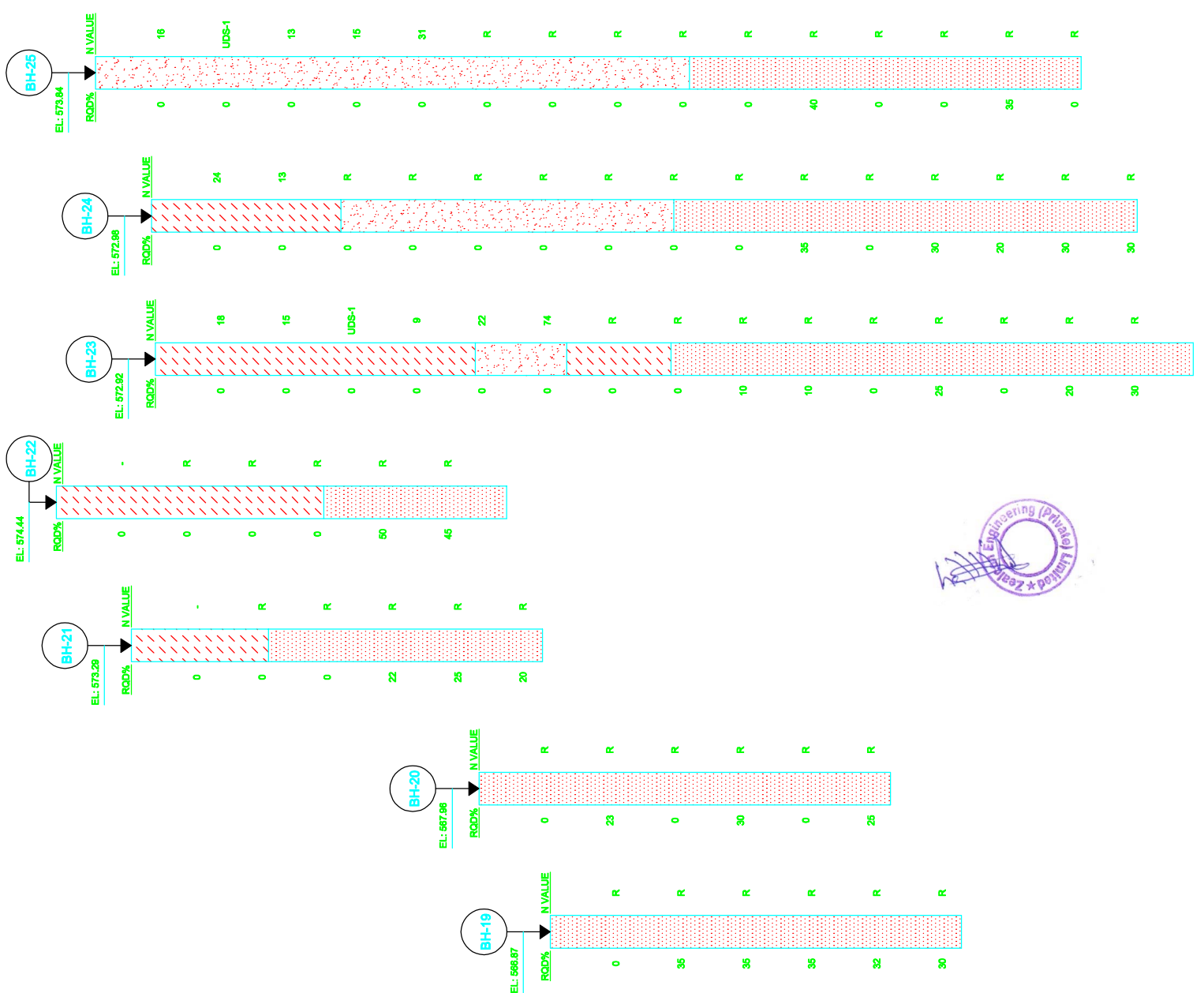
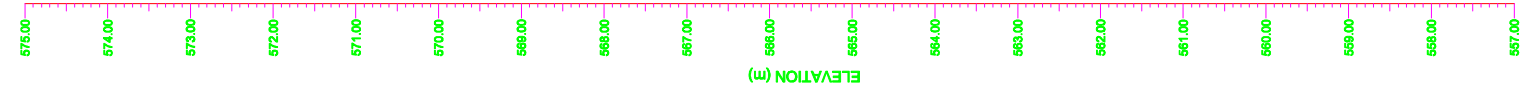
NOTES:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE NOTED.
2. THE WIDTH OF BOREHOLE IS NOT TO SCALE.

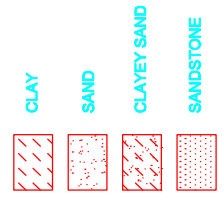
SCALE: **HOR. NTS**
VER. AS SHOWN

GEOTECHNICAL INVESTIGATION OF
NASHPA GAS PROCESSING AND LPG RECOVERY PLANT
(ZONE B)

SUBSURFACE SOIL PROFILE



LEGEND



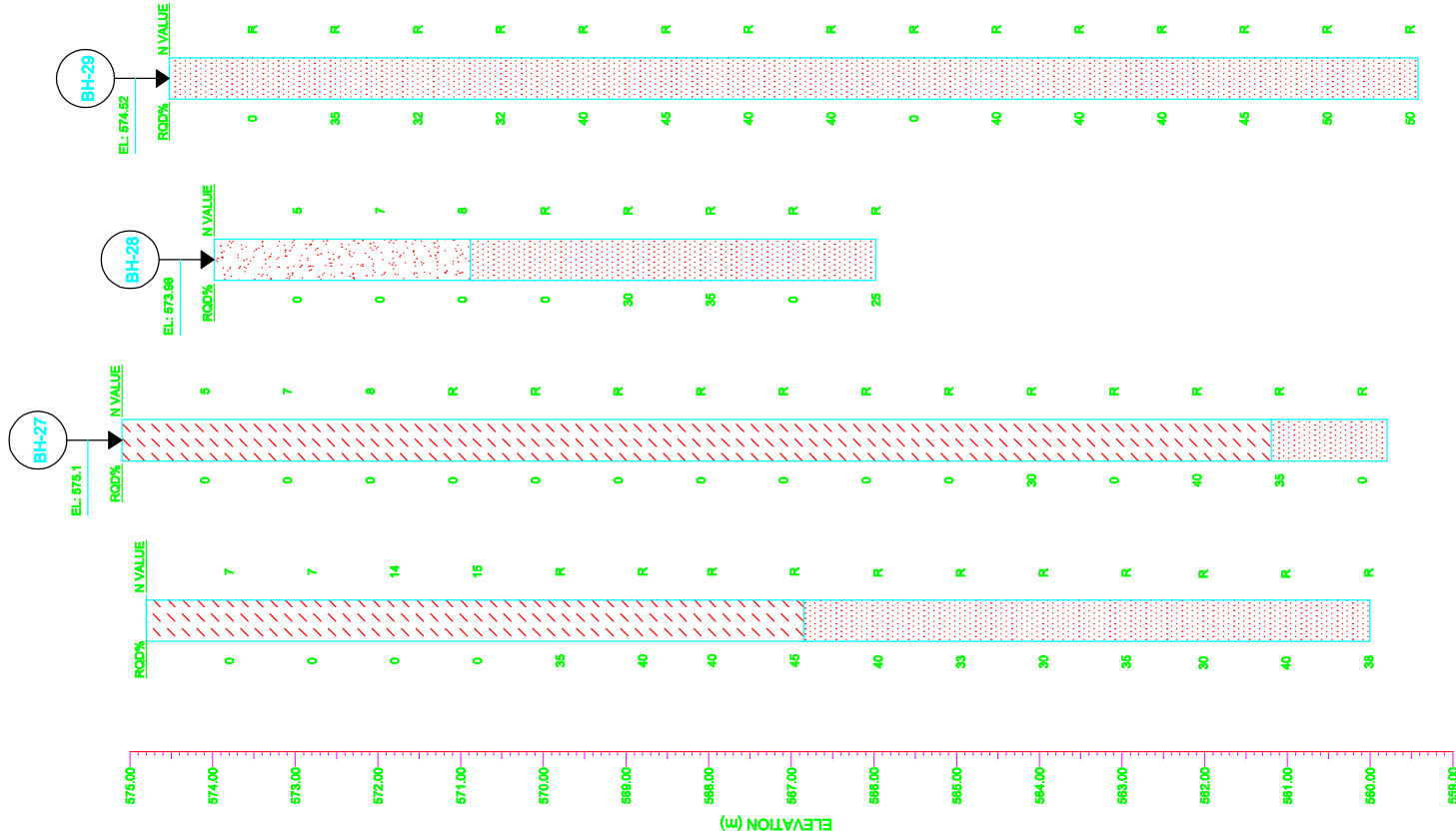
NOTES:

- 1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE NOTED.
- 2. THE WIDTH OF BOREHOLE IS NOT TO SCALE.

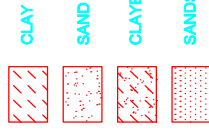


SCALE: [HOR. NTS] [VER. AS SHOWN]

GEOTECHNICAL INVESTIGATION OF
NASHPA GAS PROCESSING AND LPG RECOVERY PLANT
(ZONE B)



LEGEND



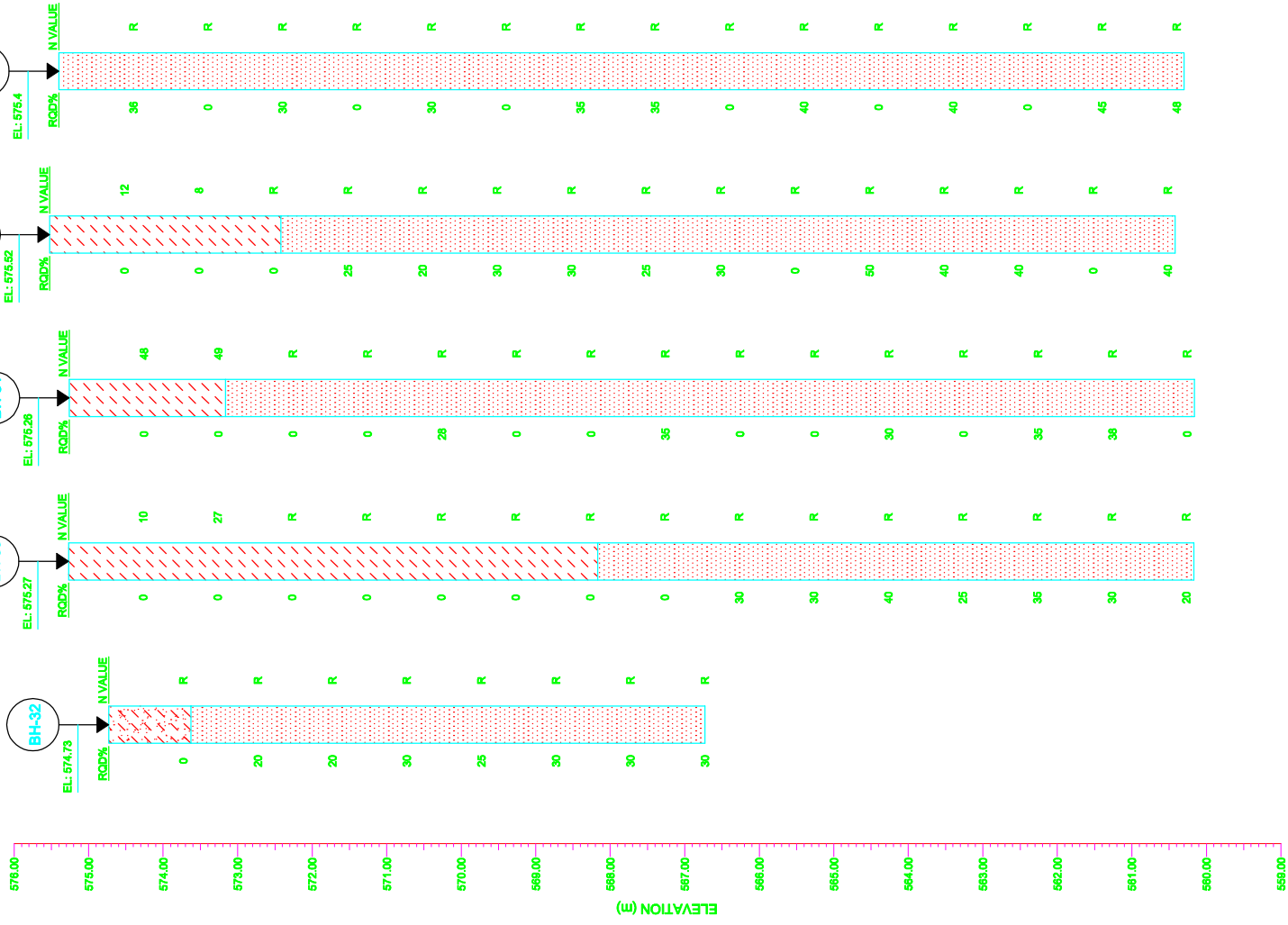
NOTES:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE NOTED.
2. THE WIDTH OF BOREHOLE IS NOT TO SCALE.

SCALE: HOR. NTS
VER. AS SHOWN

GEOTECHNICAL INVESTIGATION OF
NASHPA GAS PROCESSING AND LPG RECOVERY PLANT
(ZONE B)

SUBSURFACE SOIL PROFILE



LEGEND

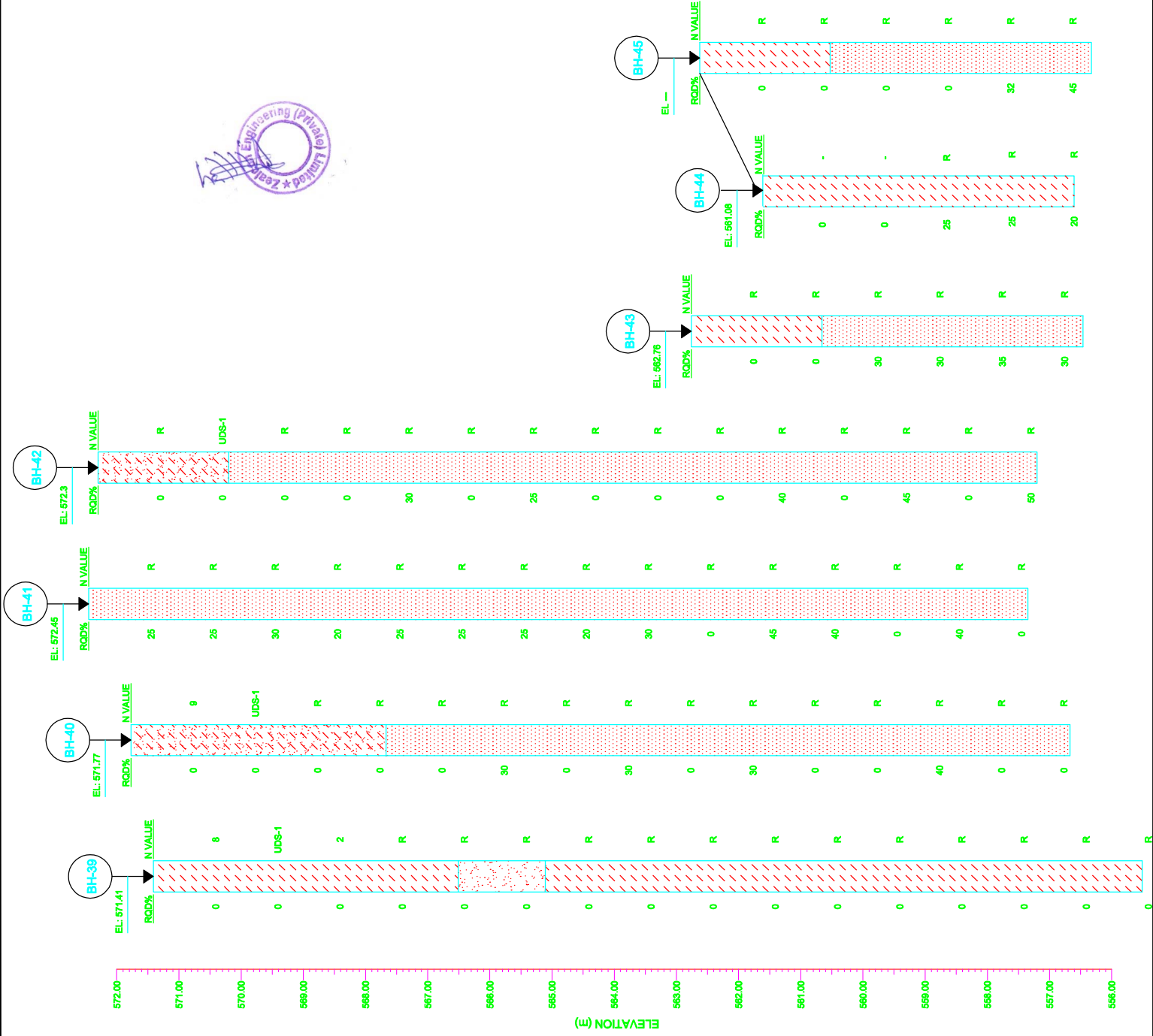
- CLAY
- SAND
- CLAYEY SAND
- SANDSTONE

NOTES:

- 1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE NOTED.
- 2. THE WIDTH OF BOREHOLE IS NOT TO SCALE.

SCALE: HOR. NTS
VER. AS SHOWN

GEOTECHNICAL INVESTIGATION OF
NASHPA GAS PROCESSING AND LPG RECOVERY PLANT
(ZONE B)



LEGEND

- CLAY
- SAND
- CLAYEY SAND
- SANDSTONE

NOTES:

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE NOTED.
- THE WIDTH OF BOREHOLE IS NOT TO SCALE.

SCALE: HOR. NTS
VER. AS SHOWN

GEOTECHNICAL INVESTIGATION OF
NASHPA GAS PROCESSING AND LPG RECOVERY PLANT
(ZONE B)

TEST PIT STRATA

SAFE

Project: Constrecution of NASHPA Gas LPG Plant,Kohat

Client Zeal Con Engineering

Test Pit # 1

Depth (m)	Material Description	Legends
0	Reddish Hard Silty Clay	
0.05		
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		



Prepared By

Amroxy

Checked By
























TEST PIT STRATA

SAFE

Project: Constuction of NASHPA Gas LPG Plant,Kohat

Client Zeal Con Engineering

Test Pit # 2

Depth (m)	Material Description	Legends
0	Silty Clay with Sand	
0.05		
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		



Prepared By

Amrood

Checked By

gpa
























TEST PIT STRATA

SAFE

Project: Constrction of NASHPA Gas LPG Plant,Kohat

Client Zeal Con Engineering

Test Pit # 3

Depth (m)	Material Description	Legends
0	Silty Clay with Sand	
0.05		
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		



Prepared By

Anwar

Checked By

[Signature]



TEST PIT STRATA

SAFE

Project: Constrction of NASHPA Gas LPG Plant,Kohat

Client Zeal Con Engineering

Test Pit # 4

Depth (m)	Material Description	Legends
0	Sand Stone	
0.05		
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		



Prepared By

Amir

Checked By



TEST PIT STRATA

SAFE

Project: Constrction of NASHPA Gas LPG Plant,Kohat

Client Zeal Con Engineering

Test Pit # 5

Depth (m)	Material Description	Legends
0	Reddish Hard Silty Clay	
0.05		
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		



Prepared By Amir

Checked By [Signature]



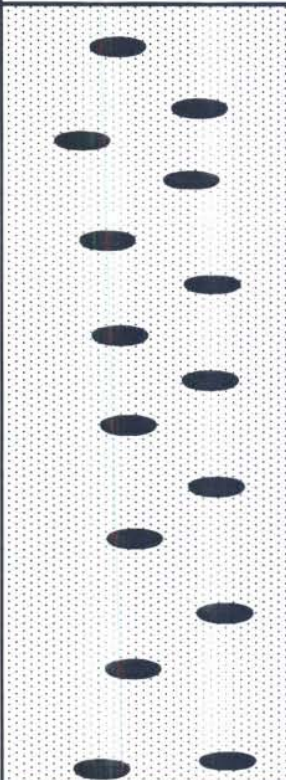
TEST PIT STRATA

SAFE

Project: Constrecution of NASHPA Gas LPG Plant,Kohat

Client Zeal Con Engineering

Test Pit # 6


Depth (m)	Material Description	Legends
0	Sand Stone	
0.05		
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		



Prepared By



Checked By


























TEST PIT STRATA

SAFE

Project: Constuction of NASHPA Gas LPG Plant,Kohat

Client Zeal Con Engineering

Test Pit # 7

Depth (m)	Material Description	Legends
0	Silty Clay with Boulder and Sand	
0.05		
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		



Prepared By

Shweta

Checked By

Yash



TEST PIT STRATA

SAFE

Project: Constrction of NASHPA Gas LPG Plant,Kohat

Client Zeal Con Engineering

Test Pit # 8

Depth (m)	Material Description	Legends
0	Silty Clay with Boulder and Sand	
0.05		
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		



Prepared By Amir

Checked By gmk



TEST PIT STRATA

SAFE

Project: Constrecution of NASHPA Gas LPG Plant,Kohat

Client Zeal Con Engineering

Test Pit # 9

Depth (m)	Material Description	Legends
0	Silty Clay with Sand Stone and Boulder	
0.05		
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		



Prepared By

Amwal

Checked By



TEST PIT STRATA

SAFE

Project:


Constuction of NASHPA Gas LPG Plant,Kohat

Client

Zeal Con Engineering

Test Pit #

10

Depth (m)	Material Description	Legends
0	Reddish Hard Silty Clay	
0.05		
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		



Prepared By

Amrood

Checked By

Yash





















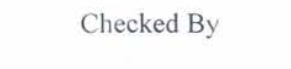





TEST PIT STRATA

SAFE

Project: Constrction of NASHPA Gas LPG Plant,Kohat

Client Zeal Con Engineering

Test Pit # 11

Depth (m)	Material Description	Legends
0	Silty Clay with Sand	
0.05		
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8	Sand Stone	
0.85		
0.9		
0.95		
1		
1.05	Sand Stone	
1.1		
1.15		



Prepared By

Shweta

Checked By

Yash



APPENDIX-C

LABORATORY TEST RESULTS



NASHPA GAS PROCESSING AND LPG RECOVERY PLANT
SUMMARY OF THE LABORATORY TEST RESULTS

Sr. No.	BH #	Sample No.	Depth	Natural Moisture Content NMC	In-situ Bulk Density	Gradation				Atterberg Limits			Material Classification		Direct Shear Test		Oedometer Test		Unconfined Compression Test	
						GRAVEL %	SAND %	SILT & CLAY %	LL	PL	PI	Unified Soil Classification System Symbol (USCS)	Material Description	ϕ	C	e _o	c _c	Qu	Failure strain	
																				(%)
1	BH-2	SPT-1	1.0 -1.45	(%)	(kN/m ³)	83	7	10					GP-GM	Poorly Graded Gravel with Silt	(Degree)	(kPa)	-			%
2	BH-3	SPT-1	1.0 -1.45			71	4	25					GM	Silty Gravel						
3	BH-6	SPT-1	1.0 -1.45			9.7	22.3	68	27	20	7		CL-ML	Sandy Silty Clay						
4	BH-10	SPT-1	1.0-1.45			0	2	98	39	23	16		CL	Sanday Lean Clay						
5		SPT-3	3.0-3.45			1	3	96	37	18	19		CL	Sanday Lean Clay						
6	BH-13	UDS-1	2.0-2.20			15	5	80	33	25	8		CL	Sanday Lean Clay			0.53	0.06		
7		SPT-3	4.0 -4.45			20	4	76	35	25	10		CL	Sanday Lean Clay						
8		SPT-1	1.0-1.45			1	4	95	40	20	20		CL	Sanday Lean Clay						
9	BH-15	UDS-1	2.0-2.2			17.4	18	64.6	35	19	16		CL	Sanday Lean Clay with Gravel			0.45	0.04	209	0.23
10		SPT-3	3.0-3.45			0	2	98	34	19	15		CL	Sanday Lean Clay						
11	BH-16	UDS-1	2.0-2.45			1	52	47	31	20	11		SC	Clayey Sand			0.55	0.06	263	0.26
13		SPT-3	3.0-3.45			0	3	97	39	23	16		CL	Sanday Lean Clay						
14		SPT-1	3.0-3.45			0	0.9	99	41	28	13		CL	Lean Clay						
15		SPT-2	2.0-2.45			0	35	65	35	26	9		CL	Sanday Lean Clay						
16	BH-23	UDS-1	3.0-3.2			0	12	88	42	26	16		CL	Sanday Lean Clay			0.49	0.08	150	0.35
17		SPT-4	5.0-5.45			3	55	42					SM	Silty Sand	31	1				
18		SPT-6	7.0-7.45			1	48	51					CL	Sanday Lean Clay						
19		SPT-3	3.0-3.45			0	69	31					SM	Silty Sand						
20	BH-24	SPT-7	7.0-7.45			0	60	40					SM	Silty Sand						
21		SPT-10	10.0-10.45			2	91	7					SP-SM	Poorly Graded Sand with Silt	31	0.9				
22	BH-25	UDS-1	2.0-2.3			4	63	33					SM	Silty Sand						
23		SPT-3	4.0-4.45			0	40	60					SM	Silty Sand						



NASHPA GAS PROCESSING AND LPG RECOVERY PLANT
SUMMARY OF THE LABORATORY TEST RESULTS

Sr. No.	BH #	Sample No.	Depth (m)	Natural Moisture Content NMC (%)	In-situ Bulk Density (kN/m ³)	Gradation			Atterberg Limits			Material Classification		Direct Shear Test		Oedometer Test		Unconfined Compression Test	
						GRAVEL %	SAND %	SILT & CLAY %	LL (%)	PL (%)	PI (%)	Unified Soil Classification System Symbol (USCS)	Material Description	Φ (Degree)	C (kPa)	e _o	cc	Qu (kPa)	Failure strain %
24	BH-27	SPT-1	1.0-1.45			0	57	43	35	20	15	SC	Clayey Sand	29	1.5				
25		SPT-4	4.0-4.45			1	13	86				CL	Sanday Lean Clay						
26	BH-30	SPT-1	1.0-1.45			1	65	34				SM	Silty Sand						
27		SPT-2	2.0-2.45			1	65	34				SM	Silty Sand						
28	BH-32	SPT-1	1.0-1.45			0	35	65				CL	Sandy Lean Clay						
29		UDS-1	2.0-2.20			0	33	67				CL	Sandy Lean Clay						
30	BH-33	SPT-5	5.0-5.45			3	45	52	23	18	5	CL	Lean Clay with Sand						
31		SPT-1	1.0-1.45			0	15	85	27	20	7	CL	Lean Clay with Sand						
32		SPT-3	3.0-3.45			18	5	77	32	24	8	CL	Sanday Lean Clay with Gravel						
33		SPT-4	4.0-4.45			0	38	62	33	21	12	CL	Lean Clay with Sand						
34	BH-34	SPT-2	2.0-2.45			2	43	55	23	18	5	CL-ML	Sandy Silty Clay						
35		SPT-1	1.0-1.45			2	47	51				CL-ML	Sandy Silty Clay						
36	BH-35	UDS-1	2.0-2.45			0	3	97				CL	Lean Clay with Sand						
37		SPT-1	1.0-1.45			0	5	95	29	22	7	CL	Lean Clay with Sand						
38	BH-37	SPT-2	2.0-2.45						38	25	13	CL	Lean Clay with Sand						
39		SPT-1	1.0-1.45			0	5	95	39	23	16	CL	Lean Clay						
40	BH-38	UDS-1	2.0-2.2			11	66	23	33	21	12	SC	Clayey Sand						
41		SPT-1	1.0-1.45			0	48	52				CL	Lean Clay with Sand						
42	BH-39	UDS-1	2.0-2.54			0	42	58	28	18	10	CL	Lean Clay with Sand					60	0.24
43		SPT-5	5.0-5.45			0	67	33				SM	Silty Sand						
44	BH-40	UDS-1	2.0-2.2			6	53	41	25	19	6	SC	Clayey Sand						
45		SPT-1	1.0-1.45			5	51	44	24	20	4	SC	Clayey Sand						
46	BH-43	SPT-1	1.0-1.45			17	26	57	38	25	13	CL	Sandy Lean Clay						
47																			



Table C-2

Chemical Analysis of Soil						
BH No.	Sample No	Depth	Suplhate	chloried %	Orgnic %	
16	SPT-2	3.0-3.45	0.04	0.02	0.8	
33	SPT-3	3.0-3.45	0.03	0.02	0.9	
32	SPT-1	1.0-1.45	0.04	0.03	0.9	
34	SPT-3	3.0-3.45	0.03	0.01	0.5	
25	UDS-1	2.0-	0.04	0.03	0.6	
38	SPT-1	1.0-1.45	0.05	0.03	0.8	



Table C-3

SUMMARY OF TEST RESULTS ON ROCK CORES					
SR. No.	BH # No.	Sample No.	Depth	Bulk Density	UCS on Rock in Kpa
1	B.H#1	R2	1.0-2.0	2.46	830
2	B.H#2	R1	2	2.485	910
3	B.H#3	R2	3.0-4.0	2.515	990
		R3	4.0-5.0	2.525	1050
4	B.H#5	R2	3.0-4.0	2.508	1030
		R6	7.0-8.0	2.55	1270
5	B.H#6	R3			
6	B.H#8	R2	1.0-2.0	2.485	970
		R4	3.0-4.0	2.505	1030
7	B.H#10	R2	5.0-6.0	2.535	
8	B.H#13	R1	5.0-5.5	2.525	1150
9	B.H#15	R3	5.0-6.0	2.54	1210
10	B.H#16	R2	5.0-6.0	2.505	1050
11	B.H#17	R2	2.0-3.0	2.485	980
		R4	4.0-5.0	2.503	1150
		R5	5.0-6.0	2.545	1170
12	B.H#29	R2	2	2.465	940
		R7	7	2.55	1270
		R11	11	2.57	1310
13	B.H#30	R5	8	2.53	1190
		R15	18	2.62	1450
14	B.H#31	R4	4	2.52	1070
		R8	8	2.545	1120
		R11	11	2.603	1290
15	B.H#32	R3	5.0-6.0	2.531	1130
		R5	7.0-8.0	2.555	1210
16	B.H#33	R1	7.0-8.0	2.535	1190
		R4	11.0-12.0	2.605	1310
		R8	14.0-15.0	2.625	1330
17	B.H#34	R2	6	2.545	1120
18	B.H#35	R2	5.0-6.0	2.525	1050
		R8	11.0-12.0	2.56	1270
19	B.H#36	R1	1	2.485	990
		R7	7	2.54	1050
		R14	14	2.56	1110
20	B.H#37	R2	3.0-4.0	2.485	1030
		R5	6.0-7.0	2.535	1210
		R11	13-14.0	2.57	1290
21	B.H#38	R1	5.0-6.0	2.505	970
		R3	7.0-8.0	2.525	1010
22	B.H#40	R6	7.0-8.0	2.535	1130
		R10	11.0-12.0	2.555	1190
23	B.H#41	R2	2.0-3.0	2.49	990
		R6	6.0-7.0	2.53	1050
		R11	11.0-12.0	2.565	1210
24	B.H#43	R1	1.0-2.0	2.47	880
		R3	3.0-4.0	2.51	950



SUMMARY SHEET

Project:-

CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Table-1 of 4

TP No.	Depth	Passing %age through Sieve Size							Atterberg Limit			Soil Classification	Field Compaction		Laboratory Compaction		Compaction %age	CBR Value at .2"			Swelling % age
		1 1/2	3/4	No. 4	No. 10	No. 40	No. 100	No. 200	LL	PL	PI		Field Dry Density	M. C. %age	Max. Dry. Density g/cc	Opt M.C. %age		90 %	95 %	100%	
1	0.50											A-4 (0)	1.934	6.5	-----	-----	94.3	-----	-----	-----	0.044
	1.0												1.916	7.5	-----	-----	93.5	-----	-----	-----	To
	CS		100	90	79	74	66	60	27	20	7		-----	-----	2.05	8.5	-----	6.7	11.3	15.4	0.087
2	0.50											A-4 (0)	1.782	5.5	-----	-----	91.9	-----	-----	-----	0.044
	1.0												1.773	6.5	-----	-----	91.4	-----	-----	-----	To
	CS			100	99	98	70	44					-----	-----	1.94	12.2	-----	6.2	9.0	11.8	0.131
3	0.50											A-4 (4)	1.656	7.5	-----	-----	89.1	-----	-----	-----	0.044
	1.0												1.636	8.3	-----	-----	87.9	-----	-----	-----	To
	CS			100	99	97	75	38					-----	-----	1.86	13.5	-----	6.0	8.9	11.9	0.131



[Signature]
Material Engineer

SUMMARY SHEET

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Table-3 of 4

TP No.	Depth	Passing %age through Sieve Size							Atterberg Limit			Soil Classification M-145	Field Compaction		Laboratory Compaction		Compaction %age	CBR Value at 2"			Swelling % age
		1 1/2	3/4	No. 4	No. 10	No. 40	No. 100	No. 200	LL	PL	PI		Field Dry Density	M. C. %age	Max. Dry Density g/cc	Opt M.C. %age		90 %	95 %	100%	
7	0.50											A-4 (0)	1.977	4.2	-----	-----	89.9				0.044
	1.0												2.11	4.8	-----	-----	95.9				To
	CS	70	65	58	56	43	40	32	25	20	5		-----	-----	2.20	7.5	-----	18.0	26.9	35.8	0.109
8	0.50											A-4 (0)	1.726	5.8	-----	-----	88.0				0.065
	1.0												1.724	6.7	-----	-----	87.5				To
	CS	100	84	80	76	71	67	59	27	19	8		-----	-----	1.96	11.8	-----	5.4	10	14.6	0.124
9	0.50											A-4 (4)	1.918	4.8	-----	-----	92.2				0.065
	1.0												1.924	5.5	-----	-----	92.5				To
	CS	100	79	56	48	44	40	37	25	10	15		-----	-----	2.08	8.5	-----	10.6	17.5	24.5	0.196



[Signature]
Material Engineer



SAFE

SUMMARY SHEET

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Table-4 of 4

TP No.	Depth	Passing %age through Sieve Size							Atterberg Limit			Soil Classification M-145	Field Compaction		Laboratory Compaction		Compaction %age	CBR Value at .2"			Swelling % age
		1 1/2	3/4	No. 4	No. 10	No. 40	No. 100	No. 200	LL	PL	PI		Field Dry Density	M. C. %age	Max. Dry. Density g/cc	Opt M.C. %age		90 %	95 %	100%	
10	0.50											A-4 (0)	1.626	5.2	-----	-----	91.1	-----	-----	-----	0.065
	1.0												1649	71	-----	-----	89.6	-----	-----	-----	To
	CS		100	80	54	45	43	40	28	18	10		-----	-----	1.84	13.8	-----	4.8	9.3	13.8	0.174
11	0.50											A-4 (0)	1.830	6.2	-----	-----	93.8	-----	-----	-----	0.044
	1.0												1.840	7.0	-----	-----	94.4	-----	-----	-----	To
	CS	100	86	73	73	69	59	34			Non-Plastic		-----	-----	1.95	11.3	-----	5.9	10.9	16.0	0.153



[Signature]
Material Engineer

GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

BH/TP: 2

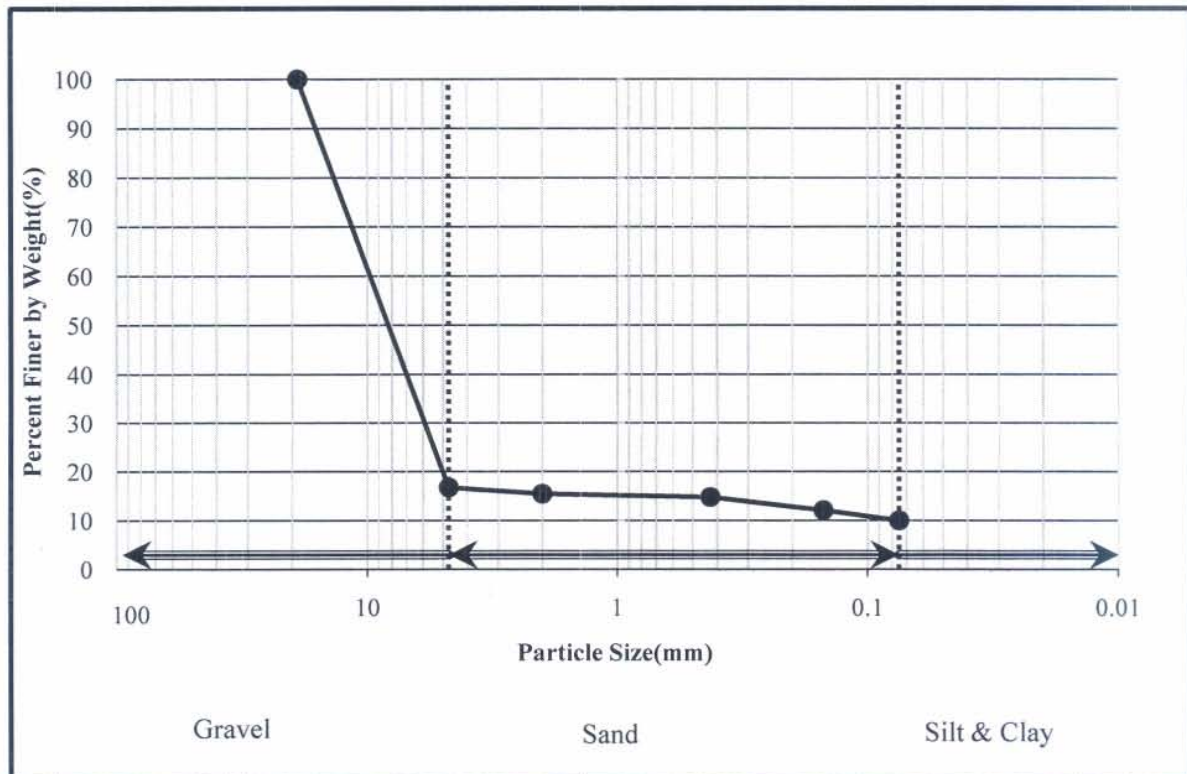
Depth (m) 1

Sample# SPT-1

Dated:

23-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	83.2	Sand %	6.8	Silt & Clay %	10
----------	------	--------	-----	---------------	----

Prepared by:



Checked by



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

BH/TP: 3

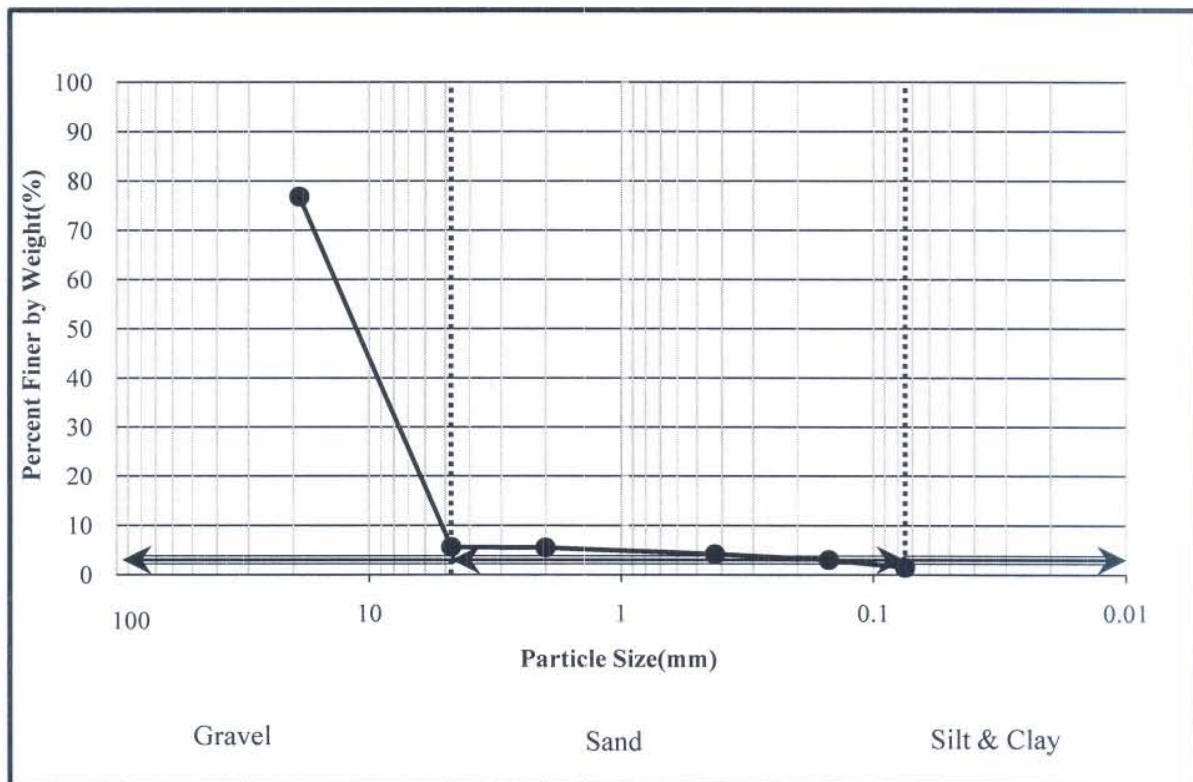
Depth (m) 1

Sample# SPT-1

Dated:

23-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	71.2	Sand %	4.1	Silt & Clay %	24.7
----------	------	--------	-----	---------------	------

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

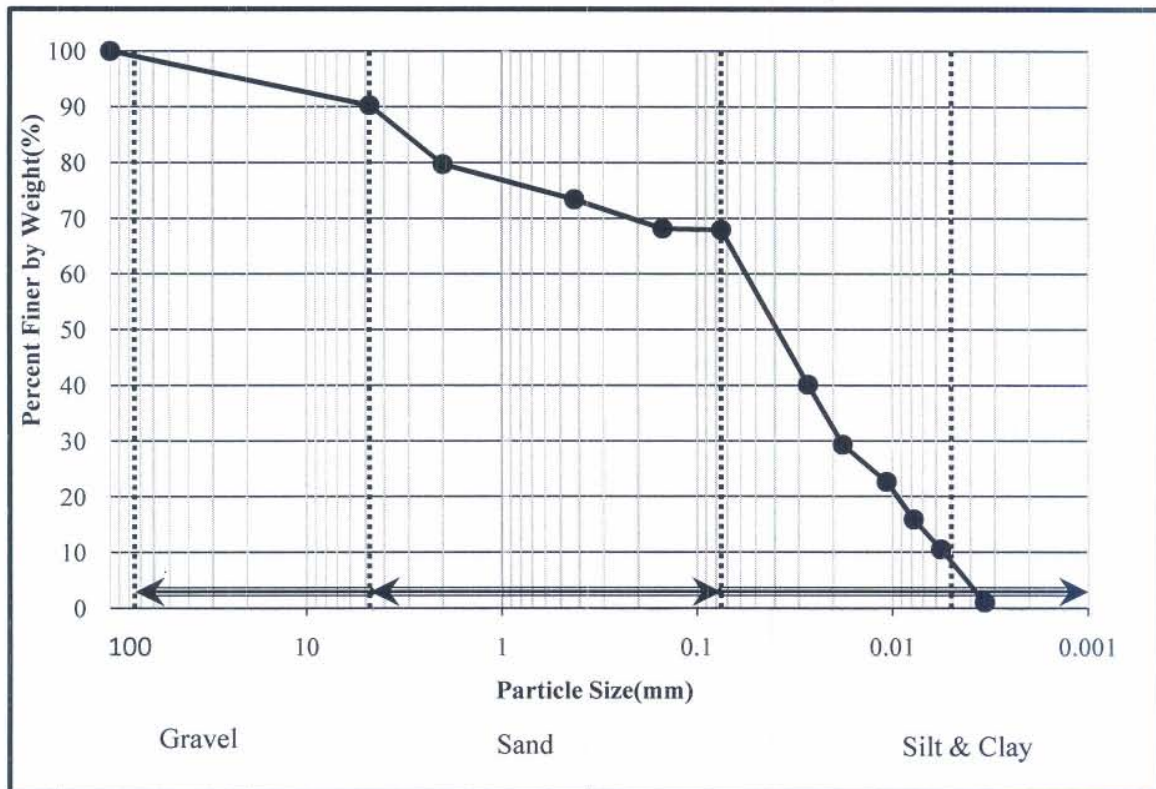
BH/TP: 6

Depth
(m) 1

Sample# SPT-1

Dated: 23/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
9.7

Sand %
22.3

Silt & Clay %
68

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

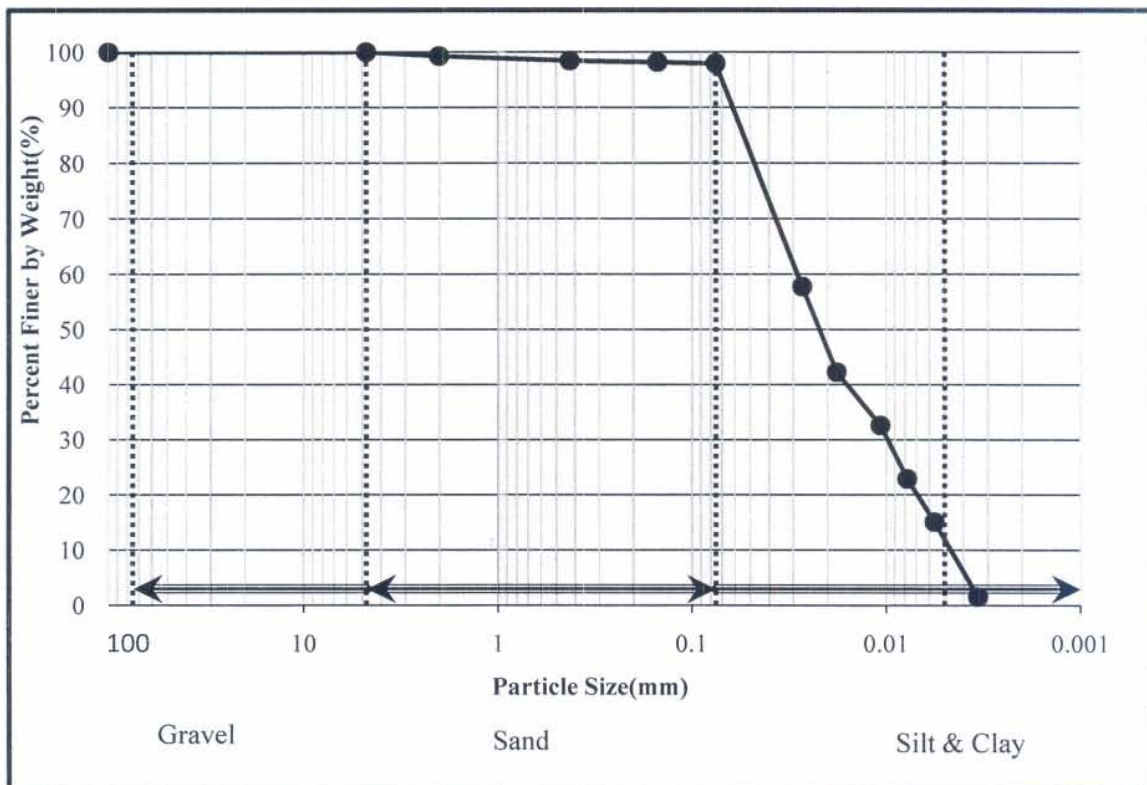
BH/TP: 10

Depth
(m) 1

Sample# SPT-1

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0

Sand %
2

Silt & Clay %
98

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

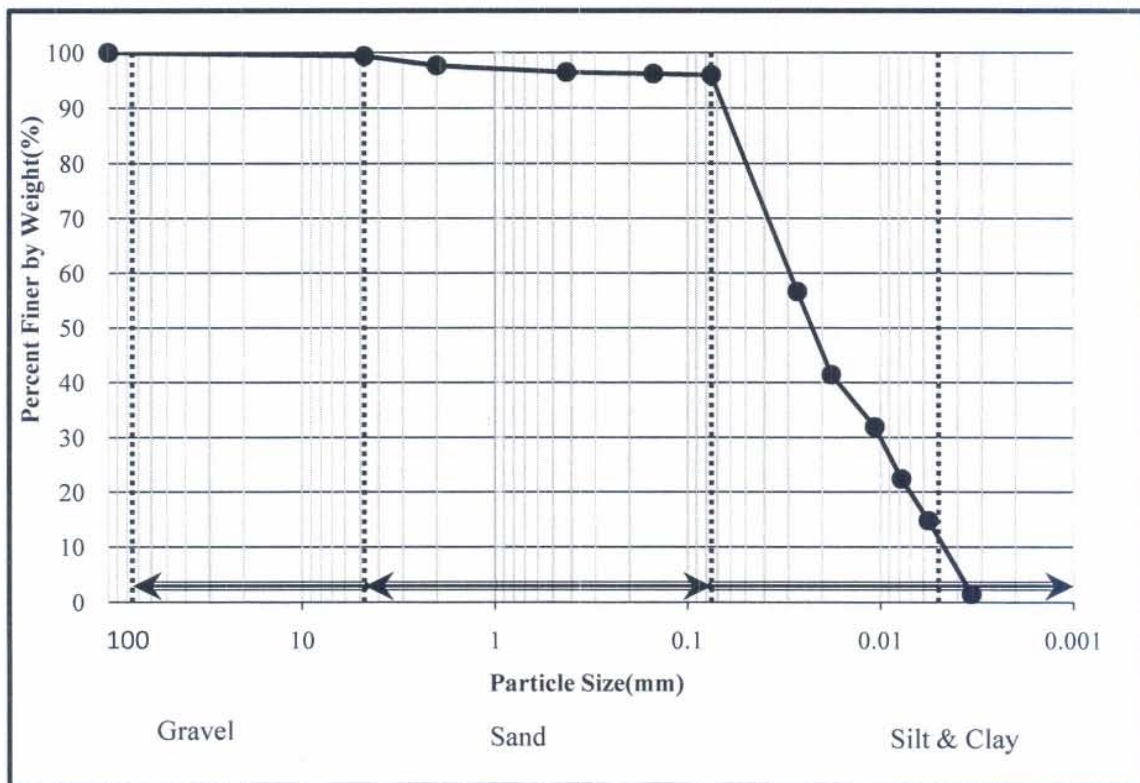
BH/TP: 10

Depth
(m) 3

Sample# SPT-3

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0.6

Sand %
3.4

Silt & Clay %
96

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

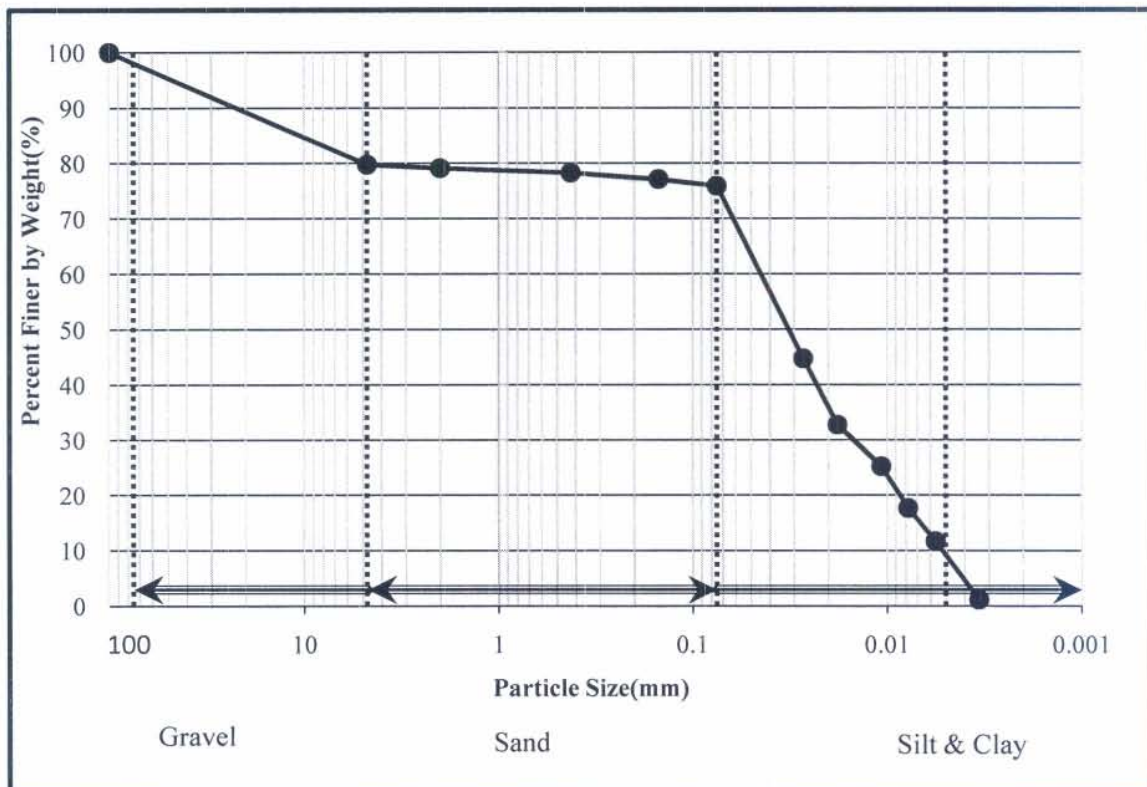
BH/TP: 13

Depth
(m) 4.0-4.45

Sample# SPT-3

Dated: 11/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
20.2

Sand %
3.9

Silt & Clay %
75.9

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

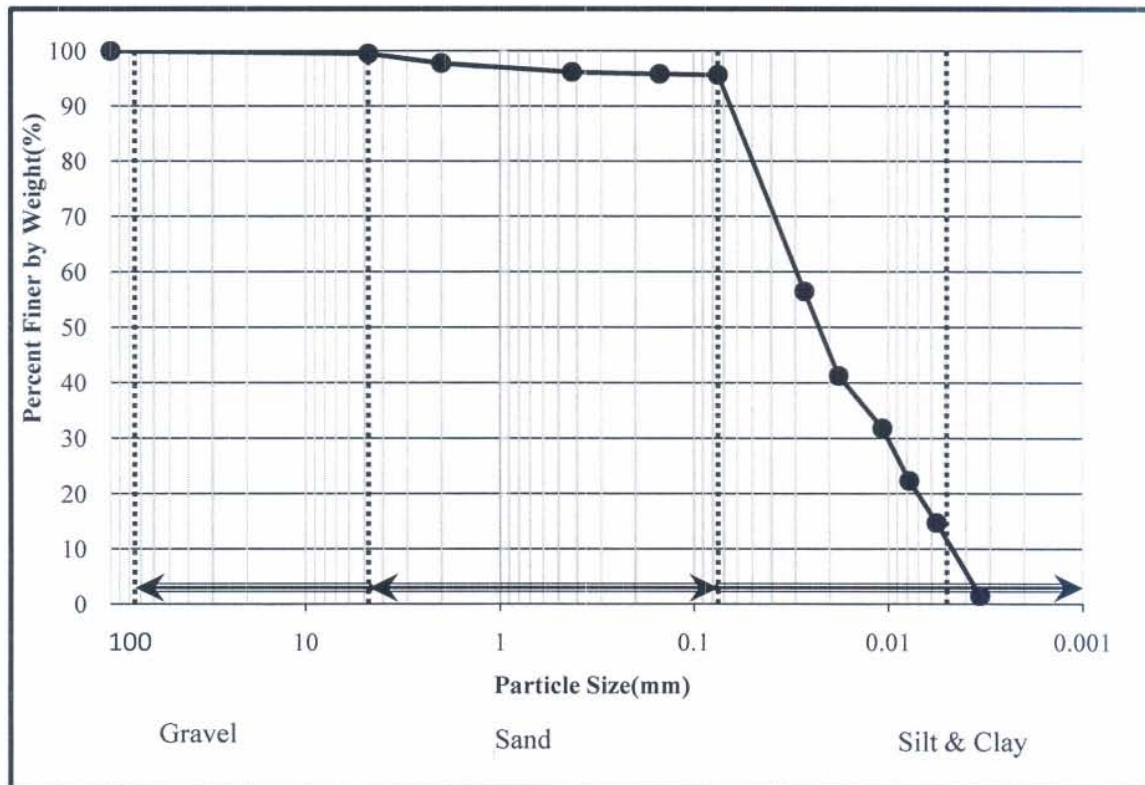
BH/TP: 15

Depth
(m) 1

Sample# SPT-1

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0.5

Sand %
3.8

Silt & Clay %
95.7

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

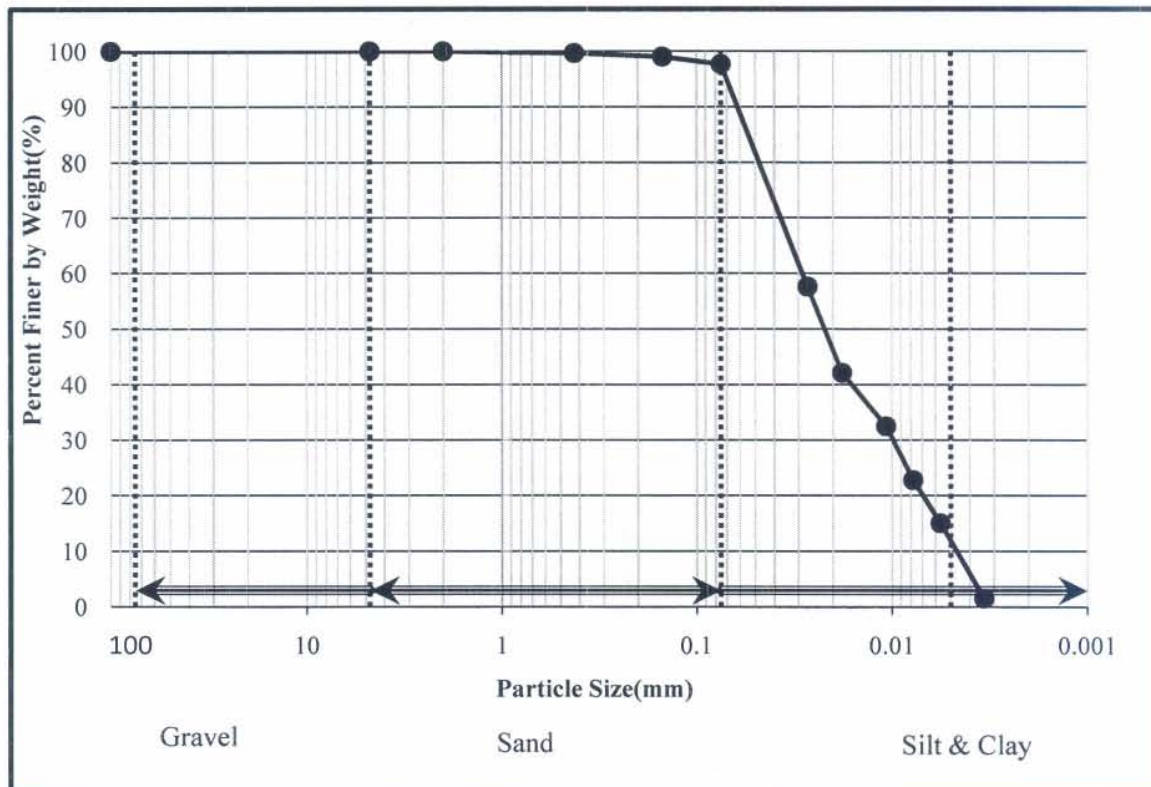
BH/TP: 15

Depth
(m) 3

Sample# SPT-2

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0

Sand %
2.3

Silt & Clay %
97.7

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

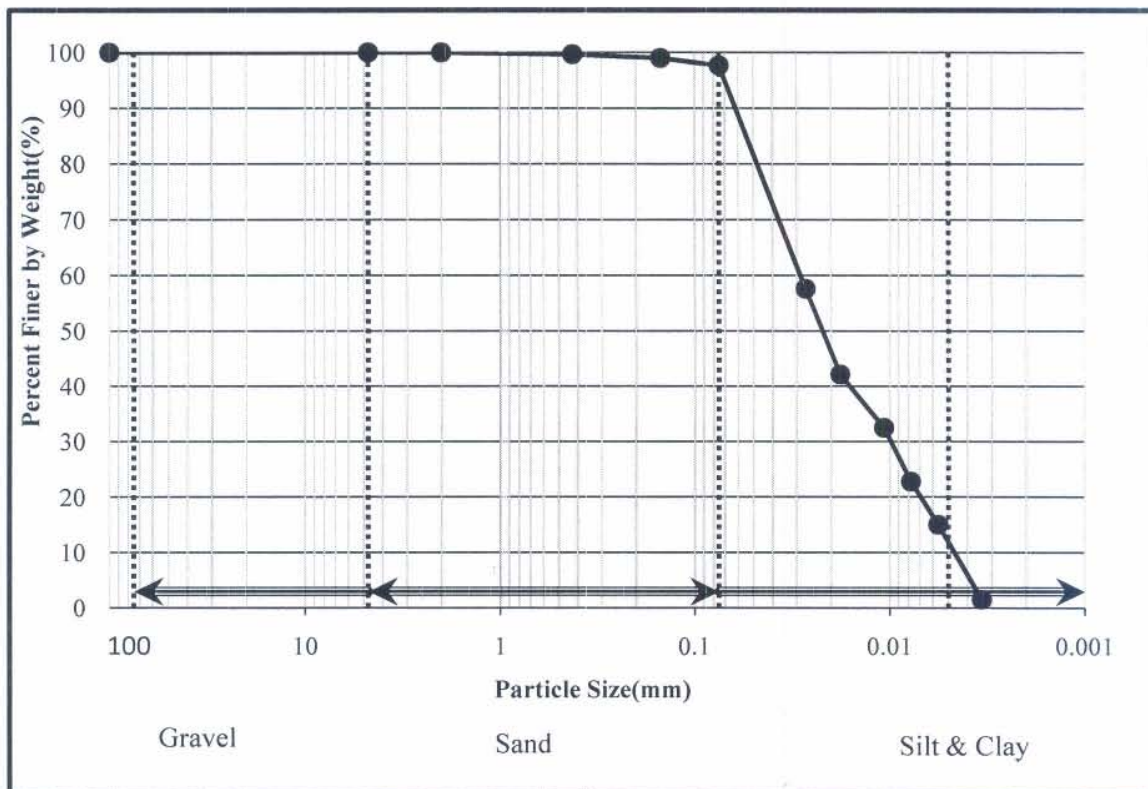
BH/TP: 15

Depth
(m) 3

Sample# SPT-3

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0

Sand %
2.3

Silt & Clay %
97.7

Prepared by:



Checked:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

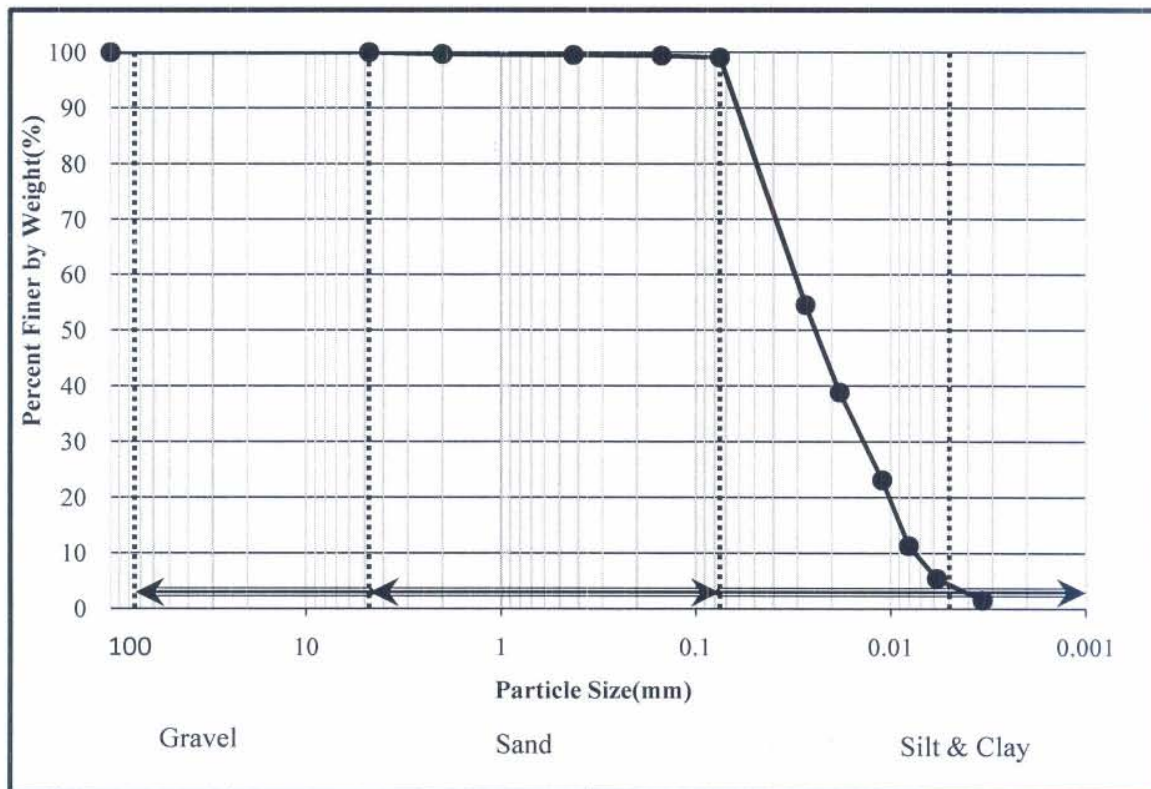
BH/TP: 16

Depth
(m) 1

Sample# SPT-1

Dated: 11/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0

Sand %
0.9

Silt & Clay %
99.1

Prepared by:



SAFE
Soil and Foundation
Engg. Services

Depth (m) 3

Dated: 10/03/2016.

Particle Size (mm)	Percent Finer by Weight (%)
100	100
2.5	100
0.6	99
0.425	98
0.25	97
0.075	54
0.06	38
0.0425	23
0.03	11
0.025	5
0.0075	1

Gravel
%
0

Sand %
2.7

Silt & Clay %
97.3

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

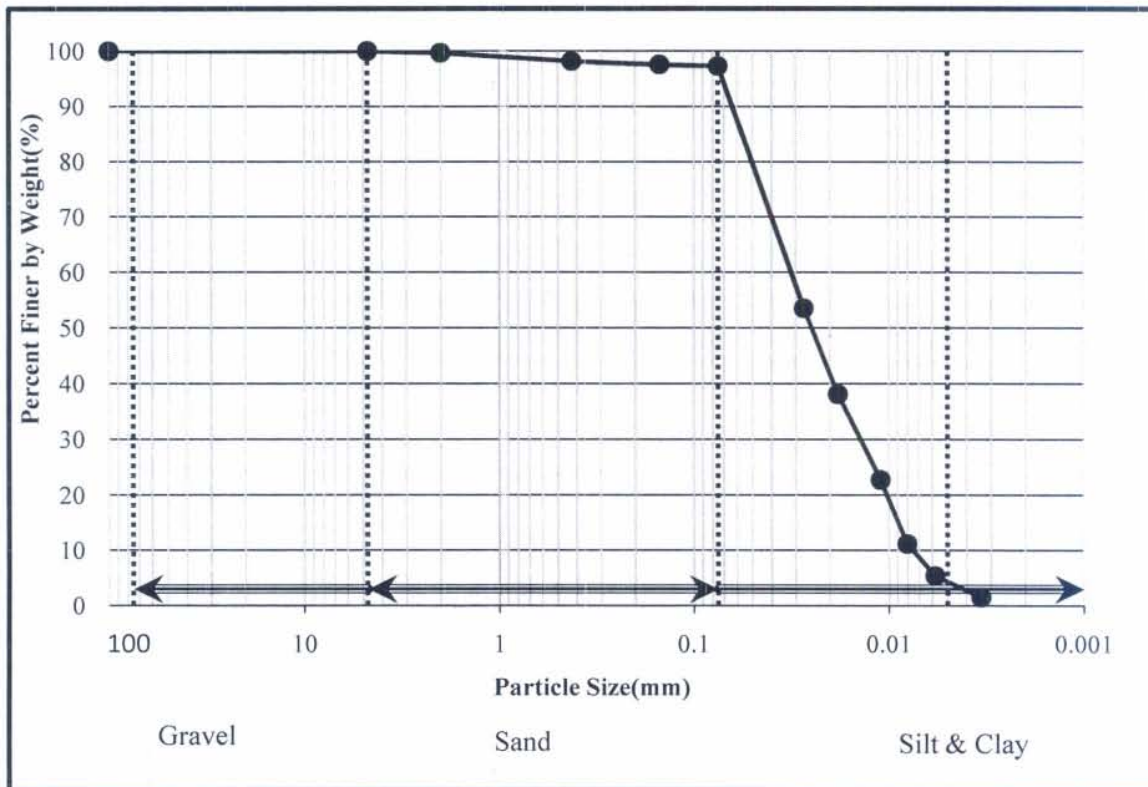
BH/TP: 16

Depth
(m) 3

Sample# SPT-3

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0

Sand %
2.7

Silt & Clay %
97.3

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

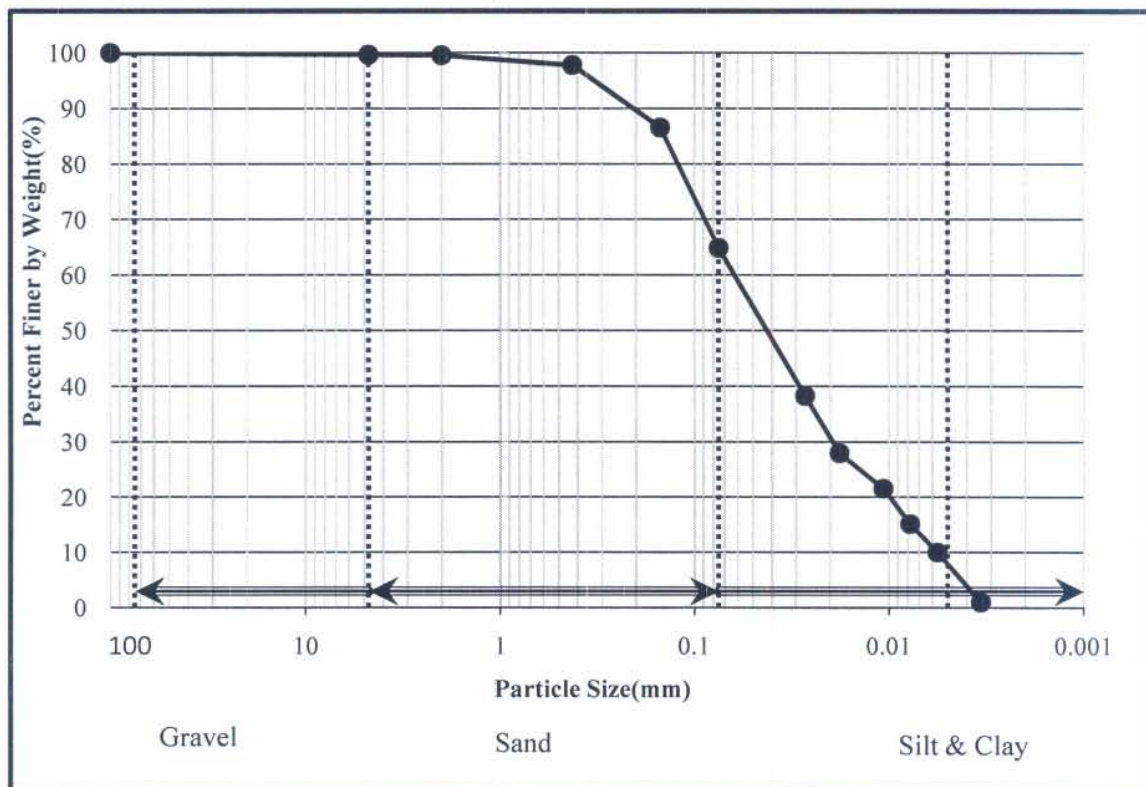
Client: Zeal & Con
Engineering

BH/TP: 23 **Depth** 2
(m)

Sample# SPT-2

Dated: 09/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0.3

Sand %
34.8

Silt & Clay %
64.9

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

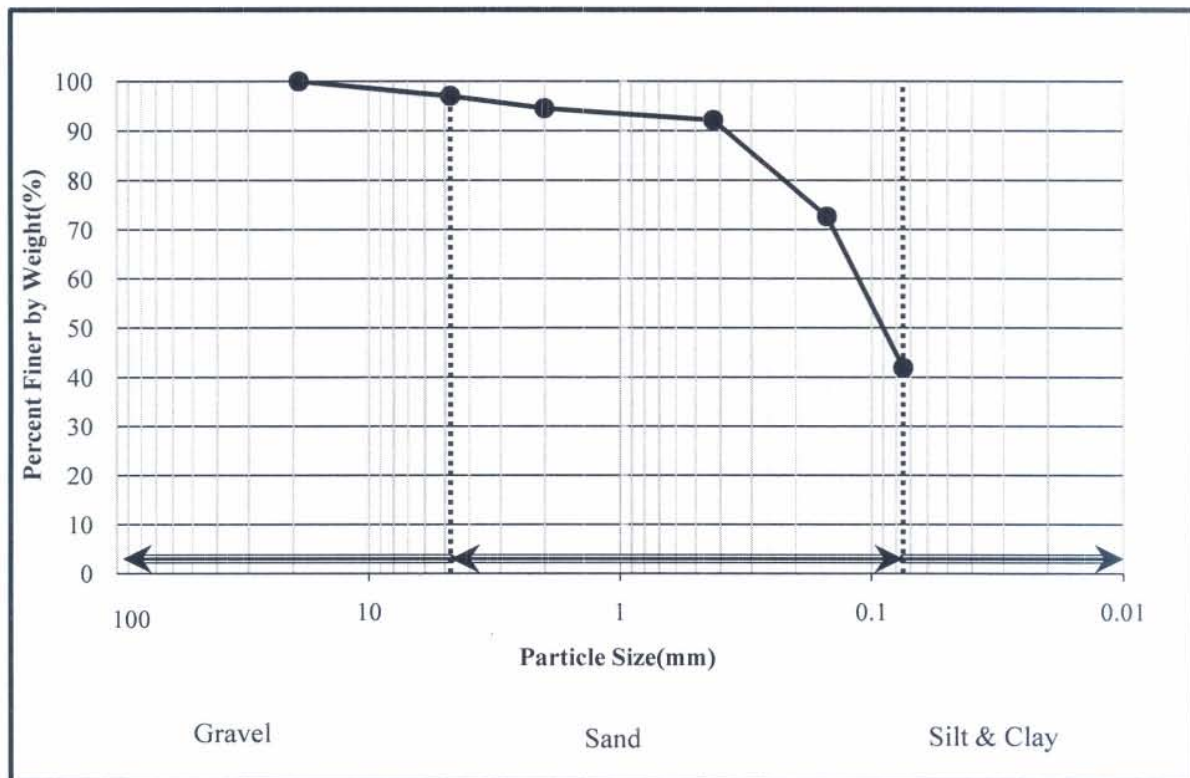
Client: Zeal & Con
Engineering

BH/TP: 23 **Depth (m)** 5

Sample# SPT-4

Dated: 09-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	2.9	Sand %	55.2	Silt & Clay %	41.9
----------	-----	--------	------	---------------	------

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

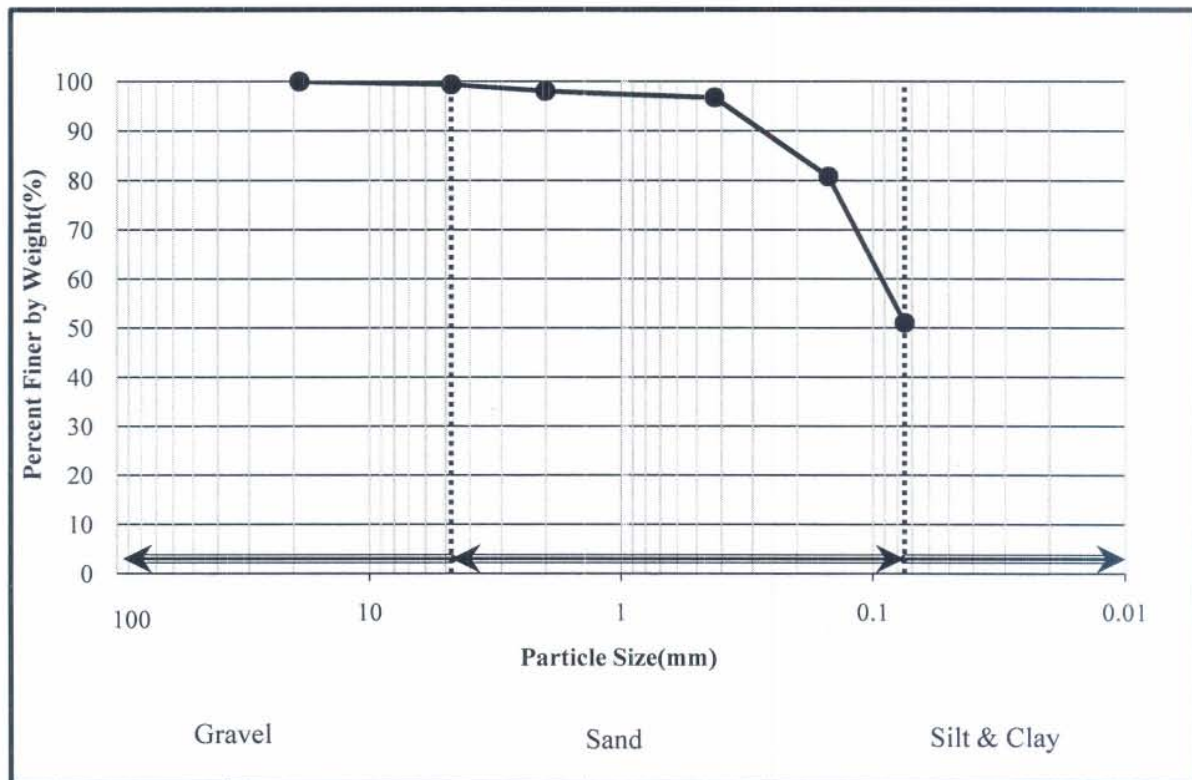
Client: Zeal & Con
Engineering

BH/TP: 23 **Depth (m)** 7

Sample# SPT-6

Dated: 09-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0.6	Sand %	48.3	Silt & Clay %	51.1
----------	-----	--------	------	---------------	------

Prepared by:



Checked by



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

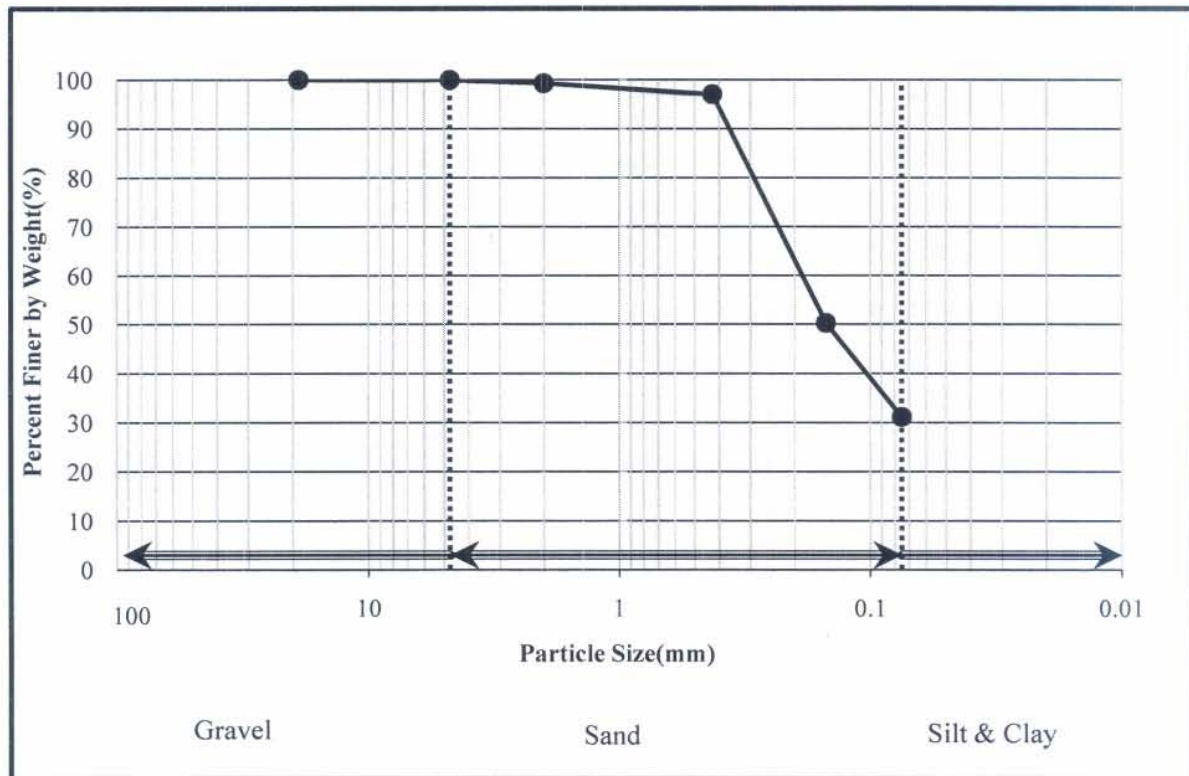
Client: Zeal & Con
Engineering

BH/TP: 24 **Depth (m)** 3

Sample# SPT-3

Dated: 09-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0	Sand %	68.8	Silt & Clay %	31.2
----------	---	--------	------	---------------	------

Prepared by:



Checked by



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

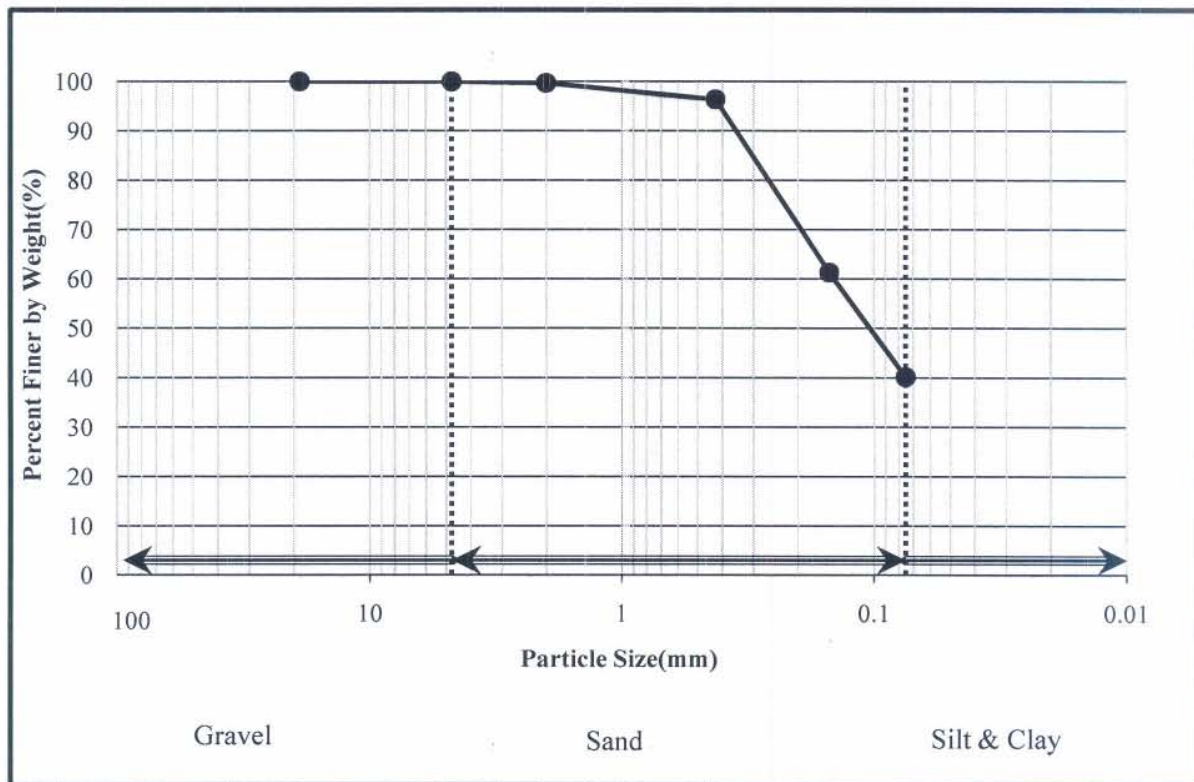
Client: Zeal & Con
Engineering

BH/TP: 24 **Depth (m)** 7

Sample# SPT-7

Dated: 09-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0	Sand %	59.8	Silt & Clay %	40.2
----------	---	--------	------	---------------	------

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

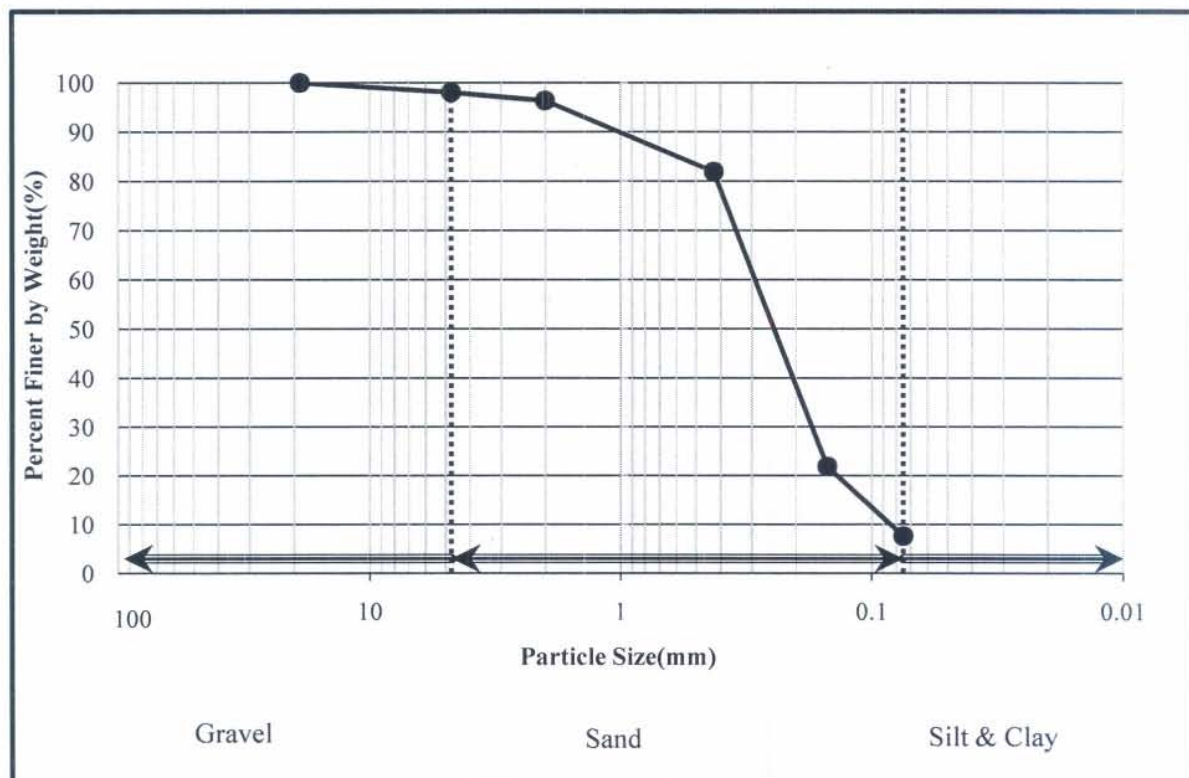
Client: Zeal & Con
Engineering

BH/TP: 24 **Depth (m)** 10

Sample# SPT-10

Dated: 09-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	1.9	Sand %	90.5	Silt & Clay %	7.6
----------	-----	--------	------	---------------	-----

Prepared by: 



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

BH/TP: 25

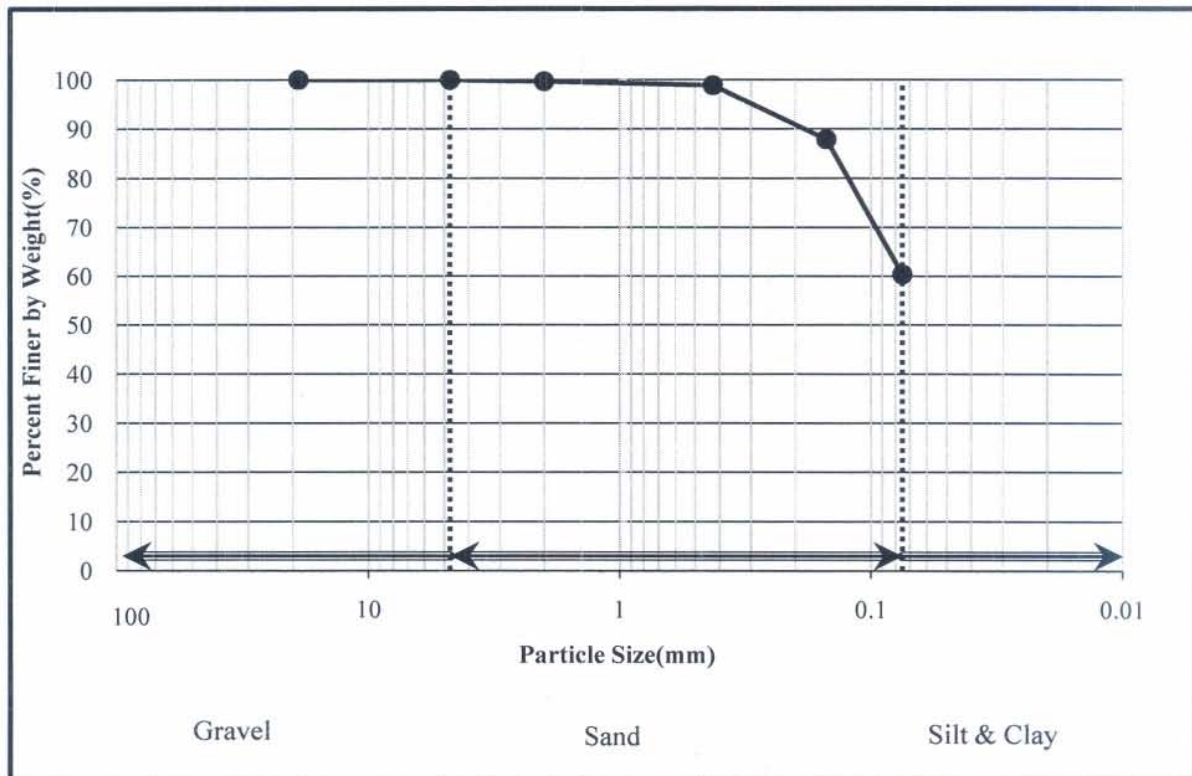
Depth (m) 4

Sample# SPT-3

Dated:

09-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0	Sand %	39.6	Silt & Clay %	60.4
----------	---	--------	------	---------------	------

Prepared by:



Checked by



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

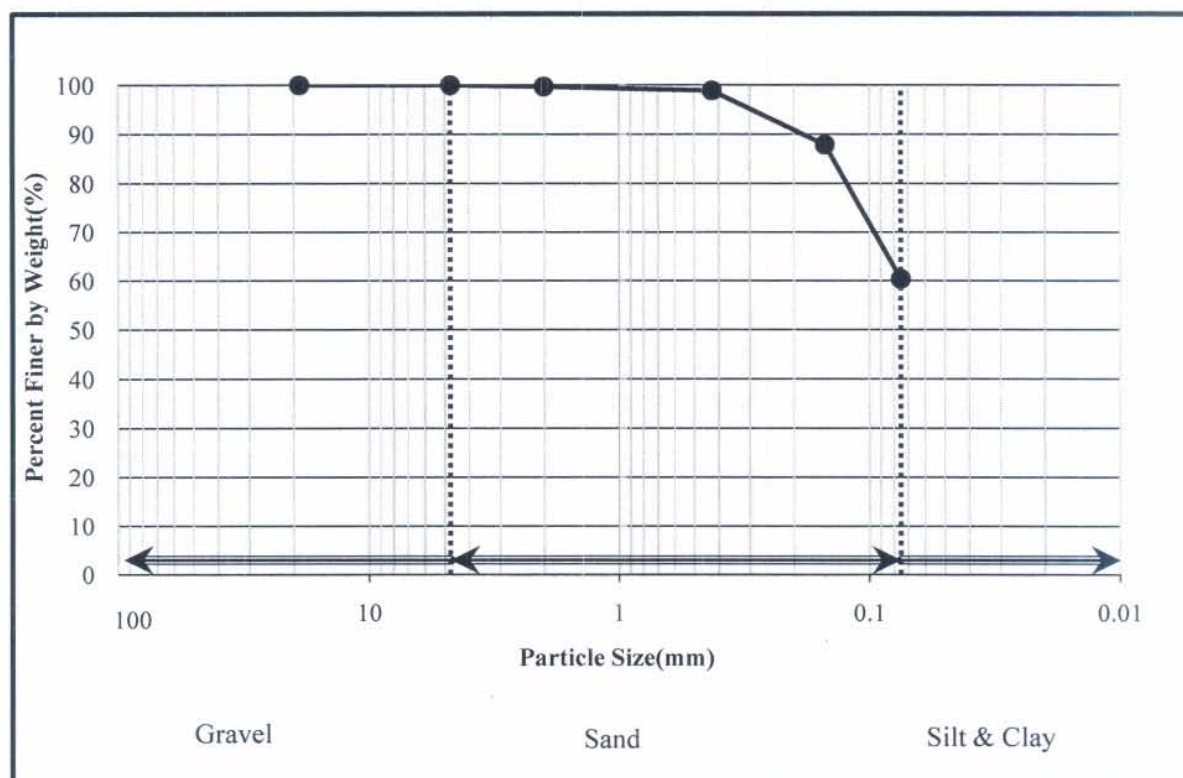
Client: Zeal & Con
Engineering

BH/TP: 25 **Depth (m)** 4

Sample# SPT-4

Dated: 09-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0	Sand %	39.6	Silt & Clay %	60.4
----------	---	--------	------	---------------	------

Prepared by:



Checked by



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

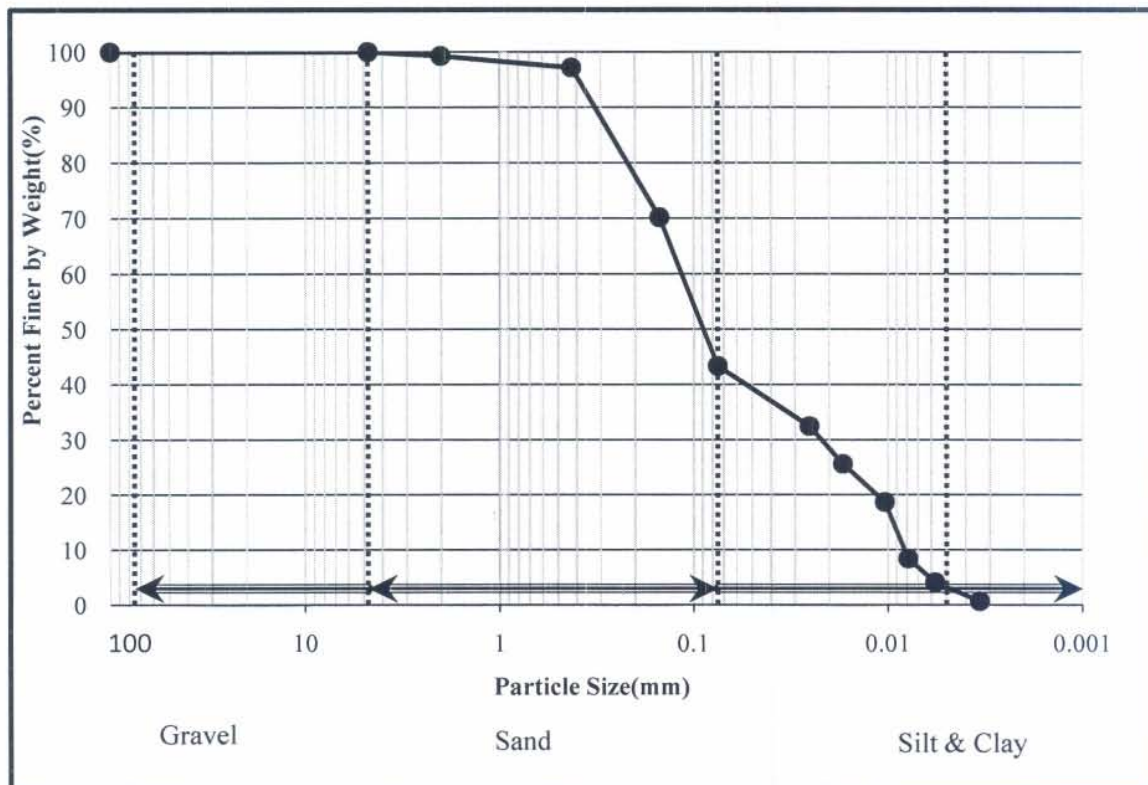
Client: Zeal & Con
Engineering

BH/TP: 27 **Depth** 1
(m)

Sample# SPT-1

Dated: 09/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0

Sand %
56.6

Silt & Clay %
43.4

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal & Con Engineering

BH/TP: 27

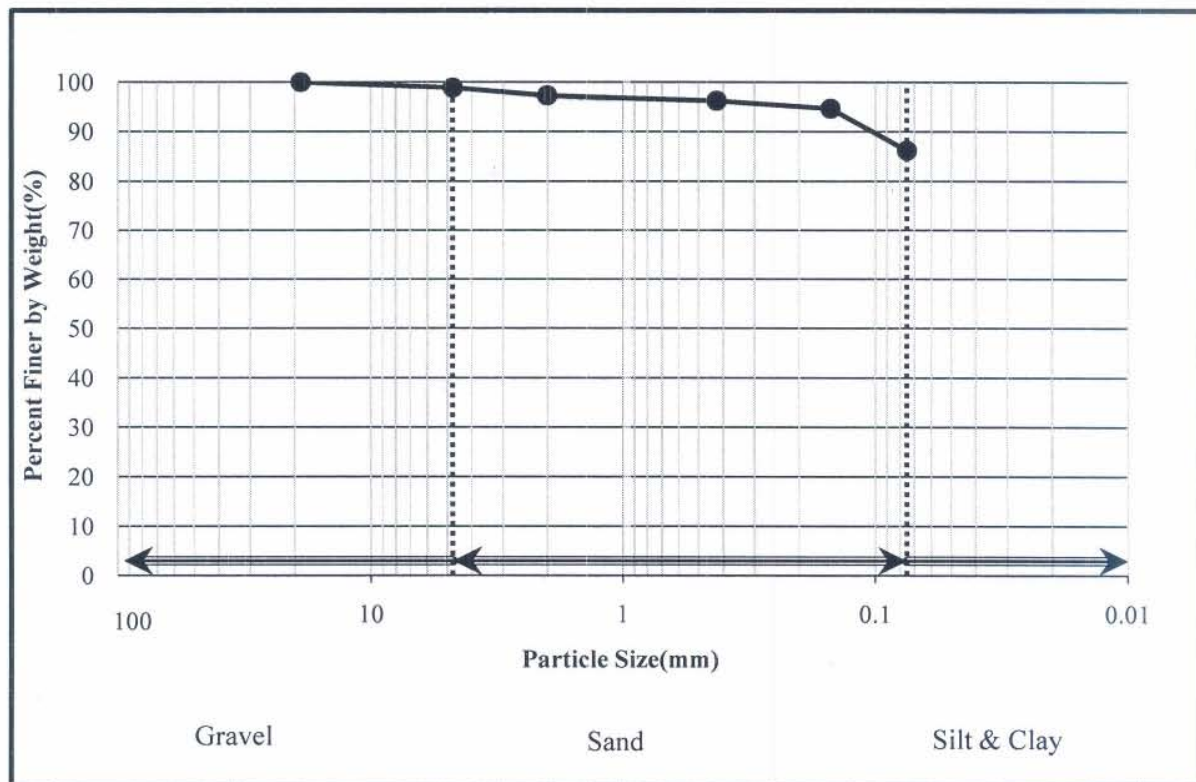
Depth (m) 4

Sample# SPT-4

Dated:

09-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	1.1	Sand %	12.7	Silt & Clay %	86.2
----------	-----	--------	------	---------------	------

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

BH/TP: 30

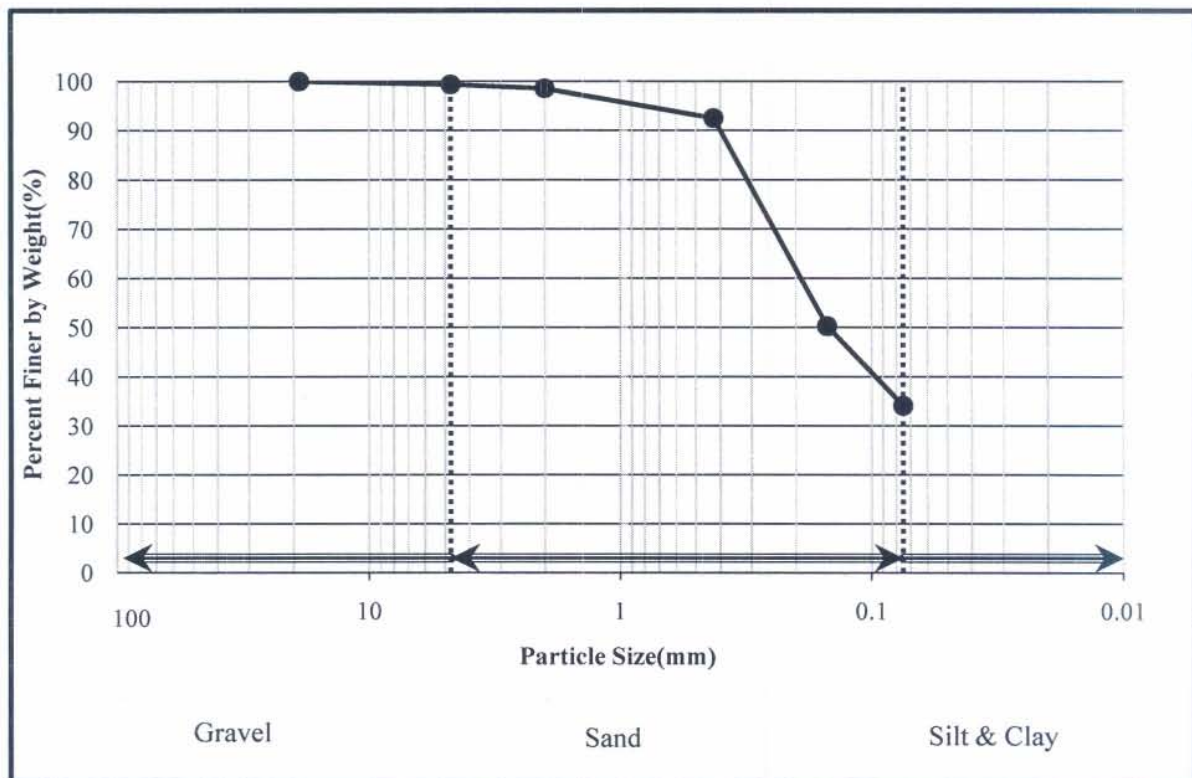
Depth (m) 1.0 - 1.45

Sample# SPT-1

Dated:

19-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0.6	Sand %	65.3	Silt & Clay %	34.1
----------	-----	--------	------	---------------	------

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

BH/TP: 30

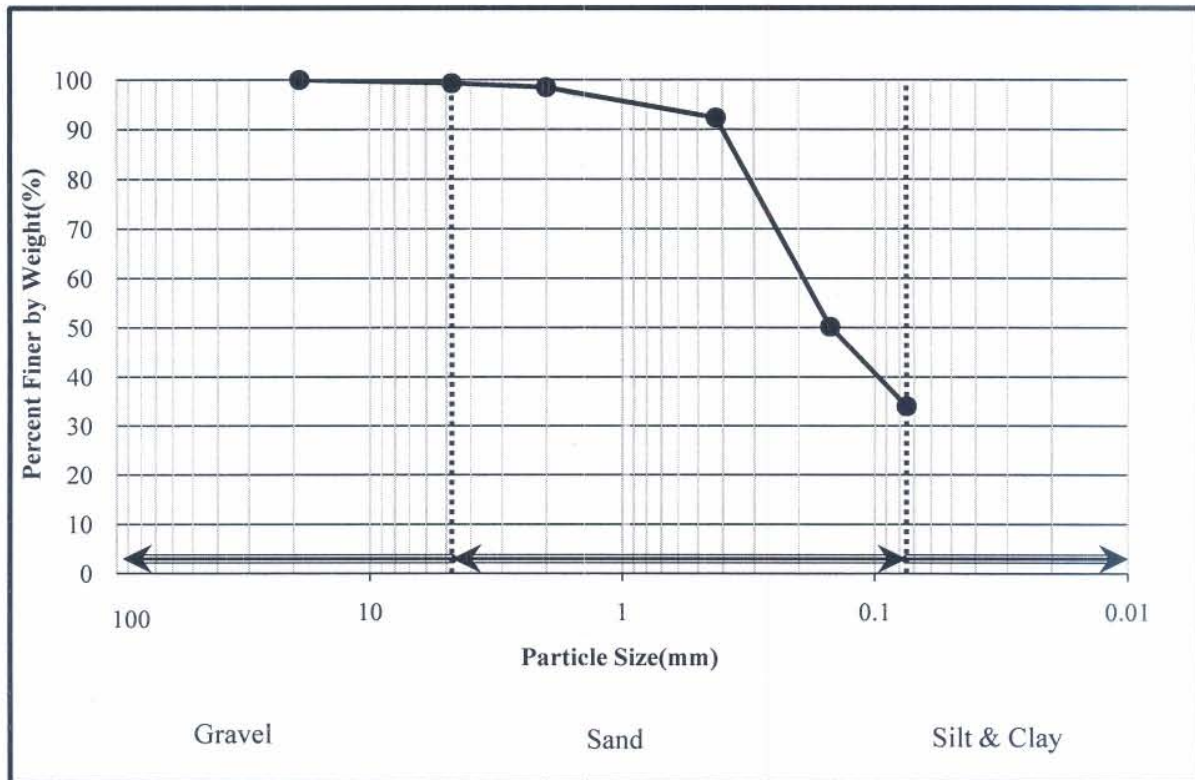
Depth (m) 2.0 - 2.45

Sample# SPT-2

Dated:

19-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0.7	Sand %	65.3	Silt & Clay %	34
----------	-----	--------	------	---------------	----

Prepared by:



GRAIN SIZE ANALYSIS

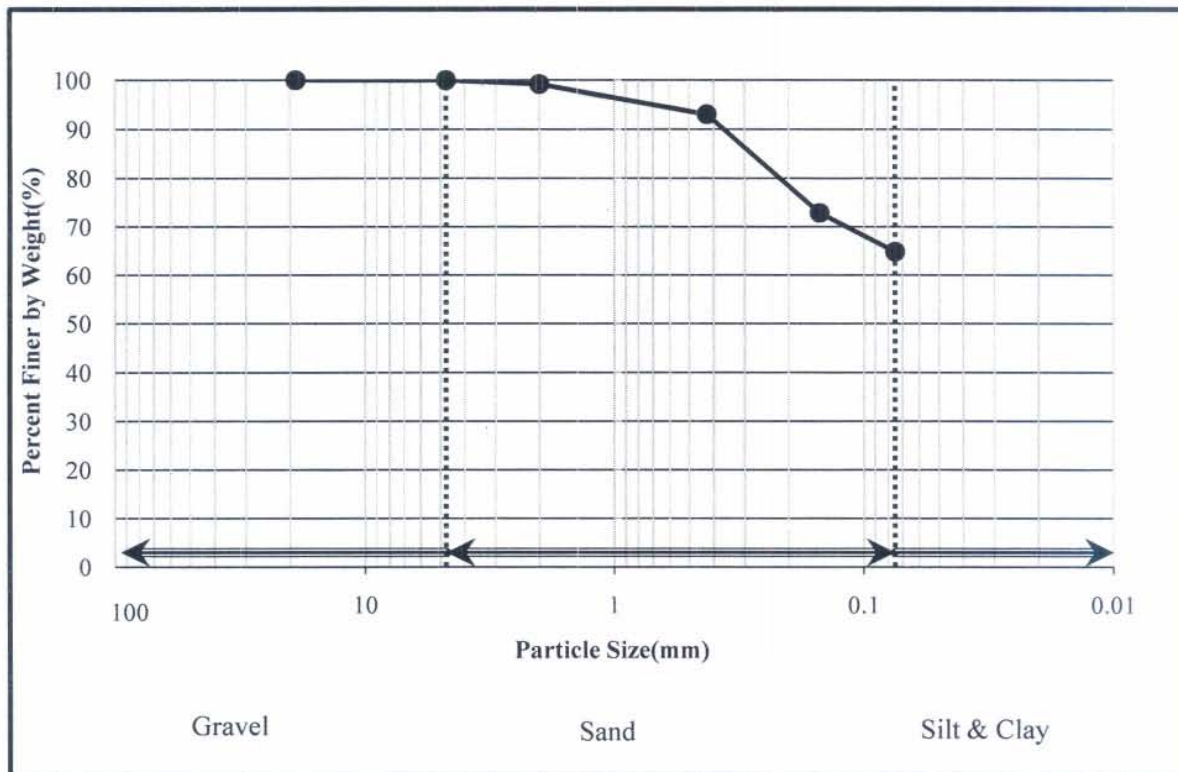
SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering **BH/TP:** 32 **Depth (m)** 1

Sample# SPT-1 **Dated:** 10-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0	Sand %	35.1	Silt & Clay %	64.9
----------	---	--------	------	---------------	------

Prepared by:



SAFE
Soil and Foundation
Engg. Services

Depth
(m) 1.0 - 1.45

Dated: 11/03/2016.

Particle Size (mm)	Percent Finer (%)
100	100
10	100
2.0	100
0.85	100
0.425	99
0.25	98
0.15	85
0.075	50
0.06	37
0.0425	22
0.03	12
0.025	8
0.02	2
0.015	0
0.0075	0

Gravel
%
0

Sand %
15.2

Silt & Clay %
84.8

Prepared by:

Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

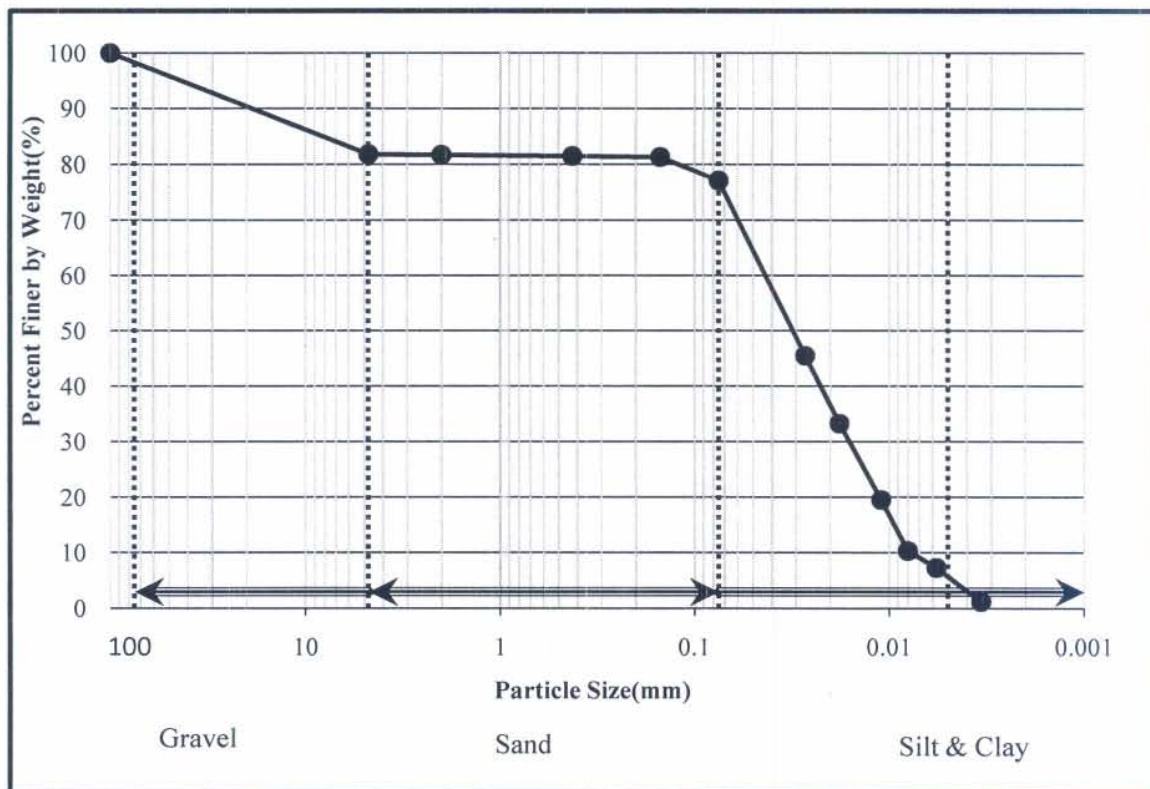
BH/TP: 33

Depth 3.0 - 3.45
(m)

Sample# SPT-3

Dated: 11/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
18.2

Sand %
4.7

Silt & Clay %
77.1

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

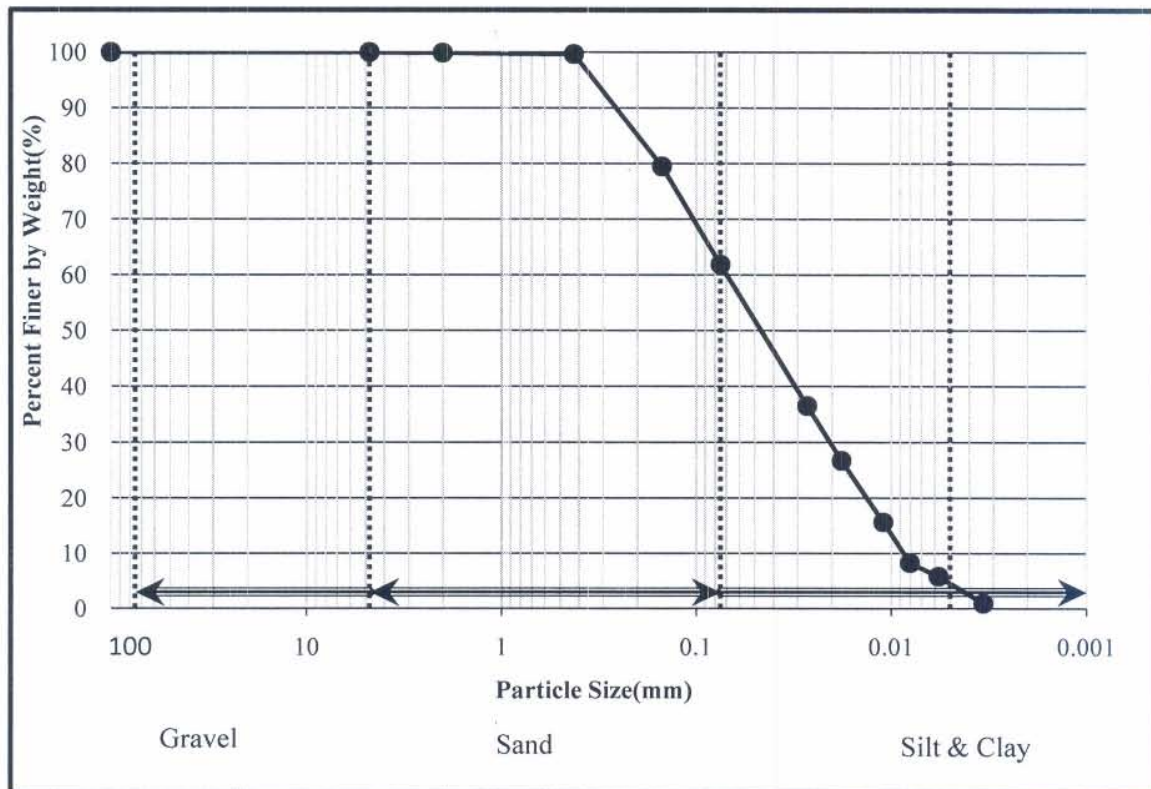
BH/TP: 33

Depth
(m) 4.0 - 4.45

Sample# SPT-4

Dated: 11/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0

Sand %
38.1

Silt & Clay %
61.9

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

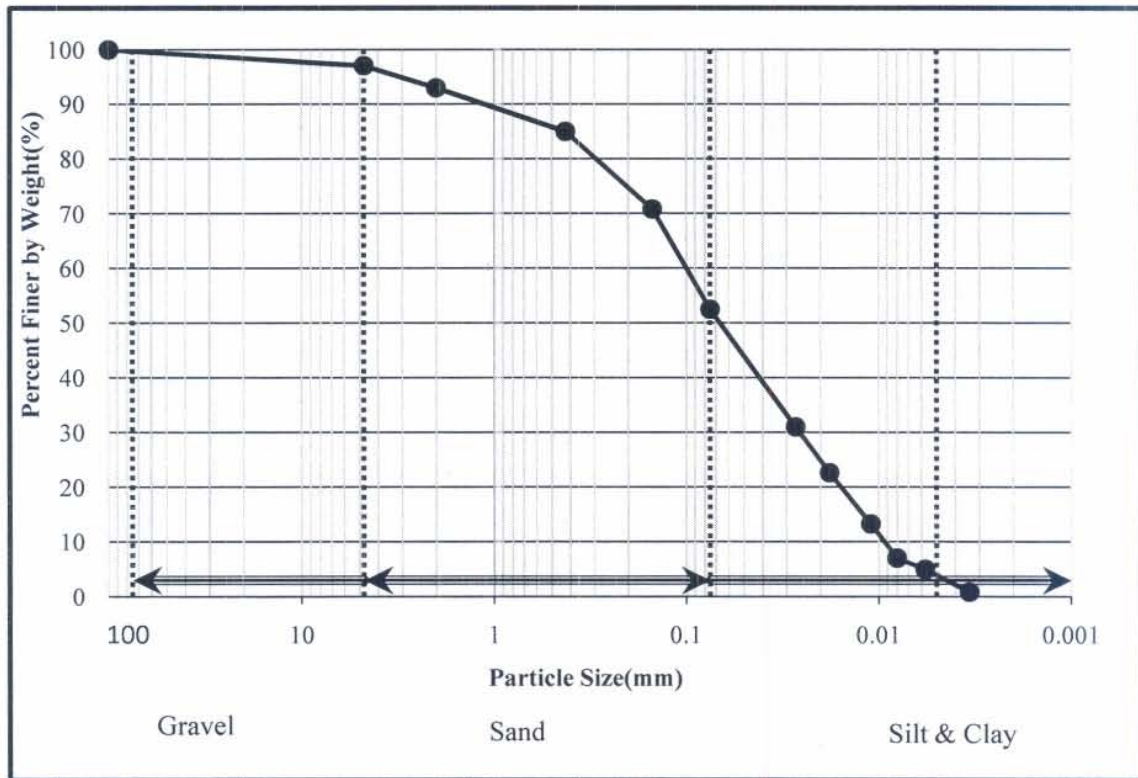
BH/TP: 33

Depth
(m) 5

Sample# SPT-5

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
2.9

Sand %
44.6

Silt & Clay %
52.5

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

BH/TP: 34

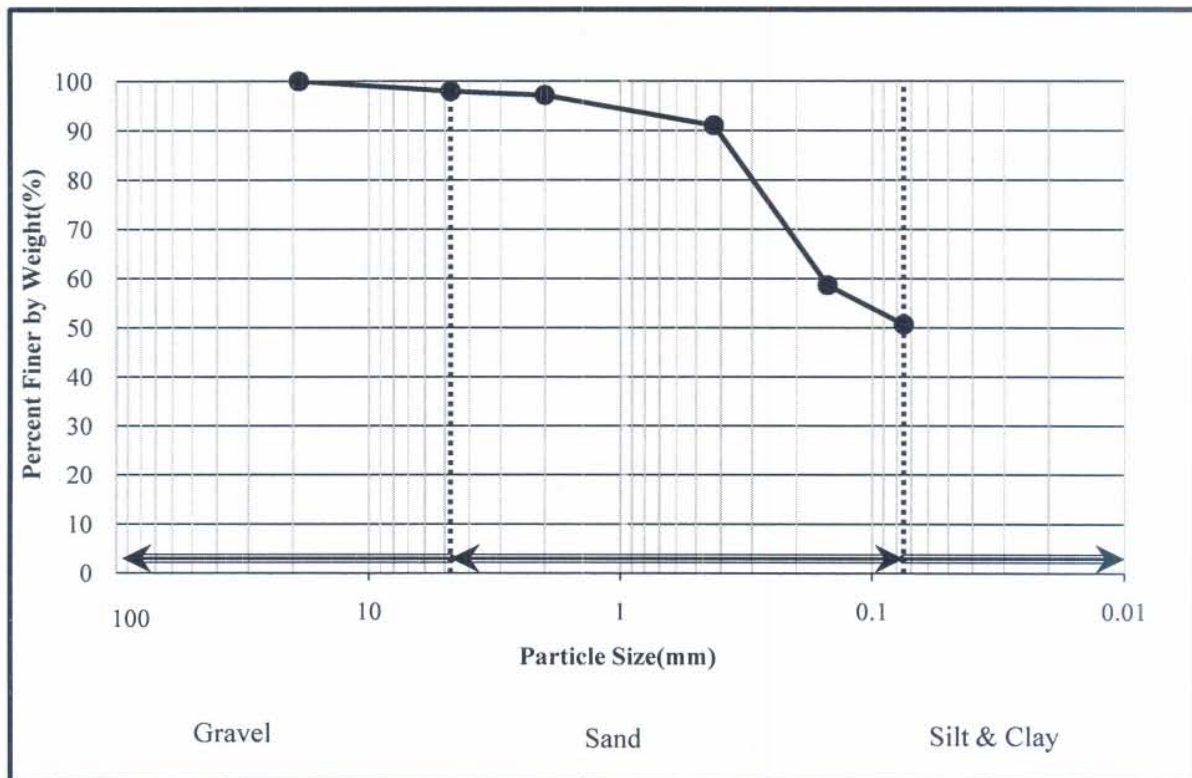
Depth (m) 1.0 - 1.45

Sample# SPT-1

Dated:

19-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	2	Sand %	47.3	Silt & Clay %	50.7
----------	---	--------	------	---------------	------

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

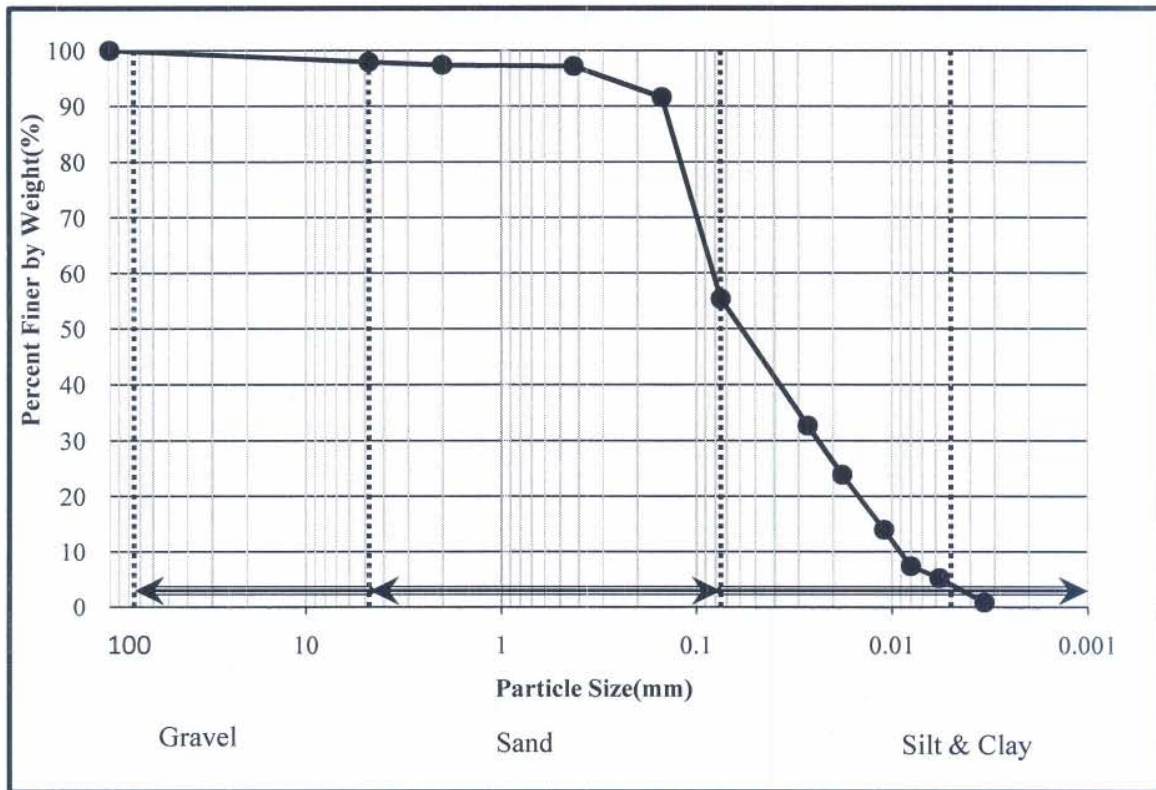
BH/TP: 34

Depth
(m) 2.0 - 2.45

Sample# SPT-2

Dated: 19/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
2

Sand %
42.6

Silt & Clay %
55.4

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

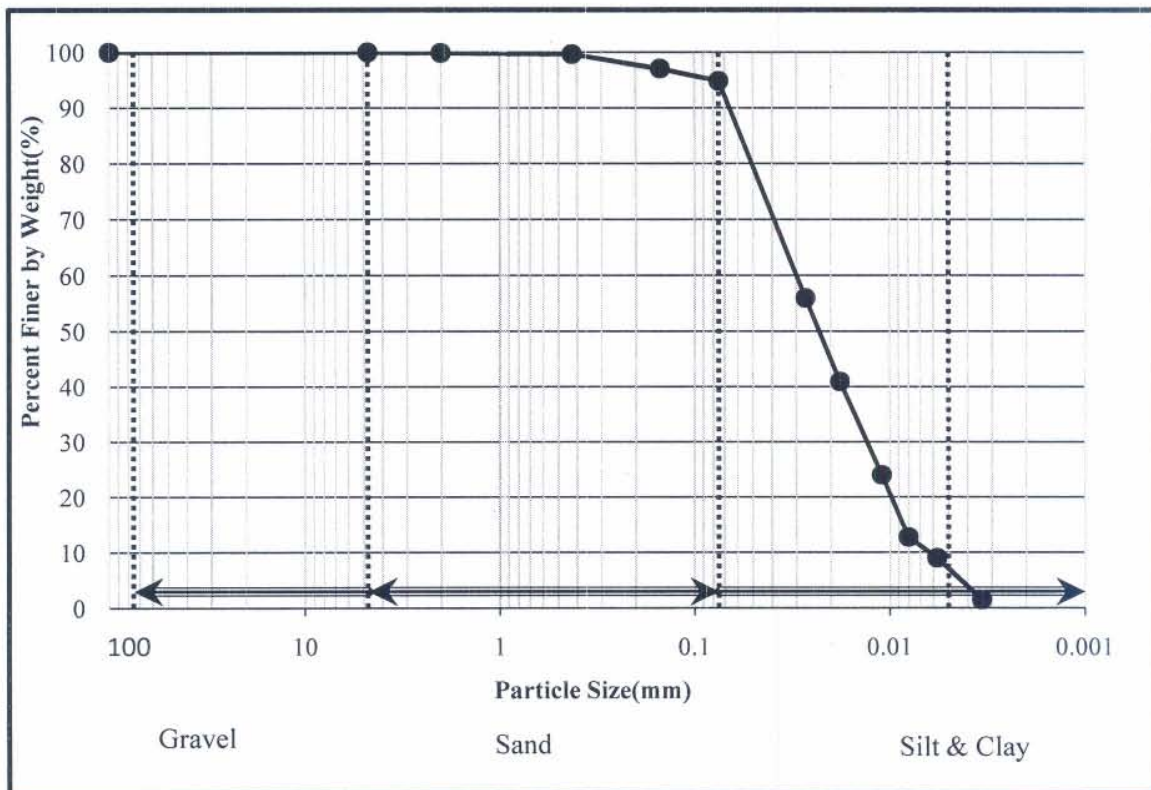
BH/TP: 35

Depth (m) 1.0 - 1.45

Sample# SPT-1

Dated: 11/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0

Sand %
5.1

Silt & Clay %
94.9

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

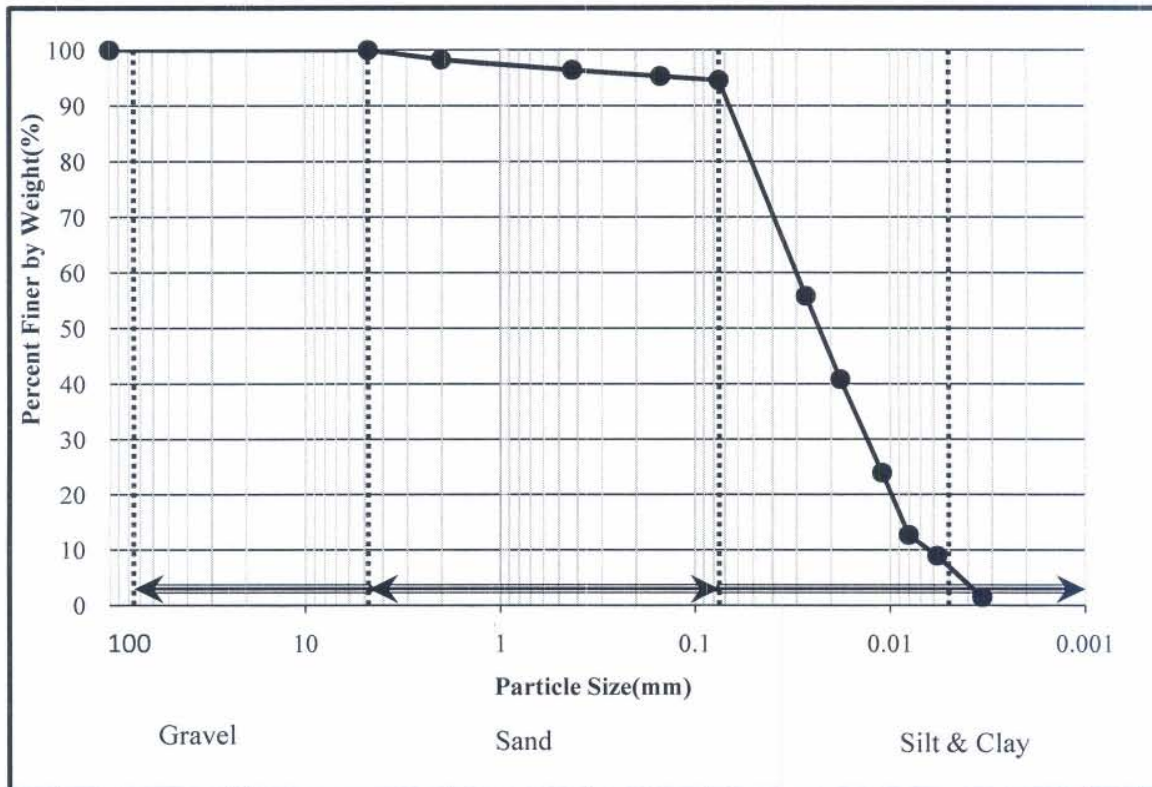
BH/TP: 37

Depth
(m) 1

Sample# SPT-1

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0

Sand %
5.4

Silt & Clay %
94.6

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

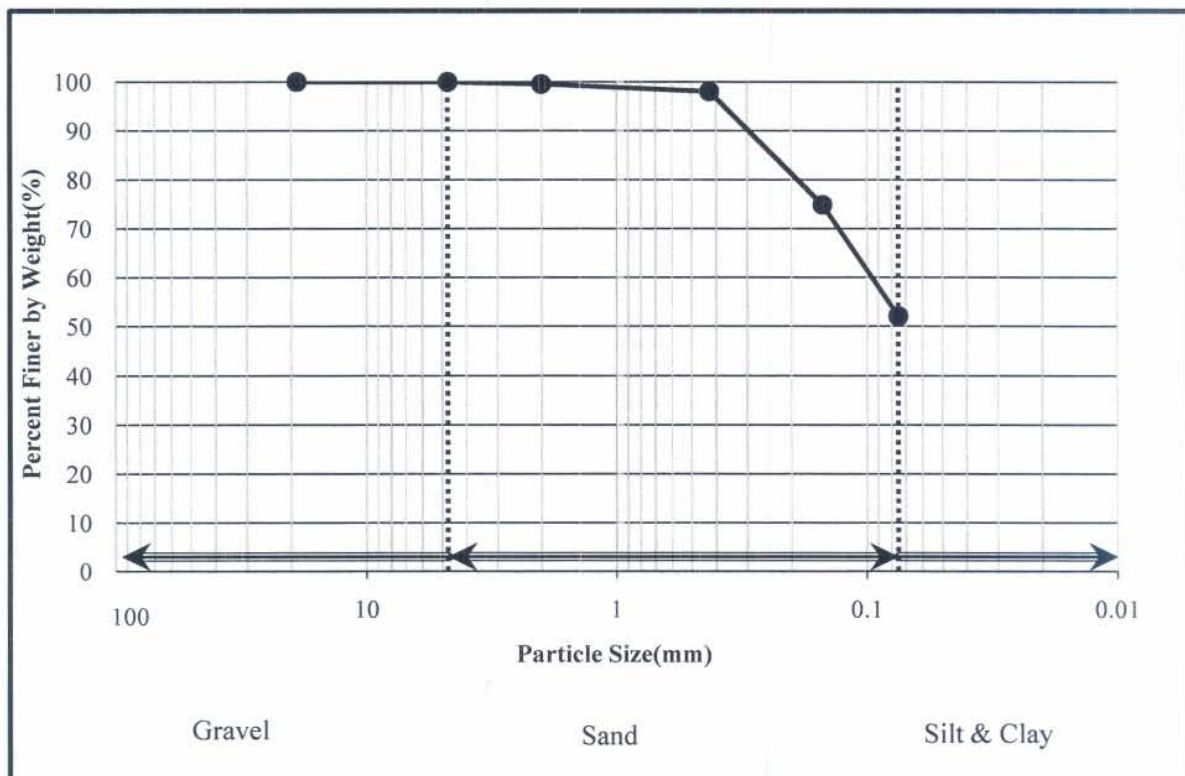
Client: Zeal & Con
Engineering

BH/TP: 39 **Depth (m)** 1

Sample# SPT-1

Dated: 09-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0	Sand %	47.9	Silt & Clay %	52.1
----------	---	--------	------	---------------	------

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

BH/TP: 39

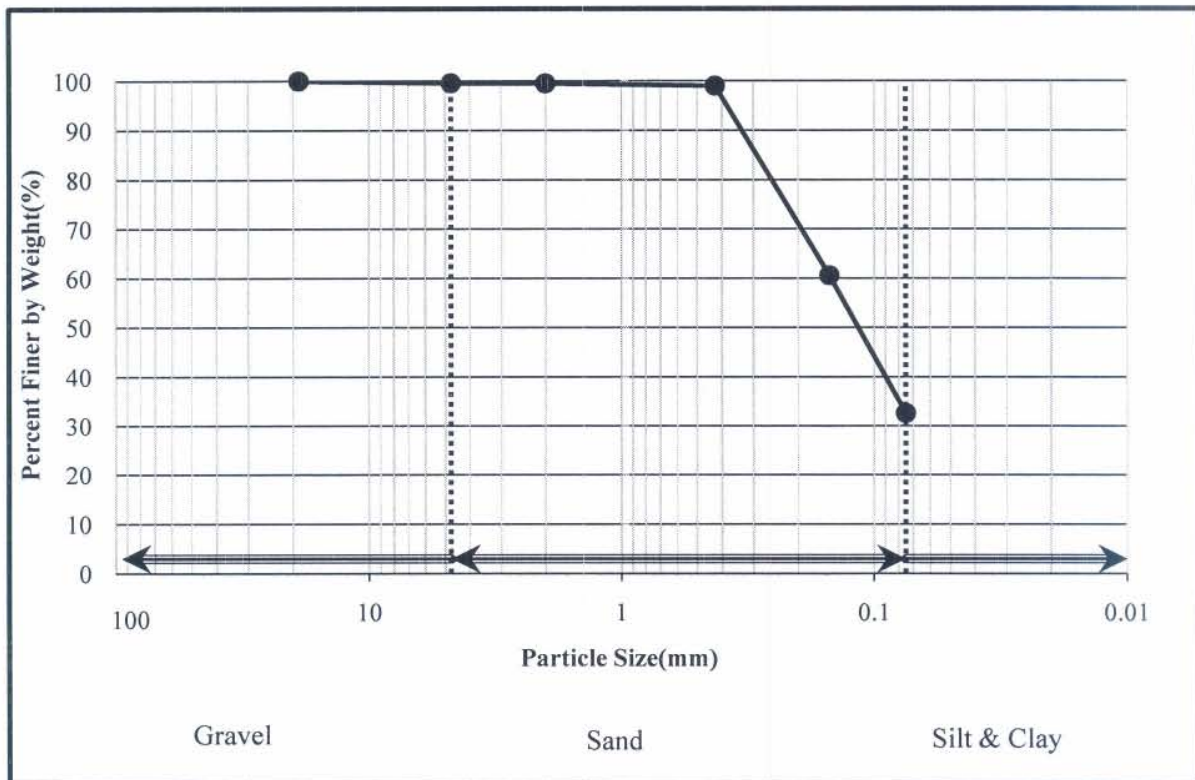
Depth (m) 5

Sample# SPT-4

Dated:

09-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0.4	Sand %	67	Silt & Clay %	32.6
----------	-----	--------	----	---------------	------

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

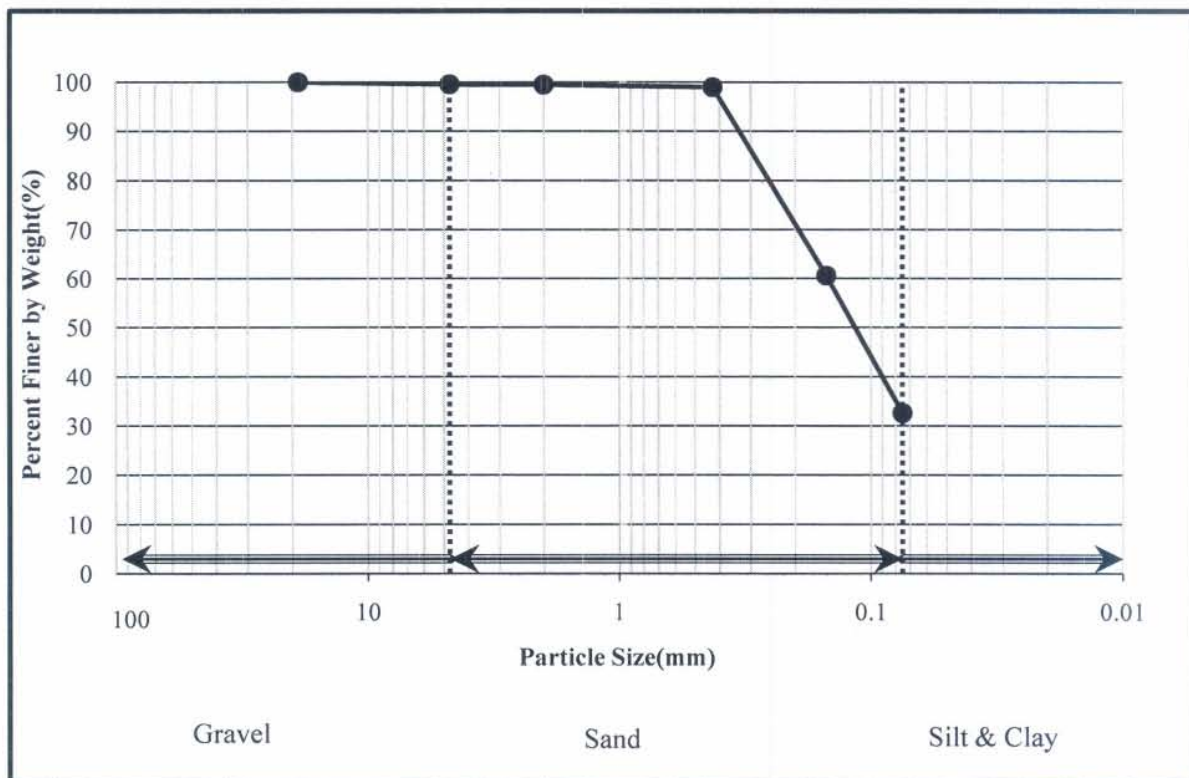
Client: Zeal & Con
Engineering

BH/TP: 39 **Depth (m)** 5

Sample# SPT-5

Dated: 09-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0.4	Sand %	67	Silt & Clay %	32.6
----------	-----	--------	----	---------------	------

Prepared by: 



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

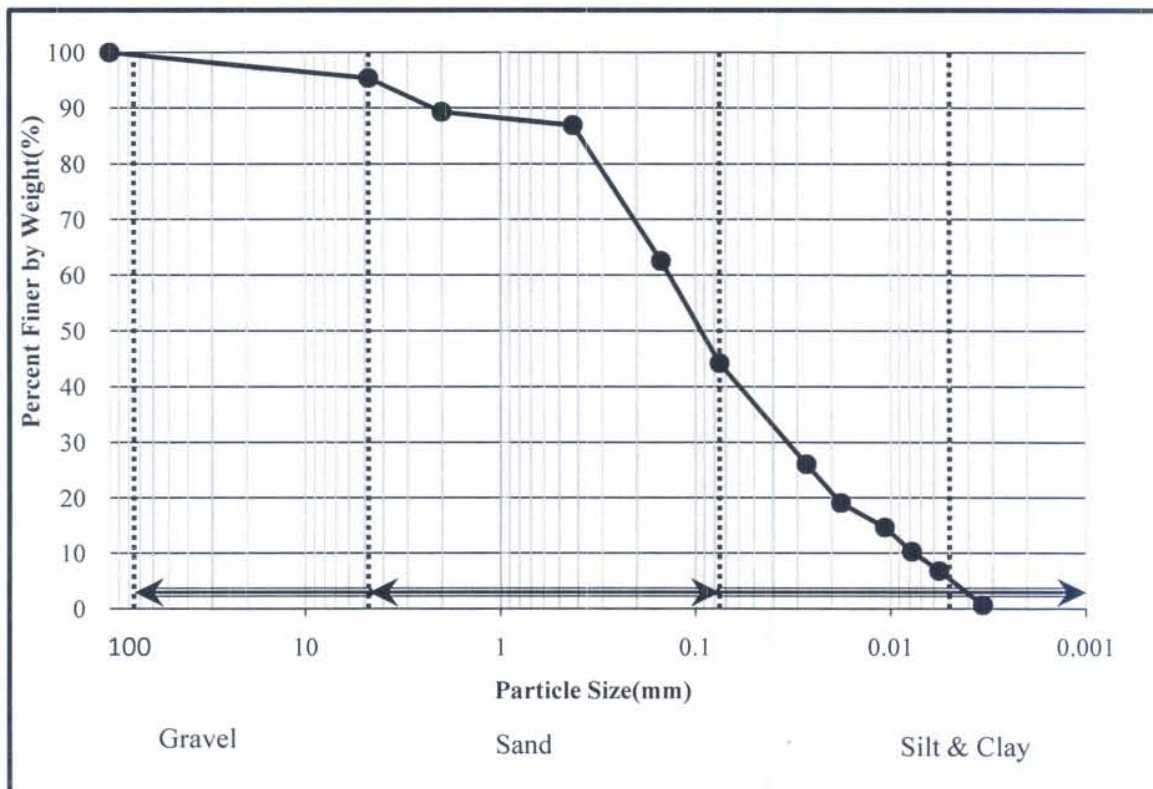
BH/TP: 40

Depth
(m) 1.0-1.45

Sample# SPT-1

Dated: 23/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
4.6

Sand %
51.2

Silt & Clay %
44.2

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

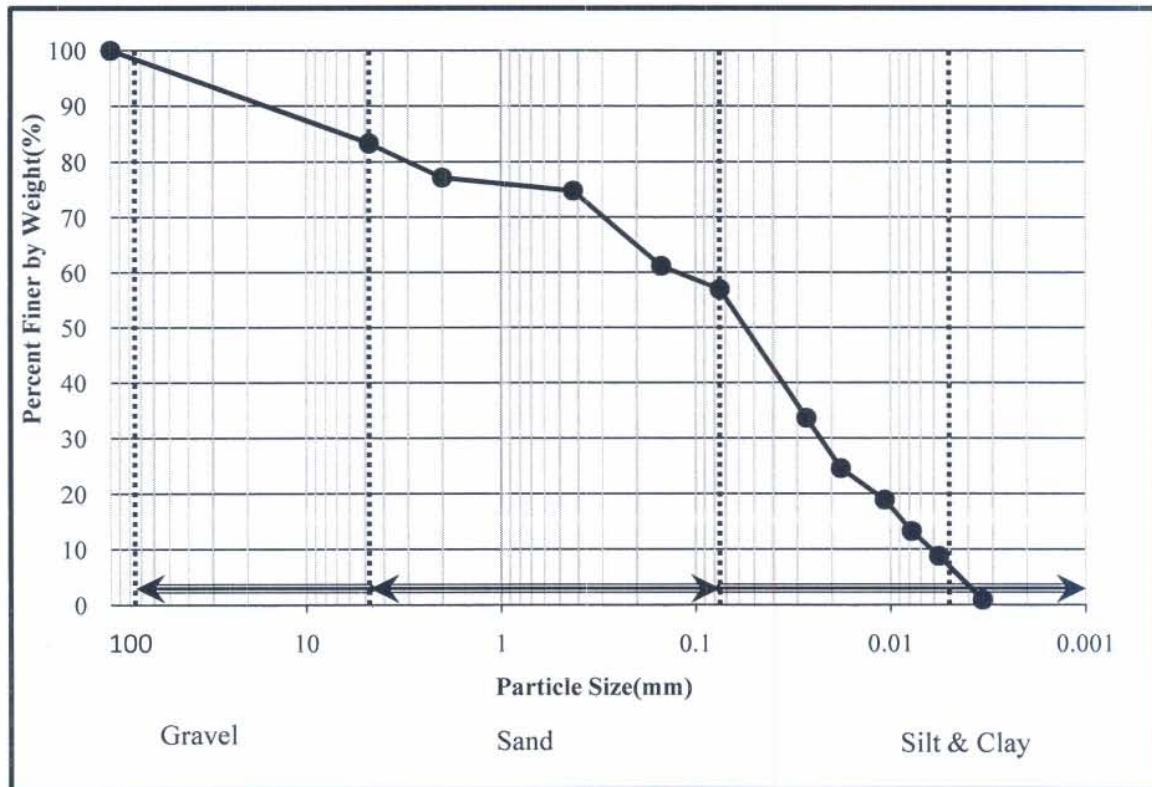
BH/TP: 43

Depth (m) 1.0-1.45

Sample# SPT-1

Dated: 23/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
16.7

Sand %
26.3

Silt & Clay %
57

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

BH/TP: 13

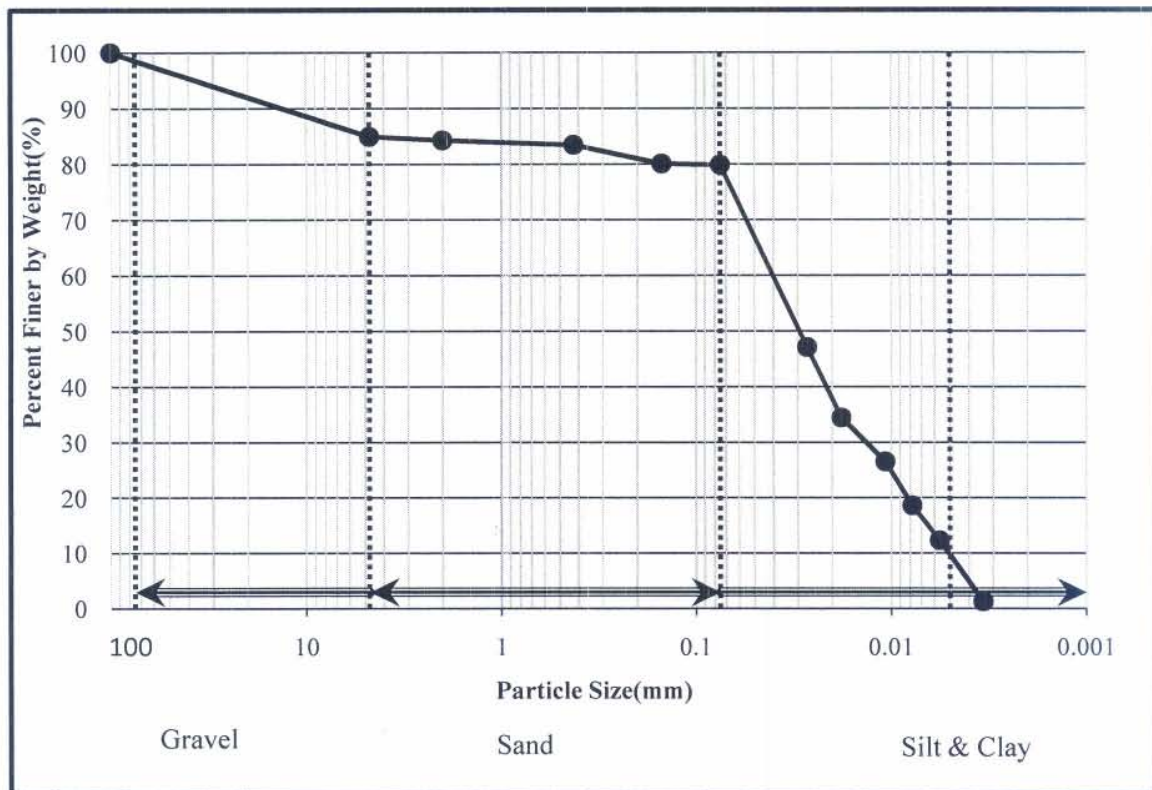
**Depth
(m)** 2.0-2.20

Sample# UDS-1

Dated:

11/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
15

Sand %
5.1

Silt & Clay %
79.9

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

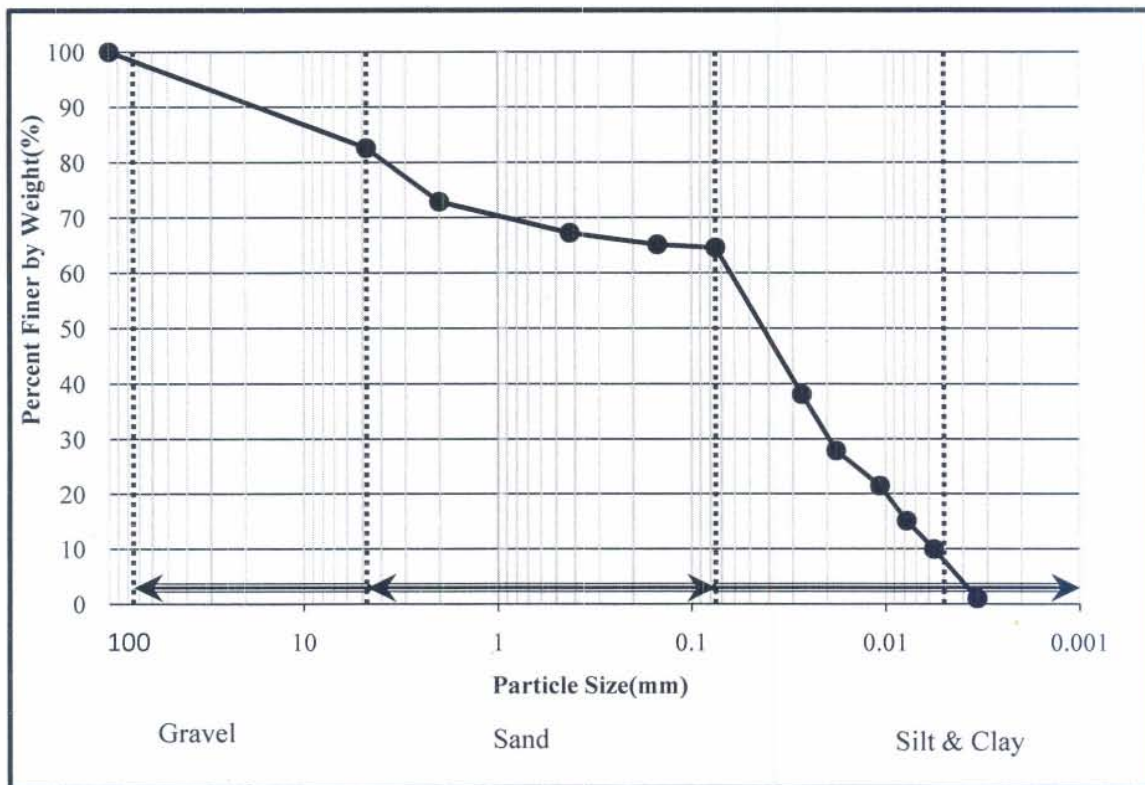
BH/TP: 15

Depth
(m) 2.0-2.20

Sample# UDS-1

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
17.4

Sand %
18

Silt & Clay %
64.6

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

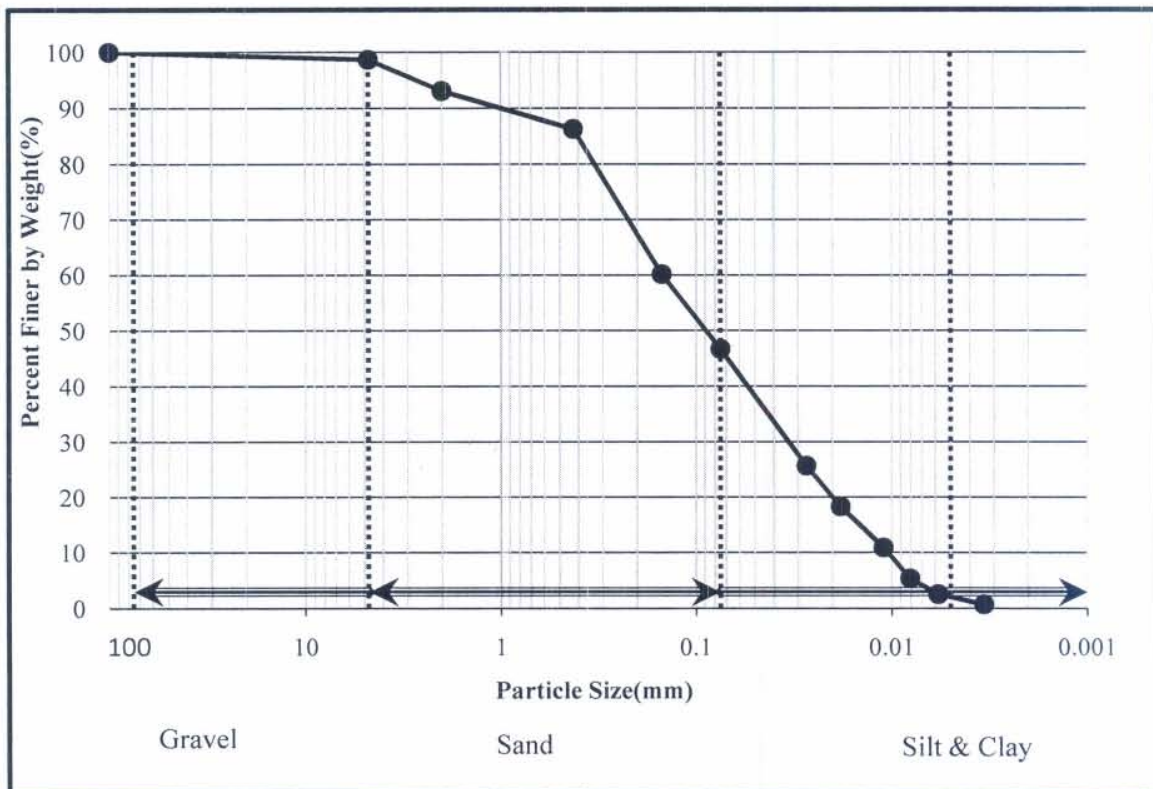
BH/TP: 16

Depth
(m) 2.0-2.20

Sample# UDS-1

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
1.3

Sand %
52

Silt & Clay %
46.7

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

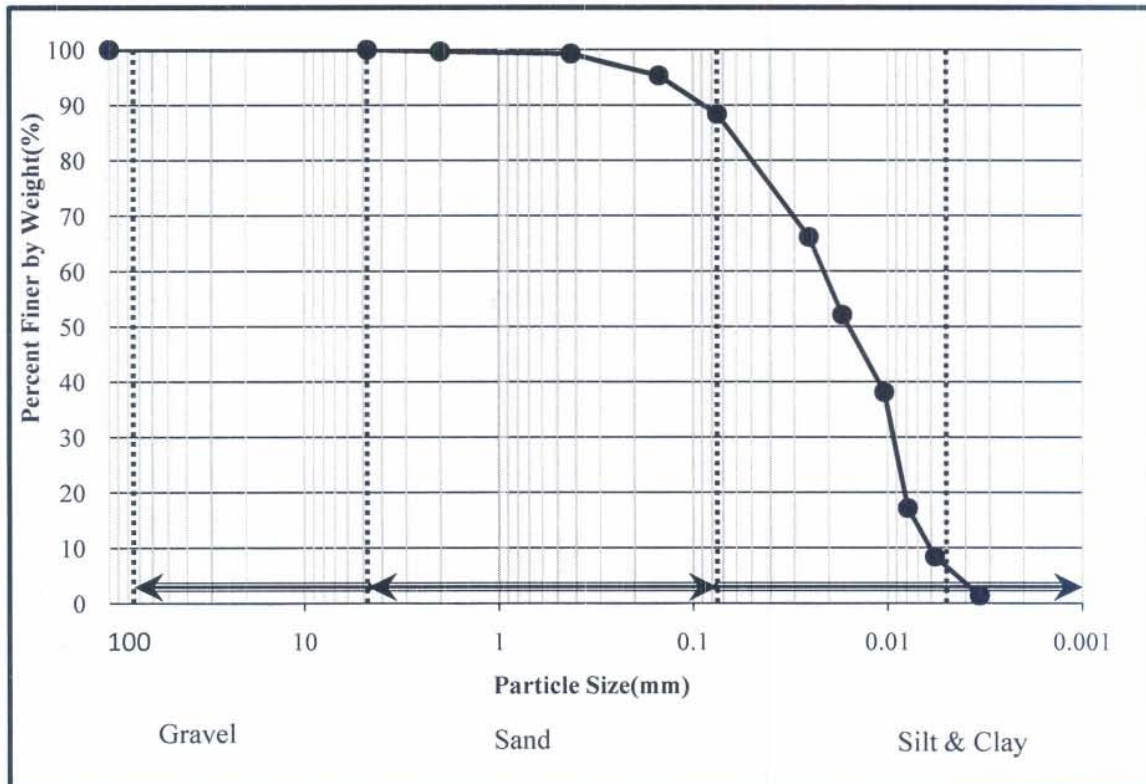
Client: Zeal & Con
Engineering

BH/TP: 23 **Depth** 3
(m)

Sample# UDS-1

Dated: 09/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0

Sand %
11.6

Silt & Clay %
88.4

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

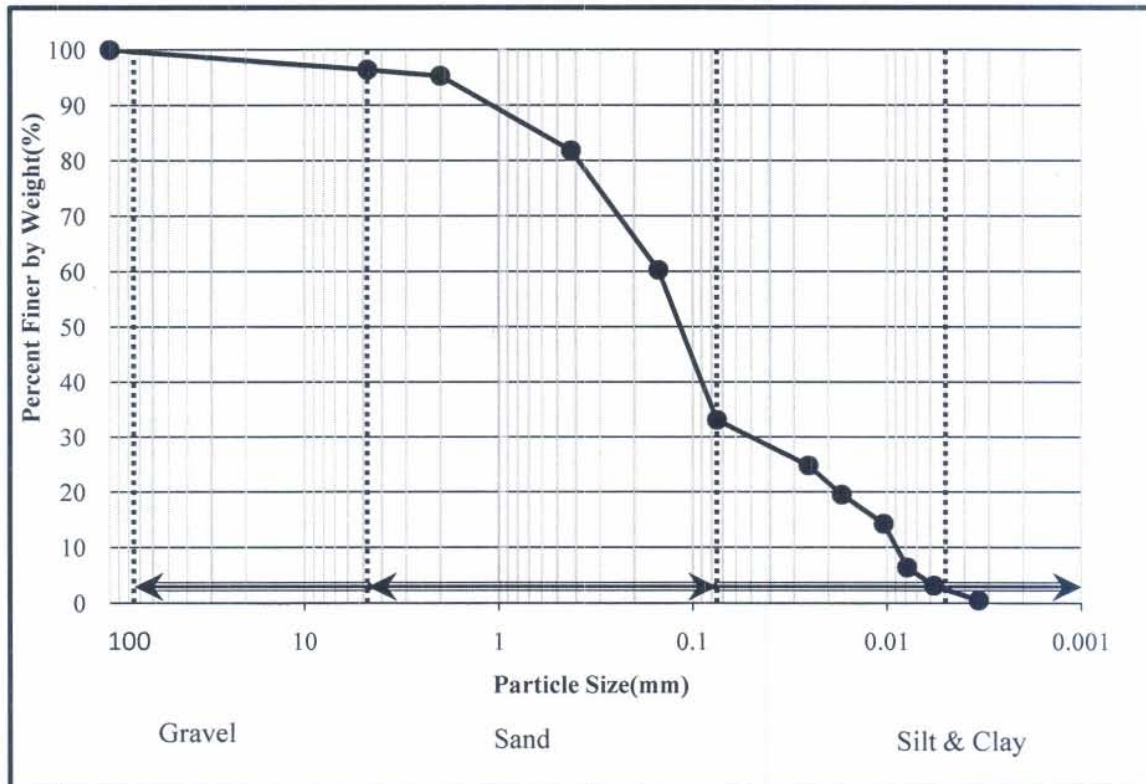
Client: Zeal & Con
Engineering

BH/TP: 25 **Depth (m)** 2 - 2.30

Sample# UDS-1

Dated: 09/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
3.6

Sand %
63.3

Silt & Clay %
33.1

Prepared by:



Checked by:

SAFE
SOIL AND FOUNDATION ENGINEERING SERVICES
House No. 17, Block A, Kichan Housing Society, Near Thane Road, Bandra, Mumbai - 400 050

GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

BH/TP: 32

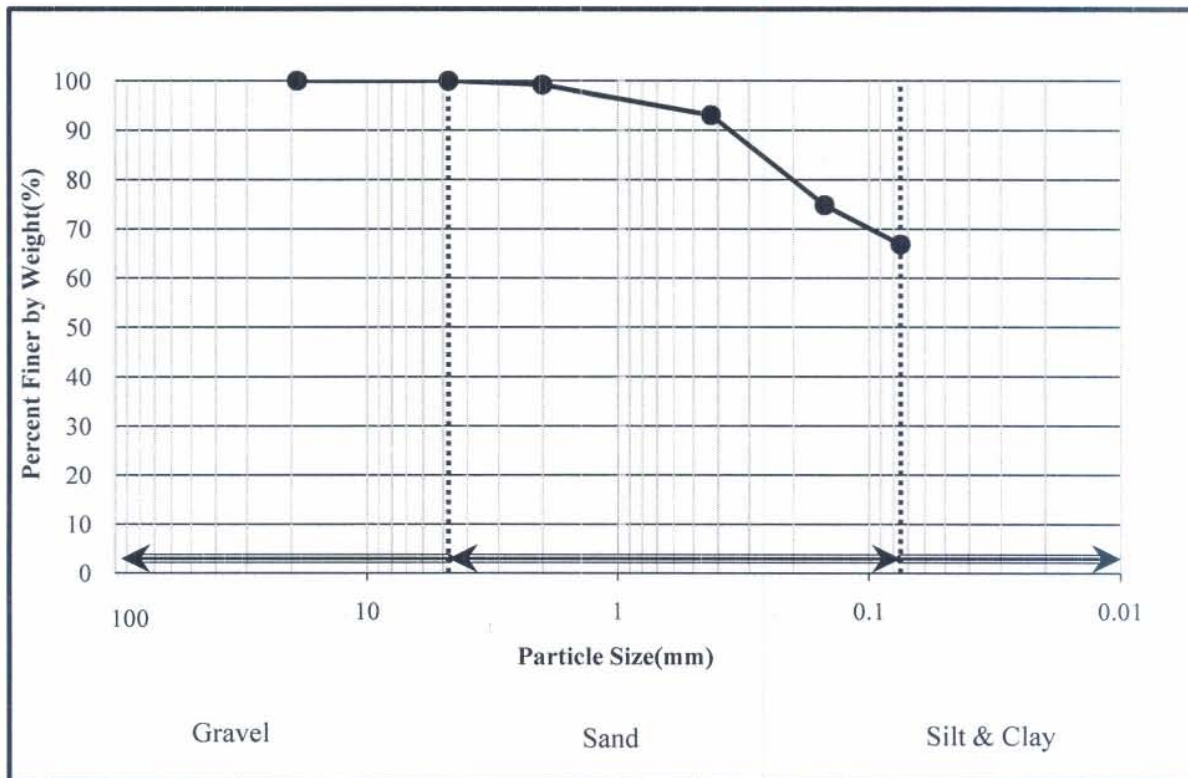
Depth (m) 2.0-2.20

Sample# UDS-1

Dated:

11-03-2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %	0	Sand %	33.1	Silt & Clay %	66.9
----------	---	--------	------	---------------	------

Prepared by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

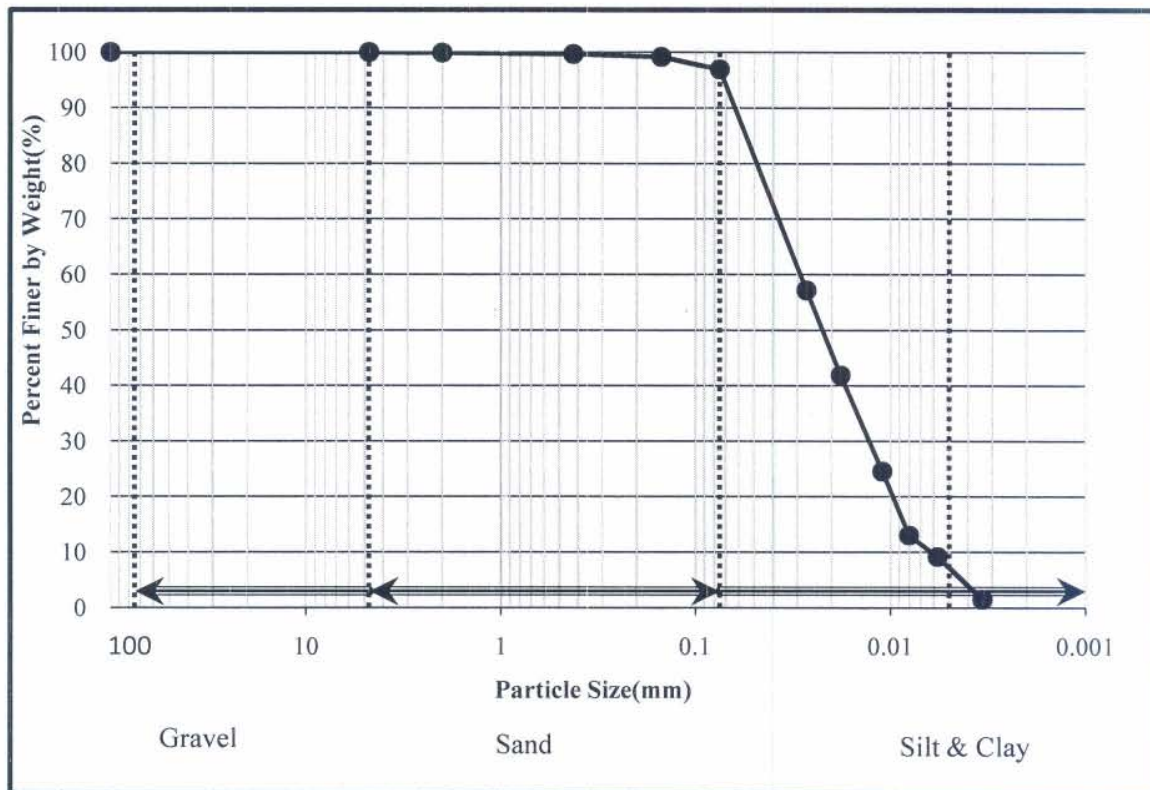
BH/TP: 35

Depth
(m) 2.0 - 2.45

Sample# SPT-2

Dated: 11/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0

Sand %
3

Silt & Clay %
97

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

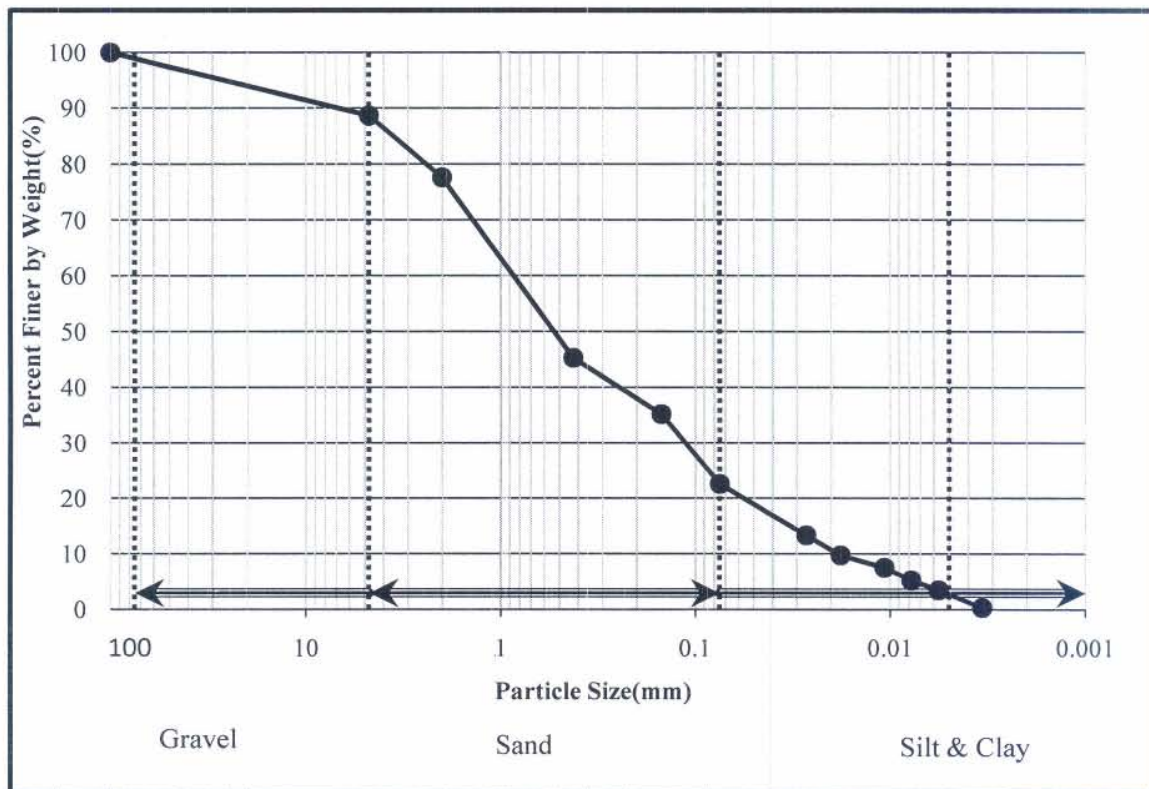
BH/TP: 38

Depth
(m) 2.0-2.20

Sample# UDS-1

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
11.3

Sand %
66.1

Silt & Clay %
22.6

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal & Con
Engineering

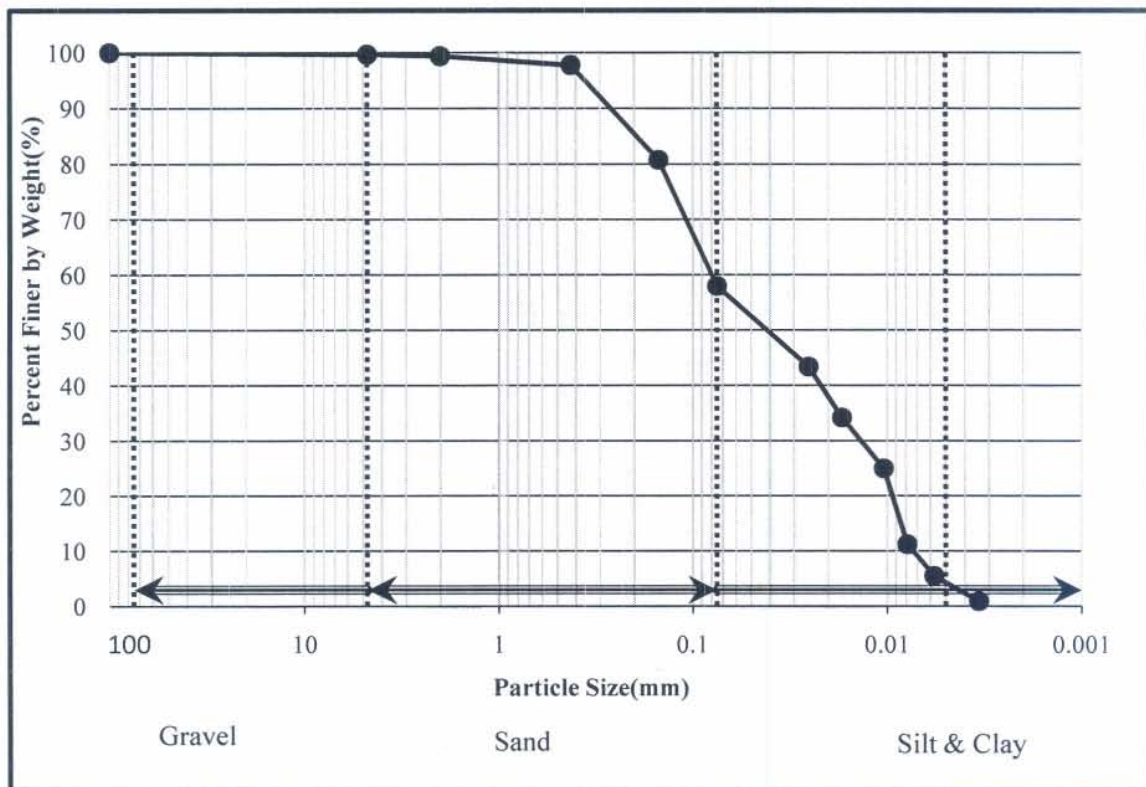
BH/TP: 39

Depth
(m) 2 - 2.54

Sample# UDS-1

Dated: 09/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
0.3

Sand %
41.7

Silt & Clay %
58

Prepared by:



Checked by:



GRAIN SIZE ANALYSIS

SAFE
Soil and Foundation
Engg. Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

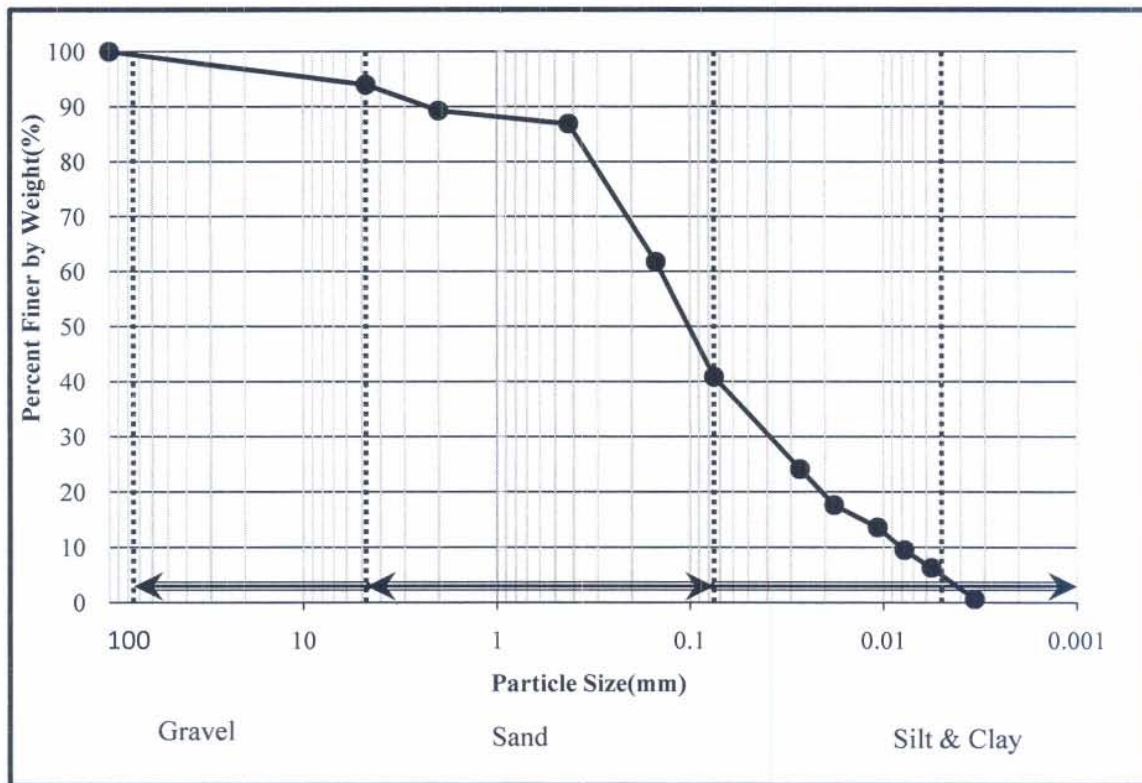
BH/TP: 40

**Depth
(m)** 2.0-2.20

Sample# UDS-1

Dated: 10/03/2016.

PARTICLE SIZE DISTRIBUTION CURVE



Gravel %
6

Sand %
53.1

Silt & Clay %
40.9

Prepared by:



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

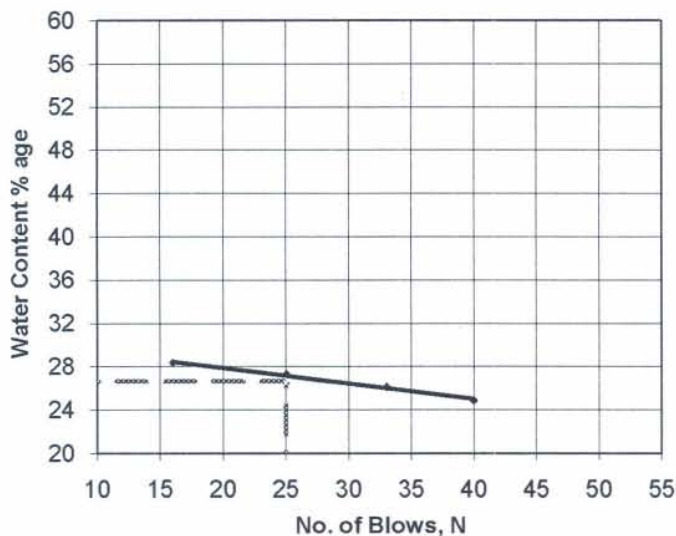
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
6	1	x	1.00--1.45	22-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	25	33	40	=====	=====
Mark on Dish	8	4	19	1	20	27
Wet Soil + Dish Weight	33.43	30.69	27.85	27.46	22.89	21.31
Dry Soil + Dish Weight	29.6	27.2	24.8	24.4	21.6	20.2
Weight of Dish	16.1	14.4	13.1	12.1	15.1	14.7
Dry Soil	13.5	12.8	11.7	12.3	6.5	5.5
Weight of Water	3.83	3.49	3.05	3.06	1.29	1.11
Moisture Content	28.4	27.3	26.1	24.9	19.8	20.1
Avg:-					19.95	



Liquid Limit	27
Plastic Limits	20
Plasticity Index	7

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

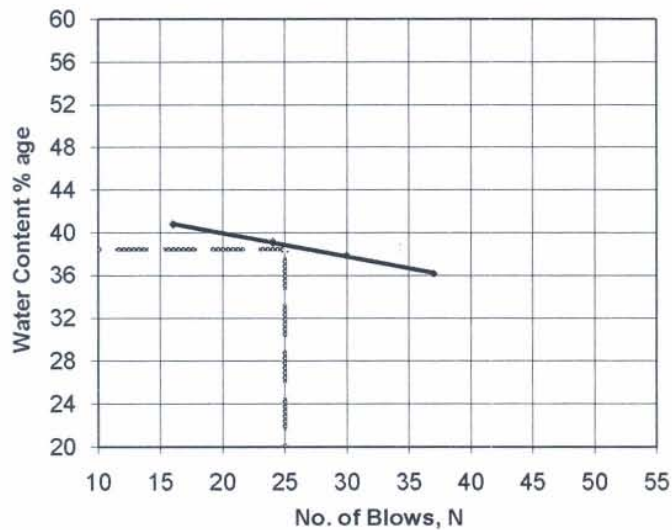
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
10	1	x	1.00--1.45	10-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	24	30	37	=====	=====
Mark on Dish	5	1	2	9	7	11
Wet Soil + Dish Weight	29.62	28.51	32.82	27.35	26.71	23.17
Dry Soil + Dish Weight	24.6	23.9	27.7	23.4	25	21.3
Weight of Dish	12.3	12.1	14.2	12.5	17.5	13.2
Dry Soil	12.3	11.8	13.5	10.9	7.5	8.1
Weight of Water	5.02	4.61	5.12	3.95	1.71	1.87
Moisture Content	40.8	39.1	37.9	36.2	22.8	23.1
					Avg:-	22.95



Liquid Limit	39
Plastic Limits	23
Plasticity Index	16

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

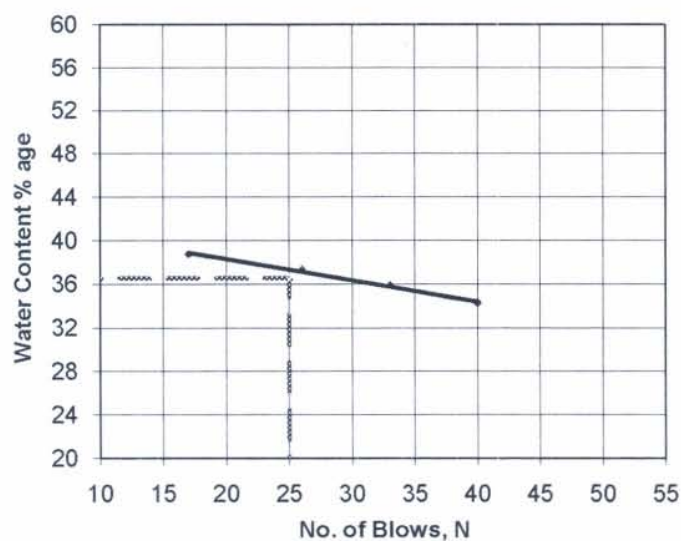
Atterberg Limits

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:- Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
10	3	x	3.00--0.00	10-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	17	26	33	40	=====	=====
Mark on Dish	25	26	37	38	23	24
Wet Soil + Dish Weight	31.46	32.86	32.84	28.80	20.22	20.29
Dry Soil + Dish Weight	27	28.2	28.1	25.1	19.1	19
Weight of Dish	15.5	15.7	14.9	14.3	12.8	11.9
Dry Soil	11.5	12.5	13.2	10.8	6.3	7.1
Weight of Water	4.46	4.66	4.74	3.70	1.12	1.29
Moisture Content	38.8	37.3	35.9	34.3	17.8	18.2
Avg:-					18.00	



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

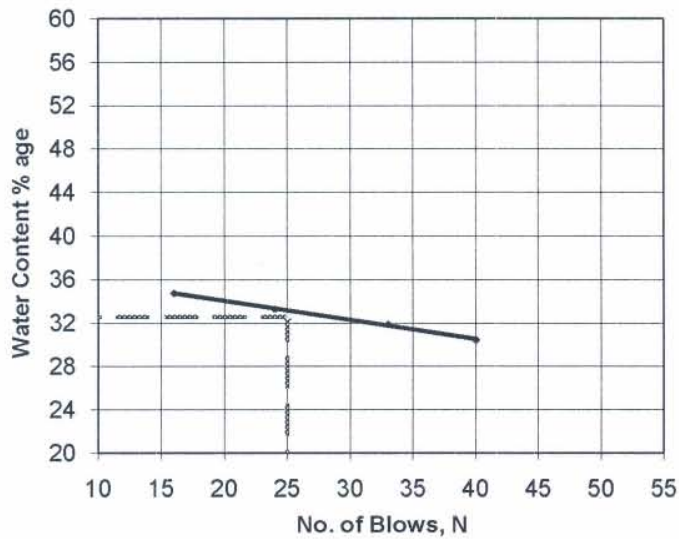
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
13	x	1	2.00--2.20	11-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	24	33	40	=====	=====
Mark on Dish	7	9	15	17	10	11
Wet Soil + Dish Weight	32.73	28.63	29.21	27.46	23.81	22.21
Dry Soil + Dish Weight	28.8	24.6	25	24.2	22.3	20.4
Weight of Dish	17.5	12.5	11.8	13.5	16.2	13.2
Dry Soil	11.3	12.1	13.2	10.7	6.1	7.2
Weight of Water	3.93	4.03	4.21	3.26	1.51	1.81
Moisture Content	34.8	33.3	31.9	30.5	24.7	25.1
Avg:-					24.90	



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

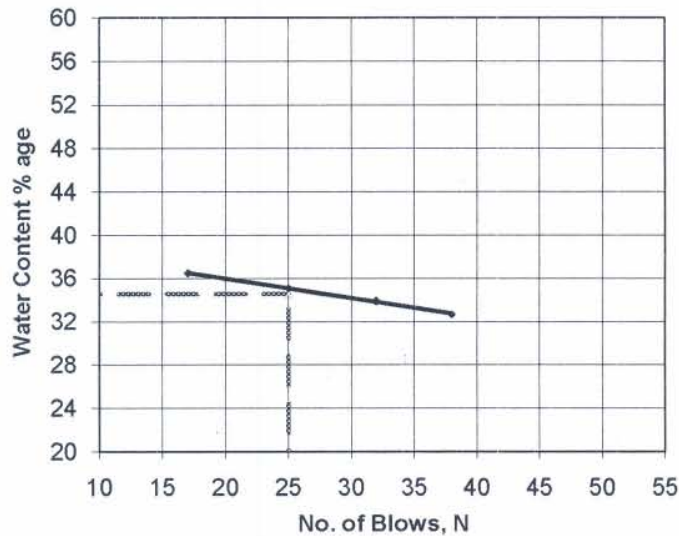
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
13	3	x	4.00--4.45	11-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	17	25	32	38	=====	=====
Mark on Dish	1	3	13	14	6	3
Wet Soil + Dish Weight	29.44	30.94	28.50	31.02	23.51	21.34
Dry Soil + Dish Weight	24.8	26.2	24.5	26.8	21.7	19.6
Weight of Dish	12.1	12.7	12.7	13.9	14.4	12.7
Dry Soil	12.7	13.5	11.8	12.9	7.3	6.9
Weight of Water	4.64	4.74	4.00	4.22	1.81	1.74
Moisture Content	36.5	35.1	33.9	32.7	24.8	25.2
Avg:-					25.00	



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

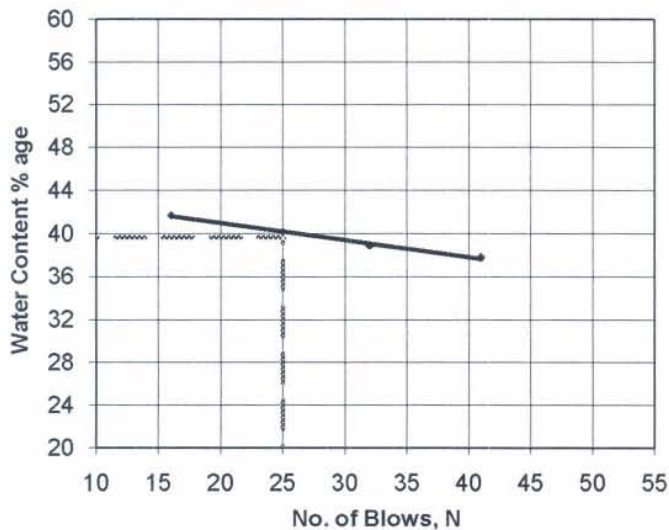
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
15	1	x	1.00--1.45	10-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	25	32	41	=====	=====
Mark on Dish	37	36	40	13	M	N
Wet Soil + Dish Weight	27.00	29.78	28.91	28.27	22.54	20.62
Dry Soil + Dish Weight	22.2	25	24.2	24	21	19.3
Weight of Dish	10.7	13.1	12.1	12.7	13.2	12.8
Dry Soil	11.5	11.9	12.1	11.3	7.8	6.5
Weight of Water	4.80	4.78	4.71	4.27	1.54	1.32
Moisture Content	41.7	40.2	38.9	37.8	19.8	20.3
Avg:-					20.05	



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

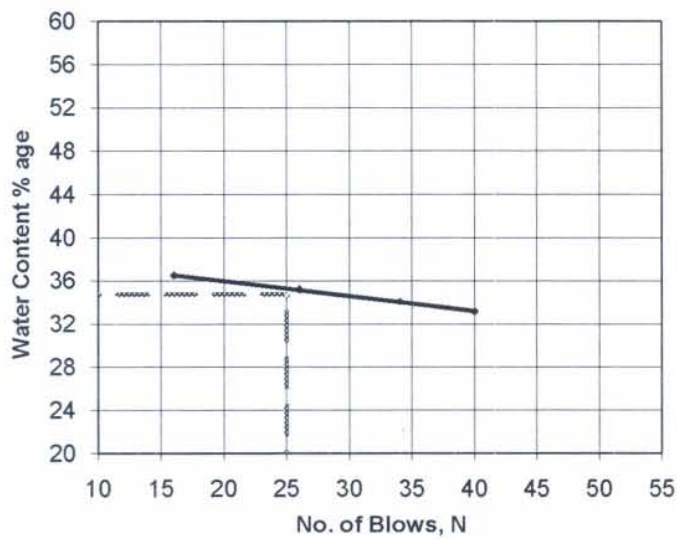
Atterberg Limits

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:- Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
15	x	1	2.00--2.20	10-03-2016.

Description	Liquid Limts				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	26	34	40	=====	=====
Mark on Dish	6	8	11	12	13	C
Wet Soil + Dish Weight	30.17	32.46	27.82	32.55	21.31	19.41
Dry Soil + Dish Weight	25.9	28.2	24.1	29	20	18.2
Weight of Dish	14.2	16.1	13.2	18.3	13.2	11.9
Dry Soil	11.7	12.1	10.9	10.7	6.8	6.3
Weight of Water	4.27	4.26	3.72	3.55	1.31	1.21
Moisture Content	36.5	35.2	34.1	33.2	19.3	19.2
					Avg:-	19.25



Liquid Limit	35
Plastic Limits	19
Plasticity Index	16

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

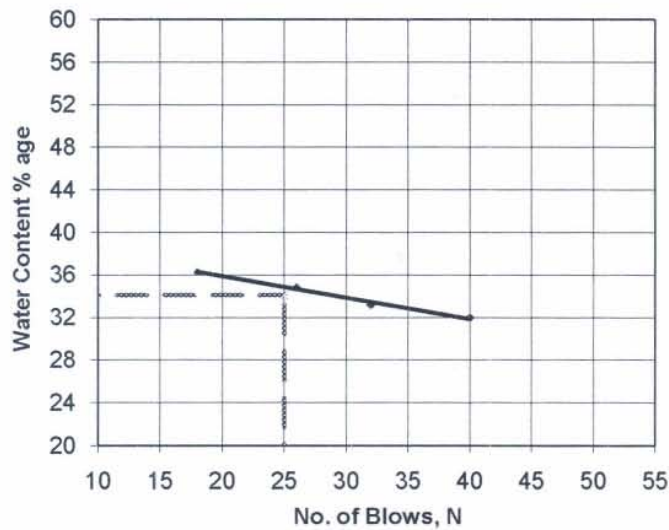
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
15	3	x	3.00--3.45	10-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	18	26	32	40	=====	=====
Mark on Dish	13	17	10	15	31	33
Wet Soil + Dish Weight	27.01	26.72	31.78	27.77	23.19	24.83
Dry Soil + Dish Weight	23.2	23.3	27.9	23.9	21.6	23.4
Weight of Dish	12.7	13.5	16.2	11.8	13.3	15.9
Dry Soil	10.5	9.8	11.7	12.1	8.3	7.5
Weight of Water	3.81	3.42	3.88	3.87	1.59	1.43
Moisture Content	36.3	34.9	33.2	32	19.2	19.1
Avg:-					19.15	



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

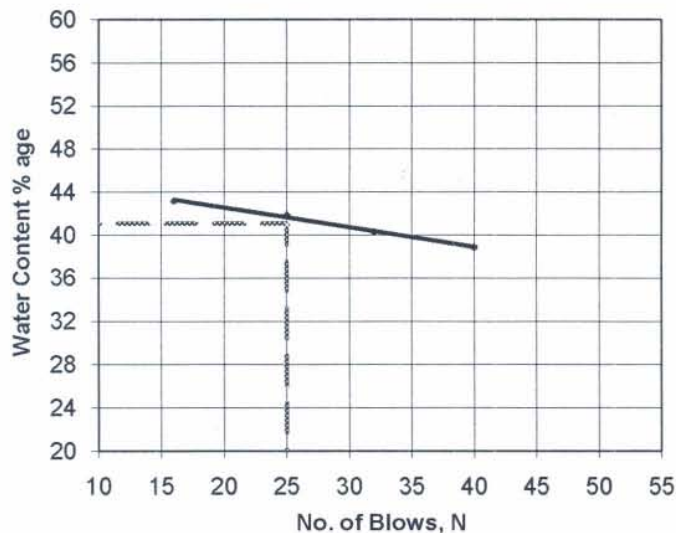
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
16	1	x	1.00--1.45	11-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	25	32	40	=====	=====
Mark on Dish	20	22	11	14	4	10
Wet Soil + Dish Weight	34.00	30.81	29.62	31.26	21.45	24.01
Dry Soil + Dish Weight	28.3	25.7	24.9	26.4	19.9	22.3
Weight of Dish	15.1	13.5	13.2	13.9	14.4	16.2
Dry Soil	13.2	12.2	11.7	12.5	5.5	6.1
Weight of Water	5.70	5.11	4.72	4.86	1.55	1.71
Moisture Content	43.2	41.9	40.3	38.9	28.2	28
					Avg:-	28.10



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

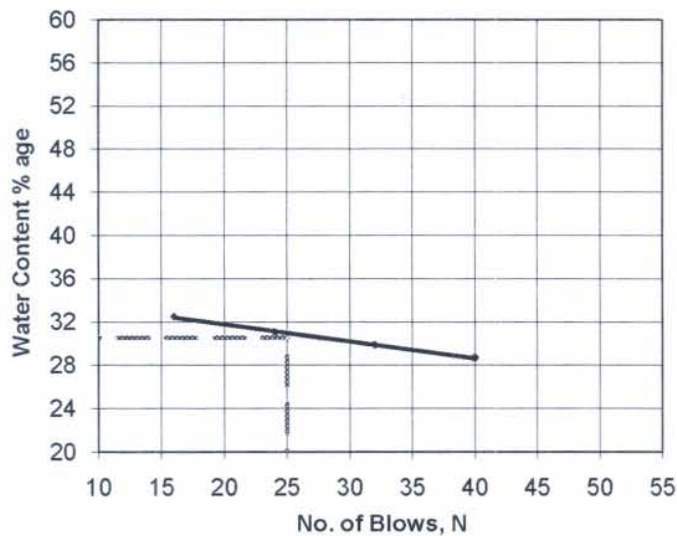
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
16	x	1	2.00--2.20	10-03-2016.

Description	Liquid Limts				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	24	32	40	=====	=====
Mark on Dish	31	33	37	39	7	8
Wet Soil + Dish Weight	25.62	30.06	29.84	24.96	25.67	24.73
Dry Soil + Dish Weight	22.6	26.7	26.4	22	24.3	23.3
Weight of Dish	13.3	15.9	14.9	11.7	17.5	16.1
Dry Soil	9.3	10.8	11.5	10.3	6.8	7.2
Weight of Water	3.02	3.36	3.44	2.96	1.37	1.43
Moisture Content	32.5	31.1	29.9	28.7	20.2	19.8
Avg:-					20.00	



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

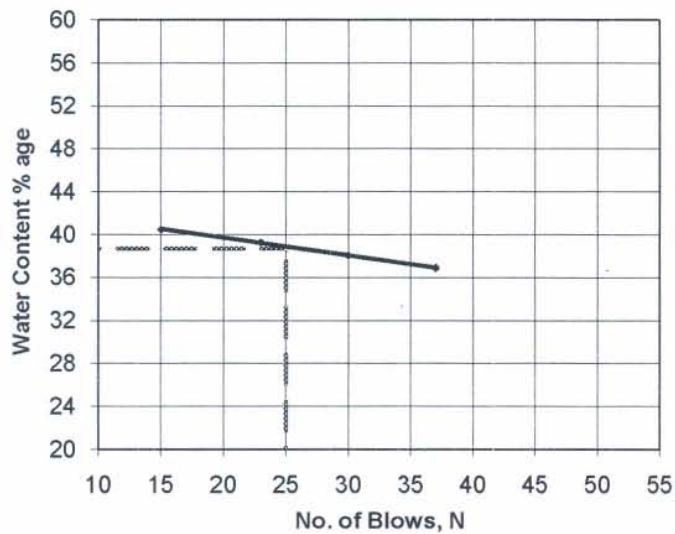
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
16	3	x	3.00--3.45	10-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	15	23	30	37	=====	=====
Mark on Dish	1	4	7	8	12	13
Wet Soil + Dish Weight	28.26	28.75	34.76	34.17	27.27	21.08
Dry Soil + Dish Weight	23.6	24.7	30	29.3	25.6	19.5
Weight of Dish	12.1	14.4	17.5	16.1	18.3	12.7
Dry Soil	11.5	10.3	12.5	13.2	7.3	6.8
Weight of Water	4.66	4.05	4.76	4.87	1.67	1.58
Moisture Content	40.5	39.3	38.1	36.9	22.9	23.2
					Avg:-	23.05



Liquid Limit	39
Plastic Limits	23
Plasticity Index	16

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

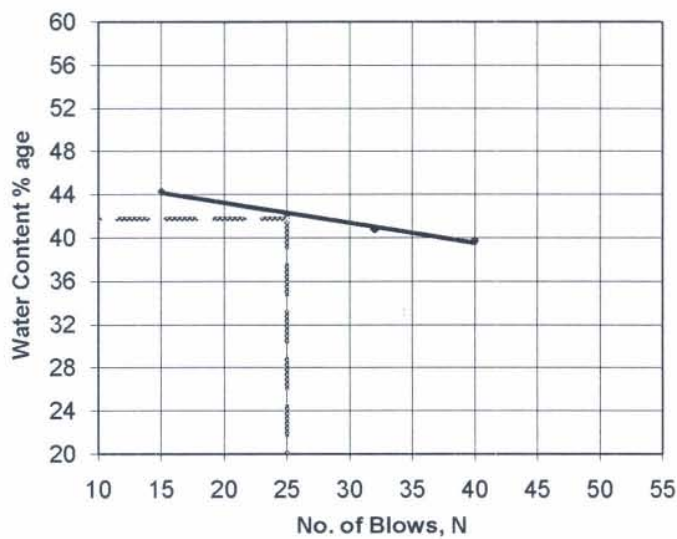
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal & Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
23	x	1	3.00-3.20	09-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	15	25	32	40	=====	=====
Mark on Dish	9	13	C	B	1	2
Wet Soil + Dish Weight	29.10	28.20	26.40	26.90	21.50	22.90
Dry Soil + Dish Weight	24	23.6	22.2	23	19.6	21.1
Weight of Dish	12.5	12.7	11.9	13.2	12.1	14.2
Dry Soil	11.5	10.9	10.3	9.8	7.5	6.9
Weight of Water	5.10	4.60	4.20	3.90	1.90	1.80
Moisture Content	44.34	42.2	40.77	39.79	25.33	26.08
					Avg:-	25.71



Liquid Limit	42
Plastic Limits	26
Plasticity Index	16

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

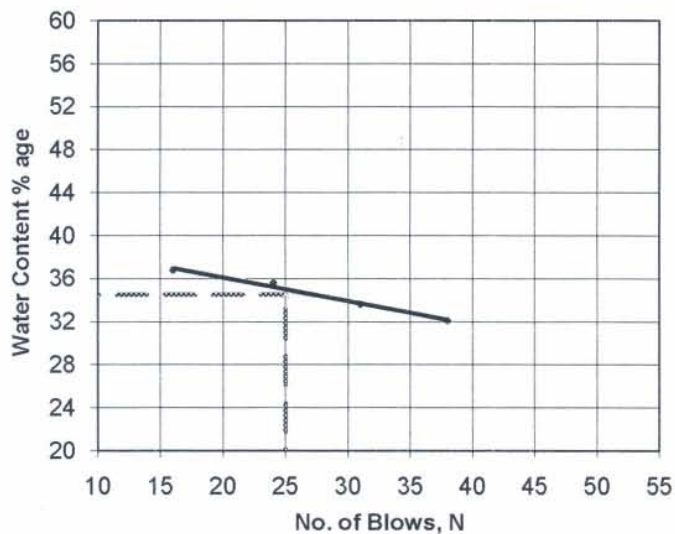
Atterberg Limits

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:- Zeal & Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
23	2	x	2.00--2.45	09-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	24	31	38	=====	=====
Mark on Dish	5	7	A	11	4	6
Wet Soil + Dish Weight	32.60	33.50	26.10	28.00	22.80	23.40
Dry Soil + Dish Weight	28	29.3	22.5	24.4	20.6	21.5
Weight of Dish	15.5	17.5	11.8	13.2	12.1	14.2
Dry Soil	12.5	11.8	10.7	11.2	8.5	7.3
Weight of Water	4.60	4.20	3.60	3.60	2.20	1.90
Moisture Content	36.8	35.6	33.64	32.14	25.88	26
					Avg:-	25.94



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

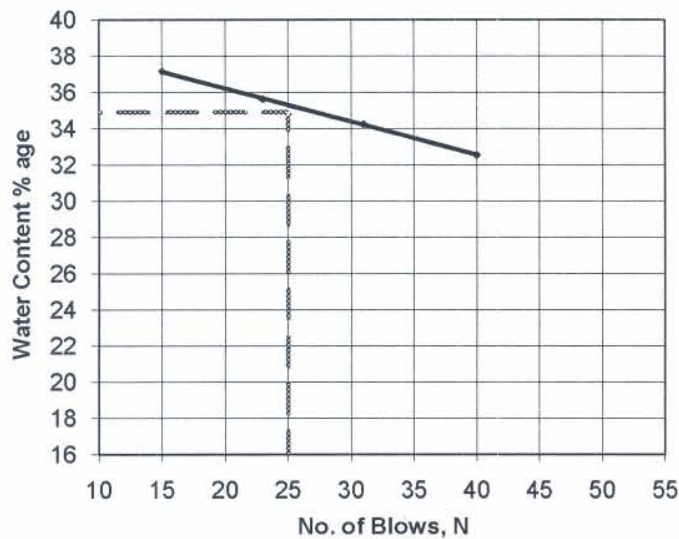
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal & Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
27	1	x	1.00--1.45	09-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	15	23	31	40	=====	=====
Mark on Dish	S	M	N	19	4	20
Wet Soil + Dish Weight	28.50	28.80	27.30	30.60	23.20	23.40
Dry Soil + Dish Weight	24	24.7	23.6	26.3	21.7	22
Weight of Dish	11.9	13.2	12.8	13.1	14.4	15.1
Dry Soil	12.1	11.5	10.8	13.2	7.3	6.9
Weight of Water	4.50	4.10	3.70	4.30	1.50	1.40
Moisture Content	37.19	35.65	34.26	32.57	20.54	20.28
					Avg:-	20.41



Liquid Limit	35
Plastic Limits	20
Plasticity Index	15

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

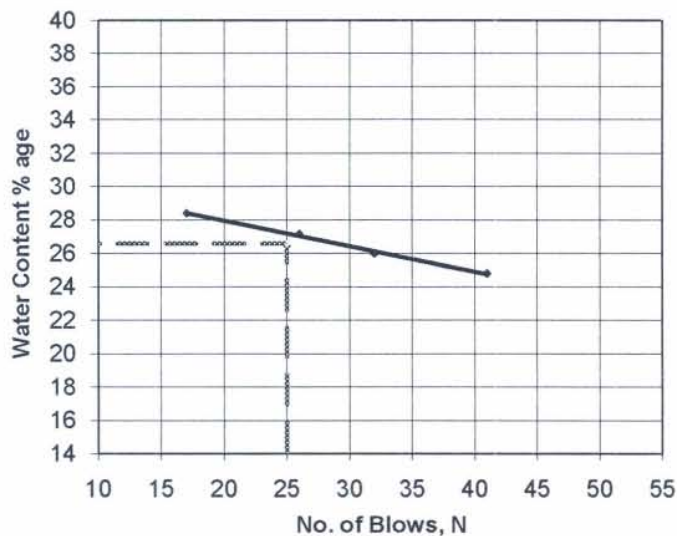
Atterberg Limits

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:- Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
33	1	x	1.00-1.45	11-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	17	26	32	41	=====	=====
Mark on Dish	27	28	30	29	12	13
Wet Soil + Dish Weight	30.24	28.91	29.23	31.65	25.99	21.20
Dry Soil + Dish Weight	26.8	25.7	26.4	28.8	24.7	19.8
Weight of Dish	14.7	13.9	15.5	17.3	18.3	12.7
Dry Soil	12.1	11.8	10.9	11.5	6.4	7.1
Weight of Water	3.44	3.21	2.83	2.85	1.29	1.40
Moisture Content	28.4	27.2	26	24.8	20.2	19.7
Avg:-					19.95	



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

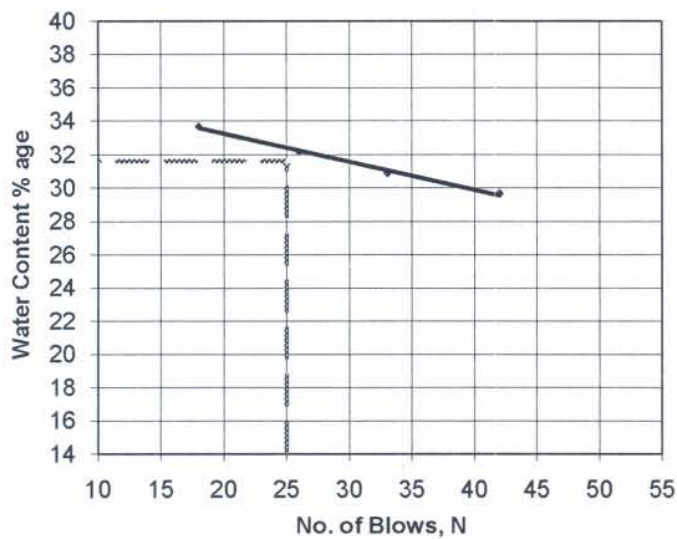
Atterberg Limits

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:- Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
33	3	x	3.00-3.45	11-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	18	26	33	42	=====	=====
Mark on Dish	14	17	21	25	B	A
Wet Soil + Dish Weight	31.55	28.70	31.02	27.56	20.01	19.50
Dry Soil + Dish Weight	27.1	25	27.1	24.8	18.7	18
Weight of Dish	13.9	13.5	14.4	15.5	13.2	11.8
Dry Soil	13.2	11.5	12.7	9.3	5.5	6.2
Weight of Water	4.45	3.70	3.92	2.76	1.31	1.50
Moisture Content	33.7	32.2	30.9	29.7	23.9	24.2
					Avg:-	24.05



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

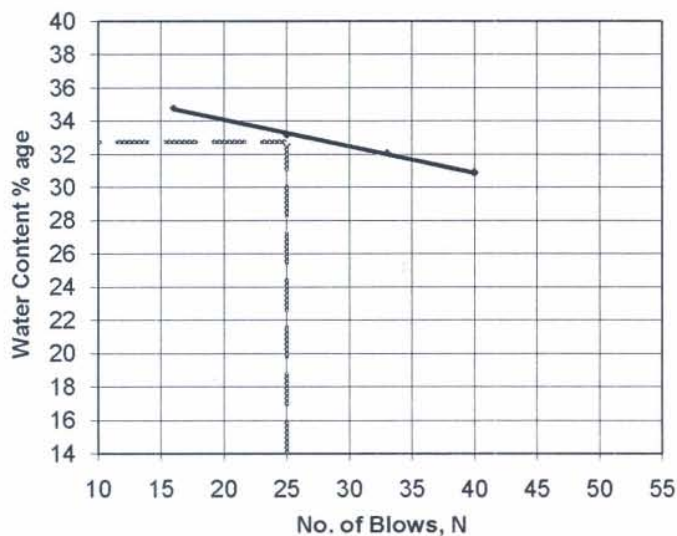
Atterberg Limits

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:- Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
33	4	x	4.00--4.45	11-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	25	33	40	=====	=====
Mark on Dish	18	13	15	21	4	7
Wet Soil + Dish Weight	32.41	28.28	28.05	27.75	22.51	26.08
Dry Soil + Dish Weight	28.2	24.4	24.1	24.6	21.1	24.6
Weight of Dish	16.1	12.7	11.8	14.4	14.4	17.5
Dry Soil	12.1	11.7	12.3	10.2	6.7	7.1
Weight of Water	4.21	3.88	3.95	3.15	1.41	1.48
Moisture Content	34.8	33.2	32.1	30.9	21.1	20.9
Avg:-					21.00	



Liquid Limit	33
Plastic Limits	21
Plasticity Index	12

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

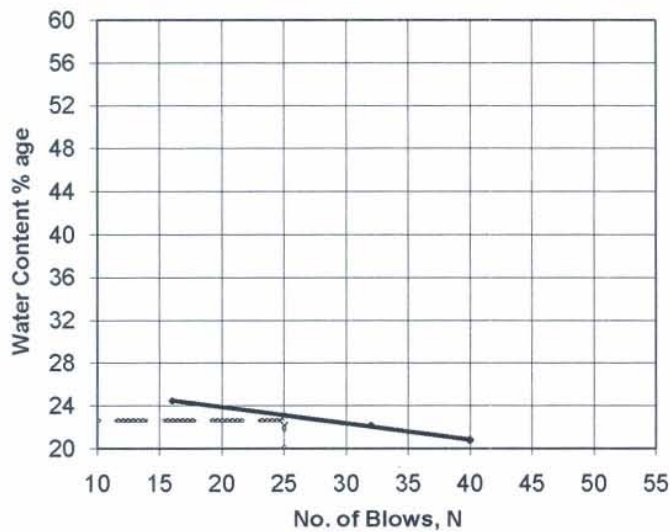
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
33	5	x	5.00--5.45	10-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	25	32	40	=====	=====
Mark on Dish	9	16	19	20	B	C
Wet Soil + Dish Weight	27.07	26.01	27.89	30.20	20.65	20.03
Dry Soil + Dish Weight	24.2	23.4	25.2	27.6	19.5	18.8
Weight of Dish	12.5	12.1	13.1	15.1	13.2	11.9
Dry Soil	11.7	11.3	12.1	12.5	6.3	6.9
Weight of Water	2.87	2.61	2.69	2.60	1.15	1.23
Moisture Content	24.5	23.1	22.2	20.8	18.2	17.8
Avg:-					18.00	



Liquid Limit	23
Plastic Limits	18
Plasticity Index	5

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

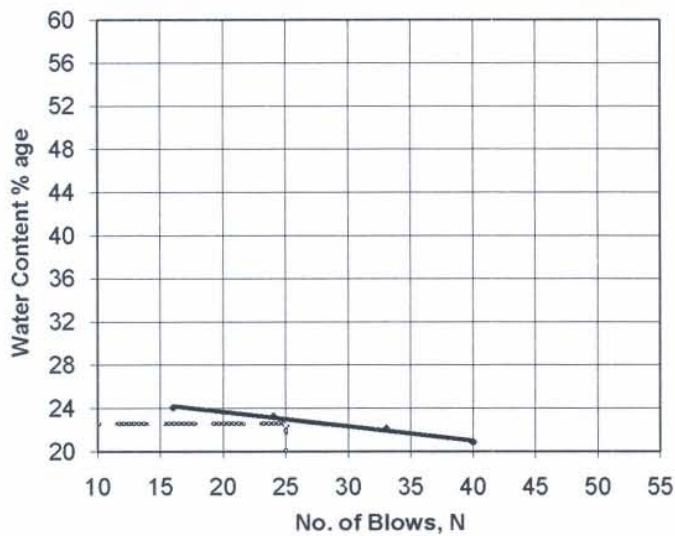
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
34	2	x	2.00--2.45	19-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	24	33	40	=====	=====
Mark on Dish	12	15	19	31	B	C
Wet Soil + Dish Weight	32.82	26.97	26.29	29.12	20.88	20.27
Dry Soil + Dish Weight	30	24.1	23.9	26.3	19.7	19
Weight of Dish	18.3	11.8	13.1	12.8	13.2	11.9
Dry Soil	11.7	12.3	10.8	13.5	6.5	7.1
Weight of Water	2.82	2.87	2.39	2.82	1.18	1.27
Moisture Content	24.1	23.3	22.1	20.9	18.2	17.9
					Avg:-	18.05



Liquid Limit	23
Plastic Limits	18
Plasticity Index	5

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

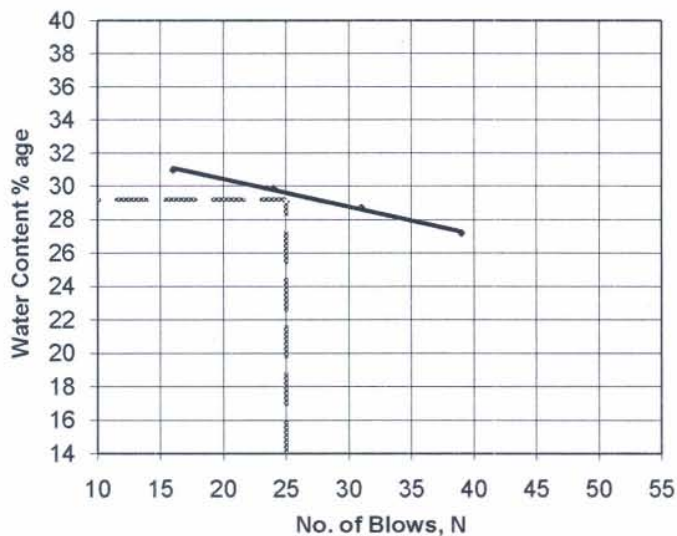
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
35	1	x	1.00--1.45	11-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	24	31	39	=====	=====
Mark on Dish	27	21	31	37	28	10
Wet Soil + Dish Weight	28.06	29.08	25.53	31.69	21.35	23.75
Dry Soil + Dish Weight	24.9	25.7	22.8	28.1	20	22.4
Weight of Dish	14.7	14.4	13.3	14.9	13.9	16.2
Dry Soil	10.2	11.3	9.5	13.2	6.1	6.2
Weight of Water	3.16	3.38	2.73	3.59	1.35	1.35
Moisture Content	31	29.9	28.7	27.2	22.2	21.8
					Avg:-	22.00



Liquid Limit	29
Plastic Limits	22
Plasticity Index	7

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

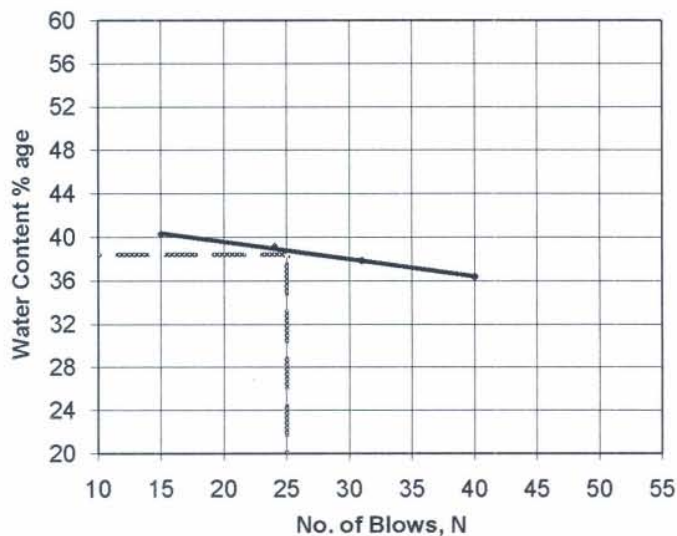
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
35	2	x	2.00--2.45	11-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	15	24	31	40	=====	=====
Mark on Dish	14	17	6	9	15	10
Wet Soil + Dish Weight	30.46	29.22	30.89	29.41	21.46	24.21
Dry Soil + Dish Weight	25.7	24.8	26.3	24.9	19.5	22.6
Weight of Dish	13.9	13.5	14.2	12.5	11.8	16.2
Dry Soil	11.8	11.3	12.1	12.4	7.7	6.4
Weight of Water	4.76	4.42	4.59	4.51	1.96	1.61
Moisture Content	40.3	39.1	37.9	36.4	25.5	25.2
Avg:-					25.35	



Liquid Limit	38
Plastic Limits	25
Plasticity Index	13

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

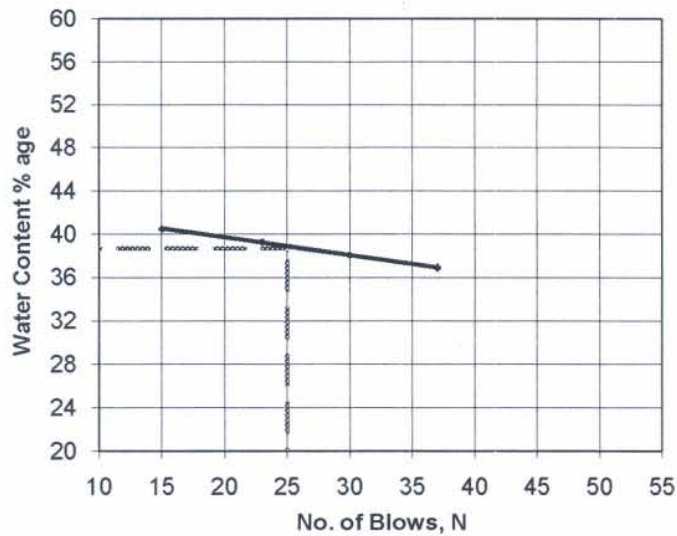
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
37	1	x	1.00--1.45	10-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	15	23	30	37	=====	=====
Mark on Dish	1	4	7	8	12	13
Wet Soil + Dish Weight	28.26	28.75	34.76	34.17	27.27	21.08
Dry Soil + Dish Weight	23.6	24.7	30	29.3	25.6	19.5
Weight of Dish	12.1	14.4	17.5	16.1	18.3	12.7
Dry Soil	11.5	10.3	12.5	13.2	7.3	6.8
Weight of Water	4.66	4.05	4.76	4.87	1.67	1.58
Moisture Content	40.5	39.3	38.1	36.9	22.9	23.2
					Avg:-	23.05



Liquid Limit	39
Plastic Limits	23
Plasticity Index	16

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

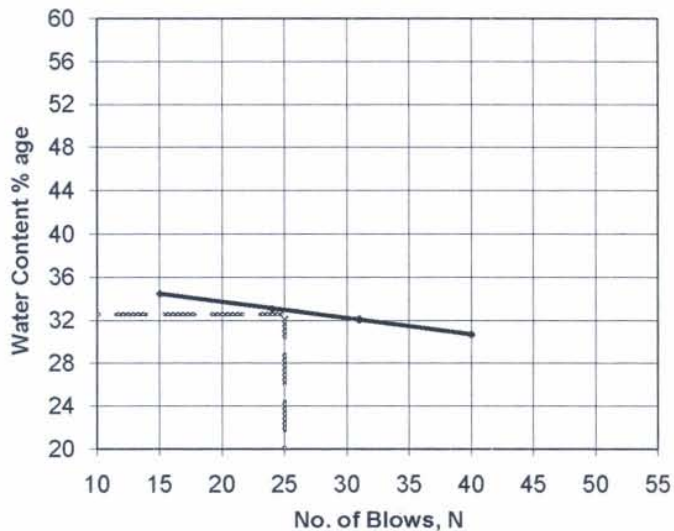
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
38	x	1	2.00--2.20	10-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	15	24	31	40	=====	=====
Mark on Dish	5	3	23	20	29	30
Wet Soil + Dish Weight	32.31	30.27	28.26	29.35	23.97	22.95
Dry Soil + Dish Weight	28	25.9	24.5	26	22.8	21.7
Weight of Dish	15.5	12.7	12.8	15.1	17.3	15.5
Dry Soil	12.5	13.2	11.7	10.9	5.5	6.2
Weight of Water	4.31	4.37	3.76	3.35	1.17	1.25
Moisture Content	34.5	33.1	32.1	30.7	21.2	20.1
Avg:-					20.65	



Liquid Limit	33
Plastic Limits	21
Plasticity Index	12

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

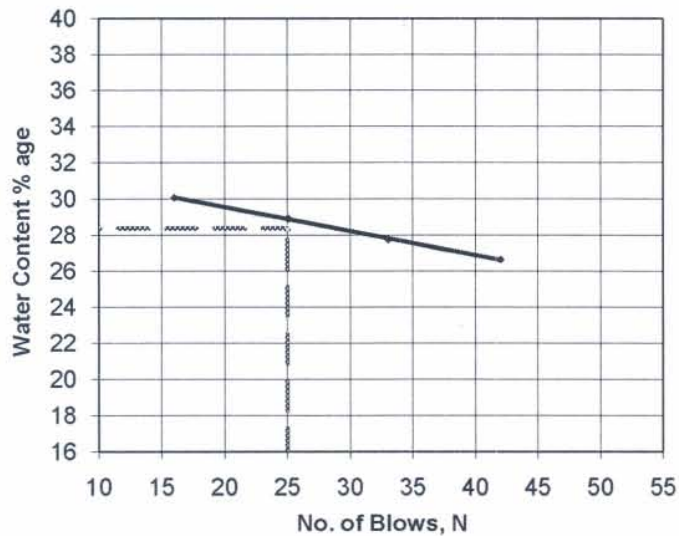
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal & Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
39	x	1	2.00--2.54	09-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	16	25	33	42	=====	=====
Mark on Dish	10	12	15	8	14	17
Wet Soil + Dish Weight	30.90	33.90	32.00	29.40	22.50	21.44
Dry Soil + Dish Weight	27.5	30.4	28.5	26.6	21.2	20.2
Weight of Dish	16.2	18.3	15.9	16.1	13.9	13.5
Dry Soil	11.3	12.1	12.6	10.5	7.3	6.7
Weight of Water	3.40	3.50	3.50	2.80	1.30	1.24
Moisture Content	30.1	28.92	27.77	26.66	17.8	18.5
					Avg:-	18.15



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

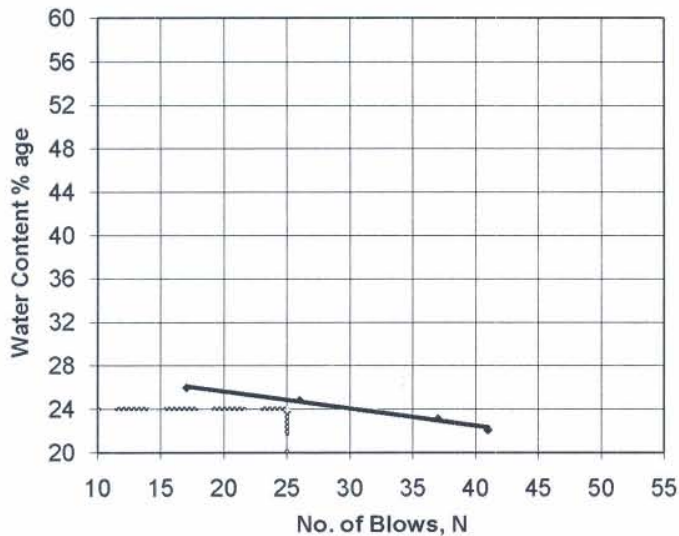
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
40	1	x	1.00--1.45	22-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	17	26	37	41	=====	=====
Mark on Dish	4	2	14	16	7	19
Wet Soil + Dish Weight	30.15	31.44	28.56	29.32	26.27	19.74
Dry Soil + Dish Weight	26.9	28	25.8	26.2	24.8	18.66
Weight of Dish	14.4	14.2	13.9	12.1	17.5	13.16
Dry Soil	12.5	13.8	11.9	14.1	7.3	5.5
Weight of Water	3.25	3.44	2.76	3.12	1.47	1.08
Moisture Content	26	24.9	23.2	22.1	20.1	19.7
Avg:-					19.90	



Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

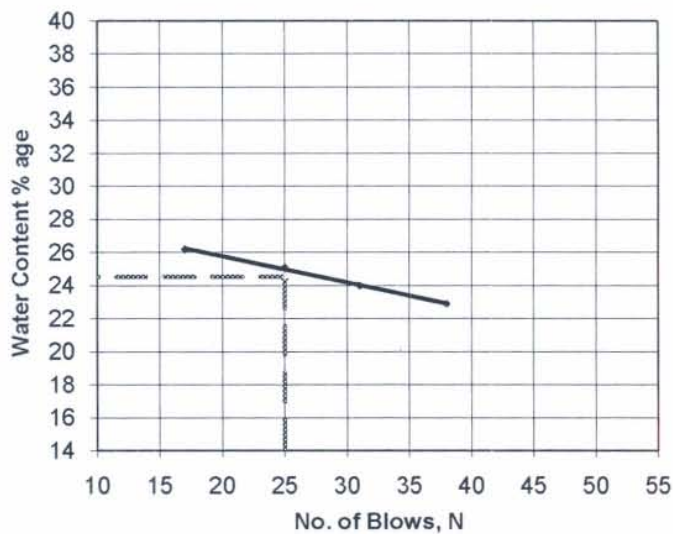
Atterberg Limits

Project:- **CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT**

Client:- **Zeal Con Engineering**

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
40	x	1	2.00-2.20	10-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	17	25	31	38	=====	=====
Mark on Dish	10	12	13	15	5	6
Wet Soil + Dish Weight	31.22	34.81	25.97	26.79	23.61	21.57
Dry Soil + Dish Weight	28.1	31.5	23.4	24	22.3	20.4
Weight of Dish	16.2	18.3	12.7	11.8	15.5	14.2
Dry Soil	11.9	13.2	10.7	12.2	6.8	6.2
Weight of Water	3.12	3.31	2.57	2.79	1.31	1.17
Moisture Content	26.2	25.1	24	22.9	19.2	18.8
					Avg:-	19.00



Liquid Limit	25
Plastic Limits	19
Plasticity Index	6

Prepared by:-

Checked by:-



SAFE

Soil And Foundation
Engineering Services
Cell: +92 0333-4303452

Atterberg Limits

Project:-

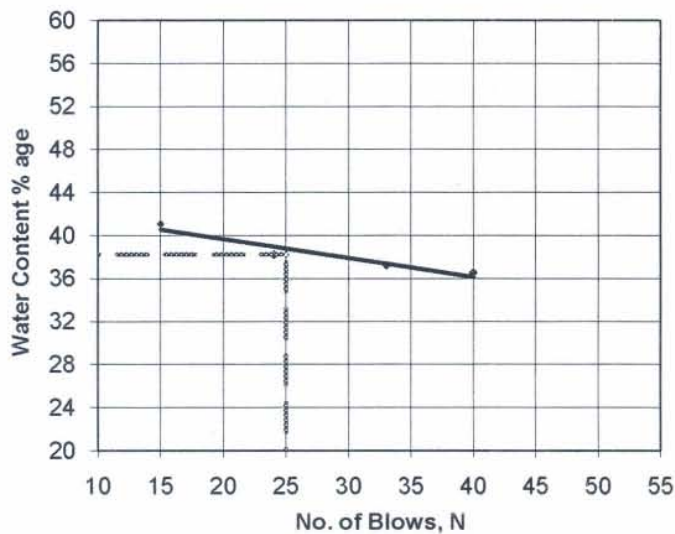
CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:-

Zeal Con Engineering

BH No.	SPT NO.	UDS NO.	Depth in meter	Dated
43	1	x	1.00--1.45	22-03-2016.

Description	Liquid Limits				Plastic Limits	
	Trial No. 1	Trial No. 2	Trial No. 3	Trial No. 4	Trial No. 1	Trial No. 2
No. of Blows	15	24	33	40	=====	=====
Mark on Dish	9	11	15	29	5	6
Wet Soil + Dish Weight	26.46	28.82	26.78	31.19	22.70	19.35
Dry Soil + Dish Weight	22.1	24.2	22.5	27.2	21.1	18.1
Weight of Dish	11.5	12.1	11	16.3	14.5	13.2
Dry Soil	10.6	12.1	11.5	10.9	6.6	4.9
Weight of Water	4.36	4.62	4.28	3.99	1.60	1.25
Moisture Content	41.1	38.2	37.2	36.6	24.2	25.6
					Avg:-	24.90



Liquid Limit	38
Plastic Limits	25
Plasticity Index	13

Prepared by:-

Checked by:-



Safe

CONSOLIDATION TEST

Project: Cons. of Nashpa Gas LPG Plant Kohat

BH-13

Depth: 2.0-2.20 meter

Sample No. UDS-1

Date: 17-03-2016

Pressure	Void Ratio	C_v	m_v	C_c
kPa		cm^2/sec	m^2/kN	
25	0.506		0.00022	0.0284
50	0.498		0.00022	0.0559
99	0.481		0.00013	0.0664
197	0.461	0.00353	0.00009	0.0898
394	0.434	0.00320		
787	0.404	0.00292		
1574	0.368	0.00292		
787	0.378			
394	0.384			
197	0.393			
99	0.398			
50	0.406			
25	0.415			

SOIL AND SPECIMEN CHARACTERISTICS

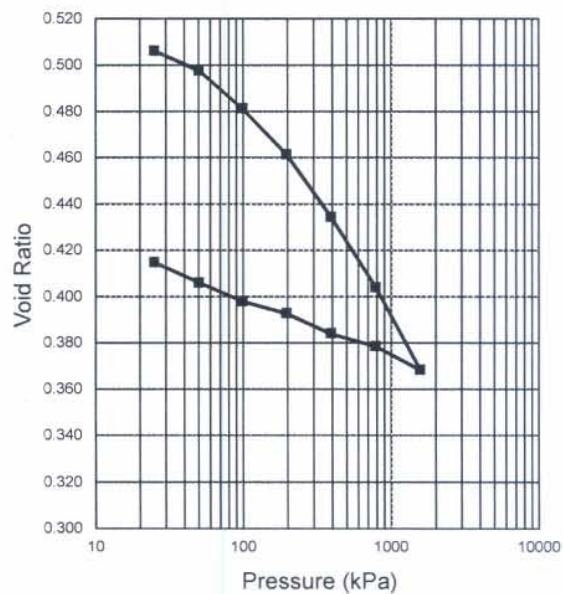
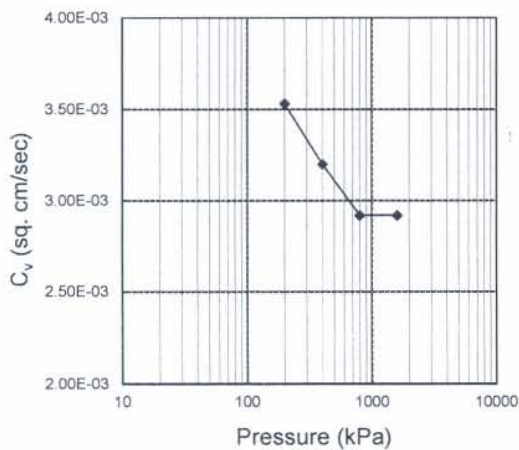
Initial Bulk Density (g/cc)	2.023
Final Bulk Density (g/cc)	2.183
Initial Water Content (%)	14.5
Final Water Content (%)	14.0
Initial Specimen Height (cm)	2.0
Specimen Diameter (cm)	6.0
Specific Gravity	2.710
Initial Void Ratio	0.5340

TEST CHARACTERISTICS

No. of Load Increments = 7

c_v = Coefficient of Consolidation,
 m_v = Coefficient of volume compressibility,
 C_c = Compression Index

C_v vs Stress



Safe

CONSOLIDATION TEST

Project: Cons. of Nashpa Gas LPG Plant Kohat

BH-15

Depth: 2.0-2.20 meter

Sample No. UDS-1

Date: 17-03-2016

Pressure kPa	Void Ratio	C_v cm^2/sec	m_v m^2/kN	C_c
25	0.430		0.00011	0.0133
50	0.426		0.00016	0.0375
99	0.415		0.00008	0.0395
197	0.403	0.00353	0.00006	0.0532
394	0.387	0.00353		
787	0.365	0.00392		
1574	0.338	0.00353		
787	0.341			
394	0.345			
197	0.349			
99	0.354			
50	0.359			
25	0.362			

SOIL AND SPECIMEN CHARACTERISTICS

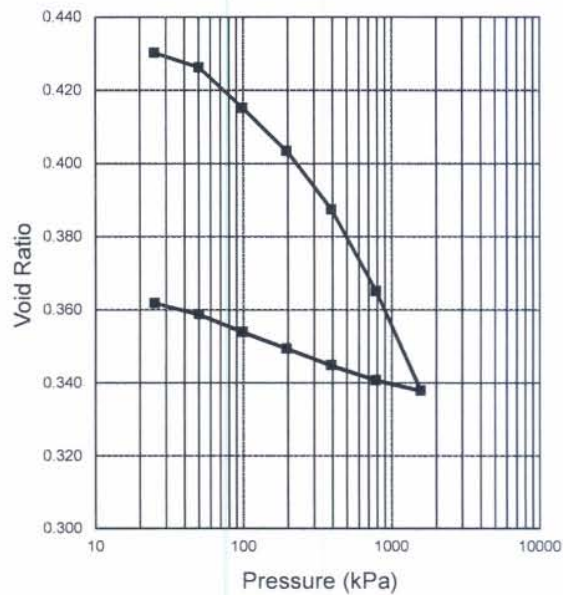
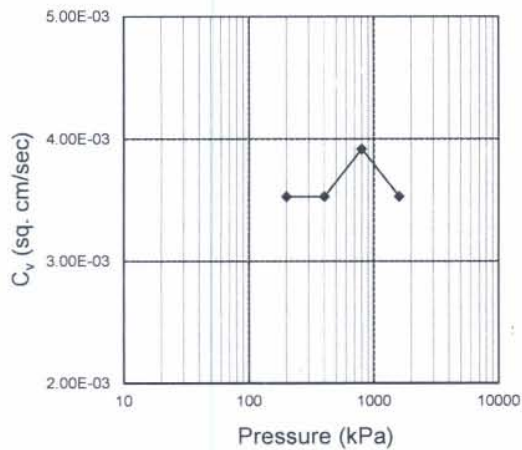
Initial Bulk Density (g/cc)	2.221
Final Bulk Density (g/cc)	2.375
Initial Water Content (%)	19.1
Final Water Content (%)	19.8
Initial Specimen Height (cm)	2.0
Specimen Diameter (cm)	6.0
Specific Gravity	2.700
Initial Void Ratio	0.4472

TEST CHARACTERISTICS

No. of Load Increments = 7

C_v = Coefficient of Consolidation,
 m_v = Coefficient of volume compressibility,
 C_c = Compression Index

Cv vs Stress



Safe

CONSOLIDATION TEST

Project: Cons. of Nashpa Gas LPG Plant Kohat

BH-16

Depth: 2.0-2.20 meter

Sample No. UDS-1

Date: 17-03-2016

Pressure	Void Ratio	C_v	m_v	C_c
kPa		cm^2/sec	m^2/kN	
25	0.515		0.00009	0.0119
50	0.512		0.00019	0.0493
99	0.497		0.00016	0.0831
197	0.472	0.00228	0.00009	0.0867
394	0.446	0.00320		
787	0.416	0.00353		
1574	0.379	0.00353		
787	0.382			
394	0.389			
197	0.396			
99	0.403			
50	0.408			
25	0.414			

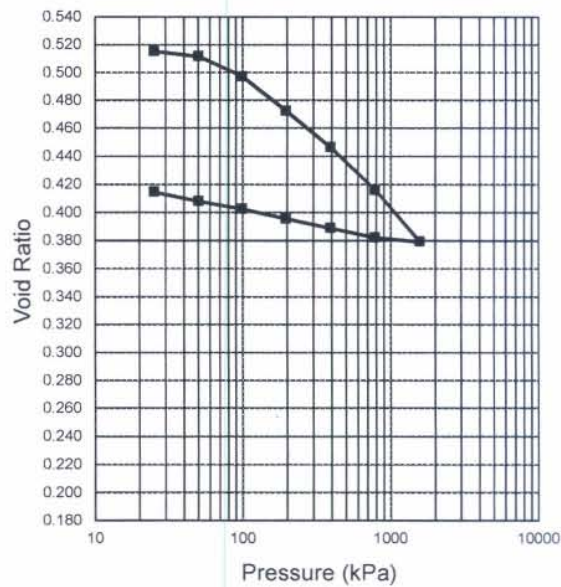
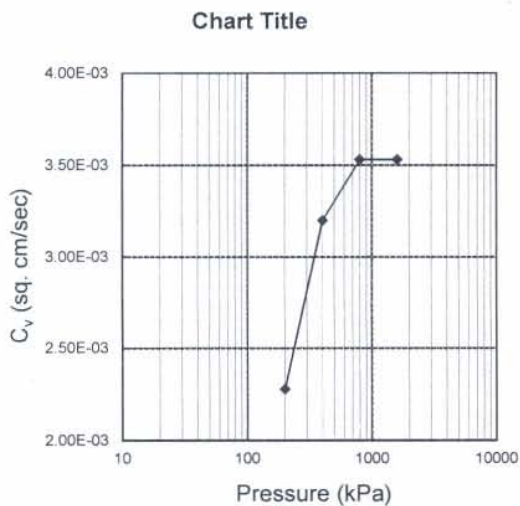
SOIL AND SPECIMEN CHARACTERISTICS

Initial Bulk Density (g/cc)	2.012
Final Bulk Density (g/cc)	2.216
Initial Water Content (%)	14.9
Final Water Content (%)	15.6
Initial Specimen Height (cm)	2.0
Specimen Diameter (cm)	6.0
Specific Gravity	2.710
Initial Void Ratio	0.5472

TEST CHARACTERISTICS

No. of Load Increments = 7

c_v = Coefficient of Consolidation,
 m_v = Coefficient of volume compressibility,
 C_c = Compression Index



Safe

CONSOLIDATION TEST

Project: Cons. of Nashpa Gas LPG Plant Kohat

BH-23

Depth: 3.0-3.20 meter

Sample No. UDS-1

Date: 17-03-2016

Pressure	Void Ratio	C_v	m_v	C_c
kPa		cm^2/sec	m^2/kN	
25	0.471		0.00024	0.0299
50	0.462		0.00030	0.0750
99	0.440		0.00020	0.0973
197	0.411	0.0058	0.00012	0.1197
394	0.375	0.0012		
787	0.334	0.0125		
1574	0.288	0.0082		
787	0.295			
394	0.304			
197	0.311			
99	0.321			
50	0.331			
25	0.344			

SOIL AND SPECIMEN CHARACTERISTICS

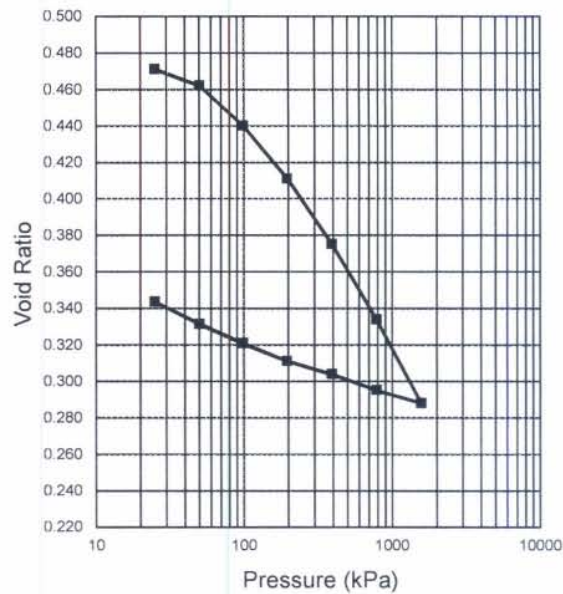
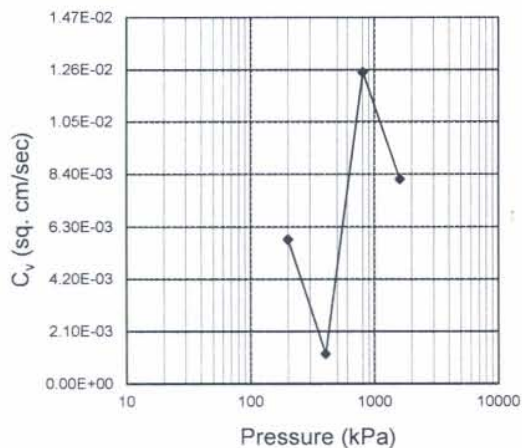
Initial Bulk Density (g/cc)	2.190
Final Bulk Density (g/cc)	2.417
Initial Water Content (%)	19.8
Final Water Content (%)	19.0
Initial Specimen Height (cm)	2.0
Specimen Diameter (cm)	6.0
Specific Gravity	2.730
Initial Void Ratio	0.4934

TEST CHARACTERISTICS

No. of Load Increments = 7

c_v = Coefficient of Consolidation,
 m_v = Coefficient of volume compressibility,
 C_c = Compression Index

Cv vs Stress



SAFE

+92 0333 4303452

Direct Shear Test

Project:

CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

BH #

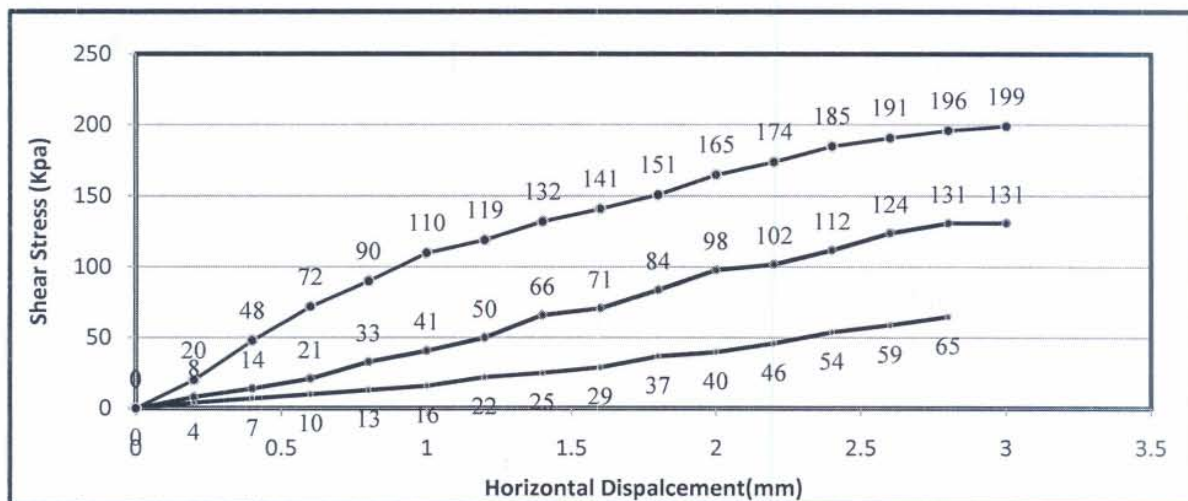
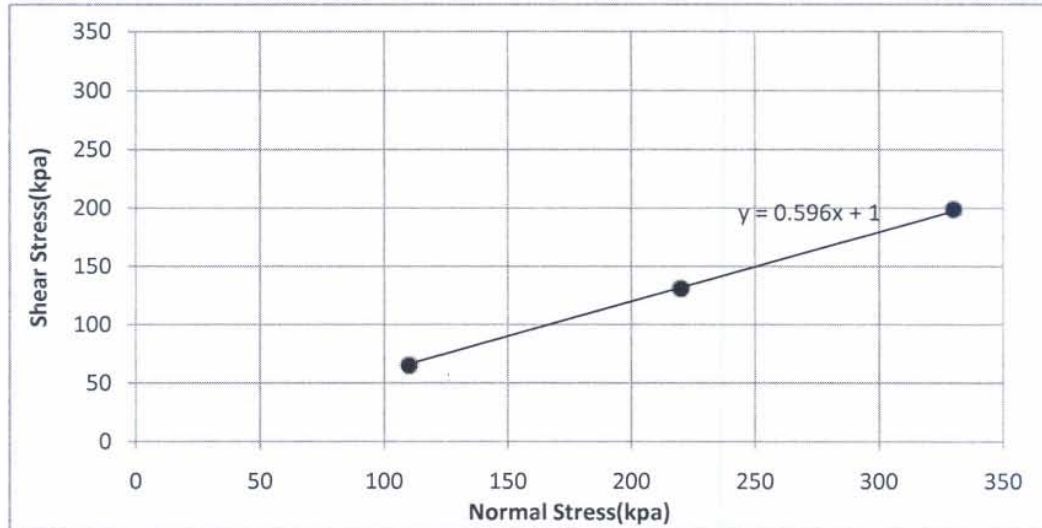
23

Depth (m)

6

Date :

09-03-2016.

**Linear Regression**

Angle of Internal Friction
Cohesion

31.0 Degree
1.0 kPa

Prepared by :

Checked by :

SAFE
FOUNDATION ENGINEERING SERVICES
Rohat No. 17, B-11, Jinnah Housing Society, Near Tinkar Road, Kohat



SAFE

+92 0333 4303452

Direct Shear Test

Project:

CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

BH #

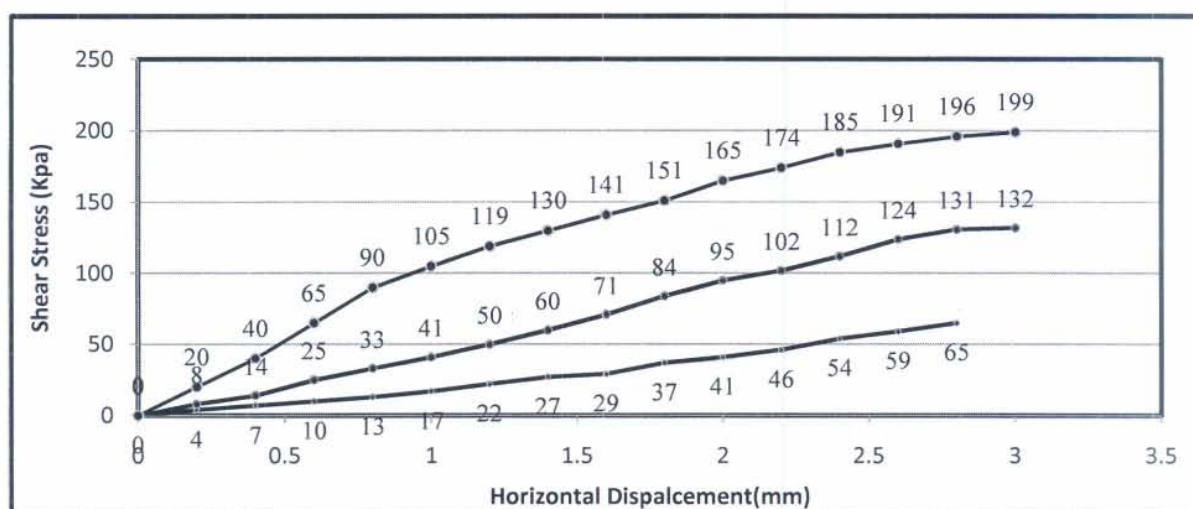
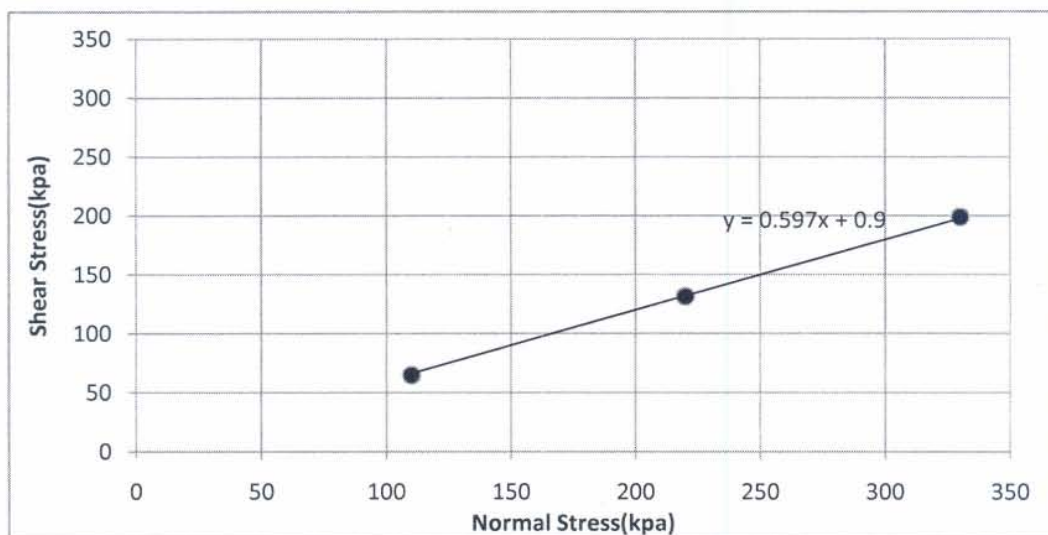
24

Depth (m)

10

Date :

09-03-2016.

**Linear Regression**

Angle of Internal Friction

31.2

Degree

Cohesion

0.90

kPa

Prepared by :

Checked by :



Direct Shear Test

Project:

CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

BH #

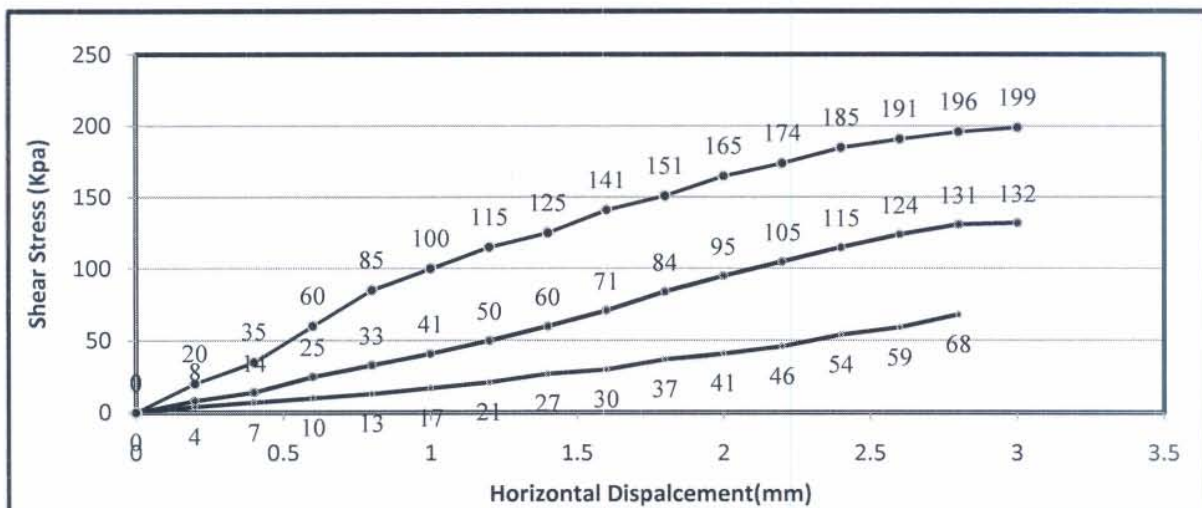
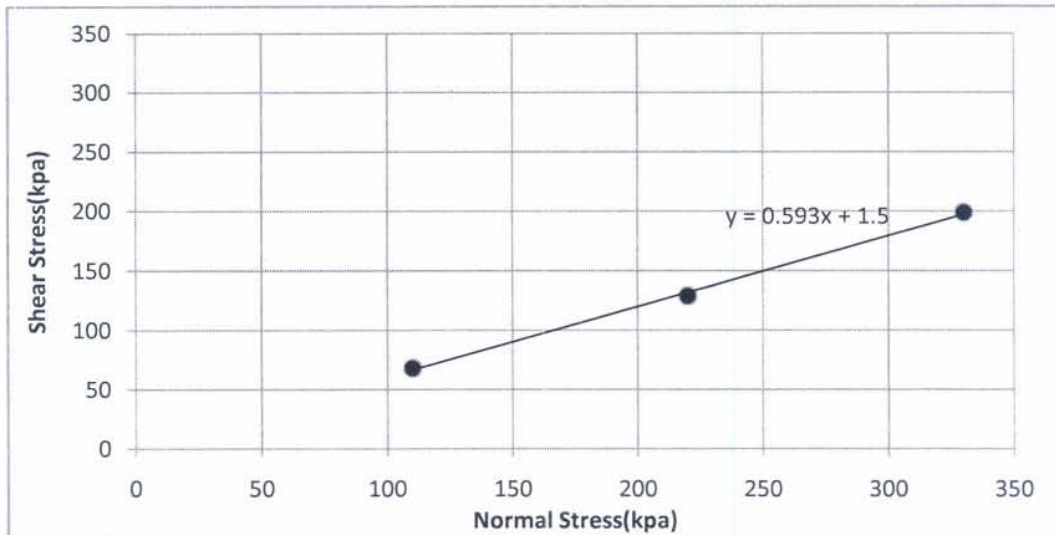
27

Depth (m)

1

Date :

09-03-2016.

**Linear Regression**

Angle of Internal Friction

29.0

Degree

Cohesion

1.50

kPa

Prepared by : _____

Checked by : _____



SAFE (Soil & Foundation Engg. Services) Lahore

UNCOFINED COMPRESSION TEST

PROJECT:

CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

BH/TP

15

UDS

1

DEPTH

2.0-2.20

m

DIA

3.5

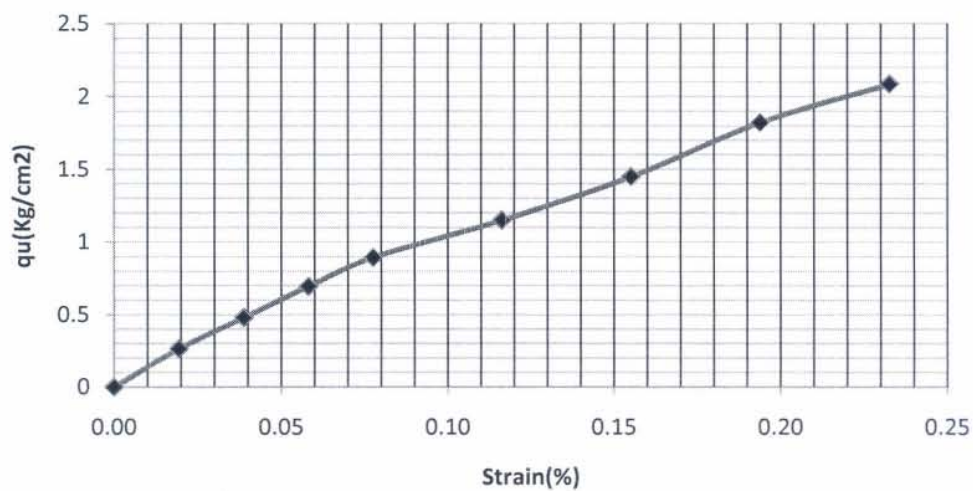
cm

LENGTH

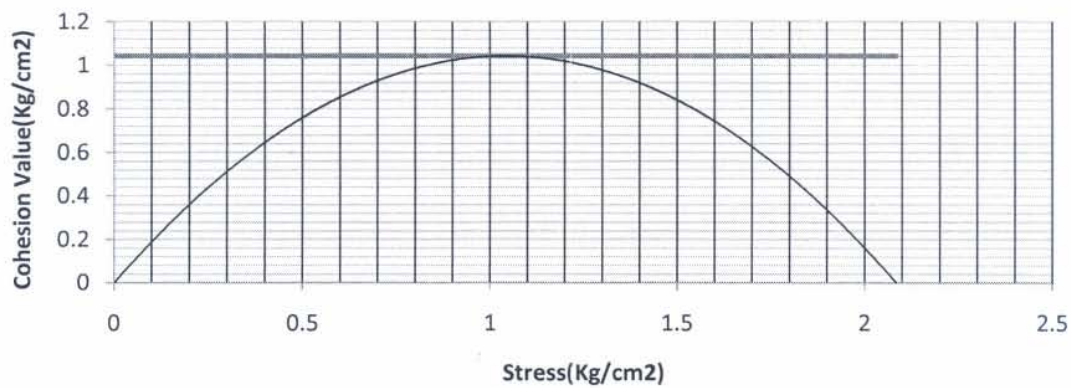
12.9

cm

qu vs strain



Mohr Circle



Cohesion Value

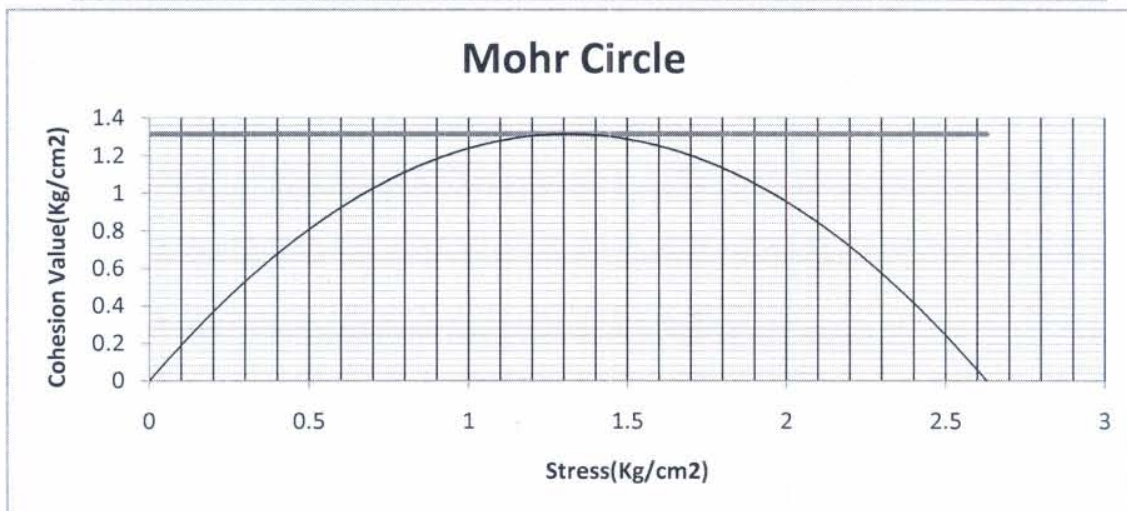
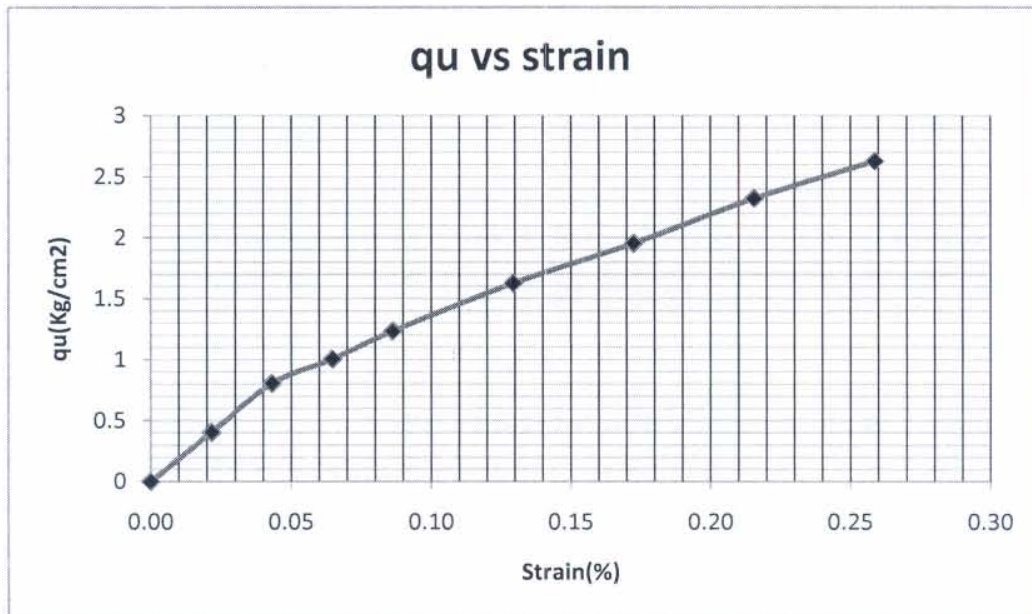
1.04

kg/cm^2



SAFE (Soil & Foundation Engg. Services) Lahore	
UNCOFINED COMPRESSION TEST	
PROJECT:	CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

BH/TP	16	UDS	1	DEPTH	2.0-2.20	m
DIA	3.5	cm	LENGTH	11.6	cm	



Cohesion Value	1.31	kg/cm ²
----------------	------	--------------------



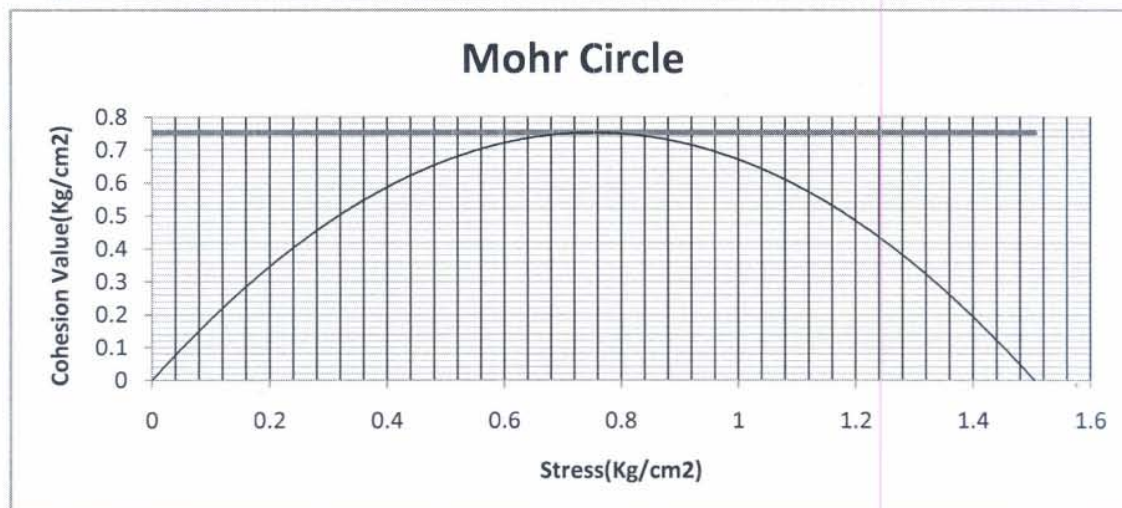
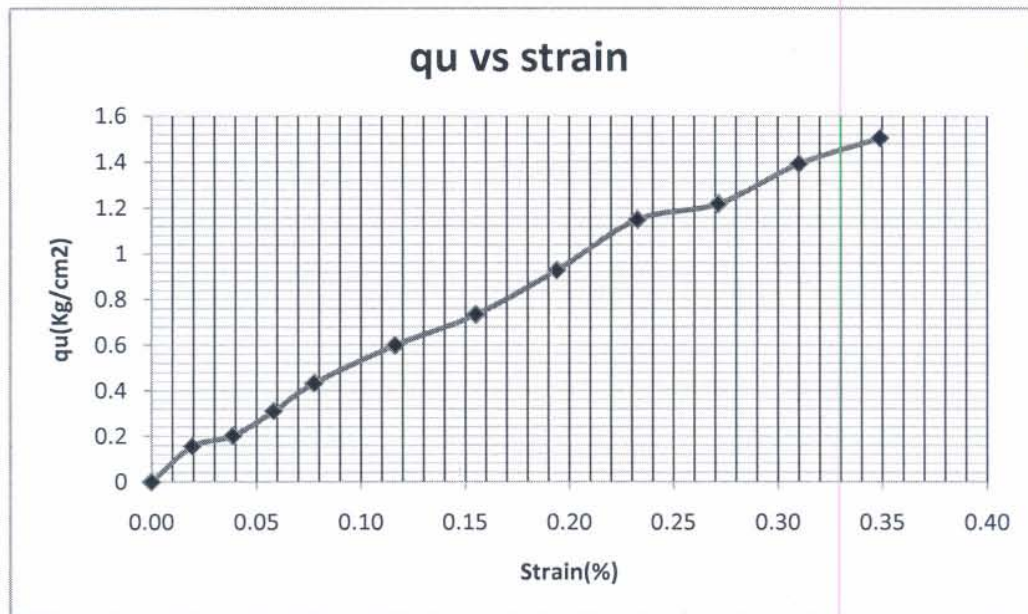
SAFE (Soil & Foundation Engg. Services) Lahore

UNCOFINED COMPRESSION TEST

PROJECT: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

BH/TP 23 UDS 1 DEPTH 3.0-3.21 m

DIA 3.5 cm LENGTH 12.9 cm



Cohesion Value 0.75 kg/cm²



UNCOFINED COMPRESSION TEST

PROJECT:

CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

BH/TP

39

UDS

1

DEPTH

2.0-2.51

m

DIA

3.5

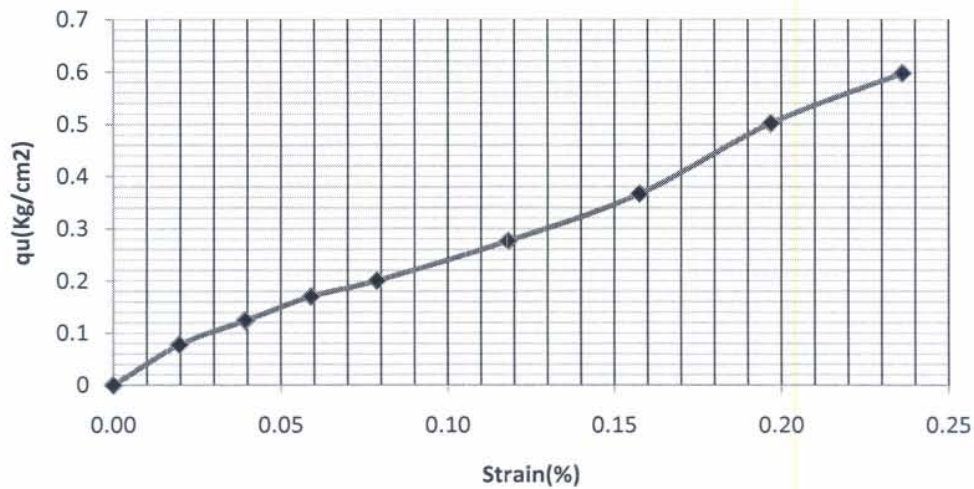
cm

LENGTH

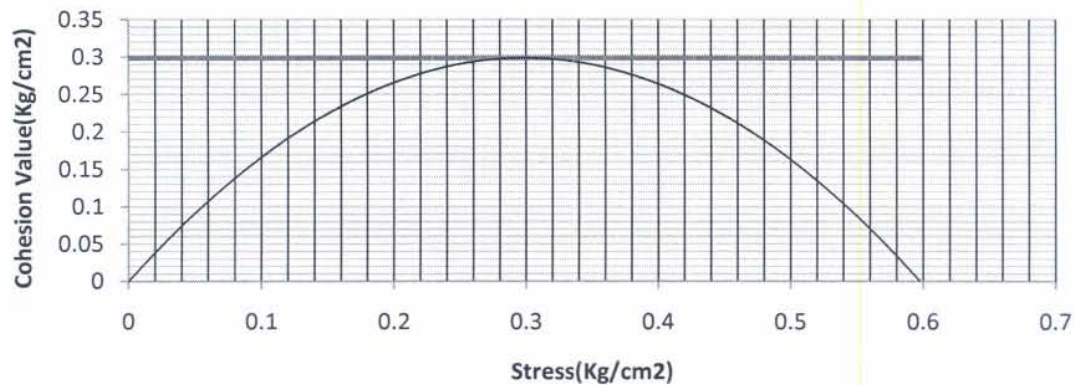
12.7

cm

qu vs strain



Mohr Circle



Cohesion Value

0.30

kg/cm²

LAB DENSITY
(Modified Proctor Test)

SAFE
Soil & Foundation Engg.
Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

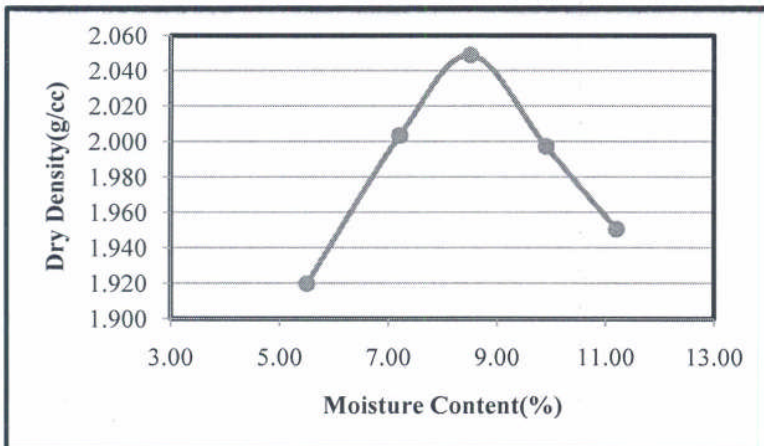
Client: Zeal Con Engineering

Sample: CS **TP :** 1 **Date** 26-03-2016.

Mould	Blows/layer	Dia of Mould	No. of Layers	Hammer Weight	Volume
1	56	15.24 Cm	5	10 lbs	2123 Cm ³

Unit Weight Determination					
Sample#	1	2	3	4	5
Weight of Mould + Soil(g)	7000	7260	7420	7360	7305
Weight of Mould(g)	2700	2700	2700	2700	2700
Weight of Soil(g)	4300	4560	4720	4660	4605
Wet Density(g/cc)	2.025	2.148	2.223	2.195	2.169
Dry Density (g/cc)	1.92	2.00	2.05	2.00	1.95

Moisture Content Determination					
Container #	7	5	12	17	21
Container+Wet Soil(g)	119.35	116.44	121.69	115.67	115.21
Container+Dry Soil(g)	115.1	111	115.5	108.7	107.2
Weight of Container(g)	37.8	35.5	42.7	38.3	35.7
Weight of Dry Soil(g)	77.3	75.5	72.8	70.4	71.5
Weight of Water	4.25	5.44	6.19	6.97	8.01
Moisture Content(%)	5.50	7.21	8.50	9.90	11.20



Maximum Dry Density(g/cc)
2.05

Optimum Moisture Content(%)
8.5

Tested By Amroo

Checked By gud



LAB DENSITY
(Modified Proctor Test)

SAFE
Soil & Foundation Engg.
Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

Sample: CS **TP :** 2 **Date** 26-03-2016.

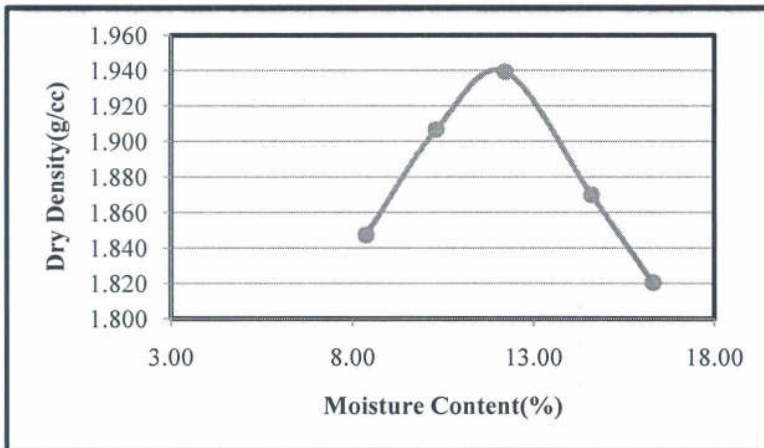
Mould	Blows/layer	Dia of Mould	No. of Layers	Hammer Weight	Volume
1	56	15.24 Cm	5	10 lbs	2123 Cm ³

Unit Weight Determination

Sample#	1	2	3	4	5
Weight of Mould + Soil(g)	6950	7165	7320	7250	7195
Weight of Mould(g)	2700	2700	2700	2700	2700
Weight of Soil(g)	4250	4465	4620	4550	4495
Wet Density(g/cc)	2.002	2.103	2.176	2.143	2.117
Dry Density (g/cc)	1.85	1.91	1.94	1.87	1.82

Moisture Content Determination

Container #	7	15	11	17	21
Container+Wet Soil(g)	122.23	120.91	123.04	121.92	123.04
Container+Dry Soil(g)	116	113	114.3	111.2	110.8
Weight of Container(g)	41.5	36.2	42.7	37.8	35.7
Weight of Dry Soil(g)	74.5	76.8	71.6	73.4	75.1
Weight of Water	6.23	7.91	8.74	10.72	12.24
Moisture Content(%)	8.36	10.30	12.21	14.60	16.30



Maximum Dry Density(g/cc)

1.94

Optimum Moisture Content(%)

12.2

Tested By Amro



Checked By Amro



**LAB DENSITY
(Modified Proctor Test)**

SAFE
Soil & Foundation Engg.
Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

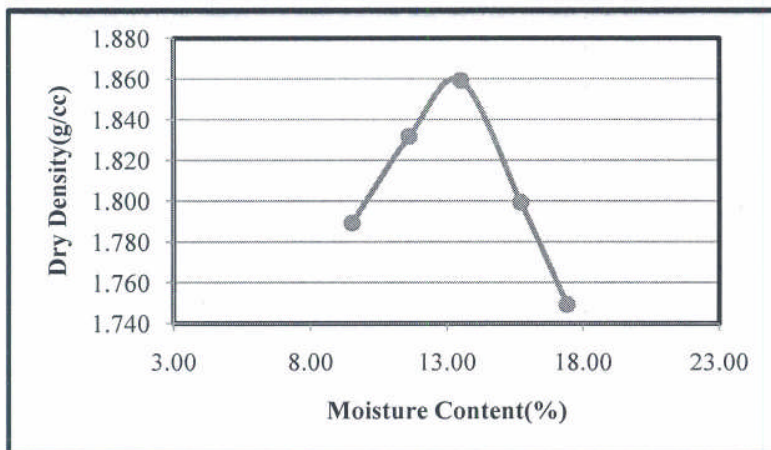
Client: Zeal Con Engineering

Sample: CS **TP :** 3 **Date** 26-03-2016.

Mould	Blows/layer	Dia of Mould	No. of Layers	Hammer Weight	Volume
1	56	15.24 Cm	5	10 lbs	2123 Cm ³

Unit Weight Determination					
Sample#	1	2	3	4	5
Weight of Mould + Soil(g)	6860	7040	7180	7120	7060
Weight of Mould(g)	2700	2700	2700	2700	2700
Weight of Soil(g)	4160	4340	4480	4420	4360
Wet Density(g/cc)	1.959	2.044	2.110	2.082	2.054
Dry Density (g/cc)	1.79	1.83	1.86	1.80	1.75

Moisture Content Determination					
Container #	27	25	8	10	5
Container+Wet Soil(g)	118.34	121.77	129.07	122.26	128.68
Container+Dry Soil(g)	111.6	112.8	118.8	110.8	114.9
Weight of Container(g)	40.7	35.5	42.7	37.8	35.7
Weight of Dry Soil(g)	70.9	77.3	76.1	73	79.2
Weight of Water	6.74	8.97	10.27	11.46	13.78
Moisture Content(%)	9.51	11.60	13.50	15.70	17.40



Maximum Dry Density(g/cc)
1.86

Optimum Moisture Content(%)
13.5

Tested By Amrood

Checked By gnd



LAB DENSITY
(Modified Proctor Test)

SAFE
Soil & Foundation Engg.
Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

Sample: CS **TP :** 4 **Date** 26-03-2016.

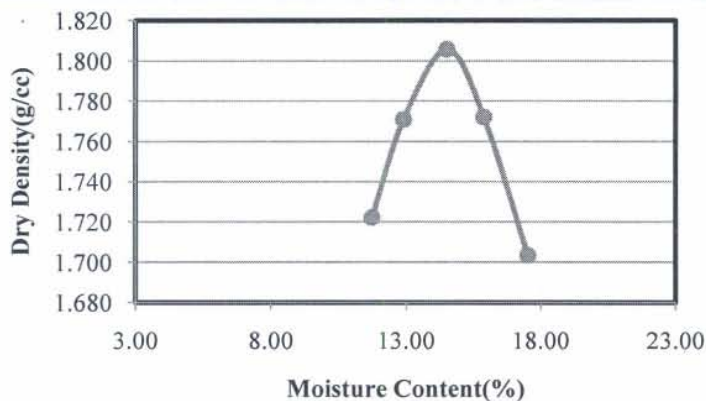
Mould	Blows/layer	Dia of Mould	No. of Layers	Hammer Weight	Volume
1	56	15.24 Cm	5	10 lbs	2123 Cm ³

Unit Weight Determination

Sample#	1	2	3	4	5
Weight of Mould +Soil(g)	6785	6945	7090	7060	6950
Weight of Mould(g)	2700	2700	2700	2700	2700
Weight of Soil(g)	4085	4245	4390	4360	4250
Wet Density(g/cc)	1.924	2.000	2.068	2.054	2.002
Dry Density (g/cc)	1.72	1.77	1.81	1.77	1.70

Moisture Content Detemination

Container #	27	25	8	10	5
Container+Wet Soil(g)	116.1	125.7	126.5	123.9	127.2
Container+Dry Soil(g)	107.6	115.6	115.2	112.5	114.1
Weight of Container(g)	35.1	37.3	37.3	40.7	39.3
Weight of Dry Soil(g)	72.5	78.3	77.9	71.8	74.8
Weight of Water	8.5	10.1	11.3	11.4	13.1
Moisture Content(%)	11.72	12.90	14.51	15.88	17.51



Maximum Dry Density(g/cc)

1.81

Optimum Moisture Content(%)

14.5

Tested By Amra



Checked By Yash



LAB DENSITY
(Modified Proctor Test)

SAFE
Soil & Foundation Engg.
Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

Sample: CS **TP :** 5 **Date** 26-03-2016.

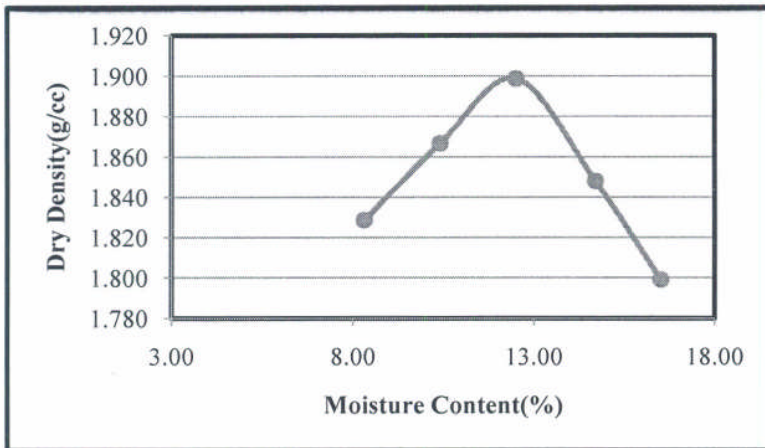
Mould	Blows/layer	Dia of Mould	No. of Layers	Hammer Weight	Volume
1	56	15.24 Cm	5	10 lbs	2123 Cm ³

Unit Weight Determination

Sample#	1	2	3	4	5
Weight of Mould + Soil(g)	6905	7075	7235	7200	7150
Weight of Mould(g)	2700	2700	2700	2700	2700
Weight of Soil(g)	4205	4375	4535	4500	4450
Wet Density(g/cc)	1.981	2.061	2.136	2.120	2.096
Dry Density (g/cc)	1.83	1.87	1.90	1.85	1.80

Moisture Content Detemination

Container #	27	25	8	10	5
Container+Wet Soil(g)	120.78	114.47	125.81	121.8	128.26
Container+Dry Soil(g)	114.7	107.1	116.6	111.1	115.8
Weight of Container(g)	41.5	36.2	42.9	38.3	40.3
Weight of Dry Soil(g)	73.2	70.9	73.7	72.8	75.5
Weight of Water	6.08	7.37	9.21	10.7	12.46
Moisture Content(%)	8.31	10.39	12.50	14.70	16.50



Maximum Dry Density(g/cc)
1.90

Optimum Moisture Content(%)
12.5

Tested By Amir



Checked By Ymt



LAB DENSITY
(Modified Proctor Test)

SAFE
Soil & Foundation Engg.
Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

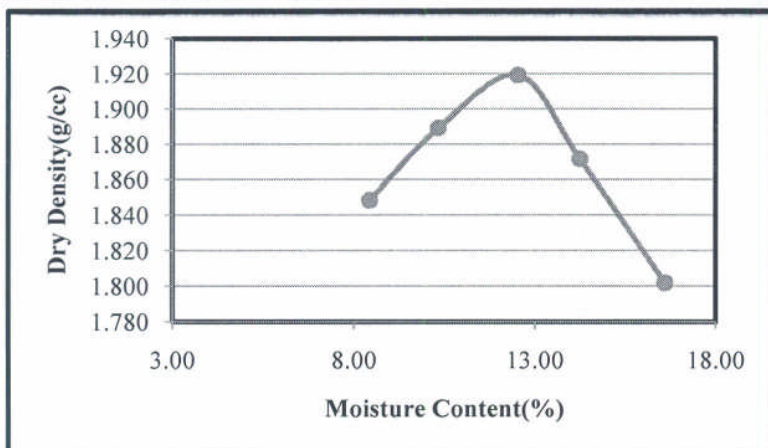
Client: Zeal Con Engineering

Sample: CS **TP :** 6 **Date** 27-03-2016.

Mould	Blows/layer	Dia of Mould	No. of Layers	Hammer Weight	Volume
1	56	15.24 Cm	5	10 lbs	2123 Cm ³

Unit Weight Determination					
Sample#	1	2	3	4	5
Weight of Mould +Soil(g)	6955	7125	7285	7240	7160
Weight of Mould(g)	2700	2700	2700	2700	2700
Weight of Soil(g)	4255	4425	4585	4540	4460
Wet Density(g/cc)	2.004	2.084	2.160	2.138	2.101
Dry Density (g/cc)	1.85	1.89	1.92	1.87	1.80

Moisture Content Detemination					
Container #	27	25	8	10	5
Container+Wet Soil(g)	125.6	108.2	132.8	114.3	114.6
Container+Dry Soil(g)	119	101.4	122.6	104.4	103.6
Weight of Container(g)	40.7	35.5	41.1	34.9	37.3
Weight of Dry Soil(g)	78.3	65.9	81.5	69.5	66.3
Weight of Water	6.6	6.8	10.2	9.9	11
Moisture Content(%)	8.43	10.32	12.52	14.24	16.59



Maximum Dry Density(g/cc)
1.92

Optimum Moisture Content(%)
12.5

Tested By



Checked By



LAB DENSITY
(Modified Proctor Test)

SAFE
Soil & Foundation Engg.
Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

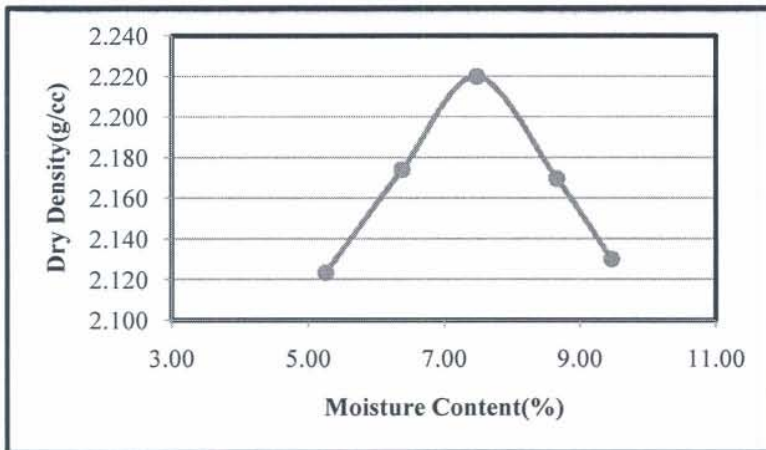
Client: Zeal Con Engineering

Sample: CS **TP :** 7 **Date** 27-03-2016.

Mould	Blows/layer	Dia of Mould	No. of Layers	Hammer Weight	Volume
1	56	15.24 Cm	5	10 lbs	2123 Cm ³

Unit Weight Determination					
Sample#	1	2	3	4	5
Weight of Mould +Soil(g)	7445	7610	7765	7705	7650
Weight of Mould(g)	2700	2700	2700	2700	2700
Weight of Soil(g)	4745	4910	5065	5005	4950
Wet Density(g/cc)	2.235	2.313	2.386	2.358	2.332
Dry Density (g/cc)	2.12	2.17	2.22	2.17	2.13

Moisture Content Detemination					
Container #	10	4	9	21	3
Container+Wet Soil(g)	112.8	104.6	118.1	116.4	111
Container+Dry Soil(g)	109.2	100.5	112.8	110.1	104.8
Weight of Container(g)	40.7	36.2	41.9	37.3	39.3
Weight of Dry Soil(g)	68.5	64.3	70.9	72.8	65.5
Weight of Water	3.6	4.1	5.3	6.3	6.2
Moisture Content(%)	5.26	6.38	7.48	8.65	9.47



Maximum Dry Density(g/cc)
2.20

Optimum Moisture Content(%)
7.5

Tested By Amro



Checked By [Signature]



LAB DENSITY
(Modified Proctor Test)

SAFE
Soil & Foundation Engg.
Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

Sample: CS **TP :** 8 **Date** 27-03-2016.

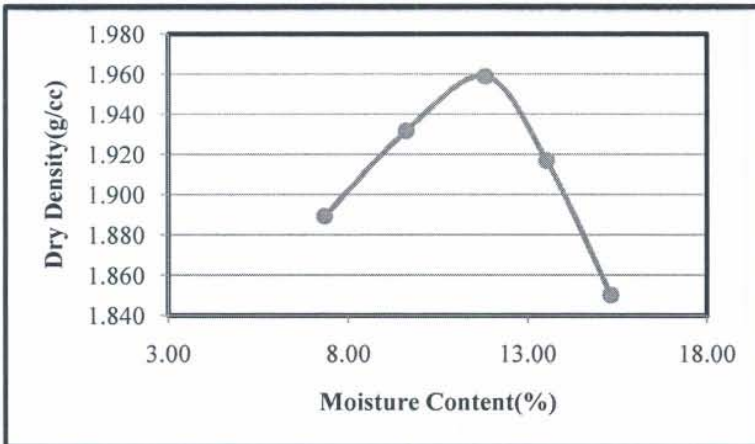
Mould	Blows/layer	Dia of Mould	No. of Layers	Hammer Weight	Volume
1	56	15.24 Cm	5	10 lbs	2123 Cm ³

Unit Weight Determination

Sample#	1	2	3	4	5
Weight of Mould +Soil(g)	7005	7195	7350	7320	7230
Weight of Mould(g)	2700	2700	2700	2700	2700
Weight of Soil(g)	4305	4495	4650	4620	4530
Wet Density(g/cc)	2.028	2.117	2.190	2.176	2.134
Dry Density (g/cc)	1.89	1.93	1.96	1.92	1.85

Moisture Content Determination

Container #	26	24	18	10	7
Container+Wet Soil(g)	106.6	110.8	121.9	122.7	115
Container+Dry Soil(g)	101.8	104.2	113.3	112.8	104.6
Weight of Container(g)	36.3	35.5	40.5	39.6	36.7
Weight of Dry Soil(g)	65.5	68.7	72.8	73.2	67.9
Weight of Water	4.8	6.6	8.6	9.9	10.4
Moisture Content(%)	7.33	9.61	11.81	13.52	15.32



Maximum Dry Density(g/cc)
1.96

Optimum Moisture Content(%)
11.8

Tested By Amir



Checked By lyn



LAB DENSITY
(Modified Proctor Test)

SAFE
Soil & Foundation Engg.
Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

Sample: CS **TP :** 9 **Date** 27-03-2016.

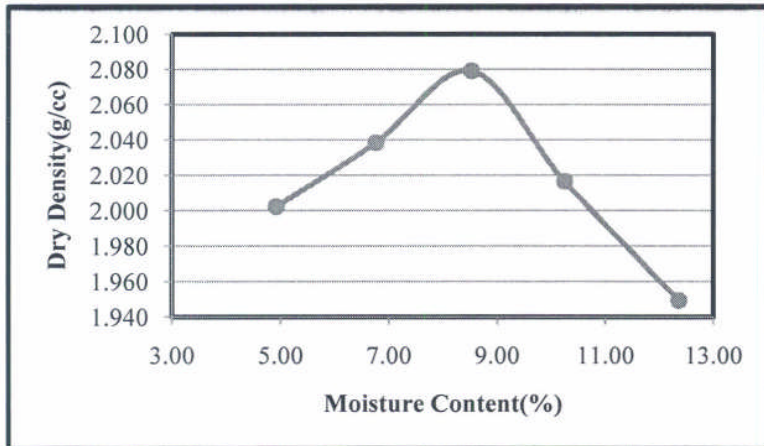
Mould	Blows/layer	Dia of Mould	No. of Layers	Hammer Weight	Volume
1	56	15.24 Cm	5	10 lbs	2123 Cm ³

Unit Weight Determination

Sample#	1	2	3	4	5
Weight of Mould + Soil(g)	7160	7320	7490	7420	7350
Weight of Mould(g)	2700	2700	2700	2700	2700
Weight of Soil(g)	4460	4620	4790	4720	4650
Wet Density(g/cc)	2.101	2.176	2.256	2.223	2.190
Dry Density (g/cc)	2.00	2.04	2.08	2.02	1.95

Moisture Content Determination

Container #	14	17	19	4	2
Container+Wet Soil(g)	114.1	116.1	122.2	116	122.2
Container+Dry Soil(g)	110.5	111	116	108.9	113.5
Weight of Container(g)	37.3	35.5	43.2	39.6	43.1
Weight of Dry Soil(g)	73.2	75.5	72.8	69.3	70.4
Weight of Water	3.6	5.1	6.2	7.1	8.7
Moisture Content(%)	4.92	6.75	8.52	10.25	12.36



Maximum Dry Density(g/cc)

2.08

Optimum Moisture Content(%)

8.5

Tested By

[Signature]



Checked By

[Signature]



**LAB DENSITY
(Modified Proctor Test)**

SAFE
Soil & Foundation Engg.
Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client: Zeal Con Engineering

Sample: CS **TP :** 10 **Date** 27-03-2016.

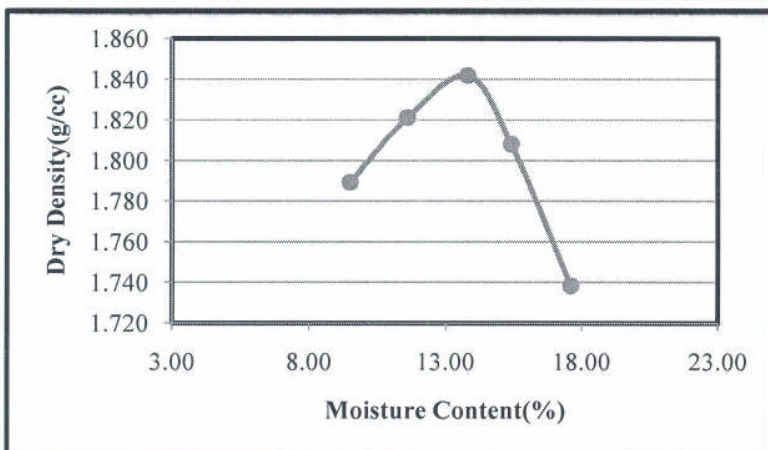
Mould	Blows/layer	Dia of Mould	No. of Layers	Hammer Weight	Volume
1	56	15.24 Cm	5	10 lbs	2123 Cm ³

Unit Weight Determination

Sample#	1	2	3	4	5
Weight of Mould + Soil(g)	6860	7015	7150	7130	7040
Weight of Mould(g)	2700	2700	2700	2700	2700
Weight of Soil(g)	4160	4315	4450	4430	4340
Wet Density(g/cc)	1.959	2.033	2.096	2.087	2.044
Dry Density (g/cc)	1.79	1.82	1.84	1.81	1.74

Moisture Content Detemination

Container #	26	30	15	21	14
Container+Wet Soil(g)	123.67	114.44	128.82	119.34	120.98
Container+Dry Soil(g)	116.4	106	118.4	108.9	108.1
Weight of Container(g)	39.9	33.2	42.9	41.1	34.9
Weight of Dry Soil(g)	76.5	72.8	75.5	67.8	73.2
Weight of Water	7.27	8.44	10.42	10.44	12.88
Moisture Content(%)	9.50	11.59	13.80	15.40	17.60



Maximum Dry Density(g/cc)

1.84

Optimum Moisture Content(%)

13.8

Tested By

[Signature]



Checked By

[Signature]



LAB DENSITY
(Modified Proctor Test)

SAFE
Soil & Foundation Engg.
Services

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

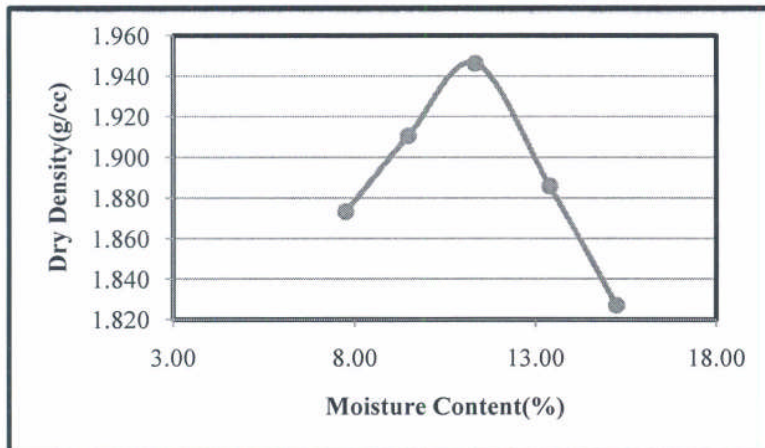
Client: Zeal Con Engineering

Sample: CS **TP :** 11 **Date** 27-03-2016.

Mould	Blows/layer	Dia of Mould	No. of Layers	Hammer Weight	Volume
1	56	15.24 Cm	5	10 lbs	2123 Cm ³

Unit Weight Determination					
Sample#	1	2	3	4	5
Weight of Mould +Soil(g)	6985	7140	7300	7240	7170
Weight of Mould(g)	2700	2700	2700	2700	2700
Weight of Soil(g)	4285	4440	4600	4540	4470
Wet Density(g/cc)	2.018	2.091	2.167	2.138	2.106
Dry Density (g/cc)	1.87	1.91	1.95	1.89	1.83

Moisture Content Detemination					
Container #	13	10	5	9	3
Container+Wet Soil(g)	113	115.4	120.9	121.8	121.9
Container+Dry Soil(g)	107.4	109.2	113.1	112.2	110.5
Weight of Container(g)	35.1	43.7	44.2	40.5	35.7
Weight of Dry Soil(g)	72.3	65.5	68.9	71.7	74.8
Weight of Water	5.6	6.2	7.8	9.6	11.4
Moisture Content(%)	7.75	9.47	11.32	13.39	15.24



Maximum Dry Density(g/cc)
1.95

Optimum Moisture Content(%)
11.3

Tested By

[Signature]



Checked By

[Signature]



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

Test Pit: 1 **Blows:** 10,30,65 **Ring Factor** 10.2

Moisture Content Determination

Description	10 Blows	30 Blows	65 Blows
Dish No.	7	8	9
Total Wet weight (g)	131	117.9	121.8
Total Dry weight (g)	123.8	111.5	115.3
Dish weight(g)	41.5	38.3	39.8
Weight of water(g)	7.2	6.4	6.5
Weight of dry soil g	82.3	73.2	75.5
Moisture Content %	8.75	8.74	8.61
Opt. Moisture Content %	8.5		

Dry Density

Description	10 Blows	30 Blows	65 Blows
Total weight (g)	8660.00	9110.00	9210.00
Weight of Mold (g)	4030.00	4230.00	3970.00
Weight of Wet Soil (g)	4630.00	4880.00	5240.00
Volume of Mold cc	2320.00	2320.00	2320.00
Wet Density g/cc	2.00	2.10	2.26
Moisture Content %	8.75	8.74	8.61
Dry Density g/cc	1.84	1.93	2.08
Max Dry Density g/cc	2.05		

Moisture Content of Specimen after Soaking

Description	10 Blows	30 Blows	65 Blows
Weight of Dish (g)	43.7	42.9	41.7
Total Wet weight (g)	129.10	126.00	121.20
Total Dry weight (g)	120.60	118.20	114.50
Weight of Water(g)	8.50	7.80	6.70
Net Dry Weight (g)	76.90	75.30	72.80
Moisture Content %	11.05	10.36	9.20



Sheet 1 of 3

CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016
Test Pit: 1 **Blows:** 10,30,65 **Ring Factor** 10.2

CBR Data

Penetration inches	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)
	10 Blows		30 Blows		65 Blows	
0.025	4	40.8	8	81.6	12	122.4
0.050	9	91.8	16	163.2	24.5	249.9
0.075	13	132.6	24	244.8	37	377.4
0.100	17	173.4	32	326.4	49	499.8
0.150	23.5	239.7	41	418.2	62	632.4
0.200	30	306	50	510	76	775.2
0.250	37.5	382.5	59	601.8	90	918
0.300	45	459	68	693.6	103	1050.6
0.350	51.5	525.3	76.5	780.3	116	1183.2
0.400	58	591.6	85	867	129	1315.8
0.450	64.5	657.9	93	948.6	141	1438.2
0.500	70.5	719.1	101	1030.2	153	1560.6

%Age Swell

Description	10 Blows	30 Blows	65 Blows
Initial Reading	0	0	0
Final Dial Reading	4.00	3.00	2.00
Percentage Swell	0.087	0.065	0.044

CBR Values

CBR Value 0.1" Penetration	5.78	10.88	16.66
CBR Value 0.2" Penetration	6.80	11.33	17.23

Sheet 2 of 3



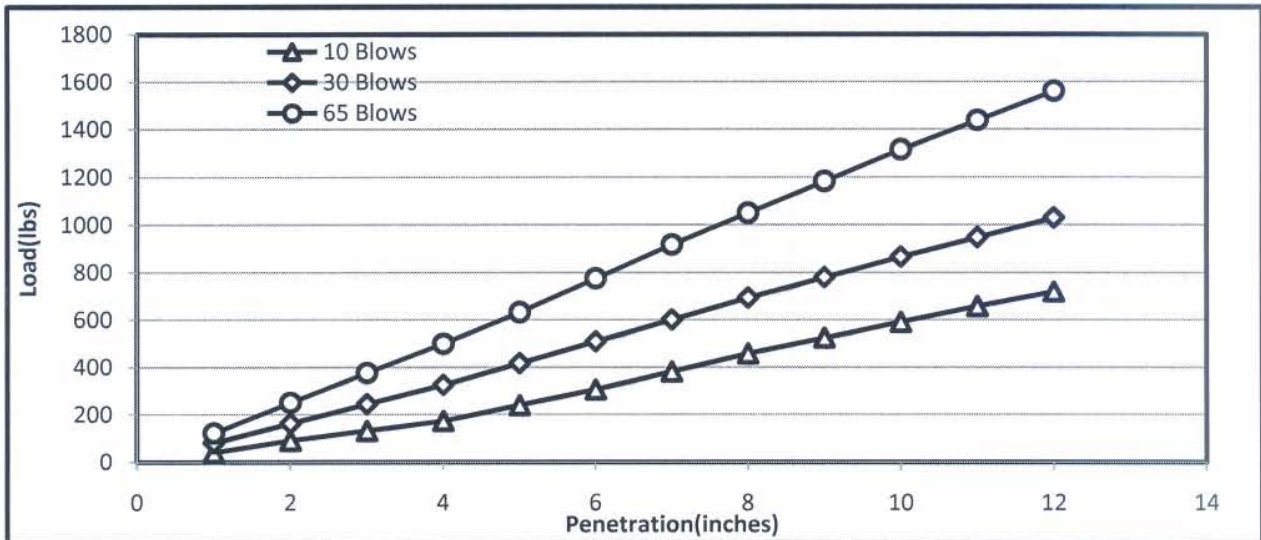
CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

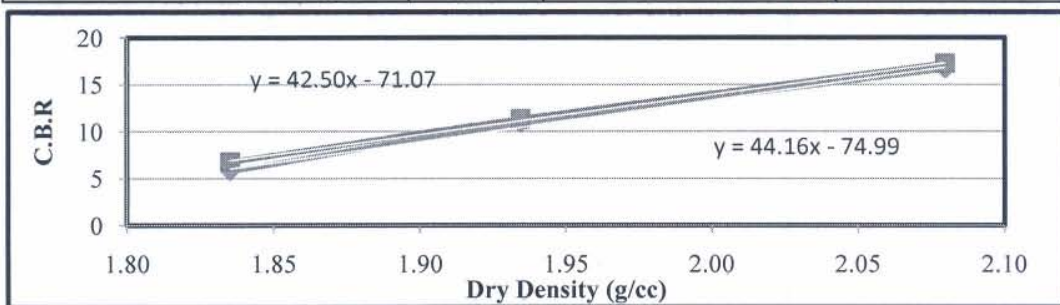
Test Pit: 1 **Blows:** 10,30,65 **Ring Factor** 10.2



Optimum Moisture Content	8.5	%	Maximum Dry Density	2.05	g/cc
--------------------------	-----	---	---------------------	------	------

CBR Data

Number of Blows Per Layer		10	30	65
C.B. R. Value at 0.1 inch		5.78	10.88	16.66
C.B.R. Value at 0.2"		6.80	11.33	17.23
Dry Density (g/cc)		1.84	1.93	2.08
Mousture Content %		8.75	8.74	8.61
Swell Potential (%)		0.087	0.065	0.044
		CBR at		
		0.1"		0.2"
90% of Maximum Dry Density	1.85	CBR at 90% O.M.C	6.49	6.71
95% of Maximum Dry Density	1.95	CBR at 95% O.M.C	11.01	11.07
100% of Maximum Dry Density	2.05	CBR at 100% O.M.C	15.54	15.43



Sheet 3 of 3



[Signature]

CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

Test Pit: 2 **Blows:** 10,30,65 **Ring Factor** 10.2

Moisture Content Determination

Description	10 Blows	30 Blows	65 Blows
Dish No.	3	3	5
Total Wet weight (g)	121.5	117	110.2
Total Dry weight (g)	112.7	108.6	101.9
Dish weight(g)	43.2	41.3	35.5
Weight of water(g)	8.8	8.4	8.3
Weight of dry soil g	69.5	67.3	66.4
Moisture Content %	12.66	12.50	12.50
Opt. Moisture Content %	12.2		

Dry Density

Description	10 Blows	30 Blows	65 Blows
Total weight (g)	8690.00	9105.00	9675.00
Weight of Mold (g)	4150.00	4330.00	4480.00
Weight of Wet Soil (g)	4540.00	4775.00	5195.00
Volume of Mold cc	2320.00	2320.00	2320.00
Wet Density g/cc	1.96	2.06	2.24
Moisture Content %	12.66	12.50	12.50
Dry Density g/cc	1.74	1.83	1.99
Max Dry Density g/cc	1.94		

Moisture Content of Specimen after Soaking

Description	10 Blows	30 Blows	65 Blows
Weight of Dish (g)	40.8	35.1	34.9
Total Wet weight (g)	124.00	118.50	112.60
Total Dry weight (g)	113.30	108.30	103.60
Weight of Water(g)	10.70	10.20	9.00
Net Dry Weight (g)	72.50	73.20	68.70
Moisture Content %	14.76	13.93	13.10



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

Test Pit: 2 **Blows:** 10,30,65 **Ring Factor** 10.2

CBR Data

Penetration inches	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)
	10 Blows		30 Blows		65 Blows	
0.025	4	40.8	6	61.2	9	91.8
0.050	8	81.6	12	122.4	18	183.6
0.075	12	122.4	18.5	188.7	27.5	280.5
0.100	16	163.2	25	255	37	377.4
0.150	20.5	209.1	32.5	331.5	47.5	484.5
0.200	25	255	40	408	58	591.6
0.250	30	306	47.5	484.5	68	693.6
0.300	34.5	351.9	55	561	78	795.6
0.350	39	397.8	62	632.4	88	897.6
0.400	43.5	443.7	69	703.8	97.5	994.5
0.450	48	489.6	76	775.2	105	1071
0.500	52	530.4	83	846.6	114	1162.8

%Age Swell

Description	10 Blows	30 Blows	65 Blows
Initial Reading	0	0	0
Final Dial Reading	6.00	4.00	2.00
Percentage Swell	0.131	0.087	0.044

CBR Values

CBR Value 0.1" Penetration	5.44	8.5	12.58
CBR Value 0.2" Penetration	5.67	9.07	13.15



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

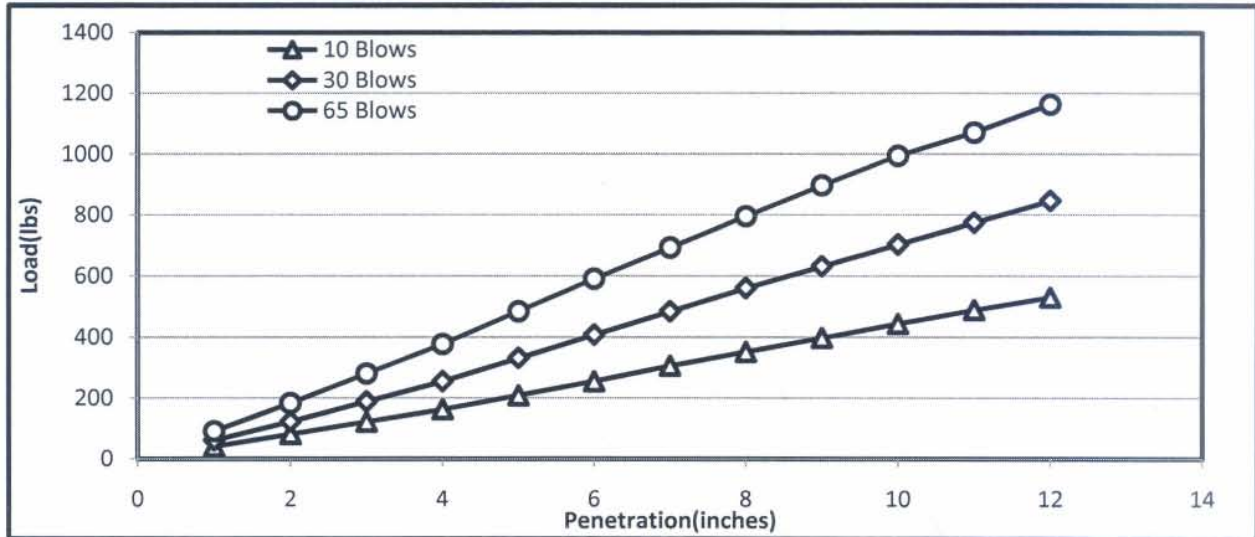
Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con
Engineering

Sample
Description CS

Starting Date: 27/03/2016
Testing Date: 31/03/2016

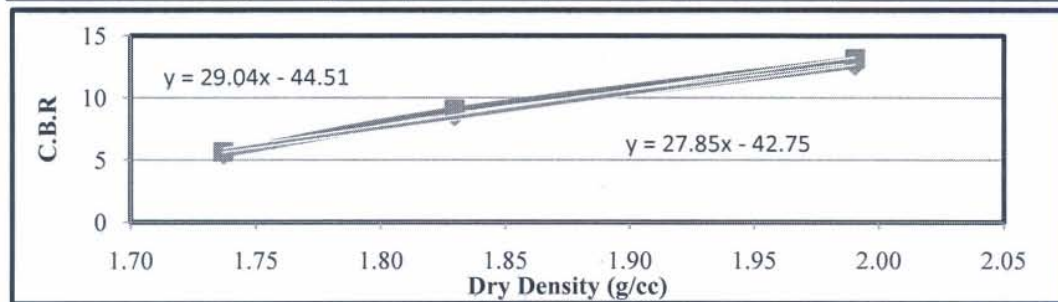
Test Pit: 2 **Blows:** 10,30,65 **Ring Factor** 10.2



Optimum Moisture Content	12.2	%	Maximum Dry Density	1.94	g/cc
---------------------------------	------	---	----------------------------	------	------

CBR Data

Number of Blows Per Layer		10	30	65
C.B. R. Value at 0.1 inch		5.44	8.5	12.58
C.B.R. Value at 0.2"		5.67	9.07	13.15
Dry Density (g/cc)		1.74	1.83	1.99
Mousture Content %		12.66	12.50	12.50
Swell Potential (%)		0.131	0.087	0.044
		CBR at	0.1"	0.2"
90% of Maxmum Dry Density	1.75	CBR at 90% O.M.C	5.88	6.19
95% of Maximum Dry Density	1.84	CBR at 95% O.M.C	8.58	9.01
100% of Maxmum Dry Density	1.94	CBR at 100% O.M.C	11.28	11.83



Sheet 3 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

Test Pit: 3 **Blows:** 10,30,65 **Ring Factor** 10.2

Moisture Content Determination

Description	10 Blows	30 Blows	65 Blows
Dish No.	9	10	11
Total Wet weight (g)	111.8	120.9	123.3
Total Dry weight (g)	103.1	111.2	113
Dish weight(g)	39.8	40.3	38.7
Weight of water(g)	8.7	9.7	10.3
Weight of dry soil g	63.3	70.9	74.3
Moisture Content %	13.74	13.50	13.86
Opt. Moisture Content %	13.5		

Dry Density

Description	10 Blows	30 Blows	65 Blows
Total weight (g)	8250.00	8720.00	9215.00
Weight of Mold (g)	3870.00	4130.00	4170.00
Weight of Wet Soil (g)	4380.00	4590.00	5045.00
Volume of Mold cc	2320.00	2320.00	2320.00
Wet Density g/cc	1.89	1.98	2.17
Moisture Content %	13.74	13.50	13.86
Dry Density g/cc	1.66	1.74	1.91
Max Dry Density g/cc	1.86		

Moisture Content of Specimen after Soaking

Description	10 Blows	30 Blows	65 Blows
Weight of Dish (g)	35.5	36.3	34.9
Total Wet weight (g)	106.30	109.20	110.00
Total Dry weight (g)	96.40	99.50	100.40
Weight of Water(g)	9.90	9.70	9.60
Net Dry Weight (g)	60.90	63.20	65.50
Moisture Content %	16.26	15.35	14.66



Sheet 1 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

Test Pit: 3 **Blows:** 10,30,65 **Ring Factor** 10.2

CBR Data

Penetration inches	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)
	10 Blows		30 Blows		65 Blows	
0.025	3.5	35.7	6.5	66.3	9	91.8
0.050	7	71.4	13	132.6	18.5	188.7
0.075	10.5	107.1	19.5	198.9	27.5	280.5
0.100	14	142.8	26	265.2	37	377.4
0.150	18	183.6	33	336.6	47.5	484.5
0.200	22	224.4	40	408	58	591.6
0.250	26	265.2	47	479.4	68	693.6
0.300	30	306	54	550.8	77.5	790.5
0.350	34	346.8	61	622.2	87	887.4
0.400	37.5	382.5	68	693.6	96	979.2
0.450	41	418.2	75	765	105	1071
0.500	45	459	82	836.4	114	1162.8

%Age Swell

Description	10 Blows	30 Blows	65 Blows
Initial Reading	0	0	0
Final Dial Reading	6.00	4.00	2.00
Percentage Swell	0.131	0.087	0.044

CBR Values

CBR Value 0.1" Penetration	4.76	8.84	12.58
CBR Value 0.2" Penetration	4.99	9.07	13.15



Sheet 2 of 3



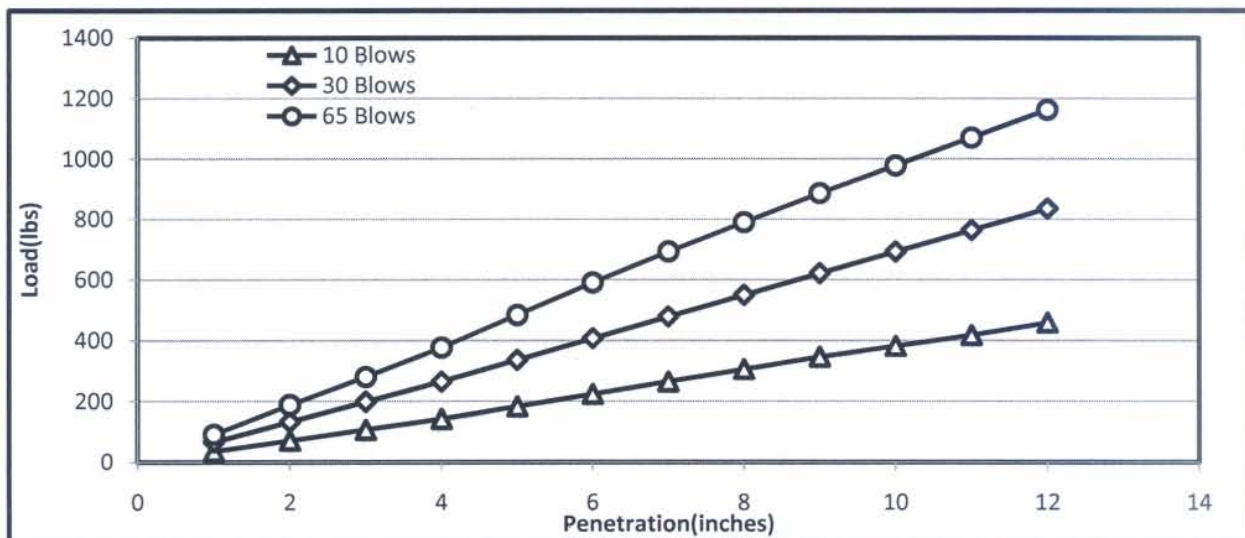
CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

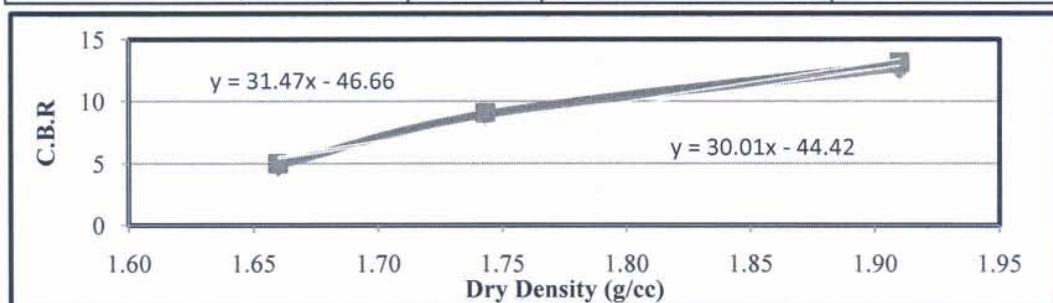
Test Pit: 3 **Blows:** 10,30,65 **Ring Factor** 10.2



Optimum Moisture Content	13.5	%	Maximum Dry Density	1.86	g/cc
--------------------------	------	---	---------------------	------	------

CBR Data

Number of Blows Per Layer		10	30	65	
C.B. R. Value at 0.1 inch		4.76	8.84	12.58	
C.B.R. Value at 0.2"		4.99	9.07	13.15	
Dry Density (g/cc)		1.66	1.74	1.91	
Mousture Content %		13.74	13.50	13.86	
Swell Potential (%)		0.131	0.087	0.044	
		CBR at		0.1"	0.2"
90% of Maxmum Dry Density	1.67	CBR at 90% O.M.C		5.82	6.02
95% of Maximum Dry Density	1.77	CBR at 95% O.M.C		8.61	8.95
100% of Maxmum Dry Density	1.86	CBR at 100% O.M.C		11.40	11.87



Sheet 3 of 3



Handwritten signature

CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

Test Pit: 4 **Blows:** 10,30,65 **Ring Factor** 10.2

Moisture Content Determination

Description	10 Blows	30 Blows	65 Blows
Dish No.	17	18	19
Total Wet weight (g)	113.5	113.4	113.5
Total Dry weight (g)	107.3	104.2	103.8
Dish weight(g)	37.8	41.9	38.3
Weight of water(g)	6.2	9.2	9.7
Weight of dry soil g	69.5	62.3	65.5
Moisture Content %	14.68	14.76	14.80
Opt. Moisture Content %	14.5		

Dry Density

Description	10 Blows	30 Blows	65 Blows
Total weight (g)	8520.00	8775.00	9220.00
Weight of Mold (g)	4210.00	4220.00	4270.00
Weight of Wet Soil (g)	4310.00	4555.00	4950.00
Volume of Mold cc	2320.00	2320.00	2320.00
Wet Density g/cc	1.86	1.96	2.13
Moisture Content %	14.68	14.76	14.80
Dry Density g/cc	1.62	1.71	1.86
Max Dry Density g/cc	1.81		

Moisture Content of Specimen after Soaking

Description	10 Blows	30 Blows	65 Blows
Weight of Dish (g)	36.3	42.9	34.9
Total Wet weight (g)	108.80	106.10	104.10
Total Dry weight (g)	72.50	63.20	70.90
Weight of Water(g)	36.30	42.90	33.20
Net Dry Weight (g)	36.20	20.30	36.00
Moisture Content %	100.28	211.33	92.22



Sheet 1 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

Test Pit: 4 **Blows:** 10,30,65 **Ring Factor** 10.2

CBR Data

Penetration inches	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)
	10 Blows		30 Blows		65 Blows	
0.025	4	40.8	7	71.4	9.5	96.9
0.050	8	81.6	14	142.8	19	193.8
0.075	12	122.4	21	214.2	28	285.6
0.100	16	163.2	28	285.6	38	387.6
0.150	19	193.8	34	346.8	49	499.8
0.200	23	234.6	45	459	59	601.8
0.250	27	275.4	48	489.6	68	693.6
0.300	31	316.2	55	561	78	795.6
0.350	35	357	62	632.4	87	887.4
0.400	38	387.6	69	703.8	97	989.4
0.450	42	428.4	76.5	780.3	106	1081.2
0.500	46	469.2	83	846.6	115	1173

%Age Swell

Description	10 Blows	30 Blows	65 Blows
Initial Reading	0	0	0
Final Dial Reading	8.00	5.00	3.00
Percentage Swell	0.174	0.109	0.065

CBR Values

CBR Value 0.1" Penetration	5.44	9.52	12.92
CBR Value 0.2" Penetration	5.21	10.20	13.37

Sheet 2 of 3



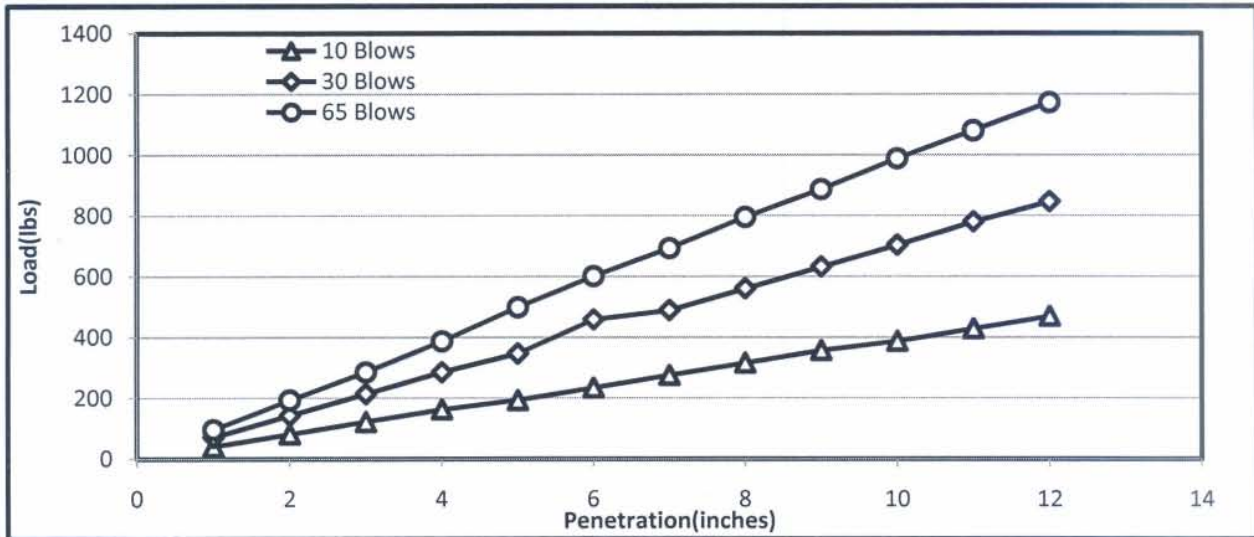
CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

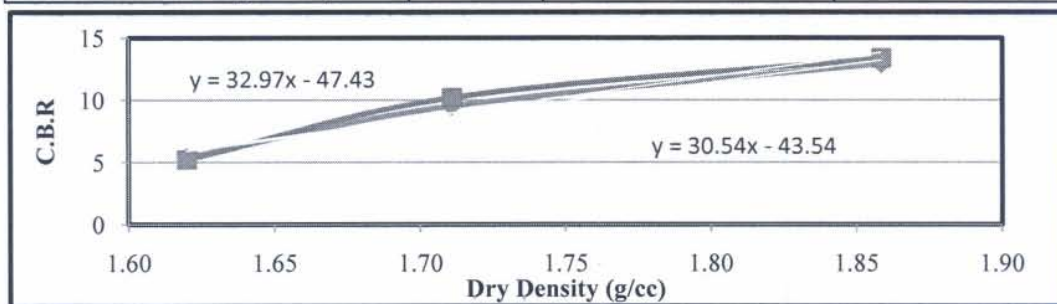
Test Pit: 4 **Blows:** 10,30,65 **Ring Factor** 10.2



Optimum Moisture Content	14.5	%	Maximum Dry Density	1.81	g/cc
--------------------------	------	---	---------------------	------	------

CBR Data

Number of Blows Per Layer		10	30	65
C.B. R. Value at 0.1 inch		5.44	9.52	12.92
C.B.R. Value at 0.2"		5.21	10.20	13.37
Dry Density (g/cc)		1.62	1.71	1.86
Mousture Content %		14.68	14.76	14.80
Swell Potential (%)		0.174	0.109	0.065
		CBR at	0.1"	0.2"
90% of Maxmum Dry Density	1.63	CBR at 90% O.M.C	6.21	6.28
95% of Maximum Dry Density	1.72	CBR at 95% O.M.C	8.97	9.26
100% of Maxmum Dry Density	1.81	CBR at 100% O.M.C	11.74	12.25



Sheet 3 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

Test Pit: 5 **Blows:** 10,30,65 **Ring Factor** 10.2

Moisture Content Determination

Description	10 Blows	30 Blows	65 Blows
Dish No.	29	27	25
Total Wet weight (g)	112.5	114.6	115.4
Total Dry weight (g)	104.4	106.2	106.4
Dish weight(g)	41.1	40.7	35.5
Weight of water(g)	8.1	8.4	9
Weight of dry soil g	63.3	65.5	70.9
Moisture Content %	12.80	12.82	12.69
Opt. Moisture Content %	12.5		

Dry Density

Description	10 Blows	30 Blows	65 Blows
Total weight (g)	8830.00	9095.00	9610.00
Weight of Mold (g)	4410.00	4430.00	4490.00
Weight of Wet Soil (g)	4420.00	4665.00	5120.00
Volume of Mold cc	2320.00	2320.00	2320.00
Wet Density g/cc	1.91	2.01	2.21
Moisture Content %	12.80	12.82	12.69
Dry Density g/cc	1.69	1.78	1.96
Max Dry Density g/cc	1.9		

Moisture Content of Specimen after Soaking

Description	10 Blows	30 Blows	65 Blows
Weight of Dish (g)	38.7	36.2	41.9
Total Wet weight (g)	104.20	104.00	113.80
Total Dry weight (g)	65.50	67.80	71.90
Weight of Water(g)	38.70	36.20	41.90
Net Dry Weight (g)	26.80	31.60	30.00
Moisture Content %	144.40	114.56	139.67



Sheet 1 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

Test Pit: 5 **Blows:** 10,30,65 **Ring Factor** 10.2

CBR Data

Penetration inches	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)
	10 Blows		30 Blows		65 Blows	
0.025	4.5	45.9	8.5	86.7	14	142.8
0.050	9.5	96.9	17	173.4	27.5	280.5
0.075	14	142.8	26	265.2	41.5	423.3
0.100	19	193.8	34	346.8	54	550.8
0.150	25	255	43	438.6	69	703.8
0.200	31	316.2	53	540.6	84	856.8
0.250	37	377.4	63	642.6	99	1009.8
0.300	43	438.6	73	744.6	113.5	1157.7
0.350	49	499.8	83	846.6	128	1305.6
0.400	55	561	92.5	943.5	142	1448.4
0.450	59.5	606.9	102	1040.4	156	1591.2
0.500	64	652.8	111	1132.2	170	1734

%Age Swell

Description	10 Blows	30 Blows	65 Blows
Initial Reading	0	0	0
Final Dial Reading	8.00	5.00	3.00
Percentage Swell	0.174	0.109	0.065

CBR Values

CBR Value 0.1" Penetration	6.46	11.56	18.36
CBR Value 0.2" Penetration	7.03	12.01	19.04

Sheet 2 of 3



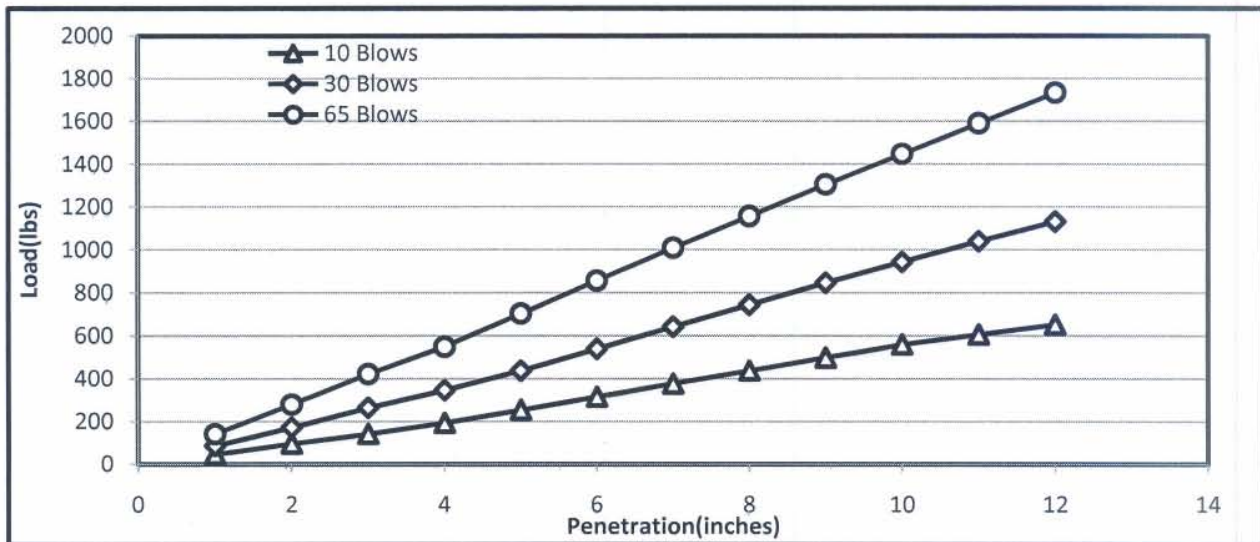
CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 27/03/2016
Testing Date: 31/03/2016

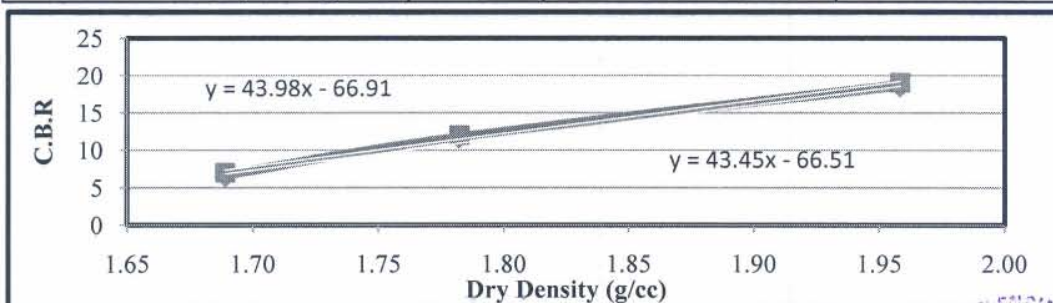
Test Pit: 5 **Blows:** 10,30,65 **Ring Factor** 10.2



Optimum Moisture Content	12.5	%	Maximum Dry Density	1.9	g/cc
--------------------------	------	---	---------------------	-----	------

CBR Data

Number of Blows Per Layer		10	30	65
C.B. R. Value at 0.1 inch		6.46	11.56	18.36
C.B.R. Value at 0.2"		7.03	12.01	19.04
Dry Density (g/cc)		1.69	1.78	1.96
Mousture Content %		12.80	12.82	12.69
Swell Potential (%)		0.174	0.109	0.065
		CBR at		
		0.1"		0.2"
90% of Maxmum Dry Density	1.71	CBR at 90% O.M.C	7.79	8.30
95% of Maximum Dry Density	1.81	CBR at 95% O.M.C	11.92	12.47
100% of Maximum Dry Density	1.90	CBR at 100% O.M.C	16.05	16.65



Sheet 3 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 6 **Blows:** 10,30,65 **Ring Factor** 10.2

Moisture Content Determination

Description	10 Blows	30 Blows	65 Blows
Dish No.	33	35	37
Total Wet weight (g)	115.3	125.1	117.3
Total Dry weight (g)	106.2	115.2	107.9
Dish weight(g)	34.9	37.3	35.1
Weight of water(g)	9.1	9.9	9.4
Weight of dry soil g	71.3	77.9	72.8
Moisture Content %	12.76	12.71	12.91
Opt. Moisture Content %	12.5		

Dry Density

Description	10 Blows	30 Blows	65 Blows
Total weight (g)	8750.00	9005.00	9435.00
Weight of Mold (g)	4280.00	4260.00	4250.00
Weight of Wet Soil (g)	4470.00	4745.00	5185.00
Volume of Mold cc	2320.00	2320.00	2320.00
Wet Density g/cc	1.93	2.05	2.23
Moisture Content %	12.76	12.71	12.91
Dry Density g/cc	1.71	1.81	1.98
Max Dry Density g/cc	1.92		

Moisture Content of Specimen after Soaking

Description	10 Blows	30 Blows	65 Blows
Weight of Dish (g)	39.5	38.3	37.3
Total Wet weight (g)	120.00	121.10	123.90
Total Dry weight (g)	109.50	110.80	113.70
Weight of Water(g)	10.50	10.30	10.20
Net Dry Weight (g)	70.00	72.50	76.40
Moisture Content %	15.00	14.21	13.35

Sheet 1 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 6 **Blows:** 10,30,65 **Ring Factor** 10.2

CBR Data

Penetration inches	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)
	10 Blows		30 Blows		65 Blows	
0.025	4	40.8	9	91.8	16	163.2
0.050	8	81.6	18	183.6	32	326.4
0.075	12	122.4	27	275.4	48	489.6
0.100	16	163.2	36	367.2	64	652.8
0.150	20.5	209.1	46.5	474.3	82	836.4
0.200	24.5	249.9	56	571.2	100	1020
0.250	29	295.8	66	673.2	117	1193.4
0.300	33	336.6	75.5	770.1	134	1366.8
0.350	37	377.4	85	867	151	1540.2
0.400	42	428.4	94	958.8	168	1713.6
0.450	46.5	474.3	103	1050.6	185	1887
0.500	51	520.2	112	1142.4	201.5	2055.3

%Age Swell

Description	10 Blows	30 Blows	65 Blows
Initial Reading	0	0	0
Final Dial Reading	7.00	5.00	3.00
Percentage Swell	0.153	0.109	0.065

CBR Values

CBR Value 0.1" Penetration	5.44	12.24	21.76
CBR Value 0.2" Penetration	5.55	12.69	22.67



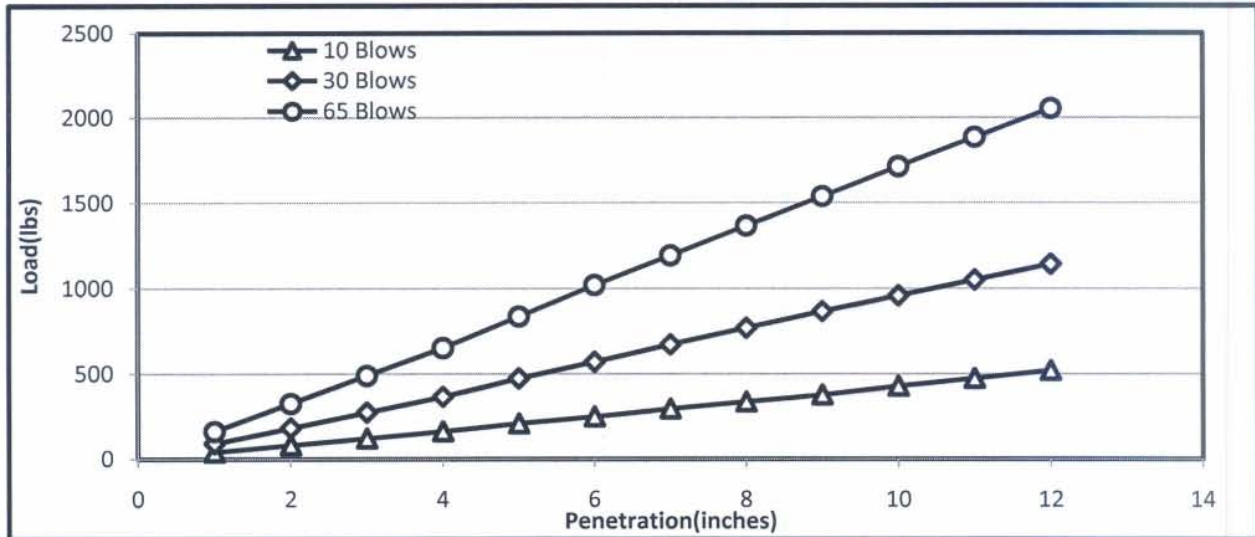
CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

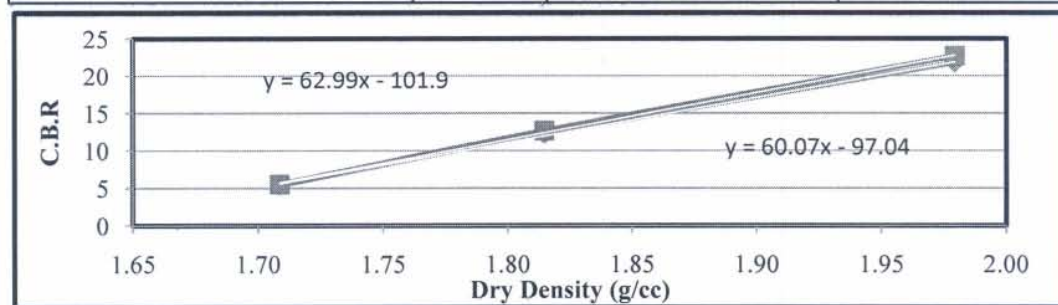
Test Pit: 6 **Blows:** 10,30,65 **Ring Factor** 10.2



Optimum Moisture Content	12.5	%	Maximum Dry Density	1.92	g/cc
---------------------------------	------	---	----------------------------	------	------

CBR Data

Number of Blows Per Layer		10	30	65
C.B. R. Value at 0.1 inch		5.44	12.24	21.76
C.B.R. Value at 0.2"		5.55	12.69	22.67
Dry Density (g/cc)		1.71	1.81	1.98
Mousture Content %		12.76	12.71	12.91
Swell Potential (%)		0.153	0.109	0.065
		CBR at	0.1"	0.2"
90% of Maxmum Dry Density	1.73	CBR at 90% O.M.C	6.76	6.95
95% of Maximum Dry Density	1.82	CBR at 95% O.M.C	12.53	12.99
100% of Maxmum Dry Density	1.92	CBR at 100% O.M.C	18.29	19.04



Sheet 3 of 3



Handwritten signature

CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 7 **Blows:** 10,30,65 **Ring Factor** 10.2

Moisture Content Determination

Description	10 Blows	30 Blows	65 Blows
Dish No.	28	29	30
Total Wet weight (g)	126.5	116.3	112.6
Total Dry weight (g)	120.5	110.8	107.4
Dish weight(g)	43.2	41.1	40.7
Weight of water(g)	6	5.5	5.2
Weight of dry soil g	77.3	69.7	66.7
Moisture Content %	7.80	7.90	7.80
Opt. Moisture Content %	7.5		

Dry Density

Description	10 Blows	30 Blows	65 Blows
Total weight (g)	9270.00	9595.00	10055.00
Weight of Mold (g)	4320.00	4350.00	4370.00
Weight of Wet Soil (g)	4950.00	5245.00	5685.00
Volume of Mold cc	2320.00	2320.00	2320.00
Wet Density g/cc	2.13	2.26	2.45
Moisture Content %	7.80	7.90	7.80
Dry Density g/cc	1.98	2.10	2.27
Max Dry Density g/cc	2.22		

Moisture Content of Specimen after Soaking

Description	10 Blows	30 Blows	65 Blows
Weight of Dish (g)	35.1	39.5	41.9
Total Wet weight (g)	108.30	108.40	112.10
Total Dry weight (g)	101.90	102.70	106.80
Weight of Water(g)	6.40	5.70	5.30
Net Dry Weight (g)	66.80	63.20	64.90
Moisture Content %	9.58	9.02	8.17

Sheet 1 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 7 **Blows:** 10,30,65 **Ring Factor** 10.2

CBR Data

Penetration inches	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)
	10 Blows		30 Blows		65 Blows	
0.025	11	112.2	20	204	27	275.4
0.050	22	224.4	41	418.2	54	550.8
0.075	33	336.6	61	622.2	81	826.2
0.100	43	438.6	80	816	109	1111.8
0.150	54	550.8	102	1040.4	140	1428
0.200	66	673.2	124	1264.8	172	1754.4
0.250	77	785.4	146	1489.2	203	2070.6
0.300	88	897.6	167.5	1708.5	233	2376.6
0.350	98.5	1004.7	189	1927.8	269	2743.8
0.400	109	1111.8	210	2142	291	2968.2
0.450	119	1213.8	231	2356.2	319.5	3258.9
0.500	129	1315.8	252	2570.4	347.5	3544.5

%Age Swell

Description	10 Blows	30 Blows	65 Blows
Initial Reading	0	0	0
Final Dial Reading	5.00	3.00	2.00
Percentage Swell	0.109	0.065	0.044

CBR Values

CBR Value 0.1" Penetration	14.62	27.2	37.06
CBR Value 0.2" Penetration	14.96	28.11	38.99

Sheet 2 of 3



Handwritten signature

CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con
Engineering

**Sample
Description**

CS

Starting Date: 28/03/2016

Testing Date: 01/04/2016.

Test Pit:

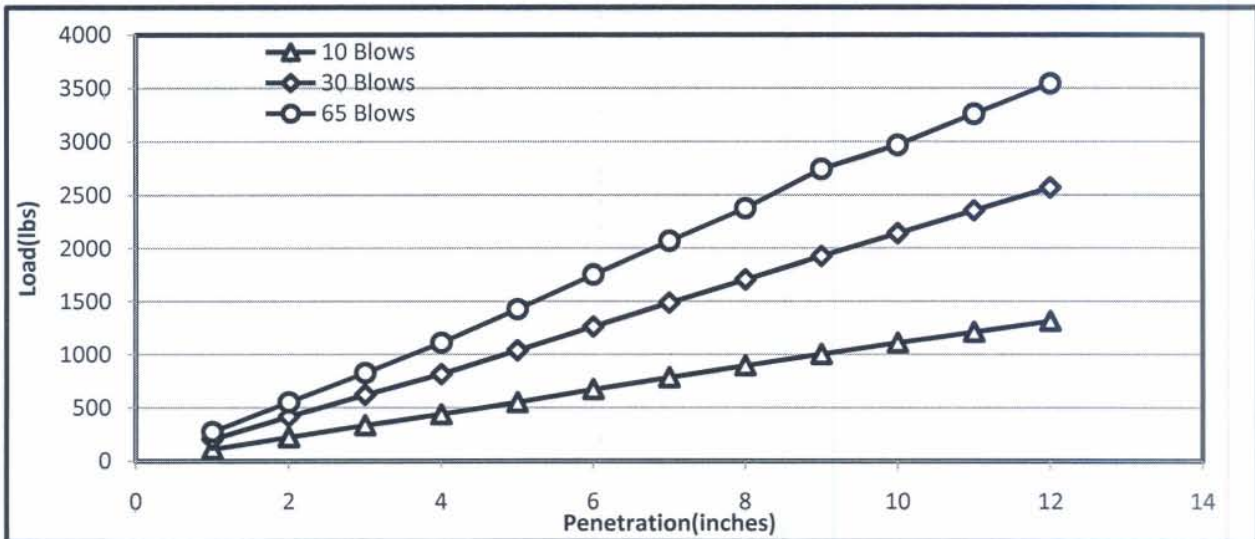
7

Blows:

10,30,65

Ring Factor

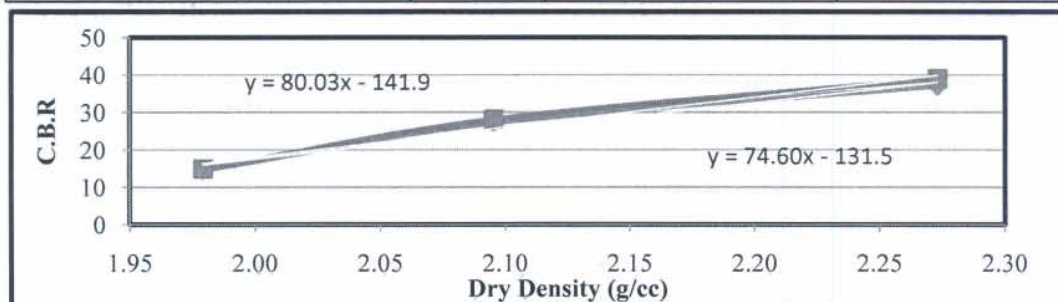
10.2



Optimum Moisture Content	7.5	%	Maximum Dry Density	2.22	g/cc
---------------------------------	-----	---	----------------------------	------	------

CBR Data

Number of Blows Per Layer		10	30	65
C.B. R. Value at 0.1 inch		14.62	27.2	37.06
C.B.R. Value at 0.2"		14.96	28.11	38.99
Dry Density (g/cc)		1.98	2.10	2.27
Mousture Content %		7.80	7.90	7.80
Swell Potential (%)		0.109	0.065	0.044
		CBR at	0.1"	0.2"
90% of Maxmum Dry Density	2.00	CBR at 90% O.M.C	17.55	18.00
95% of Maximum Dry Density	2.11	CBR at 95% O.M.C	25.83	26.88
100% of Maxmum Dry Density	2.22	CBR at 100% O.M.C	34.11	35.77



Sheet 3 of 3



[Signature]

CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 8 **Blows:** 10,30,65 **Ring Factor** 10.2

Moisture Content Determination

Description	10 Blows	30 Blows	65 Blows
Dish No.	21	22	23
Total Wet weight (g)	116.9	129	125.7
Total Dry weight (g)	108.2	114.6	116.3
Dish weight(g)	35.7	37.3	39.6
Weight of water(g)	8.7	14.4	9.4
Weight of dry soil g	72.5	77.3	76.7
Moisture Content %	12.00	12.20	12.20
Opt. Moisture Content %	11.8		

Dry Density

Description	10 Blows	30 Blows	65 Blows
Total weight (g)	8650.00	8690.00	9270.00
Weight of Mold (g)	4105.00	3890.00	4050.00
Weight of Wet Soil (g)	4545.00	4800.00	5220.00
Volume of Mold cc	2320.00	2320.00	2320.00
Wet Density g/cc	1.96	2.07	2.25
Moisture Content %	12.00	12.20	12.20
Dry Density g/cc	1.75	1.84	2.01
Max Dry Density g/cc	1.96		

Moisture Content of Specimen after Soaking

Description	10 Blows	30 Blows	65 Blows
Weight of Dish (g)	30.2	35.7	37.3
Total Wet weight (g)	107.50	110.00	112.70
Total Dry weight (g)	97.70	101.20	104.10
Weight of Water(g)	9.80	8.80	8.60
Net Dry Weight (g)	67.50	65.50	66.80
Moisture Content %	14.52	13.44	12.87



Sheet 1 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 8 **Blows:** 10,30,65 **Ring Factor** 10.2

CBR Data

Penetration inches	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)
	10 Blows		30 Blows		65 Blows	
0.025	3	30.6	6.5	66.3	12	122.4
0.050	7	71.4	13	132.6	24	244.8
0.075	10	102	20	204	36	367.2
0.100	13.5	137.7	26	265.2	48	489.6
0.150	17	173.4	33	336.6	62	632.4
0.200	21	214.2	40	408	74	754.8
0.250	24.5	249.9	47	479.4	86	877.2
0.300	28	285.6	54	550.8	98	999.6
0.350	31	316.2	61	622.2	110	1122
0.400	34	346.8	67.5	688.5	122	1244.4
0.450	37	377.4	74.5	759.9	133.5	1361.7
0.500	40	408	82	836.4	144	1468.8

%Age Swell

Description	10 Blows	30 Blows	65 Blows
Initial Reading	0	0	0
Final Dial Reading	8.00	5.00	3.00
Percentage Swell	0.174	0.109	0.065

CBR Values

CBR Value 0.1" Penetration	4.59	8.84	16.32
CBR Value 0.2" Penetration	4.76	9.07	16.77

Sheet 2 of 3



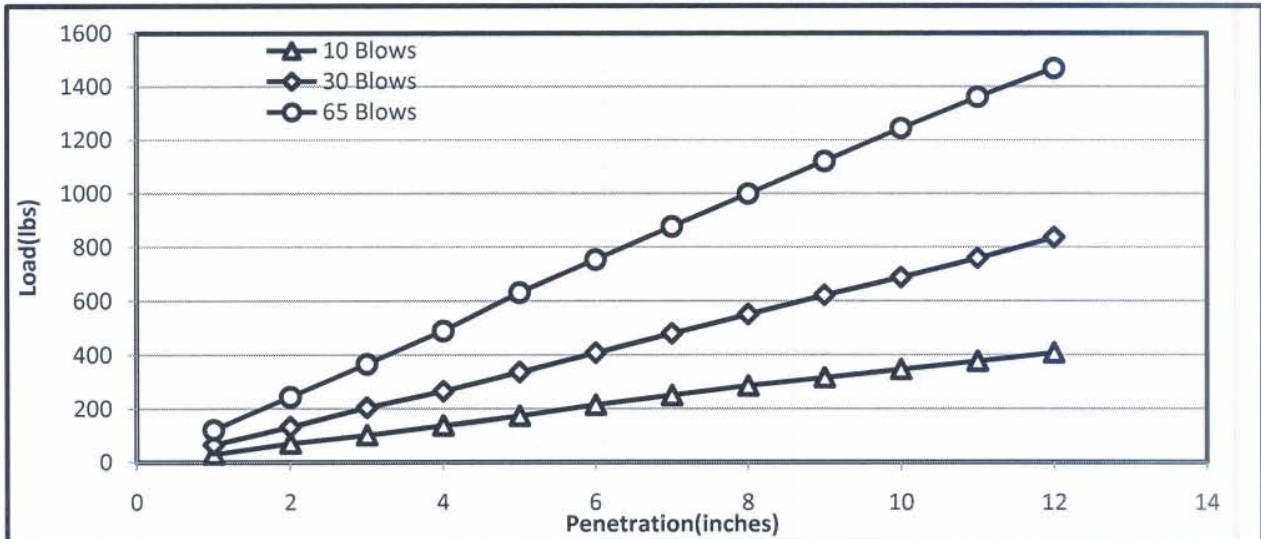
CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering Sample Description CS Starting Date: 28/03/2016
Testing Date: 01/04/2016.

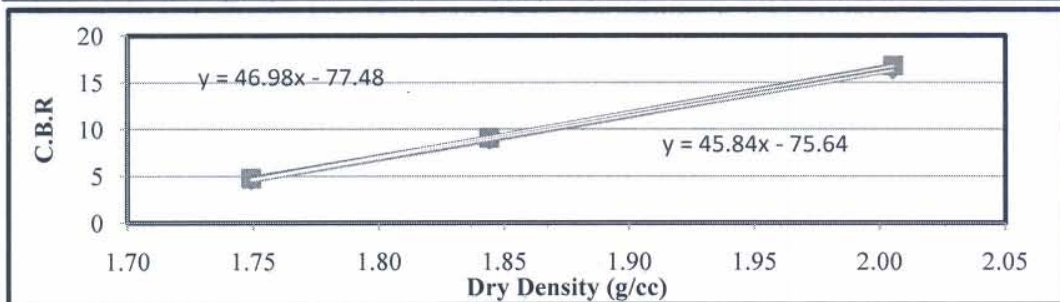
Test Pit: 8 Blows: 10,30,65 Ring Factor 10.2



Optimum Moisture Content	11.8	%	Maximum Dry Density	1.96	g/cc
--------------------------	------	---	---------------------	------	------

CBR Data

Number of Blows Per Layer		10	30	65
C.B. R. Value at 0.1 inch		4.59	8.84	16.32
C.B.R. Value at 0.2"		4.76	9.07	16.77
Dry Density (g/cc)		1.75	1.84	2.01
Mousture Content %		12.00	12.20	12.20
Swell Potential (%)		0.174	0.109	0.065
		CBR at		
		0.1"		0.2"
90% of Maxmum Dry Density	1.76	CBR at 90% O.M.C	5.22	5.39
95% of Maximum Dry Density	1.86	CBR at 95% O.M.C	9.71	10.00
100% of Maxmum Dry Density	1.96	CBR at 100% O.M.C	14.21	14.60



Sheet 3 of 3



[Signature]

CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 9 **Blows:** 10,30,65 **Ring Factor** 10.2

Moisture Content Determination

Description	10 Blows	30 Blows	65 Blows
Dish No.	13	14	15
Total Wet weight (g)	117.7	102.3	107.5
Total Dry weight (g)	111.7	96.5	101.7
Dish weight(g)	43.2	30.2	36.2
Weight of water(g)	6	5.8	5.8
Weight of dry soil g	68.5	66.3	65.5
Moisture Content %	8.76	8.75	8.85
Opt. Moisture Content %	8.5		

Dry Density

Description	10 Blows	30 Blows	65 Blows
Total weight (g)	8720.00	9170.00	9345.00
Weight of Mold (g)	4030.00	4230.00	3970.00
Weight of Wet Soil (g)	4690.00	4940.00	5375.00
Volume of Mold cc	2320.00	2320.00	2320.00
Wet Density g/cc	2.02	2.13	2.32
Moisture Content %	8.76	8.75	8.85
Dry Density g/cc	1.86	1.96	2.13
Max Dry Density g/cc	2.08		

Moisture Content of Specimen after Soaking

Description	10 Blows	30 Blows	65 Blows
Weight of Dish (g)	39.6	35.5	43.1
Total Wet weight (g)	109.20	107.80	112.90
Total Dry weight (g)	101.90	101.00	106.80
Weight of Water(g)	7.30	6.80	6.10
Net Dry Weight (g)	62.30	65.50	63.70
Moisture Content %	11.72	10.38	9.58

Sheet 1 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 9 **Blows:** 10,30,65 **Ring Factor** 10.2

CBR Data

Penetration inches	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)
	10 Blows		30 Blows		65 Blows	
0.025	7	71.4	11	112.2	20	204
0.050	14	142.8	22	224.4	40	408
0.075	21	214.2	33	336.6	60	612
0.100	28	285.6	44	448.8	80	816
0.150	36	367.2	57	581.4	102	1040.4
0.200	44	448.8	70	714	123	1254.6
0.250	51.5	525.3	83	846.6	144	1468.8
0.300	60	612	96	979.2	165	1683
0.350	67	683.4	108	1101.6	186	1897.2
0.400	74	754.8	121	1234.2	198	2019.6
0.450	81	826.2	134	1366.8	218	2223.6
0.500	81	826.2	146	1489.2	238	2427.6

%Age Swell

Description	10 Blows	30 Blows	65 Blows
Initial Reading	0	0	0
Final Dial Reading	9.00	6.00	3.00
Percentage Swell	0.196	0.131	0.065

CBR Values

CBR Value 0.1" Penetration	9.52	14.96	27.2
CBR Value 0.2" Penetration	9.97	15.87	27.88



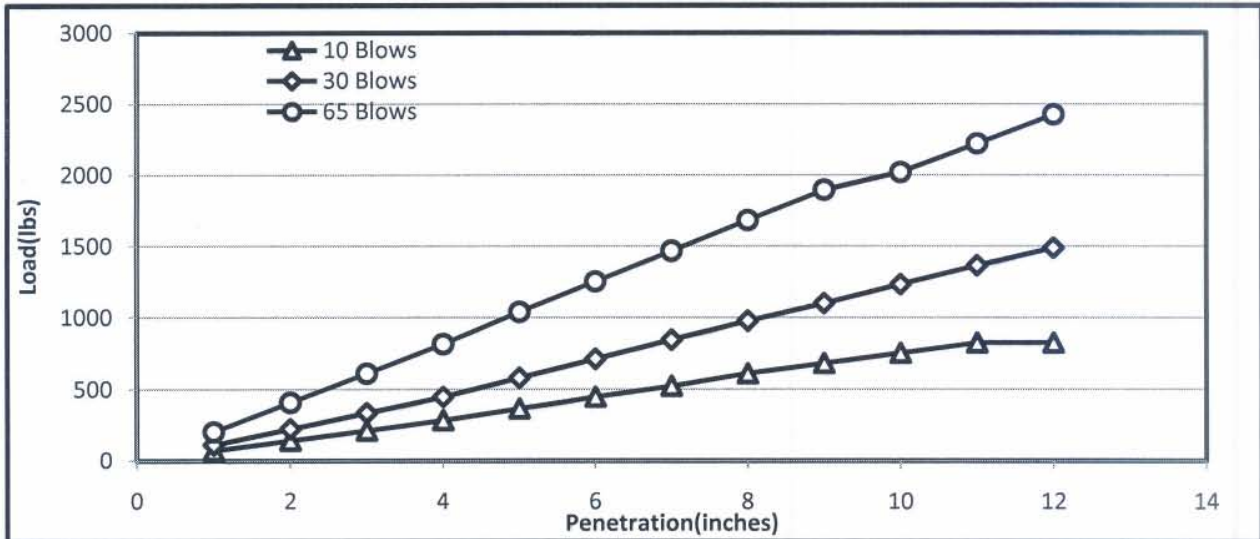
CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering Sample Description CS Starting Date: 28/03/2016
Testing Date: 01/04/2016.

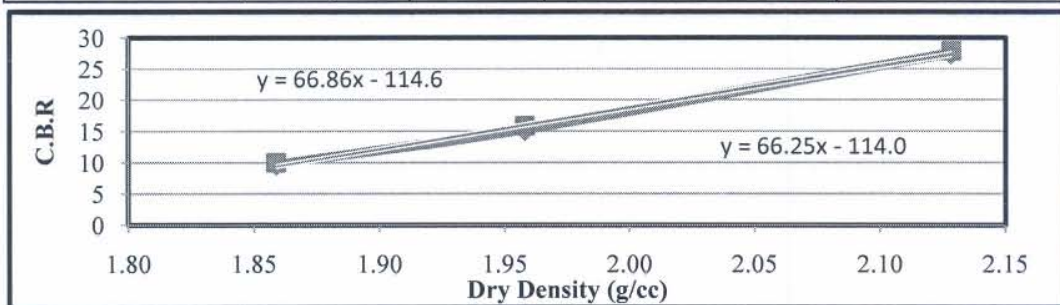
Test Pit: 9 Blows: 10,30,65 Ring Factor 10.2



Optimum Moisture Content	8.5	%	Maximum Dry Density	2.08	g/cc
--------------------------	-----	---	---------------------	------	------

CBR Data

Number of Blows Per Layer		10	30	65
C.B. R. Value at 0.1 inch		9.52	14.96	27.2
C.B.R. Value at 0.2"		9.97	15.87	27.88
Dry Density (g/cc)		1.86	1.96	2.13
Mousture Content %		8.76	8.75	8.85
Swell Potential (%)		0.196	0.131	0.065
		CBR at		
		0.1"		0.2"
90% of Maxmum Dry Density	1.87	CBR at 90% O.M.C	10.02	10.56
95% of Maximum Dry Density	1.98	CBR at 95% O.M.C	16.91	17.52
100% of Maxmum Dry Density	2.08	CBR at 100% O.M.C	23.80	24.47



Sheet 3 of 3



[Signature]

CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 10 **Blows:** 10,30,65 **Ring Factor** 10.2

Moisture Content Determination

Description	10 Blows	30 Blows	65 Blows
Dish No.	16	17	18
Total Wet weight (g)	122.3	119.5	129
Total Dry weight (g)	112	109.5	118.2
Dish weight(g)	39.5	37.8	41.8
Weight of water(g)	10.3	10	10.8
Weight of dry soil g	72.5	71.7	76.4
Moisture Content %	14.20	13.94	14.15
Opt. Moisture Content %	13.8		

Dry Density

Description	10 Blows	30 Blows	65 Blows
Total weight (g)	8505.00	8920.00	9470.00
Weight of Mold (g)	4150.00	4330.00	4480.00
Weight of Wet Soil (g)	4355.00	4590.00	4990.00
Volume of Mold cc	2320.00	2320.00	2320.00
Wet Density g/cc	1.88	1.98	2.15
Moisture Content %	14.20	13.94	14.15
Dry Density g/cc	1.64	1.74	1.88
Max Dry Density g/cc	1.84		

Moisture Content of Specimen after Soaking

Description	10 Blows	30 Blows	65 Blows
Weight of Dish (g)	36.2	42.7	38.7
Total Wet weight (g)	112.10	115.60	113.20
Total Dry weight (g)	101.50	105.60	103.50
Weight of Water(g)	10.60	10.00	9.70
Net Dry Weight (g)	65.30	62.90	64.80
Moisture Content %	16.23	15.90	14.97

Sheet 1 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 10 **Blows:** 10,30,65 **Ring Factor** 10.2

CBR Data

Penetration inches	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)
	10 Blows		30 Blows		65 Blows	
0.025	3	30.6	6.5	66.3	10	102
0.050	6.5	66.3	13	132.6	20	204
0.075	9.5	96.9	18.5	188.7	30	306
0.100	11.5	117.3	25	255	40	408
0.150	15	153	32	326.4	59	601.8
0.200	17.5	178.5	40	408	70	714
0.250	21	214.2	47	479.4	80	816
0.300	24	244.8	54	550.8	91	928.2
0.350	28	285.6	61	622.2	100	1020
0.400	31	316.2	67	683.4	109	1111.8
0.450	34	346.8	74	754.8	119	1213.8
0.500	37	377.4	81	826.2	129	1315.8

%Age Swell

Description	10 Blows	30 Blows	65 Blows
Initial Reading	0	0	0
Final Dial Reading	8.00	5.00	3.00
Percentage Swell	0.174	0.109	0.065

CBR Values

CBR Value 0.1" Penetration	3.91	8.5	13.6
CBR Value 0.2" Penetration	3.97	9.07	15.87

Sheet 2 of 3



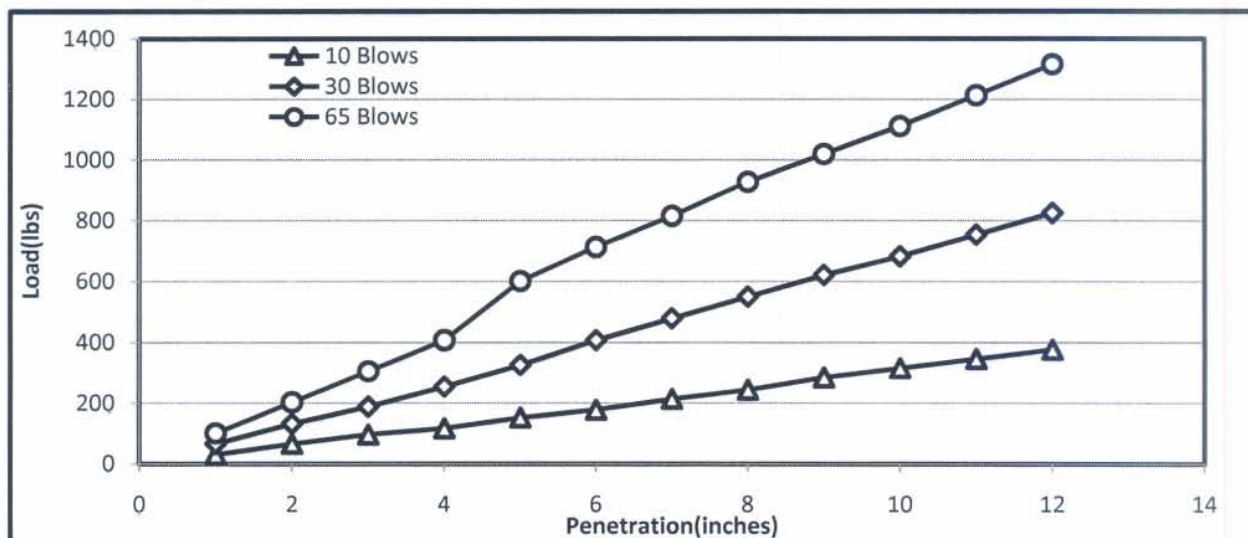
CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

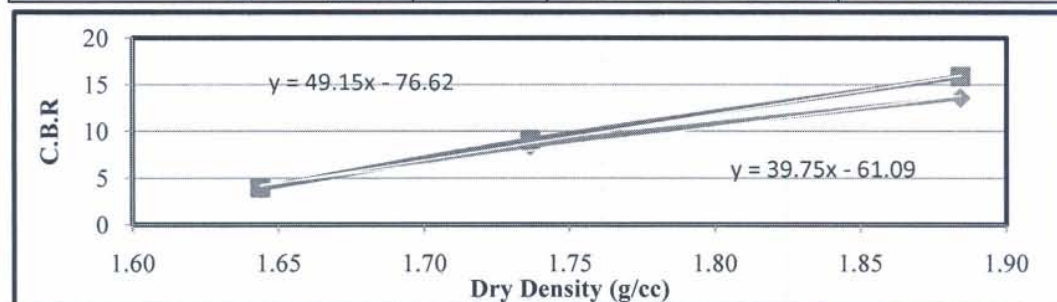
Test Pit: 10 **Blows:** 10,30,65 **Ring Factor** 10.2



Optimum Moisture Content	13.8	%	Maximum Dry Density	1.84	g/cc
---------------------------------	------	---	----------------------------	------	------

CBR Data

Number of Blows Per Layer		10	30	65	
C.B. R. Value at 0.1 inch		3.91	8.5	13.6	
C.B.R. Value at 0.2"		3.97	9.07	15.87	
Dry Density (g/cc)		1.64	1.74	1.88	
Mousture Content %		14.20	13.94	14.15	
Swell Potential (%)		0.174	0.109	0.065	
		CBR at		0.1"	0.2"
90% of Maxmum Dry Density	1.66	CBR at 90% O.M.C		4.74	4.77
95% of Maximum Dry Density	1.75	CBR at 95% O.M.C		8.39	9.29
100% of Maximum Dry Density	1.84	CBR at 100% O.M.C		12.05	13.82



Sheet 3 of 3



[Handwritten signature]

CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 11 **Blows:** 10,30,65 **Ring Factor** 10.2

Moisture Content Determination

Description	10 Blows	30 Blows	65 Blows
Dish No.	11	12	13
Total Wet weight (g)	117.1	127	128.5
Total Dry weight (g)	109	118.2	119.5
Dish weight(g)	38.7	42.7	43.2
Weight of water(g)	8.1	8.8	9
Weight of dry soil g	70.3	75.5	76.3
Moisture Content %	11.52	11.66	11.80
Opt. Moisture Content %	11.3		

Dry Density

Description	10 Blows	30 Blows	65 Blows
Total weight (g)	8385.00	8885.00	9320.00
Weight of Mold (g)	3870.00	4130.00	4170.00
Weight of Wet Soil (g)	4515.00	4755.00	5150.00
Volume of Mold cc	2320.00	2320.00	2320.00
Wet Density g/cc	1.95	2.05	2.22
Moisture Content %	11.52	11.66	11.80
Dry Density g/cc	1.75	1.84	1.99
Max Dry Density g/cc	1.95		

Moisture Content of Specimen after Soaking

Description	10 Blows	30 Blows	65 Blows
Weight of Dish (g)	39.5	38.3	35.7
Total Wet weight (g)	111.90	112.60	104.10
Total Dry weight (g)	102.80	103.80	96.60
Weight of Water(g)	9.10	8.80	7.50
Net Dry Weight (g)	63.30	65.50	60.90
Moisture Content %	14.38	13.44	12.32

Sheet 1 of 3



CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con
Engineering

Sample
Description CS

Starting Date: 28/03/2016
Testing Date: 01/04/2016.

Test Pit: 11 **Blows:** 10,30,65 **Ring Factor** 10.2

CBR Data

Penetration inches	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)	Dial Reading	Load (lbs)
	10 Blows		30 Blows		65 Blows	
0.025	4	40.8	8.5	86.7	13	132.6
0.050	8	81.6	17	173.4	26	265.2
0.075	12	122.4	25.5	260.1	39	397.8
0.100	16	163.2	27	275.4	53	540.6
0.150	21	214.2	34	346.8	67	683.4
0.200	25.5	260.1	42	428.4	80	816
0.250	30	306	51	520.2	92	938.4
0.300	34	346.8	59	601.8	104	1060.8
0.350	38	387.6	67.5	688.5	115	1173
0.400	42	428.4	76	775.2	127	1295.4
0.450	46	469.2	84	856.8	140	1428
0.500	50	510	91	928.2	153	1560.6

%Age Swell

Description	10 Blows	30 Blows	65 Blows
Initial Reading	0	0	0
Final Dial Reading	7.00	5.00	2.00
Percentage Swell	0.153	0.109	0.044

CBR Values

CBR Value 0.1" Penetration	5.44	9.18	18.02
CBR Value 0.2" Penetration	5.78	9.52	18.13

Sheet 2 of 3



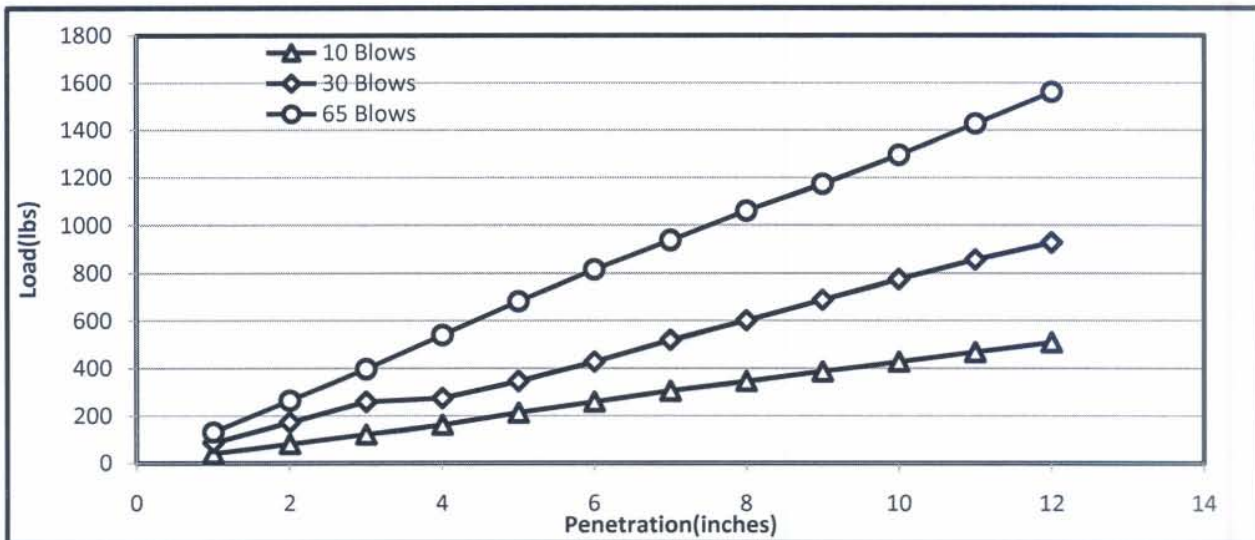
CALIFORNIA BEARING RATIO TEST

SAFE
Soil and
Foundation Engg

Project: CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client : Zeal Con Engineering **Sample Description** CS **Starting Date:** 28/03/2016
Testing Date: 01/04/2016.

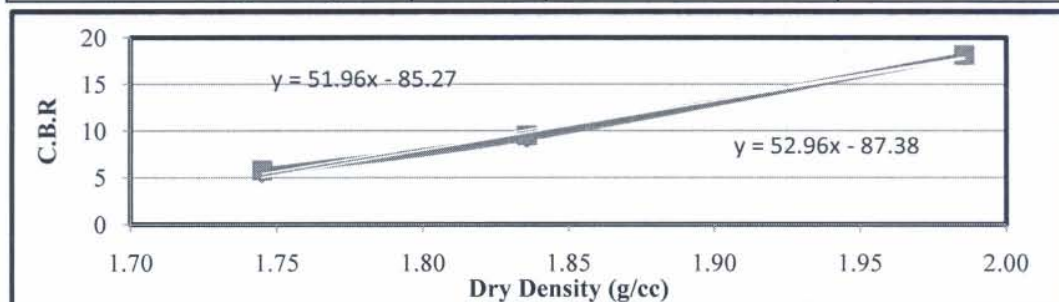
Test Pit: 11 **Blows:** 10,30,65 **Ring Factor** 10.2



Optimum Moisture Content	11.3	%	Maximum Dry Density	1.95	g/cc
---------------------------------	------	---	----------------------------	------	------

CBR Data

Number of Blows Per Layer		10	30	65	
C.B. R. Value at 0.1 inch		5.44	9.18	18.02	
C.B.R. Value at 0.2"		5.78	9.52	18.13	
Dry Density (g/cc)		1.75	1.84	1.99	
Mousture Content %		11.52	11.66	11.80	
Swell Potential (%)		0.153	0.109	0.044	
		CBR at		0.1"	0.2"
90% of Maxmum Dry Density	1.76	CBR at 90% O.M.C		5.56	5.92
95% of Maximum Dry Density	1.85	CBR at 95% O.M.C		10.73	10.99
100% of Maxmum Dry Density	1.95	CBR at 100% O.M.C		15.89	16.05



Sheet 3 of 3



[Signature]

FIELD DENSITY TEST (Sand Cone Method)

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:- Zeal Con Engineering

Sr. No.	Description	Test Trial Nos.					
		1	2				
1	Location of Test Pit	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6
2	Layyer No. Base/S-Base	0.50	0.50	0.50	0.50	0.50	0.50
3	Date of Testing	24/03/2016.	24/03/2016.	24/03/2016.	24/03/2016.	24/03/2016.	24/03/2016.
4	Wt. of Material from hole, g	7060	6815	6180	5300	4985	4365
5	Wt. of Sand before test, g	11400	11320	11250	10900	10400	10100
6	Wt. of sand After test, g	4980	4630	4770	5050	4980	5130
7	Wt. of sand to fill cone & Pit, g	6420	6690	6480	5850	5420	4970
8	Wt. of sand to fill cone, g	1760	1760	1760	1760	1760	1760
9	Wt. of sand to fill hole, g	4660	4930	4720	4090	3660	3210
10	Unit weight of sand g/cc	1.360	1.360	1.36	1.360	1.36	1.36
11	Volum of hole	3426.5	3625	3471	30007	2691	2360
12	Wet. Density of material g/cc	2.060	1.880	1.781	1.762	1.852	1.849
13	Moisture Content %age	6.5	5.5	7.5	6.8	5.9	6.9
14	Dry density of material g/cc	1.934	1.782	1.656	1.650	1.650	1.730
15	Maximum dry density (Lab) g/cc	2.050	1.94	1.86	1.81	1.90	1.92
16	Compaction % age	94.35	91.86	89.06	91.15	86.83	90.10

Tested by:- 

Checked by: 



FIELD DENSITY TEST (Sand Cone Method)

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:- Zeal Con Engineering

Sr. No.	Description	Test Trial Nos.					
		1	2				
1	Location of Test Pit	TP-7	TP-8	TP-9	TP-10	TP-11	
2	Layyer No. Base/S-Base	0.50	0.50	0.50	0.50	0.50	
3	Date of Testing	24/03/2016.	24/03/2016.	24/03/2016.	24/03/2016.	24/03/2016.	
4	Wt. of Material from hole, g	9500	6750	7600	5860	5480	
5	Wt. of Sand before test, g	11700	11500	11300	11200	10700	
6	Wt. of sand After test, g	4220	6750	4680	4920	5110	
7	Wt. of sand to fill cone & Pit, g	7480	4750	6620	6280	5590	
8	Wt. of sand to fill cone, g	1.76	1760	1760	1760	1760	
9	Wt. of sand to fill hole, g	7478.24	2990	4860	4520	3830	
10	Unit weight of sand g/cc	1.360	1.360	1.36	1.360	1.36	
11	Volum of hole	4205.9	3696	3774	3324	2816	
12	Wet. Density of material g/cc	2.060	1.826	2.010	1.763	1.946	
13	Moisture Content %age	4.2	5.8	4.8	5.2	6.2	
14	Dry density of material g/cc	1.977	1.726	1.918	1.676	1.830	
15	Maximum dry density (Lab) g/cc	2.200	1.96	2.08	1.84	1.95	
16	Compaction % age	89.86	88.07	92.21	91.08	93.85	

Tested by:- Amir

Checked by: [Signature]




FIELD DENSITY TEST (Sand Cone Method)

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:- Zeal Con Engineering

Sr. No.	Description	Test Trial Nos.					
		1	2				
1	Location of Test Pit	TP-1	TP-2	TP-3	TP-4	TP-5	TP-6
2	Layyer No. Base/S-Base	1.0m	1.0m	1.0m	1.0m	1.0m	1.0m
3	Date of Testing	24/03/2016.	24/03/2016.	24/03/2016.	24/03/2016.	24/03/2016.	24/03/2016.
4	Wt. of Material from hole, g	5750	6680	5485	4930	5275	4805
5	Wt. of Sand before test, g	11500	11350	11200	10750	10600	10200
6	Wt. of sand After test, g	5950	4780	5230	5160	4920	4870
7	Wt. of sand to fill cone & Pit, g	5550	6570	5970	5590	5680	5330
8	Wt. of sand to fill cone, g	1760	1760	1760	1760	1760	1760
9	Wt. of sand to fill hole, g	3790	4810	4210	3830	3920	3570
10	Unit weight of sand g/cc	1.360	1.360	1.36	1.360	1.36	1.36
11	Volum of hole	2786.8	3537	3096	2816	2882	2625
12	Wet. Density of material g/cc	2.060	1.889	1.772	1.762	1.830	1.830
13	Moisture Content %age	7.5	6.5	8.3	7.2	6.8	7.5
14	Dry density of material g/cc	1.916	1.773	1.636	1.644	1.713	1.703
15	Maximum dry density (Lab) g/cc	2.050	1.94	1.86	1.81	1.90	1.92
16	Compaction % age	93.48	91.42	87.96	90.81	90.16	88.69

Tested by:- 

Checked by:- 



FIELD DENSITY TEST (Sand Cone Method)

Project:- CONSTRUCTION OF NASHPA GAS LPG PLANT, KOHAT

Client:- Zeal Con Engineering

Sr. No.	Description	Test Trial Nos.					
		1	2				
1	Location of Test Pit	TP-7	TP-8	TP-9	TP-10	TP-11	
2	Layyer No. Base/S-Base	1.0m	1.0m	1.0m	1.0m	1.0m	
3	Date of Testing	25/03/2016.	25/03/2016.	25/03/2016.	25/03/2016.	25/03/2016.	
4	Wt. of Material from hole, g	8210	5790	6400	5310	6100	
5	Wt. of Sand before test, g	11600	113000	11100	10900	10600	
6	Wt. of sand After test, g	4790	5260	5090	5050	4630	
7	Wt. of sand to fill cone & Pit, g	6810	6040	6010	5850	5970	
8	Wt. of sand to fill cone, g	1760	1760	1760	1760	1760	
9	Wt. of sand to fill hole, g	5050	4280	4250	4090	4210	
10	Unit weight of sand g/cc	1.360	1.360	1.36	1.360	1.36	
11	Volum of hole	3713.2	3147	3140	3007	3096	
12	Wet. Density of material g/cc	2.211	1.840	2.030	1.766	1.971	
13	Moisture Content %age	4.8	6.7	5.5	7.1	7.9	
14	Dry density of material g/cc	2.110	1.724	1.924	1.649	1.840	
15	Maximum dry density (Lab) g/cc	2.200	1.96	2.08	1.84	1.95	
16	Compaction % age	95.90	87.98	92.51	89.62	94.36	

Tested by:- Amrood

Checked by: lynat



Project:

Bore Hole No.	SPT/UDS	Depth in (m)	Sp.Gravity
BH-4	SPT-1	1.0-1.45	2.695
BH-5	SPT-2	2.0-2.45	2.730
BH-10	SPT-1	1.0-1.45	2.750
BH-13	UDS-1	2.0-2.45	2.710
BH-15	UDS-1	2.0-2.20	2.700
BH-16	UDS-1	2.0-2.20	2.710
BH-21	SPT-2	2.0-2.45	2.725
BH-23	UDS-1	3.0-3.20	2.730
BH-23	SPT-5	6.0-6.45	2.680
BH-25	SPT-3	4.0-4.45	2.720
BH-28	SPT-3	3.0-3.45	2.630
BH-30	SPT-4	4.0-4.45	2.685
BH-32	SPT-1	1.0-1.45	2.685
BH-33	SPT-2	2.0-2.45	2.735
BH-34	SPT-3	3.0-3.45	2.685
BH-35	SPT-1	1.0-1.45	2.725
BH-36	SPT-2	2.0-2.45	2.705
BH-38	UDS-1	2.0-2.20	2.745
BH-39	SPT-1	1.0-1.45	2.715
BH-40	UDS-1	2.0-2.20	2.725
BH-41	SPT-1	1.0-1.45	2.695
BH-43	SPT-1	1.0-1.45	2.735



Prepared By

Checked By



Table C-4: Summary of Field Permeability Tests

Sr. #	Borehole No.	DEPTH (m)	Coefficient of Field Permeability (cm/sec)
1	BH-10	2.5	10^{-6}
2	BH-11	2.0	10^{-1}
3	BH-22	3.0	10^{-7}
4	BH-32	6.0	10^{-3}
5	BH-40	4.0	10^{-1}



APPENDIX-D

BEARING CAPACITY CURVES



Fig. D-1

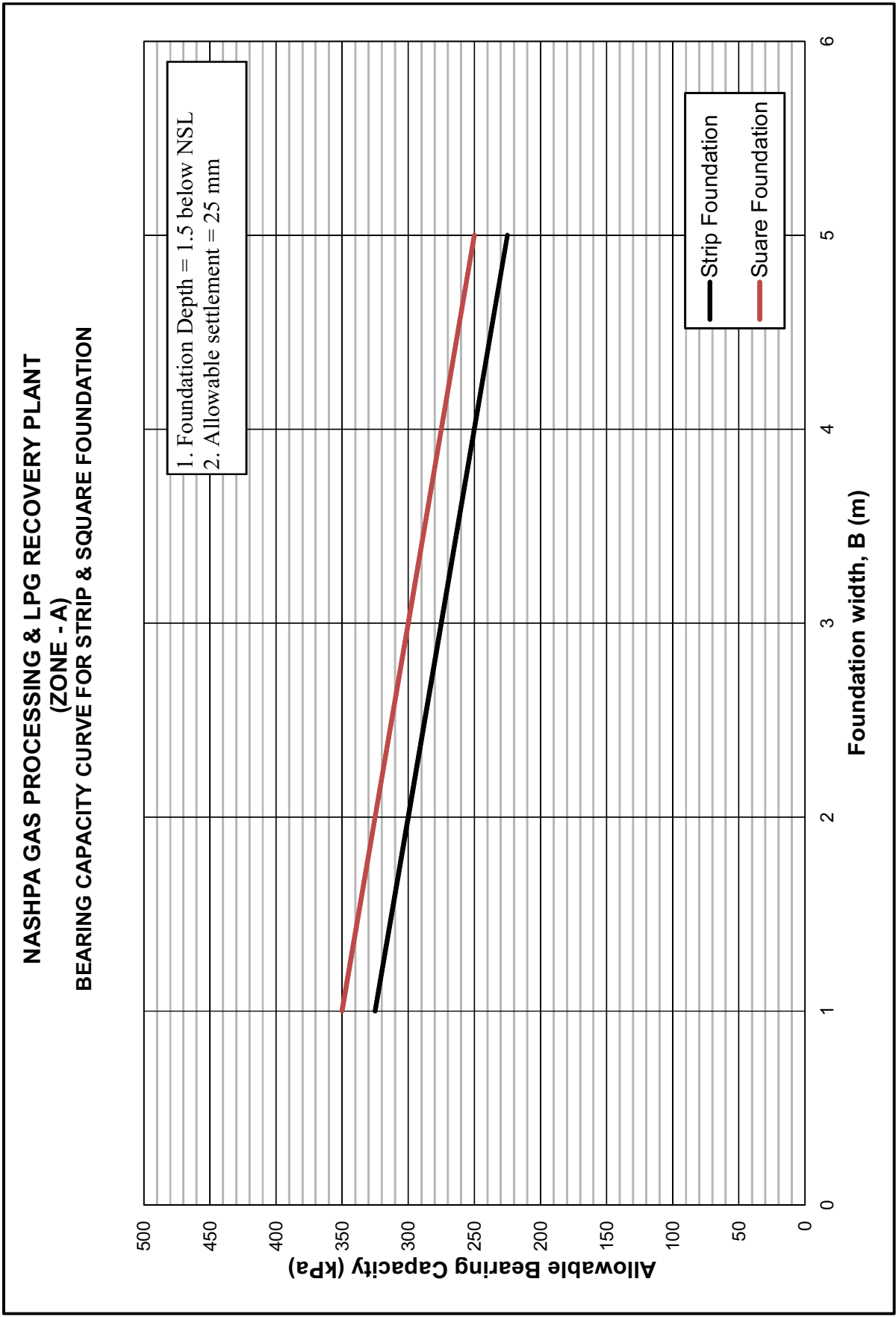


Fig. D-2

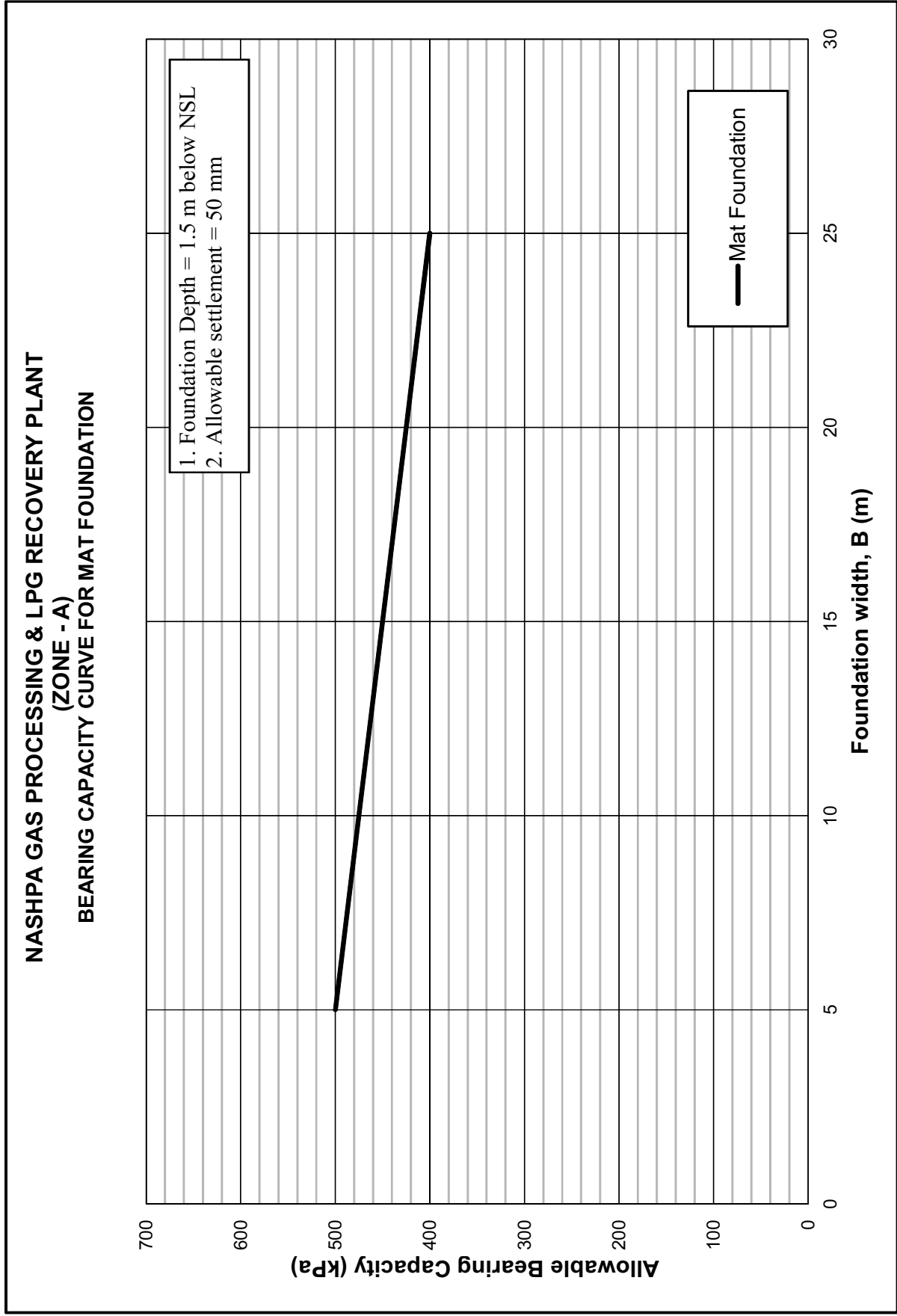


Fig. D-3

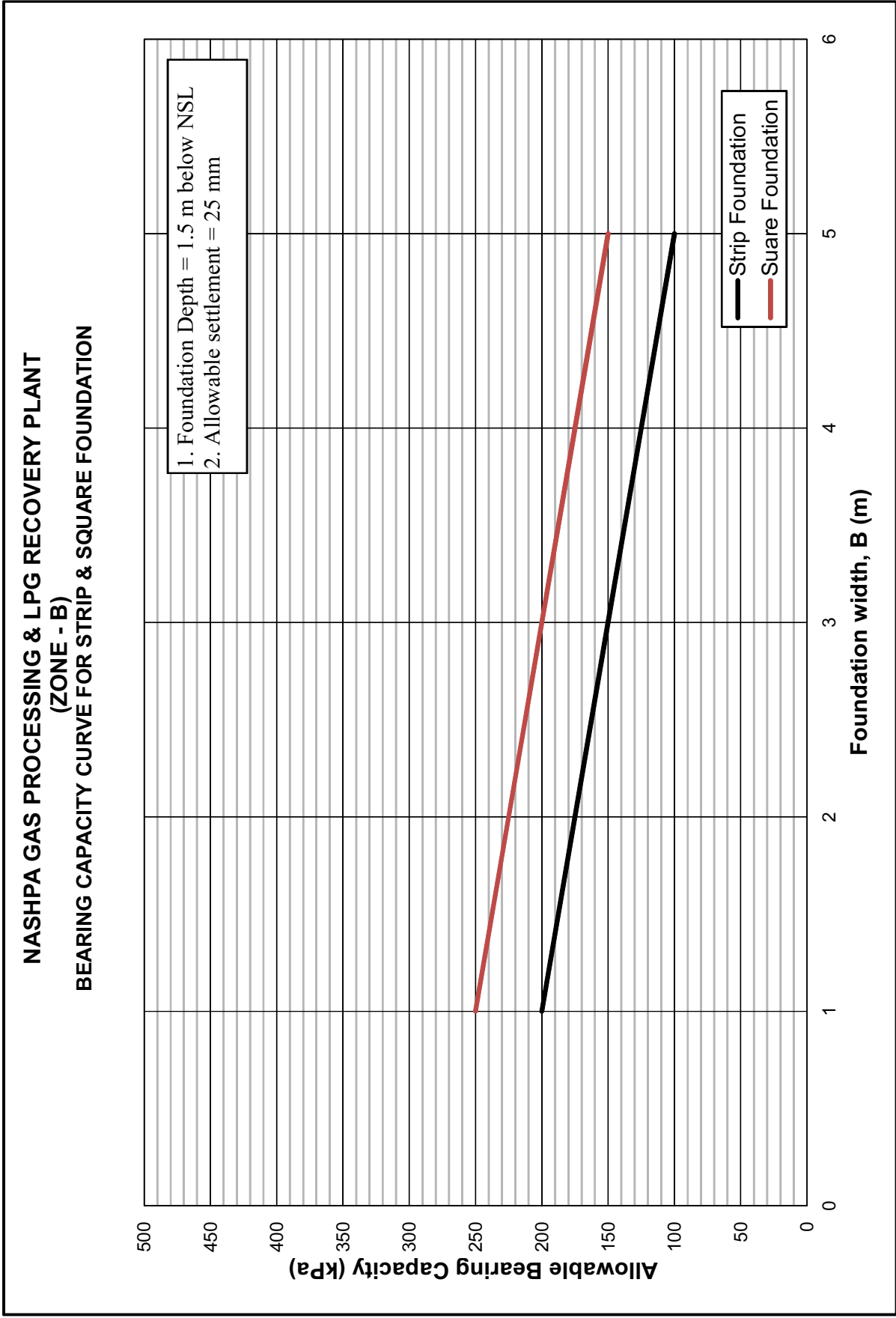


Fig. D-4

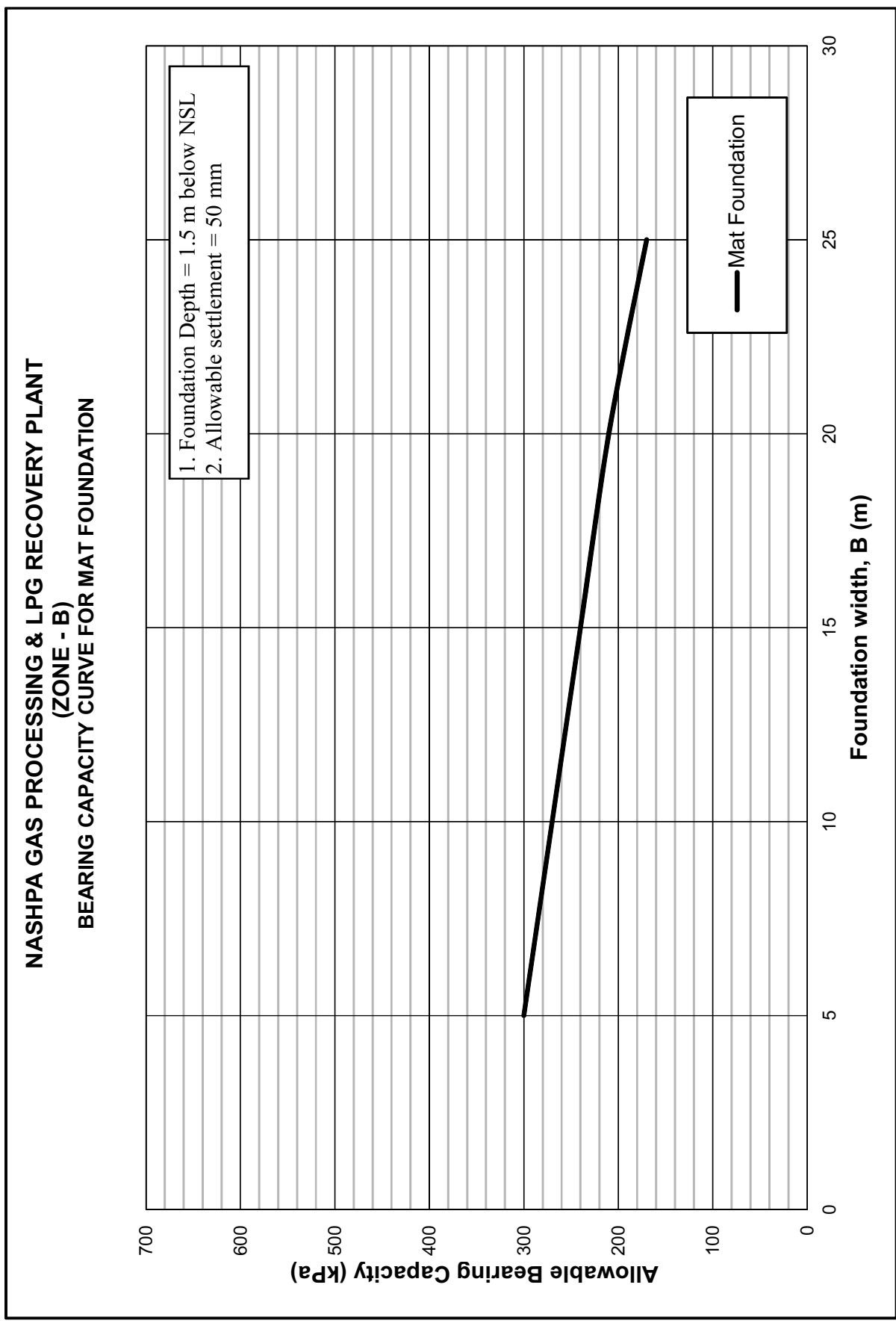


Fig. D-5

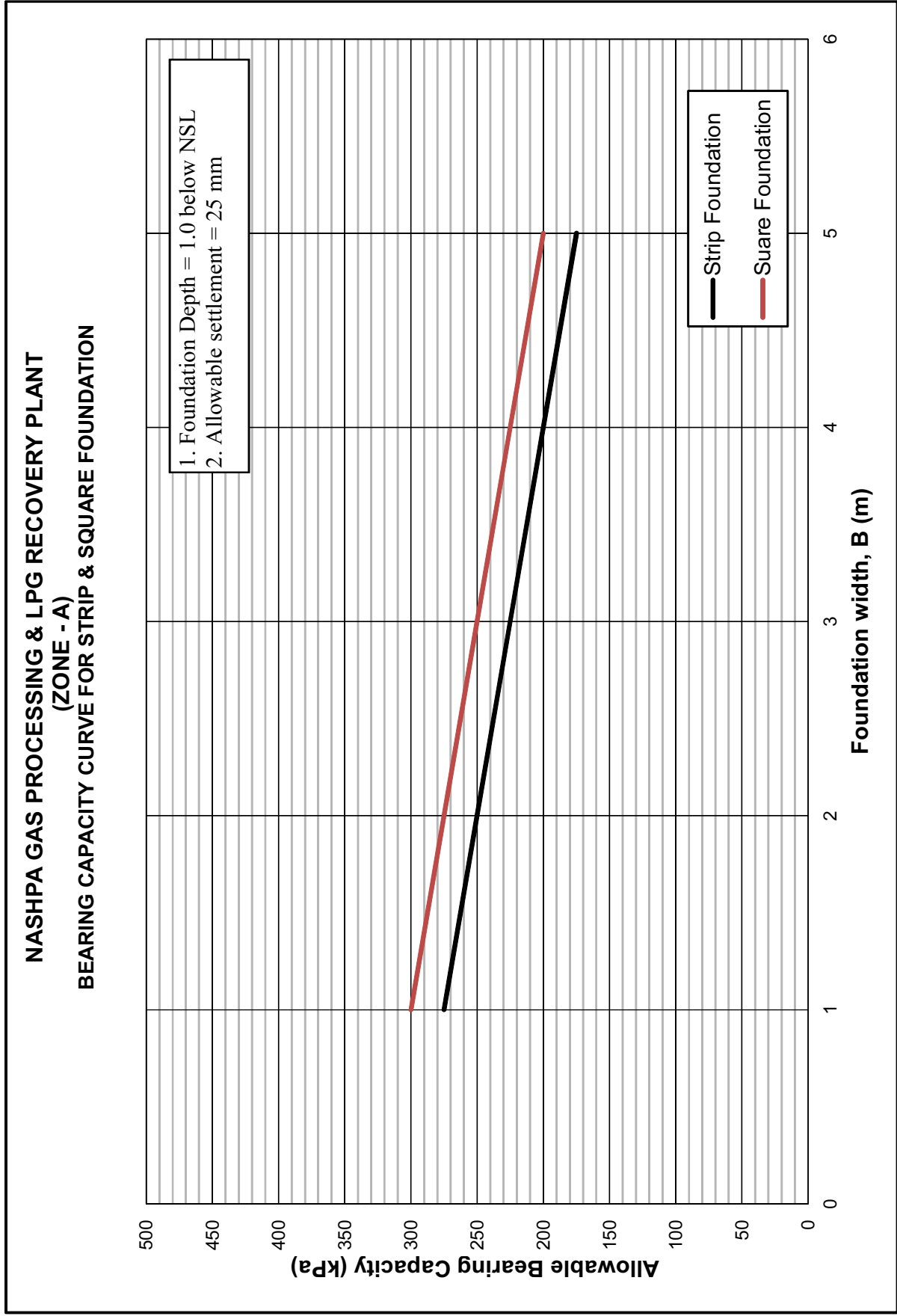


Fig. D-6

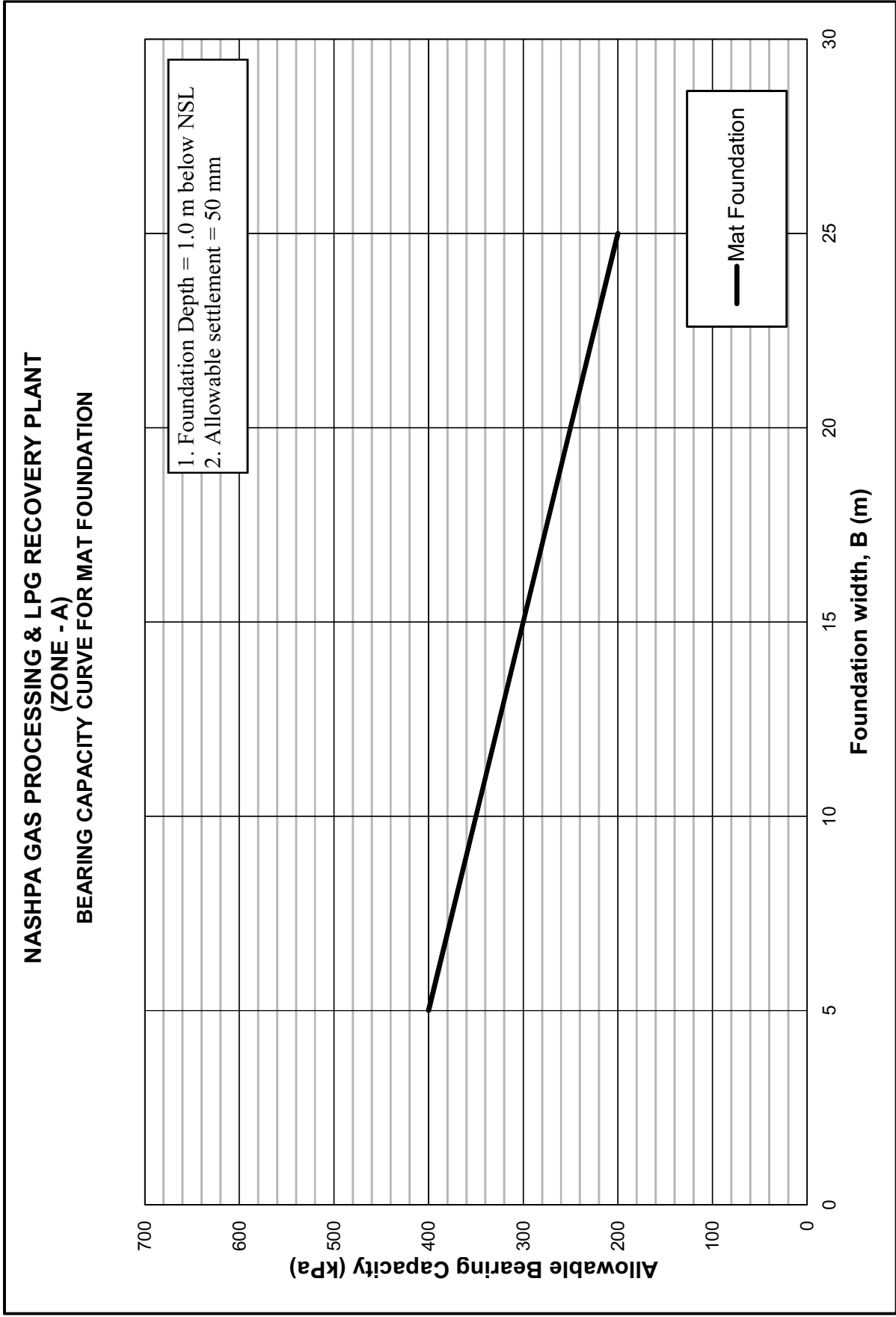


Fig. D-7

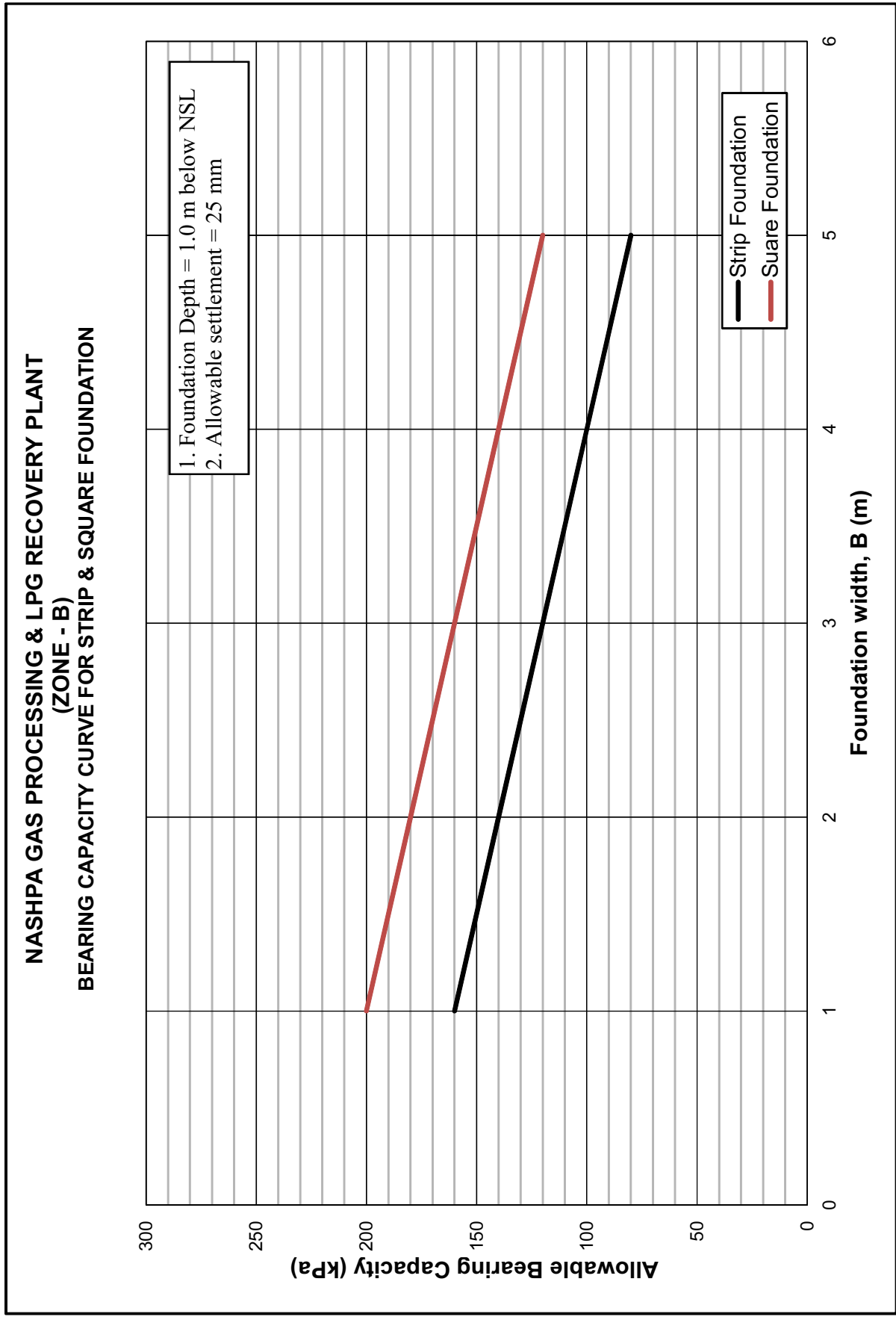


Fig. D-8

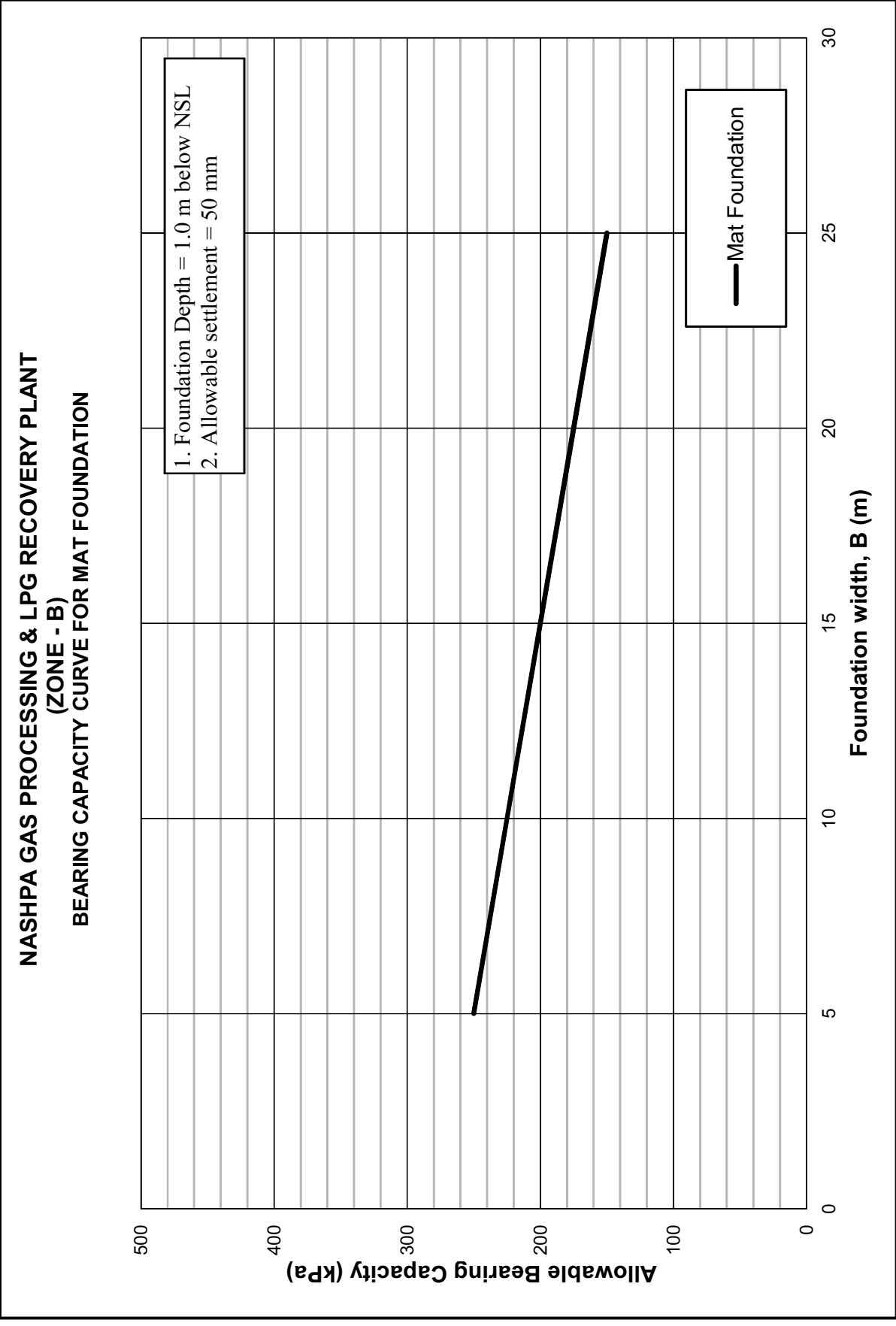


Fig. D-9

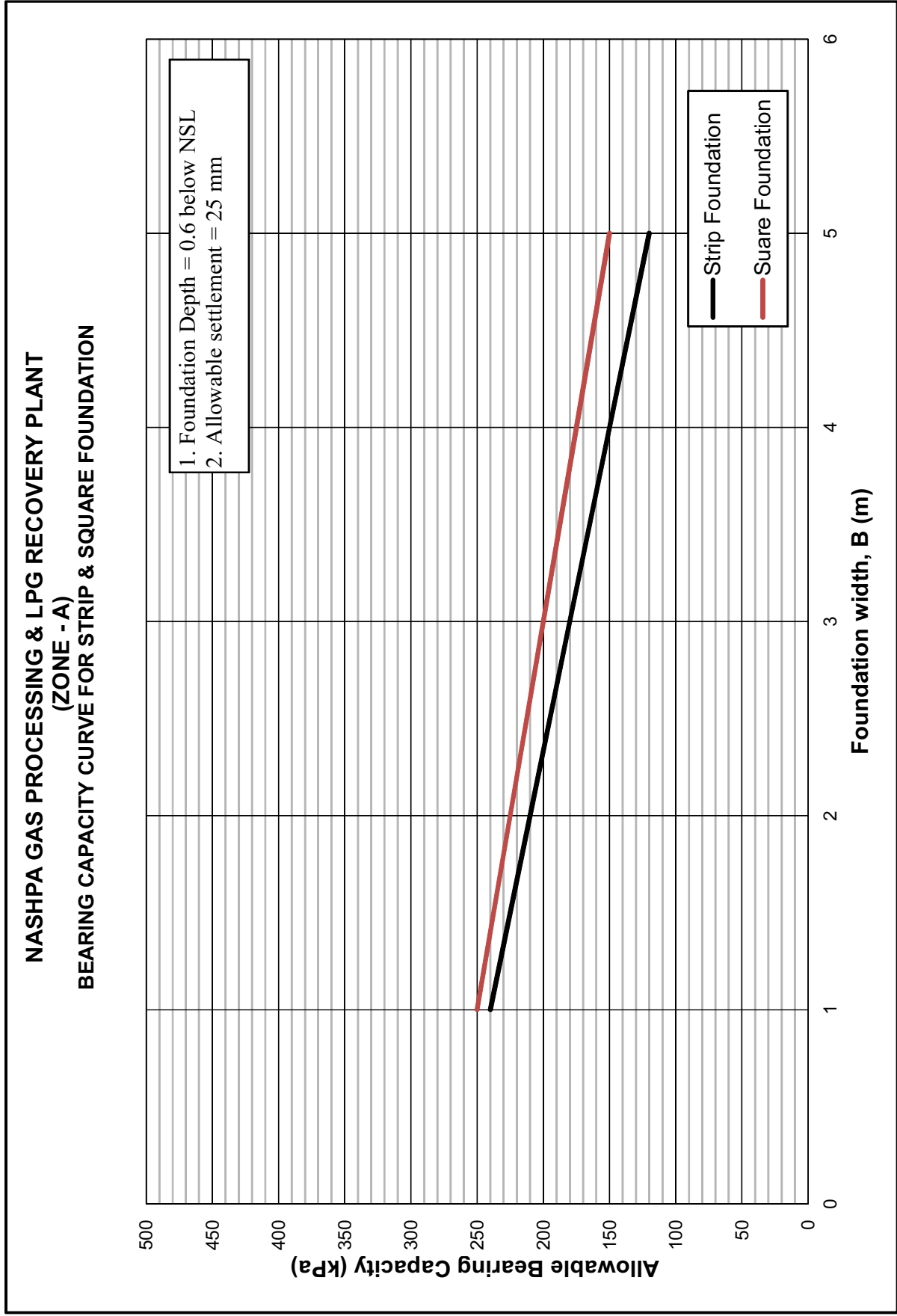


Fig. D-10

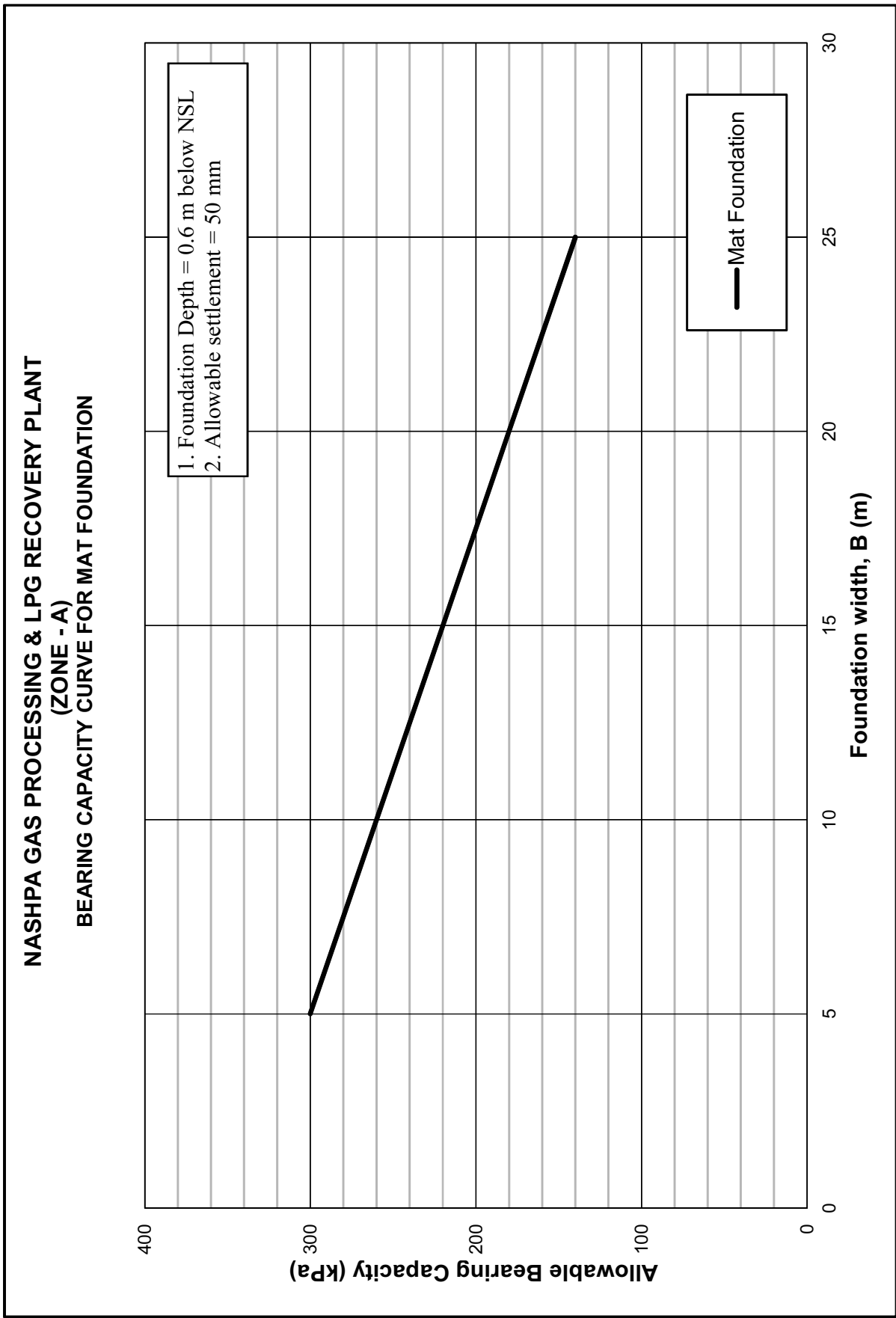


Fig. D-11

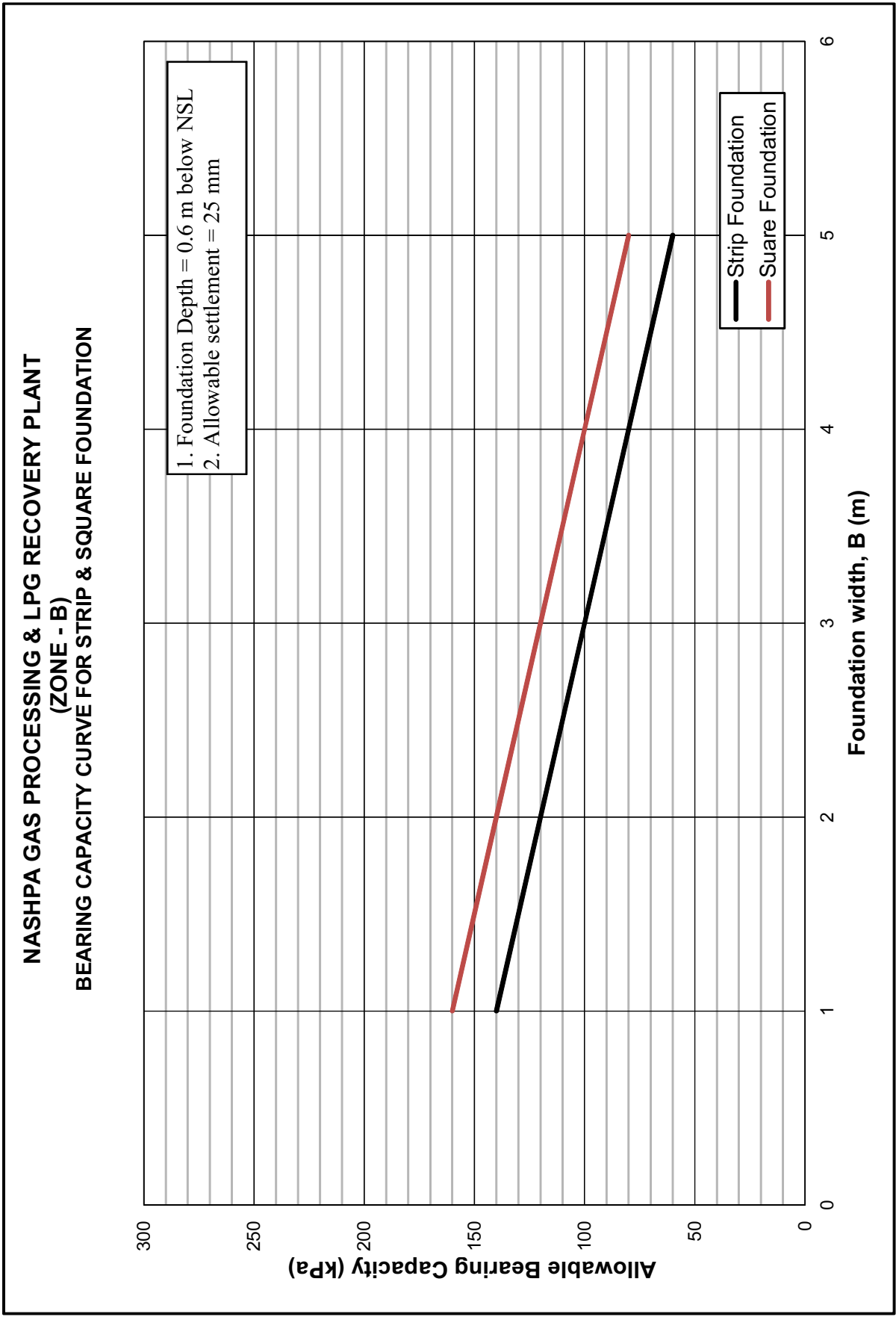


Fig. D-12

