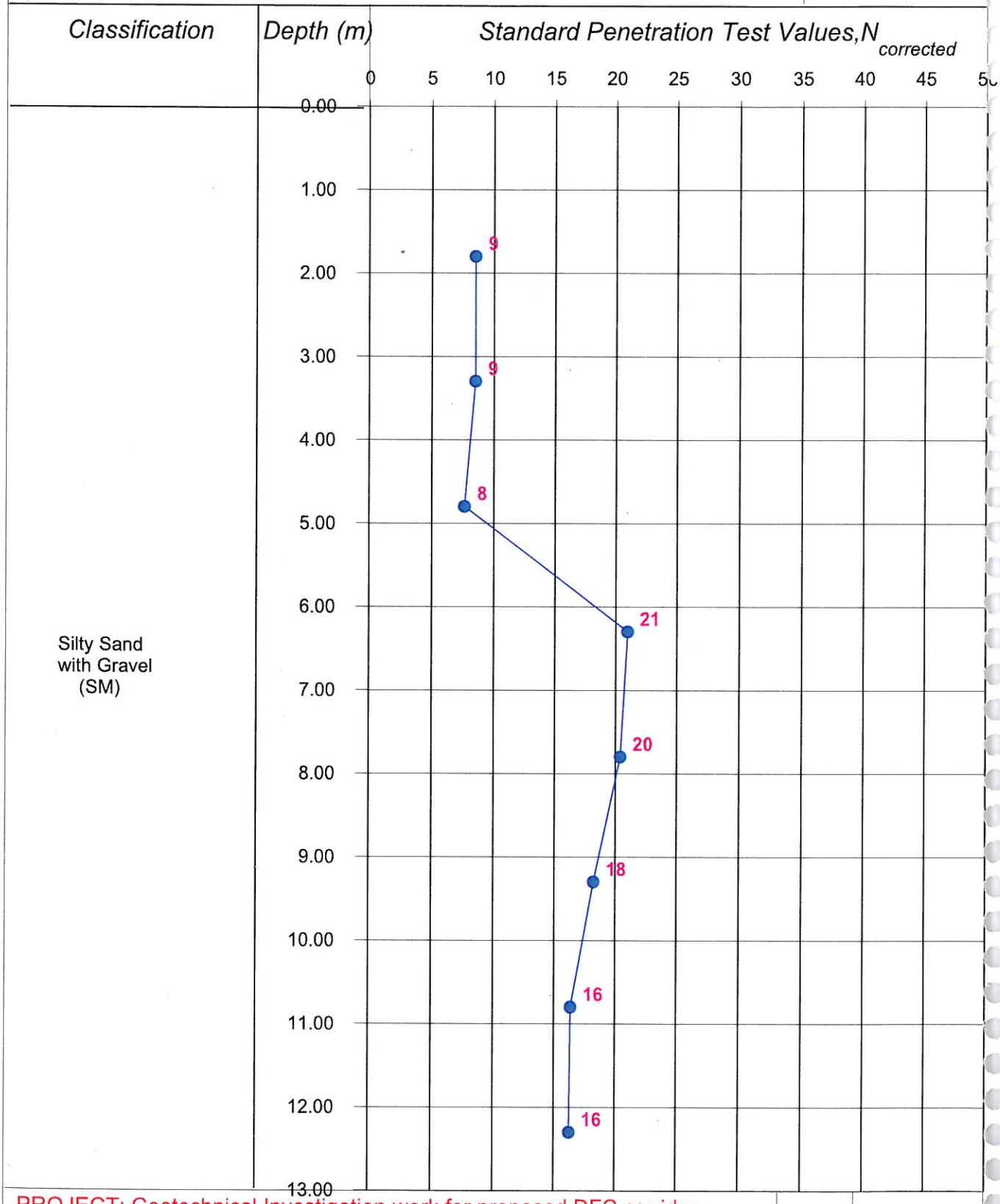
SOIL ENGINEERING CONSULTANTS | Interdistance@ 201/1-3 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP -AD

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 266.443

Location:202/2-3
BH No.: 1
Depth : 12.00
Depth of Water table :4.20 M

Date of start : 23/06/2008
Date of finish : 23/06/2008

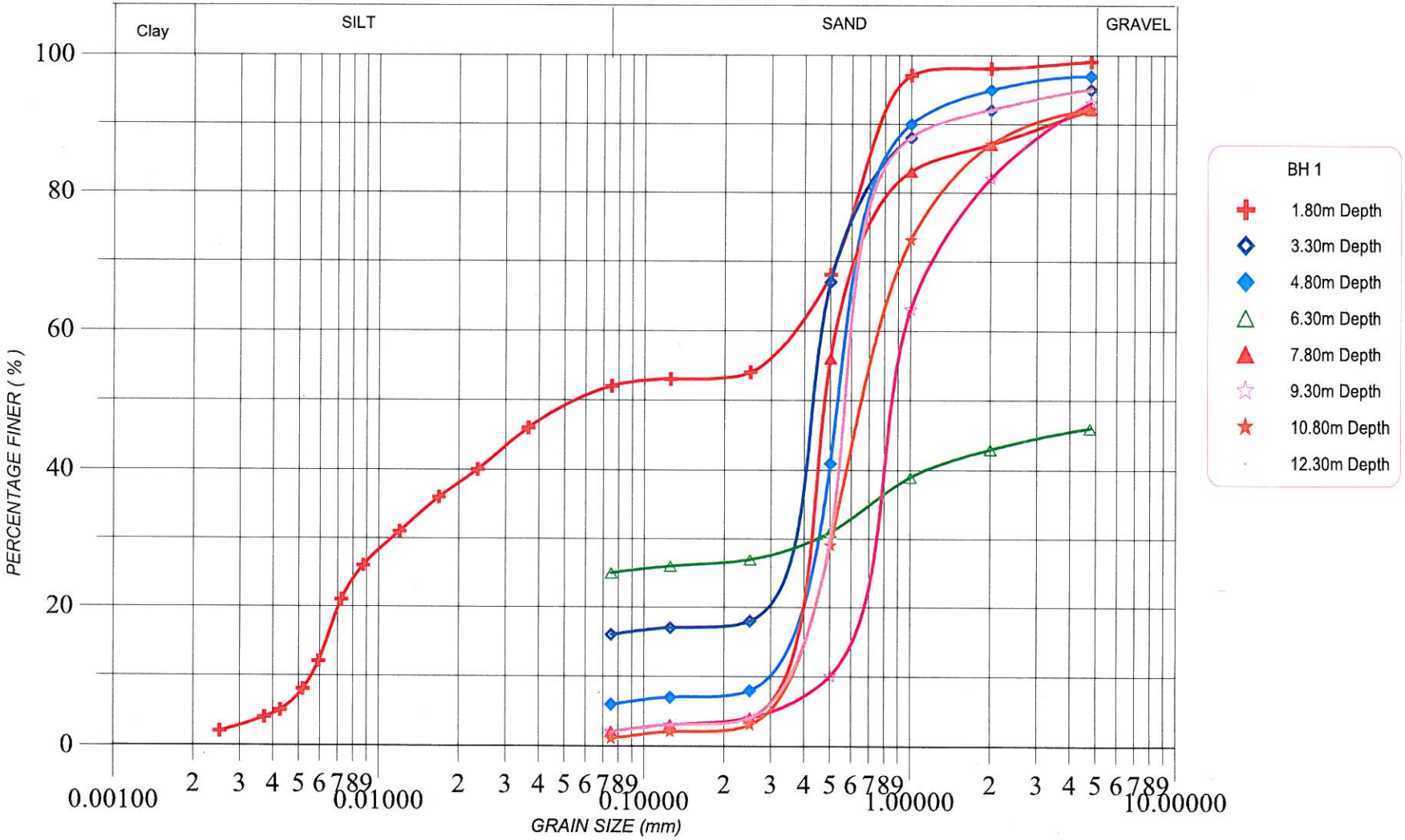
Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%) Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	r(dry)	W/C W(%)	Limits (%) L.L	P . L	Sp.Gr	Shear Parameters Type of test	C(kg/sq.cm)	phi(degrees)	Cc
266.443																	
			Sandy Silt (SM-ML)														
264.643	1.80	SPT		7	1	47	52				Non	Plastic					
263.943	2.50	UDS						1.54	1.42	8.47				DST		31	
263.143	3.30	SPT		7	5	79	16				Non	Plastic					
261.643	4.80	SPT		13	3	91	6				Non	Plastic					
260.143	6.30	SPT		20	54	21	25				Non	Plastic					
258.643	7.80	SPT		18	8	90	2				Non	Plastic					
257.143	9.30	SPT		21	7	90	3				Non	Plastic					
255.643	10.80	SPT	Silty Sand with Gravel (SM)	22	8	91	1				Non	Plastic					
254.143	12.30	SPT		24	5	93	2				Non	Plastic					

Soil Engineering Consultants

Interdistance@ 202/2-3

Job:1813

GRAIN SIZE DRISTRIBUTION CURVE

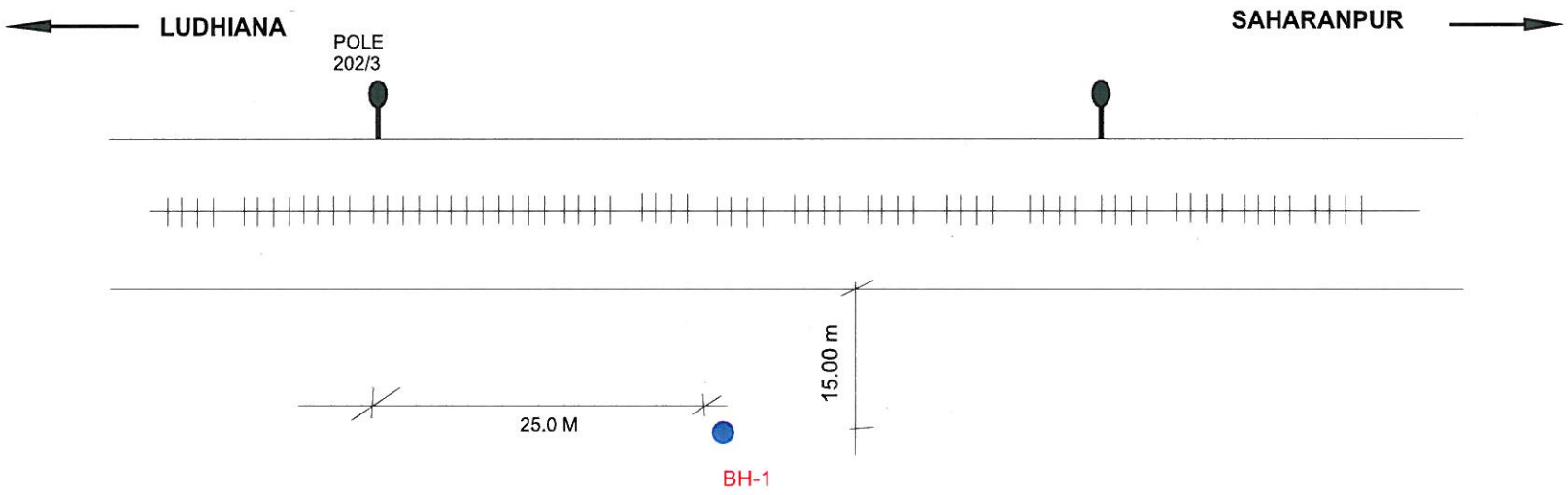


PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD-AE

SOIL ENGINEERING CONSULTANTS

Job No: 1813

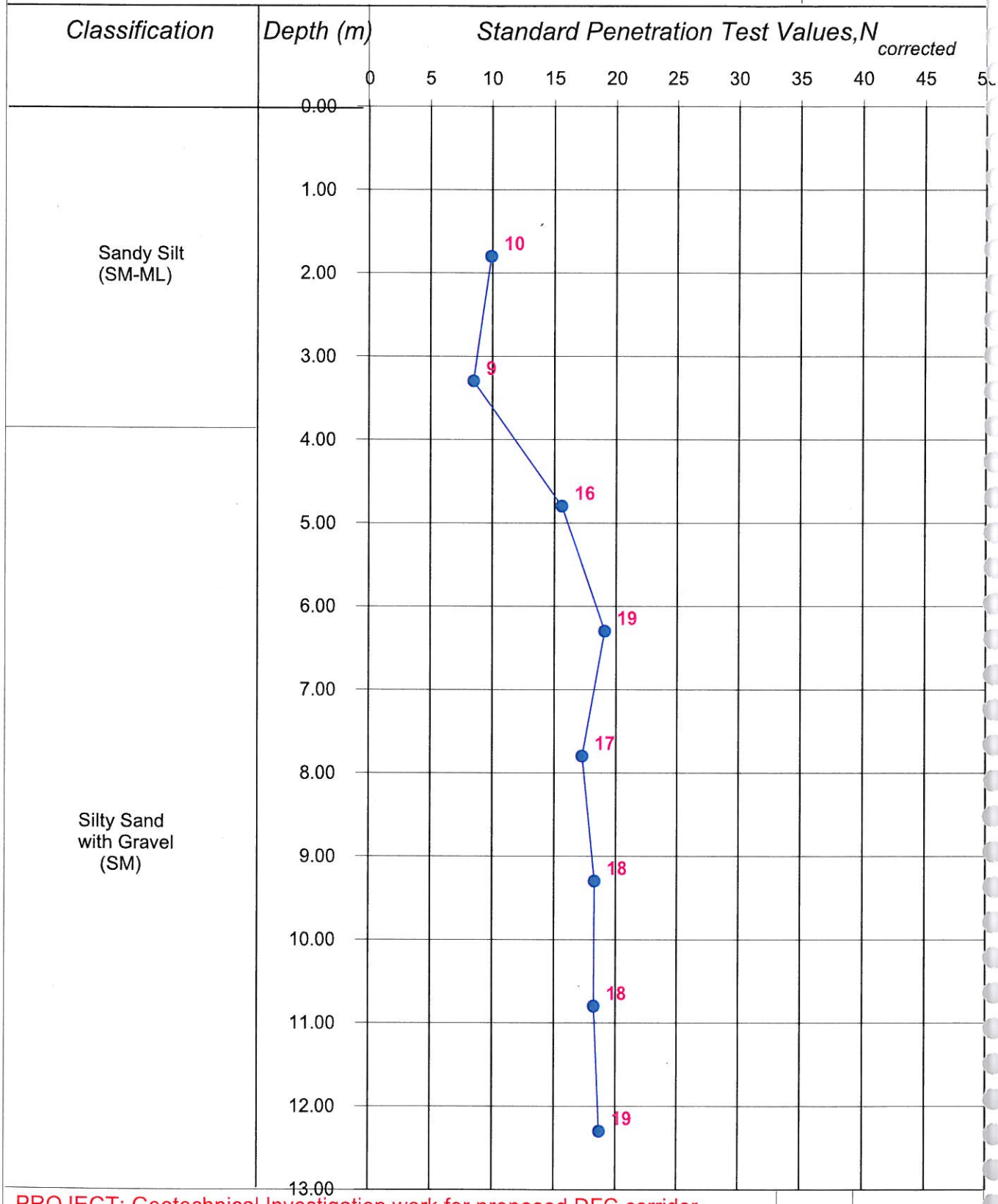


INTERDISTANCE @ 202/2-3

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-AE

SOIL ENGINEERING CONSULTANTS | Interdistance@ 202/2-3 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP - AE

0426

BORE LOG

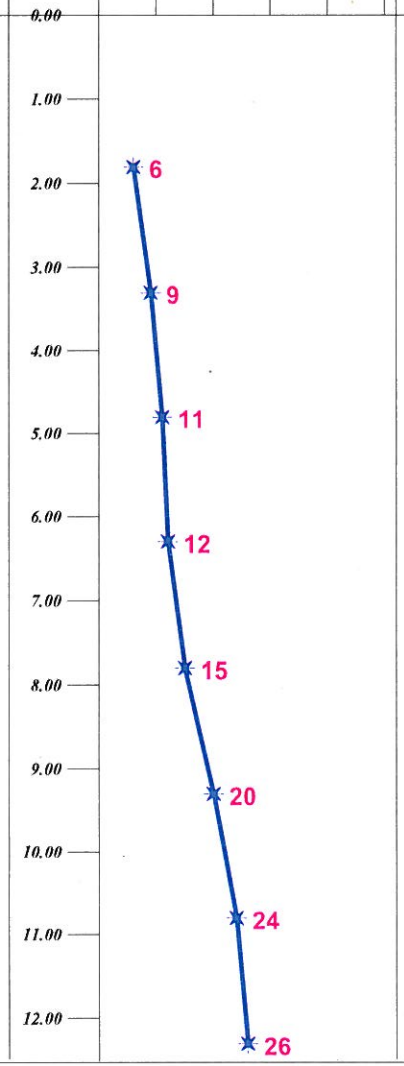
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 260.626

Location; 203/2-3
BH No.: 1
Depth : 12.00
Depth of Water table : 0.0 m

Date of start : 29/06/2008
Date of finish : 30/06/2008

Reduced Level	Depth (m)	Type of sample	Soil Classification	Grain size (%) Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	r(dry)	W/C W(%)	Limits (%) L.L	P . L	Sp.Gr	Shear Parameters Type of test	C(kg/sq.cm)	phi(degrees)	Cc
260.626																
258.826	1.80	SPT		2	89	9				Non	Plastic					
257.326	3.30	SPT		1	87	12				Non	Plastic					
255.826	4.80	SPT		1	82	17				Non	Plastic					
254.326	6.30	SPT	Silty Sand with gravel (SM)	0	83	17				Non	Plastic					
252.826	7.80	SPT		1	76	23				Non	Plastic					
251.326	9.30	SPT		0	87	13				Non	Plastic					
249.826	10.80	SPT		1	83	16				Non	Plastic					
248.326	12.30	SPT		1	80	19				Non	Plastic					



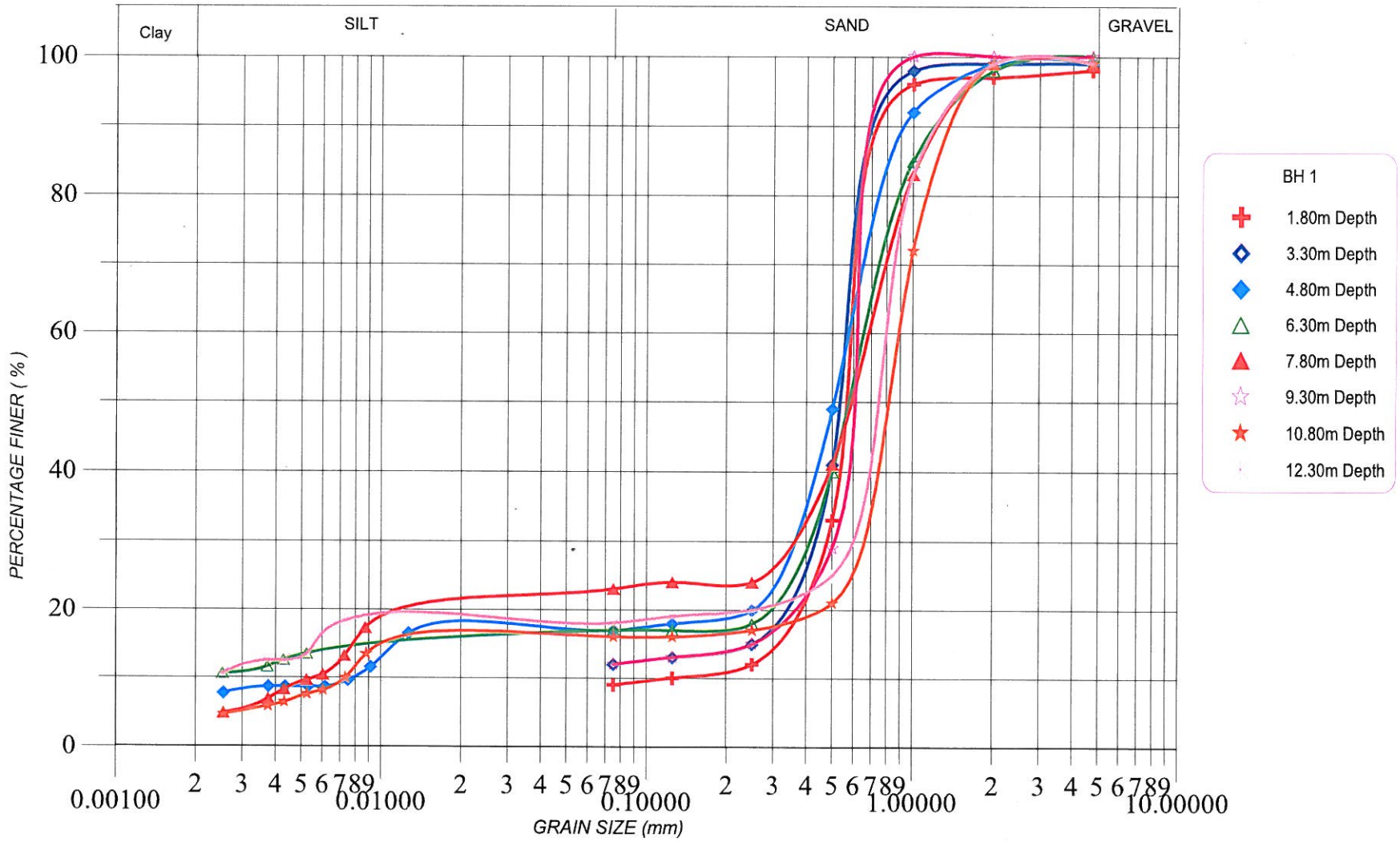
0427

Soil Engineering Consultants

Interdistance 203/2-3

Job:1813

GRAIN SIZE DRISTRIBUTION CURVE

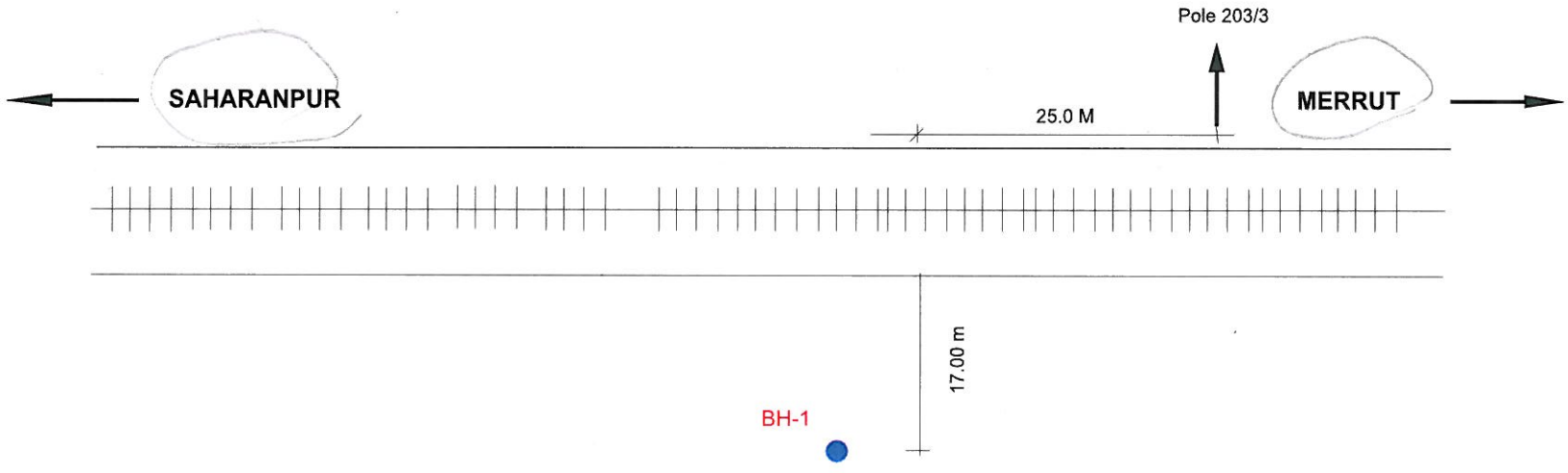


PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD-AF

SOIL ENGINEERING CONSULTANTS

Job No: 1813



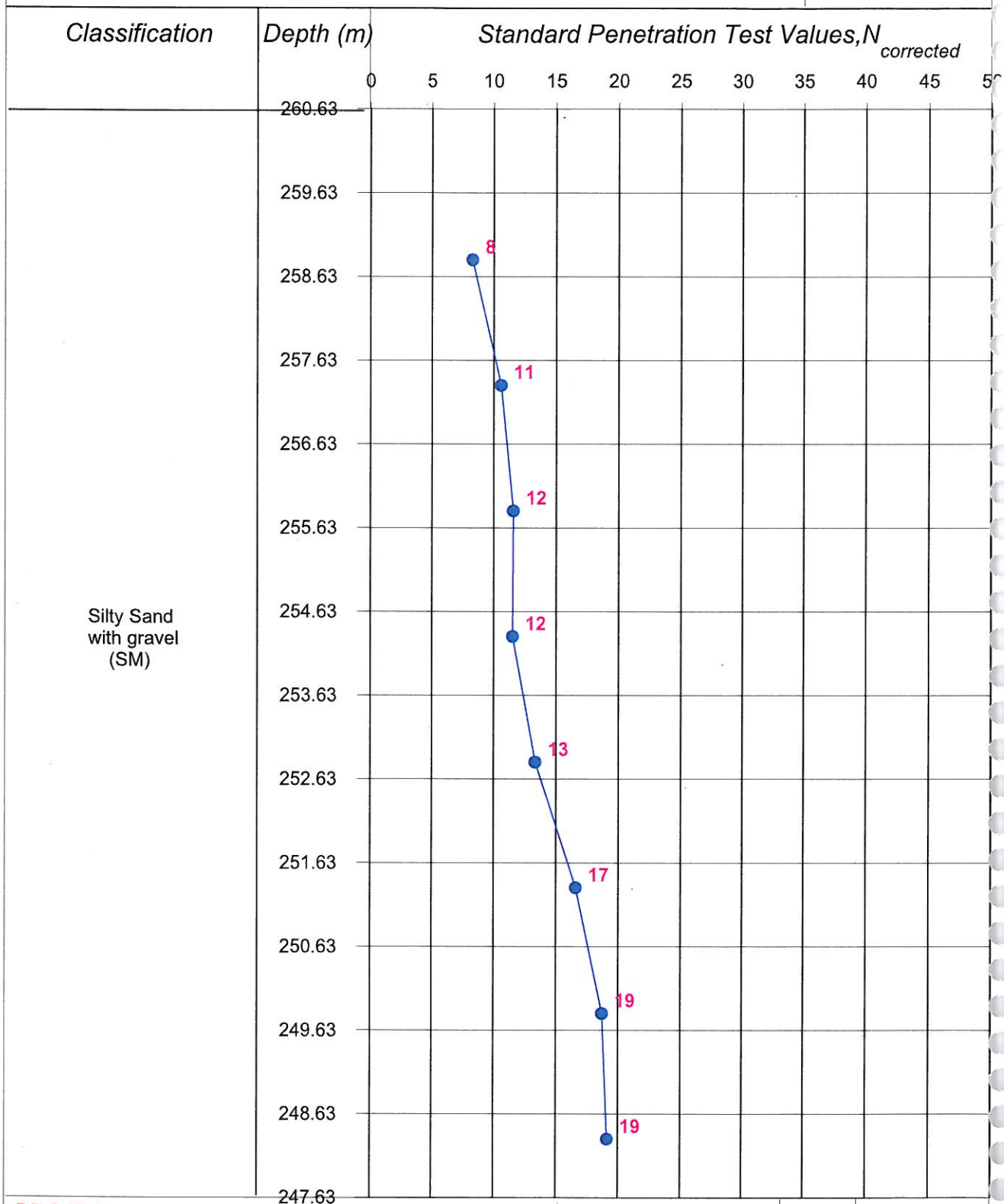
Interdistance @203/2-3

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-AF

0429

SOIL ENGINEERING CONSULTANTS | Interdistance @ 203/2-3 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP-AF

BORE LOG

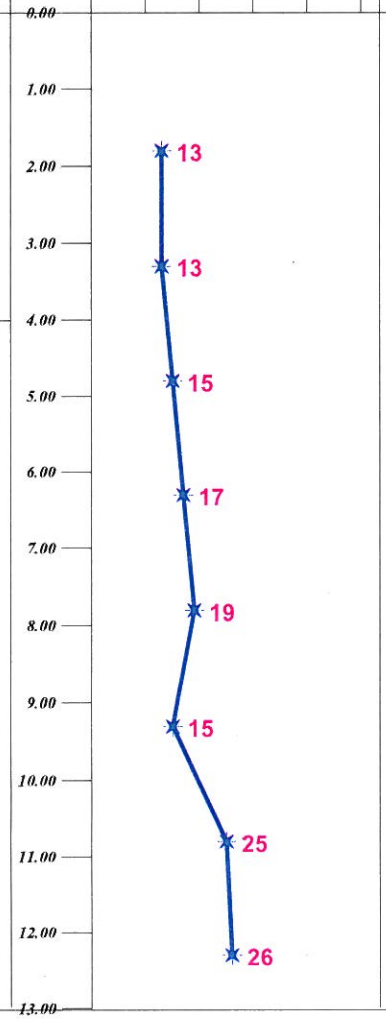
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 267.269

Location:205/29-31
BH No.: 1
Depth : 12.00
Depth of Water table : 4.50 m

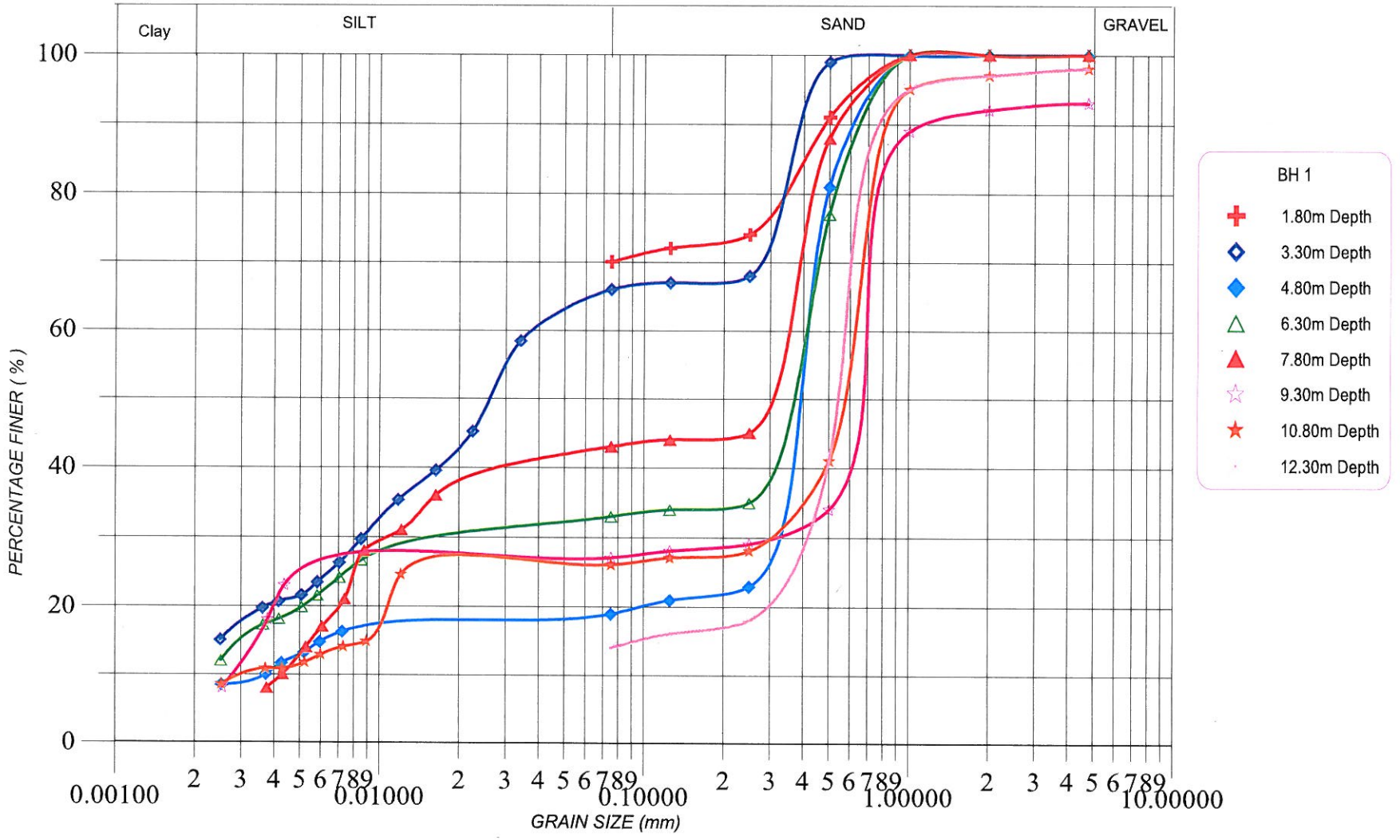
Date of start : 21/06/2008
Date of finish : 21/06/2008

Reduced Level	Depth (m)	Type of sample	Soil Classification	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L		Type of test	C(kg/sq.cm)	phi(degrees)	
267.269																
265.469	1.80	SPT	Sandy Silt (SM-ML)	0	30	70				Non	Plastic					
264.769	2.50	UDS					1.8	1.54	17.23			2.66	DST		31	
263.969	3.30	SPT		0	34	66				Non	Plastic					
262.469	4.80	SPT		0	81	19				Non	Plastic					
260.969	6.30	SPT		0	67	33				Non	Plastic					
259.469	7.80	SPT	Silty Sand with Gravel (SM)	0	57	43				Non	Plastic					
257.969	9.30	SPT		0	81	19				Non	Plastic					
256.469	10.80	SPT		0	67	33				Non	Plastic					
254.969	12.30	SPT		0	57	43				Non	Plastic					



0431

GRAIN SIZE DRISTRIBUTION CURVE



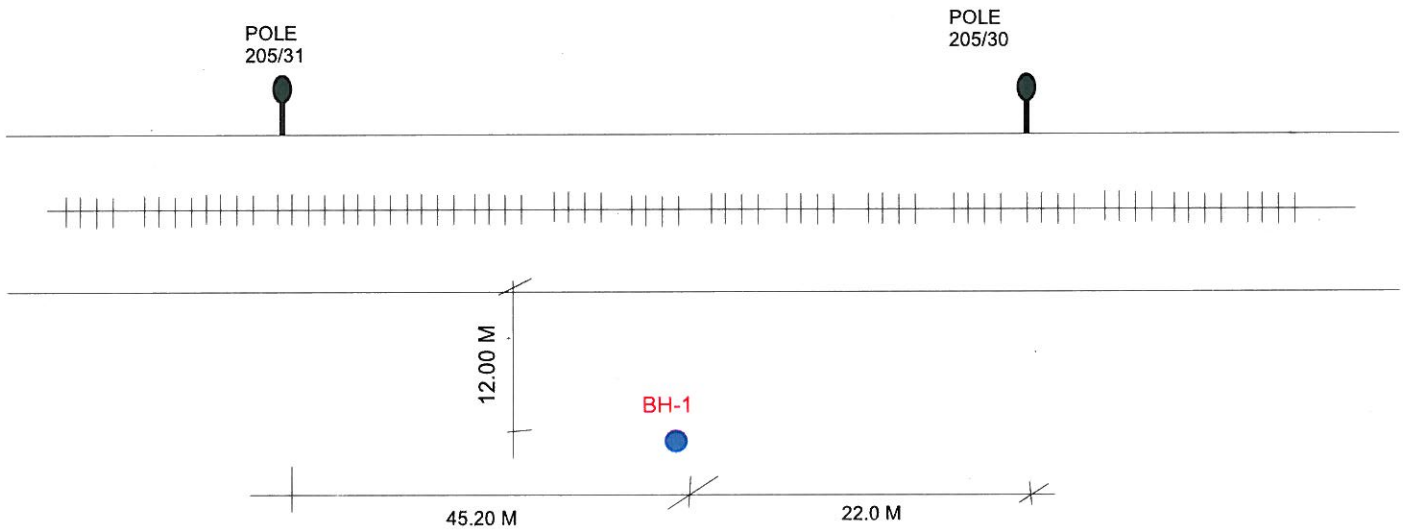
0432

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD--P

SOIL ENGINEERING CONSULTANTS

Job No: 1813

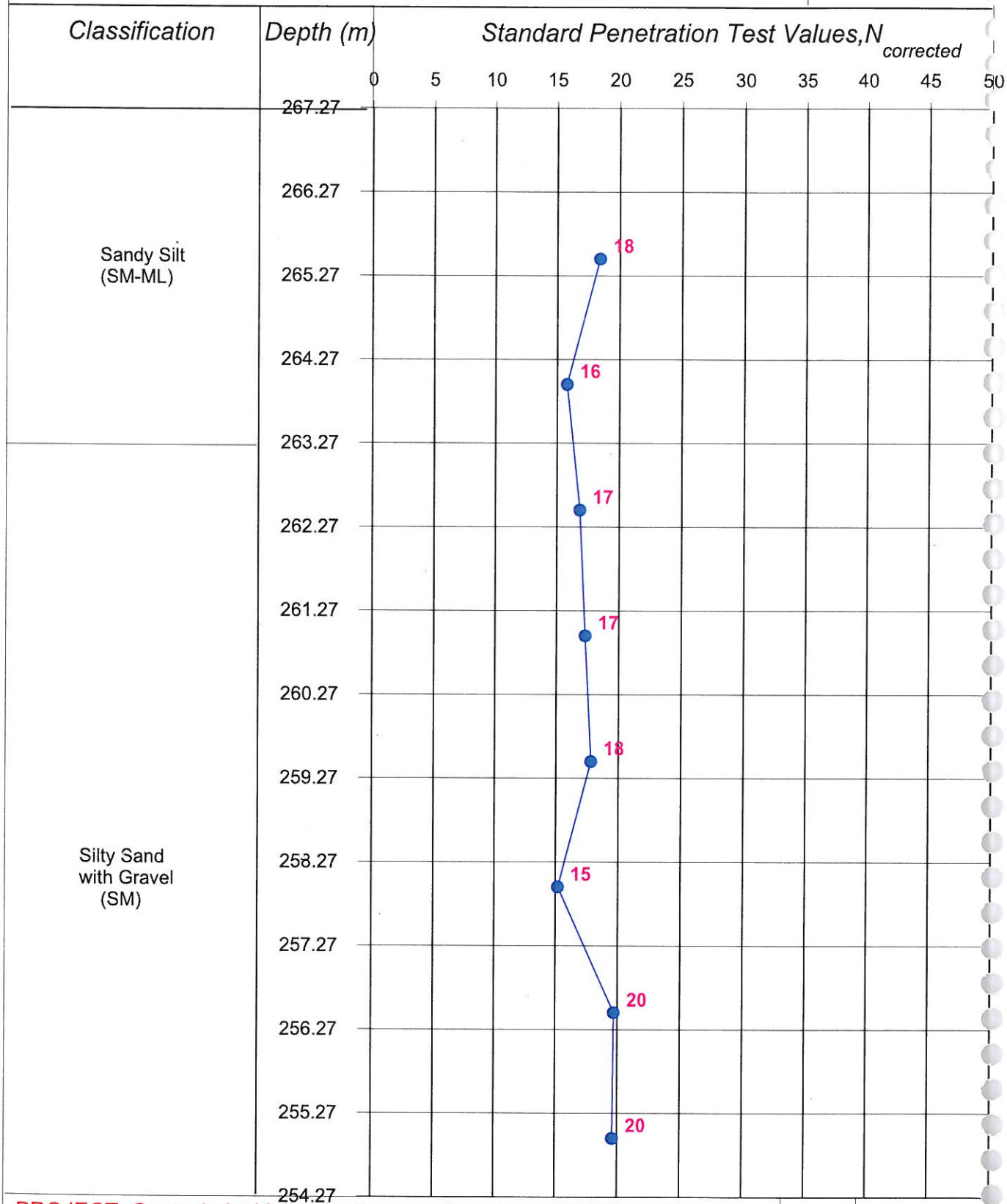


INTERDISTANCE @ 205/29-31

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-AJ

SOIL ENGINEERING CONSULTANTS | Interdistance@ 205/29-31 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP - AH

0434

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 266.774

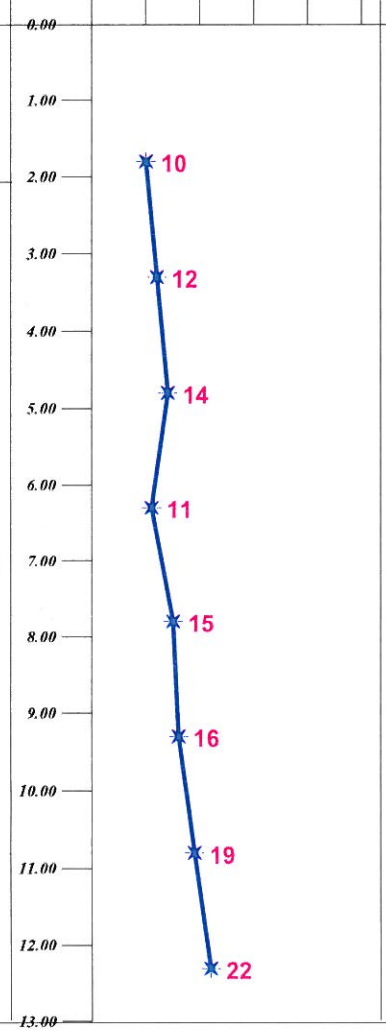
Location:206/29-31
BH No.: 1
Depth : 12.00
Depth of Water table :4.20 M

Date of start : 21/06/2008

Date of finish : 22/06/2008

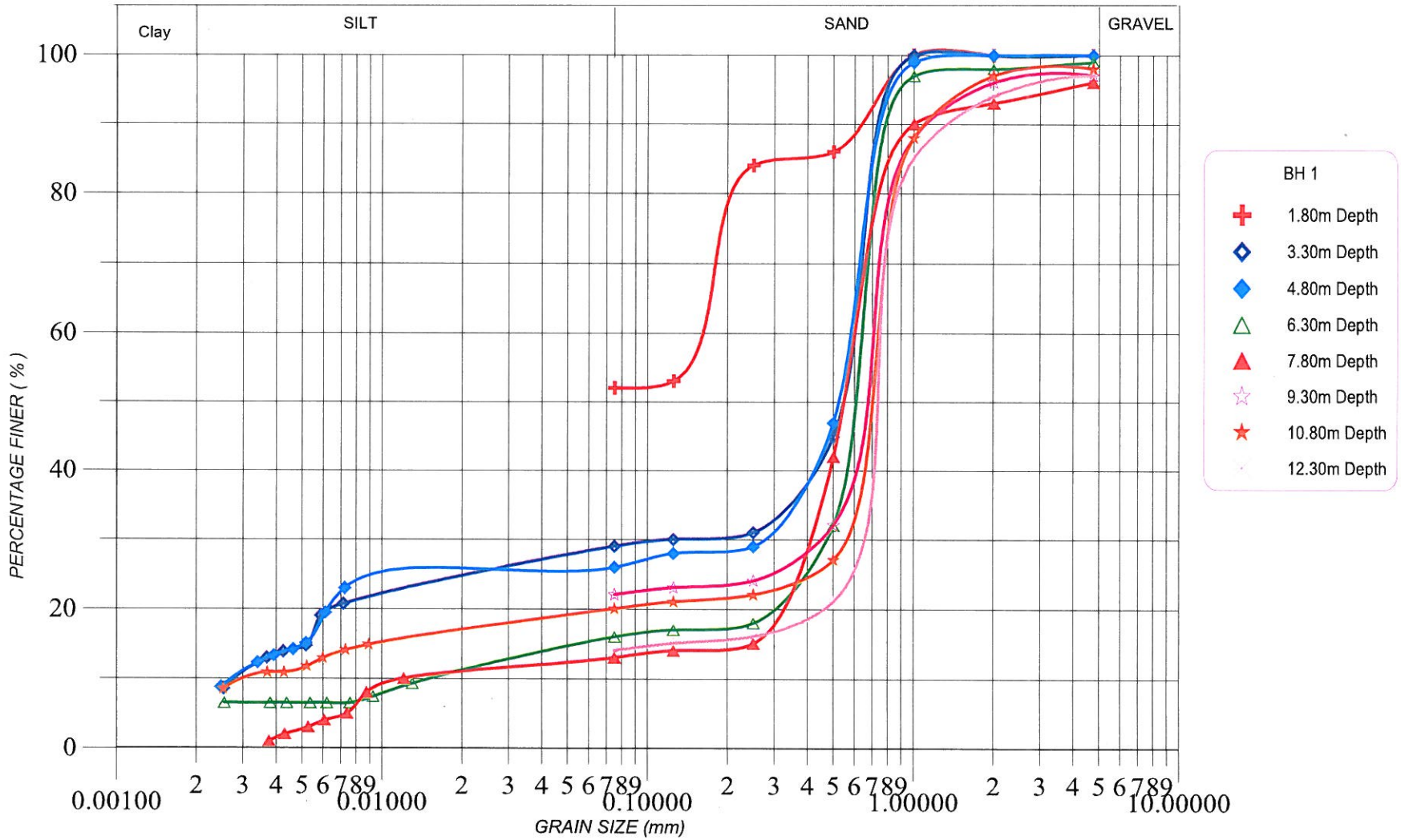
Reduced Level	Depth (m)	Type of sample	Soil Classification	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L	Sp.Gr	Type of test	C(kg/sq.cm)	phi(degrees)	Cc
266.774																
			Sandy Silt (SM-ML)													
264.974	1.80	SPT		0	48	52				Non	Plastic					
264.274	2.50	UDS					1.79	1.52	18.10			2.66	DST		30	
263.474	3.30	SPT		0	71	29				Non	Plastic					
261.974	4.80	SPT		0	74	26				Non	Plastic					
260.474	6.30	SPT		1	83	16				Non	Plastic					
			Silty Sand with Gravel (SM)													
258.974	7.80	SPT		4	83	13				Non	Plastic					
257.474	9.30	SPT		3	75	22				Non	Plastic					
255.974	10.80	SPT		2	78	20				Non	Plastic					
254.474	12.30	SPT		3	83	14				Non	Plastic					

S.P.T Plot — Observed



0435

GRAIN SIZE DRISTRIBUTION CURVE



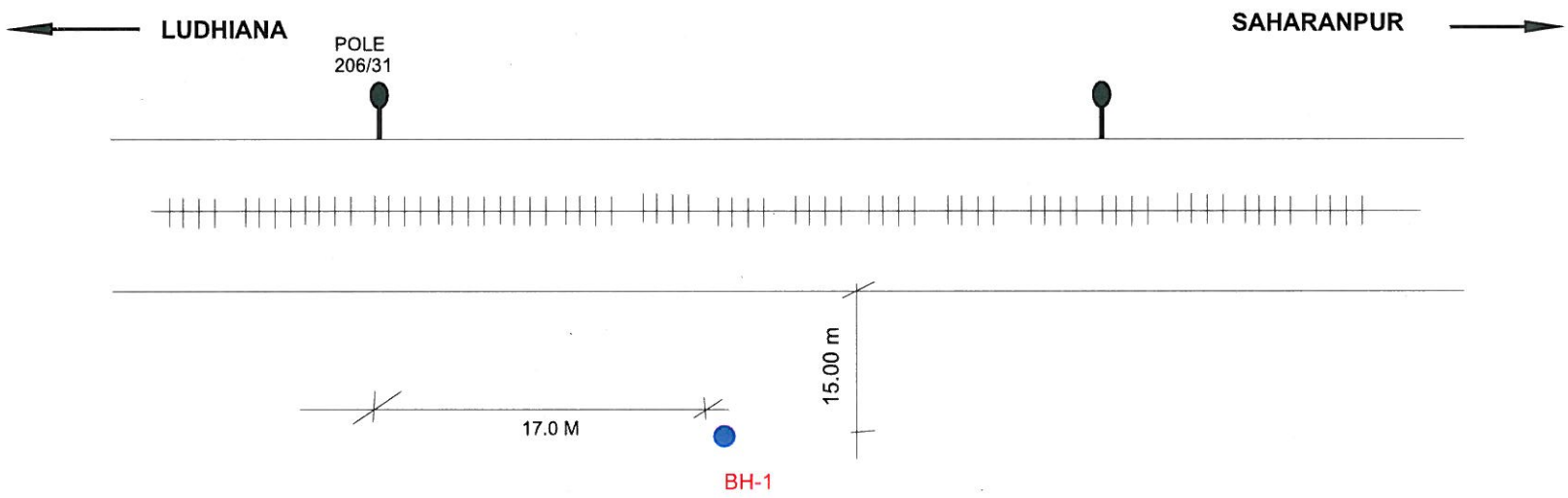
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD-Q

0439

SOIL ENGINEERING CONSULTANTS

Job No: 1813



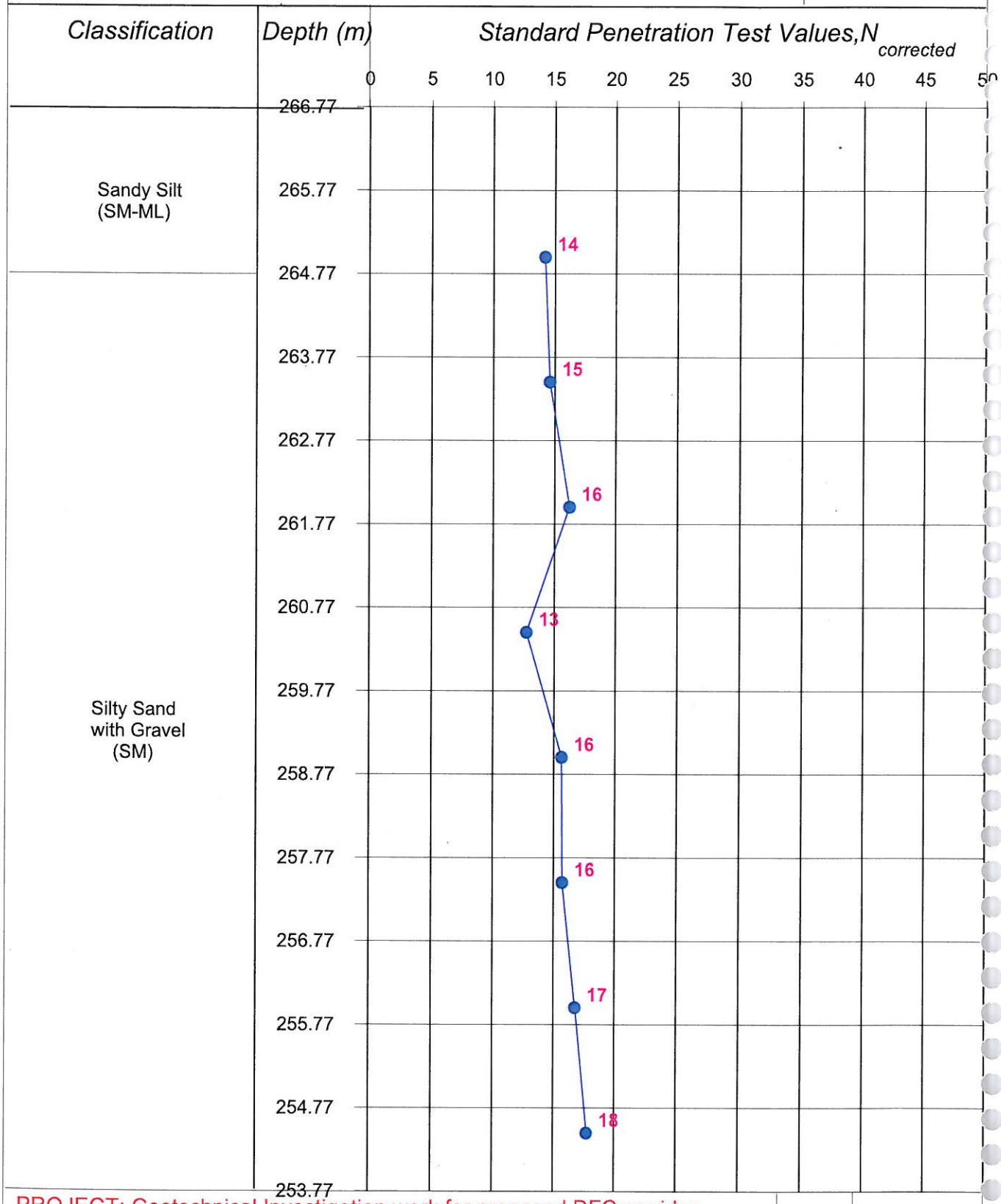
INTERDISTANCE @ 206/29-31

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-AI

0437

SOIL ENGINEERING CONSULTANTS | Interdistance@ 206/29-31 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP -AI

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

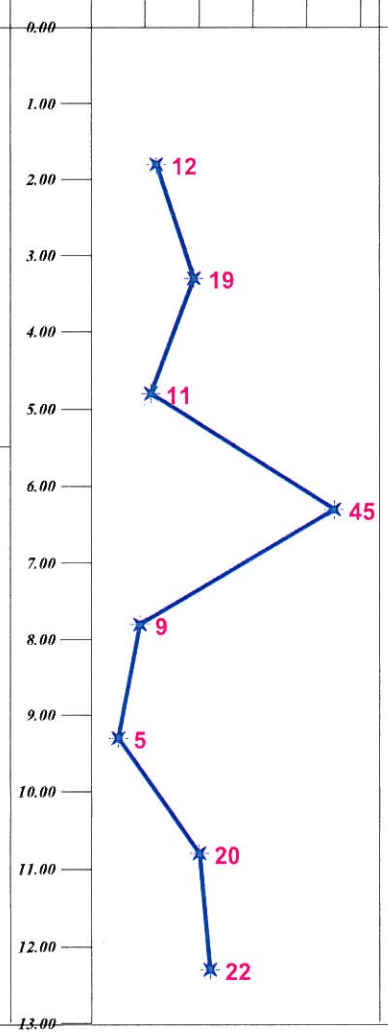
Project No. 1813 Interdistance RL: 268.420

Location:208/3-5
BH No.: 1
Depth : 12.00
Depth of Water table : 4.50 m

Date of start : 17/06/2008
Date of finish : 17/06/2008

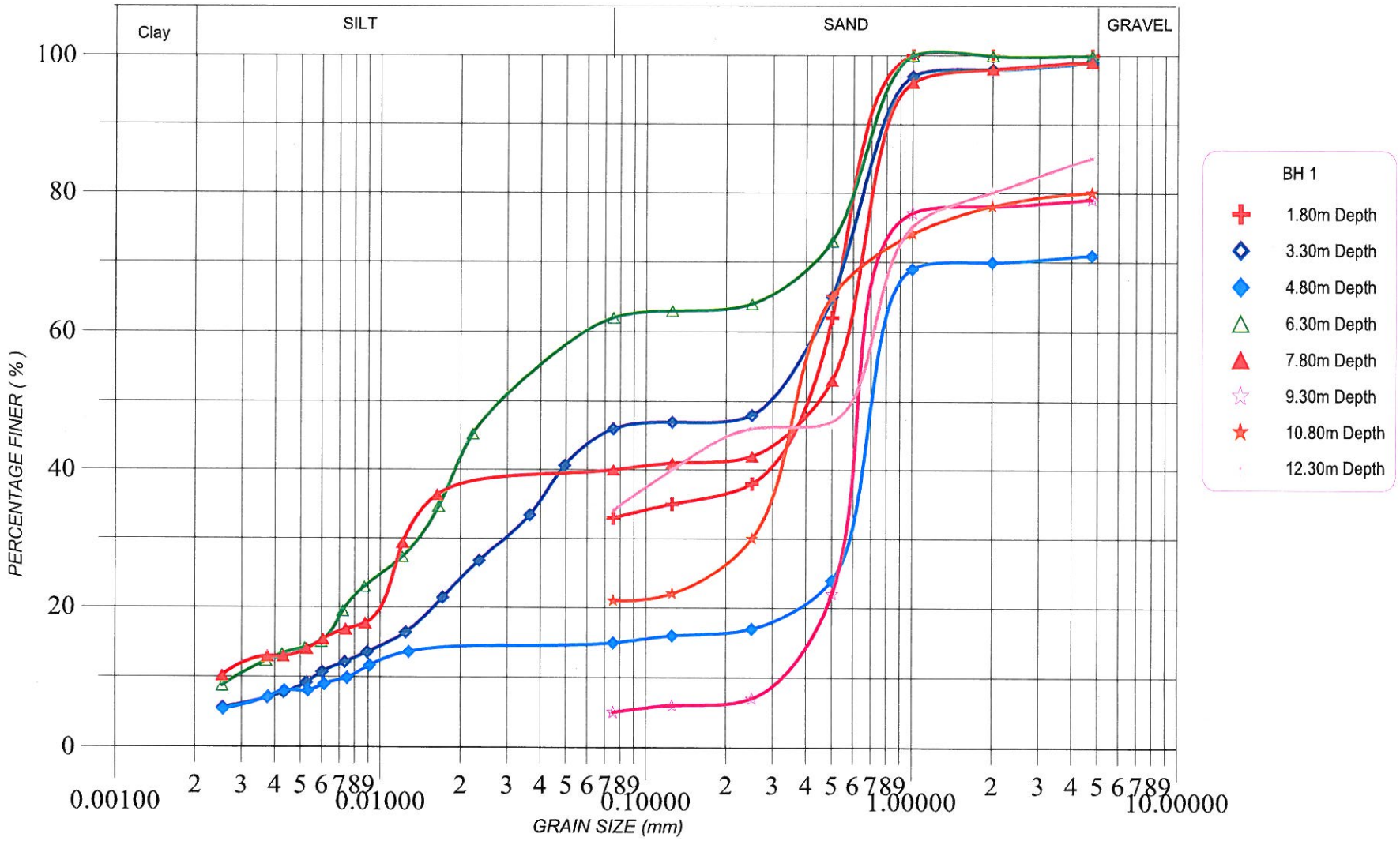
Reduced Level	Depth (m)	Type of sample	Soil Classification	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L		Type of test	C(kg/sq.cm)	phi(degrees)	
268.420																
266.620	1.80	SPT	Sandy Silt with Gravel (SM-ML)	0	67	33				Non	Plastic					
265.920	2.50	UDS					1.8	1.58	14.23			2.66	DST	0.1	30	
265.120	3.30	SPT		1	53	46				Non	Plastic					
263.620	4.80	SPT		29	56	15				Non	Plastic					
262.120	6.30	SPT	Silty Sand with Gravel (SM)	0	38	62				Non	Plastic					
260.620	7.80	SPT		1	59	40				Non	Plastic					
259.120	9.30	SPT		21	74	5				Non	Plastic					
257.620	10.80	SPT		20	59	21				Non	Plastic					
256.120	12.30	SPT		15	51	34				Non	Plastic					

S.P.T Plot — Observed



0433

GRAIN SIZE DRISTRIBUTION CURVE

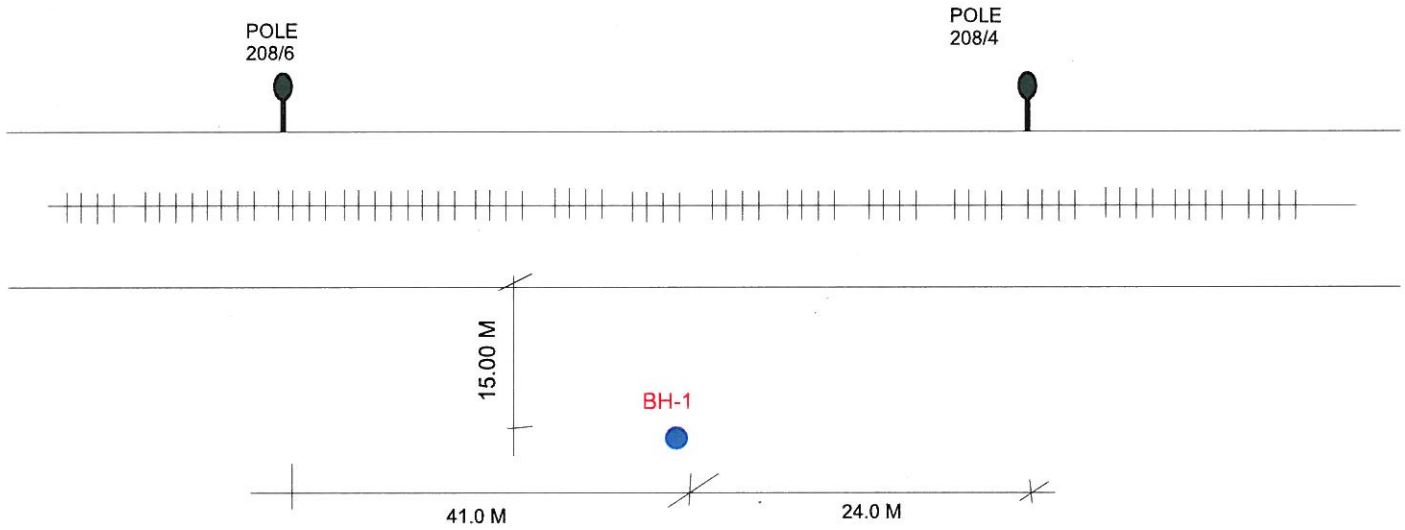


PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD-T

SOIL ENGINEERING CONSULTANTS

Job No: 1813

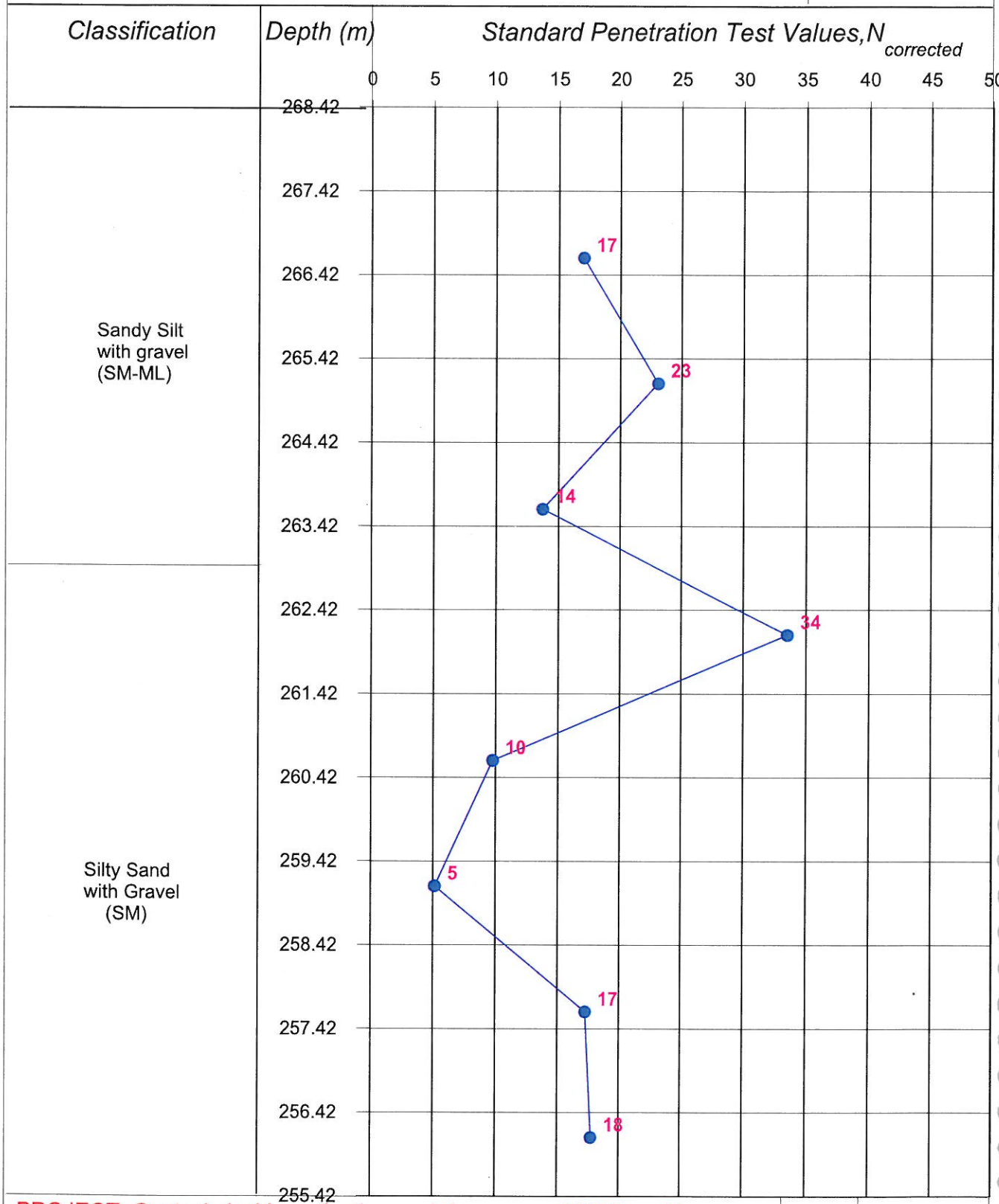


INTERDISTANCE @ 208/3-5

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-AL

SOIL ENGINEERING CONSULTANTS | Interdistance@ 208/3-5 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP -AL

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 267.850

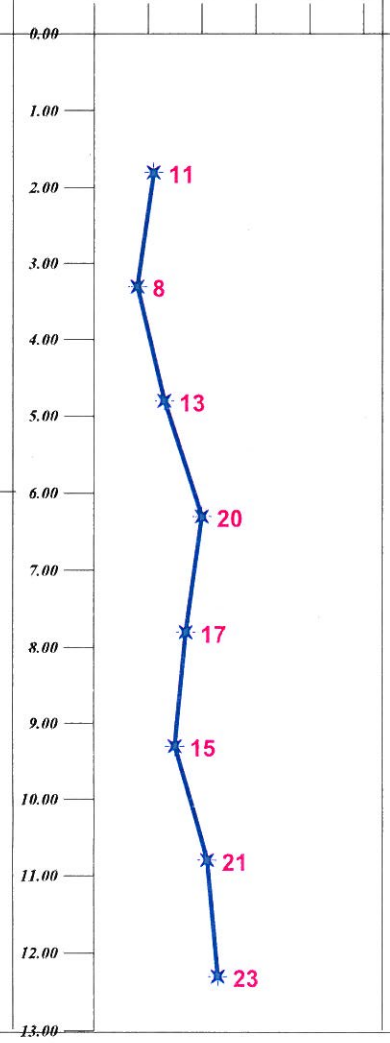
Location:210/5-7
BH No.: 1
Depth : 12.00
Depth of Water table :2.30 M

Date of start : 17/06/2008

Date of finish : 17/06/2008

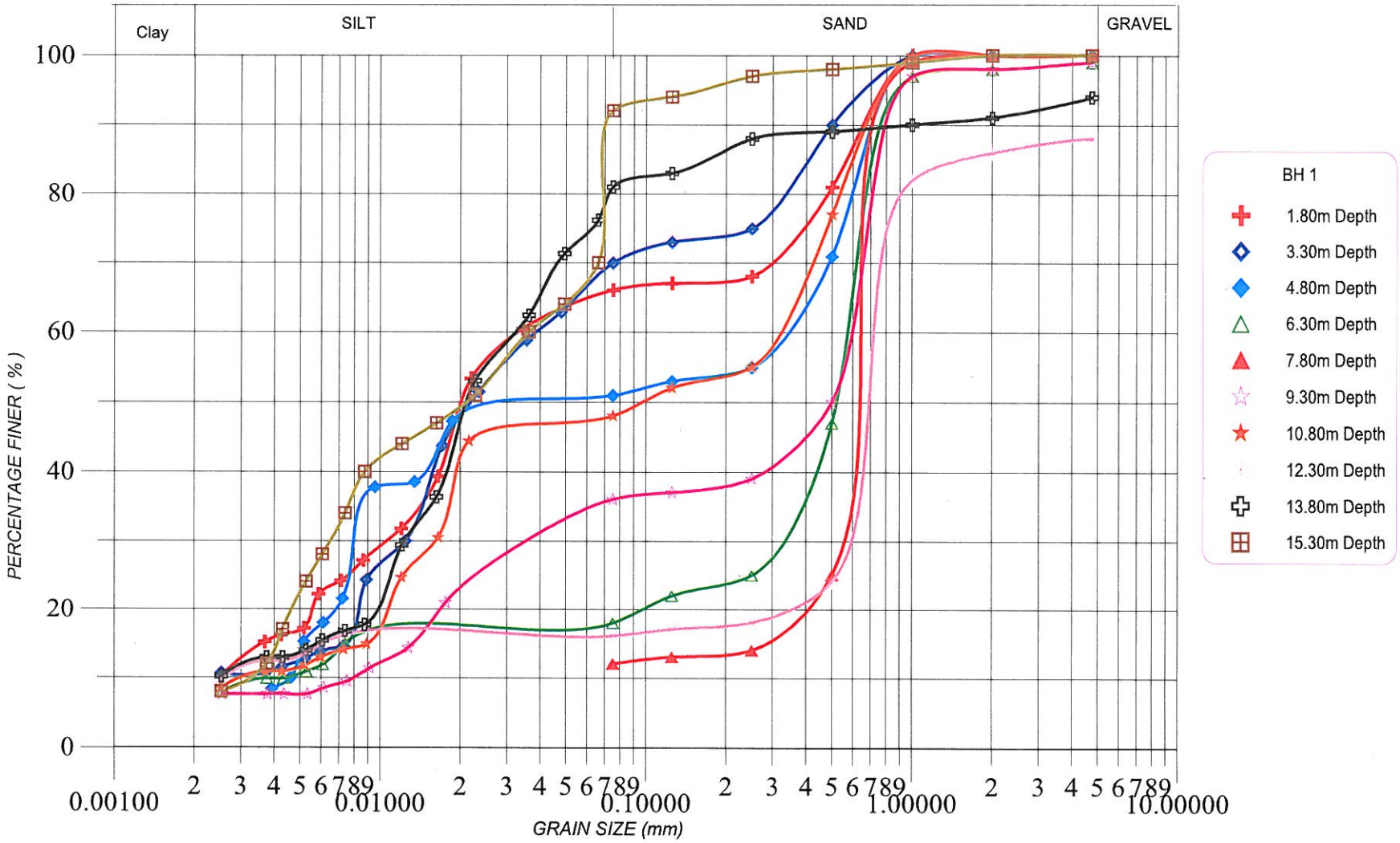
Reduced Level	Depth (m)	Type of sample	Soil Classification	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L	Sp.Gr	Type of test	C(kg/sq.cm)	phi(degrees)	Cc
267.850																
266.050	1.80	SPT	Sandy Silt with Gravel (SM-ML)	0	34	66				Non	Plastic					
265.350	2.50	UDS					1.78	1.48	20.50			2.64	DST		29	
264.550	3.30	SPT		0	30	70				Non	Plastic					
263.050	4.80	SPT		0	49	51				Non	Plastic					
261.550	6.30	SPT	Silty Sand with Gravel (SM)	1	81	18				Non	Plastic					
260.050	7.80	SPT		0	88	12				Non	Plastic					
258.550	9.30	SPT		1	63	36				Non	Plastic					
257.050	10.80	SPT		0	52	48				Non	Plastic					
255.550	12.30	SPT		12	72	16				Non	Plastic					

S.P.T Plot — Observed



0443

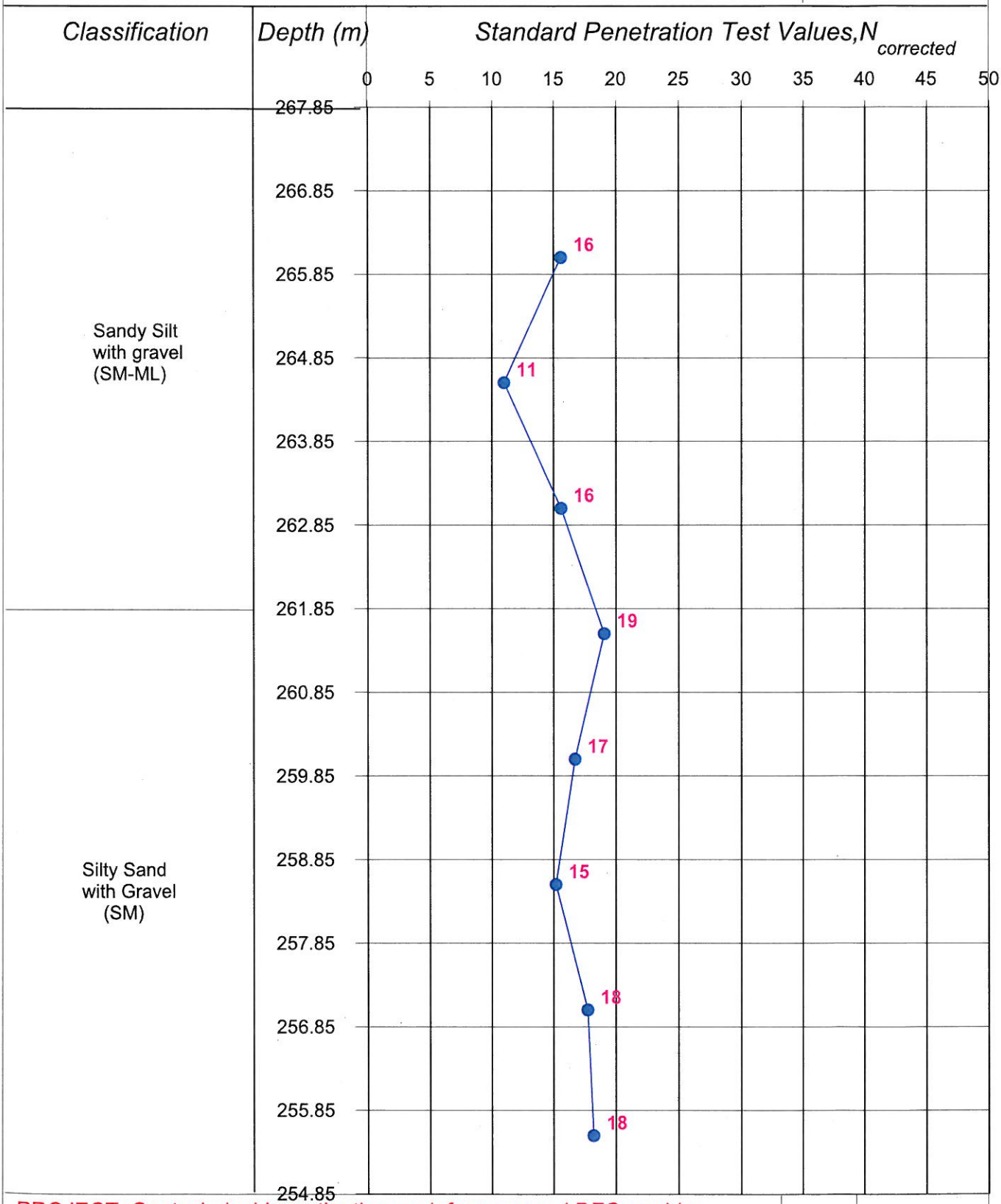
GRAIN SIZE DRISTRIBUTION CURVE



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD--V

SOIL ENGINEERING CONSULTANTS | Interdistance@ 210/5-7 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP -AN

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 277.089

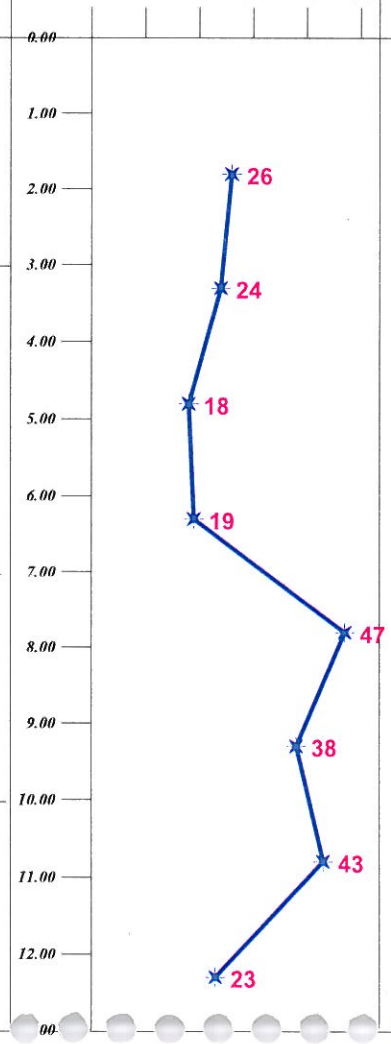
Location:213/31-33
BH No.: 1
Depth : 12.00
Depth of Water table :Not Met

Date of start : 13/06/2008
Date of finish : 14/06/2008

SOIL ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L		Type of test	C(kg/sq.cm)	phi(degrees)	
277.089																
275.289	1.80	SPT	Sandy Silt (SM-ML)	0	12	88					Non Plastic					
274.589	2.50	UDS					1.94	1.71	13.62			2.66	DST	0.1	32	
273.789	3.30	SPT		0	53	47					Non Plastic					
272.289	4.80	SPT	Silty Sand with Gravel (SM)	1	85	14					Non Plastic					
271.589	5.50	UDS					1.89	1.62	16.51				DST		31	
270.789	6.30	SPT		0	65	35					Non Plastic					
269.289	7.80	SPT	Sandy Silt (SM-ML)	0	39	61					Non Plastic					
267.789	9.30	SPT		0	36	64					Non Plastic					
266.289	10.80	SPT	Silty Sand with Gravel (SM)	0	54	46					Non Plastic					
264.789	12.30	SPT		0	59	41					Non Plastic					

S.P.T Plot — Observed

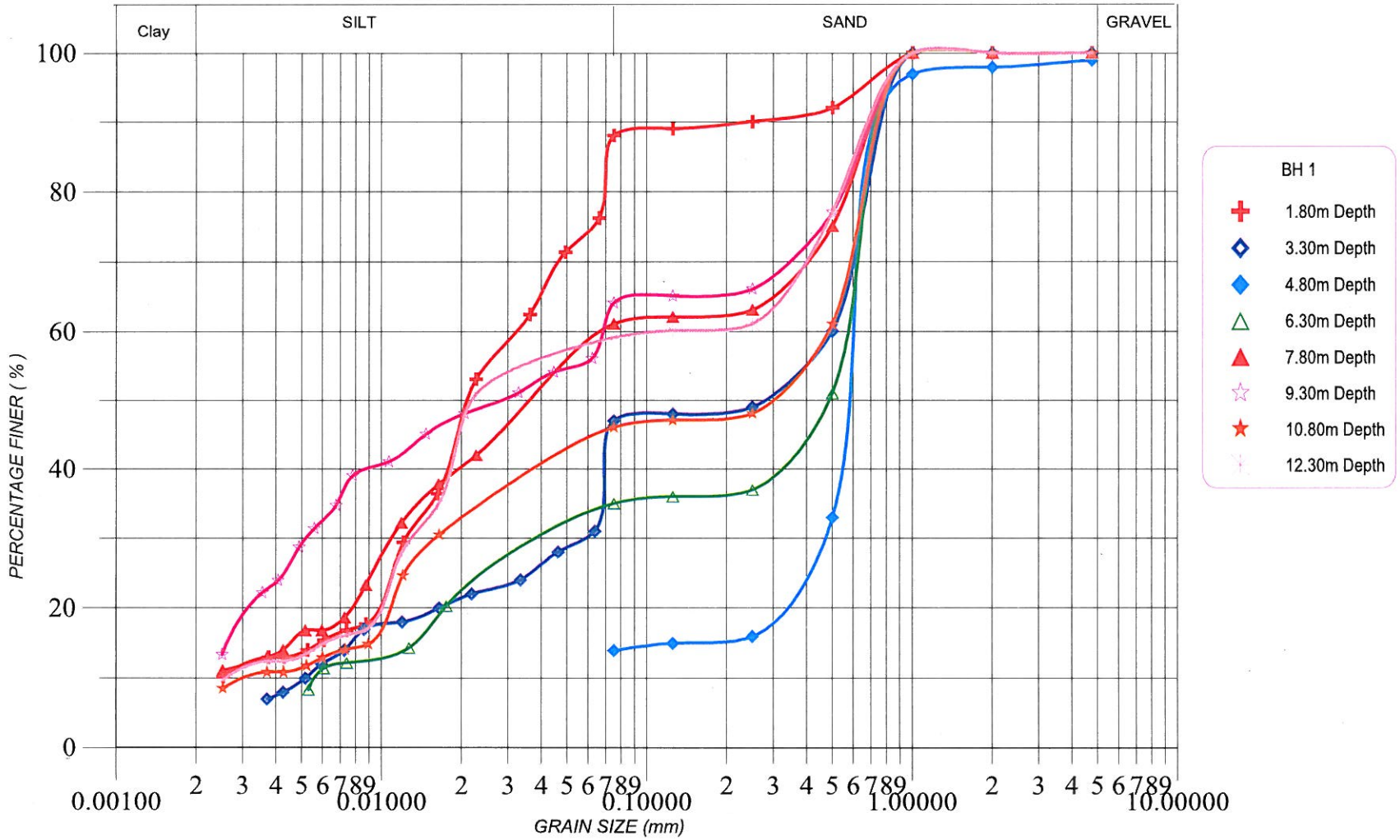


Soil Engineering Consultants

Interdistance@ 213/31-33

Job:1813

GRAIN SIZE DRISTRIBUTION CURVE



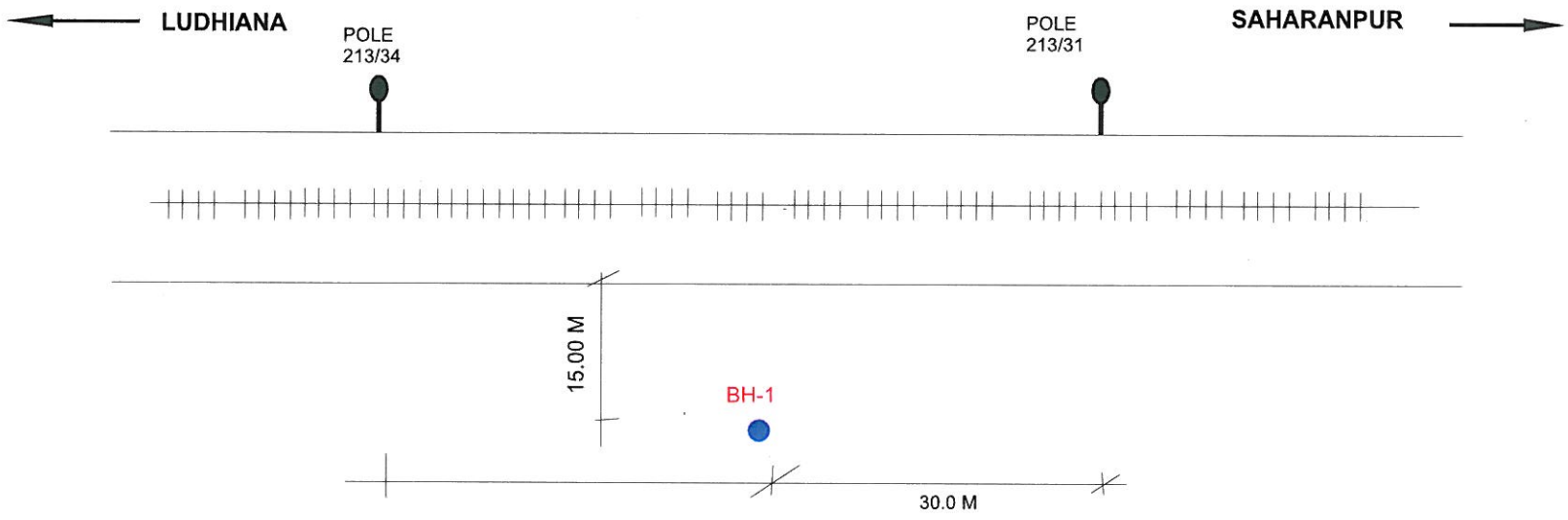
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD-AD

0427

SOIL ENGINEERING CONSULTANTS

Job No: 1813

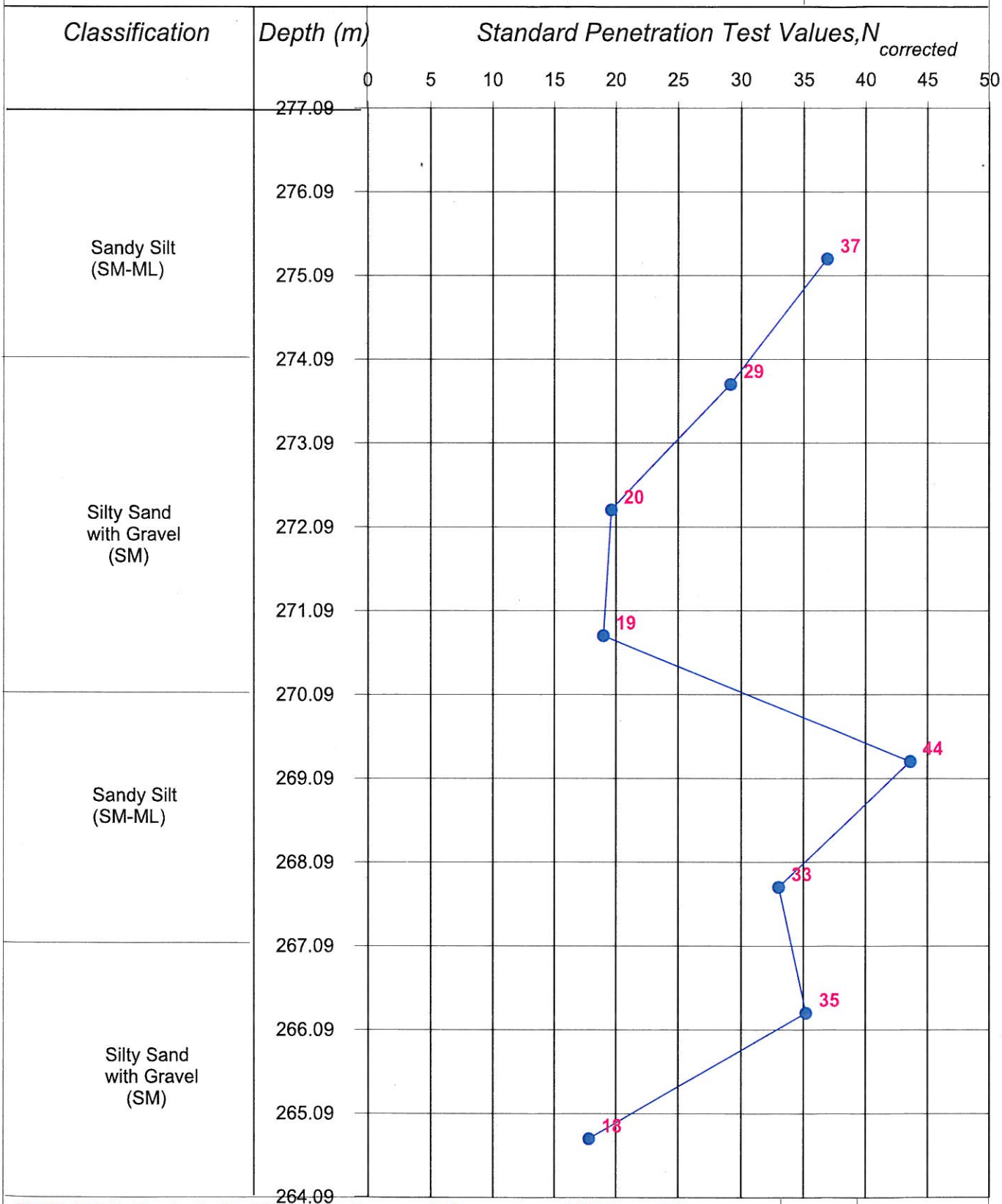


INTERDISTANCE @ 213/31-33

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-AV

SOIL ENGINEERING CONSULTANTS | Interdistance@ 213/31-33 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP -AV

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 277.913

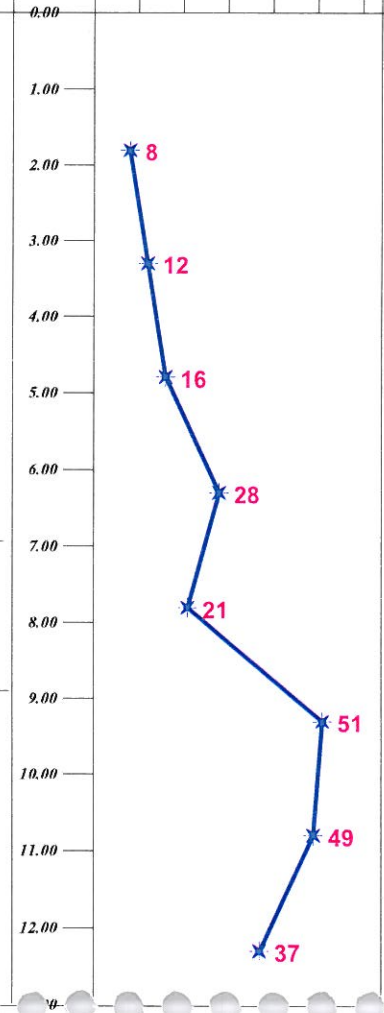
Location:215/21-23
BH No.: 1
Depth : 12.00
Depth of Water table :Not Met

Date of start : 13/06/2008
Date of finish : 14/06/2008

SOIL ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L	Sp.Gr	Type of test	C(kg/sq.cm)	phi(degrees)	Cc
277.913																
276.113	1.80	SPT		0	2	98				Non	Plastic					
275.413	2.50	UDS					1.8	1.55	15.91				DST	0.15	30	
274.613	3.30	SPT	Sandy Silt (SM-ML)	0	5	95				Non	Plastic					
273.113	4.80	SPT		0	6	94				Non	Plastic					
272.413	5.50	UDS					1.84	1.57	16.83			2.65	DST	0.1	31	
271.613	6.30	SPT		0	16	84				Non	Plastic					
270.113	7.80	SPT	Silty Sand (SM)	0	70	30				Non	Plastic					
269.413	8.50	UDS					1.86	1.59	17.11				DST		32	
268.613	9.30	SPT		0	39	61				Non	Plastic					
267.113	10.80	SPT	Sandy Silt (SM-ML)	0	9	91				Non	Plastic					
266.413	11.50	UDS					1.94	1.65	17.88				DST	0.1	33	
265.613	12.30	SPT		0	22	78				Non	Plastic					

S.P.T Plot — Observed



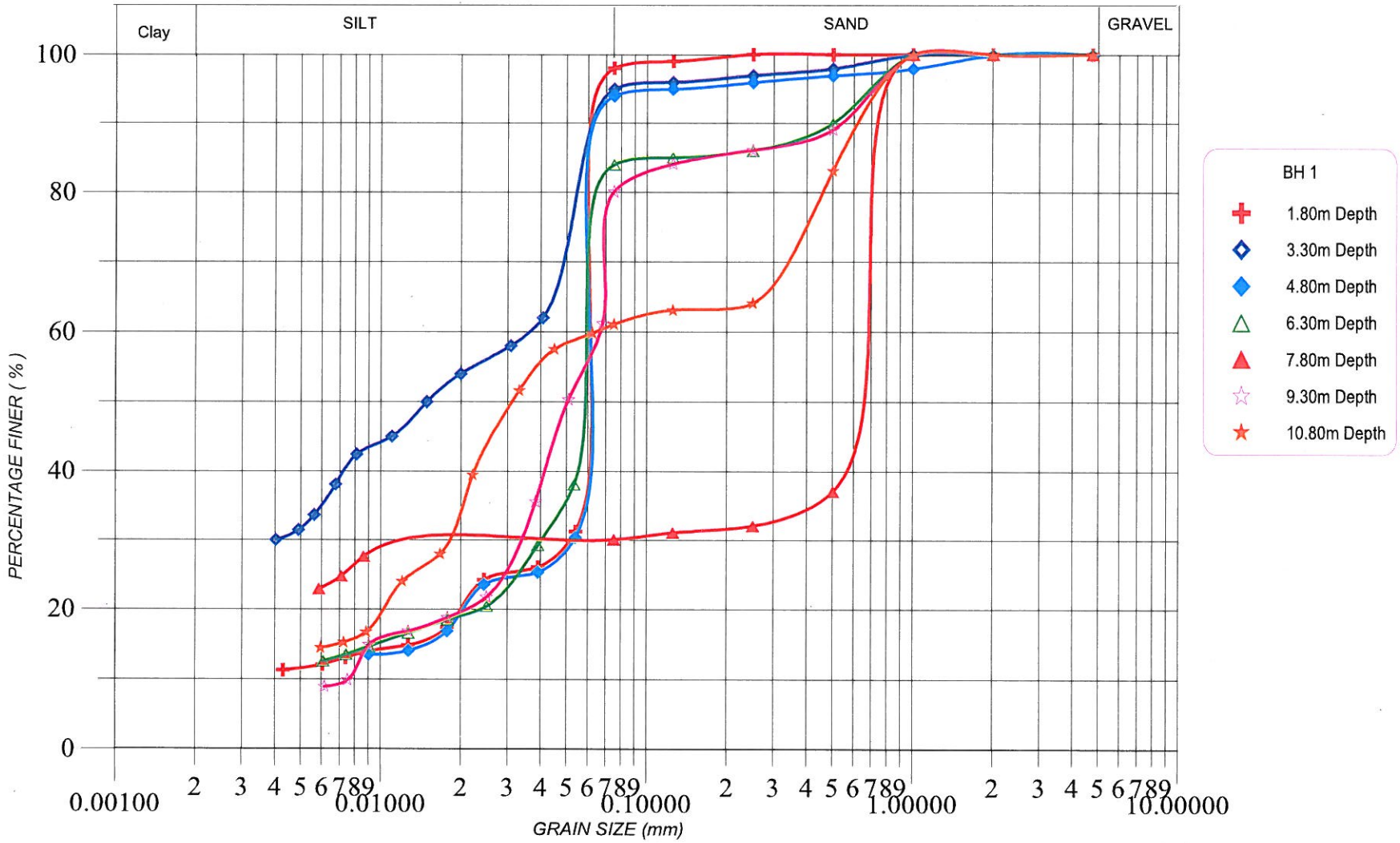
0450

Soil Engineering Consultants

Interdistance@ 215/21-23

Job:1813

GRAIN SIZE DRISTRIBUTION CURVE



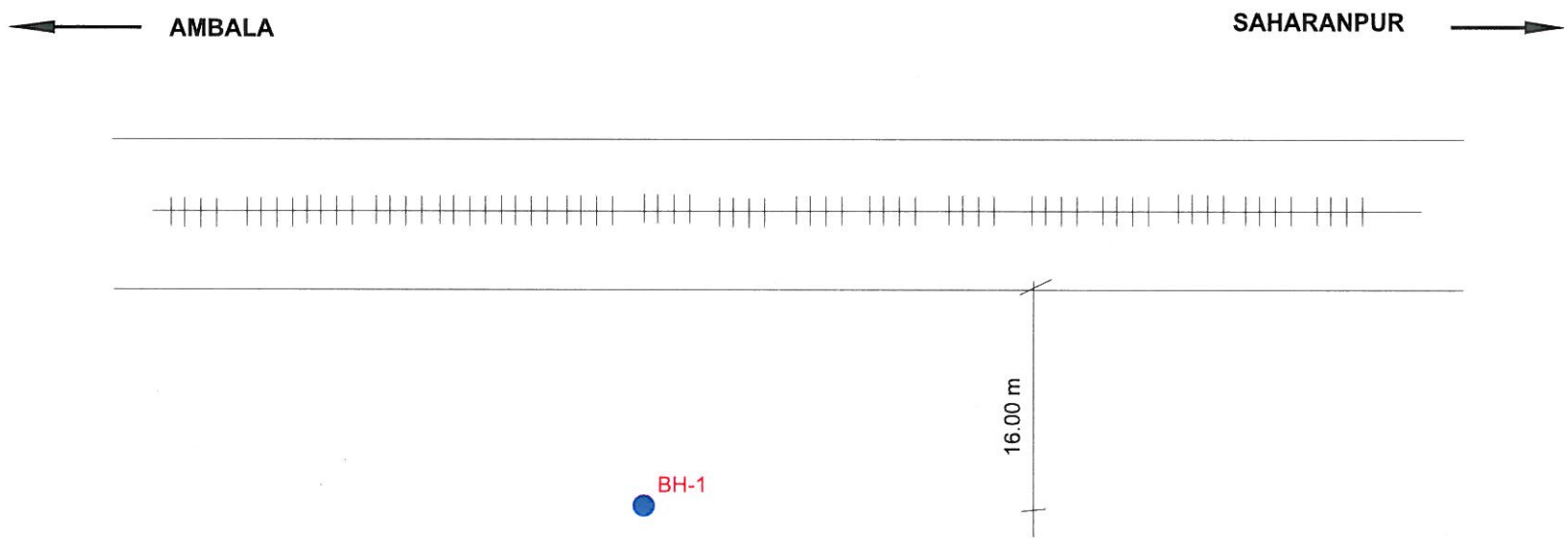
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD-AF

0451

SOIL ENGINEERING CONSULTANTS

Job No: 1813

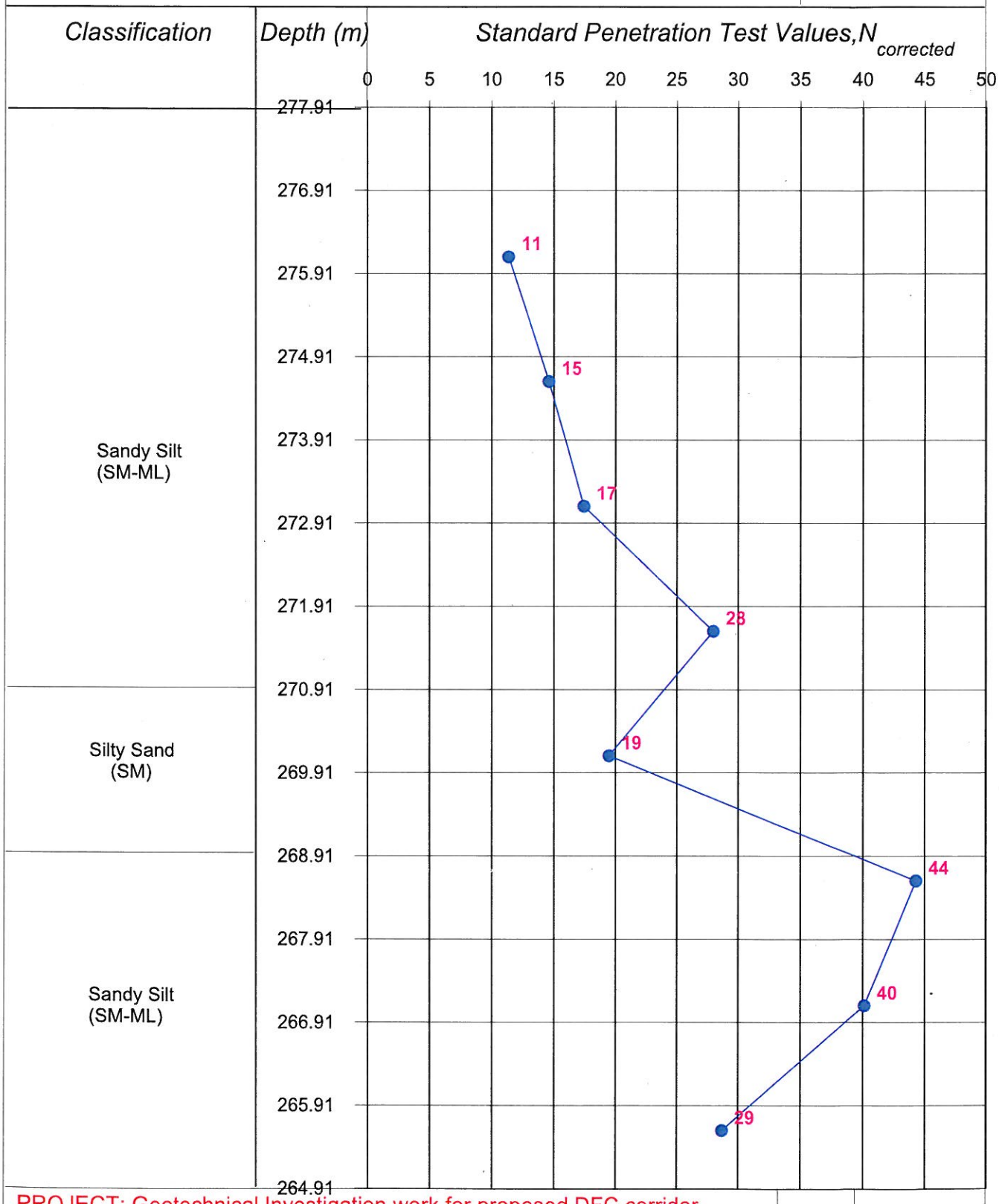


INTERDISTANCE @ 215/21-23

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-AX

SOIL ENGINEERING CONSULTANTS | Interdistance@ 215/21-23 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP -AX

0453

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 276.705

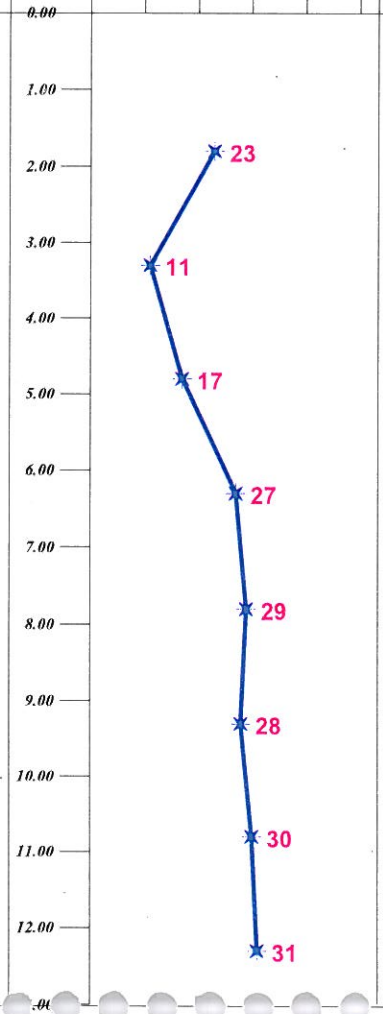
Location:217/11-13
BH No.: 1
Depth : 12.00
Depth of Water table :Not Met

Date of start : 12/06/2008
Date of finish : 13/06/2008

SOIL ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L	Sp.Gr	Type of test	C(kg/sq.cm)	phi(degrees)	Cc
276.705																
276.205	0.50	DS								Non	Plastic					
274.905	1.80	SPT		0	28	72				Non	Plastic					
274.205	2.50	UDS					1.79	1.58	13.62				DST	0.1	30	
273.405	3.30	SPT		0	25	75				Non	Plastic					
271.905	4.80	SPT	Sandy Silt (SM-ML)	0	25	75				Non	Plastic					
271.205	5.50	UDS					1.83	1.60	14.43			2.67	DST	0.1	31	
270.405	6.30	SPT		0	49	51				Non	Plastic					
268.905	7.80	SPT		0	48	52				Non	Plastic					
267.405	9.30	SPT		0	41	59				Non	Plastic					
265.905	10.80	SPT	Silty Sand with Gravel (SM)	0	60	40				Non	Plastic					
264.405	12.30	SPT		1	65	34				Non	Plastic					

S.P.T Plot — Observed



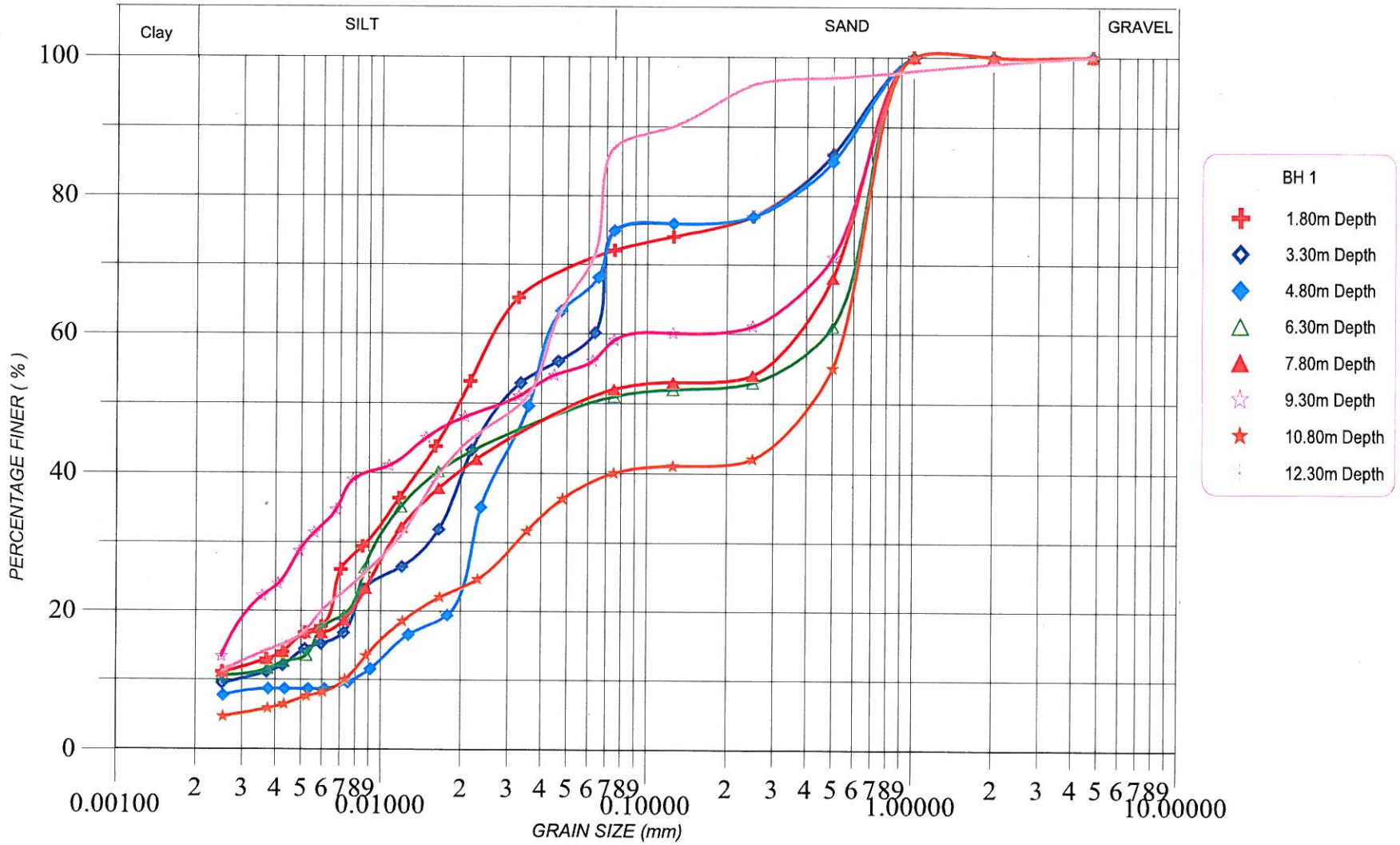
0454

Soil Engineering Consultants

Interdistance@ 217/11-13

Job:1813

GRAIN SIZE DRISTRIBUTION CURVE

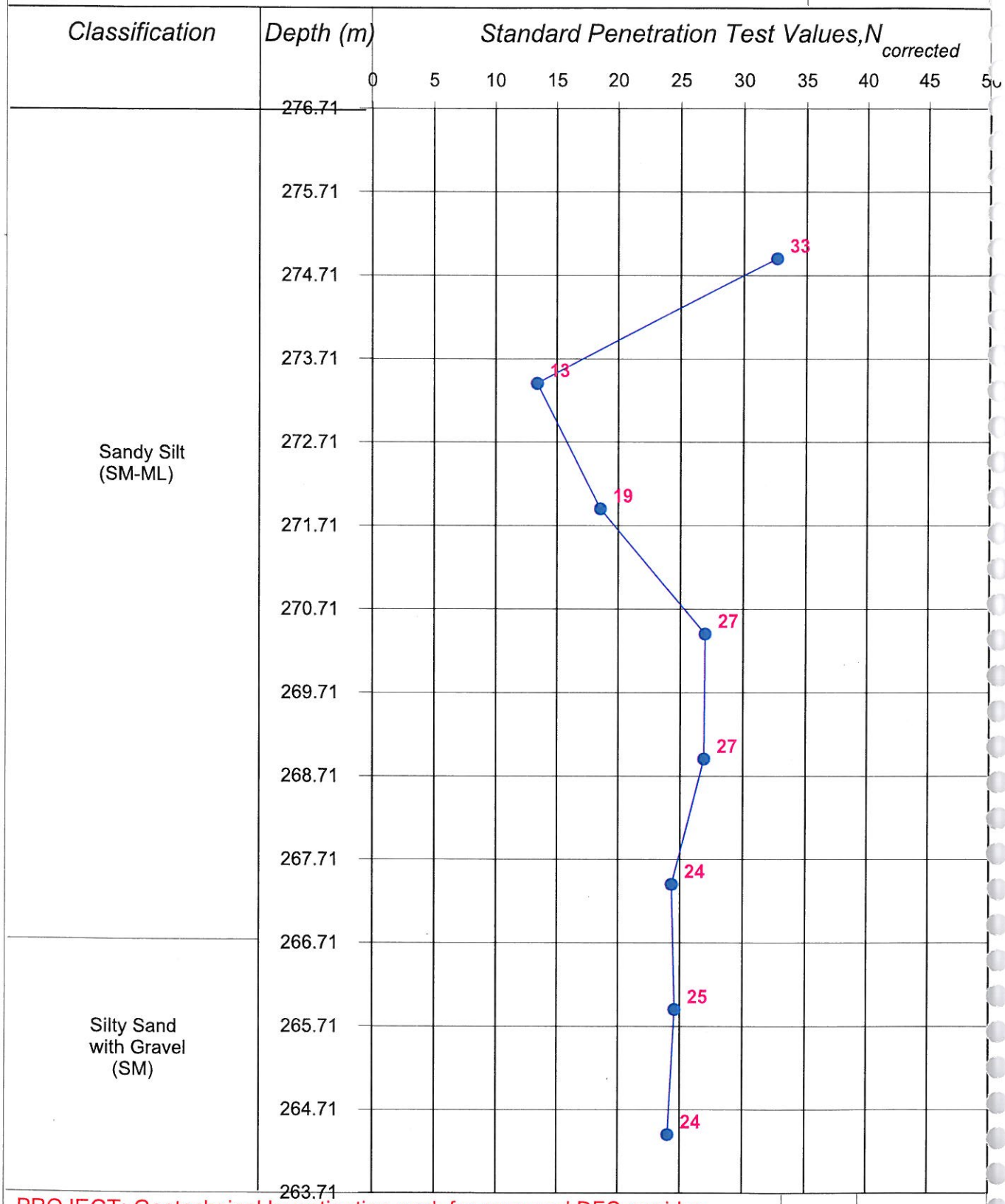


PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD-AI

0455

SOIL ENGINEERING CONSULTANTS | Interdistance@ 217/11-13 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP -BA

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

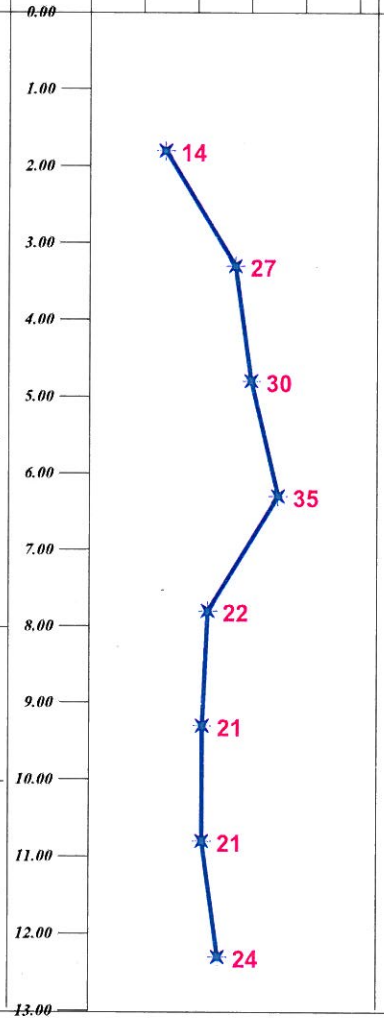
Location:219/9-11
BH No.: 1
Depth : 12.00
Depth of Water table :Not Met

Date of start : 12/06/2008
Date of finish : 12/06/2008

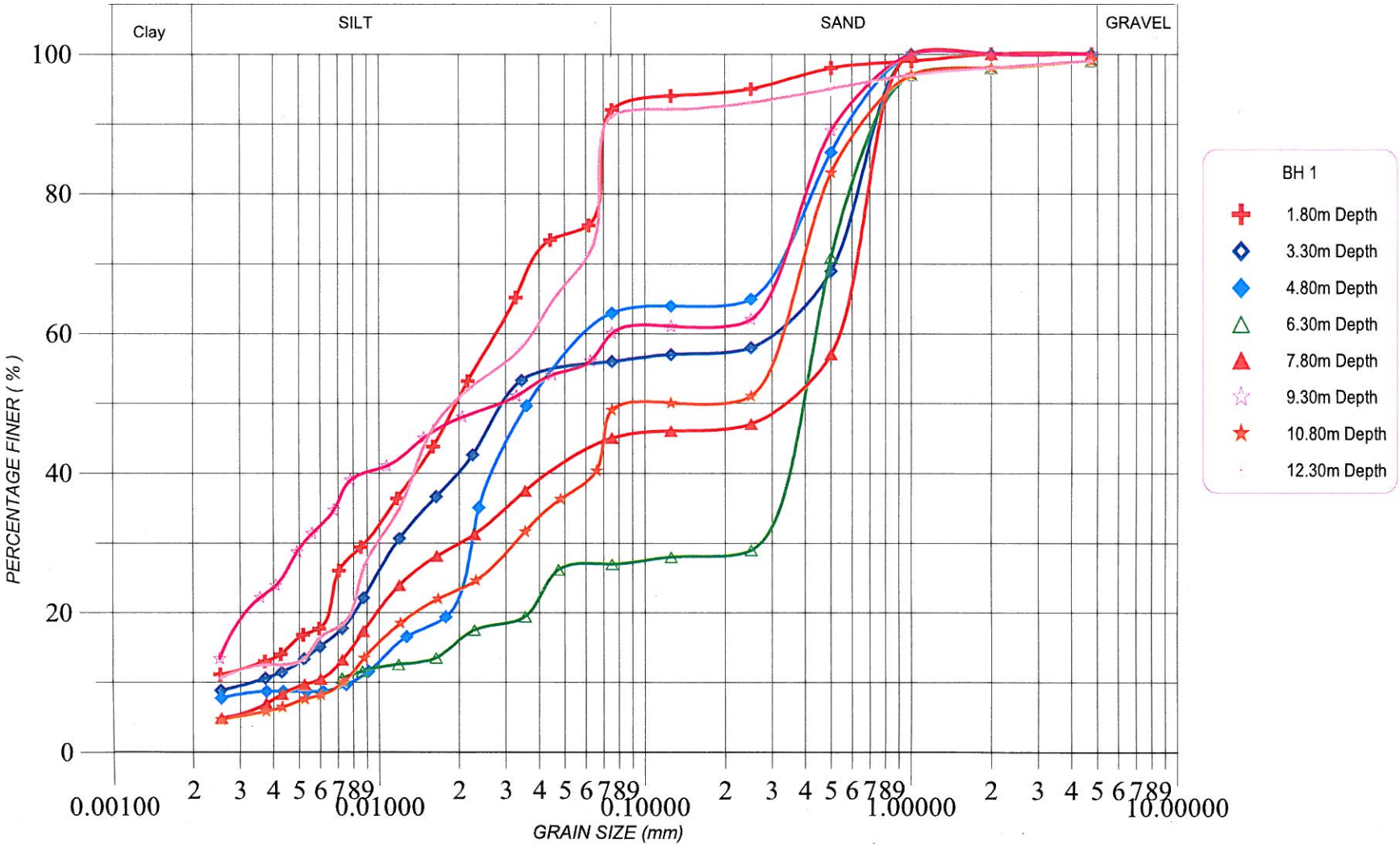
Project No. 1813 Interdistance RL: 275.743

Reduced Level	Depth (m)	Type of sample	Soil Classification	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L		Type of test	C(kg/sq.cm)	phi(degrees)	
275.743																
275.243	0.50	DS								Non	Plastic					
273.943	1.80	SPT	Sandy Silt (SM-ML)	1	7	92				Non	Plastic					
273.243	2.50	UDS					1.9	1.70	12.50			2.65	DST	0.1	32	
272.443	3.30	SPT		0	44	56				Non	Plastic					
270.943	4.80	SPT		0	37	63				Non	Plastic					
269.443	6.30	SPT	Silty Sand with Gravel (SM)	0	73	27				Non	Plastic					
267.943	7.80	SPT		0	55	45				Non	Plastic					
266.443	9.30	SPT	Sandy Silt (SM-ML)	0	40	60				Non	Plastic					
264.943	10.80	SPT	Silty Sand with Gravel (SM)	1	53	46				Non	Plastic					
263.443	12.30	SPT	Sandy Silt (SM-ML)	1	8	91				Non	Plastic					

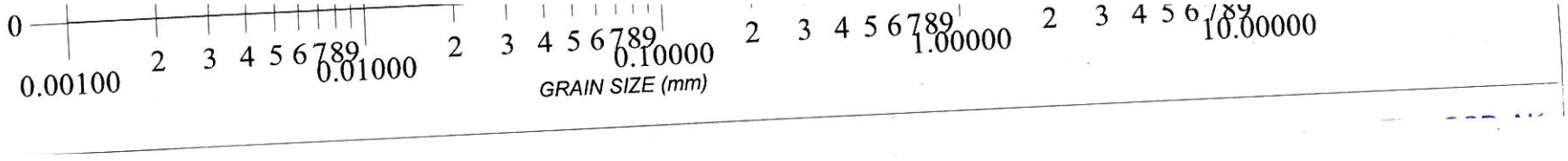
S.P.T Plot



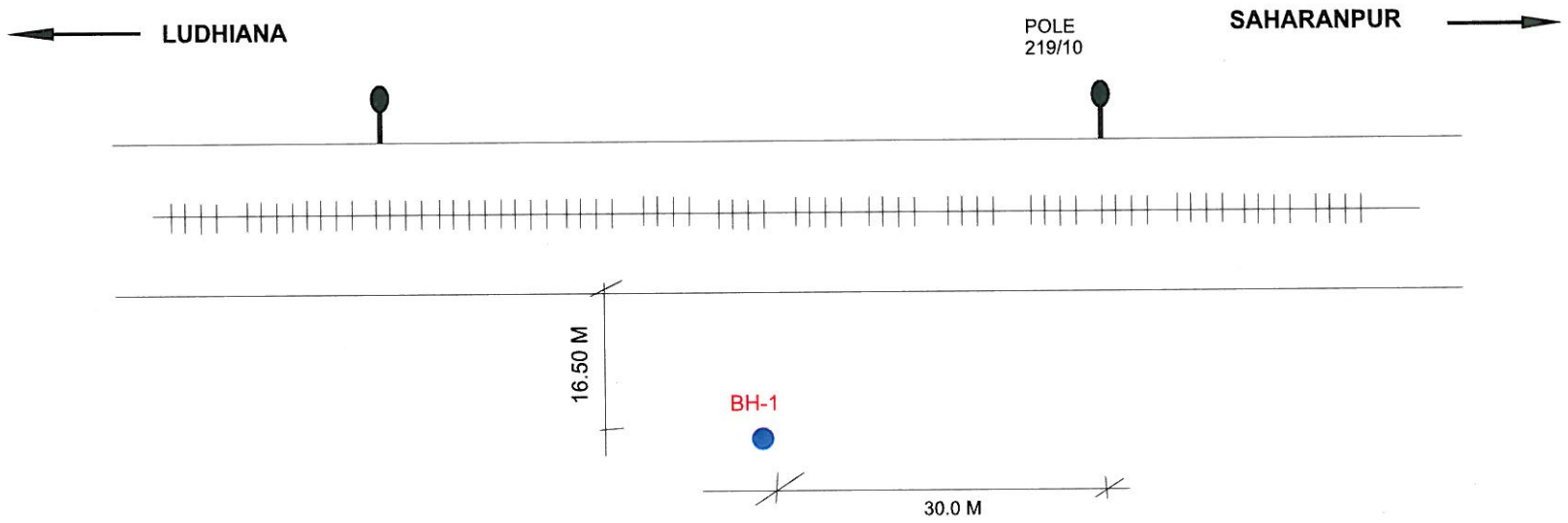
GRAIN SIZE DRISTRIBUTION CURVE



0458



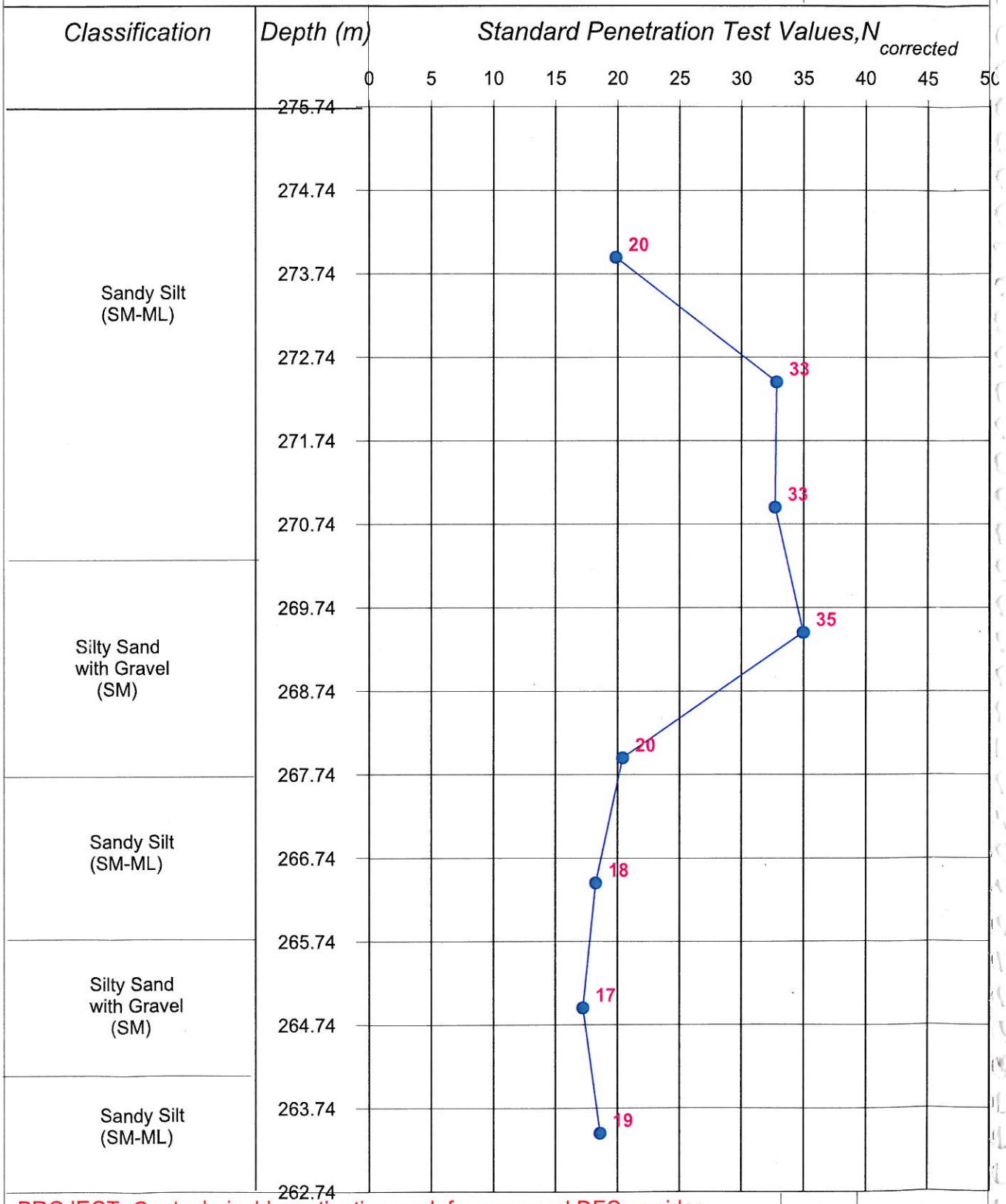
SOIL ENGINEERING CONSULTANTS **Job No: 1813**



INTERDISTANCE @ 219/9-11

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur **Fig: Plan-BC**

SOIL ENGINEERING CONSULTANTS | Interdistance@ 219/9-11 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP -BD

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 277.020

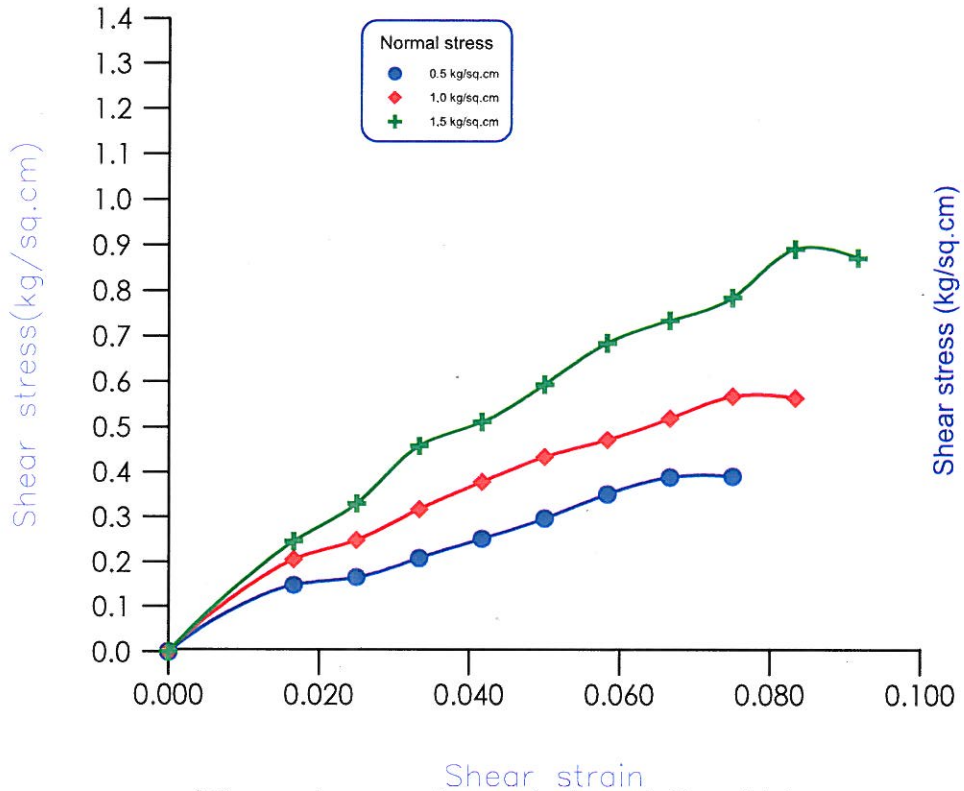
Location; 220/31-32
BH No.: 1
Depth : 12.00
Depth of Water table : Not Met

Date of start : 14/04/2008
Date of finish : 14/04/2008

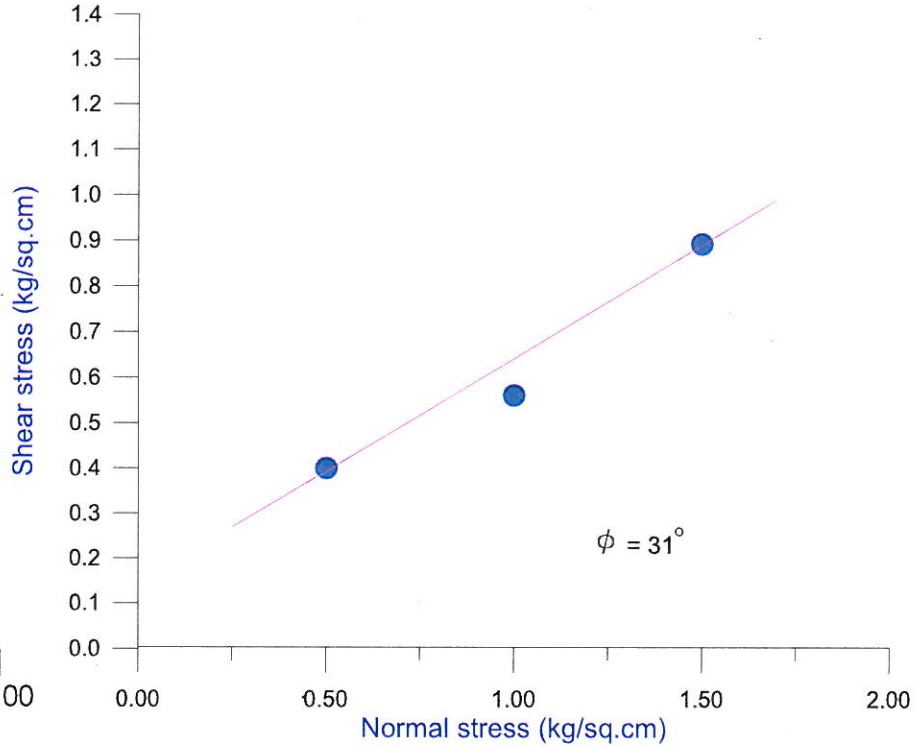
SOIL ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
				0 10 20 30 40 50 60 70 80 90 100 110 120	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L		Type of test	C(kg/sq.cm)	phi(degrees)	
277.020																	
275.220	1.80	SPT	Sandy Silt with Gravel (SM-ML)	25	1	4	95				Non	Plastic					
274.520	2.50	UDS						1.84	1.69	8.96			2.66	DST	0.15	31	
273.720	3.30	SPT		33	3	5	92				Non	Plastic					
272.220	4.80	SPT		27	0	14	86				Non	Plastic					
271.520	5.50	UDS	Silty Sand (SM)					1.87	1.63	14.45				DST		31	
270.720	6.30	SPT		47	0	64	36				Non	Plastic					
269.220	7.80	SPT		58	0	71	29				Non	Plastic					
268.520	8.50	UDS						1.93	1.66	16.23			2.68	DST		32	
267.720	9.30	SPT		42	1	61	38				Non	Plastic					
266.220	10.80	SPT	Sand Silt with gravel (SM-ML)	49	1	44	55				Non	Plastic					
265.520	11.50	UDS	Silty Sand with Gravel (SM)					1.91	1.64	16.45			2.7	DST		32	
264.720	12.30	SPT		41	1	54	45				Non	Plastic					

BH-1
DEPTH = 2.50 m.



(Shear stress - shear strain relationship)

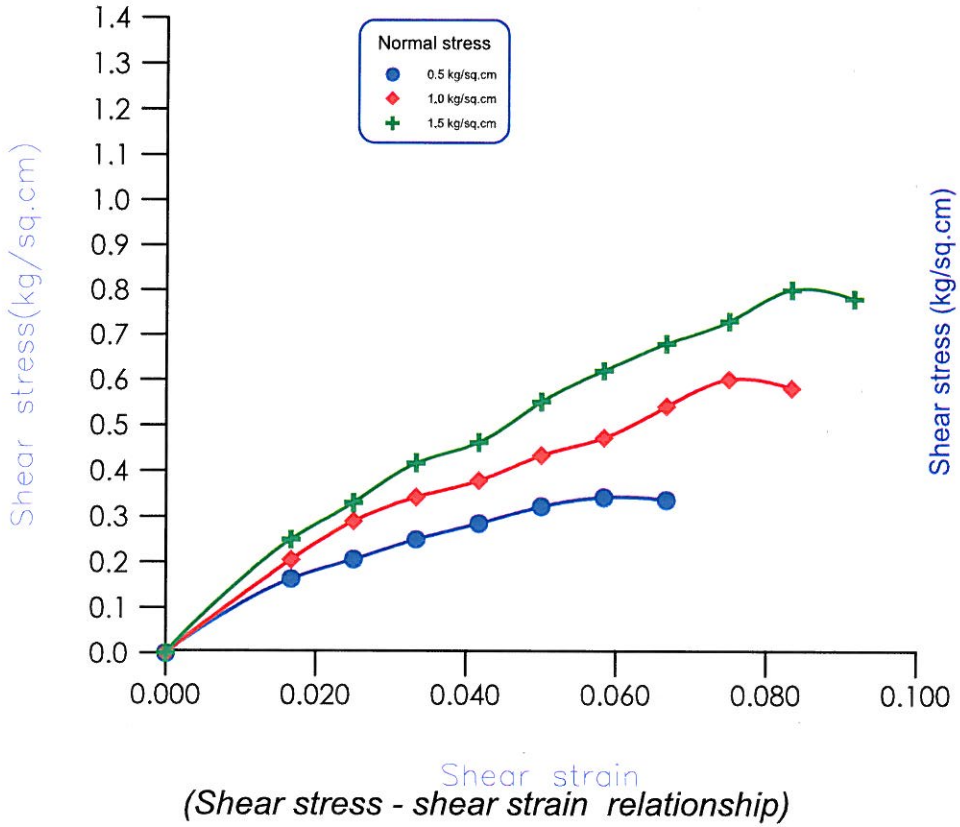


(Shear stress - Normal stress relationship)

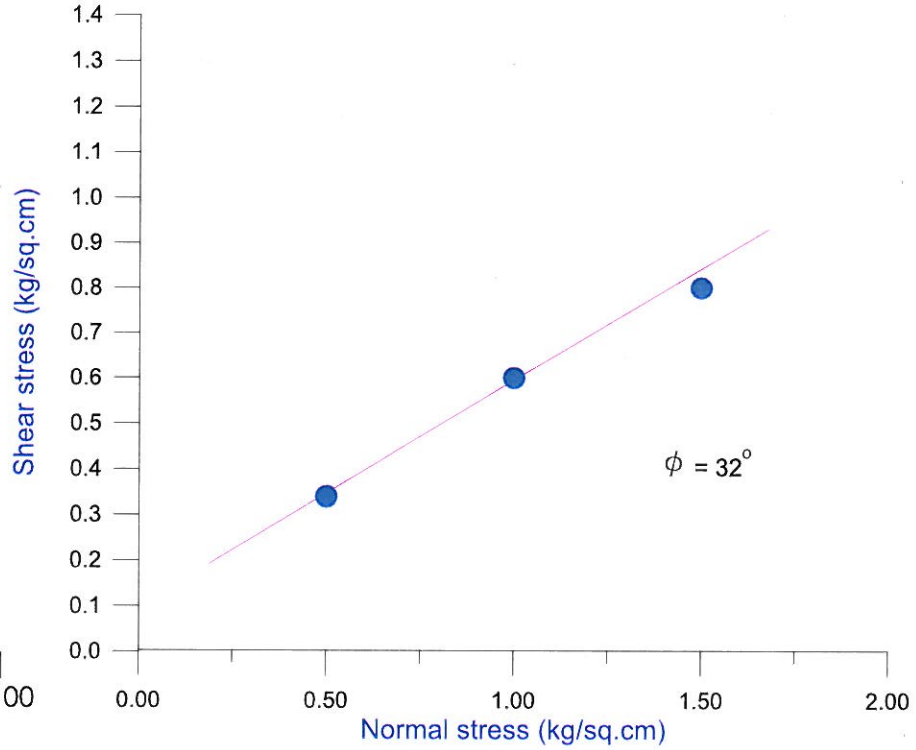
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BE1

BH-1
DEPTH = 11.50 m.



(Shear stress - shear strain relationship)



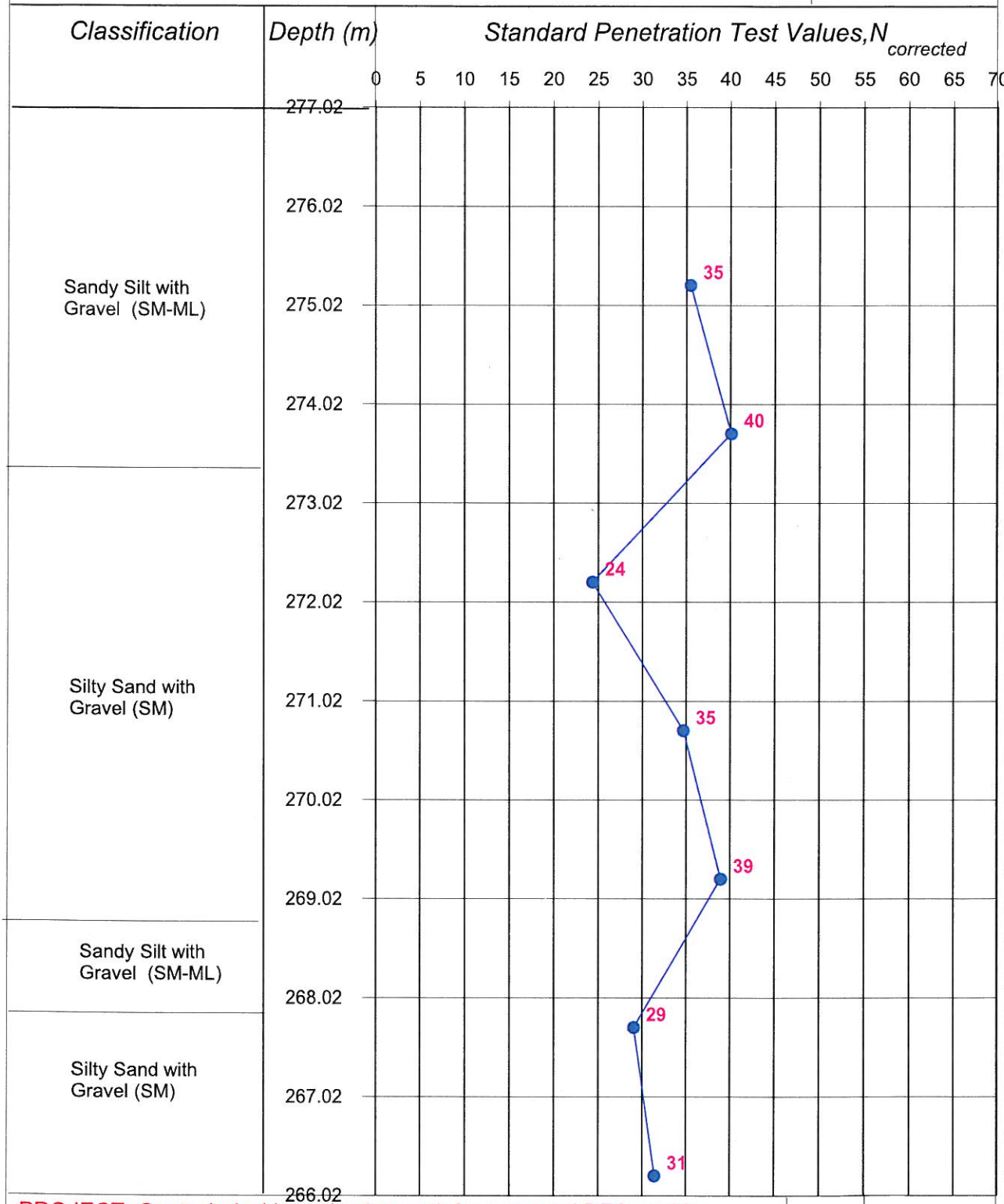
(Shear stress - Normal stress relationship)

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BE2

0453

SOIL ENGINEERING CONSULTANTS | Interdistance@ 220 31-32 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP-BE

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

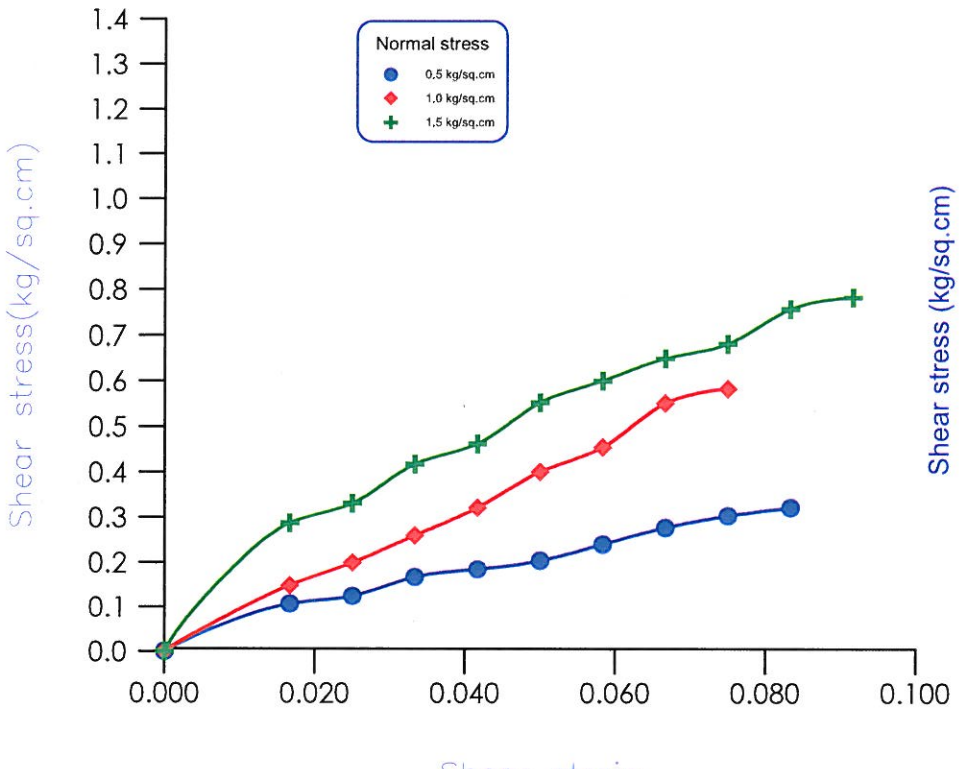
Project No. 1813 Interdistance RL: 274.979

Location; 223/9-11
BH No.: 1
Depth : 12.00m
Depth of Water table : Not Met

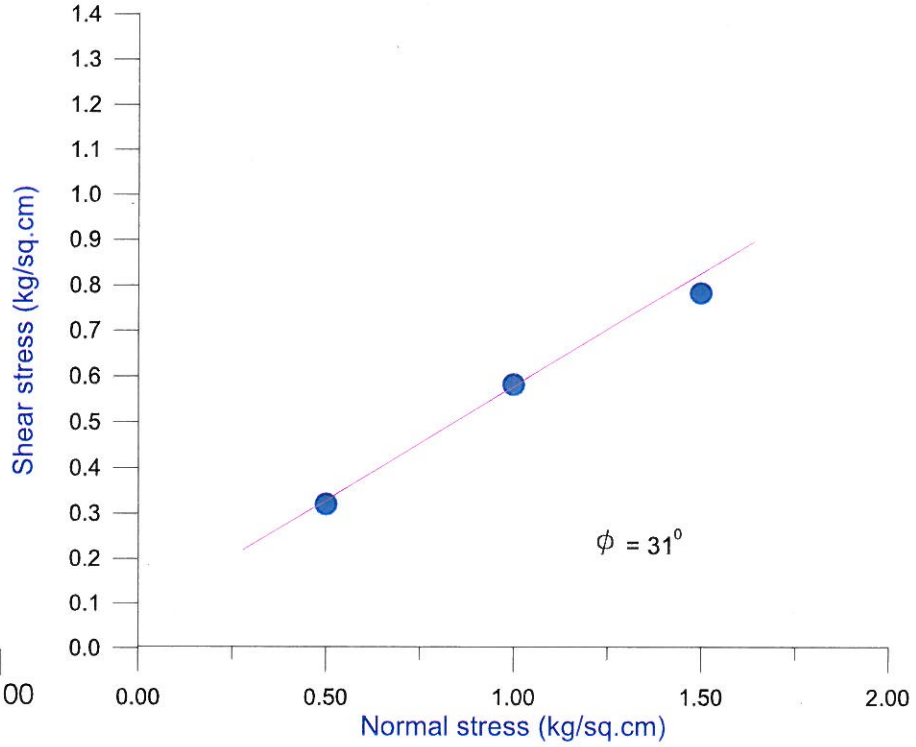
Date of start : 28/04/2008
Date of finish : 29/04/2008

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%) Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	r(dry)	W/C W(%)	Limits (%) L.L	P . L	Sp.Gr	Shear Parameters Type of test	C(kg/sq.cm)	phi(degrees)	Cc
274.979																	
274.479	0.50	DS	Sandy Silt with Gravel (SM-ML)		2	37	61				Non	Plastic					
273.179	1.80	SPT		27	0	16	84				Non	Plastic					
271.679	3.30	SPT		16	0	59	41				Non	Plastic					
270.179	4.80	SPT		17	0	72	28				Non	Plastic					
269.479	5.50	UDS						1.9	1.69	12.64				DST	0.15	30	
268.679	6.30	SPT		26	0	76	24				Non	Plastic					
267.179	7.80	SPT		22	1	69	30				Non	Plastic					
266.479	8.50	UDS	Silty Sand with Gravel (SM)					1.9	1.66	14.50			2.66	DST	0.15	31	
265.679	9.30	SPT		18	0	82	18				Non	Plastic					
264.179	10.80	SPT		27	0	82	18				Non	Plastic					
263.479	11.50	UDS						1.94	1.63	19.00				DST	0.1	30	
262.679	12.30	SPT		35	0	79	21				Non	Plastic					

BH-1
DEPTH = 8.50 m.



(Shear stress - shear strain relationship)

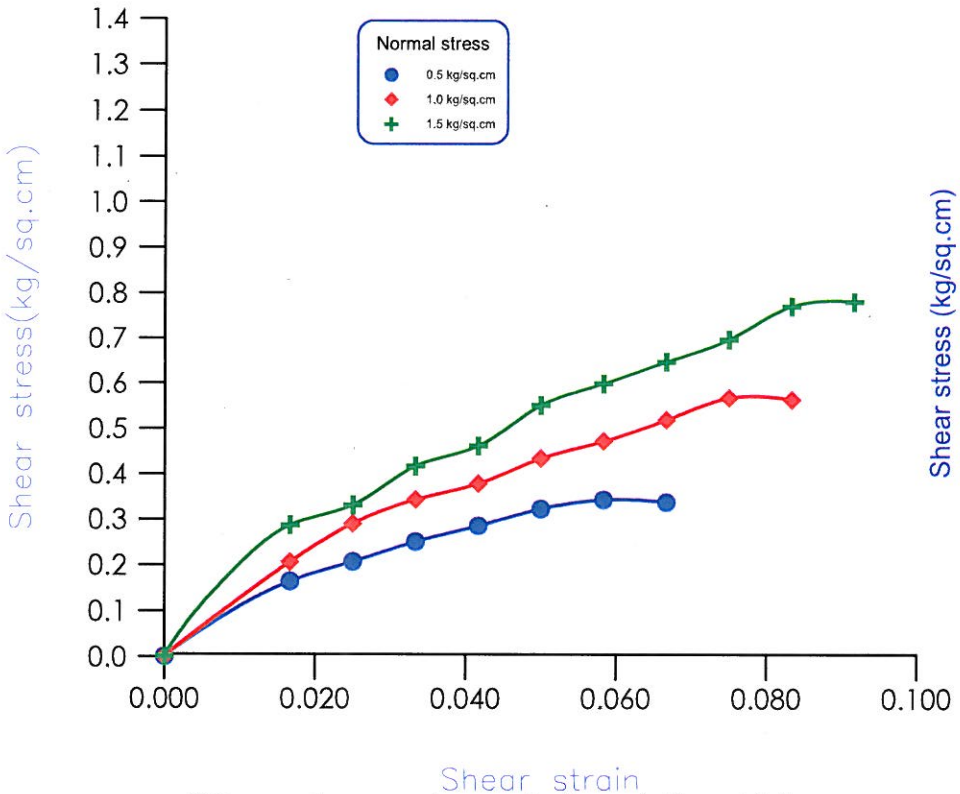


(Shear stress - Normal stress relationship)

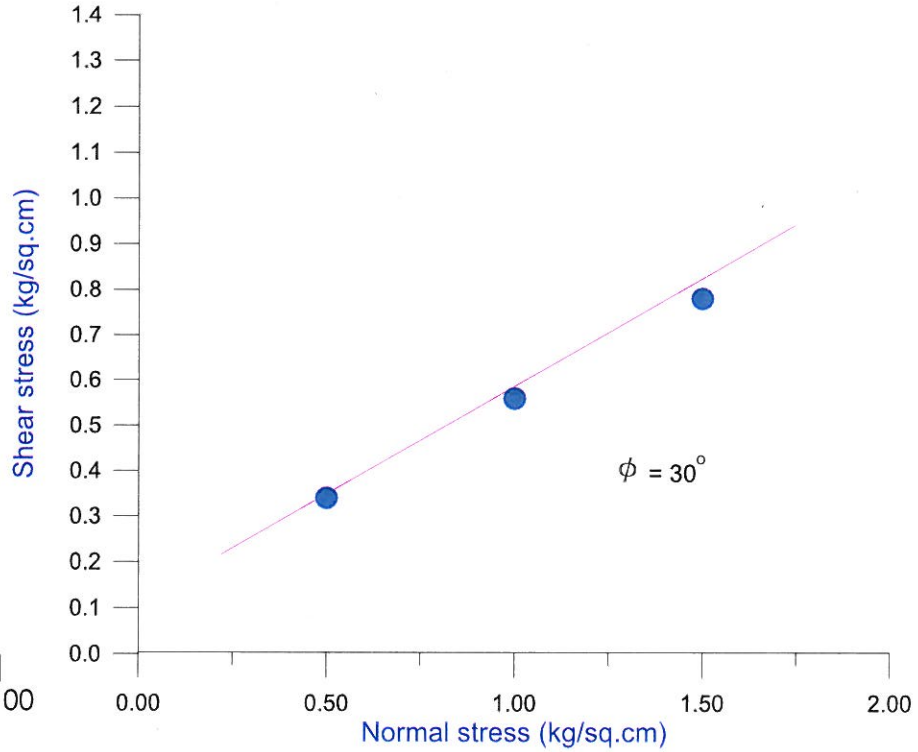
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BI1

BH-1
DEPTH = 11.50 m.



(Shear stress - shear strain relationship)



(Shear stress - Normal stress relationship)

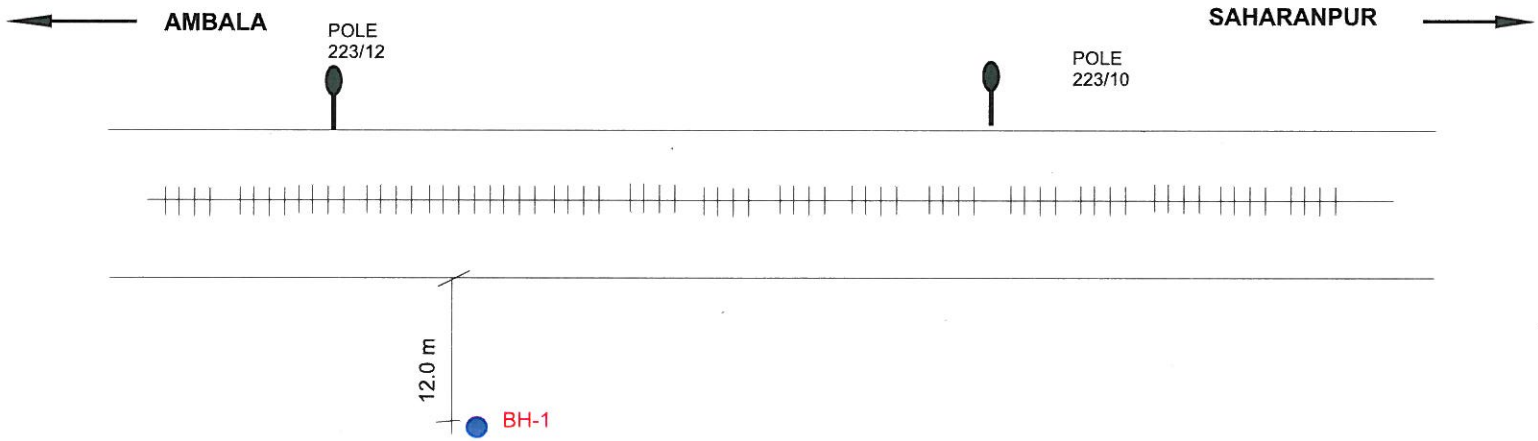
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BI2

0457

SOIL ENGINEERING CONSULTANTS

Job No: 1813



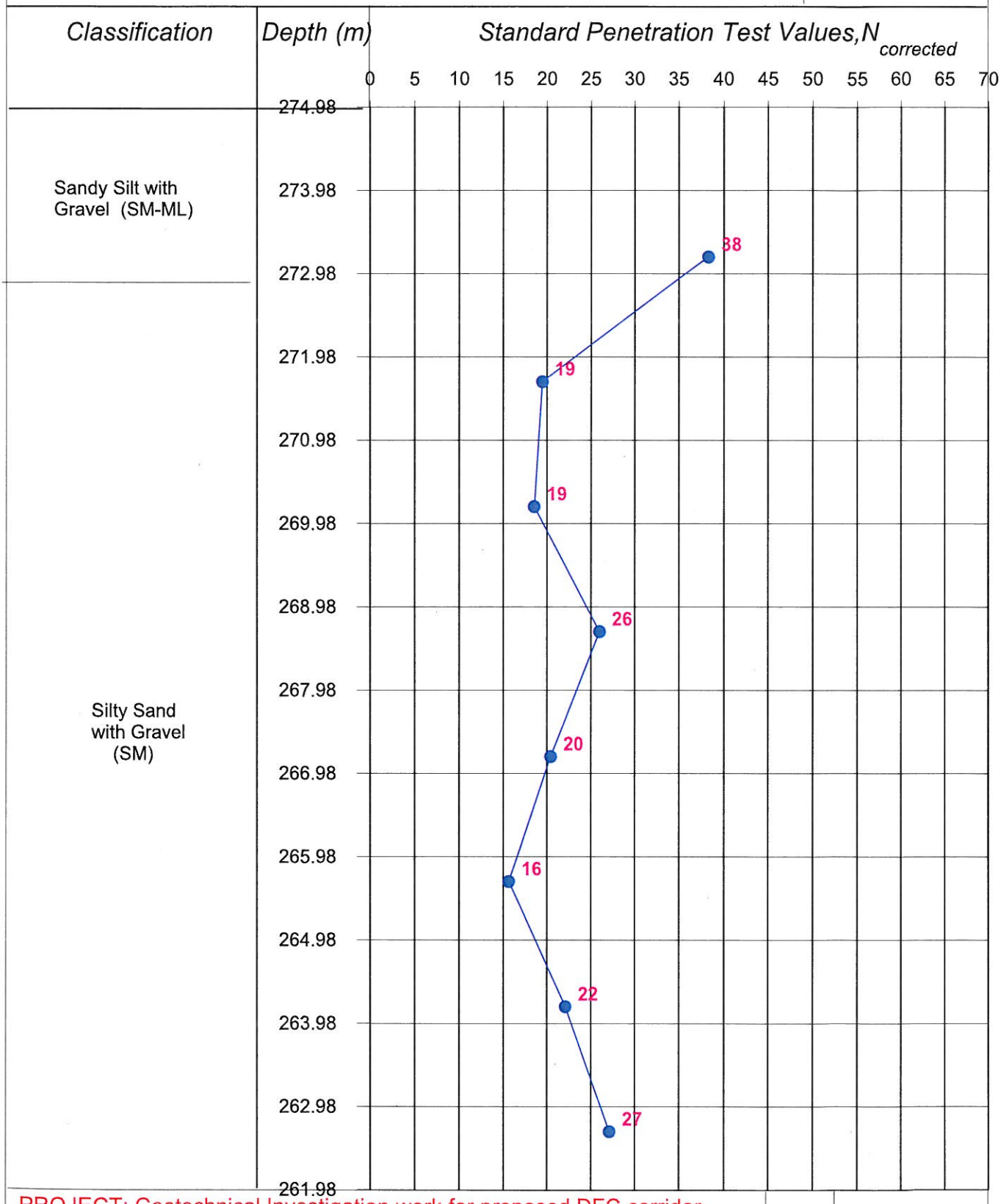
INTERDISTANCE 223/9-11

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-BI

0458

SOIL ENGINEERING CONSULTANTS | Interdistance@ 223 9-11 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP--BI1

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

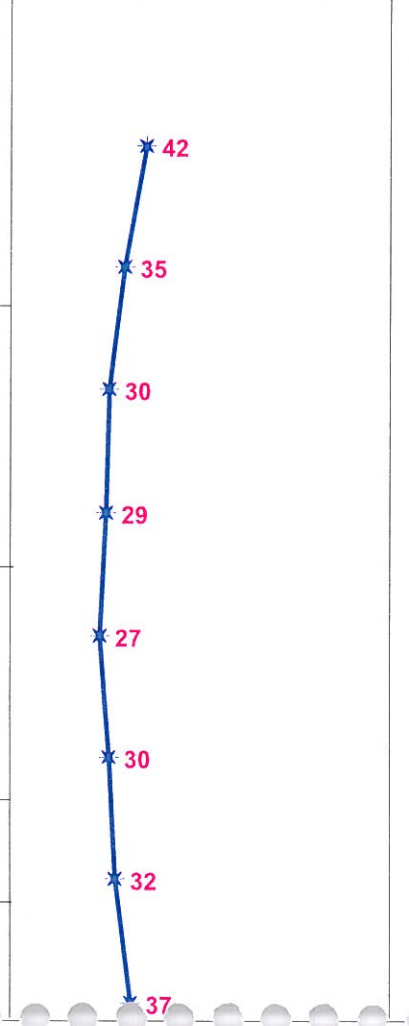
Project No. 1813 Interdistance RL: 274.583

Location; 226/5-7
BH No.: 1
Depth : 12.00
Depth of Water table : Not Met

Date of start : 15/05/2008
Date of finish : 16/05/2008

Reduced Level	Depth (m)	Type of sample	Soil Classification	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L		Type of test	C(kg/sq.cm)	phi(degrees)	
274.583																
274.083	0.50	DS								Non	Plastic					
272.783	1.80	SPT	Sandy Silt (SM-ML)	0	23	77				Non	Plastic					
272.083	2.50	UDS					1.94	1.71	13.28				DST	0.15	33	
271.283	3.30	SPT		0	21	79				Non	Plastic					
269.783	4.80	SPT	Silty Sand (SM)	0	58	42				Non	Plastic					
269.083	5.50	UDS					1.9	1.67	14.11			2.6	DST	0.15	31	
268.283	6.30	SPT		0	56	44				Non	Plastic					
266.783	7.80	SPT	Sand Silt (SM-ML)	0	46	54				Non	Plastic					
266.083	8.50	UDS					1.88	1.61	16.72			2.69	DST		32	
265.283	9.30	SPT		0	45	55				Non	Plastic					
263.783	10.80	SPT	Silty Sand (SM)	0	92	8				Non	Plastic					
263.083	11.50	UDS	Sand Silt (SM-ML)				1.92	1.60	19.86			2.67	DST		32	
262.283	12.30	SPT		0	41	59				Non	Plastic					

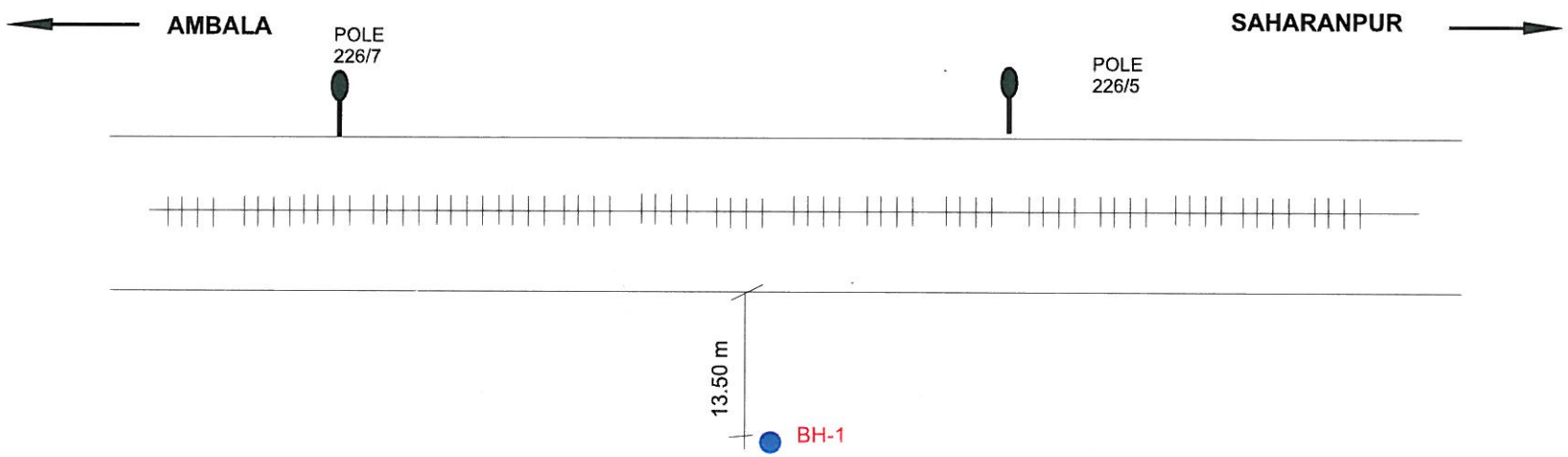
S.P.T Plot — Observed



0470

SOIL ENGINEERING CONSULTANTS

Job No: 1813



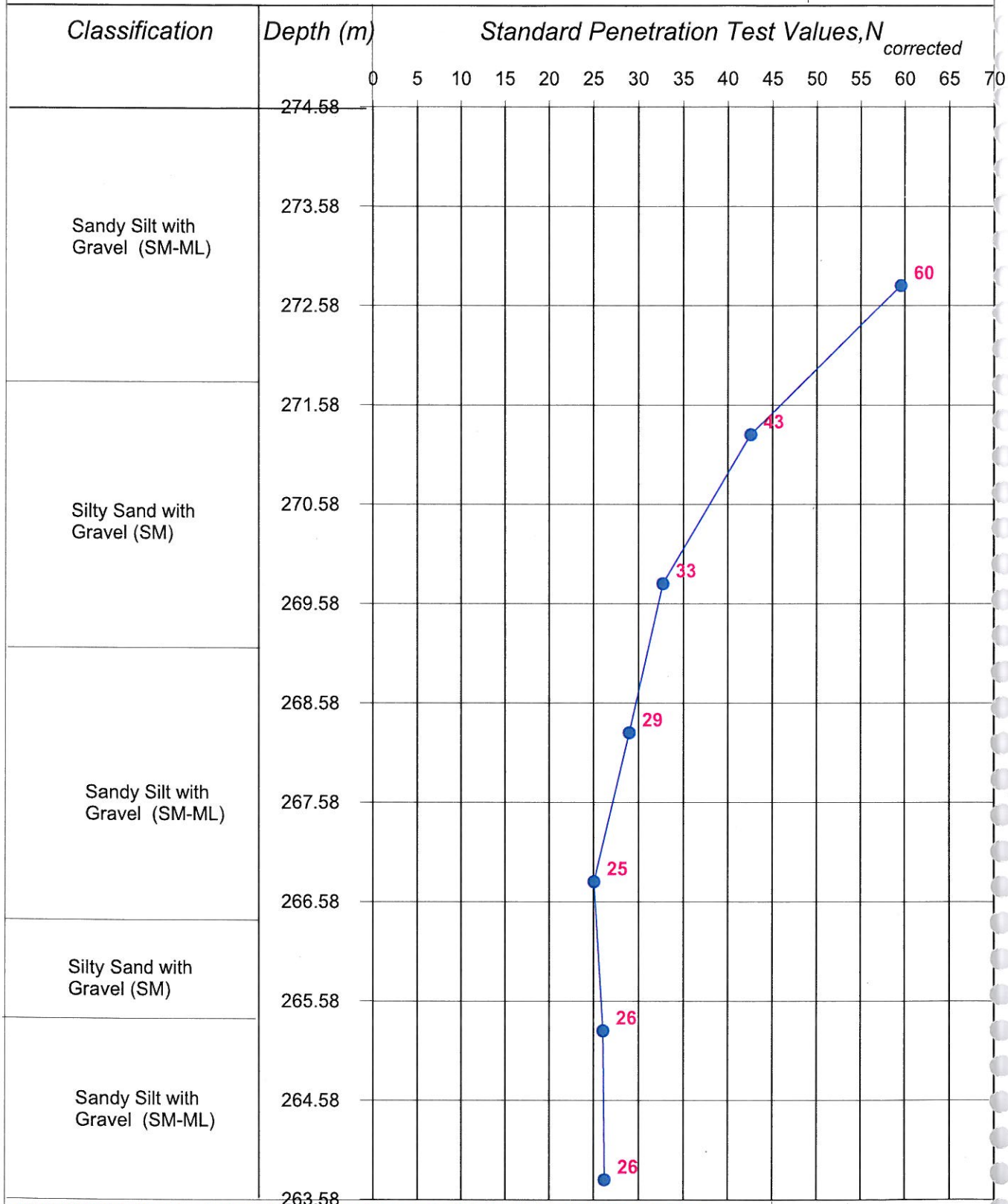
INTERDISTANCE 226/5-7

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-BL

0424

SOIL ENGINEERING CONSULTANTS | Interdistance @ 226/5-7 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP-BL

0472

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 275.436

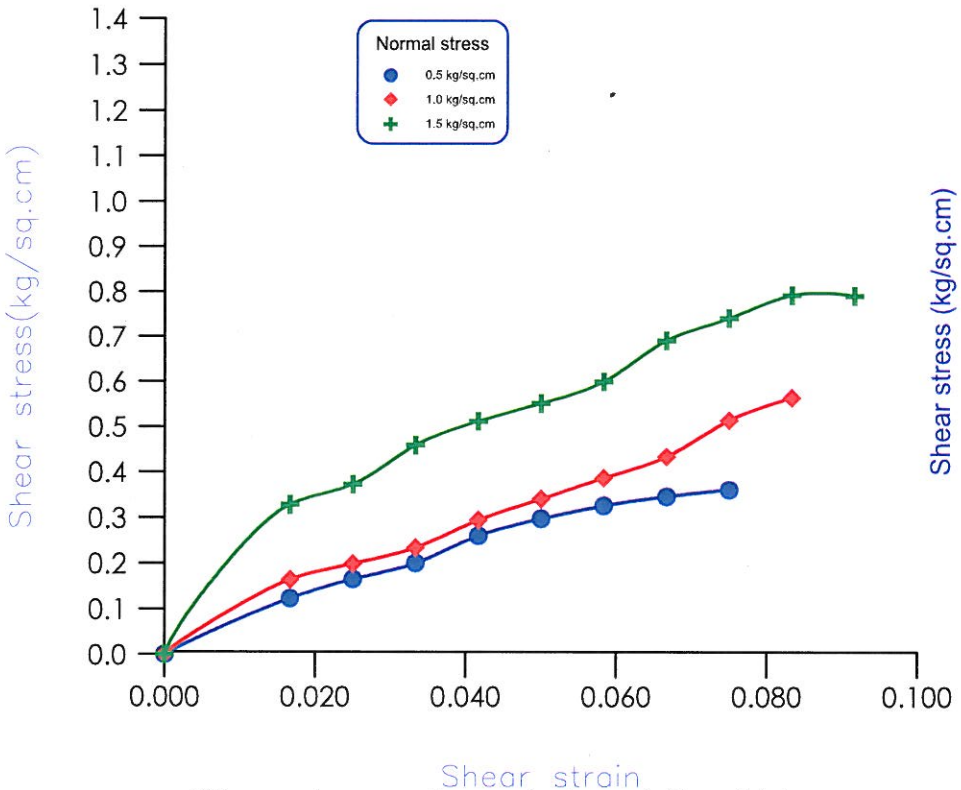
Interdistance@ 232/1-3
BH No.: 1
Depth : 12.00
Depth of Water table : Not Met

Date of start : 18/05/2008
Date of finish : 19/05/2008

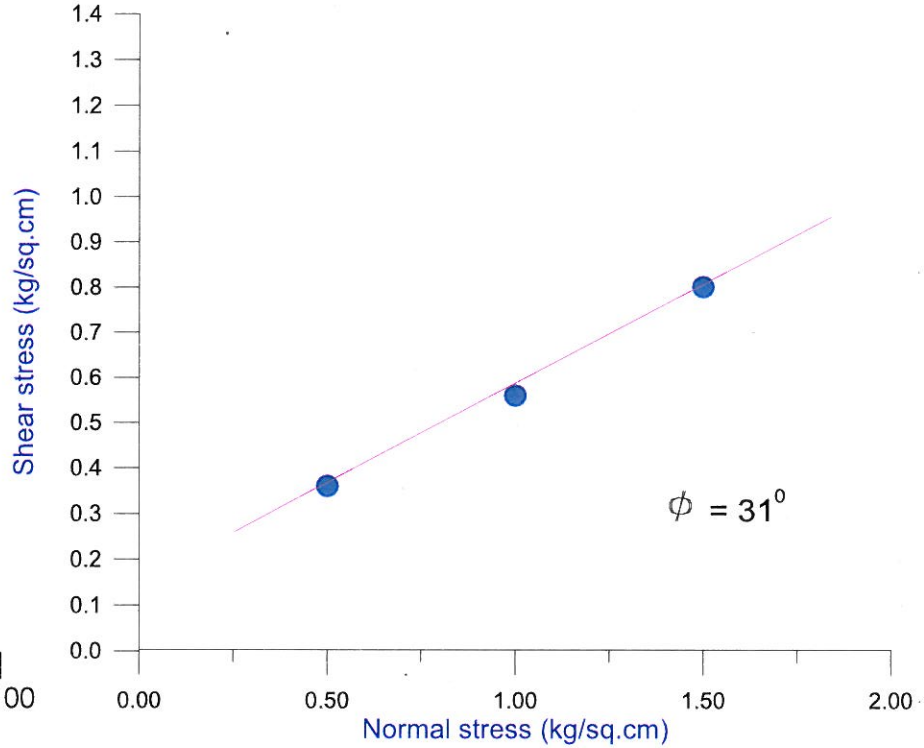
SON ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
					Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P. L		Type of test	C(kg/sq.cm)	phi(degrees)	
275.436																	
274.936	0.50	DS			0	9	91				Non	Plastic					
273.636	1.80	SPT		16	0	6	94				Non	Plastic					
272.936	2.50	UDS						1.8	1.57	14.43				DST	0.15	31	
272.136	3.30	SPT		18	0	4	96				Non	Plastic					
270.636	4.80	SPT		22	0	2	98				Non	Plastic					
269.936	5.50	UDS	Sandy Silt with Gravel (SM-ML)					1.84	1.59	15.81			2.67	DST	0.15	31	
269.136	6.30	SPT		28	0	3	97				Non	Plastic					
267.636	7.80	SPT		18	7	12	81				Non	Plastic					
266.936	8.50	UDS						184	158.31	16.23				DST	0.1	31	
266.136	9.30	SPT		25	0	15	85				Non	Plastic					
264.636	10.80	SPT		39	0	43	57				Non	Plastic					
263.936	11.50	UDS						1.96	1.67	17.41			2.68	DST	1	32	
263.136	12.30	SPT		41	0	39	61				Non	Plastic					

BH-1
DEPTH = 2.80 m.



(Shear stress - shear strain relationship)



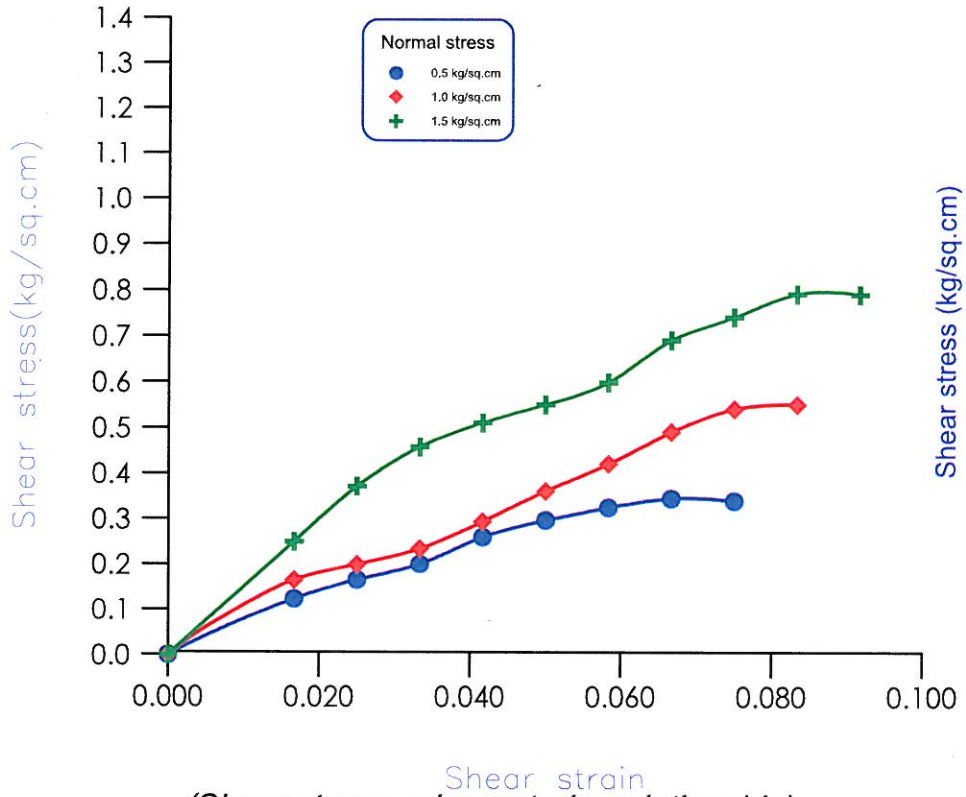
(Shear stress - Normal stress relationship)

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

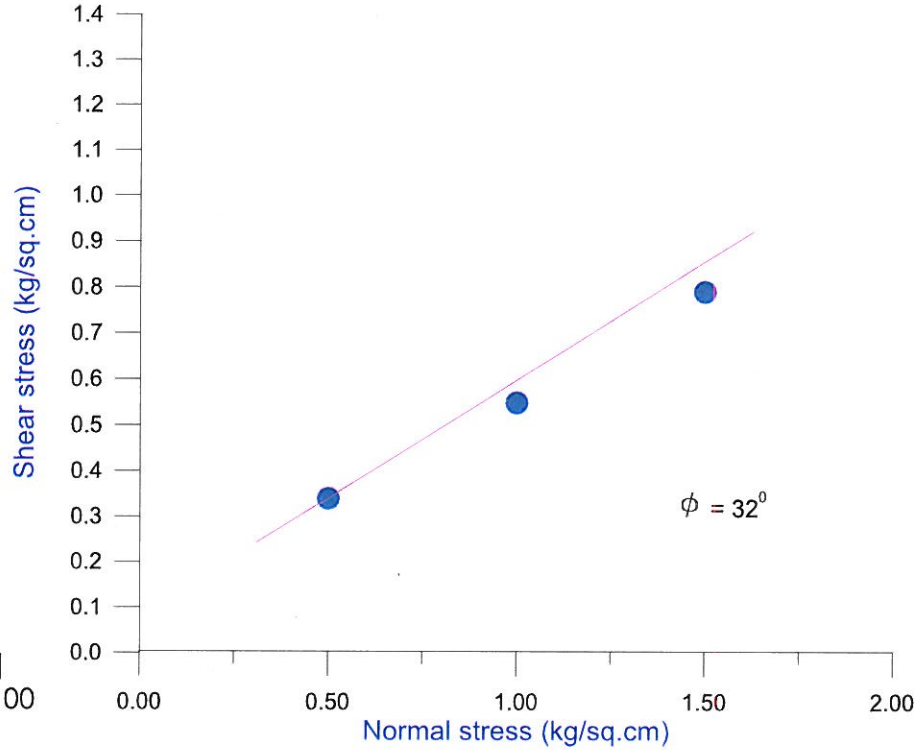
FIG- DS-BT1

0473

BH-1
DEPTH = 11.50 m.



(Shear stress - shear strain relationship)

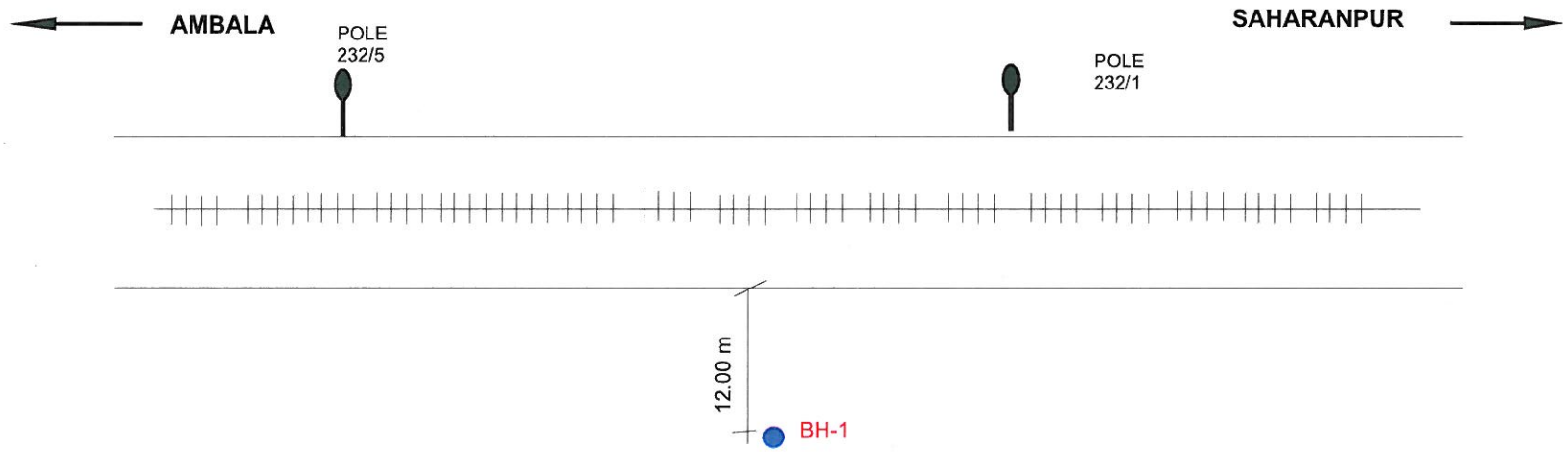


(Shear stress - Normal stress relationship)

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BT2

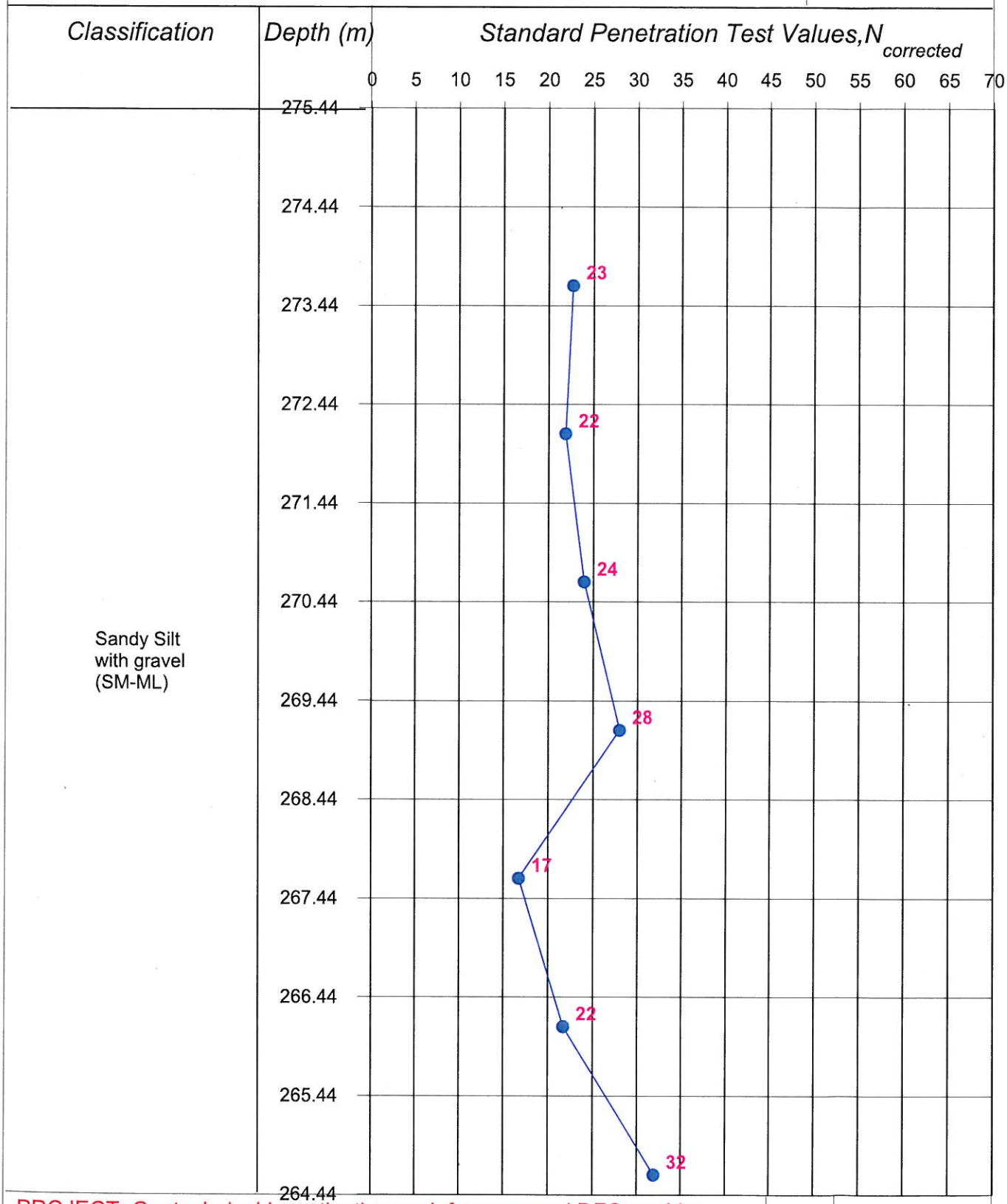
SOIL ENGINEERING CONSULTANTS **Job No: 1813**



INTERDISTANCE 232/1-3

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur **Fig: Plan-BT**

SOIL ENGINEERING CONSULTANTS | Interdistance : 232/1-3 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP--BT

0477

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 273.561

Location;234/21/23
BH No.: 1
Depth : 12.00
Depth of Water table : Not Met

Date of start : 19/05/2008
Date of finish : 20/05/2008

SOIL ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
				0 10 20 30 40 50 60 70 80 90 100	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L		Type of test	C(kg/sq.cm)	phi(degrees)	
273.561																	
273.061	0.50	USD			0	7	93				Non	Plastic					
271.761	1.80	SPT		17	2	9	89				Non	Plastic					
271.061	2.50	UDS						1.8	1.60	12.83			2.68	DST	0.16	30	
270.261	3.30	SPT		15	0	7	93				Non	Plastic					
268.761	4.80	SPT		14	0	3	97				Non	Plastic					
267.261	6.30	SPT	Sandy Silt with traces of Gravel (SM-ML)	20	0	4	96				Non	Plastic					
265.761	7.80	SPT		36	0	16	84				Non	Plastic					
265.061	8.50	UDS						1.87	1.63	14.71			2.69	DST	0.15	32	
264.261	9.30	SPT		27	0	5	95				Non	Plastic					
262.761	10.80	SPT		42	0	12	88				Non	Plastic					
261.261	12.30	SPT		27	0	3	97				Non	Plastic					

0478

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 273.439

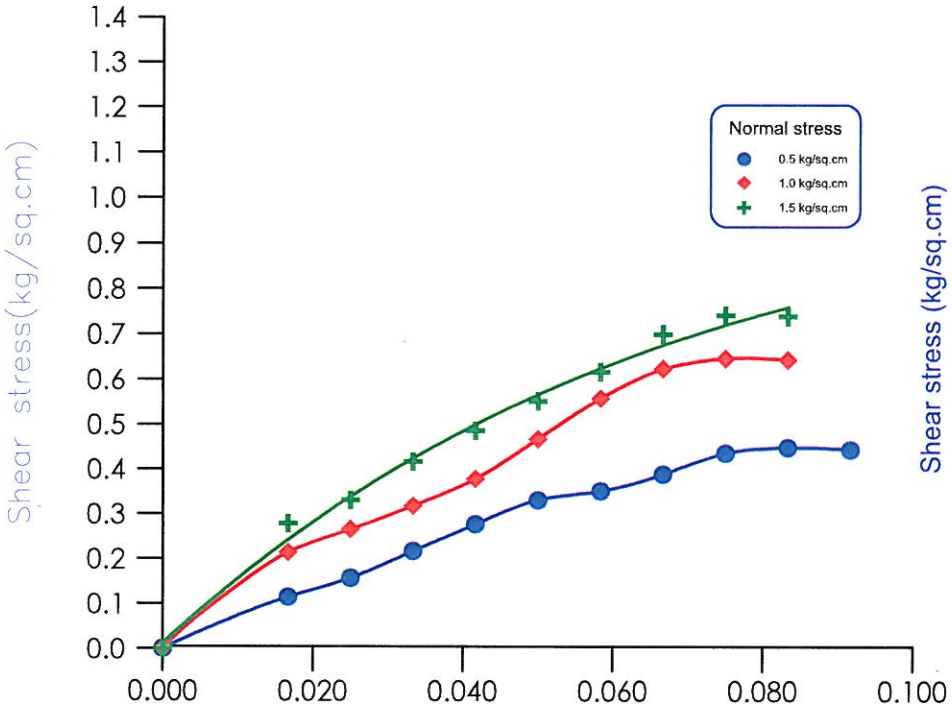
Location;234/21-23
BH No.: 1
Depth : 12.00
Depth of Water table : Not Met

Date of start : 19/05/2008
Date of finish : 20/05/2008

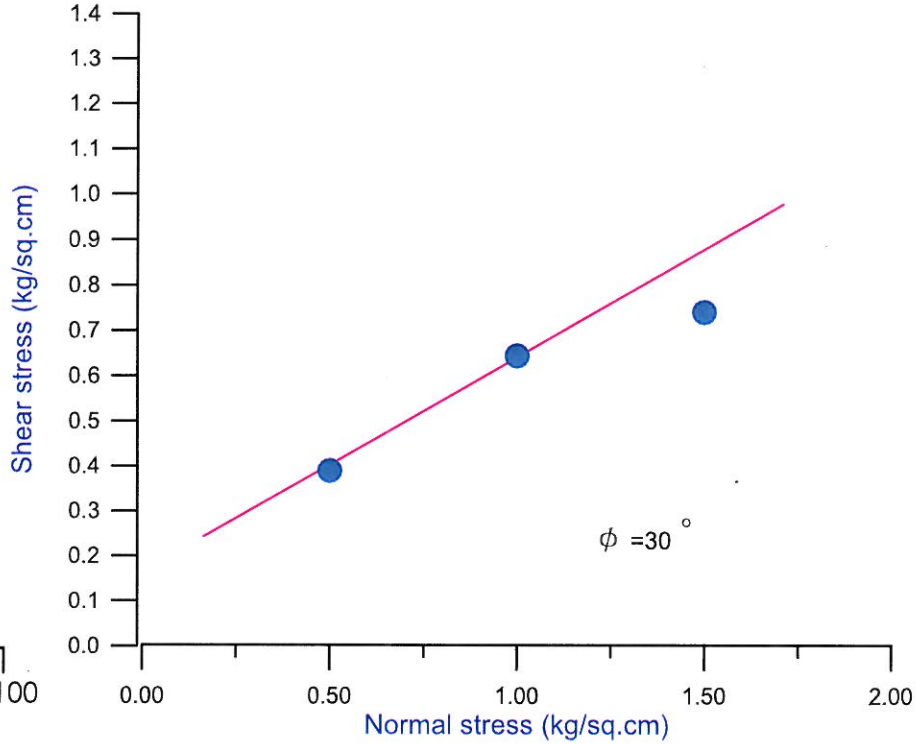
SOIL ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
				0 10 20 30 40 50 60 70 80 90 100 110 120	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P. L		Type of test	C(kg/sq.cm)	phi(degrees)	
273.439																	
272.939	0.50	USD			0	7	93				Non	Plastic					
271.639	1.80	SPT		17	2	9	89				Non	Plastic					
270.939	2.50	UDS						1.79	1.60	11.85				DST	0.15	30	
270.139	3.30	SPT		15	0	7	93				Non	Plastic					
268.639	4.80	SPT		14	0	3	97				Non	Plastic					
			Sandy Silt with Gravel (SM-ML)														
267.139	6.30	SPT		20	0	4	96				Non	Plastic					
265.639	7.80	SPT		36	0	16	84				Non	Plastic					
264.939	8.50	UDS						1.84	1.59	15.42			2.66	DST	0.15	31	
264.139	9.30	SPT		27	0	5	95				Non	Plastic					
262.639	10.80	SPT		42	0	12	88				Non	Plastic					
261.139	12.30	SPT		27	0	3	97				Non	Plastic					

BH-1
Depth-2.50m



(Shear stress - shear strain relationship)



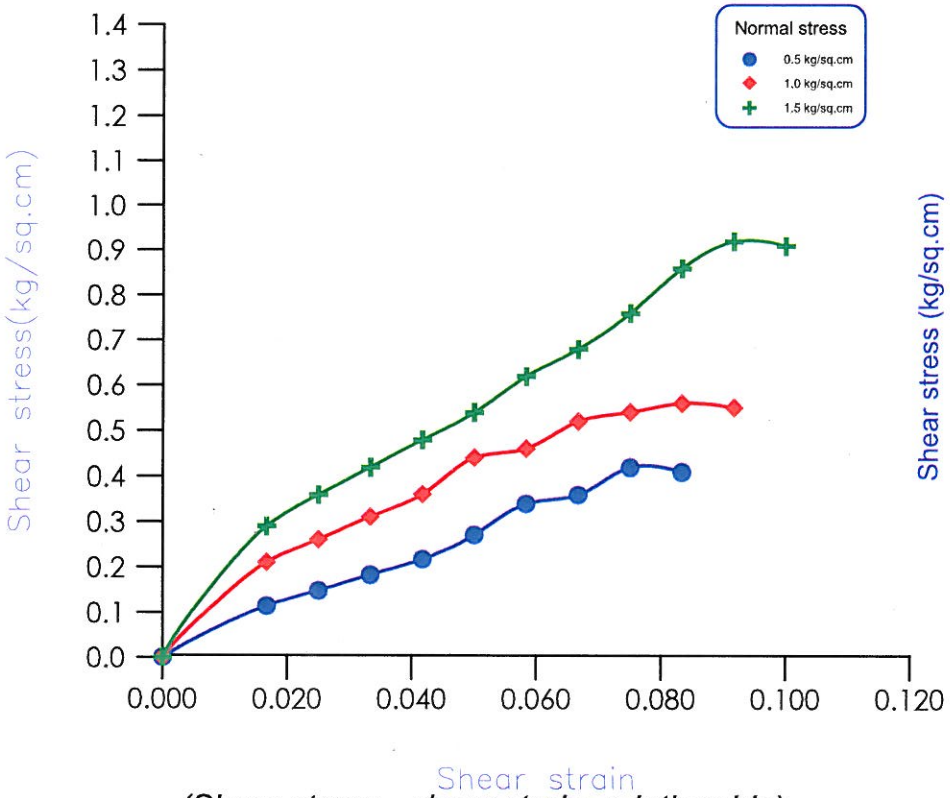
(Shear stress - Normal stress relationship)

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

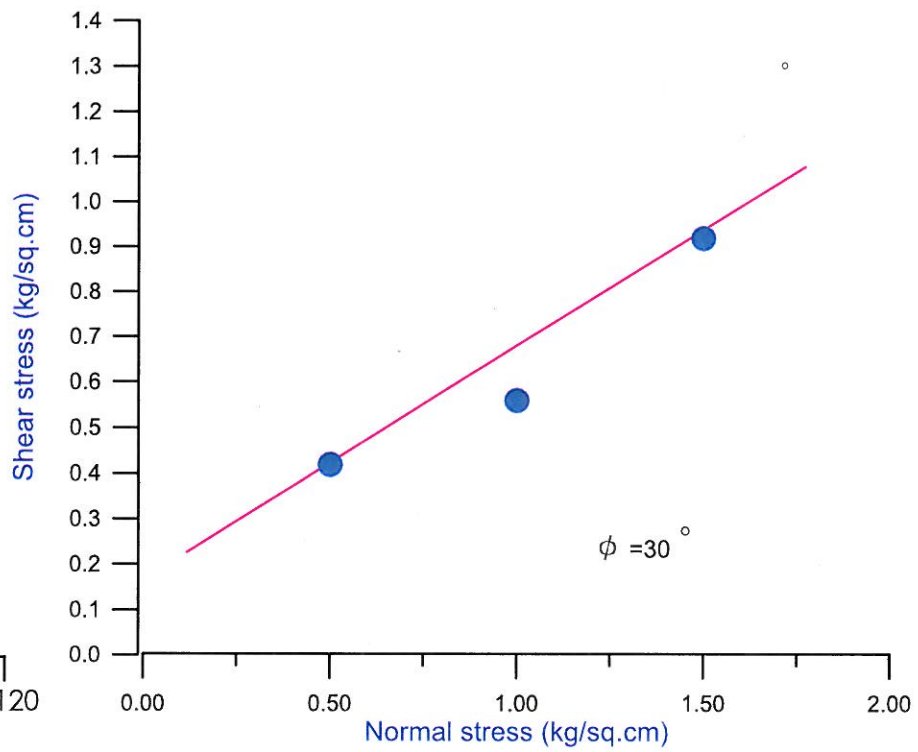
FIG- DS-BF

0480

BH-1
Depth-2.50m



(Shear stress - shear strain relationship)

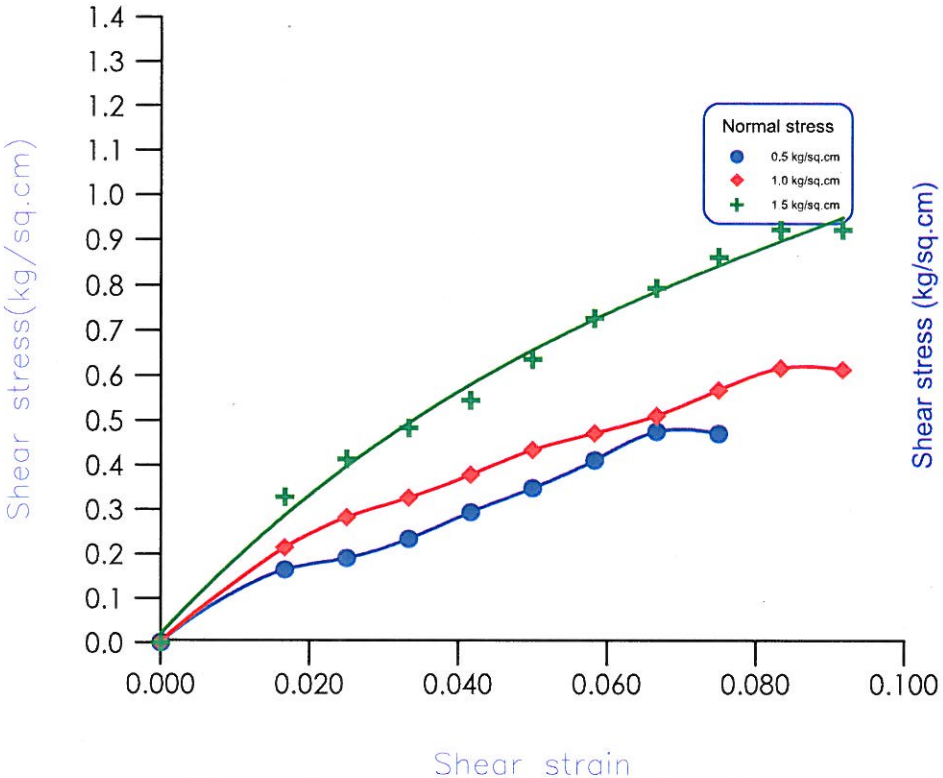


(Shear stress - Normal stress relationship)

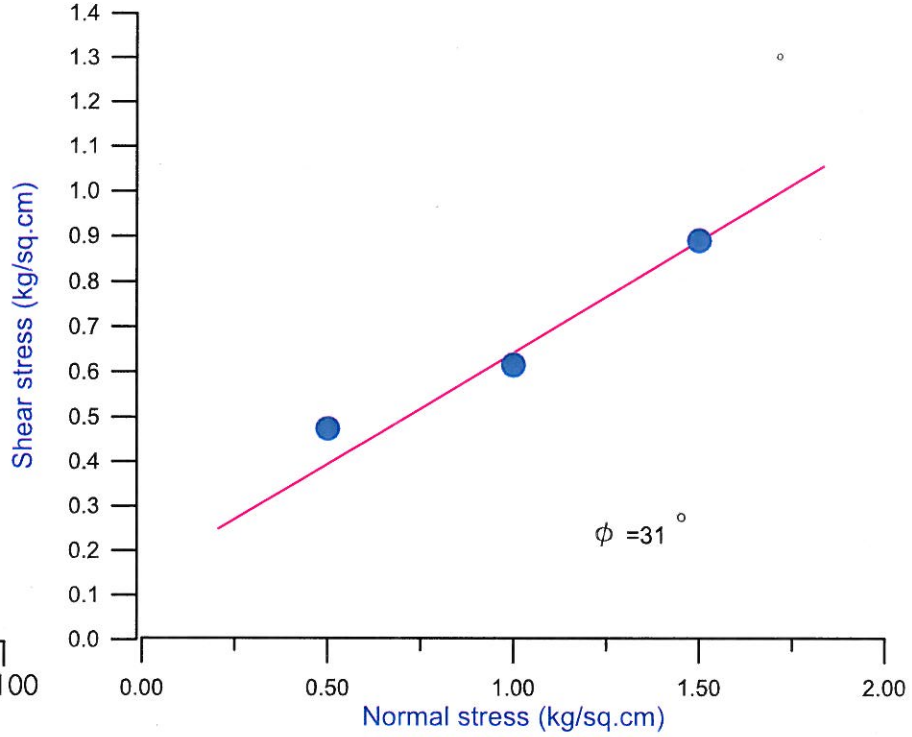
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG-BX

BH-1
Depth-8.50m



(Shear stress - shear strain relationship)



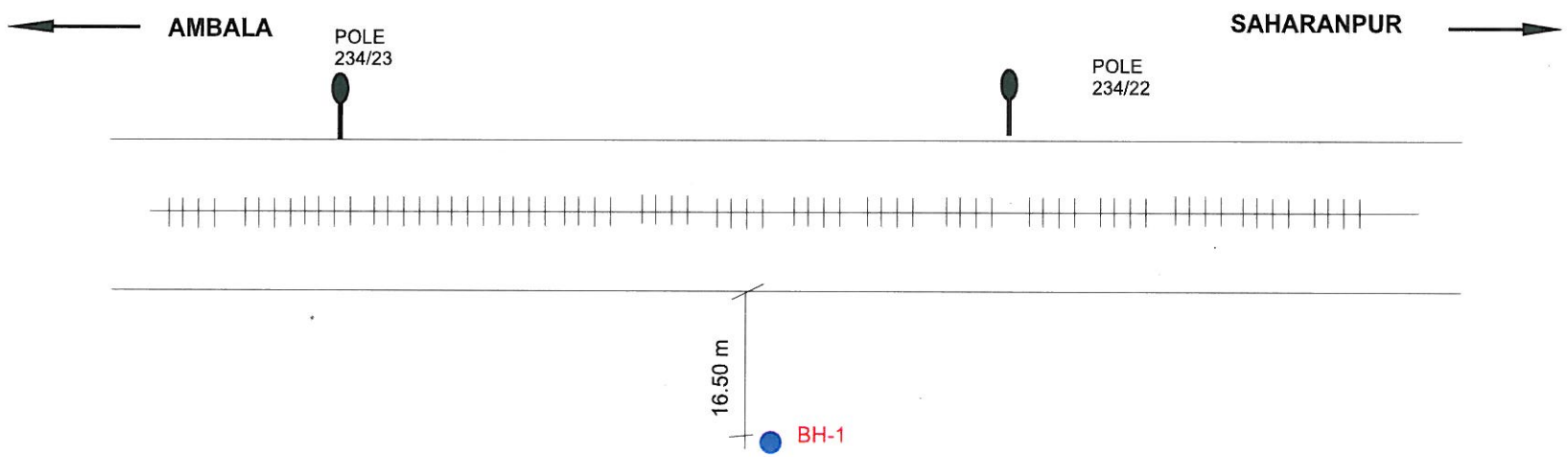
(Shear stress - Normal stress relationship)

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BX2

SOIL ENGINEERING CONSULTANTS

Job No: 1813



INTERDISTANCE 234/21-23

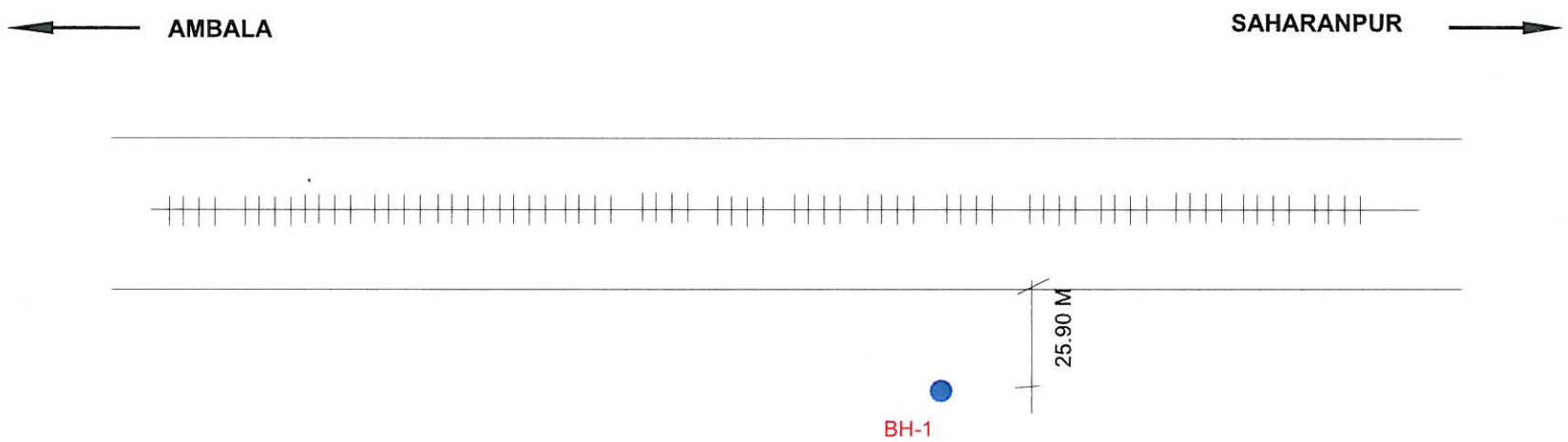
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-BF

0433

SOIL ENGINEERING CONSULTANTS

Job No: 1813



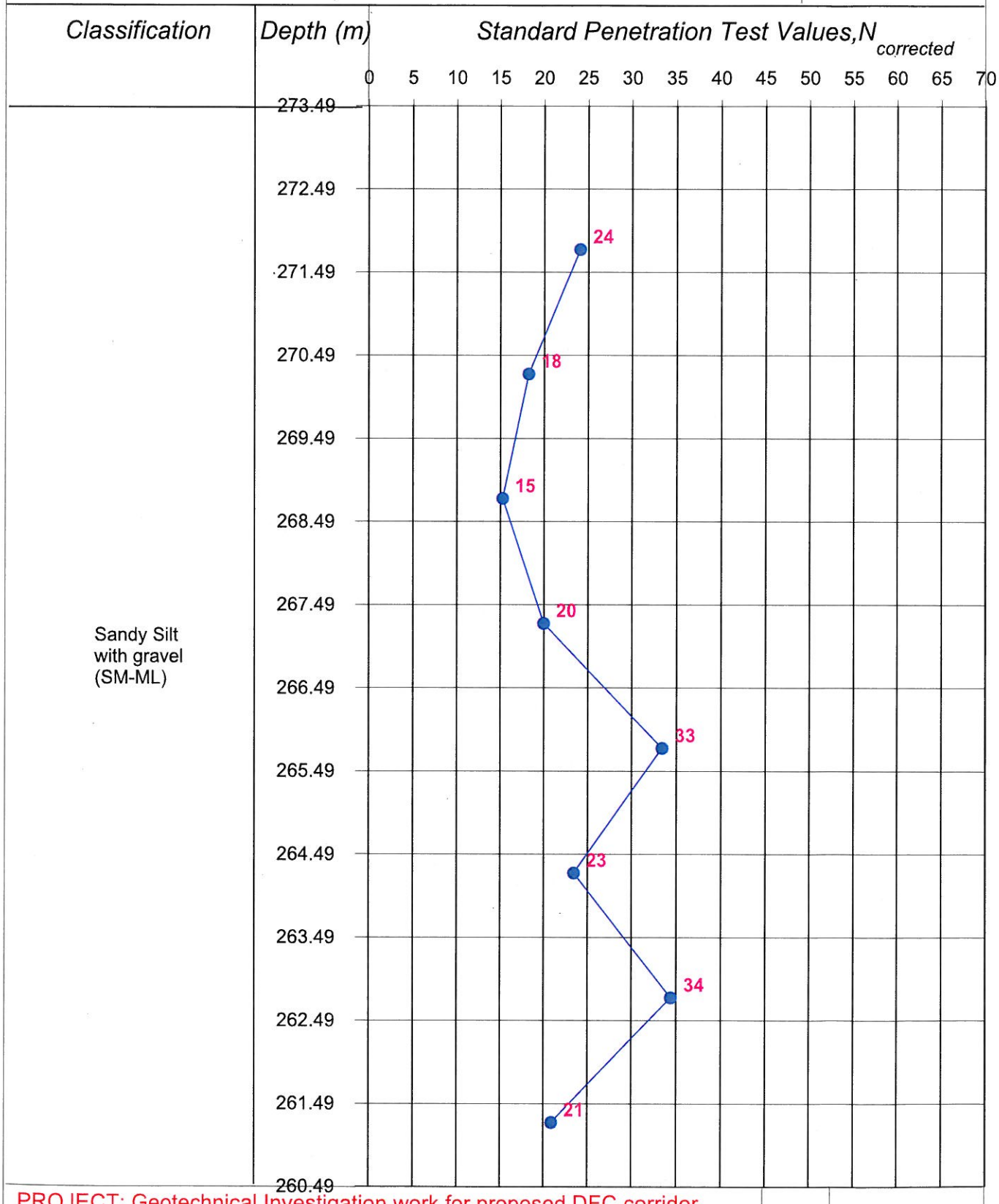
INTERDISTANCE @ 234/21-23

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-BX

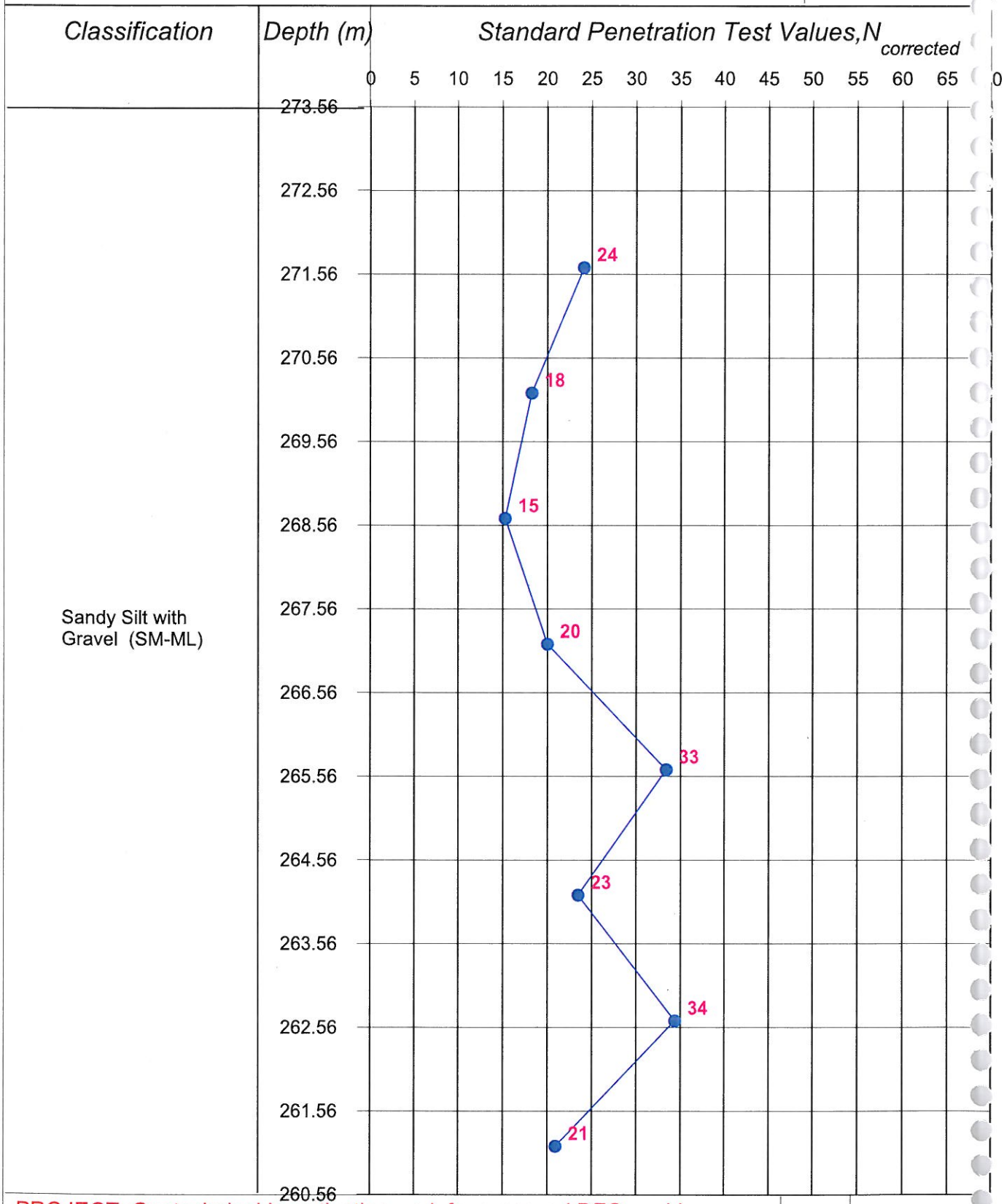
0484

SOIL ENGINEERING CONSULTANTS | Interdistance@ 234/21-23 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP--BF

SOIL ENGINEERING CONSULTANTS | Interdistance@ 234/21-23 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP - BX

0486

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 275.899

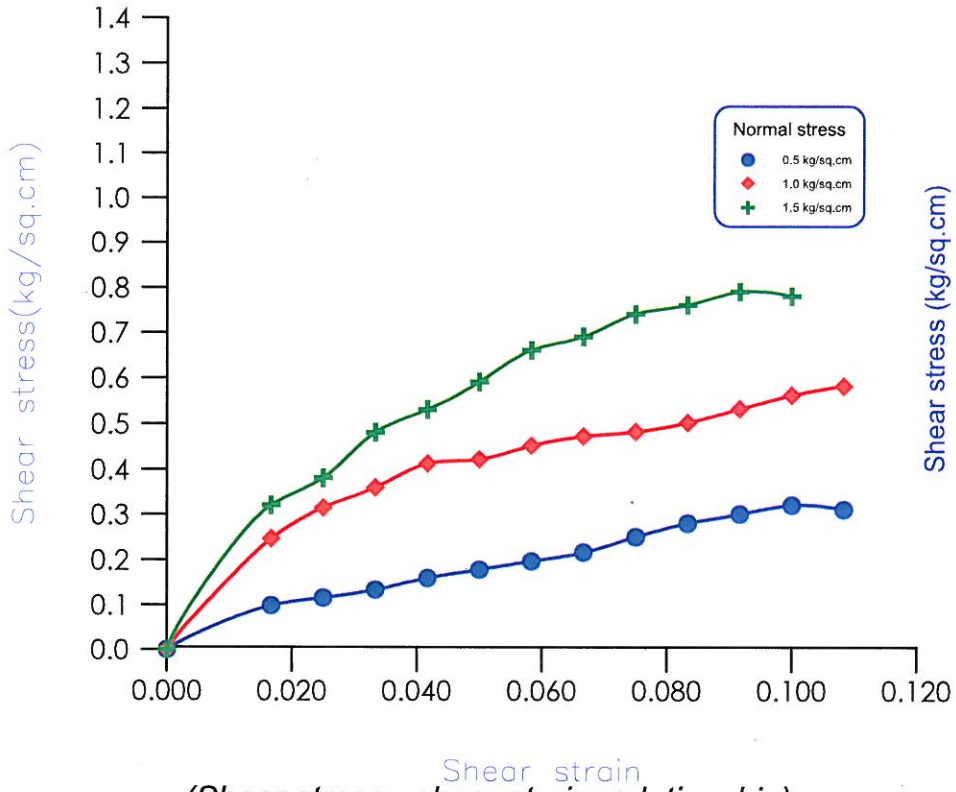
Location; 237/5-7
BH No.: 1
Depth : 12.00
Depth of Water table : Not Met

Date of start : 02/06/2008
Date of finish : 02/06/2008

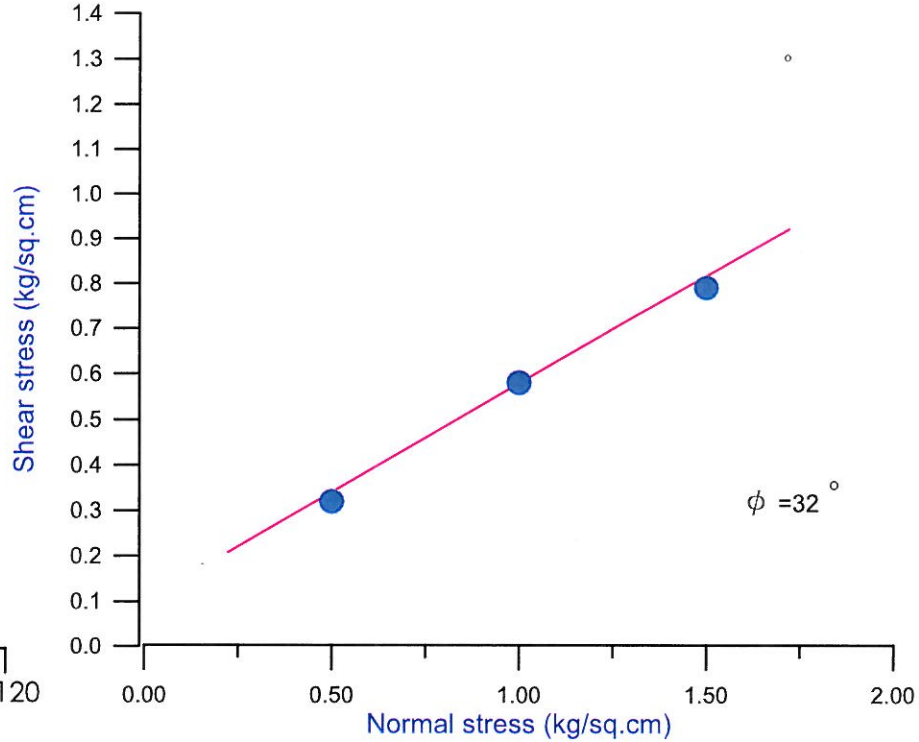
Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%) Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	r(dry)	W/C W(%)	Limits (%) L.L	P . L	Sp.Gr	Shear Parameters Type of test	C(kg/sq.cm)	phi(degrees)	Cc
275.899																	
274.099	1.80	SPT	Silty Clay of low plasticity (CL)	42	1	6	93				31	17					
273.399	2.50	UDS						1.94	1.69	14.46			2.69	UU	2.41	6	0.062
272.599	3.30	SPT		46	2	7	91				31	18					
271.099	4.80	SPT	Sandy Silt with Gravel (SM-ML)	45	1	30	69				Non	Plastic					
270.399	5.50	UDS						1.8	1.56	15.72			2.65	DST	0.1	30	
269.599	6.30	SPT		20	0	34	66				Non	Plastic					
268.099	7.80	SPT		32	0	30	70				Non	Plastic					
267.399	8.50	UDS						1.91	1.64	16.20				DST	0.1	32	
266.599	9.30	SPT		52	0	32	68				Non	Plastic					
265.099	10.80	SPT	Silty Sand (SM)	46	0	53	47				Non	Plastic					
264.399	11.50	UDS	Sandy Silt with Gravel (SM-ML)					1.9	1.62	17.45				DST	0.1	32	
263.599	12.30	SPT		59	1	47	52				Non	Plastic					

0487

BH-1
Depth-8.50m



(Shear stress - shear strain relationship)



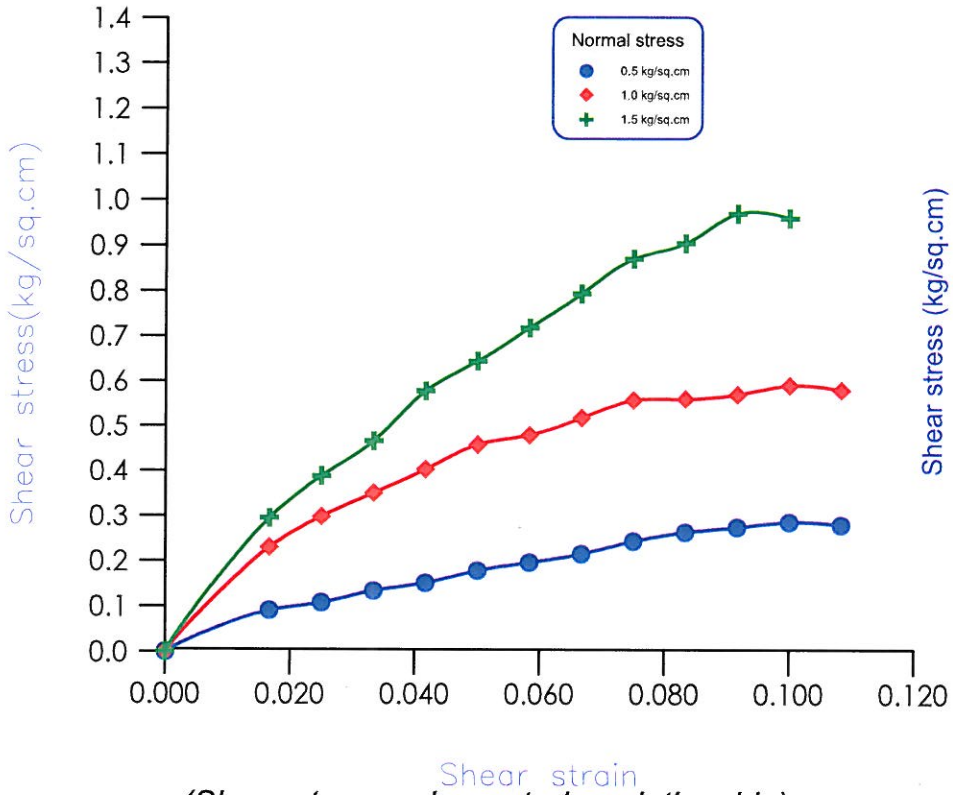
(Shear stress - Normal stress relationship)

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

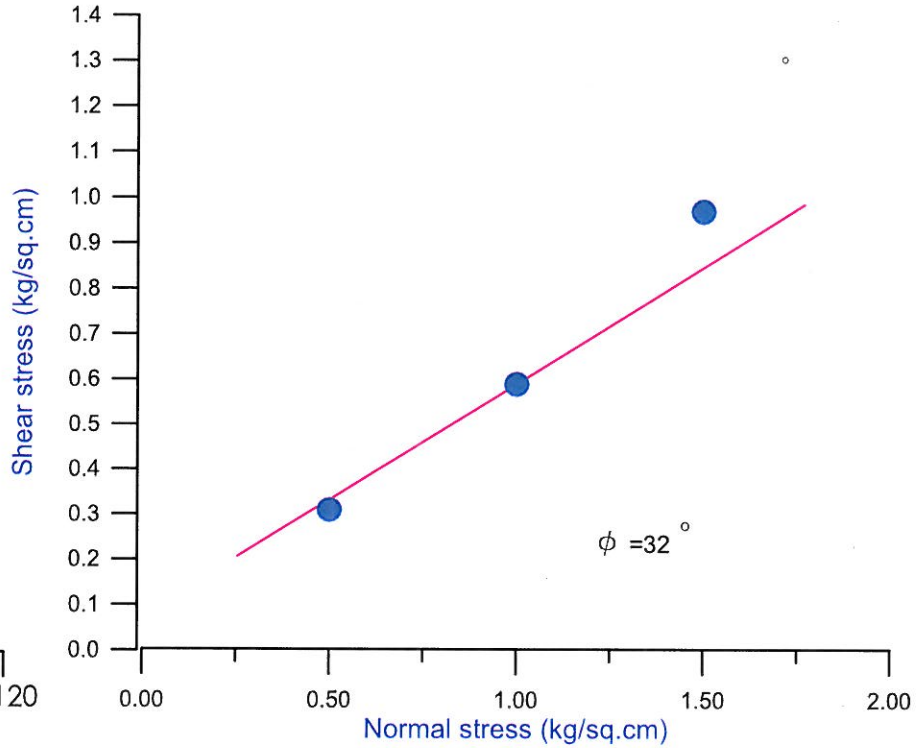
FIG- DS-CB1

0488

BH-1
Depth-8.50m



(Shear stress - shear strain relationship)



(Shear stress - Normal stress relationship)

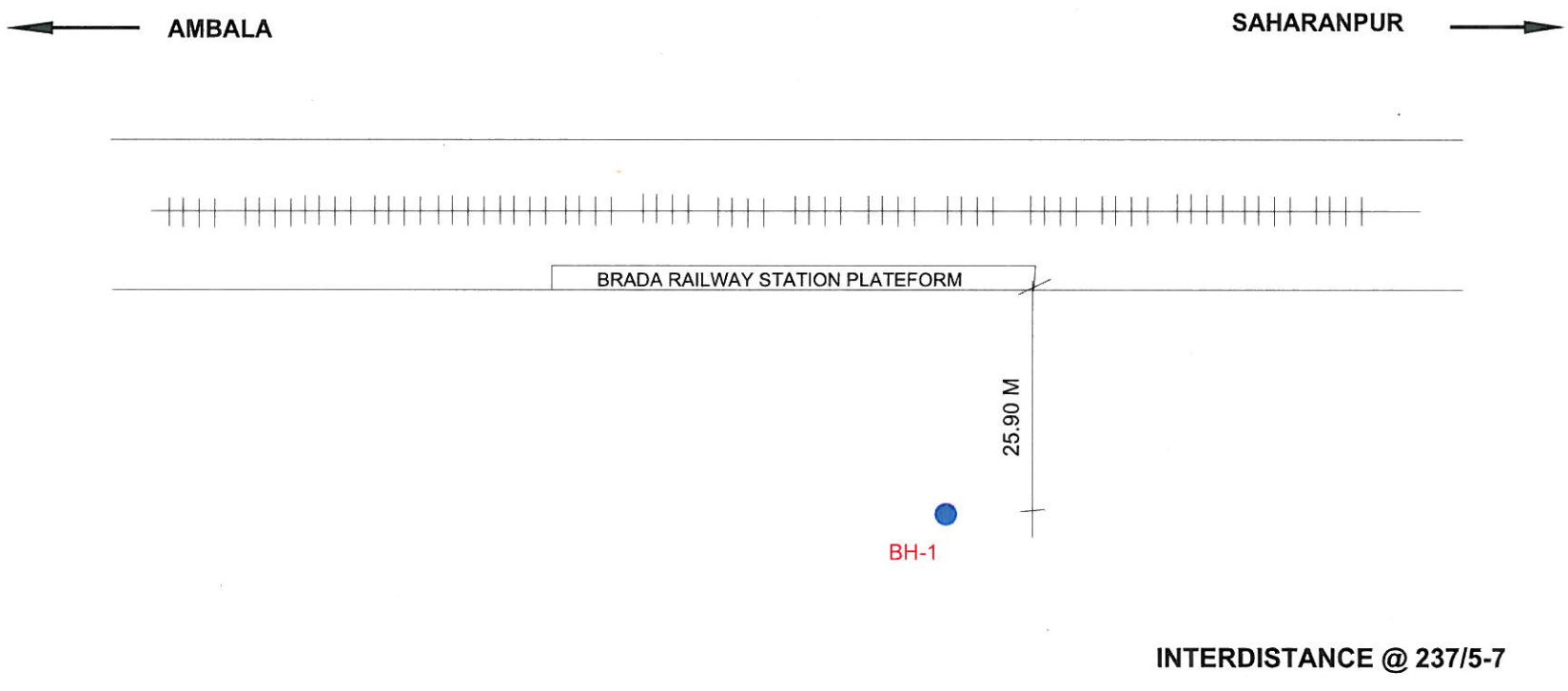
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-CB2

0489

SOIL ENGINEERING CONSULTANTS

Job No: 1813

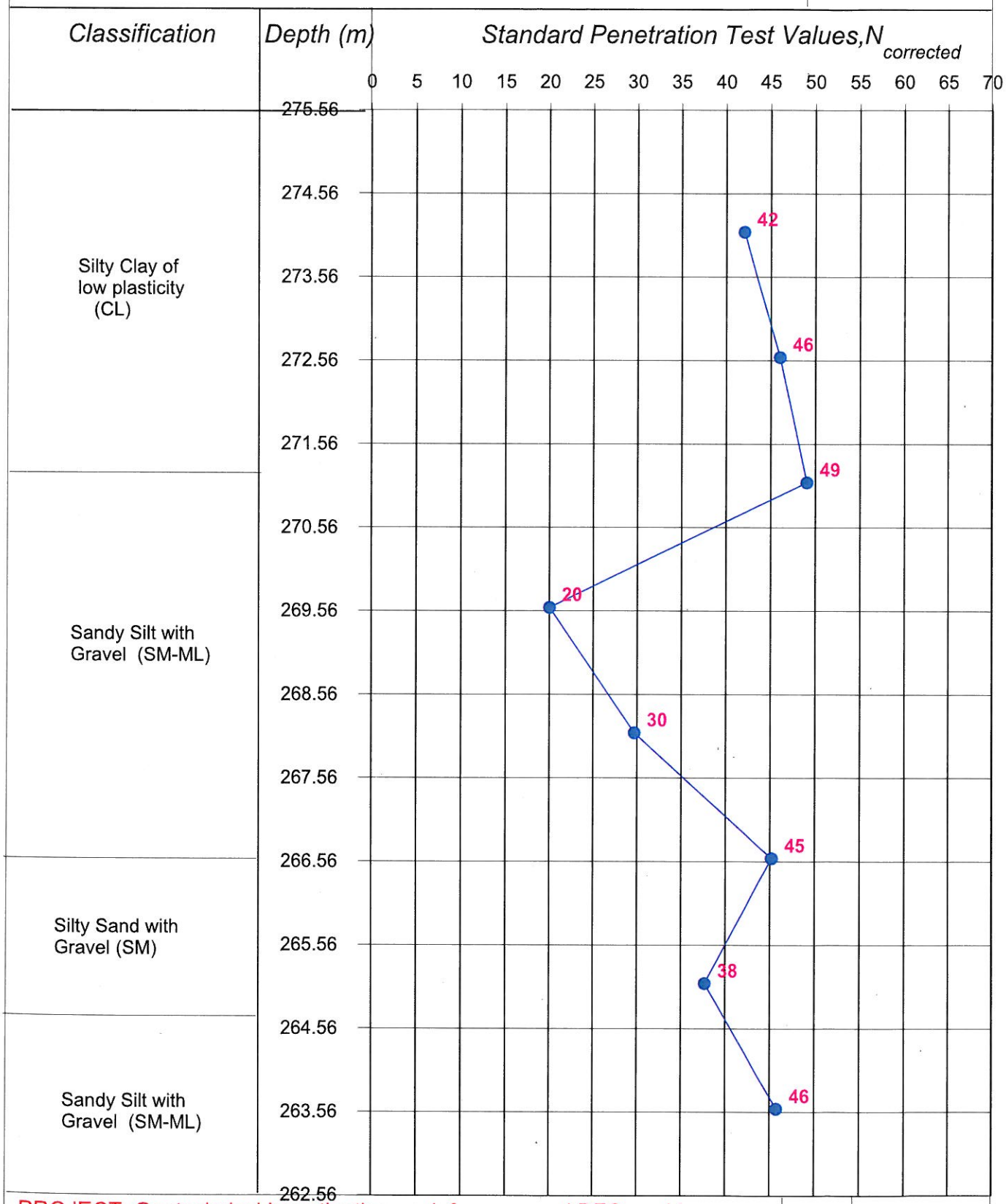


INTERDISTANCE @ 237/5-7

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-CB

SOIL ENGINEERING CONSULTANTS | Interdistance@ 237/5-7 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP - CB

0491

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 271.866

Location; 240/19-21
BH No.: 1
Depth : 12.00
Depth of Water table : 4.00 m

Date of start : 29/05/2008
Date of finish : 29/05/2008

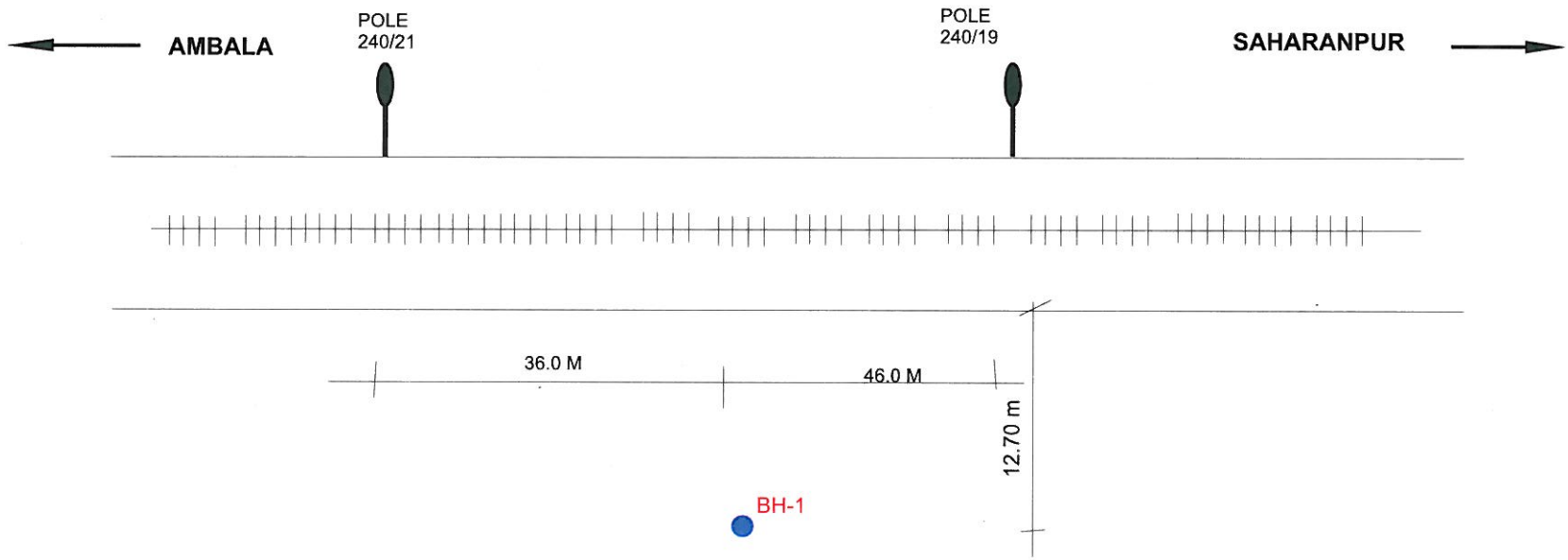
SOIL ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
				0 5 10 15 20 25 30 35 40	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L		Type of test	C(kg/sq.cm)	phi(degrees)	
271.866																	
270.066	1.80	SPT		6	0	4	96				48	23					
269.366	2.50	UDS						1.72	1.42	20.93				UU	0.48	3	0.081
268.566	3.30	SPT		8	2	6	92										
267.066	4.80	SPT		13	0	5	95										
266.366	5.50	UDS	Silty Clay of medium plasticity (CI)					1.87	1.52	22.69				UU	0.77		0.069
265.566	6.30	SPT		22	4	6	90				46	22					
264.066	7.80	SPT		17	6	8	86										
263.366	8.50	UDS						1.92	1.57	22.48			2.69	UU	0.96		0.063
262.566	9.30	SPT		20	0	4	96										
261.066	10.80	SPT		9	0	3	97				39	21					
260.366	11.50	UDS						1.72	1.41	21.64				UU	0.89		
259.566	12.30	SPT		19	0	2	98				37	20					

0490

SOIL ENGINEERING CONSULTANTS

Job No: 1813



INTERDISTANCE @ 240/19-21

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-CG

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 272.186

Location; 241/19-21
BH No.: 1
Depth : 12.00
Depth of Water table : 4.00 m

Date of start : 28/05/2008

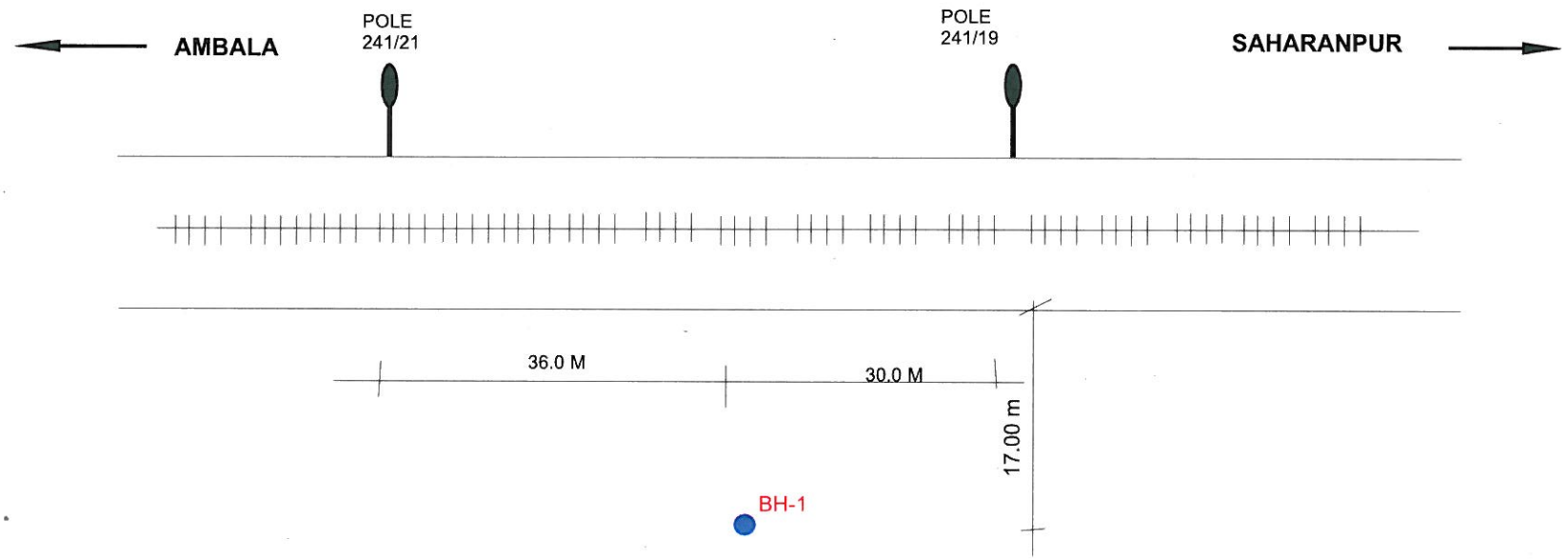
Date of finish : 28/05/2008

SOIL ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
				0 5 10 15 20 25 30 35 40	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L		Type of test	C(kg/sq.cm)	phi(degrees)	
272.186																	
270.386	1.80	SPT		13	0	5	95				34	20					
269.686	2.50	UDS						1.8	1.52	18.70				UU	0.71		0.076
268.886	3.30	SPT		11	2	15	83				36	20					
267.386	4.80	SPT		10	0	3	97				34	20					
265.886	6.30	SPT	Silty Clay of low plasticity (CL)	12	0	2	98				35	19					
264.386	7.80	SPT		18	0	3	97				34	20					
263.686	8.50	UDS						1.87	1.51	23.92			2.71	UU			0.064
262.886	9.30	SPT		20	3	7	90				33	20					
261.386	10.80	SPT		13	2	24	74										
260.686	11.50	UDS						1.84	1.53	20.41				UU	0.79		
259.386	12.30	SPT		14	0												

SOIL ENGINEERING CONSULTANTS

Job No: 1813



INTERDISTANCE @ 241/19-21

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-CH

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 272.344

Location; 242/19-21
BH No.: 1
Depth : 12.00
Depth of Water table : 4.00 m

Date of start : 27/05/2008

Date of finish : 27/05/2008

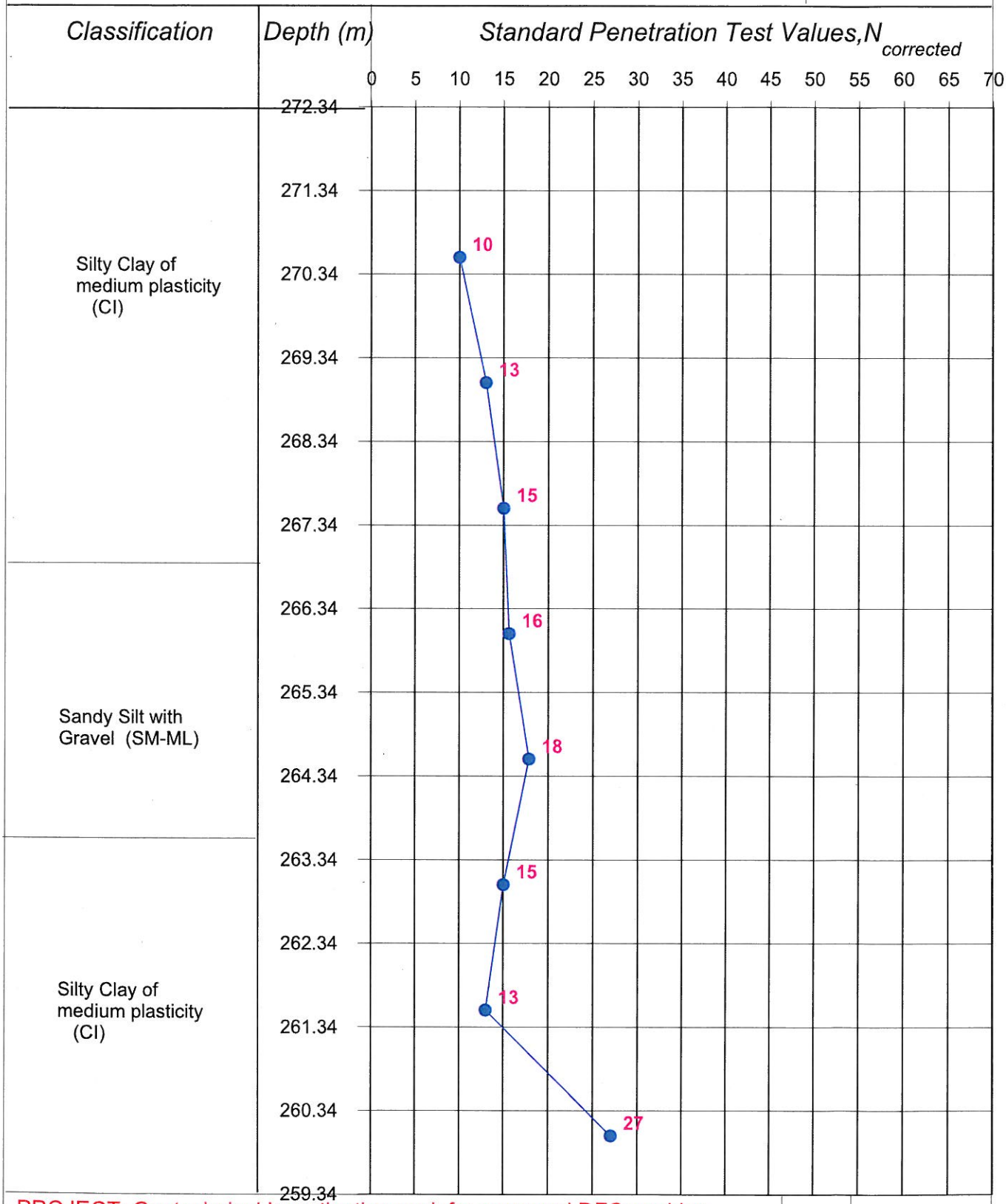
SOIL ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
					Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L		Type of test	C(kg/sq.cm)	phi(degrees)	
272.344																	
270.544	1.80	SPT		10	0	2	98				47	26					
269.844	2.50	UDS	Silty Clay of medium Plasticity (CI)					1.83	1.53	19.68			2.69	UU	0.59		0.076
269.044	3.30	SPT		13	0	5	95				42	23					
267.544	4.80	SPT		15	0	2	98				43	25					
266.044	6.30	SPT	Sandy Silt with Gravel (SM-ML)	14	0	10	90				Non	Plastic					
264.544	7.80	SPT		19	0	40	60				Non	Plastic					
263.044	9.30	SPT		15	0	2	98				39	24					
261.544	10.80	SPT	Silty Clay of medium Plasticity (CI)	13	0	2	98				36	24					
260.844	11.50	UDS						1.89	1.53	23.70			2.69	UU	0.94		0.061
260.044	12.30	SPT		25	0												

0 5 10 15 20 25 30 35 40

0493

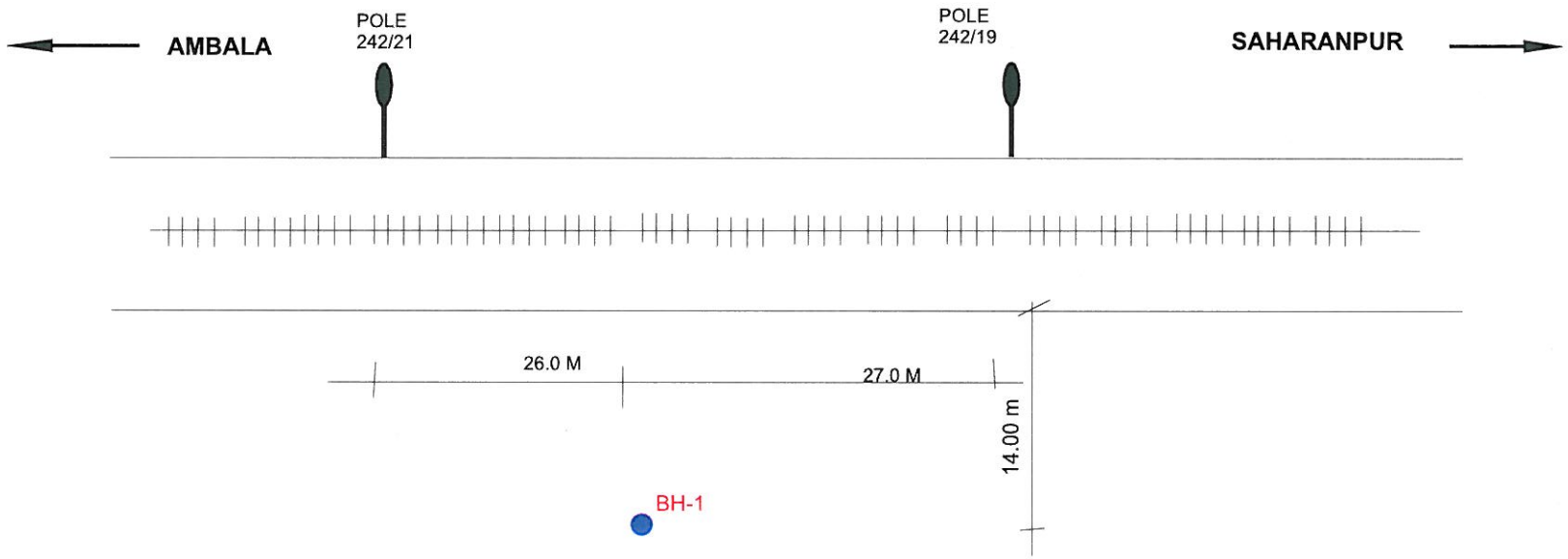
SOIL ENGINEERING CONSULTANTS | Interdistance@ 242/19-21 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP - CI

SOIL ENGINEERING CONSULTANTS

Job No: 1813



INTERDISTANCE @ 242/19-21

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-CI

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Project No. 1813 Interdistance RL: 271.490

Location; 244/9-11
BH No.: 1
Depth : 12.00
Depth of Water table : 4.50 m

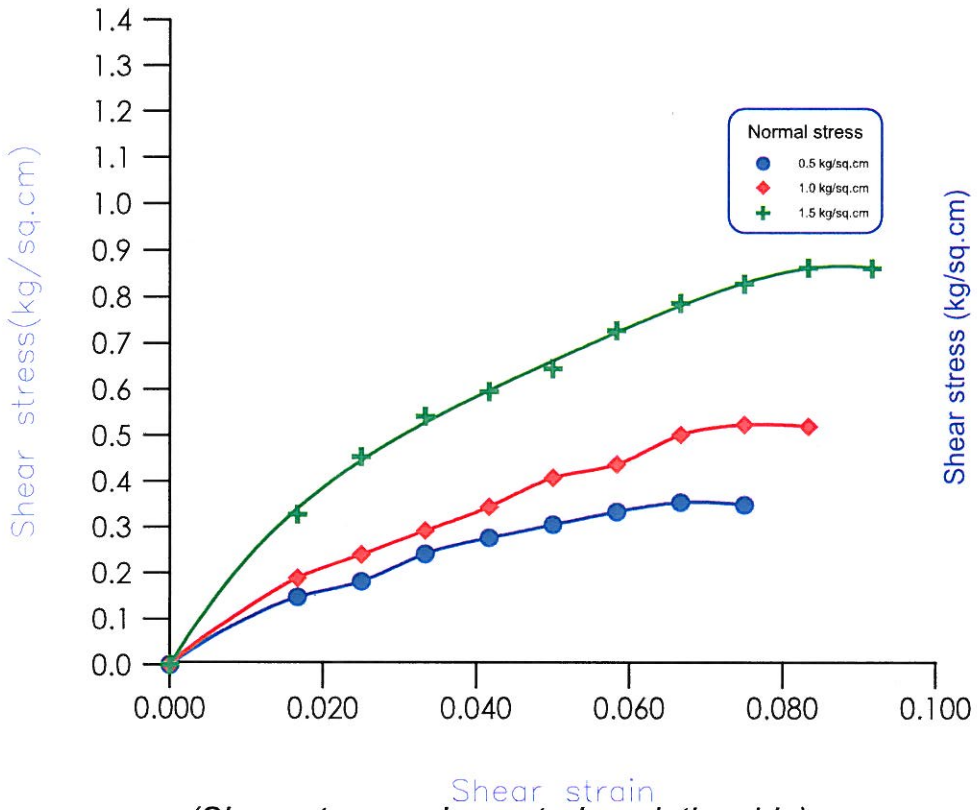
Date of start : 01/06/2008
Date of finish : 01/06/2008

SOIL ENGINEERING CONSULTANTS

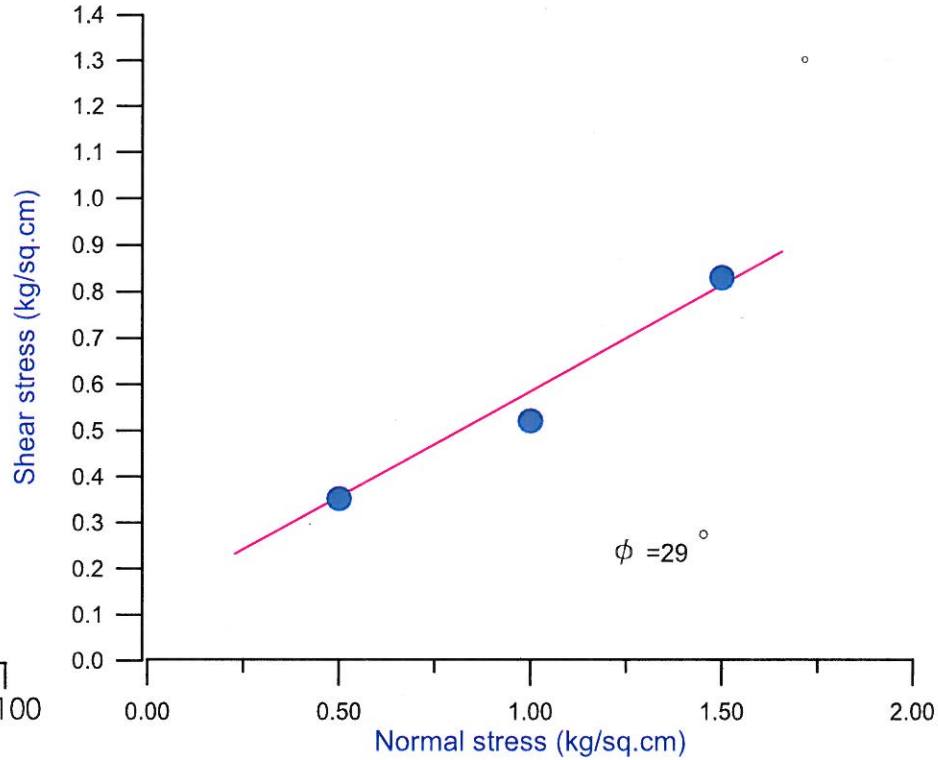
Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%)			Density (gm/cc)		W/C	Limits (%)		Sp.Gr	Shear Parameters			Cc
				0 10 20 30 40 50 60 70 80	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L		Type of test	C(kg/sq.cm)	phi(degrees)	
271.490																	
269.690	1.80	SPT		8	0	3	97					Non Plastic					
268.990	2.50	UDS						1.79	1.53	16.98			2.69	DST	0.15	29	
268.190	3.30	SPT		15	0	2	98					Non Plastic					
266.690	4.80	SPT		3	2	8	90					Non Plastic					
265.190	6.30	SPT	Sandy Silt with Gravel (SM-ML)	19	0	29	71					Non Plastic					
263.690	7.80	SPT		27	0	28	72					Non Plastic					
262.190	9.30	SPT		29	0	36	64					Non Plastic					
260.690	10.80	SPT		50	0	33	67					Non Plastic					
259.190	12.30	SPT		55	0	3	97					Non Plastic					

0490

BH-1
Depth-2.50m



(Shear stress - shear strain relationship)



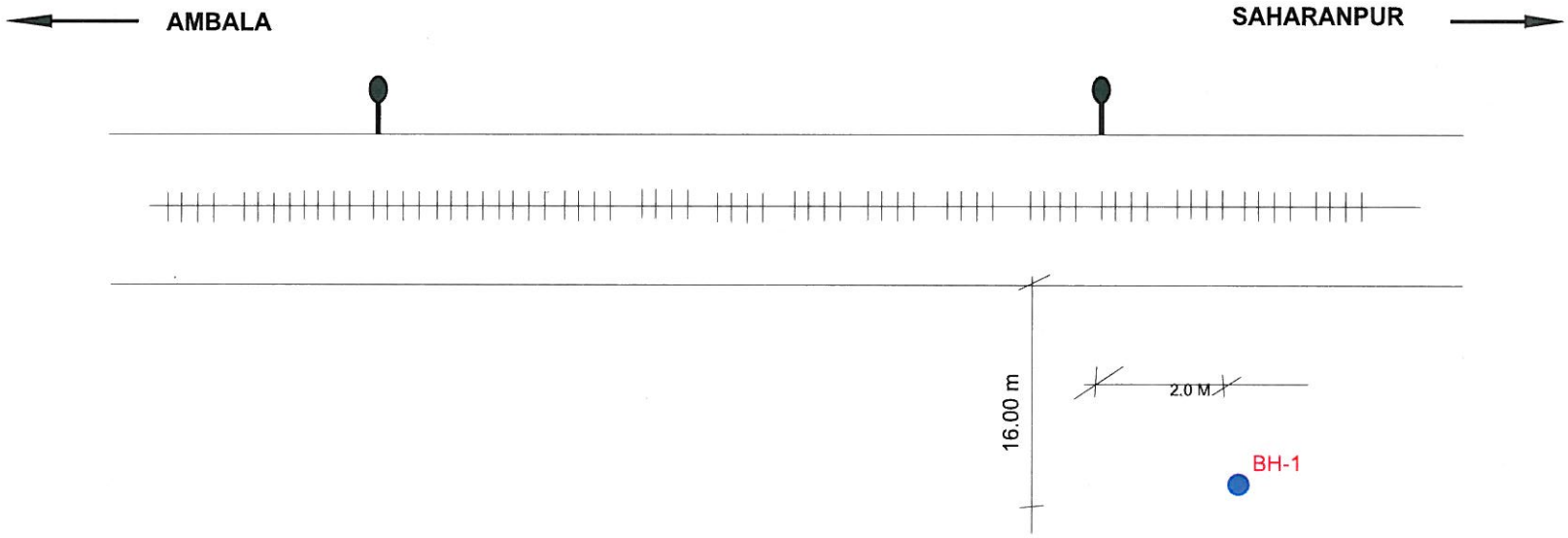
(Shear stress - Normal stress relationship)

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-CK1

SOIL ENGINEERING CONSULTANTS

Job No: 1813

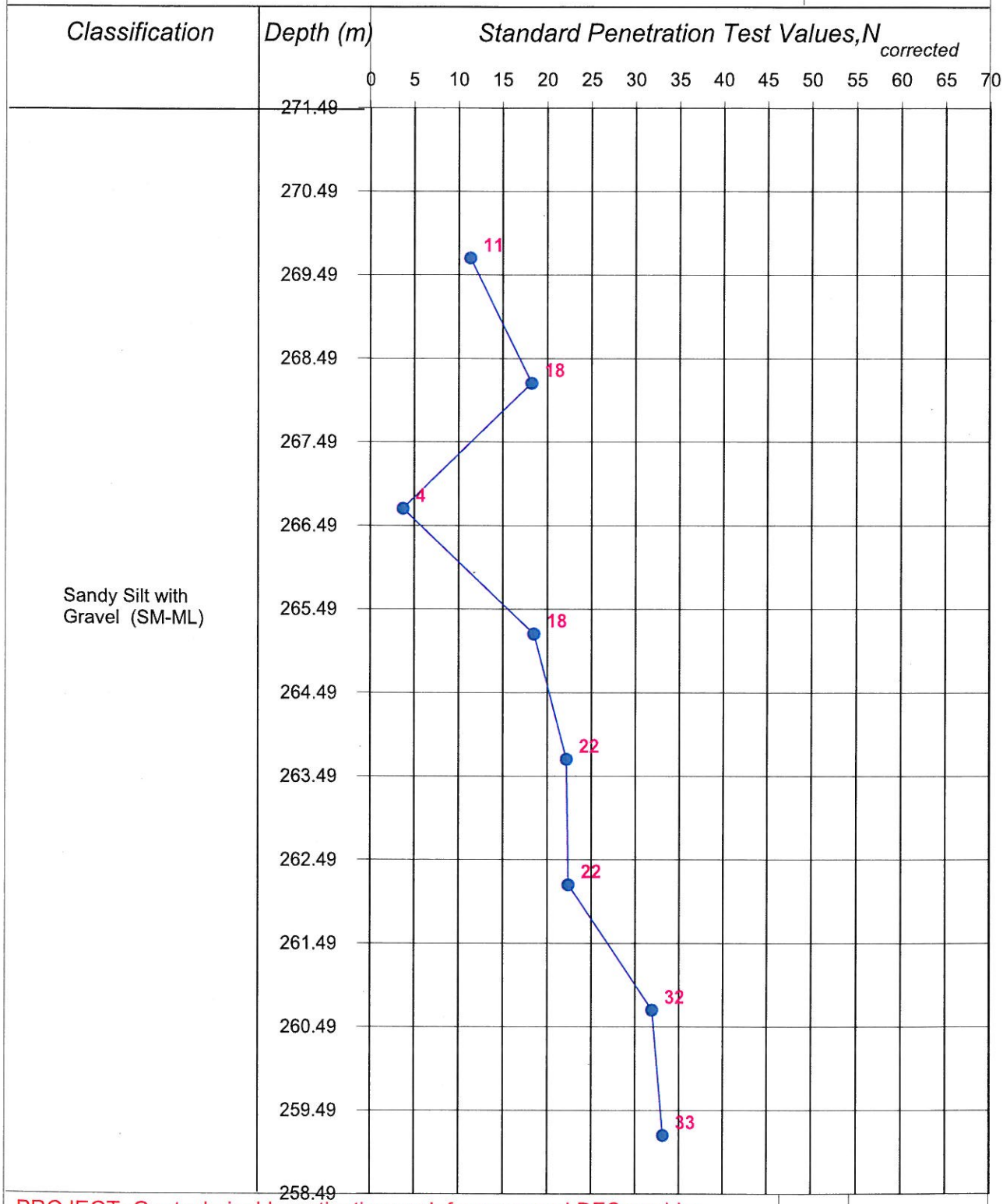


INTERDISTANCE @ 244/9-11

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-CK

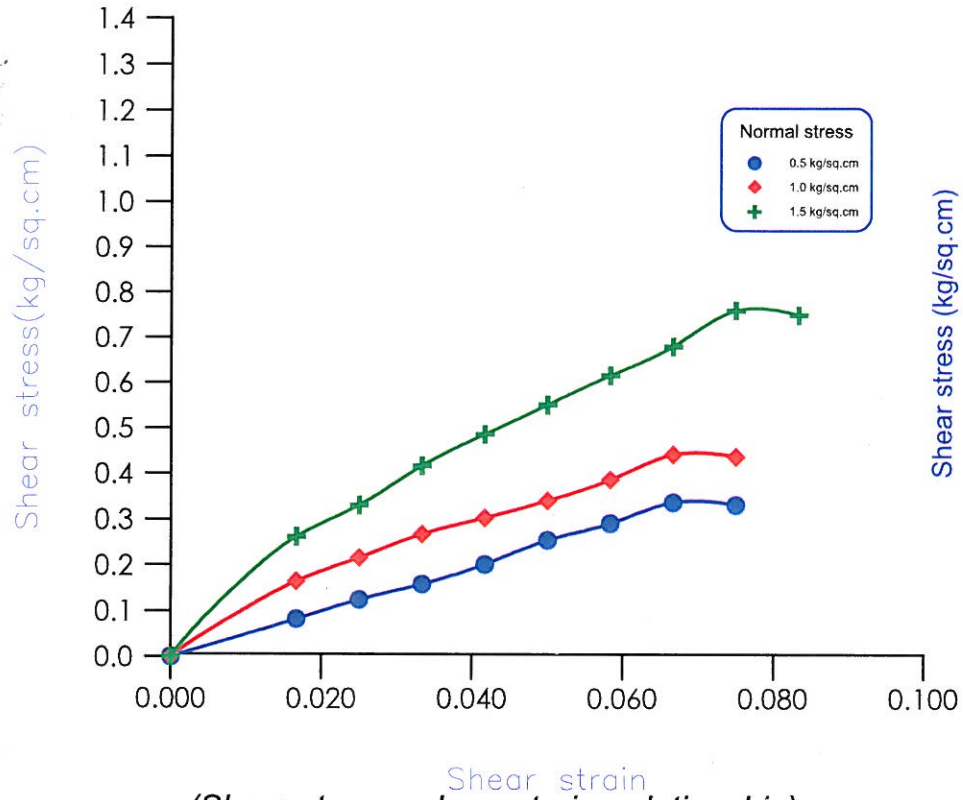
SOIL ENGINEERING CONSULTANTS | Interdistance@ 244/9-11 | Project No: 1813



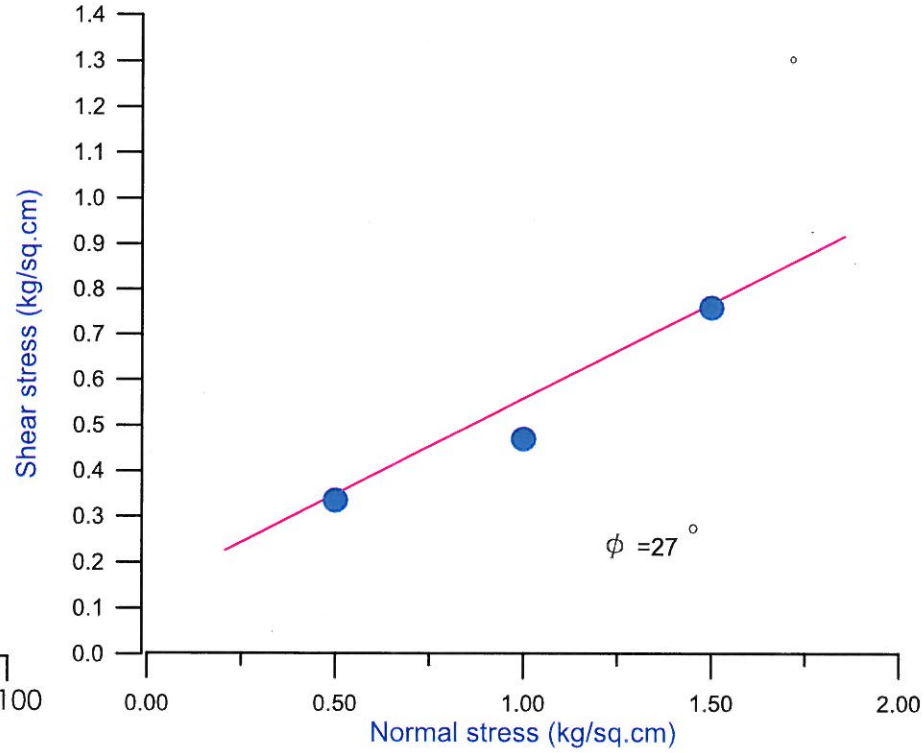
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP - CK

Soil Engineering Consltants | Interdistance@ 246/9-11 | Job.1813

BH-1
Depth-2.50m



(Shear stress - shear strain relationship)



(Shear stress - Normal stress relationship)

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | FIG- DS-CM-1

0503

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

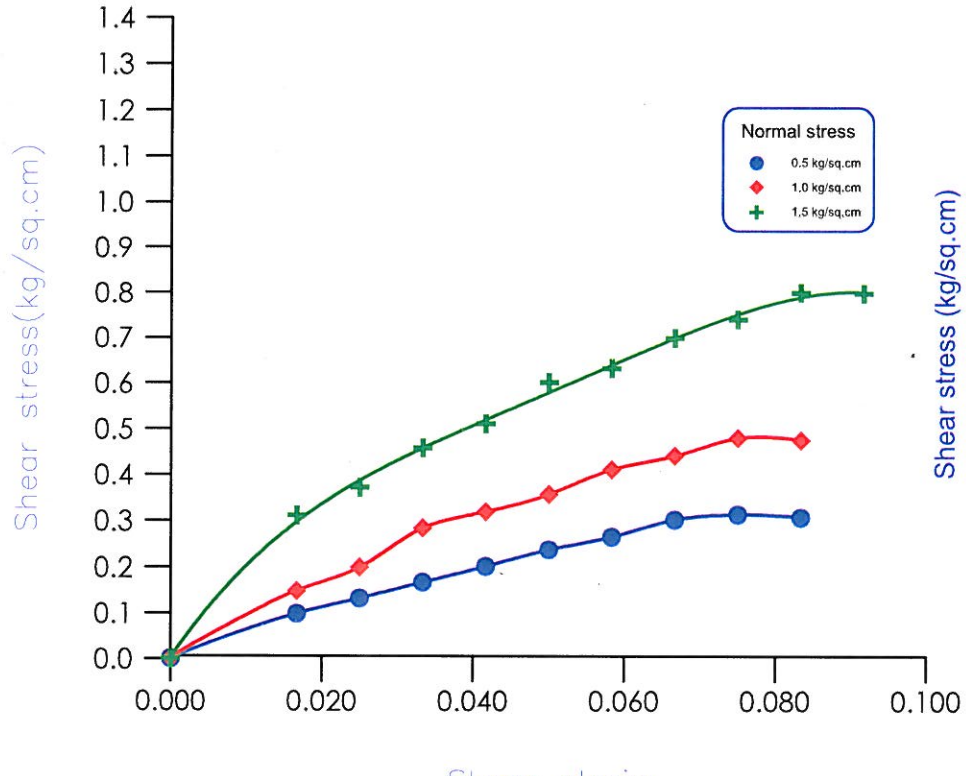
Project No. 1813 Interdistance RL: 271.891

Location; 246/9-11
BH No.: 1
Depth : 12.00
Depth of Water table : 3.40 m

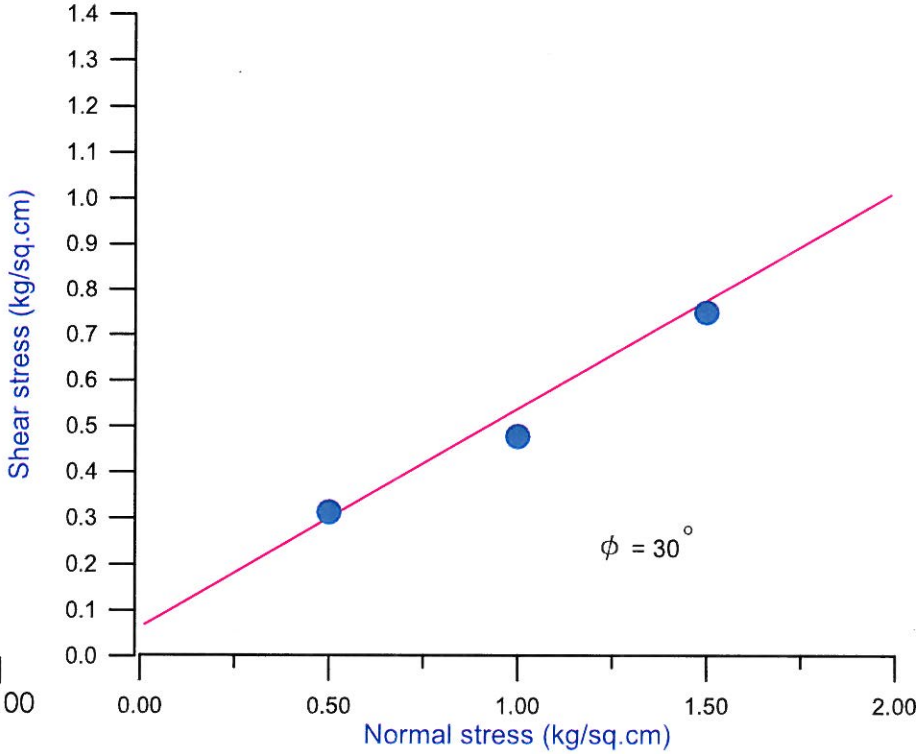
Date of start : 08/06/2008
Date of finish : 09/06/2008

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%) Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	r(dry)	W/C W(%)	Limits (%) L.L	P . L	Sp.Gr	Shear Parameters Type of test	C(kg/sq.cm)	phi(degrees)	Cc
271.891				0 5 10 15 20 25 30 35 40													
270.091	1.80	SPT		15	1	17	82					Non Plastic					
269.391	2.50	UDS						1.61	1.35	19.45			2.65	DST	0.15	27	
268.591	3.30	SPT		4	0	17	83					Non Plastic					
267.091	4.80	SPT		6	0	35	65					Non Plastic					
265.591	6.30	SPT	Sandy Silt with Gravel (SM-ML)	4	2	13	85					Non Plastic					
264.091	7.80	SPT		18	0	22	78					Non Plastic					
263.391	8.50	UDS						1.84	1.51	21.83			2.68	DST	0.1	30	
262.591	9.30	SPT		31	2	24	74					Non Plastic					
261.091	10.80	SPT		14	2	10	88					Non Plastic					
260.391	11.50	UDS						1.84	1.52	20.96				DST		30	
259.591	12.30	SPT		18	3	16	81					Non Plastic					

BH-1
Depth-11.50m



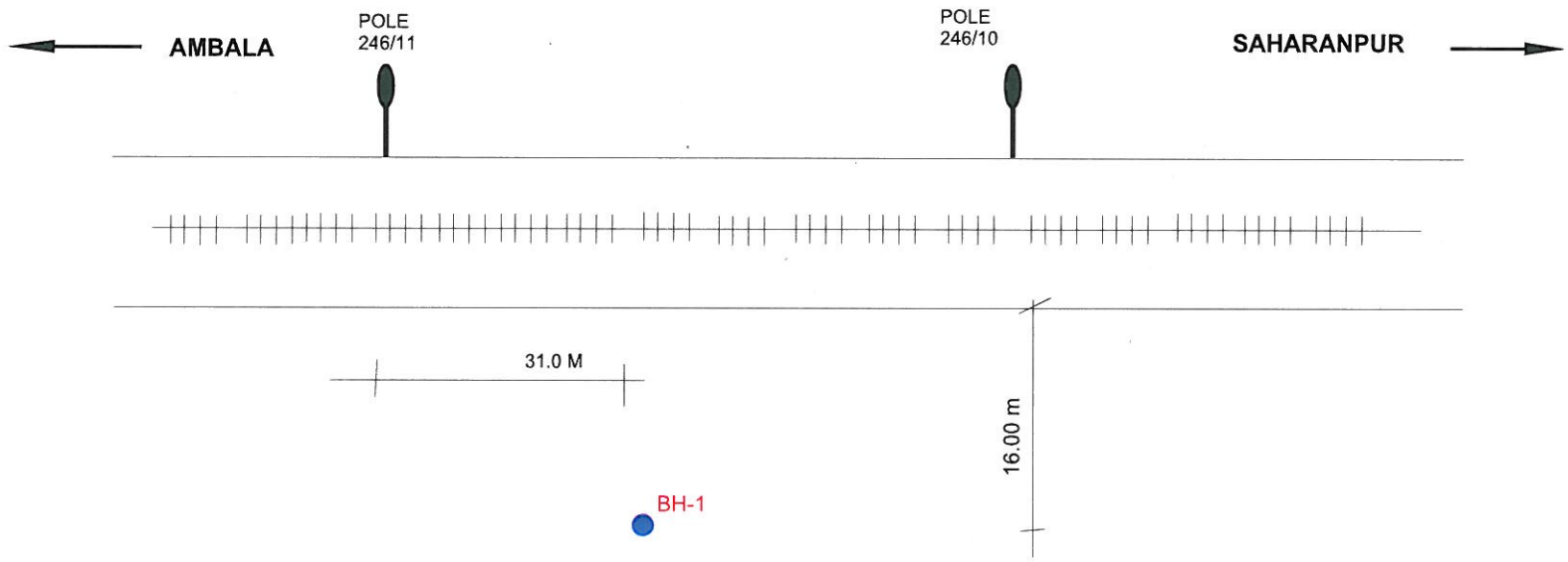
(Shear stress - shear strain relationship)



(Shear stress - Normal stress relationship)

SOIL ENGINEERING CONSULTANTS

Job No: 1813



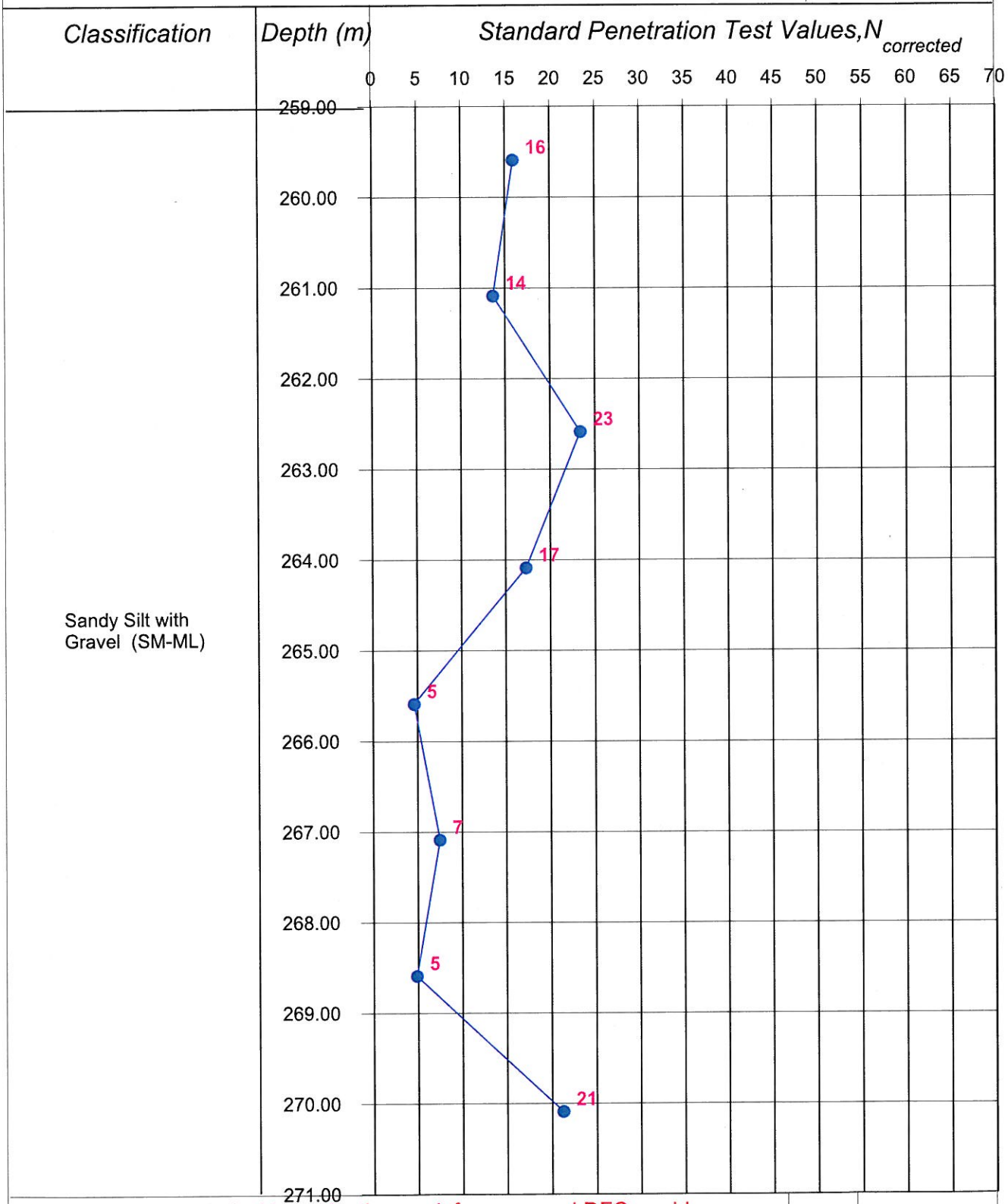
INTERDISTANCE @ 246/9-11

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-CM

0506

SOIL ENGINEERING CONSULTANTS | Interdistance@ 246/9-11 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP -CM

BORE LOG

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

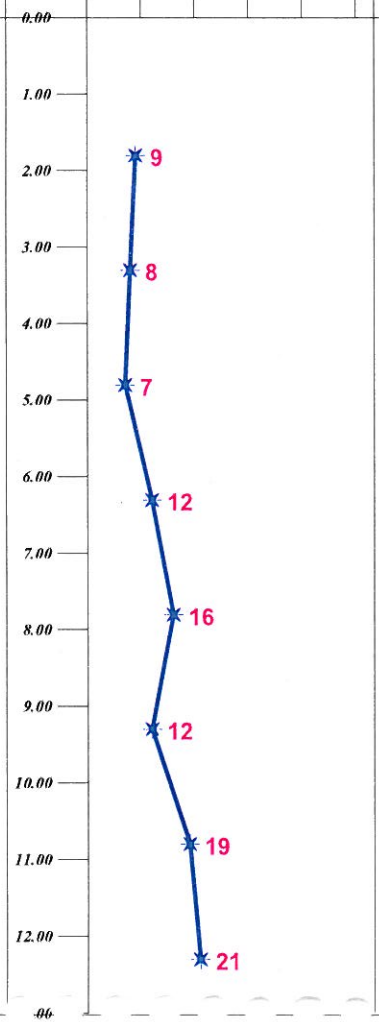
Project No. 1813 Interdistance RL: 272.076

Location:249/24-25
BH No.: 1
Depth : 12.00
Depth of Water table :3.50 M

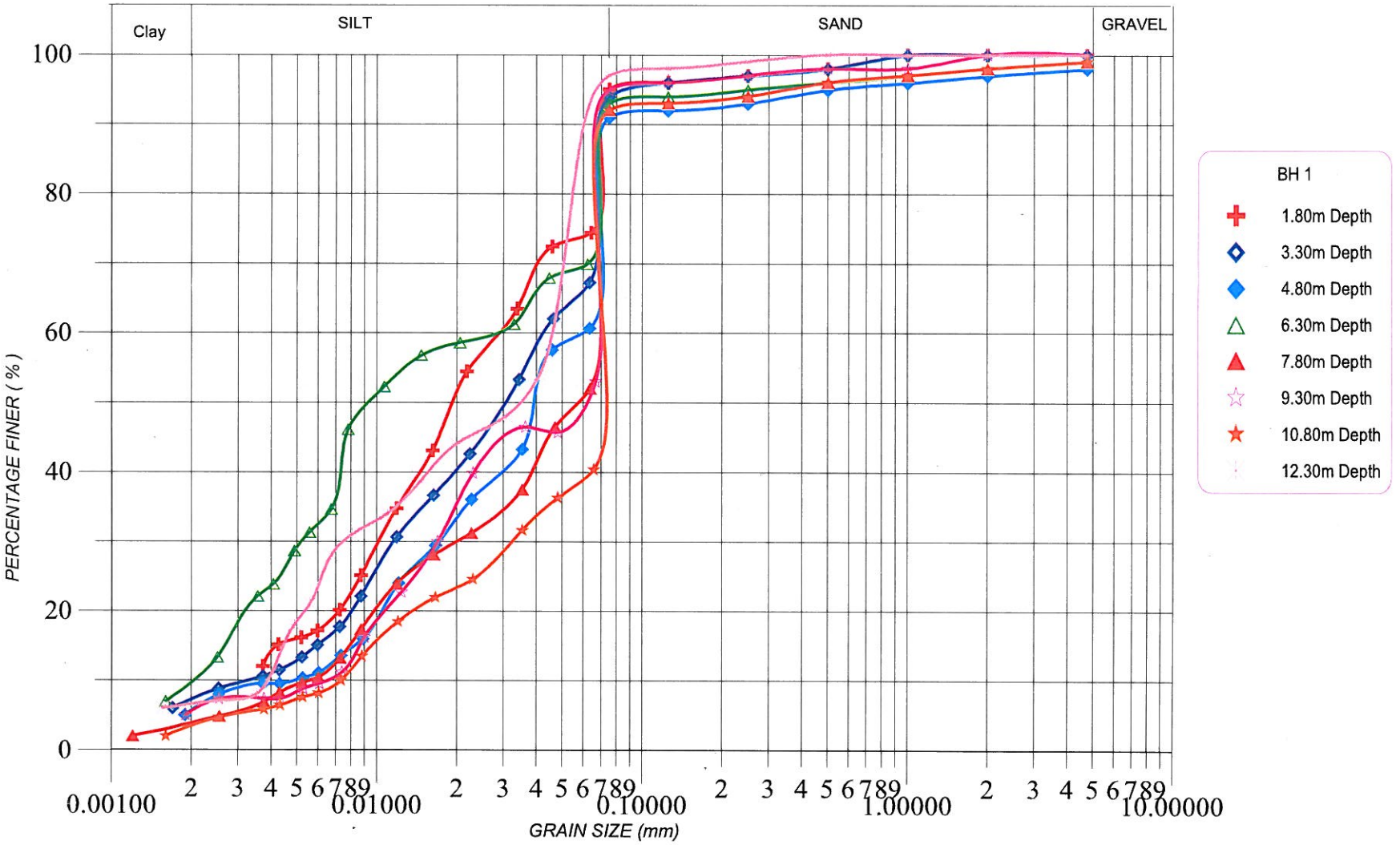
Date of start : 09/06/2008
Date of finish : 10/06/2008

Reduced Level	Depth (m)	Type of sample	Soil Classification	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P . L	Sp.Gr	Type of test	C(kg/sq.cm)	phi(degrees)	Cc
272.076																
270.276	1.80	SPT	Sandy Silt (SM-ML)	1	3	96				Non	Plastic					
269.576	2.50	UDS					1.79	1.56	14.89			2.66	DST		30	
268.776	3.30	SPT		0	6	94				34	19					
267.276	4.80	SPT		2	7	91				36	20					
266.576	5.50	UDS					1.8	1.48	21.43			2.7	DST	0.48		0.081
265.776	6.30	SPT		1	6	93										
264.276	7.80	SPT	Silty Clay of low Plasticity (CL)	1	7	92				35	20					
262.776	9.30	SPT		0	5	95				30	20					
261.276	10.80	SPT		1	7	92										
259.776	12.30	SPT		0	3	97				34	20					

S.P.T Plot



GRAIN SIZE DRISTRIBUTION CURVE

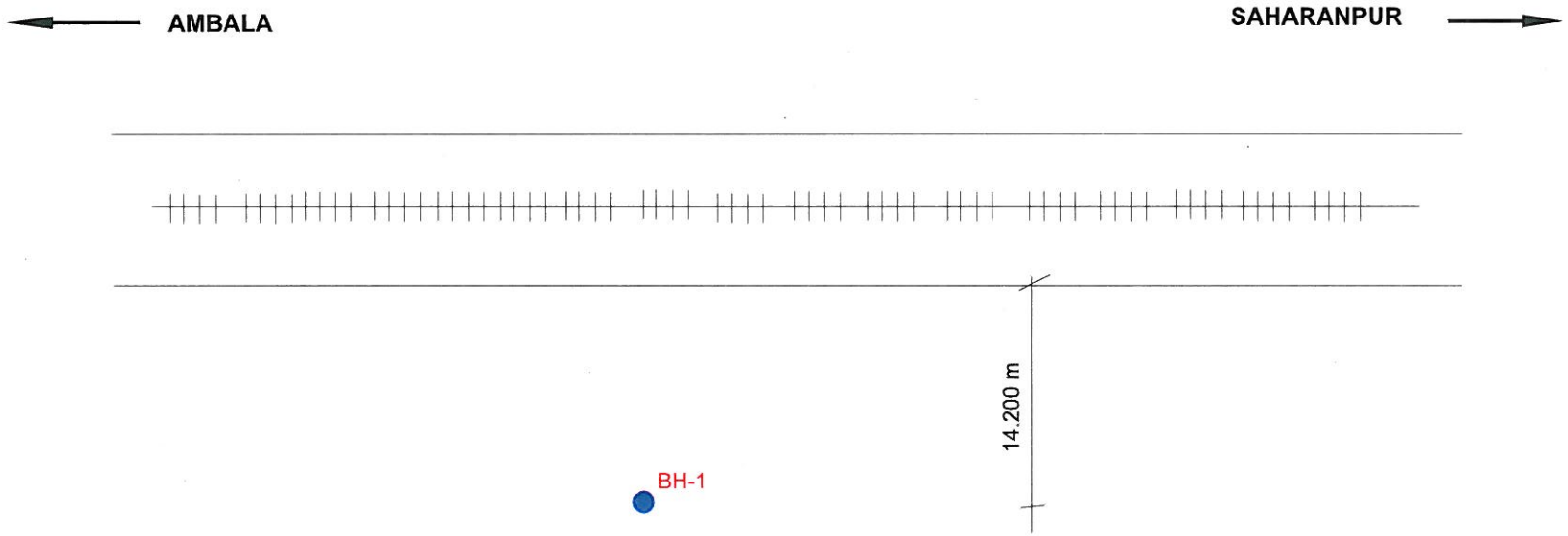


PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD-BW

SOIL ENGINEERING CONSULTANTS

Job No: 1813



INTERDISTANCE @ 249/24-26

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

Fig: Plan-CQ

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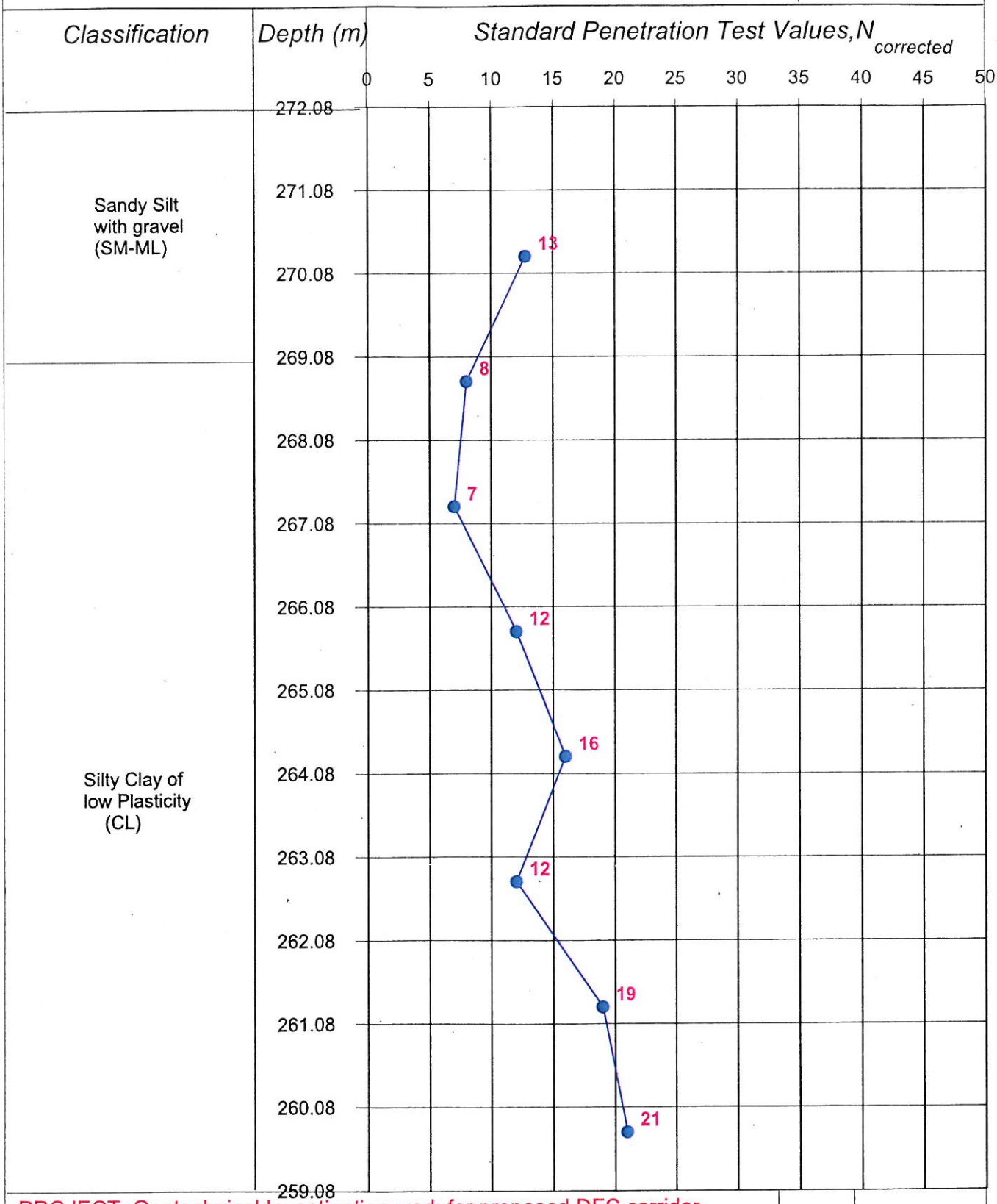
Fig: Plan-CQ

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

SOIL ENGINEERING CONSULTANTS | Interdistance@ 249/24-25 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP -CQ

0511

PROJECT:- SAHARNPUR - LUDHIANA - Parallel Section							
Chemical Analysis of Soil Sample							
Sl.No.		CH KM	BH	pH of 40% Aqueous Solution	Organic Matter(% by Mass)	Total Sulphate (as SO4, % by mass)	Chlorite (as Cl, % by Mass)
1	203	156/3-4	1	7.4	0.28	<0.05	0.034
2	Interchange	157/3-4	1	7.3	0.24	<0.05	0.034
3	204	157/13-14	1	7.3	0.23	<0.05	0.029
4	Interchange	158/12-13	1	7.2	0.26	<0.05	0.034
5	205	159/01	1	7.3	0.31	<0.05	0.035
6	Interchange	159/14-15	1	7.3	0.32	<0.05	0.031
7	206	160/13-14	1	7.3	0.25	<0.05	0.026
8	Interchange	161/13-14	1	7.4	0.26	<0.05	0.031
9	207	162/13-14	1	7.5	0.231	<0.05	0.033
10	Interchange	163/13-14	1	7.4	0.26	<0.05	0.034
11	Interchange	164/13-14	1	7.4	0.26	<0.05	0.029
12	Interchange	165/13-14	1	7.3	0.21	<0.05	0.031
13	Interchange	166/13-14	1	7.3	0.29	<0.05	0.028
14	208	167/10-11	1	7.4	0.29	<0.05	0.036
15	Interchange	168/10-11	1	7.4	0.27	<0.05	0.033
16	252B	211/41-43	1	7.4	0.26	<0.05	0.031
17	Interchange	213/31-33	1	7.1	0.24	<0.05	0.031
18	255	214/21-23	1	7.3	0.23	<0.05	0.028
19	Interchange	215/21-23	1	7.3	0.23	<0.05	0.026
20	256	216/6-7	1	7.4	0.26	<0.05	0.031

21	257	216/11-13	1	7.4	0.24	<0.05	0.029
22	Interchange	217/11-13	1	7.3	0.24	<0.05	0.026
23	258	218/9-11	1	7.3	0.24	<0.05	0.034
24	Interchange	219/9-11	1	7.4	0.23	<0.05	0.034
25	259	219/17-19	2	7.3	0.26	<0.05	0.028
26	Interchange	220/31-32	1	7.3	0.26	<0.05	0.029
27	261	221/9-11	1	7.2	0.24	<0.05	0.031
28	Interchange	223/9-11	1	7.3	0.24	<0.05	0.029
29	264	225/5-7	1	7.3	0.24	<0.05	0.026
30	Interchange	226/5-7	1	7.3	0.26	<0.05	0.034
31	269	229/23-27	1	7.4	0.27	<0.05	0.031
32			3	7.5	0.21	<0.05	0.032
33	270	230/19-21	1	7.4	0.26	<0.05	0.029
34	271	231/1-3	1	7.4	0.234	<0.05	0.028
35	Interchange	232/1-3	1	7.3	0.24	<0.05	0.028
36	272	232/19-21	1	7.3	0.263	<0.05	0.026
37	273	233/7-9	1	7.4	0.24	<0.05	0.026
38	274	233/21-23	1	7.4	0.26	<0.05	0.027
39	Interchange	234/21-23	1	7.4	0.26	<0.05	0.036
40	275	235/5-7	1	7.1	0.24	<0.05	0.033
41	Interchange	237/5-7	1	7.3	0.24	<0.05	0.031
42	282	243/9-11	1	7.3	0.24	<0.05	0.025
43	284	245/9-11	1	7.4	0.24	<0.05	0.025

43	284	2459-11	1				

PROJECT:- SAHARNPUR - LUDHIANA - Parallel Section								
Chemocal Analysis of water Sample								
Br. No	Ch	BH	Sulphate as So3 (mg/l)	Chlorides as Cl (mg/l)	Ph	Suspended solids (mg/l)	Organic solid contents	Inorganic solid contents (mg/l)
236	189/15-17	1	40.1	55.1	7.3	11.4	5.9	226.0
237	190/11-13	1	40.3	50.6	7.3	10.0	6.0	264.0
Interchange	191/11-13	1	40.5	52.6	7.4	8.4	8.5	278.0
Interchange	192/11-13	1	36.2	50.6	7.4	12.3	6.3	274.0
238	193/13-15	1	39.5	47.0	7.3	10.6	8.4	244.0
239	194/1-3	1	40.1	47.7	7.3	11.1	6.5	265.0
240	195/1-3	1	42.3	44.3	7.5	11.5	6.6	247.0
Interchange	195/17-19	1	42.8	50.3	7.4	11.8	8.6	284.0
241	196/29-01	1	45.6	50.0	7.5	8.1	7.2	291.0
		2	47.2	44.5	7.5	8.0	7.9	247.0
Interchange	197/01	1	39.1	45.8	7.3	7.9	7.9	264.0
242	197/23-25	1	38.7	39.7	7.4	9.5	9.0	258.0
		2	41.3	39.5	7.4	8.1	5.5	262.0
		3	35.2	45.2	7.3	8.1	5.7	275.0
		4	41.2	42.9	7.4	7.9	4.3	241.0
243	198/21-23	1	39.1	38.5	7.4	8.5	4.8	251.0

				7.4	7.9	4.3	241.0

243	198/21-23	1	39.1	38.5	7.4	8.5	4.8	251.0
Interchange	199/21-23	1	32.2	41.0	7.5	8.9	5.6	241.0
Interchange	203/1-3	1	21.0	45.6	7.3	7.1	5.0	238.0
244	200/2-3	1	25.6	35.3	7.4	6.9	5.5	248.0
Interchange	201/2-3	1	33.8	49.0	7.4	8.6	8.5	238.0
Interchange	202/2-3	1	29.5	47.5	7.3	9.0	7.6	241.0
246	204/31-34	1	41.1	40.1	7.3	11.3	6.9	278.0
Interchange	205/29-31	1	40.3	55.6	7.3	12.3	7.8	284.0
Interchange	206/29-31	1	37.5	60.1	7.4	10.3	9.0	258.0
247	207/3-5	1	39.3	50.9	7.4	12.4	8.1	271.0
248	207/3-5	1	39.9	53.7	7.3	10.4	8.2	268.0
Interchange	208/3-5	1	34.0	49.2	7.4	7.9	8.0	241.0
249	209/5-7	1	31.2	47.5	7.4	8.6	7.6	241.0
Interchange	210/5-7	1	35.1	38.6	7.3	8.7	7.3	264.0
250	210/15-16	1	35.6	44.9	7.4	8.7	9.1	271.0
251	210/21-23	2	33.1	46.3	7.4	8.7	6.4	259.0
			33.2	45.7	7.3	8.0	7.5	260.0
252	211/4-5	1	29.5	47.5	7.3	9.0	7.6	241.0

252A	211/13-14	1	35.2	38.2	7.3	10.0	6.3	234.0
253	212/33-35	1	37.8	42.7	7.3	11.7	8.2	289.0
254	213/7-9	1	29.4	44.1	7.3	8.7	6.9	264.0
259	219/17-19	2	25.6	41.2	7.4	8.0	7.9	259.0
260	221/5-7	1	21.1	30.0	7.3	8.5	6.0	267.0
		2	22.3	38.5	7.4	8.1	5.9	265.5
		3	27.1	33.5	7.4	7.5	5.6	271.8
262	222/9-10	1	28.5	45.6	7.5	8.1	4.9	261.1
		2	48.1	40.1	7.5	7.9	7.0	245.0
		3	43.4	52.1	7.5	7.9	7.7	244.0
		4	33.8	49.0	7.4	8.6	8.5	238.0
263	224/9-11	1	42.1	47.7	7.5	9.4	8.0	275.0
		2	41.6	48.3	7.4	9.0	8.0	260.0
		3	39.5	52.2	7.4	8.6	8.3	280.0
265	226/17-19	1	39.5	47.0	7.3	10.6	8.4	244.0
		2	40.1	47.7	7.3	11.1	6.5	265.0

2680

266	227/1-2	1	42.3	44.3	7.5	11.5	6.6	247.0
		2	38.4	44.4	7.4	10.6	7.3	298.0
		3	41.1	40.1	7.3	11.3	6.9	278.0
		4	40.3	55.6	7.3	12.3	7.8	284.0
267	227/23-25	1	37.5	60.1	7.4	10.3	9.0	258.0
		2	39.3	50.9	7.4	12.4	8.1	271.0
		3	39.9	53.7	7.3	10.4	8.2	268.0
268	228/25-27	1	41.4	56.2	7.3	10.3	6.1	304.0
		2	44.1	60.1	7.5	11.7	5.2	298.0
		3	35.7	58.5	7.4	12.6	8.6	274.0
269	229/23-27	2	42.8	50.3	7.4	11.8	8.6	284.0
		4	41.2	42.2	7.3	10.2	9.1	294.0
		5	30.1	41.1	7.4	7.8	6.5	297.0
276	235/28-32	1	33.7	47.6	7.4	8.5	6.0	310.0
		2	40.5	33.7	7.3	10.0	8.2	312.0
		3	38.6	35.4	7.3	9.5	6.0	301.0
		4	39.5	41.0	7.4	10.0	5.3	330.0
		5	32.7	38.4	7.5	9.1	6.4	298.0

279	238/15-17	1	39.9	58.1	7.4	11.0	5.7	217.0
280	238/25-27	1	40.1	55.1	7.3	11.4	5.9	226.0
		2	40.3	50.6	7.3	10.0	6.0	264.0
		3	40.5	52.6	7.4	8.4	8.5	278.0
281	239/19-21	1	41.2	44.1	7.5	12.0	5.5	281.0
		2	39.6	46.3	7.6	8.1	8.3	274.0
		3	40.3	48.2	7.6	7.9	5.5	269.0
Interchange	240/19-21	1	39.4	41.1	7.5	10.0	6.1	286.0
Interchange	241/19-21	1	38.7	44.6	7.6	9.1	5.5	268.0
Interchange	242/19-21	1	41.1	39.6	7.4	8.6	6.3	271.0
Interchange	244/9-11	1	39.4	42.3	7.4	7.1	5.5	268.0
Interchange	246/9-11	1	35.6	44.1	7.4	8.5	8.3	244.0
285	247/11-13	1	33.1	46.2	7.4	8.1	5.5	253.0
286	247/19-21	1	35.4	34.6	7.5	7.9	6.1	264.0
		2	34.6	39.5	7.5	8.5	6.4	289.0
		3	34.1	48.3	7.5	7.4	8.4	274.0
287	248/15-17	1	38.5	45.3	7.5	8.5	5.5	275.0
Interchange	249/24-25	1	36.7	45.0	7.4	12.5	6.3	264.0