BORE LOG

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

Location; 228-25-27
BH No.: 2
Depth : 30.00M
Depth of Water table : 28.00M

Date of start : 03/05/2008
Date of finish : 05/05/2008

Project No. 1813 Bridge : 268 RL: 274.153

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	Density (gm/cc) r(dry)	W/C W(%)	Limits (%) L.L	Limits (%) P . L	Sp.Gr	Shear Parameters Type of test	Shear Parameters C(kg/sq.cm)	Shear Parameters phi(degrees)	Cc
274.153																	
273.653	0.50	DS			1	9	90				Non	Plastic					
272.353	1.80	SPT		13	2	22	76				Non	Plastic					
270.853	3.30	SPT	Sandy Silt with gravel (SM-ML)	11	3	45	52				Non	Plastic					
269.353	4.80	SPT		12	0	19	81				Non	Plastic					
267.853	6.30	SPT		26	0	49	51				Non	Plastic					
266.353	7.80	SPT		20	0	11	89				Non	Plastic					
265.653	8.50	UDS						1.81	1.40	10.63				DST		31	
264.853	9.30	SPT	Silty Sand (SM)	25	0	57	43				Non	Plastic					
263.353	10.80	SPT		28	0	27	73				Non	Plastic					
262.653	11.50	UDS						1.84	1.36	14.30			2.67	DST	0.15	31	
261.853	12.30	SPT		33	0	48	52				Non	Plastic					
260.353	13.80	SPT	Sandy Silt (SM-ML)	32	0	29	71				Non	Plastic					
259.653	14.50	USD						1.87	1.17	15.28				DST	0.15	31	
258.853	15.30	SPT		63	0	35	65				Non	Plastic					
257.353	16.80	SPT		44	0	15	85				Non	Plastic					
256.653	17.50	USD						1.92	1.36	16.45			2.69	DST		32	
255.853	18.30	SPT	Silty Sand (SM)	51	0	87	13				Non	Plastic					
254.353	19.80	SPT	Sandy Silt (SM-ML)	54	0	32	68				Non	Plastic					
253.653	20.50	USD						1.87	1.69	16.83				DST	0.1	31	
252.853	21.30	SPT		33	0	47	53				Non	Plastic					
251.353	22.80	SPT		52	0	33	67				Non	Plastic					
249.853	24.30	SPT	Silty Sand (SM)	48	0	54	46				Non	Plastic					
248.353	25.80	SPT		53	0	41	59				Non	Plastic					
246.853	27.30	SPT	Sandy Silt (SM-ML)	36	3	13	84				Non	Plastic					
245.353	28.80	SPT		35	0	27	73				Non	Plastic					
24[illegible]53	0.[illegible]	S[illegible]		[illegible]	2	39	5[illegible]				[illegible]	Plas[illegible]					

BORE LOG

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

Project No. 1813 Bridge : 268 RL: 276.954

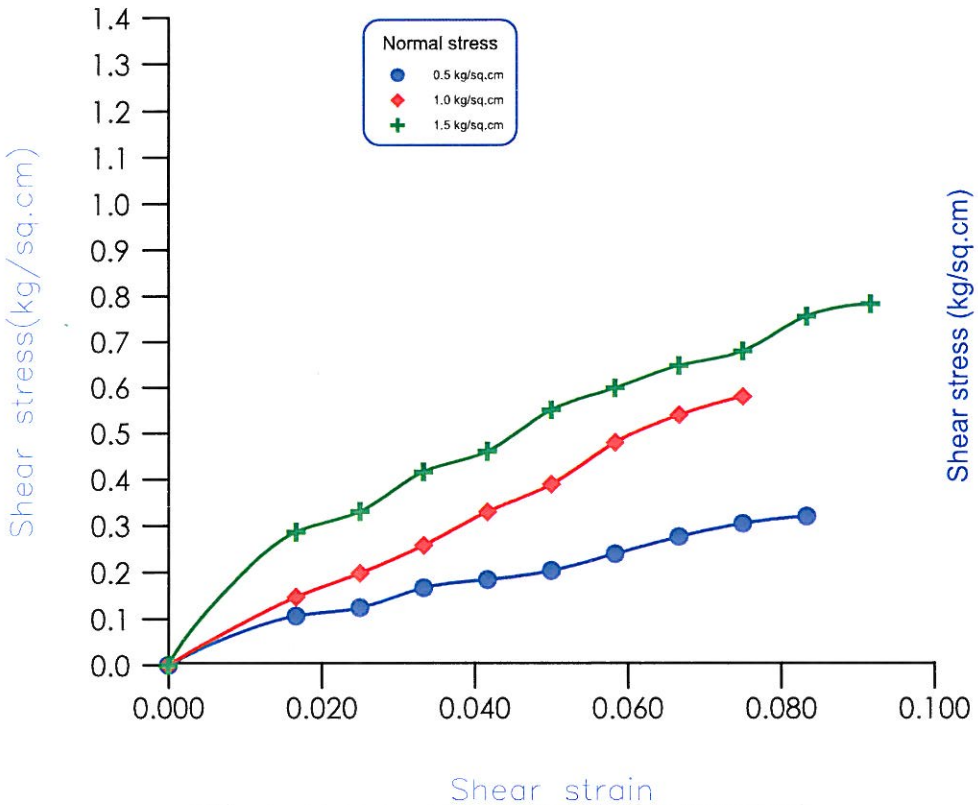
Location; 228-25-27
BH No.: 3
Depth : 30.00M
Depth of Water table : 28.00m

Date of start : 01/05/2008
Date of finish : 02/05/2008

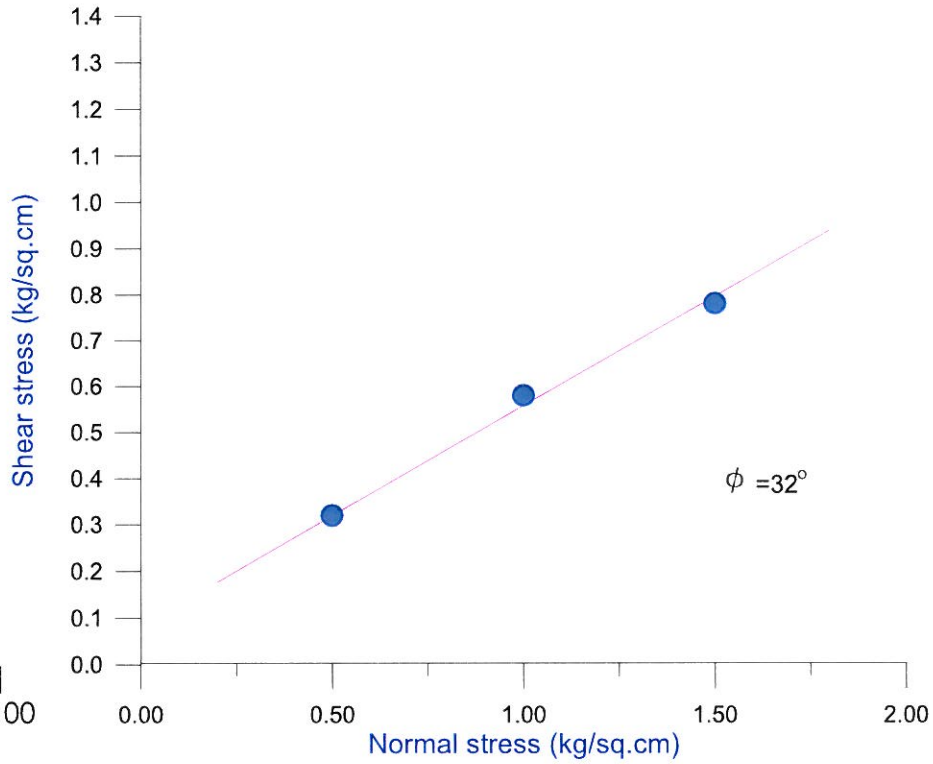
SOIL ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	Density (gm/cc) r(dry)	W/C W(%)	Limits (%) L.L	Limits (%) P . L	Sp.Gr	Shear Parameters Type of test	Shear Parameters C(kg/sq.cm)	Shear Parameters phi(degrees)	Cc
276.954																	
276.454	0.50	DS	Sandy Silt (SM-ML)		2	15	83				Non	Plastic					
275.154	1.80	SPT		15	1	34	65				Non	Plastic					
274.454	2.50	UDS						1.78	1.63	9.43				DST	0.15	29	
273.654	3.30	SPT	Silty Sand (SM)	12	0	60	40				Non	Plastic					
272.154	4.80	SPT		14	0	66	34				Non	Plastic					
271.454	5.50	UDS						1.78	1.61	10.17			2.67	DST	0.15	29	
270.654	6.30	SPT	Sandy Silt (SM-ML)	15	0	38	62				Non	Plastic					
269.154	7.80	SPT		21	0	38	62				Non	Plastic					
268.454	8.50	UDS						1.8	1.57	14.60				DST	0.1	30	
267.654	9.30	SPT		15	0	69	31				Non	Plastic					
266.154	10.80	SPT		27	0	65	35				Non	Plastic					
265.454	11.50	UDS						1.83	1.58	15.64			2.68	DST		30	
264.654	12.30	SPT	Silty Sand with Gravel (SM)	30	1	66	33				Non	Plastic					
263.154	13.80	SPT		30	3	63	34				Non	Plastic					
262.454	14.50	USD						1.87	1.61	15.88				DST		31	
261.654	15.30	SPT		32	0	58	42				Non	Plastic					
260.154	16.80	SPT	Sandy Silt (SM-ML)	40	0	39	61				Non	Plastic					
259.454	17.50	USD						1.89	1.61	17.23				DST		31	
258.654	18.30	SPT		35	0	58	42				Non	Plastic					
257.154	19.80	SPT		38	0	64	36				Non	Plastic					
255.654	21.30	SPT		36	0	62	38				Non	Plastic					
254.154	22.80	SPT	Silty Sand with Gravel (SM)	32	1	71	28				Non	Plastic					
252.654	24.30	SPT		36	1	77	22				Non	Plastic					
251.154	25.80	SPT		35	2	69	29				Non	Plastic					
249.654	27.30	SPT	Sandy Silt (SM-ML)	42	0	43	57				Non	Plastic					
248.154	28.80	SPT		39	0	47	53				Non	Plastic					

BH-1
DEPTH = 5.50 m



(Shear stress - snear strain relationship)

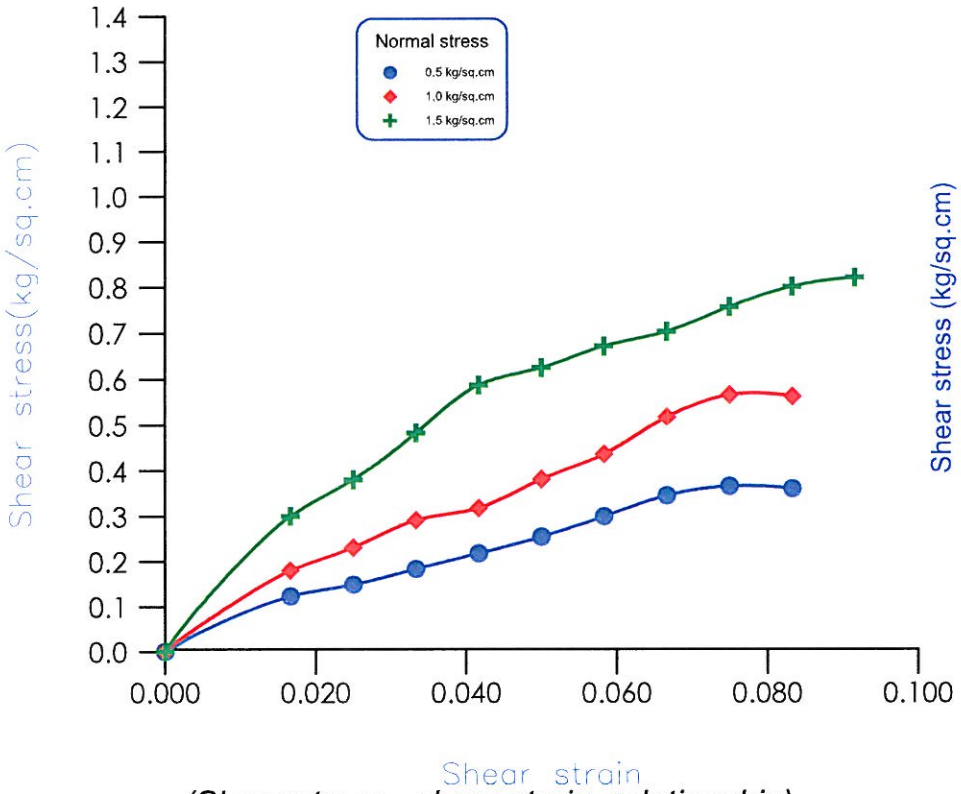


(Shear stress - Normal stress relationship)

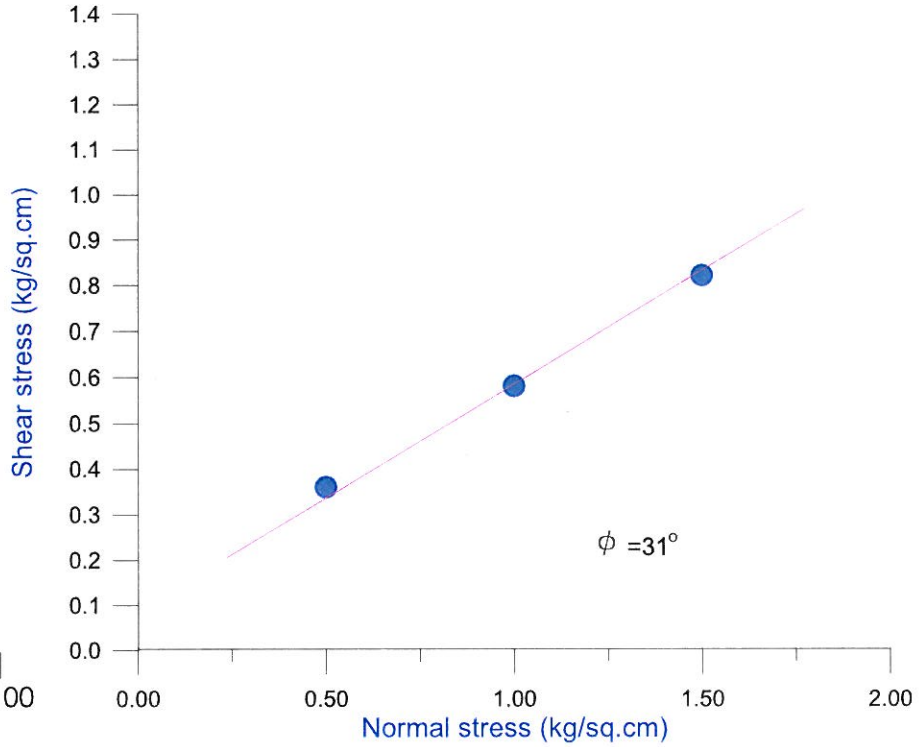
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BP1

BH-1
DEPTH = 8.50 m



(Shear stress - shear strain relationship)

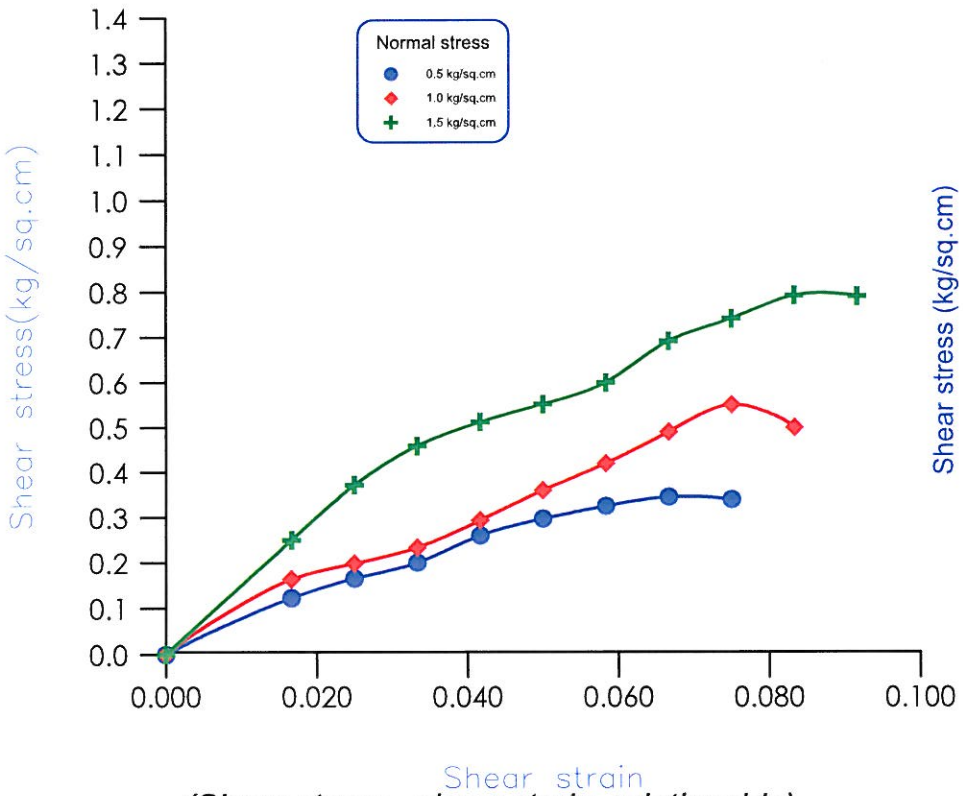


(Shear stress - Normal stress relationship)

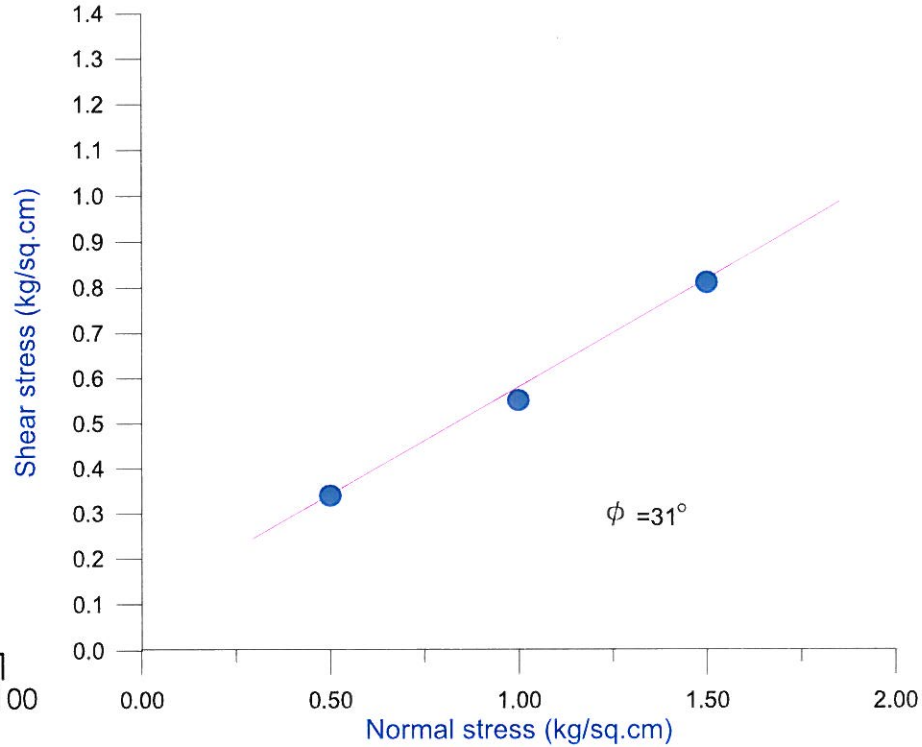
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BP2

BH-2
DEPTH = 8.50 m



(Shear stress - shear strain relationship)

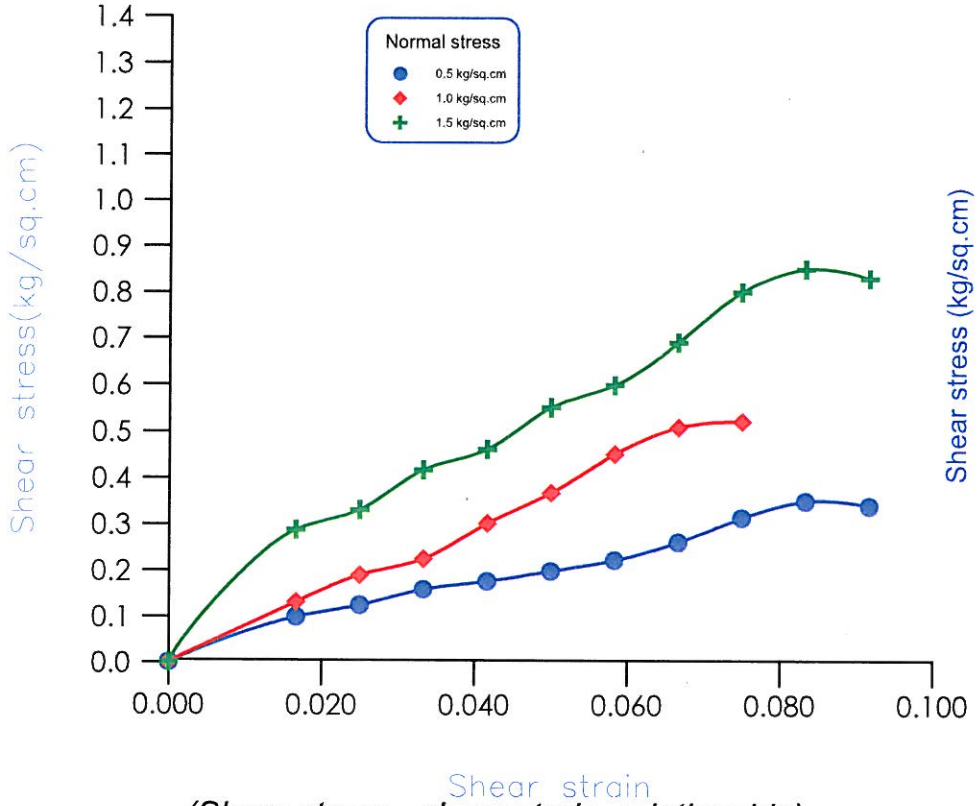


(Shear stress - Normal stress relationship)

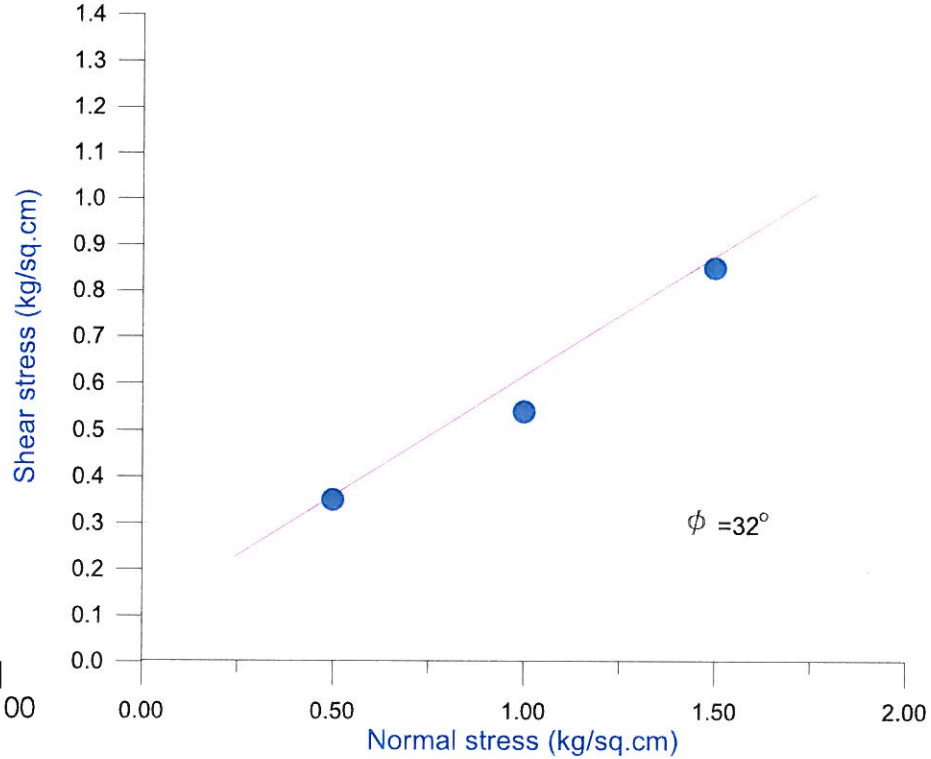
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BP3

BH-2
DEPTH = 17.50 m



(Shear stress - shear strain relationship)

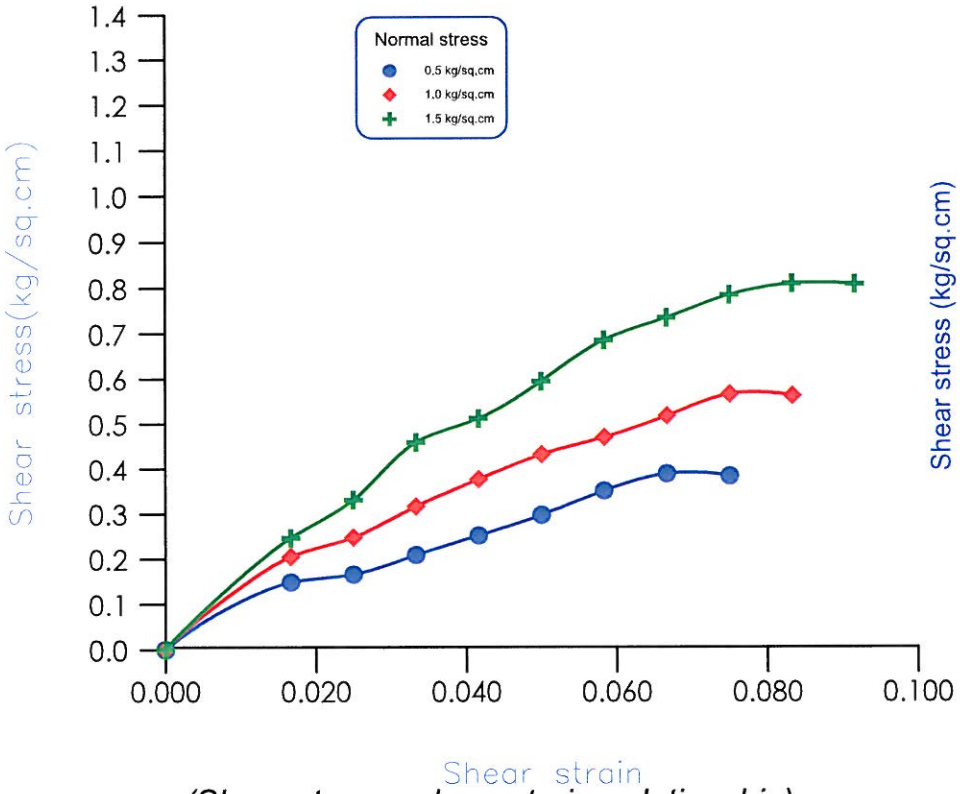


(Shear stress - Normal stress relationship)

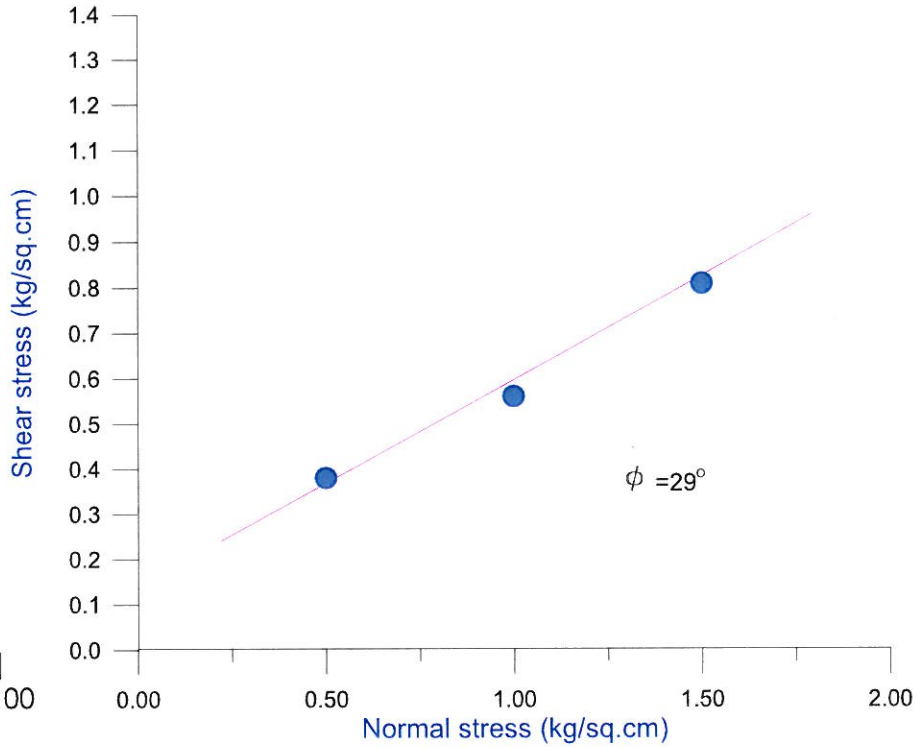
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BP4

BH-3
DEPTH = 2.50 m



(Shear stress - shear strain relationship)

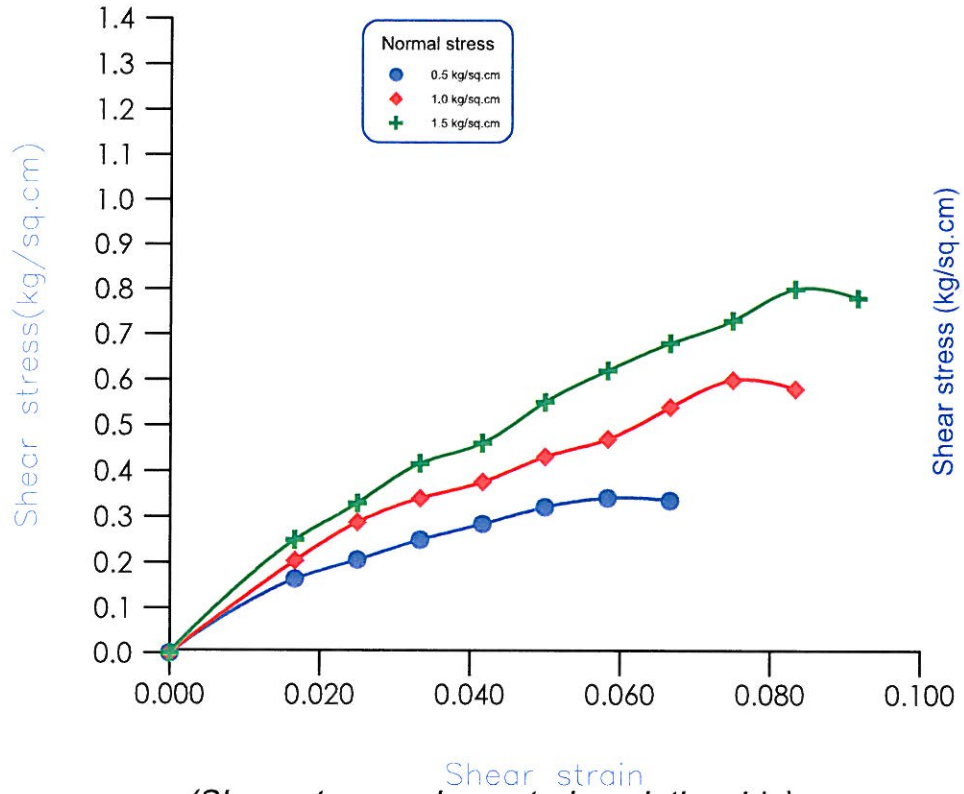


(Shear stress - Normal stress relationship)

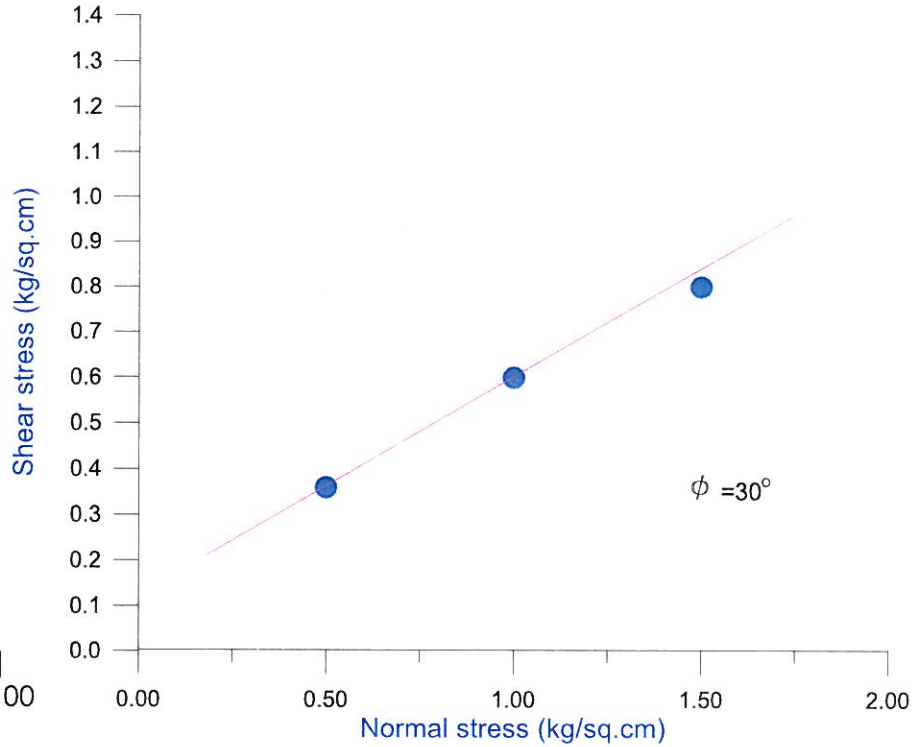
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BP5

BH-3
DEPTH = 8.50 m



(Shear stress - shear strain relationship)



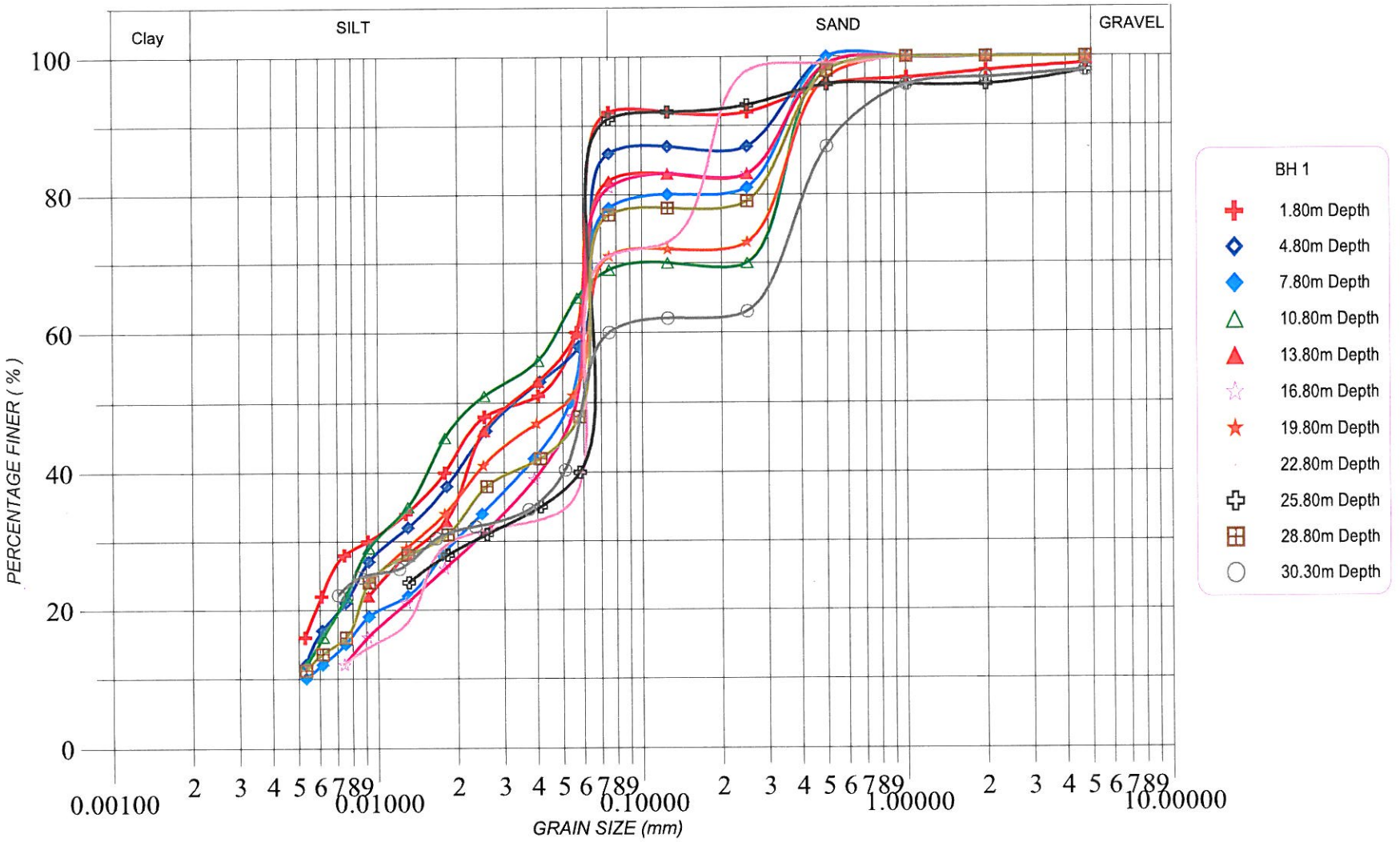
(Shear stress - Normal stress relationship)

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

FIG- DS-BP6

0253

GRAIN SIZE DRISTRIBUTION CURVE



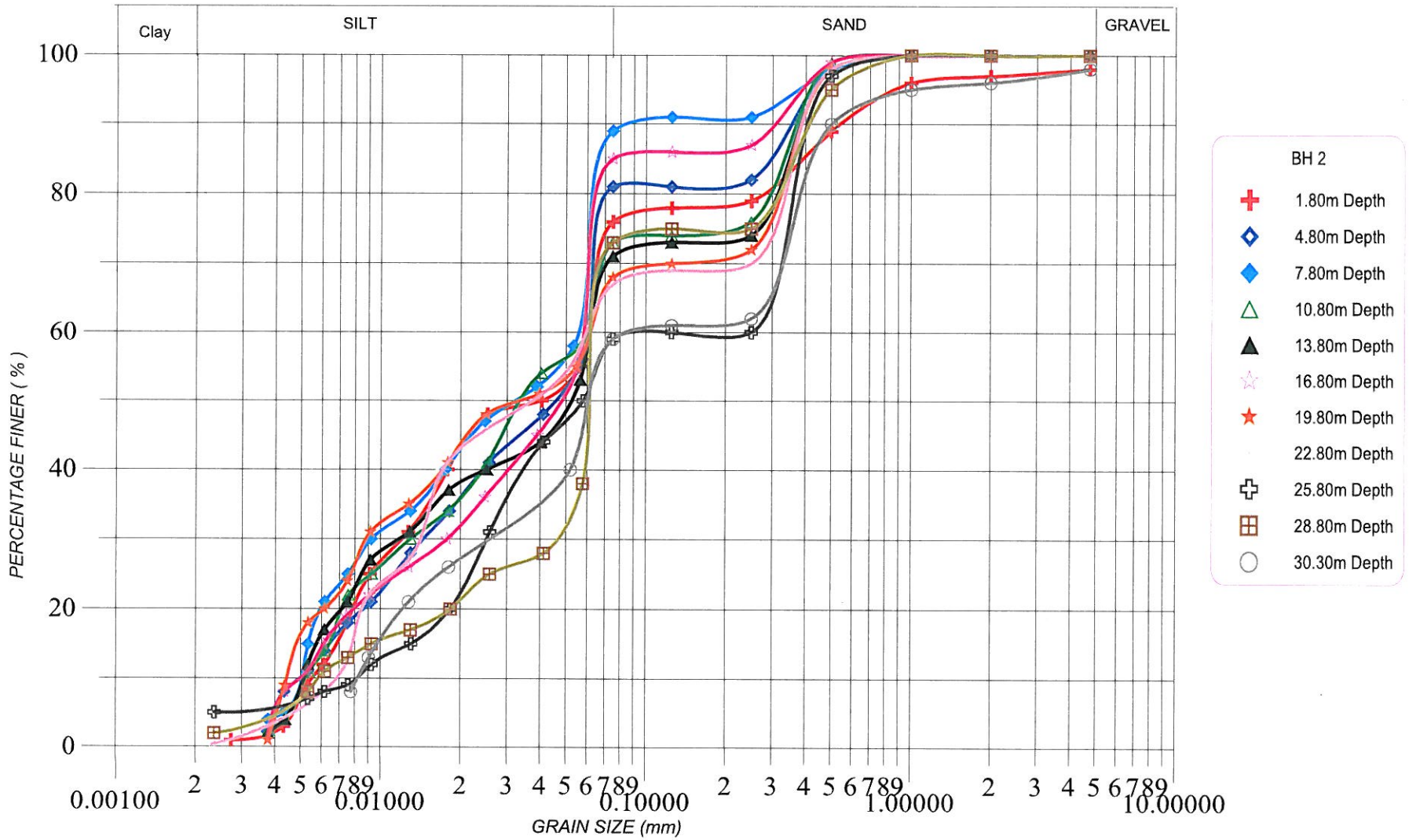
PROJECT: Geotechnical Investigation work for the proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD-BP1

Soil Engineering Consultants

Job:1813

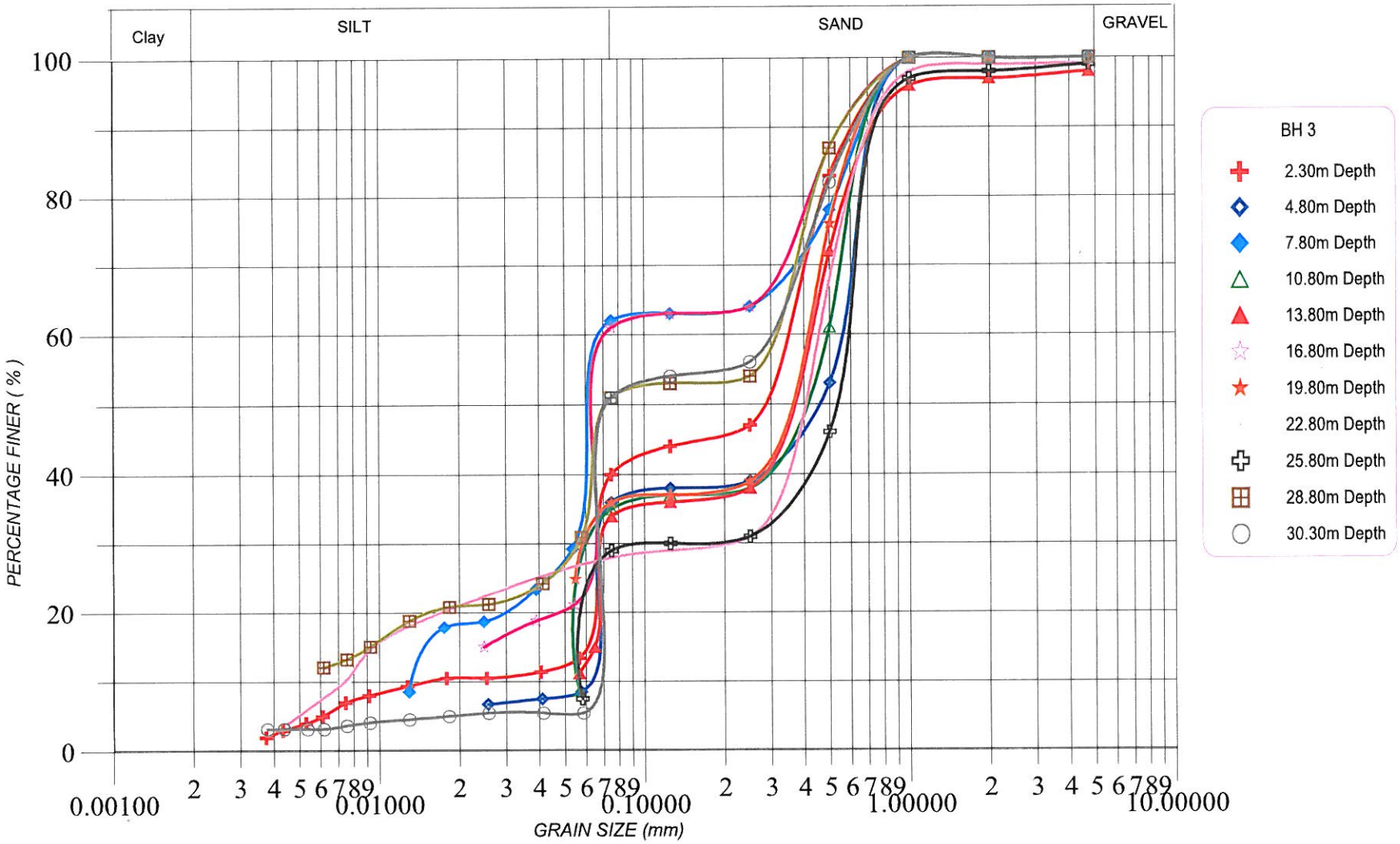
GRAIN SIZE DRISTRIBUTION CURVE



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

Fig : GSD-BP2

GRAIN SIZE DRISTRIBUTION CURVE

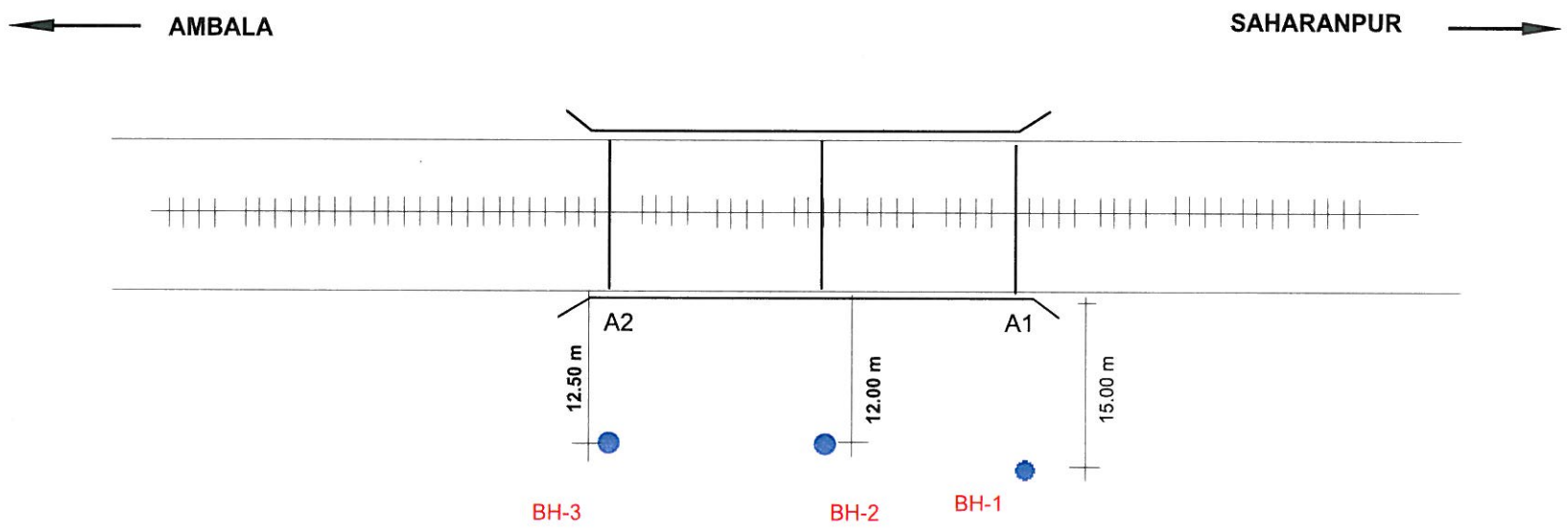


PROJECT: Geotechnical Investigation work for the proposed DFC corridor from Ludhiyana to Saharanpur

Fig : GSD-BP3

SOIL ENGINEERING CONSULTANTS

Job No: 1813



BRIDGE 268 @ CH 228/25-27

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

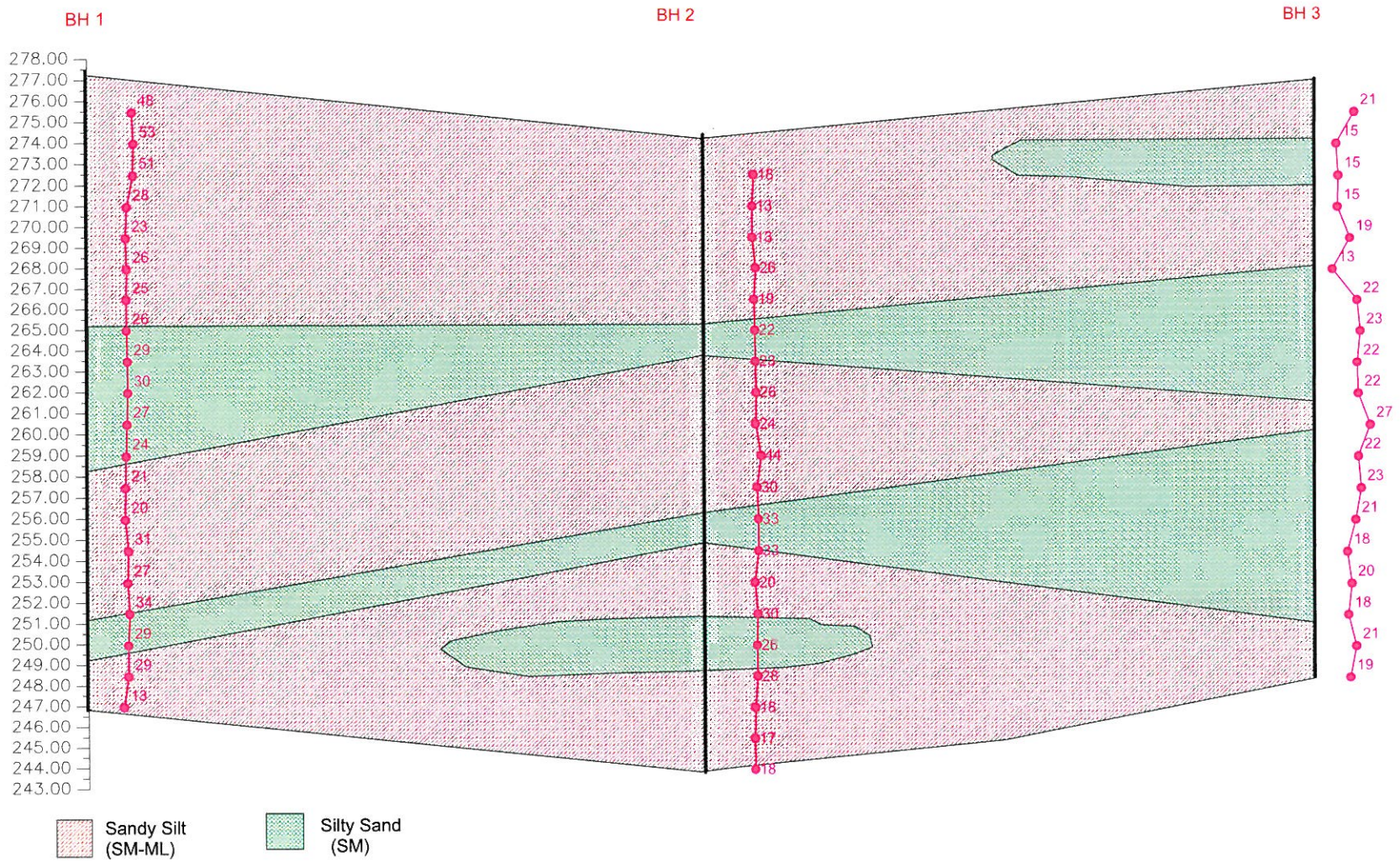
Fig: Plan-BP

0257

Soil Enginering Consultants

BR@268 228/25-27

Project No. 1813



EXPECTED SOIL PROFILE FOR PRPPOSED Mj. Br. Over JLN Feeder and J.S.B.Canal @ CH:78.565 km. ALONG BH 1 to BH 3 WITH CORRECTED SPT VALUES

PROJECT: Geotechnical Investigation work for Proposed Structures of Bahadurgarh-Hissar Section of NH-10 in the State of Haryana

Figure : Soilpro BP

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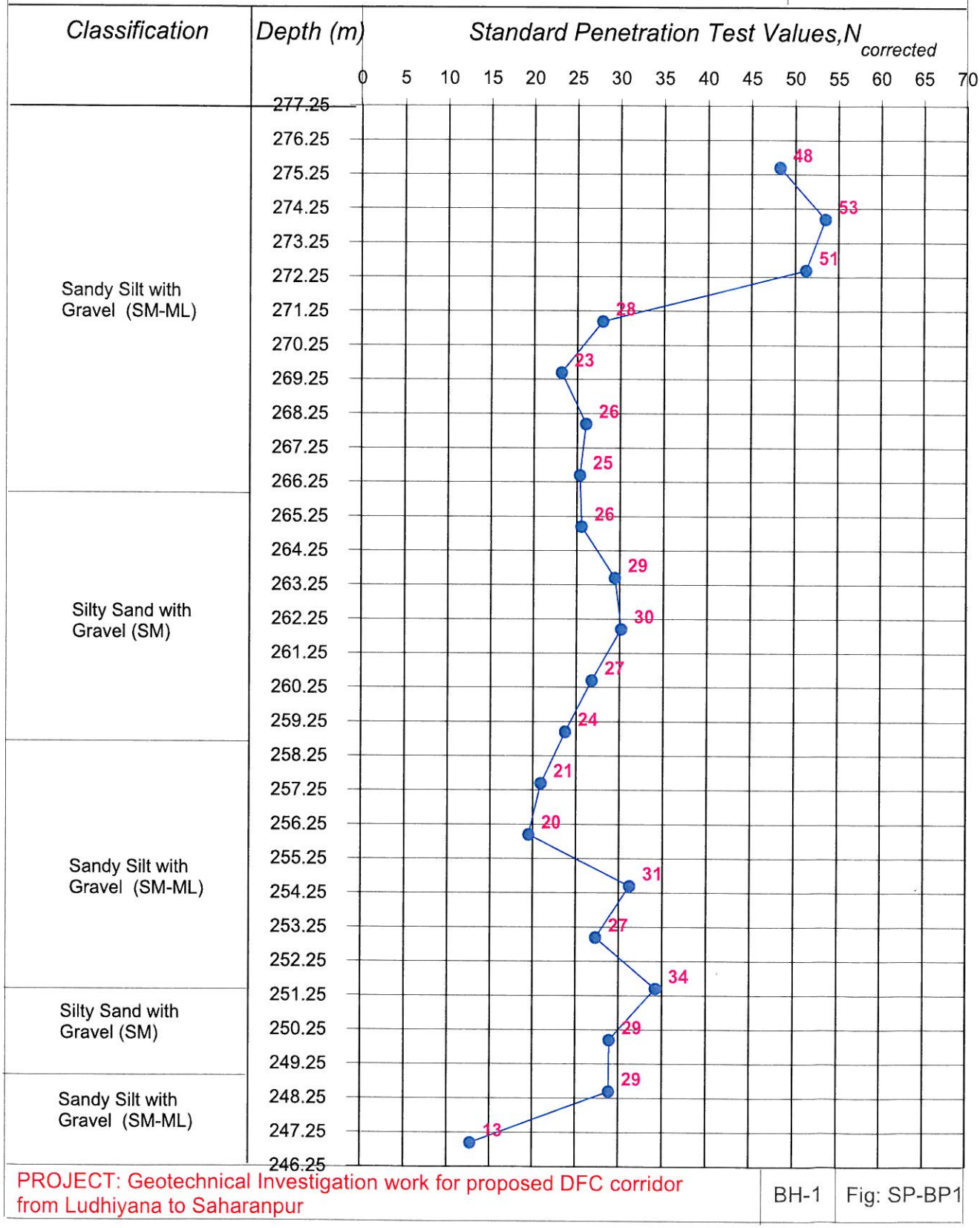
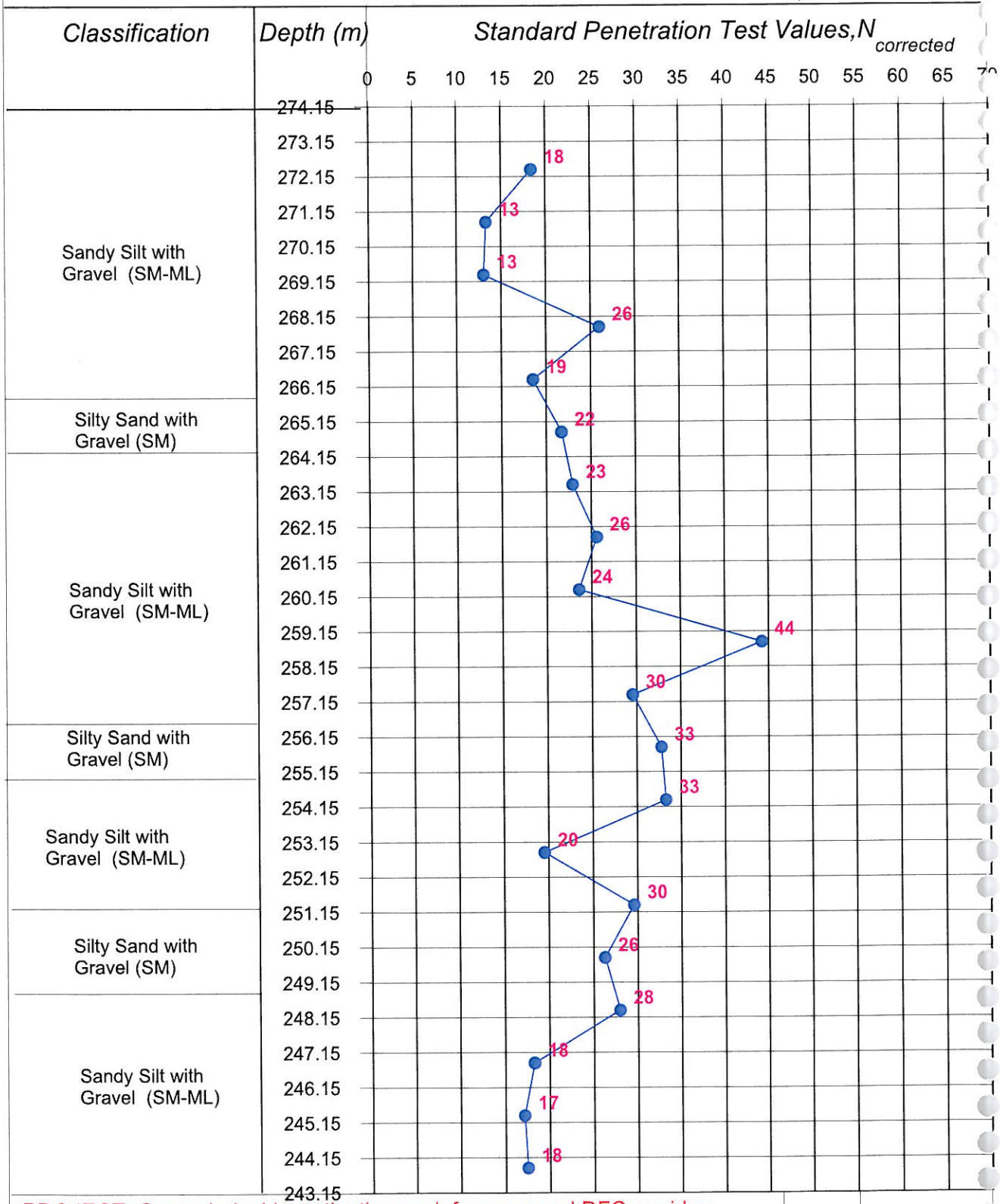


PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP-BP1

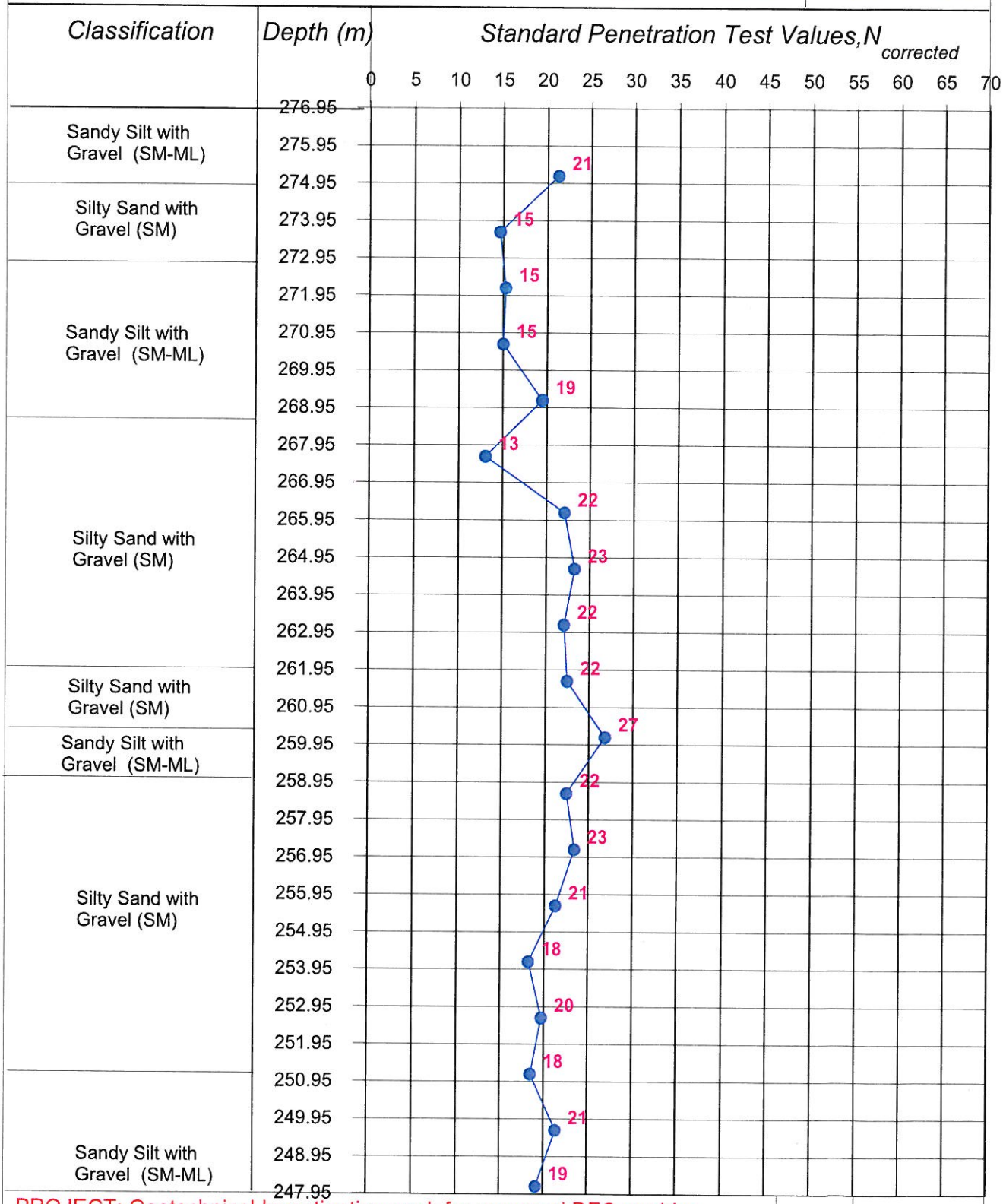
SOIL ENGINEERING CONSULTANTS | BR@268 228/25-27 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-2 | Fig: SP-BP2

0260

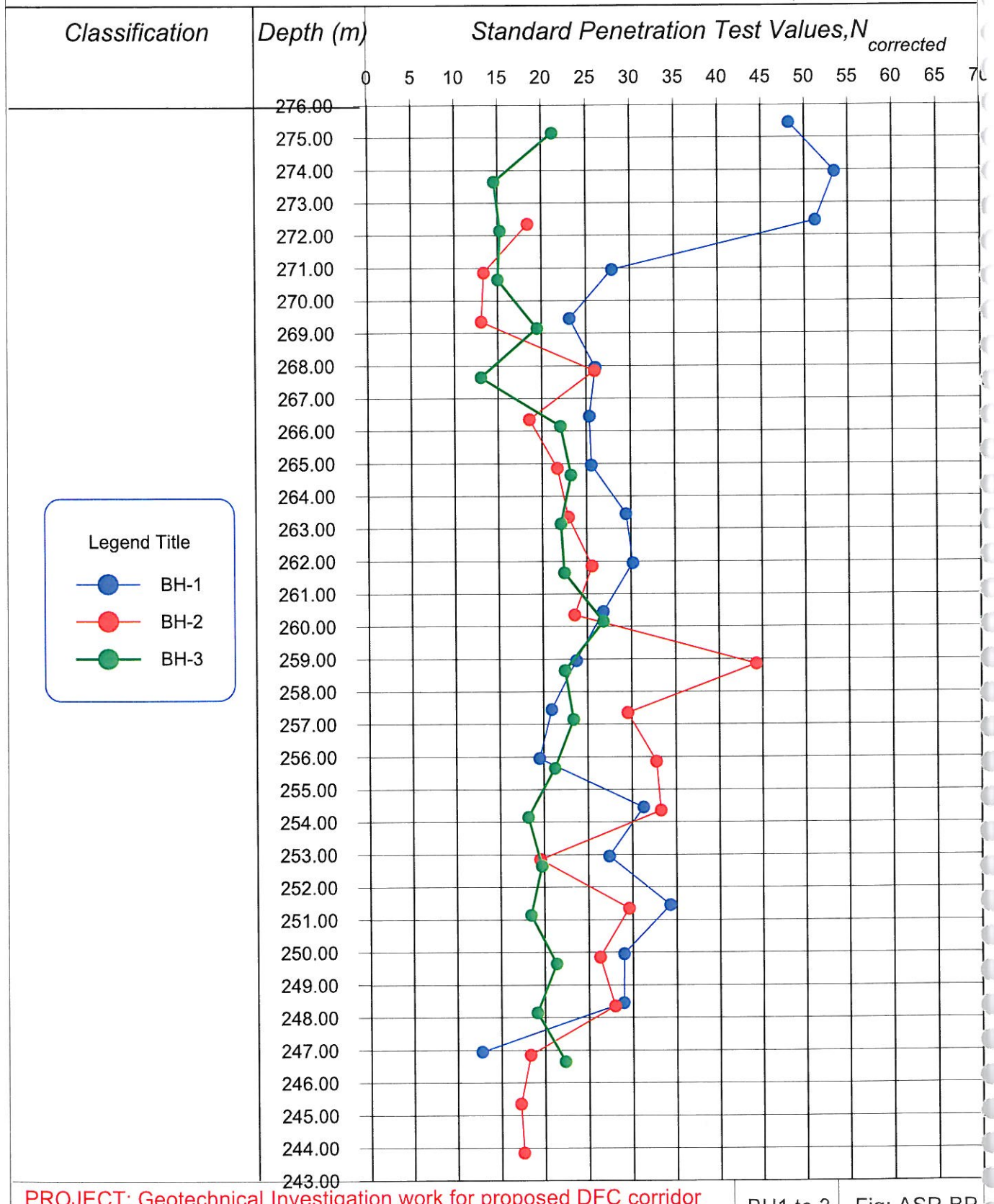
SOIL ENGINEERING CONSULTANTS | BR@268 228/25-27 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-3 | Fig: SP-BP3

0261

SOIL ENGINEERING CONSULTANTS | BR-268@ 228/25-27 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH1 to 3 | Fig: ASP-BP

0262

BORE LOG

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

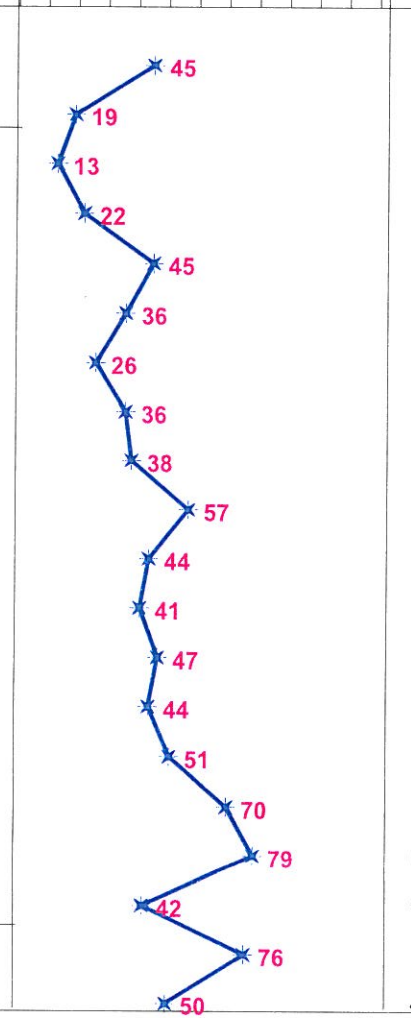
Project No. 1813 Bridge : 269 RL: 277.012

229/23-27
BH No.: 1
Depth : 30.00 m
Depth of Water table : Not Met

Date of start : 04/05/2008
Date of finish : 06/05./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)	
277.012																
276.512	0.50	DS	Silty clay of Medium Plasticity (CI)	4	4	92				Non	Plastic					
275.212	1.80	SPT		3	8	89				36	21					
274.512	2.50	UDS					1.76	1.60	9.87			2.71	UU	0.96		0.092
273.712	3.30	SPT		2	6	92				40	23					
272.212	4.80	SPT		0	2	98				Non	Plastic					
271.512	5.50	UDS					1.74	1.56	11.23				DST	0.15	28	
270.712	6.30	SPT		4	6	90				Non	Plastic					
269.212	7.80	SPT		0	24	76				Non	Plastic					
268.512	8.50	UDS					1.8	1.60	12.46			2.67	DST	0.15	31	
267.712	9.30	SPT		1	9	90				Non	Plastic					
266.212	10.80	SPT		0	5	95				Non	Plastic					
265.512	11.50	UDS					1.8	1.57	14.48				DST	0.15	32	
264.712	12.30	SPT		1	13	86				Non	Plastic					
263.212	13.80	SPT		0	2	98				Non	Plastic					
262.512	14.50	UDS	Sandy Silt with gravel (SM-ML)				1.84	1.58	16.23				DST	0.1	32	
261.712	15.30	SPT		0	31	69				Non	Plastic					
260.212	16.80	SPT		0	26	74				Non	Plastic					
259.512	17.50	UDS					1.87	1.60	16.94			2.68	DST	0.1	32	
258.712	18.30	SPT		0	6	94				Non	Plastic					
257.212	19.80	SPT		0	1	99				Non	Plastic					
256.512	20.50	UDS					1.87	1.59	17.45				DST	0.1	32	
255.712	21.30	SPT		0	12	88				Non	Plastic					
254.212	22.80	SPT		0	8	92				Non	Plastic					
252.712	24.30	SPT		0	49	51				Non	Plastic					
251.212	25.80	SPT		0	49	51				Non	Plastic					
249.712	27.30	SPT		0	14	86				Non	Plastic					
248.212	28.80	SPT	Silty Sand with Gravel (SM)	1	53	46				Non	Plastic					
246.712	30.30	SPT		4	68	28				Non	Plastic					

S.P.T Plot — Observed



0263

BORE LOG

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

Location: 229/23-27
BH No.: 2
Depth : 30.00 m
Depth of Water table : 27.00

Date of start : 07/05/2008
Date of finish : 09/05./2008

Project No. 1813 Bridge : 269 RL: 274.019

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	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
274.019																	
273.519	0.50	DS	Silty Sand with Medium Plasticity (Cl)	39	1	4	95				Non	Plastic					
272.219	1.80	SPT			3	7	90	1.78	1.62	9.72	36	21	2.71	UU	0.88		0.084
271.519	2.50	UDS		20													
270.719	3.30	SPT			0	4	96				41	22					
269.219	4.80	SPT		16	3	7	90	1.78	1.61	10.45	46	23		DST	0.16	29	
268.519	5.50	UDS															
267.719	6.30	SPT		19	0	3	97				Non	Plastic					
266.219	7.80	SPT		45	1	35	64	1.81	1.61	12.33	Non	Plastic		DST	0.1	30	
265.519	8.50	UDS															
264.719	9.30	SPT		28	0	48	52				Non	Plastic					
263.219	10.80	SPT		33	0	15	85	1.84	1.60	14.88	Non	Plastic	2.67	DST	0.15	30	
262.519	11.50	UDS															
261.719	12.30	SPT		32	0	5	95				Non	Plastic					
260.219	13.80	SPT		52	0	3	97	1.88	1.61	16.72	Non	Plastic		DST	0.1	31	
259.519	14.50	UDS	Sandy Silt with Gravel (SM-ML)														
258.719	15.30	SPT		70	0	26	74				Non	Plastic					
257.219	16.80	SPT		46	0	16	84	1.83	1.56	17.45	Non	Plastic		DST	0.1	30	
256.519	17.50	UDS															
255.719	18.30	SPT		26	0	40	60				Non	Plastic					
254.219	19.80	SPT		30	1	8	91	1.86	1.57	18.21	Non	Plastic		DST	0.1	30	
253.519	20.50	UDS															
252.719	21.30	SPT		80	0	6	94				Non	Plastic					
251.219	22.80	SPT		101	0	44	56				Non	Plastic					
249.719	24.30	SPT		57	0	36	64				Non	Plastic					
248.219	25.80	SPT		32	0	4	96				Non	Plastic					
246.719	27.30	SPT		40	0	3	97				Non	Plastic					
245.219	28.80	SPT		44	1	3	96				Non	Plastic					
[illegible]	[illegible]	[illegible]	Silty Sand with [illegible]	5	[illegible]	[illegible]	17				[illegible]	[illegible]					

0261

BORE LOG

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

Project No. 1813 Bridge : 269 RL: 274.505

Location: 229/23-27
BH No.: 3
Depth : 30.00 m
Depth of Water table : Not Met

Date of start : 10/05/2008
Date of finish : 14/05./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)	
274.505																	
274.005	0.50	DS	Sandy Silt (SM-ML)		1	3	96				Non	Plastic					
272.705	1.80	SPT		52	1	4	95				Non	Plastic					
272.005	2.50	UDS						1.88	1.71	9.83				DST	0.11	30	
271.205	3.30	SPT	Silty Clay of high Plasticity (CH)	18	0	4	96				53	25					
269.705	4.80	SPT		24	0	1	99										
269.005	5.50	UDS						1.87	1.69	10.41	49	26	2.7	UU	1.28		0.073
268.205	6.30	SPT	Sandy Silt (SM-ML)	37	0	2	98				Non	Plastic					
266.705	7.80	SPT		33	0	21	79				Non	Plastic					
266.005	8.50	UDS						1.89	1.63	16.30				DST	0.15	32	
265.205	9.30	SPT		46	0	3	97				Non	Plastic					
263.705	10.80	SPT		51	0	3	97				Non	Plastic					
263.005	11.50	UDS						1.88	1.62	16.30			2.67	DST	0.15	31	
262.205	12.30	SPT	Silty Sand (SM)	23	0	64	36				Non	Plastic					
260.705	13.80	SPT		31	0	10	90				Non	Plastic					
260.005	14.50	UDS						1.89	1.62	16.84				DST		31	
259.205	15.30	SPT	Sandy Silt (SM-ML)	44	0	40	60				Non	Plastic					
257.705	16.80	SPT		49	0	27	73				Non	Plastic					
257.005	17.50	UDS						1.86	1.59	17.11				DST			
256.205	18.30	SPT		26	0	4	96				Non	Plastic					
254.705	19.80	SPT	Silty Clay of Medium Plasticity (CI)	28	2	6	92				40	21					
254.005	20.50	UDS						1.86	1.55	20.11			2.71	UU	1.52		0.071
253.205	21.30	SPT		83	0	32	68				Non	Plastic					
251.705	22.80	SPT		77	0	19	81				Non	Plastic					
250.205	24.30	SPT	Sandy Silt with gravel (SM-ML)	60	0	61	39				Non	Plastic					
248.705	25.80	SPT		63	0	32	68				Non	Plastic					
247.205	27.30	SPT		50	4	10	86				Non	Plastic					
245.705	28.80	SPT		44	4	15	81				Non	Plastic					
244.205	30.30	SPT	Silty Sand (SM)	78	0	57	43				Non	Plastic					

BORE LOG

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

Project No. 1813 Bridge : 269 RL: 274.412

Location: 229/23-27
BH No.: 4
Depth : 30.00 m
Depth of Water table : 27.00m

Date of start : 12/05/2008
Date of finish : 13/05./2008

SOIL ENGINEERING CONSULTANTS

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
274.412																	
272.612	1.80	SPT	Silty Sand with Medium Plasticity (CI)	23	0	4	96				47	23		DST			
271.912	2.50	UDS															
271.112	3.30	SPT		20	3	7	90										
269.612	4.80	SPT		34	0	4	96				42	21					
268.912	5.50	UDS											2.7	UU			
268.112	6.30	SPT		26	2	6	92				Non	Plastic					
266.612	7.80	SPT		35	0	27	73				Non	Plastic		DST			
265.912	8.50	UDS															
265.112	9.30	SPT		26	0	3	97				Non	Plastic					
263.612	10.80	SPT		27	2	3	95				Non	Plastic					
262.912	11.50	UDS											2.67	DST			
262.112	12.30	SPT		35	2	23	75				Non	Plastic					
260.612	13.80	SPT		34	0	9	91				Non	Plastic		DST			
259.912	14.50	UDS															
259.112	15.30	SPT	Sandy Silt (SM-ML)	46	0	31	69				Non	Plastic					
257.612	16.80	SPT		47	0	33	67				Non	Plastic		DST			
256.912	17.50	UDS															
256.112	18.30	SPT		54	0	43	57				Non	Plastic					
254.612	19.80	SPT		60	0	45	55				Non	Plastic					
253.912	20.50	UDS											2.71	UU			
253.112	21.30	SPT		75	0	41	59				Non	Plastic					
251.612	22.80	SPT		68	0	29	71				Non	Plastic					
250.112	24.30	SPT		71	0	27	73				Non	Plastic					
248.612	25.80	SPT		75	0	31	69				Non	Plastic					
247.112	27.30	SPT	Silty Sand (SM)	61	0	65	35				Non	Plastic					
245.612	28.80	SPT		38	0	59	41				Non	Plastic					
24	1	30.	T			3	22										

0 10 20 30 40 50 60 70 80 90 100 110 120

9920

BORE LOG

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

Project No. 1813 Bridge : 269 RL: 277.560

Location: 229/23-27
BH No.: 5
Depth : 30.00 m
Depth of Water table : 27.50m

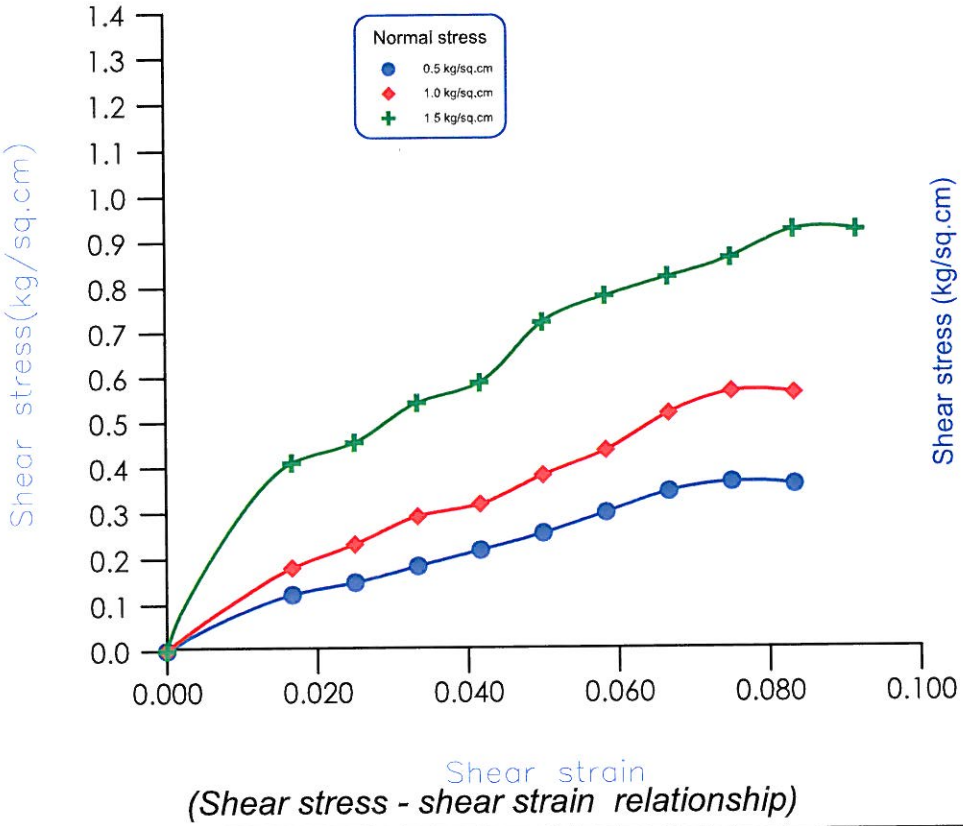
Date of start : 12/05/2008
Date of finish : 13/05./2008

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W(%)	L.L	P.L	Sp.Gr	Shear Parameters: Type of test	C(kg/sq.cm)	phi(degrees)	Cc
277.560																	
277.060	0.50	DS	Silty Sand with Medium Plasticity (CI)	24	1	3	96				Non	Plastic					
275.760	1.80	SPT			2	7	91				45	21					
275.060	2.50	UDS						1.92	1.65	16.42			2.7	UU	1.18		0.08
274.260	3.30	SPT		23	4	9	87				41	23					
272.760	4.80	SPT	Sandy Silt (SM-ML)	28	1	4	95				Non	Plastic					
272.060	5.50	UDS						1.84	1.66	10.89				DST	0.1	31	
271.260	6.30	SPT		40	0	3	97				Non	Plastic					
269.760	7.80	SPT		43	0	42	58				Non	Plastic					
269.060	8.50	UDS						1.87	1.68	11.23				DST	0.1	31	
268.260	9.30	SPT		40	2	6	92				Non	Plastic					
266.760	10.80	SPT		48	0	2	98				Non	Plastic					
266.060	11.50	UDS						1.85	1.62	14.41			2.67	DST	0.1	30	
265.260	12.30	SPT		35	0	8	92				Non	Plastic					
263.760	13.80	SPT		31	1	5	94				Non	Plastic					
263.060	14.50	UDS						1.86	1.62	15.17				DST	0.15	31	
262.260	15.30	SPT		51	0	36	64				Non	Plastic					
260.760	16.80	SPT		52	0	15	85				Non	Plastic					
260.060	17.50	UDS						1.86	1.62	15.17				DST	0.1	31	
259.260	18.30	SPT		40	2	6	92				Non	Plastic					
257.760	19.80	SPT		42	2	3	95				Non	Plastic					
257.060	20.50	UDS						1.86	1.61	11.63				DST	0.15	31	
256.260	21.30	SPT	Silty Sand (SM)	60	0	53	47				Non	Plastic					
254.760	22.80	SPT		66	0	57	43				Non	Plastic					
253.260	24.30	SPT		56	0	77	23				Non	Plastic					
251.760	25.80	SPT		58	0	55	45				Non	Plastic					
250.260	27.30	SPT		56	1	51	48				Non	Plastic					
248.760	28.80	SPT		42	1	72	27				Non	Plastic					
247.260	30.30	SPT		29	1	62	37				Non	Plastic					

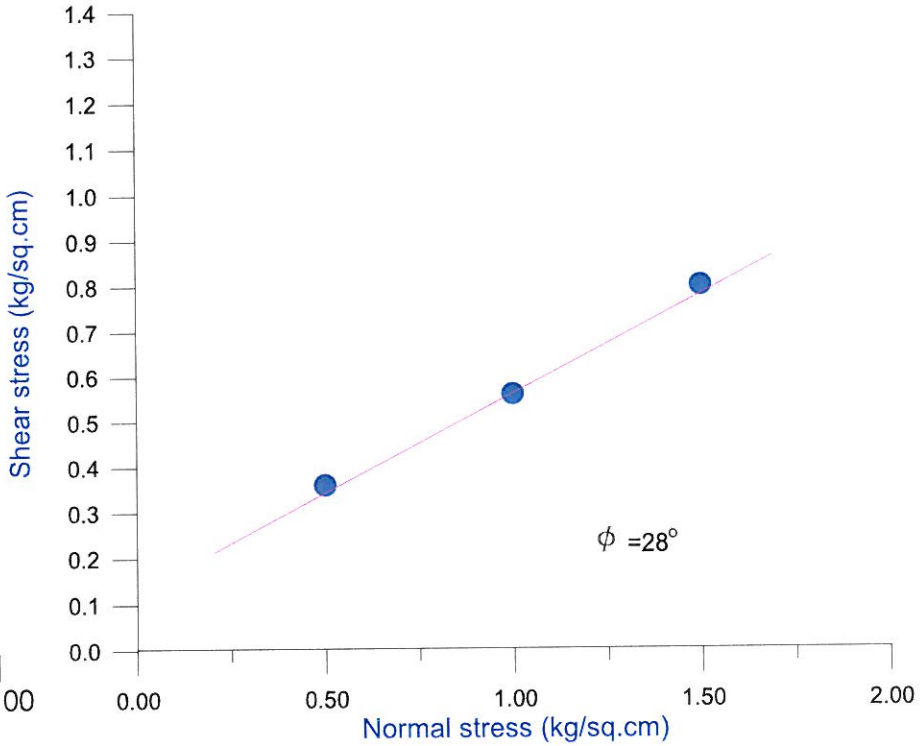
0 10 20 30 40 50 60 70 80 90 100 110 120

0267

BH-1
DEPTH = 5.50 m



(Shear stress - shear strain relationship)

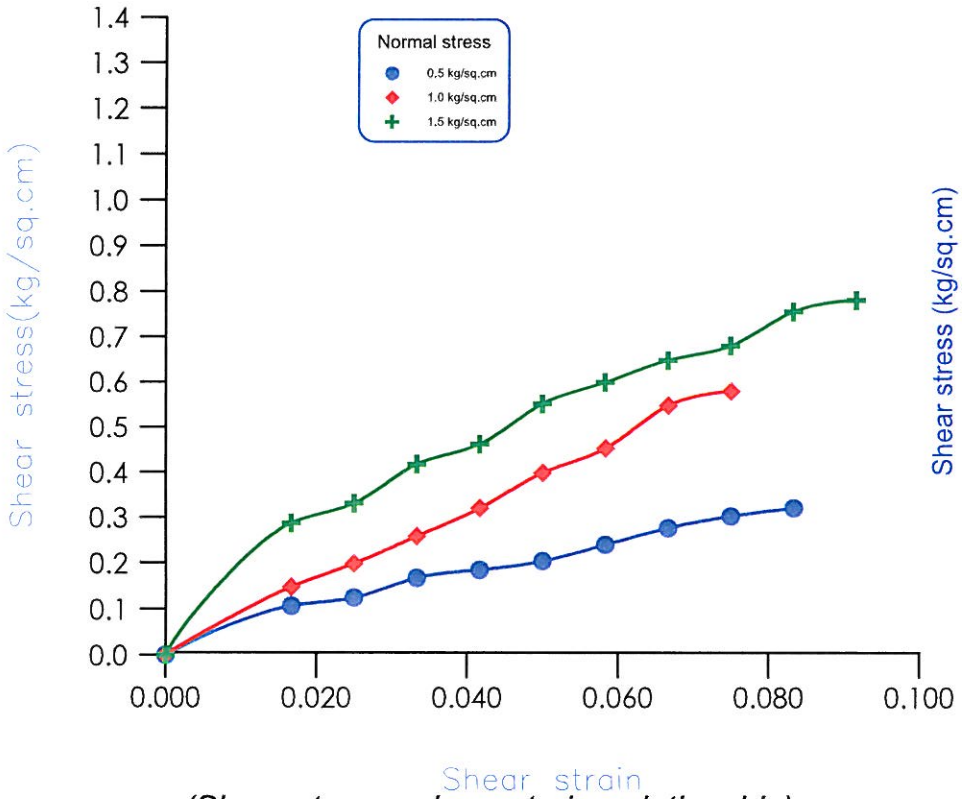


(Shear stress - Normal stress relationship)

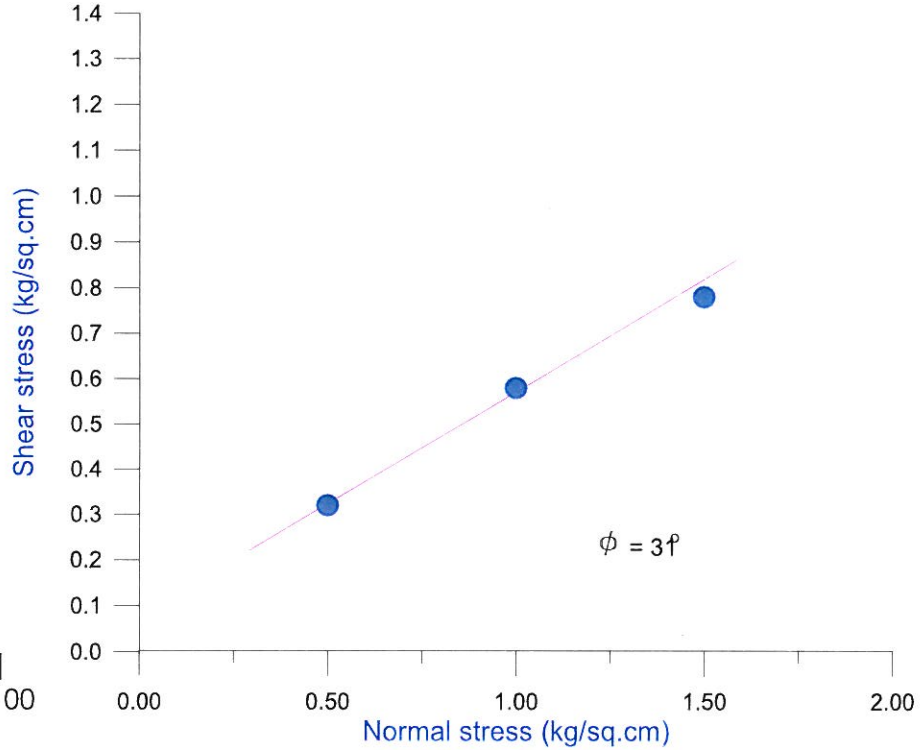
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BQ1

BH-1
DEPTH = 8.50 m



(Shear stress - shear strain relationship)



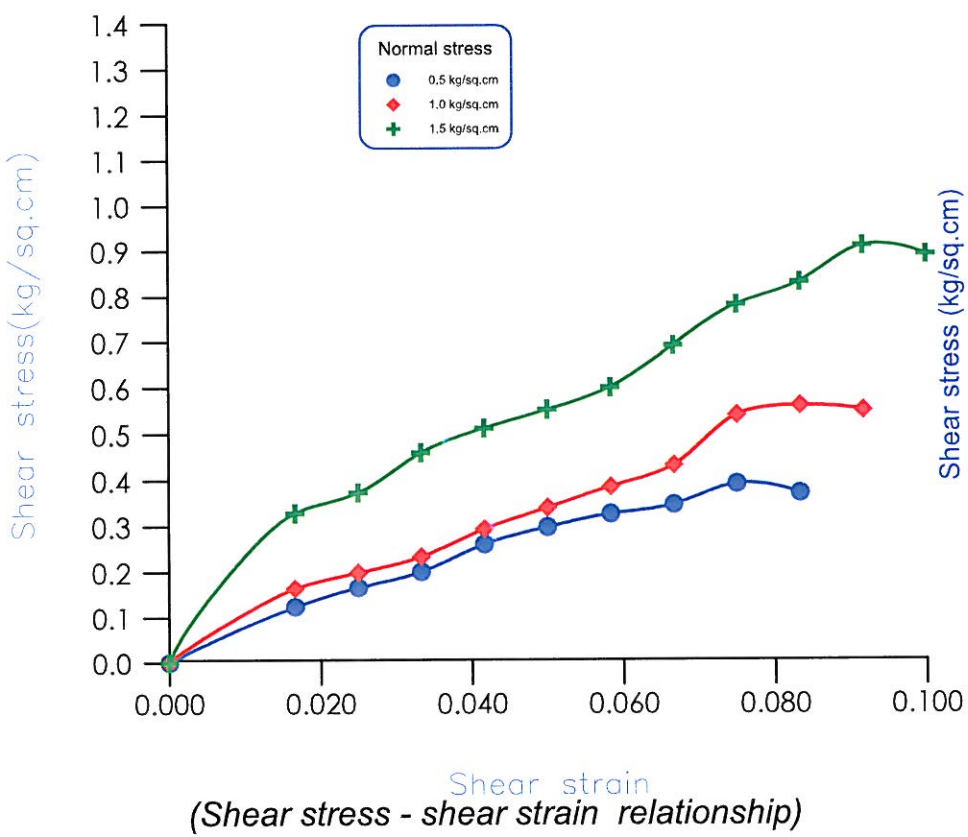
(Shear stress - Normal stress relationship)

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

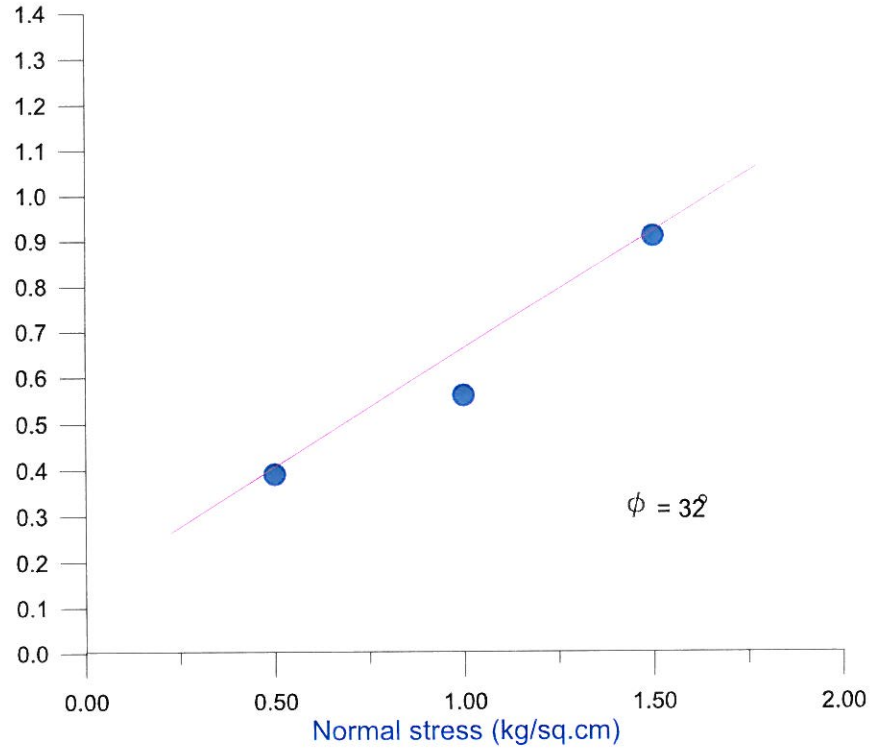
FIG- DS-BQ2

6920

BH-1
DEPTH = 11.50 m.



(Shear stress - shear strain relationship)

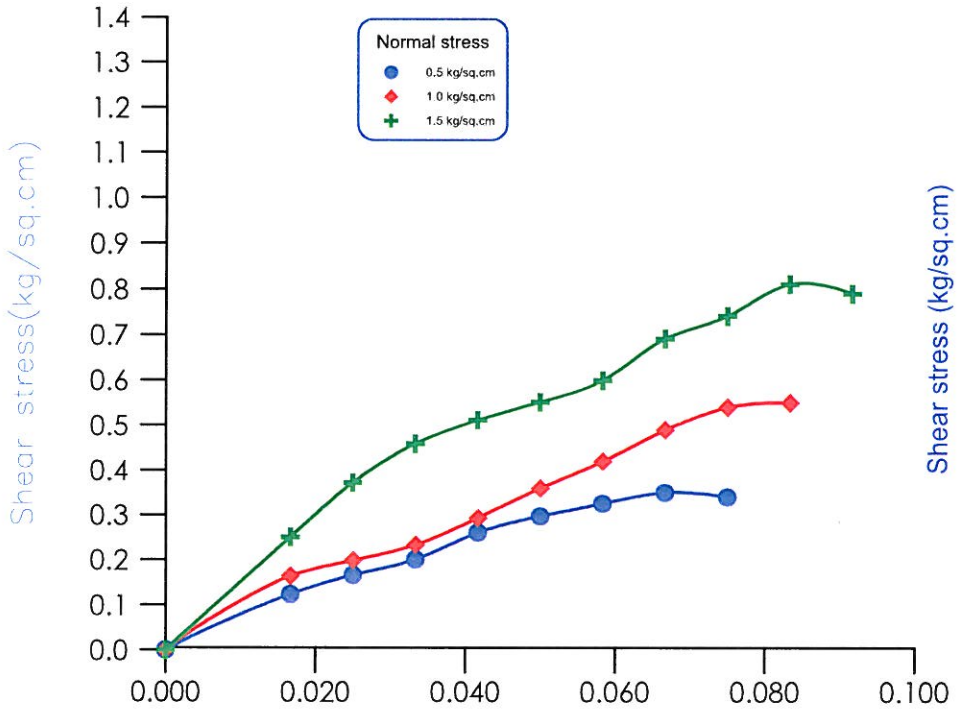


(Shear stress - Normal stress relationship)

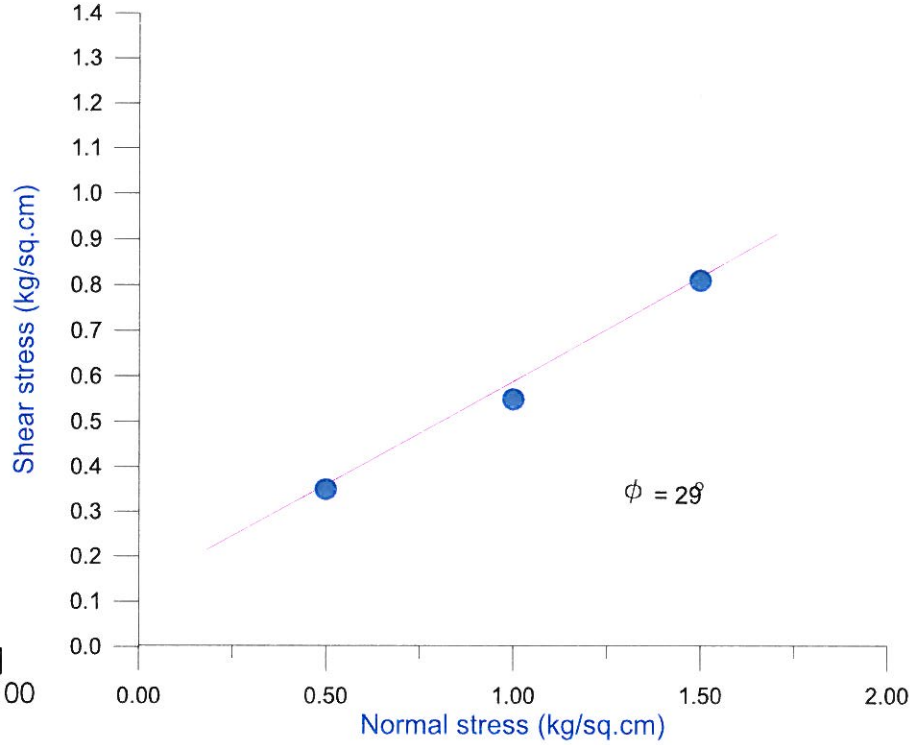
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BQ3

BH-2
DEPTH = 5.50 m.



(Shear stress - shear strain relationship)



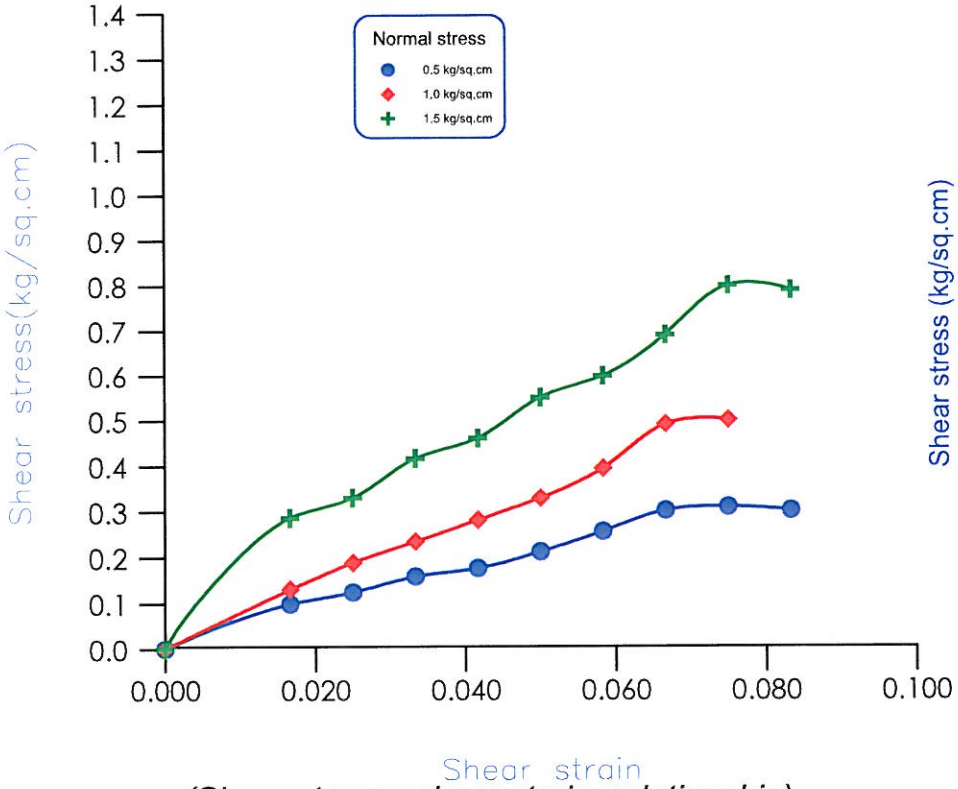
(Shear stress - Normal stress relationship)

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

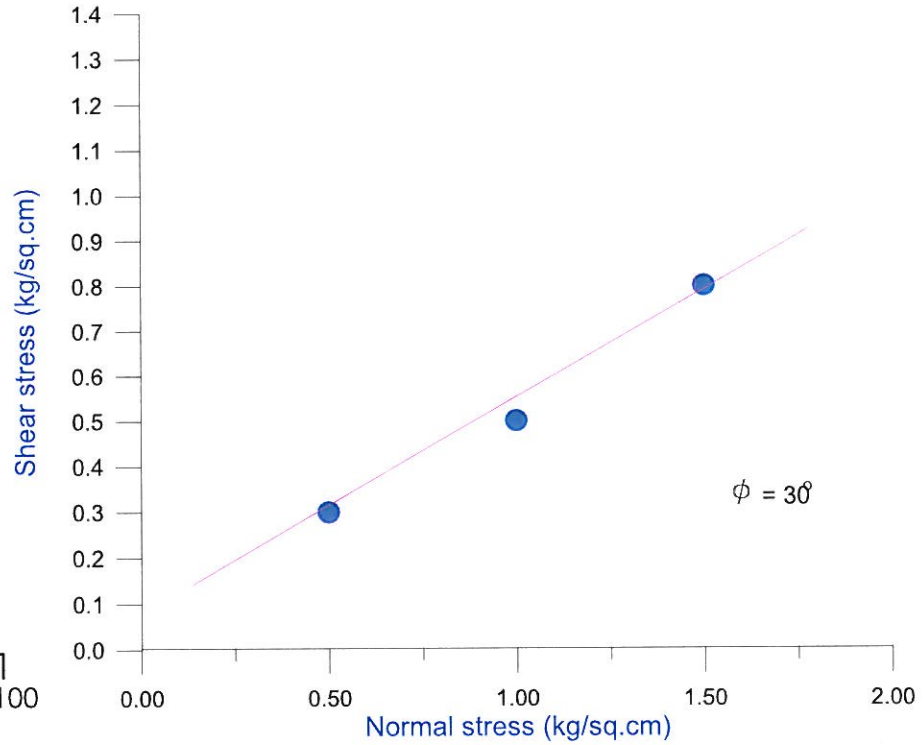
FIG- DS-BQ4

0274

BH-2
DEPTH = 8.50 m.



(Shear stress - shear strain relationship)

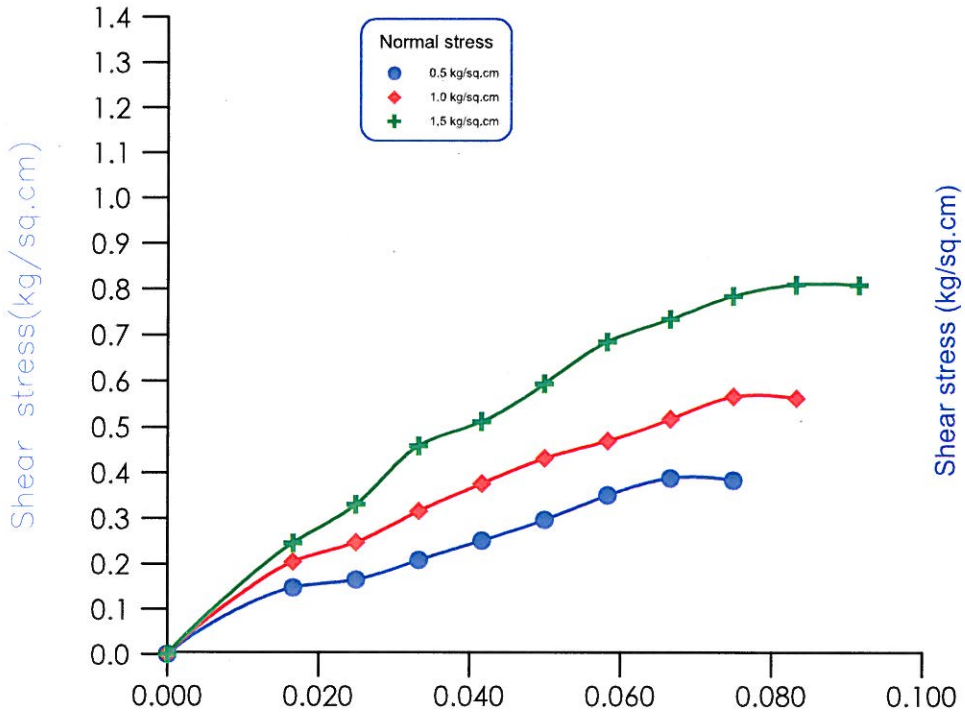


(Shear stress - Normal stress relationship)

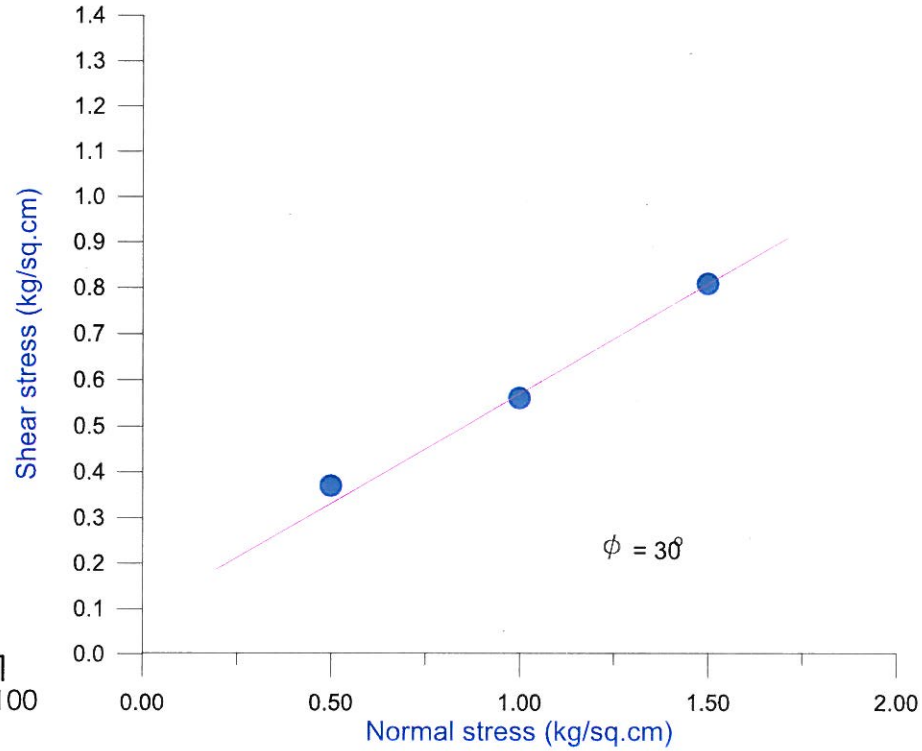
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BQ5

BH-3
DEPTH = 2.50 m.



(Shear stress - shear strain relationship)



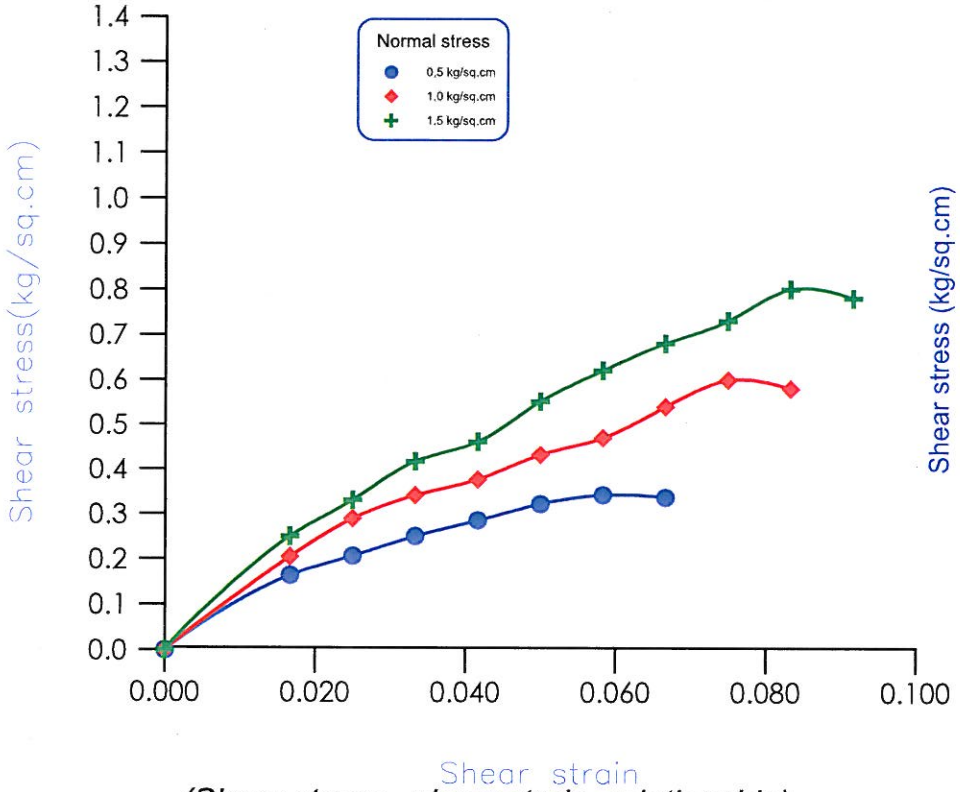
(Shear stress - Normal stress relationship)

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

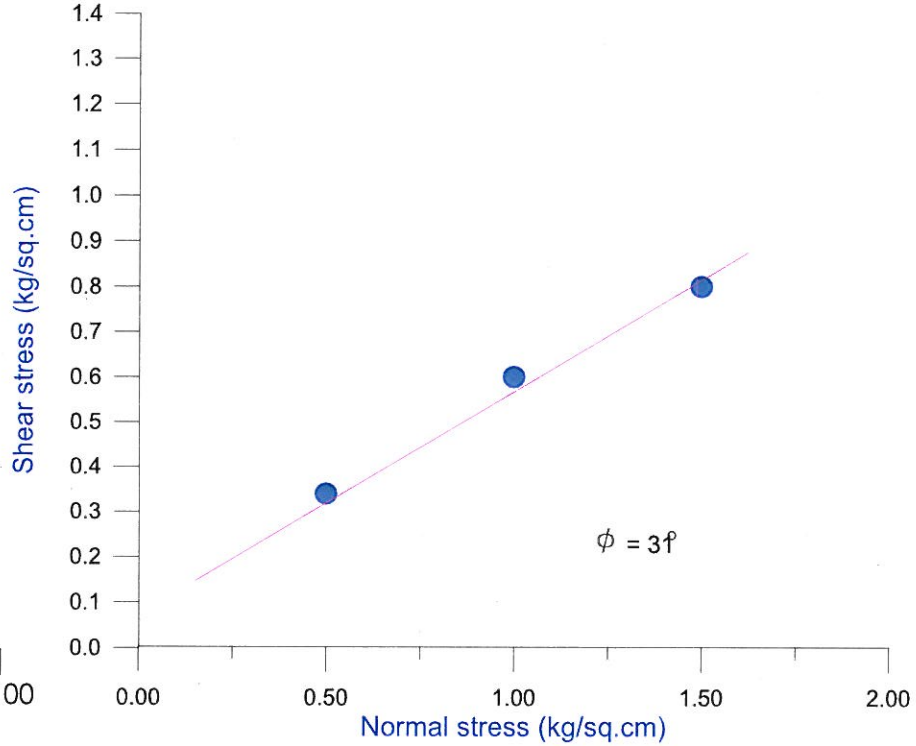
FIG- DS-BQ6

0273

BH-3
DEPTH = 11.50 m.



(Shear stress - shear strain relationship)



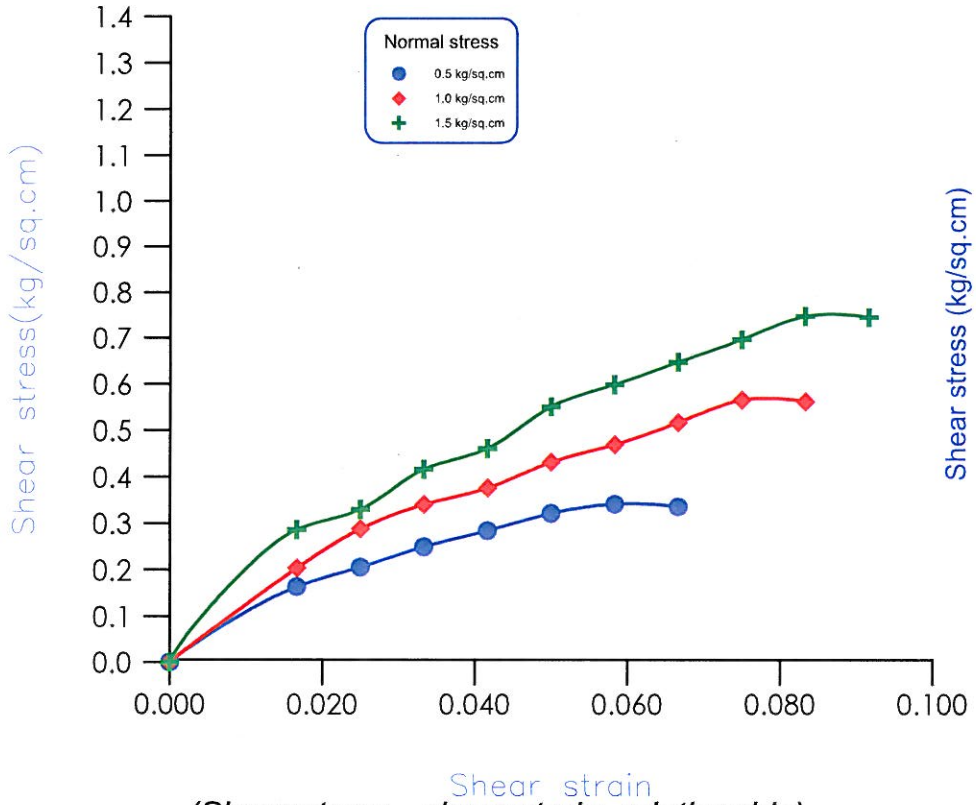
(Shear stress - Normal stress relationship)

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

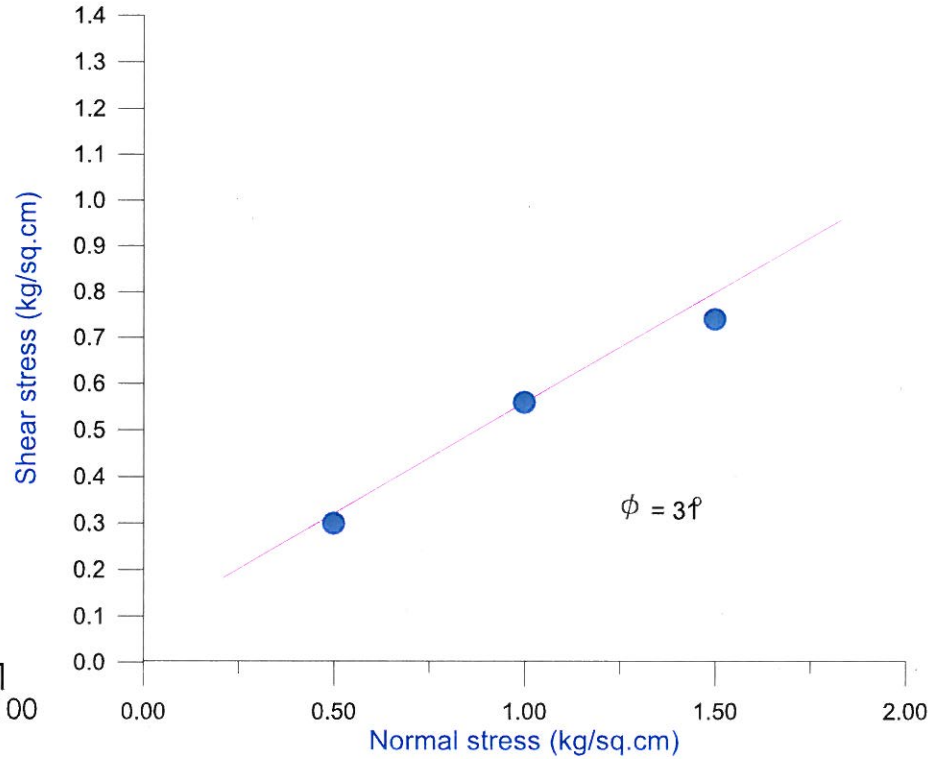
FIG- DS-BQ7

0278

BH-5
DEPTH = 5.50 m.



(Shear stress - shear strain relationship)

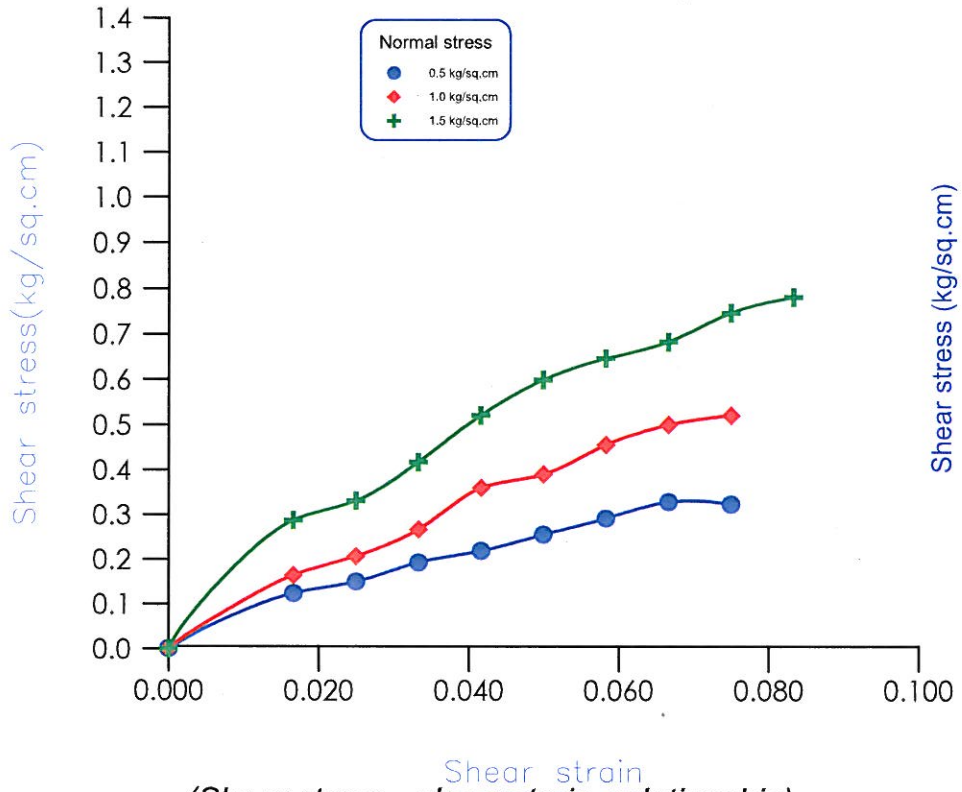


(Shear stress - Normal stress relationship)

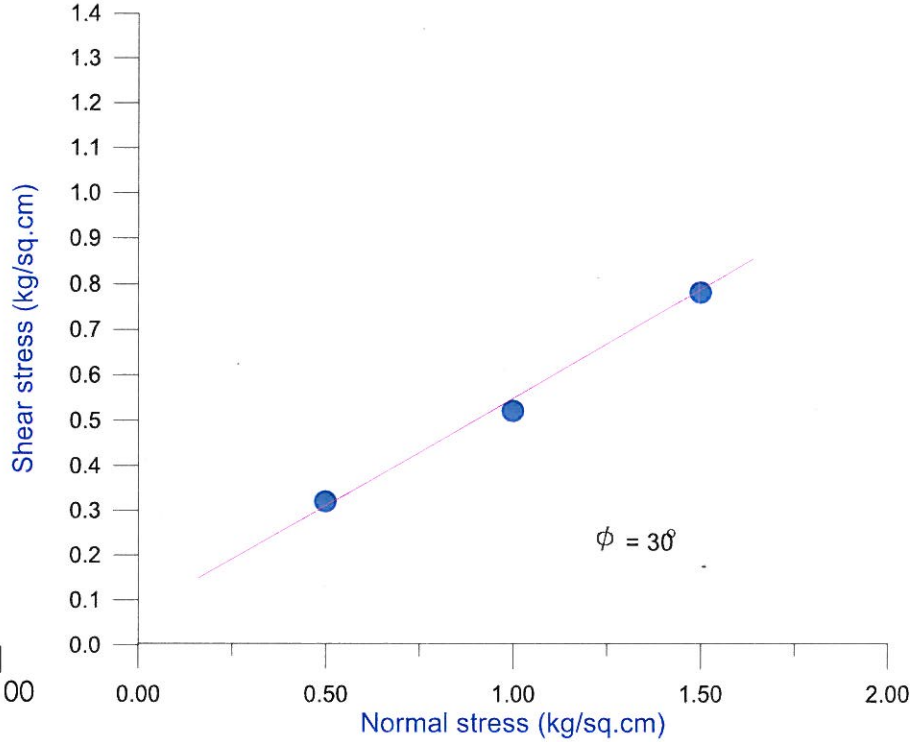
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BQ10

BH-5
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-BQ11

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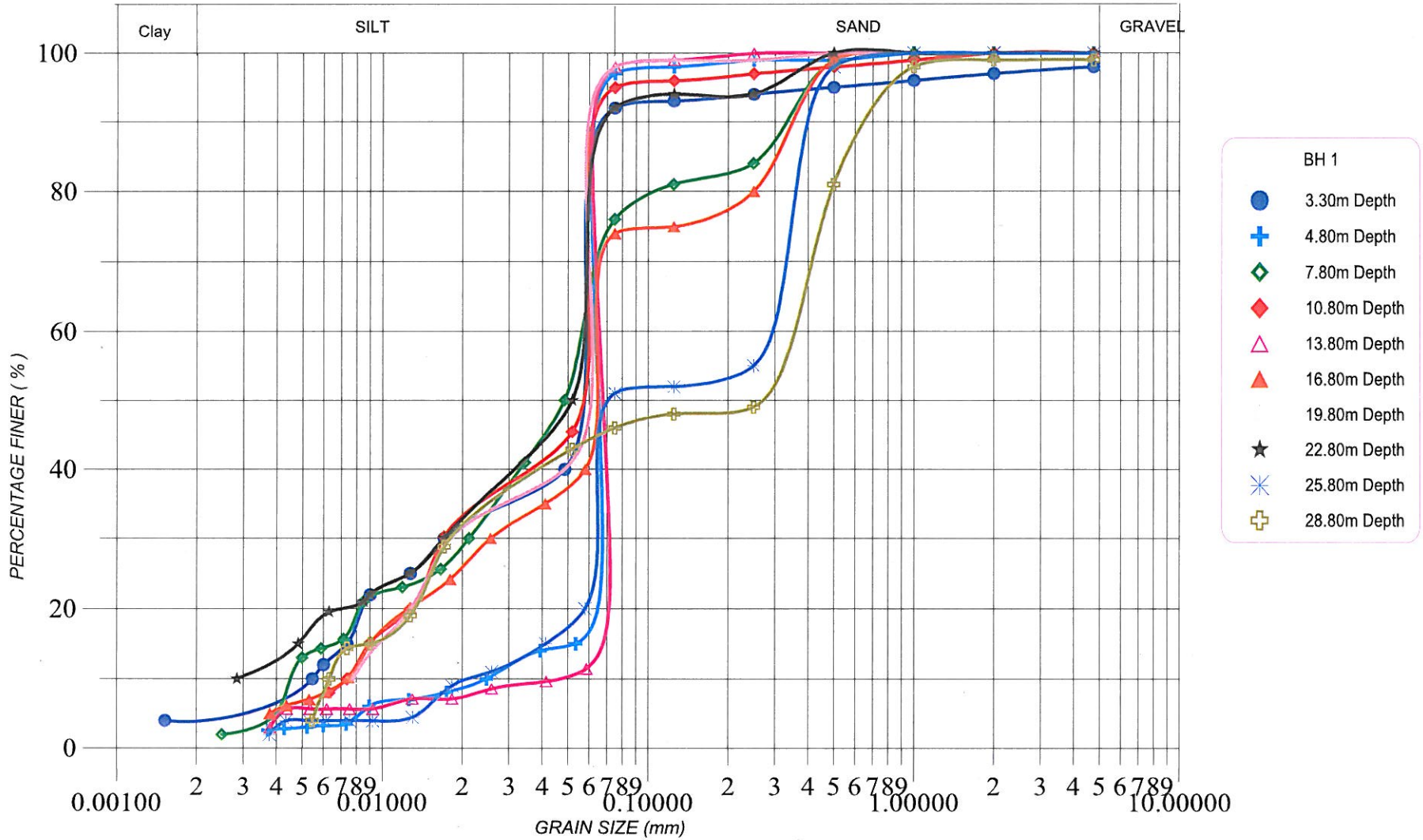
GRAIN SIZE DRISTRIBUTION CURVE



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

Fig : GSD-BQ1

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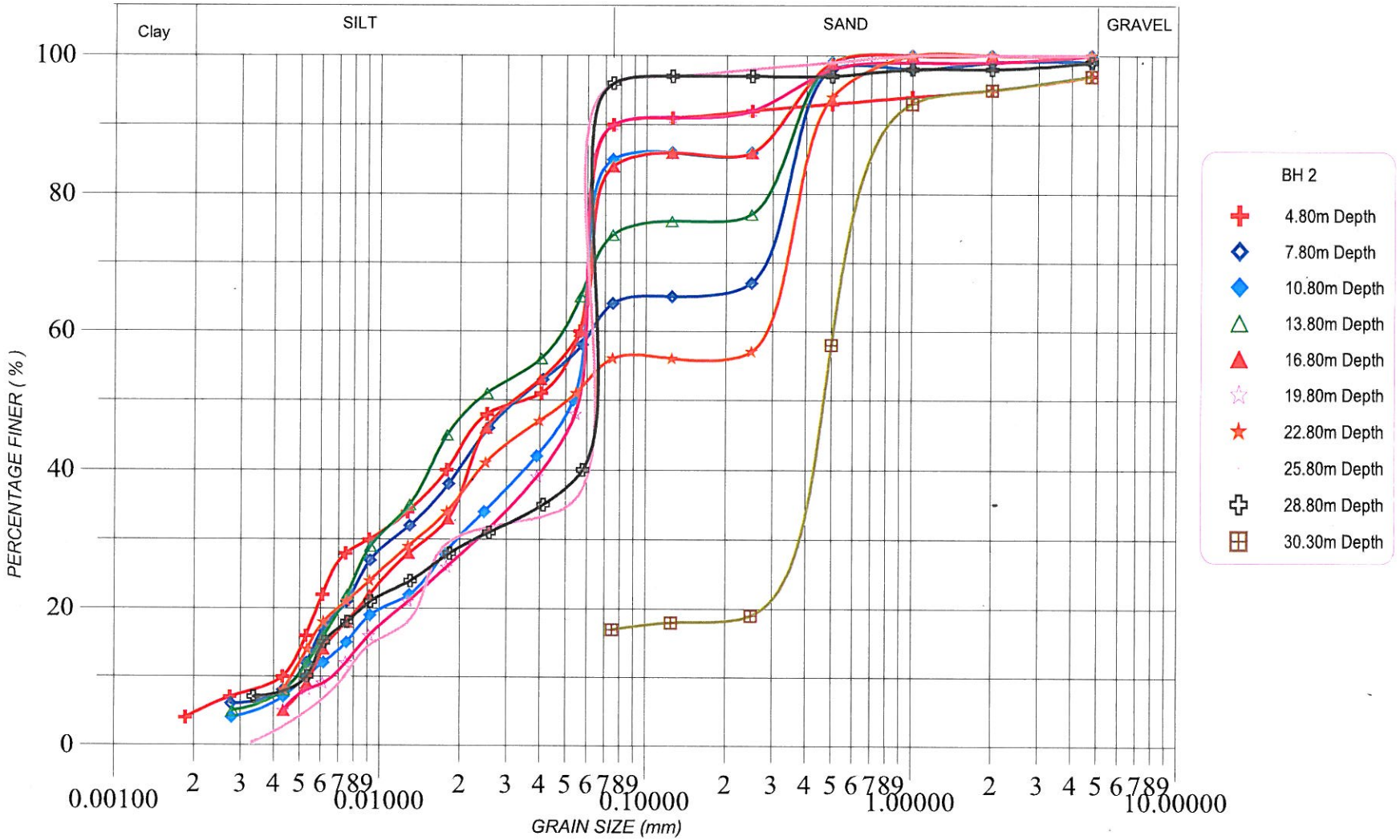
GRAIN SIZE DRISTRIBUTION CURVE



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

Fig : GSD-BQ2

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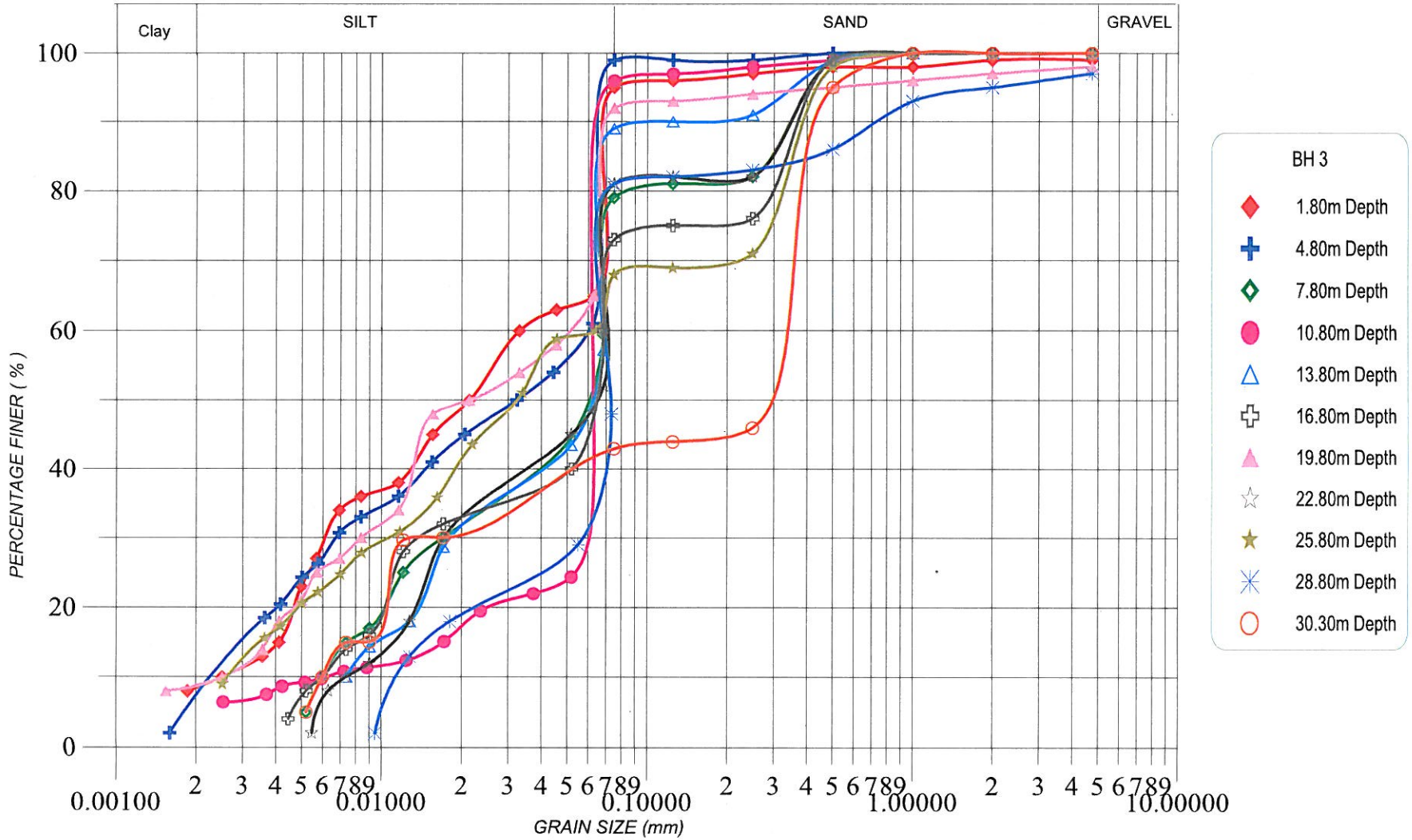
Job:1813

GRAIN SIZE DRISTRIBUTION CURVE



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

Fig : GSD-BQ3

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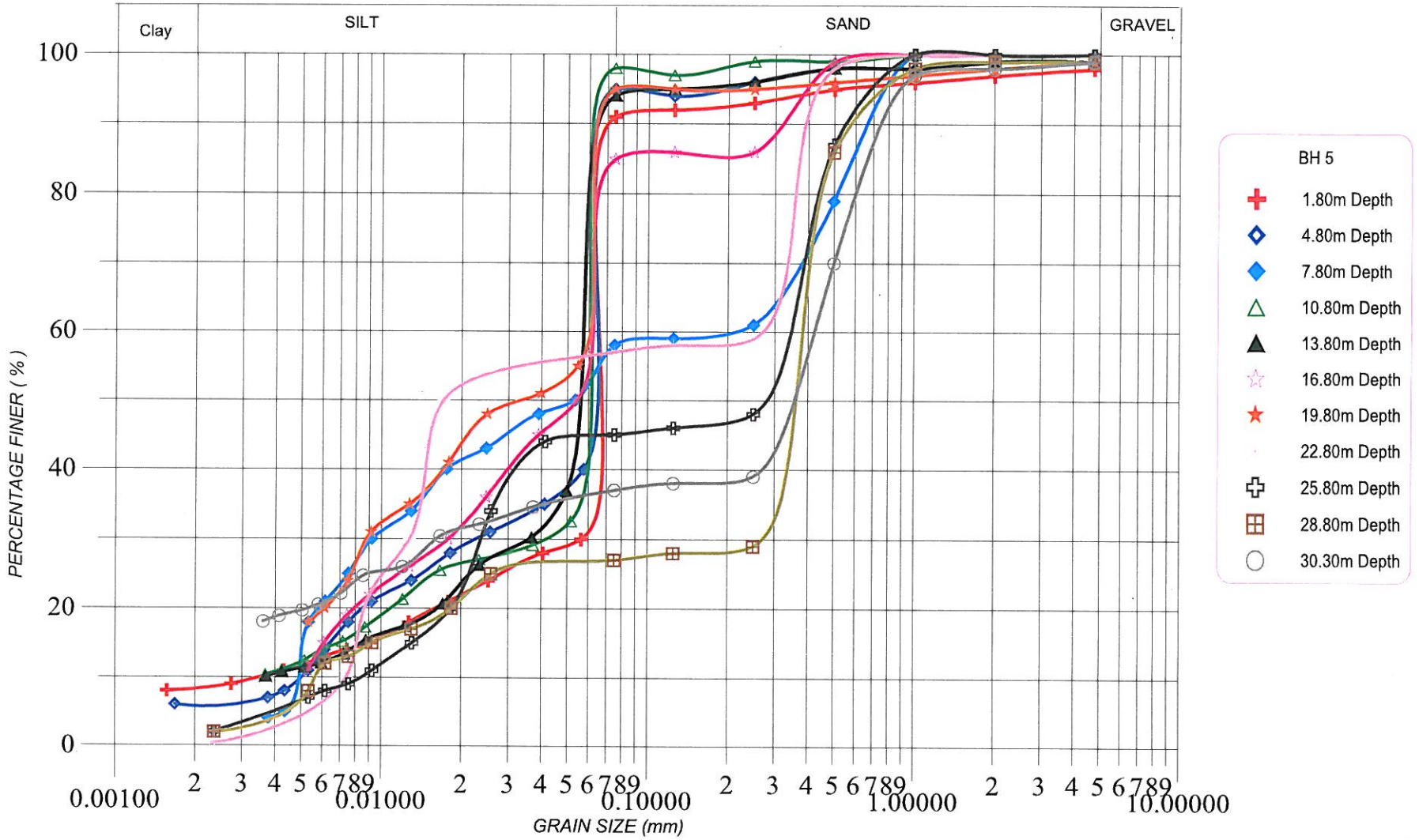
Job:1813

GRAIN SIZE DRISTRIBUTION CURVE



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

Fig : GSD-BQ5

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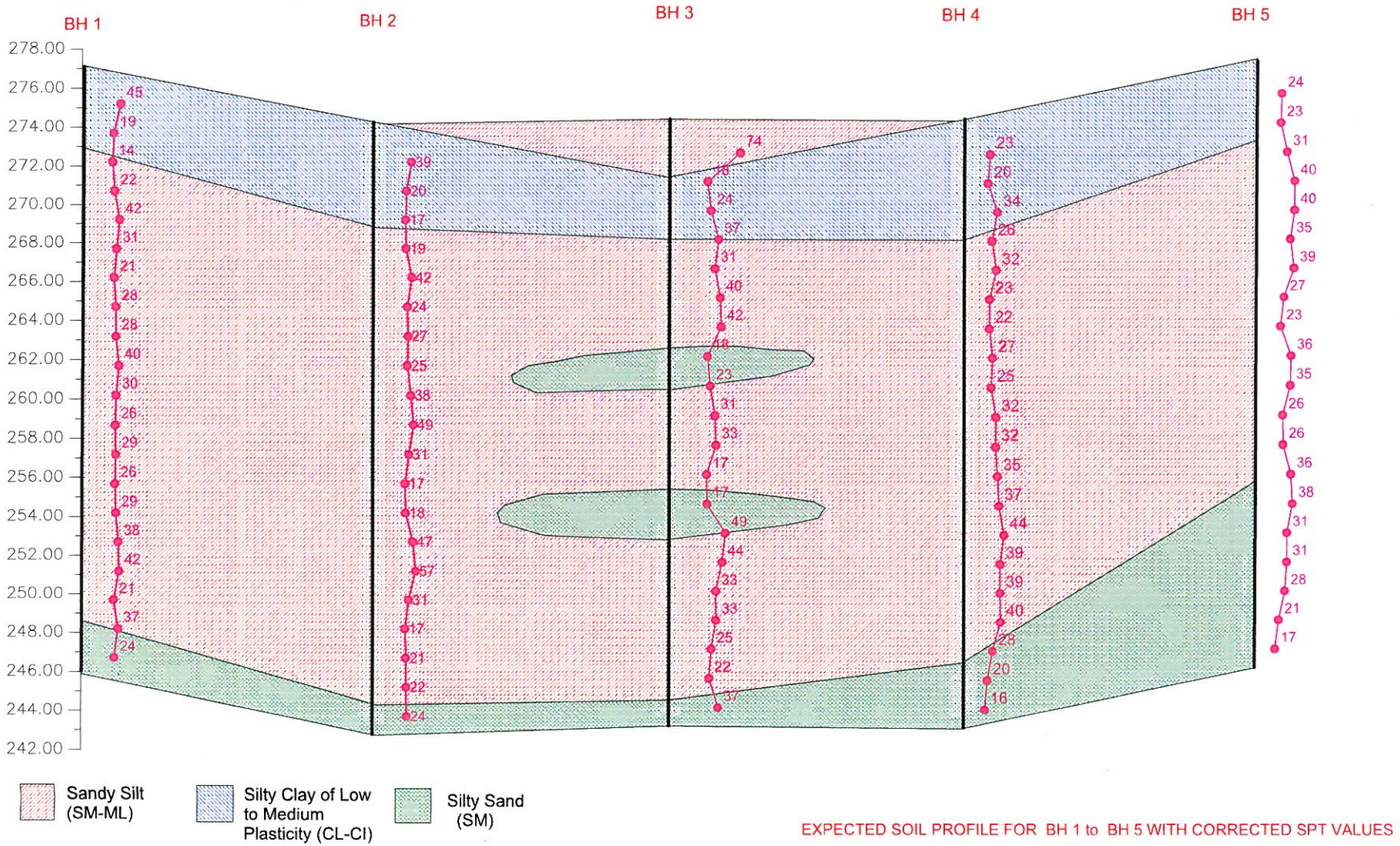
Project No. 1813



EXPECTED SOIL PROFILE FOR BH 1 to BH 5 WITH CORRECTED SPT VALUES

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

Figure : Soilpro BQ

0284

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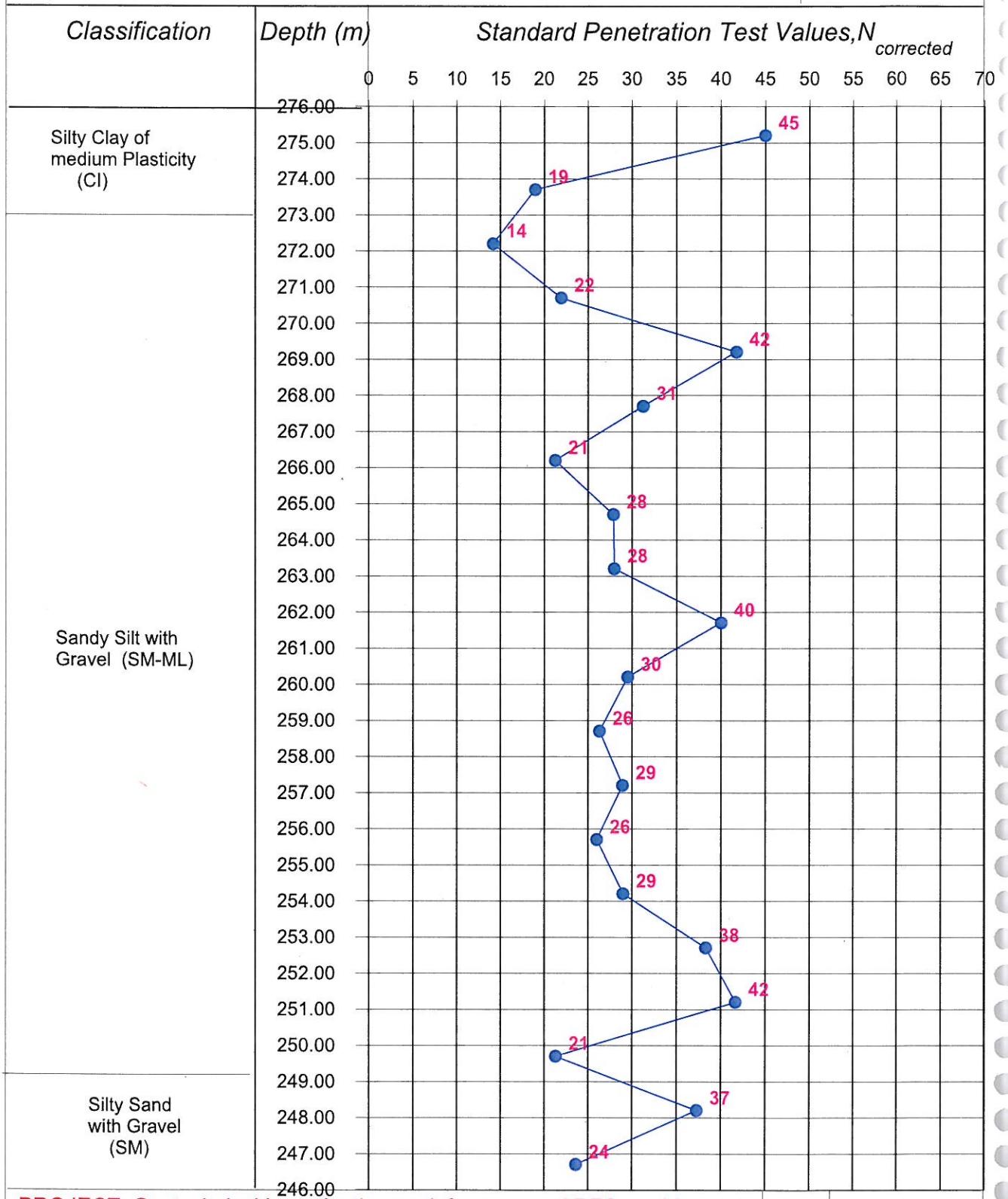
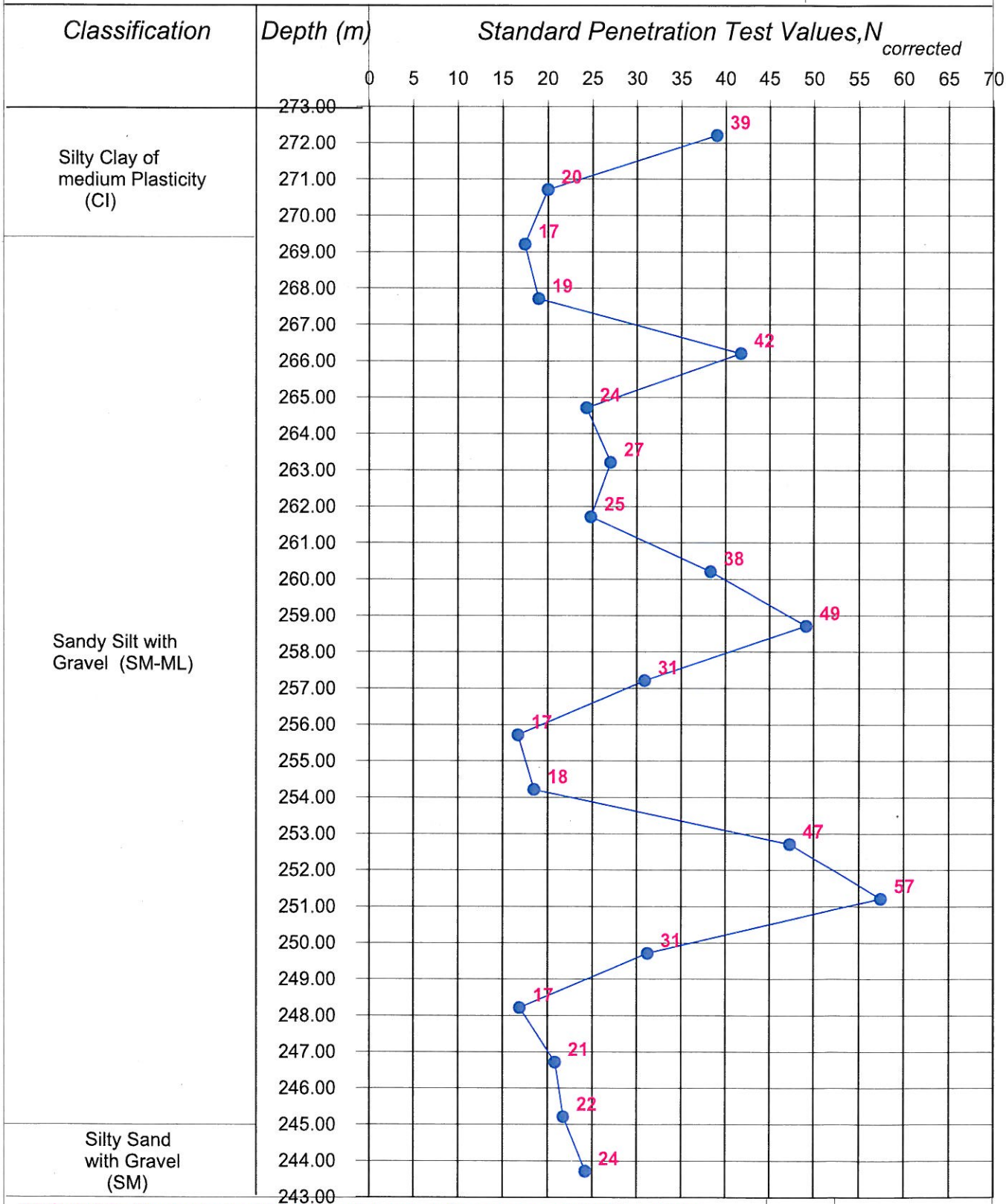


PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP--BQ1

0282

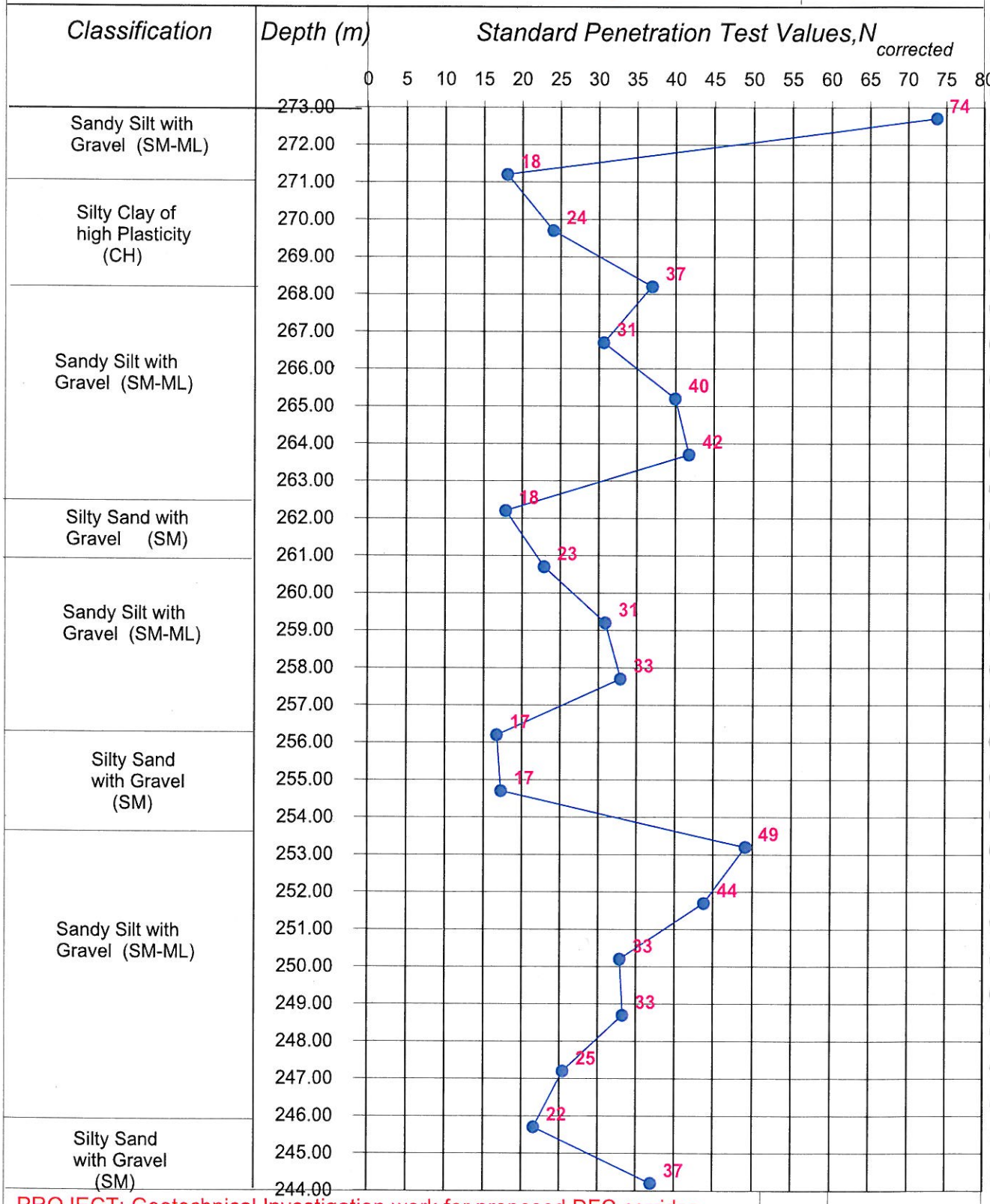
SOIL ENGINEERING CONSULTANTS | BR@ 269 229/23-27 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-2 | Fig: SP--BQ2

0283

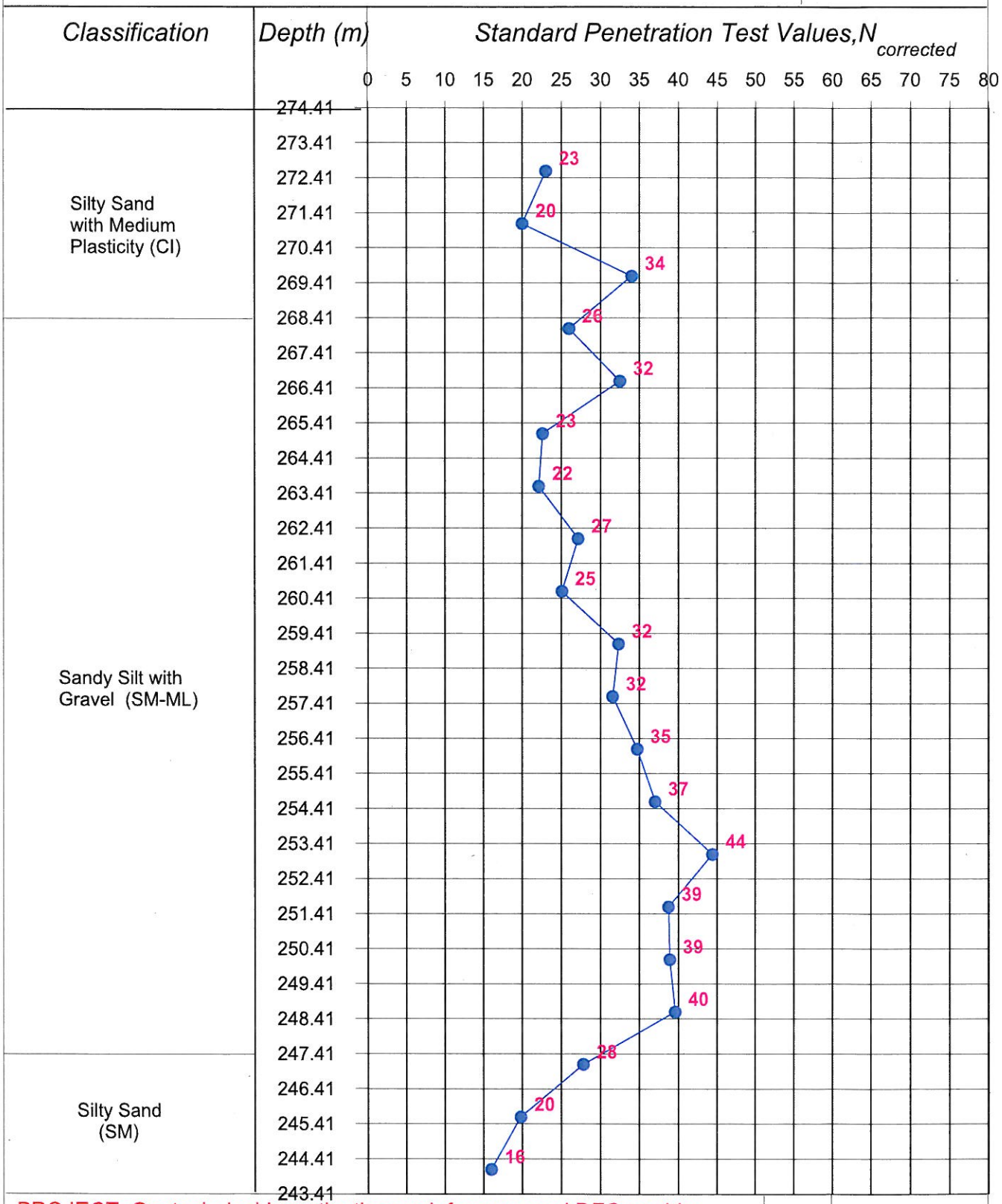
SOIL ENGINEERING CONSULTANTS | BR@ 269 229/23-27 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-3 | Fig: SP--BQ3

0204

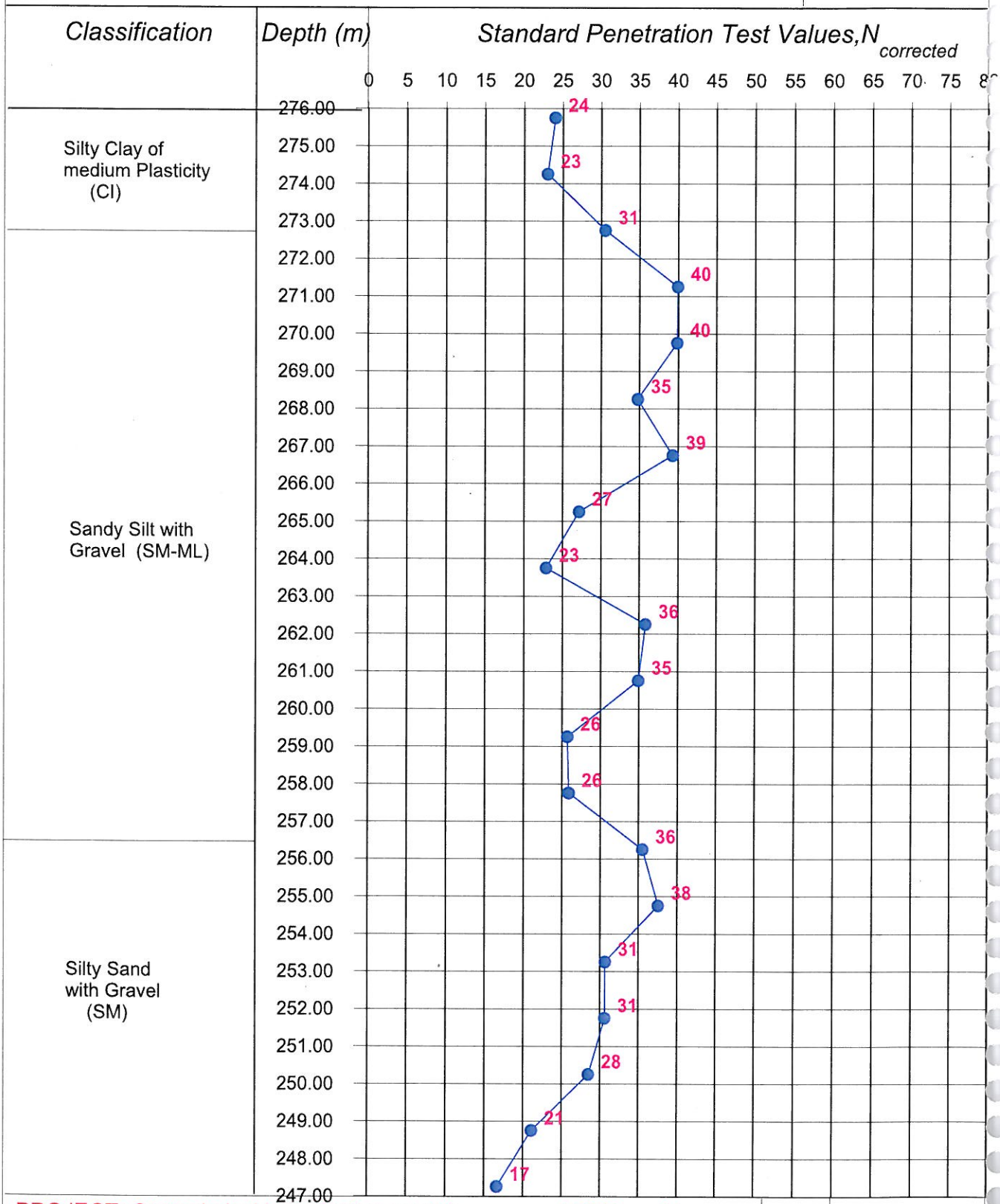
SOIL ENGINEERING CONSULTANTS | BR@ 269 229/23-27 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-4 | Fig: SP--BQ4

0285

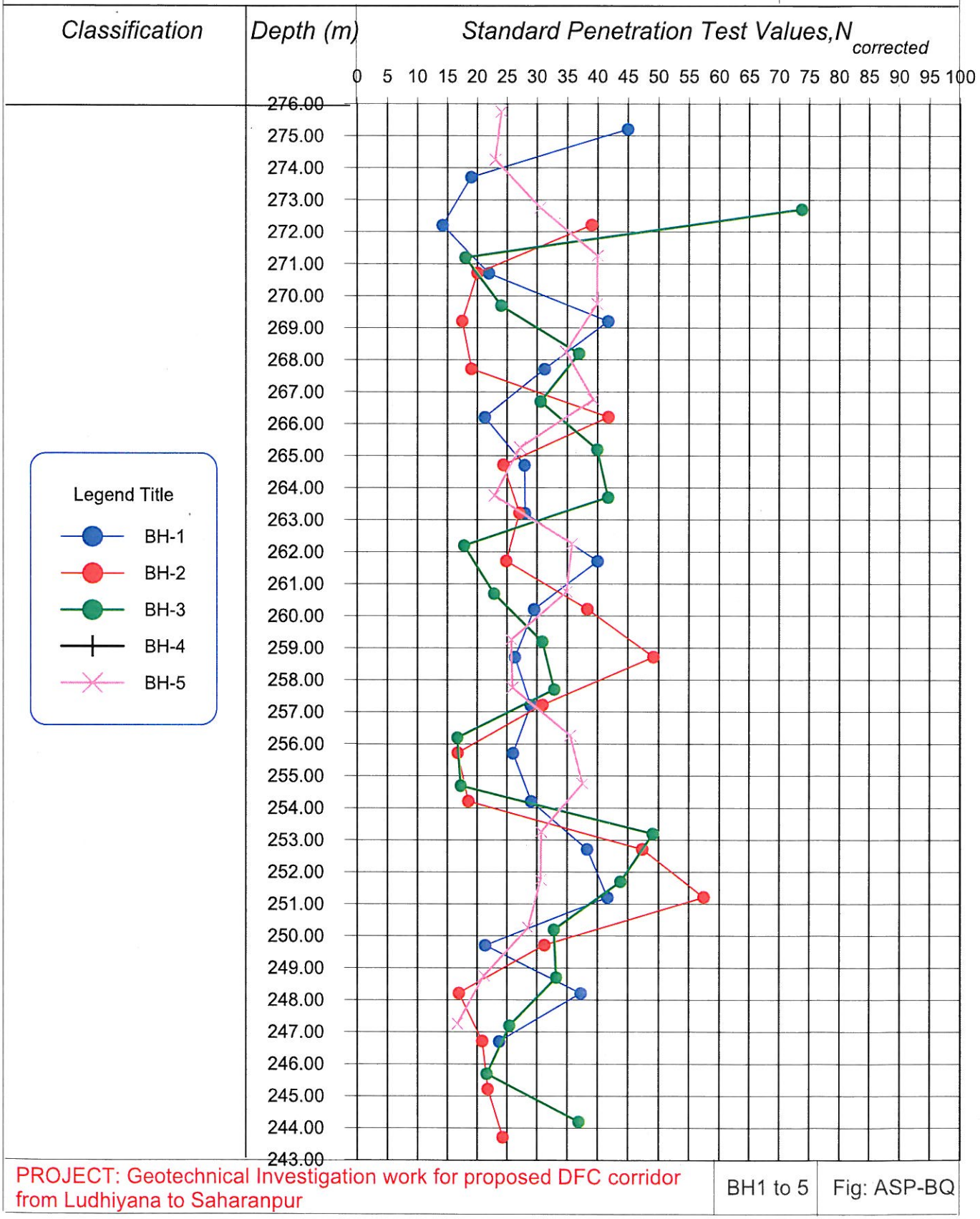
SOIL ENGINEERING CONSULTANTS | BR@ 269 229/23-27 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-5 | Fig: SP--BQ5

0286

SOIL ENGINEERING CONSULTANTS | BR@ 269 229/25-27 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH1 to 5 | Fig: ASP-BQ

0287

BORE LOG

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

Project No. 1813 Bridge : 270 RL: 273.812

Location:230/19-21
BH No.: 1
Depth : 12.00
Depth of Water table :Not met

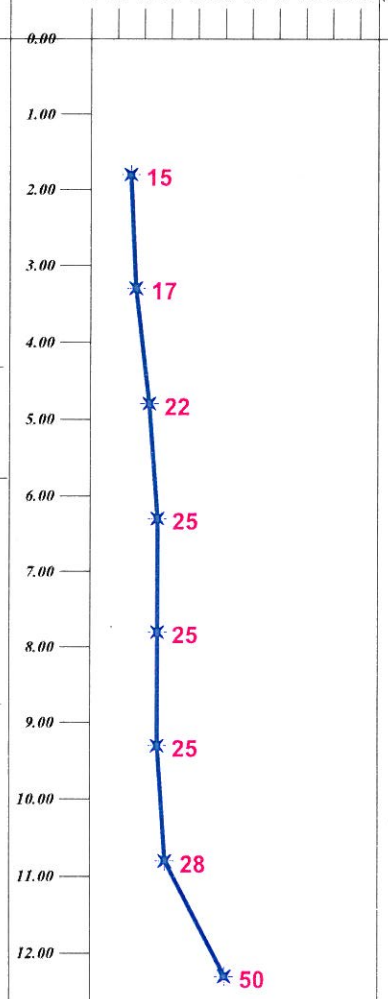
Date of start : 15/04/2008

Date of finish : 16/04/2008

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
273.812																
273.312	0.50	DS	Sandy Silt with Gravel (SM-ML)	0	27	73				Non	Plastic					
272.012	1.80	SPT		0	21	79				Non	Plastic					
271.312	2.50	UDS					1.78	1.62	9.67			2.65	DST	0.18	30	
270.512	3.30	SPT		0	48	52				Non	Plastic					
269.012	4.80	SPT	Silty Sand with Gravel (SM)	0	54	46				Non	Plastic					
267.512	6.30	SPT	Sandy Silt with Gravel (SM-ML)	0	45	55				Non	Plastic					
266.012	7.80	SPT		0	43	57				Non	Plastic					
265.312	8.50	UDS					1.86	1.67	11.43				DST	0.15	31	
264.512	9.30	SPT	Silty Sand with Gravel (SM)	0	68	32				Non	Plastic					
263.012	10.80	SPT		0	57	43				Non	Plastic					
261.512	12.30	SPT		0	53	47				Non	Plastic					

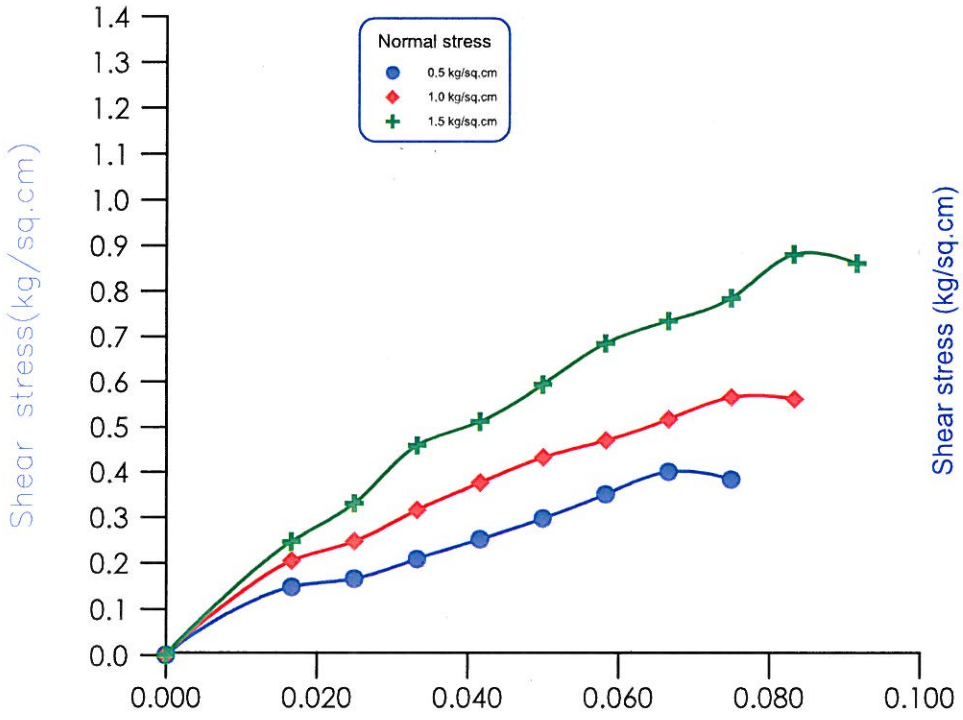
S.P.T Plot

Observed

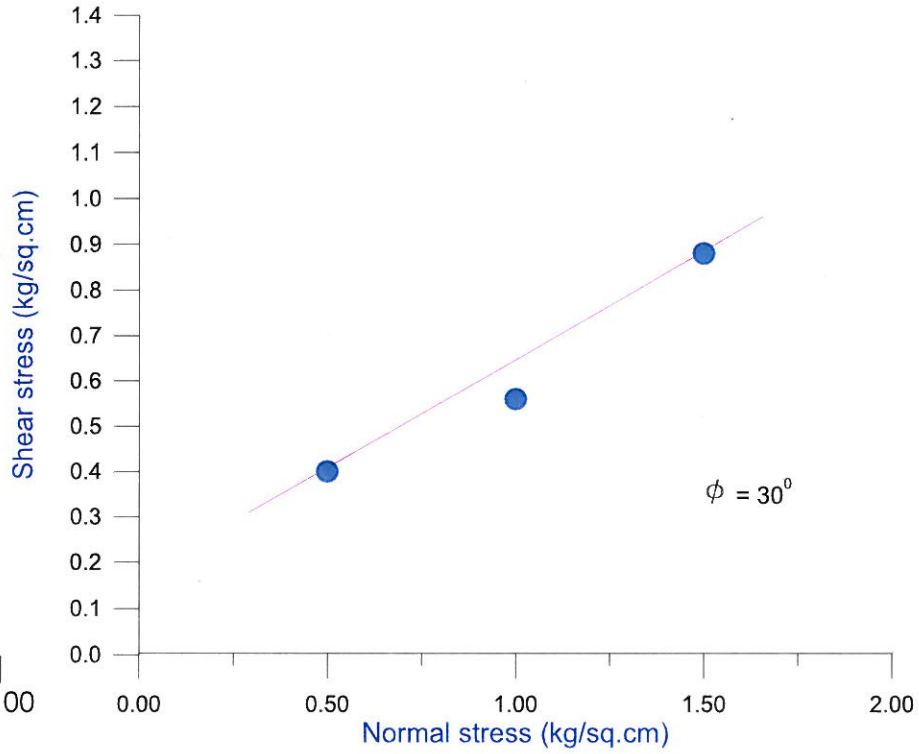


8320 02

BH-1
DEPTH = 2.50 m.



(Shear stress - shear strain relationship)



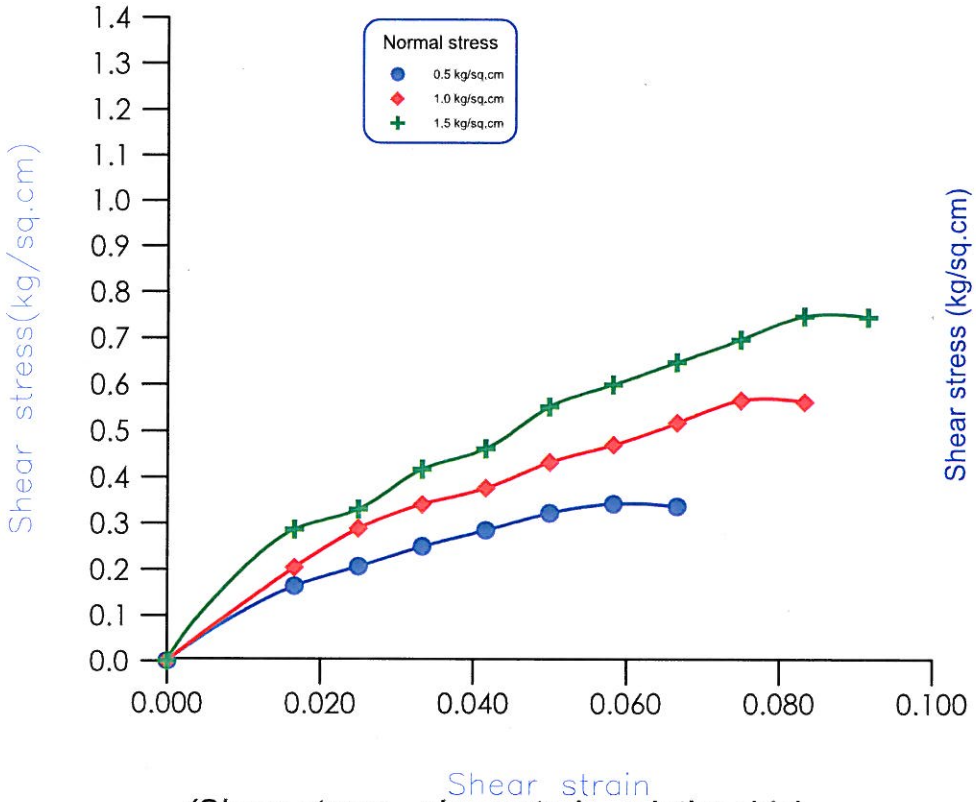
(Shear stress - Normal stress relationship)

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

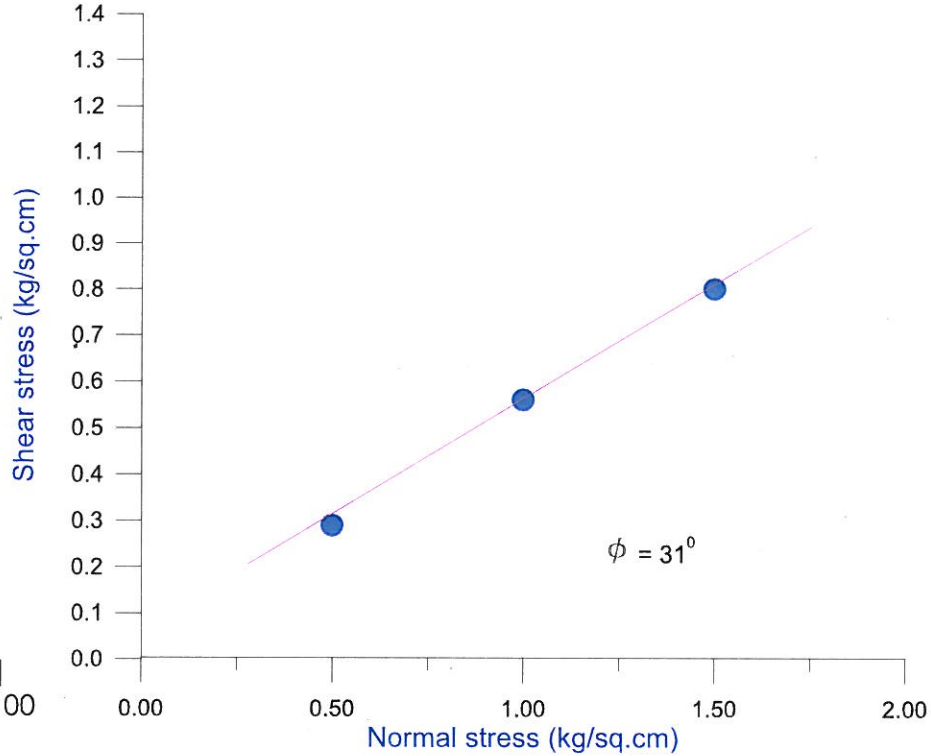
FIG- DS-BR1

0620

BH-1
DEPTH = 8.50 m.



(Shear stress - shear strain relationship)



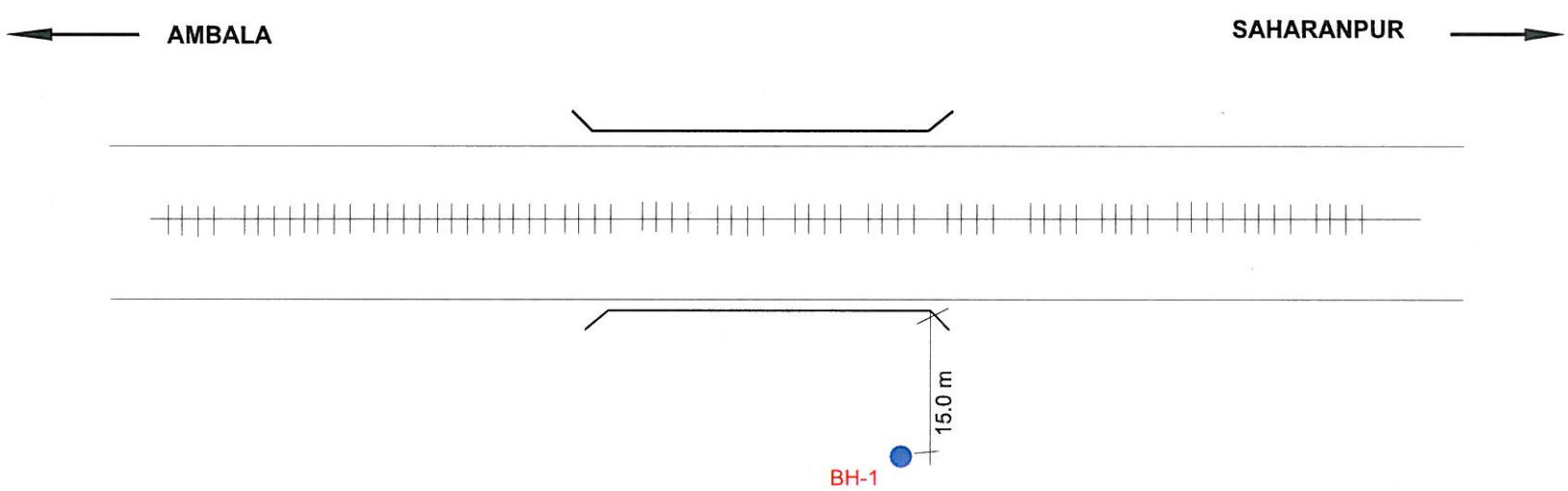
(Shear stress - Normal stress relationship)

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

FIG- DS-BR2

SOIL ENGINEERING CONSULTANTS

Job No: 1813

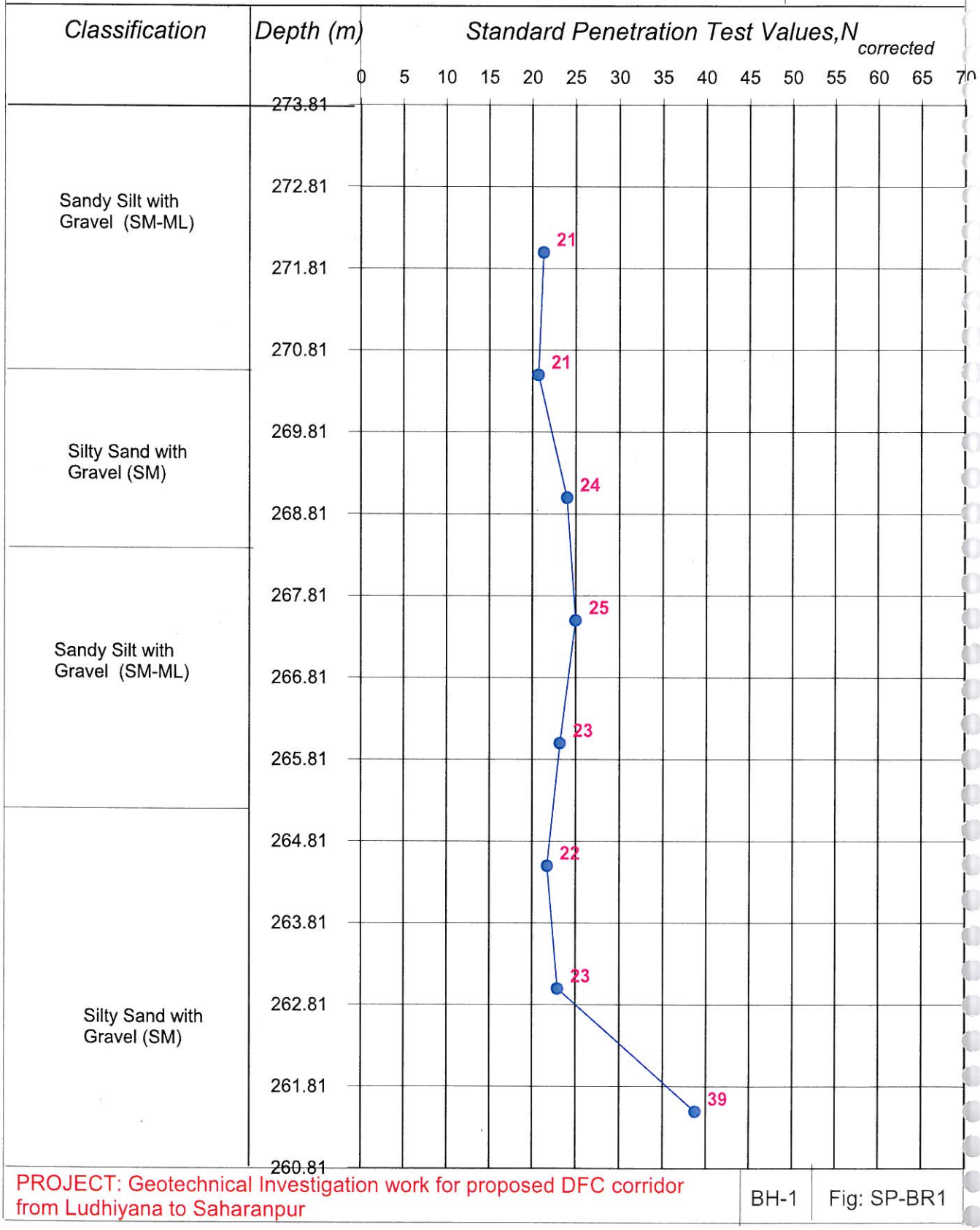


BR 270/230/19-21

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

Fig: Plan-BR

SOIL ENGINEERING CONSULTANTS | BR: 270 @ 230/19-21 | Project No: 1813



PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur | BH-1 | Fig: SP-BR1

BORE LOG

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

Project No. 1813 Bridge : 271 RL: 276.002

Location; 231/1-3
BH No.: 1
Depth : 12.00
Depth of Water table : Not Met

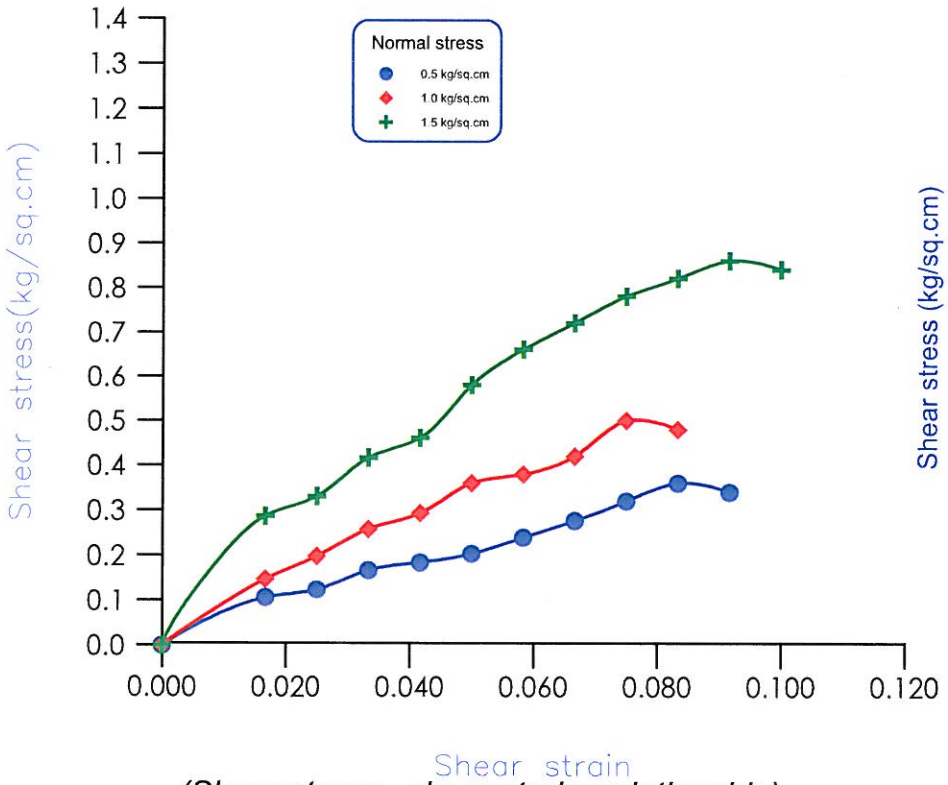
Date of start : 16/05/2008
Date of finish : 17/05/2008

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Gravel	Sand	Silt/clay	r(wet)	r(dry)	W/C W(%)	Limits (%) L.L	Limits (%) P.L	Sp.Gr	Shear Parameters Type of test	Shear Parameters C(kg/sq.cm)	Shear Parameters phi(degrees)	Cc
276.002																	
275.502	0.50	DS			2	7	91				Non	Plastic					
274.202	1.80	SPT		19	5	7	88				Non	Plastic					
273.502	2.50	UDS	Sandy Silt (SM-ML)					1.84	1.60	14.86				DST	0.15	31	
272.702	3.30	SPT		24	3	12	85				Non	Plastic					
271.202	4.80	SPT		25	0	7	93				Non	Plastic					
270.502	5.50	UDS						1.86	1.60	16.43			2.68	DST	0.1	32	
269.702	6.30	SPT		49	0	11	81				Non	Plastic					
268.202	7.80	SPT	Silty Sand (SM)	45	0	38	62				Non	Plastic					
267.502	8.50	UDS						1.89	1.61	17.23				DST	0.1	32	
266.702	9.30	SPT		36	0	57	43				Non	Plastic					
265.202	10.80	SPT	Sand Silt (SM-ML)	36	1	62	37				Non	Plastic					
264.502	11.50	UDS	Silty Sand (SM)					1.92	1.63	18.11			2.69	DST	0.1	32	
263.702	12.30	SPT		44	0	48	52				Non	Plastic					

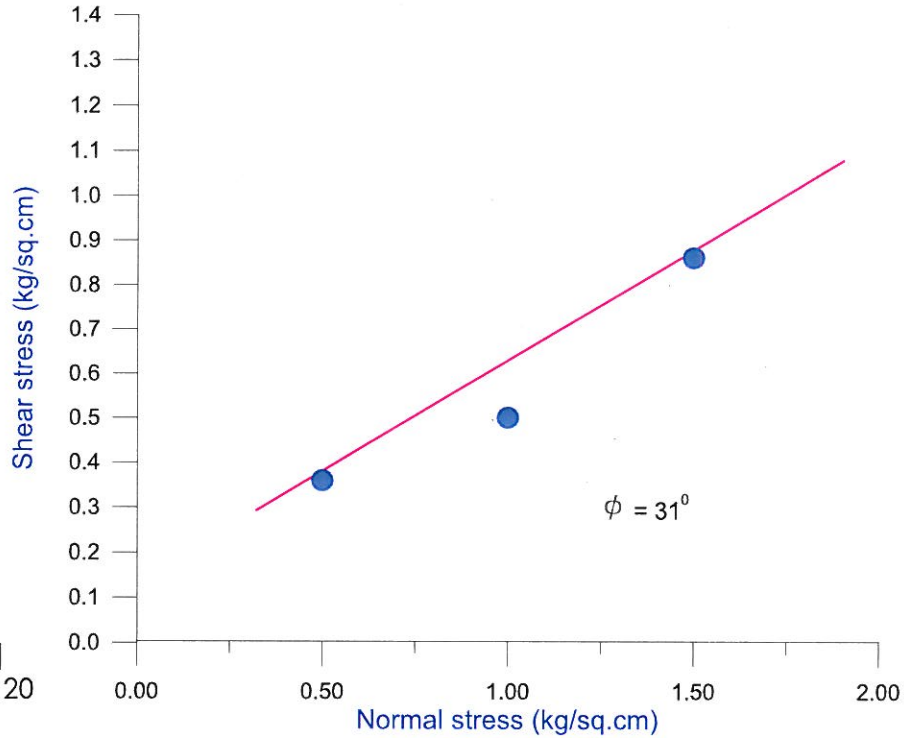
0 10 20 30 40 50 60 70 80 90 100 110 120

0620

BH-
DEPTH = 2.50 m.



(Shear stress - shear strain relationship)

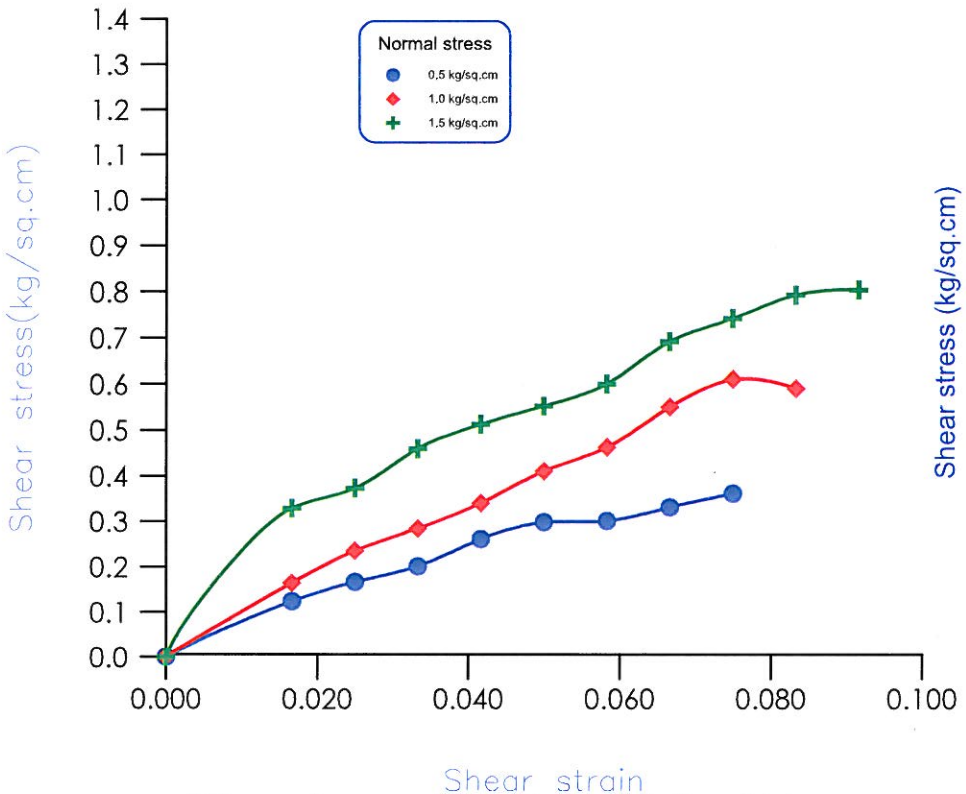


(Shear stress - Normal stress relationship)

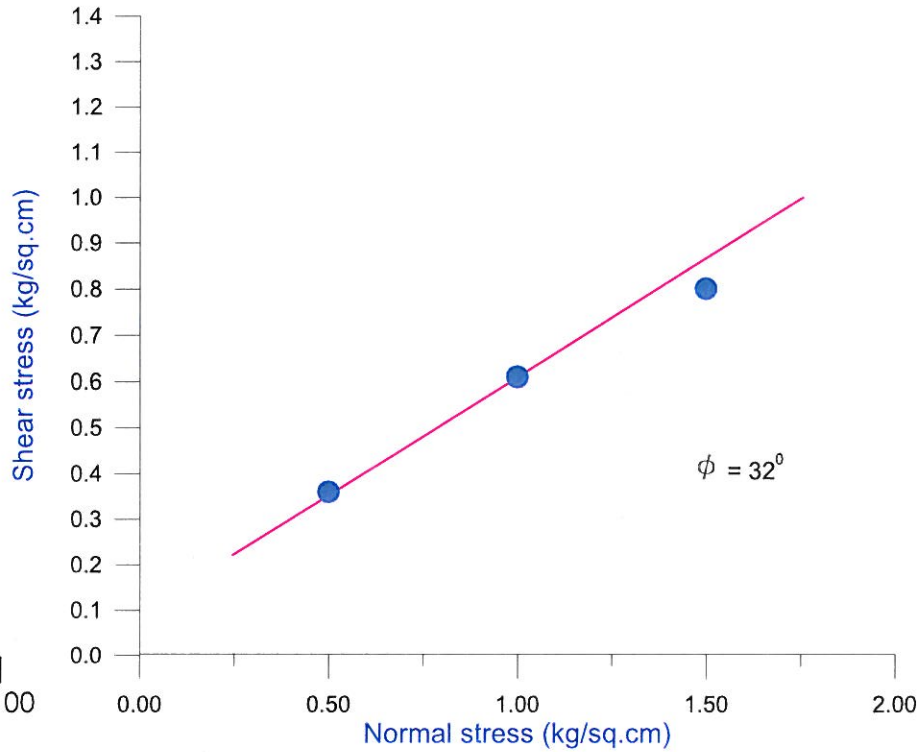
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BS1

BH-1
DEPTH = 8.50 m.



(Shear stress - shear strain relationship)



(Shear stress - Normal stress relationship)

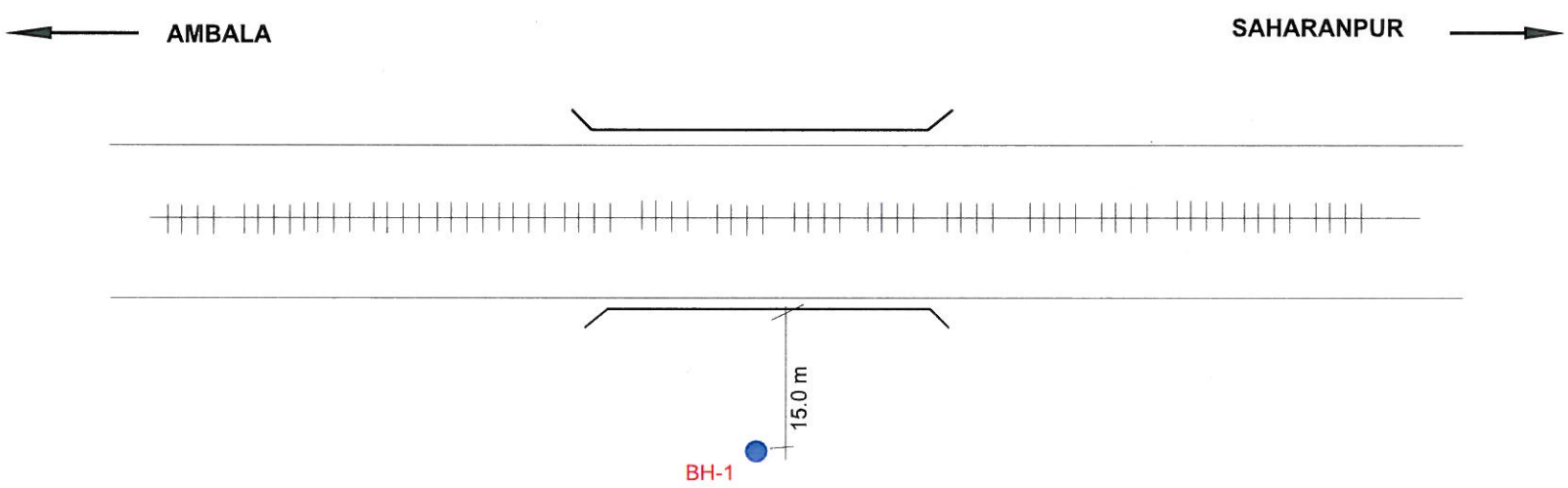
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BS2

0293

SOIL ENGINEERING CONSULTANTS

Job No: 1813

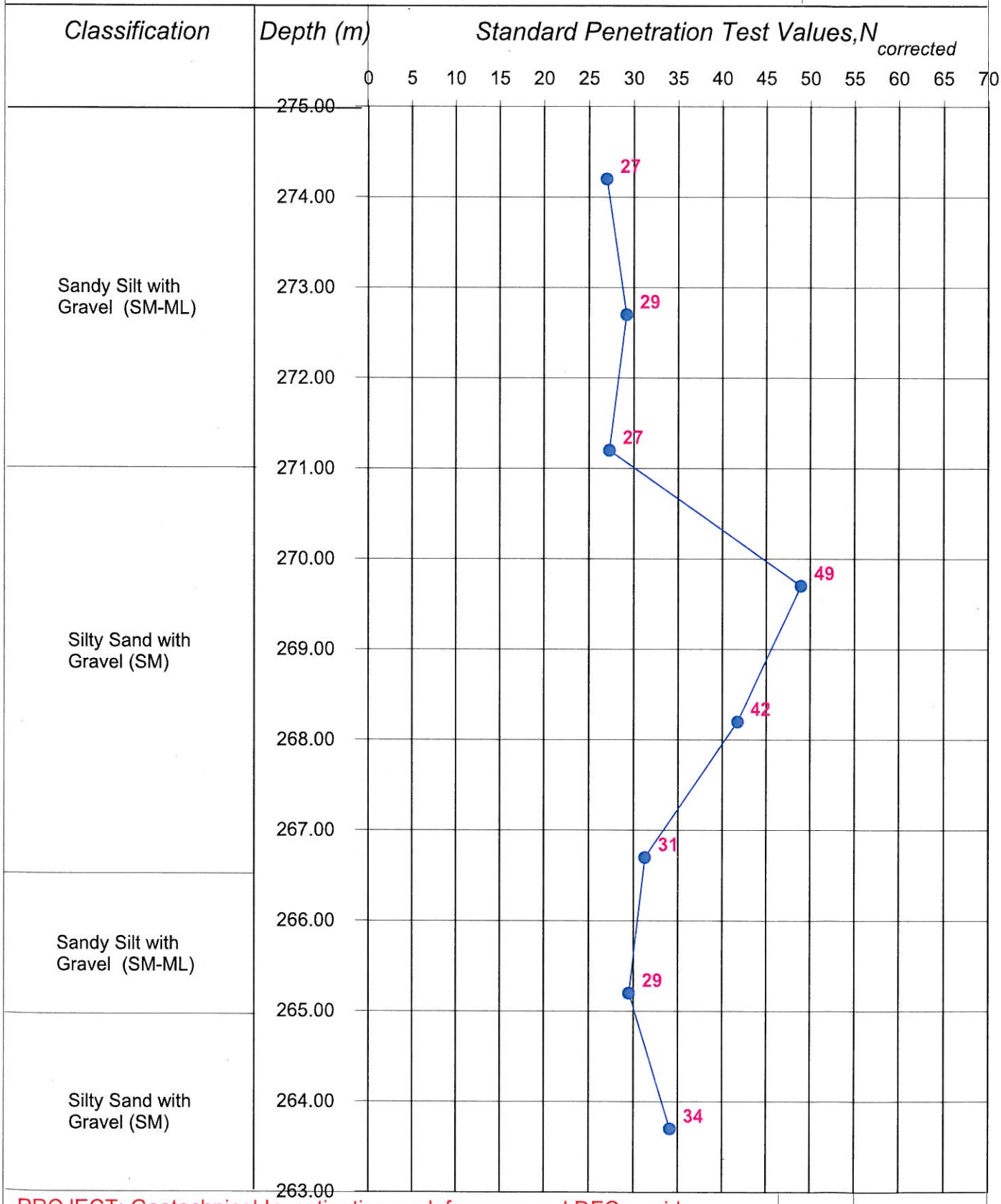


BR 271/231/1-3

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

Fig: Plan-BS

SOIL ENGINEERING CONSULTANTS | BR: 271@ 231/1-3 | Project No: 1813



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

0297

BORE LOG

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

Project No. 1813 Bridge : 272 RL: 274.841

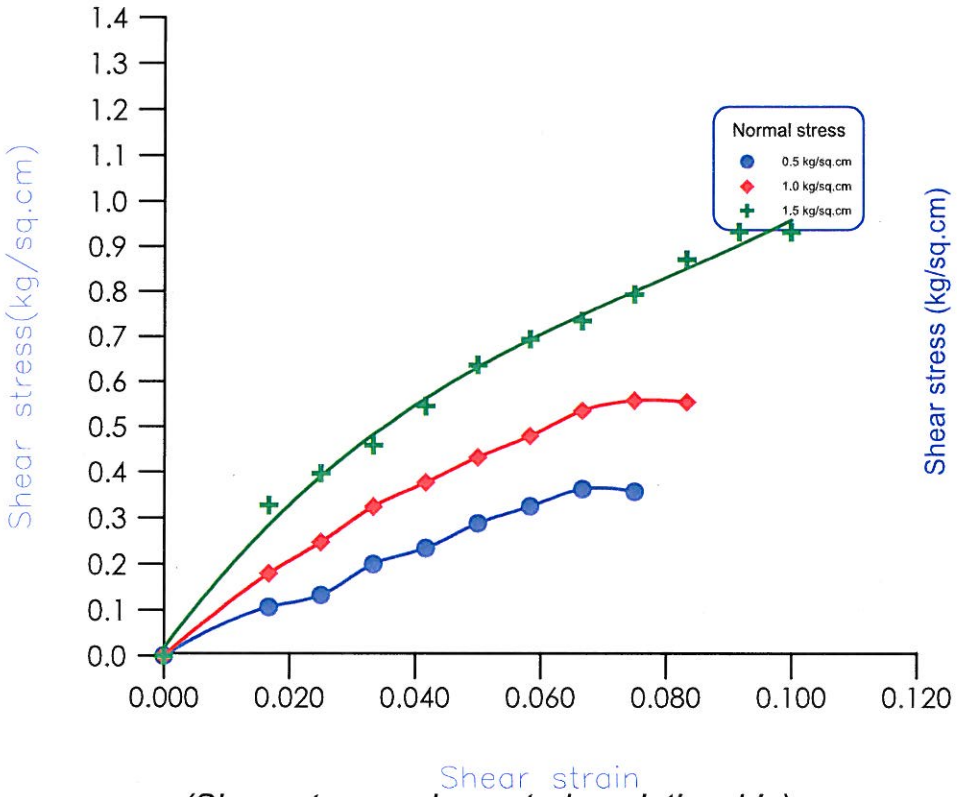
Location; 232/19-21
BH No.: 1
Depth : 12.00
Depth of Water table : Not Met

Date of start : 17/05/2008
Date of finish : 18/05/2008

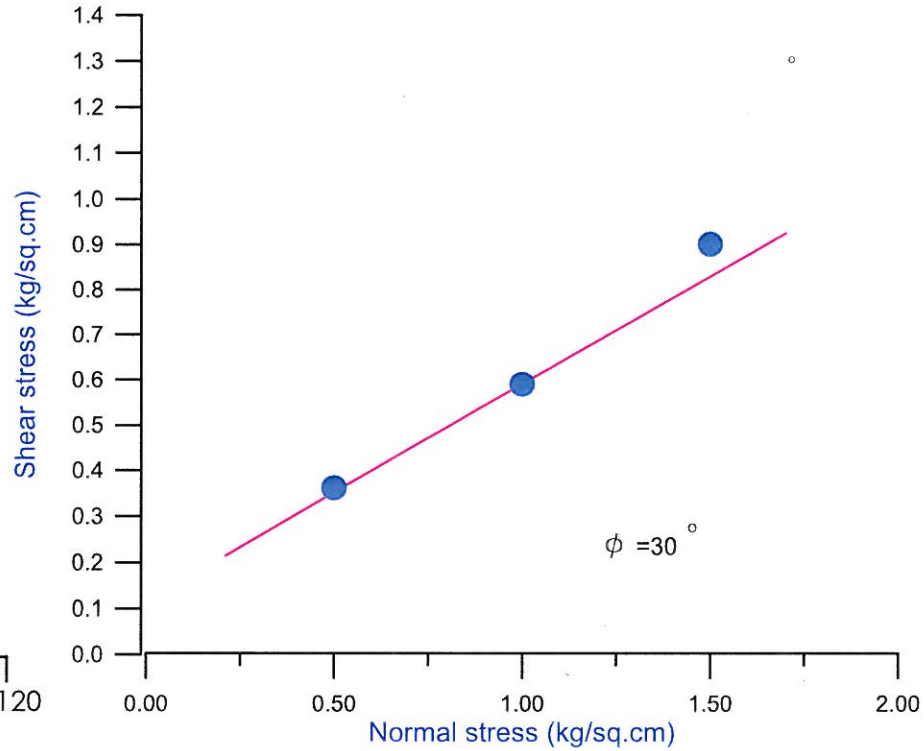
Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%) Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	r(dry)	W/C W(%)	Limits (%) L.L	P . L	Sp.Gr	Shear Parameters Type of test	C(kg/sq.cm)	phi(degrees)	Cc
274.841																	
274.341	0.50	DS			3	20	77				Non	Plastic					
273.041	1.80	SPT		22	0	7	93				Non	Plastic					
272.341	2.50	UDS						1.9	1.67	13.78				DST	0.15	31	
271.541	3.30	SPT	Sandy Silt with Gravel (SM-ML)	37	4	17	79				Non	Plastic					
270.041	4.80	SPT		19	1	9	90				Non	Plastic					
269.341	5.50	UDS						1.88	1.61	17.11			2.66	DST	0.1	30	
268.541	6.30	SPT		20	0	7	93				Non	Plastic					
267.041	7.80	SPT		22	0	3	97				Non	Plastic					
266.341	8.50	UDS						1.88	1.59	18.26			2.68	DST	0.1	31	
265.541	9.30	SPT		35	0	60	40				Non	Plastic					
264.041	10.80	SPT	Silty Sand (SM)	75	0	54	46				Non	Plastic					
263.341	11.50	UDS						1.94	1.63	19.15				DST		32	
262.541	12.30	SPT		57	0	53	47				Non	Plastic					

8620

BH-1
Depth-5.50m



(Shear stress - shear strain relationship)



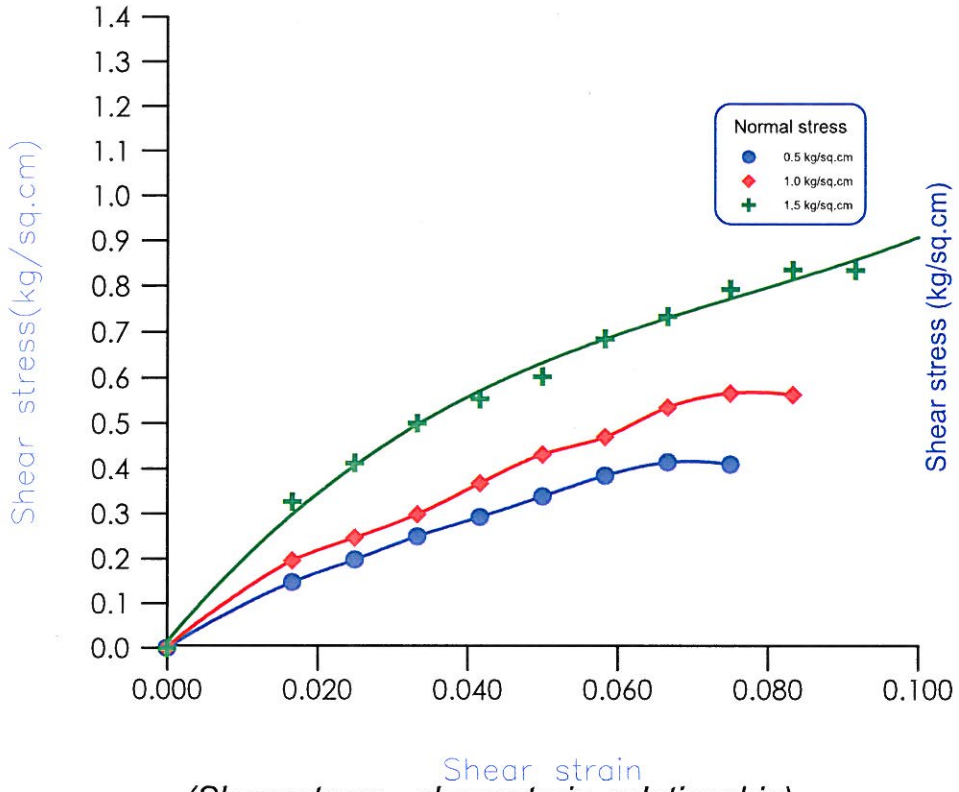
(Shear stress - Normal stress relationship)

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

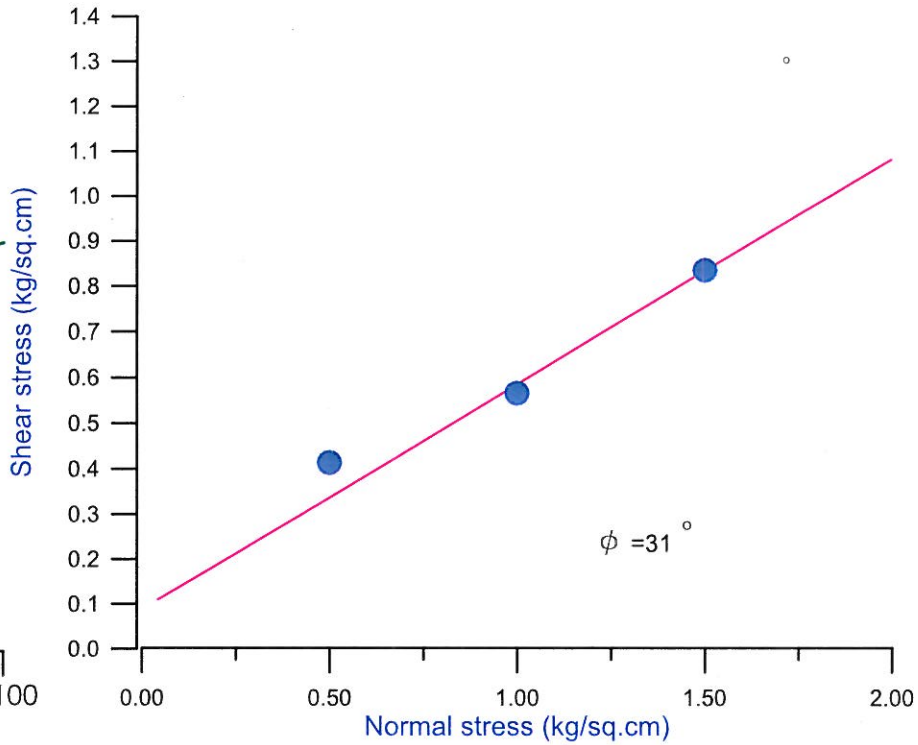
FIG- DS-BU1

6520

BH-1
Depth-8.50m



(Shear stress - shear strain relationship)



(Shear stress - Normal stress relationship)

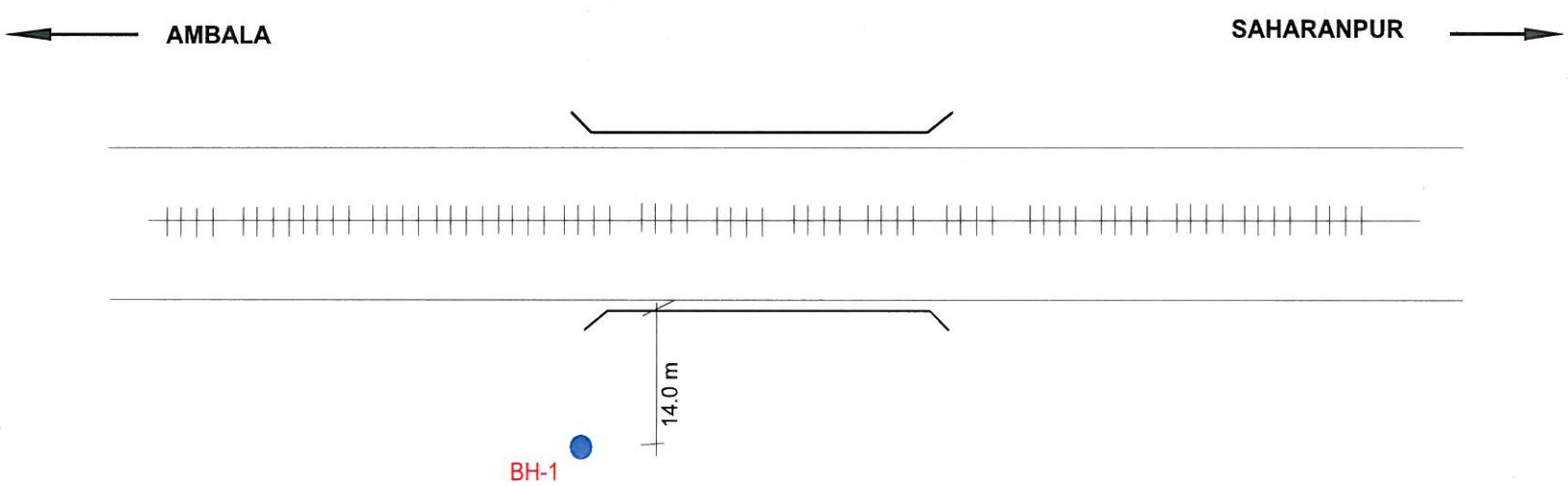
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BU2

0300

SOIL ENGINEERING CONSULTANTS

Job No: 1813

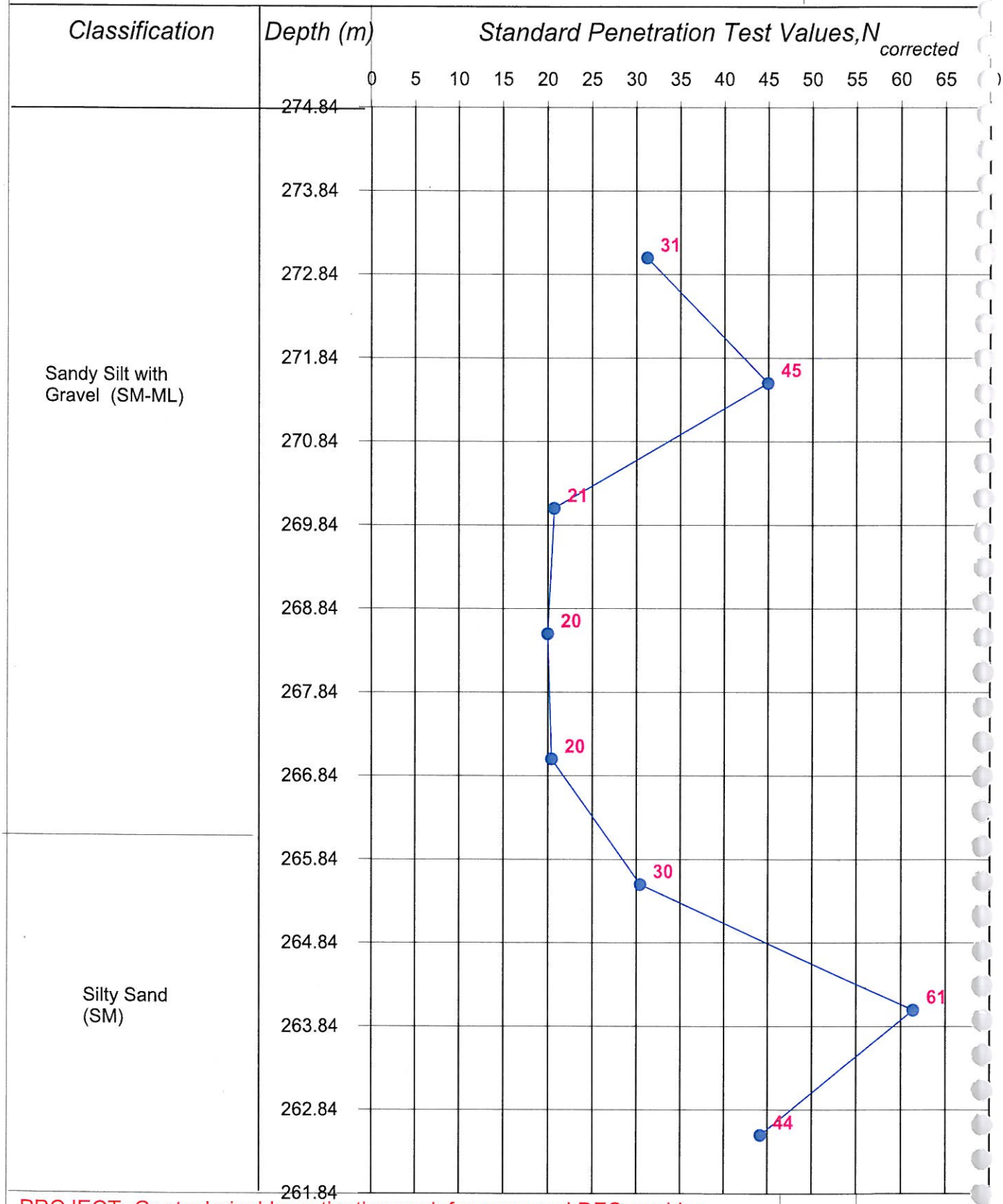


BR 272/232/19-21

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

Fig: Plan-BU

SOIL ENGINEERING CONSULTANTS | BR 272@ 232/19-21 | Project No: 1813



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

0302

BORE LOG

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

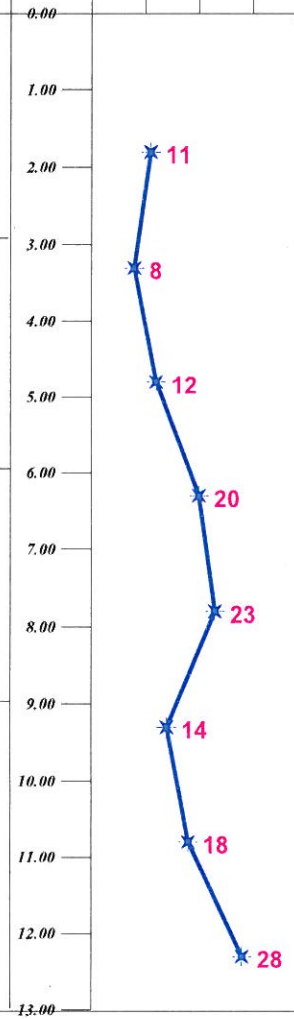
Project No. 1813 Bridge : 273 RL: 274.308

Location; 273/233-7-9
BH No.: 1
Depth : 12.45m
Depth of Water table : Not Met

Date of start : 16/05/2008
Date of finish : 17/05/2008

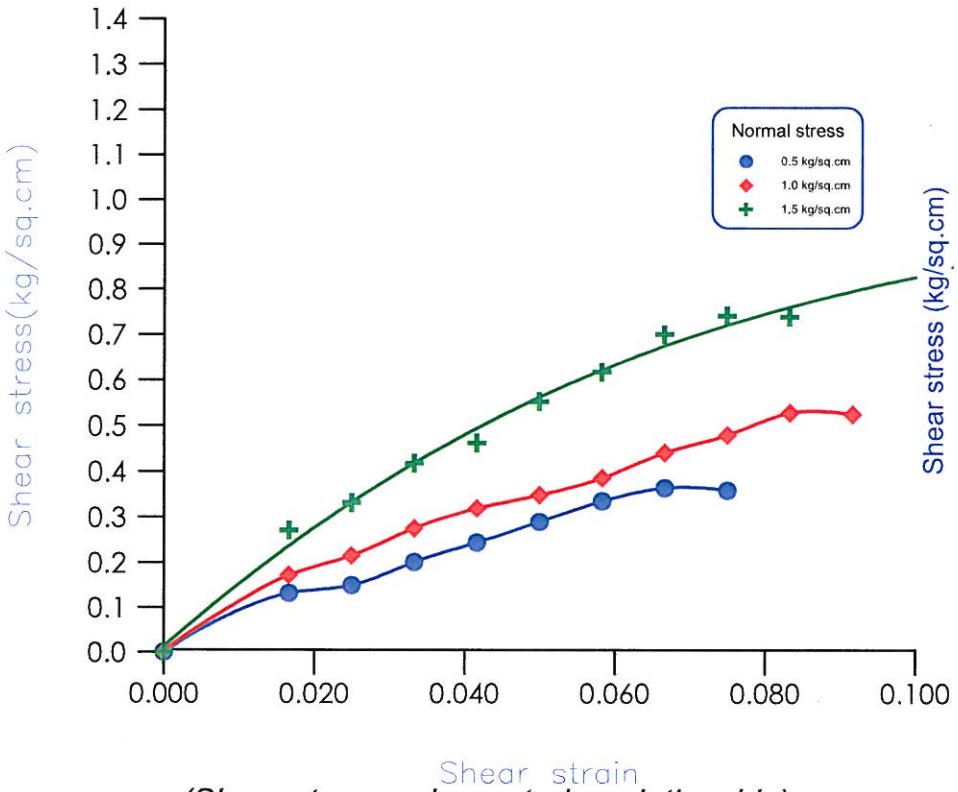
Reduced Level	Depth (m)	Type of sample	Soil Classification	Grain size (%) Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	r(dry)	W/C W(%)	Limits (%) L.L	P . L	Sp.Gr	Shear Parameters Type of test	C(kg/sq.cm)	phi(degrees)	Cc
274.308																
272.508	1.80	SPT	Silty Sand with Gravel (SM)	0	64	36				Non	Plastic					
271.808	2.50	UDS					1.68	1.50	11.86			2.66	DST	0.15	29	
271.008	3.30	SPT	Sandy Silt with Gravel (SM-ML)	0	39	61				Non	Plastic					
269.508	4.80	SPT		0	11	89				Non	Plastic					
268.808	5.50	UDS					1.78	1.55	14.64			2.66	DST	0.15	30	
268.008	6.30	SPT	Silty Sand with Gravel (SM)	0	52	48				Non	Plastic					
266.508	7.80	SPT		0	69	31				Non	Plastic					
265.808	8.50	UDS					1.76	1.51	16.44			2.67	DST		30	
265.008	9.30	SPT	Sandy Silt with Gravel (SM-ML)	0	3	97				Non	Plastic					
263.508	10.80	SPT		0	45	55				Non	Plastic					
262.808	11.50	UDS					1.83	1.56	17.23				DST	0.1	30	
262.008	12.30	SPT		0	43	57				Non	Plastic					

S.P.T Plot — Observed

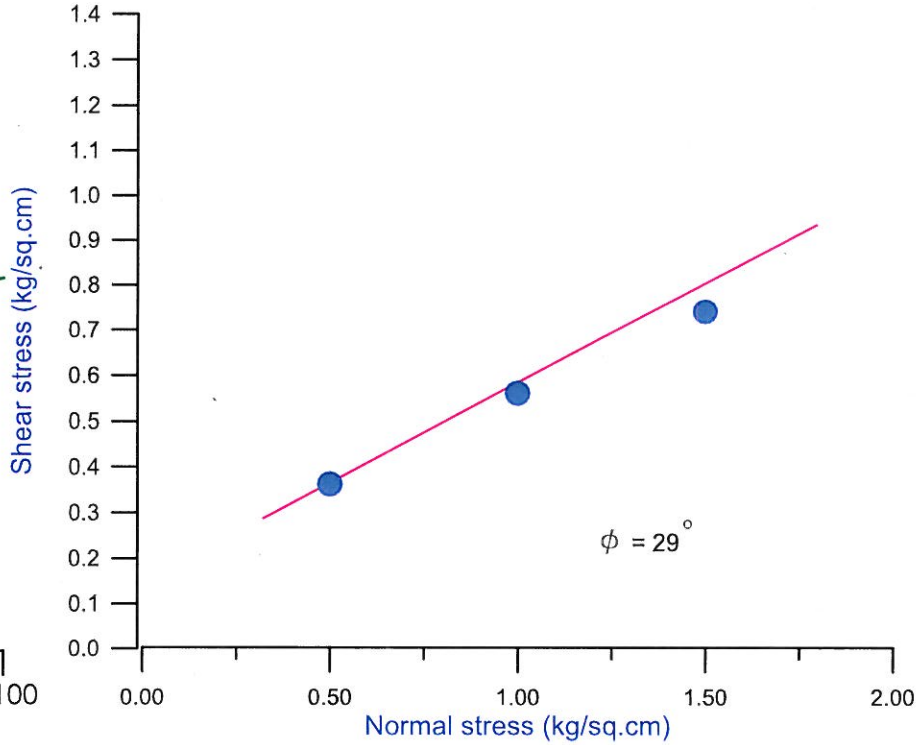


0303

BH-1
Depth-2.50m



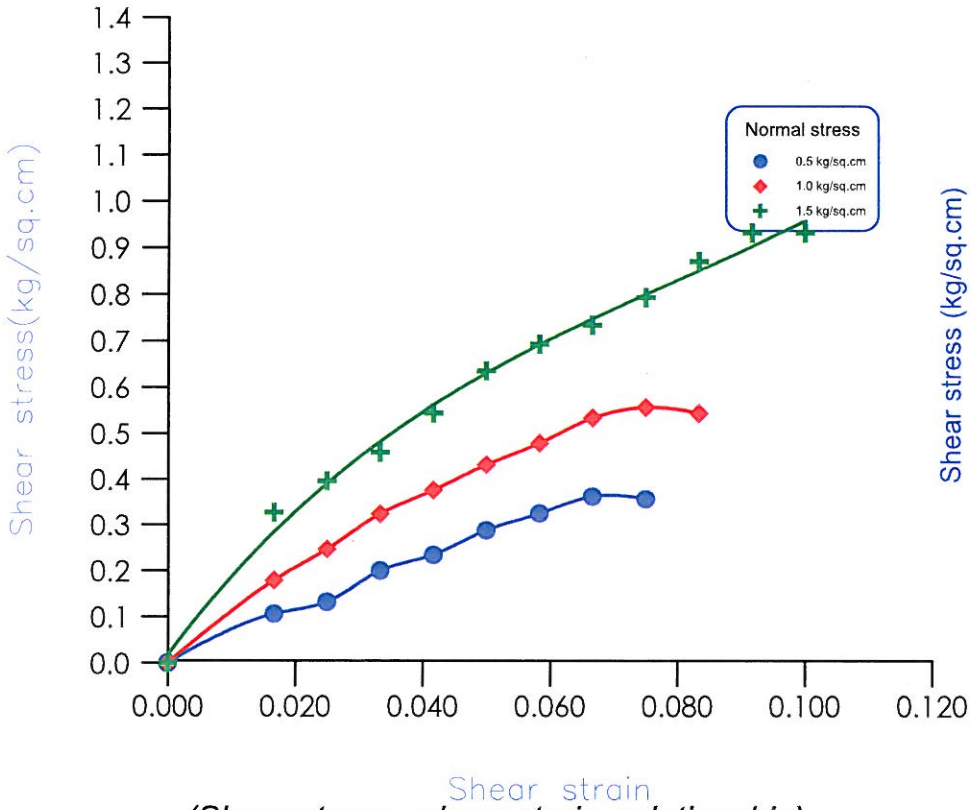
(Shear stress - shear strain relationship)



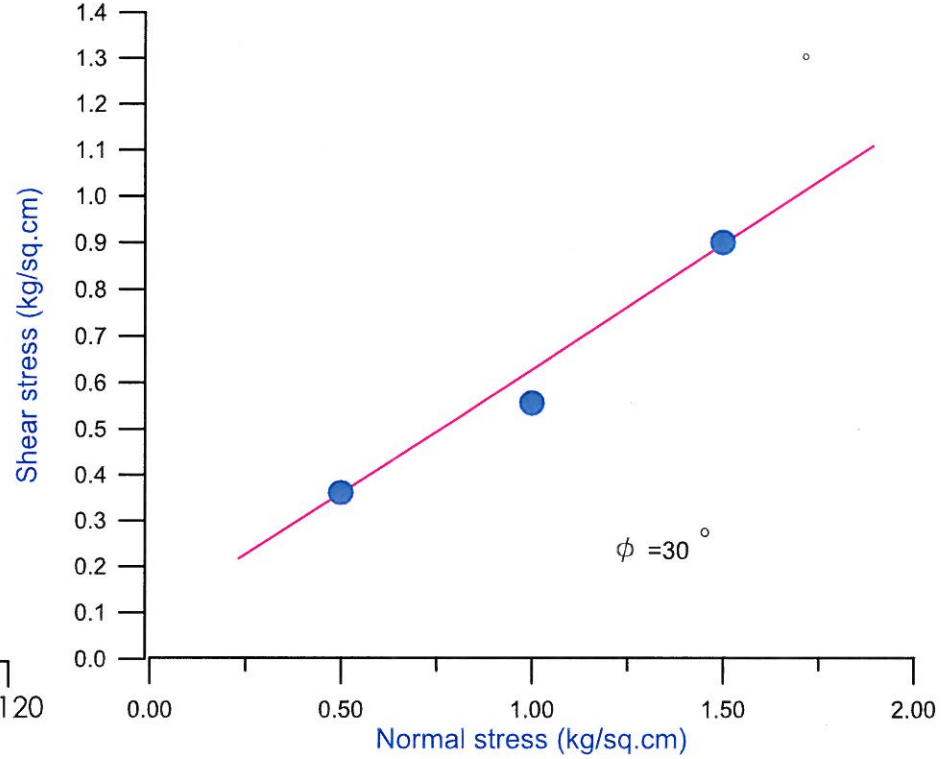
(Shear stress - Normal stress relationship)

PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur FIG- DS-BV1

BH-1
Depth-8.50m



(Shear stress - shear strain relationship)



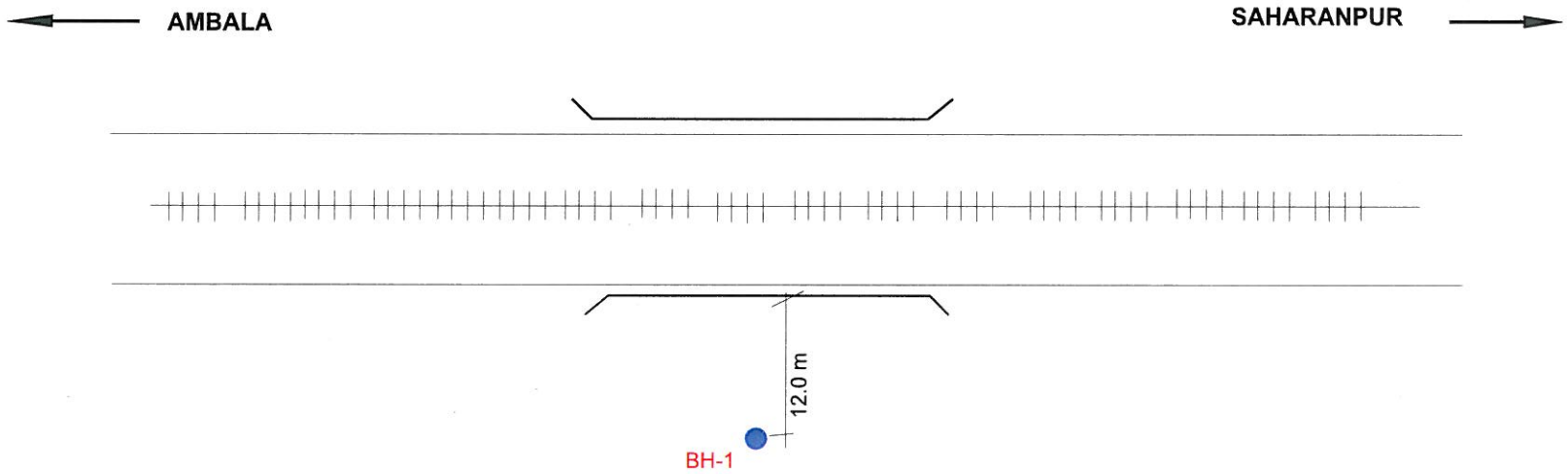
(Shear stress - Normal stress relationship)

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

FIG- DS-BV-2

SOIL ENGINEERING CONSULTANTS

Job No: 1813

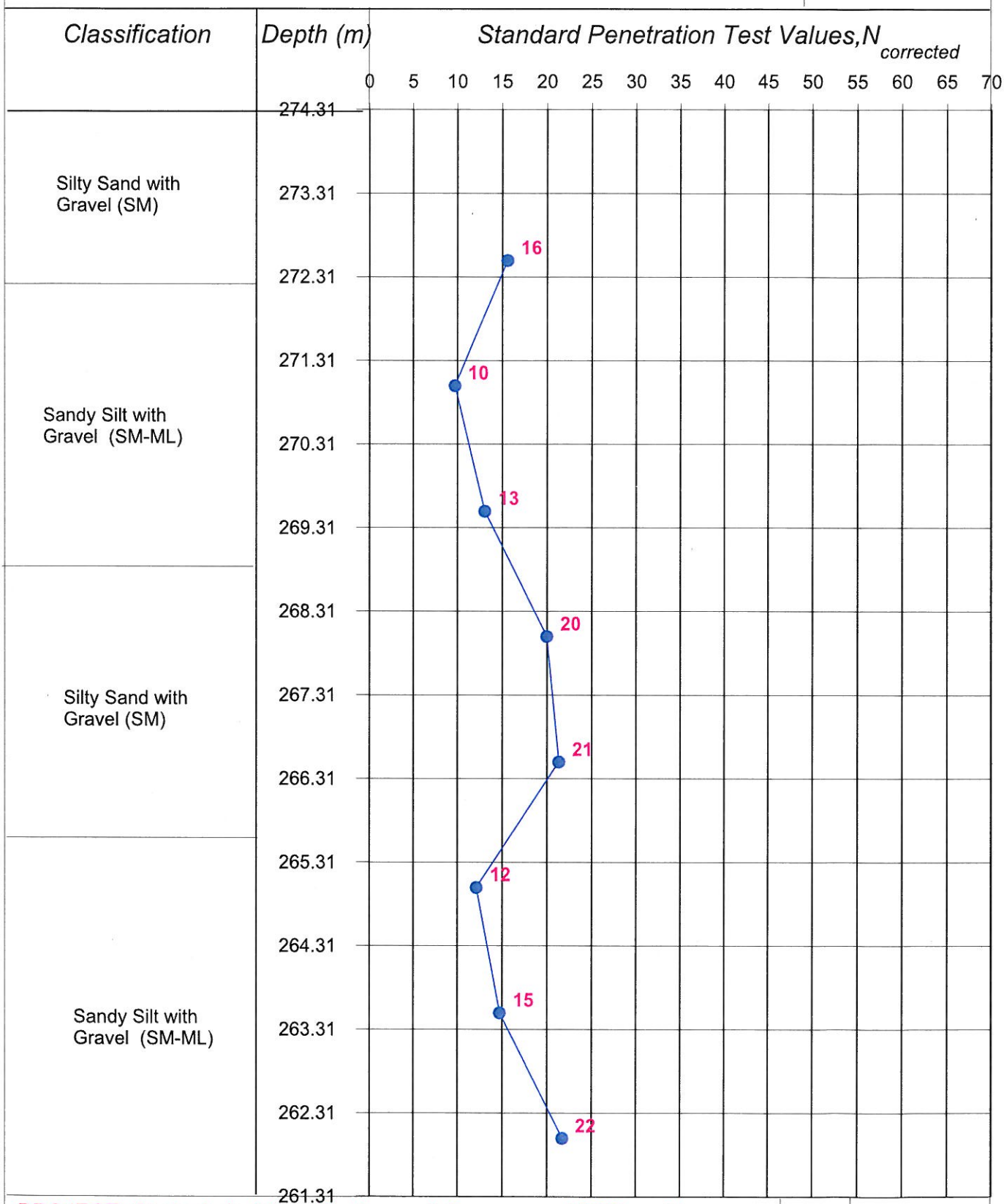


BR 273@ 233/7-9

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

Fig: Plan-BV

SOIL ENGINEERING CONSULTANTS | BR 273@ 233/7-9 | Project No: 1813



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

0307

BORE LOG

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

Project No. 1813 Bridge : 274 RL: 273.439

Location; 233-21-23
BH No.: 1
Depth : 12.45m
Depth of Water table : Not Met

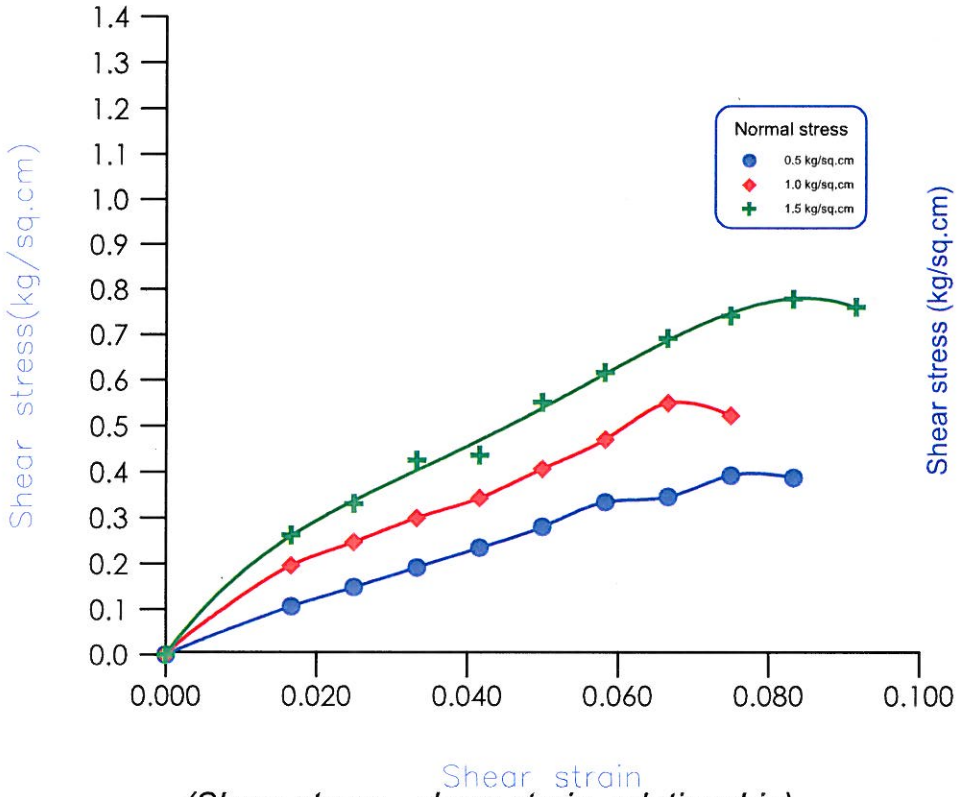
Date of start : 17/04/2008
Date of finish : 28/05/2008

SOIL ENGINEERING CONSULTANTS

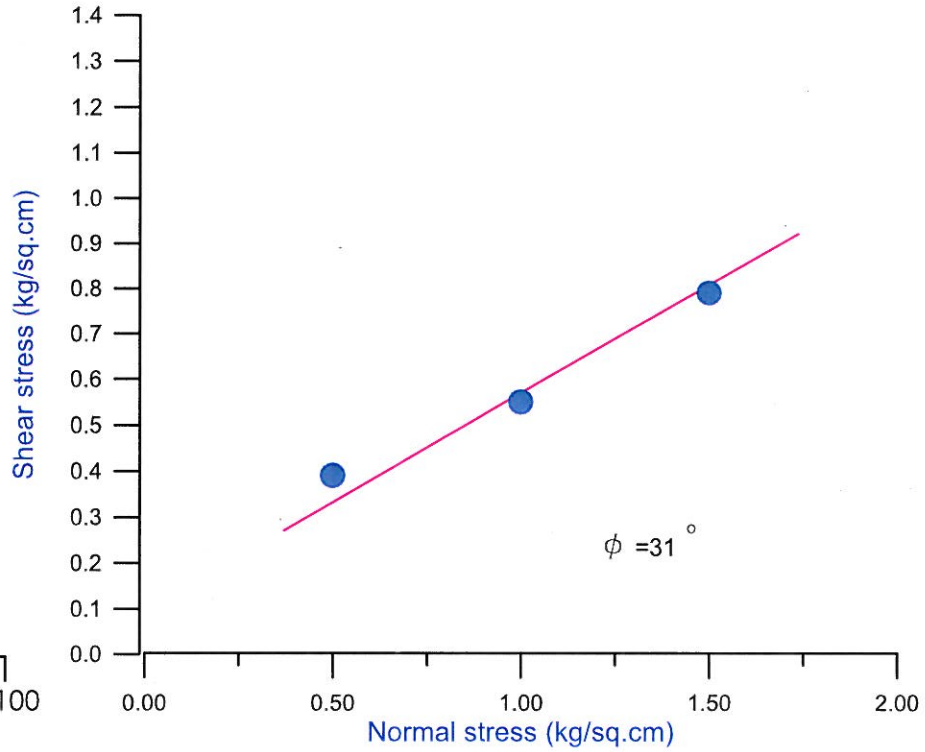
Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%) Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	r(dry)	W/C W(%)	Limits (%) L.L	P . L	Sp.Gr	Shear Parameters Type of test	C(kg/sq.cm)	phi(degrees)	Cc
273.439																	
271.639	1.80	SPT		12	0	50	50				Non	Plastic					
270.939	2.50	UDS						1.76	1.63	7.89				DST	0.15	30	
270.139	3.30	SPT		17	0	49	51				Non	Plastic					
268.639	4.80	SPT		19	2	7	91				Non	Plastic					
267.939	5.50	UDS						1.8	1.57	14.30			2.67	DST	0.1	31	
267.139	6.30	SPT	Sandy Silt with Gravel (SM-ML)	24	2	6	92				Non	Plastic					
265.639	7.80	SPT		23	1	5	94				Non	Plastic					
264.939	8.50	UDS						1.79	1.55	15.52				DST	0.1	31	
264.139	9.30	SPT		18	1	9	90				Non	Plastic					
262.639	10.80	SPT		26	3	10	87				Non	Plastic					
261.939	11.50	UDS						1.83	1.55	17.94			2.66	DST	0.15	31	
261.139	12.30	SPT		45	0	48	52				Non	Plastic					

S.P.T Plot: Observed; 0 10 20 30 40 50; 0.00 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00

BH-1
Depth-5.50m



(Shear stress - shear strain relationship)



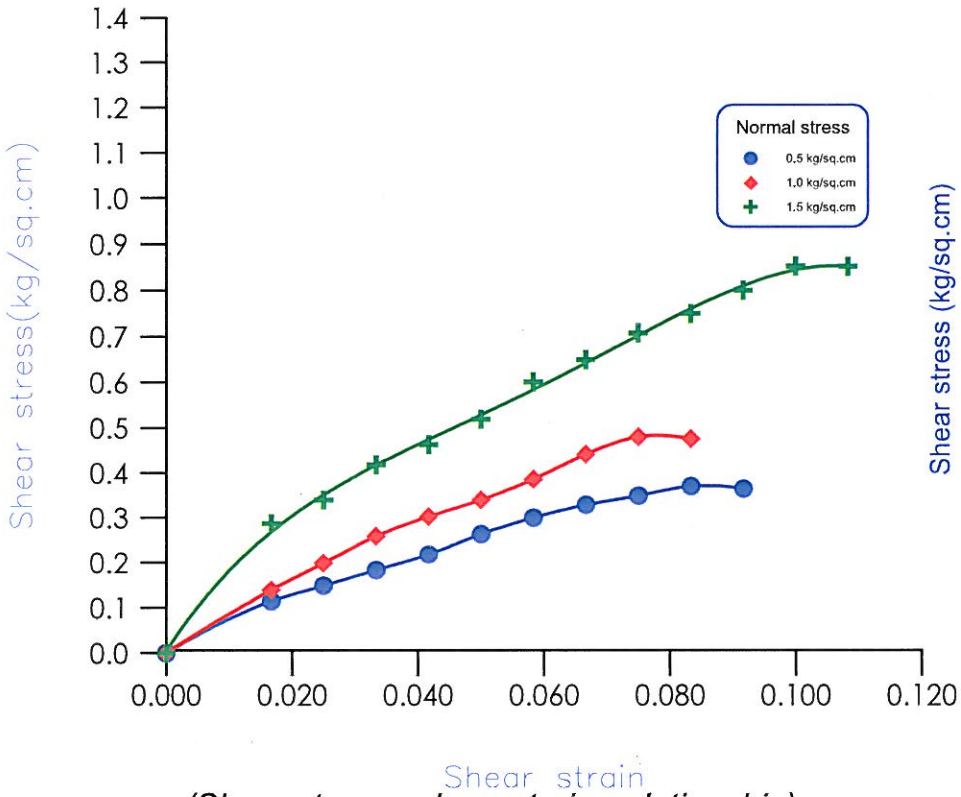
(Shear stress - Normal stress relationship)

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

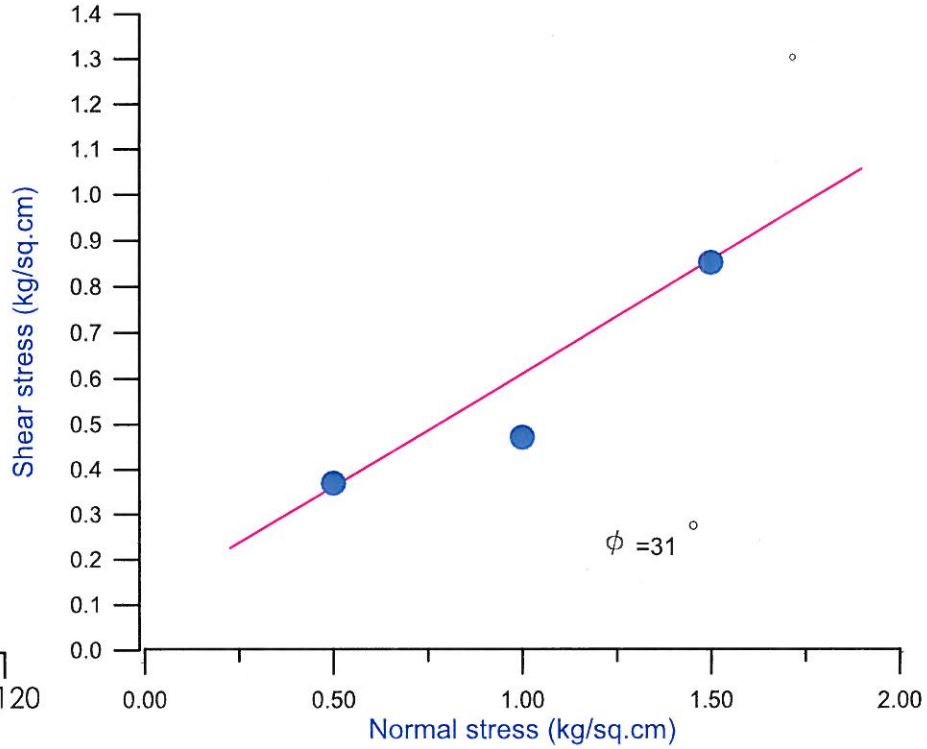
FIG- DS-BW1

0309

BH-1
Depth-11.50m



(Shear stress - shear strain relationship)



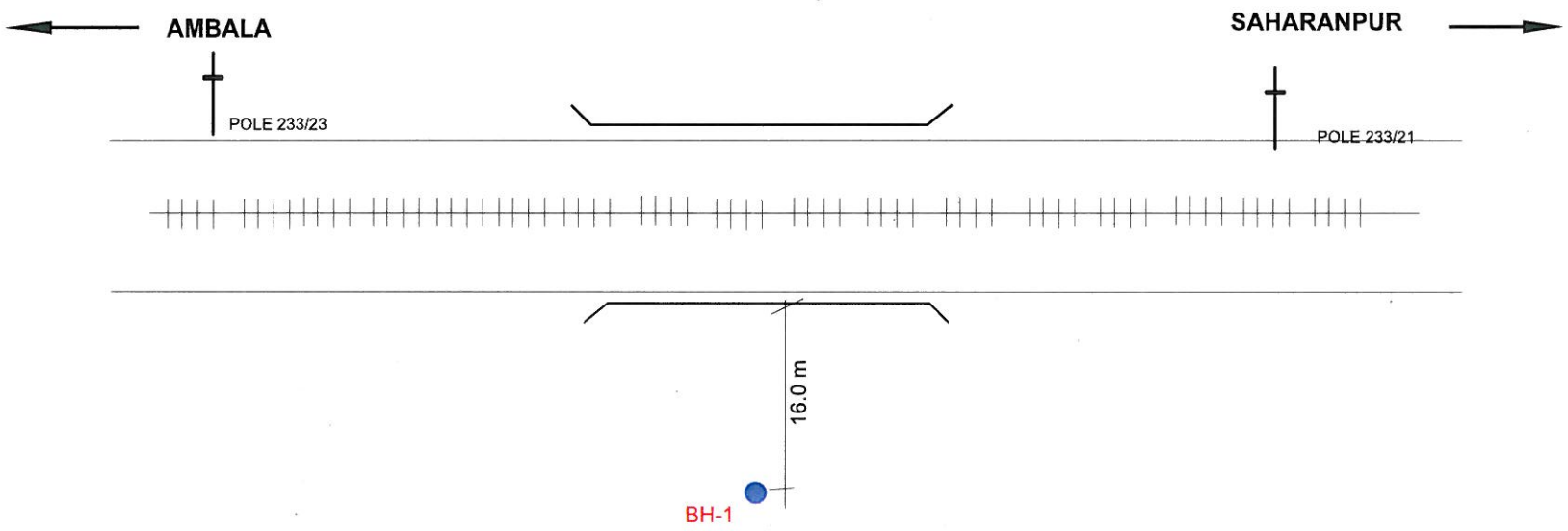
(Shear stress - Normal stress relationship)

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

FIG- DS1-BW2

SOIL ENGINEERING CONSULTANTS

Job No: 1813



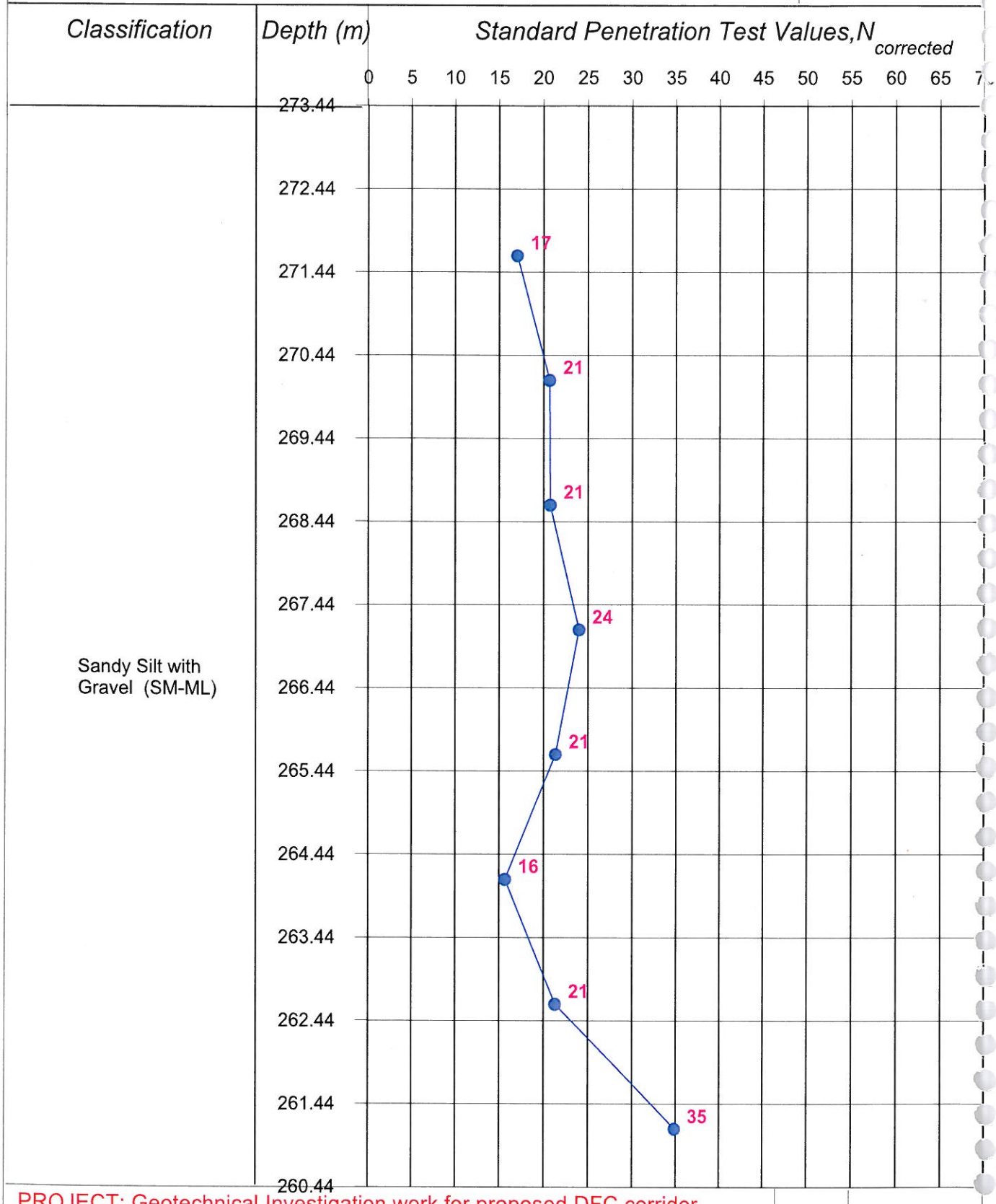
BR 274@ 233/21-23

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

Fig: Plan-BW

0311

SOIL ENGINEERING CONSULTANTS | BR 274@ 233/21-23 | Project No: 1813



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

BORE LOG

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

Project No. 1813 Bridge : 275 RL: 273.544

Location; 235/2-3
BH No.: 1
Depth : 12.45m
Depth of Water table : Not Met

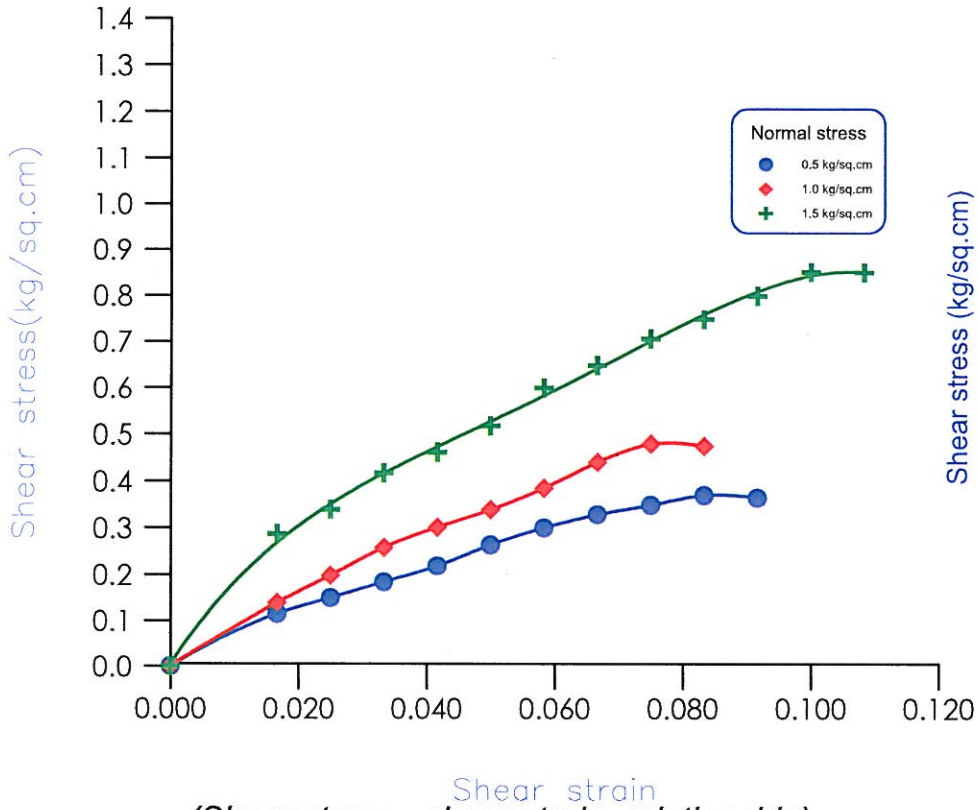
Date of start : 21/05/2008
Date of finish : 21/05/2008

SOIL ENGINEERING CONSULTANTS

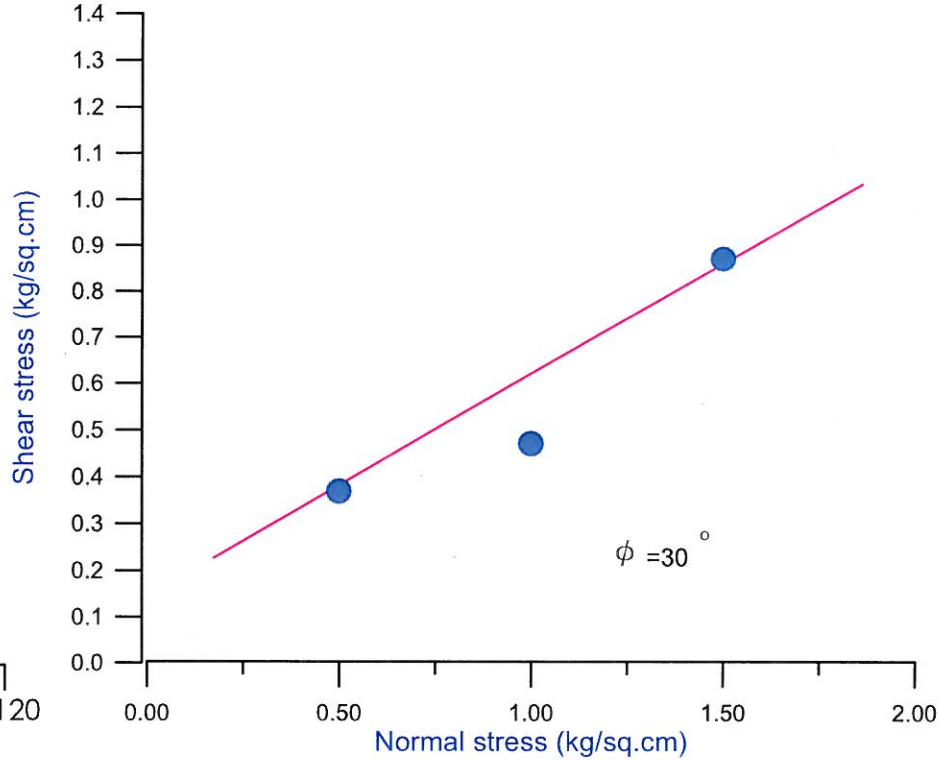
Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Grain size (%) Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	r(dry)	W/C W(%)	Limits (%) L.L	P . L	Sp.Gr	Shear Parameters Type of test	C(kg/sq.cm)	phi(degrees)	Cc
273.544																	
271.744	1.80	SPT	Sandy Silt with Gravel (SM-ML)	11	3	22	75				Non	Plastic					
271.044	2.50	UDS						1.76	1.53	14.68			2.66	DST	0.15	30	
270.244	3.30	SPT		12	3	15	82				Non	Plastic					
268.744	4.80	SPT		17	0	7	93				Non	Plastic					
267.244	6.30	SPT	Silty Clay of Low Plasticity (CL)	14	0	3	97				34	18					
265.744	7.80	SPT	Sandy Silt with Gravel (SM-ML)	20	1	40	59				Non	Plastic					
264.244	9.30	SPT		25	0	2	98				Non	Plastic					
262.744	10.80	SPT	Silty Clay of medium Plasticity (CI)	25	6	6	88				43	23					
261.244	12.30	SPT	Sandy Silt with Gravel (SM-ML)	21	0	4	96				Non	Plastic					

S.P.T Plot: Observed; 0 10 20 30 40 50; 0.00 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00

BH-1
Depth-2.50m



(Shear stress - shear strain relationship)



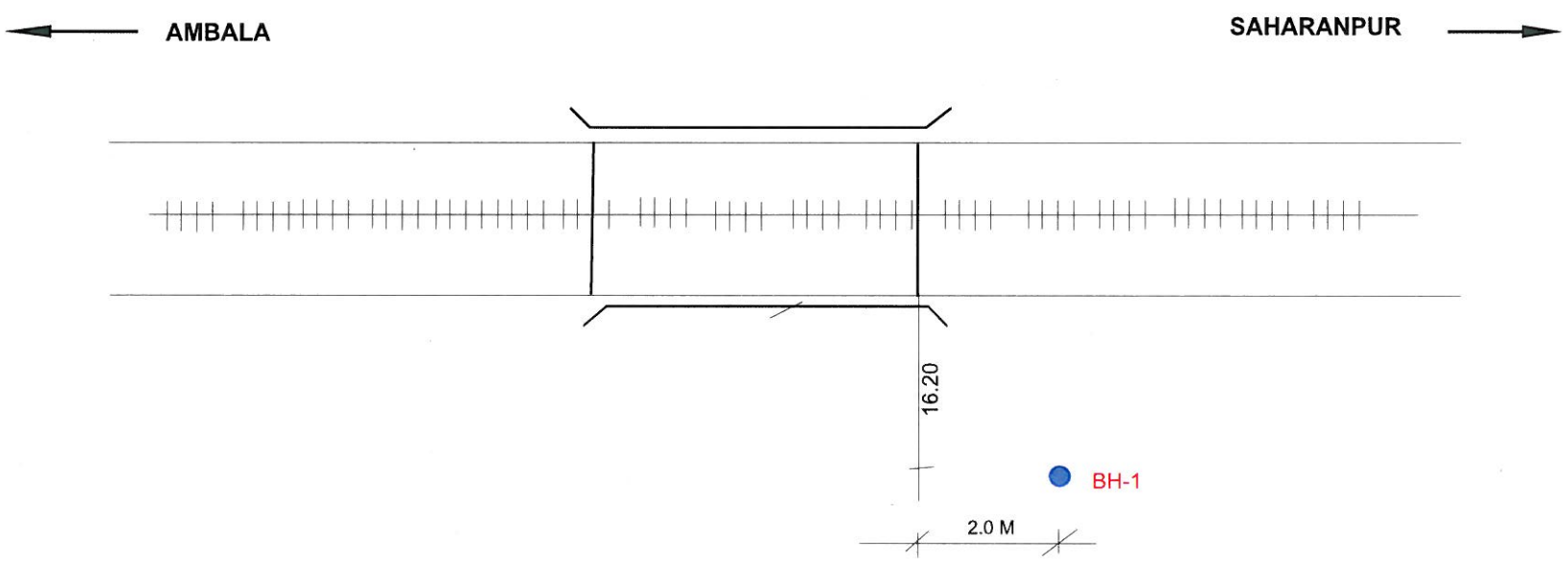
(Shear stress - Normal stress relationship)

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

FIG- DS-BY

SOIL ENGINEERING CONSULTANTS

Job No: 1813

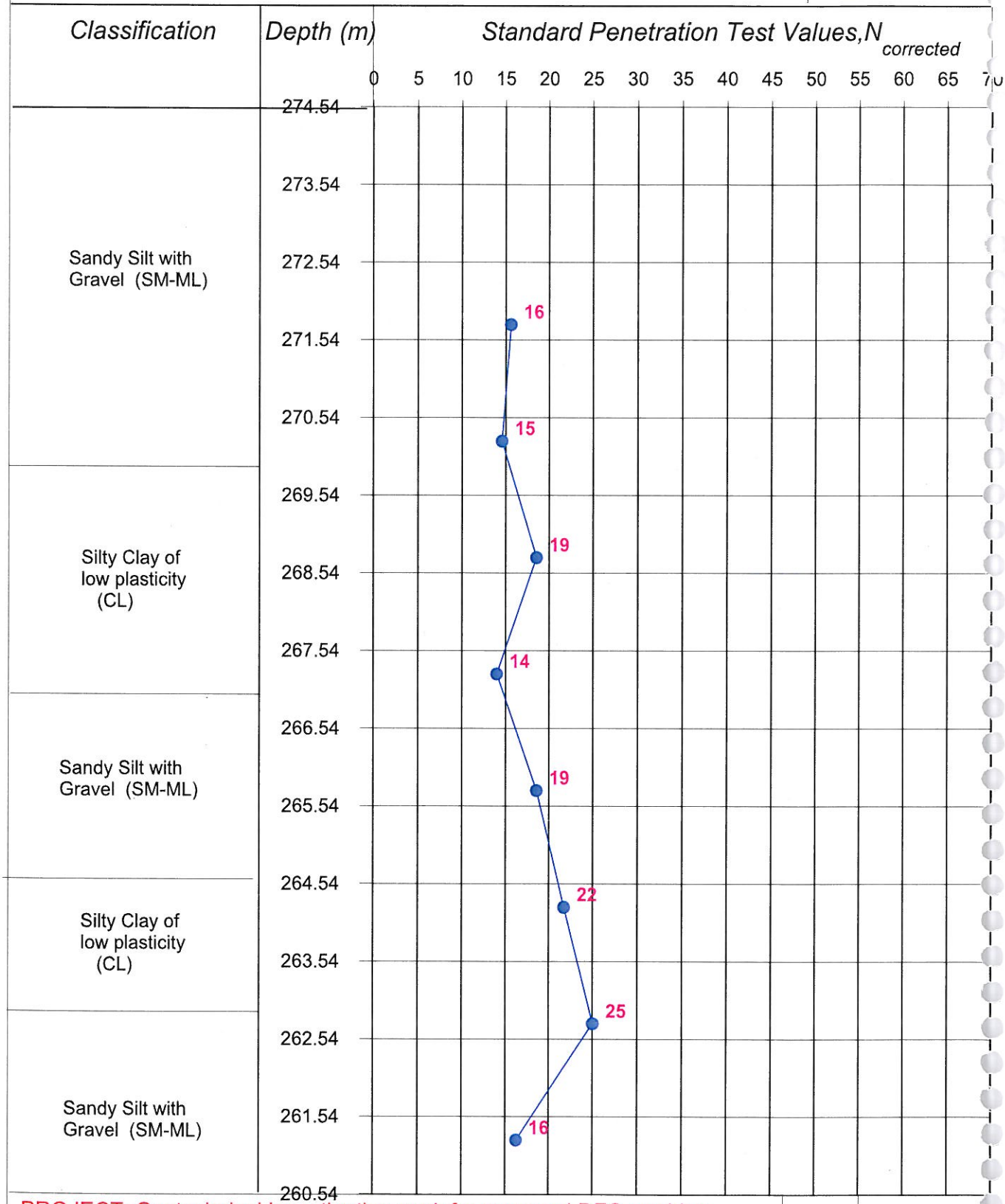


BR 275@ 235/5-7

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

Fig: Plan-BY

SOIL ENGINEERING CONSULTANTS | BR 275@ 235/2-3 | Project No: 1813



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

0316

BORE LOG

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

Location:276/235-28-32
BH No.: 1
Depth : 30.00m
Depth of Water table :14.50M

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

Project No. 1813 Bridge : 276 RL: 273.522

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	Density (gm/cc) r(dry)	W/C W(%)	Limits (%) L.L	Limits (%) P . L	Sp.Gr	Shear Parameters Type of test	Shear Parameters C(kg/sq.cm)	Shear Parameters phi(degrees)	Cc
273.022	0.50	DS	Sandy Silt with Gravel (SM-ML)	22	5	9	86				Non	Plastic					
271.722	1.80	SPT			3	5	92				Non	Plastic					
271.022	2.50	UDS						1.85	1.63	13.20				DST	0.15	31	
270.222	3.30	SPT		19	0	28	72				Non	Plastic					
268.722	4.80	SPT		15	0	57	43				Non	Plastic					
268.022	5.50	UDS						1.8	1.57	14.62				DST	0.18	30	
267.222	6.30	SPT		14	0	30	70				Non	Plastic					
265.722	7.80	SPT		20	0	34	66				Non	Plastic					
265.022	8.50	UDS						1.86	1.60	16.40			2.67	DST	0.15	31	
264.222	9.30	SPT		22	0	46	54				Non	Plastic					
262.722	10.80	SPT	Silty Clay of medium Plasticity (CI)	20	0	3	97				43	24					
262.022	11.50	UDS						1.86	1.57	18.11			2.71	UU	1.14	3	
261.222	12.30	SPT		19	0	4	96				41	24					
259.722	13.80	SPT	Sandy Silt with Gravel (SM-ML)	19	0	1	99				Non	Plastic					
259.022	14.50	UDS						1.84	1.49	23.16			2.68	DST		30	
258.222	15.30	SPT		38	0	65	35				Non	Plastic					
256.722	16.80	SPT		34	1	4	95				Non	Plastic					
256.022	17.50	UDS						1.92	1.56	22.74				DST		31	
255.222	18.30	SPT		30	0	2	98				Non	Plastic					
253.722	19.80	SPT		46	0	27	73				Non	Plastic					
252.222	21.30	SPT		26	0	2	98				Non	Plastic					
250.722	22.80	SPT		28	0	8	92				Non	Plastic					
249.222	24.30	SPT		26	0	2	98				Non	Plastic					
247.722	25.80	SPT		25	0	2	98				Non	Plastic					
246.222	27.30	SPT	Silty Clay of medium Plasticity (CI)	70	2	8	90				38	23					
244.722	28.80	SPT		81	1	8	91				39	24					
243.222	30.30	SPT		84	3	7	90				41	24					

BORE LOG

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

Project No. 1813 Bridge : 276 RL: 273.418

Location:276/235-28-32
BH No.: 2
Depth : 30.00m
Depth of Water table :14.30M

Date of start : 20/05/2008
Date of finish : 23/05/2008

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)	
272.918	0.50	DS	Sandy Silt with Gravel (SM-ML)		1	4	95				Non	Plastic					
271.618	1.80	SPT		20	1	8	91				Non	Plastic					
270.918	2.50	UDS						1.8	1.59	12.92				DST	0.15	31	
270.118	3.30	SPT		16	0	18	82				Non	Plastic					
268.618	4.80	SPT		21	1	57	42				Non	Plastic					
267.918	5.50	UDS						1.83	1.60	14.45			2.65	DST	0.17	31	
267.118	6.30	SPT		20	0	40	60				Non	Plastic					
265.618	7.80	SPT		29	1	37	62				Non	Plastic					
264.918	8.50	UDS						1.85	1.58	17.23				DST	0.1	30	
264.118	9.30	SPT		23	1	53	46				Non	Plastic					
262.618	10.80	SPT		21	0	21	79				Non	Plastic					
261.918	11.50	UDS	Silty Clay of medium Plasticity (CI)					1.89	1.59	18.91			2.72	UU	1.22	3	0.072
261.118	12.30	SPT		30	0	2	98				42	21					
259.618	13.80	SPT		18	0	1	99										
258.918	14.50	UDS	Sandy Silt with Gravel (SM-ML)					1.92	1.56	22.88				DST	0.1	31	
258.118	15.30	SPT		43	0	48	52				Non	Plastic					
256.618	16.80	SPT		48	0	37	63				Non	Plastic					
255.918	17.50	UDS						1.94	1.59	21.96			2.7	UU	1.83	3	
255.118	18.30	SPT		32	0	2	98				38	19					
253.618	19.80	SPT	Silty Clay of medium Plasticity (CI)	27	0	2	98										
252.118	21.30	SPT		37	0	2	98				39	21					
250.618	22.80	SPT	Sandy Silt with Gravel (SM-ML)	32	0	2	98				Non	Plastic					
249.118	24.30	SPT		36	0	3	97				Non	Plastic					
247.618	25.80	SPT		33	0	1	99				42	22					
246.918	26.50	UDS						1.96	1.59	23.50			2.7	UU	2.06		
246.118	27.30	SPT	Silty Clay of medium Plasticity (CI)	57	0	5	95										
244.618	28.80	SPT		100	4	8	88				44	23					
243.118	30.30	SPT		100	3	8	89										

BORE LOG

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

Project No. 1813 Bridge : 276 RL: 273.054

Location:276/235-28-32
BH No.: 3
Depth : 30.00m
Depth of Water table :14.10M

Date of start : 24/05/2008
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)	
273.054																	
271.254	1.80	SPT		20	2	8	90				Non	Plastic					
270.554	2.50	UDS						1.87	1.64	13.89				DST	0.1	31	
269.754	3.30	SPT		24	2	11	87				Non	Plastic					
268.254	4.80	SPT	Sandy Silt with Gravel (SM-ML)	10	0	33	67				Non	Plastic					
267.554	5.50	UDS						1.76	1.53	15.11			2.67	DST	0.16	30	
266.754	6.30	SPT		20	0	43	57				Non	Plastic					
265.254	7.80	SPT		22	0	31	69				Non	Plastic					
264.554	8.50	UDS						1.86	1.60	16.43				DST	0.15	30	
263.754	9.30	SPT		19	0	42	58				Non	Plastic					
262.254	10.80	SPT		10	7	40	53				Non	Plastic					
260.754	12.30	SPT		12	0	3	97				Non	Plastic					
259.254	13.80	SPT		22	2	5	93				Non	Plastic					
257.754	15.30	SPT	Silty Clay of medium Plasticity (CI)	25	0	5	95				41	21					
256.254	16.80	SPT		45	0	20	80				41	22					
254.754	18.30	SPT		19	0	2	98				39	19					
253.254	19.80	SPT	Sandy Silt with Gravel (SM-ML)	17	0	1	99				Non	Plastic					
251.754	21.30	SPT		24	0	2	98				Non	Plastic					
250.254	22.80	SPT		26	0	2	98				Non	Plastic					
248.754	24.30	SPT		36	0	2	98				Non	Plastic					
247.254	25.80	SPT	Silty Clay of medium Plasticity (CI)	34	0	4	96				43	21					
245.754	27.30	SPT		51	3	11	86				44	24					
244.254	28.80	SPT	Sandy Silt with Gravel (SM-ML)	100	5	37	58				Non	Plastic					
242.754	30.30	SPT		57	10	29	61				Non	Plastic					

BORE LOG

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

Project No. 1813 Bridge : 276 RL: 273.412

Location:276/235-28-32
BH No.: 4
Depth : 30.00m
Depth of Water table :14.20M

Date of start : 21/05/2008
Date of finish : 24/05/2008

SOIL ENGINEERING CONSULTANTS

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot (Observed)	Gravel	Sand	Silt/clay	Density (gm/cc) r(wet)	Density (gm/cc) r(dry)	W/C W(%)	Limits (%) L.L	Limits (%) P . L	Sp.Gr	Shear Parameters Type of test	Shear Parameters C(kg/sq.cm)	Shear Parameters phi(degrees)	Cc
273.412																	
271.612	1.80	SPT	Sandy Silt with Gravel (SM-ML)	16	1	12	87				Non	Plastic					
270.912	2.50	UDS						1.8	1.59	13.14				DST	0.15	28	
270.112	3.30	SPT		10	1	15	84				Non	Plastic					
268.612	4.80	SPT		20	0	33	67				Non	Plastic					
267.912	5.50	UDS						1.87	1.63	14.88				DST	0.11	31	
267.112	6.30	SPT		24	0	41	59				Non	Plastic					
265.612	7.80	SPT	Silty Sand with Gravel (SM)	23	1	59	40				Non	Plastic					
264.912	8.50	UDS						1.84	1.58	16.21			2.66	DST		30	
264.112	9.30	SPT		20	1	57	42				Non	Plastic					
262.612	10.80	SPT	Silty Clay of medium Plasticity (CI)	14	6	4	90				39	22					
261.112	12.30	SPT		15	2	7	91				41	22					
259.612	13.80	SPT		21	1	6	93				41	21					
258.112	15.30	SPT	Sandy Silt with Gravel (SM-ML)	51	0	20	80				Non	Plastic					
256.612	16.80	SPT		21	0	5	95				Non	Plastic					
255.112	18.30	SPT		17	0	13	87				Non	Plastic					
253.612	19.80	SPT		31	0	3	97				Non	Plastic					
252.112	21.30	SPT		25	0	2	98				Non	Plastic					
250.612	22.80	SPT		31	0	5	95				Non	Plastic					
249.112	24.30	SPT	Silty Clay of medium Plasticity (CI)	35	1	3	96				44	22					
247.612	25.80	SPT		40	0	1	99				46	24					
246.912	26.50	UDS						1.92	1.59	20.61			2.7	UU	2.19		0.049
246.112	27.30	SPT		53	0	3	97				44	24					
244.612	28.80	SPT		36	2	7	91				44	24					
243.912	29.50	UDS						1.98	1.64	20.42				UU	2.32		
243.112	30.30	SPT		88	4	10	86				45	26					

BORE LOG

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

Project No. 1813 Bridge : 276 RL : 273.522

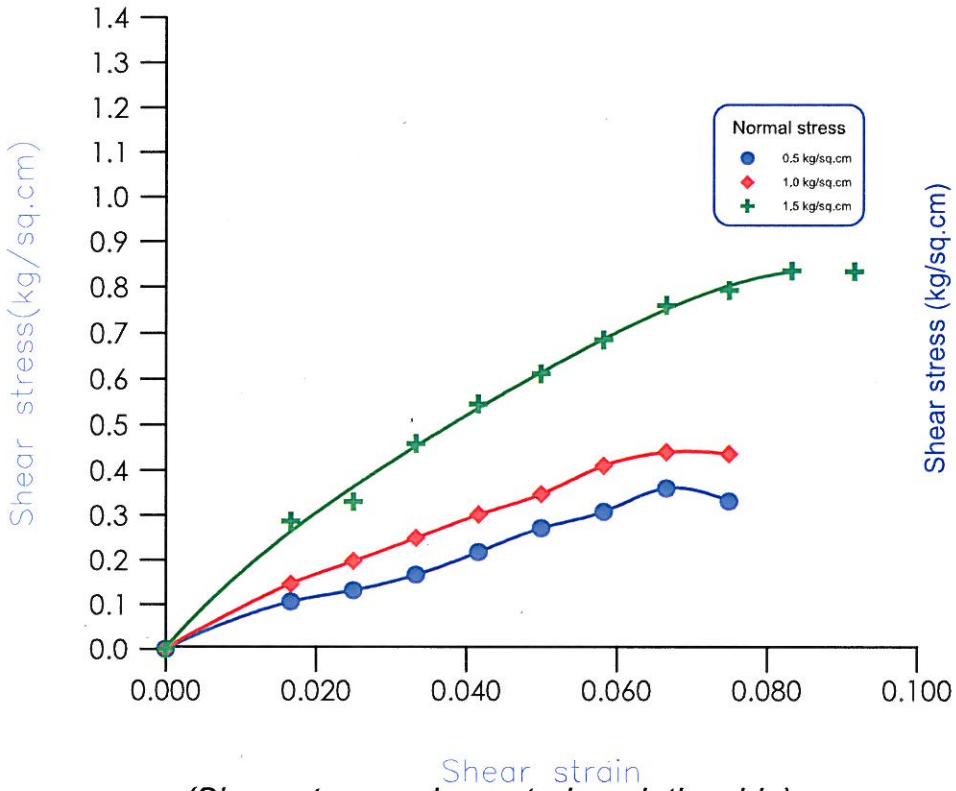
Location:276/235-28-32
BH No.: 5
Depth : 30.00m
Depth of Water table :14.00M

Date of start : 19/05/2008
Date of finish : 21/05/2008

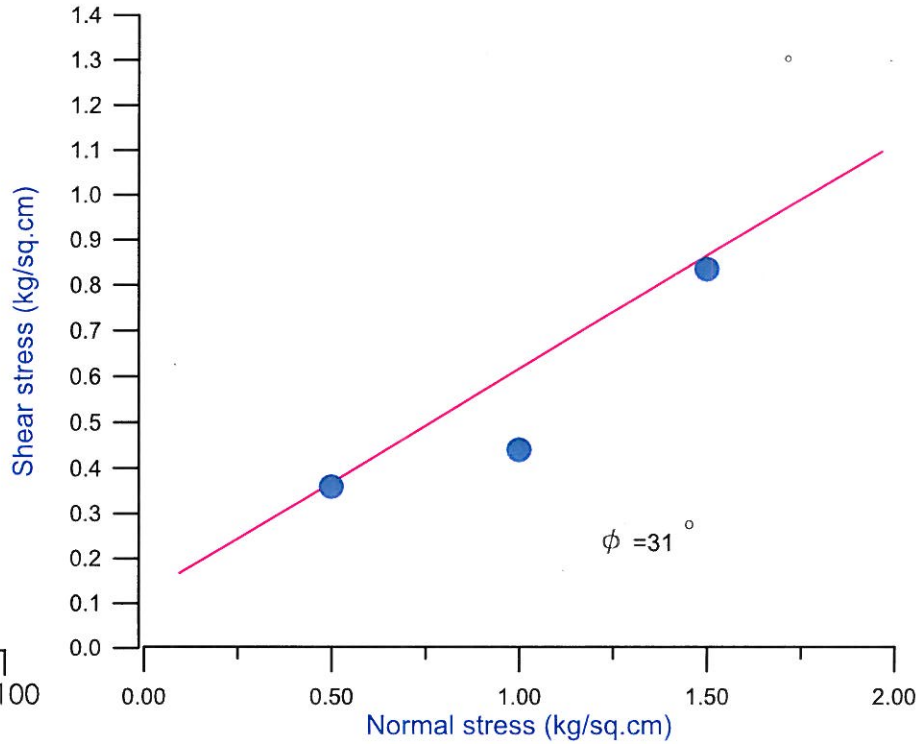
SOIL ENGINEERING CONSULTANTS

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
273.522																	
272.022	1.50	DS			2	11	87					Non Plastic					
271.722	1.80	SPT		11	2	12	86					Non Plastic					
271.022	2.50	UDS						1.72	1.54	11.62				DST	0.15	28	
270.222	3.30	SPT		19	0	22	78					Non Plastic					
268.722	4.80	SPT	Sandy Silt with Gravel (SM-ML)	9	0	23	77					Non Plastic					
268.022	5.50	UDS						1.76	1.54	13.94			2.66	DST	0.15	28	
267.222	6.30	SPT		14	0	17	83					Non Plastic					
265.722	7.80	SPT		16	0	37	63					Non Plastic					
265.022	8.50	UDS						1.8	1.55	16.11				DST	0.1	29	
264.222	9.30	SPT		14	0	44	56					Non Plastic					
262.722	10.80	SPT		12	0	3	97					Non Plastic					
262.022	11.50	UDS	Silty Clay of medium Plasticity (CI)					1.8	1.54	16.96			2.72	UU	0.69	4	0.076
261.222	12.30	SPT		14	0	5	95				38	19					
259.722	13.80	SPT	Sandy Silt with Gravel (SM-ML)	26	0	16	84					Non Plastic					
258.222	15.30	SPT		42	0	40	60					Non Plastic					
256.722	16.80	SPT		35	0	2	98				45	24					
255.222	18.30	SPT	Silty Clay of medium Plasticity (CI)	16	0	2	98				42	23					
253.722	19.80	SPT		26	0	2	98				40	21					
253.022	20.50	UDS						1.85	1.52	21.62				UU	1.28		0.066
252.222	21.30	SPT	Sandy Silt with Gravel (SM-ML)	25	0	2	98					Non Plastic					
250.722	22.80	SPT		31	0	2	98					Non Plastic					
249.222	24.30	SPT		33	0	3	97				39	21					
247.722	25.80	SPT	Silty Clay of medium Plasticity (CI)	35	2	3	95				39	22					
247.022	26.50	UDS						1.92	1.60	20.23			2.71	UU	1.89		0.048
246.222	27.30	SPT		79	0	3	97				44	23					
244.722	28.80	SPT	Sandy Silt with Gravel (SM-ML)	50	2	5	93					Non Plastic					
244.022	29.50	UDS						1.91	1.59	19.86				UU	2.73		
243.222	30.30	SPT		52	0	10	90					Non Plastic					

BH-1
Depth-2.50m



(Shear stress - shear strain relationship)

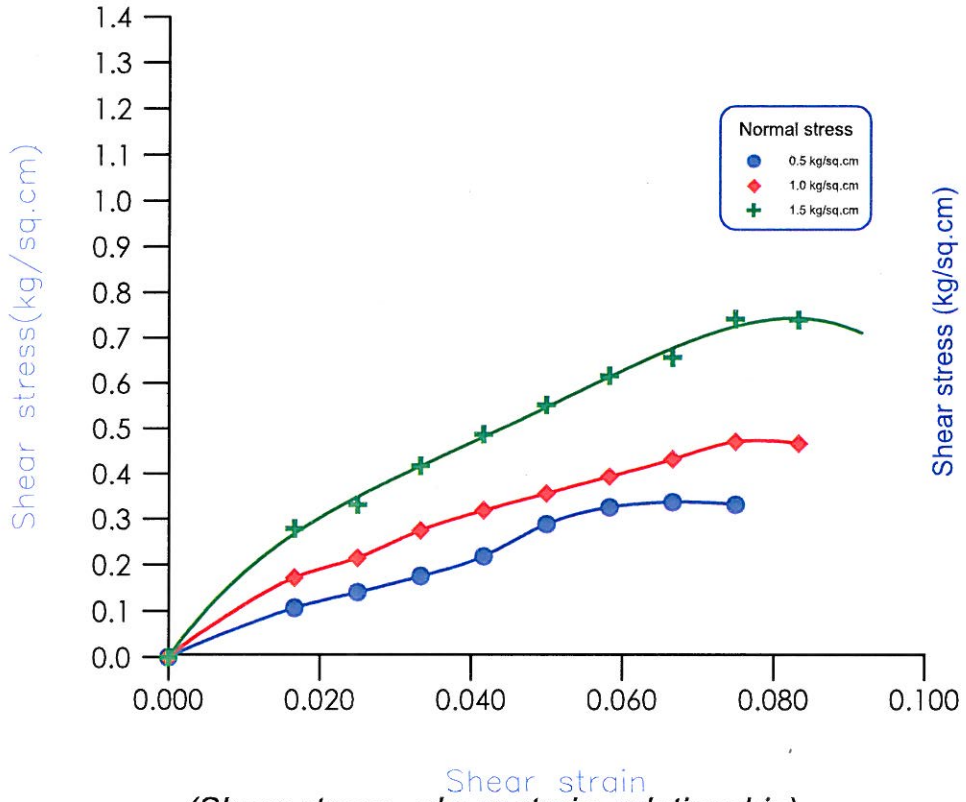


(Shear stress - Normal stress relationship)

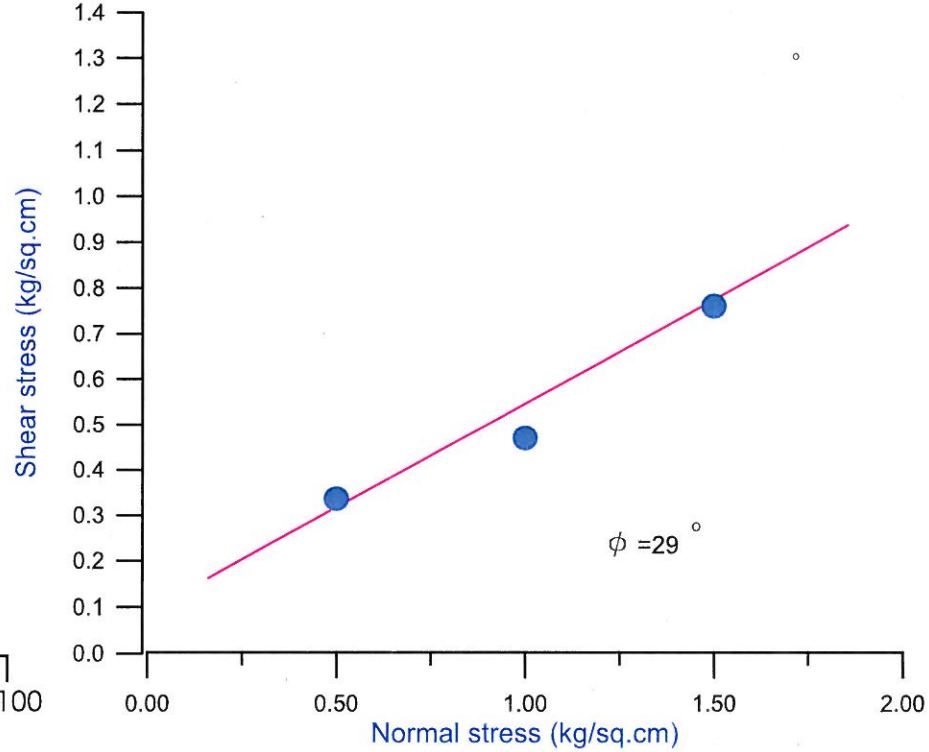
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiyana to Saharanpur

FIG- DS-BZ1

BH-1
Depth-5.50m



(Shear stress - shear strain relationship)



(Shear stress - Normal stress relationship)

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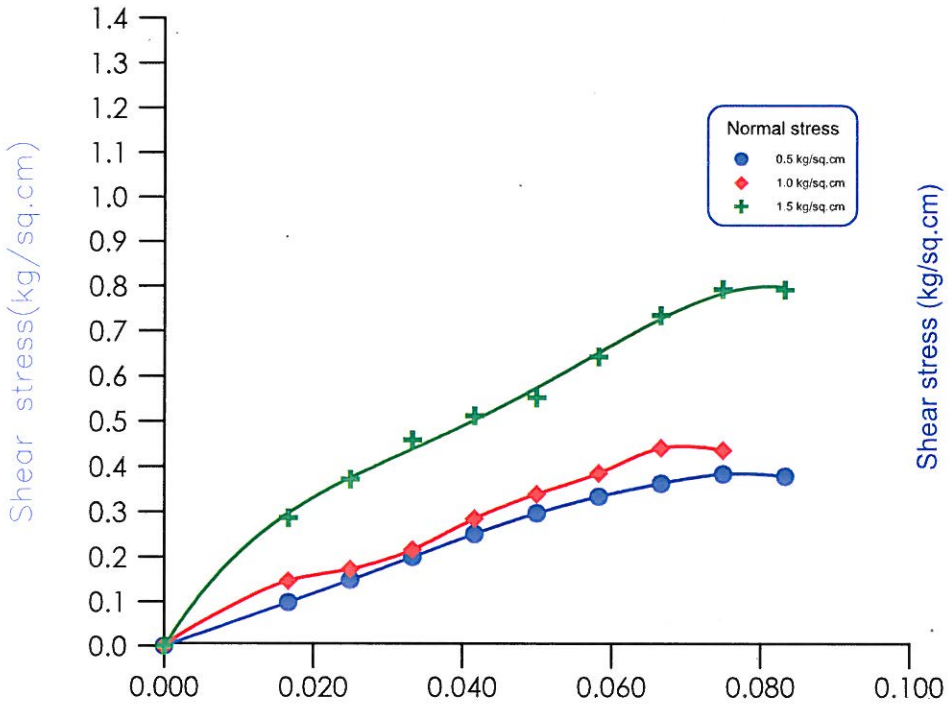
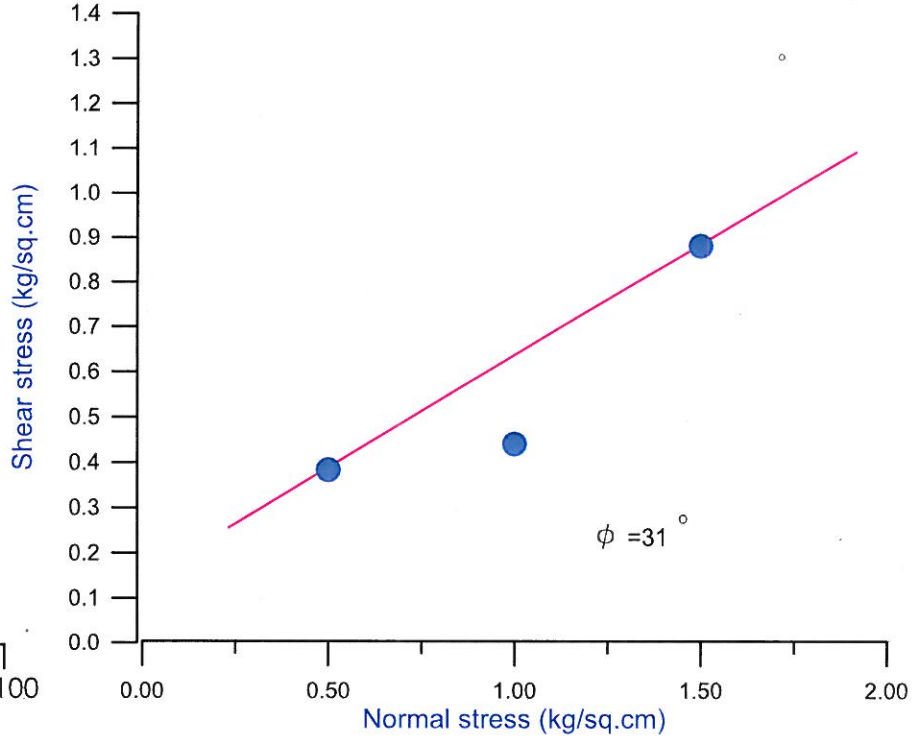
FIG- DS-CD

BH-1
Depth-8.50m



(Shear stress - shear strain relationship)



(Shear stress - Normal stress relationship)

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FIG: DS-BZ2