



डेडीकेटेड फ्रेट कोरीडोर

DESIGN AND CONSTRUCTION OF CIVIL, STRUCTURES AND TRACK WORKS FOR SINGLE LINE RAILWAY INVOLVING FORMATION IN EMBANKMENTS/CUTTINGS, BALLAST ON FORMATION, TRACK WORKS, BRIDGES, STRUCTURES, BUILDINGS, YARDS, INTEGRATION WITH IR EXISTING RAILWAY SYSTEM AND TESTING & COMMISSIONING ON DESIGN-BUILD LUMP SUM BASIS FOR SAHNEWAL - PILKHANI SECTION OF EASTERN DEDICATED FREIGHT CORRIDOR

**Contract Package: 301**

ICB No. HQ/EN/EC/D-B/SAHNEWAL - PILKHANI

**PART - 4 - REFERENCE DOCUMENT  
GEO TECH DATA - VOLUME - 3**

**SAHNEWAL TO PILKHANI**

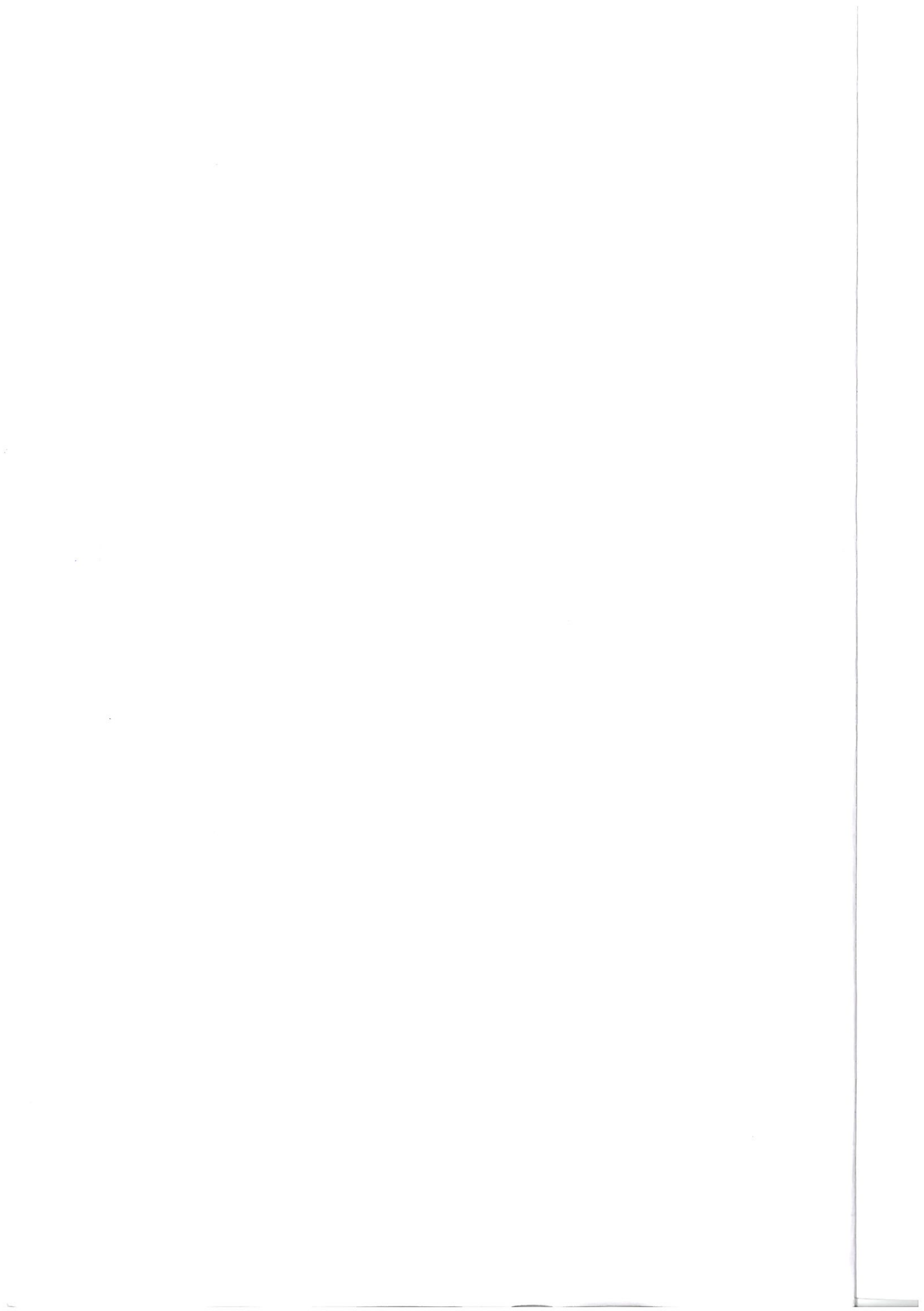
From Km. 360.200 to Km. 187.500

**GEO TECH DATA**

From Km. 187.000 to Km. 249.000

**VOL 1/7**

EMPLOYER  
DEDICATED FREIGHT CORRIDOR CORPORATION OF INDIA LIMITED  
(A GOVERNMENT OF INDIA ENTERPRISES)  
MINISTRY OF RAILWAYS  
COUNTRY : INDIA



**Bore Log Data (Km 187 - Km 249)**

S.No	Chainage	IR KM	Exist. No.	Prop. No.	Page Numbers
<b>Bridges Locations</b>					
1	118314	189/15-17	236	4	0001-0005
2	119330	190/11-13	237	5	0006-0010
3	1477.117	193/13-15	238	6	0011-0015
4	2150.00	194/1-3	239	7	0016-0021
5	3688.538	195/17-19	240	8	0022-0027
6	4030.336	196/29-01	241	9	0028-0032
7	5866.009	197/23-25	242	10	0033-0042
8	6768.721	198/21-23	243	11	0043-0047
9	8115.119	200/1-3	244	12	0048-0052
10	12986.593	204/31-34	246	14	0053-0060
11	15209.039	207/3-5	247	15	0061-0065
12	15234.834	207/3-5	248	16	0066-0069
13	17218.557	209/5-7	249	17	0070-0074
14	18533.868	210/15-16	250	19	0075-0079
15	18700	210/21-23	251	20	0080-0087
16	18350	211/4-5	252	18	0088-0091
17	19190	211/13-14	252A	21	0092-0096
18	19859.401	211/41-43	252B	22	0097-0100
19	21013.359	212/33-35	253	23	0101-0103
20	21364.873	213/7-9	254	26	0104-0107
21	22689.163	214/21-23	255	27	0108-0111
22	24303.316	216/6-7	256	28	0112-0116
23	24483.801	216/11-13	257	29	0117-0121
24	26337.284	218/9-11	258	30	0122-0125
25	27676.071	219/17-19	259	31	0126-0139
26	29000	221/5-7	260	32	0140-0156
27	29433.375	221/9-11	261	33	0157-0162
28	30450.006	222/9-10	262	34	0163-0182
29	32467.577	224/9-11	263	35	0183-0194
30	33384.33	225/5-7	264	36	0195-0197
31	34679.979	226/17-19	265	37	0198-0214
32	35209.673	227/1-2	266	38	0215-0225
33	35856.903	227/23-25	267	39	0226-0244
34	36864.174	228/25-27	268	40	0245-0262
35	37927.118	229/23-27	269	41	0263-0287
36	38819.949	230/19-21	270	42	0288-0292
37	39188.46	231/1-3	271	43	0293-0297
38	40795.995	232/19-21	272	44	0298-0302
39	41424.56	233/7-9	273	45	0303-0307
40	41880.111	233/21-23	274	46	0308-0312
41	43279.743	235/5-7	275	47	0313-0316
42	44086.609	235/28-32	276	48	0317-0342
43	46669.462	238/15-17	279	51	0343-0345
44	47040.336	238/25-27	280	52	0346-0355
45	47852.853	239/19-21	281	53	0356-0367
46	51500	243/9-11	282	54	0368-0369
47	53459.408	245/9-11	284	56	0370-0373
48	55590.612	247/11-13	285	57	0374-0377
49	55886.748	247/19-21	286	58	0378-0389
50	56653	248/15-17	287	59	0390-0393

**Bore Log Data (Km 187 - Km 249)**

S.No	Chainage	IR KM	Exist. No.	Prop. No.	Page Numbers
<b>Alignment</b>					
51		191/11-13			0394-0398
52		192/11-13			0399-0403
53		195/1-3			0404-0408
54		197/01			0409-0413
55		199/21-23			0414-0418
56		201/1-3			0419-0422
57		202/2-3			0423-0426
58		203/2-3			0427-0430
59		205/29-31			0431-0434
60		206/29-31			0435-0438
61		208/3-5			0439-0442
62		210/5-7			0443-0445
63		213/31-33			0446-0449
64		215/21-23			0450-0453
65		217/11-13			0454-0456
66		219/9-11			0457-0460
67		220/31-32			0461-0464
68		223/9-11			0465-0469
69		226/5-7			0470-0472
70		232/1-3			0473-0477
71		234/21-23			0478-0486
72		237/5-7			0487-0491
73		240/19-21			0492-0493
74		241/19-21			0494-0495
75		242/19-21			0496-0498
76		244/9-11			0499-0503
77		246/9-11			0504-0507
78		249/24-25			0508-0511
79	Chemical Analysis				0864,0880-0884

**Disclaimer :** This Booklet does not contain Page Numbers from 512 to 863 & 0866 to 0879 as these are not relevant to this section and have been deleted.



Date of start : 06/07/2008

Date of finish : 07/07/2008

Location; 189/15-17

BH No.: 1

Depth : 12.00

Depth of Water table : 2.30 m

**BORE LOG**

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

**Project No. 1813      Bridge : 236      RL : 268.900**

0398  
0403  
0408  
0413  
0418  
0422  
0426  
0430  
0434  
0438  
0442  
0445  
0449  
0453  
0456  
0460  
0464  
0469  
0472  
0477  
0486  
0491  
0493  
0495  
0498  
0503  
0507  
0511  
10-0884

# BORE LOG



Date of start : 06/07/2008  
Date of finish : 07/07/2008

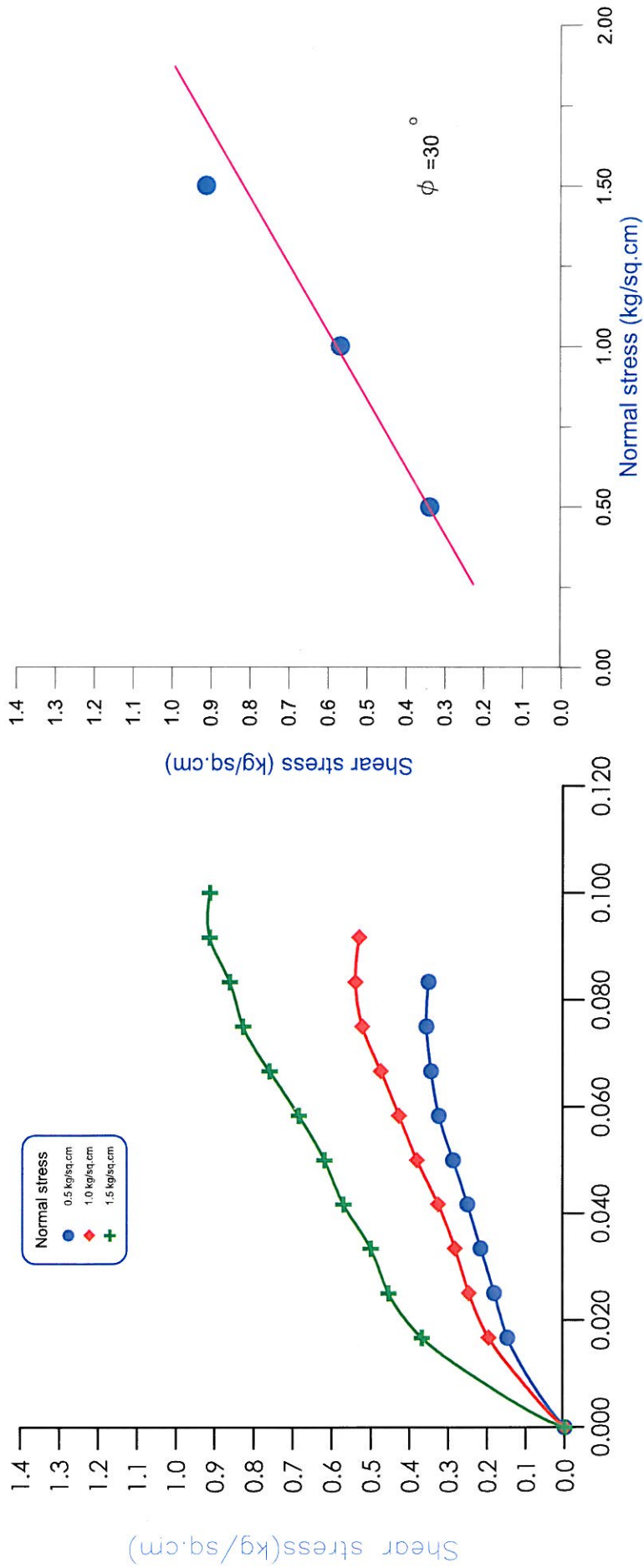
Location: 189/15-17  
BH No.: 1  
Depth : 12.00  
Depth of Water table : 2.30 m

PROJECT: Geotechnical Investigation work for proposed DFC corridor  
from Ludhiana to Saharanpur  
Project No. 1813 Bridge : 236 RL : 268.900

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot Observed	Grain size (%)			Density (gm/cc)		W/C (%)	Limits (%)		Shear Parameters					
					Gravel	Sand	Silt/clay	r(wet)	r(dry)		L.L.	P. L.	Sp.Gr	Type of test	C(kg/sq.cm)	phi(degrees)	Cc	
268.900																		
267.100	1.80	SPT	Sandy Silt with Gravel (SM-ML)	10	0	2	98	1.79	1.46	22.74	Non Plastic	Non Plastic	2.65	DST	0.1	30		
266.400	2.50	UDS																
265.600	3.30	SPT		15	1	7	92					Non Plastic	Non Plastic					
264.100	4.80	SPT	Silty Sand with gravel (SM)	20	1	5	94				Non Plastic	Non Plastic						
262.600	6.30	SPT		24	2	6	92				Non Plastic	Non Plastic						
261.100	7.80	SPT		22	0	3	97				Non Plastic	Non Plastic						
259.600	9.30	SPT		34	2	63	35				Non Plastic	Non Plastic						
258.100	10.80	SPT		36	1	81	18				Non Plastic	Non Plastic						
256.600	12.30	SPT		38	0	83	17				Non Plastic	Non Plastic						

10001

BH-1  
DEPTH = 2.50 m



PROJECT: Geotechnical Investigation work for proposed DFC corridor

FIG- DS-P

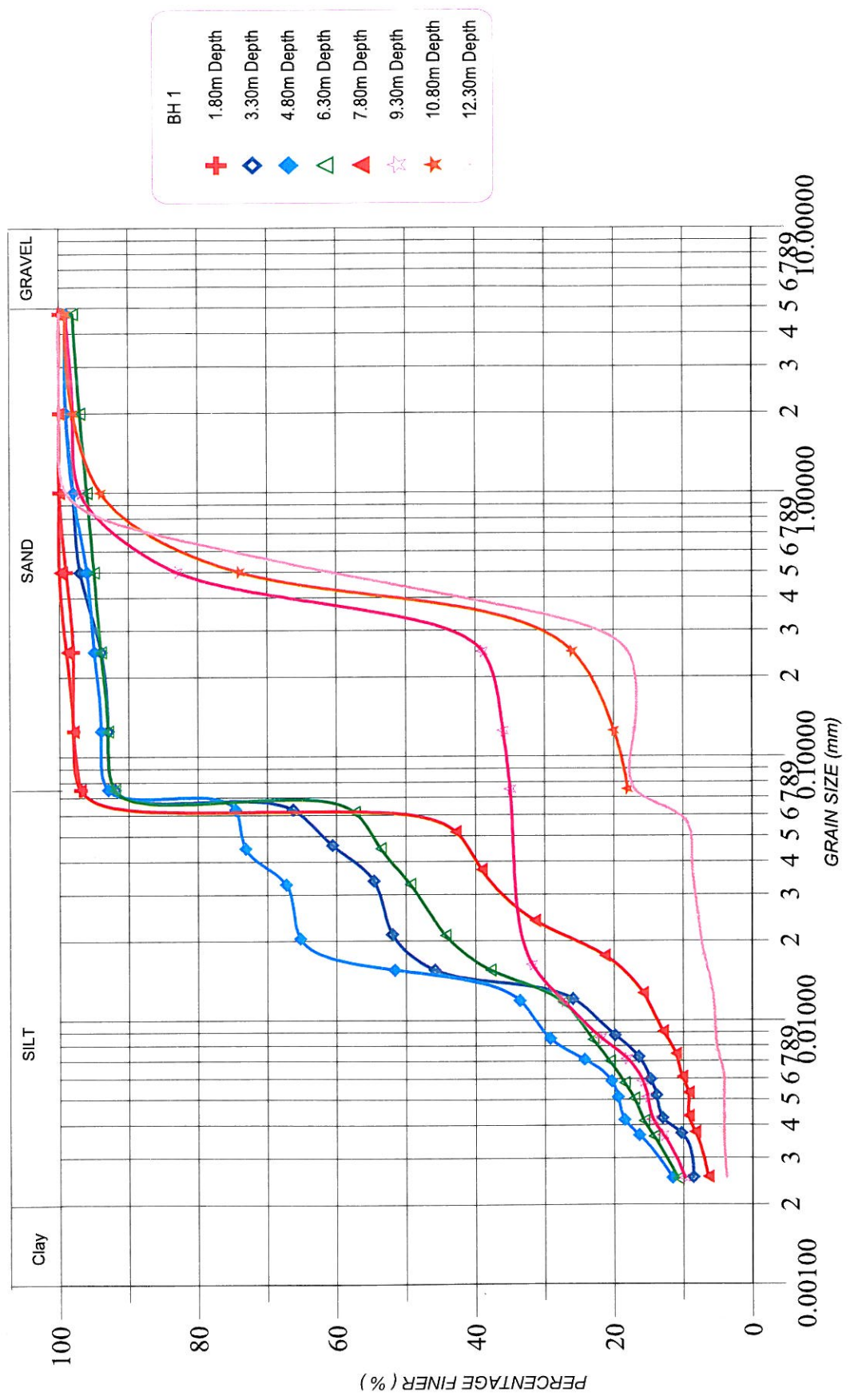
Soil Engineering Consultants

Br 236 @ 189/13-15

Job:1813

2007

GRAIN SIZE DISTRIBUTION CURVE



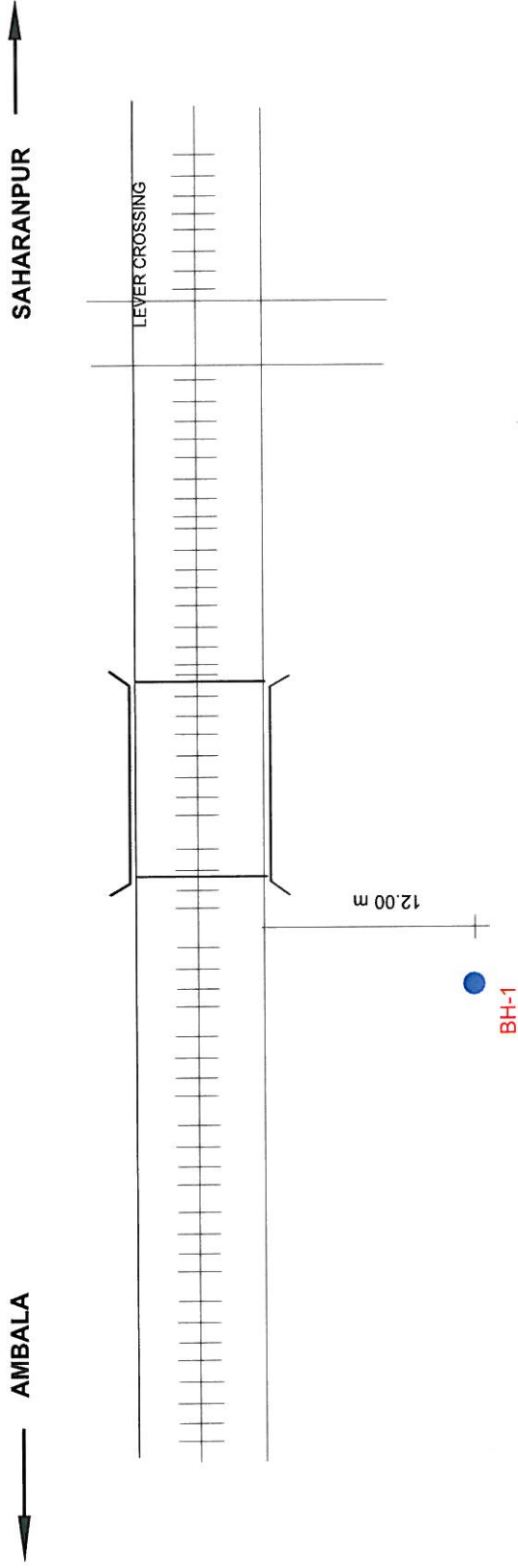
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiana to Saharanpur

Fig : GSD-P

3000

Job No: 1813

SOIL ENGINEERING CONSULTANTS

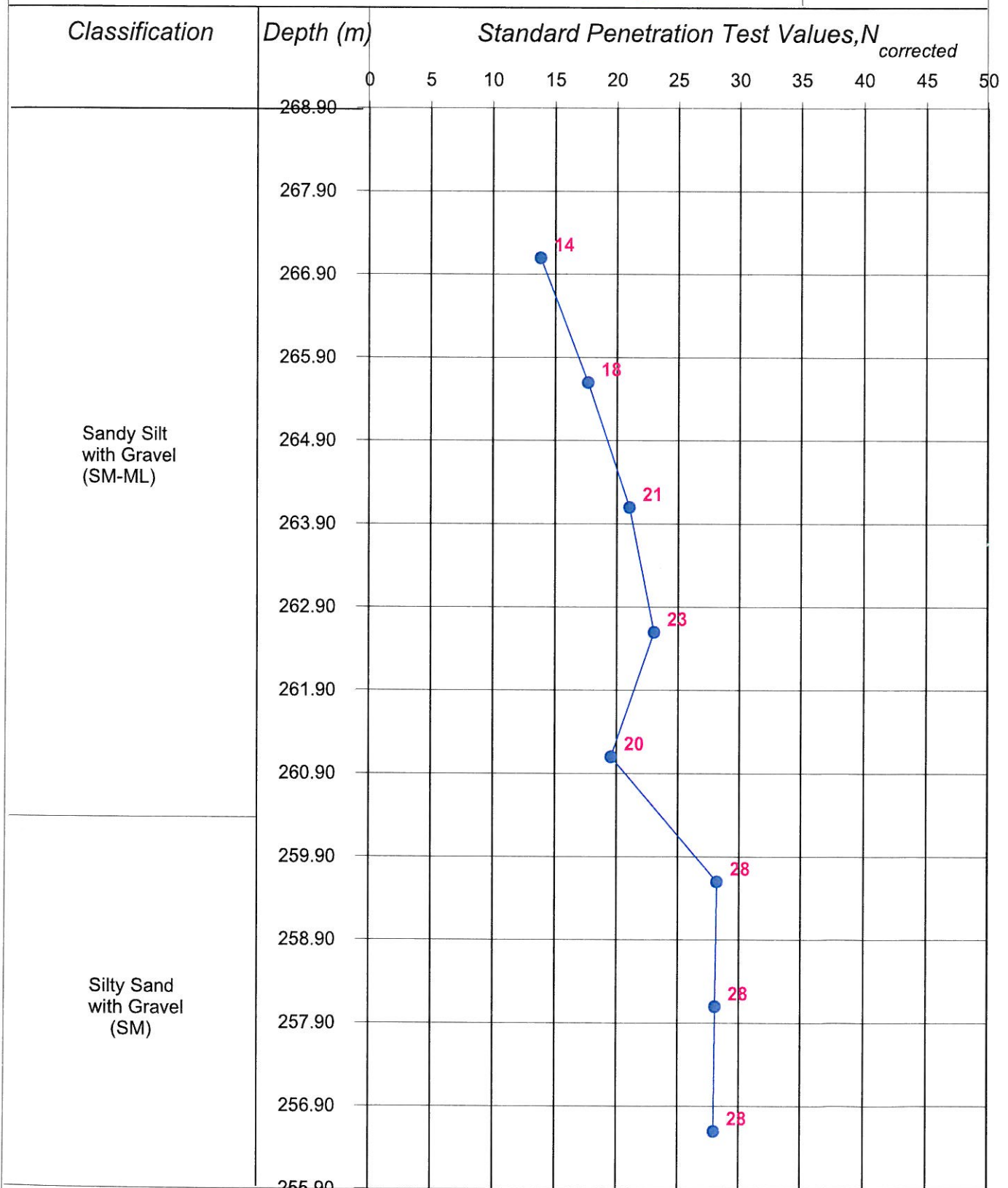


BRIDGE 236 @ 189/15-17

Fig: Plan-P

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





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

BH-1

Fig: SP-P

0005

# BORE LOG

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

Location: 190/11-13  
BH No.: 1  
Depth : 12.00  
Depth of Water table : 3.05 m

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

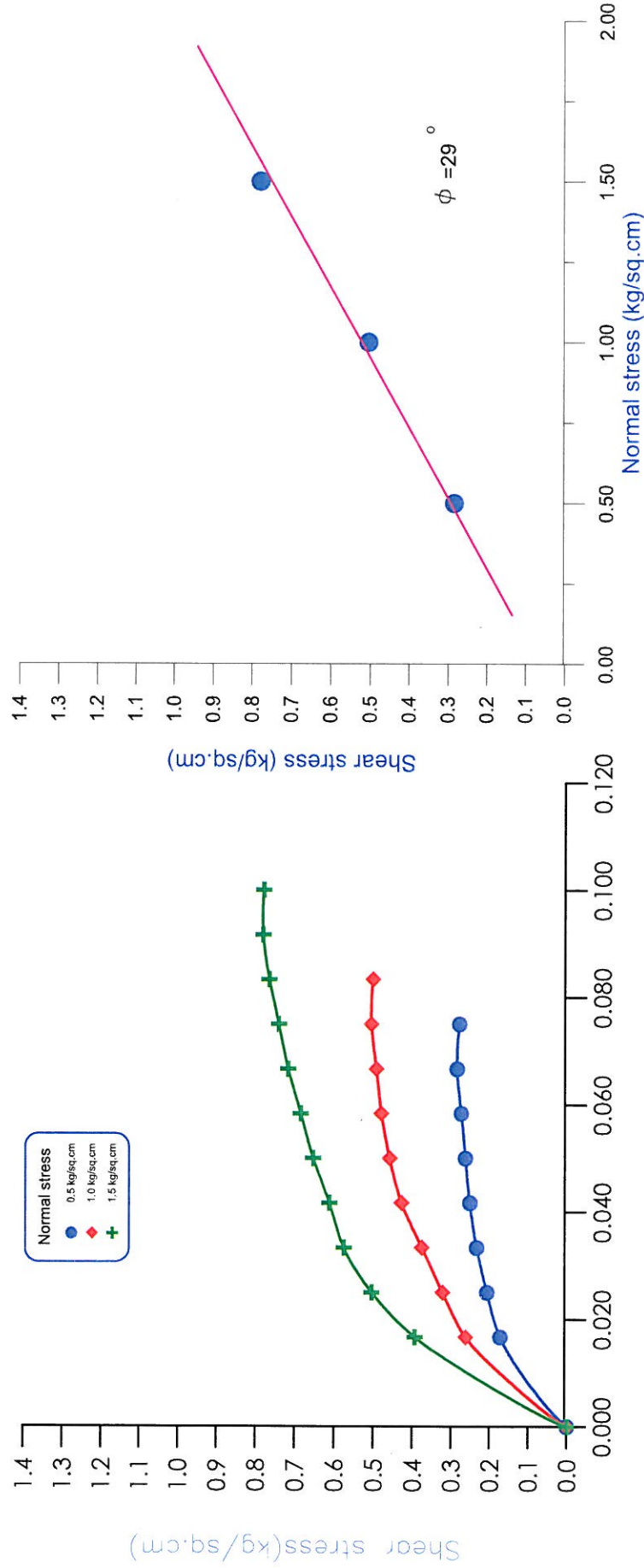


Project No. - 1813    Bridge : 237    RL: 271.305

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot			Grain size (%)		Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Observed	Gravel	Sand	Silt/clay	r(wet)	r(dry)	L.L		P. L	Type of test		C(kg/sq.cm)	phi(degrees)		
271.305																		
269.505	1.80	SPT		13	0	59	41					Non Plastic						
268.805	2.50	UDS		10	1	80	19	1.78	1.40	27.11			2.66	DST		29		
268.005	3.30	SPT		11	5	85	10					Non Plastic						
266.505	4.80	SPT	Silty Sand with gravel (SM)	15	3	89	8					Non Plastic						
265.005	6.30	SPT		14	1	83	16					Non Plastic						
263.505	7.80	SPT		15	1	85	14					Non Plastic						
262.005	9.30	SPT		20	2	8	90					Non Plastic						
260.505	10.80	SPT	Sandy Silt with Gravel (SM-ML)	20								Non Plastic						
252.005	12.30	SPT		20	1	6	93					Non Plastic						

9000

BH-1  
DEPTH = 2.50 m

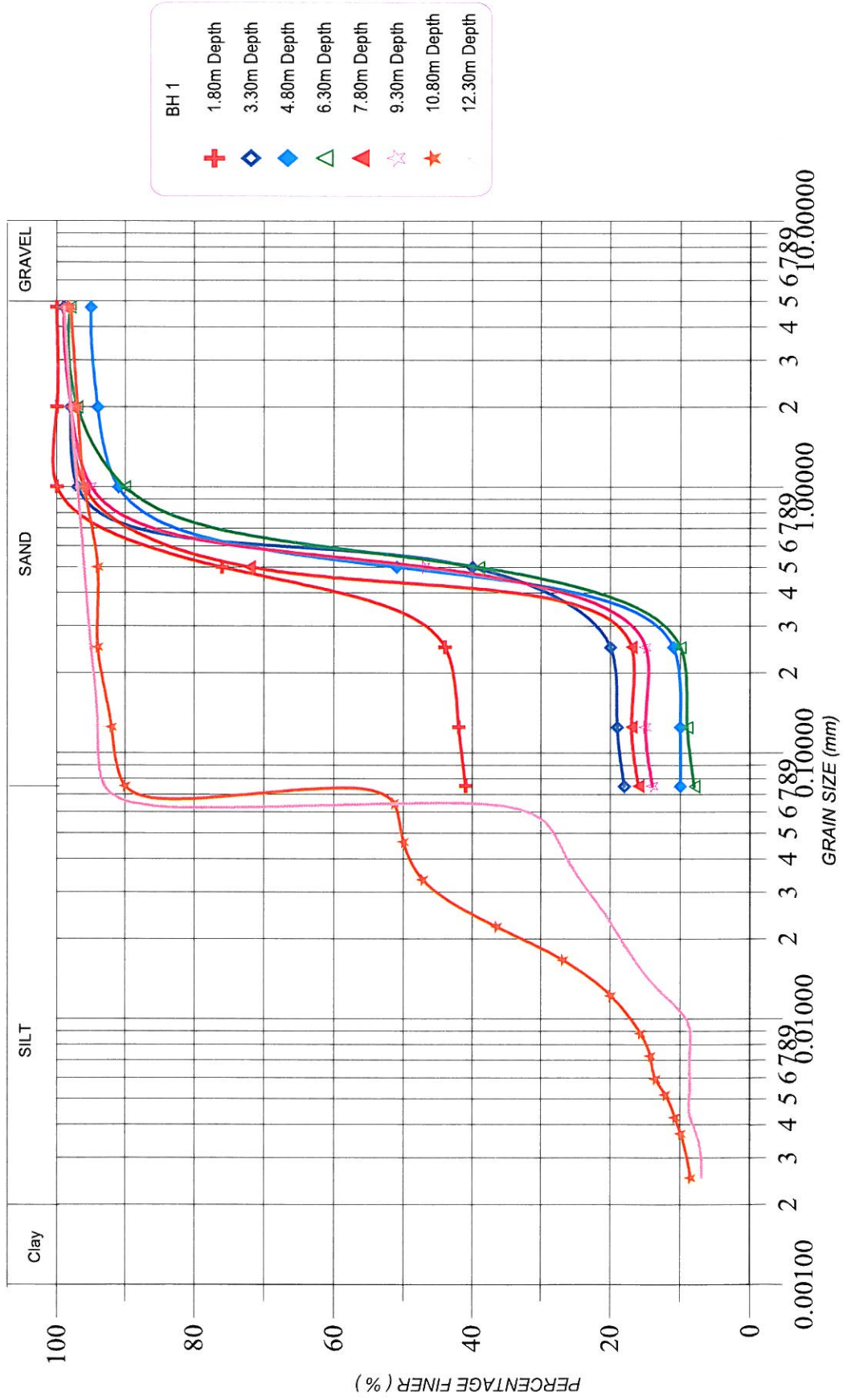


PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiana to Saharanpur

FIG- DS-Q

0000  
0000

GRAIN SIZE DRISTRIBUTION CURVE



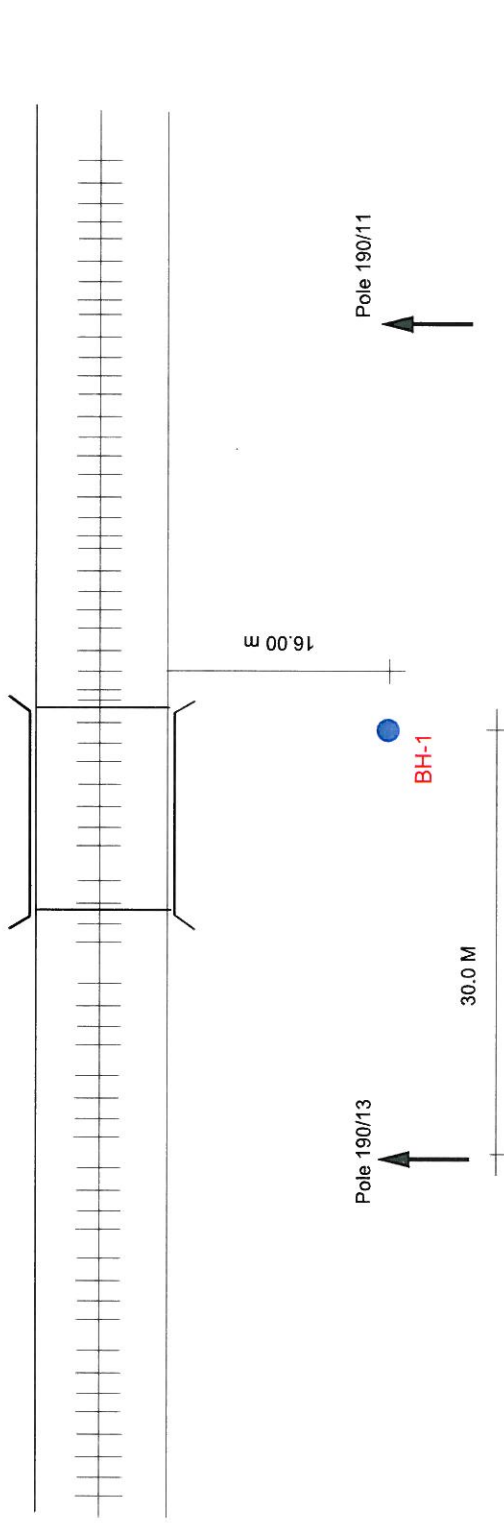
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiana to Saharanpur

Fig : GSD-Q

8000

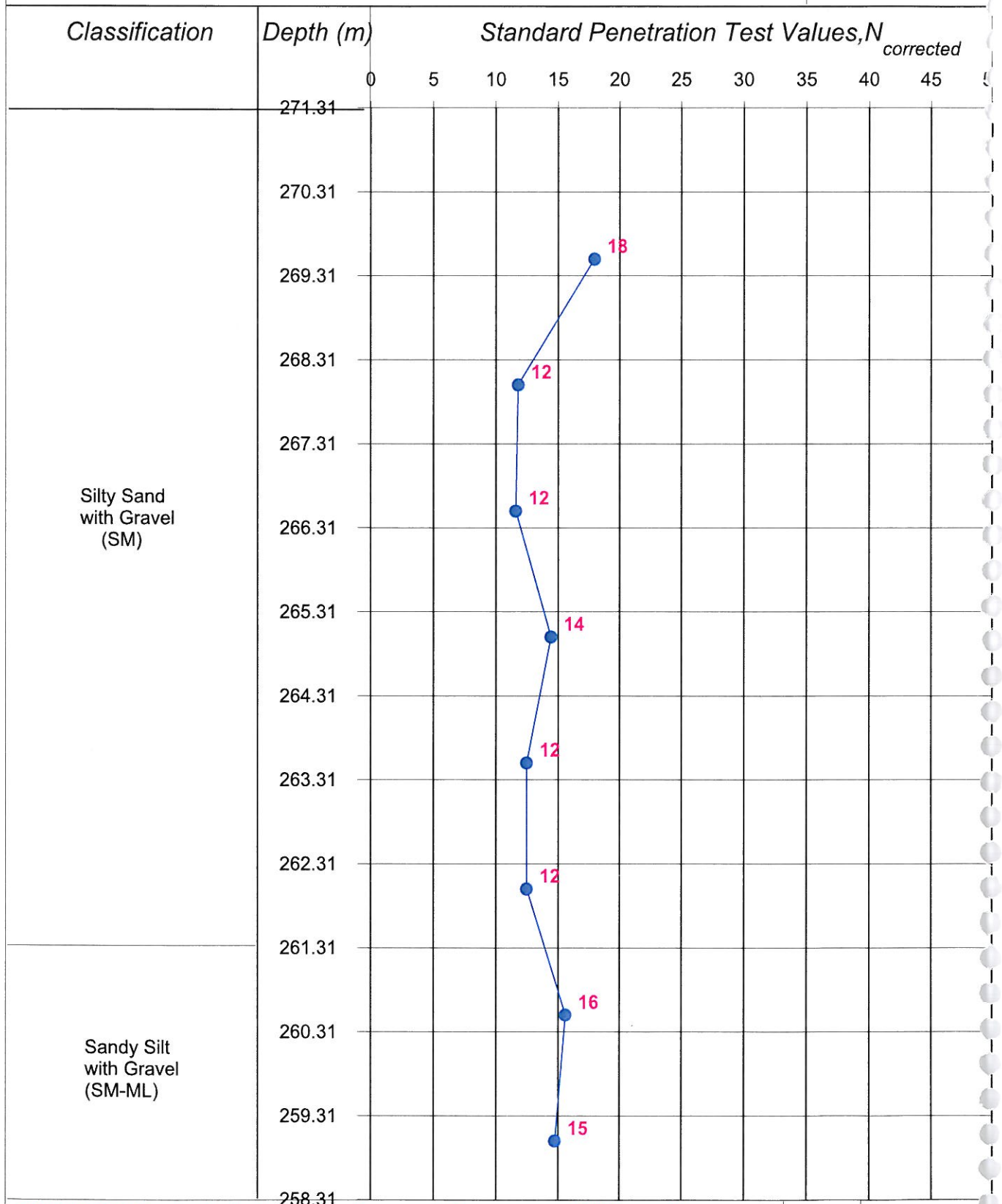
← LUDHIYANA

SAHARANPUR →



BRIDGE 237 @ 190/11-13

0000  
0009



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

BH-1

Fig: SP-Q

0010

# BORE LOG

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

**Location; 193/13-15**  
**BH No.: 1**  
**Depth : 12.00**  
**Depth of Water table : 3.00 m**

**Date of start : 02/07/2008**

**Date of finish : 03/07/2008**

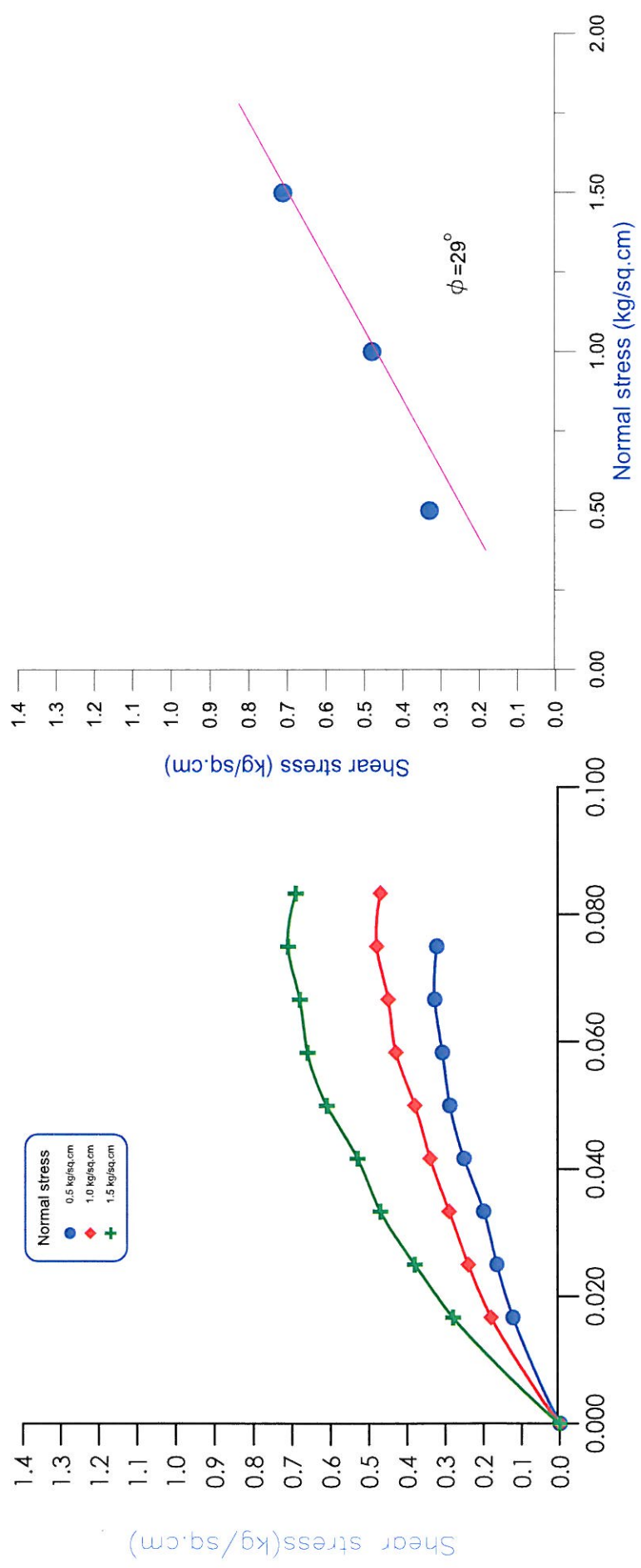


**Project No. 1813**      **Bridge : 238**      **271.047**

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot			Grain size (%)		Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc	
				Observed	Gravel	Sand	Silt/clay	r(wet)	r(dry)	Gravel		Sand	Silt/clay		L.L	P.L	Type of test		C(kg/sq.cm)
271.047																			
269.247	1.80	SPT	Sandy Silt with Gravel (SM-ML)	10	2	5	93	1.76	1.46	20.90	Non Plastic	Non Plastic	2.65	DST		29			
268.547	2.50	UDS		13	0	84	16												
267.747	3.30	SPT		10	1	70	29												
266.247	4.80	SPT	Silty Sand with Gravel (SM)	9	0	78	22												
264.747	6.30	SPT		12	2	6	92												
263.247	7.80	SPT	Sandy Silt with Gravel (SM-ML)	14	0	39	61												
261.747	9.30	SPT		29	5	71	24												
260.247	10.80	SPT	Silty Sand with Gravel (SM)	31	4	70	26												
258.747	12.30	SPT																	

0011

BH-1  
DEPTH = 2.50 m



(Shear stress - shear strain relationship)

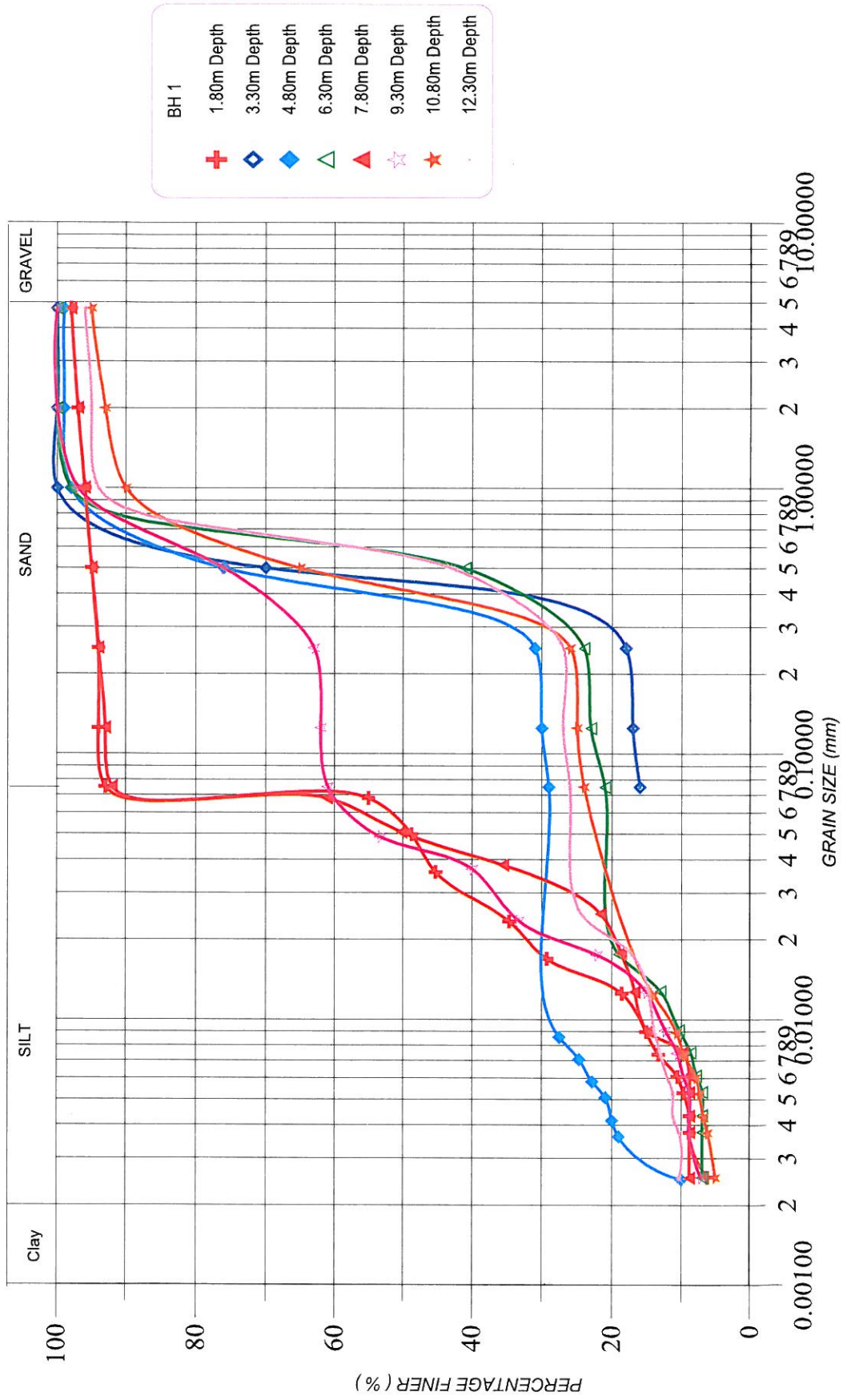
(Shear stress - Normal stress relationship)

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

FIG- DS-T

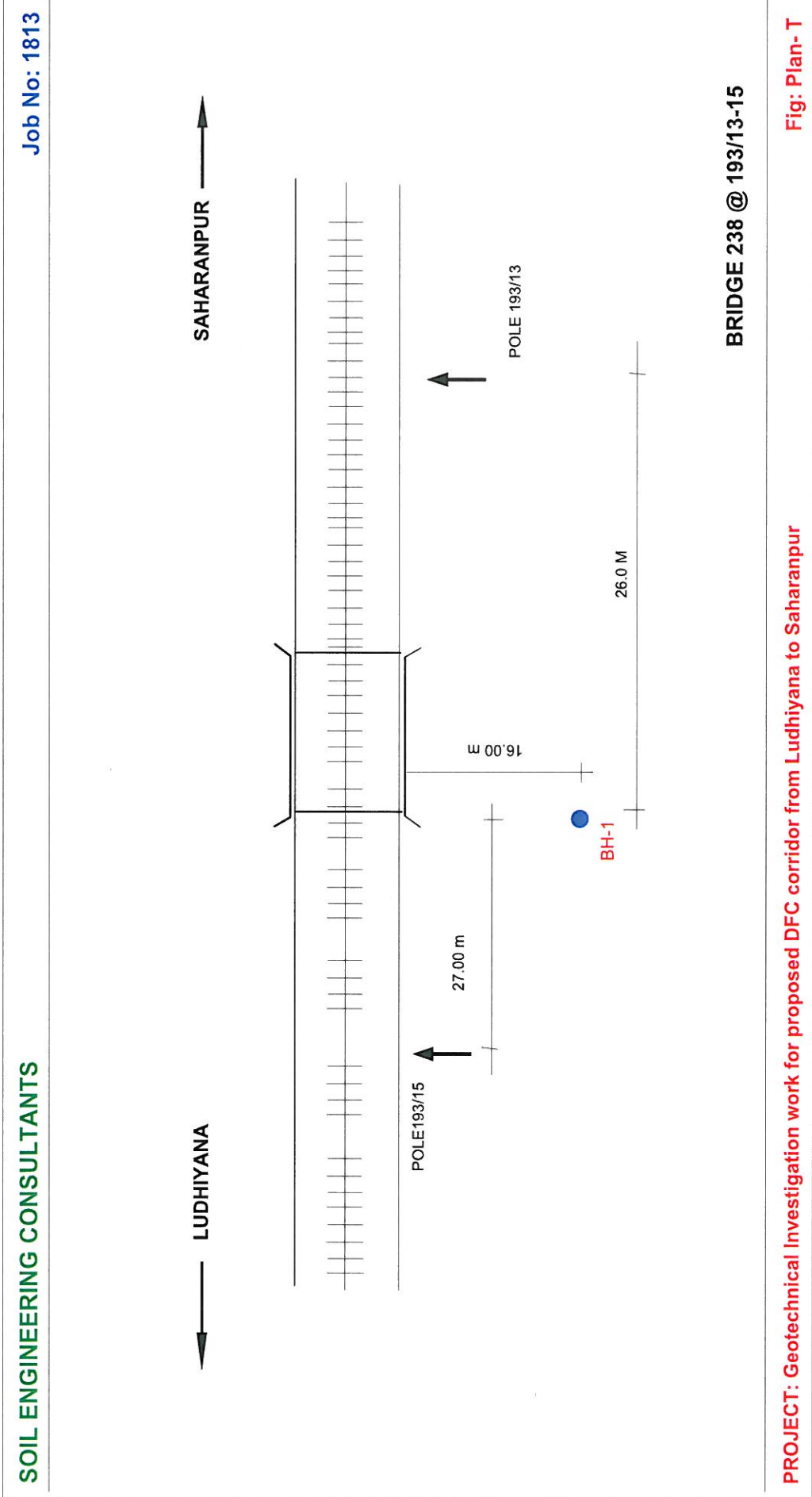


GRAIN SIZE DISTRIBUTION CURVE



19/05/2013 0013

001A



SOIL ENGINEERING CONSULTANTS

Job No: 1813

BRIDGE 238 @ 193/13-15

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

Fig: Plan- T



# BORE LOG

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

**Location:** 194/1-3  
**BH No.:** 1  
**Depth :** 12.00  
**Depth of Water table :** 7.50 m

**Date of start :** 05/07/2008  
**Date of finish :** 06/07/2008



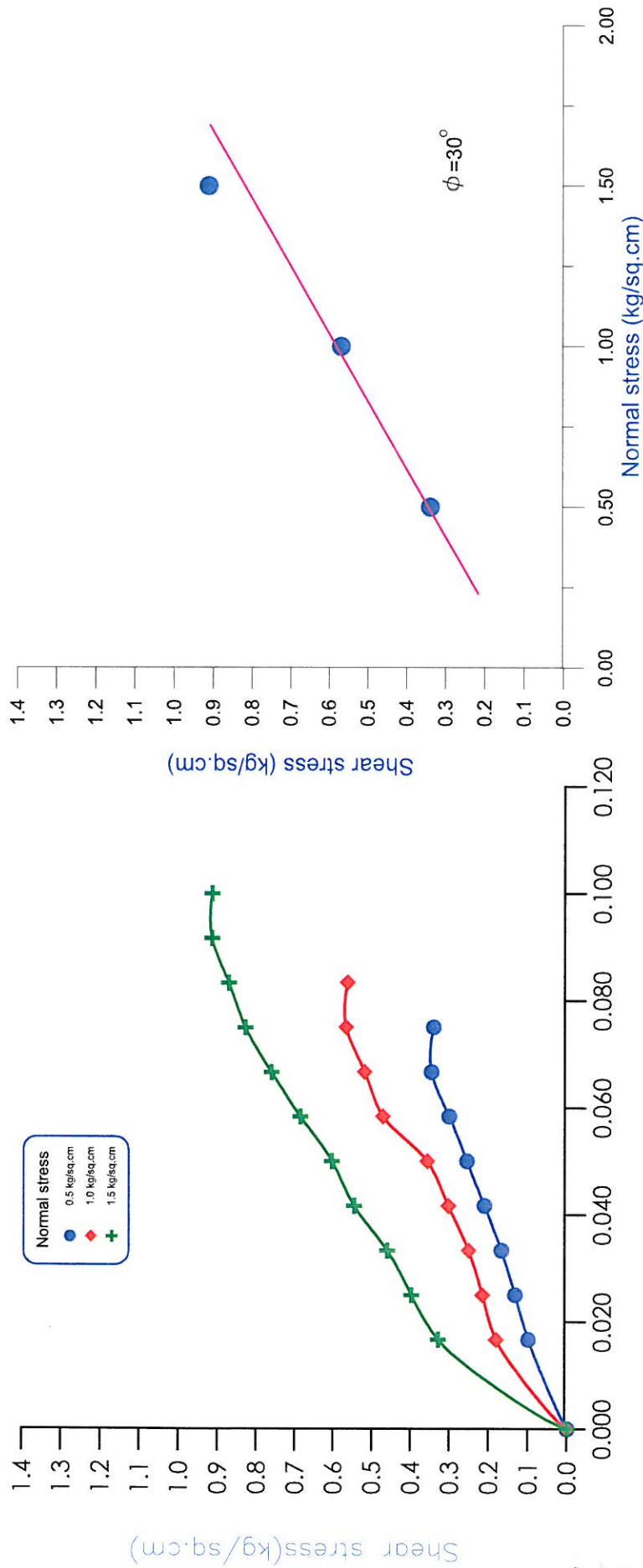
**Project No.** 1813 **Bridge :** 239

**RL :** 272.115

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot			Grain size (%)		Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Observed	Gravel	Sand	Silt/clay	r(wet)	r(dry)	L.L		P.L	Type of test		C(kg/sq.cm)	phi(degrees)		
272.115																		
270.315	1.80	SPT	Sandy Silt with Gravel (SM-ML)	14	1	15	84	1.8	1.57	14.69	Non Plastic			2.65	DST	0.1	30	
269.615	2.50	UDS			12	2	3	95										
268.815	3.30	SPT		11	1	87	12	1.78	1.49	19.24	Non Plastic			2.67	DST		29	
267.315	4.80	SPT	Silty Sand with gravel (SM)	9	1	72	27											
266.615	5.50	UDS			14	0	56	44										
265.815	6.30	SPT			11	0	75	25										
264.315	7.80	SPT		16	1	71	28											
262.815	9.30	SPT		13	0	3	97											
261.315	10.80	SPT	Sandy Silt with Gravel (SM-ML)															
259.815	12.30	SPT																

0100  
 0100  
 0100

BH-1  
DEPTH = 2.50 m



(Shear stress - Normal stress relationship)

(Shear stress - shear strain relationship)

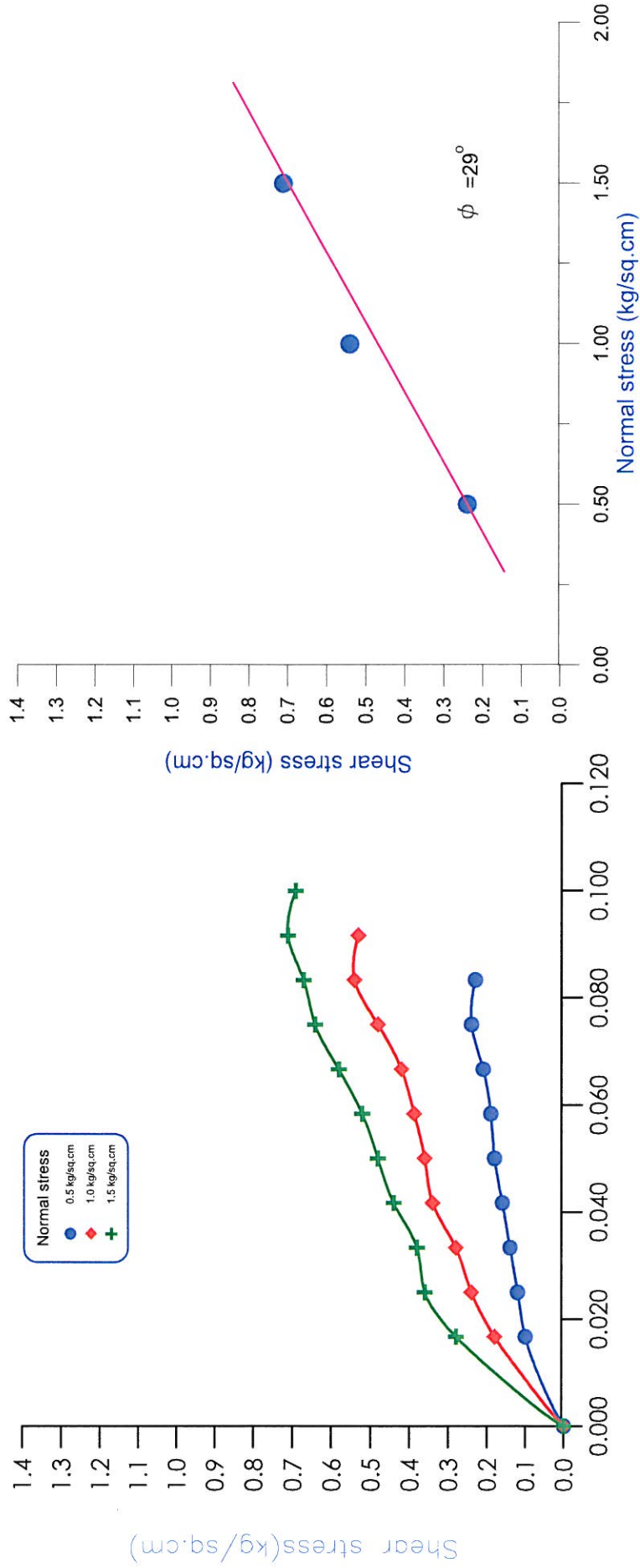
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiana to Saharanpur

FIG- DS-U

2100

0018

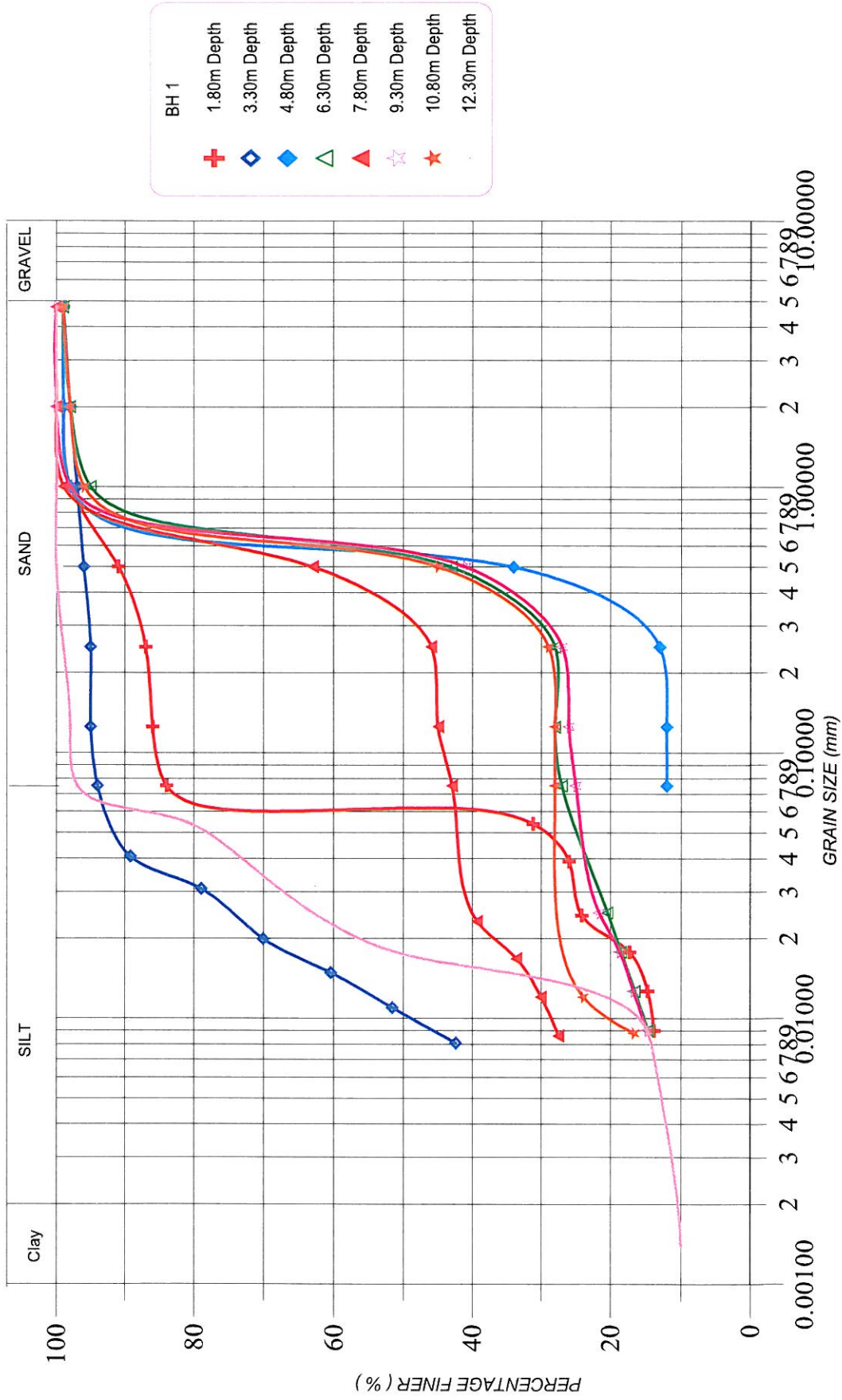
BH-2  
DEPTH = 5.50 m



(Shear stress - shear strain relationship)

(Shear stress - Normal stress relationship)

GRAIN SIZE DISTRIBUTION CURVE



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

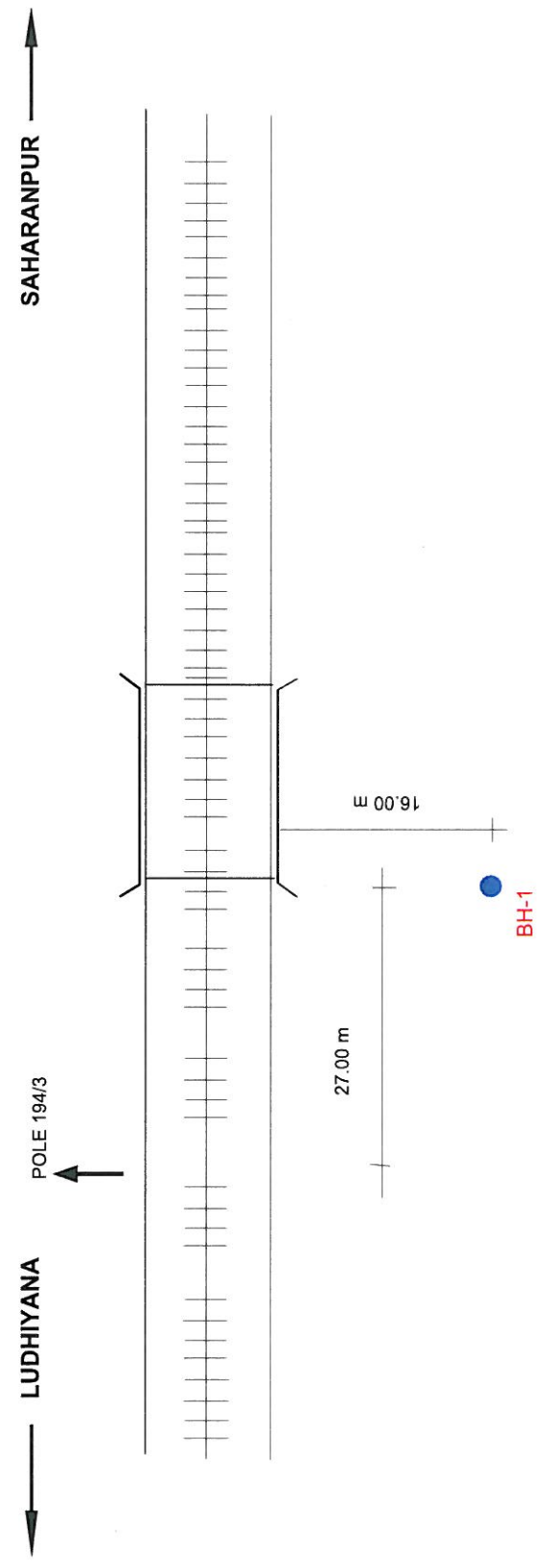
Fig : GSD-U

0019

0200

SOIL ENGINEERING CONSULTANTS

Job No: 1813

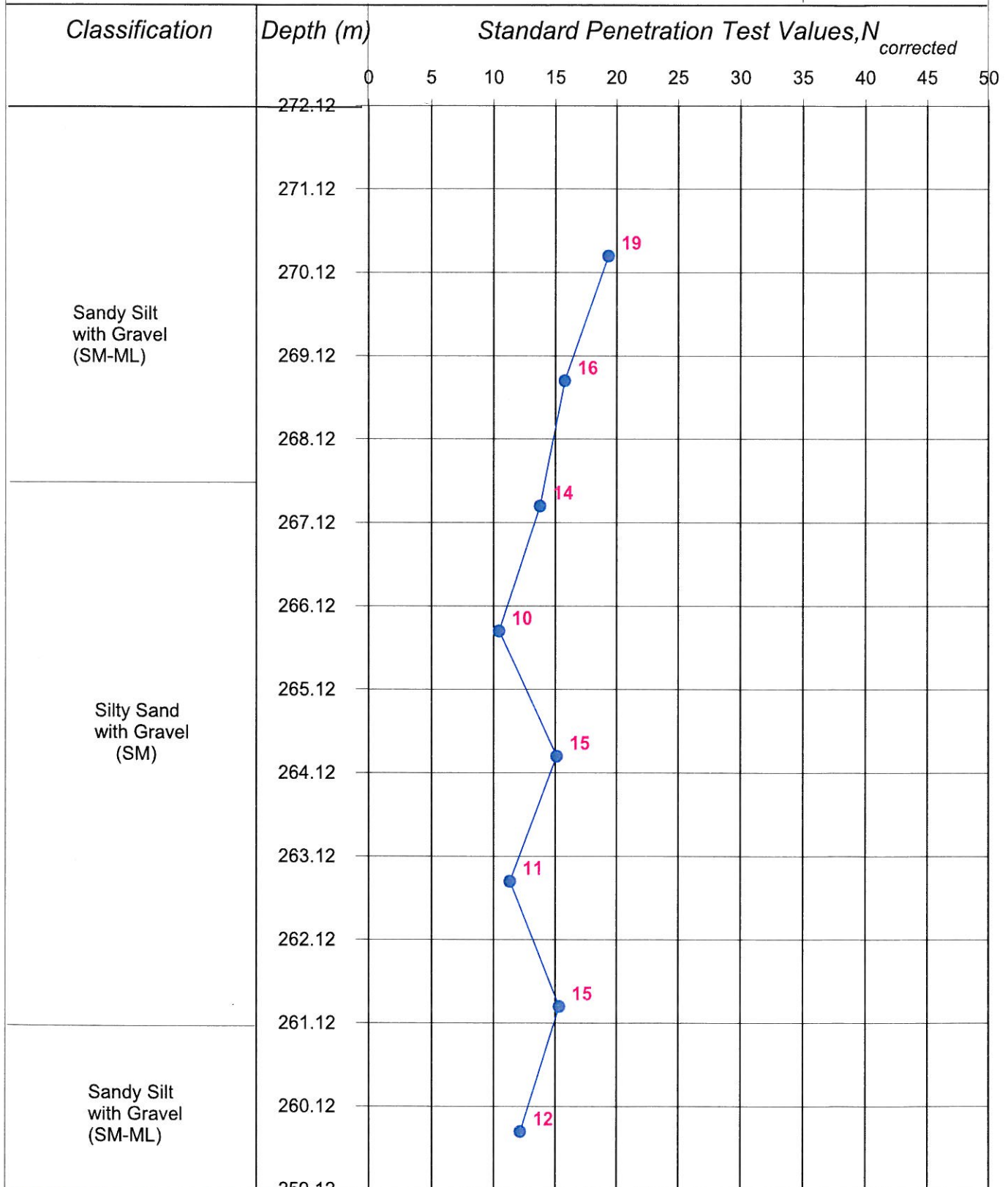


BRIDGE 239 @ 194/1-3

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

Fig: Plan- U





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

BH-1

Fig: SP-U

0021

# BORE LOG



Date of start : 07/07/2008  
Date of finish : 07/07/2008

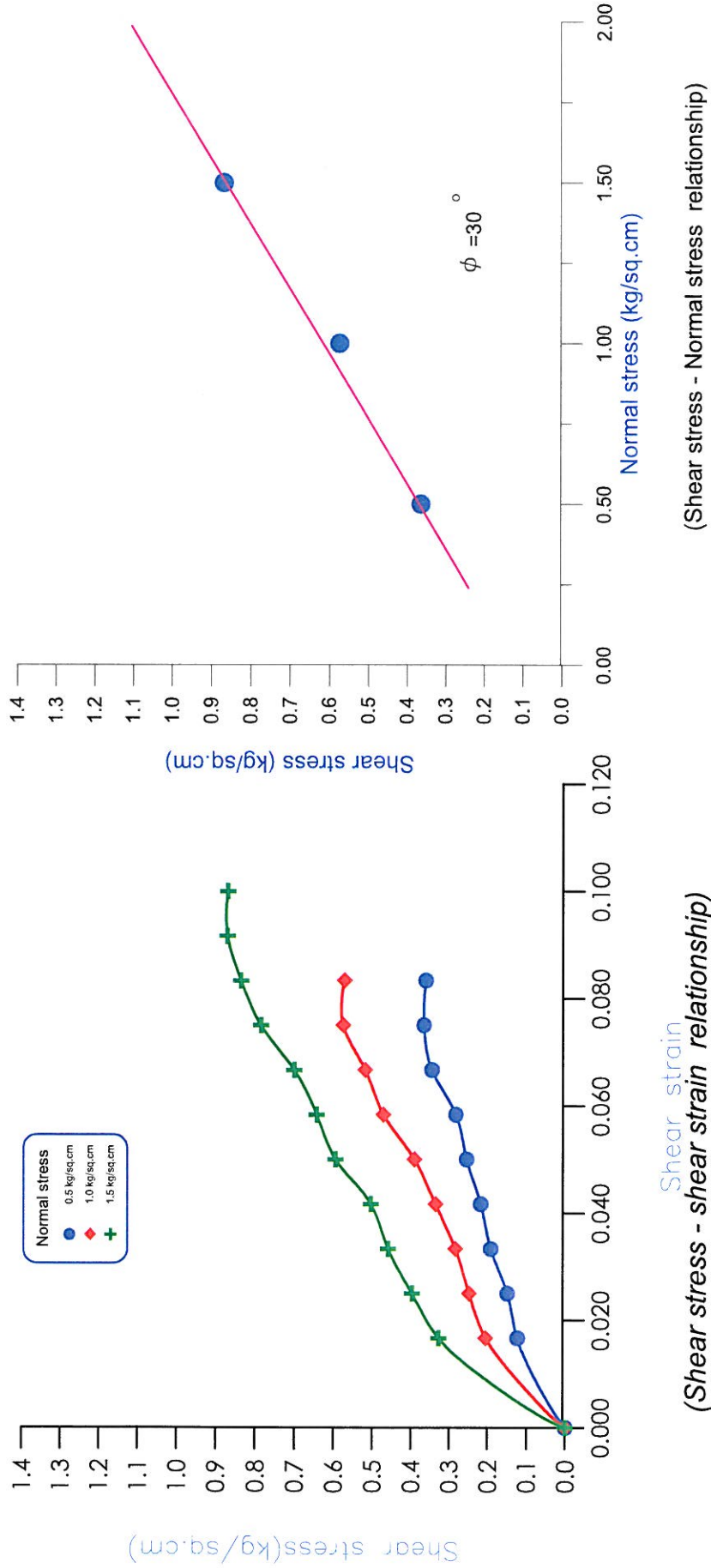
Location: 195/17-19  
BH No.: 1  
Depth : 12.00  
Depth of Water table : 2.50 m

PROJECT: Geotechnical Investigation work for proposed DFC corridor  
from Ludhiyana to Saharanpur  
Project No. 1813 Bridge : 240 RL: 268.360

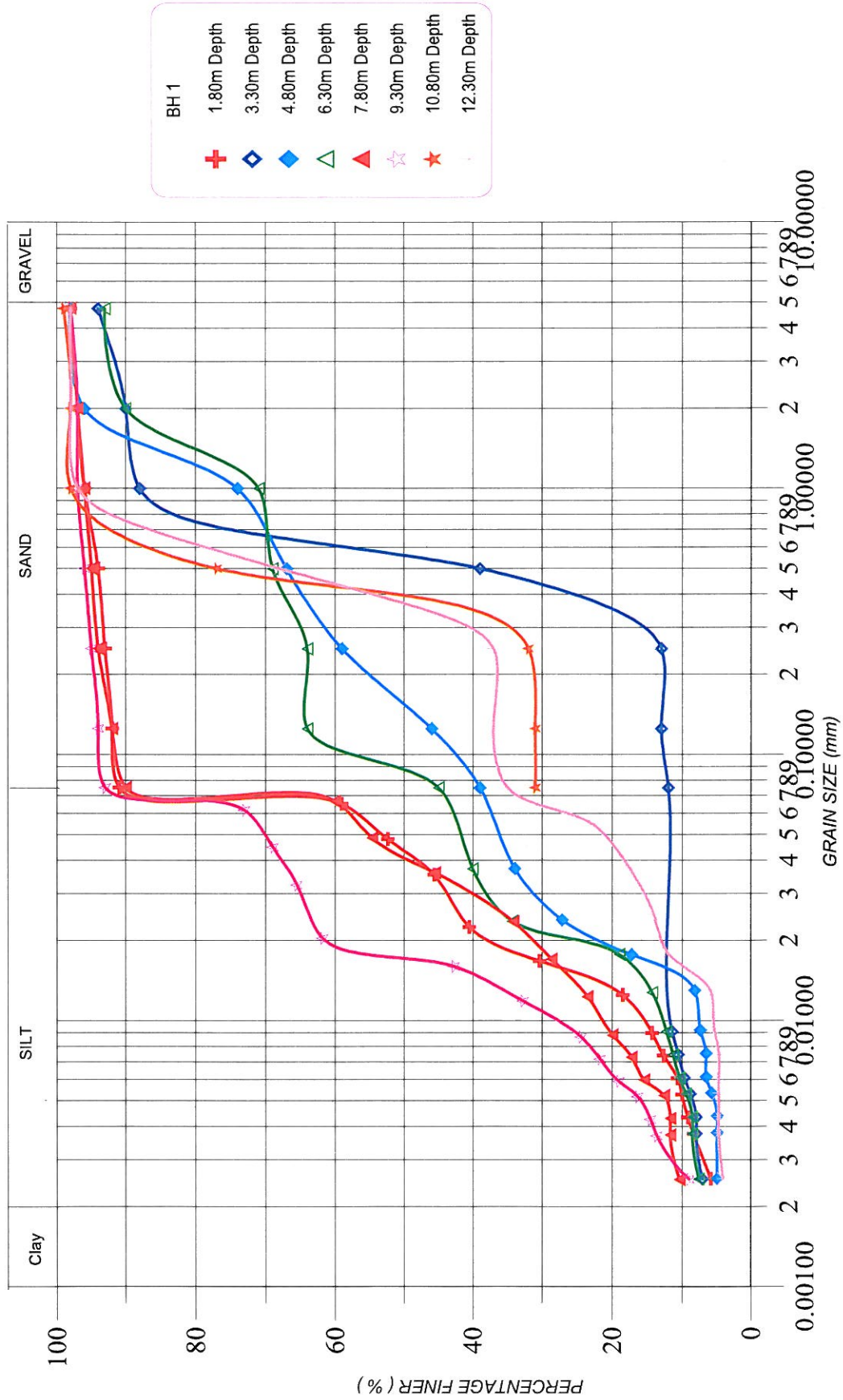
Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot		Grain size (%)			Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc	
				Observed	Corrected	Gravel	Sand	Silt/clay	r(wet)	r(dry)		L.L	P.L		Type of test	C(kg/sq.cm)	phi(degrees)		
268.360																			
266.560	1.80	SPT	Sandy Silt with Gravel (SM-ML)	14		2	7	91				Non Plastic							
265.860	2.50	UDS							1.78	1.43	24.10			2.65	DST	0.1	29		
265.060	3.30	SPT		10		6	82	12				Non Plastic							
263.560	4.80	SPT	Silty Sand with gravel (SM)	10		2	59	39				Non Plastic							
262.060	6.30	SPT		11		7	48	45				Non Plastic							
260.560	7.80	SPT		25		2	8	90				Non Plastic							
259.860	8.50	UDS	Sandy Silt with Gravel (SM-ML)			2	5	93	1.82	1.48	22.69				DST	0.1	30		
259.060	9.30	SPT		18		2	5	93				Non Plastic							
257.560	10.80	SPT	Silty Sand with gravel (SM)	25		1	68	31				Non Plastic							
255.060	12.00	SPT		35		2	63	35				Non Plastic							

0022

BH-1  
DEPTH = 8.50 m

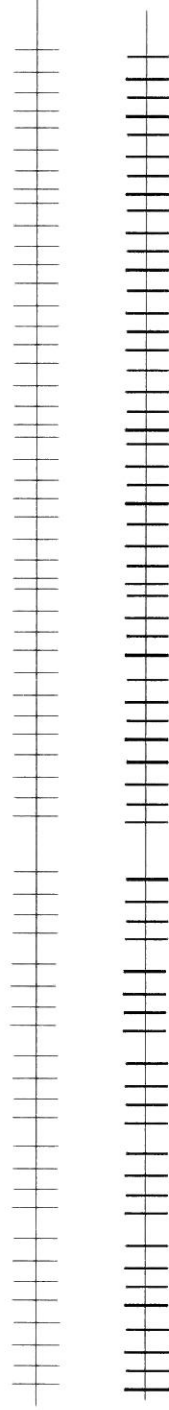
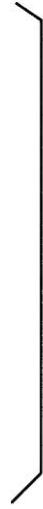


GRAIN SIZE DISTRIBUTION CURVE

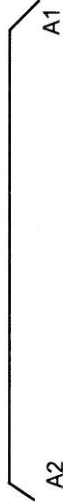


0024

SAHARANPUR →



← AMBALA



20.00 M

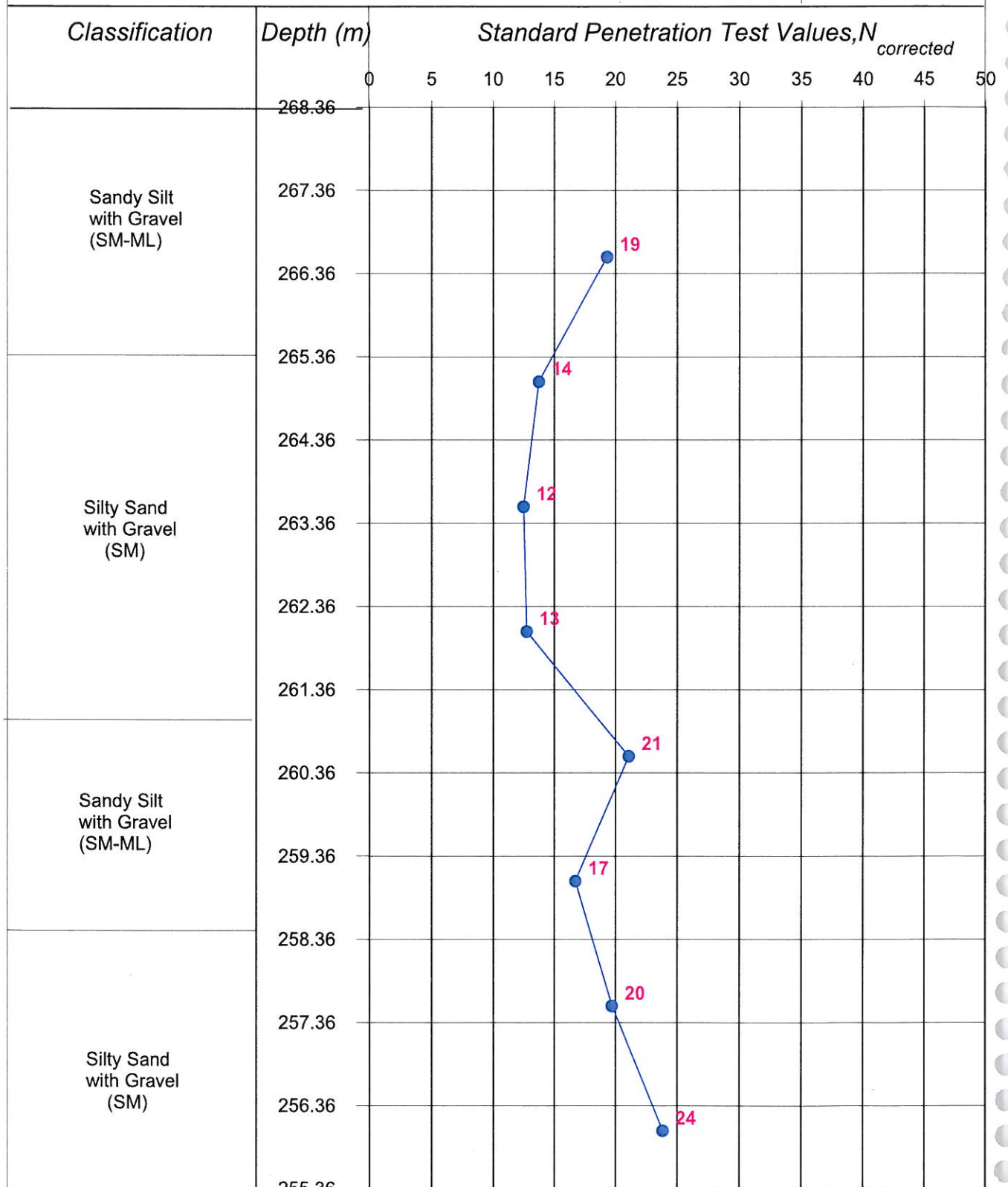
BH-1



Br 240 @ 195/17-19

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

Fig: Plan-V



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

BH-1

Fig: SP-V

0026

# BORE LOG

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

Location: 196/29-01  
BH No.: 1-A1  
Depth : 30.00m  
Depth of Water table :2.40 M

Date of start : 04/07/2008  
Date of finish : 06/07/2008



Project No. 1813 Bridge: 241 RL: 266.259

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot	Grain size (%)			Density (gm/cc)	W/C (%)	Limits (%)		Shear Parameters					
					Gravel	Sand	Silt/clay			r(wet)	r(dry)	L.L	P.L	Sp.Gr	Type of test	C(kg/sq.cm)	phi(degrees)
266.259				Observed													
264.459	1.80	SPT	Silty Sand with Gravel (SM)	4	66	33	1.47	24.66	Non Plastic	2.65							
263.759	2.50	UDS		6	70	30	1.18		Non Plastic								
262.959	3.30	SPT		5	81	17			Non Plastic								
261.459	4.80	SPT		8	81	19			Non Plastic								
259.959	6.30	SPT		12	63	37			Non Plastic								
258.459	7.80	SPT	Sandy Silt with Gravel (SM-ML)	23	87	12			Non Plastic								
256.959	9.30	SPT		23	84	16			Non Plastic								
255.459	10.80	SPT		26	44	56			Non Plastic								
253.959	12.30	SPT		31	7	91			Non Plastic								
252.459	13.80	SPT		18	4	95			Non Plastic								
250.959	15.30	SPT	Silty Sand with Gravel (SM)	20	7	91			Non Plastic								
249.459	16.80	SPT		30	48	52			Non Plastic								
247.959	18.30	SPT		54	75	25			Non Plastic								
246.459	19.80	SPT		31	53	46			Non Plastic								
244.959	21.30	SPT		41	54	46			Non Plastic								
243.459	22.80	SPT	Sandy Silt with Gravel (SM-ML)	48	16	84			Non Plastic								
241.959	24.30	SPT		51	53	47			Non Plastic								
240.459	25.80	SPT	Silty Sand with Gravel (SM)	49	53	47			Non Plastic								
238.959	27.30	SPT		54	43	55			Non Plastic								
237.459	28.80	SPT	Sandy Silt with Gravel (SM-ML)	62	4	95			Non Plastic								
235.959	30.30	SPT							Non Plastic								

# BORE LOG

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

**Location:** 196/29-01  
**BH No.:** 2-A2  
**Depth :** 30.00m  
**Depth of Water table :** 2.60 M

**Date of start :** 02/07/2008

**Date of finish :** 04/07/2008



**Project No. 1813**      **Bridge: 241**      **RL: 265.871**

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)		LL	P.L		Type of test	C(kg/sq.cm)	phi(degrees)		
265.871																		
264.071	1.80	SPT	Sandy Silt with Gravel (SM-ML)	7	1	50	49	1.53	1.25	22.86	Non Plastic		2.66	DST	0.15	18		
263.371	2.50	UDS		5	0	33	67					Non Plastic						
262.571	3.30	SPT		8	0	84	16					Non Plastic						
261.071	4.80	SPT	Silty Sand with Gravel (SM)	9	1	67	32				Non Plastic							
259.571	6.30	SPT		17	1	63	36					Non Plastic						
258.071	7.80	SPT		32	3	77	20					Non Plastic						
256.571	9.30	SPT	Sandy Silt with Gravel (SM-ML)	23	1	73	26				Non Plastic							
255.071	10.80	SPT		17	0	54	46					Non Plastic						
253.571	12.30	SPT		24	18	12	70				20.42	Non Plastic			DST	0.15	30	
252.071	13.80	UDS	Silty Sand with Gravel (SM)	21	2	4	94				Non Plastic							
251.371	14.50	SPT		22	0	89	11					Non Plastic						
250.571	15.30	SPT		27	0	57	43					Non Plastic						
249.071	16.80	SPT	Sandy Silt (SM-ML)	36	1	65	34				Non Plastic							
247.571	18.30	SPT		20	0	19	81					Non Plastic						
246.071	19.80	SPT		27	0	54	46					Non Plastic						
244.571	21.30	SPT	Silty Sand with Gravel (SM)	30	1	52	47				Non Plastic							
243.071	22.80	SPT		37	0	41	59					Non Plastic						
241.571	24.30	SPT		34	1	38	61					Non Plastic						
240.071	25.80	SPT	Sandy Silt with Gravel (SM-ML)	47	1	88	11				Non Plastic							
238.571	27.30	SPT		54	0	60	40					Non Plastic						
237.071	28.80	SPT			1	1	1					Non Plastic						
235.571	30.30	SPT			0						Non Plastic							

0028



SAHARANPUR →



← AMBALA



BH-2

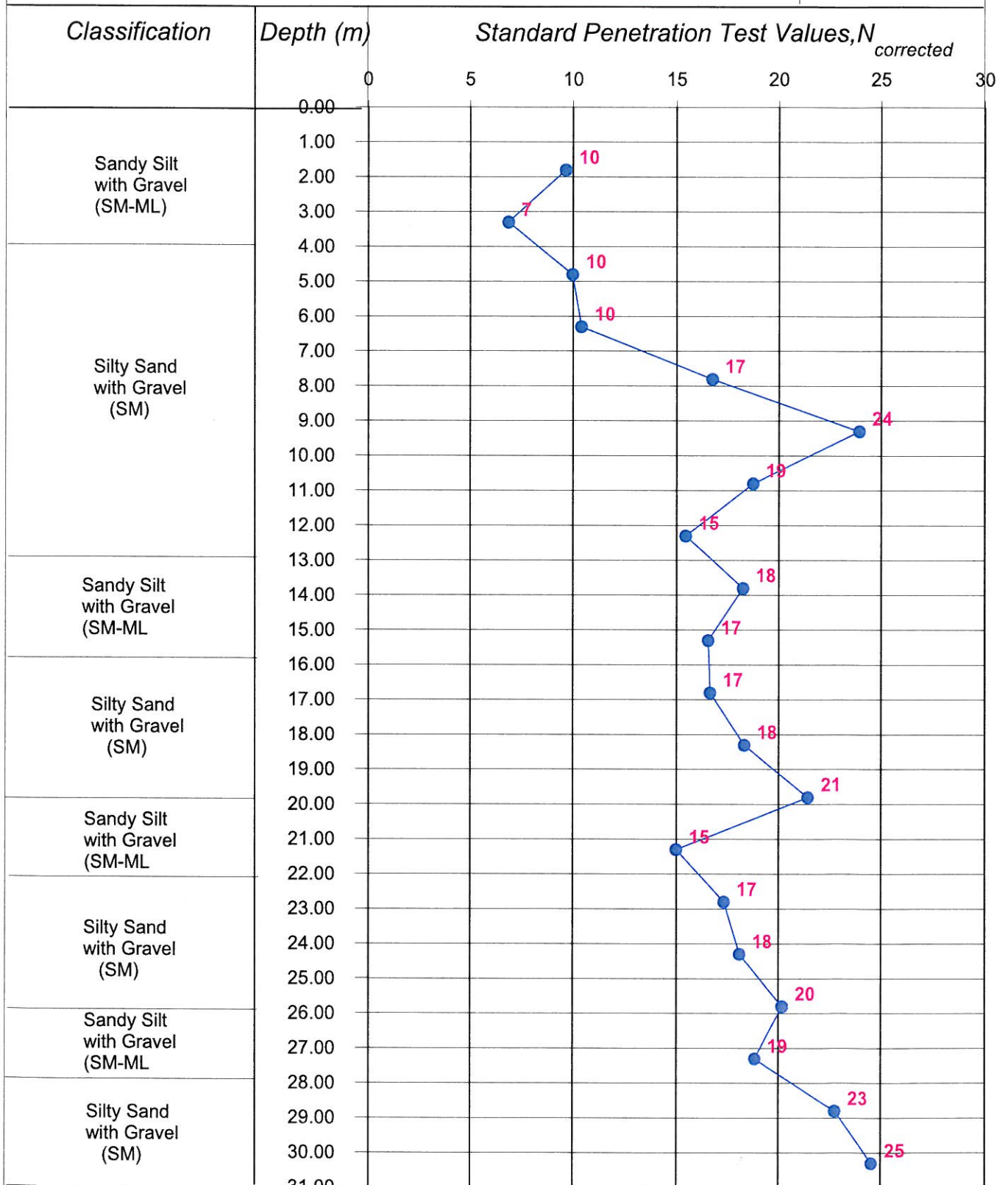
BH-1

Br 241 @ 196/29-01

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

Fig: Plan-X

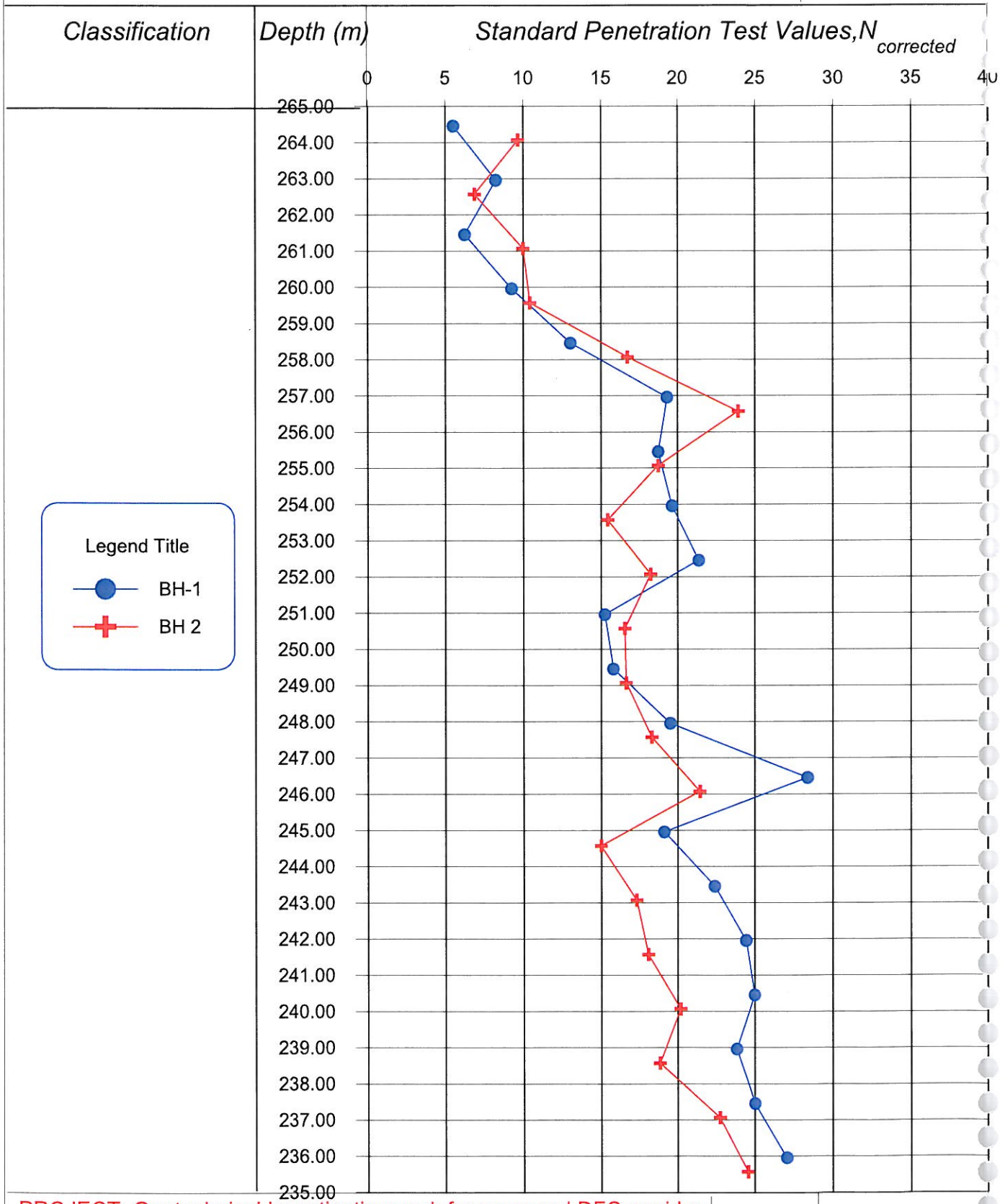




PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiana to Saharanpur

BH-2 Fig: SP-X2

0031



Legend Title  
 ● BH-1  
 + BH-2

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

BH 1 & 2

Fig: ASP-X

0032

# BORE LOG



Date of start : 04/07/2008

Date of finish : 06/07/2008

Location: 197/23-25

BH No.: 1-A1

Depth : 30.00m

Depth of Water table : 2.40 M

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

Project No. 1813 Bridge: 242 RL: 265.969

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot Observed	Grain size (%)			Density (gm/cc)		W/C (%)	Limits (%)		Shear Parameters			Cc	
					Gravel	Sand	Silt/clay	r(wet)	r(dry)		L.L	P.L	Sp.Gr	Type of test	C(kg/sq.cm)		phi(degrees)
265.969					2	61	37	1.68	1.38	21.72	Non Plastic	Non Plastic	2.69	DST		24	
264.169	1.80	SPT	Silty Sand with Gravel (SM)	7	1	67	32										
263.469	2.50	UDS			7												
262.669	3.30	SPT			10	3	78	19									
261.169	4.80	SPT	Silty Sand with Gravel (SM)	13	1	78	21										
259.669	6.30	SPT			26	1	60	39									
258.169	7.80	SPT	Sandy Silt with Gravel (SM-ML)	36	2	84	14										
256.669	9.30	SPT			41	1	18	81									
255.169	10.80	SPT	Silty Sand with Gravel (SM)	42	1	41	58										
253.669	12.30	SPT			37	3	4	93									
252.169	13.80	SPT	Sandy Silt with Gravel (SM-ML)	46	2	1	97										
250.669	15.30	SPT			50	3	4	93									
249.169	16.80	SPT	Silty Sand with Gravel (SM)	31	1	45	54										
247.669	18.30	SPT			34	1	72	27									
246.169	19.80	SPT	Sandy Silt with Gravel (SM-ML)	23	2	50	48										
244.669	21.30	SPT			29	1	51	48									
243.169	22.80	SPT	Silty Sand with Gravel (SM)	44	1	13	86										
241.669	24.30	SPT			18	1	27	72									
240.169	25.80	SPT	Sandy Silt with Gravel (SM-ML)	33	1	38	61										
238.669	27.30	SPT			38	3	40	57									
237.169	28.80	SPT	Silty Sand with Gravel (SM)	50	2	1	97										
235.669	30.30	SPT															

0033

# BORE LOG



Date of start : 27/01/2009  
Date of finish : 30/01/2009

Location: 197/23-25  
BH No.: 2  
Depth : 30.00m  
Depth of Water table : 1.30 m

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

Project No. 1813 Bridge: 242 RL: 264.412

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot	Grain size (%)			Density (gm/cc)	W/C (%)	Limits (%)		Shear Parameters			Cc
					Gravel	Sand	Silt/clay			r(wet)	r(dry)	L.L.	P.L.	Sp.Gr	
264.412			Filledup Soil	Observed											
261.112	3.30	SPT	Silty Sand with Gravel (SM)	4	2	55	43			Non Plastic					
259.612	4.80	SPT	Silty Sand with Gravel (SM)	6	0	59	41			Non Plastic					
258.112	6.30	SPT	Sandy Silt with Gravel (SM-ML)	12	1	46	53			Non Plastic					
256.612	7.80	SPT	Sandy Silt with Gravel (SM-ML)	16	0	36	64			Non Plastic					
255.112	9.30	SPT	Sandy Silt with Gravel (SM-ML)	24	0	45	55			Non Plastic					
253.612	10.80	SPT	Sandy Silt with Gravel (SM-ML)	28	1	34	65			Non Plastic					
252.112	12.30	SPT	Silty Sand with Gravel (SM)	34	1	58	41			Non Plastic					
250.612	13.80	SPT	Silty Sand with Gravel (SM)	36	0	62	38			Non Plastic					
249.112	15.30	SPT	Silty Sand with Gravel (SM)	34	1	34	65			Non Plastic					
247.612	16.80	SPT	Silty Sand with Gravel (SM)	42	1	28	71			Non Plastic					
246.112	18.30	SPT	Silty Sand with Gravel (SM)	42	0	35	65			Non Plastic					
244.612	19.80	SPT	Sandy Silt with Gravel (SM-ML)	60	1	28	71			Non Plastic					
243.112	21.30	SPT	Sandy Silt with Gravel (SM-ML)	44	2	4	94			Non Plastic					
241.612	22.80	SPT	Sandy Silt with Gravel (SM-ML)	34	0	36	64			Non Plastic					
240.112	24.30	SPT	Silty Sand with Gravel (SM)	47	0	59	41			Non Plastic					
238.612	25.80	SPT	Silty Sand with Gravel (SM)	50	1	80	19			Non Plastic					
237.112	27.30	SPT	Sandy Silt with Gravel (SM-ML)	24	0	33	67			Non Plastic					
235.612	28.80	SPT	Sandy Silt with Gravel (SM-ML)	28	0	29	71			Non Plastic					
234.112	30.30	SPT	Sandy Silt with Gravel (SM-ML)	34	0	25	64			Non Plastic					

0001 0031

# BORE LOG



Date of start : 24/01/2009  
Date of finish : 26/01/2009

Location: 197/23-25  
BH No.: 3  
Depth : 30.00m  
Depth of Water table : 1.00 m

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

Project No. 1813 Bridge: 242 RL: 264.816

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot Observed	Grain size (%)			Density (gm/cc)		W/C (%)	Limits (%)		Shear Parameters				
					Gravel	Sand	Silt/clay	r(wet)	r(dry)		L.L	P.L	Sp.Gr	Type of test	C(kg/sq.cm)	phi(degrees)	Cc
264.816			Filledup Soil														
262.316	2.50	UDS		2	0	72	28	1.43	1.18	20.78	Non Plastic		2.68	DST		23	
261.516	3.30	SPT		2													
260.016	4.80	SPT		5	2	83	15				Non Plastic						
258.516	6.30	SPT	Silty Sand with Gravel (SM)	8	0	83	17				Non Plastic						
257.016	7.80	SPT		19	0	65	35				Non Plastic						
255.516	9.30	SPT		28	1	78	21				Non Plastic						
254.016	10.80	SPT		34	0	39	61				Non Plastic						
252.516	12.30	SPT	Sandy Silt with Gravel (SM-ML)	43	0	26	74				Non Plastic						
251.016	13.80	SPT		43	2	6	92				Non Plastic						
249.516	15.30	SPT		47	1	58	41				Non Plastic						
248.016	16.80	SPT		53	2	67	31				Non Plastic						
246.516	18.30	SPT	Silty Sand with Gravel (SM)	55	0	75	25				Non Plastic						
245.016	19.80	SPT		36	0	75	25				Non Plastic						
243.516	21.30	SPT		33	1	35	64				Non Plastic						
242.016	22.80	SPT		31	0	36	64				Non Plastic						
240.516	24.30	SPT	Sandy Silt with Gravel (SM-ML)	41	0	48	52				Non Plastic						
239.016	25.80	SPT		33	0	25	75				Non Plastic						
237.516	27.30	SPT	Silty Sand with Gravel (SM)	30	0	53	47				Non Plastic						
236.016	28.80	SPT		41	2	57	41				Non Plastic						
234.516	30.30	SPT	Sandy Silt with Gravel (SM-ML)	69	1	4	95				Non Plastic						

0035

# BORE LOG



Date of start : 24/01/2009  
Date of finish : 27/01/2009

Location: 197/23-25  
BH No.: 4  
Depth : 30.00m  
Depth of Water table : 1.20 m

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

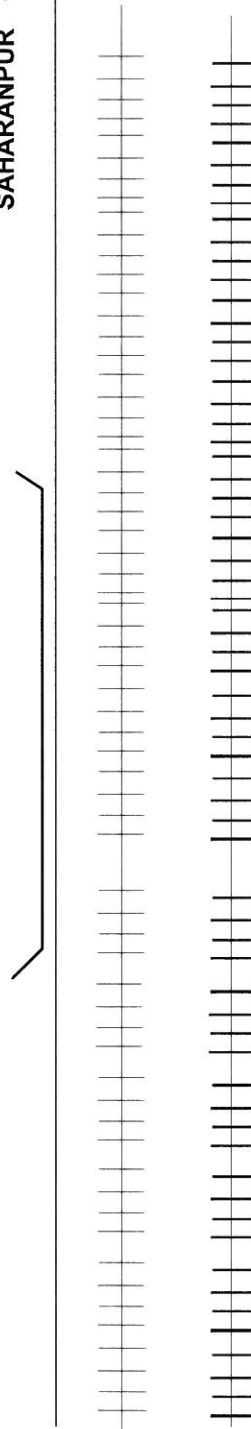
Project No. 1813 Bridge: 242 RL: 265.012

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)		P.L	L.L		Type of test	C(kg/sq.cm)	phi(degrees)	
265.012					0	66	34	1.85	1.50	23.18	Non Plastic	Non Plastic	2.69	DST	31		
263.212	1.80	SPT	Silty Sand with Gravel (SM)	17													
262.512	2.50	UDS		18													
261.712	3.30	SPT		15													
260.212	4.80	SPT		13													
258.712	6.30	SPT		17													
257.212	7.80	SPT	Sandy Silt with Gravel (SM-ML)	18													
255.712	9.30	SPT		25													
254.212	10.80	SPT		36													
252.712	12.30	SPT		39													
251.212	13.80	SPT		42													
249.712	15.30	SPT	Silty Sand with Gravel (SM)	54													
248.212	16.80	SPT		49													
246.712	18.30	SPT		58													
245.212	19.80	SPT		62													
243.712	21.30	SPT	Sandy Silt with Gravel (SM-ML)	43													
242.212	22.80	SPT		52													
240.712	24.30	SPT		48													
239.212	25.80	SPT		55													
237.712	27.30	SPT		60													
236.212	28.80	SPT		75													
234.712	30.30	SPT															

0036



SAHARANPUR →

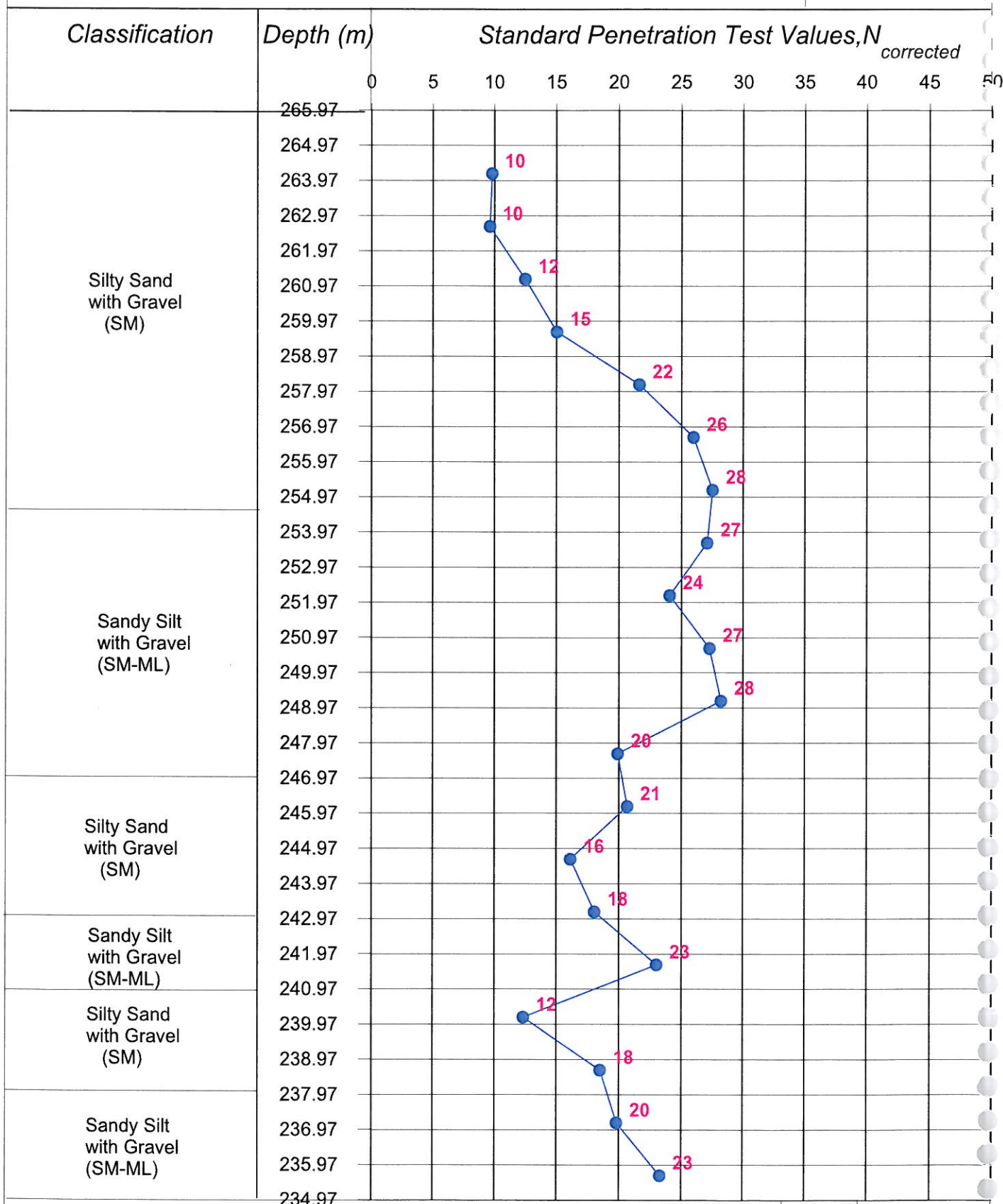


← AMBALA

Br 242 @ 197/23-25

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

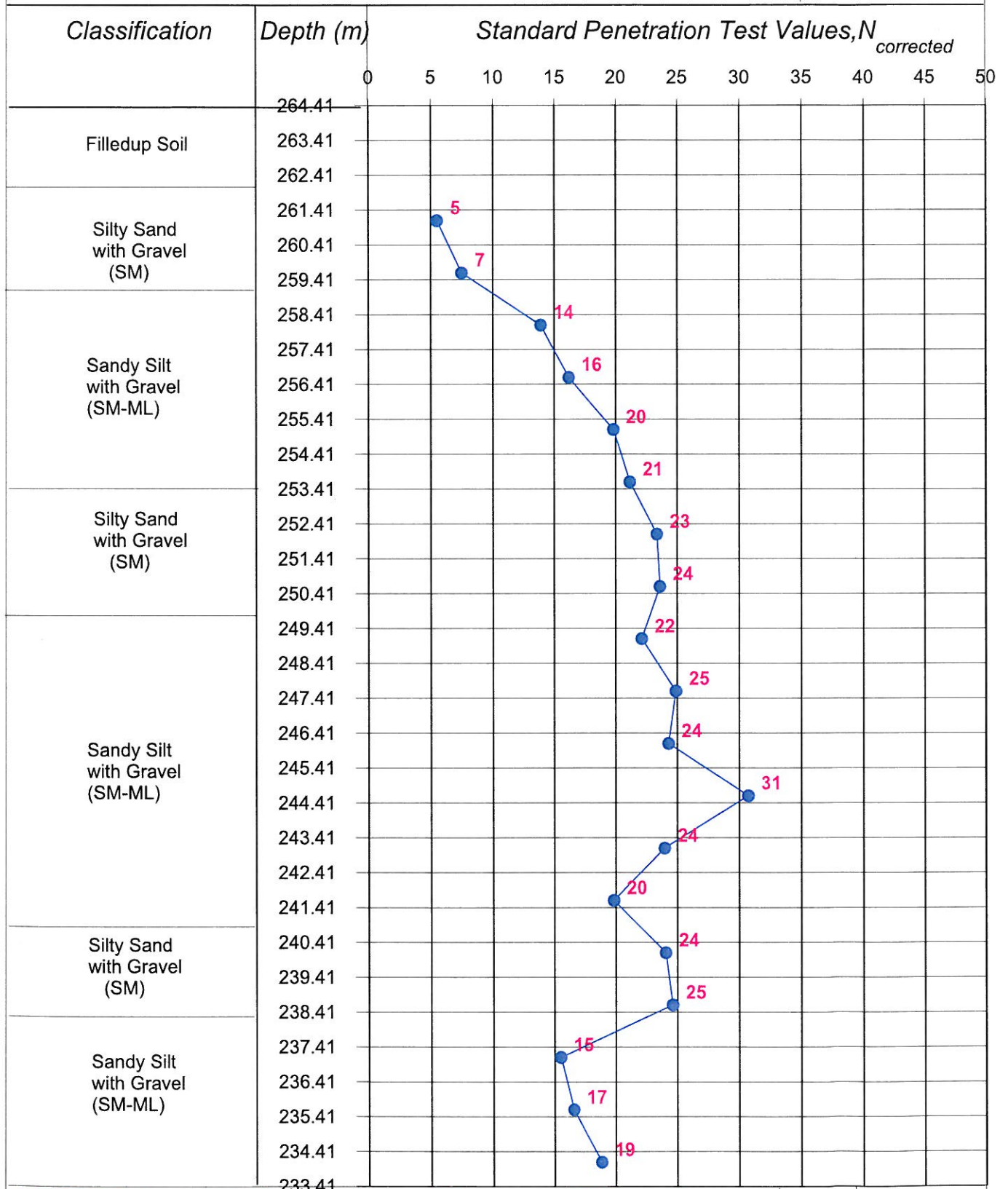
Fig: Plan-Z



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

BH-1

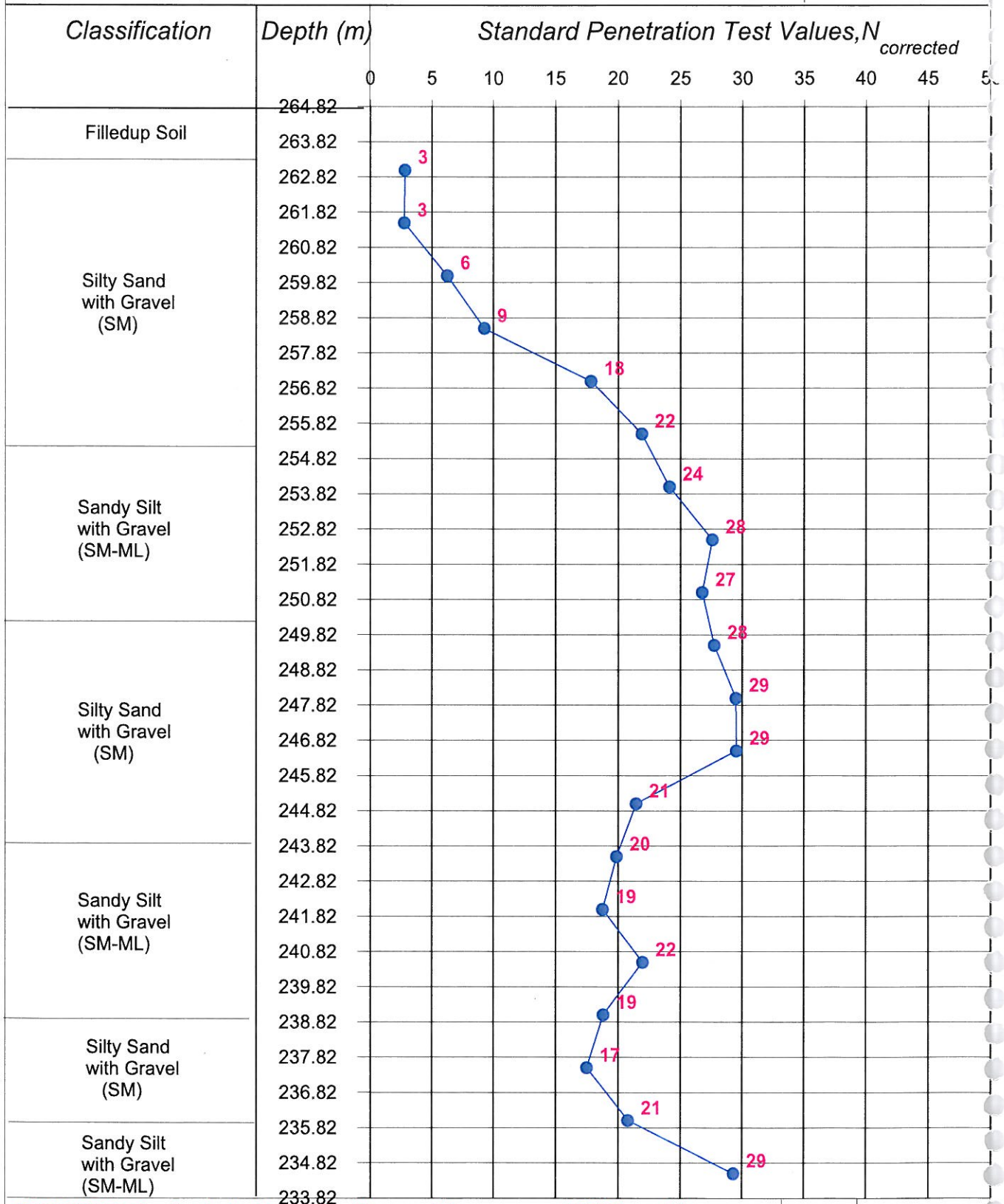
Fig: SP- Z1



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

BH-2

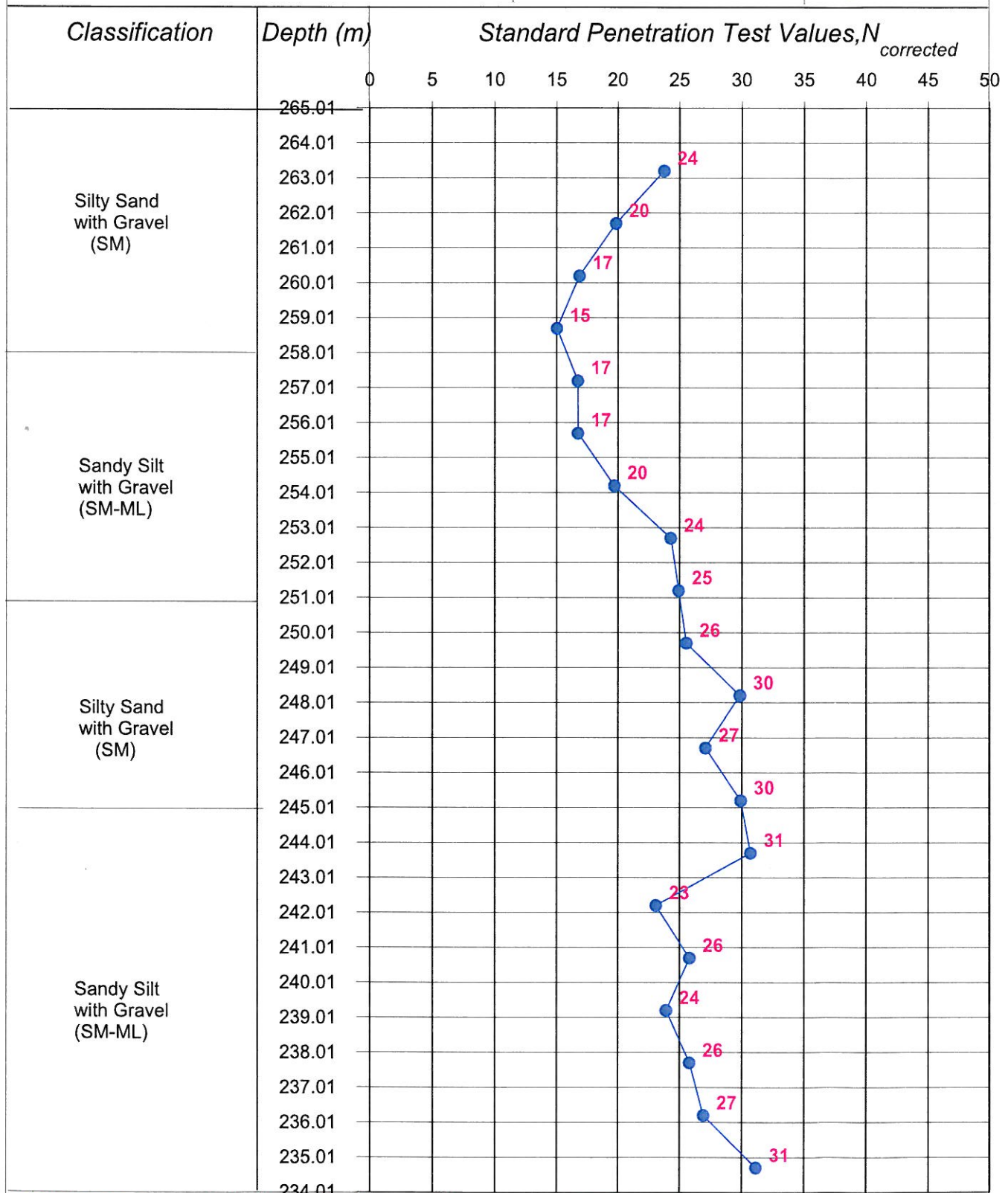
Fig: SP- Z2



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

BH- 3

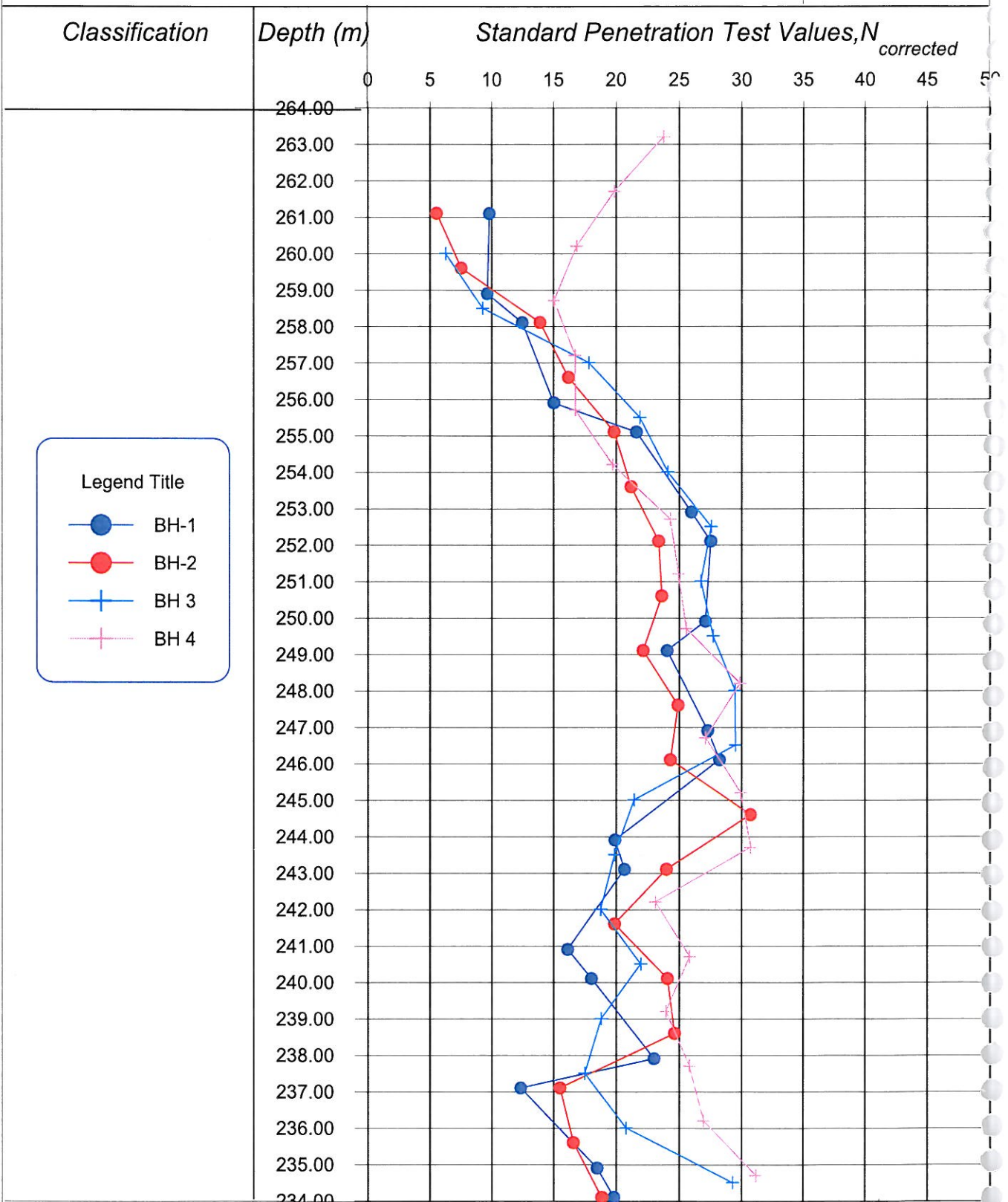
Fig: SP- Z3



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

BH- 4

Fig: SP- Z4



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

BH 1 TO 4

Fig: ASP-

# BORE LOG

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

**Location:** 198/21-23  
**BH No.:** 1  
**Depth :** 12.00  
**Depth of Water table :** 4.50 m



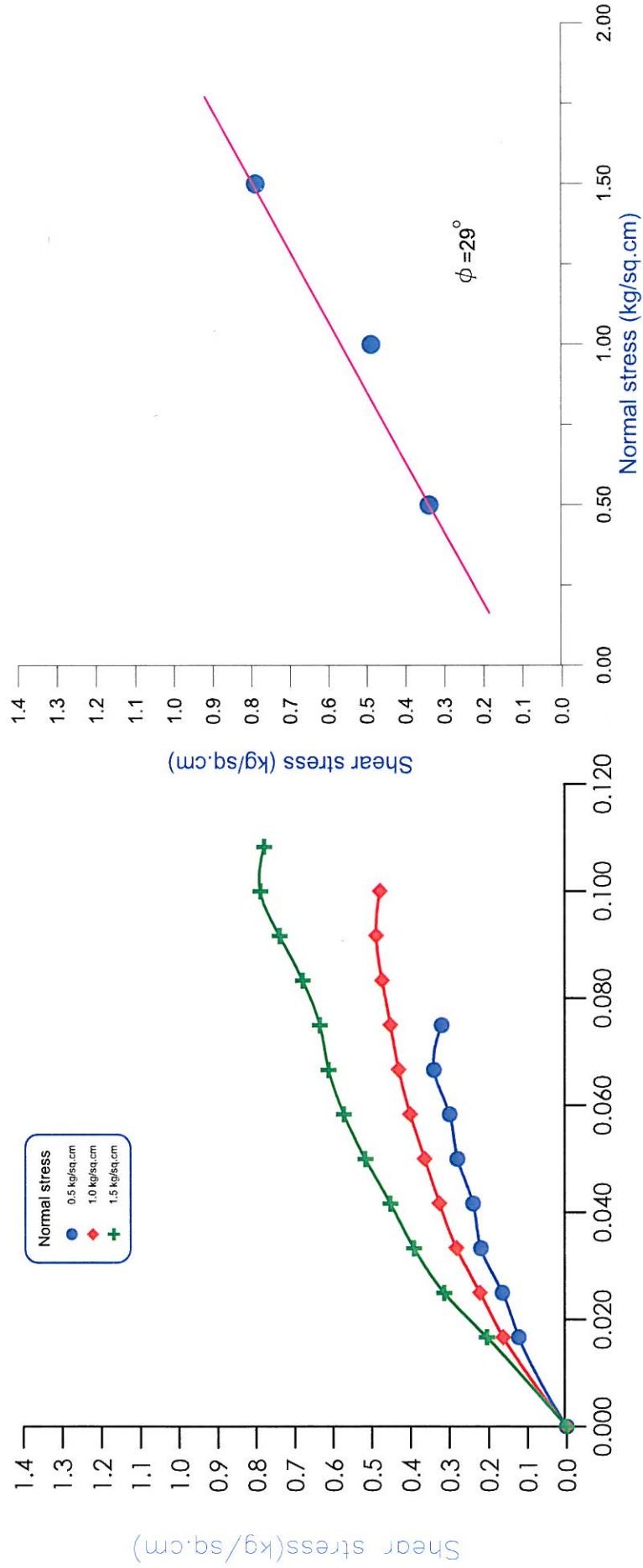
**Date of start :** 01/07/2008  
**Date of finish :** 02/07/2008

**Project No.:** 1813    **Bridge :** 243    **RL:** 265.862

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot			Grain size (%)		Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Observed	Gravel	Sand	Silt/clay	r(wet)	r(dry)	L.L		P.L	Type of test		C(kg/sq.cm)	phi(degrees)		
265.862																		
264.062	1.80	SPT		10	0	27	73	1.76	1.48	19.20	Non Plastic			2.66	DST	0.1	29	
263.362	2.50	UDS	Sandy Silt with Gravel (SM-ML)	9	0	25	75				Non Plastic							
262.562	3.30	SPT		8	1	13	86				Non Plastic							
261.062	4.80	SPT		8	0	71	29				Non Plastic							
259.562	6.30	SPT	Silty Sand (SM)	10	1	30	69				Non Plastic							
258.062	7.80	SPT	Sandy Silt with Gravel (SM-ML)	12	1	60	39				Non Plastic							
256.562	9.30	SPT		14	1	76	23				Non Plastic							
255.062	10.80	SPT	Silty Sand with gravel (SM)	22	1	78	21				Non Plastic							
253.562	12.30	SPT			1						Non Plastic							

0043

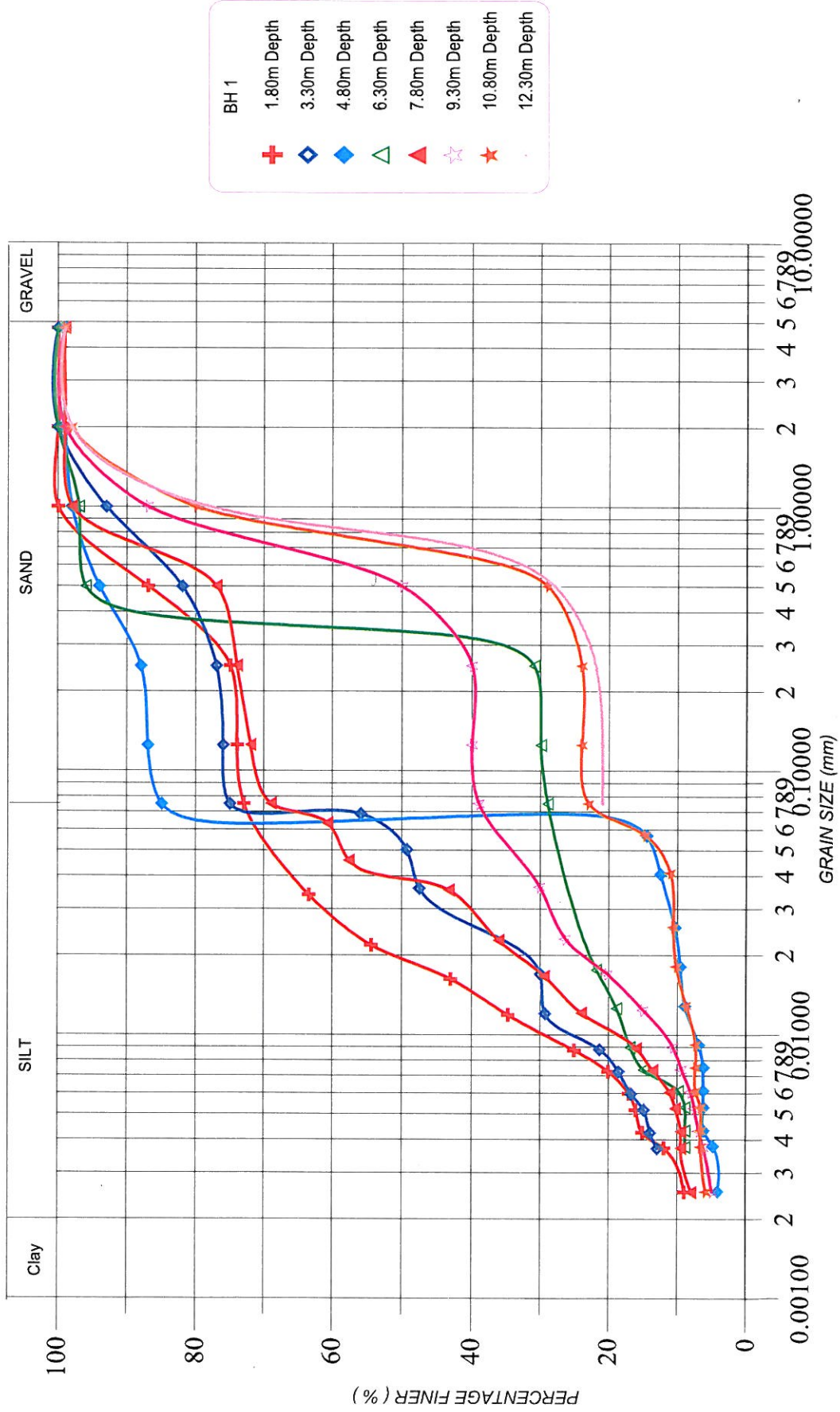
BH-1  
DEPTH = 2.50 m



0044



GRAIN SIZE DISTRIBUTION CURVE



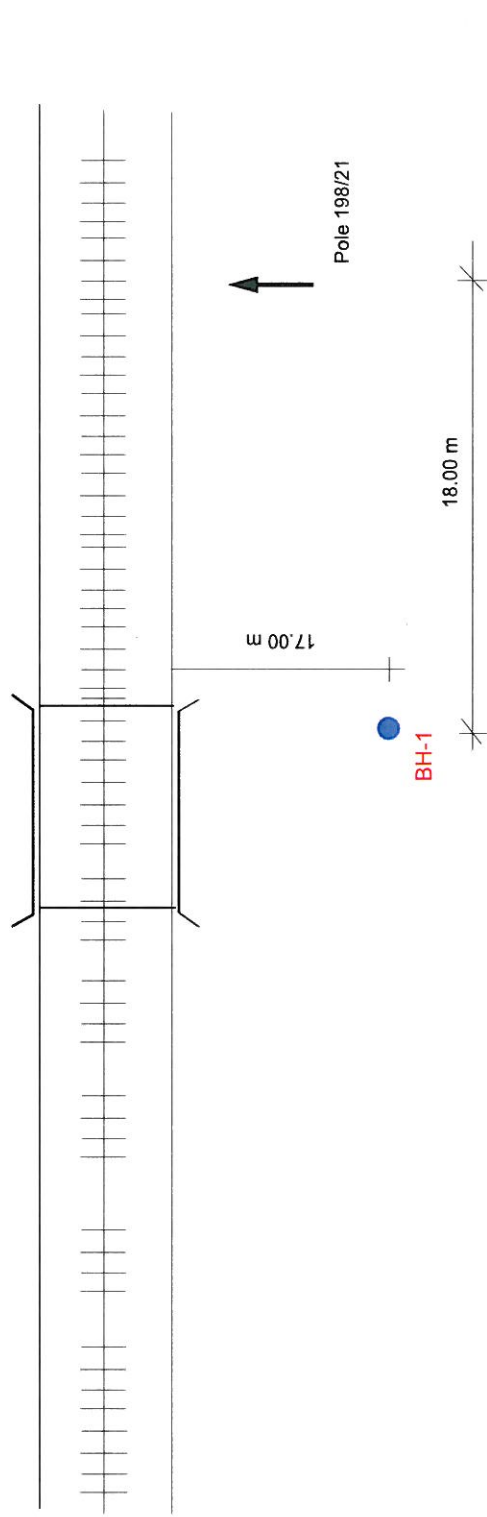
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiana to Saharanpur

Fig : GSD-AA

0045

SAHARANPUR ←

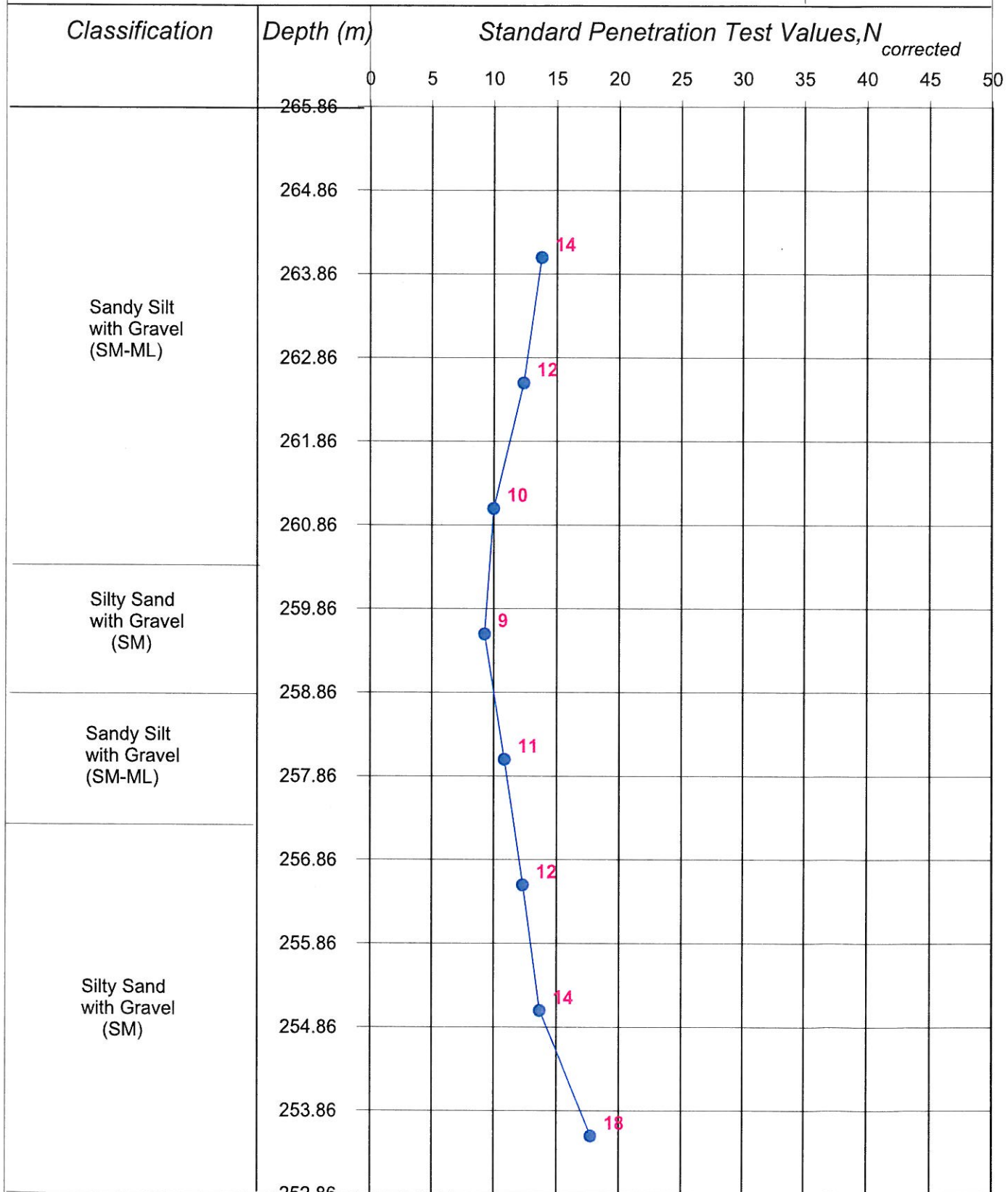
→ MERRUT



BRIDGE 243 @ 198/21-23

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

Fig: Plan-AA



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

BH-1

Fig: SP-AA

# BORE LOG

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

**Location:** 200/1-3  
**BH No.:** 1  
**Depth :** 12.00  
**Depth of Water table :** 4.0 m

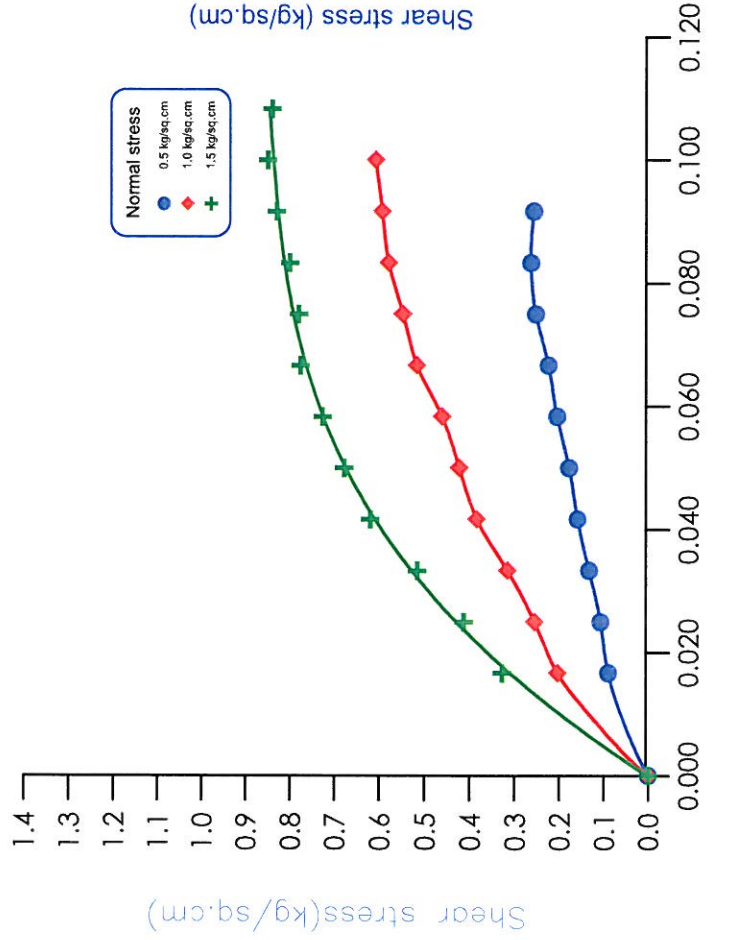
**Date of start :** 22/06/2008  
**Date of finish :** 22/06/2008



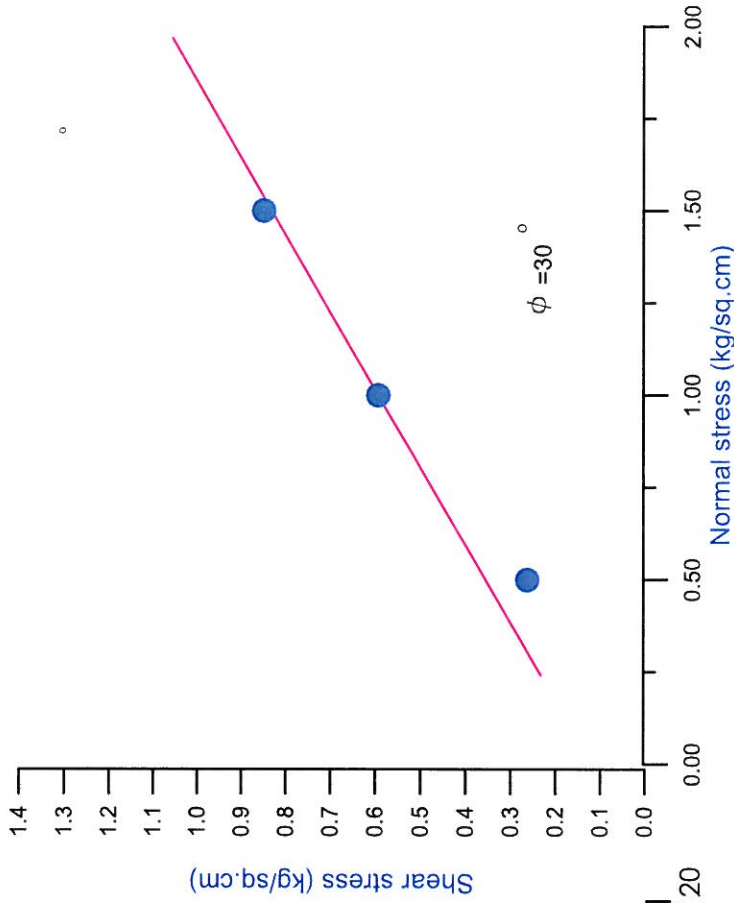
**Project No.** 1813      **Bridge :** 244      **RL:** 268.311

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot			Grain size (%)		Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Observed	Gravel	Sand	Silt/clay	r(wet)	r(dry)	L.L.		P.L.	Type of test		C(kg/sq.cm)	phi(degrees)		
268.311	0.50	DS		0														
267.811																		
266.511	1.80	SPT	Sandy Silt with Gravel (SM-ML)	9	2	9	89											
265.811	2.50	UDS																
265.011	3.30	SPT		14	2	9	89	1.8	1.50	19.82				2.66	DST	0.1	30	
263.511	4.80	SPT		13	1	94	5											
262.011	6.30	SPT		12	5	93	2											
260.511	7.80	SPT		17	4	74	22											
259.011	9.30	SPT	Silty Sand with Gravel (SM)	15	3	88	9											
257.511	10.80	SPT			15	1	89	10										
256.011	12.30	SPT		14	2	89	9											

BH-1  
Depth-2.50m



(Shear stress - shear strain relationship)

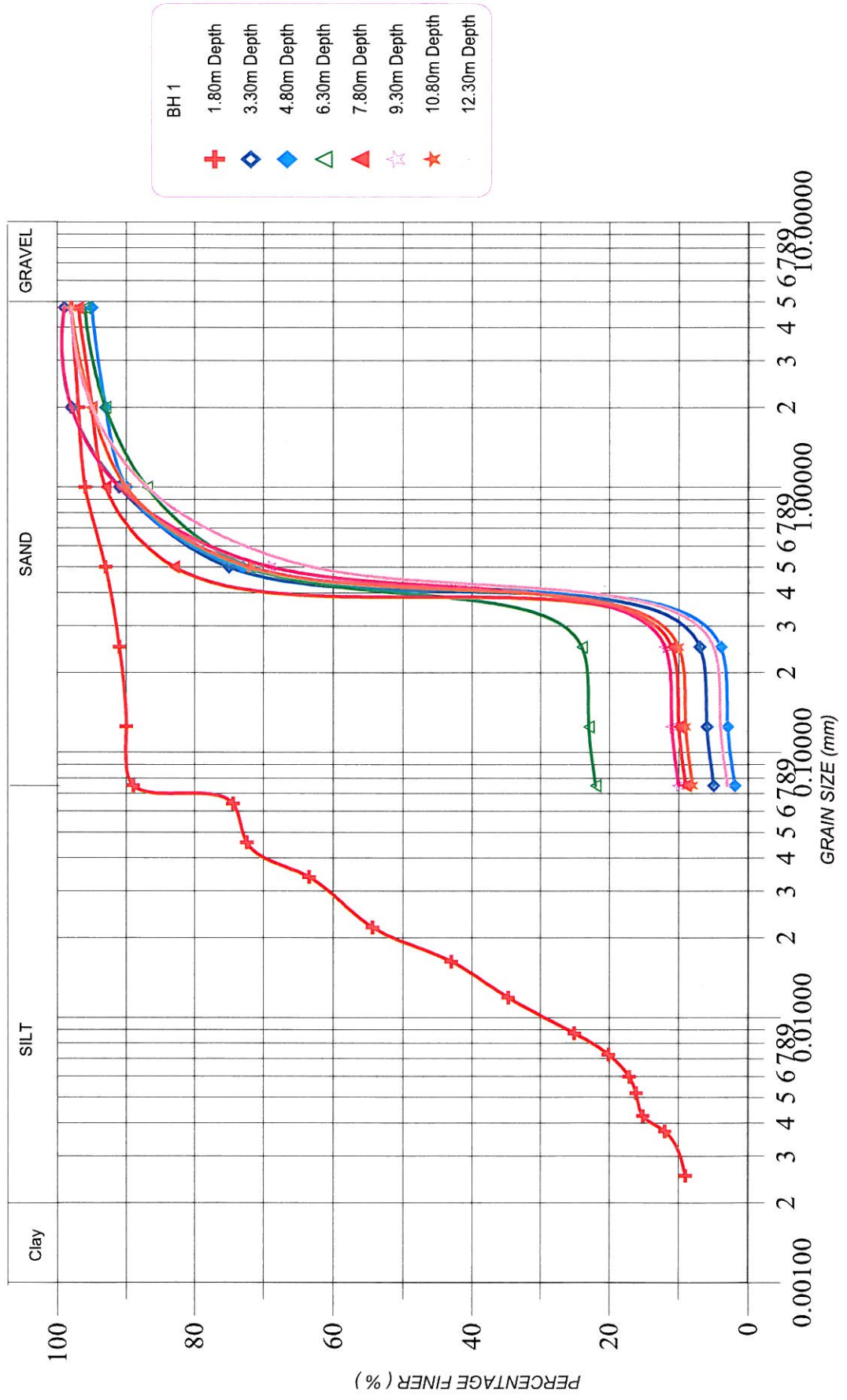


(Shear stress - Normal stress relationship)

0049

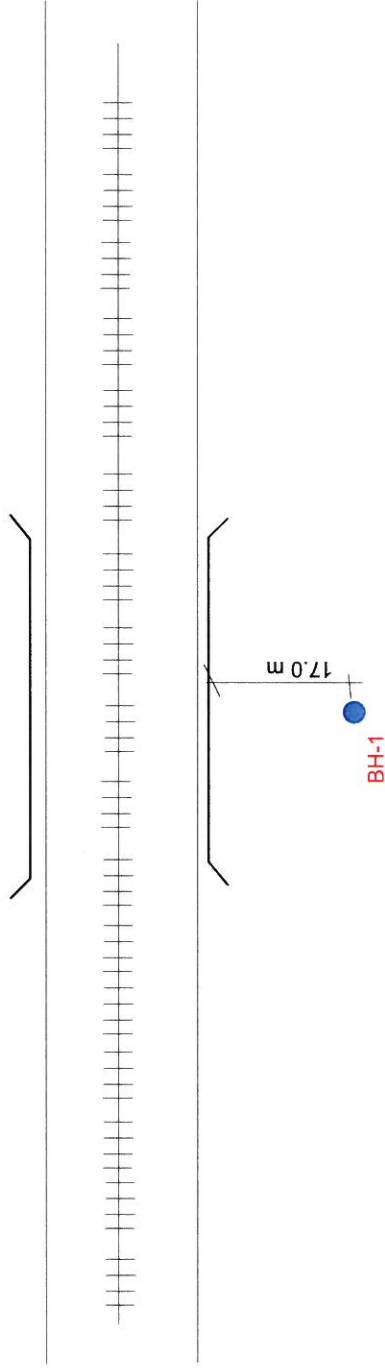
0050

GRAIN SIZE DISTRIBUTION CURVE



← AMBALA

SAHARANPUR →



BR 244@ 200/1-3

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

Fig: Plan-AC

0000 0051





# BORE LOG

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

**Location:** 204/31-32, A2  
**BH No.:** 1  
**Depth :** 12.00

**Project No.** 1813    **Bridge :** 246    **RL:** 267.222    **Rebore near** Abutment A2    **Depth of Water table :** Not Met

**Date of start :** 15/07/2008

**Date of finish :** 15/07/2008



Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot			Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Observed	Gravel	Sand	Silt/clay	r(wet)		r(dry)	L.L		P.L	Type of test	C(kg/sq.cm)	
267.222				0												
266.722	0.50	DS	Sandy Silt with Gravel (SM-ML)	7	1	9	90				Non Plastic					
265.422	1.80	SPT	Sandy Silt with Gravel (SM-ML)	3	17	9	74				Non Plastic					
264.722	2.50	UDS	Silty Clay of medium plasticity (CI)					1.69	1.50	12.86						
263.922	3.30	SPT	Silty Clay of medium plasticity (CI)		1	9	90				36	19				0.081
262.422	4.80	SPT	Sandy Silt with Gravel (SM-ML)	7	1	7	92				Non Plastic					
260.922	6.30	SPT	Sandy Silt with Gravel (SM-ML)	19	2	79	19				Non Plastic					
259.422	7.80	SPT	Sandy Silt with Gravel (SM-ML)	18	2	80	18				Non Plastic					
257.922	9.30	SPT	Silty Sand with Gravel (SM)	19	1	90	9				Non Plastic					
256.422	10.80	SPT	Silty Sand with Gravel (SM)	22	10	78	12				Non Plastic					
254.922	12.30	SPT	Silty Sand with Gravel (SM)	22	5	92	3				Non Plastic					

3500

# BORE LOG

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

Location: 204/31-33  
BH No.: 1  
Depth : 12.00  
Depth of Water table : 3.50 m

Date of start : 19/06/2008  
Date of finish : 20/06/2008

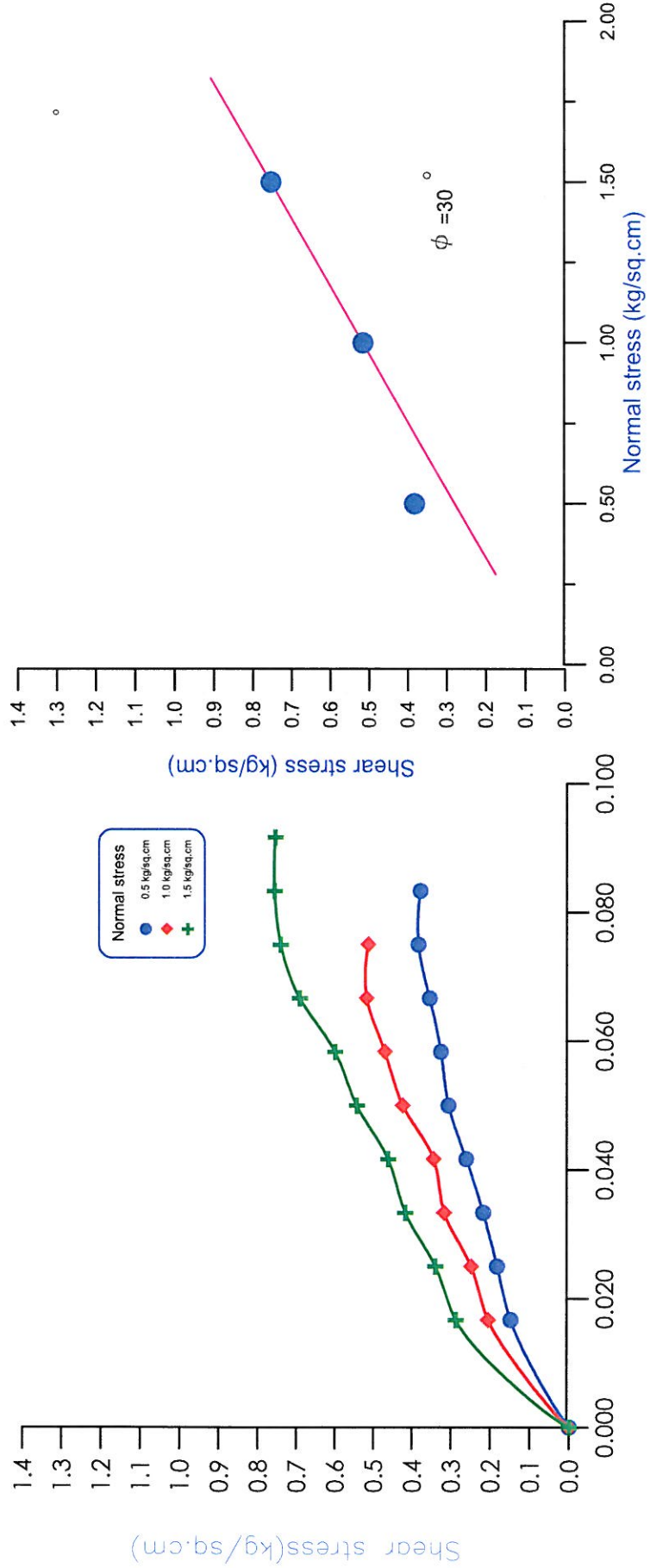


Project No. 1813 Bridge : 246 RL: 267.222

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot		Grain size (%)			Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc	
				Observed	Corrected	Gravel	Sand	Silt/clay	r(wet)	r(dry)		L.L	P.L		Type of test	C(kg/sq.cm)	phi(degrees)		
267.222																			
265.422	1.80	SPT	Sandy Silt with Gravel (SM-ML)	13		1	42	57				Non Plastic							
264.722	2.50	UDS								1.8	1.53	17.28			2.66				30
263.922	3.30	SPT		13		0	81	19				Non Plastic							
262.422	4.80	SPT		14		0	58	42				Non Plastic							
260.922	6.30	SPT		15		12	84	4				Non Plastic							
259.422	7.80	SPT	Silty Sand with Gravel (SM)	17		2	75	23				Non Plastic							
257.922	9.30	SPT			16		3	83	14				Non Plastic						
256.422	10.80	SPT		32		10	88	2				Non Plastic							
254.922	12.30	SPT		32		9	80	11				Non Plastic							

005A

BH-11  
Depth-14.50m

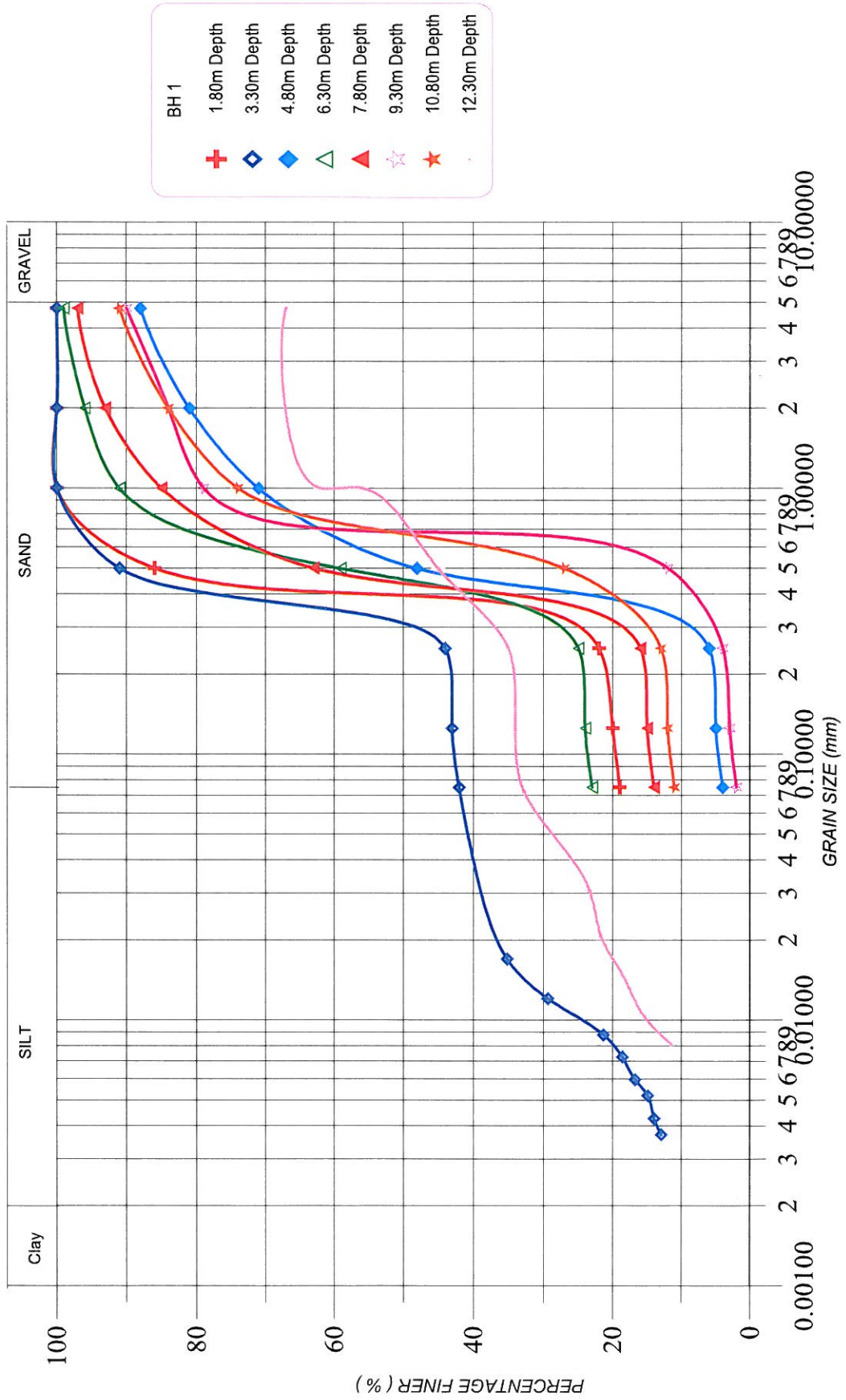


PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiana to Saharanpur

FIG- DS-AG

10055

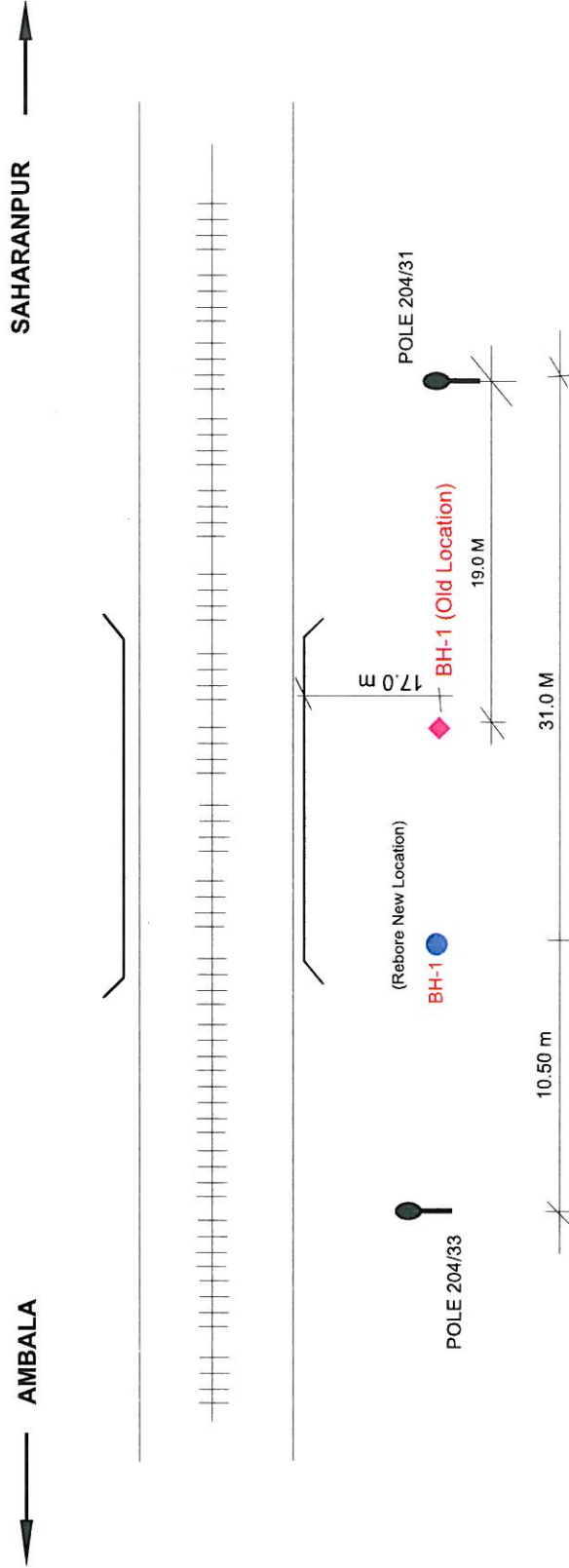
GRAIN SIZE DISTRIBUTION CURVE



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

Fig : GSD-AG

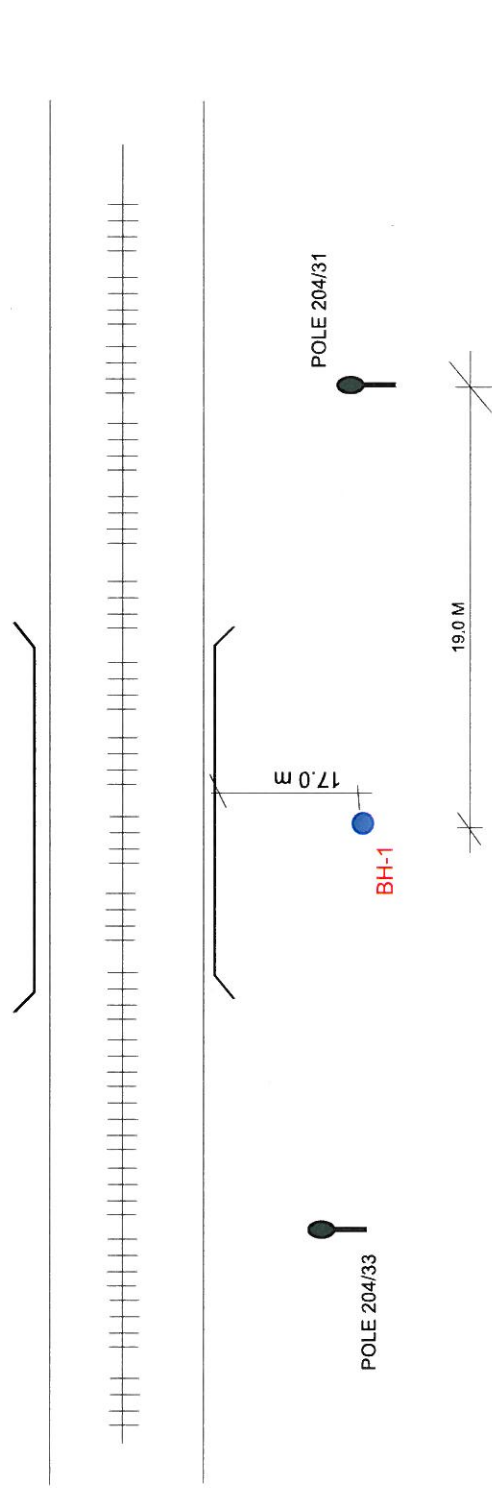
0056



BR 246@ 204/31-33

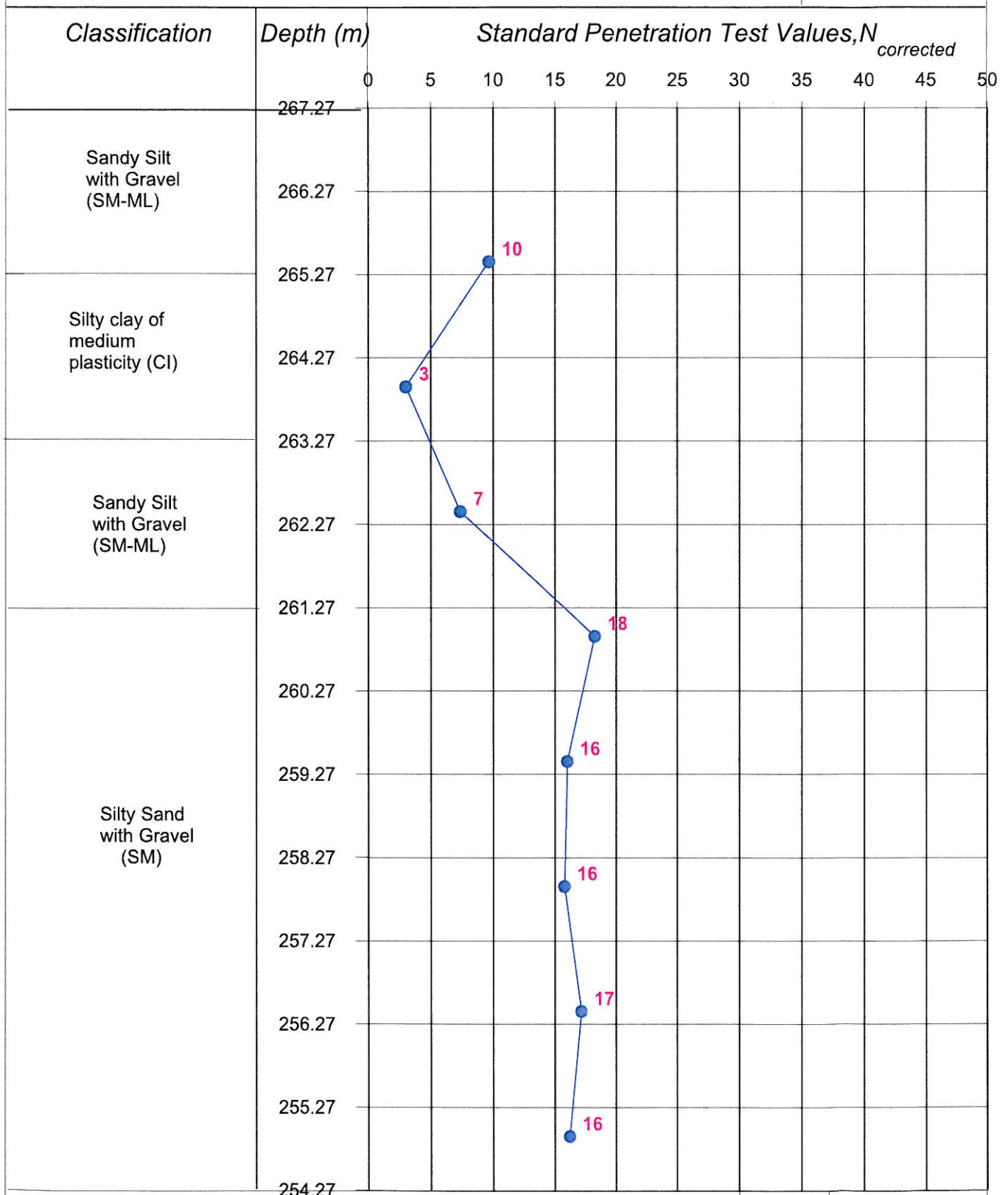
← AMBALA

SAHARANPUR →



BR 246@ 204/31-33

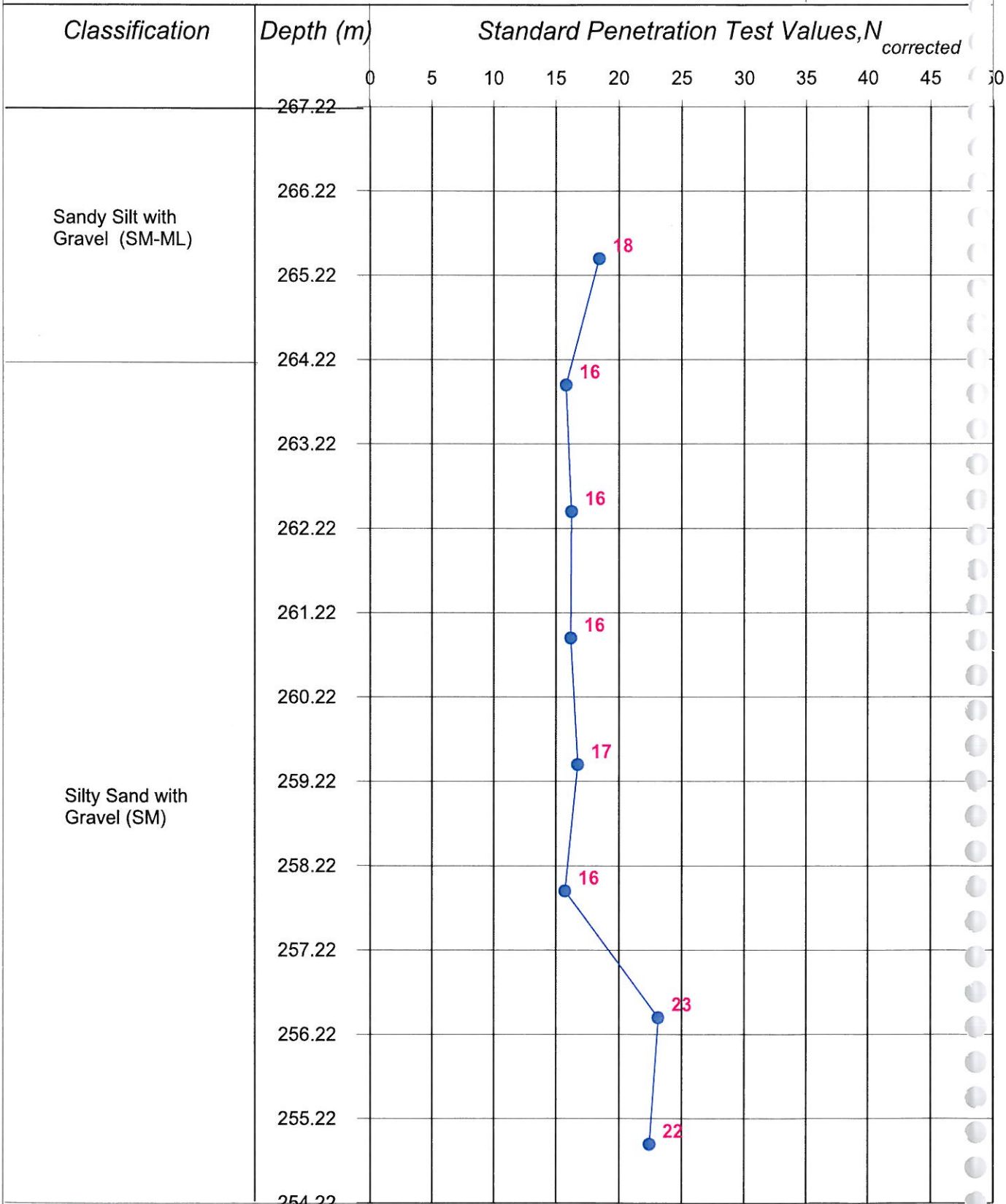
0058



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

BH-1

Fig: SP- AG



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

BH-1 Fig: SP- AC



# BORE LOG



Date of start : 20/06/2008  
Date of finish : 20/06/2008

Location: 207/3-5  
BH No.: 1  
Depth : 12.00  
Depth of Water table : 4.20 m

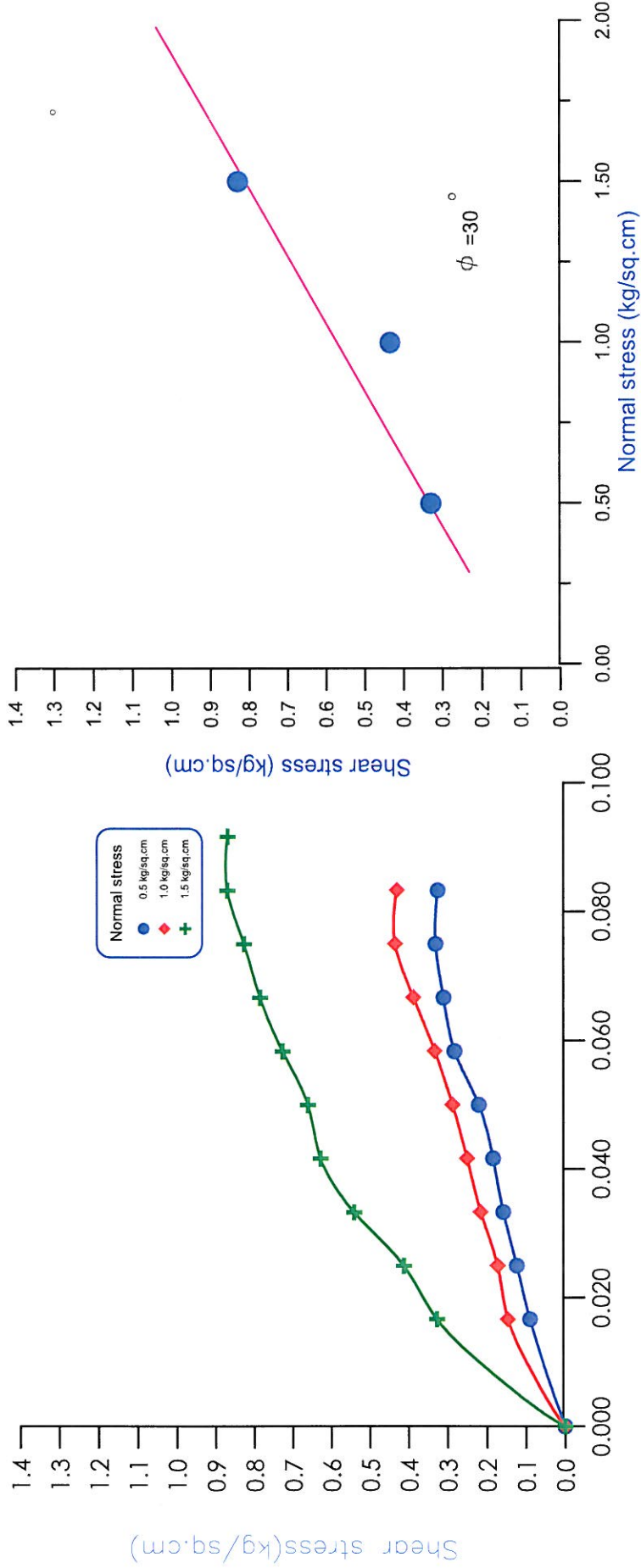
PROJECT: Geotechnical Investigation work for proposed DFC corridor  
from Ludhiana to Saharanpur

Project No. 1813 Bridge : 247 RL: 267.235

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot			Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Observed	Gravel	Sand	Silt/clay	r(wet)		r(dry)	L.L.		P.L.	Type of test	C(kg/sq.cm)	
267.235				0												
265.435	1.80	SPT		10	3	66	31			Non Plastic						
264.735	2.50	UDS		8				18.87								
263.935	3.30	SPT		11	1	68	31			Non Plastic						
262.435	4.80	SPT		15	3	80	17			Non Plastic						
260.935	6.30	SPT	Silty Sand with Gravel (SM)	15	10	63	27			Non Plastic						
259.435	7.80	SPT		15	10	67	23			Non Plastic						
257.935	9.30	SPT		16	0	67	33			Non Plastic						
256.435	10.80	SPT		19	1	82	17			Non Plastic						
254.935	12.30	SPT		23	1	88	11			Non Plastic						

0000 0061

BH-1  
Depth-2.50m



(Shear stress - Normal stress relationship)

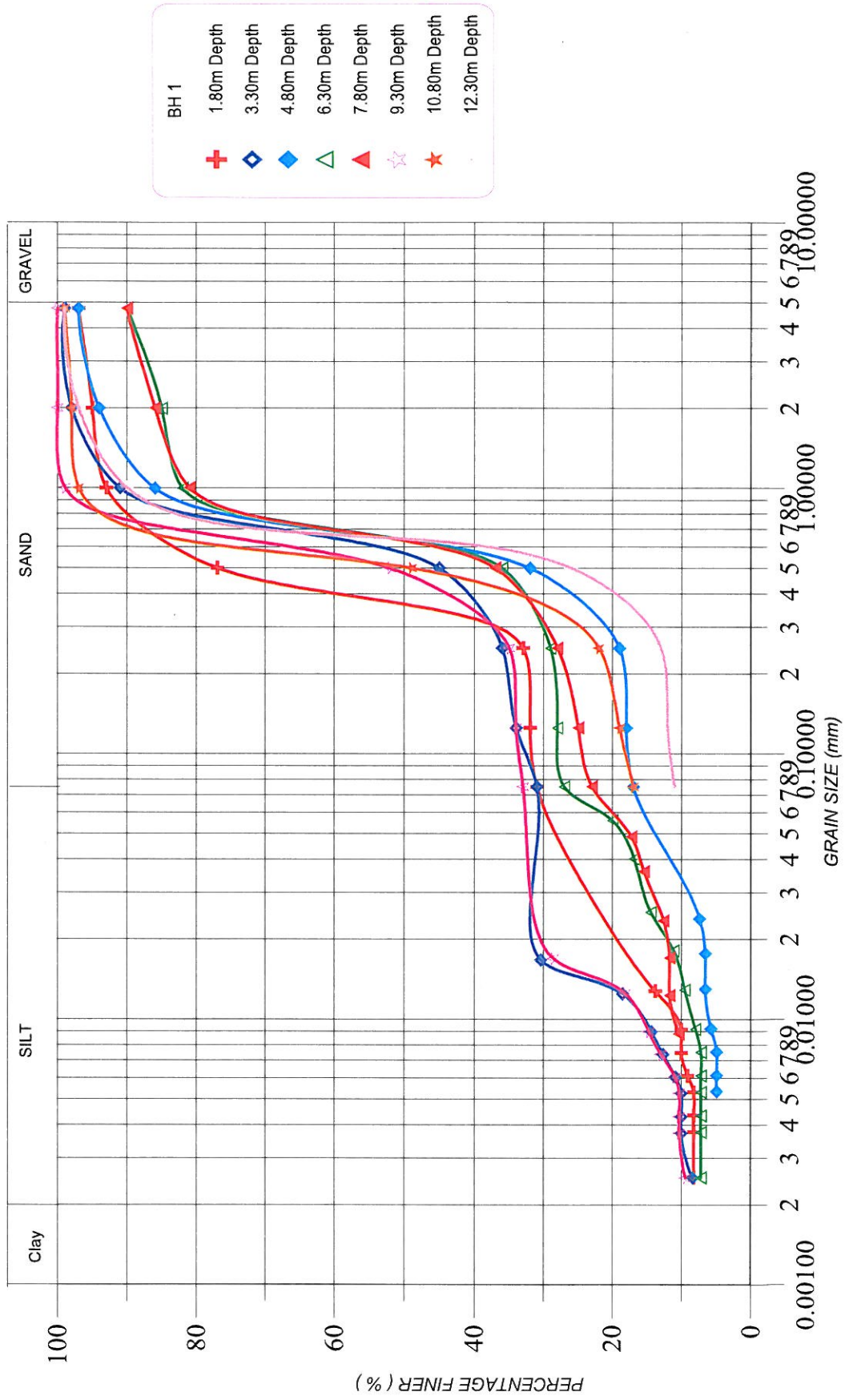
(Shear stress - shear strain relationship)

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

FIG- DS-AJ

0062

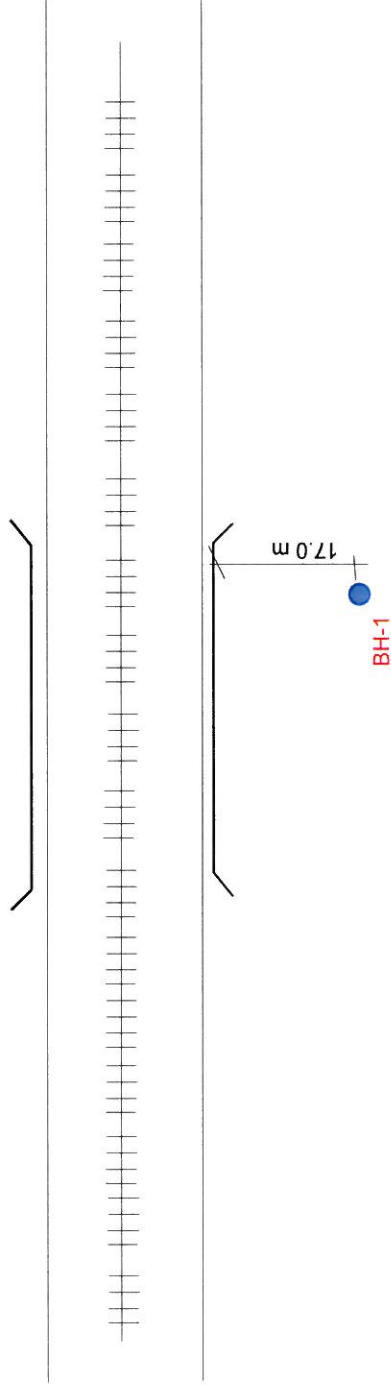
GRAIN SIZE DISTRIBUTION CURVE



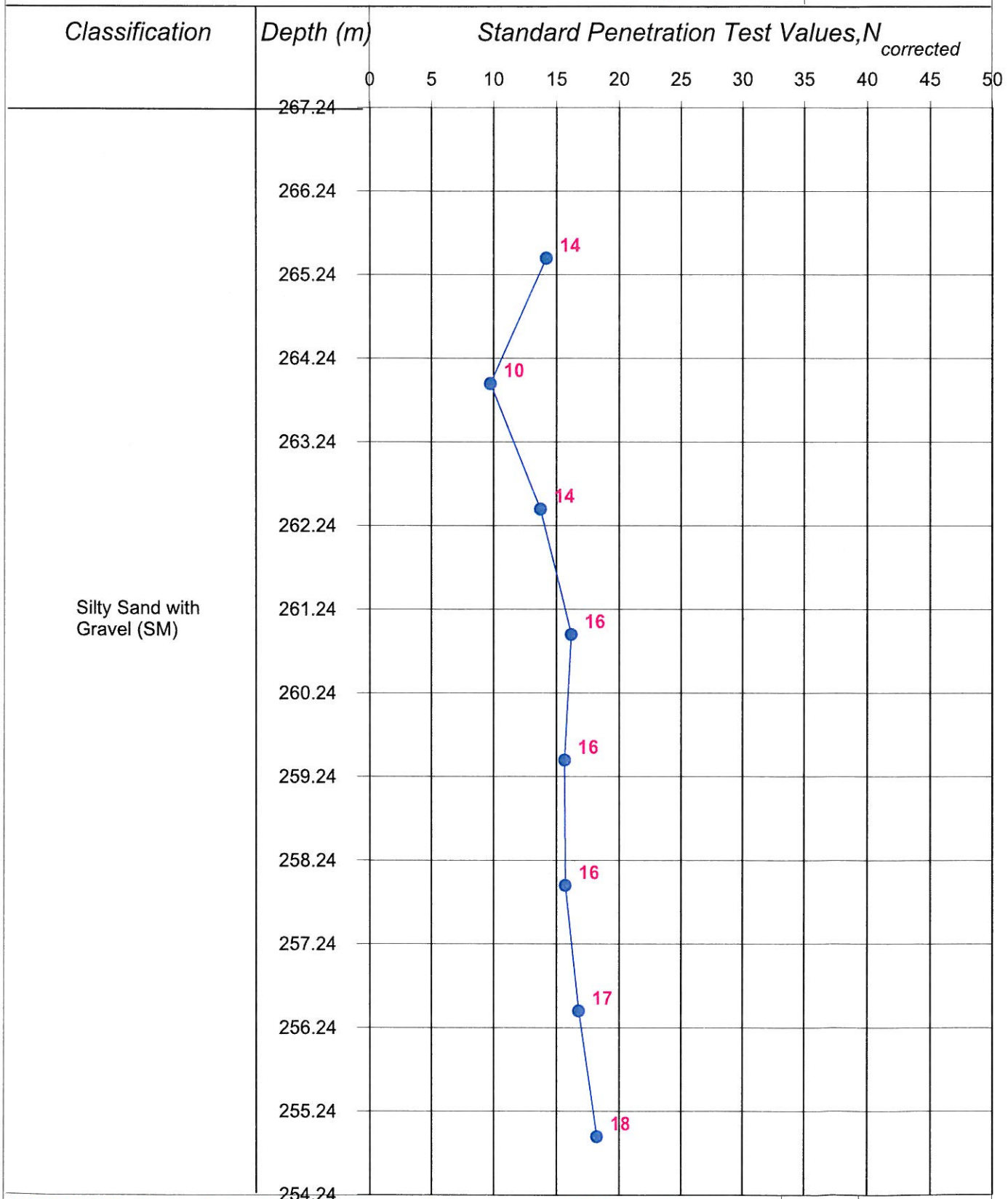
39063

← LUDHIANA

SAHARANPUR →



BR 247@ 207/3-5



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

BH-1

Fig: SP -AJ

0065

# BORE LOG



Date of start : 18/06/2008  
Date of finish : 19/06/2008

Location: 207/3-5  
BH No.: 1  
Depth : 12.00  
Depth of Water table : 4.20 m

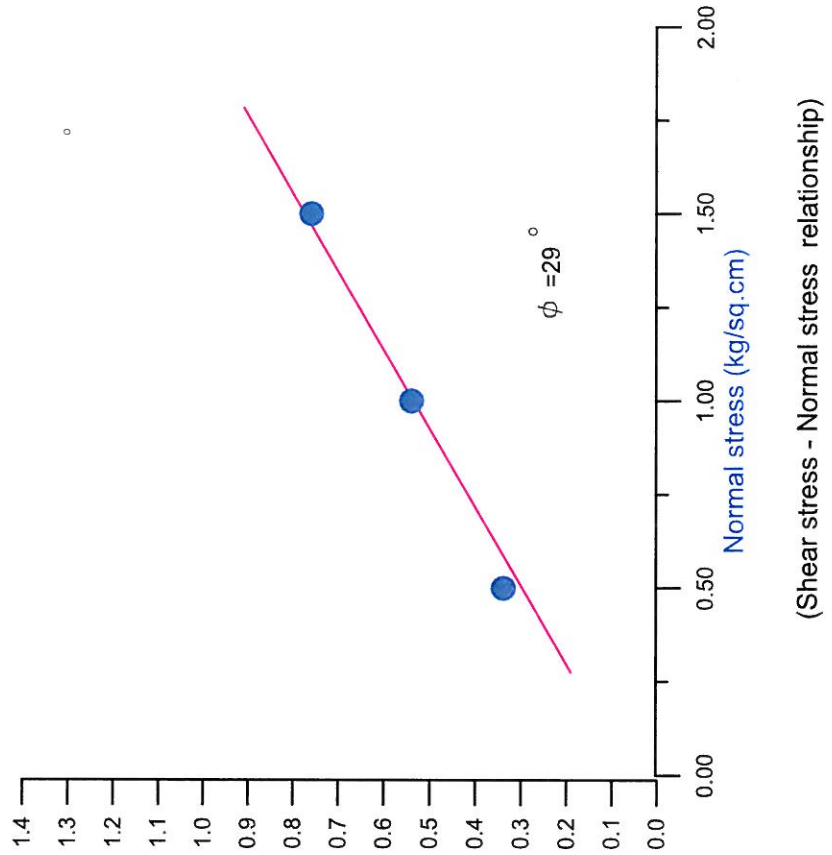
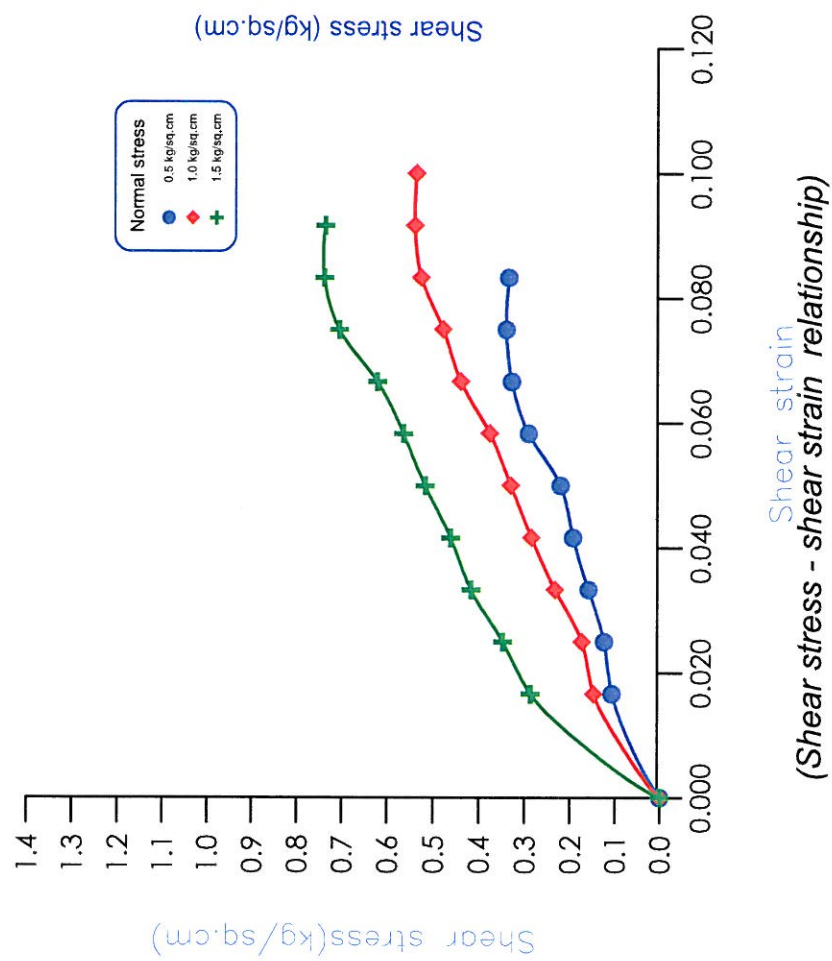
PROJECT: Geotechnical investigation work for proposed DFC corridor  
from Ludhiyana to Saharanpur

Project No. 1813 Bridge : 248 RL: 267.644

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot		Grain size (%)			Density (gm/cc)		W/C (%)	Limits (%)		Shear Parameters			Cc	
				Observed	Corrected	Gravel	Sand	Silt/clay	r(wet)	r(dry)		L.L.	P.L.	Sp.Gr	Type of test	C(kg/sq.cm)		phi(degrees)
267.644																		
265.844	1.80	SPT	Sandy Silt with Gravel (SM-ML)	7		3	12	85	1.7	1.43	19.11	Non Plastic						
265.144	2.50	UDS		6		0	24	76										
264.344	3.30	SPT		8		3	31	66				Non Plastic						
262.844	4.80	SPT		10		1	88	11				Non Plastic						
261.344	6.30	SPT		11		9	75	16				Non Plastic						
259.844	7.80	SPT	Silty Sand with Gravel (SM)	14		0	54	46				Non Plastic						
258.344	9.30	SPT		22		0	83	17					Non Plastic					
256.844	10.80	SPT		24		1	85	14				Non Plastic						
255.344	12.30	SPT																

9900

BH-1  
Depth-2.50m

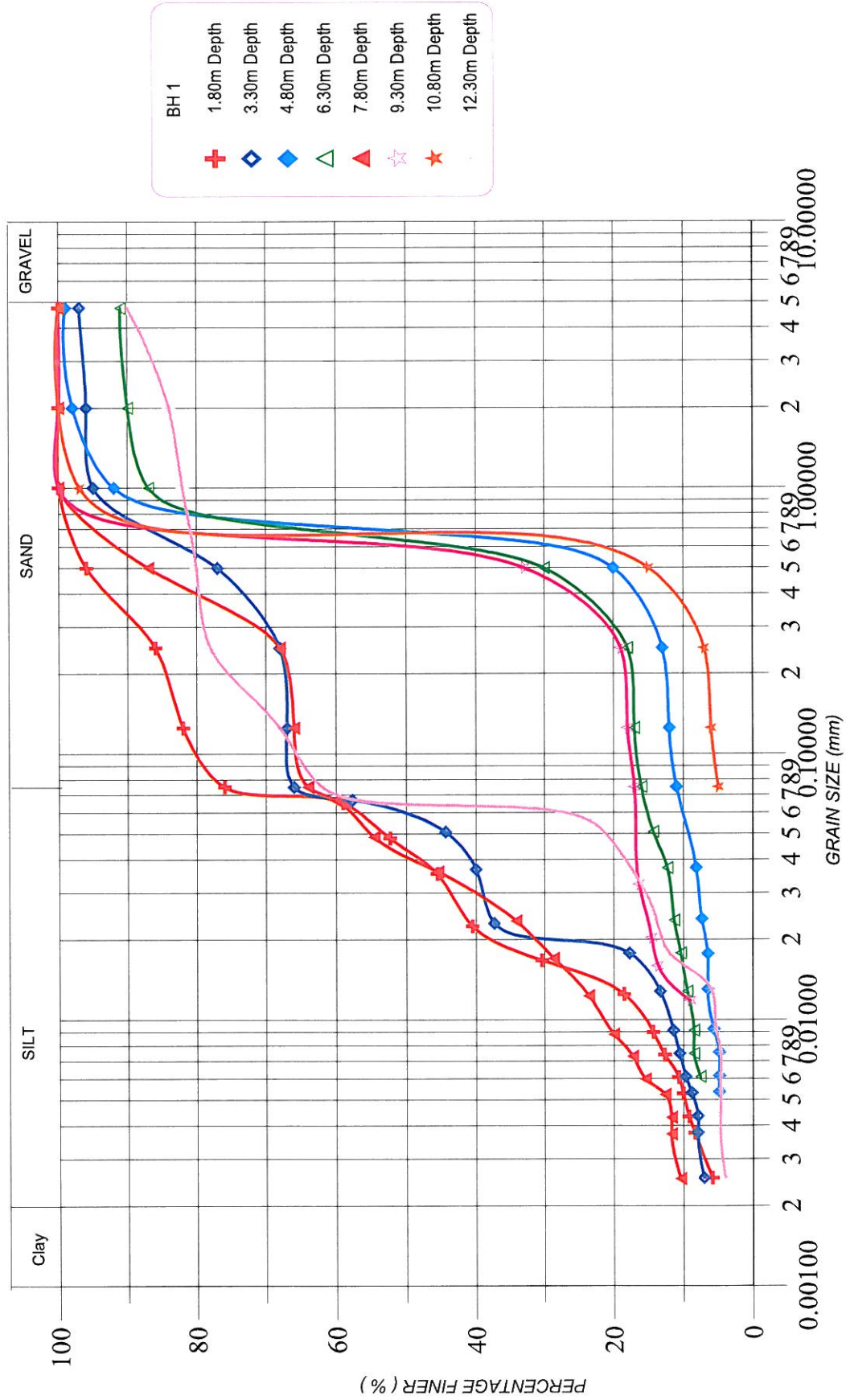


PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiana to Saharanpur

FIG- DS-AK

2900 0067

GRAIN SIZE DISTRIBUTION CURVE

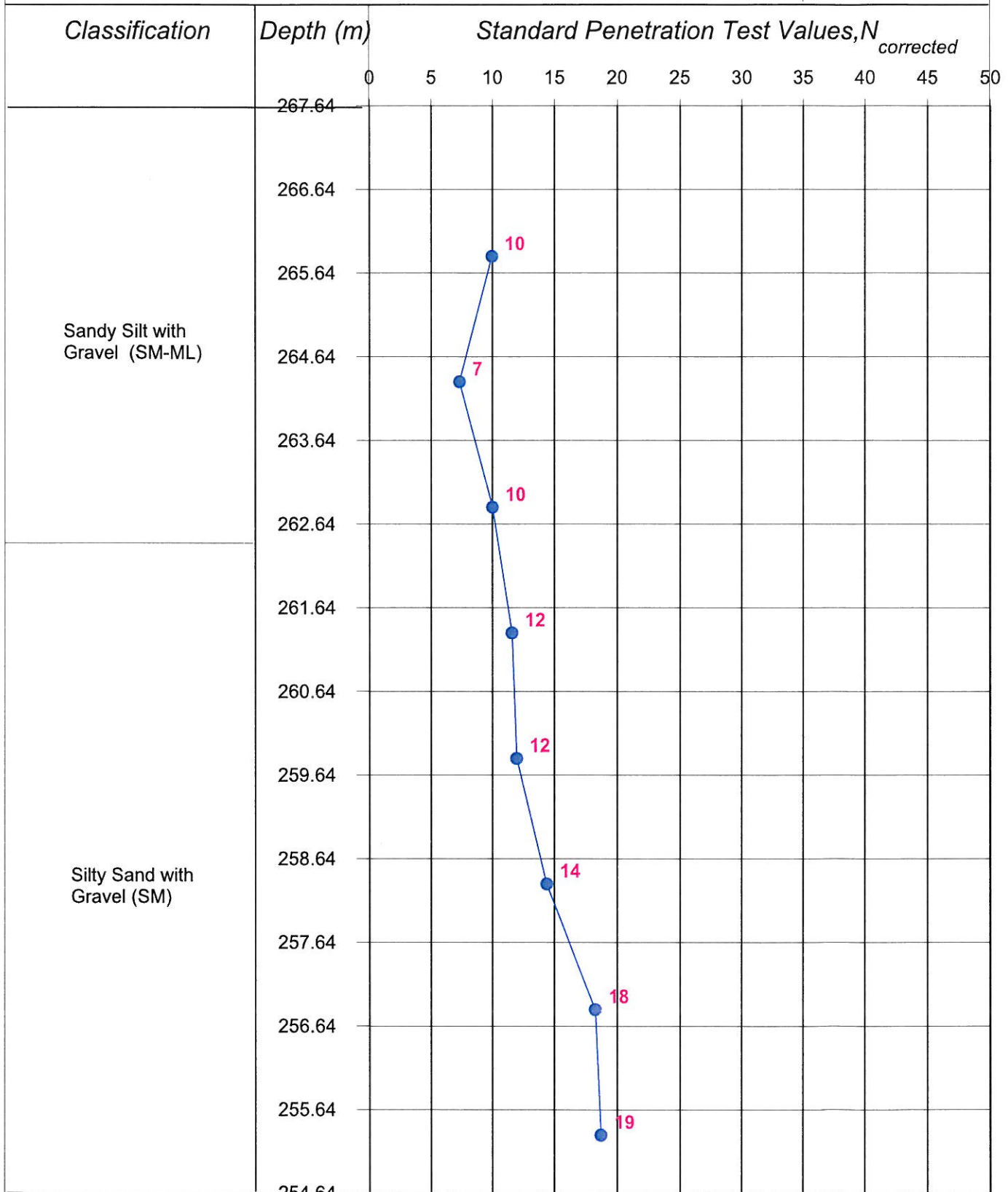


PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiana to Saharanpur

Fig : GSD-AK

8900





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

BH-1

Fig: SP -AK

# BORE LOG

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

**Location:** 209/5-7  
**BH No.:** 1  
**Depth :** 12.00  
**Depth of Water table :** 4.50 m

**Date of start :** 18/06/2008  
**Date of finish :** 18/06/2008

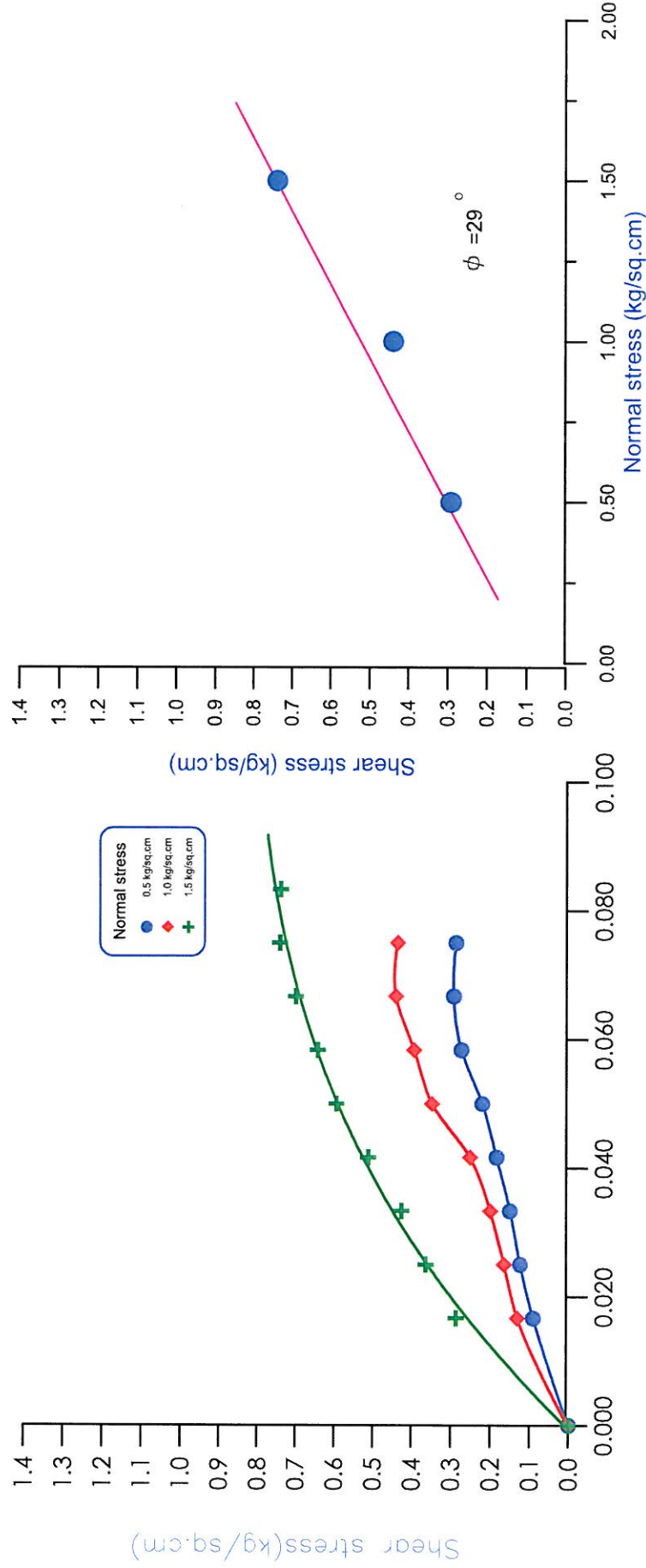


**Project No. 1813**    **Bridge : 249**    **RL: 267.420**

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot		Grain size (%)			Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc	
				Observed	Corrected	Gravel	Sand	Silt/clay	r(wet)	r(dry)		L.L	P.L		Type of test	C(kg/sq.cm)	phi(degrees)		
267.420																			
265.620	1.80	SPT	Sandy Silt with Gravel (SM-ML)	9		0	21	79	1.7	1.46	16.83	Non Plastic		2.67	DST		29		
264.920	2.50	UDS																	
264.120	3.30	SPT		6		0	15	85					Non Plastic						
262.620	4.80	SPT	Silty Sand with Gravel (SM)	12		1	47	52				Non Plastic							
261.120	6.30	SPT		13		3	59	38					Non Plastic						
259.620	7.80	SPT	Sandy Silt with Gravel (SM-ML)	17		9	53	38				Non Plastic							
258.120	9.30	SPT		17		17	52	31					Non Plastic						
256.620	10.80	SPT		16		1	59	40					Non Plastic						
255.120	12.30	SPT		17		1	45	54				Non Plastic							

0200

BH-1  
Depth-2.50m



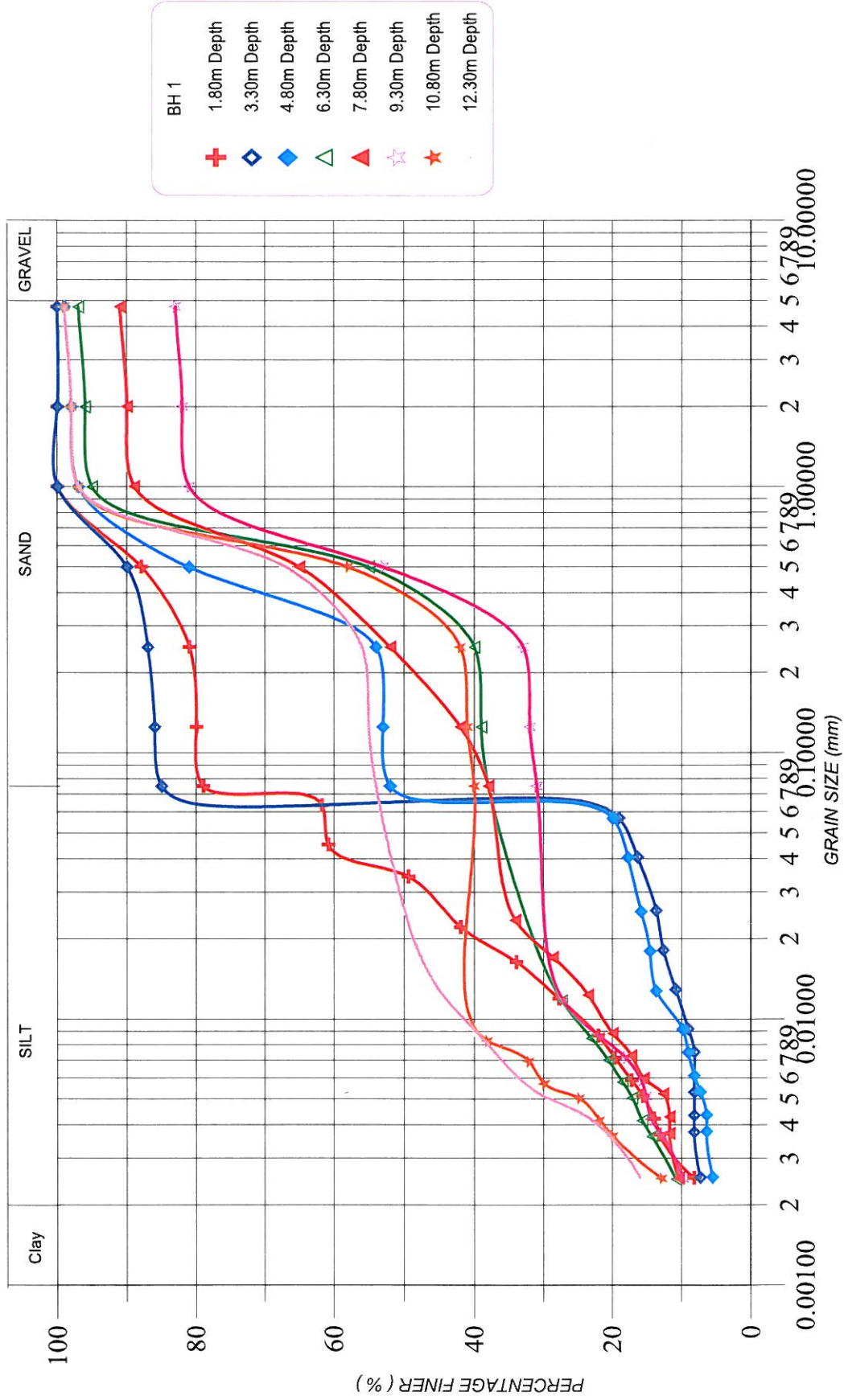
(Shear stress - Normal stress relationship) (Shear stress - shear strain relationship)

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

FIG- DS-AM

1200

GRAIN SIZE DISTRIBUTION CURVE



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

Fig : GSD-AM

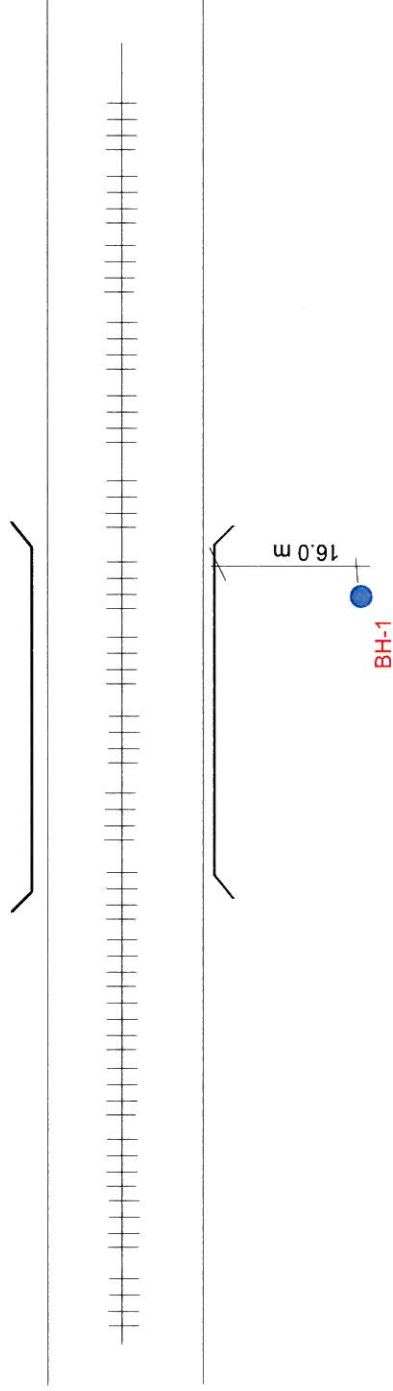
2200

SOIL ENGINEERING CONSULTANTS

Job No: 1813

← LUDHIANA

SAHARANPUR →

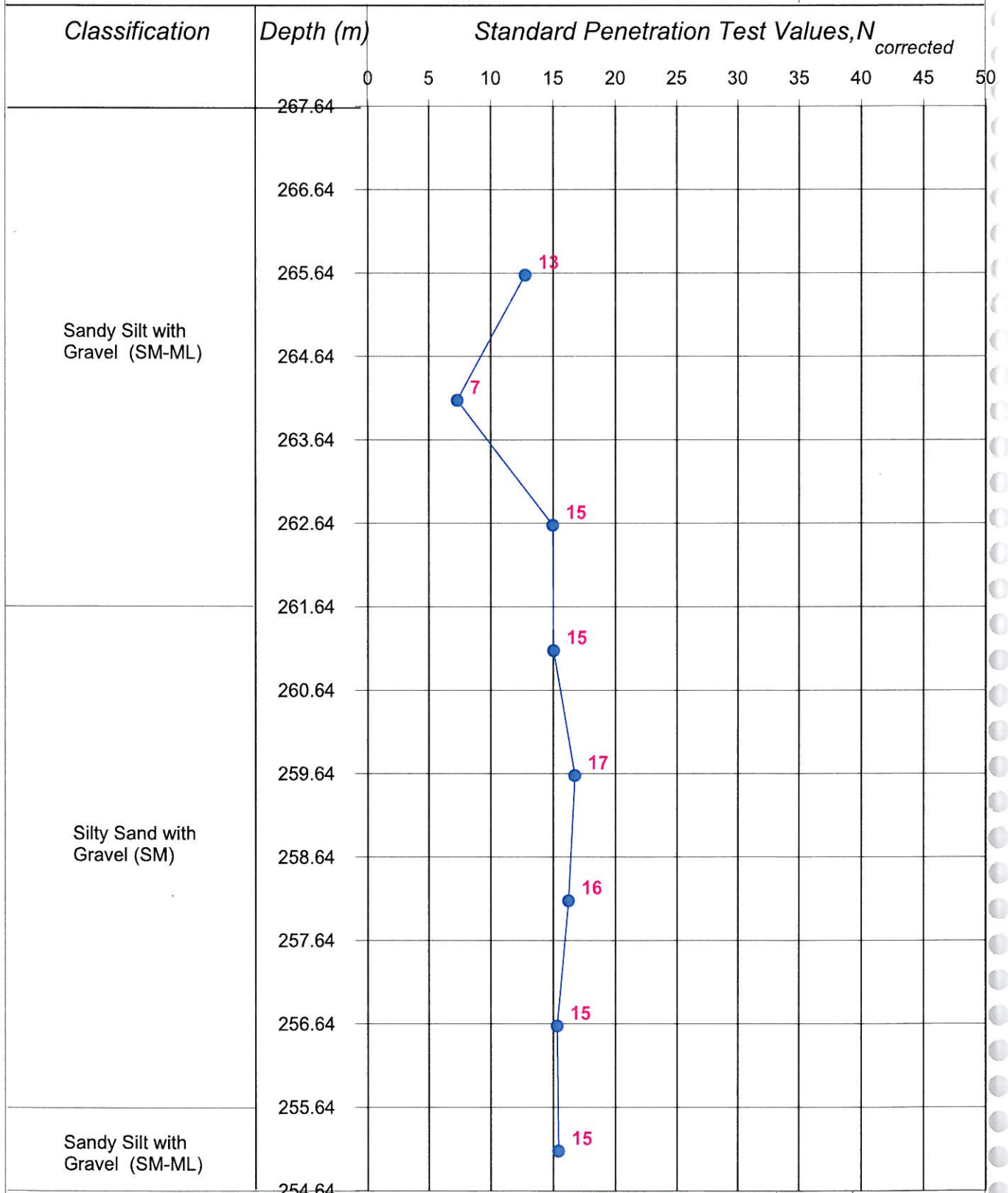


BR 249@ 207/3-5

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

Fig: Plan-AM

3100 1 1 0073



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

BH-1

Fig: SP -AM

# BORE LOG



Date of start : 15/06/2008  
Date of finish : 16/06/2008

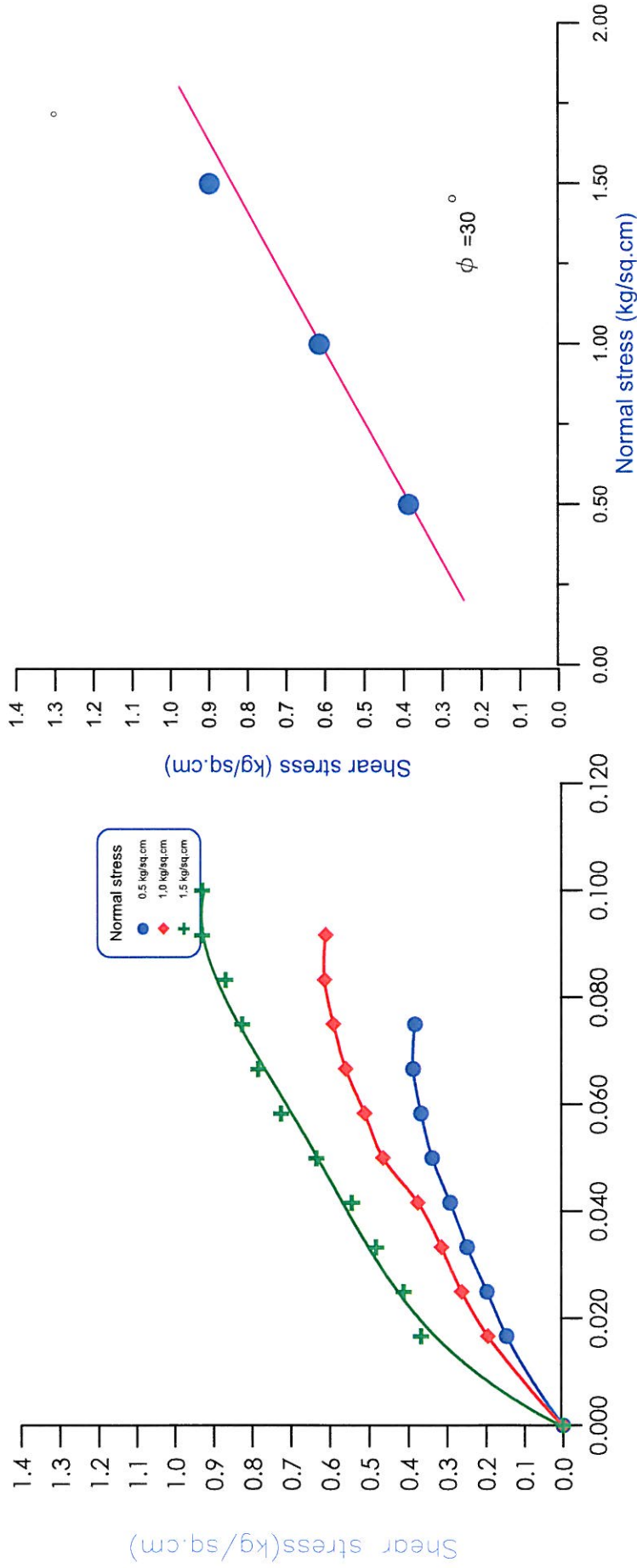
Location: 210/15-16  
BH No.: 1  
Depth : 12.00  
Depth of Water table : 1.20 m

PROJECT: Geotechnical Investigation work for proposed DFC corridor  
from Ludhiyana to Saharanpur  
Project No. 1813 Bridge : 250 RL: 269.800

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot			Grain size (%)		Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc
				Observed	Gravel	Sand	Silt/clay	r(wet)	r(dry)	LL		P.L	Type of test		C(kg/sq.cm)	phi(degrees)		
269.800																		
268.000	1.80	SPT	Sandy Silt with Gravel (SM-ML)	12	0	22	78	1.77	1.44	22.60	Non Plastic		2.65	DST	0.15	30		
267.300	2.50	UDS																
266.500	3.30	SPT		11	0	4	96				Non Plastic							
265.000	4.80	SPT		10	0	71	29				Non Plastic							
263.500	6.30	SPT		9	1	69	30				Non Plastic							
262.000	7.80	SPT	Silty Sand with Gravel (SM)	11	0	83	17				Non Plastic							
260.500	9.30	SPT			12	0	86	14				Non Plastic						
259.000	10.80	SPT		22	1	89	10				Non Plastic							
257.500	12.30	SPT		27	1	86	13				Non Plastic							

0075

BH-1  
Depth-2.50m



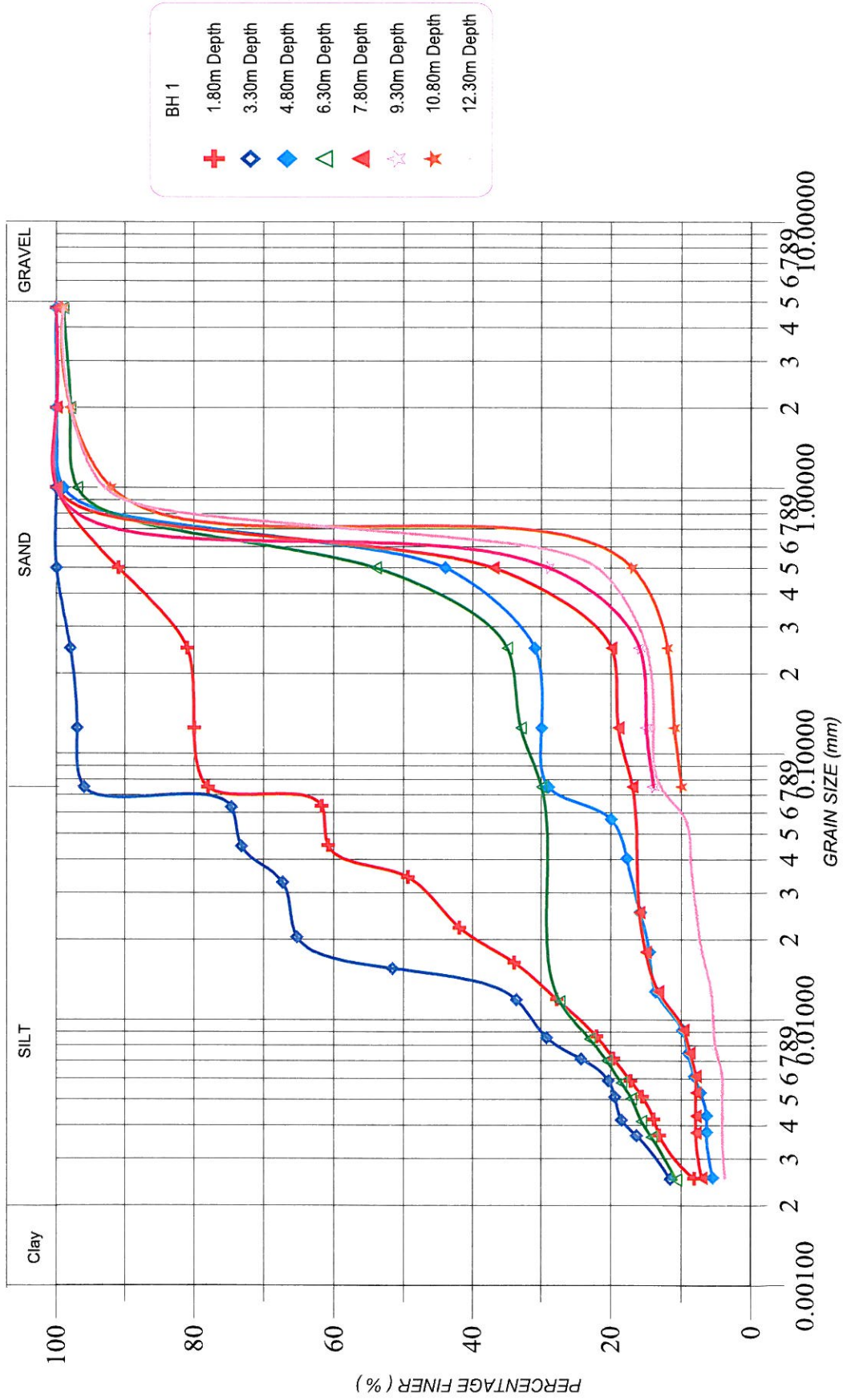
PROJECT: Geotechnical Investigation work for proposed DFC corridor from Ludhiana to Saharanpur

FIG- DS-AO

9200



GRAIN SIZE DISTRIBUTION CURVE



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

Fig : GSD-AO

2200

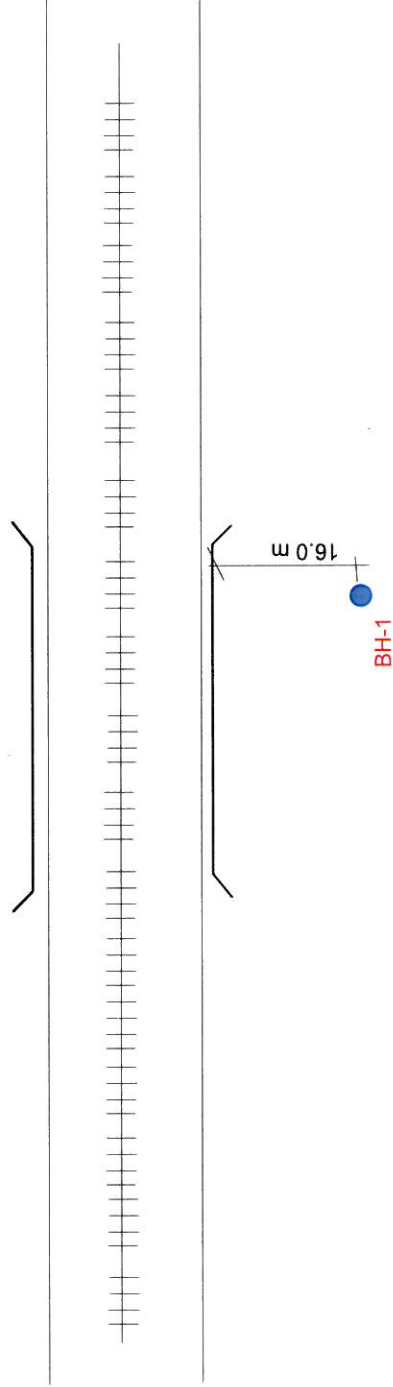
8200

SOIL ENGINEERING CONSULTANTS

Job No: 1813

← LUDHIANA

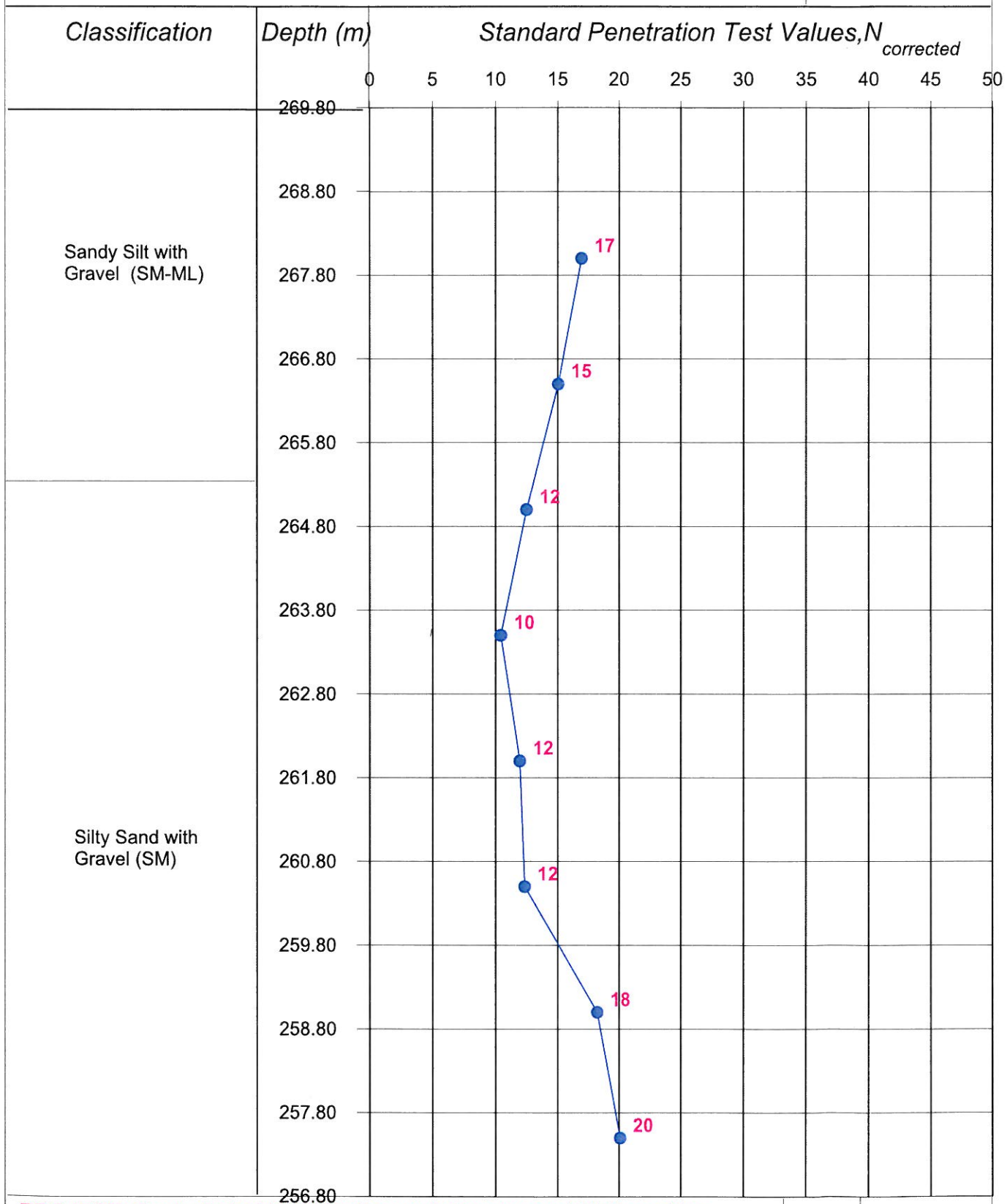
SAHARANPUR →



BR 250@ 210/15-17

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

Fig: Plan-AO



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

BH-1 Fig: SP -AO

# BORE LOG

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

**Location:** 210/21-23  
**BH No.:** 1  
**Depth :** 30.00 m  
**Depth of Water table :** 1.20 M

**Date of start :** 20/06/2008  
**Date of finish :** 22/06/2008



**Project No. 1813**    **Bridge : 251**    **RL: 264.890**

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot	Grain size (%)			Density (gm/cc)		W/C (%)	Limits (%)		Sp.Gr	Shear Parameters			Cc
					Gravel	Sand	Silt/clay	r(wet)	r(dry)		L.L	P. L		Type of test	C(kg/sq.cm)	phi(degrees)	
264.890				Observed	0	3	97	1.49	1.22	21.89	Non Plastic		2.64	DST		21	
263.090	1.80	SPT	Sandy Silt (SM-ML)	4	0	3	97				Non Plastic						
262.390	2.50	UDS		8	1	75	24				Non Plastic						
261.590	3.30	SPT		17	1	58	41				Non Plastic						
260.090	4.80	SPT		13	1	84	15				Non Plastic						
258.590	6.30	SPT		22	3	73	24				Non Plastic						
257.090	7.80	SPT	Silty Sand with gravel (SM)	20	1	71	28				Non Plastic						
255.590	9.30	SPT		25	1	75	24				Non Plastic						
254.090	10.80	SPT		29	0	72	28				Non Plastic						
252.590	12.30	SPT		38	0	86	14				Non Plastic						
251.090	13.80	SPT		32	16	57	27				Non Plastic						
249.590	15.30	SPT	Sandy Silt (SM-ML)	28	0	3	97				Non Plastic						
248.090	16.80	SPT		22	3	8	89				30	19					
246.590	18.30	SPT	Silty Clay with low plasticity (CL)	40	3	3	94	2.04	1.69	20.43	30	19	2.7	UU	2.17		0.056
245.090	19.80	SPT		48	1	11	88				Non Plastic						
244.390	20.50	UDS		57	3	6	91				Non Plastic						
243.590	21.30	SPT		53	0	2	98				Non Plastic						
242.090	22.80	SPT	Sandy Silt with Gravel (SM-ML)	67	3	2	95				Non Plastic						
240.590	24.30	SPT		1000	32	68					Non Plastic						
239.090	25.80	SPT		1002	48	50					Non Plastic						
237.590	27.30	SPT		1001	65	34					Non Plastic						
236.090	28.80	SPT	Silty Sand with gravel (SM)								Non Plastic						
234.590	30.30	SPT									Non Plastic						

0800

# BORE LOG



Date of start : 17/06/2008  
Date of finish : 19/06/2008

Location: 210/21-23  
BH No.: 2  
Depth : 30.00 m  
Depth of Water table : 6.00 M

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

Project No. 1813 Bridge : 251 RL 265.032

Reduced Level	Depth (m)	Type of sample	Soil Classification	S.P.T Plot	Grain size (%)			Density (gm/cc)		W/C (%)	Limits (%)		Shear Parameters			Cc
					Gravel	Sand	Silt/clay	r(wet)	r(dry)		L.L	P.L	Type of test	(kg/sq.cm)	phi(degrees)	
265.032				Observed												
263.232	1.80	SPT	Sandy Silt with gravel (SM-ML)	4	1	35	64	1.59	1.41	12.89	Non Plastic	P.L	DST	0.1	20	
262.532	2.50	UDS														
261.732	3.30	SPT	Silty Sand (SM)	5	0	65	35				Non Plastic					
260.232	4.80	SPT														
259.532	5.50	UDS	Sandy Silt (SM-ML)	5	0	9	91	1.68	1.40	20.16	Non Plastic		DST	0.1	26	
258.732	6.30	SPT		12	0	48	52				Non Plastic					
257.232	7.80	SPT		13	0	63	37				Non Plastic					
255.732	9.30	SPT	Silty Sand (SM)	12	0	74	26				Non Plastic					
254.232	10.80	SPT		19	0	72	28				Non Plastic					
252.732	12.30	SPT	Sandy Silt with gravel (SM-ML)	37	1	40	59				Non Plastic					
251.232	13.80	SPT		34	1	54	45				Non Plastic					
249.732	15.30	SPT	Silty Sand with gravel (SM)	28	1	78	21				Non Plastic					
248.232	16.80	SPT		30	1	41	58				Non Plastic					
246.732	18.30	SPT		28	0	38	62				Non Plastic					
245.232	19.80	SPT	Sandy Silt with gravel (SM-ML)	30	0	6	94				Non Plastic					
243.732	21.30	SPT		33	0	3	97				Non Plastic					
242.232	22.80	SPT		29	0	5	95				Non Plastic					
240.732	24.30	SPT		25	19	6	75				Non Plastic					
239.232	25.80	SPT		36	5	10	85				Non Plastic					
237.732	27.30	SPT	Silty Clay with medium plasticity (CI)	99	5	0	95				47	24				
236.232	28.80	SPT		77	1	34	65									
234.732	30.30	SPT	Sandy Silt (SM-ML)	100	26		74				Non Plastic					

1800