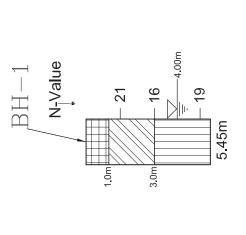
Indicative Geotech details Rly Km. 1410 to 1414 for reference



BOREHOLE PROFILE



0.00m

__ 10.00m

15<u>.00m</u>

PROJECT : GEOTECHNICAL INVESTIGATIONS FOR		LEGEND
DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).	SYMBOL	DESCRIPTION
		Silty /Sandy CLAY of low plasticity (CL)
CHAINAGE DFCC: 1408+984		Silty CLAY of medium plasticity (CI)
		Sandy SILT (ML)
		•

Ground water Table

DFCC BRIDGE NO: 214

BORE	BOREHOLE NO. 01	0.01									DATE STARTED:	29/08	29/08/2016					=		Z	GE	OTE	CH		LSE	INDIAN GEOTECHNICAL SERVICES	ES					-	a Laboratoria	
REDU	SED LEV	REDUCED LEVEL OF GROUND BORE (M)	SROUN	JD BOR	₹ (M):					L	DATE COMPLETED:	29/08	29/08/2016									Ne	New Delhi	elhi								No.	San Marie	
			Ē	IELD TE	FIELD TEST RESULTS	(5)															LA	30RA	ORY T	EST R	LABORATORY TEST RESULTS									
					G	TTECT	ST II SEE TOSE LA	u		N	Н	(_	AIN SIZE	SIS I VIVO	<u> </u>							(u		SHEAR S	SHEAR STRENGTH					Chemical Analysis Result	Analysis	Result	
	WC		.0	/3	Ď	2	RESOL	,		O I TA	łT I W	3 3T.	j	AIN OIL	- MARI -	2			(-		(%)		uno/t		CHARAC	ERISTICS		°		SOIL	SOIL SAMPLE	WA	WATER SAMPLE	IPLE
SELEVATION IN METERS	DEPTH IN METERS BELO	ЭИ⊔ЧМА2 ЧО ∃Я∪ТАИ	SAMPLE REFERENCE N	LEVEL OF WATER TABLI L.W.L	DEPTH IN METERS	NO' OE BLOWS	PENETRATION (CM)	N, VALUE (Recorded)	N, VALUE (Corrected)	SYMBOLIC REPRESENT	I'S' CFYSSIHCYLION DESCEINLION OE SOIF	TYPE OF TEST CONDUC IN THE LABORATORY	GRAVEL (%)	(%) GNAS	SILT (%)	(%)	UQUID UMIT (%)	PLASTIC LIMIT (%)	BULK DENSITY (\$1 cum.	*DRY DENSITY (froum)	MOISTURE CONTENT (SPECIFIC GRAVITY	SUBMERGED DENSITY (FREE SWELL INDEX, %	Cohesion, C, (¥sqm.)	Angle of friction (Degrees)	°9 'OITA'S GIOV	COWPRESSION INDEX	PRESSURE, kg/cm²	Hq	Chloride, % Sulphate, %	Hq	Chloride, mg/l	Ngm ,eterlqluS
0.00	0.5	DS	-		0.00 - 0.50						Brownish grey Silty CLAY of low plasticity (CL)	I	0.00	15.00	74.00	11.00 32	32.80 22	22.20 10.	10.60		ı	1	ı	I	I	ı	I	ı	ı	I	1	1	ı	ı
	1.5	san 2	1		1.00 - 1.30						Very Stiff brownish grey	On .	0.00	7.00	68.00 2	25.00 42	42.20 25	25.80 16.	16.40 1.87	37 1.58	8 18.50	50 2.68	8 0.99	I	9.80	4.00	0.696	0.18	1.80	0.70	0.02 0.09	- 6	I	I
	3.0	SPT	1		1.50 - 1.95	21	30	21	21	-	medium plasticity (CI)																							
	4.0	SPT	2	4.00m	3.00 - 3.45	16	30	16	19			DST+	0.00	36.00	61.00	3.00	Non	Non Plastic	ı	1.58	8	2.65	5 0.98	I	09:0	30.80	I	ı	I	I	1 1	1	I	I
	5.0	sa/san	2		4.00 - 4.30		Slipped				Medium dense grey Sandy SILT (ML)																					50	SZ'	09"
-5.500	0 5.5	SPT	е		5.00-5.45	19	30	19	18		5,45m	I	0.00	12.00	84.00	4.00	Non	Non Plastic	I	- 1	I	I	1	l	I	1	1	1	I	1	1		061	Z6E
NOTE:	1. CLAS	SIFICATIC	ON OF SC	JIL AS PI	1. CLASSIFICATION OF SOIL AS PER IS: 1498												₫	PROJECT	_	<u></u>	EOTEC	HNICAL	. INVES	IIGATIC	NS FOR D	GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).	ADRI T	O KHU	RJA (A	(PPRO)	K. 50 KM	-		
	2. ABBI : DS = C + = TEST *=Dry Der	2. ABBREVATION USED : DS = DISTURBED SAMPL + = TEST ON REMOULDED: **EDY Density is assumed bar	JUSED SAMPLE, ULDED SA med basec	, SPT = S MPLES, L don SPT (f	2. ABBREVATION USED 2. ABBREVATION USED SAMPLE, SPT = STANDARD PENETRATION TEST. UDS = UN = 1 ETST ON REMOULDED SAMPLES, UC: UNCONFINED COMPRESSION TEST = 1 ETST ON REMOULDED SAMPLES, UC: UNCONFINED COMPRESSION TEST = 1 Day Density is assumed based on SPT (N) value if undisturbed sample is not available.	ATTON COMPR ed samp	TEST. L ESSION ale is not	IDS = UNI TEST available	DISTURB UU :	BED SAM : UNCON	2. ABBREVATION USED - DIS - DISTURBED SAMPLE. SPT = STANDARD PENETRATION TEST. UDS = UNDSTURBED SAMPLE, DST = DIRECT SHEAR TEST. - DISTURBED SAMPLES. U.C: UNICONSPIRED COMPRESSION TEST - UNICONSOLIDATED UNDRAINED TRIANDAL TEST - DISTURBED COMPANIED TRIANDAL TEST - DISTURBED COMPANIED SHEAR TEST.	EST, WIAL TE	IS				Ö	CHAINAGE: IR	<u>∝</u>	:. 41	: 1408 + 984	4												
		Date of U	ndisturbe	d Samples	Date of Undisturbed Samples Tested : 07.09.2016 to 09.09.2016	16 to 09.	09 2016				The same of the sa	_					ā	DFCC BRIDGE No. : 214	IDGE N	Jo. : 21	4													
		Date of To	ests on Di	sturbed S.	Date of Tests on Disturbed Samples / Consolidation Tests : 07.09.2016 to 16.09.2016	ation Te	sts : 07.0	09.2016 to	, 16.09.20	116																								



New Delhi

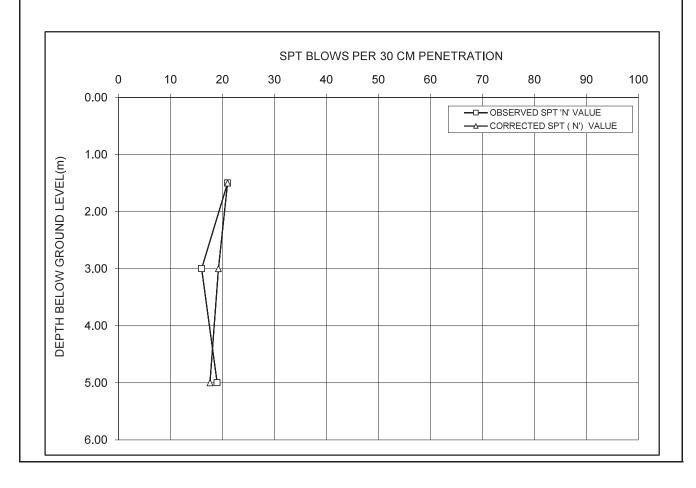
CALCULATIONS FOR CORRECTED SPT (N) VALUES

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

CHAINAGE: IR : 1408 + 984 BORE HOLE NO : 1

DFCC BRIDGE No.: 214 GWT depth below EGL (m): 4.00

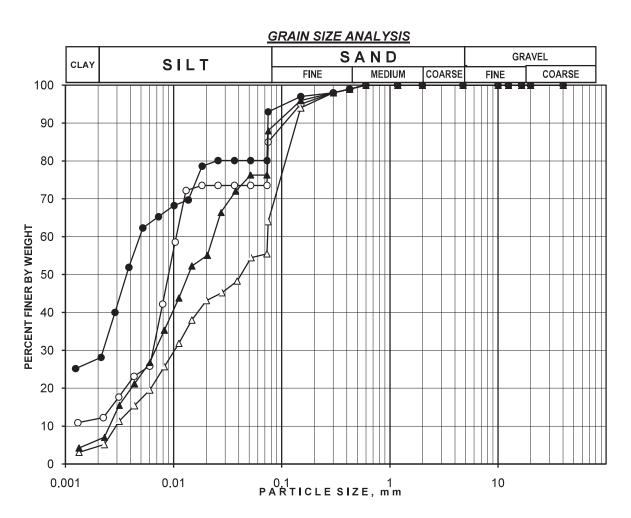
DEPTH OF SAMPLE	TYPE OF SOIL	γ _{bulk} (Bulk Unit Weight), t/m ³	OVERBURDEN PRESSURE (t/m²)	OVERBURDEN PRESSURE (kg/cm²)	OVERBURDEN CORRECTION FACTOR	OBSERVED SPT 'N' VALUE	CORRECTED SPT (N') VALUE (FOR OVERBURDEN)	FINAL CORRECTED VALUE AFTER DILATANCY CORRECTION (N")
		1.80						
1.50	Plastic	1.87	2.70	0.270	1.00	21	21.00	21
3.00	Non Plastic	1.90	5.51	0.551	1.20	16	19.22	19
5.00	Non Plastic	1.98	8.31	0.831	1.06	19	20.21	18





PROJECT : : GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

CHAINAGE: IR: 1408 + 984 DFCC BRIDGE No.: 214



Symbol	BH No.	Depth, m	Soil Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Cu	Cc
0	1	00.0-0.5	Silty CLAY of low plasticity (CL)	0.00	15.00	74.00	11.00	-	I
•	1	1.00	Silty CLAY / Lean CLAY of medium plasticity (CI)	0.00	7.00	68.00	25.00	ı	ı
Δ	1	3.00	Sandy SILT (ML)	0.00	36.00	61.00	3.00	25.22	0.48
A	1	5.00	Sandy SILT (ML)	0.00	12.00	84.00	4.00	9.12	0.77



DETERMINATION OF SILT FACTOR

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

STRUCTURE DFCC BRIDGE No.: 214 at CHAINAGE: IR: 1408+984

BORE HOLE NO. 1

DEPTH (m) 0.00 - 1.00

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.750	0.00	4.750	0.000		
2.000	0.00	3.375	0.000		
1.180	0.00	1.590	0.000		
0.600	0.00	0.890	0.000		
0.425	1.00	0.513	0.513	0.059	0.426
0.300	1.00	0.363	0.363		
0.150	3.00	0.225	0.675		
0.075	10.00	0.113	1.125		
PAN	85.00	0.038	3.188		
	100.00		5.863		

DEPTH (m) 1.00-3.00

C = 0.98 kg/cm2

fi = 4 degree

Ksf = f(1 + sqrt(c))

f = 1.5 for fi > 10 and <15

f = 1.75 for fi > 5 and <10

f = 2.0 for fi <5

Silt Factor = 3.980

DEPTH (m) 3.00 - 5.00

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.750	0.00	4.750	0.000		
2.000	0.00	3.375	0.000		
1.180	0.00	1.590	0.000		
0.600	0.00	0.890	0.000		
0.425	1.00	0.513	0.513	0.076	0.484
0.300	1.00	0.363	0.363		
0.150	4.00	0.225	0.900		
0.075	30.00	0.113	3.375		
PAN	64.00	0.038	2.400		
·					
	100.00		7.550		

DEPTH (m) 5.00-5.45

DEFIN (III)	5.00-5.45				
SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.750	0.00	4.750	0.000		
2.000	0.00	3.375	0.000		
1.180	0.00	1.590	0.000		
0.600	0.00	0.890	0.000		
0.425	1.00	0.513	0.513	0.055	0.414
0.300	1.00	0.363	0.363		
0.150	2.00	0.225	0.450		
0.075	8.00	0.113	0.900		
PAN	88.00	0.038	3.300		
	100.00		5.525		



New Delhi

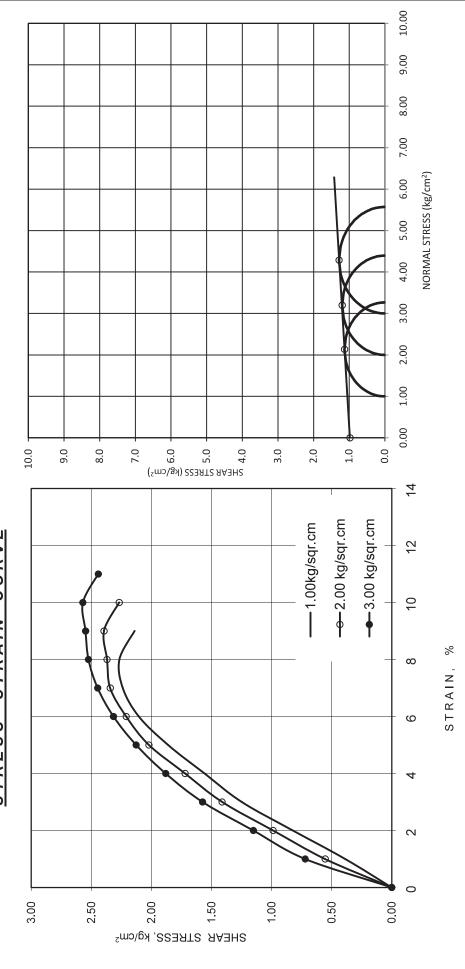
UNCONSOLIDATED UNDRAINED TRIAXIAL SHEAR TEST

"d" Degree= "c" $kg/cm^2 = 0.98$ 1.58 Dry Density (gm/cc) 1.00 Depth, m Borehole No. 01

CHAINAGE: IR: 1408 + 984 (DFCC BRIDGE NO. 214)

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

STRESS STRAIN CURVE





New Delhi

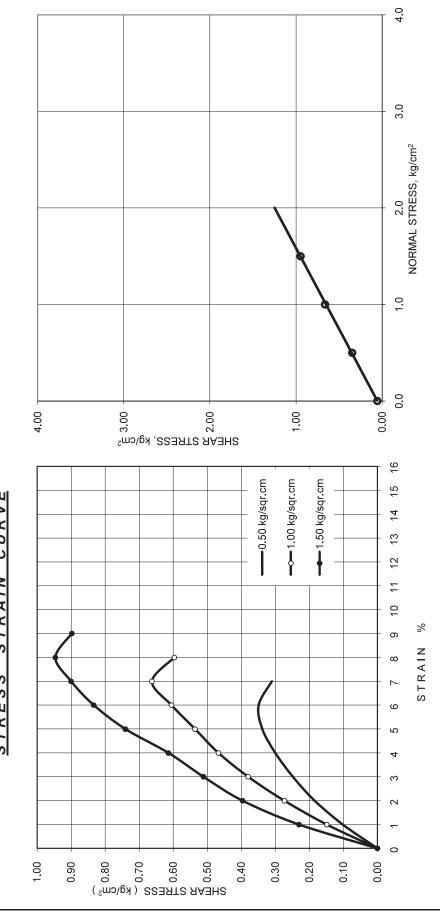
SHEAR TEST

DIRECT

	Borehole No. 1	Depth, m	3.00	Dry Density (gm/cc)	1.58	"c" kg/cm²= 0.06	"¢" Degree= 30.8
CHAINAGE	E : IR : 1408 + 984 (DFCC BRIDC	RIDGE NO.	214)				

PROJECT : GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX, 50 KM).

STRESS STRAIN CURVE





CONSOLIDATION TEST

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

CHAINAGE: 1408+984

DFCC BRIDGE No. 214

Depth (m) 1.00-1.30 **BOREHOLE No. 1**

Hs (Equivalent height of Soild), mm =

11.79

ဘိ	10						0.18					
C _v , m²/year	6		10.92	7.99	90.9	5.19	4.01	2.93				
H _{av} , mm	8		19.800	19.480	19.170	18.770	18.290	17.705				
t ₉₀ , min	7		4.00	5.29	6.76	7.56	9.30	11.90				
m _v , cm²/kg	9			0.0480	0.0380	0.0210	0.0135	0.0079				
e = H/Hs - 1	5	969'0	0.662	0.642	0.610	0.574	0.528	0.475	0.475	0.483	0.494	
Specimen Height (mm)	4	20.00	19.60	19.36	18.98	18.56	18.02	17.39	17.39	17.48	17.62	
Change in Dial Reading (mm)	3	4.00	0.40	0.24	0.38	0.42	0.54	0.63	0.00	60:0-	-0.14	
Final Dial Reading (mm)	2	00.00	3.60	3.36	2.98	2.56	2.02	1.39	1.39	1.48	1.62	
Applied Pressure (Kg/cm²)	1	0.00	0.25	0.50	1.00	2.00	4.00	8.00	8.00	2.00	0.25	

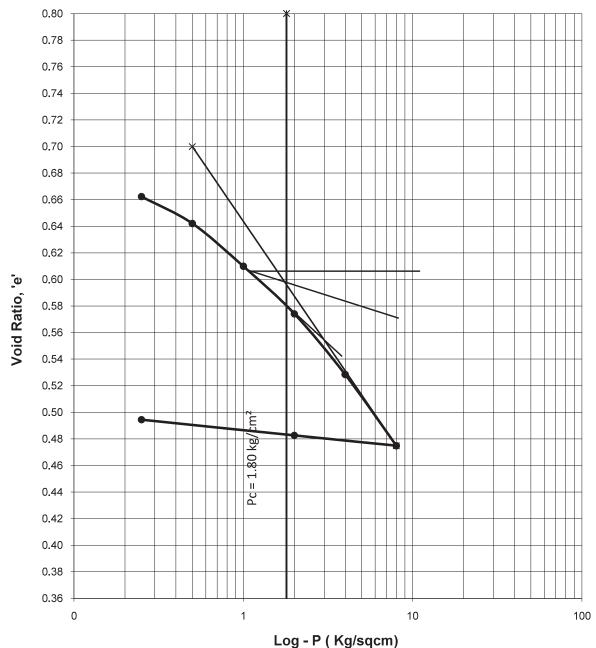


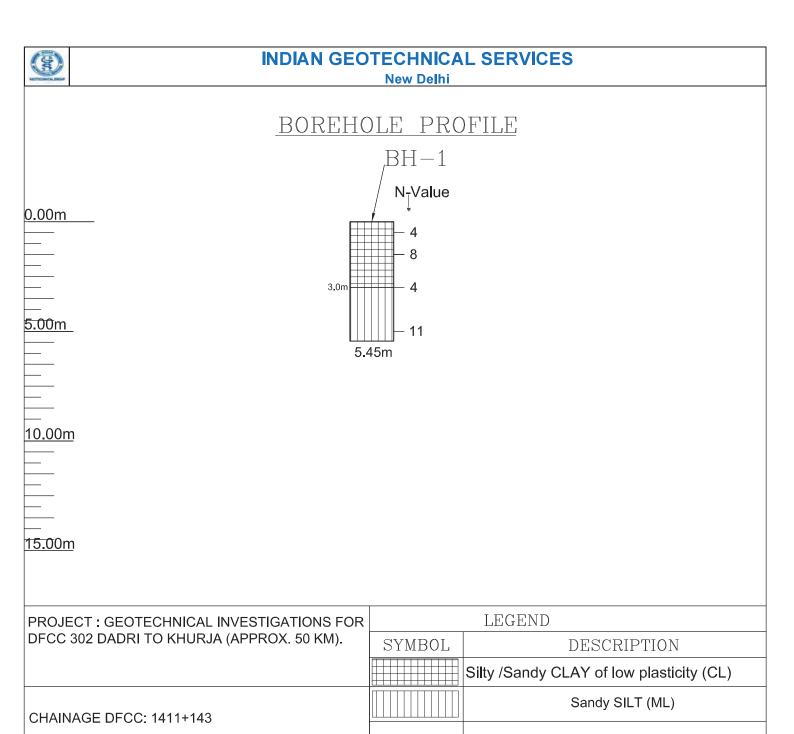
CONSOLIDATION CURVE (e - logp)

PROJECT:: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

BOREHOLE No. 1

CHAINAGE: 1408+984 Depth (m) 1.00-1.30





DFCC BRIDGE NO: 215

BORE	BOREHOLE NO. 01	10.01									DATE STARTED:	26/1	26/10/2016					_		A	GE	O	い	Ĭ	AL	INDIAN GEOTECHNICAL SERVICES	ICE	ဟ					6	The state of the s	
REDU	CED LE	VEL OF	GROU	ND BO	REDUCED LEVEL OF GROUND BORE (M):						DATE COMPLETED:	26/10/2	0/2016									Z	lew	New Delhi	hi								Month	To the same	
				FIELD	FIELD TEST RESULTS	_S																LABORATORY TEST RESULTS	ATOR	Y TES	r RESU	ILTS									
						SPT TEST RESULTS	RESUI	Z S		NC	H.	а		AIN SIZE	GRAIN SIZE ANALYSIS	SS								(w	क	SHEAR STRENGTH	СТН				Che	Chemical Analysis Result	nalysis	Result	
-	WO.		10.	/ 3	,			<u> </u>		ITAT	TIW -	STS	i							(1		(%)		пэд)		HARACTERIS	SOL	₂ O	20		SOIL SAMPLE	MPLE	MA	WATER SAMPLE	APLE
elevation in meterg	DEPTH IN METERS BEL	ЭИІЈЧМАР ПО ВЯПТАИ	SAMPLE REFERENCE N	LEVEL OF WATER TABL	DEPTH IN METERS	NO. OF BLOWS	PENETRATION (CM)	И, VALUE (Recorded)	N, VALUE (Corrected)	гливогіс керкегел.	DESCRIPTION OF SOIL	UDNOO TEST OO BYYT YROTAROBAL HIT III	GRAVEL (%)	(%) QNAS	SILT (%)	(%) AT7	רוסחום רואונג (%)	(%) TIMIT OITSAJ9	PLASTICITY INDEX (%)	BULK DENSITY (t) cum	*DRY DENSITY (f/cum)	MOISTURE CONTENT	SPECIFIC GRAVITY	SUBMERGED DENSITY	FREE SWELL INDEX, %	Cohesion, C, (Vsqm.) Angle of friction	(Degrees)	VOID RATIO, e _o	PRECONSOLIDATION	PRESSURE, kg/cm²	PH ————————————————————————————————————	Sulphate, %	Hq	Chloride, mg/l	Sulphate, mg/l
0.00		DS 0.5	1		0.00 - 0.50					Ш		I	0.00	13.00	77.00	10.00	29.30	06	9.40	1	1	ı	l l	l l	1	1	1	1		1	1		I	ı	1
		SPT	-		0.50 - 0.95	4	30	4	4	Ш	Coff to modium etiff																								
		UDS	-	diiW ie	1.00 - 1.30					Ш	yellowish grey Sandy CLAY / Sitty CLAY of low Plasticity	Y DST	0.00	20.00	72.00	8.00	28.00	19.60	8.40	1.72	1.50 1.	14.60 2	2.66 (0.94		0.80	26.80			- 6.5	6.80 0.01	0.09	ı	I	ı
	2	SPT 2.5	- 5		1.50 - 1.95	∞	30	8	8	Ш																									
	9	3.0			2.50 - 2.80						3.00m	n UUT	00.00	10.00	77.00	13.00	32.20	21.80	10.40	1.74	1.52	14.80 2	2.66 (0.95	 I	5.50 5.	5.00	ı		· I	I I	-	I	I	I
	4	SPT	е		3.00 - 3.45	4	30	4	5		Very Loose to medium	I	00.00	13.00	83.00	4.00	N	Non Plastic		I	ı	ı	ı	I	ı	ı		ı		ı	ı	ı	I	I	I
-5.000		SPT 5.0	4		5.00 - 5.45	7	30	7	12		nominal Clay (ML)	1	00.00	41.00	56.00	3.00	δN	Non Plastic		I	I	1	2.64	I	í	ı	ı	1		'	1		I	I	ı
NOTE	1. CLA	1. CLASSIFICATION OF SOIL	ON OF S		AS PER IS: 1498												_	PROJECT	5		GEOTE	ECHNIC	AL INV	ESTIG/	TIONS	GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).	302 DAI	DRI TO	KHUR.	JA (AP	PROX	50 KM			
	2. ABE DS = + = TES	2. ABBREVATION USED : DS = DISTURBED SAMPLE, + = TEST ON REMOULDED SA *=Dry Density is assumed based	ON USED ED SAMPLE OULDED &	E , SPT : SAMPLES ed on SP	2. ABBREVATION USED 1. OS = DISTURBED SAMBLE, SPT = STANDARD PENETRATION TEST. UDS = UN 1. TEST = DISTANDANDLE, SPT = STANDARD PENETRATION TEST. 1. OF TEST ON REMOULDED SAMBLE, UC: UNCONFINED COMPRESSION TEST 1. EDITY DENSITY is assumed based on SPT (N) value if undisturbed sample is not available.	TRATIOI ID COMF	N TEST. PRESSIC 1ple is no	UDS = IN TEST It availab	PSIG-	JRBED (JU : UNC	SPT = STANDARD PENETRATION TEST. UDS = UNDSTURBED SAMPLE, DST = DRECT SHEAR TEST, WHELE, UC : UNCONFINED COMPRESSION TEST UU : UNCONSOLIDATED UNDRAINED TRIAXIAL TEST ON SPT (N) value if undisturbed sample is not available	R TEST, RIAXIAL 1	EST					CHAINAGE . IR	<u>د</u> ن		4 + + + + + + + + + + + + + + + + + + +	· 1411 + 143 (BRIDGE NO 215)	E E	Ö 315											
		Date of	Undisturb	ned Samp	Date of Undisturbed Samples Tested : 07.11.2016 to 08.11.2016	016 to 0	11 201	و			Homes Janes	EBRA						DFCC BRIDGE No.	RIDGE		215	į													
		Date of	Tests on	Disturbe	Date of Tests on Disturbed Samples / Consolidation Tests: 07.11.2016 to 10.11.2016	dation T	ests:0	7.11.201	5 to 10.11	2016		63																							



New Delhi

CALCULATIONS FOR CORRECTED SPT (N) VALUES

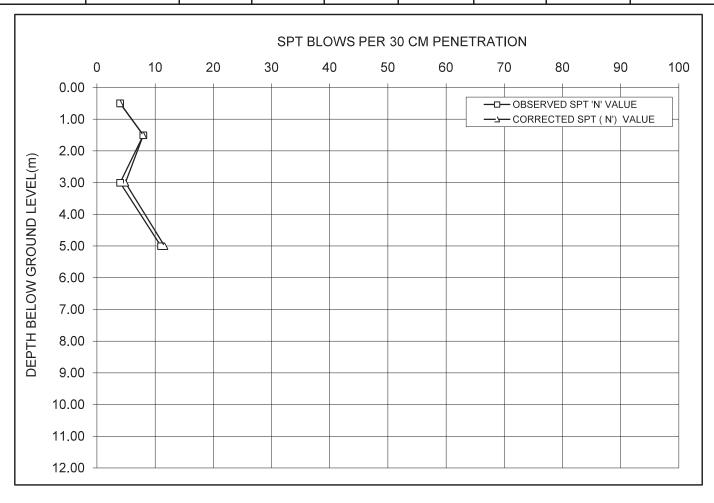
PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

CHAINAGE: IR: 1411 + 143 (Bridge No. 215)

BORE HOLE NO: 1

GWT depth below EGL (m): Not Met

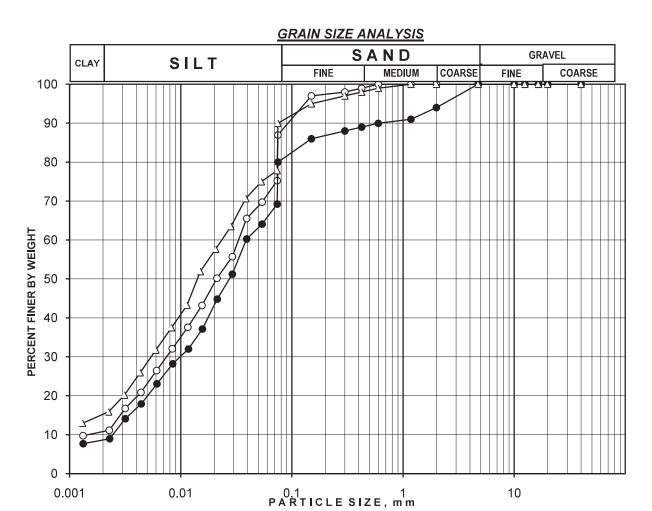
DEPTH OF SAMPLE	TYPE OF SOIL	γ _{bulk} (Bulk Unit Weight), t/m³	OVERBURDEN PRESSURE (t/m²)	OVERBURDEN PRESSURE (kg/cm²)	OVERBURDEN CORRECTION FACTOR	OBSERVED SPT 'N' VALUE	CORRECTED SPT (N') VALUE (FOR OVERBURDEN)	FINAL CORRECTED VALUE AFTER DILATANCY CORRECTION (N")
		1.65						
0.50	Plastic	1.65	0.83	0.083	1.00	4	4.00	4
1.50	Plastic	1.72	2.48	0.248	1.00	8	8.00	8
3.00	Non Plastic	1.70	5.06	0.506	1.23	4	4.92	5
5.00	Non Plastic	1.75	8.46	0.846	1.06	11	11.64	12





PROJECT: : GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

CHAINAGE: IR: 1411 + 143 DFCC BRIDGE No.:215



Symbol	BH No.	Depth, m	Soil Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Cu	C _c
0	1	0.00	Sandy CLAY / Silty CLAY of low Plasticity (CL)	0.00	13.00	77.00	10.00	22.83	1.16
•	1	1.00	Sandy CLAY / Silty CLAY of low Plasticity (CL)	0.00	20.00	72.00	8.00	15.88	1.03
Δ	1	2.50	Sandy CLAY / Silty CLAY of low Plasticity (CL)	0.00	10.00	77.00	13.00		

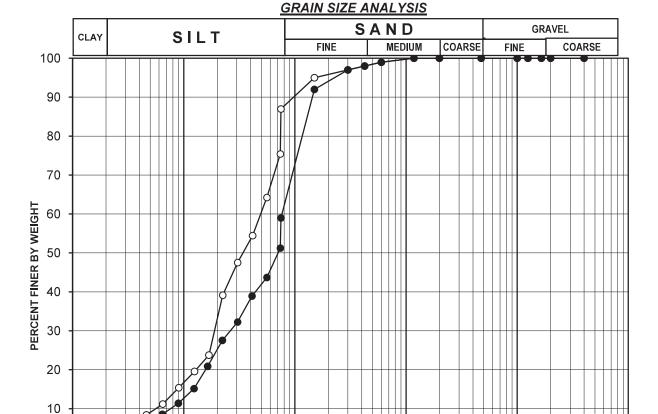


PROJECT: : GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

CHAINAGE: IR: 1411 + 143 DFCC BRIDGE No.:215

0.001

0.01



Symbol	BH No.	Depth, m	Soil Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Cu	C _c
0	1	3.00	sandy SILT with nominal Clay (ML)	0.00	10.00	77.00	13.00	ı	-
•	1	5.00	sandy SILT with nominal Clay (ML)	0.00	41.00	56.00	3.00	10.07	1.18

0.1 PARTICLE SIZE, mm 10



DETERMINATION OF SILT FACTOR

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

STRUCTURE: 1411+143 (Bridge No. 215)

BORE HOLE NO.: : 01

DEPTH, M: : 0.00-1.00

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.75	6.00	4.750	28.500		
2	3.00	3.375	10.125		
1.18	2.00	1.590	3.180		
0.6	1.00	0.890	0.890		
0.425	1.00	0.513	0.513	0.478	1.217
0.3	1.00	0.363	0.363		
0.15	1.00	0.225	0.225		
0.075	11.00	0.113	1.238		
PAN	74.00	0.038	2.775		
	100.00		47.808		

DEPTH, M: : 1.00-2.50

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.75	0.00	4.750	0.000		
2	6.00	3.375	20.250		
1.18	3.00	1.590	4.770		
0.6	1.00	0.890	0.890		
0.425	1.00	0.513	0.513	0.309	0.979
0.3	1.00	0.363	0.363		
0.15	2.00	0.225	0.450		
0.075	6.00	0.113	0.675		
PAN	80.00	0.038	3.000		
	100.00		30.910		



DETERMINATION OF SILT FACTOR

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

STRUCTURE: 1411+143 (Bridge No. 215)

BORE HOLE NO.: : 01 DEPTH, M : : 2.50-3.00

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.75	0.00	4.750	0.000		
2	0.00	3.375	0.000		
1.18	0.00	1.590	0.000		
0.6	1.00	0.890	0.890		
0.425	1.00	0.513	0.513	0.062	0.437
0.3	1.00	0.363	0.363		
0.15	2.00	0.225	0.450		
0.075	5.00	0.113	0.563		
PAN	90.00	0.038	3.375		
	100.00		6.153		

DEPTH, M: : 3.00-5.00

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.75	0.00	4.750	0.000		
2	0.00	3.375	0.000		
1.18	0.00	1.590	0.000		
0.6	1.00	0.890	0.890		
0.425	1.00	0.513	0.513	0.064	0.444
0.3	1.00	0.363	0.363		
0.15	2.00	0.225	0.450		
0.075	8.00	0.113	0.900		
PAN	87.00	0.038	3.263		
	100.00		6.378		

DEPTH, M: : 5.00-5.45

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.75	0.00	4.750	0.000		
2	0.00	3.375	0.000		
1.18	0.00	1.590	0.000		
0.6	1.00	0.890	0.890		
0.425	1.00	0.513	0.513	0.088	0.523
0.3	1.00	0.363	0.363		
0.15	5.00	0.225	1.125		
0.075	33.00	0.113	3.713		
PAN	59.00	0.038	2.213		
	100.00		8.815		



New Delhi

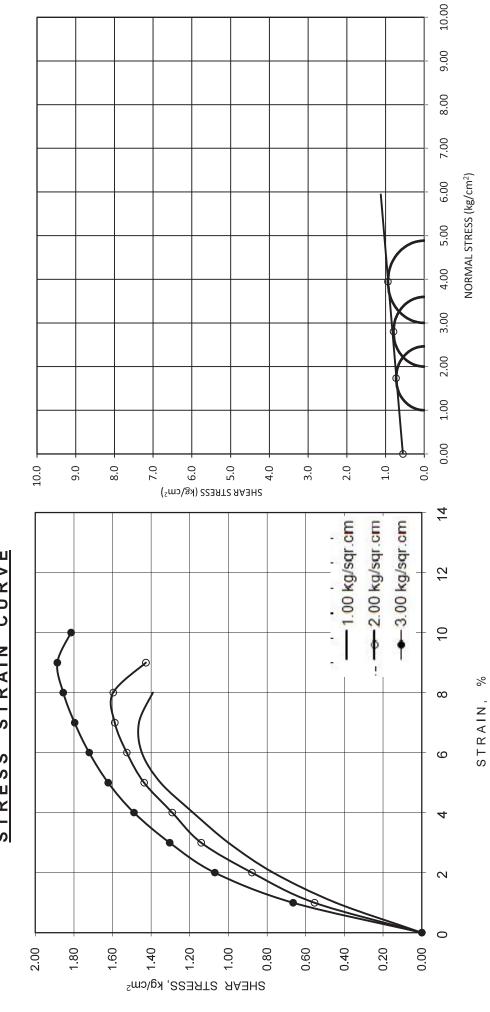
UNCONSOLIDATED UNDRAINED TRIAXIAL SHEAR TEST

rehole No. 1	Depth, m	2.50	Dry Density (gm/cc)	1.52	"c" kg/cm²= 0.55	"φ" Degree= 5
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CHAINAGE: IR: 1411+143 (DFCC BRIDGE NO. 215)

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

CURVE STRAIN STRESS





New Delhi

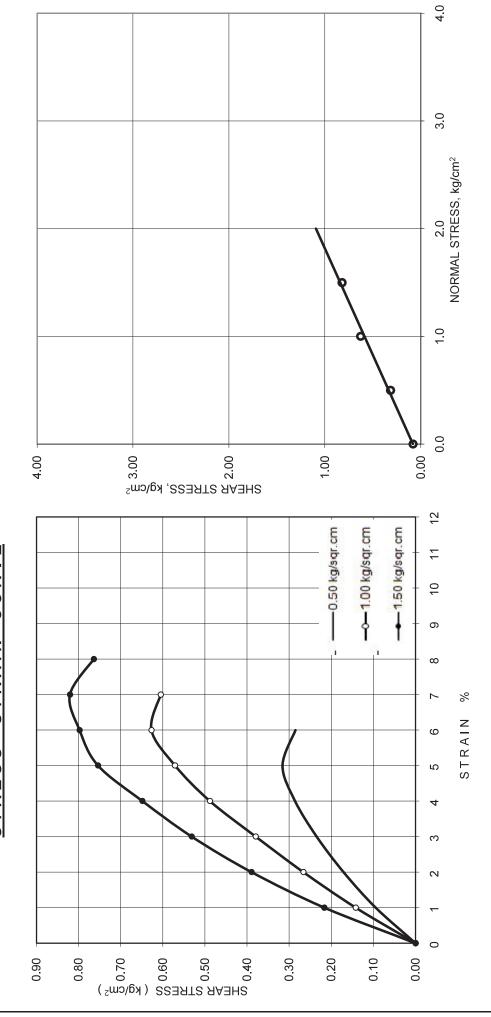
DIRECT SHEAR TEST

	rehole No. 1	Depth, m 1		Dry Density (qm/cc)	1.50	$"c" kg/cm^2 = 0.08$	"4" Degree 26.8
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CHAINAGE: IR: 1411+143 (DFCC BRIDGE NO. 215)

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

STRESS STRAIN CURVE



INDIAN GEO	INDIAN GEOTECHNICAL SERVICES New Delhi	
0.00m 0.00m 5.00m 10.00m 15.00m	BORFHOLF PROFILE BH-1 N-Value - 9 - 12 - 15 7.45m	
PROJECT : GEOTECHNICAL INVESTIGATIONS FOR	LEGEND	
DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).		PTION
	Silty SAND (SM)	D (SM)
CHAINAGE DFCC: 1411+904 (Bridge No. 216)	Ground water Table	iter Table
DECC BRIDGE NO :		

BOREH	BOREHOLE NO 01	01									DATE STARTED:	04/11	04/11/2016					_	ND	AN	GE(OTE	CH	N	AL S	INDIAN GEOTECHNICAL SERVICES	CES	(0					30	Super Contract Contra	
REDUC	REDUCED LEVEL OF GROUND BORE (M)	EL OF G	ROUN	ID BORE	: (M):						DATE COMPLETED:		04/11/2016									ž	New Delhi)e∏	=									No.	
			Ē	IELD TE	FIELD TEST RESULTS	(0															Y	BORA	TORY	TEST	LABORATORY TEST RESULTS	TS									
						1011				N	F	c	-	1 0 14	0.000	-							(u	_	붕	AR STRENG	Ŧ				Cher	Chemical Analysis Result	alysis R	esult	
	MC		•0	/3	S.	SPI IESI RESULIS	KESUL	n e		OITA.	нπνν	3 3TC	5	AIN SIZ	E ANAL 1	<u>n</u>			1.	1-	1%	(0.1	uno,t)		CHA	CHARACTERISTICS	S	°O		0,	SOIL SAMPLE	APLE	WATE	WATER SAMPLE	쁘
SABTEM IN METERS	BEFERENCE	ONIJAMAS TO BRUTAN	SAMPLE REFERENCE N	JBAT RETER TABL L.W.L	ОЕРТН ІИ МЕТЕRS	NO' OL BLOWS	PENETRATION (CM)	N, VALUE (Recorded)	N, VALUE (Corrected)	SYMBOLIC REPRESENT	DESCRIPTION OF SOIL	TYPE OF TEST CONDUC YROTAROBAL EHT NI	GRAVEL (%)	(%) GNAS	SILT (%)	CF∀\ (%)	רוסחום רושוב (%)	(%) PLASTIC LIMIT (%)	PLASTICITY INDEX (%) BULK DENSITY (1/ cum.	*DRY DENSITY (foum)	MOISTURE CONTENT (YTIVASO SIPISAS	SUBMERGED DENSITY	FREE SWELL INDEX, %	Cohesion, C,	(Vagm.) Angle of friction (Degrees)	,9 (OITAЯ GIOV	COWPRESSION INDEX	PRECONSOLIDATION	PRESSURE, kg/cm²	Chloride, %	Sulphate, %	Hq	Chloride, mg/l	Sulphate, mg/l
0.000	0.5	SO	1		0.00 - 0.50					4.000.000		I	0.00	68.00	8	0.00	Non	Non Plastic		1		1		1			1	I	1		ı	I	I	ı	1 1
	1.0	SPT	1		0.50 - 0.95	9	30	9	80																										
	1.5	san	1		1.00 - 1.30							DST	0.00	65.00	35.00	00.00	Non	Non Plastic	÷	1.66 1.52		9.10 2.63	33 0.94	4 	0.00	0 28.00	1	ı		6.80	0.01	0.09	I	ı	1
	2.0	SPT	2		1.50 - 1.95	თ	30	o	13																										
	3.0	sa/san	2		2.50 - 2.80		Slipped			Table 1	_																								
-4.000	4.0	SPT	3	4.00m	3.00 - 3.45	12	30	12	15		grey Silty SAND (SM)																								
	5.0	SPT	4	li.	4.50 - 4.95	13	30	13	15			Ţ	00.00	75.00	25.00	00.00	Non	Non Plastic	<u>'</u>	1		1	'			I	ı	I			I	I	I	ı	1
	6.0	SG/SGN	2		5.50 - 5.80		Slipped																												
	7.0	SPT	2		6.00 - 6.45	15	30	15	15																										
-8.000	8.0	SPT	9		7.00 - 7.45	5	30	15	15		7.45m	l E	0.00		56.00 44.00	0.00	Non	Non Plastic		1		- 2.64	- 40 - I	-		I	1	-	-	- 1	1	I	I	1	1
NOTE	1. CLASS	MFICATION	N OF SO	JIL AS PE	1. CLASSIFICATION OF SOIL AS PER IS: 1498												а.	PROJECT	_	<u></u>	EOTE(HNICA	LINVE	зпса	IONS FO	GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).	02 DADI	Z TO K	KHURJ	A (APP	ROX.	50 KM).			
	2, ABBRI : DS = DIE + = TEST (*=Dry Dens	2. ABBREVATION USED : DS = DISTURBED SAMPL + = TEST ON REMOULDED *=Dry Density is assumed bas	USED SAMPLE, LDED SA, red based	, SPT = ST AMPLES, U don SPT (N	ANDARD PENETF C : UNCONFINED I) value if undisturb	RATION COMPF ed samp	TEST. I	JDS = U ITEST avallable	NDISTUF UL	RBED S/	2. ABBREVATION USED S. DES DESTURBED SAMPLE. SPT = STANDARD PENETRATION TEST. UDS = UNDISTURBED SAMPLE. DST = DRECT SHEAR + = TEST ON REMOULDED SAMPLES, U.C UNCONFINED COMPRESSION TEST "Dny Density is assumed based on SPT (N) yalue if undisturbed sample is not available	SHEAR TEST, INED TRIAXIAL TEST	EST				C	CHAINAGE: IR	<u>ين</u> پز	1.	11+90	(BRID	: 1411+904 (BRIDGE NO. 216)	216)											
		Date of Un	disturbec	d Samples	Date of Undisturbed Samples Tested : 11.11.2016 to 12.11.2016	16 to 12	.11.2016				A Paparal Constant	-						DFCC BRIDGE No.	IDGE N			į		Î											
		Date of Tes	sts on Die	isturbed Sa	Date of Tests on Disturbed Samples / Consolidation Tests : 11.11.2016 to 14.11.2016	ation Te	sts : 11.	11.2016	to 14.11.	2016																									



New Delhi

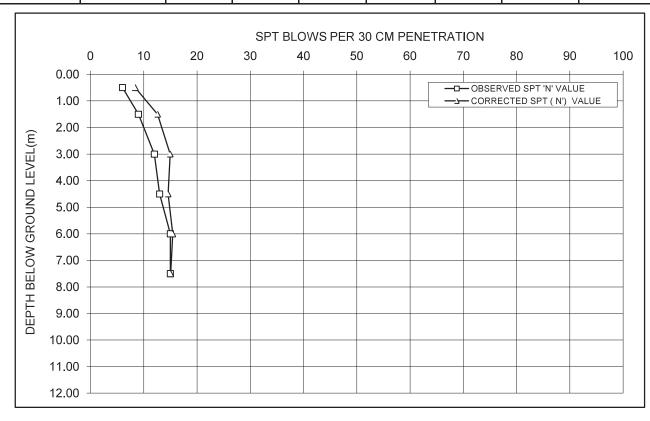
CALCULATIONS FOR CORRECTED SPT (N) VALUES

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

CHAINAGE: IR: 1411+904 (BRIDGE NO. 216) BORE HOLE NO: 1

DFCC BRIDGE No.: GWT depth below EGL (m): 4.00

DEPTH OF SAMPLE	TYPE OF SOIL	γ _{bulk} (Bulk Unit Weight), t/m³	OVERBURDEN PRESSURE (Vm²)	OVERBURDEN PRESSURE (kg/cm²)	OVERBURDEN CORRECTION FACTOR	OBSERVED SPT 'N' VALUE	CORRECTED SPT (N') VALUE (FOR OVERBURDEN)	FINAL CORRECTED VALUE AFTER DILATANCY CORRECTION (N")
		1.60						
0.50	Non Plastic	1.60	0.80	0.080	1.40	6	8.40	8
1.50	Non Plastic	1.66	2.40	0.240	1.40	9	12.60	13
3.00	Non Plastic	1.80	4.80	0.480	1.25	12	14.97	15
4.50	Non Plastic	1.95	7.00	0.700	1.12	13	14.57	15
6.00	Non Plastic	1.95	8.43	0.843	1.06	15	15.89	15
7.50	Non Plastic	1.95	9.85	0.985	1.01	15	15.10	15

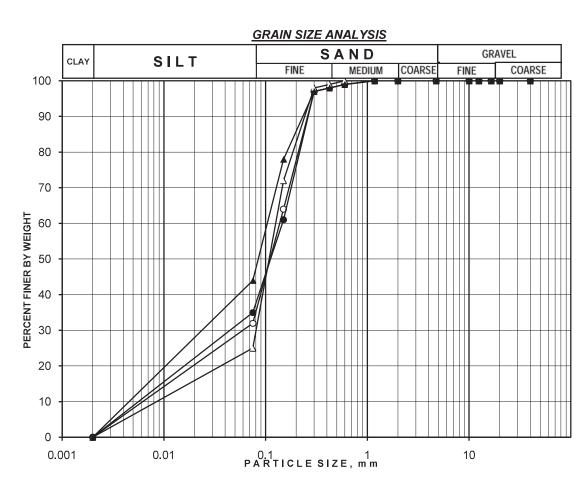




PROJECT: : GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

CHAINAGE: IR: 1411+904 (BRIDGE NO. 216)

DFCC BRIDGE No.:



Symbol	BH No.	Depth, m	Soil Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	C _u	C _c
0	1	0.00		0.00	68.00	32.00	0.00	22.16	4.19
•	1	1.00	Silty SAND (SM)	0.00	65.00	35.00	0.00	25.93	2.43
Δ	1	4.50	Silty SAND (Sivi)	0.00	75.00	25.00	0.00	14.74	6.09
A	1	7.00		0.00	56.00	44.00	0.00	22.80	1.18



DETERMINATION OF SILT FACTOR

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

STRUCTURE DFCC BRIDGE No : at CHAINAGE: IR : 1411+904

BORE HOLE NO. 1

DEPTH (m) 0.00-1.00

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.750	0.00	4.750	0.000		
2.000	0.00	3.375	0.000		
1.180	0.00	1.590	0.000		
0.600	1.00	0.890	0.890		
0.425	1.00	0.513	0.513	0.140	0.658
0.300	1.00	0.363	0.363		
0.150	33.00	0.225	7.425		
0.075	32.00	0.113	3.600		
PAN	32.00	0.038	1.200		
	100.00		13.990		

DEPTH (m) 1.00-4.50

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.750	0.00	4.750	0.000		
2.000	0.00	3.375	0.000		
1.180	0.00	1.590	0.000		
0.600	1.00	0.890	0.890		
0.425	1.00	0.513	0.513	0.141	0.661
0.300	1.00	0.363	0.363		
0.150	36.00	0.225	8.100		
0.075	26.00	0.113	2.925		
PAN	35.00	0.038	1.313		
	·	·	·		
	100.00		14.103		

DEPTH (m) 4.50-7.00

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.750	0.00	4.750	0.000		
2.000	0.00	3.375	0.000		
1.180	0.00	1.590	0.000		
0.600	0.00	0.890	0.000		
0.425	1.00	0.513	0.513	0.130	0.633
0.300	1.00	0.363	0.363		
0.150	26.00	0.225	5.850		
0.075	47.00	0.113	5.288		
PAN	25.00	0.038	0.938		
	100.00		12.950		



DETERMINATION OF SILT FACTOR

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

STRUCTURE DFCC BRIDGE No : at CHAINAGE: IR : 1411+904

BORE HOLE NO. 1

DEPTH (m) 7.00-7.45

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.750	0.00	4.750	0.000		
2.000	0.00	3.375	0.000		
1.180	0.00	1.590	0.000		
0.600	1.00	0.890	0.890		
0.425	1.00	0.513	0.513	0.115	0.597
0.300	1.00	0.363	0.363		
0.150	19.00	0.225	4.275		
0.075	34.00	0.113	3.825		
PAN	44.00	0.038	1.650		
	100.00		11.515		



New Delhi

SHEAR TEST

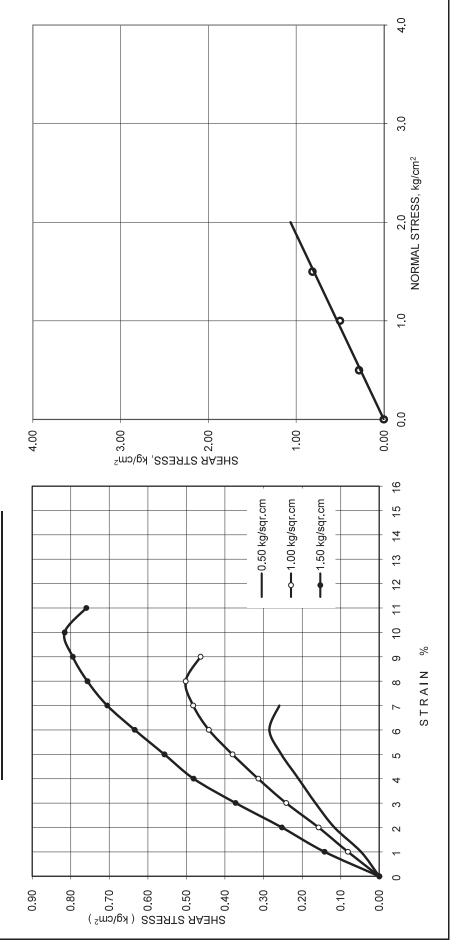
DIREC

	Borehole No. 1	Depth, m 1.00	Dry Density (gm/cc)	1.52	"c" kg/cm²= 0.00	"d" Degree= 28.0
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CHAINAGE: 1411 + 904 (Bridge No. 216)

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC PACKAGE-302 DADRI TO KHURJA (APPROX. 50 KM)

STRESS STRAIN CURVE



INDIAN GE	OTECHNICA New Delhi	L SERVICES	
0.00m 	BH-1 N-Value - 7 - 6 - 8 - 9 5.45m	FILE	
PROJECT : GEOTECHNICAL INVESTIGATIONS FOR		LEGEND	
DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).	SYMBOL		CRIPTION
		Sandy	/ SILT (ML)
CHAINAGE DFCC: 1413+130			

DFCC BRIDGE NO: 217

BORE	BOREHOLE NO. 01	. 01									DATE STARTED:	28/10/201	72016					Z	IAN	I GE	OT	땁		AL	SER	INDIAN GEOTECHNICAL SERVICES	S					S. Car	A Y De
REDUC	ED LEV	REDUCED LEVEL OF GROUND BORE (M):	ROUN	D BOR	E (M):						DATE COMPLETED:	28/10/201	//2016								_	ew	New Delhi	h								STATE OF THE PARTY	To some
			Ē	ELD TE	FIELD TEST RESULTS	TS														_	ABOR,	ATOR	/ TEST	LABORATORY TEST RESULTS	LTS								
					· · · ·	SPT TEST RESULTS	TRESU	TS		NO	Н	а	98	AIN SIZE	GRAIN SIZE ANALYSIS								(w	₩.	SHEAR STRENGTH	NGTH.				Che	Chemical Analysis Result	nalysis F	Result
	MO		.01	/ 3						ITA1	L i M	ЭТС							(*		(%)		под)	Ŭ D	ARACTER	SIICS		°O		SOIL SAMPLE	MPLE	WAT	WATER SAMPLE
SAETEM IN METERS	DEPTH IN METERS BEL	DNIJAMAS 70 BRUTAN	SAMPLE REFERENCE N	JBAT SETAW TO JEVEL L.W.L	2ЯЭТЭМ ИІ НТЧЭО	NO. OF BLOWS	реиеткатіои (см)	N, VALUE (Recorded)	N, VALUE (Corrected)	SYMBOLIC REPRESENT	DESCRIPTION OF SOIL	TYPE OF TEST CONDUC YAOTAЯO8AJ ЭНТ И	(%) J∃VARĐ	(%) DNAS	(%) XV IS	CLAY (%)	PLASTIC LIMIT (%)	(%) X∃UNI \INDEX (%)	BULK DENSITY (t/cum	*DRY DENSITY (Vcum)	MOISTURE CONTENT	SPECIFIC GRAVITY	SUBSTITUTE SOURCE SOURC	FREE SWELL INDEX, % Cohesion, C,	(redm.) Angle of friction	(Degrees)	.9 ,OITAЯ GIOV	COMPRESSION INDEX	PRESSURE, kg/cm²	PH Chloride, %	Sulphate, %	Hq	Ngm ,əbinold
000.0	0.5	DS	~		0.00 - 0.50							1	00.00	36.00	60.00	4.00	Non Plastic	ijc	Į	ı	ı	ſ	· I	· I	ı	I	ı		ı I	I I		ļ	I
	1.0	SPT	-	,	0.50 - 0.95	7	30	7	10																								
	1.5	Sau	_	diW te	1.00 - 1.30						Loose Yellowish grey Sandy SILT with nominal Clay (ML)	DST	0.00	41.00	56.00 3.	3.00	Non Plastic	tic	1.70	1.50	13.60	2.64 0	0.93	· · · · · · · · · · · · · · · · · · ·	0.50	27.00	ı	1	- 6.	6.90 0.02	0.10	1	ı
	2.5	SPT	2	M toN	1.50 - 1.95	9	30	9	σ																								
	3.0	SG/SGN	2		2.50 - 2.80		Slipped	و			3,0m																						
	4.0	SPT	ю		3.00 - 3.45	ω	30	∞	10	1	Loose grey Sandy SILT	I	0.00	68.00	62.00	0.00	Non Plastic	ijc	ı	ı	1	2.63	ı	· I	ı	1	I	1	·	1	- I	ı	ı
-5.000	5.0	SPT	4		5.00 - 5.45	o	30	თ	o		(ML) 5.45m																						
NOTE:	1, CLAS	SIFICATION	N OF SO	IL AS P	1. CLASSIFICATION OF SOIL AS PER IS: 1498												PROJECT	ECT	••	GEOT	ECHNIC	AL INV	ESTIGA	TIONS	OR DFC	: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).	DRI TO	KHUR	JA (AP	PROX	50 KM	÷	
	2. ABBR : DS = DI + = TEST *=Dry Den	2. ABBREVATION USED : DS = DISTURBED SAMPLI + = TEST ON REMOULDED: *=Dry Density is assumed bas	USED SAMPLE, ILDED SA	SPT = S MPLES, L on SPT (I	STANDARD PENE UC : UNCONFINE 'N) value if undistu	ETRATIO ED COMF Irbed san	N TEST PRESSIC nple is n	. UDS = ON TEST ot availat	UNDIST	TURBED UU : UN	2. ABBREVATION USED 1. SE = DIXHUBEL SAMPLE, SPT = STANDARD PENETRATION TEST. UDS = UNDISTURBED SAMPLE, DIRECT SHEAR TEST. 1. SET ON REMOULDED SAMPLES, UC: UNCONFINED COMPRESSION TEST 1. EDY Density is assumed based on SPT (N) value if undisturbed sample is not available	TEST, RAXIAL TI	TSE				Z	G. HAINAGE		, , ,	. 1443 ± 430 (Bridge No. 247)	oN app	177										
		Date of Un	disturbed	1 Samples	Date of Undisturbed Samples Tested : 09.11.2016 to 10.11.2016	2016 to 1	10 11 20	16			A A Land A Comment	Cont.					DFCC	DFCC BRIDGE No.	Š.	217	i Ž												
		Date of Tes	sts on Die	sturbed S	Date of Tests on Disturbed Samples / Consolidation Tests: 09.11.2016 to 12.11.2016	Idation 1	Tests : 0	9 11 201	16 to 12.1	11.2016															ļ								



New Delhi

CALCULATIONS FOR CORRECTED SPT (N) VALUES

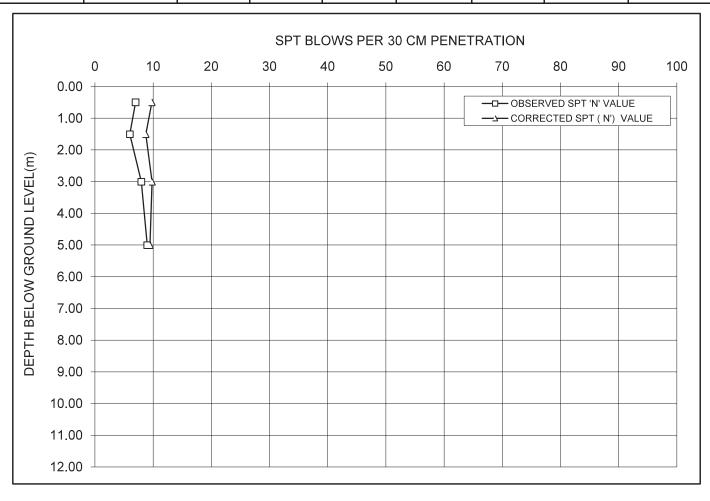
PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

CHAINAGE: IR: 1413 + 130 (Bridge No. 217)

BORE HOLE NO: 1

GWT depth below EGL (m): Not met

DEPTH OF SAMPLE	TYPE OF SOIL	γ _{bulk} (Bulk Unit Weight), t/m³	OVERBURDEN PRESSURE (t/m²)	OVERBURDEN PRESSURE (kg/cm²)	OVERBURDEN CORRECTION FACTOR	OBSERVED SPT 'N' VALUE	CORRECTED SPT (N') VALUE (FOR OVERBURDEN)	FINAL CORRECTED VALUE AFTER DILATANCY CORRECTION (N")
		1.70						
0.50	Non Plastic	1.70	0.85	0.085	1.40	7	9.80	10
1.50	Non Plastic	1.70	2.55	0.255	1.46	6	8.75	9
3.00	Non Plastic	1.75	5.10	0.510	1.23	8	9.82	10
5.00	Non Plastic	1.75	8.60	0.860	1.05	9	9.47	9

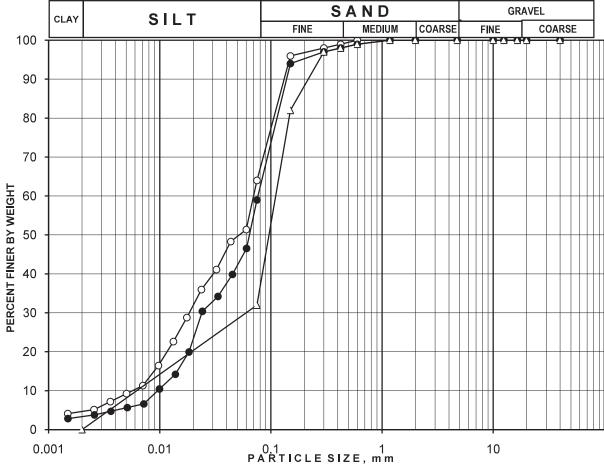




PROJECT: : GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

CHAINAGE: IR: 1413 + 130 DFCC BRIDGE No.: 217





Symbol	BH No.	Depth, m	Soil Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Cu	C _c
0	1	0.00	Sandy SILT with nominal Clay (ML)	0.00	36.00	60.00	4.00	12.28	0.86
•	1	1.00	Sandy SILT with nominal Clay (ML)	0.00	41.00	56.00	3.00	7.98	0.78
Δ	1	3.00	Sandy SILT(ML)	0.00	68.00	32.00	0.00	17.81	5.21



DETERMINATION OF SILT FACTOR

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

STRUCTURE: 1413+130 (Bridge No. 217)

BORE HOLE NO.: : 01

DEPTH, M: : 0.00-1.00

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.75	0.00	4.750	0.000		
2	0.00	3.375	0.000		
1.18	0.00	1.590	0.000		
0.6	0.00	0.890	0.000		
0.425	1.00	0.513	0.513	0.073	0.476
0.3	1.00	0.363	0.363		
0.15	2.00	0.225	0.450		
0.075	32.00	0.113	3.600		
PAN	64.00	0.038	2.400		
	100.00		7.325		

DEPTH, M: : 1.00-3.00

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.75	0.00	4.750	0.000		
2	0.00	3.375	0.000		
1.18	0.00	1.590	0.000		
0.6	1.00	0.890	0.890		
0.425	1.00	0.513	0.513	0.086	0.516
0.3	1.00	0.363	0.363		
0.15	3.00	0.225	0.675		
0.075	35.00	0.113	3.938		
PAN	59.00	0.038	2.213		
	100.00		8.590	+	

DEPTH, M: : 3.00-5.45

SIEVE SIZE (mm)	PERCENTAGE RETAINED	AVERAGE SIZE OF SIEVE	2 X 3	MEAN DIAMETER (Dm), mm	SILT FACTOR, f
1	2	3	4	4/100	
4.75	0.00	4.750	0.000		
2	0.00	3.375	0.000		
1.18	0.00	1.590	0.000		
0.6	1.00	0.890	0.890		
0.425	1.00	0.513	0.513	0.120	0.609
0.3	1.00	0.363	0.363		
0.15	15.00	0.225	3.375		
0.075	50.00	0.113	5.625		
PAN	32.00	0.038	1.200		
	100.00		11.965	+	



New Delhi

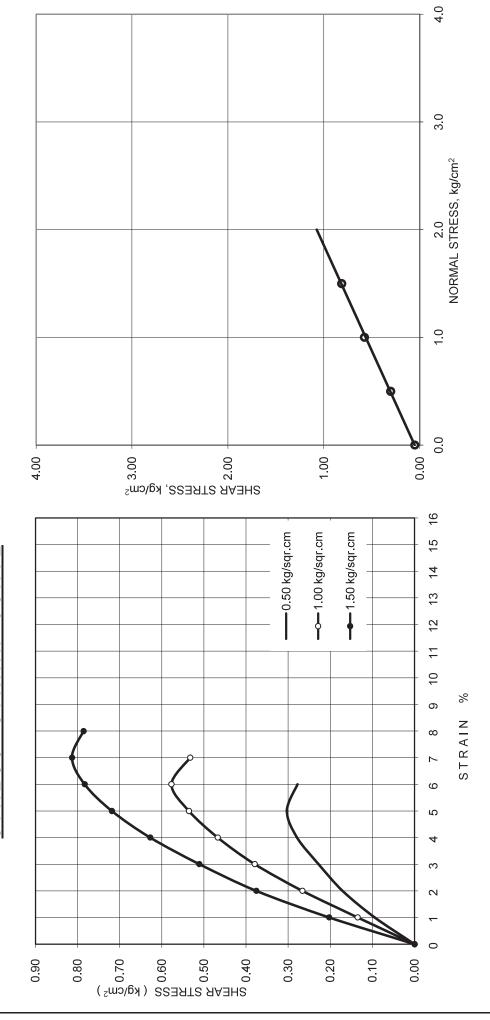
DIRECT SHEAR TEST

"¢" Degree= 27.0
"c" kg/cm²= 0.05
1.50
Dry Density (gm/cc)
1.00
Depth, m
Borehole No. 1

CHAINAGE: IR: 1413+130 (DFCC BRIDGE NO: 217)

PROJECT: GEOTECHNICAL INVESTIGATIONS FOR DFCC 302 DADRI TO KHURJA (APPROX. 50 KM).

STRESS STRAIN CURVE



Typical Computation of Liquefaction Potential by Simplified Seed & Idriss Method Strcuture No

10.5 t/m2

Dead load of Box:											
		Е	Ε	%	mm	٤				E	E
		Not Met	0	45	150	3	Without Liner	Clay	986-0	202,518	205.847
	Borelog Details	Depth of Water Table	oth of Water Table Considered	Energy delivered	Borehole Diameter	Rod Length	Presence of Liner	Soil Type	Hammer Correction	RL of Founding Level	RL of Ground Level

Earthquake Details	
Seismic Zone	VI
Zone Factor, Z	0.24
Importance Factor, I	1
Site Factor, S	1
a _{max} /g	0.24
Magnitude of Earthquake	6.5

1.45
Magnitude Scaling Factor, MSF, K

Кетатк	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
SH	>1	>1	>1	>1
свв	0.175	0.175	0.286	0.260
°″2882	0.121	0.121	0.197	0.180
CSR	0.162	0.174	0.187	0.200
K	11	1	1	1
Corr for High Overburden stress,K _o	1.00	1.00	1.00	1.00
1	8.0	0.8	8.0	8.0
,	1.00	66.0	86.0	96 0
Relative density, Dr (%)	15	15	35	35
(N¹)	11	11	18	17
⁰⁹ (¹N)	4.9	4.9	11.2	6.6
q	1.2	1.2	1.2	1.2
е	2.0	2.0	2.0	2.0
"э	0.986	986.0	986.0	1.05 0.986 5.0
ົ ວ	1.05	1.05	1.05	-
CE	0.75	0.75	0.75	0.85
°C	1.05	1.05	1.05	1.05
³o	0.75	0.75	0.75	0.75
C ^N	2.00	2.00	1.84	1.43
(kPa) ', (kPa)	0.46	1.38	2.84	4.70
s^(kPa)	96.0	2.88	5.84	9.78
Sub, density of soil (kN/m³)	0.92	0.92	0.97	0.93
Sat. density of soil	1.92	1.92	1.97	1.93
⁰⁹ N	4	4	10	10
%Fine	74	85	92	83
gr оџ гауег (m)	205.347	204.347	202.847	200.847

0.5 1.5 3

Box:

Depth (m)

Detailed Design Consultancy Services for Dadri-Khurja Section of Eastern Dedicated Freight Corridor (Package – 302)

Typical Computation of Liquefaction Potential by Simplified Seed & Idriss Method
Strcuture No
MIB 212

10.5 t/m2

Dead load of Box:

	VI	0.24	1	1	0.24	6.5
Earthquake Details	Seismic Zone	Zone Factor, Z	Importance Factor, I	Site Factor, S	a _{max} /g	Magnitude of Earthquake

9.5

1.45 Magnitude Scaling Factor, MSF, K

Borelog Details		
Depth of Water Table	2.4	٤
Depth of Water Table Considered	0	٤
Energy delivered	45	%
Borehole Diameter	150	шш
Rod Length	8	٤
Presence of Liner	Without Liner	
Soil Type	Clay	
Hammer Correction	986.0	
RL of Founding Level	202.168	E
RL of Ground Level	203 612	E

Box:

Debtի (ա)

3 3

			_
Кетагк	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
FS	>1	>1	>1
свв	0.236	0.429	0.365
°′288	0.163	0.296	0.252
CSR	0.174	0.187	0.199
К [«]	1	1	1
Corr for High Overburden stress,K _e	1.00	1.00	1.00
j.	8.0	0.8	0.8
P.J	66.0	96.0	96.0
Relative density, Dr (%)	35	35	35
(N)	15	25	23
⁰⁹ (¹ N)	9.8	16.8	14.7
q	1.2	1.2	1.2
е	2.0	5.0	5.0
[#] ɔ	986.0	0.986	0 986 2 0
°C	1.05	1.05	1.05
C	0.75	0.75	0.75
⁸ 0	1.05	1.05	1.05
³ɔ	0.75	0.75	0.75
°C	2.00	1.83	1.42
(kPa) 'z	1.41	2.85	4.77
s^(кЬ ց)	2.91	5.85	6.77
Sub. density of soil (kN/m³)	0.94	96.0	0.96
Sat. density of soil (kN/m³)	1.94	1.96	1.96
⁰⁹ N	7	15	17
9ni7%	93	54	54
gך ot Layer (m)	202.112	200.612	198.612

S. March P. C. College

Section	
Dadri-Khurja	ckage - 302)
Services for	Corridor (Pa
Consultancy	ated Freight
etailed Design	f Eastern Dedic
Detailed Design Consultancy Services for Dadri-Khurja Section	of Eastern Dedicated Freight Corridor (Package - 302)

	Typical C	omputatio	Typical Computation of Liquefaction Potential by Simplified Seed & Idriss Method	Seed & Idriss Me	poq
			Strcuture No	MIB 213	13
			Dead load of Box: 11.5 t/m2		
Borelog Details				1	
Depth of Water Table	3.5	E			
Depth of Water Table Considered	0	٤			
Energy delivered	45	%			
Borehole Diameter	150	mm			
Rod Length	3	Е			
Presence of Liner	Without Liner				
Soil Type	Clay]
Hammer Correction	986.0				
RL of Founding Level	202.857	Е			
RL of Ground Level	203.432	٤			

	Earthquake Details	Seismic Zone	Zone Factor, Z	Importance Factor, I	Site Factor, S	6/ ^{xeu} e	
11.5 t/m2							
11.5							

1,45
Magnitude Scaling Factor, MSF, K

0.24

6.5

Magnitude of Earthquake

IV 0.24

Қетағк	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
S∃	>1	>1	7.1
свв	0.398	0.187	0.209
°′∠ชชว	0.275	0.129	0.144
CSR	0.172	0.184	0.196
K [«]	1	1	
Corr for High Overburden stress,K _o	1.00	1.00	1.00
į.	8.0	0.8	0.8
L ^q	66.0	86.0	96.0
Relative density, Dr (%)	35	15	15
(N ₁) ₆₀₀₅	24	12	13
₀₉ (₁ N)	15.9	2.6	7.0
q	1.2	1.2	1.2
е	2.0	2.0	5.0
[#] ɔ	986 0	986 0	1.05 0.986
°ɔ	1.05	1.05	1.05
^E D	0.75	0.75	0.75
⁵ 2	1.05	1.05	1.05
°c	0.75	0.75	0.75
C ⁿ	2.00	1.84	1.43
(_K թa)՝ (Հ	1.44	2.84	4.70
s^(kba)	2.94	5.84	9.70
Sub, density of soi l (kN/m³)	96.0	0.93	0.93
Sat. density of soil (kN√m³)	1.96	1.93	1.93
⁰⁹ N	13	2	8
%Fine	92	84	82
RL of Layer (m)	201.932	200.432	198.432
			1

33

Box:

Depth (m)

Detailed Design Consultancy Services for Dadri-Khurja Section of Eastern Dedicated Freight Corridor (Package – 302)

Typical Computation of Liquefaction Potential by Simplified Seed & Idriss Method
Strcuture No MIB 214

9 t/m2

Dead load of Box:

Earth	Earthquake Details	
Seismic Zone		ΝI
Zone Factor, Z		0.24
Importance Factor, I	r, I	1
Site Factor, S		1
g/xeme		0.24
Magnitude of Earthquake	nake	6.5

1.45 Magnitude Scaling Factor, MSF, K

alima a Galacia a		
Depth of Water Table	4	٤
Depth of Water Table Considered	0	٤
Energy delivered	45	%
Borehole Diameter	150	mm
Rod Length	3	٤
Presence of Liner	Without Liner	
Soil Type	Clay	
Hammer Correction	986'0	
RL of Founding Level	204.426	E
RL of Ground Level	205,048	<u>ا</u>

Box:

Debtի (ա)

3 3

Remark	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
FS	N	7.1	>1
СВВ	N	0.468	0.415
° ² 2Ы	N	0.323	0.286
ะระ	¥	0.191	0.204
κ [∞]	1	П	1
Corr for High Overburden stress,K _o	1.00	1.00	1.00
1	0.7	0.8	0.8
,	66.0	86.0	96.0
Relative density, Dr (%)	65	35	35
(N¹)	36	56	25
⁰⁹ (¹N)	25.7	17.8	16.4
q	1.2	1.2	1.2
е	5.0	5.0	5.0
"э	986.0	986.0	0.986
°c²	1.05	1.05	1.05
CE	0.75	0.75	0.75
[®] o	1.05	1.05	1.05
³ɔ	0.75	0.75	0.75
C ⁿ	2.00	1.82	1,41
(kPa) '¿z	1.44	2.88	4.800
s^(kPa)	2.940	5.880	9.800
Sub. density of soil	96.0	96.0	96.0
Sat. density of soil (kN√m³)	1.96	1.96	1.96
⁰⁹ N	21	16	19
%Fine	93	64	88
ВГ oţ Гяλєι (ш)	203.548	202.048	200.048

S. March P. C. College

Typical Computation of Liquefaction Potential by Simplified Seed & Idriss Method
Strcuture No
MIB 215

8.5 t/m2 Dead load of Box:

Dea												
		٤	٤	%	mm	٤				Е	E	
		Not Met	5	45	150	3	Without Liner	Clay	986.0	205.215	207.315	
	Borelog Details	Depth of Water Table	Depth of Water Table Considered	Energy delivered	Borehole Diameter	Rod Length	Presence of Liner	Soil Type	Hammer Correction	RL of Founding Level	RL of Ground Level	

Box:

	IV	0.24	1	1	0.24	9'9
Earthquake Details	Seismic Zone	Zone Factor, Z	Importance Factor, I	Site Factor, S	a _{max} /g	Magnitude of Earthquake

_
1,45
Magnitude Scaling Factor, MSF, K

Remark	Non-Liquefiable	Non-Liquefiable	Liquefiable	Non-Liquefiable
S∃	>1	>1	0.97344	>1
свв	0.175	0.241	0.148	0.219
°″aaɔ	0.121	0.166	0.102	0.151
CSR	0.155	0.154	0,152	0.150
К [«]	1	1	1	1
Corr for High Overburden stress,K,	1.00	1.00	1.00	1.00
	8.0	8.0	8.0	8.0
P.J	1.00	66.0	86.0	96.0
Relative density, Dr (%)	15	35	15	35
soo9(¹ N)	11	16	6	14
⁰⁹ (¹ N)	4.9	8.9	3.1	7.6
q	1.2	1.2	1.2	1.2
е	5.0	5.0	2.0	2.0
[#] O	986.0	0.986	986.0	986.0
°C	1.05	1.05	1.05	1.05
CE	0.75	0.75	0.75	0.85
°2	1.05	1.05	1.05	1.05
³ɔ	0.75	0.75	0.75	0.75
°⊃	2.00	1.81	1.28	0.99
(_K թa)՝ (Հ	96.0	2.93	5.85	9.75
s^(kba)	86.0	2.93	5.85	9.75
Sub, density of soi l (kN/m³)	1.95	1.95	1.95	1.95
Sat. density of soil (kN√m³)	1.95	1.95	1.95	1.95
⁰⁹ N	4	8	4	11
%Fine	87	80	87	29
ВГ оţ Гэλєι (ш)	206.815	205.815	204.315	202.315
Depth (m)	0.5	1.5	Э	2

S. PARTICIPATION CO.

Typical Computation of Liquefaction Potential by Simplified Seed & Idriss Method Strcuture No MIB 216

t/m2	6	Dead load of Box:	
			٤
t/m2	6	Dead load of Box:	

Depth of Water Table Depth of Water Table Considered

Energy delivered Borehole Diameter

шш Ε % Without Liner Loose Sand 986.0 45 150

Ε Ε

204.158

RL of Founding Level RL of Ground Level

Box:

Hammer Correction

Soil Type

Presence of Liner Rod Length

Earthquake Details	
Seismic Zone	ΛI
Zone Factor, Z	0.24
Importance Factor, I	1
Site Factor, S	1
6/ ^{xeu} e	0.24
Magnitude of Earthquake	6.5

1,45
Magnitude Scaling Factor, MSF, K_m

C C C C C C C C C C							
Counting	Кетатк	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
Care line Care Car	S∃	7.	>1	>1	>1	>1	7
Cut. Layer (m) RL of Layer (m) Sat. density of soil Sat. dens	СВВ	0.210	0.282	0.276	0.295	0.327	0 305
Cutrine Sat. density of soil RL of Layer (m) Sat. density of soil Cutrin High Cutrin High Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of	°″28	0.145	0.194	0.191	0.203	0.225	0 210
Cutrine Sat. density of soil RL of Layer (m) Sat. density of soil Cutrin High Cutrin High Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of	CSR	0.164	0.182	0.194	0.201	0.297	0 295
Cutrine Sat. density of soil RL of Layer (m) Sat. density of soil Cutrin High Cutrin High Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of soil Cutrin High Sat. density of soil Sat. density of	K [«]	1	1	1	1	1	-
Consider St.	Corr for High Overburden stress,K _r	1.00	1.00	1.00	1.00	1.00	
Course 25 12 1.99 0.99 0.99 0.75 1.05 0.75 1.05 0.986 4.8 1.1 12.2 18 1.00 1.09 1.09 1.09 1.09 1.00 1.00 1.00	j.	8.0	8.0	8.0	8.0	8.0	
Course 25 12 1.99 0.99 0.99 0.75 1.05 0.75 1.05 0.986 4.8 1.1 12.2 18 1.00 1.09 1.09 1.09 1.09 1.00 1.00 1.00	r,	1.00	0.98	26.0	0.97	0.95	0 95
Course 25 12 1.99 0.99 6.965 3.465 1.66 0.75 1.05 0.86 4.3 1.11 12.2 13.34 14 15 2.01 1.01 13.980 7.00 1.20 1.20 1.20 1.20 1.20 1.20 1.20 1	Relative density, Dr (%)	35	35	32	35	35	35
CARREL 25 12 1.99 0.99 6.965 3.465 1.06 0.75 1.05 0.785 1.05 0.986 4.3 1.08 2.0 1 1.11 1.1270 5.990 1.75 1.05 0.75 1.05 0.986 1.3 1.08 2.0 1.11 1.1270 5.990 1.7 1.05 0.75 1.05 0.986 1.3 1.08 2.0 1.09 0.99 0.99 0.75 1.05 0.75 1.05 0.986 5.0 1.08 2.0 1.09 0.99 0.99 0.99 1.09 0.99 0.99 0.	(N)	13	18	18	19	21	20
CARREL 25 12 1.99 0.99 6.965 3.465 1.06 0.75 1.05 0.785 1.05 0.986 4.3 1.08 2.0 1 1.11 1.1270 5.990 1.75 1.05 0.75 1.05 0.986 1.3 1.08 2.0 1.11 1.1270 5.990 1.7 1.05 0.75 1.05 0.986 1.3 1.08 2.0 1.09 0.99 0.99 0.75 1.05 0.75 1.05 0.986 5.0 1.08 2.0 1.09 0.99 0.99 0.99 1.09 0.99 0.99 0.	09(,N)	7.3	11.0	12.2	13.2	13.1	12.2
Course 25 12 1.09 0.99 6.965 3.465 1.06 0.75 1.05 0.986 1.98 20.00 446 15 2.01 1.01 11.99 3.48 15 2.01 1.01 11.99 3.48 15 2.01 1.01 11.99 3.48 15 2.01 1.01 11.99 3.48 15 2.01 1.01 11.99 3.48 15 2.01 1.01 11.99 3.48 15 3.48 1.05 0.75 1.05 0.986 3.88 3.88 3.88 3.88 3.88 3.88 3.88 3.	q	1.2	1.2	1.1	1.1	1.2	1.2
Course 25 12 1.99 0.99 0.995 0.495 2.00 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.590 1.26 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.995 0.990 1.26 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.995 0.990 1.26 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.990 1.26 0.75 1.05 1.05 200.846 25 13 2.01 1.01 11.970 0.990 1.26 0.75 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.0	е	4.8	5.0	4.3	4.3	5.0	ر د
Course 25 12 1.99 0.99 0.995 0.495 2.00 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.590 1.26 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.995 0.990 1.26 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.995 0.990 1.26 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.990 1.26 0.75 1.05 1.05 200.846 25 13 2.01 1.01 11.970 0.990 1.26 0.75 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.0	°C	986.0	986 0	986'0	986'0	986 0	986 0
Course 25 12 1.99 0.99 0.995 0.495 2.00 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.590 1.26 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.995 0.990 1.26 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.995 0.990 1.26 0.75 1.05 200.846 25 13 2.01 1.01 11.970 0.990 1.26 0.75 1.05 1.05 200.846 25 13 2.01 1.01 11.970 0.990 1.26 0.75 1.05 1.05 1.05 1.05 1.05 1.05 1.05 1.0	C³	1.05	1.05	1.05	1.05	1.05	1 05
Course	C ^K		0.75	0.75	0.85	0.85	0.85
Course 25 12 1.99 0.99 6.965 3.465 1.66 1.08 2.00 1.20 1.30 8.47 1.01 1.1970 5.990 1.20 1.20 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.3	⁵ 2	1.05	1.05	1,05	1.05		1 05
204.846 (M) Sat. density of soil (kN/m³) 203.346 35 9 1.99 0.99 200.346 25 12 1.99 0.99 200.846 25 13 2.01 1.01 199.346 44 15 2.01 1.01 199.346 44 15 2.01 1.01	°C	0.75	0.75	0.75	0.75	0.75	0.75
204.846 (M) Sat. density of soil (kN/m³) 203.346 35 9 1.99 0.99 200.346 25 12 1.99 0.99 200.846 25 13 2.01 1.01 199.346 44 15 2.01 1.01 199.346 44 15 2.01 1.01	°C	2.00	2.00	1.66	1.46	1.26	1 17
204.846 (M) Sat. density of soil (kN/m³) 203.346 35 9 1.99 0.99 200.346 25 12 1.99 0.99 200.846 25 13 2.01 1.01 199.346 44 15 2.01 1.01 199.346 44 15 2.01 1.01	s^, (кթа)	0.495	1.98	3,465	4.475	5.990	7 000
204.846 25 12 1.99 Sat. density of soil (kN/m³) 203.846 25 12 1.99 203.846 44 15 2.01	(kPa) _v e	0.995	3.980	965	8,955	11.970	13 980
204.846 32 %hrine %hrine 203.346 35 9 200.846 25 12 200.846 4 1 15 18 18 18 18 18 18 18 18 18 18 18 18 18		66.0	0.99	66.0	1.01	1.01	101
204.846 25 200.846 200.846		1.99	1.99	1.99	2.01	2.01	2 01
204.846 RL of Layer (m) 200.846 846 848 848 848 848 848 848 848 848	⁰⁹ N	9	6	12	13	15	15
	9ui3%	32		25	25	44	44
Depth (m)	ВГ оі Гауег (m)	204.846	203.346	201.846	200.846	199.346	198 346
	Depth (m)	0.5	2	3.5	4.5	9	7

Typical Computation of Liquefaction Potential by Simplified Seed & Idriss Method

	t/m2
	13
	Dead load of Box:

			ľ
			ı
9			
9			
Σ			

Farthanake Details	
Seismic Zone	VI
Zone Factor, Z	0.2
Importance Factor, I	1
Site Factor, S	1
a _{max} /g	0.2
Magnitude of Earthquake	6.5

ш % Ε

45 150

Not Met

Borelog Details

Depth of Water Table Considered Depth of Water Table

Energy delivered Borehole Diameter

Ε

Without Liner Loose Sand

Presence of Liner Rod Length

Soil Type

1,45
Magnitude Scaling Factor, MSF, K

וומווווופו כמוו ככנומוו	RL of Founding Level	RL of Ground Level	

Box:

Ε Ε

202.482

986.0

			_	$\overline{}$
Қешэіқ	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
S∃	>1	>1	>1	>1
СВВ	0.236	0.215	0.245	0.243
°″ськ	0.163	0.148	0.169	0.168
CSR	0.161	0.170	0.181	0.193
К [«]	1	1	1	-
Corr for High Overburden stress,K _v	1.00	1.00	1.00	1.00
1	8.0	8.0	8.0	0.8
r,	1.00	66.0	86.0	96.0
Relative density, Dr (%)	35	35	35	35
(N ¹) ^{eocs}	15	14	16	16
09(¹ N)	9.8	7.3	9.1	9.0
q	1.2	1.2	1.2	1.2
е	5.0	5.0	5.0	5.0
"o	986.0	0.986	986.0	986.0
°2	1.05	1.05	1.05	1.05
°z	0.75	0.75	0.75	0.85
°C	1.05	1.05	1.05	1.05
°C	0.75	0.75	0.75	0.75
C ^o	2.00	2.00	1.85	1.44
s^, (кья)	0.465	1.395	2,790	4.650
(kPa) _v e	0.965	2.895	5.790	9.650
Sub. density of soil (kN/m³)	0.93	0.93	0.93	0.93
Sat. density of soil	1.93	1.93	1.93	1.93
⁰⁹ N	7	9	æ	6
%Fine	64	29	62	62
RL of Layer (m)	203.574	202.574	201.074	199.074
Depth (m)	0.5	1.5	m	2

S. PARTICIPATION CO.

Average Embankment Height	1.6 m
Borehole No	164
Top width of Embankment	13.6 m
Bottom Width of embankment	19.8 m
Density of Soil	1.8 t/m3
Dead load of embankment	2.7.t/m2

Applicable Chainage - 1409+780 to 1410+640	Bore hole Chainage – 1410+520
Applicable Chainage - 1409+780 to 1410+640	
	Applicable Chainage - 1409+780 to 1410+640

0.24

Earthquake Details

0.24 6.5 1.45

Magnitude of Earthquake Magnitude Scaling Factor, MSF, K_r

a_{max}/g

Seismic Zone
Zone Factor, Z
Importance Factor,
Site Factor, S

Borelog Details		
Depth of Water Table	Not Met	٤
Depth of Water Table Considered	5.45	٤
Energy delivered	45	%
Borehole Diameter	150	шш
Rod Length	3	Ε
Presence of Liner	Without Liner	
Soil Type	Loose Sand	
Hammer Correction	986 0	

Кетагк	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
S∃	7	7.	7	^1
виз	0.364	0.283	0.197	0.214
°″∆ X 3	0.251	0.195	0.136	0.148
ชรว	0.155	0.154	0.152	0.150
K	1			1
Corr for High Overburden stress,K _o	1.00	1.00	1.00	1.00
ı	8.0	8.0	8.0	0.8
°,	1.00	66.0	86.0	96.0
Relative density, Dr (%)	35	35	15	35
(N) ^{60CS}	23	18	13	14
₀₉ (₁ N)	14.7	11.1	6.3	7.3
q	1.2	1.2	1.2	1.2
е	5.0	2.0	5.0	5.0
"o	0.99	0.99	0.99	0.99
°C	1.05	1.05	1.05	1.05
C ^E	0.75	0.75	0.75	0.75
°C	1.05	1.05	1.05	1.05
³ɔ	0.75	0.75	0.75	0.75
C	2.00	1.81	1.28	0.99
s^, (kba)	0.975	2.925	5.850	9.750
(kPa) _v (kPa)	0.975	2.925	5.850	9.750
Sub. density of soil (۴۸/m³)	1.95	1.95	1.95	1.95
Sat, density of soil (kN/m³)	1.95	1.95	1.95	1.95
⁰⁹ N	12	10	œ	12
9ni7%	26	91	47	47
				П

0.5

Debth (m)

Average Embankment Height	m 8'0
Borehole No	165
Top width of Embankment	13.6 m
Bottom Width of embankment	16.7 m
Density of Soil	1.8 t/m3
Dead load of embankment	1.4 t/m2

		90				ΛI	0.24	1	1	0.24	6.5	1 45
Bore hole Chainage – 1410+820		Applicable Chainage - 1410+640 to 1410+960		1	Earthquake Details	Seismic Zone	Zone Factor, Z	Importance Factor, I	Site Factor, S	a _{max} /g	Magnitude of Earthquake	Magnifude Scaling Factor, MSF, K

Borelog Details		
Depth of Water Table	Not Met	Е
Depth of Water Table Considered	4.45	٤
Energy delivered	45	%
Borehole Diameter	150	шш
Rod Length	3	Е
Presence of Liner	Without Liner	
Soil Type	Loose Sand	
Hammer Correction	986 0	

Кета гк	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
FS	>1	>1	>1	>1
свв	0.307	0.204	0.223	0.240
СКК ^{у,} е	0.211	0.140	0.154	0.166
ะระ	0,155	0.154	0,152	0.151
κ°	1	1	1	1
Corr for High Overburden stress,K _o	1.00	1.00	1.00	1.00
ì	0.8	0.8	8.0	8.0
r,	1.00	66.0	86.0	0.97
Relative density, Dr (%)	35	15	35	35
(N) _{60CS}	20	13	14	16
⁰⁹ (¹N)	12.2	6.7	7.8	8.8
q	1.2	1.2	1.2	1.2
е	2.0	2.0	5.0	2.0
" ɔ	0.99	0.99	0.99	0.99
° 2	1.05	1.05	1.05	1.05
C [®]	0.75	0.75	0.75	0.75
⁸ 2	1.05	1.05	1.05	1.05
³ɔ	0.75	0.75	0.75	0.75
°C	2.00	1.81	1.28	1.11
(kPa) ',e	0.97	2.91	5.865	7.835
s^(кЬց)	0.970	2.910	5.865	7.835
Sub. density of soil (kN/m³)	1.94	1.94	1,97	1.97
Sat₌ density of soil (kN/m³)	1.94	1.94	1.97	1.97
⁰⁹ N	10	9	10	13
%Eine	98	98	89	62
Depth (m)	0.5	1.5	Э	4

Average Embankment Height	0.7 m
Borehole No	166
Top width of Embankment	13.6 m
Bottom Width of embankment	16.2 m
Density of Soil	1.7 t/m3
Dead load of embankment	1.1 t/m2

	Dole indic citatings Titatings
Applicable Chainage - 1410+960 to 1411+260	Applicable Chainage - 1410+960 to 1411+260

IV 0.24

Earthquake Details
Seismic Zone
Zone Factor, Z
Importance Factor, I
Site Factor, S

0.24 6.5 1.45

Magnitude of Earthquake Magnitude Scaling Factor, MSF, K a_{max}/g

Borelog Details		
Depth of Water Table	Not Met	E
Depth of Water Table Considered	3	E
Energy delivered	45	%
Borehole Diameter	150	шш
Rod Length	3	ш
Presence of Liner	Without Liner	
Soil Type	Loose Sand	
Hammer Correction	986.0	

Кетагк	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
SH	>1	>1	>1
свв	0.215	0.222	0.198
°″ชชว	0.148	0.153	0.137
ชรว	0.155	0.154	0.194
К [®]	1		
Corr for High Overburden stress,K _p	1.00	1.00	1.00
ī	8.0	8.0	8.0
P.J.	1.00	66.0	96.0
Relative density, Dr (%)	32	35	15
(N¹) ^{eocs}	14	14	13
₀₉ (_r N)	7.3	7.7	6.3
q	1.2	1.2	1.2
Б	2.0	2.0	5.0
"э	0.99	0.99	0.99
° 2	1.05	1.05	1.05
ď	0.75	0.75	0.75
¹ 3	1.05	1.05	1.05
³ ɔ	0.75	0.75	0.75
°C	2.00	1.81	1.48
(kPa) ', e	526.0	2.925	4.380
շ^ (кЬց)	0.975	2.925	5.880
Sub. density of soil (kN/m²)	1.95	1.95	0.97
Sat₁ density of soil (kN/m³)	1.95	1.95	1.97
⁰⁹ N	9	7	7
9ni7%	84	92	92
Depth (m)	0.5	1.5	Μ

Average Embankment Height	1,1 m
Borehole No	167
Top width of Embankment	13.6 m
Bottom Width of embankment	18.1 m
Density of Soil	1.7 t/m3
Dead load of embankment	1 9 t/m2

Bore hole Chainage – 1411+420
Applicable Chainage - 1411+260 to 1411+560

0.24

Earthquake Details

0.24 6.5 1.45

Magnitude of Earthquake Magnitude Scaling Factor, MSF, $K_{\rm m}$

a_{max}/g

Importance Factor, Site Factor, S Zone Factor, Z Seismic Zone

Borelog Details		
Depth of Water Table	Not Met	Е
Depth of Water Table Considered	4.45	ш
Energy delivered	45	%
Borehole Diameter	150	шш
Rod Length	3	Ε
Presence of Liner	Without Liner	
Soil Type	Loose Sand	
Hammer Correction	986.0	

	Кетаrk	Non-I iquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
	S4	7	\ \ \	^1	>1
	СВВ	0.364	0.261	0.237	0.195
	°″2882°°	0.251	0.180	0.164	0.134
	сгв	0.155	0.154	0,152	0.151
	К ^α	-	-	п	1
	orr for High urden stress,K,		1.00	1.00	1.00
	î	8.0	0.8	8.0	8.0
	L ^q	1-00	0.99	86.0	0.97
	ive density, Dr (%)	بر Relat	35	35	15
	(N ₁)eocs	23	17	15	12
	09(¹ N)	14.7	10.0	9.8	6.1
	q	1.2	1.2	1.2	1.2
	e	0.5	_	5.0	2.0
	°c"	0.99		0.99	1.05 0.99
	c²	1.05	1.05	1.05	1.05
	C ^g	0.75	0.75	0.75	0.75
	°C	1.05	1.05	1.05	1.05
	³o	0.75	0.75	0.75	0.75
	c″	2.00	1.81	1.28	1.11
36	s^, (kPa)	0.975	2.925	5.835	
986'0	s^(kPa)	0.975	_	5.835	7 775 7 775
ا ا	density of soil (kN/m³)	.du2 1	1.95	1.94	1.94
mmer Correction	density of soil (kN√m³)	.ts2	1.95	1.94	1.94
nmer Co	⁰⁹ N	12	6	11	6
			_	_	-

82 92 85 85

0.5

%Fine

Debth (m)

Average Embankment Height	2.2 m
Borehole No	168
Top width of Embankment	13.6 m
Bottom Width of embankment	22.3 m
Density of Soil	1.8 t/m3
Dead load of embankment	3.8 t/m2

Bore hole Chainage – 1411+720
Applicable Chainage - 1411+560 to 1411+860

0.24

Zone Factor, Z Importance Factor, I Site Factor, S Seismic Zone

Earthquake Details

0.24 6.5 1.45

Magnitude of Earthquake Magnitude Scaling Factor, MSF, K_r

a_{max}/g

etails	3.5 m	ad 3.5 m	45 %	150 mm	3 m	Without Liner	Loose Sand	986*0
Borelog Details	Depth of Water Table	Depth of Water Table Considered	Energy delivered	Borehole Diameter	Rod Length	Presence of Liner	Soil Type	Hammer Correction

C C C C C C C C C C	Кетагк	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
Control High Cont	SH	>1	>1	7.1	>1
Cart density of soil Cart density of soil Cart density of soil	свв	0.215	0.283	0.223	0.292
Sat. density of soil Sat. density Sat. densit	"ชชว	0.148	0.195	0.154	0.201
Sat. density of soil Sat. density Sat. density of soil Sat. density of soil Sat. density of soil Sat. density of soil Sat. density Sat. density of soil Sat. density of soil Sat. density Sat. density of soil Sat. density	csĸ	0.155	0.154	0.152	0.188
Cort for High Cort Cort	к [®]	1	-	п	1
N	Corr for High Overburden stress,K _o	1.00	1.00	1.00	1.00
N Sat. C C C C C C C C C	1	0.8	8.0	8.0	0.8
C C C C C C C C C C	P.J	1.00	0.99	96.0	96.0
Sat. density of soil Sub. density of soil Sub. density of soil Sub. density of soil C. C. G.	Relative density, Dr (%)	35	35	35	35
Sat. density of soil C. C	(N ¹) ^{eocs}	14	18	14	19
N Sat. density of soil	₀₉ (_r N)	7.3	11.1	7.8	11.5
Sat. density of soil Sat. density of soil Sat. density of soil Sub. density of soil C. C	q	1.2	1.2	1.2	1.2
Cat. density of soil Sat. density of soil Sub. density of soil Sub. density of soil Sub. density of soil Sub. density of soil Cat. Cat. Cat. Cat. Cat. Cat. Cat. Cat.	е				\perp
Sat. density of soil Sat. density of soil Sub. density of soil C. C. C. C. C. C. C. C. C. C	" ɔ	0.99	0.99	_	0.99
Sat. density of soil Sat. density of soil Sub. density of soil C. C. C. C. C. C. C. C. C. C	^{\$} ວ	1.05	1.05	1.05	1.05
Sat. density of soil Sat. density of soil Sub. density of soil C. C. C. C. C. 10 1.97 1.97 5.880 5.820 1.28 0.75 1.81 0.75 1.97 5.880 5.880 1.28 0.75 1.97 5.820 1.28 0.75 1.97 1.97 5.880 5.820 1.11 0.75 1.97 1.97 1.97 1.97 1.97 1.97 1.97 1.97	ď	0.75	0.75	0.75	0.85
Sat. density of soil (kN/m³) Sat. density of soil (kN/m³) Sub. density of soil (kN/m³) Sub. density of soil (kN/m³) Sub. density of soil (kPa) S. 1.95 1.95 0.975 2.025 2.025 2.025 1.81 10 1.97 1.97 5.880 5.880 1.28 15 1.97 0.97 9.820 7.820 1.11	°2	1.05	1.05	1.05	1.05
Sat. density of soil (KN/m³) Sat. density of soil (KN/m³) Sub. density of soil (KN/m³) 10 1.95 1.95 0.975 0.975 0.975 1.95 1.95 2.925 2.925 2.925 1.97 0.97 0.97 0.97 0.97 0.97 0.97 0.97 0	³ɔ	0.75	0.75	0.75	0.75
Sat. density of soil (KN/m²) Sat. density of soil (KN/m²) 10 1.95 1.95 0.975 10 1.97 1.97 5.880 15 1.97 5.880	c	2.00	1.81	1.28	1.11
Sat. density of soil (kN/m³) Sat. density of soil (kN/m³) Sub. density of soil 1:95 1:97 1:97 1:97	(kPa) ',e	0.975	2.925	5.880	7.820
N 6 199 Sat. density of soil (KN/m²)		0.975	2.925	5.880	9.820
N 6 6 10 10 10 115 115 115 115 115 115 115 11		1.95	1.95	1.97	0.97
		1.95	1.95	1.97	1.97
% Fine % Fine 7 1 1 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	⁰⁹ N	9	10	10	15
	%Fine	93	79	7.1	71

0.5

Debth (m)

Average Embankment Height	2.4 m
Borehole No	169
Top width of Embankment	13.6 m
Bottom Width of embankment	23.2 m
Density of Soil	1.7 t/m3
Dead load of embankment	4.0 t/m2

Bore hole Chainage – 1412+020	
Applicable Chainage - 1411+860 to 1412+160	90
Earthquake Details	
Seismic Zone	ΛI
Zone Factor, Z	0.24
Importance Factor, I	1
Site Factor, S	1

0.24 6.5 1.45

Magnitude of Earthquake Magnitude Scaling Factor, MSF, K

a_{max}/g

idered 4 4 45 150 150 3 Without Liner Loose Sand 0.986	Borelog Details		
4 45 45 150 3 3 Without Liner Loose Sand 0.986	Depth of Water Table	4	Ε
45 150 3 Without Liner Loose Sand 0,986	Depth of Water Table Considered	4	ш
150 3 Without Liner Loose Sand 0,986	Energy delivered	45	%
	Borehole Diameter	150	шш
	Rod Length	3	Е
	Presence of Liner	Without Liner	
	Soil Type	Loose Sand	
	Hammer Correction	986.0	

	<u>e</u>	<u>o</u>	<u>o</u>	<u>o</u>	<u>e</u>
Remark	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
S±	^1	<u>×</u>	<u>'</u>	7.	7.1
ะหร	0.195	0.283	0,331	0.424	0,379
скк ^{у,} °	0.134	0.195	0,228	0.293	0,262
ะระ	0.155	0.154	0.152	0.182	0.200
K [®]	H			H	1
Corr for High Overburden stress,K,	1.00	1.00	1.00	1.00	1.00
Ī	8.0	8.0	8.0	8.0	8.0
P.J.	1.00	66.0	86.0	0.97	0.95
Relative density, Dr (%)	15	35	35	35	35
(N ₁) _{60CS}	12	18	21	25	23
⁰⁹ (¹N)	6.1	11.1	13.3	16.7	15.2
q	1.2	1.2	1.2	1.2	1.2
Б	2.0	5.0	5.0	5.0	2.0
"э	0.99	0.99	0.99	0.99	66.0
C²	1.05	1.05	1.05	1.05	1.05
, a	0.75	0.75	0.75	0.85	0.85
°5	1.05	1.05	1.05	1.05	1.05
³o	0.75	0.75	0.75	0.75	0.75
°C	2.00	1.81	1.28	1.15	1.05
s^, (kPa)	0.97	2.91	5.820	7.275	8,730
s^(kPa)	0.970	2.910	5.820	8.775	11,730
Sub. density of soil (kN/m³)	1.94	1.94	1,94	0.97	0,97
Sat, density of soil (kN/m³)	1.94	1.94	1.94	1.97	1.97
⁰⁹ N	2	10	17	21	21
9ni7%	71	77	85	41	41
Depth (m)	0.5	1.5	Μ	4.5	9

Average Embankment Height	2.5 m
Borehole No	170
Top width of Embankment	13.6 m
Bottom Width of embankment	23.4 m
Density of Soil	1.8 t/m3
Dead load of embankment	4.4 t/m2

Bore hole Chainage – 1412+320
Applicable Chainage – 1412+160 to 1412+460

Earthquake Details

	٤	m	%	mm	Е			
	3	3	45	150	3	Without Liner	Loose Sand	0.986
Borelog Details	Depth of Water Table	Depth of Water Table Considered	Energy delivered	Borehole Diameter	Rod Length	Presence of Liner	Soil Type	Hammer Correction

ΛI	0.24	1	1	0.24	6.5	1.45	
Seismic Zone	Zone Factor, Z	Importance Factor, I	Site Factor, S	g/ _{xem} e	Magnitude of Earthquake	Magnitude Scaling Factor, MSF, K	

Кетаг к	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
S∃	>1	Ŋ	^1	^1	>1
свв	0.491	¥	0.509	0.346	0.242
"ัชชว	0.339	N	0.351	0.239	0.167
CSR	0.155	N	0.178	0.228	0.240
κ [∞]	1	п	п	1	1
Corr for High Overburden stress,K _o	1.00	1.00	1.00	1.00	1.00
1	8.0	0.7	8.0	8.0	8.0
P.J	1.00	66.0	86.0	0.97	0.95
Relative density, Dr (%)	35	65	35	35	35
(N ₁) ₆₀₀₃	27	34	27	22	16
⁰⁹ ([≀] N)	18.3	24.2	18.9	14.2	9.5
q	1.2	1.2	1.2	1.2	1.2
е	5.0	2.0	4.9	4.9	4.7
"э	0.99	0.99	0.99	0.99	0.99
ိဘ	1.05	1.05	1.05	1.05	1.05
[*] O	0.75	0.75	0.75	0.85	0.85
°C	1.05	1.05	1.05	1.05	1.05
°C	0.75	0.75	0.75	0.75	0.75
°⊃	2.00	1.80	1.47	1.28	1.14
s^, (kPa)	0,985	2.955	4,410	5.865	7.320
s^ (kPa)	0.985	2.955	5,910	8.865	11,820
Sub. density of soil (kN/m³)	1.97	1.97	0.97	0.97	0.97
Sat₌ density of soil	1.97	1.97	1.97	1.97	1.97
⁰⁹ N	15	22	21	16	12
%Fine	85	75	34	34	30
Depth (m)	0.5	1.5	٣	4.5	9

Average Embankment Height	3.1 m
Borehole No	171
Top width of Embankment	13.6 m
Bottom Width of embankment	25.8 m
Density of Soil	1.8 t/m3
Dead load of embankment	5.5 t/m2

Bore hole Chainage – 1412+620
Applicable Chainage – 1412+460 to 1412+760

0.24

Earthquake Details

0.24 6.5 1.45

Magnitude of Earthquake Magnitude Scaling Factor, MSF, K

Importance Factor, Site Factor, S Zone Factor, Z Seismic Zone

Borelog Det Depth of Water Table Depth of Water Table Depth of Water Table Considered Energy delivered Borehole Diameter Rod Length Presence of Liner Soil Type Hammer Correction	Borelog Details	oth of Water Table 4.8 m	Water Table Considered 4.8 m	nergy delivered 45 %	orehole Diameter 150 mm	Rod Length 3 m	resence of Liner Without Liner	Soil Type Loose Sand	ammer Correction 0.986
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Кетатк	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
S∃	7	>1	>1	^1	\ \ 1
СКК	0.491	0.385	0.510	0.512	0.472
скк _{т,s}	0.339	0.266	0.352	0.353	0.326
сгк	0.155	0.154	0.152	0.151	0.171
K [®]	11	-1	-1	1	П
Corr for High Jverburden stress, K _v	00.1	1.00	1.00	1.00	1.00
1	8.0	8.0	8.0	8.0	8.0
L ^q	1.00	66.0	86.0	0.97	0.95
Relative density, Dr (%)	35	35	35	35	35
(N)	27	24	27	28	27
09(¹ N)	18.3	15.5	18.7	18.8	18.7
q	1.2	1.2	1.2	1.2	1.2
е	5.0	5.0	5.0	5.0	8.4
"o	0.99	66.0	66.0	66.0	66.0
c²	1.05	1.05	1.05	1.05	1.05
s ² O	0.75	0.75	0.75	0.85	0.85
°C	1.05	1.05	1.05	1.05	1.05
°°c	0.75	0.75	0.75	0.75	0.75
c	2.00	1.81	1.28	1.04	96.0
(kPa) (kPa)	86.0	2.94	5.895	8.850	0.305
(ɐ⊿ϡ) [^] s	0.980	2.940	5.895 5	8.850 8	11,805 10,305 0,96
Sub. density of soil (kN/m³)	1.96	1.96	1.97	1.97	26.0
Sat, density of soil (kN√m³)	1.96	1.96	1.97	1.97	1.97
⁰⁹ N	15	14	24	56	28
%Fine	85	98	84	84	31
Depth (m)	0.5	1.5	Э	4.5	9

Typical Computation of Liquefaction Potential by Simplified Seed & Idriss Method

Average Embankment Height	2,5 m
Borehole No	172
Top width of Embankment	13.6 m
Bottom Width of embankment	23.6 m
Density of Soil	1.7 t/m3
Dead load of embankment	4.3 t/m2

Bore hole Chainage – 1412+920
Applicable Chainage – 1412+760 to 1413+060

IV 0.24

Earthquake Details
Seismic Zone
Zone Factor, Z
Importance Factor, I
Site Factor, S

0.24 6.5 1.45

Magnitude of Earthquake Magnitude Scaling Factor, MSF, K a_{max}/g

	Е	ш	%	mm	ш			
	Not Met	3.45	45	150	3	Without Liner	Loose Sand	986'0
Borelog Details	Depth of Water Table	Depth of Water Table Considered	Energy delivered	Borehole Diameter	Rod Length	Presence of Liner	Soil Type	Hammer Correction

Кетатк	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
S±	>1	>1	>1
ชชว	0.175	0.219	0.198
°′288	0.121	0.151	0.136
сгв	0.155	0.154	0.152
K	1	п	П
Corr for High Overburden stress,K _o	1.00	1.00	1.00
ĵ	8.0	8.0	8.0
P.J	1.00	66.0	96.0
Relative density, Dr (%)	15	35	15
(N,) _{60CS}	11	14	13
₀₉ (,N)	4.9	7.8	6.3
q	1.2	1.2	1.2
Б	2.0	4.9	5.0
"o	0.99	0.99	0.99
C [®]	1.05	1.05	1.05
C	0.75	0.75	0.75
⁸ 0	1.05	1.05	1.05
³o	0.75	0.75	0.75
C	2.00	1.82	1.29
s^, (kPa)	0.955	2.885	5.780
s [^] (kPa)	0.955	2.885	5.780
Sub. density of soil (kN/m³)	1.91	1.93	1.93
(kN/m³) Sat, density of soil	1.91	1.93	1.93
⁰⁹ N	4	7	æ
9ni7%	93	33	37
Depth (m)	0.5	1.5	m

Average Embankment Height	0.8 m
Borehole No	173
Top width of Embankment	13.6 m
Bottom Width of embankment	16.6 m
Density of Soil	1.7 t/m3
Dead load of embankment	1.3 t/m2

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Applicable Chainage - 1413+060 to 1413+360

IV 0.24

Earthquake Details

Seismic Zone
Zone Factor, Z
Importance Factor, I
Site Factor, S

0.24 6.5 1.45

Magnitude of Earthquake Magnitude Scaling Factor, MSF, K

a_{max}/g

Borelog Details		
Depth of Water Table	Not Met	ш
Depth of Water Table Considered	4	ш
Energy delivered	45	%
Borehole Diameter	150	шш
Rod Length	3	ш
Presence of Liner	Without Liner	
Soil Type	Loose Sand	
Hammer Correction	986.0	

Кетатк	Non-Liquefi	Non-Liquefia	Non-Liquefia
Sa	>1	7.	7.
свв	0.364	0.241	0.153
скк ^{у,}	0.251	0.166	0.106
сгв	0.155	0.154	0.152
κ°	1	1	1
Corr for High Overburden stress,K _o	1.00	1.00	1.00
ı	8.0	0.8	8.0
°a	1.00	0.99	96.0
Relative density, Dr (%)	32	35	15
(N) ⁹⁰⁰⁸	23	16	6
₀₉ (,N)	14.7	8.9	3.4
q	1.2	1.2	1.2
e	2.0	5.0	5.0
"э	66.0	0.99	0.99
C²	1.05	1.05	1.05
CE	0.75	0.75	0.75
°5	1.05	1.05	1.05
°c	0.75	0.75	0.75
C ^N	2.00	1.81	1.28
s^, (кЬя)	0.975	2.925	5.850
s^(кթа)	0.975	2:925	5.850
Sub. density of soil	1.95	1.95	1.95
Sat, density of soil (kM/m³)	1.95	1.95	1.95
⁰⁹ N	12	œ	4
9ni7%	28	94	22
Depth (m)	0.5	1.5	n

Кетатк	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
SH	>1	>1	>1
вис	0.364	0.241	0.153
⁶⁷ 8หว	0.251	0.166	0.106
นรว	0.155	0.154	0.152
K	1	1	1
Corr for High Overburden stress, K _o	1.00	1.00	1.00
Ţ	8.0	8.0	8.0
°a	1.00	66.0	86.0
Relative density, Dr (%)	32	35	15
(N)	23	16	6
₀₉ ('N)	14.7	8.9	3.4
q	1.2	1.2	1.2
e	2.0	5.0	5.0
"э	66.0	0.99	0.99
c²	1.05	1.05	1.05
°°	0.75	0.75	0.75
C ^B	1.05	1.05	1.05
³o	0.75	0.75	0.75
c ^o	2.00	1.81	1.28
s^, (kPa)	0,975	2.925	5.850
(kPa) S _V (kPa)	0.975	2.925	5.850
Sub. density of soil (kN/m³)	1.95	1.95	1.95
Sat, density of soil (kN/m³)	1.95	1.95	1.95

Average Embankment Height	m 6'0
Borehole No	174
Top width of Embankment	13.6 m
Bottom Width of embankment	17.1 m
Density of Soil	1.7 t/m3
Dead load of embankment	1.5 t/m2

Bore hole Chainage – 1413+520
Applicable Chainage - 1413+360 to 1413+900

IV 0.24

Earthquake Details
Seismic Zone
Zone Factor, Z
Importance Factor, I
Site Factor, S

0.24 6.5 1.45

Magnitude of Earthquake Magnitude Scaling Factor, MSF, K a_{max}/g

	Met m	ш	%	.00 mm	E	t Liner	Sand	98	
Borelog Details	ater Table Not Met	able Considered 3	elivered 45	Diameter 150	ength 3	of Liner Without Liner	Fype Loose Sand	Correction 0.986	
	Depth of Water Table	Depth of Water Table Considered	Energy delivered	Borehole Diameter	Rod Length	Presence of Liner	Soil Type	Hammer Correction	

Remark	Non-Liquefiable	Non-Liquefiable	Non-Liquefiable
	Non	Non	Non
SH	>1	>1	>1
виз	0.175	0.186	0.265
°″aਖɔ	0.121	0.129	0.182
ชรว	0.155	0.154	0.192
K	1		
Corr for High Overburden stress,K _v	1.00	1.00	1.00
1	8.0	8.0	8.0
P.a	1.00	66.0	86.0
Relative density, Dr (%)	15	15	35
(N ₁) _{60CS}	11	12	17
09('N)	4.9	2.6	10.1
q	1.2	1.2	1.2
е	0.3	2.0	5.0
" ɔ	66.0	0.99	0.99
c²	1.05	1.05	1.05
ď	0.75	0.75	0.75
C	1.05	1.05	1.05
°°°	0.75	0.75	0.75
c ^o	2.00	1.83	1.51
(kPa) '¿z	0.955	2.865	4.230
s^(kPa)	0.955	2.865	5.730
Sub. density of soil	1.91	1.91	0.91
Sat, density of soil (kN/m³)	1.91	1.91	1.91
⁰⁹ N	4	2	11
9ni7%	94	87	94
Depth (m)	0.5	1.5	т

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