



Quy Hoạch Khu Dân Cư Phước Kiến
Land Development For Phuoc Kien Resident Area

THUYẾT MINH ĐỊA CHẤT CÔNG TRÌNH
GEOLOGICAL ENGINEERING REPORT

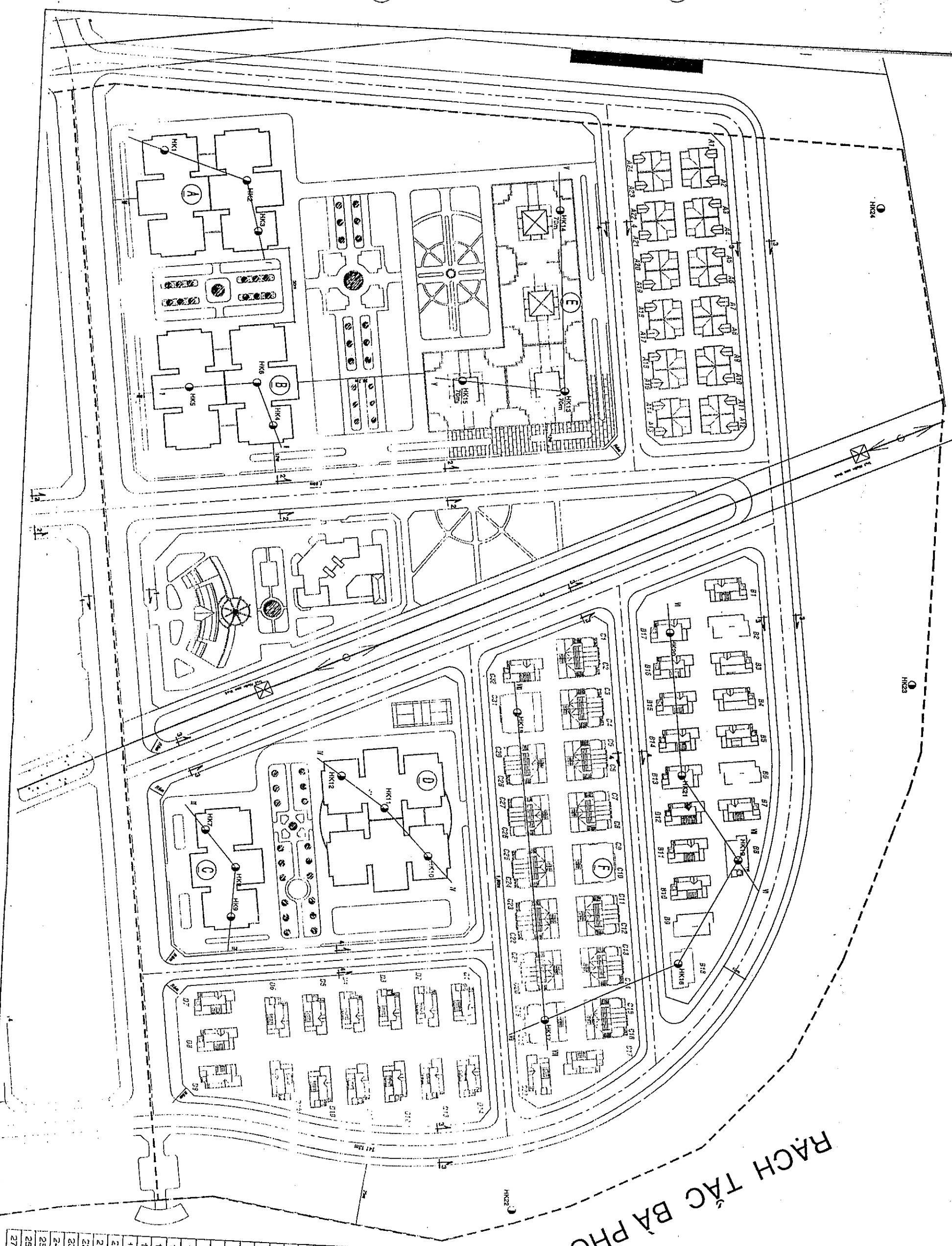
ENGLISH

Quy Hoạch Khu Dân Cư Phước Kiến
Land Development For Phuoc Kien Resident Area

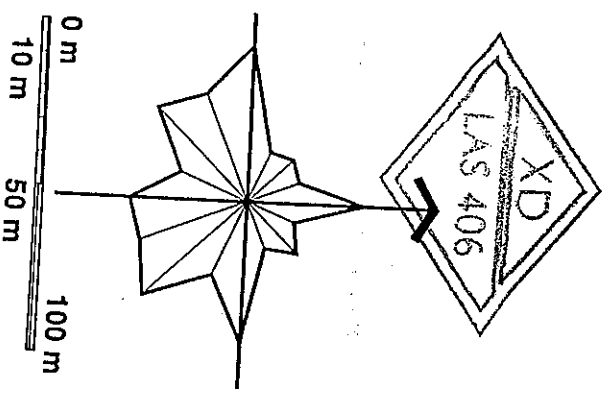
SƠ ĐỒ BỐ TRÍ HỐ KHOAN
BOREHOLE LOCATION PLAN

SƠ ĐỒ BỐ TRÍ HỒ KHOAN KHẢO SÁT ĐỊA CHẤT - PROPOSED BOREHOLE PLAN

CÔNG TRÌNH : QUY HOẠCH KHU DÂN CƯ XÃ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA

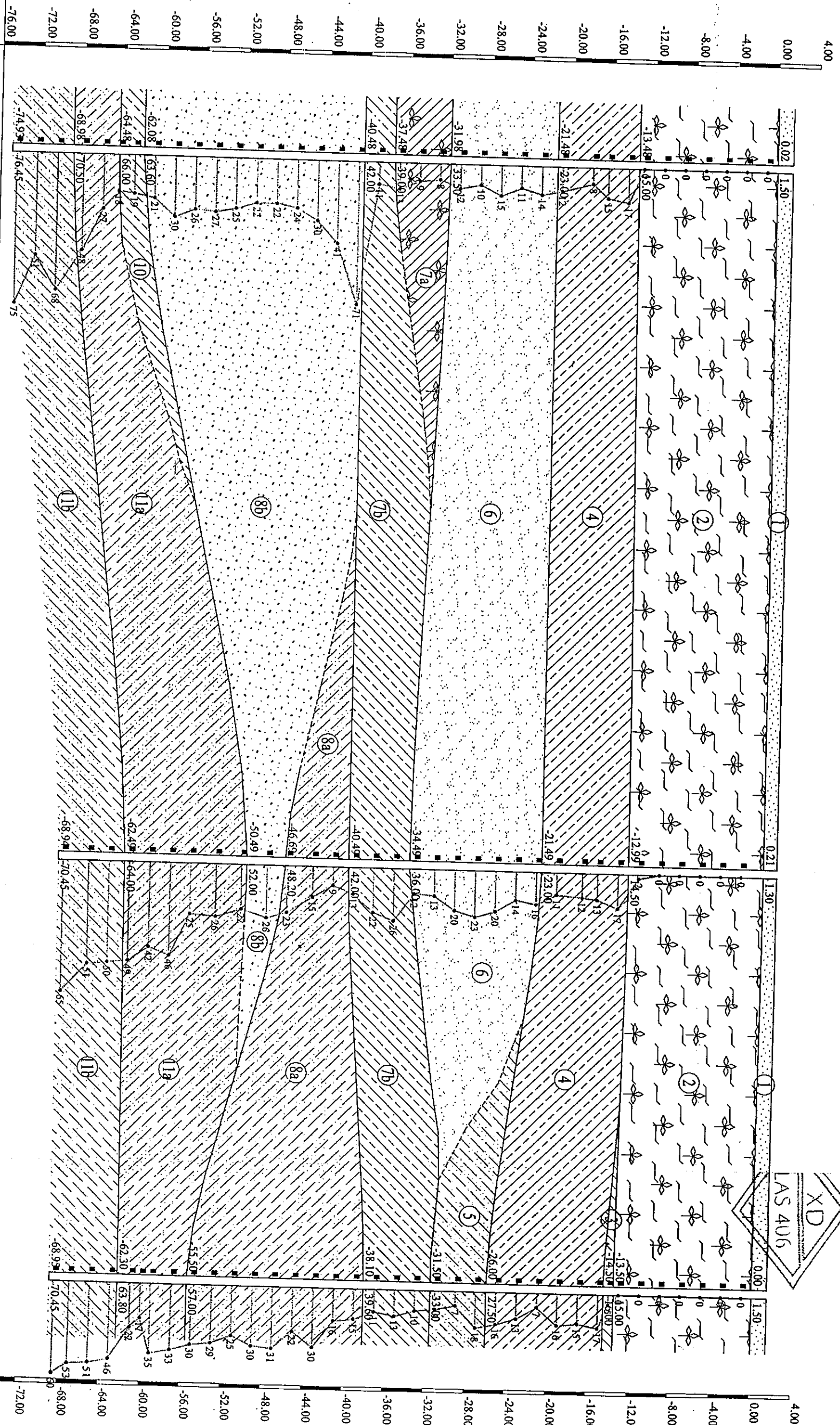


RẠCH TẮC BÀ PHỒ

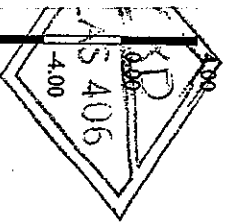


BẢNG THÔNG KÊ TỌA ĐỘ HỒ KHOAN

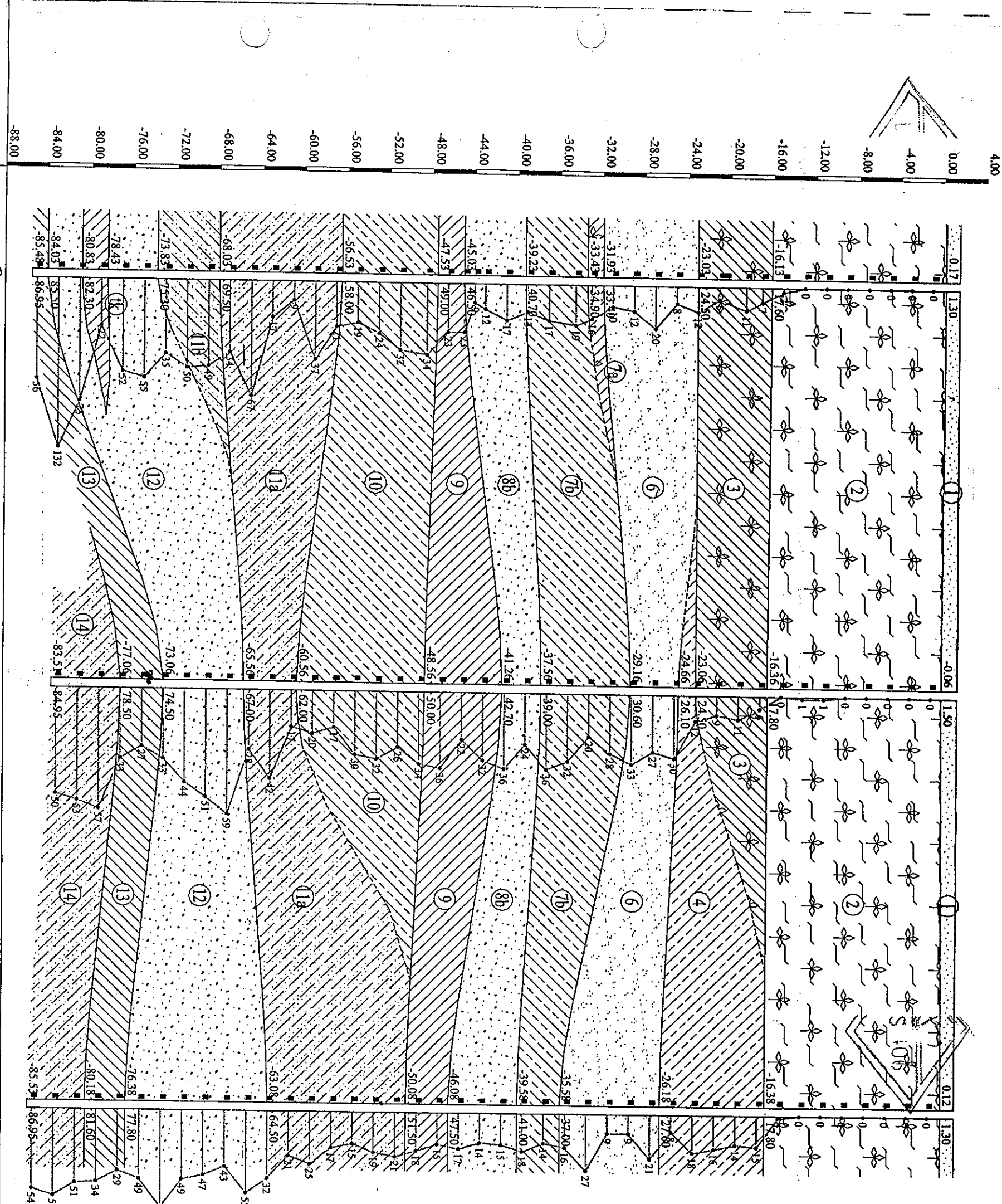
STT	TÊN ĐIỂM	E (m)	N (m)
1	HK1	604087.60	1185890.77
2	HK2	604047.98	1185894.09
3	HK3	604068.20	1185398.57
4	HK4	604146.71	1185908.96
5	HK5	604132.63	1185874.91
6	HK6	604129.44	1185901.78
7	HK9	604347.27	1185900.96
8	HK8	604327.28	1185901.83
9	HK7	604312.69	1185899.25
10	HK10	604319.10	1185978.70
11	HK11	604300.49	1185980.31
12	HK12	604288.32	1185942.61
13	HK13	604126.94	1186026.29
14	HK14	604053.86	1186020.12
15	HK15	604124.63	1185983.90
16	HK16	604357.77	1186081.36
17	HK17	604382.85	1186028.70
18	HK18	604259.05	1186011.94
19	HK19	604314.57	1186103.49
20	HK20	604223.39	1186071.97
21	HK21	604281.54	1186075.37
22	HK22	604461.20	1186018.95
23	HK23	604240.07	1186168.79
24	HK24	604046.73	1186148.70
25	GPS-01	604298.09	1185574.00
26	GPS-02	604374.18	1185742.20
27	GPS-03	604441.19	1185825.77



Số hiệu lỗ khoan	HK1	HK2	HK3
Cao độ miệng lỗ (m)	1.52	1.51	1.50
Khoảng cách lẻ (m)	34.90	20.95	55.85
Cự ly công đồn (m)	0.00	34.90	55.85

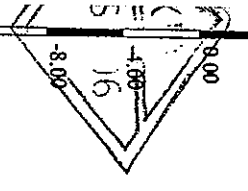
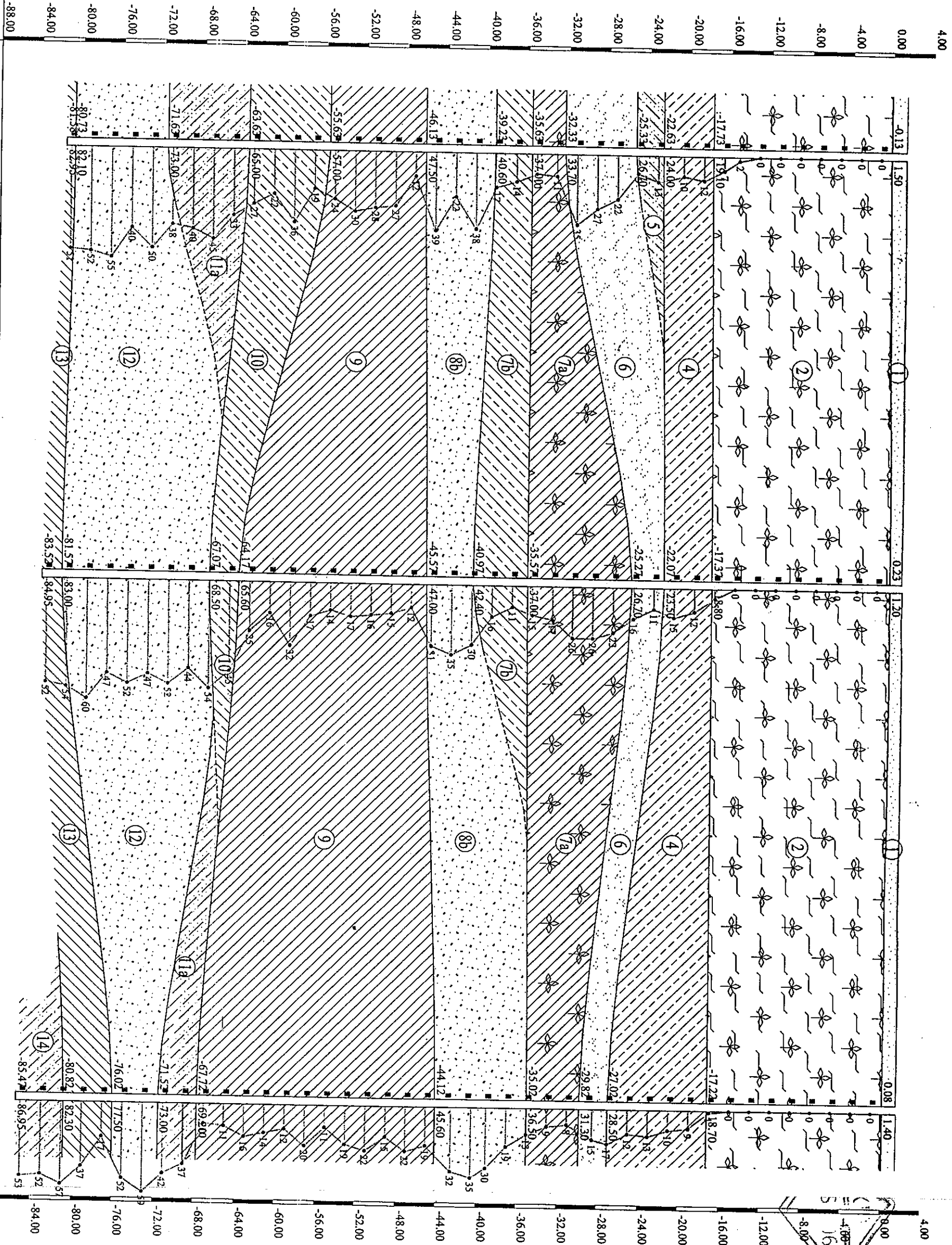


Số hiệu lỗ khoan	● HK5	● HK6	● HK4
Cao độ miệng lỗ (m)	1.52	1.57	1.54
Khoảng cách lỗ (m)	27.06	18.70	
Cự ly công đồn (m)	0.00	27.06	45.76

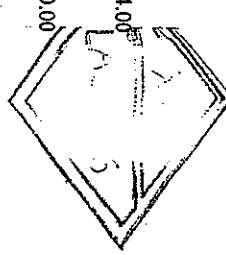
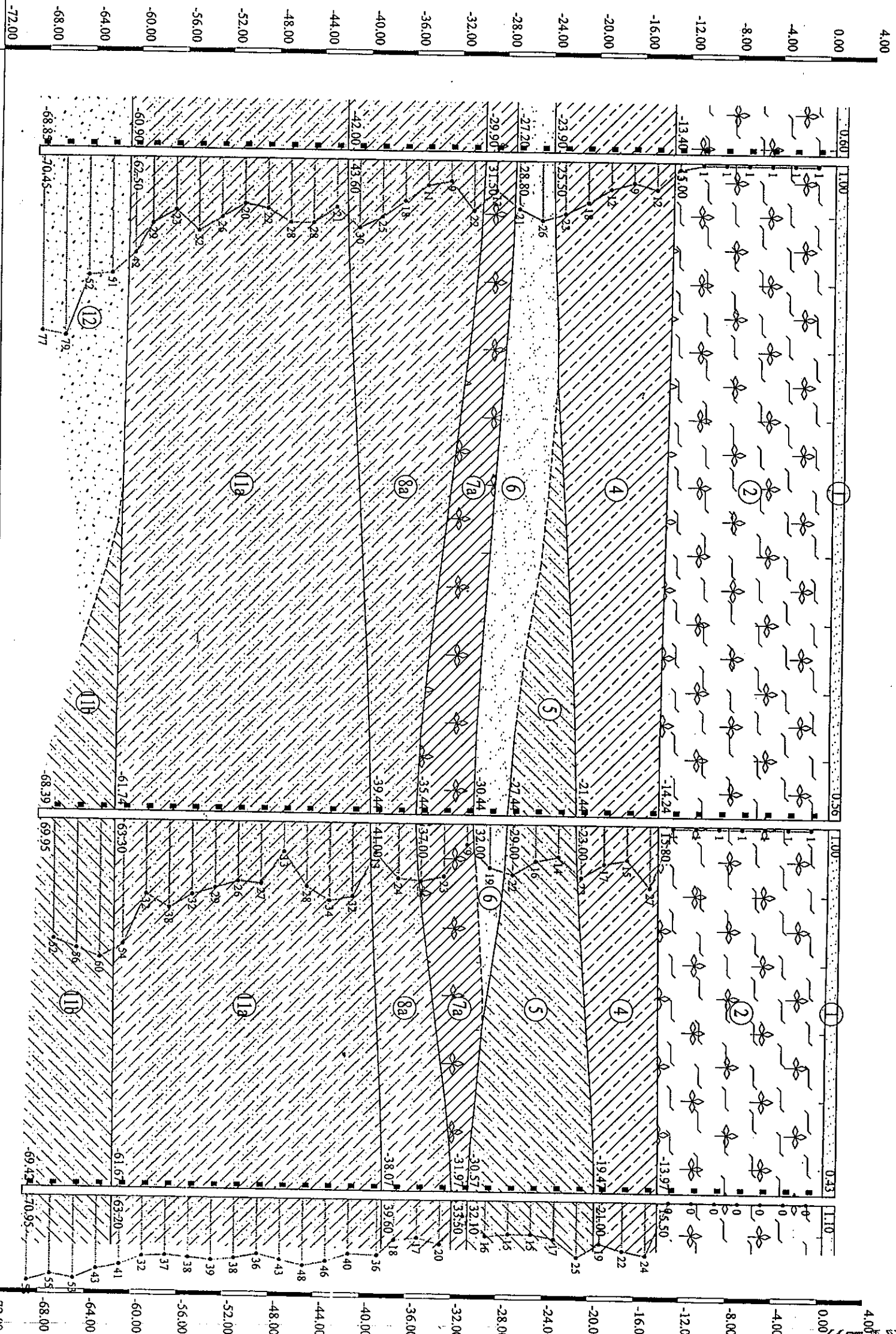


Số hiệu lỗ khoan		HK7	HK8	HK9
Cao độ miệng lỗ (m)		1.47	1.44	1.42
Khoảng cách lẻ (m)		19.30	20.01	
Tư lý công dân (m)		0.00	19.30	39.32

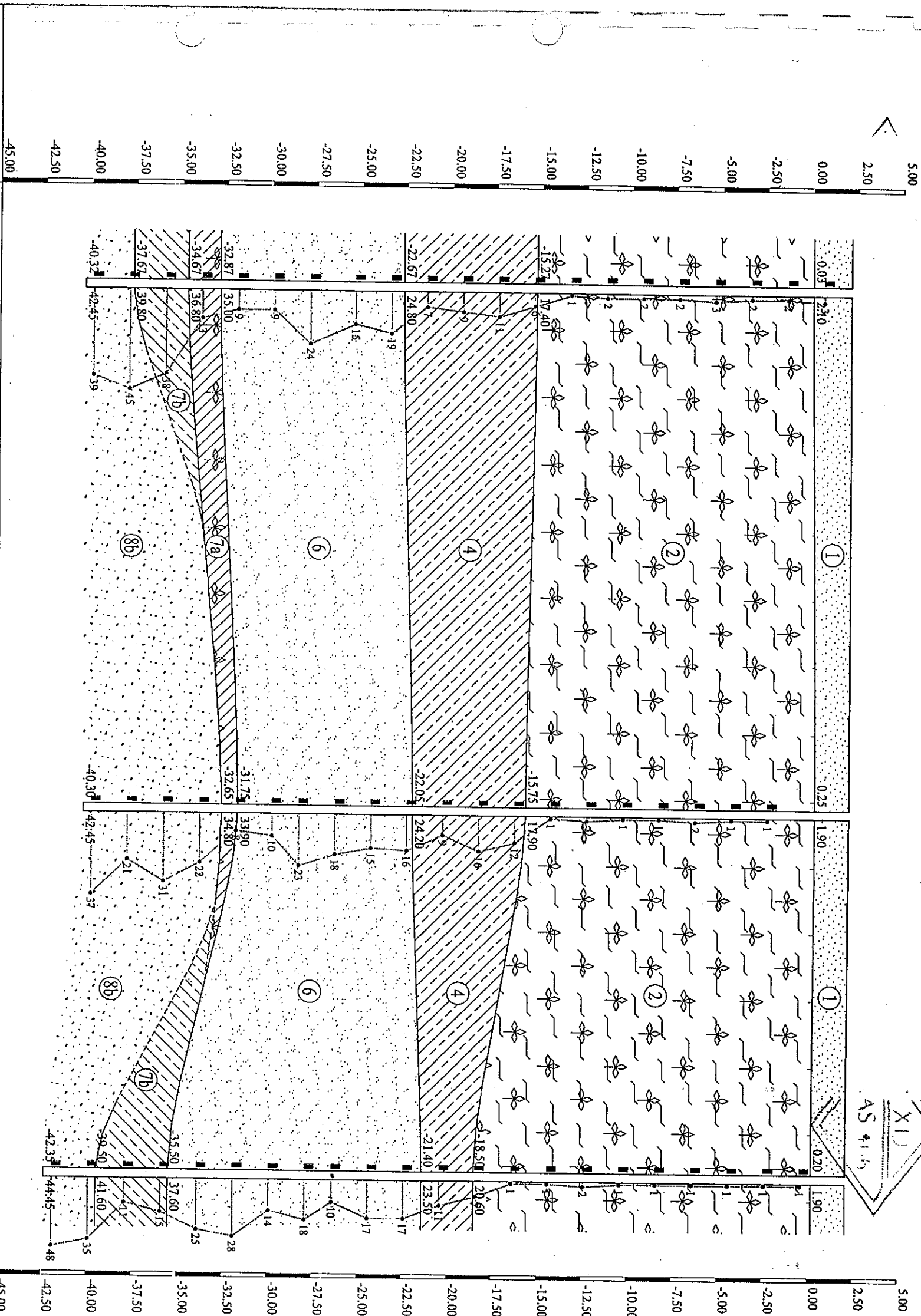
Chủ đầu tư - Owner		TRAN THAI CO., LTD	
Đơn vị khảo sát - Contractor		TRUNG TÂM KHOA HỌC ĐỊA CHẤT CÔNG TRÌNH CONSTRUCTION GEOLOGY SCIENCE CENTER	
Chủ trì KS - Geotechnical Survey manager	Eng. Bùi Huy Đình	Thực hiện Designer	Eng. Ly Van Chien
Kiểm tra Check by	Eng. Ho Hai		
Công trình - Project:			
Qui hoạch khu dân cư Phước Kiển			
LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA			
Địa điểm - Location:			
Huyện Nhà Bè, Tp. HCM - Nhà Bè District, Ho Chi Minh City			
Tên bản vẽ - Drawing name			
Mặt cắt Địa chất công trình III-III			
ENGINEERING GEOLOGICAL PROFILE III-III			
Tỷ lệ - Scale		Bản vẽ số: 3/8	
Horizontal scale: 1/200		Drawing	Ngày: 12/9/07
Vertical scale: 1/400		Date	Phiên bản: 1
			Version



Số hiệu lỗ khoan	● HK12	● HK11	● HK10
Cao độ miệng lỗ (m)	1.37	1.43	1.48
Khoảng cách lỗ (m)	21.48	26.16	
Cự ly cộng dồn (m)	0.00	21.48	47.64

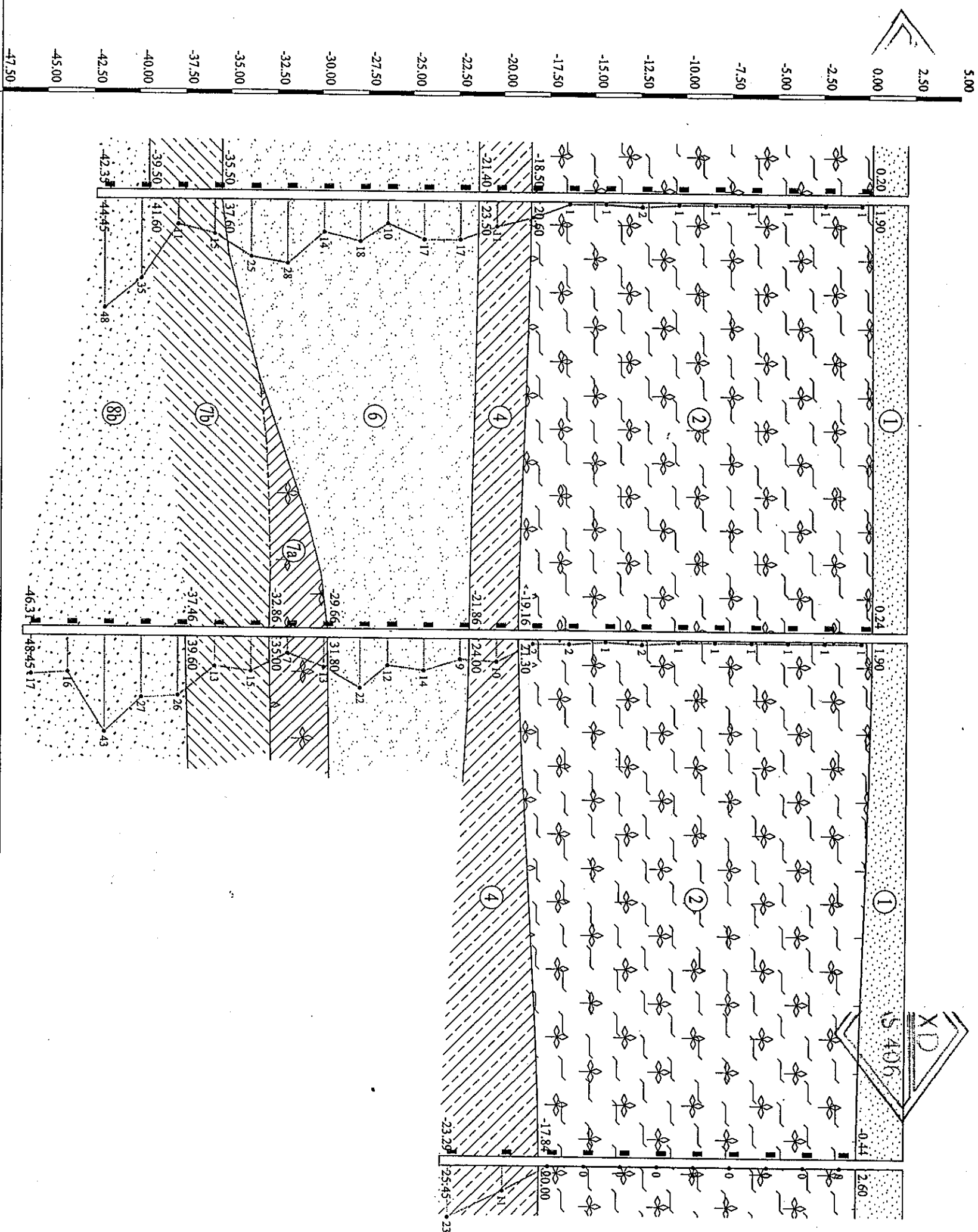


Số hiệu lỗ khoan	HK14	HK13	HK15
Cao độ miệng lỗ (m)	1.60	1.56	1.53
Khoảng cách lẻ (m)	73.26	41.45	
Cự ly cộng dồn (m)	0.00	73.26	114.72



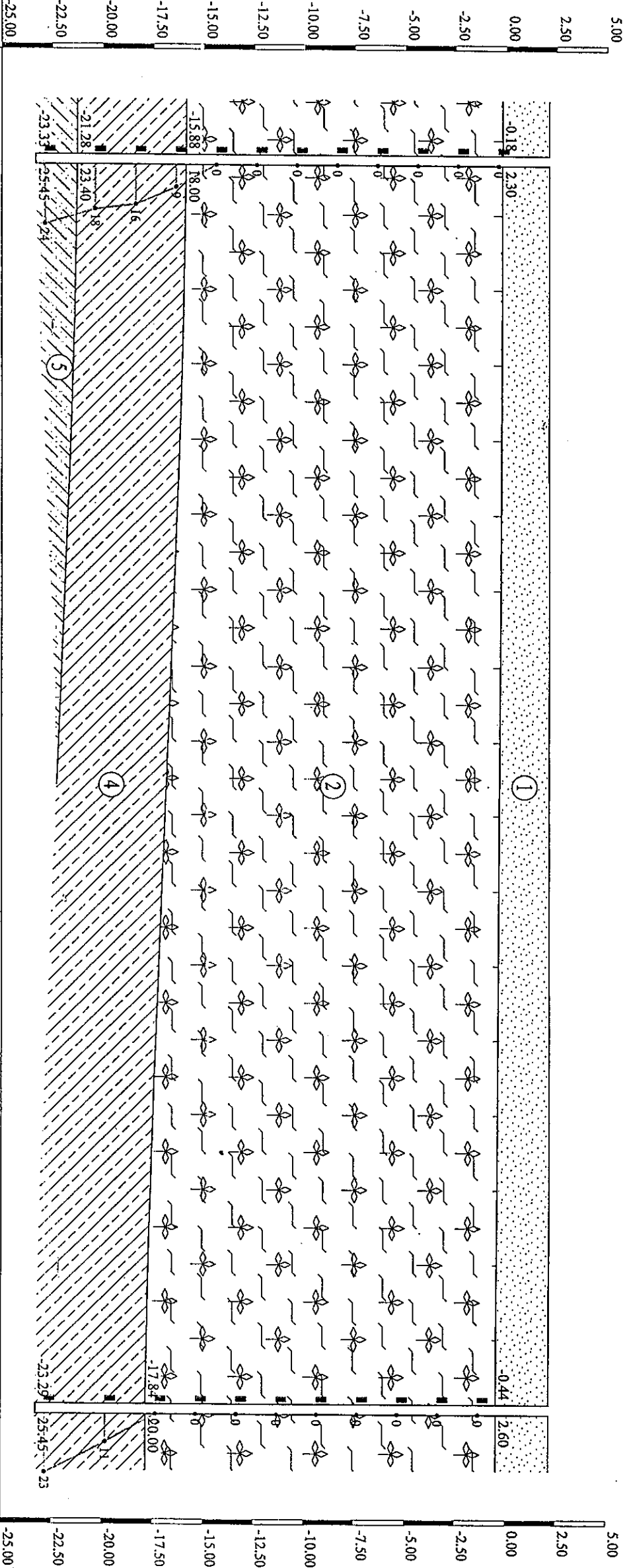
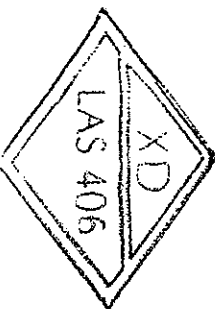
Độ hiệu lỗ khoan	HK20	HK21	HK19
Cao độ miệng lỗ (m)	2.13	2.15	2.10
Khoảng cách lỗ (m)	58.62	40.98	
Ước lượng công dồn (m)	0.00	58.62	99.60

Chủ đầu tư - Owner			
TRAN THAI CO., LTD			
Đơn vị khảo sát - Contractor			
TRUNG TÂM KHOA HỌC ĐỊA CHẤT CÔNG TRÌNH CONSTRUCTION GEOLOGY SCIENCE CENTER			
Chủ trì KS - Geotechnical Survey manager	Eng. Bùi Huy Đình		
Thực hiện Designer	Eng. Lý Văn Chiến		
Kiểm tra Check by	Eng. Hồ Hải		
Công trình - Project:			
Quy hoạch khu dân cư Phước Kiến LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA			
Địa điểm - Location:			
Huyện Nhà Bè, Tp. HCM - Nhà Bè District, Ho Chi Minh City			
Tên bản vẽ - Drawing name			
Mặt cắt địa chất công trình VI-VI ENGINEERING GEOLOGICAL PROFILE VI-VI			
Tỷ lệ - Scale		Bản vẽ số: 6/8	
Horizontal scale: 1/500		Ngày: 12/9/07	
Vertical scale: 1/250		Date	
		Phiên bản: 1	
		Version	



Số hiệu lỗ khoan	HK19	HK16	HK17
Cao độ miệng lỗ (m)	2.10	2.14	2.16
Khoảng cách lỗ (m)	48.45	58.33	
Cự ly cộng dồn (m)	0.00	48.45	106.78

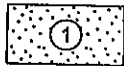
Chủ đầu tư - Owner			
TRAN THAI CO., LTD			
Đơn vị khảo sát - Contractor			
TRUNG TÂM KHOA HỌC ĐỊA CHẤT CÔNG TRÌNH CONSTRUCTION GEOLOGY SCIENCE CENTER			
Chủ trì KS - Geotechnical Survey manager	Eng. Bùi Huy Đình	Choi	
Thực hiện Designer	Eng. Lý Văn Chiến	Luuong	
Kiểm tra Check by	Eng. Ho Hai	huat	
Công trình - Project:			
Quy hoạch khu dân cư Phước Kiển LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA			
Địa điểm - Location:			
Huyện Nhà Bè, Tp. HCM - Nhà Bè District, Ho Chi Minh City			
Tên bản vẽ - Drawing name			
Mặt cắt địa chất công trình VII-VII ENGINEERING GEOLOGICAL PROFILE VII-VII			
Tỷ lệ - Scale		Bản vẽ số 7/8	
Horizontal scale: 1/500		Drawing	
Vertical scale: 1/250		Ngày: 12/9/07	
		Phiên bản: 1	



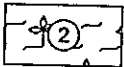
Số hiệu lỗ khoan	HK18	HK17
Cao độ miệng lỗ (m)	2.12	2.16
Khoảng cách lỗ (m)		124.93
Cự ly cộng dồn (m)	0.00	124.93

Chú	Đợt	Chủ	Thực	Đoạt	Kiểm	Chức	Công	Lưu	Địa đ	Tên l	Tỷ lệ
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DẤU HIỆU QUY ƯỚC - REMARK



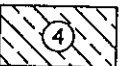
Lớp đất san lấp: cát hạt mịn lẫn xác thực vật, màu xám vàng, xám đen - Made ground include yellowish, blackish grey fine sand, mixed plant



Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen - Greenish, blackish grey clay mud someplace alternate sand, with organic and shell



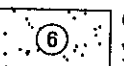
Sét đôi chỗ lẫn hữu cơ, màu xám xanh, xám đen, trạng thái dẻo mềm đến dẻo cứng - Greenish, blackish grey clay, someplace mixed organic, firm to stiff



Sét pha đôi chỗ lẫn sạn sỏi laterite, màu xám xanh loang lổ nâu vàng, trạng thái dẻo mềm đến dẻo cứng - Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff



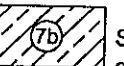
Cát pha, màu xám xanh, nâu vàng loang lổ, trạng thái dẻo - Greenish grey, yellowish brown silty sand, plastic



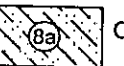
Cát hạt nhỏ đến mịn, xen kẹp sét, màu xám xanh, xám trắng, xám vàng, chặt vừa - Whitish, blackish, yellowish grey fine sand alternate clay, medium dense



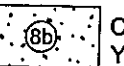
Sét xen kẹp lớp cát mỏng, đôi chỗ lẫn hữu cơ, màu xám xanh đến xám đen, trạng thái dẻo mềm - Greenish grey Clay alternate Sand, mixed organic, firm



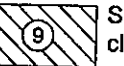
Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng - Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff



Cát pha màu xám xanh, xám vàng, trạng thái dẻo - Greenish, yellowish grey silty sand, plastic.



Cát hạt vừa đến to xen kẹp sét lẫn ít sỏi sạn thạch anh, màu xám xanh, xám vàng, chặt vừa đến chặt - Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense



Sét xen kẹp cát, màu xám nâu, nâu tím, trạng thái nửa cứng đến cứng - Brownish grey, violetish brown clay alternate sand, very stiff to hard



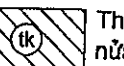
Sét pha xen kẹp cát, màu xám trắng, nâu hồng, trạng thái dẻo cứng đến nửa cứng - Whitish grey, pinkish brown silty clay alternate sand, stiff to very stiff



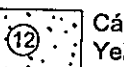
Cát pha lẫn ít sỏi sạn thạch anh, màu nâu đỏ, trạng thái dẻo - Reddish brown silty sand, mixed quartz gravels, plastic



Cát pha đôi chỗ lẫn sỏi sạn thạch anh màu nâu vàng loang lổ, trạng thái cứng - Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard



Thấu kính sét màu xám xanh loang lổ, xám nâu, trạng thái dẻo cứng đến nửa cứng - Lens greenish grey, spot, brownish grey clay, stiff to very stiff



Cát hạt nhỏ đến to lẫn ít sạn, màu nâu đỏ, xám vàng, trạng thái chặt - Yellowish grey, reddish brown fine sand to coarse sand, mixed quartz gravels, dense



Sét màu xám xanh, xám tro, trạng thái nửa cứng đến cứng - Greenish grey clay, very stiff to hard



Cát pha màu nâu đỏ, xám vàng, trạng thái cứng - Reddish brown, yellowish grey silty sand, hard

-45.31 49.95 Elevation - Depth

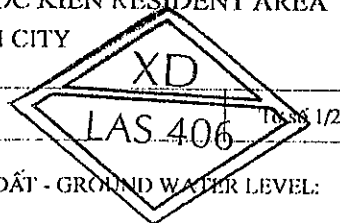
Ranh giới giả định.
Boundary putative

Ranh giới xác định.
Boundary define

HÌNH TRỤ HỔ KHOAN
BOREHOLE LOG

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG



LỖ KHOAN - BOREHOLE: HK1 TOẠ ĐỘ LỖ KHOAN: X: 604037.6 Y: 1185860.77 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.4
CAO ĐỘ LỖ KHOAN - ELEVATION: 1.516 NGÀY KHỞI CÔNG - COMMENCED: 20/7/2007
LOG BY: TRẦN QUỐC VƯƠNG ĐỘ SÂU - DEPTH: 76.45M NGÀY HOÀN THÀNH - FINISHED: 23/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
						Độ sâu (m) Depth	Số búa Blow			N _{SPT}	Đồ thị N _{SPT} Graphic N Value curve																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

XD

Tờ số 1/2

LỖ KHOAN - BOREHOLE: HK2

TOẠ ĐỘ LỖ KHOAN: X: 604047.98
Y: 1185894.09

MỨC NƯỚC DƯỚI ĐẤT - GROUNDWATER LEVEL: 0.7

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.506

NGÀY KHỞI CÔNG - COMMENCED: 24/7/2007

LOG BY: TRỊNH MINH KHIÊM

ĐỘ SÂU - DEPTH: 70.45M

NGÀY HOÀN THÀNH - FINISHED: 26/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT					MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow			Đồ thị N _{SPT} Graphic N Value curve	
							15 cm				
							N1	N2	N3		
1	0.2	1.3	1.3								Lớp đất san lấp: cát hạt mịn lẫn xác thực vật, màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant
2	-13.0	14.5	13.2		HK2-01 3.0-3.5	3.50 3.95	1	0	0	0	Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen Greenish, blackish grey clay mud someplace alternate sand, with organic and shell
				HK2-02 5.0-5.5	5.50 5.95	1	0	0	0		
				HK2-03 7.0-7.5	7.50 7.95	1	0	0	0		
				HK2-04 9.0-9.5	9.50 9.95	1	0	0	0		
				HK2-05 11.0-11.5	11.50 11.95	1	0	0	0		
				HK2-06 13.0-13.5	13.50 13.95	1	1	1	2		
4	-21.5	23.0	8.5		HK2-07 15.0-15.5	15.50 15.95	13	6	11	17	Sét pha đôi chỗ lẫn sạn sỏi laterite, màu xám xanh loang lổ nâu vàng, trạng thái dẻo mềm đến dẻo cứng Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff
				HK2-08 17.0-17.5	17.50 17.95	5	6	7	13		
				HK2-09 18.5-19.0	19.00 19.45	4	5	7	12		
				HK2-10 21.0-21.5	21.50 21.95	4	5	6	11		
				HK2-11 23.0-23.5	23.50 23.95	3	7	9	16		
6	-34.5	36.0	13.0		HK2-12 25.0-25.5	25.50 25.95	4	6	8	14	Cát hạt nhỏ đến mịn, xen kẹp sét, màu xám xanh, xám trắng, xám vàng, chặt vừa Whitish, blackish, yellowish grey fine sand alternate clay, medium dense
				HK2-13 27.0-27.5	27.50 27.95	4	8	12	20		
				HK2-14 29.0-29.5	29.50 29.95	5	10	13	23		
				HK2-15 31.0-31.5	31.50 31.95	6	7	13	20		
				HK2-16 33.0-33.5	33.50 33.95	4	6	7	13		
				HK2-17 35.0-35.5	35.50 35.95	4	5	7	12		
7b	-40.5	42.0	6.0		HK2-18 37.0-37.5	37.50 37.95	7	10	16	26	Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff
				HK2-19 39.0-39.5	39.50 39.95	9	10	12	22		

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

XD
LAS 406

Th số 2/2

LỖ KHOAN - BOREHOLE: HK2

TOẠ ĐỘ LỖ KHOAN: X: 604047.98
Y: 1185894.09

MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.7

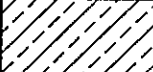
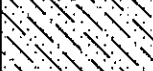
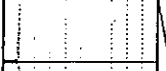
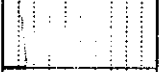
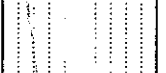
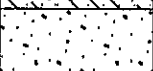
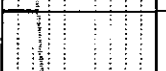
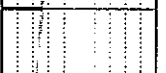
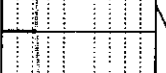
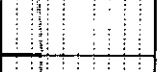
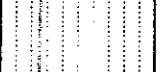
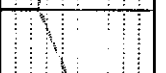
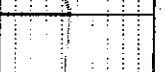
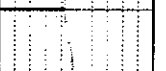
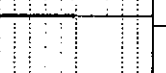
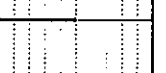
CAO ĐỘ LỖ KHOAN - ELEVATION: 1.506

LOG BY: TRỊNH MINH KHIÊM

ĐỘ SÂU - DEPTH: 70.45M

NGÀY KHỞI CÔNG - COMMENCED: 24/7/2007

NGÀY HOÀN THÀNH - FINISHED: 26/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow			N _{SPT}	Đồ thị N _{SPT} Graphic N Value curve	
							15 cm					
							N1	N2	N3			
7b	-40.5	42.0	6.0		HK2-20 41.0-41.5 41.50 41.95	3	5	8	13		Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng	
8a			6.2		HK2-21 43.0-43.5 43.50 43.95	4	4	5	9		Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff	
					HK2-22 45.0-45.5 45.50 45.95	5	7	8	15		Cát pha màu xám xanh, xám vàng, trạng thái dẻo	
					HK2-23 47.5-48.0 48.00 48.45	8	10	13	23		Greenish, yellowish grey silty sand, plastic.	
8b	-50.5	52.0	3.8		HK2-24 49.5-50.0 50.00 50.45	10	12	14	26		Cát hạt vừa đến to xen kẹp sét lẫn ít sỏi sạn thạch anh, màu xám xanh, xám vàng, chặt vừa đến chặt	
11a			12.0		HK2-25 52.0-52.5 52.50 52.95	7	10	12	22		Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense	
					HK2-26 54.5-55.0 55.00 55.45	9	12	14	26		Cát pha lẫn ít sỏi sạn thạch anh, màu nâu đỏ, trạng thái dẻo	
					HK2-27 57.0-57.5 57.50 57.95	7	10	15	25		Reddish brown silty sand, mixed quartz gravels, plastic	
					HK2-28 59.0-59.5 59.50 59.95	10	18	28	46			
					HK2-29 61.0-61.5 61.50 61.95	11	17	25	42			
					HK2-30 63.0-63.5 63.50 63.95	20	24	25	49			
11b			6.5		HK2-31 65.0-65.5 65.50 65.95	15	20	30	50		Cát pha đôi chỗ lẫn sỏi sạn thạch anh màu nâu vàng loang lổ, trạng thái cứng	
					HK2-32 67.0-67.5 67.50 67.95	9	20	31	51		Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard	
					HK2-33 69.5-70.0 70.00 70.45	22	30	35	65			

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

XD

Tr số 1/2

LỖ KHOAN - BOREHOLE: HK4

TOẠ ĐỘ LỖ KHOAN: X: 604146.71

MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.55

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.536

NGÀY KHỞI CÔNG - COMMENCED: 27/7/2007

LOG BY: NGÔ THANH TUẤN

ĐỘ SÂU - DEPTH: 70.95M

NGÀY HOÀN THÀNH - FINISHED: 30/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT					MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow ----- 15 cm			Đồ thị N _{SPT} Graphic N Value curve	
							N1	N2	N3		
1	0.0	1.5	1.5		HK4-01 2.0-2.5 2.50 2.95	1	0	0	0	Lớp đất san lấp: cát hạt mịn lẫn xác thực vật màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant	
2			14.3		HK4-02 4.0-4.5 4.50 4.95	1	0	0	0	Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen	
					HK4-03 6.0-6.5 6.50 6.95	1	0	0	0	Greenish, blackish grey clay mud someplace alternate sand, with organic and shell	
					HK4-04 8.0-8.5 8.50 8.95	1	1	0	1		
					HK4-05 10.0-10.5 10.50 10.95	1	1	0	1		
					HK4-06 12.0-12.5 12.50 12.95	1	1	0	1		
					HK4-07 14.0-14.5 14.50 14.95	1	1	0	1		
					HK4-08 16.0-16.5 16.50 16.95	16	21	24	45	Sét pha đôi chỗ lẫn sạn sỏi laterite, màu xám xanh loang lổ nâu vàng, trạng thái dẻo mềm đến dẻo cứng	
					HK4-09 18.0-18.5 19.50 19.95 20.50 20.95	14	23	28	51	Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff	
4	-14.3	15.8	5.7		HK4-10 20.0-20.5 22.50 22.95	13	19	24	43	Cát pha, màu xám xanh, nâu vàng loang lổ, trạng thái dẻo	
					HK4-11 22.0-22.5 24.50 24.95	3	4	6	10	Greenish grey, yellowish brown silty sand, plastic	
					HK4-12 24.0-24.5 26.50 26.95	3	3	5	8		
					HK4-13 26.0-26.5 28.50 28.95	3	5	7	12		
					HK4-14 28.0-28.5 30.50 30.95	4	4	5	9		
					HK4-15 30.0-30.5 32.50 32.95	7	8	10	18		
					HK4-16 32.0-32.5 34.50 34.95	3	4	5	9	Sét xen kẹp lớp cát mỏng, đôi chỗ lẫn hữu cơ, màu xám xanh đến xám đen, trạng thái dẻo mềm	
7a	-36.1	37.6	4.6		HK4-17 34.0-34.5 36.50 36.95	4	4	6	10	Greenish grey Clay alternate Sand, mixed organic, firm	
					HK4-18 36.0-36.5 38.50 38.95	10	11	14	25	Cát pha màu xám xanh, xám vàng, trạng thái dẻo	
8a	-51.1	52.6	15.0		HK4-19 38.0-38.5 40.0-40.5					Greenish, yellowish grey silty sand, plastic.	

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG



LỖ KHOAN - BOREHOLE: HK4

TOẠ ĐỘ LỖ KHOAN: X: 604146.71
Y: 1185908.96

MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.55

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.536

NGÀY KHỞI CÔNG - COMMENCED: 27/7/2007

LOG BY: NGÔ THANH TUẤN

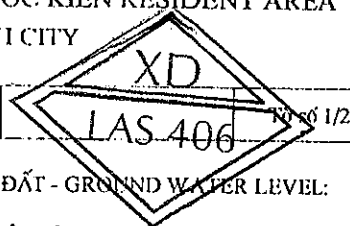
ĐỘ SÂU - DEPTH: 70.95M

NGÀY HOÀN THÀNH - FINISHED: 30/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT							MÔ TẢ ĐỊA TẢNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow 15 cm			N _{SPT}	Đồ thị N _{SPT} Graphic N Value curve		
							N1	N2	N3				
												0	
8a	-51.1	52.6	15.0		HK4-21 42.0-42.5	40.50 40.95	3	6	9	15		Cát pha màu xám xanh, xám vàng, trạng thái dẻo Greenish, yellowish grey silty sand, plastic.	
					HK4-22 44.0-44.5	42.50 42.95	9	12	15	27			
					HK4-23 46.0-46.5	44.50 44.95	8	13	16	29			
					HK4-24 48.0-48.5	46.50 46.95	10	12	17	29			
					HK4-25 50.0-50.5	48.50 48.95	8	13	15	28			
					HK4-26 52.0-52.5	50.50 50.95	11	15	18	33			
11a	-61.3	62.9	10.3		HK4-27 54.0-54.5	52.50 52.95	11	17	19	36		Cát pha lẫn ít sỏi sạn thạch anh, màu nâu đỏ, trạng thái dẻo Reddish brown silty sand, mixed quartz gravels, plastic	
					HK4-28 56.0-56.5	54.50 54.95	16	15	18	33			
					HK4-29 58.0-58.5	56.50 56.95	13	19	23	42			
					HK4-30 60.0-60.5	58.50 58.95	12	18	22	40			
					HK4-31 62.0-62.5	60.50 60.95	13	20	23	43			
					HK4-32 64.0-64.5	62.50 62.95	15	22	25	47			
11b	-69.4	71.0	8.1		HK4-33 66.0-66.5	64.50 64.95	13	23	28	51		Cát pha đôi chỗ lẫn sỏi sạn thạch anh màu nâu vàng loang lổ, trạng thái cứng Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard	
					HK4-34 68.0-68.5	66.50 66.95	18	25	32	57			
					HK4-35 70.0-70.5	68.50 68.95	20	28	34	62			
						70.50 70.95	14	23	29	52			

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÌA BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG



LỖ KHOAN - BOREHOLE: HK5 TOẠ ĐỘ LỖ KHOAN: X: 604132.63 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.2
Y: 1185874.91
CAO ĐỘ LỖ KHOAN - ELEVATION: 1.521 NGÀY KHỞI CÔNG - COMMENCED: 20/7/2007
LOG BY: TRỊNH MINH KHIÊM ĐỘ SÂU - DEPTH: 78.95M NGÀY HOÀN THÀNH - FINISHED: 24/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL		
						Độ sâu (m) Depth	Số búa Blow ----- 15 cm			N _{spt}	Đồ thị N _{spt} Graphic N Value curve			
							N1	N2	N3					
													0	20
1	0.2	1.3	1.3										Lớp đất san lấp: cát hạt mịn lẫn xác thực vật, màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant	
2			14.9		HK5-1 2.0-2.5	2.50 2.95	0	0	1	1				Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen
					HK5-2 4.0-4.5	4.50 4.95	0	0	1	1				Greenish, blackish grey clay mud someplace alternate sand, with organic and shell
					HK5-3 6.0-6.5	6.50 6.95	0	0	1	1				
					HK5-4 8.0-8.5	8.50 8.95	0	0	1	1				
					HK5-5 10.0-10.5	10.50 10.95	0	0	1	1				
					HK5-6 12.0-12.5	12.50 12.95	0	0	1	1				
					HK5-7 14.0-14.5	14.50 14.95	0	0	1	1				
					HK5-8 15.8-16.3	16.30 16.75	8	17	13	30				Sét pha đôi chỗ lẫn sạn sỏi laterite, màu xám xanh loang lổ nâu vàng, trạng thái dẻo mềm đến dẻo cứng
4	-14.7	16.2	6.3		HK5-9 18.0-18.5	18.50 18.95	5	6	8	14			Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff	
					HK5-10 20.0-20.5	20.50 20.95	3	4	5	9				
					HK5-11 22.0-22.5	22.50 22.95	5	6	7	13				Cát pha, màu xám xanh, nâu vàng loang lổ, trạng thái dẻo
5	-21.0	22.5	7.5		HK5-12 24.0-24.5	24.50 24.95	4	6	10	16			Greenish grey, yellowish brown silty sand, plastic	
					HK5-13 26.0-26.5	26.50 26.95	5	7	10	17				
					HK5-14 28.0-28.5	28.50 28.95	4	6	9	15				
					HK5-15 30.0-30.5	30.50 30.95	2	3	4	7				Cát hạt nhỏ đến mịn, xen kẹp sét, màu xám xanh, xám trắng, xám vàng, chặt vừa - Whitish, blackish, yellowish grey fine sand alternate clay, medium dense
6	-31.5	33.0	3.0		HK5-16 32.0-32.5	32.50 32.95	6	8	13	21			Sét xen kẹp lớp cát mỏng, đôi chỗ lẫn hữu cơ, màu xám xanh đến xám đen, trạng thái dẻo mềm Greenish grey Clay alternate Sand, mixed organic, firm	
7a			6.0		HK5-17 34.0-34.5	34.50 34.95	1	2	4	6				
					HK5-18 36.0-36.5	36.50 36.95	4	5	6	11				
					HK5-19 38.0-38.5	38.50 38.95	3	4	4	8				Cát pha màu xám xanh, xám vàng, trạng thái dẻo - Greenish, yellowish grey silty sand, plastic.
8a	-52.0	53.5	14.5		HK5-20 40.0-40.5									

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

XD

T8 số 2/2

LAS 406

LỖ KHOAN - BOREHOLE: HK5

TOA ĐỘ LỖ KHOAN: X: 604132.63
Y: 1185874.91

MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.2

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.521

NGÀY KHỞI CÔNG - COMMENCED: 20/7/2007

LOG BY: TRỊNH MINH KHIÊM

ĐỘ SÂU - DEPTH: 78.95M

NGÀY HOÀN THÀNH - FINISHED: 24/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT					Đồ thị N _{SPT} Graphic N Value curve	MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow ----- 15 cm			N _{SPT}		
							N1	N2	N3			
8a	-52.0	53.5	14.5		HK5-21 42.0-42.5	40.50 40.95	5	9	15	24		Cát pha màu xám xanh, xám vàng, trạng thái dẻo
					HK5-22 44.0-44.5	42.50 42.95	4	6	9	15		Greenish, yellowish grey silty sand, plastic.
					HK5-23 46.0-46.5	44.50 44.95	3	6	8	14		
					HK5-24 48.0-48.5	46.50 46.95	7	8	10	18		
					HK5-25 50.0-50.5	48.50 48.95	6	7	9	16		
					HK5-26 52.0-52.5	50.50 50.95	6	7	10	17		
					HK5-27 54.0-54.5	52.50 52.95	7	8	10	18		
11a	-71.5	73.0	19.5		HK5-28 56.0-56.5	54.50 54.95	10	12	13	25		Cát pha lẫn ít sỏi sạn thạch anh, màu nâu đỏ, trạng thái dẻo
					HK5-29 58.0-58.5	56.50 56.95	12	14	15	29		Reddish brown silty sand, mixed quartz gravels, plastic
					HK5-30 60.0-60.5	58.50 58.95	9	14	15	29		
					HK5-31 62.0-62.5	60.50 60.95	6	13	16	29		
					HK5-32 64.0-64.5	62.50 62.95	7	10	14	24		
					HK5-33 66.0-66.5	64.50 64.95	5	9	16	25		
					HK5-34 68.0-68.5	66.50 66.95	10	19	23	42		
					HK5-35 69.5-70.0	68.50 68.95	15	20	26	46		
					HK5-36 72.0-72.5	70.00 70.45	10	15	19	34		
					HK5-37 74.0-74.5	72.50 72.95	9	12	20	32		
11b	-77.4	79.0	6.0		HK5-38 76.0-76.5	74.50 74.95	28	34	37	71		Cát pha đôi chỗ lẫn sỏi sạn thạch anh màu nâu vàng loang lổ, trạng thái cứng
					HK5-39 78.0-78.5	76.50 76.95	25	32	35	67		Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard
						78.50 78.95	23	26	30	56		

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

XD
LAS 406

Trang số 1/2

LỖ KHOAN - BOREHOLE: HK6

TOẠ ĐỘ LỖ KHOAN: X: 604129.44
Y: 1185901.78

MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.6

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.566

NGÀY KHỞI CÔNG - COMMENCED: 24/7/2007

LOG BY: PHAN HOÀNG LONG

ĐỘ SÂU - DEPTH: 70.95M

NGÀY HOÀN THÀNH - FINISHED: 27/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT					Đồ thị N _{SPT} Graphic N Value curve	MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL	
						Độ sâu (m) Depth	Số búa Blow			N _{SPT}			
							15 cm						
							N1	N2	N3				
1	0.2	1.4	1.4									Lớp đất san lấp: cát hạt mịn lẫn xác thực vật, màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant	
2			14.6		HK6-1 2.0-2.5	2.50 2.95	1	0	0	0			Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen
					HK6-2 4.0-4.5	4.50 4.95	1	0	0	0			Greenish, blackish grey clay mud someplace alternate sand, with organic and shell
					HK6-3 6.0-6.5	6.50 6.95	1	0	0	0			
					HK6-4 8.0-8.5	8.50 8.95	1	1	0	1			
					HK6-5 10.0-10.5	10.50 10.95	1	1	0	1			
					HK6-6 12.0-12.5	12.50 12.95	1	1	0	1			
					HK6-7 14.0-14.5	14.50 14.95	1	1	0	1			
					HK6-8 16.0-16.5	16.50 16.95	4	4	5	9			Sét pha đôi chỗ lẫn sạn sỏi laterite, màu xám xanh loang lổ nâu vàng, trạng thái dẻo mềm đến dẻo cứng
4	-14.4	16.0	5.0		HK6-9 18.0-18.5	18.50 18.95	3	5	6	11			Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff
					HK6-10 20.0-20.5	20.50 20.95	5	7	8	15			
					HK6-11 22.0-22.5	22.50 22.95	3	4	5	9			Cát pha, màu xám xanh, nâu vàng loang lổ, trạng thái dẻo
5	-29.4	31.0	10.0		HK6-12 24.0-24.5	24.50 24.95	3	5	6	11			Greenish grey, yellowish brown silty sand, plastic
					HK6-13 26.0-26.5	26.50 26.95	5	5	5	10			
					HK6-14 28.0-28.5	28.50 28.95	5	6	7	13			
					HK6-15 30.0-30.5	30.50 30.95	9	13	15	28			
					HK6-16 32.0-32.5	32.50 32.95	2	3	4	7			Sét xen kẹp lớp cát mỏng, đôi chỗ lẫn hữu cơ, màu xám xanh đến xám đen, trạng thái dẻo mềm
7a	-34.2	35.8	4.8		HK6-17 34.0-34.5	34.50 34.95	3	3	4	7			Greenish grey Clay alternate Sand, mixed organic, firm
					HK6-18 36.0-36.5	36.50 36.95	8	10	13	23			
7b	-39.2	40.8	5.0		HK6-19 38.0-38.5	38.50 38.95	10	13	15	28			Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng
					HK6-20 40.0-40.5								Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff

AT - GROUND WATER LEVEL:

(CÔNG - COMMENCED: 24/1/2007

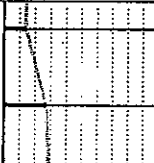
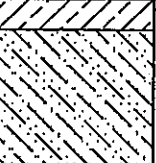
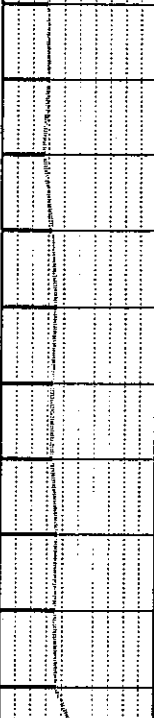
XD To 602/2

MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.6

Y: 1185901.78

NGÀY KHỞI CÔNG - COMMENCED: 24/7/2007

NGÀY HOÀN THÀNH - FINISHED: 27/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No.	Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
							Độ sâu (m) Depth	Số búa Blow			Đồ thị N _{SPT} Graphic N Value curve		
								15 cm					
								N1	N2	N3			
7b	-39.2	40.8	5.0			40.50 40.95	3	4	10	14		Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng	
8a			7.2		HK6-21 42.0-42.5	42.50 42.95	9	12	15	27		Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff	
						44.50 44.95	10	13	16	29		Cát pha màu xám xanh, xám vàng, trạng thái dẻo	
						46.50 46.95	9	13	17	30		Greenish, yellowish grey silty sand, plastic.	
						48.50 48.95	6	11	16	27	Cát pha lẫn ít sỏi sạn thạch anh, màu nâu đỏ, trạng thái dẻo		
11a			15.5		HK6-22 44.0-44.5	50.50 50.95	10	14	18	32		Reddish brown silty sand, mixed quartz gravels, plastic	
						52.50 52.95	11	16	19	35			
						54.50 54.95	10	15	18	33			
						56.50 56.95	11	16	17	33			
						58.50 58.95	11	17	19	36			
						60.50 60.95	10	17	18	35			
						62.50 62.95	10	17	19	36			
						64.50 64.95	16	27	30	57		Cát pha đôi chỗ lẫn sỏi sạn thạch anh màu nâu vàng loang lổ, trạng thái cứng	
						66.50 66.95	18	32	35	67			Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard
						68.50 68.95	17	30	36	66			
						70.50 70.95	17	32	34	66			
						11b	-69.4	71.0	7.5				

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

Tờ số 1/3

LỖ KHOAN - BOREHOLE: HK7

TOẠ ĐỘ LỖ KHOAN: X: 604347.27

MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.5

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.466

Y: 1185900.96

NGÀY KHỞI CÔNG - COMMENCED: 10/7/2007

LOG BY: TRẦN QUỐC VƯƠNG

ĐỘ SÂU - DEPTH: 86.95M

NGÀY HOÀN THÀNH - FINISHED: 18/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL						
						Độ sâu (m) Depth	Số búa Blow			Đồ thị N _{SPT} Graphic N Value curve								
							15 cm											
							N1	N2	N3									
1	0.2	1.3	1.3													Lớp đất san lấp: cát hạt mịn lẫn xác thực vật màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant		
2			16.3		HK7-1 2.0-2.5	2.50 2.95	0	0	0	0							Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen	
					HK7-2 4.0-4.5	4.50 4.95	0	0	0	0								Greenish, blackish grey clay mud someplace alternate sand, with organic and shell
					HK7-3 6.0-6.5	6.50 6.95	0	0	0	0								
					HK7-4 8.0-8.5	8.50 8.95	0	0	0	0								
					HK7-5 10.0-10.5	10.50 10.95	0	0	0	0								
					HK7-6 12.0-12.5	12.50 12.95	0	0	0	0								
					HK7-7 14.0-14.5	14.50 14.95	1	0	0	0								
					HK7-8 16.0-16.5	16.50 16.95	1	1	1	2								
3			6.9		HK7-9 18.0-18.5	18.50 18.95	3	3	4	7						Sét đôi chỗ lẫn hữu cơ, màu xám xanh, xám đen, trạng thái dẻo mềm đến dẻo cứng		
					HK7-10 19.5-20.0	20.00 20.45	4	5	6	11							Greenish, blackish grey clay, someplace mixed organic, firm to stiff	
					HK7-11 21.5-22.0	22.50 22.95	2	2	4	6								
					HK7-13 24.0-24.5	24.50 24.95	5	5	7	12								
6			8.9		HK7-14 26.0-26.5	26.50 26.95	3	4	4	8						Cát hạt nhỏ đến mịn, xen kẹp sét, màu xám xanh, xám trắng, xám vàng, chặt vừa		
					HK7-15 28.0-28.5	28.50 28.95	8	9	11	20							Whitish, blackish, yellowish grey fine sand alternate clay, medium dense	
					HK7-16 30.0-30.5	30.50 30.95	4	5	7	12								
					HK7-17 32.0-32.5	32.50 32.95	3	4	6	10								
7a	-31.9	33.4	1.5		HK7-18 34.0-34.5	34.50 34.95	5	7	9	16						Sét xen kẹp lớp cát mỏng, đôi chỗ lẫn hữu cơ, màu xám xanh đến xám đen, trạng thái dẻo mềm - Greenish grey Clay alternate Sand, mixed organic, firm		
7b			5.8		HK7-19 35.5-36.0	36.00 36.45	4	7	12	19								
					HK7-20 38.0-38.5	38.50 38.95	5	7	10	17							Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng	
					HK7-21 40.0-40.5												Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff	

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

Tờ số 2/3

LỖ KHOAN - BOREHOLE: HK7

TOẠ ĐỘ LỖ KHOAN: $\frac{X: 604347.27}{Y: 1185900.96}$

MỨC NƯỚC DƯỚI ĐẤT- GROUND WATER LEVEL: 0.5

CAO ĐỘ LỖ KHOAN - ELEVATION: 1,466

LOG BY: TRẦN QUỐC VƯƠNG

ĐỘ SÂU - DEPTH: 86.95M

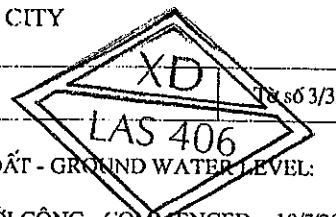
NGÀY KHỞI CÔNG / COMMENCED: 10/7/2007

NGÀY HOÀN THÀNH - FINISHED: 18/7/2007

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QUY HOẠCH KHU DÂN CƯ PHƯỚC KIỂN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

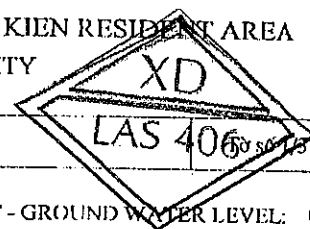


LỖ KHOAN - BOREHOLE: HK7 TOA ĐỘ LỖ KHOAN: X: 604347.27 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.5
Y: 1185900.96
CAO ĐỘ LỖ KHOAN - ELEVATION: 1.466 NGÀY KHỞI CÔNG - COMMENCED: 10/7/2007
LOG BY: TRẦN QUỐC VƯƠNG ĐỘ SÂU - DEPTH: 86.95M NGÀY HOÀN THÀNH - FINISHED: 18/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT					Đồ thị N _{SPT} Graphic N Value curve	MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow ----- 15 cm			N _{SPT}		
							N1	N2	N3			
1k	-80.8	82.3	2.4		HK7-41 80.0-80.5 HK7-42 82.0-82.5	80.50 80.95	10	10	12	22		Thấu kính sét màu xám xanh loang lổ, xám nâu, trạng thái dẻo cứng đến nửa cứng - Lens greenish grey, spot, brownish grey clay, stiff to very stiff
12	-84.0	85.5	3.2		HK7-43 84.0-84.5	82.50 82.95	20	31	42	73		Cát hạt nhỏ đến to lẫn ít sạn, màu nâu đỏ, xám vàng, trạng thái chặt - Yellowish grey, reddish brown fine sand to coarse sand, mixed quartz gravels, dense
13	-85.5	87.0	1.5		HK7-44 86.0-86.5	84.50 84.95	21	96	36	132		Sét màu xám xanh, xám tro, trạng thái nửa cứng đến cứng Greenish grey clay, very stiff to hard
						86.50 86.95	5	14	42	56		

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG



LỖ KHOAN - BOREHOLE: HK8

TOẠ ĐỘ LỖ KHOAN: X: 604327.28
Y: 1185901.89

MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.3

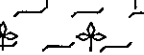
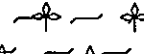
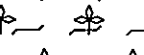
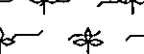
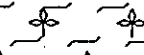
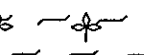
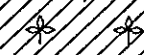
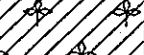
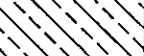
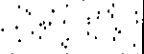
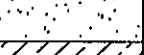
CAO ĐỘ LỖ KHOAN - ELEVATION: 1.436

NGÀY KHỞI CÔNG - COMMENCED: 19/7/2007

LOG BY: NGÔ THANH TUẤN

ĐỘ SÂU - DEPTH: 84.95M

NGÀY HOÀN THÀNH - FINISHED: 24/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẢNG DESCRIPTION OF SOIL				
						Độ sâu (m) Depth	Số búa Blow			N _{spt}	Đồ thị N _{spt} Graphic N Value curve					
							15 cm									
							N1	N2	N3				0	20	40	60
1	-0.1	1.5	1.5												Lớp đất san lấp: cát hạt mịn lẫn xác thực vật màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant	
2			16.3		HK8-1 2.0-2.5	2.50 2.95	1	0	0	0						Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen
					HK8-2 4.0-4.5	4.50 4.95	1	0	0	0						Greenish, blackish grey clay mud someplace alternate sand, with organic and shell
					HK8-3 6.0-6.5	6.50 6.95	1	0	0	0						
					HK8-4 8.0-8.5	8.50 8.95	1	0	0	0						
					HK8-5 10.0-10.5	10.50 10.95	1	0	0	0						
					HK8-6 12.0-12.5	12.50 12.95	1	0	1	1						
					HK8-7 14.0-14.5	14.50 14.95	1	0	1	1						
					HK8-8 16.0-16.5	16.50 16.95	1	0	0	0						
3			6.7		HK8-9 18.0-18.5	18.50 18.95	1	2	4	6					Sét đôi chỗ lẫn hữu cơ, màu xám xanh, xám đen, trạng thái dẻo mềm đến dẻo cứng	
					HK8-10 20.0-20.5	20.50 20.95	3	4	7	11					Greenish, blackish grey clay, someplace mixed organic, firm to stiff	
					HK8-11 22.0-22.5	22.50 22.95	2	3	6	9						
					HK8-12 24.0-24.5	24.50 24.95	3	5	7	12						
4	-23.1	24.5			HK8-13 26.0-26.5	26.50 26.95	7	12	18	30				Sét pha đôi chỗ lẫn sạn sỏi laterite, màu xám xanh loang lổ nâu vàng, trạng thái dẻo mềm đến dẻo cứng - Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff		
6	-24.7	26.1	1.6		HK8-14 28.0-28.5	28.50 28.95	6	10	17	27				Cát hạt nhỏ đến mịn, xen kẹp sét, màu xám xanh, xám trắng, xám vàng, chặt vừa		
7b			4.5		HK8-15 30.0-30.5	30.50 30.95	8	14	19	33				Whitish, blackish, yellowish grey fine sand alternate clay, medium dense		
					HK8-16 32.0-32.5	32.50 32.95	6	12	16	28					Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng	
					HK8-17 34.0-34.5	34.50 34.95	3	9	11	20					Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff	
					HK8-18 36.0-36.5	36.50 36.95	7	16	16	32					Cát hạt vừa đến to xen kẹp sét lẫn ít sỏi sạn thạch anh, màu xám xanh, xám vàng, chặt vừa đến chặt - Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense	
8b			3.7		HK8-19 38.0-38.5	38.50 38.95	11	15	21	36						
					HK8-20 40.0-40.5											

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

XD
LAS 406 1/2/3

LỖ KHOAN - BOREHOLE: HK8 TOẠ ĐỘ LỖ KHOAN: X: 604327.28 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.3
Y: 1185901.89

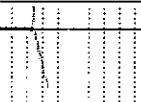
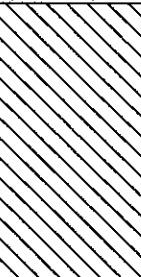
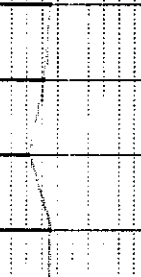
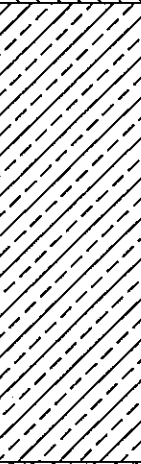
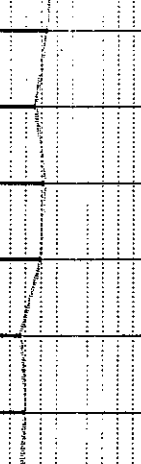
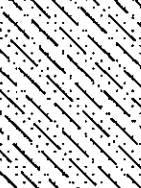
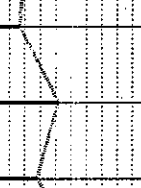
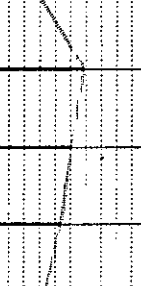
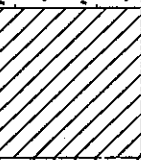
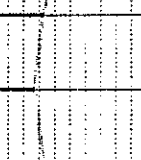
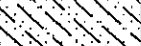
CAO ĐỘ LỖ KHOAN - ELEVATION: 1.436

NGÀY KHỞI CÔNG - COMMENCED: 19/7/2007

LOG BY: NGÔ THANH TUẤN

ĐỘ SÂU - DEPTH: 84.95M

NGÀY HOÀN THÀNH - FINISHED: 24/7/2007

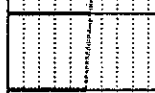
Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT										MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow ----- 15 cm			Đồ thị N _{SPT} Graphic N Value curve						
							N ₁	N ₂	N ₃		N _{SPT}					
												0	20	40	60	
8b	-41.3	42.7	3.7		HK8-21 42.0-42.5	40.50 40.95	5	7	17	24		Cát hạt vừa đến to xen kẹp sét lẫn ít sỏi sạn thạch anh, màu xám xanh, xám vàng, chặt vừa đến chặt - Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense				
9			7.3		HK8-22 44.0-44.5	42.50 42.95	10	15	21	36		Sét xen kẹp cát, màu xám nâu, nâu tím, trạng thái nửa cứng đến cứng Brownish grey, violetish brown clay alternate sand, very stiff to hard				
					HK8-23 46.0-46.5	44.50 44.95	7	12	20	32						
					HK8-24 48.0-48.5	46.50 46.95	7	10	12	22						
					HK8-25 50.0-50.5	48.50 48.95	10	12	24	36						
10			12.0		HK8-26 52.0-52.5	50.50 50.95	10	14	20	34		Sét pha xen kẹp cát, màu xám trắng, nâu hồng, trạng thái dẻo cứng đến nửa cứng Whitish grey, pinkish brown silty clay alternate sand, stiff to very stiff				
					HK8-27 54.0-54.5	52.50 52.95	5	9	17	26						
					HK8-28 56.0-56.5	54.50 54.95	10	15	17	32						
					HK8-29 58.0-58.5	56.50 56.95	7	12	18	30						
					HK8-30 60.0-60.5	58.50 58.95	7	7	10	17						
					HK8-31 62.0-62.5	60.50 60.95	5	9	11	20						
11a			5.0		HK8-32 64.0-64.5	62.50 62.95	5	5	12	17		Cát pha lẫn ít sỏi sạn thạch anh, màu nâu đỏ, trạng thái dẻo Reddish brown silty sand, mixed quartz gravels, plastic				
					HK8-33 66.0-66.5	64.50 64.95	10	20	22	42						
					HK8-34 68.0-68.5	66.50 66.95	5	12	16	28						
12			7.5		HK8-35 70.0-70.5	68.50 68.95	20	25	34	59		Cát hạt nhỏ đến to lẫn ít sạn, màu nâu đỏ, xám vàng, trạng thái chặt Yellowish grey, reddish brown fine sand to coarse sand, mixed quartz gravels, dense				
					HK8-36 72.0-72.5	70.50 70.95	18	24	27	51						
					HK8-37 74.0-74.5	72.50 72.95	12	20	24	44						
					HK8-38 76.0-76.5	74.50 74.95	30	15	18	33						
13			4.0		HK8-39 78.0-78.5	76.50 76.95	7	10	17	27		Sét màu xám xanh, xám tro, trạng thái nửa cứng đến cứng Greenish grey clay, very stiff to hard				
					HK8-40 80.0-80.5	78.50 78.95	9	13	20	33						
14	-83.5	85.0	6.5									Cát pha màu nâu đỏ, xám vàng, trạng thái cứng - Reddish brown, yellowish grey silty sand, hard				

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

Tờ số 3/3

LỖ KHOAN - BOREHOLE: HK8 **TOẠ ĐỘ LỖ KHOAN:** X: 604327.28 **MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL:** 0.3
 Y: 1185901.89
CAO ĐỘ LỖ KHOAN - ELEVATION: 1.436 **NGÀY KHỞI CÔNG - COMMENCED:** 19/7/2007
LOG BY: NGÔ THANH TUẤN **ĐỘ SÂU - DEPTH:** 84.95M **NGÀY HOÀN THÀNH - FINISHED:** 24/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow			N _{SPT}	Đồ thị N _{SPT} Graphic N Value curve	
							15 cm					
							N1	N2	N3			
14	-83.5	85.0	6.5		HK8-41 82.0-82.5	80.50 80.95	15	19	38	57		Cát pha màu nâu đỏ, xám vàng, trạng thái cứng
					HK8-42 84.0-84.5	82.50 82.95	16	22	31	53		Reddish brown, yellowish grey silty sand, hard
						84.50 84.95	11	18	32	50		

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

~~Tờ số 1/3~~

LỖ KHOAN - BOREHOLE: HK9

TOẠ ĐỘ LỖ KHOAN: $\frac{X: 604312.69}{Y: 1185889.25}$

MỤC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.5

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.421

LOG BY: NGÔ THANH TUẤN

ĐỘ SÂU - DEPTH: 86.95M

NGÀY KHỞI CÔNG - COMMENCED: 24/7/2007

NGÀY HOÀN THÀNH - FINISHED: 28/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
						Độ sâu (m) Depth	Số búa Blow 15 cm			N _{spt}	Đồ thị N _{spt} Graphic N Value curve																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRƯ LỖ KHOAN - BOREHOLE LOG

Tờ số 1/3

LỖ KHOAN - BOREHOLE: HK11

TOẠ ĐỘ LỖ KHOAN: $\frac{X: 604300.49}{Y: 1185960.31}$

MỰC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.5

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.426

LOG BY: NGÔ THANH TUẤN

ĐỘ SÂU - DEPTH: 84.95M

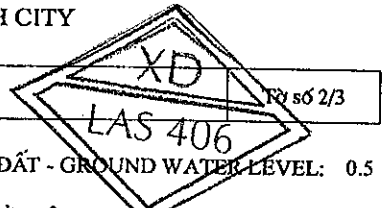
NGÀY KHỞI CÔNG - COMMENCED: 19/7/2007

NGÀY HOÀN THÀNH/ FINISHED: 25/7/2007

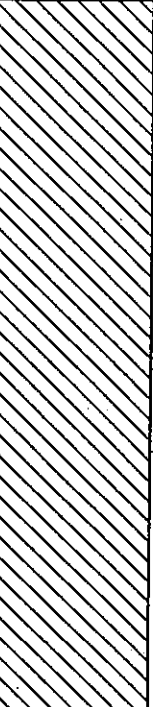
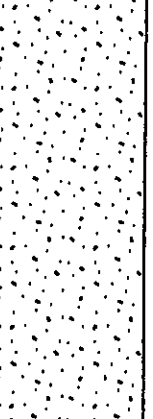
Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No.	Depth (m)	THÍ NGHIỆM SPT										MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL			
							Độ sâu (m) Depth	Số búa Blow			N _{spt}	Đồ thị N _{spt} Graphic N Value curve								
								15 cm												
								N1	N2	N3			0	20	40	60		80	100	
1	0.2	1.2	1.2															Lớp đất san lấp: cát hạt mịn lẫn xác thực vật, màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant		
2			17.6		HK11-1 2.0-2.5	2.50 2.95	1	0	0	0									Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen	
					HK11-2 4.0-4.5	4.50 4.95	1	0	0	0										Greenish, blackish grey clay mud someplace alternate sand, with organic and shell
					HK11-3 6.0-6.5	6.50 6.95	1	0	0	0										
					HK11-4 8.0-8.5	8.50 8.95	1	0	0	0										
					HK11-5 10.0-10.5	10.50 10.95	1	0	0	0										
					HK11-6 12.0-12.5	12.50 12.95	1	0	0	0										
					HK11-7 14.0-14.5	14.50 14.95	1	0	0	0										
					HK11-8 16.0-16.5	16.50 16.95	1	0	0	0										
					HK11-9 18.0-18.5	18.50 18.95	2	2	3	5										
4			4.7		HK11-10 20.0-20.5	20.50 20.95	4	5	7	12								Sét pha đôi chỗ lẫn sạn sỏi laterite, màu xám xanh loang lổ nâu vàng, trạng thái dẻo mềm đến dẻo cứng		
					HK11-11 22.0-22.5	22.50 22.95	6	7	8	15									Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff	
					HK11-12 24.0-24.5	24.50 24.95	4	5	6	11										
6			3.2		HK11-13 26.0-26.5	26.50 26.95	1	7	9	16							Cát hạt nhỏ đến mịn, xen kẹp sét, màu xám xanh, xám trắng, xám vàng, chặt vừa			
					HK11-14 28.0-28.5	28.50 28.95	5	10	13	23									Sét xen kẹp lớp cát mỏng, đôi chỗ lẫn hữu cơ, màu xám xanh đến xám đen, trạng thái dẻo mềm	
7a			10.3		HK11-15 30.0-30.5	30.50 30.95	7	9	17	26								Greenish grey Clay alternate Sand, mixed organic, firm		
					HK11-16 32.0-32.5	32.50 32.95	7	10	16	26										
					HK11-17 34.0-34.5	34.50 34.95	6	7	10	17										
					HK11-18 36.0-36.5	36.50 36.95	4	5	10	15										
					HK11-19 38.0-38.5	38.50 38.95	4	5	6	11										
7b			5.4		HK11-20 40.0-40.5	40.50 40.95	4	5	6	11								Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng		
																			Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff	

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG



LỖ KHOAN - BOREHOLE: HK11 TOẠ ĐỘ LỖ KHOAN: X: 604300.49 Y: 1185960.31 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.5
CAO ĐỘ LỖ KHOAN - ELEVATION: 1.426 NGÀY KHỞI CÔNG - COMMENCED: 19/7/2007
LOG BY: NGÔ THANH TUẤN ĐỘ SÂU - DEPTH: 84.95M NGÀY HOÀN THÀNH - FINISHED: 25/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow ----- 15 cm			Đồ thị N _{SPT} Graphic N Value curve		
							N _{SPT}					
								N1	N2		N3	
7b	-41.0	42.4	5.4		HK11-21 42.0-42.5	40.50 40.95	5	7	9	16	Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng - Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff	
8b			4.6		HK11-22 44.0-44.5	42.50 42.95	7	12	18	30	Cát hạt vừa đến to xen kẹp sét lẫn ít sỏi sạn thạch anh, màu xám xanh, xám vàng, chặt vừa đến chặt - Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense	
					HK11-23 46.0-46.5	44.50 44.95	7	15	20	35		
9			18.6		HK11-24 48.0-48.5	46.50 46.95	7	10	21	31	Sét xen kẹp cát, màu xám nâu, nâu tím, trạng thái nửa cứng đến cứng Brownish grey, violetish brown clay alternate sand, very stiff to hard	
					HK11-25 50.0-50.5	48.50 48.95	4	4	8	12		
					HK11-26 52.0-52.5	50.50 50.95	5	5	10	15		
					HK11-27 54.0-54.5	52.50 52.95	4	7	9	16		
					HK11-28 56.0-56.5	54.50 54.95	4	7	10	17		
					HK11-29 58.0-58.5	56.50 56.95	4	6	8	14		
					HK11-30 60.0-60.5	58.50 58.95	4	6	11	17		
					HK11-31 62.0-62.5	60.50 60.95	9	12	20	32		
					HK11-32 64.0-64.5	62.50 62.95	4	6	10	16		
					HK11-33 66.0-66.5	64.50 64.95	7	10	15	25		
10	-64.2	65.6	2.9		HK11-34 68.0-68.5	66.50 66.95	12	21	24	45	Sét pha xen kẹp cát, màu xám trắng, nâu hồng, trạng thái dẻo cứng đến nửa cứng - Whitish grey, pinkish brown silty clay alternate sand, stiff to very stiff	
12			14.5		HK11-35 70.0-70.5	68.50 68.95	13	22	32	54	Cát hạt nhỏ đến to lẫn ít sạn, màu nâu đỏ, xám vàng, trạng thái chặt Yellowish grey, reddish brown fine sand to coarse sand, mixed quartz gravels, dense	
					HK11-36 72.0-72.5	70.50 70.95	15	20	24	44		
					HK11-37 74.0-74.5	72.50 72.95	17	24	28	52		
					HK11-38 76.0-76.5	74.50 74.95	15	20	27	47		
					HK11-39 78.0-78.5	76.50 76.95	9	20	32	52		
					HK11-40 80.0-80.5	78.50 78.95	15	20	27	47		
	-81.6	83.0										

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

XD

Tờ số 3/3

LỖ KHOAN - BOREHOLE: HK11 TOẠ ĐỘ LỖ KHOAN: X: 604300.49 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.5
Y: 1185960.31

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.426

NGÀY KHỞI CÔNG - COMMENCED: 19/7/2007

LOG BY: NGÔ THANH TUẤN

ĐỘ SÂU - DEPTH: 84.95M

NGÀY HOÀN THÀNH - FINISHED: 25/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT					Đồ thị N _{SPT} Graphic N Value curve	MÔ TẢ ĐỊA TẢNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow			N _{SPT}		
							15 cm					
							N1	N2	N3			
12	-81.6	83.0	14.5		HK11-41 82.0-82.5	80.50 80.95	17	25	35	60		Cát hạt nhỏ đến to lẫn ít sạn, màu nâu đỏ, xám vàng, trạng thái chặt - Yellowish grey, reddish brown fine sand to coarse sand, mixed quartz gravels, dense
13	-83.5	85.0	2.0		HK11-42 84.0-84.5	82.50 82.95	15	21	33	54		Sét màu xám xanh, xám tro, trạng thái nửa cứng đến cứng Greenish grey clay, very stiff to hard
						84.50 84.95	17	23	29	52		

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

Tờ số 1/3

LỖ KHOAN - BOREHOLE: HK12

**TOẠ ĐỘ LỖ KHOAN: X: 604288.32
Y: 1185942.61**

MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.5

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.371

NGÀY KHỞI CÔNG - COMMENCED: 10/7/2007

LOG BY: TRẦN QUỐC VƯƠNG

ĐỘ SÂU - DEPTH: 82.95M

NGÀY HOÀN THÀNH - FINISHED: 18/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT							MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow ----- 15 cm			N _{spt}	Đồ thị N _{spt} Graphic N Value curve		
												N1	
1	-0.1	1.5	1.5										Lớp đất san lấp: cát hạt mịn lẫn xác thực vật, màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant
2			17.6		HK12-1 2.0-2.5 2.50 2.95	2.50 2.95	1	0	0	0			Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen
					HK12-2 4.0-4.5 4.50 4.95	4.50 4.95	1	0	0	0			Greenish, blackish grey clay mud someplace alternate sand, with organic and shell
					HK12-3 6.0-6.5 6.50 6.95	6.50 6.95	1	0	0	0			
					HK12-4 8.0-8.5 8.50 8.95	8.50 8.95	1	0	0	0			
					HK12-5 10.0-10.5 10.50 10.95	10.50 10.95	1	0	0	0			
					HK12-6 12.0-12.5 12.50 12.95	12.50 12.95	1	0	0	0			
					HK12-7 14.0-14.5 14.50 14.95	14.50 14.95	1	0	0	0			
					HK12-8 16.0-16.5 16.50 16.95	16.50 16.95	1	1	1	2			
					HK12-9 17.5-18.0 18.00 18.45	18.00 18.45	2	3	4	7			
					HK12-10 19.5-20.0 20.00 20.45	20.00 20.45	6	6	6	12			Sét pha đôi chỗ lẫn sạn sỏi laterite, màu xám xanh loang lổ nâu vàng, trạng thái dẻo mềm đến dẻo cứng
4	-22.6	24.0	4.9		HK12-11 21.5-22.0 22.00 22.45	22.00 22.45	6	5	5	10		Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff	
5	-25.3	26.7	2.7		HK12-12 24.0-24.5 24.50 24.95	24.50 24.95	5	5	8	13		Cát pha, màu xám xanh, nâu vàng loang lổ, trạng thái dẻo - Greenish grey, yellowish brown silty sand, plastic	
					HK12-13 26.0-26.5 26.50 26.95	26.50 26.95	3	4	5	9			
6			7.0		HK12-14 28.0-28.5 28.50 28.95	28.50 28.95	6	10	12	22		Cát hạt nhỏ đến mịn, xen kẹp sét, màu xám xanh, xám trắng, xám vàng, chặt vừa	
					HK12-15 30.0-30.5 30.50 30.95	30.50 30.95	7	12	15	27		Whitish, blackish, yellowish grey fine sand alternate clay, medium dense	
					HK12-16 32.0-32.5 32.50 32.95	32.50 32.95	8	15	20	35			
7a	-32.3	33.7	3.3		HK12-17 34.0-34.5 34.50 34.95	34.50 34.95	4	5	6	11		Sét xen kẹp lớp cát mỏng, đôi chỗ lẫn hữu cơ, màu xám xanh đến xám đen, trạng thái dẻo mềm - Greenish grey Clay alternate Sand, mixed organic, firm	
					HK12-18 36.0-36.5 36.50 36.95	36.50 36.95	3	4	6	10			
7b	-35.6	37.0	3.6		HK12-19 38.0-38.5 38.50 38.95	38.50 38.95	4	6	8	14		Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng - Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff	
					HK12-20 40.0-40.5								

HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

~~XD~~

~~LAS 406~~

~~TỜ~~ số 2/3

TOA ĐỘ LỖ KHOAN: X: 604288.32

X: 604288.32

MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.5

Y: 1185942.61

LOG BY: TRẦN QUỐC VƯƠNG

ĐỘ SÂU - DEPTH: 82.95M

NGÀY KHỞI CÔNG - COMMENCED: 10/7/2007

NGÀY HOÀN THÀNH - FINISHED: 18/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT							MÔ TẢ ĐỊA TẢNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow			N _{SPT}	Đồ thị N _{SPT} Graphic N Value curve		
							15 cm						
							N1	N2	N3			0	
7b	-39.2	40.6	3.6			40.50 40.95	4	7	10	17			Sét pha dới chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng - Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff
8b			6.9		HK12-21 ■ 42.0-42.5	42.50 42.95	10	17	21	38			Cát hạt vừa đến to xen kẹp sét lẫn ít sỏi sạn thạch anh, màu xám xanh, xám vàng, chặt vừa đến chặt - Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense
					HK12-22 ■ 44.0-44.5	44.50 44.95	7	10	12	22			
					HK12-23 ■ 46.0-46.5	46.50 46.95	7	24	15	39			
					HK12-24 ■ 48.0-48.5	48.50 48.95	2	4	8	12			
9	-46.1	47.5	9.5		HK12-25 ■ 50.0-50.3	50.50 50.95	5	10	17	27			Sét xen kẹp cát, màu xám nâu, nâu tím, trạng thái nửa cứng đến cứng Brownish grey, violetish brown clay alternate sand, very stiff to hard
					HK12-26 ■ 52.0-52.3	52.50 52.95	7	12	16	28			
					HK12-27 ■ 54.0-54.3	54.50 54.95	8	14	16	30			
					HK12-28 ■ 56.0-56.3	56.50 56.95	5	10	14	24			
					HK12-29 ■ 58.0-58.3	58.50 58.95	6	7	12	19			
					HK12-30 ■ 60.0-60.3	60.50 60.95	10	12	24	36			
10	-63.6	65.0	8.0		HK12-31 ■ 62.0-62.3	62.50 62.95	5	7	15	22			Whitish grey, pinkish brown silty clay alternate sand, stiff to very stiff
					HK12-32 ■ 64.0-64.3	64.50 64.95	5	9	18	27			
					HK12-33 ■ 66.0-66.3	66.50 66.95	6	11	22	33			
					HK12-34 ■ 68.0-68.3	68.50 68.95	8	18	27	45			
11a	-71.6	73.0	8.0		HK12-35 ■ 70.0-70.3	70.50 70.95	9	12	28	40			Cát pha lẫn ít sỏi sạn thạch anh, màu nâu đỏ, trạng thái dẻo Reddish brown silty sand, mixed quartz gravels, plastic
					HK12-36 ■ 72.0-72.3	72.50 72.95	8	15	23	38			
					HK12-37 ■ 74.0-74.3	74.50 74.95	7	15	35	50			
					HK12-38 ■ 76.0-76.3	76.50 76.95	8	14	26	40			
12	-80.7	82.1	9.1		HK12-39 ■ 78.0-78.3	78.50 78.95	13	19	36	55			Cát hạt nhỏ đến to lẫn ít sạn, màu nâu đỏ, xám vàng, trạng thái chặt Yellowish grey, reddish brown fine sand to coarse sand, mixed quartz gravels, dense
					HK12-40 ■ 80.0-80.3								

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

XD
LAS 406 T8.03/3

LỖ KHOAN - BOREHOLE: HK12 TOA ĐỘ LỖ KHOAN: X: 604288.32 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.5
Y: 1185942.61
CAO ĐỘ LỖ KHOAN - ELEVATION: 1.371 NGÀY KHỞI CÔNG - COMMENCED: 10/7/2007
LOG BY: TRẦN QUỐC VƯƠNG ĐỘ SÂU - DEPTH: 82.95M NGÀY HOÀN THÀNH - FINISHED: 18/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow			N _{SPT}	Đồ thị N _{SPT} Graphic N Value curve	
							15 cm					
							N1	N2	N3			
12	-80.7	82.1	9.1		HK12-41 82.0-82.5	80.50 80.95	20	22	30	52	Cát hạt nhỏ đến to lẫn ít sạn, màu nâu đỏ, xám vàng, trạng thái chặt - Yellowish grey, reddish brown fine sand to coarse sand, mixed quartz gravels, dense	
13	-81.6	83.0	0.9			82.50 82.95	12	24	27	51		Sét màu xám xanh, xám tro, trạng thái nửa cứng đến cứng Greenish grey clay, very stiff to hard

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

XD

Tỷ số 1/2

LỖ KHOAN - BOREHOLE: HK13

TOẠ ĐỘ LỖ KHOAN: X: 604126.94
Y: 1186025.29

MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.4

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.556

NGÀY KHỞI CÔNG - COMMENCED: 27/7/2007

LOG BY: TRỊNH MINH KHIÊM

ĐỘ SÂU - DEPTH: 69.95M

NGÀY HOÀN THÀNH - FINISHED: 1/8/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL					
						Độ sâu (m) Depth	Số búa Blow 15 cm			Đồ thị N _{SPT} Graphic N Value curve							
							N _{SPT}										
								0	20		40		60	80	100		
1	0.6	1.0	1.0													Lớp đất san lấp: cát hạt mịn lẫn xác thực vật, màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant	
2	-14.2	15.8	14.8		HK13-1 2.0-2.3	2.50 2.95	0	0	1	1							Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen
				HK13-2 4.0-4.5	4.50 4.95	0	0	1	1								Greenish, blackish grey clay mud someplace alternate sand, with organic and shell
				HK13-3 6.0-6.5	6.50 6.95	0	0	1	1								
				HK13-4 8.0-8.5	8.50 8.95	0	0	1	1								
				HK13-5 10.0-10.3	10.50 10.95	0	0	1	1								
				HK13-6 12.0-12.3	12.50 12.95	0	0	1	1								
				HK13-7 14.0-14.5	14.50 14.95	0	0	1	1								
				HK13-8 16.0-16.5	16.50 16.95	5	11	16	27								Sét pha đôi chỗ lẫn sạn sỏi laterite, màu xám xanh loang lổ nâu vàng, trạng thái dẻo mềm đến dẻo cứng
4	-21.4	23.0	7.2		HK13-9 18.0-18.3	18.50 18.95	5	7	8	15						Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff	
				HK13-10 20.0-20.3	20.50 20.95	6	8	9	17								
				HK13-11 22.0-22.3	22.50 22.95	8	10	13	23								
5	-27.4	29.0	6.0		HK13-12 24.0-24.3	24.50 24.95	4	6	8	14						Cát pha, màu xám xanh, nâu vàng loang lổ, trạng thái dẻo	
				HK13-13 26.0-26.3	26.50 26.95	4	7	9	16								Greenish grey, yellowish brown silty sand, plastic
				HK13-14 28.0-28.3	28.50 28.95	7	10	12	22								
6	-30.4	32.0	3.0		HK13-15 30.0-30.3	30.50 30.95	6	8	11	19						Cát hạt nhỏ đến mịn, xen kẹp sét, màu xám xanh, xám trắng, xám vàng, chặt vừa - Whitish, blackish, yellowish grey fine sand alternate clay, medium dense	
7a	-35.4	37.0	5.0		HK13-16 32.0-32.3	32.50 32.95	3	4	5	9						Sét xen kẹp lớp cát mỏng, đôi chỗ lẫn hữu cơ, màu xám xanh đến xám đen, trạng thái dẻo mềm	
				HK13-17 34.0-34.3	34.50 34.95	5	11	12	23								Greenish grey Clay alternate Sand, mixed organic, firm
				HK13-18 36.0-36.3	36.50 36.95	6	10	15	25								
8a	-39.4	41.0	4.0		HK13-19 38.0-38.3	38.50 38.95	6	10	14	24						Cát pha màu xám xanh, xám vàng, trạng thái dẻo - Greenish, yellowish grey silty sand, plastic.	
				HK13-20 40.0-40.3													

 Tờ số
 XD
 LAS 406
 ĐẤT - GROUND WATER LEVEL

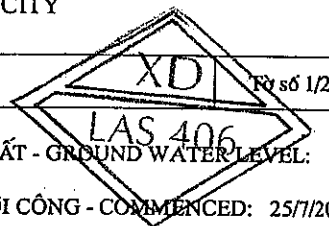
~~XD~~ ~~Tờ số 2/2~~

NGÀY HOÀN THÀNH - FINISHED: 1/8/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT							MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow ----- 15 cm			N _{SPT}	Đồ thị N _{SPT} Graphic N Value curve		
							N1	N2	N3				
												0	
8a	-39.4	41.0	4.0			40.50 40.95	4	5	8	13			Cát pha màu xám xanh, xám vàng, trạng thái dẻo Greenish, yellowish grey silty sand, plastic.
11a			22.3		HK13-21 42.0-42.5	42.50 42.95	7	11	21	32			Cát pha lẫn ít sỏi sạn thạch anh, màu nâu đỏ, trạng thái dẻo Reddish brown silty sand, mixed quartz gravels, plastic
					HK13-22 44.0-44.5	44.50 44.95	8	14	20	34			
					HK13-23 46.0-46.5	46.50 46.95	7	12	16	28			
					HK13-24 48.0-48.5	48.50 48.95	5	6	7	13			
					HK13-25 50.0-50.5	50.50 50.95	8	13	14	27			
					HK13-26 52.0-52.5	52.50 52.95	7	11	15	26			
					HK13-27 54.0-54.5	54.50 54.95	8	12	17	29			
					HK13-28 56.0-56.5	56.50 56.95	10	14	18	32			
					HK13-29 58.0-58.5	58.50 58.95	11	16	22	38			
					HK13-30 60.0-60.5	60.50 60.95	9	13	19	32			
11b	-61.7	63.3			HK13-31 62.0-62.5	62.50 62.95	13	23	31	54			Cát pha đôi chỗ lẫn sỏi sạn thạch anh màu nâu vàng loang lổ, trạng thái cứng Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard
					HK13-32 64.0-64.5	64.50 64.95	18	26	34	60			
					HK13-33 66.0-66.5	66.50 66.95	17	25	31	56			
	-68.4	70.0				68.50 68.95	16	24	28	52			

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG



LỖ KHOAN - BOREHOLE: HK14 **TỌA ĐỘ LỖ KHOAN: X: 604053.86** **MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.6**
Y: 1186020.12

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.596

NGÀY KHỞI CÔNG - COMMENCED: 25/7/2007

LOG BY: HOÀNG NGỌC THẠCH

ĐỘ SÂU - DEPTH: 70.45M

NGÀY HOÀN THÀNH - FINISHED: 27/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT					MÔ TẢ ĐỊA TẢNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow ----- 15 cm			Đồ thị N _{SPT} Graphic N Value curve	
							N1	N2	N3		
1	0.6	1.0	1.0								Lớp đất san lấp: cát hạt mịn lẫn xác thực vật màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant
2			14.0		HK14-1 2.0-2.5	2.50 2.95	0	0	1	1	Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen Greenish, blackish grey clay mud someplace alternate sand, with organic and shell
					HK14-2 4.0-4.5	4.50 4.95	0	0	1	1	
					HK14-3 6.0-6.5	6.50 6.95	0	0	1	1	
					HK14-4 8.0-8.5	8.50 8.95	0	0	1	1	
					HK14-5 10.0-10.5	10.50 10.95	0	0	1	1	
					HK14-6 12.0-12.5	12.50 12.95	0	0	1	1	
					HK14-7 14.0-14.5	14.50 14.95	1	1	2	3	
4	-13.4	15.0			HK14-8 16.0-16.5	16.50 16.95	3	5	7	12	Sét pha đôi chỗ lẫn sạn sỏi laterite, màu xám xanh loang lổ nâu vàng, trạng thái dẻo mềm đến dẻo cứng Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff
					HK14-9 18.0-18.5	18.50 18.95	3	4	5	9	
					HK14-10 20.0-20.5	20.50 20.95	3	5	7	12	
					HK14-11 22.0-22.5	22.50 22.95	5	8	10	18	
					HK14-12 24.0-24.5	24.50 24.95	4	10	13	23	
6	-23.9	25.5									Cát hạt nhỏ đến mịn, xen kẹp sét, màu xám xanh, xám trắng, xám vàng, chặt vừa - Whitish, blackish, yellowish grey fine sand alternate clay, medium dense
7a	-27.2	28.8	3.3								Sét xen kẹp lớp cát mỏng, đôi chỗ lẫn hữu cơ, màu xám xanh đến xám đen, trạng thái dẻo mềm - Greenish grey Clay alternate Sand, mixed organic, firm
8a	-29.9	31.5	2.7		HK14-15 30.0-30.5	30.50 30.95	5	6	7	13	Cát pha màu xám xanh, xám vàng, trạng thái dẻo Greenish, yellowish grey silty sand, plastic.
					HK14-16 32.0-32.5	32.50 32.95	7	10	12	22	
					HK14-17 34.0-34.5	34.50 34.95	3	3	6	9	
					HK14-18 36.0-36.5	36.50 36.95	4	5	6	11	
					HK14-19 38.0-38.5	38.50 38.95	7	8	10	18	
	-42.0	43.6			HK14-20 40.0-40.5						

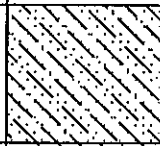
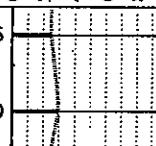
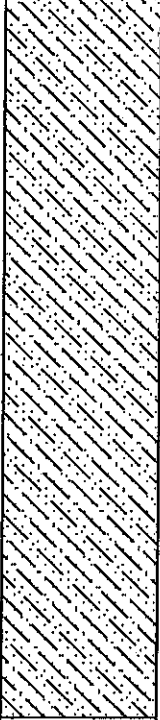
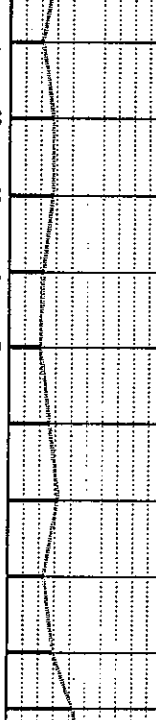
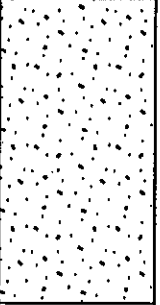
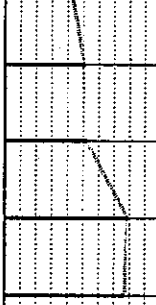
QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

XD

Tờ số 2/2

LỖ KHOAN - BOREHOLE: HK14 **TOẠ ĐỘ LỖ KHOAN:** X: 604053.86 **MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL:** 0.6
 Y: 1186020.12
CAO ĐỘ LỖ KHOAN - ELEVATION: 1.596 **NGÀY KHỞI CÔNG - COMMENCED:** 25/1/2007
LOG BY: HOÀNG NGỌC THẠCH **ĐỘ SÂU - DEPTH:** 70.45M **NGÀY HOÀN THÀNH - FINISHED:** 27/1/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẢNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow ----- 15 cm			Đồ thị N _{SPT} Graphic N Value curve		
							N ₁	N ₂	N ₃			
											N _{SPT}	
8a	-42.0	43.6	12.1		HK14-21 42.0-42.5	40.50 40.95	7	10	15	25		Cát pha màu xám xanh, xám vàng, trạng thái dẻo
					42.50 42.95	8	12	18	30	Greenish, yellowish grey silty sand, plastic.		
11a	-60.9	62.5	18.9		HK14-22 44.0-44.5	44.50 44.95	5	9	12	21		Cát pha lẫn ít sỏi sạn thạch anh, màu nâu đỏ, trạng thái dẻo
					HK14-23 46.0-46.5	46.50 46.95	6	13	15	28		Reddish brown silty sand, mixed quartz gravels, plastic
					HK14-24 48.0-48.5	48.50 48.95	8	11	17	28		
					HK14-25 50.0-50.5	50.50 50.95	6	10	12	22		
					HK14-26 52.0-52.5	52.50 52.95	7	9	11	20		
					HK14-27 54.0-54.5	54.50 54.95	6	11	15	26		
					HK14-28 56.0-56.5	56.50 56.95	8	13	19	32		
					HK14-29 58.0-58.5	58.50 58.95	6	10	13	23		
					HK14-30 60.0-60.5	60.50 60.95	8	13	16	29		
					HK14-31 61.5-62.0	62.00 62.45	10	18	24	42		
12	-68.9	70.5	8.0		HK14-32 63.5-64.0	64.00 64.45	11	24	27	51		Cát hạt nhỏ đến to lẫn ít sạn, màu nâu đỏ, xám vàng, trạng thái chặt
					HK14-33 65.5-66.0	66.00 66.45	18	25	27	52		Yellowish grey, reddish brown fine sand to coarse sand, mixed quartz gravels, dense
					HK14-34 67.5-68.0	68.00 68.45	15	39	40	79		
					HK14-35 69.5-70.0	70.00 70.45	18	37	40	77		

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRƯ LỖ KHOAN - BOREHOLE LOG

~~XD~~

~~Tổ số 1/2~~

LAS 406

LỖ KHOAN - BOREHOLE: HK15

TOA ĐỒ LỖ KHOAN: X: 604124.63

MỤC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.8

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.526

LOG BY: NGÔ THANH TUẤN

ĐỘ SÂU - DEPTH: 70.95M

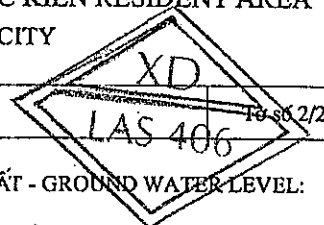
NGÀY KHỞI CÔNG - COMMENCED: 30/7/2007

NGÀY HOÀN THÀNH - FINISHED: 2/8/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No.	Depth (m)	THÍ NGHIỆM SPT					MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL				
							Độ sâu (m) Depth	Số búa Blow			Đồ thị N _{SPT} Graphic N Value curve					
								15 cm								
								N1	N2	N3						
1	0.4	1.1	1.1													Lớp đất san lấp: cát hạt mịn lẫn xác thực vật màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant
2			14.4		HK15-1 2.0-2.5	2.50 2.95	1	0	0	0		Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen				
					HK15-2 4.0-4.5	4.50 4.95	1	0	0	0		Greenish, blackish grey clay mud someplace alternate sand, with organic and shell				
					HK15-3 6.0-6.5	6.50 6.95	1	0	0	0						
					HK15-4 8.0-8.5	8.50 8.95	1	0	0	0						
					HK15-5 10.0-10.5	10.50 10.95	1	0	0	0						
					HK15-6 12.0-12.5	12.50 12.95	1	0	0	0						
					HK15-7 14.0-14.5	14.50 14.95	1	0	0	0						
4	-14.0	15.5	5.5		HK15-8 16.0-16.5	16.50 16.95	8	11	13	24	Sét pha đôi chỗ lẫn sạn sỏi laterite, màu xám xanh loang lổ nâu vàng, trạng thái dẻo mềm đến dẻo cứng					
					HK15-9 18.0-18.5	18.50 18.95	8	10	12	22	Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff					
					HK15-10 20.0-20.5	20.50 20.95	7	9	10	19						
5			11.1		HK15-11 22.0-22.5	22.50 22.95	6	11	14	25	Cát pha, màu xám xanh, nâu vàng loang lổ, trạng thái dẻo					
					HK15-12 24.0-24.5	24.50 24.95	5	7	10	17	Greenish grey, yellowish brown silty sand, plastic					
					HK15-13 26.0-26.5	26.50 26.95	4	4	11	15						
					HK15-14 28.0-28.5	28.50 28.95	4	6	9	15						
					HK15-15 30.0-30.5	30.50 30.95	3	5	11	16						
7a	-30.6	32.1	1.4		HK15-16 32.0-32.5	32.50 32.95	3	3	4	7	Sét xen kẹp lớp cát mịn, đôi chỗ lẫn hữu cơ, màu xám xanh đến xám đen, trạng thái dẻo mềm - Greenish grey Clay alternate Sand, mixed organic, firm					
8a					6.1		HK15-17 34.0-34.5	34.50 34.95	5	8	12	20				
							HK15-18 36.0-36.5	36.50 36.95	4	7	10	17	Cát pha màu xám xanh, xám vàng, trạng thái dẻo			
	-38.1	39.6			HK15-19 38.0-38.5	38.50 38.95	5	7	11	18	Greenish, yellowish grey silty sand, plastic.					

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

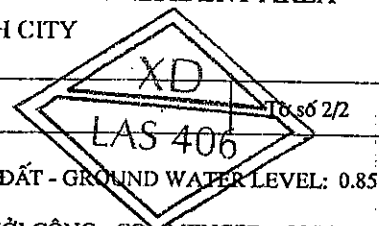


LỖ KHOAN - BOREHOLE: HK15 TOẠ ĐỘ LỖ KHOAN: X: 604124.63 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.8
Y: 1185983.9
CAO ĐỘ LỖ KHOAN - ELEVATION: 1.526 NGÀY KHỞI CÔNG - COMMENCED: 30/7/2007
LOG BY: NGÔ THANH TUẤN ĐỘ SÂU - DEPTH: 70.95M NGÀY HOÀN THÀNH - FINISHED: 2/8/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG



LỖ KHOAN - BOREHOLE: HK18 TOẠ ĐỘ LỖ KHOAN: X: 604259.05 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.85
Y: 1186011.94
CAO ĐỘ LỖ KHOAN - ELEVATION: 2.116 NGÀY KHỞI CÔNG - COMMENCED: 22/7/2007
LOG BY: HỒ HẢI ĐỘ SÂU - DEPTH: 25.45M NGÀY HOÀN THÀNH - FINISHED: 23/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/100	Sample No. Depth (m)	THÍ NGHIỆM SPT							MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
						Độ sâu (m) Depth	Số búa Blow			N _{SPT}	Đồ thị N _{SPT} Graphic N Value curve																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

~~XD~~

~~Tờ số 1/2~~

LỖ KHOAN - BOREHOLE: HK19

TOẠ ĐỘ LỖ KHOAN: $\frac{X: 604314.67}{Y: 1186103.49}$

MỤC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.82

CAO ĐỘ LỖ KHOAN - ELEVATION: 2.096

LOG BY: HOÀNG NGOC THACH

ĐỘ SÂU - DEPTH: 44.45M

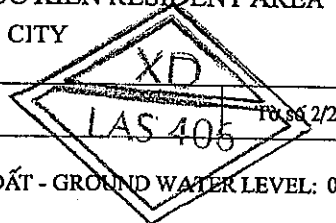
NGÀY KHỞI CÔNG - COMMENCED: 15/7/2007

NGÀY HOÀN THÀNH - FINISHED: 17/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT							MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL				
						Độ sâu (m) Depth	Số búa Blow			N _{spt}	Đồ thị N _{spt} Graphic N Value curve						
							15 cm										
							N1	N2	N3			0		20	40	60	80
1	0.2	1.9	1.9		HK19-1 2.0-2.5	2.50 2.95	0	0	1	1							Lớp đất san lấp: cát hạt mịn lẫn xác thực vật màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant
2			18.7		HK19-2 4.0-4.5	4.50 4.95	0	0	1	1							Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen
				HK19-3 6.0-6.5	6.50 6.95	0	0	1	1							Greenish, blackish grey clay mud someplace alternate sand, with organic and shell	
				HK19-4 8.0-8.5	8.50 8.95	0	0	1	1								
				HK19-5 10.0-10.5	10.50 10.95	0	0	1	1								
				HK19-6 12.0-12.5	12.50 12.95	0	0	1	1								
				HK19-7 14.0-14.5	14.50 14.95	0	1	1	2								
				HK19-8 16.0-16.5	16.50 16.95	0	0	1	1								
				HK19-9 18.0-18.5	18.50 18.95	0	0	1	1								
				HK19-10 20.0-20.5	20.50 20.95	2	3	4	7								
				4	-18.5	20.6	2.9		HK19-11 22.0-22.5	22.50 22.95	3	7	4	11			
6			14.1		HK19-12 24.0-24.5	24.50 24.95	7	8	9	17							Cát hạt nhỏ đến mịn, xen kẹp sét, màu xám xanh, xám trắng, xám vàng, chặt vừa
				HK19-13 26.0-26.5	26.50 26.95	8	8	9	17								Whitish, blackish, yellowish grey fine sand alternate clay, medium dense
				HK19-14 28.0-28.5	28.50 28.95	6	5	5	10								
				HK19-15 29.5-30.0	30.00 30.45	6	8	10	18								
				HK19-16 31.5-32.0	32.00 32.45	6	7	7	14								
				HK19-17 33.5-34.0	34.00 34.45	7	14	14	28								
				HK19-18 35.5-36.0	36.00 36.45	6	13	12	25								
				HK19-19 37.5-38.0	38.00 38.45	5	7	8	15								
7b	-39.5	41.6	4.0		HK19-20 39.5-40.0	40.00 40.45	4	5	6	11						Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff	

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

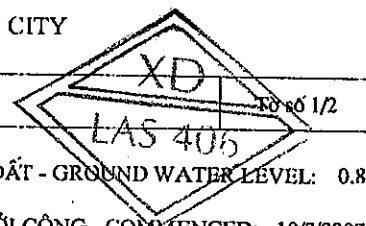


LỖ KHOAN - BOREHOLE: HK19 TOẠ ĐỘ LỖ KHOAN: X: 604314.67 Y: 1186103.49 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.82
CAO ĐỘ LỖ KHOAN - ELEVATION: 2.096 NGÀY KHỞI CÔNG - COMMENCED: 15/7/2007
LOG BY: HOÀNG NGỌC THẠCH ĐỘ SÂU - DEPTH: 44.45M NGÀY HOÀN THÀNH - FINISHED: 17/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT					MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL	
						Độ sâu (m) Depth	Số búa Blow			Đồ thị N _{SPT} Graphic N Value curve		
							15 cm					
							N1	N2	N3			
7b	-39.5	41.6	4.0		HK19-21 41.5-42.0	42.00 42.45	12	17	18	35	Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng + Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff	
8b	-42.4	44.5	2.9		HK19-22 43.3-44.0	44.00 44.45	15	19	29	48		
												Cát hạt vừa đến to xen kẹp sét lẫn ít sỏi sạn thạch anh, màu xám xanh, xám vàng, chặt vừa đến chặt - Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

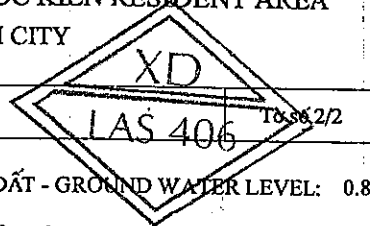


LỖ KHOAN - BOREHOLE: HK20 TOẠ ĐỘ LỖ KHOAN: X: 604223.39 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.8
CAO ĐỘ LỖ KHOAN - ELEVATION: 2.126 Y: 1186071.97
LOG BY: HOÀNG NGỌC THẠCH ĐỘ SÂU - DEPTH: 42.45M NGÀY KHỞI CÔNG - COMMENCED: 10/7/2007
NGÀY HOÀN THÀNH - FINISHED: 13/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẢNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow 15 cm			Đồ thị N _{SPT} Graphic N Value curve		
							N ₁	N ₂	N ₃			
											0	
1	0.0	2.1			HK20-1 1.0-1.5	1.50 1.95	1	1	2	3	Lớp đất san lấp: cát hạt mịn lẫn xác thực vật, màu xám vàng, xám đen - Made ground include yellowish, blackish grey find sand, mixed plant	
2			15.3		HK20-2 3.0-3.5	3.50 3.95	0	1	1	2	Bùn sét đôi chỗ xen kẹp cát lẫn hữu cơ, vỏ sò, màu xám xanh, xám đen Greenish, blackish grey clay mud someplace alternate sand, with organic and shell	
					HK20-3 5.0-5.5	5.50 5.95	0	1	1	2		
					HK20-4 7.0-7.5	7.50 7.95	0	1	2	3		
					HK20-5 9.0-9.5	9.50 9.95	0	1	1	2		
					HK20-6 11.0-11.5	11.50 11.95	0	1	1	2		
					HK20-7 13.0-13.5	13.50 13.95	0	1	1	2		
					HK20-8 15.0-15.5	15.50 15.95	0	0	1	1		
					HK20-9 17.0-17.5	17.50 17.95	5	3	3	6		
					4			7.4		HK20-10 19.0-19.5		19.50 19.95
HK20-11 21.0-21.5	21.50 21.95	3	4	5						9		
HK20-12 23.0-23.5	23.50 23.95	3	3	4						7		
HK20-13 25.0-25.5	25.50 25.95	6	8	11						19		
6			10.2		HK20-14 27.0-27.5	27.50 27.95	6	7	8	15	Cát hạt nhỏ đến mịn, xen kẹp sét, màu xám xanh, xám trắng, xám vàng, chặt vừa Whitish, blackish, yellowish grey fine sand alternate clay, medium dense	
					HK20-15 29.5-30.0	30.00 30.45	7	11	13	24		
					HK20-16 31.5-32.0	32.00 32.45	3	4	5	9		
					HK20-17 33.5-34.0	34.00 34.45	4	4	5	9		
7a	-32.9	35.0	1.8		HK20-18 35.5-36.0	36.00 36.45	5	6	7	13	Sét xen kẹp lớp cát mỏng, đôi chỗ lẫn hữu cơ, màu xám xanh đến xám đen, trạng thái dẻo mềm - Greenish grey Clay alternate Sand, mixed organic, firm	
7b			3.0		HK20-19 37.5-38.0	38.00 38.45	10	15	23	38	Sét pha đôi chỗ lẫn ít sạn sỏi Laterite, màu xám xanh, loang lổ nâu vàng, trạng thái dẻo cứng Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff	
					HK20-20 39.5-40.0							

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

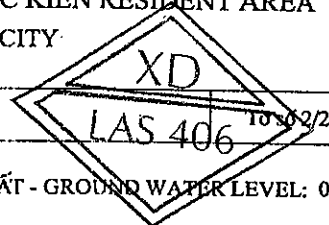


LỖ KHOAN - BOREHOLE: HK20 TOA ĐỘ LỖ KHOAN: X: 604223.39 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.8
Y: 1186071.97
CAO ĐỘ LỖ KHOAN - ELEVATION: 2.126 NGÀY KHỞI CÔNG - COMMENCED: 10/7/2007
LOG BY: HOÀNG NGỌC THẠCH ĐỘ SÂU - DEPTH: 42.45M NGÀY HOÀN THÀNH - FINISHED: 13/7/2007

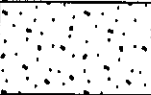
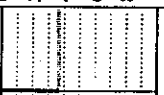
Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT							MÔ TẢ ĐỊA TẢNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow			N _{SPT}	Đồ thị N _{SPT} Graphic N Value curve		
							15 cm						
							N1	N2	N3				
8b	-40.3	42.5	2.7		HK20-21 41.5-42.0	40.00 40.45 42.00 42.45	11 22	20 22	25 17	45 39		Cát hạt vừa đến to xen kẹp sét lẫn ít sỏi sạn thạch anh, màu xám xanh, xám vàng, chặt vừa đến chặt - Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense	

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG

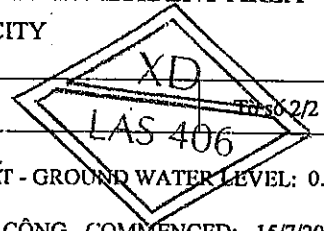


LỖ KHOAN - BOREHOLE: HK21 TOẠ ĐỘ LỖ KHOAN: X: 604281.54 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.95
Y: 1186079.37
CAO ĐỘ LỖ KHOAN - ELEVATION: 2.146 NGÀY KHỞI CÔNG - COMMENCED: 13/7/2007
LOG BY: HOÀNG NGỌC THẠCH ĐỘ SÂU - DEPTH: 42.45M NGÀY HOÀN THÀNH - FINISHED: 15/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow 15 cm			N _{spt}	Đồ thị N _{spt} Graphic N Value curve	
							N1	N2	N3			
8b	-40.3	42.5	7.7		HK21-21 41.5-42.0	42.00 42.45	13	16	21	37		Cát hạt vừa đến to xen kẹp sét lẫn ít sỏi sạn thạch anh, màu xám xanh, xám vàng, chặt vừa đến chặt - Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense

QUY HOẠCH KHU DÂN CƯ PHƯỚC KIẾN - LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA
HUYỆN NHÀ BÈ, TP HCM - NHA BE DISTRICT, HO CHI MINH CITY

HÌNH TRỤ LỖ KHOAN - BOREHOLE LOG



LỖ KHOAN - BOREHOLE: HK22 TOẠ ĐỘ LỖ KHOAN: X: 604461.2 MỨC NƯỚC DƯỚI ĐẤT - GROUND WATER LEVEL: 0.76
Y: 1186018.85

CAO ĐỘ LỖ KHOAN - ELEVATION: 1.686

NGÀY KHỞI CÔNG - COMMENCED: 15/7/2007

LOG BY: TRẦN QUỐC VƯƠNG

ĐỘ SÂU - DEPTH: 50.45M

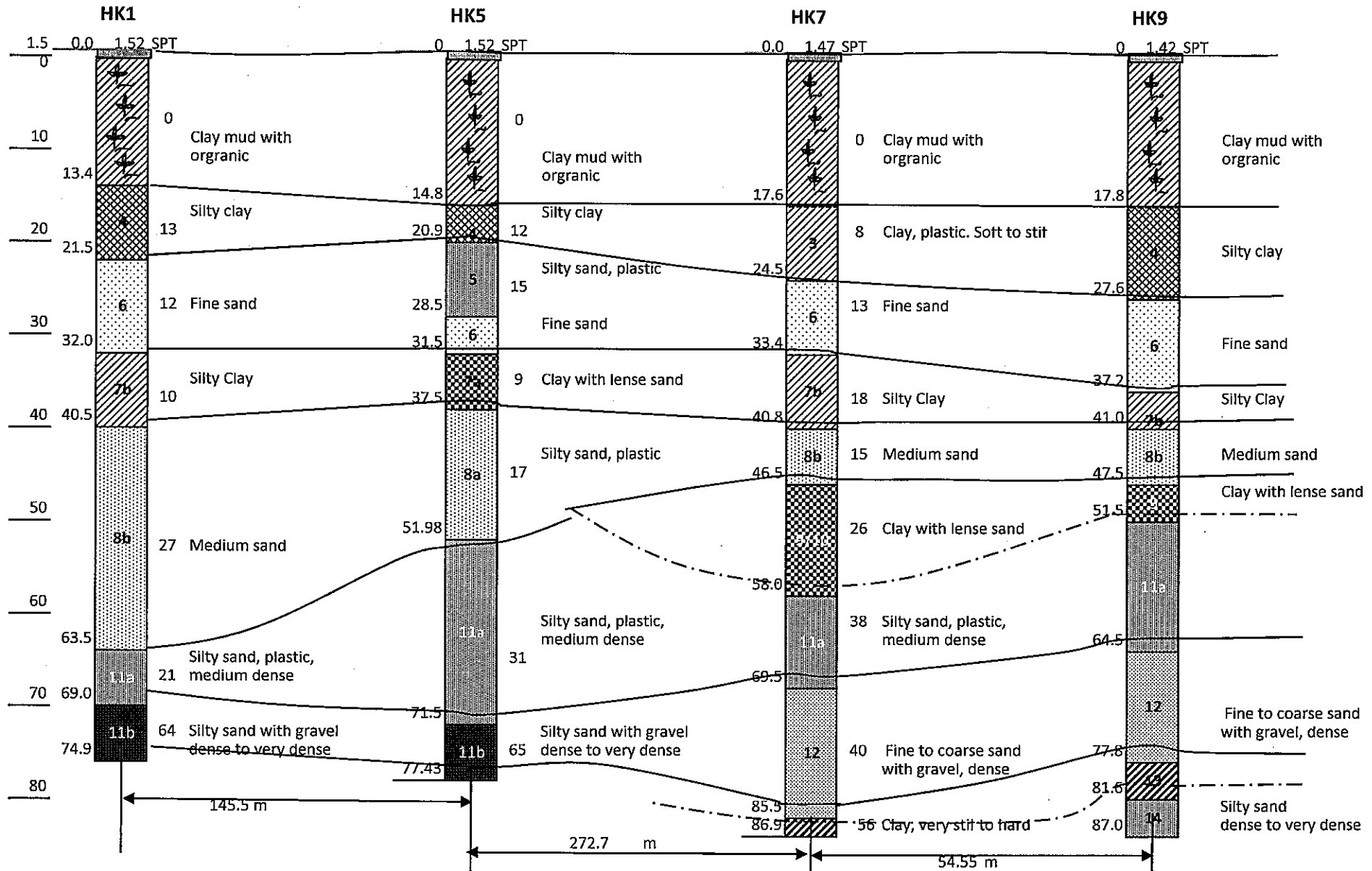
NGÀY HOÀN THÀNH - FINISHED: 17/7/2007

Ký hiệu lớp Layer	Cao độ đáy lớp (m) Elevation	Độ sâu đáy lớp (m) Depth	Bề dày lớp (m) Thickness	TRỤ CẮT LỖ KHOAN LOG TỶ LỆ - SCALE 1/200	Sample No. Depth (m)	THÍ NGHIỆM SPT						MÔ TẢ ĐỊA TẦNG DESCRIPTION OF SOIL
						Độ sâu (m) Depth	Số búa Blow ----- 15 cm			N _{SPT}	Đồ thị N _{SPT} Graphic N Value curve	
							N1	N2	N3			
8b	-42.3	44.0	7.0		HK22-20 40.5-41.0 HK22-21 42.5-43.0	41.00 41.45	4	9	10	19		Cát hạt vừa đến to xen kẹp sét lẫn ít sỏi sạn thạch anh, màu xám xanh, xám vàng, chặt vừa đến chặt - Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense
					HK22-22 44.5-45.0 HK22-23 46.5-47.0	43.00 43.45	5	9	12	21		
9	-46.3	48.0	4.0		HK22-22 44.5-45.0 HK22-23 46.5-47.0	45.00 45.45	3	4	5	9		Sét xen kẹp cát, màu xám nâu, nâu tím, trạng thái nửa cứng đến cứng
					HK22-23 46.5-47.0	47.00 47.45	5	10	16	26		Brownish grey, violetish brown clay alternate sand, very stiff to hard
11a	-48.8	50.5	2.5		HK22-24 49.5-50.0	50.00 50.45	5	7	11	18		Cát pha lẫn ít sỏi sạn thạch anh, màu nâu đỏ, trạng thái dẻo - Reddish brown silty sand, mixed quartz gravels, plastic

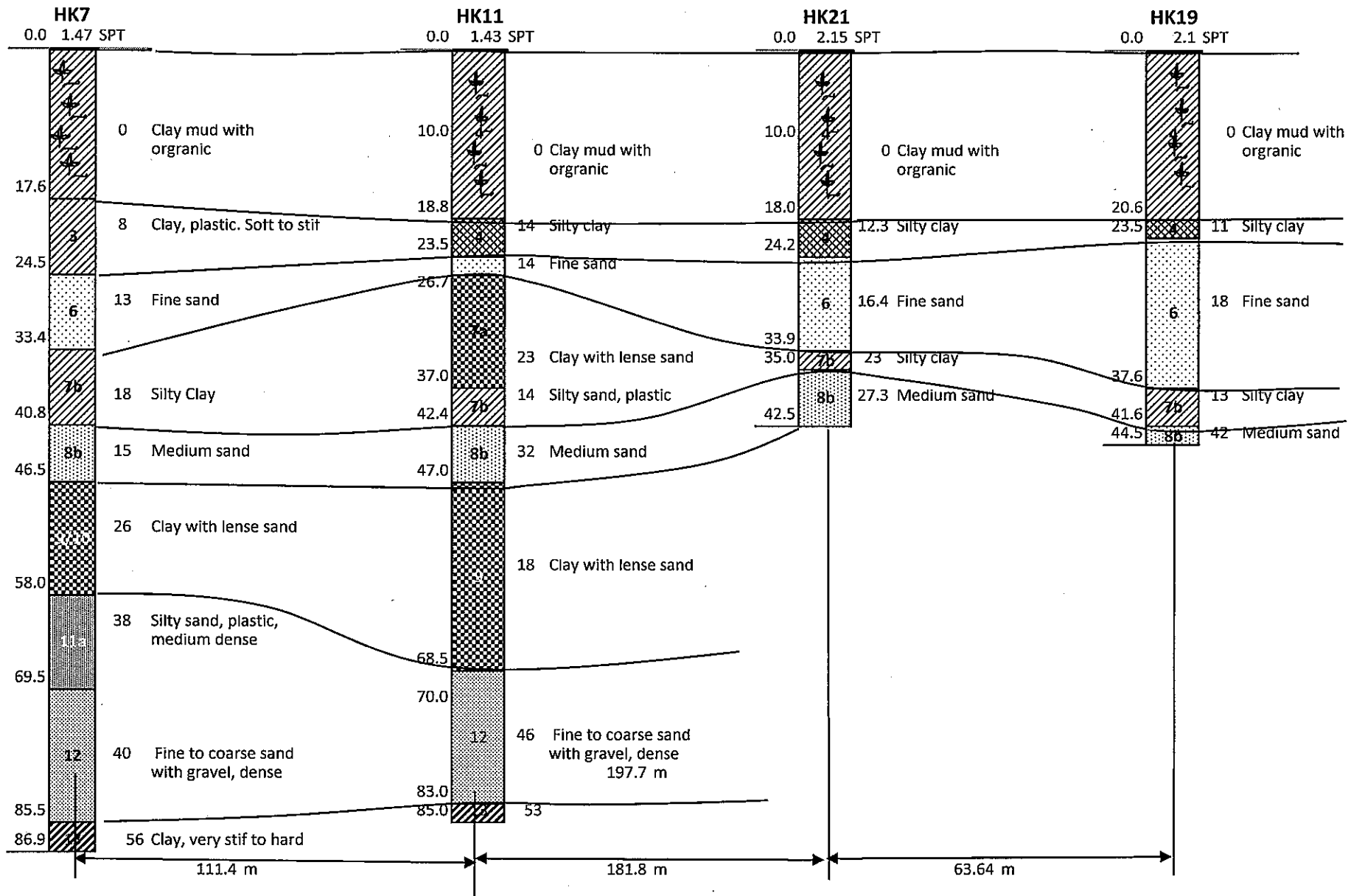
PHUOC KIEN PROJECT

SUMMARY OF GEOLOGY FEATURES

1 Geology Profile by West - East Direction



2 Geology Profile by South - North Direction



BẢNG - TABLES
TỔNG HỢP CÁC LỚP ĐẤT
SUMMARY OF SOIL LAYER TEST RESULT

HEADER	LAYER No	NAME	GRAIN SIZE (%)											I _p	φ	C	CONSOLIDATION UNDRAINED		
			>10	5 - 10	5 - 2	2 - 1	1 - 0.5	0.50 - 0.25	0.25 - 0.10	0.10 - 0.05	0.05 - 0.01	0.01 - 0.005	<0.005	I _p	φ	C	C _u kg/cm ²	φ _u Degrees	φ _{av} Degrees
														%	Degrees	kg/cm ²			
Building A	2	Greenish, blackish grey clay mud somplace alternate sand, with organic and shell						0.3	3.0	10.7	31.2	7.4	47.4	23.9	3°32'	0.050	0.174	8°11'	10°43'
	4	Greenish grey spot yellowish brown silty clay, somplace mixed laterite gravels, stiff		0.1	0.1	0.4	2.3	6.8	19.3	23.2	20.6	4.6	22.6	13.1	13°01'	0.270			
	8a	Greenish, yellowish grey silty sand, plastic		0.4	1.6	4.3	17.0	27.7	20.2	9.1	9.9	2.6	7.1	6.5	26°25'	0.055			
	11a	Yellowish grey silty sand, mixed quartz gravels, plastic		0.3	1.4	3.7	12.2	30.3	22.2	9.8	9.4	2.9	7.8	4.5	28°21'	0.061			
	11b	Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard		0.1	1.5	5.0	20.4	25.3	20.3	9.4	8.0	2.6	7.4	4.1	33°20'	0.089			
Building B	2	Greenish, blackish grey clay mud somplace alternate sand, with organic and shell					0.2	1.4	5.4	10.4	28.4	8.1	46.2	22.5	3°30'	0.050	0.162	8°58'	10°52'
	4	Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, stiff to very stiff		0.3	0.7	1.1	2.0	4.0	12.9	23.1	25.4	5.0	25.6	14.8	12°51'	0.292			
	5	Greenish grey, yellowish brown silty sand, plastic			0.2	0.4	4.2	13.6	39.8	14.9	14.2	4.6	8.2	7.5	22°56'	0.041			
	7a	Greenish grey clay alternate sand, mixed organic, firm					0.3	2.5	11.9	15.4	21.2	6.4	42.4	27.4	10°05'	0.151			
	8a	Greenish, yellowish grey silty sand, plastic		0.4	1.4	4.3	14.4	21.3	26.3	11.2	9.5	2.8	8.3	5.7	23°56'	0.052			
	11a	Reddish brown silty sand, mixed quartz gravels, plastic		0.3	0.7	2.3	10.4	29.8	26.7	10.0	8.6	2.8	8.3	5.5	28°58'	0.065			
	11b	Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard	0.2	1.7	4.4	11.0	20.2	20.5	16.4	7.1	8.6	2.6	7.4	4.3	35°01'	0.097			
Building C	2	Greenish, blackish grey clay mud someplace alternate sand, with organic						0.1	1.3	11.1	26.3	7.5	53.7	24.6	3°14'	0.050	0.170	8°10'	10°17'
	7b	Greenish grey spot yellowish brown yellowish brown silty clay, stiff				0.1	1.6	5.0	14.2	22.2	24.9	5.3	26.6	14.6	11°37'	0.260			
	10	Whitish grey, pinkish brown silty clay alternate sand, stiff to very stiff			0.7	1.2	3.4	8.3	20.3	15.8	20.4	4.9	25.0	13.3	14°15'	0.290			
	11a	Reddish brown silty sand, mixed quartz gravels, plastic			1.3	3.7	9.1	22.6	31.3	11.5	9.0	2.9	8.5	5.7	27°27'	0.052			
Building D	2	Greenish, blackish grey clay mud someplace alternate sand, with organic and shell							1.3	6.9	31.8	8.3	51.7	25.3	2°59'	0.050			
	4	Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff					1.1	6.8	23.0	24.0	19.2	4.0	21.8	12.8	11°42'	0.290			
	7a	Greenish grey clay alternate sand, mixed organic, firm						0.4	5.0	18.8	24.7	4.5	46.6	20.5	18°19'	0.200	0.211	9°30'	12°57'
	9	Brownish grey, violetish brown clay alternate sand, very stiff to hard						0.9	9.1	21.6	26.1	6.0	36.3	23.9	13°05'	0.310			
	10	Whitish grey, pinkish brown silty clay alternate sand, stiff to very stiff		0.1	1.0	1.9	5.4	4.2	10.9	25.1	26.0	5.6	19.9	14.6	16°33'	0.240	0.344	15°17'	17°18'
Building E	2	Greenish, blackish grey clay mud someplace alternate sand, with organic and shell						1.0	5.7	14.2	27.0	6.7	45.3	26.4	3°25'	0.050	0.161	8°50'	11°49'
	4	Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff		0.1	0.6	0.9	3.1	7.6	21.1	19.3	21.3	4.6	21.6	13.6	12°28'	0.26	0.333	15°17'	17°57'
	8a	Greenish, yellowish grey silty sand, plastic		1.1	3.7	5.5	8.6	15.7	29.0	16.1	9.9	3.0	7.6	5.7	24°21'	0.042			
	11a	Reddish brown silty sand, mixed quartz gravels, plastic		0.0	0.4	3.1	12.7	23.5	23.7	13.0	12.7	3.5	7.3	5.4	29°20'	0.058			
	11b	Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard		0.5	3.1	9.4	17.1	21.2	18.4	9.4	11.0	3.1	6.7	5.1	33°29'	0.096			
Building F	2	Greenish, blackish grey clay mud someplace alternate sand, with organic and shell						0.1	2.0	8.9	30.9	8.6	49.5	25.8	3°07'	0.050			
	4	Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff			0.3	0.2	0.6	4.4	14.6	23.2	26.3	5.4	25.0	14.6	11°55'	0.200			
	7b	Greenish grey spot yellowish brown silty clay, somoplace mixed laterite gravels, stiff			0.8	1.2	5.1	12.7	19.6	16.9	15.8	5.0	22.9	14.2	10°52'	0.24			

VIET NAM GEOLOGY FEDERATION
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Registration No:/07/ BG-CGSC

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HCM city, Date September, 2007

SOIL INVESTIGATION REPORT

PROJECT: LAND DEVELOPMENT FOR PHUOC KIEN RESIDENT AREA

LOCATION: NHA BE DISTRICT- HO CHI MINH CITY

I. INTRODUCTION:

I.1. Scope of survey area

Project Land Development for Phuoc Kien Resident Area is located in Phuoc Kien-Nha Be District, Ho Chi Minh City with about 13,576 ha. Construction Item : Highrise building area (from 18 to 22 floor) and villas area.

In order to commend engineering geological condition more comfortable for each building in resident area, we put the signal for building from A to F (map of location boreholes)

I.2. Reference:

- Pursuant to Construction Law No. 16/2003/QH11 dated November 26, 2003 of the 11th National Assembly of Vietnam – 4th Conference
- Pursuant to Government's Decree No 209//2004/ND-CP, on dated December 16, 2004 on the Management of the Quality Construction Works.
- Pursuant to Government's Decree No 16/2005/ND-CP, on dated February 07, 2005 about Management of Construction Investment Projects
- Pursuant to Contract between Construction Geology Science Center and Tran Thai Co., Ltd on dated 2nd July, 2007

I.3. Standard and Specification :

I.3.1. In-site work

- | | |
|---|---------------------|
| ▪ Building surveys – Basic Principles – VN Standard | : TCVN 4419 - 1987 |
| ▪ Drilling work – VN Standard | : 22 TCN 259 – 2000 |
| ▪ High rise building – Guide for geotechnical Investigation | : TCXD 194 - 2006 |
| ▪ Standard penetration tests (SPT) | : TCXD 226 - 1999 |
| ▪ Sampling works – VN Standard | : TCVN 2683 – 1995 |
| | : TCVN 5960 : 1995 |

Table 1:

No	Building Area signal	Borehole	Depth (m)	Sample	SPT (times)
1	Area A	HK1	76.45	38	38
2		HK2	70.45	33	33
3		HK3	70.45	37	37
4	Area B	HK4	70.95	35	35
5		HK5	78.95	39	39
6		HK6	70.95	35	35
7	Area C	HK7	86.95	45	44
8		HK8	84.95	42	42
9		HK9	86.95	43	43
10	Area D	HK10	86.95	43	43
11		HK11	84.95	42	42
12		HK12	82.95	41	41
13	Area E	HK13	69.95	34	34
14		HK14	70.45	35	35
15		HK15	70.95	35	35
16	Area F	HK16	48.45	24	24
17		HK17	25.45	11	11
18		HK18	25.45	12	12
19		HK19	44.45	22	22
20		HK20	42.45	21	21
21		HK21	42.45	20	20
Total			1391.95	687	686

Total of quantity of engineering geological drilling is 1391.95m, sampling is 687 samples, we carried out testing in 424 samples, 39 samples in unconfined compression test, 15 samples in Consolidation test, 30 samples in triaxial test in UU diagram, and 15 samples in triaxial test in CU diagram.

Soil investigation is carried out efficiently in accordance with current standards, made by Tran Quoc Vuong, Trinh Minh Khiem, Ngo Thanh Tuan, Phan Hoang Long, Hoang Ngoc Thach Engineers, and Ho Hai is responsible for technology.

Nominal value of each property is determined by average method of individual values except shear strength. This property is calculated by minimum square method of individual values with linear relation between shear stress and compressive stress.

Factored value is determined from nominal value divided by safe factor. With respect to shear strength and natural volume mass, safe factor is determined from probability. All of the individual values will be calculated and homogeneous level of soil. Safe factor of remaining properties is 1.

In case of the quantity of samples are under 6 for each layer, it is not necessary to make statistic but calculate average value, maximum and minimum value.

III. FEATURE OF GEOLOGICAL

III.1. Feature of Topographic:

The whole area is almost filled by fine sand and available for constructing the project property, elevation of topography in borehole location varies from 1.371m to 2.161m

III.2. Sub-surface soil condition

In order to issue engineering geological figures for design Item: Highrise Building area (from 18 to 22 floor) and Villas area of Project Land Development for Phuoc Kien Resident Area, 21 boreholes from HK1 to HK21 were carried out. The borehole locations are shown in location borehole diagram.

In survey area and drilled depth (deepest to 86.95m), there are distributions of 17 soil layers and 01 sub-layers as bellows:

- 1 Made ground include yellowish, blackish grey fine sand, mixed plant
- 2 Greenish, blackish grey clay mud someplace alternate sand, with organic and shell
- 3 Greenish, blackish grey clay, someplace mixed organic, firm to stiff
- 4 Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff
- 5 Greenish grey, yellowish brown silty sand, plastic
- 6 Whitish, blackish, yellowish grey fine sand alternate clay, medium dense
- 7 Greenish grey Clay alternate Sand, mixed organic, firm
- 8 Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff
- 9 Greenish, yellowish grey silty sand, plastic.
- 10 Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense
- 11 Brownish grey, violetish brown clay alternate sand, very stiff to hard
- 12 Whitish grey, pinkish brown silty clay alternate sand, stiff to very stiff
- 13 Reddish brown silty sand, mixed quartz gravels, plastic

- 13 Reddish brown silty sand, mixed quartz gravels, plastic
- 14 Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard
- 15 Yellowish grey, reddish brown fine sand to coarse sand, mixed quartz gravels, dense
- 16 Greenish grey clay, very stiff to hard
- 17 Reddish brown, yellowish grey silty sand, hard

Lens greenish grey, spot, brownish grey clay, stiff to very stiff. Lens locates in HK7 borehole and distributes in silty clay

Because the project has many construction items, soil properties for each item as follows:

- Item for Highrise Building Area A (HK1, HK2, HK3)
- Item for Highrise Building Area B (HK4, HK5, HK6)
- Item for Highrise Building Area (HK7, HK8, HK9);
- Item for Highrise Building Area D (HK10, HK11, HK12);
- Item for Highrise Building Area E (HK13, HK14, HK15);
- Item for Villas Area F (HK16, HK17, HK18, HK19, HK20, HK21).

III.2.1. Item for Highrise Building Area A (HK1, HK2, HK3)

In survey area of Item for Highrise Building Area A, we meet sub-surface in 13 soil layers. Features of specific distribution of layers are shown on soil profile with soil properties of layers as follows:

1. Made Ground : (sign is 1): Made ground include yellowish, blackish grey fine sand, mixed plant:

It locates in whole boreholes in building area, distributes in the top of current surface. Layer has composition of fine and soft sand. Thickness varies from 1.30m (HK2) to 1.50m (HK1, HK3), average thickness is 1.43m

2. Greenish, blackish grey clay mud someplace alternate sand, with organic and shell: (sign is 2)

It locates in whole boreholes in building area, distributes at depth from 1.30m (HK2) to 1.50m (HK1, HK3). Layer Composition is grey mud someplace alternate sand with organic. Organic content increases with depth and disintegration degree is also lower. Thickness varies from 13.20m (HK2) to 13.50m (HK1, HK3), average thickness is 13.40m. Base on SPT shows max=2.0, min=0.0, average=0.1

Base on result of calculation of 23 samples, the soil properties of this layer are shown on summary of soil layer.

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Grain size	P	%					
0.50-0.25			0.3				

0.05-0.01			31.2				
0.01-0.005			7.4				
<0.005			47.4				
Moisture content	W	%	78.6	6.060	0.077	75.7	76.8
Wet density	γ_w	g/cm ³	1.49	0.036	0.024	1.48	1.48
Dry density	γ_k	g/cm ³	0.84				
Specific gravity	γ_s	g/cm ³	2.606	0.060	0.023	2.578	2.589
Void ratio	e_o	-	2.103				
Porosity	n	%	67.8				
Saturated degree	G	%	97.5				
Liquid limit	W_L	%	64.3	4.592	0.071	62.1	63.0
Plastic limit	W_P	%	40.4	3.644	0.090	38.7	39.3
Plastic index	I_P	%	23.9				
Consistency	B	-	1.6				
Internal friction angle	ϕ	-	3°32'	0.004	0.065	3°09'	3°18'
Cohesion	C	kG/cm ²	0.050	0.001	0.025	0.048	0.049

Triaxial test in 1 sample UU and in 2 samples CU give result as belows

			Average value
Unconsolidation Undrained UU	C_u	kG/cm ²	0.109
	ϕ_u	-	2°58'
Consolidation Undrained CU	C_{cu}	kG/cm ²	0.174
	ϕ_{cu}	-	8°11'
	C'_{cu}	kG/cm ²	0.169
	ϕ'_{cu}	-	10°43'

3. Greenish, blackish grey clay, someplace mixed organic, firm: (sign is 3)

It locates in HK3 borehole, distributes at 15.00m depth. Elevation of layer bottom is 1.00m. SPT = 5.0

Base on result of calculation of 01 sample, the soil properties of this layer are shown as follows:

Property	legends	Units	Value
Grain size	P	%	
1.0-0.5			0.8
0.50-0.25			3.2
0.25-0.10			13.1
0.10-0.05			15.1
0.05-0.01			27.4
0.01-0.005			5.0

<0.005			35.4
Moisture content	W	%	44.7
Wet density	γ_w	g/cm ³	1.73
Dry density	γ_k	g/cm ³	1.20
Specific gravity	γ_s	g/cm ³	2.645
Void ratio	e_o	-	1.204
Porosity	n	%	54.6
Saturated degree	G	%	98.2
Liquid limit	W_L	%	57.5
Plastic limit	W_P	%	36.4
Plastic index	I_P	%	21.1
Consistency	B	-	0.39
Internal friction angle	φ	-	9°32'
Cohesion	C	kG/cm ²	0.256

4. Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, stiff: (sign is 4)

It locates in whole boreholes, distribute at depth from 14.50m (HK2) to 16.00m (HK3). Thickness varies from 8.00m (HK1) to 11.50m (HK3), average is 9.33m. SPT shows max=17.0m, min=7.0, average =13.5

Base on result of calculation of 11 samples, soil properties of this layer are shown as bellows:

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Gain size	P	%					
10-5			0.1				
5-2			0.1				
2-1			0.4				
1.0-0.5			2.3				
0.50-0.25			6.8				
0.25-0.10			19.3				
0.10-0.05			23.2				
0.05-0.01			20.6				
0.01-0.005			4.6				
<0.005			22.6				
Moisture content	W	%	23.0	0.880	0.038	22.5	22.7
Wet density	γ_w	g/cm ³	1.97	0.053	0.027	1.94	1.95
Dry density	γ_k	g/cm ³	1.60				
Specific gravity	γ_s	g/cm ³	2.683	0.007	0.002	2.680	2.681

Angle of repose in dry	α_K	Degrees	29°29'	30°30'	28°36'
Angle of repose in wet	α_{BH}	Degrees	25°29'	26°18'	24°36'

11. Whitish grey, pinkish brown silty clay alternate sand, very stiff: (sign is 10)

It locates in HK1, distributes at 63.60m depth. Thickness is 2.40m. SPT shows max=19.0, min=19.0, average=19.0

Base on result of calculation of 02 samples, soil properties are shown:

Property	legends	Units	Value		
			TB	max	min
Grain size	P	%			
1.0-0.5			1.8	2.6	1.1
0.50-0.25			4.7	7.4	2.0
0.25-0.10			19.0	26.3	11.7
0.10-0.05			20.8	21.3	20.2
0.05-0.01			26.4	38.4	14.4
0.01-0.005			8.0	10.7	5.2
<0.005			19.4	22.8	15.9
Moisture content	W	%	21.0	21.1	20.8
Wet density	γ_w	g/cm ³	1.98	1.99	1.96
Dry density	γ_K	g/cm ³	1.63		
Specific gravity	γ_s	g/cm ³	2.689	2.690	2.688
Void ratio	e_o	-	0.650		
Porosity	n	%	39.4		
Saturated degree	G	%	86.8		
Liquid limit	W_L	%	31.5	31.7	31.2
Plastic limit	W_P	%	18.0	18.5	17.5
Plastic index	I_P	%	13.5		
Consistency	B	-	0.22		
Internal friction angle	φ	-	18°30'	19°56'	17°04'
Cohesion	C	kG/cm ²	0.279	0.285	0.273

12. Yellowish grey silty sand, mixed quartz gravels, plastic:(sign is 11a)

It locates in whole boreholes, distributes at depth from 52.00m (HK2) to 66.00m (HK1). Composition is yellowish grey silty sand, mixed quartz gravels. Thickness varies from 4.50m (HK1) to 12.00m (HK2), average is 7.77m. SPT shows max=49.0, min=17.0, average=31.5

Base on result of calculation of 06 samples, soil properties are shown:

Property	legends	Units	Value				
			X^{tc}	S	V	X_l^{tt}	X_{ll}^{tt}
Gain size	P	%					
10-5			0.3				
5-2			1.4				
2-1			3.7				
1.0-0.5			12.2				
0.50-0.25			30.3				
0.25-0.10			22.2				
0.10-0.05			9.8				
0.05-0.01			9.4				
0.01-0.005			2.9				
<0.005			7.8				
Moisture content	W	%	15.7	2.717	0.173	13.5	14.5
Wet density	γ_w	g/cm ³	2.04	0.015	0.008	2.02	2.03
Dry density	γ_k	g/cm ³	1.76				
Specific gravity	γ_s	g/cm ³	2.666	0.013	0.005	2.655	2.659
Void ratio	e_o	-	0.515				
Porosity	n	%	34.0				
Saturated degree	G	%	81.5				
Liquip limit	W_L	%	19.1	2.170	0.114	17.3	18.0
Plastic limit	W_P	%	14.6	2.037	0.140	12.9	13.6
Plastic index	I_P	%	4.5				
Consistency	B	-	0.26				
Internal friction angle	ϕ	-	28°21'	0.025	0.046	26°24'	27°11'
Cohesion	C	kG/cm ²	0.061	0.032	0.516	0.035	0.046

13. Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard: (sign is 11b)

It locates in whole boreholes, distribufes at depth from 63.80m (HK3) to 70.50m (HK1). Thickness is not determined because whole boreholes are not drilled in this layer, average drilling depth is 35m. SPT shows max=75.0, min=46.0, average=57.0

Property	legends	Units	Value				
			X^{tc}	S	V	X_l^{tt}	X_{ll}^{tt}
Gain size	P	%					
10-5			0.1				
5-2			1.5				
2-1			5.0				

1.0-0.5			20.4				
0.50-0.25			25.3				
0.25-0.10			20.3				
0.10-0.05			9.4				
0.05-0.01			8.0				
0.01-0.005			2.6				
<0.005			7.4				
Moisture content	W	%	15.3	2.297	0.150	14.0	14.5
Wet density	γ_w	g/cm ³	2.10	0.040	0.019	2.07	2.08
Dry density	γ_k	g/cm ³	1.82				
Specific gravity	γ_s	g/cm ³	2.668	0.018	0.007	2.657	2.661
Void ratio	e_o	-	0.466				
Porosity	n	%	31.8				
Saturated degree	G	%	87.5				
Liquid limit	W_L	%	19.4	2.368	0.122	18.0	18.5
Plastic limit	W_P	%	15.3	2.453	0.160	13.9	14.4
Plastic index	I_P	%	4.1				
Consistency	B	-	0.00				
Internal friction angle	ϕ	-	33°20'	0.039	0.059	30°36'	31°39'
Cohesion	C	kG/cm ²	0.089	0.052	0.584	0.059	0.071

Conclusion and Recommendation for Highrise Building Area A:

Based on the result of soil investigation in Highrise Building area A, the sub-surface soil condition is very complex, contains 13 layer, in which weak soil layer locates in the top of surface (below sand layer). Recommendation of construction properties of layers as follows:

The layer no 2 is very weak soil, compressibility is high, thickness is thick, distribution is very large, locates in under sand layer. Therefore, before constructing, must apply a special treatment solution for this layer.

Moreover, the layer no 3, 7a are also very weak soil, but this layer rarely appears and distributes deeply.

Other layers are medium to high bearing capacity and low compressibility, can use this layer for laying construction foundation. However, depending on the building and bearing capacity, should choose suitable layer for laying foundation.

III.3. Feature of hydrographic

During drilling, the ground water level varies from 0,20m to 0,95m. It exists in made ground layer and is affected by the tide.

III.2.2. Item for Highrise Building Area B (HK4, HK5, HK6)

In survey area of Item for Highrise Building Area B, we meet sub-surface in 10 soil layers. Features of specific distribution of layers are shown on soil profile with soil properties of layers as bellows:

1. Made ground include yellowish, blackish grey find sand, mixed plant: (sign is 1)

It locates in whole boreholes in the building area, distributes at the top of current surface. Composition is fine and soft sand. Thickness varies from 1.30m (HK5) to 1.50m (HK4), average is 1.40m

2. Greenish, blackish grey clay mud someplace alternate sand, with organic and shell: (sign is 2)

It locates in whole boreholes in the building area, distributes at depth from 1.30m (HK2) to 1.50m (HK1, HK3). Composition is disintegrated clay mud, Organic content increases with depth and disintegration degree is also lower, distributes at depth from 1.30m (HK5) to 1.50m (HK4). Thickness varies from 14.30m (HK4) to 14.90m (HK5), average is 14.60m. SPT shows max=1.0, min=0.0, average=0.7

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Grain size	P	%					
1.0-0.5			0.2				
0.50-0.25			1.4				
0.25-0.10			5.4				
0.10-0.05			10.4				
0.05-0.01			28.4				
0.01-0.005			8.1				
<0.005			46.2				
Moisture content	W	%	84.3	5.046	0.060	81.7	82.7
Wet density	γ_w	g/cm^3	1.48	0.014	0.009	1.47	1.48
Dry density	γ_k	g/cm^3	0.80				
Specific gravity	γ_s	g/cm^3	2.580	0.025	0.010	2.567	2.572
Void ratio	e_o	-	2.225				
Porosity	n	%	69.0				
Saturated degree	G	%	97.8				
Liquid limit	W_L	%	62.3	2.165	0.035	61.1	61.6
Plastic limit	W_P	%	39.8	1.811	0.045	38.9	39.2
Plastic index	I_P	%	22.5				
Consistency	B	-	1.98				
Internal friction angle	ϕ	-	3°30'	0.003	0.054	3°11'	3°19'
Cohesion	C	kG/cm^2	0.050	0.001	0.022	0.048	0.049

Ti axial compression test 3 UU and 3 CU as shown belows

			Average value
Unconsolidation undrain	C_u	kG/cm^2	0.102
	φ_u	-	$2^\circ 34'$
Consolidation Undrain	C_{cu}	kG/cm^2	0.162
	φ_{cu}	-	$8^\circ 58'$
	C'_{cu}	kG/cm^2	0.158
	φ'_{cu}	-	$10^\circ 52'$

3. Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, stiff to very stiff:

It locates in whole boreholes, distributes at depth from 15.80m (HK4) to 16.20m (HK5), stiff to very stiff. Thickness varies from 5.00m (HK6) to 6.30m (HK5), average is 5.67m. SPT shows max=51.0, min=9.0, average=25.2

There is 1 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X^{tc}	S	V	X_l^{tt}	X_{ll}^{tt}
Gain size	P	%					
10-5			0.3				
5-2			0.7				
2-1			1.1				
1.0-0.5			2.0				
0.50-0.25			4.0				
0.25-0.10			12.9				
0.10-0.05			23.1				
0.05-0.01			25.4				
0.01-0.005			5.0				
<0.005			25.6				
Moisture content	W	%	23.9	1.859	0.078	22.6	23.1
Wet density	γ_w	g/cm^3	1.99	0.023	0.011	1.97	1.98
Dry density	γ_k	g/cm^3	1.61				
Specific gravity	γ_s	g/cm^3	2.687	0.015	0.006	2.676	2.681
Void ratio	e_o	-	0.669				
Porosity	n	%	40.1				
Saturated degree	G	%	95.8				
Liquip limit	W_L	%	32.9	1.728	0.052	31.8	32.3
Plastic limit	W_P	%	18.2	1.382	0.076	17.3	17.6
Plastic index	I_P	%	14.8				
Consistency	B	-	0.38				

Internal friction angle	ϕ	-	12°51'	0.028	0.122	10°14'	11°14'
Cohesion	C	kG/cm ²	0.292	0.037	0.126	0.229	0.253

Unconfined compression test 4 samples: $q_u = 1.390 \text{ kG/cm}^2$.

Tiaxial compression test 1 UU as shown belows

Unconsolidation undrain	C_u	kG/cm ²	Average value
	ϕ_u	-	0.166 9°43'

4. Greenish grey, yellowish brown silty sand, plastic: (sign is 5)

It locates in whole boreholes, distributes at depth from 21.00m (HK4), average is 9.67m. SPT shows max=28.0, min=8.0, average=13.2

There are 6 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Gain size	P	%					
5-2			0.2				
2-1			0.4				
1.0-0.5			4.2				
0.50-0.25			13.6				
0.25-0.10			39.8				
0.10-0.05			14.9				
0.05-0.01			14.2				
0.01-0.005			4.6				
<0.005			8.2				
Moisture content	W	%	20.3	0.790	0.039	19.6	19.9
Wet density	γ_w	g/cm ³	1.97	0.008	0.004	1.96	1.97
Dry density	γ_k	g/cm ³	1.64				
Specific gravity	γ_s	g/cm ³	2.677	0.003	0.001	2.674	2.675
Void ratio	e_o	-	0.632				
Porosity	n	%	38.7				
Saturated degree	G	%	85.9				
Liquip limit	W_L	%	23.4	1.292	0.055	22.3	22.7
Plastic limit	W_P	%	15.9	0.894	0.056	15.2	15.5
Plastic index	I_P	%	7.5				
Consistency	B	-	0.59				
Internal friction angle	ϕ	-	22°56'	0.014	0.034	21°42'	22°11'
Cohesion	C	kG/cm ²	0.041	0.014	0.338	0.030	0.035

5. Whitish, greenish, yellowish grey fine sand, medium dense: (sign is 6)

It locates in HK5, distributes at 30.00m depth. Thickness is 3.00m. SPT shows the result =14.0

There is 1 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value
Gain size	P	%	
1.0-0.5			4.6
0.50-0.25			15.6
0.25-0.10			65.3
0.10-0.05			12.0
0.05-0.01			2.6
Specific gravity	γ_s	g/cm^3	2.658
Angle of repose in dry	α_K	Degrees	27°20'
Angle of repose in wet	α_{BH}	Degrees	22°17'

6. Greenish grey Clay alternate Sand, mixed organic, firm:

It locates in whole boreholes, distributes at depth from 31.00m (HK6) to 33.00m (HK4, HK5). Thickness varies from 4.60m (HK4) to 6.00m (HK5), average is 5.13m. SPT shows max=11.0, min=6.0, average=8.3

There are 6 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Gain size	P	%					
1.0-0.5			0.3				
0.50-0.25			2.5				
0.25-0.10			11.9				
0.10-0.05			15.4				
0.05-0.01			21.2				
0.01-0.005			6.4				
<0.005			42.4				
Moisture content	W	%	42.7	3.714	0.087	39.7	40.9
Wet density	γ_w	g/cm^3	1.77	0.023	0.013	1.75	1.76
Dry density	γ_K	g/cm^3	1.24				
Specific gravity	γ_s	g/cm^3	2.676	0.015	0.006	2.664	2.669
Void ratio	e_o	-	1.158				
Porosity	n	%	53.7				
Saturated degree	G	%	98.7				
Liquid limit	W_L	%	53.9	1.783	0.033	52.5	53.1
Plastic limit	W_P	%	26.5	3.460	0.130	23.7	24.9

Plastic index	I_P	%	27.4				
Consistency	B	-	0.59				
Internal friction angle	ϕ	-	$10^{\circ}05'$	0.014	0.079	$8^{\circ}43'$	$9^{\circ}15'$
Cohesion	C	kG/cm^2	0.151	0.009	0.062	0.135	0.141

Unconfined compression test 2 samples: $q_u = 0.417 \text{ kG/cm}^2$.

Tiaxial compression test 1 UU as shown belows

Unconsolidation undrain	C_u	kG/cm^2	Average value
	ϕ_u	-	$10^{\circ}31'$

7. Greenish grey spot yellowish brown silty Clay, someplace mixed Laterite gravels, stiff: (sign is 7b)

It locates in only HK6, distributes at 35.80m depth. Composition is almost greenish grey silty clay, someplace mixed laterite gravels. Thickness is 5.00m. SPT shows max=28.0m, min=14.0, average=21.7

There are 2 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value		
			TB	max	min
Gain size	P	%			
5-2			0.4	0.8	0.0
2-1			0.9	1.8	0.0
1.0-0.5			8.9	9.8	8.1
0.50-0.25			17.5	17.9	17.1
0.25-0.10			23.5	23.9	23.1
0.10-0.05			10.8	11.0	10.5
0.05-0.01			9.8	10.0	9.5
0.01-0.005			3.2	3.3	3.1
<0.005			25.0	26.9	23.2
Moisture content	W	%	24.2	24.7	23.6
Wet density	γ_w	g/cm^3	2.01	2.03	2.00
Dry density	γ_k	g/cm^3	1.62		
Specific gravity	γ_s	g/cm^3	2.688	2.690	2.686
Void ratio	e_o	-	0.659		
Porocity	n	%	39.7		
Saturated degree	G	%	98.5		
Liquip limit	W_L	%	34.9	35.2	34.6
Plastic limit	W_P	%	19.9	20.2	19.5
Plastic index	I_P	%	15.1		

Consistency	B	-	0.29		
Internal friction angle	ϕ	-	11°47'	11°51'	11°43'
Cohesion	C	kG/cm ²	0.246	0.251	0.240

Unconfined compression test 1 samples: $q_u = 1.327 \text{ kG/cm}^2$.

8. Greenish, whitish grey silty sand, plastic: (sign is 8a)

It locates in whole boreholes, distributes at depth from 37.60m (HK4) to 40.80m (HK6). Composition is greenish, whitish grey silty sand, someplace mixed quartz gravels. Thickness varies from 7.20m (HK6) to 15.00m (HK4), average is 12.23. SPT shows max=33.0, min=14.0, average=23.2

There are 1 2 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Gain size	P	%					
10-5			0.4				
5-2			1.4				
2-1			4.3				
1.0-0.5			14.4				
0.50-0.25			21.3				
0.25-0.10			26.3				
0.10-0.05			11.2				
0.05-0.01			9.5				
0.01-0.005			2.8				
<0.005			8.3				
Moisture content	W	%	18.4	2.251	0.123	17.2	17.7
Wet density	γ_w	g/cm ³	1.97	0.044	0.022	1.95	1.96
Dry density	γ_k	g/cm ³	1.67				
Specific gravity	γ_s	g/cm ³	2.668	0.013	0.005	2.661	2.664
Void ratio	e_o	-	0.598				
Porosity	n	%	37.4				
Saturated degree	G	%	82.0				
Liquid limit	W_L	%	21.5	1.506	0.070	20.7	21.0
Plastic limit	W_P	%	15.8	1.113	0.070	15.2	15.4
Plastic index	I_P	%	5.7				
Consistency	B	-	0.45				
Internal friction angle	ϕ	-	23°56'	0.007	0.017	23°20'	23°34'
Cohesion	C	kG/cm ²	0.052	0.016	0.303	0.025	0.036

9. Reddish brown silty sand, mixed quartz gravels, plastic: (sign is 11a)

It locates in whole boreholes, distributes at depth from 48.00m (HK6) to 53.50m (HK5). Thickness varies from 10.25m (HK4) to 19.50m (Hk5), average is 15.08m. SPT shows max=47.0, min=24.0, average=34.3

There are 12 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Gain size	P	%					
10-5			0.3				
5-2			0.7				
2-1			2.3				
1.0-0.5			10.4				
0.50-0.25			29.8				
0.25-0.10			26.7				
0.10-0.05			10.0				
0.05-0.01			8.6				
0.01-0.005			2.8				
<0.005			8.3				
Moisture content	W	%	15.6	0.888	0.057	15.1	15.3
Wet density	γ_w	g/cm^3	2.10	0.043	0.020	2.08	2.09
Dry density	γ_k	g/cm^3	1.82				
Specific gravity	γ_s	g/cm^3	2.658	0.030	0.011	2.642	2.648
Void ratio	e_o	-	0.460				
Porosity	n	%	31.5				
Saturated degree	G	%	90.1				
Liquip limit	W_L	%	19.8	0.879	0.044	19.4	19.6
Plastic limit	W_P	%	14.4	0.667	0.046	14.0	14.2
Plastic index	I_P	%	5.5				
Consistency	B	-	0.23				
Internal friction angle	ϕ	-	28°58'	0.019	0.033	27°34'	28°07'
Cohesion	C	kG/cm^2	0.065	0.039	0.609	0.044	0.052

10. Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard: (sign is 11b)

It locates in whole boreholes, distributes at depth from 62.85m (HK4) to 73.00m (HK5). Thickness is not yet determined. Average drilling is 7.17m. SPT shows max=71.0, min=51.0, average=61.1

There are 6 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X ^{tc}	S	V	X _I ^{tt}	X _{II} ^{tt}
Gain size	P	%					
>10			0.2				
10-5			1.7				
5-2			4.4				
2-1			11.0				
1.0-0.5			20.2				
0.50-0.25			20.5				
0.25-0.10			16.4				
0.10-0.05			7.1				
0.05-0.01			8.6				
0.01-0.005			2.6				
<0.005			7.4				
Moisture content	W	%	14.2	1.140	0.080	13.2	13.6
Wet density	γ_w	g/cm ³	2.11	0.031	0.015	2.09	2.10
Dry density	γ_k	g/cm ³	1.85				
Specific gravity	γ_s	g/cm ³	2.637	0.056	0.021	2.591	2.611
Void ratio	e _o	-	0.426				
Porosity	n	%	29.9				
Saturated degree	G	%	87.8				
Liquid limit	W _L	%	19.5	0.609	0.031	19.0	19.2
Plastic limit	W _P	%	15.2	0.520	0.034	14.8	15.0
Plastic index	I _P	%	4.3				
Consistency	B	-	-0.25				
Internal friction angle	φ	-	35°01'	0.012	0.018	34°11'	34°31'
Cohesion	C	kG/cm ²	0.097	0.026	0.265	0.052	0.070

Conclusion and Recommendation for Highrise Building Area B:

Based on the result of soil investigation in Highrise Building area B, the sub-surface soil condition is very complex, contains 10 layer, in which weak soil layer locates in the top of surface (below sand layer). Recommendation of construction properties of layers as follows:

The layer no 2 is very weak soil, compressibility is high, thickness is thick, distribution is very large, locates in under sand layer. Therefore, before constructing, must apply a special treatment solution for this layer.

Moreover, the layer no 7a are also very weak soil, but this layer rarely appears and distributes deeply.

Other layers are medium to high bearing capacity and low compressibility, can use this layer for laying construction foundation. However, depending on the building and bearing capacity, should choose suitable layer for laying foundation

III.2.3 Item for Highrise Building Area C (location is HK 7, HK8, HK9)

In survey area of Item for Highrise Building Area A, we meet sub-surface in 13 soil layers. Features of specific distribution of layers are shown on soil profile with soil properties of layers as bellows

1. Made ground include yellowish, blackish grey fine sand, mixed plant: (sign is 1)

It locates in whole boreholes in the building, distributes at the top of current surface. Composition is fine and soft sand. Thickness varies from 1.30m (HK7, HK9) to 1.50m (HK8), average is 1.37m

2. Greenish, blackish grey clay mud someplace alternate sand, with organic: (sign is 2)

It locates in whole boreholes, distributes at depth from 1.30m (HK7, HK9) to 1.50m (HK8). Thickness varies from 16.30m (HK7, HK8) to 16.50m (HK9), average is 16.37m. SPT shows max=2.0, min=0.0, average=0.2

Based on result of calculation of 23 samples, soil properties are shown:

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Gain size	P	%					
0.50-0.25			0.1				
0.25-0.10			1.3				
0.10-0.05			11.1				
0.05-0.01			26.3				
0.01-0.005			7.5				
<0.005			53.7				
Moisture content	W	%	86.4	9.169	0.106	81.9	83.7
Wet density	γ_w	g/cm^3	1.48	0.014	0.009	1.48	1.48
Dry density	γ_k	g/cm^3	0.80				
Specific gravity	γ_s	g/cm^3	2.608	0.052	0.020	2.583	2.593
Void ratio	e_o	-	2.261				
Porosity	n	%	69.3				
Saturated degree	G	%	99.7				
Liquid limit	W_L	%	67.6	5.247	0.078	65.0	66.0
Plastic limit	W_P	%	43.0	3.392	0.079	41.4	42.0
Plastic index	I_P	%	24.6				
Consistency	B	-	1.77				

Saturated degree	G	%	93.9				
Liquid limit	W _L	%	36.0	2.747	0.076	33.7	34.6
Plastic limit	W _P	%	21.3	2.989	0.140	18.9	19.9
Plastic index	I _P	%	14.6				
Consistency	B	-	0.31				
Internal friction angle	φ	-	11°37'	0.032	0.156	8°31'	9°43'
Cohesion	C	kG/cm ²	0.260	0.043	0.164	0.186	0.214

Unconfined compression test 2 samples: $q_u = 1.378 \text{ kG/cm}^2$.

8. Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense: (sign is 8b)

It locates in whole boreholes, distributes at depth from 39.00m (HK8) to 41.00m (HK9). Thickness varies from 3.70m (HK8) to 6.50m (HK9), average is 5.33m. SPT shows max=24.0, min=9.0, average=15.1

There are 5 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value		
			TB	max	min
Grain size	P	%			
5-2			2.2	5.5	0.0
2-1			6.3	12.1	0.0
1.0-0.5			19.9	42.2	5.0
0.50-0.25			26.5	47.1	11.4
0.25-0.10			29.3	60.6	11.3
0.10-0.05			10.1	14.0	4.6
0.05-0.01			5.8	13.8	0.0
Specific gravity	γ _s	g/cm ³	2.666	2.685	2.656
Angle of repose in dry	α _K	Degrees	28°14'	28°31'	27°52'
Angle of repose in wet	α _{BH}	Degrees	25°22'	25°52'	24°29'

9. Brownish grey, violetish brown clay alternate sand, very stiff to hard:

It locates in whole boreholes, distributes at depth from 42.70m (HK8) to 47.50m (HK9). Composition is clay alternate sand. Thickness varies from 2.50m (HK7) to 7.30m (HK8), average is 4.60m. SPT shows max=36.0, min=15.0, average=25.6

There are 5 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value		
			TB	max	min
Grain size	P	%			
0.50-0.25			0.7	3.5	0.0
0.25-0.10			3.5	7.8	0.0

0.10-0.05			10.0	14.1	3.8
0.05-0.01			35.3	38.1	32.5
0.01-0.005			6.9	8.3	5.6
<0.005			43.5	53.0	33.5
Moisture content	W	%	24.5	32.0	18.5
Wet density	γ_w	g/cm^3	1.95	2.00	1.91
Dry density	γ_k	g/cm^3	1.57		
Specific gravity	γ_s	g/cm^3	2.718	2.771	2.694
Void ratio	e_o	-	0.731		
Porosity	n	%	42.2		
Saturated degree	G	%	91.2		
Liquid limit	W_L	%	44.2	52.3	38.2
Plastic limit	W_P	%	22.2	26.3	19.0
Plastic index	I_P	%	22.0		
Consistency	B	-	0.11		
Internal friction angle	ϕ	-	12°19'	15°10'	10°01'
Cohesion	C	kG/cm^2	0.350	0.410	0.304

Unconfined compression test 2 samples: $q_u = 1.652 \text{ kG/cm}^2$.

Triaxial compression test: 2 UU as shown belows

Unconsolidation undrain			Average value
	C_u	kG/cm^2	0.363
	ϕ_u	-	13°45'

10. Whitish grey, pinkish brown silty clay alternate sand, stiff to very stiff:

It locates in HK7 and HK8, distributes at depth from 49.00m (HK7) to 50.00m (HK8). Composition is someplace mixed quartz gravels. Thickness is thick and varies from 9.00m (HK7) to 12.00m (HK8), average is 10.50m. SPT shows max=34.0, min=17.0, average=26.8

There are 6 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Gain size	P	%					
5-2			0.7				
2-1			1.2				
1.0-0.5			3.4				
0.50-0.25			8.3				

0.25-0.10			20.3				
0.10-0.05			15.8				
0.05-0.01			20.4				
0.01-0.005			4.9				
<0.005			25.0				
Moisture content	W	%	25.5	1.829	0.072	24.0	24.6
Wet density	γ_w	g/cm ³	1.94	0.020	0.010	1.93	1.93
Dry density	γ_k	g/cm ³	1.55				
Specific gravity	γ_s	g/cm ³	2.708	0.028	0.010	2.686	2.695
Void ratio	e_o	-	0.747				
Porosity	n	%	42.8				
Saturated degree	G	%	92.3				
Liquid limit	W _L	%	35.4	1.400	0.040	34.3	34.8
Plastic limit	W _P	%	22.1	1.447	0.066	20.9	21.4
Plastic index	I _P	%	13.3				
Consistency	B	-	0.25				
Internal friction angle	ϕ	-	14°15'	0.018	0.071	12°33'	13°13'
Cohesion	C	kG/cm ²	0.290	0.024	0.083	0.248	0.264

Unconfined compression test 1 samples: $q_u = 1.435 \text{ kG/cm}^2$.

Triaxial compression test: 1 UU as shown belows

			Average value
Unconsolidation undrain	C_u	kG/cm ²	0.237
	ϕ_u	-	12°41'

11. Reddish brown silty sand, mixed quartz gravels, plastic:

It locates in whole boreholes, distributes at depth from 51.50m (HK9) to 62.00m (HK8). Composition is someplace mixed quartz gravels. Thickness varies from 5.00m (HK8) to 13.00m (HK9), average is 9.83m. SPT shows max=67.0, min=9.0, average=26.0

There are 8 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Gain size	P	%					
5-2			1.3				
2-1			3.7				
1.0-0.5			9.1				
0.50-0.25			22.6				

0.25-0.10			31.3				
0.10-0.05			11.5				
0.05-0.01			9.0				
0.01-0.005			2.9				
<0.005			8.5				
Moisture content	W	%	17.9	2.584	0.144	16.2	16.9
Wet density	γ_w	g/cm ³	2.00	0.006	0.003	2.00	2.00
Dry density	γ_k	g/cm ³	1.70				
Specific gravity	γ_s	g/cm ³	2.678	0.005	0.002	2.675	2.676
Void ratio	e_o	-	0.576				
Porosity	n	%	36.5				
Saturated degree	G	%	83.4				
Liquid limit	W _L	%	20.9	2.211	0.106	19.5	20.1
Plastic limit	W _P	%	15.3	1.761	0.115	14.1	14.6
Plastic index	I _P	%	5.7				
Consistency	B	-	0.47				
Internal friction angle	ϕ	-	27°27'	0.024	0.046	25°34'	26°18'
Cohesion	C	kG/cm ²	0.052	0.020	0.386	0.039	0.044

12. Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard: (sign is 11b)

It locates in only HK7, distributes at 69.50m depth. Thickness is 7.80m. SPT shows max=50.0, min=35.0, average=44.7

There are 6 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value		
			TB	max	min
Gain size	P	%			
10-5			0.7	1.4	0.0
5-2			3.1	4.0	2.2
2-1			5.2	8.0	2.3
1.0-0.5			10.9	17.6	4.2
0.50-0.25			18.5	23.5	13.4
0.25-0.10			24.6	30.5	18.6
0.10-0.05			11.9	15.6	8.1
0.05-0.01			13.7	17.8	9.5
0.01-0.005			3.4	4.6	2.2
<0.005			8.3	9.4	7.1
Moisture content	W	%	15.1	15.4	14.7

Wet density	γ_w	g/cm^3	2.04	2.05	2.02
Dry density	γ_k	g/cm^3	1.77		
Specific gravity	γ_s	g/cm^3	2.681	2.682	2.680
Void ratio	e_o	-	0.515		
Porosity	n	%	34.0		
Saturated degree	G	%	78.4		
Liquid limit	W_L	%	21.0	21.3	20.7
Plastic limit	W_P	%	15.5	15.6	15.3
Plastic index	I_P	%	5.6		
Consistency	B	-	-0.07		
Internal friction angle	ϕ	-	29°46'	29°58'	29°33'
Cohesion	C	kG/cm^2	0.112	0.105	0.044

13. Yellowish grey, reddish brown medium sand, mixed quartz gravels, dense:

It locates in whole boreholes, distributes at depth from 64.50m (HK9) to 82.30m (HK7). Composition is medium sand. Thickness varies from 3.20m (HK7) to 13.30m (HK9), average is 7.15m. SPT shows max=132.0, min=32.0, average=57.4

There are 11 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value		
			TB	max	min
Gain size	P	%			
>10			0.2	2.0	0.0
10-5			0.5	3.3	0.0
5-2			3.2	6.0	0.0
2-1			6.2	9.4	2.1
1.0-0.5			16.3	26.8	9.6
0.50-0.25			33.9	41.3	22.1
0.25-0.10			23.9	36.6	13.3
0.10-0.05			8.9	13.1	6.0
0.05-0.01			7.2	14.3	2.5
Specific gravity	γ_s	g/cm^3	2.657	2.662	2.651
Angle of repose in dry	α_K	Degrees	29°53'	31°00'	29°13'
Angle of repose in wet	α_{BH}	Degrees	26°24'	27°31'	25°02'

Lens greenish grey, spot, brownish grey clay, stiff to very stiff:

Lens is in layer no 12, distributes at 79.90m depth. Thickness is 2.40m. SPT =22.0

There is 1 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value
Gain size	P	%	
2-1			0.8
1.0-0.5			1.0
0.50-0.25			1.9
0.25-0.10			8.7
0.10-0.05			19.0
0.05-0.01			31.0
0.01-0.005			7.0
<0.005			30.6
Moisture content	W	%	19.2
Wet density	γ_w	g/cm ³	2.11
Dry density	γ_k	g/cm ³	1.77
Specific gravity	γ_s	g/cm ³	2.710
Void ratio	e_o	-	0.531
Porosity	n	%	34.7
Saturated degree	G	%	98.0
Liquid limit	W_L	%	33.4
Plastic limit	W_P	%	16.1
Plastic index	I_P	%	17.3
Consistency	B	-	0.18
Internal friction angle	ϕ	-	14°53'
Cohesion	C	kG/cm ²	0.282

14. Greenish grey clay, very stiff to hard: (sign is 13)

It locates in whole boreholes, distributes at depth from 74.50m (HK8) to 85.50m (HK7). Composition is greenish grey clay, very stiff to hard, someplace mixed quartz gravels. Thickness varies from 3.80m (HK9) to not yet determined, due to in HK7 not drill this layer, average drilling is 3.08m. SPT shows max=56.0, min=27.0, average=35.8

Property	legends	Units	Value		
			TB	max	min
Gain size	P	%			
>10			0.4	1.4	0.0
10-5			0.3	1.2	0.0
5-2			1.0	3.8	0.0
2-1			0.7	2.8	0.0

1.0-0.5			1.2	4.7	0.0
0.50-0.25			1.5	5.8	0.0
0.25-0.10			4.7	12.1	0.0
0.10-0.05			9.9	16.9	0.0
0.05-0.01			34.5	44.2	15.8
0.01-0.005			7.4	11.6	4.1
<0.005			38.6	44.2	33.8
Moisture content	W	%	24.9	27.8	21.3
Wet density	γ_w	g/cm ³	2.02	2.08	1.99
Dry density	γ_k	g/cm ³	1.62		
Specific gravity	γ_s	g/cm ³	2.694	2.736	2.650
Void ratio	e_o	-	0.663		
Porosity	n	%	39.9		
Saturated degree	G	%	101.0		
Liquid limit	W _L	%	44.5	48.5	41.8
Plastic limit	W _P	%	23.0	23.6	22.7
Plastic index	I _P	%	21.5		
Consistency	B	-	0.08		
Internal friction angle	ϕ	-	12°38'	14°42'	11°42'
Cohesion	C	kG/cm ²	0.439	0.620	0.335

Unconfined compression test 2 samples: $q_u = 2.291 \text{ kG/cm}^2$.

15. Reddish brown, yellowish grey silty sand, someplace alternate clay, quartz gravels, hard: (sign is 14)

It locates in HK8 and HK9, distributes at depth from 78.50m (HK8) to 81.60m (HK9). Composition is reddish brown, yellowish grey silty sand, someplace alternate clay, quartz, hard. Thickness is not determined, because all boreholes are not drilled through this layer, average drilling is 5.90m. SPT shows max=57, min=33.0, average=50.7

There are 3 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value		
			TB	max	min
Grain size	P	%			
5-2			0.5	1.2	0.0
2-1			2.6	4.3	0.1
1.0-0.5			15.0	31.9	0.3
0.50-0.25			20.0	30.7	5.7
0.25-0.10			32.9	59.9	18.0
0.10-0.05			11.0	12.9	8.0
0.05-0.01			8.2	9.6	5.8

0.01-0.005			3.0	3.7	2.0
<0.005			6.8	9.2	4.6
Moisture content	W	%	13.5	15.7	11.2
Wet density	γ_w	g/cm ³	2.05	2.13	1.94
Dry density	γ_k	g/cm ³	1.81		
Specific gravity	γ_s	g/cm ³	2.701	2.755	2.673
Void ratio	e_o	-	0.492		
Porosity	n	%	33.0		
Saturated degree	G	%	74.2		
Liquid limit	W_L	%	18.9	21.1	15.1
Plastic limit	W_P	%	13.9	16.0	11.4
Plastic index	I_P	%	5.0		
Consistency	B	-	-0.07		
Internal friction angle	ϕ	-	34°37'	35°22'	33°40'
Cohesion	C	kG/cm ²	0.072	0.130	0.016

Conclusion and Recommendation for Highrise Building Area C:

Based on the result of soil investigation in Highrise Building area C, the sub-surface soil condition is very complex, contains 15 layer, in which weak soil layer locates in the top of surface (below sand layer). Recommendation of construction properties of layers as follows:

The layer no 2 is very weak soil, compressibility is high, thickness is thick, distribution is very large, locates in under sand layer. Therefore, before constructing, must apply a special treatment solution for this layer

Moreover, the layer no 3, 7a are also very weak soil, but this layer rarely appears and distributes deeply

Other layers are medium to high bearing capacity and low compressibility, can use this layer for laying construction foundation. However, depending on the building and bearing capacity, should choose suitable layer for laying foundation

III.2.4. Item for Highrise Building Area D (HK10, HK11, HK12)

In survey area of Item for Highrise Building Area D, we meet sub-surface in 14 soil layers. Features of specific distribution of layers are shown on soil profile with soil properties of layers as bellows:

1. Made ground include yellowish, blackish grey fine sand, mixed plant: (sign is 1)

It locates in whole boreholes, distributes at the top of current surface. Composition is soft and fine sand. Thickness varies from 1.20m (HK11) to 1.50m (HK12), average is 1.37m

2. Greenish, blackish grey clay mud someplace alternate sand, with organic and shell: (sign is 2)

It locates is whole boreholes, distributes at depth from 1.20m (HK11) to 1.50m (HK12). Thickness varies from 17.30m (HK10) to 17.60m (HK11, HK12), average is 17.50m. SPT shows max=7.0, min=0.0, average=0.5

There are 13 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X ^{tc}	S	V	X _I ^{tt}	X _{II} ^{tt}
Gain size	P	%					
0.25-0.10			1.3				
0.10-0.05			6.9				
0.05-0.01			31.8				
0.01-0.005			8.3				
<0.005			51.7				
Moisture content	W	%	82.7	6.773	0.082	79.4	80.7
Wet density	γ_w	g/cm ³	1.48	0.029	0.019	1.47	1.47
Dry density	γ_k	g/cm ³	0.81				
Specific gravity	γ_s	g/cm ³	2.616	0.060	0.023	2.586	2.598
Void ratio	e _o	-	2.230				
Porosity	n	%	69.0				
Saturated degree	G	%	97.1				
Liquid limit	W _L	%	66.7	7.692	0.115	62.9	64.4
Plastic limit	W _P	%	41.3	5.897	0.143	38.4	39.6
Plastic index	I _P	%	25.3				
Consistency	B	-	1.64				
Internal friction angle	ϕ	-	2°59'	0.005	0.096	2°30'	2°41'
Cohesion	C	kG/cm ²	0.050	0.002	0.035	0.047	0.048

Triaxial compression test: 2 UU as shown belows

			Average value
Unconsolidation undrain	C _u	kG/cm ²	0.096
	ϕ_u	-	2°17'

3. Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff: (sign is 4)

It locates in whole boreholes, distributes at depth from 18.70m (HK10) to 19.10m (HK12). Thickness varies from 4.70m (HK11) to 9.80m (HK10), average is 6.47m. SPT shows max=15.0, min=1.0, average=10.4

There are 6 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X^{tc}	S	V	X_l^{tt}	X_{ll}^{tt}
Gain size	P	%					
1.0-0.5			1.1				
0.50-0.25			6.8				
0.25-0.10			23.0				
0.10-0.05			24.0				
0.05-0.01			19.2				
0.01-0.005			4.0				
<0.005			21.8				
Moisture content	W	%	23.8	1.607	0.068	22.4	23.0
Wet density	γ_w	g/cm^3	1.98	0.023	0.012	1.96	1.97
Dry density	γ_k	g/cm^3	1.60				
Specific gravity	γ_s	g/cm^3	2.668	0.108	0.041	2.579	2.616
Void ratio	e_o	-	0.667				
Porosity	n	%	40.0				
Saturated degree	G	%	95.0				
Liquid limit	W_L	%	32.0	3.311	0.103	29.3	30.4
Plastic limit	W_P	%	19.2	1.275	0.066	18.2	18.6
Plastic index	I_P	%	12.8				
Consistency	B	-	0.36				
Internal friction angle	ϕ	-	$11^\circ 42'$	0.019	0.092	$9^\circ 51'$	$10^\circ 34'$
Cohesion	C	kG/cm^2	0.290	0.025	0.087	0.246	0.263

Unconfined compression test 1 samples: $q_u = 1.037 \text{ kG/cm}^2$

Triaxial compression test: 1 UU as shown belows

			Average value
Unconsolidation undrain	C_u	kG/cm^2	0.273
	ϕ_u	-	$11^\circ 21'$

4. Greenish grey, yellowish brown silty sand, plastic: (sign is 5)

It locates in only HK12, distributes at 24.00m depth. Thickness is 2.70m. SPT shows max=13.0, min=13.0, average=13.0

There are 62 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value		
			TB	max	min
Gain size	P	%			
1.0-0.5			0.4	0.8	0.1
0.50-0.25			8.3	10.8	5.7

It locates in HK11 and HK12, distributes at depth from 37.00m (HK11, HK12) to 37.00m (HK11, HK12). Thickness varies from 3.60m (HK12) to 5.40m (HK11), average is 4.50m. SPT shows max=16.0, min=11.0, average=13.7

There are 6 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value		
			TB	max	min
Gain size	P	%			
2-1			0.9	3.7	0.0
1.0-0.5			1.6	6.8	0.0
0.50-0.25			3.8	14.2	0.0
0.25-0.10			11.5	25.4	5.3
0.10-0.05			18.5	34.6	10.8
0.05-0.01			31.4	46.7	19.2
0.01-0.005			6.7	10.5	3.2
<0.005			25.5	37.5	11.9
Moisture content	W	%	23.7	26.3	21.3
Wet density	γ_w	g/cm ³	1.98	2.03	1.92
Dry density	γ_k	g/cm ³	1.60		
Specific gravity	γ_s	g/cm ³	2.668	2.686	2.613
Void ratio	e_o	-	0.667		
Porosity	n	%	40.0		
Saturated degree	G	%	94.7		
Liquid limit	W_L	%	32.8	36.2	28.6
Plastic limit	W_P	%	19.0	20.3	16.8
Plastic index	I_P	%	13.9		
Consistency	B	-	0.34		
Internal friction angle	ϕ	-	11°20'	12°04'	10°32'
Cohesion	C	kG/cm ²	0.230	0.243	0.219

Unconfined compression test 1 samples $q_u = 1.370 \text{ kG/cm}^2$.

Triaxial compression test: 2 UU as shown belows

			Average value
Unconsolidation undrain	C_u	kG/cm ²	0.285
	ϕ_u	-	12°59'

8. Yellowish, greenish grey medium sand to coarse alternate clay, mixed quartz gravels, medium dense to dense: (sign is 8b)

It locates in whole boreholes, distributes at depth from 36.50m (HK10) to 42.40m (HK11). Thickness varies from 4.60m (HK11) to 9.10m (HK10), average is 6.87m. SPT shows max=39.0, min=13.0, average=28.4

There are 4 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value		
			TB	max	min
Gain size	P	%			
10-5			1.6	3.4	0.0
5-2			6.9	19.4	0.0
2-1			16.4	35.0	6.5
1.0-0.5			25.6	42.9	13.2
0.50-0.25			24.2	44.7	13.3
0.25-0.10			12.7	16.6	9.2
0.10-0.05			4.3	4.4	4.1
0.05-0.01			8.4	18.4	2.0
Specific gravity	γ_s	g/cm^3	2.658	2.658	2.657
Angle of repose in dry	α_K	Degrees	33°28'	28°07'	10°32'
Angle of repose in wet	α_{BII}	Degrees	25°13'	25°50'	24°31'

9. Brownish grey, violetish brown clay alternate sand, very stiff to hard: (sign is 9)

It locates in whole boreholes, distributes at depth from 45.60m (HK10) to 47.50m (HK12). Thickness varies from 9.50m (HK12) to 23.60m (HK10), average is 17.23m. SPT shows max=32.0, min=10.0, average=18.3

There are 16 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X^{tc}	S	V	X_I''	X_{II}''
Gain size	P	%					
0.50-0.25			0.9				
0.25-0.10			9.1				
0.10-0.05			21.6				
0.05-0.01			26.1				
0.01-0.005			6.0				
<0.005			36.3				
Moisture content	W	%	28.7	3.186	0.111	27.3	27.8
Wet density	γ_w	g/cm^3	1.89	0.031	0.016	1.88	1.89
Dry density	γ_K	g/cm^3	1.47				
Specific gravity	γ_s	g/cm^3	2.680	0.028	0.010	2.668	2.672

Property	legends	Units	Value		
			TB	max	min
Gain size	P	%			
0.25-0.10			2.8	3.4	1.9
0.10-0.05			16.9	21.0	11.1
0.05-0.01			31.5	43.8	16.0
0.01-0.005			4.7	5.8	3.4
<0.005			44.0	58.6	36.5
Moisture content	W	%	22.0	24.7	20.0
Wet density	γ_w	g/cm^3	2.01	2.07	1.97
Dry density	γ_k	g/cm^3	1.65		
Specific gravity	γ_s	g/cm^3	2.674	2.702	2.630
Void ratio	e_o	-	0.621		
Porosity	n	%	38.3		
Saturated degree	G	%	94.9		
Liquid limit	W_L	%	45.9	57.6	38.7
Plastic limit	W_P	%	23.5	28.4	20.2
Plastic index	I_P	%	22.4		
Consistency	B	-	-0.07		
Internal friction angle	ϕ	-	13°26'	14°29'	11°34'
Cohesion	C	kG/cm^2	0.391	0.434	0.352

Unconfined compression test 1 sample this layer: $q_u = 1.005 \text{ kG/cm}^2$.

14. Reddish brown, yellowish grey silty sand, hard: (sign is 14)

It locates in only HK10, distributes at 82.30m depth. Thickness is not yet determined, average drilling is 4.65m. SPT shows max=57.0, min=52.0, average=54.0

There are 1samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value
Gain size	P	%	
5-2			0.4
2-1			3.1
1.0-0.5			10.6
0.50-0.25			27.4
0.25-0.10			21.6
0.10-0.05			11.9
0.05-0.01			12.6
0.01-0.005			4.0

<0.005			8.4
Moisture content	W	%	12.5
Wet density	γ_w	g/cm ³	2.04
Dry density	γ_k	g/cm ³	1.81
Specific gravity	γ_s	g/cm ³	2.730
Void ratio	e_o	-	0.508
Porosity	n	%	33.7
Saturated degree	G	%	67.1
Liquid limit	W_L	%	16.4
Plastic limit	W_P	%	12.8
Plastic index	I_P	%	3.6
Consistency	B	-	-0.08
Internal friction angle	ϕ	-	33°40'
Cohesion	C	kG/cm ²	0.019

Conclusion and Recommendation for Highrise Building Area D:

Based on the result of soil investigation in Highrise Building area B, the sub-surface soil condition is very complex, contains 14 layers, in which weak soil layer locates in the top of surface (below sand layer). Recommendation of construction properties of layers as follows:

The layer no 2 is very weak soil, compressibility is high, thickness is thick, distribution is very large, locates in under sand layer. Therefore, before constructing, must apply a special treatment solution for this layer.

Other layers are medium to high bearing capacity and low compressibility, can use this layer for laying construction foundation. However, depending on the building and bearing capacity, should choose suitable layer for laying foundation

III.2.5. Item for Highrise Building Area E (HK13, HK14, HK15)

In survey area of Item for Highrise Building Area D, we meet sub-surface in 10 soil layers. Features of specific distribution of layers are shown on soil profile with soil properties of layers as bellows:

1. Made ground include yellowish, blackish grey fine sand, mixed plant: (sign is 1)

It locates in whole boreholes, distributes at the top of current surface. Composition is soft and fine sand. Thickness varies from 1.00m (HK13, HK14) to 1.10m (HK15), average is 1.03m

2. Greenish, blackish grey clay mud someplace alternate sand, with organic and shell: (sign is 2)

It locates in whole boreholes, distributes at depth from 1.00m (HK13, HK14) to 1.10m (HK15). Thickness varies from 14.00m (HK14) to 14.80m (HK13), average is 14.40m. SPT shows max=3.0, min=0.0, average=0.8

There are 12 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Grain size	P	%					
>10							
10-5							
5-2							
2-1							
1.0-0.5							
0.50-0.25			1.0				
0.25-0.10			5.7				
0.10-0.05			14.2				
0.05-0.01			27.0				
0.01-0.005			6.7				
<0.005			45.3				
Moisture content	W	%	85.2	6.993	0.082	81.4	82.9
Wet density	γ_w	g/cm^3	1.48	0.020	0.013	1.47	1.47
Dry density	γ_k	g/cm^3	0.80				
Specific gravity	γ_s	g/cm^3	2.592	0.052	0.020	2.565	2.576
Void ratio	e_o	-	2.240				
Porosity	n	%	69.1				
Saturated degree	G	%	98.6				
Liquid limit	W_L	%	66.8	5.741	0.086	63.8	65.0
Plastic limit	W_P	%	40.4	2.652	0.066	39.0	39.5
Plastic index	I_P	%	26.4				
Consistency	B	-	1.70				
Internal friction angle	ϕ	-	3°25'	0.009	0.150	2°33'	2°53'
Cohesion	C	kG/cm^2	0.050	0.003	0.057	0.045	0.047

Triaxial compression test: 4 UU and 1 CU as shown follow

			Average value
Unconsolidation undrain	C_u	kG/cm^2	0.130
	ϕ_u	-	2°11'
Consolidation Undrain	C_{cu}	kG/cm^2	0.161
	ϕ_{cu}	-	8°50'
	C'_{cu}	kG/cm^2	0.141
	ϕ'_{cu}	-	11°49'

Consistency	B	-	0.51		
Internal friction angle	φ	-	22°03'	23°29'	20°24'
Cohesion	C	kG/cm ²	0.037	0.062	0.024

5. Whitish, blackish, yellowish grey fine sand alternate clay, medium dense: (sign is 6)

It locates in HK13 and HK14, distributes at depth from 25.50m (HK14) to 29.00m (HK13). Thickness varies from 3.00m (HK13) to 3.30m (HK14), average is 3.15m. SPT shows max=26.0, min=19.0, average=22.0

There are 2 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value		
			TB	max	min
Gain size	P	%			
2-1			3.3	5.5	1.2
1.0-0.5			7.0	8.1	5.9
0.50-0.25			17.8	20.8	14.7
0.25-0.10			45.7	46.3	45.1
0.10-0.05			18.9	20.8	17.0
0.05-0.01			7.3	8.8	5.8
Specific gravity	γ_s	g/cm ³	2.669	2.683	2.656
Angle of repose in dry	α_K	Degrees	26°20'	26°43'	25°57'
Angle of repose in wet	α_{BH}	Degrees	23°10'	23°27'	22°52'

6. Greenish grey Clay alternate Sand, mixed organic, firm: (sign is 7a)

It locates in whole boreholes, distributes at depth from 28.80m (HK14) to 32.10m (HK15). Thickness varies from 1.40m (HK15) to 5.00m (HK13), average is 3.03m. SPT shows max=25.0, min=7.0, average=15.4

There are 4 samples for this layer, mechanical and physical properties as follows:

Property	legends	Units	Value		
			TB	max	min
Gain size	P	%			
1.0-0.5			0.5	1.9	0.0
0.50-0.25			3.0	9.3	0.0
0.25-0.10			10.6	23.8	0.0
0.10-0.05			18.7	20.9	16.8
0.05-0.01			28.5	45.1	12.4
0.01-0.005			3.0	4.1	1.3

<0.005			35.7	42.8	30.6
Moisture content	W	%	39.7	42.3	38.0
Wet density	γ_w	g/cm^3	1.80	1.82	1.78
Dry density	γ_k	g/cm^3	1.29		
Specific gravity	γ_s	g/cm^3	2.664	2.670	2.656
Void ratio	e_o	-	1.065		
Porosity	n	%	51.6		
Saturated degree	G	%	99.4		
Liquid limit	W_L	%	49.9	54.6	44.2
Plastic limit	W_P	%	26.2	27.8	25.0
Plastic index	I_P	%	23.8		
Consistency	B	-	0.57		
Internal friction angle	ϕ	-	$10^\circ 03'$	$11^\circ 14'$	$9^\circ 21'$
Cohesion	C	kG/cm^2	0.174	0.200	0.154

Unconfined compression test 2 samples: $q_u = 0.389 \text{ kG/cm}^2$.

7. Greenish, yellowish grey silty sand, plastic: (sign is 8a)

It locates in whole boreholes, distributes at depth from 31.50m (HK14) to 37.00m (HK13). Thickness varies from 4.00m (HK13) to 12.10m (HK14), average is 7.40m. SPT shows max=30.0, min=9.0, average=18.8

There are 4 samples test for this layer, mechanical and physical properties as follows

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Grain size	P	%					
10-5			1.1				
5-2			3.7				
2-1			5.5				
1.0-0.5			8.6				
0.50-0.25			15.7				
0.25-0.10			29.0				
0.10-0.05			16.1				
0.05-0.01			9.9				
0.01-0.005			3.0				
<0.005			7.6				
Moisture content	W	%	17.0	0.828	0.049	16.3	16.6
Wet density	γ_w	g/cm^3	2.01	0.034	0.017	1.97	1.99
Dry density	γ_k	g/cm^3	1.71				
Specific gravity	γ_s	g/cm^3	2.661	0.057	0.021	2.615	2.634

Void ratio	e_o	-	0.556				
Porosity	n	%	35.7				
Saturated degree	G	%	81.1				
Liquid limit	W_L	%	20.9	1.110	0.053	19.9	20.3
Plastic limit	W_P	%	15.2	0.911	0.060	14.4	14.7
Plastic index	I_P	%	5.7				
Consistency	B	-	0.31				
Internal friction angle	φ	-	24°21'	0.024	0.053	22°19'	23°07'
Cohesion	C	kG/cm ²	0.042	0.025	0.584	0.022	0.030

8. Reddish brown silty sand, mixed quartz gravels, plastic: (sign is 11a)

It locates in whole boreholes, distributes at depth from 39.60m (HK15) to 43.60m (HK14). Thickness varies from 18.90m (HK14) to 23.60m (HK15), average is 21.60m. SPT shows max=54.0, min=13.0, average=33.0

There are 17 samples for this layer, mechanical and physical properties as follows

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Grain size	P	%					
5-2			0.4				
2-1			3.1				
1.0-0.5			12.7				
0.50-0.25			23.5				
0.25-0.10			23.7				
0.10-0.05			13.0				
0.05-0.01			12.7				
0.01-0.005			3.5				
<0.005			7.3				
Moisture content	W	%	16.1	0.822	0.051	15.7	15.9
Wet density	γ_w	g/cm ³	2.07	0.055	0.027	2.05	2.06
Dry density	γ_K	g/cm ³	1.78				
Specific gravity	γ_s	g/cm ³	2.674	0.015	0.005	2.668	2.670
Void ratio	e_o	-	0.502				
Porosity	n	%	33.4				
Şe b-o hom	G	%	85.5				
Liquid limit	W_L	%	20.0	0.804	0.040	19.6	19.8
Plastic limit	W_P	%	14.5	0.622	0.043	14.3	14.4
Plastic index	I_P	%	5.4				
Consistency	B	-	0.28				

Internal friction angle	ϕ	-	29°20'	0.023	0.041	27°37'	28°16'
Cohesion	C	kG/cm ²	0.058	0.027	0.471	0.046	0.051

9. Yellowish brown spot whitish grey silty sand, someplace mixed quartz gravels, hard: (sign is 11b)

It locates in HK13 and HK15, distributes at depth from 63.20m (HK15) to 63.30m (HK13). Thickness varies from not yet determined, because HK13 and HK15 not yet finish this layer, average is 7.20m. SPT shows max=60.0, min=43.0, average=53.9

There are 6 samples test for this layer, mechanical and physical properties as follows

Property	legends	Units	Value				
			X ^{tc}	S	V	X _I ^{tt}	X _{II} ^{tt}
Gain size	P	%					
10-5			0.5				
5-2			3.1				
2-1			9.4				
1.0-0.5			17.1				
0.50-0.25			21.2				
0.25-0.10			18.4				
0.10-0.05			9.4				
0.05-0.01			11.0				
0.01-0.005			3.1				
<0.005			6.7				
Moisture content	W	%	13.5	0.557	0.041	13.1	13.3
Wet density	γ_w	g/cm ³	2.13	0.053	0.025	2.08	2.10
Dry density	γ_k	g/cm ³	1.88				
Specific gravity	γ_s	g/cm ³	2.663	0.013	0.005	2.653	2.657
Void ratio	e _o	-	0.417				
Porosity	n	%	29.4				
Saturated degree	G	%	86.5				
Liquid limit	W _L	%	19.6	0.542	0.028	19.1	19.3
Plastic limit	W _P	%	14.4	0.635	0.044	13.9	14.1
Plastic index	I _P	%	5.1				
Consistency	B	-	-0.18				
Internal friction angle	ϕ	-	33°29'	0.036	0.054	30°54'	31°55'
Cohesion	C	kG/cm ²	0.096	0.059	0.612	0.048	0.068

10. Yellowish grey, reddish brown fine sand to coarse sand, mixed quartz gravels, dense: (sign is 12)

It locates in HK14, distributes at 62.50m depth . Thickness is not yet determined, because HK14 not yet finish this layer, average is 7.95m. SPT shows max=79.0, min=51.0, average=64.8

There are 3 samples test for this layer, mechanical and physical properties as follows

Property	legends	Units	Value		
			TB	max	min
Gain size	P	%			
10-5			0.9	2.6	0.0
5-2			2.3	6.7	0.0
2-1			5.2	10.3	0.3
1.0-0.5			21.6	40.6	9.6
0.50-0.25			31.8	49.7	21.1
0.25-0.10			21.4	22.6	19.2
0.10-0.05			11.8	14.8	9.3
0.05-0.01			5.0	7.4	2.8
Specific gravity	γ_s	g/cm ³	2.653	2.656	2.651
Angle of repose in dry	α_K	Degrees	30°38'	31°33'	29°54'
Angle of repose in wet	α_{BH}	Degrees	27°45'	28°32'	26°56'

Conclusion and Recommendation for Highrise Building Area E:

Based on the result of soil investigation in Highrise Building area B, the sub-surface soil condition is very complex, contains 10 layers, in which weak soil layer locates in the top of surface (below sand layer). Recommendation of construction properties of layers as follows:

The layer no 2 is very weak soil, compressibility is high, thickness is thick, distribution is very large, locates in under sand layer. Therefore, before constructing, must apply a special treatment solution for this layer.

Other layers are medium to high bearing capacity and low compressibility, can use this layer for laying construction foundation. However, depending on the building and bearing capacity, should choose suitable layer for laying foundation.

III.2.6.Item for Villas Area F (HK16, HK17, HK18, HK19, HK20, HK21)

In survey area of Item for Highrise Building Area F, we meet sub-surface in 14 soil layers. Features of specific distribution of layers are shown on soil profile with soil properties of layers as bellows

1. Made ground include yellowish, blackish grey fine sand, mixed plant:

It locates in whole boreholes, distributes at the top of current surface. Composition is soft and fine sand. Thickness varies from 1.90m (HK16, HK19, HK21) to 2.60m (HK17), average is 2.12m

2. Greenish, blackish grey clay mud someplace alternate sand, with organic and shell:

It locates in whole boreholes, distributes at depth from 1.90m (HK16, HK19, HK21) to 2.60m (HK17). Thickness varies from 15.30m (HK20) to 19.40m (HK16), average is 17.08m. SPT shows max=3.0, min=0.0, average=0.9

There are 26 samples test for this layer, mechanical and physical properties as follows

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Grain size	P	%					
0.50-0.25			0.1				
0.25-0.10			2.0				
0.10-0.05			8.9				
0.05-0.01			30.9				
0.01-0.005			8.6				
<0.005			49.5				
Moisture content	W	%	88.3	9.620	0.109	85.1	86.3
Wet density	γ_w	g/cm^3	1.48	0.036	0.024	1.46	1.47
Dry density	γ_k	g/cm^3	0.78				
Specific gravity	γ_s	g/cm^3	2.600	0.049	0.019	2.584	2.590
Void ratio	e_o	-	2.334				
Porosity	n	%	70.0				
Saturated degree	G	%	98.4				
Liquid limit	W_L	%	67.7	4.628	0.068	66.1	66.7
Plastic limit	W_P	%	41.9	3.318	0.079	40.8	41.2
Plastic index	I_P	%	25.8				
Consistency	B	-	1.80				
Internal friction angle	ϕ	-	3°07'	0.004	0.074	2°44'	2°52'
Cohesion	C	kG/cm^2	0.050	0.001	0.029	0.048	0.048

3. Greenish grey spot yellowish brown silty clay, someplace mixed laterite gravels, firm to stiff:

It locates is whole boreholes, distributes at depth from 17.40m (HK20) to 21.30m (HK16). Thickness varies from 2.70m (HK16) to not yet determined, average is 5.03m. SPT shows max=23.0, min=6.0, average=11.7

There are 11 samples test for this layer, mechanical and physical properties as follows

Property	legends	Units	Value				
			X^{tc}	S	V	X_I^{tt}	X_{II}^{tt}
Gain size	P	%					
5-2			0.3				
2-1			0.2				
1.0-0.5			0.6				
0.50-0.25			4.4				
0.25-0.10			14.6				
0.10-0.05			23.2				
0.05-0.01			26.3				
0.01-0.005			5.4				
<0.005			25.0				
Moisture content	W	%	25.1	1.967	0.078	24.0	24.4
Wet density	γ_w	g/cm^3	1.98	0.042	0.021	1.95	1.96
Dry density	γ_k	g/cm^3	1.58				
Specific gravity	γ_s	g/cm^3	2.694	0.008	0.003	2.690	2.691
Void ratio	e_o	-	0.705				
Porosity	n	%	41.3				
Saturated degree	G	%	95.9				
Liquid limit	W_L	%	34.9	1.676	0.048	33.9	34.3
Plastic limit	W_P	%	20.3	2.462	0.121	18.9	19.5
Plastic index	I_P	%	14.6				
Consistency	B	-	0.33				
Internal friction angle	ϕ	-	11°55'	0.029	0.137	9°11'	10°13'
Cohesion	C	kG/cm^2	0.200	0.039	0.195	0.134	0.159

4. Greenish grey, yellowish brown silty sand, plastic:

It locates is HK18, distributes at 23.40m depth . Thickness is not yet determined, because HK18 not yet drill through this layer, drilling thickness is 2.05m. SPT= 24.0

There are 01 sample test for this layer, mechanical and physical properties as follows