

PROJECT: Geotechnical Design of the New Railway Alignment between the Existing Line and Kavala's Port

Geotechnical Design of Embankment from CH. 92+600 to CH. 93+870

RECAPITULATIVE TABLE OF RESULTS OF STATISTICAL ANALYSIS OF LABORATORY TESTS - SOIL PHYSICAL PROPERTIES

BOREHOLE	SAMPLE	DEPTH	CLASSIFICATION ACCORDING TO ASTMUSCS	ASTMUSCS CLASSIFICATION	GRAIN SIZE ANALYSIS					ATTERBERG LIMITS			BULK DENSITY		SPECIFIC GRAVITY	MOISTURE CONTENT	RELATIVE DENSITY Dr	VOID RATIO e	SATURATION DEGREE Sr	ORGANIC CONTENT	CaCO3	SULPHATE CONTENT
					GRAVEL	SAND	SILT	CLAY	SILT+CLAY	LIQUID LIMIT WL	PLASTICITY LIMIT WP	PLASTICITY INDEX IP	WET γwet	DRY γdry								
		m			%	%	%	%	%	%	%	KN/m²	KN/m³	%	%	%	%	%	%	%	%	
M8	Δ1	3.9	Poorly graded sand with silt	SM-SP	29	61			10			0			2.650	2.6						
M8	Δ2	7.9	Poorly graded sand with silt	SM-SP	16	78			6			0				18.0						
M8	Δ3	9.9	Poorly graded sand with silt	SM-SP	0	74			26			0				13.0						
M8	Δ4	13.9	Poorly graded sand with silt	SM-SP	3	89			8			0			2.570	22.0						
M8	Δ5	14.8	Clayey gravel with sand, sandy lean clay	GC,CL	46	16			38	37	24	13			2.610	28.0						
M8	Δ6	15.9	Silty sand, sandy silt	SM,ML	0	55			45			0		16.80		16.0						
M8	Δ7	17.3	Poorly graded sand with silt	SM-SP	0	94			6			0				24.0						
M8	Δ8	19.9	Poorly graded sand with silt	SM-SP	0	92			8			0				24.0						
M8	Δ9	23.9	Poorly graded sand with silt	SM-SP	0	95			5			0			2.650	22.0						
M8	Δ10	27.9	Poorly graded sand with silt	SM-SP	0	97			3			0				25.0						
M8	Δ11	29.9	Poorly graded sand	SP	21	77			2			0			2.600	23.0						
M8	Δ12	33.9	Poorly graded sand with silt	SM-SP	0	93			7			0				20.0						
M8	Δ13	37.9	Silty sand	SM	31	56			13			0				23.0						
M8	Δ14	42.3	Silty sand	SM	0	86			14			0				27.0						
M8	Δ15	45.9	Silty sand	SM	0	85			15			0			2.640	22.0						
M12	Δ1	3.90	Silty sand	SM	20	62			18	NP	NP	0			2.62	2.7						
M12	Δ2	7.30	Silty sand	SM	31	52			17	NP	NP	0				8.8						
M12	Δ3	9.90	Silty sand	SM	3	64			33	NP	NP	0			2.59	11.0						
M12	Δ4	13.90	Silty sand	SM	0	88			12	NP	NP	0		16.20		13.0						
M12	Δ5	14.80	Silty sand	SM	5	60			35	NP	NP	0		18.00		20.0						
M12	Δ6	15.90	Silty sand	SM	0	56			44	NP	NP	0				24.0						
M12	Δ7	17.90	Silty sand	SM	0	61			39	NP	NP	0				19.0						
M12	Δ8	20.70	Silty sand	SM	0	62			38	NP	NP	0			2.63	20.0						
M12	Δ9	23.90	Poorly graded sand with silt	SM-SP	0	94			6	NP	NP	0				28.0						
M12	Δ10	26.90	Poorly graded sand with silt	SM-SP	0	89			11	NP	NP	0				26.0						
M12	Δ11	29.90	Poorly graded gravels with silt and sand	GM-GP	65	27			8	NP	NP	0			2.62	6.9						
M12	Δ12	32.80	Poorly graded sand	SP	0	97			3	NP	NP	0				25.0						
M12	Δ13	36.80	Poorly graded sand with silt	SM-SP	0	92			8	NP	NP	0				23.0						
M12	Δ14	38.80	Poorly graded sand with silt	SM-SP	0	92			8	NP	NP	0				24.0						
M12	Δ15	45.80	Silty sand	SM	0	87			13	NP	NP	0				25.0						
M16	Δ1	3.90	Poorly graded sand with silt	SM-SP	16	78			6	NP	NP	0				3.2						
M16	Δ2	7.80	Poorly graded sand	SP	51	46			3	NP	NP	0				13.0						
M16	Δ3	9.90	Well graded sand with silt	SM-SW	1	89			10	NP	NP	0				20.0						
M16	Δ4	13.90	Poorly graded sand with silt	SM-SP	0	94			6	NP	NP	0			2.59	19.0						
M16	Δ5	15.90	Sandy silt, silty sand	ML,SM	2	47			51	NP	NP	0				17.0						
M16	Δ6	17.90	Well graded sand with silt	SM-SW	5	89			6	NP	NP	0				14.0						
M16	Δ11	29.3	Silty sand	SM	5	69			26	NP	NP	0				13.0						
M16	Δ12	31.90	Poorly graded sand with silt	SM-SP	30	65			5	NP	NP	0				16.0						
M16	Δ13	33.90	Poorly graded sand with silt	SM-SP	0	95			5	NP	NP	0				23.0						
M16	Δ14	37.80	Poorly graded sand	SP	18	80			2	NP	NP	0				24.0						
M16	Δ15	41.80	Poorly graded sand with silt	SM-SP	7	88			5	NP	NP	0				18.0						
M16	Δ16	43.90	Silty sand	SM	12	76			12	NP	NP	0				15.0						
M16	Δ17	47.10	Silty sand	SM	22	48			30	NP	NP	0				10.0						
M16	Δ18	49.10	Poorly graded sand with silt to poorly graded gravel with silt	SM-SP, GM-GP	46	47			7	NP	NP	0				21.0						
A2	Δ1	1.90	Silty sand	SM	0	76			24	NP	NP	0				1.4						
A2	Δ2	3.90	Poorly graded sand with silt	SM-SP	0	91			9	NP	NP	0				19.0						
A2	Δ3	7.90	Silty sand	SM	12	62			26	NP	NP	0				12.0						
A2	Δ4	10.90	Poorly graded sand with silt	SM-SP	0	95			5	NP	NP	0				23.0						
A2	Δ5	14.90	Poorly graded sand with silt	SM-SP	0	93			7	NP	NP	0			2.60	17.0						
G48	Δ1	2,30-3,00	Poorly graded sand with silt	SP - SM	2	87			11	NP	NP	0	19.10	16.5	2.66	18.0						
G48	Δ2	6,55-7,40	Silty sand	SM	7.2	70.4			22.4	NP	NP	0				7.2						
G48	Δ3	8,40-9,00											17.50	14.3	2.65	22.2						
G48	Δ4	13,30-14,00	Silty sand	SM	0	56	39	5	44	NP	NP	0	22.00	18.9	2.67	16.3						
G48	Δ5	14,00-14,60	Poorly graded sand with silt	SP - SM	0	90			10	NP	NP	0	20.40	16.2	2.67	25.7						
G48	Δ6	16,70-17,40	Well graded sand with silt	SW - SM	0	93			7	NP	NP	0	18.20	15.4	2.67	22.4						
G48	Δ7	21,70-22,40	Silty sand	SM	0	82			18	NP	NP	0	18.30	15.0	2.64	21.8						
G50	Δ1	2,00-3,00	Silty sand	SM	0	61			39	NP	NP	0	19.46		2.67	25.5		0.743	93			
G50	Δ2	6,50-7,00											19.46			28.7		0.783	97.6			
G50	Δ3	9,20-10,00	Silty sand	SM																		

PROJECT:

Geotechnical Design of the New Railway Alignment between the Existing Line and Kavala's Port

Geotechnical Design of Embankment from CH. 92+600 to CH. 93+870

RECAPITULATIVE TABLE OF RESULTS OF STATISTICAL ANALYSIS OF LABORATORY TESTS - SOIL PHYSICAL PROPERTIES

BOREHOLE	SAMPLE	DEPTH	CLASSIFICATION ACCORDING TO ASTM/USCS	ASTM/USCS CLASSIFICATION	GRAIN SIZE ANALYSIS					ATTERBERG LIMITS			BULK DENSITY		SPECIFIC GRAVITY	MOISTURE CONTENT	RELATIVE DENSITY Dr	VOID RATIO e	SATURATION DEGREE Sr	ORGANIC CONTENT	CaCO3	SULPHATE CONTENT
					GRAVEL	SAND	SILT	CLAY	SILT+CLAY	LIQUID LIMIT WL	PLASTICITY LIMIT WP	PLASTICITY INDEX IP	WET 1wet	DRY 1dry								
		m			%	%	%	%	%	%	%	%	KN/m³	KN/m³	%	%	%	%	%	%	%	%
M16	Δ7	19.70	Sandy lean clay	CL	2	10			88	38	24	14		13.80	2.54	41.0						
M16	Δ8	21.30	Sandy silt	ML	0	17			83	NP	NP	0		12.10		40.0						
M16	Δ9	23.60	Sandy silt	ML	0	9			91	41	29	12		12.90	2.50	41.0						
M16	Δ10	25.90	Sandy silt	ML	0	10			90	NP	NP	0				33.0						
A2	Δ6	16.90	Sandy silt	ML	0	46			54	NP	NP	0			2.58	36.0						
A2	Δ7	19.90	Sandy silt	ML	0	36			64	NP	NP	0				30.0						
A2	Δ8	22.90	Sandy lean clay	CL	4	36			60	39	25	14		14.40	2.60	35.0						
A2	Δ9	24.80	Sandy lean clay	CL	2	36			62	35	17	18		13.30	2.63	40.0						
G50	Δ4	12.00-12.50	Sandy silt	ML	1	39			60	NP	NP	0	20.30		2.68	24.0		0.64	100			
G50	Δ5	14.00-15.00											19.83			19.6		0.626	84			
G50	Δ6	17.00-18.00											18.70			38.4		0.99	100			
GN2	Δ3	1.70-1.90	Sandy lean clay	CL	0	36		22	64	36	22	14				21.0						
GN3	Δ2	1.20-1.60	Sandy lean clay	CL	0	13		17	87	39	24	15										
GN3	Δ5	3.60-4.00	Sandy silt	ML	0	2		39	98	46	29	17		13.0	2.51	37.0						
Layer II: Silt and clay (Alluvial deposits-ALcm)			COUNT		12	12		3	12	7	7	12	3	6	7	13		3	3			
			MINIMUM VALUE		0.00	2.00		17.00	54.00	35.00	17.00	0.00	18.70	12.10	2.50	19.60		0.63	84.00			
			MAXIMUM VALUE		4.00	46.00		39.00	98.00	46.00	29.00	18.00	20.30	14.40	2.68	41.00		0.99	100.00			
			AVERAGE		0.75	24.17		26.00	75.08	39.14	24.29	8.67	19.61	13.25	2.58	33.54		0.75	94.67			
			STANDARD DEVIATION		1.29	15.24		11.53	15.63	3.63	4.15	7.80	0.82	0.79	0.07	7.60		0.21	9.24			