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STANTON, CALIFORNIA

AREA CODE 714
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March 2, 1964

Midway Harbor, Inc.
% Jack Adams
299 Robin Hood Lane
Costa Mesa, California

File No. 63 - 503 - A

Project: William Property (Offsite for Tract 3981)
Ave. San Juan & Ave. Salvador
San Clemente, California

Subject: Soil Compaction Tests

The following report contains the results of density tests No. 1 thru 124 taken on the subject project on Feb. 11 through Feb. 21, 1964.

Preparation of Areas to Receive Fill.

Prior to development, the subject site was an undeveloped parcel of land. Before placing any fill, the entire area was cleared of all organic or deleterious material. The areas to receive fill were scarified to a depth of 8 to 10 inches, inspected by a representative of this office, and recompactd to provide a bonding between the natural soils and the imposed fill material.

The natural ground is classified as (1) a sandy clay and (2) sandstone and shale and is considered adequate to support the imposed fills under normal conditions.

In areas of natural slopes, benches have been provided in the areas filled by cutting into firm natural soil as the fill was placed to form an interlocking effect between the fill material and the natural slopes. Keys were provided at the base of fill slopes by cutting into firm natural soil.

Placement of Fill

The material utilized as fill is classified as material cut from Tract. No. 3981 during grading operations. The fill material certified by this report was placed in 4 to 6 inch lifts, watered to the moisture content shown in the test results, and compacted to the relative compaction shown by means of sheepfoot rollers and by wheel rolling.

Areas falling below the specified relative compaction of 90% were called to the contractor's attention. These areas were reworked and recompacted until the proper compaction was obtained.

Tests were taken at a frequency sufficient to insure control of the compaction operations and provide a representative cross-section of the compaction obtained.

Engineering Recommendations

Engineering evaluation of the material utilized as fill is predicated on the results of the field density tests and on laboratory analysis of the soil made for Tract No. 3981. When considered in conjunction with the underlying natural soils, the material is subject to the following recommendations:

A safe bearing value of 1500 pounds per square foot may be used for the fill material certified by this report; for conventional footings embedded at least twelve (12) inches.

The site materials should be considered expansive until proven otherwise, requiring reinforcement of all footings and slabs.

No plans were available to this office and the material placed is considered to be a partial fill. It is recommended that an "as graded" plan be prepared showing the finished elevations of the area, to delineate the fill certified by this report. Any additional fill placed on this site should be supervised by a Soils Engineer and certified to complement the certification of fills in this report.

The foregoing report and recommendations are predicated on the provision of an "as graded" plan to be attached to this report and this office accepts no responsibility for any fills placed on the site subsequent to February 21, 1964.

Compaction Standard

AASHTO T99-57, modified to provide a 10 pound hammer having a free fall of 18 inches and applying 25 blows on each of three equal layers of soil in a 1/30 cu. ft. mold, with the representative soil sample composed of material passing a #4 sieve.

Soil Classification

Maximum Density, PCF Optimum Moisture %

Yellow Brown Silty Very Fine to Fine Sand	114.0	17.0
Brown Clayey Silty Sand	113.5	17.0
Light Brown Silty Very Fine Sand	106.0	19.0
Dark Brown Silty Clay W/Shale Fragments	107.0	20.0
Brown Clayey, Silty Sand	115.5	14.5
Dark Brown Sandy Clay (Topsoil)	120.0	13.0

Field Density Tests

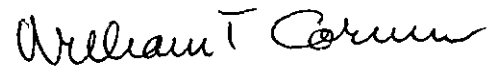
Results of the field density tests taken during this inspection are attached hereto.

Respectfully Submitted

H. V. Lawmaster & Co., Inc.



H. V. Lawmaster



William T. Corum

R.C.E. No. 6207

Field Density Tests

<u>Date</u>	<u>Test No.</u>	<u>Wet Density</u> <u>pcf</u>	<u>% Field</u> <u>Moisture</u>	<u>Dry Density</u> <u>pcf</u>	<u>Depth</u> <u>of Test</u>	<u>Depth</u> <u>of Fill</u>	<u>RELATIVE</u> <u>COMPACTION</u>
2/11	1	108.6	12.1	96.8	30"	4.0'	85.2*
	2	115.4	13.8	101.5	12"	4.0'	87.9*
	3	108.8	9.3	99.4	30"	4.0'	86.1*
	4	107.6	11.1	96.9	12"	4.0'	83.1*
	5	113.6	20.3	94.5	18"	3.0'	89.0*
	6	114.0	11.7	102.2	Retest # 1		90.2
	7	118.6	14.6	104.9	Retest # 2		90.8
	8	121.0	13.4	106.8	Retest # 3		92.4
	9	121.2	12.6	108.0	Retest # 4		93.5
	10	109.0	10.5	98.6	Retest # 5		93.2
	11	123.0	20.9	102.0	12"	6.0'	95.5
	12	110.6	16.3	95.1	12"	6.0'	90.0
2/12	13	118.6	21.2	97.9	30"	10.0'	91.5
	14	120.0	18.0	101.8	12"	10.0'	95.0
	15	115.6	16.2	99.2	36"	10.0'	92.6
	16	118.2	20.6	98.1	10"	10.0'	91.6
	17	118.6	20.5	98.4	12"	8.0'	91.8
	18	115.6	19.3	96.9	12"	12.0'	90.5
	19	111.0	15.0	96.6	18"	13.0'	91.1
	20	113.8	15.2	98.7	18"	13.0'	93.2
	21	118.6	17.4	101.0	12"	14.0'	94.5
	22	120.6	18.0	102.0	12"	15.0'	95.4
2/13	23	112.0	17.8	95.2	12"	3.0'	90.0
	24	112.6	16.4	96.6	18"	5.0'	90.4
	25	113.6	14.1	99.5	12"	17.0'	93.0
	26	116.8	11.1	104.9	18"	18.0'	90.7
	27	118.0	21.2	97.1	12"	5.0'	90.9
	28	120.0	17.9	102.0	12"	7.0'	90.0
	29	115.8	19.0	97.2	14"	19.0'	91.7
	30	119.2	19.8	99.6	14"	20.0'	93.2
	31	118.6	16.2	102.0	16"	9.0'	90.0
	32	119.2	14.0	104.8	12"	22.0'	90.7
	33	120.8	22.0	99.0	12"	22.0'	92.5

Field Density Tests

<u>Date</u>	<u>Test No.</u>	<u>Wet Density PCF</u>	<u>% Field Moisture</u>	<u>Dry Density PCF</u>	<u>Depth of Test</u>	<u>Depth of Fill</u>	<u>RELATIVE COMPACTION</u>
2/13	34	118.4	19.8	99.1	12"	11.0'	92.7
	35	120.2	18.9	101.2	12"	24.0'	94.7
	36	119.4	20.5	99.2	18"	25.0'	92.7
	37	120.8	20.7	100.1	12"	8.0'	93.7
	38	122.6	20.0	102.1	12"	13.0'	95.6
	39	116.2	16.2	100.0	16"	27.0'	93.5
	40	116.4	16.4	100.0	14"	24.0'	93.5
	41	120.0	18.8	101.1	12"	28.0'	94.6
	42	121.2	15.6	105.0	12"	29.0'	91.0
2/14	43	113.6	22.0	93.1	12"	2.0'	87.9*
	44	121.8	24.7	97.7	12"	12.0'	91.2
	45	119.0	22.0	97.5	14"	15.0'	91.0
	46	111.2	16.0	96.0	12"	31.0'	90.6
	47	111.8	16.9	95.7	Retest # 43		90.3
	48	111.0	18.0	94.1	12"	17.0'	88.8*
	49	116.2	21.2	95.7	24"	38.0'	90.2
	50	110.8	17.8	94.1	12"	34.0'	88.8*
	51	120.0	18.8	101.1	Retest # 48		95.5
	52	116.4	15.2	101.1	Retest # 50		94.6
	53	118.6	14.8	103.4	12"	6.0'	91.3
	54	116.6	17.4	99.1	12"	14.0'	93.5
	55	116.0	15.9	100.1	12"	19.0'	94.6
	56	116.0	19.6	97.1	12"	37.0'	91.6
	57	112.2	17.5	95.7	18"	15.0'	90.2
	58	122.0	19.8	102.0	29"	22.0'	95.1
	59	116.4	17.7	99.1	12"	22.0'	93.5
	60	118.8	17.7	100.9	36"	40.0'	95.1
	61	119.0	19.8	99.4	12"	40.0'	93.7
	62	118.0	21.2	97.4	30"	20.0'	91.0
	63	112.6	16.4	96.6	12"	20.0'	91.1
	64	115.8	17.5	98.5	12"	10.0'	92.9
2/17	65	120.6	17.3	102.9	12"	24.0'	90.7
	66	121.1	17.7	103.1	12"	24.0'	91.0

Field Density Tests

<u>Date</u>	<u>Test No.</u>	<u>Wet Density PCF</u>	<u>% Field Moisture</u>	<u>Dry Density PCF</u>	<u>Depth of Test</u>	<u>Depth of Fill</u>	<u>RELATIVE COMPACTION</u>
2/17	67	117.4	16.4	101.0	30"	26.0'	94.5
	68	117.2	16.0	101.1	12"	26.0'	94.6
	69	122.6	19.2	102.8	12"	42.0'	96.0
	70	121.4	18.9	102.2	12"	22.0'	95.7
	71	114.6	17.0	98.0	12"	26.0'	92.4
	72	121.2	18.7	102.4	12"	28.0'	95.9
	73	120.4	16.4	103.4	12"	30.0'	96.8
	74	123.6	19.3	103.2	18"	45.0'	96.7
	75	109.6	15.2	95.3	12"	45.0'	90.0
	76	111.2	15.9	96.2	24"	25.0'	90.7
	77	116.8	18.0	98.9	12"	25.0'	93.2
	78	117.0	19.5	98.0	12"	46.0'	92.4
2/18	79	116.6	16.0	100.5	24"	30.0'	94.9
	80	113.8	14.8	99.1	12"	30.0'	93.5
	81	123.4	18.3	104.1	12"	32.0'	91.9
	82	122.8	17.7	104.2	12"	32.0'	92.0
	83	122.0	20.7	101.1	18"	49.0'	94.7
	84	112.0	15.3	97.4	12"	49.0'	91.0
	85	112.8	18.3	95.4	12"	30.0'	90.0
	86	122.0	20.7	101.1	12"	30.0'	95.5
	87	122.8	18.2	103.8	12"	30.0'	97.0
	88	118.4	16.4	101.8	12"	32.0'	96.1
	89	121.4	17.8	103.1	12"	37.0'	91.0
	90	119.2	19.3	99.9	24"	52.0'	93.4
	91	117.0	16.0	100.9	12"	52'	94.3
	92	122.2	15.8	105.8	12"	35.0'	91.7
2/19	93	120.6	17.8	102.5	12"	30.0'	95.7
	94	116.8	17.4	99.4	18"	32.0'	93.0
	95	123.0	18.9	103.7	12"	35.0'	91.3
	96	116.4	16.0	100.5	8"	53.0'	94.0
	97	120.0	17.7	102.0	12"	53.0'	95.3
	98	120.6	16.3	103.6	10"	50.0'	91.3
	99	121.4	17.8	103.2	12"	36.0'	91.0
	100	118.6	19.2	99.4	14"	55.0'	93.0

Field Density Tests

<u>Date</u>	<u>Test No.</u>	<u>Wet Density PCF</u>	<u>%Field Moisture</u>	<u>Dry Density PCF</u>	<u>Depth of Test</u>	<u>Depth of Fill</u>	<u>RELATIVE COMPACTION</u>
2/19	101	118.0	16.6	101.2	12"	55.0'	94.6
	102	116.6	16.2	100.0	14"	38.0'	93.5
	103	122.8	18.9	103.1	12"	30.0	91.0
	104	122.2	15.8	105.9	12"	35.0'	91.5
	105	121.4	17.5	103.5	12"	53.0'	91.2
	106	120.2	19.2	100.9	12"	36.0'	94.3
2/20	107	118.6	18.9	99.9	12"	37.0'	93.3
	108	120.0	16.2	103.0	14"	38.0'	90.8
	109	124.0	19.2	103.9	12"	56.0'	91.0
	110	117.4	16.6	100.8	12"	57.0	95.0
	111	116.2	18.1	98.5	14"	57.0'	92.0
	112	118.4	16.2	96.0	12"	50.0'	96.0
	113	120.4	19.1	101.1	30"	28.0'	94.6
	114	123.2	19.8	103.0	12"	28.0'	96.3
2/21	115	120.6	19.2	101.0	12"	40.0'	94.4
	116	116.6	18.8	98.3	30"	60.0'	92.7
	117	121.6	17.8	103.2	12"	60.0'	96.5
	118	116.2	17.4	99.1	30"	60.0'	93.5
	119	122.6	14.8	107.0	12"	60.0'	92.7
	120	122.2	16.1	105.1	12"	40.0'	91.0
	121	120.8	17.2	102.9	12"	42.0'	96.1
	122	122.6	18.1	103.6	14"	61.0'	96.8
	123	123.0	20.5	102.1	12"	61.0'	95.6
	124	122.0	21.3	100.5	12"	51.0'	94.0

* Denotes areas of low compaction which were reworked and recompactd.