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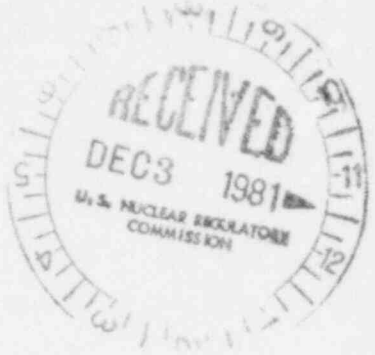

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MIDLAND PROJECT
MIDLAND DOCKET NOS 50-329, 50-330
RESULTS OF SOIL BORING AND TESTING
PROGRAM FOR AUXILIARY BUILDING (PART 2)
FILE 0485.16, B3.0.1 SERIAL 14874
REFERENCE: JWCOOK LETTER TO HRDENTON, SERIAL 13774,
DATED SEPTEMBER 22, 1981
ENCLOSURE: TEST RESULTS, AUXILIARY BUILDING (PART 2), SOIL BORING
AND TESTING PROGRAM, MIDLAND PLANT - UNITS 1 AND 2

We are providing thirty (30) copies of the enclosed Woodward-Clyde Consultants (WCC) report (Part 2) dated October 26, 1981 which documents the soil boring and sampling program and the subsequent laboratory testing program for the foundation soils at the auxiliary building. The results of these programs are presented in the form of logs of borings and in both tabular and graphical data summaries of index property, strength and compressibility testing of the foundation soils. This data is found in the appropriate appendices of the enclosed report.

Similar index and engineering property results for the auxiliary building foundation soils were presented in the WCC report of August 28, 1981 entitled, "Test Results, Foundation Soils, Auxiliary Building (Part 1), Soil Boring and Testing Program, Midland Plant - Units 1 and 2," which was previously forwarded to the NRC with the referenced correspondence of September 22, 1981. For completeness, all test results from the Part I report are included in the enclosure to this correspondence. Hence, the results of the testing programs presented in the enclosed Part 2 report are the combined results of those previously presented in the referenced Part 1 report and additional tests on soil samples of fill material and the natural foundation soil below Elevation 540'.

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The Borings COE-17 and COE-18 penetrated the granular and cohesive fill material from the existing ground surface at approximate Elevation 634' to an approximate depth of 51 and 52 feet, respectively. The ranges and average values of the results obtained from the laboratory tests performed by WCC on

the fill soil samples from both these borings are presented in the WCC report, Part 2. It can be seen from the index properties that the fill materials consisted of low plasticity silty sandy clay, clayey sand and fine to medium sand.

The WCC index properties and strength test results performed on undisturbed foundation soil samples obtained from the Borings COE-17 and COE-18 yielded the following average values at three selected thicknesses of natural soil stratum below the planned underpinning foundation elevations.

	Undrained Shear Strength (S_u), Ksf		
	Stratum Between Elevations (Ft)	Undrained Shear Strengt' (Ksf)	
		Range	Avg
4 Undrained Unconsolidated (UU) Tests	570 to 560	5.18-7.66[1,2]	6.9
5 (UU) Tests	560 to 540	7.24-10.39	8.7
11 (UU) Tests	540 to 436	6.61-10.88	8.3

[1] One UU test at Elevation 560.3' gave shear strength of 2.57 ksf and was not considered because the laboratory noted that sample disturbance took place.

[2] Another UU test at Elevation 581.4' gave shear strength of 2.62 ksf and was not considered because a depth of fill found in both the borings was to Elevation 582'. Probably this sample represented fill material.

The shear strength values presented in the above table includes those values of shear strength for the elevations of 570 through 540', previously presented in the referenced letter dated September 22, 1981, and the values of shear strength obtained from the additional tests on foundation soil samples between Elevations 570' and 436'. It can be seen from the above table that the average shear strength for the stratum above Elevation 560' was about 6.9 ksf and the average shear strength values were slightly greater than 8 ksf below Elevation 560'. Consequently, the average values of shear strength reported in our letter of September 22, 1981 are of the same approximate value as those based on the complete test program which are reported herein. It is seen from the foregoing discussion that the allowable bearing capacities based on the average shear strengths obtained from WCC tests are greater than the conservative values of allowable bearing capacity which were based on FSAR shear strength data.

Four consolidation tests were previously reported in the referenced Part 1 report. These four consolidation tests along with two additional tests are reported in the enclosed Part 2 report. These six consolidation tests were performed on soil samples obtained in the natural soils to determine a preconsolidation pressure value. The values of preconsolidation pressure from

the resulting log compression curve were evaluated using Casagrande's construction. Based on this evaluation, the preconsolidation pressures ranged from 26 ksf to 84 ksf. This range is much higher than the previously estimated range of 15 ksf to 20 ksf given in FSAR Subsection 2.5.4.2.9. This substantiates the heavily preconsolidated nature of the natural deposits in the area of the auxiliary building.

These conclusions and the data results attached as an enclosure should provide the NRC with the information necessary to evaluate the soils conditions at the auxiliary building.

G. S. Keeley for JW Cook

JWC/RLT/dsb

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