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Refer to: LIGO-L970200-0-O

To: File
From: Fred Asiri
Subject: Geotechnical Investigation of the Berm Under the Beam Tube Enclosure Slab

The purpose of this summary report is to document that the berm at the Livingston site as constructed meets the LIGO settlement requirement.

On March 24, 1997, Woodward-Clyde (LIGO Geotechnical Consultant) took the undisturbed soil samples from the berm under the beam tube enclosure slab at the Livingston site. Total of seven samples were taken through the full depth of the berm with some extension into the natural grade. Six samples were obtained along the southeast arm and one along the southwest arm. Consolidation test was performed on the seven soil samples to determine total compression of the soil under an applied load and the time rate of the squeezing of pore water from the soil. The test results were documented in the Woodward-Clyde's Final Report, April 4, 1997 (LIGO-C970547-A-O).

During a subsequent review of the report by LIGO and LIGO/Parsons staff, Woodward-Clyde was informed that an estimated dead load of 400 lb/sq. ft. should have been used instead of the 1,000 lb/sq.ft.

Woodward-Clyde reanalyzed the test result based on 400 lb/sq.ft. and amended their reported on April 11, 1997. Summary of their finding is as follow:

*At five locations settlements due to dead load are negligible. At two worst locations are on the order of 0.7 to 0.8 inches with 90% of this taking place during construction. These values are well below the LIGO allowable settlement (no more than 1 inch of total settlement along the arm for the life of the project).Thus the berm as constructed meets the LIGO settlement requirement.*

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