

New Folder Name LIGO Founding Conditions

JET PROPULSION LABORATORY

INTEROFFICE MEMORANDUM

3320-90-126

October 25, 1990

TO: Fred Asiri

FROM: A. A. Riewe *aa Riewe*

SUBJECT: LIGO Founding Conditions Proposed Hanford Site B

The geotechnical and environmental reports submitted by the Westinghouse Hanford Company (WHC) covering studies performed at the Hanford Works have been reviewed and the following presents my critique of them and suggestions for areas needing further study.

1. Geotechnical Studies

Two of the WHC Foundation reports were informative. One was prepared by Bechtel for the Fast Flux Test Facility site, located approximately 2 to 4 miles east of the proposed LIGO site "B". The other report was prepared by Golder Associates for the Skagit/Hanford Nuclear Project numbers 1 and 2 nuclear power plants. This site abutts the end of the northerly leg of the LIGO.

Subsurface conditions and soil/bedrock profiles for the above sites are very similar. Based on uniformity of topographic relief and surface materials observed by the Caltech field party during the July 1990 site visit, it is believed that very similar conditions should exist within the site B area.

The surface materials will likely consist of loose silty sands ranging in depths estimated from 5 to 20 feet in depth. These materials will be underlain by medium dense to dense sands. At the locations of the central, mid and end stations it will be necessary to remove the loose surface soils down to dense material and replace them with certified compacted soil. This should provide adequate support for mat type foundations. The vacuum tube because of its relatively light foundation loads may be adequately supported by natural undisturbed soils on conventional spread footings in cut areas where they can be founded at a minimum depth on the order of fifteen feet below the existing natural grades. Where adjacent finished grade will be near or above existing natural grades the use of short friction piles extending into the dense sands may be used. The piles will be for the control of settlement and not because additional load carrying capacity is needed.

Confirmation of the similarity of the site B soils to those of the two cited studies by field exploration on site B will be required. The primary area of concern will be establishing the depth of the surface layer of loose silty sands.

If WHC has surveyed existing structures for settlement during and after construction the information would be helpful.

2. Hydrological Studies

Typical soils in the area drain readily and WHC personnel report that no sheet or channelized flows occur. The area is arid with minimum precipitation. Ground water is typically in excess of 200 feet below existing surfaces. Additional information or study is not believed to be needed.

3. Environmental Studies

Environmental assessment will be required.