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SOIL AND FOUNDATION CONSULTANTS

BORINGS • TESTS • ANALYSES

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22 July 1983

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Modjeski and Masters  
Consulting Engineers  
John Hancock Building  
1055 St. Charles Avenue  
New Orleans, Louisiana 70113

Attention Mr. Barney Martin

Gentlemen:

Recommended Test Section  
Sewerage and Water Board of New Orleans  
Metairie Relief Canal  
Station 617+50 to Station 663+00  
Orleans and Jefferson Parishes, Louisiana

In accordance with your letter of 15 June 1983, this letter contains the recommended procedures for performance of a test section in the Metairie Relief Canal to be presented to the Corps of Engineers for their approval.

PURPOSE

Reference is made to our report for the subject project dated 23 August 1982, and in particular, to Paragraph 22 pertaining to a test section. The purpose of a test section is to develop more definitive information regarding the potential for a blow-out at the landside toe of the levee during high water conditions in the canal. To obtain this information, it is recommended that an excavation be made in the canal to the proposed design grades in order to observe changes in the hydrostatic pressures on the landside of the levee. Six (6) piezometers will be installed on the Jefferson side of the canal in order to closely monitor changes in the hydrostatic pressures. Observations on the Orleans side of the canal are not considered necessary.

SURVEYING

Prior to initiation of any work in the test area, surveying should be performed by Modjeski and Masters to:

- a. Establish the location of the test section, the location of the 6 piezometers, and the location of 2 gauges in the canal in order that the water level can be determined throughout the test period.
- b. Develop an accurate cross-section through the centerline of the test section that extends from the landside toe of the levee on the Orleans side to a point at least 150 feet from the landside toe of the levee on the Jefferson side.
- c. Establish temporary bench marks to facilitate surveying that will be required during construction and operation of the test section.

In addition, it will be necessary for Modjeski and Masters to determine all right-of-way lines, arrange all required right-of-entry and to obtain the necessary permits and approvals for performance of the work.

#### LOCATION

It is recommended that the centerline of the test section be located perpendicular to the centerline of the canal at approximately Station 643+00. This will place the test section just south of the east bound lane of the I-10. The bottom width of the excavation along the canal centerline should be 100 feet, extending between approximately Stations 642+50 and 643+50.

#### PIEZOMETERS

Upon completion of all necessary survey work, we propose to install 6 new piezometers at the following locations:

<u>No.</u>	<u>Station</u>	<u>Offset</u>
P-1	642+75	Centerline of levee
P-2	642+70	Landside toe of levee
P-3	642+80	Landside toe of levee
P-4	642+70	50' from landside toe of levee
P-5	642+80	50' from landside toe of levee
P-6	642+75	150' from landside toe of levee

All of these piezometers will be installed in accordance with the diagram shown on Enclosure 1. Immediately after all of the piezometers are installed and the gauges are established in the canal, we will begin the readings. We propose to read the 6 piezometers once a day to establish the hydrostatic condition in the sand stratum until the test excavation is begun.

### TEST EXCAVATION

A contractor that is very experienced with underwater excavations should be selected to construct the test excavation. The test excavation should be accomplished using the same technique that will be used to accomplish the project excavation. The shape of the excavation will have to be verified periodically during the test section.

It is recommended that the test excavation extend to the proposed design grade of el 4.0 Cairo Datum. A typical cross-section of the recommended test excavation is shown on Enclosure 2. Side slopes of the excavation should be no steeper than 1 vertical on 2 horizontal on the Orleans side of the canal and along the centerline of the canal. On the Jefferson side, the excavation should conform to the proposed cross-section which is a slope of 1 vertical on 3 horizontal. The test excavation should remain open for a period of 48 hours during which time the 6 piezometers and the gauge in the canal will be read at intervals of approximately 2 hours. Readings may continue for several days and, if so, the time interval will be increased accordingly. A minimum of 24 readings will be obtained.

### OTHER TESTS

In the event that the information developed from the test section indicates excessive hydrostatic pressures will develop during high water conditions, we propose to perform several field permeability tests to determine the permeability of the underlying sand to assist in design of a pressure relief system. In addition, it is recommended that a sufficient quantity of bentonite be available for placement into the test excavation to evaluate the effectiveness of this material as a sealant.

### STABILITY

Based on the results of computations shown on Figure 169 of our report dated 2 November 1981, an acceptable factor of safety should exist against failure of the levee into the canal after completion of the test excavation to design grade. Based on the results of computations shown on Figure 20 of our report dated 23 August 1982, an acceptable factor of safety should exist against blow-out of the landside toe under normal high water conditions in the canal.

Considering that the test section will be accomplished during the prime hurricane season, the contractor must be prepared to seal the excavation quickly in the event sudden high water conditions are expected. Specifications must require the

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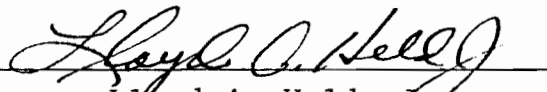
contractor to fill the test excavation with an impervious material after all of the necessary data has been obtained from this test operation.

ESTIMATED COST

In accordance with your request of 15 June 1983, our estimated cost for final preparation of the test procedure, installation of 6 piezometers, as well as collection and analysis of the data, will be on the order of \$15,000.00. This estimate does not include the cost of surveying or construction cost for excavating the test section and subsequent backfilling operations.

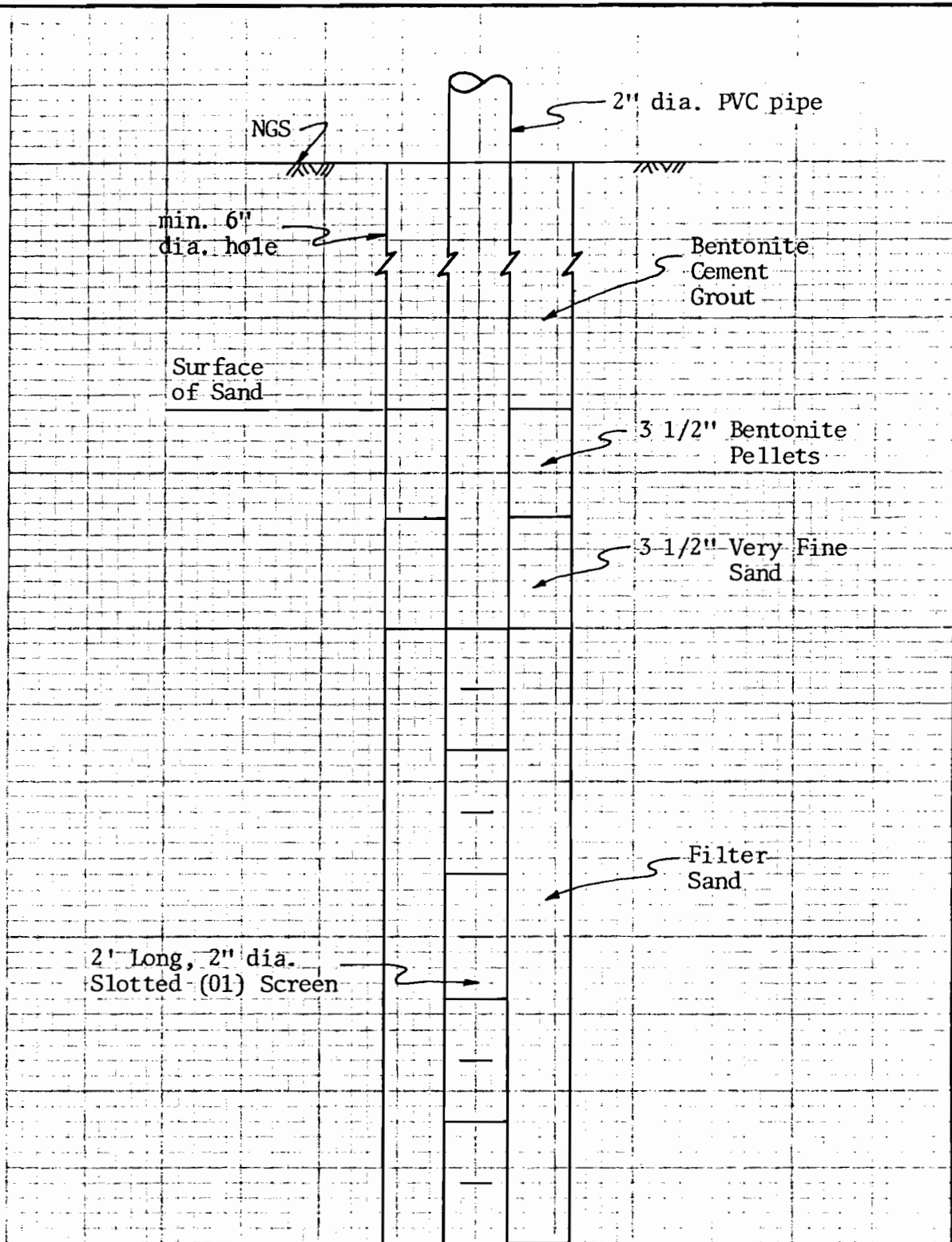
Yours very truly,

EUSTIS ENGINEERING COMPANY

By   
Lloyd A. Held, Jr.

L. J. Napolitano:ss

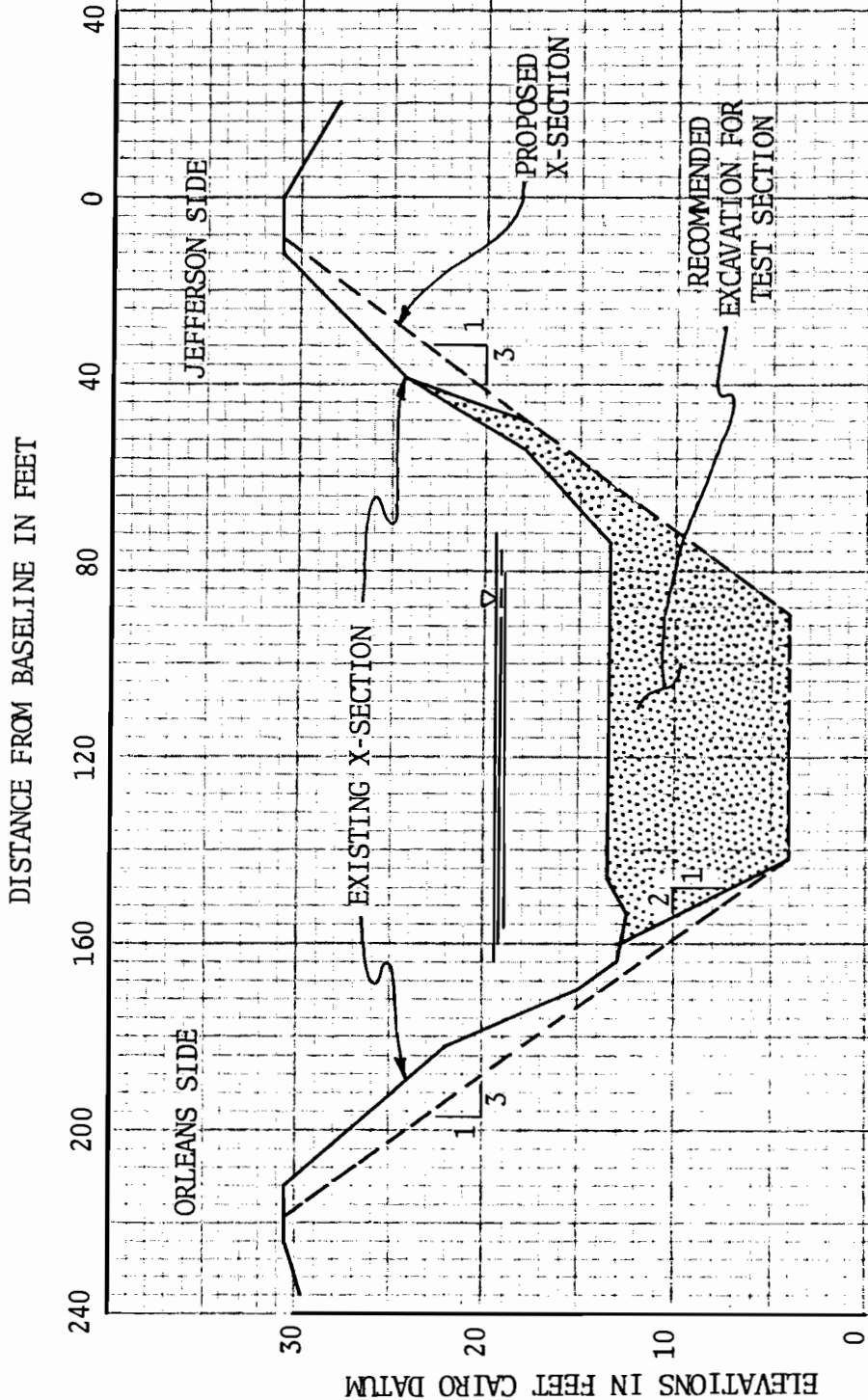
Enclosures 1 and 2



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 Sewerage and Water Board of New Orleans  
 Metairie Relief Canal  
 Station 617+50 to Station 663+00  
 Orleans and Jefferson Parishes, Louisiana

For: Modjeski and Masters, Consulting Engineers, New Orleans, Louisiana

Enc. 1



NOTES: BOTTOM WIDTH OF TEST SECTION ALONG CENTERLINE OF CANAL TO BE 100 FEET (BETWEEN APPROXIMATELY STATIONS 642 + 50 AND 643 + 50). SIDE SLOPES TO BE 1 VERTICAL ON 2 HORIZONTAL.

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