

COASTAL ENGINEERING
and
OCEANOGRAPHY STUDY
for the
BEACH NOURISHMENT PROJECT

Galveston, Texas

presented by
Dr. Y.H. Wang, P.E.
3 December 1992

ENGINEERING DESIGN ASPECTS SERVICES TO BE PERFORMED

- * QUANTIFICATION OF BORROW MATERIAL
- * ENGINEERING ANALYSIS OF SEDIMENT DATA &
OCEANOGRAPHIC FIELD MEASUREMENTS
- * SUPERCOMPUTER SIMULATIONS FOR BEST
DESIGN BEACH PROFILE
- * PREDICTION OF BEACH RESPONSE TO STORMS

QUANTIFICATION OF BORROW MATERIAL

- * SEDIMENT DATA COLLECTION BY THE PROPOSER IS
PREFERRED
- * SPACE TECHNOLOGY OF IMAGERY ANALYSIS DEVELOPED
AT THE JOHNSON SPACE CENTER WILL BE EMPLOYED
FOR CALCULATING THE AERIAL COVERAGE
- * SEDIMENT DATA AND IMAGERY ANALYSIS TOGETHER
CAN YIELD MORE RELIABLE QUANTITY INFORMATION OF
THE BORROW MATERIAL

ENGINEERING ANALYSIS OF SEDIMENT DATA
and
OCEANOGRAPHIC FIELD MEASUREMENTS

ENGINEERING ANALYSIS OF SEDIMENT DATA:

- * GRAIN SIZES AND COMPOSITION
- * INTERPRETATION OF SHORELINE POSITION
- * STATISTICAL ANALYSIS FOR CALCULATING
OVERFILL FACTOR
RE-NOURISHMENT FACTOR

OCEANOGRAPHIC FIELD MEASUREMENTS:

- * NEARSHORE DATA COLLECTION TO FILL THE GAP IN
DATA BANK: WAVE, CURRENT AND WATER LEVEL
- * SEDIMENT DATA COLLECTION AND ANALYSIS AT
PROJECT SITES

SUPERCOMPUTER SIMULATION FOR BEST DESIGN BEACH PROFILE

FOUR BEACH FILL DESIGN TEMPLATED GEOMETRIES:

1. U.S. STANDARD DESIGN
2. STORM BERM DESIGN
3. PROFILE NOURISHMENT DESIGN
4. PROTECTIVE DUNE DESIGN

A BEACH PROFILE CHANGE COMPUTER MODEL DEVELOPED BY THE CORPS OF ENGINEERS, WATERWAY EXPERIMENTAL STATION WILL BE UTILIZED FOR THE EVALUATION OF THE DESIGNS. THE PURPOSE OF THE EVALUATION IS TO DETERMINE WHICH DESIGN PROVIDES THE GREATEST SUSTAIN POWER AGAINST WAVE INDUCED STORM EROSION CAUSED BY ELEVATED WAVES AND WATER LEVEL TO THE NOURISHED BEACH WHILE MINIMIZING THE QUANTITY OF BEACH FILL.

SITE SPECIFIC PARAMETERS (GRAIN DIAMETER AND COMPOSITION, SAND VOLUME, PROJECT DIMENSIONS, INFLUENCE OF NEARBY STRUCTURES, VARYING WAVE, CURRENT, AND WATER LEVEL CONDITIONS, ETC) WILL BE FEEDING INTO THE SUPERCOMPUTER FOR CALCULATIONS AND DETERMINATION OF THE BEST BEACH FILL PROFILE FOR THE GALVESTON PROJECT.



PREDICTION OF BEACH RESPONSE TO STORMS

TO ESTIMATE THE STORM-INDUCED VOLUMETRIC CHANGES ON BEACH PROFILES THE COMPUTER MODEL IS FIRST CALIBRATED WITH MEASURED WAVE AND WATER LEVEL PARAMETERS. WITH THE CALIBRATED COMPUTER MODEL THE FOLLOWING PREDICTIONS WILL BE PERFORMED ON A SUPERCOMPUTER.

1. PREDICTION OF BEACH PROFILE CHANGE IN VOLUMETRIC TERMS FOR:
A SINGLE NORTHEASTER; TWO NORTHEASTERS BACK-TO-BACK
2. PREDICTION OF BEACH PROFILE CHANGE FOR A GIVEN STRENGTH OF HURRICANE.
3. PREDICTION OF RE-NOURISHMENT PERIODS

City of Galveston



Office of the City Manager

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November 9, 1992

Mr. Raymond Reesby
President
Reesby & Associates
2701 Avenue O
Galveston, Texas 77550

Dear Mr. Reesby:

Pursuant to your written request, I have enclosed the list of the other four engineering firms invited to submit their qualifications for the proposed beach renourishment project on Galveston Island.

The selection committee consist of myself and the following members:

1. Don Schattel, Director-City Beach Park Board
2. Pat Hallisey, Director-County Beach Park Board
3. Russ Eitel, Chairman-County Beach Erosion Committee
4. Kathy Flowers, Public Works Director

I trust that I have answered your questions.

Sincerely,

Douglas W. Matthews

Douglas W. Matthews
City Manager

DWM:gg

Enclosure

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