

CITY OF GALVESTON, TEXAS
BEACH NOURISHMENT PROJECT

Contract Documents

City Council:

Mayor:
Mayor Pro-Tem:
Council:

Barbara K. Crews
Danny A. Allen
David W. Bowers
William H. Clayton
Leo Galvan
Robert Lynch
James B. Thomas

City Manager:
Executive Assistant
to the City Manager:
Consultant:

Douglas W. Matthews
Stephanie Bowers
Coastal Planning & Engineering, Inc.

CITY OF GALVESTON

CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS FOR:

GALVESTON, TEXAS BEACH NOURISHMENT PROJECT
AS PER SPECIFICATIONS

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CITY OF GALVESTON, TEXAS

NOTICE TO BIDDERS

BID# 93-94-076

DATE SEPTEMBER 1, 1994

SEALED PROPOSALS, PREPARED IN DUPLICATE, ADDRESSED TO THE PURCHASING SUPERVISOR, CITY HALL, ROOM 302, 823 ROSENBERG, GALVESTON, TEXAS 77550, WILL BE RECEIVED UNTIL 2:00 P.M. MONDAY, SEPTEMBER 26, 1994 TO FURNISH ALL THE EQUIPMENT, MATERIAL AND LABOR AND PERFORM ALL THE WORK FOR THE FOLLOWING PROJECT:

GALVESTON, TEXAS BEACH NOURISHMENT PROJECT

ALL PRICES QUOTED SHALL BE F.O.B. DESTINATION, GALVESTON, TEXAS.

BID BOND REQUIREMENTS

ALL BIDS SHALL INCLUDE A BID BOND IN FORM OF A CASHIER'S CHECK, BANK DRAFT OR A BOND FROM A BONDING COMPANY LICENSED TO DO BUSINESS IN THE STATE OF TEXAS, IN THE AMOUNT OF FIVE PERCENT (5%) OF THE TOTAL BID PRICE. THE BID BOND IS SURETY THAT THE BIDDER WILL ENTER INTO A CONTRACT WITH THE CITY OF GALVESTON. IN CASE OF FAILURE OR REFUSAL TO DO SO, THE SURETY SUBMITTED WITH THE BID WILL BE FORFEITED AS LIQUIDATED DAMAGES BECAUSE OF SUCH FAILURE OR DEFAULT.

**PERFORMANCE AND PAYMENT BOND REQUIREMENTS
AFTER ACCEPTANCE OF SUCCESSFUL BIDDER**

THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FURNISH PAYMENT AND PERFORMANCE BONDS IN ACCORDANCE WITH ARTICLE 5160, VERNON'S ANN. CIV. ST., IN THE AMOUNT OF 100% OF THE TOTAL CONTRACT PRICE IN THE EVENT TOTAL CONTRACT PRICE EXCEEDS \$25,000.00. IF THE CONTRACT PRICE DOES NOT EXCEED \$25,000.00 AND NO PARTIAL PAYMENTS ARE TO BE MADE, THE SAID STATUTORY BONDS WILL NOT BE REQUIRED.

PRE-BID CONFERENCE

BIDDERS ARE HEREBY NOTIFIED THAT A PRE-BID CONFERENCE WILL BE HELD ON WEDNESDAY, SEPTEMBER 14, 1994 AT 2:00 P.M. AT THE CITY MANAGER'S CONFERENCE ROOM, ROOM #105, CITY HALL, 823 ROSENBERG, GALVESTON, TEXAS. ALL INTERESTED BID SUBMITTERS ARE **REQUIRED** TO ATTEND. NO BID SHALL BE CONSIDERED RESPONSIVE IF RECEIVED FROM A BIDDER WHO DOES NOT ATTEND THIS PRE-BID CONFERENCE.

IT SHALL BE EACH BIDDER'S SOLE RESPONSIBILITY TO INSPECT THE SITE OF THE WORK AND TO INFORM HIMSELF REGARDING ALL LOCAL CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. IT SHALL BE UNDERSTOOD AND AGREED THAT ALL SUCH FACTORS HAVE BEEN THOROUGHLY INVESTIGATED AND CONSIDERED IN THE PREPARATION OF THE BID SUBMITTED.

NOTE: BIDDERS MUST SUBMIT THEIR BID PROPOSAL ON THE FORMS PROVIDED IN THE CONTRACT DOCUMENTS. FAILURE TO DO SO MAY DISQUALIFY YOUR BID. A COPY OF CURRENT GENERAL LIABILITY INSURANCE CERTIFICATE SHALL BE INCLUDED WITH YOUR PROPOSAL PACKAGE.

CITY OF GALVESTON, TEXAS

PLANS, SPECIFICATIONS, PROPOSAL FORMS AND CONTRACT DOCUMENTS MAY BE EXAMINED WITHOUT CHARGE AT THE OFFICE OF THE PURCHASING SUPERVISOR AT THE ABOVE ADDRESS. THESE MAY BE OBTAINED UPON PAYMENT OF \$100.00. PLEASE MAKE CHECKS PAYABLE TO THE CITY OF GALVESTON. PLEASE CALL (409) 766-2120 FOR AVAILABILITY OF PLANS.

ALL BIDDERS UPON RETURNING SUCH PLANS PROMPTLY AND IN GOOD CONDITION WILL BE REFUNDED THEIR PAYMENT WITHIN 5 DAYS AFTER CITY COUNCIL AWARDS THE CONTRACT TO SUCCESSFUL BIDDER.

ANY QUESTIONS REGARDING PROCUREMENT PROCEDURES SHOULD BE ADDRESSED TO LUIS J. CERVANTES, PURCHASING SUPERVISOR, AT THE ADDRESS LISTED ABOVE OR AT (409) 766-2120.

QUESTIONS OF A TECHNICAL NATURE SHOULD BE ADDRESSED TO MR. KIM BEACHLER, PROJECT ENGINEER, COASTAL PLANNING AND ENGINEERING, INC. AT (407) 391-8102.

BID ENVELOPES WILL BE SEALED AND MARKED WITH BID NUMBER AND OPENING TIME ON THE OUTSIDE BOTTOM LEFT CORNER TO AVOID THE OPENING OF ANY BID BEFORE THE PRESCRIBED TIME.

BIDS SENT BY FACSIMILE (FAX) MACHINE WILL BE REJECTED AS BEING NON-RESPONSIVE TO THE SPECIFICATIONS.

ATTENTION OF EACH BIDDER IS PARTICULARLY CALLED TO THE SCHEDULE OF GENERAL PREVAILING RATE OF PER DIEM WAGES ADOPTED BY THE CITY OF GALVESTON AND SHOWN IN PARAGRAPH 18 OF THE SPECIAL CONDITIONS OF THE AGREEMENT WHICH ESTABLISHES THE MINIMUM WAGES WHICH MAY BE PAID FOR LABOR ON THIS CONTRACT. EACH BIDDER'S ATTENTION IS FURTHER DIRECTED TO PROVISIONS OF ARTICLE 5159A, VERNON'S ANN. CIV. AND THE REQUIREMENTS CONTAINED THEREIN CONCERNING THE ABOVE WAGE SCALE AND PAYMENT BY THE CONTRACTOR OF THE PREVAILING RATES OF WAGES AS HERETOFORE ESTABLISHED BY OWNER IN SAID WAGE SCALE.

THE CITY OF GALVESTON RESERVES THE RIGHT TO REJECT ANY AND ALL BIDS, IN WHOLE OR IN PART; TO WAIVE ANY INFORMALITY IN ANY BID, AND TO ACCEPT THE BID WHICH, IN ITS DISCRETION, IS IN THE BEST INTEREST OF THE CITY OF GALVESTON. IN CASE OF AMBIGUITY OR LACK OF CLEARNESS IN STATING THE PRICES IN ANY BID, THE CITY RESERVES THE RIGHT TO CONSIDER THE MOST ADVANTAGEOUS CONSTRUCTION THEREOF.



LUIS J. CERVANTES
PURCHASING SUPERVISOR
CITY OF GALVESTON, TX.

General Instructions to Bidders

GENERAL INSTRUCTIONS TO BIDDERS

1. SCOPE OF WORK:

The work to be done under the contract documents shall consist of the following:

Furnish all labor, materials, tools, and supervision necessary to nourish the Galveston beach area as specified.

The contractor shall furnish all labor, machinery, superintendence, equipment and all materials necessary to complete this project in accordance with the contract documents.

2. CONTRACT DOCUMENTS:

All work covered by this contract shall be done in accordance with the contract documents described in the General Conditions.

3. PLANS FOR USE BY BIDDERS:

It is the intent of the City of Galveston that all parties with an interest in submitting a bid on the project covered by the contract documents be given a reasonable opportunity to examine the documents and prepare a bid without charge or forfeiture of deposit. The contract documents may be examined without charge as noted in the Notice to Bidder (Invitations to Bid).

4. TIME AND ORDER OF COMPLETION:

The project work covered by the contract documents shall be fully completed within 150 calender days from the date specified in the Notice to Proceed issued by the City of Galveston to the successful bidder. The Contractor will be permitted to proceed with the work in the order of his own choosing, provided however, the City reserves the right to require the Contractor to submit a progress schedule of the work contemplated by the contract documents. In the event the City requires a progress schedule to be submitted and it is determined by the City that the progress of the work is not in accordance with the progress schedule so submitted, the City may direct the Contractor to take such action as the City deems necessary to insure completion of the project within the time specified.

5. PAYMENT:

All payments due to Contractor shall be made in accordance with the provisions of the General Conditions of the contract documents.

6. AFFIDAVITS OF BILLS PAID:

The City of Galveston reserves the right, prior to final acceptance of this project to require the Contractor to execute an affidavit that all bills for labor, materials and incidentals incurred in the construction of the improvements contemplated by the contract documents have been paid in full and that there are no claims pending, of which the Contractor has been notified.

7. MATERIALS AND WORKMANSHIP:

The intent of these contract documents is that only materials and workmanship of the best quality and grade will be furnished. The fact that the specifications may fail to be sufficiently complete in some detail will not relieve the Contractor of full responsibility for providing materials of high quality and for protecting them adequately until incorporated into the project. The presence or absence of a representative of the City at the construction site will not relieve the Contractor of full responsibility for complying with this provision. The specifications for materials and methods set forth in the contract documents provide minimum standards of quality which the Owner believes necessary to procure a satisfactory project.

8. GUARANTEES:

All equipment and materials incorporated in the project and all construction shall be guaranteed against defective materials and workmanship. Prior to final acceptance, the Contractor shall furnish to the Owner, a written general guarantee which shall provide that the Contractor shall remedy any defects in the work, and pay for any and all damages of any nature whatsoever resulting in such defects, when such defects appear within one year from date of final acceptance of the work as a result of defective materials or workmanship, at no cost to the City of Galveston.

9. PLANS FOR THE CONTRACTOR:

The Contractor will be given 5 sets (if necessary) of drawings, specifications, and related contract documents, if necessary, for his use during construction. Plans and specifications for use during construction will only be furnished directly to the Contractor. The Contractor shall then distribute copies of plans and specifications to suppliers, subcontractors, or others, as required for the proper prosecution of the work contemplated by the contractor.

10. PROTECTION OF THE WORK:

The Contractor shall be responsible for the care, preservation, conservation, and protection of all materials, supplies, machinery, equipment, tools, apparatus, accessories, facilities, and all means of construction, and any and all parts of the work, whether the Contractor has been paid, partially paid, or not paid for such work, until the date the City issues its certificate of completion to Contractor. The City reserves the right, after the bids have been opened and before the contract has been awarded, to require of a bidder the following information:

- a) The experience record of the bidder showing completed jobs of a similar nature to the one covered by the proposed contract and all work in progress with bond amounts and percentage completed.
- b) A sworn statement of the current financial condition of the bidder.
- c) Equipment schedule.

11. TEXAS STATE SALES TAX:

- A. This contract is issued by an organization which qualifies for exemption provisions pursuant to Provisions of the Texas Tax Code, SS 151.301, 151.307, 151.309.

The Contractor must, in his bid, provide for the cost of materials to be incorporated or consumed in the finished project separate and apart from the cost for labor, equipment and materials not incorporated or consumed in the finished project.

The Contractor must obtain a limited sales, excise and use tax permit or exemption certificate which shall enable him to buy the materials to be incorporated into the work without paying the tax at the time of the purchase.

- B. In order for the Contractor performing this contract to purchase consumable materials by issuing a resale certificate in lieu of payment of sales tax:

1. The contract will transfer title of consumable, but not incorporated, materials to the City at the time and point or receipt by the contractor, and no use may be made of the materials prior to passage of title.
2. The Contractor will be paid for these materials by the City as soon as practicable. Payment will not be made directly but considered subsidiary to the pertinent bid item. The Contractor's monthly estimate (if applicable), will state that the estimate includes consumables that were received during the month covered by the estimate.

3. The City's representative must be notified as soon as possible of the receipt of these materials so that an inspection may be made by the representative. Where practical, the materials will be labeled property of the City.

12. PROTECTION OF SUBSURFACE LINES AND STRUCTURES:

It shall be the Contractor's responsibility to prosecute the work contemplated by the contract documents in such a way as to exercise due care to locate and prevent damage to all underground pipelines, utility lines, conduits or other underground structures which might or could be damaged by Contractor during the construction of the project contemplated by these contract documents. The City of Galveston agrees that it will furnish Contractor the location of all such underground lines and utilities of which it has knowledge. However, such fact shall not relieve the contractor of his responsibilities aforementioned. All such underground lines or structures cut or damaged by Contractor during the prosecution of the work contemplated by this contract shall be repaired immediately by Contractor to the satisfaction of the City of Galveston, Texas, at the Contractor's expense.

13. BARRICADES AND SAFETY MEASURES:

The Contractor shall, at his own expense, furnish and erect such barricades, fences, lights, and danger signals, and shall take such other precautionary measures for the protection of persons, property and work as may be necessary.

The Contractor will be held responsible for all damage to the work due to failure of barricades, signs and lights to protect it, and when damage is incurred, the damaged portion shall be immediately removed and replaced by Contractor at his own cost and expense. The Contractor's responsibility for maintenance of barricades, signs and lights shall not cease until the date of issuance to Contractor of City's certificate of acceptance of the project.

14. EXPLOSIVES:

The use of explosives will not be permitted unless written permission to do so is obtained by the Contractor from the City.

15. CONTRACTOR'S REPRESENTATIVE:

The successful bidder shall be required to have a responsible local representative available at all times while work is in progress under this contract. The successful bidder shall be required to furnish the name, address and telephone number where such local representatives may be reached during the time that the work contemplated by this contract is in progress.

16. INSURANCE:

The Contractor shall not commence work under this contract until he has obtained all insurance as required in the General Conditions of the contract documents, from an underwriter authorized to do business in the State of Texas and satisfactory to the City. Proof of coverage shall be furnished to the City and written notice of cancellation or any material change will be provided ten (10) days in advance of cancellation or change. All policies shall contain an agreement on the part of the insurer waiving the right of subrogation.

The insurance certificates shall name the City as an additional insured and shall further state that all subcontractors are named as additional insured, or in the alternative, shall be accompanied by a statement from the Contractor to the effect that no work on this particular project shall be subcontracted.

17. LABOR AND WORKING HOURS:

Attention of each bidder is particularly called to the schedule of general prevailing rate of per diem wages included in these contract documents. The wage rate which must be paid on this project shall not be less than specified in the schedule of general prevailing rates of per diem wages as aforementioned. The bidder's attention is further directed to the requirements of Article 5159a, Vernon's Annotated Civil Statutes providing for the payment of the wage schedules previously mentioned and the bidder's obligations thereunder.

The inclusion of the schedule of general prevailing rate of per diem wages in these contract documents does not release the Contractor for compliance with any wage law that may be applicable. Construction work under this contract requiring an inspector will not be performed on weekends or holidays unless the following conditions exist:

- (1) The project being constructed is essential to the City of Galveston's ability to provide the necessary service to its citizens.
- (2) Delays in construction are due to factors outside the control of the Contractor. The Contractor is approaching the penalty provisions of the contract and Contractor can show he has made a diligent effort to complete the contract within the allotted time.

Before construction work requiring an inspector is to be performed on weekends or holidays, the Contractor must notify the Owner's representative not less than three full working days prior to the weekend or holiday that he desires to do work and obtain written permission from the Owner's representative to do such work. The final decision on whether to allow construction work, requiring an inspector, on weekends or holidays will be made by the Owner's representative.

In any event, if a condition should occur or arise at the site of this project or from the work being done under this contract which is hazardous or dangerous to property or life, the Contractor shall immediately commence work, regardless of the day of the week or the time of day, to correct or alleviate such condition so that it is no longer dangerous to property or life.

18. PAYMENT OF EMPLOYEES AND FILING OF PAYROLLS:

The Contractor and each of his subcontractors shall pay each of his employees engaged in work on the project under this contract in full (less mandatory legal deductions) in cash, or by check readily cashable without discount, not less often than once each week.

The Contractor and each of his subcontractors engaged at the site of the work shall maintain complete records and shall, file with the Owner's representative, or Engineer, a certified, sworn, legible copy of such payroll when so requested. This shall contain the name of each employee, his classification, the number of hours worked on each day, rate of pay, and net pay. The affidavit shall state that the copy is a true and correct copy of such payroll, that no rebates or deductions (except as shown) have been made, or will in the future be made from the wages paid as shown thereon. The Contractor must classify employees according to one of the classifications set forth in the schedule of general prevailing rate of per diem wages, which schedule is included in the contract documents.

The Contractor shall forfeit as a penalty of the City of Galveston on whose behalf this contract is made, ten dollars for each calender day, or portion thereof, such laborer, workman or mechanic is paid less than the wages assigned to his particular classification as set forth in the schedule of general prevailing rate of per diem wages included in these contract documents.

19. PROVISIONS CONCERNING ESCALATOR CLAUSES:

Proposals submitted containing any condition which provide for changes in the stated bid price due to increases or decreases in the cost of materials, labor or other items required for the project will be rejected and returned to the bidder without being considered.

20. PREPARATION OF PROPOSAL:

The bidder shall submit his proposal on forms furnished by the City. All blank spaces in the forms shall be correctly filled in and the bidder shall state the price both in words and numerals, for which he proposes to do the work contemplated or furnish the materials required. Such prices shall be written in ink, distinctly and legibly, or typewritten. In case of discrepancy between the price written in words and the price written in figures, the price written in words shall govern. If the proposal is submitted by an individual, his name must be

signed by him or his duly authorized agent. If a proposal is submitted by a firm, association, or partnership, the name and address of each member must be given and the proposal signed by a member of the firm, association, or partnership, or person duly authorized. If the proposal is submitted by a company or corporation, the company or corporate name and business address must be given, and Powers of Attorney authorizing agents or others to sign proposals must be properly certified and must be in writing and submitted with the proposal. The proposal shall be executed in ink.

Each proposal shall be enclosed in a sealed envelope, addressed as specified in the Notice to Bidders, and endorsed on the outside of the envelope in the following manner:

- (a) Bidder's name.
- (b) Proposal for (description of the project).

Bid proposals may be withdrawn and resubmitted at any time prior to the time set for opening of the bids, but no proposal may be withdrawn or altered thereafter.

21. BOUND COPY OF CONTRACT DOCUMENTS:

Bidder understands and agrees that the contract to be executed by bidder shall be bound and include the following:

- (a) Notice to Bidders.
- (b) General Instructions to Bidders.
- (c) Bidder's Proposal.
- (d) Statutory Bonds (if required).
- (e) Insurance Certificates.
- (f) Contract Agreement.
- (g) General Conditions.
- (h) Special Conditions.
- (i) Notice of Acceptance.
- (j) Notice to Proceed
- (k) Advertisement for Bids.
- (l) All other documents made available to bidder for his inspection in accordance with the Notice to Bidders.

If Plans and Specifications are too bulky or cumbersome to be physically bound, they are to be considered incorporated by reference into the aforementioned contract documents.

Bid Proposal

BID PROPOSAL

GALVESTON, TEXAS

DATE _____

PROJECT NO. _____

Proposal of _____
(hereinafter called "Bidder")

To the Honorable Mayor and City Council

City of Galveston, Texas (hereinafter called Owner)

Gentlemen:

The bidder, in compliance with your invitation for bids for the
project of: _____

having carefully examined the plans, specifications, instructions to bidders, notice to bidders and all other related contract documents and the site of the proposed work, and being familiar with all of the conditions relevant to the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies; and to complete the project in accordance with the plans, specifications and contract documents, within the time set forth therein at the prices stated in Exhibit "A".

The bidder binds himself on acceptance of his proposal to execute a contract and any required bonds, according to the accompanying forms, for performing and completing the said work within the time stated and for the prices stated in Exhibit "A" of this proposal.

Bidder hereby agrees to commence the work on the above project on or before a date to be specified in a written "Notice of Proceed" of the Owner and to fully complete the project within the specified time frame thereafter as stipulated in the specifications and other contract documents. Bidder hereby further agrees to pay to Owner as liquidated damages the sum stated in the Special Conditions of the Agreement, Paragraph 17 for each consecutive calendar day in excess of the time set forth hereinabove for completion of this project, all as more fully set forth in the general conditions of the contract documents.

Bidder understands that the Owner reserves the right to reject any or all bids and to waive any formality in the bidding.

The bidder agrees that this bid shall be good and may not be withdrawn for a period of one hundred-eighty (180) calendar days after the scheduled closing time for receiving bids.

The undersigned Bidder hereby declares that has has visited the site of the work and has carefully examined the plans, specifications, and contract documents pertaining to the work covered by this bid, and he further agrees to commence work on or before the date specified in the written notice to proceed, and to substantially complete the work on which has has bid; as provided in the contract documents.

Enclosed with this proposal is a Cashier's Check or Certified Check for _____ Dollars

(\$ _____) or a Proposal Bond in amount of _____ Dollars (\$ _____), which

it is agreed shall be collected and retained by the Owner as liquidated damages in the event the proposal is accepted by the Owner and the undersigned fails to execute the necessary contract documents and the required bonds (if any) with the Owner within ten (10) days after the date of receipt of written notification of acceptance of said proposal; otherwise said check or bond shall be returned to the undersigned upon demand.

Contractor

By: _____

Address: _____

Phone: _____

(Seal if Bidder is a Corporation)

ATTEST:

Secretary

EXHIBIT A PAGE 1 OF 4

BID PROPOSAL
BID FOR UNIT PRICE CONTRACTS

ALTERNATE I - BEGIN WORK ON OR ABOUT OCTOBER 1, 1994

ITEM NO.	APPROX. QUANTITY	UNIT OF MEASURE	DESCRIPTION OF ITEM WITH UNIT PRICE WRITTEN IN WORDS	MATERIAL PRICE BID	ALL OTHER COSTS	TOTAL AMOUNT BID
1.	1	L.S.	MOBILIZATION/DEMOBILIZATION UNIT PRICE:			
			@ _____			
			PER LUMP SUM			

ALTERNATE I.A. - USE OF BORROW AREA 3 ONLY

2.	710,000	C.Y.	DREDGE, TRANSPORT, PLACE AND GRADE SAND UNIT PRICE:			
			@ _____			
			PER CUBIC YARD			

3.	1	L.S.	POST-CONSTRUCTION SURVEY OF BORROW SITE			
			@ _____			
			PER LUMP SUM			

ALTERNATE I.A. TOTAL

(WORDS)

(NUMERICAL)

ALTERNATE I.B. - USE OF BORROW AREA 1 ONLY

Where are logs

2.	710,000	C.Y.	DREDGE, TRANSPORT, PLACE AND GRADE SAND UNIT PRICE:			
			@ _____			
			PER CUBIC YARD			

EXHIBIT A PAGE 2 OF 4

BID PROPOSAL
BID FOR UNIT PRICE CONTRACTS

ALTERNATE I - BEGIN WORK ON OR ABOUT OCTOBER 1, 1994

ITEM NO.	APPROX. QUANTITY	UNIT OF MEASURE	DESCRIPTION OF ITEM WITH UNIT PRICE WRITTEN IN WORDS	MATERIAL PRICE BID	ALL OTHER COSTS	TOTAL AMOUNT BID
3.	1	L.S.	POST CONSTRUCTION SURVEY OF BORROW SITE: @ _____ PER LUMP SUM			

ALTERNATE I.B. TOTAL

(WORDS)

(NUMERICAL)

ALTERNATE I.C. - OFFSHORE CUTS IN BORROW AREAS 1 AND 3
(AS SHOWN IN DRAWINGS)

2.	710,000	C.Y.	DREDGE, TRANSPORT, PLACE AND GRADE SAND UNIT PRICE: @ _____ PER CUBIC YARD			
3.	1	L.S.	POST-CONSTRUCTION SURVEY OF BORROW SITE @ _____ LUMP SUM			

ALTERNATE I.C. TOTAL

(WORDS)

(NUMERICAL)

EXHIBIT A PAGE 3 OF 4

BID PROPOSAL
BID FOR UNIT PRICE CONTRACTS

ALTERNATE II - BEGIN WORK ON OR ABOUT JANUARY 1, 1995

ITEM NO.	APPROX. QUANTITY	UNIT OF MEASURE	DESCRIPTION OF ITEM WITH UNIT PRICE WRITTEN IN WORDS	MATERIAL PRICE BID	ALL OTHER COSTS	TOTAL AMOUNT BID
1.	1	L.S.	MOBILIZATION/DEMOBILIZATION UNIT PRICE:			
			@ _____			
			PER LUMP SUM	_____	_____	_____

ALTERNATE II.A. - USE OF BORROW AREA 3 ONLY

2.	710,000	C.Y.	DREDGE, TRANSPORT, PLACE AND GRADE SAND UNIT PRICE:			
			@ _____			
			PER CUBIC YARD	_____	_____	_____

3.	1	L.S.	POST-CONSTRUCTION SURVEY OF BORROW SITE			
			@ _____			
			LUMP SUM	_____	_____	_____

ALTERNATE II.A. TOTAL

(WORDS)

(NUMERICAL)

ALTERNATE II.B. - USE OF BORROW AREA 1 ONLY

2.	710,000	C.Y.	DREDGE, TRANSPORT, PLACE AND GRADE SAND UNIT PRICE:			
			@ _____			
			PER CUBIC YARD	_____	_____	_____

EXHIBIT A PAGE 4 OF 4

BID PROPOSAL
BID FOR UNIT PRICE CONTRACTSALTERNATE II - BEGIN WORK ON OR ABOUT JANUARY 1, 1995

ITEM NO.	APPROX. QUANTITY	UNIT OF MEASURE	DESCRIPTION OF ITEM MATERIAL WITH UNIT PRICE WRITTEN IN WORDS	PRICE BID	ALL OTHER COSTS	TOTAL AMOUNT BID
3.	1	L.S.	POST CONSTRUCTION SURVEY OF BORROW SITE			
			@ _____			
			PER LUMP SUM			

ALTERNATE II.B. TOTAL

(WORDS)

(NUMERICAL)

ALTERNATE II.C. - OFFSHORE CUTS IN BORROW AREAS 1 AND 3
(AS SHOWN IN DRAWINGS)

2.	710,000	C.Y.	DREDGE, TRANSPORT, PLACE AND GRADE SAND
			UNIT PRICE:

@ _____

3.	1	L.S.	POST-CONSTRUCTION SURVEY OF BORROW SITE
----	---	------	---

@ _____

LUMP SUM

ALTERNATE II.C. TOTAL

(WORDS)

(NUMERICAL)

Addendum No.	_____	Dated:	_____
Addendum No.	_____	Dated:	_____
Addendum No.	_____	Dated:	_____
Addendum No.	_____	Dated:	_____

Bid Bond

BID BOND

THE STATE OF TEXAS

COUNTY OF GALVESTON

SURETY'S NO. _____

KNOWN ALL MEN BY THESE PRESENTS, THAT _____

(hereinafter called the Principal), as Principal, and _____

(hereinafter called the Surety), as Surety, are held and firmly bound unto the City of Galveston, Texas, a home rule municipal corporation of Galveston County, Texas (hereinafter called the Oblige), in the amount of _____

DOLLARS (\$ _____), for the payment whereof the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a Bid or Proposal to enter into a certain written Contract with the Oblige to: _____

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully enter into such written Contract, then this obligation shall be void; otherwise to remain in full force and effect.

IT IS EXPRESSLY UNDERSTOOD AND AGREED that if said Principal should withdraw its Bid anytime after such Bid is opened and before official rejection to such Bid or, is successful in securing the award thereof, said Principal should fail to enter into the Contract and furnish satisfactory Performance Bond and Payment

Bond, the Obligee, in either of such events, shall be entitled and is hereby given the right to collect the full amount of this Bid Bond as liquidated damages.

PROVIDED, further that if any legal action to be filed upon this Bond venue shall lie in Galveston County, Texas.

IN WITNESS THEREOF, the said Principal and Surety do sign and seal this instrument, this _____ day of _____ 19____.

Principal

Surety

By _____

By _____

Address _____

Address _____

APPROVED AS TO FORM:

City Attorney

NOTE: Attach Power of Attorney

Payment Bond

PAYMENT BOND

THE STATE OF TEXAS

SURETY'S NO. _____

COUNTY OF GALVESTON

KNOWN ALL MEN BY THESE PRESENTS, THAT _____

_____ of the

City of _____, County of _____, and

State of _____ as Principal, and _____

_____, as
Surety, are held and firmly bound unto the City of Galveston,
Texas, a home rule municipal corporation of Galveston County,
Texas, as Obligee, in the amount of _____

_____ Dollars (\$ _____),

for payment whereof the said Principal and Surety bind themselves,
and their heirs, administrators, executors, successors and assigns,
jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract
with the Obligee, dated the _____ day of _____, 19____, to

which contract is hereby referred to and made a part hereof as
fully and to the same extent as if copied at length herein.

NOW, THEREFORE, the condition of the obligation is that if the said
Principal shall pay all claimants supplying labor and material to
him or a subcontractor in the prosecution of the work provided for
in said contract, then this obligation shall be null and void;
otherwise, it is to remain in full force and effect.

PROVIDED, further that if any legal action to filed upon this Bond,
venue shall lie in Galveston County, State of Texas.

SURETY, for value received, stipulates and agrees that no change,
extension of time, alteration or addition to the terms of the
contract, or to the work performed thereunder, or the plans,
specifications or drawings accompanying the same, or any assignment
of the contract as may be provided for in the Instructions to

Performance Bond

Bidders, shall in anyway affect its obligation on this Bond, and does waive notice of any such change, extension of time, alteration or additions to the terms of the contract, assignment thereof, or to the work performed thereunder.

IN WITNESS THEREOF, the said Principal and Surety do sign and seal this instrument, this _____ day of _____, 19____.

Principal _____

Surety _____

By _____

By _____

Address _____

Address _____

APPROVED AS TO FORM:

City Attorney _____

NOTE: Attach Power of Attorney

PERFORMANCE BOND

THE STATE OF TEXAS

SURETY'S NO. _____

COUNTY OF GALVESTON

KNOWN ALL MEN BY THESE PRESENTS, THAT _____

(hereinafter called the Principal), as Principal, and _____

(hereinafter called the Surety), as Surety, are held and firmly bound unto the City of Galveston, Texas, a home rule municipal corporation of Galveston County, Texas (hereinafter called the Obligee), in the amount of _____

DOLLARS (\$ _____), for the payment whereof the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a Bid or Proposal to enter into a certain written Contract with the Obligee to: _____

specifically including in the scope of this work and bond, the additional maintenance guaranty provisions set forth in the contract conditions, which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein, as well as the Principal's primary obligation to perform according to plans and specifications.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully perform the work in accordance with the plans, specifications, instructions to bidders, general and special conditions, and other contract documents, including any addendum thereto, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, further that if any legal action to be filed upon the Bond, venue shall lie in Galveston County, State of Texas.

SURETY, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the work performed thereunder, or the plans, specifications or drawings accompanying the same, or any assignment of the contract as may be provided for in the instructions to bidders, shall in anyway affect its obligation on this Bond, and it does waive notice of any such change, extension of time, alteration or addition to the terms of the contract. assignment thereof, or the work to be performed thereunder.

IN WITNESS THEREOF, the said Principal and Surety do sign and seal this instrument, this _____ day of _____, 19____.

Principal

Surety

By _____

Address _____

Address _____

APPROVED AS TO FORM:

City Attorney

NOTE: Attach Power of Attorney

Certificate of Insurance

CERTIFICATE OF INSURANCE

TO: CITY OF GALVESTON
GALVESTON, TEXAS

DATE: _____
Type of
Project: _____

THIS CERTIFIES THAT _____
(Name and Address of Insured)

and the City of Galveston, Texas, are, on the date of this certificate, insured by this Company, with respect to the business operations hereinafter described, for the types of insurance and in accordance with the provisions of the standard policies used by this Company, and further hereinafter described. Exceptions to standard policy noted hereon.

TYPE OF INSURANCE

<u>Policy No.</u>	<u>Effective</u>	<u>Expires</u>	<u>Limits of Liability</u>
Workmen's Compensation			
Owner's Protective or Contingent Liability		Per Person _____ Per Occurrence _____ Property Damage _____	
Automobile		Per Person _____ Per Occurrence _____ Property Damage _____	

The foregoing Policies (do) (do not) cover all sub-contractors.

Locations Covered:

DESCRIPTION of Operations Covered:

The above policies either in the body thereof or by appropriate endorsement provide that they may not be changed or cancelled by the insurer in less than the legal time required after the insured has received written notice of such change or cancellation, or in case there is no legal requirement, in less ten ten days in advance of cancellation.

FIVE COPIES OF THIS CERTIFICATE
MUST BE SENT TO THE OWNER.

(Name of insurer)

By _____

Title _____

Contract

General Conditions of the Agreement

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GENERAL CONDITIONS OF THE AGREEMENT

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GENERAL CONDITIONS OF THE AGREEMENT

1. OWNER:

Whenever the word Owner, or the expression Party of the First Part, or First Party, are used in this contract, it shall be understood as referring to the City of Galveston, Texas.

2. CONTRACTOR:

Whenever the word Contractor, or the expression Party of the Second Part, or Second Party, is used, it shall be understood to mean the person, persons, co-partnership or corporation, to-wit:

who has agreed to perform the work embraced in this contract or to his or their legal representatives.

3. OWNER'S REPRESENTATIVE:

Whenever the word Owner's Representative or representative is used in this contract, it shall be understood as referring to:

City Hall, Galveston, Texas, under whose supervision these contract documents, including the plans and specifications, were prepared, and who will inspect constructions; or to such other representative, supervisor, or inspector as may be authorized by said Owner to act in any particular under this agreement. Engineers, supervisors or inspectors will act for the Owner under the direction of Owner's Representative, but shall not directly supervise the Contractor or men acting in behalf of the Contractor.

4. CONTRACT DOCUMENTS

The contract documents shall consist of the Notice to Bidder, General Instructions to Bidders, Proposal, Signed Agreement, Statutory Bonds (if required), General Conditions of the Agreement, Special Conditions of the Agreement, Specifications, Plans, Insurance Certificate, and all other documents made available to Bidder for his inspection in accordance with the Notice to Bidders.

The Contract Documents are complementary and what is called for by any one shall be as binding as if called for by all. In case of conflict between any of the Contract Documents, priority of interpretation shall be in the following order: Signed Agreement, Performance & Payment Bonds, Special Bonds (if any), Proposal, Special Conditions of Agreement, Notice to Contractors, Technical Specifications, Plans, and General Conditions of Agreement.

5. INTERPRETATION OF PHRASES

Whenever the words "Directed", "Required", "Permitted", "Designated", "Considered Necessary", "Prescribed", or words of like import are used, it shall be understood that the direction, requirements, permission, order, designation or prescription of the Owner's Representative is intended; and similarly, the words "Approval", "Acceptable", "Satisfactory", or words of like import shall mean approval by or acceptable or satisfactory to the Owner's Representative.

By the term "Substantially completed" is meant that the work has been made suitable for use or occupancy and is in condition to serve its intended purpose, but still may require minor miscellaneous work and adjustment.

Whenever in the Specifications or Plans accompanying this Agreement, the terms or description of various qualities, relative finish, workmanship, or other qualities of similar kind which cannot from their nature be specifically and clearly described and specified, are necessarily described in general terms, the fulfillment of which must depend on individual judgment, then, in all such cases, any questions of the fulfillment of said Specifications, or Plans shall be decided by the Owner's Representative, and said work shall be done in accordance with his interpretations of the meaning of the words, terms, or clauses defining the character of the work.

6. SUBCONTRACTOR

The term Subcontractor, as employed herein, included only those having a direct contract with the Contractor for performance of work on the project contemplated by these contract documents. Owner shall have no responsibility to any Subcontractor employed by Contractor for performance of work on the project contemplated by these contract documents, but said Subcontractors will look exclusively to Contractor for any payments due Subcontractor.

7. WRITTEN NOTICE:

Written notice shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or an officer of the corporation for whom it is intended, or if delivered at or sent certified mail to the last business address known to him who gives the notice.

8. WORK:

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and all water, light, power, fuel, transportation and all other facilities necessary for the execution and completion of the work covered by the contract documents. Unless otherwise specified, all

materials, shall be new and both workmanship and materials shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials. Materials or work described in words which so applied have well known, technical or trade meaning shall be held to refer to such recognized standards.

All work shall be done and all materials furnished in strict conformity with the contract documents.

9. SUBSTANTIALLY COMPLETED:

The term "Substantially Completed" is meant that the structure or project contemplated by the contract documents has been made suitable for use or occupancy or the facility is in a condition to serve its intended purpose, but still may require minor miscellaneous work and adjustment.

10. LAYOUT OF WORK:

Except as specifically provided herein, the Contractor shall be responsible for laying out all work and shall accomplish this work in a manner acceptable to the Owner's Representative. The Owner's Representative will check the Contractor's layout of all major structures and other layout work done by the Contractor at Contractor's request, but this check does not relieve the Contractor of the responsibility of correctly locating all work in accordance with the Plans and Specifications.

11. KEEPING OF PLANS AND SPECIFICATIONS ACCESSIBLE:

The Contractor shall be furnished with Five (5) copies, of all Plans, Profiles and Specifications without expense to him and shall keep one copy of the same consistently accessible on the job site.

12. RIGHT OF ENTRY:

The Owner's Representative may make periodic visits to the site to observe the progress and quality of the executed work and to determine, in general, if the work is proceeding in accordance with the contract documents. He will not be required to make exhaustive or continuous

on-site inspection to check the quality or quantity of the work, nor will he be responsible for the construction means, methods, techniques, sequences or procedures, or the safety precautions incident thereto. His efforts will be directed toward providing assurances for the Owner that the completed project will conform to the requirements of the contract documents, but he will not be responsible for the Contractor's failure to perform the work in accordance with the Contract Documents. On the basis of his on-site observations, he will keep the Owner informed of the progress of the work and will endeavor to guard the Owner against defects and deficiencies in the work of the Contractor.

13. LINES & GRADES:

The construction plans include a horizontal control line (baseline) and vertical control points (bench marks). These will be established or shown to the contractor prior to commencing construction. After construction has started, the Contractor shall be responsible for protecting and preserving these controls. From these controls the Contractor shall stake all alignments for the work and will be responsible for all horizontal and vertical construction staking.

14. OWNER'S REPRESENTATIVE'S AUTHORITY AND DUTY:

Unless otherwise specified, it is mutually agreed between the parties to this Agreement that the Owner's Representative shall review all work included herein. He has the authority to stop work whenever such stoppage may be necessary to insure the proper execution of the contract.

In order to prevent delays and disputes and to discourage litigation, it is further agreed that the Owner's Representative shall, in all cases, determine the amounts and quantities of the several kinds of work which are to be paid for under this contract. He shall determine all questions in relation to aid work and the construction thereof, and shall in all cases, decide every question which may arise relative to the execution of this contract on the part of said Contractor.

The Owner's Representative's estimates and findings shall be conditions precedent of the right of the parties hereto to arbitration or to any action on the contract, and to any rights of the contractor to receive any money under this contract; provided, however, that should Owner's Representative render any decision or give any direction, which in the opinion of either party hereto, is not in accordance with the meaning and intent of this contract, either party may file with said Owner's Representative within 30 days his written objection to the decision or direction so rendered, and by such action may reserve the right to submit the question so raised to arbitration as hereinafter provided. It is the intent of this Agreement that there shall be no delay in the execution of the work, therefore, written decisions or direction of the Owner's Representative as rendered shall be promptly carried out, and any claim arising therefrom shall be thereafter adjusted to arbitration as hereinafter provided.

The Owner's Representative shall, within a reasonable time, render and deliver to both the Owner and the Contractor a written decision on all claims of the parties hereto and on all questions which may arise relative to the execution of the work or the interpretation of the contract, specifications and plans. Should the Owner's Representative fail to make such decision within a reasonable time, an appeal to arbitration may be taken as if his decision had been rendered against the party appealing.

15. SUPERINTENDENCE AND INSPECTION:

It is agreed by the Contractor that the Owner's Representative shall be and is hereby authorized to appoint from time to time such subordinate engineers, supervisors, or inspectors as the said Owner's Representative may deem proper to inspect the materials furnished and the work done under this Agreement, and to see that the said materials furnished and said work is done in accordance with the Specifications therefor.

The Contractor shall furnish all reasonable aid and assistance required by the sub-ordinate engineers, supervisors, or inspectors for the proper inspection and examination of the work. The Contractor shall regard and obey the directions and instructions of any subordinate engineer, supervisor, or inspectors so appointed, when such directions are consistent with the obligations of this Agreement and the accompanying plans and specifications, provided however, should the Contractor object to any orders by any subordinate engineer, supervisor or inspector the Contractor may within six days make written appeal to the Owner's Representative for his decision.

16. CONTRACTOR'S DUTY AND SUPERINTENDENCE:

The Contractor shall give personal attention to the faithful prosecution and completion of this contract and shall keep on the work, during its progress, a competent superintendent and any necessary assistants, all satisfactory to Owner's Representative. The superintendent shall represent the Contractor in his absence and all directions given to him shall be binding as if given to the Contractor. Adequate supervision by competent and reasonable representatives of the Contractor is essential to the proper performance of the work and lack of such supervision shall be grounds for suspending operations of the Contractor.

The work, from its commencement to completion, shall be under the exclusive charge and control of the Contractor and all risk in connection therewith shall be borne by the Contractor.

The Owner or Owner's Representatives will not be responsible for the acts or omissions of the Contractor, or any subcontractors, or any of his agents or employees, or any other persons performing any of the work.

17. CONTRACTOR'S UNDERSTANDING:

It is understood and agreed that the Contractor has, by careful examination, satisfied himself as to the nature and location of the work, the confirmation of the ground, the character, quality and quantity of materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the work, and the general and local conditions, and all other matters which in any way affect the work under this contract.

No verbal agreement or conversation with any officer, agent, or employee of the Owner, either before or after the execution of this contract, shall effect or modify any of the terms or obligations herein contained.

18. CHARACTER OF WORKMEN:

The Contractor agrees to employ only orderly and competent men, skillful in the performance in the type of work required under this contract, to do the work; and agrees that whenever the Owner's Representative shall inform him in writing that any man or men on the work, are, in his opinion, incompetent, unfaithful, or disorderly, such man or men shall be discharged from the work and shall not again be employed on the work without the Owner's Representative's written consent.

19. CONSTRUCTION PLANT:

The Contractor shall provide all labor, tools, equipment, machinery and materials necessary in the prosecution and completion of this contract where it is not otherwise specifically provided that owner shall furnish same, and it is also understood that owner shall not be held responsible for the care, preservation, conservation, or protection of any materials, tools, equipment or machinery or any part of work until it is finally completed and accepted.

The building of structures for the housing of men or equipment will be permitted only at such places as the Owner's Representative shall direct, and the sanitary conditions of the grounds in or about such structure shall at all times be maintained in a manner satisfactory to the Owner's Representative.

20. SANITATION:

Necessary sanitary conveniences for the use of laborers on the work site, properly scheduled from public observation, shall be constructed and maintained by the Contractor in such manner and at such points as shall be approved by the Owner's Representative and their use shall be strictly enforced.

21. OBSERVATION AND TESTING:

The Owner or Owner's Representative shall have the right at all reasonable times to observe and test the work. Contractor shall make necessary arrangements and provide proper facilities and access for such observation and testing at any location wherever work is in preparation or progress. Contractor shall ascertain the scope of any observation which may be contemplated by Owner or Owner's Representative and shall give ample notice as to the time each part of the work will be ready for such observation. Owner or Owner's Representative may reject any work found to be defective or not in accordance with the contract documents, regardless of the stage of its completion or the time or place of discovery of such errors, and regardless of whether Owner's Observer has previously accepted the work through oversight or otherwise. If any work should be covered without approval or consent of the Owner, it must, if requested by Owner or Owner's Representative be uncovered for examination at Contractor's expense. In the event that any part of the work is being fabricated or manufactured at a location where it is not convenient for Owner or Owner's Representative to make observations of such work or require testing of said work, then in such event Owner or Owner's Representative may require Contractor to furnish Owner or Owner's Representative certificates of inspection, testing or approval made by persons competent to perform such tasks at the location where that part of the work is being manufactured or fabricated. All such tests will be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organization as may be required by law or the contract documents.

If any work which is required to be inspected, tested, or approved, is covered up without written approval or consent of the Owner or Owner's Representative, it must, if requested by the Owner or Owner's Representative, be uncovered for observation and testing at the Contractor's expense. The cost of all such inspections, tests, and approvals shall be borne by the Contractor unless otherwise provided herein. Any work which fails to meet the requirements of such tests, inspections or approval, and any which meets the requirements of any such tests or approval but does not meet the requirements of the contract documents shall be considered defective. Such defective work shall be corrected at the Contractor's expense.

Neither observations by the Owner or Owner's Representative, nor inspections, tests, or approvals made by Owner, Owner's Representative, or other persons authorized under this agreement to make such inspections, tests, or approvals, shall relieve the Contractor from his obligation to perform the work in accordance with the requirements of the contract documents.

22. DEFECTS AND THEIR REMEDIES:

It is further agreed that if the work or any part thereof, or any material brought on the site of the work for use in the work or selected for the same, shall be deemed by the Owner or Owner's Representative as

unsuitable or not in conformity with plans, specifications, and contract documents, the Contractor shall, after receipt of written notice thereof from the Owner's Representative, forthwith remove such material and rebuild or otherwise remedy such work so that it shall be in full accordance with this contract. It is further agreed that any remedial action contemplated as hereinabove set forth shall be at Contractor's expense.

23. CHANGES AND ALTERATIONS:

The Contractor further agrees that the Owner may make such changes and alterations as the Owner may see fit, in the line, grade, form, dimensions, plans or materials for the work herein contemplated, or any part thereof, either before or after the beginning of the construction, without affecting the validity of this contract and the accompanying bond.

If such changes or alterations diminish the quantity of the work to be done, they shall not constitute the basis for a claim for damages, or anticipated profits on the work that may be dispensed with. If they increase the amount of work, and the increased work can fairly be classified under the specifications, such increase shall be paid according to the quantity actually done and at the unit price established for such work under this contract; otherwise such additional work shall be paid for as provided under Extra Work. In case the Owner shall make changes or alterations as shall make useless any work already done or material already furnished or used in said work, then the Owner shall recompense the Contractor for any material or labor so used, and for any actual loss occasioned by such changes, due to actual expenses incurred in preparation for the work as originally planned.

24. EXTRA WORK:

The term "Extra Work" as used in this contract shall be understood to mean and include all work that may be required by the Owner or Owner's Representative to be done by the Contractor to accomplish any change, alteration or addition to the work shown on the plans, and specifications or contract documents, and not covered by the Contractor's Proposal, except as provided under Changes and Alterations herein.

It is agreed that the Contractor shall perform all Extra Work under the direction of the Owner's Representative when presented with a Written Work Order signed by the Owner's Representative; subject, however, to the right of the Contractor to require a written confirmation of such Extra Work by the Owner. It is also agreed that the compensation to be paid the Contractor for performing said Extra Work shall be determined by one or more of the following methods:

- Method (A)-By agreed unit prices; or
- Method (B)-By agreed lump sum; or

Method (C)-If neither Method (A) or Method (B) be agreed upon before the Extra Work is commenced, then the Contractor shall be paid the "actual field cost" of the work, plus fifteen (15%) percent.

In the event said Extra Work is performed and paid for under Method (C), the provisions of this paragraph shall apply and the "actual cost" is hereby defined to include the cost of all workmen, such as foreman, timekeepers, mechanics and laborers, and materials, supplies, teams, trucks, rentals or machinery and equipment, for the time actually employed or used on such Extra Work, plus actual transportation charges necessarily incurred, if the kind of equipment or machinery is not already on the job, together with all power, fuel, lubricants, water and similar operating expenses. Also, all necessary incidental expenses incurred directly on the account of Such Extra Work, including Social Security, Old Age Benefits, Compensation, and all insurance as may be required by any law or ordinance, or directed by the Owner, or Owner's Representative, Owner or Owner's Representative may direct the form in which account of actual field cost shall be kept and records of these accounts shall be made available to Owner's Representative. The Owner may also specify in writing before the work commences, the method of doing the work and the type and kind of machinery and equipment to be used, otherwise these matters shall be determined by the Contractor.

Unless otherwise agreed upon, the prices for the use of machinery and equipment shall be determined by using 100 percent of the latest of Equipment Expense adopted by the Associated General Contractors of America. Where Practicable the terms and prices for the use of machinery and equipment shall be incorporated in the Written Extra Work Order. The fifteen (15%) percent of the "actual field cost" to be paid the Contractor shall cover and compensate him for his profits, overhead, general superintendence and field office expense, and all other elements of cost and expense not embraced with the "actual field cost" as herein defined, save that where the Contractor's Camp or Field Office must be maintained primarily on account of such Extra Work, then the cost to maintain and operate the same shall be included in the "actual field cost".

No claim for Extra Work of any kind will be allowed unless ordered in writing by the Owner's Representative. In case any orders or instructions either oral or written, appear to the Contractor to involve Extra Work for which he should receive compensation, or an adjustment in the construction time, he shall make a written request to the Owner's Representative for written order authorizing such Extra Work.

Should a difference of opinion arise as to what does or does not constitute Extra Work, or as to the payment therefore, and the Owner's Representative insists upon its performance, the Contractor shall proceed with the work after making written request for written order and shall keep an accurate account of the "actual field cost" thereof, as provided under Method (C). The Contractor will thereby preserve the right to submit the matter of payment to arbitration as herein provided.

25. DISCREPANCIES AND OMISSIONS:

It is further agreed that it is the intent of this contract that all work described in the proposal, the specifications, plans and other contract documents, is to be done for the prices quoted by the Contractor and that such price shall include all appurtenances necessary to complete the work in accordance with the intent of these contract documents as interpreted by Owner's Representative.

If the contractor finds any discrepancies or omissions in these plans, specifications, or contract documents, he should notify the Owner's Representative and obtain a clarification before the bids are received by the Owner's Representative prior to the opening of bids, then it shall be considered that the Contractor fully understands the work to be included and has provided sufficient sums in his proposal to complete the work in accordance with these plans. It is further understood that any request for clarification must be submitted no later than five days prior to opening of bids.

26. RIGHT OF OWNER TO MODIFY METHODS AND EQUIPMENT:

If, at any time, the methods or equipment used by the Contractor are found to be inadequate to secure the quality of work or the rate of progress required under this contract, the Owner or Owner's Representative may order the Contractor in writing to increase their safety or improve their character and efficiency, and the Contractor shall comply with such order.

If at any time the working force of the Contractor is inadequate for securing the progress herein specified the Contractor shall, if so ordered in writing, increase his force or equipment, or both, to such and extent as to give reasonable assurance of compliance with the schedule of progress.

27. PROTECTION AGAINST ACCIDENT TO EMPLOYEES AND PUBLIC:

The Contractor shall take out and procure a policy or policies of Workmen's Compensation Insurance with an insurance company licensed to transact business in the State of Texas, which policy shall comply with the Workmen's Compensation laws of the State of Texas. The Contractor at all times exercise reasonable precaution for the safety of employees and others on or near work and shall comply with all applicable provisions of federal, state, and municipal laws and building and construction codes. All machinery and equipment and other physical hazards shall be guarded in accordance with the "Manual of Accident Prevention in Construction" of Associated General Contractors of America, except where incompatible with federal, state or municipal laws or regulations. The Contractor, his sureties and insurance carriers shall defend, indemnify and save harmless the Owner and all of its officers, agents and employees from all suits, actions, or claims of any

character whatsoever, brought for or on account of any injuries or damages received or sustained by any person or persons or property, on account of any negligent act or fault of the Contractor or any subcontractor, their agents or employees, in the execution and supervision of said contract, and the project which is the subject matter of this contract, on account of any negligent act or fault of the Contractor or any subcontractor, their agents or employees, in the execution and supervision of said contract, and the project which is the subject matter of this contract, on account of the failure of Contractor or any subcontractor to provide necessary barricades, warning lights, or signs, and will be required to pay any judgment with costs which may be obtained against the Owner or any of its officers, agents, or employees including attorney fees.

The safety precautions taken shall be the sole responsibility of the Contractor, in his sole discretion as an Independent Contractor; inclusion of this paragraph in the Agreement, as well as any notice which may be given by the Owner or the Owner's Representative concerning omissions under this paragraph as the work progresses, are intended as reminders to the Contractor of his duty and shall not be construed as any assumption of duty to supervise safety precautions by either the Contractor or any of his subcontractors.

28. CONTRACTOR'S INSURANCE:

The Contractor shall procure and carry at his sole cost and expense throughout the life of this contract, insurance protection as hereinafter specified. Such insurance shall be carried with an insurance company licensed to transact business in the State of Texas and shall cover all operations in connection with this contract, whether performed by the Contractor or a subcontractor, or separate policies shall be provided covering the operation of each subcontractor.

(A) Workmen's Compensation and Employer's Liability Insurance: As required by State statute governing all employees employed on a work whether employed by the Contractor or a Subcontractor on the job.

(B) Owner's Protective or Contingent Public Liability Insurance and Property Damage Liability Insurance.

The Contractor shall obtain an owner's Protective or Contingent Public Liability Insurance policy naming the City of Galveston as an additional insured and the amount of such policy shall be as follows:

\$250,000 for bodily injuries, including accidental death, to any one person, but limited to \$500,000 per occurrence, and \$100,000 for property damage.

The Contractor shall obtain a Contractor's Protective (Contingent) Liability Insurance policy and the amount of said policy shall be as follows:

In an amount not less than \$250,000 for bodily injuries, including accidental death, to any one person, but not less than \$500,000 per occurrence and in the amount of not less than \$100,000 for property damage.

(C) Automobile Insurance:

The Contractor shall procure automobile insurance providing coverage as follows:

In an amount not less than \$100,000 for injuries, including accidental death, to any one person, but not less than \$300,000 per occurrence, and in the amount of not less than \$100,000 for property damage.

(D) Proof of Coverage:

Before work on this contract is commenced, each Contractor and subcontractor shall submit to the Owner for approval 5 certificates of insurance covering each insurance policy carried and offered as evidence of compliance with the above insurance requirements, signed by an authorized representative of the insurance company setting forth:

- (1) The names and address of the insured.
- (2) The location of the operations to which the insurance applies.
- (3) The name of the policy and type or types of insurance in force thereunder on the date borne by such certificates.
- (4) The expiration date of the policy and the limit or limits of liability thereunder on the date borne by such certificate.
- (5) A statement that the insurance of the type afforded by the policy applies to all of the operations of whatever character, which are undertaken by the insured during the performance of this contract, provided such operations are required in the performance of the contract.
- (6) A provision that the policy may be canceled only by mailing written notice to the named insured at the address shown in the policy stating when, not less than ten (10) days thereafter, cancellation of such policy shall be effective, with a copy to the Owner of said letter of intent.

29. PROTECTION AGAINST CLAIM OF SUBCONTRACTORS, LABORERS, MATERIALMEN, AND FURNISHERS OF MACHINERY, EQUIPMENT AND SUPPLIES:

The Contractor agrees that he will indemnify and save the Owner harmless from all claims growing out of any demands of subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, all suppliers, including commissary, incurred in the furtherance of the performance of this contract. When Owner so desires, the Contractor shall furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged or waived.

If during the progress of the work, Contractor shall allow any indebtedness to accrue for work furnished by any of those designated in the preceding paragraph and shall fail to pay and discharge any such indebtedness within five (5) days after demand is made, then Owner may, during the period for which such indebtedness shall remain unpaid, withhold from the unpaid portion of this contract, a sum equal to the amount of such unpaid indebtedness or may apply the sum so withheld to discharge any such indebtedness.

Any and all communications between any party under this paragraph must be in writing.

30. PROTECTION AGAINST ROYALTIES OR PATENTED INVENTION:

The Contractor shall pay all royalties and license fees, and shall provide for the use of any design, device, material or process covered by letters patent or copyright by suitable legal agreement with the Patentee or Owner thereof.

The Contractor shall defend all suits or claims for infringement of any patent or copyrights and shall indemnify and save the Owner harmless from any loss on account thereof, except that Owner shall defend all such suits and claims and shall be responsible for all such loss when a particular manufacturer or manufacturers is specified or required in these contract documents by Owner; provided, however, if choice of alternate design, device, material or process is allowed to the Contractor, then Contractor shall indemnify and save Owner harmless from any loss on account thereof.

If the material or process specified or required by Owner is an infringement, the Contractor shall be responsible for such loss unless he promptly gives written notice to the Owner of such infringement.

31. LAWS AND ORDINANCES:

The Contractor shall at all times observe and comply with all Federal, State and local laws, ordinances and regulations, which in any manner affect the contract or the work, and shall indemnify and save harmless

the Owner against any claims arising from the violation of any such laws and ordinances, and regulations, whether by the Contractor or his employees. If the Contractor observes that the plans and specifications are at variance therewith, he shall promptly notify the Owner's Representative in writing and any necessary changes shall be adjusted as provided in the contract for changes in the work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner's Representative, he shall bear all costs arising therefrom.

The Owner is a municipal corporation of the State of Texas and the law from which it derives its powers, insofar as the same regulates the objects for which, or the manner in which, or the conditions under which the Owner may enter into contracts, shall be controlling, and shall be considered as a part of this contract to the same effect as though embodied herein.

32. ASSIGNMENT AND SUBLETTING:

The Contractor further agrees that he will retain personal control and give his personal attention to the fulfillment of this contract. The Contractor further agrees that subletting of any portion or feature of the work, or materials required in the performance of this contract, shall not relieve the Contractor from his full obligation to the Owner, as provided by this contractual agreement.

33. TIME FOR COMPLETION AND LIQUIDATED DAMAGES:

It is hereby understood and mutually agreed by and between the Contractor and the Owner, that the date of beginning and time for completion as specified in the Contract of work to be done hereunder are essential conditions of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the Notice to Proceed.

If the Contractor should neglect, fail, or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree as part of the consideration for the awarding of this contract, the Owner may withhold permanently from Contractor's total compensation, the sum stated in the Special Conditions of the Agreement Paragraph 17, not as a penalty, but as liquidated damages for the breach of the contract as herein set forth for each and every calendar day that the Contractor shall be in default after the time stipulated for completing the work.

It is expressly understood and agreed, by and between Contractor and the Owner, that the time for the completion of the work described herein is reasonable time for the completion of the same, taking into consideration the average climatic change and conditions and usual industrial conditions prevailing in this locality.

The amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty in fixing and ascertaining actual damages the Owner would in such event sustain, and the amount is agreed to be damages the Owner would sustain and shall be retained by the Owner from current periodical estimates for payments or from final payment.

It is further agreed and understood between the Contractor and Owner that time is of the essence of this contract.

34. TIME AND ORDER OF COMPLETION:

It is the meaning and intent of this contract, unless otherwise herein specifically provided, that the Contractor shall be allowed to prosecute his work at such time and sessions, in such order of precedence, and in such manner as shall be most conducive to economy of construction provided, however, that the order and time of prosecution shall be such that the work shall be substantially completed as a whole and in part, in accordance with this contract, the plans and specifications and within the time of completion designated in the proposals; provided, also, that when the Owner is having other work done, either by contract or by his own force, the Owner's Representative may direct the time and manner of constructing work done under this contract, so that conflicts will be avoided and the construction of the various works done for the Owner shall be harmonized.

The Contractor shall submit, at such times as may reasonably be requested by the Owner's Representative schedules which shall show the order in which the Contractor proposes to carry on the work, with dates at which the Contractor will start the several parts of the work, and estimated dates of completion of the several parts.

35. EXTENSION OF TIME:

The Contractor agrees that he has submitted his proposal in full recognition of the time required for the completion of this project, taking into consideration the average climatic range and industrial conditions prevailing in this locality, and has considered the liquidated damage provisions of paragraph 33 hereinabove set forth and that he shall not be entitled to, nor will he request, an extension of time on this contract, except when his work has been delayed an act or neglect of the Owner, Owner's Representative, employees of the Owner or other contractors employed by the Owner, or by changes ordered in the work, or by strike, walk-outs, acts of God for the public enemy, fire or flood. The Contractor may apply in writing for an extension of time, submitting therewith all written justification as may be required by Owner's Representative for such an extension as requested by the Contractor.

The Owner's Representative within ten (10) days after receipt of a written request for an extension of time by the Contractor supported by all requested documentation shall then submit such written request to the City Council of the City of Galveston for their consideration. Should the Contractor disagree with the action of the City Council on granting an extension of time, such disagreement shall be settled by arbitration as hereinafter provided.

36. HINDRANCES AND DELAYS:

In executing the contract agreement, the Contractor agrees that in undertaking to complete the work within the time herein fixed, he has taken into consideration and made allowances for all hindrances and delays incident to such work, whether growing out of delays in securing material or workmen or otherwise. No charge shall be made by the Contractor for hindrances or delays from any cause during the progress of any part of the work embraced in this contract except where the work is stopped by order of the Owner or Owner's Representative for the Owner's convenience in which event such expense as in the judgment of the Owner's Representative that is caused by such stoppage shall be paid by Owner to Contractor.

37. QUANTITIES AND MEASUREMENTS

No extra or customary measurements of any kind will be allowed, but the actual measured or computed length, area, solid contents, number and weight only shall be considered, unless otherwise specifically provided.

In the event this contract is let on a unit price basis, then Owner and Contractor agree that this contract, including the specifications, plans and other contract documents are intended to show clearly all work to be done and material to be furnished hereunder. Where the estimated quantities are shown for the various classes of work to be done and material to be furnished under this contract, they are approximate and are to be used only as a basis for estimating the probable cost of the work and for comparing their proposals offered for the work. It is understood and agreed that the actual amount of work to be done and the materials to be furnished under this contract may differ somewhat from these estimates, and that where the basis for payment under this contract is the unit price method, payment shall be for the actual amount of work done and materials furnished on the project.

38. PROTECTION OF ADJOINING PROPERTY:

The Contractor shall take proper measures to protect the adjacent or adjoining property or properties in any way encountered, which may be injured or seriously affected by any process of construction, to be undertaken under this agreement, from any damages or injury by reason of said process of construction; and he shall be liable for any and all claims for such damage on account of his failure to fully protect all

adjacent property. The Contractor agrees to indemnify, save and hold harmless the Owner against any claims for damages due to any injury to any adjacent or adjoining property, arising or growing out of the performance of this contract, but such indemnity shall not apply to any claim of any kind arising out of the existence or character of the work.

39. PRICE FOR WORK:

In consideration of the furnishing all necessary labor, equipment and material, and the completion of all work by the Contractor, and on the delivery of all material embraced in this contract in full conformity with the specifications and stipulations herein contained, the Owner agrees to pay the Contractor the prices set forth in the Proposal hereto attached, which has been made a part of this contract. And the Contractor hereby agrees to receive such prices as full compensation for furnishing all materials and all labor required for the aforesaid work, also for all expense incurred by him, and for well and truly performing the same and the whole thereof, in the manner and according to this Agreement, the attached specifications, plans contract documents and requirements of Owner's Representative.

40. PAYMENTS:

No payments made or certificates given shall be considered as conclusive evidence of the performance of the contract, either wholly or in part, nor shall any certificate or payment be considered as acceptance of defective work. Contractor shall, at any time requested during the progress of the work, furnish the Owner or Owner's Representative with a verifying certificate showing the Contractor's total outstanding indebtedness in connection with the work. Before final payment is made, Contractor shall satisfy Owner, by affidavit or otherwise, that there are no outstanding liens against Owner's premises by reason of any work under the contract.

Acceptance by Contractor of final payment of the contract price shall constitute a waiver of all claims against Owner which have not theretofore been timely filed as provided in this contract.

41. PARTIAL PAYMENTS:

On or before the 5th day of each month the Contractor shall submit to Owner's Representative an application for partial payment. Owner's Representative shall review said application for partial payment and the progress of the work made by the Contractor and if found to be in order shall prepare a certificate for partial payment showing as completely as practical the total value of the work done by the Contractor up to and including the last day of the preceding month; said statement shall also include the value of all sound materials delivered on site of the work that are to be fabricated into the work.

The Owner shall then pay the Contractor on or before the fifteenth day of the current month the total amount of the Owner's Representative Certificate of Partial Payment, less 5% of the amount thereof, if total contract award is \$400,000 or more. If total contract award is less than \$400,000, 10% will be retained. Such 5 or 10 percent shall be retained until final payment, and further, less all previous payments, and all further sums that may be retained by the Owner under the terms of this Agreement. However, it is understood that in case the whole work be near to completion and some unexpected and unusual delay occur due to no fault or negligence on the part of the Contractor, the Owner may upon written recommendation of Owner's Representative pay a reasonable and equitable portion of the retained percentage due Contractor.

42. FINAL COMPLETION AND ACCEPTANCE:

Within thirty-one (31) days after the Contractor has given the Owner's Representative written notice that the work has been completed, or substantially completed, the Owner's Representative and the Owner shall inspect the work and within said time, if the work found completed or substantially completed in accordance with the contract documents, the Owner's Representative shall issue to the Owner and Contractor his certificate of completion, and thereupon it shall be the duty of the Owner, within thirty-one (31) days, to issue a certificate of acceptance of the work to the Contractor.

43. FINAL PAYMENT:

Upon the issuance of the Certificate of Completion the Engineer shall proceed to make final measurements and prepare a final statement of the value of all work performed and materials furnished under the terms of the Agreement and shall certify this statement to the Owner, who shall pay to the Contractor on or before the 31st day after the date of the Certificate of Completion the balance due the Contractor under the terms of the Agreement, provided he has fully performed his contractual obligations under the terms of this Contract; and said payment shall become due in any event upon said performance by the Contractor. Neither the Certificate of Acceptance nor the final payment, nor any provision in the Contract Documents, shall relieve the Contractor of the obligation for fulfillment of any warranty which may be required in the Special Conditions (if any) of this contract or required in specifications made a part of this contract.

44. CORRECTION OF WORK BEFORE FINAL PAYMENT FOR WORK:

Contractor shall promptly remove from Owner's premises all materials condemned by the Owner's Representative on account of failure to conform to the contract, whether actually incorporated in the work or not; and Contractor shall at his own expense promptly replace such condemned materials with other materials conforming to the requirements of the

contract. Contractor shall also bear the expense of restoring all work of other contractors damaged by any such removal or replacement. If Contractor does not remove and replace any such condemned work within a reasonable time after a written notice by the Owner or the Owner's Representative, Owner may remove and replace it at Contractor's expense.

45. CORRECTION OF WORK AFTER FINAL PAYMENT:

Neither the final payment nor certificate nor any provision in this contract shall relieve the Contractor of responsibility for faulty materials or workmanship, and he shall remedy any defects due thereto and pay for any damage to other work resulting therefrom which shall appear within a period of one (1) year from the date of final acceptance. The Owner or Owner's Representative shall give notice of observed defects with reasonable promptness.

46. PAYMENT WITHHELD:

The Owner may, on account of subsequently discovered evidence, withhold or nullify the whole or part of any certificate to such extent as may be necessary to protect himself from loss on account of:

- (a) Defective work not remedied.
- (b) Claims filed or reasonable evidence indicating possible filing of claims.
- (c) Failure of the Contractor to make payments promptly to subcontractors or for material or labor.
- (d) Damage to another contractor.

When the above grounds are removed, or the Contractor provides a surety bond satisfactory to the Owner, which will protect amounts withheld, payment shall be made for amount withheld because of them.

47. TIME OF FILING CLAIM:

It is further agreed by both parties hereto that all questions of dispute or adjustment presented by the Contractor shall be in writing and filed with the Owner's Representative within fifteen (15) days after the Owner's Representative has given any directions, order or instruction to which the Contractor desires to take exception.

The Owner's Representative shall reply to such written exceptions by the Contractor and render his final decision in writing. In case the Contractor should appeal from the decision of the Owner's Representative, any demand for arbitration shall be filed with the Owner's Representative and the Owner in writing within ten (10) days

after the date of delivery to Contractor of the final decision of the Owner's Representative. It is further agreed that final acceptance by the Contractor of the final payment shall be a bar to any claim by either party, except where noted otherwise in the contract documents.

48. ARBITRATION:

All questions of dispute under this agreement shall be submitted to arbitration at the request of either party to the dispute. The parties may agree upon one arbitrator, otherwise, there shall be three; one named in writing by each party and the third chosen by the two arbiters selected; or if the arbitrators fail to select a third within ten (10) days, he shall be chosen by a District Judge, of Galveston County, Texas. Each arbiter shall be a resident of the City of Galveston. Should the party demanding arbitration fail to name an arbiter within ten (10) days, the Owner's Representative shall appoint shall arbiter. Should either party refuse or neglect to supply the arbiters with any papers or information demanded in writing, the arbiters are empowered by both parties to take Ex Parte Proceedings.

The arbiters shall act with promptness. The decision of any two shall be binding on both parties to the contract, unless either or both parties shall appeal within ten (10) days from date of the award by the arbiters, and it is hereby agreed that each party shall have the right for appeal and all proceedings shall be according to and governed by Arbitration Statutes of Texas, being Article 224, et seq., Vernon's Annotated Civil Statutes. **THE DECISION OF THE ARBITERS UPON ANY QUESTION SUBMITTED TO ARBITRATION UNDER THIS CONTRACT SHALL BE A CONDITION PRECEDENT TO ANY RIGHT OF LEGAL ACTION.**

The arbiters, if they deem the case demands it, are authorized to award the party whose contention is sustained, such sums as they deem proper for the time, expense and trouble incident to the appeal, and if the appeal was taken without reasonable cause, they may award damages for any delay occasioned thereby. The arbiters shall fix their own compensation, unless otherwise provided by agreement, and shall assess the costs and charges of the arbitration upon either or both parties. The award of the arbiters must be made in writing and shall not be open to objection on account of the form of proceedings or award.

49. ABANDONMENT BY CONTRACTOR:

In case the Contractor should abandon and fail or refuse to resume work within ten (10) days after written notification from the Owner or the Owner's Representative, or if the Contractor fails to comply with the orders of the Owner's Representative, when such orders are consistent with this contract, this Agreement, or the Specifications hereto attached, then the Surety on the bond shall be notified in writing and directed to complete the work and a copy of said notice shall be delivered to the Contractor.

After receiving said notice of abandonment, the Contractor shall not remove from the work any machinery, equipment, tools, materials, or supplies then on the job, but the same, together with any materials and equipment under the contract for work, may be held for use on the work by the Owner or the Surety of the Contractor, or another contractor, in completion of the work; and the Contractor shall not receive any rental or credit therefor (except when used in connection with Extra Work, where credit shall be allowed as provided for under paragraph 24 of this contract); it being understood that the use of such equipment and materials will ultimately reduce the cost to complete the work and be reflected in the final settlement.

In case the Surety should fail to commence compliance with the notice for completion herein provided for, within ten (10) days after service of such notice, then the Owner may provide for completion of the work in either of the following manners:

- (a) The Owner may employ such force of men, use of machinery, equipment, tools, materials and supplies as said Owner may deem necessary to complete the work and charge the expense of such labor, machinery, equipment, tools, materials and supplies to said Contractor, and the expense so charged shall be deducted and paid by the Owner out of monies as may be due, or that may thereafter at any time become due to the Contractor under and by virtue of this agreement. In case such expense is less than the sum which would have been payable under this contract, if the same had been completed by the Contractor, then said Contractor shall receive the difference. In case such expense is greater than the sum which would have been payable under this contract, if the same had been completed by said Contractor, then the Contractor and/or his Surety shall pay the amount of such excess to the Owner; or
- (b) The Owner, under sealed bids, after notice published as required by law, at least twice a newspaper having a general circulation in the County of location of the work, may let the contract for the completion of the work under substantially the same terms and conditions which are provided in this contract. In case of any increase in cost to the Owner under the new contract, as compared to what would have been the cost under this contract, such increase shall be charged to the Contractor and the Surety shall be and remain bound therefore. However, should the cost to complete any such new contract prove to be less than that which would have been the cost to complete the work under this contract, the Contractor and his Surety shall be credited therewith.

When the work shall have been substantially completed, the Contractor and his Surety shall be so notified and certificates of completion and acceptance, as provided in paragraph 42 hereinabove set forth, shall be issued.

A complete itemized statement of the contract accounts, certified to by the Owner's Representative as being correct shall then be prepared and delivered to Contractor and his Surety, wherein the Contractor or his Surety, or the Owner, as in the case may be, shall pay the balance due, as reflected by said statement, within thirty (30) days after the date of certificates of completion.

In the event the statement of accounts shows that the cost to complete the work is less than that which would have been the cost to the Owner, had the work been completed by the Contractor under the terms of this contract, or when the Contractor and/or his Surety shall pay the balance shown to be due by them to the Owner, then all machinery, equipment, tools, materials or supplies left on the site of the work shall be turned over to the Contractor and/or his Surety. Should the cost to complete the work exceed the contract price, and amount due the Owner within the time designated hereinabove, and there remains any machinery, equipment, tools, materials or supplies on the site of the work, notice thereof, together with an itemized list of such equipment and materials shall be mailed to the Contractor and his Surety, at the respective addresses designated in this contract; provided, however, that actual written notice given in any manner shall satisfy this condition. After mailing, or other giving of such notice, such property shall be held at the risk of the Contractor and his Surety, subject only to the duty of the Owner to exercise ordinary care to protect such property.

After fifteen (15) days from the date of said notice, the Owner may sell such machinery, equipment, tools, materials or supplies and apply the net sum derived from such sale to the credit of the Contractor and his Surety. Such sale may be made at either public or private sale, with or without notice, as the Owner may elect. The Owner shall release any machinery, equipment, tools, materials or supplies which remain on the job site that belong to persons other than the Contractor or Surety, to their proper owners.

50. ABANDONMENT BY OWNER

In case the Owner shall fail to comply with the terms of this contract and should fail or refuse to comply with said terms within ten (10) days after written notification by the Contractor, then the Contractor may suspend or wholly abandon the work, and may remove therefrom all machinery, tools and equipment and all materials on the ground that have not been included in the payments to the Contractor and have not been incorporated into the work. Thereupon, the Owner's Representative shall make an estimate of the total amount earned by the Contractor, which estimate shall include the value of all work actually completed by said Contractor, at the prices stated in the attached proposal, the value of all partially completed work, at fair and equitable price, and the amount of all Extra Work performed at the prices agreed upon or provided for by the terms of this contract, and a reasonable sum to cover the cost of any provisions made by the Contractor to carry the whole work to completion, and which cannot be utilized. The Owner's Representative shall then make a final statement of the balance due the

Contractor by deducting from the above estimate all previous payments by the Owner and all other sums that may be retained by the Owner under the terms of this Agreement, and shall certify same to the Owner who shall pay to the Contractor on or before thirty (30) days after the date of the notification by the Contractor the balance shown by said final statement as due the Contractor, under the terms of this Agreement.

51. BONDS

The successful bidder shall be required to furnish a performance bond and payment bond, in accordance with Article 5160, Vernon's Annotated Civil Statutes, in the amount of 100% of the total contract price, in the event said contract price exceeds \$25,000.00. If the contract price does not exceed \$25,000.00 and payment for work shall be made in one lump sum payment after completion and final acceptance of the work, the statutory bonds will not be required.

All bonds, if required, shall be submitted on forms supplied by the Owner, and executed by an approved surety company authorized to do business in the State of Texas. And it is further agreed that this contract shall not be in effect until such bonds are so furnished.

52. SPECIAL CONDITIONS:

In the event special conditions are contained herein as part of the contract documents and said special conditions conflict with any of the general conditions contained in this contract, then in such event the special conditions shall control.

53. LOSSES FROM NATURAL CAUSES:

Unless otherwise stated herein, all loss or damage to the Contractor arising out of the nature of the work to be done or from unusual obstructions or difficulties which may be encountered in the prosecution of the work, shall be sustained and borne by the Contractor at his own cost and expense.

54. INDEPENDENT CONTRACTOR:

Contractor is and shall remain an independent contractor, with full, complete and exclusive power and authority to direct, supervise, and control his own employees and to determine the method of the performance of the work covered hereby.

The fact that the Owner or Owner's Representative shall have the right to observe Contractor's work during his performance and to carry out the other prerogatives which are expressly reserved to and vested in the Owner or Owner's Representative hereunder, is not intended to and shall not at any time change or affect the status of the Contractor as an

independent contractor, with respect to either the Owner or Owner's Representative or to the Contractor's own employees or to any other person, firm or corporation.

55. CLEANING UP:

The Contractor shall at all times keep the premises free from accumulations of debris caused by the work, and at the completion of the work, he shall remove all such debris and also his tools, scaffolding and surplus materials and shall leave the work area broom clean or its equivalent. The work shall be left in good order and condition. In case of dispute, Owner may remove the debris and charge the cost to the Contractor.

56. CONTRACTOR'S RIGHT TO TERMINATE:

The Contractor shall have the right to terminate the contract at anytime when circumstances beyond the Contractor's control occur, through no fault of the Contractor's, which prohibit the completion of the agreement as contemplated by the parties at the time of execution. Should the Contractor choose to terminate this agreement, except as set forth above, he shall accrue no rights to full payment hereunder and shall receive only a prorata payment for the work actually performed, the amount of such payment to be assessed by Owner. Should the Contractor choose not to terminate even though cause exists under this provision, liquidated damages, as set forth herein, shall in no way be affected.

57. OWNER'S RIGHT TO TERMINATE CONTRACT:

In the event that any of the provisions of this contract are violated by the Contractor, or by any of his subcontractors, the Owner may serve written notice upon the Contractor and the Surety of its intention to terminate this contract. Such notices shall contain the reasons for such intention to terminate the contract; and unless within ten (10) days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement of the correction be made, the contract shall, upon the expiration of said ten (10) days cease and terminate.

In the event of such termination, the Owner shall immediately serve notice thereof upon the Surety and Contractor and the Surety shall the right to take over and perform the contract. Provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, the Owner may take over the work and prosecute the same at the expense of the Contractor and the Contractor and his Surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may take possession of and utilize, in completing the work, such materials, appliances, and plant as may be on the site of the work and necessary therefor.

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Special Conditions of the Agreement

SPECIAL CONDITIONS OF THE AGREEMENT

1. ABBREVIATIONS DEFINED:

Abbreviations, wherever used in the various documents of the contract, are defined as follows:

Abbreviations

AASHTO	American Association of State Highway and Transportation Officials	Kg.	Kilogram
		Lb.	Pound
		LF	Linear Foot or Feet
		M	Meter
ACI	American Concrete Institute	Max.	Maximum
		MH	Manhole
AIEE	American Institute of Electrical Engineers	Min.	Minute
		mm	Millimeter
		Mono.	Monolithic
AISC	American Institute of Steel Construction	No.	Number
		OD	Outside Diameter
		%	Percent
API	American Petroleum Institute	PI	Plasticity Index
ASA	American Standards Association	psi	Pounds Per Square Inch
Asph.	Asphalt	PVC	Polyvinyl Chloride
		R	Radius
ASTM	American Society of Testing and Materials	Reinf.	Reinforce or Reinforcing
		Rem.	Remove
AT&SF	Atchison, Topek and Santa Fe Railroad	Rep.	Replace
		R/W)
		R of W) Right of Way
Ave.	Avenue	ROW)
AWS	American Welding Society	San.	Sanitary
AWWA	American Waterworks Association	Sec.	Second
		Sq.	Square
		St.	Street
Blvd.	Boulevard	Std.	Standard
CI	Cast Iron	SWBT	Southwestern Bell Telephone Company
CL	Center Line		
cm	Centimeter	SY	Square Yard
CO	Cleanout	SUG	Southern Union Gas Company
Conc.	Concrete	SDHPT	Texas State Department of Highways and
Cond.	Conduit		
		um	Micrometers
CGMP	Corrugated Metal Pipe	Vert.	Vertical
Cu.	Cubic	Vol.	Volume
Culv.	Culvert	WUT	Western Union Telegraph Company
		Yd.	Yard

Abbreviations - Cont.

CY	Cubic Yard
Dia.	Diameter
Dr.	Driveway
Elev.	Elevation
F	Fahrenheit
FS	Federal Specifications
Ft. or '	Foot or Feet
Gal.	Gallon
H L & P	Houston Lighting & Power Co.
HP	Horsepower
Hr.	Hour
ID	Inside Diameter
In. or "	Inch or Inches
IPCEA	Insulated Power Cable Engineers Association

2. MEASUREMENT:

Measurements required for construction or for determination of pay quantities shall be in accordance with the United States Standards Measurements and Weights.

3. DATE OF SPECIFICATIONS:

All reference to standard specifications or manufacturer's installation directions shall mean the latest edition thereof.

4. FIGURED DIMENSIONS TO GOVERN:

Dimensions and elevations indicated on the drawings shall be accurately followed even though different from scaled measurements. No work indicated on the drawings, the dimensions of which are not indicated, shall be executed until dimensions have been obtained from the Engineer.

5. CONTRACTOR TO CHECK DRAWINGS AND SCHEDULES:

The Contractor shall check all dimensions, elevations, and quantities indicated on the drawings and schedules furnished to him by the Engineer, and shall notify the Engineer of any discrepancy between the drawings and the conditions on the ground, or any error or omission in drawings, or in the layouts as given by stakes, points, or instructions which he may discover in the course of the work. The Contractor will not be allowed to take advantage of any error or omission in the drawings or contract documents.

Full instructions will be furnished by the Engineer should such an error or omission be discovered and the Contractor carry out such instructions as if originally specified.

6. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES:

Shop drawings are drawings, diagrams, schedules and other data specifically prepared for the work by the Contractor or any subcontractor, manufacturer, supplier or distributor to illustrate some portion of the work.

Product data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product or system for some portion of the work.

Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the work shall be judged.

The Contractor shall provide, review, approve, and submit, with reasonable promptness and in such sequence as to cause no delay in the work or in the work of the Owner or any separate Contractor, all shop drawings, product data and samples required by the contract documents.

By approving and submitting shop drawings, product data, and samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or shall do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the work and of the contract documents.

As the Engineer's review is only for general conformance with the requirements of the contract documents, the Contractor shall not be relieved of responsibility for any deviation from the requirements of the contract documents by the Engineer's approval of shop drawings, product data or samples, unless the Contractor has specifically informed the Engineer, in writing, of such deviation at the time of submission and the Engineer has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the shop drawings, product data or samples by the Engineer's approval thereof. The Contractor shall direct specific attention, in writing or on resubmitted shop drawings, product data or samples, to revisions other than those requested by the Engineer on previous submittals.

The Contractor shall be responsible for delays caused by rejection of the submittal of inadequate or incorrect shop drawings, product data or samples. The Contractor shall be responsible for seeing that any "approved" copies of shop drawings bearing the approval of the Engineer are allowed on the job site. The Contractor shall be responsible for providing all copies of approved shop drawings necessary for the construction operation.

The Contractor shall keep adequate records of submittals and approvals so that an accurate up-to-date record file is maintained at the job site at all times.

11. UTILITY SERVICE FOR CONSTRUCTION:

Contractor is to contract for all utility service required for the construction of this project, and pay charges for same directly to utility company involved. Operate no fire hydrants without first having a meter from the City of Galveston and having placed this meter on the hydrant. Operate fire hydrant only with an approved hydrant wrench.

12. RIGHTS OF WAY AND EASEMENTS:

The Owner will furnish all right-of-way easements required for the proposed work.

13. LOCATION OF AND DAMAGE TO EXISTING UTILITIES:

The Contractor shall exercise caution to prevent damage to existing utilities during the progress of the construction work, taking care to locate same, where possible, in advance of the actual work. The Engineer will render assistance to the Contractor in the matter of determining the location of existing utilities by making such maps, records and other information as may be accessible to him, when requested to do so, but the accuracy of such information will not be guaranteed. The Contractor shall make good all damage to existing utilities resulting from his operations.

Where a pipe, duct or other structure of a utility is exposed, which in the opinion of the Engineer requires strengthening, altering or moving, the Contractor shall perform such work on same as the Engineer may order, which will be paid for as extra work in accordance with the terms of the contract relating to extra work.

Should the Contractor, in the laying out of his work, encounter any pipe, underground utility, or structure, the location of which has not been furnished to him by the Engineer, he shall bring such conditions to the attention of the Engineer for his determination of the method to be used to remove or bypass obstructions.

14. PROTECTION AND REPLACEMENT OF PROPERTY:

Where necessary, Contractor shall take down signs or other obstructions, replace in their original condition and restore damaged property or make satisfactory restitution at no cost to the Owner.

15. SIGNS AND BARRICADES:

All signs, barricades and other warning devices used to guide, warn or protect traffic in, around and through the construction area shall be

provided and maintained by the Contractor in a manner suitable to and/or as directed by the Engineer. - All such signs, barricades and warning devices shall conform to the Texas Manual on Uniform Traffic Control Devices, Part VI.

16. USE OF STREETS:

A. The Contractor will be permitted to erect such barricades as he feels necessary to prohibit the encroachment of vehicular and/or pedestrian travel within the work and/or or storage area, provided that no barricades shall be erected to obstruct the free passage to traffic in any alley or street without the approval of the Director of Traffic and Transportation.

2

B. Will not block ditches, inlets, fire hydrants, driveways, etc. without advance approval. Where necessary, provide temporary drainage.

17. LIQUIDATED DAMAGES:

As provided in Paragraph 33 of the General Conditions of the Agreement, the sum stipulated as liquidated damages for this contract is listed on the following below:

For Amount of Contract		Amount of Liquidated Damages Per Calender Day
From More Than	To and Including	
\$ 0	\$ 25,000	\$ 63
25,000	50,000	105
50,000	100,000	154
100,000	500,000	210
500,000	1,000,000	315
1,000,000	2,000,000	420
2,000,000	5,000,000	630
5,000,000	10,000,000	840
10,000,000	15,000,000	1,050
15,000,000	20,000,000	1,260
20,000,000	Over 20,000,000	1,500

18. GENERAL PREVAILING WAGE RATES:

The City of Galveston has adopted the following schedule of general prevailing rate of per diem wages which establish the minimum wages which may be paid for labor under this contract:

Laborer \$5.68

Pipelayer	\$6.59
Pipelayer helper	\$5.68
Equipment Operator	\$5.90
Mechanic	\$6.34

The bidder's attention is directed to the provisions of Article 5159a, Vernon's Annotated Civil Statutes, and the requirements contained therein concerning such wage scales and payments by the contractor of the prevailing rates of wages as heretofore established by the City of Galveston.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5 (a) (1) (11)).

Notice of Acceptance

NOTICE OF ACCEPTANCE

TO:

(Name of Bidder)

(Address of Bidder)

(City and State of Bidder)

The City of Galveston, having considered the proposals submitted and opened on the _____ day of _____, 19____, for work to be done and materials to be furnished in and for:

as set forth in detail in the Specifications, Plans and Contract Documents for such work for the City of Galveston, it appearing that your proposal is fair, equitable and to the best interest of said City, please take notice that said proposal was accepted by the City Council of the City of Galveston on the _____ day of _____, 19____, at the bid price contained therein, subject to the execution of and furnishing of all contract documents specified and required to be executed and furnished under the contract documents. It will be necessary for you to execute and furnish to the City of Galveston all such documents within ten (10) days from your receipt of this notice.

The five percent (5%) bid security, submitted with your proposal, will be returned upon the execution of such contract documents and bonds within the above specified ten (10) day period. In the event you should fail to execute and furnish such contract documents and bonds within the time limit specified, said bid security will be retained by the City of Galveston.

CITY OF GALVESTON, TEXAS

Owner's Representative

Notice to Proceed

TO: _____ (Bidder) _____ (DATE)

_____ (Address)

_____ (City, State, Zip)

REF: _____

The City of Galveston, after having received and reviewed all the required executed bonds (if any) and insurance certificates as specified in the contract documents hereby notifies the bidder listed above that he is to commence work on said project, as specified, within ten (10) calendar days upon receipt of this notice. This is formal notification to commence with the work.

Before work is started, be sure to check with Housing Department to obtain any required permits.

CITY OF GALVESTON, TEXAS

(Owner's Representative)

Advertisement for Bids

**NOTICE TO BIDDERS FOR THE INTENTION OF THE CITY OF GALVESTON, TEXAS
TO LET CONTRACT FOR BEACH NOURISHMENT PROJECT**

Sealed proposals, prepared in duplicate, addressed to the City Purchasing Supervisor, Room 302, City Hall, 823 Rosenberg, Galveston, Texas 77550, will be received until 2:00 P.M. MONDAY, SEPTEMBER 26, 1994 to furnish all labor, equipment, materials and supervision necessary for the following project:

GALVESTON, TEXAS BEACH NOURISHMENT PROJECT

in accordance with the plans and specifications on file at City Hall.

A pre-bid conference will be held at 2:00 P.M., on Wednesday, September 14, 1994 at the City Manager's Conference Room, room #105, City Hall, 823 Rosenberg, Galveston, Tx. **All interested bid submitters are required to attend.**

The plans, specifications, proposal forms and contract documents may be examined without cost at the Purchasing Supervisor, at the above address. The plans may be obtained upon payment of \$100.00. Plans and specifications costs are refundable to qualified bidders who return undamaged sets within five (5) calendar days after Council awards contract to successful bidder.

A certified or cashier's check, or an acceptable bid bond from a bonding company licensed to do business in the state of Texas, in an amount not less than five percent (5%) of the total bid shall accompany each bid as a guaranty that, if awarded the contract, the bidder will promptly enter into a contract with the City of Galveston, Texas and furnish necessary performance and payment bonds, each in the amount of the contract, as required by state law.

Bidders are expected to inspect the site of the work and to inform themselves of all local conditions under which the work is to be done.

Bidders will be allowed to modify or withdraw bids prior to the scheduled closing time for receipt of bids. However, no bid received after the scheduled closing time for receipt of bids will be accepted or opened.

No bid may be withdrawn after the scheduled closing time for receipt of bids for at least 180 calendar days.

In case of ambiguity or lack of clearness stating the price in the bids, the City of Galveston reserves the right to consider the most advantageous construction thereof, or to reject the bid. The City reserves the right to reject any and all bids and to waive any informality in the bids.

Luis J. Cervantes
Purchasing Supervisor
City of Galveston, Tx.

GALVESTON TEXAS

BEACH NOURISHMENT PROJECT

**SUPPLEMENTAL GENERAL
SPECIFICATIONS**

SUPPLEMENTAL GENERAL SPECIFICATIONS

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**GALVESTON, TEXAS
BEACH NOURISHMENT PROJECT
SUPPLEMENTAL GENERAL SPECIFICATIONS**

1.A. BID ALTERNATES.

The CONTRACTOR is requested to bid on six (6) alternates which relate to time of construction and borrow area location. These alternates are summarized as follows:

Alternate I - Begin work on or about October 1, 1994.

- I.A. Obtain all required beach fill material from borrow area 3 with the depth of cut limitations as shown in the drawings. *where*
- I.B. Obtain all required beach fill material from the designated areas of borrow area 1 with the depth of cut limitations as shown on the drawings.
- I.C. Obtain all required beach fill material from the designated areas of borrow areas 1 and 3 with the depth of cut limitations as shown on the drawings.

Alternate II - Begin work on or about January 1, 1995.

- II.A. Obtain all required beach fill material from borrow area 3 with the depth of cut limitations as shown in the drawings.
- II.B. Obtain all required beach fill material from the designated areas of borrow area 1 with the depth of cut limitations as shown on the drawings.
- II.C. Obtain all required beach fill material from the designated areas of borrow areas 1 and 3 with the depth of cut limitations as shown on the drawings.

1. COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK.

This item is covered in paragraph 4 of the Instructions to Bidders. The time stated for completion shall include final clean up of premises.

2. CONFLICTS.

To the extent that there is an express conflict between the Supplemental General Specifications and the remainder of the contract documents the Supplemental General Specifications or modifications hereto will control. Otherwise the Supplemental General Specifications are supplementary to the other contract documents.

3. CONTRACT QUANTITIES.

Potential bidders are advised that the beach fill quantity (currently estimated at 710,000 cubic yards) may be adjusted by the OWNER through the CONSULTANT without renegotiation. The OWNER will not consider the terms of the Contract as being satisfied unless at least ninety-five percent (95%) of the final design quantity is placed onto the beach and the fill is distributed so that each acceptance section contains not less than eighty-five percent (85%) of its design quantity.

4. CONSTRUCTION OFFICE.

The CONTRACTOR shall maintain, within the general project area, a construction office which shall be kept open during daytime working hours (at a minimum) while construction is underway.

5. PHYSICAL DATA.

5.1 The physical conditions indicated on the drawings and in the specifications are the results of site investigations using surveys, discrete depth measurements and vibracore sand sampler. When the indicated physical conditions are the result of site investigations by vibracore sand sampler, the sampling locations are shown on the drawings. While the OWNER'S vibracore samples may be representative of subsurface conditions at their respective locations and vertical reaches, local variations characteristic of the subsurface materials of this region are to be expected. Should any questions or discrepancies arise, the conditions should be independently confirmed by the CONTRACTOR.

5.2 Weather Conditions. The project area is subject to tropical storms and hurricanes from June through November, and to windy and/or rainy weather, including severe electrical storms, during any time of the year. It shall be the Contractor's responsibility to obtain information concerning rain, wind and wave conditions that could influence his dredging and disposal operations. Reference is made to the following publications which contain climatological and meteorological observations and data.

5.2.1 Local Climatological Data - Monthly Summary published by NOAA, Asheville, NC. Subscription price and ordering information available from the National Climatic Data Center, Federal Building, Asheville, NC 22801. This publication gives hourly wind speed and direction observations. The Annual Summary gives a summary of the observations for the period of record.

5.2.2 United States Coast Pilot Gulf of Mexico, Puerto Rico and Virgin Islands published by NOAA. For sale by National Ocean Service and its agents.

5.2.3 Summary of Synoptic Meteorological Observations: North American Coastal Marine Areas Atlantic and Gulf Coasts. Produced by Naval Weather Service, U.S. Department of Commerce. Distributed by National Technical Information Service, U.S. Department of Commerce.

5.2.4 Wave hindcast data is available at the Corps of Engineers, Galveston District Office, as "Wave Information Study, Gulf of Mexico Hindcast Wave Information" produced by the U.S. Army Corps of Engineers, Waterways Experiment Station, Coastal Engineering Research Center. Data from Station 11 reflects twenty (20) years of computer modeled wave data, at a station located in 60 feet of water offshore of Galveston. Data is available for the period January 1956 - December 1975.

5.3 Transportation Facilities. Access to the beach, pipeline route, and borrow area will be as noted in the drawings and other locations approved by the OWNER.

5.4 Boat Traffic. Boat traffic in the vicinity of the project site and borrow area will consist of pleasure and fishing boats, and commercial vessels.

5.5 Obstruction of Channel. The CONTRACTOR will be required to operate in compliance with pertinent U.S. Coast Guard regulations and to conduct the work in such a manner as to minimize any obstruction to navigation. If the CONTRACTOR's plant so obstructs any navigation channel as to make difficult or endanger the passage of vessels, said plant shall be promptly moved on the approach of any vessel to such an extent as may be necessary to afford a practicable passage. Upon completion of the work, the CONTRACTOR shall promptly remove his plant, including ranges, buoys, piles and other marks or objects placed in navigable waters or on shore.

6. LAYOUT OF WORK FOR BEACH FILL PLACEMENT.

6.1 U.S. Army Corps of Engineers (USACE) beach profiles will be used at minimum for measurement of the fill. The CONTRACTOR shall perform additional surveys he deems necessary, but must include the USACE profiles in both pre and post-construction surveys to be used for computation of fill quantities. Data as provided by the USACE, Galveston District is shown in the Contract Drawings.

6.2 From the monuments, control data and elevations shown on the Contract Drawings, the CONTRACTOR shall complete the layout of the work and shall be responsible for all measurements that may be required for the execution of the layout of the work, subject to such modifications as the CONSULTANT may require to meet changed conditions or as a result of necessary modifications to the contract work.

6.3 The CONTRACTOR shall furnish, at his own expense, such stakes, templates, platforms, equipment, tools and material, and all labor as may be required in laying out any part of the work from the monuments, control data and elevations established by the

CONSULTANT. It shall be the responsibility of the CONTRACTOR to maintain and preserve all monuments, stakes and other marks established by the CONSULTANT unless and until authorized to remove them, and if such marks are destroyed by the CONTRACTOR or through CONTRACTOR negligence, prior to their authorized removal, they may be replaced by the CONSULTANT at his discretion, and the expense of replacement will be deducted from any amounts due or to become due the CONTRACTOR. All temporary marking stakes (including grade stakes) placed by the CONTRACTOR must be completely removed upon completion of the project. All grade stakes shall be steel pipe which shall be completely removed immediately after acceptance of the beach fill.

6.4 The CONTRACTOR shall not disturb permanent markers or monuments. Disturbed, damaged or destroyed monuments will be replaced by the CONSULTANT, at his discretion, and the expense of replacement will be deducted from any amounts due, or to become due to the CONTRACTOR.

7. PAYMENT FOR MOBILIZATION AND DEMOBILIZATION FOR BEACH FILL PLACEMENT.

7.1 All costs connected with the mobilization and demobilization of all the CONTRACTOR's plant and equipment, including dredge plant and equipment, if used, will be paid for at the contract lump sum price for this item. Sixty percent (60%) of the lump sum price will be paid to the CONTRACTOR after commencement of dredging and placing a quantity of at least ten thousand (10,000) cubic yards on the beach in a twenty-four (24) hour period (or less time). CONTRACTOR's survey records may be used to assess the required dredge rate and the CONSULTANT, at his discretion, may verify the survey results. The remaining forty percent (40%) will be included in the final payment for work under this Contract.

7.2 In the event the CONSULTANT considers that the amount in this item (60%), which represents mobilization, does not bear a reasonable relation to the cost of the work in this contract, the CONSULTANT may require the CONTRACTOR to produce cost data to justify this portion of the bid. Failure to justify such price to the satisfaction of the CONSULTANT will result in payment of actual mobilization costs, as determined by the CONSULTANT at the completion of mobilization, and payment of the remainder of this item in the final payment under this Contract. The determination of the CONSULTANT is not subject to appeal.

8. ACCEPTANCE AND PAYMENT FOR BEACH FILL PLACEMENT.

8.1 Payment. All costs connected with debris removal, excavating, transporting, and constructing the beach fill shall be included in the contract unit price per cubic yard given under Item No. 2, Beach Fill, on the Schedule of Prices Bid, which payment shall also include all other items of overhead, profit, labor, material and any other costs incident to performing the Work.

8.2 Progress Payment. Monthly progress payments shall be based on 100% of completed acceptance sections which have been approved by the CONSULTANT, based on acceptance surveys by the CONTRACTOR under the supervision of the CONSULTANT or OWNER. An acceptance section will consist of the distance between adjacent groins except the easternmost section which will extend from groin 1A to profile line 11 and from profile line 11 to groin 2. Progress payments will be subject to retainage as per paragraph 41 of the General Conditions of the Agreement.

8.3 Measurement. Quantities of beach fill satisfactorily placed and meeting design template requirements will be computed for payment by use of the average end-area method. For the purposes of progress payments, the CONTRACTOR may perform progress surveys and make the computations as are necessary to determine the quantities placed during each period for which a progress payment is to be made. These progress surveys will be conducted by the CONTRACTOR at his own cost. All surveys will be supervised, reviewed, and signed and sealed by a Texas State Registered Land Surveyor. All field notes, computations and the records used by the CONTRACTOR to compute the progress payment fill quantity shall be furnished to the CONSULTANT with the Application for Payment. Unless waived in each specific use, quantity surveys made by the CONTRACTOR shall be made under the observation of a representative of the CONSULTANT. Acceptance profiles and final quantity calculations will be performed by the CONTRACTOR under the supervision of the CONSULTANT or OWNER. All acceptance surveys shall be reference to the survey baseline shown in the plans. All field notes in the form of station, range, and elevation shall be supplied to the CONSULTANT for pay volume determination. Field notes shall be dated and clearly legible.

Pre-construction surveys will be conducted by the CONTRACTOR prior to commencement of dredging. The CONTRACTOR must provide the CONSULTANT with pre-construction profile data a minimum of seven (7) days prior to the commencement of dredging so that fill placement locations can be confirmed or adjusted within the fill area. The basis of measurement will be the comparison of the pre-construction profiles and the acceptance profiles. From the gross quantities so determined, the quantity of fill materials lying above the template shown in the Contract Drawings will be deducted and the net amount used for payment.

8.4 Survey Requirements. The existing monumentation control, elevation and line azimuths are shown in the drawings. The USACE profile lines to be used for computation of fill quantities shall be surveyed from the top of the seawall across the beach and offshore to an -18 foot (NGVD) elevation. Line azimuths will be perpendicular to the seawall at each profile line.

Surveys conducted of the USACE profile lines by the CONTRACTOR shall be conducted in accordance with the following standards:

- (1) Beach profiles shall be conducted by differential leveling techniques from the back beach across the profile to approximately 300 feet from the shoreline to a

depth of 5 to 6 feet (NGVD). Offshore surveys shall be conducted by the CONTRACTOR using standard electronic positioning and hydrographic surveying equipment and techniques. The CONTRACTOR shall utilize electronic positioning equipment which has at least an accuracy of ± 3 feet. If a range-range positioning system is used, shore stations must be set to ensure cut angles are less than 150° and greater than 30° . Location of shore control stations for the beach profile must be approved by the CONSULTANT prior to the beach profile surveys.

- (2) A sufficient number of points will be taken along each line to ensure adequate description of all topographic features, and major breaks in slope, including dunes, beach berms, foreshore, and bar and trough systems, with a maximum elevation difference of approximately 1 ft. between adjacent points. The product will be a continuous line representing the beach/ocean bottom profile.
- (3) Profile lines shall be taken along azimuth perpendicular to the seawall. All data points will be within 30 feet of the established profile line. Data points obtained offshore by bathymetric survey methods (i.e., fathometer) shall be taken at a spacing of no more than 20 feet.
- (4) Offshore survey elevations will be measured to the nearest 0.1 ft. referenced to NGVD datum. To ensure this accuracy is maintained, the fathometer shall be calibrated at the start of each survey day, periodically throughout the survey, at the end of each paper roll and the end of each day. Survey vessel settlement and squat should be determined at survey speeds and applied to correct the water depth measurements. Equipment and procedures must be approved by the ENGINEER prior to conducting the survey. Positioning equipment shall be interfaced with a computer system which provides navigation information to the helmsman and simultaneously stores location and depth data.
- (5) Tides shall be measured with an electronic tide gauge placed within the project area in a location approved by the ENGINEER and data used to correct water depth measurements. The electronic tide gauge data shall be checked by several manual tide staff readings using a stilling well while conducting the offshore bathymetric surveys.
- (6) Deliverables to the CONSULTANT shall include processed survey data of range, station and elevation from each of the USACE profile baseline monuments in a hard copy form and on $5\frac{1}{4}$ " floppy disk in ASCII format. Additional information to be provided to the CONSULTANT shall include tide curves and corrections, field notes and a $1" = 200'$ plan view plot showing proposed profile line and surveyed trackline.

9. CONTRACTOR QUALITY CONTROL.

9.1 The CONTRACTOR is responsible for quality control and shall provide and maintain an effective quality control program.

9.2 The CONTRACTOR shall establish a quality control system to perform sufficient inspections and tests of all items of work, including that of his subcontractors, and to insure conformance to applicable specifications and drawings with respect to the materials, workmanship, construction, finish, functional performance and identification. This control will be established for all construction except where the technical provisions of the contract provide for specific OWNER or CONSULTANT control by inspections, tests or other means. The CONTRACTOR's quality control system will specifically include the surveillance and tests required in the Technical Specifications.

9.3 The CONTRACTOR's quality control system is the means by which he assures himself that his construction complies with the requirements of the Contract Documents. The controls shall be adequate to cover all construction operations and shall be keyed to the proposed construction sequence.

9.4 The CONTRACTOR's job supervisory staff may be used for quality control, supplemented as necessary by additional personnel for surveillance, by special technicians, or by testing facilities to provide capability for the controls required by the Technical Specifications.

9.5 The CONTRACTOR shall furnish to the OWNER within five (5) days after receipt of the "Notice to Proceed" a written quality control plan which shall include the procedures, instructions, and reports to be used. This document will include as a minimum:

- (a) The quality control organization.
- (b) The number and qualifications of personnel to be used for this purpose.
- (c) Authority and responsibility of quality control personnel.
- (d) Methods of quality control including that for his subcontractor's work. The methods shall include items to be inspected, types of inspections, duties of personnel, and methods the CONTRACTOR proposes to use to assure quality work.
- (e) Method of documenting quality control operations, inspection and testing.
- (f) Safety inspection procedures including employees responsible for supervising accident prevention activities and insuring compliance with safety measurements.

(g) Written instructions to the CONTRACTOR's representative responsible for quality control outlining his duties and responsibilities and signed by a responsible officer of the firm.

(h) A copy of daily quality control report forms and other inspection documents that are to be furnished to the CONSULTANT daily. A sample "Daily Quality Control Report" is included as an Appendix to the Supplemental General Specifications.

9.6 After the Contract is awarded and before construction operations are started, the CONTRACTOR shall meet with the CONSULTANT or his representative at the CONSULTANT's office and discuss quality control requirements. This shall be referred to as a pre-construction conference. The meeting shall develop mutual understanding relative to details of the system, including the forms to be used for recording the quality control operations, inspections, daily reports, administration of the system and the interrelationship of the CONTRACTOR, CONSULTANT and OWNER and their respective inspectors.

9.7 Unless specifically authorized by the CONSULTANT, no construction will be started until the CONTRACTOR's quality control plan is approved by the CONSULTANT.

9.8 All compliance inspections will be recorded on the Daily Quality Control Report, including but not limited to the specific items required in each technical section of the specifications. This form shall include records of corrective action taken and shall be furnished to the CONSULTANT daily.

9.9 If recurring deficiencies in an item or items indicate that the quality control system is not adequate, the CONTRACTOR shall undertake such corrective actions as directed by the CONSULTANT.

9.10 No separate payment will be made for CONTRACTOR quality control. It shall be subsidiary obligation or field overhead cost, in the same category as control supervision.

10. CONSULTANT'S SITE VISITS.

10.1 The CONSULTANT may direct the maintenance of the gauges, ranges, location marks, and limit marks in proper order and position, but the presence of the CONSULTANT shall not relieve the CONTRACTOR of responsibility for the proper execution of the work in accordance with the specifications. The CONSULTANT shall have unlimited access to the plant, pipeline access, and beach. The CONTRACTOR will be required to furnish, at the request of the CONSULTANT or OWNER suitable transportation from the shore to and from the various pieces of plant, to and from the

spoil site (beach fill area), and as required in the Environmental Protection section of the Technical Specifications.

10.2 Should the CONTRACTOR refuse, neglect or delay compliance with these requirements, the specific facilities may be furnished and maintained by the CONSULTANT and the cost thereof will be deducted from any amounts due or to become due the CONTRACTOR.

11. SUPERINTENDENT.

11.1 The CONTRACTOR shall designate, in writing to the OWNER, a superintendent(s) to receive the OWNER's instructions from the CONSULTANT. Said instructions, once received by the CONTRACTOR's superintendent(s), will be legally binding on the CONTRACTOR pursuant to this Contract. A Superintendent(s) of the CONTRACTOR must be on the site at all times during project construction or otherwise make himself available to the CONSULTANT.

12. PLANT FOR BEACH FILL PLACEMENT.

12.1 The CONTRACTOR agrees to keep on the job a sufficient dredging plant and equipment to meet the requirements of the work. The plant shall be in satisfactory operating condition and capable of safely and efficiently performing the work as set forth in the Contract Documents and the plant shall be subject to inspection by the CONSULTANT at all times. The plant shall be of sufficient size and capacity to complete the work in a timely manner. The plant listed on the Plant and Equipment Schedule, is the minimum which the CONTRACTOR agrees to place on the job unless otherwise determined by the CONSULTANT, and its listing thereon is not to be construed as an agreement on the part of the OWNER that it is adequate for the performance of the work.

12.2 All scows and vessels must be kept in good condition, the coamings repaired and the pockets provided with proper doors or appliances to prevent leakage of material.

12.3 All pipelines for hydraulic machines must be kept in good condition at all times and any leaks or breaks along their length must be promptly and properly repaired.

12.4 No reduction in the capacity of the plant employed on the work shall be made except by written permission of the CONSULTANT. The measure of the "capacity of the plant" shall be its actual performance on the work to which these specifications apply. The CONSULTANT, at his discretion, may order a field test of the capacity of the plant. If the plant, in the CONSULTANT's opinion, is not of sufficient capacity, the CONSULTANT may direct the CONTRACTOR to replace the plant with a larger capacity plant.

13. MISPLACED MATERIAL.

Should the CONTRACTOR, during the progress of the work, lose, dump, throw overboard, sink, or misplace any material, plant, machinery, or appliance, which in the opinion of the CONSULTANT should be removed, the CONTRACTOR shall recover and remove the same with the utmost dispatch. The CONTRACTOR shall give immediate notice, with description and location of such obstructions, to the CONSULTANT or inspector. Should the CONSULTANT discover such obstruction, the CONSULTANT will mark or buoy the obstruction and notify the CONTRACTOR of its location. Removal of the obstruction shall be the responsibility of the CONTRACTOR and cost of the removal will be paid for by the CONTRACTOR. Costs will include the cost for CONSULTANT to observe their removal operation. CONSULTANT's cost will be deducted from the final contract payment. Should the CONTRACTOR refuse, neglect, or delay compliance with the above requirements, such obstructions may be removed by the OWNER, and the cost of such removal may be deducted from any money due or to become due to the CONTRACTOR or may be recovered under his bond. The liability of the CONTRACTOR for the removal of a vessel wrecked or sunk without fault or negligence shall be limited to that provided in Sections 15, 19, and 20 of the River and Harbor Act of March 3, 1899 (33-U.S.C. 410 et.seq.).

14. FINAL CLEAN-UP.

Final clean-up shall include the removal of the CONTRACTOR's plant and all equipment or materials either for disposal or reuse. Plant and/or equipment or materials to be disposed of shall only be disposed of in a manner and at locations approved by the OWNER. Unless otherwise approved in writing by the OWNER, the CONTRACTOR will not be permitted to abandon pipelines, pipeline supports, pontoons, or other equipment in the disposal area, pipeline access areas, water areas, or other areas adjacent to the work site. Any stakes or other markers placed by the CONTRACTOR must be removed as a part of the final clean-up. Grades stakes placed during the fill operation shall be completely removed and shall not be left buried in the fill.

15. RESTRICTION OF PUBLIC ACCESS.

The CONTRACTOR shall be required to erect, maintain, and move as necessary, a restrictive barrier around the discharge of his hydraulic pipeline. The barrier shall be constructed so as to prevent the public from approaching the discharge from any direction closer than 100 feet. The CONTRACTOR shall post signs in a conspicuous manner stating, "**DANGER - HIGH PRESSURE DISCHARGE FROM DREDGE.**" The CONTRACTOR shall be required to prevent any public access to the end of the dredge discharge pipeline.

16. PROJECT SIGN.

The CONTRACTOR shall furnish and erect a sign at the project site. The sign shall be made of 3/4 inch plywood in accordance with sketches provided by the CONSULTANT. Sign will be placed at a location directed by the CONSULTANT.

17. SIGNAL LIGHTS.

The CONTRACTOR shall display signal lights and conduct his operations in accordance with the General Regulations of the Department of the Army and of the U.S. Coast Guard governing lights and day signals to be displayed by towing vessels with tows on which no signals can be displayed, vessels working on wrecks, dredges and vessels engaged in laying cables or pipes or in submarine or bank protection operations, lights to be displayed on dredge pipeline and day signals to be displayed by vessels of more than 65 feet in length moored or anchored in a fairway or channel and the passing by other vessels or floating plant working navigable channels, as approved by the Secretary of the Army and Commandant, U.S. Coast Guard. (33 C.F.R. 80.18 - 8-31a; 33 C.F.R. 95.51 - 95.66; 33 C.F.R. 9.22 - 90.36; 33 C.F.R. 82 and C.G. Pub. 169, Navigation Rules, International-Inland dated May 1 1977) (DAR 7-603.33).

18. NOTICE TO MARINERS.

Should the CONTRACTOR, during dredging operations, encounter any objects on the ocean , gulf, or channel bottom which could be a hazard to navigation, he will notify the CONSULTANT immediately as to the location of said object and any other pertinent information necessary for the CONTRACTOR to put out a Notice to Mariners.

19. PERMITS, EASEMENTS AND LICENSES.

The OWNER will obtain the Texas Sand, Shell, Gravel, and Marl permit, Texas Coastal Land Use easement, and the U.S. Army Corps of Engineers (USACE) permit. Any other licenses or approvals required for the prosecution of the work shall be secured and paid for by the CONTRACTOR as specified in Item 6.13 of the General Specifications. The CONTRACTOR shall obtain any and all U.S. Coast Guard dredge certifications and/or approvals. Copies of U.S. Coast Guard certification or approval must be provided at the time of award. Permits and licenses required of the CONTRACTOR include, but are not limited to, those listed above.

20. PUMPING OF BILGES.

CONTRACTORS are warned that pumping oil or bilge water containing oil into navigable water or into areas which would permit the oil to flow into such waters, is prohibited by Section 13 of the Rivers and Harbors Act of 1899 approved March 3, 1899 (30 Stat. 1152; 33 U.S.C. 407). Violation of this prohibition is subject to penalties provided for under the referenced acts.

21. ELECTRICITY.

All electric current required by the CONTRACTOR shall be furnished at his own expense. All temporary connections for electricity shall comply with NEC 1990. In the event electricity is made available by the OWNER, the CONTRACTOR shall at his own expense, install a meter to determine the amount of current used by him and such electricity will be paid or charged to the CONTRACTOR at prevailing rates or at reasonable rates as determined by the OWNER. All temporary lines will be furnished, installed, connected, and maintained by the

CONTRACTOR in a workmanlike manner satisfactory to the OWNER and shall be removed by the CONTRACTOR in like manner at his expense prior to completion of the construction.

In accordance with NEC Article 305-6, the CONTRACTOR shall provide ground fault circuit interruption (GFCI) on all 120 volt 15 and 20 ampere, single phase receptacles used for construction power. Ground fault circuit interrupters are not an acceptable substitute for grounding.

22. FIRE EXTINGUISHER-MOBILE CONSTRUCTION EQUIPMENT.

The CONTRACTOR is specifically required to provide a fire extinguisher on all mobile construction equipment with a basic minimum extinguisher rating of 20-B:C; which is equivalent to a 10-15 pound dry chemical extinguisher, compatible to the hazard involved --- combustible, flammable liquids and materials used in areas remote to other fire extinguisher equipment.

23. PROTECTION OF WORK.

23.1 Property. The CONTRACTOR shall, at its own cost and expense, support and protect all public or private property that may be encountered or endangered in the prosecution of the Work herein contemplated. The CONTRACTOR shall repair to its original condition and make good any damage caused to any such property by reason of its operation.

23.2 Risk of Loss. The Work and everything pertaining thereto shall be performed at the sole risk and cost of the CONTRACTOR from commencement until final payment by the OWNER. Any specific references contained in the Contract Documents, including the Specifications, that the CONTRACTOR shall be responsible at its sole risk and cost for the Work or any part thereof are not intended to be, nor shall they be construed to be, an exclusive listing of the circumstances in which the CONTRACTOR bears the risk of loss, but rather they are intended only to be exemplary.

All loss or damage arising out of the nature of the Work, or from the action of the elements, or from hurricanes, tropical storms, or from any unusual obstruction or difficulty, or any other natural or existing circumstances either known or unforeseen, that may be encountered in the prosecution of the Work, shall be sustained and borne by the CONTRACTOR at its own cost and expense.

The CONTRACTOR shall have no claim against the OWNER because of any damage or loss to the Work or CONTRACTOR's materials, equipment or supplies, including no claim for loss or damage due to simultaneous work by others, and the CONTRACTOR shall be responsible for the complete restoration of damaged Work to its original condition complying with the Contract Documents. Notwithstanding any other provision of this Contract, this obligation shall exist without regard to the availability of any insurance, either of the OWNER or the CONTRACTOR, to indemnify, hold harmless or reimburse the CONTRACTOR for the cost incurred in making such restoration.

24. SAFETY REQUIREMENTS.

The bidder shall review the latest Occupational Safety and Hazard Agency (OSHA) standards, to assure himself that he has full knowledge of the personal protective equipment that must be provided workmen and that he is familiar with the safety standards applicable to the prevention of accidents during the construction of this project and shall comply with all applicable provisions.

25. CONTRACTOR BACKGROUND INFORMATION - TO BE SUPPLIED WITH BID.

Attached to these Supplemental General Specifications (Appendix SGS-1) are supplements to the questionnaire in the Information for Bidders. These forms, entitled "Plant and Equipment Schedule" and "Pre-Award Information" should be completed by the CONTRACTOR and submitted with the bid.

26. HURRICANE AND SEVERE STORM PLAN.

(a) Within 20 calendar days after the Notice of Award, the CONTRACTOR shall submit as an attachment to his Accident Prevention Plan, a Hurricane and Severe Storm Plan. This plan shall include but not be limited to the following:

- (1) Types of storms anticipated (winter storm, hurricane, tornado).
- (2) Time intervals before storms when action will be taken and details of the actions taken.
- (3) List of the equipment to be used on the job and its ability to handle adverse weather.
- (4) List of safe harbors and the distance from the work area to these harbors and the time required to move the equipment to these harbors. Copies of letters of approval for the use of these safe harbors (local authorities, U.S. Coast Guard, etc.) where applicable.
- (5) Method of securing equipment in these safe harbors.
- (6) List of equipment to be utilized to make this move to safe harbors (tug boats, work boats, etc.), to include the name and horsepower of this equipment.
- (7) Methods of securing equipment not moved; i.e. pipelines (floating or submerged), pumpout stations, etc.
- (8) Plan of evacuation to include interim measures; i.e. immediate reaction plans to be taken for all storm occurrences, particularly sudden/flash storms.

(9) Operating procedures to be undertaken when critical dredge equipment fails during sudden and severe adverse weather conditions, to include breaking of spuds, swing wires, anchor wires, or other mooring equipment or facilities.

(b) The CONTRACTOR shall maintain full-time monitoring of the NOAA marine weather broadcasts, and avail themselves of such other local commercial weather forecasting services as may be available. These information broadcasts shall be the CONTRACTOR'S primary source in the decision process to implement action under the approved storm plan.

27. PRECONSTRUCTION CONFERENCE.

(a) The CONSULTANT will notify the CONTRACTOR of the time and date set for the meeting. At this conference, the CONTRACTOR shall be oriented with respect to procedures and line of authority, contractual, administrative, and construction matters. Additionally, a schedule of required submittals will be discussed. Minutes of the meeting shall be prepared by the CONSULTANT and copies supplied to all in attendance. The minutes shall become a part of the contract file. There may also be occasions when subsequent conferences will be called to reconfirm mutual understanding.

(b) Within twenty (20) calendar days after the date of the Notice of Award, the CONTRACTOR shall submit the following items in either completed or draft form for review by the CONSULTANT prior to the preconstruction conference:

Letter Appointing Superintendent

List of Subcontractors

Hurricane and Severe Storm Plan

Contractor Quality Control Plan

Environmental Protection Plan

Other Items as May be Specified Elsewhere

(c) The CONSULTANT will instruct the CONTRACTOR in the preparation of the Daily Reports which the CONTRACTOR will submit.

(d) The letter of record will be written documenting all items discussed at the conference and a copy will be furnished by the CONSULTANT to all in attendance.

**28. TEXAS WATER DEVELOPMENT BOARD REQUIREMENTS/
EXCERPTS FROM TEXAS WATER CODE.**

The resolution and Contractor's Act of Assurance contained in Appendix SGS-1 and the following EXCERPTS FROM THE TEXAS WATER CODE are to be included in the Contract Documents.

EXCERPTS FROM TEXAS WATER CODE

The following excerpts from the Texas Water Code are hereby made a part of this contract. In the event there are any conflicts between these requirements and requirements of the specifications, these excerpts will govern.

CONSTRUCTION CONTRACT REQUIREMENTS

The governing body of each political subdivision receiving financial assistance from the Board shall require in all contracts for the construction of a project:

1. that each bidder furnish a bid guarantee equivalent to ten percent of the bid price;
2. that each contractor awarded a construction contract furnish performance and payment bonds;
3. that payments be made in partial payments as the work progresses;
4. that each partial payment shall not exceed 95 percent of the amount due at the time of the payment as shown by the engineer of the project; and
5. that payment of the retainage remaining due upon completion of the contract shall be made only after:
 - a. approval by the engineer for the political subdivision as required under the bond proceedings;
 - b. approval by the governing body of the political subdivision by a resolution or other formal action; and
 - c. certification by the Development Fund Manager in accordance with the rules of the Board that the work to be done under the contract has been completed and performed in a satisfactory manner and in accordance with sound engineering principles and practices.
6. that no valid approval may be granted unless the work done under the contract has been completed and performed in a satisfactory manner according to approved plans and specifications.

FILING CONSTRUCTION CONTRACT

The political subdivision shall file with the Board a certified copy of each construction contract it enters for the construction of all or part of a project. Each contract shall contain or have attached to it the specifications, plans, and details of all work included in the contract.

INSPECTION OF PROJECTS

1. the Board may inspect the construction of a project at any time to assure that:
 - a. the contractor is substantially complying with the approved engineering plans of the project; and
 - b. the contractor is constructing the project in accordance with sound engineering principles.
2. inspection of a project by the Board does not subject the State to any civil liability.

ALTERATION OF PLANS

After the Executive Administrator approves the engineering plans, a political subdivision may not make any substantial or material alteration in the plans unless the Executive Administrator authorizes the alteration in accordance with the rules of the Board.

CERTIFICATE OF APPROVAL

The Executive Administrator may consider the following as grounds for refusal to give a Certificate of Approval for any construction contract:

1. failure to construct the project according to approved plans;
2. failure to construct the works in accordance with solid engineering principles; or
3. failure to comply with any terms of the contract.

APPENDIX SGS-1

DAILY CONTRACTOR QUALITY CONTROL REPORT

Date: _____ Report No. _____

PROJECT: Galveston Beach Nourishment

City of Galveston, Texas

WEATHER: (Clear) (P. Cloudy) (Cloudy) TEMP. Min. _____ Max. _____

Wind Speed _____ mph Direction _____

Wave Height at:

Borrow Site _____ feet

Beach disposal _____ feet

Wave Period _____ sec.

Wave Direction _____

RAINFALL: _____ Inches _____ Gauge Reading _____ Milw.

LOCATION OF DISCHARGE: Y = _____ (baseline station or state plane coordinate)

DRESSING OPERATIONS COMPLETE TO: Y = _____ (baseline station or state plane coordinate)

CONTRACTOR/SUB-CONTRACTOR and area of responsibility:

1. Work Performed Today: (Indicate location and description of work performed. Provide beach fill advance over last 24 hours. Attach dredge position printouts to this report.)

2. Results of Surveillance: (Include satisfactory work completed or deficiencies with action to be taken.)

*Make space
for DIFF. STEPS
DREDGING, DRESSING,
BORROW WATER, ETC.*

3. Tests Required by Plans and/or Specifications Performed and Results of Tests:

NINE ROAD

4. Verbal Instructions Received: (List any instructions given by Consultant or Owner on construction deficiencies, retesting required, etc., with action to be taken.)

*Ref 1
Attach*

5. Remarks: (Cover delays and any conflicts in plans, specifications or instructions.)
6. Safety Inspection: (Report violations noted; corrective instructions given; and corrective actions taken.)
7. Equipment Data: (Indicate items of construction equipment other than hand tools at job site and whether or not used and if operable.)

CONTRACTOR'S VERIFICATION: The above report is complete and correct and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications except as noted above.

Contractor's Approved
Authorized Representative

PLANT AND EQUIPMENT SCHEDULE

(This is a supplement to the questionnaire in Information For Bidders and should be attached to that questionnaire and submitted with the bid)

Plant Number

or Name _____

Type: _____

Capacity: _____

Manufacturer: _____

Age/Condition: _____

Location: _____

U.S. Coast Guard Certification:

Expiration Date: _____ (if presently certified)

Electronic Monitoring

Equipment: _____

Notes:

In preparing the above tabulation, the bidder shall insert the following information under the appropriate heading, using a separate line for each major item and an additional page if necessary.

(a) Number: For dredge, give identifying number and/or name.

(b) Type: Under this heading, give description as follows: show inside diameter of discharge pipe, horsepower of pump engine and type of power.

(c) Capacity: Under this heading, state the estimated capacity of the plant in cubic yards per hour, per day, and per month when working materials similar to those which it is anticipated will be encountered in the performance of the work.

(d) Electronic Monitoring (Positioning) Equipment: (Provide manufacturers name, description of equipment and methods of interfacing (if required) and accuracy.

PRE-AWARD INFORMATION
(attach to Bid Form)

This is a supplement to the questionnaire in the Information For Bidders and should be attached to that questionnaire and submitted with the bid.

A. Describe projects completed by Bidder most similar to the Work being bid:

Brief description should include the dollar value (unit cost, mobilization/demobilization and total cost) of the project, the year in which the work was performed, manner of execution, and, the type of project.

1. Project: _____

Brief Description: _____

Owner (Name, Address, Phone #): _____

Cost: Unit Cost: _____; Mob/Demob Cost: _____

Total Cost: _____

2. Project: _____

Brief Description: _____

Owner (Name, Address, Phone #): _____

Cost: Unit Cost: _____; Mob/Demob Cost: _____

Total Cost: _____

3. Project: _____

Brief Description: _____

Owner (Name, Address, Phone #): _____

Cost: Unit Cost: _____; Mob/Demob Cost: _____

Total Cost: _____

4. Project: _____

Brief Description: _____

Owner (Name, Address, Phone #): _____

Cost: Unit Cost: _____; Mob/Demob Cost: _____

Total Cost: _____

- B. Describe Bidder's proposed method of completing the Work being bid and a time schedule for implementing the phases involved (include attachments as necessary).

- C. List key personnel bidder proposes to use on this project including their qualifications and prior experience.

GALVESTON, TEXAS

BEACH NOURISHMENT PROJECT

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

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**GALVESTON, TEXAS
BEACH NOURISHMENT PROJECT**

TECHNICAL SPECIFICATIONS

BEACH FILL PLACEMENT

1. SCOPE

The work covered by this section consists of furnishing all plant, labor, equipment, supplies, and materials, and in performing all operations in connection with excavating, transporting, placing and grading beach fill on the beaches as indicated on the drawings and specified herein.

2. ORDER OF WORK

Prior to commencement of work, CONTRACTOR shall propose the order in which he plans to do the work. This will be a topic of discussion at the pre-work conference.

3. EXCAVATION

3.1 General. The characteristics of the materials in the borrow areas are generally indicated by the vibracore logs and grain size distribution curves attached hereto as Appendix A. All excavation for beach fill shall be performed within the limits of the permitted borrow area(s) shown on the drawings. No dredging is permitted beyond the specified depth below the existing bottom as indicated in the drawings.

The CONTRACTOR shall provide two (2) separate bids for 3 different excavation schemes, as follows:

- Alternate 1: Excavation of all required beach fill from the designated area of borrow area 3 as shown on the plans.
- Alternate 2: Excavation of all required beach fill from the designated area of borrow area 1.
- Alternate 3: Excavation of all required beach fill from the seaward areas of borrow areas 1 and 3 in the locations and to the depths shown in the drawings.

One set of bids will be provided for an October 1, 1994 work commencement date, with a second set of bids for a January 1, 1995 work commencement date.

3.2 Electronic Positioning and Dredge Depth Monitoring Equipment. The CONTRACTOR shall have in continuous operation on the dredge electronic equipment as approved by the CONSULTANT which continuously measures dredge location and depth of cut. Microwave positioning system or equivalent (see Paragraph 3.3) shall be used (as approved by the CONSULTANT). Horizontal accuracy of the positioning system shall be ± 3 feet. Vertical accuracy of the dredge depth monitoring equipment shall be ± 0.1 ft. Printouts of the dredge location in State Plane Coordinates and dredge cut depths (corrected for tides and referenced to MLLW) shall be at an interval of 15 minutes for cutterhead or dustpan dredges and 2 minutes for hopper dredges. Data will be provided daily to the CONSULTANT as part of the Quality Control Report. The CONTRACTOR shall submit written details on the positioning system. Information to be submitted shall include written description of the equipment including applicable manufacturers' brochures and data and previous jobs on which the equipment was used. The ability to adequately meet this requirement shall be a consideration in the award of the bid.

3.3 Dredge Location Control. The CONTRACTOR is required to have electronic positioning equipment that will accurately compute and plot the position of the dredge. Whenever dredging operations are underway, the location of the dredge shall be continuously monitored and fixes obtained in the Texas State Plane Coordinates System, South Central Zone. Depth of the dredge suction mechanism shall be recorded at intervals not to exceed fifteen (15) minutes for cutterhead or dustpan dredges or 2 minutes for hopper dredges. Elevations will be referenced to the datum of mean low low water (MLLW). Plots shall continuously record the dredge suction mechanism location. Such fixes, and the accompanying plots, shall be furnished to the CONSULTANT daily as part of the Quality Control Reports. The electronic positioning equipment shall be calibrated, maintained and operated so that the maximum error for the fixes recorded do not exceed 3 feet. It is preferable that the location of the master antenna be located directly over the dredge suction mechanism. In any event, the location on the dredge of the master antenna and the distance and direction from the master antenna to the dredge suction mechanism shall be reported on the Quality Control Reports. **No dredging will take place outside of the dredge or depth limits as shown on the drawings.**

DAILY Quality Control Reports to the CONSULTANT shall include 11" x 17" plots of the previous day's dredge locations showing the dredge area limits. The plot shall contain numbered position fixes which coincide to the printout discussed in paragraph 3.2 above. The numbered position fixes on the daily printout and plots shall not exceed 15 minute intervals.

3.4 Borrow Area. The CONTRACTOR shall set lighted marker buoys which have been approved by the CONSULTANT and which meet U.S. Coast Guard standards to delineate the limits of the borrow area. Lighted buoys shall be placed at corners, bends and at additional locations as shown in the drawings. The lighted buoys shall be maintained throughout the project by the CONTRACTOR. Electronic positioning as described in paragraphs 3.2 and 3.3 shall be employed to set the buoys, and to check the

positional integrity of the buoys on a **DAILY** basis. The results of these checks shall be reported daily in the quality control reports.

3.4.1 Character of Material Within Borrow Area. In general the material found within the borrow area consists of poorly graded, fine grained sand. There are thin mud and clay layers within the borrow areas. The descriptions of the material are based on the core borings which are provided in Appendix 1A and only describe the materials obtained from those investigations. The CONTRACTOR is solely responsible for any interpretation or conclusions drawn therefrom.

3.5 Encountering Rock, Rubble, Debris or Poor Quality Material in the Borrow Area. If rock, rubble or any other debris is encountered during dredging, the CONTRACTOR shall immediately cease operation and relocate to another section of the borrow area. He shall report the encounter with the rock, rubble or debris on the quality control form and immediately notify the Engineer verbally, providing location in State Plane Coordinates of the area of rock, rubble or debris. Rock, rubble or any other debris larger than two (2) inches in diameter which is excavated and placed on the beach will be removed from the beach fill by the CONTRACTOR, totally at his own cost. If the CONTRACTOR fails to remove the rock, rubble or debris, to the satisfaction of the Engineer, such debris may be removed by the OWNER and the cost of such removal may be deducted from any money due, or to become due, to the CONTRACTOR or may be recovered under his bond. The CONSULTANT will have the authority to require the CONTRACTOR to move away from pockets of poor quality material, should any be encountered during beach construction.

3.6 Preservation of Historical, Archeological, and Cultural Resources. An archeological survey of the borrow area revealed only scattered debris which consisted on pipes and cables. No vessels were located. Contractor may encounter debris during his operations.

If during construction activities, the CONTRACTOR observes items that may have historical or archeological value, such observations shall be reported as outlined in Paragraph 13 of the Environmental Protection Specifications.

3.7 Post Dredging Survey of Borrow Area. Within seven days after completion of the dredging the CONTRACTOR shall perform a hydrographic survey of the borrow area. The survey shall be performed along those survey lines spaced at 200-foot intervals and running perpendicular to the borrow area(s). The CONTRACTOR shall utilize electronic positioning equipment which has an accuracy of ± 3 feet. Data points shall be taken along each line at a spacing of no less than 20 feet. All data points shall be within 30 feet of the established lines. Elevations will be measured to the nearest 0.1 foot referenced to MLLW datum. To ensure this accuracy is maintained, the fathometer will be calibrated by a bar check at the start of each survey day, periodically throughout the survey, at the end of each paper roll and the end of each day. Equipment and

procedures must be approved by the ENGINEER prior to conducting the survey. Positioning equipment shall be interfaced with a computer system which provides navigation information to the helmsman and simultaneously stores location and depth data. Tides shall be measured with an electronic tide gauge placed at the site in a location approved by the ENGINEER and data used to correct water depth measurements.

The CONTRACTOR shall provide two final plan view plots showing 1) digital depths (tide corrected), borrow area limits, dredge area limits and track lines and 2) contour map at 1 foot depth intervals (tide corrected), borrow area limits and dredge area limits. Scale on both drawings shall be 1" = 400'. The CONTRACTOR shall also supply cross-section plots comparing the post-dredging survey lines to those in the drawings. CONTRACTOR shall supply all corrected depth and location information on 5 1/4" floppy disk in ASCII file format to the ENGINEER.

4. TRANSPORT OF EXCAVATED MATERIALS

4.1 The CONTRACTOR shall maintain a tight discharge pipeline at all times. The joints shall be so constructed as to preclude spillage and leakage. The development of a leak shall be promptly repaired and the dredge shall be shut down until complete repair has been made. Failure to repair leaks or change method of operation which is resulting in leakage during transport to discharge site will result in suspension of dredging operations and require prompt repair or change of operation to prevent leakage as a prerequisite to the resumption of dredging.

4.2 The CONTRACTOR is required to build and maintain sand ramps 15 feet wide over the shore pipe at 250 foot intervals to allow pedestrian access to the water in the park and developed areas as shown on the plans. After construction, the pipe will be removed from the beach and the area dressed.

4.3 The CONTRACTOR shall provide and maintain barricades, warning signals, and a flag man as required by local, State or Federal regulations or as directed at the discharge.

4.4 Any damages to private or public property resulting from the CONTRACTOR's operations shall be repaired by the CONTRACTOR at his expense.

5. BEACH FILL

5.1 All sand excavated from the borrow area shall be transported to, and deposited on, the beach within the lines, grades and cross sections shown on the drawings except as may be modified by the provisions of Paragraph 5.2.2. of this section. Except as specified in Paragraph 5.2.3. of this section, the CONTRACTOR shall maintain and protect the fill in a satisfactory condition at all times until final completion and acceptance of the work. CONTRACTOR will receive no payment for any fill sand

which is not contained within the limits of the fill template including the upper tolerance shown in the drawings.

5.2 Construction

5.2.1 Prior to placement of fill, the CONTRACTOR shall remove from the site of the work all snags, driftwood, and similar debris lying within the foundation limits of the beach fill section. All materials removed shall be disposed of in areas approved by the CONSULTANT and at the expense of the CONTRACTOR. Grading and other construction equipment will not be permitted outside the construction limits except for ingress or egress to and from the site.

5.2.2 The excavated material shall be placed and brought to rest on the beach to the lines, grades, and cross-section indicated on the drawings, unless otherwise provided for herein or directed by OWNER through the CONSULTANT. The beach is subject to changes and the elevations on the beach at the time the work is done may vary from the elevations shown on the drawings. The CONSULTANT reserves the right to vary the width or grade of the berm from the lines and grades shown on the plans in order to establish a uniform beach for the entire length of the project. The beach fill cross sections shown on the drawings are for the purpose of estimating the amount of fill needed and will be used by the CONSULTANT in making any change in the lines and grades. The CONTRACTOR will not be required to dress the fill below mean high water to the slope shown but will be required to do the dressing specified in Paragraph 5.3.

5.2.3 Temporary longitudinal dikes, and spreader and pocket pipe shall be used as necessary to prevent gulying and erosion of the beach and fill, to retain the fill on the beach within the limits of the fill cross-section, and to control water turbidity. Dikes or mounds shall be constructed along the waterline as necessary to direct the pipeline discharge longitudinally along the beach to avoid transverse gulying direct from the discharge point to the ocean, and to build the new berm to the design grade. The CONSULTANT may direct the CONTRACTOR to extend dikes, if necessary, to control gulying and erosion of the beach and fill. No undrained pockets shall be left in any fill during or upon completion of the work. The CONTRACTOR shall not permit waste water to flow landward of the fill section, or water to pond between the fill and upland. The CONTRACTOR shall protect existing drainage and operations. Any material, permitted to flow into or restrict the flow of an existing ditch, canal, or drain pipe, shall be promptly removed. Structures within the fill section shall be protected by the CONTRACTOR to prevent damage thereof by the CONTRACTOR's operations.

5.2.4 All grade stakes shall be steel pipe which shall be completely removed after acceptance of the beach fill.

5.3 Upon completion of all filling operations within an acceptance section, the fill shall be graded and dressed so as to eliminate any undrained pockets, abrupt lumps, and depressions in the beach fill surfaces and as necessary to comply with Paragraph 5.2.2. The bank caused by ocean wave erosion shall be graded down to a slope not steeper than one (1) foot vertical to thirty (30) feet horizontal to the water's edge.

5.4 Tolerances. Payment will be for fill placed within the template only. There will be no payment for material placed outside of the template. Any material placed above the template may be left in place at the discretion of the CONSULTANT; however, this material will not be included in the pay quantities. The CONSULTANT, in coordination with the CONTRACTOR, may make adjustments to the template after observation and review of surveys of the first acceptance section to minimize the need to overfill to meet the template.

5.5 Misplaced Materials. If any material is deposited other than in places designated or approved, the CONTRACTOR may be required to remove such misplaced material and redeposit it where directed, at his expense.

5.6 Work Area. The construction and borrow area limits available to the CONTRACTOR for accomplishing the work are shown on the drawings. Construction access will be as shown in the drawings. The CONTRACTOR shall accomplish the work in such a manner so as to minimize disruption to traffic and reduce the number of construction easements in use at any one time. The CONTRACTOR will be permitted to exclude the public for safety purposes from the work areas in the immediate vicinity of his placement and transporting operations. To minimize disruption to the beach, temporary areas for storage and maintenance of construction equipment shall be restricted to specified areas proposed by the CONTRACTOR and approved by the OWNER.

5.7 Construction Access. The CONTRACTOR shall limit access to the beach to those locations shown on the drawings or as approved by the CONSULTANT. The use of specific accesses as construction progresses will be coordinated with the CONSULTANT. The CONTRACTOR shall exercise caution when accessing and driving on the beach. Sections of the beach are heavily used by people during some periods of the year. The CONTRACTOR shall restore all damage to sidewalks and roads or any other structures to preconstruction conditions or better.

6. FINAL CLEAN-UP

Final clean-up will be as stated in Paragraph 15 of the Supplemental General Specifications.

7. REPORTING REQUIREMENTS

The CONTRACTOR will be required to prepare a daily Quality Control Report, and copies shall be furnished to the CONSULTANT on a daily basis. An adequate supply of the forms will be furnished to the CONTRACTOR at the preconstruction conference, together with additional

information and instruction on preparation and submission. Example copies of the Daily Quality Control report are appended to the Supplemental General Specifications.

8. NOISE CONTROL

8.1 Hauling and Excavating Equipment other than Dredges and Booster Pumps. All hauling and excavating equipment, other than dredges and booster pumps, used on this work shall be equipped with satisfactory mufflers or other noise abatement devices. The CONTRACTOR shall conduct his operations so as to comply with all Federal, State, and local laws pertaining to noise.

8.2 Dredges and Booster Pumps. Dredges and booster pumps used on this work shall be equipped with satisfactory mufflers or other sound abatement devices to reduce engine noise. The CONTRACTOR shall conduct his operations so as to comply with all Federal, State, and local laws pertaining to noise. The use of horns, whistles, signals, and handling of dredge pipelines shall be held to the minimum necessary in order to insure as quiet an operation as possible.

GALVESTON, TEXAS

BEACH NOURISHMENT PROJECT

ENVIRONMENTAL PROTECTION SPECIFICATIONS

ENVIRONMENTAL PROTECTION SPECIFICATIONS

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EXHIBIT C

ENVIRONMENTAL PROTECTION SPECIFICATIONS

1. SCOPE

This section covers prevention of environmental pollution and damage as the results of construction operations under this contract and for those measures set forth in other Technical Specifications. For the purpose of this specification, environmental pollution and damage are defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic, cultural, and/or historical purposes. The control of environmental pollution and damage requires consideration of air, water, and land, and includes management of visual aesthetics, noise, solid waste, radiant energy, and radioactive materials, as well as other pollutants. The CONTRACTOR shall fulfill these specifications at his own expense.

2. QUALITY CONTROL

The CONTRACTOR shall establish and maintain quality control for environmental protection for all items set forth herein. The CONTRACTOR shall record on daily reports any problems in complying with laws, regulations and ordinances, and corrective action taken.

3. PERMITS

The CONTRACTOR shall comply with all requirements under the terms and conditions set out in all permits applicable to the work. Specifically, the CONTRACTOR will familiarize himself with specific conditions contained in the Coastal Land Use permit, the Sand, Shell, Gravel, and Marl permit, and the U.S. Army Corps of Engineers (USACE) permit. Any other licenses, easements or approvals required, including, but not limited to those required by the OWNER, shall be secured and paid for by the CONTRACTOR.

4. SUBCONTRACTORS

Assurance of compliance with this section by subcontractors will be the responsibility of the CONTRACTOR.

5. NOTIFICATION

The CONSULTANT will notify the CONTRACTOR and the OWNER of any observed noncompliance with the aforementioned Federal, State, or local laws or regulations, permits and other elements of the CONTRACTOR's environmental protection plan. The OWNER will determine what action will be taken and such response will be transmitted to the CONTRACTOR by the CONSULTANT which may include stopping construction of the project until the CONTRACTOR complies with the environmental protection plan.

6. PROTECTION OF ENVIRONMENTAL RESOURCES

The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract shall be protected during the entire period of this contract. The CONTRACTOR shall confine his activities to areas defined by the drawings and specifications. Environmental protection shall be as stated in the following subparagraphs.

6.1 Protection of Land Resources

Prior to the beginning of any construction, CONSULTANT shall identify all land resources to be preserved within the CONTRACTOR's work area, which is defined as the beach seaward of the 5.0 ft. (NGVD) contour line, the pipeline easement area, and the borrow area. The CONTRACTOR shall not remove, cut, deface, injure, or destroy land resources including sand dune or berm vegetation, trees, shrubs, vines, grasses, top soil, and land forms without special permission from OWNER. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such special emergency use is permitted, the CONTRACTOR shall provide effective protection for land and vegetation resources at all times as defined in the following paragraphs. The CONTRACTOR will be responsible for the replacement of any damaged or destroyed vegetation, to the satisfaction of the OWNER. Failure to replace damaged or destroyed vegetation by the CONTRACTOR will result in replacement by the OWNER; cost of replacement will be deducted from monies due to the CONTRACTOR, or from monies which will be due to the CONTRACTOR by the OWNER.

6.1.1 Work Area Limits. Isolated areas within the general work area which are to be saved and protected shall also be identified by the OWNER and marked or fenced by the CONTRACTOR. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the marks shall be visible. The CONTRACTOR shall convey to his personnel the purpose of marking and/or protection for all necessary objects.

6.1.2 Protection of Landscape. Trees, shrubs, vines, grasses, land forms, and other landscape features to be preserved shall be designated by the OWNER, and clearly identified by the CONTRACTOR, by marking, fencing, or wrapping with boards, or any other techniques approved by the OWNER.

6.1.3. To avoid damage, no fill will be placed within 50 feet of dunes, seawalls, or vegetation by direct pipeline discharge. Mechanical means shall be used to place such material.

6.1.4. Temporary Protection of Disturbed Areas. Such methods as necessary shall be utilized to effectively prevent erosion and control sedimentation, including but not limited to the following:

6.1.4.1. Retardation and Control of Runoff. Runoff from the construction site shall be controlled by construction of diversion ditches, benches and berms to retard and divert runoff to protected drainage courses, and any measures required by areawide plans approved under paragraph 208 of the Clean Water Act. Dikes will be constructed above the mean high water line and maintained in continuous repair to allow partial settling of fine materials from dredging.

6.1.5 Temporary Excavations. Embankments for plant and/or work areas shall be controlled to protect adjacent areas from despoilment.

6.1.6 Disposal of Solid Wastes. Solid wastes (including clearing debris) shall be placed in containers which are emptied on a regular schedule. All handling and disposal shall be conducted to prevent contamination. No steel, cables, wire, pipe, drums or any other debris shall be permitted to be disposed overboard into the waters of the Gulf of Mexico, Galveston Entrance Channel, Bolivar Roads, or the Intracoastal Waterway.

6.1.7 Disposal of Chemical Waste. Chemical waste shall be stored in corrosion resistant containers, removed from the work area and disposed of in accordance with Federal, State, and Local regulations.

6.1.8 Disposal of Discarded Materials. Discarded materials other than those which can be included in the solid waste category will be handled as directed by the CONSULTANT.

6.2 Protection of Fish and Wildlife Resources. The CONTRACTOR shall keep construction activities under surveillance, management, and control to minimize interference with, disturbance to, and damage of fish and wildlife.

6.3 Protection of Air Resources. The CONTRACTOR shall keep construction activities under surveillance, management, and control to minimize pollution of air resources. All activities, equipment, processes, and work operated or performed by the CONTRACTOR in accomplishing the specified construction shall be in strict accordance with the applicable air pollution standards of the State of Texas and all Federal emission and performance laws and standards.

6.4 Protection of Sound Intrusions. The CONTRACTOR shall keep construction activities under surveillance, and control to minimize damage to the environment by noise.

6.5 Dispensing of Fuel. Fuel dispensers shall have a 4-foot square, 16-gauge metal pan with borders banded up and welded at corners right below the bibs. Edges of the pans shall be 8-inch minimum in depth to ascertain that no contamination of the ground takes place. Pans shall be cleaned by an approved method immediately after every dispensing of fuel and wastes disposed of offsite in an approved area. Should any spilling of fuel

occur, the CONTRACTOR shall immediately recover the contaminated ground and dispose of it offsite in an approved area.

7. POST CONSTRUCTION CLEAN-UP

The CONTRACTOR shall clean-up any area used for construction. Final clean-up shall be as stated in Paragraph 14 of the Supplemental General Specifications.

8. RESTORATION OF LANDSCAPE DAMAGE

The CONTRACTOR shall restore all landscape features damaged or destroyed during construction operations outside the limits of the approved work areas. Such restoration shall be in accordance with a plan submitted for approval by the CONSULTANT. This work will be accomplished at the CONTRACTOR's expense.

9. MAINTENANCE OF POLLUTION CONTROL FACILITIES

The CONTRACTOR shall maintain constructed facilities and portable pollution control devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

10. TRAINING OF CONTRACTOR PERSONNEL IN POLLUTION CONTROL

The CONTRACTOR shall train his personnel in all phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of facilities to insure adequate and continuous environmental pollution control. Quality Control and supervisory personnel shall be thoroughly trained in the proper use of monitoring devices and abatement equipment, and shall be thoroughly knowledgeable of Federal, State, and local laws, regulations, and permits as listed in the Environmental Protection Plan submitted by the CONTRACTOR. Quality Control personnel will be identified in the Quality Control Plan submitted in accordance with the General Specifications.

11. ENVIRONMENTAL PROTECTION PLAN

Within 20 calendar days after the date of Notice of Award, the CONTRACTOR shall submit in writing an Environmental Protection Plan. The Notice to Proceed will not be issued until the Environmental Protection Plan is reviewed by the CONSULTANT. Approval of the CONTRACTOR'S plan will not relieve the CONTRACTOR of his responsibility for adequate and continuing control of pollutants and other environmental protection measures. The Environmental Protection Plan shall include but not be limited to the following:

- (a) A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, and abatement that are applicable to the

CONTRACTOR'S proposed operations and the requirements imposed by those laws, regulations, and permits.

(b) Methods for protection of features to be preserved within authorized work areas. The CONTRACTOR shall prepare a listing of methods to protect resources needing protection, i.e. trees, shrubs, vines, grasses and ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, archeological and cultural resources.

(c) Procedures to be implemented to provide the required environmental protection and to comply with the applicable laws and regulations. The CONTRACTOR shall provide written assurance that immediate corrective action will be taken to correct pollution of the environment due to accident, natural causes or failure to follow the procedures set out in accordance with the Environmental Protection Plan.

(d) Drawings showing locations of any proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials.

(e) Environmental monitoring plans for the jobsite, including land, water, air and noise monitoring.

(f) Oil spill prevention.

(g) Oil spill contingency plan.

(h) Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas.

(i) A statement as to the person who will be responsible for implementation of the Environmental Protection Plan. The CONTRACTOR personnel responsible shall report directly to the CONTRACTOR'S top management and shall have the authority to act for the CONTRACTOR in all environmental protection matters.

12. FUEL OIL TRANSFER OPERATIONS

In accordance with the U.S. Coast Guard regulations (33 CFR 156.120), couplings used in fuel oil transfer operations on any vessel with a capacity of 250 or more barrels of oil shall be either a bolted or full-threaded connection; or a quick-connect coupling approved by the Commandment; or an automatic back-pressure shutoff nozzle used to fuel the vessel. An executed fuel oil transfer (Declaration) form signed by the tanker man shall be completed for each refueling operation. The U.S. Coast Guard shall also be notified prior to any refueling.

13. ARCHEOLOGICAL DISCOVERIES

No activity which may affect a State Archeological Landmark is authorized until the OWNER has complied with the provisions of the Antiquities Code of Texas. The OWNER has previously coordinated with the appropriate agencies and impacts to known cultural or archeological deposits have been avoided or mitigated. However, the CONTRACTOR may encounter unanticipated cultural or archeological deposits during construction.

If archeological sites or historic structures are discovered after construction operations are begun, the CONTRACTOR shall immediately cease operations in that particular area and notify the OWNER, the TWDB, and the Texas Historical Commission (512-463-6090). The CONTRACTOR shall take reasonable steps to protect and preserve the discoveries until they have been inspected by the OWNER's representative and the TWDB. The OWNER will promptly coordinate with the Texas Historical Commission and any other appropriate agencies to obtain any necessary approvals or permits to enable the work to continue. The CONTRACTOR shall not resume work in the area of the discovery until authorized to do so by the OWNER.

14. ENDANGERED SPECIES

No activity is authorized that is likely to jeopardize the continued existence of a threatened or endangered species as listed or proposed for listing under the Federal Endangered Species Act (ESA), and/or the State of Texas Parks and Wildlife Code on Endangered Species, or to destroy or adversely modify the habitat of such species.

If a threatened or endangered species is encountered during construction, the CONTRACTOR shall immediately cease work in the area of the encounter and notify the OWNER, who will immediately implement actions in accordance with the ESA and applicable State statutes. These actions shall include reporting the encounter to the TWDB, the U.S. Fish and Wildlife Service, and the Texas Parks and Wildlife Department, obtaining any necessary approvals or permits to enable the work to continue, or implement other mitigative actions. The CONTRACTOR shall not resume construction in the area of the encounter until authorized to do so by the OWNER.

Appendix 1 - A

Galveston, Texas Vibracore Logs

PNEUMATIC HAMMER CORE CORE # G-5

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3346825.04

551261.51

LAT./LONG.
COORDINATES

29°16.954° N

094°46.441° W

WATER DEPTH

21'3"

DATE

5/10/94

START TIME

1551

END TIME

1555

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

15'7"

LENGTH RECOVERED

15'3"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton

Rice University

ANALYSIS METHODS:

Visual Logging

Auto. Settling Tube

DEPTH CM. IN. CONTACT	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12		Muddy sands with heavily bioturbated clay interbeds 5YR5/1	3.24	87.02	11.54
64 24 23		Clay 5YR 4/1			
96 36 36		Slightly muddy sand 5YR5/1	3.07	96.36	3.45
128 48 52		Interbeds of clayey sand, clay, and muddy sand	3.25	75.69	23.79
160 60 64		Clay 5YR4/1			
192 72		Slightly muddy sand with discrete beds of fragmented shells and clay	3.13	93.41	3.56
224 84					
256 96		5Y6/1	3.05	92.82	6.85
288 108			3.00	91.71	8.10
320 120					
352 132 129		Clay with very thin laminae of muddy sand 5Y4/1			
384 144 144					
416 156 160		Muddy fine sand that grades downcore from clayey sand to interlams of sand and clay	3.65	65.11	34.89
448 168 168					
480 180 174					
480 192 183		Fine sand with abundant laminae (textural) 5Y5/1			



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-6

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3343181.55

548067.81

LAT./LONG.

COORDINATES

29°16.449° N

094°47.148° W

WATER DEPTH

21'4"

DATE

5/10/94

START TIME

1635

END TIME

1650

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

16'4"

LENGTH RECOVERED

14'7"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton

Rice University

ANALYSIS METHODS:

Visual Logging

Auto. Settling Tube

DEPTH CM. IN. CONTACT	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12		Slightly muddy sand goes to muddy sand downcore, small shell frags t/o 5Y4/1	3.07	92.92	5.31
64 24 21		Clay 5Y5/1			
96 36 24		Muddy, very fine sand with shell concentration near lower contact, lower portions of bed are heavily bioturbated. 5YR4/1	3.57	78.35	20.19
128 48 52		Very shelly, very muddy sand	3.32	89.44	3.44
160 60 62		Interlams of clay and clayey sand S:C=20:80	2.72	74.23	25.77
192 72 69		Fine sand 5Y6/1			
224 84 75		Interlams of clay and clayey sand S:C=20:80			
256 96 83		Fine sand 5Y6/1	3.34	85.98	13.96
288 108 92		Clay with very thin laminae of clayey sand. Shells concentrated in burrows (diam.=1cm.)	3.67	89.54	10.46
320 120 115		Muddy fine sand with discrete clay beds 5YR4/1			
352 132 129			3.20	74.52	25.33
384 144 141		Interbedded clay and muddy sand. S:C=50:50			
416 156 163		Clay with sand filled burrows Heavy bioturbation 5Y5/1			
448 168 176		Interlams of sandy clay and clayey sand Heavy bioturbation			
480 180 192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-16

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING COORDINATES

3343777.44
547319.20

LAT/LONG COORDINATES

29°16.322° N
094°47.041° W

WATER DEPTH

23'3"

DATE

5/12/94

START TIME

1720

END TIME

1724

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

15'9"

LENGTH RECOVERED

14'3"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH CM. IN. CONTACT	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
6		Muddy, very fine sand 5Y5/1	3.16	91.78	7.63
32 12 8		Clayey, very fine sand 5Y4/1			
64 24		Highly laminated, very fine sand; shell lag at base	3.13	94.08	5.92
96 36			3.02	60.38	17.05
128 48		Clay with muddy laminae near upper contact 5Y3/1	3.07	14.32	84.69
160 60		Muddy sand; abundant laminae partially destroyed by bioturbation.			
192 72		Interbedded to interlaminated clayey sand, clay, and sandy clay.	3.15	53.71	46.23
224 84		Very muddy sand with heavy bioturbation and destroyed laminae 5Y4/1			
256 96					
288 108		Interlaminated clayey sand and sandy clay S:C=10:90			
320 120					
352 132					
384 144					
416 156					
448 168					
480 180					
480 192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-18 #2

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3343868.17

548783.83

LAT/LONG

COORDINATES

29°16.563° N

094°47.014° W

WATER DEPTH

22'4"

DATE

5/16/94

START TIME

0907

END TIME

0909

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

13'6"

LENGTH RECOVERED

12'7"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton

Rice University

ANALYSIS METHODS:

Visual Logging

Auto. Settling Tube

DEPTH CM. IN. CONTACT	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12 12		Slightly muddy, very fine sand 5Y6/1	3.02	91.44	8.16
15		Sandy clay and clayey sand interlams	1.73 3.27	48.28 65.69	51.72 34.31
64 24 23 24		Muddy very fine sand 5Y5/1			
96 36 33		Very fine sand 5Y6/1	3.04	94.45	5.19
42		Interbedded sandy clay and clayey sand			
128 48 50		Clayey sand 5Y4/1			
60		Very fine sand with very thin clayey sand laminae 5Y6/1	2.41	98.38	1.49
160 64		Interbedded sandy clay and clayey sand			
72 76		Very fine sand with lams of muddy sand 5Y6/1			
192 84 81		Very fine sand with lams of muddy sand 5Y6/1			
224 84		Very fine sand with lams of muddy sand 5Y6/1			
96 96		Muddy sand to very muddy sand 5Y5/1-5Y4/1			
256 104		Interlaminated clay and sand			
108 115		Very fine sand 5N5	3.18	97.88	2.12
288 120 130		Interbedded muddy sand and clay; heavy bioturbation			
320 132 136		Very muddy sand 4N4			
352 144 150					
384 156					
416 168					
448 180					
480 192					



SAND



MUDDY SAND


MUDDY SAND/CLAY
INTERLAM.

MUDDY SAND/CLAY
INTERBEDS

CLAYEY
SAND

SANDY
CLAY


SHELLY SAND



SHELL HASH.



CLAY



MUD

PROJECT: Galveston Island Beach Replenishment

ANALYSIS METHODS:
Visual Logging
Auto. Settling Tube

DEPTH		LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
CM.	IN. CONTACT					
	9		Slightly muddy sand	2.72	90.40	7.85
32	12		Interlaminated muddy sand and clay	2.90	84.58	4.72
	17		Shelly muddy sand			
64	24	20	Clay	3.27	86.18	13.82
			Muddy to slightly muddy sand			
96	36		5Y5/1	2.65	35.97	63.05
	41					
128	48		Interbedded muddy sand and clay			
160	60					
	65		Slightly muddy very fine sand 5YR4/1	3.03	87.50	12.50
192	72					
	75					
224	84		Interbedded muddy sand and clay			
	96					
256	96		Clean, very fine sand			
	99					
288	108		Interbedded muddy sand and clay			
320	120					
	132					
352	133		Clay 5Y2/1			
	144		Very fine sand, slightly muddy at top; muddiness decreases downcore			
384	144					
	150					
416	156					
	168					
448	180					
480	192					



SAND



· MUDDY SAND MUDDY SAND/C
INTERLAM.



MUDDY SAND/CLAY INTERLAM. MUDDY SAND/CLAY INTERBEDS



MUDDY SAND/ INTERBEDS

CLAYEY
SAND

**SANDY
CLAY**



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-20

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING COORDINATES

3346322.01
551892.14

LAT/LONG COORDINATES

29°17.061° N
094°46.523° W

WATER DEPTH

21'9"

DATE

5/16/94

START TIME

1000

END TIME

1002

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

13'11"

LENGTH RECOVERED

13'1"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH			LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
CM.	IN.	CONTACT					
32	12	15		Shelly, very fine sand 5Y4/1	2.95	95.60	1.62
		17		Abundant shell frags			
64	24			Very fine sand 5Y4/1	2.74	95.09	4.91
96	36	44		Abundant shell frags	3.14	49.38	48.67
128	48			Interbedded muddy sand and clay S:C 30:70	3.00	78.62	21.29
160	60	59		Slightly muddy sand 5Y4/1			
		65		Interbedded muddy sand and clay S:C 50:50			
192	72	75			3.03	91.30	8.55
	84			Clean, very fine sand with occasional clay lams 5YR6/1			
224	96						
256	108	109		Shell hash			
288	120	114					
	132			Clean, very fine sand with occasional lams of clay 5YR6/1			
352	144	149			2.97	98.62	1.31
384	156	157		Laminated clay and clayey sand			
416	168						
448	180						
480	192						

STATE PLANNING
COORDINATES

3347759.86

551725.84

LAT/LONG
COORDINATES

29°17.025° N

094°46.262° W

WATER DEPTH

22'2"

DATE

5/16/94

START TIME

1027

END TIME

1029

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

14'1"

LENGTH RECOVERED

13'3"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton

Rice University

ANALYSIS METHODS:

Visual Logging

Auto. Settling Tube

DEPTH CM. IN.	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12		Very fine sand; shell frags t/o 5Y3/1	3.02	93.73	2.42
64 24			2.88	95.93	3.90
96 36		Interlaminated clay and muddy sand	3.05	51.44	48.56
		Very fine sand 5Y4/1	3.05	96.97	2.89
128 48		Very fine sand 5Y4/1	3.28	76.18	22.84
160 60		Clay with thin interbeds of muddy sand 5Y4/1			
192 72		Very fine sand 5Y4/1			
		Shell lag			
224 84		Very fine sand 5Y4/1	2.89	98.30	1.62
		Interlaminated to interbedded clay and muddy sand S:C 50:50			
256 108		Muddy, very fine sand with thin lams of clay and sand 5YR 5/1 S:C=65:35			
288 120		Clay 5Y4/1			
320 132		Shelly, very fine sand 5YR5/1			
352 144		Interlaminated to interlaminated muddy sand and clay S:C=50:50			
384 156					
416 168					
448 180					
480 192					



SAND



MUDDY SAND

MUDDY SAND/CLAY
INTERLAM.MUDDY SAND/CLAY
INTERBEDSCLAYEY
SANDSANDY
CLAY

SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-30

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING COORDINATES

3355685.45

558034.74

LAT/LONG COORDINATES

29°18.018' N

094°44.728' W

WATER DEPTH

21'5"

DATE

5/18/94

START TIME

0917

END TIME

0918

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

14'6"

LENGTH RECOVERED

14'3"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton

Rice University

ANALYSIS METHODS:

Visual Logging

Auto. Settling Tube

DEPTH CM. IN. CONTACT	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12		Fine sand with isolated interlams of mud and shelly mud; lams are heavily bioturbated making sand locally muddy. 5Y6/1-5Y5/1	3.05	95.96	3.89
64 24					
96 36			3.09	93.08	6.30
128 48					
160 60					
192 72			2.91	94.96	2.64
224 84					
256 96		Interlaminated clay and sand			
288 108		Muddy, very fine sand with textural laminations 5Y5/1 Clay 5Y4/1			
320 120		Muddy, very fine sand with textural laminations 5YR5/1	3.09	83.57	14.60
352 144		Interlaminated clay and muddy sand			
384 156					
416 168		Highly laminated (textural) muddy sand 5Y5/1			
448 180					
480 192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-31

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING COORDINATES	DEPTH		LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
	CM.	IN. CONTACT					
3352152.07	32	12	11	Bioturbated laminae of clay in sand=muddy sand 5Y5/1	2.32	96.58	2.62
556093.24	64	24	24	Highly laminated clayey sand S:C=30:70	3.33	89.76	10.12
LAT/LONG	96	36	30	Shelly, clayey sand			
COORDINATES	128	48	47	Clay 5Y3/1			
29°17.719° N	160	60		Shelly, sandy clay	2.16	97.53	2.03
094°45.406° W	192	72		Fine sand with discrete, bioturbated clayey lams 5YR7/1			
WATER DEPTH	224	84					
21'1"	256	96					
DATE	288	108		Clay with small lams of sand; sand-filled burrows; mod. bioturbation 5Y3/1			
5/17/94	320	120		Slightly muddy, very fine sand 5Y5/1			
START TIME	352	132		Interbedded clay and clayey sand; clay content increases downcore.			
0915	384	144		S:C= 50:50 to 30:70			
END TIME	416	156		Clay with interlaminated sandy clay (minor) 5Y3/1			
0917	448	168					
CORE DIAMETER	480	180					
3"							
LENGTH OF BARREL							
20'							
PENETRATION DEPTH							
16'0"							
LENGTH RECOVERED							
15'2"							
SUPPORT VESSEL:							
R/V Lonestar							
POSITIONING:							
Trimble Differential GPS							
ANALYSIS BY:							
M. Hamilton							
Rice University							
ANALYSIS METHODS:							
Visual Logging							
Auto. Settling Tube							



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-36

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3354097.38

558146.76

LAT/LONG
COORDINATES

29°18.046° N

094°45.026° W

WATER DEPTH

20'2"

DATE

5/18/94

START TIME

0940

END TIME

0942

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

LENGTH RECOVERED

14'3"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton

Rice University

ANALYSIS METHODS:

Visual Logging

Auto. Settling Tube

DEPTH CM. IN. CONTACT	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12			3.14	86.11	13.05
64 24					
96 36		Fine sand; locally muddy near mud filled burrows; shell hash at 30"; bioturbation t/o 5Y6/1	3.03	45.75	8.18
128 48			3.03	93.98	4.46
160 60					
192 72			3.08	96.44	3.26
224 84					
256 96			2.98	79.29	20.71
288 108					
320 120			2.66	98.41	1.45
352 132		Interlaminated clay and sand			
384 144		Clay 5Y4/1			
416 156		Interlaminated sand and clay S:C=40:60			
448 168					
480 172					
192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-37

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3353969.31
556844.45

LAT/LONG
COORDINATES

29°17.832° N
094°45.059° W

WATER DEPTH

21'4"

DATE

5/18/94

START TIME

1005

END TIME

1008

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

13'11"

LENGTH RECOVERED

12'5"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH CM. IN.	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12		Very fine sand; moderate bioturbation 5Y6/1	2.62	93.74	6.26
64 24 24		Clay 5Y4/1			
28		Laminated (textural) very fine sand 5Y6/1			
96 36 36		Interlaminated clayey sand, sandy clay, clay S:C=20:80			
45		Laminated (textural) very fine sand 5Y6/1	3.00	97.07	2.93
128 48 53		Clay with occasional lams of clayey sand 5Y4/1			
160 60					
192 72 81		Very fine sand; shell frags t/o 5Y6/1			
84		Clay 5Y4/1			
224 96 101		Very fine sand; shell frags t/o 5Y6/1			
256 108		Primarily clay with very thin lams of sandy clay			
288 118			2.81	97.42	2.43
120		Interlaminated clay, clayey sand, and muddy sand S:C=20:80			
320 132					
352 144 138		Clay 5Y4/1			
384 156 154		Muddy sand; moderate bioturbation 5Y6/1			
416					
168					
448 180					
480 192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE **CORE # G-38**

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING COORDINATES

3352532.75
557174.28

LAT./LONG COORDINATES

29°17.895° N
094°45.327° W

WATER DEPTH

19'5"

DATE

5/18/94

START TIME

END TIME

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

LENGTH RECOVERED

14'2"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH CM. IN.	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12		Muddy sand; bioturbation profuse; shell concentration at 27" 5Y6/1	2.82	89.61	9.89
64 24					
96 36			2.80	89.81	6.43
128 48	48	Clean fine sand 5Y7/1			
160 60	60		2.55	96.05	3.84
192 72		Slightly muddy sand; minor bioturbation 5Y5/1			
224 84	84		2.82	96.75	3.37
256 96					
288 108	108	Interlaminated clay and sand	3.05	89.59	10.41
320 120					
352 132	135				
384 144	148	Very fine sand 5Y6/1	3.05	96.55	1.76
416 156					
448 168					
480 180					
480 192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-39

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3345758.77
552375.08

LAT./LONG.
COORDINATES

29°17.144° N
094°46.634° W

WATER DEPTH

19'7"

DATE

5/18/94

START TIME

1425

END TIME

1428

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

15'7"

LENGTH RECOVERED

13'2"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH CM. IN. CONTACT	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12	6	Clay 5Y4/1; bioturbated	2.40 2.92	22.16 19.35	74.80 80.65
64 24		Highly laminated (textural), very fine sand; shells concentrated at base 5Y6/1	2.94	94.62	5.38
96 36					
128 48	44	Clay; bioturbated at top; abundant shell frags at top 5Y4/1	2.74	82.33	1.91
160 60	51		2.91	96.84	1.39
192 72		Very fine sand 5Y6/1			
224 84			2.96	96.04	3.96
256 96					
288 108	99	Interlaminated clayey sand, sandy clay, clay S:C=40:60			
320 120	117	Very fine sand 5Y6/1	2.83	97.33	2.67
352 132	124	Interlaminated clayey sand, sandy clay, clay S:C=40:60			
384 144	136	Very fine sand 5Y6/1			
416 156	150	Clay; scattered shell frags 5Y4/1			
448 168	159	Very fine sand 5YR6/1			
480 180					
480 192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-41

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3345476.30

551364.37

LAT./LONG.

COORDINATES

29°16.979° N

094°46.691° W

WATER DEPTH

20'8"

DATE

5/18/94

START TIME

1511

END TIME

1513

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

LENGTH RECOVERED

11'6"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton

Rice University

ANALYSIS METHODS:

Visual Logging

Auto. Settling Tube

DEPTH CM. IN. contact	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12 8		Shelly muddy sand 5Y4/1	2.97	87.96	8.05
12 12		Interlaminated mud and clayey sand S:C=50:50			
22 22		Muddy sand 5Y5/1	2.84	72.01	26.96
64 24		Interlaminated clay and clayey sand			
96 36		Clay 5Y3/1			
128 48 48					
160 60		Clayey sand to slightly muddy sand			
192 72		5Y4/1-5Y5/1	3.20	87.03	12.88
224 84					
256 96		Interbedded clay and clayey sand S:C=20:80			
288 108			2.82	48.63	51.19
320 120					
320 129		Fine sand 5Y6/1			
352 132					
384 144					
416 156					
448 168					
480 180					
480 192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-42

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING COORDINATES

3352915.99
557891.60

LAT./LONG. COORDINATES

29°18.011° N
094°45.250° W

WATER DEPTH

19'6"

DATE

5/18/94

START TIME

1336

END TIME

1358

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

LENGTH RECOVERED

12'1"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH CM. IN.	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12		Slightly muddy very fine sand 5Y4/2	2.78	91.94	7.68
64 24	22	Shelly muddy sand	2.75	85.02	5.89
96 36	29		2.84	89.07	10.18
128 48	37				
160 60	38				
192 72	49	Slightly muddy fine sand 5Y4/2	3.11	97.00	2.83
224 84	51		3.17	42.34	57.36
256 96	105	Clay 5Y4/1	2.90	83.24	16.38
288 108	110	Laminated (mud) very fine sand	2.81	97.57	2.33
320 120		Clean very fine sand 5Y6/1			
352 132					
384 144					
416 156					
448 168					
480 180					
192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-43

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING COORDINATES

3345134.82

550515.24

LAT/LONG COORDINATES

29°16.841° N

094°46.764° W

WATER DEPTH

22'0"

DATE

5/17/94

START TIME

1152

END TIME

1155

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

15'6"

LENGTH RECOVERED

14'9"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton

Rice University

ANALYSIS METHODS:

Visual Logging

Auto. Settling Tube

DEPTH CM. IN. contact	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12		Slightly muddy very fine sand; disturbed laminae t/o due to bioturbation; shell frags t/o 5Y5/1	3.12	81.04	6.45
64 24			2.84	96.59	2.62
96 36			2.40	8.43	91.57
128 48		Clay and muddy sand interbeds			
160 60			3.68	91.24	7.28
192 72		Very fine sand; locally muddy near intense bioturbation 5Y5/1			
224 84			2.99	97.98	2.02
256 96					
288 108					
320 120		Muddy sand with burrows; moderate bioturbation 5Y5/1			
352 132					
384 144		Interlaminated clayey sand, clay, and sandy clay S:C=30:70			
416 156					
448 168		Slightly muddy very fine sand; moderate bioturbation 5Y5/1			
480 180		Clay 5Y3/1			
		Highly laminated, very fine sand; organics concentrated in laminae 5Y5/1-5Y4/1			



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-44

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3355937.63
560160.18

LAT/LONG
COORDINATES

29°18.367° N
094°44.666° W

WATER DEPTH

19'3"

DATE

5/18/94

START TIME

1230

END TIME

1232

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

13'5"

LENGTH RECOVERED

12'7"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:


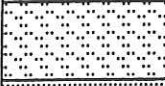







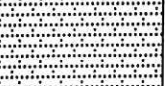






Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH CM. IN.	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12 14		Shelly fine sand; slightly muddy at top 5Y5/1	3.22	86.58	3.89
64 24 28		Muddy sand with increasing clay content downcore 5Y5/1-5Y4/1	2.92	92.12	6.86
96 36		Interlaminated to interbedded clayey sand and clay S:C= 20:80			
128 48 56					
160 60					
192 72		Fine sand; mud filled burrows 5Y5/1			
224 84					
256 96					
288 108 106		Clayey sand with discrete mud beds 5Y4/1	3.24	90.71	9.16
320 120 115					
352 132		Interlaminated clay and clayey sand			
384 144					
416 156 157		Clayey sand 5Y4/1			
448 168 165		Clay 5Y4/1			
480 180 172		Clayey sand 5Y4/1			
480 192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-45

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3357212.64
559739.70

LAT/LONG
COORDINATES

29°18.290° N
094°44.429° W

WATER DEPTH

20'2"

DATE

5/18/94

START TIME

1316

END TIME

1318

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

-

LENGTH RECOVERED

13'

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH CM. IN. contact	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12 16		Muddy sand; shell frags t/o; moderate bioturbation; disturbed laminae 5Y5/1 Clay 5Y4/1	3.16	94.87	5.01
64 24 23			3.60	94.13	3.54
96 36			3.21	96.46	3.54
128 48		Fine sand; several thin laminae of shelly sand; pre- served bivalves 5Y5/1	2.99	85.91	4.23
160 60					
192 72			2.91	96.87	2.52
224 84 84		Interbeds of clayey sand, and sandy clay; heavy bioturbation Slightly muddy sand 5Y5/1	3.20	83.44	16.06
256 96 96		Interbedded clayey sand, sandy clay and clay Clay 5Y4/1			
288 108 107					
320 120 114		Clean very fine sand 5Y6/1	3.23	78.76	21.24
352 132 137		Clay 5Y4/1			
384 144 143		Shell and gravel			
416 156 155					
448 168					
480 180					
480 192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-46

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3344579.41
548227.37

LAT/LONG
COORDINATES

29°16.467° N
094°46.884° W

WATER DEPTH

23'2"

DATE

5/17/94

START TIME

1301

END TIME

1303

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

16'2"

LENGTH RECOVERED

15'1"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH CM. IN. contact	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12 14		Very fine sand; mud filled burrows; moderate bioturbation 5Y6/1	2.54	88.42	5.10
18		Clay 5Y4/1	3.31	13.44	86.56
64 24		Very fine to fine sand; textural laminations at top			
96 36					
44					
128 48		Interlaminated muddy sand, mud, and clay			
60					
160 60		Highly laminated (textural) fine sand; increasing muddiness downcore 5Y5/1-5Y6/1	2.89	84.44	14.45
72					
192 76		Interlaminated clayey sand and clay			
84		Fine sand 5Y6/1			
224 86					
89					
96					
256		Interlaminated very muddy sand, clayey sand, clay and sandy clay S:C=20:80			
108					
288					
118					
120		Clayey sand 5Y4/1			
320 121					
132			3.35	79.02	20.98
352					
144		Interlaminated very muddy sand, clayey sand, clay and sandy clay S:C 30:70			
384					
156					
416					
168					
448					
180					
480					
192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-48

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3357585.17
560747.74

LAT/LONG
COORDINATES

29°18.454° N
094°44.352° W

WATER DEPTH
19'3"

DATE
5/18/94

START TIME
1110

END TIME
1112

CORE DIAMETER
3"

LENGTH OF BARREL
20'

PENETRATION DEPTH
14'4"

LENGTH RECOVERED
13'8"

SUPPORT VESSEL:
R/V Lonestar

POSITIONING:
Trimble Differential GPS

ANALYSIS BY:
M. Hamilton
Rice University

ANALYSIS METHODS:
Visual Logging
Auto. Settling Tube

DEPTH CM. IN.	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12		Very fine sand with occasional textural laminations 5Y6/1	3.04	93.22	6.55
64 24			2.90	97.22	2.78
96 36 36		Interlams of clay and sand	3.11	22.67	76.96
128 48 46		Muddy sand to slightly muddy sand; discrete clayey sand beds; locally increased muddiness; gravel/shell lag at base 5Y5/1-5Y4/1	3.05	28.67	70.53
160 60			2.86	96.72	2.30
192 72 78		Heavily bioturbated, shelly sandy clay 5Y4/1			
224 84 90		Heavily bioturbated shelly fine sand 5Y5/1			
256 96		Interlaminated clay and clayey sand			
288 108 101		Clay 5Y3/1			
320 120 121		Laminated very clayey sand 5Y4/1			
352 132 134		Interlaminated clay and muddy sand S:C=50:50			
384 144 149		Laminated muddy sand 5Y5/1			
416 156 165			x.xx	72.49	27.04
448 168					
480 180 192					



SAND



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SANDY
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SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-50

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3354893.23
559940.26

LAT./LONG.
COORDINATES

29°18.337° N
094°44.864° W

WATER DEPTH

18'5"

DATE

5/18/94
START TIME

1208

END TIME

1210

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

13'7"

LENGTH RECOVERED

13'3"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH CM. IN.	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12			3.37	94.42	5.28
64 24					
96 36		Fine sand; locally muddy near mud- filled burrows; moderate bioturbation 5Y6/1	2.69	85.05	9.24
128 48					
160 60			3.29	87.53	12.47
192 72					
224 84			3.10	95.29	4.56
256 96					
288 108					
320 120			2.95	89.88	9.96
320 123		Interlaminated muddy sand and clay			
352 132		Fine sand; textural laminations 5Y5/1	2.98	81.93	18.07
384 144					
384 146		Interlaminated muddy sand and clay to highly laminated (textural) muddy sand			
416 156					
416 160					
448 168					
480 180					
480 192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



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INTERBEDS



CLAYEY
SAND



SANDY
CLAY



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SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-53

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING
COORDINATES

3353889.60
558891.11

LAT/LONG
COORDINATES

29°18.170° N
094°45.060° W

WATER DEPTH

19'3"

DATE

5/18/94

START TIME

1338

END TIME

1340

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

13'1"

LENGTH RECOVERED

12'10"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH CM. IN. <i>contact</i>	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
4		Shelly very fine sand			
32 12		Very fine sand; shell frags t/o 5Y4/1	3.05	91.77	7.52
21					
64 24		Shelly fine sand	2.77	87.27	6.57
26					
96 36		Very fine to fine sand 5YR6/1			
128 48			2.82	94.93	4.35
160 60					
192 72			2.86	94.50	5.41
84		Interbeds of clayey sand 5Y5/1			
224 86					
90		Clean very fine to fine sand 5Y6/1			
256 96			3.51	97.09	2.38
288 108					
120					
320 132		Muddy sand to interlaminated clay and sandy clay; shell lag at 148" 5Y4/1	3.07	96.07	3.17
352 138					
144					
384 148					
156					
416					
168					
448 180					
480 192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD

PNEUMATIC HAMMER CORE CORE # G-54

PROJECT: Galveston Island Beach Replenishment

STATE PLANNING COORDINATES

3344865.35
551499.97

LAT/LONG COORDINATES

29°17.005° N
094°46.808° W

WATER DEPTH

19'7"

DATE

5/18/94

START TIME

END TIME

CORE DIAMETER

3"

LENGTH OF BARREL

20'

PENETRATION DEPTH

LENGTH RECOVERED

12'4"

SUPPORT VESSEL:

R/V Lonestar

POSITIONING:

Trimble Differential GPS

ANALYSIS BY:

M. Hamilton
Rice University

ANALYSIS METHODS:

Visual Logging
Auto. Settling Tube

DEPTH CM. IN. contact	LITHOLOGY	DESCRIPTION	GRAIN SIZE (PHI) MEAN	%SAND	%MUD
32 12		Very fine to fine sand; color changes correspond to slight increases in mud content	3.13	96.39	3.21
64 24		5YR6/1	2.93	98.53	1.39
96 36		5YR4/1	3.29	90.11	9.58
128 48		5YR6/1			
160 60					
192 72			2.96	97.14	2.86
224 84					
256 96		5YR4/1	3.06	87.18	12.54
288 108			3.73	84.88	14.76
320 120		Interbedded clay, shelly sand, clean fine sand and muddy sand			
352 132					
384 144					
416 156					
448 168					
480 180					
192					



SAND



MUDDY SAND



MUDDY SAND/CLAY
INTERLAM.



MUDDY SAND/CLAY
INTERBEDS



CLAYEY
SAND



SANDY
CLAY



SHELLY SAND



SHELL HASH



CLAY



MUD