Carroll & Blackman, Inc.

Consulting Engineers
Texas Registered Engineering Firm F-001054

3120 Fannin St
Beaumont, Texas 77701

Phone: 409.833.3363
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COUNTY OF JEFFERSON, TEXAS
TEXAS DEPARTMENT OF RURAL AFFAIRS
HURRICANE IKE/DOLLY ROUND 1 CRITICAL INFRASTRUCTURE PROJECT
DISASTER RECOVERY DIVISION

DRAINAGE DISTRICT NO. 7 DITCH REHABILITATION
MAIN B DIVERSION
GRANTEE CONTRACT NO. DRS010219

ADDENDUM NO. 1
JULY 1, 2013

The following corrections and clarifications are made to the plans and contract documents:

1. The **BID DATE** is hereby changed from July 2, 2013 to **JULY 16, 2013**. *All bids must be submitted with and original and three (3) copies to the Jefferson County Purchasing Agent, 1149 Pearl Street, 1st Floor, Beaumont, Texas 77701, no later than 11:00 AM, Tuesday, July 16, 2013.*
2. For clarification, this project is for the construction of a new ditch.
3. For clarification, all materials are to be supplied by the contractor.
4. The Bid Form shall be deleted in its entirety and shall be replaced with the revised Bid Form included herewith.
5. Retainage on this project will be 5%.
6. 14" Square Concrete Driven piles may be used in lieu of 16" auger cast piles.
7. A copy of the soils report is attached hereto.
8. The proposed 8 x 10 box culverts shall be installed by open cutting not by tunneling. Any reference to installation by tunneling for the 8x10 box culverts shall hereby be stricken from the plans and bid documents.
9. Accommodations shall be made to divert water flow from the 60" culvert from the existing ditch into Main B as necessary when sheet pile coffer dam is in place. (See Sheet 5 of 25.)
10. The following statement shall be added to the Instructions to Bidders:
    "27. The successful bidder will perform a minimum of 50% of the work with less than 50% of the work being done by subcontractors."
11. The following guidelines from Air Products and Chemicals, Inc. shall be added:

    1. Any and all digging within 24" in any direction of the APCI pipeline shall be done MANUALLY.

    2. A minimum clearance of 24" must be maintained between the face of the AP pipeline and the closest point of the box culverts or any other installed structure. This will be of particular significance at the northwest and southeast corners of the box culvert section where the Air Products hydrogen line will be closest to the east and west concrete headwall structures.

Kim Carroll, P.E.
Allen Sims, P.E.

Jeff Kyler, P.E.
Maryella Begley, P.E

Toby Davis, P.E.
Cody Croley, P.E.

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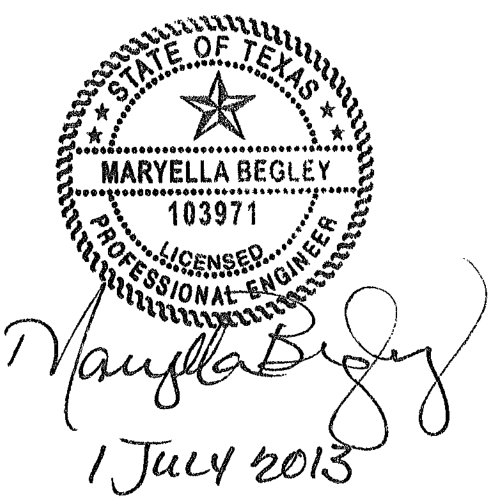
3. Upon completion of the work by the contractor, the APCI right of way is to be returned to its original grade / condition, if applicable, to the reasonable satisfaction of the APCI pipeline representative.

4. Any damage to the pipeline, coating, C/P test stations, wiring etc. shall be repaired by your contractor to the reasonable satisfaction of the APCI pipeline representative.

5. Should equipment and/or vehicles need to cross the APCI pipeline, the crossings shall be reviewed on an individual basis to determine the need for any protective matting, etc, based on weights and depth of cover and conditions at the exact location.

The current plan holders list and a copy of the pre-bid sign-in sheet are included in this addendum.

END OF ADDENDUM



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Toby Davis, P.E.
Cody Croley, P.E.

BID FOR UNIT PRICE CONTRACTS

Place: Jefferson County, Texas

Date:

Project No.: P00939

Proposal of ____ (hereinafter called Bidder), a corporation organized under the laws of the State of ______________/a partnership/an individual doing business as ____ ____ (strike out inapplicable references).

To the Jefferson County, Texas (hereinafter called Owner).

Council members:

The Bidder, in compliance with your invitation for bids for the construction of Jefferson County, Texas, Hurricane Ike/Dolly Round 1, Jefferson County Drainage District No. 7 Main B Diversion having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies; and to construct the project in accordance with the Contract Documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" of the Owner and that the Work will be fully completed within ______ **WORKING** days thereafter as stipulated in the specifications. Bidder further agrees to pay as liquidated damages, the sum of $500 for each consecutive working day thereafter as hereinafter provided in the GENERAL CONDITIONS and the SUPPLEMENTAL CONDITIONS.

Bidder acknowledges receipt of the following addenda:

Addendum No.______Dated____________________Received
Addendum No.______Dated____________________Received
Addendum No.______Dated____________________Received
Addendum No.______Dated____________________Received

BID PROPOSAL
GENERAL LAND OFFICE
HURRICANE IKE/DOLLY ROUND 1 CRITICAL INFRASTRUCTURE PROJECT
DISASTER RECOVERY DIVISION

TEXAS GENERAL LAND OFFICE
HURRICANE IKE/DOLLY ROUND 1 CRITICAL INFRASTRUCTURE PROJECT
DISASTER RECOVERY DIVISION
DRAINAGE DISTRICT NO. 7 MAIN B DIVERSION
GRANTEE CONTRACT NO. DRS010219

Bidder agrees to perform all the Drainage District No. 7 of the County of Jefferson, Texas, Hurricane Ike/Dolly Round 1 Critical Infrastructure Project Disaster Recovery Division, Jefferson County Drainage District No. 7 Main B Diversion TxCDBG No. DRS010219 work described in the specifications and shown on the plans, for the following unit prices:

ITEM NO.	APPROX QTY	UNIT	DESCRIPTION OF ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	TOTAL AMOUNT
1	1	LS	Mobilization Maximum 5% @ ______________________________ ____________________ per lump sum.		
2	3	ACRE	Clearing and grubbing, complete and in place, as identified in the Plans and Specifications @ _______________ ______________________________ ________________________ per acre.		
3	45,000	CY	Channel Excavation, complete and in place @ _______________________ ______________________________ ____________________per cubic yard.		
4	1	LS	Gate Structure, including Precast Concrete Pile, Sheet Piling, Structural Concrete, Structural Steel Bridge, Overshot Gate with actuator including all necessary appurtenances and testing, all in strict accordance with the Plans and Specifications, all complete and in place @ ______________________________ ____________________per lump sum.		

5	1	LS	50 ft wide Bridge Structure, including Precast Concrete Pile, Sheet Piling, Structural Concrete, Structural Steel including all necessary appurtenances and testing, all complete and in place @ ______________________ ____________________ per lump sum.		
6	12,600	SY	Construction of Concrete Channel Liner, 6" thick bottom and 6" thick slopes, complete and in place @ _______________________________ ____________________per square yard.		
7	1,400	LF	Placement of (7) 6' x 10' Concrete Box Culverts x 200 LF by tunneling, all complete and in place @ ___ _______________________________ ____________________per linear foot.		
8	1,056	LF	Placement of (8) 8' x 10' Concrete Box Culverts x 132 LF, all complete and in place @ ___ _______________________________ ____________________per linear foot.		
9	500	LF	Fencing, including construction of Temporary Safety Fencing with Signage, all complete and in place @ ___ _______________________________ ____________________per linear foot.		
10	4,000	LF	Trench Safety System, all complete and in place @ ___ _______________________________ ____________________per linear foot.		
11	3	ACRE	Grading and Seeding, and other surface restoration, all complete and in place @ ___ _______________________________ ____________________per acre.		
12	1	LS	Stormwater Pollution Prevention Plan		

			compliance, all complete and in place @ ___ ________________________________ ______________________per lump sum.		

TOTAL BASE BID ____dollars and __________ cents Base Bid. ($_____________)

ALTERNATE BID ITEMS

ITEM NO.	APPROX QTY	UNIT	DESCRIPTION OF ITEM WITH UNIT BID PRICE WRITTEN IN WORDS	UNIT PRICE	TOTAL AMOUNT
1D	1	LS	To provide a 30 foot wide bridge structure instead of a 50 foot wide bridge structure, as identified in the Plans and Specifications @ ________________________________ _________________________ per each.		

TOTAL ALTERNATE BID 1D:
____
____Dollars and,
___________________________Cents ($____).

(Amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.)

The prices mentioned herein shall be full compensation for furnishing all materials, equipment, labor and all other expenses necessary to perform the work in accordance with these Specifications and Contract Documents.

If the contract is to be awarded, it will be awarded to the Best Bid, the lowest Bidder or the Bidder whose evaluation by OWNER or whose Bid indicates to the OWNER that the award will be in the best interest of the Project.

Bidder understands that the Owner reserves the rights to reject any and all bids and to waive any informalities in the bidding. Bidder acknowledges that quantities are not guaranteed and final payment will be based on actual quantities determined as provided in the Contract Documents and Specifications, if applicable. The calculation of quantities of lines at various depths will be based on the plan and profile sheets and not on measurements made in the field unless it has been determined by the Engineer that there is a discrepancy between the plan and profile sheets and the actual elevations in the field.

Bidder agrees that the work will be substantially completed and completed and ready for final payment in accordance with the General Conditions within the time limits set forth in the Agreement. Bidder accepts the provision of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified in the Agreement.

The following documents are attached to and made a condition of this Bid:

(a) Required Bid Security in the form of ________________________and the amount of $__________________________. The Bid Security shall become the property of the owner in the event the contract and bond are not executed within the time set forth above, as liquidated damages for the delay and additional expense caused to the Owner thereby.

(b) A tabulation of Subcontractors, Suppliers and other persons and organization required to be identified in this Bid.

(c) Required BIDDER's Qualification Statement with supporting data.

Terms used in this Bid which are defined in the General Conditions or Instructions will have the meanings in the General Conditions or Instructions to Bidders.

(d) Completed Non-Collusion Affidavit

SUBMITTED ON ______________________________, 20 .

If BIDDER is:

<u>An Individual</u>
By____(SEAL)
(Individual's Name)
doing business as____
Business address:____
____
Phone No.:____

<u>A Partnership</u>
By____(SEAL)
(Firm Name)
____
(General Partner)
Business address:____

____
Phone No.:____

A Corporation
By____(SEAL)
(Corporation Name)
____(State of Incorporation)
By____(SEAL)
(Name of Person Authorized to Sign)
____
(Title)
(Corporate Seal)

Attest____
Business address:____
____
Phone No.:____

Date of Qualification to do business is____

A Joint Venture

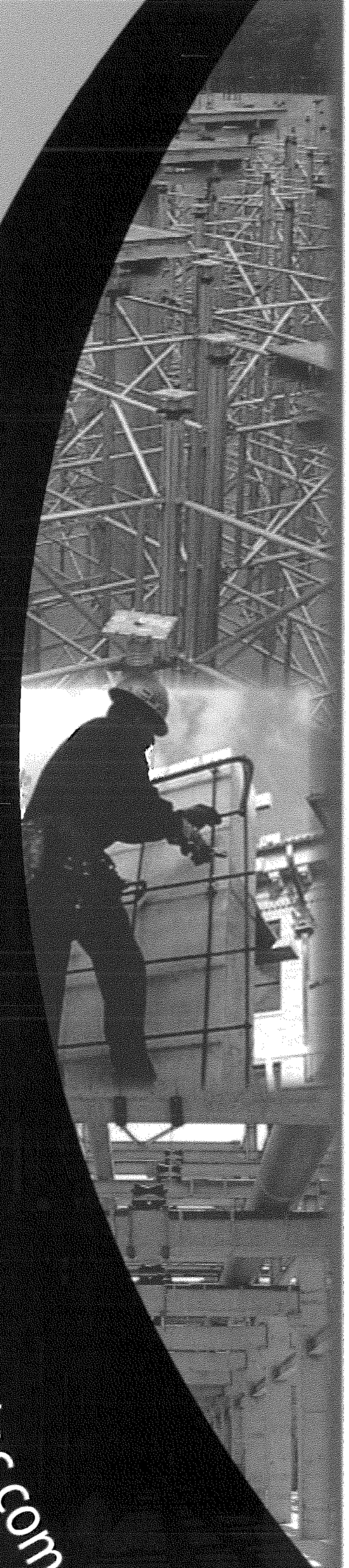
By____(SEAL)
(Name)
____
(Address)

By____(SEAL)
(Name)
____
(Address)

Phone Number and Address for receipt of official communications:
____
____

(Each joint venturer must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above.)

Tolunay-Wong Engineers, Inc.



GEOTECHNICAL ENGINEERING STUDY
PROPOSED NEW OVERSHOT GATE STRUCTURE
NORTHEAST GATE STRUCTURE – MAIN B DIVERSION CANAL
PORT ARTHUR, TEXAS

Prepared for:

Carroll & Blackman, Inc.
3120 Fannin Street
Beaumont, Texas 77701

Prepared by:

Tolunay-Wong Engineers, Inc.
2455 West Cardinal Drive, Suite B
Beaumont, Texas 77705

August 10, 2011

Project No. 11.23.248 / Report No. 44135

www.tweinc.com

Geotechnical Engineering
Environmental Consulting
Construction Materials Testing
Deep Foundations Testing

HOUSTON • CORPUS CHRISTI • DALLAS/FORT WORTH
BEAUMONT • BATON ROUGE • GAINESVILLE

Tolunay-Wong Engineers, Inc.

2455 West Cardinal Drive, Suite B • Beaumont, Texas 77705 • Phone: (409) 840-4214 • Fax: (409) 840-4259

August 10, 2011

Carroll & Blackman, Inc.
3120 Fannin Street
Beaumont, Texas 77701

Attn: Mr. Phillip Hotzen II, E.I.T.
photzen@cbieng.com

Ref: Geotechnical Engineering Study
Proposed New Overshot Gate Structure
Northeast Gate Structure – Main B Diversion Canal
Port Arthur, Texas
TWE Project No. 11.23.248 / Report No. 44135

Dear Mr. Hotzen,

Tolunay-Wong Engineers, Inc. (TWE) is pleased to submit this report of our geotechnical engineering study for the above referenced project. This report contains a detailed description of the field and laboratory work performed for this study as well as the soil boring log including tabulated laboratory test results. Also included in this report are our geotechnical design and construction recommendations for the proposed new overshot gate structure at the northeast gate structure on the Main B Diversion Canal in Port Arthur, Texas.

We appreciate the opportunity to work with you on this phase of the project and look forward to the opportunity to provide additional services as the project progresses. If you have any questions regarding the report or if we can be of further assistance, please contact us.

Sincerely,

TOLUNAY-WONG ENGINEERS, INC.
Texas Board of Professional Engineers Firm Registration No. F-000124

Brett Becker, E.I.T.
Staff Professional

Patrick J. Kenney, P.E.
Vice President – Southeast Region
Engineering Services

STATE OF TEXAS
PATRICK J. KENNEY
87894
LICENSED
PROFESSIONAL ENGINEER
87891

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APPENDICES

Appendix A: Field Program Location Plan
Drawing No. 11.23.248-01

Appendix B: TWE Project Boring Log B-1 and a Key to
Terms and Symbols used on the Boring Log

Appendix C: Allowable Driven Pile Capacity Curves and Capacity Tables

1 INTRODUCTION AND PROJECT DESCRIPTION

1.1 Introduction

This report presents the results of the geotechnical engineering study for the proposed new overshot gate structure on the Main B Diversion Canal in Port Arthur, Texas. This study was conducted in accordance with TWE Proposal No. P11-B158 dated July 14, 2011 and authorized by Ms. Maryella Begley, P.E. on July 18, 2011.

1.2 Project Description

We understand that the project consists of constructing an overshot gate structure on a new diversion canal to be constructed at the Main B Canal in Port Arthur, Texas. We understand that the gate structure and diversion canal will be used to channel water from the Main B Canal to the Golden Pond Detention Pond Facility which is located approximately 1,250-ft southwest of the project site.

Based on project drawings provided by the Client, we understand that the proposed new diversion canal channel will have 2H:1V side slopes with a 40-ft wide ditch bottom. The diversion canal will pass under a new steel bridge structure and 20-ft wide concrete roadway prior to entering the proposed gate structure and Main B Canal.

Based on discussions with the Client, we understand that 14-in square, prestressed, precast concrete piles are being considering as deep foundation support of the proposed new overshot gate structure. We understand that the driven concrete piles will be tied into into concrete pile caps approximately 2-ft wide by 2.5-ft tall along each side of the gate structure. The pile caps are shown to be structurally integrated into the bottom slab of the gate structure as well. The required axial compression capacity of the driven concrete piles will be on the order of 100-kips to 150-kips.

2 PURPOSE AND SCOPE OF SERVICES

The purposes of our geotechnical engineering study were to investigate the soil and groundwater conditions within the project site and to assist our client in the design and construction of suitable foundations for the proposed new overshot gate structure.

The scope of services for the project consisted of:

1. Drilling one (1) soil boring to a depth of 80-ft below existing ground surface at the new proposed overshot gate structure site to evaluate subsurface stratigraphy and groundwater conditions;

2. Performing geotechnical laboratory tests on recovered soil samples to evaluate the physical and engineering properties of the strata encountered;

3. Geotechnical design and construction recommendations for deep foundation systems including axial and lateral capacities of driven precast concrete piles.

The scope of services did not include any environmental assessment for the presence or absence of wetlands or of hazardous or toxic materials within or on the soil, air or water at this site. Any statements in this report or on the boring log regarding odors, colors, unusual items and conditions are strictly for the information of the client. A geological fault study was also beyond the scope of this study.

3 FIELD PROGRAM

TWE conducted an exploration of subsurface soil and groundwater conditions at the project site on July 21, 2011. One (1) soil boring was performed to a depth of 80-ft below existing ground surface for the proposed new overshot gate structure.

The boring location is presented on Drawing No. 11.23.248-01 in Appendix A of this report. Drilling and sampling of the soil boring was performed using a buggy-mounted drill rig. Our field personnel coordinated the field activities and logged the borehole.

3.1 Drilling Methods

Field operations were performed in general accordance with *Standard Practice for Soil Investigation and Sampling by Auger Borings* [American Society for Testing and Materials (ASTM) D 1452]. The soil boring was drilled using an all-terrain buggy-mounted drilling rig equipped with a rotary head. The borehole was advanced using dry-auger drilling methods. Typically, borings are dry-augered using a flight auger to advance the borehole until groundwater is encountered or until the borehole become unstable and collapses. At that point, the soil boring is completed using wash-rotary drilling techniques. Samples were obtained continuously to a depth of 12-ft, at 13-ft to 15-ft, 18-ft to 20-ft and at 5-ft depth intervals thereafter until the boring completion depth of 80-ft was reached.

3.2 Soil Sampling

Fine-grained, cohesive soil samples were recovered from the soil boring by hydraulically pushing a 3-in diameter, thin-walled tube a distance of about 24-in. The field sampling procedures were conducted in general accordance with the *Standard Practice for Thin-Walled Tube Sampling of Soils* (ASTM D 1587). TWE's geotechnician visually classified the recovered soils and obtained a penetration resistance measurement of the recovered soils using a calibrated pocket penetrometer. A factor of 0.67 is typically applied to the penetrometer measurement to estimate the undrained shear strength of the Gulf Coast cohesive soils. The samples were extruded in the field, wrapped in foil, placed in moisture sealed plastic bags and protected from disturbance prior to transport to the laboratory. The recovered soil sample depths and pocket penetrometer measurements are presented on the boring log in Appendix B.

Coarse-grained, cohesionless and semi-cohesionless soil samples were collected with the Standard Penetration Test (SPT) sampler driven 18-in by blows from a 140-lb hammer falling 30-in (ASTM D 1586). The number of blows required to advance the sampler three (3) consecutive 6-in depths are recorded for each corresponding sample on the boring log. The N-value, in blows per foot, is obtained from SPT by adding the last two (2) blow count numbers. The compactness of the cohesionless and semi-cohesionless samples and the consistency of the cohesive samples are inferred from the N-value. The samples obtained from the split barrel sampler were visually classified, placed in moisture sealed plastic bags and transported to our laboratory. The SPT sampling intervals and blow counts are presented on the boring log in Appendix B.

3.3 Boring Log

Our interpretation of general subsurface soil and groundwater conditions at the soil boring location is included on the boring log. The interpretations of the soil types throughout the boring depths and the locations of strata changes were based on visual classifications during field sampling and laboratory testing using ASTM D 2487, Unified Soil Classification System, and ASTM D 2488, Description and Identification of Soils. The boring log includes the type and interval depth for each sample along with the corresponding pocket penetrometer readings for cohesive soils. The boring log and a key to terms and symbols used on the boring log are presented in Appendix B.

3.4 Groundwater Measurements

Groundwater levels were measured in the open borehole during dry-auger drilling. Water level readings were taken in the open borehole when groundwater was first encountered and then at five (5) minute intervals thereafter over a fifteen (15) minute time period. The groundwater observations are summarized in Section 5.4 of this report entitled *"Groundwater Observations."*

4 LABORATORY SERVICES

A laboratory testing program was conducted on selected samples to assist in classification of the soils encountered in the project boring and to evaluate the physical and engineering properties of the strata encountered at the project site.

4.1 Laboratory Testing Program

Laboratory tests were performed in general accordance with ASTM standards to measure physical and engineering properties of the recovered samples. The types and brief descriptions of the laboratory tests performed are presented below.

Table 4-1
Laboratory Testing Program

Type of Test	Testing Method
Amount of Materials in Soils Finer than Sieve No. 200	ASTM D 1140
Unconfined Compression (UC)	ASTM D 2166
Natural Water Content of Soil	ASTM D 2216
Atterberg Limits	ASTM D 4318
Dry Unit Weight	-

Amount of Materials in Soils Finer than No. 200 (75-µm) Sieve (ASTM D 1140)
This test method determines the amount of materials in soils finer than the No. 200 (75-µm) sieve by washing. The loss in weight resulting from the wash treatment is presented as a percentage of the original sample and is reported as the percentage of silt and clay particles in the sample.

Unconfined Compressive Strength of Cohesive Soil (ASTM D 2166)
This test method determines the unconfined compressive strength of cohesive soil in the undisturbed or remolded condition using strain-controlled application of an axial load. This test method provides an approximate value of the strength of cohesive materials in terms of total stresses. The undrained shear strength of a cohesive soil sample is one-half (1/2) the unconfined compressive strength.

Water (Moisture) Content of Soil by Mass (ASTM D 2216)
This test method determines water (moisture) content by mass of soil where the reduction in mass by drying is due to loss of water. The water (moisture) content of soil, expressed as a percentage, is defined as the ratio of the mass of water to the mass of soil solids. Moisture content may provide an indication of cohesive soil shear strength and compressibility when compared to Atterberg Limits.

Liquid Limit, Plastic Limit and Plasticity Index of Soils (ASTM D 4318)

This test method determines the liquid limit, plastic limit and the plasticity index of soils. These tests, also known as Atterberg limits, are used from soil classification purposes. They also provide an indication of the volume change potential of a soil when considered in conjunction with the natural moisture content. The liquid limit and plastic limit establish boundaries of consistency for plastic soils. The plasticity index is the difference between the liquid limit and plastic limit.

Dry Unit Weight of Soils

This test method determines the weight per unit volume of soil, excluding water. Dry unit weight is used to relate the compactness of soils to volume change and stress-strain tendencies of soils when subjected to external loadings.

The laboratory test results are presented on the boring log in Appendix B.

5 SITE CONDITIONS

Our interpretations of soil and groundwater conditions within the project site are based on information obtained at the soil boring location only. This information has been used as the basis for our conclusions and recommendations. Subsurface conditions may vary at areas not explored by the project boring. Significant variations at areas not explored by the soil boring will require re-evaluation of our recommendations.

5.1 Site Description and Surface Conditions

The project site is located adjacent to the Main B Canal near the existing northeast gate structure in Port Arthur, Texas. The site is currently semi-developed and cleared of trees and brush. The site was flat with grass and weed cover at the time of our subsurface exploration. Surface conditions at the time of our field program were dry with adequate drainage.

5.2 Subsurface Soil Stratigraphy

The generalized subsurface soil profile as interpreted from boring B-1 consists of very stiff to hard lean clay (CL) and lean clay with sand (CL) from existing ground surface to a depth of 10-ft followed by firm fat clay (CH) to the 17-ft depth. We then encountered a water bearing clayey sand (SC) stratum from 17-ft to 23-ft followed by stiff lean clay (CL) to the 33-ft depth. A layer of firm to stiff fat clay (CH) was observed from 33-ft to 53-ft below existing ground surface with firm lean clay (CL) from 53-ft to 58-ft followed by stiff silty clay with sand (CL-ML) to the 63-ft depth. From 63-ft to the boring completion depth of 80-ft, we encountered very dense poorly graded sand (SP) and poorly graded sand with silt (SP-SM). We observed silt and sand seams, ferrous nodules and slickensides within the cohesive soil matrix. Detailed descriptions of the soils encountered at the boring location are presented on the boring log included in Appendix B.

5.3 Subsurface Soil Properties

Results of Atterberg limits tests on selected samples recovered from the soil boring indicate liquid limits ranging from 25 to 89 and corresponding plasticity indices of 5 to 64. Undrained shear strengths ranged from 770-psf to 2,280-psf within the cohesive soil matrix with corresponding dry unit weights of 95-pcf to 113-pcf. Pocket penetrometer readings taken on recovered cohesive soil samples ranged from 1.00-tsf to +4.50-tsf. The cohesive soils recovered from the soil borings were inferred to have firm to hard, but typically stiff consistencies.

The in-situ moisture content of the selected cohesionless samples recovered from the project boring ranged from 25% to 26%. We recorded SPT N-values ranging from 67 to 109 blows per foot within the cohesionless soil strata indicating very dense relative densities. The measured fines content of these cohesionless soil samples recovered from split-barrel sampling ranged from 0% to 10%.

Tabulated laboratory test results at the recovered sample depths are presented on the boring log in Appendix B

5.4 Groundwater Observations

Groundwater measurements obtained from the soil boring are presented in Table 5-1 below.

Table 5-1
Groundwater Level Measurements

Groundwater Level Measurements				
Soil Boring	**Soil Boring Completion Depth**	**Free Water Depth**	**Static Water Depth**	**Caved Depth**
B-1	80-ft	17.5-ft	14.1-ft	--

Groundwater levels may fluctuate with climatic and seasonal variations and should be verified before construction. Accurate determination of the static groundwater level is typically made with a standpipe piezometer. Installation of piezometers to evaluate long-term groundwater conditions within the project was not included in our scope of work.

6 DEEP FOUNDATION RECOMMENDATIONS

We have been requested to provide axial and lateral capacities for various sizes and depths of driven piles. Recommendations for alternate foundation systems not included herein can be provided upon request. We expect the driven piles to develop adequate skin friction capacities within the competent cohesive soils from approximate depths of 23-ft to 63-ft along with significant end-bearing resistance within the very dense cohesionless soils encountered below 63-ft to the boring completion depth of 80-ft. However, we anticipate practical refusal to driving piles into the very dense sands deeper than about 70-ft. We recommend that the driven piles be tipped into this very dense sand stratum in order to provide the maximum bearing capacity with minimal settlement. The following sections provide our recommendations for driven precast concrete piles.

6.1 Axial Pile Capacity

We have developed unit friction and end bearing capacity curves for calculating allowable pile capacity in use with driven precast concrete piles at the proposed new overshot gate structure site. The design factor curves (F and E) are provided in Appendix C of this report. Example calculations illustrating the proper use of these curves are provided on the figures. The unit friction (F) and end bearing (E) curves include a minimum factor of safety of 2.0. A factor of safety of 3.0 was applied to end bearing capacity and to side friction capacity when computing tension capacity. The values presented are based on the assumption that the piles to be installed will have a minimum center-to-center spacing of at least three (3) pile widths. If groups of piles having spacing of less than three (3) widths are being considered for this project, TWE should be contacted to analyze group capacities and settlements.

In order to assist in pile selection, pile capacity tables for several driven pile sizes and depths are also presented in Appendix C of this report. The values for "F" and "E" given in the pile capacity tables are taken from the pile capacity curves provided for individual piles having a minimum center-to-center spacing of at least three (3) pile widths. The pile depths listed are measured from existing ground surface. Although we provided pile capacities to depths up to 80-ft, we anticipate practical refusal to driving piles into the very dense sand stratum deeper than about 70-ft. Some general guidelines for estimating group pile capacities are provided in Section 6.3 of this report.

It should be noted that the tension capacity is based solely on soil-pile interaction. Piles and pile cap connections should be structurally capable of resisting design uplift loads. A detailed analysis of axial load versus settlement for deep foundations was beyond the scope of this investigation. However, for single isolated piles designed in accordance with the computed allowable values of side friction and end bearing, foundation settlements should be less than about 0.5-in.

6.2 Lateral Pile Capacity

For deep foundations, lateral loads are resisted by the soil as well as the rigidity of the pile. Lateral capacity will vary with pile type and properties, degree of fixity and pile spacing. Typically, lateral loads are analyzed using the p-y method in which the soil is modeled as a series of non-linear springs. This procedure with appropriate computer codes (i.e., LPILE by Ensoft, Inc.) has the advantage that major factors influencing soil resistance are inherently included in the semi-empirical p-y design criteria. Detailed analyses can be performed for the final pile size and configuration upon request.

For the conditions observed at the proposed new overshot gate structure site, we have developed the following soil parameters in Table 6-1 below for use with lateral analysis of pile foundations.

Table 6-1
Lateral Shaft Design Parameters

Depth Range (ft)	LPILE Soil Type	Effective Unit Weight, γ' (pci)	Cohesion, c (psi) or Friction Angle, φ	Lateral Modulus, *k* (pci)	Strain Factor, ε_{50}
0 - 10	Stiff Clay without Free Water	0.072	14.58	1000	0.005
10 - 17	Stiff Clay without Free Water	0.071	5.03	100	0.010
17 - 23	Sand (Reese)	0.03	30°	20	--
23 - 33	Stiff Clay with Free Water	0.033	5.56	100	0.010
33 - 53	Stiff Clay with Free Water	0.026	9.38	500	0.007
53 - 58	Stiff Clay with Free Water	0.033	2.08	30	0.020
58 - 63	Stiff Clay with Free Water	0.033	3.13	30	0.020
63 - 80	Sand (Reese)	0.03	42°	125	--

6.3 Pile Groups

As previously mentioned, groups of piles having a center-to-center spacing of less than three (3) pile widths should be analyzed for group efficiency. If pile groups are planned for this project, TWE should be contacted to analyze group capacities and settlements once the final pile size, depth and group configurations are selected. Some general guidelines for estimating group pile capacities are provided below.

6.3.1 Axial Group Efficiency

The following method can be used to determine the axial capacity of pile groups. This method assumes that the piles and confined soil mass encompassed by the group act as a unit like a pier. The ultimate bearing capacity of the cluster, Q_c, is equal to the ultimate load carried in friction by the circumferential area of the group plus the ultimate load resistance derived from the base of the assumed equivalent pier.

$$Q_c = f_s A_c + 9 C_u A_b$$

f_s	=	Ultimate Unit Soil-Pile Adhesion (psf)
A_c	=	Circumferential Embedded Area of Equivalent Pier (ft)
C_u	=	Soil Shear Strength at Pile Tips (psf)
A_b	=	Base Area of Equivalent Pier (ft^2)

A pile group is considered safe against bearing failure if the number of piles in the group times the applied design load per pile does not exceed Qc/F.S. (F.S. = Factor of Safety). If the total group design load is greater than Qc/F.S., one alternative is to reduce the design load for individual piles within the group accordingly. Based on this approach to pile group capacity analysis, pile spacing can be determined in which full capacity of individual piles is utilized. Generally, a pile spacing of at least three (3) pile widths, center-to-center, is selected as a first approximation.

6.3.2 Pile Group Settlement and Spacing

Vertical movement (settlement) of individual piles when subjected to structural loading will be the sum of elastic pile deformation and pile tip movement. Settlement of pile groups will depend on individual pile movements, pile spacing and the compressibility of the soils below the pile tips. Pile spacing is important in reducing pile group movement. A minimum pile spacing of at least three (3) pile widths, center-to-center, is assumed and should be maintained if possible. Closer spacing could result in increased group settlement and a reduction of load-carrying capacity of individual piles as indicated below.

Total settlements of the group, primarily elastic in nature, will occur during loading and may be on the order of 0.5-in to 1-in for normal operating conditions. Differential settlements between adjacent groups may occur as a result of variation in applied load, group size and group location. Structural connections and adjacent structures also supported on adjacent pile foundations should be designed for differential settlements between adjacent pile groups on the order of 0.5-in to 0.75-in. Once foundation design is complete, TWE should be contacted in order to determine the consolidation settlement of the final pile group design.

6.3.3 Lateral Group Effects

The reduction of the lateral pile capacity due to group action involves factors such as pile spacing, location of the pile within the group, soil-pile stiffness ratios, direction of loading and other factors. When lateral loads have been selected for design purposes, group reductions can be estimated by using the lateral group efficiency factors presented in Table 6-2 on the following page.

Table 6-2 Static Lateral Group Efficiency Factors	
S/W (Center-to-Center Spacing/ Width)	**Group Efficiency**
3.0	0.55
3.5	0.65
4.0	0.75
5.0	0.85
6.0	1.00

The group lateral efficiency factors above should be applied as follows:

Allowable Lateral Load of Pile Group = (N)(GE)(SPALL)

N = Number of Piles in Group
GE = Group Efficiency Factor
SPALL = Single Pile Allowable Lateral Load

The above procedure for determining lateral group reduction is considered to provide a general estimate of group efficiency. A more detailed approach to determining the lateral grouping effects is provided in *"Analysis and Design of Shallow and Deep Foundations"* by Lymon C. Reese, William M. Isenhower, and Shin-Tower Wang (2006 edition). Article 15.5.3 of this publication describes a method in which the *p-y* curves for a single pile are modified to take into account the group effect. This article concludes that the group effect could be taken into account most favorably by reducing the value of *p* for the *p-y* curve of the single pile to obtain *p-y* curves for the pile group.

The LPILE computer program provides a mechanism whereby the *p-y* modification factor can be included in the input file. The *p-y* modification factor is calculated based on the number of piles in the group, pile spacing, pile diameter/width, location of the pile to be analyzed within the group and the direction of the horizontal loading on the group with respect to the group geometry. This method is considered to provide more realistic estimates of lateral group effects than the general procedure provided above.

6.4 Driven Pile Installation

Pile driving hammers should be selected according to pile type, length, size and weight of pile, as well as potential vibrations resulting from pile driving operations. Care should be taken to assure that the hammer selected is capable of achieving the desired penetration without causing damage to the piles or causing excessive vibrations which could damage existing structures nearby.

Each pile should be driven to the desired tip elevation and driving resistance without interruption in the driving operations. Supplemental techniques like pilot holes or jetting are not considered necessary for this project based on the soils encountered and design pile capacities. These supplemental techniques should be avoided since they may reduce pile capacities. Driving of center cluster piles first will facilitate driving operations. Accurate records of the final tip elevation and driving resistances should be obtained during the pile driving operations.

Some pile heaving may be experienced during installation of adjacent displacement type piles. It is therefore recommended that tip elevations of piles be recorded and if significant heave is noted after driving of subsequent piles, provisions must be made for reseating them.

7 LIMITATIONS AND DESIGN REVIEW

7.1 Limitations

This report has been prepared for the exclusive use of Carroll & Blackman, Inc. and their design team for specific application to the design and construction of the proposed new overshot gate structure at the Main B Diversion Canal in Port Arthur, Texas. Our report has been prepared in accordance with the generally accepted geotechnical engineering practice common to the local area. No other warranty, express or implied is made.

The analyses and recommendations contained in this report are based on the data obtained from the referenced subsurface explorations within the project site. The soil boring indicates subsurface conditions only at the specific locations and times performed and only to the depth penetrated. The soil boring does not necessarily reflect strata variations that may exist at other locations within the project site. The validity of the recommendations provided is based in part on assumptions about the stratigraphy made by the Geotechnical Engineer. Such assumptions may be confirmed only during earthwork and foundation installation. Our recommendations presented in this report must be re-evaluated if subsurface conditions during construction are different from those described in this report.

If any changes in the nature, design or location of the project are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and the conclusions modified or verified in writing by TWE. TWE is not responsible for any claims, damages or liability associated with interpretation or reuse of the subsurface data or engineering analyses without the expressed written authorization of TWE.

7.2 Design Review and Construction Monitoring

Review of the design and construction drawings should be performed by TWE before release. The review is aimed at determining if the geotechnical design and construction recommendations contained in this report have been properly interpreted. Design review is not within the authorized scope of work for this study.

Construction surveillance is recommended and has been assumed in preparing our recommendations. These field services are required to check for changes in conditions that may result in modifications to our recommendations. The quality of the construction practices will affect foundation performance and should be monitored.

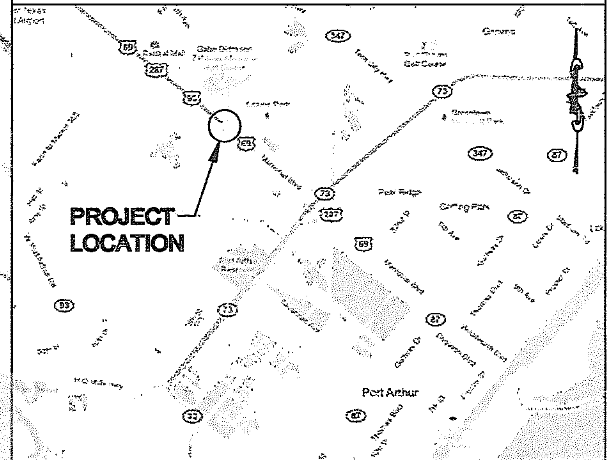
7.3 Closing Remarks

We appreciate the opportunity to be of service during this phase of the project and we look forward to continuing our services during the construction phase and on future projects.

APPENDIX A

SOIL BORING LOCATION PLAN
DRAWING NO. 11.23.248-01

VICINITY MAP



FIELD PROGRAM COORDINATES

BORING	DEPTH	LATITUDE	LONGITUDE
B-1	80'	29° 55' 53.57" N	93° 58' 30.03" W

LEGEND

⊕ BORING LOCATION

BY	DATE	REVISIONS	NO.

Tolunay-Wong Engineers, Inc.
Beaumont, Texas

BORING LOCATION PLAN
PROPOSED NEW OVERSHOT GATE STRUCTURE
MAIN B CANAL DIVERSION CANAL
PORT ARTHUR, TEXAS

DRAWN BY:	M.M.	DWG. NO.	11.23.248-01
CHECKED BY:	T.G.H.	SCALE:	N.T.S.
APPROVED BY:	P.J.K.	DATE:	JUNE 19, 2011

APPENDIX B

TWE PROJECT BORING LOG B-1 AND
A KEY TO TERMS AND SYMBOLS USED ON BORING LOG

LOG OF BORING B-1

PROJECT: Northeast Gate Structure
Main Canal B Diversion Canal - Port Arthur, Texas

CLIENT: Carroll & Blackman, Inc.
Beaumont, Texas

COORDINATES: N 29° 55' 53.57"
W 93° 58' 30.03"
SURFACE ELEVATION: --
DRILLING METHOD:
Dry Augered: 0' to 20'
Wash Bored: 20' to 80'

DEPTH (FT)	MATERIAL DESCRIPTION	(P) POCKET PEN (tsf) (T) TORVANE (tsf)	STD. PENETRATION TEST BLOWCOUNT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COMPRESSIVE STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)	PASSING #200 SIEVE (%)	OTHER TESTS PERFORMED
0	Hard brown LEAN CLAY (CL), with gravel	(P)4.50										
	Hard brown SANDY LEAN CLAY (CL)	(P)4.50		13		40	29				68	
	-becomes very stiff with sand seams and pockets	(P)4.00										
5	Very stiff brown and tan LEAN CLAY (CL)	(P)3.00		15	113	45	32	2.28	10			
	-becomes stiff and dark brown	(P)1.50										
10	Firm light gray and tan FAT CLAY (CH) -with ferrous nodules from 10' to 12'	(P)1.25		28	95	66	51	0.78	3			
		(P)1.00										
15	Light gray and tan CLAYEY SAND (SC)			22		29	13				44	
20												
	Stiff light brown LEAN CLAY (CL), with silt seams	(P)2.00		27	95	43	26	0.77	2			
25		(P)2.75										
30	Stiff gray FAT CLAY (CH) -with slickensides from 33' to 35'	(P)1.25		48	74	80	58	1.80	3 *			
35												

COMPLETION DEPTH: 80 ft
DATE BORING STARTED: 07/21/11
DATE BORING COMPLETED: 07/21/11
LOGGER: J. Turner
PROJECT NO.: 11.23.248

NOTES: Free water was encountered at a depth of 17.5-ft during dry-auger drilling and rose to a depth of 14.1-ft after fifteen (15) minutes.

LOG OF BORING B-1

PROJECT: Northeast Gate Structure
Main Canal B Diversion Canal - Port Arthur, Texas

CLIENT: Carroll & Blackman, Inc.
Beaumont, Texas

COORDINATES: N 29° 55' 53.57" W 93° 58' 30.03"
SURFACE ELEVATION: --
DRILLING METHOD:
Dry Augered: 0' to 20'
Wash Bored: 20' to 80'

MATERIAL DESCRIPTION	(P) POCKET PEN (tsf) (T) TORVANE (tsf)	STD. PENETRATION TEST BLOWCOUNT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COMPRESSIVE STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)	PASSING #200 SIEVE (%)	OTHER TESTS PERFORMED
Stiff gray FAT CLAY (CH)											
-firm from 38' to 40	(P)1.00										
-with slickensides from 43' to 45'	(P)1.25		56	67	89	64	1.13	2 *			
-becomes firm	(P)1.00										
Firm gray SANDY LEAN CLAY (CL)	(P)1.00		23		30	8				53	
Stiff gray SILTY CLAY with SAND (CL-ML)	(P)1.50		23		25	5				76	
Very dense light gray POORLY GRADED SAND (SP)		19/6" 30/6" 37/6"	26							0	
		9/6" 29/6" 50/5"									

Depth scale (FT): 40, 45, 50, 55, 60, 65, 70

COMPLETION DEPTH: 80 ft
DATE BORING STARTED: 07/21/11
DATE BORING COMPLETED: 07/21/11
LOGGER: J. Turner
PROJECT NO.: 11.23.248

NOTES: Free water was encountered at a depth of 17.5-ft during dry-auger drilling and rose to a depth of 14.1-ft after fifteen (15) minutes.

TOLUNAY-WONG ENGINEERS, INC.

LOG OF BORING B-1

PROJECT: Northeast Gate Structure
Main Canal B Diversion Canal - Port Arthur, Texas

CLIENT: Carroll & Blackman, Inc.
Beaumont, Texas

COORDINATES: N 29° 55' 53.57"
W 93° 58' 30.03"
SURFACE ELEVATION: --
DRILLING METHOD:
Dry Augered: 0' to 20'
Wash Bored: 20' to 80'

ELEVATION (FT)	DEPTH (FT)	SAMPLE TYPE	SYMBOL	MATERIAL DESCRIPTION	(P) POCKET PEN (tsf) (T) TORVANE (tsf)	STD. PENETRATION TEST BLOWCOUNT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COMPRESSIVE STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)	PASSING #200 SIEVE (%)	OTHER TESTS PERFORMED
				Very dense light gray POORLY GRADED SAND (SP)											
	75			Very dense light gray POORLY GRADED SAND with SILT (SP-SM)		50/5.5" 39/6" 50/5"	25							10	
	80			Bottom @ 80'											
	85														
	90														
	95														
	100														
	105														

COMPLETION DEPTH: 80 ft
DATE BORING STARTED: 07/21/11
DATE BORING COMPLETED: 07/21/11
LOGGER: J. Turner
PROJECT NO.: 11.23.248

NOTES: Free water was encountered at a depth of 17.5-ft during dry-auger drilling and rose to a depth of 14.1-ft after fifteen (15) minutes.

TOLUNAY-WONG ENGINEERS, INC.

SYMBOLS AND TERMS USED ON BORING LOGS

Most Common Unified Soil Classifications System Symbols

- Fill
- Pavement
- Lean Clay (CL)
- Lean Clay w/ Sand (CL)
- Sandy Lean Clay (CL)
- Fat Clay (CH)
- Fat Clay w/ Sand (CH)
- Sandy Fat Clay (CH)
- Silty Clay (CL)
- Sandy Silty Clay (CL-ML)
- Silty Clayey Sand (SC-SM)
- Clayey Sand (SC)
- Sandy Silt (ML)
- Silty Sand (SM)
- Silt w/ Sand (ML)
- Well Graded Sand (SW)
- Well Graded Sand w/ Gravel (SW-GM)
- Poorly Graded Sand (SP)
- Poorly Graded Sand w/ Silt (SP-SM)
- Silt (ML)
- Elastic Silt (MH)
- Elastic Silt w/ Sand (MH-SP)
- Silty Gravel (GM)
- Clayey Gravel (GC)
- Well Graded Gravel (GW)
- Well.Graded Gravel w/ Sand (SP-GM)
- Poorly Graded Gravel (GP)
- Peat

Sampler Symbols	Meaning
	Pavement core
	Thin - walled tube sample
	Standard Penetration Test (SPT)
	Auger sample
	Sampling attempt with no recovery
	TxDOT Cone Penetrometer Test

Field Test Data

2.50	Pocket penetrometer reading in tons per square foot
8/6"	Blow count per 6 - in. interval of the Standard Penetration Test
	Observed free water during drilling
	Observed static water level

Laboratory Test Data

Wc (%)	Moisture content in percent
Dens. (pcf)	Dry unit weight in pounds per cubic foot
Qu (tsf)	Unconfined compressive strength in tons per square foot
UU (tsf)	Compressive strength under confining pressure in tons per square foot
Str. (%)	Strain at failure in percent
LL	Liquid Limit in percent
PI	Plasticity Index
#200 (%)	Percent passing the No. 200 mesh sieve
( )	Confining pressure in pounds per square inch
*	Slickensided failure
**	Did not fail @ 15% strain

RELATIVE DENSITY OF COHESIONLESS & SEMI-COHESIONLESS SOILS

The following descriptive terms for relative density apply to cohesionless soils such as gravels, silty sands, and sands as well as semi-cohesive and semi-cohesionless soils such as sandy silts, and clayey sands.

Relative Density	Typical N_{60} Value Range*
Very Loose	0-4
Loose	5-10
Medium Dense	11-30
Dense	31-50
Very Dense	Over 50

* N_{60} is the number of blows from a 140-lb weight having a free fall of 30-in. required to penetrate the final 12-in. of an 18-in. sample interval, corrected for field procedure to an average energy ratio of 60% (Terzaghi, Peck, and Mesri, 1996).

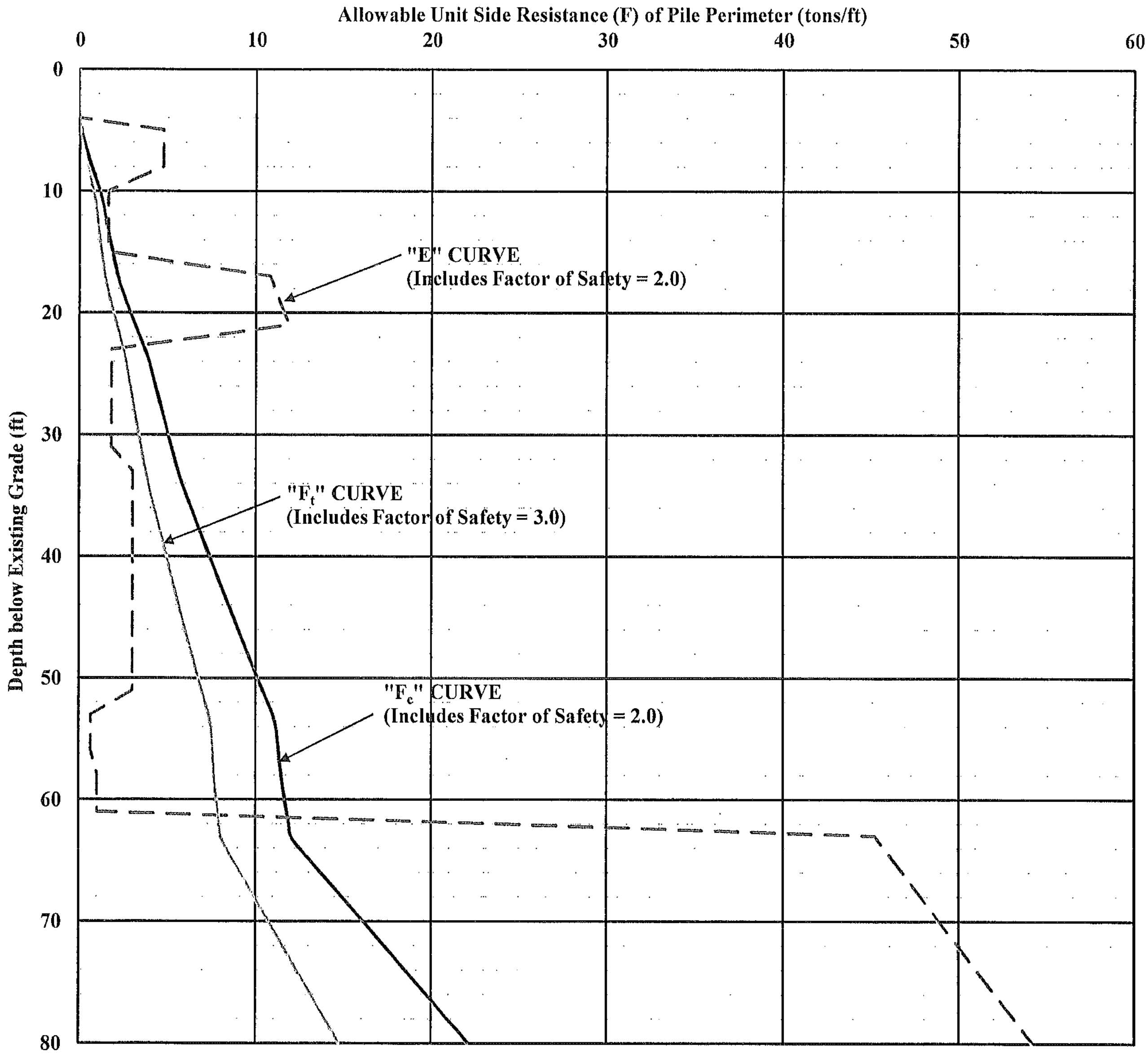
CONSISTENCY OF COHESIVE SOILS

The following descriptive terms for consistency apply to cohesive soils such as clays, sandy clays, and silty clays.

Pocket Penetrometer (tsf)	Typical Compressive Strength (tsf)	Consistency	Typical SPT "N_{60}" Value Range**
pp < 0.50	qu < 0.25	Very soft	≤ 2
0.50 ≤ pp < 0.75	0.25 ≤ qu < 0.50	Soft	3-4
0.75 ≤ pp < 1.50	0.50 ≤ qu < 1.00	Firm	5-8
1.50 ≤ pp < 3.00	1.00 ≤ qu < 2.00	Stiff	9-15
3.00 ≤ pp < 4.50	2.00 ≤ qu < 4.00	Very Stiff	16-30
pp ≥ 4.50	qu ≥ 4.00	Hard	≥ 31

** An "N_{60}" value of 31 or greater corresponds to a hard consistency. The correlation of consistency with a typical SPT "N_{60}" value range is approximate.

ALLOWABLE UNIT SIDE FRICTION AND END BEARING RESISTANCE
DRIVEN PRECAST CONCRETE PILES



DESIGN EQUATIONS:

Compression: $Q_c = PF_c + AE$

Tension: $Q_t = PF_t$

TERMS:

P = Average Pile Perimeter (ft)

A = Pile Tip Area (ft²)

F_c, F_t & E = Allowable Unit Friction (Compression/Tension) and End Bearing Factors

$Q_{c,t}$ = Allowable Pile Capacity in Compression and Tension (tons)

EXAMPLE:

Precast Concrete Pile

(14-in x 14-in Square, 70-ft Length)

P = 4.67 ft

A = 1.36 ft²

F_c = 16.07 tons/ft

F_t = 10.72 tons/ft

E = 48.83 tons/ft²

Q_c = (4.67)(16.07) + (1.36)(48.83) = 141-tons

Q_t = (4.67)(10.72) = 50-tons

Project: Main B Diversion Canal - Overshot Gate Structure Port Arthur, Texas	Tolunay-Wong Engineers, Inc.	**Project No.:** 11.23.248 **Scale:** As shown.
Client: Carroll & Blackman, Inc. Beaumont, Texas	**Allowable Unit F & E Curves Driven Concrete Piles**	**Appendix C Figure 1**

SQUARE PRECAST CONCRETE PILES
Allowable Axial Capacity (tons)

Pile Width (in) (Square)	Embedment Depth (ft)	Perimeter (ft)	Area (ft^2)	Design Factors from Curves			Compression (tons)	Tension (tons)
				F_c	F_t	E		
12	30	4.00	1.00	5.04	3.36	1.81	22	13
12	35	4.00	1.00	6.09	4.06	3.02	27	16
12	40	4.00	1.00	7.38	4.92	3.02	33	20
12	45	4.00	1.00	8.73	5.82	3.02	38	23
12	50	4.00	1.00	10.11	6.74	3.02	43	27
12	55	4.00	1.00	11.23	7.49	0.67	46	30
12	60	4.00	1.00	11.66	7.77	1.02	48	31
12	65	4.00	1.00	13.07	8.72	46.22	99	35
12	70	4.00	1.00	16.07	10.72	48.83	113	43
12	75	4.00	1.00	19.07	12.72	51.47	128	51
12	80	4.00	1.00	22.07	14.72	54.11	142	59
14	30	4.67	1.36	5.04	3.36	1.81	26	16
14	35	4.67	1.36	6.09	4.06	3.02	33	19
14	40	4.67	1.36	7.38	4.92	3.02	39	23
14	45	4.67	1.36	8.73	5.82	3.02	45	27
14	50	4.67	1.36	10.11	6.74	3.02	51	31
14	55	4.67	1.36	11.23	7.49	0.67	53	35
14	60	4.67	1.36	11.66	7.77	1.02	56	36
14	65	4.67	1.36	13.07	8.72	46.22	124	41
14	70	4.67	1.36	16.07	10.72	48.83	141	50
14	75	4.67	1.36	19.07	12.72	51.47	159	59
14	80	4.67	1.36	22.07	14.72	54.11	177	69
16	30	5.33	1.78	5.04	3.36	1.81	30	18
16	35	5.33	1.78	6.09	4.06	3.02	38	22
16	40	5.33	1.78	7.38	4.92	3.02	45	26
16	45	5.33	1.78	8.73	5.82	3.02	52	31
16	50	5.33	1.78	10.11	6.74	3.02	59	36
16	55	5.33	1.78	11.23	7.49	0.67	61	40
16	60	5.33	1.78	11.66	7.77	1.02	64	41
16	65	5.33	1.78	13.07	8.72	46.22	152	46
16	70	5.33	1.78	16.07	10.72	48.83	173	57
16	75	5.33	1.78	19.07	12.72	51.47	193	68
16	80	5.33	1.78	22.07	14.72	54.11	214	78
18	30	6.00	2.25	5.04	3.36	1.81	34	20
18	35	6.00	2.25	6.09	4.06	3.02	43	24
18	40	6.00	2.25	7.38	4.92	3.02	51	30
18	45	6.00	2.25	8.73	5.82	3.02	59	35
18	50	6.00	2.25	10.11	6.74	3.02	67	40
18	55	6.00	2.25	11.23	7.49	0.67	69	45
18	60	6.00	2.25	11.66	7.77	1.02	72	47
18	65	6.00	2.25	13.07	8.72	46.22	182	52
18	70	6.00	2.25	16.07	10.72	48.83	206	64
18	75	6.00	2.25	19.07	12.72	51.47	230	76
18	80	6.00	2.25	22.07	14.72	54.11	254	88

Note: Pile embedment depth is the depth below existing grade.

Project: Main B Diversion Canal - Overshot Gate Structure, Port Arthur, Texas	**Tolunay-Wong Engineers, Inc.**	**Project No.:** 11.23.248 **Scale:** As shown.
Client: Carroll & Blackman, Inc., Beaumont, Texas	**Allowable Axial Capacity Driven Timber and Concrete Piles**	**Appendix C Figure 2**

PRE-BID MEETING ATTENDEES

MAIN "B" Diversion

June 25, 2013

NAME/COMPANY	ADDRESS AND EMAIL	TELEPHONE AND FAX NUMBER
BorTunCo, LLC	6315 Hermonn Dr Houston, TX 77050 dkornegay@bortunco.com	713-907-7715 832-300-3334
Mike Westering NBG Constructors, Inc	9702 Synott Houston Tx 77083 mwestering@consolidated.net	832-722-4591 281-495-0911
Chris Talling / BakerCorp	11890 Stone Oak Beaumont, TX 77705 ctalling@bakercorp.com	409-284-5498 409-832-8400
Billy Patterson Allco	2220 College St. Beaumont, Texas bpatterson@Allco.com	409-860-4459 409-860-3857
MK Constructors Mike Kelley	2485 North Street Vidor Tx 77662 Sales@MKconstructors.com	409-769-0089 409-769-1288
Beth Waxman David Waxman	Box 900, Jasper, Tx 75951 beth.waxman@sbcglobal.net	409 384 3458 409 384 5719
Doug Potts Jim Coates	10326 Green Tree Houston, Tx 77042 james_coates3@comcast.net	713 899-8894
Mike Williams Brystar Contracting	8385 Chemical Rd Beaumont TX Mike@Brystar.com	409 498 3055 409 842 6768 ex 111
Sarah Kelly Triple B Services	820 Old Atascocita Rd Huffman, TX 77336 tiffany@triplebservices.com	281-324-3264 281-324-1304

PRE-BID MEETING ATTENDEES

MAIN "B" Diversion

June 25, 2013

NAME/COMPANY	ADDRESS AND EMAIL	TELEPHONE AND FAX NUMBER
Jamey West	Jefferson Cty. Purchasing jwest@co.jefferson.tx.us	409-835-8593
Mark Simon Simco Enterprises	P.O. Box 877 Groves, TX 77619 marks_1@sbcglobal.net	962-8593 284-9335
Bronson Barrow Triangle Concrete	1255 Montrose Bmt, 77707 bronson.TLine@live.com	861-1650 861-1911
Richard Knox Placo	P.O. Box 8120 Lumberton, TX 77657	755-3667 755-3878
Allen Sims CBI	3120 Fannin St. Beaumont, TX ~~77~~ 77701 asims@cbieng.com	409-833-3363 833-0317
Maryella Begley CBI	mbegley@cbieng.com	"

JEFFERSON COUNTY DRAINAGE DISTRICT NO. 7
County of Jefferson, TX
Hurricane Ike/Dolly Round 1 Critical Infrastructure Project
Disaster Recovery Division
Drainage District No. 7 Ditch Rehabilitation - MAIN B DIVERSION

Project Manager: Maryella Begley
Apparent Low Bidder:
Awarded To:

$ 150.00

MANDATORY Pre-Bid Conference Tuesday, June 25, 2013, @ 2:00pm
@ the offices of Jefferson County Drainage District No. 7
4401 Ninth Avenue, Port Arthur, TX 77642
BIDS ARE TO BE SUBMITTED TO: the Jefferson County Purchasing Agent
1149 Pearl St., 1st Floor, Beaumont, TX 77701
NO LATER THAN 11:00a.m., Tuesday, July 2, 2013
Bids will be publicly opened and read in the Commissioners Court Room at that time

NO	CONTRACTOR/ADDRESS	PHONE NUMBER	FAX NUMBER	Pick-up/Mail Date
1.	Carroll & Blackman, Inc. 3120 Fannin St. Beaumont, TX 77701	(409) 833-3363	(409) 833-0317	
2.	Jefferson County Drainage District #7 4401 Ninth Avenue Port Arthur, TX 77642			
3.	Jefferson County Engineering 1149 Pearl St., 5th Floor Beaumont, TX 77701	(409) 835-8584	(409) 835-8718 drao@co.jefferson.tx.us	Delivered 06/12/2013
4.	David J. Waxman, Inc. 126 Marvin Hancock Dr. P O Drawer 900, Jasper, TX 75951	(409) 384-3458	(409) 384-5719	FedEx Ground 06/13/2013
CD	AGC of Southeast TX 5458 Ave A Beaumont, TX 77705	(409) 835-6661	(409) 835-3319 agcsetx@agcsetx.com	FedEx Ground 06/13/2013
CD	AGC of Texas 2400 Augusta, Ste 305 Houston, TX 77057	(713) 334-7100	(713) 334-7130 houston@agctx.org	FedEx Ground 06/13/2013
CD	AMTEK 4001 Sherwood Houston, TX 77092	(713) 956-0100	(713) 956-53401 planroom@amtekusa.com houstonamtek@gmail.com	FedEx Ground 06/13/2013
CD	McGraw-Hill (DODGE) 4300 Beltway Place, Suite 180 Arlington, TX 76018	(972) 854-6007	(888) 667-8198 nicole.wilson@mhfi.com dodge_document_sc@mcgraw-hill.com	FedEx Ground 06/13/2013

#6500-19

JEFFERSON COUNTY DRAINAGE DISTRICT NO. 7
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CD	iSqFt ATTN: Erica Taylor 4500 Lake Forrest Dr., Suite 502 Cincinnati, OH 45242	(800) 364-2059	(866) 570-8187 beaumont@isqft.com etaylor@isqft.com houstonpr@isqft.com jhouser@isqft.com iswftmr@gmail.com (if over 10mb)	FedEx Ground 06/13/2013
CD	Reed Construction Data Doc Processing, Ste 100 30 Technology Pkwy Norcross, GA 30092	(303) 265-6497 (877) 733-3411	(678) 680-1968 Pam.graham@reedbusin ess.com Dora.bybee@reed business.com addenda@ or enoch.choi@	FedEx 06/12/2013
CD	Virtual Builders Exchange 7035 W. Tidwell Bldg J, Ste 112 Houston, TX 77092	(832) 613-0201	(832) 613-0344 josh@virtualbx.com tawny@virtualbx.com sean@virtualbx.com	FedEx Ground 06/13/2013
CD	CDC News-Construction Data Co Attn: Maria Shelby 4201 W Parmer Lane, Bldg. A 200 Austin, TX 78727	(800) 872-7878 (512) 634-5965 (Maria) (512) 634-5963 (Ana)	plans@cdcnews.com lhighland@cdcnews. com (512) 634-5997 (L highland's phone)	FedEx Ground 06/13/2013
5.	ALLCO 6720 College P.O. Box 3684 Beaumont, TX 77704	(409) 860-4459	(409) 860-3857 jchristopher@allco.com mdelord@allco.com kburrell@allco.com	Picked up 06/12/2013
6.	Brystar 8385 Chemical Rd Beaumont, TX 77705	(409) 842-6768	(409) 842-6461 ron@brystar mike@brystar	
7.	PLACO 11939 Leatherwood Dr., P.O. Box 8120, Lumberton, TX 77657	(409) 755-3878	(409) 755-3667 johnplakeiii@ msn.com rfrazier@gtbiz class.com	Picked up 06/13/2013

#6500-19

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8.	MK Constructors 2485 North St. Vidor, TX 77662	(409) 769-0089	(409) 769-1288 carriev@ mkconstructors.com	Picked up 06/13/2013
9.	Triple B Services 820 Old Atascocita Road Huffman, TX 77336	(281) 324-3264	tiffany@tripleb services.com	Picked up 06/17/2013
10.	Triangle Concrete Services, Inc. 1255 Montrose St Beaumont, TX 77707	(409) 861-1650	(409) 861-1911 knox.tcinc@live.com	Picked up 06/24/2013
11.	Conroe Pipe 5150 Jefferson Chemical Rd Conroe, TX	(713) 899-8894	(713) 914-0794 James_coates3@ comcast.net	Picked up @ Pre-Bid 06/25/2013
12.	Simco 3101 Main Ave Groves, TX 77619	(409) 962-8593	(409) 963-3831 simcoent@sbcglobal. net	Picked up 06/26/2013
13.				
14.				

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