

# ALEXANDER ISLAND BORING SUMMARY SHEET

<b>BORING ID:</b>	<u>13-B11</u>
<b>BORING TYPE:</b>	<u>Borrow Source</u>
<b>DEPTH:</b>	<u>60'</u>
<b>ELEVATION:</b>	<u>26.37'</u>
<b>X (US SURVEY FT):</b>	<u>3225389.99</u>
<b>Y (US SURVEY FT):</b>	<u>13831061.05</u>
<b>DEPTH TO WATER:</b>	<u>2.2'</u>

Client: USACE-Galveston District      Boring: 13-B11  
 Date/Time Drilling Begun: 12.22.13/1220      Date/Time Drilling Ended: 12.22.13/1455  
 Driller: Jason New      Logger: Eddie Ficker      Designated X (Easting): 3225390  
 Drill Rig: Mobile B57      Designated Y (Northing): 13831061      Z (Elevation):  
 Total depth: 30      Initial Water Encounter (Depth, date/time): 3.1 FT, 12.22.13/1229      Water Depth (15 min.): 2.2 FT

1220  
 ↑  
 Dredge Spoil / Large Material  
 ↓

Feet	USCS Log	Sample Interval (ft)	Amount Material Obtained (in)	Sample Type Blow Counts	Number of Tubes	Pocket Pene. (tsf)	Shear Strength (tsf)	Description (SOIL TYPE, color, moisture, plasticity, consistency, density, inclusions, etc.)
0	SC	0-2	18	ST	1 <sub>B</sub>	—	—	Silty, Clayey, SAND (F-C), Gray, Moist, Loose <sup>Common shell frags</sup>
2	SM/CH	<del>2-4</del> 3.5-5	9	<del>SS</del> T-1-2	1 <sub>B</sub>	0.5	—	Mixed <sup>Silty SAND (F-M), Gray, Wet, V. Loose</sup> Silty CLAY, Reddish Brown + Brownish Gray, Moist, High Plast.
5	SM/CH	<del>5-7</del> 4-8	16	ST	1 <sub>T</sub>	1.25	—	S.A.A.; Mixed S.A.A.
7'	SC/CH	7-9 8-8	21	ST	1 <sub>T</sub>	∅	0.25	S.A.A. Mixed + includes Black, Carbonaceous SAND (F-C) and Black (OH)
9'	SC	9-11 8-10	21	ST	1 <sub>B</sub>	—	—	Silty, Clayey SAND (F-C), V. Light Brownish Gray, Wet, <sup>Common shell frags</sup>
13 1/2"	CL	13.5-15	19	<del>SS</del> T-1-2	1 <sub>B</sub>	∅	0.2	Silty CLAY w/SAND, V. Light Brownish Gray, Moist, Med. Plast., Soft
15	SC/CH	15-17	18	ST	1 <sub>B</sub>	—	—	S.A.A. - Mixed with V. clayey SAND (F-C), V. Light Brownish Gray, Moist & with Reddish Brown, CLAY, Moist, Stiff, High Plast.
16 1/2"	CH?	17-19	∅	ST	∅	—	—	CLAY, V. Light Brownish Gray, Moist, High Plast., STIFF (CH)
17'	CH?	17-19	∅	ST	∅	—	—	No Recovery; Drilled to 18' pushed tube from 18'-20'
18'	CH	18-20	18	ST	1 <sub>T</sub>	0.5	—	CLAY, Brownish Gray, Moist, High Plast., Soft.
20								


Weather: 12-22-13 - Breezy, overcast, ~60°F

Comments: F-C = fine to coarse grained      F-M = fine to medium grained  
 Frags = fragments


Plast. = Plasticity      Med. = Medium      B=bag, T=tube  
 V. = Very

USCS Log Legend:



 US Army Corps of Engineers, Southwestern Division  
 Galveston District  
 2000 Fort Point Road/P.O. Box 1229  
 Galveston, TX 77553-1229

Alexander Island  
 Houston Ship Channel  
 Baytown, TX

 Quaternary Resource Investigations, L.L.C.  
 Government & Industry in Harmony with the Environment  
 13588 Florida Boulevard, Baton Rouge, Louisiana 70819

Client: USACE-Galveston District

Boring: 13-B11

Page 2 of 2

Feet	USCS Log	Sample Interval (ft)	Amount Material Obtained (in)	Sample Type Blow Counts	Number of Tubes	Pocket Pene. (tsf)	Shear Strength (tsf)	Description (SOIL TYPE, color, moisture, plasticity, consistency, density, inclusions, etc.)
20	CH	20-22	7	ST	1 <sub>T</sub>	0.5	—	S.A.A.; soft to med. stiff
	OH/CH	22-24	20	ST	1 <sub>T</sub>	∅	0.35	CLAY, Dark Gray, Moist, High Plast., V. soft to Black (OH)
25	OH/CH	24-26	14	ST	1 <sub>T</sub>	∅	0.35	S.A.A.; Dark Gray (CH) + BIK (OH)
	OH/CH	26-28	13	ST	1 <sub>T</sub>	0.5	—	S.A.A.; Mixed w/ Black + Light Brown (CH) (OH) + Trace of Fine SA
30	OH/CH	28-30	8	ST	1 <sub>T</sub>	∅	0.35	S.A.A.
30								Encountered Pipeline? @ 30' stopped drilling.
35								
40								

END  
1455

Backfill?

Weather: 12-22-13: Breezy, Overcast, ~60°F

Comments: BIK = Black plast. = Plasticity V. = Very SA = SAND B = bag, T = tube

USCS Log Legend:



US Army Corps of Engineers, Southwestern Division  
Galveston District  
2000 Fort Point Road/P.O. Box 1229  
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Alexander Island  
Houston Ship Channel  
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COPY OF PEGGY LAKE GEOTECH BH - PEGGY LAKE TEMPLATE GDT - 4/4/14 15:03 - F:\QRI DATA\TECHNICAL\JOBS (CURRENT)\AGE - GALVESTON\2012-12-20 GEOTECHNICAL\CONTRACT\TASK ORDER DY06 2013-09-10 ALEXANDER ISLAND\DELIVERABLES\ALEX



Quaternary Resource Investigations, LLC  
 13588 Florida Boulevard  
 Baton Rouge, LA 70820  
 Telephone: 225-292-1400  
 Fax: 225-292-1404

# BORING NUMBER 13-B11

PAGE 1 OF 1

**CLIENT** USACE-Galveston District      **PROJECT NAME** Alexander Island  
**PROJECT NUMBER** W912HY-13-D-0001-DY06      **PROJECT LOCATION** Alexander Island, Baytown, TX  
**DATE STARTED** 12/22/2013 12:20:00 **COMPLETED** 12/22/2013 2:55:00 **GROUND ELEVATION** 26.3712 ft      **HOLE SIZE** 8.25 inches  
**DRILLING CONTRACTOR** QRI      **NORTHING** 13831061 ft      **EASTING** 3225390 ft  
**DRILLING METHOD** Hollow Stem Auger      **DRILLING RIG MAKE/MODEL** Mobile B57 on Gemco Articulated Platform  
**LOGGED BY** Eddie Ficker      **TOTAL DEPTH** 30 ft      **GROUND WATER LEVEL** ▽ **AT TIME OF DRILLING** 3.10 ft / Elev 23.27 ft  
**WEATHER** cloudy, 60, breezy      ▽ **24 HOURS AFTER DRILLING** 2.20 ft / Elev 24.17 ft

GRAPHIC LOG	USCS SYMBOL	MATERIAL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE	RECOVERY (in)	SPT BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	FIELD TORVANE (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS				MINUS #200 SIEVE CONTENT (%)	COMPRESSIVE STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)		
											LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX							
	SC	Silty clayey SAND; fine to coarse grained, gray, moist, loose, shell fragments common	0	ST	18		-			17										
	SM	Silty SAND; (fine to medium grained, gray, wet, very loose) mixed with silty CLAY (reddish brown and brownish gray, moist, high plasticity, soft)	▽	NR	0															
5			SS	9	1-1-2 (3)	0.5				26										
	CL	Silty SAND; (fine to medium grained, black, wet, very loose, carbonaceous) mixed with silty CLAY (reddish brown and brownish gray, moist, high plasticity, soft) with black organic CLAY		ST	16		1.25			15										
				ST	21		0	0.25		26										
	SC	Silty clayey SAND; fine to coarse grained, very light brownish gray, wet, shell fragments common	10	ST	21		-			19										
				NR	0															
	CL	Silty CLAY; with SAND, very light brownish gray, moist, medium plasticity, soft reddish brown, moist, high plasticity, stiff silty CLAY mixed with very clayey SAND, fine to coarse grained, very light brownish gray, moist	15	SS	19	1-1-2 (3)	0	0.2		35	49	16	33	81						
				ST	18		-			32										
	CH	CLAY; very light brownish gray, moist, high plasticity, stiff brownish gray, soft soft to medium stiff  dark gray (CH) to black (OH), moist, high plasticity, very soft  light brown (CH) and black (OH), with trace of fine SAND	20	ST	18		0.5		73	45	109	29	80	94	0.51	2	0			
				ST	7		0.5		61											
				ST	20		0	0.35	61	66	81	35	46			0.48	3	9		
			25	ST	14		0	0.35		49										
				ST	13		0.5			58										
				ST	8		0	0.35	69	51							0.45	4	0	

Bottom of borehole at 30.0 feet.



POINT	EASTING (X)	NORTHING (Y)	ELEV. (Z)	BORING
1	3,224,839.86	13,829,574.96	26.07	13-B01 SURVEYED
2	3,224,468.96	13,829,647.11	27.56	13-B02 SURVEYED
3	3,224,781.02	13,829,832.05	27.42	13-B03 SURVEYED
4	3,225,085.04	13,829,951.90	28.02	13-B04 SURVEYED
5	3,224,798.15	13,830,185.96	26.71	13-B05 SURVEYED
6	3,225,137.02	13,830,319.06	27.97	13-B06 SURVEYED
7	3,225,402.24	13,830,377.84	27.40	13-B07 SURVEYED
8	3,225,137.84	13,830,656.99	27.34	13-B08 SURVEYED
9	3,225,431.15	13,830,710.11	28.02	13-B09 SURVEYED
10	3,225,763.04	13,830,892.08	27.75	13-B10 SURVEYED
11	3,225,389.99	13,831,061.05	26.37	13-B11 SURVEYED
12	3,225,579.86	13,831,378.86	26.12	13-B12 SURVEYED
13	3,225,136.04	13,831,406.95	26.39	13-B13 SURVEYED
14	3,225,382.99	13,831,732.99	28.30	13-B14 SURVEYED
15	3,225,027.98	13,831,671.05	27.36	13-B15 SURVEYED
16	3,224,743.97	13,831,628.99	25.72	13-B16 SURVEYED
17	3,224,619.87	13,832,095.98	27.15	13-B17 SURVEYED
18	3,224,819.95	13,832,313.05	29.49	13-B18 SURVEYED
19	3,225,218.97	13,832,197.96	29.61	13-B19 SURVEYED
20	3,225,789.02	13,832,191.02	24.98	13-B20 SURVEYED
21	3,225,424.06	13,832,424.86	25.99	13-B21 SURVEYED
22	3,225,960.93	13,832,420.96	23.86	13-B22 SURVEYED
23	3,226,409.90	13,832,382.04	22.95	13-B23 SURVEYED
24	3,226,641.04	13,832,554.90	23.17	13-B24 SURVEYED
25	3,226,468.10	13,832,757.96	23.39	13-B25 SURVEYED
26	3,226,192.06	13,832,587.05	23.82	13-B26 SURVEYED
27	3,225,917.94	13,832,796.84	24.65	13-B27 SURVEYED
28	3,225,689.17	13,832,584.94	24.74	13-B28 SURVEYED
29	3,225,406.03	13,832,775.88	26.23	13-B29 SURVEYED
30	3,225,210.96	13,832,605.92	27.31	13-B30 SURVEYED
31	3,224,956.08	13,832,789.07	30.03	13-B31 SURVEYED
32	3,224,892.10	13,832,575.99	29.78	13-B32 SURVEYED
33	3,224,600.87	13,832,572.04	30.06	13-B33 SURVEYED
34	3,228,153.92	13,827,285.05	25.73	13-P01 SURVEYED
35	3,225,272.89	13,827,557.13	24.82	13-P02 SURVEYED
36	3,224,485.02	13,828,683.79	23.82	13-P03 SURVEYED
37	3,224,458.15	13,829,880.09	24.00	13-P04 SURVEYED
38	3,225,186.78	13,830,885.15	27.81	13-P05 SURVEYED

3,224,655.30 13,829,970.20 Via Exxon Mobil

3,225,009.40 13,830,410.30 Via Exxon Mobil

3,225,494.19 13,830,624.52 Via Exxon Mobil

3,225,508.40 13,831,329.60 Via QRI

3,225,326.00 13,831,726.80 Via QRI

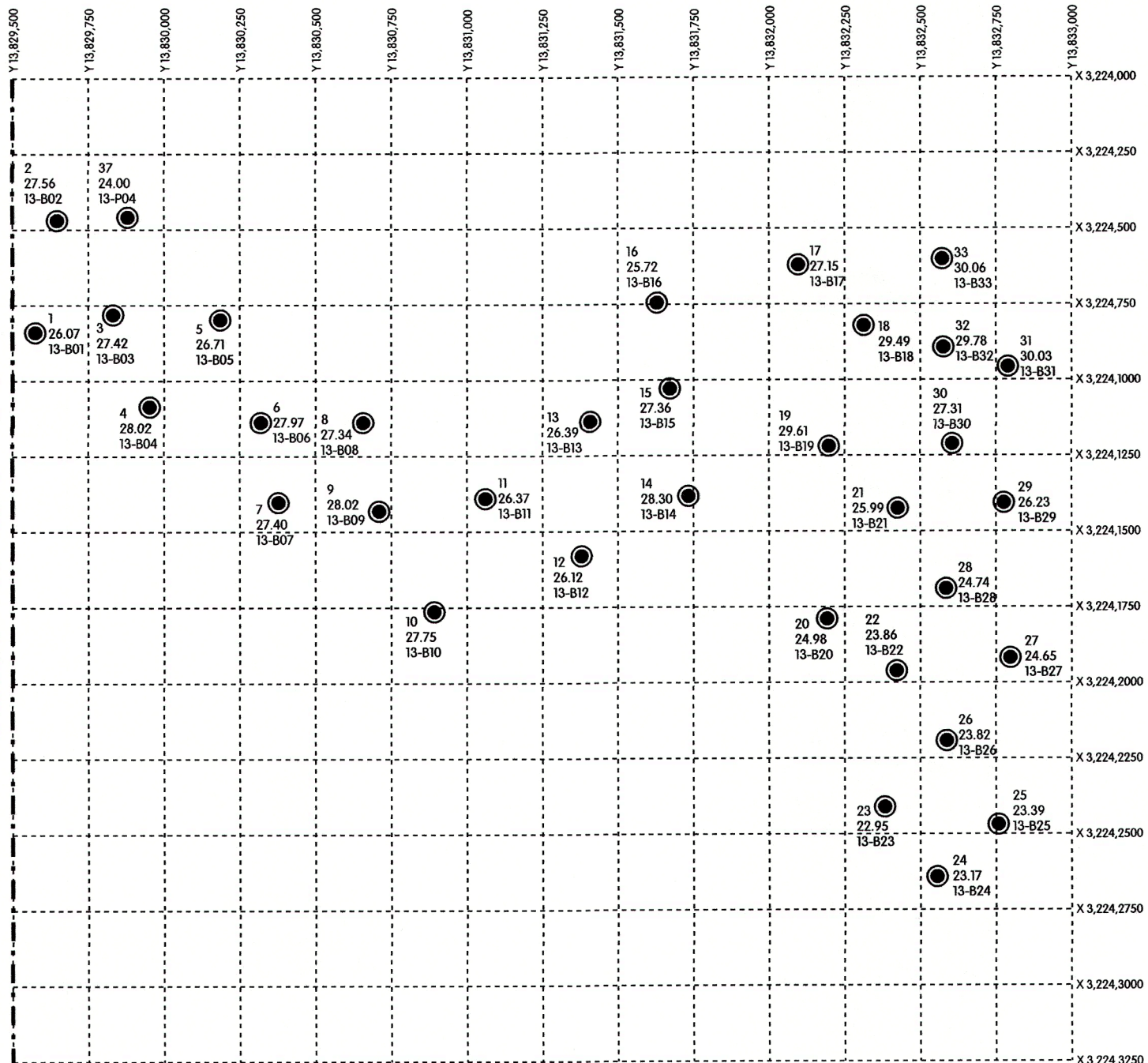
Removed from Contract

Removed from Contract

Removed from Contract

3,226,407.90 13,832,440.70 Via QRI

MATCHLINE SEE SHEET 2 OF 2



**PROJECT BENCHMARK:**

HARRIS COUNTY FLOODPLAIN REFERENCE MARK NUMBER 070020, BRASS DISC IN THE WEST END OF THE NORTH HEADWALL PARK ROAD 1836 APPROXIMATELY 845 FEET SOUTHEAST OF HIGHWAY 134

ELEV. 3.68 FEET, NAVD 1988, 2001 ADJUSTMENT.

THE MONUMENT IS CONSTRAINED TO THE NGS PUBLISHED ELEVATION FOR THE NORTHEAST 2250 CORPS ARP ADJUSTED BY NGS IN 2001 AND AS PUBLISHED IN PID AJ6430 EPOCH DATE 1997.00

RYAN 2006 CORPS OF ENGINEERS MONUMENT BRASS DISC IN CONCRETE LOCATED AT THE NORTHWEST CORNER OF PEGGY LAKE PLACEMENT AREA.

ELEV. 4.34, NAVD 88

**NOTES:**

1. THE COORDINATES SHOWN HEREON ARE TEXAS SOUTH CENTRAL ZONE NO. 4204 STATE PLANE GRID CORRDINATES (NAD 83), AS DERIVED FROM GPS OBSERVATIONS.

GPS OBSERVATIONS ARE BASED ON THE SMARTNET SYSTEM OPERATED BY LEICA GEOSYSTEMS UTILIZING SPIDERNET SOFTWARE TO OBTAIN CENTIMETER ACCURACIES. MEASURMENTS WERE MADE UTILIZING LEICA VIVA GS15 AND GS12 RECEIVERS.

2. ALL BORING LOCATIONS ARE AS NOTED IN THE TABLE ABOVE.

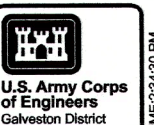
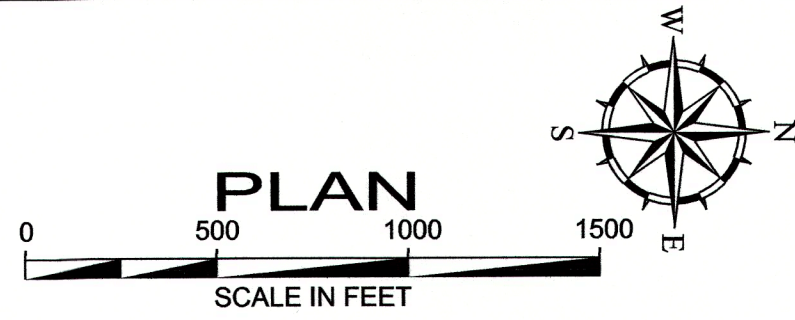
3. SMARTNET ADJUSTED STATION COORDINATES ARE TIED TO NAD83 (NA2011) DATUM AS DEFINED BY THE NGS CORS DATASHEETS OF THOSE STATIONS HELD FIXED IN THE ADJUSTMENT. FULLY CONSTRAINED ADJUSTED COORDINATES ARE REPORTED TO BE ACCURATE TO ABOUT +/-0.5 CM IN HORIZONTAL AND +/- 1. 5 CM IN VERTICAL AT 95% CONFIDENCE (2-SIGMA) LEVEL.

4. BORE HOLES WERE ADJUSTED IN THE FIELD BY QRI STAFF AND SURVEYED IN THAT LOCATION COORDINATES FOR THAT LOCATION ARE AS SHOWN IN THE TABLE ABOVE.

I, KEVIN DREW MCRAE, A TEXAS REGISTERED PROFESSIONAL LAND SURVEYOR, HEREBY CERTIFY THAT THIS SURVEY WAS PERFORMED ON THE GROUND BY ME OR UNDER MY SUPERVISION ON THIS THE 19TH DAY OF NOVEMBER, 2013.

*Kevin Drew McRae*

KEVIN DREW MCRAE  
REGISTERED PROFESSIONAL LAND SURVEYOR  
TEXAS REGISTRATION NO. 5485



Rev.	Description	Date	By

Drawn by: X	Checked by: X	Date: X	Scale: AS SHOWN
Designed by: X	Submitted by: X	Approval Recommended by: X	Approval by: X

U.S. ARMY ENGINEER DISTRICT, GALVESTON  
GALVESTON, TEXAS  
PREPARED UNDER THE DIRECTION OF  
CHRISTOPHER W. SALLESE, Col., C.E.,  
DISTRICT COMMANDER

BORING HOLE LOCATIONS  
TASK ORDER NO. DY06  
CONTRACT NO. W912HY13-D-0001  
ALEXANDER ISLAND PLACEMENT AREA  
PASADENA, TEXAS  
HARRIS COUNTY, TEXAS

Drawing No.:
Sheet 1 of 2
File No. xxx XXX-XXX

**KM Surveying, LLC**  
3902A REESE ROAD - SUITE 300  
ROSENBERG, TEXAS 77471  
713-234-6627  
www.kmsurveying.com

DRAWN BY: CTC      CHECKED BY: KDM

BY: SUBSER DATE: 1/18/2014 TIME: 2:54:30 PM

POINT	EASTING (X)	NORTHING (Y)	ELEV. (Z)	BORING
1	3,224,839.86	13,829,574.96	26.07	13-B01 SURVEYED
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**PROJECT BENCHMARK:**

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ELEV. 3.68 FEET, NAVD 1988, 2001 ADJUSTMENT.

THE MONUMENT IS CONSTRAINED TO THE NGS PUBLISHED ELEVATION FOR THE NORTHEAST 2250 CORPS ARP ADJUSTED BY NGS IN 2001 AND AS PUBLISHED IN PID AJ6430 EPOCH DATE 1997.00

RYAN 2006 CORPS OF ENGINEERS MONUMENT BRASS DISC IN CONCRETE LOCATED AT THE NORTHEAST CORNER OF PEGGY LAKE PLACEMENT AREA.

ELEV. 4.34, NAVD 88

**NOTES:**

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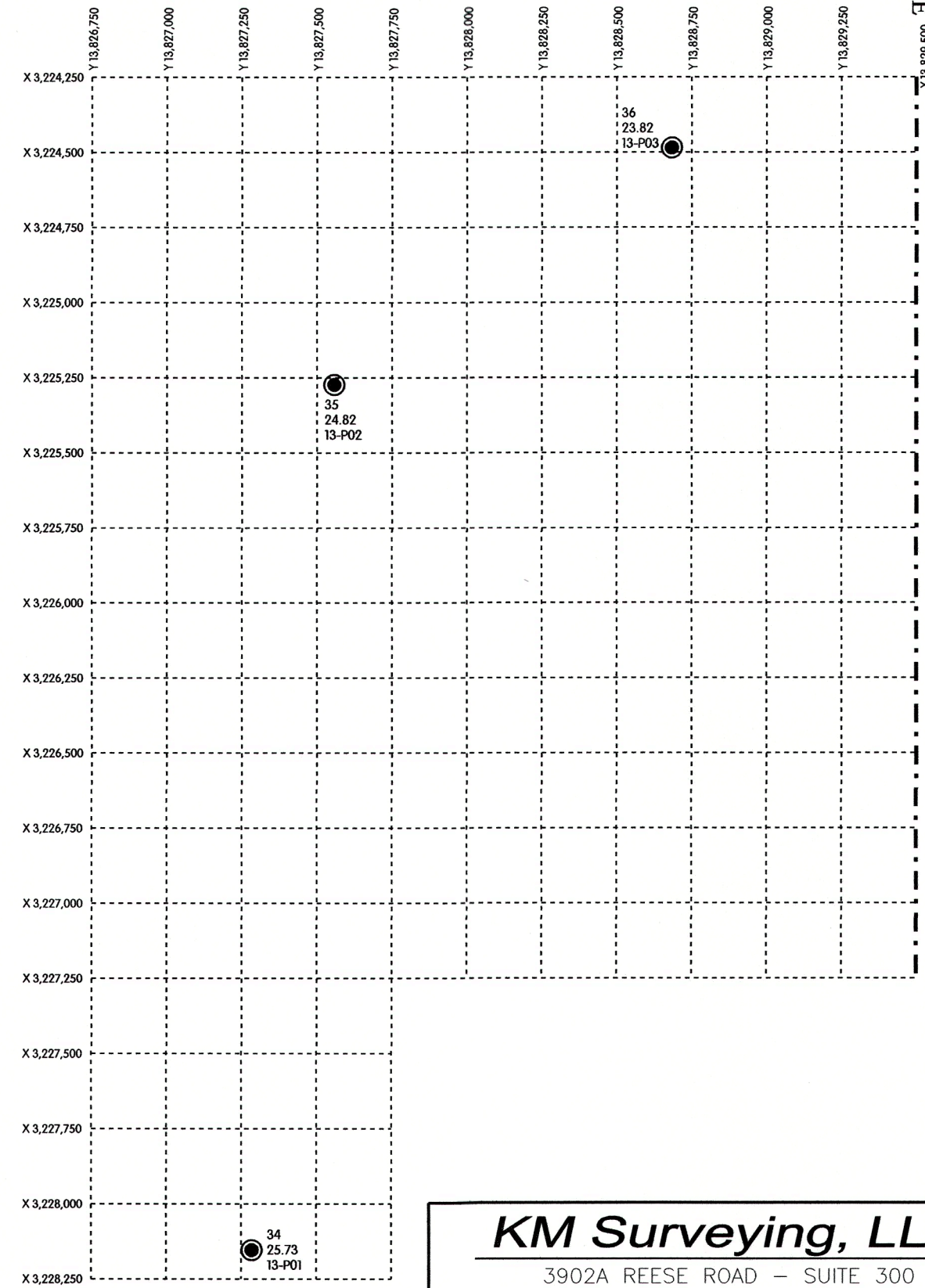
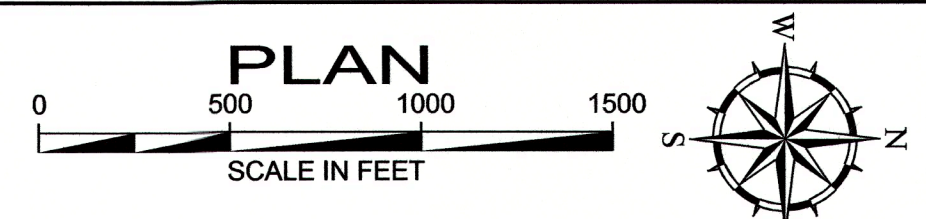
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*Kevin Drew McRae*  
 KEVIN DREW McRAE  
 REGISTERED PROFESSIONAL LAND SURVEYOR  
 TEXAS REGISTRATION NO. 5485



MATCHLINE SEE SHEET 1 OF 2

Rev.	Date	Description

U.S. ARMY ENGINEER DISTRICT GALVESTON  
 CORPS OF ENGINEERS  
 GALVESTON, TEXAS

PREPARED UNDER THE DIRECTION OF  
 CHRISTOPHER W. SALLESE Col., C.E.,  
 DISTRICT COMMANDER

Drawn by: X  
 Checked by: X  
 Submitted by: X  
 Approved by: X

Date: X  
 Scale: AS SHOWN  
 Approved/Recommended: X

DAVID E. PROBYN, P.E.  
 State Registered Professional Engineer, Civil Engineering Branch

PETE G. PEREZ, P.E.  
 State Registered Professional Engineer, Surveying and Mapping Division

BORING HOLE LOCATIONS  
 TASK ORDER NO. DY06  
 CONTRACT NO. W9127HY-13-D-0001  
 ALEXANDER ISLAND PLACEMENT AREA  
 PASADENA, TEXAS  
 HARRIS COUNTY, TEXAS

**KM Surveying, LLC**  
 3902A REESE ROAD - SUITE 300  
 ROSENBERG, TEXAS 77471  
 713-234-6627  
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