

**Little Lake Shoreline Protection & Marsh
Creation Project
BA-37**

SCI PROJECT NO. 136477

**SUMMER 2009 POST CONSTRUCTION MONITORING
REPORT**



September 2009

**Prepared for:
Office of Coastal Protection & Restoration**

Prepared By:
Shaw Coastal, Inc.
197 Elysian Drive
Houma, Louisiana 70363



SURVEY REPORT

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SECTION 1

METHODOLOGY REPORT

DESCRIPTION

This report details the procedures followed by Shaw Coastal Inc. to provide the Office of Coastal Protection & Restoration (OCPR) with required monitoring data to measure the elevation changes related to the marsh creation areas for the Little Lake Shoreline Protection/Dedicated Dredging Near Round Lake project (BA-37).

Services include an elevation survey along pre-determined transects to determine marsh elevations, and on settlement plates installed in the rock dike.

LOCATION

The Little Lake Shoreline Protection and Marsh Creation (BA-37) is a shoreline protection and marsh creation project located in the central Barataria Basin in Lafourche Parish, Louisiana. The Little Lake Shoreline Protection and Marsh Creation project area is located on the southwestern shoreline of Little Lake from Superior Canal to Plum Point. The Little Lake project area is generally bound by the East and West Forks of Bayou L'Ours and the southern shoreline of Little Lake from Plum Point westward to Breton Canal.

The site is accessible only by boat. The nearest boat launch is the Clovelly Farms on Clovelly Canal located in Cut Off, Louisiana.

The purpose of the project was to prevent erosion along approximately four (4) miles of Little Lake shoreline; create 488 acres of intertidal wetlands along the Little Lake shoreline; nourish and maintain 532 acres of intermediate marsh; and reduce the land-loss rates by 50% over the 20-year life of the project. The project consists of constructing a shoreline protection rock dike in open water along the shoreline of Little Lake and using dredged material from Little Lake to create/nourish intertidal marsh along the Little Lake shoreline. The project is sponsored by the United States Department of Commerce / National Ocean and Atmospheric Administration (NOAA) National Marine Fisheries Services (NMFS) and the Office of Coastal Protection & Restoration (OCPR) under the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA).

PLANNING AND LAYOUT OF THE GPS SURVEY

This scope of services involves the completion of a topographic survey along predetermined transects inside the BA-37 marsh creation area, and on the tops of settlement plates installed in the rock dike. The survey also includes 6 locations with 100 ft. x 100 ft. grid of elevation shots which are used to calculate an average marsh elevation at those 6 grid locations.

TOPOGRAPHIC SURVEYS

The points were surveyed utilizing Real Time Kinematic (RTK) surveying techniques. This survey was referenced to the LDNR Louisiana Coastal Zone (LCZ) GPS Network. The LCZ Secondary Monument used as the GPS reference station for this project is the BA-37-SM-01 and BA-37-SM-02 monuments. The latest summary sheet showing the most recent adjusted position and elevation for these monuments are in Appendix A.

The equipment that was used on this project was a Trimble 5700 RTK base station with a Trimble 5800 rover unit. The data was collected and stored on a Trimble TS Cell data collector. All survey data was recorded in LSZ NAD 83 feet (coordinates) and NAVD 88 feet (elevations).

On a daily basis the RTK base station was setup over a TBM (pt. no. 3) the base station used a fixed antennae height. Then the TBM and setup were then checked against a secondary monument prior to gathering data and again immediately after. At the end of each day the data was downloaded and processed through TGO (Trimble Geomatics Office) software. Once the survey data was downloaded into TGO and processed it was then exported to Land Development software.

Points were collected along predetermined transect lines and point locations as shown on the attached drawing (3 of 13), as well as on the top of each of the 24 settlement plates, and the 100 ft x 100 ft grids.

QUALITY ASSURANCE PROCEDURES

Two LDNR LCZ monuments (BA-37-SM-01 and BA-37-SM-02) were used for the surveys. The elevations for these monuments are located in Appendix A. On the first day of surveying, the base station was set up on BA-37-SM-02 and a TBM was set (pt. 3) at an elevation of +3.89 ft. This TBM was selected because it is the same TBM used since construction of BA-37. For the duration of the survey, the base station was set on the TBM. Because BA-37-SM-01 appeared to be unreliable, BA-37-SM-02 was used as a daily check.

During the data processing phase, it became apparent that there was a discrepancy between this year's survey data, and previous years' data. In previous years, a TBM elevation of +3.69 ft was used. Upon further review, it was determined that +3.89 ft may be more accurate. However, since a TBM elevation of +3.69 ft has been used since the construction phase, it was determined that using +3.69 ft would produce a more consistent and useful data set. Therefore, all of the field survey data was adjusted by -0.20 ft.

TIMELINE OF SURVEY

Field surveys were conducted between 7/22/2009 and 8/20/2009 by Randy Peterson and Kent Belanger with the support of Matthew Sevier. Data was downloaded at the end of each field visit by Randy Peterson. The drawings and draft survey report were developed by Michael Cortez from 8/20/2009 to 9/2/2009 under the supervision of Tyler Ortego, E.I. and delivered on 9/15/2009. The final report was reviewed and stamped by Henry Schwartz, P.L.S., and delivered on 9/16/09.

MARSH ELEVATION AVERAGES

In addition to similar surveys done in the past 2 years, an average marsh elevation survey was tasked for 2009. The additional work consisted of surveying 6 designated locations, in 100 by 100 ft grids with 20 equally spaced points throughout the grid. The average elevations for each grid can be found below in Table 1. The elevation data for the grid shots are located in Section 3.

Table 1 2009 Average Marsh Elevations

| Location | 1 | 2 | 3 | 4 | 5 | 6 |
|----------------|------|------|------|------|------|------|
| Average Height | 1.86 | 1.01 | 1.04 | 1.63 | 1.45 | 0.58 |

SECTION 2

DRAWING FILES

Attached are twelve (13) drawing sheets created for the project area with all transects and elevation shots clearly labeled and plotted using the coordinates. On the plan view, the coordinate system that the drawing is referenced is the Louisiana State Plane Coordinates, South Zone, and the North American Datum of 1983 (NAD 83) in feet. Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88) in feet.

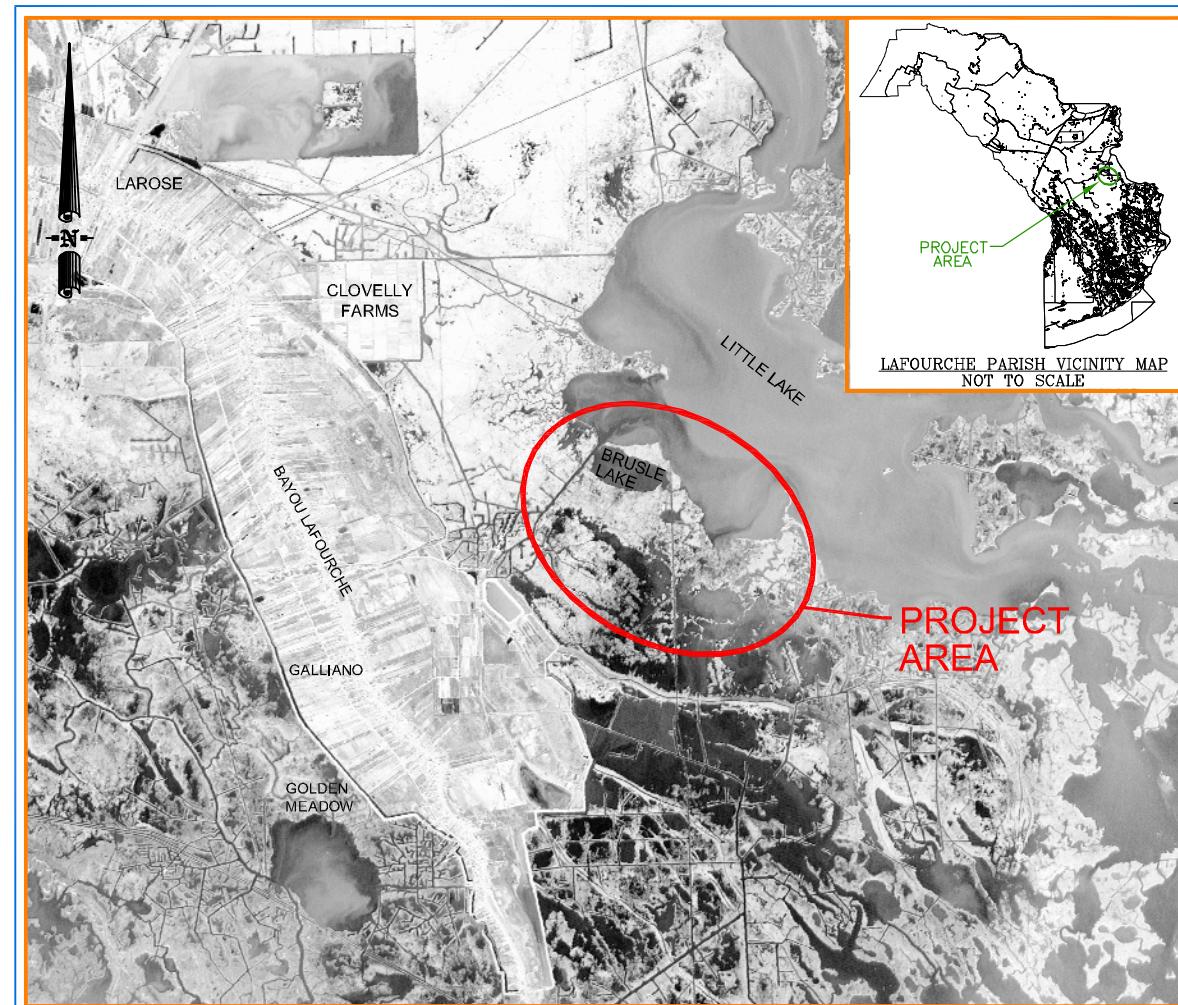
Office of Coastal Protection and Restoration
 LITTLE LAKE SHORELINE PROTECTION & MARSH CREATION
 BA-37
 LAFOURCHE PARISH

SUMMER 2009 POST CONSTRUCTION MONITORING REPORT



INDEX TO SHEETS

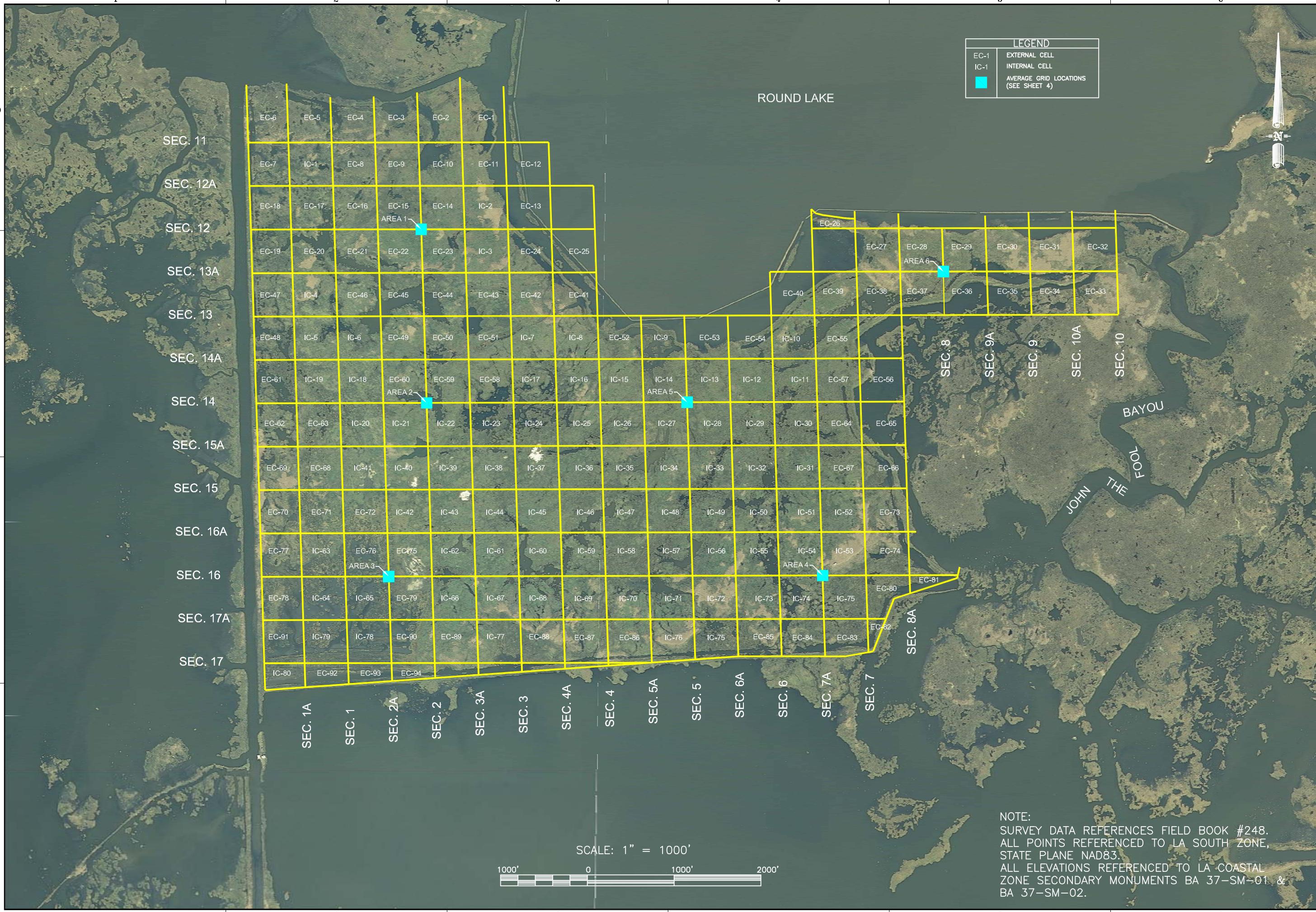
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| 1. | TITLE SHEET |
| 2. | MARSH TRANSECTION PLAN VIEW |
| 3. | AS-BUILT & POST CONSTRUCTION SURVEYS |
| 4. | AVERAGE GRID LOCATION ELEVATIONS |
| 5. | MARSH CROSS SECTIONS 1A-2 |
| 6. | MARSH CROSS SECTIONS 3A-4 |
| 7. | MARSH CROSS SECTIONS 5A-6 |
| 8. | MARSH CROSS SECTIONS 7A-8 |
| 9. | MARSH CROSS SECTIONS 9A-10 |
| 10. | MARSH CROSS SECTIONS 11A-13 |
| 11. | MARSH CROSS SECTIONS 13-15A |
| 12. | MARSH CROSS SECTIONS 15-17 |
| 13. | SETTLEMENT PLATE ELEVATION SURVEY |



PROJECT LOCATION MAP



STATE OF LOUISIANA
INSET MAP
NOT TO SCALE

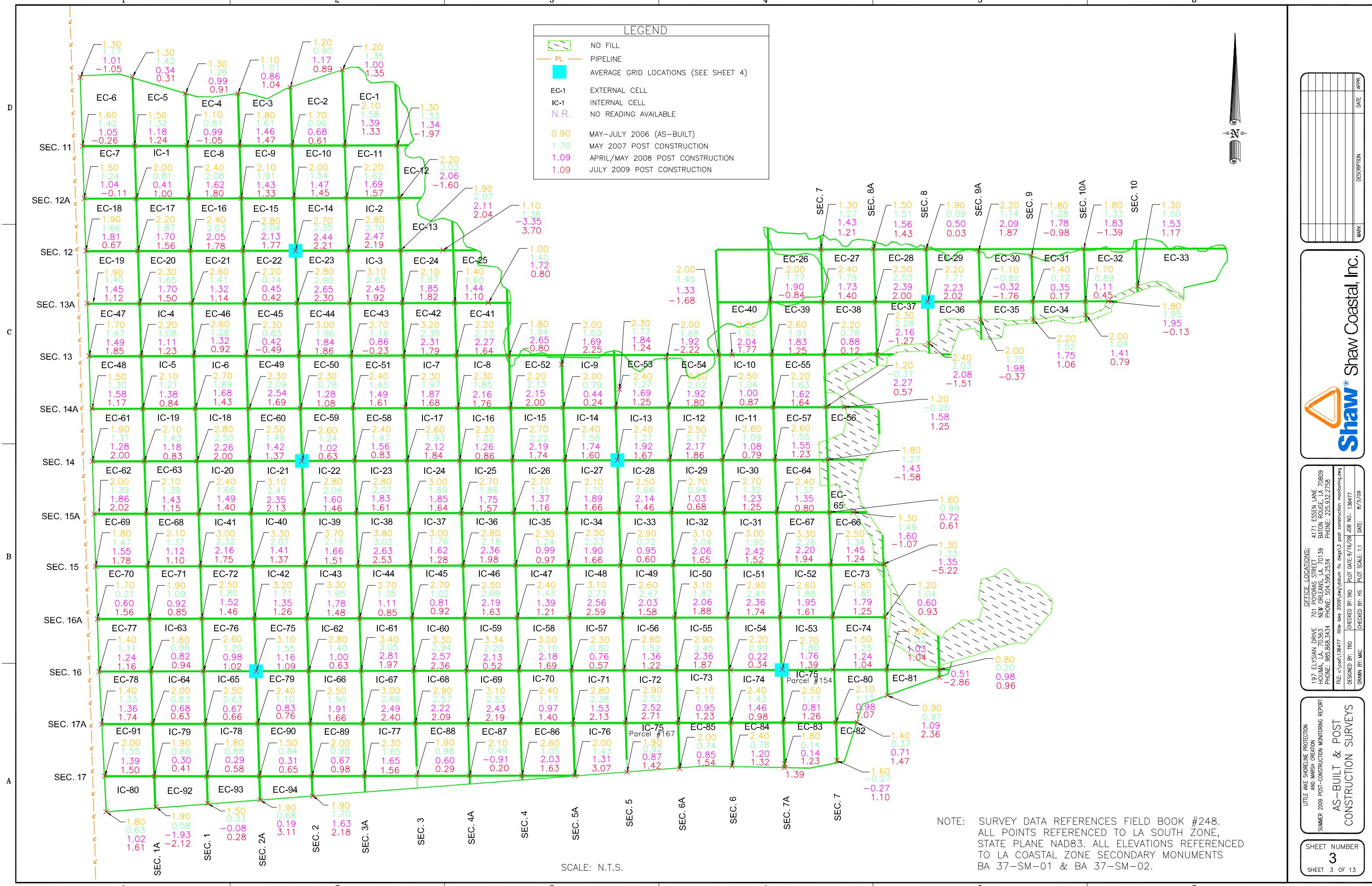


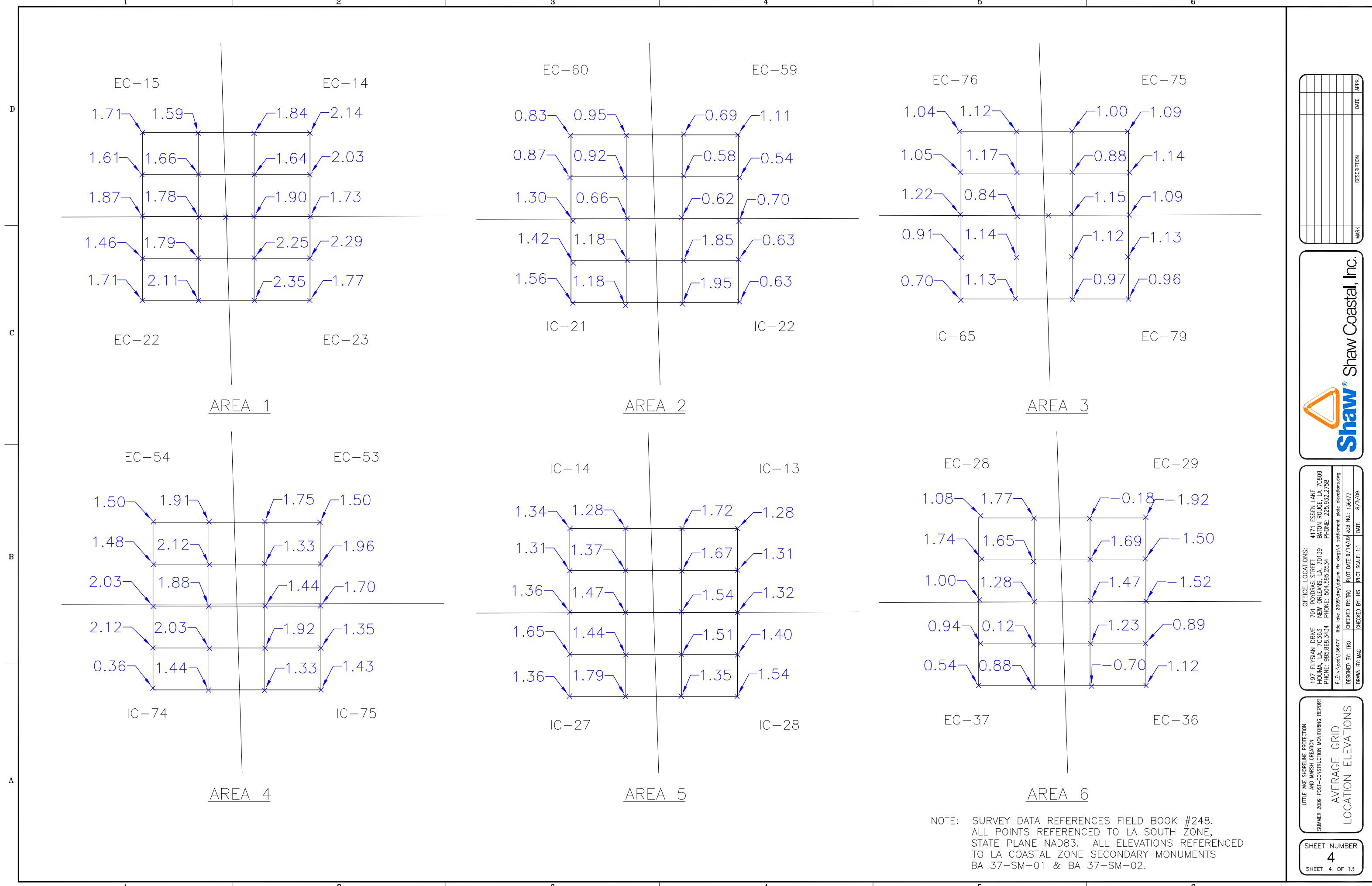
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AND MARSH REPAIR
SUMMER 2009 POST-CONSTRUCTION MONITORING REPORT
MARSH TRANSECT PLAN VIEW

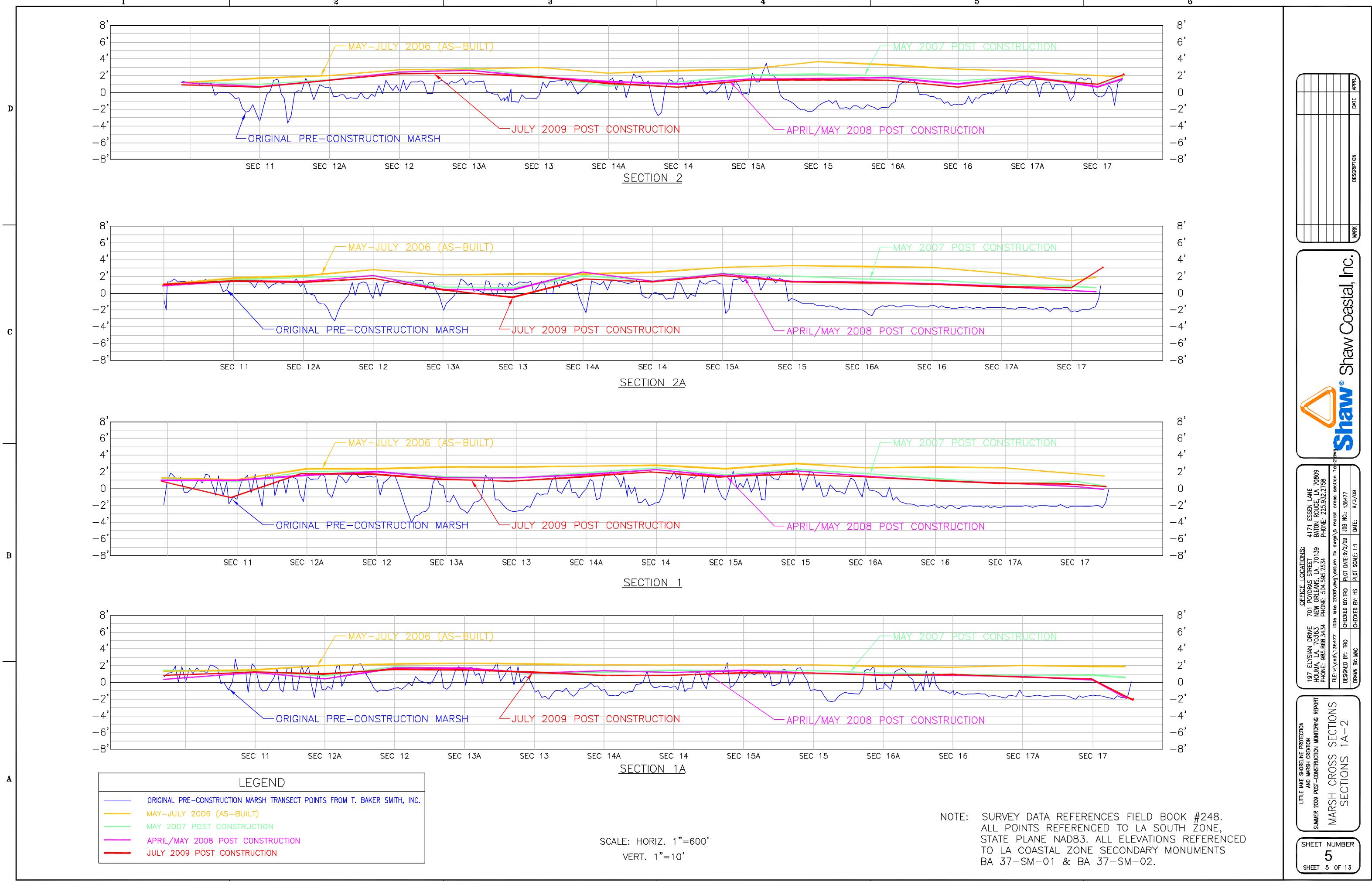
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SHEET 2 OF 13

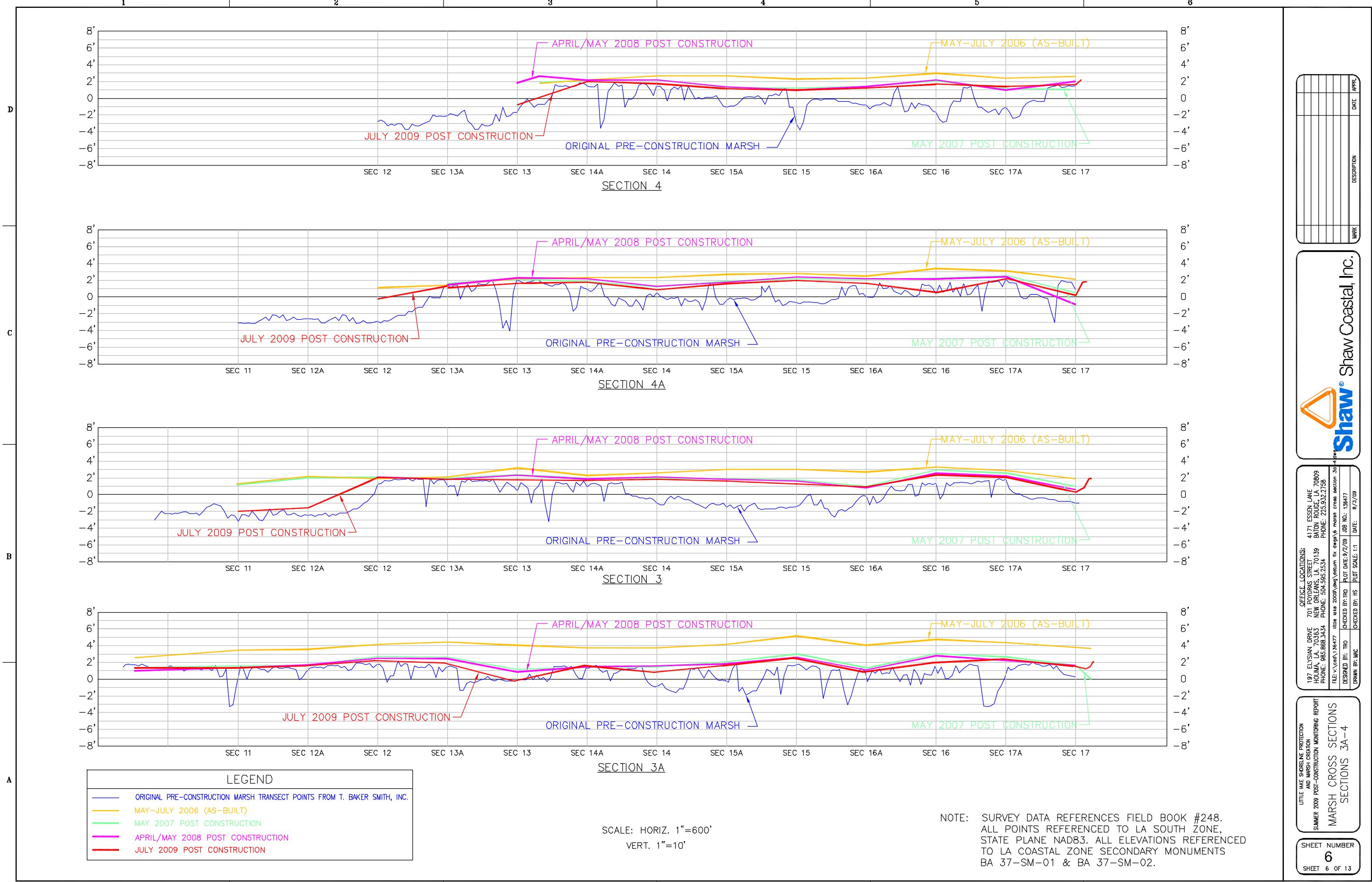
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HOUMA, LA 70365 NEW ORLEANS, LA 70139 BATON ROUGE, LA 70809
PHONE: 985.868.3434 PHONE: 504.565.2334 PHONE: 225.352.2758
FILE: v:\\cad\\V13\\427\\ Little Isle_2009\\deg\\ datum fix deg\\2 mesh transect plan view.dwg
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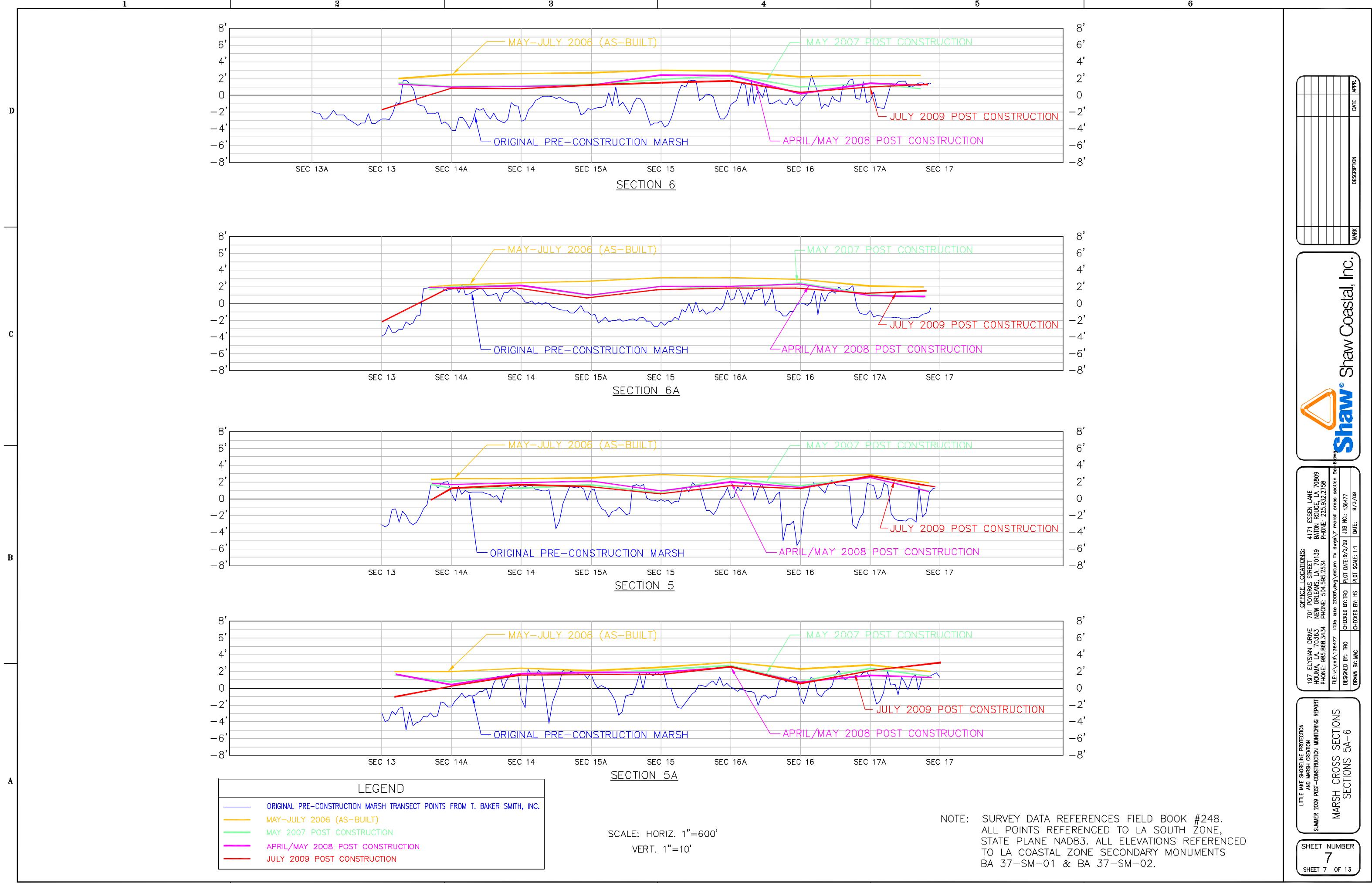
Shaw Coastal, Inc.











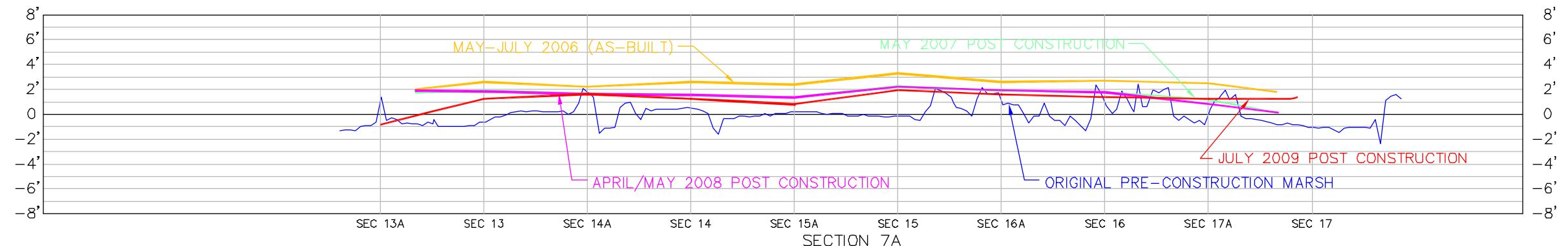
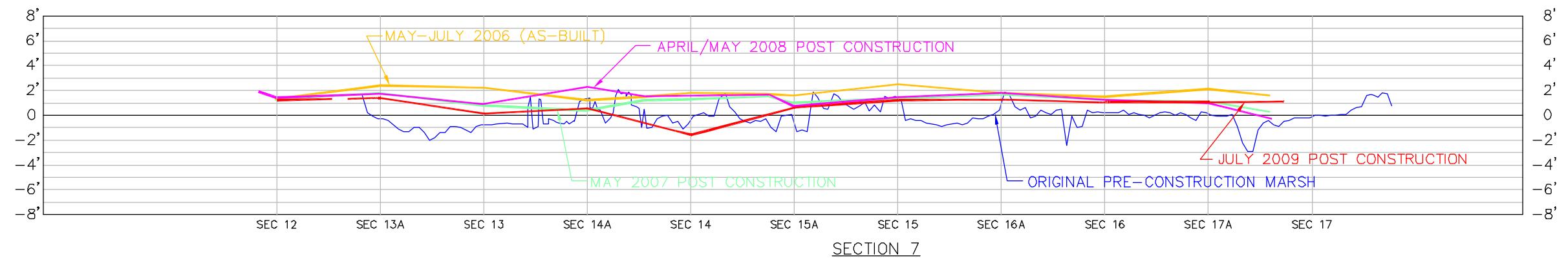
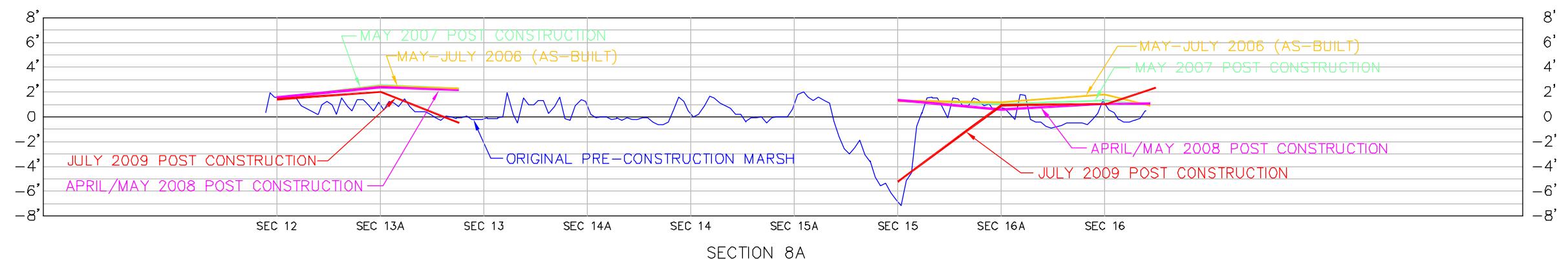
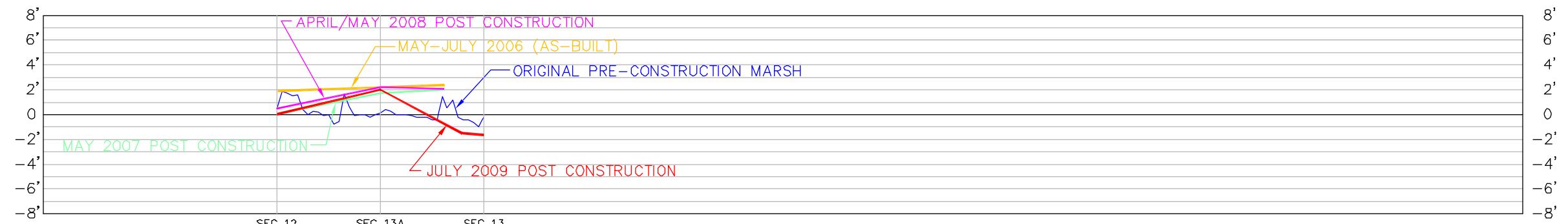
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| | | | | | | | | |



OFFICE LOCATIONS:
4171 LESSON LANE
701 ROYDAS STREET
BATON ROUGE, LA 70809
PHONE: 225.352.2758
FILE: v-C:\cad\13\18477 DATE: 2009-08-04 datum: fe
march cross section 7a-8
DESIGNED BY: TRO PLOT DATE: 9/2/09 JOB NO.: 35477
DRAWN BY: MAC CHECKED BY: HS PLOT SCALE: 1:1 DATE: 8/5/09

LITTLE TATE SHORELINE PROTECTION
AND MARSH CREATION
SUMMER 2008 POST-CONSTRUCTION MONITORING REPORT
MARCH CROSS SECTIONS
SECTIONS 7A-8

SHEET NUMBER
8
SHEET 8 OF 13

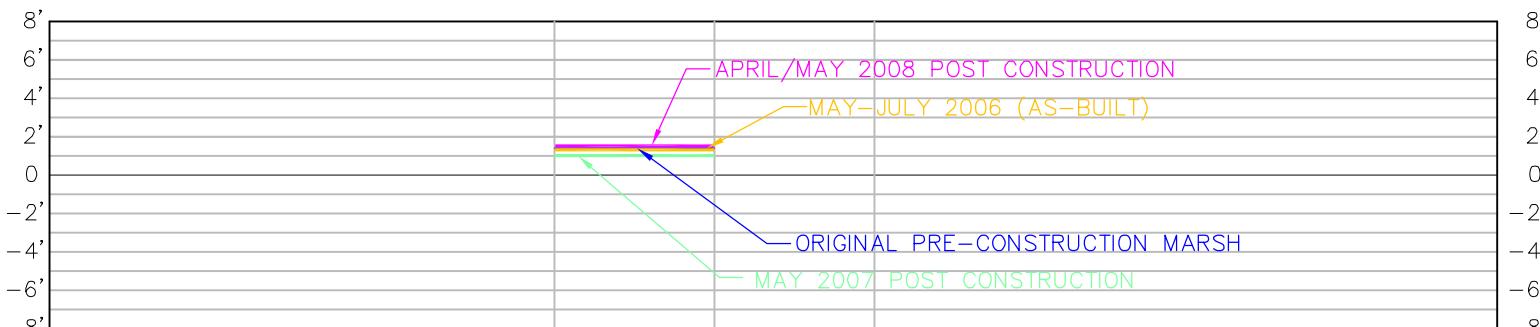


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| ORIGINAL PRE-CONSTRUCTION MARSH TRANSECT POINTS FROM T. BAKER SMITH, INC. | |
| MAY-JULY 2006 (AS-BUILT) | |
| MAY 2007 POST CONSTRUCTION | |
| APRIL/MAY 2008 POST CONSTRUCTION | |
| JULY 2009 POST CONSTRUCTION | |

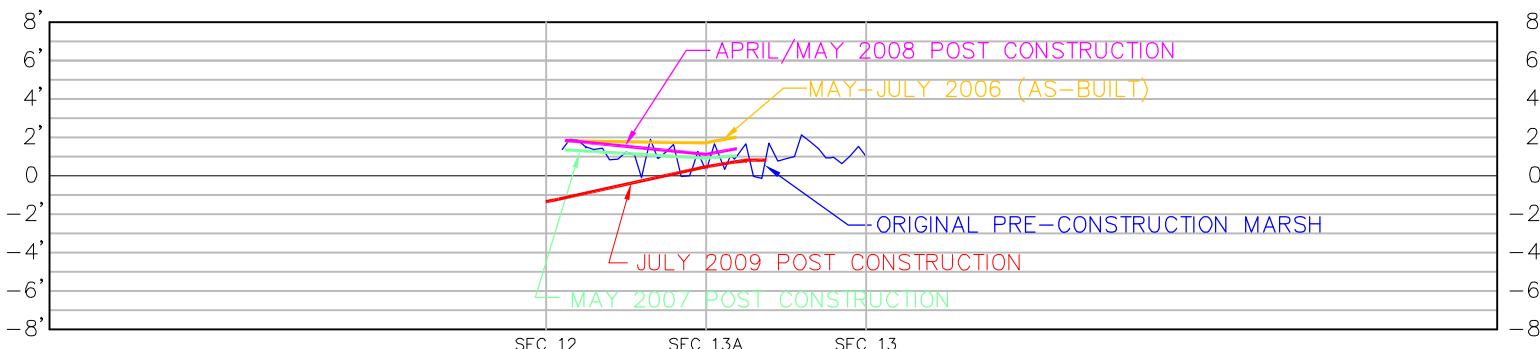
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VERT. 1"=10'

NOTE: SURVEY DATA REFERENCES FIELD BOOK #248.
ALL POINTS REFERENCED TO LA SOUTH ZONE,
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TO LA COASTAL ZONE SECONDARY MONUMENTS
BA 37-SM-01 & BA 37-SM-02.

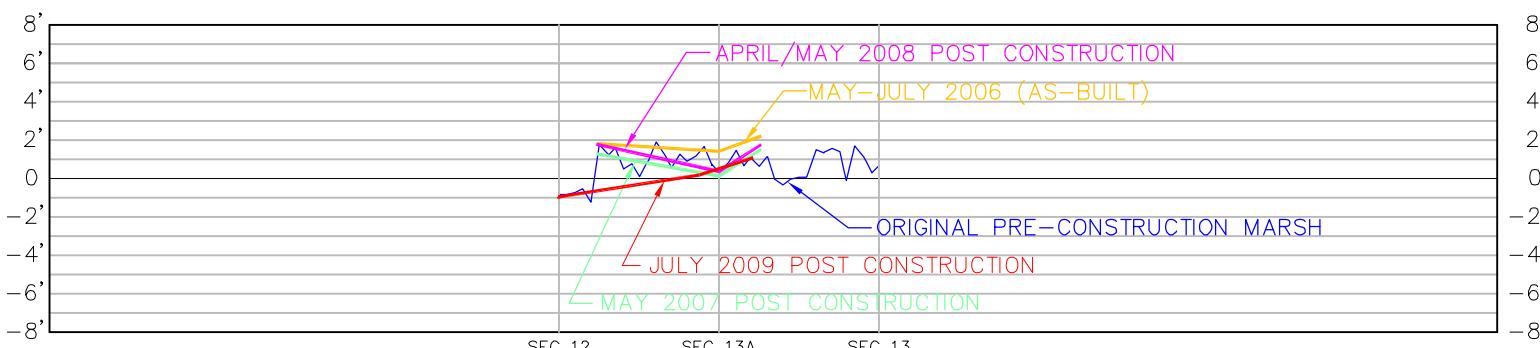
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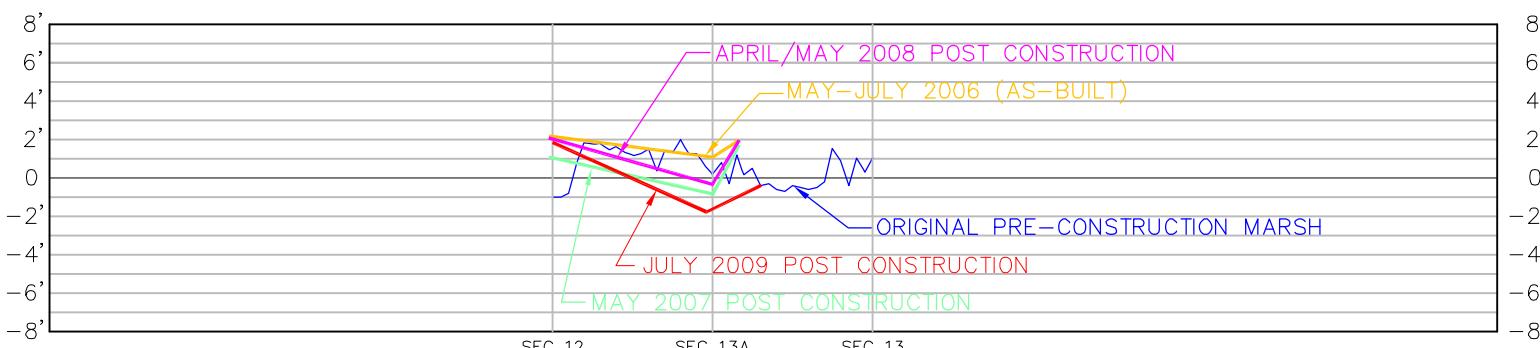
SECTION 10



SECTION 10A



SECTION 9



SECTION 9A

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| ORIGINAL PRE-CONSTRUCTION MARSH TRANSECT POINTS FROM T. BAKER SMITH, INC. | |
| MAY-JULY 2006 (AS-BUILT) | |
| MAY 2007 POST CONSTRUCTION | |
| APRIL/MAY 2008 POST CONSTRUCTION | |
| JULY 2009 POST CONSTRUCTION | |

SCALE: HORIZ. 1"=600'
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BA 37-SM-01 & BA 37-SM-02.

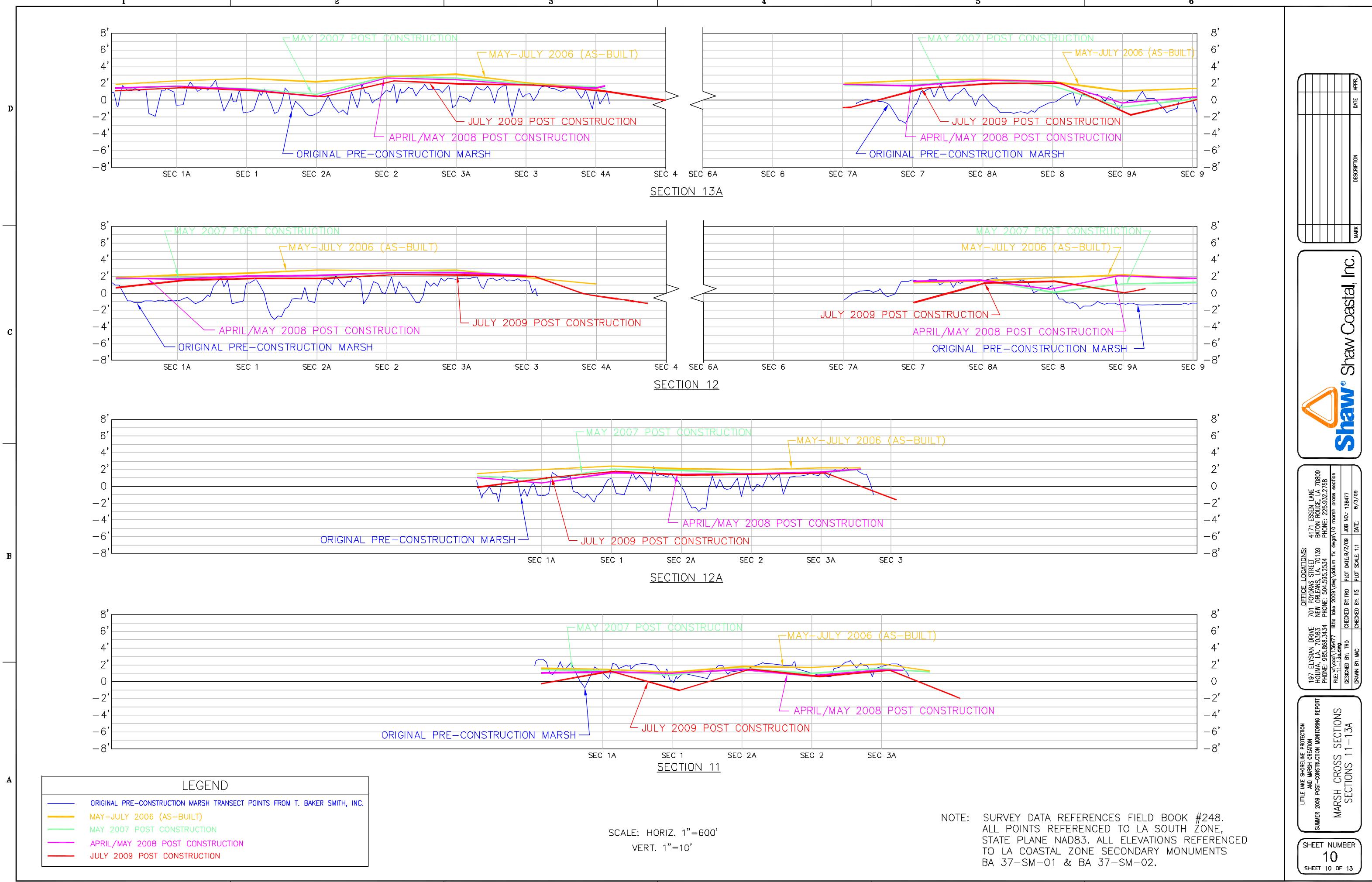
LITTLE LAKE SHORELINE PROTECTION
SUMMER 2009 POST-CONSTRUCTION MONITORING REPORT
MARCH CROSS SECTIONS 9A-10

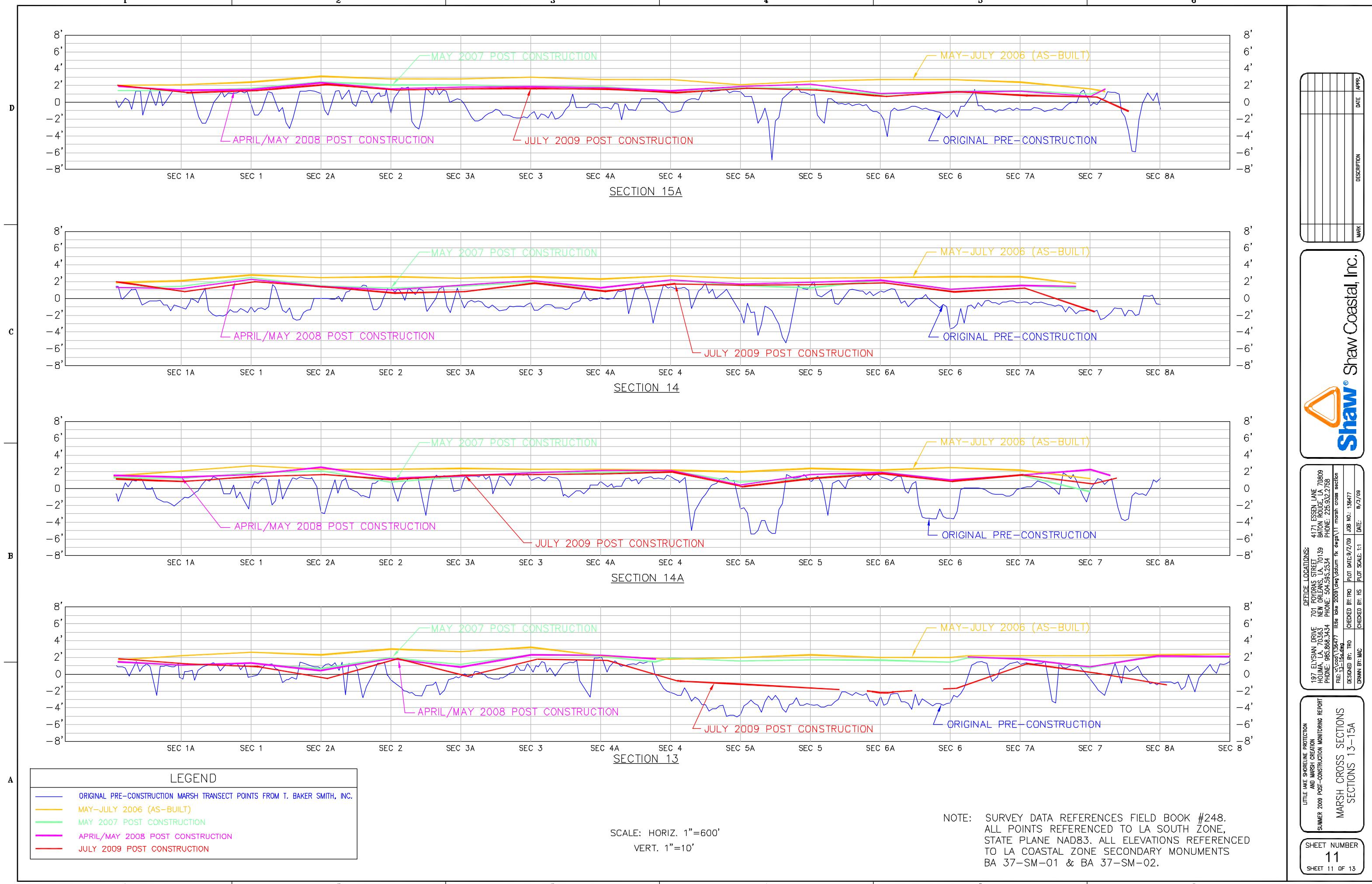
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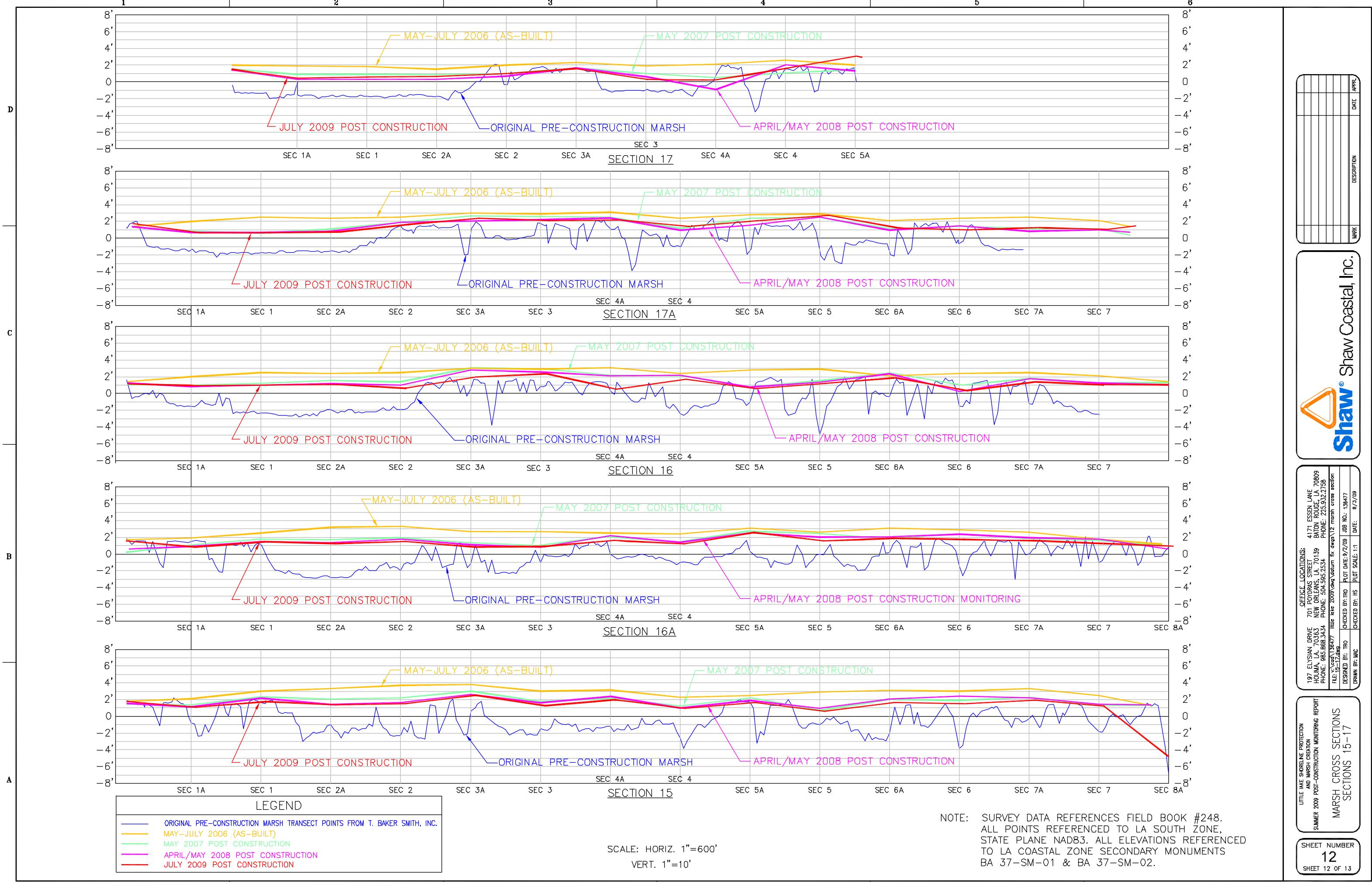


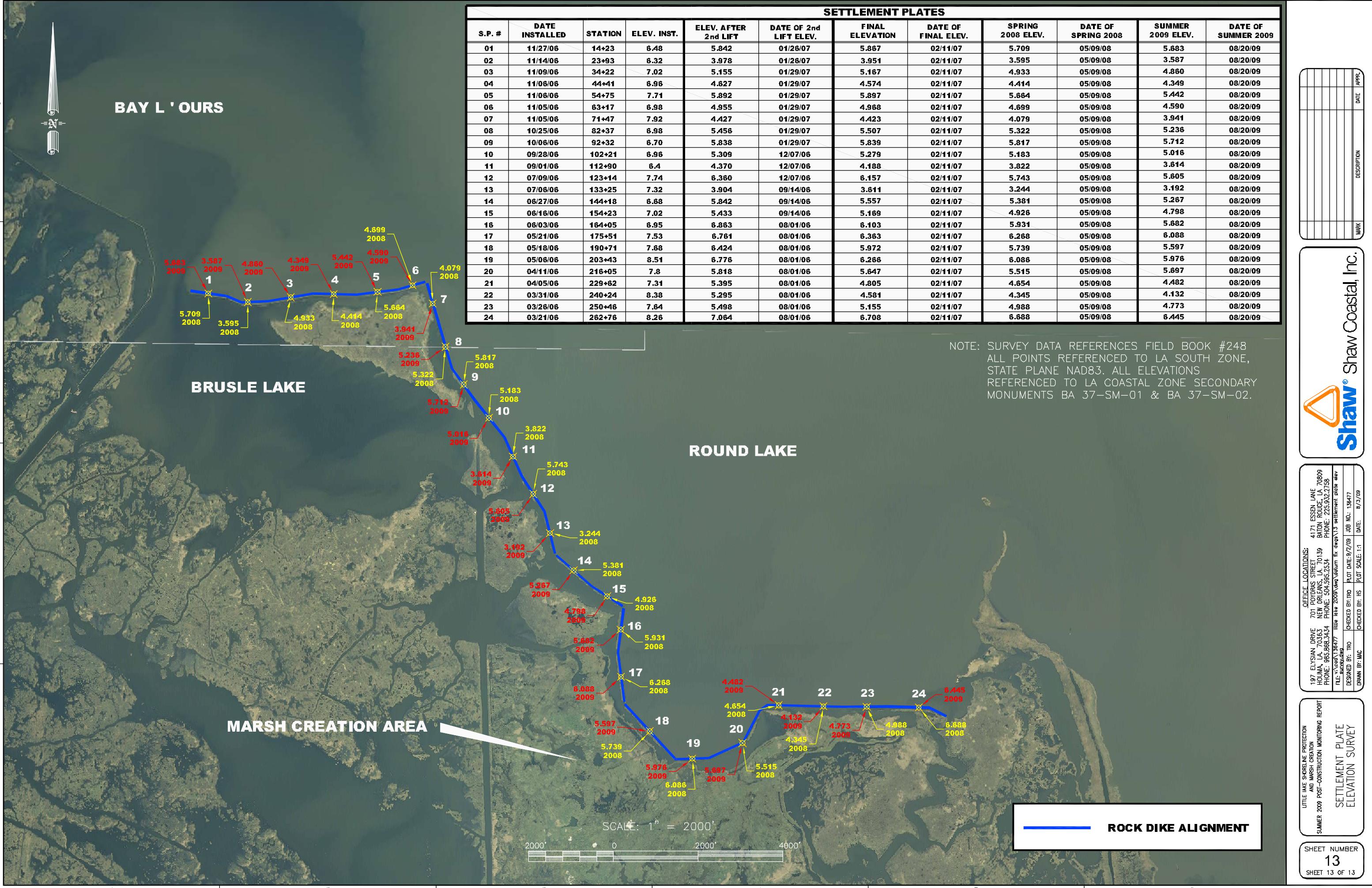
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| | DRAWN BY: ANC CHECKED BY: HS PLOT SCALE: 1:1 DATE: 8/5/09 |









SECTION 3

SURVEY DATA

A hard copy of the Survey data is attached.

Three (3) data files are produced in attached sheets:

- 1. Survey Data Summer 2009 Post Construction Monitoring.xls**
- 2. Survey Data Summer 2009 Settlement Plates.xls**
- 3. Marsh Elevation Averages.doc**

The files will contain survey data reported in Louisiana State Plane Coordinates, South Zone in feet with NAVD 88 elevations in feet.

Adjusted Survey Data
Summer 2009 Post Construction Monitoring

| Point No. | Northing | Easting | Elevation | Description |
|------------------|-----------------|----------------|------------------|--------------------|
| 101 | 363981.49 | 3638772.86 | 2.78 | sm01 |
| 1 | 363981.44 | 3638772.85 | 2.78 | sm01 |
| 2 | 350270.15 | 3655746.23 | 3.18 | sm02 |
| 102 | 350270.17 | 3655746.18 | 3.18 | sm02 |
| 3 | 349553.81 | 3642771.74 | 3.275 | RR SPIKE |
| 103 | 349553.88 | 3642771.69 | 3.49 | base pt |
| 1340 | 349553.74 | 3642771.73 | 3.729 | 3 |
| 1341 | 349545.13 | 3642752.15 | 0.738 | tow |
| 1342 | 349508.13 | 3642771.05 | 3.803 | bolt |
| 1343 | 349553.77 | 3642771.69 | 3.695 | rr spike |
| 1344 | 363981.39 | 3638772.87 | 2.836 | 1 |
| 1345 | 349545.53 | 3642751.76 | 0.981 | tow |
| 1346 | 349508.15 | 3642771.03 | 3.857 | 1342 |
| 1347 | 350270.24 | 3655746.19 | 3.158 | 2 |
| 1348 | 363981.42 | 3638772.83 | 2.786 | 1 |
| 1829 | 357055.34 | 3642575.24 | -1.052 | 3000 |
| 1830 | 357060.11 | 3643071.52 | 0.306 | 3001 |
| 1831 | 357050.40 | 3643069.60 | 0.84 | 3001 |
| 1832 | 356902.43 | 3643575.81 | 0.909 | 3002 |
| 1833 | 356901.42 | 3644075.08 | 1.042 | 3003 |
| 1834 | 356916.11 | 3644075.12 | -0.124 | 3003 |
| 1835 | 356960.66 | 3644573.84 | 0.892 | 3004 |
| 1836 | 357126.38 | 3645069.09 | 1.352 | 3005 |
| 1837 | 357145.26 | 3645068.74 | 0.825 | 3005 |
| 1838 | 356988.55 | 3645576.86 | -1.821 | 3006 |
| 1839 | 356404.85 | 3645589.79 | -1.973 | 3007 |
| 1840 | 356406.63 | 3645091.75 | 1.329 | 3008 |
| 1841 | 356406.33 | 3644590.84 | 0.614 | 3009 |
| 1842 | 356404.85 | 3644092.07 | 1.469 | 3010 |
| 1843 | 356405.93 | 3643590.27 | -1.047 | 3011 |
| 1844 | 356401.72 | 3643091.30 | 1.237 | 3012 |
| 1845 | 356400.70 | 3642595.56 | -0.261 | 3013 |
| 1846 | 355903.56 | 3642611.94 | -0.112 | 3014 |
| 1847 | 355901.75 | 3643106.96 | 1.003 | 3015 |
| 1848 | 355905.23 | 3643606.49 | 1.8 | 3016 |
| 1849 | 355904.58 | 3644107.23 | 1.334 | 3017 |
| 1850 | 355904.94 | 3644606.98 | 1.446 | 3018 |
| 1851 | 355907.09 | 3645107.19 | 1.569 | 3019 |
| 1852 | 355905.18 | 3645611.61 | -1.604 | 3020 |
| 1853 | 355907.50 | 3645816.40 | -1.248 | 3021 |
| 1854 | 355407.40 | 3645622.81 | 2.035 | 3024 |
| 1857 | 365283.79 | 3635862.03 | 5.619 | 13 |
| 1858 | 365090.06 | 3636798.25 | 3.475 | 12 |
| 1859 | 365213.67 | 3637811.15 | 4.94 | 11 |
| 1860 | 365297.94 | 3638823.99 | 4.456 | 10 |
| 1861 | 365361.33 | 3639854.89 | 5.65 | 9 |
| 1862 | 365524.61 | 3640679.56 | 4.612 | 8 |
| 1863 | 365100.50 | 3641157.36 | 4.031 | 7 |
| 1864 | 364081.89 | 3641466.32 | 5.285 | 6 |
| 1865 | 363198.46 | 3641910.66 | 5.815 | 5 |

Adjusted Survey Data
Summer 2009 Post Construction Monitoring

| Point No. | Northing | Easting | Elevation | Description |
|------------------|-----------------|----------------|------------------|--------------------|
| 1866 | 362416.74 | 3642510.63 | 5.084 | 4 |
| 1867 | 361510.07 | 3643087.66 | 3.692 | 14 |
| 1868 | 360633.75 | 3643575.18 | 5.677 | 15 |
| 1869 | 359713.61 | 3643976.95 | 3.086 | 16 |
| 1870 | 358840.01 | 3644543.63 | 5.4 | 17 |
| 1871 | 358237.21 | 3645343.19 | 4.96 | 18 |
| 1872 | 357458.13 | 3645667.74 | 5.86 | 19 |
| 1873 | 356340.68 | 3645686.87 | 6.273 | 20 |
| 1874 | 355064.99 | 3646379.86 | 5.597 | 21 |
| 1875 | 354428.93 | 3647388.09 | 5.939 | 22 |
| 1876 | 354809.22 | 3648566.36 | 5.344 | 23 |
| 1877 | 355705.73 | 3649413.31 | 4.34 | 24 |
| 1878 | 355692.53 | 3650468.85 | 4.262 | 25 |
| 1879 | 355697.23 | 3651487.35 | 4.617 | 26 |
| 1880 | 355687.05 | 3652715.61 | 6.506 | 27 |
| 1881 | 349508.15 | 3642771.00 | 3.823 | 1342 |
| 1882 | 350270.15 | 3655746.23 | 3.207 | 2 |
| 1883 | 363981.37 | 3638772.82 | 2.903 | 1 |
| 1884 | 355405.92 | 3645122.71 | 2.192 | 3025 |
| 1885 | 355405.47 | 3644622.60 | 2.21 | 3026 |
| 1886 | 355404.26 | 3644122.90 | 1.771 | 3027 |
| 1887 | 355404.12 | 3643621.88 | 1.776 | 3028 |
| 1888 | 355402.11 | 3643121.93 | 1.563 | 3029 |
| 1889 | 355404.77 | 3642627.67 | 0.672 | 3030 |
| 1890 | 354903.08 | 3642642.15 | 1.12 | 3031 |
| 1891 | 354902.22 | 3643137.70 | 1.5 | 3032 |
| 1892 | 354904.00 | 3643637.10 | 1.14 | 3033 |
| 1893 | 354903.54 | 3644137.85 | 0.415 | 3034 |
| 1894 | 354906.48 | 3644637.90 | 2.305 | 3035 |
| 1895 | 354907.83 | 3645137.96 | 1.925 | 3036 |
| 1896 | 354908.59 | 3645639.10 | 1.825 | 3037 |
| 1897 | 354909.10 | 3646138.98 | 1.096 | 3038 |
| 1898 | 354661.60 | 3648643.45 | -1.096 | 3053 |
| 1899 | 354919.30 | 3649141.23 | -0.842 | 3054 |
| 1900 | 355421.47 | 3649124.77 | -1.081 | 3055 |
| 1901 | 355417.55 | 3649623.21 | 1.207 | 3056 |
| 1902 | 355419.44 | 3650124.99 | 1.426 | 3057 |
| 1903 | 355420.78 | 3650624.16 | 0.031 | 3058 |
| 1904 | 355401.53 | 3651126.49 | 1.873 | 3059 |
| 1905 | 355358.61 | 3651626.87 | -0.979 | 3060 |
| 1906 | 355424.66 | 3652126.07 | -1.39 | 3061 |
| 1907 | 355426.07 | 3652626.97 | -1.582 | 3062 |
| 1908 | 355068.63 | 3652640.38 | 1.168 | 3063 |
| 1909 | 354923.86 | 3652359.06 | -0.132 | 3064 |
| 1910 | 354922.87 | 3652139.92 | 0.45 | 3065 |
| 1911 | 354921.15 | 3651636.49 | 0.167 | 3066 |
| 1912 | 354920.12 | 3651138.70 | -1.755 | 3067 |
| 1913 | 354919.33 | 3650639.37 | 2.025 | 3068 |
| 1914 | 354917.85 | 3650140.67 | 1.999 | 3069 |
| 1915 | 354917.63 | 3649640.64 | 1.4 | 3070 |

Adjusted Survey Data
Summer 2009 Post Construction Monitoring

| Point No. | Northing | Easting | Elevation | Description |
|------------------|-----------------|----------------|------------------|--------------------|
| 1916 | 354414.71 | 3649154.69 | 1.252 | 3071 |
| 1917 | 354416.37 | 3649655.74 | 0.118 | 3072 |
| 1918 | 354418.87 | 3650156.23 | -1.272 | 3073 |
| 1919 | 354525.70 | 3650649.54 | -1.513 | 3074 |
| 1920 | 354750.36 | 3651144.53 | -0.372 | 3075 |
| 1921 | 354752.24 | 3651646.18 | 1.064 | 3076 |
| 1922 | 354793.77 | 3652146.67 | 0.787 | 3077 |
| 1923 | 354411.47 | 3648650.20 | -1.684 | 3052 |
| 1924 | 354384.90 | 3648152.66 | -2.22 | 3051 |
| 1925 | 354408.59 | 3646654.01 | -0.798 | 3048 |
| 1926 | 354407.78 | 3646155.34 | 1.639 | 3047 |
| 1927 | 354403.25 | 3645652.31 | 1.786 | 3046 |
| 1928 | 354405.80 | 3645151.61 | -0.227 | 3045 |
| 1929 | 354405.15 | 3644655.50 | 1.855 | 3044 |
| 1930 | 354406.28 | 3644154.51 | -0.49 | 3043 |
| 1931 | 354403.40 | 3643654.86 | 0.915 | 3042 |
| 1932 | 354403.45 | 3643154.36 | 1.226 | 3041 |
| 1933 | 354403.52 | 3642659.01 | 1.854 | 3040 |
| 1934 | 353902.65 | 3642688.34 | 1.168 | 3093 |
| 1935 | 353901.68 | 3643169.33 | 0.838 | 3092 |
| 1936 | 353904.13 | 3643669.81 | 1.427 | 3091 |
| 1937 | 353902.33 | 3644179.14 | 1.687 | 3090 |
| 1938 | 353905.55 | 3644667.73 | 1.082 | 3089 |
| 1939 | 353907.36 | 3645169.66 | 1.61 | 3088 |
| 1940 | 353915.03 | 3645669.97 | 1.683 | 3087 |
| 1941 | 353908.62 | 3646167.91 | 1.762 | 3086 |
| 1942 | 353909.67 | 3646668.05 | 2.004 | 3085 |
| 1943 | 353911.67 | 3647167.23 | 0.237 | 3084 |
| 1944 | 353910.79 | 3647672.98 | 1.251 | 3083 |
| 1945 | 353913.25 | 3648171.56 | 1.797 | 3082 |
| 1946 | 353913.71 | 3648668.57 | 0.869 | 3081 |
| 1947 | 353916.22 | 3649171.22 | 1.637 | 3080 |
| 1948 | 353918.44 | 3649672.19 | 0.566 | 3079 |
| 1949 | 353917.78 | 3649844.73 | 1.247 | 3078 |
| 1950 | 353416.62 | 3649686.40 | -1.58 | 3108 |
| 1951 | 353415.57 | 3649186.44 | 1.227 | 3107 |
| 1952 | 353415.72 | 3648684.40 | 0.788 | 3106 |
| 1953 | 353414.08 | 3648184.21 | 1.863 | 3105 |
| 1954 | 353412.99 | 3647686.51 | 1.674 | 3104 |
| 1955 | 353412.41 | 3647185.83 | 1.597 | 3103 |
| 1956 | 353411.03 | 3646688.29 | 1.744 | 3102 |
| 1957 | 353408.24 | 3646186.49 | 0.864 | 3101 |
| 1958 | 353407.10 | 3645685.24 | 1.838 | 3100 |
| 1959 | 353406.66 | 3645186.18 | 0.827 | 3099 |
| 1960 | 353405.57 | 3644685.21 | 0.633 | 3098 |
| 1961 | 353404.17 | 3644185.82 | 1.371 | 3097 |
| 1962 | 353403.42 | 3643683.00 | 2.005 | 3096 |
| 1963 | 353403.81 | 3643183.83 | 0.831 | 3095 |
| 1964 | 353401.19 | 3642689.02 | 1.996 | 3094 |
| 1965 | 349508.15 | 3642771.04 | 3.837 | 1342 |

Adjusted Survey Data
Summer 2009 Post Construction Monitoring

| Point No. | Northing | Easting | Elevation | Description |
|------------------|-----------------|----------------|------------------|--------------------|
| 2000 | 363981.44 | 3638772.23 | -0.2 | |
| 2001 | 349553.88 | 3642771.69 | -0.2 | |
| 1966 | 349508.15 | 3642771.03 | 3.845 | 1342 |
| 1967 | 350270.25 | 3655746.16 | 3.201 | 2 |
| 1968 | 363981.44 | 3638772.86 | 2.834 | 1 |
| 1969 | 352900.44 | 3642705.75 | 2.023 | 3124 |
| 1970 | 352902.50 | 3643200.88 | 1.153 | 3123 |
| 1971 | 352903.28 | 3643700.66 | 1.398 | 3122 |
| 1972 | 352905.46 | 3644199.69 | 2.126 | 3121 |
| 1973 | 352907.65 | 3644701.69 | 1.464 | 3120 |
| 1974 | 352907.40 | 3645201.20 | 1.608 | 3119 |
| 1975 | 352907.76 | 3645701.21 | 1.641 | 3118 |
| 1976 | 352909.69 | 3646202.26 | 1.571 | 3117 |
| 1977 | 352910.07 | 3646701.07 | 1.155 | 3116 |
| 1978 | 352911.85 | 3647202.49 | 1.657 | 3115 |
| 1979 | 352913.35 | 3647701.11 | 1.458 | 3114 |
| 1980 | 352913.65 | 3648201.84 | 0.683 | 3113 |
| 1981 | 352913.51 | 3648703.22 | 1.251 | 3112 |
| 1982 | 352916.06 | 3649204.29 | 0.804 | 3111 |
| 1983 | 352917.88 | 3649703.80 | 0.61 | 3110 |
| 1984 | 352917.70 | 3649931.58 | -1.068 | 3109 |
| 1985 | 352418.37 | 3649717.10 | 1.237 | 3139 |
| 1986 | 352417.55 | 3649223.49 | 1.94 | 3138 |
| 1987 | 352405.35 | 3648718.52 | 1.517 | 3137 |
| 1988 | 352414.71 | 3648217.56 | 1.648 | 3136 |
| 1989 | 352413.50 | 3647717.20 | 0.603 | 3135 |
| 1990 | 352412.09 | 3647219.46 | 1.658 | 3134 |
| 1991 | 352411.86 | 3646717.32 | 0.972 | 3133 |
| 1992 | 352411.12 | 3646217.20 | 1.979 | 3132 |
| 1993 | 352407.17 | 3645717.57 | 1.278 | 3131 |
| 1994 | 352408.08 | 3645216.96 | 2.527 | 3130 |
| 1995 | 352407.23 | 3644716.00 | 1.506 | 3129 |
| 1996 | 352405.70 | 3644217.03 | 1.368 | 3128 |
| 1997 | 352404.28 | 3643715.91 | 1.752 | 3127 |
| 1998 | 352403.43 | 3643215.48 | 1.095 | 3126 |
| 1999 | 352401.02 | 3642721.12 | 1.775 | 3125 |
| 2002 | 351901.27 | 3642737.36 | 1.557 | 3156 |
| 2003 | 351901.95 | 3643232.18 | 0.853 | 3155 |
| 2004 | 351904.50 | 3643732.75 | 1.458 | 3154 |
| 2005 | 351904.94 | 3644232.26 | 1.262 | 3153 |
| 2006 | 351905.32 | 3644733.52 | 1.482 | 3152 |
| 2007 | 351905.65 | 3645234.56 | 0.846 | 3151 |
| 2008 | 351908.36 | 3645733.24 | 0.918 | 3150 |
| 2009 | 351909.42 | 3646233.36 | 1.628 | 3149 |
| 2010 | 351911.35 | 3646733.02 | 1.212 | 3148 |
| 2011 | 351910.85 | 3647232.69 | 2.589 | 3147 |
| 2012 | 351912.51 | 3647731.82 | 1.578 | 3146 |
| 2013 | 351914.63 | 3648232.77 | 1.877 | 3145 |
| 2014 | 351915.04 | 3648734.18 | 1.737 | 3144 |
| 2015 | 351916.79 | 3649236.11 | 1.608 | 3143 |

Adjusted Survey Data
Summer 2009 Post Construction Monitoring

| Point No. | Northing | Easting | Elevation | Description |
|------------------|-----------------|----------------|------------------|--------------------|
| 2016 | 351920.05 | 3649735.17 | 1.252 | 3142 |
| 2017 | 351922.00 | 3650235.23 | 0.928 | 3141 |
| 2018 | 352422.08 | 3650217.37 | -5.216 | 3140 |
| 2019 | 351419.24 | 3650249.95 | 1.04 | 3172 |
| 2020 | 351420.11 | 3650750.48 | 0.961 | 3173 |
| 2021 | 351345.19 | 3650753.12 | -2.86 | 3174 |
| 2022 | 351175.10 | 3650257.69 | 2.356 | 3175 |
| 2023 | 351419.01 | 3649740.56 | 1.044 | 3171 |
| 2024 | 351420.96 | 3649255.74 | 1.394 | 3170 |
| 2025 | 351414.83 | 3648765.49 | 0.341 | 3169 |
| 2026 | 351416.24 | 3648250.20 | 1.869 | 3168 |
| 2027 | 351414.00 | 3647750.52 | 1.222 | 3167 |
| 2028 | 351413.26 | 3647250.66 | 0.569 | 3166 |
| 2029 | 351413.21 | 3646750.66 | 1.692 | 3165 |
| 2030 | 351408.28 | 3646252.71 | 0.522 | 3164 |
| 2031 | 351410.00 | 3645750.69 | 2.357 | 3163 |
| 2032 | 351408.93 | 3645250.83 | 1.973 | 3162 |
| 2033 | 351406.34 | 3644749.46 | 0.631 | 3161 |
| 2034 | 351404.68 | 3644249.84 | 1.087 | 3160 |
| 2035 | 351404.57 | 3643746.48 | 1.017 | 3159 |
| 2036 | 351402.61 | 3643247.15 | 0.942 | 3158 |
| 2037 | 351401.58 | 3642753.60 | 1.155 | 3157 |
| 2038 | 350068.19 | 3642820.84 | 1.607 | 3193 |
| 2039 | 350406.94 | 3642806.76 | 1.5 | 3192 |
| 2040 | 350901.58 | 3642778.61 | 1.738 | 3191 |
| 2041 | 350114.84 | 3643295.11 | -2.119 | 3194 |
| 2042 | 350145.27 | 3643789.12 | 0.282 | 3197 |
| 2043 | 350179.70 | 3644286.61 | 3.109 | 3198 |
| 2044 | 350217.92 | 3644785.07 | 2.177 | 3201 |
| 2045 | 349508.10 | 3642771.00 | 3.877 | 1342 |
| 1360 | 349545.13 | 3642751.76 | 0.814 | tow |
| 1361 | 350270.25 | 3655746.08 | 3.107 | 2 |
| 1362 | 350404.29 | 3643277.93 | 0.412 | 3195 |
| 1363 | 350403.67 | 3643781.16 | 0.576 | 3196 |
| 1364 | 350406.24 | 3644280.07 | 0.65 | 3199 |
| 1365 | 350405.84 | 3644778.67 | 0.981 | 3200 |
| 1366 | 350406.54 | 3645279.38 | 1.56 | 3202 |
| 1367 | 350408.73 | 3645781.12 | 0.289 | 3203 |
| 1368 | 350411.77 | 3646279.76 | 0.195 | 3204 |
| 1369 | 350410.08 | 3646779.22 | 1.629 | 3205 |
| 1370 | 350409.20 | 3647280.86 | 3.072 | 3206 |
| 1371 | 350445.64 | 3647779.41 | 1.416 | 3207 |
| 1372 | 350478.81 | 3648278.36 | 1.539 | 3208 |
| 1373 | 350502.96 | 3648777.83 | 1.315 | 3209 |
| 1374 | 350522.18 | 3649279.41 | 1.229 | 2x4 |
| 1375 | 350487.81 | 3649277.98 | 1.392 | 3210 |
| 1376 | 350555.68 | 3649776.20 | 1.097 | 2x4 |
| 1377 | 350917.74 | 3649967.66 | 1.473 | 3176 |
| 1378 | 350917.13 | 3649766.15 | 1.067 | 3177 |
| 1379 | 350908.16 | 3649765.16 | 1.049 | 2x4 |

Adjusted Survey Data
Summer 2009 Post Construction Monitoring

| Point No. | Northing | Easting | Elevation | Description |
|------------------|-----------------|----------------|------------------|--------------------|
| 1380 | 350917.73 | 3649266.71 | 1.263 | 3178 |
| 1381 | 350913.61 | 3648766.52 | 0.984 | 3179 |
| 1382 | 350914.47 | 3648264.76 | 1.228 | 3180 |
| 1383 | 350913.11 | 3647765.33 | 2.713 | 3181 |
| 1384 | 350903.14 | 3647264.90 | 2.128 | 3182 |
| 1385 | 350910.72 | 3646764.37 | 1.398 | 3183 |
| 1386 | 350900.39 | 3646264.41 | 2.19 | 3184 |
| 1387 | 350907.78 | 3645764.24 | 2.089 | 3185 |
| 1388 | 350908.21 | 3645263.18 | 2.402 | 3186 |
| 1389 | 350906.49 | 3644763.06 | 1.657 | 3187 |
| 1390 | 350905.48 | 3644264.25 | 0.757 | 3188 |
| 1391 | 350903.89 | 3643763.65 | 0.661 | 3189 |
| 1392 | 350902.70 | 3643264.12 | 0.631 | 3190 |
| 1394 | 349545.04 | 3642751.96 | 1.058 | tow |
| 1395 | 350270.19 | 3655746.12 | 3.116 | 2 |
| 1396 | 363981.36 | 3638772.87 | 2.925 | 1 |
| 1397 | 355455.96 | 3644572.82 | 1.71 | 4043 |
| 1398 | 355430.83 | 3644572.52 | 1.606 | 4054 |
| 1399 | 355406.12 | 3644572.65 | 1.871 | 4055 |
| 1400 | 355380.98 | 3644572.93 | 1.461 | 4056 |
| 1401 | 355355.82 | 3644572.76 | 1.711 | 4059 |
| 1402 | 355355.85 | 3644606.28 | 2.107 | 4058 |
| 1403 | 355380.97 | 3644606.12 | 1.793 | 4053 |
| 1404 | 355405.54 | 3644606.48 | 1.779 | 4051 |
| 1405 | 355431.07 | 3644606.16 | 1.665 | 4050 |
| 1406 | 355455.63 | 3644606.02 | 1.593 | 4042 |
| 1407 | 355455.50 | 3644639.37 | 1.838 | 4041 |
| 1408 | 355430.84 | 3644639.52 | 1.64 | 4048 |
| 1409 | 355405.73 | 3644639.40 | 1.899 | 4049 |
| 1410 | 355381.08 | 3644639.61 | 2.252 | 4052 |
| 1411 | 355355.72 | 3644639.75 | 2.352 | 4057 |
| 1412 | 355355.71 | 3644672.77 | 1.772 | 4047 |
| 1413 | 355380.89 | 3644672.62 | 2.292 | 4046 |
| 1414 | 355405.79 | 3644672.80 | 1.729 | 4045 |
| 1415 | 355430.78 | 3644672.77 | 2.028 | 4044 |
| 1416 | 355455.63 | 3644672.73 | 2.141 | 4040 |
| 1417 | 354971.22 | 3650592.31 | 1.078 | 4006 |
| 1418 | 354945.46 | 3650592.95 | 1.742 | 4007 |
| 1419 | 354921.10 | 3650591.68 | 1.004 | 4015 |
| 1420 | 354895.09 | 3650592.23 | 0.936 | 4016 |
| 1421 | 354869.93 | 3650590.94 | 0.544 | 4019 |
| 1422 | 354868.96 | 3650623.63 | 0.883 | 4018 |
| 1423 | 354894.37 | 3650624.03 | 0.118 | 4014 |
| 1424 | 354919.89 | 3650624.28 | 1.276 | 4012 |
| 1425 | 354943.87 | 3650623.89 | 1.646 | 4005 |
| 1426 | 354969.78 | 3650624.22 | 1.773 | 4003 |
| 1427 | 354969.64 | 3650657.30 | -0.178 | 4002 |
| 1428 | 354945.21 | 3650657.60 | 1.686 | 4004 |
| 1429 | 354920.40 | 3650657.91 | 1.471 | 4011 |
| 1430 | 354894.98 | 3650657.93 | 1.226 | 4013 |

Adjusted Survey Data
Summer 2009 Post Construction Monitoring

| Point No. | Northing | Easting | Elevation | Description |
|------------------|-----------------|----------------|------------------|--------------------|
| 1431 | 354869.62 | 3650658.42 | -0.699 | 4017 |
| 1432 | 354869.91 | 3650690.92 | 1.122 | 4010 |
| 1433 | 354895.19 | 3650690.63 | 0.891 | 4009 |
| 1434 | 354920.26 | 3650690.95 | -1.52 | 4008 |
| 1435 | 354945.65 | 3650690.47 | -1.496 | 4001 |
| 1436 | 354970.24 | 3650690.80 | -1.92 | 4000 |
| 1437 | 353463.02 | 3647736.72 | 1.277 | 4020 |
| 1438 | 353438.29 | 3647736.73 | 1.313 | 4021 |
| 1439 | 353412.96 | 3647736.56 | 1.315 | 4028 |
| 1440 | 353387.83 | 3647736.67 | 1.396 | 4029 |
| 1441 | 353362.99 | 3647736.41 | 1.537 | 4034 |
| 1442 | 353363.05 | 3647703.08 | 1.346 | 4035 |
| 1443 | 353387.88 | 3647703.33 | 1.51 | 4032 |
| 1444 | 353413.33 | 3647703.21 | 1.54 | 4030 |
| 1445 | 353437.80 | 3647703.54 | 1.674 | 4023 |
| 1446 | 353462.99 | 3647703.52 | 1.724 | 4022 |
| 1447 | 353463.02 | 3647670.08 | 1.278 | 4024 |
| 1448 | 353437.96 | 3647669.89 | 1.368 | 4025 |
| 1449 | 353412.93 | 3647669.88 | 1.468 | 4031 |
| 1450 | 353387.67 | 3647670.05 | 1.444 | 4033 |
| 1451 | 353362.93 | 3647669.91 | 1.787 | 4036 |
| 1452 | 353363.04 | 3647636.36 | 1.363 | 4039 |
| 1453 | 353388.04 | 3647636.66 | 1.646 | 4038 |
| 1454 | 353413.24 | 3647636.59 | 1.36 | 4037 |
| 1455 | 353437.91 | 3647636.63 | 1.313 | 4027 |
| 1456 | 353462.99 | 3647636.74 | 1.342 | 4026 |
| 1457 | 353456.07 | 3644734.88 | 1.11 | 4060 |
| 1458 | 353430.59 | 3644735.82 | 0.539 | 4064 |
| 1459 | 353404.46 | 3644735.55 | 0.696 | 4065 |
| 1460 | 353381.60 | 3644735.35 | 0.626 | 4066 |
| 1461 | 353356.49 | 3644735.93 | 0.632 | 4073 |
| 1462 | 353431.59 | 3644702.62 | 0.582 | 4067 |
| 1463 | 353406.62 | 3644701.27 | 0.619 | 4068 |
| 1464 | 353381.05 | 3644702.50 | 1.853 | 4071 |
| 1465 | 353456.51 | 3644702.59 | 0.693 | 4061 |
| 1466 | 353455.72 | 3644668.42 | 0.95 | 4062 |
| 1467 | 353430.84 | 3644667.53 | 0.924 | 4069 |
| 1468 | 353406.21 | 3644668.99 | 0.657 | 4070 |
| 1469 | 353381.28 | 3644668.95 | 1.177 | 4072 |
| 1470 | 353354.30 | 3644667.93 | 1.178 | 4075 |
| 1471 | 353455.59 | 3644634.88 | 0.828 | 4063 |
| 1472 | 353430.54 | 3644634.85 | 0.871 | 4076 |
| 1473 | 353404.72 | 3644636.68 | 1.302 | 4077 |
| 1474 | 353379.68 | 3644636.84 | 1.423 | 4078 |
| 1475 | 353355.84 | 3644636.42 | 1.557 | 4079 |
| 1476 | 353355.33 | 3644701.83 | 1.946 | 4074 |
| 1477 | 351455.00 | 3644297.24 | 1.087 | 4100 |
| 1478 | 351430.19 | 3644298.35 | 1.14 | 4104 |
| 1479 | 351405.15 | 3644298.26 | 1.089 | 4105 |
| 1480 | 351380.16 | 3644297.49 | 1.106 | 4106 |

Adjusted Survey Data
Summer 2009 Post Construction Monitoring

| Point No. | Northing | Easting | Elevation | Description |
|------------------|-----------------|----------------|------------------|--------------------|
| 1481 | 351380.10 | 3644297.32 | 1.13 | 4106 |
| 1482 | 351354.90 | 3644297.74 | 0.957 | 4107 |
| 1483 | 351354.83 | 3644264.28 | 0.972 | 4117 |
| 1484 | 351380.17 | 3644263.94 | 1.125 | 4112 |
| 1485 | 351405.78 | 3644263.95 | 1.153 | 4109 |
| 1486 | 351430.60 | 3644264.20 | 0.875 | 4108 |
| 1487 | 351455.20 | 3644264.02 | 0.995 | 4101 |
| 1488 | 351454.71 | 3644231.11 | 1.117 | 4102 |
| 1489 | 351430.51 | 3644231.25 | 1.171 | 4110 |
| 1490 | 351404.56 | 3644231.35 | 0.937 | 4111 |
| 1491 | 351404.21 | 3644231.33 | 0.844 | 4111 |
| 1492 | 351379.83 | 3644231.09 | 1.145 | 4113 |
| 1493 | 351355.23 | 3644230.25 | 1.129 | 4118 |
| 1494 | 351354.20 | 3644197.75 | 0.703 | 4119 |
| 1495 | 351379.75 | 3644198.06 | 0.913 | 4116 |
| 1496 | 351405.41 | 3644197.42 | 1.219 | 4115 |
| 1497 | 351430.65 | 3644197.39 | 1.05 | 4114 |
| 1498 | 351454.99 | 3644197.01 | 1.039 | 4103 |
| 1499 | 351465.60 | 3649199.97 | 1.503 | 4089 |
| 1500 | 351440.32 | 3649200.11 | 1.475 | 4090 |
| 1501 | 351415.11 | 3649199.86 | 2.034 | 4095 |
| 1502 | 351390.57 | 3649199.70 | 2.122 | 4096 |
| 1503 | 351366.57 | 3649199.72 | 0.356 | 4099 |
| 1504 | 351365.31 | 3649232.87 | 1.444 | 4098 |
| 1505 | 351390.19 | 3649233.42 | 2.03 | 4094 |
| 1506 | 351415.37 | 3649233.06 | 1.875 | 4092 |
| 1507 | 351440.18 | 3649233.31 | 2.124 | 4088 |
| 1508 | 351465.57 | 3649233.22 | 1.91 | 4086 |
| 1509 | 351465.75 | 3649266.53 | 1.753 | 4085 |
| 1510 | 351440.55 | 3649266.38 | 1.328 | 4087 |
| 1511 | 351415.47 | 3649266.72 | 1.437 | 4091 |
| 1512 | 351390.33 | 3649266.61 | 1.915 | 4093 |
| 1513 | 351365.20 | 3649266.34 | 1.331 | 4097 |
| 1514 | 351365.57 | 3649299.98 | 1.432 | 4084 |
| 1515 | 351390.30 | 3649299.82 | 1.349 | 4083 |
| 1516 | 351415.49 | 3649299.70 | 1.701 | 4082 |
| 1517 | 351440.48 | 3649299.72 | 1.962 | 4081 |
| 1518 | 351465.21 | 3649299.38 | 1.502 | 4080 |
| 1519 | 351545.42 | 3649375.61 | 2.777 | cor house boat |
| 1520 | 349508.11 | 3642771.04 | 3.824 | 1342 |
| 1521 | 349544.82 | 3642752.13 | 0.885 | tow |
| 2233 | 355378.87 | 3653426.33 | 2.789 | cl |
| 2232 | 355585.54 | 3653015.72 | 3.267 | cl |
| 2231 | 355588.74 | 3652776.30 | 6.445 | pipe |
| 2230 | 355615.02 | 3652032.43 | 3.276 | cl |
| 2227 | 355610.74 | 3651547.74 | 4.773 | pipe |
| 2228 | 355605.11 | 3651016.10 | 3.151 | cl |
| 2226 | 355616.28 | 3650529.71 | 4.132 | pipe |
| 2225 | 355639.70 | 3649474.15 | 4.482 | pipe |
| 2189 | 365116.15 | 3641311.69 | 3.941 | pipe |

Adjusted Survey Data
Summer 2009 Post Construction Monitoring

| Point No. | Northing | Easting | Elevation | Description |
|------------------|-----------------|----------------|------------------|--------------------|
| 2190 | 364094.76 | 3641610.48 | 5.236 | pipe |
| 2191 | 363581.60 | 3641770.88 | 2.288 | cl |
| 2193 | 362835.55 | 3642306.50 | 2.671 | cl |
| 2192 | 363207.09 | 3642046.04 | 5.712 | pipe |
| 2197 | 361029.12 | 3643424.00 | 2.665 | cl |
| 2198 | 360625.75 | 3643684.85 | 5.605 | pipe |
| 2195 | 361963.26 | 3642999.82 | 2.767 | cl |
| 2194 | 362419.07 | 3642638.23 | 5.016 | pipe |
| 2196 | 361506.58 | 3643206.16 | 3.614 | pipe |
| 2188 | 365595.82 | 3641177.07 | 3.511 | cl |
| 2187 | 365627.68 | 3641138.27 | 2.325 | cl |
| 2186 | 365545.15 | 3640837.99 | 4.59 | pipe |
| 2185 | 365453.67 | 3640505.68 | 2.136 | cl |
| 2184 | 365389.91 | 3640011.71 | 5.442 | pipe |
| 2183 | 365326.28 | 3639518.87 | 2.253 | cl |
| 2182 | 365336.53 | 3638980.20 | 4.349 | pipe |
| 2181 | 365350.11 | 3638494.31 | 2.874 | cl |
| 2180 | 365262.60 | 3637966.31 | 4.86 | pipe |
| 2179 | 365174.71 | 3637436.61 | 3.062 | cl |
| 2178 | 365149.08 | 3636952.60 | 3.587 | pipe |
| 2177 | 365142.58 | 3636808.44 | 2.846 | cl |
| 2176 | 365292.42 | 3636434.15 | 1.26 | cl |
| 2175 | 365351.87 | 3636018.40 | 5.683 | plate |
| 2174 | 365413.80 | 3635598.61 | 3.124 | cl |
| 1129 | 363981.49 | 3638772.91 | 3.058 | 1 |
| 2206 | 357978.33 | 3645795.19 | 2.577 | cl |
| 2205 | 358211.91 | 3645429.24 | 4.798 | pipe |
| 2207 | 357931.33 | 3645813.83 | 2.887 | cl |
| 2208 | 357429.40 | 3645746.19 | 5.682 | pipe |
| 2209 | 356881.95 | 3645680.81 | 3.035 | cl |
| 2199 | 360217.85 | 3643947.27 | 3.223 | cl |
| 2200 | 359701.49 | 3644077.62 | 3.192 | pipe |
| 2204 | 358445.87 | 3645073.56 | 3.047 | cl |
| 2203 | 358822.15 | 3644635.80 | 5.267 | pipe |
| 2201 | 359226.44 | 3644194.09 | 3.044 | cl |
| 2202 | 359179.90 | 3644225.25 | 3.121 | cl |
| 2224 | 355647.71 | 3649199.48 | 3.16 | cl |
| 2223 | 355514.34 | 3649018.69 | 2.917 | cl |
| 2222 | 354762.25 | 3648637.46 | 3.229 | cl |
| 2221 | 354751.62 | 3648618.45 | 5.697 | pipe |
| 2210 | 356311.56 | 3645754.22 | 6.088 | pipe |
| 2211 | 355707.77 | 3645834.80 | 3.128 | cl |
| 2212 | 355664.52 | 3645847.89 | 2.724 | cl |
| 2213 | 355029.10 | 3646434.55 | 5.597 | pipe |
| 1134 | 354910.60 | 3646459.05 | 0.801 | 811 |
| 1135 | 355408.92 | 3646024.83 | 0.143 | 810 |
| 1131 | 354414.41 | 3648778.48 | 1.77 | 814 |
| 2220 | 354396.64 | 3647828.87 | 3.2 | cl |
| 2219 | 354383.14 | 3647436.15 | 5.976 | pipe |
| 1132 | 354087.26 | 3647705.51 | 1.236 | 813 |

Adjusted Survey Data
Summer 2009 Post Construction Monitoring

| Point No. | Northing | Easting | Elevation | Description |
|------------------|-----------------|----------------|------------------|--------------------|
| 2215 | 354375.07 | 3647041.31 | 2.627 | cl |
| 1133 | 354320.80 | 3647158.06 | 2.25 | 812 |
| 2217 | 354368.36 | 3647076.14 | 2.804 | cl |
| 2216 | 354369.53 | 3647057.01 | 2.785 | cl |
| 2214 | 354386.47 | 3647022.89 | 2.974 | cl |
| 1128 | 350270.15 | 3655746.16 | 3.159 | 2 |
| 1343 | 349553.77 | 3642771.69 | 3.695 | rr spike |
| 2173 | 349543.68 | 3642751.88 | 1.846 | tow |
| 1127 | 349508.10 | 3642771.05 | 3.81 | 1342 |

Adjusted Survey Data
Summer 2009 Settlement Plates

| Point No. | Northing | Easting | Elevation |
|------------------|-----------------|----------------|------------------|
| 1880 | 355580.42 | 3652775.38 | 6.506 |
| 1879 | 355602.77 | 3651547.29 | 4.617 |
| 1878 | 355608.17 | 3650528.79 | 4.262 |
| 1877 | 355631.83 | 3649473.43 | 4.34 |
| 1863 | 365107.95 | 3641310.98 | 4.031 |
| 1864 | 364086.33 | 3641609.84 | 5.285 |
| 1865 | 363198.53 | 3642045.39 | 5.815 |
| 1868 | 360617.46 | 3643684.42 | 5.677 |
| 1866 | 362410.91 | 3642637.59 | 5.084 |
| 1867 | 361498.57 | 3643205.61 | 3.692 |
| 1862 | 365536.77 | 3640837.41 | 4.612 |
| 1861 | 365381.67 | 3640011.16 | 5.65 |
| 1860 | 365328.51 | 3638979.69 | 4.456 |
| 1859 | 365254.54 | 3637965.83 | 4.94 |
| 1858 | 365140.96 | 3636951.76 | 3.475 |
| 1857 | 365343.97 | 3636017.51 | 5.619 |
| 1871 | 358203.52 | 3645428.59 | 4.96 |
| 1872 | 357421.26 | 3645745.41 | 5.86 |
| 1869 | 359693.38 | 3644077.05 | 3.086 |
| 1870 | 358814.21 | 3644635.04 | 5.4 |
| 1876 | 354743.75 | 3648617.63 | 5.344 |
| 1873 | 356303.67 | 3645753.46 | 6.273 |
| 1874 | 355021.18 | 3646433.78 | 5.597 |
| 1875 | 354375.16 | 3647435.66 | 5.939 |

Adjusted Survey Data
Average Marsh Elevations

In addition to similar surveys done in the past 2 years, an average marsh elevation survey was tasked for 2009. The additional work consisted of surveying 6 designated locations, in 100 by 100 ft grids with 20 equally spaced points throughout the grid. The average elevations for each grid can be found below in Table 1:

Table 1 2009 Average Marsh Elevations

| Location | 1 | 2 | 3 | 4 | 5 | 6 |
|----------------|------|------|------|------|------|------|
| Average Height | 1.86 | 1.01 | 1.04 | 1.63 | 1.45 | 0.58 |

Adjusted Survey Data
Average Marsh Elevations

| Areas | 1 | 4 | 2 | 5 | 3 | 6 |
|-------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Grid Points | EC-15, EC-14, EC-22, EC_23 | EC-60, EC-59, IC-21, IC-22 | EC-76, EC-75, IC-65, EC-79 | EC-54, EC-53, IC-74, IC-75 | IC-14, IC-13, IC-27, IC-28 | EC-28, EC-29, EC-37, EC-36 |
| Elevation | 1.71 | 0.83 | 1.04 | 1.5 | 1.34 | 1.08 |
| | 1.61 | 0.87 | 1.05 | 1.48 | 1.31 | 1.74 |
| | 1.87 | 1.3 | 1.22 | 2.03 | 1.36 | 1 |
| | 1.46 | 1.42 | 0.91 | 2.12 | 1.65 | 0.94 |
| | 1.71 | 1.56 | 0.7 | 0.36 | 1.36 | 0.54 |
| | 1.59 | 0.95 | 1.12 | 1.91 | 1.28 | 1.77 |
| | 1.66 | 0.92 | 1.17 | 2.12 | 1.37 | 1.65 |
| | 1.78 | 0.66 | 0.84 | 1.88 | 1.47 | 1.28 |
| | 1.79 | 1.18 | 1.14 | 2.03 | 1.44 | 0.12 |
| | 2.11 | 1.18 | 1.13 | 1.44 | 1.79 | 0.88 |
| | 1.84 | 0.69 | 1 | 1.75 | 1.72 | -0.18 |
| | 1.64 | 0.58 | 0.88 | 1.33 | 1.67 | 1.69 |
| | 1.9 | 0.62 | 1.15 | 1.44 | 1.54 | 1.47 |
| | 2.25 | 1.85 | 1.12 | 1.92 | 1.51 | 1.23 |
| | 2.35 | 1.95 | 0.97 | 1.33 | 1.35 | -0.7 |
| | 2.14 | 1.11 | 1.09 | 1.5 | 1.28 | -1.92 |
| | 2.03 | 0.54 | 1.14 | 1.96 | 1.31 | -1.5 |
| | 1.73 | 0.7 | 1.09 | 1.7 | 1.32 | -1.52 |
| | 2.29 | 0.63 | 1.13 | 1.35 | 1.4 | 0.89 |
| | 1.77 | 0.63 | 0.96 | 1.43 | 1.54 | 1.12 |
| Average | 1.86 | 1.01 | 1.04 | 1.63 | 1.45 | 0.58 |

SECTION 4

FIELD NOTES

All field survey information documented in field book #248, recorded is attached.

π@⁽¹⁰²⁾ Smo2 350270.172 3655746.175 3.38

✓rrspike¹³⁴³ 349553.767 36412771.694 3.89

✓⁽¹³⁴⁴⁾ Smo1 363981.394 3638772.871 3.03

πrrspike⁽¹³⁴³⁾ 349553.767 36412771.694 3.89

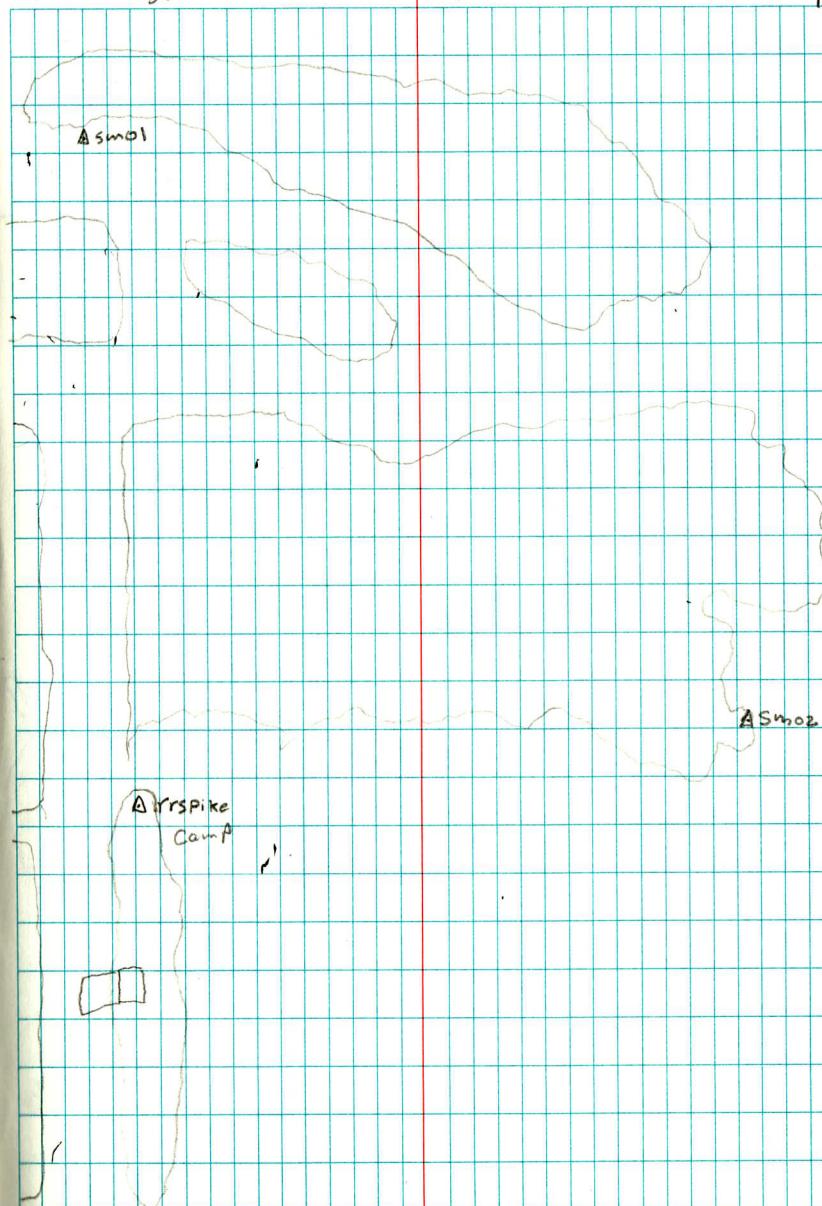
✓⁽¹³⁴⁷⁾ Smo2 350270.244 3655746.186 3.36

✓⁽¹³⁴⁸⁾ Smo1 363981.414 3638772.827 2.99

Set up on Smo2 @ took chksht
on Rrspike @ camp, chksht Smo2
moved to campsite pt took shots on
Smo1 + Smo2 using new campsite Elevation
3.89

TPeterson
PBelanger
Book# 248
136477
7-2009

(47)



Little Lake

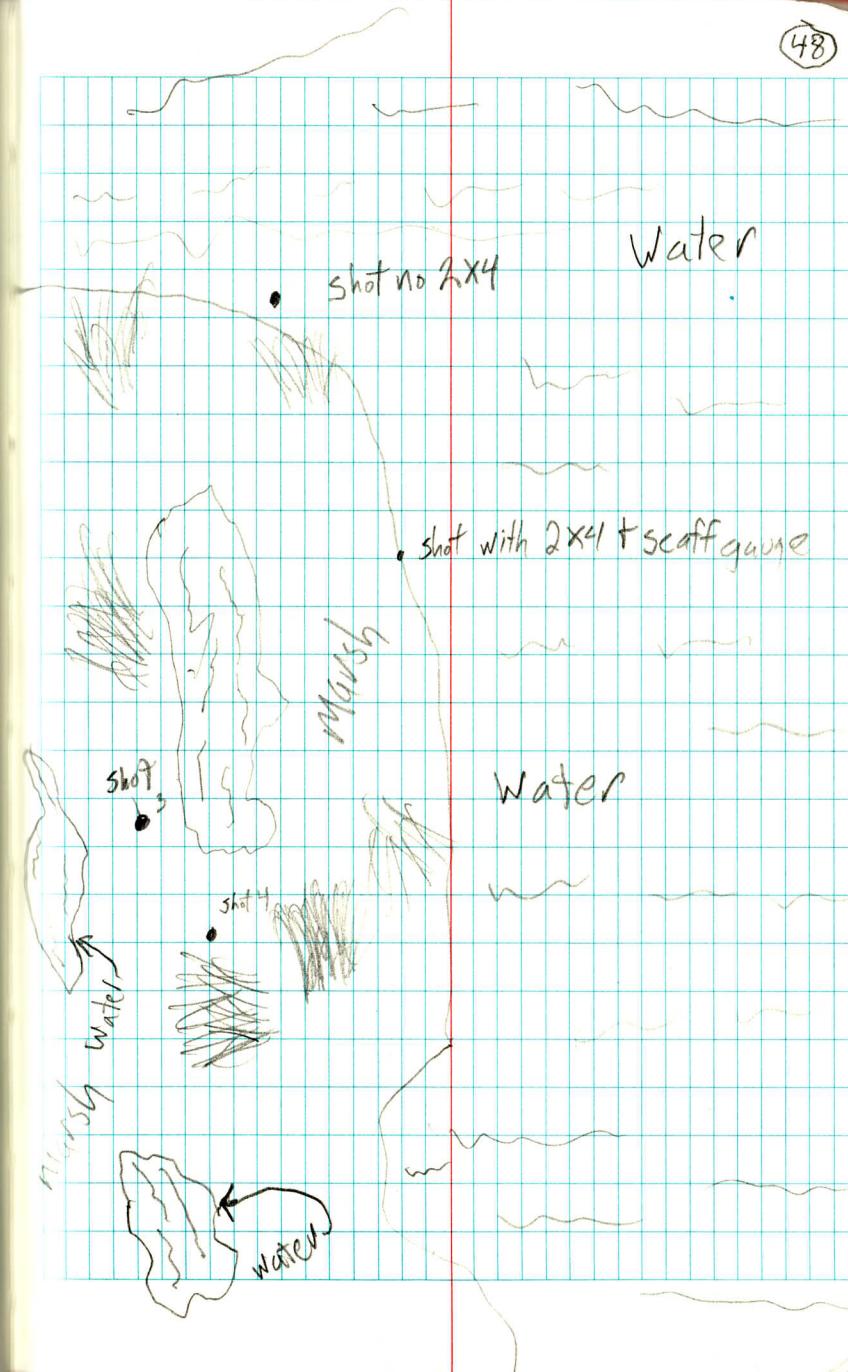
7-20-09

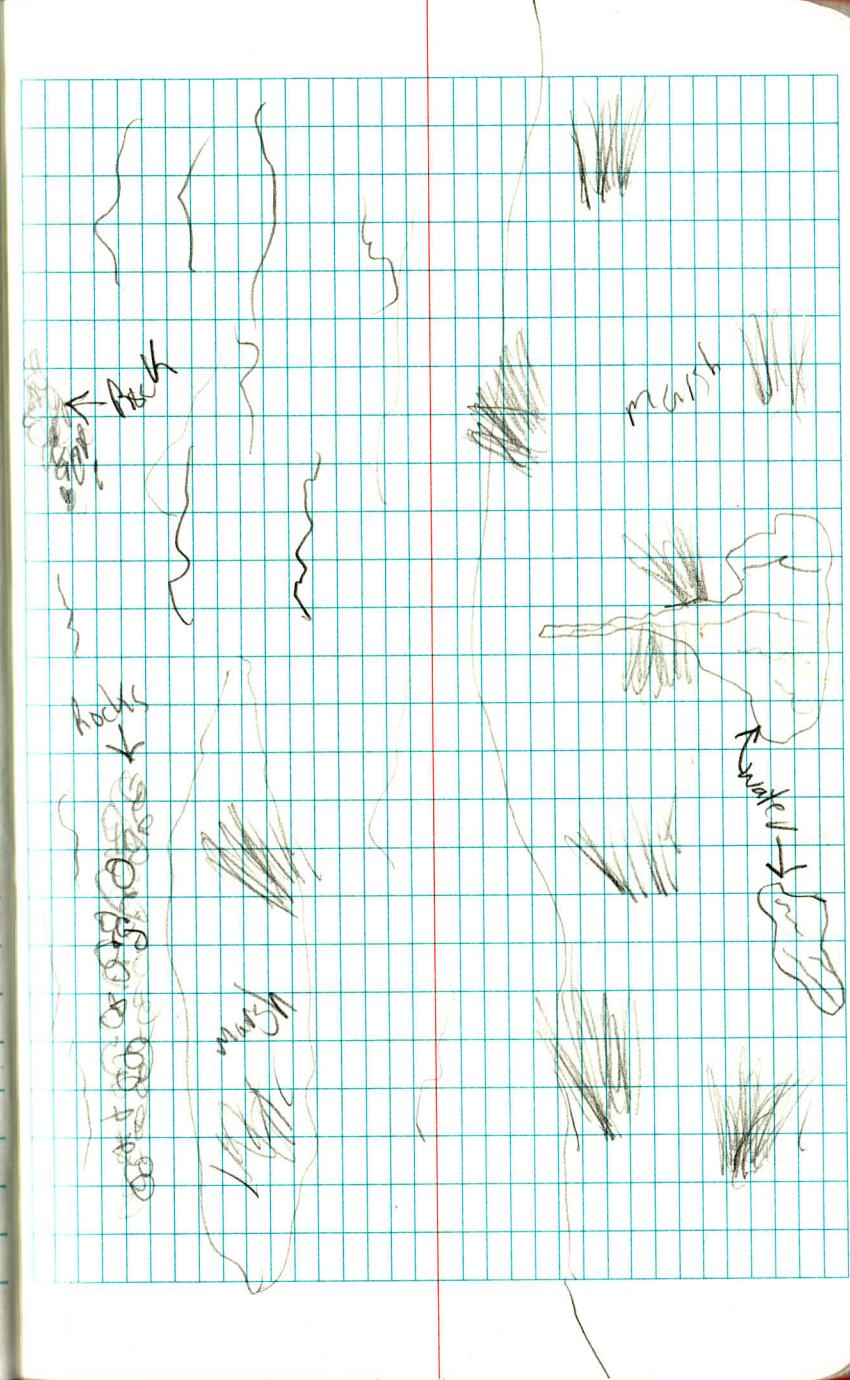
Airboat

Randy
Matt
Kent

TOW .9 nine tenths 8:00 AM

TOW 1.12 11:10 AM





Kent
Randy

Carolina Skiff
LITTLE LAKE

TOW = 1.46 10:30 AM

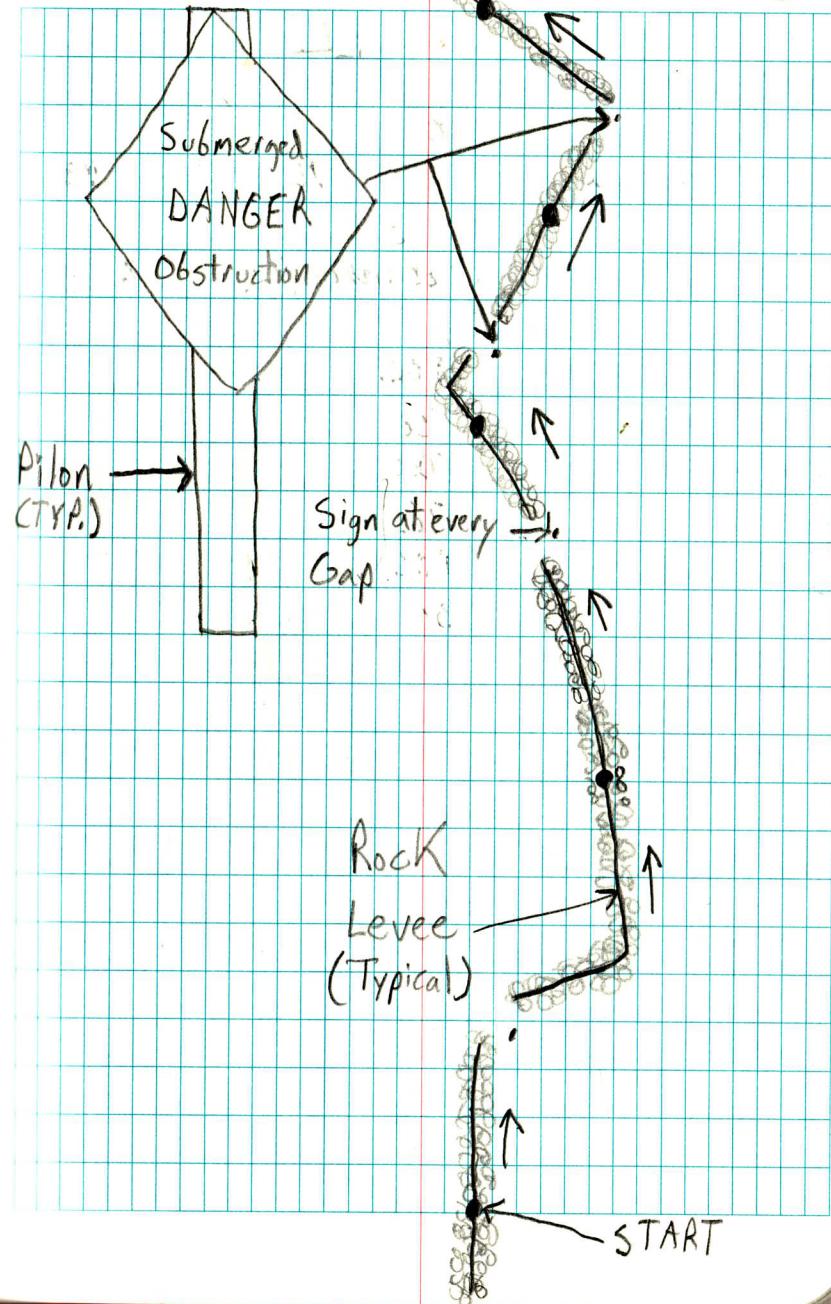
N E Elev.

- (1857) 365283.793, 3635862.033 5.819
(Top of Sediment Cap (TYP.)
- (1858) 365090.055, 3636798.252 3.675
TOC
- (1859) 365213.672, 3637811.148 5.140
TOC
- (1860) 365297.944, 3638823.993 4.656
TOC
- (1861) 365361.329, 3639854.887 5.850

7-22-09

Little Lake

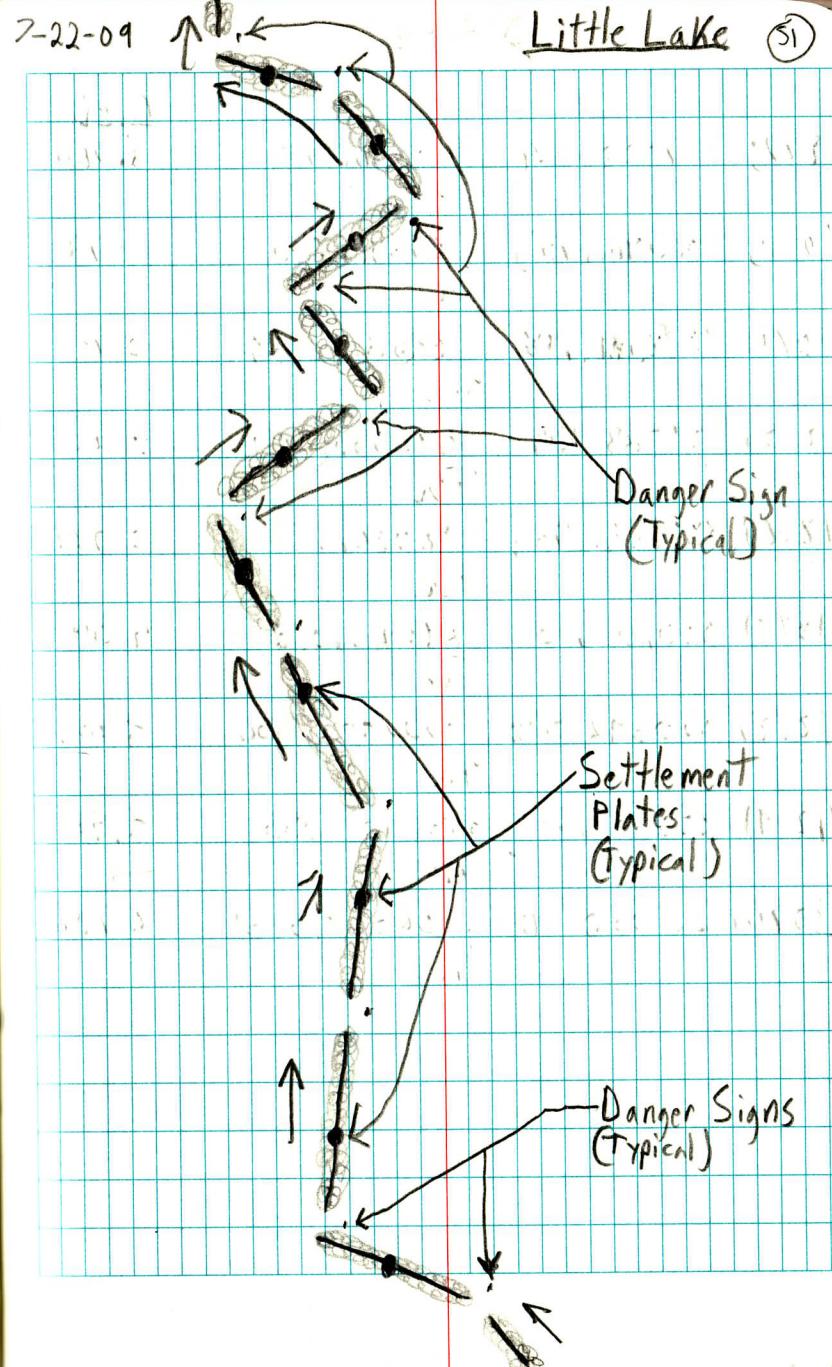
50



7-22-09

| | N | E | Elev. |
|--------|-------------------|---------------|-------|
| (1862) | 365524.609 | , 3640679.562 | 4.812 |
| | TOC | | |
| (1863) | 365100.498 | , 3641157.358 | 4.231 |
| | TOC | | |
| (1864) | 364081.888 | , 3641466.324 | 5.485 |
| | TOC | | |
| (1865) | 363198.456 | , 3641910.655 | 6.015 |
| | TOC | | |
| (1866) | 362416.743 | , 3642510.633 | 5.284 |
| | TOC | | |
| (1867) | 361510.068 | , 3643087.658 | 3.892 |
| | TOC | | |
| (1868) | 360633.754 | , 3643575.184 | 5.877 |
| | TOC | | |
| (1869) | 359713.611 | , 3643976.945 | 3.286 |
| | TOC | | |
| (1870) | 358840.011 | , 3644543.625 | 5.600 |
| | TOC | | |
| (1871) | 358237.209 | , 3645343.187 | 5.160 |
| | Top of Cap (Typ.) | | |

7-22-09

Little Lake

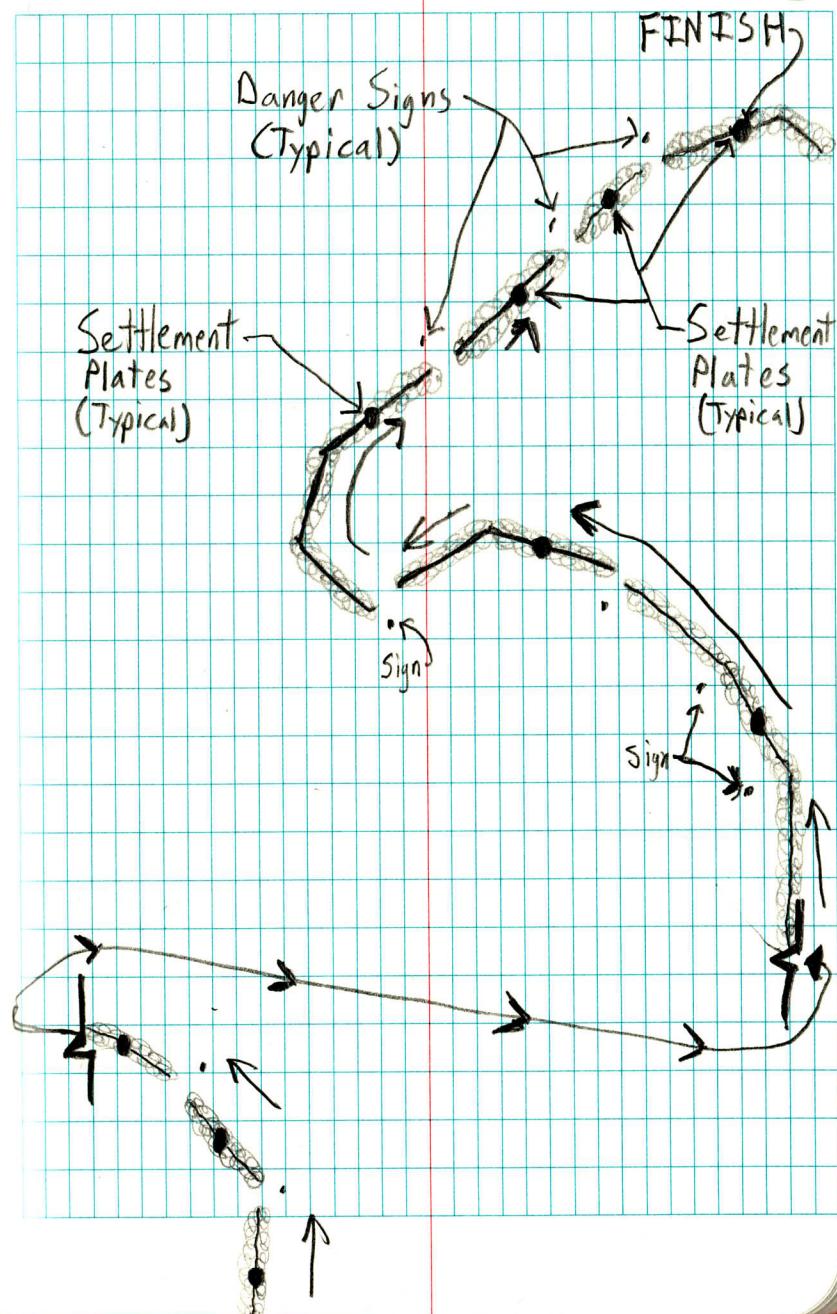
(51)

7-22-09

| | <u>N</u> | <u>E</u> | Elev |
|--------|------------|---------------|-------|
| (1872) | 357458.129 | , 3645667.741 | 6.060 |
| | TOC | | |
| (1873) | 356340.675 | , 3645686.868 | 6.473 |
| | TOC | | |
| (1874) | 355064.986 | , 3646379.864 | 5.797 |
| | TOC | | |
| (1875) | 354428.934 | , 3647388.091 | 6.139 |
| | TOC | | |
| (1876) | 354809.216 | , 3648566.357 | 5.544 |
| | TOC | | |
| (1877) | 355705.731 | , 3649413.305 | 4.540 |
| | TOC | | |
| (1878) | 355692.528 | , 3650468.850 | 4.462 |
| | TOC | | |
| (1879) | 355697.226 | , 3651487.353 | 4.917 |
| | TOC | | |
| (1880) | 355687.045 | , 3652715.611 | 6.706 |
| | TOC | | |

7-22-09

(52)



7-23-09

LITTLE LAKE

Kent

MATT

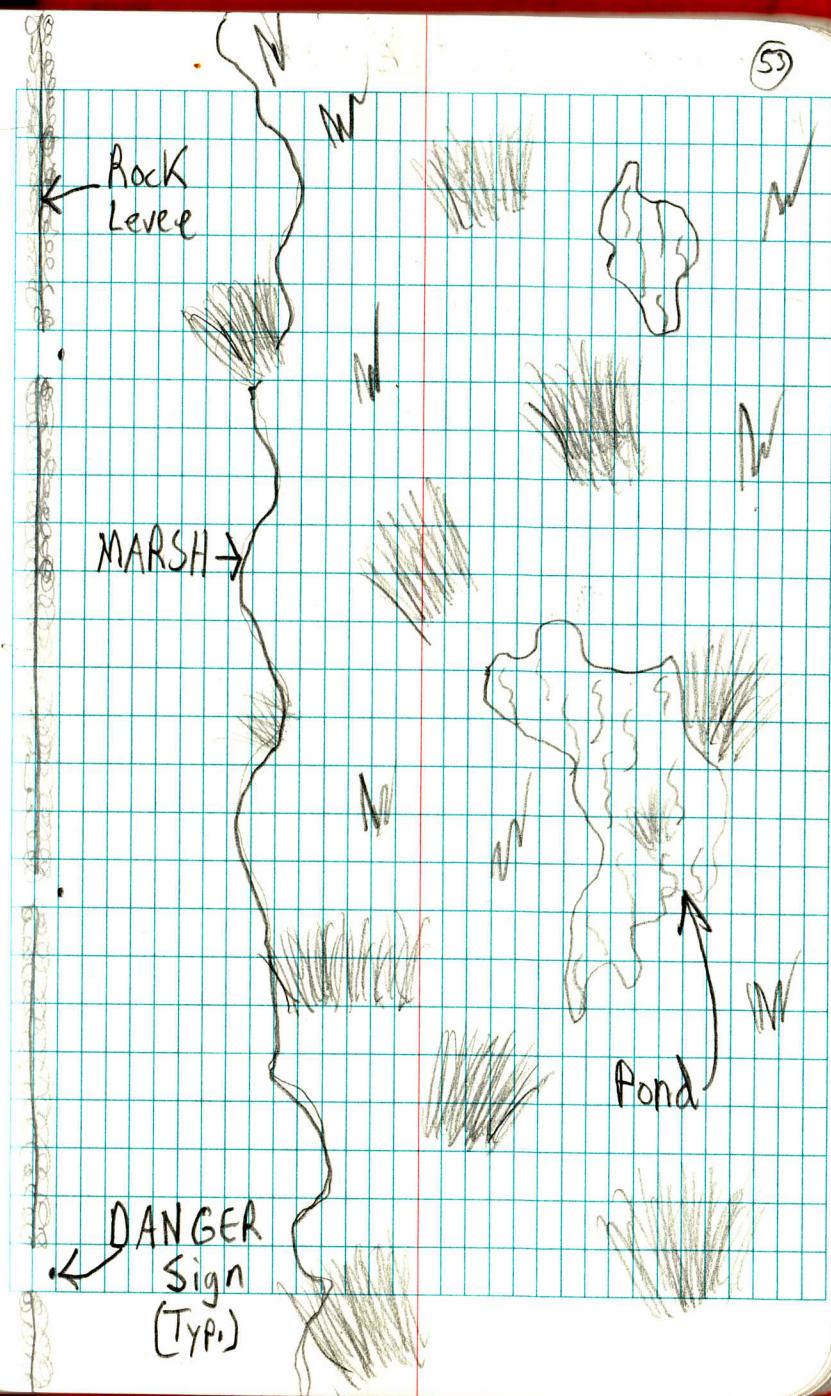
Randy

Airboat

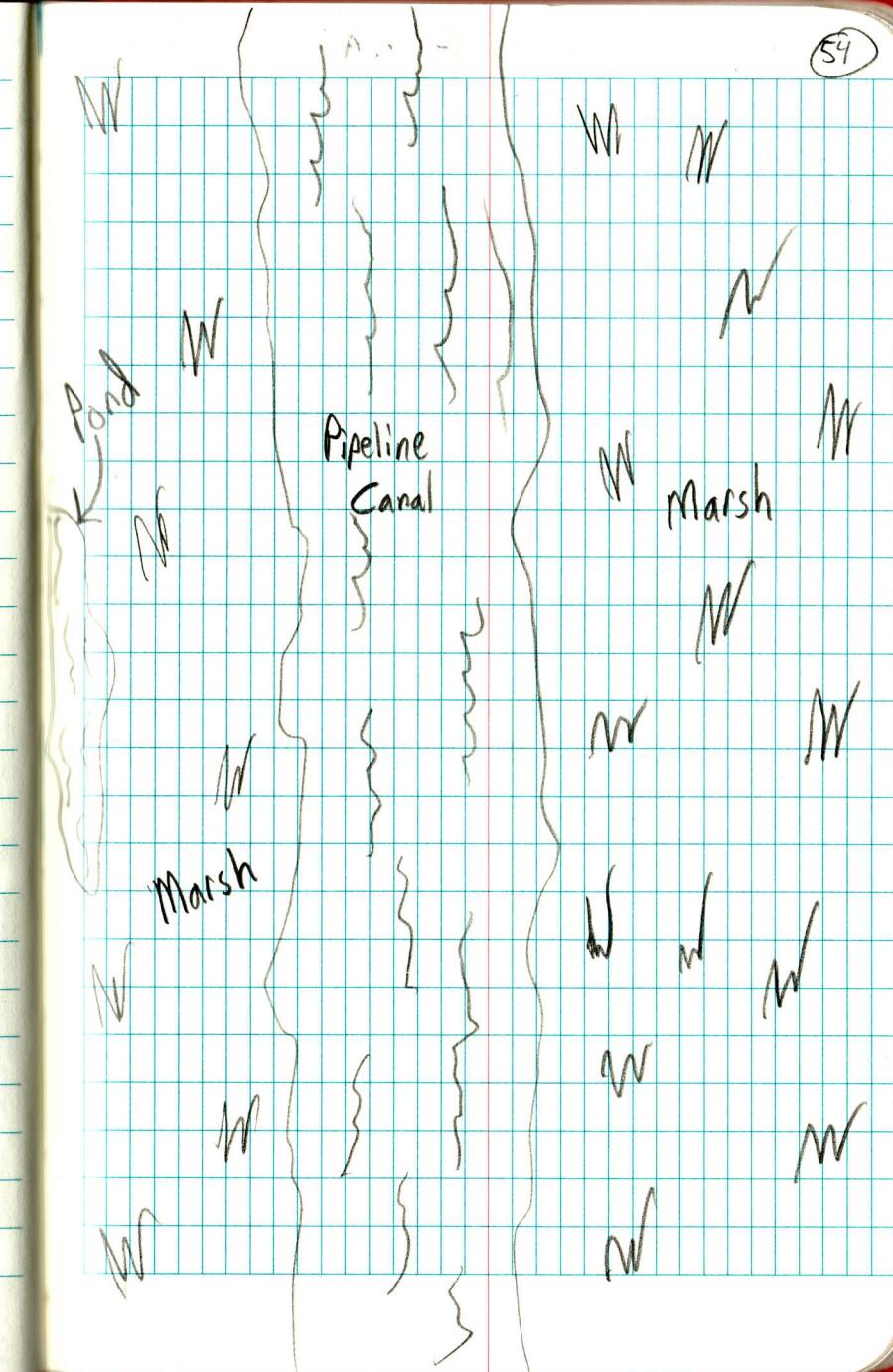
TOW = .9 7:50 AM

TOW = 1.3 1:51 PM

| | N | E | Slew |
|--------|------------|---------------|-------|
| (1881) | 349508.149 | , 3642770.917 | 4.023 |
| | NG | | |
| (1882) | 350270.15 | , 3655746.225 | 3.407 |
| | NG | | |
| (1883) | 363981.371 | , 3638772.817 | 3.103 |
| | NG | | |
| (1884) | 355405.924 | , 3645122.709 | 2.392 |
| | NG | | |
| (1885) | 355465.473 | , 3644822.595 | 2.4) |
| | NG | | |



7-23-09



7-24-09

LITTLE LAKE

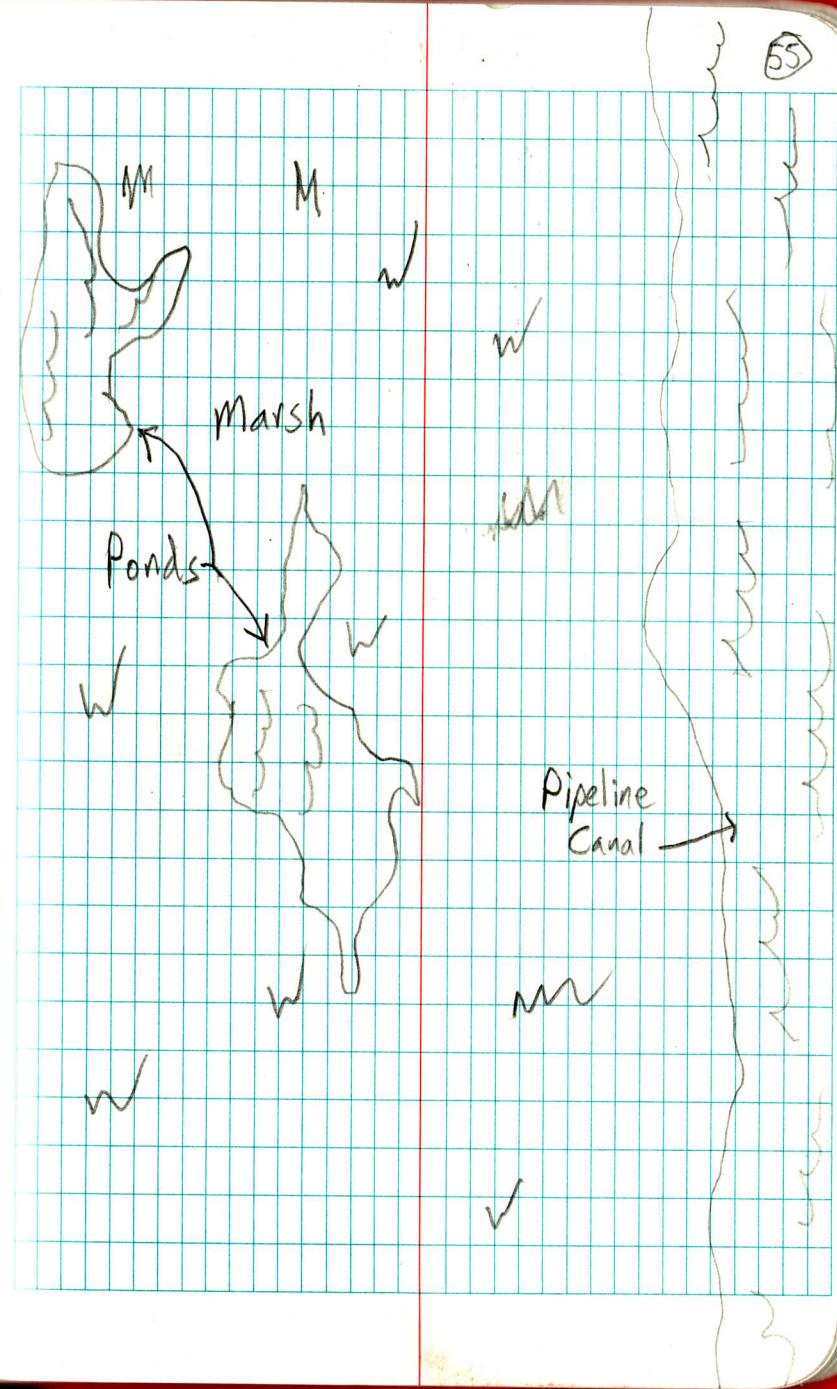
Kent
Randy
Matt

Airboat

TOW = .88 8:05 AM

TOW = 1.16 2:30 PM

55



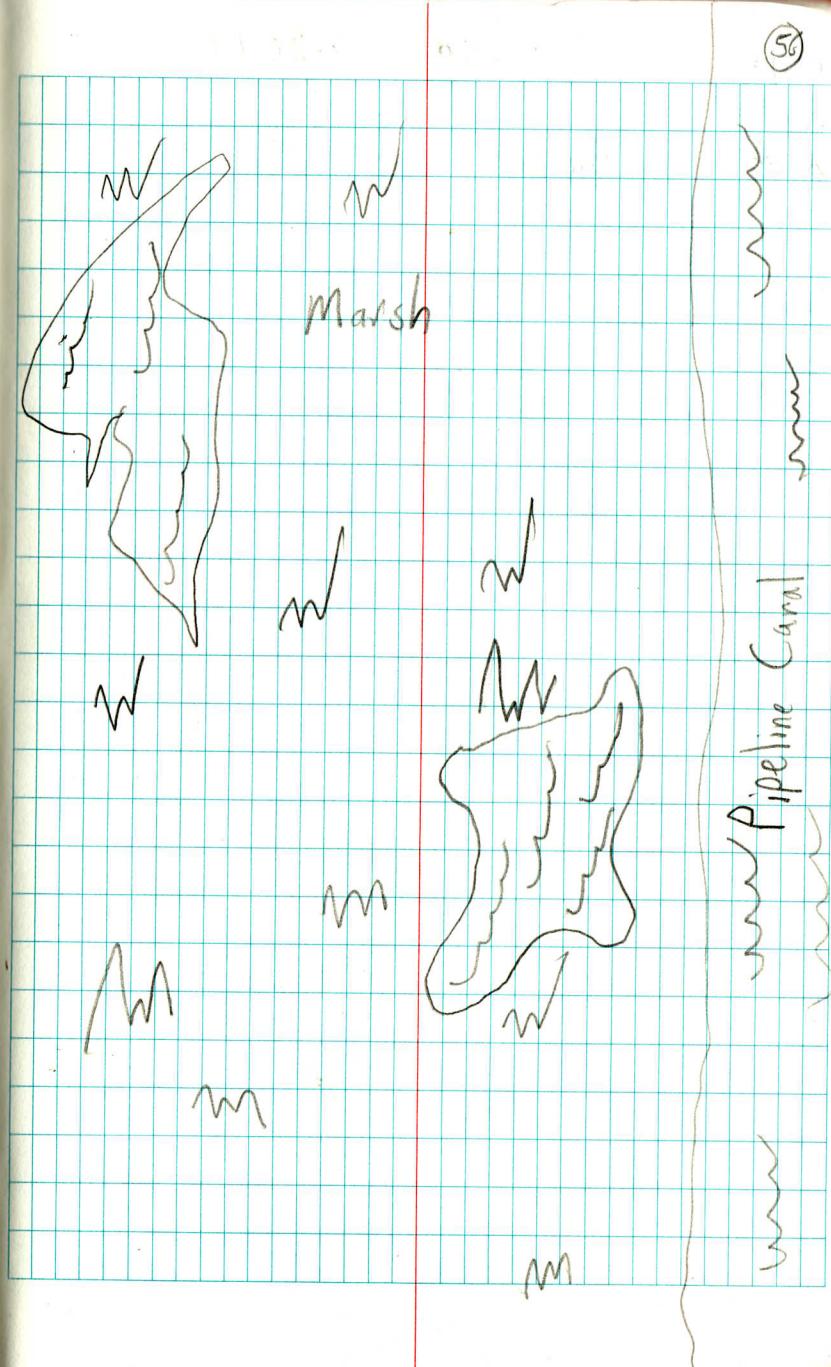
Matt

7-27-09 Little Lake

Randy
Kent

Airboat

TOW = 1.01 12:30 PM

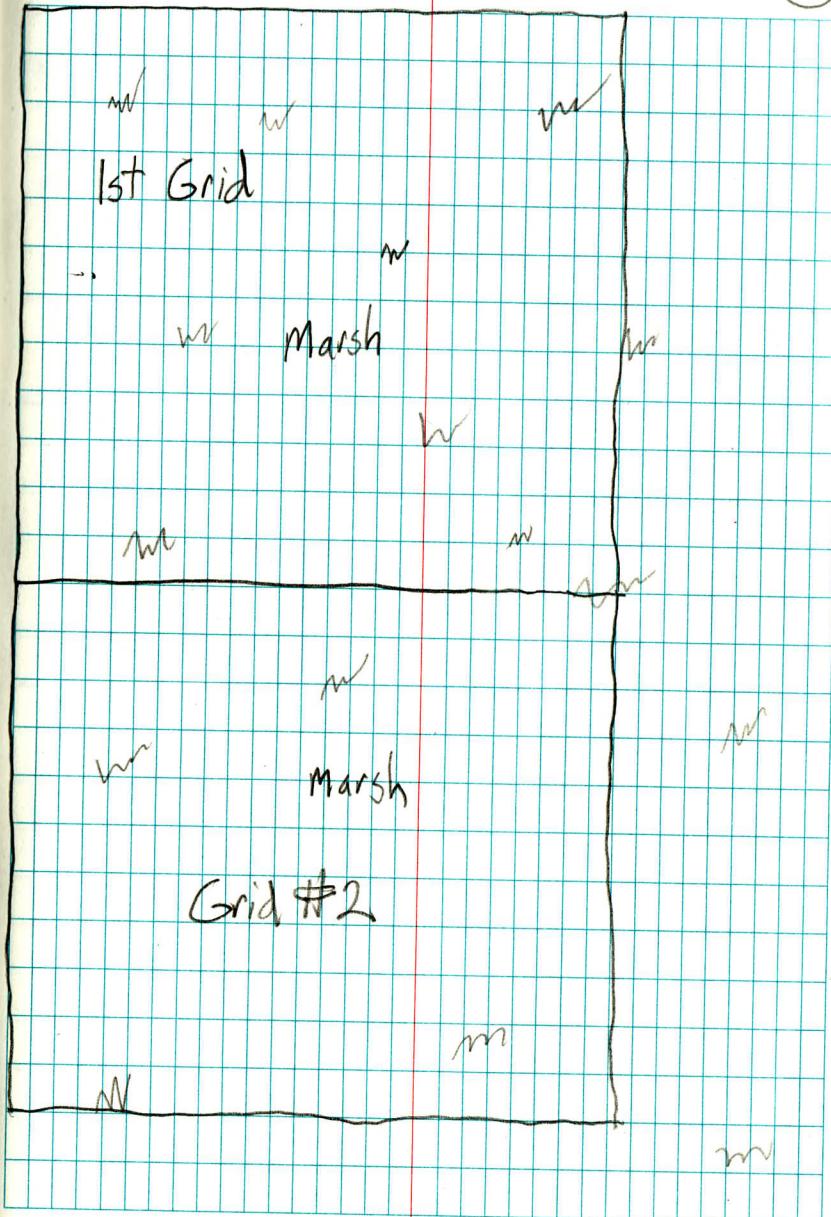


Matt Little Lake 7-28-09
Randy
Kent Airboat

TOW = 1.25 9:30 AM

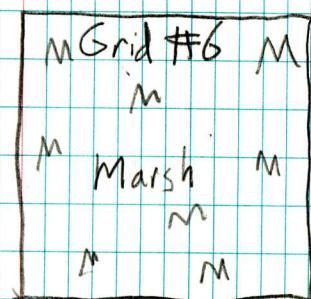
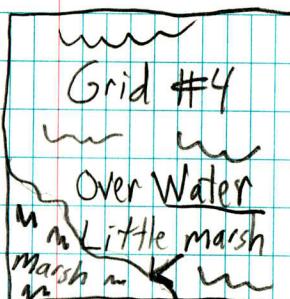
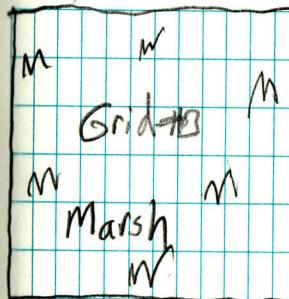
TOW = 1.08 3:15 AM

(57)



7-28-09

(58)



Litt Lake opus RR Spike @
Receiver Files For opus (59)

| Date | File # | P# | Disc. |
|---------|-----------|--------|----------|
| 7/22/09 | 18362030✓ | (1343) | rr spike |
| 7/23/09 | 18362040✓ | (1343) | rr spike |
| 7/24/09 | 18362051✓ | (1343) | rr spike |
| 7/27/09 | 18362080✓ | (1343) | rr spike |
| 7/28/09 | 18362090 | (1343) | rr spike |

Little Lake

7-23-09

All Natural Ground Shots Continued

| | | | |
|--------|------------|---------------|--------|
| (1914) | 354917.847 | , 3650140.668 | 2.199 |
| (1915) | 354917.63 | , 3649640.642 | 1.6 |
| (1916) | 354414.713 | , 3649154.691 | 1.452 |
| (1917) | 354416.368 | , 3649655.742 | 0.318 |
| (1918) | 354418.87 | , 3650156.232 | -1.072 |
| (1919) | 354525.697 | , 3650649.539 | -1.313 |
| (1920) | 354750.364 | , 3651144.526 | -0.172 |
| (1921) | 354752.237 | , 3651646.184 | 1.264 |
| (1922) | 354793.768 | , 3652146.673 | 0.987 |
| (1923) | 354411.465 | , 3648650.197 | -1.484 |
| (1924) | 354384.899 | , 3648152.663 | -2.02 |
| (1925) | 354408.587 | , 3646654.005 | -0.598 |
| (1926) | 354407.779 | , 3646155.337 | 1.839 |
| (1927) | 354403.245 | , 3645652.31 | 1.986 |
| (1928) | 354405.797 | , 3645151.61 | -0.027 |
| (1929) | 354405.151 | , 3644655.503 | 2.055 |
| (1930) | 354406.277 | , 3644154.512 | -0.29 |
| (1931) | 354403.398 | , 3643654.864 | 1.115 |
| (1932) | 354403.454 | , 3643154.361 | 1.426 |
| (1933) | 354403.524 | , 3642659.009 | 2.054 |
| (1934) | 353902.648 | , 3642688.336 | 1.368 |
| (1935) | 353901.682 | , 3643169.333 | 1.038 |
| (1936) | 353904.129 | , 3643669.814 | 1.627 |
| (1937) | 353902.329 | , 3644179.139 | 1.887 |
| (1938) | 353905.545 | , 3644667.727 | 1.282 |

| | | | |
|--------|------------|---------------|-------|
| (1939) | 353907.362 | , 3645169.659 | 1.81 |
| (1940) | 353915.031 | , 3645669.965 | 1.883 |
| (1941) | 353908.62 | , 3646167.911 | 1.962 |
| (1942) | 353909.667 | , 3646668.053 | 2.204 |
| (1943) | 353911.672 | , 3647167.225 | 0.437 |
| (1944) | 353910.788 | , 3647672.979 | 1.451 |
| (1945) | 353913.247 | , 3648171.556 | 1.997 |
| (1946) | 353913.708 | , 3648668.571 | 1.069 |
| (1947) | 353916.216 | , 3649171.224 | 1.837 |
| (1948) | 353918.435 | , 3649672.019 | 0.766 |
| (1949) | 353917.775 | , 3649844.732 | 1.447 |
| (1950) | 353416.617 | , 3649686.4 | -1.38 |
| (1951) | 353415.569 | , 3649186.435 | 1.427 |
| (1952) | 353415.717 | , 3648684.398 | 0.988 |
| (1953) | 353414.084 | , 3648184.206 | 2.063 |
| (1954) | 353412.992 | , 3647686.509 | 1.874 |
| (1955) | 353412.407 | , 3647185.829 | 1.797 |
| (1956) | 353411.032 | , 3646688.292 | 1.944 |
| (1957) | 353408.242 | , 3646186.49 | 1.064 |
| (1958) | 353407.099 | , 3645685.241 | 2.038 |
| (1959) | 353406.661 | , 3645186.175 | 1.027 |
| (1960) | 353405.574 | , 3644685.205 | 0.833 |
| (1961) | 353404.169 | , 3644185.816 | 1.571 |
| (1962) | 353403.424 | , 3643683.001 | 2.205 |
| (1963) | 353403.811 | , 3643183.833 | 1.031 |
| (1964) | 353401.186 | , 3642689.017 | 2.196 |
| (1965) | 349508.153 | , 3642771.039 | 4.037 |

| | Little Lake | 7-24-09 | All Natural Ground control | (2012) | 351912.506 | 3647731.819 | 1.778 |
|--------|-------------|-------------|----------------------------|--------|------------|-------------|--------|
| (1984) | 352917.703 | 3649931.576 | -0.868 | (2013) | 351914.633 | 3648232.771 | 2.077 |
| (1985) | 352418.368 | 3649717.102 | 1.437 | (2014) | 351915.042 | 3648734.18 | 1.937 |
| (1986) | 352417.548 | 3649223.486 | 2.14 | (2015) | 351916.793 | 3649236.11 | 1.808 |
| (1987) | 352405.353 | 3648718.521 | 1.717 | (2016) | 351920.046 | 3649735.167 | 1.452 |
| (1988) | 352414.711 | 3648217.563 | 1.848 | (2017) | 351922.001 | 3650235.231 | 1.128 |
| (1989) | 352413.501 | 3647717.202 | 0.803 | (2018) | 352422.079 | 3650217.373 | ~5.016 |
| (1990) | 352412.093 | 3647219.458 | 1.858 | (2019) | 351419.239 | 3650249.949 | 1.24 |
| (1991) | 352411.858 | 3646717.321 | 1.172 | (2020) | 351420.11 | 3650750.476 | 1.161 |
| (1992) | 352411.116 | 3646217.2 | 2.179 | (2021) | 351345.193 | 3650753.12 | -2.66 |
| (1993) | 352407.169 | 3645717.573 | 1.478 | (2022) | 351175.1 | 3650257.69 | 2.556 |
| (1994) | 352408.083 | 3645216.961 | 2.727 | (2023) | 351419.006 | 3649740.556 | 1.244 |
| (1995) | 352407.231 | 3644716.001 | 1.706 | (2024) | 351420.959 | 3649255.74 | 1.594 |
| (1996) | 352405.699 | 3644217.032 | 1.568 | (2025) | 351414.83 | 3648765.486 | 0.541 |
| (1997) | 352404.276 | 3643715.913 | 1.952 | (2026) | 351416.24 | 3648250.195 | 2.069 |
| (1998) | 352403.426 | 3643215.483 | 1.295 | (2027) | 351414.003 | 3647750.52 | 1.422 |
| (1999) | 352401.022 | 3642721.119 | 1.975 | (2028) | 351413.255 | 3647250.66 | 6.769 |
| (2000) | 351961.265 | 3642737.356 | 1.757 | (2029) | 351413.212 | 3646750.662 | 1.892 |
| (2003) | 351901.952 | 3643232.18 | 1.053 | (2030) | 351468.278 | 3646252.705 | 0.722 |
| (2004) | 351904.5 | 3643732.752 | 1.658 | (2031) | 351409.996 | 3645750.688 | 2.557 |
| (2005) | 351964.94 | 3644232.263 | 1.462 | (2032) | 351408.934 | 3645250.828 | 2.173 |
| (2006) | 351905.322 | 3644733.521 | 1.682 | (2033) | 351406.338 | 3644749.461 | 0.931 |
| (2007) | 351905.651 | 3645234.56 | 1.046 | (2034) | 351404.681 | 3644249.836 | 1.287 |
| (2008) | 351908.362 | 3645733.241 | 1.118 | (2035) | 351464.567 | 3643746.476 | 1.217 |
| (2009) | 351909.423 | 3646233.355 | 1.828 | (2036) | 351402.608 | 3643247.149 | 1.142 |
| (2010) | 351911.349 | 3646733.02 | 1.412 | (2037) | 351401.58 | 3642753.603 | 1.355 |
| (2011) | 351910.854 | 3647232.691 | 2.789 | (2038) | 350668.187 | 3642820.844 | 1.807 |

Little Lake

7-24-09

Natural Ground

(1377)

350917.736, 3649967.659

NG ↓ 1.673

| | | | | | | | | |
|--------|------------|-------------|--------|-------|------------|-------------|-----|-------|
| (2039) | 350406.94 | 3642806.761 | 1.7 | (378) | 350917.131 | 3649766.15 | ↓ | 1.267 |
| (2040) | 350901.577 | 3642778.608 | 1.938 | (379) | 350908.162 | 3649765.162 | 2x4 | 1.249 |
| (2041) | 350114.843 | 3643295.109 | -1.919 | (380) | 350917.734 | 3649266.714 | NG | 1.463 |
| (2042) | 350145.27 | 3643789.123 | 0.482 | (381) | 350913.614 | 3648766.522 | ↓ | 1.184 |
| (2043) | 350179.702 | 3644286.614 | 3.309 | (382) | 350914.468 | 3648264.761 | ↓ | 1.428 |
| (2044) | 350217.923 | 3644785.073 | 2.377 | (383) | 350913.114 | 3647765.327 | ↓ | 2.913 |
| (2045) | 349508.102 | 3642771.004 | 4.077 | (384) | 350903.138 | 3647264.903 | ↓ | 2.328 |
| | N | E | Elev. | (385) | 350910.723 | 3646764.371 | ↓ | 1.598 |

Little Lake

7-27-09

| | | | | | | | | | |
|--------|------------|-------------|-----|-------|-------|------------|-------------|----|-------|
| (1360) | 349545.133 | 3642751.759 | TOW | 1.014 | (386) | 350900.393 | 3646264.41 | ↓ | 2.39 |
| (1361) | 350270.248 | 3655746.084 | NG | 3.307 | (387) | 350907.78 | 3645784.243 | ↓ | 2.289 |
| (1362) | 350404.293 | 3643277.929 | ↓ | 0.612 | (388) | 350908.211 | 3645263.179 | ↓ | 2.602 |
| (1363) | 350403.67 | 3643781.158 | ↓ | 0.776 | (389) | 350906.49 | 3644763.656 | ↓ | 1.857 |
| (1364) | 350406.237 | 3644280.065 | ↓ | 0.85 | (390) | 350905.475 | 3644264.247 | ↓ | 0.957 |
| (1365) | 350405.844 | 3644778.673 | ↓ | 1.181 | (391) | 350903.891 | 3643763.653 | ↓ | 0.861 |
| (1366) | 350406.54 | 3645279.381 | ↓ | 1.76 | (392) | 350902.701 | 3643264.122 | NG | 0.831 |
| (1367) | 350408.733 | 3645781.124 | ↓ | 0.489 | | | | | |
| (1368) | 350411.768 | 3646279.755 | ↓ | 0.395 | | | | | |
| (1369) | 350410.076 | 3646779.215 | ↓ | 1.829 | | | | | |
| (1370) | 350409.196 | 3647280.864 | ↓ | 3.272 | | | | | |
| (1371) | 350495.639 | 3647779.41 | ↓ | 1.616 | | | | | |
| (1372) | 350478.81 | 3648278.362 | ↓ | 1.739 | | | | | |
| (1373) | 350502.962 | 3648777.825 | NG | 1.515 | | | | | |
| (1374) | 350522.118 | 3649279.41 | 2x4 | 1.429 | | | | | |
| (1375) | 350487.806 | 3649277.978 | NG | 1.592 | | | | | |
| (1376) | 350555.678 | 3649776.198 | 2x4 | 1.217 | | | | | |

Little Lake

7-28-09

| | | | | |
|-------|------------|-------------|----|-------|
| (393) | 349545.039 | 3642751.961 | ↓ | 1.258 |
| | | TOW | | |
| (395) | 350270.194 | 3655746.116 | NG | 3.316 |
| (396) | 363981.355 | 3638772.871 | ↓ | 3.125 |
| (397) | 355455.964 | 3644572.821 | ↓ | 1.91 |
| (398) | 355430.826 | 3644572.524 | ↓ | 1.806 |
| (399) | 355406.122 | 3644572.653 | ↓ | 2.071 |
| (400) | 355380.971 | 3644572.929 | ↓ | 1.661 |
| (401) | 355355.823 | 3644572.759 | NG | 1.911 |

7-28-09 Little Lake

| | | | |
|--------|------------|---------------|-------|
| (1402) | 355355.845 | , 3644606.28 | 2.307 |
| (1403) | 355380.965 | , 3644606.12 | 1.993 |
| (1404) | 355405.537 | , 3644606.483 | 1.979 |
| (1405) | 355431.071 | , 3644606.155 | 1.865 |
| (1406) | 355455.631 | , 3644606.023 | 1.793 |
| (1407) | 355455.502 | , 3644639.373 | 2.038 |
| (1408) | 355430.84 | , 3644639.521 | 1.84 |
| (1409) | 355405.727 | , 3644639.402 | 2.099 |
| (1410) | 355381.078 | , 3644639.614 | 2.452 |
| (1411) | 355355.719 | , 3644639.748 | 2.552 |
| (1412) | 355355.713 | , 3644672.769 | 1.972 |
| (1413) | 355380.891 | , 3644672.622 | 2.492 |
| (1414) | 355405.791 | , 3644672.802 | 1.929 |
| (1415) | 355430.783 | , 3644672.767 | 2.228 |
| (1416) | 355455.634 | , 3644672.729 | 2.341 |
| (1417) | 354971.223 | , 3650592.306 | 1.278 |
| (1418) | 354945.455 | , 3650592.95 | 1.942 |
| (1419) | 354921.103 | , 3650591.68 | 1.204 |
| (1420) | 354895.093 | , 3650592.232 | 1.136 |
| (1421) | 354869.934 | , 3650590.938 | 0.744 |
| (1422) | 354868.963 | , 3650623.628 | 1.083 |
| (1423) | 354894.373 | , 3650624.033 | 0.318 |
| (1424) | 354919.893 | , 3650624.277 | 1.476 |
| (1425) | 354943.869 | , 3650623.885 | 1.846 |
| (1426) | 354969.783 | , 3650624.224 | 1.973 |
| (1427) | 354969.644 | , 3650657.301 | 0.022 |

All are NB

| | | | |
|--------|------------|---------------|--------|
| (1428) | 354945.207 | , 3650657.602 | 1.886 |
| (1429) | 354920.402 | , 3650657.907 | 1.671 |
| (1430) | 354894.977 | , 3650657.934 | 1.426 |
| (1431) | 354869.616 | , 3650658.416 | -0.499 |
| (1432) | 354869.908 | , 3650690.916 | 1.322 |
| (1433) | 354895.186 | , 3650690.626 | 1.091 |
| (1434) | 354920.262 | , 3650690.951 | -1.32 |
| (1435) | 354945.651 | , 3650690.472 | -1.296 |
| (1436) | 354970.242 | , 3650690.799 | -1.72 |
| (1437) | 353463.019 | , 3647736.718 | 1.477 |
| (1438) | 353438.241 | , 3647736.727 | 1.513 |
| (1439) | 353412.955 | , 3647736.563 | 1.515 |
| (1440) | 353387.828 | , 3647736.668 | 1.596 |
| (1441) | 353362.991 | , 3647736.412 | 1.737 |
| (1442) | 353363.054 | , 3647703.084 | 1.546 |
| (1443) | 353387.879 | , 3647703.33 | 1.71 |
| (1444) | 353413.329 | , 3647703.212 | 1.74 |
| (1445) | 353437.798 | , 3647703.54 | 1.874 |
| (1446) | 353462.991 | , 3647703.521 | 1.924 |
| (1447) | 353463.021 | , 3647670.076 | 1.478 |
| (1448) | 353437.955 | , 3647669.891 | 1.568 |
| (1449) | 353412.932 | , 3647669.881 | 1.668 |
| (1450) | 353387.673 | , 3647670.053 | 1.644 |
| (1451) | 353362.929 | , 3647669.907 | 1.987 |
| (1452) | 353363.038 | , 3647636.359 | 1.563 |
| (1453) | 353383.638 | , 3647636.359 | 1.563 |
| (1454) | 353413.237 | , 3647636.59 | 1.56 |

| | | | | | | | | | |
|--------|------------|---------------|----|-------|--------|------------|---------------|----|-------|
| (1455) | 353437.909 | , 3647636.626 | NG | 1.513 | (1482) | 351354.901 | , 3644297.739 | | 1.157 |
| (1456) | 353462.99 | , 3647636.743 | | 1.542 | (1483) | 351354.832 | , 3644264.276 | NG | 1.172 |
| (1457) | 353456.065 | , 3644734.875 | | 1.31 | (1484) | 351380.174 | , 3644263.942 | | 1.325 |
| (1458) | 353430.594 | , 3644735.823 | | 0.739 | (1485) | 351405.778 | , 3644263.948 | | 1.353 |
| (1459) | 353404.462 | , 3644735.548 | | 0.896 | (1486) | 351430.6 | , 3644264.197 | | 1.075 |
| (1460) | 353381.595 | , 3644735.346 | | 0.826 | (1487) | 351455.195 | , 3644264.621 | | 1.195 |
| (1461) | 353356.487 | , 3644735.927 | | 0.832 | (1488) | 351454.714 | , 3644231.108 | | 1.317 |
| (1462) | 353431.587 | , 3644702.619 | | 0.782 | (1489) | 351430.506 | , 3644231.249 | | 1.371 |
| (1463) | 353486.619 | , 3644701.272 | | 0.819 | (1490) | 351404.559 | , 3644231.352 | | 1.137 |
| (1464) | 353381.053 | , 3644702.502 | | 2.053 | (1491) | 351404.205 | , 3644231.33 | | 1.044 |
| (1465) | 353456.506 | , 3644762.586 | | 0.893 | (1492) | 351379.829 | , 3644231.089 | | 1.345 |
| (1466) | 353455.722 | , 3644668.422 | | 1.15 | (1493) | 351355.232 | , 3644230.247 | | 1.329 |
| (1467) | 353430.844 | , 3644667.529 | | 1.124 | (1494) | 351354.196 | , 3644197.753 | | 0.903 |
| (1468) | 353406.212 | , 3644668.986 | | 0.857 | (1495) | 351379.75 | , 3644198.057 | | 1.113 |
| (1469) | 353381.282 | , 3644668.952 | | 1.377 | (1496) | 351405.414 | , 3644197.417 | | 1.419 |
| (1470) | 353354.297 | , 3644667.929 | | 1.378 | (1497) | 351430.653 | , 3644197.393 | | 1.25 |
| (1471) | 353455.593 | , 3644634.88 | | 1.028 | (1498) | 351454.991 | , 3644197.013 | | 1.239 |
| (1472) | 353430.544 | , 3644634.845 | | 1.071 | (1499) | 351465.597 | , 3649199.965 | | 1.703 |
| (1473) | 353404.716 | , 3644836.684 | | 1.502 | (1500) | 351440.315 | , 3649200.105 | | 1.675 |
| (1474) | 353379.682 | , 3644636.838 | | 1.623 | (1501) | 351415.105 | , 3649199.863 | | 2.234 |
| (1475) | 353355.842 | , 3644836.416 | | 1.757 | (1502) | 351390.571 | , 3649199.695 | | 2.322 |
| (1476) | 353355.331 | , 3644701.831 | | 2.146 | (1503) | 351366.566 | , 3649199.722 | | 0.556 |
| (1477) | 351455.084 | , 3644297.238 | | 1.287 | (1504) | 351365.311 | , 3649232.867 | | 1.644 |
| (1478) | 351430.191 | , 3644298.349 | | 1.34 | (1505) | 351390.192 | , 3649233.416 | | 2.23 |
| (1479) | 351405.146 | , 3644298.255 | | 1.289 | (1506) | 351415.374 | , 3649233.055 | | 2.075 |
| (1480) | 351380.158 | , 3644297.487 | | 1.306 | (1507) | 351440.179 | , 3649233.313 | | 2.324 |
| (1481) | 351380.097 | , 3644297.318 | NG | 1.33 | (1508) | 351465.565 | , 3649233.222 | NG | 2.11 |

| | Little Lake | 7-28-09 | |
|--------|----------------|-------------|--------------|
| | W | E | <u>Elev.</u> |
| (1509) | 351465.754, | 3649266.531 | 1.953 |
| (1510) | 351440.55, | 3649266.384 | 1.528 |
| (1511) | 351415.465, | 3649266.72 | 1.637 |
| (1512) | 351390.327, | 3649266.614 | 2.115 |
| (1513) | 351365.196, | 3649266.343 | 1.531 |
| (1514) | 351365.571, | 3649299.984 | 1.632 |
| (1515) | 351390.303, | 3649299.818 | 1.549 |
| (1516) | 351415.493, | 3649299.697 | 1.901 |
| (1517) | 351440.483, | 3649299.717 | 2.162 |
| (1518) | 351465.213, | 3649299.381 | 1.762 |
| | NG | | |
| (1519) | 351545.424, | 3649375.606 | 2.977 |
| | Cor house boat | | |
| (1520) | 349508.114, | 3642771.037 | 4.024 |
| | NG | | |
| (1521) | 349544.817, | 3642752.127 | 1.085 |
| | Tow | | |

(65)

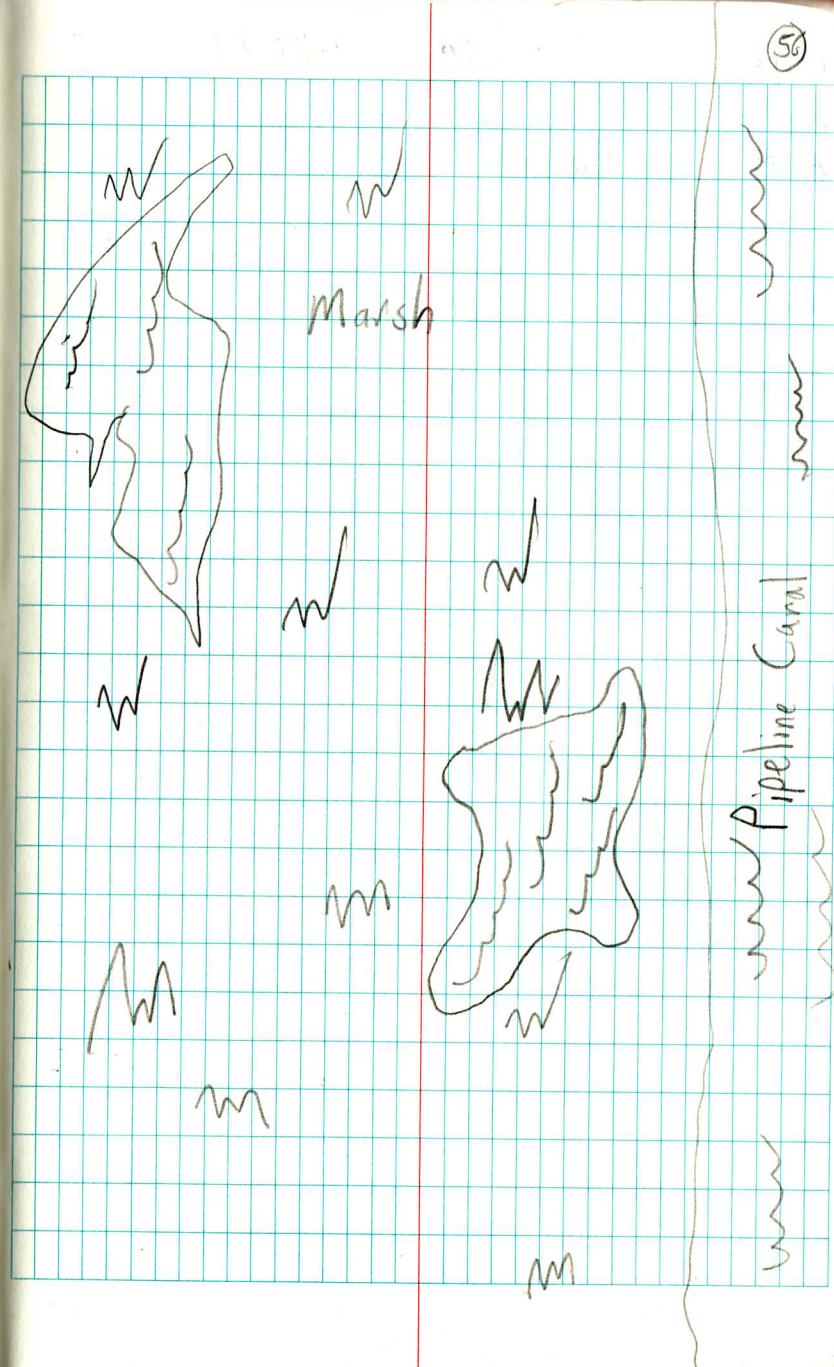
Matt

7-27-09 Little Lake

Randy
Kent

Airboat

TOW = 1.01 12:30 PM

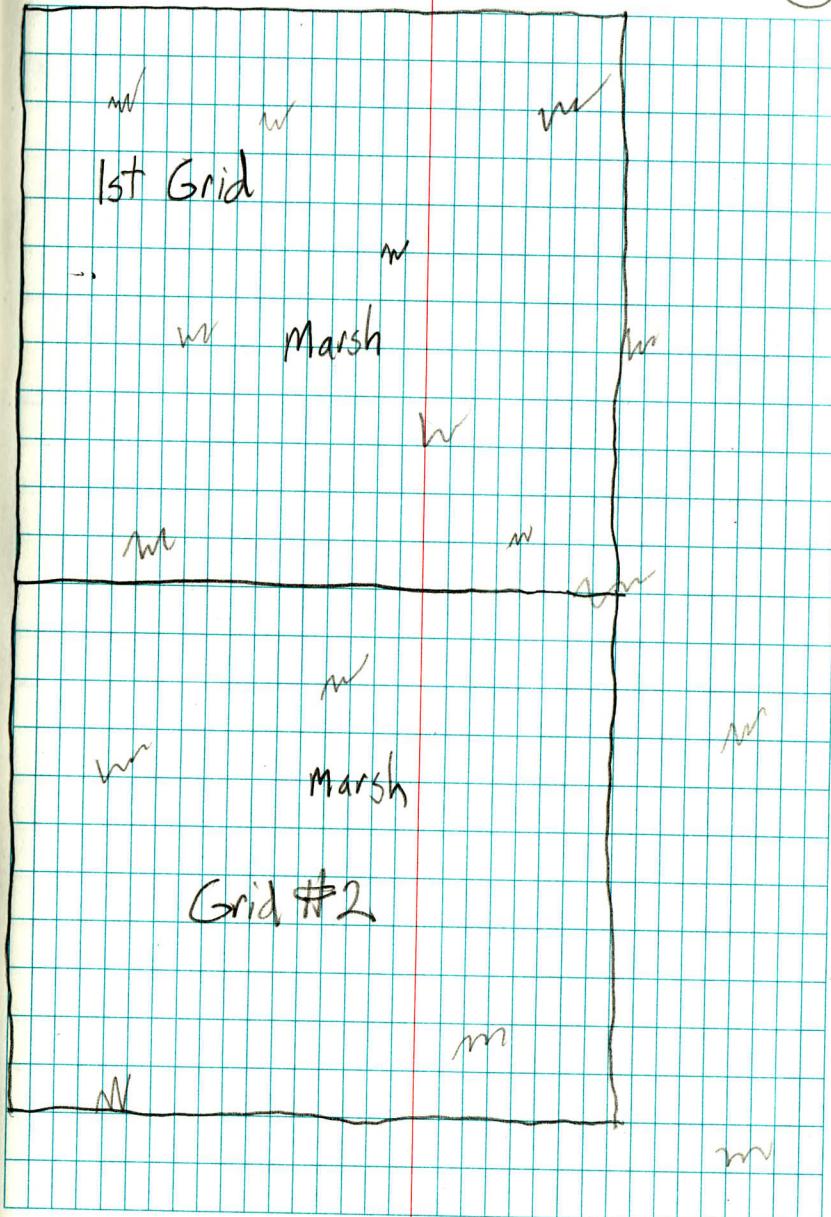


Matt Little Lake 7-28-09
Randy
Kent Airboat

TOW = 1.25 9:30 AM

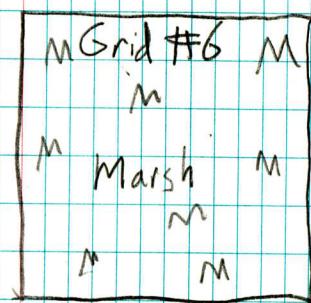
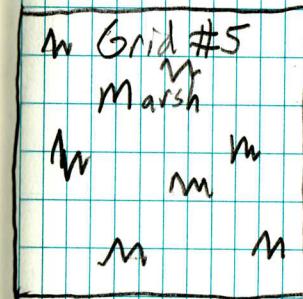
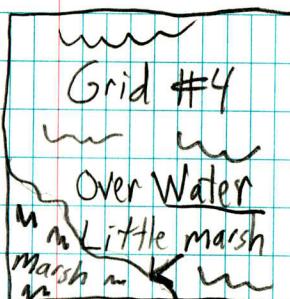
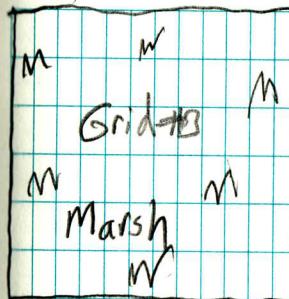
TOW = 1.08 3:15 AM

(57)



7-28-09

(58)



Litt Lake opus RR Spike @
Receiver Files For opus (59)

| Date | File # | P# | Disc. |
|---------|-----------|--------|----------|
| 7/22/09 | 18362030✓ | (1343) | rr spike |
| 7/23/09 | 18362040✓ | (1343) | rr spike |
| 7/24/09 | 18362051✓ | (1343) | rr spike |
| 7/27/09 | 18362080✓ | (1343) | rr spike |
| 7/28/09 | 18362090 | (1343) | rr spike |

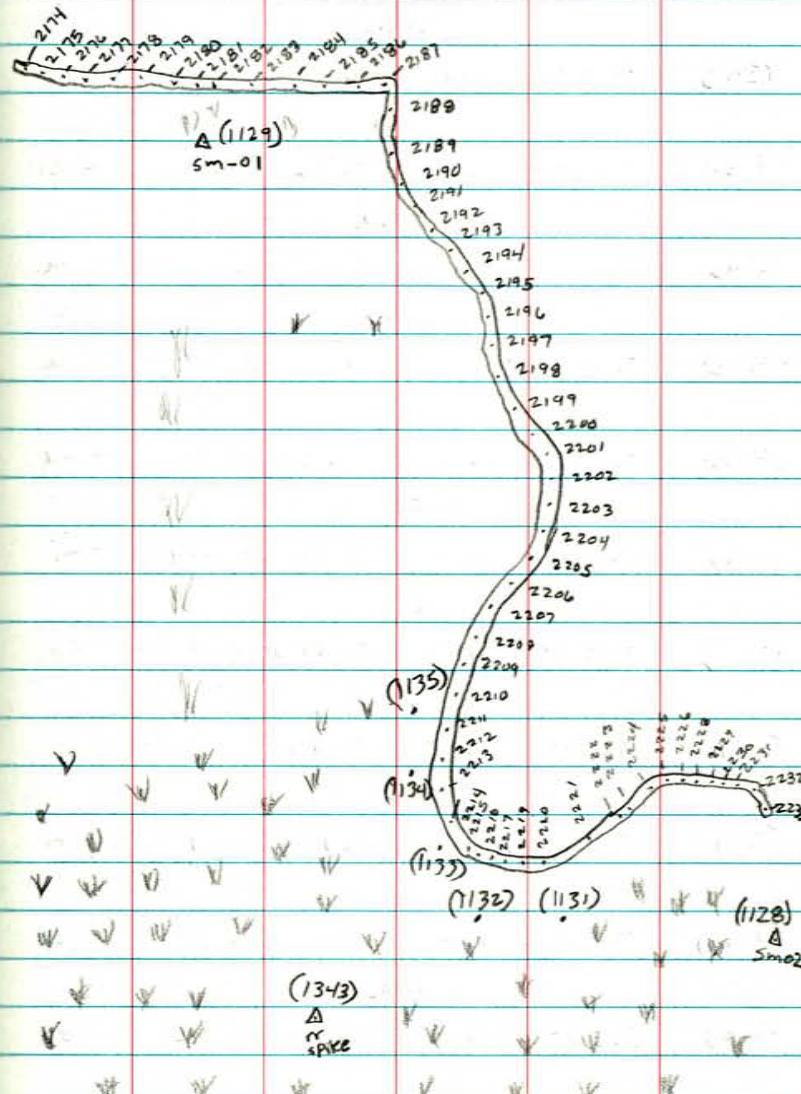
| | | | |
|--------|----------------|-------------|------|
| (1129) | 363981.492 | 3638772.908 | 3.26 |
| | SM-01 | | |
| (1343) | 349553.767 | 3642771.694 | 3.89 |
| | VRSpike | | |
| (121) | 349508.102 | 3642771.048 | 4.01 |
| | BOLT IN Piling | | |
| (128) | 350270.149 | 3655746.162 | 3.36 |
| | SM-02 | | |
| (2174) | 365413.804 | 3635598.611 | 3.32 |
| | E | | |
| (2175) | 365351.866 | 3636018.401 | 5.88 |
| | Pipe | | |
| (2176) | 365292.417 | 3636434.149 | 1.46 |
| | Q | | |
| (2177) | 365142.583 | 3636808.443 | 3.04 |
| | E | | |
| (2178) | 365149.081 | 3636952.601 | 3.78 |
| | Pipe | | |
| (2179) | 365174.707 | 3637436.605 | 3.62 |
| | E | | |
| (2180) | 365262.596 | 3637966.307 | 5.06 |
| | Pipe | | |
| (2181) | 365350.107 | 3638494.306 | 3.07 |
| | Q | | |

A Peterson
Ø Belanfer

136477

(29)

8/20/09



(2182) 365336.533 3638980.198 4.55

Pipe

(2183) 365326.275 3639518.866 2.45

E

(2184) 365389.913 3640011.713 5.64

Pipe

(2185) 365453.667 3640505.681 2.33

E

(2186) 365545.150 3640837.994 4.79

Pipe

(2187) 365627.676 3641138.269 2.53

E

(2188) 365595.819 3641177.066 3.71

E

(2189) 365116.154 3641311.693 4.14

Pipe

(2190) 364094.757 3641610.482 5.44

Pipe

(2191) 363581.602 3641770.881 2.49

E

(2192) 363207.093 3642046.043 5.91

Pipe

(2193) 362835.554 3642306.501 2.87

E

TPeterson

OBelanger

136477

(30)

8/20/09

(2194) 362419.074 3642638.230 5.22

Pipe

(2195) 361963.264 3642999.816 2.97

E

(2196) 361506.583 3643206.155 3.81

Pipe

(2197) 361029.116 3643423.995 2.86

E

(2198) 360625.747 3643686.853 5.81

Pipe

(2199) 360217.853 3643947.272 3.4

E

(2200) 359701.488 36441077.617 3.39

Pipe

(2201) 359226.444 3644194.086 3.24

E

(2202) 359179.896 3644225.251 3.32

E

(2203) 358822.153 36441635.804 5.47

Pipe

(2204) 358445.874 36445073.558 3.24

E

(2205) 358211.905 3645429.240 5.00

Pipe

TPeterson
Bolanger

136477

(31)

8/20/09

A Peterson
B Belanger

136477

(32)
8/20/99

(2206) 357978.329 3645795.189 2.77

4

(2207) 357931.731 3645813.833 3.08

4

(2208) 357429.400 3645746.192 5.88

4

(2209) 354881.927 3645680.814 3.24

4

(2210) 356311.556 3645754.220 6.29

Pipe

(2211) 355707.772 3645834.802 3.32

4

(2212) 355664.518 3645847.885 2.92

4

(2213) 355029.095 3646434.547 5.79

Pipe

(2214) 354386.474 36417022.886 3.17

4

(2215) 354375.069 3647041.312 2.83

4

(2216) 354369.525 3647057.011 2.98

4

(2217) 354368.356 3647076.157 3.05

4

(2219) 354383.140 3647430.146 6.17

Pipe

(2220) 354396.436 3647828.868 3.40

Q

(2221) 354751.623 3648618.446 5.90

Pipe

(2222) 354762.251 3648637.455 3.43

Q

(2223) 355514.340 3649018.685 3.11

Q

(2224) 355647.713 3649199.475 3.36

Q

(2225) 355639.700 3649474.146 4.68

Pipe

(2226) 355616.281 3650529.713 4.33

Pipe

(2227) 355605.105 3651016.101 3.75

Q

(2228) 355610.737 3651547.740 4.97

Pipe

(2229) 355615.023 3652032.429 3.47

Q

(2230) 355588.141 3652776.296 6.64

Pipe

H Peterson
♂ B. Larva

136477

8/20/09

(33)

(2232) 35 5585.541 3653015 719 3.46

Q

(2233) 355328.871 3653426 731 2.99

Q

(1131) 354 414.414 364 48778.480 1.97

NG

(1132) 354 087.262 364 7705.507 1.43

NG

(1133) 354 320.802 364 7158.058 2.45

NG

(1134) 354 910.598 364 6459.046 1.00

NG

(1135) 355 408.919 364 6024.830 0.34

NG

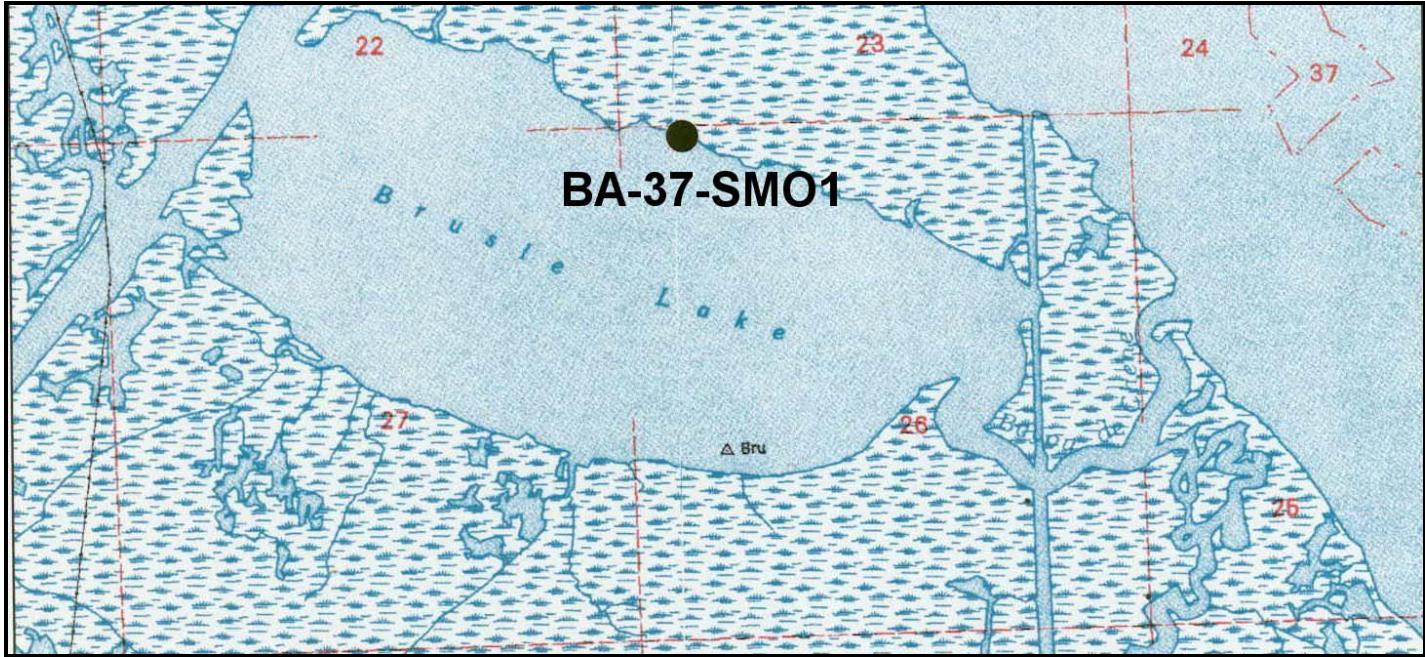
Peterson
Belarus

136477

(34)
8/20/09

Appendix A

Secondary Monument Data Sheet



VICINITY MAP

Scale: 1" = 2000'

Reproduced from USC&GS "Golden Meadow Farms" Quadrangle

Station Name: "SM01"

Location: The monument stamped BA-37-SM01 is located near the north shore of Brusle Lake in Lafourche Parish, Louisiana. The monument is approximately 11.8 miles southwest of the intersection of Bayou Lafourche and the Gulf Intracoastal Waterway in Larose, Louisiana.

Monument Description: NGS style floating sleeve monument; datum point set on 9/16" stainless steel sectional rods driven 88 feet to refusal, set in sand filled 6" PVC pipe with access cover set in concrete, flush with ground.

Stamping: BA-37-SM01

Installation Date: 08-15-02 **Date of Survey:** August 16 and 17, 2002

Monument Established By: T. Baker Smith & Son, Inc.

For: Louisiana Department of Natural Resources, CRD

Adjusted NAD 83 Geodetic Position

Lat. 29°29' 45.72302" N

Long. 90°12' 29.46131" W

Adjusted NAD 83 Datum LSZ (1702) Feet

N= 363,981.440

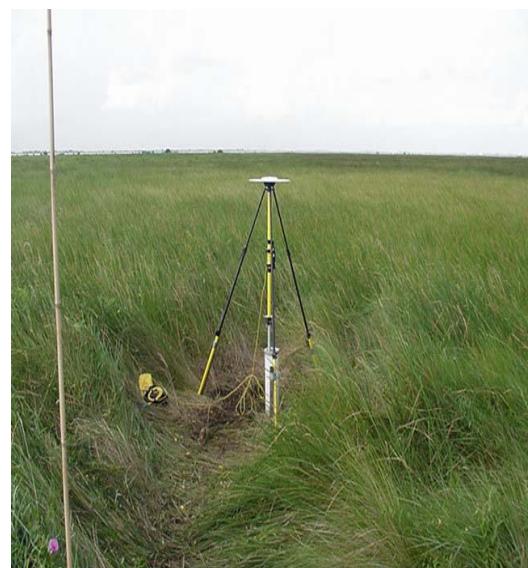
E= 3,638,772.849

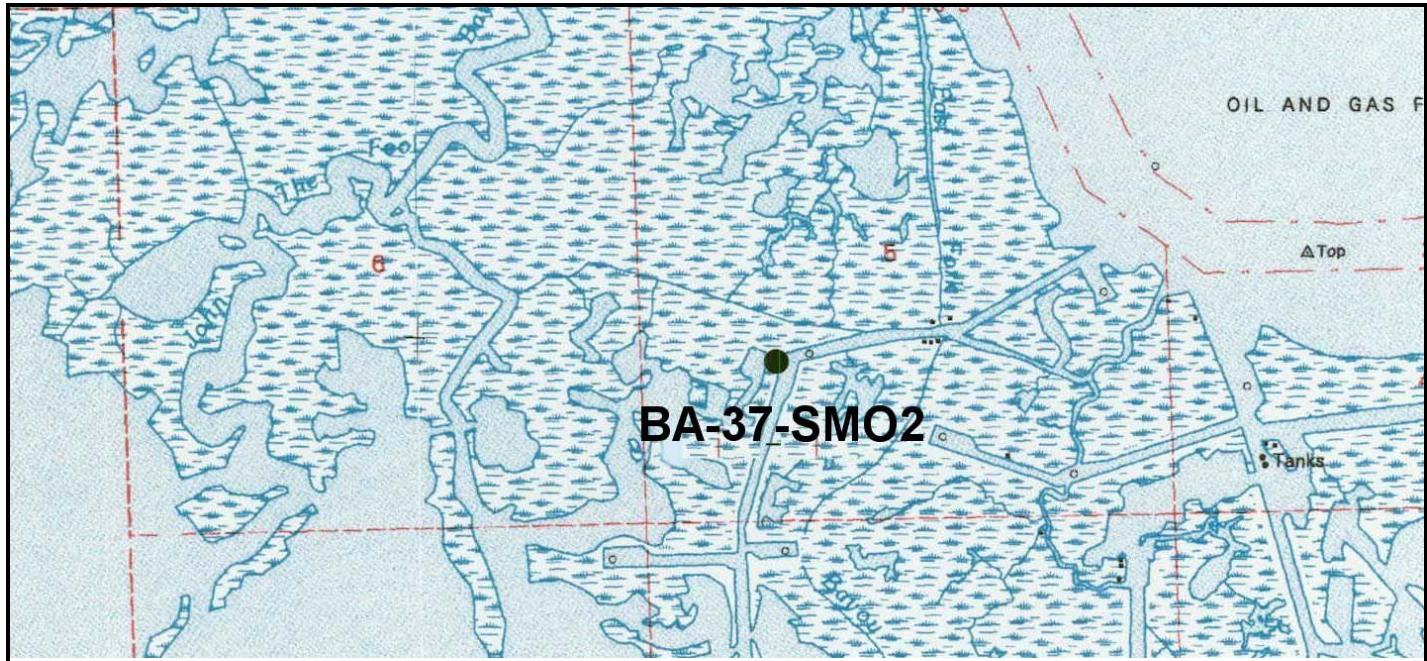
Adjusted NAVD88 Height

Elevation = 2.981 feet (.909 mtrs)

Geoid99 Height = -24.899 mtrs.

Ellipsoid Height = -23.990 mtrs.





VICINITY MAP Scale: 1" = 2000'

Reproduced from USC&GS "Golden Meadow Farms" Quadrangle

Station Name: "SM02"

Location: The monument stamped BA-37-SM02 is located just less than 2 miles south Plum Point which is located within Little Lake in Lafourche Parish, Louisiana. The monument is approximately 13.9 miles southwest of the intersection of Bayou Lafourche and the Gulf Intracoastal Waterway in Larose, Louisiana

Monument Description: NGS style floating sleeve monument; datum point set on 9/16" stainless steel sectional rods driven 104 feet to refusal, set in sand filled 6" PVC pipe with access cover set in concrete, flush with ground.

Stamping: BA-37-SM02

Installation Date: August 15, 2002 **Date of Survey:** August 16 and 17, 2002



Monument Established By: T. Baker Smith & Son, Inc

For: Louisiana Department of Natural Resources, CRD

Adjusted NAD 83 Geodetic Position

Lat. 29°27' 28.30362" N
Long. 90°09' 18.99432" W

Adjusted NAD 83 Datum LSZ (1702) Feet

N= 350,270.145
E= 3,655,746.234

Adjusted NAVD88 Height

Elevation = 3.384 feet (1.031 mtrs)



Geoid99 Height = -24.760 mtrs.
Ellipsoid Height = -23.729 mtrs.

Appendix B

Survey Report and Data (CD-ROM)

Appendix C

Land Surveyor's Certificate
