

Coast 2050 Region 4

CLEAR MARAIS (CS-22) C/S-22-MSPR-0398-1 PROGRESS REPORT No. 1

for the period
March 20, 1997 to March 20, 1998

Project Status

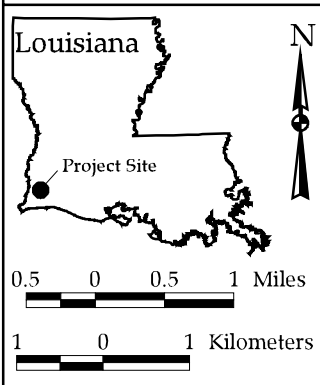
This is the first in a series of progress reports describing the Department of Natural Resources Coastal Restoration Division monitoring for the Clear Marais Shoreline Protection project. This report, and all subsequent Progress Reports for the project, will identify the monitoring data being collected and will briefly discuss the preliminary results from project monitoring efforts.

Project Description

The Clear Marais shoreline protection project area is located along the north bank of the Gulf Intracoastal Waterway (GIWW) in Cameron Parish, Louisiana, between the Alkali ditch and Goose Lake (figure 1). The project encompasses 4,311 acres (1,745 ha) of highly organic freshwater marsh including 2,056 acres (832 ha) of vegetated marsh and 2,255 acres (913 ha) of open water. With construction of the GIWW, which was deepened to its present depth of 12 feet (3.7 m) between 1942 and 1949, an avenue has been provided for high energy wave action from boat traffic in the GIWW. This wave energy increases during high river stages in the Calcasieu-Sabine basin (USDA 1993). Marshes located adjacent to the GIWW in the project area are protected from rapid fluctuations of water salinity and water level by a water management levee. Increased tidal action and boat wakes threaten to breach this levee and connect the GIWW with interior ponds and marshes. Should breaches occur, saltwater and erosional forces from the GIWW could threaten the integrity of the remaining vegetated freshwater marsh. In March 1997, a 35,000 ft (10.7 km) limestone breakwater was completed 0-50 ft (0-15.2 m) from (and parallel to) the northern bank of the GIWW in 3-4 ft (0.9-1.2 m) of water to prevent the continued erosion of the management levee and the encroachment of the GIWW into the project area.

Methods

Near-vertical color-infrared aerial photography (1:12,000 scale) will be used to measure vegetated and non-vegetated areas for the project and reference sites. Aerial photography will be scanned, mosaicked, georectified and analyzed by National Wetlands Research Center (NWRC) personnel according to the standard operating procedure described in the *Quality Management Plan for Coastal Wetlands Planning, Protection, and Restoration Act Monitoring Program* (Steyer et al. 1995). The photography was obtained in 1994 (preconstruction) and will be repeated in 2006 and 2015 (post-construction). Shoreline markers in the project area (n = 34) were placed at maximum intervals of 1000 ft (305 m) on the existing shoreline behind the rock breakwater and in the reference area (n = 5) extending west from the project area for 1 mi (1.6 km). A global positioning system (GPS) will be used to obtain coordinates for each shoreline marker and shoreline positions will be documented in 1997, 2000, 2003, 2006, 2010, and 2015 by direct measurement.



Data Source:
 LA Dept of Natural Resources
 Coastal Restoration Division
 Database Analysis Section

1994 Satellite Imagery

Date: December 10, 1997
 Map I.D.: 97-5-048

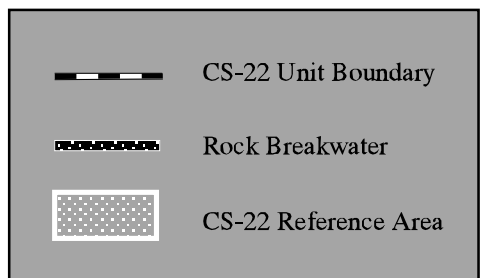


Figure 1. Clear Marais (CS-22) project area, reference area, and shoreline protection feature location.

Results/Discussion

The shoreline has been divided into 3 distinct areas/land types based on shoreline erosion rates. Type 1 (directly adjacent to Clear Marais wetlands, markers 22 - 34) has experienced severe erosion, type 2 (from the end of the management levee to Brannon ditch, markers 9 - 22) has experienced moderate erosion, and type 3 (east of Brannon ditch to the Alkali ditch, markers 1 - 9) has experienced mild erosion (figures 2 and 3).

Color-infrared aerial photography of the preconstruction project and reference areas was obtained on November 7, 1994. The photography was checked for flight accuracy, color correctness, and clarity. The duplicate photography was prepared for Geographic Information System (GIS) analysis and the original film was archived. A digital file with 300 pixels-per-inch resolution was created from the photography for GIS analysis. Using ERDAS Imagine, an image processing and GIS software, the photography was mosaicked and used for basemap production. Global positioning system (GPS) points were collected in the field to georeference the basemap to a Universal Transverse Mercator (UTM) coordinate system. The preconstruction map will then be analyzed, using ERDAS Imagine, to determine land-to-water ratios and acreages.

The reference area was not dedicated before the preconstruction aerial photography flight, and not officially included in the flight plan. However, the reference area was captured in the last frame for the project area. The reference area has since been included in the photo-mosaic and will receive GIS analysis to determine preconstruction conditions.

A professional cross-sectional survey was conducted by Aucoin and Associates, Inc. of Eunice, La. in September 1997. Elevational data were collected at the permanent shoreline markers along transects extending 50 ft (15.2 m) north of the vegetated marsh edge to approximately 50 ft (15.2 m) south of the breakwater toward the GIWW channel. Roughly, every fifth cross-section was extended to include profiles for the entire width of the GIWW including 50 ft (15.2 m) of the south shore (figures 5 and 6). Elevational readings for each cross section were gathered at 10 ft (3 m) intervals between the existing shoreline and rock dike. Typical elevational profiles in the reference area and within each land type in the project area are shown in figures 4 - 7. The survey included GPS referencing of shoreline markers, the actual shoreline (vegetation edge in project and reference areas), and the rock breakwater position. The position of the vegetation edge will be compared to future data sets for interpretation and evaluation of project effectiveness.

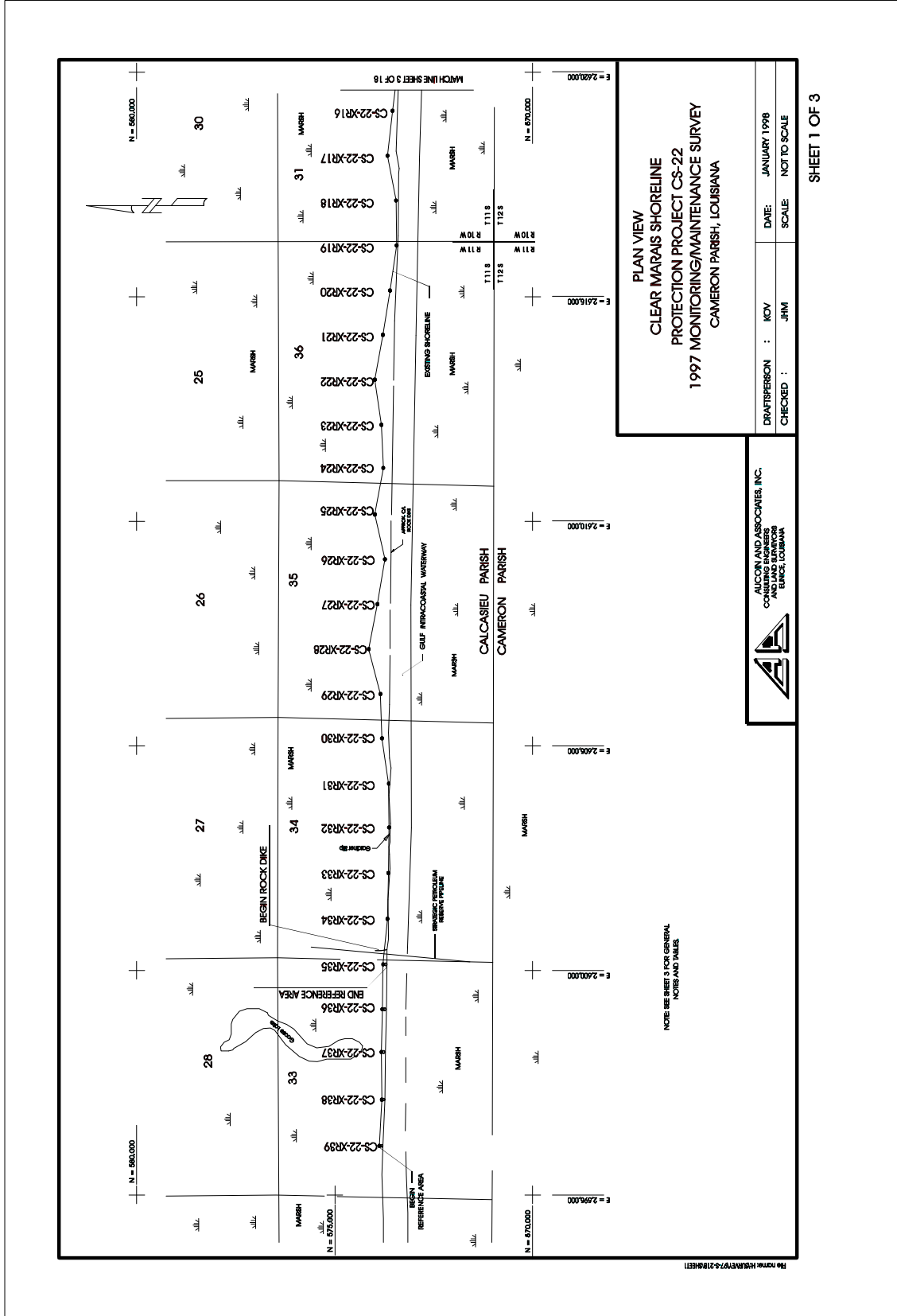


Figure 2. Partial plan view of the western portion of the Clear Marais (C/S-22) project area incorporating shoreline markers 16 - 39. Markers 35 - 39 are in the reference area, markers 22 - 34 are in land type 1, and markers 16 - 21 are in land type 2.

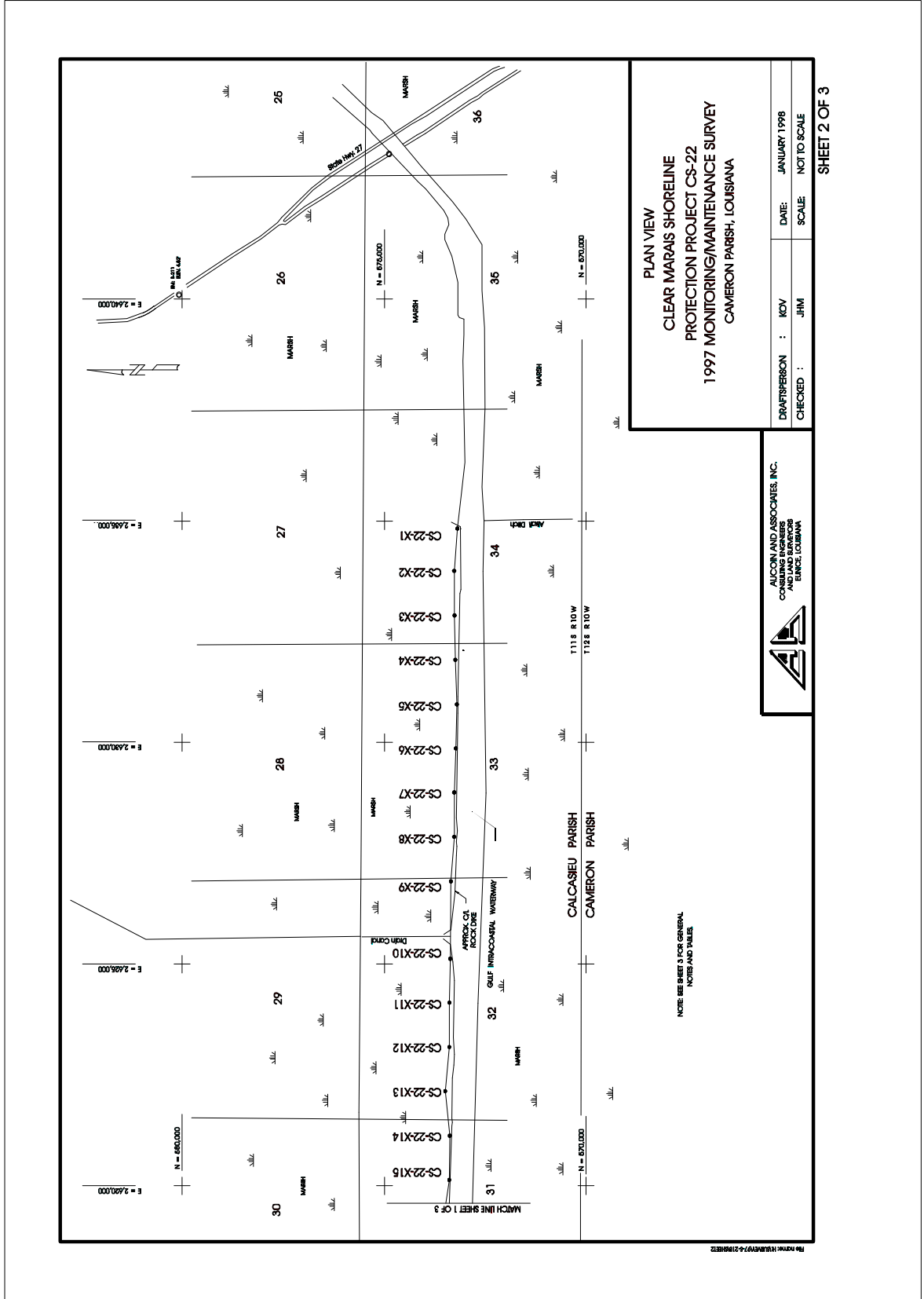


Figure 3. Partial plan view of eastern portion of the Clear Marais (C/S-22) project area incorporating shoreline markers 1 - 15. Markers 9 - 15 are in land type 2 and markers 1 - 8 are in land type 3.

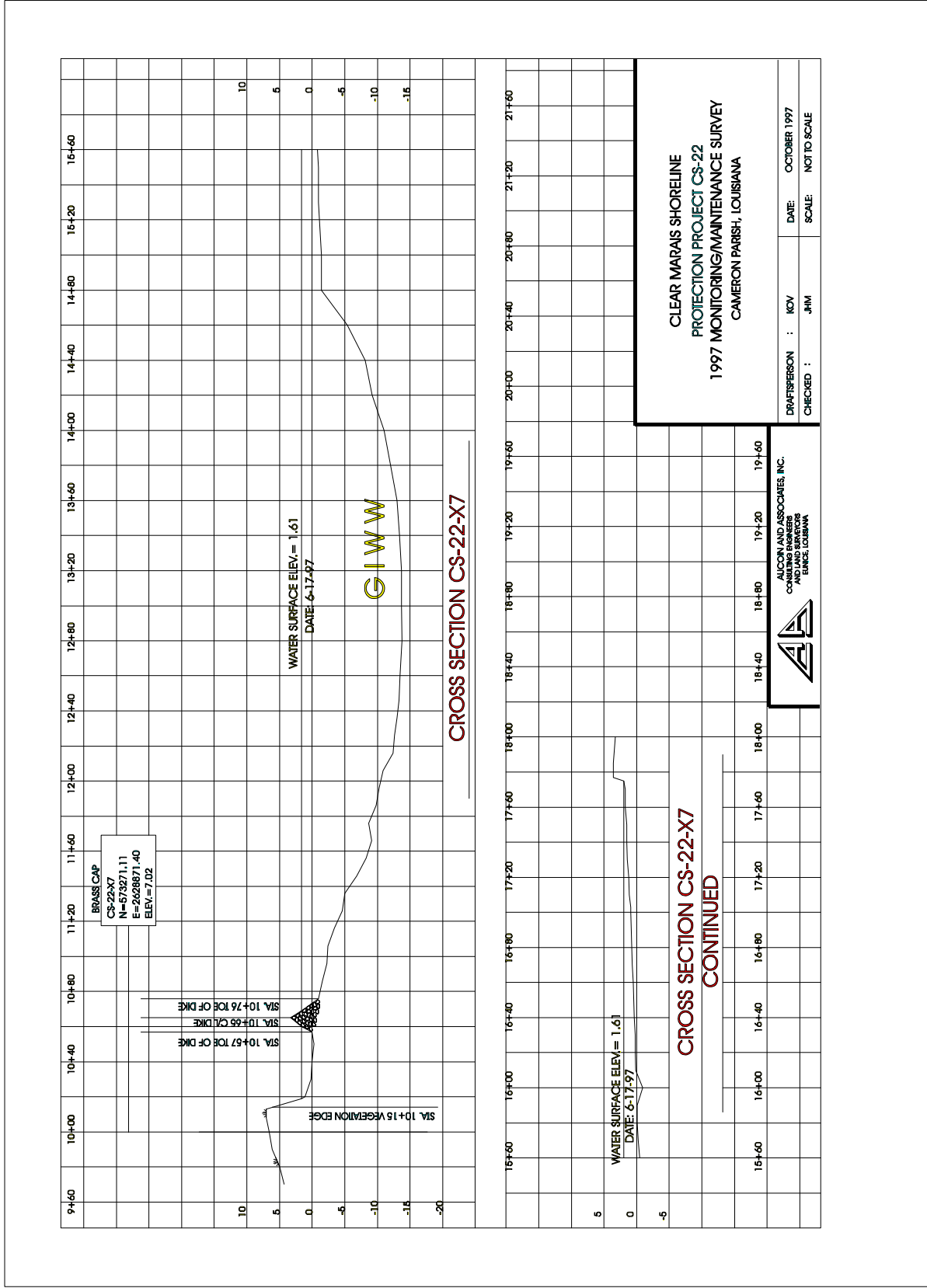


Figure 4. Representative cross-section from land type 3 (station 7) in the project area.

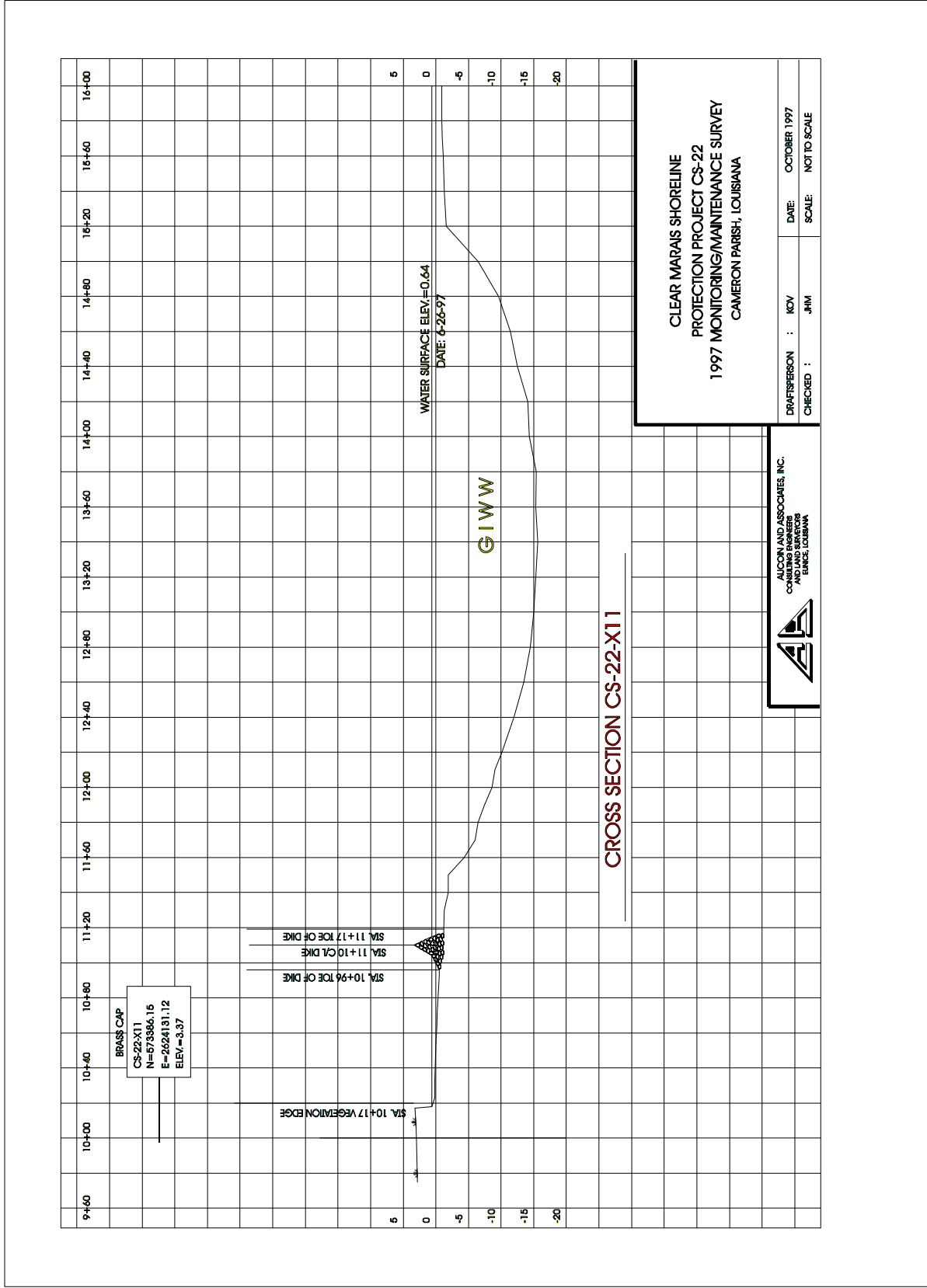


Figure 5. Representative cross-section from land type 2 (station 11) in the project area.

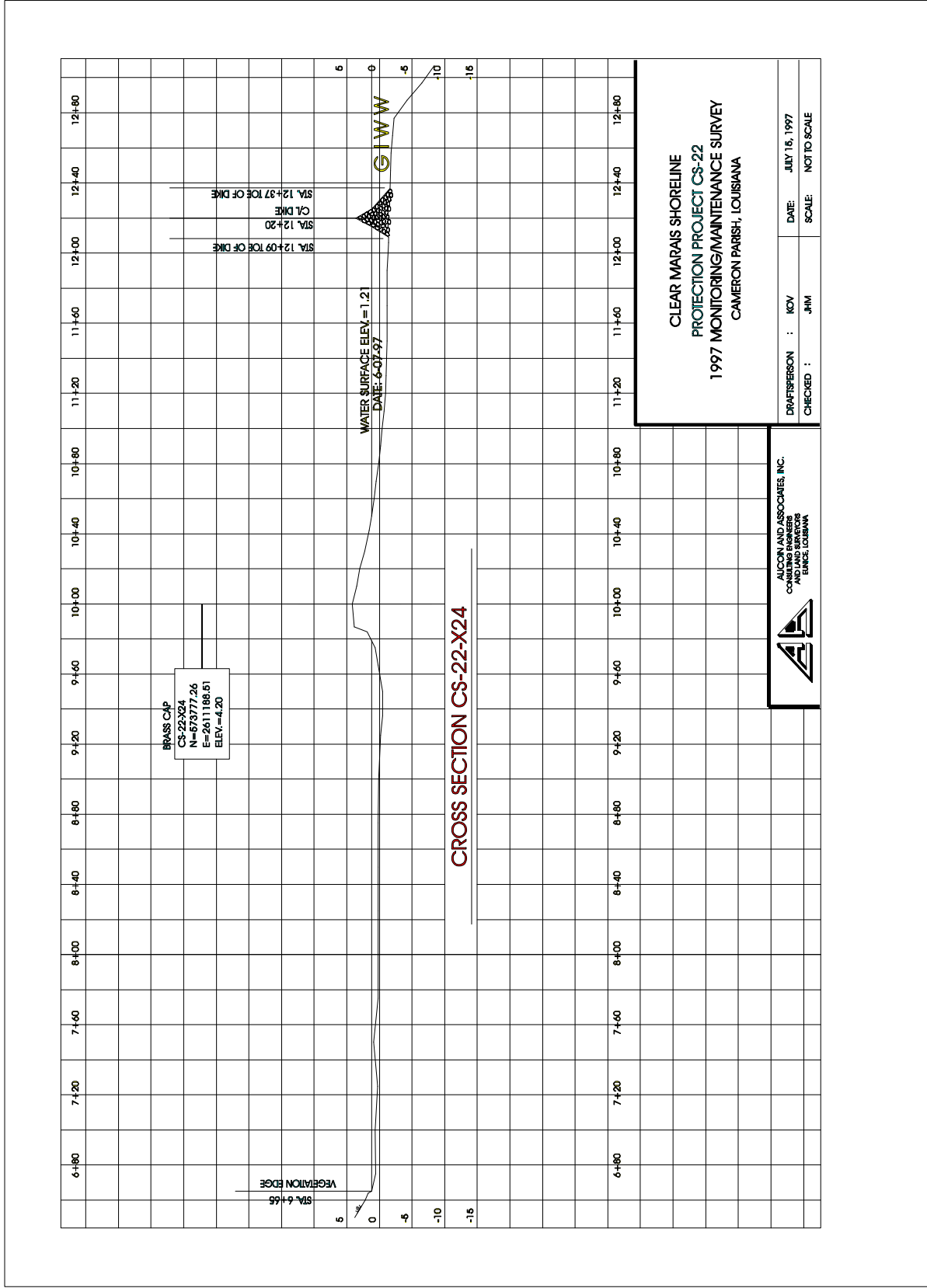


Figure 6. Representative cross-section from land type 1 (station 24) in the project area.

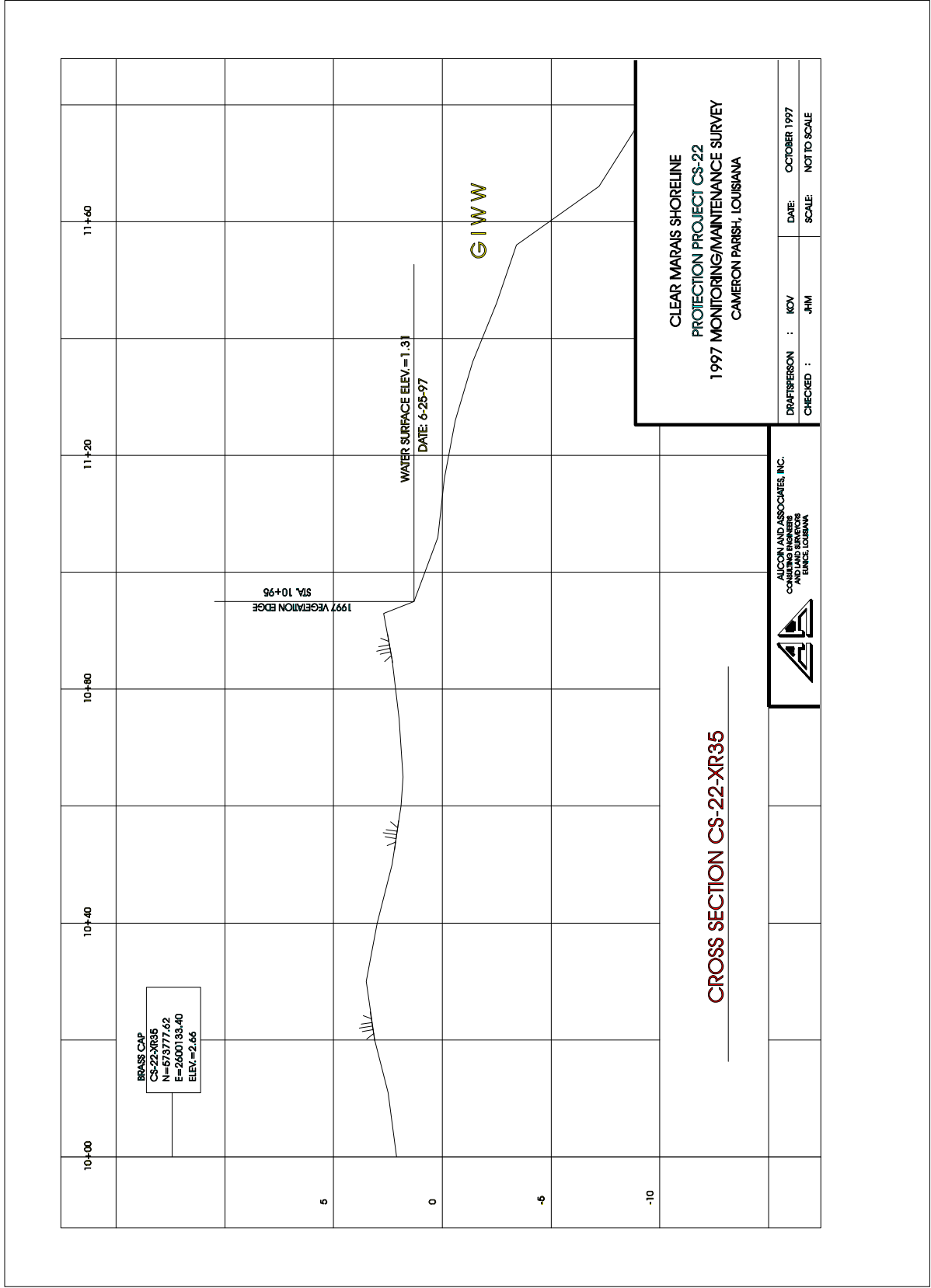


Figure 7. Representative cross-section taken in the reference area (station 35).

References

Steyer, G. D., R. C. Raynie, D. L. Steller, D. Fuller and E. Swenson 1995. Quality Management Plan for Coastal Wetlands Planning, Protection, and Restoration Act Monitoring Program. Open-file series no. 95-01. Baton Rouge: Louisiana Department of Natural Resources, Coastal Restoration Division.

U.S. Department of Agriculture, Soil Conservation Service 1993. Calcasieu-Sabine River Basin Study Report. Alexandria, LA: Soil Conservation Service. 152 pp.

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Construction Start:	November 1, 1996	
Construction End:	March 20, 1997	