

## CORROSION SURVEY OF STEEL SHEET PILES IN BUFFALO BAYOU: HOUSTON, TEXAS

## Condition of structural steel piles evaluated in downtown Houston waterway.

Deepwater Corrosion Services was contracted to investigate the condition of steel sheet pile walls at two sites along Buffalo and White Oak bayous at the northern end of Houston's downtown. The Harris County Flood Control District operates cathodic protection systems at the two sites. The White Oak Bayou site includes the east and west banks of the bayou between its confluence with Buffalo Bayou and Main Street, and the Buffalo Bayou site includes the north and south banks of the bayou adjacent to Wortham Center between Prairie St. and Preston St.

This inspection included: An interrupted survey on the submerged side of the walls using divers to sample potentials close to the wall at about 10 feet intervals using a CP gun with both copper and silver electrodes (as the bayou water is categorized as fresh) to verify the previous survey validity; Identification of any sharp potential excursions resulting from electrical resistive connections in the pile sections; Collection of water and mud samples for resistivity testing; Deploying a test anode as a sacrificial retrofit while performing the survey to verify the current delivery to the sheet pile; and an assessment of the existing condition of the steel sheet pile and recommendations for corrective actions.

In 1993 an ICCP system was commissioned at White Oak Bayou and in 1998 at Buffalo Bayou to provide CP for the bare structural sheet piles at both locations. The systems consisted of rectifiers and deep-well style anode ground beds. Permanent reference electrodes and test stations were added at White Oak only. The Transformer Rectifier units are rated at 20 V and most are outputting less than their maximum capacity. The current survey identified multiple discontinuities being present. The next stage would be to specifically identify where the discontinuities are located and take corrective action. The overall evaluation of the CP survey at both sites indicates that a significant portion of the sheet piles were unprotected and Deepwater recommended that action be taken.

More info at www.stoprust.com



BUFFALO BAYOU AND WHITE OAK BAYOU The bayous meet at the north end of downtown Houston



MILES OF PILES The CP survey found them mostly unprotected.



TROUBLE BELOW A diver using a Polatrak® CP Gun™ found multiple discontinuities along the sheet pile walls.



TRANSFORMER RECTIFIERS Six of the seven TRs from the original ICCP system were still functioning

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