

**ILLINOIS BEACH STATE PARK, LAKE COUNTY, ILLINOIS
SECTION 204 BENEFICIAL USE OF DREDGED MATERIAL**

APPENDIX B – CIVIL DESIGN



September 2013



**DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
231 SOUTH LASALLE STREET
CHICAGO, ILLINOIS 60604**

**ILLINOIS BEACH STATE PARK – SECTION 204
LAKE COUNTY, IL**

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August 2, 2013

GENERAL

Purpose and Scope

The purpose of this Appendix is to: 1) discuss existing survey, utility and topographic information; 2) describe design criteria, engineering methods and procedures that were used to layout the project features shown on *EX-01*; and 3) present the methods used and calculations developed for construction quantities.

DESIGN ANALYSIS

General

The main report discusses the alternatives considered for this report. This design analysis will only cover the recommended plan which involves the placement of dredged material from Waukegan Harbor in the nearshore zone at an elevation of -18 to -20 LWD at the North Unit of Illinois Beach State Park (IBSP).

Survey and Mapping

No bathymetric surveys of the sediment placement areas were available. Although not shown on *EX-01*, the existing topographic contours were created from a LIDAR survey of Lake County. The 2-foot contours of the survey represent the general slopes of the terrain. Also not shown is the mapping for the parcels and easements which are ESRI Shape File format in Illinois State Plane Projection, and NAD83 Datum provided by Lake County. This information will be used in the design phase for general GIS applications and should not to be used in place of a field survey to determine precise location of features and boundaries for any engineering design, legal, or regulatory purposes.

Access/Staging/Storage

Access to the placement area including but not limited to sediment placement and monitor surveys will be made by a barge from Lake Michigan. Vehicle access to the beach can be made through the public roads to the park. Vehicle traffic and staging/storage areas will not be permitted on the beach. Any damaged areas will be restored to previous conditions.

Utilities

No utility survey information was available in the vicinity. It is anticipated that there will be no impacts to utilities on land. However, there are 3 shipwrecks located approximately 1000-feet off the shoreline near 21st Street. The contractor shall maintain 100-feet of clearance to avoid impacts.

Quantity Calculations

Sediment placement quantities will be verified by the Civil Design Section using Microstation. Microstation Inroads will be used to create digital terrain models, or surfaces, from existing soundings and proposed contours that compare existing and proposed surfaces to calculate the sediment cut/fill quantities. This is done by projecting prisms from one surface to the other and computing the volume of each prism for a total volume. The net earthwork cut/fill is used as a basis for the sediment placement lump sum bid item.

