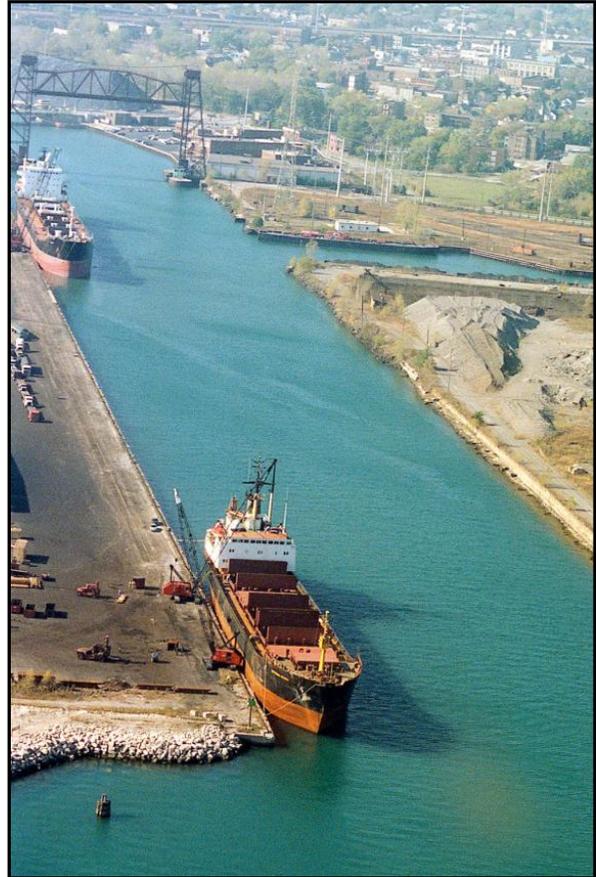


# Chicago Area Waterway System

## Dredged Material Management Plan & Integrated Environmental Assessment

### APPENDIX E: CIVIL DESIGN

DRAFT



Prepared By:

Chicago District and Rock Island District



**US Army Corps  
of Engineers®**

June 2015

<b>1.0</b>	<b>Purpose and Scope</b> .....	<b>1</b>
<b>2.0</b>	<b>Site Access, Staging and Storage</b> .....	<b>1</b>
<b>3.0</b>	<b>Demolition, Debris Removal, Grading and Erosion Control</b> .....	<b>Error! Bookmark not defined.</b>
<b>4.0</b>	<b>Utilities</b> .....	<b>3</b>
<b>5.0</b>	<b>Surveying and Mapping</b> .....	<b>4</b>
<b>6.0</b>	<b>Maintenance of Traffic</b> .....	<b>4</b>
<b>7.0</b>	<b>References</b> .....	<b>5</b>
<b>8.0</b>	<b>Attachments</b> .....	<b>5</b>
8.1	CDF CAPACITY CALCULATIONS .....	5
8.2	BID SCHEDULE ASSUMPTIONS .....	5
8.2	Civil Drawings.....	5

## **1.0 Purpose and Scope**

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

## **2.0 Site Access, Staging and Storage**

### Site 313R (Ridgeland Ave.)

Access to the site can be made from 119<sup>th</sup> Street/Shey Drive just off Ridgeland Avenue. This roadway extends through an Illinois Department of Transportation storage facility and leads to the MWRD site which is restricted by a locked gate. An existing paved road 24 feet wide can be used to access the site along the south. Due to limited open areas around the perimeter of the site, it is anticipated that staging and storage will occur on the existing paved parking lot at the southwest corner of the site.

### Site 329L-B (Republic Steel)

Access can be made from Carondolet Avenue to 122<sup>nd</sup> Street along the southern portion of the site. The site is restricted on the east by railroads and access around the perimeter is limited due to the overall footprint of the CDF. Based on remaining space available, a gravel staging and storage area has been placed adjacent to 122<sup>nd</sup> Street.

### Site 328R (Stony Island)

Access is made from 122<sup>nd</sup> Street just east of Stony Island Avenue. The site is restricted by a security guard gate and has a paved center and perimeter drive aisles. The staging and storage area has been placed north of the CDF to minimize travel distance from the site entrance.

### Site 330L (LTV)

Just off 116<sup>th</sup> Street is the entrance at the southeast corner of the site. The site has been compacted from the constant truck movements, so access around the site is manageable using the established roads. A gravel staging and storage area has been located adjacent to the CDF also to minimize travel distance from the site entrance.

### Site CH02 (Lake Fill South)

An existing dirt haul road along the southern portion of the site and 87<sup>th</sup> Street can be used to gain access. A gravel staging and storage area will be needed and is placed adjacent to the CDF.

### Site CH03 (Lake Fill North)

An existing dirt haul road off S. Lake Shore Drive extends along the north edge of the slip. A gravel staging and storage area will be needed and is placed in an open area immediately west of the existing breakwater.

In general, equipment and construction should avoid damage to existing buildings and facilities within the project limits even if they are not currently in use. Any damaged areas will be restored to previous conditions.

Vehicle and equipment access to the interior of the CDF's can be accomplished by constructing an 18 feet wide ramp, with gravel, at a 10% slope. With limited space at Site 313R between the facility's proposed southern T-Wall and existing access road, sheet pile would need to be installed to support the ramp—otherwise, 2:1 side slopes of an earthen ramp would encroach onto the access road. The civil drawings show a 17 feet high exterior entrance and an interior exit ramp to be constructed all at once. The interior ramp does not have sheet pile wall to support it. Storage capacity of the facility will account for the volume of the earthen ramp. The remaining sites all were designed with 18 feet wide earthen interior/exterior ramps with gravel. Placement of material near the interior ramp should be avoided to allow vehicles to properly maneuver.

### **3.0 Demolition, Debris Removal, Grading and Erosion Control**

#### Site 313R (Ridgeland Ave.)

The existing site does not contain any known above ground structures to be demolished. Grading is not within the scope of work for this project. The proposed features will be installed to match the existing topography. Any excavated material will be hauled offsite. Tree clearing and grubbing around the site perimeter will be necessary for construction of the proposed features. An existing drainage ditch borders the north and east sides of the project and should be protected by erosion control measures in accordance with the Illinois Urban Manual. Upon completion of the project, disturbed areas will be restored with permanent vegetation.

#### Site 329L-B (Republic Steel)

No above ground structures or features exist to be demolished. Minor tree clearing and grubbing will be required to install the site features. There are existing dirt haul roads which could remain and be abandoned in place. The roads may also provide some benefit for equipment and vehicle traffic during construction. Minor grading will be necessary to slope the bottom of the CDF south towards the proposed decant structure. Also, a perimeter drainage ditch will be installed along the exterior toe of the north berm to accommodate overland drainage from the north. All excess material must remain onsite and may be used for construction of the berm.

#### Site 328R (Stony Island)

The site does not contain any features or structures that will be demolished. Also, no vegetation exists so no clearing or grubbing is necessary. The proposed features will be installed to match the existing topography. Any excavated material will be hauled offsite.

#### Site 330L (LTV)

The site is void of vegetation so no clearing and grubbing is necessary. Since the site is currently being used for recycling and storage of metals, it is unknown if the material will be removed from the site prior to construction, or if it can be salvaged. It was anticipated the material would remain onsite and a debris removal bid item would be necessary. However, it was assumed the gravel stockpiles in the southwest corner would be removed by the current owner. Minor grading will be necessary to slope the bottom of the CDF south towards the proposed decant structure. All excess material must remain onsite and may be used for construction of the berm.

#### Site CH02 (Lake Fill South)

No demolition, clearing and grubbing, and grading will be necessary to access or install the site features. Any excavated material or debris encountered during construction will be hauled offsite.

#### Site CH03 (Lake Fill North)

No demolition, clearing and grubbing, and grading will be necessary to access or install the site features. Any excavated material or debris encountered during construction will be hauled offsite.

In general, the project limits should be protected by proper erosion control measures in accordance with the Illinois Urban Manual. Any existing areas disturbed will be restored with permanent vegetation.

### **4.0 Utilities**

#### Site 313R (Ridgeland Ave.)

The existing drying beds can be divided into 5 cells, each draining by pavement swales to decant structures along the south side of the cells. The decant structures are connected by existing 18 & 24 inch reinforced concrete pipes (RCP). Flow is directed east and connects to an existing 66 inch interceptor sewer at the northeast corner of the easternmost cell. This 66 inch sewer runs along the entire northern portion of the site and ultimately drains to MWRD's Calumet Treatment Plant. The proposed sediment facility will replace the existing drainage infrastructure with new decant structures and drainage pipe. The 24 inch RCP between existing Decant Structure #5 and #6 will be disconnected and capped at its upstream and downstream inverts. New 24 inch RCP will connect Decant Structure #5 and drain via gravity to proposed filter cells. The filter cells used on this project were taken from the cells used at the Chicago CDF. No further design has been done at this time. Effluent pipe from the filter cells will discharge to a proposed lift station before connecting to an existing manhole by an 8 inch force main. The new incoming invert should be above or match the invert where the existing 24 inch RCP was previously disconnected.

Based on the utility information obtained from MWRD as-built plans dated September 1991, and site investigations, minimal utility conflicts and relocations are anticipated for construction of the sediment facility. Special care for the 66 inch sewer should be taken during installation of the walls for the sediment facility. Also, 12 inch RCP and storm manholes drain the parking lot, buildings, and open areas around the buildings and should be avoided during wall installation. There are 6 existing light poles adjacent to the access road along the south. These poles and conduit may need to be removed and reinstalled to accommodate construction. Watermain does service the existing buildings but these lines will not be impacted during construction. A detailed utility survey should be conducted in the design phase and reviewed to determine any impacts to existing utilities.

#### Site 329L-B (Republic Steel)

No utility information was provided for this site. A site visit also revealed no known utilities since the site was restricted by heavy brush and jersey barriers. It is assumed that there is no utility infrastructure that exists within close proximity of the project limits. Refer to the plans for

the layout of the effluent discharge pipes and structures. Verification on the nearest existing sewer for a connection is required.

#### Site 328R (Stony Island)

No utility information was provided for this site. A site visit revealed an existing drainage infrastructure since this site was formerly an MWRD drying bed. The site has decant structures around the east and west perimeter that apparently drain to a detention basin located in the southwest corner of the site. The proposed CDF does not utilize or restore any of the existing features due to the berm footprint and current and active operation of the site. Refer to the plans for the layout of the effluent discharge pipes and structures. Verification on the nearest existing sewer for a connection is required.

#### Site 330L (LTV)

No utility information was provided for this site. A site visit also revealed no known utilities. It is currently in operation and could not be accessed. It is assumed that there is no utility infrastructure that exists within close proximity of the project limits. Refer to the plans for the layout of the effluent discharge pipes and structures. Verification on the nearest existing sewer for a connection is required.

#### Site CH02 (Lake Fill South)

No utility information was provided for this site. It is assumed that there is no utility infrastructure that exists within close proximity of the project limits. Refer to the plans for the layout of the effluent discharge pipes and structures. Verification on the nearest existing sewer for a connection is required.

#### Site CH03 (Lake Fill North)

No utility information was provided for this site. It is assumed that there is no utility infrastructure that exists within close proximity of the project limits. Refer to the plans for the layout of the effluent discharge pipes and structures. Verification on the nearest existing sewer for a connection is required.

### **5.0 Surveying and Mapping**

The existing topographic contours and spot elevations shown on the civil drawings were taken from a LIDAR Contours of Cook County projected in Illinois State Plane East, NAD83. The contours represent the general slopes of the terrain. The aerials shown are ESRI images last updated November 13, 2013. The mapping for the parcel lines are ESRI Shape File format projected in Illinois State Plane East, NAD83. This information is provided for general GIS applications and should not to be used in place of a field survey to determine precise location of features and parcel boundaries for any engineering design, legal, or regulatory purposes.

### **6.0 Maintenance of Traffic**

Maintenance of traffic during construction will be required per City and State standards—depending on the road being used to access the site. Consideration of other entities still occupying the site during construction may be necessary. All pavement and road surfaces damaged must be replaced in accordance with City or State standards.

## **7.0 References**

U.S. Army Corps of Engineers, 1993, *Engineering and Design Cost Engineering Policy and General Requirements, Engineering Regulation 1110-1-1300*, Department of the Army, Washington D.C., 26 March 1993.

U.S. Army Corps of Engineers, 1999, *Engineering and Design for Civil Works Projects, Engineering Regulation 1110-2-1150*, Department of the Army, Washington D.C., 31 August 1999.

## **8.0 Attachments**

**8.1 CDF Capacity Calculations**

**8.2 Bid Schedule Assumptions**

**8.3 Civil Drawings**