FROM THE FIELD: DEVELOPING BEST MANAGEMENT PRACTICES (BMPS) FOR TURBIDITY IN CONSTRUCTION OF DREDGED MATERIAL PLACEMENT

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US Army Corps of Engineers®


Duluth-Superior Harbor – MN Point Beach Nourishment


Green Bay Harbor – Cat Island Dredged Material Disposal Facility

DEVELOPING & COORDINATING BMPS FOR TURBIDITY

- Prior to construction, USACE will coordinate with regulating functions of the State on the development and establishment of best management practices that will be used when placing dredged material

- BMPs focus on reducing turbidity in the water column relative to the standards established for the body of water, which can be accomplished by operational or mechanical means

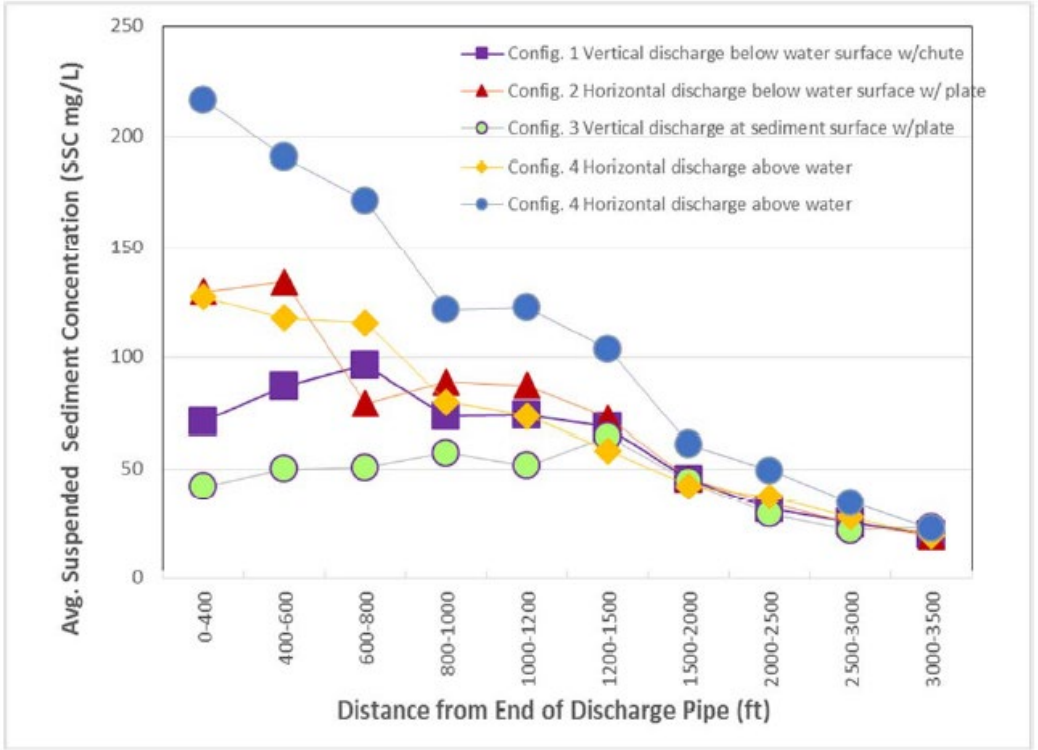
- Highlight projects that utilized innovative BMPs for turbidity control
  - Duluth-Superior Harbor, MN, WI (Detroit District)
  - Green Bay, WI – Cat Island (Chicago District)

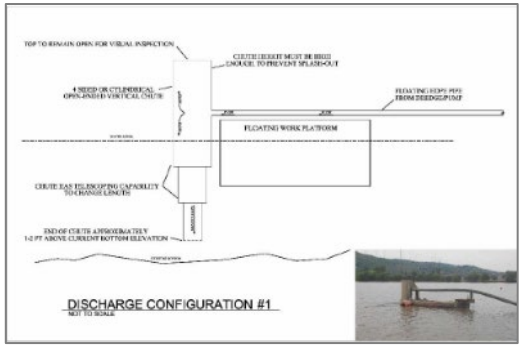
21ST AVE PILOT STUDY (2013-2015)

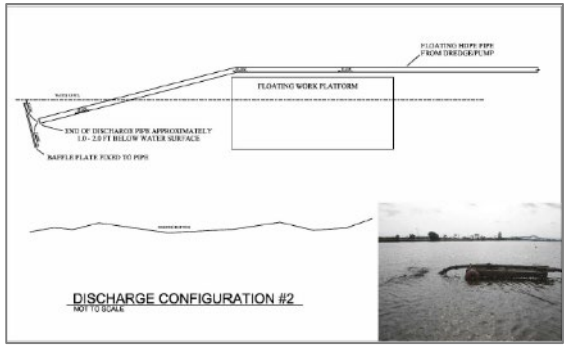
- Funded study designed to evaluate different engineered discharge pipe configurations as BMPs to minimize water column turbidity during in-water placement of dredged material.

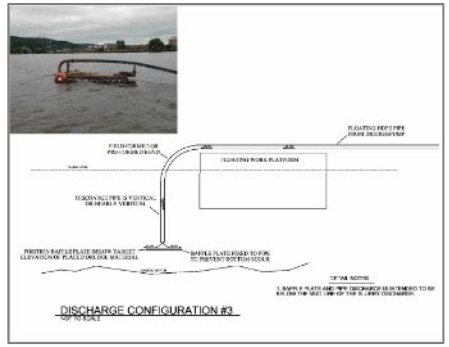
- USACE Detroit District, USACE Engineering Research Development Center (ERDC) for interpretation and subject mater expertise from USGS to develop turbidity sampling and collection.

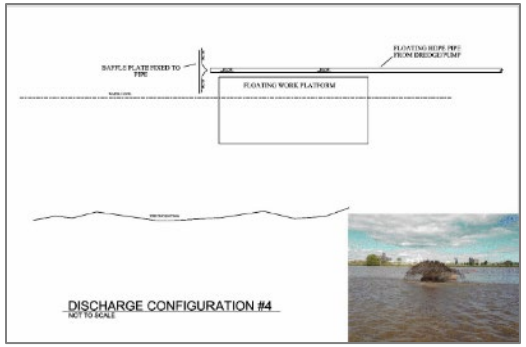
- Outcome was better understanding the effectiveness of utilizing discharge pipe configuration; finding most effective way to reduce turbidity was vertically discharging material nearest to sediment surface with a baffle plate; defining a project zone to determine effectiveness of silt curtain









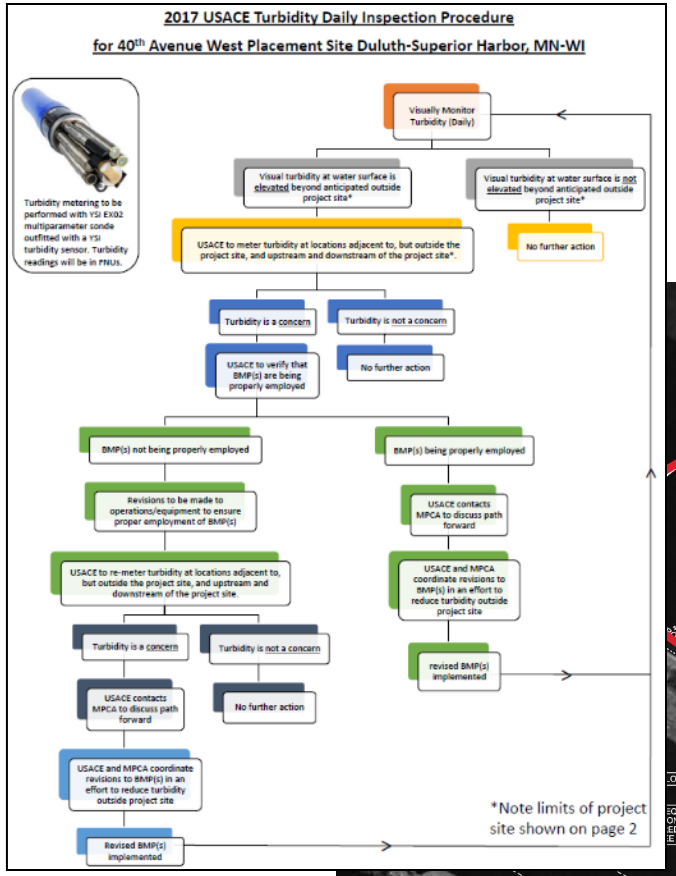


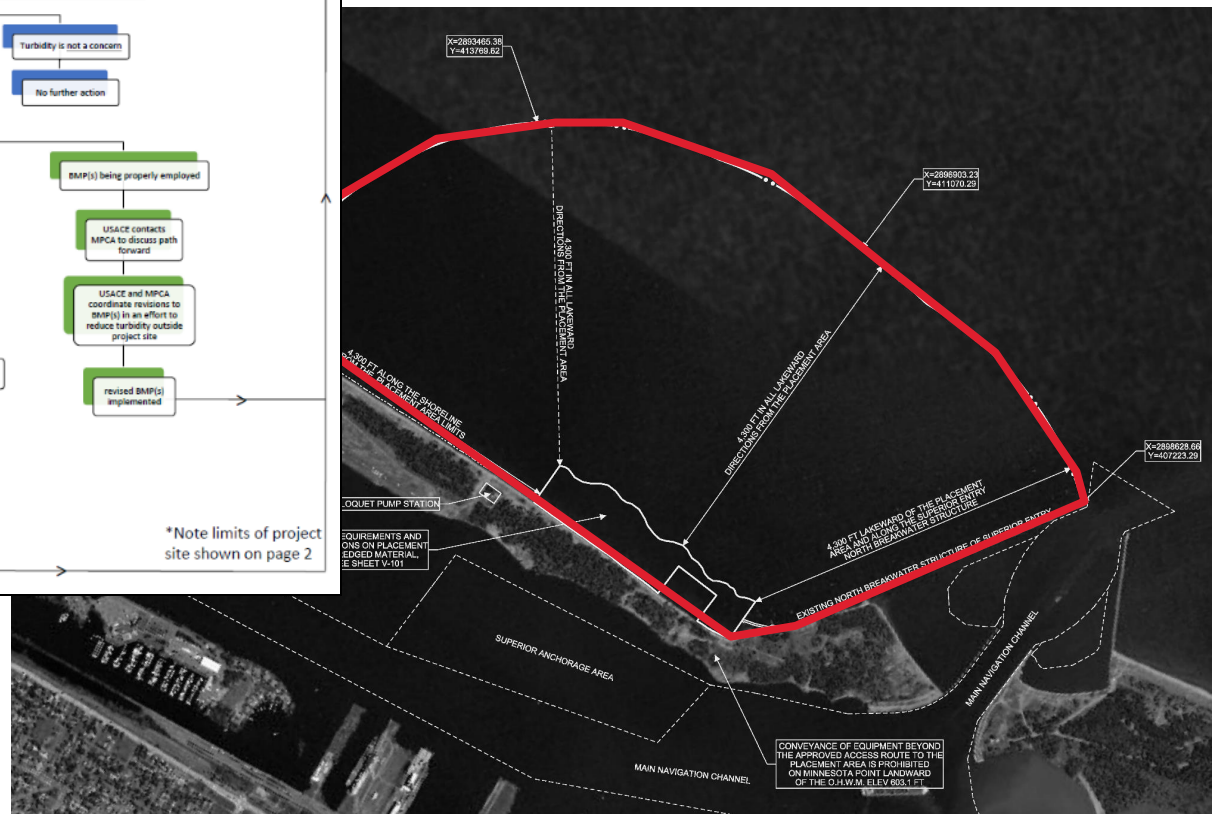
BMP: ESTABLISHING PROJECT LIMITS

- Developing and coordinating project limits define a zone where temporary exceedances in turbidity are expected during placement

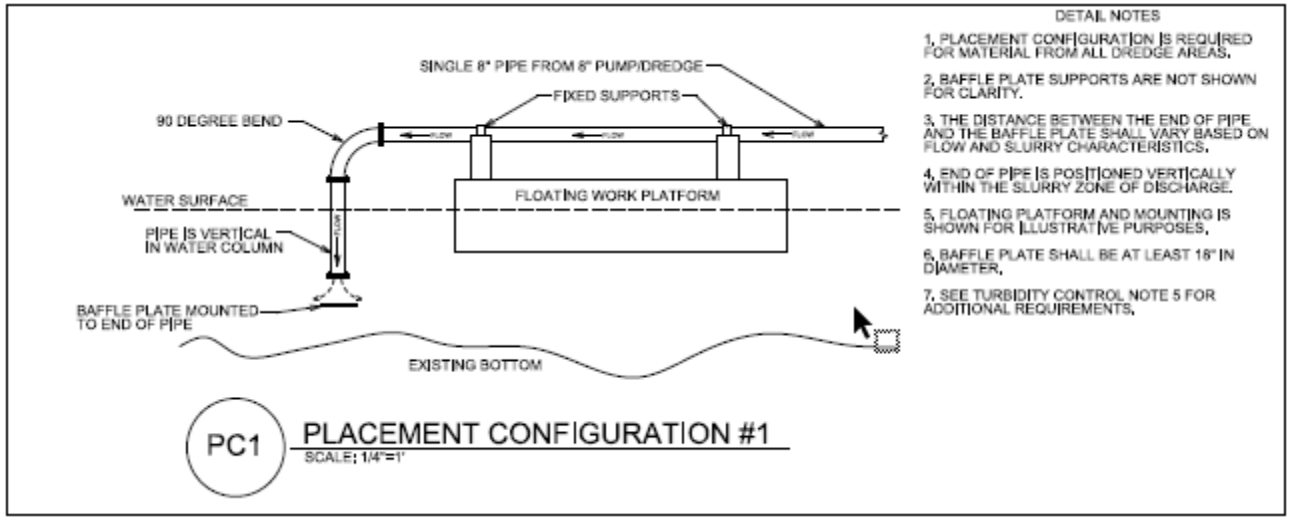
- Define a site that will be monitored and subject to daily inspection procedures

- Each project site will be unique given the body of water and hydrodynamics of the project setting



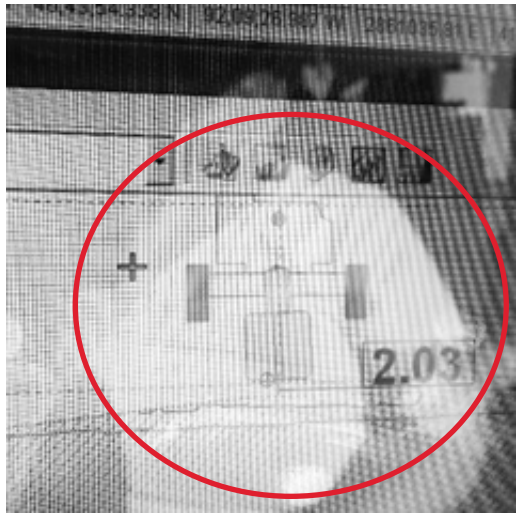


BMP – SHALLOW WATER PLACEMENT



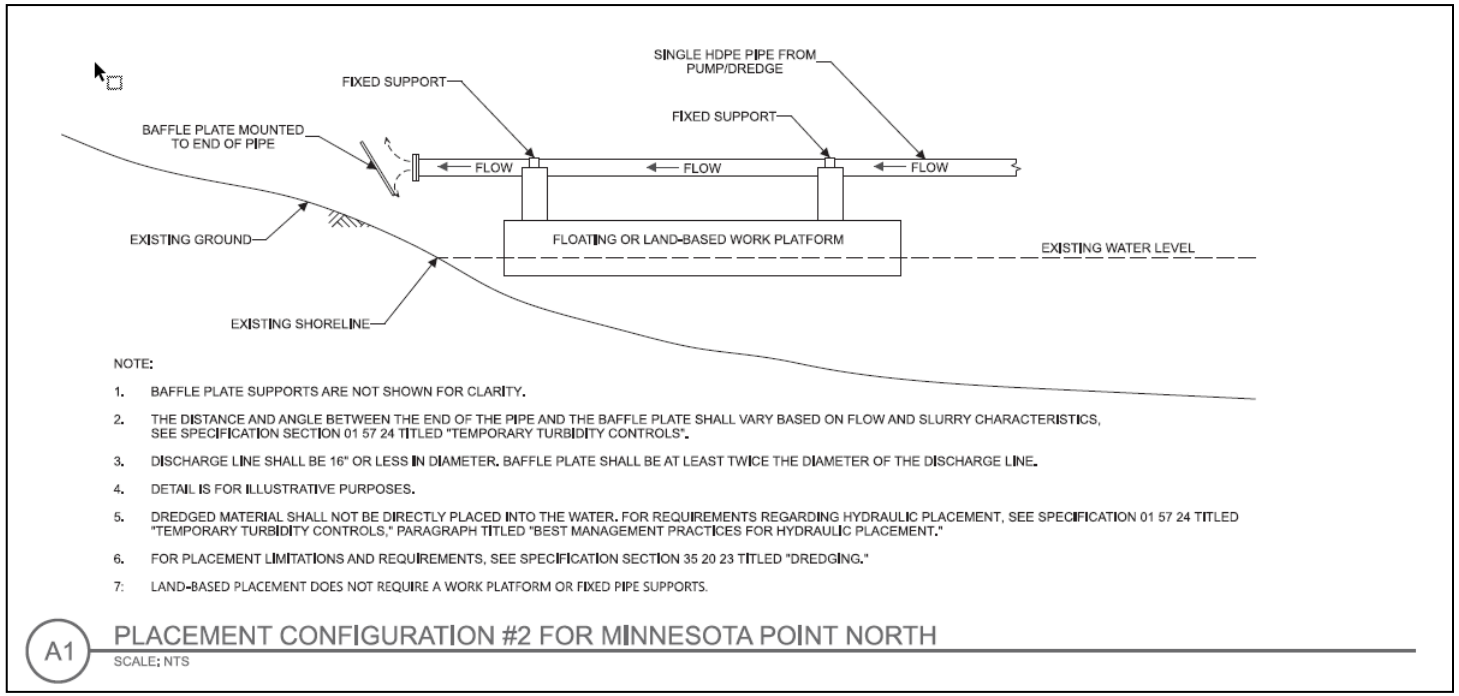
<u>Application of pilot study utilized to develop BMPs and contractor requirements for future projects.</u>

- 40th Ave West construction included placement with no utilization of silt curtain
- Define project limit with daily inspection procedures
- Hydraulic placement: utilize submerged discharge pipe with 90 deg bend and baffle plate
- Mechanical placement: placing bucket nearest bottom prior to opening

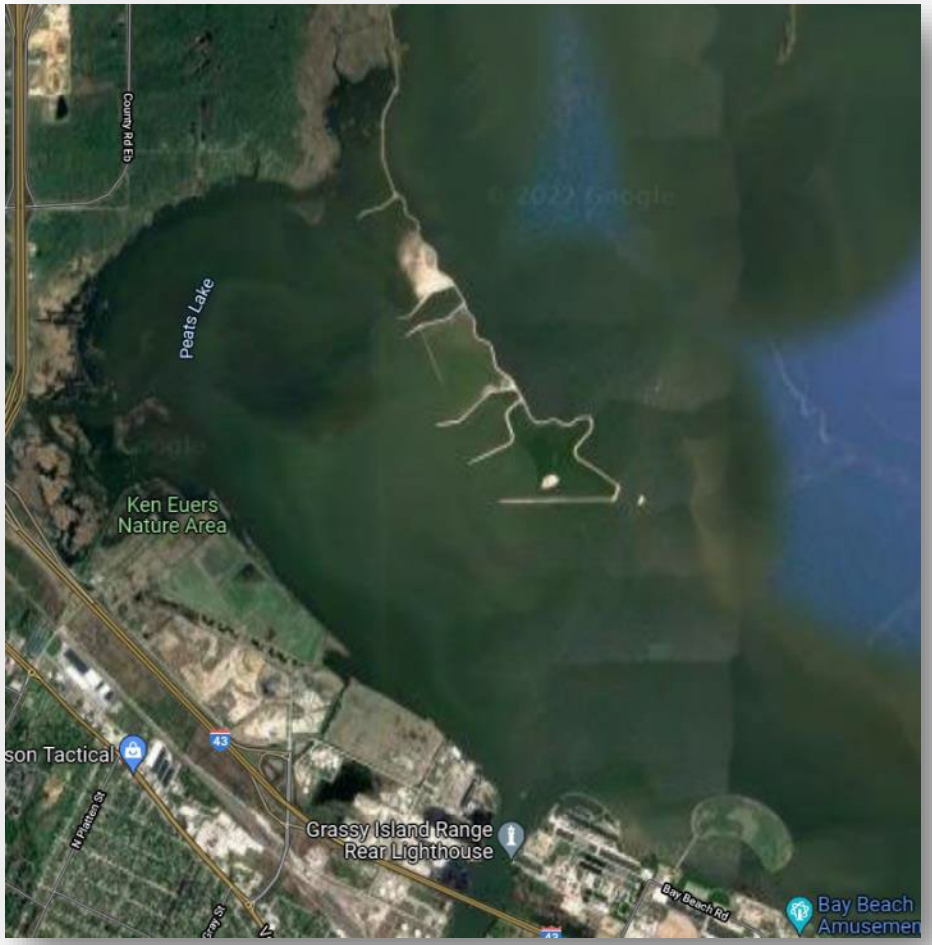


BMP – BEACH NOURISHMENT

- Limitation on production rate and pump operation
- Horizontal discharge pipe with angled baffle plate
- Onshore placement and placement sloping
- Daily visual inspection



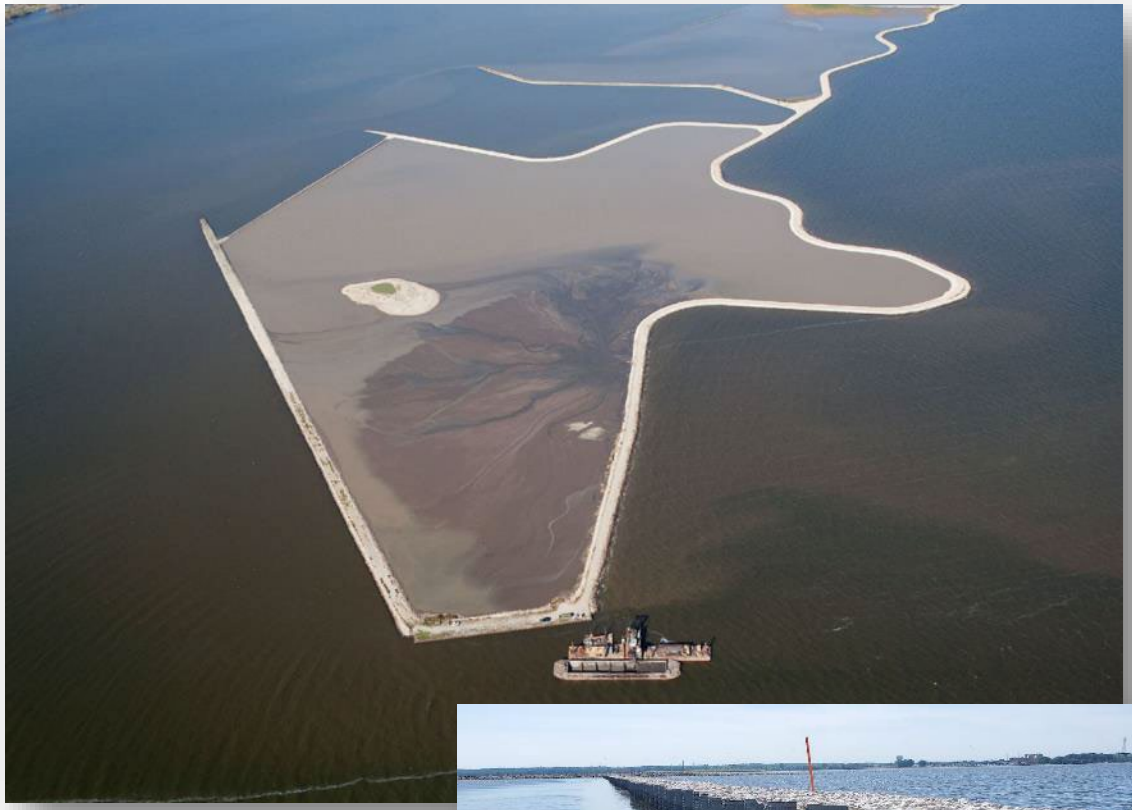
GREEN BAY DREDGING – CAT ISLAND DMDF

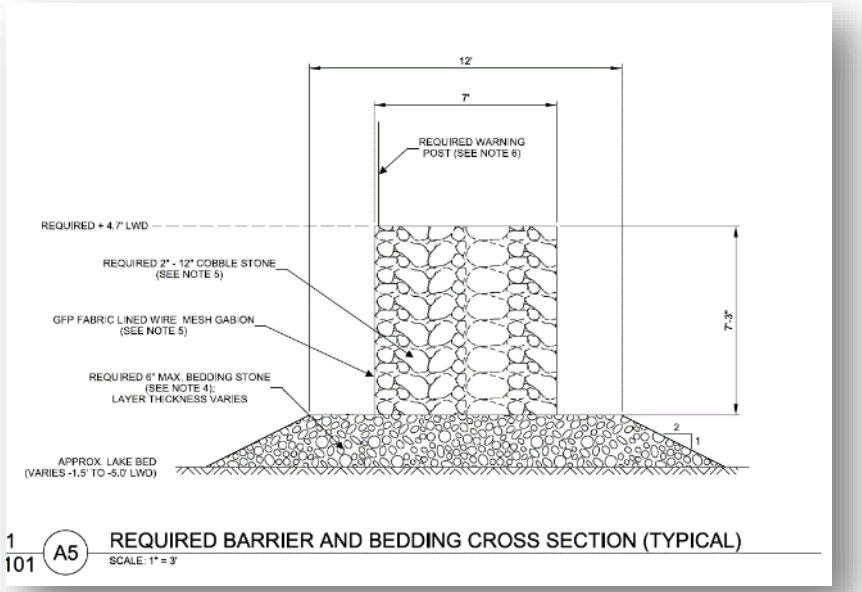


- Built in 2014
- Project partners WDNR, USFWS, Brown County, and others
- Designed to be in water placement
- Turbidity longer lasting and therefore traveled farther due to variability of dredged material characteristics (sand vrs fines)
- Needed to find a way to keep material in the cell and control turbidity during dredge material placement

- **Twice Daily inspection of offload piping**
- **Aerial Recon – pictures before/during/after**
- **Turbidity barrier**

2019 CAT ISLAND - CELL CLOSURE





- Annually coordinate with the CIAC committee
- Developed list of BMP alternatives in coordination with other agencies
- Hesco Barrier determined to be the most effective/cost efficient – and consistent with partner goals
- Temporary function (turbidity filter and sediment stabilization) with long term habitat improvement
  - Gravel bedding stone works as a filter
  - Round rocks used for ultimate shoreline habitat

QUESTIONS

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