



Innovative Reuse of Dredged Material

Contract Award to Schnabel Engineering

*Maryland Port Administration Solicitation No. J03S0232091
Request for Proposals No. 270025-S*

FACT SHEET

Contract Award

The Maryland Port Administration (MPA) has awarded the first contract under Solicitation No. J03S0232091 for the Innovative Reuse of Dredged Material. This award was to Schnabel Engineering on December 17, 2008, in the amount of \$948,418. The scope of their project includes a combined laboratory and field demonstration project on the amendment of slag fines to fine-grained dredged material from the Cox Creek Dredged Material Containment Facility (DMCF) and use in constructed fill applications such as embankments or other structural fill applications. The laboratory phase of work is designed to develop technical data for geotechnical design and analysis purposes. The field demonstration is designed to illustrate the feasibility of construction and associated performance against industry standards of the earthwork construction industry.

Background

Schnabel Engineering has previously conducted laboratory and field studies on the use of dredged material in constructed fill applications in the Philadelphia area. In these studies, dredged material from the U.S. Army Corps of Engineers Fort Mifflin DMCF was amended with crushed glass generated from waste glass collected in Philadelphia. They found that the addition of crushed glass significantly enhanced the geotechnical properties of dredged material, allowing it to meet Pennsylvania Department of Transportation specifications for embankment and structural fill.

Maryland has strict standards for metals concentrations in soils used in both residential and non-residential applications. If such standards are applied to dredged material derived soils, concentration levels of arsenic commonly found in the sediment from the Baltimore area may pose a problem. Dredged material from marine environments such as Baltimore Harbor or Chesapeake Bay tend to become acidic when exposed to the atmosphere for extended periods of time due to the oxidation of iron that naturally occurs in the sediment. The decrease in pH tends to boost the release of metals from metallic salts contained in the sediment increasing their potential for migration from the dredged material. Thus, an amendment is required that tends to neutralize the acid formation and increase the pH of the dredged material, thus minimizing the migration potential of metals present in the dredged material. Slag fines, a byproduct of steel manufacturing, were identified by Schnabel Engineering as a locally available waste product that could potentially meet this requirement. Plus, slag fines will act as a setting agent somewhat like lime or volcanic ash to improve the strength and other structural properties of the dredged material.

Project Summary

Schnabel Engineering will construct five trial embankments at the Cox Creek DMCF including one consisting of 100% dredged material, one consisting of 100% slag fines, and three consisting of various blends (20/80, 50/50, and 80/20) of dredged material and slag fines. The trial embankments are to be trapezoidal in shape, 12 feet high, 12 feet wide, and 50 feet long, with 3 to 1 ramps and 2 to 1 side slopes. Approximately 4,000 cubic yards of dredged material from the Cox Creek DMCF will be used in the embankments. The slag fines will be imported from stockpiles at Sparrows Point where they are generated as a byproduct of the steel making operations. Two types of available slag fines will be evaluated for their performance in the laboratory study with one selected for use in the field demonstration.

The trial embankments will be constructed adjacent to the top rim of the North Cell at Cox Creek so that all precipitation coming in contact with the treated dredged material in the embankments will flow into the North Containment Cell. This runoff will be contained in the Cell along with precipitation that falls directly into the Cell or water that is released from the dredged material periodically placed in the Cell. All water in the Cell is routinely analyzed for contaminants and treated if required before release to the Bay in compliance with an existing permit issued by the Maryland Department of the Environment (MDE). MPA will apply to MDE to modify the existing Cox Creek DMCF permit to allow collection in the Cell of the runoff from the trial embankments. Schnabel Engineering will coordinate directly with MDE to obtain any additional required permits and develop a program to conduct additional required monitoring of the embankments and associated runoff. For example, arsenic and other metal constituents commonly found in sediments from the Baltimore area will be closely monitored to assess their potential for release and migration from the treated dredged material.

Testing of the embankments will include laboratory and field geotechnical testing using protocols approved by the Maryland State Highway Administration (MSHA) and analytical testing to determine the migration potential for metals and organics contained in the treated dredged material. In-place strength testing will be conducted using a cone penetrometer (a standard testing device) immediately after construction and after a period of 360 days. Coring of the embankments will be conducted to collect samples for laboratory geotechnical testing. The results will be compared to construction material criteria from the MSHA to determine suitability of the material for use as engineered fill on highway or other construction projects. The laboratory and field activities to be conducted by Schnabel are scheduled for completion in 18 months.

**Project
Coordination**

The project is being closely coordinated with MPA, MDE, MSHA, and the Maryland Environmental Service (MES), which operates the Cox Creek DMCF. A coordination meeting was held with MSHA on December 9, 2008, regarding their participation and cooperation in the project. A project coordination meeting was held at Cox Creek on January 12, 2009, where Schnabel personnel presented details on proposed activities and MDE personnel discussed permitting issues. Additional coordination meetings will be held periodically over the duration of the project.

For more information, contact Bill Lear at (410) 385-4462.