Development of Port Infrastructure with Contaminated Sediments: Marine Commerce Terminal in New Bedford, Massachusetts

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Background/Objectives. In 2009, the newly formed Massachusetts Clean Energy Center (MassCEC) was tasked with facilitating plans to integrate offshore wind into the Massachusetts energy landscape. One of MassCEC's first tasks was to assess the infrastructure needs that this new industry might have and determine where appropriate and beneficial infrastructure upgrades could facilitate the development of the industry. The result of this assessment was identification of the need for a terminal facility and the Port of New Bedford, Massachusetts was selected as the location. This location would allow the Marine Commerce Terminal (MCT) to be in close proximity to offshore wind development areas along the East Coast and the City viewed the proposed terminal as a pathway to enhancing its economic future through support of the offshore wind industry. The terminal site is directly south of an existing marine terminal facility, and prior to development included areas of upland, intertidal and subtidal land. Due to its industrial history, New Bedford harbor was heavily contaminated with polychlorinated biphenyls (PCBs) after World War II and in 1983 the U.S. Environmental Protection Agency (EPA) designated the harbor as a Superfund site under the Comprehensive Environmental Response, Compensation and Liability Act. The contaminated sediments are underlain by glacial till, glacial outwash and relatively shallow bedrock. The geologic conditions, contaminated sediments, and requirements for a heavy land side lift capacity created challenges that were addressed throughout the design and construction of the MCT.

Approach/Activities. The MCT modified 1,000 lf of existing shoreline, creating a terminal facility comprised of cellular steel cofferdams and pile supported concrete relieving platform with deep-water access and roughly 20 acres of port terminal space engineered to sustain mobile crane and storage loads that rival the highest capacity ports in the nation. The most demanding requirement of the terminal structure is supporting a ground pressure load of 4,100 psf and the maximized reach of fully loaded cranes (500 tonnes at a distance of 30 meters) to operate right up to the offshore edge of the platform and laterally for the entire 1,000 foot length of the newly constructed facility.

A total of approximately 900,000 cubic yards (cy) of materials were dredged to complete the project design, including approach channels to the new marine facility and dredging at the berth adjacent to the new quayside to accommodate the types of vessels anticipated to be serviced by the Terminal. Of that, more than 280,000 cubic yards of sediment was contaminated with levels of PCBs and heavy metals that could not be reutilized within the project and were disposed of in a Confined Aquatic Disposal (CAD) Cell. Dredged materials that were geotechnically suitable were reused within the facility.

Results/Lessons Learned
The project design addressed the unique design criteria in the context of the complexities of the site and in 2016, the MCT in New Bedford, MA was completed and is the first purpose built port facility in the nation designed to support the construction, assembly and deployment of offshore wind projects, as well as handle bulk, break-bulk, container shipping and large specialty marine cargo.