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Design and Construction of the Bermuda South Basin Land Reclamation

Aiden Horan, CEng

Jay Cashman, Inc.

Rian Johnson, PE, SE, P.Eng.

PND Engineers, Inc.

Thursday, March 1, 2018

**Wyndham Boston Beacon Hill
5 Blossom Street, Boston, MA**

**5:30 PM Social/Registration;
6:30 PM Dinner and Program**



This presentation will provide an overview of the Bermuda South Basin Land Reclamation Project. The project is located on Bermuda's West End and created nine acres of new land inside the southeastern corner of the existing breakwater. This reclaimed land acted as the staging area for the 2017 America's Cup event village and provided a viewing area for the races in the nearby Great Sound. The first part of the project involved relocation of approximately 140,000 cubic yards of previously deposited sand onto a shallow plateau to begin the creation of the land. This operation was completed via a clamshell bucket dredge mobilized from the United States. Another 160,000 cubic yards of four-inch minus granite was transported to the site from Canada via self-offloading bulk carrier. The depth of fill material for the new 9 acres ranged from approximately 5 feet to 43 feet in depth. Vibrocompaction was used for deep soil compaction of the fill materials

A new bulkhead was needed to create a new quay wall within the Dockyard's basin. The bulkhead, measuring approximately 1,350 linear feet, was needed on two sides of the land reclamation area. A traditional tied-back combi-wall was initially proposed for the site. However, an Open Cell Sheet Bulkhead was proposed by the contractor and ultimately selected for construction for several reasons. The Open Cell Sheet Bulkhead provided a large cost saving for the owner over the combi-wall method and was able to adapt to the variable geotechnical conditions and support the tall bulkhead height. The design was adapted to both the loose marine sediments and shallow bedrock encountered in the basin. The seawall was constructed over a period of four months and was completed in July 2016 in time to begin staging the America's Cup race.

This presentation provides an overview of the geotechnical considerations for design, the design adaptation to the geotechnical site conditions, and the geotechnical analysis for the bulkhead structure including wall stability, settlement, and deflection measurements. The presentation will also cover the logistical and construction process ranging from dredging, earth moving, pile driving, marine operations and the deep soil compaction method required for the installation of the land reclamation and bulkhead.



Speakers:

Aiden Horan is a project manager with Jay Cashman Inc. He received his bachelor of science in civil engineering from the National University of Ireland, Galway and a master's degree in Geotechnical Engineering from MIT. Mr. Horan has over 10 years civil engineering contracting experience working in Ireland, the UK, Canada, Bermuda and the US on infrastructure projects, tunneling works, marine construction, deep foundations and project delivery. Mr. Horan is a Chartered Engineer (Europe) and has previously been the lead author on technical papers relating to civil engineering contracting and given multiple presentations at industry events on civil engineering contracting and Geotechnical Engineering topics.

Rian Johnson is a senior engineer and principal with PND Engineers. He received a bachelor of science in civil engineering from the University of Washington and followed up with a master's degree in civil engineering from Stanford University with a focus in Design/Construction Integration. Mr. Johnson is a registered professional engineer with 15 years of professional experience working for public agencies and as an engineering consultant. Mr. Johnson has worked on a wide variety of deep foundations and marine infrastructure projects from the Inside Passage of Alaska to the U.S. Gulf Coast. He served as the engineering project manager for the Bermuda South Basin Land Reclamation Bulkhead.

Registration Deadline: Monday, February 26, 2018

\$115 Member, \$145 Non-Member

\$100 Public Sector Member, \$115 Public Sector Non-Member

\$40 Student Member and Senior Member (65+)

Information/Registration:

Register to attend this meeting and pay by credit card online at <http://bit.ly/GIDinnerMeetingMarch2018>. To register online for an event at the BSCES member rate you must login using your BSCES assigned username and password. If you do not know your BSCES member login information call 617/227-5551. You can also register for this event by mail or email. To do so, download and complete a [BSCES Event Registration Form](#) and follow the submission instructions. Cancellations received after Monday, February 26, 2018 and no-shows will be billed.