

## **PROJECT DESCRIPTION:** **Shipyard Structure**

**Morris-Shea Project Component:**  
**Deep Foundation**  
**Patented DeWaal Drilled**  
**Displacement Pile**



# **MORRIS-SHEA**

## Shipyard Structure

### **DDP PERFORMANCE CONCLUSION:**

- REDUCED MATERIAL COSTS
- HIGHER PRODUCTION RATES
- IMPROVED LOAD CAPACITY
- IDEAL IN VARIED SOIL

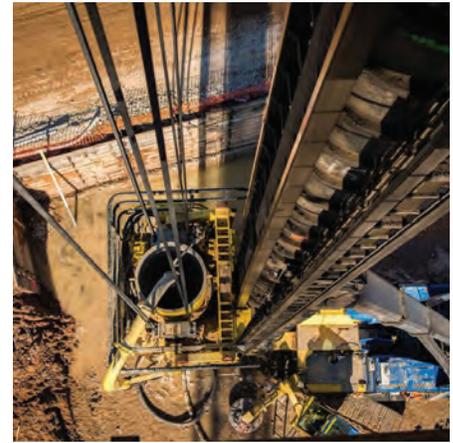
### **ENGINEERED RE-DESIGN:**

The foundation redesign for a shipyard project incorporated high capacity DeWaal Drilled Displacement Piles with a more efficient foundation concrete design, creating savings in the project's cost and schedule. The original plans and specifications called for ~1100 EA 20-inch diameter driven pipe piles, which made for a very expensive foundation and required a long lead time for the delivery of the pipe material. A driven precast concrete pile option was also considered, but had similar cost and schedule disadvantages as well. Morris-Shea's redesign was able to reduce the quantity to 700 DeWaal piles and create a significant reduction in pile cap quantity.



### **FOUNDATION INSTALLATION:**

The DeWaal Pile System is a drilled, full displacement, cast-in-place concrete pile installed by powerful, fixed mast drill rigs capable of applying high rotational torque and crowd forces to the unique DeWaal tool. Installation of this patented system was performed in a safe, simple and rapid single-pass process that densified the soil, improved shaft friction and increased overall pile capacity. The DeWaal Pile was ideal for installation in a jobsite where shallow groundwater and loose to medium-dense soil profiles were found. This field-proven pile eliminated pile driving concerns such as hammer noise and vibration, associated with driven pipe piles. DeWaal piles also eliminated the expense of waste removal.



### **SITE TESTING:**

The load test program demonstrated that DeWaal piles clearly satisfy the project's design requirements while providing significant reductions in cost and schedule compared to the original design. The geotechnical engineer performed the original project investigation and assisted with planning and implementation of Morris-Shea's additional Cone Penetration Tests (CPT) and pile load testing program. Morris-Shea performed 32 CPT soundings across the site with depths ranging from 65 to 100-feet. The CPTs provided an accurate delineation of the subsurface soil conditions and specifically defined the elevation of the dense sand bearing layer. DeWaal piles were installed and load tested in each of the three new large structures onsite. Test pile lengths varied with the fluctuations in depth to the dense sand layer.

### **SUBSURFACE CONDITIONS:**

The jobsite contained highly variable soil conditions. The depth to the dense sand bearing layer fluctuated from 65 to 80-feet below ground surface and often changed rapidly in short distances. Final pile lengths at this site varied as much as 25-feet in the same structure.



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