MORRIS-SHEA BRIDGE CO.,INC.
BIRMINGHAM, ALABAMA

Paper Machine Basement
Albany, GA

Secant Walls • Drilled Shafts • Excavation • Earth Retention • Top-Down Construction

DEEP FOUNDATIONS CONTRACTORS SINCE 1969

CONSTRUCTION PERIOD:
TBD

OWNER:
Procter & Gamble

CLIENT:
Procter & Gamble

STRUCTURAL ENGINEER:
TDB

GEOTECHNICAL ENGINEER:
TBD

SCOPE OF WORK:

Secant Wall *Details?*

750mm Drilled Shafts?

Excavation *Details?*

Summary:

The construction of a new Valmet high speed, state-of-the-art paper machine at Procter & Gamble's Albany, Georgia facility provided an opportunity for Morris-Shea to introduce a revolutionary "top-down" construction method to the US. The key to this approach is the ability to construct below grade excavations at the same time as superstructure erection occurs. This approach was successfully utilized at the Albany facility, resulting in a $30 million savings to the owner. A 6 month schedule reduction was realized, which provided significant interest savings and early startup.

Introduction

The proposed paper machine at Procter & Gamble's Albany facility required a basement to be constructed in addition to a steel framed above grade superstructure. By introducing the idea of a top-down construction method at an early stage of design, Morris-Shea demonstrated the feasibility of construction and advantages of this approach. Upon acceptance of the concept by Procter & Gamble's design team, Morris-Shea performed the design of the basement retaining walls, column supports, and temporary access area required to enable basement excavation. In addition, schedule and sequencing proposals were formulated. A "zero settlement" design criteria was implemented as required by the high-speed paper machine specifications.

Morris-Shea's design and proposed schedule was submitted to the design team and project management for review prior to commencement of work.

Design Concept:

Conventional basement excavation and superstructure construction would typically follow the following steps:

1. Installation of sheet piles or H-piles if a lagging wall is to be used.
2. Excavation to first level of tie- backs.
3. Install tie-backs.
4. Repeat steps 2 and 3 if required.
5. Excavate to bottom of basement.
6. Install foundation piles.
7. Excavate, form and pour pile caps and grade beams.

8. Form and pour walls and columns.
9. Prop, form and pour the operating platform.
At this stage, after suitable curing of the concrete, superstructure erection can begin.

With a top-down approach, however, the basement retaining wall is constructed from existing grade by constructing a secant piled wall. Column shafts are also installed from grade, with the drilled shaft forming the column between the bottom of the basement and the operating platform slab.

The operating platform is also cast on grade, eliminating the requirement to prop and form for an elevated pour. Because the operating slab is constructed prior to basement excavation, it forms a prop for the secant wall, typically eliminating the need for any tie-backs.

An opening is left in the secant wall, as shown above to allow access for excavation.

Upon installation of the secant wall and column shafts, and operating platform, excavation of the basement and superstructure erection can commence simultaneously. Thereby eliminating the slow multi-step procedure associated with conventional construction practice, resulting in cost and schedule savings.

Construction Methods:

Prior to installation of the secant wall shafts, a concrete guide wall is constructed that ensures the correct shaft spacing and intersection. The guide wall can be incorporated as part of the capping beam.

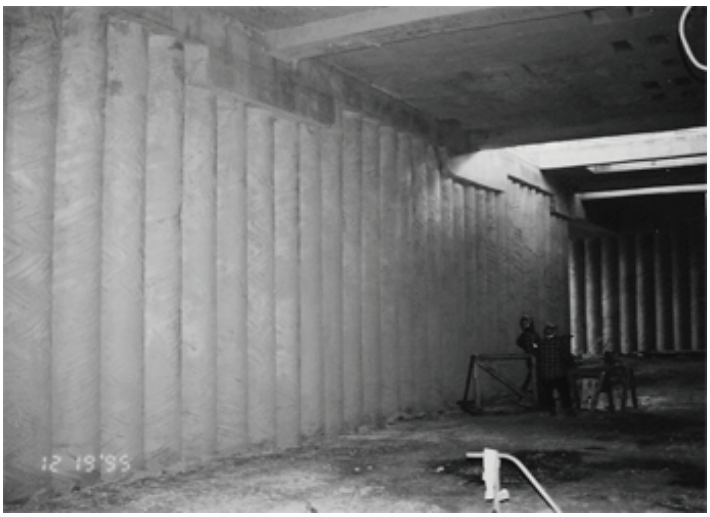
After completion of the guide wall, the installation of the odd numbered unreinforced “female” piles begins (piles 1, 3, 5, 7 etc). After suitable strength gain has been achieved, reinforced “male” piles are installed (piles 2, 4, 6, 8 etc).

Morris-Shea typically uses 880mm diameter shafts at a spacing of approximately 750mm for secant walls. However, diameters can be varied depending on structural requirements. A “cased ahead” shaft construction method is used with an oscillator.[???]

Morris-Shea has performed extensive concrete mix design analysis and field trials to perfect concrete strength gain characteristics.ng casing with a carbide cutting edge. The use of casing facilitates cutting of the female shafts and helps maintain shaft verticality.

Bauer and Delmag fixed mast kelly bar rigs were used for construction of the wall and column shafts, with an assist crane used to install reinforcement cages.

Upon completion of the retaining wall shafts, construction of the basement access ramp can commence. At the same time, superstructure erection can begin.



Columns and the secant wall formed by the drilled shafts can be left as the finished product, or a more aesthetic concrete wall can be formed and poured. In the case of the Albany facility, the shafts were used as the finished product.

Due to the success of the this project, Morris-Shea was contracted to install three additional secant wall basements for P&G paper machines. The second project was adjacent to the first one in Albany, while the other two were located at P&G's Cape Girardeau, MO facility.

More Information:

For more information on the Procter & Gamble Albany Georgia Paper Machine Basement Project, Secant Walls, Drilled Shafts, Earth Retention, Excavation or Top-Down Construction Methods, please contact:

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