

New Bulkhead for an Old Mill

by

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As part of the ongoing repairs to the Van Wyck-Lefferts Tide Mill, located in Puppy Cove, a new timber bulkhead will be constructed around the foundation of the mill this winter. The original bulkhead was constructed in 1983 to protect the stacked stone foundation of the mill.

The mill was constructed on a stone foundation, as an extension of the dam structure. The north and west sides of the structure abut the dam, with the south and east faces exposed to the waters of Huntington Harbor. Tidal waters flood the foundation for about two-thirds of the tidal cycle. The perimeter foundation walls are approximately 4-feet thick at the base and approximately 3-feet thick at the top. The height of the foundation walls are approximately 4-feet high, from the mudline to the underside of the timber sill beams. There are, also, four (4) isolated support piers for the building framing above. Three (3) of the piers are situated along the east-west centerline of the mill. The fourth pier is offset to the south of the centerline, to support the millstone apparatus and former water wheel axle. Each of the piers is approximately 4-feet wide by 5-feet long, and 4 -feet high. They are also constructed of stone.

The stone foundation was constructed with mortar joints, which have eroded over time, resulting in the stone resembling a loose-laid condition. Efforts have been made in the past to re-point the joints with mortar to provide some stability to the stone. The deterioration of the mortar joints has resulted in some damage to the foundation, with stones being displaced from their position. At some time in the past (1930's??), to stabilize the exposed south and east foundation walls, a concrete wall was constructed on the exterior of the foundation, to protect the stone from wave action and ice damage during the winter. However, over the following 40 to 50 years, the salt water deteriorated the concrete encasement. By 1982, the bottom of the concrete had broken off and was resting on the ground, leaving the upper portion hanging off the top of the stone foundation. The weight of the concrete was levering the stones out of position, and had thinned a portion of the south wall to about 1-foot thick.

In 1983, through the Society for the Preservation of Long Island Antiquities (SPLIA), an effort was made to repair/stabilize the foundation so that the mill did not collapse. Due to budget constraints, a full repair could not be done. The main effort was to repair severely damaged areas, and protect and stabilize the foundation until future repairs could be effected. The work performed in 1983 consisted of removing the remainder of the concrete from the south and east faces; reconstructing a part of the south foundation wall by replacing the stone and mortar; and constructing a timber bulkhead around the south and east sides of the foundation, to protect it from wave and ice damage. The interstitial space between the stone foundation and timber bulkhead was filled with crushed stone, so as to impart uniform vertical support to the stone foundation walls. At the time, it was anticipated that the bulkhead would be needed for 25-30 years before proper repairs could be accomplished.

The construction of the bulkhead consisted of vertical posts driven into the harbor bottom; horizontal walers at the top, middle, and bottom of the posts, vertical timber sheeting behind the walers, and ¾-inch diameter tie-rods drilled through the stone foundation connecting to timber chocks on the interior of the stone foundation wall. The bulkhead was constructed approximately 30-inches in front of the stone foundation. The space between the bulkhead and foundation wall was then filled with 1-inch nominal crushed bluestone.

A large section of concrete was left in place, at the opening through the foundation where the water wheel used to be, at the southwest corner of the mill. This concrete was in good condition at the time, and was securely encased around the exterior and interior of the foundation. It was felt that this concrete was providing effective protection of the foundation, and that removing the concrete could destabilize the stone foundation. Also, the cost of this removal, and subsequent additional bulkheading, was not in the allotted budget.

Based upon an engineering inspection performed in February 2020, the bulkhead has performed well, providing effective protection of the foundation from ice and tidal damage. Comparison of photos from 1984 and 2020 show little change to the repaired stone foundation. However, the bulkhead is in poor condition. The life expectancy of a timber bulkhead is in the range of 35-45 years, depending upon its environmental exposure. The bulkhead is approaching the 40-year mark and it is seriously deteriorated. The timbers are rotted, and bolts are rusted.



Deteriorated concrete encasement - 1983



South facing bulkhead – 2020



East-facing bulkhead - 2020

The engineering assessment of 2020 determined that the bulkhead structure should be retained as a permanent barrier to provide protection of the foundation into the future, as it had provided good protection since it had been installed. It was recommended that the bulkhead be replaced as soon as funds were available. Plans were drawn up for the new bulkhead. It was determined that removal of the existing bulkhead would allow the crushed stone fill to spill out onto the harbor bottom, as there is no way to adequately remove the crushed stone without damaging the bulkhead. This was detrimental to the site and ran counter to NYSDEC protocols. It was decided to keep the existing bulkhead and install the new bulkhead directly in front of the existing. The new bulkhead will, again, be a timber structure, as it fits the aesthetics of the site and mill structure. A steel sheet bulkhead was considered, which would have a life expectancy of about 80 years. However, the NYSDEC was not amenable to that proposal. Besides, the look of the steel would be very industrial, which would be out-of-place in that setting.

With plans and approvals in hand, the Van Wyck-Lefferts Tide Mill Sanctuary, Inc., board of directors applied to the Robert David Lion Gardiner Foundation for a matching grant to allow for construction of the new bulkhead. The grant was approved, and a contractor has been engaged to perform the installation. Given the mill touring season from June through October, and wildlife considerations of the adjacent mill pond sanctuary, the bulkhead work will begin in late January this year and should take about 4-6 weeks to complete, depending upon weather conditions.