

MARINA and SHORELINE CONDITION SURVEY

**Fishing Creek Farm
Anne Arundel County, Maryland**

**PREPARED FOR:
Fishing Creek Farm HOA
1228 Cherry Tree Lane
Annapolis, Maryland 21403**

September 26, 2012

**ANDREWS, MILLER AND ASSOCIATES
A Division of Davis, Bowen & Friedel, Inc.
106 N. Washington Street
Easton, Maryland 21601**

AMA/DBF 2307A001.001



Andrews, Miller & Associates

A DIVISION OF DAVIS, BOWEN & FRIEDEL, INC.

ARCHITECTS ENGINEERS SURVEYORS

Edward T. Fullord, P.E.
Oner Yucel, P.E.
Eric W. Tolley Prop. L.S.

September 26, 2012

Mr. Eamonn McGeady
Fishing Creek Farm
C/o Mr. Eamonn McGeady
11710 Beltsville Drive, Suite 105
Beltsville, MD 20705

RE Fishing Creek Farm
AMA/DBF #2307A001.001

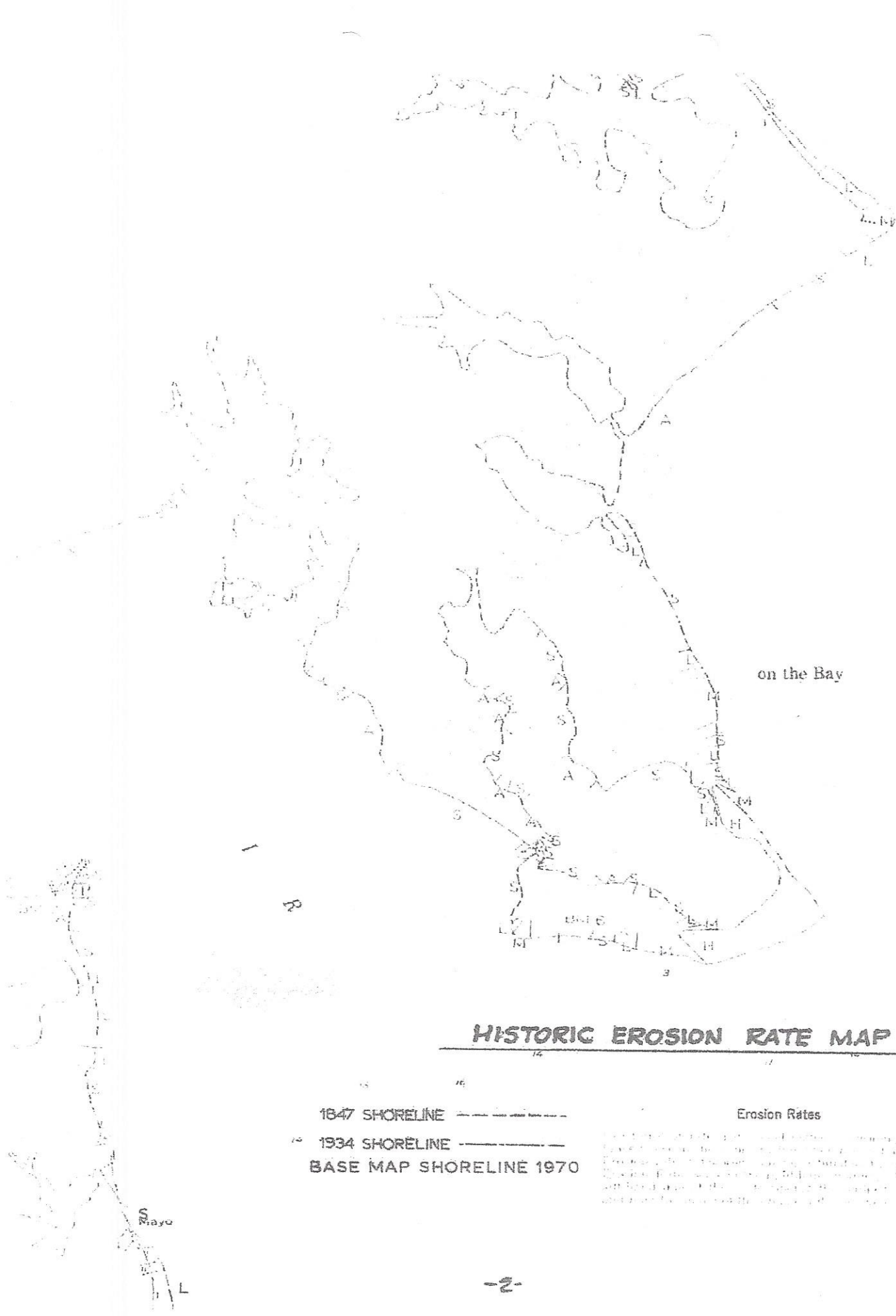
Dear Mr. McGeady:

On Thursday afternoon, September 6, 2012 during a low tide, you and I walked and observed areas along Fishing Creek Farm HOA's (FCF) shoreline. A very limited reconnaissance level site investigation (duration about 2 hours) of the marina and boat ramp areas and selected sites along the development's shoreline was performed at that time. The entire shoreline was not investigated due to the lack of budget and time available during our meeting. You indicated that "Record Drawing" of the various shoreline improvements were not readily available. The following is a summary of items observed and discussed during our meeting. Also included are budgetary unit prices for recommended improvements to the existing shoreline and marine structures and potentially future shore erosion control measures

The "Historic Erosion Rate Map" shown in Figure 1 compares FCF's shoreline between 1847 and 1970. Generally the shoreline has migrated landward generally <2' per year (classified as 'slight'). However, at the confluence of Cherrytree Cove's northerly shoreline at the point fronting on South River, the erosion historically has varied from slight to Low (2' to 4') to Moderate (4' to 8').

On October 1, 2008, the "Living Shoreline Protection Act of 2008 took effect in Maryland mandating that *"Improvements to protect a person's property against erosion shall consist of nonstructural shoreline stabilization measures that preserve the natural environment, such as marsh creation"*. Exceptions to this State mandate include: 1) *"In areas designated by Department mapping as appropriate for structural shoreline stabilization measures, and 2) In areas where the person can demonstrate to the Department's satisfaction that such measures are not feasible, including areas of excessive erosion, areas subject to heavy tides, and areas too narrow for effective use of nonstructural shoreline stabilization measures"*. Mapping by MDE has not been developed as of the writing of this letter report.

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on the Bay

HISTORIC EROSION RATE MAP

1847 SHORELINE - - - - -
 1934 SHORELINE ————
 BASE MAP SHORELINE ······

Erosion Rates

The erosion rates shown on this map were calculated by comparing the 1847 shoreline with the 1934 shoreline and the 1934 shoreline with the 1970 shoreline. The erosion rates were calculated by dividing the distance between the shorelines by the number of years between the shorelines. The erosion rates were calculated in feet per year.

A plan showing the existing improvements along the Development's 2½ miles of shoreline is shown in Figure 2. Note that the majority of the shoreline is generally positioned within the relatively protected water bodies of Duvall Creek and Cherrytree Cove. However, the shoreline fronting on South River is exposed to long off-shore fetches which can potentially generate wave conditions causing significant erosion of the shoreline. It is AMA/DBF's opinion that South River's >5 mile fetch from the south and 2 mile fetch from the west create excessive erosive conditions where a nonstructural shoreline stabilization project is not feasible. AMA/DBF recommends structural improvements at these locations (i.e.: stone revetment).

The condition survey is divided as follows:

BOAT RAMP AREA: The existing single lane, concrete surfaced boat ramp and courtesy piers (Photo 1) appeared to be in good condition except for twisting and warping of the pier's deck planks. Although the ramp has a shallow toe (about -2' MLW) and the courtesy piers are constructed from relatively small sized piles and lumber, it is AMA/DBF's opinion that the boat ramp facility (except for deck replacement) has >15 years of life remaining before significant improvements are needed. The decking or portions thereof should be replaced within the next five years at an estimated cost of \$30 to \$35/ LF. A "home-made" style hinged timber gangway resting on floating pontoons is located at the waterward end of the easterly courtesy pier allowing access to the water for persons launching canoes and kayaks. Since the gangway articulates constantly with the tides and boat wakes, regular maintenance should be provided to ensure its continued safe use.

A low profile dumped riprap sill extends from both sides of the boat ramp along the mean low water line paralleling the shoreline (Photo 2 and 3). A narrow ban of wetland vegetation provides a protective buffer between the sill and the vertical bank at the road.

SHORELINE AT BOAT RAMP / MARINA AREAS: Wetland vegetation provides limited protection to the vertical banks located landward of the boat ramp (Photo 3) and marina areas (Photo 4 and 5). Drain outlets encased in stone filled gabion baskets are located at two separate areas along the shore. Scattered areas of the shoreline are void of wetland vegetation thereby exposing several sections of the vertical bank to erosive wave action (Photo 6). It is AMA/DBF's opinion that at a minimum, *Spartina alterniflora* should be sprigged between the mid and high tide lines at these areas (\$0.70/sf to \$0.85/sf). If funding allows, the sprigging should be supplemented with construction of a low profile revetment (Figure 3) located landward of the vegetation along the vertical bank scarp at an additional estimated cost of \$150 to \$250/ft. Alternately, a formal living shoreline consisting of a low profile stone sill and 20' to 30' width of

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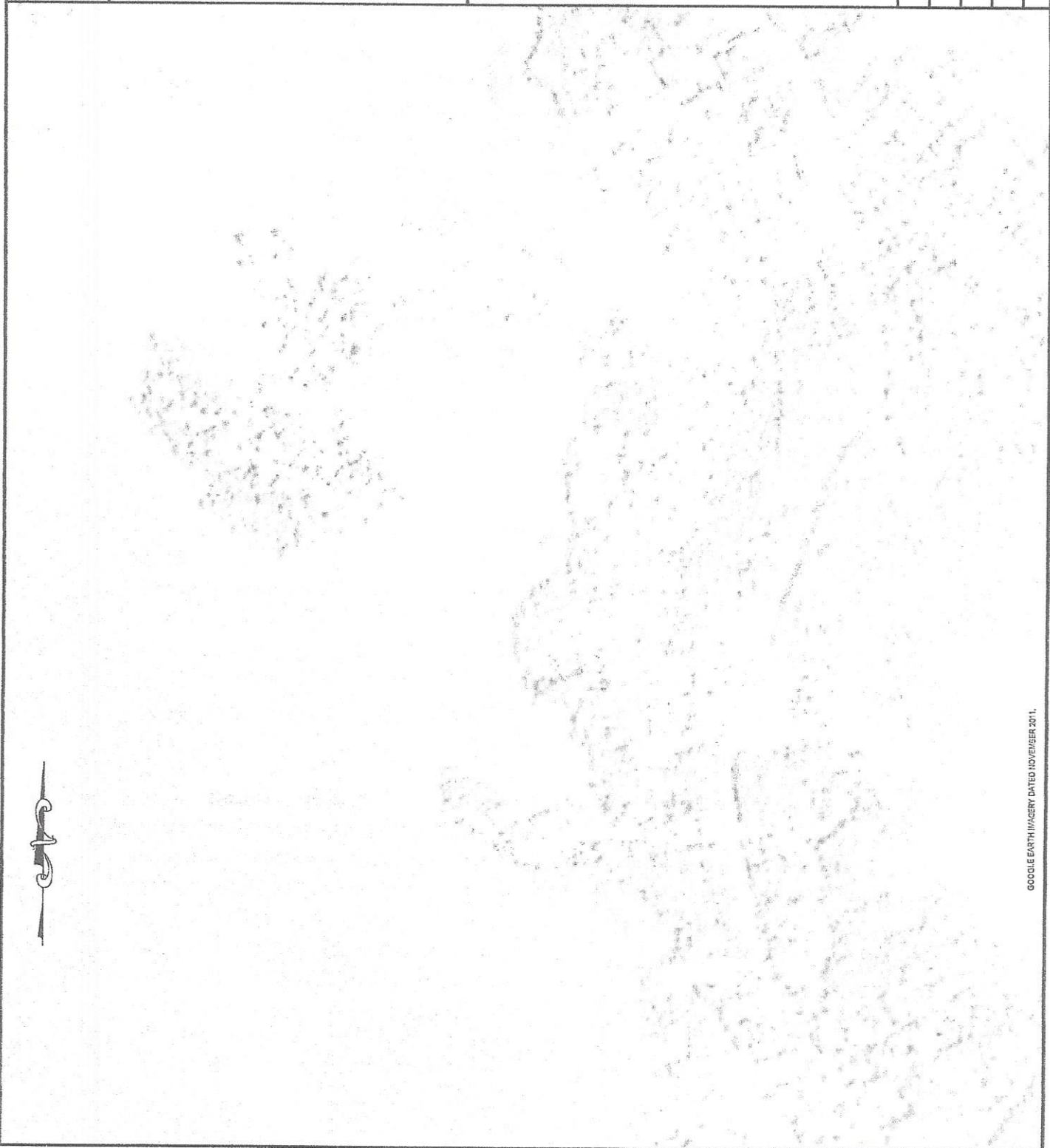


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ANNE ARUNDEL COUNTY, MARYLAND

**EXISTING CONDITION SURVEY
 - PLAN -
 FISHING CREEK FARMS**

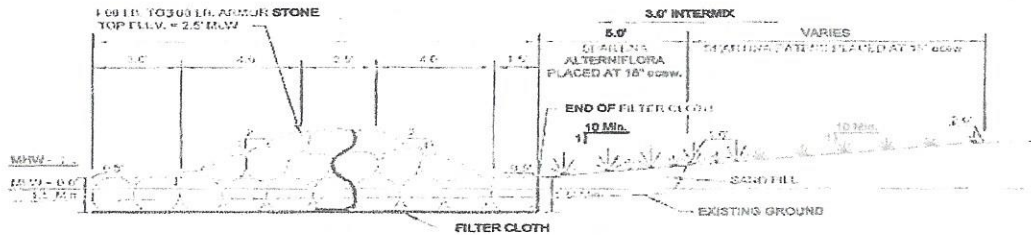
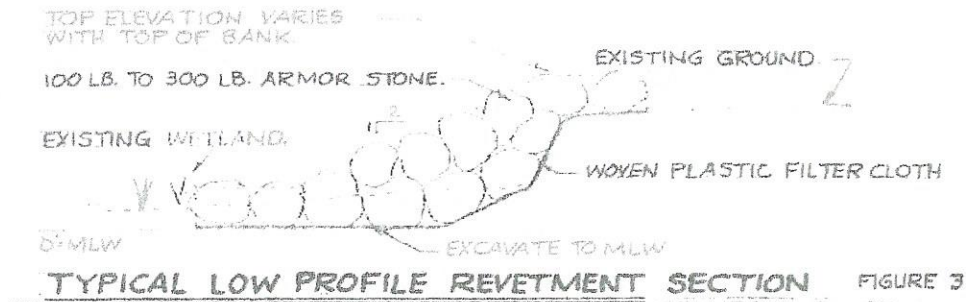
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SCALE	1" = 300'
PROJECT NO.	2307A001.001
FIGURE 2	



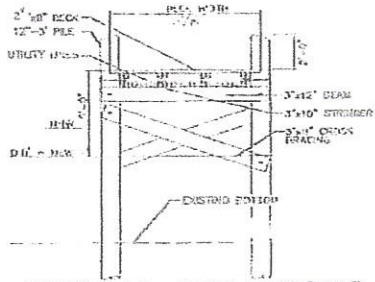
GOOGLE EARTH IMAGERY DATED NOVEMBER 2011.



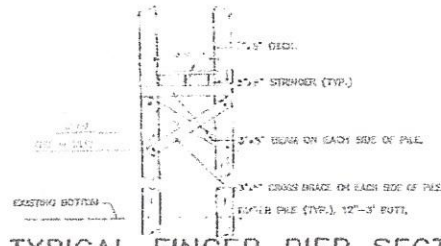
Spartina alterniflora and *Spartina patens* sprigged into imported sand fill (Figure 4) should be constructed at an estimated cost of \$390 to \$460/ft. Except for sprigging wetland vegetation into the existing ground; environmental approvals are required prior to any construction activities.



MARINA: The existing community marina is a fixed timber pier facility. Amenities include water, electric and sewage pumpout (Photo 7) services for the 42 slip (including 3 transient slips) facility (Photo 8). Eight feet of water provides deep water access to the slips. Boat lifts within several of the slips are the responsibility of individual slip users (boat lift, additional support piles, maintenance, etc). Except for a damaged finger pier (boat uplifted end of pier) located at the westerly end of the marina and twisted and warped deck planks, it is AMA/DBF's opinion that the collector pier, finger piers and mooring piles have >15 years of life remaining before significant structural improvements are needed. The estimated cost for replacement of the collector pier (Figure 5) is \$400 to \$450/ LF, replacement of the finger piers (Figure 6) is \$7K to \$8K each, and replacement of the mooring piles is \$700 to \$900 each, all as shown in Table 1.



TYPICAL COLLECTOR PIER SECTION FIGURE 5



TYPICAL FINGER PIER SECTION FIGURE 6

TABLE 1

**OPINION OF PROBABLE CONSTRUCTION COSTS
SCHEMATIC LEVEL**

BOAT RAMP

New Ramp Complete: \$90K to \$110K
 New Courtesy Pier: \$300 to \$350/ LF.
 Re-deck Pier: \$30 to \$35/ LF.

SHORELINE LANDWARD MARINA & RAMP

Formal "Living Shoreline" Complete: \$390 to \$460/ LF.
 Stone Sill Only: \$280 to \$340/ LF
 Low Profile Revetment Only: \$150 to \$250/ LF
 Wetland Grasses Only: \$0.70 to \$0.85/ plant site

MARINA

Marina Complete (42 slips): \$850K to \$950K (excluding boat house)
 Collector Pier (8' wide): \$400 to \$450/ LF
 Finger Pier: \$7K to \$8K each
 Mooring Pile: \$700 to \$900 each
 Re-deck Collector Pier: \$40 to \$45/ LF
 Water System Only Complete: \$23 to \$27/ LF
 Replace Capboard: \$8 to \$9/ LF
 Repair Sump Areas: \$2K to \$4K/ sump
 Electric System Only Complete: \$5K to \$6K/ slip
 Fire Suppression Only Complete: \$30 to \$35/ LF
 Boat House Replacement: \$150K to \$200K

BULKHEAD @ ROAD

New Bulkhead Complete: \$900 to \$1200/ LF

SOUTHERLY END CHERRYTREE LANE

Stone Revetment: \$500 to \$600/ LF

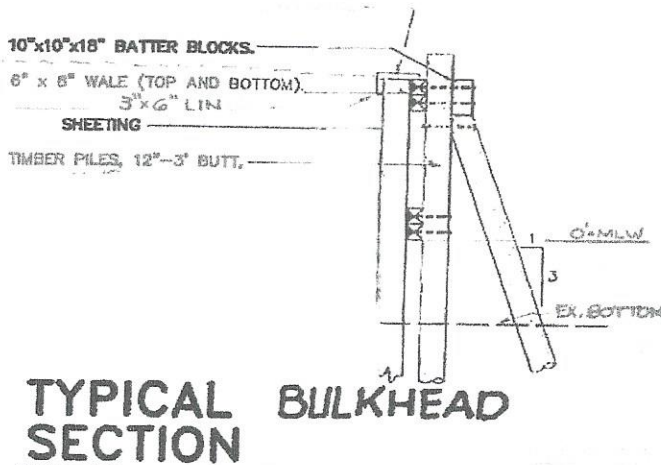
ELEVATED WALKWAY with RAILS

Walkway Complete: \$600 to \$700/ LF
 Re-deck (6' wide): \$30 to \$40/ LF.

Although the elevation of the collector pier allow the utilities to be positioned above the still-water level during normal storm events, the wet environment and occasional inundation during severe storm events will accelerate the need for replacing the utilities. It is AMA/DBF's opinion that replacement or significant improvements to the utilities could be required within the next 10-15 years, particularly with significant storm events associated with extreme high tides becoming more frequent. The estimated cost for total replacement of the utilities is shown in Table 1.

The existing boat house located at the landward end of the marina's collector pier is in a general state of disrepair. Windows to the boathouse are broken, the electrical service is questionable and the foundation piles appear to be reaching the end of their serviceable life (Photo "Boathouse"). It is AMA/DBF's opinion that the boat house will need significant improvements or total replacement within the next 5 to 10 years at an estimated cost of \$150K to \$200K.

BULKHEADED SHOULDER ALONG CHERRYTREE LANE: Approximately ¼ mile east of the Clubhouse along the northerly shoulder of Cherrytree Lane, a timber bulkhead (+/- 240 L.F.) protects the paved roadway against erosion from tidal waters of Duvall Creek (Photo 9). The batter pile supported bulkhead appears to be in generally good condition except for twisted and warped timber capboards and evidence of minor soil leakage (Photo 10) at several locations. It appears that the existing structure had previously replaced an older bulkhead. Decayed anchor rods (>1" dia.) extend landward through the existing T&G sheeting from the existing bulkhead's vertical pile. AMA/DBF theorizes that this rod is attached to the earlier bulkhead's buried anchor piles thereby creating a redundant anchorage system. It is AMA/DBF's opinion that the existing timber bulkhead has >15 years of life remaining before significant improvements are needed; however, if replaced (Figure 7), the estimated cost would be from \$900 to \$1200/LF.



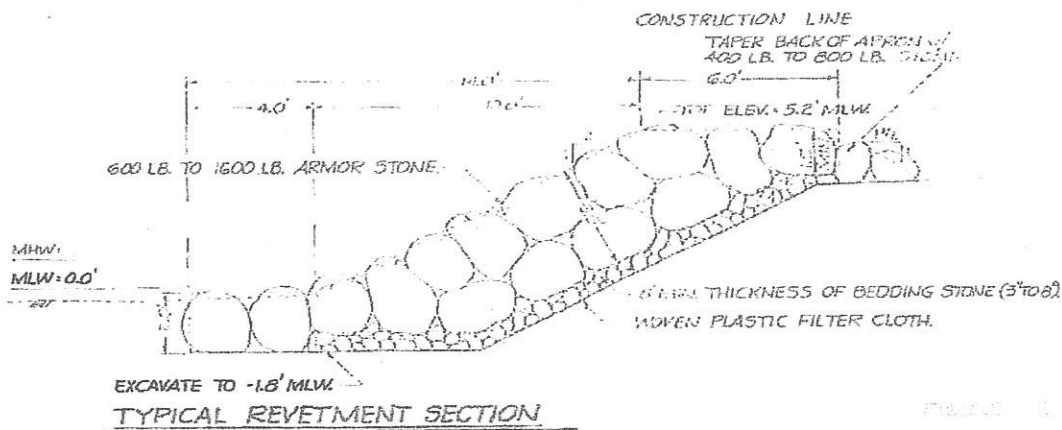
AMA/DBF recommends that the capboard be replaced and the sump areas be repaired when funding becomes available. The estimated cost for these improvements is on the order of \$4K to \$8K.

SOUTHERLY TERMINAL END OF CHERRYTREE LANE:

According to discussions during our meeting, the property owner at the end of

Cherrytree Lane constructed the existing timber bulkhead located at the end of the right-of-way. A stone revetment with splash apron provides protection against erosion west of the bulkhead (Photo 11). The revetment appears to be in generally good condition although debris litters the top of the structure (Photo 12). Unlike timber bulkheads which rot after years of service and could ultimately have a catastrophic failure if not maintained, stone revetments do not rot. Correctly designed and constructed stone revetments typically require maintenance only after severe storm events that exceed the design level of the structure and then typically only requiring repositioning of displaced armor stone units. It is AMA/DBF's opinion that the existing stone revetment has >15 years of life remaining before significant maintenance/ improvements may be needed.

Time during our visit did not allow investigating the shoreline located west of the existing revetment. However, according to the "Historic Erosion Rate Map" (Figure 1) and aerial photographs showing fallen trees along the shore, this area is actively experiencing erosion. No upland improvements at the site are endangered by erosion. It is AMA/DBF's opinion that construction of a "Living Shoreline" at this location would not be appropriate due to wave conditions generated by the >5 mile fetch. In the event FCF elects to prevent the continuing erosion of the shoreline at this location, AMA/DBF recommends construction of a stone revetment (Figure 8) at a cost on the order of \$500 to \$600/ ft.



ELEVATED WALKWAY: Time did not allow for an investigation of the elevated walkway (Photo 13) leading to the sand spit located at the southerly entrance into Cherrytree Cove. Typically, a timber pier's/ walkway's life expectancy is between 25 to 35 years before significant rehabilitation or total replacement of the structure is required, provided the structure was properly designed and constructed. This time obviously varies depending upon the maintenance performed on the structure, the quality of materials used, the experience/workmanship of the Contractor who performed the work, changes in the site condition (i.e.: greater depth of water at the pier/ walkway, heavier loading exerted on the structure than originally designed, etc.). You indicated during our meeting that the existing walkway was very labor intensive to construct. In the event the elevated walkway needs to be reconstructed in the near future, AMA/DBF estimates that the cost for construction would be on the order of \$600 to \$700/ LF.

The proceeding is a generalized summary of the findings noted during my brief visit on September 6th. Structure's life expectancy referenced in this report are based upon conditions

observed by AMA/DBF during this very brief visit. Timing for improvements to the structures could change as the structures continue to age and deteriorate. Regular scheduled monitoring of the shoreline's condition should be implemented to ensure that shoreline improvements are functioning as intended. The plans and sections included within this report are schematic only at this time.

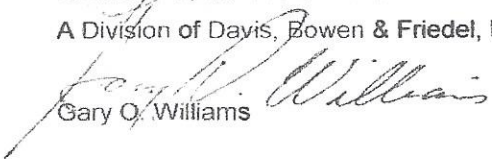
Further, the "Recommendations" and the "Opinion of Probable Cost" presented are based upon AMA/DBF's experience and represents our best judgment as experienced and qualified professional engineers familiar with the marine construction industry. However, we cannot and do not guarantee that proposals, bids or actual project or construction costs submitted and/or performed by the Contractors will not vary from the Opinion of Probable Costs specified.

I trust that this letter report is sufficient for your intended purposes. Should you have any questions upon reviewing this report, please feel free to give me a call.

Very truly yours,

ANDREWS, MILLER and ASSOCIATES

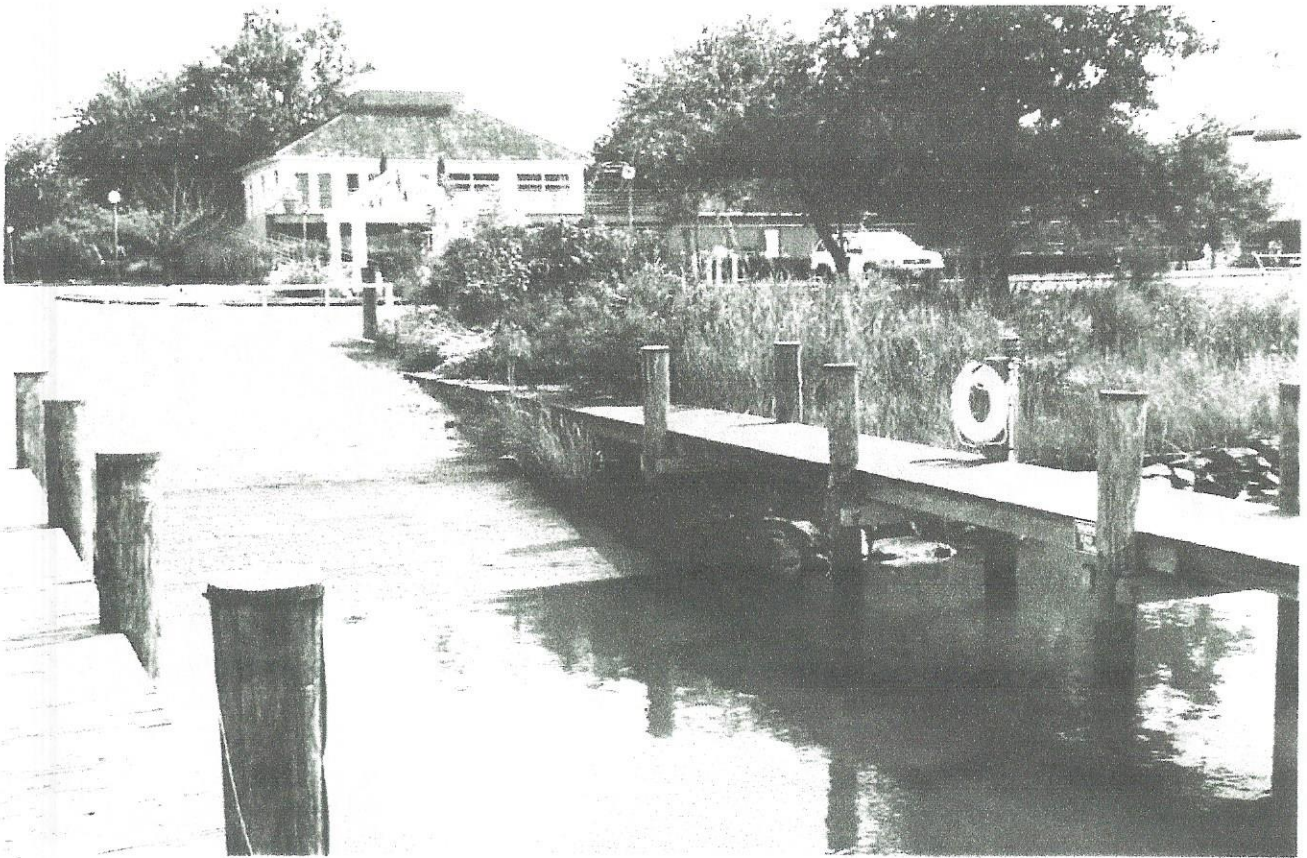
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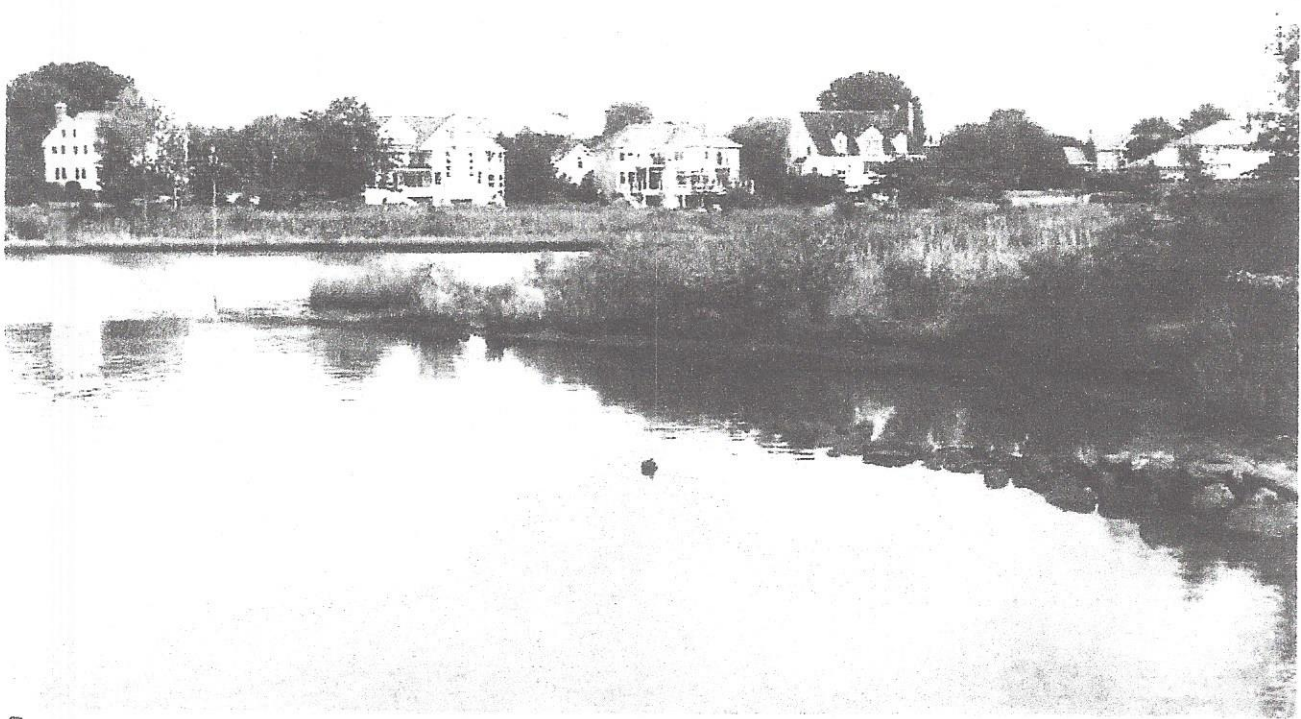

Gary O. Williams

Enclosures
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APPENDIX 1

Photographs





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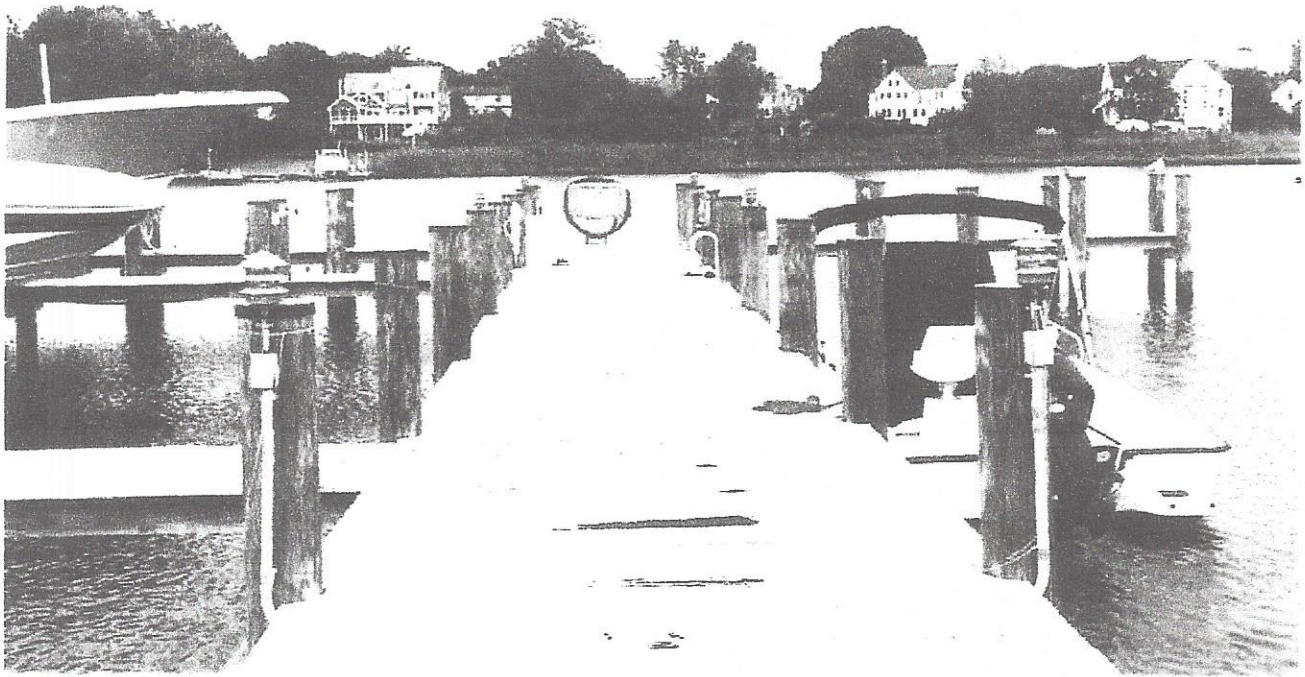
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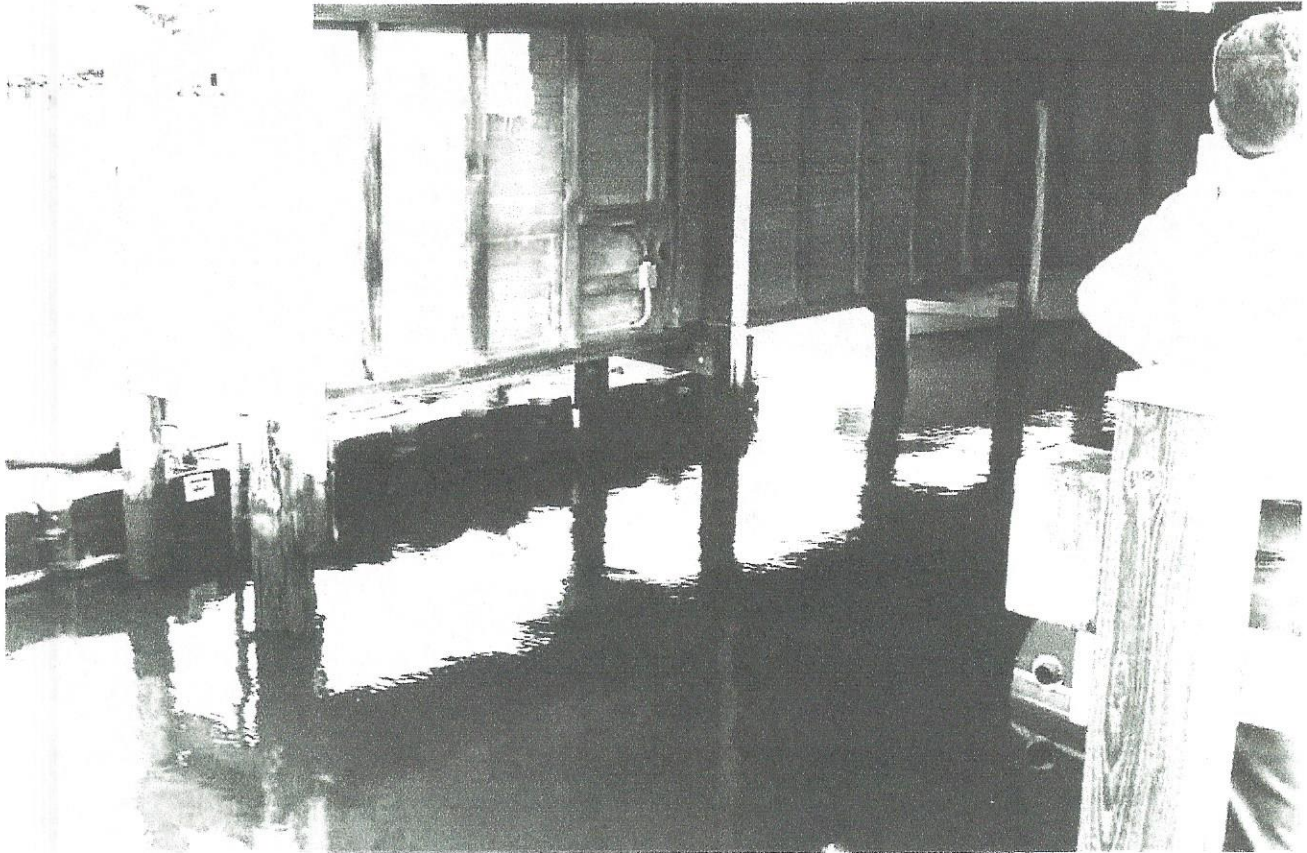


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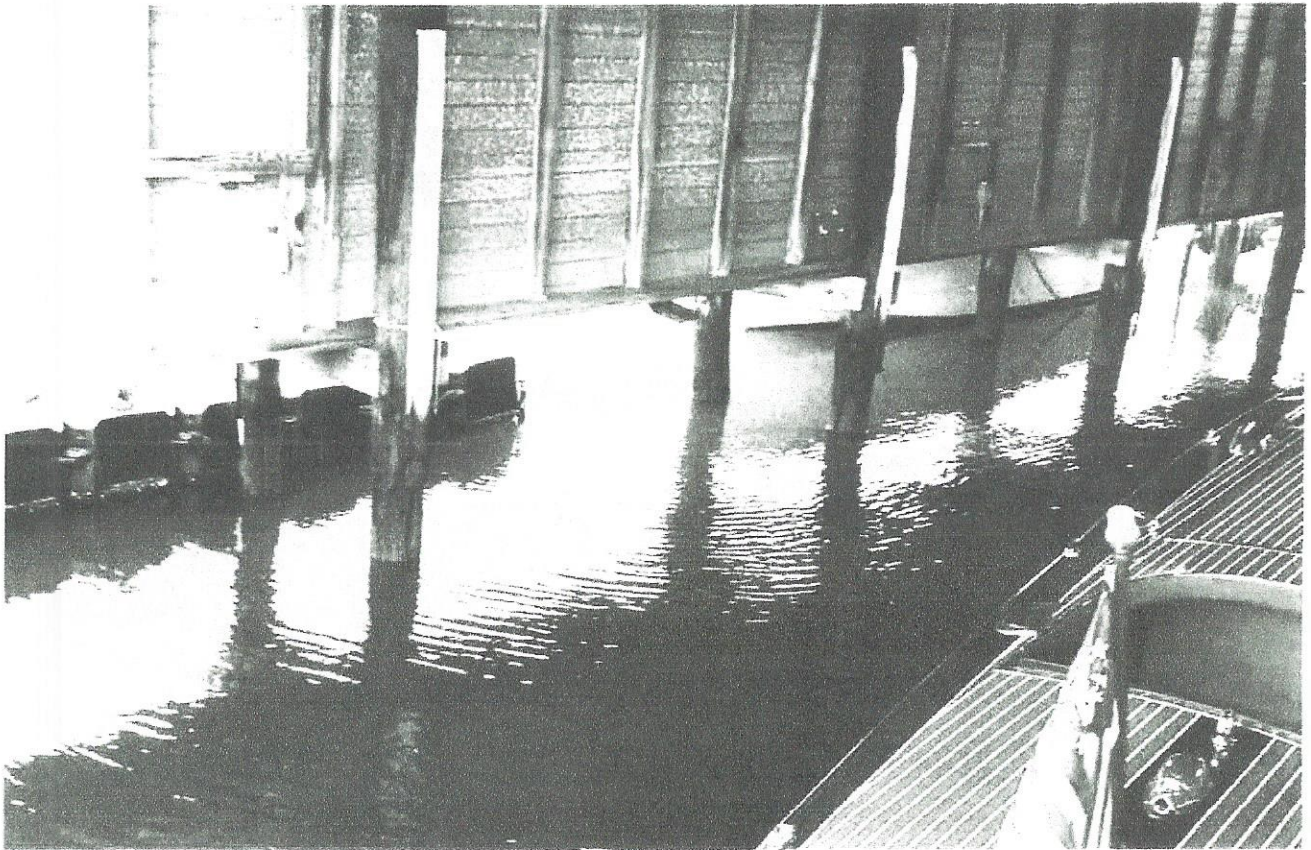


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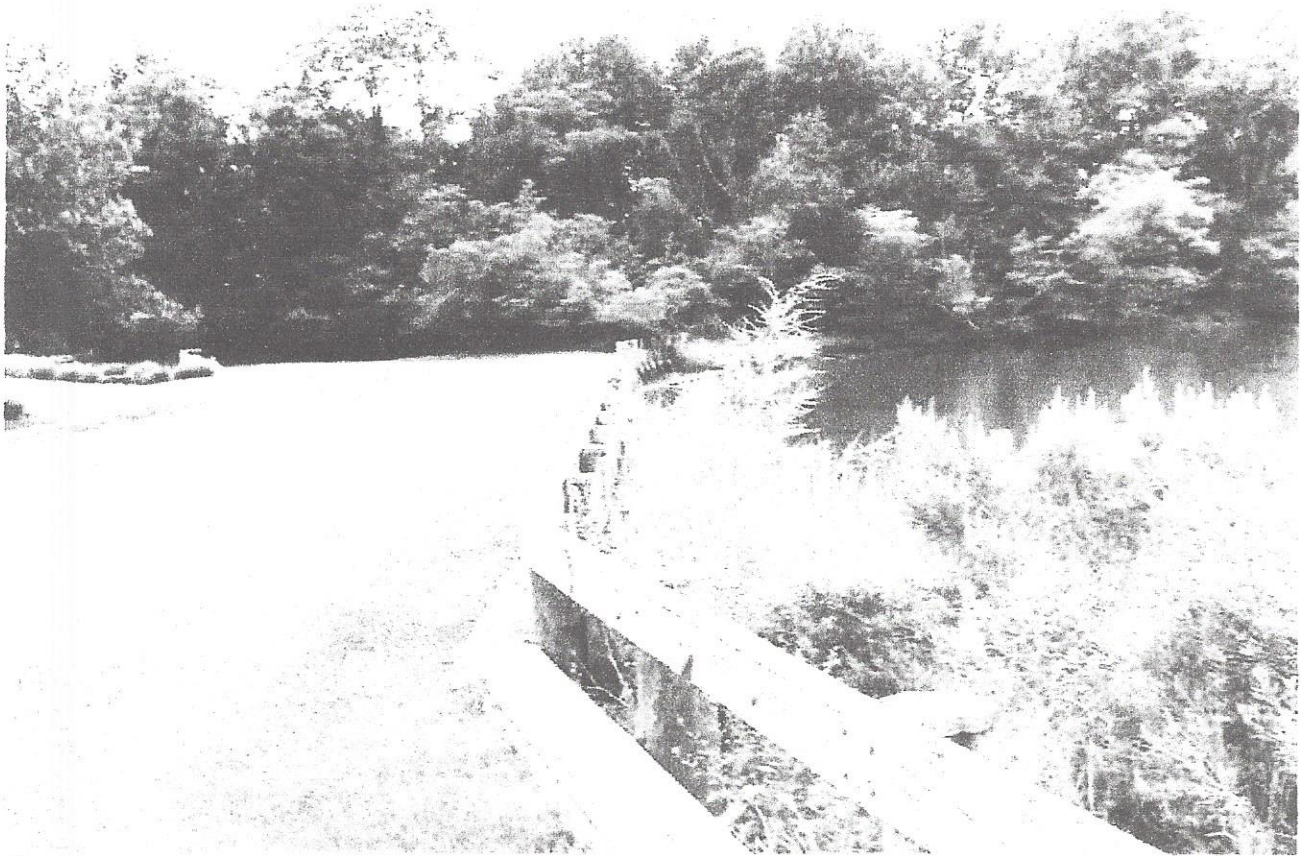




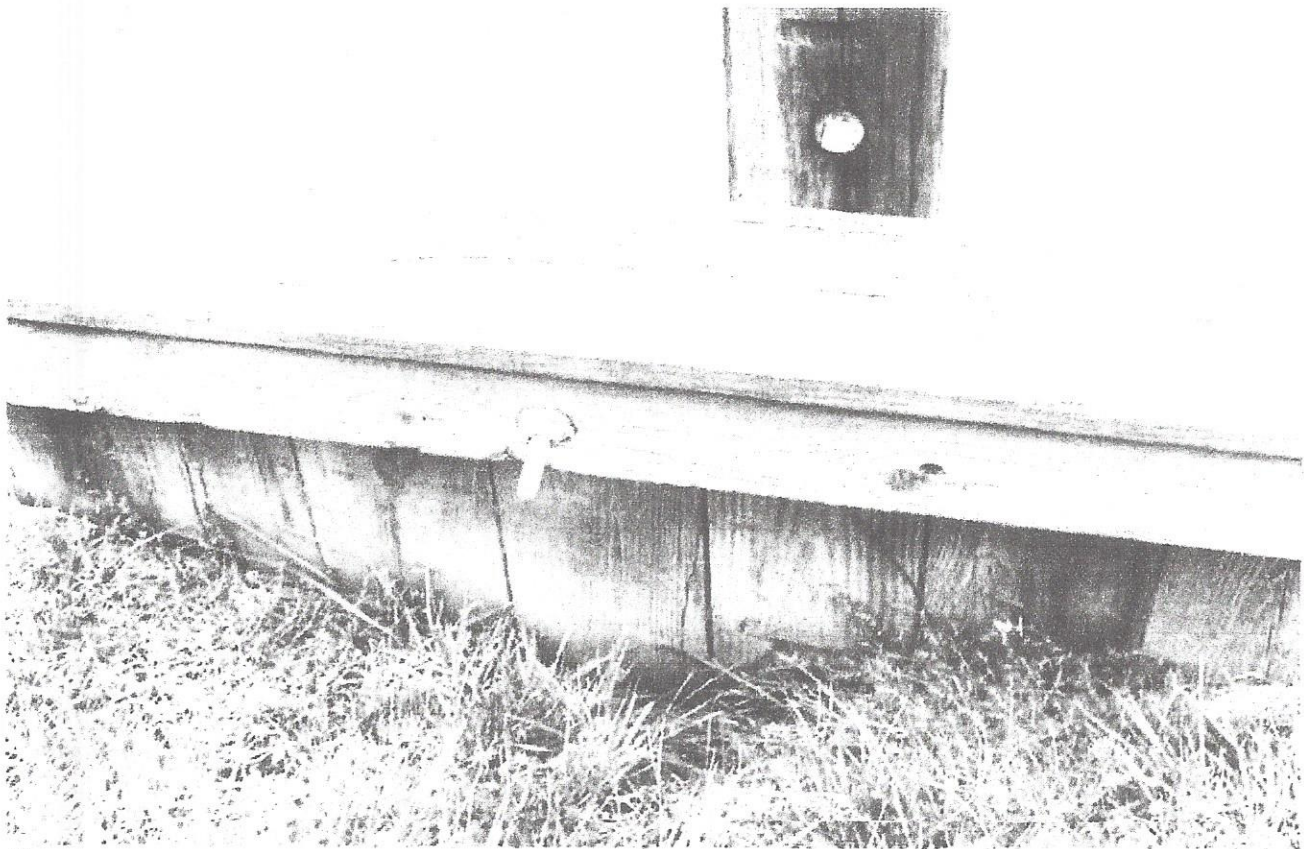
BOAT HOUSE



BOAT HOUSE



9



10



11



12

