ABOVE WATER AND UNDERWATER INSPECTION OF FOUNDATION AND CONCRETE BASE

NEW LONDON LEDGE LIGHTHOUSE NEW LONDON, CT.

AUGUST 2010



By:

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EXECUTIVE SUMMARY

On June 9, 2010, Appledore Marine Engineering, Inc. (AMEI) completed an above and underwater inspection of the Concrete Base and Boarding Platform for New London Ledge Lighthouse located in New London, CT. The objective of the inspection was to assess the structural integrity of the foundation system.

The inspected components of the lighthouse included the following:

1. The original vintage (circa 1909) concrete base.
2. The circa 1939 sheet pile Boarding Platform.

Overall the Lighthouse foundation system is in Poor condition. The findings are summarized as follows:

1. The original Concrete Base is in Fair condition. Observations include:
    a. Widespread concrete scaling exists on the exterior Concrete Base walls.
2. The Boarding Platform is in Serious condition. Observations Include:
    a. Widespread steel sheet corrosion holes exist at mean low water (MLW).
    b. The anchor bolts and band plate for the sheeting exhibit widespread severe corrosion.
    c. The concrete cap, fender system and mooring hardware are all in Serious condition.

Archive records indicate the lighthouse is founded on an approximately 33’ high timber crib of which the outer 8 feet was filled with concrete and contains an inner core consisting of riprap and gravel. This original Crib Foundation is the main structural support for the lighthouse. None of the crib elements are accessible or visible as they are completely covered by the Boarding Platform. Archive information indicates that the Boarding Platform was constructed approximately 30 years after the original Crib Foundation construction to repair deteriorated concrete and timber members. Archive construction details for the Crib and the Boarding Platform are lacking in specifics. This lack of information, combined with the Cribs inaccessibility, makes assessment of its condition difficult.

The Boarding Platform is believed to be a structural element of the lighthouse foundation as it appears to have been constructed to arrest deterioration to the concrete and timber crib elements as well as providing a berthing area for vessels. At the time of the inspection no settlement, rotation or differential movement was observed in the lighthouse structure which indicates that the original Crib Foundation is currently stable. However, given the Serious condition of the Boarding Platform it can no longer provide protective encapsulation to the original Crib Foundation and deterioration is expected to progress on Crib Foundation elements eventually leading to a foundation failure.

Formal recommendations for repairs are beyond the scope for this study; however, we were asked to comment on possible repair solutions. Our recommendation for a repair to the Boarding Platform is to construct new sheeting outside of the existing sheeting and tie that to the Concrete Base. This repair is expected to be in the range of $1.5 million dollars.

The scaling concrete along the exterior of the base is more of a cosmetic concern than structural issue and should be addressed by removing loose concrete and replacing it with a new surface layer of concrete. No cost is provided for this repair as it will vary greatly depending on the exact nature of the repair specified.

Findings from this inspection are believed to be reasonably representative of the condition of the Lighthouses' foundation; however, a full design level inspection is required for a detailed structural evaluation, cost estimate and design of repairs.

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OVERVIEW

On June 9, 2010, Appledore Marine Engineering, Inc. (AMEI) completed an above and underwater inspection of the Concrete Base and Boarding Platform for New London Ledge Lighthouse located in New London, CT. The objective of the inspection was to assess the structural integrity of the lighthouses foundation system.

FACILITY DESCRIPTION

Construction on the lighthouse was completed in 1909. Relevant portions of the original design plans are attached in Appendix D. The lighthouse is founded on a timber crib. It is believed the crib was constructed of timber and steel fasteners/framing and was towed to the site and filled with gravel, riprap and concrete. The cribs overall dimension is 52' x 52' and was approximately 33' feet tall. Archive records indicate the outer 8' of the crib was filled with concrete that contained two bands of reinforcing. The concrete is reported to have been poured directly on bedrock. The inner portions of the crib were believed to be filled with rip rap and gravel.

The crib supports a Concrete Base. Archive information suggests the base is approximately 52' x 52' x 18' high. Details on reinforcing for the base along with how it is connected to the Crib Foundation were not available.

In approximately 1939 a steel sheet pile Boarding Platform was added around the Concrete Base and Crib Foundation. Archive records suggest the Platform structure was constructed to repair the cracked and spalled concrete Crib wall and timber elements. The steel sheets extend into rip rap along the perimeter at mud line. On the surface they terminate approximately at 3.5' above MHW. The steel sheets are flat plates and are located approximately 2.5' off the concrete base sidewalls. The space between the Concrete Base/Crib Wall and the steel sheeting has been filled with concrete and the sheets have a 9" thick concrete slab as a cap that is approximately 3' wide. The typical section shown in the Southwest Elevation/Section is from archive information.

INSPECTION METHODOLOGY

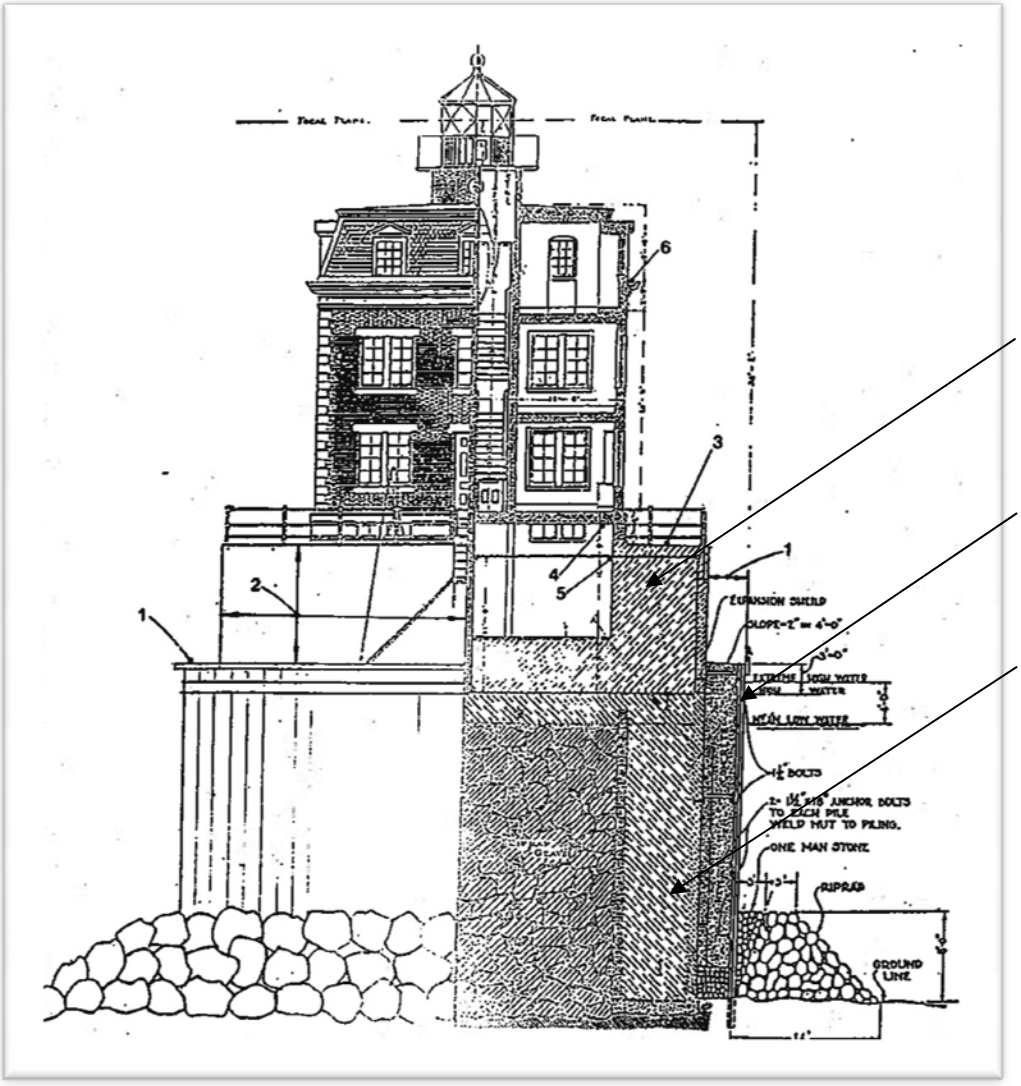
Access to the lighthouse was provided by Mr. Brae Rafferty through a vessel furnished by Project Oceanology.

The inspection consisted of general underwater observations of the steel sheet pile and above-water inspection of the concrete base. The underwater inspection was based on Level I techniques utilizing a four-man dive crew. The inspection included tactile and visual methods. Approximately 5% of the sheeting was cleaned to allow for more detailed observations (Level II investigation). Portions of the steel sheets were randomly selected for ultrasonic thickness measurements to assess the extent of corrosion. The findings from these investigations are detailed in Appendix C.

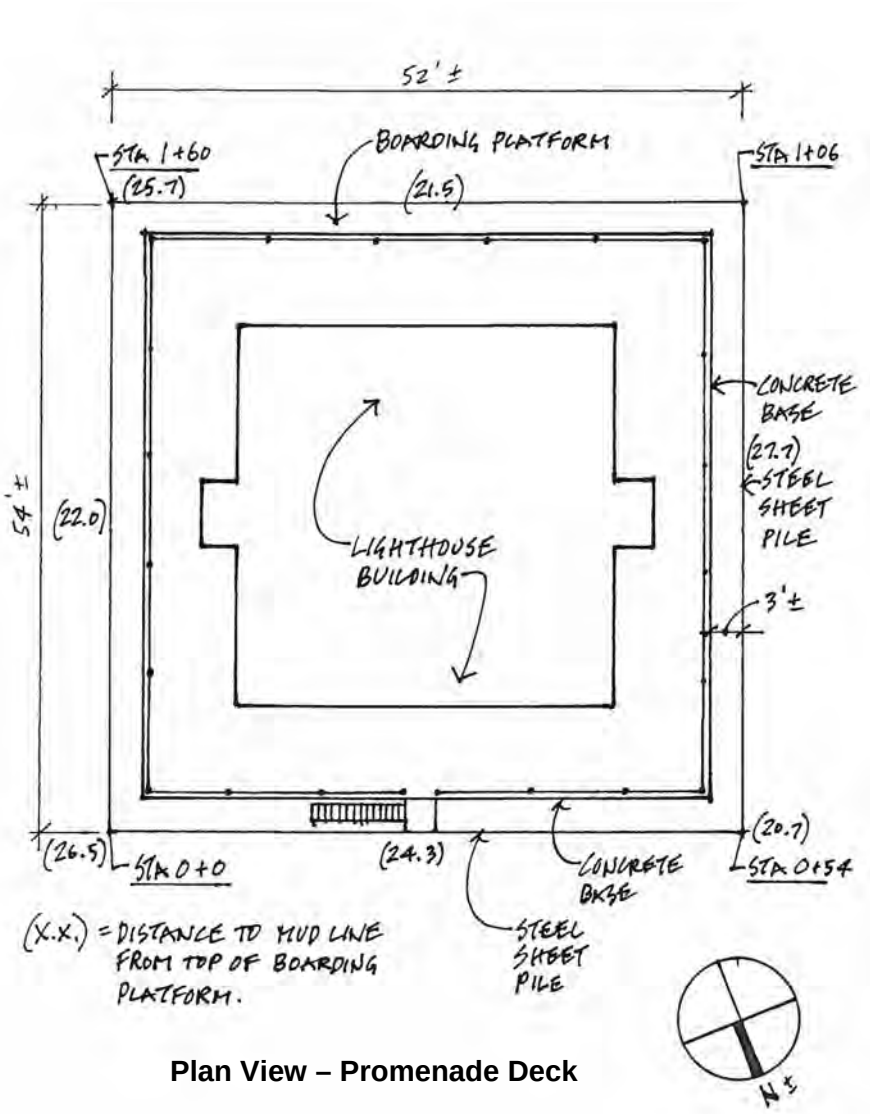
The inspection also included above water observations of the concrete base and exposed portions of the steel sheet piles. The inspection of the base and above water portions of the sheeting was conducted by a professional engineer at low water. The inspection included tactile and visual methods along with selective cleaning and soundings.

The following items were excluded from the inspection:

1. Structural elements located above the concrete base.
2. Utilities
3. Ladders and railings
4. Geotechnical investigations
5. Material sampling, testing or coring of existing structures.
6. As built dimensions (no specific attempt was made to validate the archive drawings and they are assumed to be correct).



SOUTHWEST ELEVATION/SECTION



Plan View – Promenade Deck

OBSERVATIONS

Concrete Base:

In general the Concrete Base is in Fair condition. No signs of major foundation defects were observed (differential cracking, settlement or rotation). The walls for the base appear to be approximately 10' thick. The exterior of the walls were observed to have wide spread scaling and spalls of up to 3" depth. No reinforcing steel or related reinforcing corrosion was observed. The concrete surface for the Promenade Deck was in Satisfactory condition with only minor defects observed.

The concrete scaling is most likely the result of repeated freeze thaw cycles combined with the wet environment experienced by the exterior walls. The typical repair technique for this type of defect includes surface grinding to remove loose concrete and install a new thin bonded overlay or possibly a shotcrete surface. It is recommended that material testing be completed

to assess concrete properties and a detailed mapping of the deteriorated concrete walls be completed prior to adopting final repair recommendations and estimates for this portion of the structure.

Crib Foundation:

The Crib Foundation appears to be in Fair condition. The exact condition is unknown because it is fully concealed by the Boarding Platform and is neither accessible nor visible in anyway. The Crib and its associated fill is the primary foundation support structure.

Archive information indicates that both the Crib's concrete wall and its timber framing were deteriorating by the mid 1930's. Addressing this deterioration is the stated objective of the Boarding Platform construction in 1938 and 1939. Unfortunately the extent of this deterioration does not appear to be documented.

It is our assumption that the 8' thick wall was initially intended to be a structural footing and a containment skeleton for the fill materials placed inside. However, it does not appear as though the concrete was reinforced and maintaining high quality of concrete placed underwater can be difficult. These factors combined with exposure to the harsh marine environment appear to have lead to enough deterioration by the mid 1930's to cause concern for the long term stability of the lighthouses foundation. The Boarding Platform was intended to encapsulate the Crib Foundation and protect it from further decay due from the marine environment.

Relevant information on the timber crib framing can be found in the Appendix containing the archive drawings. The concrete Crib Wall is reported to have been poured on bedrock and has two reinforcing collars (one near mud line and one near MHW). It is unclear if any additional reinforcing was used during construction. It is assumed the Crib Foundation was designed as a gravity structure and was not pinned to the bed rock. The details for how the crib was attached to the base and at what elevation are also lacking. We encourage the Lighthouse Foundation to continue its efforts to gather archive information as it will greatly improve the ability to assess the structural condition of the foundation and need for repairs in the future.

Given that the Lighthouse shows no visible signs of movement or settlement, the thickness of the 8' concrete walls, and that they are still somewhat protected by the Boarding Platform, we have assumed this structure is stable and in Fair to Poor condition. In lieu of completing expensive material testing and cores to improve confidence in this assessment we recommend efforts be placed on gathering additional archive information.

Boarding Platform:

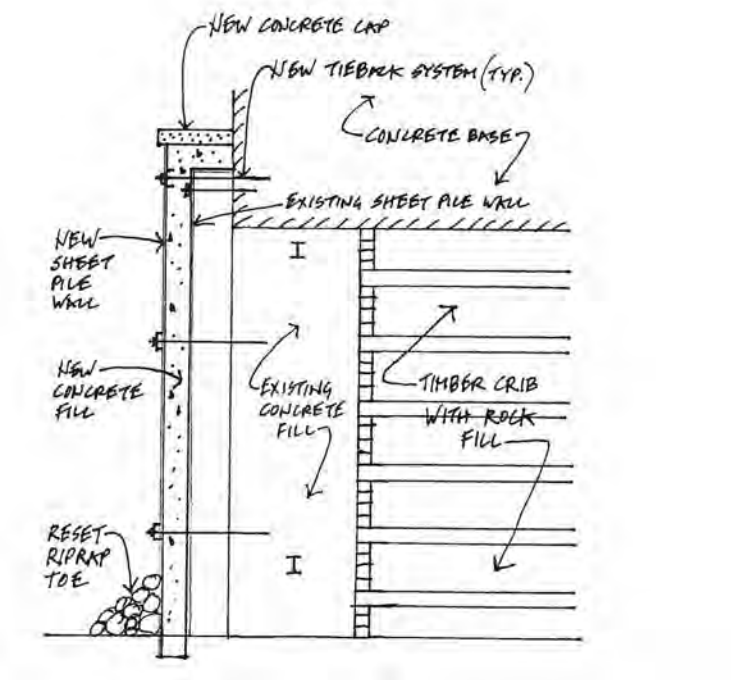
The Boarding Platform is in Serious condition with widespread corrosion near MLW. This widespread corrosion also exists in the band plate and anchor rods. Some of the rods were observed to have failed from corrosion. The steel sheeting has rotated away from the concrete base and created a gap in excess of 3" in isolated areas. The steel sheets were observed to penetrate rip rap along the mud line around the entire perimeter of the structure. Thickness measurements taken along the sheeting indicates an average thickness of 0.25" below elevation -7.0 and quickly transitioning to near zero at elevation -1. No tie backs were observed

below MLW; however, the sheets were covered by approximately 6" of growth and it is possible additional rods existed below MLW as shown on the archive drawings. It is assumed the sheets were driven to refusal into bedrock and the rip rap was then placed along the mud line for toe stability. No evidence of failure was observed along the toe of the sheeting.

The steel sheeting supports a concrete cap slab, a fender system and mooring hardware. The concrete cap is also in Serious condition due to heavy cracking and distress associated with the sheet pile movement. The remaining remnants of the fender system are in Critical condition due to corrosion. The mooring fittings are also in Critical condition due to corrosions and limited capacity of the sheeting and should not be used.

The Boarding Platform is at the end of its service life and requires replacement in the near term. The suggested repair approach is to construct a new steel sheet pile platform leaving the existing system in place (see Repair Schematic 1). This approach would consist of installing new sheeting some nominal distance from the existing sheeting, grouting the void between the new and old walls and tying the new structure into the existing concrete base and concrete crib wall. To complete this it is anticipated that upper portions of the existing sheeting will need to be removed. In addition the riprap along the toe would need to be removed and reset after the new wall was constructed. The new structure would provide long-term protection for the concrete crib wall and result in a wider platform around the concrete base then currently exists today and would include a new fender system and mooring hardware.

The cost for this repair has not been formally estimated and is not part of this project scope; however, it is expected to be approximately $1.5 million.



Sheet Pile Repair Schematic

CONCLUSION:

Overall the lighthouse foundation is in Poor condition.

The Boarding Platform is in Serious condition and significant repairs are required in the near term. Repair cost is preliminarily estimated to be approximately $1.5 million. It is noted that the Platform appears to be a critical structural element and its deteriorated condition is expected to impact the overall stability of the structure over time.

The lighthouse does not show any signs of gross foundation failures such as differential cracking, settlement or rotation. The primary structural concern at this point is the related potential impacts of the failing Boarding Platform and the lack of detailed information on construction resulting in uncertainty on the of the Crib Foundation's condition.

The Concrete Base is in Fair condition with widespread scaling to the exterior surfaces. This scaling can be repaired by removal of the loose surface concrete and replacement with new materials. The scaling is mainly a cosmetic concern and not a structural concern due to the thickness of the concrete base. The cost of repairs will vary widely depending on the extent and nature of repairs selected.

This report is based on a limited inspection and was intended to generally describe the condition of the structure. The procedures and extent of data collected are not suitable for detailed evaluations or design. A subsequent damage level inspection should be completed if a further assessment of repair alternatives is required.

APPENDIX A

PHOTOGRAPHS



Photo 1:

Overall picture of lighthouse.



Photo 2:

Typical steel sheeting with widespread corrosion holes.



Photo 3:

Typical steel sheeting with widespread corrosion holes.



Photo 4:

Typical view of concrete sheet pile cap pulled away from concrete base.

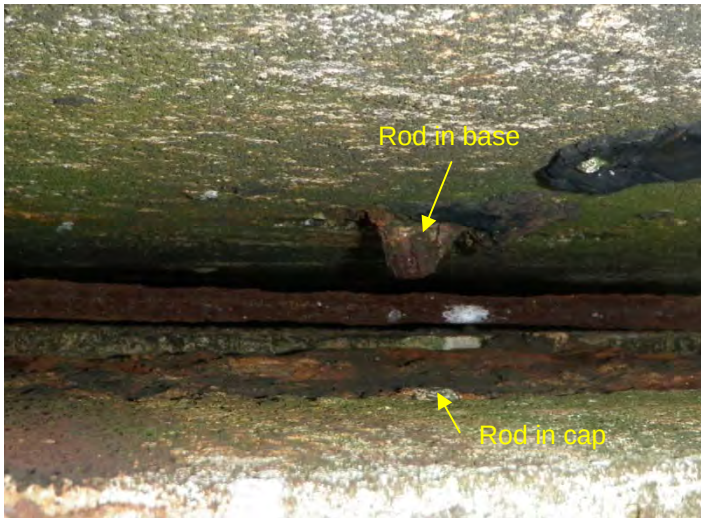


Photo 5:

View of failed anchor rod connecting steel sheets to concrete base. Picture taken in gap between base and concrete cap.

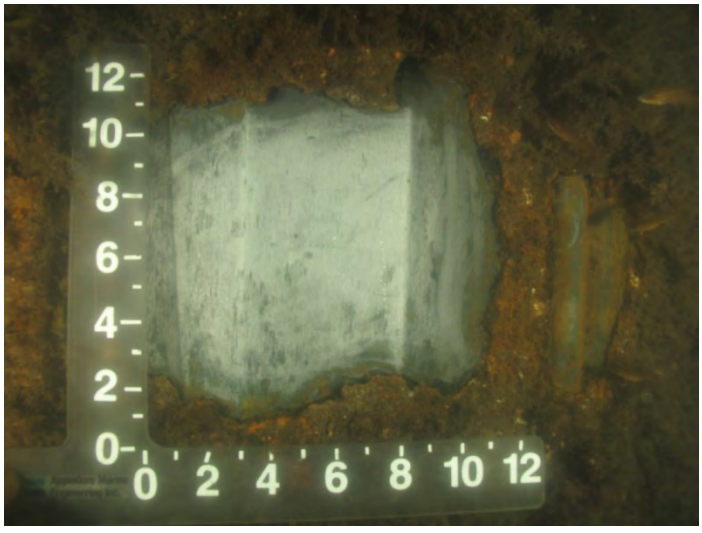


Photo 6:

Typical underwater view of cleaned steel sheet at elevation -10.

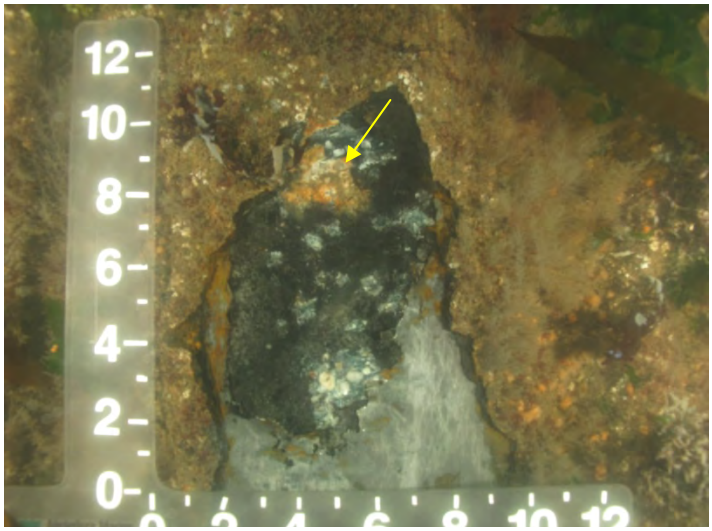


Photo 7:

Typical view of small corrosion holes observed at elevation -4.5.



Photo 8:

Overall view of scaling concrete on base wall.



Photo 9:

Typical view concrete scaling on base wall.



Photo 10:

Close up view of scaling concrete.



Photo 11:

Typical view of top surface of concrete base (generally in Satisfactory condition).



Photo 12:

Vessel used for site access.

APPENDIX B

KEY PERSONNEL

KEY PERSONNEL

Name	Affiliation	Position	Phone
Brae Rafferty	ALF/New London Light House Foundation	President	(860) 445-9007
Larry Wagner, P.E.	Appledore Marine Engineering	Principal, Diver	(603) 766-4591
Wallace Mosher, P.E.	Appledore Marine Engineering	Project Manager, Diver	(603) 766-1870
Brent Sullivan	Appledore Marine Engineering	Diver	(603) 766-1870
David Marcotte, P.E.	Appledore Marine Engineering	Engineer, Diver	(603) 766-1870

APPENDIX C

INSPECTION DATA

Job Name:	New London Light	Note Taker:	Dick Leverone
Job Number:	5095	Inspector 1:	Brent Sullivan
Date:	June 9 2010	Inspector 2:	
Facility:	Lighthouse Foundation	Sheet Number:	
A/W or U/W:	UW	Half Cell:	Ag AU Cl
		Threshold Corrosion:	-0.733

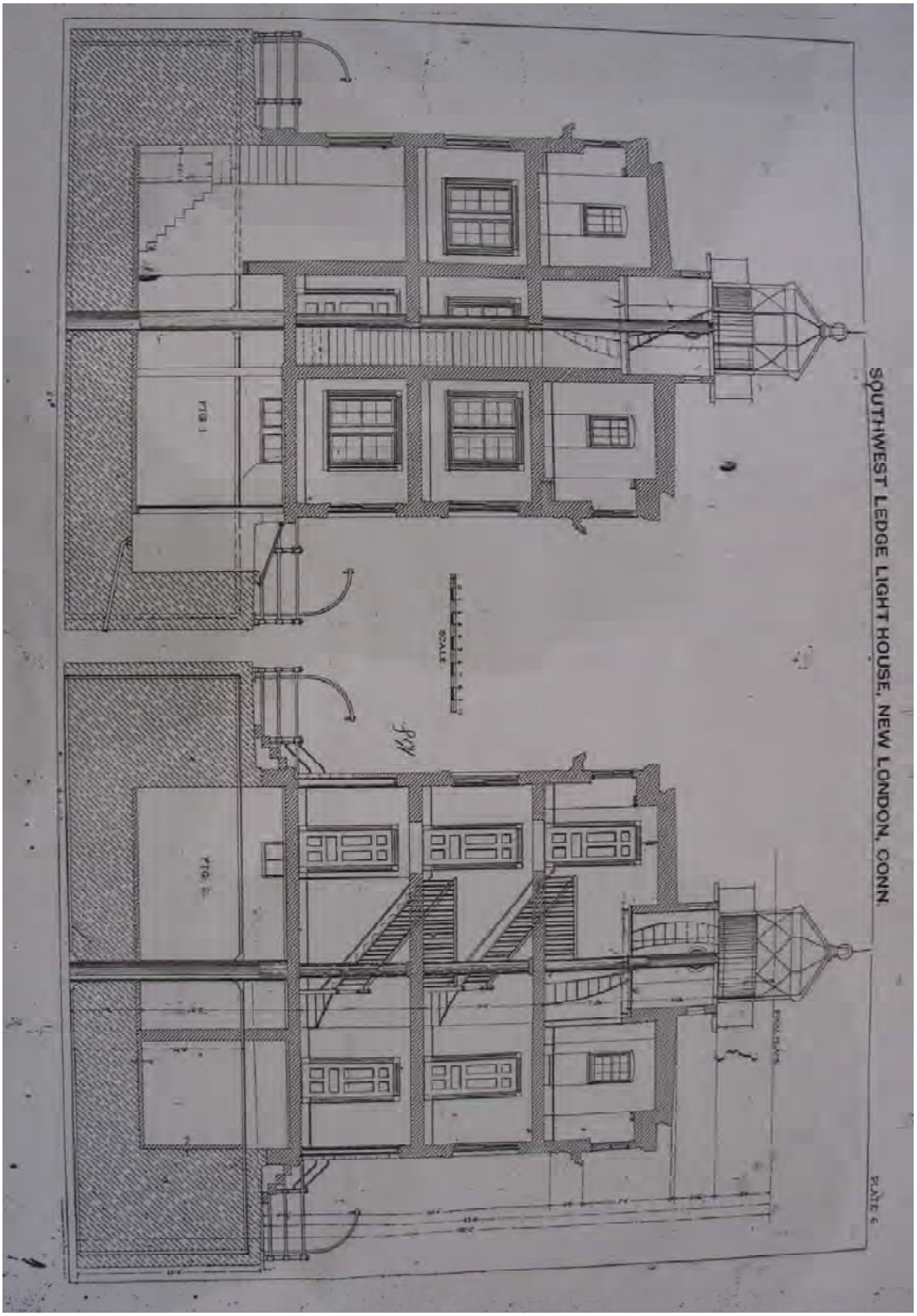
LOCATION				UT Reading (in)	Volt Potential (mv)	ELEVATION (MLLW = 0)
BENT/ STATION	ROW	ELEMENT	ZONE			
0+20		SSP	ML	0.265		-19 ML
				0.26		-12
				0.275		- 8
				0.26		- 7
				0.24		- 6
				0.13		- 5
				0		- 4
				0		- 3
				0		- 2
				0		- 1
0+70		SSP	ML	0.25		-21 ML
				0.275		-12
				0.29		-8
				0.21		-7
				0.135		-6
				n/a	Heavy Pitting	-5
				0		-4 to 0
2+07		SSP	ML	0.285		- 19
				0.285		-18
				0.29		-19
				0.28		-12
				0.295		-11
				0.275		-10
				0.235		at -6
				0		at -5 (punched hole)
				0.145		-7
				0		-4
				0		-3
				0		-2
				0		-1
				0.29		-8
				n/a		-9
1+25		SSP	ML	0.215		-10
				0.165		-8
				0.14		-7
				0.13		-6
				0.13		-5
				0.18		-4
				0.125		-3
				0	(punched holes)	- 2 to 0

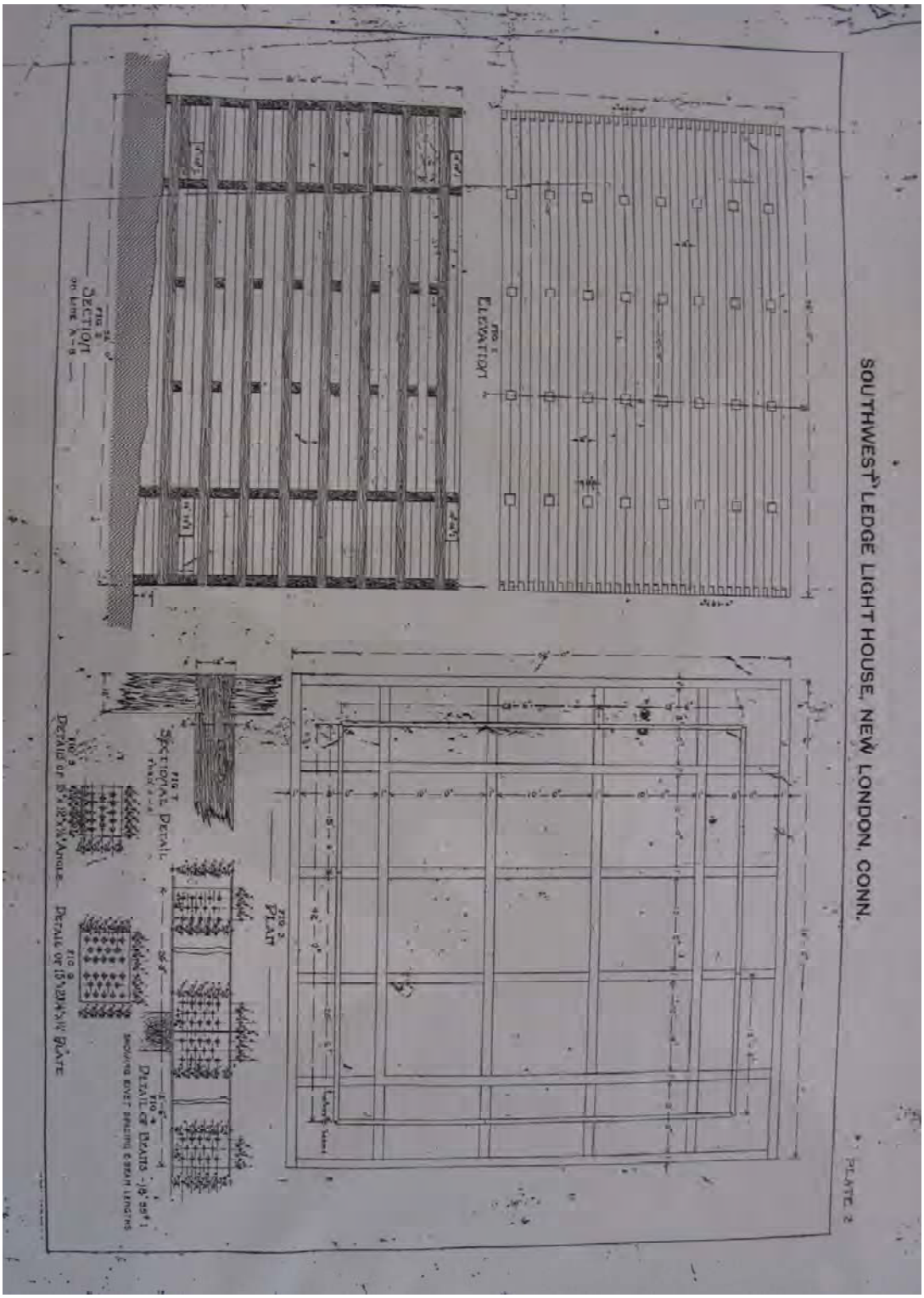
Underwater Level II Cleaned Locations and Observations:

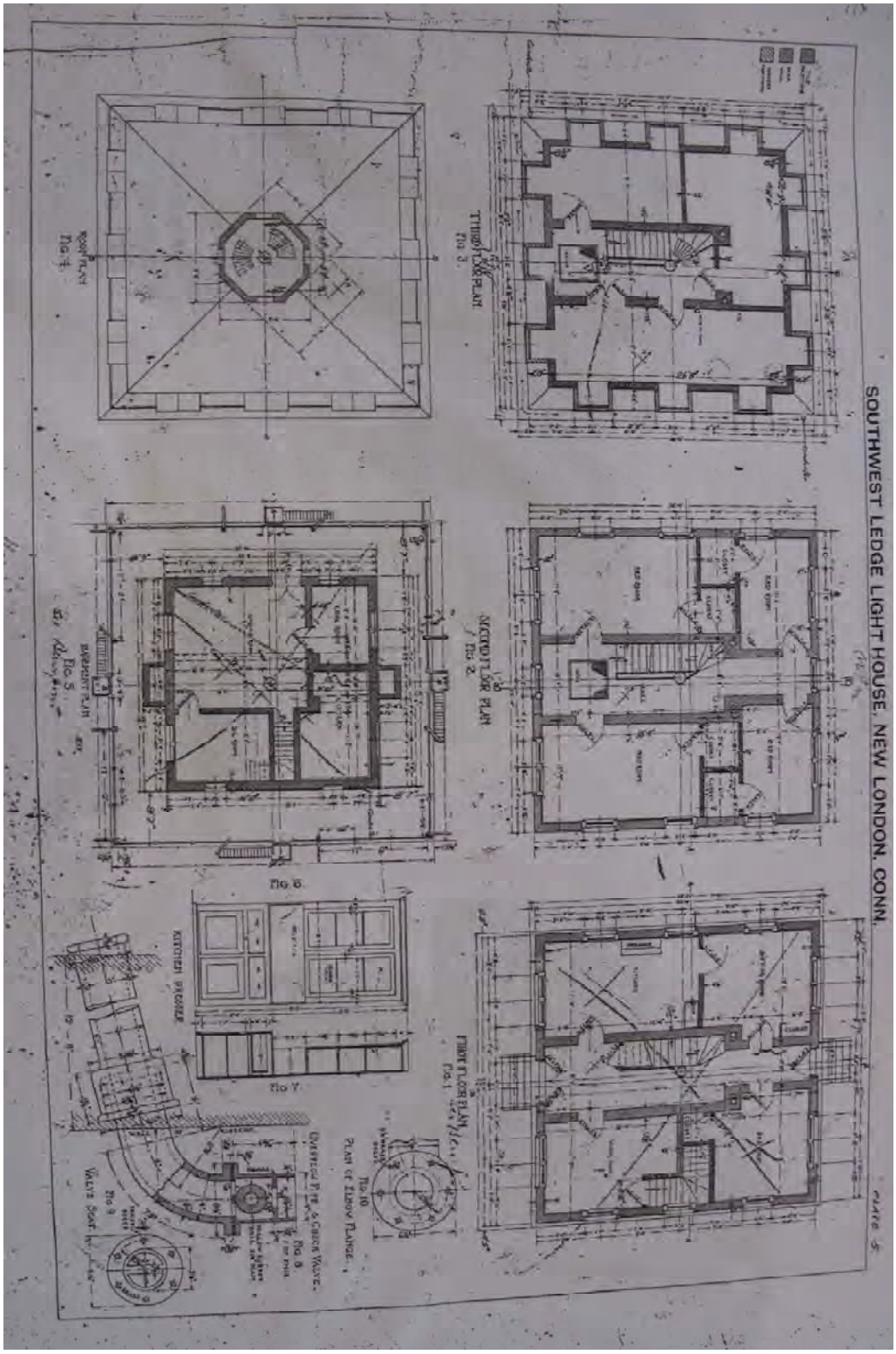
Station	Elevation MLLW=0	Observation
0+00	-12	Corner, no defect
0+10	ML	Sheeting extends into rip rap
0+20	-16	Minor surface corrosion - smooth steel (see photo 6)
0+20	-12	Minor surface corrosion - smooth steel (see photo 6)
0+40	-19	Minor surface corrosion - smooth steel (see photo 6)
0+40	-12	Minor surface corrosion - smooth steel (see photo 6)
0+40	-6	Minor surface corrosion - smooth steel (see photo 6)
0+53	ML	Sheeting extends into rip rap
0+55	-12	Corner, no defect
0+70	-6	Minor surface corrosion - smooth steel (see photo 6)
0+70	-13	Minor surface corrosion - smooth steel (see photo 6)
0+80	-13	Minor surface corrosion - smooth steel (see photo 6)
0+90	-18	Minor surface corrosion - smooth steel (see photo 6)
0+95	-6	Minor surface corrosion - smooth steel (see photo 6)
1+06	ML	Corner, sheet extends into rip rap, no defects
1+20	-9	Minor surface corrosion - smooth steel (see photo 6)
1+20	-14	Minor surface corrosion - smooth steel (see photo 6)
1+45	ML	Sheeting extends into rip rap
1+50	-19	Minor surface corrosion - smooth steel (see photo 6)
1+80	-9	Minor surface corrosion - smooth steel (see photo 6)
1+80	-12	Minor surface corrosion - smooth steel (see photo 6)
1+80	-20	Minor surface corrosion - smooth steel (see photo 6)
2+05	-6	Small corrosion hole resulting from cleaning (see photo 7)
2+05	-9	Minor surface corrosion - smooth steel (see photo 6)
2+05	-19	Minor surface corrosion - smooth steel (see photo 6)

APPENDIX D

ARCHIVE DRAWINGS


SOUTHWEST LEDGE LIGHT HOUSE, NEW LONDON, CONN.
PLATE 6


SOUTHWEST LEDGE LIGHT HOUSE, NEW LONDON, CONN.
PLATE 2
FIG 1 ELEVATION
FIG 2 SECTION on LINE X-Y
FIG 3 PLAN
FIG 7 SECTIONAL DETAIL
FIG 8 DETAIL OF 5"x3½"x⅜" ANGLE
FIG 9 DETAIL OF 15"x¾" PLATE
FIG 4 DETAIL OF BOLTS -1⅛" DIA.
SHOWING RIVET SPACING & BOLT LENGTHS


SOUTHWEST LEDGE LIGHT HOUSE, NEW LONDON, CONN.
PLATE 5
ROOF PLAN
Fig 4
THIRD FLOOR PLAN
Fig 3
SECOND FLOOR PLAN
Fig 2
BASEMENT PLAN
Fig 5
Fig 6
KITCHEN DRESSER
Fig 7
FIRST FLOOR PLAN
Fig 1
Fig 8
Fig 9
Fig 10
PLAN OF ELBOW FLANGE

SOUTHWEST ELEVATION
N.T.S.

1. Constructed in 1909, the foundation for New London Ledge Lighthouse consists of an inner timber crib filled with rock and gravel measuring 34'x34' and an outer, perimeter timber crib filled with concrete offset approximately 8' from the inner cribbing. Crib foundation bears on native rock approximately 33½ feet below low water. Entire crib foundations skirted with steel sheet pilings offset 4' ± from outer crib wall with void filled with concrete (see "Findings").

2. Bearing on rock and concrete filled timber crib foundation, a mass concrete substructure (50'x50' in plan) rises to an elevation approximately 18' above low water forming the promenade deck.

3. Vertical reinforcement of concrete substructure consists of steel framework made up of angles embeded with approximately 1' cover. Horizontal reinforcement and bracing comprised of two layers of 4x4x½ angle stock radiating from central steel support column 20" diameter extending to lantern level deck. Top layer of horizontal steel situated approximately 3' above first level floor.

4. Structure for levels 2 and 3 consists of exterior three wythe brick masonry walls founded on concrete substructure and two triple wythe interior brick masonry bearing walls supported by first level masonry (north) and steel pipe columns and integral steel beam (south) at the lower level.

5. Floors at levels 2, 3, and 4 comprised of expanded wire reinforced concrete deck supported by integral steel beams with 3"x8" chestnut sleepers and wood flooring. Supplemental support of central hallway and stairs provided by steel framing partially carried by central support column originating in substructure below first level floor and extending to the lantern deck.

6. At level 4 exterior brick masonry bearing walls support timber frame mansard roof structure fitted with 12 dormers. Interior brick masonry continues for support of watch and lantern levels.

7. Watch level is octagonal in plan with exterior masonry walls rising to underside of lantern deck. At four faces of watch level brass portholes are provided.

8. Situated approximately 3½' above the roof surface is the lantern deck. The lantern level is supported by the central column and brick masonry walls forming the watch level. The lantern deck is made up of radial steel plate with integral flanges. Cast iron walls sheeted in bronze rise to a 4' ± high circular parapet and reduces to structural mullions for support of a cast iron frame roof structure with sheet metal roofing. Reduction in diameter of the lantern house provides an exterior lantern deck.

DESCRIPTION

NEW LONDON LEDGE

U.S. COAST GUARD, 3rd DISTRICT
GOVERNORS ISLAND, N.Y.

CREDELL & PAUL, INC.
CONSULTING STRUCTURAL ENGINEERS

FIGURE 1

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1. Repair damaged portions of rubber "D" type fendering system located on northeast face of sheet piling. Install rubber "D" type fendering at southwest face of steel sheet pile boarding deck.
2. Install galvanized steel handrail on the face of substructure for safety of personnel on boarding deck.
3. Replace lower run of stairway at southwest access. Lower replacement stairway to be hinged approximately 8' above boarding deck level. Lower section of stairs to be raised and lowered by hand operated winch or servo mechanism with remote control. Provide similar arrangement at northeast location.
SOUTHWEST ELEVATION
N.T.S.
RECOMMENDATIONS
PRIORITY 1 - ACCESS / SECURITY
NEW LONDON LEDGE
U.S. COAST GUARD, 3rd DISTRICT
GOVERNORS ISLAND, N.Y.
CRDELLI & PAUL, INC.
CONSULTING STRUCTURAL ENGINEERS
FIGURE 3
15

1. No bird screening on ventilator.
2. Roof leaks at base of mansard where built-up roofing has failed over deteriorated integral gutter system.
3. Moderate corrosion of rail/post connection and bottom of posts at socket to deck stub at promenade deck.
4. Concrete topping and water proofings exhibit pervasive alligatoring, corrosion and deterioration at promenade deck. Some disbonding/delamination of concrete overlay at discrete areas.
5. Reinforcement steel at underside of second level deck corroding; concrete delaminated and spalling at observed perimeter locations (3 - 4" widths at west wall).
6. Radial steel framing passing through cistern on south corner severely corroded (50% section remaining). Remaining members exhibit minor corrosion at embedment in masonry. Expansive forces of corrosion causing minor cracking and spalling of masonry.
7. Hairline cracks and efflorescense observed on face of substructure. Sounding with hammer reveals no delamination.
8. Lower stairway on west removed.
9. Safety railing missing at west boarding deck.
10. Sections of horizontal "D" type fenders torn from connectors. No fendering observed at southwest location.
11. Impact damage and deterioration of concrete overlay deck at east corner of boarding deck.
12. Boarding deck separated approximately 2½" from concrete face of substructure. Backing rod (2" diameter) observed in opening at several locations; however no caulk present.
13. Concrete boarding deck overlays concrete filling void between repair sheets and timber cribbing.
14. Installation of 1" x 12" steel plate "tie band" to gird sheet piling (1948).
15. Additional anchor bolts used to cinch sheets bulging at midspan (1945).
16. Steel sheet pile skirting 35' ± long driven continuously around structure; portions of outer timber crib removed; void filled with concrete (1930).

SOUTHWEST ELEVATION / SECTION
N.T.S.

FINDINGS

NEW LONDON LEDGE

U.S. COAST GUARD, 3rd DISTRICT
GOVERNORS ISLAND, N.Y.

CODELLI & PAUL, INC.
CONSULTING STRUCTURAL ENGINEERS

FIGURE 2

1. Remove concrete boarding deck and concrete comprising skirting below to sound concrete. Strengthen remaining concrete with vertical steel reinforcing bars. Cast replacement concrete and boarding deck anchored to substructure and fitted with rubber waterstop.

2. On the surface of the concrete substructure where surface cracks, efflorescence and corrosion of reinforcement are observed remove deteriorated concrete, seal small cracks, epoxy inject large cracks, apply latex modified mortar at areas of deterioration ¼"-1¼" deep, for deeper repairs use later modified concrete. Brush blast entire substructure surface and apply polyamide epoxy paint with urethane topcoat over entire surface.

3. Remove concrete overlay, weatherproofing and toppings at promenade deck. Remove deteriorated portions of substructure brush blast clean substrate, apply bonding agent and cast portland cement concrete overlay deck, provide sealed joint at interior vertical face around entire structure, rout remaining concrete to provide groove joint for sealing.

4. At underside of second level deck remove deteriorated and delaminating concrete to expose reinforcing steel. Provide minimum ¾" clearance above steel remove corrosion from reinforcement steel by sand blasting, apply latex modified portland cement grout flush with remaining concrete.

5. At first level remove portions of brick masonry damaged by corrosion of horizontal, radial angles forming top layer of reinforcement and bracing for substructure, blast clean steel angles, apply polyamide epoxy paint with urethane top coat, replace brick masonry. At locations where steel angles were embeded in concrete, blast clean steel and paint as above.

6. At roof gutter remove built-up roofing to expose original gutter. Fill gutter with polystyrene sloped to drain. Install built-up roofing properly flashed under adjacent mansard roofing.

SOUTHWEST ELEVATION / SECTION
N.T.S.

RECOMMENDATIONS
PRIORITY 2 - STABILIZATION

NEW LONDON LEDGE

U.S. COAST GUARD, 3rd DISTRICT
GOVERNORS ISLAND, N.Y.

CRDELL & PAUL INC.
CONSULTING STRUCTURAL ENGINEERS

FIGURE 4

16

AJM

RECEIVED
LIGHTHOUSES
Third 8 AM '38

DEPARTMENT OF COMMERCE
LIGHTHOUSE SERVICE

RECOMMENDATION AS TO AIDS TO NAVIGATION

OFFICE OF SUPERINTENDENT OF LIGHTHOUSES
Staten Island, N.Y.

June 30, 19 38

8574

THE COMMISSIONER OF LIGHTHOUSES:

1. Name of aid: New London Ledge Light Station
2. Locality: New London Harbor

3. Proposed action and necessity therefor: Install sheet pile cofferdam and fill with concrete to protect foundation.

4. Total estimated cost: $30,000.
5. Appropriation: P.W.A. Projects, 1938
6. Payment: To be made from funds to be allotted.
7. Estimated annual maintenance cost: same as heretofore
8. Authority is also requested to purchase the material needed, and not now on hand, at an estimated cost of $28,901. , and to do the work by contract with bond, $ 28,901. ; hired labor and depot force, $ ---- ; crew of vessels, $ ----- This method of performance is considered the most economical and advantageous to the service.
(If it is proposed to do the work partly or wholly by hired labor rather than by contract, give reasons therefor under Item 9)
9. Description, location, and other information:

PROJECT NO. 49.

The existing wood crib is decayed and falling apart, the concrete is cracked and eroded by the ice and needs protection and support to prevent collapse of station.

Concur - Thank much For clear / Cuf

The estimates shown have been made very close as funds for this work are limited, and information is requested if in the event of the low bid being more than funds available, it would be permissible to apply a portion of the funds allocated for Turkey Point to this work, and postpone some of the work at Turkey Point.

FORM 83 Attached.

Two - in different orders

7 Bps 3-3N-6

For and in the Absence of the Superintendent.

Spec in Eng Div.

F. W. OCKENFELS, ASST. SUPERINTENDENT

DEPARTMENT OF COMMERCE
BUREAU OF LIGHTHOUSES
Washington, July 5, 1938

Copy returned to the Superintendent of Lighthouses, approved as recommended, except as noted. He will proceed with the work and report its status, until completed, as required by regulations or instructions in general but subject to the modifications noted below and as shown in red on drawings and specifications.

(Continued)

11—4055

APPENDIX E

INSPECTION TERMINOLOGY

CONDITION RATING DESCRIPTIONS

Rating	Description
Good	No visible damage, or only minor damage is noted. Structural elements may show very minor deterioration, but no overstressing is observed. No repairs are required.
Satisfactory	Limited minor to moderate defects or deterioration are observed, but no overstressing is observed. No repairs are required.
Fair	All primary structural elements are sound, but minor to moderate defects or deterioration is observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure. Repairs are recommended, but the priority of the recommended repairs is low.
Poor	Advanced deterioration or overstressing is observed on widespread portions of the structure, but does not significantly reduce the load-bearing capacity of the structure. Repairs may need to be carried out with moderate urgency.
Serious	Advanced deterioration, overstressing, or breakage may have significantly affected the load-bearing capacity of primary structural components. Local failures are possible and loading restrictions may be necessary. Repairs may need to be carried out on a high-priority basis with urgency.
Critical	Very advanced deterioration, overstressing, or breakage has resulted in localized failure(s) of primary structural components. More widespread failures are possible or likely to occur, and load restrictions should be implemented as necessary. Repairs may need to be carried out on a very high priority basis with strong urgency.

From: *Underwater Investigations, Standard Practice Manual*, ASCE, 2001.

INSPECTION LEVEL DESCRIPTIONS

Level	Description
Modified Level I	Visual check on components without an in-depth inspection of each individual component. Typically used to detect obvious gross or major damage to systems or groupings of components.
Level I	Visual or tactile inspection of underwater components without the removal of marine growth.
Level II	Partial marine growth removal of a statistically representative sample - typically 10% of all components.
Level III	Nondestructive testing (NDT) or partially destructive testing (PDT) of a statistically representative sample - typically 5% of all components. May consist of PDT of wood and remaining thickness measurement of steel components.

From: *Underwater Investigations, Standard Practice Manual*, ASCE, 2001.

Modified Level I definition per Appledore Marine Engineering.