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THE ROOSEVELT ISLAND LIGHTHOUSE
BUILDING CONDITION SURVEY

Roosevelt Island, New York

Prepared for:

The Roosevelt Island Operating Corporation
591 Main Street, Roosevelt Island, NY, 10044

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DRAFT

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Lighthouse, circa 1890

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I. INTRODUCTION

This Building Condition Survey of The Roosevelt Island Lighthouse located at the northern most tip of The Island was undertaken at the request of the Roosevelt Island Operating Corporation (RIOC). The objective of the survey is to study the conditions of the exterior and interior components of the building and to outline areas of present problems and defects together with possible future areas of concern.

Our site observations were conducted on July 13, 2018. Conditions evident on these dates, as well as conditions found in our previous Condition Survey dated June 2011 are discussed in this Report. The report will provide recommendations for long-term improvements to the building, which will increase the useful life of the structure, seek to eliminate potentially unsafe conditions, and reduce the regular operating and maintenance expenses.

All observations were made by visual inspection and reference to photographs. No historic fabric was removed or altered for this inspection, and no scaffolding or other inspection structures were constructed. No intrusive methods were used to inspect the structure. Therefore, only observations of the exterior surfaces of the Lighthouse normally accessible were possible. Hidden conditions may exist in places where there are no visible clues. It is, therefore, probable that in the future some problems may appear which are not presently predictable.

The evaluation and recommendations are based on previous experience with buildings of similar construction. There will be instances where the amount of work required to correct problems may be less than, or may exceed, what has been anticipated. Every effort has been made to make this report as complete as possible.

The major repair budget is for a single Phased Project, with cost estimates provided, indicating the general range of expense to be expected for the various items. The costs are based on 2018 dollars, and do not include professional fees, site protection or applicable taxes. The sequencing of some budget items may not correspond directly to the written description due to overall planning strategies and scheduling concerns. The overall budget costs assume that the work will be completed in large phases. If work items are done singularly the actual costs may be greater due to proportionally higher overhead and mobilization costs.

II. GENERAL DESCRIPTION

A. HISTORICAL DATA:

Architect: Renwick & Sands
James Renwick, Jr. (1818-1895) was the Supervising Architect for the Department of Public Charities and Correction of the City of New York during the period of the Lighthouse construction.

Iron Work: Awarded to M.M. Kinney for \$1,383 on April 12, 1872.

Painting: L.H.Cohen at a cost not to exceed \$150 on July 31, 1872.

Stone Mason: Attributed to island inmates John McCarthy and Thomas Maxey.
A stone at the lighthouse (since lost/stolen) depicted the following:

THIS IS THE WORK
THAT WAS DONE BY
JOHN McCARTHY
WHO BUILT THE LIGHT
HOUSE FROM THE BOTTOM TO
TOP ALL YE THAT DO PASS BY MAY
PRAY FOR HIS SOUL WHEN HE DIES.

September 21, 1871 – NY Tribune Article indicating the decision for *“the erection of a lighthouse at the northern end of Blackwell’s Island, on the Bread and Cheese Reef, which will add greatly to the safe navigation of Hell Gate.”*

April 8, 1872 – Letter written to the Office of the Light-House Board, Washington DC indicating that the Department of Public Charities and Correction of the City of New York are constructing a Stone Lighthouse that will be completed by May 1st, 1872.

April 18, 1872 – Letter written to the Office of the Light-House Board, Washington DC requesting a *“lens of the 4th order” for use in the proposed lighthouse. The color of the light should be “fixed red”.*

June 5, 1872 – Ordinance passed by the Common Council for the Lighthouse on Blackwell’s Island *“...Be lighted every night...on and after September 15, 1872”.*

May 20, 1903 – Thomas A. Edison films a movie of Blackwell’s Island with images of the lighthouse.

1915 ± - Last image with original Lantern, Observation Deck and Lens visible.

February 22, 1922 – Brooklyn Daily Eagle article mentioning *“Repairs have been started on the Blackwell’s Island lighthouse... Scaffolding has been erected about the lighthouse, and cement is being placed in crevices where the stones have become loosened by the weather.”*

1933 ± - The Light House was decommissioned. First image with new Lantern design.

March 16, 1972 – Named to the National Register of Historic Places. March 23, 1976 – Designated a New York City Landmark.

B. BUILDING DATA:

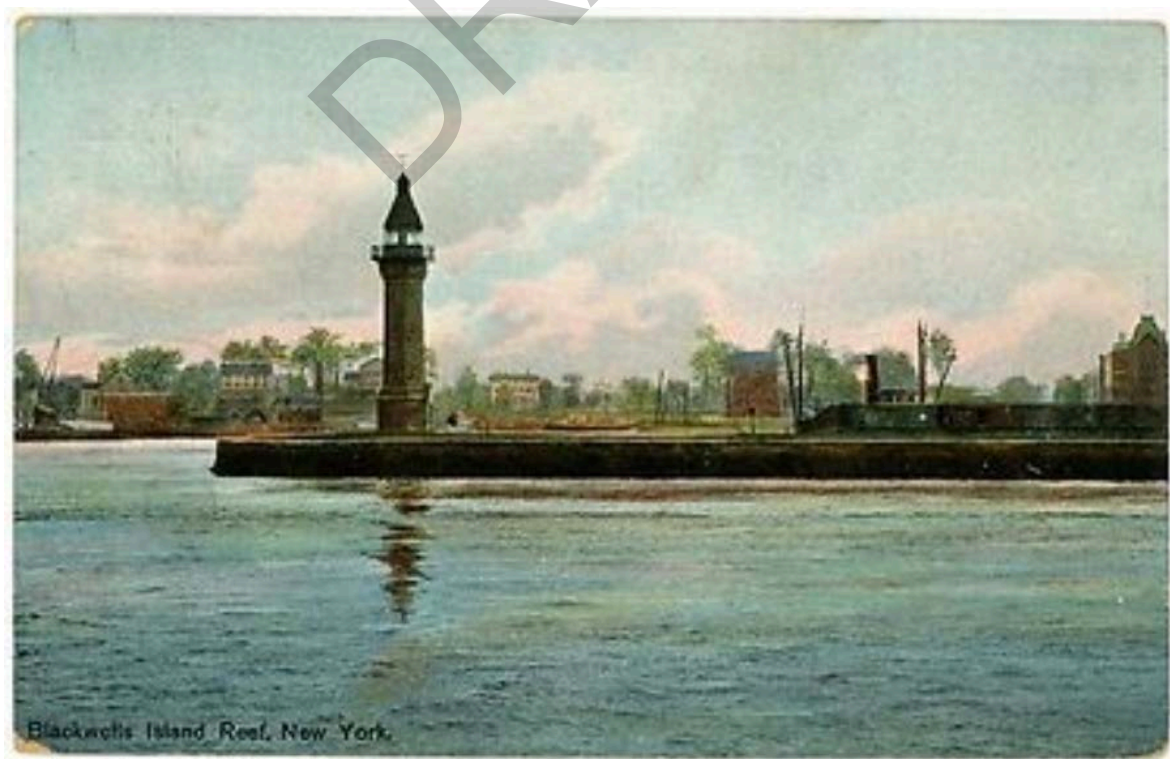
Block: 816
Lot: 7501
Year Built: 1872
Height: $\pm 43'-6''$ to the Observation Deck
 $\pm 55'$ to the top of Lantern

Original Height: $\pm 65'$ to the top of Lantern + $5'-0''$ weathervane

Landmark Status: Individual Landmark

C. RESTORATION HISTORY:

1. Sometime between 1915 and 1933 - The steep pitched octagonal lantern was replaced with a new cast iron ten (10) sided stock lighthouse lantern with a much shallower roof pitch. In addition the decorative iron observation platform and railing were completely replaced with a new cast in place concrete platform and simpler iron rail design.
2. 1978/79 – Restoration of the Lighthouse lantern and Sitework for Lighthouse Park, prepared by Nicholas Quennell Associates.
3. 1998 – Mention of some restoration work and new lights.
4. 2011 – Condition Survey Report prepared by Thomas A. Fenniman Architect.



Post card - circa 1917

III. COMPONENT SURVEY

A. EXTERIOR COMPONENTS

1. **STONE MASONRY:** The octagonal lighthouse is constructed of a rock-faced, coursed gray ashlar with drafted edges at the corners. The stone (gray gneiss) was quarried on the island and has numerous tool and drill marks that are visible throughout.

The massive stone lintel stones above the door are offset by the simpler stone profiles found at the two windows.

An ornately carved band of stylized leaves/croquets is found at the top where the stone steps back to the start of the observation deck.

Observations

- i. ***Staining*** - The stone masonry is generally in good clean condition, however, at the upper stepped section there are deposits staining the stone from the deteriorating concrete platform.

At the upper decorative leaves deep staining from pollutants is noted primarily at the north elevation.

- ii. ***Spalled Stone*** - Some minor spalled stone is evident within the decorative cut stone units through out.

- iii. ***Eroded Mortar Joints*** - Most areas of the masonry mortar are in good condition, however, areas where eroded joints were noted are localized primarily to the north facing stones. Also, there is evidence of two mortar colors one dark (newer) and one lighter are found within the stonework.

- iv. *Paint splatter and drips were evident around the stonework from previous work done without proper protection.*

2018 - The stone mortar joints have continued to deteriorate and will require repointing.

Recommendations:

- i. *Test the older mortar to determine the original color and composition.*
- ii. *Perform a test cleaning at an area of efflorescence and graffiti to see effectiveness prior to full scale cleaning.*
- iii. *The masonry mortar joints will require partial repointing at severely exposed locations using appropriate methods and mortars. Full scale repointing will be required in 5-10 years.*
- iv. *Remove and clean paint drips and splatters from stone masonry.*

2. **CONCRETE:** The upper section of stone is capped by a poured in place octagonal slab of concrete with eight (8) integral concrete brackets located at the midpoint of each face. This slab creates the platform of the observation deck that was originally constructed of metal (based on historic photographs) and supported by brackets at the corners.

Observations

- i. **Concrete Coating** - *The exposed top face of the concrete has a topical coating applied to inhibit moisture penetration. This coating is in poor condition and does not terminate properly at the base of the lantern.*

Excessive amounts of moisture has migrated into the slab as evidenced by the cracks and noted staining at the underside. This condition has most likely compromised some of the reinforcing steel.

- ii. **Concrete Cracks** - *Cracks have developed at numerous locations throughout the underside of the slab. Cracked and loose sections of the concrete were noted at the south perimeter edge of the platform. These cracks pose dangerous conditions that should be addressed by removing loose sections.*

Recommendations:

- i. *A test to determine the design of the concrete use and reinforcing bars should be made to better evaluate the soundness of the platform. This can be accomplished by cutting cylindrical cores that are afterwards analyzed in a laboratory.*
- ii. *If the structure is deemed sound the concrete platform must be resurfaced with a new high performance breathable waterproof coating with migratory corrosion inhibitors.*
- iii. *All concrete sections must be sounded for loose material. All sections found to be defective must be cut back to sound material and patched with an appropriate concrete patching mortar.*
- iv. **2018 – The condition of the concrete deck has further deteriorated to the point that full scale replacement is likely required**

3. **CAST IRON:** As previously stated the cast iron lantern at the top is not original to the structure but was a later “stock” replacement lantern installed sometime between 1920-1940. The original lantern, as seen in photographs and the Thomas Edison movie, depict a much more ornate hand rail and platform structure together with a steep pitched eight (8) sided lantern with a smaller pyramidal peak at the very top with a pronounced weathervane.

All of these original cast iron elements are gone and the much simpler railing with ten (10) sided lantern exists today.

2018 - The cast iron sections have continued to deteriorate and will require full scale replacement.

Observations

- i. **Cast Iron Lantern Base** – The ten (10) sided lantern base has fixed panels with alternating panels having an integral ventilator. The panels are mounted directly into the cast concrete platform. Rust has developed at all bolted joints and connections. Excessive rust has caused structural failure of some of the connections.
- ii. **Cast Iron Lantern Top** – The ten (10) sided lantern top has pie shaped panels that have been repaired/strapped during a previous restoration campaign. Rust has developed at all bolted joints and connections. Excessive rust has caused structural failure at many the connections.
- iii. **Cast Iron Ventilator Orb** – At the peak there is a cast iron ring mounted by an orb with ventilating holes at the perimeter. At this time this cast iron unit has cracked into pieces and is only held in place by gravity.
- iv. **Cast Iron Railings** – As mentioned the existing railings are not the original more decorative units but a stripped down simple picket type railing with the square posts embedded into the concrete platform. The current condition is fair to good with some minor rust developed.

The rusting of the inner supports for the posts could be attributing to some of the deterioration of the concrete noted above.

Recommendations:

- i. All cast iron sections of the lantern need to be dismantled and repaired offsite and or replaced. The lower base sections and the upper roof sections have been greatly undermined by the excessive rust and spreading of the sections.

As the existing deteriorated lantern components are not original, consideration can be made to possibly recreate the more unique steep pitched lantern roof as depicted in historic photographs.

- ii. The ventilator orb will require complete replacement.
- iii. The railings are not code compliant and will require either replacement or modification.

B. INTERIOR COMPONENTS

1. **BRICK MASONRY and STUCCO:** The interior walls are common red brick masonry covered with the deteriorated remains of a scored cement stucco finish.

Based on the rough finish of the stucco and that it was installed over the finished faces of the stone lintels it appears that the cement stucco is a later addition possibly at the same time as the concrete platform was installed.

Observations:

- i. *The stucco is in a very deteriorated state with loose sections throughout the height of the tower.*
- ii. *The underlying brick masonry is in fair to good condition with evidence of eroded mortar joints throughout.*

Recommendations:

- i. *Carefully remove all sections of stucco within the tower.*
 - ii. *Test the interior mortar to determine the original color and composition.*
 - iii. *Repoint all mortar joints at the brick masonry with an appropriate pointing mortar.*
 - iv. ***2018 - The brick mortar joints have continued to deteriorate and will require 100% repointing.***
2. **WOOD STAIR:** A central wooden spiral stair is located within the tower for the full height without any handrails and only a minor landing just below the lantern platform.

Observations:

- i. *The wooden risers and treads are loose and deteriorated at much of the upper sections of the stair.*
- ii. *The large diameter central wooden post has evidence of splits and checks but is still structurally sound.*
- iii. ***2018 – The lower 8 treads have collapsed/missing and will require replacement.***

Recommendations:

- i. *Depending on the long term goal for the Lighthouse either a restoration of the wood stair can be accomplished or the complete replacement with a new open grate galvanized metal spiral stair can be installed.*
- ii. *Install a perimeter railing mounted to the masonry.*
- iii. *Install new landing below the lantern platform level with a new galvanized metal access stair to the lantern.*

C. DOORS AND WINDOWS

1. **DOORS:** Located at the base of the tower is a perforated diamond plate door scribed to the stone opening. This door is a simplistic facsimile of what was a more ornate paneled door as seen in the photograph of 1890.

Observations:

- i. *The door is in fair condition and opens inward creating a minimal space for a vestibule.*
- ii. *The padlock and hasp locking system is not very aesthetic in appearance and awkward to navigate.*
- iii. **2018 - The half height door leading out of the lantern is completely missing.**

Recommendations:

- i. *Replace door with a new outswing paneled to replicate original.*
 - ii. *Install new hinges and locking hardware that is more appropriate for the function and use.*
 - iii. *Replace door at Lantern with a full height door integral with the restored lantern.*
2. **WINDOWS:** Located within the tower are two (2) windows allowing light into the central stair. These window units were renovated during the 1978 campaign and had new stainless steel wire protection screens installed at the exterior.

Observations:

- i. *The sealant at the interior perimeter of the metal frames is in poor condition.*
- ii. *The window units and frames along with the exterior protection screens are in poor condition.*

Recommendations:

- i. *Replace the two (2) windows with new fixed units with hurricane rated glass.*

D. SITEWORK:

1. **PAVING:** At the base of the Lighthouse there is a depressed paved area bounded by carved stone blocks with a scalloped edge. These stones appear to be original and follow the same aesthetic of the tower components.

Observations:

- i. *Due to the unstable soil conditions beneath the paving the stone pavers and edging have moved and settled.*
- ii. *Some of the edge stones exhibit chips and spalls but are mostly in good condition.*
- iii. *The bluestone pavers are installed in a variegated layout and have open joints and broken units at areas.*

Recommendations:

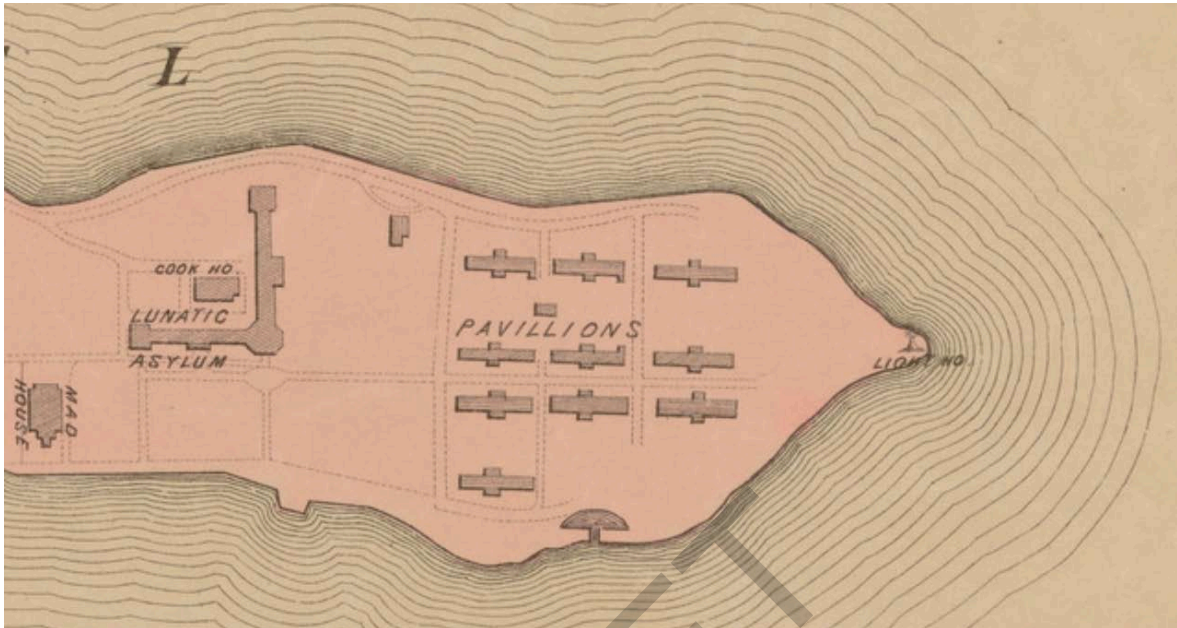
- i. Reset perimeter stones on a new grade beam to inhibit settling.*
 - ii. Reset pavers and replace damaged units with new to match existing.*
- 2. BOLLARDS:** There are two (2) decorative stone bollards mounted at either side of the entrance step to the Tower Base. These stones are carved in a similar style and are most likely original to the building. They were reset during the 1978 campaign.

Observations: *The stones are in good condition except for the damaged/broken tip of each bollard. Graffiti is evident at one unit as well.*

Recommendations: *Remove graffiti from stone and clean remaining units with appropriate material.*

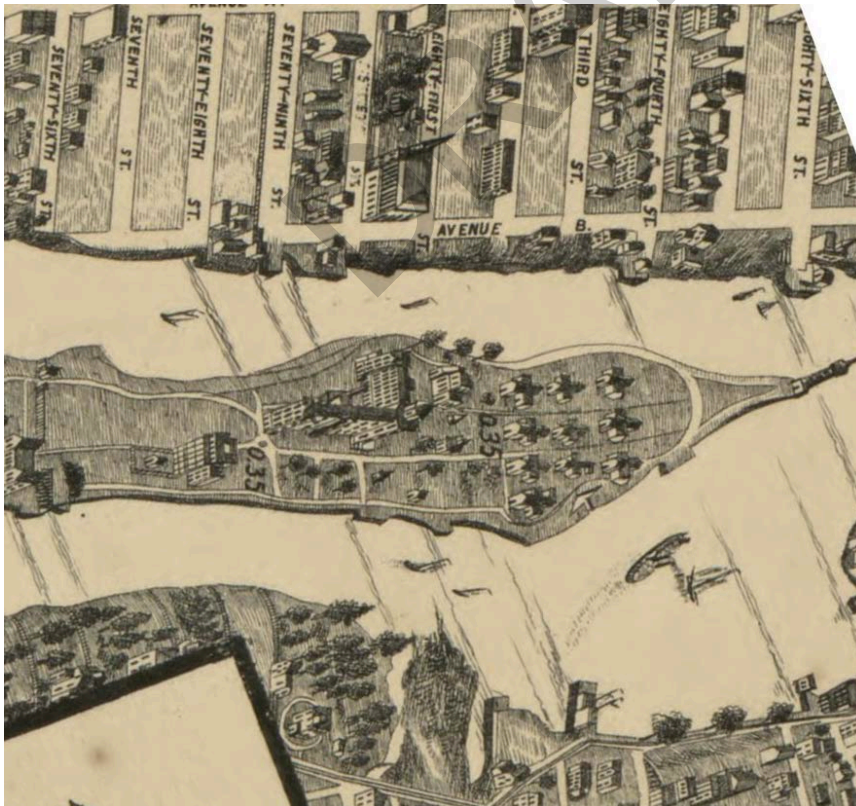
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IV. IMAGES/PHOTOGRAPHS



1. 18

79 Map - Showing lighthouse at northern tip of Blackwell's Island. *NYPL Collection*



2. 1879 Taylor Map - Showing lighthouse at northern tip of Blackwell's Island. *NYPL Collection*



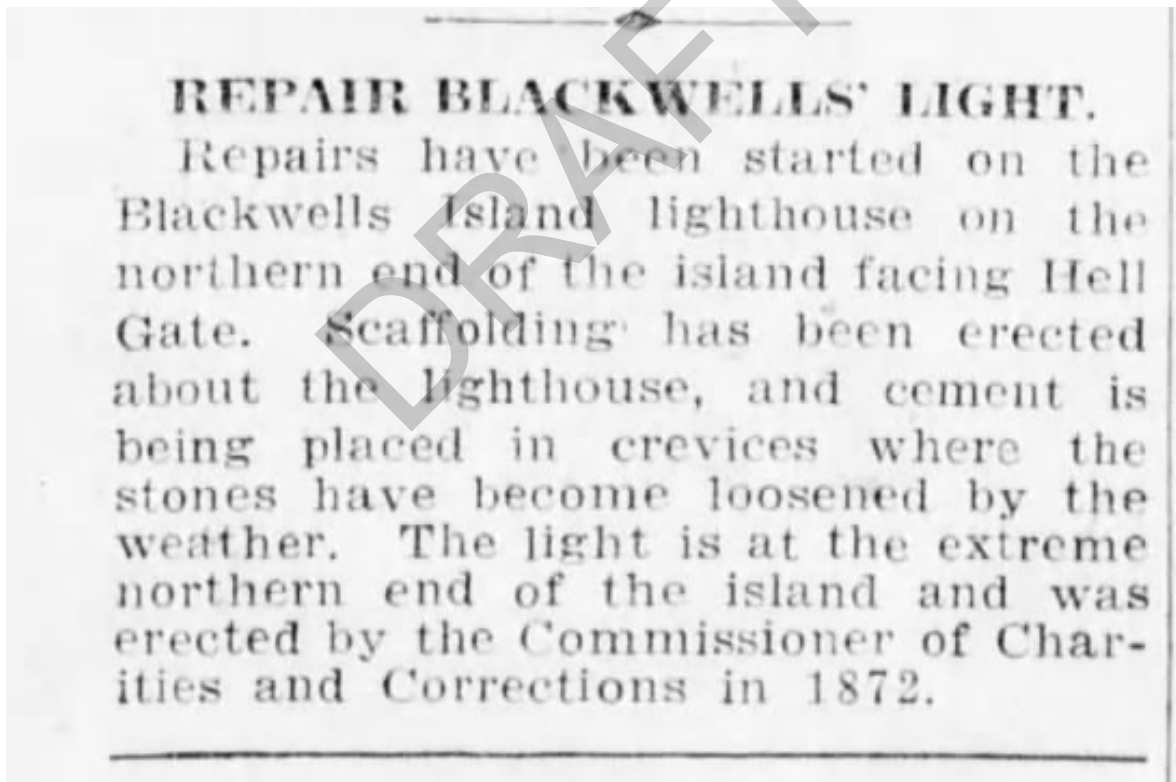
1895 – Image looking at northern tip of Blackwell's Island from the north. *MCNY Collection*



4. 1903 Map. *NYPL Collection*



5. 1923 Image looking at northern tip of Blackwell's Island from the north. *NYPL Collection.*
Note: It appears that the upper lantern has been modified or being reconstructed.



5. Article in Brooklyn Daily Eagle – February 23, 1922.



6. Detail View of 1890 Photo showing original cast iron deck walk and eight-sided lantern.
Note: Faint image of weathervane at peak of ventilator.



7. 1933 - First image of new ten-sided lantern configuration with concrete deck at walkway.
NYPL Collection.



8. Upper section of Lighthouse from the south.



9. Entrance door and unique stone gable detail.



10. View of underside at deteriorated concrete deck.



11. Severely deteriorated concrete deck.



12. Severely deteriorated concrete deck.



13. Cracks developing at perimeter of concrete deck.



14. Drone Photo showing severe deterioration at entire concrete deck.



15. Drone Photo showing severe deterioration at entire concrete deck.



16. Drone Photo showing severe deterioration at entire concrete deck.



17. Drone Photo showing severe deterioration at entire concrete deck.



18. Deteriorated cast iron ventilator at the top.



19. Underside view of ventilator and deteriorated cast iron sections.



20. Severely deteriorated/rusted lower sections of cast iron with snapped bolt connections.



21. Severely deteriorated/rusted upper sections of cast iron with snapped bolt connections.



22. Typical stress cracks at cast iron sections.



23. Typical stress cracks at cast iron sections.



24. Moisture damage at upper sections of interior masonry and underside of concrete deck.



25. Deeply eroded mortar joints at brick masonry.



26. Deeply eroded mortar joints at lower section of brick masonry from rising damp.



27. Loose and deteriorated sections of wood spiral stair.



28. Interior walls have failing stucco.



29. View at base with historic granite bollards at either side of entrance.



30. Bluestone paving and granite curbing have settled with open joints.
Light fixtures have filled with water.



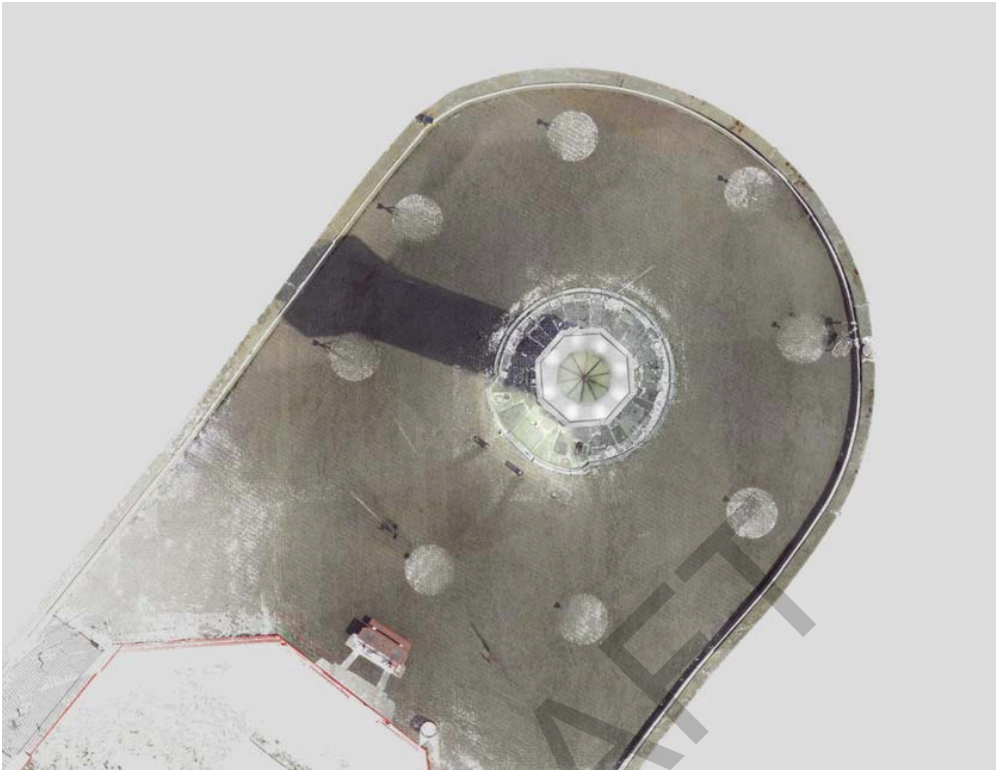
31. A mixture of old and new bluestone sections with open joints.



32. Current light fixture is a repurposed street lamp with 250 watt bulb.



33. Depiction of what the original 4th Order Fresnel lens looked like.



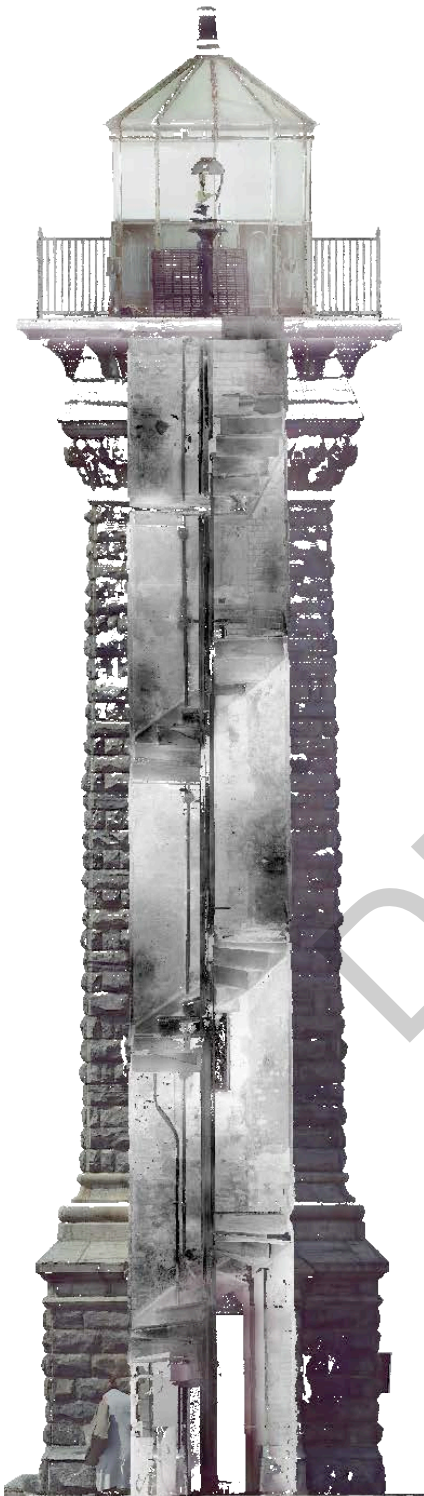
34. Site view of the lighthouse



35. Detail site view of the lighthouse.

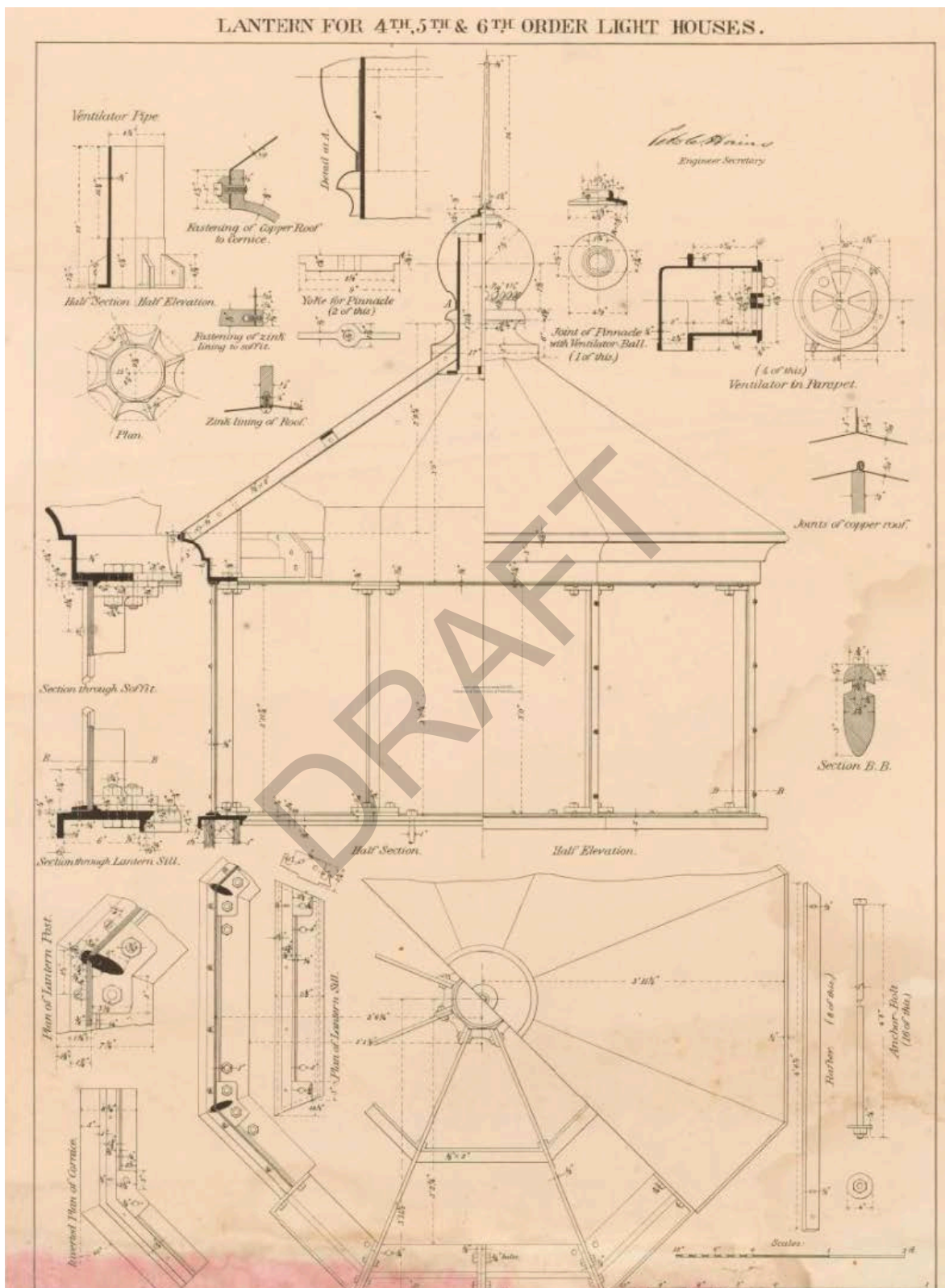


36. Laser scan views of the South and East elevations.



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37. Laser scan Section View.



38. Historic drawing of cast iron lighthouse components similar to current configuration.
