

APPENDIX A:
LIST OF SURVEYED SITES AND RESULTS

A P P E N D I X A:
LIST OF SURVEYED SITES AND RESULTS

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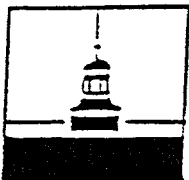
<u>Name</u>	<u>CRS #</u>	<u>Status</u>
Baker Rear Range	N-12698	Eligible
Bulkhead Bar Front Range	N-4245	Eligible
Bellevue Rear Range	N-12700	Eligible
New Castle Front Range	N-12701	Eligible
Marcus Hook Front	N-12702	Eligible
Ship John Shoal	K-6499	Eligible
Brandywine Shoal Lighthouse	K-6502	Eligible
Miah Maull Shoal	K-6501	NJ Register
Port Mahon Lighthouse(foundation)	K-6498	Eligible (Archeo)
Cross Ledge (foundation)		Eligible (Archeo)
Marcus Hook Rear	N-12087	Registered
Reedy Island Rear	N-5120	Registered
Liston Front Range	N-3901	Registered
Fenwick Island Lighthouse	S-187	Registered
Mispillion Lighthouse	S-441	Registered
Harbor of Refuge Lighthouse (1908)	S-186	Registered
Fourteen Foot Bank Lighthouse	K-6490	Registered
Delaware Breakwater Rear Light	S-186	Registered
Delaware Breakwater East End	S-186	Registered
Delaware Breakwater West End	S-186	Registered
Harbor of Refuge North End	S-186	Registered
Harbor of Refuge Light (1927)	S-186	Registered
Upper Middle Shoal Lightship		Gone
Brandywine Shoal Lightship		Gone
Five Fathom Bank Lightship		Gone
Fourteen Foot Bank Lightship		Gone
Fenwick Island Lightship		Gone
Overfalls Lightship		Gone
Christiana Depot		Gone
Edgemoor Supply Buoy Depot		Gone
Cherry Island Flats Depot		Gone
Bombay Hook Lighthouse		Gone
Cape Henlopen Light		Gone

New Castle Front/Rear Range		Replaced
Christiana Front/Rear Range		Replaced
Cherry Island Front/Rear Range		Replaced
Murderkill River Front/Rear Range		Replaced
St. Jones River Front/Rear Range		Replaced
Fort Delaware Beacon		Replaced
Delaware City Beacon	N-12697	Replaced
Bulkhead Bar Rear Range	N-12699	Replaced
Smyrna River Front/Rear Range		Replaced
Leipsic River Front Range		Replaced
Little River Front Range		Replaced
Mispillion South Jetty Beacon		Replaced
Pea Patch Island Dike Middle		Replaced
Pea Patch Island Dike Gap		Replaced
Pea Patch Island Dike Upper		Replaced
Appoquinimink Front Range		Replaced
Bellevue Front Range		Replaced
Grubb Landing Beacon		Replaced
Elbow of Cross Ledge	K-6500	Replaced
Port Mahon Lighthouse (current)		Replaced
Reedy Island Front Range		Replaced
Elbow of Cross Ledge (original base)		Replaced top
Delaware East Day Beacon		Not Found
Delaware West Day Beacon		Not Found
Edgemoor Beacon		Not Found
Baker Front Range		Not Found
Christiana South Jetty Beacon		Not Found
Lewes Depot		Not Found
Rehoboth Canal Jetty		Not Found
Broadkill Beacon		Not Found
Leipsic River Rear Range		Not Found
Little River Rear Range		Not Found
Broadkill River Day Marker		Not Found
Cape Henlopen Day Marker		Not Found
Port Penn Front/Rear Range		Not Found
Christiana Beacon		Not Found
Delaware Breakwater Beacon		Not Found

Delaware Breakwater Light
Liston Rear Range
Mispillion South Jetty
Reedy Island Jetty

Not Found
Not Found
Not Found
Not Found

APPENDIX B:
AIDS TO NAVIGATION COMPLETED SURVEY FORMS



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
CONSTRUCTION DATA FORM

FORM CRS-1

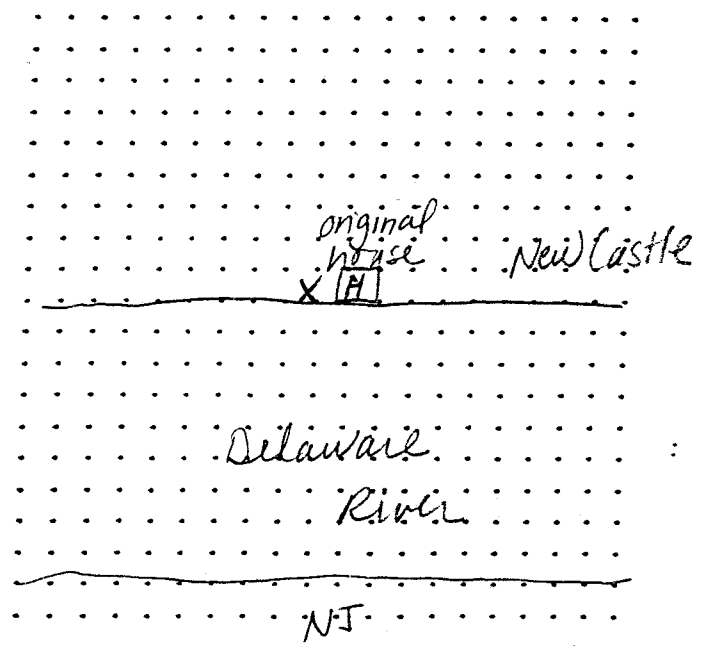
CRS no. N-12701
SPO Map 08-09-33
Hundred New Castle
Quad Wilmington South
Zone 18
Acreage

1. ADDRESS OF PROPERTY: New Castle Front Range Light
2. DATE OF INITIAL CONSTRUCTION: 1876
3. STYLE/FLOOR PLAN:
4. ARCHITECT/BUILDER:
5. INTEGRITY: a) original site x b) moved
c) if moved, when and from where
d) list major alterations and dates (if known)
6. CONDITION: good X modern structure deteriorated
remarks: Original keeper's dwelling remains at site
7. DESCRIBE THE RESOURCE AS COMPLETELY AS POSSIBLE:
 - a) Overall shape
stories
bays
wings
 - b) Structural system
 - c) Foundation
materials
basement
 - d) Exterior walls (modern over original)
materials
color(s)
 - e) Roof
shape; materials
cornice
dormers
chimney location(s)

Newcastle Front Range

- f) Windows
 - spacing
 - type
 - trim
 - shutters
- g) Door
 - spacing
 - type
 - trim
- h) Porches
 - location(s)
 - materials
 - supports
 - trim
- i) Interiors details (if accessible)

SKETCH MAP (provide north arrow)



8. Surveyor: _____ Date of Form _____



NPS National Maritime Initiative Inventory of Maritime Resources

AIDS TO NAVIGATION Survey Form

Completed by (Name/Organ/Phone): Center for Historic Architecture and Engineering
University of Delaware, Newark DE 19717

Resource Name: New Castle Front Range

LOCATION

State: Delaware ; Location: Near edge of Delaware River about 1.75 miles southwest
(body of water, point of land, etc.) of New Castle.

City Vicinity: New Castle ; County New Castle

OWNERSHIP

Owner/Manager/Federal Agency with Jurisdiction:

Mr. William E. Cross owns house and land

Owner Address: United States Coast Guard
Philadelphia, Pa

Owner Phone: 215-241-4847

STATUS

Active Light: TRUE FALSE UNKNOWN

Year Inactive: _____

Automated Light: TRUE FALSE UNKNOWN

Year Automated: 1964

Daymarker: TRUE FALSE UNKNOWN

Site Only (no buildings remaining): TRUE FALSE UNKNOWN

CURRENT TOWER

Site Date: 1876 demolished in 1964
Current Tower Constructed: 1964 White steel, skeleton tower with
automated light.

Foundation (circle one):

Construction Materials (circle primary):

Natural/Emplaced
Dressed Stone/Timber
Scrub Piling
Piling
Caisson Concrete
Crib

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Reinforced Concrete
Steel

Other: _____

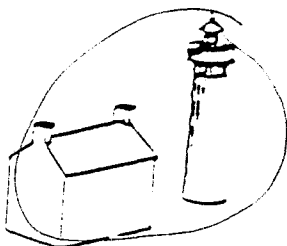
Other: _____

Tower Shape (circle one):

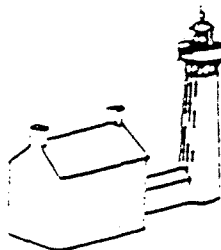
Square Cylindrical Conical Skeletal Pyramidal Hexagonal Octagonal

Relationship to Other Structures (circle one):

Separate

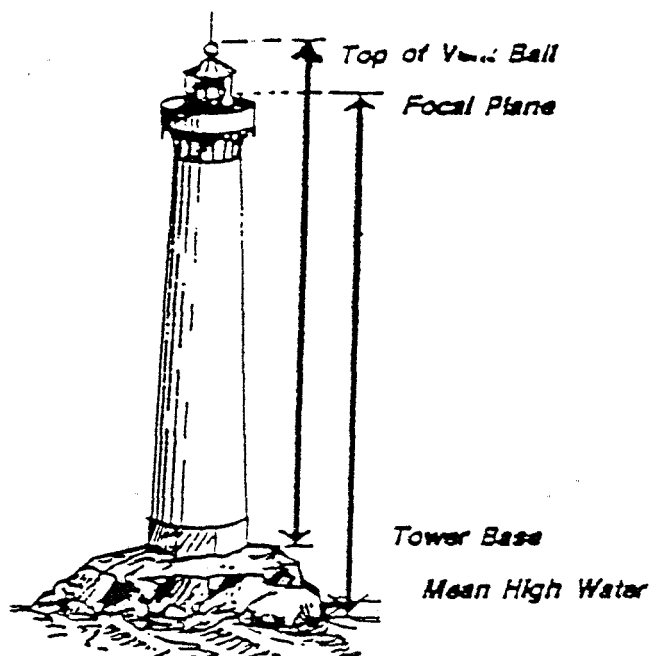


Attached



Integral





Tower Height: _____ feet, _____ inches

Height of Focal Plane: _____ feet, _____ inches

Markings/Patterns: _____

LENS

Current Optic: _____

Year Installed: _____

Original Optic: _____

Year Installed: _____

Optic Characteristics: _____

PRIMARY KEEPERS QUARTERS

Number of Stories: 2

Building Materials (circle primary):

Rubble Stone

Dressed Stone

Brick first story

Wood

Cast Iron frame 2nd story

Steel

Other: _____

Building Style: _____
(Cape Cod, Duplex, Victorian, etc.)

Year Constructed: _____

Total # of Keepers Quarters: _____

CURRENT SOUND SIGNAL

Signal Type: _____

Signal Characteristics: _____

Building Materials (circle primary):

Rubble Stone

Dressed Stone

Brick

Wood

Cast Iron

Steel

Other: _____

Building Style: _____

Year Constructed: _____

ASSOCIATED STRUCTURES (Indicate # of each):

Sound Signal Buildings: _____ brick

Oil Houses: X Cisterns: _____ Garages: _____ wooden Barns: X

Bridges/Tunnels/Catwalks: _____ Docks/Cranes/Marine Railroads: _____ Storage Buildings: _____

outhouse X Brick walkway X

SITE SIGNIFICANCE

On a State Inventory? TRUE FALSE UNKNOWN Date Listed: _____

National Register Status (circle one):

Listed

Part of Larger Listing

Determined Eligible by the Keeper

Determined Ineligible by the Keeper

Determined Eligible by the SHPO

Determined Ineligible by the SHPO

No Status

Unknown

Recorded by the Historic American Buildings Survey (HABS): TRUE FALSE UNKNOWN

Recorded by the Historic American Engineering Record (HAER): TRUE FALSE UNKNOWN

Designated National Historic Landmark (NHL): TRUE FALSE UNKNOWN

Owned or managed by the NPS: TRUE FALSE UNKNOWN Park: _____

Name of Aid to Navigation New Castle Front Range
Location On Bank of DE River 1.75 miles SW of New Castle
Year 1876 site 1964 Current Structure
CRS no. _____
SPO Maps _____
Hundred New Castle
Quad Wilmington South
Zone 18
UTM E 448897 N 4388039

Describe The Resource As Completely As Possible:

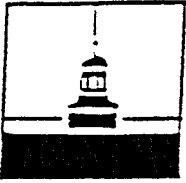
Fixed Light Beacons - Harbor Light _____
Range Light ✓ Front ✓ Rear _____
River or Channel Light _____

Non-Fixed Aids - Lightship _____ Temporary _____ Permanent _____
Bouy ✓
Natural Marker _____
Other _____

Is the Aid to Navigation - Manned _____ Unmanned ✓

Elements Found in the Interior:

Are there any threats or hazards at the site?



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
PROPERTY IDENTIFICATION FORM

FORM CRS-3

CRS no. _____
SPO Map _____
Hundred New Castle
Quad Wilmington South
Zone 18
Acreage _____

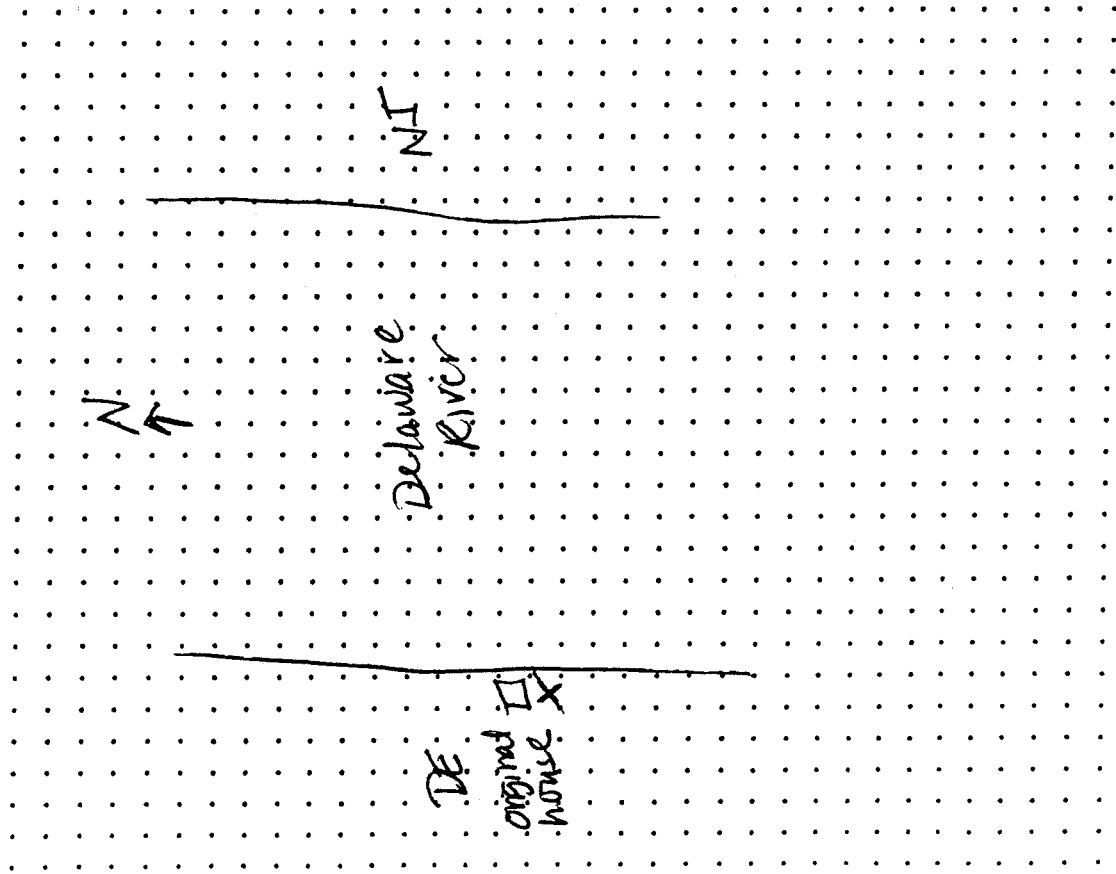
1. NAME OF PROPERTY: New Castle Front Range
2. STREET LOCATION: 1.75 miles southwest from New Castle on shore of Delaware.
3. OWNER'S NAME: United States Coast Guard/ William E. Cross TEL: # 215-271-4847
ADDRESS: Philadelphia Pa
4. TYPE OF LOCUS: a) building _____ b) structure X c) site _____
d) object _____ e) district _____ f) other _____
5. SURROUNDINGS OF LOCUS: (check more than one if necessary)
a) fallow field _____ b) cultivated field _____ c) woodland _____
d) scattered buildings _____ e) densely built up _____ f) other _____
6. FUNCTION: original _____ present _____
7. LIST ADDITIONAL SHEETS USED

8. YOUR NAME: Leslie Bashman, Center for Historic Architecture
and Engineering
YOUR ADDRESS: University of Delaware, Newark, DE 19717 # 302-451-8097
ORGANIZATION (if any) Center for Historic Architecture DATE January 15, 1991
and Engineering

USE BLACK INK ONLY

8. SKETCH MAP

Please indicate position of locus in relation to geographical landmarks such as streams and roads.



INDICATE NORTH ON SKETCH

9. CONTEXT

Consider the following:

- relationship to setting
- associated traditions or stories
- noteworthy features
- comparison with others in area
- threats

10. Comprehensive Planning:

- Time Period(s)
- Cultural Concept

11. Evaluation and Eligibility

List area(s) of significance and criteria

12. Certification

Survey: Name/Title _____

Date _____

BAHP: Name/Title _____

Date _____



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
CONSTRUCTION DATA FORM

FORM CRS-1

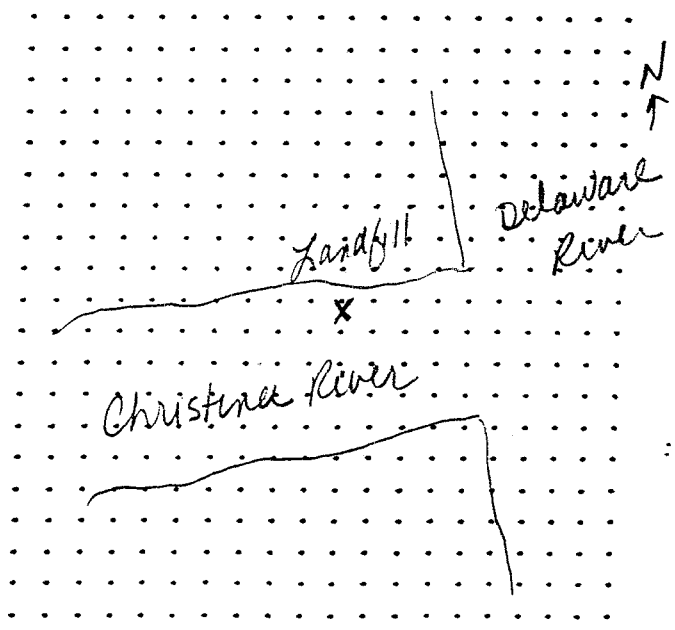
CRS no. N-12700
SPO Map 10-11-33
Hundred Wilmington
Quad Wilmington South
Zone 18
Acreage

1. ADDRESS OF PROPERTY: Bellevue Rear Range Light
2. DATE OF INITIAL CONSTRUCTION: 1909
3. STYLE/FLOOR PLAN:
4. ARCHITECT/BUILDER:
5. INTERGRITY: a) original site X b) moved
c) if moved, when and from where
d) list major alterations and dates (if known)
6. CONDITION: good X deteriorated
remarks:
7. DESCRIBE THE RESOURCE AS COMPLETELY AS POSSIBLE:
 - a) Overall shape
stories
bays
wings
 - b) Structural system
 - c) Foundation
materials
basement
 - d) Exterior walls (modern over original)
materials
color(s)
 - e) Roof
shape; materials
cornice
dormers
chimney location(s)

Bellvue Rear Range

- f) Windows
 - spacing
 - type
 - trim
 - shutters
- g) Door
 - spacing
 - type
 - trim
- h) Porches
 - location(s)
 - materials
 - supports
 - trim
- i) Interiors details (if accessible)

SKETCH MAP (provide north arrow)



8. Surveyor: _____ Date of Form _____

USE BLACK INK ONLY



NPS National Maritime Initiative Inventory of Maritime Resources

AIDS TO NAVIGATION Survey Form

Completed by (Name/Organ/Phone): Center for Historic Architecture and Engineering
302-451-8097

Resource Name: Bellevue Rear Range Light

LOCATION

State: Delaware; Location: Northern shoal of the Christina River
(body of water, point of land, etc.)

City Vicinity: Wilmington; County New Castle

OWNERSHIP

Owner/Manager/Federal Agency with Jurisdiction:

United States Coast Guard

Owner Address: Philadelphia

Owner Phone: 215-271-4847

STATUS

Active Light: ☒ TRUE ☐ FALSE ☐ UNKNOWN

Year Inactive: _____

Automated Light: ☒ TRUE ☐ FALSE ☐ UNKNOWN

Year Automated: _____

Daymarker: ☐ TRUE ☒ FALSE ☐ UNKNOWN

Site Only (no buildings remaining): ☐ TRUE ☐ FALSE ☐ UNKNOWN

CURRENT TOWER

Site Date: 1909; Current Tower Constructed: 1909

Foundation (circle one):

Construction Materials (circle primary):

Natural/Emplaced
Dressed Stone/Timber
Screw Piling
Piling
Caisson
Crib

☒ concrete

Rubble Stone
Dressed Stone
Brick
Wood
☒ Cast Iron
Reinforced Concrete
Steel

Tall, black pyramidal
skeleton iron tower
on concrete foundation

Other: _____

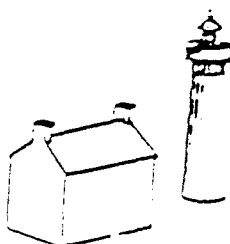
Other: _____

Tower Shape (circle one):

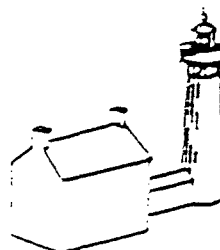
Square Cylindrical Conical ☒ Skeletal ☒ Pyramidal Hexagonal Octagonal

Relationship to Other Structures (circle one):

Separate

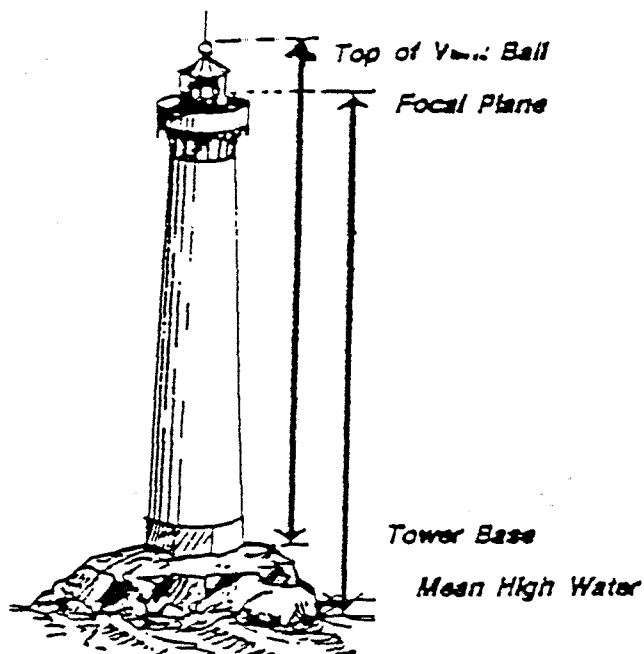


Attached



Integral





Tower Height: 104 feet, inches
 Height of Focal Plane: feet, inches
 Markings/Patterns: _____

LENS

Current Optic: _____
 Year Installed: _____
 Original Optic: _____
 Year Installed: _____
 Optic Characteristics: _____

CURRENT SOUND SIGNAL

Signal Type: _____
 Signal Characteristics: _____
 Building Materials (circle primary):
 Rubble Stone
 Dressed Stone
 Brick
 Wood
 Cast Iron
 Steel
 Other: _____
 Building Style: _____
 Year Constructed: _____

PRIMARY KEEPERS QUARTERS

Number of Stories: _____
 Building Materials (circle primary):
 Rubble Stone
 Dressed Stone
 Brick
 Wood
 Cast Iron
 Steel
 Other: _____
 Building Style: _____
 (Cape Cod, Duplex, Victorian, etc.)
 Year Constructed: _____
 Total # of Keepers Quarters: _____

ASSOCIATED STRUCTURES (Indicate # of each):

Sound Signal Buildings: _____ Oil Houses: _____ Cisterns: _____ Garages: _____ Barns: _____
 Bridges/Tunnels/Catwalks: _____ Docks/Cranes/Marine Railroads: _____ Storage Buildings: _____

SITE SIGNIFICANCE

On a State Inventory? TRUE FALSE UNKNOWN Date Listed: _____

National Register Status (circle one):

- Listed
- Part of Larger Listing
- Determined Eligible by the Keeper
- Determined Ineligible by the Keeper
- Determined Eligible by the SHPO
- Determined Ineligible by the SHPO
- No Status
- Unknown

Recorded by the Historic American Buildings Survey (HABS): TRUE FALSE UNKNOWN

Recorded by the Historic American Engineering Record (HAER): TRUE FALSE UNKNOWN

Designated National Historic Landmark (NHL):
 TRUE FALSE UNKNOWN

Owned or managed by the NPS: TRUE FALSE UNKNOWN Park: _____

Name of Aid to Navigation Bellvue Rear Range
Location Christina River North Shoal
Year 1909
CRS no. _____
SPO Maps _____
Hundred Wilmington
Quad Wilmington South
Zone 18
UTM E455597 N4396630

Describe The Resource As Completely As Possible:

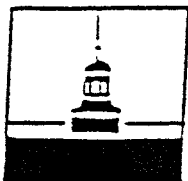
Fixed Light Beacons - Harbor Light _____
Range Light ✓ Front _____ Rear ✓
River or Channel Light _____

Non-Fixed Aids - Lightship _____ Temporary _____ Permanent _____
Bouy _____
Natural Marker _____
Other _____

Is the Aid to Navigation - Manned _____ Unmanned ✓

Elements Found in the Interior:

Are there any threats or hazards at the site?



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
PROPERTY IDENTIFICATION FORM

FORM CRS-3

CRS no. _____
SPO Map _____
Hundred Wilmington
Quad Wilmington South
Zone 18
Acreage _____

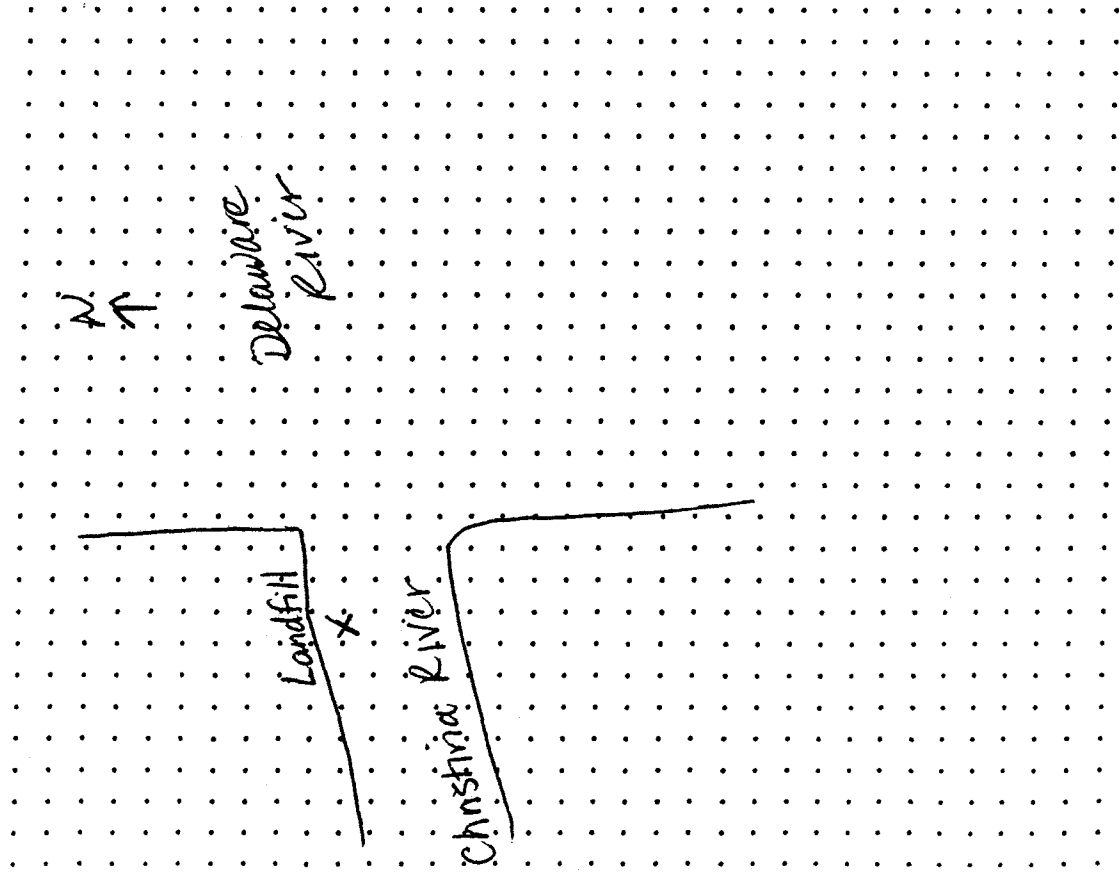
1. NAME OF PROPERTY: Bellevue Rear Range Light
2. STREET LOCATION: Christina River- North shoal
3. OWNER'S NAME: United States Coast Guard TEL. # 215-271-4847
ADDRESS: Philadelphia
4. TYPE OF LOCUS: a) building _____ b) structure X c) site _____
d) object _____ e) district _____ f) other _____
5. SURROUNDINGS OF LOCUS: (check more than one if necessary)
a) fallow field _____ b) cultivated field _____ c) woodland _____
d) scattered buildings _____ e) densely built up _____ f) other X
6. FUNCTION: original X present _____
7. LIST ADDITIONAL SHEETS USED

8. YOUR NAME: Leslie Bashman # _____
YOUR ADDRESS: University of Delaware, Newark, DE 19717 # 302-451-8097
ORGANIZATION (if any) Center for Historic Architecture and Engineering DATE January 15, 1990

USE BLACK INK ONLY

8. SKETCH MAP

Please indicate position of locus in relation to geographical landmarks such as streams and roads.



INDICATE NORTH ON SKETCH

9. CONTEXT

Consider the following:

- a) relationship to setting
- b) associated traditions or stories
- c) noteworthy features
- d) comparison with others in area
- e) threats

10. Comprehensive Planning:

- a. Time Period(s)
- b. Cultural Concept

11. Evaluation and Eligibility

List area(s) of significance and criteria

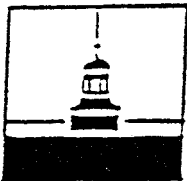
12. Certification

Survey: Name/Title

Date

BAHP: Name/Title

Date



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
CONSTRUCTION DATA FORM

FORM CRS-1

CRS no. N-12702
SPO Map 12-13-36
Hundred Brandywine
Quad Marcus Hook
Zone 18
Acreage

1. ADDRESS OF PROPERTY: Marcus Hook Front Range
2. DATE OF INITIAL CONSTRUCTION: 1925
3. STYLE/FLOOR PLAN:
4. ARCHITECT/BUILDER:
5. INTEGRITY: a) original site X b) moved
c) if moved, when and from where
d) list major alterations and dates (if known)
6. CONDITION: good X deteriorated
remarks:
7. DESCRIBE THE RESOURCE AS COMPLETELY AS POSSIBLE:
 - a) Overall shape
stories
bays
wings
 - b) Structural system
 - c) Foundation
materials
basement
 - d) Exterior walls (modern over original)
materials
color(s)
 - e) Roof
shape; materials
cornice
dormers
chimney location(s)

Marius Hook Front Range

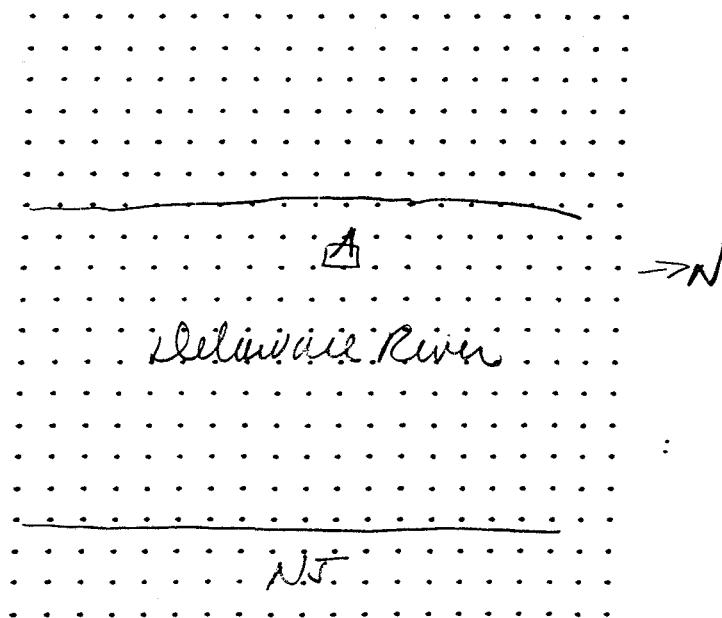
f) Windows
 spacing
 type
 trim
 shutters

g) Door
 spacing
 type
 trim

h) Porches
 location(s)
 materials
 supports
 trim

i) Interiors details (if accessible)

SKETCH MAP (provide north arrow)



8. Surveyor: _____ Date of Form _____

USE BLACK INK ONLY



NPS National Maritime Initiative Inventory of Maritime Resources

AIDS TO NAVIGATION Survey Form

Completed by (Name/Organ/Phone): Center for Historic Architecture and Engineering 302-451-8097

Resource Name: Marcus Hook Front Range

LOCATION

On Delaware River about 100 yds from the west bank along the axis of the shipping channel

State: Delaware ; Location: (body of water, point of land, etc.)

City Vicinity: Edgemoor ; County New Castle

OWNERSHIP

Owner/Manager/Federal Agency with Jurisdiction:

United States Coast Guard

Owner Address: Philadelphia, Pa

Owner Phone: 215-271-4847

STATUS

Active Light: TRUE FALSE UNKNOWN

Year Inactive:

Automated Light: TRUE FALSE UNKNOWN

Year Automated: 1925 same year built

Daymarker: TRUE FALSE UNKNOWN

Site Only (no buildings remaining): TRUE FALSE UNKNOWN

White/Red

CURRENT TOWER

Site Date: 1925 ; Current Tower Constructed: 1925

Foundation (circle one):

Construction Materials (circle primary):

Natural/Emplaced
Dressed Stone/Timber
Screw Piling
Piling
Caisson Concrete
Crib

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Reinforced Concrete
Steel

Other:

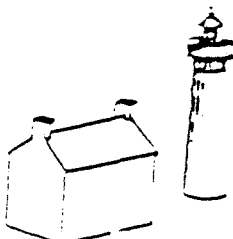
Other:

Tower Shape (circle one):

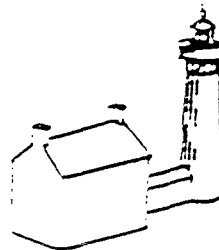
Square Cylindrical Conical Skeletal Pyramidal Hexagonal Octagonal

Relationship to Other Structures (circle one):

Separate

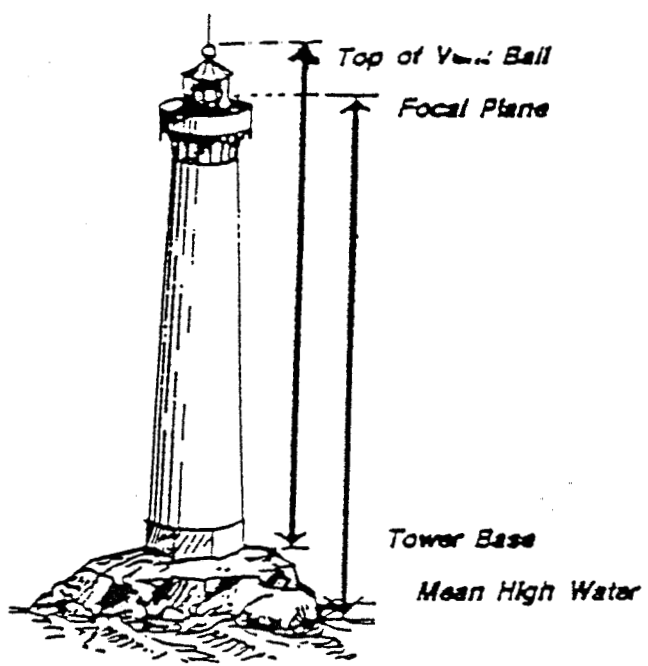


Attached



Integral





Tower Height: _____ feet, _____ inches
Height of Focal Plane: _____ feet, _____ inches
Markings/Patterns: _____

LENS

Current Optic: _____
Year Installed: _____
Original Optic: _____
Year Installed: _____
Optic Characteristics: _____

CURRENT SOUND SIGNAL

Signal Type: _____
Signal Characteristics: _____
Building Materials (circle primary):
 Rubble Stone
 Dressed Stone
 Brick
 Wood
 Cast Iron
 Steel
Other: _____
Building Style: _____
Year Constructed: _____

PRIMARY KEEPERS QUARTERS

Number of Stories: _____
Building Materials (circle primary):
 Rubble Stone
 Dressed Stone
 Brick
 Wood
 Cast Iron
 Steel
Other: _____
Building Style: _____
 (Cape Cod, Duplex, Victorian, etc.)
Year Constructed: _____
Total # of Keepers Quarters: _____

ASSOCIATED STRUCTURES (Indicate # of each):

Sound Signal Buildings: _____ Oil Houses: _____ Cisterns: _____ Garages: _____ Barns: _____
Bridges/Tunnels/Catwalks: _____ Docks/Cranes/Marine Railroads: _____ Storage Buildings: _____

SITE SIGNIFICANCE

On a State Inventory? TRUE FALSE UNKNOWN Date Listed: _____

National Register Status (circle one):

- Listed
- Part of Larger Listing
- Determined Eligible by the Keeper
- Determined Ineligible by the Keeper
- Determined Eligible by the SHPO
- Determined Ineligible by the SHPO
- No Status
- Unknown

Recorded by the Historic American Buildings Survey (HABS): TRUE FALSE UNKNOWN

Recorded by the Historic American Engineering Record (HAER): TRUE FALSE UNKNOWN

Designated National Historic Landmark (NHL):
TRUE FALSE UNKNOWN

Owned or managed by the NPS: TRUE FALSE UNKNOWN Park: _____

Name of Aid to Navigation Marcus Hook Front Range Light
 Location On Delaware River in Edgemont 100 yds from West bank
 Year 1925 built & automated
 CRS no. _____
 SPO Maps _____
 Hundred Brandywine
 Quad Marcus Hook
 Zone 18
 UTM E 459249 N 4402837

Describe The Resource As Completely As Possible:

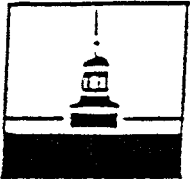
Fixed Light Beacons - Harbor Light _____
 Range Light ☒ Front ☒ Rear _____
 River or Channel Light _____

Non-Fixed Aids - Lightship _____ Temporary _____ Permanent _____
 Bouy _____
 Natural Marker _____
 Other _____

Is the Aid to Navigation - Manned _____ Unmanned ☒

Elements Found in the Interior:

Are there any threats or hazards at the site?



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
PROPERTY IDENTIFICATION FORM

FORM CRS-3

CRS no. _____
SPO Map _____
Hundred Brandywine
Quad Marcus Hook
Zone 18
Acreage _____

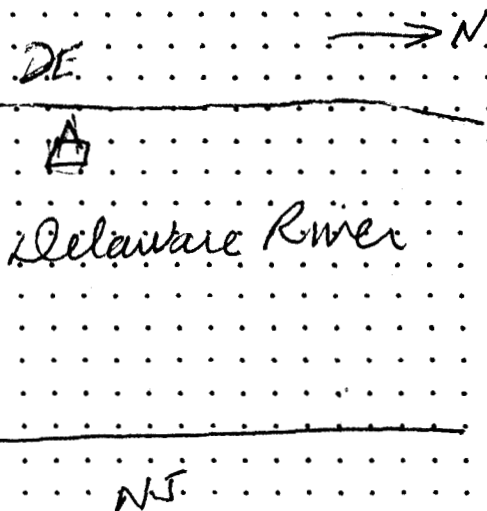
1. NAME OF PROPERTY: Marcus Hook Front Range
2. STREET LOCATION: on Delaware River near Edgemoor
3. OWNER'S NAME: United States Coast Guard TEL. # _____
ADDRESS: Philadelphia
4. TYPE OF LOCUS: a) building _____ b) structure X c) site _____
d) object _____ e) district _____ f) other _____
5. SURROUNDINGS OF LOCUS: (check more than one if necessary)
a) fallow field _____ b) cultivated field _____ c) woodland _____
d) scattered buildings _____ e) densely built up _____ f) other X
6. FUNCTION: original _____ X present _____
7. LIST ADDITIONAL SHEETS USED

8. YOUR NAME: Leslie Bashman # _____
YOUR ADDRESS: University of Delaware # 302-451-8097
ORGANIZATION (if any) Center for Historic Architecture DATE January 15, 1990
and Engineering

USE BLACK INK ONLY

8. SKETCH MAP

Please indicate position of locus in relation to geographical landmarks such as streams and roads.



INDICATE NORTH ON SKETCH

9. CONTEXT

Consider the following:

- a) relationship to setting
- b) associated traditions or stories
- c) noteworthy features
- d) comparison with others in area
- e) threats

10. Comprehensive Planning:

- a. Time Period(s)
- b. Cultural Concept

11. Evaluation and Eligibility

List area(s) of significance and criteria

12. Certification

Survey: Name/Title _____ Date _____
BAHP: Name/Title _____ Date _____



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
CONSTRUCTION DATA FORM

FORM CRS-1

CRS no. K6498
SPO Map 12304
Hundred Little Creek
Quad Little Creek
Zone 18
Acreage

1. ADDRESS OF PROPERTY: Port Mahon Lighthouse
2. DATE OF INITIAL CONSTRUCTION: 1831
3. STYLE/FLOOR PLAN:
4. ARCHITECT/BUILDER:
5. INTERGRITY: a) original site b) moved
c) if moved, when and from where
d) list major alterations and dates (if known)
Rebuilt four times
6. CONDITION: good X deteriorated

remarks: Base of old lighthouse is visible - destroyed by fire in 1984
concrete filled iron foundation columns remain.

7. DESCRIBE THE RESOURCE AS COMPLETELY AS POSSIBLE:

- a) Overall shape
stories
bays
wings
- b) Structural system
- c) Foundation
materials
basement
- d) Exterior walls (modern over original)
materials
color(s)
- e) Roof
shape; materials
cornice
dormers
chimney location(s)

USE BLACK INK ONLY

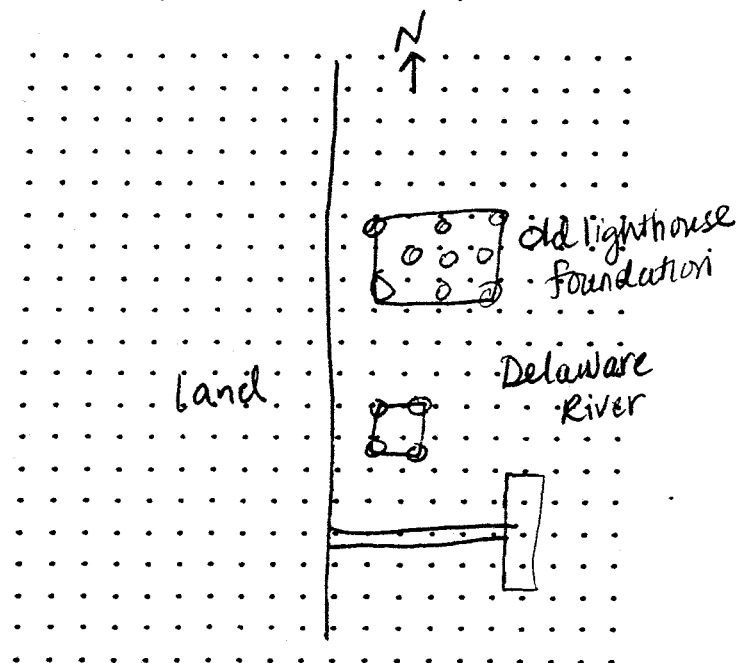
f) Windows
spacing
type
trim
shutters

g) Door
spacing
type
trim

h) Porches
location(s)
materials
supports
trim

i) Interiors details (if accessible)

SKETCH MAP (provide north arrow)



8. Surveyor: _____ Date of Form _____

USE BLACK INK ONLY



NPS National Maritime Initiative Inventory of Maritime Resources

AIDS TO NAVIGATION Survey Form

Completed by (Name/Organ/Phone): Center for Historic Architecture and Engineering
302-451-8097

Resource Name: Port Mahon Lighthouse

LOCATION

State: Delaware; Location: Delaware River near Little Creek
(body of water, point of land, etc.)

City Vicinity: Little Creek; County: _____

OWNERSHIP

Owner/Manager/Federal Agency with Jurisdiction:

United States Coast Guard

Owner Address: Philadelphia, Pa.

Owner Phone: 215-271-4847

STATUS

Active Light: ☒ TRUE ☐ FALSE ☐ UNKNOWN

Year Inactive: _____

Automated Light: ☒ TRUE ☐ FALSE ☐ UNKNOWN

Year Automated: 1955

Daymarker: ☒ TRUE ☐ FALSE ☐ UNKNOWN

Site Only (no buildings remaining): TRUE FALSE UNKNOWN

CURRENT TOWER

Site Date: 1831; Current Tower Constructed: _____

Foundation (circle one):

Natural/Emplaced
Dressed Stone/Timber
Screw Piling
☒ Piling
Caisson
Crib

Construction Materials (circle primary):

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Reinforced Concrete
☒ Steel

Other: _____

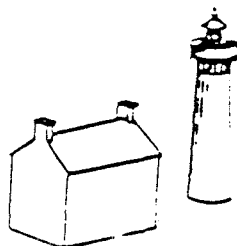
Other: _____

Tower Shape (circle one):

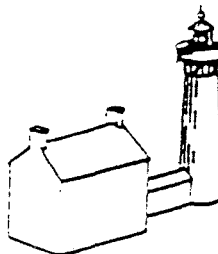
☒ Square ☐ Cylindrical ☐ Conical ☒ Skeletal ☐ Pyramidal ☐ Hexagonal ☐ Octagonal

Relationship to Other Structures (circle one):

Separate

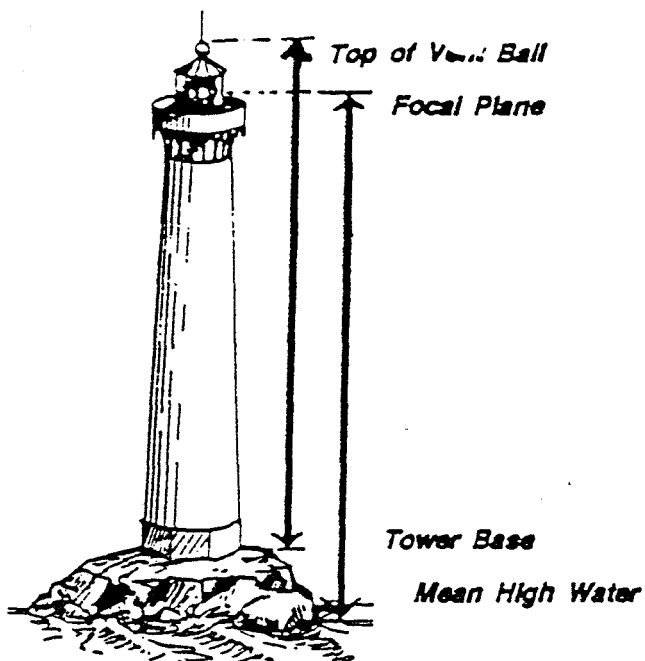


Attached



Integral





Tower Height: _____ feet, _____ inches
 Height of Focal Plane: _____ feet, _____ inches
 Markings/Patterns: _____

LENS

Current Optic: _____
 Year Installed: _____
 Original Optic: _____
 Year Installed: _____
 Optic Characteristics: _____

CURRENT SOUND SIGNAL

Signal Type: None

Signal Characteristics: _____
 Building Materials (circle primary):

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Steel

Other: _____

Building Style: _____

Year Constructed: _____

PRIMARY KEEPERS QUARTERS

Number of Stories: None
 Building Materials (circle primary):

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Steel

Other: _____

Building Style: _____
 (Cape Cod, Duplex, Victorian, etc.)

Year Constructed: _____

Total # of Keepers Quarters: _____

ASSOCIATED STRUCTURES (Indicate # of each):

Sound Signal Buildings: _____ Oil Houses: _____ Cisterns: _____ Garages: _____ Barns: _____

Bridges/Tunnels/Catwalks: _____ Docks/Cranes/Marine Railroads: _____ Storage Buildings: _____

SITE SIGNIFICANCE

On a State Inventory? TRUE FALSE UNKNOWN Date Listed: _____

National Register Status (circle one):

Listed
Part of Larger Listing
Determined Eligible by the Keeper
Determined Ineligible by the Keeper
Determined Eligible by the SHPO
Determined Ineligible by the SHPO
No Status
Unknown

Recorded by the Historic American Buildings Survey (HABS): TRUE FALSE UNKNOWN

Recorded by the Historic American Engineering Record (HAER): TRUE FALSE UNKNOWN

Designated National Historic Landmark (NHL):
 TRUE FALSE UNKNOWN

Owned or managed by the NPS: TRUE FALSE UNKNOWN Park: _____

Name of Aid to Navigation Port Mahon Lighthouse
Location Delaware River near Little Creek
Year 1831
CRS no. _____
SPO Maps _____
Hundred Little Creek
Quad Little Creek
Zone 18
UTM E465473 N4336372

Describe The Resource As Completely As Possible:

Fixed Light Beacons - Harbor Light _____
Range Light _____ Front _____ Rear _____
River or Channel Light X

Non-Fixed Aids - Lightship _____ Temporary _____ Permanent _____
Bouy _____
Natural Marker _____
Other _____

Is the Aid to Navigation - Manned ~~M~~ Unmanned X

Elements Found in the Interior:

Are there any threats or hazards at the site?



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
PROPERTY IDENTIFICATION FORM

FORM CRS-3

CRS no. _____
SPO Map _____
Hundred Little Creek
Quad Little Creek
Zone 18
Acreage _____

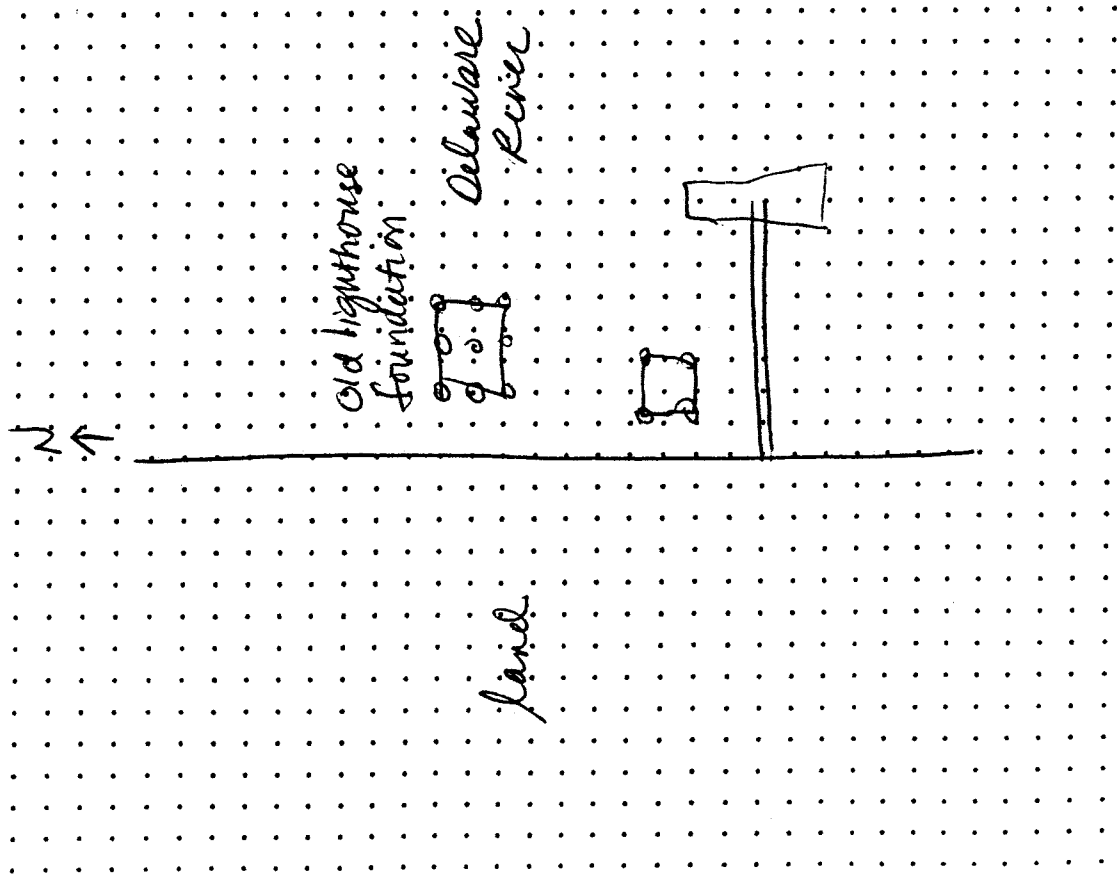
1. NAME OF PROPERTY: Port Mahon Lighthouse
2. STREET LOCATION: _____
3. OWNER'S NAME: United States Coast Guard TEL. # 215-271-4847
ADDRESS: Philadelphia, Pa.
4. TYPE OF LOCUS: a) building _____ b) structure X c) site _____
d) object _____ e) district _____ f) other _____
5. SURROUNDINGS OF LOCUS: (check more than one if necessary)
a) fallow field _____ b) cultivated field _____ c) woodland _____
d) scattered buildings _____ e) densely built up _____ f) other X
6. FUNCTION: original _____ present _____
7. LIST ADDITIONAL SHEETS USED

8. YOUR NAME: Leslie Bashman # _____
YOUR ADDRESS: University of Delaware # 302-451-8097
Center for Historic Architecture
ORGANIZATION (if any) _____ and Engineering DATE January 15, 1991

USE BLACK INK ONLY

8. SKETCH MAP

Please indicate position of locus in relation to geographical landmarks such as streams and roads.



INDICATE NORTH ON SKETCH

9. CONTEXT

Consider the following:

- relationship to setting
- associated traditions or stories
- noteworthy features
- comparison with others in area
- threats

10. Comprehensive Planning:

- Time Period(s)
- Cultural Concept

11. Evaluation and Eligibility

List area(s) of significance and criteria

12. Certification

Survey: Name/Title _____

Date _____

BAHP: Name/Title _____

Date _____



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
CONSTRUCTION DATA FORM

FORM CRS-1

CRS no. K6501
SPO Map 12304
Hundred _____
Quad _____
Zone 18
Acreage _____

1. ADDRESS OF PROPERTY: Miah Maull Shoal Lighthouse
2. DATE OF INITIAL CONSTRUCTION: 1913 *(state of NJ Register)*
3. STYLE/FLOOR PLAN: _____
4. ARCHITECT/BUILDER: _____
5. INTERGRITY: a) original site X b) moved _____
c) if moved, when and from where _____
d) list major alterations and dates (if known) _____
6. CONDITION: good X deteriorated _____
remarks: _____
7. DESCRIBE THE RESOURCE AS COMPLETELY AS POSSIBLE:
 - a) Overall shape
stories
bays
wings
 - b) Structural system
 - c) Foundation
materials
basement
 - d) Exterior walls (modern over original)
materials
color(s)
 - e) Roof
shape; materials
cornice
dormers
chimney location(s)

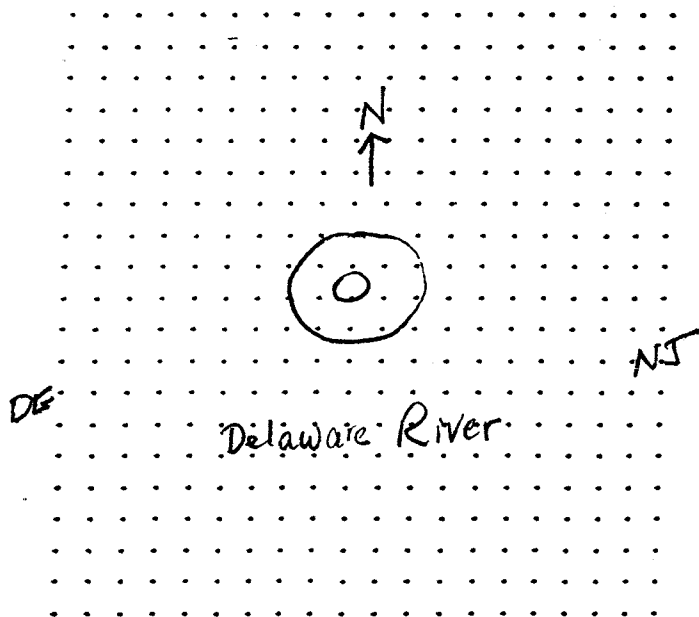
f) Windows
spacing
type
trim
shutters

g) Door
spacing
type
trim

h) Porches
location(s)
materials
supports
trim

i) Interiors details (if accessible)

SKETCH MAP (provide north arrow)



8. Surveyor: _____ Date of Form _____

USE BLACK INK ONLY



NPS National Maritime Initiative Inventory of Maritime Resources

AIDS TO NAVIGATION Survey Form

Center for Historic Architecture and Engineering
302-451-8097

Completed by (Name/Organ/Phone):

Resource Name: Miah Maul Shoal Lighthouse

LOCATION

State: Delaware; Location: Middle of channel in Delaware River
(body of water, point of land, etc.)

City Vicinity: _____; County _____

OWNERSHIP

Owner/Manager/Federal Agency with Jurisdiction:

United States Coast Guard

Owner Address: Cape May, New Jersey

Owner Phone: 609-884-6987

STATUS

Active Light: ☒ TRUE ☐ FALSE ☐ UNKNOWN

Year Inactive: _____

Automated Light: ☒ TRUE ☐ FALSE ☐ UNKNOWN

Year Automated: _____

Daymarker: ☐ TRUE ☒ FALSE ☐ UNKNOWN

Site Only (no buildings remaining): ☐ TRUE ☐ FALSE ☐ UNKNOWN

CURRENT TOWER

Site Date: _____; Current Tower Constructed: _____

Foundation (circle one):

Construction Materials (circle primary):

*Natural/Emplaced
Dressed Stone/Timber
Screw Piling
Piling
Caisson
Crib*

*Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Reinforced Concrete
Steel*

Other: _____

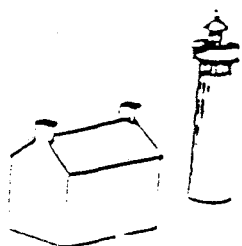
Other: _____

Tower Shape (circle one):

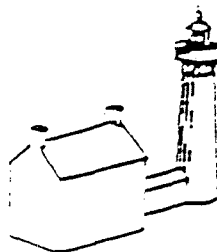
☐ Square ☒ Cylindrical ☐ Conical ☐ Skeletal ☐ Pyramidal ☐ Hexagonal ☐ Octagonal

Relationship to Other Structures (circle one):

Separate

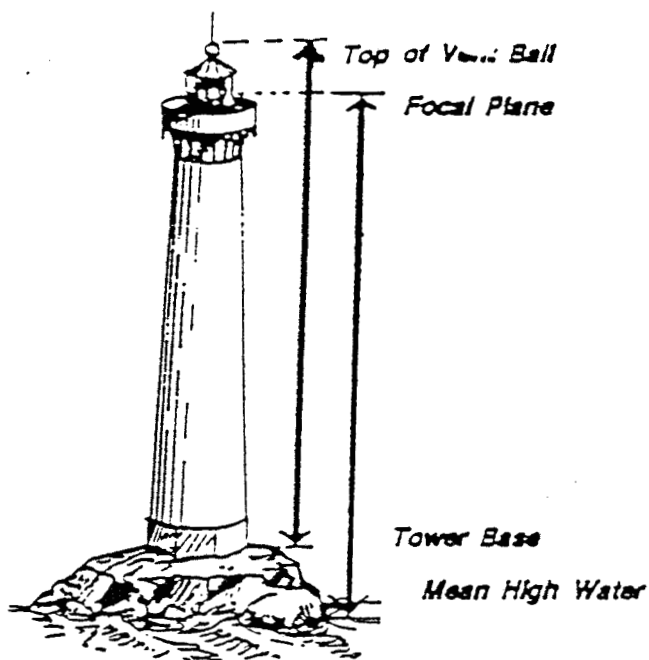


Attached



Integral





Tower Height: _____ feet, _____ inches

Height of Focal Plane: _____ feet, _____ inches

Markings/Patterns: Red cylindrical watchroom, black lantern, red conical tower, grey cylindrical pier

LENS

Current Optic: _____

Year Installed: _____

Original Optic: _____

Year Installed: _____

Optic Characteristics: _____

CURRENT SOUND SIGNAL

Signal Type: Yes, horns are visible

Signal Characteristics: _____
Building Materials (circle primary):

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Steel

Other: _____

Building Style: _____

Year Constructed: _____

PRIMARY KEEPERS QUARTERS

Number of Stories: _____
Building Materials (circle primary):

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Steel

Other: _____

Building Style: _____
(Cape Cod, Duplex, Victorian, etc.)

Year Constructed: _____

Total # of Keepers Quarters: _____

ASSOCIATED STRUCTURES (Indicate # of each): None

Sound Signal Buildings: _____ Oil Houses: _____ Cisterns: _____ Garages: _____ Barns: _____

Bridges/Tunnels/Catwalks: _____ Docks/Cranes/Marine Railroads: _____ Storage Buildings: _____

SITE SIGNIFICANCE

On a State Inventory? TRUE FALSE UNKNOWN Date Listed: New Jersey

National Register Status (circle one):

Listed
Part of Larger Listing
Determined Eligible by the Keeper
Determined Ineligible by the Keeper
Determined Eligible by the SHPO
Determined Ineligible by the SHPO
No Status
Unknown

Recorded by the Historic American Buildings Survey (HABS): TRUE FALSE UNKNOWN

Recorded by the Historic American Engineering Record (HAER): TRUE FALSE UNKNOWN

Designated National Historic Landmark (NHL):
TRUE FALSE UNKNOWN

Owned or managed by the NPS: TRUE FALSE UNKNOWN Park: _____

Name of Aid to Navigation Miah Maul Shoal Lighthouse
Location Middle of channel in Delaware River
Year 1913
CRS no. _____
SPO Maps _____
Hundred _____
Quad _____
Zone 18
UTM E481895 N4330614

Describe The Resource As Completely As Possible:

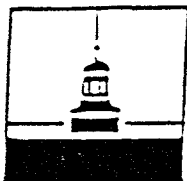
Fixed Light Beacons - Harbor Light _____
Range Light _____ Front _____ Rear _____
River or Channel Light X

Non-Fixed Aids - Lightship _____ Temporary _____ Permanent _____
Bouy _____
Natural Marker _____
Other _____

Is the Aid to Navigation - Manned _____ Unmanned X

Elements Found in the Interior:

Are there any threats or hazards at the site?



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
PROPERTY IDENTIFICATION FORM

FORM CRS-3

CRS no. _____
SPO Map _____
Hundred _____
Quad _____
Zone 18
Acreage _____

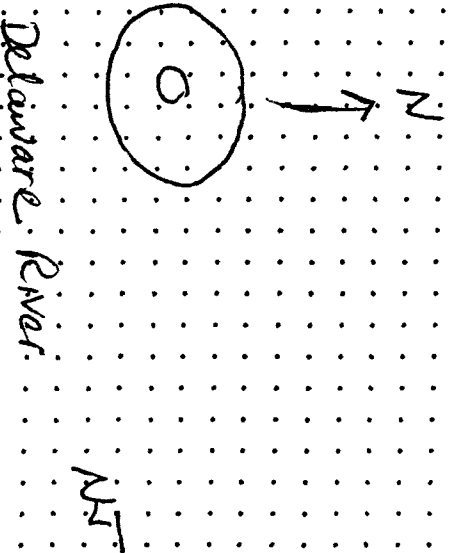
1. NAME OF PROPERTY: Miah Maul Shoal Lighthouse
2. STREET LOCATION: Middle of channel in Delaware River
3. OWNER'S NAME: United States Coast Guard TEL. # 609-884-6987
ADDRESS: Caep May, NewJersey
4. TYPE OF LOCUS: a) building _____ b) structure X c) site _____
d) object _____ e) district _____ f) other _____
5. SURROUNDINGS OF LOCUS: (check more than one if necessary)
a) fallow field _____ b) cultivated field _____ c) woodland _____
d) scattered buildings _____ e) densely built up _____ f) other X
6. FUNCTION: original X present _____
7. LIST ADDITIONAL SHEETS USED

8. YOUR NAME: Leslie Bashman # _____
YOUR ADDRESS: University of Delaware # 302-451-8097
ORGANIZATION (if any) Center for Historic Architecture
and Engineering DATE February 9, 1991

USE BLACK INK ONLY

SKETCH MAP

Please indicate position of locus in relation to geographical landmarks such as streams and roads.



INDICATE NORTH ON SKETCH

9. CONTEXT

Consider the following:

- a) relationship to setting
- b) associated traditions or stories
- c) noteworthy features
- d) comparison with others in area
- e) threats

10. Comprehensive Planning:

- a. Time Period(s)
- b. Cultural Concept

11. Evaluation and Eligibility

List area(s) of significance and criteria

12. Certification

Survey: Name/Title
BAHP: Name/Title

Date
Date



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
CONSTRUCTION DATA FORM

FORM CRS-1

CRS no. K6499
SPO Map 12304
Hundred _____
Quad Bombay Hook
Zone 18
Acreage _____

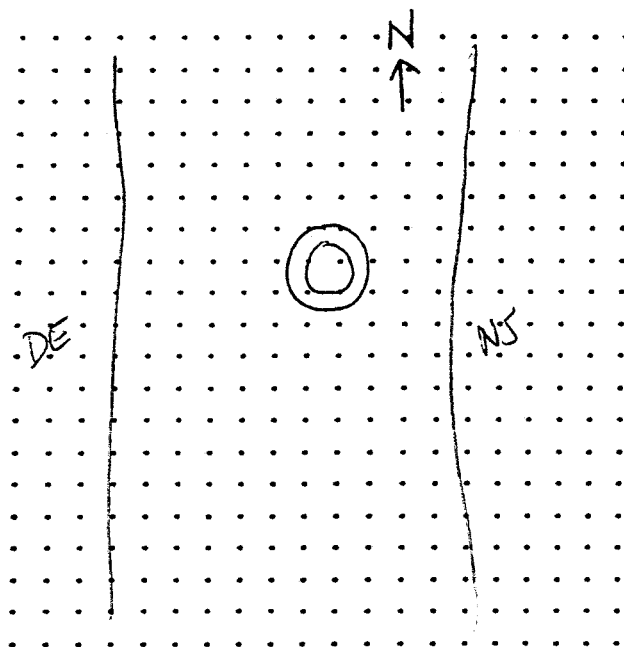
1. ADDRESS OF PROPERTY: Ship John Shoal
2. DATE OF INITIAL CONSTRUCTION: 1874
3. STYLE/FLOOR PLAN: _____
4. ARCHITECT/BUILDER: _____
5. INTERGRITY: a) original site x b) moved _____
c) if moved, when and from where _____
d) list major alterations and dates (if known) _____
Repairs to structure 1989-1990
6. CONDITION: good x deteriorated _____
remarks: _____
7. DESCRIBE THE RESOURCE AS COMPLETELY AS POSSIBLE:
 - a) Overall shape
stories
bays
wings
 - b) Structural system
 - c) Foundation
materials
basement
 - d) Exterior walls (modern over original)
materials
color(s)
 - e) Roof
shape; materials
cornice
dormers
chimney location(s)

USE BLACK INK ONLY

- f) Windows
 - spacing
 - type
 - trim
 - shutters
- g) Door
 - spacing
 - type
 - trim
- h) Porches
 - location(s)
 - materials
 - supports
 - trim

i) Interiors details (if accessible)

SKETCH MAP (provide north arrow)



8. Surveyor: _____ Date of Form _____

USE BLACK IN ONLY



NPS National Maritime Initiative Inventory of Maritime Resources

AIDS TO NAVIGATION Survey Form

Center for Historic Architecture and Engineering
302-451-8097

Completed by (Name/Organ/Phone): _____

Resource Name: Ship John Shoal

LOCATION

State: DE/NJ; Location: In channel of Delaware River
(body of water, point of land, etc.)

City Vicinity: None

County: _____

OWNERSHIP

Owner/Manager/Federal Agency with Jurisdiction:

United States Coast Guard

Owner Address: Cape May, New Jersey

Owner Phone: 609-884-6987

STATUS

Active Light: TRUE FALSE UNKNOWN

Year Inactive: _____

Automated Light: TRUE FALSE UNKNOWN

Year Automated: 1973

Daymarker: TRUE FALSE UNKNOWN

Site Only (no buildings remaining): TRUE FALSE UNKNOWN

CURRENT TOWER

Site Date: 1874; Current Tower Constructed: _____

Foundation (circle one):

Construction Materials (circle primary):

Natural/Emplaced
Dressed Stone/Timber
Screw Piling
Piling
Calisson
Crib

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Reinforced Concrete
Steel

Other: _____

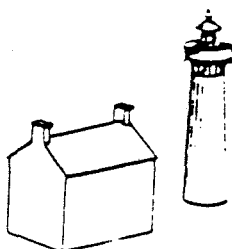
Other: _____

Tower Shape (circle one):

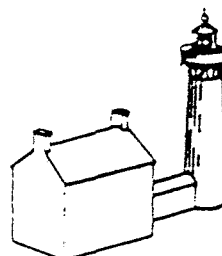
Square Cylindrical Conical Skeletal Pyramidal Hexagonal Octagonal

Relationship to Other Structures (circle one):

Separate

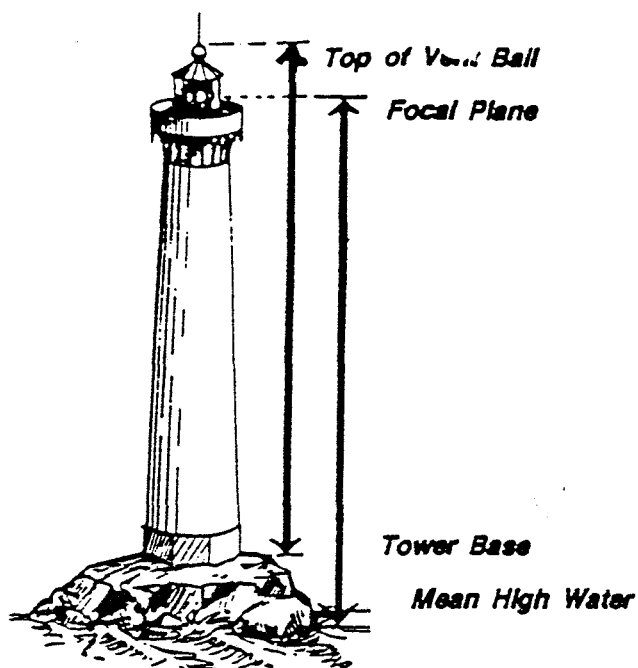


Attached



Integral





Tower Height: _____ feet, _____ inches
 Height of Focal Plane: 53 feet, _____ inches
 Markings/Patterns: _____

LENS

Current Optic: Fourth order lens
 Year Installed: _____
 Original Optic: _____
 Year Installed: _____
 Optic Characteristics: _____

CURRENT SOUND SIGNAL

Signal Type: None
 Signal Characteristics: _____
 Building Materials (circle primary):
 Rubble Stone
 Dressed Stone
 Brick
 Wood
 Cast Iron
 Steel
 Other: _____
 Building Style: _____
 Year Constructed: _____

PRIMARY KEEPERS QUARTERS

Number of Stories: 1
 Building Materials (circle primary):

Rubble Stone
 Dressed Stone
 Brick
 Wood
 Cast Iron
 Steel

Other: _____
 Building Style: Victorian
 (Cape Cod, Duplex, Victorian, etc.)

Year Constructed: _____

Total # of Keepers Quarters: _____

1 story brown octagonal dwelling with high mansard roof, cylindrical foundation filled with concrete.

ASSOCIATED STRUCTURES (Indicate # of each):

Sound Signal Buildings: _____ Oil Houses: _____ Cisterns: _____ Garages: _____ Barns: _____
 Bridges/Tunnels/Catwalks: _____ Docks/Cranes/Marine Railroads: _____ Storage Buildings: _____

SITE SIGNIFICANCE

On a State Inventory? TRUE FALSE UNKNOWN Date Listed: _____

National Register Status (circle one):

Listed
 Part of Larger Listing
 Determined Eligible by the Keeper
 Determined Ineligible by the Keeper
 Determined Eligible by the SHPO
 Determined Ineligible by the SHPO
 No Status
Unknown

Recorded by the Historic American Buildings Survey (HABS): TRUE FALSE UNKNOWN

Recorded by the Historic American Engineering Record (HAER): TRUE FALSE UNKNOWN

Designated National Historic Landmark (NHL):
 TRUE FALSE UNKNOWN

Owned or managed by the NPS: TRUE FALSE UNKNOWN Park: _____

Name of Aid to Navigation Ship John Shoal
Location In middle of channel of Delaware River
Year 1874
CRS no. _____
SPO Maps _____
Hundred _____
Quad Bombay Hook
Zone 18
UTM E467499 N4350513

Describe The Resource As Completely As Possible:

Fixed Light Beacons - Harbor Light _____
Range Light _____ Front _____ Rear _____
River or Channel Light X

Non-Fixed Aids - Lightship _____ Temporary _____ Permanent _____
Bouy _____
Natural Marker _____
Other _____

Is the Aid to Navigation - Manned _____ Unmanned X

Elements Found in the Interior:

Are there any threats or hazards at the site?



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
PROPERTY IDENTIFICATION FORM

FORM CRS-3

CRS no. _____
SPO Map _____
Hundred _____
Quad Bombay Hook
Zone 18
Acreage _____

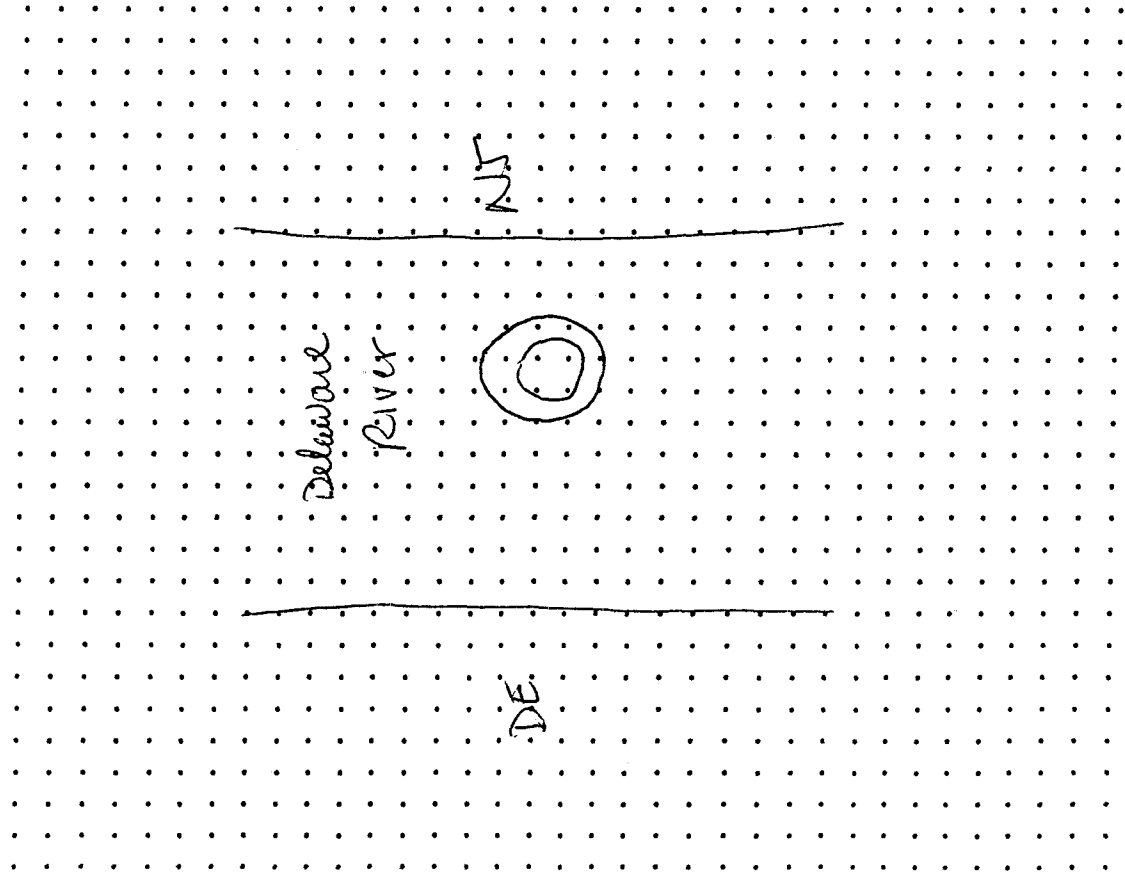
1. NAME OF PROPERTY: Ship John Shoal
2. STREET LOCATION: Middle of the channel of the Delaware River
3. OWNER'S NAME: United States Coast Guard TEL. # 609-884-6987
ADDRESS: Cape May, New Jersey
4. TYPE OF LOCUS: a) building _____ b) structure X c) site _____
d) object _____ e) district _____ f) other _____
5. SURROUNDINGS OF LOCUS: (check more than one if necessary)
a) fallow field _____ b) cultivated field _____ c) woodland _____
d) scattered buildings _____ e) densely built up _____ f) other X
6. FUNCTION: original X present _____
7. LIST ADDITIONAL SHEETS USED

8. YOUR NAME: Leslie Bashman # _____
YOUR ADDRESS: University of Delaware # 302-451-8097
Center for Historic Arcitecture
ORGANIZATION (if any) and Engineering DATE February 09, 1991

USE BLACK INK ONLY

8. SKETCH MAP

Please indicate position of locus in relation to geographical landmarks such as streams and roads.



INDICATE NORTH ON SKETCH

9. CONTEXT

Consider the following:

- relationship to setting
- associated traditions or stories
- noteworthy features
- comparison with others in area
- threats

10. Comprehensive Planning:

- Time Period(s)
- Cultural Concept

11. Evaluation and Eligibility

List area(s) of significance and criteria

12. Certification

Survey: Name/Title _____

Date _____

BAHP: Name/Title _____

Date _____



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
CONSTRUCTION DATA FORM

FORM CRS-1

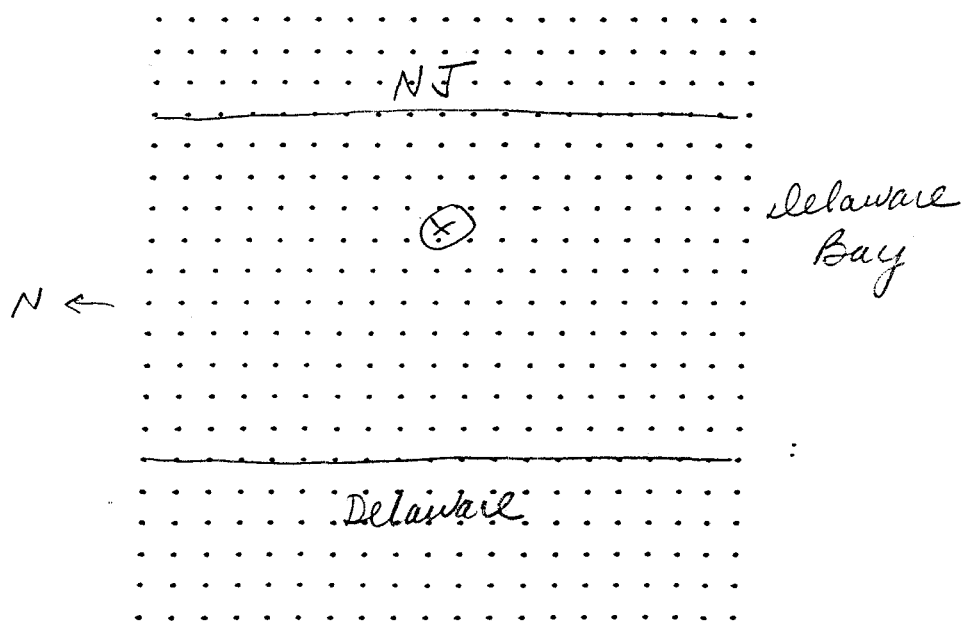
CRS no. K 6502
SPO Map 12304
Hundred _____
Quad _____
Zone 18
Acreage _____

1. ADDRESS OF PROPERTY: Brandywine Shoal Lighthouse
2. DATE OF INITIAL CONSTRUCTION: 1850- Screwpile 1914- Current Structure
3. STYLE/FLOOR PLAN: _____
4. ARCHITECT/BUILDER: _____
5. INTEGRITY: a) original site _____ b) moved X 50 feet from first screwpile
c) if moved, when and from where _____
d) list major alterations and dates (if known) _____
6. CONDITION: good X deteriorated _____
remarks: _____
7. DESCRIBE THE RESOURCE AS COMPLETELY AS POSSIBLE:
 - a) Overall shape
stories 1823- Lightship placed
bays 1827 Ordinary structure
wings 1850-1914 First screwpile
1914 Caisson light- 50 feet from first screwpile
1974 automated
 - b) Structural system
 - c) Foundation
materials
basement
 - d) Exterior walls (modern over original)
materials
color(s)
 - e) Roof
shape; materials
cornice
dormers
chimney location(s)

Brandywine Shoal

- f) Windows
 - spacing
 - type
 - trim
 - shutters
- g) Door
 - spacing
 - type
 - trim
- h) Porches
 - location(s)
 - materials
 - supports
 - trim
- i) Interiors details (if accessible)

SKETCH MAP (provide north arrow)



8. Surveyor: _____ Date of Form _____

USE BLACK INK ONLY



NPS National Maritime Initiative Inventory of Maritime Resources

AIDS TO NAVIGATION Survey Form

Completed by (Name/Organ/Phone): Center for Historic Architecture and Engineering

302-451-8097

Resource Name: Brandywine Shoal Lighthouse

LOCATION

State: Delaware; Location: Delaware Bay
(body of water, point of land, etc.)

City Vicinity: Lewes, Delaware; County: _____

OWNERSHIP

Owner/Manager/Federal Agency with Jurisdiction:

United States Coast Guard

Owner Address: Cape May, New Jersey

Owner Phone: 609-884-6987

STATUS

Active Light: ☒ TRUE ☐ FALSE ☐ UNKNOWN

Year Inactive: _____

Automated Light: ☒ TRUE ☐ FALSE ☐ UNKNOWN

Year Automated: 1974

Daymarker: ☐ TRUE ☐ FALSE ☐ UNKNOWN

Site Only (no buildings remaining): ☐ TRUE ☐ FALSE ☐ UNKNOWN

CURRENT TOWER

Site Date: 1850; Current Tower Constructed: 1914

Conical structure completed in 1914 is built on caisson

Foundation (circle one):

Construction Materials (circle primary):

Natural/Emplaced
Dressed Stone/Timber
Screw Piling
Piling
☒ Caisson
Crib

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
☒ Reinforced Concrete
Steel

reinforced concrete. Lighthouse is white except for the lantern which is painted red.

Other: _____

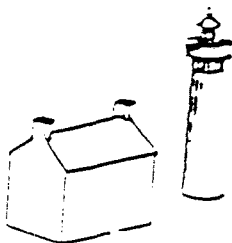
Other: _____

Tower Shape (circle one):

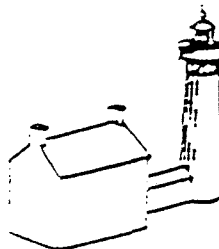
Square ☐ Cylindrical ☐ ☒ Conical ☐ Skeletal ☐ Pyramidal ☐ Hexagonal ☐ Octagonal

Relationship to Other Structures (circle one):

Separate

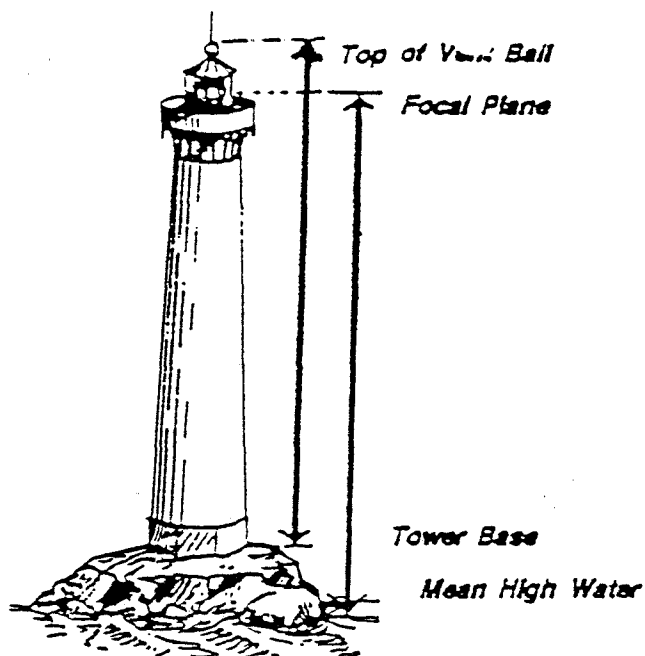


Attached



Integral





Tower Height: _____ feet, _____ inches
 Height of Focal Plane: _____ feet, _____ inches
 Markings/Patterns: _____

LENS

Current Optic: _____
 Year Installed: _____
 Original Optic: Third order fresnel lens
 Year Installed: _____
 Optic Characteristics: _____

CURRENT SOUND SIGNAL

Signal Type: intermittent fog horn
 Signal Characteristics: _____
 Building Materials (circle primary):
 Rubble Stone
 Dressed Stone
 Brick
 Wood
 Cast Iron
 Steel
 Other: concrete
 Building Style: _____
 Year Constructed: _____

PRIMARY KEEPERS QUARTERS

Number of Stories: _____
 Building Materials (circle primary):
 Rubble Stone
 Dressed Stone
 Brick
 Wood
 Cast Iron
 Steel
 Other: _____
 Building Style: _____
 (Cape Cod, Duplex, Victorian, etc.)
 Year Constructed: _____
 Total # of Keepers Quarters: _____

ASSOCIATED STRUCTURES (Indicate # of each):

Sound Signal Buildings: _____ Oil Houses: _____ Cisterns: _____ Garages: _____ Barns: _____
 Bridges/Tunnels/Catwalks: _____ Docks/Cranes/Marine Railroads: _____ Storage Buildings: _____
 three outside walkways (galleries) at lantern room, watchroom and main floor level.
SITE SIGNIFICANCE

On a State Inventory? TRUE FALSE UNKNOWN Date Listed: _____

National Register Status (circle one):

- Listed
- Part of Larger Listing
- Determined Eligible by the Keeper
- Determined Ineligible by the Keeper
- Determined Eligible by the SHPO
- Determined Ineligible by the SHPO
- No Status
- Unknown

Recorded by the Historic American Buildings Survey (HABS): TRUE FALSE UNKNOWN

Recorded by the Historic American Engineering Record (HAER): TRUE FALSE UNKNOWN

Designated National Historic Landmark (NHL):
 TRUE FALSE UNKNOWN

Owned or managed by the NPS: TRUE FALSE UNKNOWN Park: _____

Name of Aid to Navigation Brandywine Shoal Lighthouse
 Location Ollawake River
 Year 1914 50 feet from first Scripps date 1823
 CRS no. _____
 SPO Maps _____
 Hundred _____
 Quad _____
 Zone 18
 UTM E490160 N4315033

Describe The Resource As Completely As Possible:

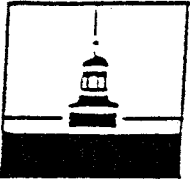
Fixed Light Beacons - Harbor Light _____
 Range Light _____ Front _____ Rear _____
 River or Channel Light ☒

Non-Fixed Aids - Lightship _____ Temporary _____ Permanent _____
 Bouy _____
 Natural Marker _____
 Other _____

Is the Aid to Navigation - Manned _____ Unmanned ☒

Elements Found in the Interior:

Are there any threats or hazards at the site?



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
PROPERTY IDENTIFICATION FORM

FORM CRS-3

CRS no. _____
SPO Map _____
Hundred _____
Quad _____
Zone 18
Acreage _____

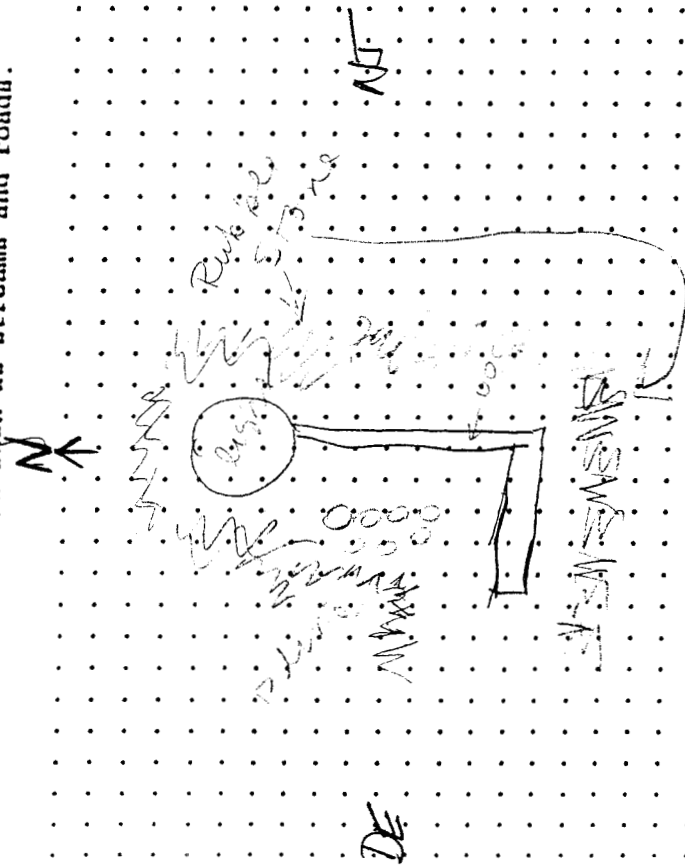
1. NAME OF PROPERTY: Brandywine Shoal Lighthouse
2. STREET LOCATION: situated about a mile from the lower end of Brandywine Shoal,
easterly side of main shipping channel in the lower Delaware Bay.
3. OWNER'S NAME: United States Coast Guard TEL. # 609-884-6987
ADDRESS: Cape May, New Jersey
4. TYPE OF LOCUS: a) building _____ b) structure _____ c) site _____
d) object _____ e) district _____ f) other _____
5. SURROUNDINGS OF LOCUS: (check more than one if necessary)
a) fallow field _____ b) cultivated field _____ c) woodland _____
d) scattered buildings _____ e) densely built up _____ f) other x
6. FUNCTION: original x present _____
7. LIST ADDITIONAL SHEETS USED

8. YOUR NAME: Leslie Bashman # _____
YOUR ADDRESS: University of Delaware, Newark, DE 19717 # 302-451-8097
ORGANIZATION (if any) Center for Historic Architecture DATE January 15, 1990
and Engineering

USE BLACK INK ONLY

3. SKETCH MAP

Please indicate position of locus in relation to geographical landmarks such as streams and roads.



INDICATE NORTH ON SKETCH

9. CONTEXT

Consider the following:

- relationship to setting
- associated traditions or stories
- noteworthy features
- comparison with others in area
- threats

10. Comprehensive Planning:

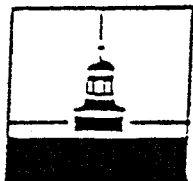
- Time Period(s)
- Cultural Concept

11. Evaluation and Eligibility

List area(s) of significance and criteria

12. Certification

Survey: Name/Title _____ Date _____
 BAHF: Name/Title _____ Date _____



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
CONSTRUCTION DATA FORM

FORM CRS-1

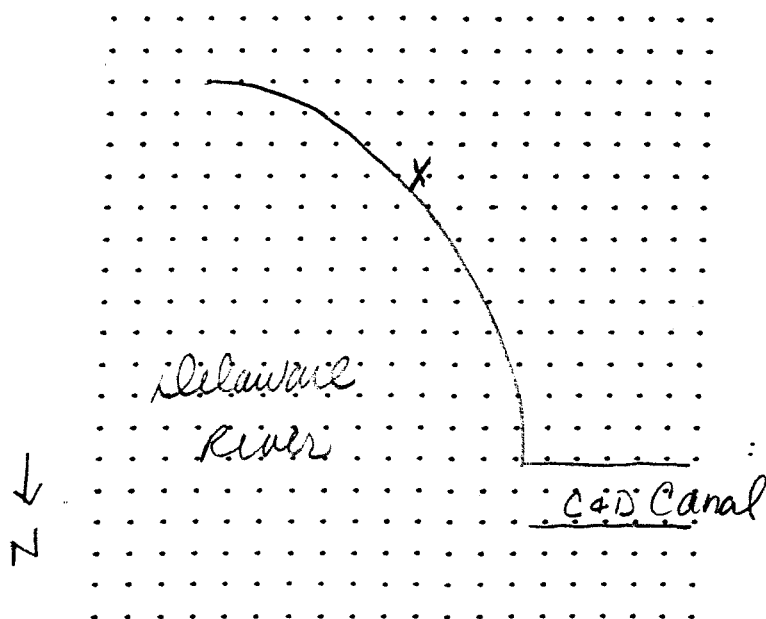
CRS no. N-12698
SPO Map 10-11-30
Hundred St. Georges
Quad Delaware City
Zone 18
Acreage

1. ADDRESS OF PROPERTY: Baker Rear Range
2. DATE OF INITIAL CONSTRUCTION: 1902, 1906
3. STYLE/FLOOR PLAN:
4. ARCHITECT/BUILDER:
5. INTERGRITY: a) original site X b) moved
c) if moved, when and from where
d) list major alterations and dates (if known)
6. CONDITION: good X deteriorated
remarks:
7. DESCRIBE THE RESOURCE AS COMPLETELY AS POSSIBLE:
 - a) Overall shape
stories
bays
wings
 - b) Structural system
 - c) Foundation
materials
basement
 - d) Exterior walls (modern over original)
materials
color(s)
 - e) Roof
shape; materials
cornice
dormers
chimney location(s)

Baker River Range

- f) Windows
 - spacing
 - type
 - trim
 - shutters
- g) Door
 - spacing
 - type
 - trim
- h) Porches
 - location(s)
 - materials
 - supports
 - trim
- i) Interiors details (if accessible)

SKETCH MAP (provide north arrow)



8. Surveyor: _____ Date of Form _____

USE BLACK INK ONLY



NPS National Maritime Initiative Inventory of Maritime Resources

AIDS TO NAVIGATION Survey Form

Completed by (Name/Organ/Phone): Center for Historic Architecture and Engineering
302-451-8097

Resource Name: Baker Rear Range

LOCATION

State: Delaware; Location: Delaware River just south of C & D Canal
 (body of water, point of land, etc.)

City Vicinity: Delaware City; County New Castle

OWNERSHIP

Owner/Manager/Federal Agency with Jurisdiction:
United States Coast Guard

Owner Address: Philadelphia, Pa

Owner Phone: 215-271-4847

STATUS

Active Light: ☒ TRUE ☐ FALSE ☐ UNKNOWN

Year Inactive: _____

Automated Light: ☒ TRUE ☐ FALSE ☐ UNKNOWN

Year Automated: _____

Daymarker: ☐ TRUE ☐ FALSE ☐ UNKNOWN

Site Only (no buildings remaining): ☒ TRUE ☐ FALSE ☐ UNKNOWN

CURRENT TOWER

Site Date: 1902; Current Tower Constructed: 1906

Foundation (circle one):

Natural Emplaced
 Dressed Stone Timber
 Screw Piling
 Piling
 Caisson
 Crib
 concrete

Construction Materials (circle primary):

Rubble Stone
 Dressed Stone
 Brick
 Wood
Cast Iron
 Reinforced Concrete
 Steel

Other: _____

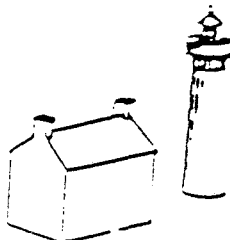
Other: _____

Tower Shape (circle one):

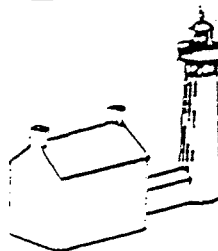
☐ Square ☐ Cylindrical ☐ Conical ☒ Skeletal ☒ Pyramidal ☐ Hexagonal ☐ Octagonal

Relationship to Other Structures (circle one):

Separate

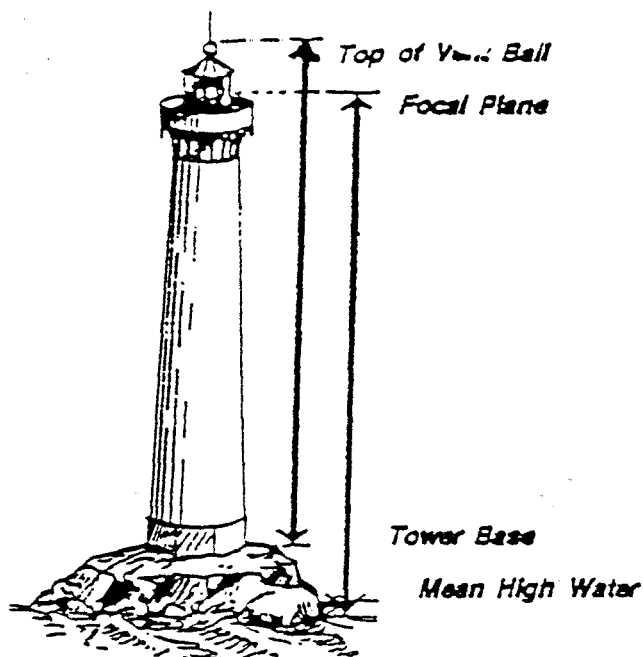


Attached



Integral





Tower Height: _____ feet, _____ inches
 Height of Focal Plane: _____ feet, _____ inches
 Markings/Patterns: _____

LENS

Current Optic: _____
 Year Installed: _____
 Original Optic: _____
 Year Installed: _____
 Optic Characteristics: _____

CURRENT SOUND SIGNAL

Signal Type: _____
 Signal Characteristics: _____
 Building Materials (circle primary):
 Rubble Stone
 Dressed Stone
 Brick
 Wood
 Cast Iron
 Steel
 Other: _____
 Building Style: _____
 Year Constructed: _____

PRIMARY KEEPERS QUARTERS

Number of Stories: _____
 Building Materials (circle primary):
 Rubble Stone
 Dressed Stone
 Brick
 Wood
 Cast Iron
 Steel
 Other: _____
 Building Style: _____
 (Cape Cod, Duplex, Victorian, etc.)
 Year Constructed: _____
 Total # of Keepers Quarters: _____

ASSOCIATED STRUCTURES (Indicate # of each):

Sound Signal Buildings: _____ Oil Houses: _____ Cisterns: _____ Garages: _____ Barns: _____
 Bridges/Tunnels/Catwalks: _____ Docks/Cranes/Marine Railroad: _____ Storage Buildings: _____

SITE SIGNIFICANCE

On a State Inventory? TRUE FALSE UNKNOWN Date Listed: _____

National Register Status (circle one):

- Listed
- Part of Larger Listing
- Determined Eligible by the Keeper
- Determined Ineligible by the Keeper
- Determined Eligible by the SHPO
- Determined Ineligible by the SHPO
- No Status
- Unknown

Recorded by the Historic American Buildings Survey (HABS): TRUE FALSE UNKNOWN

Recorded by the Historic American Engineering Record (HAER): TRUE FALSE UNKNOWN

Designated National Historic Landmark (NHL):
 TRUE FALSE UNKNOWN

Owned or managed by the NPS: TRUE FALSE UNKNOWN Park: _____

Name of Aid to Navigation Baker Rear Range
Location South of Delaware Chesapeake Canal on bank
Year Site 1902, 1906 current tower
CRS no. _____
SPO Maps _____
Hundred St. Georges
Quad Delaware City
Zone 18
UTM E 451019 N 4376803

Describe The Resource As Completely As Possible:

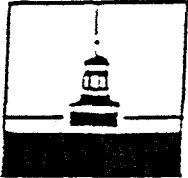
Fixed Light Beacons - Harbor Light _____
Range Light ✓ Front _____ Rear ✓
River or Channel Light _____

Non-Fixed Aids - Lightship _____ Temporary _____ Permanent _____
Bouy _____
Natural Marker _____
Other _____

Is the Aid to Navigation - Manned _____ Unmanned ✓

Elements Found in the Interior:

Are there any threats or hazards at the site?



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
PROPERTY IDENTIFICATION FORM

FORM CRS-3

CRS no. _____
SPO Map _____
Hundred St. Georges
Quad Delaware City
Zone 18
Acreage _____

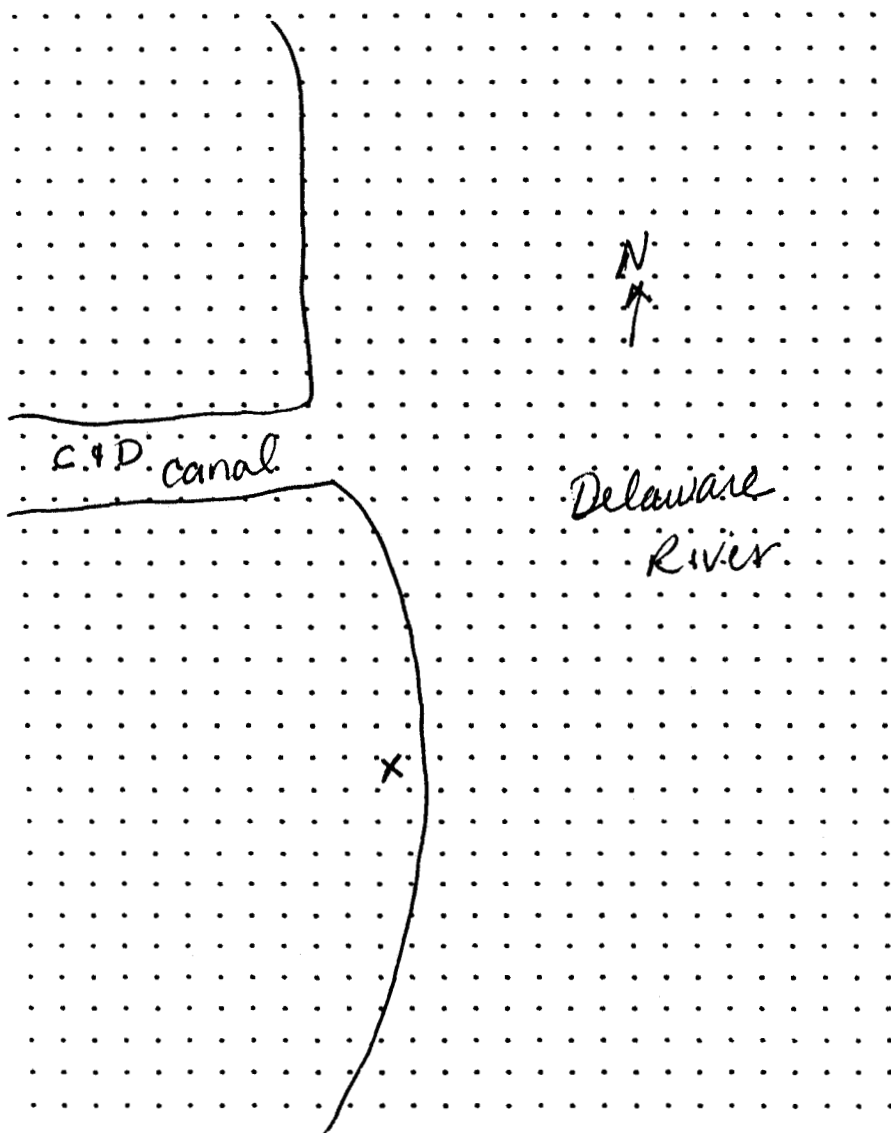
1. NAME OF PROPERTY: Baker Rear Range
2. STREET LOCATION: Delaware River just south of C & D Canal
3. OWNER'S NAME: United States Coast Guard TEL. # 215-271-4847
ADDRESS: Philadelphia, Pa.
4. TYPE OF LOCUS: a) building _____ b) structure X c) site _____
d) object _____ e) district _____ f) other _____
5. SURROUNDINGS OF LOCUS: (check more than one if necessary)
a) fallow field _____ b) cultivated field _____ c) woodland _____
d) scattered buildings _____ e) densely built up _____ f) other X
6. FUNCTION: original X present _____
7. LIST ADDITIONAL SHEETS USED

8. YOUR NAME: Leslie Bashman # _____
YOUR ADDRESS: University of Delaware # 302-451-8097
ORGANIZATION (if any) Center for Historic Architecture and Engineering DATE January 15, 1990

USE BLACK INK ONLY

8. SKETCH MAP

Please indicate position of locus in relation to geographical landmarks such as streams and roads.



INDICATE NORTH ON SKETCH

9. CONTEXT

Consider the following:

- a) relationship to setting
- b) associated traditions or stories
- c) noteworthy features
- d) comparison with others in area
- e) threats

10. Comprehensive Planning:

- a. Time Period(s)
- b. Cultural Concept

11. Evaluation and Eligibility

List area(s) of significance and criteria

12. Certification

Survey: Name/Title _____ Date _____
BAHP: Name/Title _____ Date _____



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
CONSTRUCTION DATA FORM

FORM CRS-1

CRS no. N-4245
SPO Map 10-11-33
Hundred NewCastle
Quad Wilmington South
Zone 18
Acreage

1. ADDRESS OF PROPERTY: Bulkhead Bar Front Range
2. DATE OF INITIAL CONSTRUCTION: 1929
3. STYLE/FLOOR PLAN:
4. ARCHITECT/BUILDER:
5. INTERGRITY: a) original site X b) moved
c) if moved, when and from where
d) list major alterations and dates (if known)
6. CONDITION: good X deteriorated
remarks:
7. DESCRIBE THE RESOURCE AS COMPLETELY AS POSSIBLE:
 - a) Overall shape
stories
bays
wings
 - b) Structural system
 - c) Foundation
materials
basement
 - d) Exterior walls (modern over original)
materials
color(s)
 - e) Roof
shape; materials
cornice
dormers
chimney location(s)

USE BLACK INK ONLY

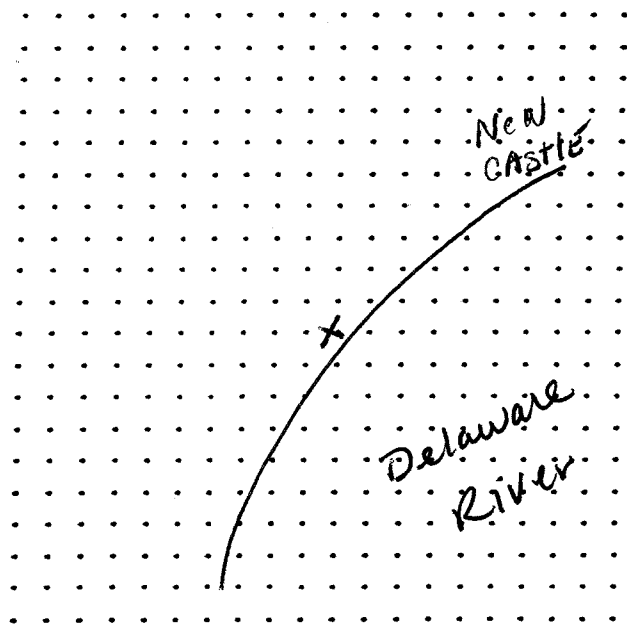
f) Windows
spacing
type
trim
shutters

g) Door
spacing
type
trim

h) Porches
location(s)
materials
supports
trim

i) Interiors details (if accessible)

SKETCH MAP (provide north arrow)



8. Surveyor: _____ Date of Form _____

USE BLACK INK ONLY



NPS National Maritime Initiative Inventory of Maritime Resources

AIDS TO NAVIGATION Survey Form

Center for Historic Architecture and Engineering
302-451-8097

Completed by (Name/Organ/Phone): _____

Resource Name: Bulkhead Bar Front Range

LOCATION

State: Delaware; Location: On bank of Delaware River just south of New Castle
(body of water, point of land, etc.)

City Vicinity: New Castle; County New Castle

OWNERSHIP

Owner/Manager/Federal Agency with Jurisdiction:

United States Coast Guard

Owner Address: Philadelphia, Pa.

Owner Phone: 215-271-4847

STATUS

Active Light: TRUE FALSE UNKNOWN

Year Inactive: _____

Automated Light: TRUE FALSE UNKNOWN

Year Automated: _____

Daymarker: TRUE FALSE UNKNOWN

Site Only (no buildings remaining): TRUE FALSE UNKNOWN

CURRENT TOWER

Site Date: 1929; Current Tower Constructed: _____

Foundation (circle one):

Construction Materials (circle primary):

*Natural/Emplaced
Dressed Stone/Timber
Screw Piling
Piling
Caisson
Crib*

*Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Reinforced Concrete
Steel*

Other: _____

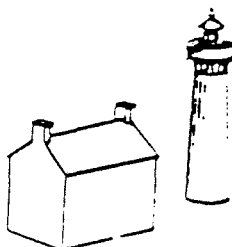
Other: _____

Tower Shape (circle one):

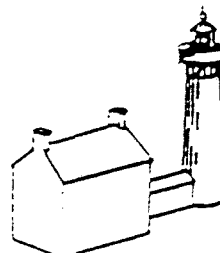
Square Cylindrical Conical Skeletal Pyramidal Hexagonal Octagonal

Relationship to Other Structures (circle one):

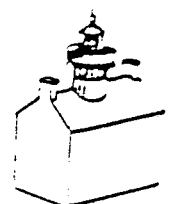
Separate

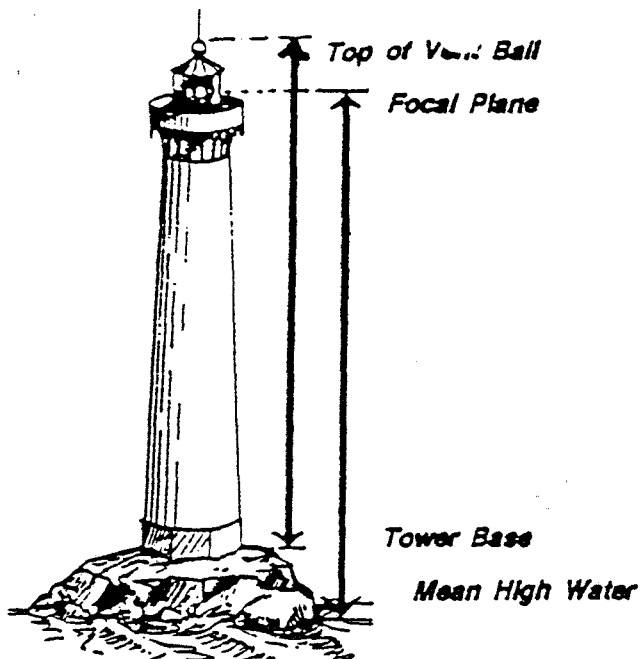


Attached



Integral





Tower Height: _____ feet, _____ inches

Height of Focal Plane: 42 feet, _____ inches

Markings/Patterns: _____

LENS

Current Optic: _____

Year Installed: _____

Original Optic: _____

Year Installed: _____

Optic Characteristics: _____

CURRENT SOUND SIGNAL

Signal Type: _____

Signal Characteristics: _____

Building Materials (circle primary):

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Steel

Other: _____

Building Style: _____

Year Constructed: _____

PRIMARY KEEPERS QUARTERS

Number of Stories: _____

Building Materials (circle primary):

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Steel

Other: _____

Building Style: _____
(Cape Cod, Duplex, Victorian, etc.)

Year Constructed: _____

Total # of Keepers Quarters: _____

ASSOCIATED STRUCTURES (Indicate # of each):

Sound Signal Buildings: _____ Oil Houses: _____ Cisterns: _____ Garages: _____ Barns: _____

Bridges/Tunnels/Catwalks: _____ Docks/Cranes/Marine Railroads: _____ Storage Buildings: _____

SITE SIGNIFICANCE

On a State Inventory? TRUE FALSE UNKNOWN Date Listed: _____

National Register Status (circle one):

Listed
Part of Larger Listing
Determined Eligible by the Keeper
Determined Ineligible by the Keeper
Determined Eligible by the SHPO
Determined Ineligible by the SHPO
No Status
Unknown

Recorded by the Historic American Buildings Survey (HABS): TRUE FALSE UNKNOWN

Recorded by the Historic American Engineering Record (HAER): TRUE FALSE UNKNOWN

Designated National Historic Landmark (NHL):
TRUE FALSE UNKNOWN

Owned or managed by the NPS: TRUE FALSE UNKNOWN Park: _____

(OVER)

Name of Aid to Navigation Bulkhead Bar Front Range
Location Bank of Delaware River just south of New Castle
Year 1929
CRS no. _____
SPO Maps _____
Hundred New Castle
Quad Wilmington South
Zone 18
UTM E N

Describe The Resource As Completely As Possible:

Fixed Light Beacons - Harbor Light _____
Range Light X Front X Rear _____
River or Channel Light _____

Non-Fixed Aids - Lightship _____ Temporary _____ Permanent _____
Bouy _____
Natural Marker _____
Other _____

Is the Aid to Navigation - Manned _____ Unmanned X

Elements Found in the Interior:

Are there any threats or hazards at the site?



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
PROPERTY IDENTIFICATION FORM

FORM CRS-3

CRS no. _____
SPO Map _____
Hundred New Castle
Quad Wilmington South
Zone 18
Acreage _____

1. NAME OF PROPERTY: Bulkhead Bar Front Range
2. STREET LOCATION: On bank of Delaware River just south of New Castle
3. OWNER'S NAME: United States Coast Guard TEL. # 215-271-4847
ADDRESS: Philadelphia, Pa.
4. TYPE OF LOCUS: a) building _____ b) structure X c) site _____
d) object _____ e) district _____ f) other _____
5. SURROUNDINGS OF LOCUS: (check more than one if necessary)
a) fallow field _____ b) cultivated field _____ c) woodland _____
d) scattered buildings _____ e) densely built up _____ f) other X
6. FUNCTION: original _____ X present _____
7. LIST ADDITIONAL SHEETS USED

8. YOUR NAME: Leslie Bashman # _____
YOUR ADDRESS: University of Delaware # 302-451-8097
Center for Historic Architecture
ORGANIZATION (if any) and Engineering DATE January 15, 1991

USE BLACK INK ONLY

Please indicate position of locus in relation to geographical landmarks such as streams and roads.

This image shows a full page of dot grid paper. The background is white, and it is covered with a regular pattern of small, solid black dots. The dots are arranged in straight horizontal and vertical rows, creating a grid-like appearance. There are no margins, text, or other markings on the page.

INDICATE NORTH ON SKETCH

Consider the following:

- a) relationship to setting
- b) associated traditions or stories
- c) noteworthy features
- d) comparison with others in area
- e) threats

10. Comprehensive Planning:

- a. Time Period(s)
- b. Cultural Concept

11. Evaluation and Eligibility

List area(s) of significance and criteria

12. Certification

Survey: Name/Title

BAHP: Name/Title

Date _____

Date _____



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
CONSTRUCTION DATA FORM

FORM CRS-1

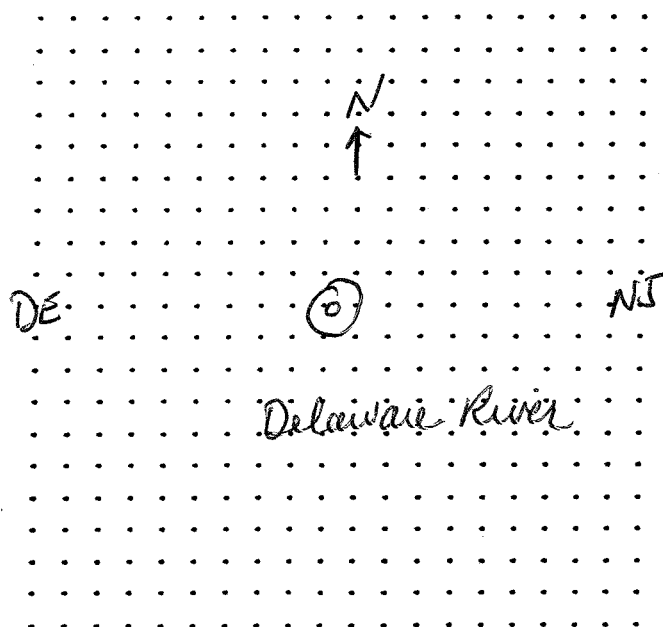
CRS no. K
SPO Map 12304
Hundred _____
Quad _____
Zone 18
Acreage _____

1. ADDRESS OF PROPERTY: Cross Ledge
2. DATE OF INITIAL CONSTRUCTION: 1875
3. STYLE/FLOOR PLAN: _____
4. ARCHITECT/BUILDER: _____
5. INTERGRITY: a) original site X b) moved _____
c) if moved, when and from where _____
d) list major alterations and dates (if known) _____
NO shaft or light remains
6. CONDITION: good _____ deteriorated _____
remarks: original base - light missing from top
7. DESCRIBE THE RESOURCE AS COMPLETELY AS POSSIBLE:
 - a) Overall shape
stories
bays
wings
 - b) Structural system
 - c) Foundation stone
materials
basement
 - d) Exterior walls (modern over original)
materials
color(s)
 - e) Roof
shape; materials
cornice
dormers
chimney location(s)

USE BLACK INK ONLY

- f) Windows
 - spacing
 - type
 - trim
 - shutters
- g) Door
 - spacing
 - type
 - trim
- h) Porches
 - location(s)
 - materials
 - supports
 - trim
- i) Interiors details (if accessible)

SKETCH MAP (provide north arrow)



8. Surveyor: _____ Date of Form _____

USE BLACK INK ONLY



NPS National Maritime Initiative Inventory of Maritime Resources

AIDS TO NAVIGATION Survey Form

Completed by (Name/Organ/Phone): Center for Historic Architecture and Engineering
Resource Name: Cross ledge 302-451-8097

LOCATION

State: DE/NT; Location: Middle Channel in Delaware River
(body of water, point of land, etc.)

City Vicinity: _____; County _____

OWNERSHIP

Owner/Manager/Federal Agency with Jurisdiction:

United States Coast Guard

Owner Address: Cape May, NJ

Owner Phone: 609-884-6987

STATUS

Active Light: TRUE FALSE UNKNOWN Year Inactive: _____
Automated Light: TRUE FALSE UNKNOWN Year Automated: _____
Daymarker: TRUE FALSE UNKNOWN
Site Only (no buildings remaining): TRUE FALSE UNKNOWN

CURRENT TOWER

Site Date: _____; Current Tower Constructed: _____

Foundation (circle one):

Natural/Emplaced
Dressed Stone Timber
Screw Piling
Piling
Caisson
Crib

Construction Materials (circle primary):

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Reinforced Concrete
Steel

Other: _____

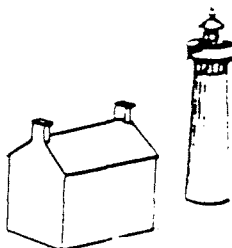
Other: _____

Tower Shape (circle one):

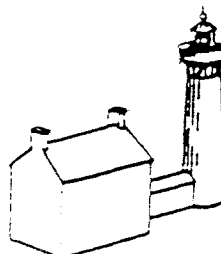
Square Cylindrical Conical Skeletal Pyramidal Hexagonal Octagonal

Relationship to Other Structures (circle one):

Separate

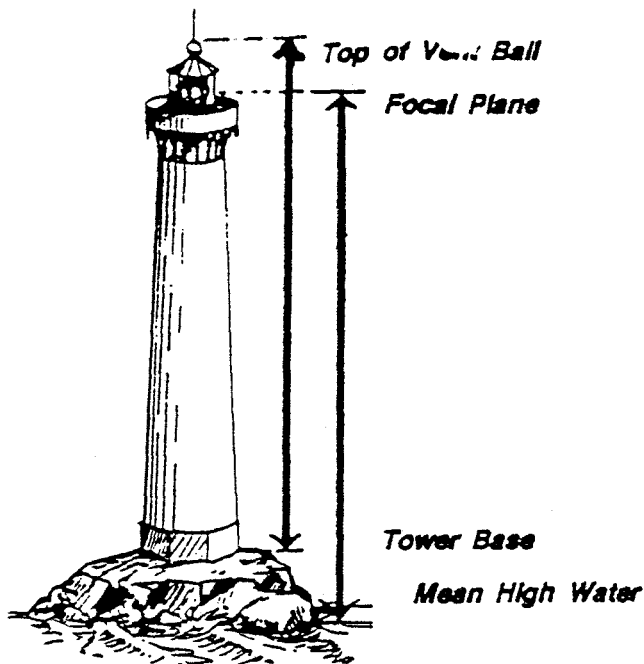


Attached



Integral





Tower Height: _____ feet, _____ inches
 Height of Focal Plane: _____ feet, _____ inches
 Markings/Patterns: original stone foundation

LENS

Current Optic: _____
 Year Installed: _____
 Original Optic: _____
 Year Installed: _____
 Optic Characteristics: _____

CURRENT SOUND SIGNAL

Signal Type: None

Signal Characteristics: _____
 Building Materials (circle primary):

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Steel

Other: _____

Building Style: _____

Year Constructed: _____

PRIMARY KEEPERS QUARTERS

Number of Stories: None
 Building Materials (circle primary):

Rubble Stone
Dressed Stone
Brick
Wood
Cast Iron
Steel

Other: _____

Building Style: _____
 (Cape Cod, Duplex, Victorian, etc.)

Year Constructed: _____

Total # of Keepers Quarters: _____

ASSOCIATED STRUCTURES (Indicate # of each):

Sound Signal Buildings: _____ Oil Houses: _____ Cisterns: _____ Garages: _____ Barns: _____

Bridges/Tunnels/Catwalks: _____ Docks/Cranes/Marine Railroads: _____ Storage Buildings: _____

SITE SIGNIFICANCE

On a State Inventory? TRUE FALSE UNKNOWN Date Listed: _____

National Register Status (circle one):

Listed
Part of Larger Listing
Determined Eligible by the Keeper
Determined Ineligible by the Keeper
Determined Eligible by the SHPO
Determined Ineligible by the SHPO
No Status
Unknown

Recorded by the Historic American Buildings Survey (HABS): TRUE FALSE UNKNOWN

Recorded by the Historic American Engineering Record (HAER): TRUE FALSE UNKNOWN

Designated National Historic Landmark (NHL):
 TRUE FALSE UNKNOWN

Owned or managed by the NPS: TRUE FALSE UNKNOWN Park: _____

Name of Aid to Navigation Cross ledge
Location Middle Channel of Delaware River
Year _____
CRS no. K
SPO Maps Navigational Chart 12304
Hundred _____
Quad _____
Zone 18
UTM E 479529 N4334689

Describe The Resource As Completely As Possible:

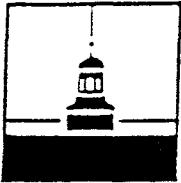
Fixed Light Beacons - Harbor Light _____
Range Light _____ Front _____ Rear _____
River or Channel Light ☒

Non-Fixed Aids - Lightship _____ Temporary _____ Permanent _____
Bouy _____
Natural Marker _____
Other _____

Is the Aid to Navigation - Manned _____ Unmanned ☒

Elements Found in the Interior:

Are there any threats or hazards at the site?



DELAWARE STATE HISTORIC PRESERVATION OFFICE
BUREAU OF ARCHAEOLOGY AND HISTORIC PRESERVATION
15 THE GREEN, DOVER, DE 19901

CULTURAL RESOURCE SURVEY
PROPERTY IDENTIFICATION FORM

FORM CRS-3

CRS no. K
SPO Map 12304
Hundred _____
Quad _____
Zone 18
Acreage _____

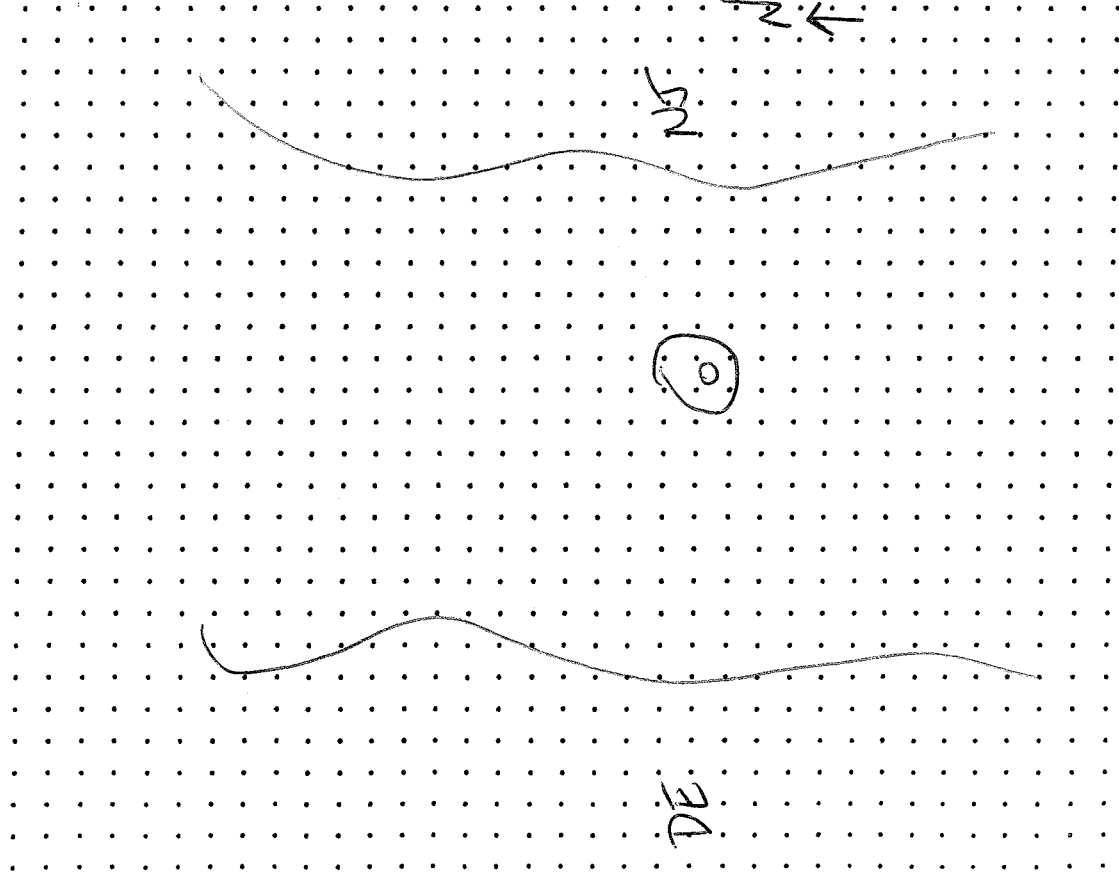
1. NAME OF PROPERTY: Cross Ledge
2. STREET LOCATION: _____
3. OWNER'S NAME: United States Coast Guard TEL. # 609-884-6987
ADDRESS: Cape May, NJ
4. TYPE OF LOCUS: a) building _____ b) structure X c) site _____
d) object _____ e) district _____ f) other _____
5. SURROUNDINGS OF LOCUS: (check more than one if necessary)
a) fallow field _____ b) cultivated field _____ c) woodland _____
d) scattered buildings _____ e) densely built up _____ f) other _____
6. FUNCTION: original _____ present none - only base remains
7. LIST ADDITIONAL SHEETS USED

8. YOUR NAME: Leslie Bashman # _____
YOUR ADDRESS: University of Delaware # 302-451-8097
Center for Historic Architecture
and Engineering
ORGANIZATION (if any) _____ DATE February 10, 1991

USE BLACK INK ONLY

8. SKETCH MAP

Please indicate position of locus in relation to geographical landmarks such as streams and roads.



INDICATE NORTH ON SKETCH

9. CONTEXT

Consider the following:

- a) relationship to setting
- b) associated traditions or stories
- c) noteworthy features
- d) comparison with others in area
- e) threats

10. Comprehensive Planning:

- a. Time Period(s)
- b. Cultural Concept

11. Evaluation and Eligibility

List area(s) of significance and criteria

12. Certification

Survey: Name/Title _____

Date _____

BAHP: Name/Title _____

Date _____

APPENDIX C:
NATIONAL REGISTER NOMINATIONS FOR
PREVIOUSLY LISTED AIDS TO NAVIGATION

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM

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SEE INSTRUCTIONS IN HOW TO COMPLETE NATIONAL REGISTER FORMS
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC

Fenwick Island Lighthouse Station

AND/OR COMMON

2 LOCATION

STREET & NUMBER

Delaware/Maryland Border Line

CITY/TOWN

Fenwick Island

VICINITY OF

CODE

10

NOT FOR PUBLICATION

CONGRESSIONAL DISTRICT

One

COUNTY

Sussex

CODE

003

3 CLASSIFICATION

CATEGORY

DISTRICT

☒ BUILDINGS

STRUCTURE

SITE

OBJECT

OWNERSHIP

PUBLIC

PRIVATE

☒ BOTH

PUBLIC ACQUISITION

IN PROCESS

☒ BEING CONSIDERED
(Lighthouse only)

STATUS

☒ OCCUPIED

☒ UNOCCUPIED

WORK IN PROGRESS

ACCESSIBLE

☒ YES RESTRICTED

YES UNRESTRICTED

NO

PRESENT USE

AGRICULTURE

COMMERCIAL

EDUCATIONAL

ENTERTAINMENT

GOVERNMENT

INDUSTRIAL

MILITARY

MUSEUM

PARK

☒ PRIVATE RESIDENCE

RELIGIOUS

SCIENTIFIC

TRANSPORTATION

☒ OTHER Navigation

Aid

4 OWNER OF PROPERTY

NAME

Multiple

STREET & NUMBER

STATE

CITY/TOWN

VICINITY OF

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE

REGISTRY OF DEEDS, ETC.

Multiple

STREET & NUMBER

STATE

CITY/TOWN

6 REPRESENTATION IN EXISTING SURVEYS

TITLE

Delaware Cultural Resource Survey

S-187

DATE

1978

FEDERAL ☒ STATE ☒ COUNTY ☒ LOCAL

DEPOSITORY FOR
SURVEY RECORDS

Hall of Records

STATE

Delaware

CITY/TOWN

Dover

FORM AS SUBMITTED TO OAHF

DESCRIPTION

CONDITION

X. EXCELLENT
--GOOD
FAIR

-- DETERIORATED
RUINS
UNEXPOSED

CHECK ONE
-- UNALTERED
X. ALTERED

CHECK ONE
X. ORIGINAL SITE
-- MOVED

DATE

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Fenwick Island Lighthouse Station is a group of five structures located about one-third mile west of the Atlantic Ocean, immediately north of the Delaware-Maryland state line at Fenwick Island, Delaware. The group includes the white-painted brick Fenwick Island Lighthouse, a small steel shed at its base, two lighthouse keeper's houses, and a frame barn. All were originally situated on a ten-acre light station tract, which has been gradually reduced in size through transfers of land to the State of Delaware and sale to private property owners. At the present time only the lighthouse itself and the small shed at its base are federally-owned, on a lot 40 feet by 60 feet enclosed by a chain-link fence. Both houses and the barn are now privately owned. Most of the remainder of the light station property is now divided among a group of small trailer parks used by the large number of summer tourists who visit the area. The area included within this nomination to the National Register of Historic Places runs for 240 feet along the state line, by 70 feet north and south. (An attached diagram shows the layout of the five buildings in question).

There is a wealth of material relating to the station on file in Record Group 26 in the National Archives in Washington, D.C. Among the most valuable sources in describing the station is a "Description of Light-House Tower, Buildings, and Premises at Fenwick Island Light Station, Delaware", prepared for the Lighthouse Establishment of the old Department of Commerce and Labor in 1907. In addition, a full set of original construction drawings of the tower and buildings is on file in the cartographic section of the Archives. Also in Record Group 26 are a partially-damaged correspondence section pertaining to the station, records of employment and payment of station personnel, and other records. Thus, it is possible to obtain details of the original construction of the station, as well as of the changes in equipment and construction of the structures over the years.

DESCRIPTION OF BUILDINGS:

The Lighthouse (S-187)

The Fenwick Island Lighthouse is a brick, conical-type tower 84 feet, 5 inches in height from the base of the tower to the ventilator ball atop the lantern assembly. The brick portion of the structure rests on a rubble stone masonry base on grillage which extends about 12 feet, 6 inches below the surface of the ground and about 3 feet above the ground, forming a water table for the brick tower. The brick portion is about 75 feet tall. It consists of an outer brick wall about 27 inches thick at the base and about 14 inches thick at the top of the tower. An inner cylindrical wall is about 9 inches thick from top to bottom. It is also constructed of brick. The lighthouse is at the top of the water table. The stone and brick portions of the tower were originally white-washed and are now painted white. The outside gallery around the watchroom at the top of the brick tower and the lantern assembly are painted black. The bricks of the outer wall are laid in American bond with fifteen stretcher courses divided by a header course. The entrance to the tower is through a door in the south wall at the level of the top of the water table. The tower contains five windows at various levels. One window is located on the first floor and one on the watchroom level, both facing east.

HCPS 500A
11/78

UNITED STATES DEPARTMENT OF THE INTERIOR
HERITAGE CONSERVATION AND RECREATION SERVICE

**NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM**

Penwick Island Lighthouse Station

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DATE ENTERED

CONTINUATION SHEET

ITEM NUMBER 7 PAGE 1

Those at other levels face south, north, and west. All are six-over-six double sash type with black-painted trim.

The first floor interior of the tower is round with arched alcoves set into the east and west walls. A cast-iron spiral stairway extends from the first floor to the watch room with four landings spaced at intervals.

A galvanized iron tube of about 3 inches in diameter extends up through the center of the tower. It is believed that this device was used to transport containers of mineral oil up to the lantern.

The watchroom originally contained a small table and a small heater ventilated by a stovepipe, which extended up through the lantern and out through the roof of the tower. It was probably removed in 1940 when the lighting mechanism was automated.

A doorway is set in the west wall of the watchroom and leads out to a cast-iron gallery, polygonal in plan and 10-sided, running around the outside of the tower at the watchroom level. The outside of the doorway is boxed in with a wooden windbreak. The gallery is surrounded at waist height by an iron railing with iron mesh guards attached. An outside ladder extends from the watchroom gallery to the rim around the lantern, giving outside access to the lantern through a glass door on the south side of the lantern.

An interior iron stairway leads from the watchroom to the interior of the lantern. The lantern is polygonal in plan with 10 sides. Each side contains two 4-inch-thick glass plates, each of which is 2 feet, 5 1/2 inches wide by 2 feet, 7 inches tall. The height of the glass in each of the 10 sides of the lantern housing is 5 feet, 2-3/8 inches. The side corresponding to the outside ladder from the watchroom gallery is a single storm pane hinged on the side. The floor of the lantern is cast-iron. The roof is constructed with cast-iron plates held by wrought-iron strips and covered with tin. A cylindrical ventilator with a hemispherical top extends above the roof of the lantern assembly.

The lens and prism assembly and lighting mechanism were mounted on a cast-iron pedestal of about 1 1/2 feet in diameter which, in turn, was mounted on a shaft 7 1/4 inches in diameter. The lens and electrical lighting mechanism were removed from the lighthouse by the U. S. Coast Guard on December 13, 1979. The pedestal and shaft are still in place.

FORM AS SUBMITTED TO OAHF.

T
I
C

O

N

FENWICK ISLAND LIGHTHOUSE STATION (S-187)
UTM A 18/495181/4255690

Penwick Island

ISLAND

Point of Cedars
Island

Point of Edge

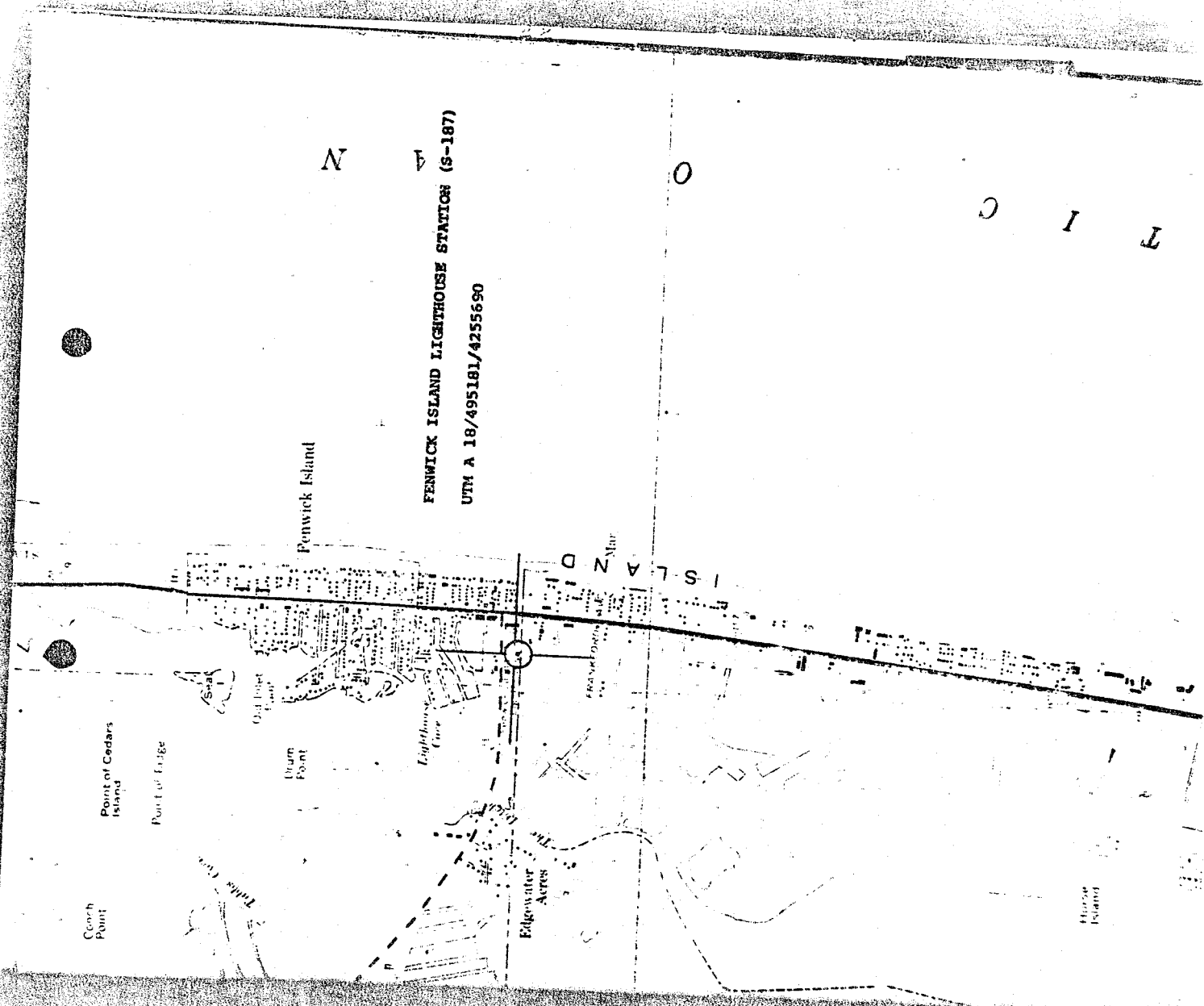
Drum
Point

Lighthouse
Tower

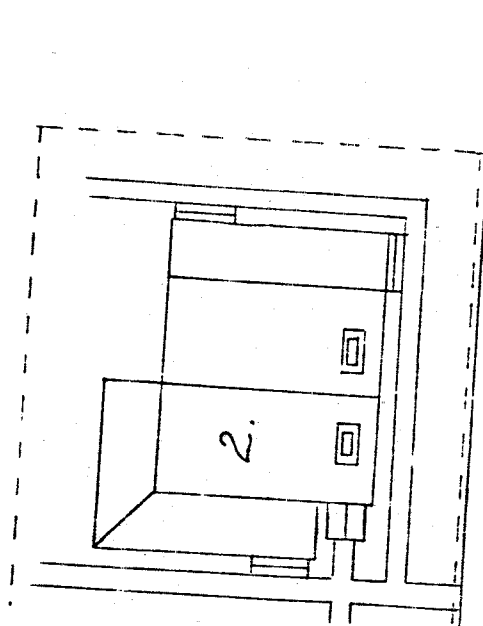
Edgewater
Acres

Coch
Point

Horse
Island



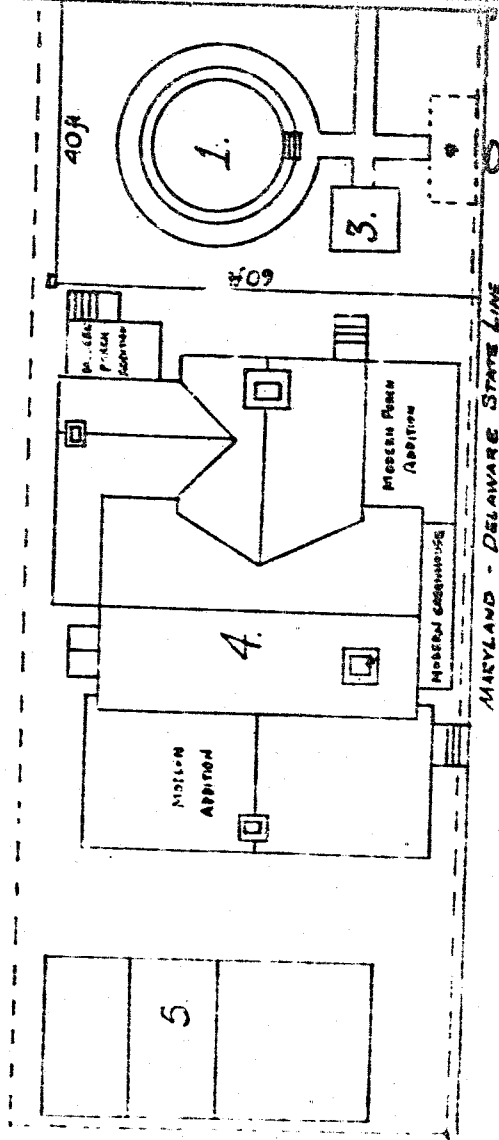
FORM AS SUBMITTED TO CAMP



PROBABLE LOCATION
OF ORIGINAL OIL HOUSE

SITE MAP of EXISTING STRUCTURES FENWICK LIGHT STATION

NOT TO SCALE S-187 DRAWN BY DICK CARTER - 1979



TRANS-PENINSULAR
LINE MARKER
(1751)

1. Light house
2. 1858 Keeper's House
3. Generator House (Circa 1940)
4. 1882 Keeper's House

Form 100-10
Rev. 12-74

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NATIONAL PARK SERVICE

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CONTINUATION SHEET

SHEET WHEN 10 PAGE 1

Verbal Boundary Description: (Continued)

station barn, the line turns north 90 degrees and runs northerly a distance of 70 feet, then east 90 degrees and eastward for 147 feet to the eastern property line of the Fryer property and then south along that line to the point of beginning.

MAJOR BIBLIOGRAPHICAL REFERENCES

1. Records pertaining to the light station housed in Peabody Group 26, The National Archives, Washington, D.C.
2. Francis Ross Holland, Jr.: AMERICA'S LIGHTHOUSES - THEIR ILLUSTRATED HISTORY SINCE 1790. Brattleboro, Vermont: The Stephen Greene Press 1972

GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY less than 2 acres

QUADRANGLE NAME Assawoman Bay

UTM REFERENCES

A	11.8	11.9	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	13.0
ZONE	EASTING	NORTHING											
C													
E													
G													

QUADRANGLE SCALE 1: 24,000

VERBAL BOUNDARY DESCRIPTION

The property being nominated begins at the point where the eastern property line of Frederick Fryer intersects the Delaware-Maryland State Line. It extends westward along the state line for a distance of 240 feet. At a point immediately west of the western end of the light

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

FORM PREPARED BY

NAME - TITLE
Mr. Dick Carter, Historic Preservation Planner

ORGANIZATION
Sussex County Department of Planning and Zoning

STREET & ADDRESS
Sussex County Courthouse, The Circle

CITY OR TOWN
Georgetown,

DATE
January, 1979

TELEPHONE
302-856-7701 Ext. 304

STATE
Delaware

STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS

NATIONAL STATE X LOCAL

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE Acting Director/Div. of Historical & Cultural Affairs

DATE 3/6/79

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

ATTEST KEEPER OF THE NATIONAL REGISTER

DATE

CHIEF OF REGISTRATION

DATE

FHR-8-300A
(11/78)

UNITED STATES DEPARTMENT OF THE INTERIOR
HERITAGE CONSERVATION AND RECREATION SERVICE

**NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM**

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Fenwick Island Lighthouse Station

CONTINUATION SHEET

ITEM NUMBER 8 PAGE 1

of French manufacture was installed. The light was turned on for the first time on August 1, 1859, and it continued in operation without interruption for nearly 120 years until December 13, 1978, when it was turned off by the U.S. Coast Guard.

During the course of its existence, the Fenwick Island Lighthouse Station has undergone numerous changes in its method of operation as new technological innovations were made in lighting equipment. A second lighthouse keeper's house was erected in 1881. A bridge to the mainland was built in 1892 which, though designed to improve access to the station, also served to open up the Fenwick Island area to early recreational development. In 1940, the lighthouse was automated and much of the original 10-acre light station property was sold. The keeper's houses and other station structures, with the exception of the lighthouse itself and one small generator house, are now privately owned.

The light station site is of further historical significance to the state because of the location on the southern property line of the first boundary stone of the 1751 Trans-peninsular Line which served as the basis for the later Mason-Dixon Line. The boundary stone, bearing the arms of the Lords Baltimore of Maryland on its southern face and those of the Penn Family of Pennsylvania and "the Three Lower Counties Upon Delaware" on its northern face, is already listed in the National Register of Historic Places as a part of the Delaware Boundary Line (D-101).

SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE	CHECK AND JUSTIFY BELOW
PREHISTORIC	ARCHAEOLOGY PREHISTORIC	RELIGION
1400-1499	ARCHAEOLOGY HISTORIC	SCIENCE
1500-1599	ARCHITECTURE	SCULPTURE
1600-1699	ART	SOCIAL/HUMANITARIAN
1700-1799	COMMERCE	THEATER
1800-1899	COMMUNICATIONS	X TRANSPORTATION
1900-		X OTHER (SPECIFY)

Navigation Aid

SPECIFIC DATES 1858

BUILDER/ARCHITECT

STATEMENT OF SIGNIFICANCE

The Fenwick Island Lighthouse Station, situated 1,500 feet west of the Atlantic Ocean immediately north of the Delaware-Maryland State Line at Fenwick Island, Delaware, is the last remaining lighthouse on the Delaware-Maryland ocean coast. As such, it is of significance to the history of navigation in Delaware coastal waters. The conical, white-painted brick lighthouse and the group of frame structures at its base, which make up the station complex, are also of architectural significance to the state since they are the only structures of their respective types in Delaware.

Delaware has had a part in the history of lighthouses in the U.S. for more than 200 years. Because of the state's location on the Atlantic Ocean and the Delaware River and Bay, it was the site of some of the earliest aids to navigation in what is now the U.S. In 1767 America's seventh lighthouse was built at Cape Henlopen, the entrance to the Delaware Bay, 20 miles north of Fenwick Island. That cylindrical stone structure collapsed in 1926, as the result of beach erosion. During the nineteenth century, a series of wooden and iron lighthouses were erected along the Delaware River and Bay, including several iron screw-pile and caisson-type lighthouses located in the shipping channel of the bay.

The Fenwick Island Light, the only brick, conical-type light ever built in the state, was erected in 1858 and early 1859 during a period of rapid expansion and improvement in the nation's system of aids to navigation. The newly-created (1852) U.S. Lighthouse Board reported to Congress in 1855 that "a light-house in the vicinity of Fenwick's Island will serve to guide vessels from the southern ports, bound into the Delaware, and also the great coasting trade with the same or a more northern destination. Fenwick's Island Shoal is a very dangerous one for those, and also in some degree for the European trade of Philadelphia. It is very common for ships coming from the eastward to fall in with the coast considerably to the southward of Cape Henlopen, and in thick weather a light on Fenwick's Island would serve to ascertain their position when the Henlopen light was invisible . . ."

The report also noted that the nearest light to the south, that at the southern tip of Assateague Island on Virginia's Eastern Shore, sixty miles south of Cape Henlopen, was so far from the mouth of the Delaware Bay that vessels sailing northward were in danger of piling up on the Fenwick Shoal before they were able to sight the Henlopen Light.

As a result, Congress authorized construction of a lighthouse at Fenwick Island on August 18, 1856, at a cost not to exceed \$25,000. A site was selected, which amounted to about 10 acres, and construction of the lighthouse, a lighthouse keeper's house, a storehouse and other structures began early in 1858. When the work was completed early the following year at a cost of \$23,748, a Fresnel-type lens of the third order

FHR-8-300A
(11/78)

UNITED STATES DEPARTMENT OF THE INTERIOR
HERITAGE CONSERVATION AND RECREATION SERVICE

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Fenwick Island Lighthouse Station

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CONTINUATION SHEET

ITEM NUMBER 7 PAGE 6

section is horizontal weatherboarding. The present owner of the property uses a portion of the first floor of the barn as an office. The original barn doors have been removed and a conventional door installed. A door has also been installed into the second floor loft area. It has access to an outside stairway running down the front of the building. Two windows have been installed in the north wall of the structure. Although substantially altered, the original lines of the structure are visible. It is the only one of the buildings which retains a wood-shingled roof.

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM

Fenwick Island Lighthouse Station

CONTINUATION SHEET

ITEM NUMBER 7

PAGE 5

The house consists of a two-story main section and two one-story wings with a third modern one-story wing. The largest of the original one-story wing is laid out on an east-west line, connecting to the center of the east side of the main section (which runs north and south). The smaller one-story wing is also on a north-side line running from the north side of the larger wing. It is also connected to the east wall and north wall of the main section.

All gable ends in the original section as well as in the modern wing have vertical board-and-batten siding. They are decorated with king posts, collar braces, collar beams, sawn decorations on rafter ends, sawn decoration on purlin ends and brackets supporting the purlins, each of which has crossed diagonal collar braces. While the modern wing gable end does not have the elaborate gable decoration, it does have decorated rafter ends and bracketed purlins supporting the roof overhang.

The main house and original wings, as well as the modern wing, have cut shingle siding below the gable ends and corner boards. Wind " and door trim is extremely simple and consists of simple board surrounds with vertical board heads. No pintles survive on the window surrounds of the newer keeper's house and it is uncertain whether the structure ever had shutters. The main section and each of the three wings have chimneys in the gable ends. Those on the wings are exposed and chimneys running up through the overhanging roof. The chimney in the main section is interior and off center and runs up through the roof near the southwest corner. All chimneys are brick and all appear to have been either rebuilt or repointed in recent years. The roofs of the house are of horizontal boards covered with modern asphalt shingles, which probably replace original wooden shingles.

The one-story wing extending out to the northern end of the house is unusual in that the northwest slope of the roof extends down in a saltbox effect across a portion of the north gable end of the main section of the house. Just to the west of the point where it ends, is a small gable-roofed basement entrance.

While access to the interior of the house was not possible, the present owner said that it has extensively remodelled the interior when he purchased the property several years ago. As previously noted, the changes to the exterior of the house do not severely alter the appearance or quality of the structure.

The Barn (S-187.5)

The light station barn is a two-story, gable-roofed structure which appears to be of about the same vintage as the second keeper's house and may have replaced an earlier barn. It has been altered considerably and possesses less of its original integrity than the other four structures. A one-story lean-to garage has been added to its south side. The board-and-batten gable end has been repeated in the barn in a less skillful manner than in the house. The board-and-batten work extends along the one remaining visible side (north) about 1 1/2 ft. below the eaves. Below the board-and-batten

FHR-8-300A
(11/78)

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Fenwick Island Lighthouse Station

CONTINUATION SHEET

ITEM NUMBER 7 PAGE 4

the chimneys are in the same location and since their bases are of identical size, type, and material, it is probable that the western chimney also had a brick hood originally and that it was removed and the wind deflector installed in the relatively recent past.

The house is also distinguished by a decorative ovolo-moulded cornice on the east and west sides and by simple mouldings on the door and window surrounds. The brick foundation and shingle side walls are painted white. The main and porch roofs are covered with modern red asphalt shingles.

Although it was not possible to gain access to the interior of the house, which is only occupied in the summer months, an 1878 description notes that it possesses three rooms with an entry and stairway on the first floor, three rooms with a attic stairway on the second floor, and an attic. The report also mentions a summer kitchen, but it is uncertain whether the term refers to a separate wing now gone or to the enclosed portion of the porch. Early descriptions also mention that in addition to a regular well, rain gutters on the house fed into a 2,800-gallon brick cistern. It is uncertain whether this cistern remains.

Second Lighthouse Keeper's House (S-187.4)

The second keeper's house, located just under 20 feet west of the lighthouse, was as noted previously built in 1882 to relieve overcrowding in the original house. It is also of frame and shingle construction and, according to the present owner, possesses the same interior weatherboarding under the shingles. The shingles of the later house, however, are conventional late nineteenth century cut or sawn shingles and not of the unusually-thick bevelled type evident in the older house. The gable ends of the house are of board-and-batten construction. The boards are pointed at the bottoms for decorative effect.

The house is of the Victorian Gothic style with gable end decoration and rafter end decoration, typical of much coastal area government construction in the last quarter of the nineteenth century. It is extremely similar in style to the Indian River Life-Saving station (S-453) which was built 15 miles north in 1881 and now listed in the National Register of Historic Places. It has been altered in recent years with the addition of two enclosed porches, a small greenhouse area around the foundation of the south gable end of the main section of the house, and a wing on the west end of the house. The present owner of the house and the barn is extremely conscious of the historical nature of the property, however, and has attempted with a fair degree of success to make the additions blend in with the original character of the structure. In the case of the west end addition, especially, it is difficult to tell that the wing is not original. The only incongruous feature is a block foundation instead of a brick foundation. Even this difference is minimized by the fact that the foundations of both wing and main house are painted red.

FORM AS SUBMITTED TO OAHF

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

Fenwick Island Lighthouse Station

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CONTINUATION SHEET

ITEM NUMBER 7 PAGE 3

The interior of the house has undergone frequent alterations, both during the time it served as a part of the station complex and since it has been privately owned, but the basic exterior appearance of the structure is largely unchanged from its nineteenth-century appearance.

The house is unusual in its structure in that it is frame-covered with one layer of weatherboarding, with the weatherboard covered, in turn, by extremely thick (at least 4-inch and possibly 3/4-inch) cut cypress shingles with a beveled edge at the bottom. The inside walls are plaster and lath.

All window and door surrounds have their original trim, although the original shutters have been removed from the windows. The driven iron pintles for the shutters are still in place.

The double-pile, three-bay house has three windows on east and west sides on the second floor. The east side floor is covered by an 8-foot-deep porch running the full width of the house. A doorway with four-light transom is at the north end of the east wall. The wood frame porch is supported by white-painted brick piers. The ends of the porch roof are shingled in the same heavy cypress shingles as the house.

A porch also extends around the middle and northern two bays of the west front facing the lighthouse and around the first bay of the northern gable end of the house. The west side is enclosed with sawn shake shingles and appears to have been altered in the late-nineteenth or early-twentieth centuries.

A doorway with four-light transom is located in the center of the west side first floor. An entrance to the basement is located underneath the window at the southern end of the west side.

On the north side of the house a window is situated in the center of the second floor wall, with an attic window overhead in the gable end. On the south end of the house, first and second floor windows are situated at the southwest corner. A smaller window is located in the south gable end. All windows in the house, including those in the gable ends are double with six-over-six windows.

Brick chimneys of the interior end type are located on either side of the roof beam at the southern end of the house. The chimneys are stuccoed up to about 18 inches above the roof line. The eastern chimney has a brick arched hood, while the western one has a flat top and is covered with a modern sheet metal wind deflector. Since

UNITED STATES DEPARTMENT OF THE INTERIOR
HERITAGE CONSERVATION AND RECREATION SERVICE

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INVENTORY -- NOMINATION FORM**

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Fenwick Island Lighthouse Station

CONTINUATION SHEET

ITEM NUMBER 7 PAGE 2

The Fenwick Island Lighthouse is believed by local historians to have first used whale oil for its lamps, followed by a conversion to mineral oil about 20 years after the lighthouse began operation in 1859.

The flashing cycle of Fenwick Island Lighthouse utilized a fixed white light with a white flash of about 20 seconds duration every two minutes. The flash was accomplished by means of three solid panels affixed to a revolving framework which were mounted outside the lens and prism mechanism. The revolving action was governed by a weight-activated clock, manufactured in 1878 by George M. Stevens Company of Boston, which was connected to the revolving apparatus of the "chariot" type which revolved around a track 17 inches in diameter through the use of six bronze guide wheels and twelve smaller wheels.

The clock was, in turn, connected vertically down through the watchroom floor and then horizontally by an iron cable to a weight tube of wrought-iron mounted in the wall of the tower. The tube was about 17-4 feet deep, long enough to allow the mechanism to revolve for about five hours on one winding. The clock and revolving machinery was protected by six bronze-framed glass doors and was mounted on a four-post, cast-iron table. The lamps themselves were standard fourth order oil lamps. They were replaced in 1899 by fourth order electric lamps. It is uncertain how much of this equipment was still in the lighthouse at the time it was shut down by the Coast Guard.

Generator Shed (S-187.3)

The small shed at the base of the lighthouse, the only other structure on property still owned by the federal government, is made of steel and is about 8 feet square. It is painted white with a red-painted flat roof and a black-painted smokestack.

The steel shed replaces an earlier 8 x 10-foot frame oil shed which was built 14 feet south of the lighthouse in 1831 for the storage of mineral oil. The steel structure, which sits just to the southwest of the tower, was probably installed in 1940 or shortly before. The generators once housed in it have been removed.

First Lighthouse Keeper's House (S-187.2)

The first of the two lighthouse keeper's houses at the light station is a two-story frame structure built on a brick foundation over a brick basement. It was built in 1857 and 1858 and served the families of both lighthouse keepers, with one family on each floor, until overcrowded conditions brought about construction of the second and larger house in 1882.

National Register of Historic Places Registration Form

1. Name of Property

2. Location

3. Classification

Number of contributing resources previously listed in the National Register _____

4. State/Federal Agency Certification

State or Federal agency and bureau

State or Federal agency and bureau

5. National Park Service Certification

☐ other, (explain:)

Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)
Coast Guard Facility

Current Functions (enter categories from instructions)
Coast Guard Facility

7. Description

Architectural Classification
(enter categories from instructions)

Other: Lighthouse
Colonial Revival

Materials (enter categories from instructions)

foundation concrete

walls concrete

roof concrete

other concrete

Describe present and historic physical appearance.

Marcus Hook Range Rear Light (U.S. Coast Guard Light List Number 2255) is located in a quiet residential neighborhood in Bellefonte, Delaware. The facility was built in the years 1918 - 1920 and includes a tall reinforced-concrete tower, a separate keeper's dwelling, and an outbuilding which served as a garage, storage area, and oil shed. The tower is near the crest of a high ridge and serves as the rear light marking the line of the channel in the Delaware River. The front light is located in the water some 1.5 miles to the northeast and is a flashing white light mounted on a square skeleton tower. It is not included as part of the nominated property.

The tower, keeper's dwelling and outbuilding are all contributing elements of the nomination. The tower, situated well back from the street, is square in plan and rises from a three-step base to a height of 100'. The corners are buttressed up to the level of the gallery which surrounds the cube-shaped lantern at the top. The entrance to the tower faces Lighthouse Road; it is fitted with a modern steel-plate door, a replacement for the wood-and-glass double doors shown in early photographs. The tower below the gallery was poured in nine sections. Each section, other than the topmost, has one window so that there are two openings on each side of the tower, with the spacing varying from side to side. Windows have concrete sills covered with flashing and molded wood frames and are fitted with four-over-four sash. The windows have recently been repaired by the use of casement windows with a glass and muntin arrangement that duplicates the original windows. Decorative effects are limited. There are simple bed moldings beneath the gallery and the roof of the lantern, and the gallery's balustrade is formed of a solid concrete rail with rectangular sunken panels.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:

☐ nationally ☒ statewide ☐ locally

Applicable National Register Criteria ☒ A ☐ B ☒ C ☐ D

Criteria Considerations (Exceptions) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)

Maritime History

Engineering

Period of Significance

1918 - 1939

Significant Dates

NA

Cultural Affiliation

NA

Significant Person

NA

Architect/Builder

unknown

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

Marcus Hook Range Rear Light is significant as an early use of reinforced concrete in lighthouse construction (Criterion C) and as a major Delaware River range light, an integral component of early 20th century improvements to the shipping channel below Philadelphia (Criterion A). One of a half-dozen historic range lights on the Delaware, it is the only one constructed of concrete. Its significance as a historic resource is heightened by the presence of the related dwelling and oil shed.

Marcus Hook Range Rear Light reflects the modernization by the federal government of the Delaware River Channel in the early 20th century. The Army Corps of Engineers in 1910 approved the deepening of the channel below Philadelphia from 30' to 35' in depth. Because part of the deepened channel had to be relocated two new ranges, Marcus Hook and Chester, were laid out to take the place of Schooner Ledge Range. Together with the front range light, Marcus Hook Range Rear Light defines the center line of the channel, for this portion of the river. The Marcus Hook Range is used by ships coming down river from Philadelphia and other upriver ports. It is 7,000 yards long. It is just over 200 yards wide. The range lights are at the southern end of the channel. A river pilot or ship's captain keeps both the rear light and the front light aligned on top of each other in coming down river. In this way he knows that the ship is in the proper channel.

Re-inforced concrete was first used for lighthouses on the Pacific coast in 1908, when the tower at Point Arena, California, was rebuilt after its destruction in the earthquake of 1906. Other

United States Department of the Interior
National Park ServiceNational Register of Historic Places
Continuation SheetSection number 8 Page 2

concrete lighthouses off California, Oregon, Washington, and Alaska were built in subsequent years. On the Atlantic coast, the material had primarily been used for minor structures such as the small 1912 oil shed at Delaware Breakwater Light, but in 1913 the lighthouse at Brandywine Shoal was re-built with not only a large reinforced concrete superstructure but a caisson-shell of the same material. The Lighthouse Service's experiments with concrete continued in 1916, when the 100' tower for the Marcus Hook Range was designed. The usual practice at the time was the use of iron or steel skeleton towers for rear range lights, and in fact, Marcus Hook's companion, the 1917 Chester Rear Range Light, was such a tower. Other than providing an extremely strong structure, reinforced concrete would appear to have only minor advantages over steel. Even though the material itself was cheaper, the building of forms, placement of reinforcing rods, and pouring of cement on the upper levels must have been much more complicated than the erection of a largely pre-fabricated tower, something the U.S. Lighthouse Service had been doing since the 1870s. In addition to its structural strength, however, concrete provides a nearly maintenance-free surface, both interior and exterior.

At the time the Marcus Hook Range Rear Light was constructed, all of this nation's lighthouses were under the control of the Bureau of lighthouses, an agency of the Department of Commerce. The Bureau had been part of the Commerce Department since 1903. Prior to that it had been a branch of the Treasury Department. The Bureau itself was created in 1910 to replace the lighthouse Board. That Board had been established in 1852 as a nine-member group that supervised the construction and maintenance of the lighthouse system. In 1939, the Bureau of lighthouses was abolished and its duties transferred to the U.S. Coast Guard, a branch of the Treasury Department.

One of the hallmarks of all of the various agencies that have had control over lighthouses has been their desire to provide a safe and reliable system of aids to navigation. The adoption of improved lighting and focusing systems is one example. The use of new materials such as concrete or pie cast iron is another example. The agencies have also been very willing to work with other agencies such as the Army Corps of Engineers to insure the safe flow of shipping along the coasts and inland to major ports.

United States Department of the Interior
National Park Service

**National Register of Historic Places
Continuation Sheet**

Section number 7 Page 2

The interior of the lighthouse features steel stairs running along the outside wall. Other than the stepped flat moldings which surround the windows, there is no interior finish. The concrete of walls, floors, and ceilings is exposed. The electric light shines through a large plate-glass window on the lantern's east face. The original light was focused by a dish-shaped fourthorder Fresnel range lens. The lens rested upon an iron pedestal and consisted of eight rings of cut glass held in place by brass retainers for a total diameter of about 36". It is marked "BARRIER PAVARD 7 TURENNE, constructuers, Paris." That lens has been donated to the Philadelphia Maritime Museum, Philadelphia, PA. The tower is now illuminated by a powerful fixed searchlight with a red lens. The original light source was a acetylene gas lamp.

The keeper's house is a two and one-half story brick dwelling, Colonial Revival in style, with the ridge of its gable roof parallel to the road. The walls are of textured brick laid up in Flemish bond, with splayed brick lentils over the windows, which are fitted with six-over-one sash. A flat-roofed porch runs across the front of the house, sheltering the entry centered in the three-bay facade. Decorative effects include a full return of the cornice across the gable ends and quarter-circle attic lights on either side of the exterior chimney on the northeast end. The one-story brick outbuilding is similarly detailed. Although the original sliding door has been replaced with a modern roll-up garage door, the outbuilding retains its original asbestos-shingled roof similar to that initially installed on the dwelling.

The facility is in fair condition. The dwelling and outbuilding appear to be in good repair and retain their historical appearance substantially intact. The tower itself has not fared as well. The concrete has undergone natural weathering, exposing the river-gravel aggregate beneath the surface. There are a few places where gouges have exposed small sections of reinforcing rod. More importantly, large pieces of concrete along the lower edge of balustrade are spalling and coming off; repairs have not been successful. However, the structural integrity of the tower, the condition of the lantern roof, and the inherently long-lasting exterior material all appear basically sound.

9. Major Bibliographical References

SEE ATTACHED SHEET

Previous documentation on file (NPS):

- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- ☐ previously listed in the National Register
- ☐ previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings Survey # _____
- ☐ recorded by Historic American Engineering Record # _____

☒ See continuation sheet

Primary location of additional data:

- ☒ State historic preservation office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other

Specify repository: _____

10. Geographical Data

Acreage of property _____ .75

UTM References

A

1	8
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4	5	6	8	6	0
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4	4	0	1	2	8	0
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Zone Easting Northing

B

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Zone Easting Northing

C

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D

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☐ See continuation sheet

Verbal Boundary Description

The nominated parcel is that lot described in the deed, the parcel dated February 20, 1977 and recorded in deed book L27 P281 in the New Castle Recorder of Deeds Office in Wilmington, DE.

☐ See continuation sheet

Boundary Justification

The bounds are the original tax parcel that made up the Coast Guard/Light Service property.

☐ See continuation sheet

11. Form Prepared By

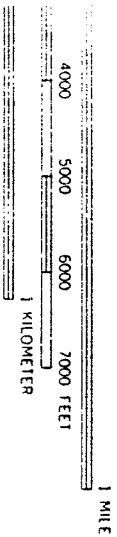
name/title See attached sheet

organization Bureau of Archaeology & Historic Preservation date October 1988

street & number 15 The Green telephone (302) 736-5685

city or town Dover state DE zip code 19901

VAL 10 FEET
 SEA LEVEL



QUADRANGLE LOCATION



Heavy duty
 Medium duty
 Interstate Route
 U. S. Route
 State Route

ROAD CLASSIFICATION

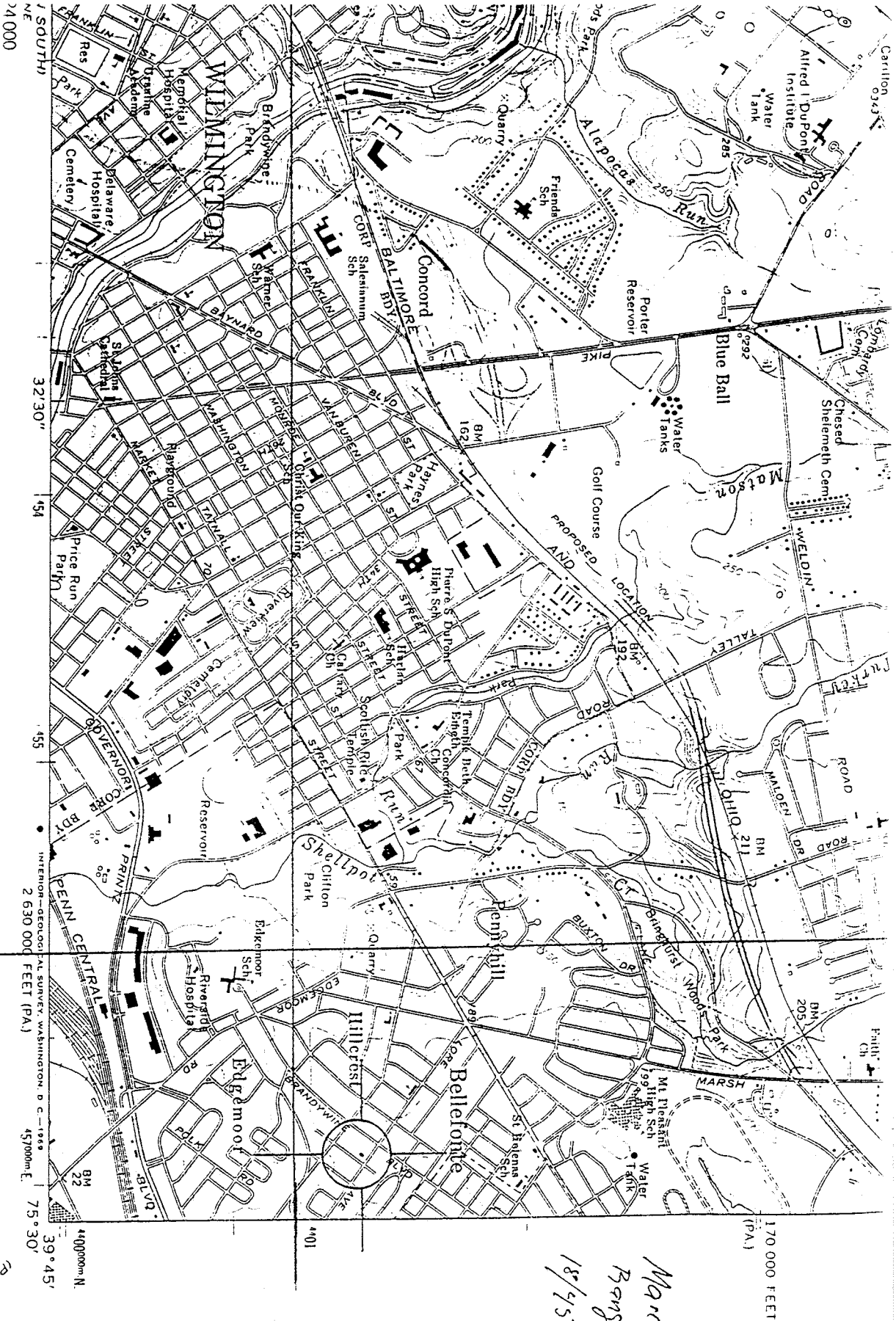
(PENNS GROVE)
 5963 III NW

WILMINGTON NORTH, DEL. — PA.

SE/4 WEST CHESTER 15 QUADRANGLE

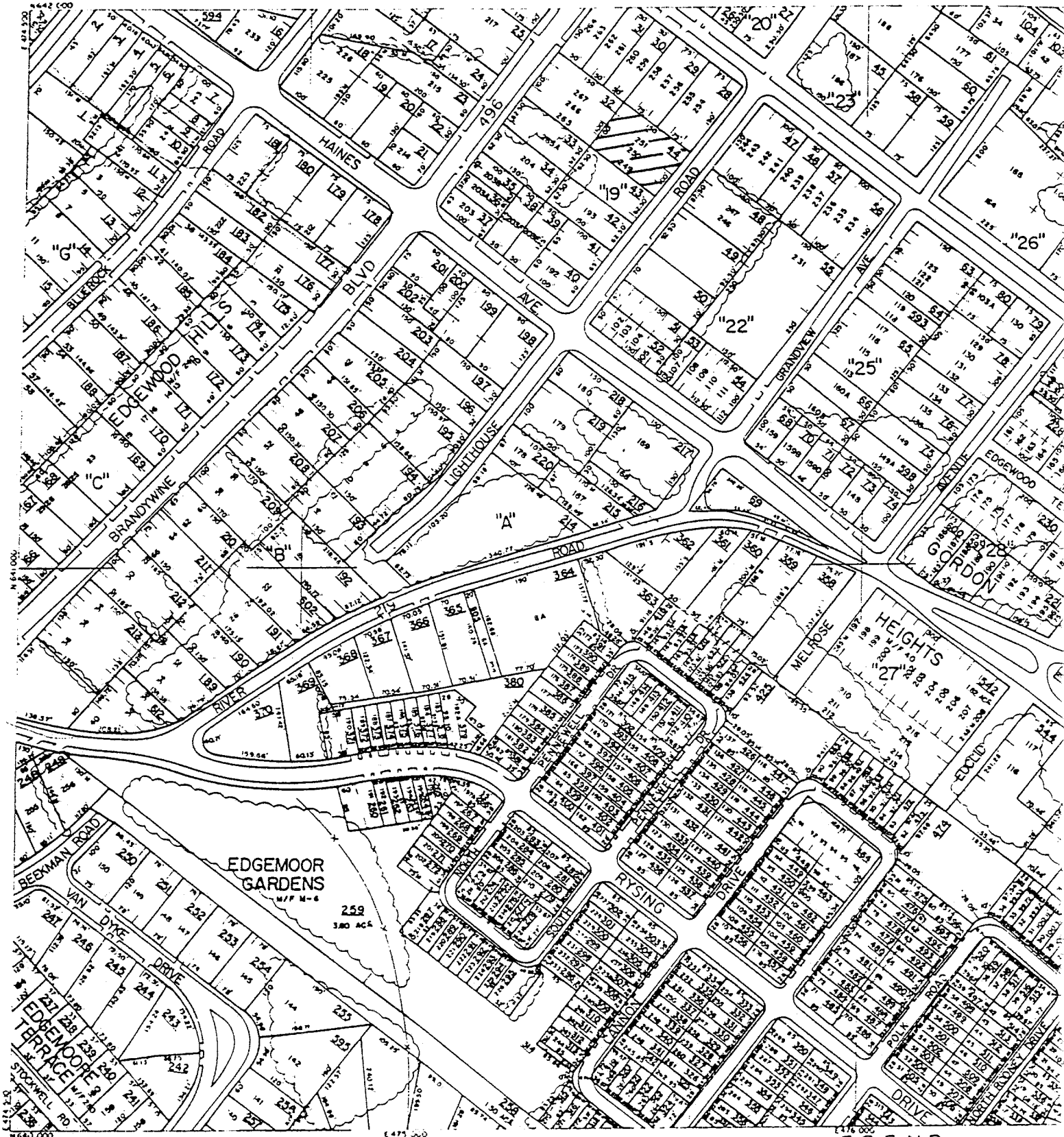
N3945—W7530/7.5

1967



Marius Hook
 Range Near 444
 18/456 810/4401280

Marcus Hook Range Rear Light
 New Castle County, DE.
 Top is north
 not to scale - dimensions as marked



LEGEND

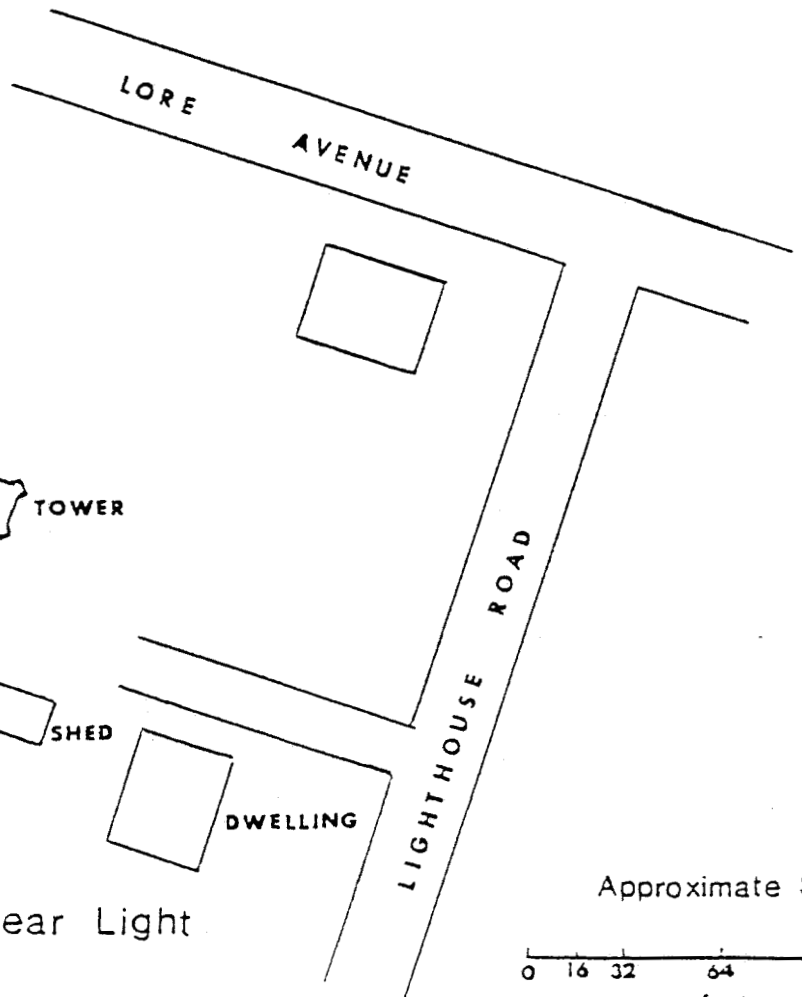
MAP PREPARED BY
 L. ROBERT KIMBALL
 Consulting Engineers
 (MEMBERS, PENNSYLVANIA)

MAP LOCATION

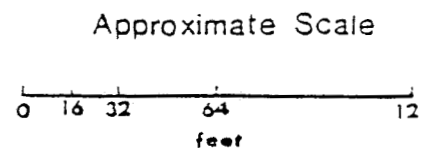
139	140	141
145	146	147
149	150	151

INTERSTATE HIGHWAY	STATE LINE	CEMETERY
U.S. HIGHWAY	COUNTY LINE	CHURCH
LEGISLATIVE ROUTE	UNINCORPORATED LINE	SCHOOL
ROAD, PAVED	CORPORATE LIMITS	WOODED AREA
ROAD, UNPAVED	BRIDGE	FENCE
RAILROAD	STREAM	WATER
	POND	BENCH MARK
	FIELD LINE	BLOCK SECTION

THIS MAP, IN WHOLE OR IN PART, MAY NOT
 BE REPRODUCED IN ANY FORM OR BY
 ANY MEANS WITHOUT WRITTEN PER-
 MITSION OF THE ENGINEER OF THE
 RANGE OF NEW CASTLE COUNTY



Site Plan of
Marcus Hook Range Rear Light



United States Department of the Interior
National Park ServiceNational Register of Historic Places
Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Propertyhistoric name Miah Maull Shoal Lighthouseother names/site number N/A**2. Location** 39 07.6 N.latitude; 75 12.6 W.longitude in Delaware Baystreet & number 5 miles southwest of Egg Island Point☐ not for publication

city, town

☐ vicinitystate New Jerseycode 034county Cumberlandcode 011zip code N/A**3. Classification**

Ownership of Property

- ☐ private
☐ public-local
☐ public-State
☒ public-Federal

Category of Property

- ☐ building(s)
☐ district
☐ site
☒ structure
☐ object

Number of Resources within Property

Contributing

111

Noncontributing

- buildings
 sites
 structures
 objects

0 Total

Name of related multiple property listing:

N/ANumber of contributing resources previously
listed in the National Register 0**4. State/Federal Agency Certification**

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this
☐ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the
National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.
In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of certifying official

Date

State or Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of commenting or other official

Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is:

- ☐ entered in the National Register.
☐ See continuation sheet.
☐ determined eligible for the National
Register. ☐ See continuation sheet.
☐ determined not eligible for the
National Register.

☐ removed from the National Register.☐ other, (explain:)

Signature of the Keeper

Date of Action

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 7 Page 1

MIAH MAULL SHOAL LIGHTHOUSE
New Jersey Cumberland County

was under the supervision of the Civil Engineering Command of the third U.S. Coast Guard District. Since then, the regular source of electricity has been commercial power via 5KV submarine cable connected to the main source at Cross Ledge.

In case of commercial power failure, the back-up system in the basement takes over. The system in substance consists of 12.5 KVA generator, automatic transfer, distribution panel, and 2300V primary and 120/208V secondary transformer. In an emergency, the power generating system provides A.C. electricity to the 1,000 watt lamps in the Fresnel lantern, flasher and lamp changer, double fog signal, boiler, fresh and sanitary water pumps, kitchen range, refrigerator and hot water heater, tower lighting and radio transmitter.

Modernization Program

Under the July 1983 Modernization Program - with a December 1985 supplement - the same Command placed a contract with Maida Engineering Inc. for electrical, mechanical and structural work (structural work essentially called for welding of steel plate in connection with the electrical and mechanical details). The work included the removal of outmoded equipment, accessories and conduit; and the installation, connection and purchases/ government furnished of up-to-date replacements. Modernization had been underway, weather permitting, for at least three years when the program was completed in the fall of 1988.

A systems approach, including on-shore supervisory control, covered shore power and on site emergency energy, emergency light flashing, fire protection, fluorescent lighting, fog and halon signal and environmental conditions. The emergency energy system and almost all of the new equipment were installed and connected in the first floor. The high voltage cable, power cut-outs, fuel tanks, ground connections, surge arrestors went to the vault in the basement. Marine plywood covering was put over windows and sashes, steel plates welded to port openings and hatch covers and all other openings filled in with materials matching the contiguous materials for environmental control.

During the modernization program - but not specified in it - the roof gallery was removed due to deterioration with serious hazards and to excessively high cost to repair or replace. A steel security door was installed over the original wooden double door entrance to the tower. Although covered, the one-over-one sashes were not disturbed.

Historic Resource Consultants' supplement to the firm's December 1, 1982 Site Visit Report brings out that the walls of the living quarters as well as the walls of the staircases and watch deck are panelled with wood-fiber. No drawing nor bill of materials has come to light to provide clear-cut details on the panelled

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 7 Page 2

MIAH MAULL SHOAL LIGHTHOUSE
New Jersey Cumberland County

walls. Instead, one of the 1983 modernization drawings shows an existing bulkhead detail for the first floor with an interior T. & G. wood wall. A reasonable inference from the 3rd District Civil Engineering Command's 1948 drawings indicates the likelihood of panelled wood walls. The drawings were for the rehabilitation of the living quarters, but no mention of walls was made in them.

The lighthouse keepers occupied the living quarters until 1975.

Sources:

1. Office of Superintendent of Lighthouses Prints of Improvements to Machinery for Fog Signal Drawings dated August 1938.
2. U.S. Coast Guard 3rd District Civil Engineering prints of A.C. Electrification drawings dated May 13, 1958.
3. U.S. Coast Guard 3rd District Civil Engineering Prints of Modernization Drawings and Bills of Materials dated July 28, 1983.
4. Historic Resource Consultants supplement to the firm's December 1, 1982 Site Visit Report.

All four sources carry "Miah Maull Shoal Light-house" in their captions. All prints of drawing and bill of materials provided by the Shore Maintenance Detachment, Ninth U.S. Coast Guard District. Site Visit Report provided by Bruce Clouette, Partner.

United States Department of the Interior
National Park ServiceNational Register of Historic Places
Continuation SheetSection number 7 Page 3MIAH MAULL SHOAL LIGHTHOUSE
New Jersey Cumberland CountyHistorical Physical AppearanceFoundation

The foundation, painted gray, is 40 feet in ⁱⁿdiameter at the bottom, tapers inward to a neck of 30 feet diameter. Above the neck, it flares out to create a trumpet shape. The foundation is 43 feet in height. A caisson (foundation shell) was erected on shore near Wilmington, Delaware. It consisted of seven courses (levels) of cast iron plates connected to each other with bolts through internal flanges. The shell, partially filled with concrete, was towed to the site where it was placed upon a steel cylinder footing and set in concrete on 187 white oak piles previously driven 22 feet into the shoal bottom.

Then a 40' wide band of riprap (broken rock loosely thrown together) was placed around the footing to prevent scouring. Concrete was poured into the unfilled space in the shell, leaving some 10' at the top unfilled to serve as a basement area. Six round portholes ventilated the basement.

Basement

Space existed in the basement and in the foundation courses for an air tank, a boiler, a cistern, a coal room, and oil room, a vault and a water tank. The 4.0' x 9'2" vault with an entrance from the basement floor is placed largely in Course #5. These utilities are essential for the comfort of the keepers and for the operation of the lighthouse.

Several of the other cast iron plates in Courses #4 and #6 are modified for run-off of cistern overflow, sink waste and water closet waste. Course #5 takes care of the mooring rings on the boat landing platform. The cornice of the tower is connected to plates in Course #7.

A chimney which provides for two 8" x 8" flue openings for furnace gases and smoke is otherwise embedded in reinforced concrete for five feet below the first floor. An oblong chimney with a 16" diameter extends to the roof along the brick lined wall plates to the roof of the third floor. A flue opening is on each of the three dwelling floors. From the third floor roof, the chimney is held in place by a chimney stay fixed to the edge of the lantern floor balcony. The chimney is then in place beyond the lantern floor levels with the base of the ventilator ball.

A ladder 17-3/4" wide and 16'1" tall stands from below and above mean low water and mean high water and is attached to the landing platform. The railed landing platform measures 3'9-1/2" x 2'1-3/4". Another ladder with the same width as the platform stands 11'7" and is fixed to the first deck under a 2'0" x 2'0" landing hatch.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 7 Page 4

MIAH MAULL SHOAL LIGHTHOUSE
New Jersey - Cumberland County

There are two boat landings and ladders, one on the west side and another on the east side of the tower.

Tower

The tower, 59 feet above mean high water, also is cast iron (brick lined) with plates bolted together with internal flanges. It accommodates in ascending order, a three-story dwelling area, a one-story watch deck and a lantern deck. A roofed veranda features a cast iron piped rail encircling the deck of the first story. Smaller railings are around the watch and lantern decks.

A center column is the interior structural element of the tower extending from the basement floor to the top of the watch deck (fourth floor). It is cast iron 3/4 inch thick with an 11 inch inside diameter. There are a total of four 3-1/2 x 10 inch column circular openings covered with sheet iron doors: two such openings in the basement and one each on the third and fourth floors. The center column stands in 2 feet 6 inch square cast iron floor plate on the basement floor.

The associated structural strength of the center column comes from the cast iron plates of the tower wall interconnected between the three dwelling floors and the watch deck. In the case of the dwelling area, the individual wall plates are uniform in size, are classified as either inside or outside elevations and are slightly different in numbers, in keeping with the varying radii. In comparison, the wall plates of the watch deck are smaller in size, are fewer in number, but are likewise either inside or outside elevation and for the same reason.

All wall plates reflect a similar design, form the contours of the tower, have raised edges and are bolted together. Windows and doors for the dwelling and watch tower are cut out of the exterior plates. Holes are drilled into the wall and floor plates for downspouts and pipes leading to the basement facilities.

A 3" I beam is placed across the top of the watch tower, beneath the lantern floor.

Cast iron floor plates connect the dwelling tower wall plates to the center column. In a similar vein as the wall plates, the floor plates are uniform in size and are in different numbers depending upon the respective radii of the dwelling and watch tower. The vertical section of the first floor is fitted with T-iron supports, both the vertical and horizontal sections of the second floor are fitted with similar supports, and the horizontal section above of the third is likewise supported.

A staircase is cut out of the floor plates on the south side of the tower for each of the three dwelling floors. Another cut-out on the first floor provides for a trap door covering the coal chute to the coal room in the basement.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 7 Page 5

MIAH MAULL SHOAL LIGHTHOUSE
New Jersey Cumberland County

Two 5" I-beams are in place on the first floor, another on the second floor and still another on the third floor. Three of the beams extend from the wall plates to the center column. The second I-beam on the first floor is at right angle to the other I-beam.

Wood floor 2" thick overlays the cast iron floor.

In sum, the circumference wall plates and the central column, all cast iron, are the structural elements of the tower. Collateral support flows from the interconnected cast iron floor plates and the steel beams.

Dwelling Area

The three-story dwelling area, each floor 9 feet in height, tapers from a base diameter of about 26 feet to a top diameter of some 23-1/2 feet. Seven windows on the first floor and eight each on the second and third floors have wooden one-over-one sashes in cast iron surrounds with molded lintels. A wooden double door in a cast iron frame, also with a molded lintel and with rectangular lights over recessed panels provides access to the dwelling area on the south side of the tower.

The dwelling area approximates a conventional home style with a kitchen and dining room on the first floor, with two bedrooms and a bathroom on the second floor and with two more bedrooms on the third floor. A pantry, storage room and four closets are appropriately located. Rooms are separated for privacy and for functional use by horizontal and vertical partitions essentially of channel and plate iron.

Dresser - 3'6" side, 8'0" high and 15" deep - with two-way doors, drawers and shelves and rimmed in iron plate is fixed to the first floor and the ceiling.

A roofed veranda encircles the first deck. The 5/32" sheet steel roof plates with 32 rafters are secured by flanges to the tower wall plates below the second floor windows. It has an approximate one foot slope from the tower wall plates to the 5" x 7" gutter, with three downspouts bolted to 7'8" columns. The twelve columns slip over 3-3/4" floor plate tenons. Sixteen 3'11-1/4" posts and the twelve columns are linked together by three levels of 1-1/4" pipe to form the cast iron Truscon railing around the first deck.

Watch Deck and Lantern Tower

In contrast, the diameter of the fourth floor (watch deck) and the lantern floor are considerably smaller than the 26' and 23-1/2' diameter of the three dwelling floors. The diameter of the watch deck is 15' and slightly more than 8' high. The diameter

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 7 Page 6

MIAH MAULL SHOAL LIGHTHOUSE
New Jersey Cumberland County

of the lantern floor is 8' in diameter and has a focal point of a little more than 5'.

The framing plan of both the fourth floor and the lantern floor provides for further structural support by the strategic placement of steel I-beams. Each floor has an I-beam across its diameter which is connected to the central column and to the wall plates. Other I-beams on each floor are either directly or indirectly attached to the central column and the wall plates.

A semi-circular iron staircase with separate up and down ways between the fourth floor and lantern floor is completely affixed to the central tower via cast iron floor plates. There are eleven newel posts which support the handrail between the fourth floor and the lantern floor. The stairs in between are treaded.

Four round-arched windows with plain cast iron surrounds are set in a like number of outside wall plates of the fourth floor (watch deck). A pane of glass 20" x 20" is in place on each one over one 1-3/4" sash. Metal weather stripping is put in the crevices between the sash and the window frame.

A 1-3/4" thick metal arched door is the balcony entrance to the fourth floor. It has three separate panes of glass, the largest is arched and measures 16" x 28". A projecting molding is across the door near the threshold.

Pipe railings with orb-shaped finials (terminals pointed upward) encircle the galleries at the watch deck and the lantern deck. The watch deck railing consists of eight sections, each one with four posts standing 3' high bolted through a 3" steel I-beam below deck and with twenty-four 3/4" vertical pipes and three 1/2" horizontal pipes. In comparison, the lantern deck is comprised of six sections, each one with three posts also standing 3' high bolted through a 3" steel I-beam below deck and with ten 3/4" vertical pipes and three horizontal pipes.

In short, the railings are cast iron, shouldered and riveted. Excluding the finials, a watch deck section is 3' x 6' and the lantern deck section 3' x 4'.

The Lantern

The circular plan lantern stage has walls of cast iron plate below its diagonal lattice-glazed window which extends completely around the lantern. Sheet metal covers the pitched roof of the lantern and is surmounted by a ventilator ball with lightning rods.

Augustin Fresnel, a French physicist, perfected a lens in 1822 that revolutionized the lighting of lighthouses by simplifying the maintaining of a good light. Fresnel devised seven orders or sizes, of lenses, depending upon the power of light needed. The

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 7 Page 7

MIAH MAULL SHOAL LIGHTHOUSE
New Jersey Cumberland County

first-order was the largest and gave the most powerful light. The smallest was a sixth order lens. (there was a three-and-a-half order lens).

The Fifth Auditor dragged his feet on accepting the superiority of the Fresnel lenses so that by 1851, only three light stations in the United States were equipped with the lenses. And they came about by the special acts of Congress. Congress also stipulated that Fresnel lenses were to be placed in all new lighthouses and in lighthouses that needed new lighting apparatuses.

Congressional action brought about a change in the administration of lighthouses from the Fifth Auditor (1820-1852) to the Lighthouse Board (1852-1910).

In the 1870's the Lighthouse Board once again undertook experiments seeking a better fuel. In 1878, the board began introducing kerosene, or mineral oil, into lighthouses. The slowness in introducing mineral oil was due to the fact that the lens lamp had to be converted to use the new fuel.

The Fresnel Lense and the kerosene fuel were still in general use when the initial Congressional appropriation was made for the Mial Maull Shoal Lighthouse on June 30, 1906 and when the lighthouse was in the 1907-08 planning stage. Both found their way into the structure of the lighthouse during the 1909-1913 construction stage.

Whatever its design and construction the top deck (tower) has one primary mission: to support the light the mariner needs to see. The lighthouse is, principally a nighttime aid and, as a consequence, the most important aspect of the lighthouse is the light.

The top deck of the Miah Maull Shoal Lighthouse is fitted with a Fresnel lantern (1-1/2' x 3') which encloses a fourth order lens, a hydraulic lamp and a rotating or clockwork mechanism. Kerosene is inventoried and kept in the basement as fuel for the lamp. The lantern, under the lighthouse keeper's surveillance, creates the light characteristics for protecting nearby navigation.

The lantern occultates white at 4 seconds with a nominal range of 15 nautical miles for the white sector and 12 nautical miles for the red sector. The arc of the red sector extends approximately from northwest to southwest and covers the Brown and Joe Flogger shoals along the main shipping channel.

A series of prisms held in brass retainers form a vertical cylinder and the lens concentrates the light from the lamp into a narrow intense beam. Red plastic affixed inside the lantern's glazing causes the beam.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 7 Page 8 MIAH MAULL SHOAL LIGHTHOUSE
New Jersey Cumberland County

The source of the light is the incandescent oil vapor lamp. Kerosene is forced into a vaporized chamber where it strikes the hot walls and is instantly changed into a vapor. The gas goes through a series of small holes to a mantle (fabric net).

This lamp was the final step in the refinement of the flame. Subsequent improvements in lighting went beyond fire: electricity, now solar.

Source:

Prints of 22 drawings with Miah Maull Shoal Lighthouse in caption provided by Shore Maintenance Detachment, Ninth U.S. Coast Guard.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:

☐ nationally ☐ statewide ☐ locally

Applicable National Register Criteria ☒ A ☐ B ☒ C ☐ D

Criteria Considerations (Exceptions) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)

Engineering

Maritime History

Transportation

Period of Significance

1908-1913

Significant Dates

Dec. 1913

Cultural Affiliation

N/A

Significant Person

none

Architect/Builder

Lynchburg Foundry Co., Lynchburg, Va.

Tatnall-Brown Co., Wilmington, Del.

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

The Miah Maull Shoal Lighthouse is a well-preserved embodiment of the cast-iron and concrete caisson foundation technology which was used from 1876 to 1913 in lighthouses that occupied waterbound sites in the northeastern United States. At least 50 such lighthouses were built. Miah Maull Shoal, designed in 1907 and completed in 1913, was the last example of this type built before reinforced concrete technology was introduced; it was also one of the last major navigational aids built in the Delaware Bay. As part of a string of lighthouses in the bay and the lower Delaware River that were in place before World War One, Miah Maull Shoal helped foster the improved navigation of the Delaware that was crucial to the success of the Hog Island Shipyard (now the site of the Philadelphia International Airport), which was established in 1917. By the end of the conflict, Hog Island had become the largest shipyard in the world. Miah Maull Shoal lighthouse meets Criterion A under the category of Transportation and Criterion C under the category of Engineering, as an embodiment of an important engineering technology.

The Miah Maull shoal itself, which was named for an eighteenth-century Delaware mariner, was 800 yards wide and 3,000 yards long at a depth of 13 feet--a significant hazard to large modern ships, which required a much greater draft. The need for a deep channel, both for commercial and for military purposes, was foreseen during the early years of this century. Now known as the Philadelphia Ship Channel, it was called for by Congress in the River and Harbor Act of 1909 to be a 35-foot deep channel at least 800 feet wide from the Philadelphia and Camden wharves and shipyards to the mouth of Delaware Bay, to replace an existing 600-foot wide, 26-foot deep channel begun in 1885. Subsequent improvements have deepened the channel to 40 feet.

☒ See continuation sheet

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

MIAH MAULL SHOAL LIGHTHOUSE
New Jersey Cumberland County

Section number 8 Page 1

Miah Maull Shoal lighthouse was designed as one of the major navigational aids required for this channel. Appropriations to build it were approved by Congress in acts of June 30, 1906, March 4, 1907, and March 4, 1911. The lighthouse was designed during 1907-8 to employ a pre-fabricated conical cast-iron shell resting on a foundation of pilings surrounded by rip-rap. In this method of construction, the shell was pre-fabricated, towed to the site, and sunk by filling it with concrete. The contract for the shell was awarded in May 1908 to the Lynchburg Foundry Company, of Lynchburg, Virginia, even before site work began. The plates were delivered to Wilmington, Delaware, where they were subsequently assembled and the shell floated. Work at the site was started on July 24, 1908. The Coast Guard towed the shell to the site in August 1909, and the sinking and filling was completed by November. In June 1910, with the building's superstructure under construction, Engineering News described the emerging edifice.

The foundation shell is 40 ft. in diameter at the base and 42 ft. 8 ins. in height. It is composed of 224 1+1/4-in. cast-iron plates in seven courses, the top course being bell shaped.... The superstructure will consist of a three-story iron dwelling....

The superstructure of Miah Maull Shoal lighthouse was completed on February 20, 1913 and its permanent fog signal was placed in operation on December 5, 1913.

Less than one year later, the Great War erupted in Europe. As part of the American response, the United States commissioned a great number of new military vessels. In September 1917, after the American entry into the war, the American International Shipbuilding Corporation was awarded a contract to build fifty large cargo ships, and in the following month a subsequent contract added seventy more, all to be completed before the end of July 1919. To meet this extraordinary demand, the company secured Hog Island, a large island along the west shore of the Delaware River just south of the confluence of the Schuylkill River. In a crash construction program from September through December 1917, the company built the Hog Island Shipyard in order to fulfill its contract, which could not be handled by existing shipyards in the Delaware Valley. The ships produced by the Delaware River shipyards for World War One proved the need for the Philadelphia

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 8 Page 2

MIAH MAULL SHOAL LIGHTHOUSE
New Jersey Cumberland County

deep channel and its value for national security. Of the navigational aids in the Delaware, the Miah Maull Shoal lighthouse most clearly represents the improvements of this period.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 9 Page 1

MIAH MAULL SHOAL LIGHTHOUSE
New Jersey Cumberland County

Light List 1989. United States Department of Transportation. United States Coast Guard.

Survey of Coast Guard, First through Seventeenth Districts. Lewis C. Maull.

Rout, Thomas J.; and A.E. Arledge. "Building the Miah Maull Shoal Lighthouse." Engineering News 63, 22 (June 2, 1910):630-632.

Report of the Commissioner of Lighthouses. September 15, 1915. United States Department of Commerce, Bureau of Lighthouses. Washington, DC.

Drawings

Office of Superintendent of Lighthouses. Prints of Improvements to Machinery for Fog Signals. August 1938.

U.S. Coast Guard. 3rd District. Civil Engineering Prints of A.C. Electrification. May 13, 1958.

U.S. Coast Guard. 3rd District. Civil Engineering Prints of Modernization. Drawings and bills of materials. July 28, 1983.

Ninth U.S. Coast Guard Shore Maintenance Division. Prints of original construction drawings. 1907-1908.

MIAH MAULL SHOAL LIGHT

Light List Number: 37980 (Volume I)

Geodetic Position: 39-07.6 North, 75-12.6 West

✓ Lamp: 1000 Watt

✓ Lantern: 4th Order Classical Fresnel

✓ Characteristic: Occulting White at 4 second interval

✓ Nominal Range: 15 nautical miles (white sector); 12 nautical miles (red sector); red from 137.5 degrees true to 333 degrees true

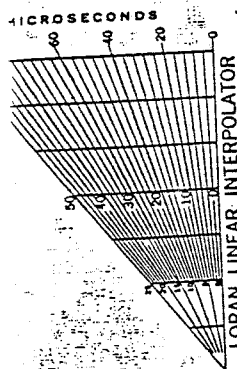
✓ Power Type: Commercial power via submarine cable

✓ Horn: 1 blast every 10 seconds (1 second blast)

Emergency Light: Of lower intensity with same characteristic as main light if main light is extinguished.

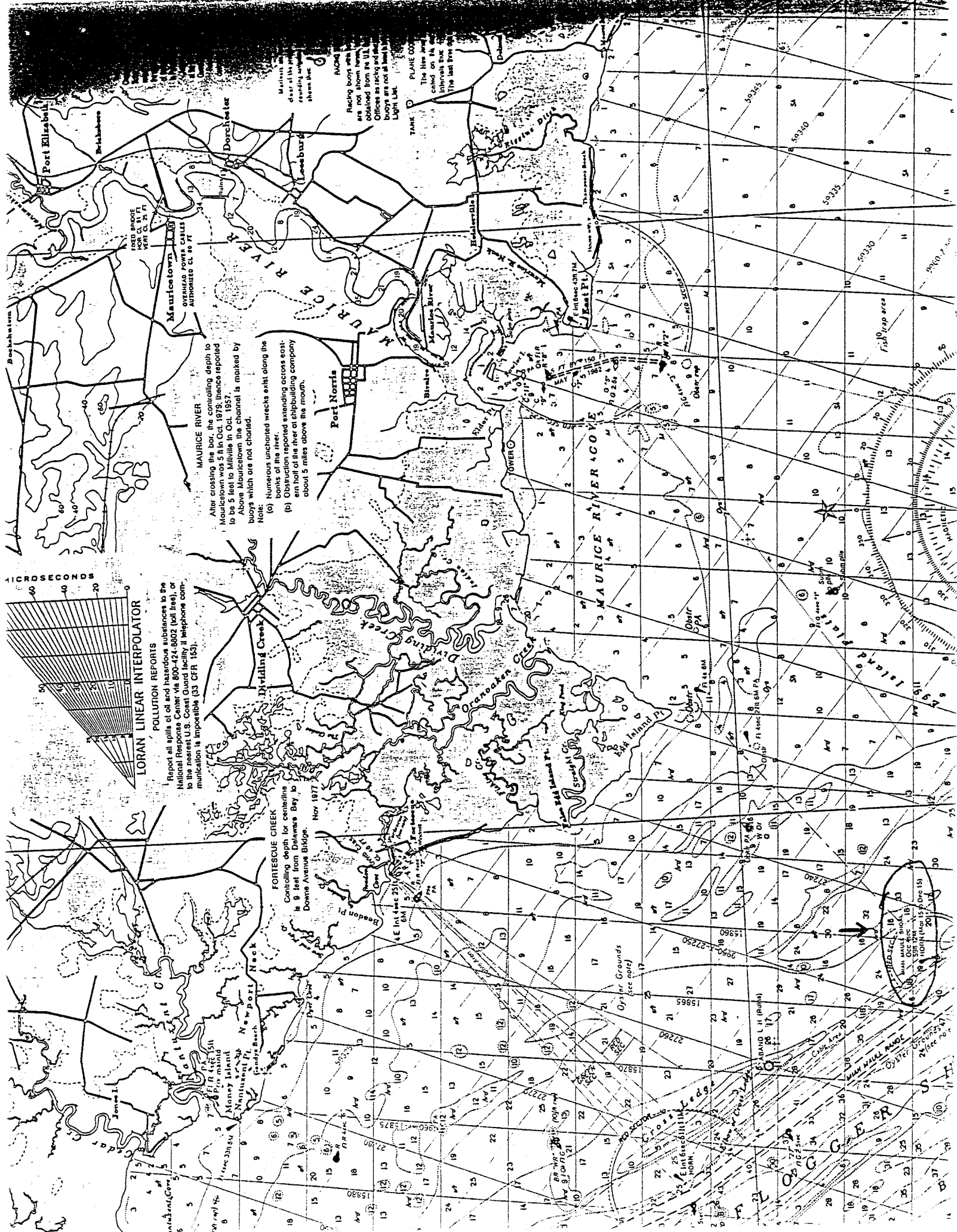
Located on north end of shoal

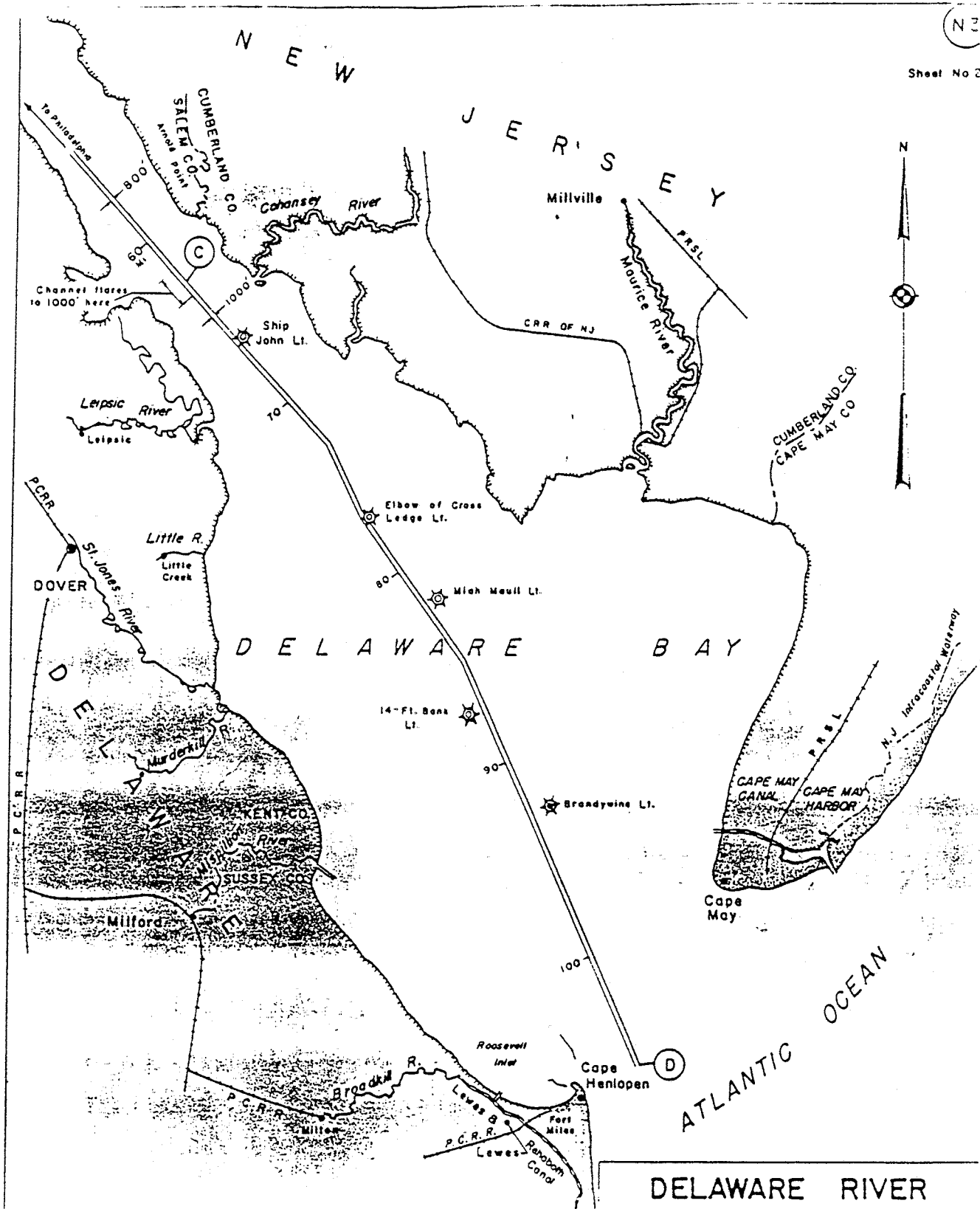
Shoal dimensions: 800 yards X 3000 yards - 13 foot depth




POLLUTION REPORTS

Report all spills of oil and hazardous substances to the National Response Center via 800-424-8802 (toll free), or to the nearest U.S. Coast Guard facility if telephone communication is impossible (33 CFR 153).





LEGEND

Channel indicated thus 

NOTE

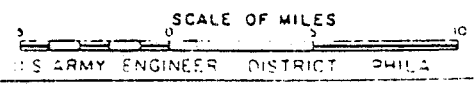
Distance in miles below Allegheny Ave., Phila., shown along side of channel

DELAWARE RIVER
PHILADELPHIA TO THE SEA

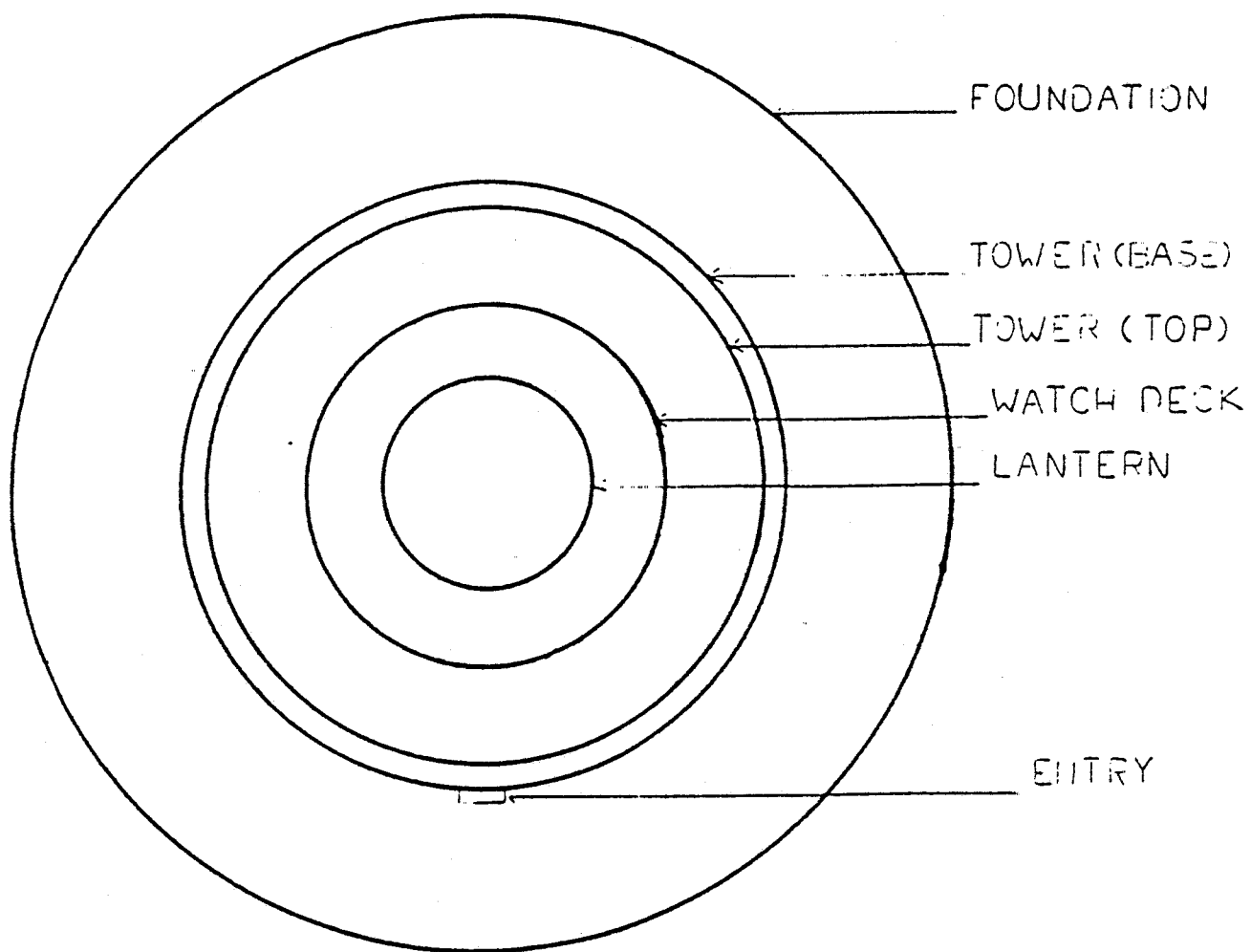
PENNA., N.J. & DEL.

40-FOOT CHANNEL

REVISED 30 JUNE 1969

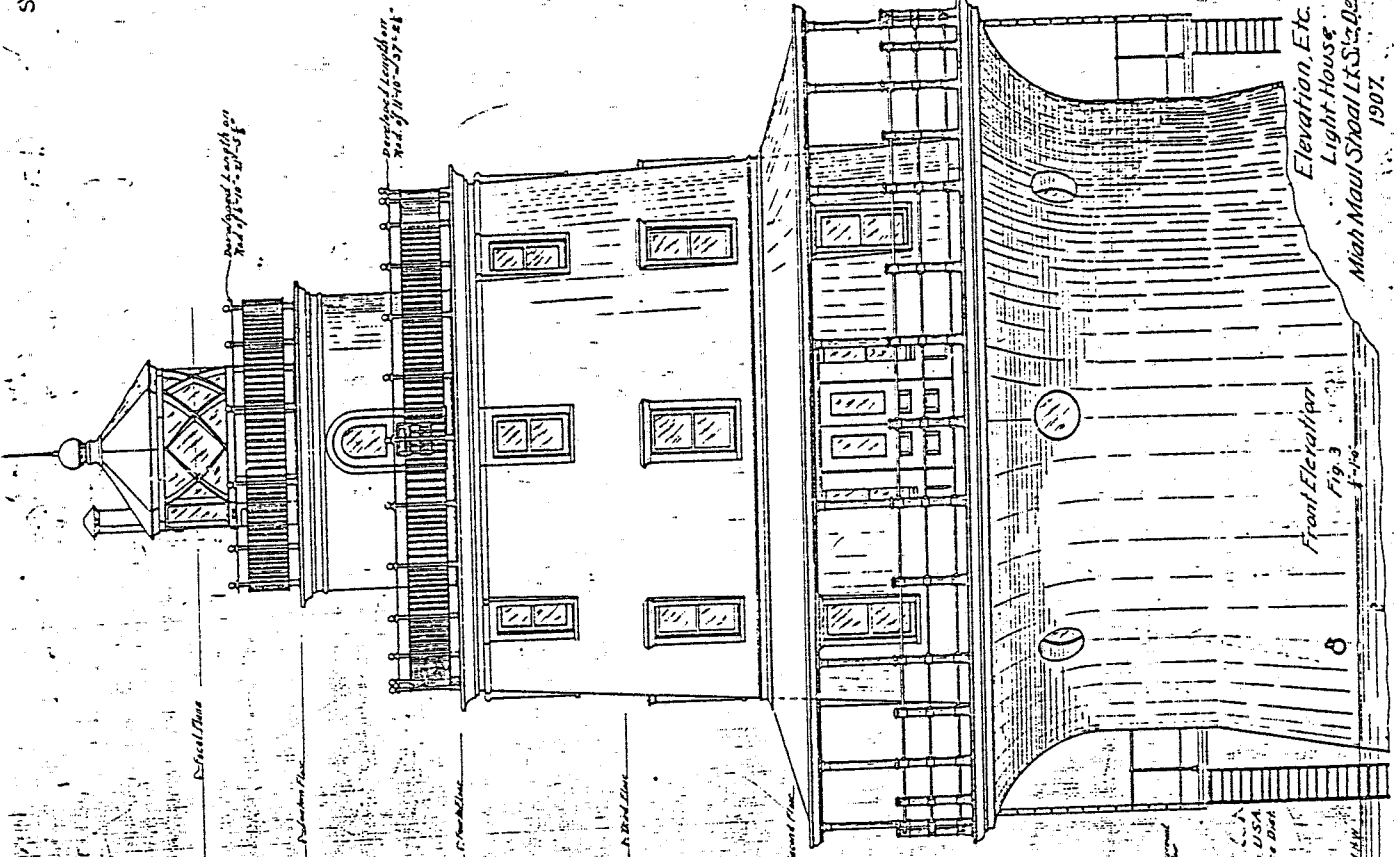


PLAN OF
MIAH MAULL SHOAL LIGHTHOUSE



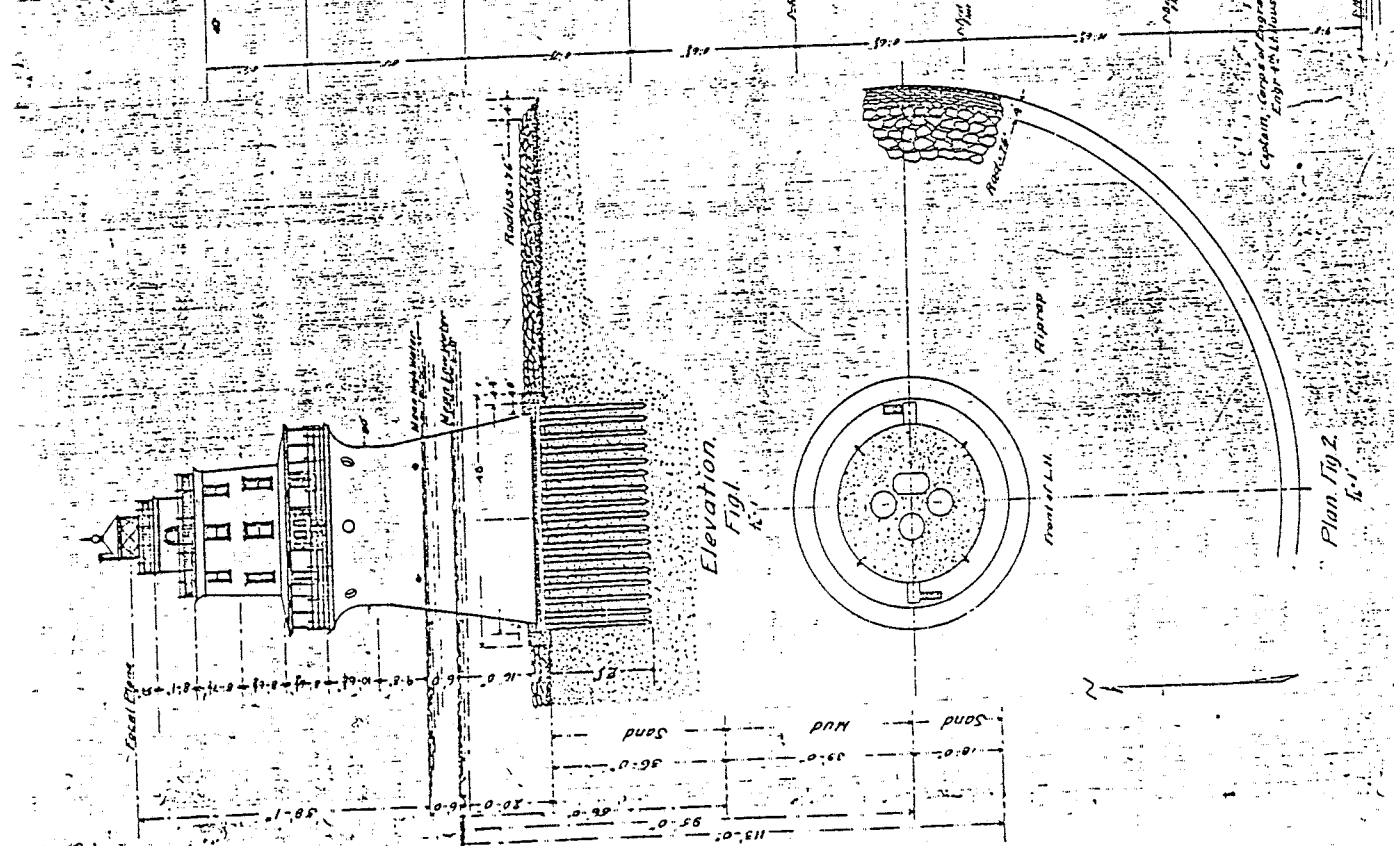
$1/8" = 1'$

Sheet No. 1
(of 5)



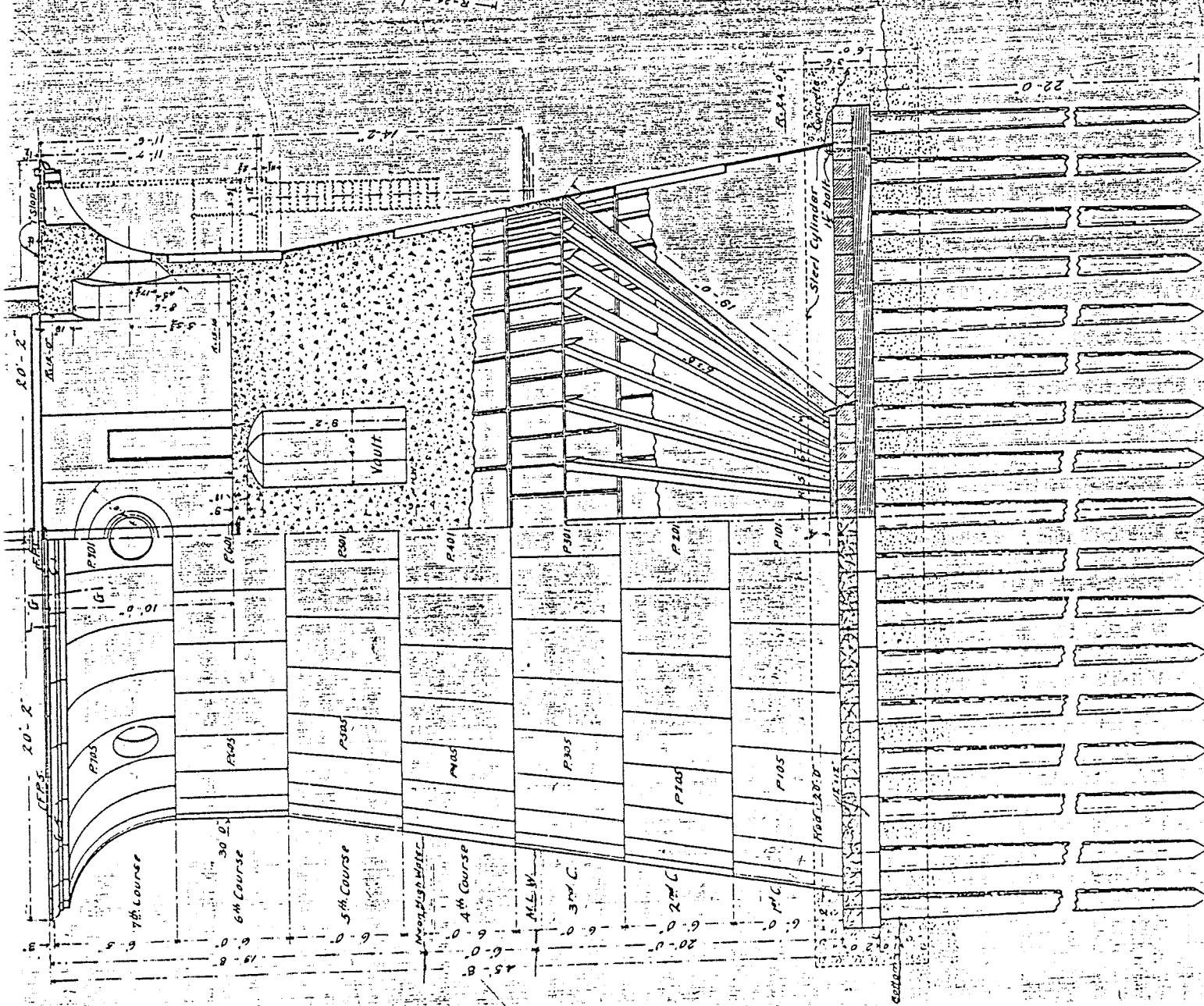
Elevation, Etc.
Light House
Miah Maul Shoal Lt. S. Del. 5. 1907.

Front Elevation
Fig. 3



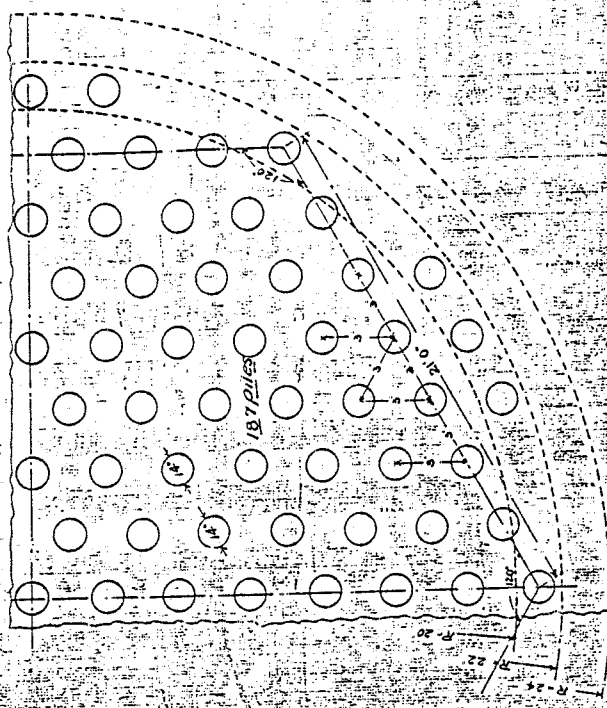
Plan Fig. 2
Fig. 1

Copyright 1907 U.S.A.
Copyright 1907 U.S.A.

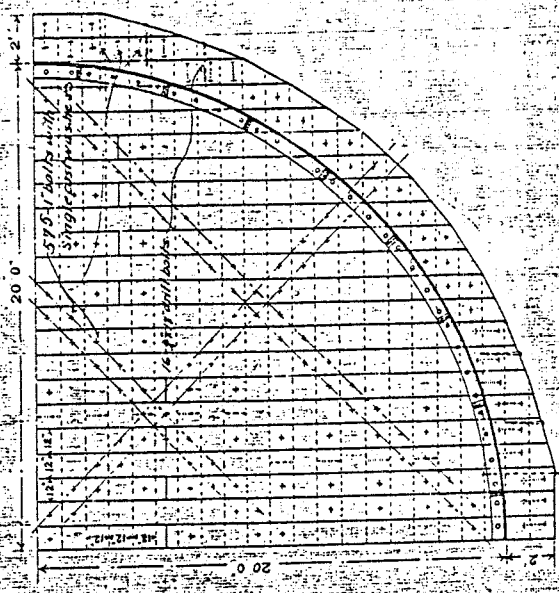


Half Elevation Foundation Shell Etc.
Fig. 1

Half Section, Foundation Shell Etc.
Fig. 1

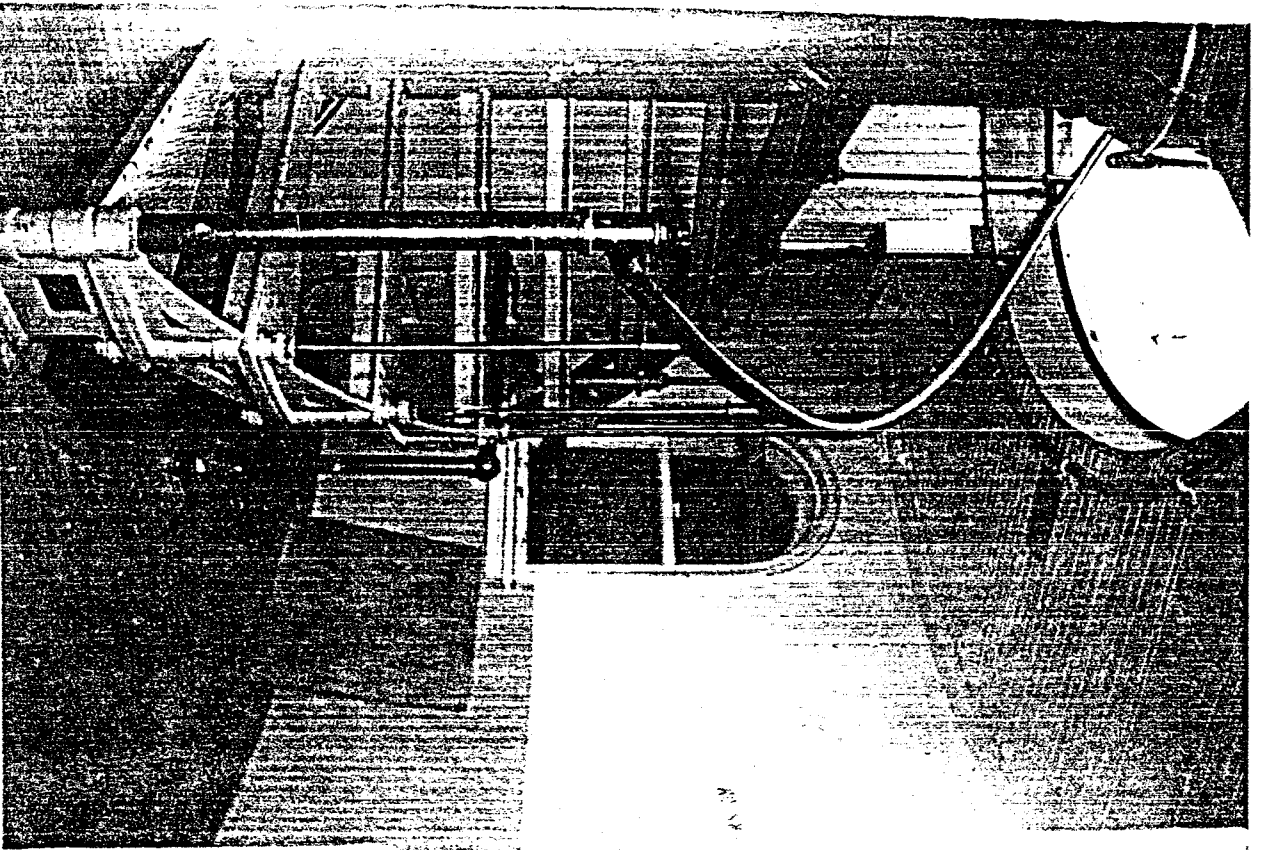
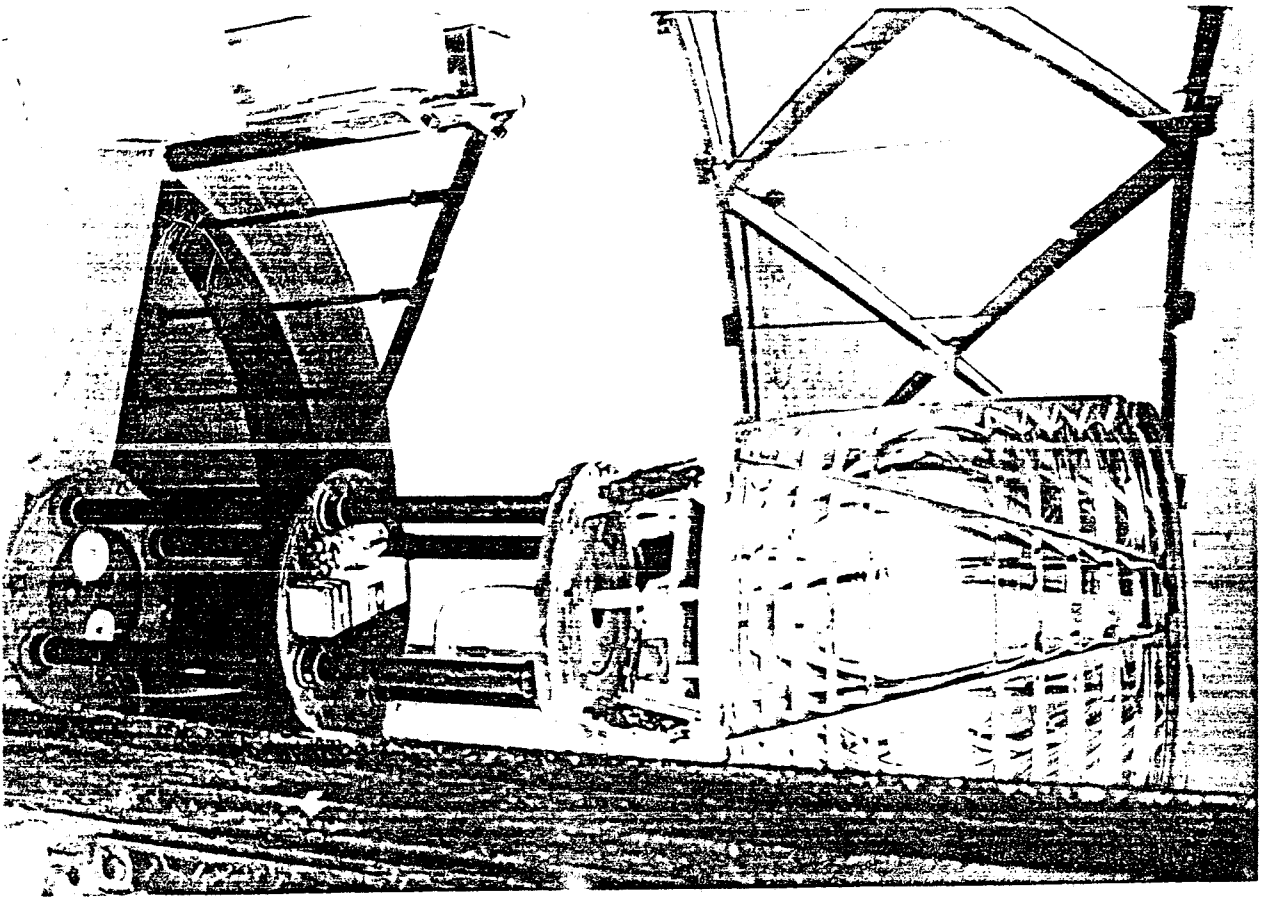


Part Plan, Pile Foundation
Fig. 2



Part Plan, Grillage
Fig. 3

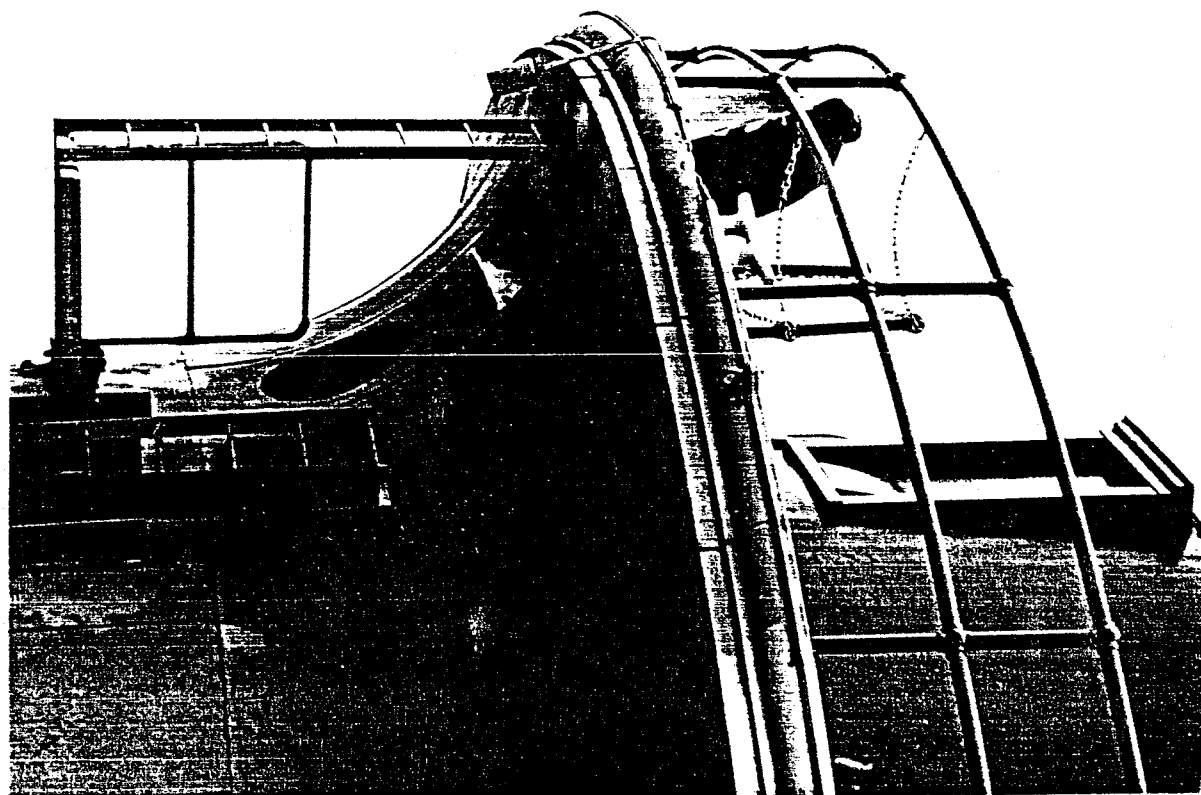
Foundation Shell, Grillage &
Light House
Miah Maul Shoal Lt. Sta. Del. E.
1907

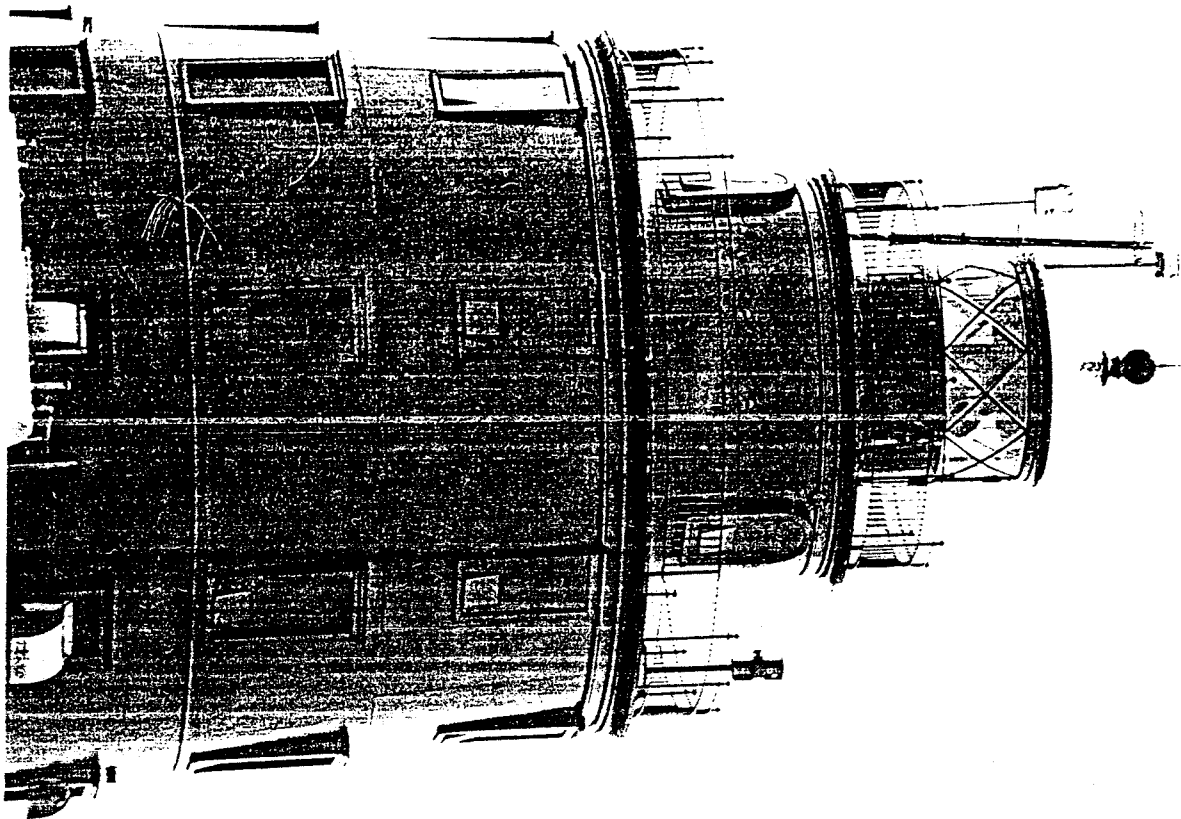


Penultimate level, View NW (interior)
Topmost level, View NW (interior)

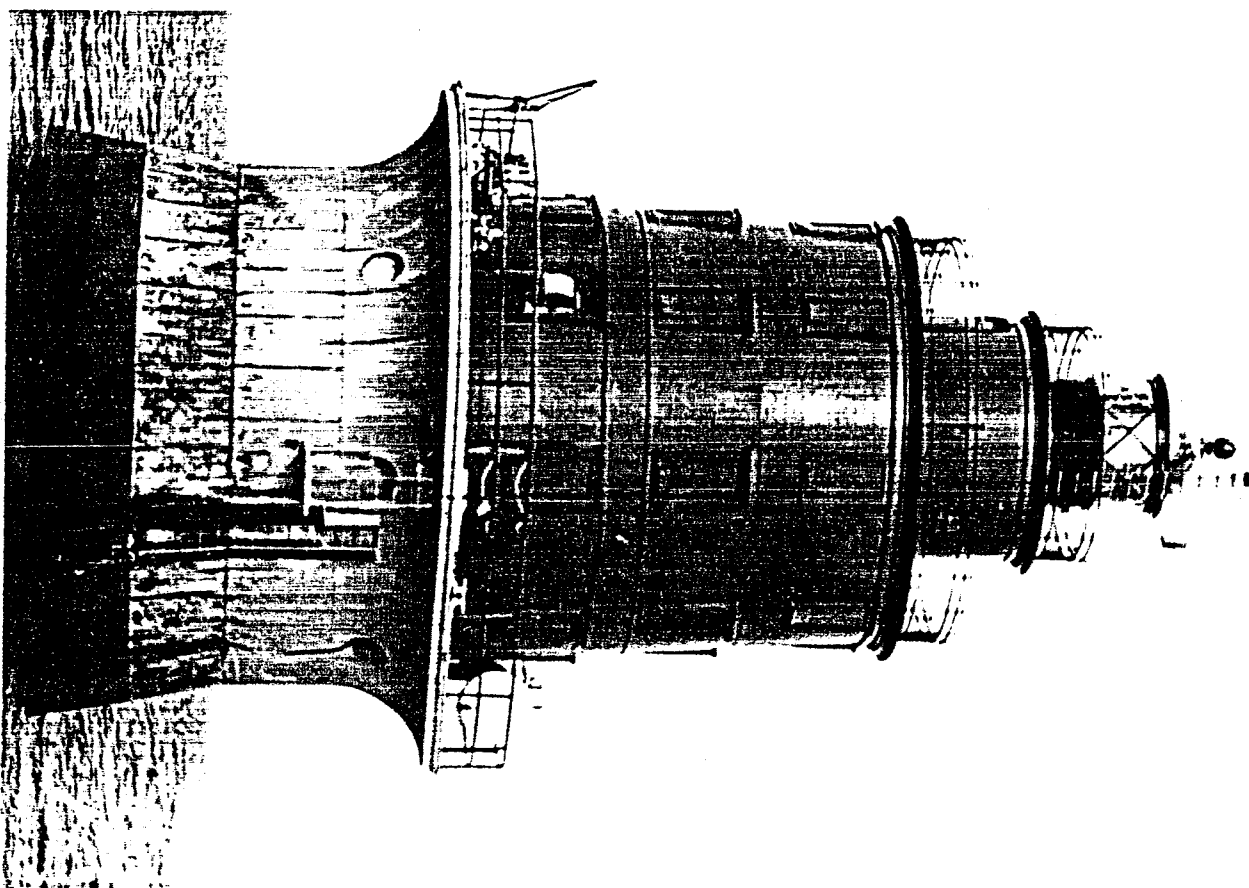


View N
Topmark, View NE

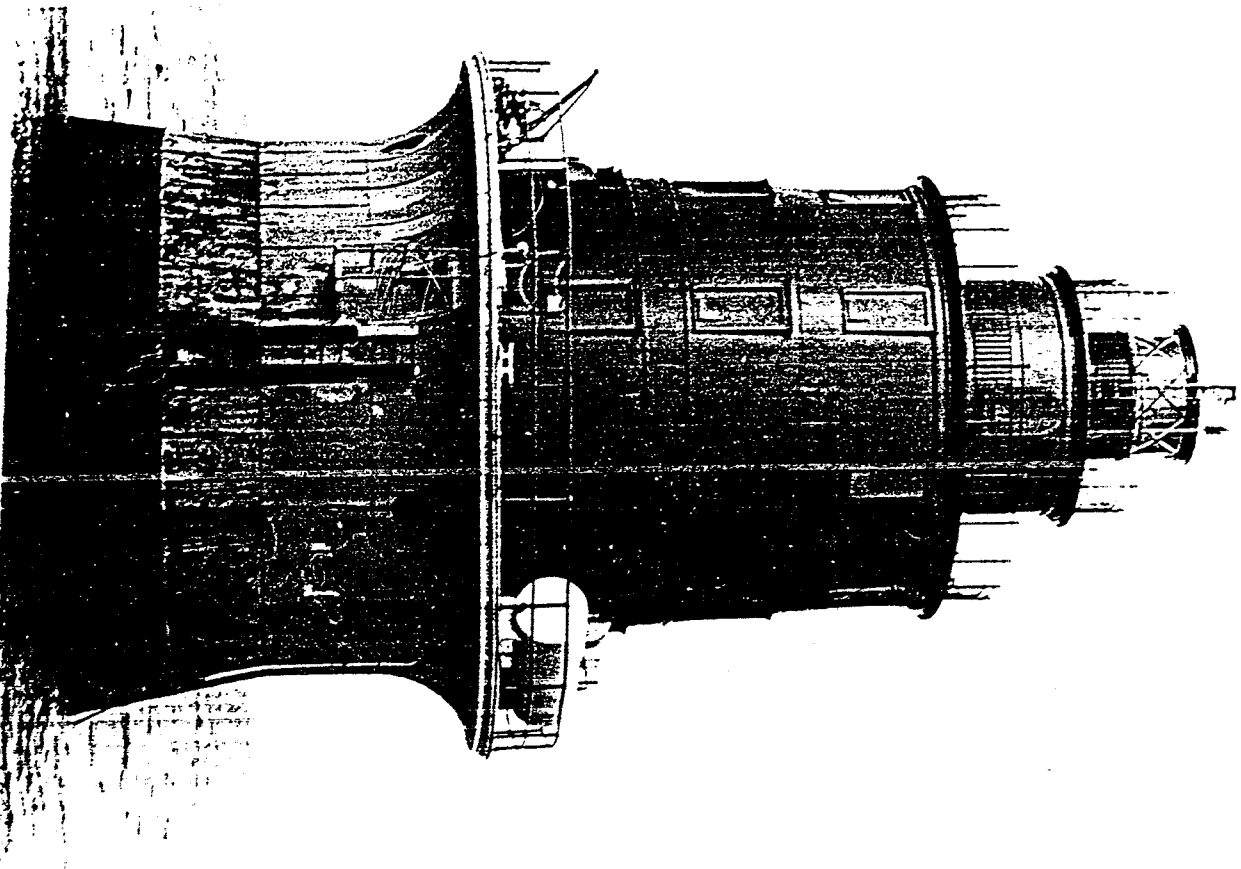




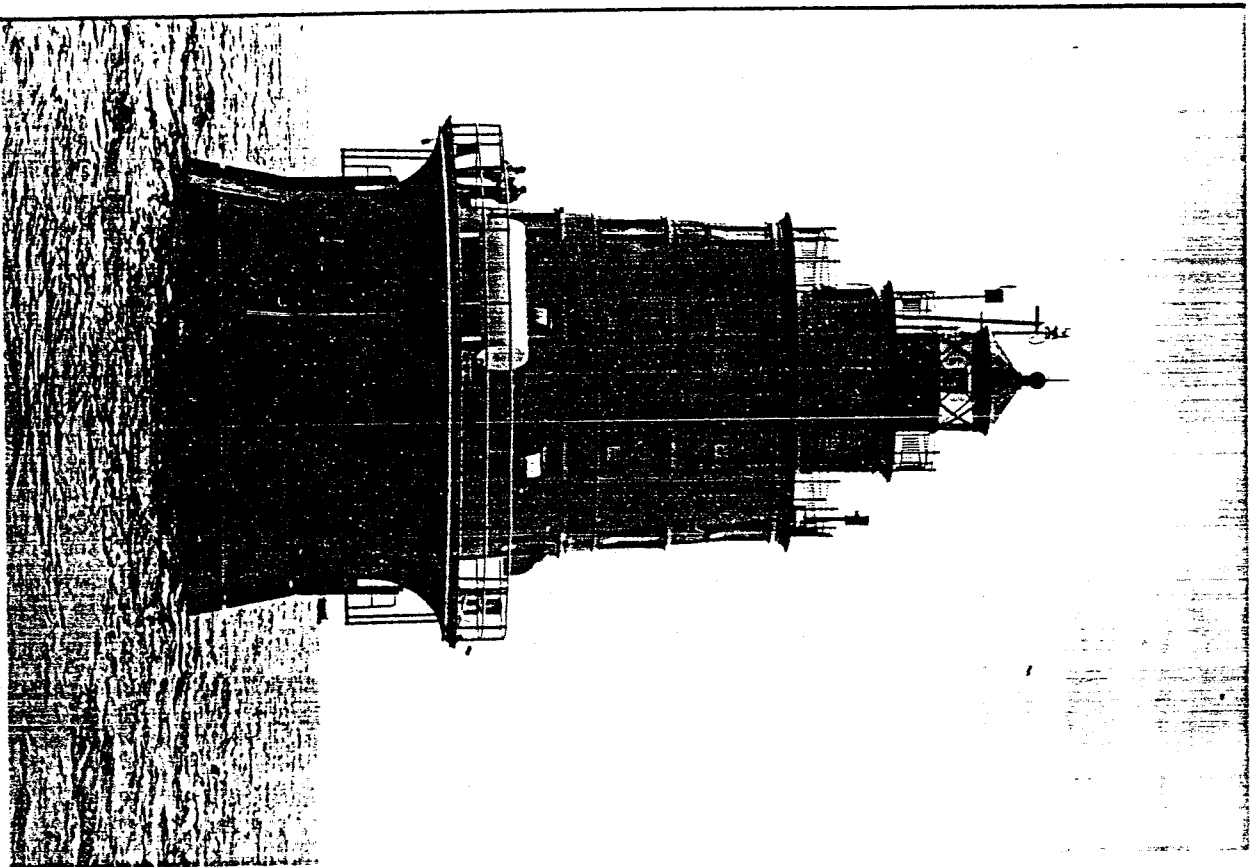
View NW
View SW

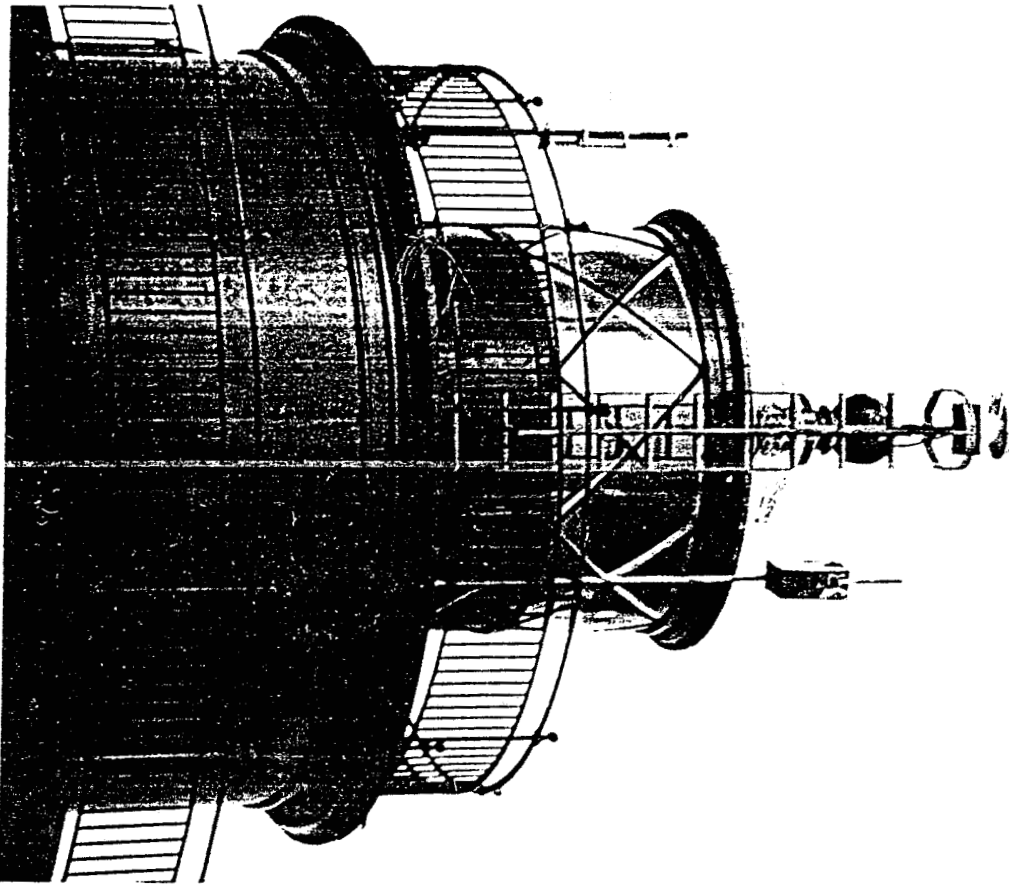


PRO-LINE #14913
KLEER-VU IND. 5x7

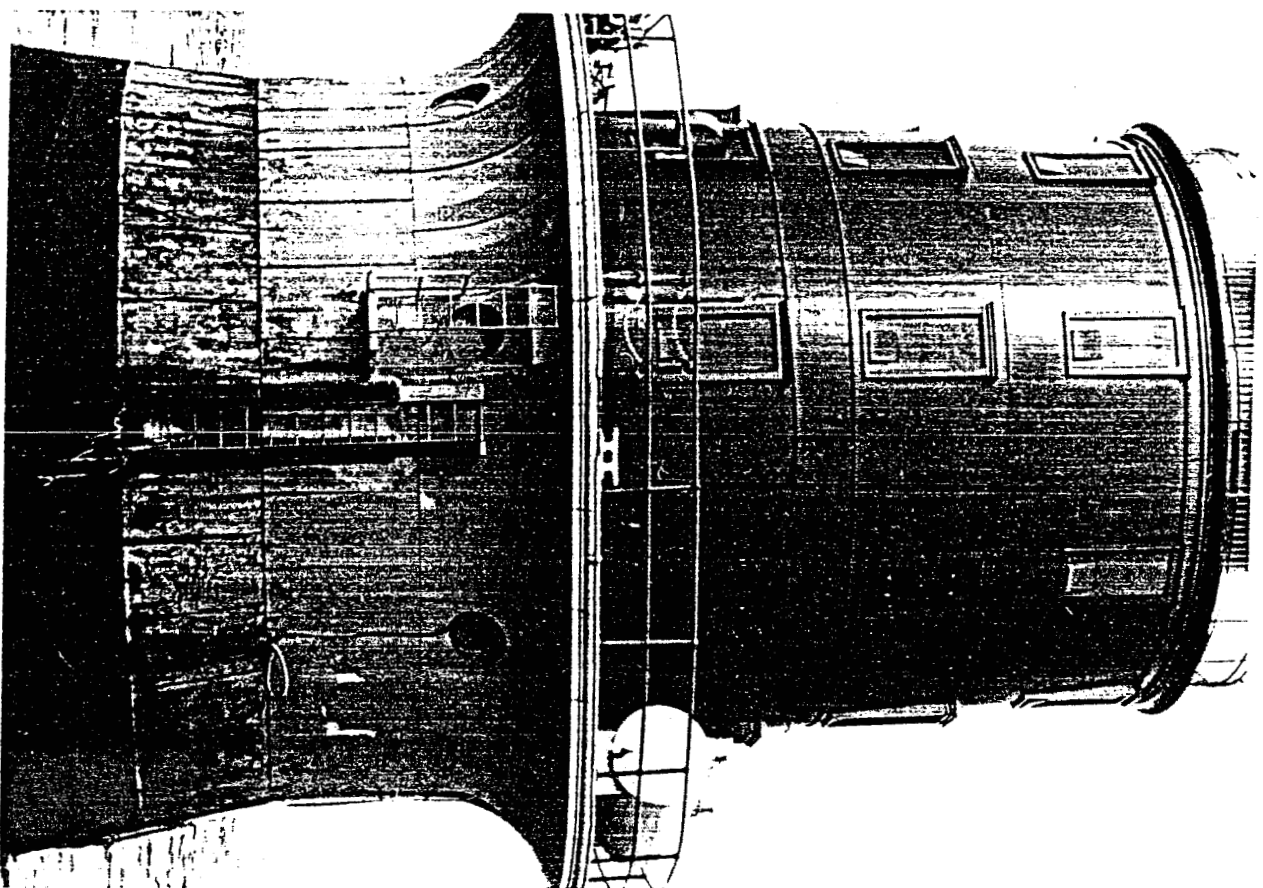


View S
View W

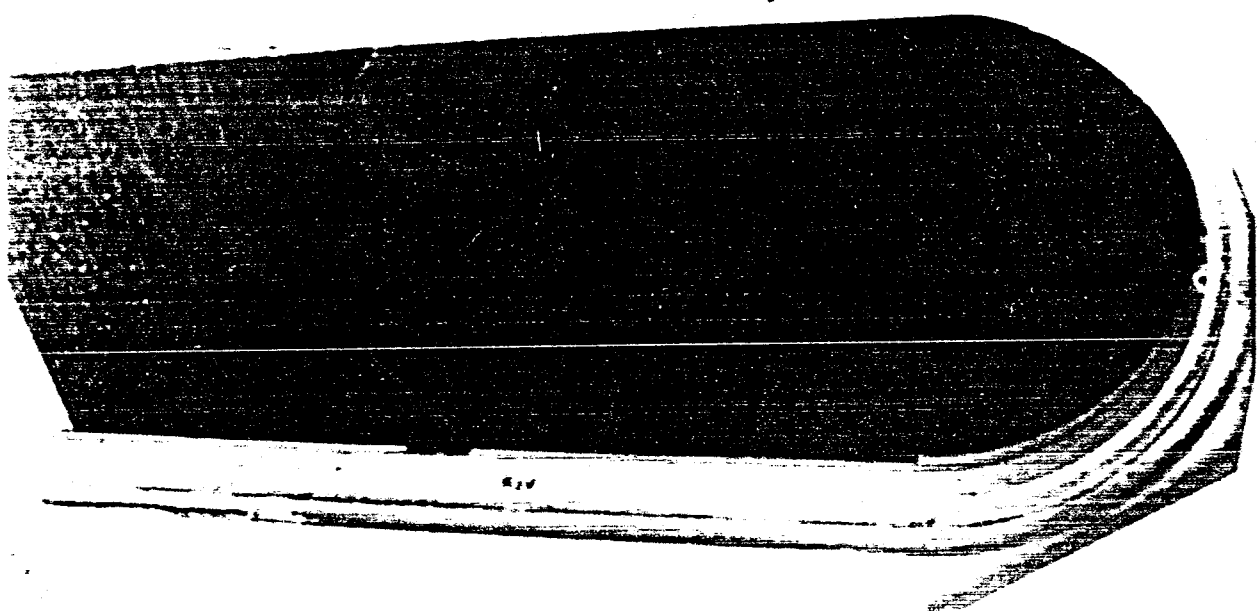
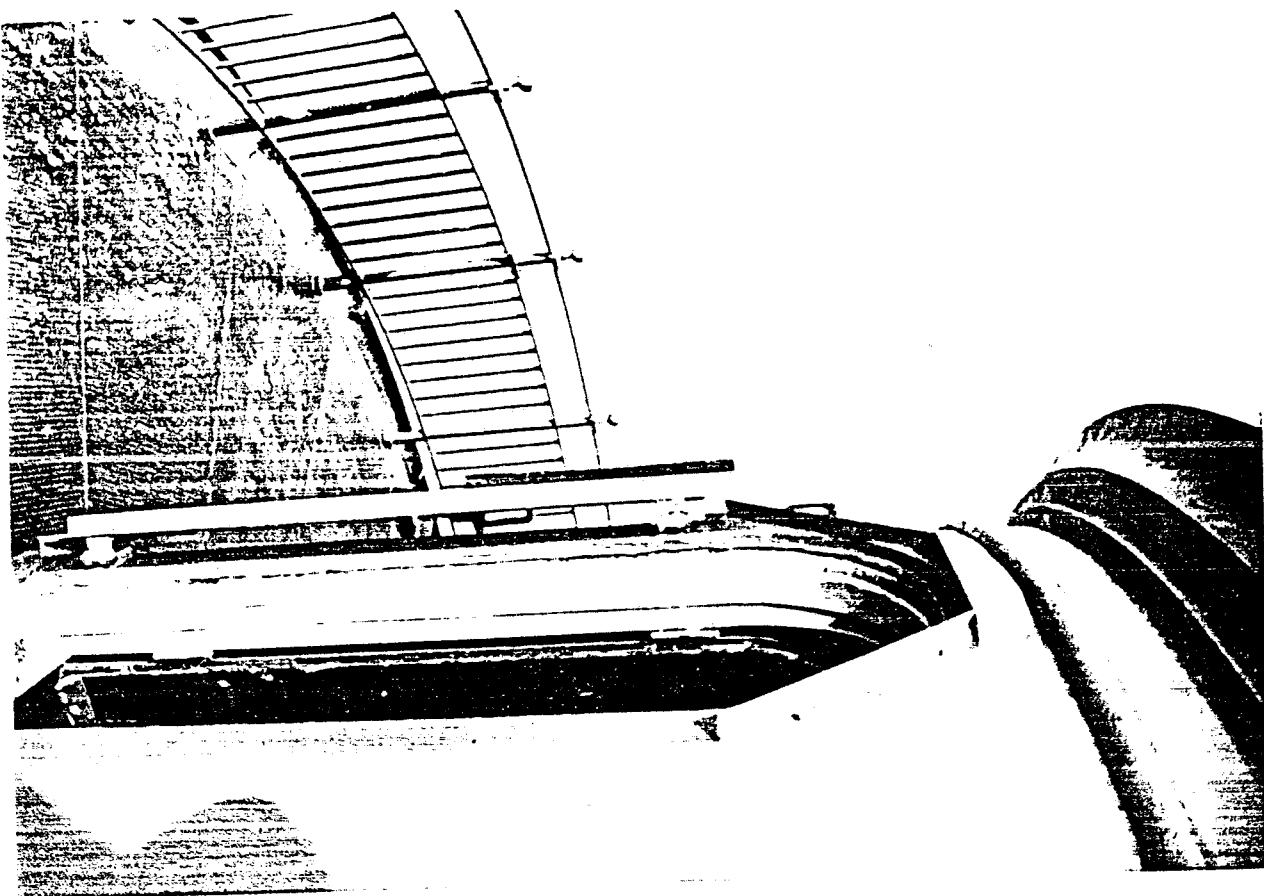




View W
View NW



Penultimate level, View S (interior) ↗
↙ Penultimate level, View NW (exterior)



United States Department of the Interior
National Park ServiceNational Register of Historic Places
Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name Fourteen Foot Bank Light
other names/site number United States Coast Guard Light List #1355

2. Location

street & number Fourteen Foot Bank ☐ not for publication
city, town Bowers Beach ☒ vicinity
state Delaware code DE county Kent code _____ zip code NA

3. Classification

Ownership of Property	Category of Property	Number of Resources within Property	
<input type="checkbox"/> private	<input checked="" type="checkbox"/> building(s)	Contributing	Noncontributing
<input type="checkbox"/> public-local	<input type="checkbox"/> district	<u>0</u>	<u>0</u> buildings
<input type="checkbox"/> public-State	<input type="checkbox"/> site	<u>0</u>	<u>0</u> sites
<input checked="" type="checkbox"/> public-Federal	<input checked="" type="checkbox"/> structure	<u>1</u>	<u>0</u> structures
	<input type="checkbox"/> object	<u>0</u>	<u>0</u> objects
		<u>1</u>	<u>0</u> Total

Name of related multiple property listing:
NA

Number of contributing resources previously
listed in the National Register NA

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this
☒ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the
National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.
In my opinion, the property ☒ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of certifying official

SHPO, Acting Director, Division of Historical & Cultural Affairs

State or Federal agency and bureau

Date 3/10/89

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of commenting or other official

Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is:

☐ entered in the National Register.

☐ See continuation sheet.

☐ determined eligible for the National
Register. ☐ See continuation sheet.

☐ determined not eligible for the
National Register.

☐ removed from the National Register.

☐ other, (explain:)

Signature of the Keeper

Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)

Coast Guard Facility

Current Functions (enter categories from instructions)

Coast Guard Facility

7. Description

Architectural Classification

(enter categories from instructions)

Other: Lighthouse

Materials (enter categories from instructions)

foundation cast iron

walls cast iron

roof cast iron

other stone

Describe present and historic physical appearance.

Fourteen-Foot Bank Lighthouse (Light List Number 1355) rises abruptly up out of the water almost in the middle of Delaware Bay, some twelve miles east of Bowers, Delaware. The lighthouse consists of a white two-and-half story gable-roofed dwelling, cruciform in shape, with an integral square tower. The superstructure rests upon a bell-shaped caisson, 35' in diameter, 24' high, formed of 12 courses of cast-iron plates and filled with cement. The foundation shell is sunk more than 33' into the surrounding shoal; when it was completed in 1886, it was the first light in the United States built by the pneumatic caisson method.

The dwelling is Classical Revival in style, with full returns of the cornice on each of its three principle gables. The main roof extends westward from the square tower which is built into the front or east end of the lighthouse. Gable-roofed wings extending to either side are somewhat lower in height, and the angles between wings are occupied by one-story infills, giving the lighthouse an octagonal plan. The eight-sided lantern located atop the three-story tower has vertical muntins between its glass panes, a pyramidal roof, and an orb-shaped ventilator-lightning rod. The entire structure - walls, roof, and cornice - is constructed of iron plates bolted together through interior flanges. The lighthouse is further protected by a heavy standing-seam metal roof.

A pipe railing with ornamental turned stanchions surrounds the deck on top of the foundation, and another simple rail of pipe and flat stock forms a gallery at the top of the tower. Cast-iron window frames are finely detailed with consoles below the sills and a full classical entablature - architrave, frieze, and molded cornice - across the top. The windows have all been blocked up but formerly contained two-over-two sash. Other parts of the structure include ladders on the caisson which permit boarding from several directions; a small crane (not original) near the northeast corner; two brick chimneys in the north- and southwest angles and a modern stack running up the west

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:

☒ nationally ☐ statewide ☐ locally

Applicable National Register Criteria ☒ A ☐ B ☒ C ☐ D

Criteria Considerations (Exceptions) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)

Maritime History

Engineering

Period of Significance

1885 - 1939

Significant Dates

NA

Cultural Affiliation

NA

Significant Person

NA

Architect/Builder

Heap, Major F. P.

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

Fourteen-Foot Bank Lighthouse is a landmark in the history of lighthouse engineering, the first American use of the pneumatic caisson method of foundation construction (Criterion C). This technique, while difficult, represented a great advance in dealing with the problem of locating lighthouses on unstable sandy bottoms. Using a pressurized wooden chamber open at the bottom, the shoal at Fourteen-Foot Bank was excavated to a depth of more than 33'. As the digging progressed, more tiers of iron plates were added so as to keep the top of the foundation shell above water, and the cavity (except the air shaft) filled with concrete. Following the pioneering effort at Fourteen-Foot Bank, ten other lights in similar circumstances were built by this method, at which time more precise ways of pile-driving superseded the use of pneumatic caissons. Although the dwelling and tower are less revolutionary than the substructure, they constitute a good example of the use of cast-iron plates for superstructures, a construction technique characteristic of the period. One of the Bay's more stylish lights, Fourteen-Foot Bank's Classical Revival form and details reflect the federal government's penchant for classical architecture in public buildings. Finally Fourteen-Foot Bank Lighthouse is also significant because it reflects the great increase in shipping, and consequent need for an improved system of navigational aids, which occurred in the late 19th century (Criterion A).

Fourteen-Foot Bank is a critical turning point for ships navigating the Delaware Bay and had been marked by a lightship as early as 1876. As in the case of other lightships in the Bay, however, this arrangement proved inadequate; ice floes and storms tended to force the lightship from its mooring when it was most needed.

9. Major Bibliographical References

Holland, Francis Boss, Jr. America's Lighthouses: An Illustrated History (New York: Dodd Publications, 1988)

Johnson, Arnold B. The Modern Lighthouse Service (Washington: Government Printing Office, 1890)

National Archives, Still Picture Branch, photographs c. 1900

Snow, Edward Bowe Famous Lighthouses of America (New York: Dodd, Mead & Co., 1955)

U.S. Lighthouse Board, Annual Report 1877 - 1886

☐ See continuation sheet

Previous documentation on file (NPS):

- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- ☐ previously listed in the National Register
- ☐ previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings Survey # _____
- ☐ recorded by Historic American Engineering Record # _____

Primary location of additional data:

- ☒ State historic preservation office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other

Specify repository: _____

10. Geographical Data

Acreage of property _____ .07

Coordinates: 39 02.9 75 11.0

UTM References

A

1	8	4	8	4	2	0	0	4	3	2	1	9	5	0
Zone			Easting					Northing						

C

Zone			Easting					Northing						

B

Zone			Easting					Northing						

D

Zone			Easting					Northing						

☐ See continuation sheet

Verbal Boundary Description

The bounds of this nomination are the lighthouse and the riprap foundation surrounding the lighthouse. This extends for approximately 20 feet from the base of the caisson.

☐ See continuation sheet

Boundary Justification

The boundary includes the lighthouse and the foundation material associated with the lighthouse.

☐ See continuation sheet

11. Form Prepared By

name/title SEE ATTACHED SHEET

organization Bureau of Archaeology & Historic Preservation date January 1989

street & number 15 The Green telephone (302) 736 - 5685

city or town Dover state DE zip code 19901

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 7 Page 2

elevation; and a mast with emergency beacon attached to the west side of the lantern. Interrupting the rail on the northwest rim of the caisson deck is a small hip-roof iron-plate privy, complete with its own lightning rod.

The interior of the lighthouse continues the classical motif, with window and door surrounds of the fluted board and corner block type. Walls are finished with a wainscot of narrow vertical boards, and the four-panel interior doors appear original. The hallway inside the double iron-plate entrance doors contains the stairway to the upper levels. The natural dark maple rail is carried on simple square balusters. Where they take their first turn, the stringers are shaped in a long, graceful S-curve. The railings within the stairwells are narrow round sections of wood. They are covered with twine in a variety of wrapping patterns and knots. There were installed by the lighthouse keepers in their spare time.

The first floor of the lighthouse contains the diesel generators for electric power. The lights and the foghorn are powered by this equipment which is of modern design. The horn is turned off when a crew is on board for inspection duties as it is too loud and intense for the human ear.

The lens is old but not original to this lighthouse and is a drum-shaped Fresnel lens mounted on a four-cornered brass pedestal. Marked "HENRY LEPEAUTE Paris," it is about 18" in diameter and 2' high. The focal plane is 59' above sea level. Plastic insets form a red sector covering the shoal to the southwest. The red sector provides a warning to mariners for the Brown and Joe Flogger shoals. The white main beam can be seen for 15 miles. The red insert reduces the light's visibility to 12 miles.

The lighthouse is in fair condition. Both railings have large sections missing and some of the interior trim has been removed. Overall, however, the light retains its historical appearance, the chief alteration being the blocking off of the windows.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 8 Page 2

Moreover, traffic on the channel had greatly increased in the 1870s; imports into Philadelphia almost doubled in that decade. Ships carrying goods and passengers to Philadelphia not only had to avoid Fourteen-Foot Bank, but nearby Brown and Joe Flogger shoals as well. The Lighthouse Board began planning in 1882 for a permanent light to better mark these hazards.

After considering several options, the board adopted the suggestion its engineer, Major D.P. Heap, that an iron-plate foundation be sunk into the shoal with the pneumatic-caisson method. First used in lighthouse construction (with mixed results) in building the Rothersand, Germany, light in 1881-82, the pneumatic caisson used compressed air to create an underwater chamber in which excavation crews could work. When the Fourteen-Foot Bank Light was designed, it was still an extremely advanced technique.

A lighthouse constructed in this manner offered several advantages over alternative methods. The screw-pile lighthouses which were the previous state-of-the-art were susceptible to ice damage and proved better suited to warmer waters than Delaware Bay. Iron caissons attached to wooden piles driven into the sand had been used at Ship John Shoal light and Great Beds in New York Harbor. Precise pile driving was difficult, however, and involved underwater leveling of the piling by diving crews. Moreover, the foundation had to be accurately and securely set onto the piling. With the pneumatic method, however, the foundation itself could be sunk into the shoal, providing a more stable base.

The wooden caisson, as well as the first three courses of iron plates was assembled on shore at Lewes, Delaware, and towed to the site, where it was submerged and work was begun. A ship's tender, "Moro Castle" was used as a construction platform, warehouse, and worker's barrack. On site, workmen entered the caisson and worked within the air-shaft working chamber to excavate the shoal. When the iron plate walls broke the surface of the water, the caisson was filled with concrete to the water level.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 8 Page 3

Thirty-eight men spent the summer of 1885 working on the excavation and filling the caisson. According to one author the following incident occurred as the construction crew was preparing to leave the work site:

"In a heavy southerly sea, the Moro Castle parted her moorings and began to drift down toward the lighthouse cylinder. which at the time was only eight feet above the water and filled with concrete to water level. The steamer was about to hit the obstruction a glancing blow, but several of the men sitting on the upper flanges of the cylinder dropped fenders to ward off the vessel. Thus the Moro Castle struck relatively gently. Nevertheless that light bump was enough to prevent the men from leaving their seated positions, for it momentarily opened the joints between the cylinder sheets a tiny fragment of an inch--just enough to catch their trouser seats when the joints closed again. As their floating home was rapidly leaving them, the workmen, with a single shout, discarded the garments in which they were trapped and leaped aboard the Moro Castle with only their pride injured." (Snow, p.144)

After the caisson was complete, 1,000 tons of riprap were placed around the caisson. A mast with a light was left to mark the site of the caisson. The lighthouse was completed during the summer of 1886 and occupied that fall. After weathering several storms, the lighthouse trembled during storms, consequently 2,000 additional tons of riprap were added to the base of the lighthouse.

The superstructure is also characteristic of the improved lighthouse technology of the 1880s. Unlike the stone, brick, and frame structures common earlier, the iron-plate dwelling and tower at Fourteen-Foot Bank was pre-fabricated and bolted together on the site, an important economy in the construction stage. Moreover, when properly painted, the iron was as maintainable any substance until reinforced concrete became available.

**United States Department of the Interior
National Park Service**

**National Register of Historic Places
Continuation Sheet**

Section number 8 Page 4

In its stylishness, the light at Fourteen-Foot Bank is more akin to the lighthouses of the 1870s than the prosaic conical towers which prevailed in the 1880s and 1890s. The Classical cornice moldings, the gables treated as pediments, and the molded door surrounds in the interior are all elements derived from the architecture of ancient Greece. Fourteen-Foot Bank was recognized in its time as a major engineering accomplishment, and this may explain why a more elaborate superstructure was chosen.

Classical architecture had passed from fashion in private construction, but governmental projects continued to favor the style for its connotations of elegance and permanence. Although it is not the original lens in the lighthouse, the present lens at Fourteen-Foot Bank dates from 1918 and is one of a dwindling number of in-place Fresnel lenses. The Fresnel lens was the major innovation in lighthouse illumination of the 19th century.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 8 Page 5

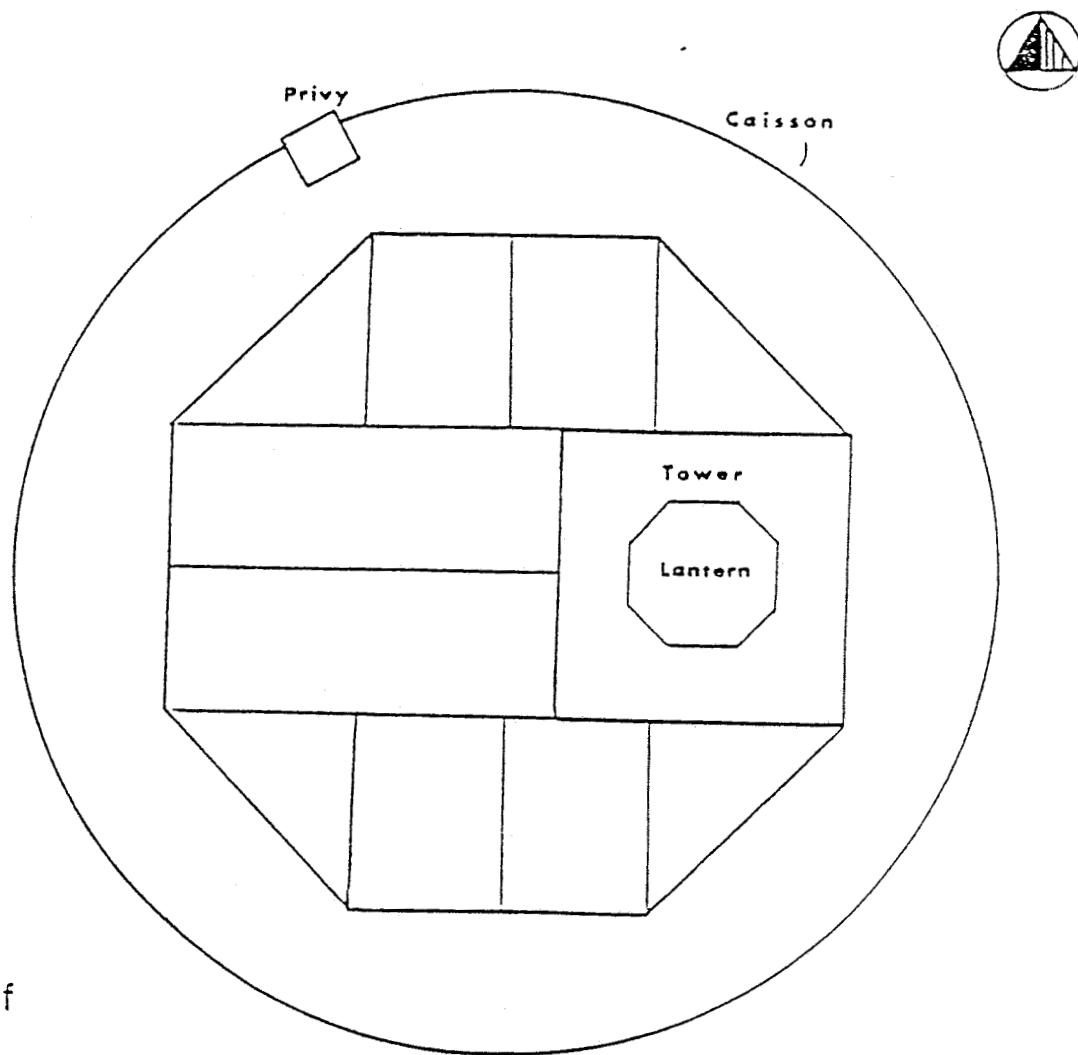
COMPREHENSIVE PLANNING

The Fourteen-Foot Bank as a federal constructed aid to navigation is important to the historic theme of transportation and communication. As an example of a specific solution to an engineering problem, i.e. the permanent display of a fixed point of light, the light and its related buildings is significant to the theme of architecture, engineering and decorative arts.

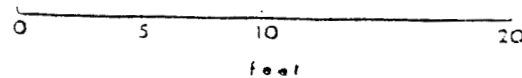
Geographically, the Fourteen-Foot Bank Light falls within the Coastal Zone by virtue of its location in the Delaware Bay.

Constructed in 1885-1886, the light represents the intensification of the rate of Urbanization and Suburbanization in Delaware. Increasing traffic to all the ports along the Delaware Bay caused the federal government to significantly up grade the aids to navigation in the Bay or River and to improve the depths of the various channels.

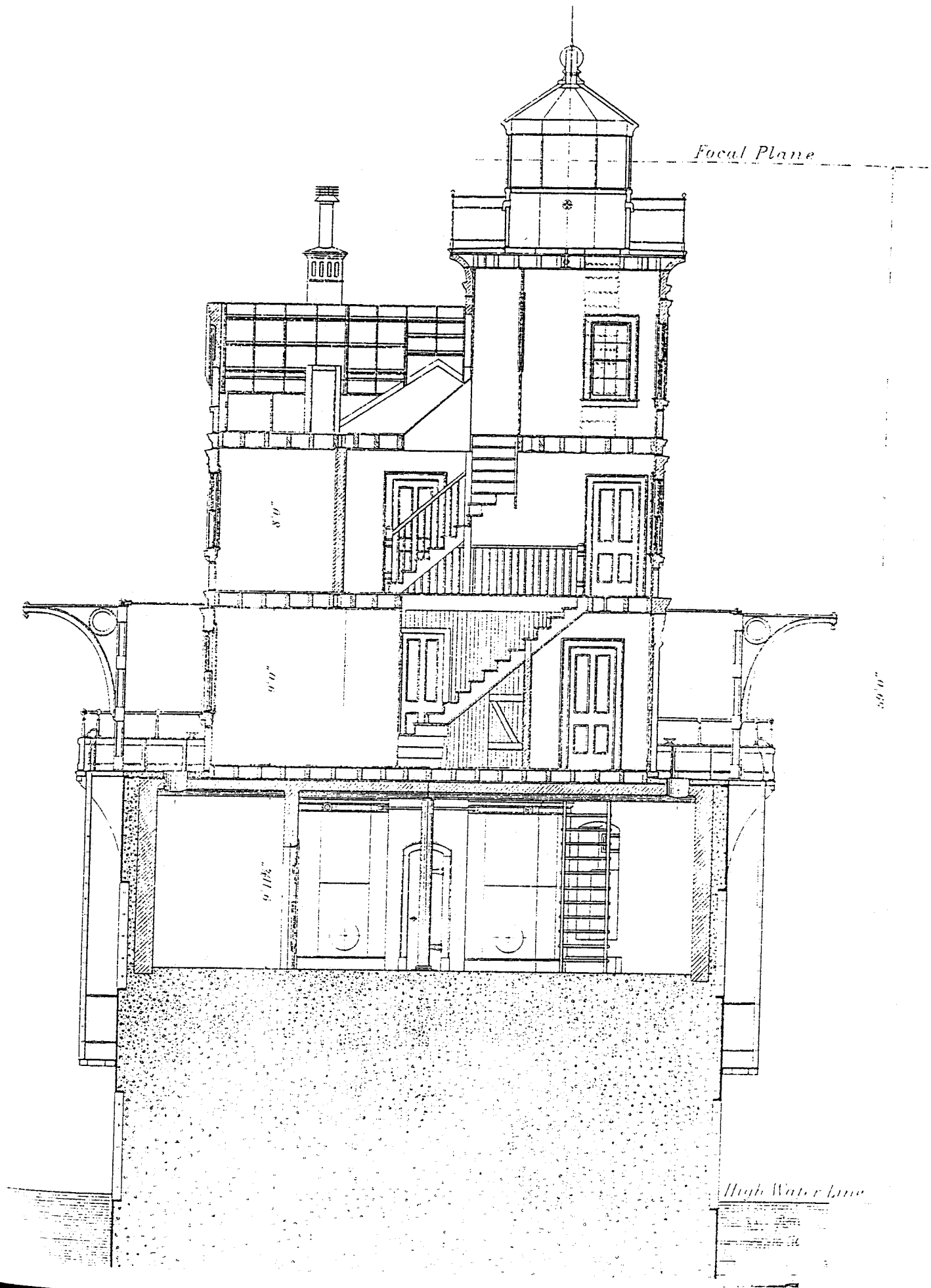
Site Plan of Fourteen-Foot Bank Light



Approximate Scale



From: F.B. Holland America's big houses



United States Department of the Interior
National Park Service

National Register of Historic Places
Inventory—Nomination Form

For NPS use only

received

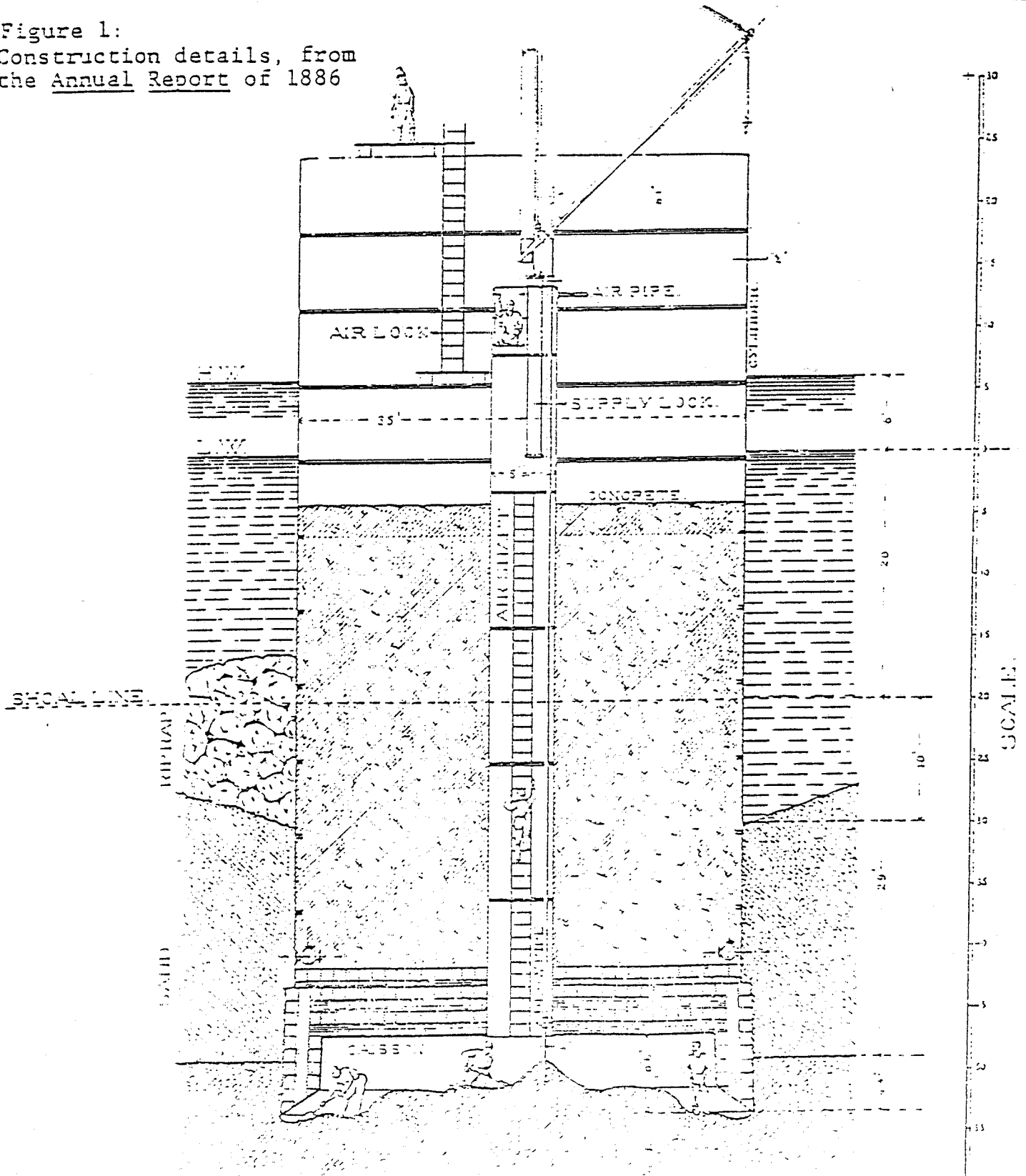
date entered

Continuation sheet Fourteen-Foot Bank Lighthouse
Delaware Bay, DE

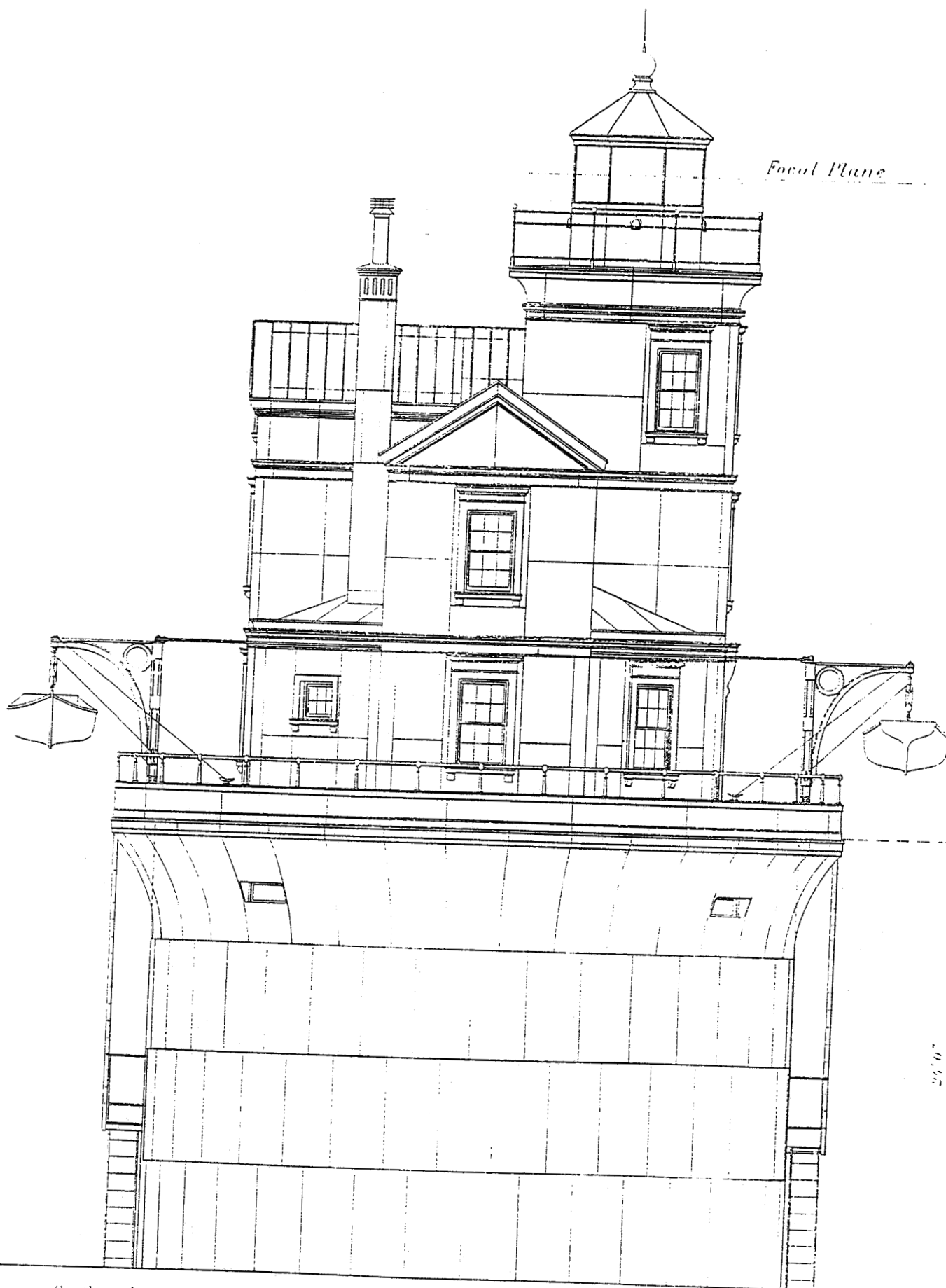
Item number 8

Page 2

Figure 1:
Construction details, from
the Annual Report of 1886



From F.B. Hallard America's lighthouses



South and sectional elevations (1886) of the caisson lighthouse established in 1887 at Fourteen Foot Bank in Delaware Bay. The cast-iron caisson was floated into

position and filled with concrete. Compare this elevation with the exterior photograph of Sandy Point (Maryland light, on page 117. Drawing in the author's collection

United States Department of the Interior
National Park ServiceNational Register of Historic Places
Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name Reedy Island Range Rear Light
other names/site number U.S. Coast Guard Light List #2195 CRS #N-5120

2. Location

street & number Rt. 9 at Road 453 ☐ not for publication
city, town Taylors Bridge - Townsend ☒ vicinity
state Delaware code DE county New Castle code 003 zip code 19734

3. Classification

Ownership of Property

☒ private
☐ public-local
☐ public-State
☒ public-Federal

Category of Property

☒ building(s)
☐ district
☐ site
☒ structure
☐ object

Number of Resources within Property

Contributing	Noncontributing
<u>3</u>	<u>2</u> buildings
<u>0</u>	<u>0</u> sites
<u>1</u>	<u>0</u> structures
<u>0</u>	<u>0</u> objects
<u>4</u>	<u>2</u> Total

Name of related multiple property listing:

NANumber of contributing resources previously
listed in the National Register NA

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this
☒ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the
National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.
In my opinion, the property ☒ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of certifying official

Date

SHPO, Acting Director, Division of Historical & Cultural Affairs

State or Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of commenting or other official

Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is:

- ☐ entered in the National Register.
☐ See continuation sheet.
- ☐ determined eligible for the National
Register. ☐ See continuation sheet.
- ☐ determined not eligible for the
National Register.

☐ removed from the National Register.☐ other, (explain:) _____

Signature of the Keeper

Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)

Coast Guard Facility

Current Functions (enter categories from instructions)

Coast Guard Facility

domestic single dwelling

domestic secondary structure

7. Description

Architectural Classification

(enter categories from instructions)

Other: Lighthouse

Colonial Revival

Materials (enter categories from instructions)

foundation Concrete

walls Iron

roof Iron

other Iron

Describe present and historic physical appearance.

Reedy Island Range Rear Light (U.S. Coast Guard Light List number 2195) is a tall tower of large cast-iron pipe segments. The light is about two miles from the west bank of the Delaware River and is located in an agricultural setting at the rural crossroads known as Taylor's Bridge. Together with the front range light, mounted on a small tower dating from 1951 and not included as part of this nomination, Reedy Island Range Rear Light functions to mark the centerline of a portion of the main channel of the river. Completed in 1910, the facility included not only the light but also several related outbuildings now under private ownership: a keeper's dwelling, small barn, brick oil shed and a small farmshed. A modern (1988) non-contributing fiberglass building at the base of the tower houses an emergency communications and lighting center. It is Coast Guard owned and maintained. The ancillary structures are all part of the nominated property but the small farmshed is a non-contributing building.

The tower is 35' square in plan at the base, diminishing to 10' at the top. The tower's nine legs rest upon 6' feet-high octagonal poured-concrete pads. The pipe sections which make up both the vertical and horizontal members of the tower are held together by diagonal tie rods running between cast-iron junctions. Horizontal members are in two parts jointed in the middle through large circular flanges. The tower's skeletal frame supports a cylindrical watch-room of 10' diameter which in turn is surmounted by an octagonal lantern room with a pyramidal roof and orb-shaped ventilator-lightning rod. Both the large octagonal deck below the watch-room and the watch-room roof are fitted with simple cast iron railings. The light is reached by means of a 7' diameter central stair cylinder.

The ground entrance is on the south side and provides the only decorative feature of the light. Above the narrow double plate doors is a molded cornice resting on large fluted consoles. The rounded center section of this lintel is decorated with a star.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:

☐ nationally ☒ statewide ☐ locally

Applicable National Register Criteria ☒ A ☐ B ☒ C ☐ D

Criteria Considerations (Exceptions) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)

Maritime History

Engineering

Period of Significance

1910 - 1939

Significant Dates

NA

Cultural Affiliation

NA

Significant Person

NA

Architect/Builder

unknown

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

The light station at Reedy Island Range Rear Light is significant as one of a small number of major Delaware range lights dating back to the first decade of the 20th century. Its construction technique is characteristic of the standardized skeleton towers which had evolved by the 1890s (Criterion C). The cast-iron pipe segments with flanged ends and special joint sockets made for a tower that was adaptable to different heights and other conditions, easy to erect, and capable of being dismantled and moved if needed. The light also has significance as part of the early 20th century improvements to the Delaware River channel (Criterion A). The continued growth of shipping to and from the port of Philadelphia, as well as faster and larger ships, made it necessary for the Corps of Engineers to dredge a deeper channel in the river. Consequently, the range lights established in the late 1870's, administered by the U.S. Lighthouse Service, Bureau of Lighthouses, were rebuilt and realigned as part of the project. The significance of Reedy Island Range Rear Light is augmented by the related buildings which surround the tower. The barn, oil shed and keeper's dwelling are important components of the site which reflect the operation of the facility before automatic electric lighting was installed. Relatively unaltered, these secondary structures contribute to the historical integrity of the site.

The Reedy Island Range Rear Light is also important to American Lighthouse history. The light was authorized by the Lighthouse Board but completed by the Bureau of Lighthouses. The latter agency was authorized in 1910. In 1939, the Bureau was absorbed into the U.S. Coast Guard.

Reedy Island Rear is an example of the second-generation of skeleton towers. Previous range lights also had a central cast-iron stair tower, watch-room, and lantern, but their outside bracing consisted of girders rivetted together at the joints. The advantage of the pipe segments at Reedy Island Rear is that

☒ See continuation sheet

9. Major Bibliographical References

SEE ATTACHED SHEET

Previous documentation on file (NPS):

- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- ☐ previously listed in the National Register
- ☒ previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings Survey # _____
- ☒ recorded by Historic American Engineering Record # DE - 11

☒ See continuation sheet

Primary location of additional data:

- ☒ State historic preservation office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other

Specify repository: _____

10. Geographical Data

Acreage of property .75

UTM References

A

1	8	4	4	9	1	5	0	4	3	6	1	8	4	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Zone Easting Northing

C

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

B

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Zone Easting Northing

D

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

☐ See continuation sheet

Verbal Boundary Description

SEE ATTACHED SHEET

☒ See continuation sheet

Boundary Justification

The bounds are the original tax parcels that made up the Coast/Light Service property.

☐ See continuation sheet

11. Form Prepared By

name/title SEE ATTACHED SHEET

organization Bureau of Archaeology & Historic Preservation date January, 1980

street & number 15 The Green telephone (302) 736 - 5685

city or town Dover state DE zip code 19901

United States Department of the Interior
National Park Service

**National Register of Historic Places
Continuation Sheet**

Section number 7 Page 2

The stair cylinder is constructed of heavy metal plates bolted together through welded-on interior flanges. Inside, the cast-iron steps spiral around the central column from which they are suspended. The walls of the hollow column are not solid but instead have a regular pattern of small rectangular openings. Set into the walls of the stair cylinder are cast-iron frames for the widely spaced window openings (fitted with two-over-four sash) and sockets for receiving the vertical members which brace the cylinder from the surrounding tower. The present light, a red beacon with integral lens and reflector, is not the original. It shines through the northeast face of the lantern, the only side not blocked off with metal plates. The tower is painted black, its original color. The light is set at 110 feet above the ground.

The dwelling to the southwest is a two-story hip-roofed clap-boarded house of cruciform plan. Along the front part of the house is a porch with Tuscan columns and a rail of turned balusters. The house has a wooden cave cornice. The small hip-roofed barn has dormers front and rear and has a band of board-and batten siding below the eaves. The oil shed with attached privy at the rear is constructed of white glazed brick. It has a hip-roof, and there are remnants of a sheet-metal classical cornice at the eaves. The outbuildings have standing-seam metal roofs. A small non-contributed wooden shed sits to the east of the barn. It is in bad condition and was not associated with the range light.

The light is in generally good condition, with fresh paint both inside and out; only minor penetration of moisture is occurring. Cracks in the foundation pads caused their replacement in January of 1989. The Coast Guard required the contractor to duplicate the original pads in material and size. The appearance of the tower today differs little from that shown in historical photographs. The replacement of the original illuminating apparatus is the chief alteration. Though the paint is in poorer condition, the privately owned dwelling, barn and also retain a high degree of historical integrity. The Coast Guard owned oil house is in good repair.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 8 Page 2

they could simply be fitted into the junctions, with only the tie rods needed to hold the structure together. Thus both design and erection of the tower were simplified.

Pipe-segment towers were used not only for range lights but also whenever a fairly protected land-based tower was needed. Coney Island Light (1891) in New York harbor and Cape Charles Light-house (1894) at the entrance to Chesapeake Bay are of similar age and construction. Unlike the earlier light towers, which had extensive Classical detailing, these later towers had only a vaguely Eastlake-inspired lintel over the entry as stylistic embellishment. The tower at Reedy Island represents the refined engineering and standardization of design which typified turn-of-the-century lighthouse construction. As such, it is very different in character from the Liston Range Rear Light (1877) located about five miles from the Reedy Island Range Rear Light.

Range lights like Reedy island Rear function in pairs to indicate the centerline of the channel. The front light is lower in height and lines up with the higher rear light only when viewed from a ship on course. Reedy Island Range Light was one of several built or rebuilt following the 1901 dredging of a 30' - deep shipping channel to Philadelphia. Some of the pre-existing range lights, such as the Liston Range Rear Light were moved, others simply retained in place, and still other sections were marked by new lights such as Reedy Island Rear Light. The Reedy Island Range is used by ships leading down river. It is 6775 yards long and 200 feet wide.

The close cooperation between the Army Corps of Engineers and the various agencies responsible for the aids-to-navigation has a long history in the Delaware Bay and River. The Corps of Engineers built the Delaware Breakwater and the National Harbor of Refuge in Lewes and provided platform for the erection of light-houses on both breakwater. The Corps of Engineers and the Coast Guard continue to cooperate in maintaining a safe and clear shipping channel.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 8 Page 3

COMPREHENSIVE PLANNING

The Reedy Island Range Rear Light as a federal constructed aid to navigation is important to the historic theme of transportation and communication. As an example of a specific solution to an engineering problem, i.e. the permanent display of a fixed point of light, the light and its related buildings is significant to the theme of architecture, engineering and decorative arts.

Constructed in a modern era of Delaware's history, the light and its outbuildings fall within the urbanization and suburbanization period in Delaware's history.

Geographically the light and its related buildings fall within the coastal zone.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 9 Page 1

Bibliography:

Holland, Francis Ross, Jr. America's Lighthouses: An Illustrated History (New York: Dover, Publications, 1988)

Lankton, Larry D. "Reedy Island Range Rear Light, : Typescript, Historic American Engineering Record (HAER DE-11)

National Archives, Still Picture Branch, photograph, 1910

U.S. Coast Guard, Third Coast Guard District, Governors Island, Civil Engineering Section, drawing file.

U.S. Lighthouse Board, Annual Report, 1903 - 1910.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 10 Page 1

VERBAL BOUNDARY DESCRIPTION

The bounds of this nomination are the bounds of the original parcel of land which is today held by the U.S. Coast Guard and a private individual.

Deed references, recorded at the New Castle County Recorder's Office, Wilmington, DE.

Book D-19, page 97 (original 5.7 acre lighthouse parcel, September 11, 1901)

Book S-054, page 498 (portion of parcel sold in 1954)

United States Department of the Interior
National Park Service

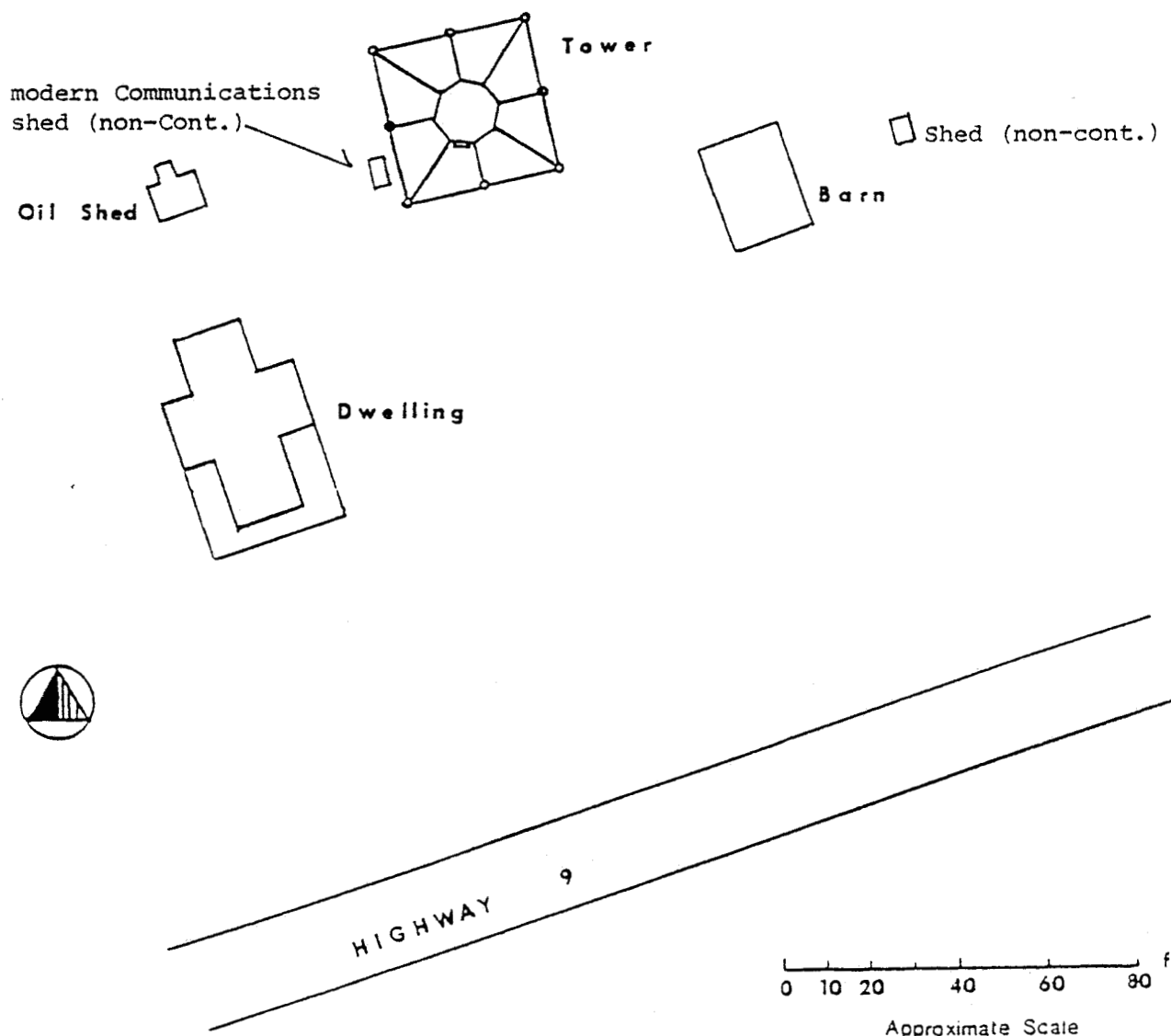
National Register of Historic Places Continuation Sheet

Section number 11 Page 1

Nomination originally prepared by: Bruce Clouette and Matthew Roth of
Historic Resource Consultants, 55 Van Dyke Avenue, Hartford, CT
under contract in 1983 to the United States Coast Guard.

Nomination updated and edited by: Stephen G. Del Sordo, Historian,
Bureau of Archaeology and Historic Preservation.

Site Plan of
Reedy Island Range Rear Light



United States Department of the Interior
Heritage Conservation and Recreation Service

National Register of Historic Places Inventory—Nomination Form

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

For HCRS use only

received

date entered

1. Name

historic Mispillion Lighthouse and Beacon Tower

and/or common

2. Location

street & number Northeast end of County Road 203 not for publication

city, town Milford x vicinity of congressional district

state Delaware code 10 county Sussex code 005

3. Classification

Category	Ownership	Status	Present Use
<u> </u> district	<u>x</u> public	<u> </u> occupied	<u> </u> agriculture <u> </u> museum
<u>x</u> building(s)	<u>x</u> private	<u> </u> unoccupied	<u> </u> commercial <u> </u> park
<u>x</u> structure	<u> </u> both	<u>x</u> work in progress	<u> </u> educational <u> </u> private residence
<u> </u> site	Public Acquisition	Accessible	<u> </u> entertainment <u> </u> religious
<u> </u> object	<u> </u> in process	<u>x</u> yes: restricted	<u>x</u> government <u> </u> scientific
	<u> </u> being considered	<u> </u> yes: unrestricted	<u> </u> industrial <u> </u> transportation
	<u>x</u> NA	<u> </u> no	<u> </u> military <u>x</u> other: vacant bldg.

4. Owner of Property

name Lighthouse Property: Mr. & Mrs. Eugene Racz SEE ALSO ATTACHED SHEET

street & number R.D. 1, Box 417; Mispillion Lighthouse Road

city, town Milford x vicinity of state Delaware 19963

5. Location of Legal Description

courthouse, registry of deeds, etc. Sussex County Courthouse

street & number The Circle

city, town Georgetown state Delaware

6. Representation in Existing Surveys

title Cedar Creek Hundred Survey S-441 has this property been determined eligible? yes x no

date 1984 federal x state county local

depository for survey records Bureau of Archaeology & Historic Preservation

city, town Dover state DE

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

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received

date entered

Continuation sheet

Item number

Page

OWNER OF PROPERTY

4

1

The steel beacon tower and the 108.4 x 75.15 foot parcel on which it is situated are owned by the U.S. Government. A specific address is as follows:

U.S. Coast Guard
Third Coast Guard District
Office of Aids to Navigation
Governor's Island, Building 135 A
New York, N.Y. 10004

7. Description

Condition		Check one	Check one	
<input type="checkbox"/> excellent	<input type="checkbox"/> deteriorated	<input type="checkbox"/> unaltered	<input checked="" type="checkbox"/> original site	Beacon tower moved in 1929.
<input type="checkbox"/> good	<input type="checkbox"/> ruins	<input checked="" type="checkbox"/> altered	<input checked="" type="checkbox"/> moved	date <u>Lighthouse on original site.</u>
<input checked="" type="checkbox"/> fair	<input type="checkbox"/> unexposed			

Describe the present and original (if known) physical appearance

The Mispillion Lighthouse is a two-story, wood-frame, carpenter gothic structure with a wood-frame lighthouse tower rising from it. The entire structure is approximately 65 feet tall. Atop the tower is a steel and glass light chamber with a conical metal top. The building is "L" shape in plan with the tower rising from the point where the two sides of the "L" meet. The two lower stories are presently sided with red-painted asbestos shingles, while the lower portion of the tower below the light chamber is sided with machine-sawn, unfinished wooden shingles. Portions of the original wood weatherboarding which once covered the exterior of the entire structure are still visible at the rear of the building.

The lighthouse is largely unaltered in shape except that the original front and rear porches have been removed and the original octagonal railing around the outside of the light room is gone. In addition, the original six-over-six window sashes were replaced at an unknown time in the early 20th century with three-over-one sashes and one-over-one sashes in all but two windows. A 1953 painting of the lighthouse shows that the newer window units had already been installed at that time, and that the light room railing was already gone, though the porches remained.

The wood-shingled roof of the lighthouse is pierced by two original brick chimneys with arched brick tops. The gable ends retain their original simple Stick-style decorations, which include purlins and diagonal brackets at the bases of the roof planes with collar ties and king posts. The gable ends are finished with decorative sawn vertical board and batten trim. The building sits on original brick piers. Early photographs show it surrounded by a fence, but no trace of this remains.

Also on the lighthouse property are three more modern structures, none of which is associated with the historical function of the lighthouse. These include a two-story restaurant structure, a small bait and ice house, and a one-story concrete block dwelling. Only the bait and ice house is in the nominated area, however.

Also included in the nomination is a steel skeleton beacon tower, 60 feet in height, which has held the light since it was moved from the lighthouse in 1929. The beacon tower was originally built by the U.S. Coast Guard at Cape Henlopen in about 1924 to replace the Cape Henlopen Light, that structure having become unstable because of erosion. Cape Henlopen Lighthouse collapsed in 1926 and the site was deactivated. In 1929, the decision was made to move the tower to Mispillion and reerect it there. The beacon tower occupies one corner of the original lighthouse property which is still owned by the U.S. Government. The parcel of land it occupies is approximately 108 feet by 75 feet and it is located at the northernmost corner of the parcel. The tower is approximately 20 feet square, including its concrete supporting piers, at its base, tapering as it rises. The beacon was deactivated by the Coast Guard in 1984, although there are plans to reactivate it.

THIS PROPERTY CONTAINS ONE CONTRIBUTING BUILDING AND ONE CONTRIBUTING STRUCTURE

8. Significance

Period	Areas of Significance—Check and justify below			
<input type="checkbox"/> prehistoric	<input type="checkbox"/> archeology-prehistoric	<input type="checkbox"/> community planning	<input type="checkbox"/> landscape architecture	<input type="checkbox"/> religion
<input type="checkbox"/> 1400–1499	<input type="checkbox"/> archeology-historic	<input type="checkbox"/> conservation	<input type="checkbox"/> law	<input type="checkbox"/> science
<input type="checkbox"/> 1500–1599	<input type="checkbox"/> agriculture	<input type="checkbox"/> economics	<input type="checkbox"/> literature	<input type="checkbox"/> sculpture
<input type="checkbox"/> 1600–1699	<input checked="" type="checkbox"/> architecture	<input type="checkbox"/> education	<input type="checkbox"/> military	<input type="checkbox"/> social/
<input type="checkbox"/> 1700–1799	<input type="checkbox"/> art	<input type="checkbox"/> engineering	<input type="checkbox"/> music	<input type="checkbox"/> humanitarian
<input checked="" type="checkbox"/> 1800–1899	<input type="checkbox"/> commerce	<input type="checkbox"/> exploration/settlement	<input type="checkbox"/> philosophy	<input type="checkbox"/> theater
<input checked="" type="checkbox"/> 1900–	<input type="checkbox"/> communications	<input type="checkbox"/> industry	<input type="checkbox"/> politics/government	<input type="checkbox"/> transportation
		<input type="checkbox"/> invention		<input type="checkbox"/> other (specify)

Specific dates 1873 Builder/Architect Unknown

Statement of Significance (in one paragraph)

The Mispillion Lighthouse is the sole surviving wood-frame lighthouse in the State of Delaware and one of only three Delaware Bay lighthouses still standing on Delaware soil (the other two are iron lighthouses at Taylor's Bridge and Port Penn, both of which are listed in the National Register). The Mispillion Lighthouse is significant under National Register Criterion "C" as a building which embodies the distinctive characteristics of a type and period of architecture important to the history of Delaware. The present Mispillion Lighthouse dates from 1873 and is the third such structure to have marked the entrance to the Mispillion River since 1831. The first lighthouse fell victim to erosion. The second, which was deactivated in 1859, was later sold and moved into the nearby community of Milford where it was converted into use as a storehouse. The present building was also deactivated in 1929 and was replaced by a 60-foot standard skeleton steel beacon tower. This steel structure was moved to Mispillion Light from Cape Henlopen where it had earlier been erected behind the old Cape Henlopen Lighthouse when that structure became seriously threatened by erosion. After the Henlopen Light collapsed in April, 1926, the decision was made to abandon the location as a lighthouse site and the steel tower became surplus. It was moved to Mispillion, where it still operates, because the wood-frame lighthouse was in poor repair and it was deemed less expensive to replace it with the steel tower than to repair it. The steel tower and a small plot of land on which it stands continue to be owned by the federal government. Because of its importance to this site and Cape Henlopen the tower is also nominated.

At the peak of its activity in the late 1800's, the Mispillion Light Station had a full-time lighthouse keeper. The station was located on a 2.161 acre tract of land, one of the original owners of which was former Delaware Governor Charles Polk. In addition to the combined lighthouse and keeper's dwelling structure, the station also had such structures as a barn, a storage building, a cow shed, a pig pen and a privy. In 1911 the original oil-powered lighting mechanism was replaced by an automated "4-tank AGA acetylene lighting system" which operated from acetylene gas produced in a small power house behind the lighthouse and stored in storage tanks inside the lighthouse structure. The introduction of this system made the position of lighthouse keeper unnecessary, but the lighthouse service made the decision to hire a local waterman as caretaker, paying him \$60 per year and allowing him to live in the keeper's dwelling free of charge since, "it is anticipated that the total abandonment of the dwelling at this isolated point might invite occupancy and possible vandalism by the fishing contingent which operates in this vicinity."

In 1932, the federal government sold the lighthouse and most of the light station property to two local businessmen for \$400, retaining the land on which the newer steel beacon tower stands. After acquiring the property, the purchasers erected a restaurant and a small house on the property and built a dock along the waterfront for use by local fishermen. Although the Mispillion light has continued to operate atop the steel tower with several brief interludes ever since, the days of its primary importance when wooden sailing vessels plied the river and newly-built boats from the Milford boatyards passed by on their way to the Delaware Bay are distant memories.

9. Major Bibliographical References

Scharf, J. Thomas, History of Delaware, 1609-1888. Philadelphia: L.J. Richards & Co., 1888. Vol. II, Page 1255.

Hurley, Edward Millis "A Short Narrative History of Milford," contained in the volume entitled, A History of Milford, Delaware. Milford Historical Society, 1962.

10. Geographical Data

Acreage of nominated property (22,500 square feet) .52 acres

Quadrangle name Mispyllion River, Delaware

Quadrangle scale 1:24,000

UMT References

A

1	8
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4	7	2	6	6	0
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4	3	1	0	7	6	0
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Zone

Easting

Northing

B

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Zone

Easting

Northing

C

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E

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G

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H

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Verbal boundary description and justification

See continuation sheet

List all states and counties for properties overlapping state or county boundaries

state	code	county	code
-------	------	--------	------

state	code	county	code
-------	------	--------	------

11. Form Prepared By

name/title Richard B. Carter / Sussex County Preservation Planner

organization Sussex County Preservation Office date January, 1986

street & number P.O. Box 589 telephone (302) 856-7701, Ext. 361

city or town Georgetown state Delaware

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

☐ national ☐ state ☒ local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the Heritage Conservation and Recreation Service.

State Historic Preservation Officer signature

title

date

For HCRS use only

I hereby certify that this property is included in the National Register

date

Keeper of the National Register

Attest:

date

Chief of Registration

United States Department of the Interior
National Park Service

**National Register of Historic Places
Inventory—Nomination Form**

For NPS use only

received

date entered

Continuation sheet

Item number

Page

MAJOR BIBLIOGRAPHICAL REFERENCES

9.

2

National Archives; General Services Administration; Washington, D.C.

Record Group 26, Records of the U.S. Coast Guard:

1. Selected Records from Lighthouse Site File, Delaware, No. 19.
2. Excerpts from the Annual Reports of the U.S. Lighthouse Board, 1857-1907, contained in "Clipping File."
3. Correspondence of the U.S. Lighthouse Service for the period 1900-1939, contained in "File No. 1047."

United States Department of the Interior
National Park Service

**National Register of Historic Places
Inventory—Nomination Form**

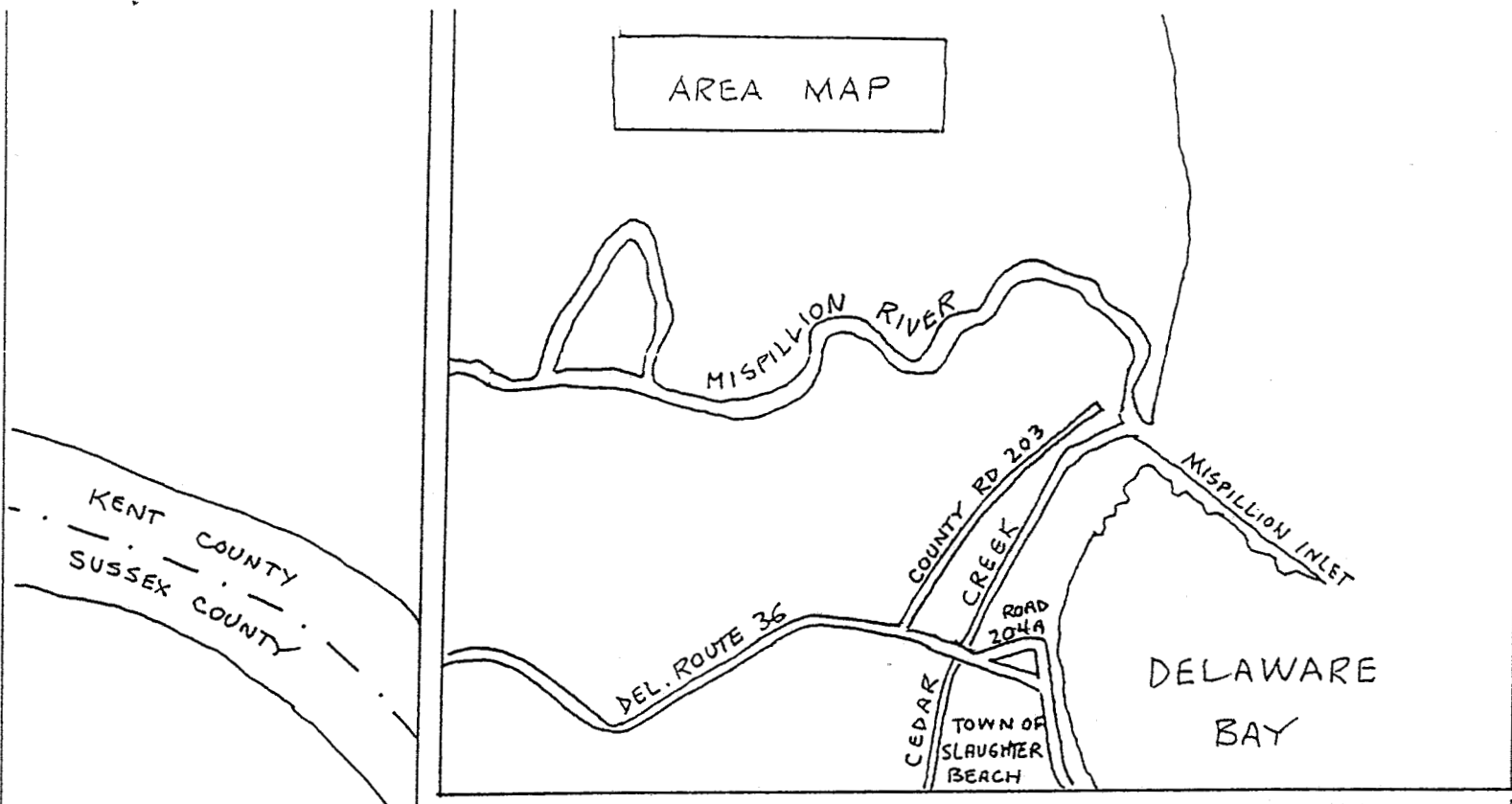
For NPS use only
received
date entered

Continuation sheet	Item number	Page
VERBAL BOUNDARY DESCRIPTION AND JUSTIFICATION	10	1

The nominated area is a rectangle enclosing both the Mispillion Lighthouse and the steel U.S. Government beacon tower. The rectangle includes the entirety of the U.S. Government property at the site (a smaller rectangle of 75.15 feet by 108.4 feet) and a portion of the larger privately-owned property on which the Mispillion Lighthouse is situated. The nominated area is at the northeastern end of County Road 203 and at the northwestern end of the Mispillion Inlet, at the point where Cedar Creek and the Mispillion River join and enter the Delaware Bay. For a precise location, see the following attached documents:

1. Copy of Area Map and Site Map.
2. Map of Nominated Area.
3. Photocopy of 1903 Survey drawing of the property as amended in 1904, 1907, and 1929, the original of which is in the National Archives, Records Group 26, Washington, D.C.

AREA MAP



MR. & MRS. EUGENE RACZ
PARCEL
WITH
MISPILLION
LIGHTHOUSE
1.52 ACRES

U.S. GOVERNMENT
PARCEL
WITH STEEL
TOWER

COUNTY ROAD 203

CEDAR CREEK

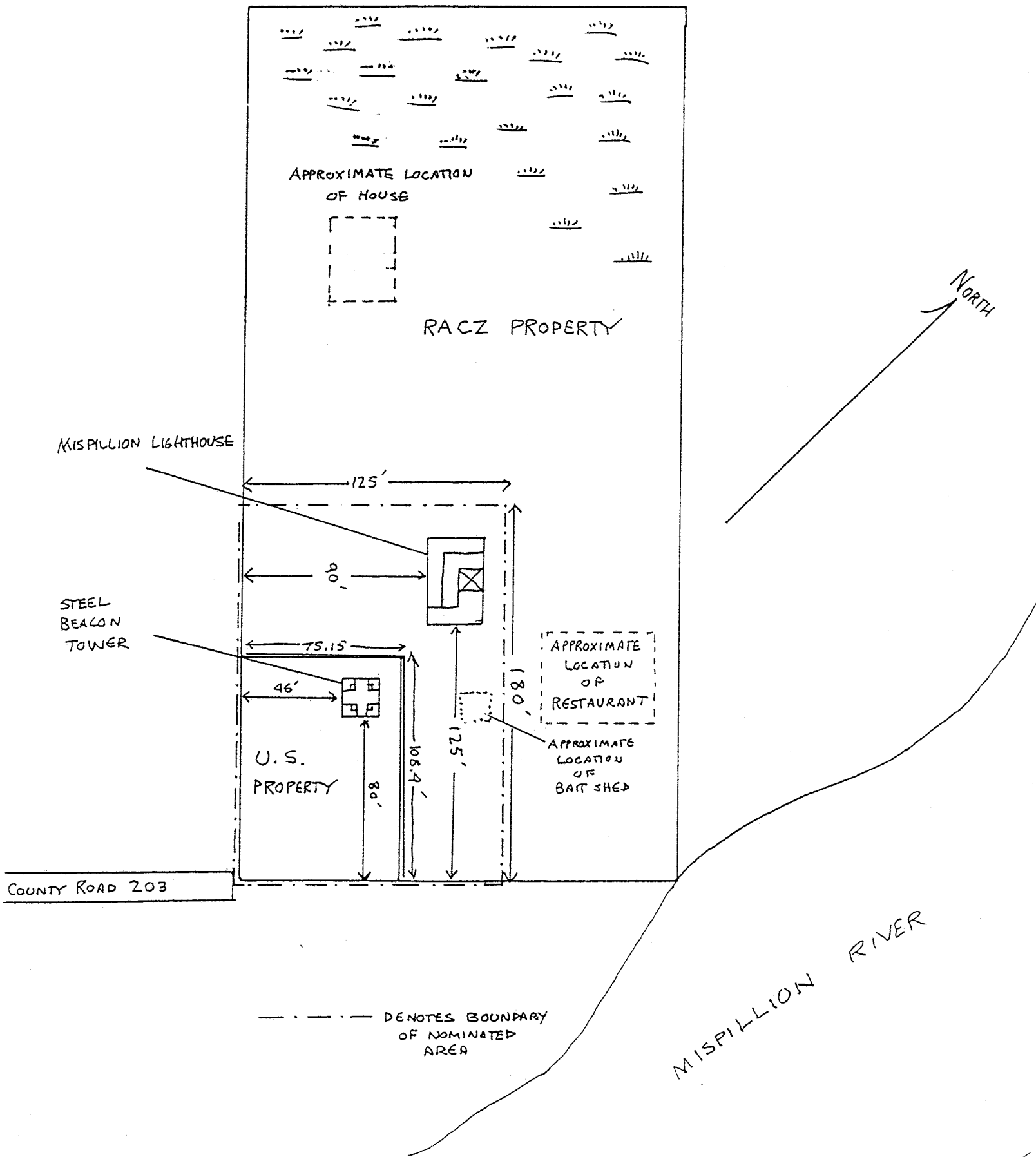
SITE MAP
(TRACING FROM PORTION
OF SUSSEX COUNTY
TAX MAP NUMBER:
3-30-5
400' EQUALS 1 INCH

N

KENT COUNTY
SUSSEX COUNTY

MISPILLION INLET

MAP OF NOMINATED AREA



United States Department of the Interior
National Park ServiceNational Register of Historic Places
Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name National Harbor of Refuge and Delaware Breakwater Harbor Historic District
other names/site number S-186

2. Location

street & number Lewes Harbor, Cape Henlopen and the Delaware Bay ☐ not for publication
city, town Lewes ☐ vicinity
state Delaware code DE county Sussex code 005 zip code 19958

3. Classification

Ownership of Property

☒ private
☐ public-local
☐ public-State
☒ public-Federal

Category of Property

☐ building(s)
☒ district
☐ site
☐ structure
☐ object

Number of Resources within Property

Contributing	Noncontributing
<u>1</u>	<u>1</u> buildings
<u>1</u>	<u>0</u> sites
<u>XX 17</u>	<u>2</u> structures
<u>0</u>	<u>0</u> objects
<u>XX 19</u>	<u>3</u> Total

Name of related multiple property listing:

NANumber of contributing resources previously
listed in the National Register 2

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this
☒ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the
National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.
In my opinion, the property ☐ meets ☒ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of certifying official

Date

John R. Kern
Director, Division of Historical and Cultural Affairs

State or Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of commenting or other official

Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is:

- ☐ entered in the National Register.
☐ See continuation sheet.
- ☐ determined eligible for the National
Register. ☐ See continuation sheet.
- ☐ determined not eligible for the
National Register.
- ☐ removed from the National Register.
- ☐ other, (explain:)

Signature of the Keeper

Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)

Transportation/water-related

Current Functions (enter categories from instructions)

Transportation/water-related

7. Description

Architectural Classification

(enter categories from instructions)

other: Harbor of Refuge

other: breakwater

Colonial-Revival

Materials (enter categories from instructions)

foundation Stone

walls Steel

Shingle

roof Asphalt

other Stone

Water

Describe present and historic physical appearance.

The National Harbor of Refuge/Breakwater Harbor is located at Lewes, Delaware at the mouth of the Delaware Bay where it empties into the Atlantic Ocean. The inner harbor, the Breakwater Harbor is now located behind Cape Henlopen. Due to natural forces, the Cape has been moving to the north and west into the harbor complex. Outside of the district but on its landward border is Cape Henlopen State Park, a small industrial complex and some resort development. Included within the district and the only point on which it touches land is the former United States Coast Guard Station. The station is now operated by the Pilots Association of the Delaware River and Bay as its station and headquarters.

The breakwaters that create the two harbors are listed on the National Register of Historic Places.

The complex was begun in 1828 when two portions of the inner breakwater were constructed. They consisted of a rubble stone main breakwater 2,100 feet long (.1 on USGS map) and an ice breaker pier (.2) that is 1,700 feet long. The ice breaker pier cuts across the line of the breakwater at an angle of 33 degrees. The two portions are 160 feet wide at the base and 20 feet wide above the water. The height of the breakwater above the water varies with the tide. These two portions of the inner breakwater are constructed of Brandywine granite from New Castle County, Delaware. The stone was loaded on barges, carried down the Delaware River and dumped overboard. The individual stone weighs from 1/4 to 6 tons each.

A lighthouse was constructed on the northeast end of the breakwater in 1848. Later a federal signal station and a maritime exchange telegraph station were built on the breakwater. These have all been removed.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:

☒ nationally ☐ statewide ☐ locally

Applicable National Register Criteria ☒ A ☐ B ☐ C ☐ D

Criteria Considerations (Exceptions) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)

Transportation

Period of Significance

1826-1938

Significant Dates

NA

Cultural Affiliation

NA

Significant Person

NA

Architect/Builder

William Strickland and others

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

The Harbor of Refuge/Breakwater Harbor is a significant general aid to navigation that was begun in 1826. The original breakwater and ice pier were designed by William Strickland. This original harbor was the first such structure of its kind in the Western Hemisphere and the third in the world. The harbor was improved and enlarged during the nineteenth century when it reached its present size and configuration. During the twentieth century, the federal government improved and rebuilt the lighthouses and the Lifesaving/Coast Guard Station. The harbor is credited with saving countless ships and hundreds of lives. It continues to serve its original function although it is not usable by large draft ships.

The Breakwater and Harbor of Refuge Breakwater are listed in the National Register of Historic Places.

The safe harbor created by the two breakwaters was considered an important priority by ship owners from the early development of coastal navigation along the Atlantic Coast. The harbor is located at the mouth of the Delaware Bay. Up river is the port city of Philadelphia, one of the most important and busiest ports in the nation throughout our nation's history.

The entrance to the Delaware Bay is a very dangerous one. The water depth varies greatly due to the numerous shoals. Cape Henlopen, which marks the southern mouth of the Bay, shifts over time and it has an extensive shoal, known as Hens and Chickens shoal, directly to seaward. The cape and the shoals were marked with one of the first American lighthouses. Constructed in 1767, it fell into the sea due to erosion in 1926.

As commerce developed and the size and draft of sailing ships increased during the late eighteenth and early nineteenth centuries, the need for a safe haven at Lewes was extensively

☒ See continuation sheet

9. Major Bibliographical References

SEE ATTACHED SHEET

Previous documentation on file (NPS):

- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- ☐ previously listed in the National Register
- ☐ previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings Survey # _____
- ☒ recorded by Historic American Engineering Record # _____

☒ See continuation sheet

Primary location of additional data:

- ☒ State historic preservation office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other

Specify repository: _____

10. Geographical Data

Acreage of property 2430

UTM References

A

Zone	Easting	Northing
------	---------	----------

C

Zone	Easting	Northing
------	---------	----------

B

Zone	Easting	Northing
------	---------	----------

D

Zone	Easting	Northing
------	---------	----------

☒ See continuation sheet

Verbal Boundary Description The bounds of the National Harbor of Refuge Breakwater Historic District are drawn on the attached map. The line on the outer edge of the Harbor of Refuge Breakwater MNOA is drawn to include the furthest outward extension of the breakwater base. Line DEFG is the inner limit of the Breakwater Harbor's deep basin. The district is only on land at the Pilot's Station headquarters and then only deep enough to extend 15 feet past the southern facade of the main station building.

☐ See continuation sheet

Boundary Justification

The boundary includes all of the harbor area created by the two breakwaters plus the ice breaker piers and the former Coast Guard parcel.

☐ See continuation sheet

11. Form Prepared By

name/title Stephen G. DelSordo, Historian

organization Bureau of Archaeology & Historic Preservation date August, 1988

street & number 15 The Green telephone (302) 736-5685

city or town Dover state DE zip code 19901

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 7 Page 2

In 1883, the open space [.3] between the two piers was closed. The stone came from the same quarries as the original piers. However, the stone was cut in a more regular fashion and was laid up with a steam derrick. Hence the appearance of the new section of the breakwater is much more regular. The newer section is slightly narrower than the original sections of the breakwater.

In 1896, a new and larger safe harbor was authorized by Congress. The National Harbor of Refugee [.4] is located 6,500 feet north of the Breakwater on a shoal known as the Shears. It was built with dressed stone and is very regular in appearance. The stone used is much larger than that of the Breakwater. Some of the stone weighs 13 tons. The Harbor of Refuge breakwater is 8,040 feet long at its low water mark and 7,950 feet long at the top. It is 40 feet wide. It was not built in a straight line but rather extends 2,500 feet northward and turns inward 18 degrees.

In 1901, a set of ten stone ice breaker piers [.5] were constructed 1,250 feet north of the Harbor of Refuge breakwater. They are constructed of dressed stone and lie in a line 1,300 feet long.

There are two lighthouses within the complex. The first [.6] is located on the eastern end of the inner breakwater. It is a small conical cast iron tower constructed in 1885. It is set upon a circular concrete foundation. The tower is 49 feet high. It is 22 feet in diameter at the base, tapering to 18 feet at the gallery or exterior walkway. The watchroom above the gallery is 11 feet in diameter.

The tower is composed of four tiers of cast iron plates bolted together. The interior of the tower is lined with 2 feet of brick. The dominate feature of the interior is a large central cast-iron column. The stairs between each level are set into the outer wall. Hardwood floors are laid over the iron plate subfloors. Much of the original woodwork is still intact although the lighthouse has undergone some modernization. The interior is divided into four levels. The first is an entrance level. The second is a kitchen, the third is a bathroom and the fourth is sleeping quarters.

The watchroom is a fifth level. It supports the lantern. The present light was installed after 1908. It is a small drum shaped Fresnel lens about 15" x 20". The focal plane of the light is 61 feet above sea level. The lantern is a glass and steel plate enclosure for the light. The glass is covered with red plastic inserts except for the northwest section.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 7 Page 3

Associated with the lighthouse is a reinforced concrete oil shed [.7] built in 1912. It is 100 feet west of the lighthouse. It housed fuel for the light prior to its electrification as well as other flammable supplies for the lighthouse. There is also a small wooden access pier and walkway [.8] near the old shed and connected to the lighthouse. This provided access to the facility. These were built in the 1940s to replace older similar piers and walkways.

The second lighthouse [.9] is located on the east end of the Harbor of Refuge breakwater. It was constructed in 1926 as a replacement for an earlier lighthouse that was damaged in 1920. The foundation of the lighthouse is a cast iron caisson of curved plates bolted together. It is lined with three feet of poured concrete. A concrete wall surrounds the caisson.

The lighthouse tower is a three story cylindrical tower 25 feet in diameter with a one story watchroom above. The watchroom is 15 feet in diameter and is topped by an octagonal lantern with a pyramid roof. There is a gallery at both the watchroom and lantern level. The overall height of the lighthouse is 76 feet above the breakwater.

The interior of the lighthouse is dominated by a large central cylinder about 8 feet in diameter. The cylinder contains a spiral staircase. The walls within the lighthouse are covered with vertical beaded boards. The floors are narrow hardwood boards resting on I-beams running from the central cylinder to the outer walls.

The lighthouse has suffered some deterioration from the weather. A portion of the seaward gallery was damaged, along with the concrete base when a freighter ran into the lighthouse several years ago.

A number of small modern light towers are located within the harbor complex. One each is located on the northeast end of each breakwater. Two more are mounted on the 1901 ice breaker piers. One is on the most easterly pier and one is on the most westerly pier. All of the lights including the two lighthouses are electrified. The power is provided by a cable that comes from the shore and which is laid on the sea head.

The only portion of the historic district that touches land is at the former United States Coast Guard Station [.10]. At the station is a modern residence [.11] at the site of the original 1884 lifesaving boathouse [the boathouse was moved in 1978 to a spot

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 7 Page 4

on the Lewes-Rehoboth Canal where it is operated as a museum by the Lewes Historical Society]. There is also a modern pier and walkway [.12] which provides ready access to the pilot boats.

The United States Coast Guard Station at Lewes Harbor is a two and one half story Colonial Revival, balloon-frame building constructed in 1938. Now functioning as a river pilot's station, the exterior of the building is little changed from its date of construction. The lot occupied by the station is not extensive. On the south side is the Cape May-Lewes ferry complex. On the north side of a small housing complex.

The station building is a five bay, center hall plan building with a matching one story wing on each gable end. The principle facade faces the harbor. It has a slightly raised foundation and a full basement. The entire building is covered in wood shingle, its original siding. Across the front is a screen enclosed porch supported by paired Tuscan columns. The porch balustrade matches a balustrade on the porch's flat roof. The windows are six-over-six, double hung sash protected by storm windows and the original louvered shutters. The corners of the building and the wings have Tuscan influenced corner boards. The rear facade has an entrance portico covering its offset entrance. The second floor window pattern is the same as that on the front facade.

The gable roof has a box cornice. The main block has three dormers on each face. The window openings are fashioned in a romanesque arch. A single chimney stack rises from the north interior gable end of the main block but it is offset slightly towards the rear from the center ridge.

On top of the building is an enclosed observation platform. It is decorated with an original Chinese Chippendale railing. The tower itself has two-over-two double hung sash windows on all four sides. The windows are arranged in a modern interpretation of a palladian window with a wider center window and narrow flanking windows. Instead of the three window pattern on the west or rear side of the tower, that side has one window and a door. The tower has a shallow pyramid roof topped by a weathervane showing a sloop-rigged sailing vessel.

The wings provide balance to the main block. Each has three double hung sash windows across the front and rear. The north wing has a modern exterior gable end chimney. There is no chimney on the south wing.

The interior of the station has been altered from its original configuration by the pilots in order to make the building

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 7 Page 5

functionable for their special needs. A large meeting room has been created on the first floor. This required that the original stair be relocated towards the north. The south wing had a fireplace and heavy wood panelling added to the walls on the first floor. On the second floor, a series of small bedrooms have been added. The building serves as a pilot's "motel" as well as headquarters, hence the need for bedrooms. The pilots are required to be on duty or on call during their shifts. The station provides them with comfortable quarters and work space while they wait for ships to arrive at the mouth of the bay.

A feature of the entire complex is a turning basin [.13] that was dredged within the inner Breakwater Harbor. It is only apparent on nautical charts and is not shown on local or USGS maps. The turning basin provides a clear safe area for large vessels to maneuver without fear of running aground. The exact date of the initial dredging is not clear, however, it would appear to have been in existence by the end of World War I. Since the harbor complex is not used by modern cargo ships, the depth of the turning basin has not been maintained. The U.S. Coast Guard has established a moving area for vessels in the Delaware Bay just north of Lewes. It extends for several miles up the Bay.

United States Department of the Interior
National Park ServiceNational Register of Historic Places
Continuation SheetSection number 7 Page 6

Contributing and Non-contributing Resources

<u>Map #</u>	<u>Resource</u>	<u># of Elements</u>	<u>Type</u>
1	original breakwater	1	Contributing Structure
2	original ice breaker pier	1	Contributing Structure
3	1883 stone closure of breakwater	1	Contributing Structure
4	outer breakwater	1	Contributing Structure
5	1901 ice breaker piers	10	Contributing Structure
6	1885 inner lighthouse	1	Contributing Structure
7	oil shed	1	Contributing Structure
8	pier and walkway	1	Non-Contributing Structure
9	1926 outer lighthouse	1	Contributing Structure
10	former Coast Guard Station	1	Contributing Building
11	modern residence	1	Non-Contributing Building
12	modern pier and walkway	1	Non-Contributing Structure
13	turning basin	1	Contributing Site

United States Department of the Interior
National Park ServiceNational Register of Historic Places
Continuation SheetSection number 8 Page 2

pursued by Philadelphia maritime interests. Ships that tried to take refuge behind Cape Henlopen in storms were often run aground.

In 1822, Congress allocated funds to study the possible construction of a harbor of refuge. A board of three experts was created to study the problem. They were General Simon Bernard, a former French officer who was the chief engineer of the U. S. Army; Major J. G. Totlen, his assistant and a former professor of mathematics at West Point; and Commodore William Bainbridge, an expert on coastal fortifications. They recommended a large permanent harbor. Their recommendation was favorably received. In 1825, Congress authorized the construction of the breakwater. William Strickland was appointed chief engineer.

As designed by Strickland, the harbor would be established with the construction of the long breakwater [.1] and the ice breaker pier [.2]. Work began in 1828, when contracts were let for the first shipments of stone. Strickland did not directly oversee the construction of the harbor, he preferred to remain in Philadelphia and continue his architectural practice. [In 1837, while working on the harbor, Strickland designed the New Sussex County Courthouse in Georgetown]. The day-to-day construction of the harbor was assigned to an officer from the U. S. Army. The construction of the harbor was not finished until 1839. By that time 835,000 tons of stone had been used to build the breakwater and ice breaker pier. The long construction period was due mostly to the small annual sums that the U. S. Congress appropriated for the harbor.

In 1833, the Army asked Strickland to design a lighthouse for the harbor. He submitted plans that year and construction started in 1834. The lighthouse was placed on the west end of the breakwater.

During those same years, mooring buoys were to be placed within the harbor for the convenience of ships. This was a tradition in European ports. There is no physical evidence that the buoys were ever provided. In 1876, the Western Union Telegraph Company was given permission to use the lighthouse as a telegraph station. Shortly thereafter, the Philadelphia Maritime Exchange built a building next to the lighthouse to use as a reporting station. These buildings were removed in 1885.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number 8 Page 3

The harbor was an immediate success and it soon became evident that it was too small to provide a totally safe harbor. During storms more than 200 ships would crowd into the harbor. On a regular basis during the 1840s, 25 vessels a day would be in the harbor. The harbor was only about 400 acres in size. Furthermore, the gap allowed strong tides and ice flows to enter the harbor with resulting damage to the ships located there.

During the 1850s and the 1860s, regular repairs and additions were made to the ice breaker pier and the breakwater. The height of the breakwater was increased slightly. A major problem in the harbor was a constant shoaling problem. Several ships had run aground and larger ships had trouble entering and using the harbor.

In the 1870s and 1880s, the federal government increased the functions of the Breakwater Harbor. In 1871, the Army Corps of Engineers began construction of an iron pier out into the harbor. The pier was completed in 1882. It was designed to permit railroad connections directly to ships anchored in the harbor. The project was not financially successful. The pier was 1,700 feet long. It was constructed of wrought iron screw pile shafts with wood decking. Later in its life, it was used by the U. S. Lifesaving Station at the harbor and by the U. S. Quarantine Station at Lewes. That station had been established in 1889. The station was set upon 41 acres with a complex of buildings that developed into isolation wards and a hospital as well as quarters for station personnel. From 1917 to 1918, the U. S. Navy used the station as a Navy base. The Navy apparently held onto the station after World War I. The site was officially abandoned as a quarantine station in 1926. The buildings were all removed in 1931. The iron pier shafts are still in place. They are in bad repair and are not a part of the historic district as it was and is a hazard to navigation.

A lifesaving station was established on the harbor in 1882. The first building was a boathouse that stood near the present Coast Guard Station. The second building was a regular lifesaving station that included crew's quarters. The first building still survives. The lifeboat house is in Lewes on the Lewes and Rehoboth Canal where it functions as a museum. The lifesaving station was moved to Rehoboth Beach in 1938. It was used by the Veterans of Foreign Wars as a club house. It does not seem to have survived the intense development of Rehoboth Beach. The

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 8 Page 4

present building [.10] used as the pilot's station was constructed in 1938 by the U.S. Coast Guard.

The rise in activity within the Breakwater Harbor increased demands for a significant improvement to the harbor. The most obvious need was to close the gap between the breakwater itself and the icebreaker pier. The need for better protection was forcibly demonstrated when an October, 1877 hurricane destroyed a large number of ships within the harbor and a number of vessels could not get into the harbor.

In 1883, Congress authorized the closing of the gap between the icebreaker pier and the breakwater. The design of the closure was based on an 1836 engineering report by the Corps of Engineers. The base rests on a brush mattress that is 145 feet wide, 15 feet less than the original breakwater. The mass of the closure is rubble stone with a dressed stone cap which is 20 feet wide.

The slope of the closure is steeper than that of the original breakwater. The closure was not completed until 1898.

When the gap was closed, the 1848 lighthouse that had stood on the western end of the breakwater was rendered obsolete. In 1885, the U. S. Board of Lighthouse built the present light [.6] on the eastern end of the breakwater. The original lighthouse was removed. Its removal meant that the Western Union Telegraph Company had to build a new building on the breakwater. This building has also been removed. The light can be seen by vessels on the ocean side of the cape as well as by ships in the bay and Harbor. The lens in the lighthouse is the third one to be placed in the tower. It is one of the few remaining fresnel lenses in place in a working lighthouse in the United States.

In 1896, a new breakwater to be called "The National Harbor of Refuge" was authorized by Congress. It was to be constructed on a shoal known as "The Shears." In addition to the new breakwater, the plan called for the construction of a row of icebreaker piers which was begun in 1901. The entire project was finished in December of 1901. The total cost was \$2,090,765.82. The construction techniques used to fill in the gap of the original breakwater were employed in the construction of the new

United States Department of the Interior
National Park Service

**National Register of Historic Places
Continuation Sheet**

Section number 8 Page 5

breakwater. The design and construction techniques were used as the model for other breakwaters in the United States planned after the success of the National Harbor of Refuge was demonstrated.

An important part of the design was the lighting of the National Harbor. A lighthouse was constructed on the eastern end of the breakwater. Colonial-Revival in design, it was heavily damaged in 1920. A new lighthouse [.9] was built to replace it in 1926. This new lighthouse and the earlier one it replaced had increased in importance in 1924 when the 1767 Cape Henlopen lighthouse was abandoned. That lighthouse was in danger of falling into the sea and was considered by the U. S. Bureau of Lighthouses to be unusable. Hence the National Harbor of Refuge lighthouse was required to take over its duties. The Cape Henlopen light fell into the sea on April 13, 1926.

In 1938, the U.S. Government made their last major change to the National Harbor of Refuge and Breakwater Harbor. The original lifesaving station was declared surplus and moved away. A new Colonial-Revival style Coast Guard station was built to take its place. The lifesaving service boathouse remained in the front yard of the Coast Guard station until 1978 when it was moved into Lewes by the Lewes Historical Society.

In 1939, the U.S. Coast Guard absorbed the U.S. Bureau of Lighthouses. At this time the responsibility for the lighthouses and navigation markers with the Harbor of Refuge and the Breakwater Harbor became a Coast Guard function. The two lighthouses continued to be manned but that practice was discontinued in the 1950s. In 1939, the Coast Guard also assumed responsibility for the lighthouses in the Delaware Bay and along the Delaware River and Atlantic Coast. The Coast Guard also took over the lightships that marked the entrances to the shipping lanes in the Atlantic Ocean. The breakwaters and the icebreaker piers remain the responsibility of the U.S. Army Corps of Engineers.

The Coast Guard occupied the building until the early 1970s. The property was declared surplus and given to the University of Delaware. The University used the property as part of its marine studies complex. The building was used by the University for several years and then it was traded to the Pilots Association of the Delaware Bay and River who are the current owners. The Pilots Association uses the property to berth the pilot boats and

United States Department of the Interior
National Park ServiceNational Register of Historic Places
Continuation SheetSection number 8 Page 6

to provide a place for the pilots to wait for ships coming into the Delaware Bay. The control of the ship movements up the Delaware Bay and River is controlled by the pilots. They serve an apprenticeship that requires that they be able to draw a navigation map of the Bay and River from memory. As ships approach the mouth of the Bay, they are required to contact the pilots association and request that a pilot be placed on board. A special watch tower is maintained on the tip of Cape Henlopen in a converted World War II submarine watchtower. The radar and communications equipment there enables the Pilots Association to assist ships coming to the Delaware Valley ports. Their activities and the modern ship technology and radar equipment has meant that the National Harbor of Refuge and Breakwater Harbor no longer are as important to commercial navigation as they once were. Their primary function now is a safe recreational harbor for the resort town of Lewes. The harbor does remain important to the Cape May-Lewes Ferry operated by the Delaware River Port Authority. The ferry boat slip is located at the edge of the harbor and next to the pilot's station. The ferry boats usually travel through the National Harbor of Refuge harbor on their way to and from Cape May. On the ferry property there is a small unmarked cemetery that is used to mark the use of that property as a graveyard for sailors who died on ships in the breakwater harbor or who were brought here by ships for burial. However, the lighthouses are still an important and vital aid to navigation in that they help mark the dangerous entrance to the Delaware Bay.

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Section number 9 Page 1

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United States Department of the Interior
National Park Service

**National Register of Historic Places
Continuation Sheet**

Section number 10 Page 2

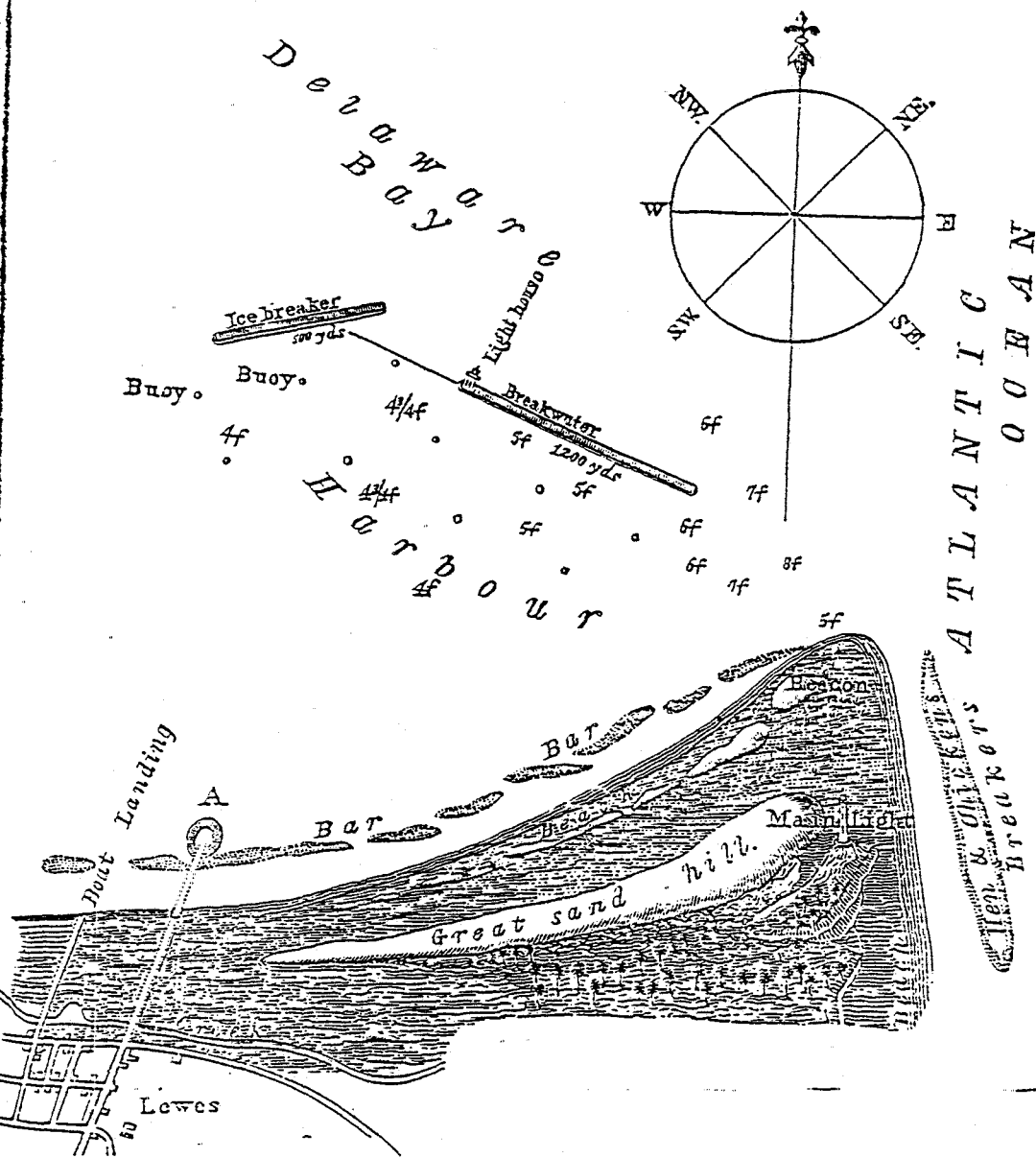
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N	18/490330/4298640
O	18/491760/4296720

their religious system, or their institutions a different thing. This we are not obliged to either by christianity, nor charity, nor piety. There is a broad line of distinction, which every man must perceive. Nor can I understand how a true protestant, much less a puritan, should encourage and patronize the catholic system of superstitions. It is a necessary part of catholicism to proselytes; and most catholics use constantly this view. We should be on our guard, as to the encroachments or proselytizing of the catholics; and thus counteract the effects of bringing the young and ignorant over to peculiar dogmas and practices. I care not much is done in this way and for this view of their tenets, we hold to be very erroneous. It is our duty to use proper means to prevent their spread, and their influence. But let us not take the maxim, sometimes attributed to them, that the end justifies the means, as it was to Paul, that the end justifies the means, or to do evil that good may come. We are bound to do them justice and to show kindness. Their persons and property should be protected; and the free enjoyment of their religion allowed them. Further than this, protestants should go: The worthy descendants of New-England puritans may not go. If they have been treated unjustly, let not such treatment be repeated. We hold to the pure doctrines, the scriptures of our fathers, as we believe them agreeable to the inspired gospel. When we meet with Romantics like *Cheverus* and *Fenelon*, we must love them with all their errors. For they are earnest and pious men. And may be the same others like them, of that community, to be combatted by argument and kindness. Even the skeptics and irreligious, the geologists to pity, and seek to reform. "The Lord came not to destroy men's lives, but to save them."

Colonel Dodge, of the United States, has lately found a quarry of Chalk near Lewes. This mineral had not before been found in our country, though sought for long and in vain; except that Professor Newcomb found some, a few years ago, in the western part of the State, but less pure and of less extent than that found by Colonel Dodge.—It is probably a simple carbonate of lime, and not a compound salt; but pure Chalk has never been found in the United States.

SONNET.—FROM THE ITALIAN.

When I behold this empty show
Of life, and think how soon it will have fled—
When I consider how the honored head
Heavily struck by death's mysterious blow
Heart is wasted in the melting snow,
And hope, that comfort, is nearly dead;
Seeing these things have been so long outspread,
And yet so sluggish is my flight and low,
I therefore should complain and weep,
I should with love, or fortune, or the fair,
So cause I have myself must bear it all,
As like a man and trifle called to sleep,
With death beside me, feed on empty air
Or think how soon this mouldering garb must fall.



DELAWARE BREAK-WATER.

The above view is from an authentic source; and is a reduced copy of the original Survey. The scale of the map is one eighth of an inch to 100 feet, and embraces the relative situations of the Breakwater, Ice breaker, Cape Henlopen, Hen and Chickens' shoal, and such part of the ocean and shore as extends from the town of Lewes to the Beacon lights. The objects gained by this artificial harbor in the stead of Lewes are—to shelter vessels from the force of waves caused by the winds blowing from the North-West round by the North; and also to protect them against injuries arising from floating ice descending from the North-West. Its main purpose is to provide a safe refuge for vessels from the designing either to ascend the Bay or to seek shelter during stormy weather under the ice of the

upon reference to the Map, are from the E. N. E. forming one entrance of half a mile in width between the pitch of the Cape and the eastern end of the Breakwater; and the other of 350 yards in width between the western end of the Breakwater and the Ice-breaker, which is a distinct work, disposed at an angle of 33 degrees from the right line direction of the Breakwater. These two works enclose an area of water surface of upwards of a square mile, forming the harbor between them and the cove of the Bay shore. The depth of water, at low water, varies from 3 fathoms at the entrance of the Cape, to 4 fathoms opposite the boat landing, which is 2 1/2 miles from the Beacon Light House.

The Dike of stone called the Breakwater, is 1200 yards in length, and presents a line of defence from all Northerly and Easterly winds.

The Dike of stone forming the Ice-breaker is 500 yards in length, and protects the harbor from the

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DELAWARE BREAKWATER HARBOR
HISTORIC DISTRICT

The map depicts the coastal area around Cape Henlopen. Key features include:

- Harbor of Refuge**: Located at the top left.
- Breakwater Harbor**: Located at the bottom left.
- Cape Henlopen**: A large peninsula on the right side.
- Lighthouses**: Numerous lighthouses are marked with letters and numbers in circles (e.g., 5, 4, 9, 2, 6-7-8, 13, 10, 11, 12).
- Breakwaters**: Several breakwaters are shown, some labeled with numbers in circles (e.g., 5, 4, 13).
- Lookout Towers**: Two lookout towers are indicated near Cape Henlopen.
- Rehoboth Beach**: Located along the eastern shore.
- Cape May-Lewes Ferry**: Indicated on the western side.
- Depth Soundings**: Various numerical values representing water depths are scattered across the map.
- Compass Roses**: Two cross-shaped symbols indicating orientation.
- Handwritten Annotations**: Circled numbers and letters are placed throughout the map, likely for identification or survey purposes.

SHEARS

~~Harbor of~~
Refuge

REPORT

BENCH

CAPE MAY-LEWES FERRY
(TOLL)

COMPANY:

C a p e

BOUNDARY

Breakwater Harbor

Henlopen.

I
-
2

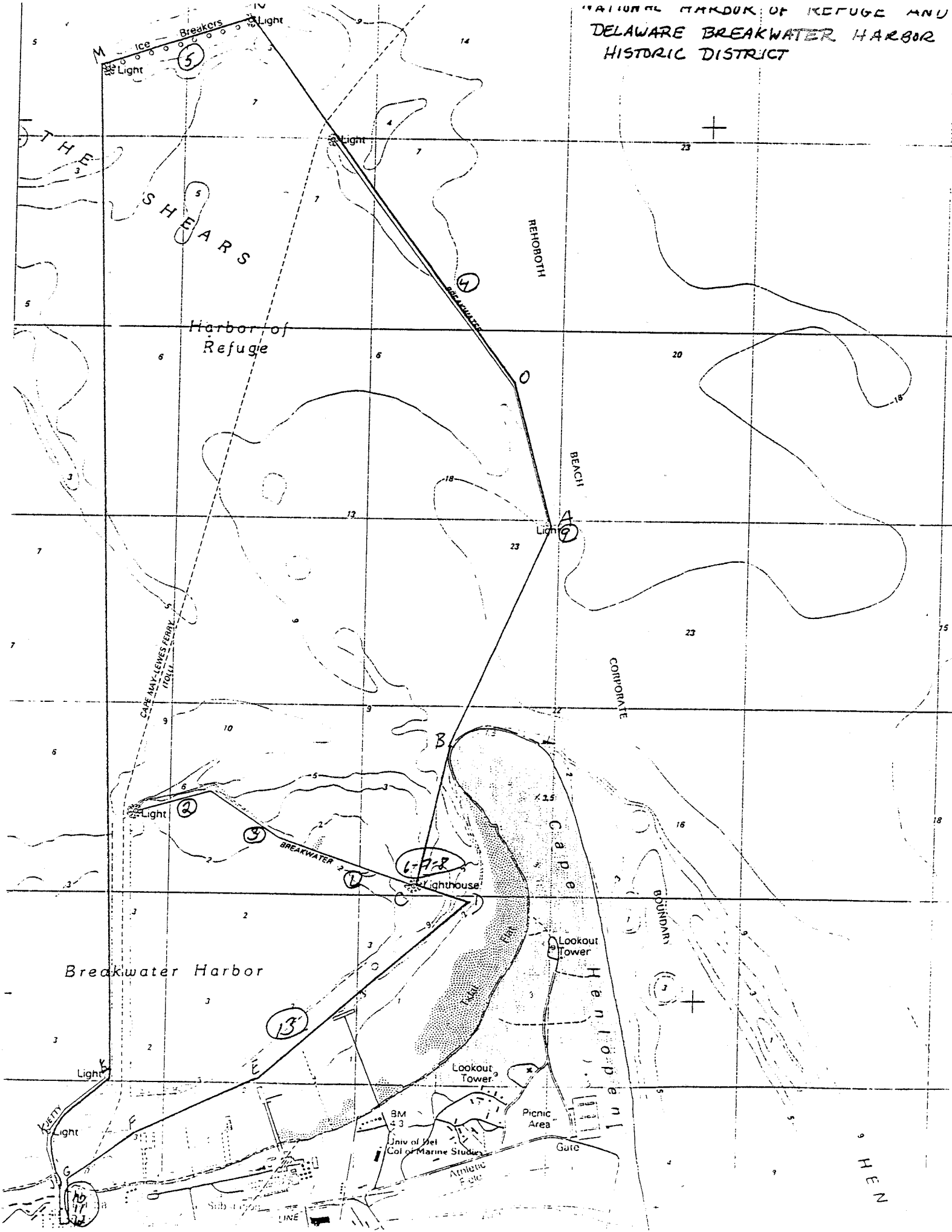
This nautical chart depicts the Harbor of Refuge and Breakwater Harbor. Key features include:

- Harbor of Refuge:** The main body of water, with a "RED SECTOR" marked near the entrance.
- Breakwater Harbor:** A smaller harbor area, also marked with a "RED SECTOR".
- Henlopen:** A peninsula or headland at the bottom of the chart, featuring a "TOWER" and "Marsh".
- Navigation Aids:**
 - Fl 4sec 15ft (Fish Haven)
 - Fl 4sec 27ft (Breakwater)
 - Fl 5sec 72ft 20M 57 HORN
 - Fl 6sec 61ft 4M
 - Fl 7sec 28ft "1"
 - Fl 8sec 48ft (Priv maintd)
 - Fl 15ft (Ok)
- Obstructions:** Numerous "Obstr" (obstructions) are marked with numbers in circles, indicating hazards to navigation.
- Depth Soundings:** Numerous depth soundings are provided throughout the chart, ranging from 1 to 80 fathoms.
- Other Features:**
 - "Ice breakers" and "Fish Haven (auth min 8 ft)" are noted.
 - "S Sh P" (Shoal Sand Point) is marked near the entrance.
 - "Wk" (Wreck) is noted near the Breakwater Harbor.
 - "GONG" (Gong) is noted near the Henlopen area.
 - "Pile" and "Ferry" are also indicated.

A hand-drawn sketch of a road intersection. A solid line representing a road runs horizontally. A dashed line, labeled 'Ruins', crosses it at an angle. Below the intersection, there is a small 'X' mark and some scribbled lines.

H E I

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BREAKWATER HARBOR HISTORIC DISTRICT

