

A Celebration of Delaware's Guiding Beacons



***Lewes Ferry Terminal
Lewes, Delaware
September 30, 2004
1 p.m.***

Delaware Breakwater East End Lighthouse

Located on the eastern end of the Delaware Breakwater, this brown conical structure was built in 1885. The tower is composed of four tiers of cast iron plates lined with two feet of brick. It is twenty-two feet in diameter at the base and is set upon a circular concrete foundation. When completed it was equipped with a fourth order Fresnel lens which showed a fixed white light with a red sector facing seaward to warn mariners of the dangerous shoals off Cape Henlopen. The light's focal plane was sixty-one feet above sea level with a visibility of thirteen nautical miles. A steam powered Daboll fog trumpet was added in November 1885. The lighthouse served as the front light of the Delaware Breakwater Range from 1903 until 1918. It was automated on July 11, 1950. For a time during the 1960s and 1970s, the structure was used as a base of operations by the Pilots' Association of the Bay and River Delaware. The lighthouse was decommissioned in 1996. On February 5, 1999, the Delaware Breakwater East End Lighthouse was formally conveyed by the United States Government to the State of Delaware.

Harbor of Refuge Lighthouse

A temporary light was established on the south end of the recently completed National Harbor of Refuge Breakwater on January 1, 1902. It was replaced in 1908 by a three-story frame lighthouse. A series of storms damaged the structure, resulting in its removal and replacement in 1926. The present Harbor of Refuge Lighthouse became operational on November 15, 1926. This white and black structure consists of a three story cylindrical tower with a watch room above. The foundation is a cast iron caisson of curved plates bolted together. It is lined with three feet of concrete. The lighthouse stands seventy-six feet above the breakwater. It shows a flashing white light seventy-two feet above mean high water which is visible fourteen miles to sea. Coast Guard light keepers manned the light until it was automated in December 1973. In 2004, the Harbor of Refuge Lighthouse was transferred by the United States Department of the Interior to the Delaware River and Bay Lighthouse Foundation.

- Delaware Public Archives, 2004

A Celebration of Delaware's Guiding Beacons

Unique Lighthouse Partnership

James Johnson, Jr., Executive Director, D.R.B.A.

Bob Trapani, President, DRBLHF

Dedication of Delaware Historic Markers

Delaware Breakwater East End Lighthouse

Representative Joe Booth, Delaware House of Representatives

Russ McCabe, Delaware State Archives

Harbor of Refuge Lighthouse

Senator Gary Simpson, Delaware State Senate

Russ McCabe, Delaware State Archives

Harbor of Refuge Lighthouse Transfer Ceremony

Secretary Gale Norton, U.S. Department of the Interior

U.S. Coast Guard Representative

Mark Lally, Regional Director for U.S. Senator Tom Carper

Mayor James Ford, City of Lewes

Bob Trapani, Delaware River & Bay Lighthouse Foundation

Light Refreshments





Established 1999

Delaware River and Bay Lighthouse Foundation, Inc.

www.delawarebaylights.org

Delaware Breakwater East End Lighthouse

- The lighthouse sits on the easterly end of the Delaware Breakwater, which was built over a period of 40 years from 1829 through 1869. The wall is 0.8 miles long and was used by ships to escape the northeast storms in particular.
- A temporary light was established on the east end of the breakwater in April 1885
- The actual Delaware Breakwater East End Lighthouse first exhibited a light on October 2, 1885
- The lighthouse is established into the breakwater at an approximate depth of 11-feet
- The lighthouse was outfitted with a second order Daboll fog trumpet in November 1885
- The light's focal plane above sea level was 61 feet, with the structure itself being described as a brown, conical tower, 56 feet in height.
- The lighthouse was equipped with a fourth order Fresnel lens and showed a fixed white light with a red sector seaward approximately 13 nautical miles. The red sector warned mariners of a dangerous shoal off Cape Henlopen.
- The Delaware Breakwater East End Lighthouse weathered some of Delaware's biggest storms...March 1888, September 1889 and March 1962.
- During the first tow years (1886 & 1887) of the fog horn's operation, the signal sounded 898 and 912 hours respectively. During these hours of operation, the lightkeepers feed the fog horn an average of 6 tons of coal to keep it operating.
- The lighthouse served as the front light of the Delaware Breakwater Range from 1903 to 1918.
- The Delaware Breakwater East End Lighthouse was automated on July 11, 1950.
- The Pilots' Association used the lighthouse as a base of operations from 1963 into the 1970's when the Pilot boat *Philadelphia* went to dry dock for maintenance and repairs
- The lighthouse was decommissioned in 1996.

07628

02367 219

Prepared by:

Gabriel N. Steinberg

Gabriel N. Steinberg
GSA, Region IV
Office of Regional Counsel
4-U-DE-460

QUITCLAIM DEED

THIS INDENTURE, made this 5th day of February, 1999 between the UNITED STATES OF AMERICA, Grantor, acting by and through the Administrator of General Services, under and pursuant to the powers of authority contained in the Federal Property and Administrative Services Act of 1949, 63 Stat. 377, as amended, (40 U.S.C. 484(k)(3)), and regulations and orders promulgated thereunder, hereinafter referred to as Grantor, and THE STATE OF DELAWARE, DEPARTMENT OF STATE, acting by and through its Division of Historical and Cultural Affairs, hereinafter referred to as Grantee.

The Grantor, for the good and valuable consideration set forth below, does remise, release, and forever quitclaim unto the Grantee, all its right, title interest and claim in and to that certain property, hereinafter referred to as the "Delaware Breakwater Light", at Delaware Bay, Lewes, Delaware, and more specifically described as a lighthouse, wharf structures and stairs, oil storage shed, timber platform and walkways, situated on riprap in Delaware Bay, Cape Henlopen, Lewes, Delaware, and as shown on Exhibit "A" which is attached hereto, made a part hereof, and consists of two pages.

Consideration : 0 0.00 Exempt Code: A

County	State	Total
0.00	0.00	0.00
counter	Date: 03/08/1999	

02367 2220

SUBJECT, HOWEVER, to any and all existing conditions, restrictions, and easements, recorded or unrecorded, including those specified in the application of the Grantee for obtaining property for Historic Monument purposes.

The property is listed on the National Register of Historic Places and the Grantee, under the Historic Surplus Property Program, which consists of the Delaware Breakwater Light, associated oil house, walkways, and dock located in the Delaware Bay, Lewes, Sussex County, Delaware, in consideration of this conveyance, hereby covenants on behalf of itself, its successors and assigns at all times to the Delaware Historic Preservation Office and the Grantor to maintain and preserve the Delaware Breakwater Light historic features all as more fully described in Exhibit "B", which is attached hereto, made a part thereof and consists of three pages.

GRANTEE covenants for itself, its successors, and assigns and every successor in interest to the property hereby conveyed, or any part thereof, that the said Grantee and such successors, and assigns shall not discriminate upon the basis of race, color, religion, national origin, or sex in the use, occupancy, sale, or lease of the property, or in their employment practices conducted thereon. This covenant shall not apply, however, to the lease or rental of a room or rooms within a family dwelling unit; nor shall it apply with respect to religion to premises used primarily for religious purposes. The United States of America shall be deemed a beneficiary of this covenant without regard to whether it remains the owner of any land or interest therein the locality of the property hereby conveyed and shall have sole right to enforce this covenant in any court of competent jurisdiction.

Although no hazardous substance activity has been identified by the Grantor, pursuant to §120(h) of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA" or "Superfund"), codified at 42 U.S.C. §9620(h), the Grantor hereby covenants and warrants that any environmental response action or corrective action for hazardous substance activity resulting from such activity, if any, prior to the date of this deed shall be conducted by the United States of America. Therefore, the Grantee, for itself, its successors and assigns, grants the United States of America access to the aforescribed property for any case in which a response action or corrective action is found to be necessary after the date of this deed at the aforescribed property or such access is necessary to carry out a response action or corrective action on adjoining property.

GRANTEE FURTHER COVENANTS and agrees for itself, its successors and assigns, and every successor in interest to the property hereby conveyed as follows:

a. That the Grantee shall forever use the property in accordance with its application, and the terms and conditions contained in the "Program of Preservation and Utilization," accepted February 27, 1998.

b. Other than as provided for in the approved "Program of Preservation and Utilization," in "a" above, the property shall not be sold, leased, assigned, or otherwise disposed of, except to another State or local governmental agency that the Secretary of the Interior is satisfied can assure the continued use and maintenance of the property for historic monument purposes. However, nothing in this provision shall preclude the Grantee from providing facilities and services to the visiting

public compatible with the approved program through leasing or concession agreements entered into with third parties, provided the prior concurrence of the Secretary of the Interior, or designee, is obtained to such agreements.

c. Biennial reports setting forth the use made of the property during the preceding two year period shall be filed by the Grantee with the Secretary of the Interior. If the Administrator of General Services has authorized revenue-producing activities, the Grantee shall file with the Secretary of the Interior every two years the following reports:

- (1) Financial report. The financial report shall include the following:
 - (a) Statement of income from all sources during the reporting period.
 - (b) Statement of expenses classified according to the following heads:
 - (i) Repair, rehabilitation, and restoration;
 - (ii) Recurring maintenance requirements; and
 - (iii) Administration and operation.
 - (c) Statement of disposition of excess income.

The financial report will cover two accounting years, whether fiscal or calendar, as mutually agreed by the Grantee and the Secretary of the Interior, and will be submitted within 90 days after the close of the accounting year.

(2) The Secretary of the Interior shall have the right, at his discretion, to audit such financial records, to examine such other records, and to inspect such portions of the granted property as may, in his judgment, be necessary to safeguard the interests of the United States of America.

d. The Grantor shall have the right, during any national emergency, including any existing national emergency, to full unrestricted use of the property without charge; provided, the Grantor shall bear the entire cost of maintenance of all property so used. It shall pay fair rental for use of improvements added by the Grantee without Federal aid.

e. Title to the property transferred shall revert to the Grantor at its option in the event of noncompliance with any of the terms and conditions of disposal and this Quitclaim Deed.

The property hereby conveyed has heretofore been declared surplus to the needs of the UNITED STATES OF AMERICA, is presently under the jurisdiction of the General Services Administration, is available for disposal and its disposal has been heretofore authorized by the Administrator of General Services, acting pursuant to the above referred to laws, regulations and orders.

TO HAVE AND TO HOLD the foregoing property, together with any improvements thereon, structures, related personal property, and appurtenances, unto Grantee, its successors and assigns forever.

IN WITNESS WHEREOF, the UNITED STATES OF AMERICA has caused these presents to be executed in its name by JAMES BRANDON, Contracting Officer, Property Disposal Division, General Services Administration, Region IV, Atlanta, Georgia, this the 5th day of February, 1999.

WITNESSES:

Bettie L. Jennings
Susan Wells

UNITED STATES OF AMERICA
Acting by and through the
Administrator of General Services

By: James Brandon
JAMES BRANDON
Contracting Officer
Property Disposal Division
General Services Administration
Region IV, Atlanta, GA

02367 224

STATE OF GEORGIA)
)
COUNTY OF FULTON)

This day, before the undersigned, a Notary Public in and for the State of Georgia, personally appeared JAMES BRANDON, Contracting Officer, Property Disposal Division, General Services Administration, Region IV, Atlanta, Georgia, to me well known and known to be the person described in and who executed the foregoing instrument of conveyance on behalf of the UNITED STATES OF AMERICA, General Services Administration.

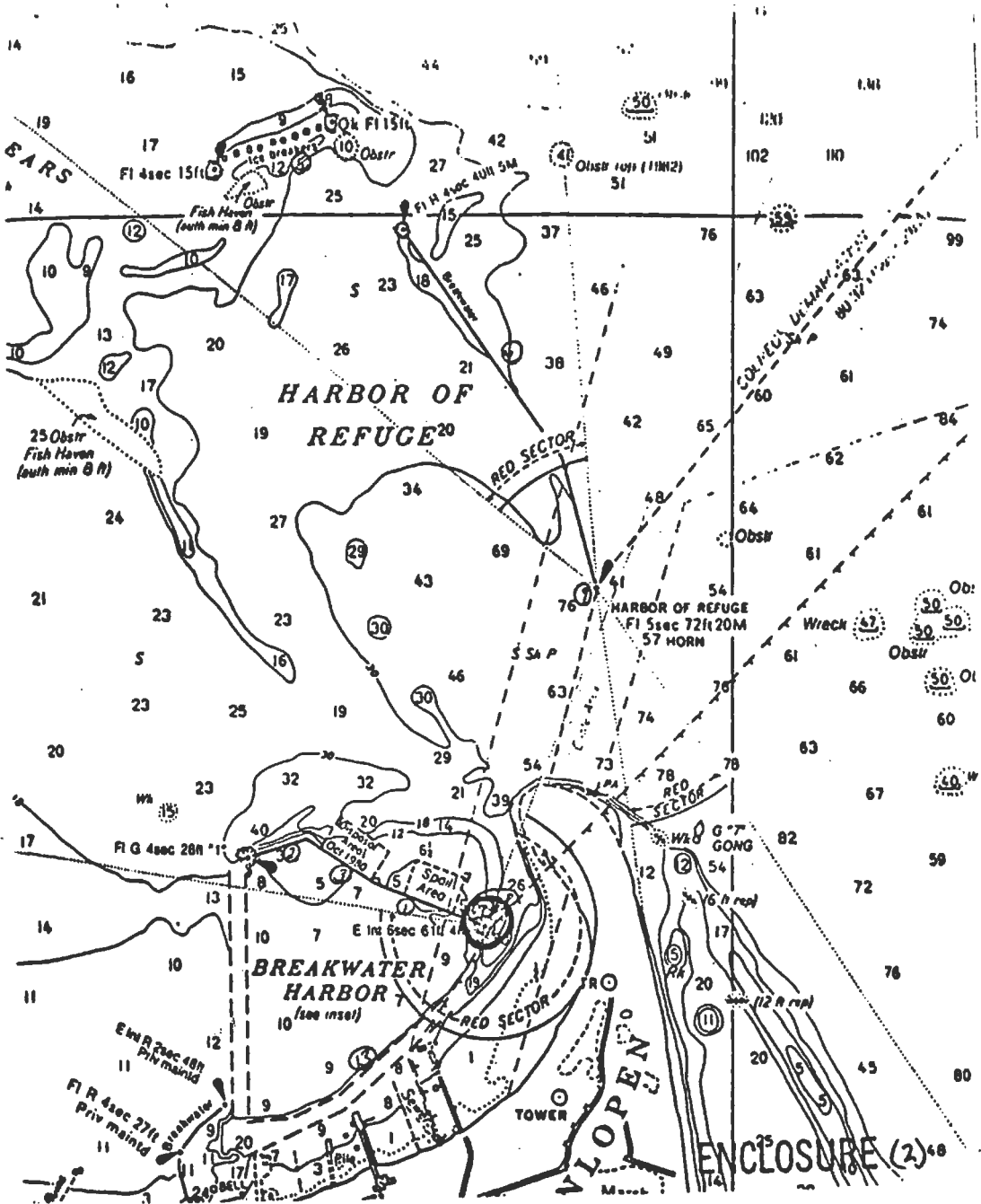
Given under my hand this 5th day of February, 1999.

Glenda L. Green
Glenda L. Green
Notary Public
State of Georgia



Notary Public, Fulton County, Georgia
My Commission Expires March 22, 2002

HARBOR OF REFUGE AND HOLAWAKE
BREAKWATER HARBOUR, NIO JAK DISTRICT

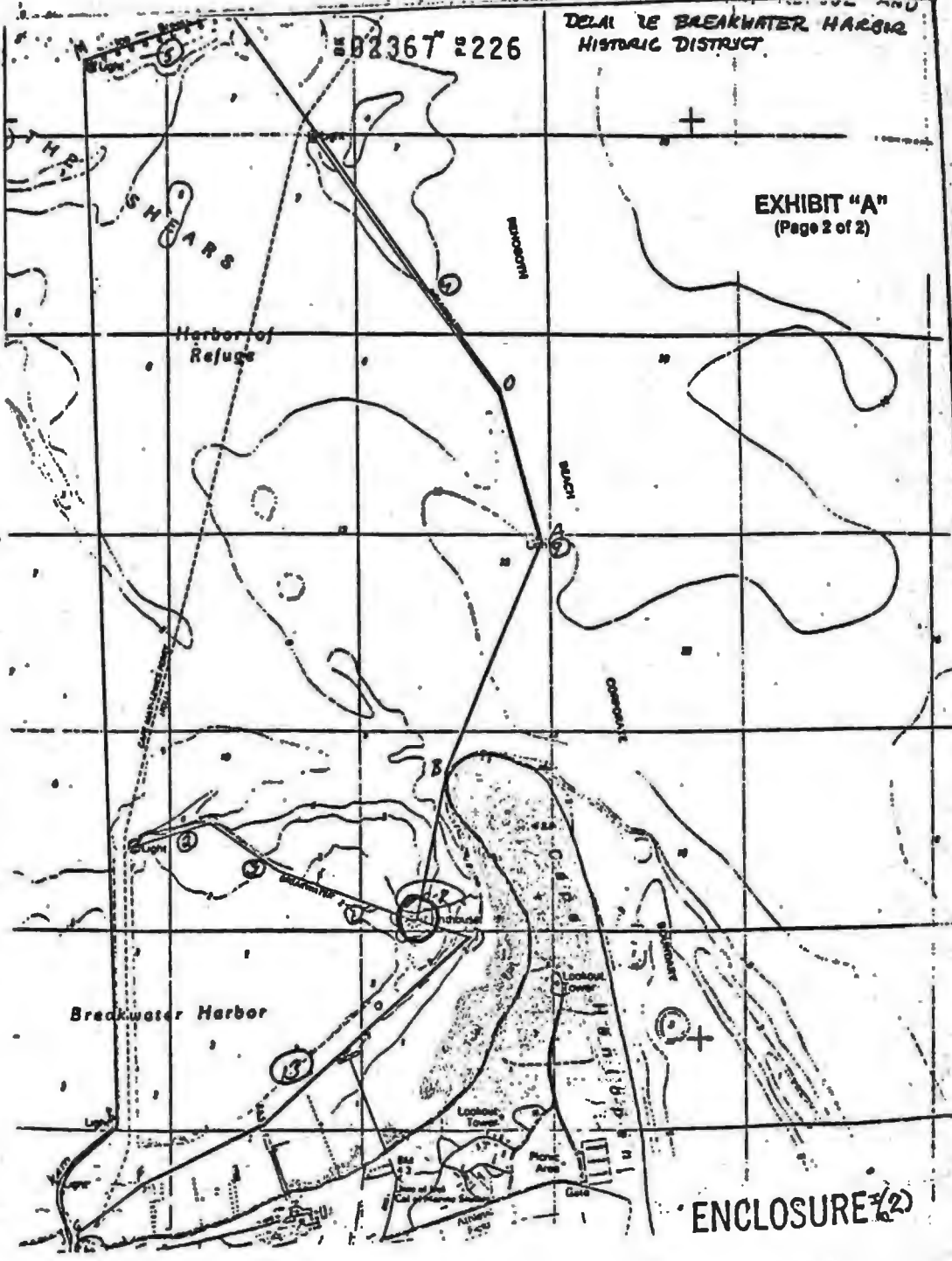


ENCLOSURE (2) 68

DELAWARE BREAKWATER HARBOUR
HISTORIC DISTRICT

82367 2226

EXHIBIT "A"
(Page 2 of 2)



ENCLOSURE 2/2

Preservation Covenant 02367 227
Delaware Breakwater Light
Delaware Bay, Lewes, Delaware

In consideration of the conveyance, under the Historic Surplus Property Program, of the Delaware Breakwater Light, associated oil house, walkways, and dock located in the Delaware Bay, Lewes, Sussex County, Delaware.

The Division of Historical and Cultural Affairs hereby covenants on behalf of itself, its heirs, successors and assigns at all times to the Delaware Historic Preservation Office to maintain and preserve the Delaware Breakwater Light historic features as follows:

1. The Delaware Department of State shall preserve and maintain the Delaware Breakwater Light in accordance with the recommended approaches in the Secretary of the Interior's *Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* (National Park Service, 1983) and the *Historic Lighthouse Preservation Handbook* in order to preserve and enhance those qualities that make the Delaware Breakwater Light eligible for inclusion in the National Register of Historic Places.

In addition, care of the fresnel lens shall be in accordance with the Coast Guard's *Instructions to Light-Keepers and Master of Lighthouse Vessels* (1902, pp.20-33), the forthcoming National Park Service Tech Note, "*Preventive Care for Classical Lighthouse Lenses*", and/or as directed by the Curator for the Coast Guard.

2. The Delaware Department of State shall not undertake nor permit to be undertaken any construction, alteration, or remodeling of the Breakwater Light that could affect the integrity or appearance of the Breakwater Light without first consulting the Delaware State Historic Preservation Office regarding the scope of work to be performed, and taking into account the Delaware State Historic Office's comments thereon.

502367 2228

3. The Delaware State Historic Preservation Office shall be permitted at all reasonable times to inspect the Delaware Breakwater Light to ascertain if the above conditions are being observed.

A violation of this covenant shall be considered a violation of the conditions of the conveyance of the Breakwater Light to the Delaware Department of State under the Historic Surplus Program. In the event of a violation of this covenant, and in addition to any remedy now or hereafter provided by law, the Delaware State Historic Preservation Office, following reasonable notice to the Delaware Department of State, shall notify the National Park Service and General Services Administration.

4. The Delaware Department of State agrees that the Delaware State Historic Preservation Office may at its discretion, without prior notice to the Delaware Department of State, convey and assign all or part of its rights and responsibilities contained herein to a third party.
5. This covenant is binding upon the Delaware Department of State, successors, and assigns in perpetuity. Restrictions, stipulations, and covenants contained herein shall be inserted by the Delaware Department of State verbatim or by express reference in any deed, lease agreement, or other legal instrument by which it divests itself of either the fee simple title or any other lesser estate in the Delaware Breakwater Light or any part thereof.
6. The failure of the Delaware State Historic Preservation Office to exercise any right or remedy granted under this instrument shall not have the effect of waiving or limiting the exercise of any other right or remedy or the use of such right or remedy at any other time.

02367 229

The covenant shall be a binding servitude upon the Delaware Breakwater Light and shall be deemed to run with the property. Execution of this covenant shall constitute conclusive evidence that the Delaware Department of State agrees to be bound by the foregoing conditions and restrictions and to perform to obligations herein set forth.

RECORDED OF DEEDS

99 MAR -8 AM 9:12

SUSSEX COUNTY
DOC. SURCHARGE PAID

Received

MAR 0 9 1999

ASSESSMENT DIVISION
OF SUSSEX CTY

EXHIBIT "B"
(Page 3 of 3)

4-15-99

State of Delaware
Div. of Historical & Cultural Affairs
401 Federal St. Dover, DE 19901

1976 nomination/listing

S.186

Form No. 10-300 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM

FOR OFFICIAL USE ONLY
RECEIVED
DATE ENTERED

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

1 NAME

HISTORIC Delaware Breakwater and Harbor of Refuge, National Harbor of Refuge

AND/OR COMMON Delaware Breakwaters and Lewes Harbor (Preferred Name)

2 LOCATION

STREET & NUMBER Cape Henlopen __NOT FOR PUBLICATION

CITY, TOWN Lewes X VICINITY OF One CONGRESSIONAL DISTRICT

STATE Delaware CODE 10 COUNTY Sussex COUNTY CODE 002

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
<input type="checkbox"/> DISTRICT	<input checked="" type="checkbox"/> PUBLIC	<input checked="" type="checkbox"/> OCCUPIED	<input type="checkbox"/> AGRICULTURE	<input type="checkbox"/> MUSEUM
<input type="checkbox"/> BUILDING(S)	<input type="checkbox"/> PRIVATE	<input type="checkbox"/> UNOCCUPIED	<input type="checkbox"/> COMMERCIAL	<input type="checkbox"/> PARK
<input checked="" type="checkbox"/> STRUCTURE	<input type="checkbox"/> BOTH	<input type="checkbox"/> WORK IN PROGRESS	<input type="checkbox"/> EDUCATIONAL	<input type="checkbox"/> PRIVATE RESIDENCE
<input type="checkbox"/> SITE	<input type="checkbox"/> PUBLIC ACQUISITION	<input type="checkbox"/> ACCESSIBLE	<input type="checkbox"/> ENTERTAINMENT	<input type="checkbox"/> RELIGIOUS
<input type="checkbox"/> OBJECT	<input type="checkbox"/> IN PROCESS	<input type="checkbox"/> YES RESTRICTED	<input type="checkbox"/> GOVERNMENT	<input type="checkbox"/> SCIENTIFIC
	<input type="checkbox"/> BEING CONSIDERED	<input checked="" type="checkbox"/> YES UNRESTRICTED	<input type="checkbox"/> INDUSTRIAL	<input checked="" type="checkbox"/> TRANSPORTATION
		<input type="checkbox"/> NO	<input type="checkbox"/> MILITARY	<input type="checkbox"/> OTHER:

4 OWNER OF PROPERTY

NAME Corps of Engineers, U. S. Army

STREET & NUMBER Customs House, Second & Chestnut Streets

CITY, TOWN Philadelphia ___ VICINITY OF Pennsylvania STATE

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC. Sussex County Court House

STREET & NUMBER The Circle

CITY, TOWN Georgetown STATE Delaware

6 REPRESENTATION IN EXISTING SURVEYS

TITLE Historic American Engineering Record

DATE 197- X FEDERAL ___ STATE ___ COUNTY ___ LOCAL

DEPOSITORY FOR SURVEY RECORDS Library of Congress

CITY, TOWN Washington STATE D.C.

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
<input checked="" type="checkbox"/> EXCELLENT	<input type="checkbox"/> DETERIORATED	<input checked="" type="checkbox"/> UNALTERED	<input checked="" type="checkbox"/> ORIGINAL SITE
<input type="checkbox"/> GOOD	<input type="checkbox"/> RUINS	<input type="checkbox"/> ALTERED	<input type="checkbox"/> MOVED DATE _____
<input type="checkbox"/> FAIR	<input type="checkbox"/> UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The breakwaters at Lewes reflect three stages of construction: the two-part original breakwater, the connection between these two parts, and the outer breakwater. All three breakwaters stand within the protective arm of Cape Henlopen, a long sandspit that forms the entrance to Delaware Bay. Protected by land on the west, the Cape on the south, and the two breakwaters on the east, the two harbors provide protection for ships of all sizes.

The first portion of the breakwater, begun in 1828, consisted of a rubble-stone icebreaker 1,700 feet long and a main breakwater 2,800 feet long. The fill is 160 feet wide at the base. The material is Brandywine granite, quarried along the Delaware River in New Castle County. The first lighthouse, completed in 1848, stood at the northeast end of the original main breakwater.

A federal signal station and a private telegraph station once occupied sites on the original breakwater.

The gap between the two original structures is filled by a similar stone structure that was begun in 1883 and finished in 1897. The connection across the gap differs from the original rubble breakwater in its squared-stone superstructure and the wooden mat on which it rests.

A newer breakwater, called the "National Harbor of Refuge," is also built of rubble stone, but the fill is more precisely arranged, permitting a steeper slope to seaward.

The new structure stands 6,500 feet farther north, on a shoal known as the Shears. Since it was built with steam derricks, its construction was more precise than the first, which was constructed by rolling rocks off the sides of barges. Dressed stones, some weighing 13 tons, were set in place on the superstructure. The breakwater is 8,040 feet long at the low water line and 7,950 feet long at the top.

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"/> 1600-1899	<input type="checkbox"/> ARCHITECTURE	<input type="checkbox"/> EDUCATION	<input type="checkbox"/> MILITARY	<input type="checkbox"/> SOCIAL/HUMANITARIAN
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> ART	<input checked="" type="checkbox"/> ENGINEERING	<input type="checkbox"/> MUSIC	<input type="checkbox"/> THEATER
<input checked="" type="checkbox"/> 1800-1899	<input checked="" type="checkbox"/> COMMERCE	<input type="checkbox"/> EXPLORATION/SETTLEMENT	<input type="checkbox"/> PHILOSOPHY	<input checked="" type="checkbox"/> TRANSPORTATION
<input type="checkbox"/> 1900-	<input type="checkbox"/> COMMUNICATIONS	<input type="checkbox"/> INDUSTRY	<input type="checkbox"/> POLITICS/GOVERNMENT	<input type="checkbox"/> OTHER (SPECIFY)
		<input type="checkbox"/> INVENTION		

SPECIFIC DATES 1828, 1883, 1896

BUILDER/ARCHITECT William Strickland, Simon Bernard and others

STATEMENT OF SIGNIFICANCE

Superlative adjectives have been used to describe the engineering feat represented by the breakwaters at Lewes. The recent Delaware HAER catalogue says that the inner breakwater was "the first structure of its kind in the Western Hemisphere."

While its priority may be argued, the breakwater was nonetheless a major contribution to the progress of American engineering, executed by a major figure in engineering history, and conceived on a scale seldom considered before in America.

Cape Henlopen was a dangerous anchorage for sailing ships from the time of earliest settlement. Henry Hudson, in his voyage of discovery, chose not to sail up Delaware Bay because of the shoals. Hens and Chickens Shoal, on the ocean side of the Cape, was one of the first American sites to be marked by a lighthouse. The harbor formed by Cape Henlopen was inadequate protection against storms. Ships that anchored in the lee of the Cape were often driven onto the beach or up the Bay to the shallow bars. The need for an artificial harbor became clear, as deeper-draft shipping increased early in the nineteenth century.

Congress appropriated funds for an initial study in 1822. To carry out the reconnaissance, a board of three officers was appointed, including the foremost engineers of the day. General Simon Bernard, lately a brigadier-general in the French army, had been employed at the recommendation of Lafayette to be chief engineer of the U.S. Army. Major J. G. Totten, his assistant, had been the first professor of mathematics at West Point. Commodore William Bainbridge, the naval member, was one of the senior commanders in the Navy, and an expert on coastal fortification. Their report, recommending a large and permanent harbor, resulted in a construction appropriation in 1828. To build the breakwater, another commission was formed, consisting of General Bernard; Commodore John Rodgers, the ranking captain in the Navy; and William Strickland, a Philadelphia architect who had recently resigned as chief engineer of the eastern division of the Pennsylvania mixed transportation system. Strickland would survive the other commissioners, finally completing the project in 1841.

Even before the breakwater was completed, it saved many ships from disaster. During the years that followed, more and larger ships crowded behind the breakwater, taxing its anchorage space to the limit. The 1877 storm, in which more than 200 vessels took shelter there, proved that the old breakwater was becoming obsolete. Several large craft, unable to get into the harbor, were lost in the storm. In 1883, Congress responded to the need by providing for a new structure to close the gap between Bernard and Strickland's two breakwaters. Work progressed slowly on the connection, which was not finished until 1897.

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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

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CONTINUATION SHEET

ITEM NUMBER 8 PAGE 2

Another disastrous storm in 1889 and increases in the drafts of oceangoing ships accented the need for a larger and deeper harbor. Finally in 1896, Congress authorized the new "National Harbor of Refuge" farther offshore.

Both breakwaters have served as models for similar structures elsewhere. The random stone breakwaters at San Pedro, California and Sandy Bay, Massachusetts are among the projects that followed the Delaware examples.

< The last major structure to be built in the breakwater complex was the series of ten stone icebreakers to the north of the outer breakwater. They were added to the project in 1900, to protect ships in the harbor from floes coming down the bay. The United States Army Corps of Engineers administers the breakwater complex today.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

- HAER Delaware Inventor, 1975.
 Gilchrist, Agnes Addison. William Strickland, Architect and Engineer, 1788-1854.
 New York: Da Capo Press, 1969.
 Scharf, J. Thomas. History of Delaware. Philadelphia: L. J. Richards & Co., 1888.
 Strickland, William. Reports on Canals, Railways, Roads, and Other Subjects,
 Philadelphia 1826.

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY 1.000
 UTM REFERENCES

A	1,8	4,9,2	0,0,0	4,2,9,8	6,5,0	B	1,8	4,9,2	0,0,0	4,2,9,4	00,0
	ZONE	EASTING		NORTHING			ZONE	EASTING		NORTHING	
C	1,8	4,8,9	5,8,0	4,2,9,4	0,0,0	D	1,8	4,8,9	5,8,0	4,2,9,8	6,5,0
	ZONE	EASTING		NORTHING			ZONE	EASTING		NORTHING	

VERBAL BOUNDARY DESCRIPTION

The nominated property consists of three parts: the inner breakwater, the Delaware Breakwater, and the row of icebreakers.

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: Edward F. Heite, Historic Registrar
 ORGANIZATION: Div. of Historical & Cultural Affairs DATE: January 1976
 STREET & NUMBER: Hall of Records TELEPHONE: 302-678-4564
 CITY OR TOWN: Dover 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 National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

Lauren C. King

TITLE Director

DATE 3/22/76

FOR NPS USE ONLY

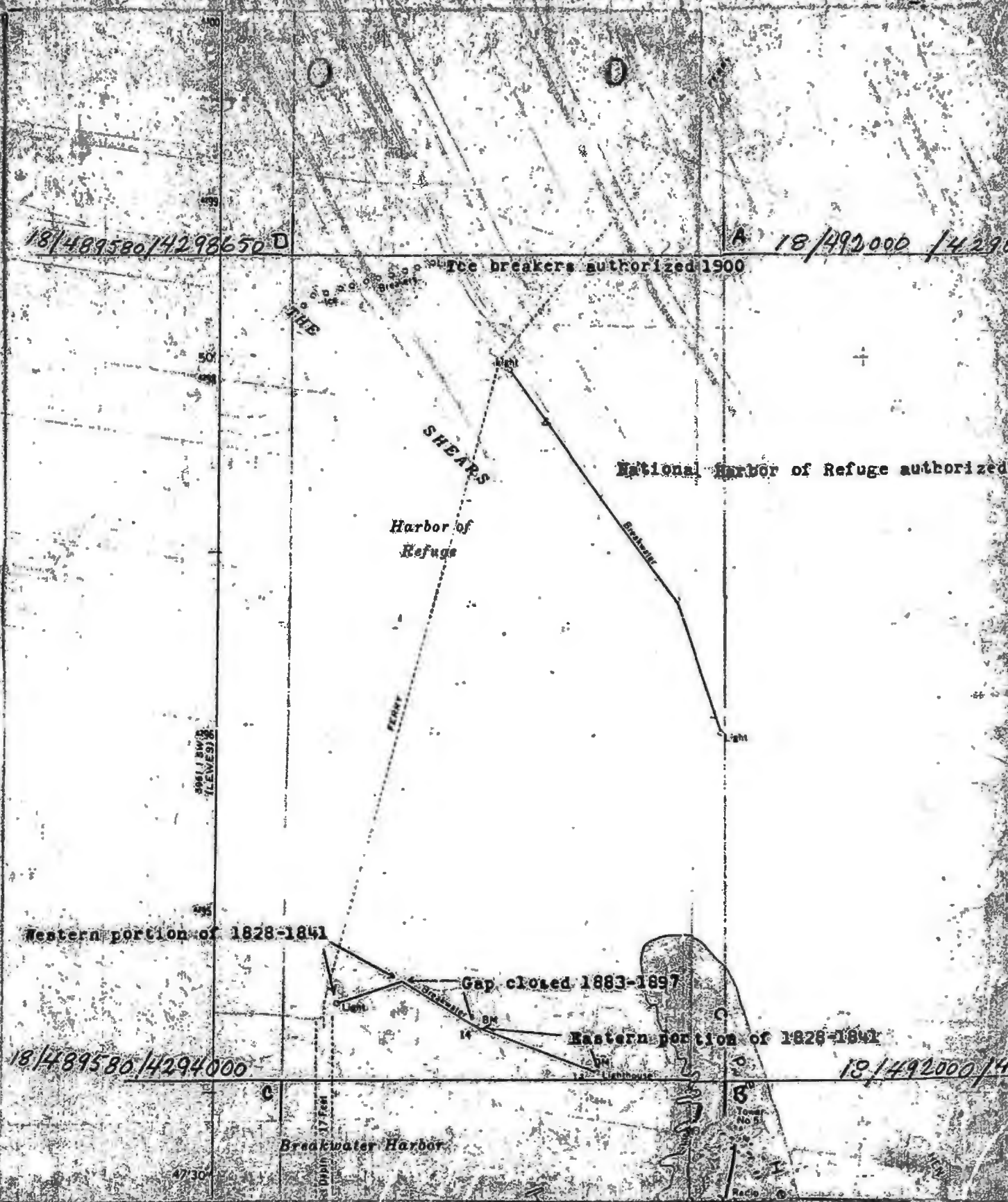
I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
 ATTEST:

DATE

KEEPER OF THE NATIONAL REGISTER



A 18/492000 / 4298650

authorized 1900

National Harbor of Refuge authorized 1896

1883-1897

Eastern portion of 1828-1841

18/492000 / 4294000

6
Tower
No 5

I
Radio

Lighthouse

(5)

McCabe Russ (DOS)

From: Susan Abbott [susan.abbott@nara.gov]
Sent: Tuesday, September 28, 2004 3:37 PM
To: McCabe Russ (DOS)
Subject: Re: Lighthouse Keepers

Dear Mr. McCabe:

Your email was forwarded to me by Howard Lowell. I checked the Registers and located the following additional information about Pernel B. Norman, Robert Salmons, and the Keepers and Assistant Keepers at the Delaware Breakwater East End Lighthouse:

Pernel B. Norman resigned as Keeper of Delaware Breakwater September 20, 1889. Robert Salmons was promoted to Keeper of Delaware Breakwater September 23, 1889. Norman was nominated as Acting Keeper of the Delaware Breakwater Rear Light March 12, 1890. He was given the full appointment April 10, 1891.

Keepers at Delaware Breakwater East End Lighthouse

Keeper Willard H. Hall (nominated October 21, 1885, served until 1896) Keeper William J. Salmons (nominated February 21, 1896)

Assistant Keeper William J. Salmons (nominated October 21, 1885) Assistant Keeper Charles E. Marshall (nominated October 19, 1891) Assistant Keeper Edward Long (nominated February 7, 1894)

In the course of checking the Registers I located correspondence relating to Robert W. Salmons' nominations and promotion. If you would like copies of this correspondence please send me your street address.

If you have any other questions regarding lighthouses, lifesaving stations, revenue cutter service or any other maritime records please don't hesitate to send me an email.

Finally, I think our families are well acquainted. My parents are Howard and Kelly Abbott of Georgetown, DE. I believe your parents are regular attendees at their annual Christmas party. I don't know if we've ever met, I'm generally tied up with bartending duties on these occasions, but I'm pleased to make your acquaintance via email.

Sincerely,

SUSAN ABBOTT
Old Navy and Maritime Records
Textual Reference Division
National Archives and Records Administration

>>> "McCabe Russ (DOS)" <russ.mccabe@state.de.us> 09/27/04 03:50PM >>>

Hi Howard. Hope all is well. I am in need of some direction/assistance.

On Thursday, September 30, Secretary of the Interior Gale Norton will be in Lewes to sign a deed transferring ownership of the Harbor of Refuge Lighthouse to the Delaware River & Bay Lighthouse Foundation. During the same ceremony, the lease for the Delaware East End Breakwater Lighthouse will be transferred to the Foundation by the River & Bay Authority (who have been the lessees of the light since ownership was transferred from the federal government to the State of Delaware in 1999). Big shock and surprise - we will be unveiling two markers concerning the lighthouses during the event (my first-ever sheet-pulling with a cabinet secretary).

Both properties are a part of the National Harbor of Refuge Historic District (listed in the National Register). In working with the Foundation to develop related documentation/information, a question has arisen concerning the East End Lighthouse. Long story short - there was another/earlier lighthouse on the Delaware Breakwater at the time

of construction in 1885. We have a piece of correspondence from NARA (27 November 1985) - Juridical, Fiscal and Social Branch, Civil Archives Division - stating that per "the registers of Lighthouse Keepers and Assistant Keepers" - one Purnell B. Norman was appointed assistant keeper of the "Cape Henlopen Breakwater Light" on 10/16/1869. He was promoted to keeper in 1877 and was removed from service at the end of the first quarter in 1890. We have another record from 1889 that indicates that a Robert Salmons was serving as assistant keeper under Norman at that time. Since there were two lighthouses on the inner breakwater from 1885 until the early 20th century - we are uncertain as to whether Norman and Salmons were the keepers of both lights when the East End light was built in 1885 - or if additional keepers were appointed. The aforementioned 1889 item is a letter mentioning the rescue of a ship's crew and the "lighthouse" - and we would like to use it in our PR packet - we're just not sure which light/lights Norman and Salmons were responsible for at the time (and if they weren't the keepers of the newer light, who was?). If you could forward this inquiry to the appropriate folks - and it isn't too difficult to check the registers to clear this up - I will, once again, be in your debt. Speaking of which, don't forget my rain check for coffee next time your down my way. Take care and many thanks.

Russ

1988 nomination listing
Amendment to boundary

United States Department of the Interior
National Park Service

National 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	Category of Property	Number of Resources within Property	
<input checked="" type="checkbox"/> private	<input type="checkbox"/> building(s)	Contributing	Noncontributing
<input type="checkbox"/> public-local	<input checked="" type="checkbox"/> district	<u>1</u>	<u>1</u> buildings
<input type="checkbox"/> public-State	<input type="checkbox"/> site	<u>1</u>	<u>0</u> sites
<input checked="" type="checkbox"/> public-Federal	<input type="checkbox"/> structure	<u>XX 17</u>	<u>X 2</u> structures
	<input type="checkbox"/> object	<u>0</u>	<u>0</u> objects
		<u>XX 19</u>	<u>X 3</u> Total

Name of related multiple property listing: NA

Number 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 John K. Kern

Date 12/22/1988

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 NA

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.

See continuation sheet

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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 Refuge [.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.

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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

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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

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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.

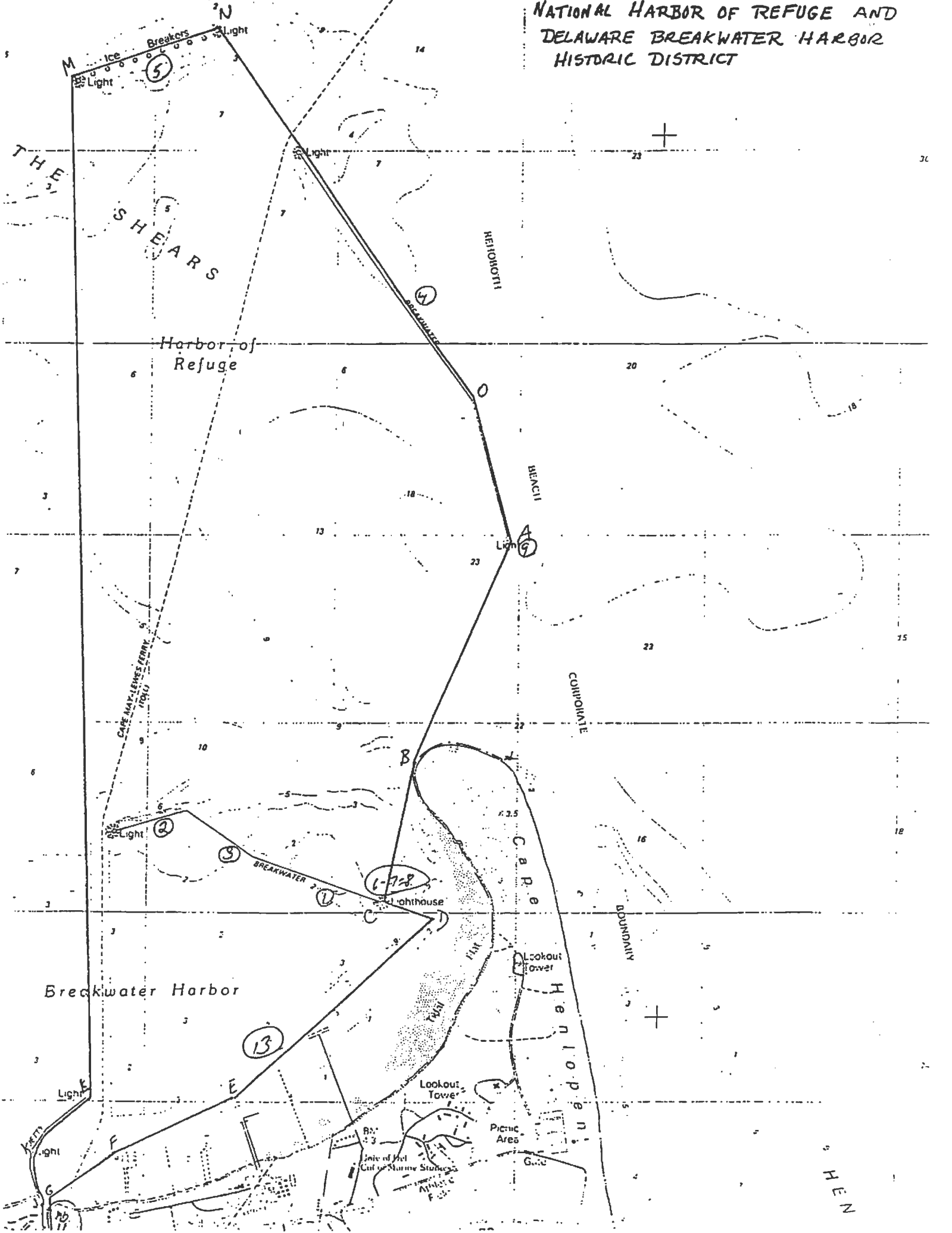
A feature of the entire complex is a turning basin [.13] that was dredged within the inner Breakwater Harbor. It is only apparent on nautical charts and is not shown on local or USGS maps. The turning basin provides a clear safe area for large vessels to maneuver without fear of running aground. The 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.

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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

NATIONAL HARBOR OF REFUGE AND
 DELAWARE BREAKWATER HARBOR
 HISTORIC DISTRICT



THE SHEARS

Harbor of Refuge

Breakwater Harbor

HENLOPEN

BIENCI

COUPONATE

Cape

HENLOPEN

HEN

CAPE MAY LEWIS FERRY

Lighthouse

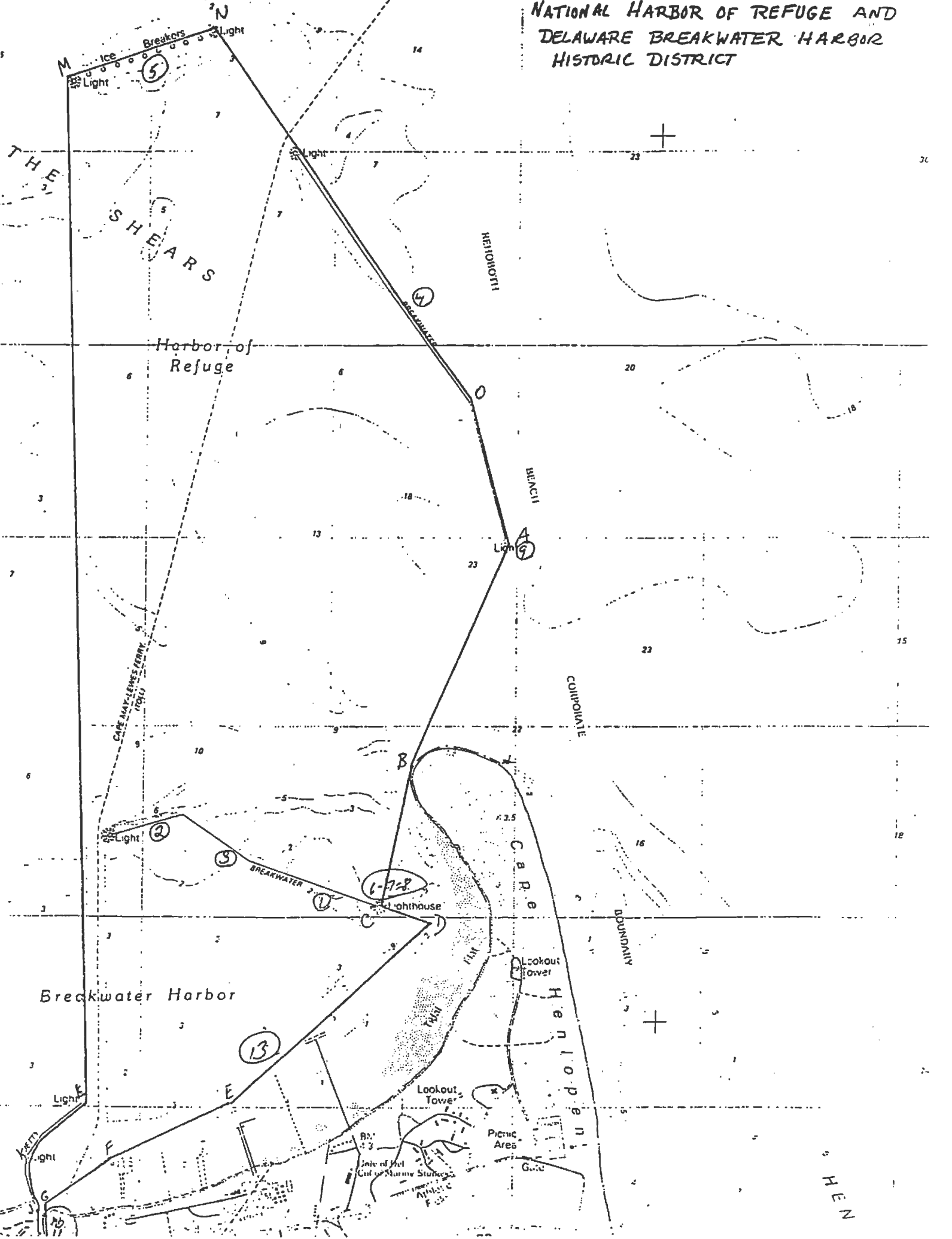
Lookout Tower

Lookout Tower

Picnic Area

Site of the
 Cut-up Marine Station

Garage



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

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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.

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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

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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

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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

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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.

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National Park Service

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A 18/491960/4295950
B 18/491450/4294790
C 18/491300/4294050
D 18/491560/4293960
E 18/490490/4293020
F 18/489840/4292740
G 18/489510/4292490
H 18/489520/4292240
I 18/489490/4292230
J 18/489490/4292440
K 18/489410/4292720
L 18/489710/4293020
M 18/489670/4298390
N 18/490330/4298640
O 18/491760/4296720

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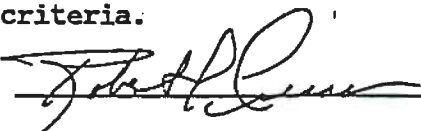
National Register of Historic Places Continuation Sheet

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National Harbor of Refuge/Delaware Breakwater Historic District, Lewes
Delaware

In my opinion, the property meets _____ does not meet the National
Register criteria.

Signature



Name Robert Crecco

Title/Agency Historic Preservation Officer, U.S. Department of Transportation

Address 400 7th Street, S.W., Washington, D.C. 20590

Date 2/22/89

United States Department of the Interior
National Park Service

RECEIVED

JAN 18 1989

Archaeology & Historic
Preservation

National Register of Historic Places
Continuation Sheet

Section number _____ Page _____

National Harbor of Refuge/Delaware Breakwater Historic District, Lewes
Delaware

In my opinion, the property X meets _____ ~~does not meet~~ the National
Register criteria.

Signature James W. Hand

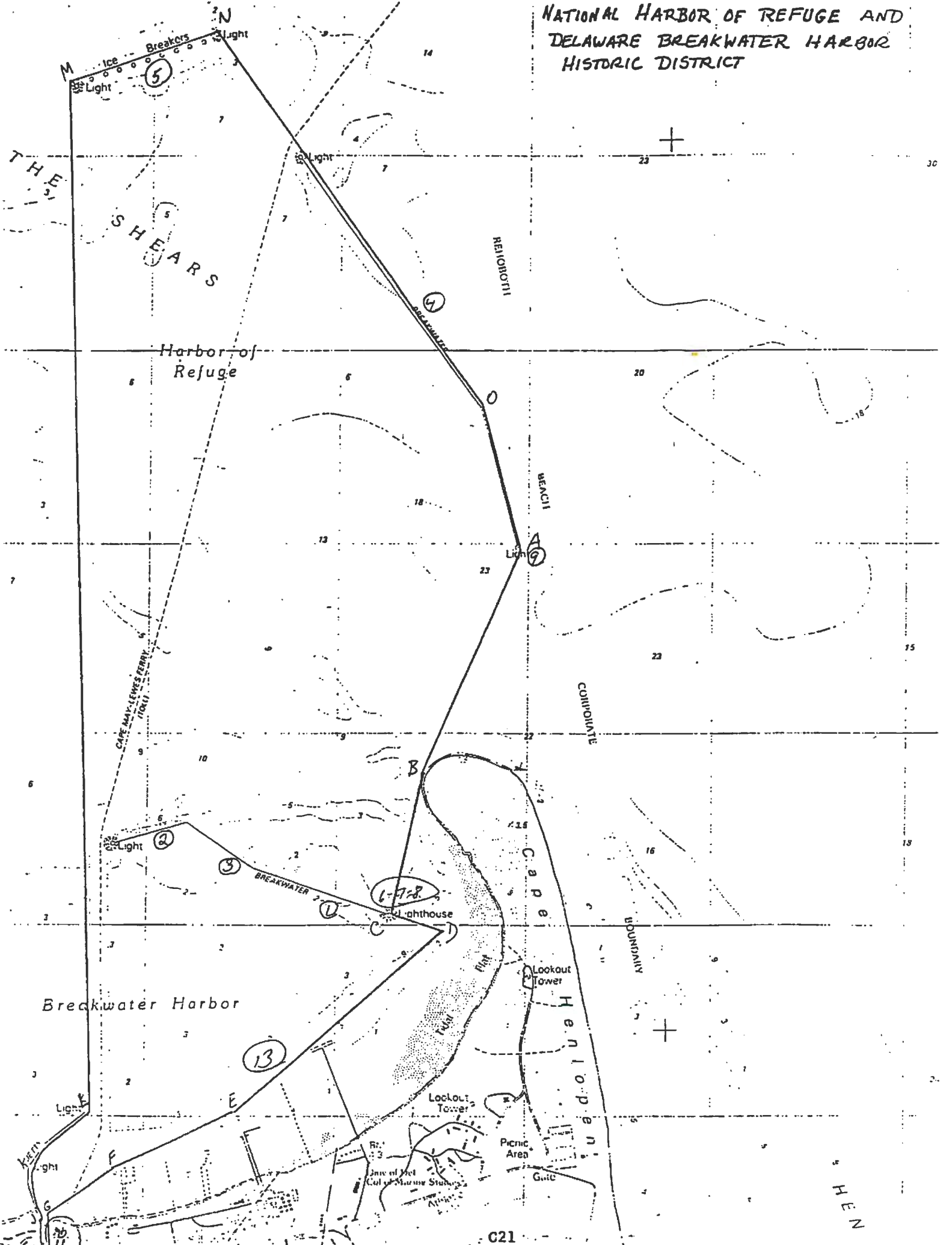
Name JAMES W. HAND

Title/Agency ENVIRONMENTAL MGR./CORPS OF ENGINEERS

Address 20 MASSACHUSETTS AV., WASH., D.C. 20314

Date 11 JANUARY 1989

NATIONAL HARBOR OF REFUGE AND
DELAWARE BREAKWATER HARBOR
HISTORIC DISTRICT



C21

United States Department of the Interior
National Park Service

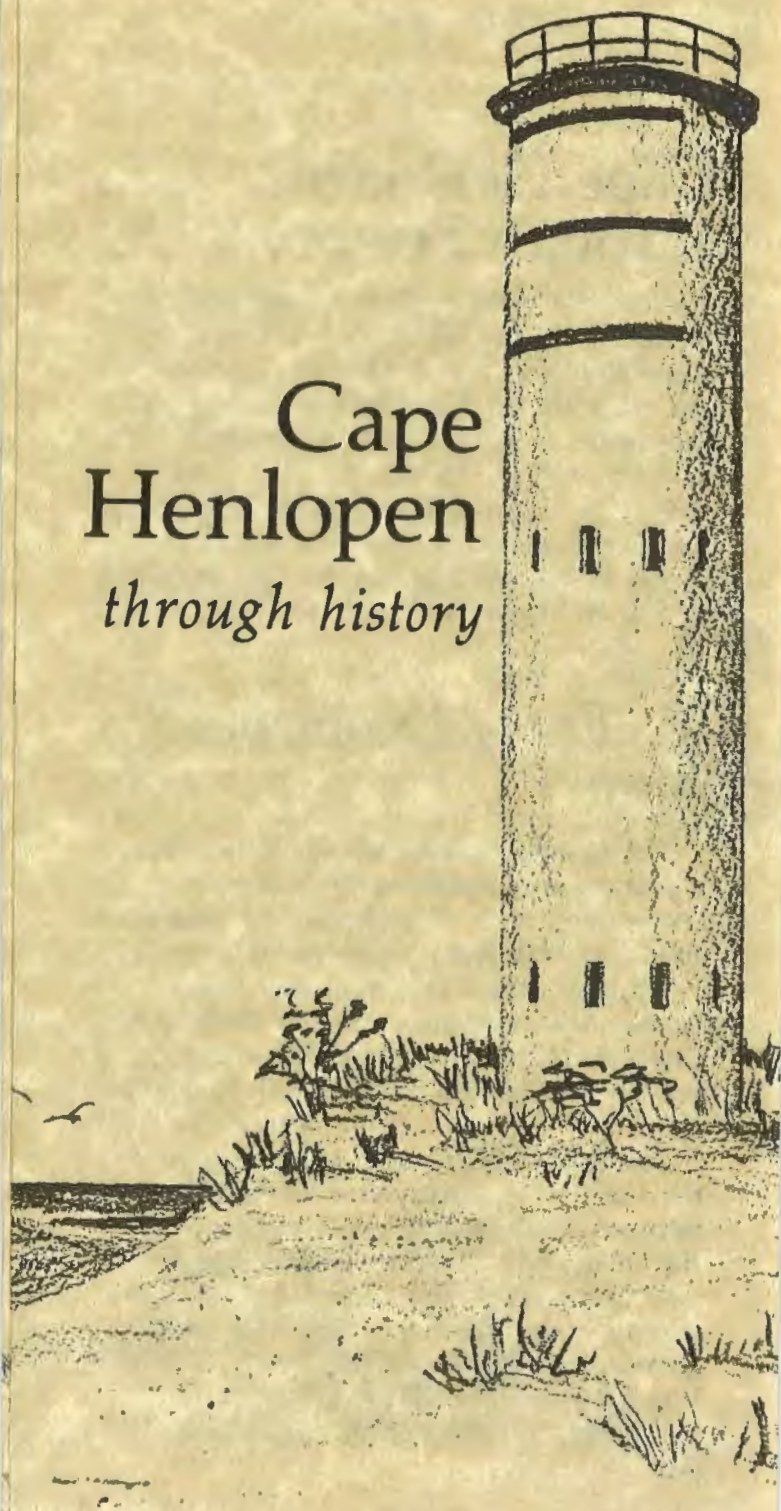
National Register of Historic Places
Continuation Sheet

Section number 7 Page 6

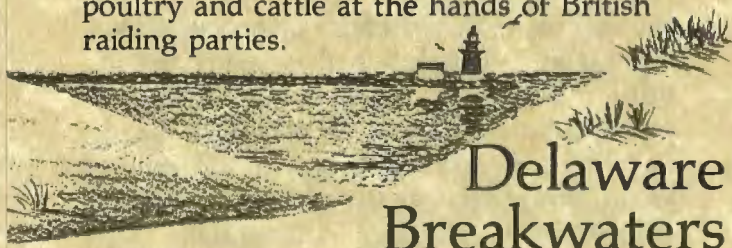
Contributing and Non-contributing Resources

<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

Cape
Henlopen
through history



of 1813, a British fleet occupied the mouth of the Delaware Bay. Its intent was to strangle the maritime trade of Wilmington and Philadelphia. The English invaders demanded fresh food and water from the townspeople of Lewes. The citizens refused and on April 6, 1813; the British began a long-range naval bombardment of Lewes. Trees on marshes obstructed the view of the enemy and damage to the town was minor. American militia assembled on the beach discouraged would-be landing parties. Until hostilities ceased, small farms along the Delaware shores continued to suffer great losses of sheep, poultry and cattle at the hands of British raiding parties.



Delaware Breakwaters

The two lengths of stone barriers which form the harbor of Lewes are commonly known as the "Delaware Breakwater." But officially, the inner harbor is the Delaware Breakwater and the outer one, more than twice the former's length, is the "Harbor of Refuge." Each barrier has its own navigation lights which are visible from shore. As in the case of the Henlopen Lighthouse, the mounting loss of life and cargo along the Delaware coast sparked the merchants and ship owners of Philadelphia and Wilmington to petition and receive federal assistance in the building of a shelter for vessels at the mouth of the Delaware Bay. Construction on the inner barrier began in 1828, and was completed about 1839. Work on the outer breakwater began in 1892 and ended in 1898. Together they provide acres of safe anchorage for vessels.

Lantern on Lewes

Where the Past is Present

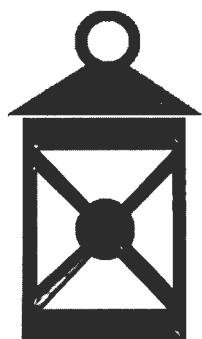
Stories of Historic Lewes, Delaware

Told in a Lively Manner

by

Hazel D. Brittingham

Hazel D. Brittingham



Design and Layout
Elaine Ippolito

The Delaware Bay Breakwaters

For almost a century, mariners inward-bound from Atlantic voyages have been greeted by a pair of lighthouses at the entrance to Delaware Bay. Just off Lewes and within the curve of Cape Henlopen, the East End Light beamed illumination to men of the sea from 1885; while in water of greater depth the Harbor of Refuge Light served the same purpose from 1901. (Both lighthouses were decommissioned in 1996.) Each tower rests on the eastern end of a massive granite breakwater. They may be seen at a relatively close range from land at the birdnesting area at Cape Henlopen State Park.

The haven formed by the two breakwaters is often spoken of locally as the Harbor of Refuge. Technically, the inner breakwater (also called the first or old breakwater) is the Delaware Breakwater; its construction got underway in 1828. It was initially composed of two sections—the breakwater and an ice breaker pier—separated by a gap measuring 1350 feet. The breakwater is anchored by the East End Light, the rust-colored conical structure on a circular concrete base.

The interval between the first breakwater and the ice breaker was closed by work performed during the last two decades of the 1800s. Simultaneously, construction was commenced on a new and enlarged harbor—the outer breakwater also called the second or new breakwater—but officially listed as the National Harbor of Refuge. Completed by 1901, its terminus has been home to the Harbor of Refuge Light, the current structure being the white cylindrical tower rising above a substantial black base.

The following is an account of the construction of the two breakwaters that present a formidable feature in Lewes's coastal portrait and figure prominently in its maritime history.

The Inner Breakwater

In addition to encountering the shoal-laden Delaware Bay, ships heading upriver, many to the port of Philadelphia, were ever at the mercy of storms and in special peril at the trysting place of ocean and bay. The need for a sanctuary for sailing vessels caught in storms, or otherwise temporarily detained, prompted merchants and mariners to look to the federal government for assistance in the construction of such a shelter. After untold numbers of attempts and urgings, promoters found an ally in America's sixth president, John Quincy Adams, who favored large internal improvement projects and supported the idea of an artificial harbor off Lewes. Congress first appropriated funds in 1828, and contracts were let for stone from the Palisades in New York's Hudson River. (Eventually, all stone for the breakwaters and ice breakers came from the Brandywine area in upper Delaware.)



Early view of East End Lighthouse

An architect and engineer, William Strickland of Philadelphia, was appointed chief engineer to superintend



*1890 view of Strickland Lighthouse (left) and
Signal Station of Philadelphia Maritime Exchange*

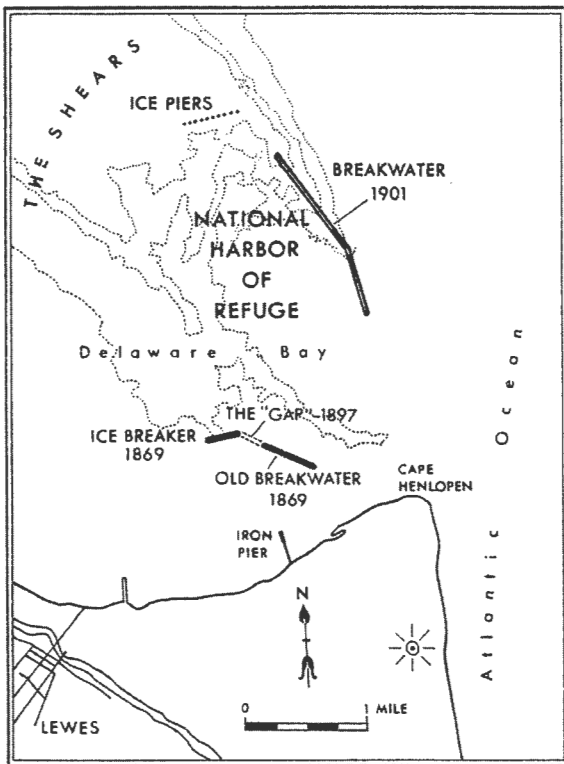
the construction of two detached barriers—a breakwater and ice breaker pier of his own design. At first, stones of about 1/4 ton were used but soon were found to be too small to furnish an adequate base. When boulders ranging from 2 1/2 to 6 tons were found suitable, improved machinery for handling them was required. Strickland is credited with designing the man-powered crane put to use in 1831.

Trial and error reigned since there was no precedent on which to rely. The work season, restricted because of weather conditions, generally ranged from April through September. Adverse winds were matched by the uncertainty of Congress's willingness to provide a constant flow of money. Work, which stalled during 1834 because of lack of appropriation, proceeded at a reduced pace when resumed. Shoaling was experienced, and anticipated completion dates were set, passed, and forgotten.

By 1840, approximately 90 percent of the original intent of the project had been met, but the final date of completion was not until 1869 when the design height of 14 feet above low water was attained. Records of the Corps of

Engineers cite the breakwater as 2586 feet at its base which averages 160 feet in width, with a top width of 22 feet, and the ice breaker pier as running a distance of 1400 feet. Additionally, the Corps claims that the project was the second greatest structure of its kind in the world, on a par with the Plymouth, England, breakwater. Building of this precedent-setting structure in America spanned the terms of a dozen presidents and cost over two million dollars.

Another Strickland signature was placed on the project when he designed a stone and concrete lighthouse built at the then-western end of the barrier. Called the



*Courtesy of U. S. Army Corps of Engineers,
Philadelphia District*

Strickland Lighthouse, it was on station from 1838 until 1903, and the structure performed other maritime duties until 1942. It has been removed.

Even prior to completion of the first breakwater, larger ships were beginning to find the protected area too shallow to navigate. However, the haven served well in time of need, and it is known that by 1840 approximately 25 vessels used it daily. Within a few hours of storm threats, over 200 ships crowded into the harbor. One writer of the day described such a time as presenting “a forest of masts moving and swaying to and fro as trees bent into the wind.”

A temporary light on the eastern end of the breakwater was replaced in 1885 by the East End Light which took over lighthouse duties earlier performed by the Beacon located on the point of Cape Henlopen. (This Beacon is not to be confused with the older and more lofty Cape Henlopen Lighthouse which fell seaward in 1926, ending a 160-year career of cautioning seamen of the dangerous shoals and the restless sandy cape at the bay entrance.)

Closing the Gap

The 1350-foot space between the inner breakwater and its ice breaker pier was found to cause tidal action that greatly diminished the harbor’s effectiveness. After years of discussion, studies, and political pleas, money was appropriated to close the gap. Approved in 1882, work continued until 1898. A steam derrick for handling ever-larger boulders allowed more precision and economy in the process. This construction, and that of the new and larger breakwater to follow, utilized a brush mattress foundation; the mats were woven from pine trees cut at Cape Henlopen.

The Outer Breakwater and Ice Breakers

A new and larger outer breakwater to run for about 1 1/2 miles and to include a series of ice breakers at its upper end for the purpose of breaking up ice floes, was authorized by Congress in 1896. The construction, placed 6500 feet north of the inner barrier, was completed on December 11, 1901. The steam derricks handling the stone allowed the use of boulders weighing up to 13 tons which were placed in a step arrangement to reduce the intensity of wave action. The dressed stone provided a more regular appearance than that of the Delaware Breakwater.

The length of rock measures 7950 feet at water level and extends to a depth of about 50 feet; the top surface is 40 feet wide. The cost was some over two million dollars. Names closely associated with the latter project include those of Col. C. W. Raymond, officer in charge of the Philadelphia District, U.S. Army Corps of Engineers, and a noted marine engineer, J. F. Hasskarl.

The Harbor of Refuge Light was built as soon as the breakwater base was ready, and it assumed the job of illumination previously furnished by the Strickland Lighthouse. According to varied accounts of the amount of stone required to build the breakwaters and ice breakers, it appears that slightly under 2 1/2 million tons of granite were delivered to the work sites by water transportation during a time span from 1828 until after the arrival of the 20th century.

Neither stretch of the sea-surrounded stone is laid in a straight line; each is angled. Some evidence of the configuration may be seen by travelers using the Cape May-Lewes Ferry. When leaving Lewes, the vessels normally follow a route through the National Harbor of Refuge, emerging between the outer breakwater and its archipelago of ice breakers.

Recently accepted for inclusion on the National Register of Historic Places is the complex titled National Harbor of Refuge and Delaware Breakwater Harbor Historic District. This nautical district is a “first” on the Register and includes not only the breakwaters, their lighthouses and the ice breakers, but the former Coast Guard Station now owned and used by the Pilots Association of the Bay and River Delaware.

And what of today and the role played by the breakwaters in modern-day shipping? In this era when tankers range as much as four times the length of those early 200-foot-long sailing schooners and do not require refuge, the haven offered between the granite structures continues to serve. Not only recreational fishing boats, but ships of medium size and small coastal craft in pursuit of their trades find the shelter helpful.

The bulwarks of stone remain changeless during times awash in a sea of change.



*View of the first Harbor of
Refuge Lighthouse.
Damaged by a storm in
1920, it was replaced by a
new structure in 1926.*