Form No. 10-306 (Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR FEDERAL PROPERTIES

FOR NPS USE ONLY
RECEIVED ~~JUL 26 1984~~ SEP 18 1984
DATE ENTERED OCT 31 1984

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

1 NAME

HISTORIC: Carysfort Lighthouse

AND/OR COMMON:

LOCATION

STREET & NUMBER: Key Largo National Marine Sanctuary — __NOT FOR PUBLICATION

CITY, TOWN: X VICINITY OF Key Largo — CONGRESSIONAL DISTRICT:

STATE: Florida — CODE: 12 — COUNTY: Monroe — CODE: 87

CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	__OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	X UNOCCUPIED	__COMMERCIAL	__PARK
X STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
__OBJECT	__IN PROCESS	X YES: RESTRICTED	X GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	__YES: UNRESTRICTED	__INDUSTRIAL	X TRANSPORTATION
	N.A.	__NO	__MILITARY	__OTHER:

AGENCY

REGIONAL HEADQUARTERS: *(If applicable)* Office of Ocean and Coastal Resource Management

STREET & NUMBER: 2001 Wisconsin Avenue, N.W.

CITY, TOWN: Washington — VICINITY OF — STATE: D.C.

LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.: N.A.

STREET & NUMBER:

CITY, TOWN: — STATE:

6 REPRESENTATION IN EXISTING SURVEYS

TITLE: N.A.

DATE:

__FEDERAL __STATE __COUNTY __LOCAL

DEPOSITORY FOR SURVEY RECORDS:

CITY, TOWN: — STATE:

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
__EXCELLENT	__DETERIORATED	X UNALTERED	X ORIGINAL SITE
__GOOD	__RUINS	__ALTERED	__MOVED DATE_____
X FAIR	__UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The Carysfort Lighthouse is a wave-swept, iron skeleton tower structure built in 1852 at Carysfort Reef, 12 miles northeast of South Channel, Key Largo, Florida. Situated at latitude 25° 13' 17", Longitude 80° 12' 40", the lighthouse is within the boundaries of the Key Largo National Marine Sanctuary.

The foundation level of the structure consists of a central and eight peripheral vertical iron screw piles that describe an octagon, 50' wide, pile to pile. The construction rises from this level as a five story octagonal pyramid to the light, the focal plane of which is 106' above mean low water. A two-story keeper's quarters is 24' above the foundation level, contained within a circular enclosure made up of 24 curved iron plates. The skeltal structure is braced with lateral iron girts and iron diagonal and radial tie-bars, resulting in a light-house that has needed only minimal repairs (1906, 1929, 1966, and 1975) over its 130 years of continuous operation as a first-class seamark.

Carysfort Reef consists of a hard upper crust, primarily elkhorn and staghorn corals, over a calcareous sand layer, a soil condition that virtually dictated the use of screw piles for the foundation construction. Based on a drawing copied by the Office of the Lighthouse Board in 1875, the screw piles used here consisted of 13" hollow iron shafts with a steel tipped, 22" diameter auger-like bit of two complete turns. The nine foundation piles were literally screwed through the coral and sand crust to a depth of 10'. They were then capped with 4'0"D iron disks, each of which weigh, according to the drawings, 1692 pounds. The hollow shafts were used to house 9"D iron piles which extend the full depth of the screw pile and the foot-plates and rise to a height of 15'11". The eight peripheral piles are capped with cast iron angle sockets with 20" bulbous connectors that accept the iron lower chords, girts and radial beams of the skeleton. The foundation level of the lighthouse is cross-braced with 2"D iron ties with turnbuckles, the ties running from the outer piles to the central pile. The central pile is capped with a 3'D cast iron socket, semi-circular in section, with 12" deep, 4"D bored sleeves to recieve the radial beams extending from the peripheral piles.

When built, the foundation level of the lighthouse was provided with a full deck consisting of 3" x 12" timbers bolted to 6" x 8" joists that rested on the iron girts and radial beams. At this time, only two wedge shaped sections remain, one to either side of the due-north pile. The existing deck is later and is bolted to the iron structure. A 5' x 8' section of the northeast quadrant is missing.

The open space between the foundation level deck and the two-story keeper's quarters is 24' in height, and tapers in plan from the 50' octagon to one of 43'8" at the lower level of the enclosed space above. The iron peripheral piles are 29'6" long and extend through elaborate, 20" deep cast iron knees at the underside of the second floor, where they fit into 4' long cast iron sleeves. The piling above this level is reduced in diameter to 7" and continues above the roof of the quarters.

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The central pile terminates in an 8'0" D cast iron socket that has an 11" deep outer ring connected to the 11" D central housing by eight spoke-like ribs. A collar above the center socket is cast to receive sixteen wood floor joists, which are let into the upper part of the collar and rest on iron stirrups.

Entrance to the two-story keeper's quarters is provided through a later, counterweighted iron trap door, which is reached by a ladder and a suspended stair from the deck below. Originally, the suspended stair had a catwalk and was served by a graceful iron spiral stair arranged around the central pile. The spiral stair was lost in a hurricane in 1929 and was replaced with a wood ladder. The existing steel ladder dates from the 1950's. The keeper's quarters is in the form of a truncated cone, with two rings of 24 curved iron plates at each level forming the exterior walls. The first floor level is 17" above the bottom edge of the lower plates, the second floor level 17" above the seam between the two rings. The lower level has a loading door in the north-northeast quadrant, seven rectangular window openings and sixteen 12" portholes (installed in 1906). The upper level has four full height, double doors alternating with four double casement type windows. All door and window openings at both levels have iron or iron-clad full sized paired shutters, now spot welded closed.

Photographic and documentary evidence shows that an exceptional cast and wrought iron balcony once surrounded the keeper's quarters at the second floor line. A 5'0" wide walkway was enclosed by a 3'6" rail that consisted of a flat handrail and three part wrought iron balustrade. The upper part of the balustrade was composed of scallop-on-scallop grillework, joined with ball connectors to 22" tall square iron balusters. The lower band, set 5" above the walkway, had an open, 6" tall diamond pattern. Records indicate that the balcony was in deteriorated condition in the mid 1950's and was unused. It was destroyed by Hurricane Donna in 1966. Drawings copied in 1874 from the original (1848) drawings show a second iron balustrade,along the edge of the roof of the keeper's quarters No other evidence of this feature has been found-the roof was rebuilt in 1929, obliterating any possible scars of the balustrade. The roof of the two-story enclosed section is constructed of iron plates, tapering from 16" at the stair enclosure to 6'10" at the outer edge. A rain collector that gathered water for the storage tanks in the first level was removed in 1975.

The interior of the lower level of the keeper's quarters is an open plan, dominated by a concentric ring of six large iron storage tanks (originally 4 water and 2 oil)clustered around the central column. The tanks are 5'0" high, create a circle 14' in plan, are flat roofed and are provided with circular inspection plates in the upper part of each 600 gallon segment. The first floor is constructed of three concentric

rings of iron plates, the plates bolted together on the underside of the floor. The outer ring of plates does not meet the wall, with 8" open space between the foor and exterior plates. This may indicate that the interior of the lower level was originally finished in some fashion, as shown in drawings dated as late as 1950. No evidence, architectural or otherwise, has come to light to document this treatment, and the walls are now protected with a painted-on mastic compound. The open space continues through the second floor cavity, permitting air to circulate from below the lower floor to and through the roof of the two-story construction. The eight peripheral piles are inset 9" at the floor level so that they would be clear of any interior wall treatment, and terminate the the exposed underside of the rolled iron plate second floor at heavy cast rion knees. Access to the upper level is by a ladder-stair constructed of steel channels and diamond plate treads, obviously latter but probably replacing a similar stiar of wood. Ceiling height in the lower level is 6'6".

The upper level, which was the keeper's apartment, retains virtually all of its 1852 fabric, with only minor, reversible later alterations. The plan remains as one of four essentially equal sized spaces set off with full height partitions at the cardinal points, except that the northerly wall is 15° east of north. The walls running from the central enclosed stair that reaches the light tower to the north and to the east are provided with double doors, each leaf four raised panels in design (Grecian ovolo sticking) with molded architraves. Both units remain. The walls running to the south and the west have single, four panel doors centered in the wall originally. The door in the west wall has been moved towards the central stair enclosure. This enclosure had a similar single door, now removed. There is a double door in the exterior wall of each of the four spaces, each leaf with two glazed panels over a single raised panel, and each space has a window consisting of paired casements, three lights in each sash. The doors extend into the room areas in enclosed vestibules, with a built-up threshold and floor, with a screen door at the outer edge of the jamb liners, and paired iron shutters. The doors opened to the now removed balcony.

The exterior walls are sheathed with tongue and groove paneling, which is also used at the stair enclosure. The peripheral piles along the exterior are cased and the cross partitions and ceiling paneled. The partitions have 10" wide recessed panels framed with applied ogee sticking, seperated by 4" stiles. The ceiling has the same recessed design with the panels radiating from the stair to the outer walls. Each of the four rooms also has a projecting built-in closet, with four panel doors and paneled walls similar to the cross partitions.

Mid-20th century alterations include, in addition to the relocation of the door in the west wall, the construction of a series of frame partitions in the southwest quadrant. The southerly partition encloses a pump room (the pump and a water heater remain), with succeeding partitions setting off a bath and a small galley.

The stair to the light is enclosed in an 8'7" iron shaft that extends 38'3" above the roof of the quarters to the light tower floor. The interior of the enclosure from the second floor level to the ceiling is sheathed with the same beaded, tongue and groove siding as used in the exterior walls. The shaft has an interior diameter of 7'2" with a 10." central column, resulting in 31" long, wedge shaped treads with a 7 1/2" rise. Originally, all treads were iron, but approximately 25% have been replaced with wood. The shaft is constructed of curved iron panels, bolted together at the inside, continuous flanges. There is a rolled iron door providing access to the roof of the keeper's quarters, with a series of eight portholes for light and air. The center column terminates at a cast iron socket that has the appearance of a Tuscan capital. Two feet in diameter with an 11" hub, the socket has eight sleeves for the floor joists of the light tower, which rest on the edge of the iron wall plates.

The skeleton structure between the keeper's quarters and the light tower repeats the eight peripheral piles and central column. The outer piles are 6"D to a point 20'0" above the roof line of the dwelling, then are reduced in size to 5"D.

The cylindrical light tower is 11'8" in diameter at the interior, two full stories in height. The lower level is 6'11" to the underside of a 25" deep catwalk that surrounds the lantern, the catwalk reached by an iron ladder-stair. The interior walls are sheathed with beaded paneling to the catwalk. The iron housing for the lantern is circular in plan, with one quadrant cut away to provide service access to the light itself. The housing is cast in a decorative paneled pattern. The rotator installed in 1852 and electrified in 1926 remains, but the lantern is now fixed in place. This lower level of the light tower was partially enclosed in 1926 to house a generator and later the storage batteries that now power the light.

There is a low, solid panel above the catwalk in the upper level of the light tower, with three rings of glass stacked above it at the exterior wall, all set into iron vertical ribs and frames. The ribs support a flattened conical roof. The low paneled area above the catwalk has a series of cast iron vents, much like scuppers in a vertical position When built, the Carysfort Lighthouse had a fixed light, but after only four months, in July, 1852, it was provided with a first-order revolving Fresnel lenticular illuminating apparatus constructed in Paris by Henry

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Lepaute. The lens consisted of sixteen panels with an inside diameter of 6' 01/2". It was lit by eighteen oil lamps arranged in two concentric rings of eleven and seven lamps, and had 21" reflectors. The light was classified as a dioptic light (the light passing through the glass lenses and prisms, which concentrated it into parallel beams). At some point near the turn of the century the light source fuel was changed from oil to kerosine (with four 30" tanks strapped below the floor of the lower level of the keeper's quarters), and as mentioned, was switched to electricity in 1926. The light was officialy de-manned after WW II and fully automated, served first by underwater cables from Key Largo, which soon failed, and later by storage batteries. Most of the original cast iron light housing, lenses and reflectors, and other parts of the lamps remain and are in good condition. Iron cresting along the edge of the roof of the light tower was destroyed during the 1966 hurricane.

Records of the Lighthouse Board for 1852 describe the color scheme of the structure, with the piles and other members of the skeleton painted black, the exterior walls of the light house keeper's quarters and the light tower red, and the windows and doors white.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION	
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE	
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE	
__1600-1699	X ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN	
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER	
X 1800-1899	X COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	__TRANSPORTATION	
__1900-	__COMMUNICATIONS	__INDUSTRY	__POLITICS/GOVERNMENT	X OTHER (SPECIFY)	
		__INVENTION		Maritime History	

SPECIFIC DATES	1848-52	BUILDER/ARCHITECT	Engineer	Builder
			H. Stansbury	Merrick & Sons

STATEMENT OF SIGNIFICANCE

The Carysfort Lighthouse is of historic, architectural and engineering significance to the maritime history of the Nation. Completed in 1852, the lighthouse, and the reef on which it is located, is named after the HMS Carysfort, which ran aground at the site in October 1770. Funds for a lighthouse were appropriated by Congress in 1837, but due to the Indian Wars, design was not started until 1848, with completion four years later. The design was started by Captain Howard Stansbury, completed by Major Thomas E. Lannard of the Corps of Engineers. J.W.P. Lewis was the Assistant Engineer, in charge of construction. The well known Philadelphia iron works of Merrick and Son was awarded the construction contract (Ref. 1.) who fabricated and preassembled the skeleton structure at their yard before shipping it to Key Largo. The original lighting aparatus, a "revolving Fresnel lenticular illuminating" device (Augustin Jean Fresnel, a French physicist, designed the first dioptic or lenticular light in 1823, describing it as a "curtain of prisms in front of a light and centered around a bull's eye lens", Ref. 2) was constructed by Henry LaPaute in Paris. It was first illuminated on March 10, 1852.

Colonel J.T. Albert, Chief, Corps of Topographic Engineers prepared a site survey in February, 1845 to determine the need for navigational aids along the Atlantic coastline of Florida. Citing extensive marine traffic in the region and mentioning the numerous and trecherous hazards to shipping, he recommended that a series of lighthouses be constructed on the reefs that extend from Cape Florida to the Tortugas, identifying Carysfort Reef as the most dangerous reef in the 200 mile span. Law 3-3-1848) reauthorized the construction of a lighthouse to replace an outmoded and ineffective light vessel (moved to Brenton's Reef in Rhode Island), this time specifying a "screw-pile lighthouse", for Carysfort Reef. The existing structure was the first of a series of lighthouses built during this period, spaced so that navigators would "not lose sight of one before coming into view of another". Colonel Albert noted that the Eddystone Lighthouse (1706, John Reynolds, rebuilt 1882) had proved its durability, and the design of this structure, along with others in the English and Irish Channels, was suggested as a model for the Carysfort Lighthouse.

The first use of cast iron as as seamark was probably the Carr Rock Beacon (1813-21) off the coast of Fife Ness, Scotland, but the most important influence on the design of the Carysfort Lighthouse is a structure built on Marpin Sands in the Thames Estuary, London. Designed by Alexander Mitchell, who had previously developed a technique for mooring ships using wood screw-piles and tested the principles of wood screw-piles at a lighthouse at the mouth of the river Wyre, Lancaster in 1835.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

Reference 1. Letter from Bureau ofTopographic Engineers to Merrick and Sons, Philadelphia May 30, 1850 (Nat. Archives)

Reference 2. Beaver, Patrick, A History of Lighthouses, Secaucus, New Jersey, 1973, p. 51

Reference 3. Ibid, p.58 Also see: Stevenson, D. Allen, The World's Lighthouses Before 1820, London, Oxford Univ. Press, 1959

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY 0.5 Acres

UTM REFERENCES N.A. (No USGS map for this site) Lat 25° 13' 17" Long 80° 12' 40"

	ZONE	EASTING	NORTHING
A			
B			
C			
D			

VERBAL BOUNDARY DESCRIPTION

Located at the seaward edge of Carysfort Reef, near the westerly edge of the Gulf Stream, 12 miles northeast of South Channel, Key Largo, Florida

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

STATE	CODE	COUNTY	CODE
N.A.			
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE: Russell Wright, AIA, Consultant to Sanctuary Programs Division

ORGANIZATION: NOAA/NOS/OCRM

DATE: May 15, 1984

STREET & NUMBER: 3300 Whitehaven Street N.W.

TELEPHONE: 202/634-4236

CITY OR TOWN: Wahsington

STATE: D.C. 20235

12 CERTIFICATION OF NOMINATION

STATE HISTORIC PRESERVATION OFFICER RECOMMENDATION

YES ✓ NO ___ NONE ___

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

In compliance with Executive Order 11593, I hereby nominate this property to the National Register, certifying that the State Historic Preservation Officer has been allowed 90 days in which to present the nomination to the State Review Board and to evaluate its significance. The evaluated level of significance is ___ National ___ State ✓ Local.

FEDERAL REPRESENTATIVE SIGNATURE Reginald C. McCallum

TITLE Department of Commerce Preservation Officer

DATE Jul 23, 1984

FOR NPS USE ONLY

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

Patrick Andrus

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION

DATE 10/31/84

ATTEST:

DATE

KEEPER OF THE NATIONAL REGISTER

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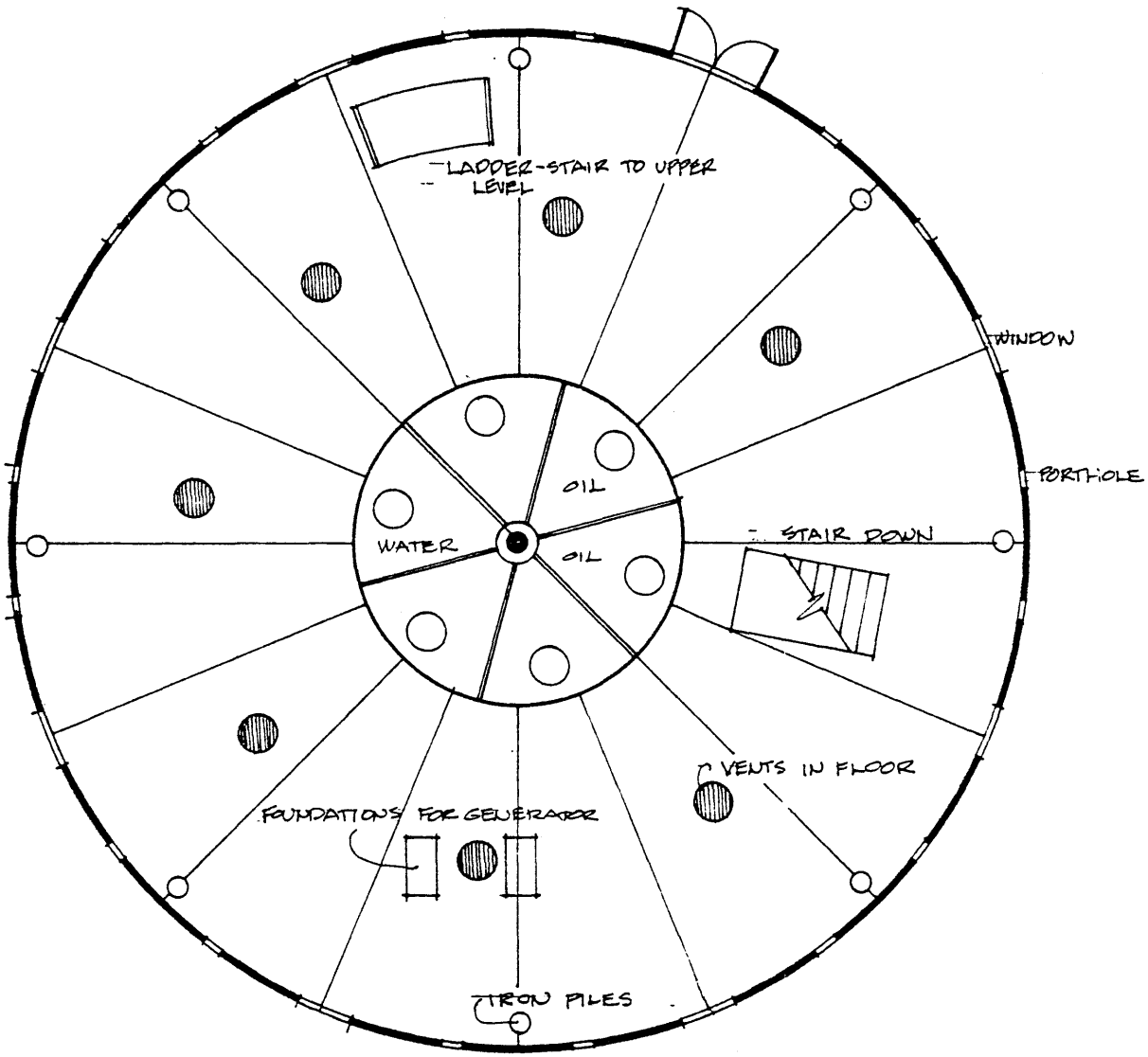
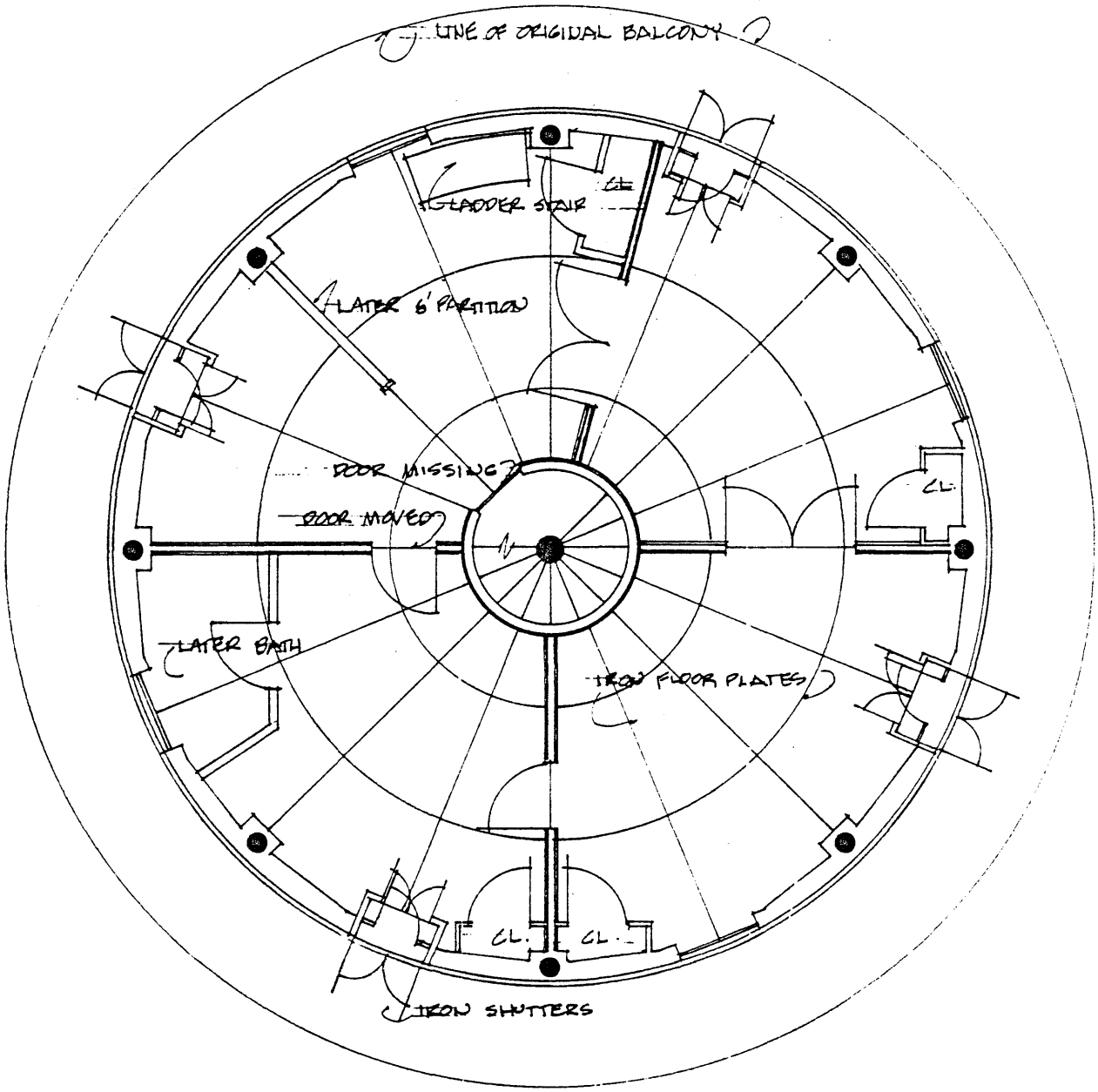
Mitchell improved on the wood piling by using cast iron screw-piles at Marpin Sands in 1838, where the skeleten consisted of eight peripheral piles centered on a single central pile, all of which formed an octagon (as at Carysfort). Mitchell patented his invention in 1842, and according to A History of Lighthouse (Ref 3)"screw-pile lights were built all over the world but particulary in the United States, where they found especial favor". Other screw-pile lighthouse of importance include one at Fowey Rocks (Florida, 1876), similar in design to Carysfort, and Thomas Point, perhaps the largest, at the head of Chesapeake Bay in Maryland.

The Carysfort Lighthouse has been in continuous operation as a First Class light since it was first illuminated in 1852. It is now automated, powered by storage batteries and a small solar panel, mounted on the roof of the light housing. The last lighthouse keeper was replaced during WW II when the structure was used as one of a series of lookout towers in the watch for German U-boats. It has been used recently as a base for research in marine biology and in study of the reefs.

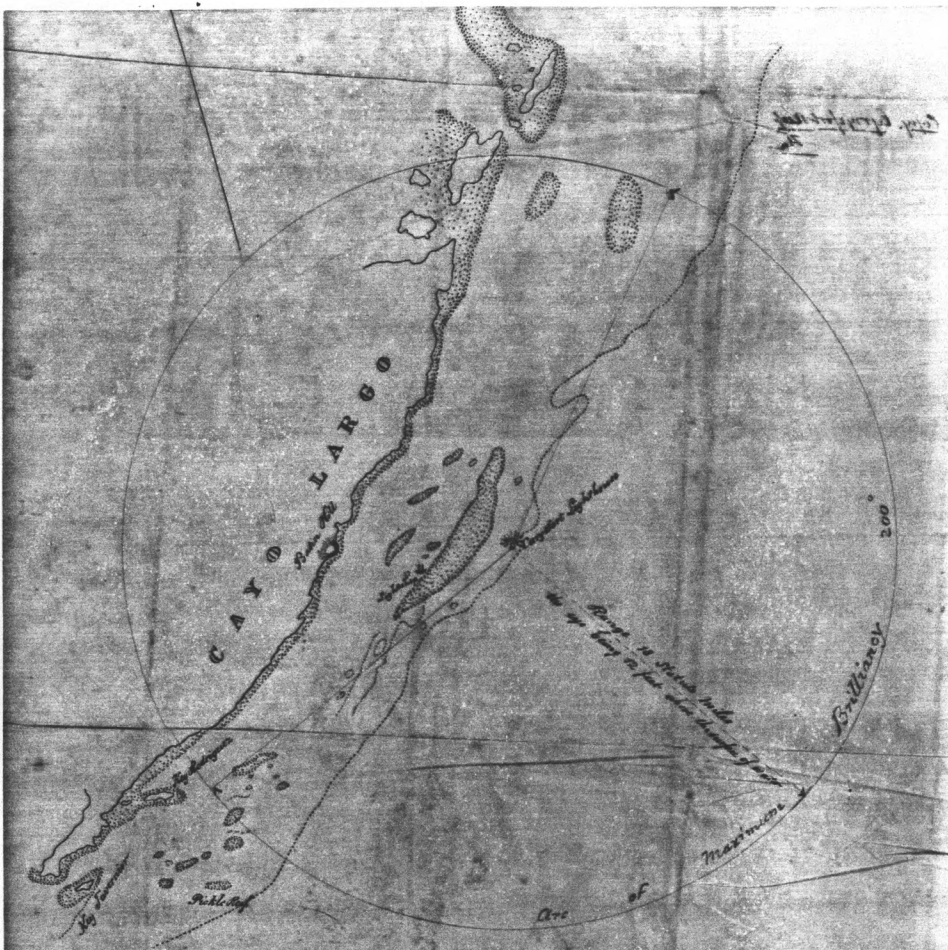
In addition to maritime history and engineering significance, the lighthouse is also important for its excellent interior finish in the keeper's quarters (second level) and as a focal point of the Key Largo National Marine Sanctuary, designated in December, 1975 under provisions of the Marine Protection, Research and Sanctuaries Act of 1972 (16 USC 1431-1434). The National Sanctuary is managed by the Office of Coastal Zone Management, U.S. Department of Commerce, and is adjacent to the John Pennekamp Coral Reef State Park.



FIRST FLOOR - KEEPER'S QUARTERS
CARYSFORT LIGHTHOUSE - KEY LARGO, FLA
SCALE 1/8"=1'0"
R. WRIGHT 10/81



SECOND FLOOR - KEEPER'S QUARTERS
JARYSFORT LIGHTHOUSE - KEY LARGO, FLA
SCALE 1/8" = 1'0"
R. WRIGHT 10/81



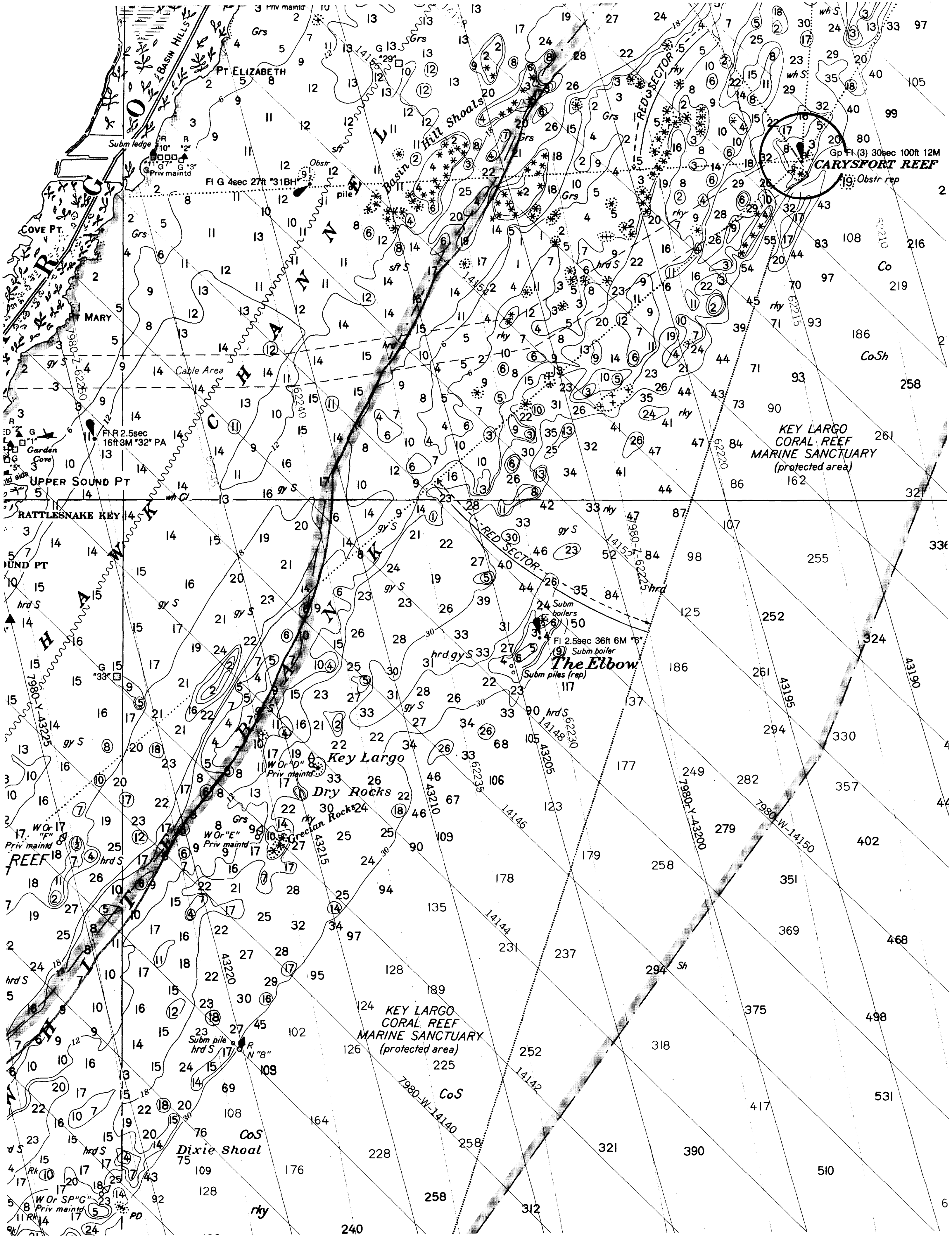
SKETCH

of a portion of Florida Reef

showing the position of the

CARYSFORT LIGHTHOUSE

Approved: Office of the Light-House Board, August 12th 1874.



HAWK CHANNEL
Basin Hill Shoals
PT ELIZABETH
BASIN HILLS
COVE PT
PT MARY
UPPER SOUND PT
RATTLESNAKE KEY
Garden Cove
Cable Area
Subm ledge
Fl G 4sec 27ft "31BH"
Obstr
pile
Fl R 2.5sec 16ft 3M "32" PA
CARYSFORT REEF
Gp Fl (3) 30sec 100ft 12M
Obstr rep
RED SECTOR
KEY LARGO CORAL REEF MARINE SANCTUARY (protected area)
The Elbow
Subm boilers
Subm boiler
Subm piles (rep)
Fl 2.5sec 36ft 6M "6"
Key Largo Dry Rocks
W Or "D" Priv maintd
Grecian Rocks
W Or "E" Priv maintd
W Or "F" Priv maintd
REEF
Subm pile
R N "8"
Dixie Shoal
W Or SP "G" Priv maintd
PD