ADDRESS ALL COMMUNICATIONS TO
SUPERINTENDENT OF LIGHTHOUSES
CHELSEA, MASS.

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DEPARTMENT OF COMMERCE

LIGHTHOUSE SERVICE

2685E

OFFICE OF SUPERINTENDENT, 2D DISTRICT
37 MARGINAL STREET
CHELSEA, MASS.

LIGHTHOUSES
Nov 23 8 47 AM '38
Nov 23

November 21, 1938

2685E

Commissioner of Lighthouses

Subject: Destruction of Whale Rock Light Station in storm of September 21, 1938.

Reference: Bureau endorsement on Memorandum October 31, 1938, re visit of Mr. G. C. Huxford, Edgewood, R.I.

Wrote ad 12/1/38 D

The remains of Whale Rock Light Station were visited and examined on November 9, 1938, by the 2nd District Associate Engineer.

Prior to the storm, this station consisted of a vertically sided cylindrical base with cast iron shell plating filled with stone and masonry, surmounted by a tower in the shape of a conical frustum with cast iron shell plating, located on a solid rock ledge which shoaled very rapidly from deep water on all sides to just awash at high water. The conical frustum was four 8' stories high, thus providing a kitchen on the level of the station pier deck and separate rooms on each of the three upper floors for quarters for the three keepers. The lower three stories had windows of regular double hung sash, while the fourth story had only heavy marine port holes. The basement containing the cisterns, coal bins, and storage space was located in the cylindrical pier directly beneath the kitchen. The conical tower was surrounded by a roof at the second floor level which carried from the tower out over the circumferential deck to the edge of the pier caisson. This roof was made of a heavy rockboard material 5/8" thick fastened by a continuous angle to the tower and bolted at its outer edge to the cast iron gutter which in turn was carried on stanchions on the concrete deck. The ceiling of the fourth story consisted of cast iron segments whichoverhung the tower with supporting cast iron brackets, forming the floor for the watch room and watch room gallery. Above the watchroom was located the light. The entire conical tower below the watchroom was lined with brick masonry with thickness diminishing upward. A fabricated steel cantilever landing platform was located at the main deck level from the north side of the pier whichwas surrounded by a pipe railing and supported a hand derrick in its northwest corner. The ladder to the tower was reached from the rock bottom to the deck and was fastened directly to the caisson.

Investigation showed the caisson pier and ladder to still be intact and sound, including the basement and concrete deck. Most of the kitchen floor was still in place, as well as the cast iron basement stairs. But above this deck level everything is gone or wrecked. As near as could be determined, the first and second floors above the deck, including both the cast iron sections and wood flooring and all wall brick with most of the cast iron shell supporting same, was dropped and still remains or slightly overhangs the northwest side of the deck and landing platform. No evidence was found of any portion of the tower or lantern which existed above the second floor. The landing platform is still intact, but badly twisted. The cast iron tower shell plates were broken into pieces, so that it was difficult to positively identify the previous location of many of them. Several sections of the second story course were identified, same still bearing the angle iron to the lower leg of which the deck roof had been fastened but from which it is now mostly broken away. One plate was found bearing the name "G. W. and F. S. Smith Iron Co., Boston, Mass." Inquiry discloses that this company liquidated without successors about 1915. No sections were positively identified as those whose bottom flanged edges had borne on the concrete pier. However, two or three sections of the concrete base, six to ten feet in length, were sufficiently cleared of debris along the perimeter of the tower base to disclose no evidence of anchor bolts or any other means by which the cast iron tower plates were actually held to the masonry pier, except for the brick tower lining, which appeared to be 8" thick at the bottom, and the mass of the entire tower. All other vertical and horizontal plate section edges bore evidence of butting flanges inwardly fastened by bolts of apparently 7/8" diameter. Many flange holes were unbroken and empty, showing that bolts had been either sheared off, pulled through, or missing. Remaining flange bolts are badly corroded and slightly turned, and burred head edges on a few indicate that they were pulled through the plate flange holes. All portions of the wreckage that remains on the base are nearly directly below their original positions, with most shell plates broken and pushed out from the circumference of the floors which they surrounded. Several light and washable items, such as marine libraries, books, shoes, clothing, made-up bed, etc., are still intact, appear to have been water soaked but show no evidence of having had water rushing over or around them.

From these findings it would appear that the top two stories, watch room and lantern, broke loose from the lower two

stories and went overboard. Most keepers at other similar stations who were on duty during the storm state that they took refuge in the top story, as the seas smashed out the ordinary sash but did not break the port lights. The deceased keeper of Whale Rock was undoubtedly in the same place when the top portion of the tower went. The keeper of another similar tank light states that the seas shook his station quite violently until the deck roof gave way, when the shock was appreciably decreased. Whale Rock's roof undoubtedly withstood similar shocks, which no doubt jarred loose the bolting of the flanges of the sections that went overboard, and broke down the interior brick work. With the top gone and brick lining gone or weakened, the remaining two floors dropped down, probably, distorting the shell plates sufficiently to collapse them. Due to the fact that the bed, wood floors, wood book cases, wood boxes, etc., were not washed away and that the debris is nearly all intact on the pier with but a slight leaning to the northwest, it would appear that the lower two sections of the tower collapsed after the high waters had receded and the wind had died down somewhat.

No drawings are on file showing the construction details of this structure, nor of Sakonnet Light, a similar structure. Drawings of Plum Beach Light show it to have a cast iron shell anchored to the concrete base by 1-1/4" anchor bolts. Plum Beach must be anchored as it withstood the storm, but suffered appreciably in its base where the supporting brick work has several new cracks, one of pure compression, and has opened up old ones, besides several new cracks in the cast iron pier caisson shell.

Due to the indefiniteness of the anchorage of all similar tank lights, it is recommended that investigations be made at all similar tank lights by removing sufficient brick wall lining to definitely ascertain whether or not all such towers are properly anchored to their piers, and that proper anchorage be made where same is absent or at fault.

It is recommended that a contract be let for clearing all material from Whale Rock pier, that all usable material be salvaged, and a concrete slab be placed over the entire deck with a proper opening left to the basement stairs, leaving the pier without any superstructure until such time as navigation proves the existing lighted whistle buoy to be inadequate and a more efficient aid is necessary. A member of this office will be present during such clearing to fur-

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ther study conditions that may have existed.

This office has not received any definite notice that the deceased keeper's body has been recovered.

Geo. E. Eaton
Superintendent.