Visit to Plymouth Breakwater, 20 May 2023

by Ken Trethewey

The author acknowledges the kind permission of the King's Harbour Master (Plymouth) for the visit.

Above: The author celebrates the end of a fifty-year wait to get the key to the Plymouth Breakwater lighthouse. [Photo: Ann Dodkin]

Summary

On Saturday 20 May 2023, a group of 21 members of the Association of Lighthouse Keepers visited the Plymouth Breakwater lighthouse, something that has not been possible for many years since the automation of the light and the removal of its keepers. It was followed by an excursion to the Eddystone lighthouse and a return to the point of departure in Looe. This report presents a detailed study of a rarely described lighthouse and uncovers some previously unreported facts about its history.

Above: Leaving Looe in two boats chartered from Looe Sea Safari.
Below: Passing Rame Head, its summit-built chapel the site of a fourteenth century ecclesiastical lighthouse.

Our group of twenty-one lighthouse enthusiasts assembled on the quayside next to the departure point of Looe Sea Safari at 0930. After donning the essential life-jackets we set off for Plymouth Breakwater, travelling across Whitsand Bay at 25 knots in beautifully calm waters, passing Rame Head and the old Penlee Point fog signal station on our 25 km (15.5 mi) journey.

Above: Passing Penlee Point and the old Trinity House Fog Signal Station and keepers' accommodation building.
Below: Approaching the Breakwater. The skippers contact the Longroom (KHM) for permission to land.

Plymouth has a naval base at Devonport and the Breakwater is managed by the Ministry of Defence who do not allow casual visits by tourists. The lighthouse was built in 1843 when the Breakwater - begun in 1812 - was finished and lit for the first time the following year. Management of the lighthouse passed from Trinity House to the MoD in 1993, although Trinity House employees still maintain the light.

Above: Landing is tricky. A vertical ladder with metal rungs must be climbed and then scaffolding hazards negotiated.
Below: Once on the Breakwater, the lighthouse is 690 m distant along the western side.

Access onto the Breakwater was difficult, by means of a vertical metal ladder that some of us were unfortunately unable to climb. Once at the top, the way forward was hazardous because of an array of scaffolding poles and planks, but this did not deter those who made it onto this amazing structure. The Breakwater was constructed between 1812 and 1843 and is made of an estimated four million tons of large stone blocks. The structure is 1575 m long, and we landed in the centre of it, at the half-way distance, close to the fort (see later pages) that is situated 30 metres behind the great block structure.

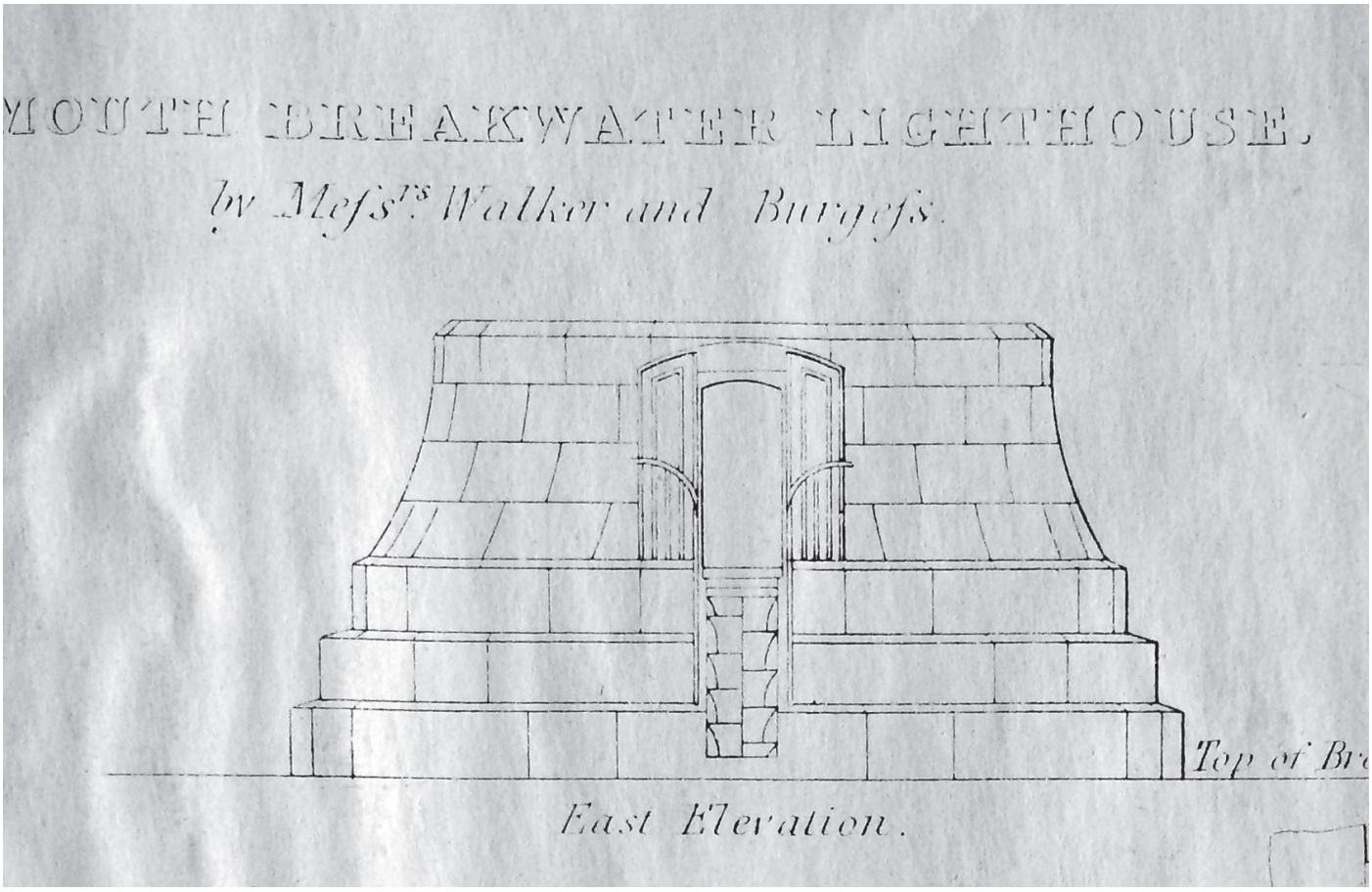
Above and Below: The Breakwater is surprisingly wide, its edges gently sloped to minimize damaging impact by the sea, whilst extracting the energy out of the waves. An additional line of huge blocks were later added along the south-facing seaward edge, dropped in place using specially designed cradles to lift and drop such heavy stones.

Above: The central part of the Breakwater has extra reinforcement that once formed a harbour for supply of stone.
Below: A typical view of the top surface of the Breakwater shows the interlocking stones.

The surface of the Breakwater was significantly pock-marked, both by erosion and man-made holes, and made slippery by the usual marine growths that are found on water-soaked surfaces. Some care was necessary as we made our way across this uneven slippery surface towards the lighthouse at the far west end of the Breakwater.

Above: One stone has March 1828 engraved into it, laid during the course of the build.
Below: Many of the stones have holes used to facilitate placement. White whiskers of a marine growth are everywhere.

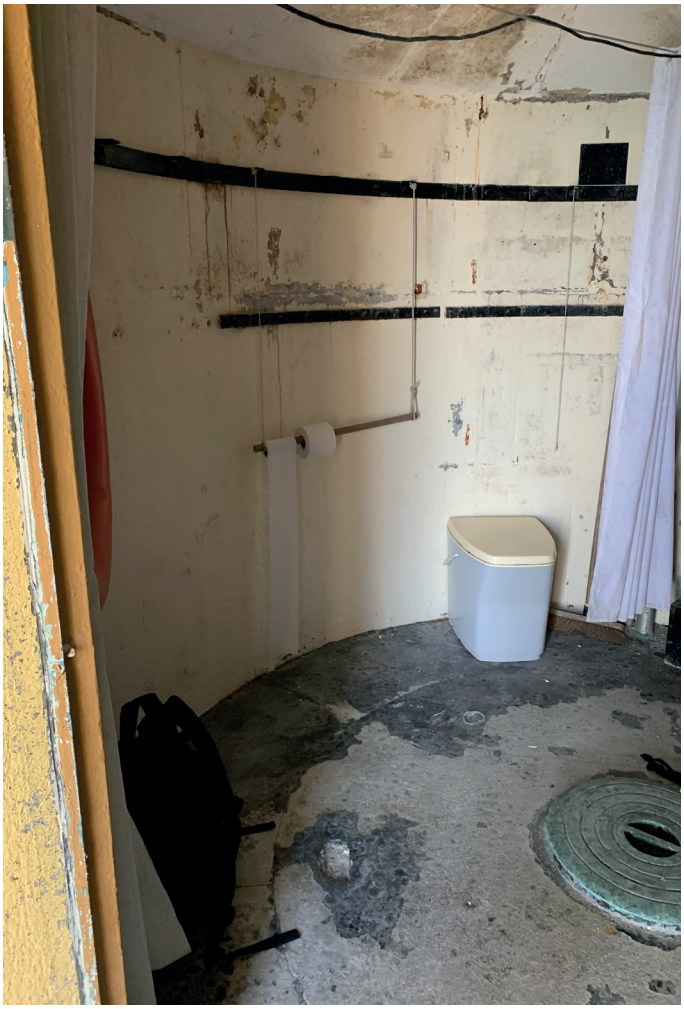
Once at the lighthouse, it was my job to unlock the door. This was much easier said than done. First I had to climb a set of near-vertical stone steps which took me to the entrance door about 2 m above the base level of the Breakwater. At this point, it was necessary for me to unlock the padlock and open the two great gunmetal doors. These must have weighed half a ton each and although they were in excellent condition, I was unable to move them. The doors were set in a sliding mechanism and did not open outwards. I tried with all my effort to slide the right-hand door open, but failed. Fortunately, a stronger member of our group was able to achieve what I could not.



Above: The entrance to the lighthouse, as shown in the design by Messrs Walker and Burgess.
Below: The entrance as it is in 2023. The two gunmetal doors are very heavy and slide in horizontal tracks.

Above: Level 1. The entrance door from the inside.
Below: The window-less oil store room, level 1.

Above: The staircase going up anti-clockwise.
Below: The manhole in the floor, is for the water tanks.



Level 2: This was originally called the oil store - two half-doors at the entrance because there is no room for a single door. The purpose of the unique, kidney-shaped plinths is curious, apart from elevating containers that need to be raised off the floor, as is the case with what looks like a water tank on the right, below.

So, with the right-hand door open wide enough for us to enter, we were inside a lobby where we found another door. This door seemed to be locked, for again I could not make it budge. I had no second key, and I thought our mission was doomed to end in failure. Fortunately, after some serious tugging, the door gave way and we were finally able to make our way inside. There were five levels of stone rooms, surmounted by a wrought iron lantern. On the first level, we found a basic room - once known as the water room - with the usual array of oddments that make sense only to those who work there. We also found a chemical toilet hidden behind a curtain hanging crudely from temporary fixings. Luckily, none of us needed to use it, although it was a close run thing! The staircase led upwards anti-clockwise on the right and ascending the stone stairs we found level two where there had been an oil store.

Level 3 - The living room
Above: A porcelain sink covered by a work surface. A close-up of the water supply, a lead pipe that could not be used today because of toxicity.

Above: A small work area and drawer filled with modern tea mugs. [Photo: Ann Dodkin.]
Below: Useful storage space is to be found beneath the stone staircase.

The living room (or kitchen, as it was often called) left us with just a fraction of the atmosphere it would have once had. Was there ever a dining table? Almost certainly. A comfy chair? Maybe not. There was a fireplace, where cooking was carried out, a sink, with its tap and pump that pulled water up from the tank below, through lead pipes that would be too toxic to use today. A drawer had been conveniently left open to show us where the tea mugs were to be found. A pity - a cuppa would have been nice! A cupboard contained modern items left by workmen. One point of interest is that the cupboard door is planar, whilst the entrance door is beautifully crafted in a curve to fit the curvature of the tower. No, it's not a figment of my camera lens.

Above: Level 4. In the bedroom the usual curved bunk beds are to be found. The Low light is also found here.
Below: This photo shows the position of the low (secondary) light relative to the bunks. [Photo: Ruth Drinkwater.]

Above: Level 5. It seems (see Appendix) that the service room was a last minute addition to the design. We note the smaller windows that circle the structure. [Photo: Ruth Drinkwater.] Below: A unique, so-far unexplained feature.

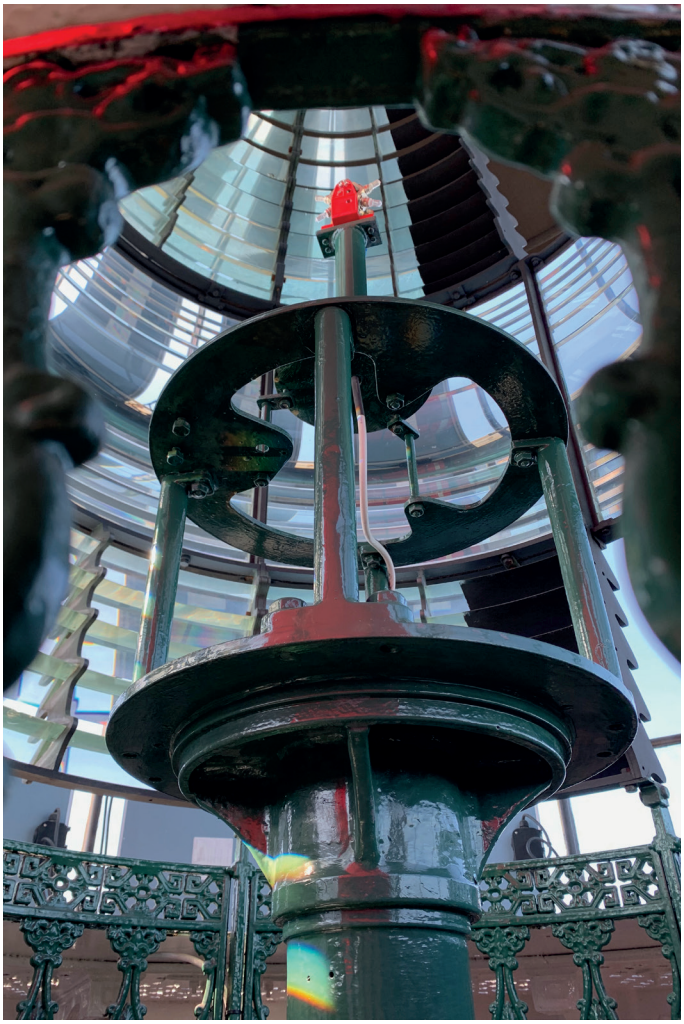
A low, secondary light has been shown from a window in the bedroom for most, if not all of the tower's existence. The light was a white, isophase, flashing type, meaning alternate white and dark every four seconds from a height of 12 m and visible for 10 miles through the narrow angle of 8° from 031° to 039°. This angle is intended to show the bearing for ships leaving port by sailing across Plymouth Sound.

According to Findlay's List of Lights (1900) it seems that the low light was installed in 1880 as a fixed white light to cover what was described as an open channel SW ¼W to SW by W¼W (phew!) Perhaps even then the Sound was starting to build up silt deposited from Plymouth's major rivers, making the exit across the Sound more difficult than it might have been. However, an earlier edition of 1862 also lists a low light but with no further details.

Above: The smaller windows of the service room are of two angled panes set in gunmetal. [Photo: Ruth Drinkwater.]
Below: The stairs leading down from the service room to the bedroom. [Photo: Ruth Drinkwater.]

Above: The steps leading down from the lantern room to the service room. The pedestal of the optic is on the left.
Below: Ventilators in the wall of the cast iron lantern.

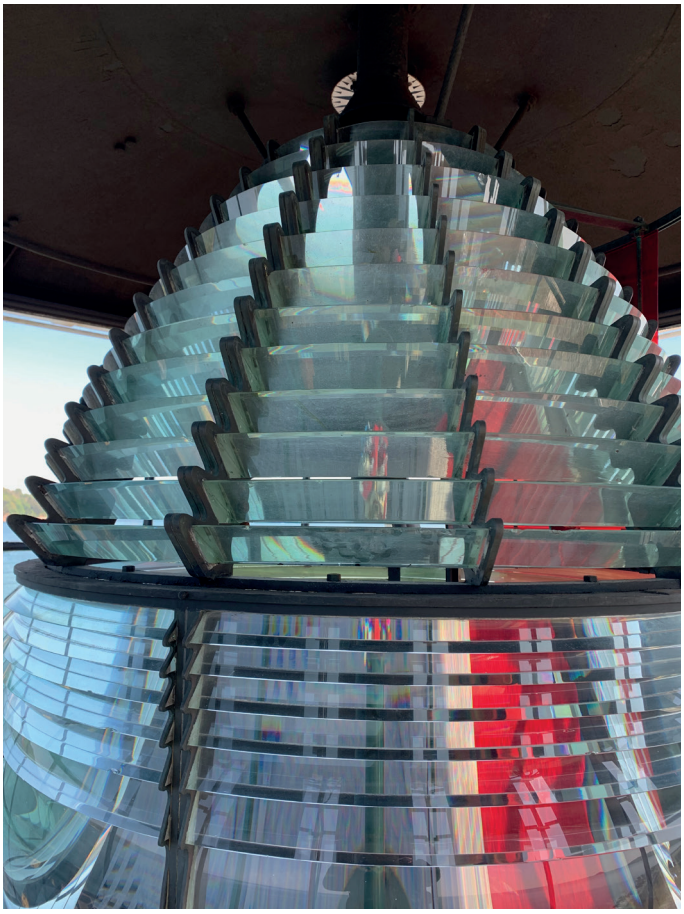
Above: The lower lantern area contains batteries to supply the light in emergency. Air vents around the inside wall are seen around the white-painted cast-iron lower part of the lantern.
Below: The magnificent cast-iron pedestal on which the beautiful optic is mounted. [Photo: Ruth Drinkwater.[



Above: The original pedestal remains in place inside the optic. A cable provides the electricity for the lamp.
Below: The landward side of the optic has a cut-out section to give access to the light source. We note that the flue that would have carried away the gases - products of combustion of earlier paraffin lights - is also still present, leading up to its joint with the roof.

It was a joy to finally reach the cast iron lantern on level six where we found a beautiful beehive optic with its red sectors, almost dominating the space in the bright sunlight. The main light currently flashes once every ten seconds, white with a red sector to the north-east; the subsidiary white light has an isophase characteristic, two seconds on, two seconds off. The optic itself was in beautiful condition, and in the centre of it were a number of small halogen bulbs on an auto-changer which would rotate bulbs in a vertical plane if one failed. The great mass of glass was lifted high up on a substantial platform, so as to send its light out through the square lantern panes that were above head height.

Above: The optic - known as a 'beehive' - is complete from this angle, but has a cut-out section on the reverse side that enables access for maintenance and visitors like me to look at the light inside.
Below: In this case, there are a number of small halogen lamps that can be rotated into position if one should fail.



Views of the original optical apparatus. Unlike the situation in some other lighthouses, there are no rotating parts of the light mechanism. The optic remains in a fixed position and the light is switched on and off by electronic control.

The list of lights published by Findlay (1862) lists the Breakwater light as follows:

On W end; bright to seaward, but red E of NE ½E from it. A second order, fixed lenticular light shown at a height above high water of 63 ft; visible 9 miles (1844).

In 1900, the same publication listed it as:

A granite tower 76 feet high on the W end. Light eclipsed 3 secs every ½ min.; bright seaward, between E by S and NE through S and red over the anchorage.

The 2019/20 edition of the Admiralty List of Lights gives the characteristic and details as:

Fl WR 10s, from a white round granite tower of 23 m (75 ft) in height. The white sector covers bearings of from 262°-208° (306°); the red from 208°-262° (54°). The white light is shown from a height of 19 m (62 ft) visible for 12 mi; the red is visible for 9 mi. The white secondary light is shown from a height of 12 m and visible for 10 mi through the narrow 4° angle from 033° to 037°.

The electronic fog signal gives a blast every fifteen seconds. All of this data remains correct in 2023.

Above: This photo perfectly shows the old fog bell that was in use until 1994, when it was replaced by the modern white unit on the balcony in the lower right corner of the photo. [Photo: Nick Tadd]

One sad point was that we could not exit onto the balcony to see the beautiful old fog bell. Neither was it visible from inside. The bell remained in use until 1994, when it was replaced by an electronic fog horn. Fortunately, one of our group had brought a drone and this enabled some photography of the bell from outside.

Above: Members of the visiting group captured from a drone. [Photo: Nick Tadd]
Below: The lighthouse from the air showing the wide apron at the front of the tower. [Photo: Nick Tadd]

Above: The view from the lighthouse looking east. The other end of the Breakwater is 1.5 km distant.
Below: A fort is located at the mid-point of the Breakwater, deserted and unused today apart from the antenna.

Above: The Breakwater Fort, built in 1860.
Below: A head-on photo of the fort. The distance of the fort from the stones of the Breakwater is 50 m.

Above: As we depart, we head around the eastern end of the Breakwater. Houses of Heybrook Bay are in the distance.
Below: The eastern end is the site of a refuge for shipwrecked seamen who climb into the iron ball until rescue arrives.

On leaving the Breakwater, we circumnavigated the east end where there is an iron ball refuge for ship-wrecked sailors. Then we headed out to the Eddystone in excellent sea conditions, a distance of 19 km (12 mi) that took about 40 minutes on our superbly powerful twelve-seater ribs.