

PLYMOUTH BREAKWATER 50° 20' 4"N 004° 9' 35"W

A pictorial and short historical record.....

Plymouth Sound was in the perfect position to provide a base for the British Navy. However the prevailing south-westerlies made the Sound unsafe in winter for months on end, when gales would stream in from the Atlantic. Cawsand Bay could shelter ships ready to put to sea, from the south westerlies, but was not ideal for refitting and replenishment. (Especially so when the wind came on strongly from the East or South East). An Easterly wind which would allow the French to leave Brest easily, but trap the British fleet in Cawsand Bay!

Torbay was often used as an alternative refuge anchorage in periods of strong Westerlies.

So, by the late 18th century plans were afoot, to construct, what was at the time, the largest civil engineering project in the land.

There was also the suggestion that a mole be constructed between St Nicholas Island and Mt Edgcumbe, it was never taken up.

A breakwater 850 fathoms long would provide an anchorage for fifty naval vessels without obstructing the channels.

Previously, plans had been considered for a mole from Penlee constructed off in a North Easterly direction which was intended to protect the Sound. It was never proceeded with.

On a related point, there was talk of a breakwater within Cawsand Bay (from Pier Cellars) to aid the D.Day landing preparations - again, it was never undertaken.

ESTIMATE

Of the probable Expense of a BREAKWATER and PIER, for the sheltering of PLYMOUTH SOUND and BOUVISAND BAY.

To 2,000,000 tons of Lime-stone, in blocks of from one-and-a-half to two tons weight, in the Breakwater, 7s. 6d. per ton	}	£750,000
To 360,000 tons, in the Pier proposed to be built from Anduru Point, 7s,	}	126,000
Contingencies, say at £ 20. per cent. on the whole		175,200
		£1,051,200
		£1,051,200

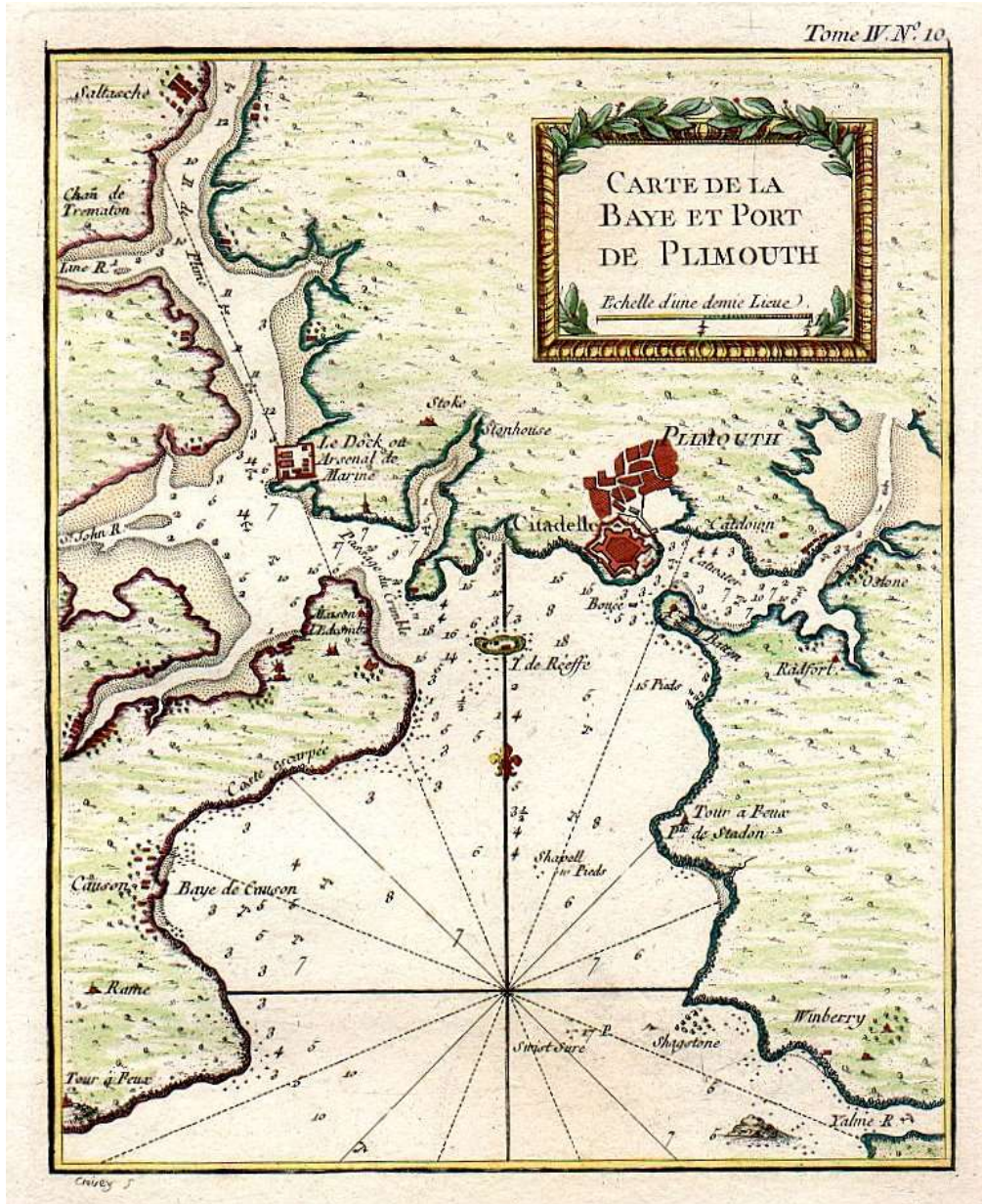
ESTIMATE

Of the probable Expense of a Cut-stone PIER and two LIGHT-HOUSES, to be built on the surface of the great Breakwater.

To 42,000 cubic yards of Masonry, in the out and inside walls of the Pier, 27s.	}	£44,700
To 62,000 cubic yards of Rubble filling, between the out and inside walls of the Pier, 6s	}	18,600
To paving the top of the Pier with large blocks of stone, 8,500 square yards	}	22,950
To two Light-houses, with Reflectors and Argand Lamps		5,000
Contingencies, £20 per cent.		28,650
		£119,900
		£119,900

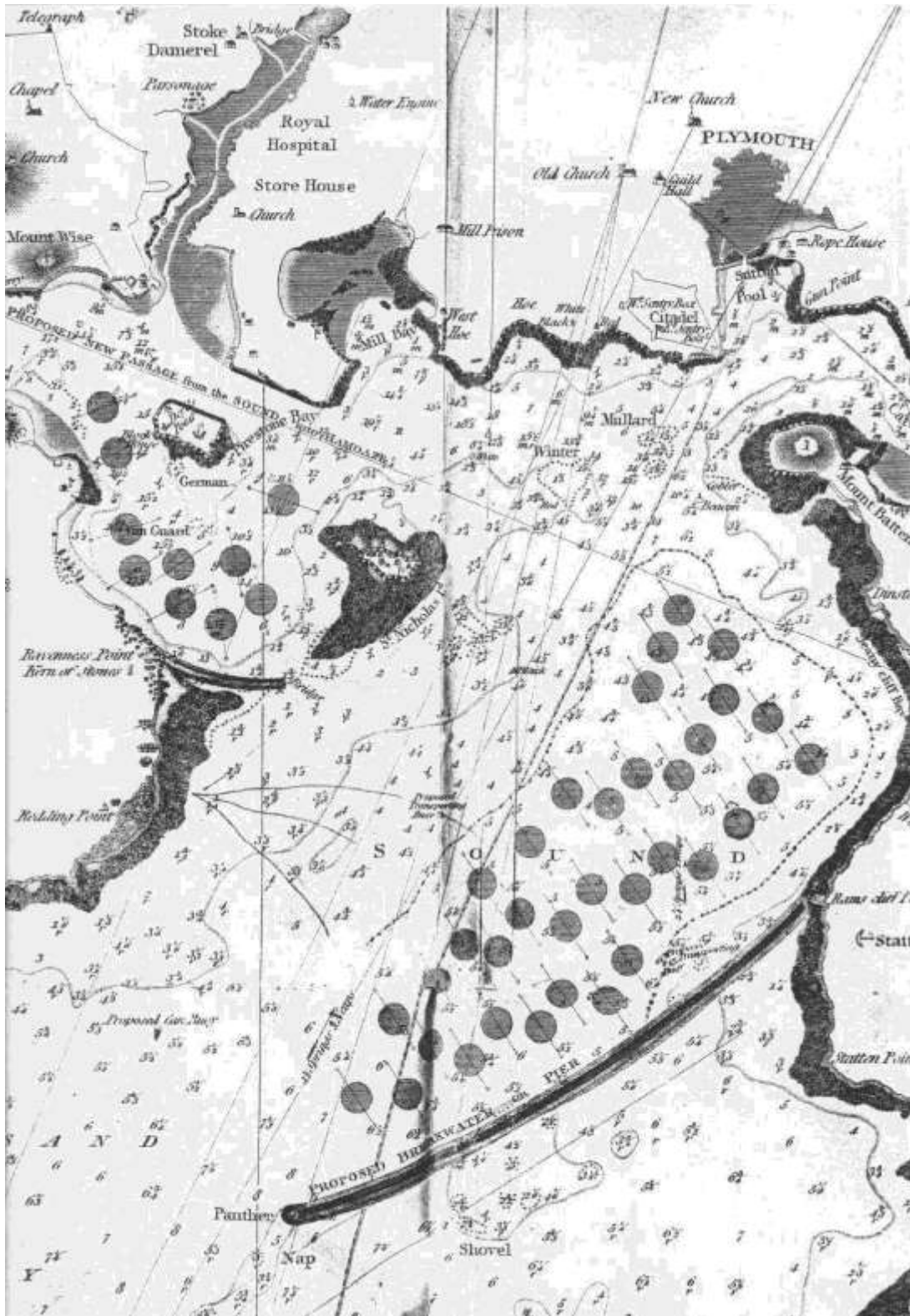
Ref: 'A Companion to the Plymouth and Devonport National Breakwater'

George Granville 1825 Pub J Johns Devonport.

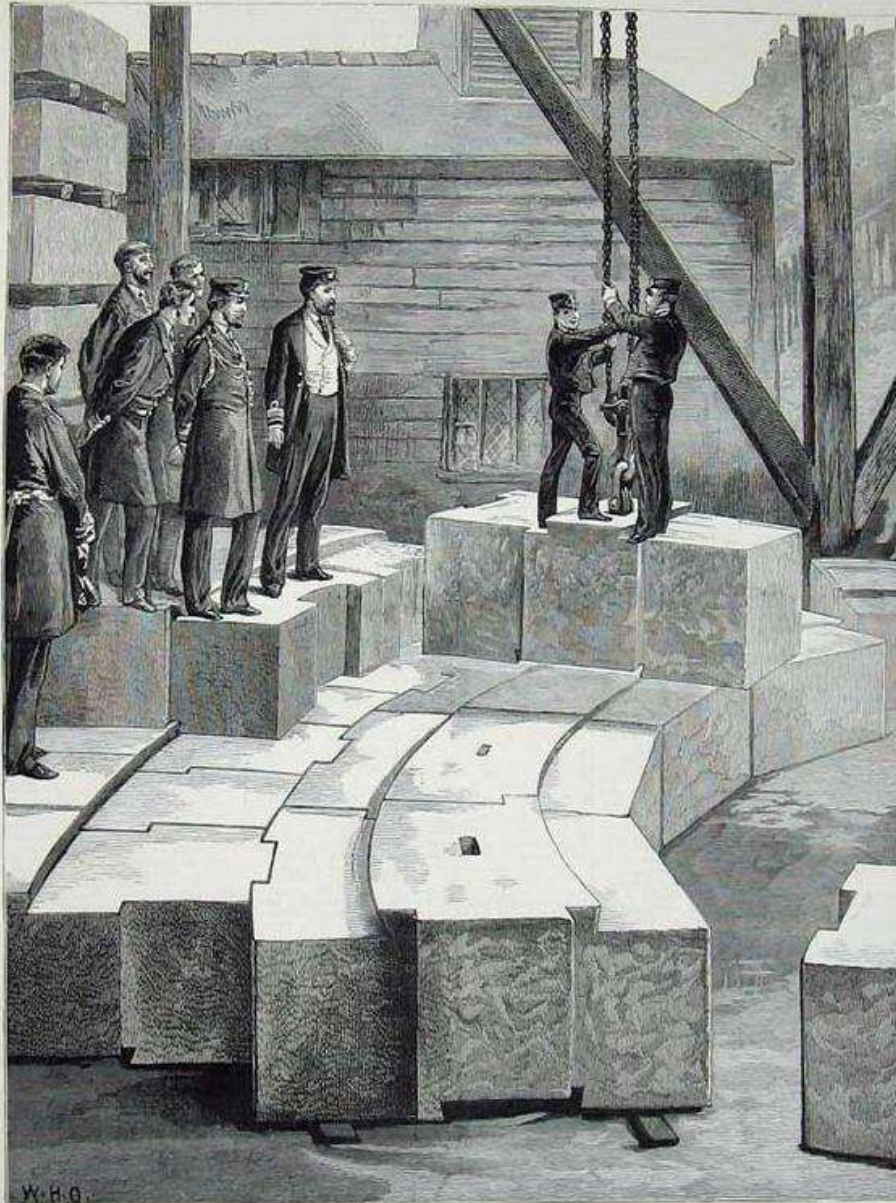


Carte de la Baye et Port de Plymouth 1760s

No Breakwater, but shallow patches upon which to build a breakwater.



In 1788 a plan was put to the Government by a Mr Smith, the Master-Attendant at the nearby Royal Dockyard, to construct a pier from the eastern shore at Staddon to the Panther Rock - making use of the shallow patches - but still open to the SW gales. Additionally there were concerns that the Sound would silt up over large areas



THE NEW EDDYSTONE LIGHTHOUSE: THE STONE-CUTTING ESTABLISHMENT AT ORESTON.

1879 New Eddystone Light House - Stone cutting Oreston Lon Ill News 30 8 1879

Quarrying began on August 12th 1812

From the caverns within the limestone quarries, were found remains of rhinoceros, bear ,hyena, deer, fox and wolf. There was no external openings to these caverns.

The stone was transported to the site by vessels with railway tracks running fore and aft inside the hull. This allowed each 'stone' to be craned on board and onto a truck, and then 'run out' over the stern and into the sea when on site. For very precise block laying, a crane vessel was used.

Quantity of Stone deposited:

	Tons.
In 1812	16,045
1813	171,198
1814	239,480
1815	264,207
1816	306,033
1817	320,405
1818	169,219
1819	225,460
1820	225,852
1821	about 120,000

	Tons.
Blocks of One ton and under	740,000
One to three tons each	565,000
Three to five tons each	435,000
Five tons and upwards	120,000

*Establishment for carrying on the Design;
Contracts, &c.*

ESTABLISHMENT BEFORE THE REDUCTION:

	Persons.
A Superintendent, with proper officers and clerks . . .	10
Warrant Officers and Masters of Stone Vessels employed by Government	} 21
Seamen to navigate these Vessels	90
Seamen in the Superintendent's Vessels, the Light-vessel, Boats' crews, &c.	} 45
Masons, blacksmiths, carpenters, sailmakers, and labour- ers, at Oreston	} 89
<hr/>	
In the immediate pay of Government	
Seamen employed in the Contractors' Vessels	170
Quarrymen, labourers, &c. employed at Oreston by the Contractors	} 300
<hr/>	
Total establishment	
	<hr/> 675 <hr/>

King's Vessels employed	10
Contractors' ditto	43

PRESENT ESTABLISHMENT:

	Persons.
Superintendent, with officers and clerks.	
Employed at the Breakwater	27
Ditto in King's Vessels	40
Ditto in Contractors' Vessels	23
Ditto in the Quarries, about	60
Besides a suitable proportion of Mechanics, &c.	

King's Vessels employed	5,		of 70 tons
Contractors' ditto . . .	6,		of 35 to 60 tons
Sheer Vessel	1,		of 70 tons

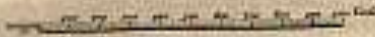
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BREAKWATER.



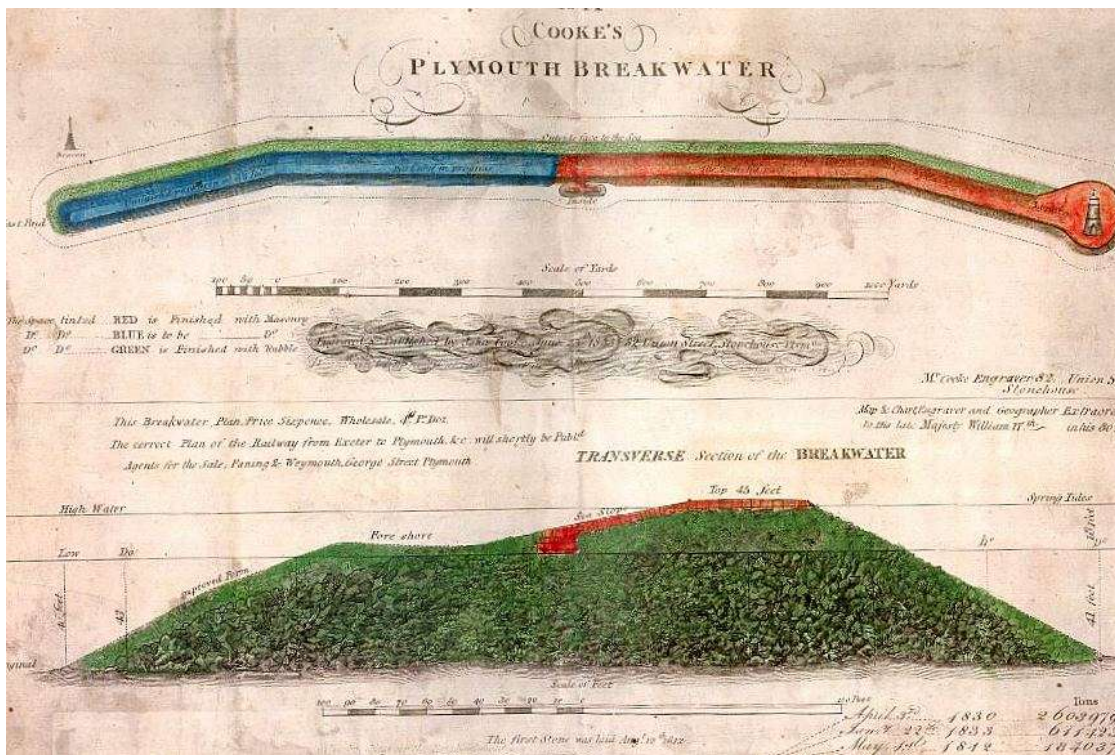
M. The space between the Red Lines, describes the part finished.
D. between the Red and Blue Lines appears from 6 to 13 Feet above LOWT.
B. between the Blue and Green Lines the part approaching the Surface.



TRANSVERSE Section of the finished part of the BREAKWATER.



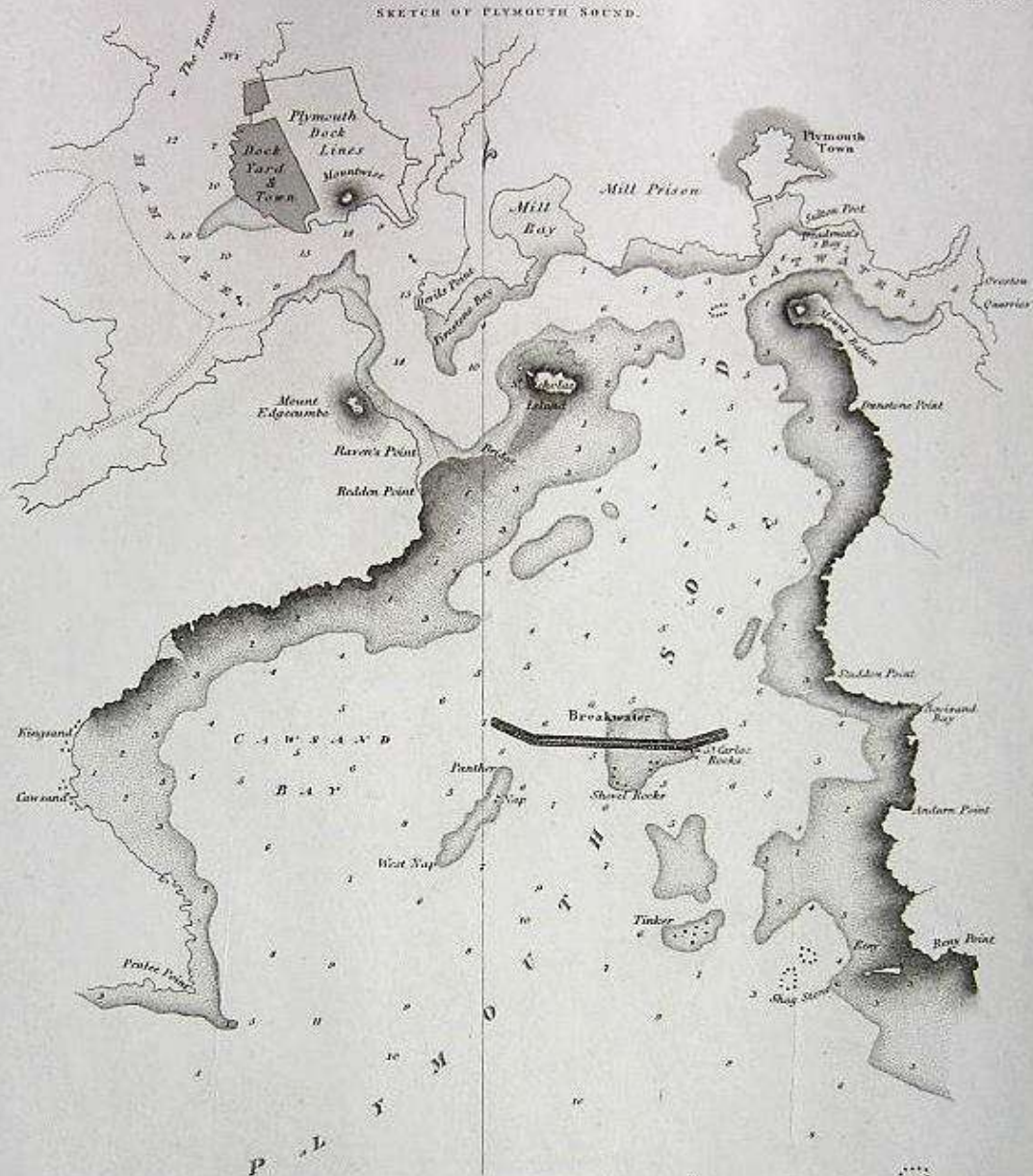
M. The first stone was laid August 26th 1811.
The quantity of Stone deposited to April 30th 1819.
1,421,252 Tons.



BREAKWATER.

PLATE CXXIX.

SKETCH OF PLYMOUTH SOUND.



TRANSVERSE SECTION of the FINISHED PART of the BREAKWATER.

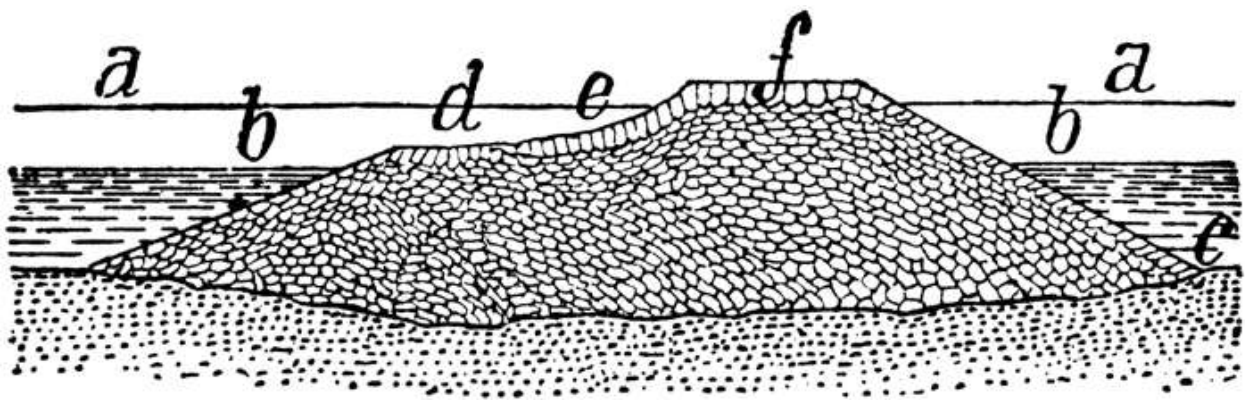


Des. by W. Harrison, Esq.

1842 Plymouth Sound Aikman 7th Edition Encyc. Britannica



A Trinity House diagrammatic drawing of the Breakwater Lighthouse



Whitney, William Dwight *The Century Dictionary: An Encyclopedic Lexicon* 1911

a, level of the top; b, b, low water at spring tide; c, bottom; d, foreshore; e, sea-slope; f, top



The Breakwater Looking West - James Harding

Note: the tower above Penlee Point



Breakwater looking from the West

T Allom 1829

UNPRECEDENTED NOVELTY.

The First Travelling Vehicle ever seen on the
Breakwater.

REYNOLDS AND SON,

BEG to inform their Friends, and the Inhabitants of Plymouth, Devonport, and Stonehouse generally, that, with the kind permission of the authorities, their "FAVOURITE"

O M N I B U S

WILL RUN FROM

THE EAST END OF THE BREAKWATER,

TAKING A TURN ROUND THE LIGHTHOUSE, ON

TUESDAY, JULY 23,

(Weather Permitting.)

Being the first Travelling Vehicle ever seen on the Breakwater.

The Fine Fast Sailing Smack, "SISTERS," will be in attendance to take parties from Sutton Pool, precisely at TEN o'clock.

Tickets of Admission to the Smack One Shilling each, to be had of Mr. R. R., at the London Inn, Vauxhall Street. The Ride One Shilling additional.

REFRESHMENTS TO BE HAD.

A Superior Band will Attend.

N.B. The SMACK will leave SUTTON POOL precisely at TEN o'clock.

Early Application for Tickets must be made, as the number issued is limited.

22s. to 26s.

DRIVING ON THE BREAKWATER.—On Tuesday last, according to the announcement last week, the novel feat of running an omnibus over the Breakwater, was accomplished by Messrs. Reynolds, of the London Inn, Vauxhall-street. The singularity of the undertaking attracted a vast number of persons; it is stated that not less than 1000 individuals landed on the Breakwater in the course of the day. At about 10 o'clock the "Favourite" omnibus, with the horses, were shipped in the "Sisters," smack, for the Breakwater, where they were unshipped about eleven; watermen were put in requisition and most of their boats engaged, so that simultaneously with the Sisters, a variety of other craft were discharging their animated and joyous cargoes on the Breakwater which speedily became the scene of vivacious pleasure. Immediately after landing the horses were put to draw tandem fashion, and the number of candidates for the first drive were very numerous. With a full fare the omnibus started, and having gone the length of the novel and stupendous road, passed round the lighthouse, at the western end, returned and then took a succession of similar drives. The driving was at a steady pace by Mr. Reynold's jun., and the whole without an effort to lessen the pleasure of the occasion. The whole scene was enlivened by the musical strains of the fine band of the 75th regiment which attended by permission of the officers. The scene was that of a village fair surrounded by the placid waters of the mighty deep, and the day's proceedings were evidently highly gratifying to all participators of this unrivalled treat.



A stroll on the Breakwater - early 1900s

Steve Johnson Cyberheritage website



'Amelia' Aground on the Breakwater 1934



Grounded on the Plymouth Breakwater - 13 April 1945



'Freya' Aground 1947

Technical notes:

In 1811 Civil Engineer John Rennie was instructed by the Admiralty to draw up plans for a breakwater that would transform the Sound into a 1,000 acres of safe anchorage.

About 25 acres of a Plymouth quarry at Oreston disappeared to build this structure. (bought from the Earl of Bedford for £10,000) Two million tons of limestone were estimated to be needed in blocks 1 ½ to 2 tons each.

The work was envisaged to take six years and an estimated 100 vessels of 50 tons each were to transport 'stone,' in the event only 50 vessels were used.

Plymouth Breakwater is a 1,560 metres (1,710 yd) stone breakwater protecting Plymouth Sound and the anchorages therein. It is 13 metres (43 ft) wide at the top and the base is 65 metres (213 ft). It lies in about 10 metres (33 ft) of water. Around 4 million tons of rock were used in its construction which began in 1812 at the then-colossal estimated cost of £1.5 million (equivalent to £74.7 million today).

It was begun in 1812, and its construction took twenty-eight years. About four and a half million tons of limestone were brought from the Oreston quarries, and two and a half million cubic feet of granite from Dartmoor. The central length is 1,000 yards, each of the wings being 350 yards, making the total length nearly a mile. The original cost was added to with the expense of the lighthouse and on frequent repairs and renovations.

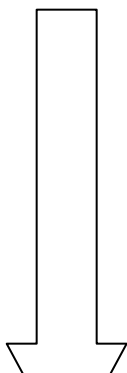
The foundation stone was laid on Shovel Rock August 8, 1812. It followed a line over Panther Rock, Shovel and St. Carlos Rocks

A violent storm on November 23rd 1824 removed upwards of 200,000 tons of stone, effectively a layer 30 inches deep over a distance of 200 yards had been depositing to the north of the Breakwater. The remaining blocks were more firmly settled by the agitations of the storm.

This storm resulted in a 26 foot spring tide. Parts of Cawsand and Millbrook would have both been flooded to a depth of up to six feet! (£7000 - £10,000 of damage reported).

First wreck on the Breakwater (Western End) 24.11.1824 COROMANDEL 110 tons Faro to London. Mr Richard Eddy, pilot of Cawsand rowed to the breakwater and subsequently safely landed five persons in Plymouth

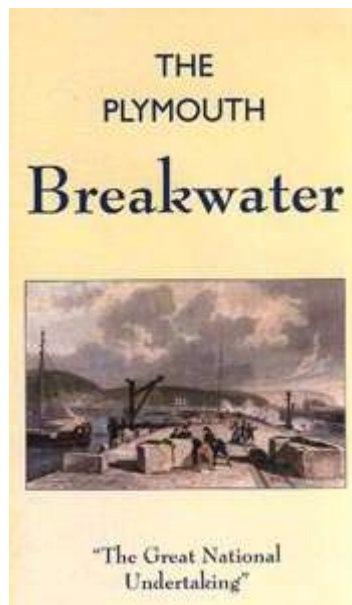
The actual cost of the work was quoted as £1,500,000, some £300,000 over estimate



FURTHER REFERENCES:

The Plymouth Breakwater: "The Great National Undertaking" DVD

by Peter Mitchell on July 4, 2007



Encyclopaedia: http://en.wikipedia.org/wiki/Plymouth_Breakwater

A dive- club website: <http://www.submerged.co.uk/plymouthbreakwater-building.php>

Local Historian: <http://www.cyber-heritage.co.uk/fort/fort.htm>

Specialist Study Group: <http://www.palmerstonforts.org.uk/gall/breakwater.php>