The Threat to Portsmouth Harbour

by

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Contents

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Executive Summary

The harbour has always depended on the scouring effect of the strong ebb tide, itself reliant on the presence of Blockhouse Point, which physically consists of a deep bank of sand and shingle, topped by the Fort itself.

Some 35% of the harbour has been reclaimed since 1660, radically changing the natural geometry and tidal flows.

Dredging for the new aircraft carriers, and the subsequent erosion of Hamilton Bank, immediately to the South of the old Fort, is the only apparent cause of the accelerating local seashore erosion. Evidence that the Bank is yet, or will become, stable is lacking.

Immediate threat

The greatest immediate threat is the undermining of Blockhouse Fort. Even a partial collapse would lead to a reduced tidal scour, silting and subsequent loss of deep water access.

The issue of Hamilton Bank has to be addressed and a permanent solution sought. Failure to consider this as the cause of an otherwise unexplained and rapid seashore erosion, or even to measure and record the changing situation, is inexplicable. The visual evidence seems compelling - see for example figs 33-36 [pages 31-2].

Potential sale of the establishment is inappropriate in the current circumstances.

No agency accepts responsibility and, until the cause is addressed, action is restricted to reactive work of a strictly temporary nature. No permanent repairs are currently planned.

Cumulative Threats

As to the harbour itself, it is served by many organisations, applying their own regulations, apparently assuming that the overall process will cover everything. Small, relatively insignificant schemes continue to pass through the system causing cumulative damage to the harbour. No single authority has been identified, charged with either holding these organisations to account or safeguarding the future of the harbour as a whole.

To inform such decisions, no relevant corporate memory for the harbour has been located.

The paper concludes that urgent action is required to avert the immediate threat, and identifies some possible future solutions, such as the introduction of a Harbour Board.

If we do not stop abusing Portsmouth Harbour we will lose it.

The historical overview of the harbour is included to give context to the present situation.

Busy readers might wish to turn directly to 'Current Issues', starting on page 29.

Introduction - The Threat to Portsmouth Harbour

Portsmouth Harbour is now under greater threat than ever. Individual stakeholders, whether in the fields of commerce, defence, environment or recreation, seek the cheapest solution to their particular issues, while all-powerful bureaucrats dictate, selectively apply their own agendas with little attention given to the wider consequences of their actions. The superficial appearance of a well-regulated harbour serves to disguise an unsatisfactory process with no coherent plan to safeguard the interests of the harbour as a whole; sound judgement appears lacking and democratic accountability virtually non-existent.

This paper starts with an historical overview to provide the context, before moving to assess current problem areas. The fact that Hamilton Bank and Blockhouse Wall are the current focus reflects the urgency of these particular issues rather than the absence of others, such as silting on the western side of the harbour, and increased tidal stream at the harbour entrance impacting on some users. Much depends on unknowns, such as the weather, but potentially the current situation at the harbour entrance could be terminal for most interests.

As I write, the future of the harbour is in the balance and urgent decisions are still outstanding. There is hope. At Blockhouse Wall some emergency repairs have been done although funding is not controlled at the establishment level, and no commitment has yet been made to carry out permanent repairs. Less hopeful, the organisation with a responsibility for handling the erosion of Hamilton Bank has yet to be identified.

Better harbour-wide communication and coherent action on behalf of all the stakeholders is needed, with the requirements of the harbour as a whole being the absolute and over-riding priority. Having explored the issues, the paper seeks to give suitable conclusions and possible solutions. All harbour users are at risk, particularly those requiring deep water.

It is more than three centuries since we established that the harbour depended on the ebb tidal scour. A breach of the seawall, leading to flooding in Gosport, and subsequent harbour silting, remains a possibility, repairable at a cost.. Potentially more dangerous, and a situation never before reached, is the undermining of the old fort itself, sitting as it is on a bank of sand and shingle. Erosion and reduced tidal scour would potentially cause rapid silting, and hence loss of the deep water harbour. The undermining process has started and could be catastrophic; the cost of re-establishing the harbour entrance would be eye-watering.

I am not a subject expert and time is pressing which is why the issues have not been rigorously researched, being based on information immediately to hand. The intention is to inform; any errors are mine.

If we do not stop abusing Portsmouth Harbour, we will lose it. There is nothing new here. As recorded in 1860, '**that narrow tongue of land insignificant as it may appear is the salvation of Portsmouth Harbour.**'[1]

CHD Dec 2020

[1] Adm Martin Papers; British Library [hereafter BL], Add. MS 41408, undated, c.1860.

The Historical Overview

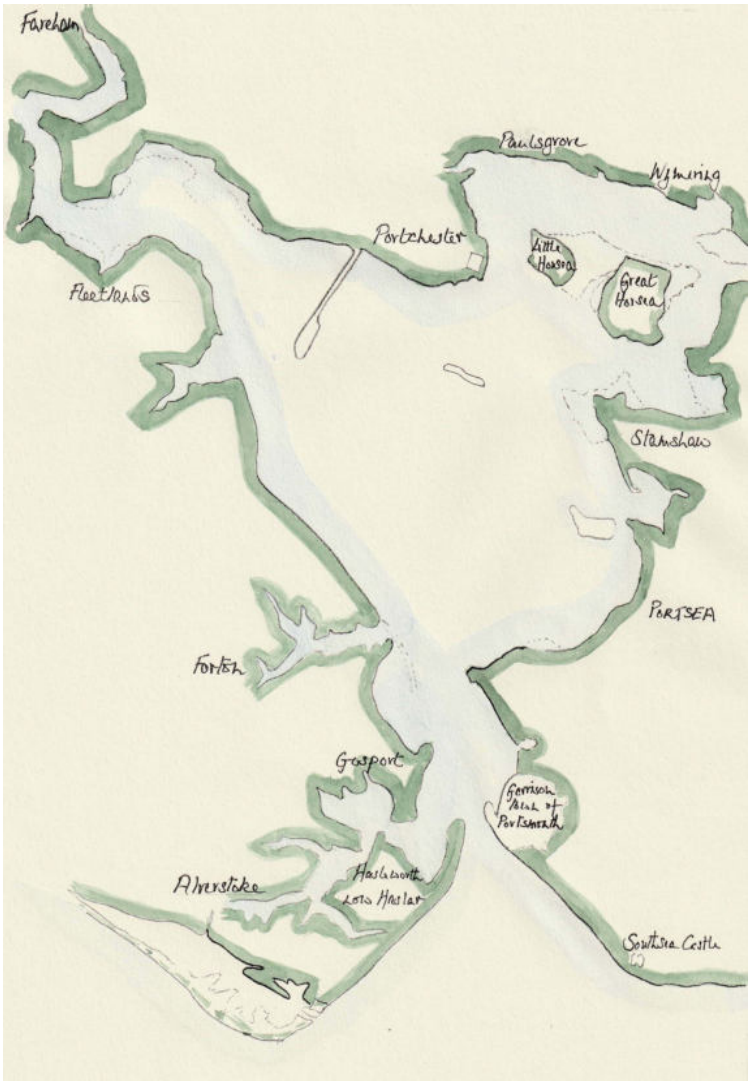

Figure 1 Portsmouth Harbour, c.1626. Modern place name spellings have been used in this sketch adapted from D. Hodson, *Maps of Portsmouth before 1801,* [hereafter Hodson], 3a. CHD.

Inside the Harbour - Reclamation

Fig. 1 shows a nominal harbour plan in c.1626.[2] Land reclamation, still modest, was beginning to grow. A very rough estimate would indicate that, by the end of the French Wars in 1815, reclamation still accounted for only 10 to 15% of the whole. In 1823, it was already having a noticeable effect on tidal conditions in the Harbour.

> 'PORTSMOUTH HARBOUR
>
> During the late war the gun-wharf and victualling stores have been most commodiously extended by solid projections into the harbour; but which have considerably reduced in size, and materially affected the navigation of the harbour, particularly the projections near the harbour's mouth, by altering the natural currents of the ebb and flood-tides round the Point-beaches.' [ie Blockhouse & Portsmouth Points].

[2] The terms 'plan' and 'chart' are used advisedly. It is rare for maps to show underwater shoals &c. Equally, as charts were updated from time to time, no need existed to update topographical details unless required by a change in navigational features.

> The dock-yard, gun-wharf, and victualling stores now occupy one entire side of the harbour, except the *small Town Quay*, and a place called the *Camber*.[3]

Portsmouth Harbour is a natural haven centrally placed on the South coast sheltered by the Isle of Wight to the South East and Portsdown Hill to the North, and originally fed, from the West via Stokes Bay, by the littoral drift of shingle. It is the tidal flow, and the resultant ebb scour, which has been the predominant factor in maintaining such an important space over the years.

In the 1870s and 1880s a significant programme of reclamation was undertaken chiefly in the dockyard, with the addition of new basins. The spoils from this went to form the present day Whale Island. A little later, Horsea Islands, Large and Little, were infilled to provide a torpedo firing range.

Modern studies indicate that 35% of the harbour has now been reclaimed, and it is not known what is in the pipeline.[4] Encroachments inexorably impact on the harbour, and even something as simple as Gunwharf Quay still reclaimed an extra seven acres. In some cases, the impact goes by un-remarked. In others, consequences are relatively immediate.[5] Every scheme has an impact and yet there is scant evidence either of the application of corporate memory or of any coherent overview within the harbour stakeholder community.[6]

As indicated above, the harbour is largely dependant on the strong ebb tide. Admiralty charts tend to be conservative here. Thus, for example, the 1942 chart indicates a spring ebb of 4.1 knots. The 2018 Imray chart notes 3.9 knots which is scarcely credible. Even in the 1980s, operating submarines out of Haslar Lake, ebb tides in excess of 5 knots were not uncommon. Further, 'visitmyharbour' website notes, for 2012, '4.9 knots (corresponding to 6 knots or more with tides of the greatest range)'. Yachtsmen confirm a marked increase since the recent dredge, making entry into the harbour problematic over a longer period during the ebb. The Portsmouth Baseline Document notes 'over 1.2m/s [equating to 2.4 knots] based on the ABPmer model produced as part of the Environmental Impact Assessment for this dredge.[7] An unexpected increase in the tidal stream might be expected to exacerbate erosion at the edges of the channel in particular, and consequently raise more silt.

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3 *Treatise on Dry Rot*, John Burridge, London, 15 July 1823; pp. 118-9.

4 Portsmouth Baseline Dredging Document [hereafter PBD] dated Oct 2017, p. 35.

5 For example, new Horsea Island reclamation started in the early 1970's. By 1978, silting was causing significant issues for Portchester Sailing Club moorings. Portchester Sailing Club, 1928-1978 [50th Anniversary Pamphlet].

6 PBD, p. 8 notes, for example, that no attempt was made to consider matters before 2004 because the records were 'incomplete'.

7 This assessment could make interesting reading. It is difficult to comprehend that this dredge would mean a reduction in the ebb tide. It might also question why the matter wasn't raised as a risk to the harbour, maintained largely as it is on the ebb tidal scour. The only web copy identified in the time available has been archived. PBD, p. 38.

Inside the Harbour - Dredging

Reclamation work is significant but so is dredging, with both having direct impact on the harbour. As might be expected, dredging records are sparse.

Since time immemorial a shoal, slightly offset towards Gosport, had run up the centre of the harbour - see fig. 2. The perceived cause was movement into the harbour of shingle [littoral drift] which settled on the North end of Blockhouse Point. If the quantity and levels became too high here, then the shingle progressed up through the harbour along the line of this shoal which connected with 'Elson Elbow', to the North of Burrough Island.[8]

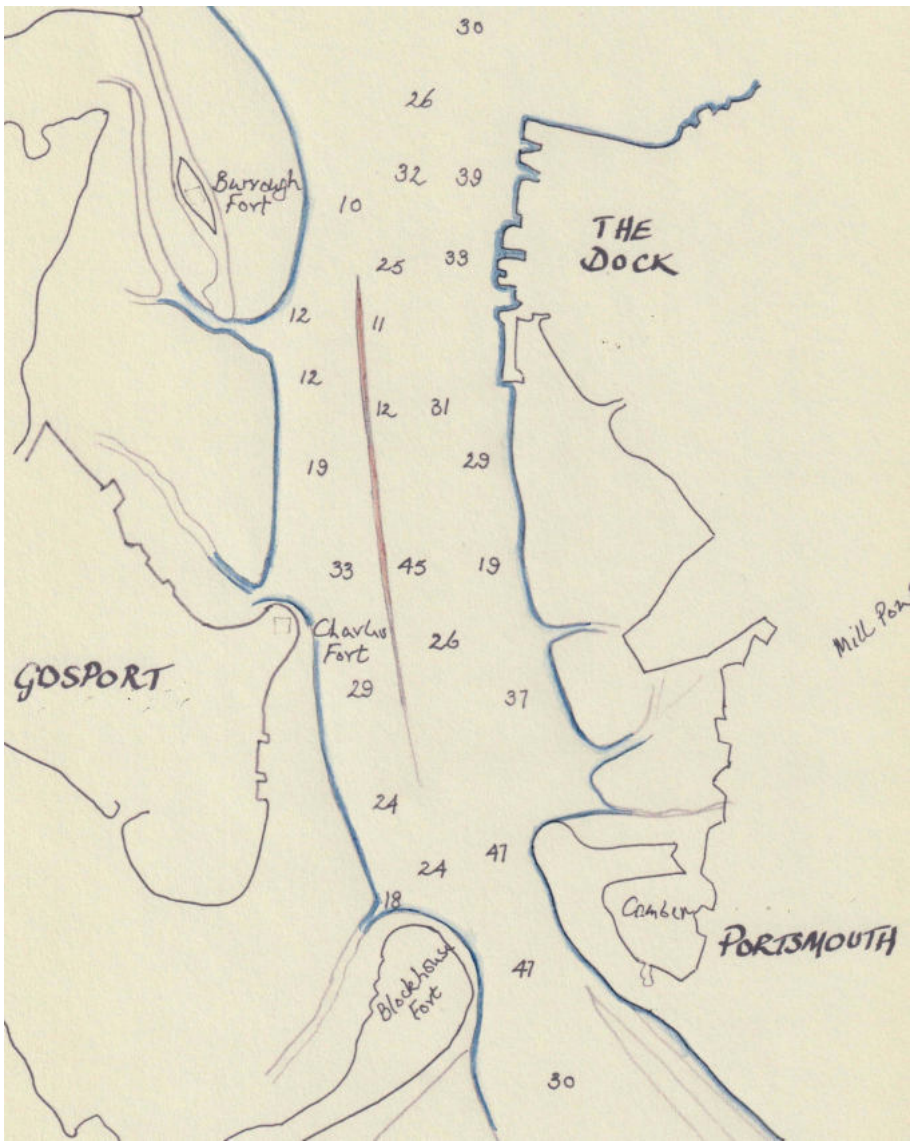

Figure 2 1716. Harbour detail. The middle ground [or shoal] runs up the centre of the harbour, slightly offset towards the Gosport side. Sketch adapted from Hodson 14a. CHD.

[8] Sometimes 'Burrow Island' (see fig. 3) or 'Rat Island'. 'Burrough Fort' was also known as 'James' Fort'.

As ships grew in size, this shoal became a real embarrassment, and the central part has long since been dredged away. The Northern part, Burrow Bank has now mostly gone - see fig. 3.

Figure 3 1858, Burrow Bank; Admiralty Chart 2631, detail.

Of particular interest here, the part to the South, now known as Ballast Patch, has been equally irritating to users of large vessels.[9]

Shipping of the day required to dump ballast before entering port and embark the same on leaving. Those attempting to maintain navigable channels would invariably be in conflict with those who used them. A classic case came to a head when, in 1735, HMS *Britannia* grounded briefly on her way into Portsmouth. - a fresh survey was taken - see figure below. Perhaps it was John Uphill's misfortune to be caught dumping ballast in the approach channel in 1737. The Yard Commissioner wanted to charge him and the Portsmouth Corporation were unwilling to pay the prosecution costs.[10]

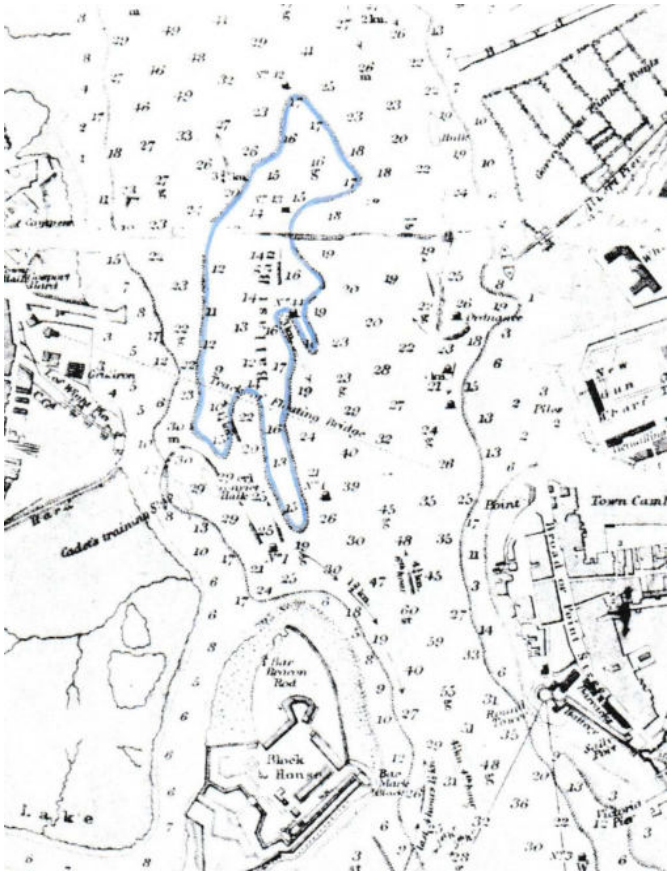

Figure 4 1858, Ballast Bank; Admiralty Chart 2631, detail.

9 'The Ballast Bank, lying as it does in mid-channel must, I think, be admitted to be a very serious evil...', Paper 'On the General Features of Portsmouth Harbour'; undated, c.1860; BL, Add. MS 41408, fol. 281r.

10 The National Archives [hereafter TNA], ADM 106/893/95 dated 21 Nov 1737 and ADM 106/891/174 dated 8 Nov 1737.

The other side of the coin was those wishing to take on ballast. The cheapest source was Blockhouse Point and here there was some difference of opinion between the Ordnance Board, who owned and maintained the fort, and the Navy. The Admiralty considered that too much shingle was a potential threat to the harbour while the Board of Ordnance demonstrated that such removal was putting the fort at risk. The dilemma is neatly summarized in a report from the local Ordnance Engineer, proposing repairs at Blockhouse Fort in 1751:

> 'I humbly beg leave to represent that about 6 Tons of Beach are daily taken away, from the narrow point of land at North of this Fort for ballasting Ships of War, and other Vessels in the Harbour which has within these few years occasioned the Sea gaining 30 feet in Breadth on the East Shoar [sic] next the mouth of the Harbour, ... [to the detriment of] the preservation of this Fort.'[11]

The naval response from the Yard Master Attendant was equally informative:

> 'We have been to Blockhouse and viewed the Beach there, and find that some Hundreds of Tuns of Ballast have been thrown in by the Sea, more than taken from thence for Five Months past, and are of Opinion that the Ballast that may be wanting for the use of his Maj.ts Ships, may be taken from thence without detriment to the place; when it blows hard from the SE to the SW the Beach becomes very Steep, and the Tide of Ebb which runs strong round the inner part of Blockhouse, washes the Shingle into the Channel which sets it over to the Middle Ground; so that if no Ballast for the future is to be taken from thence, it may in time prove of bad consequence.'[12]

An uneasy truce ensued, and it should be mentioned here that theft of ballast shingle was not unknown causing the occasional guard to be set. This print, 1830s, might fairly represent such an event on Blockhouse Point.

Figure 5 Blockhouse Point in 1830s, looking across to Portsmouth. The beach is obviously depleted.

11 TNA, WO 55/2273, p. 16. Officers to Board of Ordnance, 1751 estimates.

12 TNA, WO 55/2272; letter Master Attendant to Comm'r at Portsmouth Yard, 3 May 1751.

Still the subject recurred from time to time. Indeed as late as 1848, the Admiralty had cause to write to the Ordnance Board:

> 'It appearing that the ground at the entrance to Portsmouth Harbour on the North side of Blockhouse Fort is rapidly wearing away, in consequence of the removal of Shingle ... I am commanded by my Lords Commissioners of the Admiralty to request that you will give directions for Immediately suspending the removal of any more shingle, by the men employed under your Department until an official report upon the subject has been received.
>
> I am further to add that my Lords have called for the Report, but that in a matter of so much importance, they do not like to risk a day's delay.'[13]

The Gosport Engineer replied the next day:

> 'I find that a portion of the Bank of Shingle extending to about 150 feet in length and 4 feet in depth has been recently washed away during the late heavy gales, commencing from the termination of the Breakwater lately completed by the Department and extending towards the Harbour...[14]

The Commanding Royal Engineer protested that no shingle had been removed by his department, that the estimated cost for the new [see yellow wall in fig. 6] would be £950 and then went on to suggest that 'it does not appear to be an Ordnance question but one connected with the preservation of the Harbour' [and therefore a charge to the Admiralty][15].

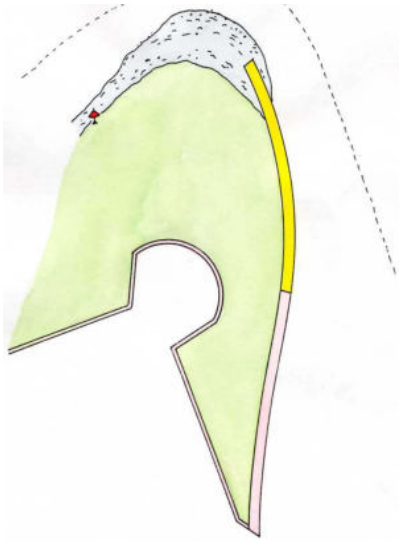

Figure 6 1848. The pink coloured wall represents the breakwater 'lately constructed' and yellow - that now proposed. The top of both can still be seen today. Sketch adapted from WO 44/284. CHD.

Ballasting problems probably eased over time with the increased use of iron ballast. Dredging is a different matter. Dredgers were in use in the C18th, and a steam dredger was known to have been operating in Portsmouth Harbour by the 1820s. With increased harbour use, and larger ships, the requirement only increased. Bearing in mind the massive reclamation projects being undertaken, these together with an equally ambitious dredging programme, must have altered the harbour very significantly. The key point remained unchanged - enough of Ballast Bank was retained to deflect the fast flowing ebb tide through the harbour entrance.

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13 TNA, WO 44/284, letter Admty to Ordnance Board, dated 5 Jan 1848. 'Immediately' was underlined in the original. Such matters were then treated with rather more urgency.

14 Ibid., letter to Commanding Royal Engineer at Portsmouth, 6 Jan 1848.

15 Ibid., letter to Inspector General of Fortifications, 6 Jan 1848.

This period is less well researched but by 1900, there was inevitably an item about Portsmouth Harbour dredging in the annual *Navy Estimates*, e.g.

1901 Dredging of Portsmouth Harbour continues

1902 At Portsmouth, the outer and inner bars and approach channel are practically completed. In the inner harbour more than half the number of berths required have been dredged. The approach to Fountain Lake and the widening opposite M caisson has been completed to 25ft LWOST.

1903 At Portsmouth the approach channel has been dredged as far as possible. In the inner harbour ten berths have been finished, and three others well advanced.

1904 At Portsmouth the outer and inner bars and the approach channel are completed. Eleven berths have been dredged and two others are nearly finished. Of the cruiser berths in Fountain Lake one group of three is completed and another group is one-third done.

1905 Portsmouth - about 3 feet more still have to be dredged at the outer and inner bars. One more berth has been dredged and one nearly finished. The work on cruiser berths in Fountain Lake is being proceeded with as fast as possible; the second group of three is now about half done. The deepening of the channel abreast of the ASSISTANCE berth is done, and the entrance to Fountain Lake has been widened. [not sure where ASSISTANCE berth was].[16]

And so the seemingly relentless work continued, quite possibly inspired by sheer frustration:

> In Jan 1901, MINERVA was stopped from sailing by QHM. The CinC wanted to know why, since Portsmouth was the 'First Naval Port of the Empire'. QHM responded that it had been blowing a full gale on top of a full spring tide, 'taking into consideration the weather and the tide, (it) would have been very dangerous....'
>
> He went on, 'as a remedy for this I can only suggest that the entrance to the harbour be widened by the removal of Blockhouse Point Fort...' The matter was referred to the Hydrographer and no further action was taken.[17]

A century later, it is not Dreadnoughts but the new carriers which have added such an additional strain to these natural resources. This time, it would appear that the homework has been less than thorough and there are now some issues.

Included in the carrier dredge was the deepening of Fountain Lake by 2 metres. There is history here and it is can only be hoped that this was taken into account. In the 1980s, over-dredging required a backfill to prevent Fountain Lake jetty toppling into the harbour.[18]

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16 All quotes from appropriate pages of *Brassey's Naval Annual*.

17 TNA, ADM 1/7492/A123, dated 23 Jan 1901.

18 Information available to the author when Operations Officer to the Submarine Squadron at *Dolphin* in the 1980s.

Haslar Lake will be investigated separately - see below. Before leaving dredging there is one more aspect that needs to be mentioned - the immense growth in sailing capacity and facilities within the harbour. With the possible exception of Port Solent [which is locked in and therefore counts towards the 'reclaimed' figures], the vast majority of these facilities are on the Gosport side of the harbour. All these marinas are dredged, probably to two or three metres, displacing the mud flats and further altering the tidal flow.

In 1860, there appeared to be more awareness about the factors involved than noted more recently and it is worth quoting an example, from the papers of Admiral Martin, which relate to 'Tidal Scour and the importance of maintaining Tide Volume and Natural Flow:

> 'As an example of this I would draw attention to the comparatively late erection of Blockhouse Fort [the author is referring to the 1845 rebuild], where the Sea Wall at the North end was brought in advance from the crest of the Beach which has had the tendency of diverting the set of the Tides at this part of the Harbour. What was the consequence? Why, the Beach was, and still continues to be acted upon by the water, and from being what it originally was, - a fine bold beach, it is now, to a very great extent, denuded of the shingle, and has become a flat and low shore.'[19]

At what stage, fed by the littoral drift, the shingle stopped rolling along from Stokes Bay and into the harbour, is difficult to pinpoint. Certainly the 1845 rebuild could have been significant. But it is possible that wider considerations were at play. Southampton has a similar history of reclamation and dredging. Likewise, dredging has been extensive in the western Solent; there will be others better qualified to explain the changes. However an equilibrium had been struck. While the seawall had been protected by the shingle, it was then covered by the massive fortification on the Point. It is only now, with the rapidly reducing shoreline, that the vulnerability is exposed.

[19] BL Add. MS 41408 fol. 5 283r, undated, Adm Martin papers, c. 1860.

Haslar Lake

Immediately to the left on entering Portsmouth Harbour is Haslar Lake (sometimes Oyster Pool Lake), the name generally used for the eastern end until about half way up the inlet when it then becomes Stoke Lake. The last water before the village today is an artificially created lagoon, referred to as Little Anglesey Lake. The whole inlet is considered separately here for reasons which will become apparent, and because of the obvious vulnerability if a breach should occur in the Blockhouse sea wall.

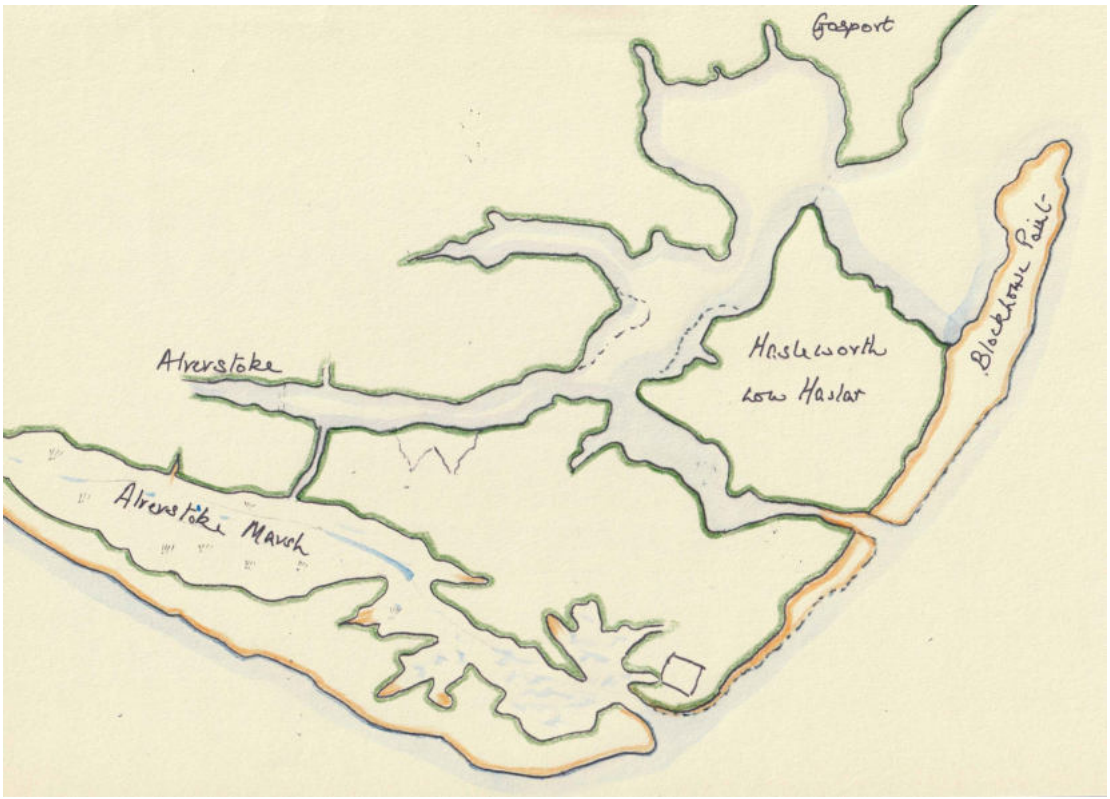

Figure 7 c.1600. A sketch adapted from Hodson 3a. At this period, there was a narrow opening into the sea to the South West of Hasleworth later the site of Haslar Hospital. CHD.

The river Alver, flowed from the West through Stoke Marsh and thence to the sea, part being diverted through Alverstoke and into Stoke Lake [Little Anglesey Lake] - see fig. 8.

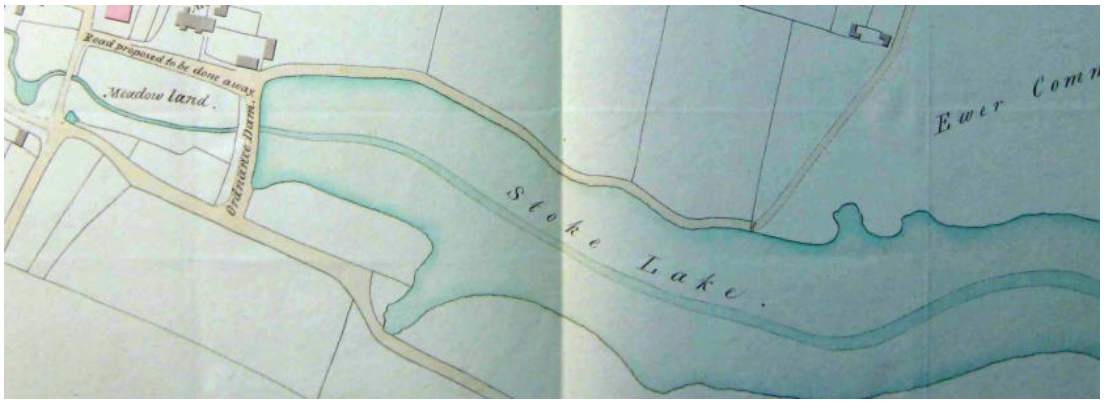

Figure 8 1814 - Flow of Alver tributary through the village into Stoke Lake. TNA, WO 44/241.

Turning again to Haslar Lake

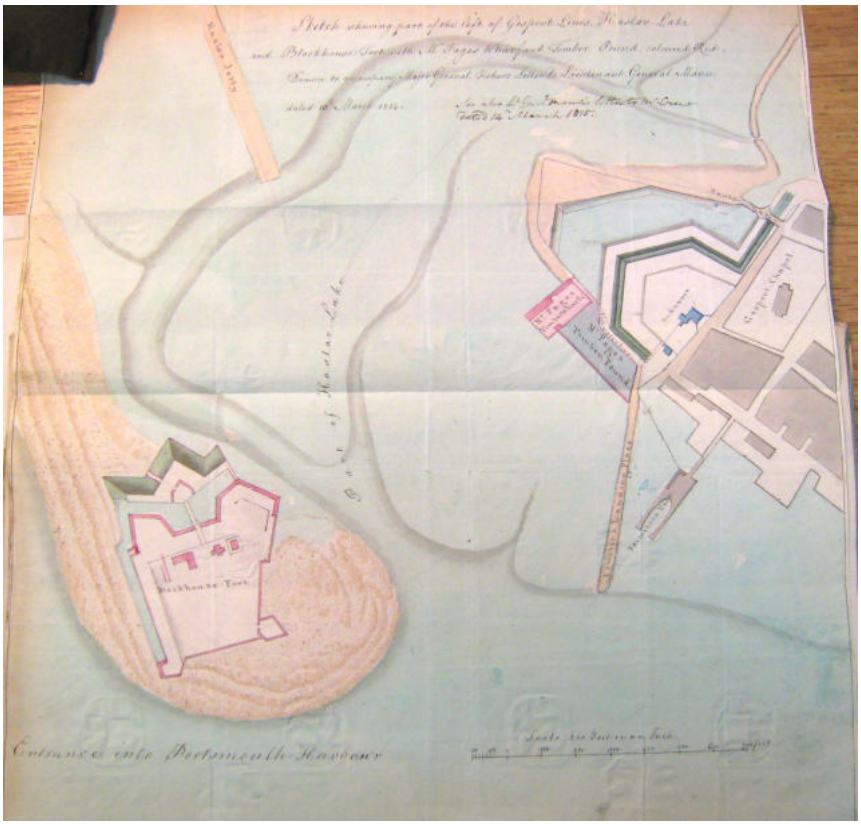

Figure 9 1815. The entrance to Haslar Lake with Blockhouse Fort to the left. The thin 'strand' stretching from the Gosport fortifications to the deep water is the Convict Hard, constructed in 1803; detail, TNA, WO 44/241.

The land between the Fort and Haslar is, with the exception of the original narrow causeway, all reclaimed land - roughly the current playing fields, for use by HMS *St Vincent* when employed as a Training Ship and the [Submarine] School Area, mostly reclaimed as playing fields for the Sick Berth Assistants from Haslar.

The installation of the Gunboats and associated slips, alongside Haslar, to the North of the bridge appears to have required limited dredging.

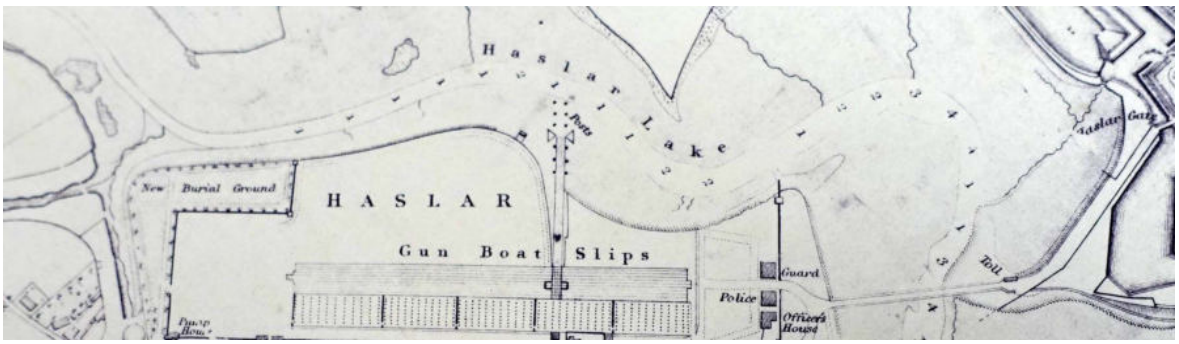

Figure 10 1858 Haslar Lake at Gunboat slips [of a similar date]. No obvious signs of dredging effort here. Haslar Bridge bottom right; Admiralty Chart 2631, detail.

Little dredging would have been necessary for the Submarine Mining Engineers who took over the Fort in 1870, although they did erect a jetty and extension- still in evidence.

In 1905, submarines moved into Blockhouse, and pre-emptive dredging started in 1904:

> 'Dredging commenced in earnest at the site of the proposed new submarine dock at Haslar on Tuesday. The large dredger ENOCH commenced work there in place of the smaller one previously used, which had been found to be of insufficient capacity to cope with the work.'[20]

Figure 11 Conceivably the original 'submarine' dredge in which case the date is 1904. Note the man in the middle ground standing on the mud. MoD.

[20] Hampshire Telegraph, 4 June 1904, p. 7, col. 4.

The dredge was completed by 1905 and the post-dredge survey completed in October 1905. The dredging for the new floating dock is clearly delineated. The soundings are in feet.

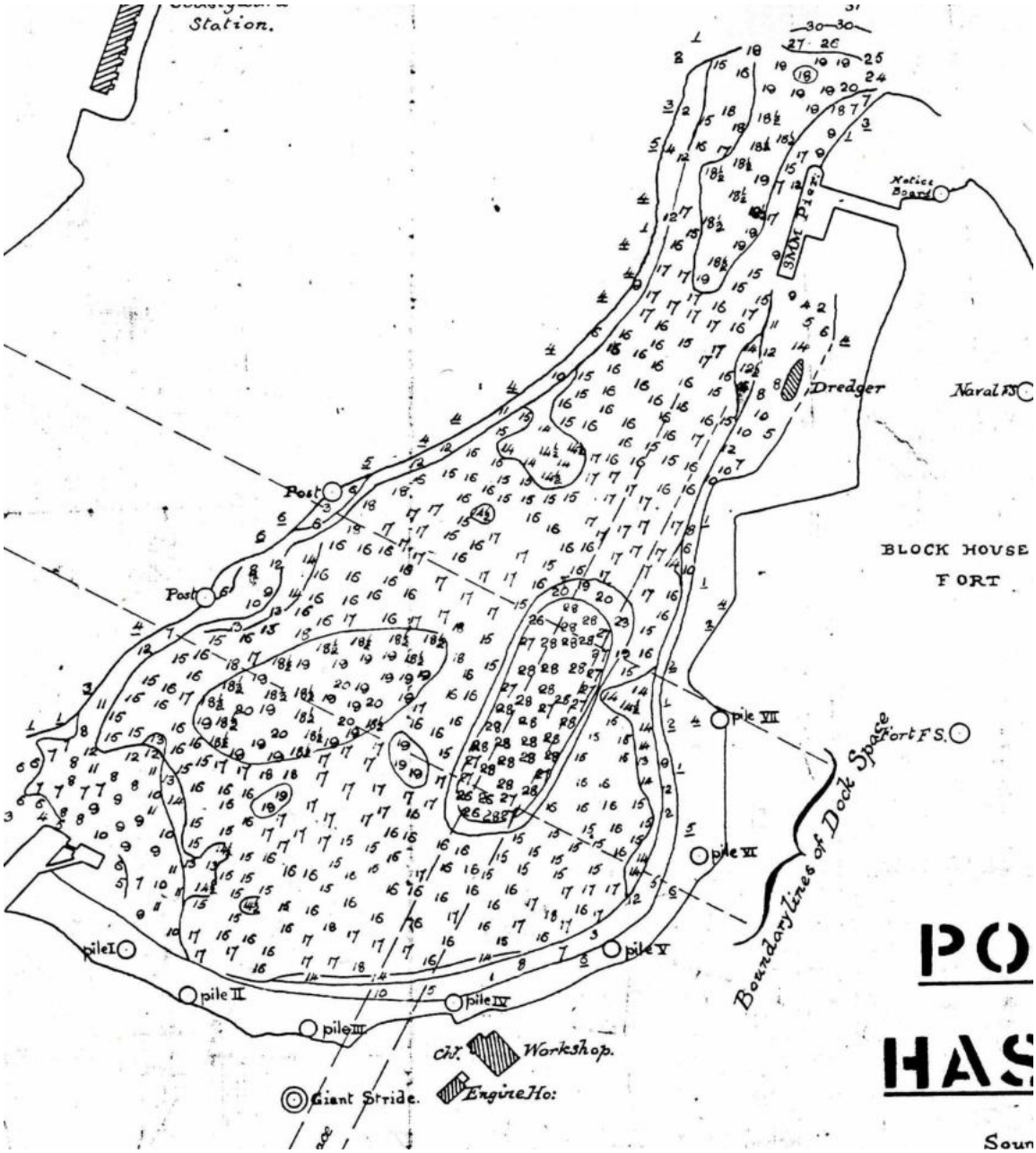

Figure 12 1905 - Soundings 'reduced to the level of Low Water of Ordinary Spring Tides or 6ft 2 in below the Ordnance Datum which is 6ft 4in on the stone tide scale at the entrance to No. 5 Dock or the zero of the stone scale on the wall on the north side of the King's Stairs' - Portsmouth Drawing No. SD 181, sounded Oct 1905.

Comparison with an Admiralty Chart of 1942 suggests very little change.[21] The lake was deepened post War for the larger conventional submarines. In the mid 1980s the intention was to dredge at the *Dolphin* jetty face to a depth of 5.5 metres. The safety of this was challenged at the time but it is believed this work subsequently went ahead.[22]

The other proposal was to move Ballast Patch buoy and to reduce the bank.[23] Here too, the work later went ahead. The bank was reduced and the buoy replaced with a pile, now rather closer to the Gosport shoreline.[24] The expected result of this work was inevitable. The strong ebb from the harbour now impinged on the North of Blockhouse, already believed to be fragile and additional rock armour had to be added to the existing piles. The situation here has not been monitored further.

Accelerated silting is self-evident. By way of illustration, the deep channel outside the Haslar Marina was, in 1990, maintained at 10 m, then 8 m and then allowed to reduce to 6m. I understand thought is now being given to a further reduction to 4m.[25] The reason is simple - cost. The Marina conducts it's own routine dredging within the berths. Soft silt currently accumulates at the rate of 10cm per year, rather more slowly than in the channel.[26] There are obvious consequences. It is only a matter of time before the commercial viability of marinas in this lake becomes questionable. If the Blockhouse wall is breached, any impact on Gosport will be magnified, the shallower the water here is.

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21 Admiralty Chart 2625, published 30 Oct 1942 with small corrections to 1946. Private collection.

22 This would have rendered the jetty unstable. Just a few years earlier Fountain Lake Jetty had been over-dredged, and starting falling into the harbour; back-filling was required. CHD

23 Without the existing bank to divert the full ebb tide through the harbour entrance, the concern was for more stress on the North of Blockhouse Point, and increased silting in Haslar Lake. CHD

24 Haslar Marina [mud flats on Gosport shore opposite Blockhouse] was also dredged at this time to c.2.5 metres.

25 No maintenance dredging is listed for Haslar Lake channel but accompanying plans make the situation unclear; PBD, pp. 11-14 & 16.

26 The expressed hope that, 'the ebb dominant tide regime [would] self-clear the berths and channel thereby minimising sedimentation' may be true for much of the harbour, but not for Haslar Lake; PBD, p. 10.

Harbour Approaches

The harbour approach has not always been straightforward. This section gives a brief overview of how this important channel has developed over the years, and the cause of current issues. The impact of dredging on the Blockhouse Wall is considered in the next section.

As with all such channels, they used to shift with winds and tides. Here, albeit taken from a map, is an 'introductory' view of the state in 1626.

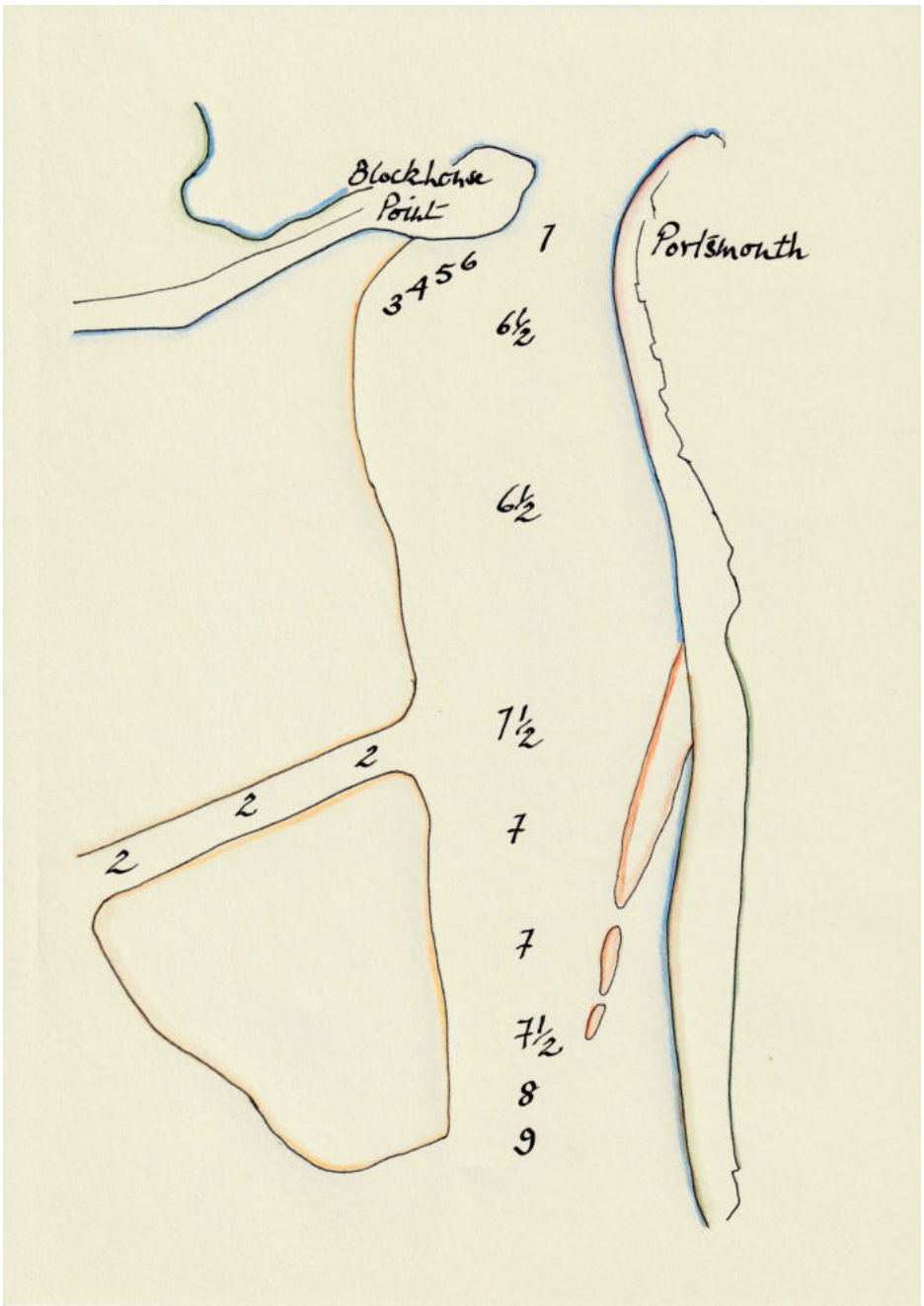

Figure 13 1626. Sketch adapted from a later plan of 1678, the channel details are believed to reflect the original 1626 survey; see Hodson, 3b. CHD.

In 1735, as a result of HMS *Britannia* grounding briefly on her way into harbour, a special survey was carried out - see fig. 14 below.

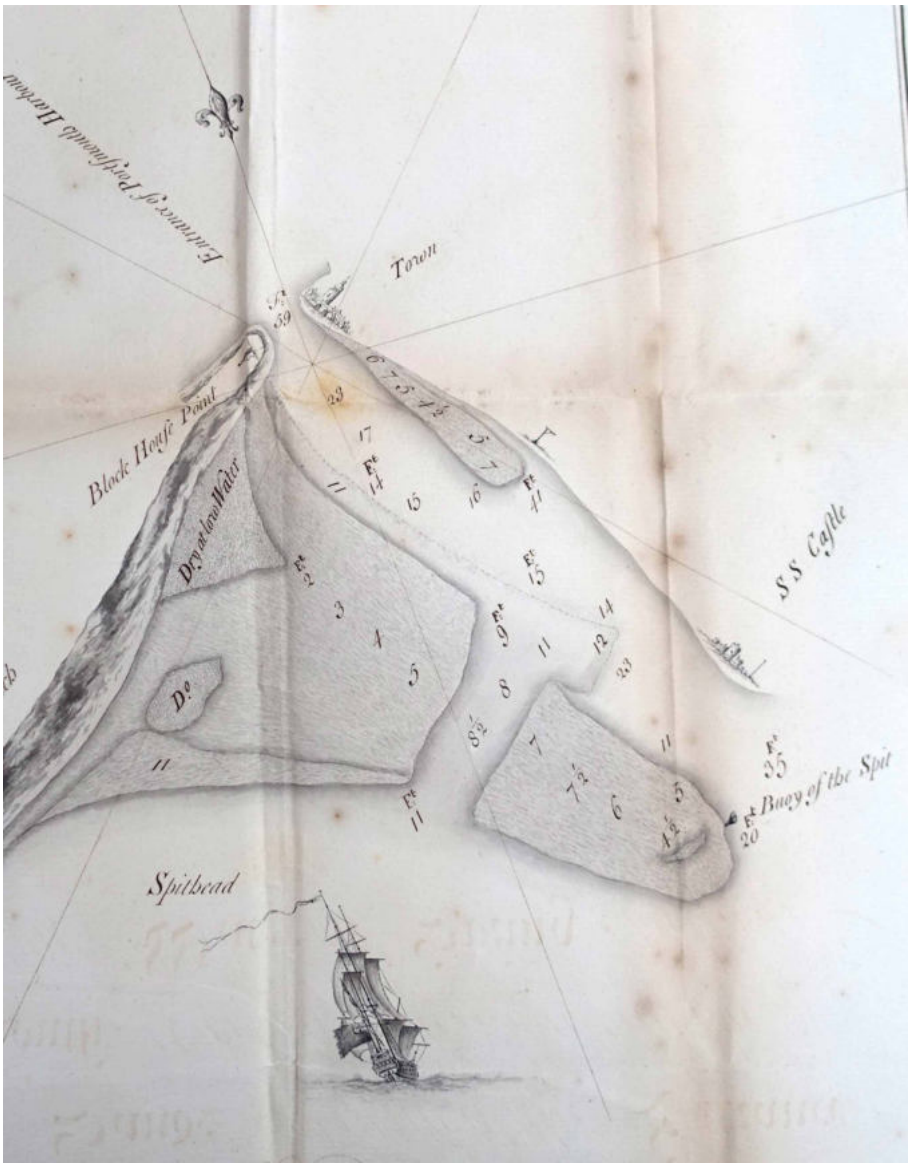

Figure 14 Portsmouth Harbour approach channel, with a known survey date of 1735; a slightly deeper channel (soundings in feet) but otherwise little change. Land to seaward of Blockhouse is still drying at low water. TNA, ADM 106/869/79.

There were continuing issues with this channel, not least the illegal dumping of ballast on the way into harbour - see above. Evidence suggests this was invariably the action of merchant ships; the masters [and commanding officers] of ships of war were easily sanctioned.

The shallowest part of the main channel shown in fig.14 is 12 feet. In 1844, the local pilot noted 'there is on the bar at low water ordinary spring-tides, namely 12.5 feet', remarkable stability in over a hundred years. This was imposing a serious constraint on use of the harbour - see fig. 15 below.

Figure 15 1858. Channel still constrained by the 'Bar' - see bottom centre of the image. Note Hamilton Bank has a mean depth of 3 to 4 feet; based on Admiralty Chart 2631, detail.

A major project was instituted in 1860 to dredge this bar, to maintain Portsmouth's reputation of being accessible at every state of the tide.

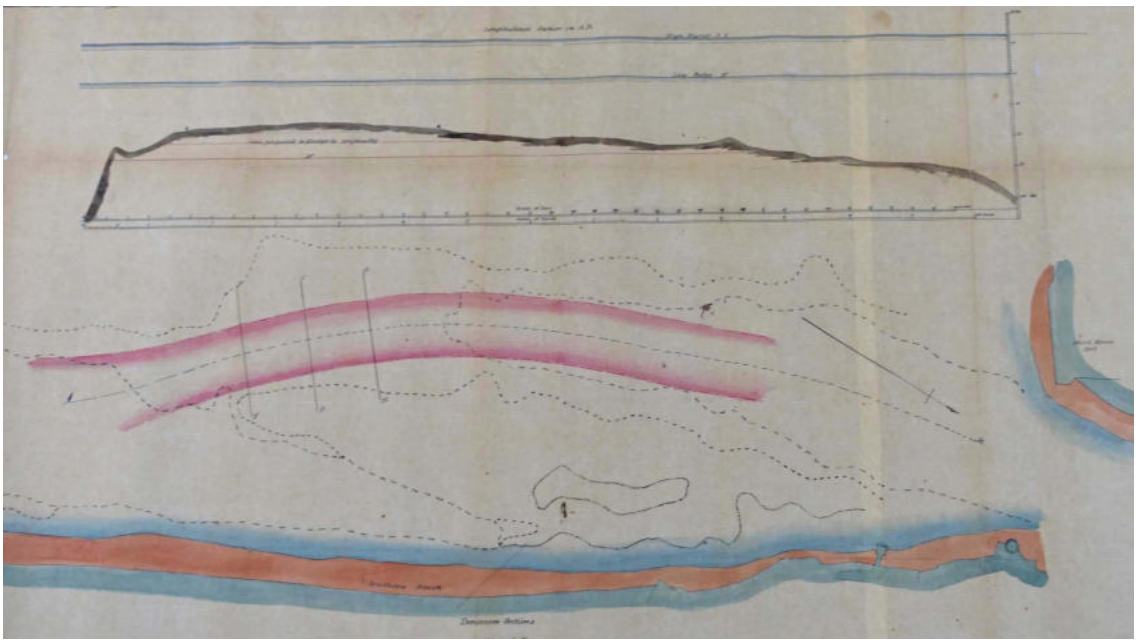

Figure 16 c.1860. Proposed dredge of the bar in the approach channel to Portsmouth, to about 25 feet below LWOST. Blockhouse Fort is to the extreme right.; TNA, MRQ 1/33.

This was but a start; just like today it is a continuing process as the requirements change. Indications are that the Inner Bar had been dredged to a satisfactory depth by about 1905 - presumably just in time for the newer battleships.

Figure 17 1942. Compare with fig 15 and note the depth over Hamilton Bank. Although the depth of the channel has been significantly increased, stability has been maintained; Admiralty Chart 2625, detail.

Dredging might have doubled the depth of the main channel in a century but the profile of Hamilton Bank has been maintained and the beach at Blockhouse seawall is largely unaffected by the changes.

By 1974 the channel had been significantly deepened and straightened, with a dredged depth of 9.4 metres from Outer Spit Buoy to the harbour entrance.

The difference between this work and the more recent dredge is not difficult to spot - soft edges. When dealing with natural materials such as sand and shingle, stability is unlikely to be achieved by digging a trench with sharply defined edges, particularly in an area where the most cursory historical investigation might have suggested caution.

Blockhouse Wall - Historical

General

The vulnerability of the narrow strip of land from Haslar to Blockhouse Point has long been recognized. The first noted reference being in 1677, when Sir John Kempthorne, then Commissioner at Portsmouth Yard, reported, 'the sea has for some time been gaining .... it may endanger its making a passage through that neck to the great prejudice of the harbour'.[27] Similar letters are noted in 1699,[28] 1711,[29] and 1747[30] but these are by no means the only instances of particularly stormy weather or damage. A pattern emerges of sound work, followed by neglect and then the urgent necessity for remedial action. The process is well captured in a paper dated c1860:

> 'The Beach from Blockhouse Fort to Haslar Hospital ... though protected by a Stone Embankment is nevertheless, when the South West Gales are on, very much acted upon by the Sea, which occasionally makes considerable breaches in the stone facing; and no matter what the cost of repairing and maintaining the Breakwater may be, it must be done.... that narrow tongue of land insignificant as it may appear is the salvation of Portsmouth Harbour.'[31]

Figure 18 c1820. A pilot boat beats out of harbour. Haslar is in the background and harbour entrance to the right. The fort is really exposed. MoD.

The fact is costly repairs have always been necessary. Today the fort is just as vulnerable to gales from the South.

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27 From Sir John Kempthorne, then Commissioner of Portsmouth Yard, *A Descriptive Calalogue of the Naval MSS in the Pepysian Library*, Vol. 57 [Navy Records Society, 1922], p. 554.

28 Col. Gibson to Ordnance Board, letter dated 2 Dec 1699, TNA WO 55/319, p. 62.

29 e,g. M Richards [Ordnance Engineer]; BL Stowe 477, fol. 10.

30 Letter from John Turner, Overseer of Work at Haslar, dated 20 Jan 1746/7; National Maritime Museum [hereafter NMM] ADM/Y/P/115.

31 Adm Martin Papers; BL, Add. MS 41408, undated, c.1860.

Blockhouse Point was first mentioned as a defensive position in 1417 as one end of the defensive chain - the other end, at Portsmouth, being defended by the Round Tower which still exists in a rather modified form. Skipping a couple of centuries [and works not relevant here] a battery of guns, facing down the main shipping channel, was positioned on this exposed spit in 1666 A plan in 1688 provides a datum point regarding the spit and what became the Hamilton Bank.

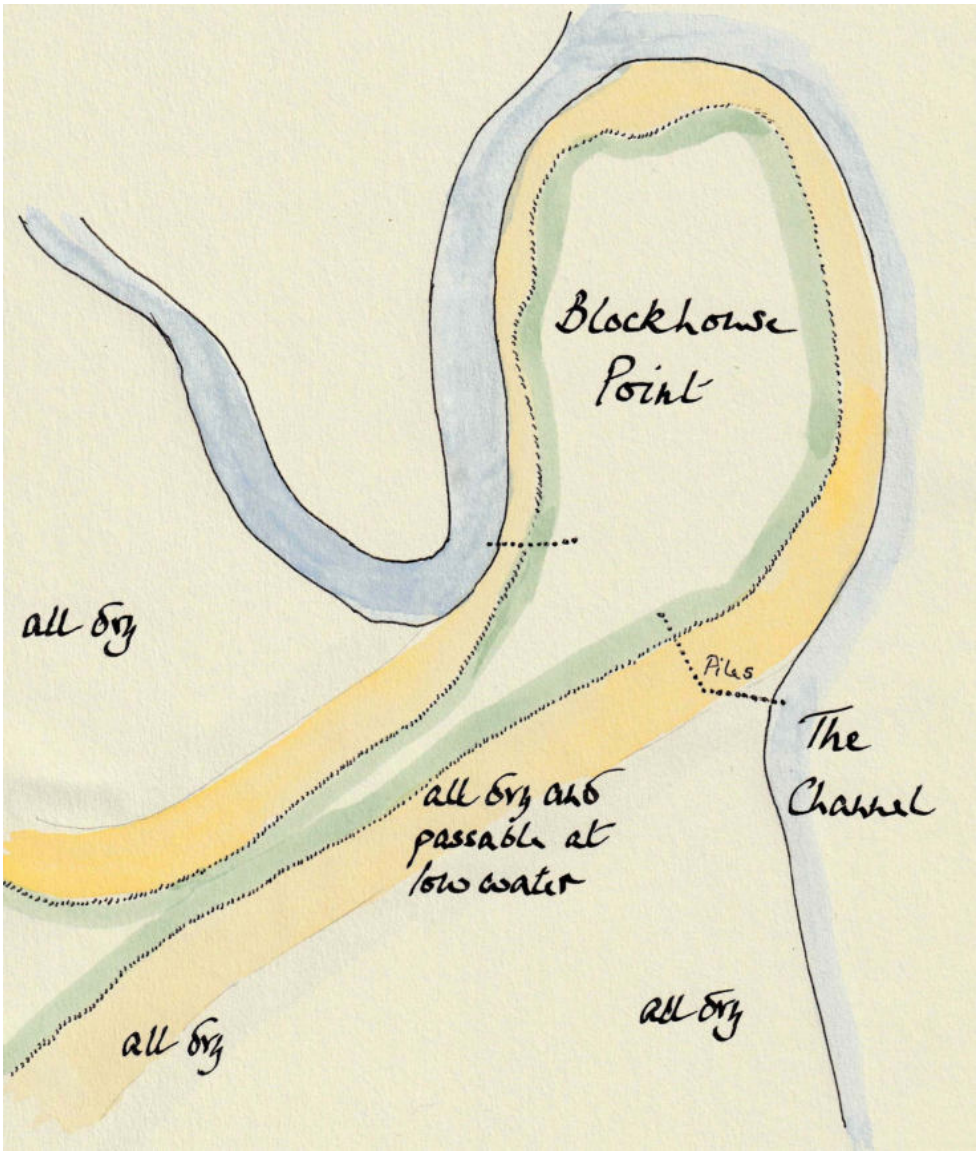

Figure 19 1688. Sketch adapted from a drawing by Thomas Phillips, the Portsmouth engineer, in a letter to Lord Dartmouth. The proposed battery of guns has not been shown here. Original at Stafford Record Office [hereafter SRO], D1778, I, 1307. CHD.

The narrow tongue of land is clearly shown. This is where the sea was reported to have washed over in 1677. The bank itself is shown 'all dry' off the drawing to the bottom, possibly not far short of the Swash Way.

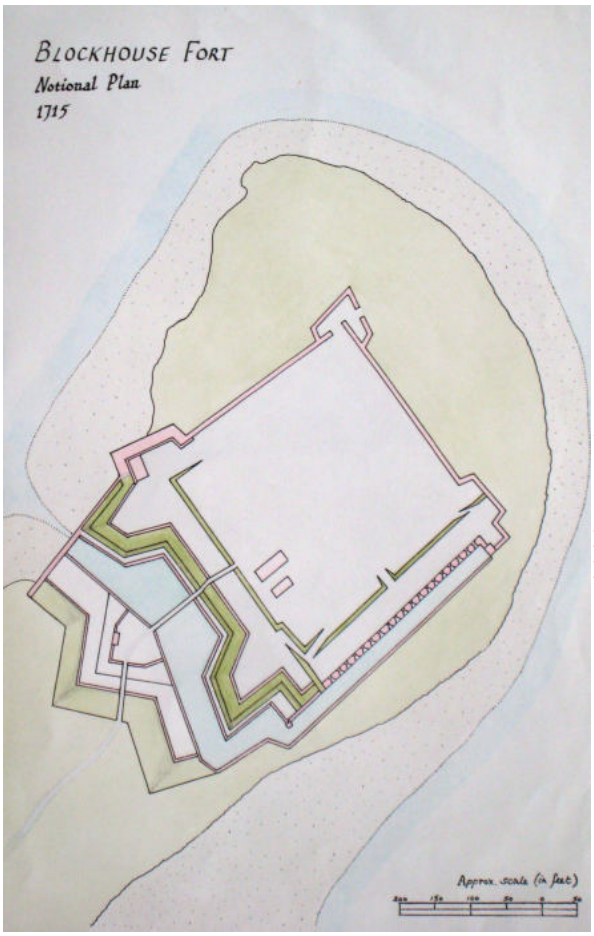

Figure 20 1715; the fort as rebuilt during Queen Anne's time. Of particular interest here, the outer wall at the bottom of the plan approximates to the position of the 2013 damage; a notional plan adapted from some two dozen partial or low quality images, viewed at multiple places. CHD.

Figure 21 c1756. 'L' at the bottom left refers to an earlier repair, 'Wharf and Grind, built in the Year 1746, to stop a Breach made by the Sea, which endangered the Entrance of Portsmouth-Harbour.' Note centre right, where the beach is receding, as tidal eddies cause erosion, requiring extensive piling; MoD, Admiralty Library, Pfo B/31, detail.

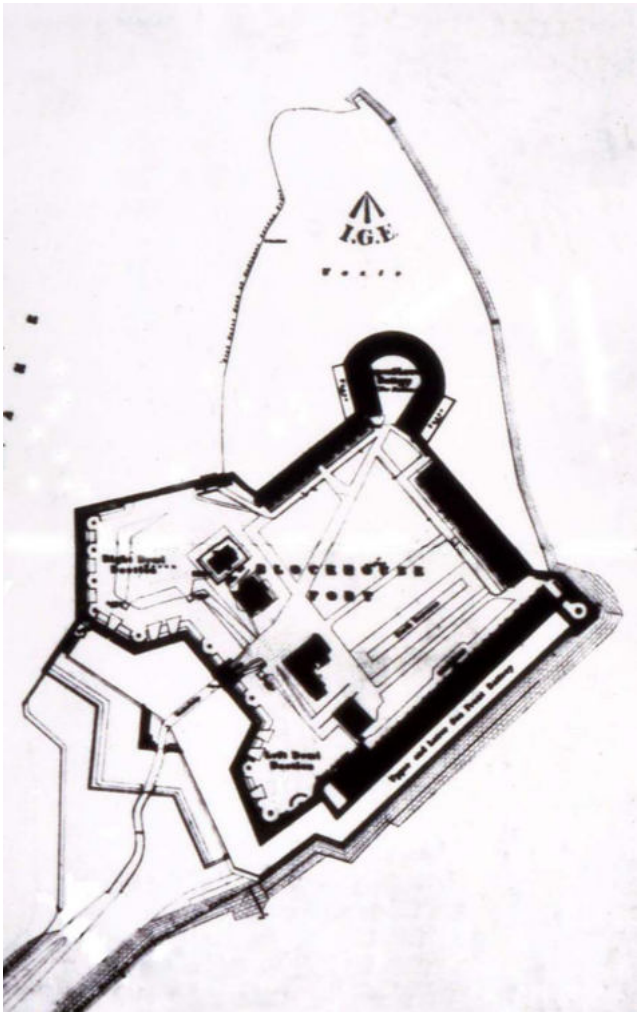

Figure 22 1840s rebuild. This dates the wall in front of the main battery. The wall from there to the bottom left is from an earlier age. MoD.

There was significant rebuilding here during the French Wars, at a cost in current prices in excess of £5m.[32] The fort still suffered considerable damage in the great storm of January 1817.[33] And the beach was under threat again in 1819, requiring urgent repairs, 'to prevent the Sea making a Breach into Haslar Lake'.[34]

When the major reformation of the fort was undertaken in the 1840s, with the new upper battery built [including the still existing moat and seawall] major repair work is not noted for some years. It is conceivable that this stems from the demise of the Board of Ordnance and different record keeping priorities by the War Office.

For a century, the Moat Wall in front of the main battery, provided with regular routine maintenance, has been of little concern although repeated dredging of the main channel, had raised fears of shore erosion.
The same was not true of the short section of wall to the SW of the moat. Defensive piling was certainly necessary here by the turn of the century, to protect the ancient wall from storms.

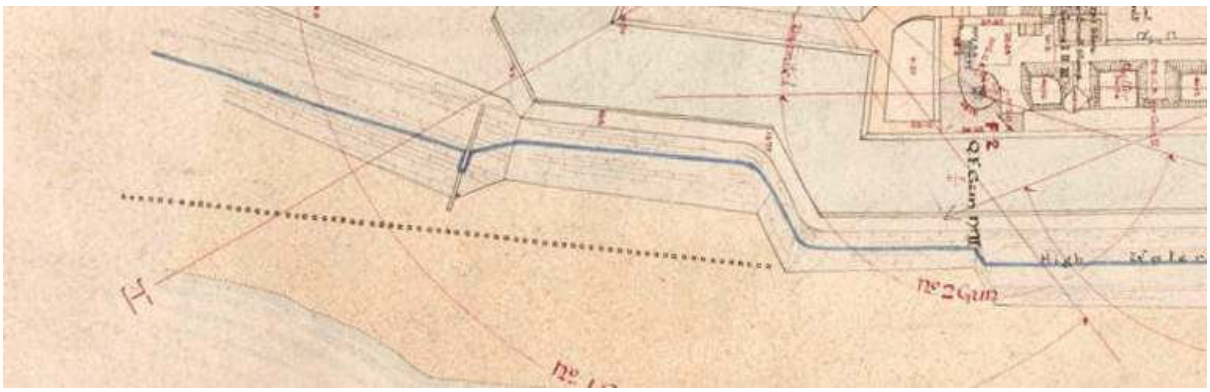

Figure 23 1890s. The remains of this line of piles [the dotted horizontal line] are still visible; TNA, WO 78/5028/003/1, detail.

[32] Letter to Gen. Man from Col. Fenwick dated 12 Apr 1816; Royal Engineers Corps Library, [hereafter RECL], POR 0/3/40, pp. 22-3.

[33] Letter to Gen. Man from Capt Buchanan RE, dated 22 Jan 1817; RECL POR 0/3/40, pp. 284-5.

[34] Letter to RH Crew Esq. from Col Bryce RE, dated 31 Mar 1819; RECL POR 0/3/41, pp. 443-4.

Fig. 24 shows the piles still in place and able to fulfill their original function - to disperse the full strength of the waves on this vulnerable part of the wall. Perhaps because they deteriorated relatively rapidly, or some Senior Officer thought they looked 'untidy' - whatever, they were cut off at shore level in the 1930s.

Figure 24 1928. Piles still in place. MoD.

Figure 25 1987 Remains of the piles - see fig. 24 above. MoD.

It is the wall behind this original line of wooden piles which has been at the highest risk.

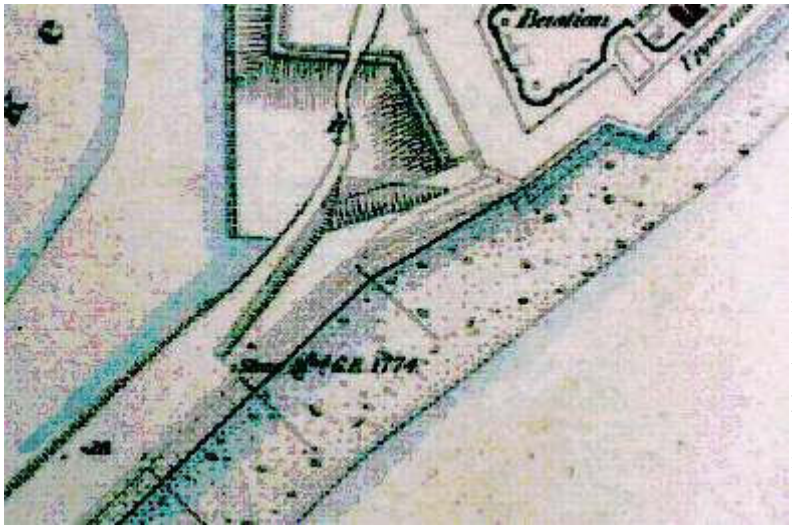

Fig 26 Portsmouth, as a natural deep water harbour, is well protected from all but southerly gales. It is relatively rare south-easterly gales which, in combination with a high tide, cause the lowest parts of the fort to flood and renders the causeway impassable. This section, at the western end of the Queen Anne fortifications has been rather crudely incorporated into the moat wall, leaving a small indentation which remains vulnerable to the present day. The wall itself is exposed to every southerly gale, the more so as the beach level recedes [source unidentified].

The hole in fig. 27 illustrates the construction method. A wooden framework, in-filled with marl - usually a combination of clay and flint - then tamped and capped with a stone facing. Wear on the stone is inevitable. All remains well until inadequate maintenance allows waves to penetrate through the wall itself where, over time, a void is hollowed out.

Figure 27 The hole on the wall in 1986. MoD.

Given the appropriate storm conditions, sea is able to flood from the bottom at the same time as waves penetrate from the top. Trapped air is compressed and expands explosively as the wave passes - hence few stones remaining in the hole. This cause was identified in 1986 and ignored.

The next major hole appeared in 2006 in almost the same spot which does not say a huge amount for the quality of the first repair. Note a totally different form of collapse due to the altered construction after the repair.

Figure 28 2006. The hole in the wall, in almost the same spot. Note the WW11 construction to the right; [source unidentified].

Inaction or lack of maintenance allowed progressive erosion - hollowing out within the wall which goes on largely un-noticed; the real weaknesses only becoming readily apparent when the wall is stressed. The gale of December 2013 was just such an instance; the wave action came close to causing a breach in the wall.

Figure 29 Just to the right of the 2006 hole, the WW11 structure [Fig. 28 above] has been demolished. CHD.

Figure 30 6 Jan 2014. The explosive nature of the event is self-evident; most of the stone facings have been blown clean out of the hole. CHD.

Figure 31 14 Jan 2014. The repair looks suitably impressive but, in practice, probably served to expedite the erosion process. CHD.

Remedial action was taken very promptly, even for an emergency temporary repair. Six years later, it seems that any thought of a permanent repair had long since been conveniently forgotten. Storms in 2020 exposed the wall again and tossed out much of the rock armour.

Current Issues - Portsmouth Harbour - General

Portsmouth Harbour is a natural haven centrally placed on the South coast sheltered by the Isle of Wight to the South East and Portsdown Hill to the North, but more vulnerable to Southerly gales. It is the tidal flow and resultant ebb scour, which has been the predominant factor in maintaining the harbour over the years.

The key to maintaining this flow is the constriction formed at the harbour entrance. It is Blockhouse Point on the Western side of the entrance, which is now at risk due to a number of factors, the most prevalent being rapid acceleration in seashore erosion, almost certainly caused by recent dredging, which included a significant part of Hamilton Bank, immediately to the South of the Fort.

A core sample indicates that the Fort is sitting on a bank of sand and shingle, some 24 metres thick , below which clay starts to appear. The seashore, now at foundation level, is lower now than in living memory. Once started, erosion of the exposed sand and shingle would be expected to be rapid. The threat is obvious and, without the scour, major silting of the harbour itself is inevitable.

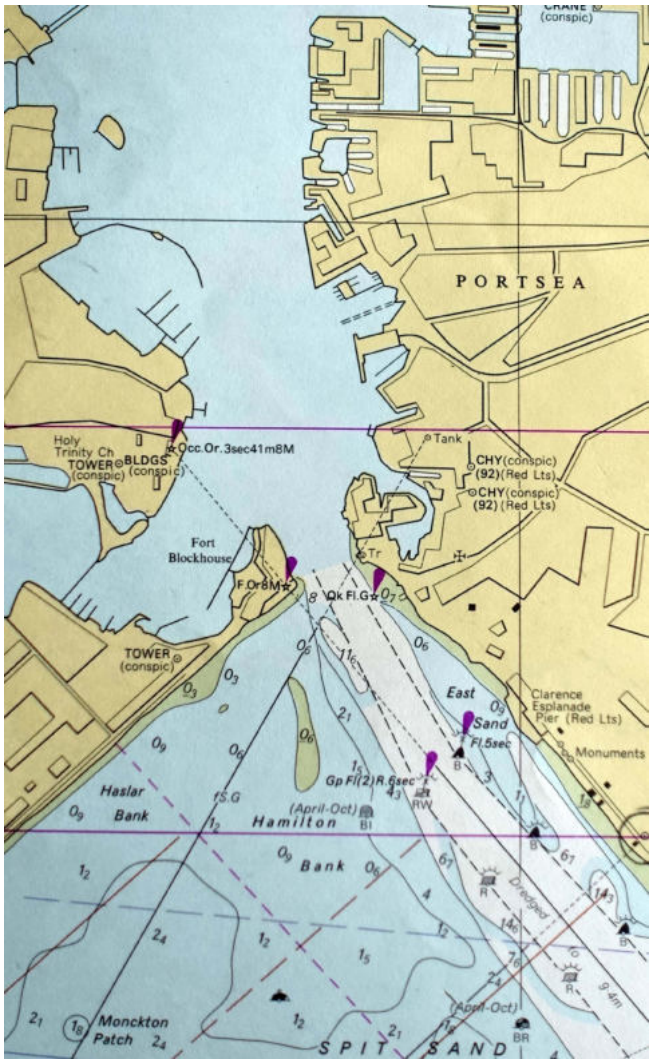

Figure 32 Detail, 1974 Admiralty Chart 394, UKHO.

There is a corresponding threat from inside the harbour, as changes, whether to key features or from innumerable smaller projects, have all made a cumulative impact, unsurprising given the estimate that 35% of the harbour has been reclaimed in the last 300 years.

For background, the Queen's Harbour Master [QHM] is the regulatory authority of the Dockyard Port [including the harbour and East Solent], and has statutory control. The Defence Infrastructure Organisation [DIO] is responsible for the Defence Estate and, amongst other things, dredges on behalf of the Dockyard Port.[35] Before the arrival of the new aircraft carriers, DIO carried out an Environmental Impact Assessment between 2005 and 2009, before the main dredge was started in c.2015.

[35] I am grateful to the Minister of State for Defence Procurement for pointing out that DIO has regular meetings with Portsmouth & Gosport Strategic Land and Asset Board; Gosport Task Force, QHM; Heritage Action Zone as well as engaging with Gosport Borough Council, Portsmouth City Council, Solent Local Enterprise Partnership and the Environment Agency, amongst others. Letter dated 27 March 2020.

Current Issues - Main Channel & Hamilton Bank

The causes of the current concerns are simple; neglect and the carrier dredge. The most significant here is the latter.

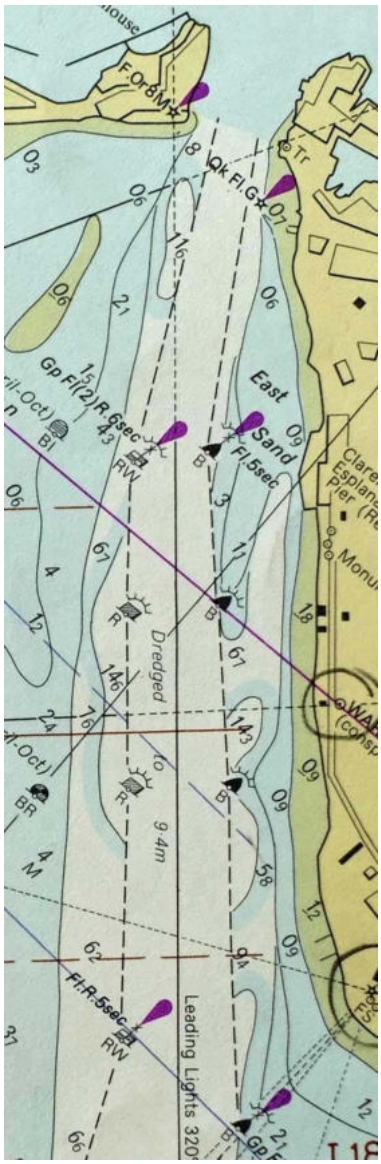

Figure 33 1974. Admiralty Chart 394; © UKHO

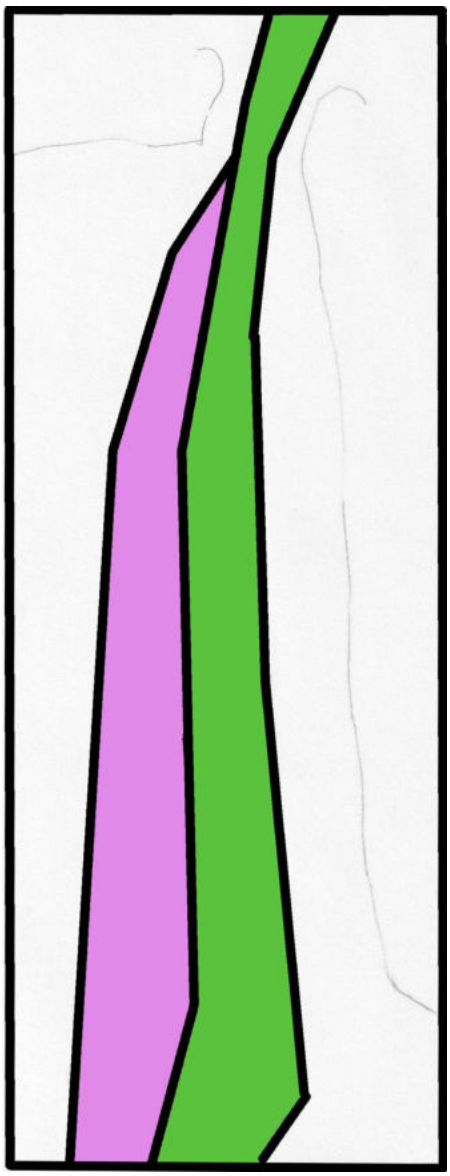

Figure 34 Purple is new dredge - based on original at PBD, p. 15; CHD.

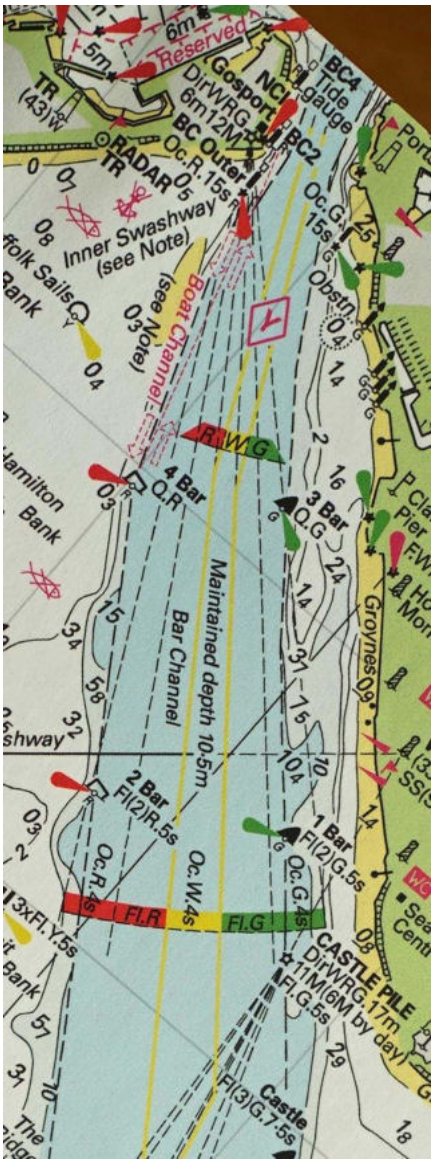

Figure 35 Post QE dredge; © Imray Laurie Norie and Wilson Ltd.

Compared with the Admiralty chart for1974 [latest pre-dredge to hand], the post-dredge chart demonstrates inroads made into the Hamilton Bank with a wider channel than ever before, the bank being taken in places from less than 3 to 11 metres.[36] A relatively stable environment has been transformed, and the almost immediate impact of this work on Blockhouse Wall seems entirely predictable, and indeed had been predicted. This questions the thoroughness of the pre-dredge Environmental Impact Assessment.

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[36] In general, the actual dredge depth [ADD] is one metre lower than the minimum depth [MMD]; PBD, p. 10. For the approach channel, ADD will be 10.8 metres, & MMD 10.5 m; PBD, pp. 11-12.

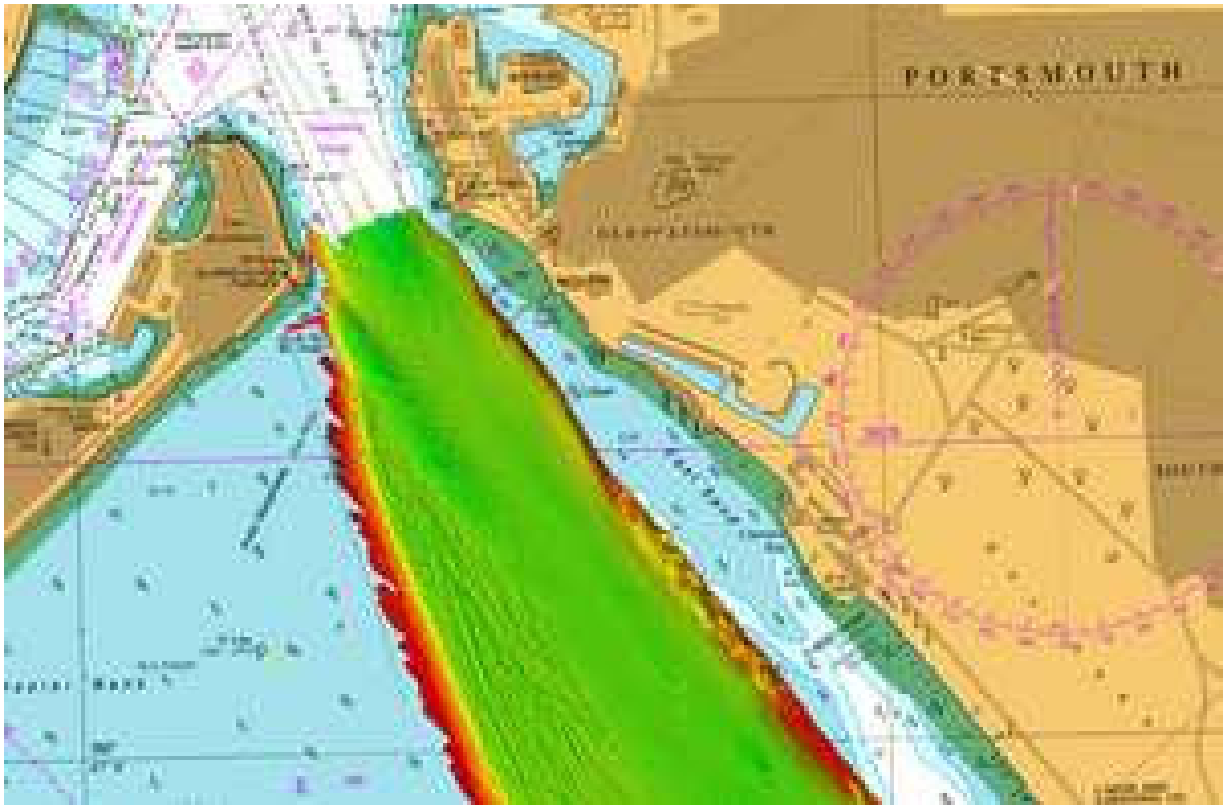

Figure 36 Bathymetric Data for Portsmouth approaches gathered by HMS *Gleaner*, showing the actual profile, post-dredge. Hamilton Bank is immediately to the south of the Fort, to the right of Haslar Bank; the red colour represents near vertical sides; UK Hydrographic Office, published Aug 2017 [i.e. post-dredge]. © UKHO.

The result of the carrier dredge provided a wider and deeper channel than ever before, with near vertical sides, in a material largely composed of sand and shingle. It was inevitable and entirely predictable that the sides would be unstable, the rate of any 'slippage' being dependant to a great extent on weather conditions. Likewise it was expected that the greatest erosion would be from the Hamilton Bank due to the combined effect of prevailing weather patterns and littoral drift. It would be wonderful to be proved wrong but all the evidence suggests that the partial collapse of Hamilton Bank is progressive.

The rate of erosion, as observed along the Blockhouse Wall, is noticeable and, left unchecked, threatens the future of the harbour. While the deficiencies of the wall defences are at least being addressed, there is no parallel action regarding the cause of the erosion. One reason appears to be a denial of any link between the dredge and the rapidly eroding shoreline, strange considering the timing and the absence of any other tangible cause for such a change. That said, there seems to be some doubt regarding which agency would be expected to take a lead here or fund any remedial work.

In such a critical situation, it might be thought essential to establish just what is actually happening, not least to inform the way ahead. In Sept. 2019, a cheap low-tech method of measuring the erosion was suggested - no action has been taken or is proposed. This is considered little short of disgraceful. See estimated changes in next section.

Current Issues - Blockhouse Moat Wall

In 2019, damage became apparent in front of the main battery at Blockhouse, and the alarm was raised. This damage put the fort itself at risk since a partial collapse would have an immense impact on the harbour.

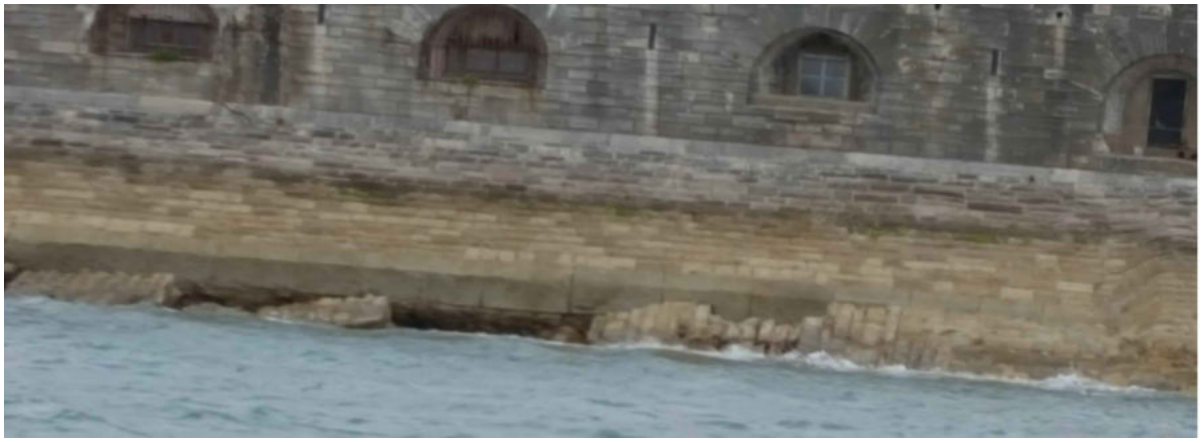

Figure 37 6 Aug 2019. Damage to sea wall in front of Blockhouse main battery. CHD.

This was not entirely unexpected and the possibility had been highlighted, on numerous occasions since the 1980s, when research revealed that Blockhouse Fort was perched on top of an 80 foot pile of sand and shingle, with precious little clay for some depth below that. Indeed, when the well at the fort was sunk in 1847, fresh water was expected at 160 feet, as at Haslar. In the event, drilling continued until reliable fresh water was found here at 310 feet. This serves to illustrate the fact that the hard structure of the Fort has provided protection for many years, all the time the shoreline has remained above foundation level.

In 1700, much of Hamilton Bank dried at low water [ie appeared at or just above the water]. Comparison using charts and photographs would suggest that this had reduced by perhaps two feet at the wall face by 2000. Since then it would appear to have dropped by at least another 2-3 feet [c.1m], most since 2015. Indeed, those working on the repairs suggest there has been a noticeable fall in the last year. This has to be, at best, a qualified estimate which makes it even more inexplicable why no effort has been made to establish an accurate record.

With the current rate of shore erosion, the whole structure immediately becomes prone to collapse as the supporting sand and shingle is further exposed to sea action. Without major remedial work, the only question remains not if, but when.

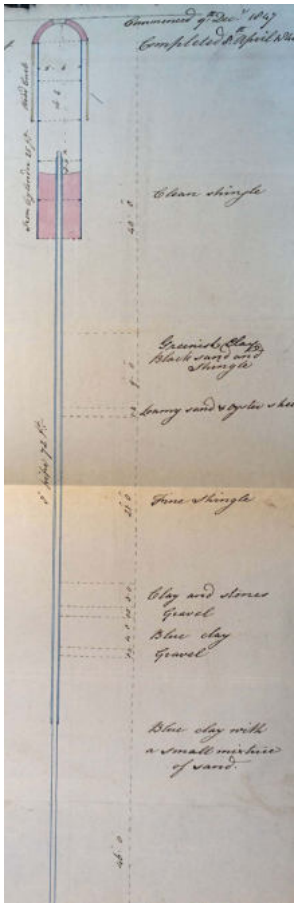

Figure 38 1847. Top of well core from centre of the Fort. TNA, WO 44/283.

Back to 2019, this was a reactive situation. Accepting that it takes time to agree and finance permanent solutions, the inevitable decision was made for another emergency temporary repair, itself risking further damage if left in place for too long.

Figure 39 Aug 2020. The emergency repair at the SW end of the moat wall. CHD.

The temporary emergency repair to the SW end of the moat has been completed to a very high standard. For this repair, heavier and larger rock has been used [a total of 1,500 tons] and efforts made to 'seal' the work in place to avoid the failure of the 2014 work. This will certainly buy time.

The whole of this moat wall is in danger of being undermined, and part of it, particularly at the end close to the harbour entrance, is in a very 'tired' state. At the harbour entrance end of the moat, the piles are not in great shape.

Figure 40 2020. The harbour entrance piles, looking North. The steel is shot and the concrete backing, seen through the piles, does not look in good shape. AM.

The corner of the wall, just to the left of the piles - see fig.40 - is prone to damage. The top corner here has been repaired several times since 2014. The stones of the wall here are very worn. DIO are planning to repoint this year.

Figure 41 2014. Looking down from the top of the wall, close to the harbour entrance. CHD.

Figure 42 2019. Looking down from the top of the wall, close to the harbour entrance. For the first time in living memory, the remains of the piles, used when forming this part of the wall, are exposed. CHD.

It is noticeable that stone has been ‘washed along the extremity of the wall - old stone facings and some rock armour from the failing 2014 emergency repair. Undoubtedly some stone is already dropping into the channel at the harbour entrance. Learning from the experience, the new ‘moat’ repair has used rather heavier rock armour and has attempted to stabilize the rocks.

Although from a different part of the wall, fig. 43 demonstrates how it only takes a small amount of extra erosion to start the undermining process,

Figure 43 2020. A graphic illustration of the undermining process. Once the water gets under the existing defences, the only ‘resistance’ here is sand and shingle. AM.

Undermining of the fort would be catastrophic.

Current Issues - Blockhouse, Old Sea Wall between Moat and modern piling.

Moving back to the older part of the seawall, it will therefore come as no surprise that, post the carrier dredge, the seawall [as opposed to Moat Wall] at Blockhouse is being undermined as well. By way of illustration compare photographs taken in 1987 with another taken in August 2019.

Figure 44 The foreshore in 1987. The remains of the 1900s piles are at the water's edge. MoD.

The pavement (centre, fig. 45), exposed c.2015 for the first time in many decades, probably represents a Victorian repair. The shoreline has eroded significantly. And then compare with fig.46 below.

Figure 45 August 2019. The same position as above. The 1900s piles are almost gone. CHD.

Figure 46 Feb 2020. Post Storm 'Dennis'. The shoreline was still receding and the platform [centre] was coming apart; CHD.

As noted above, it was recommended in Sept 2019 that a rough, low tech and cheap method of measuring the beach height should be implemented as a matter of some urgency, to establish whether the shore levels were stable. No action was taken but the photographs provided the answer - it was still moving. Other photographs indicated that the wall facing here was becoming more porous following each gale - ripe for another breach.

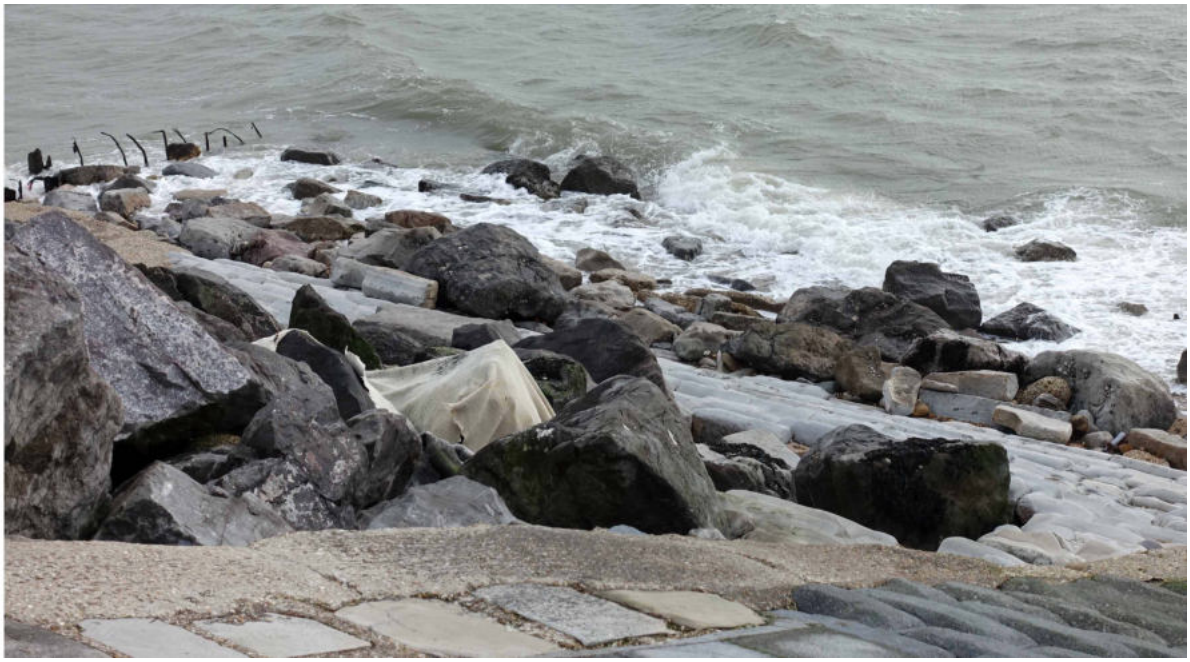

Figure 47 Feb 2020. The 2014 'temporary emergency repair' after Storm Dennis; note how the rock armour has been tossed around like marbles; the repair was failing; CHD.

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While rock armour may give some protection, the main threat in this situation is the ‘explosion’ of the wall as happened in 1986 and again in 2013. Recourse has been made once again to rock armour alone for another ‘temporary emergency repair’.

In a seamless continuation from the earlier moat repairs, work has just been completed here, again to a high standard, covering the most unstable part of the wall with nearly 3,000 tons of rock armour. A welcome short-term reduction in the risk of a breach.

Figure 48 Oct 2020. The new temporary repair extending from the recently completed moat work [bottom left] - see fig. 39. CHD.

Figure 49 The repair stops short of the sheet piling, apparently due to some issue with the MMO licence extension. CHD.

Undermining here, foreground centre, is well advanced , and a breach here is entirely possible. However, the wall is still in a better state than it has been for some time. Much depends now on the weather and the rate of beach erosion before a more permanent repair can be done.

There will be inevitable variations in shoreline levels. Indeed, in the harbour there are records of such events in the 'Historical Overview' above. Outside the harbour, there have been issues over the years as lack of maintenance or particularly strong gales have tested the ability to maintain the sea defences. But there is a difference between these type of events and the current marked and apparently sustained erosion.

The most logical cause is the recent dredging operations. Yet some decision-makers appear to remain in denial, seemingly not even prepared to investigate the cause.

Measurement of what is happening at the shoreline here is absolutely crucial. As mentioned earlier, a low cost practical means of doing this was suggested over a year ago but no plans are known to implement such a basic and essential requirement. Visual evidence alone would suggest that, if anything, erosion is accelerating.

Realistically, an equilibrium of levels should be expected, but much will depend on the amount and frequency of maintenance dredging, weather, and natural flows being maintained.

It is understood that DIO is now carrying out an assessment study into the way ahead here, considering the whole wall from Haslar to the harbour entrance, with an expected report date of March 2021. This has to be positive but time will tell whether something approaching a permanent repair, with sheet-piling supported by rock armour, will be proposed. Naturally costings, timescales, and the final design all depend of establishing the cause and expected final extent of the shore erosion.

Current Issues - Sheet Piling - Brief Notes

This paper has had to draw the line somewhere and only a cursory look has been taken at the wall from Fort Monckton to just short of the old Blockhouse Fort. Here it is likely that damage from successive storms forced more permanent solutions in the past. Sheet piling was used for the whole length, with concrete used to fill in gaps/reinforce the original wall behind the piles. The work was probably carried out by sections as circumstances dictated rather than as a cohesive whole. Some sections are now protected to seaward by rock armour. The date of this work is currently unknown and the defences are understood to be in a poor state.

Looking at the part of the piled wall, within the Fort Blockhouse establishment, as far as the boundary with the old Haslar Hospital, there are a few obvious issues.. At the fort end, roughly in line with the new radar mast, part of the sheet piling has gone completely, and adjacent piles are parting company from the concrete backing - see fig.50.

Figure 50 Aug 2020. Piles, last noted in place in photograph dated 2014, are now missing completely. Piles and concrete backing are parting company in the foreground. CHD.

A hundred yards or so further to the SW opposite the old submarine school, emergency repairs are planned to arrest damage to a section of the sheet- piling, parted from the concrete backing during the storms earlier this year - see fig. 51. Current indications suggest that while failure to maintain the groynes is a contributory factor, eroding shoreline is the primary cause rather than failure of the piles.

Figure 51 Aug 2020 Pile damage opposite the old submarine school. CHD.

Current Issues - Fort Blockhouse - Sales Potential

In autumn 2019, the stated intention was to delay sale of the establishment until the end of 2021; there could now be further delay with the realisation that the land is effectively worthless until permanent repairs are completed. Future value will also be influenced by uncertainty regarding erosion of the Hamilton Bank and the costs, of neglected maintenance, required to bring the wall back to a reasonable standard of repair. As it stands, the current temporary 'fixes' are no substitute for proper repairs for which no dates have been (or are likely to be) forthcoming.

To make a potential sale, there must be some perception that house-building, on the reclaimed land currently covered by the former submarine school, would be lucrative, Indeed, on a fine day, the outlook is wonderful but rather more malign when the wind blows - see fig 52. Getting insurance might be an issue particularly as the water hitting the wall is now about one metre deeper. Presumably potential house owners will have to insure against sea defence costs unless the public purse intends to provide indemnity in perpetuity.

Figure 52 1987. The scene during a moderate gale, looking from the Fort towards Haslar. Potential building site to the right. In a storm, the wall takes a terrible battering. A description of one such event reads, 'large volumes of seawater pass over the sea wall carrying with it quantities of shingle and large concrete slabs. The road became impassable ...'. As noted earlier, the large concrete structure in the foreground was carried away in Dec 2013. The subsequent temporary emergency work, never replaced with a permanent repair, was itself badly damaged by Storm Dennis in Feb 2020. MoD.

As to the area of the fort itself, flood risk is the reason why many post 1845 buildings have a raised ground floor level. The lowest lying areas become flooded in SE gales and the fort cutff when the road becomes impassable.
It is still conceivable that someone might purchase the real estate, unaware or prepared to ignore the above factors. The scenario springs to mind with a breach occurring, and a court case strung out for years as the new owner attempts to recover costs from the MOD. Meanwhile, the breach increases in size, placing Haslar Marina and Gosport under immediate threat, and the harbour itself at increasing jeopardy.

In summary, the repair and ongoing maintenance costs will exceed potential sale proceeds. Any delays, whether through court cases or restricted access to the site, would threaten local lives and property, have operational implications, be costly to the public purse and have all the potential for a PR disaster.

The conclusion has to be that sale would gain little, restrict access for inevitable repairs and prove even more expensive to the tax-payer. One of the great strengths of this establishment, in military use since about 1420, has been the ability to adapt to changing circumstances over the years. Retention could prove a very attractive investment in the future of not just the harbour.

Figure 53 Main fort gate to the right, looking towards the jetty - date unknown. MoD.

Current Issues - Inside the Harbour

Having examined the historical background, it is appropriate to give a brief layman's interpretation of what now appears to be happening within the Harbour.

The national significance of dredging for the carriers is obvious, although the impact of this work within the harbour is unknown. What seems somehow invidious is that, in the same enclosed space it is possible on one hand to allow removal of thousands of tons of silt while on the other refusing to countenance a potentially beneficial solution due to the perceived damage caused by driving a single pile. The wish to preserve the natural habitat and ecology is understood and supported just as much as the national interest.[37] It is the process used to assess and sometimes adjudicate between conflicting demands which appears questionable and damaging to the harbour as a whole.

Communication between harbour stakeholders, albeit limited, does exist and is laudable. The relevant national organisations apply their own rules and regulations which are then used extensively as guidance or direction for other stakeholders. This provides a framework but is not itself sufficient. Too often there is the appearance that, if potential changes or planning applications successfully pass through the system, every aspect will have been assessed, all boxes ticked, and a satisfactory solution reached. Local people, more conversant with the issue, are able to comment [& contribute], but all too often, their views, dismissed for a number of reasons at, perhaps, an initial planning stage, are lost by the time a specific scheme is subsequently assessed at a broader and potentially more encompassing level.

The result, in the unique harbour environment, is that such a box-ticking process can overlook the stresses placed on the harbour as a whole. While defence projects undoubtedly have the largest impact, there are many small, relatively insignificant schemes which continue to pass through the system.[38] With a bit of dredging here or land reclamation there, they cumulatively contribute to the damage. Over time there may be an extra knot at the entrance, or accelerated silting somewhere else, while those most likely to supply the relevant local knowledge [or suffer the economic or social consequences] are effectively unrepresented and the harbour as a whole suffers.

By way of illustration, two cases have recently come to light, both coincidentally in Haslar Lake which is apparently being allowed to silt up - see p. 15 above.

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37 In passing it seems noteworthy that the planning process considers bird habitats in some detail but virtually ignores those for fish. Likewise, the nitrate run-off 'solution' which proposes new reed beds in exchange for local building, while providing a new habitat for terns or godwits may well lead to loss of habitat for plaice or flounders.

38 Nothing here should be taken as anti-development. Some change is inevitable and indeed beneficial. It is the matter of balance between perceived benefit and impact on the harbour which appears lacking.

Case Study One. Expansion of Haslar Marina.

The proposed new plans extend the marina concerned up to 40m further into the channel between Blockhouse Jetty and Gosport. QHM has stated that if use was to be made of the jetty once again for berthing warships, the security cordon rules, restricting access to all boat traffic within 50M of the vessel(s), would be applied. The last pontoons used on this jetty were 5M wide; reducing this to a more manageable 3M and, say, 13.5M beam of ship [typical Fishery Protection Vessel], the outer limit of the security cordon would be 66.5M from the jetty face. As a result, all boat traffic, in or out of Haslar Lake, would have be stopped, and all boats moored on the outboard side of the marina boundary would have to be moved. The planning authority chose to disregard this information from QHM on the grounds that the future ownership of the Blockhouse establishment and use of the jetty was in doubt. This matter, while coincidental to the current concerns, demonstrates just how counter-intuitive decisions are being made.

What is extraordinary is that the process could have progressed so far,[39] without any apparent thought regarding how the new arrangements might change the tidal flow in and out of Haslar Lake, probably alter the tidal stream (in the lake and possibly in the harbour entrance), and undoubtedly change the current silting pattern. Such considerations, together with other similar relatively minor schemes, accumulatively change the harbour while the decision-making process seems increasingly distanced from local people with relevant information.

Case Study Two. Flood Defences for Alverstoke

Coincidentally, another scheme has been approved to bolster flood defences at the top of the same inlet, Little Anglesey Lake, essentially a man-made, partly tidal, salt water lagoon.

The chosen option, at the top of the lagoon was simple, cheap and complied with all the regulations. The alternative option, requiring an upgrade of the existing sluice at the seaward end of the lagoon, cost twice as much but, by protecting more houses for more than twice as long, was undoubtedly more cost-effective. Although backed by local opinion, this option transcended bureaucratic rules and was accordingly ruled out.

There is no evidence that the bureaucracy concerned was either aware of the policy decision regarding silting of Haslar Lake, or had considered how operation of the ‘sluice’ could have been employed to help clear silt in the upper reaches, or was prepared to support a rule-breaking decision which might benefit the harbour as a whole.

In summary , the first case is the more complex. Undoubtedly there are difficulties, when considering matters such as tidal flow, tidal stream and silting, as to just how assessments are made, how accumulative impacts are considered and how predictions are quantified. Ignoring the issue altogether is not a responsible option. The second case study demonstrates how potentially beneficial schemes can be overlooked when the bureaucratic rules are treated as inviolate. The potential for the harbour to suffer, on both counts, is apparent.

[39] Currently awaiting a final decision from the Marine Management Organisation - Nov 2020.

It is appropriate here to look briefly at the complexities of the tidal stream. As demonstrated elsewhere, the harbour is largely dependant on the strong ebb tide. Admiralty charts tend to be conservative here. Thus, for example, the 1942 chart indicates a spring ebb at the harbour entrance of 4.1 knots.

The 'visitmyharbour' website notes, for 2012, '4.9 knots (corresponding to 6 knots or more with tides of the greatest range)', while the 2018 Imray chart notes 3.9 knots which is questionable given that, back in the 1980s, when operating submarines out of Haslar Lake, ebb tides in excess of 5 knots were not uncommon. A further interesting figure is from the Portsmouth Baseline Document which notes 'over 1.2m/s [equating to 2.4 knots] based on the ABPmer model produced as part of the Environmental Impact Assessment for this dredge.[40] UKHO concluded that there were, 'some adjusted tidal stream rates (not vastly different)' post dredge.[41]

Professional fisherman note consistently higher spring tides but no particular changes to the tidal stream. Yachtsmen by contrast, for whom minor changes are immediately noticeable due to limited engine power, have remarked on a noticeable increased difficulty entering the harbour during the ebb tide since the dredge was completed. Whether this is due to increased ebb flow rate or duration is difficult to assess. Either might be expected to exacerbate erosion at the edges of the channel in particular, and raise more silt. In 2020, it should not be too difficult to measure, record and publish actual figures.

Individual stakeholders, whether in the fields of commerce, defence, environment or recreation, will always seek the cheapest solution to their particular issues. As explored above, the superficial appearance of a well-regulated harbour appears to disguise an unsatisfactory process which is formulaic, resistant to challenge and seemingly unable to produce a coherent plan capable of protecting, or even considering, the interests of the harbour as a whole.

With so much existing bureaucracy, it seems counter-intuitive to suggest introduction of yet another body. However the future of the harbour is currently being risked through neglect. It is conceivable that there is already a mechanism in place which merely need a thorough overhaul to deal more effectively with matters outlined in this paper. However the question does need to be asked. For Portsmouth Harbour, is there a single organisation, tasked to safeguard the harbour, and capable of holding all the disparate decision makers to account? In the absence of any such organisation, thought should be given to the introduction of a democratically accountable Harbour Board with just such powers.

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40 This assessment could make interesting reading. It is difficult to comprehend that this dredge would mean a reduction in the ebb tide. It might also question why the matter wasn't raised as a risk to the harbour, maintained largely as it is on the ebb tidal scour. The only web copy identified in the time available has been archived. PBD, p. 38.

41 Email Jones [UKHO] to Donnithorne, Nov 2017.

Conclusions

Hamilton Bank

The main channel approach dredge is causing predictable erosion of the Bank.

No attempt has been made to measure the erosion.

Erosion continues with no evidence than any equilibrium has been reached.

The agency responsible for actioning, executing or funding any remedial work here currently remains unidentified.

The MoD/RN will become the obvious scapegoats.

Blockhouse

North Point & Harbour Entrance

No assessment has been made of the rock armour in the harbour entrance or, more specifically and perhaps more crucially, of that on the North Point, opposite Ballast Patch.

Wall to SW of the Main Battery

The foreshore in front of the Blockhouse wall, built on sand and shingle, is receding, more in the last five years than in the previous 300 years probably due to ongoing erosion of the Hamilton Bank.

The temporary 'emergency' repair, completed in 2014, has failed. A new temporary 'emergency' temporary' repair has just been completed. To a commendably high standard.

One section of this wall remains undermined and unprotected. Further damage could cause a breach into Haslar Lake, leading to increased risk of flooding in Gosport and to the viability of a number of marinas.

The silting up of Haslar Lake, as a matter of policy, increases the risk to Gosport and the marinas, in the event of a breach.

Moat Wall

The foreshore, in front of the moat wall, has reached a critical level. Undermining here would be catastrophic, risking loss of the deep-water harbour and extortionately expensive repairs, yet the tidal scour and hence existence of the harbour depends on this point remaining *in situ*.

Blockhouse (continued)

The temporary ‘emergency’ repair to the moat wall has been carried out to a high standard.

Sheet Piling

The piles at the harbour entrance are completely eroded.

Shoreline erosion is undermining sheet piles between the Fort and Haslar. It is possible that Haslar Bank is also being eroded.

Maintenance, Planning and Potential Sale

To date no plans have been contemplated for any permanent repair. DIO have started an Assessment Study, due to report in March 2021. The scope of this work is unknown.

Temporary emergency repairs have their place but are being treated here as substitutes for lasting solutions; papering over the cracks until the site can be sold. Additional risks and costs are inevitable - poor value for money for the taxpayer.

Sheet piling, combined with rock armour would provide a more secure solution, but is not currently being considered.

Stone from the wall, dislodged by sea action, is rolling along the wall into the main channel at the harbour entrance. Action is reportedly in hand to retrieve as much as possible.

The local establishment management should be congratulated on their handling of the temporary repairs, given the lack of maintenance provision and uncertainties regarding disposal of the site.

The intention remains to sell the establishment although not before 2022.

Without undertaking permanent repairs and bringing maintenance up to an acceptable level, it would be indefensible to expect anyone else to fund the work.

Currently the site is considered worthless. For it to pass out of public ownership at such a time would be irresponsible.

General

The harbour is under immediate threat and these conclusions unashamedly concentrate on the these specific factors. Other issues, pertinent to the harbour as a whole, some noted in the paper, should not be ignored.

The threat, to continued viability of both the naval and commercial docks, is obvious.

The silting of Haslar Lake, as a matter of policy, puts Gosport at increased risk in the event of a wall breach.

QHM is nominally responsible for the harbour and East Solent.

A number of authorities, including DIO and the Environment Agency, have specific responsibilities; each organisation having their own interests, priorities and budgets.

Divergent aims are not helpful. The relationship between DIO and the Royal Navy is, in this context, mystifying.

The larger the organisation, the more able it is to impose intractable rules or ride roughshod over many smaller stakeholders. Democratic accountability is being lost.

Communication between harbour stakeholders, albeit limited, does exist and is laudable. However, reclamation and dredging schemes appear to be undertaken piecemeal with scant regard for the overall impact on the harbour. Evidence suggests that crucial issues are being missed.. It is ironic, for example, that a very detailed document exists regarding maintenance dredging and yet no mechanism appears available to deal with the ongoing erosion of Hamilton Bank.

The timing and severity of storms [and hence potential expenditure] is impossible to predict in such an exposed position, being dependant on many variable factors.

Rising sea levels and increased frequency of storms will only exacerbate the situation.

The current threat is seen to stem from three factors:

1. Inadequacies of the pre-dredge Environment Impact Assessment which failed to address fundamental issues.

2. Lack of key infrastructure maintenance, with any essential repairs being necessarily reactive, short term solutions. No permanent repair has been undertaken on the seawall for a very long time.

3. Failure to acknowledge the erosion of Hamilton Bank, and to identify who is responsible for taking remedial action.

In summary,

A combination of Hamilton Bank erosion, severe weather, partial collapse of Blockhouse Wall and maintenance failure have all contributed to the current risk to the deepwater harbour at Portsmouth, not least threatening the future viability of the carrier base port and the commercial docks.

Temporary ‘emergency’ repairs have bought some strictly limited time.

Until the issue is acknowledged, and action taken to address the cause, the risk can only increase.

A recovery plan is urgently required.

Management of the harbour necessitates a more coherent approach. More needs to be done to address wider issues within the harbour as a whole, at the same time injecting a degree of democratic accountability which is curiously lacking. The larger and more remote stakeholders must be as accountable within the harbour context as everyone else.

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Solutions

Hamilton Bank

The agency responsible for management of the erosion issue should be identified as soon as possible.

Measurement of what is actually happening over the Bank needs to be established.

A management plan is required - urgently.

Blockhouse Repairs and Maintenance

Planned emergency work should continue as early as possible. Such repairs will buy some time but are no substitute for permanent work

It is known that DIO is progressing an Assessment Study, of the wall from Haslar to the harbour entrance, due to report in March 2021, and this may provide some answers.

Blockhouse Sale

Sale should be put on hold until at least all permanent repairs here are completed.

Serious consideration should be given to retention of the establishment which might prove a sound and cost-effective investment for the future of the Harbour.

Management Conflicts

Align organisational aims to resolve bureaucratic conflicts within the Portsmouth Harbour environment.

Harbour Management

The future of the harbour is currently being risked through neglect. It is conceivable that there is already a mechanism in place which merely needs a thorough overhaul to deal more effectively with matters outlined in this paper. However the question does need to be asked. For Portsmouth Harbour, is there a single organisation, tasked to safeguard the harbour, and capable of holding all the disparate decision makers to account? In the absence of any such organisation, thought should be given to the introduction of a democratically accountable Harbour Board with just such powers.