Portsmouth
the island city

building better flood resilience for southsea’s frontage + common

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Portsmouth - The Island City papers
June 2017 (R.3a)
THE VISION

building better flood resilience for southsea’s frontage + common
- for a more sustainable Portsmouth

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on planning in Portsmouth and the region,
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implementation, practice and policy.
1 Introduction

1.1 Background

The City of Portsmouth has been allocated around £86.28m for sea defence works along roughly 4.5km of the Portsmouth and Southsea frontage, extending from Portsmouth Old Town to Eastney beach. This covers the coastline fronting what is known as flood cell 1 (fig. 2).

In this location sea defence investment is urgently needed as the residual life expectancy of the existing sea defences is, in some places, less than 10 years. But the sea defences now being designed are also intended to address sea flooding that accounts for estimates of climate change induced rises in sea level up to the year 2100 to the standard of a 1:200 year flood risk probability.

The designs being developed are based on a policy of “Holding the Line”. This envisages a new sea defence wall along all the frontage which is mainly constructed from concrete stepped revetments.

As roughly 12% of Portsmouth’s economy derives from tourism (2014) it is imperative that the city also nurtures, maintains and enhances its most valuable assets and amenities, and that the Southsea frontage in particular should remain one of the UK’s premier sea fronts.

1.2 Framework

This report follows upon the independent related research instigated under the Portsmouth Elephant Cage programme. This is described in the section on research methodology. This programme raised a number of significant critiques about the policy, strategy and designs for sea defences currently being implemented, and highlighted unforeseen and detrimental social, environmental and economic impacts. These findings are summarised within this report.

A wider review of the context also highlights various other specific issues. Between Long Curtain Moat and South Parade these include:

• The potential redevelopment of Clarence Pier
• The potential need to rebuild the existing swimming pool and recreation centre (The Pyramids)
• Improved access and use of the public estate.
• The need to improve and enhance the existing visitor economy and experience. Including the provision of conference facilities and further amenities.
• The historic assets, including the scheduled monuments, registered park, and listed buildings.

![Fig. 2. Extent of flood cell 1 on the Southsea frontage](image)

![Fig. 3. Public consultation responses to sea defence proposals (ESCP)](image)
A number of other increasingly pressing strategic issues also need resolution including:

- Low bike and mixed mode transport usage and a dominant impact from existing vehicle parking demand and provision.
- Pressure on the Victorian infrastructure, specifically the combined drainage system, which constrains opportunity for growth.

Given the intents, the level of public investment being made, and the irreversible long term impacts of the proposed works a key question remaining about the existing proposals is whether there may be better solutions which might also contribute to addressing wider issues, and which, by attracting inward investment, could better enhance Portsmouth’s future.

In response to consultations undertaken by East Solent Coastal Partnership (ESCP) the public consortium entrusted with implementing new coastal defences, the public clearly expressed their values, priorities and concerns with regards to proposals for the new sea defence works (fig. 3)

But the policy framework, remit, process and scopings might appear to have been a constraint upon ESCP more fully and comprehensively exploring all options.

1.3 Proposition

Unfettered by existing policy constraints this report proposes an alternative fully integrated design strategy accounting for the imperatives and wider identifiable factors, which might contribute far more towards enhancing Portsmouth, do so without detriment to the existing assets and amenity, and provide a long term solution fit for purpose.

For example this study illustrates how land lost through managed coastal realignment may be offset by locating facilities, including parking, below ground, within a wider masterplan.

It is believed that this shows clearly the need for more and better integrated planning and design, ongoing design iteration and further public engagement to unlock a more refined and nuanced resolution in the best interests.

This detailed investigation covers only a 2.7km length of the frontage covering 81.57 hectares. It includes Southsea Common, and is delineated by the existing properties of Portsmouth and Southsea bounding the common and the Solent. From Clarence Esplanade frontage this extensive area of the common ranges in width from 0.53 km to 0.36km (fig. 14).

The detail findings reported here, in particular regarding managed coastal re-alignment, re-purposing the topography of historic assets and SUDS water storage, are also seen as having wider potential application along other parts of the Portsmouth flood cell 1 frontage and elsewhere, nationally and globally.
2 Context

2.1 Southsea frontage + common

Historically much of Southsea common was marsh and heathland having a single route connecting Southsea Castle and Portsmouth old town. This route ran parallel with the beach, which apparently extended back considerably further than today\(^{9}\).

By the 1871 Clarence Pier with the Esplanade running parallel to the beach, and the Serpentine road had become well established. Pleasure trips by boat from the pier were a great attraction and the frontage was developed in a formal Victorian idiom.

The radial circulation focused on Clarence Pier, along with Clarence Esplanade promenade (fig.21) and the second, western, avenue of the Lady’s mile were established later and by the 1890’s\(^{10}\).

The current Clarence Pier, designed by Portsmouth architects R. Lewis Reynish, was opened in 1961. This followed its destruction by bombing in 1941. Previously it had a ballroom, sundecks and tea rooms, but now houses bars, cafes, restaurants, eateries, ice cream parlours, games halls and a hotel along with miscellaneous beach front pier activities. At the time of writing its funfair was closed.

The buildings from the 1960’s are jaunty, although public circulation through the site, the facilities, servicing and parking are all poorly addressed. By contemporary standards the experience might best be described as jaded (fig.8 + 9).
To the east and directly adjacent to Clarence pier lies the Hoverport, the world’s only commercial hovercraft service that provides frequent connections to the Isle of Wight (fig. 10).

The frontage is rich in scheduled monuments including the remnant of the Ravelin Wall and Long Curtain Moat, which was part of the defences encircling Old Portsmouth and the Dockyard, and Southsea Castle. The battlements of these two monuments provide the only real elevation in an otherwise flat landscape (fig. 14).

Southsea Castle, is the most notable fortification and is positioned on a land promontory between Clarence Esplanade and Southsea Beach. It was originally built by Henry VIII (fig. 15). Around this promontory hard sea defence walls currently exist to preserve the monument.

Lying to the north of Southsea Castle is the D-Day Museum and to the east Portsmouth’s swimming pool and recreational centre, The Pyramids, which suffered extensive water damage after recent breaches in the sea defences.

A number of other listed structures including the Royal Naval War Memorial and various military campaign memorials are also situated along the coast (fig. 12 + 13).
Unlike Eastney beach, and because of the MOD’s off shore jurisdiction, the Clarence Esplanade beach has never received a Blue Flag classification. Nonetheless this shingle beach has been continuously popular for recreation and leisure (fig. 11).

The Clarence esplanade and Southsea frontages in most parts have level access to the beach (fig. 11 + 12). Some low walls to the back of the promenade have been added since the 1950, for protection against storm over-topping (fig. 7) along with the more robust hard sea walls around Southsea Castle.

Otherwise the beaches have been characterised by their ease of access from the city along most of the frontage, enhancing their amenity value.

The beach and common remain highly popular today and also host a number of transient activities including the Victorious Festival (fig.16), the Southsea show and Americas cup events(fig.17). For the later tiered seating is provided on Southsea Castle battlements looking out to the Solent.

When considering the future, realising the overall value of the beach front and common should be foremost.

“the beaches have been characterised by their ease of access from the city along most of the frontage, enhancing their amenity value.”
"When considering the future, realising the overall value of the beach front and common should be foremost."
“roadways and parking together account for roughly 15.8% of the total area...these figures appear to be high”

2.2 Land use analysis

As an island city, densely populated by roughly 205 thousand inhabitants, Portsmouth has little available landscape amenity. An area analysis of Southsea common is therefore a valuable indicator of the efficiently and effectiveness of current land uses. This can be an indicator of whether this important asset could be used better (Table.1).

Clarence Pier currently occupies roughly 1.704 hectares and comprises 2.09% of the area of Southsea common defined in this study.

This detailed land use evaluation shows that roadways and parking together account for roughly 15.8% of the total area. Roadways (including on street parking) takes up 9.53 hectare, or 11.68% of the overall area, with designated off street parking taking 3.367 hectares, or 4.13% of the area. On and off street parking together accounts for roughly 5.7 hectares or 7% of the land surface area (fig.18). Given the functions and pressuer on the city’s amenity space these figures appear to be high.

It appears change could be affected which might improve the efficiency of these land uses, to obtain a better environment with more amenity.

The number of facilities, in a single location on the south east of the common, Southsea Tennis Club, the miniature golf course, paddling pool and volleyball facilities is also notable because all these facilities are coalesced into one 3.3 hectare mass covering 4.05% of the Common. (fig.19)

Whilst this is indicative of the demand for these facilities, their collective massing affects the surrounding common. These sites act as a pinch point in the circulation across the Common, affecting public way-finding, reducing connectivity and also affecting how flexibly the common can be used for other events such as the Victorious Festival. The pinching of the circulation in this location is further compounded by the Aquarium, the battlements of Southsea Castle and D-Day museum to the south.

Dispersing some facilities could open opportunities for improving the wider public realm. Appropriately, in the case of the volleyball courts and paddling pool, it might also enable them to be placed nearer to the beach.

Table. 1. Summary schedule of Southsea Common, landuses and relative areas.

<table>
<thead>
<tr>
<th>AREAS</th>
<th>hectares</th>
<th>% of site</th>
<th>% B/F</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Southsea Common designated site area</td>
<td>81.567</td>
<td>100.00%</td>
</tr>
<tr>
<td>1</td>
<td>Clarence Pier</td>
<td>1.704</td>
<td>2.09%</td>
</tr>
<tr>
<td>2</td>
<td>Roadways</td>
<td>9.527</td>
<td>11.68%</td>
</tr>
<tr>
<td>3</td>
<td>Designated parking areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>areas of which:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>off street</td>
<td>3.367</td>
<td>4.13%</td>
</tr>
<tr>
<td></td>
<td>on street (incl. within 2 above)</td>
<td>2.332</td>
<td>2.86%</td>
</tr>
<tr>
<td></td>
<td>Total 3.1 - 3.2</td>
<td>5.699</td>
<td>6.99%</td>
</tr>
<tr>
<td>4</td>
<td>Enclosed areas:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Garrison Church adjacent playing fields &amp; bowling green</td>
<td>4.473</td>
<td>5.48%</td>
</tr>
<tr>
<td>4.2</td>
<td>Southsea tennis club, golf, volleyball ball, paddle etc facilities</td>
<td>3.303</td>
<td>4.05%</td>
</tr>
<tr>
<td>4.3</td>
<td>Other misc enclosures: Aquarium, childrens play, etc</td>
<td>0.631</td>
<td>0.77%</td>
</tr>
<tr>
<td>4.4</td>
<td>Ravellein moat</td>
<td>0.890</td>
<td>1.09%</td>
</tr>
<tr>
<td>4.5</td>
<td>In accessible areas otherwise:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Buildings not already incl. above</td>
<td>1.501</td>
<td>1.84%</td>
</tr>
<tr>
<td>1-5 Total</td>
<td></td>
<td>31.13%</td>
<td></td>
</tr>
</tbody>
</table>
“change might be affected which could improve the efficiency of these land uses, to obtain a better environment with more amenity.”
2.3 The topography

The remaining fragment of the Ravelin Wall and the battlements of Southsea Castle are the only significant elements of raised ground on Southsea common.

The battlements have long been significant elements of the city’s military defences, and in future might viably be considered as contributions to the city’s sea defences, as elements of a more holistic approach.

Offshore in the charted depths of the Solent the original channel leading up to Clarence Pier is visible, along with the shipping navigation channel accessing Portsmouth harbour, which has its depth maintained by dredging (fig. 20). This lies roughly 190m off Clarence Pier.

The dredged navigation channel influences the coastal profile. As the channel depth has been lowered there is a tendency for sediment from adjacent areas to slump down into it, pulling material in from the surrounding areas. This has potential consequences for erosion back on the shoreline.

With the dredging of a new channel that is now aligned straight with the channel through the harbour mouth (shown to the north west) the impact of this potential erosion on Clarence Esplanade may diminish. But the impact of this work which has recently been completed remains unknown.

“The battlements have long been significant elements of the city’s military defences, and in future might viably be considered as contributions to the city’s sea defences”
2.4 The current sea defence proposals

An evaluation of the current proposals for sea defences found that the proposed sea wall raised a number of challenges. These focused on:

- “The separation of the promenade, beach and sea from Southsea common and the city to the north.
- In many parts a sea wall exceeding 2m in height would be apparent from the land-side severing the city from connecting fluidly with the coast and blocking views of the sea. In some places it was found that this wall rose above 3m (fig. 22).
- The lack of much apparent integration of the engineering with the landscape character to the land-side of the defences.

- The extensive use of concrete hard-wall engineered solutions, including use of terraced sea walls, rather than alternative coastal defence typologies. Concrete constructions ... delivering a coastal frontage that can be less sustainable, hospitable and poorly accessible for children and the elderly. They have often been found to require extensive cleaning.
- ....In part the remit of this funding stream, its outputs and programme were seen to be causal.”

It was also found that:

- “Roads and promenades running parallel and immediately adjacent to the coast line, were being treated as fixed elements in the schemes layout impacting the options available (fig 18).
- Minor listed buildings including wind shelters, seats and monuments which might be readily re-located were being treated as fixed edifices and points of reference despite their small size and the relative ease of their movement.”

To effectively evaluate any sea front resolution:

- Southsea Common an area extending 0.5km back from the sea front is inseparably part of the frontage and should be considered conjunctively.
The Portsmouth Elephant Cage (p.41) undertook a public consultation at which a 1:1 scale model was presented showing from the common the impact of the height of the ESCP’s proposed sea wall design in various locations (fig. 22).

It was felt that this abrupt vertical barrier would have a significantly adverse impact on the foreshores amenity and the tourist economy, whether or not access stairs and ramps were provided at intervals.

The ESCP design proposals presented in their public consultation cited as an exemplar the recent works completed to the frontage at Cleveleys, which lies just north of Blackpool (fig.23 + 26). The ESCP design for a concrete terraced revetment with curvature is illustrated in plan and artist impression (fig.21 + 25).

For children, the elderly or any age, descending these revetments offers a hostile experience that is far more hazardous than descending a beach.

As experience clearly shows existing concrete sea walls also weather rapidly, erode with age and are difficult to maintain in pristine condition along this coastline (fig.24).

The research seriously questioned the economic, environmental and ecological impacts of the proposals, whether or not these were an adequate response to the public consultation and considered it likely these would significantly diminish the value of the sea front. It might seem that during the progression of the sea defence proposals the originally quoted vision and objectives appeared to have become lost in the process.

Between the 1950-70’s many of the UK’s finest cities were destroyed by road works that are now considered a liability. Are we in danger of doing something similar to our coastline?
“For children, the elderly or any age, descending these revetments is more hazardous than descending a beach”

“Southsea Seafront should be a vibrant space, a place to experience the natural unspoilt environment, take-in the fascinating nautical views across the Solent and enjoy quality leisure facilities, events and activities all the year round”.

(The Vision. Seafront Strategy. 2010. PCC)
2.5 Sea front profiles

(Ref. Section line ‘B’ fig.21 for the location of this profile)

The existing frontage

The current profile of the beach (fig.27) allows wave energy to be dissipated on the incline of the beach more effortlessly than is provided by a more vertical or cliff like wall. Waves simply break and roll up the beach. This also affords opportunity for the public to safely retreat up the beach as tides come in, in time honoured fashion.

Where the sea defences are more vertical, such as around Southsea Castle, the energy from storm breakers is dissipated abruptly over a smaller surface area and leads to large spumes and an increased probability of water over-topping the sea wall. In these locations such sudden over-topping from apparently safe public refuges can be more hazardous to people.

Undermining and over-topping of the existing frontage defences however is now an increasing occurrence. With sea level rises and storm surge events the existing Portsmouth to Eastney beach frontage will in all events be breached well before 2100 and Portsmouth will be flooded.

The ESCP proposed frontage

A hard wall revetment design has been proposed and developed by ESCP (fig.28) based on their remit to raise the height of the sea defences in the space available between the roadway and the sea, to comply with the policy of “Holding the Line”

In this design, by necessity, the sea defences have to be more vertical and to absorb greater wave energy, are formed of concrete. A wall located to the back of the promenade captures over-topping and spumes in storm events. In such cases the frontage promenade would be more hazardous.

In this location when viewed from the land-side rear this wall section rises 3.1m above Southsea common and from this side provides an abrupt barrier to access and views for all. The width of the residual beach may also diminish significantly and be entirely lost by 2100.

If projected rises in sea levels change with for example more melt off the Antarctic ice cap, then the revetment would need to be raised again, further diminishing amenity.

Managed coastal realignment

This alternative (fig.29) considers managed coastal re-alignment. This is entirely feasible given the width of Southsea common and landscape improvement opportunities.

In this version, a multifunctional, unbreachable and adaptable dike is built further back from the coast and road. Landscaping is gently graded over this dike down to a fully enhanced and retained beach.

Three lines of defence are provided.

The beach allows wave energy to be dissipated safely on its gentle incline, as a first line of defence. Dunes or landscape graded up to the dike provide a secondary defence line, with the dike provides the final defence line.

Frontage promenades may be provided along the beach and on the crest of the dike. The environment, ecology and amenity can be enhanced, with seasonal/transient activity located on the beach side of the dike.

From land-side there is threshold and barrier free access for all ages and by 2100 there is still a beach. The dike is more readily adaptable as it can be easily raised in future, if needed.

This opportunity exists if the existing road, parking and promenade is reconsidered and there is an appropriate mixed strategic sea defence approach that manage coastal realignment along the frontage.
“when viewed from the land-side this wall section rises 3.1m above Southsea common to the rear and provides an abrupt barrier to access and views for all. The width of the residual beach may also diminish significantly and be entirely lost by 2100.”

“This opportunity exists if the existing road, parking and promenade is reconsidered and there is an appropriate mixed strategic sea defence approach.”
3  Case study. An alternative sea defence strategy.

3.1  Katwijk

As part of the Elephant Cage research a particularly informative sea defence exemplar on the Dutch coastline was visited that delivered a unique managed coastal realignment scheme.

In this recently completed project at the town of Katwijk the new defences are seamlessly integrated with the landscape. The design delivers an enviable beach, coastal landscape and parking capacity for the town and beach users and an ecologically rich coastal habitat.

In conjunction with the beach, providing a first line of defence, backing dunes provide the second line of defence and a dike the third defence line.

The design provides a 100m wide strand with a further 120m of dunes, a dike and behind this an underground parking facility (total overall frontage depth = 220m) (fig. 30).

This provides sea defence for a 1:4000 year flood risk, and significantly higher than is proposed in Portsmouth.

The underground garage is 0.5km long and provides 663 parking spaces behind the new 0.9 km long dike[9].

The genius of this sophisticated solution is that it is hardly noticeable (fig. 31). The sea, beach, naturalised coastal landscape and town predominate (fig. 32).
Case study. An alternative sea defence strategy.

“The genius of this sophisticated solution is that it is hardly noticeable.”
For Katwijk massive tourism potential has been delivered with the most enduringly popular characteristics of the coast, in an extremely robust and environmentally friendly way.

Great care has been taken in ensuring the highest quality of design has been achieved. Access to the underground garage is via entrances disguised as dunes within the landscape (fig.34), and a high quality of intelligently deployed and well considered materials are used sparingly.

Beach restaurants, and cafes are incorporated along the beach, on seasonal licences and considered as temporary or sacrificial facilities (fig. 33). Off season they are demounted and placed into storage to avoid winter storm damage.

Along with providing regeneration for both the town and the coast this scheme delivers amenity and sea defences to a higher level than anything comparable in the UK.

This project illustrates how infrastructure investment has been efficiently and effectively used to maximum benefit, but is in many ways quite opposite to what is now being proposed in Portsmouth.
The work was carried out by a collaborative integrated design lead and contract management team by: OKRA Landscape architects (Public Space), WB de Ruimte (planning study, tendering and contract management), Ballast Nedam and Rohde Nielsen (the engineering design works and project implementation), ARCADIS Netherlands (dike construction), Royal HaskoningDHV (parking garage) and others. The project has received considerable international recognition and a large number of awards including the BNA Building of the Year 2016.
4 Proposal

4.1 Southsea Common proposed layout  fig. 37

Illustrated here is an alternative plan for Southsea common. The layout, strategy and detail is described further in the following pages.

This responds to all the area imperatives and the related issues previously identified, with a masterplan that envisages a long term solution proposing much wider value and benefits.

This proposal adopts a mixed strategic approach, integrating future sea defences, economic, developmental, social, cultural and environmental priorities. The sea defences ‘Hold the Line’ around Southsea Castle, around Nelsons redoubt, developing Clarence pier as a groyne, but introduces managed coastal realignment between, and along the remaining sections of Clarence esplanade and the South Parade front.

It is considered this strategy is better capable of maintaining the areas amenity, securing its assets and attracting inward investment, sustainably into the future and within a phased development programme.

This offers a beach front having unimpeded access through a new naturalised landscape by adopting a sea defence approach similar to that in Katwijk (p.18-21) in those locations.

While improving the opportunity and benefits from the redevelopment of Clarence Pier and existing historic assets, locations for new recreational and other facilities are also provided. This has the potential to deliver growth for the city’s tourist economy, environmental and ecological improvements, better connectivity with the sea along with a coastal defence strategy that is adaptable and capable of meeting a 1:4000 year incidence of sea flooding. As there is a low degree of confidence in current estimates of acceleration in sea level rise, due to ice melt, such contingent adaptability is important[10].
fig. 37. The Southsea common proposal. Key plan, Red line identifies the study area and the new Clarence pier
4.2 Design strategy

fig. 38

To the rear of the Clarence Pier redevelopment (p. 28-31) the existing re-purposed topography of the Ravelin Wall and Southsea Castle battlements are linked together with a new sea dike (fig. 38). This delivers the final sea defence line, which in this proposal would be buried under a naturalised landscape. On the sea front the second line of defence is provided by the landscape fronting the sea. This then leads down to the beach, providing the first line of defence. Like Katawijk this offers well graded and unimpeded access to an enhanced beach frontage for all.

This strategy of re-purposing Southsea Castle’s battlements and the Ravelin wall and linking them with a dike, might equally be ascribed as a solution to address coastal defence in flood cell 1 further to the East and particularly between the forts at Eastney Barracks.

A sea groyne reducing impacts from longshore drift and creating sheltered coves to either side is provided by the new Clarence pier. A public Lido is proposed within the Ravelin Moat to enhance the visitor experience to Portsmouth. Some of the Lido facilities are constructed at the junction with the Ravelin Wall and the dike to better accommodate the link in the sea defence line.

Underground parking is provided to the land side of the dike. This provides capacity to reduce parking impacts elsewhere, by removing and relieving existing requirements. Above ground this also enhances the landscape amenity whilst providing long term sustainable income.

A new underground conference centre is proposed in close proximity to Clarence Pier, the Queens Hotel and Holiday Inn, and adjacent to the underground parking. Conferencing is predominantly a ‘black box activity’ that can be readily located below ground, with light provided by wells in Southsea common.

Relieving parking pressure on existing sites then opens opportunity to relocate the Pyramids recreation centre on the D Day Museum car park site, within the battlement walls, along with a possible

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fig. 38, The Southsea Common. Proposed key strategic elements
new cultural facility on the existing volley ball site, currently located opposite. Well planned these additional facilities might create a much needed recreational, cultural and leisure quarter in proximity to the Castle and Museum, further enhancing the city’s identity.

Extending from the Castle to South Parade in the south east, it is proposed that the coastal defence protection is backed with a proprietary 4m diameter concrete pipe buried beneath ground. The capacity for storing 23,000 cu m. of water over this length can be used to help relieve storm water pressure from the area known as ‘The Great Morass’ (to the immediate north) which has resulted in sewage over flows into Langstone Harbour and the Solent from the city’s existing combined drainage system.

4.3 Connections and circulation

fig. 39

Some new routes are proposed which add more clear connections between the city, the common and the sea.

Two sea fronting promenades are now provided, one on top of the proposed dike along with a sea front promenade. Access is also improved from Old Portsmouth.

There is a dedicated public transport terminal and drop off route serving the new facilities which are not part of the main vehicular network, with the latter proposed on a shared surface. Parts of Clarence Esplanade, Pier Road and the whole of Long Curtain road are removed.

The Hoverport terminal is relocated to the North of Clarence pier with an enlarged beach apron provided to allow for the future expansion of this service to Southampton and beyond.
4.4 Public transport, parking and drop off  

Parking is now concealed underground below the common and behind the new dike. This new 3.16 hectares, 0.96 km long underground garage would have an estimated capacity for 1,270 parking spaces.

Whilst relieving existing surface parking pressure and providing new capacity, this ensures access can be well provided in proximity to all new and existing facilities including Clarence Pier, the proposed conference centre, the relocated Hoverport and the entire frontage. The dedicated public transport terminal and a drop off route also connect directly with the underground garaging.

Various new public routes would be designed to permit service vehicles beach access over shared surfaces.

Some surface parking could, where indicated, be retained.

In this proposal the anticipated area of Southsea Common amounts to 77.7 hectares, which represents an approximate loss of 3.89 hectares.

However when the provision of 3.17 hectares of underground garaging, the removal of part of Clarence Esplanade, Pier Road, and Long Curtain road and the rearrangement of the road network is accounted there is a net gain in usable area.

“...when the provision of 3.17 hectares of underground garaging, the removal of Clarence Esplanade and the rearrangement of the road network is accounted there is a net gain of usable area.”
4.5 Landscape strategy  

The line of the new sea defence structure allows a more naturally graded coastline, offering an improved beach frontage with additional long term economic, social and environmental benefits that also conserve and enhance historic assets.

Existing tree lined avenues are consolidated with new extensions to the tree lined avenues of the Ladies Mile and Western Parade.

Adjacent to the Queens Hotel, on entry from the town to the north, and at the end of Castle Road new public gateway spaces are formed and created at key entry points to the Common.

Given the proportionate orders of economic benefit delivered, for example, by nearby Medmerry it is to be anticipated this alternative might easily be seen to deliver greater long term benefits.

A full comparative economic assessment of this alternative scheme might be commissioned.
5 Proposal details

5.1 Clarence Pier redevelopment

Redevelopment on Clarence Pier
Considering the likely scenario (fig. 42) for higher density redevelopment over the full width of the existing Clarence Pier site (however fragmented) it can be seen how this would have significant impact on views from the Southsea frontage, effectively creating a wall, between the city and the sea.

The heavy black line in the diagram (fig. 43) shows its effective length.

Sea views from the Clarence Pier site (Red line) are limited on redevelopment, with one long side land-facing (Line shown - black). This reduces the site value.

The numerous long lease holdings, thought to number eight in total, on Clarence Pier may have adverse impact on implementing the programme for the proposed coastal defence works.

Alternative plan for Clarence Pier
Rotating the site area 90 degrees (fig. 44 + 46) significantly reduces the impact on views from the Southsea frontage.

A land-swap permitting redevelopment to the south and adjacent to the existing site would mitigate programme impacts on any coastal defence works, enabling redevelopment of Clarence Pier to progress and contribute more to the wider benefit at an earlier stage.

This also unlocks the opportunity to gain value from longer frontages having better sea views (Line shown - RED) with only the shortest side facing the land. (Line shown - BLACK).

It is proposed to realign the new site on an axis with the nexus of Western Parade, Castle Road and Kent Road.

By projecting the new site forward modestly into the Solent, a groyne is effectively provided on the frontage, contributing towards natural beach deposition and recharging either side (fig. 45+20).
fig. 45. Plan diagram. The new configuration can contribute to the coastal protection of the adjacent frontages delivering sheltered coves to either side, by acting as a groyne.

fig. 46. Key Plan. The same land area of Clarence Pier re-envisioned in the alternative scenario.

“Rotating the site area 90 degrees significantly reduces the impact on views from the Southsea frontage.”

Proposal details

KEY

1  The Solent
2  Existing Clarence Pier site boundary
3  Southsea Common
A, B + C  View points on the existing urban frontage towards Clarence Pier.
Proposed form and massing of Clarence Pier

Distinguished isolated built forms, like light houses (fig.48) and sea side piers, are traditional landmarks of the British coastline.

On Clarence Pier such distinction might best be achieved by coalescing the programmes of the disparate buildings and functions on the existing site into a single entity, and raising the height of the form (fig.47).

This would also sustain way finding, making the site more readily apparent from within Portsmouth city centre. Effectively the volume currently distributed at ground level could be raised and the sites development density increased (fig. 49).

Different functions distributed over the height could provide a range of new facilities. Located within the pier structure itself ‘black box’ activities such as building service functions, exhibitions, multiplex cinemas, clubs, further parking or the relocated aquarium might then be included (fig.51).

With free public access on both the pier and at roof level thrilling and distinctive new opportunities for Portsmouth would be opened up (fig. 50)
fig. 50. Conceptual view from the public roof top on the proposed Clarence Pier

fig. 51. Indicative section through proposed Clarence Pier, illustrating potential activities

Proposal details
“...enhancing the Portsmouth visitor experience a public Lido is proposed for bathing within the Ravelin Moat”

fig. 53. Key plan. Location of new Ravelin Moat Lido

Tiered changing cubicles provide a sea defence wall


Old Portsmouth

The concept for the Old Portsmouth coastal zone, is focused around the reappraisal of the area’s history through public interaction and the active engagement with a hard-engineered coastal flood defence. This is achieved through:

- Encouraging public engagement with forgotten historic monuments.
- Improving pedestrian permeability by removing barriers to open space.
- Enhancing the experience of hard engineered coastal flood defence, through the notion of ‘journey’.
- Developing a high-quality landscape proposal.

Concept Section

Concept photomontage

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“....enhancing the Portsmouth visitor experience a public Lido is proposed for bathing within the Ravelin Moat”
Further enhancing the Portsmouth visitor experience, a public Lido is proposed for bathing within the Ravelin Moat.

Constructed with the land based facilities at the junction knuckled between the new dyke with the Ravelin Wall, in the north east, this would allow the continuation of the primary sea defence line, whilst providing opportunity to sensitively mask the new construction to the existing Ravelin wall (fig. 53). Pool side decking, water-side access elements and piers would lie outside the primary sea defence line and float on pontoons within the moat (fig55).

There is a history of famous UK lido structures which also contribute to providing sea defence structures (fig 52), with a number of cities also recently developing highly successful low cost new facilities (fig.54). On the Spee in Berlin a city lido was recently constructed from a barge, by crowd funding.

With upgrading and repairs to the sea water sluice, to improve sea water capture and recharging the moat provides an exceptional opportunity to readily provide a sun drenched sea side lido within this historic setting.

If however water was to be contained in the Moat, then further opportunities emerge.

Outdoor swimming works best and are most economically successful were there are good water temperatures over most of the year. This has been achieved in a number of existing pool complexes using simple low tech solar water heating, where circulated pool water is pumped over cubicle roofs, or by using proprietary solar water heating.

In this way modest increases in water temperatures can significantly extend customer demand, the swimming season and economic value.

5.2 Ravelin Moat Lido
5.3 Conference facilities

fig. 56

A new Conference centre is located below ground in a location in close proximity to and sustaining both the existing hotels (The Queens Hotel and the Holiday Inn) and a new hotel proposed on Clarence Pier. This would provide the required new facilities whilst strengthening and consolidating the local economy. The location is also well located for access to existing amenities within the historic town, Southsea, the Castle and along the historic frontage.

Contemporary conferencing, performance and exhibitions are largely black box activities which may be located suitably beneath ground. However it is proposed to illuminate the public areas from a 650 sq meter light well. (Shown on plan as a green oval in Southsea Common)

Integral vehicular servicing and parking is provided by the new underground car park, which also serves Clarence Pier and the Hovercraft Terminal.

This facility would, with the exception of it’s entrance, be concealed beneath the common’s landscape. Underground conference centres have innumerable precedents worldwide with, for example, notable existing underground conference centres in the UK at the Grange St Paul’s Hotel and UK Gov. Dept for BIS, London.

The Portsmouth Conference facility, total floor plate for option indicated amounts to approx.

- 5,750m² (excl. light-well)

By comparison ’The Brighton Centre’ provides:

- Auditorium 1, 4,500 seater at 1,941m²
- Auditorium 2, 650 seater at 597m²
- A Foyer providing 1,300m² exhibition space,
- 2 floors each seating 400 at 400m² or sub-divisible into individual rooms of 200m² each
- over a total floor plate of approx. 4,238m² (allowing 30% circulation + servicing total = 5,510m²)

This conference facility at this location could significantly enhance opportunity for inward investment, delivering sustainable growth for all the city and without adverse impact on the landscape and amenity value if done to a sufficiently considerate standard.
Any sea defence works requires the repositioning or relocation of many of the significant listed memorials, but the settings of many of these particularly the campaign memorials is becoming overwhelmed in the ever increasing leisure and commercial bustle of the seafront promenade. This proposal therefore reviews the setting of the monuments.

The Portsmouth War Memorial, maintained on its existing navigational alignment, is proposed to be repositioned to a location further inland on the crest of the new dike (fig. 57). This offers better long term protection for the monument against salt water erosion, whilst increasing the monuments stature and prominence from both land and sea.

Forgathering the other dispersed memorials from along Clarence esplanade, together with the War Memorial into a considered landscape ensemble (fig. 58) might offer a more powerful, focused and evocative setting, improving their stature, whilst strengthening their historic narrative.

“Forgathering the dispersed memorials... together with the War Memorial into a considered landscape ensemble might offer a more powerful, focused and evocative setting, improving their stature”

5.4 Sitting the historic monuments
With new underground garaging, relieving existing parking pressure opportunities are opened up. It is proposed to relocate the swimming pool (The Pyramids) on the site of the D Day Museum car park site, within the battlement walls. A proposed new cultural facility on the existing volley ball site opposite is also identified (fig. 60). Well planned quality buildings in these locations might create a much needed recreational, cultural and leisure quarter in proximity to the existing Castle and Museums, further enhancing the city’s identity.

Tennis, volley ball, children's paddling, golf and park servicing compound are dispersed within the new landscape to improve public permeability across the common, their individual site locations and their access to the beach or parking. The new dyke or existing Ravelin and Battlements typically improve the shelter from the sea winds.

Dispersal of activities also better allows for more flexible use of the landscape areas, for example for holding transient activities such as the Victorious Festival, the Americas Cup and Southsea show which can now be more easily accommodated in the newly designed landscape.

5.5 Building and enclosures on Southsea Common

fig. 59

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The Rock Garden along with the Rose Garden are also proposed for relocation within this plan. The former for landscape, access and amenity improvements and to enhance shelter. The Rose Garden would be relocated following the removal of the leg of Clarence Esplanade to the east, which it is proposed to close. Using the incline of the dike, new skate board facilities are also programmed.

To the north west it is proposed to relocate bowling onto Governors green and relocate the MOD sports ground to close proximity with the Royal Naval Club on Pembroke Road.

Other small historic elements would be relocated appropriately within the new landscape setting.
5.6 Blue-green strategy

Portsmouth has a dedicated Victorian sewer network which combines both rainwater and wastewater from people’s homes.

These sewers, known as combined sewers can have up to 25 times more water in them during storms than during dry weather. The system is reliant upon the combined outflows being pumped to Eastney. From here it is then pumped a significant distance north east to the Budds Farm sewage treatment works in Havant. Treated wastewater is then pumped back to the Eastney pump station and from there into the sea (Fig.61). This system has secured the Blue Flag category along Eastney beach.

In addition to this three underground storm tanks located at Fort Cumberland provide backup storage for 40 million litres of storm water managed by two new underground pump stations (with a further 7m l at Budds Farm). During heavy rain the pump station releases storm water (rain water and diluted waste water), from an outfall at Fort Cumberland. These additional provisions were completed in 2015.

Climate change has increased the intensity of rainstorms which, along with projected rises in population, place ongoing pressures on this system.

To provide for the future, it is proposed to supplement the existing system with new capacity by capturing surface water from intense rainfall storms in a Sustainable Urban Drainage system (SUDS) system. Excess would then be stored in a cistern comprising a large diameter sewer pipe buried within the rear of the sea defence wall (Fig. 62 + 64). This principle could also be extended elsewhere around Portsea Island, in a manner similar to the London ring main.

The 370m length of 4m diameter pipe illustrated, would store 46 million litres of clean water, and more than the existing storm water storage currently provided at Fort Cumberland.
In this particular location it could reduce surface water flooding risks in the area of the Great Morass (fig. 63), storing surface water which would be sufficiently clean for pumping directly into the Solent, without detrimental impact on the Blue Flag quality of the beaches. It could also provide emergency pump storage backup for the lowest lying ground, in event of any failure of the sea defences.

Termed a ‘Blue/Green’ strategy, this facility could complementing the city’s future drainage management capacity, irrespective of the coastal sea defence typology otherwise adopted.
5.7 New vistas and axis

New vistas, and views are opened up to enhance orientation from within Portsmouth and Southsea, ease access and to provide improved alignments with significant elements.

Where ever possible routes from the city are taken on direct alignment to the sea front, offering clear and expanding views on approaching the frontage.

The proposed Clarence Pier also provides a landmark identifying the seafront from inland locations.

Whilst retaining the Naval Memorial on its existing navigational alignment, its relocation also now becomes more prominent from Western Parade and Nightingale Road, providing an urban signifier.

A vista towards Southsea Castle is also opened up from the junction of Clarence Parade and Western Road.

New public spaces are then created at major nodes and confluences, with a key public space developing adjacent to the Queens Hotel.
Southsea has one of the UK’s premier and most unique urban seafronts.

Evidence shows that the sea defences being proposed could adversely impact the city’s future prospects, the amenity and environmental quality, its economic prosperity and ecology. If Portsmouth is to remain competitive as a tourist destination of choice, and deliver the best quality environment for its residents, the issues raised by this report require address.

When the public were consulted during the early design stage, they were offered only three options for the sea defence designs. All of these were based on a policy of ‘holding the line’, which is only one of a number of strategic approaches. From this only a single type of design solution can derive and, however well it is delivered, inevitably is based on a raised sea-wall formed of concrete.

This report highlights how an alternative design strategy can deliver much more, and how with nuanced policy and a mixed strategic approach that also engages with the city and the common, this can better deliver Portsmouth’s future vision.

This report recommends:

• The current policy to ‘hold the line’ should be reviewed and the design strategy unconstrained, to allow for the development of the most appropriate, high quality and best value coastal defences for Portsmouth.

• Through consultation the public should be offered a genuine choice from all available coastal design strategy scenarios.

• Economic and environmental impact assessments of any proposed sea defences should fully evaluate all approaches relating to flood cell 1, including the alternative described in this report, and do so in a city wide context.

• From the requirement for new sea defences a better sea front design should be developed that is appropriate to the city’s context and aims to enhance its assets and ecology.

• With roughly £86.28m being invested on flood cell 1, the design of new sea defences needs to be more thoroughly considered with the investment better deployed to maximise benefits.

• Further leveraging of investment should be explored and alternative scenarios studied for addressing the long term risks, opportunities and rewards.
6.1 Research methodology

Contributions informing this report were developed through an international collaborative investigation the ‘Portsmouth Elephant Cage’ an initiative instigated and organised by Project Compass CIC (UK) and Architectuur Lokaal (NL). Held in two stages between November 2016 and March 2017, this design research into Portsmouth’s southern sea defences engaged experienced international practitioners, along with young professionals with expertise in the fields of engineering, architecture, landscape design and planning.

This cross disciplinary research took international and local evidence, to analyse and evaluate a wide range of alternatives that might be applied to deliver more responsive coastal defence solutions for Portsmouth, and also visited various exemplars on the Dutch coast and in Rotterdam in March 2017. Design options for Portsmouth were researched, explored and developed.

Full details of the Portsmouth Elephant Cage, its process, mentors, participants, the international research contributions, papers, presentations video, and the design outputs presented at public consultation may be found by link to the following website www.portsmouthisland.uk.

A further 2017 paper discussing the objectives, processes, research, outputs and findings of the first stage of the Elephant Cage is forthcoming.

After conclusion of the Elephant Cage 19 of those professionals who participated responded to a survey. At least 74% rising to 95% strongly agreed or agreed that in relation to the ESCP proposals presented alternative coastal defence strategies might contribute to delivering: better quality design solutions, more ecological benefits, better whole life value, more contextual solutions, delivering more social benefits and there was further potential for design innovation.

The proposals reported here are a synthesis, initially developed from the Elephant Cage research and findings along with further enhancement.

Two masters students at the Portsmouth school of Architecture in particular have contributed to this further stage. Russell Gould contributed to further research insights and images relating to the Ravelin Lido and Clarence Pier’s redevelopment, along with the 1:1 scale models prepared for the Elephant Cage public consultation. Alex Paul contributed further insights and images on the coastal profiles and the re-envisioning of Southsea common.
6.2 References


(4) (ESCP to 2017)

(5) (1797 Survey) drawing of Portsmouth. © The British Library Board


(10) (AR5) IPCC (Intergovernmental Panel on Climate Change; AR 5- 5th assessment) report Climate Change 2013: Chpt 13. Sea Level Change. * There is currently low confidence in projecting the onset of large-scale grounding line instability in the marine-based sectors of the Antarctic ice sheet. (p.1136 & 13.3.1 to 13.3.3, 13.4.3, 13.4.4) the report projections of sea level rise are larger than in theAR4 Report of 2009, primarily because of improved modelling of land-ice contributions. * Retrieved 27 June 2017: http://www.climatechange2013.org/images/report/WG1AR5_Chapter13_FINAL.pdf

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(14) (Menteth W. 2017)

(15) (Elephant Cage Participants Survey 2017) A Portsmouth Elephant Cage Survey. 16th - 29 March 2017. A survey covering both stage 1 and 2 of the Portsmouth Elephant Cage. Questionnaires were submitted to the 38 participants eliciting 19 (50%) responses. Whilst being a small and professional sample, the responses from those having the skills and expertise to interrogate drawn information, technical and planning data, are clearly indicative

6.3 Images

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fig. 66 & table 2. The Portsmouth Elephant Cage.
6.4 Credits

The research process leading to this report has been sustained by many others deserving of recognition and thanks. In particular the other directors of Project Compass CIC and our Dutch colleagues at Architectuur Lokaal, Cilly Jansen and Indira van’t Klooster, who together organised and resourced the Portsmouth Elephant Cage, enabling fresh international insights to be brought forward to inform Portsmouth's potential.

The individual contributions by all Elephant Cage participants has also informed and impacted this synthesis. The names of all thirty eight are recorded on the Elephant Cage website.

Most particularly I am grateful to Martin Knuijst, Director of OKRA landscape architects, whose intelligent, sensitive and delightful Katwijk works deeply impressed all those who visited it, evidencing how successful innovative coastal design can be.

This research, running in parallel with a masters programme at the Portsmouth School of Architecture, has been sustained with generous support from academic colleagues, in particular Francis Graves, senior lecturer at the Portsmouth school of Architecture, and two masters in architecture students Russell Gould and Alex Paul who have also made significant contributions to the final design synthesis.

The Island City Papers, available digitally at www.portsmouthisland.uk, distribute publications on design and planning in Portsmouth and the region.

Independent authors are invited to contribute illustrated articles to this series of open architectural and planning publications whose purpose is to explore the future of the region and the city of Portsmouth.

Portsmouth - The Island City. Building better flood resilience for Southsea’s frontage + common
June 2017  R.3a
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Erratum’s corrected revision 3.a. (by section, page, & paragraph)
2.1 p.7. para. 1. “..only commercial Hoverport in the world. ” - amended to “lies the Hoverport, of the world’s only commercial hovercraft service.”
2.1 p.7 para. 2. “Long Moat” amended to “Long Curtain Moat”
2.4 p.13 para. 6. “casual” amended to “Causal”
4.5 p. 27 para. 3. “old Portsmouth” – deleted and amended to “town”, to remove ambiguity.
5.3 p. 34 para. 4 "commons” amended to "common’s"