

RSrnYC & RAFYC

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NAVIGATIONAL RISK ASSESSMENT

March 2013

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ROYAL SOUTHERN YACHT CLUB

&

ROYAL AIR FORCE YACHT CLUB

NAVIGATIONAL RISK ASSESSMENT

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1. INTRODUCTION

The Royal Southern Yacht Club (RSrnYC) and RAF Yacht Club (RAFYC) are neighbouring Yacht clubs located on the Hamble waterfront. Jointly the clubs have prepared a proposal for the development of the water areas and associated mooring facilities which are described as:

“Reconfiguration of berthing facilities and installation of additional pontoons to provide more flexible and efficient berthing provisions. Improved arrangements for access to water for a range of users including: floating all-tide dinghy slipway; disabled access berth; crane and holding berth; dedicated visitor and event berthing.

Capital dredging works to create additional water depth to berths and the associated facilities. A new sheet piled quay wall with suspended timber deck and infill behind to replace the existing failing structure and removal of inspection piles and existing slipway.”

In summary the reasons for the development are:

- To secure the failing landside structures
- To provide improved access to water for a greater range of users
- To improve ease of navigation
- Meet with evolving customer demands for more efficient mooring systems

This paper assesses the safety and ease of Navigation for both the existing and proposed mooring layouts, in order that the impacts of the proposals can be fully understood in terms of navigational risk. Further details of the proposals and project justification can be found within the material prepared to support the various consent applications.

It is to be noted that in order to cover a number of licensing and consenting issues, this Navigational Risk Assessment covers both the activities falling within the Jurisdiction of the River Hamble Harbour Authority (all water areas up to Mean High Water) under the Port Marine Safety Code, and the activities within the confines of the mooring layout. Whilst within the jurisdiction of the RHHA it is the responsibility of the individual operator to demonstrate to the Harbour Authority that activities are

being assessed, managed and controlled. This report considers and assesses the activity based risks of the proposed scheme layout as a whole, in reality the operations of the RSnYC and RAFYC will be dealt with as separate assessments by each operator.

2. EXECUTIVE SUMMARY

The Royal Southern and RAF Yacht Club seek to develop their water areas and deliver a holistic mooring layout that provides improved facilities and considers the range of users and associated facility requirements.

The ultimate objective of this report is to answer the following key questions from a considered position and in recognition of industry standards, experience, best practice and expert evidence:

1. Will the safety of navigation within the proposed layout meet the requirements of the Port Marine Safety Code?

We find that in all instances it will.

2. Does the layout conform to industry standards for moorings and access ways?

We find that it does, our assessment confirms that the layout in its entirety conforms to industry standards. It is to be noted that the layout exceeds the minimum standards for the main manoeuvring area.

3. Will the proposed development result in an increase or a decrease in the risks associated with marine activities and operations?

The layout as illustrated on drawing number MP189-106 results in a decrease in activity based risks. This is brought about by a number of factors namely:

- Reduced rates of tidal flow throughout the mooring areas
- Linear and more predictable direction of tidal flow
- Reduction of complex tidal flow and streams within the locality of the RAFYC slipway
- Mooring structures conform to industry standards
- Deep water throughout eases navigation in comparison to the existing layout
- Reduced user groups ensures management of the facility can be controlled, maintained, and periodically assessed

- Segregated, separated and clearly defined moorings, facilities and user groups
- Ability to manage the local tidal flows created as a result of the capital dredge in the south west corner
- Dedicated mooring allocations, for members and visitors

This assessment is based on the following plans:-

- **MP189 – 106 ~ Appendix 1 (Equivalent Drawing No. MP189-203)**
- **MP189 – 106.1 ~ Appendix 2 (Equivalent Drawing No. MP189-203.1)**

3. REFERENCE MATERIAL

This report has been generated utilising the following methods and points of reference:

- **The Yacht Harbour Association**
(TYHA) design standards Code of Practice for the Design, Construction and Operation of Coastal and Inland Marinas and Yacht Harbours published by the Yacht Harbour Association Ltd 2007. This Code of Practice sets out guidelines for the design and operation of yacht harbours and marinas used for recreational boating. This is the most relevant guidance document available from which to make comment about the technical design of the proposed mooring layout.
- **Port Marine Safety Code**
The Port Marine Safety Code (PMSC) latest revision October 2009, applies to all harbour authorities in the UK that have statutory powers and duties (Hamble River Harbour Master in the case of this proposal). The latest revision included representation from the Department from Transport and the Maritime and Coastguard Agency (MCA) along with a wide range of interested parties.

Harbour Authorities have been created by statute to serve public interest and the public do have rights of passage within the proposed water areas (existing rights of passage between mid-stream moorings and the mooring ring at the foot of the public right of way shore side). Public interest is a wider

consideration than that solely of River users and includes both the local community and the environment.

Harbour Authorities have a duty of reasonable care to ensure that those who may choose to navigate within the facility may do so without danger to life or property. It is understood however that the safety of navigation within the confines of the proposed layout fall directly to the owners/manager (the duty holder) to conform to or exceed the standards as set out by the RHHA, who will require evidence that activity based risks are being monitored, assessed and controlled. This is the case with the private moorings and marinas up and down the length of the River Hamble.

- **River Hamble Harbour Authority**

The River Hamble Harbour Master has been used as a point of reference along with the associated Byelaws, Harbour Masters Directions and Notice To River User publications. This Navigation Risk Assessment has been the subject of extensive discussion with the River Hamble Harbour Master and his comments have been addressed throughout the process. Consequently the methodology has been endorsed by the River Hamble Harbour Master. Furthermore the discussion of the findings of the NRA have been acknowledged by the Harbour Master and has formed part of his consideration of the Harbour Works License Application.

- **Risk Assessments**

An assessment of navigational risks has been carried out for both the existing layout and the proposed scheme. These activity based risk assessments form the basis of the assessment and result in a risk factor rating. The rating takes into account: likelihood, frequency and severity. Where a potential risk is unavoidable measures should be put in place to manage the risk to a level that is as low as reasonably practicable (ALARP).

- **ABPmer Hydrodynamic & Geomorphological Assessment**

ABPmer have carried out a hydrodynamic assessment of the likely impacts of the proposal and in particular the removal of the intertidal area immediately to the east of the RSrnYC building. The findings of the analysis have a direct impact upon the proposals and are therefore referenced within this report.

- **Anecdotal Evidence**

The existing mooring facilities and water areas are accessed by a number of user groups. Anecdotal evidence from users where appropriate has been sought to inform the findings of this assessment.

It is against the above points of reference that we have been instructed by the client team (RSrnYC & RAFYC) to assess the risks associated with marine activity and operations both prior to and following the pontoon development works. This report comments on the ability for users of the facilities to continue to utilise the moorings and facilities without danger to their lives or property.

It is also to be noted that all vessels using the River Hamble must acknowledge and comply with the International Regulations for the Prevention of Collisions at Sea 1972 (COLREGs). In addition ALL vessels must adhere to Byelaws and Directions as set out by the River Hamble Harbour Master. It remains the responsibility of all River users to familiarise themselves with the relevant laws, Byelaws and Directions.

4. METHODOLOGY

The existing mooring layout has been the subject of an activity and risk review to ascertain numerical risk and hazard ratings. In addition the key user groups and vessel types have been identified in an attempt to present relative findings in the context of both the existing and proposed mooring layouts.

The proposed layout has also been the subject of a review to assess and measure the technical design against industry standards.

This risk assessment has been updated throughout the design development process to take account of project evolution and feedback from the Harbour Master. A revision in early January 2013 has included the latest Notice to River Users. The scheme drawing references have been the subject of an update to reflect the package of drawings being submitted with the application. The drawings and Figures referred to in this Navigation Risk Assessment have not been subject to material change and therefore findings of the assessment remain consistent with the application drawings.

5. RISK ASSESSMENTS

The aim of the risk assessments is to identify, define and minimise the risks that have to be managed within the layout. The overall risk rating is made up of two components namely; the hazard and the risk. A Hazard is defined as something with the potential to cause harm, loss or injury. A Risk is a combination of the likely frequency of occurrence and subsequent consequence/severity as a result of the incident. The risk assessments aim to identify the hazards that may occur, the events that may cause them and the risk control measures that may be applied to mitigate and manage them.

Where a risk is unavoidable the Port Marine Safety Code states that Safety Management Systems are put in place to mitigate the risk and manage it to as low as reasonably practicable (ALARP).

The risk assessments carried out identify if any potential risks associated with a navigational hazard can be managed to ALARP. If this is not the case any additional measures that can be put into place to mitigate and reduce the risk to an acceptable level (ALARP) must be administered.

The risks are assessed using a risk/severity matrix. This system enables us to determine whether a risk is classified as ALARP or not. In addition The Port Marine Safety Code outlines the further requirement for harm to Persons, Environment, Asset and Port Use to be assessed as individual components. Below we outline the matrices used to assess the Navigational Risks of both the existing and proposed layouts.

Frequency	Severity		
	1 Slight Harm	2 Moderate	3 Extreme
1 Very Unlikely	Very Low Risk	Very Low Risk	Low Risk
2 Unlikely	Very Low Risk	Medium Risk	High Risk
3 Likely	Low Risk	High Risk	Very High Risk
4 Very Likely	Medium Risk	Very High Risk	Very High Risk

Table 5.1 Risk Factor Matrix (frequency multiplied by severity)

A numerical risk assessment method is utilised to assess the frequency and severity as noted in Table 5.1.

The results from the risk assessment evaluation can be categorised in the following Table 5.2:

Risk Factor numerical rating	Assessment result	Comment
1-4	Very low, low & medium risk	Equals ALARP
6	High Risk	Refer table 5.4
8-12	Very High Risk	Refer table 5.4

Table 5.2 Risk Assessment Categorisation

A frequency and severity assessment is also made for each of the components as outlined in the PMSC, is noted below in Table 5.3.

PMSC ~ Risk Assessment of frequency			
1 - Very Unlikely	2 - Unlikely	3 - Likely	4 - Very Likely
Less than 1% chance of being experienced in a 30 year period	Experienced 1 in 10 year period	Experienced 1 in 1 year period	Experienced 12 in 1 year period

PMSC ~ Risk Assessment of component parts - Severity			
	1 - Slight Harm	2 - Moderate Harm	3 - Severe Harm
Person	Superficial injuries cuts and bruises	Minor fractures, burns, concussion	Major fractures, multiple injuries, fatal injuries
Asset	Superficial hull damage no water ingress	Vessel holed ingress of water	Major damage complete loss of vessel
Environment	Minor pollution less than 50 litres of pollutant	Moderate pollution less than 250 litres of pollutant	Major pollution greater than 250 litres of pollutant
Reputation	Incident dealt with internally. Minor inconvenience.	Adverse local publicity, loss of revenue, restrictions to navigation	Bad widespread publicity. Prolonged loss of revenue & restrictions to navigation

Table 5.3 PMSC Risk and Severity Assessment

Very Low Risk	No action is required. Control Measures are adequate. Record and re-assess annually.
Low Risk	No additional controls are required. Consideration may be given to a more cost effective solution or improvement that imposes no additional cost burden. Monitoring is required to ensure that the controls are maintained.
Medium Risk	Efforts should be made to reduce the risk, but the costs of prevention should be carefully measured and limited. Risk reduction measures should be implemented within a defined time period. Where a moderate risk is associated with extremely harmful consequences, further assessment may be necessary to establish more precisely the likelihood of harm as a basis for determining the need for improved control measures.
High Risk	The act should not take place until the risk has been reduced. Considerable resources may have to be allocated to reduce the risk. Where the risk is extant urgent action should be taken.
Very High Risk	The act should not take place until the risk has been reduced. If it is not possible to reduce the risk, even with unlimited resources, the evolution has to be prohibited.
Note:	<i>Very Low Risk, Low Risk and Medium Risk indicates that the risk has been managed to ALARP.</i>

Table 5.4 PMSC Component, Severity and Frequency Rating.

6. TIDAL CONDITIONS

The study site is subject to the following tidal conditions:

Tidal state	Tidal height reference to Chart Datum (CD)
Mean High Water Springs (MHWS)	4.5m
Mean High Water Neaps (MHWN)	3.8m
Mean Low Water Neaps (MLWN)	1.9m
Mean Low Water Springs (MLWS)	0.7m
Neap Tidal Range	1.9m
Spring Tidal Range	3.8m

It is to be noted that strong North East winds can decrease water depths by approximately 0.6m.

The Tidal flows on the River Hamble are known to be significant due not least to the double high water and resultant Ebb flow rates. The Ebb flow just after high water on a Spring tide is the most significant flow within the River which for clarification has been recorded at 0.77 knots at the southern end of the inner mid-stream pontoon. The study site has a long established intertidal mud flat directly outside the RSrnYC

building and extending eastwards to the walk ashore pontoon. This mudflat rises to approximately 2.3m above Chart Datum.

The physical make-up of the mud flat influences the tidal flows within the proposed development zone. The effects of the removal of this intertidal mud have been the subject of an independent review by hydrographical specialists ABPmer. The key findings of their report are noted below, as they have a significant impact upon the proposed scheme.

7. RISK ASSESSMENT OF EXISTING MOORING LAYOUT

The Main Navigation Channel running up and down the River Hamble has been the subject of a separate review to ascertain the existing flow of vessels, manoeuvring areas and any significant pinch points. Figure 7.1, illustrates the existing channel widths throughout the length of the River from the entrance through to Bursledon Bridge.

As the principle design of the proposed pontoon development does not encroach on the main navigational channel, but does cease any vessel movement between the existing mid-stream moorings it is important to confirm the suitability of this channel in the context of the River Hamble for all vessels transiting both up and downstream.

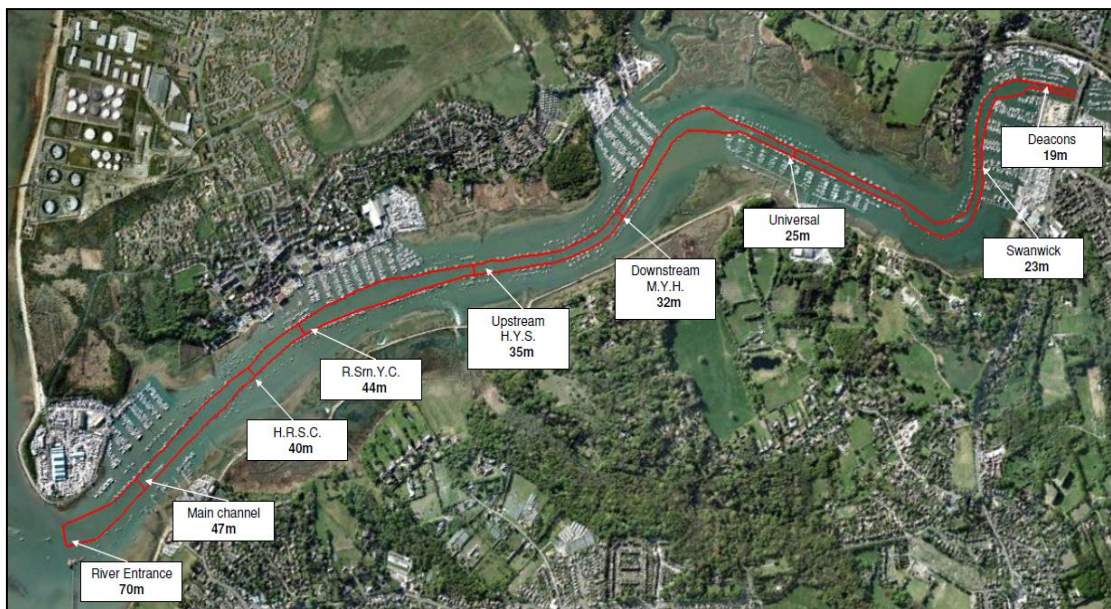


Figure 7.1 River Hamble Main Channel Widths and Pinch Points

It is evident that the main channel opposite the RSnYC outer midstream moorings offers a comparable clear water area to the main channel nearer the main entrance to the River at Warsash. Moreover the channel width of 44m is flanked either end by a 65m manoeuvring area to the north and a 75m manoeuvring area to the south.

A point to note is that vessels utilising the Hamble slipway for launch or recovery and heading upstream from the slipway or downstream to the slipway will enter or be within the main channel at some juncture. The development of the RSnYC & RAFYC berthing proposal therefore only changes the point at which vessels enter or leave the main channel. Vessels downstream from, or upstream to the Hamble slipway are unaffected by the proposals.

The existing configuration is broken down into distinct areas of assessment brought about by the navigation of vessels in and around the facility. The areas of assessment are illustrated in Figure 7.2 and 7.3. For consistency the proposed layout utilises the same assessment method in order that areas of navigational review may be compared on a before and after development basis.

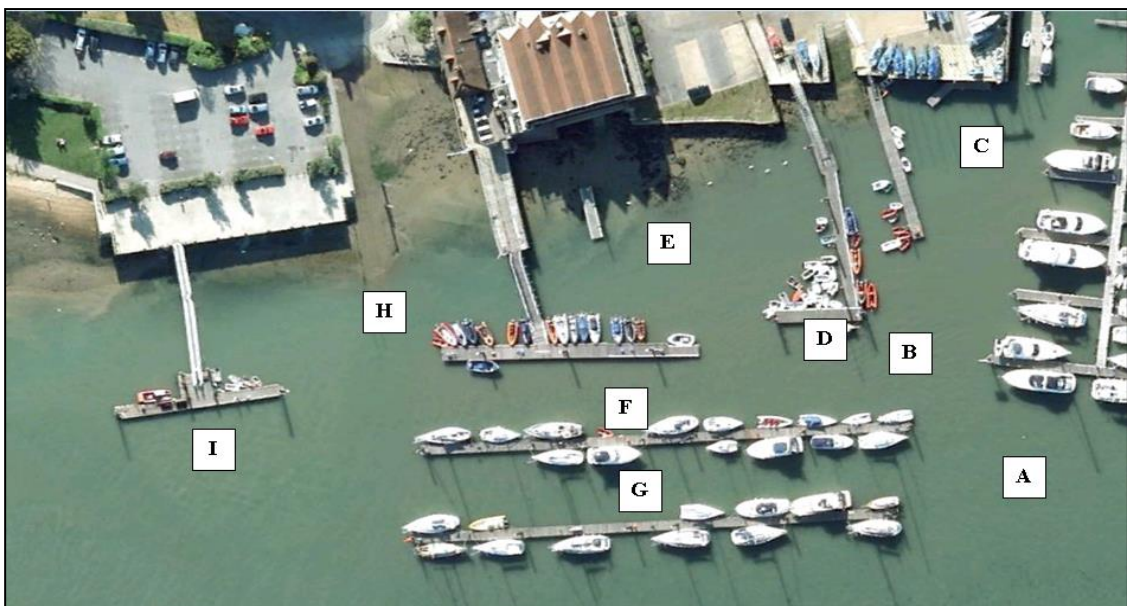


Figure 7.2 Key Points of Activity and Assessment

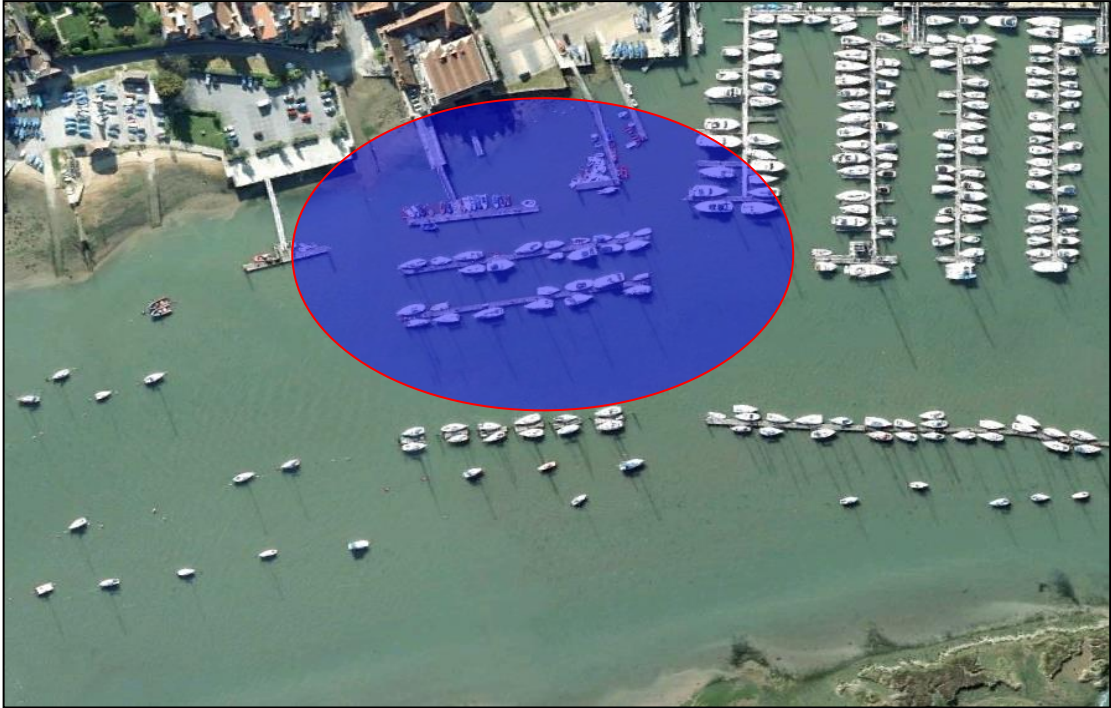


Figure 7.3 Key Points of Activity and Assessment Across River

The activities relating to the use of the “existing” configuration have been assessed and are covered in the following section. An aerial plan of the site locating the various facilities is noted in Appendix 3. The areas are described as:

- **A** – Main channel manoeuvring area
- **B** – Upstream Entrance/Exit and manoeuvring area from moorings and facilities
- **C** – Shared fairway/inner channel
- **D** – RAF Hammerhead berth
- **E** – Intertidal mud flat and Inspection Pile location
- **F** – Inner, mid-stream mooring zone
- **G** – Outer midstream mooring zone
- **H** – Hamble Slipway entrance/Exit and Inspection Piles
- **I** – Hamble Jetty landing

7.1 Area A – Main Channel

The main access channel of approximately 44m in clear width directly opposite the Royal Southern outermost pontoons opens out to almost 65m in Area A. This area is currently utilised by a range of vessels and users that include:

- Vessels navigating to and from the Port Hamble Fuel Berth located on the end of B pontoon to the north of the 65m manoeuvring area
- Vessels entering/exiting Port Hamble Marina (upstream A pontoon and downstream B pontoon)
- All vessels exiting the existing mooring configuration heading upstream (generally on an Ebb tide)
- Vessels entering the midstream moorings and RAFYC pontoon generally during the flood tide

In addition to the above a number of small leisure craft that are not directly associated with or utilise the facilities therein transit between the mid-stream moorings entering the main channel at this point. This is contrary to RHHA guidance on safe navigation of small vessels heading upstream, who elect to navigate through the mooring zone for convenience. The previous advice of Trinity House in respect of lighting of the area is also relevant.

7.1.1 RHHA Position

The River Hamble Harbour Masters Direction number 2 states:

Harbour Masters Direction River Hamble Harbour Authority

By virtue of the provisions of Sec. 52 Harbour, Docks & Piers Clauses Act 1847, Sec. 12 Southampton Harbour Act 1939, Article 37 and Schedule 2 The River Hamble Harbour Revision Order 1969 the Harbour Master gives the following Direction: Issued on 29 March 2006 under Notice to River Users 20 of 2006

Harbour Master's Direction No 2

1. This Direction is given to Masters¹ and persons having command or charge of any vessel².
2. This Direction applies at all times and in all areas within the limits of the River Hamble Harbour³.

¹ Sec. 3 Harbour, Docks & Piers Clauses Act 1847

² As defined in Article 3 of the River Hamble Harbour Revision Order 1969 thus: "vessel" includes any thing (howsoever propelled or moved) constructed or used to carry persons or goods by water

³ As prescribed in Article 4 of the River Hamble Harbour Revision Order 1969

3. All vessels shall comply with the International Regulations for Preventing Collisions at Sea 1972 (the Rules) (as amended and as they may be amended in the future).

The Harbour Master has made it clear that this means that vessels shall not proceed upstream on the western side of the main channel (against the flow of traffic) (Rule 9a), and that vessels crossing the main channel (to and from the eastern shore) shall not impede the passage of a vessel which can safely navigate only within a narrow channel or fairway (Rules 9b and 9d).

7.1.2 Trinity House

Historic correspondence between the RHHA and Trinity House from December 1999 confirms the approval of Trinity House to extinguish navigation lights previously fixed to the RSrnYC walk-ashore pontoons and establish two new lights at either end of the outer RSrnYC pontoons. The point is made in this correspondence that the outer pontoons are inshore of the navigation channel. The relevant correspondence is provided at Appendix 4.

The position of the lights opposite the RSrnYC is identified in Figure 7.4 which in turn confirms clearly the location of the Main Navigation Channel.

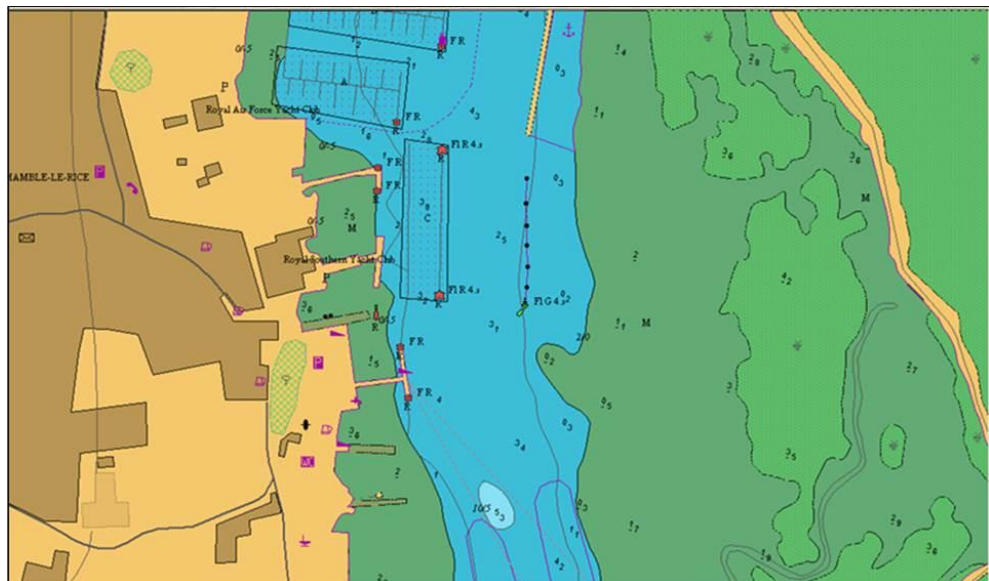


Figure 7.4 – Location of Navigation Marks

An assessment of risk based on the noted activity has been made and the findings are noted below:

The manoeuvring area is approximately 65m in diameter and currently accommodates the number and range of vessels utilising the area. Vessels enter and leave the water area depending on prevailing conditions, type of vessel and direction of passage. The area falls within the jurisdiction of the RHHA and is considered to be managed to ALARP not least as the area is one of the widest points of the River.

The activity of vessels entering and exiting the main channel at point 'A' is assessed below:

Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	2	1	1	1
Risk Factor	4	2	2	2
ALARP in all relevant categories	YES			

The above assessment is made with the exception of vessels making passage upstream from point A on the western side of the main channel which is in breach of the COLREGs and the Harbour Masters Direction No.2 this activity is assessed as being very high risk.

The activity of vessels entering the main channel at point 'A' and continuing upstream on the west side of the channel is assessed as noted below:

Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	3	3	3	3
Severity (1 - 3)	3	1	3	3
Risk Factor	9	3	9	9
ALARP in all relevant categories	NO			

7.2 Area B – Upstream Entrance/Exit and manoeuvring area from moorings

This area encompasses multiple activities from a range of users, namely:

- RAFYC members entering and exiting their hammerhead berth
- RAFYC members tenders
- RAFYC members using inspection piles and tidal slipway
- RSrnYC tidal slipway users (tenders, dinghies, day boats)
- RSrnYC static crane users
- Port Hamble berth holders
- RSrnYC mooring holders

In addition to the above, a number of vessels that transit between the inner mid-stream moorings enter the main channel via this water area. It is assessed that vessels other than those moored within the facilities should not enter the main channel at this point for a number of reasons:

- Vessels should not be navigating upstream on the western side of the channel, transiting between the mid-stream moorings and re-entering the main channel to continue along the western side of the channel. This activity is against COLREGs and the Harbour Masters Direction No.2.
- Vessels launching from the Hamble Slipway should navigate directly across the main channel opposite the slipway where the channel is at its greatest width (approximately 75m).
- The Port Hamble Fuel Berth is located within the area and is heavily utilised during the peak season.
- Making passage through a narrow mooring zone is inherently more hazardous than making passage through a clearly defined and dedicated channel over five times the width of the largest mid-stream mooring zone.

A risk assessment based on activity has been made and the findings are noted below:

There are a range of users, (both powered and unpowered vessels) utilising this restricted water area. The restrictions of the water area (approximately 20m diameter) and the size of vessels utilising it, some current vessels being as large as 18.5m make the water area confined for manoeuvring. It is also noteworthy that

the individual finger berths facing downstream at Port Hamble can accommodate larger vessels, the largest being approximately 23m L.O.A. The existing access way and fairways do not comply with industry standards in this regard.

Anecdotal evidence suggests that this area is prone to risk due to the following key influencing factors:

- Multiple users of a restricted water area
- Unpredictable flood and ebb tidal flows as illustrated in Figure 7.5 and 7.6 from mid to low tide (due to the influence of the intertidal mudflat to west)
- Large vessels of up to 18.5m l.o.a. manoeuvring in a confined water area
- Unsighted vessels making passage between the inner moorings
- Sailing vessels without auxiliary engine power being towed through this area
- Multiple users with no single management/control of the water area, the area is somewhat self-regulating and it is the responsibility of the each vessels skipper to ensure safety of navigation
- As the facility is utilised at times by visitors with no prior experience of the water area, tidal flows or prevailing conditions

In general, this area is deemed to present a potential conflict of navigation based on the above points and historic evidence based incidents and is deemed to present a high risk classification. The implementation of Control measures results in the risk being reduced to Medium and therefore ALARP.

Control Measure 1.	Education of members on tidal flows within the area and the importance of planning vessel movements around the tidal cycle.
Control Measure 2.	Escort boats/safety boats monitoring VHF channels.
Control Measure 3.	RSrnYC and RAFYC Bosuns carrying out berth allocation and advising visiting vessels local conditions (tidal flows etc)
Control Measure 4.	Protocols for use of inspection piles regulating use and vessel traffic to and from each facility.

Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	2	2	2	2
Risk Factor	4	4	4	4
ALARP in all relevant categories	YES			



Figure 7.5 Flood Tidal Flows & Resultant Anticlockwise Eddy



Figure 7.6 Ebb Tidal Flows & Resultant Clockwise Eddy & Easterly Flow Stream

7.3 Area C – Shared Inner Fairway

This shared channel and water area accommodates vessels from the following users:

- RAFYC inspection pile users
- RAFYC slipway users
- RAFYC walk ashore pontoon users
- RAFYC tenders
- Port Hamble berth holders (downstream A pontoon only)
- RSnYC static crane users

This area measuring approximately 20m at its narrowest point is only utilised by vessels entering or leaving a designated berth or facility, be it temporary allocation or permanent allocation. Whilst the water area is restricted, so too are the vessel sizes that utilise the space which are in turn restricted by the physical constraints of water depth, berth size, crane, inspection pile and slipway capacity. The area is predominantly utilised by long term members/berth holders who are aware of the inherent local conditions.

This area has periods of intensive use as access and egress from the various facilities is predominantly timed around tidal access and flow rates, i.e. half an hour before and including high water when flow rates are minimal and tidal access is at its greatest. With a range of users vying for the same tidal access window there is often excessive congestion within the facilities from the following users:

- Unpowered sailing vessels being launched or recovered from the Static crane
- Unpowered sailing vessels being launched or recovered from the RAFYC slipway
- Unpowered vessels being towed to or from the RSnYC slipway pontoon
- RAFYC and RSnYC tenders entering or departing their respective holding pontoons
- Vessels entering or departing the RAFYC inspection piles
- Port Hamble Berth Holders(A pontoon) entering or departing their moorings

Transiting through the area requires navigation across the tide and as such passage planning has long been required to gain safe access and egress from this water area.

It is considered that the area presents a High risk however control measures in place reduce the risk rating to Medium and it is assessed that the area is being managed to ALARP.

Control Measure 1.	Only Certified operators may use the Static crane.			
Control Measure 2.	Dinghies are escorted out of and into the mooring areas.			
Control Measure 3.	Dinghy users must wear life jackets at all times.			
Control Measure 4.	RSrnYC Bosuns manage allocation of berths within the area and communicate tidal flow and local conditions to users.			
Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	2	2	2	2
Risk Factor	4	4	4	4
ALARP in all relevant categories	YES			

7.4 Area D – RAFYC Hammerhead berth

This facility is utilised by the following user groups:

- RAF members
- RAF member tenders & RIBs
- RAF non-member visitors

In addition to the above, a number of vessels that transit between the inner mid-stream moorings pass through this water area.

The pontoon has clear access and egress through the RSrnYC inner midstream moorings and Zone A, the main channel manoeuvring area. Caution is required when utilising the facility due to the following local conditions:

- Unpredictable tidal flows as a consequence of the intertidal mud flat
- Vessels transiting through the mid-stream moorings

The area is assessed as being medium risk due to the range of users within the confines of the water area, the restricted manoeuvring areas and tidal flows.

Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	2	1	2	2
Risk Factor	4	2	4	4
ALARP in all relevant categories	YES			

7.5 Area E – Intertidal mud flat and Inspection Pile location

This area is used by RSrnYC members accessing their walk ashore pontoons and utilising the inspection piles. The main consideration of this zone is the spring tidal flows throughout and the unpredictable nature of the tidal flows due to the intertidal mud flat. Vessel sizes within this zone are commensurate with the facilities and do not pose a significant risk and are assessed as being low risk.

Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	1	1	1	1
Severity (1 - 3)	2	2	2	1
Risk Factor	2	2	2	1
ALARP in all relevant categories	YES			

7.6 Areas F & G Mid-stream mooring zone

This mooring zone is used not only by vessels mooring alongside the pontoons but by vessels making passage through the water area. Vessels making passage through these zones include the following:

- Port Hamble Berth Holders (Downstream A pontoon only)
- RAFYC members making passage to their facilities
- RSrnYC members making passage to/from the facilities
- Other river users making passage through the facility from and to the main river channel

The latest River Hamble Harbour Authorities Notice To River Users of 2nd January 2013 makes reference to ‘access channels’ in section 15 as noted below:

“There are a number of channels on the River Hamble which run parallel to the main channel and give access to pontoons, moorings, jetties and slipways. These access channels are frequently used by operators of small craft (sailing dinghies, tenders etc) who wish to remain clear of the main channel. However, the access channels are also used by larger vessels to gain access to moorings etc. This can lead to potentially dangerous situations, particularly where head-on encounters occur between vessels in narrow channels. Operators of all vessels which use these access channels should be aware of these dangers and navigate with due caution.”

A number of typical existing passages through the mid-stream moorings are illustrated in Figure 7.7.

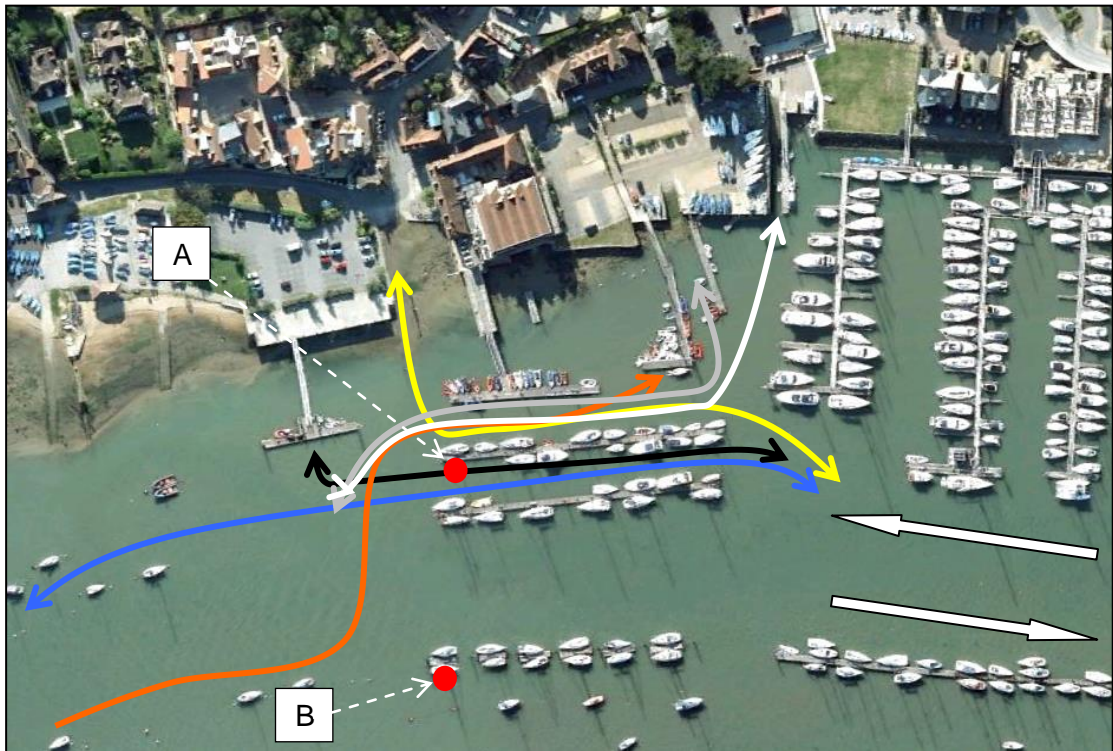


Figure 7.7 Typical existing mid-stream mooring routes of navigation

It is to be noted that upstream passage through the mid-stream moorings and along the west of the main navigation channel results in vessels entering the main channel on the starboard side of vessels headed downstream. This is against safe navigational protocol (vessels must pass Port to Port), COLREGs and the Harbour Master’s Direction No.2. These vessels also emerge into the main channel immediately adjacent to the busy Port Hamble Fuel Berth.

Significantly, vessels transiting through the mid-stream moorings either leave or enter the main channel to do so. Any perceived benefit in passing through this area is therefore limited. By contrast on the opposite side of the River there is a continuous zone outside of the main channel and moorings within which small craft can navigate.

The mid-stream moorings have been designed primarily to accommodate vessels moored in a linear configuration alongside the pontoon structures. When vessels are mooring in this configuration, there is in the range of 7.5 to 8.5m clear open water between vessels. This is assessed as being adequate for the existing vessel types and sizes to enter and exit the berths. This is not however considered adequate as a navigation channel, particularly given the poor lines of sight and potential for vessels to be moving in both directions. The proximity of the busy Port Hamble fuel berth immediately upstream of this zone is another relevant consideration.

The RSrnYC have the ability to install a temporary (maximum 28 days per annum) link pontoon between their walk ashore pontoon and the inner mid-stream mooring. This activity is carried out in order that the club can increase access to the water by land and vice versa during regattas and event hosting. The installation of the temporary pontoons does create its own inherent risk associated with vessels making passage through the mid-stream moorings without the knowledge of the existence of the link pontoon. With no area to turn a vessel of anything greater than 6 -7m (depending on the prevailing conditions) around within the mooring area, a number of incidents have occurred whereby vessels have collided within the mid –stream mooring zones.

The clear water areas are illustrated in Figure 7.8

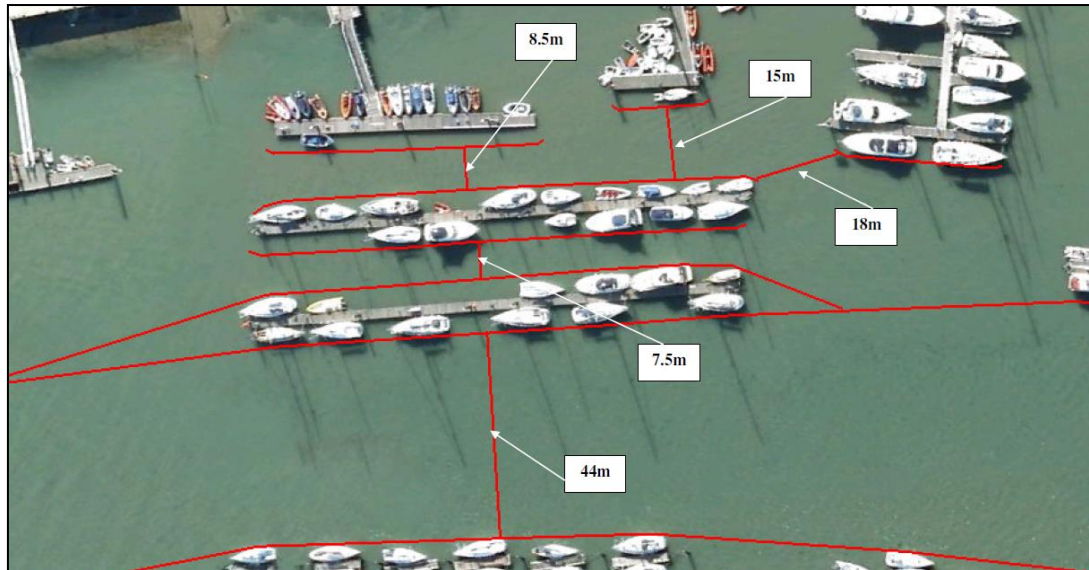


Figure 7.8 Indicative Inner Mooring Clear Widths

The widths between the mooring zones of between 7.5m and 8.5m do not comply with industry standards for an inner channel of navigation as outlined in TYHA guidelines for marinas as noted overleaf:

“Inner Channels”

The minimum width must be 20m or 1.5 L whichever is the greater where L is the L.O.A. of the largest craft using this secondary channel. The width of a channel is measured from the outboard side of any craft that are berthed on either side of the said channel.”

With vessels of over 13m currently berthing on the mid-stream moorings, this would dictate the need for a clear width of a little under 20m. Whilst this existing configuration is not a marina, it is the only guidance document available from which to draw a comparison and is considered appropriate due to the focus of leisure vessel activity in the area. A 10m vessel of approximately 3.2m beam (boat width) with fenders set either side transiting through the inner moorings has a little over 2m either side throughout the 55m length of alongside pontoons. There is not sufficient room for such vessels to pass safely (port to port) with any another vessel passing through this mooring zone.

In addition a number of vessels berthed on the downstream side of Port Hamble A-pontoon have a beam of up to 5.3m. With fenders down either side of such a vessel there would be in the region of only 1.3m tolerance either side of the vessel

to transit through the wider of the two channels. These vessels should not ideally be transiting through this area.

The main channel (of approximately 44m width) opposite the RSrnYC mid-stream pontoons as illustrated in Figure 7.1 should be utilised as the main path of upstream/downstream navigation.

Small vessels such as canoes, rowing boats and tenders transit through the mooring zones entering from the main channel either upstream or down-stream from the study area exiting back into the main channel or the Hamble Slipway. These vessels are less susceptible to the width restriction between the mooring zones as vessel beam is considerably less.

Tidal flow rates have been recorded at the study site by specialist ABPmer. At point 'A' referenced in figure 7.7 peak flow rates during the flood tide are 0.35m/s or 0.68 of a knot. At point 'B' across the river peak flow rates during the flood tide are 0.52m/s or 1.01 knots. Whilst flow rates are greater in the main channel the 0.33 knot difference is slight and would be almost undetectable for a vessel that was making headway downstream against the flood tide flow. In addition the difference in flow rates between point 'A' and the west side of the main channel (used by vessels heading downstream) are probably less than 0.33 of a knot as this point is only some 20m to the east of point 'A'. It is to be noted that peak flow rates further upstream in the main channel opposite the location of Hamble Yacht Services are recorded as being 0.9m/s or 1.75 knots. Vessels making passage downstream in the main navigation channel from this point are already exposed to tidal flow rates far greater than that experienced at points 'A' or 'B'.

The risk assessed with the activity of transiting through the midstream mooring facilities is rated as high based on historic evidence from both the RAFYC and RSrnYC members and our own likelihood and severity assessment.

Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	3	1	3	3
Risk Factor	6	2	6	6
ALARP in all relevant categories	NO			

7.7 Area H – Hamble Slipway entrance/Exit and Inspection Piles

This water area and facility is utilised by a range of different users, from:

- Personal water craft (i.e. kayak, canoe, inflatable dinghy etc.)
- Trailer boats/vessels capable of being launched on a tidal slipway
- Vessels utilising the inspection piles
- The facility is not widely utilised by members of RAFYC, Port Hamble Marina or RSnYC and therefore there is little evidence of activity from the slipway through the mooring zone to a berth or facility. It is to be noted however that vessels travelling upstream to the mooring zones within the study site or downstream from moorings within the study site, may pass through this water area across the path of vessels heading to or from the Hamble Slipway facility as illustrated in Figure 7.8.

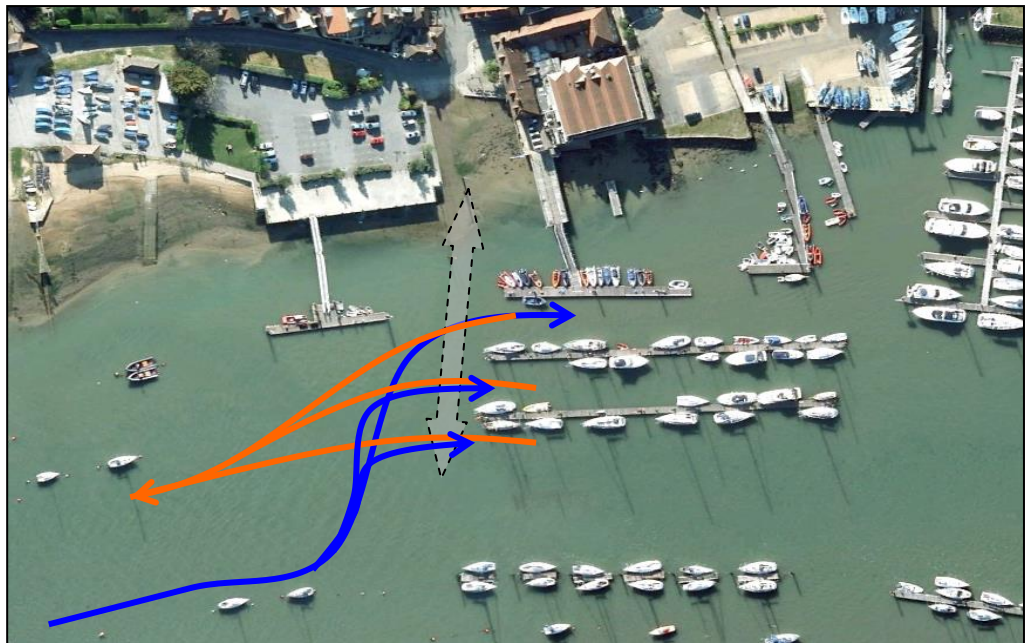


Figure 7.8 Cross flow activities to and from Hamble Slipway facility

Correspondence from the Department for Transport as part of the Coastal Protection Act consent for the installation of the temporary link pontoon has also been reviewed to understand the historic context of the proposed pontoon development. In response to an objection to the installation of the temporary 'link' pontoon at the RSnYC a letter to the Hamble Parish Council on 30th April 2004 from the then Harbour Master of the River Hamble stated the following:

“The Harbour Master gave the view that the use of the mooring channel as a passage upstream is undesirable due to the risk involved, namely the fast flowing tide and the lack of a clear line of sight. He states that it is difficult for larger vessels to see and avoid tenders in such a closed channel with a strong following tide. The Harbour Master advised that it would be safer for river users to navigate directly across the eastern side of the river from the Hamble jetty, and then to proceed upstream. Additionally, a further channel between piles C10 – C15 and C20 – C25 is available to river users outside the main channel. The Harbour Master referred to the channel as a mooring channel and approach, stating that he would not classify it as a secondary channel”.

The existing mooring structures have not altered since the review and Harbour Masters assessment noted above. The area is assessed as having medium risk rating.

Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	1
Severity (1 - 3)	2	1	2	1
Risk Factor	4	2	4	1
ALARP in all relevant categories	YES			

7.8 Area I – Hamble Jetty landing

The Hamble Jetty pontoon is used by a range of vessels from visiting overnight craft, through to year round tender berthing and water taxi facilities. There is a manoeuvring area of approximately 75m opposite the pontoon structures which enables vessels to enter and exit the berth from the main navigation channel with relative ease notwithstanding the tidal flow rates. This manoeuvring area is some 10m larger in diameter than the manoeuvring area found to the north of the study site and therefore represents the largest area from which to manoeuvre within the locality of the study site.

It is understood that there are plans to enhance the berthing facilities within this area, which are excluded from this review. This area is managed to ALARP and has a low risk rating.

Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	2	1	1	1
Risk Factor	4	2	2	2
ALARP in all relevant categories	YES			

8. ABPmer HYDRODYNAMIC & GEOMORPHOLOGICAL ASSESSMENT

A desk based study of the impacts and effects of the proposed dredge works has been carried out by ABPmer. The summary findings of the research are noted within this section.

Due to the small scale of the development works proposed the overall direct effects will be minimal and local to the development site. General changes to flow rates are considered marginal, albeit there is a shift of flow dynamics from the RAFYC Slipway to the RSnYC pier. The following summary statement is provided to highlight the pertinent findings of the desk study assessment:

The capital dredge works will have the effect of increasing the cross section of the estuary in front of the RSnYC and RAFYC (berths), thus leading to localised changes in tidal flows. Flows will be drawn into the new dredge pocket, in the same way that currently occurs to the north of the development site into Port Hamble Marina. The existing pattern of tidal flows into the Port Hamble Marina dredge pocket (both on the flood and ebb tide) creates an eddy in the very south west corner, adjacent to the RAFYC facilities. As a result of the works, tidal flows will be drawn in earlier on the flood tide (and extended for longer on the ebb) creating a smoothing of the tidal effects at this location. As a consequence the most noticeable effect of the works will be to remove or significantly reduce the current eddy and a create a new smaller eddy effect in the south west corner of the new dredge pocket in front of RSnYC. In addition, the flows in the area of the works will be more consistent and reliable than they currently are due to these localised hydrodynamic changes.

More specifically the impacts of the works are summarised as:

- The Maximum flow rate recorded at the south end of the inner mid-stream pontoon (Point A figure 7.7) over a Spring Ebb tide of 3.5m range is less than 0.4 metres per second or 0.77 knots.
- As a direct consequence of the capital dredge and the removal of the intertidal mud flat directly affronting the RSnYC, the cross-sectional area of the river is increased at this point. This increased cross-sectional area amounts to 114m².

- An existing eddy created by the flood and ebb tidal flow in the vicinity of the RAFYC slipway is removed or significantly reduced as a consequence of the capital dredge.
- An easterly flow stream from the RAFYC slipway to the main channel (over an ebb tide) is reduced as a result of the removal of the intertidal mud.
- Flow directions throughout the proposed development are more consistent and reliable as a consequence of the capital dredge.
- A small eddy will be created in the South west corner of the RSrnYC pier as the complex flow patterns seen at the RAFYC slipway will be reduced and transferred southwards as a consequence of the capital dredge.
- Minor alterations to flow rates around the proposed capital dredge in the areas of remaining intertidal (south of the scheme) will result as a consequence of the re-profiled bed levels.
- There will be no direct or indirect upon any designated areas, and any indirect impacts are considered to be insignificant as they may be undetectable.
- The sediment budget in the vicinity of the proposed works is likely to remain similar, with a shift of sediment away from Port Hamble Marina and the RAFYC to the RSrnYC due to the migration of eddies noted above.

Significantly the key findings of the study confirm that the eddy occurring in area C of the navigation risk assessment is reduced or potentially removed as a result of the proposed works. This area currently has the most intensive range of activities and vessel types in the most unpredictable water area. Furthermore many vessels utilising this area are unpowered and manoeuvring is therefore difficult. The easterly flow stream running broadside to the Port Hamble Marina moorings on an ebb flow is also reduced, which will directly ease of navigation within this area.

- A reduction and shift of the eddy from the RAFYC slipway to the RSrnYC south west corner, will be manageable as a consequence of the following factors:
 - Vessels within this area will all be powered and of a size to be able to counter the flows.
 - Vessels within this area will be long term berth holders who will have an appreciation of the inherent flows within their berths.
 - The area will not be utilised by visitors who may not appreciate the flows within this area

- The eddy will not affect users of the Hamble Slipway, inspection piles or jetty as the flow pattern does not extend further southward than the RSnYC pier.

9. RISK ASSESSMENT OF PROPOSED MOORING LAYOUT

9.1 Proposed Mooring Layout

Section 2 of the Yacht Harbour Association Code of Practice for the Design, Construction and Operation of Coastal and Inland Marinas and Yacht Harbours 2007 (the Code of Practice) suggests guidelines for channel widths, inner channel widths and fairway widths.

The recommendations within the Code of Practice have been compared against the proposed mooring layout and we can confirm that the proposal meets with the guidelines. In addition the scheme provides for a manoeuvring area of greater size than identified in the standards.

Risk Assessments have been carried out for the proposed scheme within the water areas identified in the existing layout, the findings are noted below along with a summary text on any improvements to ease or safety of navigation for the specific area.

side of the Channel will significantly improve safety of navigation within this area. This area is assessed as being medium risk and can be managed to ALARP.

Control Measure 1.	RSrnYC Bosuns are to be responsible for overseeing and managing the pontoons. Berth allocation, control and direction of vessel movements are to be carried out by means of VHF radio.			
Control Measure 2.	Dinghy events to include provision of safety boat escort.			
Control Measure 3.	Educational literature to berth holders and signage positioned at entrance pontoon indicating requirement to maintain safe speed, proceed with caution and to call up Bosun on VHF prior to entrance/departure from berth.			
Control Measure 4.	Bosuns are to monitor RAFYC and Port Hamble Marina VHF communications.			
Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	2	1	1	1
Risk Factor	4	2	2	2
ALARP in all relevant categories	YES			

9.3 Area B – Dedicated manoeuvring area

The dedicated manoeuvring area offers a far greater water area for vessel movements into and out of the moorings than currently exists. This increase represents over 65% more useable water area in which to manoeuvre. In particular this improves the access and egress from the eastern downstream Port Hamble A Pier, where predominantly larger vessels are berthed. The improved and more predictable tidal flows will also benefit navigation in this area.

Vessels should be restricted from rafting on the alongside pontoons within this zone to ensure that a minimum of 1.5 x the largest vessel length is maintained as a turning circle at all times. It is to be noted that all vessels entering and exiting the proposed configuration with the exception of the downstream and outer midstream berths, will pass through this water area. This includes powered, un-powered, motor, sail, tender, rib and dinghies. The dedicated, segregated and demarked mooring zones and navigation channels mitigate the potential risks associated with a single point of access.

This area is assessed as being medium risk and can be managed to ALARP.

Control Measure 1.	RAF YC to monitor and control allocation of hammerhead berth via VHF.			
Control Measure 2.	RSrnYC Bosuns to control allocation of alongside berths to ensure clear turning area is maintained at 35m.			
Control Measure 3.	Multiple sailing dinghies not to be released from launching and holding berths without safety boat assistance.			
Control Measure 4.	RSrnYC Bosuns to monitor VHF and control vessel movements.			
Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	2	1	2	2
Risk Factor	4	2	4	4
ALARP in all relevant categories	YES			

9.4 Area C – Shared fairway/inner channel

This shared access channel has the benefit of having a user group removed from it (RSrnYC static crane users). With this user group removed the water area is utilised only by RAFYC and Port Hamble berth holders, making safe management of the water area more achievable. The full tidal access within this area also increases the manoeuvring areas for the existing Port Hamble berth holders and increases the access window and therefore reduces peak vessel activity and the associated risk.

The pinch point within this mooring area is increased from 20m to 22m increasing the useable water area in which to navigate.

Dedicated finger berths within this zone running parallel with the tidal flows will also ease manoeuvring in this area. Vessels moored alongside the main walkway pontoon in an east west orientation will need to ensure safe navigation across the direction of the tidal flow to and from the berth. Flow rates within the proposed layout are reduced and regularised which it is acknowledged will assist ease of navigation.

The eddy that currently forms within the area adjacent to the RAFYC slipway is reduced and potentially removed as a consequence of the dredging works; in addition the easterly tidal flow that runs from the RAFYC slipway towards the main channel is again reduced or removed. The reduction or potential removal of these un-predictable tidal flows is assessed as a significant benefit of the scheme for vessels within this area. The more consistent tidal flows throughout the tidal range make use of this water area more predictable.

This area is assessed as low risk and can be managed to ALARP.

Control Measure 1.	RAFYC to ensure vessel allocation does not exceed designed limits on all upstream pontoons.			
Control Measure 2.	RAFYC to monitor RSrnYC and Port Hamble VHF channels.			
Control Measure 3.	Vessels utilising RAFYC Slipway and Inspection piles to call up RAFYC on VHF prior to entry/departure.			
Control Measure 4.	Educational literature to berth holders and signage positioned at entrance pontoon indicating requirement to maintain safe speed, proceed with caution and to call up RAFYC on VHF prior to entrance/departure from berth.			
Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	1	1	1	1
Risk Factor	2	2	2	2
ALARP in all relevant categories	YES			

9.5 Area D – Hammer head berth

The Hammerhead berth is located within an inner channel of approximately 22m in width, reducing to some 15m when vessels are berthed on either side, which complies with industry standards for vessels of up to 10m L.O.A. With clear separation of activities within the adjacent water areas the allocation of water area uses, improved tidal flows and access window reduce the activity based risks within the area. This water area is assessed as being low risk and can be managed to ALARP.

Control Measure 1.	RSrnYC Bosuns to control allocation of alongside and hammerhead berths to ensure clear manoeuvring areas are maintained.			
Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	1	1	1	1
Risk Factor	2	2	2	2
ALARP in all relevant categories	YES			

9.6 Area E – Inner finger berths

These moorings are designed to be utilised by the club members rather than visiting vessels with less experience of the tidal flows associated with the river, and this will enable the club to manage the risks associated with navigation within this area. The revised layout will be in line with the tidal flow albeit there will be a small tidal eddy in the south west corner of the mooring area as a result of the dredging works. This local flow will be managed by the club and powered vessels will be allocated to berths that this flow will affect. The reduced velocity and more predictable tidal flow along with the compliance to the design codes mitigates the risks associated with navigation within the confines of the proposed layout. Relatively strong tidal flows will remain a feature of this area as they are in many similar berthing facilities on the River Hamble and as such the user's consideration of the prevailing tidal conditions will remain a feature of managing the risk.

This area is assessed as being medium risk and control measured will be required to manage activity based risk associated with the use of this water area which can be managed to ALARP.

Control Measure 1.	Vessels entering/departing the pontoons are to call up the Bosun on VHF prior to vessel movements.
Control Measure 2.	RSrnYC Bosun to allocate appropriate vessels to finger pontoons dependant on tidal conditions.
Control Measure 3.	Bosuns to advise visitors of any local tidal flow conditions prior to entry /departure from the pontoons.
Control Measure 4.	During difficult conditions (wind/tide) Bosun to provide berthing assistance.

Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	2	2	1	1
Risk Factor	4	4	2	2
ALARP in all relevant categories	YES			

9.7 Area F - Inner channel

This channel will need to be regulated in terms of vessels rafting to allow clear unimpeded access to vessels berthed within zone E. Our assessment assumes 1 No. vessel alongside the north south orientated alongside pontoon, if this is increased, navigation to the berths within zone E will be compromised.

During club events, rallies and regattas, vessels may be rafted 2 abreast, however careful management and berth allocation will be required along with dock side assistance. Only with the above measures in place should vessels be rafted within this zone.

This area is low risk in everyday situations and can also be managed during peak event periods to ensure it remains ALARP.

Control Measure 1.	Vessels entering/departing the pontoons are to call up the Bosun on VHF prior to vessel movements.			
Control Measure 2.	RSrnYC Bosun to allocate appropriate vessels to finger pontoons dependant on tidal conditions.			
Control Measure 3.	Bosuns to advise visitors of any local tidal flow conditions prior to entry /departure from the pontoons.			
Control Measure 4.	During difficult conditions (wind/tide) Bosun to provide berthing assistance.			
Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	1	2	2
Severity (1 - 3)	1	2	1	1
Risk Factor	2	2	2	2
ALARP in all relevant categories	YES			

9.8 Area G – Outer moorings

It is understood that the outer moorings will be utilised by visiting and non-member vessels. This measure will reduce the risks associated with navigation within the proposed layout by ensuring users that are not familiar with the local conditions are berthing in the zone with reduced tidal influence. Furthermore the access and manoeuvring areas exceed TYHA standards and the berths run in line with the tidal flows.

Vessels will be able to utilise the most easterly moorings during the full tidal cycle, approaching the mooring from upstream during the flood cycle and downstream during the ebb cycle. There is a single point of entry/exit from the 8 No. moorings located within the area marked 'G', with 21m clear width and a 44m wide channel it is assessed that this number of vessels does not present a significant risk to vessels transiting up and down stream. The area and activities are assessed as being low risk.

Control Measure 1.	Bosun to allocate berths via VHF prior to vessel arrival.			
Control Measure 2.	Bosun to advise visiting vessels of berthing conditions (tidal flow etc) prior to vessel entry.			
Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	1	1	1	1
Risk Factor	2	2	2	2
ALARP in all relevant categories	YES			

9.9 Area H – Hamble Slipway entrance/Exit and Inspection Piles

The installation of a dedicated tender pontoon at the south east end of the existing pier structure protrudes some 10m south of the current configuration. However this pontoon is not located in an area that is useable slipway due to heavy siltation of soft mud. In addition the pontoon structure protrudes no further south than the existing walk ashore pontoon.

Vessels utilising the slipway and inspection piles to or from a downstream position will not be unduly affected by the proposal and therefore the risks associated with the scheme are comparable with existing and are considered acceptable.

Vessels wishing to navigate to the slipway from upstream or from the slipway upstream will not have the ability to navigate between the mid-stream mooring pontoons, thus avoiding associated risks.

Vessels transiting downstream will remain in the main channel and will turn towards the slipway as soon as they are clear of the southerly pontoons. Or vessels transiting downstream on the inside of the eastern channel will cross the main channel opposite the slipway. It is not considered that either of the proposed routes for small craft will create any increased risk for users or vessels.

Vessels leaving the slipway and heading upstream should follow the Harbour Masters directions and will navigate across the main channel within the 75m clear water area and therefore will join the main channel directly opposite the slipway structure or filter into the eastern side of the main channel for smaller vessels. It is notable that the channel at this point of the River is nearly at its widest. Currently vessels making passage upstream from the slipway enter the main channel either opposite the slipway or opposite Port Hamble Marina depending on their chosen route, significantly they must enter the main channel at some point and to that end, we do not assess that any risks are increased as a result of the proposed pontoon configuration. The removal of unpowered vessels entering the main channel opposite the Port Hamble Marina Fuel Berth is assessed as a benefit arising from the scheme.

Under the proposals the number of vessels berthed on the south side of the proposed pontoon layout are fixed and the ability for multiple vessels to navigate between the mid-stream pontoons and enter or exit the moorings opposite the Hamble slipway is removed. The number and impact of vessels crossing the path of the Hamble slipway facility is therefore reduced as a consequence of the scheme. This is assessed as being of benefit to Hamble Slipway and Inspection pile users.

It is assessed that all vessels being required to utilise the main channel opposite the Royal Southern Yacht Club ensures consistency of navigation with reduced

potential for conflict of vessel movements within the existing mid-stream mooring zones. This is assessed as being low risk.

Control Measure 1.	Signage to be introduced at the head of the slipway communicating use of lifejackets and upstream passage routes.			
Risk categories identified	Person	Environment	Asset	Reputation
Frequency (1-4)	2	2	2	2
Severity (1 - 3)	1	1	1	1
Risk Factor	2	2	2	2
ALARP in all relevant categories	YES			

9.10 Area I – Hamble Jetty landing

The proposal does not adversely affect the Hamble Jetty pontoon activities as the safe manoeuvring areas around the facility are un-altered. In addition berth numbers and therefore vessel numbers are limited within this area, therefore vessel numbers manoeuvring will be more consistent. The area remains low risk.

9.11 Crane berth and floating slipway

The re-positioning of the static crane and the proposed floating slipway are located some 10m apart. As the slipway is to be utilised for non-powered vessels a holding berth will be utilised that in turn has a proximity to the crane berth of 5 metres. A safe system of work is to be employed to ensure that: A) Crane operations and slipway operations are not run concurrently and that B) a physical barrier is installed to the south east of the crane pontoon to ensure that vessels cannot navigate within the radius of the static crane C) The crane is only operated by certified personnel with a dedicated banksman.

The clear separation of activities within this water area is viewed as being a benefit of the scheme.

10. CONCLUSIONS

The proposed pontoon configuration as outlined in drawing number MP189-106, associated activities and risks are assessed as being capable of being managed to ALARP without exception.

When the proposed risks are assessed against the existing risks, there are improvements to ease of navigation and safety of navigation. Figure 10.1 summarises the existing and proposed activity based risks.

Area	Existing Configuration	Proposed Configuration	Summary of Reasons for Change
A	Very High Risk	Medium Risk	Reduced number of users entering area A. Vessels navigating upstream directed to appropriate side of main channel.
B	Medium Risk	Medium Risk	Increased & Improved manoeuvring area by 60%, reduction of vessel numbers and improved tidal flows.
C	Medium Risk	Low Risk	Removal of user group (Crane launched vessels), Separation of club activities, increased tidal access, improved tidal flows
D	Medium Risk	Low Risk	Separation of club activities and reduction of vessel numbers.
E	Low Risk	Medium Risk	Increased provision of moorings, launched vessels and increased flows (affects pontoon berths only)
F	High Risk	Low Risk	Removal of vessels navigating in narrow mooring area
G	High Risk	Low Risk	Removal of vessels navigating in narrow mooring area
H	Medium Risk	Low Risk	Reduction of vessel numbers crossing routes of navigation to and from the slipway.
I	Low Risk	Low Risk	Reduction of vessel numbers crossing routes of navigation to and from the slipway.

Figure 10.1 Risk Assessment Summary

In summary the removal of the intertidal mudflat resulting in reduced tidal flow, more consistent and predictable flow directions and the linear berthing orientation creates a more predictable environment in which to navigate vessels.

The pontoon layout complies with industry standards and allows greater manoeuvring areas than are currently in place. User groups are physically separated within the confines of the scheme and the risks associated with vessels navigating through the narrow existing mid-stream mooring zones is removed.

A single area of the scheme presents an increased level of risk albeit ALARP. Area E currently has infrequent use due to the physical make-up of the area being intertidal and without the provision of mooring facilities. The proposed scheme introduces increased activity within this area as a function of the capital dredge and associated pontoon installation, and increased launching facilities. In addition the ABPmer report confirms that tidal flows within this isolated area will imitate the flows currently observed at the foot of the RAFYC slipway. Due to the above factors activity based risk is increased, however the risk can be managed.

Navigation aids are to be incorporated into the design to include:

- 2 No. Navigation lights (2FR vert) are to be positioned on the outer pontoon structures upstream and downstream
- Outer pontoon piles are to be painted with a 2m band of high visibility red paint
- Pontoon structures to be illuminated with low level lighting
- Clear signage to be installed on the hammerhead berths of RSrnYC and RAFYC pontoons to advise of VHF channel to contact relevant mooring controller.

Safe systems of work are required to manage the static crane and floating slipway activities and are to be reviewed annually. Due to the tidal flows experienced on the River Hamble at times, berthing in some areas will continue to be quite challenging and clear communication to visiting yachts will continue to be an important measure in managing risks if injuries are to be avoided. All associated activities within the proposed facility should be re-assessed on an annual basis. It is these risk assessments that will inform what precautions and measures should be in place/put into place to ensure the risks remain ALARP.

It is accepted that there may be times when vessels using the facilities will make unintended contact with other vessels or structures in which case efficient use of fenders should be used to provide protection from slight harm.

A reasonable reliance will continue to be placed on all skippers having some nautical experience and competent control of their vessel. It must also be recognised that at certain times skippers will continue to await more favourable conditions before entering or leaving the facilities, particularly in consideration of tidal flows. This has long been a feature of moorings on the River Hamble.

11. APPENDICES

Appendix 1. – MP189 – 106 (Equivalent Drawing No. MP189-203)

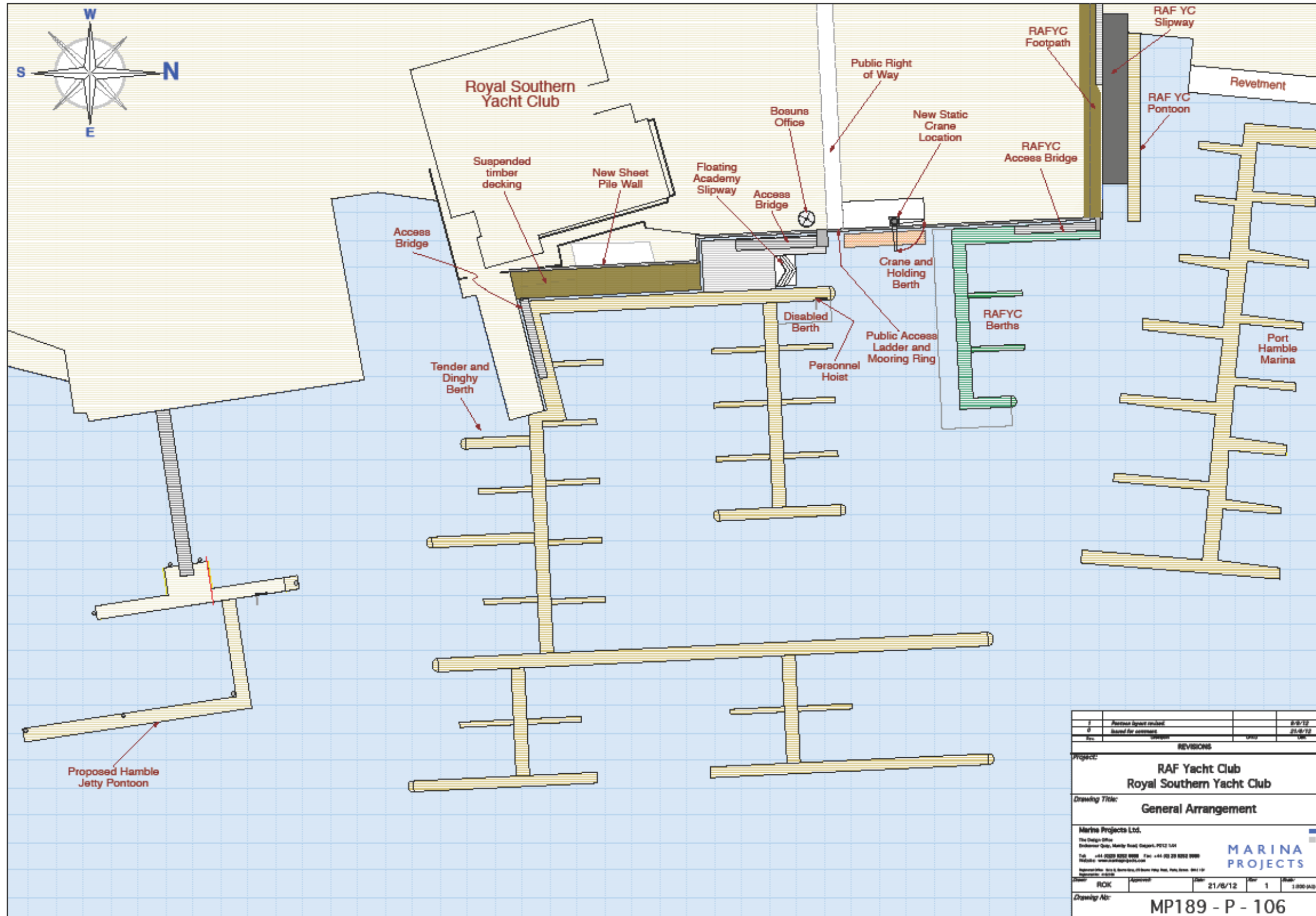
Appendix 2. – MP189 – 106.1 (Equivalent Drawing No. MP189-203.1)

Appendix 3. – Annotated Aerial Photograph

Appendix 4. – RHHA and Trinity House Correspondence, December 1999.

Appendix 5. – Drawing Reference Addendum

Appendix 1. – MP189 – 106



Rev	Description	Date
1	Access layout revised	8/8/12
0	Issued for comment	21/6/12
Rev	Design	Drawn

REVISIONS

Project:
**RAF Yacht Club
Royal Southern Yacht Club**

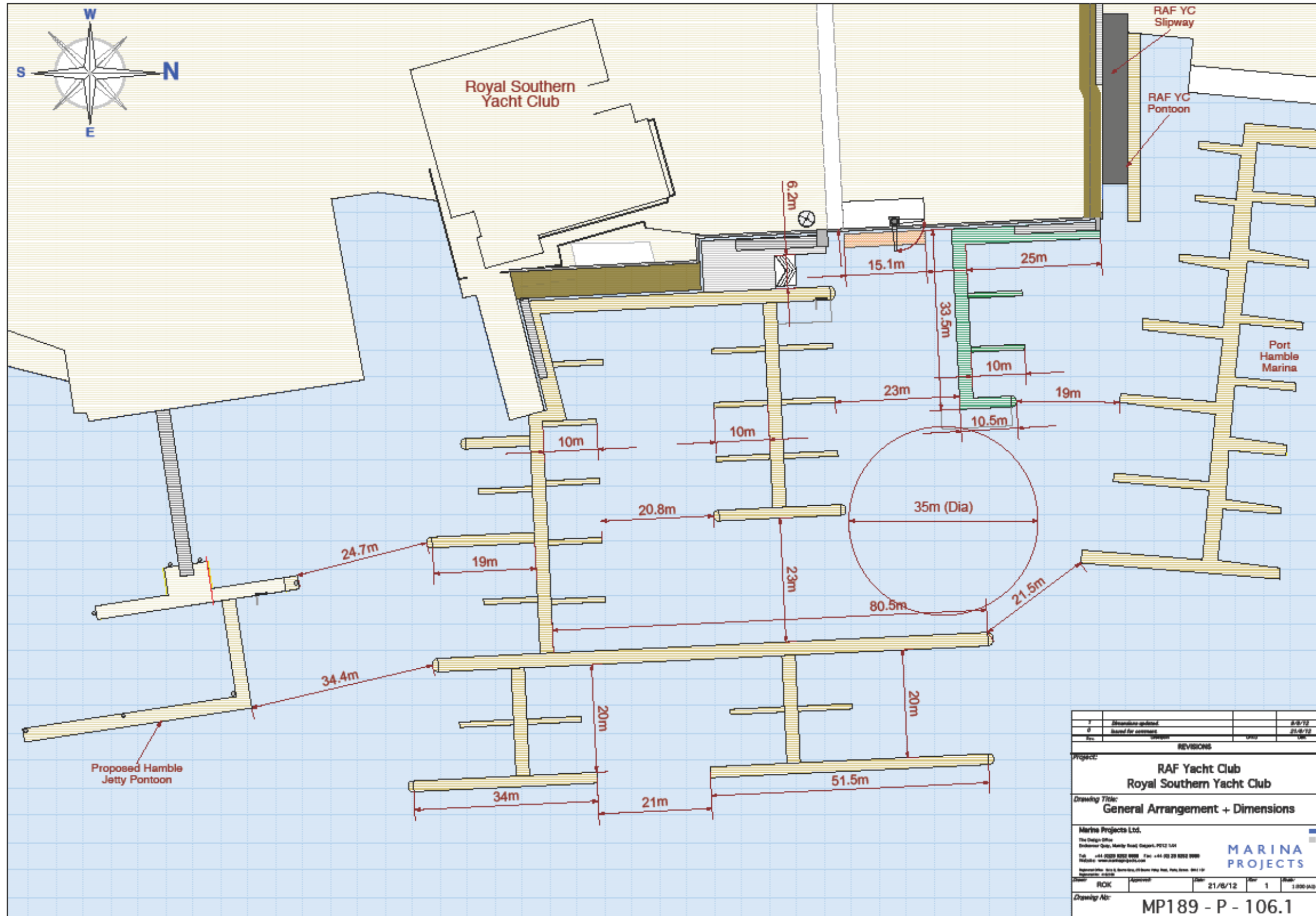
Drawing Title:
General Arrangement

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Registered in England

Scale: ROK Approved Date: 21/6/12 No: 1 Size: 1:1000 A3

Drawing No: **MP189 - P - 106**

Appendix 2. – MP189 – 106.1



Appendix 3. – Annotated Aerial Photograph



Appendix 4. – RHHA and Trinity House Correspondence, December 1999.

11th December 1999

Captain Glass
Director of Navigation Requirements
Trinity House Lighthouse Service
Tower Hill
London
EC3N 4DH

Dear Sir

Re:- Roval Southern Yacht Club Pontoon

S.End - Code 02111 Sequence No: 002500

N.End - Code 02110 Sequence No: 002550

In recent years, two continuous mooring pontoons have been secured to piles offshore of the Royal Southern Yacht Club pontoon and inshore of the navigation channel downstream from the MDL - Port Hamble.

These moorings are unfit at this time.

It is proposed to extinguish the lights reference above and to establish two (2) new lights, (Flash.Red.4 seconds) at either end of the offshore pontoon on piles C/D and C15 as indicated on the drawing attached.

I would be grateful of your approval for this proposal as per section 78 of the Harbour Docks and Piers Clauses Act 1847.

Yours faithfully

Captain R B Exley
Harbour Master



Trinity House Lighthouse Service

Serving the Mariner

From: NAVIGATION	To: HAMPSHIRE
Date: 20/12/99 11:10	
Pages including this one: 0002	Fax No: 01489576387
TAGfax Post ID: 00000865	

DeskID : 451996180
 Sender : NAVIGATION
 Subject : Royal Southern Yacht Club

From Node: LONDONST

Our ref : LL/SAN/AD/99
 Your ref:

The Harbour Master,
 Hampshire County Council,
 Harbour Masters Office,
 Shore Road,
 Warsash,
 HAMPSHIRE

Dear Sir,

ROYAL SOUTHERN YACHT CLUB

With reference to your letter dated 11 December, 1999, concerning the above, the sanction of the Corporation of Trinity House under section 76 of the Harbours Docks and Piers Clauses Act, 1847, is hereby conveyed to Hampshire County Council to discontinue the 2 x 2 FR lights, on the S.End and N.End of the Royal Southern Yacht Club Pontoon, and to the establishment in lieu of:-

Fl.R. 4s at either end of the new offshore pontoon on piles C10 and C15.

Please arrange to forward three copies of any local Notice to Mariners issued in connection therewith.

Director of Navigational Requirements
 Trinity House Lighthouse Service, Tower Hill, London, EC3N 4DH



Appendix 5. – Drawing Reference Addendum

ADDENDUM

8TH FEBRUARY 2013

The evolution of the project design over the past 12 months has taken into consideration a number of influential factors that have been the subject of continued research. This iterative design process has resulted in the final scheme layout (MP189-203).

A key aspect of the design process has been to incorporate the findings of a Navigational Risk Assessment that first ascertains existing risk areas before attempting to remove or mitigate any such identified risk through considered design. An earlier layout was used to inform an assessment of Hydrodynamic and Geomorphological effects of the existing and proposed schemes (by ABPmer). To that end a layout that had already been the subject of extensive consultation and refinement was used to ensure a meaningful assessment could be made. The layout that forms the basis of the ABPmer report and the Navigation Risk Assessment is referenced as (MP189-106).

In order to ensure consistency of reference material, the Navigation Risk Assessment continues to refer to the original layout drawing. There have been no layout changes that have a negative impact upon the findings of either report, not least as the changes all represent improved ease of Navigation.

For clarity the key changes made to the original plan (MP189-106) consist of the following:

- Increase the main entrance channel from 21.5m to 26m
- Re-locate the RAFYC pontoons in their entirety south to increase the minimum dimension between Port Hamble berths and the RAFYC berths to 22m
- Reconfigure the RAFYC pontoons in order that the Hammerhead berth is located 2.5m to the west

Without exception, the changes made and reflected on Drawing MP189-203 improve ease of Navigation. The findings of the Navigational Risk Assessment therefore apply to the application drawings of which MP189-203 forms the main basis for the scheme.
