

NAVIGATION IMPACT ASSESSMENT

PROPOSED CRUISE BERTH FACILITY

at Dun Laoghaire Harbour

For Dun Laoghaire Harbour Company

Prepared By



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1 Introduction

1.1 Purpose of this Report

Dun Laoghaire Harbour Company's (DLHC) vision for Dun Laoghaire Harbour is "*to be recognized internationally as an exciting waterfront, marine and tourist destination*". It is currently implementing a major regeneration masterplan to utilise the 200 year old heritage environment to achieve this vision and also to establish closer integration with Dun Laoghaire town centre.

As an element of Dun Laoghaire Harbour Company's major regeneration masterplan, DLHC seeks planning permission for a cruise berth facility within the harbour and associated dredging to allow next generation cruise ships to enter the harbour. Landside works are also proposed. Full details of the proposed development are set out in the plans and particulars submitted as part of the planning application.

This report assesses the navigation risk posed to marine activities within Dun Laoghaire Harbour as a result of the proposed development, during both the construction and operational phase. Existing and proposed mitigation measures to reduce / eliminate this navigation risk are also examined. This report should be read in conjunction with Chapter 5.1.3 of the accompanying EIS.

1.2 Assessment of Navigation Impact

This assessment has been carried out by Stephen Little & Associates with input from Consulting Engineers, Waterman Moylan and with expert input from maritime specialists from Dun Laoghaire Harbour Company (DLHC), including:

Captain Simon Coate is a Master Mariner and Harbour Master in Dun Laoghaire. Captain Coate spent 29 years at sea in the Merchant Navy, with the marine oil exploration industry and then with Commissioners of Irish Lights. He joined Dun Laoghaire Harbour Company in 1991 and was appointed Port Operations Manager in 2000 with responsibility for security and all port related commercial activities. He was appointed Harbour Master of Dun Laoghaire in 2009.

Tim Ryan is operations manager with Dun Laoghaire Harbour Company. He was previously Aids to Navigation Inspector with the Commissioner of Irish Lights. Mr. Ryan is a chartered engineer and a chartered Environmentalist with considerable experience in marine navigation risk assessments throughout the island of Ireland. Mr. Ryan has been consulted and has advised on many port, harbour, renewable energy and marine agriculture developments during his time as Inspector at CIL.

Captain Philip Cowman had been Harbourmaster of the Port of Waterford for 16 years prior to his retirement in November 2009. He was fully involved in the construction of new port facilities. Waterford Port was successful in attracting the importation, storage and onward shipment of WFGs in recent years. Philip was a Director of Cruise Ireland since its inception in 1994, representing the Port of Waterford. Philip established tender landing facilities in Dunmore East which successfully handled tendering from the largest cruise vessels calling to Ireland. Since retirement, Philip has provided cruise industry consultation, covering port marketing, berth development and pontoon landing facilities, to the Port of Waterford, Dun Laoghaire Harbour, Failte Ireland and Celtic Wave, (Celtic Wave is an Intereg. 1V Cruise Marketing Initiative in the Irish Sea). Prior to joining the port, he was a Captain and Operations/Ports Manager in the Irish Continental Group, operating major ferries between Ireland, United Kingdom and North West France.

1.3 Marine Activity in Dun Laoghaire Harbour

Dun Laoghaire Harbour is used for both leisure and commercial activities. The following port users can be found in Dun Laoghaire Harbour (see also www.dlharbour.ie):

- **Ferry service**

There is currently no ferry service in operation from Dun Laoghaire Harbour. Stena line ceased operating a seasonal service to Holyhead with its HSS catamaran in 2014. DLHC is actively seeking an alternative seasonal ferry service provider to operate from either Berth 3 or Berth 4 within the harbour.

- **Royal National Lifeboat Institution (RNLI)**

The RNLI have a life boat station, office and shop premises located between the Carlisle Pier and the East Pier. A 14-metre Trent Class Lifeboat named 'RNLB Anna Livia', is moored adjacent to the base of the Carlisle Pier. The RNLI also utilise a boat house and slipway at the foot of the East Pier for the inshore lifeboat.

- **Irish Coast Guard (IRCG)**

The IRCG has a local unit which covers the Dublin Bay area from Howth to Bray. The IRCG have an office, incident support base and training centre located within the BIM building on Crofton Road in Dun Laoghaire. IRCG staff are based in the harbour and conduct regular training exercises between emergency calls.

- **Commissioner of Irish Lights (CIL)**

CIL have their head office and maintenance depot in Dun Laoghaire Harbour.

- **Naval service**

The naval service is a regular user of Dun Laoghaire Harbour. Ships berth at Nos 2 & 3 on Carlisle Pier or No 4 St Michael's Pier.

- **Marine Activity Centre**

Based on the West Pier, there are at present three organisations operating from this building – the Dun Laoghaire Vocational Educational Committee, the Irish National Sailing School and the Irish Youth Sailing Club (The two latter organisations being Irish Sailing Association recognised teaching establishments).

- **8ú Calafort, Cuan Dun Laoghaire, Gasóga Mara** (8th Port of Dublin, Dun Laoghaire Harbour, Sea Scouts Group):

The Sea Scouts meet in the Sea Scouts Den on the West Pier.

- **Rowing and diving clubs** have their base in the public boatyard in the coal harbour. Diving clubs have no base in Dun Laoghaire Harbour, only moorings.

- **Public Boatyard and slipway**

The public boatyard is an area for the public to store their boats (dinghies mostly) and use the slipway for launching them.

- **Fishermen**

There are a number of fishing vessels operating from Traders Wharf.

- **Dun Laoghaire Marina**

Opened in 2001, the Dun Laoghaire Marina has grown in success and now has capacity for 820 boats. The marina can be accessed 24 hours a day by boats of up to 4m draft. The marina has berths to suit boats from 6m to 30m in length with a maximum displacement weight of 80 tonnes.

- **Yacht clubs**

9 yacht clubs have their base in Dun Laoghaire Harbour:

1. The National Yacht Club (NYC)
2. The Royal St George Yacht club (RstGYC)
3. The Royal Irish Yacht Club (RIYC)
4. The Dun Laoghaire Motor Yacht Club (DMYC)
5. The Dublin Bay Sailing Club (DBSC)
6. The Royal Alfred Yacht Club (RAYC)
7. Irish National Sailing Club (INSC)
8. Irish Youth Sailing Club (IYSC)
9. Sailing in Dublin (SID)

The clubs DBSC and RAYC are virtual clubs and do not have premises.

Collectively, Dun Laoghaire's waterfront clubs have in the order of 5,000 members, who in turn own approximately 700 keelboats and 1,000 dinghies. Generally keelboats are stored and moored in the water and dinghies are stored on shore. With the development of the Dun Laoghaire Marina since 2001, sailing has become a year round activity. Racing can involve up to 400 boats. Dinghy racing takes place typically within Seapoint and Scotsman's Bay (to the west and east of the harbour). On occasion, dinghy racing takes place inside the harbour by permission.

- **Sail training vessels** visit the harbour occasionally.
- **Freight vessels** visit the harbour occasionally.
- **Dublin Bay Cruises** operate the St. Bridget in Dublin Bay and offer cruises in and around the Bay including trips to Dublin City, Dun Laoghaire, Howth and Dalkey Island. The St. Bridget sails from Berth 1 in Dun Laoghaire Harbour. The cruises cater for up to approximately 120 people.

1.4 Consultation

Pre-application consultation meetings were held a number of harbour users / stakeholders including:

- Dun Laoghaire Harbour Master
- St Michael's Rowing Club
- Sea Scouts
- Irish National Sailing School
- Dun Laoghaire Motor Yacht Club
- Royal National Lifeboat Institution (RNLI)
- Coal Harbour Users Group
- Marina Company
- Commissioners of Irish Lights
- National Yacht Club
- Dublin Bay Sailing Club
- Royal Saint George Yacht Club
- Royal Irish Yacht Club

- The Water Wags
- Dun Laoghaire Business Improvement District (BID) Company

These meetings provided valuable information that has informed this Navigation Impact Assessment and the wider planning application.

2 Existing Information

2.1 Introduction

The proposed cruise berth facility will extend in a perpendicular fashion from the base of the eastern breakwater into the centre of the harbour with an associated channel and turning circle also being dredged to allow larger cruise ships enter the harbour and dock at the proposed cruise berth.

As shown in Figure 2.1 and 2.2 below, the proposed cruise berth is located in the centre of the harbour and has the potential to impact and a number of marine activities. The navigation risk assessment has been carried out for the central harbour area in order to identify and mitigate any potential impact on the users of Dun Laoghaire Harbour.

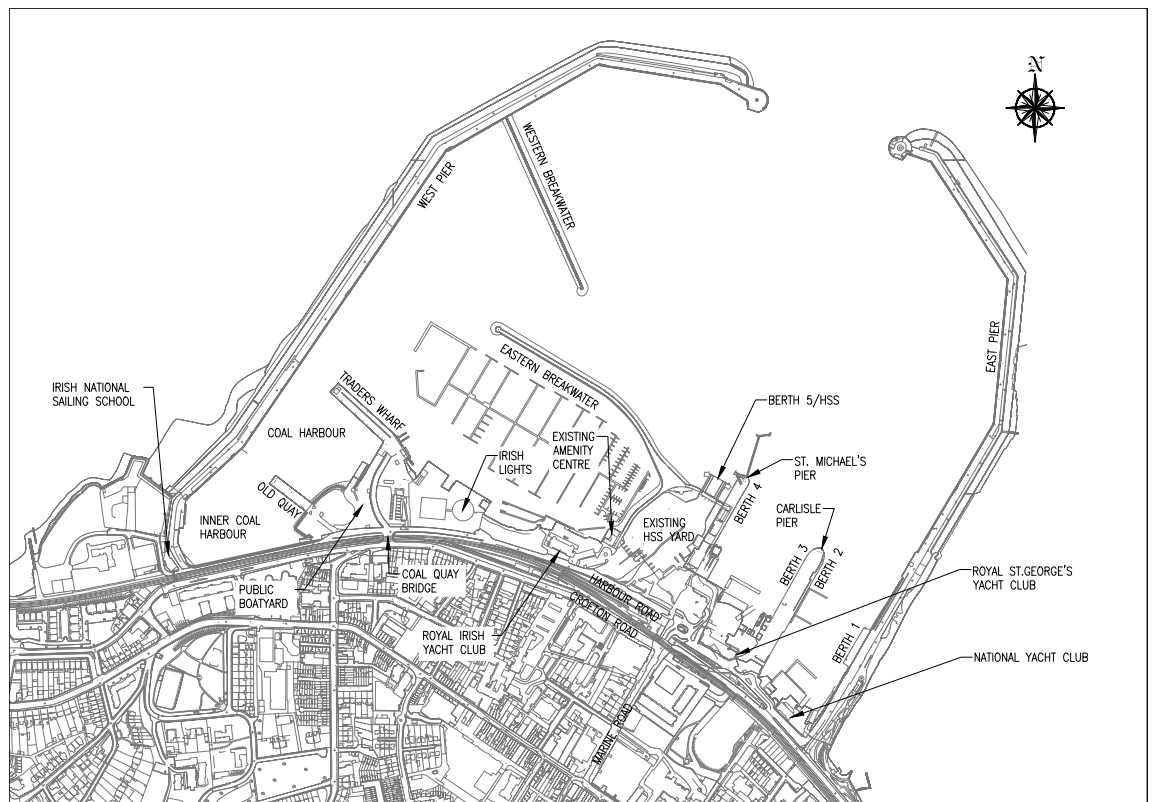


Figure 2.1: Existing harbour with harbour users identified

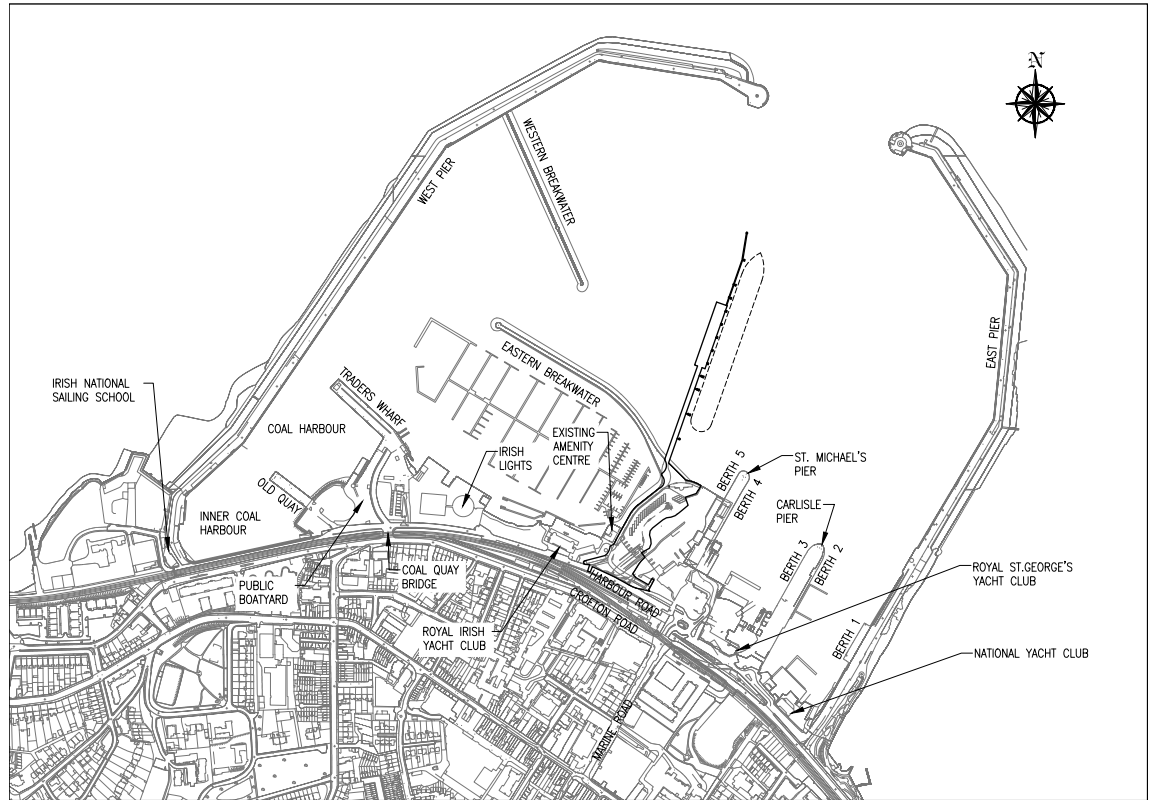


Figure 2.2: Proposed development with harbour users identified

The following sections look at each activity within the harbour; the navigation risks posed; and existing / proposed measures to mitigate such risk.

This assessment should be read in conjunction with Section 5.1.3 of the accompanying EIS.

From the outset, it is worth noting that racing within the harbour is only allowed by permission.

2.2 Ferry Service

There is currently no ferry service in operation from Dun Laoghaire Harbour. Stena Line ceased operating a seasonal service to Holyhead with its HSS catamaran in 2014. DLHC is actively seeking an alternative seasonal ferry service provider to operate from either Berth 3 or Berth 4 within the harbour.



Photo: Peter Barrow 21st August 2006. Tel: 0872-559638

Figure 2.3: Stena Line berthed in Dun Laoghaire Harbour

2.3 Commissioner of Irish Lights

The Commissioners of Irish Lights (CIL) is the General Lighthouse Authority for the island of Ireland (ROI and NI) responsible for the provision, maintenance and management of all physical/electronic aids to navigation (AtoN) and marking/removal of wrecks posing a danger to marine navigation. CIL is also responsible for the superintendence and management, including statutory sanction, of local AtoN provided by ports, local authorities and other bodies. The CIL coastal marine infrastructure (over 250 mainland and off-shore locations) provides the platform for AtoN monitoring, traffic analysis, MetOcean/environmental, commercial and lighthouse tourism services. CIL's mission statement is "*To promote and deliver services for the safety and protection of persons, infrastructure and interests at sea in a modern context*" and to ensure Ireland meets its obligations under the SOLAS Convention and supports the trade and tourism sectors.



Figure 2.4: Commissioner of Irish Lights



Figure 2.5: Granuaile alongside Carlisle Pier

2.4 Naval Service

Dun Laoghaire Harbour is used regularly by Ireland's naval service. The service plays a vital role of fishery protection and their vessels are occasionally seen tied up on the Carlisle Pier or St. Michaels Pier.



Figure 2.6: Naval Services Vessel (LE Aoife) moored at Berth 1

2.5 Marine Activity Centre

The Irish Nautical College and Training School was based in this building at the root of the West Pier from 1951 to 1975. Subsequently BIM leased the building until 1986 as a training centre for members of the service. In keeping with this tradition, Roinn na Mara opened the premises as a Marine Activity Centre in June 1989 to provide a facility for training in sailing and other water sports, safety training courses and lectures on marine matters. There are at present three organisations – the Dun Laoghaire Vocational Educational Committee, the Irish National Sailing School and the Irish Youth Sailing Club – operating from the Centre (The two latter organisations being Irish Sailing Association recognised teaching establishments).



Figure 2.7: Marine Activity Centre

2.6 8ú Calafort, Cuan Dun Laoghaire, Gasoga Mara

This group is identified as 8ú Calafort, Cuan Dun Laoghaire, Gasóga Mara (8th Port of Dublin, Dun Laoghaire Harbour, Sea Scouts Group and also by the national identity of 39th Dublin, Sea Scout Group). Sea Scout groups traditionally use the Sea Scouting identity rather than the national identity. This group meet in the Sea Scout Den on the West Pier in Dun Laoghaire, opposite the DMYC.

In 8ú Calafort members receive an excellent grounding in seamanship in addition to the other outdoor skills and sporting activities normally associated with scouting such as hillwalking and camping.

In addition to being a Sea Scout Group, the group was also founded as an Irish speaking group. Although the group has not managed to maintain the original aim of being fully Irish speaking, the use of the Irish language is actively encouraged. The group continue to use the language where possible e.g. for boating orders.

8ú Calafort operate 2 Sea Cub 'Packs', 2 Sea Scout 'Troops' and 1 Venture Scout 'Unit'.

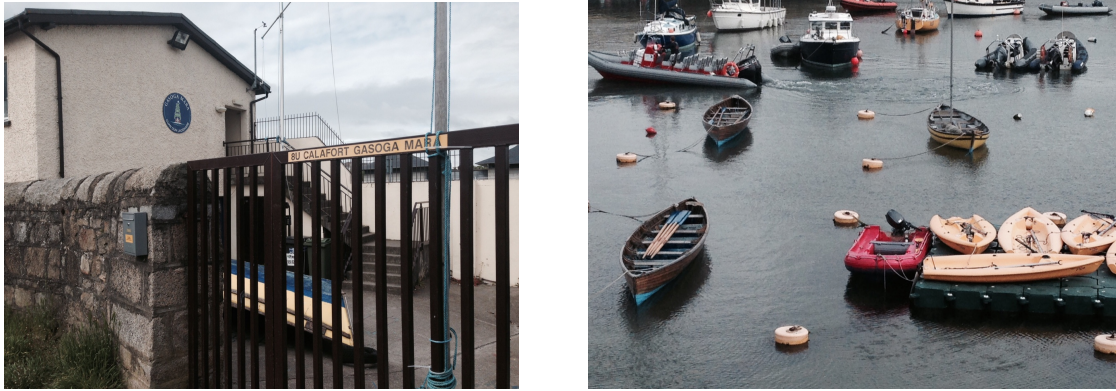


Figure 2.8: 8ú Calafort, Cuan Dun Laoghaire, Gasoga Mara – Clubhouse and Boats

2.7 Rowing and Diving Clubs

Rowing

St. Michael's Rowing Club was founded in Dun Laoghaire Harbour in the early 1920's and is based in the Coal Harbour. Today, the club consists of over 100 members from complete beginners to experienced rowers, and with all abilities and backgrounds. The club practice coastal rowing in traditional skiffs, unique to this part of the world.



Figure 2.9: Rowing in Dun Laoghaire Harbour

Diving

A number of Sub Aqua Clubs (SACs) use moorings in the Coal Harbour but only operate outside the harbour.



Figure 2.10: Diving RIB's in Dun Laoghaire Harbour

2.8 Public Boatyard and Slipway

A boatyard is provided in the Coal Harbour for members of the public who do not have access to yacht clubs or storage facilities. The two public slipways provide popular access to the water and are a hive of activity in the summer months. The Dun Laoghaire Harbour Company facilitates interaction and meetings with representatives of user groups of the public boatyard under the heading of 'The Coal Harbour's User Group' (CHUG).



Figure 2.11: Slipway, Dun Laoghaire Harbour

2.9 Fishermen

There are a number of fishing vessels operating from Traders' Wharf (mainly whelk fishermen). Shore fishing is also available from the harbour's east and west piers.



Figure 2.12: Fishing Boats at Traders Wharf Dun Laoghaire Harbour

2.10 Dun Laoghaire Marina

Dun Laoghaire Marina opened on St Patrick's Day, 2001. Since then, the marina has grown in success and now has capacity for 820 boats. The marina can be accessed 24 hours a day by boats of up to 4m draft. The marina has berths to suit boats from 6m to 30m in length with a maximum displacement weight of 80 tonnes.

Dun Laoghaire Marina is a Five Gold Anchor rated marina and has everything you would expect from a high standard marina.



Figure 2.13: Dun Laoghaire Marina

2.11 Yacht Clubs

2.11.1 The National Yacht Club (NYC)

The NYC occupies the south east area of the harbour, between the East Pier and Carlisle Pier. The club owns and manages a number of floating pontoons located immediately in front of the club house. Smaller sailing boats (dinghies) such as 'Optimists', 'Lasers' and 'International 420s' for junior sailors are stored on the yacht club premises and launched from the club slipway. Larger dinghies such as 'Flying Fifteens' and 'SB3s' are sailed by adults and launched with the NYC boat crane. Larger vessels, include cruiser yachts, are predominantly moored in the location area along the East Pier (East Bight swing moorings). The NYC has open launches that ferry members to their moorings.



Figure 2.14: NYC Mooring pontoon

2.11.2 The Royal St George Yacht Club (RSGYC)

The RSGYC is a well established yacht club within Dun Laoghaire Harbour with a clubhouse located between the Carlisle Pier and St Michael's Pier. Most of the member's boats are moored in the Dun Laoghaire Harbour Marina and a tender service operates between the clubhouse and the marina.



Figure 2.15: RSGYC

2.11.3 The Royal Irish Yacht Club (RIYC)

The RIYC is located on the Harbour Road adjacent to the current HSS Standage area fronting onto the Dun Laoghaire Marina.



Figure 2.16: RIYC Clubhouse



Figure 2.17: RIYC Clubhouse

2.11.4 The Dun Laoghaire Motor Yacht Club (DLMYC)

Founded in 1965, the DLMYC is located at the base of the West Pier.



Figure 2.18: DLMYC Clubhouse

2.11.5 The Dublin Bay Sailing Club (DBSC)

The DBSC is the largest yacht-racing organisation in Ireland. The DBSC is an umbrella club of all the Dun Laoghaire Harbour Yacht Clubs organising a number of sailing events for its members. Apart from a Starter's Hut on Dun Laoghaire West Pier, the club possesses no premises. Moorings and the usual onshore facilities are provided by the local yacht clubs. The Dun Laoghaire Marina accommodates a considerable number of racing yachts.

2.11.6 The Royal Alfred Yacht Club (RAYC)

The RAYC was founded in 1857 as an umbrella club and does not have a physical premises within the harbour. The RAYC organise race events and leagues for yacht racers from Dun Laoghaire and Howth harbours.

2.11.7 Irish National Sailing School (INSS)

Founded in 1972, the INSS is located on the West Pier is the largest sail training provider in Ireland.



Figure 2.19: INSC

2.11.8 Irish Youth Sailing Club (IYSC)

This is a small club located at the base of the West Pier. The club is a voluntary run children's sailing / youth club. The club undertakes sailing, kayaking, banana boating, powerboating, windsurfing and fishing during the summer months. During the winter months, the club offers a programme of indoor events such as navigation and first aid courses. The club hosts sailing events on school holidays and the summer months; and events take place within and outside the harbour. Refer to Figure 2.19 above.

2.11.9 Sailing in Dublin (SID)

Sailing in Dublin is a small club located in the public boatyard. The club offers members regular sailing in keelboats, which generally takes place in Dublin Bay. Dinghy sailing takes place outside the harbour depending on weather conditions.

2.12 The Royal National Lifeboat Institution (RNLI)

The RNLI is based on either side of the NYC. Their main office and access point is located at the base of Carlisle Pier. The RNLI additionally have a boat house at the base of the East Pier.

The RNLI is listed as a charity, with the purpose of saving lives at sea. Their volunteer crews are on call 24/7 and provide a lifeboat search and rescue service around the UK and Ireland. In Dun Laoghaire, this service is provided with the aid of a 14-metre Trent Class Lifeboat named 'RNLB Anna Livia', which is moored just off the base of Carlisle Pier.



Figure 2.20: 'RNLB Anna Livia' owned and used by the RNLI.

Additionally, a 16-foot D-Class Inshore Lifeboat (ILB), named 'Tony Heard' is launched off the slipway, with a crew of 3.



Figure 2.21: 'Tony Heard' owned and used by the RNLI.

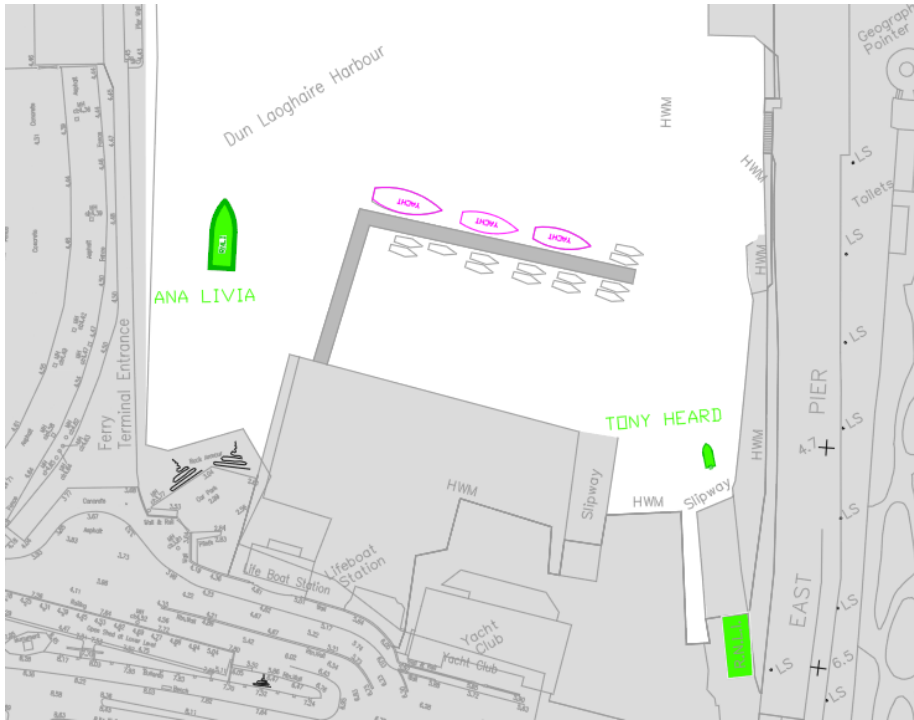


Figure 2.22: Locations of RNLi vessels in Dun Laoghaire Harbour

Recent launches from the Dun Laoghaire lifeboat station is provided in Table 1 below.

Table 2.1: RNLi Recent Launches from Dun Laoghaire (rnli.org 28 May 2015)

Date	Time
25/05/2015	16:15
13/05/2015	21:23
13/05/2015	20:56
10/05/2015	16:18
09/05/2015	16:13
09/05/2015	15:19
08/05/2015	14:24
06/05/2015	20:42
27/04/2015	13:30

2.13 Berth 1

Berth 1 has a depth ranging between 3-6m above chart datum.

The only vessels that berth frequently alongside Berth 1 are those belonging to 'Dublin Bay Cruises'. They had a seasonal 6 month contract (March to October 2013) with DLHC and have been allowed to temporarily moor on Berth 1. Planning permission has recently been granted on 13th May 2015 for the installation of an urban beach and floating pool facility (Planning permission ref: D13A/0682 & ABP PL06D.244306 refers) at Berth 1, and as a result of this project, the vessels that moor here will be relocated within the harbour.

2.14 Berth 2/3 Carlisle Pier

Until recently Berths 2 and 3, alongside Carlisle Pier has been largely unused. However, since 2011, DLHC have moored a small number of vessels ranging from cruise vessels (such as the Wind Surf) to a freight vessel delivering tanks for the Guinness Brewery alongside the Pier. The depth at these berths ranges from 5-7m above chart datum.

Berth 2 and 3 are used by DLHC for occasional mooring of vessels including:

- Irish navy vessels, e.g. 'LE Aoife'
- Irish Lights Vessel 'ILV Granuaile'
- Visiting yachts or tall ships

The landward end of the Carlisle Pier itself is used mostly for car parking. For special events during the summer, such as the 'La solitaire du Figaro' and 'Route des Princes' race, DLRCC and DLHC install pontoons alongside Carlisle Pier to accommodate competing yachts. The pontoons are removed after each event.



Figure 2.23: Windsurf moored at Berth 2



Figure 2.24: Berth 2/Carlisle pier with temporary pontoons

2.15 Berth 4

Berth 4 has recently (2013) accommodated a small catamaran service (Stena Lynx). The berthing infrastructure for this vessel still remains in position and is due to be removed in 2015. Otherwise Berth 4 is regularly used by the Irish Naval Service and the Commissioners of Irish Lights. The depth at berth 4 is 5.8 m above chart datum.

2.16 Swing Moorings

There are a small number of swing moorings in the areas just in front of the NYC and RSGYC. There are currently a small number of vessels moored here. There are a number of swing moorings in the Coal Harbour and Inner Harbour. In 2014 all swing moorings in the west bight were eliminated and the east bight moorings were reduced by 50%.



Figure 2.25: Moorings at Dun Laoghaire Harbour (Source: Sgt Paul Maguire - Irish Air Corps, 2014)

2.17 Public Slipways

There are 3 public slipways within the harbour. The largest and busiest is connected to the public boat yard and is accessible from the Coal Harbour car park. This area includes another slipway adjacent to the accommodation walk single carriageway road to the West Pier. A third public slipway is located at the base of the East Pier. However, due to the greater accessibility by car of the public slipway in the Coal Harbour, the slipway at the East Pier is not often used.

2.18 Eastern Breakwater

The eastern breakwater is predominantly used as an amenity by visiting members of the general public who use the breakwater as a walking space. It should be noted that fishing is prohibited on the eastern breakwater.

2.19 Western Breakwater

Members of the general public use the western breakwater as an amenity spaces for walking. It should be noted that fishing is prohibited on the western breakwater.

2.20 West Pier

The West Pier is used as an amenity space by a number of different users such as walkers, runners, roller bladders and anglers. Angling activities take place off the seaward side of the pier and at the roundheads located at the mouth of the harbour.

2.21 East Pier

The East Pier is used as an amenity space by a number of different users such as walkers, runners and anglers. Pedestrian numbers are available for this pier via people counters. Angling activities take place off the seaward side of the pier and at the roundheads located at the mouth of the harbour.

3 Proposed Development

The proposed cruise berth facility will involve two distinct elements, namely the landside of the development and the marine side of development.

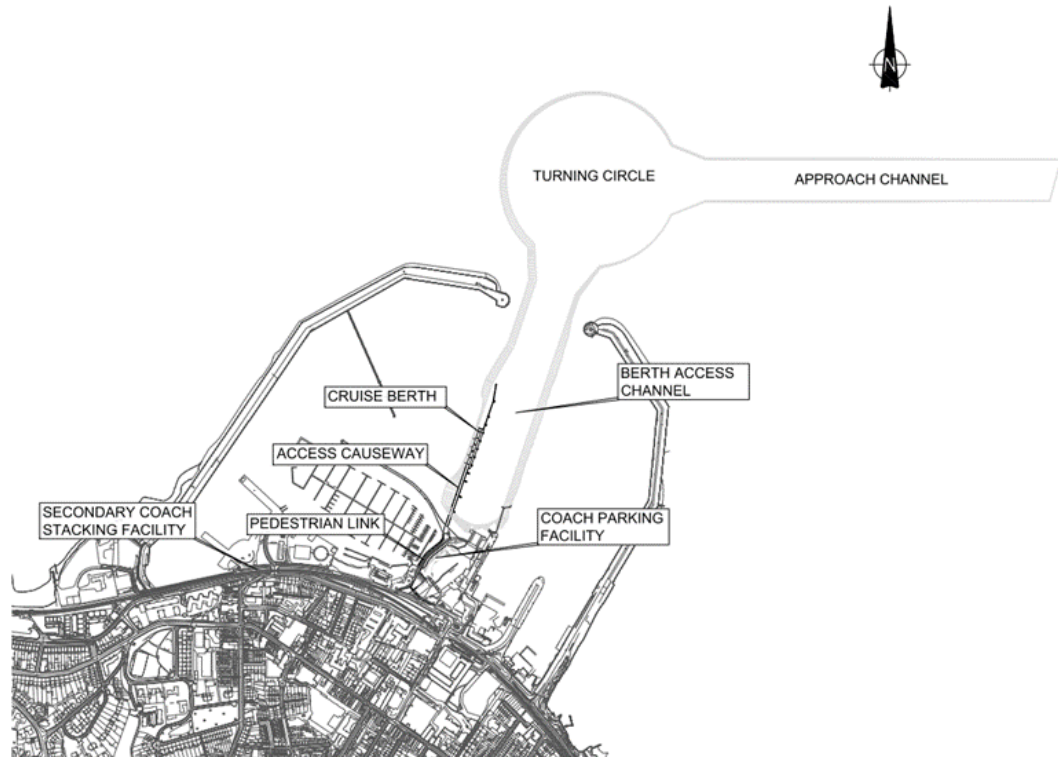


Figure 3.1: Site Plan of Proposed Development

3.1 Landside Development

The proposed landside works comprise:

- A shared use pedestrian and private vehicle access zone located adjacent to the existing marina together with a new boardwalk parallel to this shared area, complete with new feature lighting
- A new pedestrian footpath with high quality concrete pavement along Harbour Road providing linkage with the existing Terminal Plaza complete with new feature lighting
- A 20 coach drop off / pick up area within a dedicated section of the existing HSS ferry marshalling area
- A coach overflow holding area placed within accommodation walk which straddles the Old Quay Bridge at the west of the harbour
- Local modifications to an existing retaining wall adjoining the car park located adjacent to the Old Quay area also at the west of the harbour
- Demolition of certain harbour infrastructure such as an RC boundary wall along the HSS Yard boundary, the motorist's administration building, a section of the porte cohere canopy structure, plus tree removal and replacement
- Construction of new buried utilities and services, and miscellaneous lighting columns and signage for vehicles and non-motorised users.

Given the landside of development takes place on the land, it has no impact on marine navigation. As such it will not form part of this assessment. This assessment will focus on the marine side of development and the potential impacts this may have on the existing marine navigation within Dun Laoghaire Harbour.

3.2 Maritime Development

The marine side of construction has two distinct processes. These are the construction of a cruise berth and the dredging of a navigation channel in order to make the harbour navigable for next generation cruise ships.

The cruise berth project will also involve the dredging of an access channel from Dublin Bay to the cruise berth in the harbour and the dredging of a turning circle outside of the mouth of the harbour. A channel width of 120m is proposed and the turning circle will be 500m in diameter.

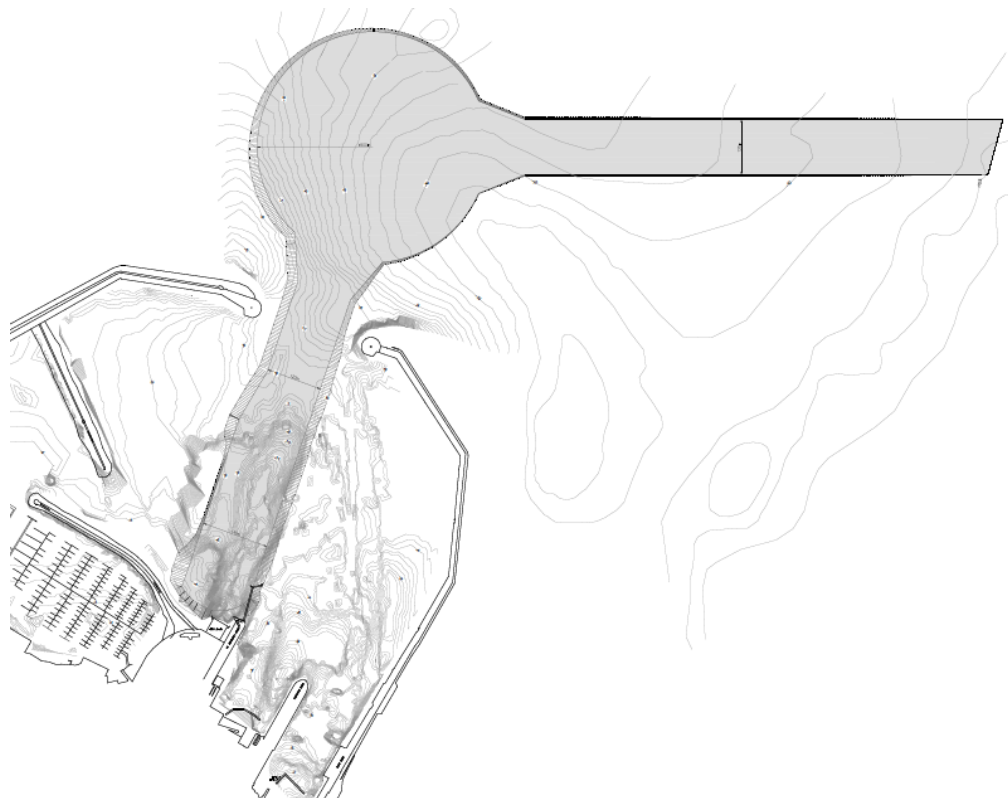


Figure 3.2 – The Approach Channel and Turning Circle

It is anticipated that the dredging of a navigation channel into the harbour and associated dumping at sea of waste material will have minimal impact on harbour activities given its temporary phased nature. An Indicative Construction Programme is included in Section 3 of the accompanying EIS. As such, it is proposed not to include these processes with this Navigation Impact Assessment.

The proposed cruise berth is located in the centre of the harbour extending in a perpendicular fashion from the base of the eastern breakwater into the centre of the harbour. The cruise berth is adjacent the HSS Berth on St Michaels Pier.

The cruise berth is made of three distinct elements including an access causeway of c. 170 metres, a jetty of c. 120 metres and a maintenance walkway of c. 140 metres all combining to form a structure of approximately 430 metres in length. This is illustrated in Figure 3.3 below.

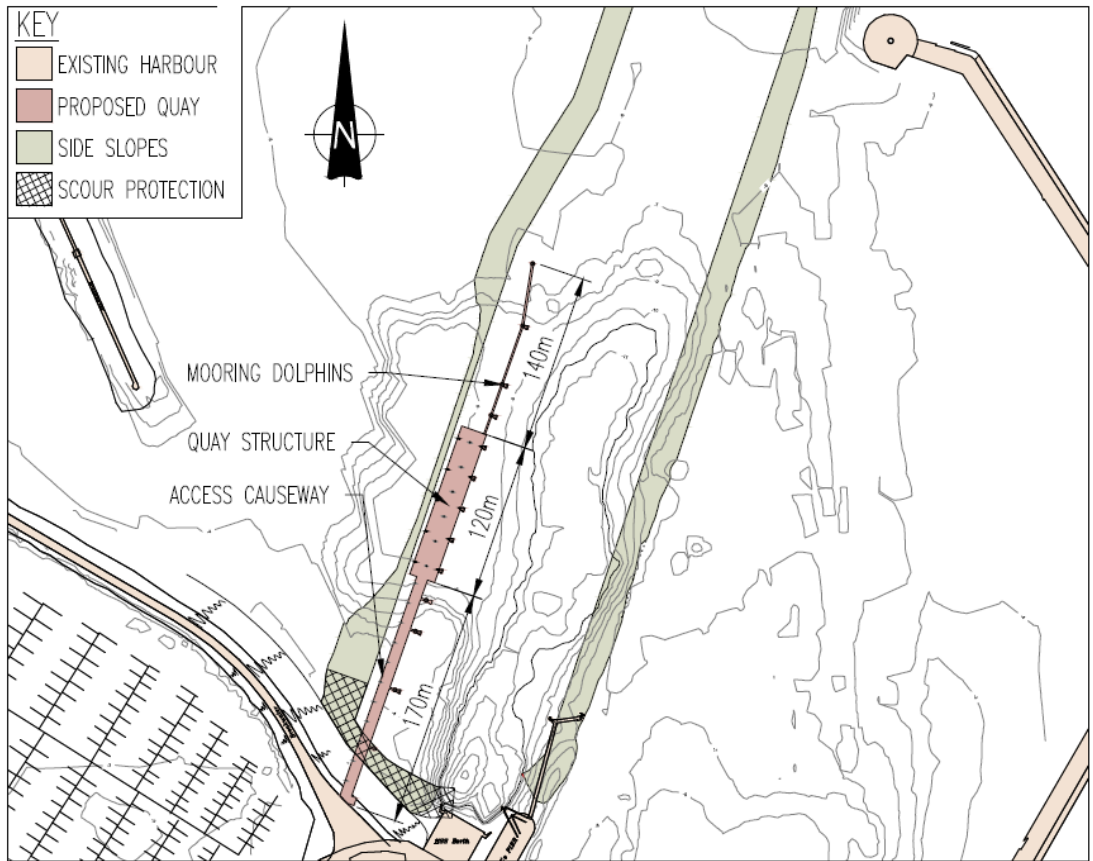


Figure 3.3 – Plan of the Quay Structure

The channel and berth will be oriented to align with the centre of the existing harbour entrance so that the cruise ship will not have to undertake any turns within the harbour itself. The cruise vessel will either turn outside the harbour and back down the channel onto the berth, or steam onto the berth and back out into the turning circle, depending on conditions.

4 Navigation Risk Assessment

4.1 Introduction

The introduction of a new berth with the associated berthing infrastructure and dredged channel requires consideration in terms of Navigation Risk from several perspectives including:

- Navigation Risks to existing harbour users including:
 - Risks during construction phase of the project
 - Risks during operational phase of the project
- Risks to large vessels on approach or departing from the new berth

4.2 Hazard identification

Potential hazards to navigation identified can be categorised into to broad categories as follows.

4.2.1 Construction phase hazards

Hazards identified during the construction phase include:

- Construction plant & equipment
- Exclusion Zones
- Partly constructed infrastructure
- Partly dredged channels

4.2.2 Operational Phase hazards

Hazards identified during the operational phase include:

- The completed berth structure
- The transition from dredged channel to shallower areas

4.3 Risk identification

Once hazards have been identified, risks can be assigned to the various hazards as detailed below.

4.3.1 Risks posed by construction phase hazards

Risks associated with the various hazards include:

- Construction plant & equipment
 - Risk of collision between a vessel and construction plant and equipment including dredging vessels
 - Risk of floating plant and equipment breaking free and subsequent collision with vessel or infrastructure

- Exclusion Zones
 - Increased risk of collision between vessels due to restricted navigation space
- Partly constructed infrastructure
 - Risk of collision between a vessel and partly constructed infrastructure
- Partly dredged channels
 - Risk of a deep draught vessel grounding due to incomplete dredging programme
 - Risk of a deep draught vessel attempting port entry while dredging is incomplete.

4.3.2 Risks posed by operational phase hazards

Risks associated with the various hazards include:

- The completed berth structure:
 - Risk of collision between a (non cruise ship) vessel and the completed structure
 - Risk of collision between a berthing cruise ship and the completed structure
 - Increased risk of collision between vessels due to restricted navigation space
- The arrival or departure of cruise ships in the harbour:
 - The risk of a vessel colliding with a cruise ship approaching or leaving the new berth.
 - Risk of a deep draught grounding due to navigating outside of dredged channel
 - Risk of a deep draught vessel grounding due to weather conditions
 - Risk of a cruise ship impacting with the East or West Pier Roundheads

4.4 Assessment of Risk

UK DTI Guidance states that the scope and depth of the risk assessment, together with the tools and techniques necessary to carry this out, should be proportionate to the:

- Scale of the development; and
- Magnitude of the risks

It is considered that the proposed cruise berth is a "Low risk, Small scale development", (i.e. "a development in an area where the potential risks are low, and/or a small scale development"). For this reason, this navigation risk assessment is based on a qualitative technique of "expert judgement".

The expert judgement has been provided by members of DLHC management who are familiar with the harbour and the berthing arrangements within the harbour: Operations Manager Mr. Tim Ryan, Harbour Master Captain Simon Coate with input from Captain Philip Cowman (Retired HM Port of Waterford).

Table 4.1 below illustrates the scoring system used when rating the risk. The system is based on assessing the probability and consequence; and scoring it in accordance with their rating.

Probability is rated from 0, not probable to 5, very frequent and the consequence is rated from 0, no consequences to 5, catastrophic consequences.

Table 4.1: Risk Rating Scoring System

Probability →	0 none	1.extremely remote	2 remote	3 probable	4 frequent	5 very frequent
Consequence ↓						
0 none	0	0	0	0	0	0
1 minor	0	1	2	3	4	5
2 moderate	0	2	4	6	8	10
3 major	0	3	6	9	12	15
4 severe	0	4	8	12	16	20
5 catastrophic	0	5	10	15	20	25

Risk = Consequence times Probability

Risk factors 1 to 5 (Green) are "Tolerable"

Risk factors 6 to 14 (Yellow) are "Consider"

Risk factors of 15 (Red) and more are "Intolerable".

4.5 Existing mitigation measures

There are a set of protocols know as Notices to Mariners already in place within Dun Laoghaire Harbour. Outlined below are the existing Notices to Mariners. These notices are included in Appendix 5.1.2 of the EIS.

4.5.1 Marine Notice No.29 Small Craft Operating At Entrances To Ports (DTTAS)

The Department of Transport would like to advise that all small boats (sailing, rowing or power driven) are strictly required to keep out of the fairway channel at the entrance to the country's ports.

4.5.2 Marine Notice No. 1 (2015) Notices to Mariners In Force (Harbour Master)

All Dun Laoghaire Notices to Mariners are automatically cancelled at 2359 hours on the 31st December 2014.

At that time 2015 Notices to Mariners will come to in to force until specifically cancelled or until 2359 hours on the 31st December 2015.

4.5.3 Marine Notice No. 2 (2015) Fairway Priorities (Harbour Master)

The harbour fairways and approaches are generally to be kept clear and free. It is prohibited to anchor or lay moorings in these areas as marked on navigational publications and charts.

No Race Marks, Buoys, Floats, etc. are to be laid in the fairways or the near approaches to the harbour - other than by specific, written permission from the Harbour Master.

Any Lobster / Crab Pots that are laid shall remain clear of all harbour navigational waters, and slipways.

Clear Fairway Priorities

Large power driven vessels (Ferries, Lighthouse Authorities, Naval) have priority over all other craft, including the area of the harbour limits that extend 600 metres seaward of the harbour mouth.

Signals

Large power driven vessels are to sound a prolonged blast when approaching the harbour mouth from either direction, or the appropriate signal when maneuvering off, departing or preparing to depart from their berths.

Irrespective as to whether or not any such signal is sounded, the obligation remains for small craft to give priority to the large power driven vessels.

4.5.4 Marine Notice No. 3 (2015) VHF Reporting; Sound signals(Harbour Master)

VHF Reporting

All vessels (including fishing but excluding pleasure craft) are required to call "Harbour Office Dun Laoghaire" on VHF Channel 14 as follows:-

- 1 ETA at Breakwater at least two hours in advance, and for any scheduled ferries & local fishing craft a call at least half an hour in advance.
- 2 ETD at least one hour in advance, followed by confirmation five minutes prior to departure or for scheduled ferries & local fishing craft a call five minutes prior to departure.

Sound Signals

All power driven vessels shall on approaches to the harbour mouth (both arriving and departing) sound one prolonged blast on the whistle in accordance with Rule 34(e) of the "International Regulations for Preventing Collisions at Sea".

A vessel shall sound when departing, both by day and night:-

- (a) Departing ship's head out, one prolonged blast on the whistle.
- (b) Departing stern first, sound three short blasts on the whistle

A vessel may also sound a preliminary, prolonged blast, just prior to departure, so as to alert other harbour users of its imminent departure.

4.5.5 Marine Notice No. 4 (2015) Small Craft – Various Regulations And Restrictions (Harbour Master)

Main Fairway Large power driven Vessels (Ferries, Lighthouse Authorities, Naval, smaller power-driven vessels with restricted manoeuvrability such as cruise ship tenders etc) have priority over all other craft in the main fairways and harbour approaches.

It is incumbent upon each individual small craft, but especially boats engaged in sail training, to ensure early and sufficient action is taken to present a free and unhindered passage to the large power-driven vessels.

Attention is also drawn to the "Maritime Safety Act, 2005" whereby the contravention of its Section No. 23 attracts heavy fines and /or terms of imprisonment for, "Dangerous navigation or operation of vessels"; and to the DTTAS Notice No 29 of 2009 – "Small craft operating at entrances to ports".

The Marina Fairway is to be kept clear at all times. Craft transiting to/from sea are to keep on the Starboard side of their fairway.

Windsurfing, Paragliding, etc. are NOT permitted within the harbour unless with specific permission in writing from the Harbour Master.

Speed Limits - Speedboats, Jet Skis, etc are to observe a speed of 8 Knots (15 kph) This applies to all craft in Dun Laoghaire Harbour and its approaches. This limit reduces to 4 knots (or no wake) within the marina.

Diving, Sub Aqua, Swimming activities, etc are generally NOT permitted within the harbour owing to the danger from water traffic. Application for permission to dive (e.g. for servicing of yacht moorings) must be made in writing. Diving may then take place only when the specific permission (in writing) is received from the Harbour Master. The activity must comply with all the operational conditions of the granted permission.

Harbour Recreational Area for Small Craft is the triangular area of the North Bight-westwards of a line from West Pier Lighthouse to the marina west breakwater.

4.5.6 Marine Notice No. 5 (2015) Passenger Ship Tendering (Harbour Master)

This Notice to Mariners is intended to provide for the regulation of all ship-carried tenders used for transferring passengers from cruise ships anchored in Dublin Bay into Dun Laoghaire Harbour.

Anchorage

Passenger ships intending to tender into Dun Laoghaire Harbour should normally anchor within the recommended Dublin Bay anchorage area. Please note that the water that lies between the charted anchorage area and Dun Laoghaire Harbour is used by leisure sailing and yacht racing. This area contains numerous statutorily sanctioned sail racing marker buoys. The position of the buoys can be found listed in the Dublin Port Company, Notice to Mariners No 14 of 2014.

Preparation

Special attention should be given to Department of Transport, Tourism and Sport Notice 19 of 2014 and a copy of the Safety Proposal Plan required by that notice must be provided to Dun Laoghaire Harbour prior to the commencement of any operations.

This Safety Proposal Plan must also contain a Risk Assessment and Standard Operating Procedure specific to tendering operations from the proposed anchorage position into Dun Laoghaire Harbour.

If a ship wishes to anchor at a position outside the recommended anchorage area and closer in to the entrance of Dun Laoghaire, a written request must first be submitted to the Dublin Port Harbour Master. This to include the aforementioned Risk Assessment and Standard Operating Procedure and a Communications Plan.

Operation restrictions

There is a speed limit of 8 knots within the harbour.

All Tenders should stand well clear of any large commercial vessels arriving in to, or departing from, Dun Laoghaire.

All Tenders should be aware that many pleasure boats operate in and out of Dun Laoghaire Harbour and they should navigate with caution at all times and the pleasure boats are requested to not obstruct these tenders whilst within Dun Laoghaire Harbour Limits.

Attention must be given to the Dublin Port Company, Notice to Mariners No 10 of 2014.

Communication Plan

The following should be noted in the Communication plan:

The ship and all its tenders are required to maintain a listening watch on VHF Channel 12 for VTS Dublin while operating within the Dublin Port area of jurisdiction.

Once tenders cross over into the Dun Laoghaire Harbour area of jurisdiction they should change over to VHF Channel 14.

A Dun Laoghaire Harbour craft will be stationed between the anchored ship and the mouth of Dun Laoghaire Harbour to monitor all tender movements and RIBs will be provided to guide tenders to the tender berth(s).

Tender berths

The primary tender berth is located in the Coal Harbour in the western side of the harbour

Lat: 53° 17.84' N

Long: 06° 08.63' W

If more than one cruise ship is operating on the same day a second tender berth will be provided on the east side of Carlisle Pier in the eastern side of the harbour

Lat: 53° 17.70 N

Long: 06° 07.80' W

On such occasions a second monitoring craft will be stationed within the harbour to direct tenders from both ships to their appropriate berths.

4.6 Risk Assessments

Detailed risk assessment for the risks identified are included below and summarised in Section 5 of the report.

4.7 Navigation Risk Assessments Constriction Phase

4.7.1 RA 01 Construction phase - Construction Plant and Equipment

Hazard: Construction Plant and Equipment -					Residual Risk Ratings with Control Measures Implemented		
Risk	Probability (Low 1-5 High)	Severity (Low 1-5 High)	Risk Rating (Probability x Severity)	Additional Control Measures	Probability	Severity	Rating
Risk of collision between a vessel and construction plant and equipment.	3	4	12	<p>Notice to Mariners (NtoM) to be issued to advise Harbour Users of commencement, duration and movements of construction equipment.</p> <p>Exclusion Zones to be established and suitably marked with (lighted) navigation buoys. Details to be included in NtoM.</p> <p>Construction Plant and equipment to be well secured and relocated to a sheltered location should poor weather be forecast.</p> <p>Vessels carrying out dredging to display appropriate navigation lights and keep appropriate watch requirements while operating.</p>	1	4	4
Risk of floating plant and equipment breaking free and subsequent collision with vessel or infrastructure	2	4	8	<p>Construction Plant and equipment to be well secured and relocated to a sheltered location should poor weather be forecast.</p> <p>Dedicated berthing location to be provided for construction vessels within the harbour</p>	1	4	4

4.7.2 RA 02 Construction phase - Exclusion Zone

Hazard: Exclusion Zone -					Residual Risk Ratings with Control Measures Implemented		
Risk	Probability (Low 1-5 High)	Severity (Low 1-5 High)	Risk Rating (Probability x Severity)	Additional Control Measures	Probability	Severity	Rating
Risk that the introduction of a construction Exclusion Zone will increase the risk of collision between vessels due to restricted navigation space	2	4	8	Notice to Mariners (NtoM) to be issued to advise harbour users of the location, timing, marking and extent of the exclusion zone The Exclusion zone to be designed in such a manner as to limit the risk of restricting the existing harbour navigation areas and maintaining safe fairways.	1	4	4

4.7.3 RA 03 Construction phase - Partly Constructed Infrastructure

Hazard: Partly Constructed Infrastructure -					Residual Risk Ratings with Control Measures Implemented		
Risk	Probability (Low 1-5 High)	Severity (Low 1-5 High)	Risk Rating (Probability x Severity)	Additional Control Measures	Probability	Severity	Rating
Risk of collision between a vessel and partly constructed infrastructure	3	4	12	<p>Notice to Mariners (NtoM) to be issued to advise harbour users of commencement, duration and progress of construction.</p> <p>Exclusion Zones to be established and suitably marked with (lighted) navigation buoys. Details to be included in NtoM.</p> <p>Construction Plant and equipment to be well secured and relocated to a sheltered location should poor weather be forecast.</p>	1	4	4

4.7.4 RA 04 Construction phase - Partly dredged channels-

Hazard: Partly dredged channels-					Residual Risk Ratings with Control Measures Implemented		
Risk	Probability (Low 1-5 High)	Severity (Low 1-5 High)	Risk Rating (Probability x Severity)	Additional Control Measures	Probability	Severity	Rating
Risk of a deep draught vessel grounding due to incomplete dredging programme	1	5	5	<p>Dredged Channel not advised to UKHO for charting until confirmed by full hydrographic survey post construction works.</p> <p>Any enquiries from ships with deep draught controlled via Harbour Master who can deny entry.</p>	1	5	5
Risk of a deep draught vessel attempting port entry while dredging is incomplete.	1	5	5	<p>Dredged Channel not advised to UKHO for charting until confirmed by full hydrographic survey post construction works.</p> <p>Any enquiries from ships with deep draught controlled via Harbour Master who can deny entry</p>	1	5	5

4.8 Navigation Risk Assessments Operational Phase

4.8.1 RA 05 Operational phase – The Completed Berth Structure

Hazard: The Completed Berth Structure -					Residual Risk Ratings with Control Measures Implemented		
Risk	Probability (Low 1-5 High)	Severity (Low 1-5 High)	Risk Rating (Probability x Severity)	Additional Control Measures	Probability	Severity	Rating
Risk of collision between a (non-cruise ship) vessel and the completed structure.	3	4	12	<p>The completed structure will be notified to the UK Hydrographic Office for inclusion of UKHO nautical charts.</p> <p>A Notice to Mariners will issue on completion of the construction advising home and visiting vessels of the existence of the Pier and its location.</p> <p>The Pier will have appropriate navigation markings (lighted) both at the end of the pier and at the "underpass section.</p> <p>The Pier will have low level lighting along its length in darkness to assist vessels identify it.</p>	1	4	4

<p>Risk of collision between a berthing Cruise Ship and the completed structure</p>	<p>1</p>	<p>5</p>	<p>5</p>	<p>It is not anticipated that the risk of a Cruise Ship colliding with the new pier whilst berthing will be any greater than any other ship berthing on any other similar sized pier. Much of the risk associated with berthing is mitigated within the ships operational procedures.</p> <p>The Pier is designed to withstand normal berthing forces.</p> <p>The Pier will have appropriate navigation markings (lighted) at the end of the pier .</p> <p>The Pier will have low level lighting along its length in darkness to assist vessels identify it.</p> <p>Berthing Vessels will be transiting at very low speeds within the harbour approach.</p>	<p>1</p>	<p>5</p>	<p>5</p>
<p>Increased risk of collision between vessels due to restricted navigation space</p>	<p>3</p>	<p>5</p>	<p>15</p>	<p>The completed structure will be notified to the UK Hydrographic Office for inclusion of UKHO nautical charts.</p> <p>A Notice to Mariners will issue on completion of the construction advising home and visiting vessels of the existence of the Pier, its location and the position of the revised fairways post construction.</p> <p>A Local Notice will issue to all harbour users prior to the arrival of any large ship into the harbour providing details of the ships arrival and departure times and the allocated berth.</p> <p>The Pier will have appropriate navigation markings (lighted) both at the end of the pier and at the "underpass section.</p>	<p>1</p>	<p>5</p>	<p>5</p>

				The Pier will have low level lighting along its length in darkness to assist vessels identify it.			
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4.8.2 RA 06 Operational phase – The arrival or departure of Cruise Ships in the Harbour

Hazard: The arrival or departure of Cruise Ships in the Harbour -					Residual Risk Ratings with Control Measures Implemented		
Risk	Probability (Low 1-5 High)	Severity (Low 1-5 High)	Risk Rating (Probability x Severity)	Additional Control Measures	Probability	Severity	Rating
The risk of a vessel colliding with a Cruise Ship approaching or leaving the new berth	3	5	15	<p>The completed structure will be notified to the UK Hydrographic Office for inclusion of UKHO nautical charts.</p> <p>A Notice to Mariners will issue on completion of the construction advising home and visiting vessels of the existence of the Pier and its location.</p> <p>A Local Notice will issue to all harbour users prior to the arrival of any large ship into the harbour providing details of the ships arrival and departure times and the allocated berth.</p> <p>Cruise Ships will be added to the list of vessels afforded priority within the fairways</p> <p>Cruise Ships will have a Pilot with local knowledge on-board</p> <p>Cruise Ships, like other large vessels will announce their arrival/departure by sound signals.</p> <p>The Harbour Office will be in VHF contact with the Cruise Ship, and other vessels in</p>	1	5	5

				the vicinity			
Risk of a deep draught grounding due to navigating outside of dredged channel	2	5	10	<p>The dredged channel will be notified to the UK Hydrographic Office for inclusion of UKHO nautical charts.</p> <p>A Notice to Mariners will issue on completion of the construction advising home and visiting vessels of the existence of the Pier and the dredged channel.</p> <p>The entrance to the dredged channel will be marked by a pair of lateral navigation buoys with synchronised lights</p> <p>The remainder of the channel and the turning circle will be marked by virtual buoys which will be apparent on the Ships ECDIS system</p> <p>A weather station with digital readouts is available in the Harbour Masters Office and the Harbour Office, providing real time wind and tidal data for the ship.</p> <p>Berthing Vessels will be transiting at very</p>	1	5	5

				low speeds within the harbour approach.			
Risk of a deep draught vessel grounding due to weather conditions	2	5	10	<p>Cruise Ships will notify the Harbour Master / Harbour Office in advance of arrival.</p> <p>The Harbour Master will assess weather conditions at the time of the announced arrival.</p> <p>A weather station with digital readouts is available in the Harbour Masters Office and the Harbour Office, providing real time wind and tidal data for the ship.</p> <p>The Harbour Master will contact the Ships Master and advise of local conditions and any concerns based on the specific conditions at the time.</p> <p>The Ships Master may abort the arrival, prior to entering the dredged channel if conditions are not deemed suitable.</p>	1	5	5

<p>Risk of a Cruise Ship impacting with the East or West Pier Roundheads.</p>	<p>2</p>	<p>5</p>	<p>10</p>	<p>The dredged channel will be notified to the UK Hydrographic Office for inclusion of UKHO nautical charts.</p> <p>A Notice to Mariners will issue on completion of the construction advising home and visiting vessels of the existence of the new pier, the approach to the new Pier and the dredged channel.</p> <p>The dredged channel and therefore the approach is located centrally between the roundheads to provide maximum distance from each.</p> <p>Visiting Ships will enter the Harbour on approach to the new pier at very low speeds.</p> <p>Cruise Ships will have a Pilot with local knowledge on-board</p> <p>The beam of a large cruise ship is similar to the Stena HSS (40m). The beam of the Splendida is 34m and the beam of the Royal Princess is 36m. The clear width between the roundheads is approximately 230 metres, therefore there is ample space for the cruise ships to navigate through the entrance to the harbour</p>	<p>1</p>	<p>5</p>	<p>5</p>
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5 Additional Mitigation Measures

5.1 Proposed mitigation Measures

Given the existing protocols that exist within the harbour as outlined above under the Notices to Mariners, it is proposed to build on these protocols. The Notices to Mariners that have been put in place by the DTTAS and the Harbour Master are effective in mitigating potential conflict between users of Dun Laoghaire Harbour.

A Specific Notice to Mariners will be developed outlining the protocol to harbour users to be adhered to during a cruise visit. Similar protocols have been successfully developed for the HSS visits and also for smaller cruise vessel visits. As detailed below, existing Marine Notice No. 5 is already in place for cruise visits to Dun Laoghaire Harbour. It is anticipated that this approach will ensure that all potential risks to users of the harbour will be mitigated successfully. It should also be noted that similar approaches have been adopted by many harbours in Ireland and abroad for dealing with the visit of cruise vessels.

Having regard to the existing Notices to Mariners, the following amendments will ensure that cruise vessel visits to the harbour will not result in any uncertainty. This approach will ensure that there are well established and well known procedures for all harbour users and should mitigate any potential for conflict to arise. Please see proposed amendments below: -

No. 2 Fairway Priority:

- Cruise vessels will be added to the list of vessels afforded priority within the fairways

Marine Notice No. 3 (2015) VHF Reporting; Sound signals(Harbour Master):

- Cruise vessels will be required to report to the Harbour Master via VHF radio stating their time of arrival at Dun Laoghaire Harbour.
- Cruise vessels will sound signal to all other vessels when entering the harbour and also prior to departure.

Marine Notice No. 4 (2015) Small Craft – Various Regulations And Restrictions (Harbour Master)

- Specific reference can be included to cruise vessels entering and departing the harbour, which will mitigate conflict between the cruise vessels and smaller crafts.

Marine Notice No. 5 (2015) Passenger Ship Tendering (Harbour Master)

- This Notice specifically governs the visit of cruise vessels that visit Dun Laoghaire Harbour and use tenders to off load passengers. It is expected that a similar Notice will be developed to govern the visit of a cruise vessel to the berth. This will clearly set out the protocols to be followed and mitigate any potential for conflict.

The mitigation measures outlined above will ensure the Dun Laoghaire Harbour operates in a safe and efficient manner during cruise visits.

6 Impact of the proposed development on existing navigation

6.1 Ferry Service

There is currently no ferry service in operation from Dun Laoghaire Harbour. Stena Line ceased operating a seasonal service to Holyhead with its HSS catamaran in 2014. The existing Stena Line infrastructure, is shown on the planning drawings as being removed when the cruise berth is in place. Following the departure of Stena Line from Dun Laoghaire Harbour in recent months, discussions have commenced between the Harbour Company and Stena Line to have this infrastructure removed in line with the agreement in place. That process, including all necessary consents, is being undertaken independently of this cruise berth proposal. As a result, the proposal drawings and the EIS have assumed that this infrastructure will have been removed before the cruise berth is operational.

It is noted however that DLHC is actively seeking an alternative seasonal ferry service provider to operate from either Berth 3 or Berth 4 within the harbour. It is anticipated there will be no impact on such a ferry service by the proposed cruise berth.

6.2 Commissioner of Irish Lights (CIL)

The development of the cruise berth will have no impact on the activities of the Commissioner of Irish Lights activities within the harbour. The CIL, when calling to Dun Laoghaire Harbour, berth at Berth No. 2 / Carlisle Pier and operate vessels between Carlisle Pier and their headquarters. The location of the cruise berth will mean a longer passage within the harbour, however it will not impede their activities within the harbour.

6.3 Naval Services

The navy visits to Dun Laoghaire Harbour have diminished considerably since 2013 (12 visits) with 1 visit in 2014 and 1 visit so far this year (2015). This is mainly because of the closure of No 1 berth to shipping. On occasions when the Naval Services visit the harbour, they berth at Berth No. 3, which will not be impacted upon by the proposed cruise berth.

The development of the cruise berth may be of benefit to the Naval Services as it may be made available for their use in the off-peak cruise season. This purpose-built cruise berth would offer the Naval Services a world class berthing facility. No other Irish Port could offer the Naval Services the use of such a facility.

6.4 Marine Activity Centre

There will be no impact on the Marine Activity Centre.

6.5 8u Calafort, Cuan Dun Laoghaire, Gasoga Mara

There will be no impact on 8u Calafort, Cuan Dun Laoghaire, Gasoga Mara.

6.6 Rowing and Diving Clubs

Some impact is envisaged as the berth will lie across the path that the St Michael's Rowing Club use as a training route.

There will be no impact on diving clubs.

6.7 Public Boatyard and Slipway

There will be no impact on this facility.

6.8 Fishermen

It is predicted that the impact on fishermen using the harbour as a result of the proposed cruise berth will be minimal. Generally all fishing activities take place outside the harbour. Cruise visits and visiting times will be available to all fishing crews well in advance of a visit. This will allow crews the opportunity to arrange their departure and return and avoid conflict with the cruise vessel.

6.9 Dun Laoghaire Marina

It is anticipated that the cruise berth will have minimal impact on the users of Dun Laoghaire Marina.

6.10 Yacht Clubs

It is not anticipated that there will be any direct negative impacts to any of the Dun Laoghaire yacht clubs. Racing inside the harbour is only allowed by permission - and every request will be assessed on the day. The training area in the West Bight will not be impacted by the cruise berth.

The issue of wind has been raised by a number of yacht club members expressing a concern that cruise ships may block wind within the harbour. In reality, large cruise ships at berth will have an effect on the wind patterns locally, and will result in "wind shadow" downwind of the ship. The affected area will vary depending on a number of factors, including the size of the ship, the direction of the wind and the speed of the wind. No matter what direction the wind is blowing, there will always an area of the harbour that will be windward of ships at berth and therefore unaffected. This unaffected area of the harbour will always be available for dinghy/youth sailing. It will also be possible to sail in the area affected by "wind shadow" on the leeward (sheltered) side of the ship, with the exception possibly of up close to the ship. Winds blowing roughly parallel to the ship will have little or no "wind shadow" effect. Experienced sailors are familiar with the "wind shadow" effect as their sails create "wind shadow" and a knowledge of this effect is used to gain competitive advantage in racing by manoeuvring to put their competitors in the bad wind caused by the "wind shadow" of their boats.

6.11 The Royal National Lifeboat Institution (RNLI)

It is envisaged that the location of the cruise berth will have no impact on any RNLI vessel navigation.

It is not anticipated that impacts will occur when the cruise ship is either entering or leaving the mouth of the harbour. It is anticipated that the RNLI would be able to pass through the mouth of the harbour at both the arrival of a cruise ship and at departure in order to gain access to Dublin Bay.

If the need were to arise for the RNLI to exit the harbour during the arrival or departure of a cruise vessel, a call will be made to the bridge of the cruise vessel. The situation would be clearly explained to the cruise vessel captain and the RNLI would be allowed pass the cruise vessel.

6.12 Berth No. 1

Planning permission has recently been granted on 13th May 2015 for the installation of an urban beach and floating pool facility (Planning permission ref: D13A/0682 & ABP PL06D.244306 refers) at Berth 1. The siting of the proposed cruise berth facility has had regard to this Urban Beach Project – refer to Section 3.6 of this EIS for further details (Main Alternatives Considered).

Recently Berth 1 has been closed to shipping and as such there will be no impact arising from the development of the Cruise Berth.

The only vessels that berth frequently alongside Berth 1 are those belonging to 'Dublin Bay Cruises'. They had a seasonal 6 month contract (March to October 2013) with DLHC and have been allowed to temporarily moor on Berth 1. As a result of the approved urban beach project, the vessels that moor here will be relocated within the harbour.

6.13 Berth No. 2 / Carlisle pier

It is considered that the cruise berth will not impact on ships berthing at the Carlisle Pier as a result of the development of the cruise berth.

6.14 Berth No. 3

It is anticipated there will be no impact on the users of berth No. 3 during the construction and operation of the cruise berth.

6.15 Berth No. 4

It is anticipated there will be no impact on the users of berth No 4 during the operation of the cruise berth however the berth may be utilised by the contractor during construction.

6.16 Swing Moorings

There will be no impact on the small number of swing moorings located within the harbour.

The swing moorings were originally located in the west and east Bights of the Western and Eastern Pier walls of the harbour. It should be noted that the Dun Laoghaire Harbour Company has restructured the moorings in the harbour.

The west bight has been completely decommissioned and the east bight moorings have been reduced by 50%.

It is anticipated that there will be little or no impact on the users of these moorings.

6.17 Public Slipway

The users of the public slipway will not be affected by the location and operation of the cruise berth.

6.18 Eastern Breakwater

During the construction phase of the development, it is predicted there will be an impact upon the general public walking on the Eastern Breakwater. The impact will arise from restricted access to the Breakwater during construction of the cruise berth and associated landside enabling works.

Access will not be restricted to the Breakwater during the operational phase.

6.19 Western Breakwater

It is predicted there will be no impact arising from the development of the cruise berth on any of the identified users of the western breakwater.

6.20 West Pier

The users of the western pier will not be impacted during the construction or operation of the cruise berth.

6.21 East Pier

The users of the eastern pier will not be impacted during the construction or operation of the cruise berth.

7 Conclusion

This Navigation Impact Assessment has been undertaken to determine the potential impact of the proposed cruise berth on the existing users of Dun Laoghaire Harbour in terms of navigation risk. The report concludes that there will be no significant adverse impact on the existing harbour users / marine activities subject to the implementation of appropriate management / mitigation measures in the interests of the overall harbour.