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COMHLACHT CHALAFORT ÁTHA CLIATH
DUBLIN PORT COMPANY

Alexandra Basin Redevelopment Project

Environmental Impact Statement

Volume I | Main Document






TABLE OF CONTENTS

EIS NON TECHNICAL SUMMARY VOLUME 4

APPENDICES

LIST OF FIGURES

LIST OF TABLES

LIST OF PLATES

1 INTRODUCTION

1.1 PROJECT SUMMARY

Dublin Port Company (DPC) produced a Masterplan in 2012 covering the period 2012 to 2040. In this Masterplan, DPC set out their proposals for major developments within the Port and Entrance Channel over the next thirty years.

DPC now wishes to advance a number of projects highlighted in the Masterplan document, mainly:

1 Works at Alexandra Basin West including construction of new quays and jetties, remediation of contamination on the bed of the basin, capital dredging to deepen the basin and to achieve the specified depths of -10m Chart Datum (CD) at the new berths.

2. Infilling of the Basin at Berths 52 & 53 and construction of a new river berth with a double tiered Ro-Ro ramp.

3. Deepening of the fairway and approach to Dublin Port to increase the ruling depth from -7.8m CD to -10.0m CD.

This is the most significant infrastructural development planned by DPC in the past 100 years and will involve a major capital investment on behalf of the Port. It reinforces the Port's commitment to providing a top level port to the City of Dublin and Ireland as a whole. Ireland is an Island and the importance of being able to import and export goods in and out of the country is a basic requirement and vital to our livelihoods and economy as a whole.

1.2 PROJECT JUSTIFICATION (STATEMENT OF NEED)

1.2.1 Background

The Alexandra Basin Redevelopment (ABR) Project is the first major infrastructure project to be brought for planning and other consents from Dublin Port Company's Masterplan 2012 to 2040.

The Masterplan recognises the need to provide capacity in the Port to cater for 60m (million) gross tonnes of cargo by 2040 and was approved by the Board of Dublin Port Company (DPC) in February 2012. It was also subsequently endorsed by Government in its National Ports Policy 2013 in the following terms:

"The government endorses the core principles underpinning the company's Masterplan, and the continued commercial development of Dublin Port Company is a key strategic objective of National Ports Policy".

The locations of these three projects in relation to the engineering options identified in the Masterplan are shown in Figure 1.1. The development also includes works to deepen the Port's shipping channel and form part of the consent application process. .

The ABR Project emanates from ideas presented in the Masterplan and its design is based on an in-depth evaluation of needs (supported by detailed modelling and simulation studies) and a determination of the potential environmental impact of the proposed development during the EIA process.

The ABR Project complements recent and continuing initiatives by DPC to, in some cases, regain operational control over port lands and, more generally, to influence port operators to increase their utilisation of port lands. Figure 1.2 shows lands which have been reacquired / redeveloped by DPC in recent times (or which are in the process of being reacquired / redeveloped) for the transit storage of cargo.

These initiatives have recently included the publication by DPC of a policy document[1] setting out the company's policies regarding the use of port lands and appropriate targets for their utilisation for different types of cargo.

In identifying the engineering options in the Masterplan, DPC recognised significant levels of public concern about the expansion of the Port through further infill in Dublin Bay. The Masterplan confirmed that the Company would continue to develop the Port within its current footprint to the maximum extent possible before any major reclamation works might be considered.

The ABR Project, therefore, focuses on a combination of redeveloping existing (and in some cases life-expired) infrastructure and using existing port lands at higher utilisation levels.

Beyond this, and to maximise the operational efficiency of the Port, many of the new berths proposed in the ABR Project have been designed to be multipurpose to cater for the needs of a range of ship and cargo types.

[1] http://www.dublinport.ie/fileadmin/user_upload/documents/Franchise_Review_Consultation_Document_-_3rd_February_2014.pdf

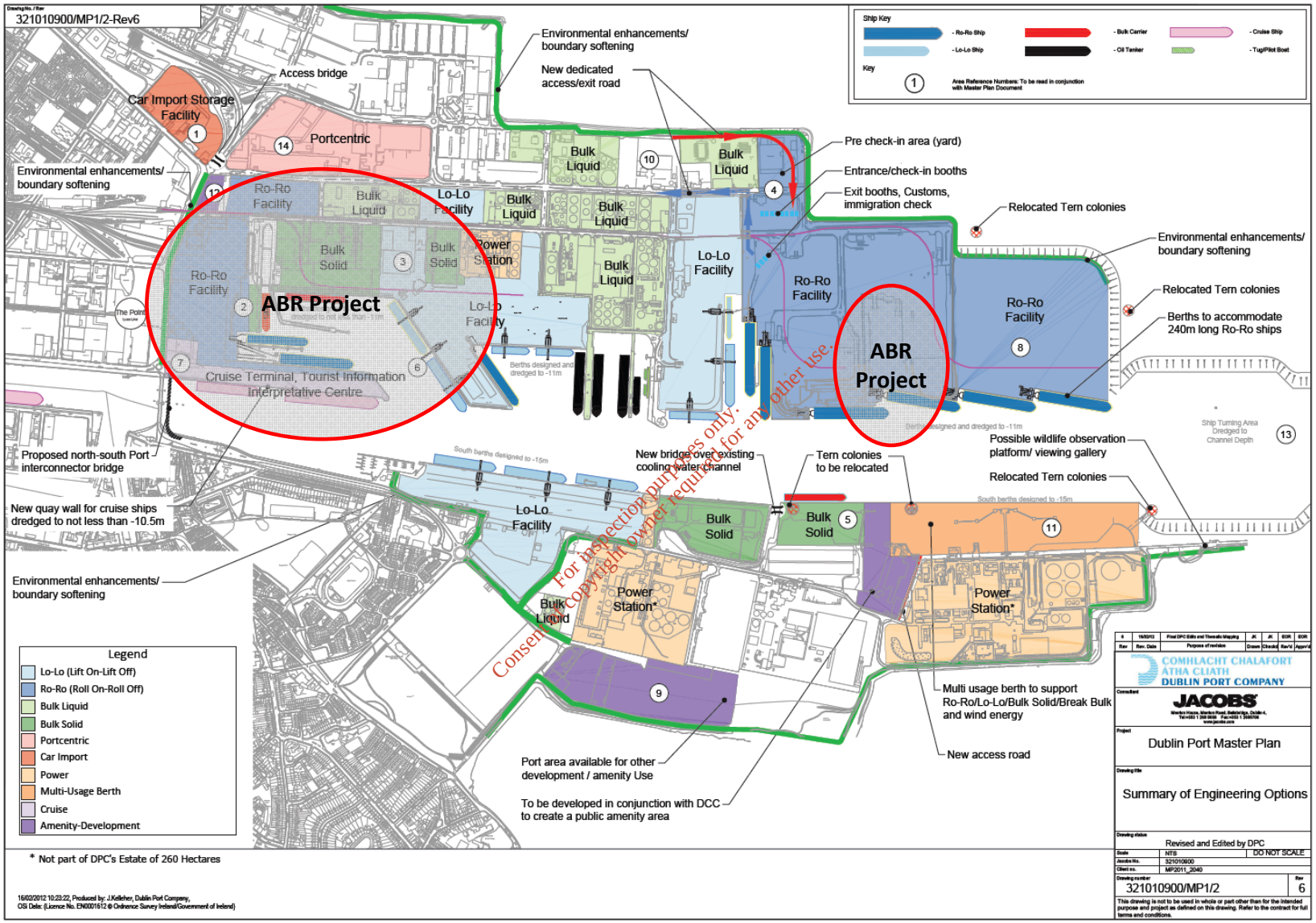


Figure 1.1 ABR Project in the context of DPC's Masterplan 2012 to 2040

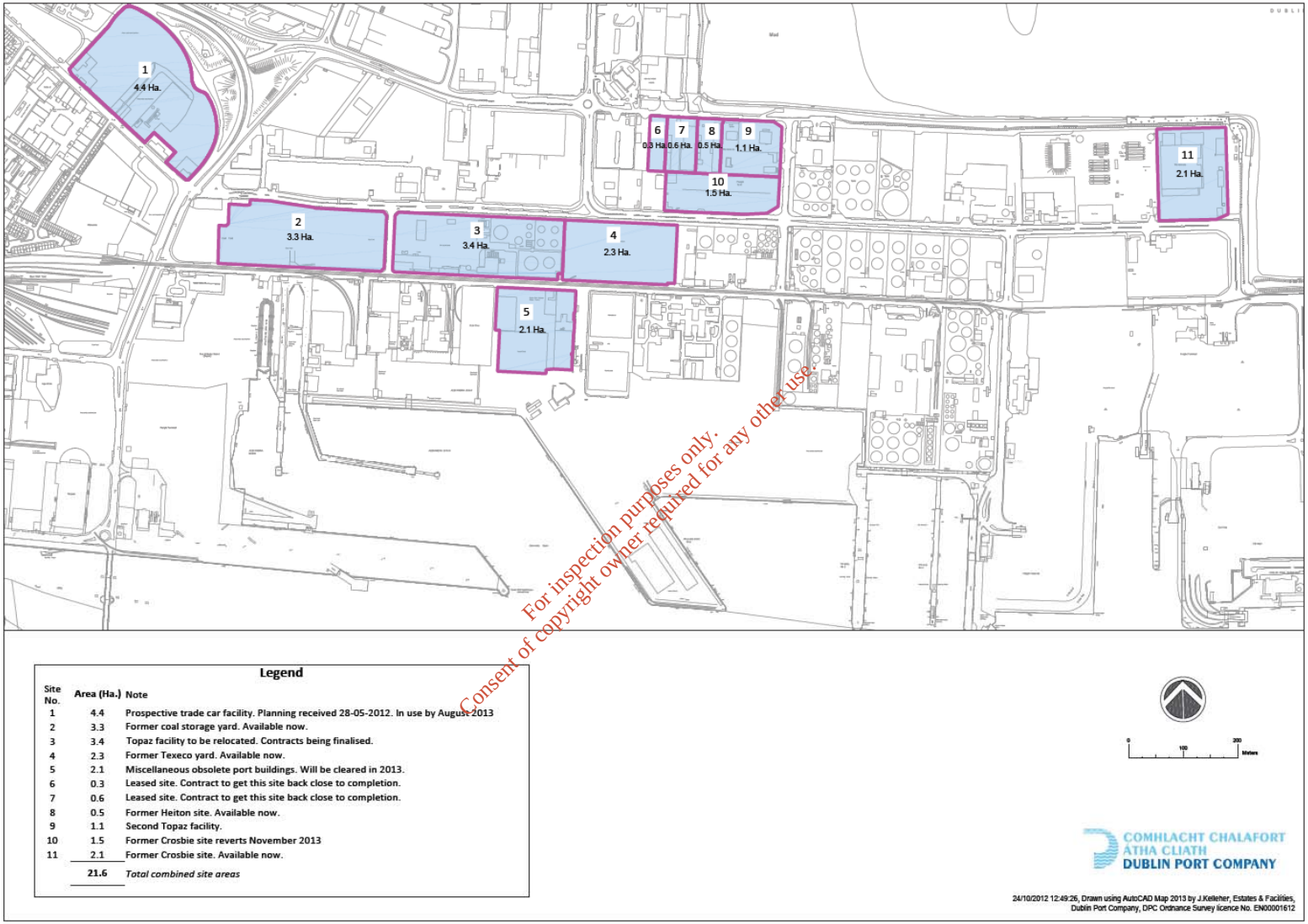


Figure 1.2 Lands re-acquired or in the process of being re-acquired by DPC

1.2.2 Why is the ABR Project Needed?

The need for the project arises for a number of reasons:

1. Dublin Port needs to make timely provision for the anticipated growth in volumes of both cargo and passengers.
2. Dublin, as the centre of national economic activity and given the regional connectivity afforded by the road and rail network, is the preferred location for the providers of shipping services to operate to and from.
3. Dublin Port needs to prepare for increases in ship sizes and the changing operational preferences of the providers of shipping services. The Port also needs to be able to cater for a large increase in the number of ship arrivals each day.
4. Dublin Port needs to re-configure port operations to best meet future capacity requirements without additional infill beyond the existing port boundaries
5. Existing infrastructure is approaching the end of its useful life and needs to be renewed / replaced.
6. Undertaking the works in Alexandra Basin West will allow DPC to take steps to address a legacy contamination issue in the basin which restricts DPC's ability to carry out routine and essential maintenance dredging operations.

1.2.3 Future-proofing the Port

The ABR Project is, to a large extent, a re-engineering of port infrastructure built between the late Victorian period and the 1960's. The engineering works proposed in the project are on berths that are currently in use. This makes the project challenging in its implementation.

Moreover, it will be built at a time of growing volumes. Having seen the Port's volumes decline by 9.5% between the peak of 2007 (30.9m gross tonnes) and 2012 (28.0m gross tonnes), volumes are beginning to increase again and are up by 3.0% to 28.8m tonnes in 2013.

DPC is, therefore, challenged to complete the proposed works before volumes grow to the extent that works cannot be carried out without disrupting the businesses of the Port's customers and damaging the wider economy.

Against this background, some of the elements of the ABR Project are intended to deal with current demand and operational requirements while also future-proofing the Port by providing the capacity to further deepen berths in future years as and when required to meet market demand.

In particular, it is planned as a key part of the ABR Project that the major disruption in port activity resulting from large civil engineering works will occur on a phased basis in a way that will not result in major disruption to the movement of cargo (both import and export) through the Port.

Figure 1.3 shows the locations of the Port's main existing berths.

Table 1.1 then summarises the changes to the working depths which the proposed development will deliver. Table 1.1 shows:

(a) The standard depth[2] of existing berths
(b) The proposed standard depth for new berths to be provided
(c) The depths to which it is proposed to dredge the new berths as part of the proposed development[3]

The extent of the proposed development is emphasised by Table 1.1 which shows that about one-third of the Port's working berths will be rebuilt as part of the proposed development.

The operational efficiency of the Port will also be enhanced by making many of the berths suitable for different types of ships and cargo. For example, it is intended that the redeveloped North Wall Quay Extension would cater for multiple uses including:

- Car transporters
- Ro-Ro vessels
- General cargo vessels
- Cruise ships (in season)
- Visiting naval
- Tall ships.

The multiple uses to which DPC puts many berths in the Port is a feature of Dublin Port and contributes to maximising the infrastructure utilisation.

[2] The standard depth is the maximum depth to which a berth can be dredged without undermining it. The actual depth available at a berth will typically decline over time before maintenance dredging is necessary to bring the working depth back towards the standard depth.

[3] The difference between the proposed standard depths of the new berths and the depths to which it is proposed to dredge these new berths provides the future proofing the Port requires to allow it handle deeper draughted ships in the years ahead.

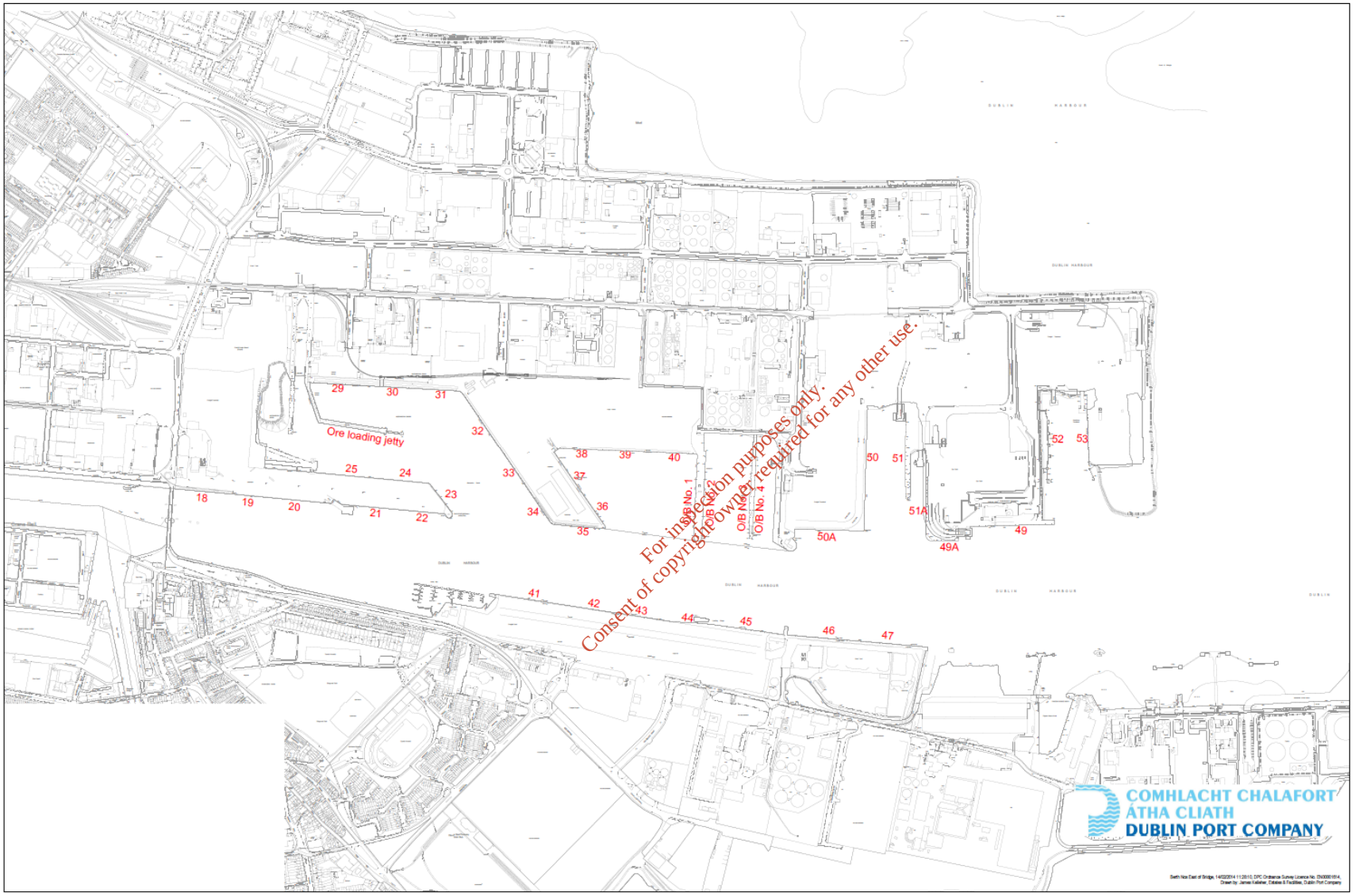


Figure 1.3 Location of Dublin Port's main existing berths

Table 1.1 A summary of the depths of Dublin Port's main berths (current, proposed and ultimate)

Berth ID's	Part of proposed development?	Location	Current standard depth	Proposed standard depth	Proposed dredged depth	Comment
			(a)	*(b)*	*(c)*	
18 to 22	**Yes**	**North Wall Quay Extension**	**6.5m**	**15.0m**	**10.0m**	**North Wall Quay Extension will be reconfigured. It will be shortened, narrowed and deepened.**
23	**Yes**	**North Wall Quay Extension**	**7.1m**	**n/a**	**n/a**	
24 to 25	**Yes**	**North Wall Quay Extension**	**7.7m**	**15.0m**	**10.0m**	
Jetty	**Yes**	**Ore loading jetty**	**9.8m**	**n/a**	**n/a**	**The ore loading jetty will be removed and replaced by a dedicated jetty for large Ro-Ro ships.**
29 to 30	**Yes**	**Alexandra Quay West**	**10.3m**	**15.0m**	**10.0m**	**Alexandra Quay West will be lengthened by expanding Berth 29 westwards.**
31	**Yes**	**Alexandra Quay West**	**9.8m**	**15.0m**	**10.0m**	
32 to 34	**Yes**	**Ocean Pier West**	**9.5m**	**15.0m**	**10.0m**	
35	**Yes**	**Ocean Pier South**	**9.5m**	**15.0m**	**10.0m**	
36 to 37	No	Alexandra Basin East	10.3m	n/a	n/a	
38 to 40	No	Alexandra Quay East	12.0m	n/a	n/a	
OB1	No	Oil berth	10.4m	n/a	n/a	
OB2	No	Oil berth	10.7m	n/a	n/a	
OB3	No	Oil berth	10.1m	n/a	n/a	
OB4	No	Oil berth	6.5m	n/a	n/a	
50	No	DFT container terminal	9.5m	n/a	n/a	
50A	No	DFT container terminal	11.0m	n/a	n/a	
51	No	Ro-Ro berth	8.0m	n/a	n/a	
51A	No	Ro-Ro berth	8.0m	n/a	n/a	

Berth ID's	Part of proposed development?	Location	Current standard depth	Proposed standard depth	Proposed dredged depth	Comment
			(a)	*(b)*	*(c)*	
49A	No	Ro-Ro berth	8.0m	n/a	n/a	
49	No	Ro-Ro berth	11.0m	n/a	n/a	
52	**Yes**	**Ro-Ro berth**	**8.0m**	**n/a**	**n/a**	**Both berths will be replaced by a single new long river berth (New Berth 52). This berths will have a Proposed Standard Depth of 15m and a Proposed Dredged Depth of 10.0m**
53	**Yes**	**Ro-Ro berth**	**5.9m**	**n/a**	**n/a**	
41	No	MTL container terminal	7.4m	n/a	n/a	
42 to 43	No	MTL container terminal	11.0m	n/a	n/a	
44	No	MTL container terminal	8.0m	n/a	n/a	
45	No	MTL container terminal	8.7m	n/a	n/a	
46 to 47	No	South Bank Quay	11.0m	n/a	n/a	
48	No	ESB oil jetty	11.0m	n/a	n/a	

1.2.4 Factors determining a port's capacity

The capacity and effectiveness of any port depend on five attributes:

1. Adequate depth and navigability of the approach channel
2. The availability of berths with sufficient depths alongside
3. The availability of back-up land and facilities for the transit storage of cargo
4. Proximity to the port's ultimate customers
5. Quality of the landside access.

In the case of Dublin Port, proximity and landside access are probably as favourable as they could be.

In the case of landside access, Dublin Port has the immediate connection through the Dublin Port Tunnel to the M50 and beyond to the national motorway network. In addition, Dublin Port has an active and busy connection to the national rail network with daily trains transporting large volumes of lead and zinc ore concentrates from Tara Mines and a daily container train service to Ballina.

Moreover, since the publication of the Masterplan 2012 to 2040, Dublin Port Company is on course to complete the assembly of 21.6 hectares of port land suitable for the transit storage of growing volumes of import and export cargo. The location of these lands is shown in Figure 1.2.

With three of the above five criteria satisfied, only the channel and berths remain outstanding and the proposed project seeks to address each of these.

The historic success of Dublin Port is founded on the efforts over centuries to provide the Port's channel, berths and land in the shallow and sandy waters of Dublin Bay. These waters are characteristic of most of the east coast of Ireland where there are no great natural harbours (such as Cork, Falmouth or Sydney) but where ports developed for the most part on the estuaries of not very big rivers.

It is a story of considerable engineering ingenuity and of the continual upgrading of old infrastructure to meet new demands. Moreover, it is a continuing story where the challenges of the past remain essentially the same today and Dublin Port Company is trying to foresee the capacity that is needed for the future and to plan and build accordingly.

The project now proposed envisages the upgrading of the port's access channel and berths to ultimately cater for a range of ships significantly larger than can currently be accommodated:

- Container ships with draughts of up to about 12.5m with capacities in excess of 3,500 TEU
- Dry bulk ships with draughts of up to 12.5m with deadweight capacities in the region of 55,000 tonnes

- Deepsea Ro-Ro ships with draughts approaching 12.0m and lengths approaching 300m
- Multipurpose (freight and passenger) Ro-Ro ferries with lengths of up to 240m
- Cruise ships with lengths of up to 340m and draughts of about 9.0m

1.2.5 Dublin Port is the Preferred Location for shippers

Dublin is the largest port both within the Republic of Ireland and on the island of Ireland as a whole, particularly in the unitised cargo modes (Ro-Ro and Lo-Lo) as shown below in Table 1.2.

Table 1.2 Overview of Ireland's Ports (2012)

	Dublin	Republic of Ireland	Northern Ireland	Island of Ireland
Population		4.6m	1.8m	6.4m
Ports		19	5	24
Port tonnes[4]	19.9m	47.6m	23.6m	71.2m
Ro-Ro units	718,377	833,791	748,000	1,581,791
Lo-Lo TEU	526,738	732,316	231,000	963,316

Dublin's large market share arises due to three factors:

- The large population in the hinterland (1.8m in the Greater Dublin Area)
- The port's location at the hub of the national road and rail networks
- The proximity of the Port to the west coast UK ports of Holyhead (133km), Liverpool (250km) and Milford Haven (227 km)

These factors have led to Dublin's share of port traffic increasing far faster than that of other ports in the Republic of Ireland in the 22 years from 1990 as shown in Figure 1.4. and in Table 1.3.

[4] The tonnes shown here are net tonnes as reported by the CSO and UK's Department for Transport

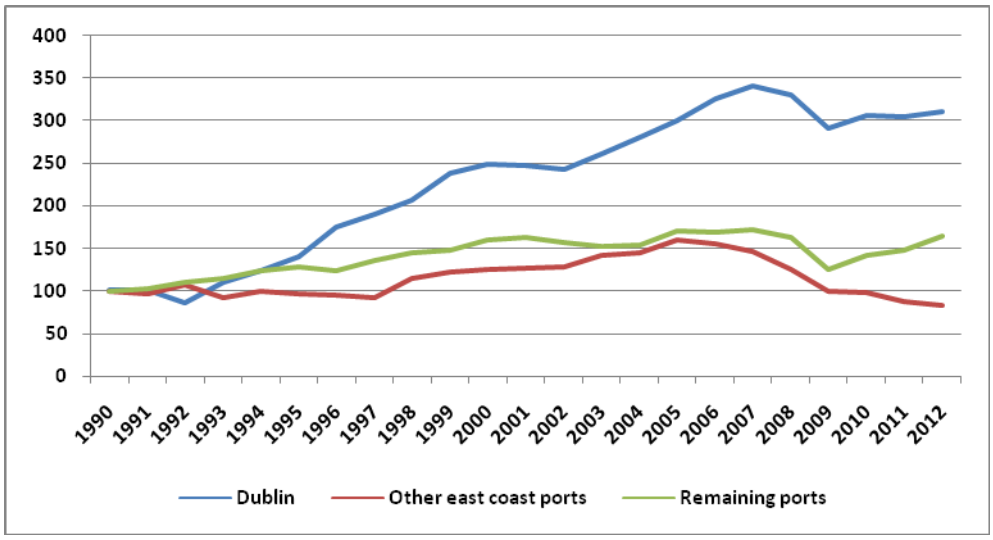


Figure 1.4 Trends in Port Tonnages, 1990 - 2012

While other ports on the East coast of Ireland[5] have seen their volumes decline by -0.8% per annum on average, Dublin has grown by 5.3%.

Moreover, Dublin's growth rate is more than twice that of other Irish ports on the south and west coasts[6] which have had growth of 2.3% since 1990.

Table 1.3 Growth rates in Ports in the Republic of Ireland, 1990 - 2012

	AAGR 1990 to 2012
Dublin	5.3%
Other east coast ports	-0.8%
Remaining ports	2.3%

[5] Greenore, Dundalk, Drogheda, Dun Laoghaire, Wicklow, Arklow, New Ross, Rosslare, Waterford

[6] Cork, Youghal, Bantry, Castletownbere, Kinsale, Fenit, Shannon Foynes, Kilrush, Galway, Sligo, Killybegs

1.2.6 Cargo Volumes and Dublin Port's Masterplan

There has been a long term trend of relentless growth in Dublin Port's volumes. Table 1.4 summarises past trends and projected future trends over the 90 years from 1950 to 2040.

In the 30 years to 1980, the volume of goods handled in Dublin Port increased at an average rate of 3.2% per annum.

In the following 30 years to 2010, the level of growth increased to 4.6%.

Trading patterns in Dublin Port, supported by economic analysis carried out for DPC, indicates that growth will continue in the future albeit at a lower long-term rate. In particular, DPC believes that a rate of 2.5% per annum in the 30 years to 2040 is realistically achievable.

Table 1.4 Dublin Port's long-term growth rates, 1950 – 2040

	Gross tonnes[7]	AAGR[8]
1950	2,856	-
1980	7,300	3.2%
2010	28,879	4.6%
2040	60,000	2.5%

It is believed that growth will not be the same across all modes but that some modes will grow more strongly than others. In Dublin Port Company's Masterplan it is envisaged (and supported by expert analysis) that the average annual growth of 2.5% would be spread across the different cargo modes as shown in Table 1.5.

[7] These figures are '000 gross tonnes and are five year rolling averages. Gross tonnes includes the weight of goods, their immediate packaging and (for the unitised modes) the tare weight of containers and freight trailers. Gross weight is derived from ships manifests and differs from the weight of goods shown by the CSO in its statistics. CSO tonnages for the unitised modes do not include the tare weights of containers and freight trailers.

[8] Average Annual Growth Rate

Table 1.5 Masterplan growth predictions 2010 - 2040

'000 gross tonnes (five year rolling average)	2010	2040	AAGR
Ro-Ro	16,403	41,920	3.2%
Lo-Lo	6,317	10,480	1.7%
Bulk Liquid	4,009	4,000	0.0%
Bulk Solid	2,054	3,500	1.8%
Break Bulk	96	100	0.1%
Total tonnes	**28,879**	**60,000**	**2.5%**
Unitised	***22,720***	***52,400***	***2.8%***
Non-unitised	***6,159***	***7,600***	***0.7%***

Unitised ('000 units)	2010	2040	AAGR
Ro-Ro	701	1,791	3.2%
Lo-Lo	377	625	1.7%
Totals	**1,078**	**2,416**	**2.7%**

Lo-Lo ('000 TEU)	2010	2040	AAGR
Lo-Lo	641	1,063	1.7%

In particular, DPC believes that the port's unitised business (Ro-Ro and Lo-Lo) will grow at a faster rate (2.8%) than its non-unitised business, primarily bulk liquid and bulk solid commodities (0.7%).

As a result of this differential, unitised cargoes will account for 87.3% of total cargo by 2040 compared to 78.7% in 2010.

Moreover, within the unitised category, DPC believes that Ro-Ro will grow faster (3.2%) than Lo-Lo (1.7%).

1.2.7 Reasonableness of DPC's volume projections to 2040

The underlying justification for the proposed project is the requirement for DPC to cater for future growth in cargo volumes through Dublin Port. In this section, the continuing reasonableness of the Masterplan's long-term growth assumptions is assessed by reference to a number of factors:

- Trends in the early years of the Masterplan
- Impact of the recession in the early years of the Masterplan's 30 year planning period
- Comparison with growth trends in the years since 1990
- The long-term relationship between cargo volumes and economic growth
- The comparison of projected cargo volumes with population growth projections

- The impact of actual growth being different in future years to that assumed in the Masterplan

Trends in recent Years

The early years of the Masterplan's 30 year period coincided with the collapse in the economy since 2007. The effect of this on Dublin Port's volumes in each year since 2007 is shown below in Figure 1.5.

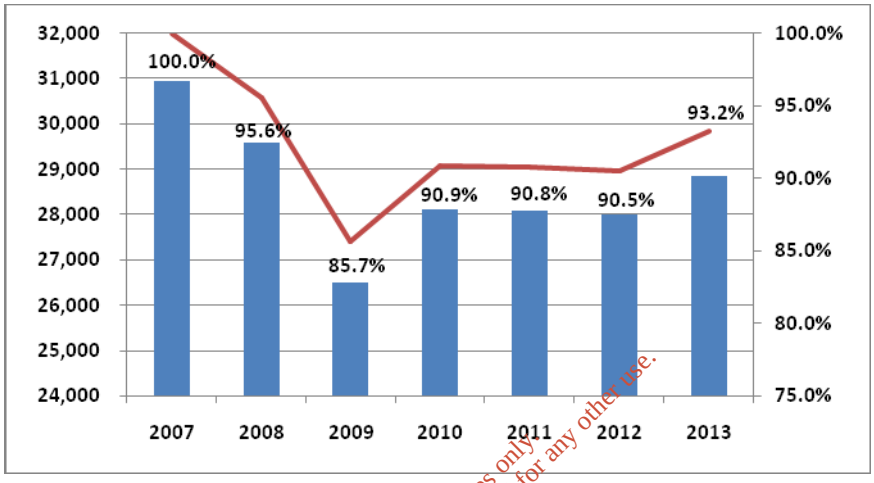


Figure 1.5 Trends in port volumes ('000 tonnes) 2007 t0 2013

The growth in the first three years of the Masterplan has lagged behind the 2.5% assumed average annual growth rate.

However, against a background of the port having achieved growth of 3.0% in 2013 even in advance of any significant economic recovery, DPC believes that the long-term 2.5% growth rate to 2040 remains a reasonable basis for future planning.

Based on the above recent trends shown in Figure 1.5, it is clear that the Masterplan's assumed growth level of 2.5% has not been attained in the early years of the projection period from 2010 to 2040. Table 1.6 indicates that volumes today are in the region of 3.2m gross tonnes behind where the Masterplan had projected them to be.

Table 1.6 Masterplan projections compared to actual cargo levels 2010 to 2013 *('000 gross tonnes, five year rolling averages)*

Year	Masterplan	Actual	Difference
2010	28,879	28,879	-
2011	29,601	28,645	- 956
2012	30,341	28,057	- 2,284
2013	31,100	27,913	- 3,187

However, given the +3.0% growth seen in 2013, DPC believes it likely that the slow start since 2010 could be quickly made up by faster growth.

In particular, an average growth rate of 3.6% would bring actual volumes into line with the Masterplan's assumed level within a decade. This is not a high level by comparison to long run historical growth levels in the 30 years to 2010 or by comparison with the one year growth level seen in 2013.

On the other hand, if average growth ran at 2.9% over the longer period to 2040, then the target of 60.0m tonnes by 2040 would still be met.

Based on the above considerations, DPC remains convinced that the Masterplan's growth assumptions are a reasonable and prudent basis for planning the Port's future capacity requirements.

Comparison of Masterplan growth rates with trends since 1990

The Masterplan growth rates shown in Table 1.5 are realistically achievable by comparison with actual growth rates seen in Dublin Port over the past two decades as shown below in Table 1.7 for the period from 1990 to 2013.

By comparison with the Masterplan assumed growth rate of 2.5% between 2010 and 2040, the actual growth rate between 1990 and 2013 was much higher at 5.9%.

Table 1.7 Average annual growth rates by mode 1990 to 2013

Mode	AAGR 1990 to 2013
Ro-Ro	9.2%
Lo-Lo	4.1%
Bulk Liquid	2.4%
Bulk Solid	3.4%
Break Bulk	-7.5%
Overall	**5.9%**

Cargo volumes and economic growth

There has been a strong relationship between economic growth and Dublin Port's volumes over the years as shown in Figure 1.6. In particular, over the long run, port volumes have increased at 1.36 times the rate of economic growth.

Between 1990 and 2012, Dublin Port's volume increased at an average rate of 6.1%. Over the same period GDP increased at 4.5% as shown below in Figure 1.6.

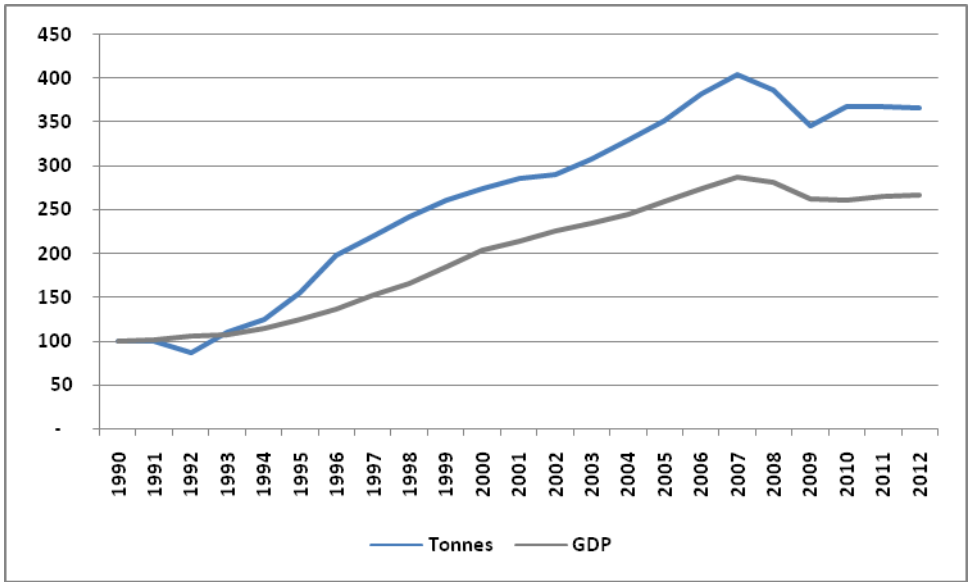


Figure 1.6 Trends in Dublin Port gross tonnage and GDP[9], 1990 to 2012

Having come through a five year period since 2007 during which GDP declined by an average of 1.5% per annum (and Dublin Port's volumes by 2.0%), Dublin Port's volumes returned to growth (3.0%) during 2013.

DPC believes that a return to economic growth will drive a corresponding increase in port volumes.

Were the long run relationship between Dublin Port's volumes and GDP to continue, average economic growth of 1.8% would be sufficient to generate port volume increases of 2.5% per annum.

Cargo volumes and population growth

Economic growth is, in part, a function of population growth and, as well as a strong relationship with GDP, there has also been a strong correlation between population and Dublin Port's volumes.

This is shown in Table 1.8 for the period from 1951 to 2011. The table also shows recently published CSO[10] population projections[11] to 2046 with port volumes extrapolated.

[9] Constant GDP at 2011 values

[10] http://www.cso.ie/en/media/csoie/releasespublications/documents/population/2013/poplabfor2016_2046.pdf

[11] The CSO's projections are based on three different assumed levels of migration and two different assumed levels of fertility. These yield six different scenarios. The scenario used in this paper is the M2F2 scenario which envisages a return to a small net inward migration by 2016 combined with a decline of fertility rates in Ireland to European levels by 2026.

If this relationship were to continue over the period of the CSO's population projections to 2046, then we would expect to see Dublin Port's tonnage reaching a level of 60.9m tonnes by 2041 and 66.6m tonnes by 2046.

Table 1.8 Trends in Dublin Port tonnage and population, 1951 to 2011 and extrapolated to 2046

	Year	Population	Tonnage (5-year rolling average)
Historical	1951	3.0 m	3.2 m
	1956	2.9 m	3.3 m
	1961	2.8 m	3.2 m
	1966	2.9 m	4.2 m
	1971	3.0 m	5.5 m
	1979	3.4 m	6.9 m
	1981	3.4 m	7.5 m
	1986	3.5 m	6.9 m
	1991	3.5 m	7.3 m
	1996	3.6 m	10.4 m
	2002	3.9 m	20.7 m
	2006	4.2 m	25.5 m
	2011	4.6 m	28.7 m
Projected	2016	4.7 m	34.0 m
	2021	4.9 m	39.6 m
	2026	5.0 m	44.9 m
	2031	5.2 m	49.8 m
	2036	5.3 m	55.2 m
	2041	5.5 m	60.9 m
	2046	5.6 m	66.6 m

This projection to 2041 of 60.9m tonnes is very much in line with DPC's Masterplan assumption of 60.0m tonnes by 2040 and supports a conclusion that Dublin Port's volumes will grow in the years ahead beyond the current capacity limits within which Dublin Port is operating at present.

The ABR Project is being brought forward at this time to ensure that the Port is optimally configured to accommodate this growth.

What if the future projections are wrong?

The history of recent decades has shown that accurately projecting economic growth in the short term is very difficult. Accurately projecting economic growth over decades is all but impossible.

The same applies for projecting port volumes[12].

Given the strong link between economic growth and Dublin Port's volumes there is, therefore, a very real likelihood that the volume scenario DPC has developed to 2040 will either be too conservative or too optimistic. On balance, DPC believe that it is more likely that volumes will be greater than projected rather than less. However, DPC simply does not know with any degree of certainty.

DPC's approach to dealing with this uncertainty is core within the Masterplan.

In the event that volumes grow faster than projected, DPC will seek to bring engineering options forward for planning and other consents sooner rather than later.

On the other hand, if growth is more sluggish than projected, projects will be brought forward later rather than sooner.

As regards the timing and scope of the ABR Project, DPC believes that the project is probably marginally on the late side in relation to the likely growth levels over the next five to ten years.

1.2.8 Passenger and Cruise Volumes

Beyond cargo volumes, DPC believes that Dublin Port's cruise business will grow considerably. In particular, DPC is confident that Dublin City has the potential to attract significantly more cruise visitors.

Dublin Port's cruise ship and passenger volumes have increased dramatically over the past decade as shown in Figure 1.7.

[12] Probably the best example of this comes from the Dublin Transport Initiative report of 1995 which projected that Dublin Port's volumes would reach 10.7m tonnes by 2011. However, by 2000, the volume through the port had already reached 21.0m gross tonnes. (See Page 14 of *A Platform for Change* published by The Dublin Transportation Office in November 2001).

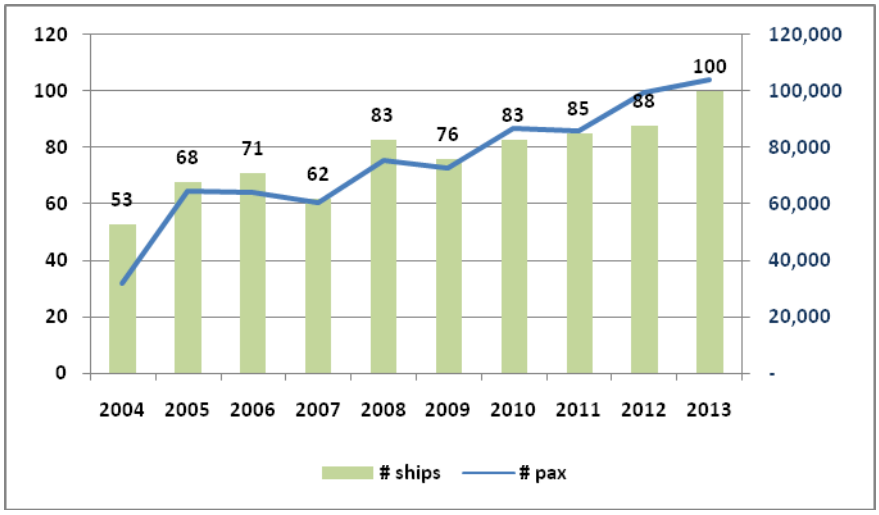


Figure 1.7 Trends in Dublin Port's cruise business 2004 to 2012

DPC believes that cruise passenger volumes will continue to increase substantially based on projections of potential shown below in Figure 1.8 (passenger numbers) and Figure 1.9 (number of cruise ships)[13]. This is because Dublin Port is the preferred location for cruise vessels to visit, not just in terms of the Port's capacity to accommodate large vessels, but also given the proximity to the City Centre.

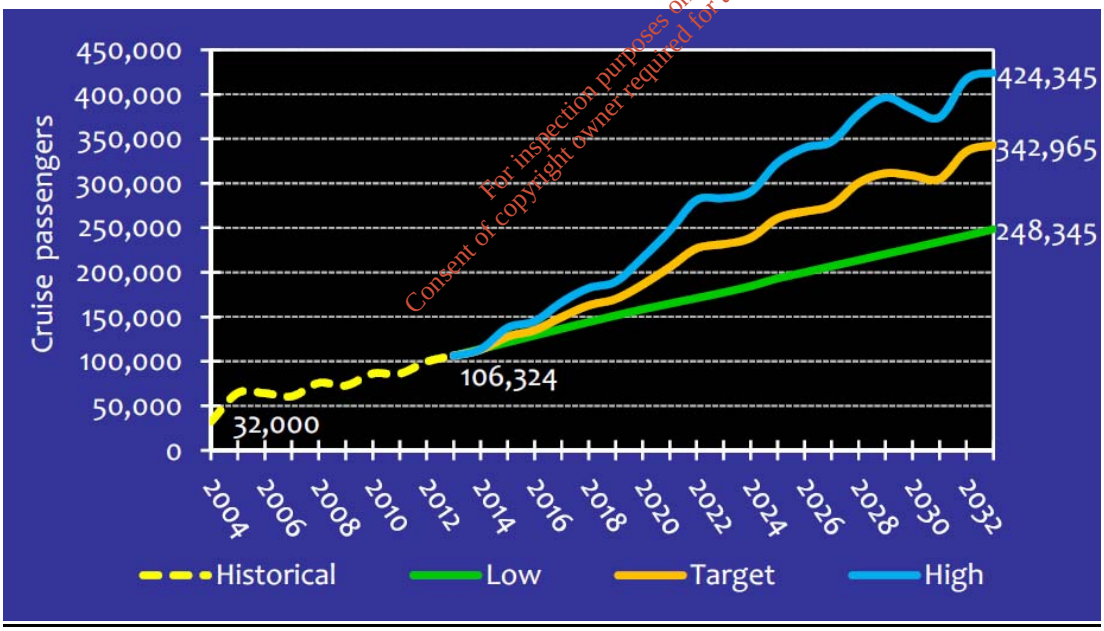


Figure 1.8 Projections of cruise passenger numbers to 2032

[13] These projections were prepared for Dublin Port Company in June 2012 by international consultants Bermello Ajamil & Partners.

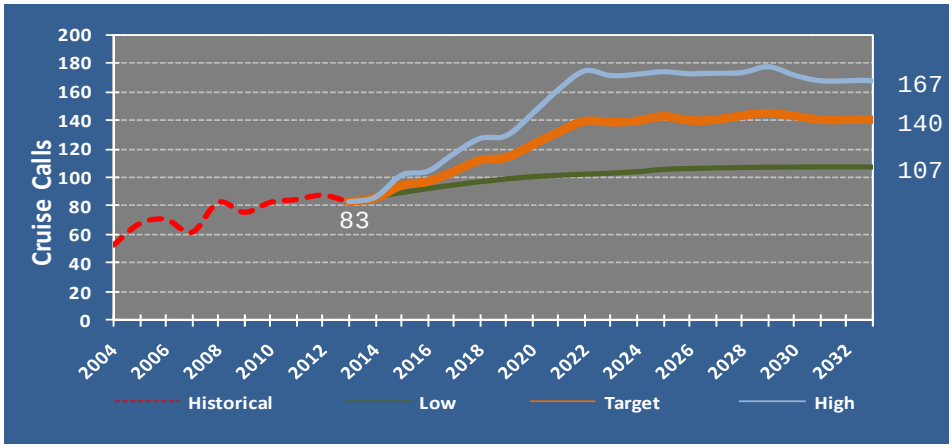


Figure 1.9 Projections of cruise ship numbers to 2032

1.2.9 The Tidal and Depth Constraints

The primary constraint in Dublin Port is the maintained depth of the channel. This is currently -7.8m by reference to Chart Datum[14].

This depth was achieved over a considerable period dating back nearly 200 years to 1818 when the construction of the North Bull Wall was commenced. The progression of the deepening of the Port's channel is shown in Figure 1.10.

The motivation for the construction of the North Bull Wall was to build on the benefits which the Great South Wall had already delivered (in holding back the movement of sand from the South Bull) by inducing a tidal scour of the shipping channel which would cause it to deepen over time.

The wall was completed in stages up to 1824 and had the intended effect of deepening the channel and bar as a result of the induced tidal scour. Within 50 years, the depth available at low water more than doubled from 2.0m to almost 5.0m.

The next significant development occurred in 1904 when Dublin Port & Docks Board acquired a suction dredger (the *Sandpiper*) which, by 1909 had further deepened the bar to 6.0m.

[14] Chart Datum is 0.2m above Ordinance Datum (Poolbeg). From this point onwards in this document, where figures for berth depths or channel depths are quoted they should be understood to be expressed in metres below Chart Datum.

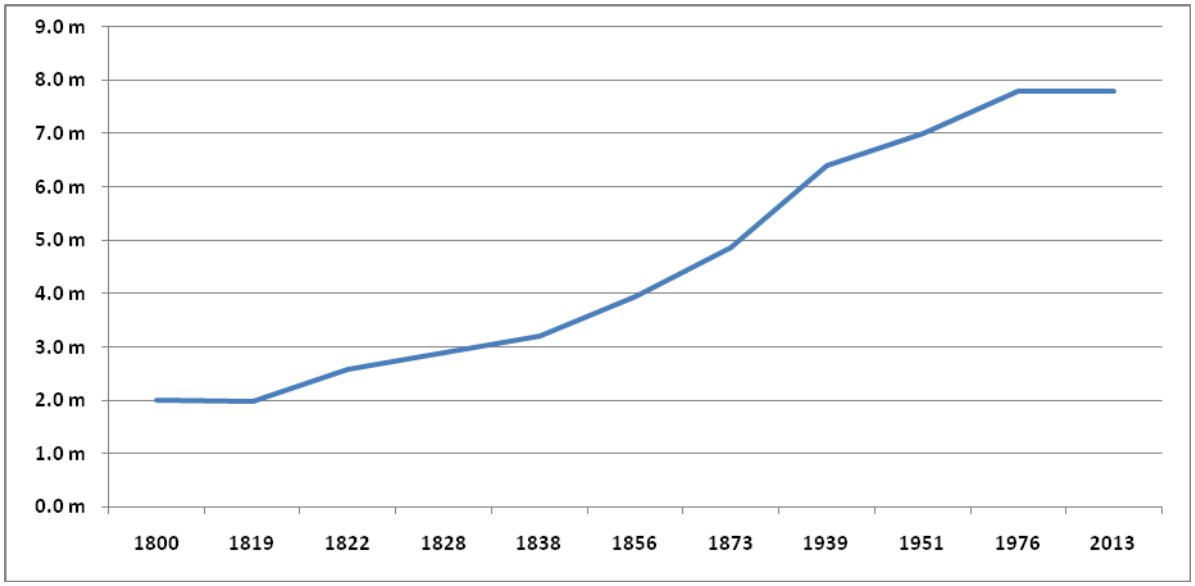


Figure 1.10 Indicative progression of the deepening of the bar and channel in Dublin Port since 1800

With a channel depth today of -7.8m CD, the depth available across the annual phases of the tides varies between two extremes:

- The Highest Astronomical Tide (HAT) expected in Dublin Port is 4.5m CD (implying a depth of water in the approach channel and fairway of 12.3m).
- The Lowest Astronomical Tide (LAT) is -0.1m CD giving 7.7m of water[15].

Between these two extremes, the depth of water is best described by reference to the mean levels of spring tides and neap tides.

Table 1.9 indicates that the current channel depth of -7.8m CD allows Dublin Port accept ships with draughts of up to **10.2m** on most days in the year but within a tidal window.

Ships with draughts of up to **7.5m** can enter the port without tidal restriction on most days over the course of the year. In practice, the maximum draught for ships operating daily fixed time schedules (notably Ro-Ro ferry companies who account for 50% of Dublin Port's volume) is **6.8m**.

[15] HAT and LAT are the highest and lowest tides which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions

Table 1.9 Draught handling capabilities at different channel depths

Current maintained depth: -7.8m CD	Mean high water	Channel depth	Max draught*		Mean low water	Channel depth	Max draught*
Spring tides	4.1m CD	11.9m	10.9m		0.7m CD	8.5m	**7.5m**
Neap tides	3.4m CD	11.2m	**10.2m**		1.4m CD	9.2m	8.2m

Proposed maintained depth: -10.0m CD	Mean high water	Channel depth	Max draught		Mean low water	Channel depth	Max draught
Spring tides	4.1m CD	14.1m	13.1m		0.7m CD	10.7m	**9.7m**
Neap tides	3.4m CD	13.4m	**12.4m**		1.4m CD	11.4m	10.4m

* Assumes an under keel clearance of 1.0m

The proposed increase in channel depth would increase the maximum draught of ship on most days during the year to 12.4m (with a tidal restriction)[16].

It would also allow ships with draughts of up to 9.7m enter the port at any stage of the tide on most days of the year (with no tidal restriction). In practice, a channel of -10.0m CD would allow ships with draughts of up to 9.0m to enter the Port on every day of the year.

1.2.10 The average cargo load in Dublin is increasing

The average size of a ship's cargo in Dublin Port has consistently increased over the years. Table 1.10 below shows the average cargo (discharged and loaded) per ship arrival in each cargo mode for the period from 1990 to 2013.

Table 1.10 Trends in average cargo sizes by mode, 1990 to 2013

Mode	Unit of measurement	1990	2013	Change
Ro-Ro	Units per ship	69	160	x 2.3
Lo-Lo	TEU per ship	197	538	x 2.7
Bulk Liquid	Tonnes per ship	3,759	8,443	x 2.2
Bulk Solid	Tonnes per ship	3,167	5,720	x 1.8
Break Bulk	Tonnes per ship	1,580	1,520	x 1.0

[16] Utilisation of this maximum draught capacity would require deepening of berths in future years below the levels envisaged in this current project. However, the berths to be built as part of the ABR Project would be designed to allow this local dredging to be carried out as and when required.

In the case of Ro-Ro, the average cargo interchanged (i.e. discharged and loaded) per ship has increased by 230% in 23 years.

However, there has been an even larger increase of 270% in Lo-Lo (container) shipments.

The increasing cargo loads has been facilitated by a gradual increase in ship size.

1.2.11 The sizes of ships are increasing

The size of ships is increasing worldwide and the largest ships in specific categories have reached extraordinary sizes in recent years as shown in Table 1.11.

Table 1.11 A selection of large ship characteristics in various modes

Name	Category	Year	Capacity	Length	Breadth	Draught
Stena Hollandica	Ro-Ro	2010	5,500 lane-metres 1,376 passengers	240m	32.0m	6.5m
Maersk McKinlay Moller	Lo-Lo	2013	194,153 DWT 18,000 TEU	399m	59.0m	16.0m
Vale Korea	Bulk solid	2013	400,000 DWT	362m	65.0m	23.0m
TI Oceania	Bulk liquid	2003	441,585 DWT	380m	68.0m	24.5m
Oasis of the Seas	Cruise liner	2009	Berths 6,360 Crew 2,165	361m	47.0m	9.3m

Whereas Dublin Port might aspire to accommodate the largest Ro-Ro and cruise ships, it is inconceivable that the port would seek to handle the largest ships in other modes.

It is necessary, therefore, for Dublin Port Company to take a view on the reasonable maximum size ship which the Port should cater for in the coming decades particularly in the Lo-Lo and bulk solid modes.

1.2.12 The size of ships Dublin Port needs to cater for in the future

The trend in cargo size and ship size across all modes is inexorably upward and DPC believes that in order to maintain national competiveness and operational efficiencies Dublin Port needs to plan now for the provision of infrastructure to cater for larger ships. The need is different across the modes as discussed below.

Container ships

The maximum size of container ship which can currently be handled in Dublin is limited by a combination of constraints (including berth depths and channel depth) to give a practical maximum draught in the region of 9.0m. In practice, the maximum size of container ship which has called to the Port in recent years is in the order of 1,400 TEU.

As the size of container ships increases at the top end to 18,000 TEU, it is inevitable that there will be a cascading downwards of what were once ocean-going container ships into the short sea sector (including Ireland to Continental Europe). DPC believes that Dublin Port needs to be able to cater in the future for container ships with a nominal capacity up to about of 3,500 TEU.

Table 1.12 shows an analysis of the distribution of ship lengths and ship draughts for 2,726 ships in the range 1,000 TEU to 3,500 TEU. It is clear from this analysis that ship length will not be an issue for container ships but the project will need to provide deeper water in the approach channel if Dublin Port is going to handle container ships up to 3,500 TEU.

Table 1.12 Distribution of container ship lengths and draughts in the range 1,000 TEU to 3,500 TEU[17]

Length	# ships		Draught	# ships	Cumulative %
100m	11		8.0m	100	3.7%
150m	327		9.0m	460	20.5%
200m	1,620		10.0m	574	41.6%
250m	737		11.0m	545	61.6%
300m	31		12.0m	829	92.0%
			12.4m	**111**	**96.1%**
			13.0m	76	98.9%
			14.0m	31	100.0%
	2,726			**2,726**	

The proposed increase in channel depth would allow 96.1% of ships with TEU capacities in the range 1,000 to 3,500 TEU to enter the Port.

Looking at ranges of TEU size in Table 1.13, the proposed increased channel depth would allow Dublin Port to accept 91.5% of ships in the capacity range 2,001 TEU to 3,000 TEU and 86.9% of ships in the range to 3,500 TEU.

[17] Based on data extracted from Sea-Web™ database (www.sea-web.com)

Table 1.13 Container ship draughts in the range 1,000 TEU to 3,500 TEU

TEU range	No. ships with draught ≤ 12.4m	%	No. ships with draught > 12.4m	Totals
1,000 to 2,000	1,747	99.0%	18	1,765
2,001 to 3,000	733	91.5%	68	801
3,001 to 3,500	139	86.9%	21	160
Totals	**2,619**	**96.1%**	**107**	**2,726**

These percentages relate to maximum draught. On many occasions ships will operate at less than full draught and in reality, therefore, the percentage of ships in each category which could access Dublin Port would be even higher than indicated above.

Dry bulk

Ships in the dry bulk category vary greatly in size. In Dublin Port, dry bulk shipments vary from about 3,000 tonnes up to about 25,000 tonnes.

Dublin Port has a growing trade in bulk commodities in the larger size of bulk carriers. These commodities include animal feed and increasingly biomass. Cargo parcels shipped into Dublin are limited to a maximum size in the order of 25,000 tonnes due to the channel depth constraint.

A deepening of the channel as proposed will greatly increase the number of bulk carriers which can access Dublin Port and will enable larger shipments to be received.

Deepsea Ro-Ro

There is a category of Ro-Ro ships with the capability to also take containers on deck which has started to call to Dublin Port in recent years.

This category includes deep-sea ships which typically have draughts in the range 9.6m to 11.6m and lengths in excess of 200m. Dublin Port anticipates there being increased demand from ships in this category.

Multipurpose Ro-Ro

The largest part of Dublin Port's tonnage is Ro-Ro, mostly on multipurpose passenger / freight ferries. Such ships are neither particularly long nor deep draughted. The larger ships are now, however, at lengths (240m) which the berths in Dublin Port cannot accommodate.

A key element of the proposed project is, therefore, to provide two berths (one new berth and the other by way of an extension to Berth 49) with double-tiered loading ramps which can accommodate these longer multipurpose Ro-Ro ferries.

Cruise ships

In the case of cruise ships, on the other hand, the proposed channel depth would allow virtually all cruise ships to enter the Port at any stage of the tides as shown by the analysis of 556 cruise ships in Table 1.14. This analysis mirrors that shown previously in Table 1.12 for containers ships.

Table 1.14 Distribution of cruise ship lengths and draughts[18]

Length	# ships		Draught	# ships
100m	234		8.0m	451
150m	63		9.0m	99
200m	61		10.0m	4
250m	51		11.0m	1
300m	112		12.0m	1
350m	32			
400m	3			
	556			**556**

The primary limitation in Dublin Port is ship length and the maximum size of ship which can be accommodated currently is 300m. Given the potential for large growth of Dublin Port's cruise business, the proposed project will provide for longer ships to allow this potential to be realised and the great majority of the world's fleet of cruise ships would be able to access new berths in Dublin Port.

1.2.13 Ship number projections

Increased cargo volumes imply increased ship numbers.

However, as ships get bigger and as the average cargo per ship increases, the rate of increase in the number of ships calling to Dublin Port will be lower than the rate of increase in cargo tonnes.

DPC believes that average cargo volumes in each mode will continue to increase over the period of the Masterplan, albeit at a lower rate than seen in the period 1990 to 2013. Table 1.15 summarises the assumed levels of increase in the years to 2040.

[18] Based on data extracted from Sea-Web™ database (www.sea-web.com)

Table 1.15 Assumed increase in average cargo volume per ship 2013 to 2040

	2013 to 2040
Ro-Ro	25%
Lo-Lo	100%
Bulk Liquid	20%
Bulk Solid	50%
Break Bulk	10%

The above increases over the period 2013 to 2040 are conservatively less than those shown previously for the period 1990 to 2013. Based on these assumptions, Table 1.16 shows the number of ship arrivals for 2013 and the projected numbers for 2040 by mode.

Table 1.16 Trend in ship arrivals[19] from 2013 to 2040

	2013	2040	2013	2040
	# ships per year		# ships per day	
Ro-Ro	4,928	9,696	14	27
Lo-Lo	1,101	1,066	3	3
Bulk Liquid	445	403	1	1
Bulk Solid	338	464	1	1
Break Bulk	39	50	0	0
Cruise	87	160	0	0
Other	118	200	0	1
Total	7,055	12,038	19	33

The above analysis suggests that the projected 115% increase in cargo in the years to 2040 (from 28.9m to 60.0m tonnes as shown in Table 1.5) will result in a 71% increase in ship numbers.

The largest part of Dublin Port's business is Ro-Ro and, within this mode, 85% of the volume is on ships operating on fixed daily schedules to UK west coast ports. These ships operate with guaranteed slot times which are grouped in various windows over the course of a day. These windows amount to five hours.

[19] Five year rolling averages

By 2040, the projected increase in Ro-Ro volumes will likely increase these guaranteed Ro-Ro windows to ten hours over the course of the day to accommodate 8,242 arrivals (being 85% of 9,696 Ro-Ro arrivals) over the course of a year.

This would leave 14 hours per day available for the remaining 3,797 arrivals an increasing number of which would be deep-draughted.

In these circumstances it would be difficult at times for deep draughted ships (deep even by today's standards) to enter the port without significant delays while they wait for sufficiently high water at times when UK Ro-Ro ferry movements are not being prioritised.

Aside from the requirement to be able to handle deeper draughted ships than can be handled today, the increasing tidal window restrictions described above is an important motivator for the proposed channel deepening.

1.2.14 Dublin Port needs to configure port operations to best meet future capacity requirements without additional infill beyond the existing port

All of Dublin Port's current estate was developed on land reclaimed from the sea.

For many years this was achieved on the basis of Ministerial approved Harbour Works Orders. The last significant such order was S.I. No. 24 / 1988 which authorised works in Alexandra Basin.

Since 1988, the only application Dublin Port has made to expand the footprint of the Port was the proposed infilling of 21 hectares to the east of the port. The proposed project would have created additional berths for both Ro-Ro and Lo-Lo. Permission was ultimately refused by An Bord Pleanála in June 2010 (29N.PA0007).

Subsequent to this refusal, the focus of DPC has shifted to development of the Port's existing estate including lands over which it has been possible for the Company to regain control. This shift of focus is central to its Masterplan 2012 to 2040.

DPC's efforts to regain control over port lands have been greatly facilitated by the economic collapse since 2007 which has eliminated speculation on the redevelopment of port lands for non-port uses. As a result, DPC has land available to provide transit storage for cargo in proximity to the proposed works in this project.

1.2.15 Existing Infrastructure needs to be renewed

It is proposed to build or rebuild 2,700m of berths. Part of the need for this arises due to the age and condition of 1,200m of existing berths as follows:

- The 230m bulk jetty in Alexandra Basin West was completed in 1967 and is now 47 years old. Over its life it has been used for the handling of fertilisers (Gouldings 1967 to 1976), coal (the National Coal Company to 1984) and lead and zinc ore concentrates (Tara Mines since 1977). Repairs were to the jetty were completed in March 2007 to give it an additional ten years or so of useful life.

- Ocean Pier was constructed between 1940 and 1954 and is now 60 years old. It is in poor condition. In particular, Berths 32 to 35 on Ocean Pier are not suitable for planned future uses, particularly for container handling. These berths are part of a wider run of berths from 29 to 40 which are approaching the end of their useful lives. To date, 38 to 40 have been rebuilt and the proposed rebuilding of 29 to 35 within this project will largely complete the necessary capital refurbishment of Alexandra Quay West (29 to 31), Ocean Pier (32 to 37) and Alexandra Quay East (38 to 40).

- The construction of North Wall Quay Extension to provide river berths with depths of 6.5m and berths on the north side of the wall (in what is now Alexandra Basin) of 7.7m was commenced in 1871 by Bindon Blood Stoney. These were the deep berths of the time and followed on from the standard set by the reconstruction of Sir John Rogerson's Quay and Great Britain Quay between 1869 and 1888. These works were the first major development works undertaken by the then newly established (in 1868) Dublin Port & Docks Board. By today's standards and by reference to future requirements, these berth depths are insufficient.

1.2.16 The Legacy Contamination Issue

Alexandra Basin West is contaminated particularly with heavy metals as a result of past ship building and ship repair activities. One effect of this contamination is to limit DPC's ability to carry out essential maintenance dredging operations. For example, Berths 32 to 35 were dredged in 2005 under the terms of a Waste Permit issued by Dublin City Council. At that time 40,000m^3 of contaminated dredge spoil were removed and shipped to Germany for treatment and disposal at a cost to DPC of €4.0m.

The berths in Alexandra Basin West will become increasingly busy in the future and it is important (both operationally and financially) that DPC is able to include these berths within routine maintenance dredging campaigns.

1.2.17 Graving Dock no. 2

The new berth configuration proposed in Alexandra Basin West involves the extension of Berth 29 on Alexandra Quay West westwards in front of the entrance to Graving Dock #2. As a result, the port will lose the utility of this graving dock.

In common with many ports, the availability of ship repair facilities in Dublin Port was traditionally an important part of the Port's overall offering of infrastructure and services.

However, the operation of graving docks was always financially challenging and, while deemed to be an appropriate cost for Dublin Port & Docks Board to bear in the past, Dublin Port Company's view now is that the pressure on it to make best use of the Port's existing estate allied to the poor commercial returns from the Port's graving dock combine to make Graving Dock #2 redundant.

Graving Dock #2 dates from 1957 and, when built, was considered by Dublin Port & Docks Board to be of national importance in the wake of the Emergency during which time there had seen an increase in ship repair work in the Port. Absent this consideration, it is doubtful if

Graving Dock #2 would have been built against a background where there were already ongoing financial deficits in the operation of Graving Dock #1 (which had been built in 1860).

The poor financial performance of graving dock operations in Dublin Port continued and over the past 30 years:

- From 1994 to 1997, Graving Dock #2 was operated by Liffey Marine Limited (which went into liquidation).
- From 1998 to 2002 Harris Pye took over but this company also went into liquidation.
- In 2003 Dublin Graving Docks Limited took over the facility and are still in situ today.

At this stage, the poor financial return from Graving Dock #2 represents an underutilisation of port assets and is sufficient reason alone for DPC now to reconfigure the graving dock and its 1.4 hectare curtilage. Commercially, DPC earns about one sixth of what would be earned by an equivalent land area elsewhere in the Port close to working berths.

In addition to this, Graving Dock #2 is suffering the same fate as the original Graving Dock #1 and as ships get bigger it is able to accommodate fewer and fewer of the ships which call to the Port. The proposed deepening of the channel and berths will exacerbate this situation.

Graving Dock #2 currently handles in the region of 25 to 30 ships in a given year and, at this stage, half of the vessels arriving into the Port could not be accommodated if the need arose for repairs at short notice.

Table 1.17 Proportion of arriving ships that could enter Graving Dock #2

	# arrivals	% that could enter graving dock
2012	6,742	51.8%
2013	6,711	50.0%

The small number of ships which use graving Dock #2 can be readily accommodated in docks elsewhere in Ireland (Belfast and Cork) or on the west coast of Britain (including Liverpool and Milford Haven).

Against the above background, DPC intends to close Graving Dock #2 to allow the westward extension of Berth 29.

1.2.18 Concluding Remark

The ABR Project is justified on a number of bases ranging from the need to provide capacity for projected growth to the requirement to replace life-expired assets. The project is part of a Government-endorsed Masterplan which sets out a development strategy for the Port over the next 30 years. Given the long lead time to construct port assets and given their long economic life, the project incorporates measures to future proof the Port.

1.3 CONSIDERATION OF ALTERNATIVES

1.3.1 Introduction

Five generic options have been identified and are described in detail. These are

1. The “Do Nothing” Scenario
2. Use of other Locations within the Port Area.
3. Creation of New Additional Port Areas
4. Alternative East Coast Locations and other Port Locations on the South and West Coasts.
5. Other Locations for New Ports

These are tested as appropriate against criteria relating to:

- Size,
- Shape,
- Proximity to deep water,
- Road and rail access.
- Vessel requirements
- Landside requirements
- Environmental considerations,
- Planning considerations

The project contains two main elements the first relating to cruise vessels and the second to cargo handling with specific reference to the unitised trade. Although the berths for cruise vessels are primarily dedicated to such vessels during the cruise season they will be multi-purpose and available for other vessel types as the need arises.

1.3.2 The “Do Nothing” Scenario

Cruise Vessels

The growth in cruise liner business worldwide is notable with Dublin Port now being one of the principle ports of call for ships serving the industry in north-western Europe. 27 Cruise ships docked in Dublin Port in 1994 and c.100 visited the port in 2013. Cruise passengers are an important component of Dublin’s tourism industry and are a significant factor in maintaining the vitality of the city centre retail core and the city’s cultural attractions. Fáilte Ireland in its report entitled *Cruise Tourism in Ireland Research Report 2010* set the total expenditure in Dublin at €10.2 million and an average expenditure per passenger of €100 for that year.

The Port is also close to Dublin International Airport circa 20 minutes away and offers passengers quick access to international connections.

Better facilities for cruise liners are required to provide an attractive environment and meet the needs of the cruise companies.

Although the ships come in different sizes there is a move towards larger vessels and Dublin Port must change to accommodate them in order to maintain and grow its cruise business

with all the economic advantages it brings to the City. It is not considered that it is an option to 'do nothing'.

Unitised Trade

Port and shipping services are of major and increasing importance in Ireland because of the nature of its economy as an open trading nation without land or bridge connections to Britain and the European market. Although recent difficult economic conditions have seen a curtailing of growth in goods movements particularly in relation to imports, traffic in the form of Ro-Ro increased in aggregate by 9.4% annually between 1990 and 2012 and increased by 4.4% in the case of Lo-Lo during the same period in Dublin Port. The volume of trade in containerised traffic is anticipated to increase further and the Port's Masterplan envisages an annual growth rate of 3.2% for Ro-Ro and 1.7% for Lo-Lo traffic up to 2040.

If Ireland is to continue to grow economically, it will depend on updating facilities for larger ships and additional or more suitable berthage. It is therefore not an option to "do nothing" if trade in the Dublin Regional market is to be served economically and efficiently. Provision must be made for additional deep water berthage and additional landside container and vehicle areas.

Dublin Port is designated as a Tier 1 Port in the Government's *National Ports Policy 2013* and this places an obligation on the Company to ensure timely provision of suitable infrastructure facilities to cater for renewed economic growth.

It is also recognised as one of the three core ports in Ireland under the TEN-T network by the European Union forming part of a trans-European transport network providing integrated international long-distance high speed routes. The network involves the provision of guidance and investment.

There is inevitably a delay of some years between the planning of a significant new Port infrastructure improvements and a date when it becomes available for use and this is recognised in *National Ports Policy 2013*. Long-term damage can be done to the economy if port facilities are not delivered in a timely fashion. The recent economic downturn provides a window of opportunity when provision can be made at favourable construction costs and when new construction could alleviate some of the high levels of unemployment in the construction industry. Dublin Port Company has the capacity in terms of finance and organisation to provide improved cargo handling facilities economically and speedily.

It is not an option to 'do nothing'.

1.3.3 Other Locations within the Port Area

Cruise Vessels

Cruise Vessels to date have generally been catered for in Alexandra Basin West at available berths. Occasionally they are moored south of the River. Small cruise vessels have also been accommodated at Sir John Rogerson's Quay.

Two studies were carried out that are of relevance.

- The first dated July 2011 entitled **Local Action Plan City of Dublin Cruise Traffic and Urban Regeneration of City-Port Heritage** as a joint plan by Dublin City Council, The Dublin Docklands Development Authority and Dublin Port Company.

- The second dated September 2011 entitled **Dublin Port Internal Report 3 Analysis of Options for Cruise Vessels** was undertaken as a preparatory paper for the Port's Masterplan to determine the most suitable location for dedicated cruise liner berths.

Site No. 1

Site No. 1 is the chosen location. It is situated at North Wall Quay Extension. The Local Action Plan determined it as the most suitable location. Its main advantage is its proximity to the city centre and high visibility. It creates a good visual interface and allows the Port to reconnect and integrate with the City. It is proximate to the Point Luas stop so that cruise passengers and crew could access the City independently and quickly and not necessarily rely on coach/taxi travel. It would take passengers away from the main cargo handling areas and the visual disamenity that some passengers associate with cargo/industrial areas. It is close to the motorway system and coaches could reach typical tourist destinations such as the Boyne Valley and Glendalough quickly without traversing the city. Security is more easily handed in that the area is easily contained away from main cargo handling areas.

There are appropriately sized land areas for coach and taxi traffic.

It has the disadvantage of requiring the partial demolition of the North Wall Quay Extension, which is of industrial heritage value, in order to accommodate a turning circle for large vessels.

Site No. 2

This site was identified in Internal Report 3 and is located on the southern side of the river at the Lo-Lo facility occupied by Marine Terminals Ltd. It has sufficient landside areas and is close to deep water. However it is beyond reasonable walking distance to fixed public transport in the form of either a Luas or Dart stop. The current road network would involve coaches traversing city roads to reach the Motorway system. It is isolated from the City proper and would not assist the reintegration of the port with the City. Its main advantage is that it lends itself to environmental improvement. It could also form part of the regeneration of the Poolbeg Penninsula. The current Lo-Lo facility has been the subject of complaints from residents in the immediate vicinity mainly due to noise and it may appear that cruise vessels might be less objectionable however when cruise vessels dock here they are also the subject of complaint because of traffic generation and noise.

Site No. 3

This is a location in Poolbeg Harbour that was suggested in the 2008 DDDA Draft Poolbeg Planning Scheme. It was seen as a location for a cruise terminal forming the heart of a new urban area with a refurbished Pigeon House Power Station and a cluster of retail, residential and office uses. Its disadvantages are that it is located in the heart of a heavily industrialised area which contains Seveso sites in proximity. It is surrounded by uses such as generating plant, sewage treatment plant and the proposed incinerator. It is isolated from the city centre and any fixed rail public transport system. It can accommodate only one vessel at a time.

There are also operational and cost issues involved in all three locations although it can be noted that the preferred location is not the cheapest option.

Unitised Trade

The existing Dublin Port Company lands extend to some 260 hectares. Circa 130 hectares are in active Port use directly relating to shipping activity in the form of Roll On-Roll Off (Ro-Ro) and Load On-Load Off (Lo-Lo) and bulk cargo operations. Circa 76.5 hectares are in non-core related port activities located mainly to the northern and southern parts of the Port. The remainder is made up of roads and infrastructure as well as vacant land.

The port lands approached capacity for the unitised trade in 2007 and DPC has operated a policy of recovering suitable lands from leaseholders for unitised operations over the years in its efforts to meet demand. This policy has been more successful in recent years as the hope value associated with possible property development on these lands has disappeared and more realistic values have applied.

An examination of vacant and short-term let lands was undertaken as part of the Dublin Port Masterplan to assess their capacity in the future for both Lo-Lo and Ro-Ro facilities as well as bulk cargo handling. Growth in bulk cargo is not expected to be significant. These areas are set out in Figure 3 of the Masterplan and the unitised trade options are set out on Figure 5 of the Masterplan.

As can be seen there are a number of options available to meet the need for accommodating larger vessels with appropriate landside freight/transport areas, modern cranes and ramps. In selecting the project sites the key consideration was making use of existing port areas. The land use is established and acceptable in principle in planning terms and issues such as those in relation to the impact on the Natura 2000 sites are insignificant.

There are effectively two sites that make up the main areas of the project. The first of these is the existing facility based around Alexandra Basin West. The works involve deepening the berths for larger ships as well as landside changes to facilitate greater capacity for Ro-Ro traffic by filling in the more modern dry dock (graving Dock #2) but restoring the old graving dock (Graving Dock #1) which is of industrial archaeological interest. The second site involves the infilling of Berths 52 and 53 to provide greater Ro-Ro capacity whilst providing reconfigured berths with deeper dredged pockets and approach channel.

Other sites identified in the Masterplan are less advantageous and can involve land reclamation (which poses environmental problems), are not well configured for the unitised trade, are remote from motorway and rail access, distant from deep water and/or are not available within a reasonable period.

1.3.4 Creation of Additional Port Areas

Cruise Vessels

The 21 hectare Gateway Project Lands are the only obvious other lands that could be developed for cruise liners. However this project was refused approval by An Bord Pleanála because the Board was not satisfied that the proposed development would not adversely affect the integrity of the South Dublin Bay and River Tolka Estuary SPA and was not

satisfied that it would not adversely affect the natural heritage of Dublin Bay. The location is remote from the City centre.

The only other lands within the Port area that could be reclaimed are those to the north in the Tolka Estuary or to the South fronting Sandymount Strand. Neither of these areas is adjacent to the navigable channel and are also remote from the City. The environmental impact would be significant in that the direct loss of habitat would be large and involve areas that are of ornithological importance. Impacts would be permanent and likely to be in contravention of the Habitats Directive. The dredging would also have a more significant effect on the Benthic Community. The visual impacts on landscape would be more significant in either scenario as the Port would move closer to the existing shoreline. There would be a loss of recreational waters on the northern side and Sandymount Beach would be impacted on the Southern side. Large vessels would encroach into areas used for recreational sailing and windsurfing.

Unitised Trade

Similar factors apply in relation to providing facilities for the unitised trade. The Gateway site is the only practical area for additional provision and the northern and southern sides of the Port are remote from deep water. In addition there are landside problems in that the adjacent lands in the north side are fragmented and are less easily acquired.

1.3.5 Alternative Locations in Existing Ports

Cruise Vessels

Cruise ships currently visit a number of Irish ports including Belfast, Dublin, Dun Laoghaire, Waterford, Cork (Cobh), Galway, Killybegs, Shannon Foynes and Derry. Dublin, Belfast and Cork are the significant ports of call. Normally ships will visit two ports as part of an itinerary and Belfast and Dublin or Dublin and Cork would be typical combinations. The ports are therefore not alternatives as such for cruise vessels as Dublin is a major attraction and is the most popular destination. In effect the market dictates the destinations visited.

The only possible exception is Dun Laoghaire where Dun Laoghaire Harbour Company has recently sought to develop cruise liner traffic into its harbour. It attracted 2 visits in 2012 and 4 in 2013. To date ships entering Dun Laoghaire are constrained by quayside dimensions and the use of much of the harbour area for pleasure craft. The use of tugs is likely to be an issue in relation to larger vessels. A number of large vessels such as the Queen Mary II have moored in Dublin Bay and passengers have reached Dun Laoghaire Harbour by tender. Dun Laoghaire has an appealing visual environment as its principal attraction. However it is more remote from the main cultural and retail attractions in Dublin City Centre and the Motorway system and traffic to and from the port crosses densely developed residential areas. The Dun Laoghaire Harbour Company has applied for strategic infrastructure status for improved facilities which would enhance its suitability for larger vessels however the Dublin Port Company is confident that Dublin City Centre is a strong attraction for cruise passengers and that Dun Laoghaire will continue to play a complimentary role in the future. It can be noted that the subject planning application is for multi-purpose berths whereas the proposed Dun Laoghaire facility is understood to be for a dedicated cruise berth.

Unitised Trade

There are a number of Ports that cater for the unitised trade along the east and south coast. Dublin Port primarily serves the Dublin Region, 62% of all goods arriving in the Port remaining within 50 km of Dublin Port and 48% of all exports originate within 50km of the port. The National Ports Policy designates Dublin Port as a Tier 1 Port as one of National Significance and states that "the continued commercial development of Dublin Port Company is a key strategic objective of National Ports Policy". The policy document recognises that port traffic has increasingly gravitated towards the larger ports in recent years to avail of capacity and economies of scale, in particular ship size. The policy document also recognises that competition between ports can be limited due to their geographical location and thus accessibility to major shipping routes and domestic market places. The natural advantages enjoyed by certain ports can be countered by adoption of a landlord-type operating model, which provides for intra-port competition. Dublin Port operates such a landlord model and robust competition exists between the shipping lines and their agents.

The Port is located at the heart of the state's largest conurbation and economically dynamic area and its proximity to the market it serves means that it must meet the demands placed on it.

The only ports that are likely to have spare unitised capacity or increased capacity within the short to medium-term are Belfast, Waterford, Greenore and possibly Cork. They are all too distant from the Dublin Market to be economic. Waterford at one stage in the past did attract custom from the southern part of the Dublin region because of city centre traffic congestion however with the opening of the Port Tunnel that traffic is now almost wholly using Dublin Port.

Their use to serve the Dublin Market would:

- Impact negatively on national competitiveness because of increased costs,
- Involve unsustainable traffic movements with a rise in fuel consumption and environmental emissions.
- Cause unnecessary impacts on the carrying capacity of the National Road system.

In both economic and environmental terms there are no real alternatives to the improvements planned for Dublin Port.

Appendix 1 sets out consideration in some detail of other ports as possible alternatives. In addition, there is also a summary provided of volumes through Dublin and 14 other ports in the years 2000 to 2012.

1.3.6 Locations for new ports

The only two proposals that were made for new ports on the East Coast are those at Bremore and Loughshinny. Neither proposal was designed to accommodate cruise vessels so that unitised trade is the only category to be considered.

Bremore

An application was made to An Bord Pleanála in 2007 for the proposed development of a deep water port, logistics centre and business park in Bremore in North County Dublin to be designated as Strategic Infrastructure Development (PL06F.PC0039). Precise details of the proposal are not available in the public domain particularly with regard to layout and size. However it has been stated in publicity issued by Drogheda Port Company that the project is designed to cater for up to 10 million tonnes of freight, including 350,000 TEU Lo-Lo units, 409,000 Ro-Ro units and 1 million tonnes of general and bulk cargoes. Three phases of development are proposed, the first phase of development is designed to provide circa 500 m of linear Quay for container and general cargo handling, two Ro-Ro and one high speed berths for road freight, car and foot passenger traffic. The depth alongside is designed to be in the order of -10.5m CD with a potential for a further deepening to -12.0m CD. A decision as to whether it constitutes Strategic Infrastructure has not been made.

The proposal was submitted by Bremore Ireland Port Ltd. which is made up of Castlemarket Holdings Ltd in conjunction with Drogheda Port Company. It is unclear whether the proposal is active given the length of time it is with the Board for designation.

The proposal does not feature in National Ports Policy. The Policy states that the Department of Transport, Tourism and Sport will examine the transfer of Drogheda Port to Local Authority control.

It is not a realistic alternative given its absence from National Ports Policy. Its scale would suggest a long lead-in time and there may be little prospect of it being funded in present economic circumstances. It also faces difficulties in relation to large-scale infrastructure provision, environmental and archaeological issues.

This site is located some 33.8km from Dublin City so that traffic accessing the Dublin market would be 10 times that of a similar vehicle servicing the Dublin area from Dublin Port.

Loughshinny

The construction of a new port at Loughshinny was mooted some thirty years ago. Nothing further of significance has been heard of the project and it is not included in any adopted national regional or local plans or policies.

It shares many of the site characteristics of Bremore.

1.3.7 Conclusions

The proposed development offers the only realistic solution within the immediate terms to the Dublin Region's requirements for the movement of the unitised trade in and out of the region by sea.

1.4 THE PLANNING PROCESS

1.4.1 Introduction

Following consultations under Section 37B of the Planning and Development Act, 2000 as amended, An Bord Pleanála served noticed to the applicants (Dublin Port Company) under section 37B(4)(a) which stated that they had decided that the proposed development would be strategic infrastructure within the meaning of section 37A of the Act. Any application for the proposed development must therefore be directly to the Board under Section 37E of the Act. The Board will however review the suite of planning and other guidance and policy documents as applicable from the national to local level. Aside from this section of the EIS on planning, the application also includes a Planning Report which argues the case for the project as being in the interests of the proper planning and sustainable development of the area.

In addition to the application to An Bord Pleanála, applications will also be made to the EPA for a Waste License and a Dumping at Sea Permit. Foreshore consent under the Foreshore and Dumping at Sea (Amendment Act) 2009 will also be sought from the Department of Environment, Heritage and Local Government.

The proposed development is set within the context of a number of key economic and planning policies or guidance documents. They include the following:

1.4.2 National

The National Spatial Strategy 2002 – 2020 (NSS)

Introduction

The Strategy provides an 18-year planning framework for Ireland and develops a hierarchy of development locations based around major centres throughout the Island.

Current Status

The Minister for the Environment, Communities and Local Government indicated in February 2013 that the Government was re-examining the Strategy and that work on a new successor strategy would take place with the aim of having the revised strategy in place by the end of the year. This raised a question mark as to the status of the existing strategy, however in reply to a Dáil question, Ms Jan O Sullivan, Minister for State at the Department, stated that "*the NSS had not been abolished or removed and remains in place. However proposals will be brought to Government later this year for a roadmap to develop a successor strategy that will take account inter alia, of our significantly changed economic circumstances and to contribute to sustainable national recovery.*"

The Department are currently carrying out a scoping exercise to determine the appropriate content of a successor strategy.

The National Spatial Strategy and Dublin

The NSS recognises that the efficient movement of people and goods will be essential to bring out the innate potential of places and promote balanced regional development. The ability of Greater Dublin to attract large-scale inward investment is recognised as being clearly associated with its perceived advantage being a significant urban area within international transport connections. It also recognises that Ireland's spatial context is closely related to the wider global context. It identifies a matrix of London, Paris, Amsterdam, Rotterdam and Frankfurt as key European economic region for Ireland. It states that effective connections to and from this region are essential if Ireland is to remain in a position to capitalise on its proximity in terms of contributing to and benefiting from a competitive EU economy.

It includes a Figure (Figure 1.11 in this section) that illustrates Ireland's international spatial context in broad terms. This Map identifies the main corridor to and from Ireland as linking Dublin through the North and Midlands of England to London that in turn links through to the rest of the city matrix referred to above. The Strategy recognises that the Greater Dublin Area has experienced rapid development that has driven much of the Country's economic success in recent years and delivered vital national benefits.

The NSS supports Dublin's pivotal role in the national economic success and states that it is essential for balanced regional development that the performance of the Greater Dublin area be built upon and physically consolidated. It summarises the relevant spatial policies of the NSS as a more efficient Greater Dublin Area with a comment that the Greater Dublin Areas' vital national role will be secured in terms of improved mobility, urban design quality, social mix, international and regional connections.

It states that the continued health of Dublin is critically dependant on good international access.

The National Spatial Strategy and Dublin Port

International Access (page 63 of the Strategy) states that Dublin Port is vital to the national economy and that of Dublin itself and adjoining regions. It goes on to state that "*the Port faces a shortage of capacity giving rise to a need for more land to accommodate its expanding activities. Possible solutions to this in the medium to the longer term and of benefit to the Port itself and the City might lie in promoting alternative locations for some current and future Dublin Port activities, such as the transit and storage of petro-chemicals, bulk goods and cars, more Port business to and from various parts of the country to other nationally strategic Ports could be encouraged. This in some cases may require substantial investment in facilities at alternative Ports*"

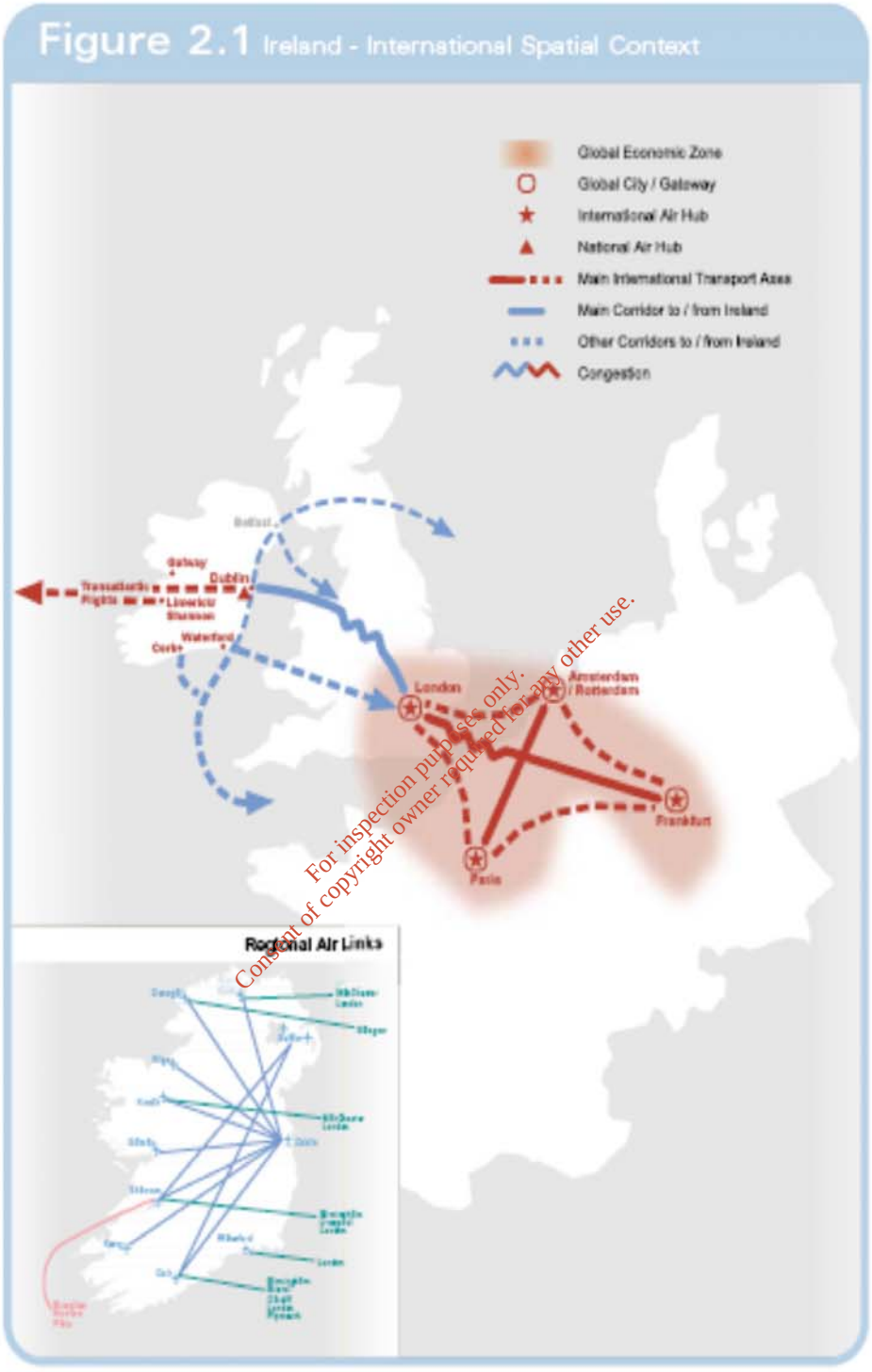


Figure 1.11 Irelands International Spatial context in broad terms

The NSS recognises the shortage of capacity and the need for more land to accommodate its expanding activities. The solution suggested for the medium to long term in terms of petro-chemicals, bulk cargo and cars, lies at the heart of the Port's Masterplan and this is dealt with below. However, it does not offer any short term solution to the principal growth area of unitised trade which is an immediate requirement. Its encouragement of more Port business to and from various parts of the Country to other strategic Ports is not a sustainable solution and would unnecessarily increase Ireland's footprint and neither is it a particularly economic solution. It would involve substantial investment in facilities at alternative Ports in a situation where those Ports do not have the financial capability of financing such facilities without recourse to state assistance. They would also be reliant on State investment for infrastructural development. This in turn affects Ireland's competitive cost base.

The recent National Ports Policy 2013 which is considered below recognises the issues and is based in terms of today's economic circumstances.

The need for more space for the unitised trade in the medium term can be achieved through the present proposal which involves bringing further landside areas into unitised use and reconfigured berthage.

National Development Plan 2007 – 2013

The National Development Plan and Ports Policy

The National Development Plan "Ports Sub Programme" acknowledges that the broad conclusions of a Port capacity project published in October 2006 demonstrates that the projects being proposed by the Port sector (including that of Dublin Port) have the potential to deliver adequate capacity for the Island going forward. However, the Plan notes that the Government proposes to undertake a comprehensive study of the role of Dublin Port taking account of locational considerations in the context of overall Ports policy on the Island, wider transport policy, urban development policy, the National Spatial Strategy and National Economic Policy and this review will take account of the findings of the City Council Study. Such a comprehensive Government Study was not prepared.

The National Development Plan was overtaken by the severe downturn in the economy and the Government published Infrastructural Investment Priorities 2010-2016 – A Financial Framework which stated in relation to the Ports Programme that:-

"The strategic objective of this programme is to ensure that Ireland has a modern ports infrastructure capable of meeting demand and which supports international competitiveness by enhancing sea access for people, goods and services. This programme has come to an end and the expectation is that all future investment by the Dublin Port Company will be made on a commercial basis, funded by user charges and other revenue streams developed by the companies. A small level of continued Exchequer capital investment in regional ports will be required prior to their handover to Local Authorities."

Although it was indicated by the present Government on taking office that a new National Development Plan would be prepared to take account of current economic and social realities, to date no plan has been published.

National Ports Policy 2013

The National Ports Policy was published by the Minister for Transport, Tourism and Sport in 2013. It is designed to set out a roadmap for the Ports sector for at least the next generation, setting down clear objectives, the policies to achieve them and timelines for doing so.

The National Ports Policy document acknowledges that general policy for the Ports sector has been laissez faire since corporatisation of Ports began in 1997 and now introduces a clear categorisation of the Ports sector in Ireland with the aim of ensuring the commercial seaports make a full contribution to facilitating economic recovery and prosperity.

Ports are divided into Ports of National Significance (Tier1), Ports of National Significance (Tier 2) and Ports of Regional Significance. (See Introduction of Policy Page 20).

Three port companies are identified as operating Tier 1 Ports of National Significance - Dublin Port Company, the Port of Cork Company and the Shannon Foynes Port Company. (Para 2.3 Page 23)

The Ports Policy notes that the European Union's revised TEN-T programme will open up possibilities for ten-T Ports to avail of funding facilities to be put in place through the Connecting Europe Facility. For inclusion in the core transport network, ports must enjoy significant volumes of freight and/or passenger traffic, have a high level of international connectivity and be connected to the core European rail and road network by 2030.

The criteria used by the European Union Commission are broadly similar to those used in identifying the Ports of National Significance in the Ports Policy. These are Ports that:-

- are responsible for at least 15% - 20% of overall tonnage through Irish Ports and
- have a clear potential to lead development of future port capacity in the medium and long-term, when and as required

Three Ports are proposed for inclusion in the TEN-T CORE NETWORK i.e. Dublin, Cork and Shannon Foynes.

The Policy states:-

"The continued commercial development of these three Ports of National Significance is a key objective of National Ports Policy".

Section 2.5.1 refers specifically to Dublin Port Company as follows:-

"Dublin Port Company is the State's largest Port Company. It handles approximately 43% of all seaborne trade in the State. The Port's importance is even more pronounced in the higher-value unitised (LoLo and RoRo) sectors where it handles approximately 70% of all LoLo and 85% of all RoRo trade in the State.

In February 2012, Dublin Port published its Masterplan which sets out a vision of development over the next 30 years. The plan represents a comprehensive framework for the long-term development of the Port and is underpinned by three core principles:-

- *Maximisation of usage of existing Port lands*
- *Reintegration of the Port with the City*
- *Development of the Port to the highest environmental standards*

It is recognised that the location of Dublin Port Company inevitably gives the Port competitive advantage over other Ports and will give rise to competition concerns. However, a continuation and strengthening of the landlord model of operation in the Port's estate will allow for continued intra-port competition between the privately operated Port Terminals within the Port estate.

The Government endorses the core principles underpinning the Company's Masterplan and the continued commercial development of Dublin Port Company is a key strategic objective of National Ports Policy."

Section 4 of the Policy document considers Ports policy and the planning and development system.

It highlights the need for Port master planning and ensuring that relevant planning and development strategies are complementary and consistent. It encourages the embedding of such Masterplans into planning strategies and bringing clarity to the future Development Plans for each Port. National and Regional Guidelines are required to recognise the importance of the three categories of Ports and allow for their continued development.

The document also considers the relationship between Ports and their Cities and highlights the need for sufficient replacement capacity in situations where previous Port related lands are planned for re-development for other uses, such as commercial and residential use. It acknowledges the widespread recognition across the European Union of the benefits to be gained from the reintegration of a Port's relationship with its City and community.

It encourages Ports and Local Authorities to collaborate on issues of mutual benefit and work together to maximise the potential afforded by their natural, as well as manmade, environment.

Section 5 of the policy document considers environmental and foreshore issues.

1.4.3 Regional

The Regional Planning Guidelines for the Greater Dublin Area 2004-2016

<u>The Guidelines and Dublin Port</u>

The Guidelines consider Dublin Port and Dublin Airport as the premier international access points not only to the Greater Dublin Region but also to the Country and accepts that the

continued development of these assets is essential in the interests of underpinning Ireland's future in international competitiveness. It points to the provision of the Port Tunnel in alleviating some measures of the current landside problems and suggests that land access arrangements to the Port could be further improved by the completion of the orbital Motorway around Dublin and the development of a southern Port access route.

The Guidelines advise that Dublin Port must give consideration to trends in shipping and the rapid growth in the unitised cargo trade and observes that it will be essential to meet as far as is reasonable and practicable, the means for increasing size and capacity of sea-going vessels, the introduction of new shipping routes and the demand for more berthing and handling facilities. It observes that in independent Studies carried out by the Department of Communications, Marine and Natural Resources, it was suggested that the capacity issue will be critical for Dublin by 2007-2008 and that existing land uses at the Port could be reviewed with a view to making more efficient use of existing lands as part of the process of considering further land requirements for Port related uses. The economic downturn and the consequent reduction in trade volumes meant that the capacity constraints were not reached as predicted. The Dublin Port Masterplan allowed a strategic approach to be adopted to the efficient use of lands and planning to meet future capacity requirements.

The Guidelines recognise the importance of the Port as effectively the most important port in the Country.

1.4.4 Local Plans

Dublin City Development Plan 2011-2017

The City Development Plan is the primary local plan for Dublin City of which the Port forms part. It sets out a wide-ranging series of policies and objectives for the City and refers to the Port in a number of instances.

The Development Plan and the Port

The Plan notes the need to support the national role of Dublin Port as set out in the NSS (page 126)

It sets out the following in paragraph 4.4.1.2:-

"Dublin City Council fully supports and recognises the important national and regional role of Dublin Port in the economic life of the City and the region and the consequent need in economic competitiveness and employment terms to facilitate Port activities which may involve Port development or relocation in the longer term. Dublin Port will have a significant role to play in the future development and growth of the City and it is considered prudent to plan the structure of this part of the City, including the proposed public transport network to fully integrate with the developing new City infrastructure and character, while having regard to the Dublin City Council Study - Dublin Bay, An integrated Economic Cultural and Social Vision for Sustainable Development (2007).

Dublin City Council recognises Dublin Port as a major source of employment in the area, as well as the need for Ferry Terminal services and linkages to the natural amenity of Dublin Bay. The Plan recognises the importance of Dublin Port to the National, Regional and City

economy and states that the City Council will work with the Port Company in maximising the competitiveness of Dublin Port in cargo and passenger number terms.

The Plan recognises the importance of Dublin Port to the National, Regional and City economy and states that the City Council will work with the Port Company in maximising the competitiveness of Dublin Port in cargo and passenger number terms."

Zoning

The lands that form part of the development as well as those adjoining it, are largely zoned Z7 Employment Industry and the objective is *"To provide for the protection and creation of industrial uses and facilitate opportunities for employment creation."*

The text accompanying the zoning objective states:-

"The majority of these lands are located in the Port area. The primary uses in these areas are those which result in a standard of amenity that would not be acceptable in other areas. They can unavoidably cause bad neighbour problems due to the generation of disamenities such as noise smells and heavy goods traffic etc. Activities include industry other than light industry; manufacturing, repairs, open storage, waste material treatment, and transport operating services.

These areas require a measure of protection from other non-compatible clean uses as this can result in conflict and limit the expansion of the primary use of the area."

The permitted uses include port related industries and facilities, open storage depots, transport depots and warehousing.

The Eastern By-Pass

Policy S19 states that "*It is the policy of Dublin City Council To support the provision of a link between north Dublin Port and the Southern Cross/South Eastern Motorway via an eastern by-bass of the city, in conjunction with and co-operation with other transport bodies, the National Road Authority and local authorities. The preferred method is by means of a bored tunnel and the preferred route is under Sandymount Strand and Booterstown Marsh. However the route and detailed design of the link road will be subject to an environmental impact Assessment and all statutory requirements, including a public consultation process, by the relevant authorities. An appropriate assessment of the proposed project for the entire route is also required in accordance with the Habitats Directive."*

There is no objective for the Eastern Bypass in the written statement

Map F that accompanies the written statement show an indicative line for the Eastern Bypass

Transport 21

Although it considers other national infrastructure projects it's prime focus is on Dublin and for convenience it is considered under the Local Plan heading. The Transport 21 Programme announced in November 2005 sets out the ten year investment framework taking account of

major economic, social and demographic changes over the past decade, the National Spatial Strategy and the need to provide a modern transport network for the future and notes that the bulk of public transport investment will be in the Greater Dublin Area whose population would rise by a further 300,000 people by 2011. The major projects identified are:-

- Completion of the Metro North Line from the City Centre to Swords via Dublin Airport
- Phased development of the Metro West line
- Enhancement and extension of the Luas network
- Commencement of the Heuston Docklands Interconnector and the electrification of sections of the Dublin Suburban Rail network
- Expansion of the capacity of the suburban rail networks through City Centre re-signalling, quadrupling of track on the Kildare line and re-opening of the Dublin to Navan Rail link.

The above projects are all essentially concerned with passenger movement and not with goods movement.

The Dublin Docklands Area Master Plan Review 2008

The Dublin Docklands Development Authority published a review of the Masterplan in 2008. This review sets out the following policies in relation to the Port. .

ED7 - Collaborate with Dublin City Council, Dublin Port, the Dublin Transportation Office, the Rail Procurement Agency and other agencies to promote the early provision of key infrastructural works.

ED33 - Facilitate in co-operation with the Port Company and Dublin City Council, the National role of Dublin Port in providing for the ease of movement of consumer goods and people to and from the Greater Dublin Area and beyond. In assessing proposals for the Port area, the Authority will have regard to the important role the Port plays in the economic life of the City and the consequent need in trade and employment terms to facilitate Port development.

ED34 - Co-operate with the Dublin Port Company and Dublin City Council to implement a programme of traffic management to reduce through traffic from the city centre and the local road network in the vicinity of the Port. The Authority supports the completion of the Eastern Bypass which would greatly facilitate this programme.

ED35 - Ensure that development of the Docklands does not compromise existing employment in the Port.

ED36 - Support initiatives that recognise the need for a co-ordinated approach to ensure and promote both leisure and international trade.

A further review might have been anticipated for 2013, however the Minister for the Environment, Community and Local Government announced the dissolution of the Authority planned for November 2013 but then postponed pending the disposal of Authority assets.

Latest indications are that the Authority will be dissolved in June 2014 and the Docklands Masterplan will apply until that date.

The North Lotts and Grand Canal Planning Scheme

This Planning Scheme which was prepared by Dublin City Council following the designation of the area by the Minister for the Environment, Community and Local Government as a Strategic Development Zone was made by the Council on the 5th November 2013. Appeals were made against the Scheme to An Bord Pleanála and the Board's decision and an oral hearing is planned to commence on the 25th February 2014. There is little reference to Dublin Port however the proposed Eastern Bypass is mentioned.

Other Studies

There are four other studies, all of which deal with issues in Dublin Bay which have a direct impact on Dublin Port. They include:-

- The aforementioned "*Dublin Bay - An Integrated Economic, Cultural and Social Vision for Sustainable Development*"
- The Dublin Port National Development Plan Study
- The Special Task Force on Dublin Bay established by the Minister for the Environment, Local Government and Heritage.
- The Local Action Plan- City of Dublin

"Dublin Bay – An Integrated Economic, Cultural and Social Vision for Sustainable Development"

This Study which was produced at the height of the economic boom advocates the use of Port Company lands for property development. It does not include the lands currently owned by Dublin City Council or ESB in the Port area in this recommendation and deals solely with Dublin Port land. It is predicated on the belief that the City has no other room to grow and that the Dublin Port Company owned lands are the primary growth lands available. It does not take into account planned growth initiatives in terms of public transport proposals and development associated with them for the Greater Dublin Area. It does not recognise that redundant Port lands have been (since 1987) and are in the process of development mainly within the Dublin Docklands Development Authority Area. It does not deal comprehensively with the impact that such a proposal would have on the trading economy of the Country as a whole or in particular on the Dublin Region. No alternative locations are assessed.

The authors also produced a report on its public consultation of this Plan. This recorded both views in favour of the conclusions and views against.

The Dublin Port National Development Plan Study (The Indecon Report)

This economic report was published by the Department of Transport in July 2009. Its terms of reference were to assess the role and future development of Dublin Port within the context of the National Development Plan.

It examined the costs and benefits of various scenarios including:

- The relocation of all or part of Dublin Ports existing activities to an alternative location;
- Existing port activities continuing to expand with demand and;
- Port activities continuing at current levels with growth catered for at alternative locations.

It reached eight conclusions as follows:

1. The level of port capacity requirements will be influenced by economic growth and by developments in consumer expenditure.
2. There is potential to improve the capacity utilisation of ports in Ireland and this should be pursued as a priority.
3. There is need to develop additional port capacity in Ireland by 2025-2030 and this would require the expansion of Dublin Port or the development of the proposed Bremore Port or some equivalent facility to provide capacity for the Irish economy.
4. Both Dublin Port's proposed 21 ha development and the development of new port capacity such as the proposed Bremore Port would have positive net present values.
5. Nothing should be done at policy level to block either the proposed expansion of Dublin Port or the proposed development of Bremore at this stage.
6. The proposals for Bremore and Greenore and other Ports combined with the continuation of Dublin Port would have a higher new economic benefit than the complete closure of Dublin Port.
7. The scenario involving a potential closure of Dublin Port would have city wide sustainability benefits but these would not justify the additional cost involved.
8. Consideration must be given to the timing and costs and benefits and who would pay for the capital expenditures and the long timescale required for implementing a scenario involving the closure of Dublin Port.

The Special Task Force on Dublin Bay established by the Minister for the Environment, Local Government and Heritage

The Task Force was set up at the end of May 2008 and no information was available on their reports to the Minister.

Local Action Plan City of Dublin - Cruise Traffic and Urban Regeneration of City-Port Heritage as a key for Sustainable Economic, Social and Urban Development

This Plan was prepared under the auspices of the URPACTII Programme funded by the European Regional Development Fund. The overall goal of the Plan is to develop a strategy for the development of cruise traffic and the urban regeneration of this Port area that would articulate a new relationship between the City and Port.

The Plan was developed in conjunction with Dublin Port Company, the Dublin Docklands Development Authority and a Local Support Group made up of tourism, business and marine interests.

The Plan researches and analyses:-

- Cruise traffic and its existing and potential contribution to the City
- The physical nature of the Port, the Quays and the relationship between Port and City, highlighting the lack of connectivity.

It identifies the Liffey side of Alexandra Basin as the preferred location for cruise ships and possible future use of Terminal 3 as a Terminal for cruise vessels. It also identifies a need to physically improve the general area in terms of public access, new surface finishes, landscaping and amenities.

The Plan sets out three main Specific Objectives with a sub-set of actions as follows:

<u>Specific Objective 1</u>

To transform, regenerate and adapt the physical and environmental components of the Port.

Action 1.1: To provide a cruise Terminal and improve connectivity between the Port and the City

Action 1.2: To promote a sense of public space within the Port area

<u>Specific Objective 2</u>

To maximise the potential of cruise traffic and Port heritage as economic and social generator.

Action 2.1: To promote the provision of a Visitor Centre in the Docklands area

Action 2.2: To promote social infrastructure and address the effects of community services in the City.

Specific Objective 3

To Plan and manage the cruise development within a global city project.

Dublin Port Master Plan 2012-2040

Although, it is not a statutory plan, Dublin Port's Masterplan has been explicitly endorsed in the National Ports Policy, 2013.

The Masterplan presents a vision for future operations at the Port and critically examines how the existing land use at Dublin Port can be optimised for merchandise trade purposes, passenger and cruise vessels. It is designed to:-

- Plan for future sustainable growth and changes in facilitated seaborne trade in goods and passenger movements to and from Ireland and the Dublin Region in particular
- Provide an overall context for future investment decisions
- Reflect and provide for current National and Regional Guidelines and initiatives
- Ensure there is harmony and synergy between the plans for the Port and those for Dublin City, the Dublin Docklands Area and neighbouring counties within the Dublin Region.
- Give some certainty to customers about how the Port will develop in the future to meet those requirements
- Better integrate the Port with the City and its people

The Plan would facilitate the Port in handling up to 60 million tonnes of goods by 2040.

The Masterplan was the subject of extensive consultation with the public and interested parties. It was also subject to Strategic Environmental Assessment and Appropriate Assessment. Although not a statutory plan, it is framed within the context of EU, national, regional and local Development Plan policies and follows best practice in terms of planning for Ports. It can be noted that the National Port Policy document recommends that the major Ports in the country carry out such a plan.

Strategic Objectives area set out under a number of headings as follows:-

Port Functions

- Ensure the safe operation and sustainable development of the Port and its approach waters and provide appropriate infrastructure, facilities, services, accommodation for ships, goods and passengers to meet future demand.

- Optimise the use of lands on the Port Estate through rationalising the distribution and location of specific areas of activity such as Ro-Ro, Lo-Lo, Ferry Services, Cruise ships, Liquid/Bulk Goods and storage areas with necessary reconfigurations of service facilities as required.
- Recover lands that are not being used for critical Port activity and re-use for such activity
- Develop quaysides adjacent to deep water to their maximum in accordance with environmental/licensing requirements
- Use new and developing technologies to increase throughput to its maximum
- Identify configurations for extending berthage and storage that mitigate impact on adjacent environmentally sensitive/designated areas.
- Provide adequate water depth to accommodate larger/deeper draught vessels in accordance with environmental/licensing requirements.

Investment and Growth

- Utilise the Masterplan as a framework for investment and growth based on the Port's projected demand forecasts
- Maximise throughput by means of structured charges for land usage and cargo usage

Integrating with the City

- Achieve close integration with the City and people of Dublin through a commitment to respect soft values associated with the location, operation and impact of the Port
- Promote movement linkages in the form of pedestrian and cycle routes
- Enhance the general aesthetics/visual impact of the Port around the interface with the City.

Movement and Access

- Provide for a public transport route to serve passengers and those working within the Port to improve the modal transport split
- Develop a transport plan for the Port Estate in conjunction with the National Transport Authority and Dublin City Council
- Promote non-motorised sustainable transport modes, including cycling and walking
- Maximise the use of rail transport for goods to and from the Port
- Promote the provision of future transport infrastructure that facilitates shipping and related Port activities
- Enhance existing infrastructure to provide dedicated access/exit routes to Port facilities.

Environment and Heritage

- Ensure a development framework that is compatible with adjoining areas with particular regard for areas in Dublin Bay which are designated under the Habitats Directive and the Birds Directive. This development framework will also take account of the recommendations and mitigation measures arising from the SEA, AA and other relevant plans for the protection of natural resources, including the protection of water resources, designated and non-designated sites, aquatic ecology and protection against flood risk.
- Integrate new development with the built and natural landscapes of the surrounding areas
- Promote sustainable design in the natural and built environment
- Secure the preservation of all Protected Structures within the Port Estate
- To promote in the development of future Port facilities the principle of universal design to make environments inherently accessible for those with and without disabilities.
- A promotion of excellence and focus on good quality in design, where possible.

Recreation and Amenity

- Promote Dublin Port for recreation and amenity by highlighting walks and cycle routes offering facilities for bird watching and viewing wildlife, as well as views of the Bay and wider environment, as well as the activity within the Port.
- Develop landmark attractions such as a Port Heritage Centre
- Maximise public access to the waterfront and enhance the public realm by landscaping and by high cleanliness standards.

Security

- Ensure that key areas of the Port retain good security provision in accordance with ISPS requirements.

Future Review

- Identify a strategy for future review of the Masterplan against underlying assumptions and performance of the Port business and also assess how the Masterplan is achieving its objectives and targets.

The Masterplan sets out a number of options for future development based on forecasts of economic projections, trade volumes and capacity projections for the various cargo modes. These options are mapped, as well as described.

The subject project represents the first phase of the Masterplan. The essential characteristics of the project are the provision of cargo and cruise vessel berthage at the interface of the Port with the City at Alexandra Basin with the provision of compensatory open container space at berths further to the east, together with berth and channel deepening. It also includes for an enhanced boundary treatment and easy access to the Luas Stop at the Point

Depot. The proposed development achieves a number of the objectives set out above relating to Port Activity, Integration with the City, Movement and Access and Recreational and Amenity. It will greatly improve the cruise passengers experience and bring the visual glamour associated with cruise vessels closer to the City.

The project is also designed to meet the other objectives set out in relation to the environment and heritage by minimising any impacts on the environment, including natural heritage and mitigating any negative impacts.

1.4.5 Conclusion and Compliance with Planning Policy

As stated in the introduction to this section of the EIS, the Planning Report included in the suite of documents accompanying the application sets out the arguments for the proposal in planning terms.

However it can be stated within the EIS that the proposal complies with all the above mentioned documents.

It complies with:

- Government policy with regards to Ports
- The **Z 7** Employment and Industry zoning objective for the area in the Dublin City Development Plan
- The ambition for integration with the city in the Masterplan and Local Action Plan (with the location of cruise berths at North Wall Quay Extension as well as the interpretive elements which will be available to the public)

It meets

- The medium term capacity requirements recognised in the NSS, the Regional Planning Guidelines for the greater Dublin Area and the Port Company's own Masterplan.

A number of the plans referred to above are effectively out of date and have not been revised and some were influenced by the economic boom conditions that prevailed at the date of their publication. Some were influenced by proposals by third parties to build an entirely new port in North County Dublin and by the proposals set out for property development within the Port in the Dublin Bay Study commissioned by Dublin City Council.

There have been developments in relation to the Eastern Bypass as a result of meetings held between Dublin City Council, the National Roads Authority and Dublin Port Company that are covered in detail in the Planning Report accompanying the planning application. It can be noted that location and reservation is now agreed with the principal parties involved. It can be noted that the ABR Development does not impede the delivery of the Eastern Bypass.

None of the elements of industrial archaeological interest are included in the Record of Protected Structures so the issue of compliance in that respect does not arise however the conservation of heritage items within the port is a significant element of the application and

can be seen as being in the interests of the proper planning and sustainable development of the area.

The major advance in terms of clarity in relation to planning ports and Dublin Port in particular is National Ports Policy 2013. For the first time there is an unambiguous recognition of the importance of the Port and its need to cater for economic growth in the Dublin Region and Ireland as a whole as well as its role in the wider European context. There is no mention of relocating or abandoning the Port to property development.

It can be expected that revised planning documents at regional and local level will reflect the Port's Policy to remove any ambiguities in relation to the Port's future. The endorsement of the Port Company's Masterplan within the Policy is a strong indication of Government support. The current proposal is the first component. of the Masterplan.

1.5 SCOPE AND FORMAT OF THE ENVIRONMENTAL IMPACT STATEMENT

1.5.1 Scope of the EIS

Prior to work commencing on the EIS, it is important that the scope of works is effectively defined. The scoping exercise confirms the nature of the development, the extent of the environmental assessment, the key issues and the level to which these issues need to be addressed.

A scoping exercise was carried out at the beginning of this project to determine the issues that needed to be addressed in the EIS. The scoping exercise involved the following main elements:

- Preliminary consultation with the principal statutory and non-statutory consultees;
- Preliminary site visits to assess the likely environmental impacts at first hand;
- A desktop study where information about the site from a number of sources was examined.

Once the key issues were identified, baseline studies/surveys were carried out. The studies enable the prediction of the likely environmental impacts arising from the proposed development. These impacts are evaluated in terms of their significance, nature and magnitude.

The main aim of the environmental assessment, as part of the design process, is to ensure that any potentially damaging effects are avoided or minimised and that the beneficial aspects of the project are enhanced. The best means of impact mitigation is to avoid it in the planning and design process. Reduction involves lessening the degree of an impact that cannot be completely avoided. Reducing the impact acknowledges that some degree of adverse impact will arise, but provides the means by which the conditions can be improved or compensated for.

Although the scoping exercise is carried out at the beginning of the Environmental Impact Assessment, the scoping itself continues throughout the project and in particular during the main consultation phase as outlined in Chapter 2 of this EIS.

A summary of the potential impacts identified during the scoping study are presented in Table 1.18.

Table 1.18 Scoping Matrix

Environmental Topic (Ref: EIA regulations)	Potential Impacts			
	Construction Phase		Operational Phase	
	Degree of Potential Impact	Description	Degree of Potential Impact	Description
FLORA AND FAUNA				
Birds	-	• Disturbance and removal of feeding and roosting areas. • Noise impact of construction activities	- to 0	• Possible disturbance from increase port activities
Marine Mammals	-	• Disturbance during construction activities particularly with regards to piling and dredging activities.	0	• No further impacts envisaged.
Benthic Ecology	-	• Loss of benthic habitats and fauna during dredging operations. • Sedimentation from dredging activities.	0	• Re-colonisation of habitats and re-establishment of populations envisaged to take place quickly.
Terrestrial Ecology	- to 0	• Disturbance, particularly if bats are present	0	• No impact envisaged.

FISHERIES				
Fisheries	-	• Potential impact during dredging operations from increase in turbidity of water and loss of benthic feeding material. • Potential impact on migratory fish depending on time of year dredging is carried out.	0	• No impact envisaged during operational phase as benthic habitats and fish population expected to recover quickly.
Aquaculture	0	• There are no aquaculture sites within Dublin Bay	0	• No impacts envisaged.
AIR AND CLIMATE				
Noise	-	• Impact of noise during construction operations	- to 0	• Potential increase in noise due to port operations. Mitigation measures may be required
Vibration	-	• Potential for vibration during piling and dredging operations	0	• No impact envisaged.
Air, Climate and Odour	- to 0	• Potential for increase in dust during construction activities • Possibility for production of offensive odour when dredging sediment with high organic content.	- to 0	• Potential increase in greenhouse gasses due to port operations
MATERIAL ASSETS				
Roads and Traffic	- to 0	• Potential increase of HGV movements during construction	0 to +	• Closure of exits onto East Wall Road has potential to have positive impact.

Utilities including water supply, sewerage, electricity and gas networks	- to 0	• Potential for short-term disruption to utilities during construction work.	0	• No impact envisaged.
CULTURAL HERITAGE (INCLUDING ARCHAEOLOGY)				
Cultural heritage	- to 0	• Loss of infrastructure of architectural heritage importance during construction activities. • Recovery of items of cultural heritage significance during construction activities.	0 to +	• Opening up of Graving Dock #1 • Presentation of items of cultural heritage significance as part of ABR project.
Archaeology	- to 0	• Potential to uncover previously unrecorded archaeological material during dredging and construction activities.	0	• No further impact envisaged.
HUMAN BEINGS				
Human beings (Socio-economic & tourism)	+	• Potential increase in revenue in local businesses from spends during construction phase. • Potential for increase in local employment as a result of the construction phase.	+ -	• Economic benefits brought about from the ABR scheme. • Loss of ship repair business at Graving Dock #2
LANDSCAPE AND VISUAL				
Visual Impact	-	• Temporary impact of plant and machinery during construction phase.	- to 0	• Potential visual impact of increase in operations at the port.

GEOLOGY AND SOILS				
Contaminated Sediment	-	• Removal of contaminated sediments from Alexandra Basin and treatment and encapsulation within Berths 52/53. • Potential for loss of sediments to marine environment during dredging operations	0	• No impact envisaged.
Aquifers	-	• Potential for impact during construction activities	0	• No impact envisaged
WATER				
Water quality & Flood Risk	-	• Potential for increase in suspended solids and turbidity levels during dredging operations.	0	• No impact envisaged.
COASTAL PROCESSES				
Coastal processes	- to 0	• Potential change to coastal processes within Dublin Bay as a result of the capital dredging scheme operations.	0	• No further impact envisaged.

1.5.2 Format of the EIS

The Environmental Protection Agency (EPA) has produced guidelines on the production of an EIS in line with the Environmental Impact Assessment Regulations, and these guidelines have been followed in the production of this report. The EIS has been structure in what the EPA term a Grouped Format Structure, which examines each topic as a separate section referring to the existing environment, the proposed development, impacts and mitigation measures.

The EIS is divided into four parts as below, and is shown in Figure 1.12

Part I: Provides the background information on the project, including the need for the project, the alternatives considered and the policy background.

Part II: Describes the project, from site development through to site operations.

Part III: Describes the existing environment, the predicted impact of the proposed operation, and submits mitigation measures to lessen the degree of the impacts.

Part IV: Provides a summary of impacts and mitigation measures.

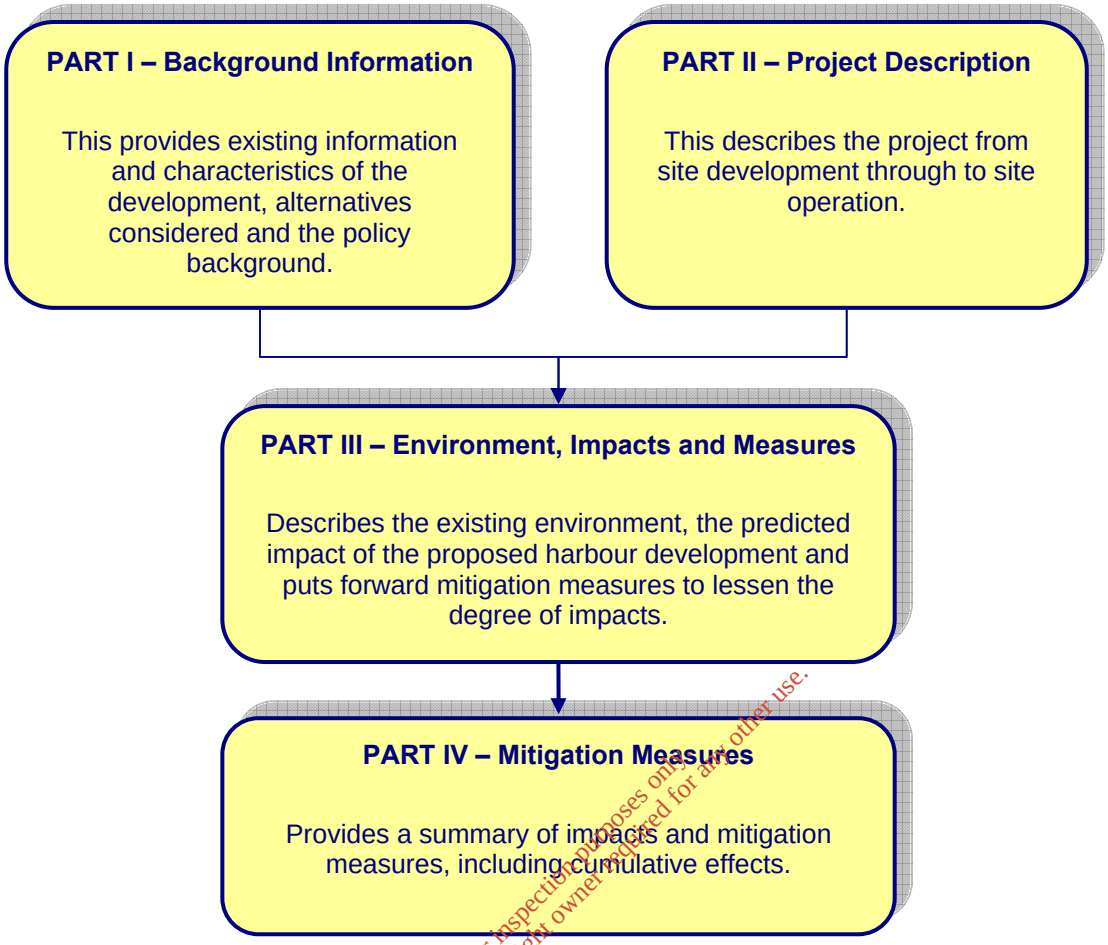


Figure 1.12 Format of the Environmental Impact Statement

2. CONSULTATION PROCESS

2.1 INTRODUCTION

The Alexandra Basin Redevelopment (ABR) Project is the first development proposal from the Dublin Port Company Masterplan 2012 to 2040 and reflects the extensive consultation processes undertaken in the preparation of the Masterplan and more directly in the context of this specific proposal. The process of consultation has enabled Dublin Port Company (DPC) to solicit opinions on general development options for the Port and facilitated differing perspectives to be taken into account in the initial stages of the development proposal. The consultation processes have helped to shape the proposal now being presented to An Bord Pleanála.

2.2 CONSULTATION AND THE MASTERPLAN

In January 2011, DPC commenced a 14 month long consultation process for the Masterplan. The process was aimed at soliciting views from a wide circle of stakeholders whose perspectives on the operations and future of the port were regarded as important.

The consultation process involved:

- Extensive face to face briefings with key stakeholders prior to the launch of an Issues Paper.
- The publication of a detailed Issues Paper in April 2011 outlining the matters that were being taken into consideration in the context of the Masterplan and the initiation of a formal consultation process to secure submissions on the Masterplan.
- A comprehensive media information campaign surrounding the Masterplan designed to solicit interest and participation in the masterplanning process.
- Public information and notices including advertisements, door to door leaflet drops, and an information briefing published for local residents and stakeholders. The briefing was circulated to 60,000 households adjoining the Port area.
- A targeted outreach programme to key stakeholders.
- A significant digital media initiative with a dedicated micro website and a You Tube video detailing the background to the Masterplan.
- Initiation of a distinct statutory stakeholder consultation process around the preparation of the Strategic Environmental Assessment to accompany and inform the Masterplan.
- A series of events including
  - A seminar on the soft values of the port.
  - Local community briefings in Clontarf, East Wall and Ringsend.
  - A conference for commercial, industry and public affairs stakeholders.
  - An event for customers of Dublin Port Company.

- Direct briefings with a selection of community and environmental groups.

- The publication of a draft Masterplan in November 2011 for further consultation which provided a clear view as to how Dublin Port might be developed over the long-term. The draft Masterplan reflected the many observations and suggestions received from stakeholders in response to the Issues Paper.

- The publication of a Masterplan in February 2012 which took account of all submissions and observations made during the consultation processes in the preceding 12 months.

The key documents produced during this period of consultation are shown in Figure 2.1.

The consultation process for the Masterplan created a significant level of interest and active participation.

The community briefings attracted over 100 people from Clontarf, East Wall and Ringsend. The conference was attended by 140 key stakeholders, while additional briefings were held with 12 organisations and groups.

The publication of the Issues Paper secured 222 formal responses from a range of participants including statutory bodies, commercial entities and community groups. This was a very encouraging response rate for a consultation process of this nature and, in particular, the level of understanding of the matters outlined in the Issues Paper was extremely high.

Having examined and considered the detailed responses, DPC published a draft Masterplan in November 2011 which reflected many of the excellent and constructive suggestions from the Issues Paper consultation.

The draft Masterplan consultation process conducted over November and December 2011 secured 34 formal responses from a range of participants categorised as follows:

- Submissions by Individuals & Community Groups – 19 respondents

- Submissions by Public Representatives – 3 respondents

- Submissions by governmental/statutory bodies – 9 respondents

- Submissions by Commercial entities – 3 respondents

The object of the consultation process was to create awareness of Dublin Port, to identify the issues that DPC was seeking to address in the Masterplan and, most importantly, to encourage participation and submissions on the Issues Paper and draft Masterplan to contribute to the final Masterplan. A key aspect to the consultation process was to identify some of the key parameters which should inform individual projects which should subsequently emerge from the Masterplan.

Figure 2.1 Masterplan Documentation

The ABR Project directly reflects and addresses many of the key observations made during the consultation process for the Masterplan such as:

- Recognition that DPC should fully exhaust all viable alternatives to meeting the operating requirements of the Port before engaging in additional reclamation works.
- An acceptance that Dublin Port is a key part of national strategic infrastructure and plays a key role in the life of the City and the Greater Dublin area.
- A desire for greater integration between the Dublin City and Dublin Port.
- A need for any subsequent development and increased port activity to take account of the marine ecology and the important natural resource presented by Dublin Bay.
- The proposed new location for cruise ship disembarkation was viewed very favourably. There was strong agreement that the suggested location was situated in a more attractive setting for passengers arriving into the city. This forms a core part of the current development proposal through the creation of multi use berths adjacent to the North Wall Quay Extension which can accommodate cruise vessels in berths as close to the City as it is practically possible to get.
- The need for any new development proposals to be accompanied by a significant community gain, in particular with new environmental enhancements and boundary softening. The potential offered for additional cultural gain was also recognised given the historical fabric of some port infrastructure.
- Concerns about how future developments might impact on the areas surrounding the port lands in terms of transport, noise and amenity.

2.3 CONSULTATION AND THE ABR PROJECT

Building on the extensive consultation carried out during the process to develop the Masterplan, DPC and their consultants, RPS, carried out further extensive consultation on the ABR Project in the course of developing the current proposal.

2.3.1 Consultation with Statutory and Relevant Bodies

During the course of the Consultation, discussions took place with the following statutory and relevant bodies:

- An Bord Pleánala
- Dublin City Council
- National Parks and Wildlife Service
- Department of Arts, Heritage and the Gaeltacht

- Department of Environment, Community and Local Government
- National Roads Authority
- National Transport Authority
- Department of Transport
- Failte Ireland
- Environmental Protection Agency
- Marine Institute

Consultation with the statutory bodies continued throughout the Environmental Impact Assessment process and, in particular, where potential issues were raised during the impact assessment phase.

Letters were also sent to the relevant statutory and non-statutory consultees listed in Table 2.1, informing them of the proposed development and inviting their comments on the proposal.

Table 2.1 Statutory and Non-Statutory Bodies consulted as part of the EIA Process

Department of Communications, Energy and Natural Resources	Environmental Protection Agency	Department of Transport, Tourism and Sport
Development Applications Unit, Department of Arts, Heritage and the Gaeltacht	The Arts Council	An Taisce
Birdwatch Ireland	Bord Gais Eireann	Bord Iascaigh Mhara
Dublin Regional Authority	Inland Fisheries Ireland, Swords	Inland Fisheries Ireland, Blackrock
Coillte	Commissioners of Irish Lights	Department of Agriculture, Food and the Marine
Health and Safety Authority	Failte Ireland	Office of Public Works
National Roads Authority	Department of Education and Skills	Department of Jobs, Enterprise and Innovation
Department of Foreign Affairs and Trade	Department of Health	Electricity Supply Board

Eircom	Health Service Executive	Geological Survey of Ireland
Heritage Council	Marine Institute	Irish Rail
Irish Whale and Dolphin Group	Waterways Ireland	Radiological Protection Institute of Ireland
RNLI	Dublin City Council	National Transport Authority

A summary of the responses received from the consultees is set out below in Table 2.2.

Table 2.2 Summary of written responses from Consultees

Consultee	Date Sent	Date Reply	Reply Format			Comments
			☎			
Department of Communications, Energy and Natural Resources	24/4/2013					
Department of Transport, Tourism and Sport	24/4/2013					
Environmental Protection Agency	24/4/2013					
Department of Arts, Heritage and the Gaeltacht	24/4/2013	23/5/2013			X	▪ The Scoping response from this Department is co-ordinated through their Development Applications Unit.
An Comhairle Ealaion	24/4/2013					
An Taisce	24/4/2013	29/4/2013			X	▪ Remarked that "ecological evaluation of proposal is required" ▪ An Taisce agree with strategy of "securing enhanced capacity of existing berthage areas, before any further infill"

Consultee	Date Sent	Date Reply	Reply Format			Comments
			☎			
Birdwatch Ireland	24/4/2013	03/07/2013			X	▪ Potential species of conservation concern on the site are Black Guillemots. It is important that nesting sites are provided. ▪ Terns also need to be considered in the EIS
Bord Gáis Eireann	24/4/2013	29/4/2013			X	▪ Bord Gais provided map showing their infrastructure in vicinity of the proposed works in Dublin Port. ▪ A "Code of Practice 2011" booklet and "Safety Advice Booklet" were provided.
Bord Iascaigh Mhara	24/4/2013					
Inland Fisheries Ireland (Blackrock)	24/4/2013					
Dublin Regional Authority	24/4/2013	17/5/2013			X	▪ Advice is provided on legislation and guidelines which should be consulted when preparing the EIA and AA.
Inland Fisheries Ireland HQ	24/4/2013					
Coillte	24/4/2013					
Commissioners of Irish Lights	24/4/2013					
Department of Agriculture, Food and the Marine	24/4/2013	30/4/2013		X		▪ The letter will be brought to Minister Coveney's attention at next practical juncture.
Department of Agriculture, Food and the Marine	24/4/2013	23/5/2013			X	▪ The Climate Change Division asked for an extension to the deadline for replies as they need more time to formulate their response to our scoping request.

Consultee	Date Sent	Date Reply	Reply Format			Comments
			☎			
Health and Safety Authority	24/4/2013					
Failte Ireland	24/4/2013	29/4/2013			X	▪ Failte Ireland provided guidelines for treatment of tourism within the EIS
Office of Public Works	24/4/2013					
National Roads Authority	24/4/2013	16/5/2013			X	▪ General information provided on what needs to be addressed in EIA in terms of road impacts. ▪ NRA's Feasibility Report and Corridor Protection Study for the Eastern Bypass needed to be referred to.
Department of Education and Skills	24/4/2013					
Department of Jobs, Enterprise and Innovation	24/4/2013	26/4/2013		X		▪ Letter to acknowledge our scoping request and the matter will be brought to Minister Bruton's attention at the earliest opportunity.
Department of Foreign Affairs and Trade	24/4/2013					
Department of Health	24/4/2013					
Development Applications Unit, DAHG ***Archaeological Unit***	24/4/2013	14/5/2013			X	▪ Response provided on the requirements of the Underwater Archaeological Unit of the DAHG. Of note is the requirement to carry out side scan sonar, magnetometer and sub-bottom profiling. All to be carried out at a narrow line spacing of 20m.

Consultee	Date Sent	Date Reply	Reply Format			Comments
			☎			
Development Applications Unit, DAHG ***National Parks and Wildlife Service***	24/4/2013	23/5/2013			x	▪ An ecological survey of the proposed development site must be carried out. The EIS should include results of all surveys. ▪ The impact of the development on flora, fauna and habitats must be assessed and in particular regard paid to Natura 2000 sites. ▪ This project should be subject to Appropriate Assessment screening and if necessary an Appropriate Assessment.
Development Applications Unit, DAHG ***National Parks and Wildlife Service***	24/4/2013	23/5/2013			X	▪ Recommendations provided to consult a wide range of Dept publications on protection of habitats, flora and fauna.
Electricity Supply Board	24/4/2013	17/5/2013			X	▪ Detailed response provided by ESB where they highlight their infrastructure in the Port area. In particular the location of 220kV cables were emphasised and a map was provided showing locations of same. ▪ ESB is fully supportive of enhancement of port facilities.
Eircom	24/4/2013					
Health Service Executive	24/4/2013					
Geological Survey of Ireland	24/4/2013					

Consultee	Date Sent	Date Reply	Reply Format			Comments
			☎			
Heritage Council	24/4/2013					
Irish Rail	24/4/2013					
Marine Institute	24/4/2013					
Irish Whale and Dolphin Group	24/4/2013	20/5/2013		X		▪ The IWDG point out that Dublin Bay is an important area for harbour porpoise. ▪ The impact on harbour porpoises of disposal at sea operations must be carefully addressed in the EIA and Appropriate Assessment
Waterways Ireland	24/4/2013					
Radiological Protection Institute of Ireland	24/4/2013					
RNLI	24/4/2013					
Dublin City Council	24/4/2013	16/5/2013		X		▪ The scoping request has been referred to the Deputy City planner for his attention. ▪ Also the scoping request has been forwarded to the City parks superintendent and executive manager of engineering.
National Transport Authority	24/4/2013	28/05/2013			X	▪ Any traffic increases brought about by the proposed development must be considered in the impact assessment. ▪ The impact of the scheme on the proposed Eastern Bypass Route must be considered by the EIS.

2.3.2 Public Consultation

An extensive programme of public consultation concerning the ABR project was undertaken between September and November 2013 to seek the views of the wider public on the proposed ABR Project and the Community Gain proposal to be advanced as part of the project.

The Community Gain proposal, involves the transfer of 10.5 hectares of land owned by DPC on Bull Island to Dublin City Council (DCC)and the allocation of €1.2m by DPC to DCC towards the cost of a study and a new visitor centre for Bull Island.

The consultation process involved:

- The publication of a community newsletter (Appendix 2) on the ABR Project and the community gain element, which was circulated to over 40,000 homes in areas adjacent to the Port.
- Meetings with local community groups in areas directly adjacent to the Port.
- Briefings with local public representatives on the ABR Project and the Community Gain proposal – these meetings included one to one briefings with individual public representatives and also with Local Area Committees of Dublin City Council.
- The development of a dedicated website to explain the proposed initiative and facilitate feedback. The website link is as follows www.dublinport.ie/masterplan/dublinportabr
- A dedicated community consultation process to seek views on both the ABR Project and the Community Gain proposal – the consultation process sought respondents' views in general but also invited responses around specific questions about the project and the Community Gain proposal.
- The publication of public notices (Appendix 2) in local newspapers.
- An extensive media campaign to publicise the project which secured wide coverage in all national and local print, electronic and online media outlets.

2.3.3 Issues raised during the public consultation exercise

The consultation process on ABR Project and the Community Gain proposal secured written responses from 34 parties. A number of specific comments/issues were raised during the consultation process which have been addressed in this EIA, where relevant, and the application for development being brought to An Bord Pleánala, including:

- Broad based support for the community gain proposal outlined by DPC as part of the ABR Project.
- The need for timely development of facilities at Dublin Port to accommodate trade levels, trends in shipping and economic development.
- The maximisation of use of current land in Dublin Port as an alternative to additional encroachment into Dublin Bay.

- Support for new berthing facilities for cruise vessels given the increase in the level of cruise traffic and the economic contribution presented by cruise liners.
- Recognition of the need for closer integration between the Port and the City.
- Recognition of the potential for cultural heritage gain presented by the ABR Project – specifically around the restoration of Graving Dock #1 with modernity and cultural heritage co-existing.
- Need for better public transportation links between the Port and the City.
- Boundary softening between the Port and surrounding areas would be a significant benefit from the development.
- A desire to comment on the specific development proposals once presented to An Bord Pleánala and to participate more fully in the development assessment process.
- Some concerns about the impact of the proposed development on the displacement of commercial activity currently carried out in Dublin Port.
- A desire that any proposals from Dublin City Council for Bull Island following on from the implementation of the community gain proposal should be subject to appropriate consultation, best practice and the relevant planning consent and environmental assessment processes.

2.3.4 Further Consultation

In addition to the significant level of consultation undertaken in the development of the Masterplan and as part of the ABR Project to date, it is planned to undertake a major public information exercise to inform all stakeholders of the proposed development when the planning application is lodged with An Bord Pleánala. The purpose of this information exercise will be to inform people of the development proposals, the impacts arising and to ensure that they are aware of the opportunities available to them to participate in the development assessment process. The public information will be imparted on an objective basis to encourage the maximum possible public participation in the planning assessment process and will include:

- Submission of the application and accompanying documentation to the relevant statutory stakeholders
- The planning application and related materials being posted to a dedicated website independent of the main DPC website.
- The planning application and associated documentation being made available at the offices of DPC and available in electronic format for members of the public on request.
- A public information campaign including:
  - Public notices
  - Advertisements
  - Public consultation sessions in local community centres

- A newsletter circulated to local residents

- A mail-shot to public representatives and local community/residents/social and environmental groups

- A media information campaign including national and local media through multiple formats.

2.4 CONCLUSION

The development proposals advanced in the ABR Project reflect the significant levels of consultation that have taken place since 2011 on the future of Dublin Port. The specific issues raised during the consultation process on the ABR Project have been addressed and, where possible, mitigated to reduce the environmental impact of the development.

The various submissions and comments made in relation to the proposed development have been fully considered by the consultants in the preparation of this Environmental Impact Statement and by the applicants in the design of the scheme. Every effort has been made to address all concerns raised and, where possible, mitigation measures have been proposed to minimise the environmental impact of the proposed development.

3. SITE DESCRIPTION

This Chapter of the EIS describes the location of the site and its existing use.

3.1 SITE LOCATION AND SITE CONTEXT

The proposed development is located within Dublin Port Estate, Dublin, the largest Port in Ireland located on the East Coast of Ireland and within the navigation channel and fairway from Dublin Port into Dublin Bay.

Dublin Port Estate comprises an area of circa 260 hectare spanning both the North and South banks of the River Liffey (Figure 3.1).

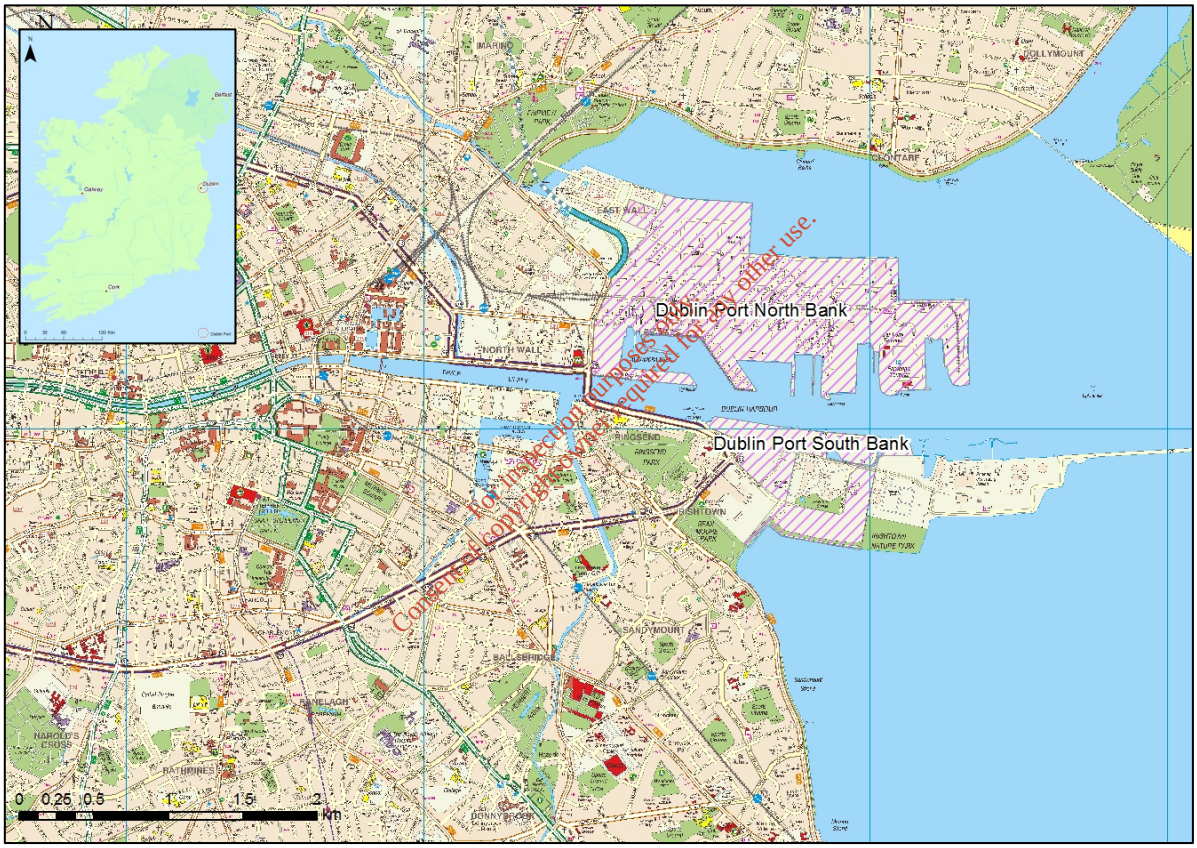


Figure 3.1 Location of Dublin Port

The proposed Alexander Basin Redevelopment Project comprises works to be undertaken in three areas as follows:

- Alexandra Basin West
- Berths 52 / 53
- The navigation channel and fairway from Dublin Port into Dublin Bay

The locations of Alexandra Basin West and Berths 52 / 53 in Dublin Port are shown in Figure 3.2.

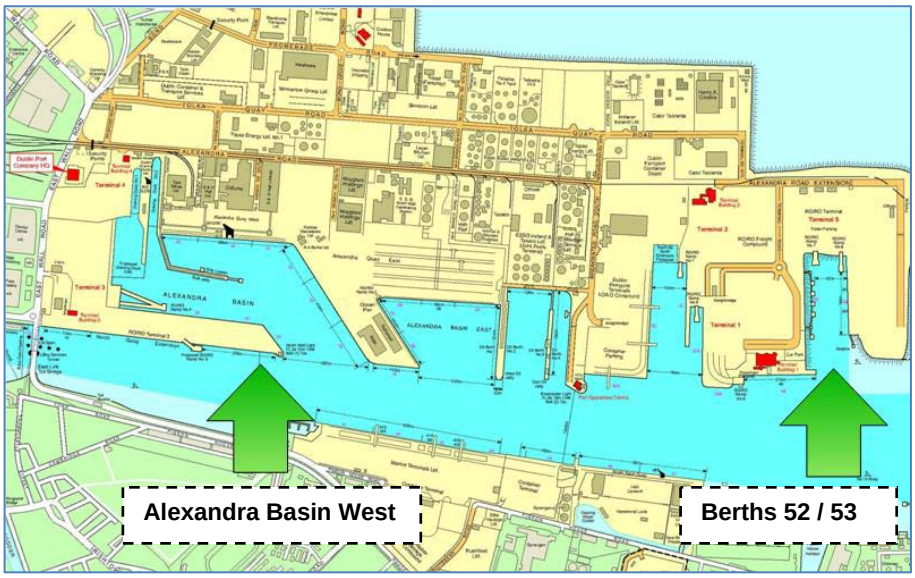


Figure 3.2 Location of Alexandra Basin West and Berths 52 / 53

A capital dredging scheme is an integral part of the development. Its purpose is to deepen Alexander Basin West and the navigation channel and fairway from Dublin Port into Dublin Bay from its current depth of -7.8m Chart Datum (CD) to a depth of -10m CD as shown in Figures 3.3 and 3.4.

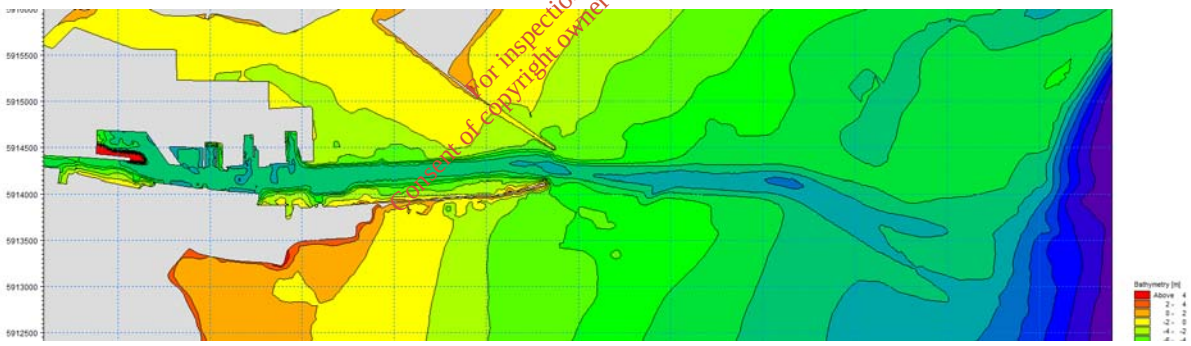


Figure 3.3 Existing navigation channel and fairway bathymetry to Mean Sea Level (MSL)

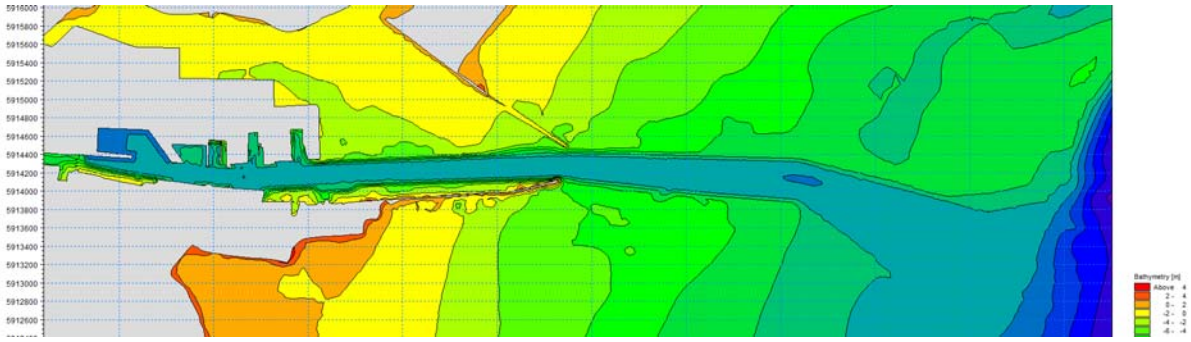


Figure 3.4 Proposed navigation channel and fairway bathymetry to Mean Sea Level (MSL)

3.2 EXISTING LAND USE

Alexandra Basin West

The existing land-use within Alexandra Basin West is solely Port related as shown in Figure 3.5.

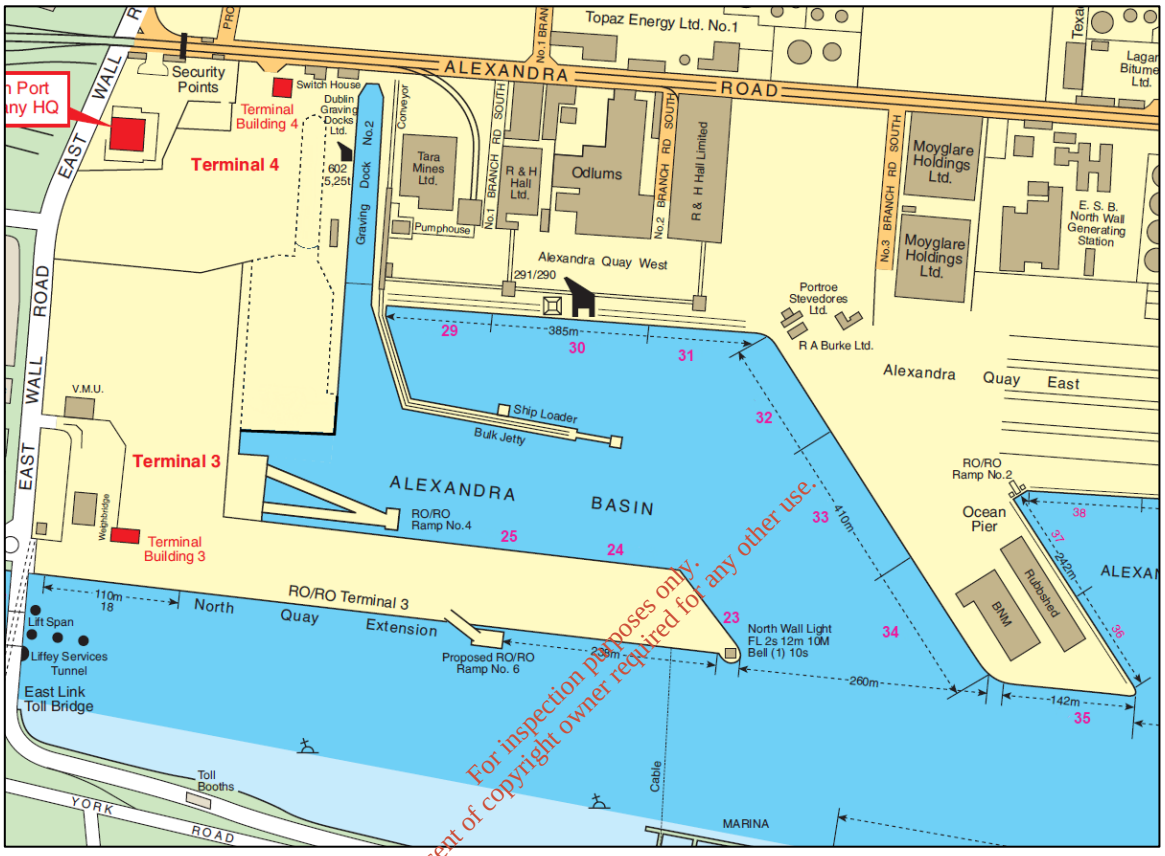


Figure 3.5 Alexandra Basin West – Existing Land-use

A description of each of the main components is presented below:

Berths 29 – 31

The vessels utilising Berths 29 to 31 within Alexandra Basin West are predominantly bulk carriers importing bulk cargo such as grain/feed-stuff. There are hopper systems and cranes on the quayside at these berths for handling of the bulk goods and transfer to road wagons or storage. There is an elevated conveyor system running along the length of the quay. Several buildings set back from the quay are used for bulk storage. Views of Berths 29 to 31 are shown in Plate 3.1.

Plate 3.1 Views of Berths 29 to 31

Berths 32 to 34

Berths 32 to 34 on the west side of Ocean Pier and within Alexandra Basin West are multi-purpose and are used for the importation and exportation of a wide variety of cargo including: Lift-on Lift-off off (Lo-Lo) containers; Roll-on Roll-off (Ro-Ro) containers, trailers and cars; bulk cargo; and break bulk cargo. Mobile cranes are used for cargo handling on these quays. Cruise ships also use these quays. There are two buildings on these quays which fall outside the Alexander Basin Redevelopment Project.

Bulk Jetty

The Bulk Jetty within Alexander Basin West is dedicated for the export of lead/zinc ore concentrates from Tara Mines. The jetty has a sealed conveyor system which connects back into a transfer building which takes the ore concentrates off train deliveries directly from the mines in Co. Meath. Whilst vessels can berth on both sides of the jetty, the hopper only delivers material to the northern side. The bulk jetty is shown in Plate 3.2.

Plate 3.2 View of the Bulk Jetty

North Wall Quay Extension

North Wall Quay Extension forms the outer part of Alexander Basin West, separating the basin from the River Liffey and forms the greater part of Terminal 3. Ro-Ro vessels use Ro-Ro ramps No. 4 and No. 6 located on either side of the North Wall Quay Extension. Ro-Ro ramp No. 4 is a dual level linkspan with a vertical quay wall on the southern side with pneumatic fenders. Ro-Ro ramp No. 6 is a single level linkspan and provides a river berth for Ro-Ro vessels and is the more used given its convenient river berth location. Both ramps are used by P&O.

A lighthouse, fabricated from steel, is located at end of the North Wall Quay Extension and is often used as a point of reference for vessels entering port. The North Wall Quay Extension and lighthouse are shown in Plate 3.3.

Plate 3.3 Views of North Wall Quay Extension

Graving Docks

There are two Graving Docks immediately to the north of Alexandra Basin West. Graving Dock #1, which is the older of the two docks dating from 1860, was filled in by Dublin Port Company in 2010. Graving Dock #2 was designed and built in the 1950's. Graving Dock #2 is approximately 29m wide and 200m long and is used for ship repair and maintenance.

The lead in jetty to the south of the graving dock is occasionally used as an additional berth for vessels waiting to enter Graving Dock #2.

Berths 52 / 53 (Terminal 5)

The existing land-use at Berths 52 / 53, also known as Terminal 5, is solely Port related as shown in Figure 3.6.

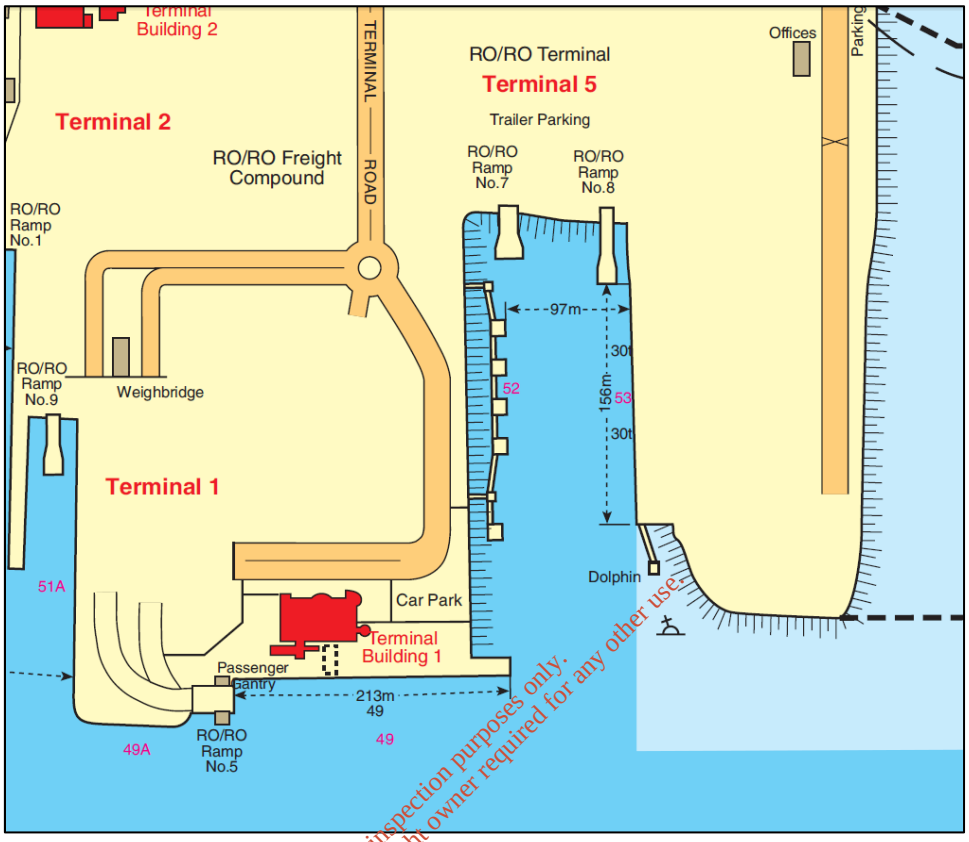


Figure 3.6 Berths 52 / 53 (Terminal 5) – Existing Land-use

Berths 52 / 53 are located in a basin at the eastern end of the Port, on the northern side of the River Liffey. Both berths 52 and 53 are fitted with Ro-Ro ramps, (Ramps No. 7 and No. 8) and are currently used by Seatruck for their Ro-Ro services to the UK.

Berth 53 had a new 30m wide floating linkspan (Ramp No. 8) installed in 2011. On the eastern edge of the berth is a vertical quay wall with pneumatic fenders.

Berth 52 has an older floating linkspan (Ramp No. 7) which is 20m wide. There are berthing dolphins to the western side with pneumatic fenders on the seaward face. There is a rock revetment on the western and northern banks of the basin.

Navigation Channel – Existing use

The navigation channel is controlled by Dublin Port Company which is the competent authority with responsibility for the safe passage of all shipping entering and leaving the Port. No other commercial activities are permitted within the navigation channel for safety reasons. Maintenance dredging of the navigation channel takes place on a regular basis to maintain a depth of -7.8m CD.

4. PROJECT DESCRIPTION

This chapter of the Environmental Impact Statement describes the proposed Alexandra Basin Redevelopment Project. Consideration is also given to construction activities associated with the works and operation and maintenance of the completed facilities.

The proposed development is located within the confines of Dublin Port Company's land and the navigation channel approaching Dublin Port.

4.1 PROPOSED DEVELOPMENT WORKS

This section of the EIS describes the proposed quay wall improvements, dredging and infill works required to achieve the project objectives.

Figure 4.1A below shows the site location plan for the overall scheme.

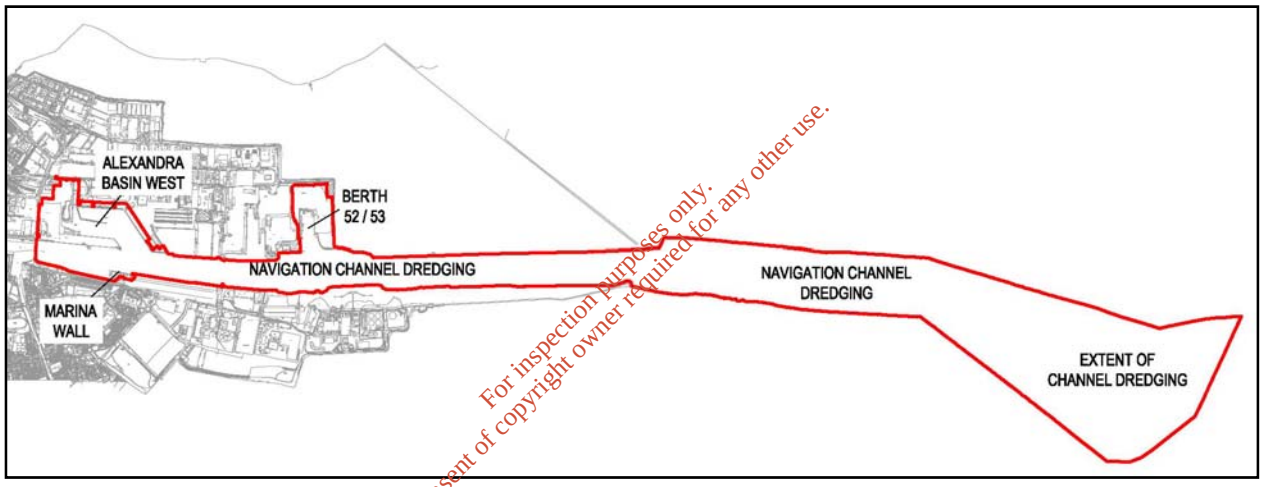


Figure 4.1A Site Location Plan

The proposed development works comprise the following elements, full details of which are included on the planning application drawings:

Navigation Channel (extent shown on Figure 4.1A above)

- Dredging of Liffey Channel to -10m CD, from East Link Bridge to Dublin Bay Buoy over a six year period
- Construction of surge protection/retaining wall at Poolbeg Marina

Alexandra Basin (as per Figure 4.1B below)

- Dismantling of infrastructure and removal of infill material
- Quay wall refurbishment/construction (designed to accommodate future dredging to a level of -15.0m CD)
- Installation of Ro-Ro ramps
- Ro-Ro jetty construction
- Dredging of basin and berths to -10.0m Chart Datum (CD)
- Treatment of contaminated dredged material and re-use as infill on site
- Excavation and restoration of Graving Dock No. 1
- Infilling of Graving Dock No. 2 with treated dredged material
- Relocation of ore concentrates loading operations to Alexandra Quay West Extension
- Development of cultural heritage interpretative space

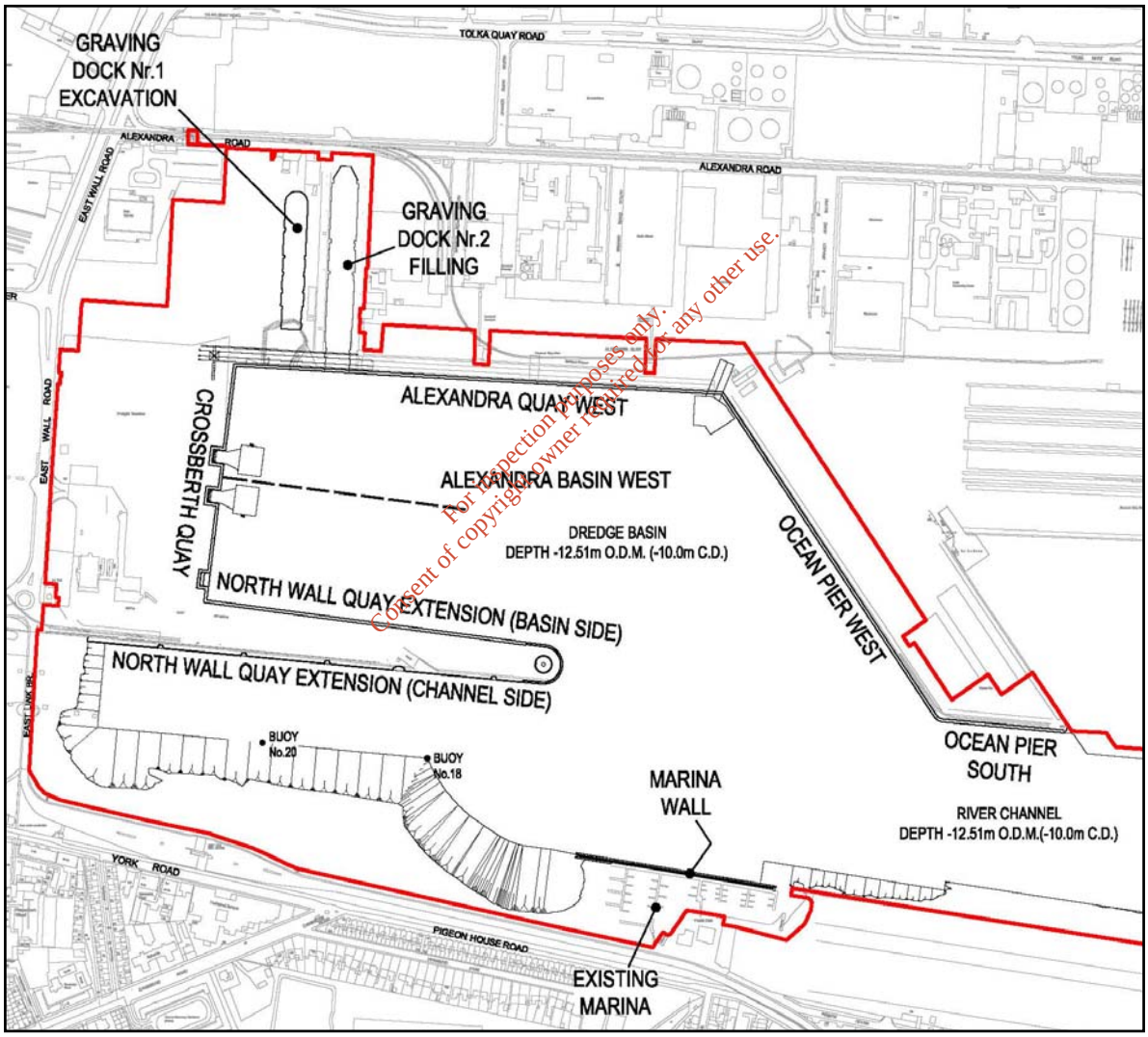


Figure 4.1B Alexandra Basin West Works

Existing Berth 52 / 53 (as per Figure 4.1C below)

- Dismantling and removal of existing infrastructure
- Infilling of existing Berth 52 / 53 with treated dredged material
- Raising of existing surface levels by approx.1.4m
- Quay wall construction
- Mooring jetty construction
- Installation of Ro-Ro ramp

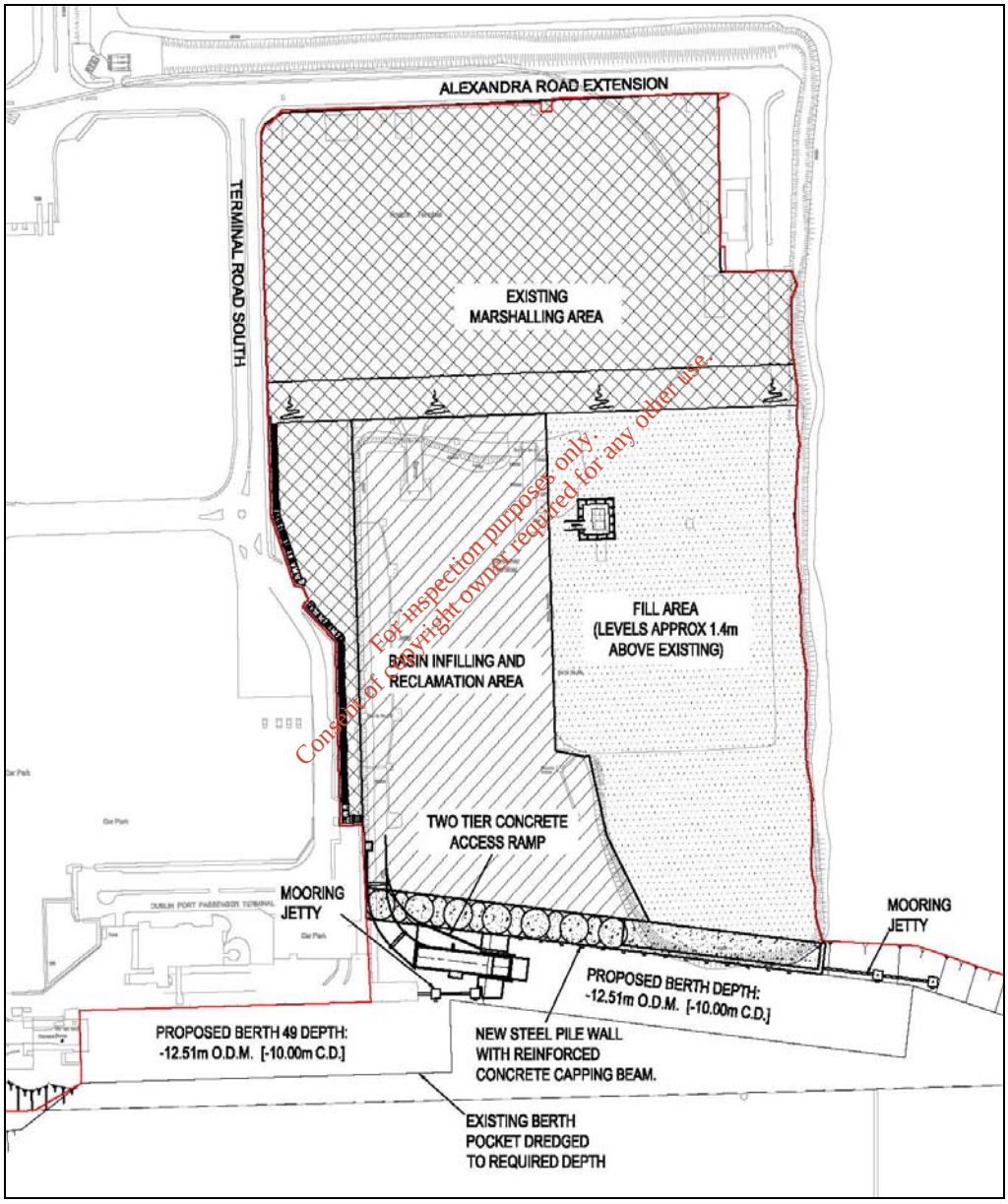


Figure 4.1C Works at Existing Berth 52 / 53

Community Gain proposals

The community gain proposal comprises the transfer of ownership of a portion of Bull Island from Dublin Port Company to Dublin City Council and finance to facilitate the provision of information and facilities on the Island.

4.1.1 Alexandra Basin

The works proposed within Alexandra Basin West involve removal of infrastructure, quay wall refurbishment, dismantling of a section of the North Wall Quay Extension, dredging and infilling.

Quay Wall Construction

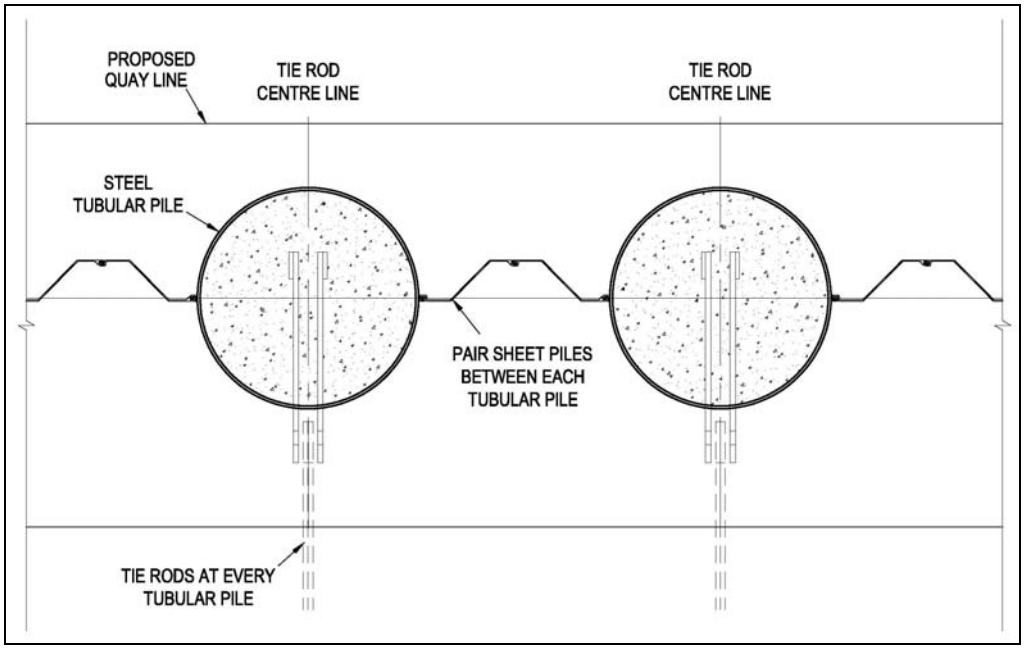
Proposed quay construction/refurbishment works within Alexandra Basin West include:

- Refurbishment of existing quay walls along Ocean Pier (approx 555m long)
- Refurbishment of existing quay walls along Alexandra Quay West (approx 400m long)
- Construction of new quay wall extension to Alexandra Quay West (approx 130m long)
- Construction of new quay wall along Crossberth Quay (approx 250m long)
- Installation of new mooring jetty for Ro-Ro berths (approx 273m long)

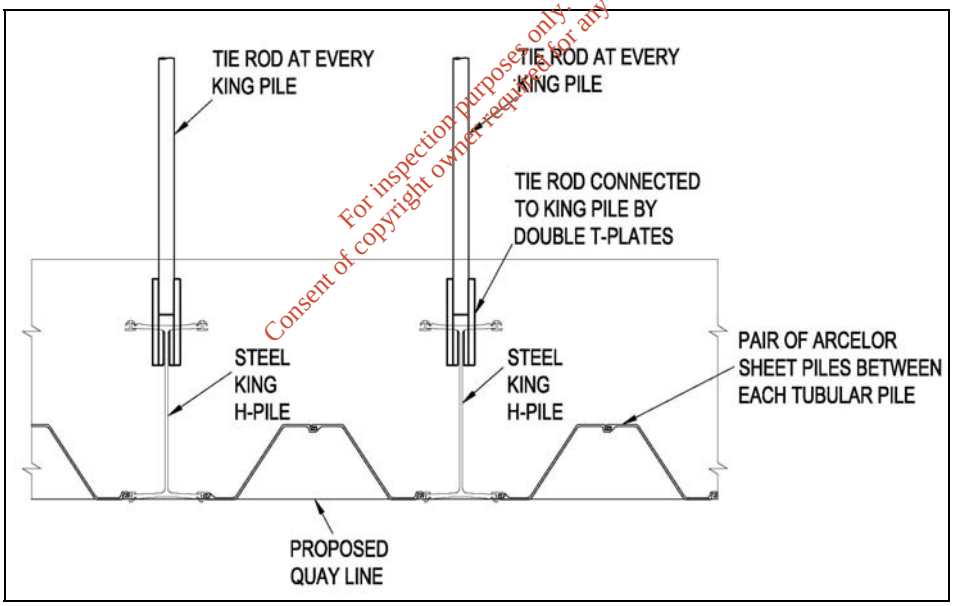
A dredge depth of -10.0m CD is proposed for Alexandra Basin, however, the quay wall infrastructure will be designed to facilitate possible future dredging to -15.0m CD.

Recesses will be formed in the quay walls to facilitate the construction of bankseat structures for the installation of Ro-Ro ramps.

The anticipated form of construction for the quay walls within Alexandra Basin West will comprise a steel combi-wall. This will consist of sheet piles extending between intermittent king piles. These king piles will be either steel H-sections or tubular steel sections. Typical sections of both forms of construction are shown below in Figure 4.2.



Tubular Pile Combi-Wall Construction



H-Pile Combi-Wall Construction

Figure 4.2 Typical Cross Sections of Combi-Wall Construction

The primary piles of front quay wall will be installed to a depth determined by a combination of factors including; the local bedrock level, condition of the bedrock, the condition of the overlying material, the imposed quay loadings and the final geometry of the selected pile profile. It is proposed to construct new quay walls and structures over a significant area of Dublin Port and it is anticipated that the bedrock level will vary to some degree along the proposed quay lines.

Based on available geotechnical information it is anticipated that the primary piles of the new quay walls will be installed to depths ranging between -20m ODM and -35m ODM, with the final depths depending on the local ground conditions and proximity to the standard dredge depth. In areas of relatively shallow bedrock the piles will be cored into the rock as required to achieve overall stability of the quay structure and to sustain any imposed loads. Intermediate sheet piles forming quay walls will be installed to depths in excess of the standard dredge depth to protect against undermining and loss of material from behind the quay wall. The final design and construction depth of intermediate sheet piles will be determined by local material properties but will extend beyond the dredge depth by 2-4m.

The quay wall will be tied to a sheet piled anchor wall or a reinforced concrete anchor beam, depending on the proximity of existing structures/operations to the quay side.

The berthing face to the quay structure will be formed by the installation of a reinforced concrete capping beam. Fenders will be fixed to the concrete capping beam to provide a suitable berthing face.

The deck behind the combi-wall quay will be reinstated to tie-in with the existing surfacing and deck levels.

The final choice of quay wall construction technique will be decided at detailed design stage and subsequent to further site investigation. However, both are similar in terms of installation methodology.

The form of construction for the 273m long Ro-Ro jetty proposed for Alexandra Basin will be an open pile structure, constructed using a series of piled mooring dolphins, which will be connected using a steel walkway structure.

A typical detail for the Ro-Ro jetty is shown in Figure 4.3 below.

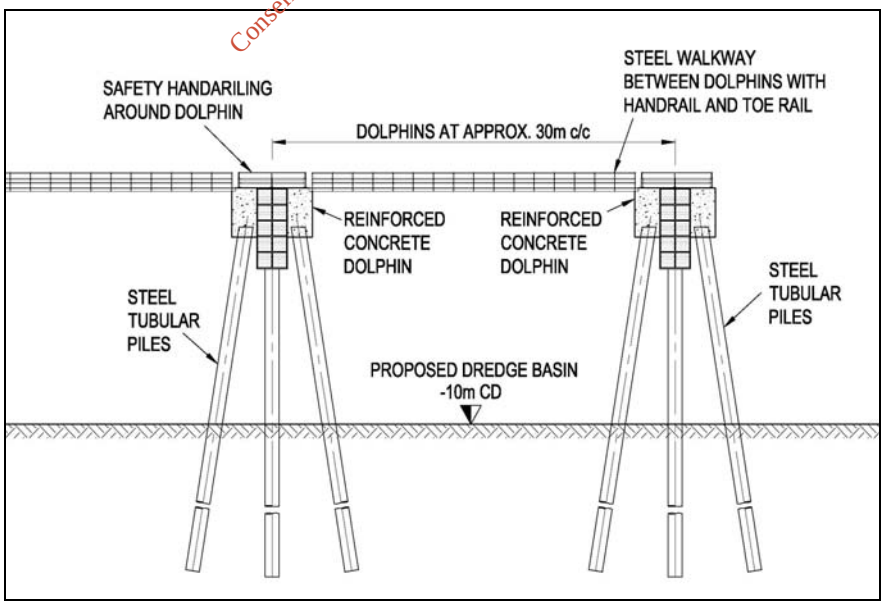


Figure 4.3 Alexandra Basin Ro-Ro Jetty Form of Construction

4.1.2 North Wall Quay Extension

The proposals for the redevelopment of Alexandra Basin include the removal of an area of approximately 21,700m^2 (equating to approx. 2.2 hectares) from the existing North Wall Quay Extension to facilitate access to Alexandra Basin for larger vessels.

The area to be removed is shown on Figure 4.4.

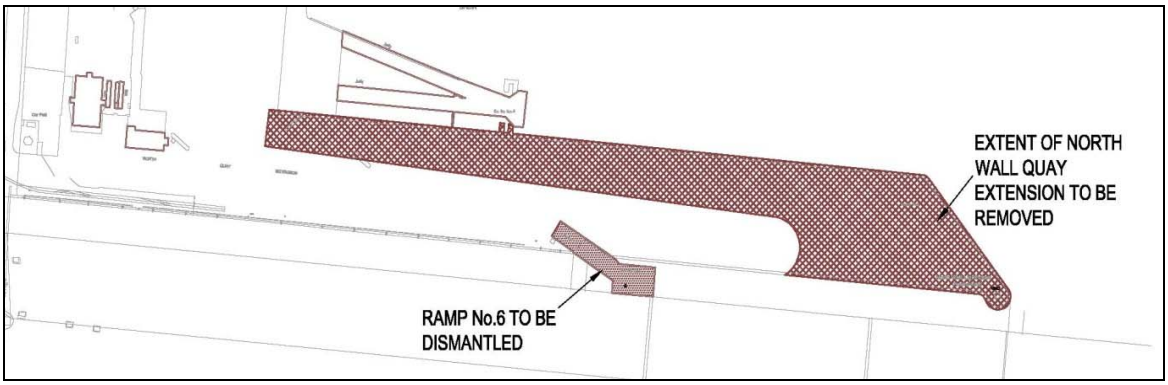


Figure 4.4 Extent of North Wall Quay Extension Removal

The scheme also involves the re-fronting of the existing masonry walls with a steel combi-wall structure to facilitate dredging to -10.0m CD (and possible future dredging to -15.0m CD).

The following quay wall works are proposed:

- Construction of a new quay wall along the Alexandra Basin West side of North Wall Quay Extension, (approx 351m long); and
- Re-fronting of the remaining existing quay wall along the Liffey river side of North Wall Quay Extension and along quay roundhead (approx 586m long).

The anticipated form of construction for these quay walls will also comprise a steel combi-wall with a reinforced concrete capping beam, as previously discussed.

As part of the overall Conservation Strategy for the ABR Project, the new quay wall structure proposed for the North Wall Quay Extension will be modified to be cognisant of the historical nature of the structure.

Prior to the commencement of the modification works, 3D laser technology will be used to record the original quay structure both above and below water.

A salvage policy will be in place during the construction phase for the recovery of granite blocks for re-use, not only as part of this scheme and other areas of the port, but also for other noteworthy conservation schemes.

The Conservation Strategy for the project includes salvaging an intact 350 tonne concrete block (used by Bindon Blood Stoney as the foundations for the quay walls) for use in a publicly accessible interpretation area at the Western end of the quay (referred to as Interpretive Zone 1). The block will be augmented by a contemporary structure architecturally designed.

A 55m long section of the original quay wall adjacent to East Link Bridge will be retained in its original condition. This section of the quay wall will provide the public with a view of the original form of construction and quay wall features, including the granite facing block, steps, a recessed ladder and mooring ring complete with original granite surround (sample shown in Plate 4.1 below).

Plate 4.1 Existing Mooring Ring on North Wall Quay Extension

Six conservation zone recesses will be provided along the river side of the quay wall to allow the original wall to be legible, by showing features such as the original mooring rings and steps along the North Wall Quay Extension. Figure 4.5 below shows the location of these proposed recesses and Figure 4.6 shows the proposed detail for the opening at the existing mooring ring locations. Details of proposed conservation zones are included in the MOLA Architecture drawings and the Conservation Strategy.

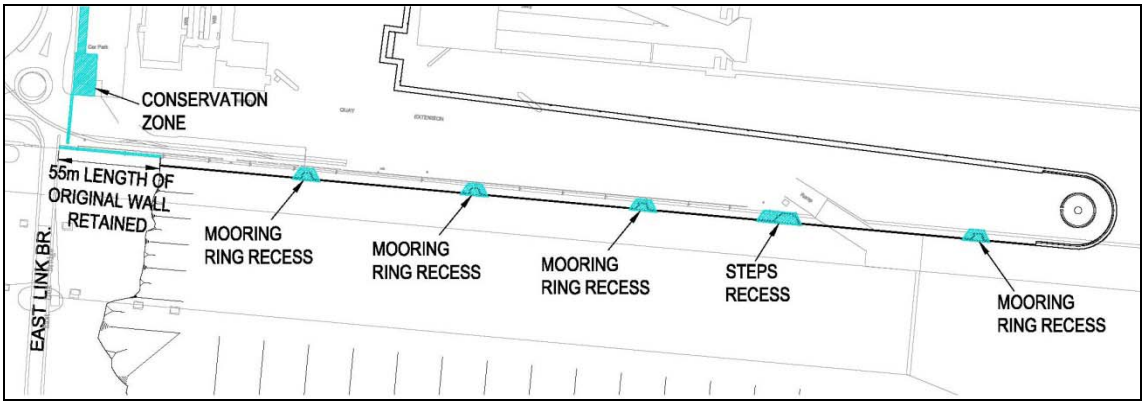


Figure 4.5 Location of Conservation Zone Recesses

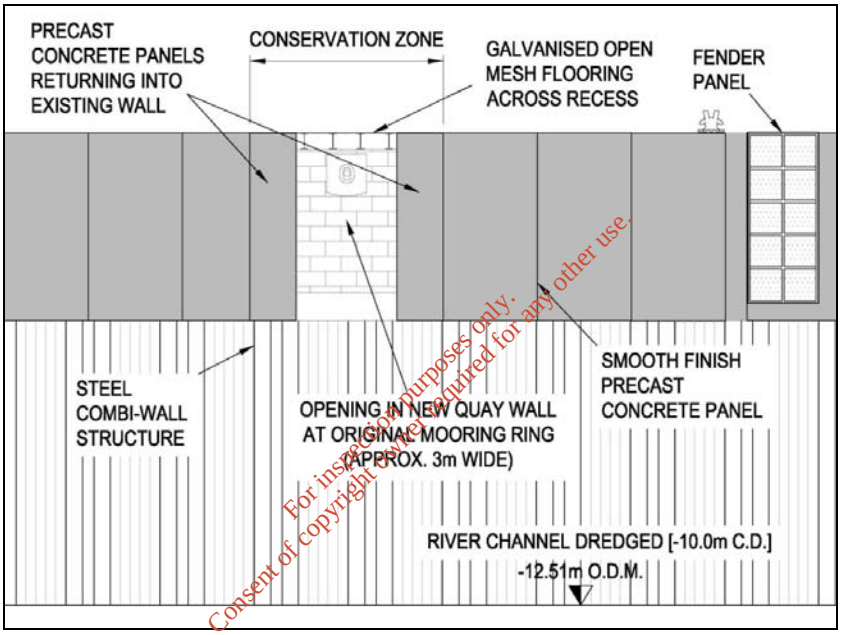


Figure 4.6 Mooring Ring Opening Detail

A high quality reconstruction of the quay end will be undertaken to include the lighthouse, with a curved granite wall protruding above the fender line on the eastern end of the new quay. This detail is shown in Figure 4.7. This area will form a public interpretation zone with controlled access, given that it is located within an operational area of the Port.

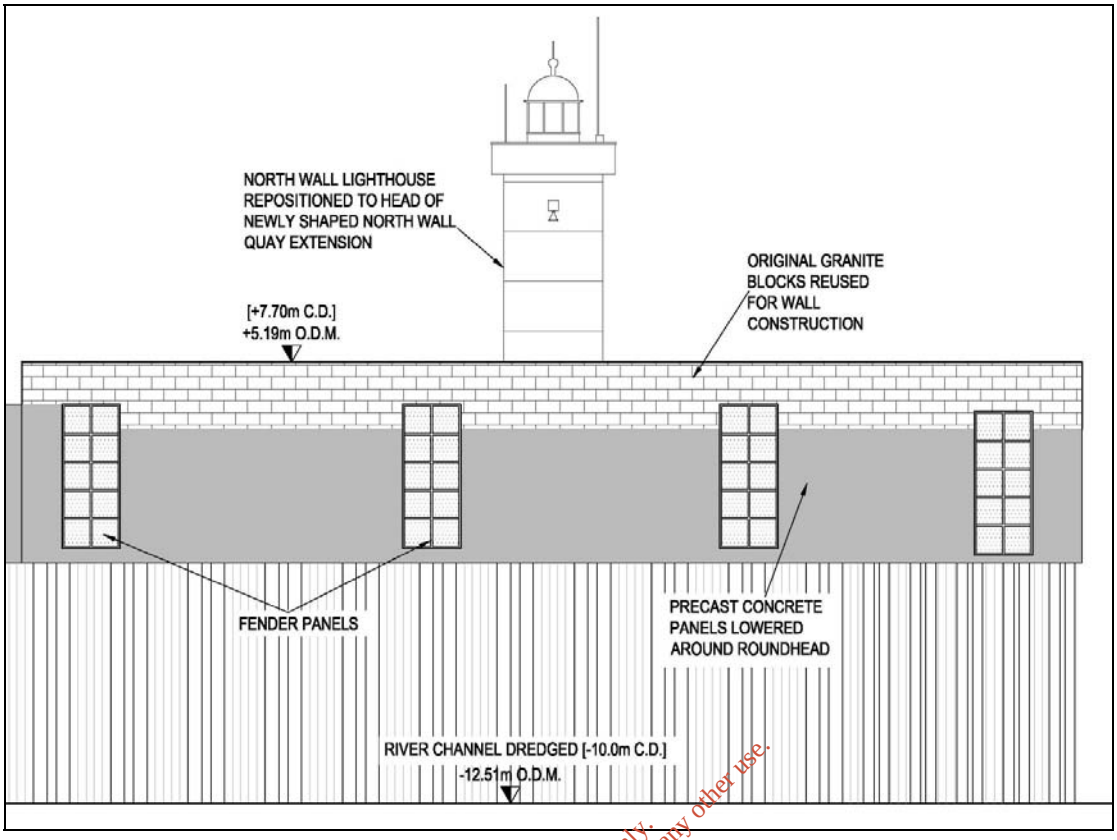


Figure 4.7 North Wall Lighthouse Detail

Salvaged granite blocks will be used as paving blocks to provide a delineated walkway extending from the interpretive conservation zone adjacent to East Link Bridge, along the centre of the quay, to the lighthouse interpretative zone at the eastern end of the quay.

Quay wall granite blocks will be reused to delineate the line of the original quay along the surface of the new quay structure.

Dismantling and Removal of Existing Structures

In order to facilitate the redevelopment of Alexandra Basin West, the dismantling and removal of the following infrastructure is required:

- Bulk jetty (approx area of 3,200m^2)
- Lead-in jetty at Graving Dock No.2 (approx area of 1,200m^2)
- Section of North Wall Quay Extension (approx area of 21,700m^2)
- P&O Buildings (total approx area of 1,715m^2)
- Ramp No. 4 within Alexandra Basin
- Ramp No.6 along North Wall Quay Extension

The locations of the infrastructure to be removed are shown on Figure 4.8.

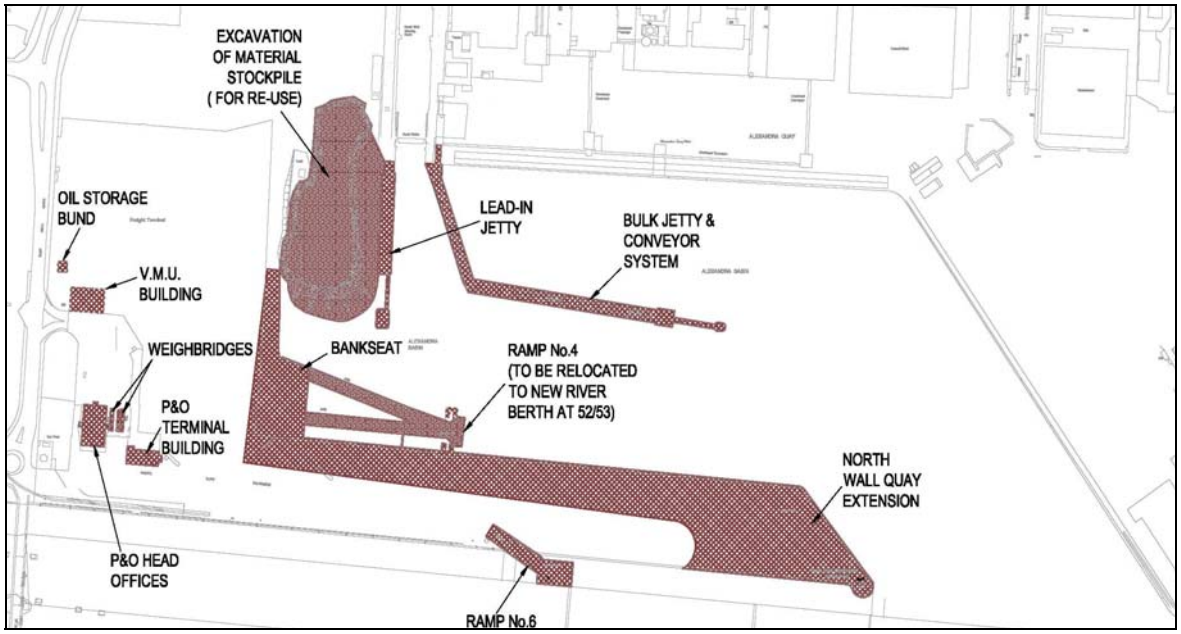


Figure 4.8 Alexandra Basin West Infrastructure to be removed

A Management Asbestos Survey was undertaken on the buildings and structures in Alexandra Basin to be demolished as part of the scheme (attached in Appendix 4) to provide initial indication of asbestos containing materials (ACMs). The survey was completed in accordance with the Irish Health and Safety Authority (HSA) guidance document Asbestos-containing Materials (ACMs) in Workplaces - Practical Guidelines on ACM Management and Abatement (2013) and the UK guidance document HSG264 Asbestos: The Survey Guide (Health & Safety Executive, 2010).

No suspected asbestos containing materials were identified in the marine structures and ramps during the management survey. Asbestos gaskets were identified in the boiler room of the P&O Head Offices building. Whilst these works (to remove the asbestos gaskets) do not require a licenced contractor, they should be disposed of as asbestos waste. A number of areas could not be accessed during the survey, as listed in the survey report, and must be presumed to contain asbestos until assessed by a competent person. In any event, these items/areas should be subject to a detailed asbestos survey prior to demolition.

Where appropriate, the material generated from the removal of the above listed infrastructure will be screened and re-used onsite within the Port. All other material will be disposed of offsite in accordance with all relevant statutory requirements and regulations.

As noted earlier, it is proposed to recover the granite facing blocks from the dismantling of the North Wall Quay Extension. These will be beneficially re-used as outlined in the Conservation Strategy.

It is proposed to remove an existing stockpile of infill material (approx 110,000m^3) from the northwest corner of Alexandra Basin West. This stockpile consists of bunds formed using made ground from within the Port and railway ballast, filled with silt material from previous extension works to Berth 50. This material will be re-used for other construction activities within the Port.

As part of the overall Conservation Strategy for the scheme it is proposed to excavate and restore Graving Dock No.1. This was previously infilled by Dublin Port Company with approximately 19,000m^3 of clean sand and capped with 1,000m^3 of crushed concrete. It is envisaged that the excavated sand and crushed concrete will be beneficially re-used for construction activities within the Port.

Dredging

As part of this scheme, Alexandra Basin West will be dredged to -10.0m CD. In order to achieve this, approximately 470,000m^3 of material must be removed from the basin.

Extensive sampling and environmental testing has shown that this material is contaminated with heavy metals. The methodology for the dredging of contaminated material is discussed in Section 4.1.4 of this Chapter.

Treatment and Re-use of Material

The dredged material recovered from Alexandra Basin West will be treated and transported by barge to a treatment facility adjacent to Berth 52/53. It will be stabilised and modified to improve the engineering properties of the material, to allow its re-use as fill material for reclamation works identified within the Port. This process is explained in more detail in Section 4.1.4 of this Chapter.

As part of this scheme it is proposed to seal and fill Graving Dock No. 2 at Alexandra Basin West to provide space for open hardstanding space for storage/parking. It is envisaged that approximately 55,000m^3 of treated material will be required, which will be transported from the treatment facility at Berth 52/53 to the Graving Dock No. 2 by trucks along the internal port road network. The graving dock will be filled with treated material and capped with crushed material to tie in with the surrounding surface levels. A layer of sand and a geotextile material will be placed in the graving dock prior to the infilling, to act as a separation layer. This will facilitate future reversal of the infilling works if required.

Surfacing

The reinstated areas behind the quay walls and the reclamation area at Graving Dock Nr 2 will be surfaced using a combination of concrete slabs and bituminous surfacing or block paving for trafficked areas and trailer parking.

The North Wall Quay Extension will be surfaced using a flexible heavy duty pavement, with specific areas identified for the use of salvaged granite setts to highlight conservation areas along the quay (see Conservation Strategy under separate cover).

4.1.3 Existing Berth 52 / 53

The works proposed at Berth 52 / 53 involve the removal of existing infrastructure, quay wall construction and infilling with treated dredge material to provide a large hardstanding area for open storage (see Figure 4.1C).

Infrastructure

The following infrastructure is proposed to facilitate the development of Berth 52 / 53:

- Construction of a new quay wall at Berth 52 / 53 (approx 300m long)
- Construction of new 75m long mooring jetty for New Berth 52
- Construction of new 40m long mooring jetty to extend existing Berth 49

As part of this scheme it is proposed to dredge a berthing pocket to -10.0m CD along the new quay wall, however, the quay infrastructure will be designed to facilitate potential future dredging to -15.0m CD.

It is anticipated that a cellular cofferdam form of construction will be used to close off Berth 52/53 from the main navigation channel. The existing bed level along the proposed line of the quay will be excavated to the required level; the cells will then be constructed sequentially from the East side of the Berth using interlocking sheet piles and filled with suitable granular material. The cells will be constructed using piling plant, initially operating from the existing revetment and then from the preceding cell in turn once completed.

Fenders will be mounted on the Southern face of the cofferdams to provide a berthing face for the proposed multi-purpose berth. Associated mooring and berthing dolphins will be installed to the East of the Berth to stabilise the existing revetment for dredging operations.

The form of construction for the mooring jetties proposed at Berth 52 / 53 and Berth 49 will be an open pile structure, constructed using a series of piled mooring dolphins, which will be connected using a steel walkway structure.

A two tier concrete approach structure with piled bridge supports is also required to provide access to ramp No. 4 from the new river berth quay. Reinforced concrete dolphin structures will also be required to facilitate the installation of ramp No.4 from Alexandra Basin.

Dismantling and Removal of Existing Structures

As part of the proposed works at Berth 52 / 53, there is a requirement to dismantle and remove the existing infrastructure in the basin (Figure 4.9), namely:

- Open pile jetty at Berth 52 (approx. area 500m^2)
- Concrete dolphin at Berth 53 (approx. area 100m^2)
- Ro-Ro ramp No. 8- to be relocated to Alexandra Basin for re-use
- Ro-Ro ramp No. 7- to be decommissioned

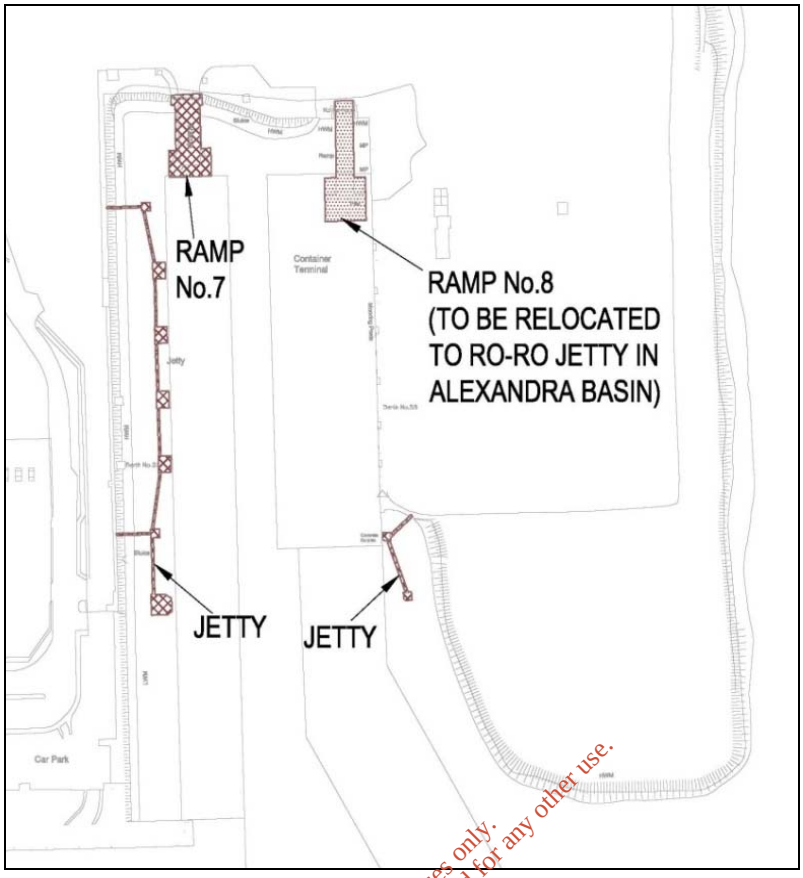


Figure 4.9 Berth 52 / 53 Infrastructure to be removed

A Management Asbestos Survey was undertaken on the structures at Berth 52 and 53 to be demolished as part of the scheme (attached in Appendix 4). No suspected asbestos containing materials were identified in the marine structures. Limited access was available to the underside of these structures, therefore, they should be subject to a detailed asbestos survey prior to demolition

Treatment and Re-use of Material

The dredged material recovered from Alexandra Basin will be treated and transported by barge to a treatment facility adjacent to Berth 52 / 53. It will be stabilised and modified to improve the engineering properties of the material, to allow its re-use as fill material.

As part of this scheme it is proposed to fill the basin at Berth 52 / 53 to provide open storage space and a new river berth at the port entrance. It is also proposed to raise the surface levels at the marshalling area adjacent to the infilled basin at Berth 52 / 53 by approximately 1.4m.

The material will be treated and placed in Berth 52 / 53 to tie in with the proposed reclamation levels for the area adjacent to the basin. The volume of treated dredge material required for these operations are outlined in Table 4.1.

Table 4.1 Berth 52 / 53 Infill Volumes

Receptor	Volume (cubic metres)
Infilling of Basin at Berth 52/53 (to existing levels adjacent to basin)	400,000
Raising level of infilled basin to +7.1m CD (+4.6m O.D.M.)	49,000
Raising level of area adjacent to infilled basin to +7.1m CD (+4.6m O.D.M.)	70,000
Total Volume of Infill at Berth 52/53	**519,000**

The treatment facility will initially be positioned to the East of and immediately adjacent to Berth 52 / 53. The material will be removed from the barges, which will be surrounded by spill plates at the new cellular cofferdam and transported to the treatment site.

The existing surfacing over the southern half of the fill area shown on Figure 4.1C will be stripped in sections and stored on the northern half for reuse. Treated material will be spread over these stripped sections, with the existing surfacing reinstated to overlay the treated material. This operation will raise the existing levels by approximately 1.4m.

The treatment facility will be repositioned within this southern area to permit all sections to be raised to match the surrounding levels.

Following on from this, the process will be repeated to allow the northern half of the fill area to be filled to the required level. The surfacing can then be reinstated and sloped accordingly to tie in with the surrounding surface levels. Suitably sized rock armour will be placed along the eastern sloped edge of the raised area, in keeping with the existing revetment.

Existing surface levels will be retained around the Terminal 5 substation to avoid any impact on the building or cables. A buffer zone will be provided around the perimeter of the building and a slope will be formed around the extremities to meet the surrounding raised levels. An upstand wall will be provided along the top of the slopes and an access ramp will be provided to retain vehicular access to the substation.

Surfacing

The infill area at Berth 52 / 53 and the raised area adjacent to the infill site will be surfaced using a combination of concrete slabs and bituminous surfacing or block paving for trafficked areas and trailer parking.

4.1.4 Navigation Channel

Marina Protection Works

In order to negate any potential impact of the channel dredging or the alterations to the North Wall Quay Extension on the Poolbeg Marina, it is proposed to construct a 220m long surge protection/retaining wall, with a new floating pontoon along the edge of navigation channel at

Poolbeg Marina. This structure will also serve to protect vessels moored in the marina from the wash produced by vessels manoeuvring in the vicinity of North Wall Quay Extension.

It is envisaged that the form of construction used will be a steel combi-wall (see Figure 4.2). The proposed wall will be designed to facilitate possible future dredging to -12.0m CD. Figure 4.10 shows a section through the proposed structure.

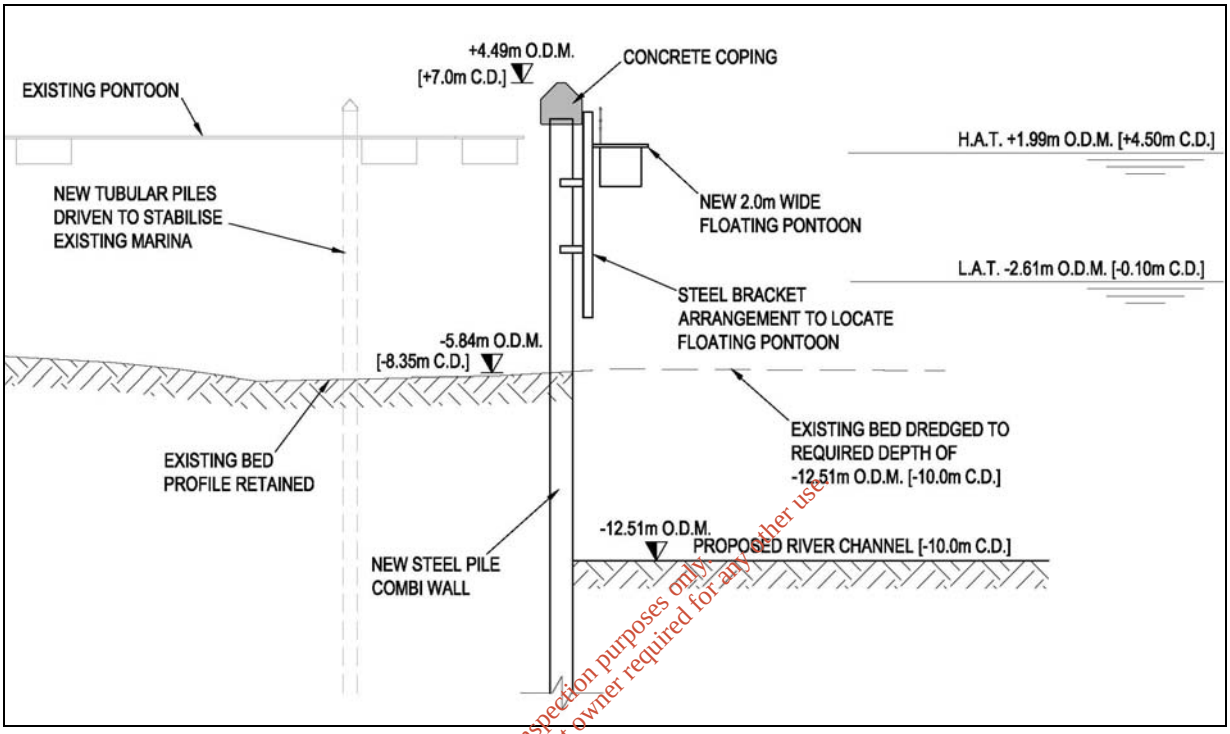


Figure 4.10 Structure at Poolbeg Marina

Great South Wall Protection Works

It is envisaged that stabilisation works will be required to the Great South Wall to negate any impact from the channel dredging and realignment. These works will include the placement of additional rock armour to protect the lower existing rock armour slopes around the bull lighthouse to prevent any undermining of the existing structure. The dredged side slopes will also be steepened and stabilised at this location using concrete mattresses. Typical concrete mattresses are shown in Plate 4.2.

Plate 4.2 Concrete Mattresses being Lifted into Position

In order to avoid the encroachment of the dredge channel into the Special Protection Area (SPA) adjacent to New Berth 52, it is necessary to steepen the dredged side slopes. Cable tied concrete mattresses will also be placed on the slopes along this stretch of the channel to stabilise the slopes.

Dredging and Disposal

The following dredging will be undertaken as part of the proposed works to permit access to Alexandra Basin and provide sufficient water depths for vessels in Alexandra Basin at all stages of the tide:

- Dredging of Alexandra Basin to -10.0m CD
- Dredging of the Liffey Channel to -10.0m CD from the East Link Bridge to the Dublin Bay Buoy.

This equates to approximately 6,370,000m^3 of dredging. The alignment of the dredge channel is shown in Figure 4.1A.

Bed conditions in Alexandra Basin West comprise sandy, silty, clays. The navigation channel within the port consists of silts, fine sands and gravels. The outer channel consists of fine sands, with silts forming the channel side slopes.

A suite of sampling and environmental testing has been undertaken to quantify and identify the nature of the contamination within the bed materials of Alexandra Basin West and the Liffey Channel.

The results shows that the bed materials within the Alexandra Basin West are contaminated with heavy metals such as Arsenic, Copper, Chromium, Cadmium, Nickel, Lead, Mercury and Zinc at depths exceeding 2m.

Lower levels of contamination were recorded in the channel sediments adjacent to the basin. The volumes of material to be dredged are outlined in Table 4.2 and the locations of these areas are shown in Figure 4.11 below.

Table 4.2 Dredge Volumes

Source Location	Material Status	Approx Volume (m^3)
Alexandra Basin West	Heavily Contaminated	470,000
Navigation Channel	Slight/Moderately Contaminated	500,000
Navigation Channel	Uncontaminated	5,400,000
Total Volume	-	**6,370,000**

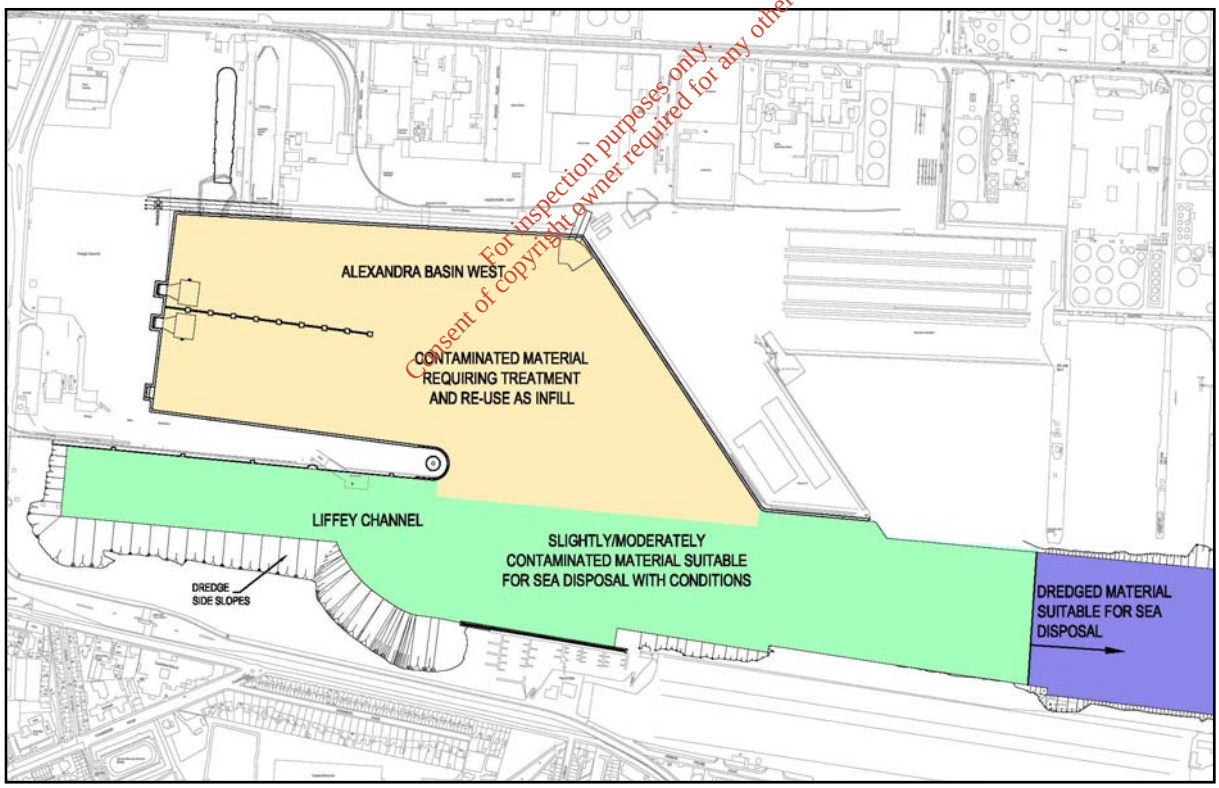


Figure 4.11 Dredge Material Locations

Consultations with the Marine Institute have indicated that the contaminated material within Alexandra Basin West is not suitable for disposal at sea. Therefore it is proposed that this material will be treated and re-used for reclamation within the Port.

Under previous dredging campaigns the disposal of slight/moderately contaminated material to a designated sea disposal site has been permitted with specific conditions in place (capping).

It is therefore envisaged that the slight/moderately contaminated material from the navigation channel will be suitable for disposal at sea with the same restrictions imposed as per the previous dredging campaign.

Dredging of Uncontaminated Material

Uncontaminated dredged material will be transported and disposed of at the licensed Burford Bank offshore disposal site. The nature of this disposal site is discussed in Chapter 9 Coastal Processes.

It is envisaged that the dredging of uncontaminated material will be carried out during winter months only (October to March) to negate any potential impact on salmonid migration and summer bird feeding, notably terns, in the vicinity of the dredging operations.

The channel dredging will be apportioned to be undertaken over a period of six winter seasons, commencing at the channel mouth and continuing westwards into the port.

Within each portion, the channel will be dredged to the required depth along one side, maintaining an open shipping lane at all times. Once completed, the opposite side of the channel will be dredged to depth, with the shipping lane changed to the newly dredged section.

The marine sediments from the outer channel, comprising mainly fine sands, between the North Bull Wall / Great South Wall and the Dublin Bay Buoy will be dredged using a Trailer Suction Hopper Dredger, or equivalent. The dredger will transport the material directly to the licensed sea disposal site (see Chapter 9 Coastal Processes).

Inside the Port's walls, the bed material changes to silts, sands and gravel. This section of the channel will be dredged to the required design depths by an excavator which will operate from a floating pontoon. The dredged material will be loaded into barges and transported directly to the licensed sea disposal site.

Disposal of dredged material to the licensed dump site will require application for a Dumping at Sea Permit from the EPA.

Dredging of Contaminated Material

Dredging of contaminated material will be undertaken to the design dredge level for the scheme. The dredging will be undertaken using a floating pontoon with an excavator mounted clamshell bucket adapted for environmental dredging. This will minimise the disturbance and escape of material at the seabed and during removal through the water column.

Slight/Moderately Contaminated Sediments in the Liffey Channel

Dredging of slight/moderately contaminated silty material adjacent to the North Wall Quay Extension and the entrance to Alexandra Basin West will be undertaken in conjunction with the dredging of gravels from the main channel. The slight/moderately contaminated silts deposited at the dump site will be overlaid (capped) with the dredged gravels.

Disposal of this dredged material to the licensed dump site will require application for a Dumping at Sea Permit from the EPA. DPC attended two pre-application consultation meetings with EPA on 19th September 2013 and 10th December 2013.

Heavily Contaminated Sediments in Alexandra Basin West

For the dredging of Alexandra Basin West, a silt curtain will be utilised around the dredger whilst the dredging of contaminated material is ongoing.

It is envisaged that the dredging of the contaminated sediments will not be seasonally dependent, as the silt curtain will serve to prevent the spread of suspended contaminated sediments beyond the dredge foot print.

This dredged material will be loaded onto barges to be transported to the treatment facility at Berth 52/53. No overtopping of barges will be permitted and spill plates will be utilised to prevent spillage during offloading operations.

In order to minimise the stockpiling of dredged material, the rate of dredging will be determined by the rate of treatment of the dredged material.

The treatment process proposed for the contaminated material is discussed in Chapter 11 - Soils and Geology.

Infilling Works

It is proposed to seal off and infill Graving Dock No. 2 and Berth 52/53 with treated material dredged from Alexandra Basin. It is also proposed to raise existing surface levels to approximately +7.1m CD (+4.59m O.D.M) over an area of approximately 95,000m^2 in the area of Berth 52/53.

A summary of the infilling works to be undertaken as part of the ABR Project is shown in Table 4.3.

Table 4.3 Summary of Infill Works

Receptor	Volume (cubic metres)
Total Volume of Infill at Berth 52/53	519,000
Graving Dock Nr. 2	55,000
Total receptor capacity	**574,000**

4.1.5 Port Equipment

The works associated with this scheme are required to permit a reconfiguration of the existing operations within Alexandra Basin West and at Berth 52 / 53. It is therefore envisaged that all operations within these areas will be similar to current operations.

In order to facilitate the operations within the proposed basin layout and at the new river berth at 52/53, it is necessary to reconfigure existing equipment and install new equipment such as:

- Relocation of existing ramp No. 8 from Berth 53 to Crossberth Quay;
- Installation of ramp No. 8 and 1nr new Ro-Ro ramp to serve 273m long Ro-Ro jetty;
- Relocation of double deck ramp No. 4 from Alexandra Basin to the new Berth 52;
- Installation of double Ro-Ro ramp at intersection between Alexandra Quay West and Ocean Pier West; and
- The relocation of the ore concentrates loading operations to new quay across entrance to Graving Dock No.2.

There is no proposal for additional cranes within the port, as part of this scheme, other than normal upgrading of harbour mobile cranes as and when required.

A recess and bankseat structure will be constructed in the Crossberth Quay adjacent to the North Wall Quay Extension. This will facilitate the installation of a Ro-Ro ramp at a later date. However, as part of this scheme, it is envisaged that this recess will be covered to provide a continuous deck and quay face.

Crane rail beams supported on piles will be incorporated into the new quay wall on Ocean Pier. These beams will future proof the quay, permitting the possible installation of crane rails at a later stage. The installation of crane rails is not proposed as part of this scheme.

Table 4.4 outlines the existing Port activities at Alexandra Basin West and Berth 52 / 53, the proposed activities and the equipment/services required to facilitate the reconfiguration of operations.

Table 4.4 Summary of Port activities and equipment required

Area of Port	Current Activity	Proposed Activity	Equipment Required
Alexandra Quay West	Feed Bulk	Multipurpose Berths	Double Ro-Ro ramp at intersection between Ocean Pier West and Alexandra Quay West
Bulk Jetty	Ore Concentrates	To be removed and ore operations relocated to extended Alexandra Quay	Conveyor System to be installed on Alexandra Quay West
Crossberth Quay	None	Ro-Ro Berth	Ro-Ro jetty and two ramps
Ocean Pier	Bulk Containers	Multipurpose Berths	Double Ro-Ro ramp at intersection between Ocean Pier and Alexandra Quay
North Wall Quay Extension	Ro-Ro	Multipurpose Berths - Cruise ships (during cruise season) - Car transporters - Ro-Ro for general cargo - Visiting naval ships	Ro-Ro ramp on basin side of North Wall Quay Extension
Berth 52/53	Ro-Ro	Ro-Ro	Double Tiered Ramp & Mooring Jetty at New River Berth for longer multipurpose Ro-Ro ferries
Berth 49	Ro-Ro	Multipurpose Ro-Ro Berth	Mooring jetty to extend existing berth for longer multipurpose Ro-Ro ferries

Services and Security

The proposed scheme will be provided with the following services and security features.

Drainage System

The reclaimed infill area at Graving Dock No. 2 will require a suitable drainage system. Storm water runoff from this site will be collected and passed into the existing storm water drainage system. The storm water drainage system will collect rainwater incident upon the site for discharge to the harbour waters via a series of existing silt traps, oil interceptors/separators and outfalls.

The outfall pipes for the existing storm water drainage system on the site will be extended through the proposed quay walls as part of the proposed works.

A new drainage system will be required for the newly shaped North Wall Quay Extension. This system will include appropriate interceptors/separators and will be discharged by outfalls through the new quay walls.

The reclamation area at Berth 52 / 53 will also require a new drainage system. All existing outfalls will be extended through the proposed reclamation and quay wall. A new drainage system will be required for the infilled area. This will incorporate a full retention system and will tie into the existing system at the outfall point in the quay wall.

Water Supply

Water supply will be by connection to the local mains system.

Mechanical and Electrical Services

The proposed lighting for the marshalling areas at Berth 52 / 53, North Wall Quay Extension and along the Western side of Alexandra Basin will comprise 30m high, raising and lowering masts with multiple floodlight arrangements, comprising Abacus Rhea AL5216 units, with 1,000W SON-T lamps. LED fittings will be used for high mast lights.

Lighting has been designed to provide an average lighting level of 50 lux in these areas. Proposed lighting layouts are shown in the planning drawings.

There are no proposals to alter the existing lighting along Alexandra Quay West and Ocean Pier.

The lighting will be designed and fitted onsite with the aid of a laser guidance technique to ensure consistency with the design, and to prevent direct glare into surrounding properties and illumination of the night sky.

Power supply will be by connection to the local electricity grid system.

Ducting will be installed along all new quay walls proposed in this scheme to allow for the installation of ship to shore power, should the future operations of the port necessitate this.

Fencing and Security

Appropriate security fencing will be provided around the boundary of the infilled area at New Berth 52 and the marshalling area at the North Wall Quay Extension to comply with the requirements of the International Ship and Port facility Security Code (ISPS). The fencing will be painted in a dark colour to minimise its visual impact. Security gates will be positioned at the entrance/exits to these areas.

CCTV cameras will be installed within the site of the marshalling and storage areas at New Berth 52 and the North Wall Quay Extension.

Safety Equipment

All quayside areas will be provided with mooring bollards, ladders and safety chains in accordance with the requirements of BS6349 Code of Practice for Maritime Structures.

Fire hydrants will be provided at regular intervals in all working and storage areas.

Navigation Equipment

In order to accommodate the proposed works there will be some amendments to the existing navigation markers which shall be carried out in conjunction with the Harbour Master and the Commissioners of Irish Lights. The relevant changes are illustrated on the planning application drawings.

Navigation simulations have been carried out by Dublin Port Company pilots, personnel from the Harbour Masters department and a cruise ship captain to confirm the proposed port layout can be accessed in a safe and efficient manner. These simulations were carried out at the National Maritime College of Ireland in Ringaskiddy. The simulation exercise confirmed that there will be no difficulties with the handling of vessels up to 350m LOA and that the proposed layout for the North Quay Extension and Alexandra Basin is suitable for safe use by the proposed vessels.

The positions of the required navigation buoys for the channel are shown on the Channel package of planning drawings.

Port Access

It is proposed to close the following accesses:

- Alexandra Road will be closed to all vehicular traffic (except that associated with Dublin Port Company Headquarters). The existing gates adjacent to the entrance to the Port Centre will be closed and locked, opening only to accommodate trains.

- Terminal 3 access will be closed by permanently locking the existing gates. All affected traffic will be redirected through the port to Promenade Road.

- The exit gate from the North Wall Quay Extension on to the East Wall Roundabout will be closed permanently to all vehicular access. A pedestrian access gate will be provided.

All other access and transport routes within the port will remain unchanged.

Landscaping Works

No planting is proposed as part of this scheme. The area around the excavated and restored Graving Dock No. 1, and the Interpretation Zone adjacent to East Link Bridge will be landscaped in line with the MOLA Architecture drawings.

Historic Structures Proposals

The scheme involves the retention and conservation of structures including three cranes and capstans associated with Graving Dock No. 2 with post 1970 structures of local significance only being demolished.

In line with the Conservation Strategy it is proposed to infill Graving Dock No. 2 with material removed from Alexandra Basin West.

The material will be stabilised and then placed in the dock on a suitable separation medium, such as a sand and geotextile layer, to facilitate any future reversal of the infilling process.

The existing pair of lock gates will be positioned at the intermediate gate positions within the dock and the entrance to Alexandra Basin West will be closed by the new quay wall. A structural deck slab, supported on tubular piles, will form the new quay surface and transfer imposed loading from harbour cranes, loading hoppers and conveyors, through piles to the underlying bedrock. The suspended quay slab will also provide stability to the quay wall while protecting the underlying dock from these substantial imposed loads.

The tubular piles will be installed at locations to minimise impact on the existing dock structure through isolation sleeves; these are cored through the dock floor in advance, to minimise the impact of piling operations and future loading on the existing structure. Inclined ground anchors will be installed from the deck slab through the dock floor to provide additional stability to the primary quay wall.

If required in the future, these works can be reversed to return the graving dock to its current condition, with minimal impact on the structural fabric of the dock.

As part of the Conservation Strategy for the scheme, Graving Dock No. 1 will be excavated and restored. This graving dock and its curtilage will be accessible to the public on a regulated basis under DPC's supervision.

It is proposed to restore the pump house adjacent to Graving Dock No. 1 by undertaking necessary repairs to the external envelope, such as re-slating its roof with natural tiles, repairing red brick and redecorating external joinery.

A conservation area is proposed along the western port boundary wall along East Wall Road. The original granite setts along the east side of the port boundary wall will be used to delineate the original quay line. These will therefore be retained in-situ. The entrance gates will also remain in place.

The proposals for these historic structures are covered in more detail in Chapter 12 Cultural Heritage and in the Conservation Strategy.

4.2 CONSTRUCTION ACTIVITIES

4.2.1 Programme/Phasing

The construction activities are divided between two primary work streams: the civil engineering works required to facilitate the creation of deep berths and enclose Berths 52 / 53 and dredging of the main channel and of Alexandra Basin West. These civil engineering works are broken into three distinct, sequential phases. A flow chart detailing the order of these works is contained in Figure 4.13.

A draft construction programme has been developed, based on this order of works, as part of this application and is contained in Appendix 4. The draft programme includes a three month break in marine based piling operations between March and May (inclusive), to mitigate against any potential impact on migrating smolts in the river channel.

4.2.2 Dredging

There are two distinct dredging phases within the project. The rate of dredging of the main channel is determined by the capacity of the disposal site to accommodate the material deposited and the length of dredging season, typically six months / annum.

Considering these two constraints it is estimated that the main channel dredging could be completed, given favourable conditions, within six years. A secondary constraint is the requirement to have the North Wall Quay Extension and the Marina Wall works completed prior to undertaking the dredging of the channel adjacent to these works.

In addition, consideration will be given to any enabling works required in the vicinity of the Great South Wall prior to dredging in the adjacent area.

The dredging of Alexandra Basin West is dependent upon two preceding work streams; the closing of Berths 52 / 53 with a cellular cofferdam, to allow infilling of the area behind with the dredged material (following treatment and stabilisation), and the requirement to have sufficient re-fronted quay wall established to facilitate the dredged depth. The rate of dredging within Alexandra Basin West will be determined by the rate of treatment of the dredged material.

4.2.3 Civil Engineering Works

The civil engineering works largely comprise the re-fronting of the existing quay walls within Alexandra Basin West and the reconfiguration of existing berths within the basin and in Berths 52 / 53.

Given that no additional new berths are created during the course of the works there are significant operational challenges associated with maintaining and continuing port operations during the reconfiguration of the berths in the two affected areas. These dictate that a sequential and interconnected phasing of the works is required.

It is proposed to carry out the works in three distinct but overlapping phases, largely determined by operational requirements involving transfer of customer operations as berths are reconfigured. The overall sequence is outlined in Figure 4.13.

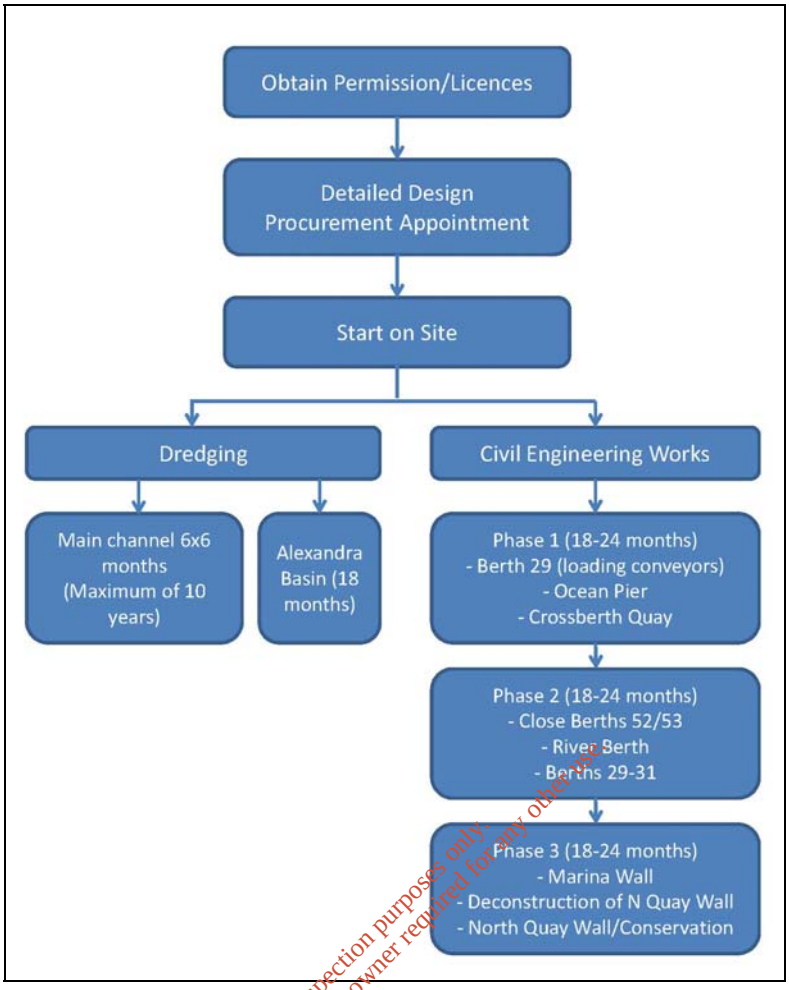


Figure 4.13 Project Construction Phases

It is envisaged that the following works will be undertaken during the first phase of the construction stage:

- Construction of new quay walls and the reconfiguring of existing loading facilities within the North West corner of Alexandra Basin West
- Demolition of existing vessel loading jetties and plant
- Re-fronting of Ocean Pier
- Construction of the new berths on Crossberth Quay
- Relocation of customers from existing Berths 52 / 53 to Crossberth Quay berths

The second phase of the project will include the following works:

- Closure of Berths 52 / 53

- Construction of New Berth 52 (river berth)
- Relocation of customers from Alexandra Basin West back to New Berth 52
- Re-fronting of Alexandra Quay West
- Dredging of Alexandra Basin West
- Treatment of dredge material and infilling of Graving Dock No. 2 and Berths 52 / 53

The third phase of the project comprises two distinct constructions:

- Installation of a new Marina wall on the Southern Side of the channel at Poolbeg marina
- Deconstruction, re-fronting and conservation of the North Wall Quay Extension

It is anticipated that each of the three phases will last between 18 and 24 months, overlapping to give construction duration of 36-47months (excluding channel dredging).

Temporary Site Compound

An area will be required for the establishment of the contractor's site compound. The site compound will be used for the contractor's site office accommodation and facilities and will include an area for temporary storage of construction materials.

An area will be allocated to accommodate the contractor's compound for plant and materials which is to be agreed with the Port. A suitable area will be made available on existing port lands close to the site of the proposed works within Alexandra Basin West.

An additional area will also be made available adjacent to Berth 52 / 53 for both a dedicated treatment facility and contractor's site compound.

Once the reclamation works have been commenced at Berth 52 / 53, further areas will be available to the contractor.

The contractor's compounds will be secured by the contractor.

Pollution Control

The construction works will involve civil and marine engineering works and mechanical and electrical works.

All machinery used during the construction phase of the works will be required to be in good working order and free from oil and hydraulic fluid leakages. If machinery maintenance has to take place, it will be carried out at least 100m away from the sea. Fuel for machinery will be required to be stored in a secure and bunded area.

Certain elements of the works may be constructed using reinforced in-situ concrete. No losses of concrete (cement) to the sea will be permitted during this phase of the works.

The proposed dredging works will be undertaken in a manner which will minimize the suspended solids loading within the water column.

Site Safety

Safety will be of prime importance during the construction works. The works will be subject to the Safety, Health and Welfare at Work Act 2005 and the Safety, Health and Welfare at Work (Construction) Regulations, 2013. All aspects of design construction will be reviewed with regard to health and safety and a risk assessment will be carried out.

A project supervisor (design phase) will be appointed to produce a pre-tender Health and Safety Plan for the project. The principal contractor will be responsible for the control and co-ordination of health and safety during the works and will be appointed as the project supervisor (construction stage).

Waste Disposal

Contractors working on site during the works will be responsible for the collection, control and disposal of all wastes generated by the works. An indication of the types of waste likely to be generated by the works and the most appropriate method of disposal are presented in Table 4.5.

Table 4.5 Typical Wastes Generated by the Construction Works and recommended disposal / treatment options

Activity	Waste Generated	Disposal/Treatment Recommendations
Demolition Waste	Construction materials, concrete, steel, clay pipes	Collected onsite for disposal by licensed waste contractor.
General Construction Waste	Waste oils	Collected by waste recycling contractor.
	Other waste	Collected in skips for disposal by licensed waste contractor.
General Office/Messing	Paper, packaging, canteen etc.	Collected in covered skips/large bins for disposal by a licensed waste contractor.
Temporary Site Toilets	Sewage	Emptied under contract for disposal at an appropriate facility.

4.3 OPERATIONAL ACTIVITIES

4.3.1 Maintenance

When construction work has been completed, the quays will require minimal maintenance.

Although some siltation may occur in the new dredged areas, the water depth is such that this is unlikely to cause any significant problem in the short term.

Any maintenance dredging of the channel which may be required in the longer term will likely be carried out as part of DPC's regular maintenance dredging programme. The material generated would likely be disposed of at sea at a licensed disposal site agreed in accordance with DPC's maintenance dredging licence. This has been standard practice in the port for decades.

Environmental testing has shown that contaminated material is present within Alexandra Basin West below the proposed dredge level of -10.0m CD. Therefore, any further dredging of Alexandra Basin West would require additional sampling and testing to determine the extent of contamination and a suitable treatment technique.

4.3.2 Pollution Control

Surface water from the main quays and working areas will be collected by a system of drainage channels and gullies. The surface water will be discharged to sea via oil interceptors/separators to ensure that no pollution is released into the harbour or surrounding waters.

Waste Disposal from Vessels

DPC operates an Environmental Management System (EMS) which includes procedures for the disposal of waste from berthed vessels.

All waste to be disposed of from berthed vessels will be handled and disposed by a licensed waste disposal contractor. Waste awaiting disposal will not be permitted to be stored on the quayside.

Discharges from vessels to the harbour waters will not be permitted.

5. FLORA AND FAUNA

This Chapter of the Environmental Impact Statement (EIS) assesses the impact of the proposed development on the natural environment in terms of birds, marine mammals, terrestrial ecology and marine ecology (including fisheries).

An Appropriate Assessment was also undertaken in accordance with the EU Habitats Directive and EU Birds Directive for the qualifying interests within the candidate Special Areas of Conservation (cSAC) and Special Protection Areas (SPA) within Dublin Bay, estuary and surrounding area. The Appropriate Assessment is presented as a separate Habitats Directive Assessment - Natura Impact Statement supporting the Planning Application.

5.1 BIRDS

5.1.1 General Introduction

This section covers impacts on birds in the Dublin Port area and in the navigational channel and approaches to the port. It also addresses any possible impacts on the Special Protection Areas within Inner Dublin Bay.

5.1.2 Methodology

Bird surveys within the port area

The habitats within Dublin Port are highly artificial. Nevertheless, they are used by a limited number of bird species in both winter and summer. A desk review was undertaken of all previous information on birds in the port area and a series of baseline surveys were carried out over the full year January 2013 to January 2014. Additional surveys of wintering birds in the Tolka Estuary (between the Port and Clontarf) were carried out during the four winters up to, and including, 2012/13. During 2013/14, a series of boat-based surveys were also undertaken of seabirds in the navigation channel and approaches to the port. The methodologies for these surveys are outlined below.

Winter bird surveys

Brent Geese

The berths at Alexandra Basin West are used for the unloading of agricultural products and occasional spillage of these materials attracts flocks of Brent Geese to forage here. A series of surveys of Brent Geese was undertaken in Alexandra Basin West between January and April 2013 (12 surveys) and between October 2013 and January 2014 (five surveys). These surveys were targeted on a wide range of tide heights and ranges and different times of day. Geese were counted using 10 x 50 binoculars and any ringed birds were recorded with their alphanumerical codes. All other bird species present in Alexandra Basin West were also recorded on these dates.

Winter Bird Surveys in the Tolka Estuary

A total of 27 monthly low tide surveys have been undertaken between the months of September and April, over four winters, covering all of the intertidal areas in the Tolka Estuary from Fairview to the Bull Wall (Figure 5.1.1). Due to adverse weather, no surveys were undertaken in September or November 2010 but an additional survey was carried out in April 2011. All waterbird species have been mapped and counted in a total of nine sub-sectors.

On each date, the survey was started at or near the time of low tide and continued for two to three hours, or until the majority of birds had left the estuary. On a spring tide, most birds leave the estuary after mid-tide and fly north-east to the North Bull Lagoons where they ultimately spend the high-tide period. In most situations, a single count in the period two hours either side of low tide has been found to be the most accurate reflection of the maximum number of birds present on a site (Burton *et al.* 2004). All surveys of the Tolka Estuary were carried out in daylight.

Basic analysis has been undertaken to calculate peak counts and trends over the four years. This survey is being continued by BirdWatch Ireland through 2013/14 as part of the Dublin Bay Birds Project which is funded by the DPC.

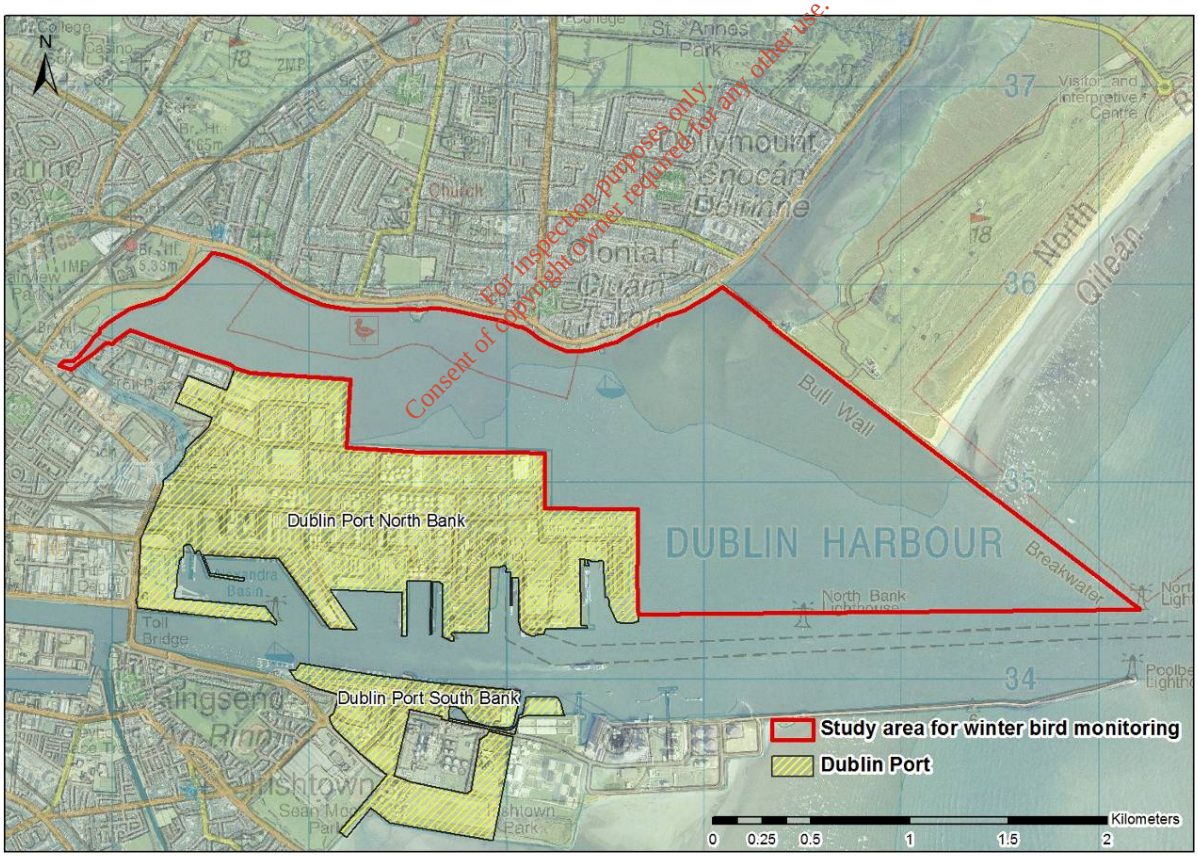


Figure 5.1.1 Study area for winter bird monitoring in Tolka Estuary (outlined in red)

Breeding bird surveys

Black Guillemots

Black Guillemots breed throughout Dublin Port, mainly in the piers and other structures. They were surveyed using the methods outlined in Mitchell *et al.* (2004). The survey method involved early morning (05:00-09:00) counts of birds on the water between late March and mid-May at the start of the breeding season. A total of five surveys were undertaken in Alexandra Basin West and a full survey of the port from Butt Bridge to the Poolbeg Power Station was carried out on 17th May 2013. This survey was boat-based and was undertaken by two experienced observers.

Tern colonies

Dublin Port has held a breeding colony of Common Terns and Arctic Terns since at least 1949. In recent years the colony has established on two mooring dolphins close to the Poolbeg Power Station and this has been well-monitored since 1995 (Merne 2004). This monitoring has been continued since 2011 by BirdWatch Ireland. A total of six visits were made to the colony, as part of the Dublin Bay Birds project, between 3rd May and 9th September 2013 to census nesting terns. Breeding productivity of the terns has also been recorded by BirdWatch Ireland.

Bird surveys within the shipping channel

A series of six surveys of all birds located within the shipping channel, from the Alexandra Basin West to the Dublin Bay Buoy, was undertaken in the period June 2013 to January 2014. The methodology for these surveys followed the standard seabirds-at-sea census technique outlined by Camphuysen *et al.* (2002). The surveys were conducted by two experienced observers from the deck of a vessel, operated by DPC. A number of parallel transects at 600m spacing were followed on each survey. Recording of all birds present was undertaken simultaneously on both sides of the vessel out to a maximum distance of 300m. The study area was subdivided into six survey boxes (marked A to F in Figure 5.1.2). Birds were identified to species and their activity was recorded as flying, swimming, roosting, etc. Direction of flight was also recorded.

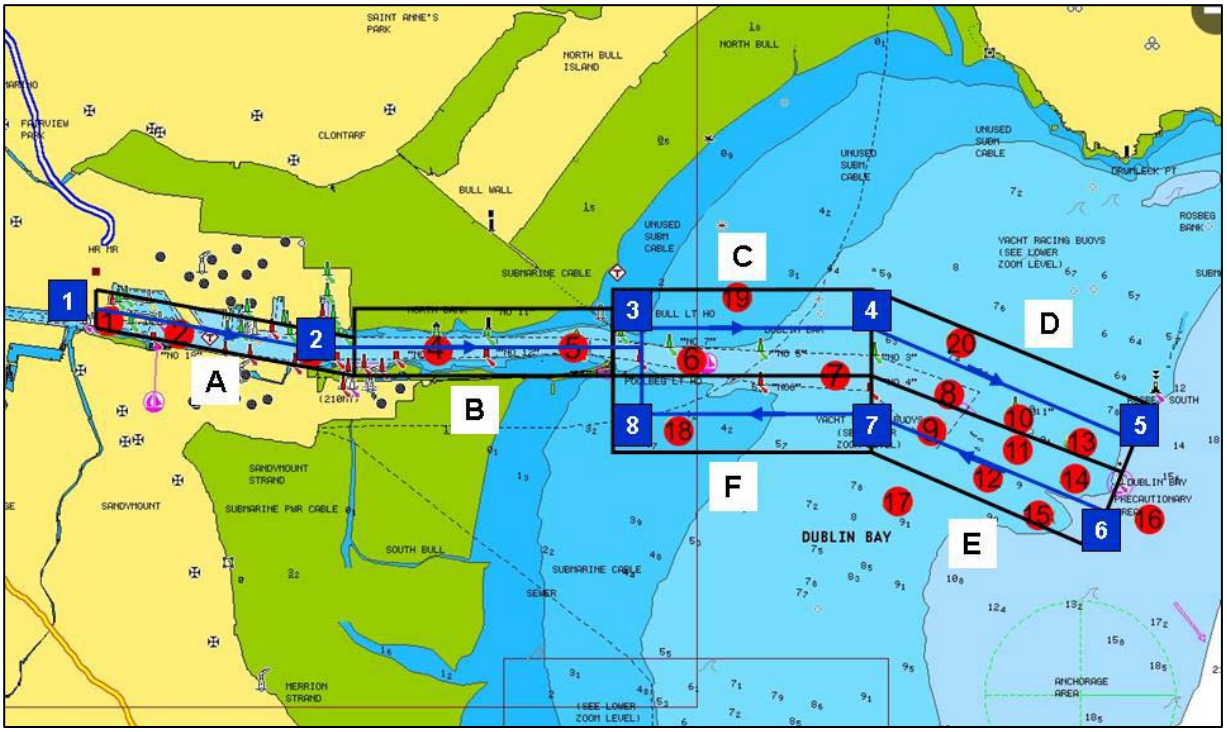


Figure 5.1.2 Study area for seabird surveys in the shipping channel and approaches to Dublin Port. The study area was subdivided into six survey boxes (marked A to F). The numbers 1-8 represent waypoints used for navigation purposes

5.1.3 Description of the existing environment

Designated areas

There are two designated Special Protection Areas (SPA) for birds in the vicinity of the proposed development and a further six SPAs on the wider Dublin coastline, that could have connectivity with the proposed development area. These are considered here because the proposed development may have some indirect impacts on species that are among their special conservation interests. These SPAs are:

South Dublin Bay and River Tolka Estuary (site code 004024)

North Bull Island (site code 4006)

Skerries Islands (site code 4122)

Rockabill (site code 4014)

Lambay Island (site code 4069)

Ireland's Eye (site code 4117)

Howth Head (site code 4113)

Dalkey Island (site code 4172)

The special conservation interests of these SPAs are listed in Table 5.1.1.

Table 5.1.1 Special Conservation Interests for the SPAs in the areas surrounding Dublin Bay

	Special Conservation Interests for Special Protection Areas							
	South Dublin Bay and River Tolka E...	North Bull island	Skerries Islands	Rockabill	Lambay Island	Irelands Eye	Howth Head	Dalkey Island
Greylag Goose					●			
Light-bellied Brent Goose	●	●	●					
Shelduck		●						
Teal		●						
Pintail		●						
Shoveler		●						
Oystercatcher	●	●						
Ringed Plover	●							
Golden Plover		●						
Grey Plover	●	●						
Knot	●	●						
Sanderling	●	●						
Purple Sandpiper			●	●				
Dunlin	●	●						
Black-tailed Godwit		●						
Bar-tailed Godwit	●	●						
Curlew		●						
Redshank	●	●						
Turnstone		●	●					
Fulmar					●			
Cormorant			●		●	●		
Shag			●		●			
Roseate Tern	●			●				●
Common Tern	●			●				●
Arctic Tern	●			●				●
Black-headed Gull	●	●						
Lesser Black-backed Gull					●			
Herring Gull			●		●	●		
Kittiwake					●	●	●	
Common Guillemot					●	●		
Razorbill					●	●		
Puffin					●			

Bird populations within Dublin Port

Wintering birds

Brent Geese

Flocks of Brent Geese use the Alexandra Basin West between approximately November and April each winter. These birds breed in the high arctic of Northern Canada and migrate to Ireland in September and October. Initially, they forage on intertidal vegetation in Dublin Bay but, as the natural resources are depleted, they switch to feeding primarily on amenity grasslands around Dublin City (Benson 2009). The berths at Alexandra Basin West are used for the unloading of agricultural products and occasional spillage of these materials attracts flocks of Brent Geese to forage here from about November onwards.

The principal attraction for the geese in Alexandra Basin West is the spilled agricultural products that accumulate on the quays (mainly on Berths 29 to 31 and on Ocean Pier). For most of each day, a large flock is present swimming within the Basin. When there is no disturbance on the quayside, the geese fly up to feed intensively on the agricultural products. A peak of 450 geese was counted in Alexandra Basin West in both winters 2012/13 and 2013/14. The threshold for an internationally or nationally important site is one used regularly by over 260 geese (Boland and Crowe 2012).

A number of the Brent Geese has been colour-ringed by the Irish Brent Goose Research Group and these birds carry individual alpha-numerical codes that can be easily read from a stationary vehicle on the quay. A total of 11 individual ringed geese were identified in Alexandra Basin West in the period January to April 2013 and a further 10 ringed birds were identified in the period November 2013 to January 2014. The full re-sighting history of these marked individuals indicates that they use a wide variety of both intertidal and inland sites from Kilcoole Marshes in Co Wicklow to Baldoyle Bay in north Dublin.

Several of the individual geese have already been recorded repeatedly in Alexandra Basin West with at least 14 marked birds recorded more than once at the site and five marked birds re-sighted in both winters 2012/13 and 2013/14. One individual has been recorded in this flock on seven separate dates. This confirms that there is a high degree of site faithfulness and that some of the geese are becoming habituated to this food source.

Within the Dublin-Wicklow area, the birds commute around a large number of sites (mostly on amenity grassland). They often move between sites within the same day, largely due to disturbance (Benson 2009). While ships are unloading in Alexandra Basin West, the geese do not feed on the quay but most revert to feeding on nearby grassland. This was evident on 29th March 2013, when two of the ringed geese previously recorded in the Basin on 10th March were feeding in a flock at Irishtown Nature Reserve. Ringed geese, recorded regularly at Alexandra Basin West, have also been recorded feeding at Irishtown Stadium on the south side of Dublin Port. As the only attraction for the geese in Alexandra Basin West is the source of food in the agricultural products, they are likely to occur wherever these cargos are offloaded in the future.

These geese are widely travelled, making annual return migrations each year from arctic Canada, passing through Iceland, Northern Ireland (and occasionally Scotland) en route to Ireland, where they winter each year (Boland and Crowe 2012, Inger *et al.* 2006, Robinson *et al.* 2004). Brent Geese wintering in Ireland have shown a consistent increase since the early 1990s and Dublin Bay area now holds the largest single group in the Republic of Ireland, with

a peak of 5,290 geese in the period 2004/05-2008/09 (Boland and Crowe 2012). This makes the Dublin area of special importance and the conservation of this sector of the population is vital to the overall stability of the species.

Wintering birds in the Tolka Estuary

The Tolka Estuary is the nearest intertidal area to the Alexandra Basin West and to the Liffey Channel for shipping entering the Basin. The estuary is not covered in the monthly IWeBS[1] counts as these are normally concentrated during the high tide period when most of the estuary is covered by water and the majority of the birds have moved to the Bull Island lagoons (Crowe 2005, 2006).

Monitoring of birds in the Tolka Estuary has been undertaken, on behalf of DPC, over the four winters 2009/10 to 2012/13. Table 5.1.2 gives a summary of the main species recorded over this period.

Table 5.1.2 Overall mean of all counts and mean of peak counts for each species in the Tolka Estuary during the four winters 2009/10 to 2012/13.

Species	*Scientific Name*	*Overall mean*	*Mean Peak*
Mute Swan	*Cygnus olor*	0	4
Brent Goose	*Branta bernicla*	312	855
Shelduck	*Tadorna tadorna*	9	37
Mallard	*Anas platyrhynchos*	1	3
Wigeon	*Anas penelope*	10	41
Teal	*Anas crecca*	1	3
Pochard	*Aythya ferina*	0	2
Tufted Duck	*Aythya fuligula*	0	1
Goldeneye	*Bucephala clangula*	1	3
Red-breasted Merganser	*Mergus serrator*	12	33
Cormorant	*Phalacrocorax carbo*	3	9
Red-throated Diver	*Gavia stellata*	0	0
Little Grebe	*Tachybaptus ruficollis*	0	0
Great Crested Grebe	*Podiceps cristatus*	11	35
Little Egret	*Egretta garzetta*	1	3
Grey Heron	*Ardea cinerea*	7	14
Oystercatcher	*Haematopus ostralegus*	316	458
Ringed Plover	*Charadrius hiaticula*	0	0
Grey Plover	*Pluvialis squatarola*	20	63
Golden Plover	*Pluvialis apricaria*	177	789
Lapwing	*Vanellus vanellus*	0	1
Knot	*Calidris canutus*	541	2,251
Sanderling	*Calidris alba*	2	12
Turnstone	*Arenaria interpres*	34	67
Dunlin	*Calidris alpina*	1,214	3,915
Redshank	*Tringa totanus*	366	677

[1] IWeBS is the Irish Wetland Bird Survey organised by BirdWatch Ireland.

Species	Scientific Name	Overall mean	Mean Peak
Greenshank	*Tringa nebularia*	1	5
Black-tailed Godwit	*Limosa limosa*	73	283
Bar-tailed Godwit	*Limosa lapponica*	690	1,419
Curlew	*Numenius arquata*	281	498
Black-headed Gull	*Choicocephalus ridibundus*	2,225	6,673
Common Gull	*Larus canus*	68	251
Herring Gull	*Larus argentatus*	247	544
Lesser Black-backed Gull	*Larus fuscus*	14	62
Great Black-backed Gull	*Larus marinus*	10	26
Black Guillemot	*Cepphus grylle*	0	1
Total waterbirds			**19,035**

The Tolka Estuary holds particularly large concentrations of Brent Goose, Oystercatcher, Golden Plover, Knot, Dunlin, Redshank, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Black-headed Gull, Common Gull and Herring Gull. The sum of peak counts for all species in the estuary in 2012/13 was 18,900 birds. This was close to the average of the previous three winters (19,080 birds). The total number of birds wintering in the entire area of Dublin Bay has been relatively stable over the last decade, although a decline was recorded in 2010/11 for the first time since 2003/04 (Crowe *et al.* 2012). The mean of peak counts in Dublin Bay over the last five winters is 31,700. The Tolka Estuary is thus a very important sub-site, especially at low tide, when it holds the majority of all the birds in Dublin Bay.

Breeding birds

Black Guillemots

Dublin Port holds a sizeable colony of breeding Black Guillemots, estimated at a minimum of 82 adult birds in May 2013. This could be considered as a loose breeding colony of at least 41 pairs (Figure 5.1.3). The birds breed throughout the Port in disused drainage pipes and other cavities, especially in the older piers and structures. A total of five early morning surveys of Alexandra Basin West were undertaken in April and May 2013. A peak of 16 birds was recorded in Alexandra Basin West on the 17th May 2013. This equates to eight breeding pairs and represents approximately 20% of the population in Dublin Port. The birds are very active in the early morning and commute in and out of the Port via the main Liffey channel. They feed on fish caught in shallow waters of Dublin Bay.

Black Guillemots are relatively common and widespread around the Irish coastline although, unlike most colonial seabirds, they rarely occur in large concentrations. Natural nest sites are generally in crevices at the base of rocky cliffs but they are also commonly nest in harbour walls and even in artificial nest boxes (Mitchell *et al.* 2004).

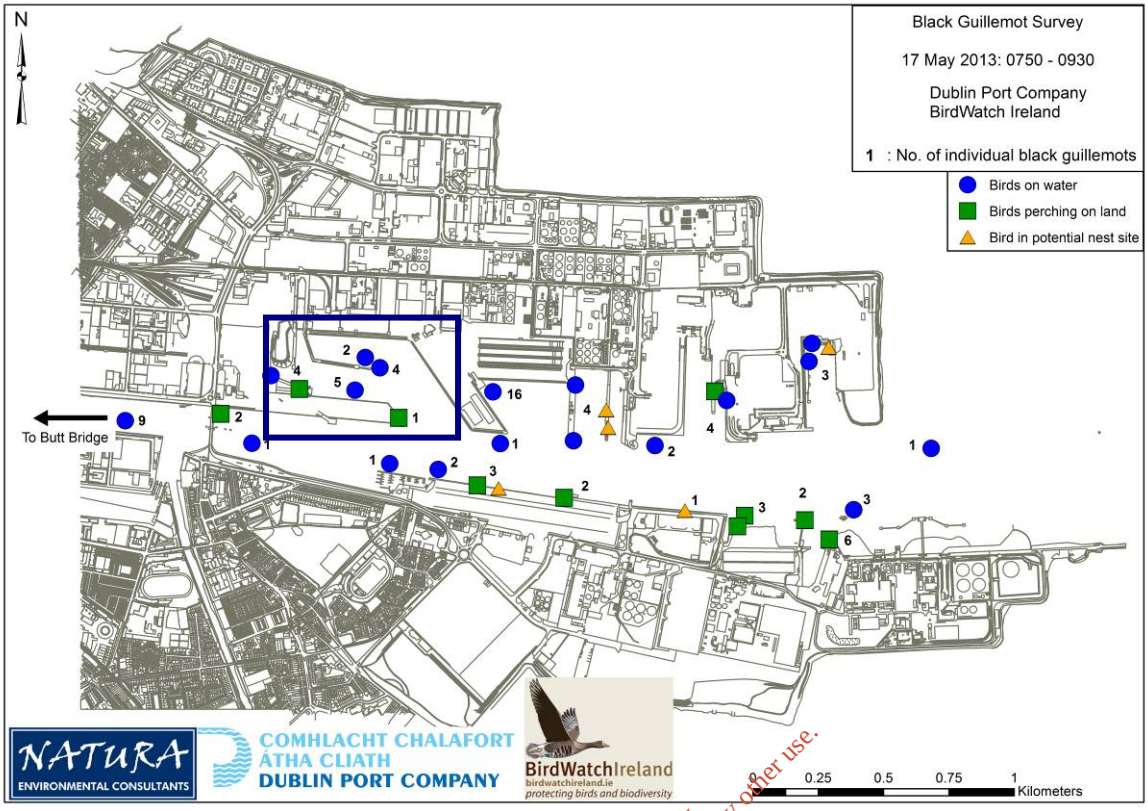


Figure 5.1.3 Results of a survey of Black Guillemots in Dublin Port on 17th May 2013. Figures refer to individual birds. Alexandra Basin is indicated by a blue rectangle.

Breeding Terns

Dublin Port has held a breeding colony of Common Terns (*Sterna hirundo*) and Arctic Terns (*S. paradisaea*) since at least 1949 and this has been well-monitored since 1995 (Merne 2004). The terns breed mainly on two mooring structures (known as the ESB and CDL dolphins) on the south side of the River Liffey, near the Poolbeg power station. The birds are generally present on these structures from May to August and numbers have been increasing steadily since the 1990s. In 2011, 499 pairs of Common Tern and 37 pairs of Arctic Tern bred and well over 700 chicks were ringed. Data for 2012 are not available but in late summer the majority of the chicks were predated on the nests and productivity was low (S. Newton, pers comm.).

A total of six visits were made by BirdWatch Ireland to the colony in 2013, between the 3rd May and the 9th September, to assess the success of the breeding season. At least 418 pairs of Common Terns nested on the ESB platform, and at least 25 pairs of Arctic Tern and one Common Tern nested on the CDL platform. The overall mean clutch size of Common and Arctic Tern nests combined was 2.40. A total of 449 Common Terns and 33 Arctic Terns were ringed. While breeding productivity could not be accurately calculated, the estimated minimum productivity, calculated as the number of fledged chicks per egg-laying pair, was 1.05 and 1.38 for Common and Arctic Terns respectively. No evidence of mammalian predators was recorded on either of the platforms in 2013. However a minimum of 69 eggs were depredated by avian predators (BirdWatch Ireland, unpublished data). This suggests a slight decrease in the size of the colony since 2011. It is likely that the structures used are at maximum capacity

and that there is little space for any expansion here. In 2013, a single pair of Common Terns also nested successfully on a moored raft in the Tolka Estuary to the north of Dublin Port.

Both species of terns can occasionally be seen feeding in the wake of large ships entering and leaving the port. Terns are occasionally recorded in Alexandra Basin West but do not regularly feed there.

Other bird species

A number of other bird species have been recorded regularly in Alexandra Basin West, although none of these (apart from pigeons) has been recorded breeding here. These are summarised in Table 5.1.3.

Table 5.1.3 Other bird species recorded in Alexandra Basin West in 2013

Species	Scientific name	Frequency
Grey Heron	*Ardea cinerea*	*Single bird regularly recorded at the west end of the Basin*
Cormorant	*Phalacrocorax carbo*	*Occasionally recorded roosting on jetties in the centre of the Basin*
Mallard	*Anas platyrhynchos*	*One or two pairs in the Basin throughout the year*
Peregrine	*Falco peregrinus*	*Single bird occasionally recorded hunting pigeons in the Basin*
Black-headed Gull	*Chroicocephalus ridibundus*	*Flocks regularly forage on spilt agricultural products on the quays.*
Herring Gull	*Larus argentatus*	*Small numbers of birds feed and roost in the Basin.*
Great Black-backed Gull	*Larus marinus*	*Small numbers of birds feed and roost in the Basin. Occasionally prey on Black Guillemot.*
Grey Wagtail	*Motacilla cinerea*	*One or two birds recorded at the west end of the Basin*
Feral Pigeon	*Columba livia (domest.)*	*Large flocks feed throughout the year on spilt agricultural products on the quays*

Bird populations in the shipping channel

Birds using the shipping channel and approaches to Dublin Port had not been surveyed prior to 2013 except in the section between the Tolka estuary and the Great South Wall where small numbers of Cormorants, Shags, Great Crested Grebes and Red-breasted Mergansers are frequently recorded in winter (see Table 5.1.1).

From June 2013 to January 2014 a series of six dedicated boat-based surveys of seabirds in the shipping channel area was undertaken. The area covered was from the Alexandra Basin West to the outermost limit of dredged channel at the Dublin Bay Buoy. The study area was divided into a series of six survey boxes as shown in Figure 5.1.2 and all parts of these were covered to within a distance of 300m. The overall results of the surveys are given in Table 5.1.4.

Table 5.1.4 Total number of birds recorded in the shipping channel in 2013-14

Species	*Scientific name*	Jun	Jul	Aug	Sep	Nov	Jan	Mean	Peak
Great Northern Diver	*Gavia immer*	0	0	0	0	0	4	1	4
Great Crested Grebe	*Podiceps cristatus*	0	0	0	0	2	3	1	3
Manx Shearwater	*Puffinus puffinus*	0	1	0	0	0	0	0	1
Gannet	*Morus bassanus*	21	8	0	7	0	0	6	21
Cormorant	*Phalacrocorax carbo*	84	90	131	138	107	73	104	138
Shag	*Phalacrocorax aristotelis*	5	3	6	15	27	21	13	27
Grey Heron	*Ardea cinerea*	0	1	0	0	0	0	0	1
Brent Goose	*Branta bernicla hrota*	0	0	0	0	9	301	52	301
Shelduck	*Tadorna tadorna*	2	0	0	0	0	0	0	2
Wigeon	*Anas crecca*	0	0	0	0	0	11	2	11
Teal	*Anas crecca*	0	0	0	0	4	0	1	4
Oystercatcher	*Haematopus ostralegus*	0	0	0	0	0	1	0	1
Black-tailed Godwit	*Limosa limosa*	0	0	0	0	2	0	0	2
Turnstone	*Arenaria interpres*	0	10	6	0	0	0	3	10
Mediterranean Gull	*Larus melanocephalus*	0	6	3	4	2	1	3	6
Black-headed Gull	*Chroicocephalus ridibundus*	8	58	292	665	502	634	360	665
Common Gull	*Larus canus*	1	7	5	0	3	59	13	59
Lesser Bl-backed Gull	*Larus fuscus*	1	4	0	0	0	0	1	4
Herring Gull	*Larus argentatus*	64	66	156	74	33	113	84	156
Great Bl-backed Gull	*Larus marinus*	3	10	8	5	2	21	8	21
Larus gulls	*Larus* species	0	0	0	1	0	61	10	61
Kittiwake	*Rissa tridactyla*	138	0	0	1	0	0	23	138
Gull species	Unidentified gulls	0	0	0	1	0	0	0	1
Sandwich Tern	*Sterna sandvicensis*	3	1	1	1	0	0	1	3
Roseate Tern	*Sterna dougallii*	0	2	0	0	0	0	0	2
Common Tern	*Sterna hirundo*	46	173	121	0	0	0	57	173
Arctic Tern	*Sterna paradisaea*	27	20	4	0	0	0	9	27
Common/ Arctic Tern	*Sterna* species	86	245	5	1	0	0	56	245
Common Guillemot	*Uria aalge*	36	7	56	56	77	61	49	77
Razorbill	*Alca torda*	0	0	0	5	52	0	10	52
Black guillemot	*Cepphus grylle*	50	56	5	4	8	13	23	56

The most abundant species throughout the surveys was Black-headed Gull with a peak of 665 in September. The majority of these birds were roosting on and around the outfall from the Ringsend Wastewater Treatment Works. A large flock of Kittiwake was also foraging in the inner port in June but was not recorded for the rest of the year. Common and Arctic Terns were common in the port in June to August (the main breeding season) but were largely absent later on. Black Guillemots also used the shipping channel regularly during the breeding season (June and July) but were relatively scarce after that. Significant numbers of Cormorants and Herring Gulls use the port and shipping channel for foraging and roosting throughout the year and Common Guillemots were also present in most surveys. The flock of Brent Geese recorded in January was feeding within Alexandra Basin but moved to the shipping channel when disturbed. Most other species occurred irregularly or in small numbers.

5.1.4 Likely Significant Impacts

Summary of works within Alexandra Basin West Redevelopment

The redevelopment of Alexandra Basin West will include construction of new quays and jetties; remediation of contamination on the bed of the basin; capital dredging to deepen the basin and to achieve specified depths of up to -10m CD at the new berths (further detail is contained in Chapter 4). The dredging will involve removal of circa 0.47 million cubic metres of mainly silty material from the Alexander Basin West most of which is contaminated or partially contaminated.

A suite of sampling and environmental testing has been undertaken to quantify and identify the nature of the contamination within the bed materials of Alexandra Basin West. The results show that the bed material is contaminated with heavy metals such as Arsenic, Copper, Chromium, Cadmium, Nickel, Lead, Mercury and Zinc. High levels of contamination were measured within Alexandra Basin West at depths exceeding 2.0m. This material is deemed to be unsuitable for disposal at sea.

Dredging of contaminated material within Alexander Basin West will be undertaken to the design dredge level for the scheme. The dredging will be undertaken using a floating pontoon with an excavator mounted clamshell bucket adapted for environmental dredging. This will minimise the disturbance and escape of material at the seabed and during removal through the water column. A silt curtain will be utilised around the dredger whilst the dredging of contaminated material is ongoing. These will serve to reduce the spread of suspended contaminated sediments beyond the dredge foot print. The dredged material will be loaded onto barges to be transported to a treatment facility at Berths 52/53. In order to minimise the stockpiling of dredged material, the rate of dredging will be determined by the rate of treatment of the dredged material (see Chapter 4).

Impacts on birds

Brent Geese are present in Alexandra Basin West each winter from approximately November to April. The geese are attracted to feed from spilled agricultural products on the quays, mainly on Berths 29-33. They also swim in flocks on the water in the Basin. These birds move frequently between different parts of Dublin Bay and the species is one of the special conservation interests of the two Special Protection Areas in Dublin Bay. Numbers of geese recorded in Alexandra Basin West peaked at 450 birds in both winters 2012/13 and 2013/14. Recording of marked birds indicates that there is a high degree of site fidelity among the individual geese using the Basin.

Redevelopment of the quays and jetties in the Basin will take place on a phased basis so that shipping can continue to use parts of the Basin at all times. As agricultural products will continue to be unloaded here, albeit in different locations, the geese will continue to be attracted to the spillages. They are already habituated to high levels of shipping activity and associated noise so that construction noise is unlikely to have any additional effects. The geese will tolerate vehicles to a distance of less than 20m so it is likely that they will not be disturbed by construction vehicles. While the geese do swim on the surface of the Basin, they do not feed while on the water. They will thus not be exposed to contaminated sediments during the dredging operations. It is concluded that there will be no significant impact of this part of the proposed development on wintering Brent Geese within Alexandra Basin West.

Black Guillemots are present in Alexandra Basin West, mainly in spring and summer months. A maximum of 16 birds was recorded within the Basin in May 2013 and this represents about 20% of the total breeding population in Dublin Port. The birds breed in cavities within the existing quays and jetties, including a number of disused drainage pipes. These cavities will be removed preceding the redevelopment works to prevent their use by the birds during demolition. Mitigation measures will be introduced to provide alternative nest sites in neighbouring areas of the port, in advance of the redevelopment. Black Guillemots are rarely seen foraging in the water areas of the Basin as it is unlikely that their preferred fish prey occurs here in sufficient density.

The breeding tern colonies on the mooring dolphins in Dublin Port are sufficiently remote from Alexandra Basin West (approximately 2km) and will not be directly affected by the redevelopment works. Terns are rarely recorded flying within the Basin as it is unlikely that their preferred fish prey occurs here in sufficient density. The dredging of spoil from the Basin will not therefore have any indirect impacts on breeding terns.

The other incidental bird species, listed in Table 5.1.3, either forage on the spilled agricultural products in Alexandra Basin West (Mallard, Feral Pigeon, Grey Wagtail) or roost on some of the jetties (Herring Gull, Great Black-backed Gull, Grey Heron). None of these species will be significantly affected by the proposed development.

Summary of works at the Berth 52/53 Basin

The proposed development includes the infilling of the Berth 52/53 Basin at the eastern end of the north port. This will be followed by the construction of a new river berth with a double-tiered Ro-Ro ramp (see Chapter 4). The dredged material recovered from Alexandra Basin West will be transported by barge to a treatment facility adjacent to Berth 52/53. It will be stabilised and modified to improve the engineering properties of the material, to allow its re-use as fill material for reclamation works identified within the Port. As part of this scheme it is proposed to fill Berth 52/53 to provide open storage space and a new river berth at the port entrance. The contaminated dredge material from the Alexander Basin West will be used for the fill material. The material will be treated and placed in Berth 52/53. This process is explained in more detail in Chapter 11 – Geology and Soils.

Impacts on birds

There are no significant inter-tidal areas within the basin occupied by Berths 52 and 53. This is a confined deep water area and does not hold any significant numbers of birds in winter. The basin will be fully contained within a new steel pile wall prior to reclamation. This will prevent any escape of fill material to the Liffey channel or to the wider areas of Dublin Bay. Thus, no significant impacts on wintering birds are predicted.

The only breeding birds present in the vicinity of Berths 52/53, are Black Guillemots which use the area mainly in spring and summer months. A maximum of four birds was recorded within this Basin in May 2013 and this represents about 5% of the total breeding population in Dublin Port. The birds breed in cavities within the existing quays and jetties. These cavities will be removed preceding the redevelopment works to prevent their use by the birds during demolition. Mitigation measures will be introduced to provide alternative nest sites in neighbouring areas of the port, in advance of the redevelopment. Black Guillemots are rarely seen foraging in the water areas of the Basin as it is unlikely that their preferred fish prey occurs here in sufficient density. The infilling of this area will not cause any significant impacts on Black Guillemot.

Summary of works associated with capital dredging of the Approach Channel

The proposed development includes dredging of the Approach Channel to Dublin Port to a level of -10m CD, extending from the North Wall Quay Extension (downstream of the East Link Bridge) to Dublin Bay Buoy. This equates to circa 5.9 million cubic metres of dredging (excluding the 0.47 million cubic metres from the Alexandra Basin West). Proposals for disposing of this material are detailed in Chapter 9 – Coastal Processes.

In order to negate any potential impact of the channel dredging on Poolbeg Marina, it is proposed to construct a surge protection/retaining wall along the edge of navigation channel adjacent to the Marina. This structure will also serve to protect vessels moored in the marina from the wash produced by long vessels (circa 340m in length) manoeuvring about the North Wall Quay Extension.

The dredging of the Approach Channel will be carried out over a period of approximately six years with the main works confined to winter months. The dredging will involve the removal of 3.2 million cubic metres of mainly fine sand in the outer channel and 2.7 million cubic metres of mainly silty material from the inner channel.

The sediment quality of the material to be dredged within the approach channel has been tested for contamination and is deemed suitable for disposal at sea. There is however an area immediately adjacent to Alexandra Basin West where low levels of contamination have been identified requiring this material to be disposed of at sea only at low tide and immediately covered by sand or gravel.

The uncontaminated material from the channel will be dredged to the required design depths by a trailer suction dredger or equivalent. The dredged material will be loaded into barges and transported directly to the licensed sea disposal site located at the entrance to Dublin Bay (subject to the granting of a Dumping at Sea Permit by the EPA).

It is envisaged that the dredging of uncontaminated material will be carried out during winter months only (October to March) to negate any potential impact on salmonid mitigation and summer bird feeding, notably terns, in the vicinity of the dredging operations.

Impacts on birds

Direct impacts of dredging

The shipping channel is used by a range of seabirds and other species throughout the year (see Table 5.1.4). The dredging works in the channel will be carried out in phases over six years. The work will be confined to winter months (October to March) and will thus not affect birds foraging during the breeding season. Maintenance dredging was carried out in the channel in 2012 and no significant changes in bird populations in the Tolka Estuary area in winter 2012/13 were recorded that could be connected with the dredging activity. All birds using Dublin Port's shipping channel and approaches are habituated to high levels of shipping activity. A single dredging vessel, involved in the proposed capital dredging for this project, would not cause any significant additional disturbance potentially affecting wintering waterbirds and seabirds within the shipping channel.

Indirect or long-term impacts of dredging

The intertidal areas of the Tolka Estuary are an important habitat for wintering birds (see Table 5.1.2). The simulations carried out for this project have modelled the deposition of suspended sediment during the dredging process. The deposition of suspended material in the Tolka Estuary has been shown to be less than 0.002kg/m^3, which equates to a deposition of less than 0.0002mm (See Chapter 9 - Coastal Processes). This will have no significant impact on the inter-tidal areas of the Tolka Estuary.

Dredging of the proposed channel to -10m CD will not significantly alter the tidal regime, wave climate or sediment transport regime in Dublin Bay outside the immediate area of the navigation channel. The deepened navigation channel is unlikely to be susceptible to rapid infilling and will have a similar stability to the existing channel. It is therefore concluded that there will be no significant impacts of the dredging on surrounding inter-tidal areas within Dublin Bay, either in the short-term or long-term. There will thus be no indirect effects on waterbirds in these locations.

A review of the impacts of capital and maintenance dredging in the Tamar estuary, in south-west England, was published by Widdows *et al.* (2007). This estuary is a Special Protection Area under the EU Birds Directive which requires annual maintenance dredging as well as occasional capital dredging for new installations. Maintenance dredging here involves annual removal of between 5,000 and 200,000 tonnes of dry sediment per year. During two periods of capital dredging in the Tamar, the amount of sediment dredged was between 500,000 and 700,000 tonnes per year. Annual estimates for ten species of wildfowl and waders were analysed over several decades in the Tamar Estuary. There were no significant correlations between overwintering bird numbers and dredging activity. Declines in Teal and Wigeon over 30 years were related to milder winters which changed the migratory patterns of these species.

Turbidity in the water of the Dublin Port shipping channel has the potential to increase marginally in the immediate vicinity of the dredging works (see Chapter 9). Fish-eating birds, such as Black Guillemots, Cormorants or terns, can be sensitive to increasing turbidity as they use their eyes to chase and capture their prey under water. A review of ecological effects of dumping of dredged sediments in the Netherlands was published by Essink (1999). The increase in turbidity in the Dutch coastal zone since the 1960s was considered as a possible cause of reduced breeding success of Sandwich Tern breeding in the Wadden Sea area, caused by the greater distance from the breeding colony that adult terns have to fly in order to obtain sufficient prey for their young (Essink 1999).

The large breeding colony of Common Terns within Dublin Port has been monitored closely since 1995. Breeding productivity (number of fledged young per nesting pair) between 1995 and 2002 averaged at 1.50 (range 1.20 to 1.79) (Merne 2004). In 2013 the estimated productivity for this colony was in the range 1.05 to 1.91 (median 1.48) (BirdWatch Ireland, unpublished data). This suggests that the overall productivity of the terns is relatively stable over the medium term and has not been negatively affected by dredging of the Liffey Channel in 2012. The breeding colonies in Dublin Port are principally occupied by terns from late April to August. From July to September, large flocks of migratory terns gather in Dublin Bay and roost on Sandymount Strand (Merne *et al.* 2008). By early October, the majority of these birds have left the bay completely. As the proposed dredging of the navigation channel will take place in winter months only, when the terns are absent, there will be no residual increase in suspended sediments from dredging by the time the terns return to the colonies in late April.

Black Guillemots, which also breed within Dublin Port, are rarely seen foraging within the Liffey channel but most frequently feed in the wider area of Dublin Bay and are seen returning to the nest sites carrying small fish. They are mainly present here in spring and summer but only small numbers are present in the channel in autumn and winter (see Table 5.1.4). Thus, they will not be significantly impacted by the dredging works which will take place in the winter months only.

It is concluded that the capital dredging of the shipping channel will have no significant impacts on birds in the channel itself or in the surrounding intertidal areas of the Tolka Estuary or other intertidal parts of Dublin Bay.

5.1.5 Overall impacts on Special Protection Areas in Dublin Bay

There are two Special Protection Areas (SPAs) in inner Dublin Bay and a further six SPAs on the wider Dublin coastline, that may have connectivity to the Dublin Port area (Section 5.1.3 above). There will be no direct overlap between the Alexandra Basin West redevelopment; infill of the Berths 52/53 Basin; or capital dredging of the Liffey channel with the SPA boundaries. Some of the Special Conservation Interests of these SPAs, occur within Dublin Port and the shipping channel (Table 5.1.5) although there is no scientific evidence linking any of the species with individual breeding colonies.

Table 5.1.5 Special Conservation interests of SPAs recorded within Alexandra Basin West or the Dublin Port Shipping Channel.

	South Dublin Bay and River Tolka Estuary	North Bull Island	Skerries Islands	Rockabill	Lambay Island	Irelands Eye	Howth Head	Dalkey Island	Occurs in Alexandra Basin	Occurs in Dublin Port Shipping Channel
Light-bellied Brent Goose	●	●	●						√	√
Shelduck		●								√
Teal		●								√
Oystercatcher	●	●								√
Black-tailed Godwit		●								√
Turnstone		●	●							√
Cormorant			●		●	●			√	√
Shag			●		●					√
Roseate Tern	●			●				●		√
Common Tern	●			●				●		√
Arctic Tern	●			●				●		√
Black-headed Gull	●	●							√	√
Lesser Black-backed Gull					●					√
Herring Gull			●		●	●			√	√
Kittiwake					●	●	●			√
Common Guillemot					●	●				√
Razorbill					●	●				√

Alexandra Basin West Redevelopment

Of these special conservation interests, only the Light-bellied Brent Goose occurs in significant numbers within the Alexandra Basin West. It is concluded in Section 5.1.4 that there will be no significant impact of the proposed development on wintering Brent Geese within Alexandra Basin West as the development will be carried out in phases and agricultural products will continue to be offloaded at different berths within the port. The geese will adapt quickly to any new source of feeding. Black-headed Gulls and Herring Gulls also forage on the spilled agricultural products but these will continue to be available both during and after construction. Cormorants roost in small numbers on some of the jetties within the Basin. There are abundant alternative roost sites within the Port and these will remain available both during and after construction. None of the special conservation interests, listed in Table 5.1.6, occurs within the existing Berths 52/53 and there will be no indirect effects of the development of this area on the SPAs.

Capital dredging of Shipping Channel

The frequency of occurrence of the various Special Conservation Interests in the Shipping Channel and the type of activity of these species is outlined in Table 5.1.7. Seven of the species are infrequent and have only been recorded flying over the channel. These species will not be affected by the dredging activity. Common Tern and Arctic Tern occasionally forage in the channel in summer months but, as these are absent in winter, they will not be affected by the dredging works.

Table 5.1.7 Special Conservation Interests of SPAs and the frequency of occurrence within the Dublin Port Shipping Channel

Species	*Frequency*	*Activity within the channel*
Light-bellied Brent Goose	Infrequent	Flying over the channel
Shelduck	Infrequent	Flying over the channel
Teal	Infrequent	Flying over the channel
Oystercatcher	Infrequent	Flying over the channel
Black-tailed Godwit	Infrequent	Flying over the channel
Turnstone	Infrequent	Flying over the channel
Cormorant	Frequent	Foraging and roosting on jetties and navigation
Shag	Frequent	Foraging and roosting on jetties and navigation
Roseate Tern	Infrequent	Flying over the channel
Common Tern	Frequent	Roosting on navigation buoys
Arctic Tern	Frequent	Roosting on navigation buoys
Black-headed Gull	Frequent	Foraging and roosting on jetties and navigation
Lesser Black-backed Gull	Frequent	Foraging and roosting on navigation buoys
Herring Gull	Frequent	Foraging and roosting on navigation buoys
Kittiwake	Frequent	Foraging
Common Guillemot	Frequent	Foraging
Razorbill	Frequent	Foraging

Black-headed Gulls do not breed in the Port and the large flocks that forage and roost in the Liffey channel will be unaffected by the proposed capital dredging because they mainly feed in the vicinity of the outfall from Ringsend Waste Water Treatment Works, which will not be

affected by the proposed dredging works. Three tern species and Kittiwake are present in the Port and on the shipping channel only during the summer months (April to August). As the proposed dredging of the navigation channel will take place in winter months (October to March), when these birds are absent, they will be unaffected by the proposed development. None of the other species, listed in Table 5.1.6 or 5.1.7, is likely to be affected in a significant way by the proposed development. There is no evidence that any of the seabird species present in the Shipping Channel in winter, is linked with the SPAs in the Dublin area. These birds are known to range widely outside the breeding season and many of the breeding birds from Dublin seabird colonies may have dispersed to other parts of the North Atlantic in winter (Mitchell *et al*. 2004).

The nearest parts of any SPA to the Liffey Channel are in the Tolka Estuary, which is largely intertidal. The likely deposition of suspended material in the Tolka Estuary has been shown to be less than 0.002kg/m^3, which equates to a deposition of less than 0.0002mm. This will have no significant impact on the inter-tidal areas of the Tolka Estuary or on the Special Conservation Interests for the SPA or any of the other SPAs listed in Table 5.1.6.

As the Conservation Objectives for all SPAs are “To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests”, it is concluded that there will be no significant impacts on these Natura 2000 sites, either during construction or operation of the Alexandra Basin West redevelopment.

5.1.6 Mitigation Measures

Alexandra Basin Redevelopment and Infill of Berths 52/53

Brent Geese

The Brent Geese that regularly use Alexandra Basin West in winter have adapted to feeding on spilled agricultural products. Redevelopment of the quays and jetties in the Basin will be carried out on a phased basis so that shipping will continue to use parts of the Basin at all times. As agricultural products will continue to be unloaded here, albeit in different locations, the geese will continue to be attracted to the spillages. No other mitigation measures are required for this species.

Black Guillemots

Black Guillemots readily nest in artificial sites including disused drainage pipes and other cavities in quays and jetties in both Basins. The birds generally come ashore and occupy the nest holes in October, some five months prior to egg-laying (Greenwood 1987, 1991). Young birds have generally left the nests by late August (Ferguson-Lees *et al.* 2011). In order to avoid disturbance to nesting birds, any existing nest holes in piers to be demolished, will be blocked or otherwise made inaccessible in the month of September preceding the development works. Prior to this, temporary artificial nest boxes (10 No.) will be provided for the birds in immediately adjacent parts of the port, for the duration of construction works. In addition, concrete nest boxes (10 No.) will be incorporated into the new quays and jetties, at appropriate locations selected at the detailed design stage, to encourage the birds to return to these areas in subsequent breeding seasons.

5.1.7 Conclusions

With full implementation of the mitigation measures outlined in section 5.1.6, there will be no significant impacts of the proposed development on either breeding birds or wintering birds within the Port or the Liffey Channel. It is concluded that there will be no significant impacts of the proposed development on the Conservation Objectives of the Special Protection Areas in Dublin Bay or neighbouring coastlines.

5.2 MARINE MAMMALS

5.2.1 General Introduction

This Section details the potential risks to marine mammals and recommendations for mitigation measures related to the proposed Alexandra Basin Redevelopment (ABR). It is based on a site visit, information from published and unpublished literature and communication with local relevant authorities. This Section is based on information on proposed development which involves demolition works, piling, dredging and dumping of dredge spoil.

5.2.2 Legislation pertaining to marine mammals in Irish Waters

Marine mammals are protected by national legislation and by a number of international regulations which the Republic of Ireland is a signatory. The main legislation that affords protection to marine mammals in Irish waters is the Wildlife Act (1976) amendment Act (2000), which prohibits wilful interference to wild mammals and disturbance of resting and breeding sites.

All cetacean (whales, dolphins and porpoises) species occurring in European waters are afforded protection under the EC Habitats Directive (92/43/EEC). The current transposition of this legislation in Ireland is the EC 'Birds and Natural Habitats' Regulations (2011). All cetaceans are included in Annex IV of this Directive as species '*in need of strict protection*'. Additionally the harbour porpoise (*Phocoena phocoena*) and bottlenose dolphin (*Tursiops truncatus*) are designated Annex II species ('*those animals of community interest, whose conservation requires the designation of special areas of conservation*'). Ireland's two pinniped (seals) species, the harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*), are also designated Annex II species under the EC Habitats Directive.

The Republic of Ireland is also signatory to conservation orientated agreements under the Bonn Convention on Migratory Species (1983); the OSPAR Convention for the Protection of the Marine Environment of the northeast Atlantic (1992); and the Berne Convention on Conservation of European Wildlife and Natural Habitats (1979).

In light of the legislation and conservation status of marine mammals, careful assessment and consideration must be given prior to and during all anthropogenic activity with potential for effects on these species and their habitat.

Lambay Island in Co. Dublin is designated as a candidate Special Area of Conservation (cSAC) with the grey seal listed a species of qualifying interest and the harbour seal has also recently been added as a qualifying feature.

Rockabill to Dalkey Island was designated as a cSAC in 2012. Harbour porpoise is listed as a qualifying interest for this site. The proposed capital dredging scheme extends into the new Rockabill to Dalkey cSAC. The licensed offshore disposal site for dredge spoil, located to the west of the Burford Bank, also lies within the cSAC.

An Appropriate Assessment has been carried out for the proposed project in accordance with Article 6.3 of the Habitats Directive (see Habitats Directive Assessment - Natura Impact Statement under separate cover).

5.2.3 Marine mammals in area

It is necessary to determine what marine mammals use the waters in the vicinity of the proposed works, and likely extended zone of influence in order to estimate the likely significance of any impacts resulting from the proposed development.

Cetaceans

Based on species' ecology and sighting records cetacean species likely to use the area of Dublin Bay and the dump area at Burford bank include harbour porpoises (*Phocoena phocoena*), bottlenose dolphins (*Tursiops truncatus*), minke whales (*Balaenoptera acutorostrata*), Risso's dolphins (*Grampus griseus*) and common dolphins (*Delphinus delphis*) (Evans, 1992, Berrow *et al*., 2001; 2008; Ingram, 2000; Ingram *et al.*, 2001 and 2003; Rogan *et al*., 2001; Ó Cadhla *et al*., 2004; O Brien *et al*., 2009; IWDG, 2013).

An overview and literature review for each cetacean species occurring within and likely to occur within the study area is set out below.

Harbour Porpoise

Sightings of Europe's smallest cetacean species, the harbour porpoise, have been relatively common off all coasts of Ireland and in the Irish Sea (Northridge *et al*., 1995; Hammond *et al*., 1995; Pollack *et al*., 1997; Berrow *et al.,* 2001; Ó Cadhla *et al.,* 2004; Anderwald et al., 2011). The small size of harbour porpoises and their erratic surfacing behaviour can make them difficult to detect. There are however relatively frequent sightings of the species within Dublin Bay, including the dredge disposal site and shipping channel (IWDG, 2013). Surveys of harbour porpoise, carried out at specific sites around the Irish coast, identified Dublin Bay as an important area for the species with high densities in Dublin Bay of 1.19 per km^2 reported, representing one of the highest densities of the species recorded in Ireland to date (Berrow *et al*., 2008). Surveys of cetaceans in the waters outside of Dublin Bay, in the western Irish Sea, indicated that harbour porpoise were by far the most abundant species in the area with relative abundance of harbour porpoise estimated at 0.55 porpoise per km^2 (Berrow *et al*., 2011). Sighting rates of harbour porpoise, and thus local densities, were notably higher adjacent to Rockabill and Lambay Islands. This was consistent with Berrow *et al*. (2008) who recorded high densities during smaller scale harbour porpoise surveys in the same area. This suggests that this could be a good habitat for harbour porpoises. The Rockabill to Dalkey Island cSAC is designated for the conservation and protection of this species.

Harbour porpoises produce high-frequency sounds used for echolocation and communication, but do not make frequency-modulated whistles typical of many delphinids. The high frequency sounds are comprised entirely of click trains, produced in two narrow band frequency components, one between 1-20 kHz and the other between 120-160 kHz (peaking around 125-130 kHz) (Goodson *et al*., 1995). Maximum source level is estimated at between 149 and 177 dB re 1µPa at 1 m (Akamatsu *et al.,* 1992).

Harbour porpoises are very sensitive to vessel noise and activity and are unlikely to approach areas of high activity (Polacheck & Thorpe, 1990). However it is the cetacean species most likely to be affected by the proposed works considering the importance of the area for harbour porpoise. Mitigation measures outlined in Section 5.2.9 will minimize potential impacts of the proposed works on this species.

Bottlenose Dolphin

A coastal species of cetacean commonly sighted in western Irish waters (Evans, 1992, Pollock *et al.,* 1997) bottlenose dolphins are numerous on the south and west coasts (Ingram and Rogan, 2003; Ingram *et al*., 2001, 2003). There are resident communities in the waters of the outer Shannon estuary (Ingram, 2000; Ingram and Rogan, 2003) and a transient population recorded off all Irish coasts (O Brien *et al*., 2009). Bottlenose dolphins have been occasionally recorded in Dublin Bay (IWDG 2013). However, the area is not significant at national level for bottlenose dolphins and the dolphins sighted there are likely to be part of a transient population. Bottlenose dolphins are a wide-ranging species and individuals commonly travel between coastal regions especially during the summer months (Ingram *et al*., 2003).

The bottlenose dolphin makes a wide range of vocalisations. Echolocation clicks (used for orientation and foraging) are composed of intense short duration broadband clicks (40-130 kHz) (Au, 1993). Burst pulse vocalisations may have a variety of social functions (0.2-16 kHz). Whistles are pure tone frequency modulated calls ranging from 2-20 kHz. Clicks and whistle vocalisations can be made simultaneously.

Bottlenose dolphins may be attracted to vessel activity, making them potentially vulnerable to physical harm from industrial activities, including dredging. Mitigation measures outlined in Section 5.2.9 will minimize potential impacts of the proposed works on this species.

Minke Whale

The most common species of baleen whale found around Irish coasts, the minke whale is frequently recorded around all parts of the west coast (Pollock *et al*., 1997, Berrow *et al.,* 2002; Ó Cadhla *et al.,* 2004). Research conducted in UK waters suggest that the species moves southwards to inshore Atlantic Margin waters in spring and summer, remaining until late autumn following which numbers decline (Pollack *et al.,* 2000; Northridge *et al*., 1995). The minke whale has been sighted in near inshore waters around Ireland and of all whale species that use Irish waters is the species with the most near-shore distribution, and therefore potentially the most vulnerable to anthropogenic noise resulting from development in the marine environment. Vocalisations of minke whales involve intense, low frequency, broadband (0.5-1 kHz bandwidth) and harmonic down-sweeps with maximum source level of 165 dB re 1 re 1µPa at 1 m (Edds, 1988).

Minke whales have been sighted in outer Dublin Bay (IWDG, 2013) and it is possible they occasionally use the proposed dumping area west of the Burford Bank. There were six sightings of individual minke whales off the Dublin Coast during cetacean surveys of the north Irish Sea in 2011, with most sightings east of Rockabill and Lambay Island off north County Dublin (Berrow *et al*., 2011). Mitigation measures outlined in Section 5.2.9 will minimize potential impacts of the proposed works if there is occasional use of the area by this species.

Common Dolphin

Although a mainly oceanic species, common dolphins have been frequently observed in large schools around the coasts of Ireland (Pollock *et al.,* 1997; Gordon *et al*., 2000) and it is the most commonly stranded cetacean around the Irish coast (Berrow & Rogan, 1997). The mobile schools of common dolphins seen in coastal waters tend to be foraging for shoaling fish species.

Vocalisations of common dolphins vary from whistles of 1-50 kHz frequency (mainly 6-12 kHz, max. source level 172dB re 1µPa at 1 m) to echolocation clicks which may reach 150 kHz (max. source levels 170 dB re 1µPa at 1 m) (Evans, 1973; Moore & Ridgway, 1995). Clicks and whistles may be given simultaneously.

Common dolphins are attracted to vessels and are easily sighted and identified. It is considered unlikely that the proposed works within Dublin Port will impact upon common dolphins in the area as they do not frequent the waters of inner Dublin Bay; however it is possible they will occasionally use the area of the outer bay, where the proposed dumping of dredged material will take place, west of the Burford Bank. Mitigation measures outlined in Section 5.2.9 will minimize potential impacts of the proposed works on this species.

Risso's Dolphin

In Ireland Risso's dophin have generally been recorded close to the coast with highest numbers of sightings between August and February (Pollack *et al*., 1997; 2000). A large and robust species, Risso's dolphins are slow moving and often seen in small schools (Berrow *et al.,* 2002). Risso's dolphins will not usually approach vessels but are readily recognised by their distinctive colouration patterns and large size.

Vocalisations include a variety of clicks, whistles, and pulsed calls. Whistles are rarely heard, but range over 2.5-20 kHz, maximum source level of 170 dB re re 1µPa at 1 m. Clicks have peak frequency at 65 kHz and durations of 40-100 secs (Au, 1993).

It is considered unlikely that the proposed works will impact upon this species as there are no records of this species in Dublin Bay, however mitigation measures outlined in Section 5.2.9 will minimize potential impacts of the proposed works if there is occasional use of the area by this species.

Pinnipeds

Based on species' ecology and sighting records, seal species likely to use Dublin Bay and the area of the proposed dredge spoil disposal site include harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*). An overview and literature review for both seal species occurring within, or likely to occur within, the study area is set out below.

Harbour seal

Harbour seals (also known as "common seals") have established themselves at terrestrial colonies (or haul-outs) along all coastlines of Ireland, which they leave when foraging or moving between areas and to which they return to rest ashore, rear young and engage in social activity. These haul-out groups of harbour seals have tended historically to be found among inshore bays and islands, coves and estuaries (Lockley, 1966; Summers *et al.,* 1980), particularly around the hours of lowest tide. Harbour seals in Ireland use terrestrial sites mainly on the western seaboard, with highest numbers in NW and SW Ireland (Cronin et al., 2008).

The closest recorded haul-out site of harbour seals to Dublin Bay is Lambay Island where approximately 30 harbour seals were observed during national census in 2003 (Cronin *et al*., 2004), and 2012 (Duck & Morris, 2013). Smaller haul-out groups were also observed at Skerries Island (3 individuals) and further north at Clogher Head (8 individuals) and Dundalk harbour (eighteen individuals) (Cronin *et al*., 2004). Larger haul-out groups of harbour seals

occur further north in Carlingford Lough. An aerial census of harbour seals in Carlingford Lough during 2011 recorded a total of 255 harbour seals at haul-out sites within the Lough (SMRU, unpublished). The number of harbour seals counted during surveys at terrestrial sites generally represents 60-70% of the seals using the area, as some will be at sea, therefore using a correction factor on the haul-out count data over 400 harbour seals could potentially use Carlingford Lough.

Recent findings from tagging harbour seals in SW Ireland suggest that harbour seals are local foragers, generally staying within 20km of their haul-out sites (Cronin *et al*., 2008); however, studies in the UK have shown that harbour seals travel further distances from haul out sites (over 100km), therefore it is possible that harbour seals from sites in Carlingford Lough use the waters of Dublin Bay and very likely that harbour seals from haul-out sites on Lambay and Skerries and Dundalk harbour use Dublin Bay.

Harbour seals are most vulnerable at their terrestrial haul-out sites during breeding and moulting periods. These events occur between June and September in Ireland.

In addition to the identified terrestrial sites, the surrounding waters surrounding haulout sites are likely to be critical habitat for harbour seals, for feeding and/or for navigation to more offshore foraging areas. Results from a study by the author on the haul-out behaviour of harbour seals in southwest Ireland in recent years suggests that harbour seals spend up to 80% of their time at sea (Cronin, 2007; Cronin *et al.,* 2008). Similar behaviour patterns have been seen in studies of harbour seals in Scotland (Sharples, SMRU *pers comm*, Thompson & Miller, 1990). Unlike grey seals, harbour seal adults continue to forage during the breeding season (Bonnes *et al.,* 1994). In addition the mating strategy is based on males diving and calling at aquatic display sites (Van Parijs *et al*, 1997, 2000, Hayes *et al*., 2004). Disturbance from anthropogenic noise during this period could potentially affect mating success. The hearing range of harbour and grey seals extends over wide frequencies, including the ultrasonic spectrum. The area of best hearing is between 8 and 25 kHz, with acute hearing also at lower frequencies (Møhl 1968, Terhune & Turnbull 1995). There is potential for harbour seals using the waters in the vicinity of Dublin Bay to be at risk to potentially detrimental impacts of the proposed piling, dredging and disposal of dredge spoil. Mitigation measures outlined in Section 5.2.9 will minimize potential impacts of the proposed works.

Grey seal

Grey seals are distributed throughout Irish coastal waters and commonly seen hauled out on more exposed shores than the harbour seal (Kiely, 1998). The large colonies of grey seals on the Irish coastline are predominantly on the western seaboard on the northwest and southwest coasts and islands; although relatively large numbers of grey seals are also found in southeast Ireland e.g. Wexford harbour, Saltee Islands (O Cadhla *et al*., 2007).

A national census of the grey seal population in 2005 identified grey seal breeding sites in Co. Dublin at Lambay Island, Dalkey Island, Irelands Eye and St. Patricks Island (Ó Cadhla *et al.,* 2007). Pup counts were small at these sites (less than 3); apart from Lambay where 49 pups were counted. Further surveys conducted in 2009 recorded 77 pups on Lambay Island and Ireland's Eye (Ó Cadhla *et al*. 2013). These sites are also important to grey seals during the annual moult (Jan-April) in particular St. Patricks Island and Lambay Island, where 137 and 110 grey seals respectively were observed during a moult census in 2007 (O Cadhla & Strong, 2007). A group of 36 grey seals were also observed on Dalkey Island during the 2007 census and 26 grey seals on Rockabill. Four grey seals were sighted in Dublin Bay during aerial surveys as part of a harbour seal population survey in August/September 2012, with a further

62 observed on Lambay Island at this time (Duck & Morris 2013). This suggests over 300 grey seals use the islands in Co. Dublin, particularly for moulting. Grey seals are frequently seen in the waters of Dublin Bay at Dun Laoghaire and Howth harbour (and at Howth Harbour, they have been known to take fish offcuts), Bull Island and Sandycove. Seals have also been recorded hauled out on the beach at Bull Island. Larger colonies of grey seals occur further south in Wexford Harbour at Raven Point, where up to 450 grey seals haul-out during the annual moult period (pers. ob.). The Saltee Islands in Co. Wexford are also an important breeding and moulting site for grey seals.

Grey seals are also most vulnerable at their terrestrial haul-out sites during breeding and moulting periods. These events occur between September and March in Ireland. The waters surrounding terrestrial haulout sites are likely to be a critical habitat for grey seals, for feeding and/or for navigation to more offshore foraging areas. Grey seal have a wider offshore foraging distribution than harbour seals and therefore grey seals from haul-out sites in Co. Dublin as well as from the large breeding and moult colonies on the coast and islands of Co. Wexford will potentially use the waters of Dublin Bay for foraging and/or navigation. They will therefore be at risk to potentially detrimental impacts of the proposed piling, dredging and dumping. Mitigation measures outlined in Section 5.2.9 will minimize potential impacts of the proposed works.

5.2.4 Site Visit

A visit to Dublin Bay and site of the proposed works was made by a qualified marine biologist (M. Cronin) on 27th and 28th July 2013.

Observation Methods

The waters in Dublin Bay were surveyed from two vantage points on the north shore of the harbour (Figure 5.2.1) using a telescope (equipped with a 30x eyepiece) mounted on a tripod and 10 x 50 Leica binoculars for all marine mammals at sea between 14.00 and 18.00 on 27th July 2013 (two hours either side of high tide). The two vantage points (A & B) provided visibility of Dublin Bay, as well as the waters surrounding the bay (Plate 5.2.1). The conditions on 27th July were favourable for visual surveillance, with a Beaufort sea-state of 2-3 and a light South Easterly breeze. Observations of marine mammals at sea are affected by prevailing sea conditions with a decline in sighting probability in Beaufort sea-states of three or higher.

The shorelines and waters of Dublin Bay (Plate 5.2.2) were surveyed using 10 x 50 Leica binoculars for all marine mammals ashore during the low water period between 08.00 and 12.00 (two hours either side of low water) on 28th July. The low water period was surveyed in order to maximise the likelihood of observing seals hauled out on the shoreline. Supplementary data on marine mammal presence was collected during bird surveys in the area.

Results

- One seal (unidentified species) was observed approximately 300m southeast of North Bull Island on 27th July at 17.35

- Two grey seals were observed approximately 100m from shore at Dun Laoghaire on 28th July at 10.30

- While no cetaceans were observed during the dedicated visual observations, this does not indicate that the area is not visited by dolphins or porpoises particularly given the transient nature of cetacean movement patterns.

- Supplementary visual observations by consultants undertaking visual surveys for birds recorded three harbour porpoise at the outer channel near the Dublin Bay Buoy on 25th June, and three further harbour porpoise between North Bull Light and Buoy 3 at the north side of the outer channel on 26th August 2013.

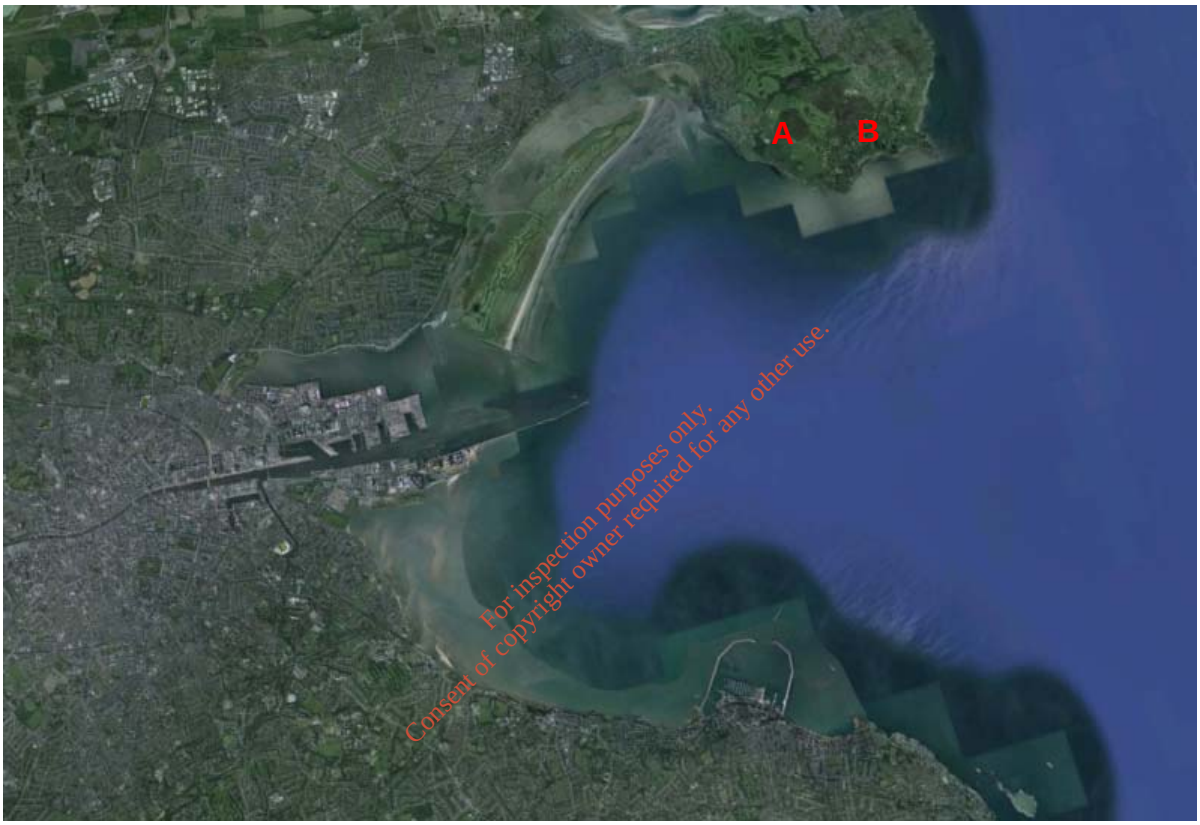


Figure 5.2.1 Location of observation points A & B for marine mammal survey, Dublin Bay