MWP

Universal Access Feasibility and Options Report

Balscadden Bay Beach

Fingal County Council

14th October 2022

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1. Introduction

This report is a feasibility study and options assessment for a universal access at Balscadden Bay Beach, Co. Dublin.

The purpose of this report is to describe the existing access and surrounding topography, to assess the coastal processes and shoreline evolution, and to propose and assess potential new access route options for the beach.

1.1 Project Background

Balscadden Bay Beach is a small sandy east-facing beach adjacent to Howth Harbour to the north. Existing access consists of a set of steps of varying steepness, and in varying states of disrepair. It is not universally accessible. It is proposed that access could be improved depending on the feasibility of varying access options.

Figure 1 Aerial view of Balscadden Bay Beach showing key features

Balscadden Bay Beach is a sandy beach which runs approximately 100m, from north to south, shown in Figure 1. The upper beach is backed by a concrete promenade and concrete walls, in front of which there is a relatively steep sandy beach. The cliff in this area is roughly 15m high, and the existing concrete access steps from the Balscadden Road at the top of the cliff lie inset into the overgrown cliff face.

Figure 2 Aerial Oblique Coastal Photograph of Balscadden Beach

An aerial view of the Balscadden Bay beach, from the Coast of Ireland Survey which was flown in September 2003 using aerial oblique digital video photography as part of the Irish Coastal Protection Strategy Study, is shown in Figure 2.

To the northern end of the beach is a rocky outcrop, which lies adjacent to an apartment building and a carpark on the coastline. Further north of the carpark, there is a rocky/shingle beach, a sloped stone embankment and a sloped access point to the Balscadden Road. This can be seen in the Oblique aerial photo, Figure 3 below.

Further north is Howth FHC east pier.

Balscadden beach is flanked on the south by the rocky cliffs of Howth Head which extends more or less due east from the beach for about 1km giving considerable shelter from southerly waves in the Irish Sea.

Figure 3 Aerial Oblique Coastal Photograph of Coastline North of Balscadden Bay Beach

1.2 Scope of Report

This report relates to the feasibility phase and consists of:

- Topographic details.
- Coastal processes.
- Geotechnical considerations.
- Options & feasibility assessment.
- Cost comparison.
- Other considerations:
    - Environmental.
    - Coastal protection/erosion concerns.
    - Land ownership considerations.

2. Shoreline Topography

2.1 General

A topographic survey was procured for the purposes of this study, to ascertain the key existing levels in the vicinity, and to identify any constraints. Levels provided are to ODMalin datum. The following sections present some extracts from this survey.

2.2 Beach Topography

The concrete promenade at the top of Balscadden Beach has an elevation of appoximately 3.9m ODM. A profile of the beach and cliff is shown in Figure 4, showing the ground level at various features of the cliff and beach.

The beach immediately adjacent to the concrete promenade lies at about 3 to 3.3m ODM. Seawards of the promenade the beach drops rather steeply to about 0.5m ODM over 20 metres. The steep slope of the beach can be more clearly seen from the side, from the coast nearby, as shown in Figure 5.

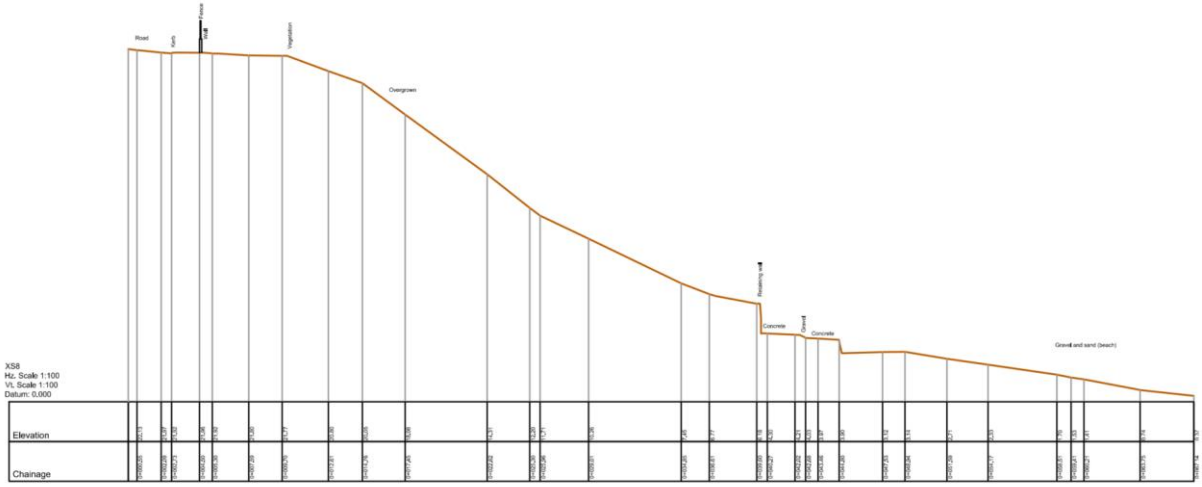

Figure 4 Profile through Balscadden Beach (XS8)

Figure 5 View of the beach from the northern end

2.3 North end rock and stone beach Topography

At the north end of Balscadden beach, near base of wall fronting the apartments, the beach levels are approx. 0.75 to 1 m ODM as the rock outcrop fronting the property begins. Top of rock outcrop levels vary and has high points of 1.13 to 1.35m ODM. The bottom of the slope of the rocks and rubble lies at approximately 0mODM.

Further north, around the corner (at Cross section XS2 as seen in Figure 6), there is a carpark adjacent to the apartments and the coast. The car park has a level of 6.75 m ODM. A rock armour slope fronts the car park. It has a crest level of 5.67mODM. The rock armour crest is narrow. The toe level of the armour is 2.12mODM . The overall width of rock armour is 5m and lies at a slope of 1.5:1. The beach level just below is 0mODM.

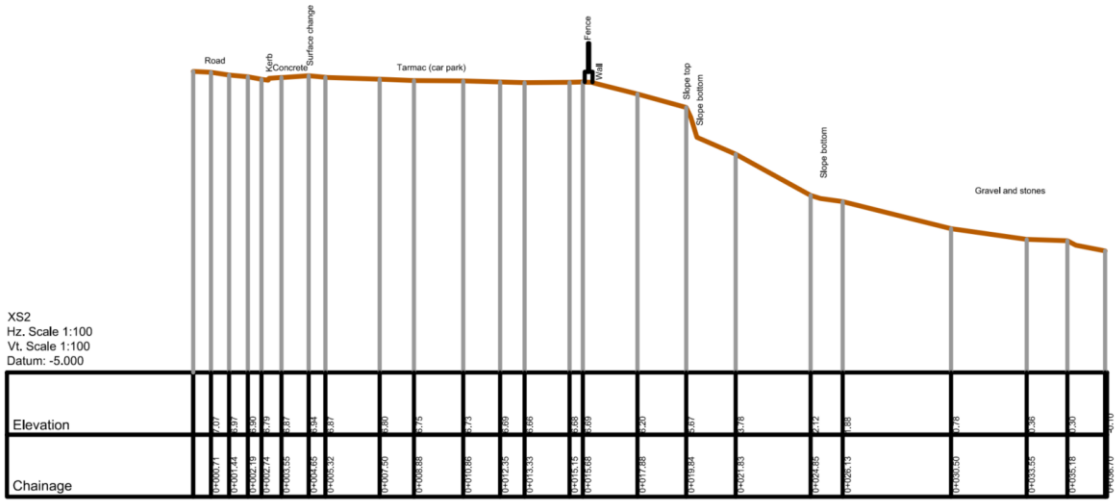

Figure 6 Cross Section at Carpark north of Apartments (XS2)

2.4 Topography of the existing access steps

In the vicinity of the existing steps, the top of cliff/road level is 18.39mODM. The top of stairs starts at 18.41mODM and the bottom of stairs has a level of 3.93mODM. This gives an overall height drop over the entire stairway of 14.5m. The total chainage of the existing stairs is approximately 40m. and overall pitch of stairway of 21.1deg along its length. A developed profile through the stairs is shown in Figure 7 below.

The beach level fronting the stairs is 3mODM.

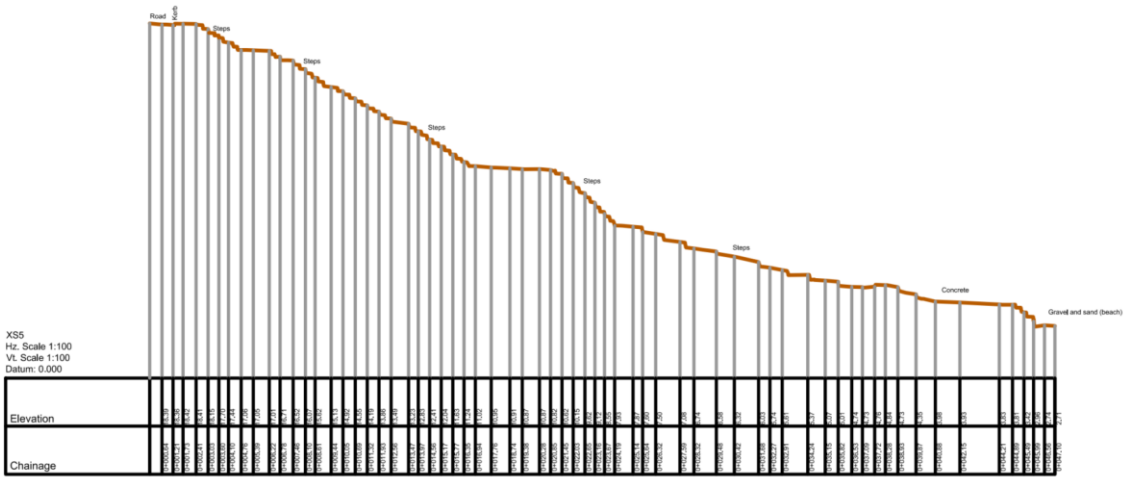

Figure 7 Cross section through Steps (XS5) – along the centreline of the existing access steps

A section just south of the steps shows the road level rising to 19.25mODM.
The highest point of the cliff at this location is a little seaward of the road and is at 19.9mODM.
The bottom of the cliff at 4.15mODM.

Several lines were superimposed on the profile on Figure 8 in order to assess how steep the slope of the cliff is in the vicinity of the steps. This is undertaken to allow an assessment to be made of the existing cliff slopes against a probable long term stable slope. The lines indicate:

- At its steepest section, from the top of the slope to the first retaining wall, the cliff has a slope of approx. 40deg.
- From the top of the cliff to the second lower retaining wall, the cliff has an overall slope of 32degrees.
- The overall slope from the top of cliff to the base of the cliff is 26degrees.

The above have implications in terms of the overall stability of the cliff face in the vicinity of the existing steps. See section 3.3 on geotechnical aspects.

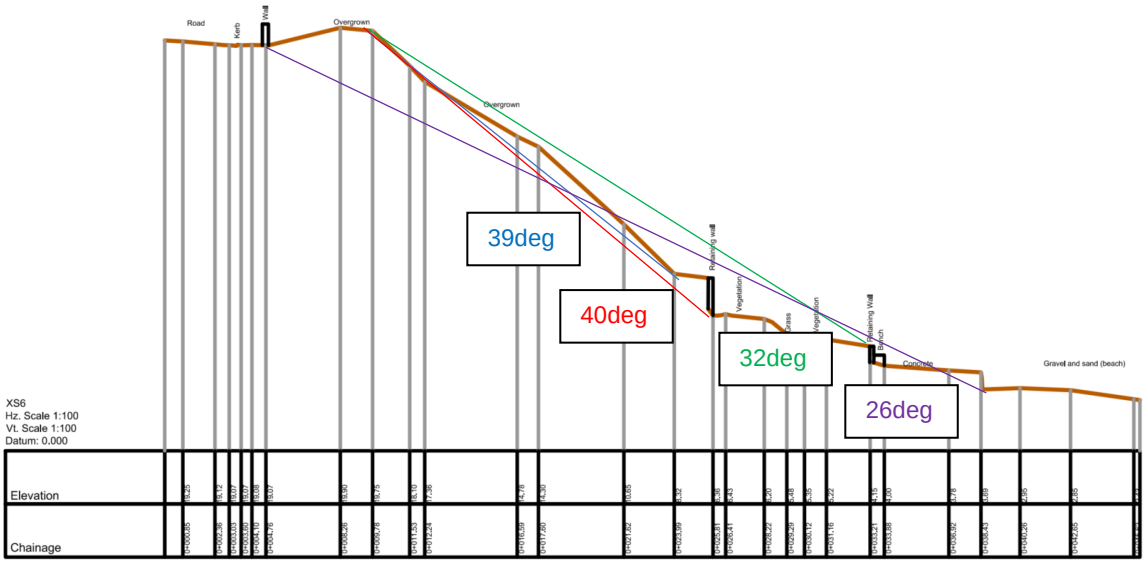

Figure 8 Cross section just south of steps (XS6)

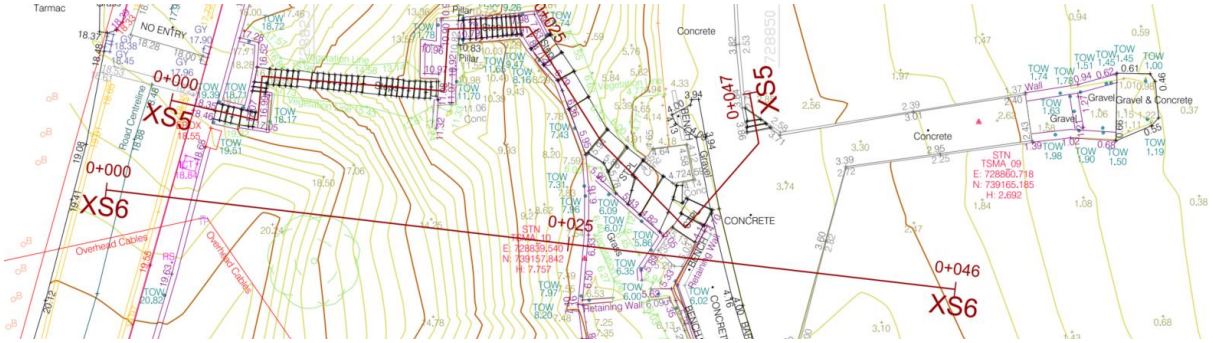

Figure 9 Plan showing steps cross section location

3. Physical Processes

3.1 General

Physical processes of relevance to the provision of a universal beach access include coastal processes, potential shoreline evolution and geotechnical aspects.

3.2 Coastal Processes

It is important to understand the coastal process context of the beach at the base of the cliff to properly assess beach access options

Coastal processes/information of relevance include:

- Topography and Bathymetry (beach/seabed levels)

- Tide Levels
- Extreme Water Levels
- Inshore Wave Climate
- Joint Probability of Waves and Water Levels
- Historic coastal evolution

3.2.1 Bathymetry

Information on the seabed in Balscadden Bay was obtained from the Admiralty Chart for the area, which offers bathymetric detail on seabed levels. In chart no.1415 for Dublin Bay, the coast off Balscadden Bay is shown in the inset detail of Howth Harbour. The depths in the chart below, Figure 10 , are given to Chart Datum, which is 0.2m above OD Poolbeg (ODP), and 2.5m below OD Malin i.e. ODM.

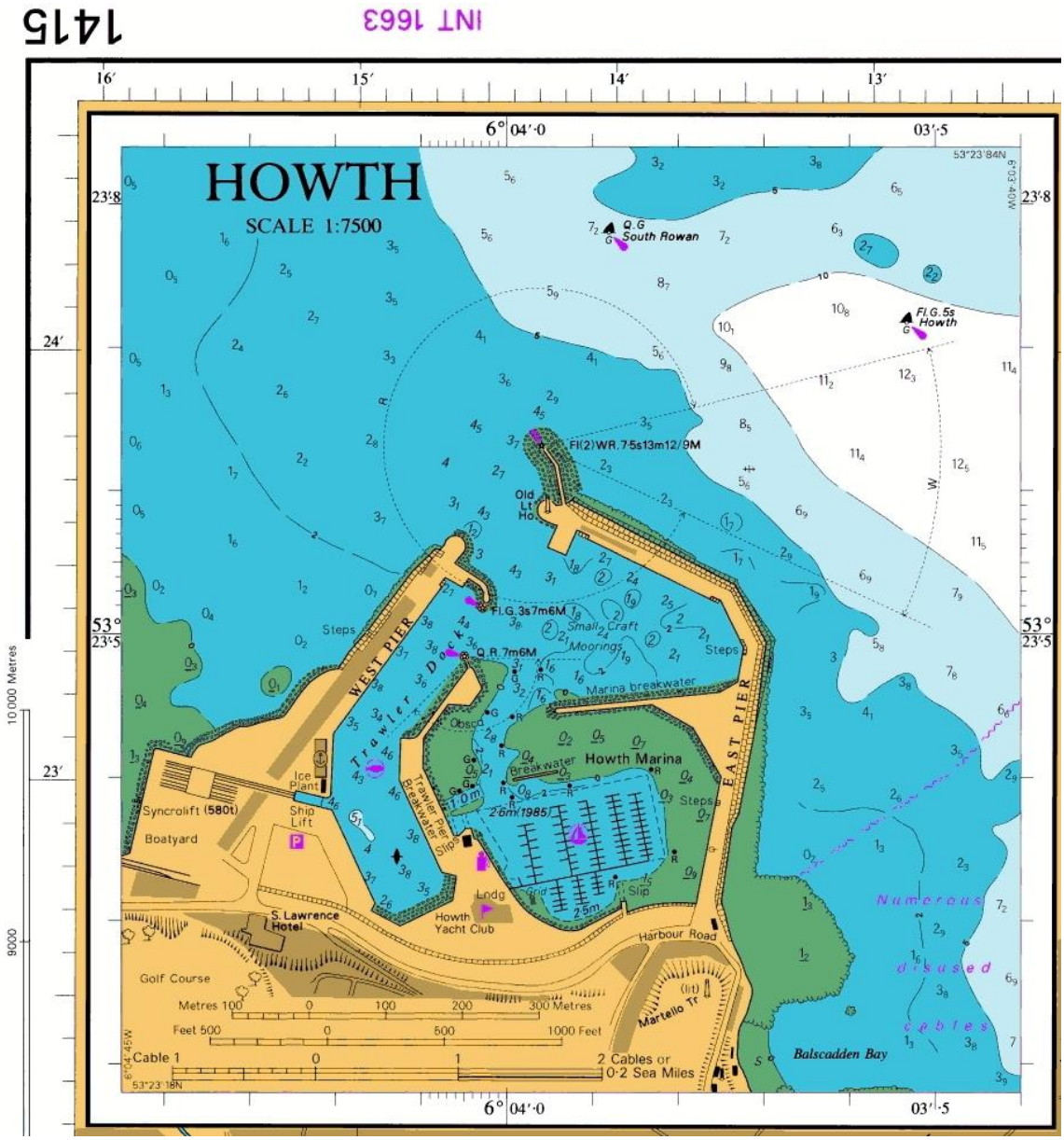

Figure 10 Admiralty Chart for Balscadden Bay, Chart no.1415

Depths of seabed just off the beach are indicated at 0m Chart Datum, so a level of -2.5 m ODM offshore from Balscadden beach.

3.2.2 Tides

Water levels in Balscadden vary due to astronomical and meteorological influences. The astronomical effects result in tides which are predictable in terms of heights and time of occurrence. Astronomic tides have a pattern of occurrence with a 12.4hr period between succeeding high tide levels. On top of this semi diurnal periodicity there is an approximate 14 day cycle where tides go from spring to neap and back to spring. There are a number of other astronomic cycles relating to equinoctial tides which on springs are slightly higher than the mean spring values and a much longer almost 20 year cycle for the occurrence of Highest Astronomic Tides. The variation in levels between mean spring levels over such a period is in the order of 0.5m for Howth and can be significant. However, meteorological effects can result in much higher water levels than due to astronomic tides.

Astronomic tide levels are given in Table 1 below for Howth. These values have been used over the area of the study. Tide levels are given in m to Chart Datum, and converted here to m ODMalin.

Table 1 Tide Levels for Howth from Admiralty Tide Tables

Howth	HAT	MHWS	MHWN	MLWN	MLWS
m Chart Datum	4.6	4.1	3.3	1.3	0.5
m OD Malin	2.1	1.6	0.8	-1.2	-2.0

HAT – Highest Astronomical Tide; MHWS – Mean High Water Springs; MHWN – Mean High Water Neaps; MLWN – Mean Low Water Neaps; MLWS – Mean Low Water Springs.

3.2.3 Extreme Levels

On top of the tidal effects are effects due to meteorological influences which can cause water levels to be significantly above or below the astronomic tide levels. However, estimates have been made by the OPW of extreme water levels due to a mix of tide and astronomic and meteorological influences. The Irish Coastal Wave and Water Level Modelling Study (ICWWS 2019, as updated based on readings from 2018) provides modelled extreme sea water levels at numerous points around the Irish coast.

These estimates are given in terms of Annual Exceedance Probabilities (AEP) as a percentage, which if divided into 100% can be converted to return period of years. Extreme water levels are important in terms of erosive effects as it is during extreme water level events that considerable erosion can occur; or it is when the largest waves can reach the shoreline resulting in the greatest forces and most overtopping and potentially sediment transport. See Table 2 below for the extreme water levels nearest Balscadden.

Figure 11 Location of extraction points NE_09 – NE_25

The extreme water levels are presented in Appendix M of the ICWWS 2018 report, and an extract of the relevant table for Point NE_18 is shown in Table 2 below. This shows estimates of present-day extreme water levels and for 2100 for a range of climate change scenarios.

Table 2 Extreme Water Levels

Point NE18_ ODMalin (OSGM15)				
AEP	Present Day	MRS	HES	HES+
50%	2.61	3.16	3.66	4.16
20%	2.70	3.25	3.75	4.25
10%	2.76	3.31	3.81	4.31
5%	2.83	3.38	3.88	4.38
2%	2.91	3.46	3.96	4.46
1%	2.98	3.53	4.03	4.53
0.50%	3.04	3.59	4.09	4.59
0.10%	3.19	3.74	4.24	4.74

Sea level rise will have an impact on the above tide and extreme water levels. The estimated rise to 2100 for a Mid Range (MRS), High End (HES), and Extreme High + End (HES+) climate change scenarios are 0.5m, 1.0m and 1.5m respectively.

3.2.4 Waves

3.2.4.1 Inshore Wave Conditions

Note that these locations, while designated inshore, relate to conditions slightly seawards of Balscadden Bay. These conditions are attenuated as they propagate shorewards into the bay – particularly by reducing water depths.

The Irish Coastal Protection Strategy Study (ICPSS) North East Coast Appendix 4, provides Wave Modelling Tables including wave conditions just off Howth. The study uses joint probability analysis to derive extreme water levels around the coastline. The relevant point is Point 7, the nearest estimation point to the study area. It lies north of Balscadden and Howth, and north of Ireland's Eye Island. Such conditions are approximately applicable to the area off Howth Head.

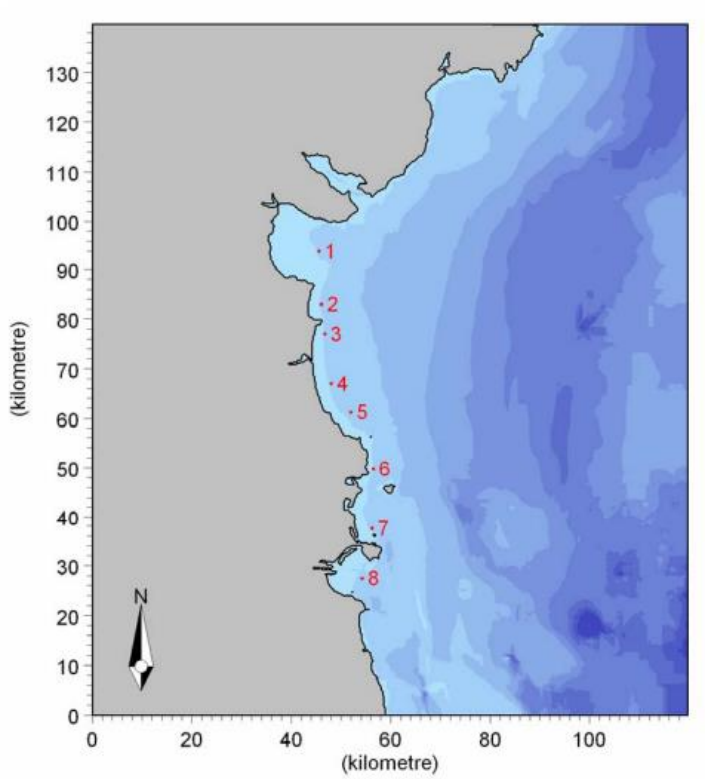

Figure 12 ICPSS North East Coast Inshore Wave Climate Estimation Point Locations

Table 3 ICPSS NE Point 7 - 1 in 100 Joint Probability Return Period

1 in 100 Joint Probability Return Period			
Point 7	Inshore Climate		
	Hm0 (m)	Tm (s)	MWD (deg)
1in5	2.946	6.633	37.15
1in20	2.439	6.098	33.247
1in100	1.891	5.418	28.273

1in5	3.866	7.366	55.526
1in20	3.206	6.768	52.59
1in100	2.478	5.98	48.988
1in5	4.58	7.759	71.273
1in20	3.967	7.281	70.773
1in100	3.269	6.676	70.031
1in5	4.567	7.768	87.664
1in20	3.972	7.278	87.939
1in100	3.264	6.666	88.694
1in5	4.139	7.798	101.876
1in20	3.606	7.325	103.058
1in100	2.991	6.728	104.63
1in5	5.885	10.211	105.43
1in20	5.325	9.66	106.729
1in100	4.586	8.975	108.143
1in5	4.356	9.622	111.912
1in20	3.808	9.079	113.273
1in100	3.142	8.36	115.467

Where return period refers to water level, Hm0 refers to significant wave height in metres, Tm refers to mean wave period in seconds and MWD is the mean wave direction in degrees from True North.

Table 4 ICPSS NE Point 7 - 1 in 200 Joint Probability Return Period

1 in 200 Joint Probability Return Period			
Point 7	Inshore Climate		
	Hm0 (m)	Tm (s)	MWD (deg)
1in5	3.175	7.054	39.646
1in20	2.842	6.897	38.256
1in100	2.218	6.24	33.714
1in5	4.212	7.643	56.692
1in20	3.785	7.612	55.606
1in100	2.968	6.883	52.365
1in5	4.955	8.034	71.559
1in20	4.345	7.577	71.03
1in100	3.637	7	70.42
1in5	4.934	8.051	87.519
1in20	4.335	7.581	87.839
1in100	3.644	6.991	88.171
1in5	4.478	8.069	101.14
1in20	3.936	7.616	102.387
1in100	3.32	7.047	103.798
1in5	6.231	10.607	104.852
1in20	5.569	8.819	107.505
1in100	5.091	9.433	107.35

1in5	4.747	9.997	111.25
1in20	3.92	8.034	116.17
1in100	3.582	8.837	114.137

For the 1 in 100 year Joint Probability Event, significant wave heights of between 1.9 and 5.9m can occur, with peak periods of 5.4 to 10.2 seconds.

For the 1 in 200 year Joint Probability Event, significant wave heights of between 2.2 and 6.2m can occur, with peak periods of 6.24 to 10 seconds.

3.2.4.2 Depth Limited Waves

Waves break in shallow water. The waves given in **Table** 3 and Table 4 above are large compared to what can exist at the toe of the beach at Balscadden. Waves of relevance to any access structure will therefore be limited by water depths just seawards of the structure.

With a historic High Water Mark at the cliff base/the modern day promenade, the depth limited waves generated off the coast will act on the structures on this beach and at the base of the cliff.

Beach levels approximately 20m seawards of the promenade are 0.5m ODM. With extreme water level of 3.04 for the present day scenario 0.5% AEP (to protect for the 200 year event), waves of Hs 1.52m , or 2.12m allowing for a 1m increased depth due to beach draw down in such events.

The area fronting the rock outcrop at the north of the beach, can see bed depths of -1.3m ODM (as per the bathymetric chart). To estimate a design wave height for potential works in this area, using the 0.5% AEP present day WL, assuming a design life of 50 years, the design water depth is estimated at 3.35m, giving a design Hs of approximately 2.79m.

3.3 Geotechnical Considerations

The evolution of a shoreline depends on wave and tidal action and the nature of the shoreline. Wave and tidal action depends on the shoreline orientation and plan shape with respect to offshore wave action. Changes to the shoreline depends on the dominant sediment transport mechanism and on the nature of the shoreline – be it rock, glacial till or soft clay.

The parameters of more immediate interest in a coastal study are the glacial till and other deposits that were laid down in the past and have been reworked to some degree to give the coastline of interest now.

Figure 13 and Figure 14 below are extracts from Geological Survey of Ireland mapping showing the underlying rocks and the overburden material in the vicinity of the study area. The underlying rock consists of:

- the Ballysteen Formation comprised of Dark muddy limestone, shale is shown in blue on the northern half of Balscadden Bay, and
- the Elsinore Formation which is comprised of a polymict melange (an ill-assorted mixture of various fragmented rock types) which is made up of quartzite, greywacke, siltstone, mudstone, and calcareous sandstone in a chaotic mudstone-sandstone matrix. Components vary in size from pebbles to blocks hundreds of metres across.
- The dark area between these two formations is a fault line.

Figure 14 shows the quaternary sediments which for the overburden of soil in the area. It is described as a hummocky sand and gravel over the entire study coastline. It is likely to be a glacial till which is over-consolidated, and can therefore stand at a steeper slope than its long term slope.

While cliffs of over-consolidated material can stand at quite a steep slope they have a long-term stable slope related to the nature of the material in the cliff. The long term stable slope occurs when the cohesive forces in the soil relax in time. There is no known timeline to the occurrence of a long term stable slope. Cliffs made from a mix of sand and gravel could have a probable long-term stable slope of 1 vertical to 1.5 to 2.0 horizontal (34 to 26 deg), to allow a flatter, more stable profile. In terms of potential risk and uncertainties it is best to include a buffer in such estimates, of say half the cliff height. This would give for risk assessment purposes slopes of 22 to 26 degrees.

An accurate assessment of the long term stable slope would require a more accurate assessment of the nature of the cliff material. However, the assessment here would concur with what can be seen on the ground at the site – the cliff is probably steeper than it would be in the long term, certainly at certain parts of the cliff face.

The conclusion of the above would be that the risk from cliff instability of the cliff face above Balscadden Beach needs to be monitored in the long term, and that any beach access works constructed on the cliff face would also require cliff stabilization measures.

Figure 13 Bedrock geology mapping extract showing Balscadden Bay and its surrounds, from the Geological Survey of Ireland (GSI)

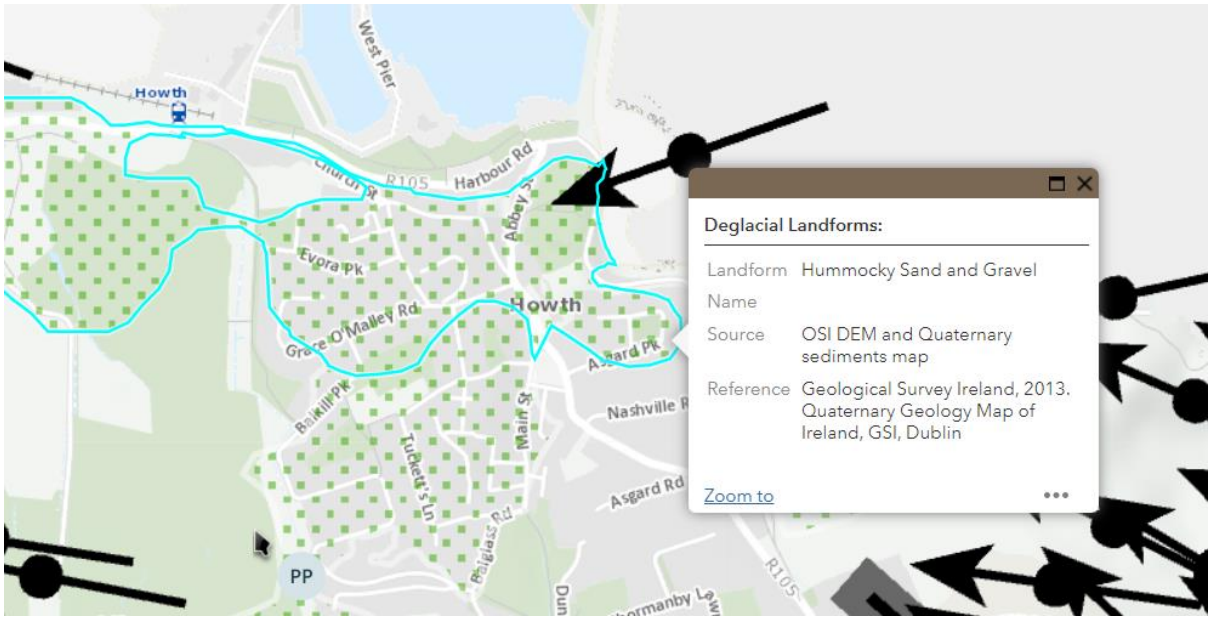

Figure 14 Quatenerary geomorphology mapping from GSI, showing Hummocky Sand Gravel Ice marginal landforms along the cliff face at Balscadden Bay

3.3.1 Historic Coastal Evolution

An overlay of present day mapping with historic 25" mapping, see Figure 15below indicates that there is little evidence of coastal retreat in the area. Based on evidence of existing coastal defences, in the area, this is not unusual given those defences, and does not mean that erosions poses no threat. And, any beach access needs to be protected from wave action.

Figure 15 Historic map (1913) compared to recent aerial photography of the area

3.4 Options Assessment

Potential options for a new accessible access to the beach include:

- An improved, extended, meandering set of access steps around the site of the existing steps. Cliff stabilisation would form part of such works, which could be beneficial to cliff stabilisation in the area.
- A promenade on the seafront of the apartment complex, connecting the beach to lower ground to the north. Rock armour defense, or specialized concrete defences, of this promenade on the seawards would also add benefits in terms of protection to the coastline in this area.
- Tourist attraction- type access – cable car/funicular/vertical lift/boardwalk.

Figure 16 Area of interest, and outlines showing the locations of the potential options costed in this report; Blue: proposed location on cliff of new stair or ramp access, Green: proposed location of new concrete promenade route to the north

3.4.1 Steps

A new access stairway in a similar location as the existing stairway, constructed in compliance with building regulation requirements for public stairs, could provide greater access to Balscadden Bay Beach. However, it would not be universal access.

Building Regulations 2014 Guidance Document K - Stairways, Ladders, Ramps and Guards provides recommendations on maximum rise, minimum going, maximum pitch, and optimum values in each case based

on I.S. 158:1987 and BS 5395-1:2010. Technical Guidance Document M - Access and Use provides guidance on stairs to satisfy the needs of ambulant disabled people.

The dimensions of such a stairway would be as follows:

- From the topographic survey, the overall drop of the staircase from road level to the promenade was approximately 14m.
- And allowing 300mm optimum going, and landings of 1.5m depth each, gives a total stair chainage length of minimum 46.8m.
- Overall stairway width on the cliff face would be approximately 12m.

Additionally:

- Soil nailing would be required to stabilise the slope in the vicinity of the stairway- 30m width of cliff face total; 15m either side of the centre line of the stairway.
- Rock armour protection at the base of the stairs would be required to protect the cliff base for approximately 30m.
- There would be a cost associated with the removal of the current stairs, and for potentially complex temporary works for the construction of the new stairway.

3.4.2 Universal Access Ramp on Cliff Face

A new access ramp in a similar location to the existing stairway could potentially provide universal access to Balscadden beach.

- As with the stairs, the overall drop of the entire ramp from road level to the promenade is approximately 14m. This could be considered excessive from a usability point of view.
- To accommodate a longer ramp length, the overall ramp width on the cliff face would be approximately 40m.
- Each run of the ramp would have a slope of not more than 1 in 20.
- The same additional requirements for soil nailing of the cliff face in the vicinity of the ramp, rock armour protection at the base of the cliff, and removal costs of the existing stairway would apply.

3.4.3 Promenade to north of beach over rock outcrop

An alternative option to provide potential universal access to Balscadden Bay beach would be by constructing a reinforced concrete promenade to the north of the beach, extending approximately 100m around the apartments on the seaward side up to the seafront adjacent to the carpark to the north of the apartments. It would also consist of an RC parapet wall between the walkway and the crest of the protection to the seaward side. The promenade level and the crest level of the required rock armour or x-bloc protection would be 5mODM. This would in turn provide protection to the existing apartment building from wave action.

This option would require significant protection to the seaward side of the promenade, and there are two ways this could be achieved:

- Rock armour, in the form of 8T rocks at a slope of 1:2, could be employed to withstand the estimated design wave height in the area. (This would be suitable for a design Hs of 2.8m).

- In place of rock armour protection, specialized X-bloc units could be used as a potentially more robust form of protection of the coastline in this area. The level and footprint would be the same as that of the rock armour option.

3.4.4 Alternative Options- Funicular System or Vertical Lift

Consideration was also given to tourist attraction-type forms of access, in the form of cable cars or funicular systems. Examples of similar scale and scope were investigated, such as the Lynton & Lynmouth Cliff Railway.

A similar option was explored for Balscadden Bay Beach Access. Such an option would consist of a base structure at the beach level, the railway-type structure up the sloped cliff face, and a landing base at the top of cliff road level. Such an option would also require the cliff to be stabilised in the vicinity of the structure.

Such a structure would also require a large foundation for support, cliff stabilisation, entry and exit structures and considerable non-civil engineering costs. It is worth noting that besides an expensive capital cost, the annual operational costs are significant and recurring. Further considerations for such an option would include piling, geotechnical complexity, major construction and disruption to traffic and residents in the area. This option is not likely to be cost effective nor preferred from a buildability point of view.

3.5 Other Considerations

3.5.1 Environmental Considerations

The feasibility of any proposed option is dependent on further environmental assessment. Two of the criteria on which a project might not be feasible would be if it falls within a Special Area of Conservation (SAC) or a Special Protection Area (SPA). SPAs and SACs are European designated Natura 2000 sites, and have legally protected status.

The legal basis on which SACs are selected and designated is the EU Habitats Directive, transposed into Irish law as amended in 1998 and 2005.

Ireland is required under the terms of the EU Birds Directive (2009/147/EC) to designate Special Protection Areas (SPAs) for the protection of listed rare and vulnerable species, regularly occurring migratory species, and wetlands especially those of international importance

The study area lies adjacent to the Howth Head Coast SPA, designated for Kittiwake (Rissa tridactyla).

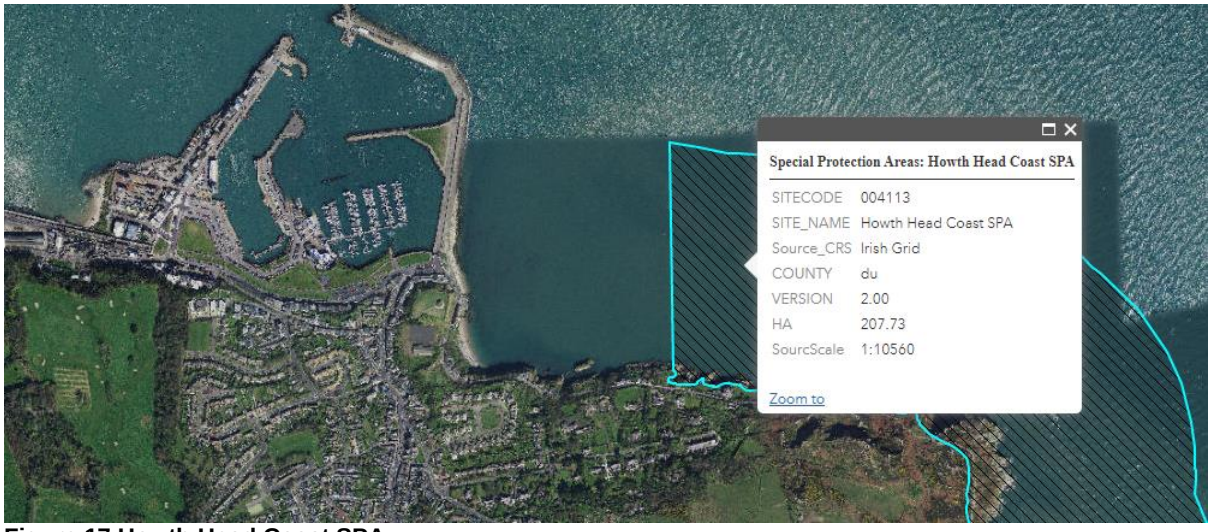

Figure 17 Howth Head Coast SPA

However, the coastline of interest falls within the Howth Head SAC (as shown in Figure 18). The qualifying interests for the SAC are:

- 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts
- 4030 European dry heaths

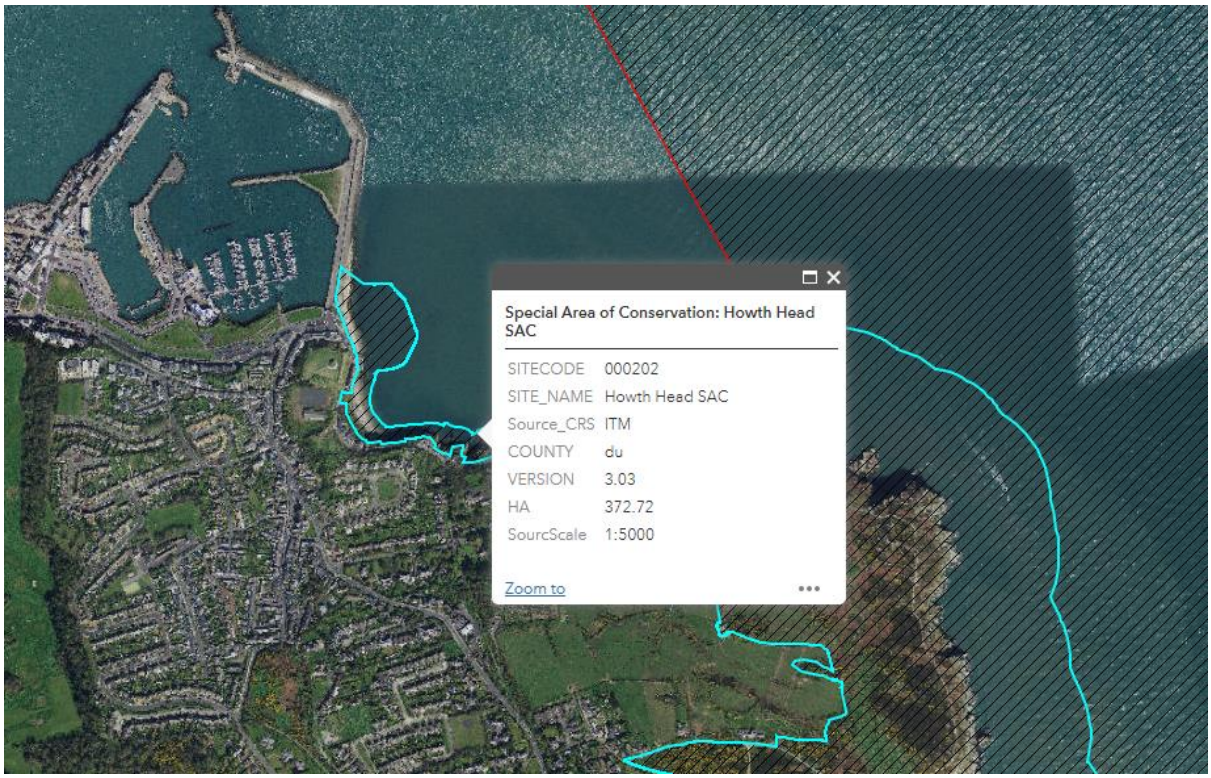

Figure 18 Howth Head SAC

An Appropriate Assessment (AA) screening will be required to determine if the proposed works are likely to have a significant effect on any Natura 2000 site. An Appropriate Assessment in the form of a Natura Impact Statement (NIS) report might then be required if screened in by this process. An Appropriate Assessment (AA) is an assessment of the potential adverse effects of the project, where the NIS is assessed by a competent authority and a determination is made.

There is a potential issue that the feasible options considered may result in permanent loss of the SAC qualifying interest. SAC implications exist for both the cliff stairs and the promenade, and these would have to be determined by conducting an AA screening.

3.5.2 Coastal protection/erosion concerns

This aspect was assessed as part of Historic Coastal Evolution, see section 3.3.1

Combining coastal protection efforts in the form of rock armour coastal defence with a boardwalk type access at the north end of Balscadden beach could be beneficial to the coastline.

Similarly, the soil nailing cliff stabilisation measures that would have to be undertaken as part of constructing a new stairway would have benefits for cliff stability in this area, although this would only span approx. 30m of the cliff face.

3.5.3 Land ownership considerations

Records available for the area have been assessed to determine land ownership and developments in the area. These are summarised and presented as an appendix to this report (Appendix B).

3.6 Options Assessment

The above considerations form the basis of a qualitative assessment of options. Each option is ranked out of 5 (as per Table 5) out of for effectiveness as potential universal access, cost, maintenance, buildability, and ease of use for the user, and additional bonus to the works in the form of cliff stabilisation or coastal protection provided. The results of this ranking is presented in Table 6 below.

Table 5 Colour key for the options assessment ranking matrix

Score	Colour
5 – High	
4 – Medium-High	
3 – Medium	
2 – Low-Medium	
1 – Low	

Table 6 Options assessment ranking matrix for proposed access solutions

	Effective-ness / Universal access [1]	Cost [2]	Mainten-ance Required [3]	Additional Coastal Protection Provided [4]	Cliff stabilisation Provided [5]	Build-ability [6]	Ease of Use [7]	Total
New Stairway	1	4	4	2	3	3	3	**20**
Access Ramp	5	5	4	2	5	3	2	**26**
Promenade Access	5	5	4	5	1	4	5	**29**
Funicular Lift	5	2	1	2	3	2	5	**20**

[1] High scores are awarded to options which are effective, in that they provide universal access
[2] High scores are awarded to options which are estimated to come at a lower capital cost
[3] High scores are awarded to options with lower maintenance requirements

[4] *High scores are awarded to options which provide additional coastal protection to areas beyond the proposed works*
[5] *High scores are awarded to options which provide additional cliff stabilisation to the coastline*
[6] *High scores are awarded to options which are easily buildable*
[7] *High scores are awarded to options which offer most ease of use to the user*

This qualitative assessment ranks the promenade access ramp option as the more preferrable of the four options presented.

3.7 Risks

The main risks and uncertainties, and potential constraints, in such a project are outlined and discussed to the following section. Any of the following has the potential to make the proposed works unfeasible.

3.7.1 Geo-technical site investigations

The potential feasibility of any proposed solution is subject to a detailed geo-technical site investigation to determine the composition and competency of the cliff and rock in the area of the proposed works.

3.7.2 Slope stability during course of works

In the course of any works being carried out in the area, the slope stability of the cliff face, adjacent to the Balscadden road and the homes located there would be of key concern. Any potential undermining of the safety of the properties and public road would be an unacceptable risk. This would have to be assessed as part of the design of any works.

3.7.3 Impact of the works on the adjacent/ risk to the residential apartment block

The promenade access ramp to the north end of the beach, seaward of the apartment block, would have to be conducted taking care not to adversely impact the residents of the apartment block which is directly adjacent. There is also likely to be added protection provided by the additional of rock armour as part of these proposed works. However, works such as rock breaking can be disruptive, and care must be taken of the affect associated vibrations can have on nearby structures.

3.7.4 Specialist works and facilitation works given the site constraints

Given the restricted nature of the site of the proposed works options, extra costs would have to be factored in to allow for specialist works. The technical considerations would be considerable, and would need to be explored fully prior to completion of design.

3.7.5 Planning and Consenting

There are potential issues and uncertainties in terms of planning at this site, as the proposed works lie within an SAC. As a minimum, an Appropriate Assessment (AA) screening will be required, which could result in the need for a Natura Impact Statement (NIS). In this case, An Bord Pleanála would assess the planning application and determine if permission can be granted. Screening for EIAR may also be required. The planning process would also have a phase of public consultation, and there is the potential for objections from local community groups, residents etc..

Furthermore, any works carried out below the historic High Water Mark (HWM) would require a foreshore lease which would have to be granted by the Foreshore Unit of the Department of Housing, Local Government and Heritage, which is an open-ended process.

3.7.6 Legal issues

There would be legalities involved in acquiring land for the footprint of the actual works proposed, and also for the facilitation works, which would not be insignificant. Also, as mentioned above, any works or development below the HWM would require third party consent from the Department of Housing, Local Government and Heritage in the form of a foreshore lease.

3.8 Conclusions

In assessing the feasibility of a new or improved access for Balscadden Bay Beach, first a topographic survey was procured. Topographic data, coastal process data, geotechnical considerations and historic coastline evolution were all used to assess the coastline of interest.

An options assessment was conducted of universal beach access solutions.

- A new and improved set of steps, in a similar location to the existing steps, could be put in place to the appropriate standards to ensure non-universal but ambulant disabled access. As this option can only provide ambulant access it is not preferred.
- A new potentially universal access ramp in the approximate location of the existing set of steps. This option would take up a greater surface area of the cliff face. While this could provide universal access, the drop and the length of the ramp is considerable, would not be easy for a wheelchair user to use, and therefore this option is not preferred.
- A promenade to the north end of the beach connecting it to the Howth FHC west breakwater further north is an alternate option. This option could provide universal access, and with a low drop for the user is preferred.
- A railway-type lift structure solution is likely to be the most expensive, with high annual maintenance requirements, and technically complex to construct.

The potential benefits of such solutions are also discussed. Coastal defences being incorporated as part of the promenade ramp access solution could prove very beneficial to the coastline and the assets adjacent to it.

Consideration was also given to aspects which would determine the viability or feasibility of any preferred option. Environmental protection status, such as the SAC and SPA designations in the area, would potentially dictate whether an option can be implemented. These considerations formed the basis of an initial high-level options assessment ranking above, from which the promenade ramp access to the north option was deemed the highest scoring solution on aggregate of all criteria. The report also aimed to highlight the many risks and constraints, any of which could make proposed works unfeasible at this location.

Appendix 1

Site Location and Site Photographs

Figure 19 Site Location Map, and survey area of interest shown

Figure 20 Balscadden Bay Beach, with existing access route just seen

Figure 21 Existing Access Route Steps to beach

Figure 22 Concrete promenade at Balscadden Bay Beach

Figure 23 Vegetation above the promenade, Balscadden Bay Beach

Figure 24 Slipway on beach, and view towards shoreline

Figure 25 Broken concrete structure along beachfront

Figure 26 Balscadden Bay beach, looking north

Figure 27 Interface of Concrete wall and rock outcrop, north end of Balscadden Bay Beach

Figure 28 Carpark, as seen from beach, showing rock armour and concrete interface

Figure 29 Coastline adjacent to carpark, looking south

Figure 30 North end of carpark and start of roadside wall along Balscadden Road, looking north

Figure 31 Wall adjacent to Balscadden road North of Carpark

Figure 32 Balscadden road, landward and seaward edges seen

Figure 33 North end of coastline road, access point from Balscadden Road

Figure 34 North end of the coastline in this study, sloped wall, adjacent to public toilets

Appendix B

Land Ownership Information

Residential Properties

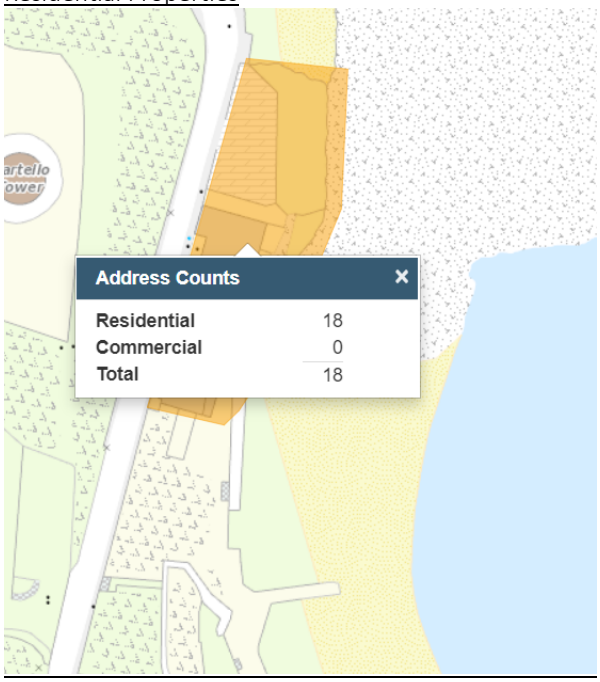

Figure 35 Residential properties count (18) adjacent to the rock outcrop to the north of Balscadden Bay Beach

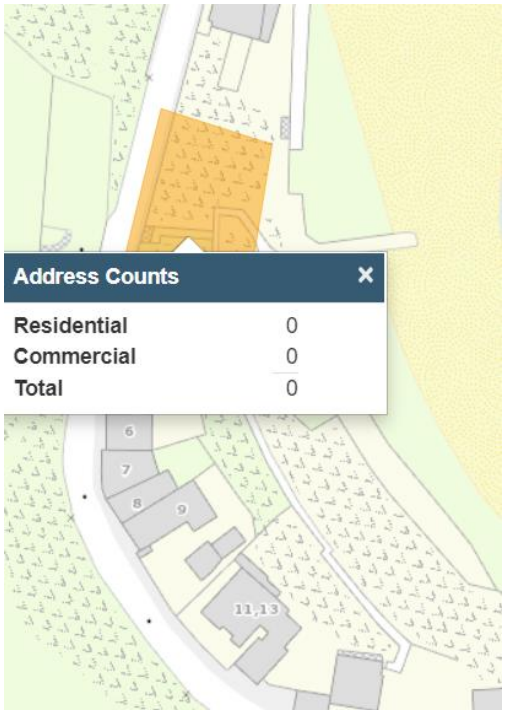

Figure 36 Residential properties count (0) adjacent to the stairway access in the cliff at Balscadden Bay Beach

Companies

Marlet property group limited
Balscadden gp3 limited: registry of deeds public search application no. S2021rd094798v Balscadden gp3 ltd (on behalf of) Balscadden 3 ltd partnership

Cormac Kavanagh: registry of deeds public search application no. S2021rd094783m
Premises Balscadden Howth descd
In 19754927 as Balscadden road

Creyak landbank investment limited registry of deeds public search application no. S2021rd0947 conveyance: ground at Balscadden road Howth

Crevak trading gp ltd. Mortgage: ground at Balscadden road Howth
Lands and premises at Balscadden road Howth (grantee Balscadden gp3 ltd on behalf of Balscadden 3 ltd partnership

Deeds Gerard Beshoff to Paula Conolly 9&10 Balscadden Road
Planning at 9 Balscadden road by Paula Connolly
7 Balscadden road mortgage to Paula Connolly

Grainne Mallon Sunnylands Balscadden Rd Howth, and ground at rear of Sunnylands Registry of Deeds Public Search Application No. S2021RD094757

Premises Balscadden road Howth 11 & 15

Troika Properties Athlone Ltd Registry of Deeds Public Search Application No. S2021RD0947 – Ground at main street Howth

Balmain Inn Limited - Registry of Deeds Public Search Application No. S2021RD094 : Ground at Balscadden Road and at Main St. all descd as the Bailey Court Hotel & Premises known as Royal Hotel Howth; Premises Main Street descd as ground at Balscadden Road

Planning pending for former bailey court hotel , Crevak trading: demolition, strategic housing

52 2 bedroom units granted in 2008 planning ref F07A/ 1349, further demo: Ref F14A 0108

Cliff House, applicant C. Kavanagh – planning for boiler room and toilet, planning Ref F97A 1071.

Figure 37 and Figure 38 show the extents of the private properties of 6 and 8 Balscadden road, respectively.

There are no dealings pending for either of the properties 6 or 8 Balscadden road.

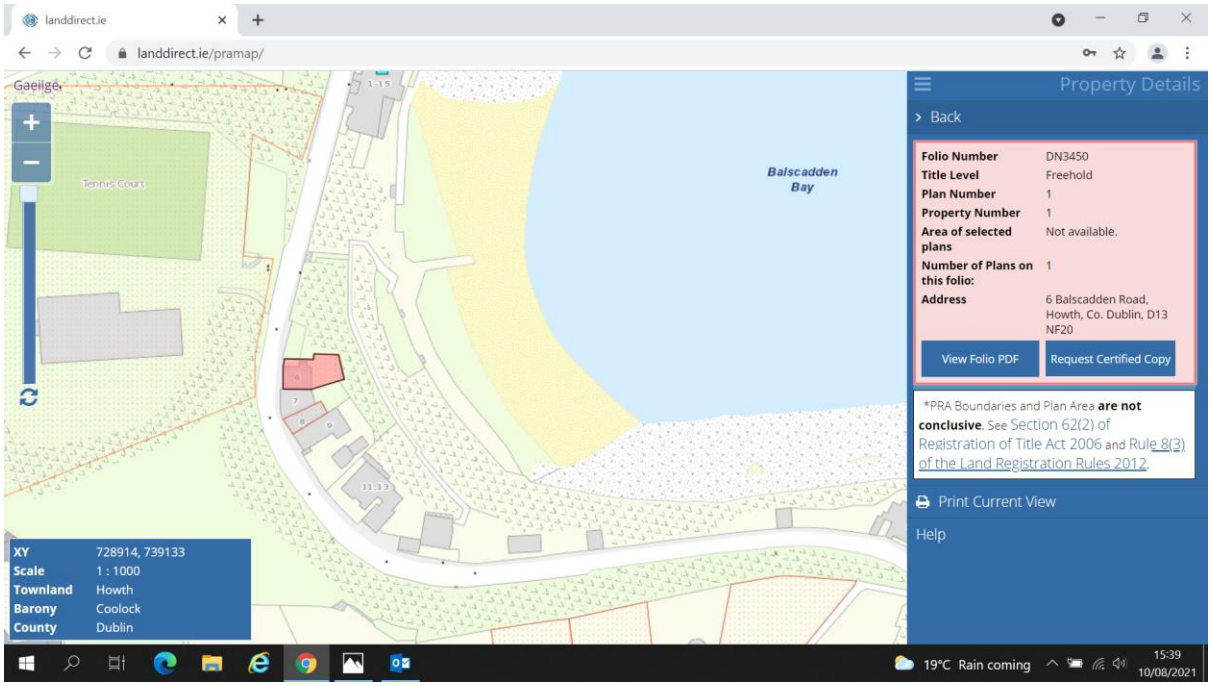

Figure 37 DN3450 6 Balscadden Road

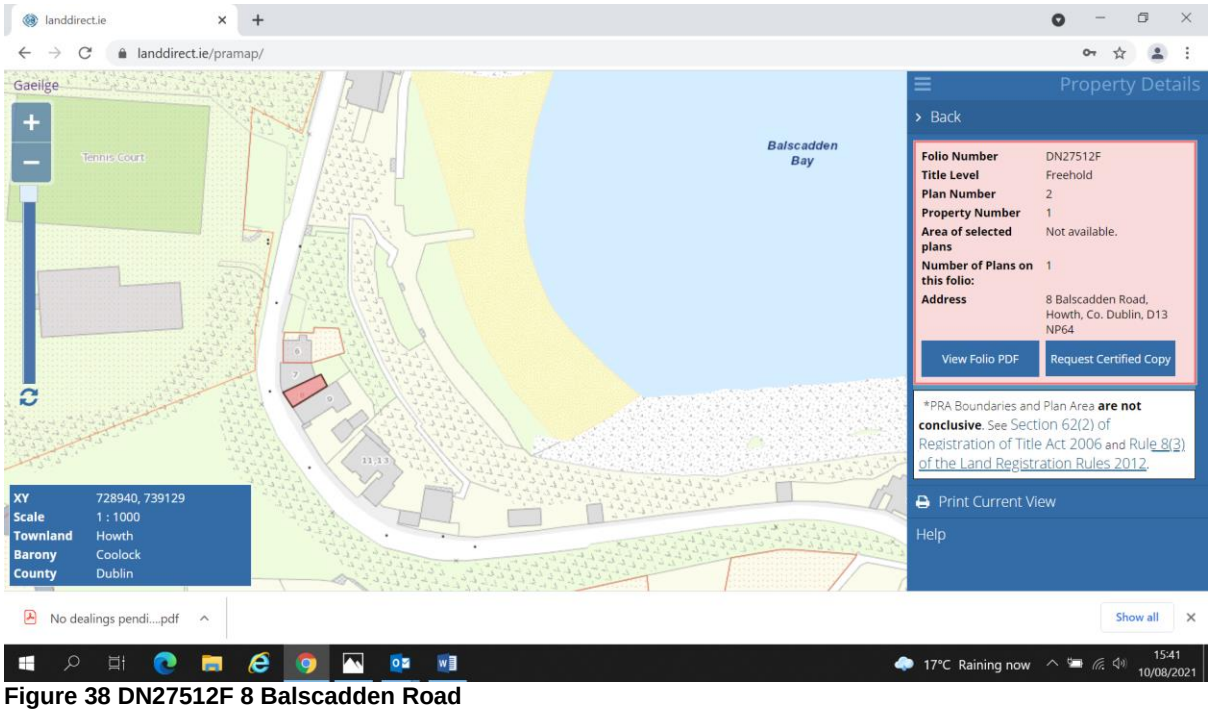

Figure 38 DN27512F 8 Balscadden Road