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RIAI ACCREDITED CONSERVATION PRACTICE GRADE I

ARCHITECTURAL HERITAGE ASSESSMENT

for

PROPOSED SANDYMOUNT FLOOD DEFENCES

Strand Road, Sandymount, Dublin 4

Client: **Dublin City Council**

Stage: **Planning Application (Part 8)**

Date: **22 August 2017**

Directors
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Contents

1.0 Introduction

This report has been prepared to assess the architectural heritage impact of proposed interventions to the Sea Wall forming the east of Strand Road in the area between Lea Road in the north to Strand Mews in the south, to form coastal flood defences.

The proposal is shown on the Part 8 application drawings prepared by Dublin City Council Environment and Transportation Department, Drawing Nos. SM-2015-778-XX to SM-2015-778-XX.

The proposal consists of the following elements:

1. Raising the crest of the wall up to a maximum of 360mm within the stretch to the north of the Sandymount Martello Tower, tapering away to zero to the north of Gilford Avenue.
2. Raising an existing rubble-stone retaining wall forming an arc around the seaward side of the Martello Tower by c. 750 to 800mm.
3. Alterations to the wall adjoining the Sandymount Martello Tower, incl. minimal raising of the wall immediately to the south of the tower.
4. Introduction of flood gates of varying detail at 11 no. gaps in the wall along the length of the proposed Works Area.

1.1 Record of Protected Structures

The Sea Wall is included in the Record of Protected Structures (ref. No. 7861), as is the Sandymount Martello Tower (ref. no. 7860).

1.2 Record of Monuments and Places (RMP)

The Martello Tower is the only site listed, having Ref. No. DU019-018

Description: *Built on the sandy foreshore at Sandymount in 1804. Comprises a circular tower built of cut granite. The doorway in the W is defended by machicolation. A string course marks the parapet level, which held an armament of twenty-four pounder guns on a traversing platform (Turner 1983, 94; Kerrigan 1996, 168, 174). In the mid -1860s the tower was disarmed and let to the Earl of Pembroke, landlord for the Sandymount area. It was later bought by Dublin Tramways Co. (Bolton et al 2012, 145). Compiled by Geraldine Stout (uploaded 25 September 2012)*

1.3 Architectural Conservation Area

The Sandymount and Environs ACA does not extend as far as the part of Strand Road where the works are proposed.

1.4 Natural Heritage

The park outside the Sea Wall adjoins the southern half of Dublin Bay. The National Parks and Wildlife Service has designated the following areas of protection under the Habitats Directive:

- South Dublin Bay Special Area of Conservation (SAC), ref no. 000210.
- South Dublin Bay and River Tolka Estuary Special Protection Area (SPA), ref. no. 004024.

In addition, the bay has been designated the 'Dublin Bay Biosphere' by UNESCO.

2.0 History and Significance

2.1 Early Development

In the Middle Ages, the land between the River Dodder and the sea belonged to Richard de St Olof, passing to the Bagods of Baggotrath and then to the Fitzwilliam family, later Viscounts Fitzwilliam of Merrion, the developers of much of the south side of Georgian Dublin. The site where Sandymount was to develop was known as Scallet Hill. The coastline was formed of 'furze-covered sand dunes', and fishing for herring became well established from Blackrock to Ringsend. (Source: Sandymount Village Design Statement, 2011).

In 1731 Viscount Fitzwilliam established a brick works along the shore to supply his building projects in Dublin. Roque's map of 1760 shows 'Lord Merrion's Brick Fields' and the original settlement at Sandymount named after them as 'Brickfield Town'. The shoreline is marked as 'The Strand of Merrion' facing onto tidal sand flats marked 'South Bull'. A channel marked 'Cock Lake' curves around the coastline, having a spur which cuts across the brick fields into a sea-lough, just south of the present-day Sydney Parade Avenue.

in 1791 Lord Fitzwilliam commenced construction of an embankment to protect the brick works from the sea (Source: Sandymount Village and Environs ACA Report). The embankment 'extended all the way from Williamstown [between Booterstown and Blackrock] to Prospect Terrace [corner of Strand Road and Marine Terrace]'. Topographical and map sources indicate that the embankment at this point consisted of rocks rather than the formal road and wall that we see today.

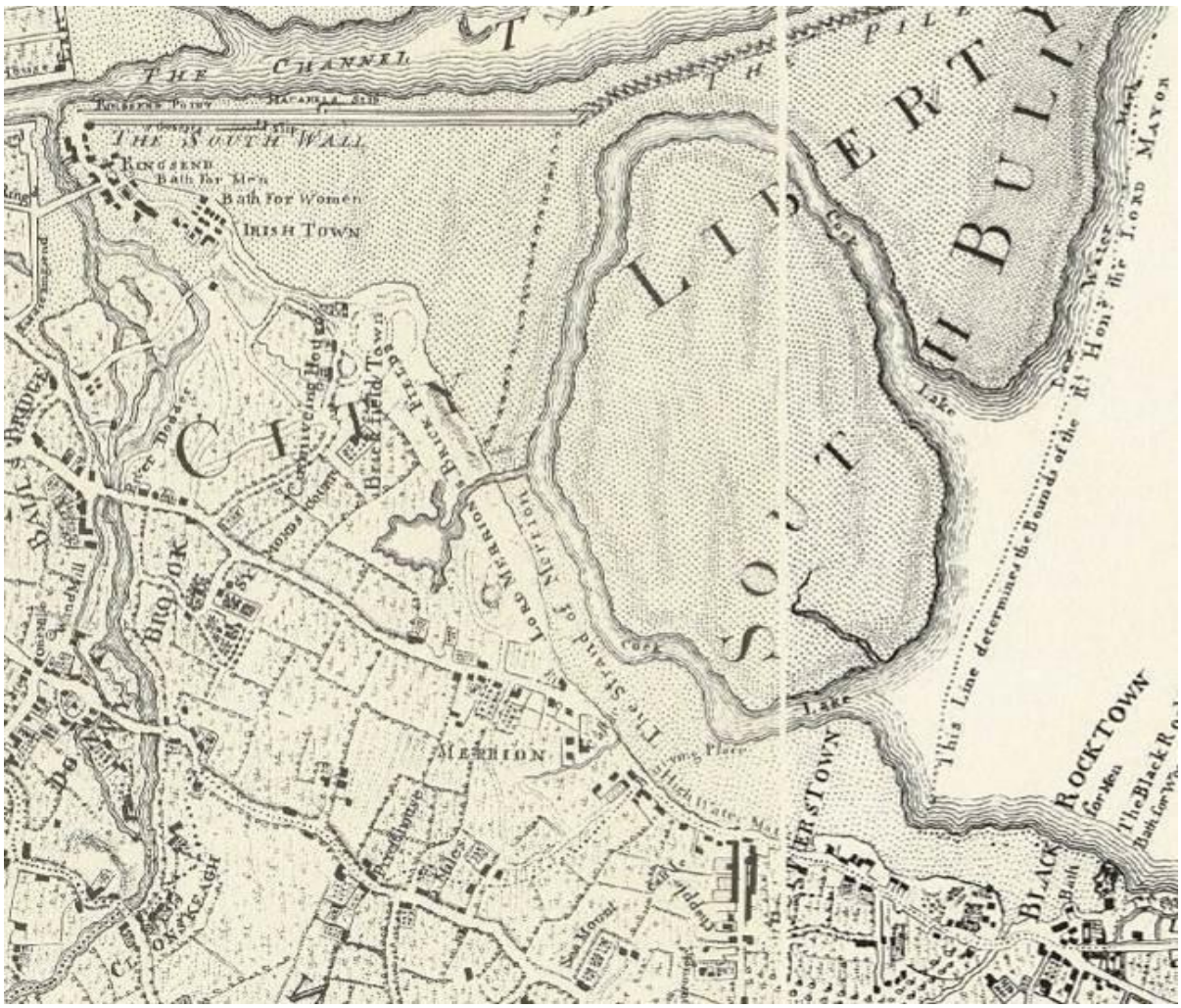

Fig. 1: John Rocque's map of County Dublin, 1760

2.2 Nineteenth Century

From about 1800 the development of Sandymount commenced in earnest. Fitzwilliam renamed Brickfield Town as 'Sandymount', and began leasing land for building of suburban villas. Sandymount Martello Tower was built on the strand in 1805 as part of a chain of 28 defensive towers and batteries stretching from Bray to Balbriggan, designed and constructed in 1804-1805 to protect against the imminent threat of a French invasion during the Napoleonic Wars (1803–1815).

Fig. 2: View of the Martello tower at Sandymount, Co Dublin, by James Henry Brocas (1790-1846) published/created between ca. 1810 and 1846 (Copyright National Library of Ireland)

Fig. 3: Sketch of the Martello tower at Sandymount, Co Dublin, by Samuel Frederick Brocas (1792-1847), published/created between ca. 1812 and 1847 (Copyright National Library of Ireland)

Although an embankment was commenced in 1791, there is evidence that the sea-wall was not actually built until some decades later. Taylor's map of 1816 and Duncan's map of 1821 indicate the seashore as a jagged line, and three sketches drawn after the Martello Tower was built, one by James Henry Brocas (1790-1846), and two by his brother Samuel Frederick Brocas (1792- 1847) show the shoreline protected by rocks.

Fig. 4: Sketch from the Martello tower at Sandymount, Co Dublin, looking across Dublin bay towards Howth and the Poolbeg lighthouse, by Samuel Frederick Brocas (1792-1847). Published/created between ca. 1812 and 1847 (Copyright National Library of Ireland)

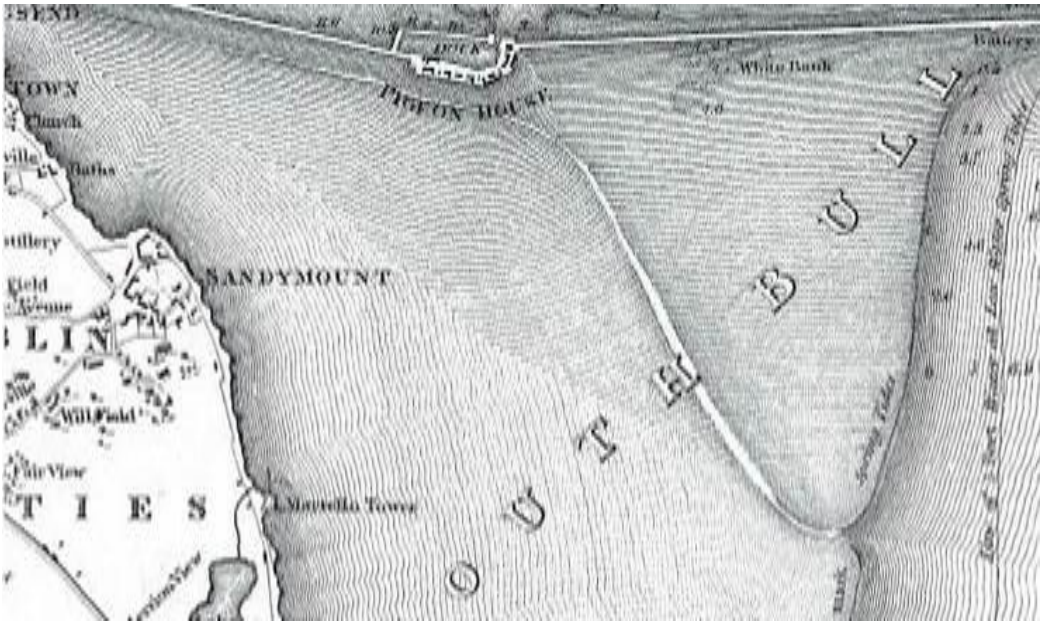

Fig. 5: Extract from Duncan's map of Dublin 1821

Topographical views and cartographic sources indicate that the Strand Road and the sea wall were built between 1821 and 1837, when the first edition Ordnance Survey was drawn. The wall consisted of a raised road and a stone sea-wall or revetment. The promenade formed in this way encouraged people to build seaside villas overlooking the bay, and isolated examples are already in place on this map. The map shows the proposed works area as a straight coastline, with a thin line indicating a narrow strand outside the wall, roughly corresponding to the length and width of the park at the present-day Sandymount Strand. The sea-lough shown by Rocque was still in existence.

The Fitzwilliam Estate controlled the residential development of the area, granting long leases and requiring a high standard of construction. By the end of the century the full length of the Strand Road had been developed as a series of distinct terraces of varying lengths for upper-middle class residents forming a broken line interspersed with detached villas, the predominant style being the stucco architecture associated with the seafront.

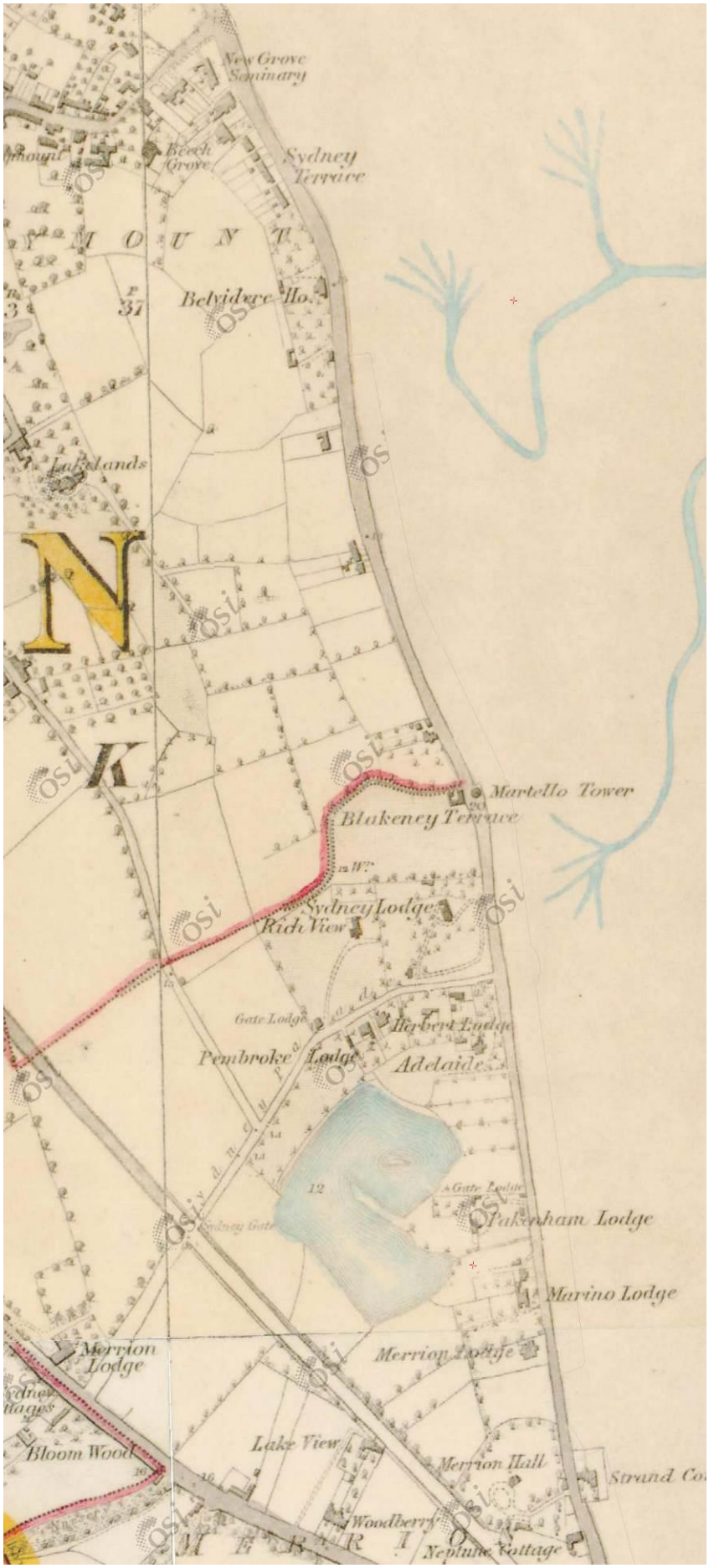

Fig. 6: Extract from first edition Ordnance Survey map of 1837 (original scale 6" to 1 mile)

Fig. 7: Gilford Avenue to the Martello Tower, from large-scale OS map surveyed 1865 (original scale 5' to 1 mile)

Fig. 8: Martello Tower and stretch of wall to south (as far as present carpark) as shown on large-scale OS map surveyed 1865 (original scale 5' to 1 mile)

The large-scale Ordnance Survey 5' map surveyed in 1865 gives a detailed layout of the Strand Road, then named Beach Road, including the wall and the Martello Tower. It shows only four breaks in the sea wall in the Proposed Works Area:

1. A narrow break at the present 'Gap 1', then a single opening with a projecting landing and four steps descending parallel to the sea wall on the strand side
2. A slipway c. 130m north of the Martello Tower. Shown on a Lawrence Collection photo of c. 1900 (see Figs. 12, 13 and 19), this survives today as a recess in the line of the wall.
3. A narrow feature just north of the Martello Tower at the present 'Gap 5', then having a flight of five steps beginning in the footpath and running perpendicular to the wall. It is not clear from the map if these descended through a break in the wall from footpath level to the strand, or rose up onto the top of the wall without a break. A freestanding OS 'War Dept Stone' shown next to this does not survive today.
4. A curved indent to the south of the Martello Tower at the present 'Gap 6'. This lay at the point where the sea wall splayed out to surround the tower on its seaward side. The indent is shown on a Lawrence Collection photo of c. 1900 (see Figs. 9 and 15) but does not survive today. A freestanding OS 'War Dept Stone' shown next to this does not survive today.

The Martello Tower is shown having a small low ancillary building on the seaward side, now replaced by a two-storey extension. The sea wall extended forward to meet this structure on both sides. A flight of steps rose around the road-facing side of the tower, visible also in a historic photograph).

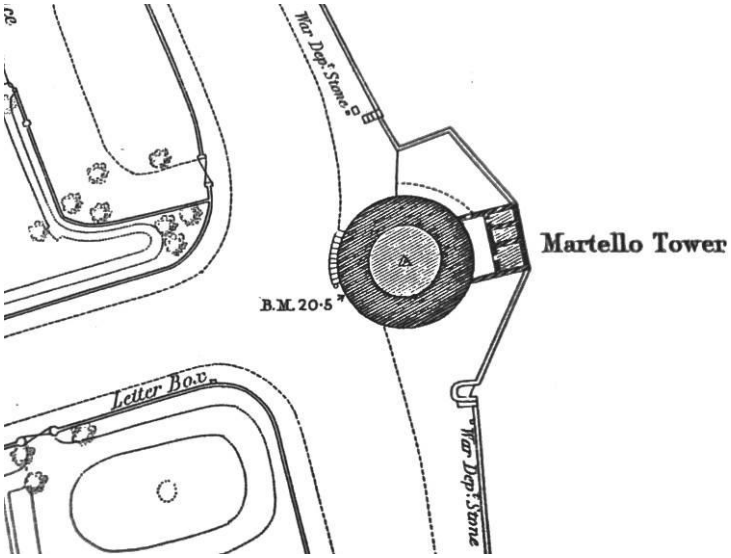

Fig. 9: Detail extract from 1865 map showing Martello Tower and adjoining breaks in the sea wall.

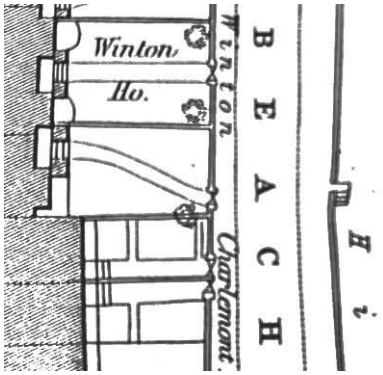

Fig. 10: Detail extract from 1865 map showing break at 'Gap 1'
Fig. 11: Detail extract from 1865 map showing slipway c. 130m north of Martello Tower

Fig. 12: Strand Road, Lawrence Collection, c. 1900 (Copyright: National Library of Ireland)

Fig. 13: Extract from previous image. Note steps/slipway onto strand (Copyright: National Library of Ireland)

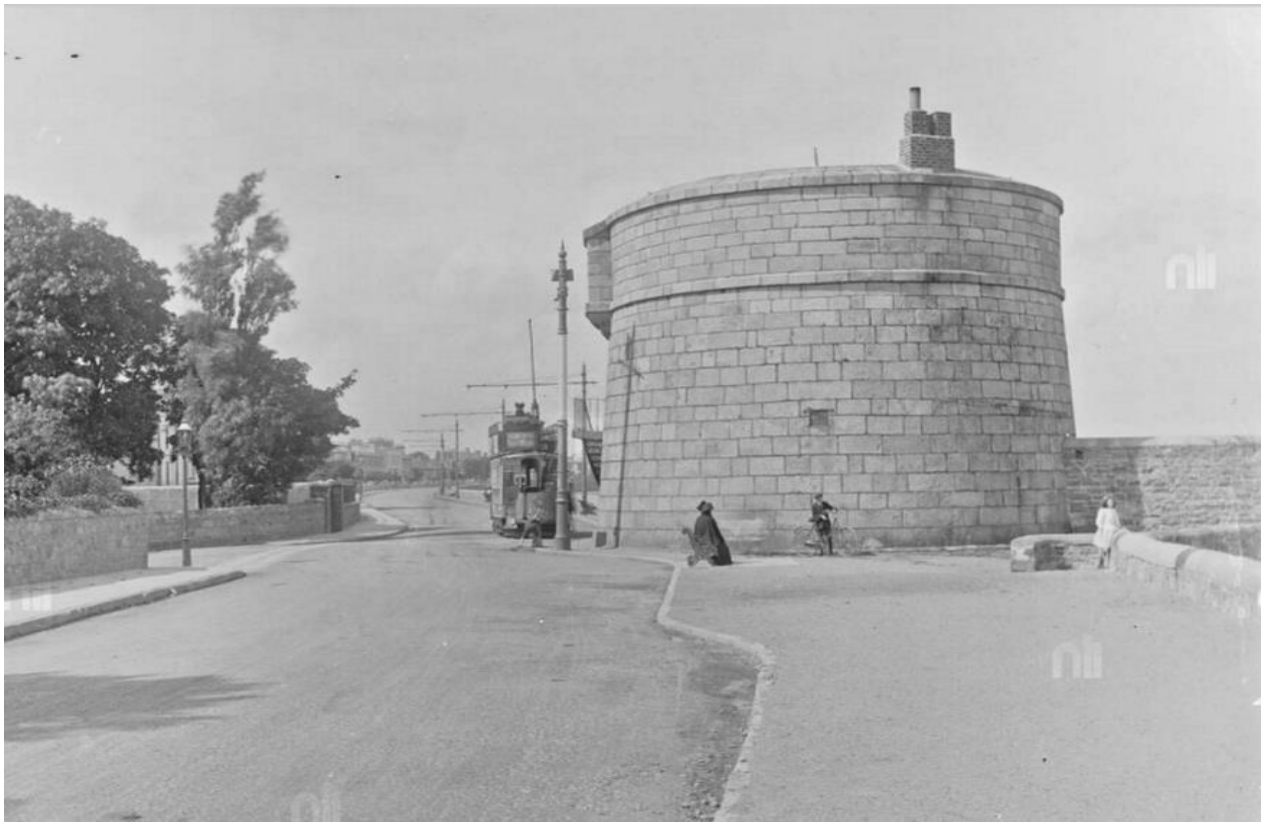

Fig. 14: Sandymount Martello Tower, Lawrence Collection, c. 1900
(Copyright: National Library of Ireland)

Fig. 15: Detail of previous image showing how the sea-wall joined the Martello Tower

Sandymount was incorporated into the Pembroke Township in 1863. Horse drawn trams to Dublin were introduced in 1872 running along Strand Road, operated by the Dublin Tramway Company, whose stables and yards were built on Gilford Road, with cottages for tramway workers in built in 1894. A second slipway was introduced just south of Merrion Strand (Gap 10), at some point between 1865 and 1907.

In 1883 the 'Merrion Pier, Promenade and Baths' were erected at Sandymount Strand, opposite the end of Sydney Parade Avenue. The baths consisted of a cast-iron and timber pier 350ft (106m) in length and 14ft (4.2m) in width, floored with deal planks and extending out into the water to a bathing pool of mass-concrete, having refreshment rooms mid-way along the pier and changing rooms facing the pool. The bathing pool was divided into two for males and females, measuring 120ft by 80ft (36.5m x 24m) and 120ft by 40ft (36.5m x 12m) respectively. The baths operated for less than 40 years, closing in 1920 as a result of the collapse of a section of the sea wall to the baths. The pool is the only part of this once extensive complex which survives today (Source: Conservation Report by Frank Keohane, 2015).

Fig. 16: Strand Road with Martello Tower and pier in distance, Lawrence Collection, c. 1900 (Copyright: National Library of Ireland)

Fig. 17: Pier showing refreshment room and changing rooms (Source: Report by F. Keohane)

Fig. 18: Entrance to pier from Strand Road. Note section of pier wall at left of image. (Source report by F. Keohane)

Fig. 19: Strand Road looking north from the Martello Tower, Fergus O'Connor Collection, 1900-1920 (Copyright: National Library of Ireland)

Fig. 20: Extract from Ordnance Survey map of 1907 (original scale 25" to 1 mile)

2.3 Twentieth century

The Ordnance Survey 25" map of 1907 shows the development which had taken place over the Victorian period, including the pier and baths. The pier and baths closed in 1920. In 1936, Sandymount came under the jurisdiction of Dublin City Council (then Dublin Corporation).

In 1972 the present-day park was created on the seaward side of the sea-wall, and a succession of opening were created in the wall. Where the park adjoined the east side of the Martello Tower a retaining wall of rubble stone was created. The tower, which had been used by the Dublin Tramways Company, became a popular cafe in the 1960s. A two-storey extension was added c. 1980 having large double-height windows on three canted faces to the seaward side. A mild-steel railing on top of the retaining wall would appear to have been added at this time. The restaurant is now closed and the large windows screened by roller blinds.

Two car parks were laid out within the park prior to 1995, at Gilford Road and between Adelaide Mews and Merrion Strand, and a third was added before 2000 just south of the Martello Tower. Widened entrances were crated in the former sea-wall to enable access to the car parks.

Fig. 21: Wiltshire Photographic Collection, 1969, prior to creation of park (Copyright: NLI)

Fig. 22: Photograph by Michael Walker taken in 1972 when park was created outside the sea wall (Copyright: National Library of Ireland)

Fig. 23: Aerial view showing park and car parking areas and modern planting.

3.0 Architectural Description

3.1 Sea Wall

The wall is built of roughly squared Dublin-calp limestone rubble, and has a coping stone of roughly finished Wicklow granite of semi-circular profile over most of the Proposed Works Area. The coping is of square profile in the northernmost tip of the Proposed Works Area, extending back towards Rinsgend. The transition occurs at the junction to Gilford Avenue.

The wall varies in height from 650 to 850mm above the footpath level on Strand Road. The ground level on the seaward side of the wall within the Proposed Works Area is, by and large, equal to the pavement level.

The wall has been repointed with sand cement mortar. The pointing mortar extends onto the masonry units which detracts from the intended character of the wall. Coping stones have also been pointed in similar manner with sand cement, in some places as raised strap-pointing. There is widespread damage to the pointing and masonry, and the wall would benefit from wholesale repointing on both faces.

3.2 Gaps in the wall

Eleven gaps have been created in the wall over the full length of the Proposed Works Area, numbered on the application drawings as Gap 1 to Gap 11.

- Gap 1 is in the location of one of six historic gaps. It comprises of a pedestrian entry point at the northern end of the park and now consist of two openings, a narrow slit, and the pedestrian opening. The height of the wall varies slightly from one side to the other. A free-standing section of wall has been rebuilt in line with this opening inside the park, to prevent cyclists riding into the park.
- Gap 2 is a wide vehicular entrance at the northern end of the car park at Gilford Road. It has an overhead barrier to restrict the entry height. The ground to the north is grass, with tarmac across the opening width and a planted shrubbery margin to the south.
- Gap 3 is a wide vehicular entrance at the southern end of the car park at Gilford Road. It has an overhead barrier to restrict the entry height. The ground to the south is grass, with tarmac across the opening width and a planted shrubbery margin to the north.
- Gap 4 is a wide pedestrian entrance opposite a flight of steps which connect the raised level of the park to the strand below. A free-standing section of wall has been rebuilt in line with the opening inside the park to prevent vehicles driving in.
- The former slipway north of the Martello Tower, one of the six historic gaps, has been blocked with a short section of wall using salvaged material and detail.
- Gap 5 is in the location of one of six historic gaps. Formerly a narrow stair adjacent to the Martello Tower, it has been widened to from an access point into the park with a coin-operated public toilet. A section of wall coping has been reused to the south of the opening, alongside the gate leading down to the lower ground around the tower.
- Gap 6 is in the location of one of six historic gaps. Formerly a curved indent where the wall changed direction to extend out around the Martello Tower, it has been widened and reconfigured to form an access point into the park. Sections of salvaged wall coping have been reused to cap the retaining wall to the lower area around the tower, at the footpath side and alongside the access path. To the south of the opening a course of granite blocks below the rounded coping is visible above the surface of the footpath.

- Gap 7 is a wide vehicular entrance to the car park to the south of the Martello Tower. The opening is flanked by low cylindrical granite posts reused from another location. An overhead barrier of steel has been erected further back to restrict the entry height. The ground to both sides is planted with a shrubbery margin between the parking spaces and the wall on the north, and a row of recycling containers to the south.
- The former entrance to the Sandymount Strand Pier at Sydney Parade Avenue was an earlier breach in the sea wall, one of the six historic gaps. It was filled in when the pier closed in 1920, or at some point since. The rebuilt section consists of a long section of salvaged rubble stone centred on Sydney Parade Avenue built slightly higher with a square coping finished with sand-cement. At either end a concrete stile has been formed, the northern one having been rebuilt in recent years.
- Gap 8 is a wide vehicular entrance at the northern end of the car park between Adelaide Mews and Merrion Strand. It has an overhead barrier to restrict the entry height. The ground to the north is grass, with tarmac across the opening width and a planted shrubbery margin to the south.
- Gap 9 is a wide vehicular entrance at the southern end of the car park between Adelaide Mews and Merrion Strand. It has an overhead barrier to restrict the entry height. The ground to the south is grass, with tarmac across the opening width and a planted shrubbery margin to the north.
- Gap 10 is a former slipway north of the Martello Tower, one of six historic gaps. It consists of an inward curve in the line of the sea wall t the north of a widened pedestrian opening, having a rebuilt free-standing section using salvaged material and detail set back from the line of the sea wall to prevent cyclists entering the park.
- Gap 11 is a narrow pedestrian entrance at the southern end of the park, having a rebuilt free-standing section using salvaged material and detail set back inside the park tto prevent cyclists entering the park.

4.0 Statement of Significance

4.1 Architectural Interest

The sea wall is a significant feature of the urban setting of Sandymount and of the coastal landscape of Dublin Bay.

The materials used are typical for the city, being a combination of Dublin calp and a rounded coping of Wicklow granite. These materials enrich the urban setting.

The walls retain remnants of several historical features, such as two slipways and the end of the former ‘Merrion Pier, Promenade and Baths’ at Sydney Parade Avenue. The walls which adjoin the Martello Tower form the context of a very significant building, characteristic of the coastline of Dublin.

The wall is poorly presented and would benefit from conservation works.

4.2 Historical Interest

The sea wall is a physical record of the historical development of the shoreline in Dublin Bay, charting the development of Sandymount from a small settlement based around brick making and fishing to become a middle-class suburb close to the city.

4.3 Technical Interest

The sea-wall is a work of civil engineering which forms an element of a wider landscape of coastal engineering projects including the eighteenth-century South Bull Wall (1715-1731, extended 1795), the early nineteenth-century north Bull Wall (1820-25) and Dun Laoghaire harbour (1816-22), four lighthouses, and the military engineering chain of Martello Towers (1804-05).

5.0 Methodology for Proposed Works

The proposed alterations and conservation work should be carried out according to the following methodology.

5.1 Conservation Principles

All works to the protected structure should be carried out in accordance with best conservation practice, as defined by the International Council on Monuments and Sites (ICOMOS) in the Venice Charter of 1964, and in subsequent charters, and summarised in the Dept of Arts Heritage Regional Rural and Gaeltacht Affairs (DAHRRGA) *Architectural Heritage Protection Guidelines for Planning Authorities*.

This requires adherence to the following basic principles:

- Conservation work to be based on an understanding of the building and its historical development. The primary aim should be to retain and recover the significance of the building.
- Any alterations should be carried out in accordance with the principle of 'minimal intervention'.
- Repairs to original fabric should always be favoured over replacement. Where replacement of an original element is unavoidable, this should be historically accurate in form and materials.
- Where lost elements must be reconstructed, these should aim for historic authenticity and avoid conjecture in as far as possible.
- Modern interventions should be reversible and visually identifiable.
- New work should be recorded.
- Works should be carried out by suitably skilled craftspeople with proven expertise in their trade working with historic buildings.

5.2 Raising of Wall

In order to achieve adequate coastal flood defences, the crest of the wall must be raised to 4.2m ODM in areas where it does not already reach this point.

- The areas which are to be raised are marked in blue and red on the Part 8 application drawings, the blue being areas where minimal raising up to 150mm is required, the red being areas where the wall must be raised by 150 to 360mm.
- Raising the wall in the relevant stretches will be achieved by taking off the granite coping, adding a course of Dublin calp stone and resetting the historic coping to finish the wall head. The additional stone would be laid in traditional lime-sand mortar finished in traditional technique.

- In addition, it is proposed to remove earlier sand-cement pointing from the retained part of the wall and to repoint. This will serve to achieve a better match between the new and existing masonry.
- Repairs to existing masonry will be made in traditional technique using Dublin calp limestone laid and pointed in in lime-sand mortar.
- As part of these works, historic slipways and openings will be reflected in the new layout as far as is practicable.

5.3 Rubble stone masonry:

- Clean down exposed surfaces of stonework and remove all loose mortar and biological growth.
- Lime mortar to be used. No mortars using Portland cement to be used.
- Build up stone wall course by course. Set squared quoin stone at corners and complete course with rubble before proceeding to next quoin.
- Build outer and inner faces with larger rubble stones with smooth face outwards following horizontal lines of existing courses. Stones to be laid with longer flat side down. Smaller stones to complete spaces between larger stones, and bring top of course to a horizontal line. Small stones to be set so as to prevent rocking of larger stones.
- Bedding: Sedimentary stone such as limestone and sandstone has been formed in layers. These stones should be laid with their natural bedding layers running horizontally. Face or edge bedding can lead to spalling or cracking of stone.
- Bond: Ensure vertical joints are spanned by larger stones, do not allow vertical joints to continue from one course to next.
- Build up core of wall carefully with rubble bonded to face stone as wall rises course by course.
- Ensure that 'through-stones' which bind inner and outer faces together are maintained, ideally one per m^2 of wall. Where through stones are not possible provide 'bond stones' which extend into the core of the wall with short edge out. Tilt through-stones and bond-stones slightly outwards to expel water.
- Insert 'pinnings' or chips of stone into wider joints at end of days work while mortar is still wet. Pinnings to reduce width of joints to optimum with of 12-20mm. Wider joints will tend to shrink and crack. In vertical joints pinnings to be tilted outwards.
- Mortar to be finished flush to surface of stone or slightly recessed where arrises (edges) are rounded. Finished joint to be beaten with a stiff brush to close shrinkage cracks and expose sand aggregate.

5.4 Pointing repairs

- Rake out loose mortar with hand tools, retaining any 'pinnings', i.e. chips of stone set into joints. Avoid use of power tools (exercise extreme care in cases where use is approved by the architect).
- Remove any ferrous items. Any traces of mould oil to be removed from surfaces by scrubbing with water containing detergent and rinsed with fresh water.
- Dry-brush to remove all loose particles
- Remove all organic growth from within the joint.

- Dry masonry can draw moisture from lime mortar before it has cured and cause it to crumble and fail. Dampen surfaces as well as necessary to equalise suction before pointing. Particular attention must be paid to more absorbent areas. Surfaces must be wetted and re-wetted as work proceeds.
- Mortar to be of lime-sand in proportion 1:2.5 using traditional hydraulic lime NHL 3.5 and coarse sharp sand aggregate from local sand pits. No mortars using Portland cement to be used.
- Pinnings (chips of stone) to be inserted into wider joints to ensure a maximum joint width of c. 20mm.
- Joints to be pointed flush to surface of stone or slightly recessed where arrises are rounded.
- Finished joint to be beaten with a stiff brush to close shrinkage cracks and expose sand aggregate.

5.5 Protection of lime work

- Setting of lime mortar occurs primarily by carbonation (i.e. contact to CO2 in the air with very gradual release of water). Full carbonation will take several weeks and it is important that the mortar is protected from rapid drying out.
- Work should be carefully covered at the end of day's work with damp hessian sacking and polythene sheets to ensure that render/plaster/pointing does not dry out before it cures.
- Extra care must be taken with porous masonry and in warm or windy weather conditions.
- To ensure adequate setting, work must be protected at all times from frost, rain, sunlight and drying winds for 2 days in summer, and up to 7 days in winter using tarpaulin and straw.

– Keep finished work damp by spraying intermittently with clean water.

6.0 Flood Protection at Openings

Two types of flood gates are proposed to the openings at Gaps 1 to 11:

- Type 1: Side-hung floodgates, similar to those fitted in the Dodder Flood Protection scheme.
- Type 2: Folding barriers stored in a trench across the opening, with demountable supports, also stored in the trench, similar to those fitted on the Liffey Boardwalk in Dublin city centre.

Type 2 would be used where falls on the seaward side within the park cannot be altered.

6.1 Side-Hung Floodgates

These would be used where levels on the seaward side within the park allow a side-hung barrier.

- This system can be provided in either double-leaf or single-leaf versions and can be lift-hinged or swing-hinged.
- In open position, the gates will open back against the seaward face of the wall.

- The hanging side of the gate will require an upright post of rectangular profile. These posts will be set behind the wall as seen from the Strand Road, with the long side parallel to it. A metal box secured with a padlock will form the top of the post to protect the operating mechanism from vandalism. This will cause the post to rise above the crest of the wall. The upper edge of the floodgates will alight to the crest of the rounded wall coping wall.
- The threshold is formed of a metal plate, needed to achieve the necessary seal below the closed gate.
- The flood gates can be designed to operate on a level threshold allowing unrestricted vehicle, pedestrian and disabled access.
- Where feasible, some reconfiguration of ground surfaces and planting inside the park will be carried out to allow for the swing of the gates to remain unimpeded. These landscape features do not contribute to the significance of the wall, and therefore such changes will have no impact of historic fabric. Higher tree planting which contributes to the visual rather than historic character of the setting will not need to be removed.
- Free-standing sections of wall, put in place to prevent vehicles or cyclists from entering the park and composed of reused salvaged material, will be removed and the salvaged materials reused in repair works, or to better reflect the historic form of the sea wall.

Impact: The posts and door leaves will be visible from the seaward side when open. The posts are by necessity slightly higher than the wall, but these are proposed to stand behind it to minimise its visual impact when seen from Strand Road. The floodgates, post and threshold will be painted in a grey-brown colour to match the colour of the granite coping. This will mitigate the visual impact when seen from the seaward side. The impact of the posts where they rise over the crest of the wall will be minimal once painted to match the coping.

Fig. 24: Lift-hinged flood gate at Dodder Flood Protection Scheme

Fig. 25: Lift-hinged flood gate at Dodder Flood Protection Scheme

Fig. 26: Rectangular post with box to protect operating mechanism

Fig. 27: Swing-hinged flood gate at Dodder Flood Protection Scheme

6.2 Folding Barriers Stored in Trench

Where existing ground levels do not permit the use of side-hung flood gates, folding barriers, stored in a trench across the threshold of the opening are proposed.

- The folding barriers consist of two or more folding metal sections parallel to the ground level, which are lifted out of a metal trench.
- Supporting fins at either end are folded down into the base of trench.
- Where a wide barrier is necessary, additional fins are located at intervals along its length, which also fold down into the base of the trench.
- When the barrier is closed it stands at a tilted angle within the opening in the seawall.
- When the barrier is open it is folded away in the trench and forms a threshold similar in width to the thickness of the sea wall. A metal plate is required on the jamb of the opening of the wall.

Impact: The impact on the historic environment is minimal, as only the threshold and jamb plates are visible, and these are visually unobtrusive.

Fig. 28: Trench in which supporting fins and folding barrier are stored (Liffey Boardwalk)

Fig. 29: Barrier in closed position

Fig. 30: Barrier in open position
Fig. 31: Plate at jamb of opening in open position

6.3 Proposal at Martello Tower

This original sea wall in this location, shown on the OS map of 1865 (see Figs. 8 and 9), has disappeared to make way for the modern extension to the Martello Tower. The present wall is a retaining wall, located further away from the Martello Tower, separating the park from a lower grassed area around it. It is built of un-mortared granite rubble and does not rise above the surface of the park, the level change guarded by a mild-steel fence. This wall needs to be raised to the required level of 4.2 ODM, an increase of c. 750-800mm in height.

- It is proposed to create a reinforced concrete wall to replace the existing un-mortared granite. The wall would be a retaining wall up the park level, and would extend upwards by an additional 750 to 800mm to the top of the coping. The concrete would be faced on the visible sections on both sides with Dublin calp rubble stone, built in traditional technique using and lime mortar.
- Due to the greater wall thickness, the coping would be of square profile, repeating the historic detail which exists in the northernmost section of the Proposed Works Area, also in Wicklow granite. The existing mild steel fence would be re-fitted to the top of the coping.
- The original sea wall on Strand Road to the south of the Martello Tower will be brought to the required level by raising both the rounded coping and the visible course of large-format squared granite beneath it, inserting the required height of rubble stone masonry below ground level where it would not be visible from the road side.

7.0 Conclusion

The proposed interventions are essential works to protect against flooding. The architecturally significant sea wall will be raised in traditional construction. This will afford the opportunity for repointing of the existing masonry. Pointing of the full wall will make the raised height almost imperceptible and the overall visual affect will be positive.

The openings in the sea wall are not in themselves of heritage significance, having been created when the park was laid out in the 1970s, and subsequently when the three car parks were introduced.

The proposed flood gates will be concealed from view from Strand Road by their placement on the seaward side of the wall or in trenches across the thresholds of the openings. The impact of visible elements will be mitigated by painting to blend with the historic granite coping.

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