

Sandymount Coastal Flood Defence Scheme – Phase 1

Part 8 Proposal



Dublin City Council, Regional Projects & Flood Advisory Office

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1.0 Introduction

Sandymount Promenade (Figure 1.1) is situated along the sea front of the coastal village suburb of the same name. It is located approximately 5km from the centre of Dublin city. Dublin City Council (DCC) proposes to construct coastal flood defence measures along the existing promenade between Gilford Avenue (to the north) and St. Alban's Park (to the south). The works consist primarily of raising the existing sea wall located at the back of footpath (on Strand Road) from the Martello Tower to the northern tip of the promenade, installation of flood gates within 12 pedestrian and vehicular entrances along the entire length of the promenade and repair work to the existing wall where required.



Figure 1.1 – Aerial view of Sandymount Promenade from north end of Promenade to Martello Tower to the south (Google Maps, 2017)

In April 2003, Royal Haskoning was appointed as service provider on the Dublin Coastal Flooding Protection Project. The Dublin Coastal Flooding Protection Project was initiated in direct response to the extreme tide and flood event that was experienced across Dublin city during the 1st February 2002. The tide was the highest on record, being approximately 1 metre above the predicted astronomical tide for that day. It caused extensive flooding to over 1250 properties and disruption at a number of locations across Dublin city. The Dublin Coastal Flooding Protection Project is primarily aimed at addressing the risk from tidal flooding around the coastline and within the tidal reaches of a number of the rivers. More specifically the project area encompasses:

- The coastline from the Martello Tower to the North of Portmarnock, to the east pier at Howth Harbour.
- The coastline from the Martello Tower on the South side of Howth Head to the Dublin city boundary at Merrion, including the Bull Island and the Dublin Port area.

The main objectives and aims of the Dublin Coastal Flooding Protection Project are to:

- Undertake a strategic examination of the risk to Dublin from coastal flooding.
- Identify appropriate strategies and polices to combat and manage the risk.
- Identify short term urgent works on experience gained from the February 2002 event.
- Identify medium to long term options to reduce and/or manage the risk.
- Learn from the past.

In order to achieve these specific study objectives and aims, a number of study tasks and goals must be achieved. These include:

- Capture and analyse all relevant project data.
- Consult and liaise with all other Dublin City Council (DCC) and Fingal County Council (FCC) flood risk initiative projects.
- Carry out a public information campaign, including the creation of a web site.
- Undertake a detailed asset condition survey of the coastal and tidal defences within the project area.
- Undertake a probabilistic assessment of existing tidal records.
- Undertake mathematical modelling for use in the development of a forecasting system.
- Identify areas at risk to coastal flooding and quantify the extent of those risks.
- Assess the impact of flood risks identified.
- Identify risk reduction Works and assess the merits of each to identify a preferred option(s).
- Develop preferred option(s) into work packages and prioritise.

- Investigate and provide a specification for the development of an Early Warning System.
- Identify a long term strategy for the area.

Each of the above specific goals and tasks were incorporated within the project programme and methodology to ensure that the overall project aims were achieved.

The Sandymount Coastal Flood Defence Scheme currently consists of two phases. Phase 1 relates to the back of footpath wall along the existing promenade from Gilford Ave to St. Alban's Park. Phase 2 relates to the seawall between Gilford Avenue and Seafort Avenue.

The required flood defence level of 4.2m Malin Head has been provided as an output of the Dublin Coastal Flooding Protection Project. The defence level corresponds to the modelled 1:200 year combined event taking account of climate change modelling and freeboard (safety margin).

Phase 1 consists of raising the existing wall located at the back of footpath by up to 360mm and the installation of floodgates in the vehicular and pedestrian accesses along the entire promenade. It involves reducing the size of some of the pedestrian and vehicular accesses. It is anticipated that the Works will commence in 2017.

Phase 2 is currently at preliminary design stage with coastal defence options being reviewed. It is anticipated that extensive Environmental Impact Assessments will have to be carried out due to Dublin Bay being labelled a Special Area of Conservation. This phase of Works is at least 3-4 years from completion.

Flood defences have already been constructed opposite Marine Drive and beside Merrion Gates.

2.0 Outline of the Proposed Development

This Section briefly outlines the main focus of intended works as part of Phase 1.

2.1 Design Process

The scheme is designed to find a balance between the social requirement of protecting lives and property from tidal flooding and the visual impact as well as other elements of the environment.

2.2 Description of the Works

The works to which this application relates are the improvement and provision of flood defences along the existing promenade on Strand Road between Gilford Avenue and St. Alban's Road. (Please refer to Appendix A for further details of proposed works.) The works will take approximately 6 months to complete. The flood defence works will include:

- The extension (i.e. raising) of existing back of footpath wall (Figure 2.1) by up to approximately 360mm. Similar stone to existing will be used for the raising of the wall.
- Repair and refurbishment of existing back of footpath wall, to current visual standard.
- Provision and installation of flood gates.
- Construction of ~65m of a new stone wall 800mm high around the sea side of the Martello Tower.
- Erection of site compound on promenade.
- Remove existing shrubbery and replace where required.
- Closure of sections of the existing footpath.
- Access to be maintained to the promenade.
- Reconstruction of promenade and footpath (where required) to existing standard.



Figure 2.1 – Wall at back of footpath

3.0 Environmental Issues

This section outlines the potential environmental effects and mitigation measures that are recommended for the proposed scheme.

3.1 Biodiversity, Flora and Fauna

The proposed works are located in the immediate vicinity of two European sites designated for nature conservation, notably the South Dublin Bay Special Area of Conservation and South Dublin Bay and River Tolka Estuary SPA.

South Dublin Bay SAC lies to the south of the River Liffey in County Dublin and extends from the South Wall to the West Pier at Dún Laoghaire. It is an intertidal site with extensive areas of sand and mudflats and some areas of embryonic shifting dunes. It is of considerable conservation interest for a variety of habitats listed on Annexes I and II of the Habitats Directive and holds areas of dwarf eelgrass (*Zostera noltii*) and green algae (*Ulva* spp. *Enteromorpha* spp.) which are important for resident and migratory bird species. The site is a fine example of a coastal system, and the site is also an internationally important bird site.

The intertidal sand and mudflats within Dublin Bay are optimal winter waterfowl habitat and the site is recognised as being of international importance. The South Dublin Bay and River Tolka Estuary SPA comprises a good portion of Dublin Bay. It includes the intertidal area between River Liffey and Dún Laoghaire and the estuary of the River Tolka to the north of the River Liffey, as well as Booterstown Marsh. The intertidal flats extend for over 3 km at their widest point. The site is a SPA of special conservation interest for bird species including Brent Goose, Oystercatcher, Ringed Plover, Knot, Dunlin and other wading birds, such as Common and Arctic tern.

Standard pollution prevention measures and best practice construction will all help to minimise potential degradation/disturbance of habitats used by wintering waterfowl.

3.1.1 Construction phase mitigation

Timing of Construction Works

There are mitigation measures specific to birds which are listed below and pertain to both the timing of works and visual screening as follows:

Works shall be carried out during the main summer season (May to July inclusive) when the least number of birds are present so as to minimise potential disturbance. Species occurring in

internationally significant numbers, such as Brent Goose, Oystercatcher, Ringed Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwits and Redshank are largely not present during the summer months.

The Contractors proposed construction programme will be agreed with DCC, the Project Ecologist and NPWS at the commencement of the contract. Any extension beyond the periods agreed with NPWS will require the approval of all bodies.

Visual Screening

It is anticipated that all works can be completed outside of the overwintering period for birds, however should the works require to be completed during this period visual screening will be applied to the sides of the construction compound facing the South Dublin Bay and River Tolka Estuary SPA in order to minimise the potential for disturbance impacts on birds from human activity within the compound. The screening (envisaged as a 2.5m high timber or geo-textile hoarding) will be provided on the sea wall along the length of the promenade.

Monitoring

Owing to the high conservation value of the South Dublin Bay system, the contractor shall have a suitably qualified ecologist as part of the project team to ensure that construction activities are carried out in accordance with the best practice control measures prescribed and do not result in disturbance to birds on the mudflats.

It is essential that good liaison is established with the local NPWS management. In particular, NPWS should be kept informed of the planning timescale for the proposed development.

At the end of construction works, a site inspection will be carried out by the ecologist and a report will be prepared for the NPWS.

Prior to the commencement of development, the applicant shall employ a suitably qualified ecologist for the construction phase of the scheme. The Ecologist shall have access to the Construction Methodology Plan and shall, where he/she considers it appropriate in regard to the Construction Environmental Management Plan (CEMP), have an input into that plan. The Ecologist shall:

- Liaise with the contractor in regard to restrictions on works in terms of time, duration and location of such works;
- Advise in regard to the implementation of associated mitigation measures;

- Advise on the duration, scale and extent of any vehicular movements, deemed necessary for construction purposes only, which may be permitted across the mudflats;
- Liaise with the NPWS prior to commencement, upon completion and as agreed with NPWS during the construction phase.

Vegetation Clearance Restrictions

The roadside length of the promenade is lined with planted vegetation consisting of discontinuous hedgerow of exotic origin and some small trees – chiefly Holm oak (*Quercus ilex*). This vegetation could potentially be used as breeding bird habitat during the main bird nesting season of 1st March to 31st August. Any necessary cutting of trees, bushes and hedgerows will be restricted during this period and care taken to ensure that any such activities do not result in an offence being committed under the Wildlife Act (1976) or the Wildlife Amendment Act (2000), save where prior clearance has been given for such activities by a suitably qualified ecologist.



Figure 3.1 View north on Sandymount Promenade from the Martello Tower (Source: Google Earth)

3.1.2 Screening for Appropriate Assessment

The first stage of the Appropriate Assessment process, Screening, has been completed in compliance with the relevant European Commission and national guidelines. The potential impacts during the construction and operation of the proposed Sandymount Coastal Flood Defence Scheme - (Phase 1) have been considered in the context of the Natura 2000 sites, their Qualifying Interests and respective Conservation Objectives.

Following the Screening assessment and in applying the Precautionary Principle, it is concluded that Phase 1 of the Sandymount Coastal Flood Defence Scheme will not, either on its own or in combination with other plans and projects, have any adverse effect on the integrity of the South Dublin Bay SAC, the South Dublin Bay and Tolka River Estuary SPA or any other Natura 2000 site. The Screening concludes that there is no potential for significant effects on Natura 2000 sites in view of their Conservation Objectives and that there is no reasonable scientific doubt in that regard.

3.2 Human Beings

The proposed development will provide an overall positive impact to the community in Sandymount and the surrounding area. This positive impact will include for a reduced threat to human health and existing established land uses including dwellings, businesses, amenity facilities and their consequential financial losses caused by coastal flooding. Sensitive Receptors include houses located along the sea front and within the local area, and other amenities such as schools and hospitals, sports centres and businesses. The provision of a flood defence scheme will protect approximately 1,000 properties from the estimated 200 year flood event and approximately 3,000 properties will have reduced flooding risk from the 1,000 year flood event. There will be some negative impacts associated with the proposed development, however these will be short term in nature and will be limited to the construction phase. The operational stage will have minimal if any adverse impact on human beings. The increase in wall height may pose a minor visual obstruction to residents along the sea front, however this is negligible compared to the positive impacts of reduced risk of flooding. Photographs of the proposed wall height were presented to the public at three Public Consultation Workshops on Thursday 21st July 2016 and only one submission highlighted visual impacts as a concern.

The construction phase is likely to pose some negative impacts, although these will likely be temporary in nature. The works required to construct the Scheme will be small scale and will be carried out mainly from the seaward side of the wall on the existing grass bank to minimise effects on road traffic and pedestrians. The most significant impacts will be noise and vibration however this will be mitigated and limited to working hours as discussed in Section 3.3.

The appointed contractor will be required to prepare and implement a Construction Environmental Management Plan (CEMP), to be approved by DCC prior to the commencement of construction. The contractor will identify an Environmental Manager/Site Representative who will be responsible for implementing the Plan and who will act as a liaison between the contractor, DCC and the public with regard to the environmental management of the development works.

Any requirement to impact on traffic flow along the Strand Road (R118) in addition to the closure of sections of the existing footpath during construction, will be set out in a Traffic Management Plan will be submitted for approval to DCC Road and Traffic Division by the appointed contractor prior to the commencement of any construction works as part of the Construction Environmental Management Plan (CEMP).

The Contractor shall appoint a project liaison officer with specific responsibility for keeping the public, and, in particular, adjoining residents informed in advance of those elements of the construction works which can be expected to cause significant noise impacts.

3.3 Noise and Vibration

There will be no significant impacts from the Operational Phase of the proposed scheme.

It is predicted that there are likely to be short term impacts in terms of noise and vibration during the works. It is proposed that various practices be adopted during construction, including:

- limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- establishing channels of communication between the contractor, Local Authority and residents;
- appointing a site representative responsible for matters relating to noise and vibration;
- monitoring typical levels of noise and vibration during the works;
- all site access roads will be maintained so as to mitigate the potential for vibration from lorries.

The noise levels outlined in Table 3.1 are a guide to the Maximum Permissible Noise Levels allowed at the Façade of Dwellings during construction as recommended in the NRA/TII *Guidelines for the Treatment of Noise and Vibration in National Road Schemes (Revision 1, 2004)*.

Table 3.1 Maximum Permissible Noise Levels at the Façade of Dwellings during construction

Days and Times	Noise Levels (dB re. 2×10^{-5} Pa)	
	$L_{Aeq(1hr)}$	L_{Amax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Note Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the relevant local authority*

The TII/NRA guidance document also sets guidance levels for vibrations due to construction works to prevent potential damage to buildings. Therefore compliance with the levels in Table 3.2 should ensure that there is little to no risk of even cosmetic damage to buildings. There is likely to be very low levels of vibrations as the proposed works are minor in nature. Removal of the capstone will be the only likely source of vibrations as the remainder of work is likely to be completed by hand or using small vehicles. The works will only require a small volume of materials to be delivered to site as the wall is being raised by between 0mm and 360mm, depending on the existing height of the wall at each section.

Table 3.2 Allowable vibration velocity

Allowable vibration velocity (Peak Particle Velocity) at the closest part of any sensitive property* to the source of vibration, at a frequency of		
Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
8 mm/s	12.5mm/s	20mm/s

** The term property as used in the TII/NRA Guidelines for the Treatment of Noise & Vibration in National Road Schemes Rev 1, 2009 refers exclusively to buildings rather than the associated cartilage.*

While there will be low levels of noise and potential for low vibrations during construction phase, minimal noise or vibration increases will be associated with operational phase of the proposed development.

Prior to commencement of any construction works on site, the contractor shall ensure that a Construction Environmental Management Plan (CEMP) is prepared and approved by the employer prior to commencement of works on site.

3.4 Air Quality

The current Air Quality Index for Sandymount is 'Good' based on the EPAs monitoring programme. The key parameters in relation to air quality are distances from the works to the sensitive receptors, the average traffic speeds and traffic levels due to construction. There will be no impacts from the Operational Phase. Due to the small scale nature of the construction works and the small numbers of construction vehicles required, it is predicted that there will not be any significant air quality impacts as a result of the construction phase of the Scheme. A dust minimisation plan will be incorporated into the contractors Construction Environmental Management Plan (CEMP) for the construction phase of the project, to ensure that all dust related impacts are controlled.

4.0 Architectural Heritage Assessment

See Appendix B

5.0 Public Consultation

Initially, the Regional Projects & Flood Advisory Office briefed Councillors about the project proposals at the monthly meeting of the South-East Area Committee which was held on Monday 13th June 2016 in the Council Chamber, City Hall.

Following this, 2,000 leaflets were dropped (Figure 3) in the Sandymount area on Thursday 14th July and Friday 15th July inviting residents to attend three public consultations. These public consultations took place on Thursday 21st July in the Sandymount Hotel, Herbert Road, Dublin 4.

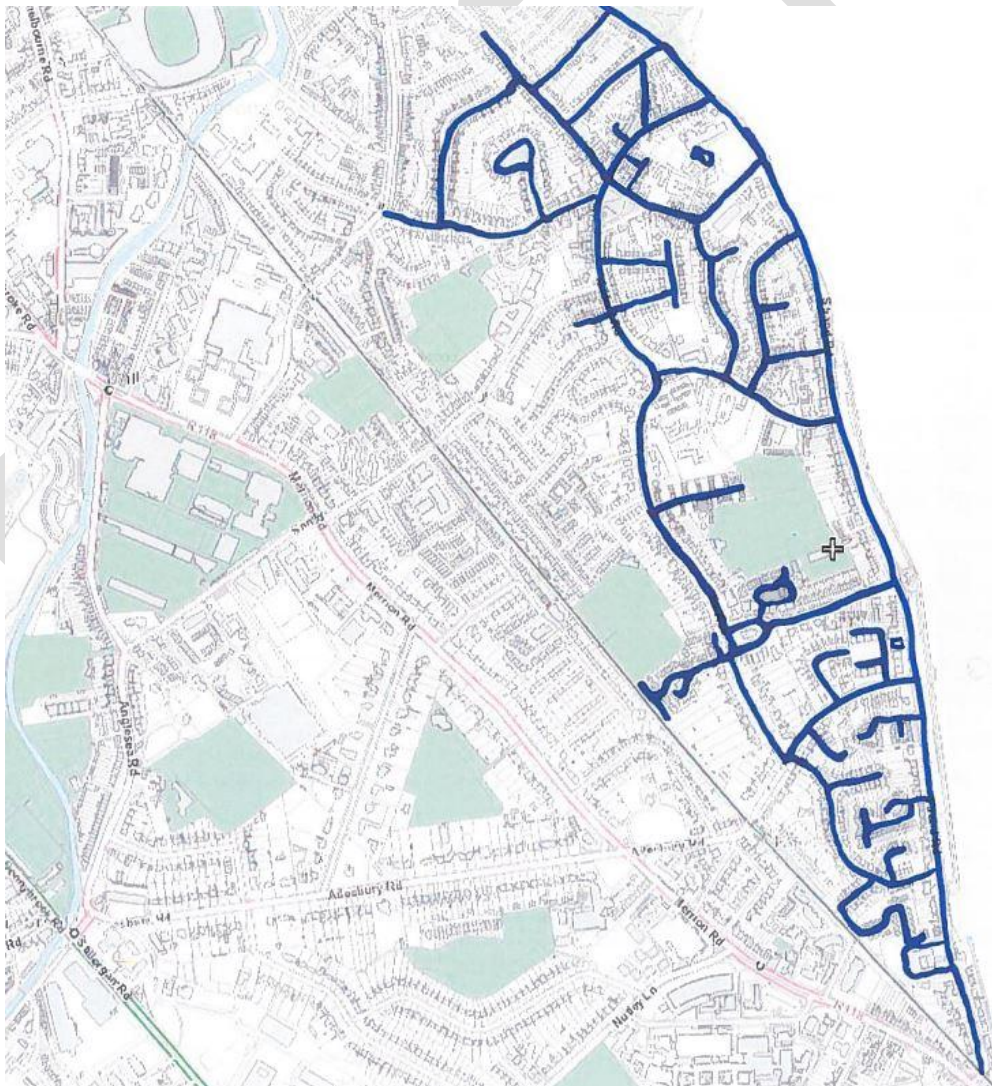


Figure 3 – Extent of leaflet drop coverage outlined in dark blue

In addition to the leaflet drop, Dublin City Council's Twitter account was used to inform all its (42,600) followers about the meeting (Figure 4).

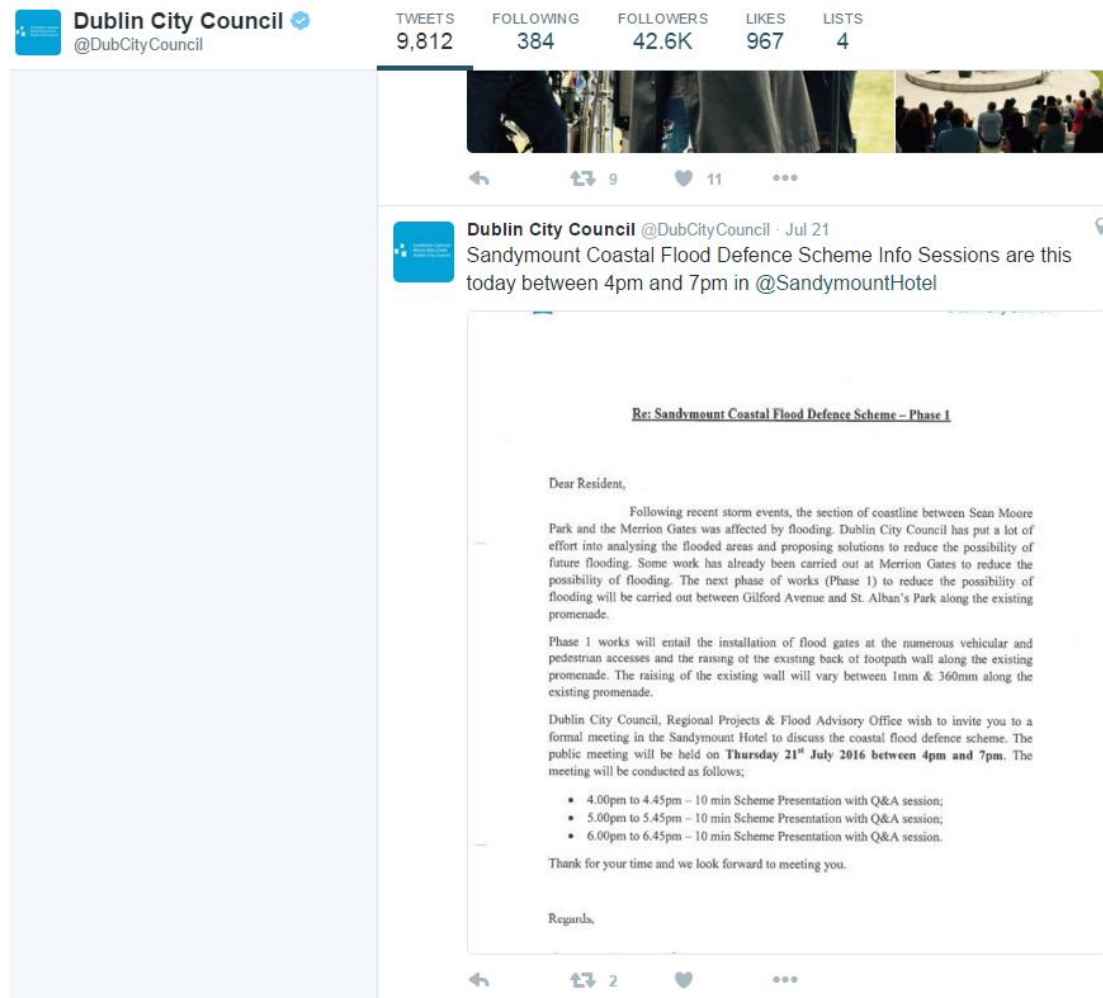


Figure 4 – Dublin City Council Twitter account used to advertise the meeting

The public consultation meetings commenced on the hour starting at 16:00, 17:00 and 18:00 where attendees could choose a time that suited them best. The meetings detailed elements of the project including an overview of the scheme, why an increase in wall height is required, details on wall height increments and information relating to flood gates. Each session ended with an opportunity for members of the public to ask questions. Each session was well attended with over seventy people attending in total. For those who provided contact details Figure 5 illustrates the distribution of attendees dwelling geographically throughout the Sandymount area. All information has been aggregated to Street level and no individual's address is specifically identified.

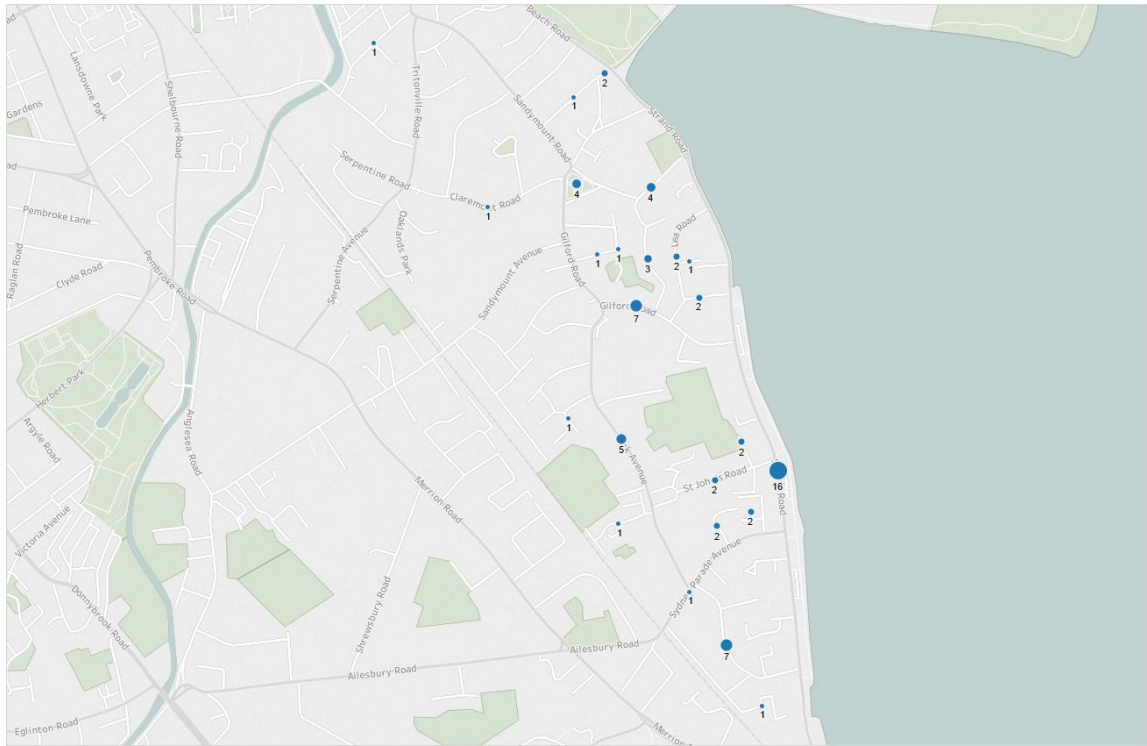


Figure 5 – Geographical distribution of attendees throughout Sandymount area

Figure 6 illustrates this information in a tree map where the quantity of attendees is represented by nested rectangles whose size and depth of colour indicates the amount of people who were present at the information sessions.



Figure 6 – Graphical distribution of attendees per street

Generally, the proposals were received positively; however, a large proportion of attendees voiced opinions during each Q&A session. Figure 7 – Issues of concern to residents re Sandymount Coastal Flood Defence Scheme – Phase 1 illustrates the broad topics of concern among residents as communicated during each session.

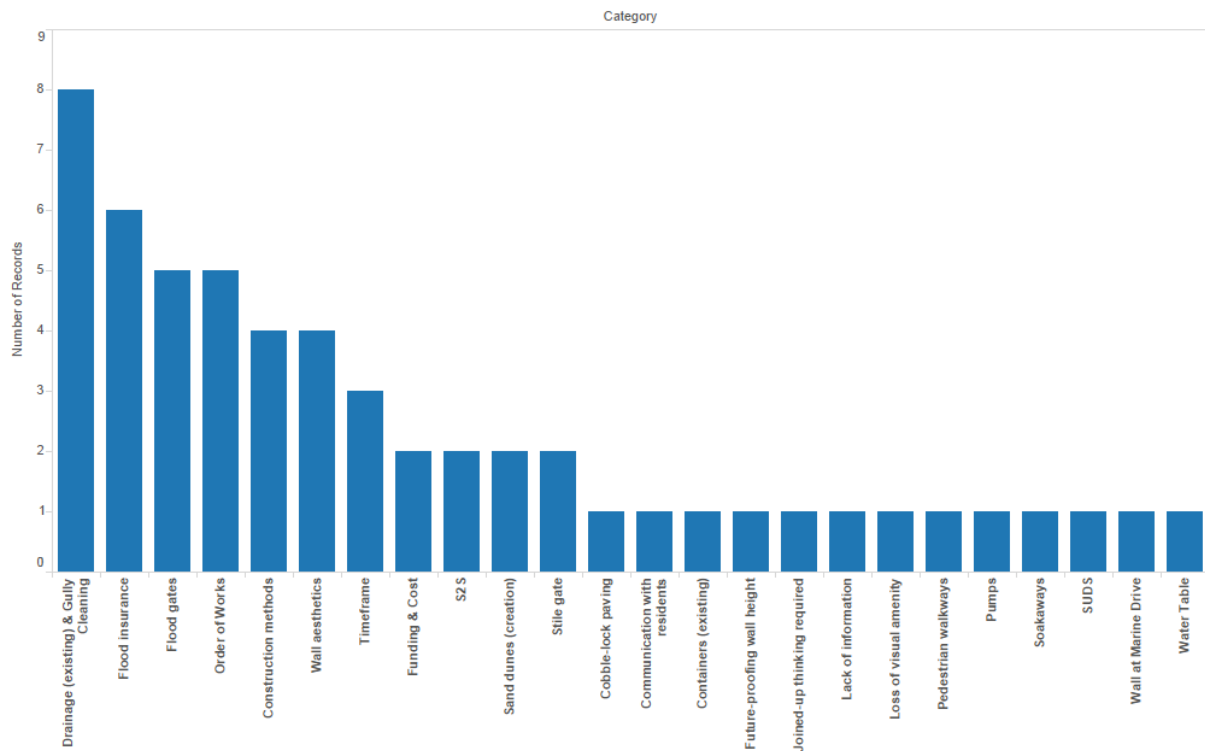


Figure 7 – Issues of concern to residents re Sandymount Coastal Flood Defence Scheme – Phase 1

As a follow-up to the main concerns raised from residents (Drainage (existing) & Gully Cleaning) regarding the maintenance and cleaning of existing road gullies and further to the response given throughout the information sessions, it has been confirmed with the Surface Water Maintenance and Flood Risk Management Section that gullies in the Sandymount area are routinely cleaned 2- 3 times per year. They are also cleaned in advance of every predicted high tide/storm event.

In relation to the concern regarding the water table, the water table will not be affected by the proposed works.

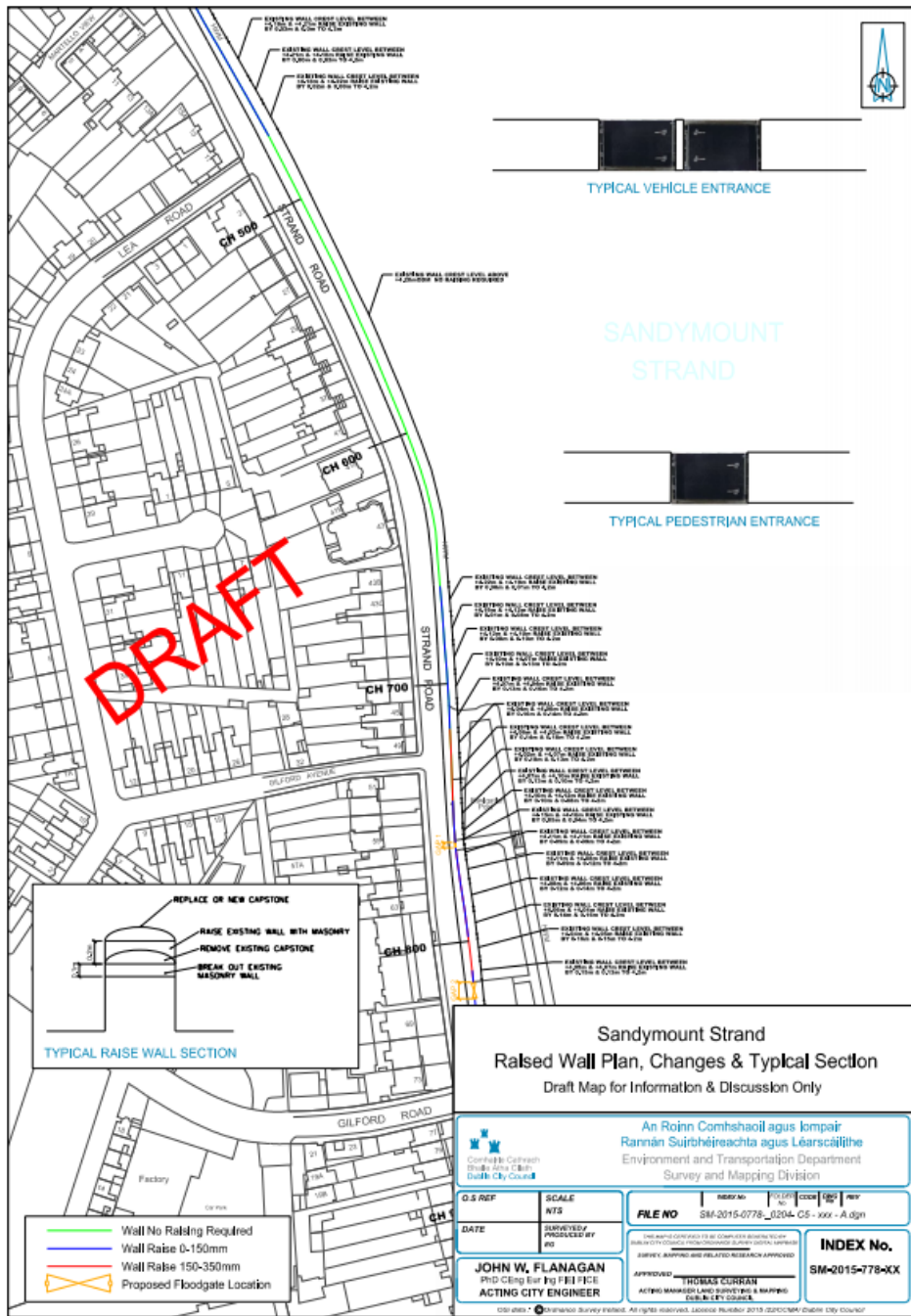
It was proposed to permanently close the pedestrian access directly south of the Martello Tower as part of the proposed works however this was opposed by a number of residents. As a result, this pedestrian access will not be closed.

In relation to the concern of loss of visual amenity, DCC Regional Projects & Flood Advisory Office presented photographs at the public consultation which detailed the height that the wall needed to be raised opposite each property along Strand Road.


6.0 Conclusion

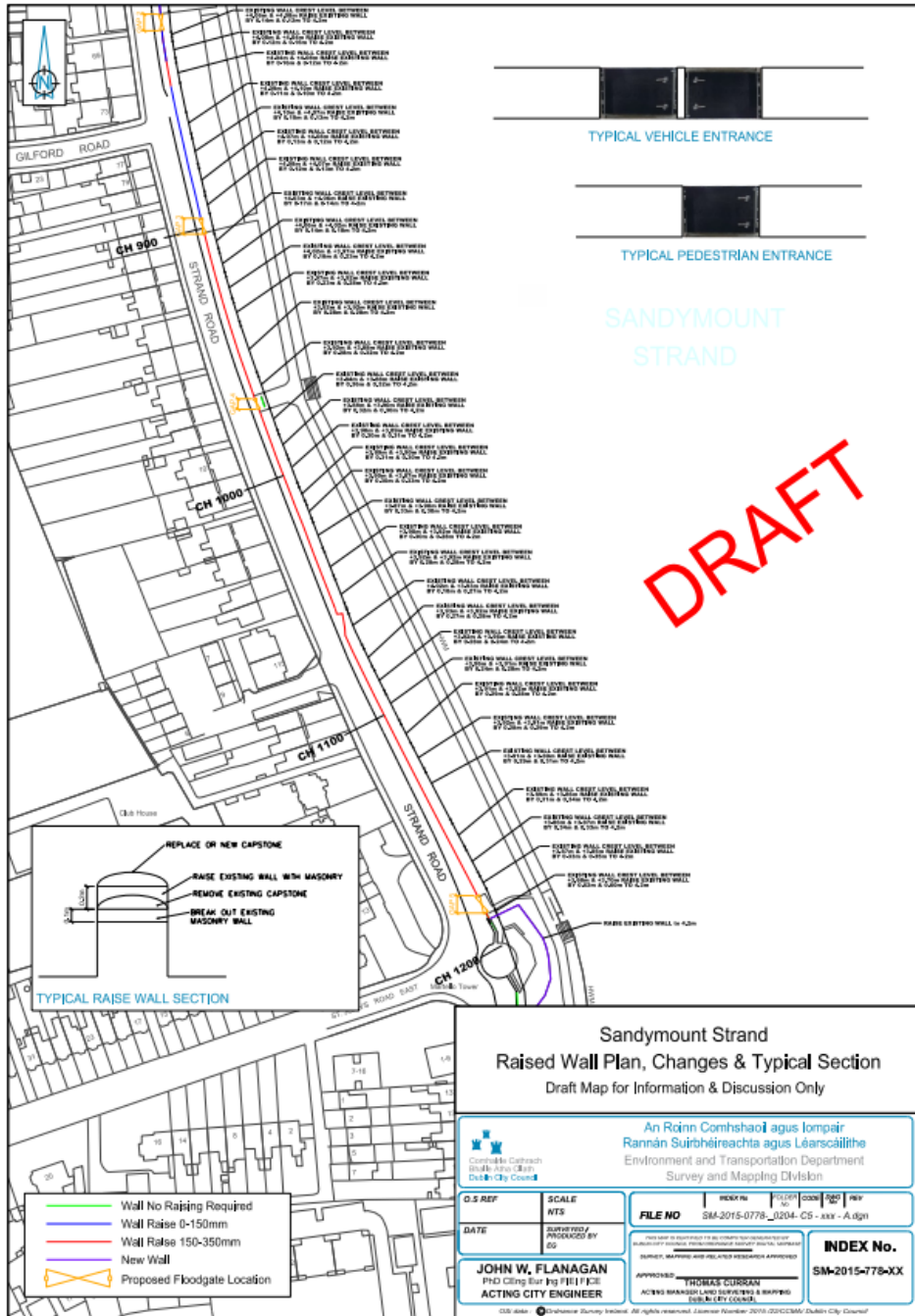
This report supports a Part 8 application for the Sandymount Coastal Flood Defence Scheme – Phase 1. The overriding purpose of the Sandymount Coastal Flood Defence Scheme – Phase 1 is to provide an increase in protection against coastal flooding along the existing promenade from Gilford Avenue to St. Alban’s Park.

Appendix A



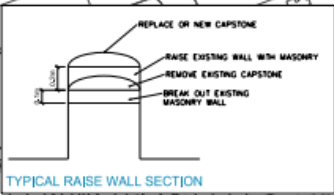
Sandymount Strand
Raised Wall Plan, Changes & Typical Section
 Draft Map for Information & Discussion Only

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SANDYMOUNT STRAND

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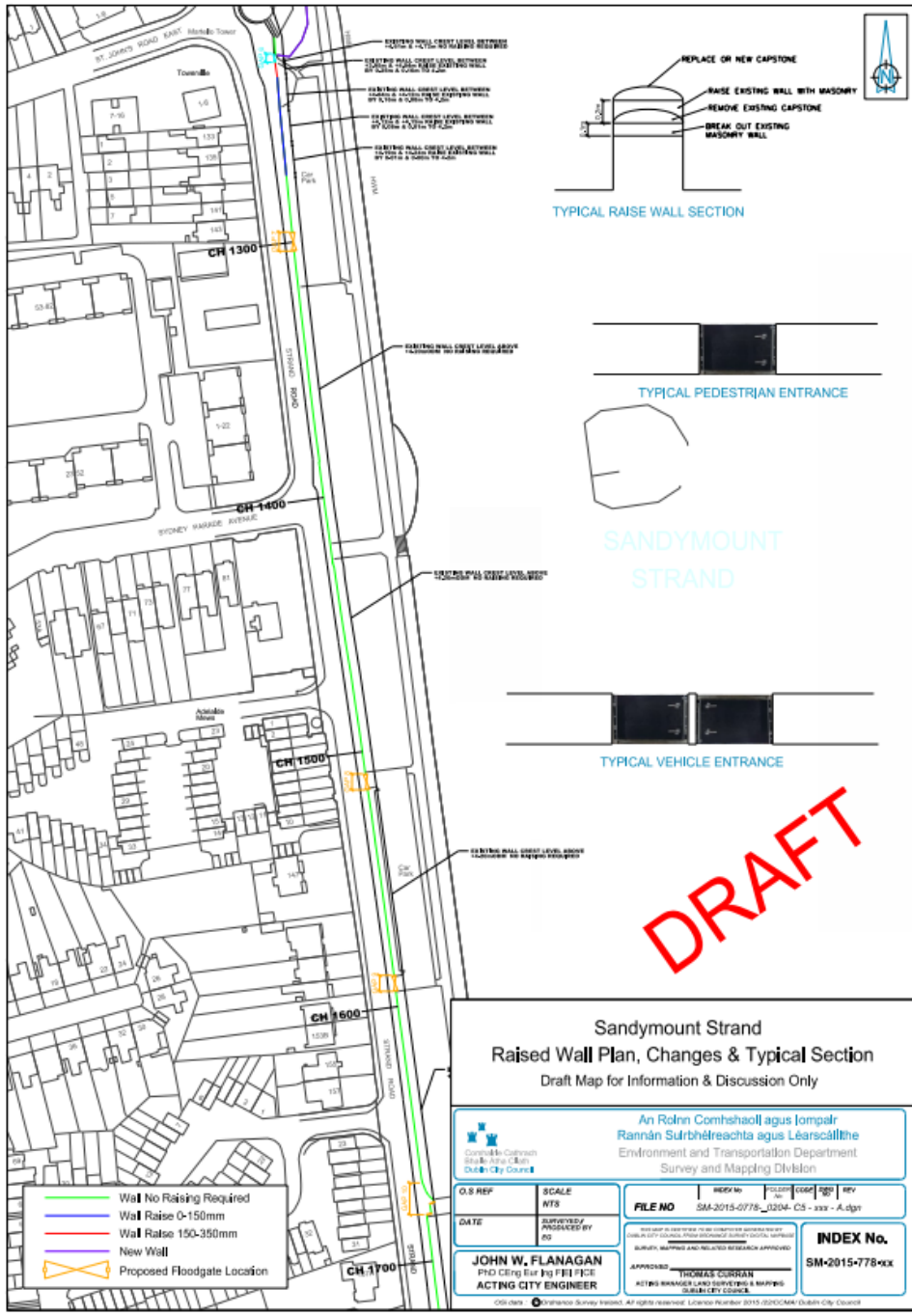


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- Wall No Raising Required
- Wall Raise 0-150mm
- Wall Raise 150-350mm
- New Wall
- ▭ Proposed Floodgate Location

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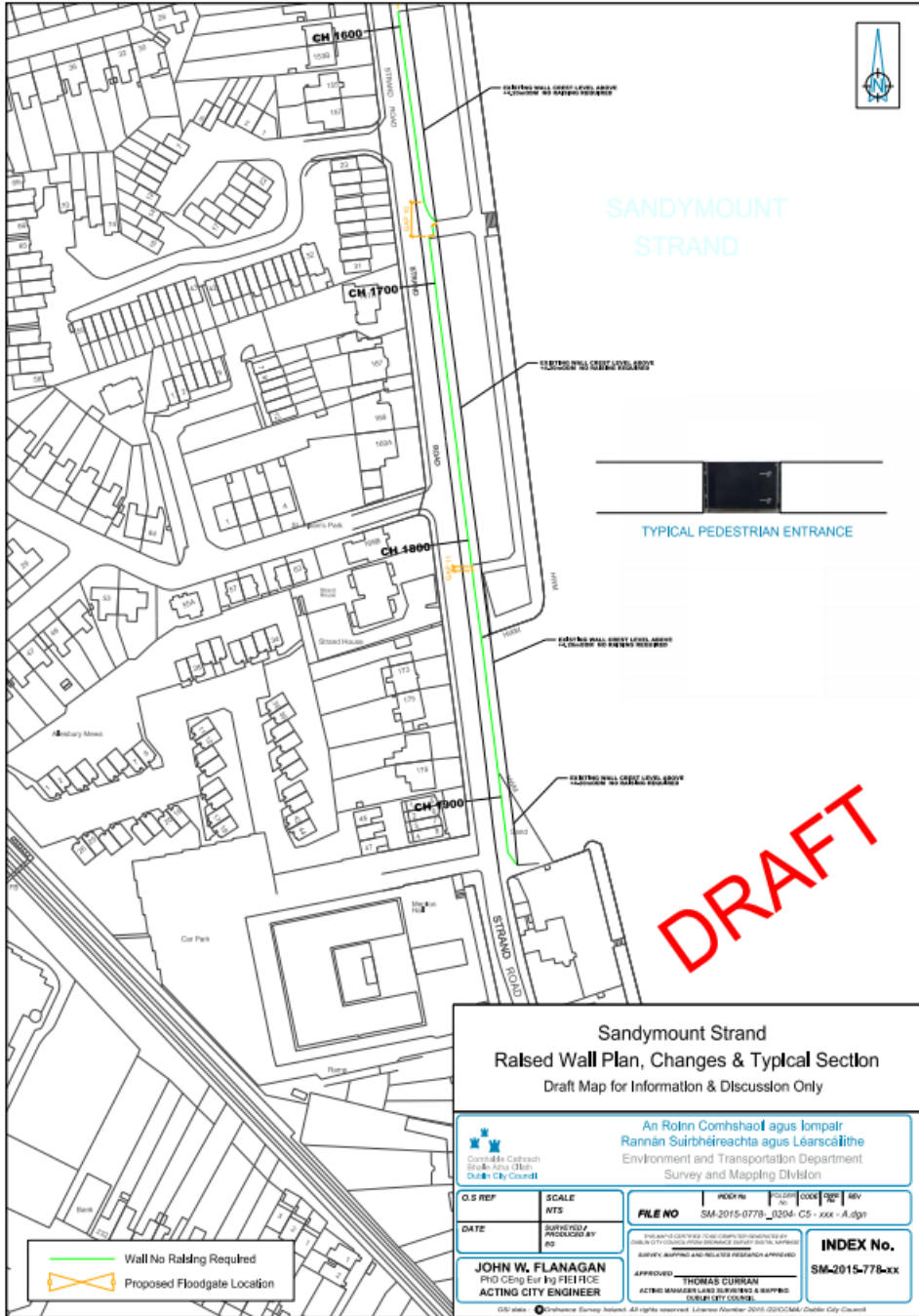


- Wall No Raising Required
- Wall Raise 0-150mm
- Wall Raise 150-350mm
- New Wall
- X Proposed Floodgate Location

**Sandymount Strand
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Appendix B