Douglas Flood Relief Scheme
(including Togher culvert)

NTS

Environmental Impact Statement
Non-Technical Summary

May 2017

OPW
Oifig na nOibreacha Poiblí
The Office of Public Works

Cork County Council
Comhairle Contae Chorcaí

ARUP

Cork County Council

Douglas Flood Relief Scheme (including Togher Culvert)

Environmental Impact Statement - Non-Technical Summary

NTS

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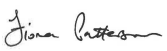
		Signature			
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Non-Technical Summary

Introduction

Cork County Council, in collaboration with the Office of Public Works (the funding authority for the scheme), intends to undertake engineering works along the Ballybrack Stream, Grange Stream and Tramore River with the objective of minimising the risk of flooding in the areas of Douglas and Togher in the County and City of Cork. Numerous significant flood events have occurred in the Douglas and Togher areas, necessitating the proposal to introduce flood relief works. Cork County Council is the lead authority for the purposes of Section 85 of the Local Government Act 2001.

The proposed Douglas Flood Relief Scheme (including Togher Culvert) will include the construction of direct flood defences and conveyance improvement measures along the Ballybrack Stream, Grange Stream and Tramore River. The direct defences proposed include flood walls and embankments with the conveyance improvements consisting of channel widening, channel deepening and the introduction of or replacement of culverts.

Study Areas

The study areas for the proposed scheme are located in Togher and in Douglas, both of which are generally located within the Tramore River catchment area. Refer to **Figure 1.1 Site Location - Overview**.

The Tramore River rises in the southwest of Togher and flows eastwards into the Douglas River estuary, which discharges into Lough Mahon. A number of tributaries join the Tramore River, the largest of which is the Ballybrack Stream, which flows north through Douglas before joining the Tramore River in a culverted section at Douglas Village Shopping Centre. The Grange Stream is a tributary of the Ballybrack Stream. Note, the Douglas River is more commonly known as the Ballybrack Stream, and will be referred to as such in this report. The Grange Stream is a tributary of the Ballybrack Stream.

Construction works for the proposed scheme will take place in four separate areas along the Tramore River, Ballybrack Stream and Grange Stream as follows:

Area 1: Ballybrack Stream through Douglas

Area 2: Tramore River through St Patrick's Mills, Douglas

Area 3: Grange Stream (tributary of Ballybrack Stream) through Donnybrook Commercial Centre

Area 4: Tramore River through Togher

The works will take place over an approximate channel length in each area listed above as follows:

Area 1: 620m

Area 2: 80m

Area 3: 480m

Area 4: 810m

The general study area is shown in **Figure 1.1**. For some environmental disciplines (such as ecology), the study area was more extensive. For other disciplines, the study area was much smaller.

Figures 1.2a and **1.2b** show key plans of the proposed flood relief scheme in Douglas and Togher respectively. All areas are located south of the N40 Cork City South Ring Road. In Douglas, the northern extent of the proposed scheme is at St Patricks Mills and the southern extent is as far as the Donnybrook Commercial Centre. In Togher, the northern extent is at the Greenwood Estate, and the southern extent is at the Lehenaghmore Industrial Estate.

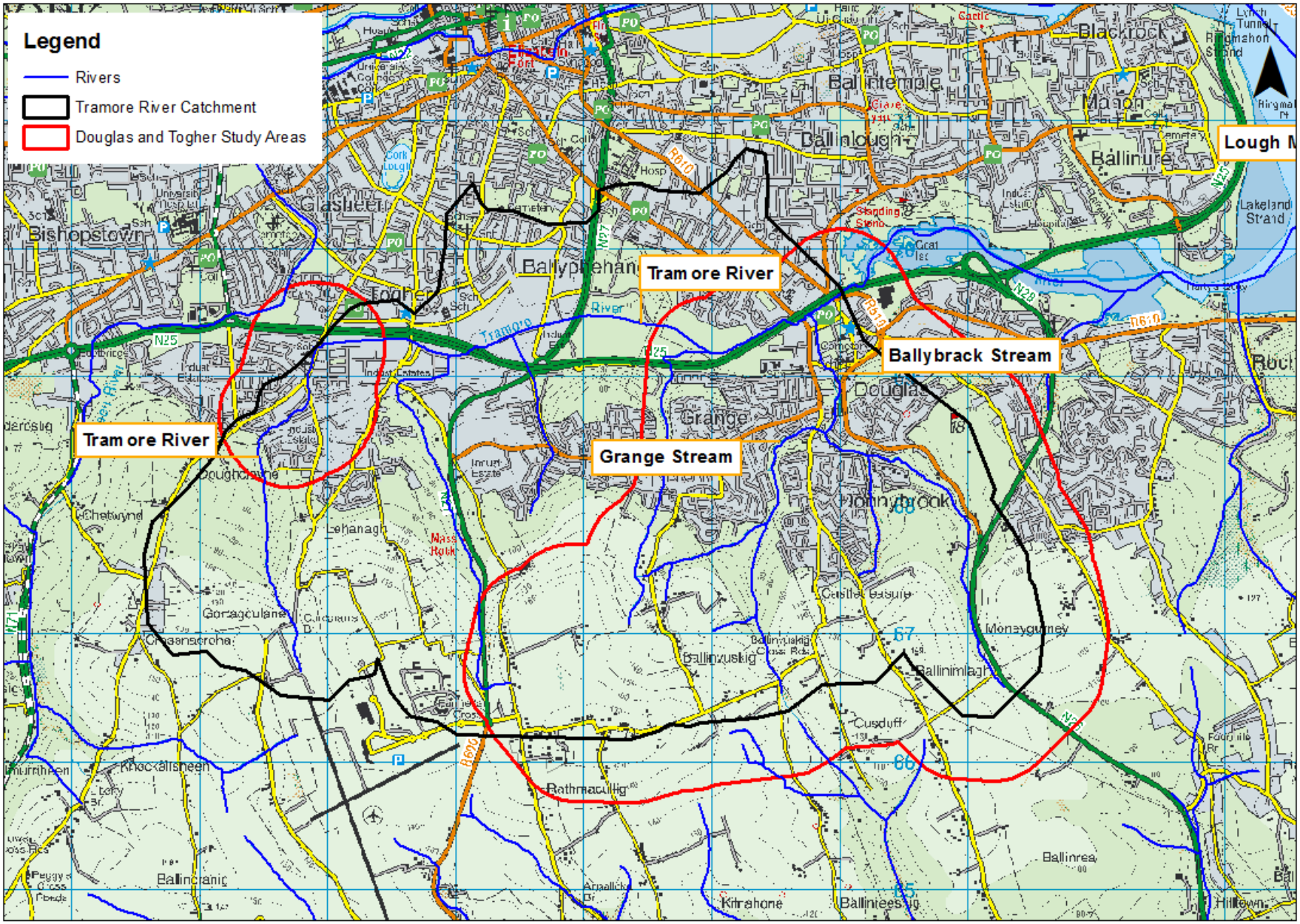


Figure 1.1 Site Location – Overview. Douglas Flood Relief Scheme (including Togher Culvert) Study Areas

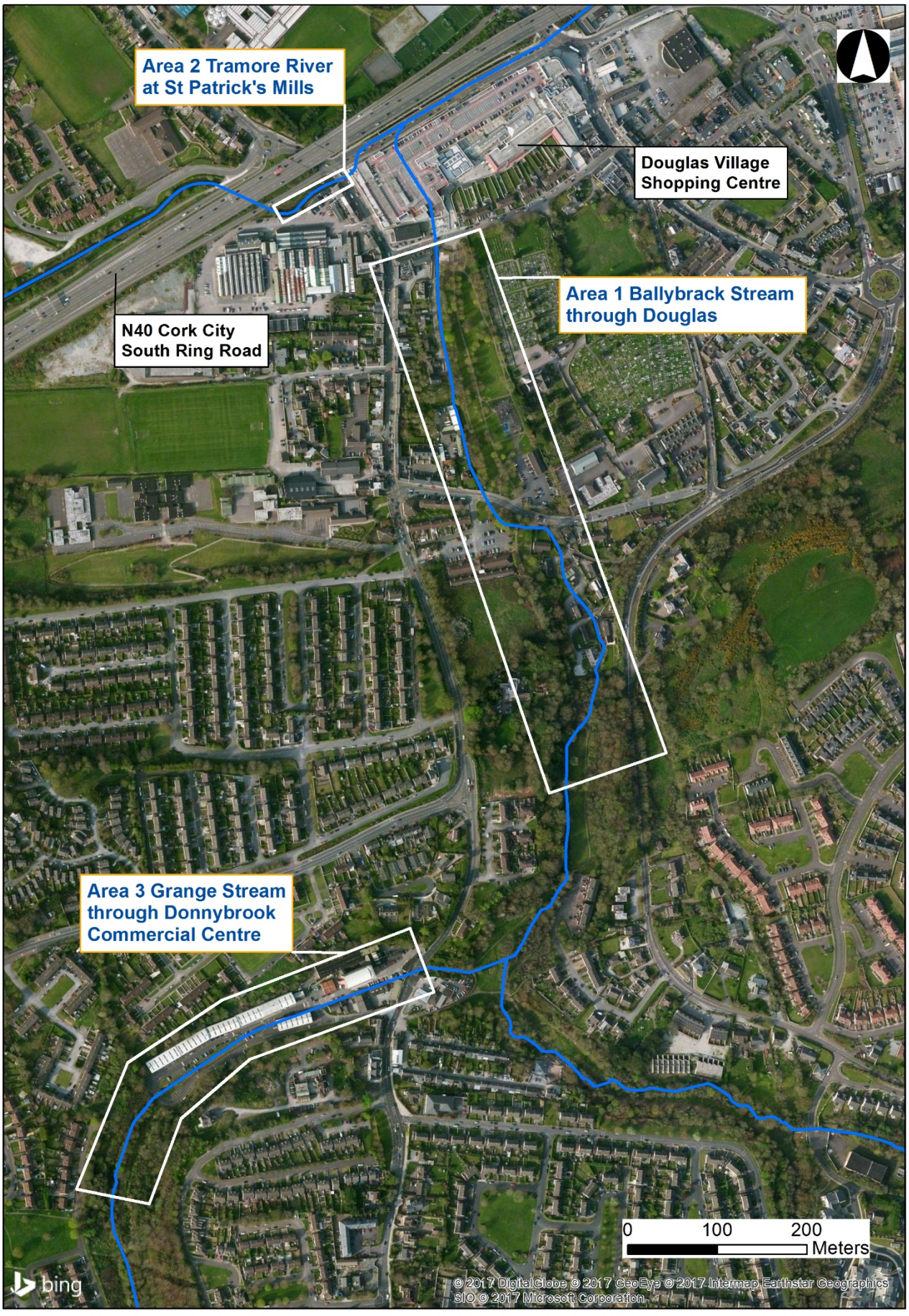


Figure 1.2a Douglas Key Plan

Figure 1.2b Togher Key Plan

Environmental Impact Statement

The Environmental Impact Statement has been prepared in order to report the findings of an appraisal of the environmental effects of the proposed scheme.

The Environmental Impact Statement has been prepared in accordance with the relevant provisions, set out in the Planning and Development Regulations 2001, as amended and the EIA Directive 2011/92/EU. Moreover, although the requirements of Directive 2014/52/EU have not yet been transposed into Irish law, this EIS has had regard to the provisions of Directive 2014/52/EU. Due regard has also been given to guidelines and advice notes for the preparation of environmental impact statements, published by the Environmental Protection Agency.

Need for the Proposed Scheme

The Office of Public Works (OPW) in partnership with both Cork City and Cork County Councils carried out a Catchment Flood Risk Assessment and Management (CFRAM) Study for the Lee Catchment which includes the Tramore River Catchment. The CFRAM, which was published in February 2010, recommended flood relief measures for the Togher area.

However, a number of particularly destructive and disruptive flooding events have occurred in the Douglas area as well as in the Togher area in recent years. The flood event in June 2012 was particularly significant, extending throughout Douglas and Togher. There was significant damage caused to residences in the Ravensdale area, as well as in Douglas village centre (including the Douglas Village Shopping Centre), the St Patrick's Mills centre, Donnybrook Commercial Centre and commercial properties in Togher. There was also significant damage to community and amenity facilities in the above areas.

In the future, the risk of flooding may increase. Future changes which have the potential to affect the risk of flooding include:

- Climate change resulting in higher rainfall and higher tide levels;
- Geomorphological processes, such as sedimentation transport, which affects the area of conveyance of the river channel, and erosion;
- Development within the catchment of the Tramore River and its tributaries, which does not conform to the principles of sustainable drainage, and which adversely affects the response of the catchment to rainfall; and
- Changes in land use, including forestation and land drainage.

As a result of the findings of the CFRAM study and the recent flood events in the area, Cork County Council, in association with the OPW, commissioned Arup to develop a Flood Relief Scheme for Douglas and Togher. The purpose of the scheme was to assess and develop a viable, cost effective and sustainable drainage scheme to alleviate flooding in the Douglas and Togher areas. The flood relief scheme design presented in this EIS is as a result of this detailed analysis.

Alternatives Considered

The development of the proposed scheme up to this stage was a process requiring an extensive assessment of different options for flood relief scheme design. The process included the assessment of the validity of all potential flood alleviation measures for each of the segments of the study area. In order to arrive at the final scheme design, a number of stages were followed. These required co-ordinated collaboration between the engineering and environmental teams. The design process required the following assessments:

- Constraints Study
- Hydrology Study
- Hydraulic Modelling
- Site Investigations
- Flood Risk Assessment
- Options Assessment
- Information required for Appropriate Assessment Screening; and
- Environmental Impact Statement.

Input was required from each of the preliminary assessments in order to finalise the design for the scheme that is being considered as part of the EIS.

A constraints study was carried out during 2014 and 2015 in order to identify the main constraints that could either be affected by possible flood alleviation measures or issues that could constrain the viability or design of these measures. Information for the constraints study was gathered with regard to the likely environmental impacts of the proposed scheme and statutory requirements for EIA. The constraints study can be downloaded at www.douglasfrs.ie.

The process for the selection of the preferred flood relief options is outlined below:

- An initial screening of a long list of possible flood risk management measures against a predetermined set of criteria, was carried out to determine their potential viability;
- A technical assessment of potentially viable flood risk management measures was undertaken; and
- Potential flood relief options were developed using combinations of flood risk management measures which were determined to be technically viable.

These flood relief options were then subjected to multi-criteria assessments, allowing a preferred flood relief option to be selected.

The options assessment report can be downloaded at www.douglasfrs.ie.

Considerable public consultation was carried out as part of the design process and has been a vitally important part of the evolution of the proposed scheme and the ultimate decision on a preferred option.

Two public information days were held during the early stages of the project (26th February 2014 and 8th October 2014). These consultations were held at the early Constraints Stage and at the Emerging Preferred Options Stage. Cork County Council and members of the design team have also engaged in direct consultation with relevant stakeholders, residents and affected landowners. The feedback from this consultation process was carefully considered in the development of the preferred scheme.

The options were holistically reviewed by the project team as they were developed, and relevant issues were discussed with key representatives of the OPW, Cork County Council and the designers. Following the multi-criteria assessment, the preferred options were brought forward for further development.

A further public information day was held on 4th of April 2017 to present and explain the developed scheme and the statutory approval process to the public and affected residents. Information relating to each public information day carried out can be downloaded at www.douglasfrs.ie.

Outline of the Proposed Scheme

Main elements of the proposed scheme

The main aspects of the proposed flood relief scheme comprise the following construction works:

- Construction of new flood defence walls and/or replacement of existing walls with new flood defence walls;
- Replacement of and/or extension of existing culverts;
- Removal of and/or replacement of bridges;
- Removal of existing trash screens and construction of new trash screens;
- Local channel widening, deepening, realignment and regrading of river channel and bank stabilisation;
- Construction of new earthen flood defence embankment;
- Construction of 2 no. underground surface water pumping stations;
- Relocation of 2 no. ESB substations/kiosks close to their existing locations;
- Provision of civil works such as road/footpath re-grading at a number of locations;
- Removal of vegetation and trees to facilitate construction works;
- Protecting drainage outlets along the line of flood defence works with non-return valves;
- Local diversion of services to facilitate construction;
- Landscaping and tree planting;
- Once construction is completed, ongoing maintenance of the river channel, trash screens etc.

It is also noted that many of the linear defences will require the temporary removal of boundary walls and fences to facilitate construction access (generally parallel with watercourses). These boundary walls/fences will be reinstated on completion in agreement with the landowners. Landscaping and replanting will also be carried out on completion in agreement with landowners.

Description of the proposed scheme by area

As presented in **Figure 1.1** the proposed scheme is geographically divided into a number of areas. The proposed flood defence works are summarised by area in the sections below.

Area 1: Ballybrack Stream through Douglas

Area 2: Tramore River through St. Patrick's Mills, Douglas

Area 3: Grange Stream (tributary of Ballybrack Stream) through Donnybrook Commercial Centre

Area 4: Tramore River through Togher

A number of representative photomontages have been prepared so as to more fully illustrate the physical and visual nature of aspects of the proposed scheme. A selection of the photomontages is included in **Appendix 1** of this Non-Technical Summary and are from/of the following locations:

- View 1 – View of open channel of Tramore River at Togher Road
- View 2 – View of open channel of Tramore River at St. Patrick's Mills
- View 3 – View towards Ballybrack Stream within Douglas Community Park
- View 4 – View of Ballybrack Stream from grounds of ICA building
- View 5 – View of Ballybrack Stream within Ravensdale

Area 1 Ballybrack Stream through Douglas

The proposed works in Area 1 comprise:

- Construction of a new coarse screen in Ballybrack woods in order to capture any large debris;
- Construction of new flood defence walls and/or replacement of existing walls with new flood defence walls in the Ravensdale area;
- Upper and Middle Ravensdale bridges to be retained. New bridge parapets (low wall along the bridge) to be constructed on these bridges;
- Local channel widening and channel realignment of the Ballybrack stream in the Ravensdale area;
- Removal of Lower Ravensdale vehicular bridge and replacement with new vehicular bridge and new access road to residences on the western bank. Existing road to be regraded to tie into proposed bridge;

- Removal of ICA pedestrian bridge. Construction of new alternative pedestrian access to the ICA Hall;
- Removal of Church Road cycle track bridge. Construction of new combined cycle/pedestrian track in this area;
- Replacement of Church Road culvert;
- Channel widening and deepening of the Ballybrack stream through the Community Park. Right river bank (eastern side) to be raised slightly in same area (small embankment);
- Local bank stabilisation works of left bank (western side) in Douglas Community Park;
- Relocation of existing c. 2 m x 2 m ESB substation located adjacent to the Ballybrack Stream in the northern part of Douglas Community Park to within 10 m of its current position to facilitate the construction works;
- Relocation of existing c. 1.5 m x 1.5 m ESB substation located adjacent to the left bank channel of the Ballybrack Stream to within 5 m of its current position to facilitate the construction works;
- Existing footpath in Douglas community Park to be realigned and regraded;
- Removal of vegetation and trees to facilitate the construction works;
- Protecting drainage outlets along the line of flood defence works with non-return valves;
- Local underground surface water pumping station
- Local diversion of services where necessary to facilitate construction
- Landscaping and tree planting
- Once construction is completed, ongoing maintenance of the river channel, trash screens etc.

Area 2 Tramore River through St. Patrick's Mills, Douglas

The proposed works in Area 2 comprise:

- New flood defence wall to be constructed along the right bank of the Tramore river upstream of the bridge at West Douglas Street;
- New bridge parapet (low wall along the bridge) to be constructed on the western side of the bridge at West Douglas Street;
- Local underground surface water pumping station;
- Local diversion of services where necessary to facilitate construction.

Area 3 Grange Stream (tributary of Ballybrack Stream) through Donnybrook Commercial Centre

The proposed works in Area 3 comprise:

- Permanent removal of one existing trash screen upstream of commercial centre;
- Replacement of a second existing trash screen within commercial centre;
- Replacement of existing section of culvert with new culvert;
- Regrading and removal of sediment and reinforcement of channel banks;
- Local diversion of services where necessary to facilitate construction.

Area 4 Tramore River through Togher

The proposed works in Area 4 comprise:

- Replacement of existing trash screen with new trash screen at Lehenaghmore Industrial Estate;
- Realignment of a section of river channel immediately upstream of the proposed new trash screen to facilitate tie-in with new culvert;
- Replacement and extension of existing culvert with new culvert between Lehenaghmore Industrial Estate and downstream of Greenwood Estate;
- Regrading of Lehenaghmore Road to divert overland flow towards the Tramore River;
- Localised regarding of the existing footpath and ramp in the vicinity of the entrance to the Greenwood Estate to divert overland flow towards the Tramore River;
- Local diversion of services where necessary to facilitate construction.

Construction Activities

The construction of the proposed scheme will be undertaken using industry standard construction methodologies.

Where possible, access to the works area will be gained from the dry (land) side of the channel to minimise impacts on the watercourse. In some locations however, due to a constricted working area or access issues, temporary over pumping or piping of the watercourses or temporary diversion channels/culverts (where space allows) will be required to facilitate the construction of the works from within the river channel. Thus these works will be carried out in the dry. In the case of St Patrick's Mills, it is envisaged that a small section of works will be carried out from a temporary working platform on a scaffold attached to the bank over the river.

Where access to the river channel is required, detailed method statements will be drawn up which deal specifically with the works proposed. The method statements will be drawn up in consultation with the supervising ecologist and will be agreed with the National Parks and Wildlife Service (NPWS) and Inland Fisheries Ireland (IFI) prior to the commencement of works.

Construction of some of the linear defences will require the temporary removal of boundary walls and fences to facilitate construction access (generally parallel with watercourses). These boundary walls/fences will be reinstated on completion in agreement with the landowners. There will also be a number of trees and other vegetation which will require removal to facilitate the works throughout the scheme area. Replanting of trees and other vegetation will take place, where feasible.

A detailed construction traffic management plan will be prepared and agreed with Cork County Council by the Contractor in advance of any works taking place on site. Traffic management will be set up for the works as required. Alternative access routes will be agreed with Cork County Council and An Garda Siochána. It is envisaged that traffic measures such as a stop-go system, temporary one-way traffic systems or similar will be implemented to allow the construction works to take place and at the same time to manage traffic. It is not anticipated at this stage that full road closures will be required.

Subject to statutory consent, construction of the proposed scheme will commence mid-2018. An overall construction duration of approximately 18 months is envisaged with an estimated completion date of late 2019/early 2020. The total 18 month construction period has been estimated to allow for poor weather over the winter months, mobilisation between sites and seasonal ecological restrictions. It is anticipated that the Contractor will construct the works in Douglas and Togher simultaneously. Specific activities (such as Lower Ravensdale bridge and Church Road bridge replacement) will be completed over a much shorter duration.

Normal construction working hours will be observed. These are 08.00 – 19.00 Monday to Friday and 09.00 – 16.00 on Saturday. It may be necessary in exceptional circumstances to work outside these hours. Heavy or noisy construction activities will be avoided outside normal hours and the amount of work outside normal hours will be strictly controlled. Approval from Cork County Council will be obtained for works outside normal hours. The planning of such works will have regard to nearby sensitive receptors. The removal of waste material off site by road and regular deliveries to site will be generally confined to daytime hours but outside of peak traffic hours, from 10.00 – 16.00.

It is envisaged that the average number of construction personnel on site will be circa 26 personnel but this will vary depending on the construction activities required and seasonal constraints and will likely peak during the summer months when up to 40 construction personnel are envisaged.

A Construction Environmental Management Plan (CEMP) will be prepared prior to construction commencing. The CEMP will comprise all of the construction mitigation measures, which are set out in this EIS, and any additional measures which are required by any conditions attached to the statutory consent issued by An Bord Pleanála.

Implementation of the CEMP will ensure disruption and nuisance are kept to a minimum. The plan will have regard to the guidance contained in the handbook published by Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site Guide, 4th Edition (CIRIA 2015).

It is anticipated that, with the proper implementation, phasing and management of construction activities, the construction phase of the development will have no significant or long-term impact on the surrounding environment.

Biodiversity

To assess the ecological impacts of the proposed scheme a range of assessments and surveys were undertaken. These surveys were conducted to identify the presence or likely presence of protected species and habitats within the study area. The value of these ecological receptors were determined and the possible impacts that the proposed scheme may have upon them were assessed. Mitigation measures were proposed in order to offset any identified negative impacts. Consultation meetings were also held with Inland Fisheries Ireland (IFI).

All of the habitats within the study area were of local value, with none recorded as being of international value.

The Cork Harbour Special Protection Area (SPA) and Great Island Channel Special Area of Conservation (SAC) are located 0.4km and 6.9km respectively from the proposed works area. Significant impacts on these and all other European designated sites (Natura 2000 sites) have been ruled out (refer to the separate 'Screening Report for Appropriate Assessment' in Appendix 6.5 for further details).

Two proposed Natural Heritage Areas (pNHAs) are hydrologically connected to the works namely Douglas River Estuary (0.5km away) and Dunkettle Shore (4km away). No significant impacts on are predicted to occur with respect to these pNHAs.

The field surveys identified the presence of common mammal species including brown rat, rabbit and fox, common terrestrial bird species which typically occur in a suburban landscape, more specialised bird species associated with aquatic habitats, bat populations along the stream/river corridors, salmonid, brown trout, eel and three spined stickleback populations in the different streams/rivers and Japanese Knotweed within specific works areas of the proposed scheme. A survey carried out for otters did not record signs of their presence within the proposed works areas. However, otters do occur within the catchment and are likely to move through or feed within the proposed works areas.

Overall, the majority of ecological impacts will arise during the construction phase as a result of disturbance to otter, fish, birds and bats, damage to and loss of small areas of habitats, including treelines, and potential water pollution incidents and sediment mobilisation. None of the impacts are considered to be significant.

A range of mitigation measures have been proposed in the EIS to offset potential negative impacts, including appropriate timing of the works, replacement planting, pollution prevention measures and habitat reinstatement. All construction works and mitigation measures relating to ecology will be monitored by a suitably qualified ecologist.

Consequently, the residual ecological impact of the construction and operation of the proposed scheme will be neutral or of minor negative significance only, provided that the identified mitigation measures are fully implemented and monitored.

Landscape and Visual Impact

The proposed scheme was assessed with regard to its visual impact and its impact on the character of the landscape.

The wider landscape character in both the Togher and Douglas areas is recognised in the Cork County Development Plan (2014) as having very high value and sensitivity.

The area also possesses a rich built and industrial heritage, with two protected structures and a number of buildings included in the National Inventory of Architectural Heritage in close proximity to the study area. There are no designated scenic landscapes or routes within the study areas. The nearest scenic route is identified in the Cork County Development Plan (2014) as the S56 east of the airport, approximately 1km from the Togher site and approximately 2km from the Douglas sites. It is considered scenic due to its views towards the city skyline and its northern ridge. Views towards/out of the study areas are limited by intervening topography.

Certain temporary and localised impacts on the overall landscape character and visual appearance of the study area will occur during the construction phase. These will vary from significant negative impacts to moderate positive impacts depending on the location and the works taking place. Impacts during the operational phase will incorporate the effects of design and a number of mitigation measures, resulting in any significant negative impacts being reduced to moderate/slight negative impacts for the most part, particularly as existing and new planting matures.

A number of significant positive impacts will additionally emerge from the proposed scheme. These will relate to the enhancement of the visual environment and public realm, the enhancement of public and residential amenity, the enhancement of recreational aspects and the protection of historical townscapes and structures from flooding.

Overall the landscape is deemed capable of accommodating the changes arising from the proposed scheme, and without adverse impacts to the valued elements and sensitivities that define the area at local and wider scales.

Population and Human Health

The overall impacts of the proposed scheme will be permanent and positive as the risk of flooding of residential, retail and commercial properties, local amenities, tourist facilities etc. will be reduced once the scheme is completed.

The increased flood protection as a result of the proposed scheme will contribute to securing businesses and jobs in the area. Existing properties will benefit from the greater flood protection and this will also contribute towards attracting additional investment and jobs to the area as properties become more attractive to rent or buy.

There is the potential for short term negative impacts on people during the construction phase arising from construction activities. The construction phase of the proposed scheme will last approximately 18 months. Potential impacts include general nuisance (air, dust, noise and vibration), accessibility and traffic restrictions. Short-term, negative impacts on economic activity may arise due to these potential impacts.

Implementation of a Construction Environmental Management Plan (CEMP) will ensure that disruption and nuisance are kept to a minimum and that the proposed scheme will not have a significant negative impact during the construction phase. The impact on local economic activity will be reduced by ensuring access to local businesses is maintained. A construction traffic management plan will also be prepared and implemented. Traffic restrictions will be limited in time to ensure that impacts are only felt for the shortest possible period of time.

There is a potential short term positive economic impact during construction due to the short-term increase in employment. Where possible, a local labour force will be employed, and the required materials will be sourced locally. Local businesses may also benefit from an increase in demand for their goods and services due to spending from construction workers in the area.

Noise and Vibration & Air Quality and Climate

The impacts of the predicted noise and vibration and air quality and climate from the proposed development were appraised. Potential impacts during both the construction phase and the operational phase were considered.

During the construction phase, the potential noise and vibration impacts will be associated with site preparation works, construction activities, and construction vehicle movements. All noise emissions and vibration are predicted to be in compliance with the relevant standards.

The construction phase of the development may also have a short-term impact on air quality in the immediate vicinity of the site due to activities including excavations, embankment works, general construction activities and construction traffic. All emissions will be required to be in compliance with air quality standards.

Post construction, while there will be infrequent maintenance works at some of the works areas, the resulting noise, vibration and air quality impacts will be negligible.

The construction and operation of the proposed scheme will not have a significant effect on the local or global climate.

Soils, Geology and Hydrogeology & Hydrology

During construction, soil, including river bank material will be excavated for the proposed flood defence structures. It is proposed that as much of this excavated material as possible will be reused within the scheme for flood defence works such as the reinstatement and construction of new embankments and the re-grading of footpaths. The residual material will require removal off-site to a suitable licenced facility.

There is potential for the contamination of soils, groundwater and surface water as a result of construction activities. However, the implementation of a CEMP and in particular pollution prevention control measures will minimise the risk of pollution of soils, groundwater or surface water during construction.

The proposed scheme will significantly reduce the risk of fluvial (river) flooding in the Togher/Douglas area in the future.

A wide range of mitigation measures have been specified for the construction and operational phases of the project. These mitigation measures seek to ensure that construction and operational discharges are controlled to prevent potential pollution impacts to all receiving surface water systems, groundwater bodies and their downstream catchment areas. The mitigation measures also seek to ensure the risk of flooding from all sources is not exacerbated during the construction and operational phases.

Archaeology, Architectural and Cultural Heritage

There are a total of 34 recorded archaeological sites listed in the Record of Monuments and Places for County Cork and the Sites and Monuments Record Database of the National Monuments Service within 2km of the proposed scheme. These sites reflect human activity in the landscape extending back to the Bronze Age (circa 2,400-500BC). There are 21 structures listed in the Record of Protected Structures (RPS) in the Cork County Development Plan (2014) within 2km of the proposed scheme. There are 68 buildings included in the National Inventory of Architectural Heritage (NIAH) within 1km of the proposed scheme.

Two structures included in the RPS in the Cork County Development Plan (2014) are in proximity to the proposed works; St Patrick's Woollen Mills which is included twice in the RPS, listed as St Patrick's Woollen Mills and Douglas Woollen Mills, and millhouses associated with the milling complex at Donnybrook Commercial Park.

A number of buildings included in the NIAH are in close proximity to the proposed works. In Douglas, a number of these are adjacent to the works areas; a terrace of eight houses near the Tramore River at Douglas Mills/St Patrick's Woollen Mills and the former water mill, associated store or warehouse and office associated with the milling complex at Donnybrook Commercial Park. In Togher, one of these is adjacent to the works areas; a single-storey house near Tramore River upstream of Togher Road Roundabout, Togher.

Impacts on the above listed features will vary but will generally be associated with the setting of these features and the visual amenity impact on them. A number of impacts will be temporary only as they will be associated solely with the construction phase of the proposed scheme. The elimination of future flooding events from affecting these features will have a significant positive impact on them.

A wading and metal detector survey was undertaken on the watercourses where works are proposed within the proposed scheme and no features of archaeological potential were revealed.

Mitigation will be by licensed archaeological monitoring in multiple areas where it is considered possible that *in situ* subsurface deposits may be present or by licenced archaeological monitoring by an experienced underwater archaeologist where it is considered possible that underwater archaeological deposits may survive.

All construction works in the vicinity of the two protected structures identified above will be securely fenced off and separated by a buffer zone from the protected structures. Intermittent archaeological monitoring and inspection of the buildings will be undertaken. Archaeological monitoring and inspection of the buildings identified above that are included in the NIAH and in close proximity to the proposed works will also be undertaken.

No mitigation is required for the operation of the scheme.

Roads and Traffic

The potential traffic impacts due to the proposed scheme will be primarily associated with the construction phase of the works. It is estimated that construction will take approximately 18 months, and that the scheme will be delivered in a number of individual works areas or phases.

Construction impacts will largely be associated with restriction on access to certain portions of the existing road network due to ongoing works, additional traffic flows on sections of the existing road network due to haulage of excavated material which is not reused on site, the delivery of materials to site and the movements of workforce traffic.

The increase in traffic flows on the local road network due to construction vehicles and construction workforce traffic movements are expected to be minor.

However, traffic measures such as a stop-go system, temporary one-way traffic systems or similar will be considered for implementation to allow the construction and utility diversions to be undertaken and at the same time to manage traffic. It is expected that the majority of the intensive works on the public road will be programmed to be carried out in the summer months to avoid school traffic, etc. such as outside the primary school on the Togher Road. In Ravensdale it is likely that access will be restricted to a number of residential properties while the Lower Ravensdale Bridge is demolished. Vehicular access will be restricted for three weeks while pedestrian access will be maintained via a temporary bridge.

Alternative provisions will be made to accommodate displaced residential parking demands for the duration of the works.

Upon completion of the works, there are likely to be minor ongoing operational elements associated with regular channel maintenance. Channel maintenance will be required on an infrequent basis at a number of locations throughout the scheme. These works will be minor, with minimal requirements for maintenance vehicles and staff, and will have a negligible impact.

Material Assets

The impacts of the proposed scheme on material assets including local settlement, roads and the transport network, commercial and industrial development, wastewater and water supply, services, natural resources and waste management were appraised. The proposed scheme is not predicted to have any significant adverse impacts on material assets.

During the construction phase, there will be temporary disruption to local settlement, roads and the transport network and services, while there is the potential for temporary disruption to commercial and industrial development and wastewater and water supply. With the implementation of appropriate mitigation, impacts are not predicted to be significant.

The construction of the proposed scheme will require the use of natural resources in the form of engineering fill, water, electricity and fuel for construction vehicles and plant machinery. Construction works associated with the proposed scheme are likely to generate construction waste from excavation works and general construction activities. Where possible, excavated material will be used on site. The residual material will be removed off-site to a suitable licenced facility.

Potential adverse impacts of the proposed scheme on material assets during the operational phase will be associated with maintenance activities to be carried out. These activities will include clearing of the trash screens to prevent blockages and invasive plant species (Japanese knotweed) treatment. Potential impacts on material assets from these activities are not predicted to be significant.

The implementation of the proposed scheme will reduce the risk of flooding within the study area. This will result in a residual positive impact on local settlement, roads and the transport network as well as commercial and industrial development.

Other Impacts, Interactions and Cumulative Effects

At the initial stage in the preparation of the EIS and during the design of the flood defences, the potential for significant cumulative and indirect impacts and interactions was examined and any such potential impacts were identified. Where the potential for significant cumulative and indirect impacts and interactions was identified, such impacts and interaction of impacts were included in the scope and addressed in the baseline and impact assessment studies for each of the relevant environmental media and aspects of the project.

The cumulative and indirect impacts and interaction of impacts are presented in the chapters of the EIS which address the most relevant environmental media. An effects matrix has also been developed and is included in the main text of the EIS. The purpose of the effects matrix is to identify potential effects in the different environmental media.

Viewing and Purchasing the Environmental Impact Statement

Copies of the application documents and the Environmental Impact Statement, of which this is a non-technical summary, will be available for inspection or purchase at the offices of Cork County Council, County Hall, Carrigrohane Road, Cork between the hours of 9am and 4pm on working days from the 18th May 2017 to the 29th June 2017 (inclusive of both dates), at Douglas Library, Douglas Village Shopping Centre, Douglas. Co. Cork between the hours of 10am and 5.30pm on working days (Tuesday to Saturday) from the 18th May 2017 to the 29th June 2017 (inclusive of both dates) and from the offices of An Bord Pleanála, 64 Marlborough Street, Dublin 1 between the hours of 9:15am and 5:30 pm on working days from the 18th May 2017 to the 29th June 2017 (inclusive of both dates).

The application documents and EIS will also be available online at the scheme website (www.douglasfrs.ie).

Appendix 1

Photomontages

PHOTOMONTAGES

for
Project No. 6074
Douglas FRS

for
Client: Arup

Date: 10 May 2017
Document Number: Appendix 7.1

Brady Shipman Martin
Canal House
Canal Road
Dublin 6

Tel: +353 (0)1 208 1900
Email: mail@bradyshipmanmartin.com

BSM
Est.
1968
Brady Shipman Martin.
Built.
Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
Project Name:	DOUGLAS FRS	Document Title:	PHOTOMONTAGES	Date:	10 May 2017

CONTENTS AMENDMENT RECORD

This report has been issued and amended as follows:

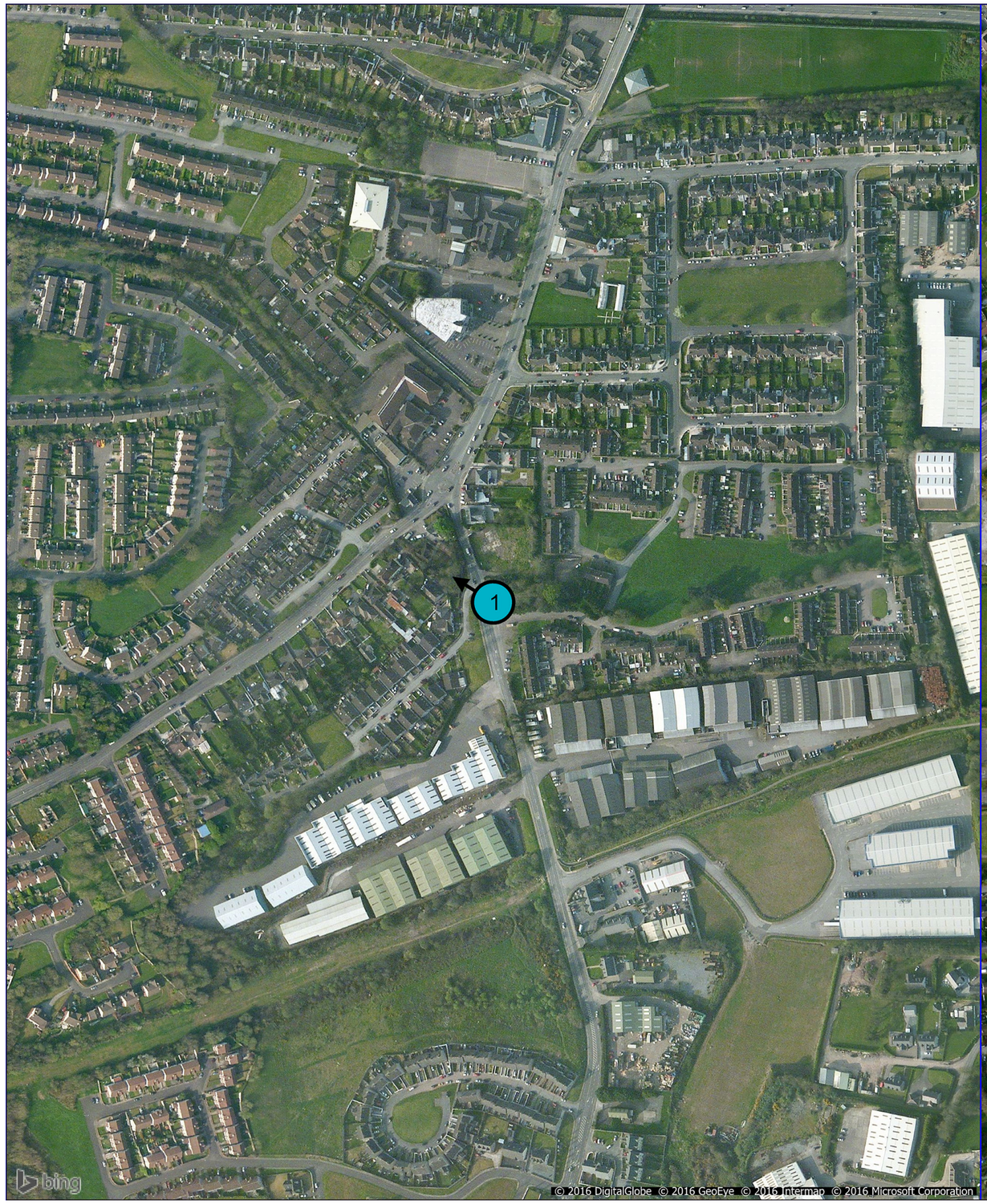
REVISION	DESCRIPTION	DATE	PREPARED BY	CHECKED BY
00	View Location and 5 no. of Photomontages	15 November 2016	BP	DBos
01	Revision to 4 no. of Photomontages	16 November 2016	BP	DBos
02	Revision to 4 no. of Photomontages	31 March 2017	RN	DBos
03	One Photomontage retaken from new location, revision to 3 no. of Photomontages	5 May 2017	RN	DBos
04	revision to 2 no. of Photomontages	8 May 2017	RN	DBos
05	revision to 1 Photomontage	10 May 2017	RN	DBos

PHOTOMONTAGE TABLE OF CONTENT

Day:	15	16	31	05	08	10												
Month:	11	11	03	05	05	05												
Year:	16	16	17	17	17	17												
FIGURE NUMBER	**REVISION**																	
7.1.0	00	00	00	01	01	01												
7.1.1.1	00	00	00	00	00	00												
7.1.1.2	00	01	02	03	03	04												
7.1.2.1	00	00	00	00	00	00												
7.1.2.2	00	00	00	00	00	00												
7.1.3.1	00	00	00	00	00	00												
7.1.3.2	00	01	02	03	04	04												
7.1.4.1	00	00	00	00	00	00												
7.1.4.2	00	01	02	03	03	03												
7.1.5.1	00	00	00	01	01	01												
7.1.5.2	00	01	02	03	04	04												

BSM Est. 1968 Brady Shipman Martin. Built. Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
Project Name:	DOUGLAS FRS	Document Title:	PHOTOMONTAGES	Date:	10 May 2017



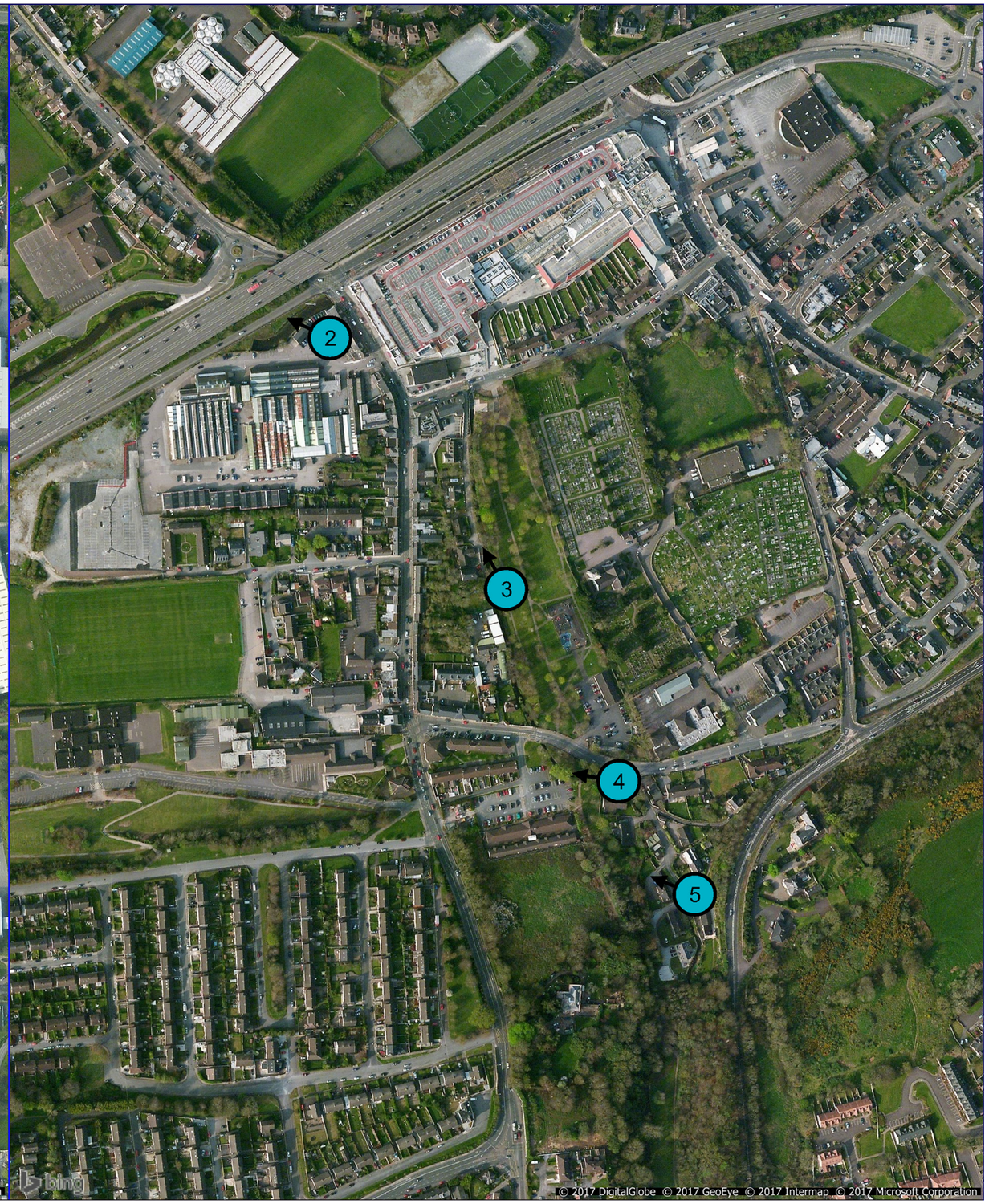


Figure: 7.1.0 View Location Map

Rev: 01

BSM Est. 1968 Brady Shipman Martin. Built. Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
Project Name:	DOUGLAS FRS	Document Title:	PHOTOMONTAGES	Date:	10 May 2017

< 73.7° / 24mm	< 65.5° / 28mm	< 54.4° / 35mm	< 39.6° / 50mm	< 28.8° / 70mm	ANGLE OF VISION / LENS FOCAL LENGTH	70mm / 28.8° >	50mm / 39.6° >	35mm / 54.4° >	28mm / 65.5° >	24mm / 73.7° >

Figure: 7.1.1.1 **Rev: 00**

View 1 - Lehenaghmore, Togher
As Existing

BSM Est. 1968 Brady Shipman Martin. Built. Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
Project Name:	DOUGLAS FRS	Document Title:	PHOTOMONTAGES	Date:	10 May 2017

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Figure: 7.1.1.2 **Rev: 04**

View 1 - Lehenaghmore, Togher
As Proposed

BSM Est. 1968 Brady Shipman Martin. Built. Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
Project Name:	DOUGLAS FRS	Document Title:	PHOTOMONTAGES	Date:	10 May 2017

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Figure: 7.1.2.1 **Rev: 00**

View 2 - St Patrick's Mills
As Existing

BSM Est. 1968 Brady Shipman Martin. Built. Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
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< 73.7° / 24mm	< 65.5° / 28mm	< 54.4° / 35mm	< 39.6° / 50mm	< 28.8° / 70mm	ANGLE OF VISION / LENS FOCAL LENGTH	70mm / 28.8° >	50mm / 39.6° >	35mm / 54.4° >	28mm / 65.5° >	24mm / 73.7° >

Figure: 7.1.2.2 **Rev: 00**

View 2 - St Patrick's Mills
As Proposed

BSM Est. 1968 Brady Shipman Martin. Built. Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
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Figure: 7.1.3.1 **Rev: 00**

View 3 - Douglas Community Park
As Existing

BSM Est. 1968 Brady Shipman Martin. Built. Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
Project Name:	DOUGLAS FRS	Document Title:	PHOTOMONTAGES	Date:	10 May 2017

< 73.7° / 24mm	< 65.5° / 28mm	< 54.4° / 35mm	< 39.6° / 50mm	< 28.8° / 70mm	ANGLE OF VISION / LENS FOCAL LENGTH	70mm / 28.8° >	50mm / 39.6° >	35mm / 54.4° >	28mm / 65.5° >	24mm / 73.7° >

Figure: 7.1.3.2 **Rev: 04**

View 3 - Douglas Community Park
As Proposed

BSM Est. 1968 Brady Shipman Martin. Built. Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
Project Name:	DOUGLAS FRS	Document Title:	PHOTOMONTAGES	Date:	10 May 2017

< 73.7° / 24mm	< 65.5° / 28mm	< 54.4° / 35mm	< 39.6° / 50mm	< 28.8° / 70mm	ANGLE OF VISION / LENS FOCAL LENGTH	70mm / 28.8° >	50mm / 39.6° >	35mm / 54.4° >	28mm / 65.5° >	24mm / 73.7° >

Figure: 7.1.4.1 **Rev: 00**

View 4 - Church Road, Douglas
As Existing

BSM Est. 1968 Brady Shipman Martin. Built. Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
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< 73.7° / 24mm	< 65.5° / 28mm	< 54.4° / 35mm	< 39.6° / 50mm	< 28.8° / 70mm	ANGLE OF VISION / LENS FOCAL LENGTH	70mm / 28.8° >	50mm / 39.6° >	35mm / 54.4° >	28mm / 65.5° >	24mm / 73.7° >

Figure: 7.1.4.2 **Rev: 03**

View 4 - Church Road, Douglas
As Proposed

BSM Est. 1968 Brady Shipman Martin. Built. Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
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Figure: 7.1.5.1 **Rev: 01**

View 5 - Ravensdale, Douglas
As Existing

BSM Est. 1968 Brady Shipman Martin. Built. Environment.

Project Number:	6074	Document Number:	Appendix 7.1	Revision:	05
Project Name:	DOUGLAS FRS	Document Title:	PHOTOMONTAGES	Date:	10 May 2017

< 73.7° / 24mm	< 65.5° / 28mm	< 54.4° / 35mm	< 39.6° / 50mm	< 28.8° / 70mm	ANGLE OF VISION / LENS FOCAL LENGTH	70mm / 28.8° >	50mm / 39.6° >	35mm / 54.4° >	28mm / 65.5° >	24mm / 73.7° >

Figure: 7.1.5.2 **Rev: 04**

View 5 - Ravensdale, Douglas
As Proposed

BSM Est. 1968 Brady Shipman Martin. Built. Environment.