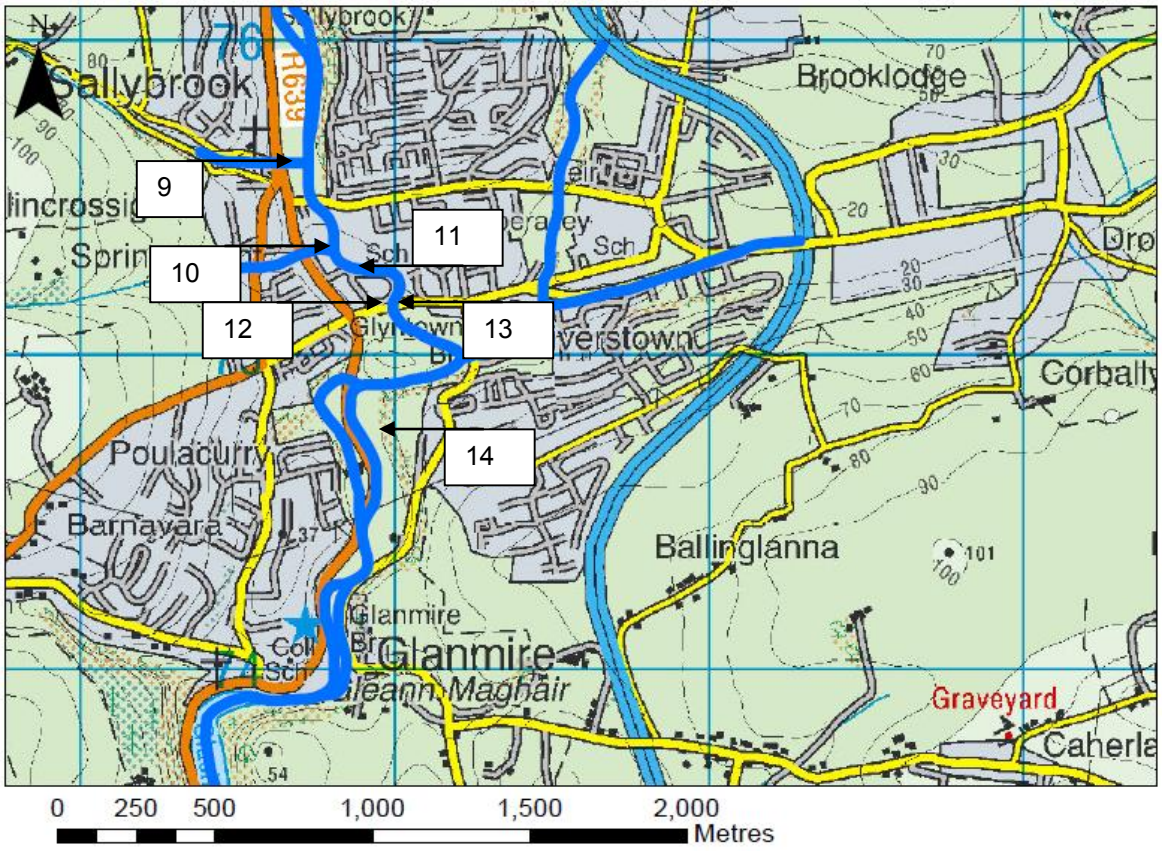
3.4 Sallybrook to Glanmire

Figure 3-11 Reach overview



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Downstream of Sallybrook the channel flows through a narrow urban corridor. The channel remains slightly incised, possibly due to historic straightening due to protected river banks. Sediment is delivered to this reach via several steep tributaries.

Figure 3-12 Downstream of Sallybrook (Point 9)

Figure 3-13 Adjacent to the Glanmire shopping centre (Point 10a)

Figure 3-14 Adjacent to the lower area of the Glanmire shopping centre (Point 10b)

At the Glanmire shopping centre several areas of bank instability exist (Figure 3-13 and Figure 3-14). The channel at this point is confined and relatively narrow compared to reaches upstream. There is limited deposition due to the steepness in some sections and disruption from upstream to the sediment transport process. The channel banks are high in most locations due to land raising and embankments. As a result, during flood conditions all energy is concentrated within the channel which is leading to bank erosion and instability. In many places existing bank protection has been undermined and has collapsed into the river. This section appears to be starved of sediment, suggesting upstream structures, such as the old weirs are influencing in-channel processes. As a result, the channel has excess stream power leading to the erosion processes along the beds and bank. In order to reduce the flood impact and erosion within this section various options could be investigated including flood storage options upstream and also improving the in-channel morphology which is currently degraded, to manage the existing high energy conditions.

Downstream of the shopping centre the channel widens slightly. Flood defences exist, which protect an adjacent housing estate. The defences act as a constraint to the channel in terms of its floodplain connection. The wider nature (Figure 3-15) of the channel here has allowed for the

deposition of some sediment (dominated by fines). In the majority of cases the depositional features are vegetated which suggests that the channel has reacted following past intervention (i.e. it has adjusted to a more natural narrow channel), probably as a result of the construction of the flood defences. This indicates that if any future maintenance of this section occurs (such as sediment removal or flood defence improvements) deposition of this nature will continue to occur.

Figure 3-15 Defences downstream of the Glanmire shopping centre, adjacent to the housing estate (Point 11)

Downstream of the housing estate the channel enters a parkland area and connection to the floodplain is improved. In areas of the channel where flows are reduced fine sediment deposition is occurring (Figure 3-16) and in some areas small pockets of gravels (Figure 3-17) have been deposited, however, gravel deposition is not widespread. If sediment is removed as part of any future maintenance works, it should be expected that sedimentation will re-establish itself naturally.

Figure 3-16 Upstream of the park (Point 12)

Figure 3-17 Parkland area (Point 13)

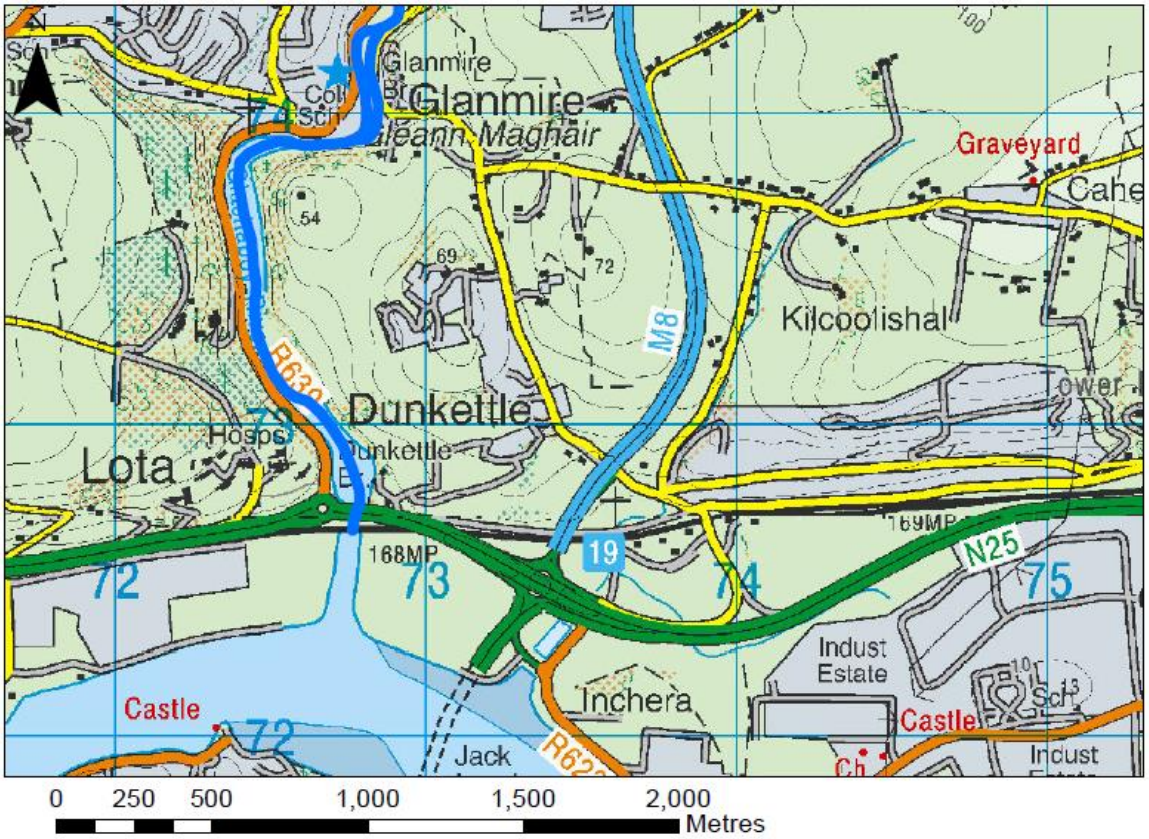
In the downstream section of the park a weir exists, which historically was used to feed a mill leat (which is still active). This causes upstream impoundment through the park increasing fine sediment deposition (Figure 3-18). Downstream of the weir some minor scour has occurred along

with a small area of gravel deposition, in a classic weir pool morphology. The channel then enters a canalised section with steep walls on both banks which act to prevent any channel migration. As a result, flows within this section have the ability to transport gravels downstream resulting in little deposition apart from coarser sediment at the edges of the channel through this section.

Figure 3-18 Impoundment (Point 14)

3.5 Glanmire to Lough Mahon

Figure 3-19 Reach overview



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At Glanmire bridge, deposition of gravels is occurring on the left bank (Figure 3-20). Downstream of the bridge the river gradually becomes wider and eventually is influenced by the tidal regime. This influences water levels and flow conditions downstream of Glanmire, resulting in some deposition of tidally derived muds and silts. The deposition of this sediment appears low therefore there is little risk of increased sedimentation in this section.

Figure 3-20 Sections downstream of Glanmire

3.6 Summary system function

The upper sections of the Glashaboy are generally steep and well connected to the floodplain. The upper sections of the channel are generally stable with a stable armoured bed (vegetated in parts). Fine sediment being delivered from upstream is generally at a low level and this material appears to be moving through the upper part of the system rather than accumulating as bar deposits. However, more evidence of fine sediment deposition was noted in the lower, more modified reaches of the channel. Gravel inputs from upstream appear limited, however several steep tributaries deliver gravels into the system at regular points along the reach.

In the lower reaches, the channel is sensitive to surrounding urban land use and past historic modifications. In some modified sections the channel has become degraded (i.e. a lack of flow has resulted in excessive fine sediment deposition) and in other sections in channel measures to modify the channel are not working with in-channel processes (such as deposition and transportation). As a result, several significant areas of bank erosion and instability exist. These influence local sediment supply and deposition. In most cases ad-hoc bank protection has been used, but evidence suggests after several years this will fail and / or require maintenance.

Tidal fine sediment inputs are similarly very low. The deposition of this sediment appears low (i.e. no large accumulations) therefore there is little risk of increased sedimentation in this section.

4 Flood Relief Options Review

4.1 Introduction

Due to the iterative nature of design of a flood relief scheme, further works were identified after the first audit and assessment. These addition activities are discussed in Appendix A.

4.2 Sallybrook Industrial Estate

4.2.1 Option 1A

Figure 4-1 Typical conditions upstream of the industrial estate

This is a moderately active section of the channel upstream of the mill leat with a gravel / cobble bed that is partly mobilised during higher flows. The river is disconnected from its floodplain in several locations through this reach as a result of informal flood defences. This elevates in-channel energy levels during higher flows, preventing formation of significant gravel features. Under existing conditions, flow velocities vary between 1.0-2.4m/s for bankfull flows upstream of the mill leat, that are capable of moving medium to large gravels. Downstream of the old mill, the channel is moderately incised and the channel bed is dominated by cobbles. Bankfull flow velocities through this section range from 0.2-2.2m/s.

The proposed works for this reach appear to be formalising the existing flood embankments and creating a flood defence wall that ranges between 0.6-1.1m above existing ground levels and tying into existing embankments at one location. As the channel is already moderately disconnected form the floodplain as a result of incision and the informal flood embankments, there is a moderate impact on existing flow hydraulics for the Q100 and Q2 event, with flow velocities increasing by 0.1-0.2m/s. This is unlikely to significantly change the sediment regime through this reach.

As a result, there may be a low level increase in delivery of sediment to downstream reaches as a result of the elevated energy levels created by the increase in length of flood defence embankment.

4.3 Hazelwood Shopping Centre

Figure 4-2 Typical conditions adjacent to the shopping centre


This reach is an active section of the river, with bank erosion common. Bank erosion is particularly occurring on the bend upstream of the confluence. There is a decent supply of sediment from upstream and adjoining steep tributaries. Historic straightening, possible dredging, informal flood embankments and bank protection works all act to increase energy levels during the channel during elevated flows as a result of the disconnected floodplain, loss of channel length through straightening and restriction of lateral processes. The channel is also relatively narrow through this section when compared to upstream reaches which again increases in-channel energy levels during elevated flows. This means there are few depositional features on the channel bed despite the strong supply of sediment to the reach.

4.3.1 Option 2A Direct defences (with conveyance improvements on Cois na Gleann Stream)

The set-back defences in the upper part of this reach for this option still allow some connectivity to the floodplain and are therefore unlikely to significantly influence the existing flow and sediment regime at this point. Through the section where new flood walls and embankments are proposed, velocities for the Q100 event increase by 0.2-0.3m/s. Existing velocities of up to 2.4m/s for a Q2 flow are capable of moving large gravels and the increases in velocities as a result of the proposed works will still fall within this mobility range. This quantifies the existing erosion witnessed through this reach.

The proposed works will result in some change to the existing dynamics through the reach as a result in the increase in length of online flood embankments. These are unlikely to help the river reach WFD status objectives although they are unlikely to result in significant deterioration (small risk of change from current).

4.3.2 Option 2B Conveyance improvements (dredging)

Dredging of this reach will increase the carrying capacity of the channel which is achieved through increasing the depth of the channel. The banks through this reach are already steep and unstable and would become even more unstable as a result of the overdeepening created by the dredging. In combination with the high velocities through the reach, bank failure and erosion is likely to increase unless significant protection works are undertaken. There is a strong supply of sediment to the reach from upstream reaches and adjoining tributaries, therefore dredged material will soon be replaced. Removing the sediment from the channel will put the reach into a state of disequilibrium, meaning the channel will seek to redress the sediment balance by increased erosion immediately upstream (risking propagation of incision upstream) and increased local bank erosion.

This option is unlikely to be WFD compliant due to negative impacts on geomorphological conditions locally and upstream.

4.3.3 Option 2C, 2D and 2E Combination of direct defences and conveyance improvements

(Arrangement 1, 2 and 3)

This option is likely to have similar impacts to option 2A as the online flood walls and embankments in the downstream section of the reach are proposed. However, the proposed wider bridge will improve flow and sediment conveyance to downstream reaches, reducing the impacts on the sediment processes here during higher flows and therefore improving sediment continuity as a result of the reduced impounding effect associated to the existing structure.

For option 2D, the localised channel widening could encourage some localised deposition of gravel. The modelling shows a 0.1-0.2m/s reduction in flow velocities at this point, however, the velocities are still energetic enough to transport small to medium gravels.

For option 2E, the new flood relief culvert alongside the bridge is unlikely to achieve significant benefit in reducing energy levels and encouraging deposition of gravel locally as option 2D. The replacement of the downstream bridge will improve flow and sediment conveyance to downstream reaches as a result of the single span footbridge that is proposed. There is a 0.3m/s increase in the Q100 flow velocity immediately upstream of the proposed footbridge that supports this conclusion.

The proposed works will result in some change to the existing dynamics through the reach as a result in the increase in length of online flood embankments. These are unlikely to result in significant deterioration in WFD status (small risk of change from current).

4.4 Meadowbrook Housing Estate

4.4.1 Option 3A Direct Defences (with conveyance improvements on Springmount Stream)

Figure 4-3 Typical conditions adjacent to Meadowbrook Housing Estate

In the section of the river downstream of the shopping centre the channel widens slightly. Flood defences exist on the right bank, which protect an adjacent housing estate. The defences act as a constraint to the channel in terms of its floodplain connection. The wider nature of the channel here has allowed for the deposition of some sediment (dominated by fines). In the majority of cases the depositional features are vegetated which suggests that the channel has reacted following past intervention (i.e. it has adjusted to a more natural narrow channel), probably as a result of the construction of the flood defences and disconnected floodplain over the right bank.

The replacement and building of the flood wall through this reach increases the Q100 flow velocities by 0.1-0.2m/s. These flows are capable of mobilising medium to large gravels. The increase in velocities for flows impacted by the flood walls will result in more sediment being mobilised and transferred to downstream reaches compared to existing conditions.

The proposed works will result in some change to the existing dynamics through the reach as a result in the increase in length of online flood embankments. These are unlikely to result in significant deterioration in WFD status (small risk of change from current).

4.5 Butlerstown / Glenmore

4.5.1 Option 4A Conveyance improvements

This reach of the river is moderately active and has been historically straightened that has acted to increase in channel energy levels during high flows. This prevents formation of any significant morphological features on the channel bed. The structures on the Butlerstown Stream provide a constriction that is likely to impact the flow and sediment regime at higher flows.

The proposed works aim to improve the conveyance through inclusion of flood relief culverts, a new flood embankment and works to existing walls.

The new flood embankment is likely to increase in channel energy levels that may result in erosion and transport of sediment on the channel bed. For the Q100 event, velocities increase by up to 0.5m/s from a maximum of 2.0-2.1m/s within the reach where the new embankment is proposed on the Glenmore Stream. This is a significant increase and could change the channel morphology within this reach as larger gravels will be able to be transported with the higher velocities.

Replacement of the culvert upstream of the M8 on the Glenmore stream will alter the sediment regime as the new culvert will be larger and laid at a suitably slacker gradient. Regrading of the upstream and downstream channel to accommodate the new culvert will cause a local change in geomorphological conditions, and this may alter the sediment dynamics downstream. Use of appropriate mitigation measures for new culverts, as detailed in the IFI (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent of Waters will be required. Introduction of some pools and riffle sequences should be considered in this reach.

The potential impacts on the flow and sediment dynamics through the reach along Glenmore Stream may change the geomorphological condition of the channel. Monitoring and appropriate mitigation measures should be used to offset this potential change.

4.5.2 Option 4B Combination of direct defences and conveyance improvements

This option is similar to option 4A with the addition of a flood defence embankment that is to be set back from the channel over the right bank. As the embankment is to be set back on the Butlerstown Stream, there is limited impact on the hydraulics through this reach for the majority of flows. Otherwise, similar impacts to those described above will be experienced.

4.6 O'Callaghan Park to Glanmire Bridge

4.6.1 Option 5A Direct Defences

Figure 4-4 Typical conditions through O'Callaghan Park


This reach is characterised by a moderately active channel with some deposition of gravel and fines and some embryonic riffle pool sequencing. There is an impounded section of watercourse within this reach as a result of the large weir downstream, this creates elevated levels of fine sediment deposition on the channel bed. There is some evidence of bank erosion outside of the impounded area.

Of the works proposed here, the majority are set back flood defences that are relatively minor and protect localised areas that are unlikely to significantly impact the geomorphological processes of this reach. The only section that may result in elevated in channel energy levels for higher flows is the option for a new flood defence wall at St Patricks Mill. This was predicted to increase flood disconnection, and containment of flows in the channel, elevating energy levels that may promote increased erosion of the channel bed and banks. It would have also result in more flow and sediment being conveyed downstream. As a result, the option was discounted in favour of individual property protection.

5 Conclusions and next steps

The geomorphological audit has shown that the Glashaboy is presently not actively transporting much gravel sized material. The river in its upper reaches has good floodplain connectivity, but in its lower reaches, as the urban influences encroach into the channel and floodplain and confine the river corridor, instabilities in the channel occur and erosional processes increase.

Sediment deposition is generally at a low level. The main supply of sediment into the system is from bank erosion, steep tributaries and glacial sediment re-working (in the very upper reaches). Run off from agricultural areas also inputs fine sediment in to the system with limited buffer strips due to a poor quality riparian zone in many locations. Where sediment accumulation issues exist within the system these tend to be as a result of modifications to the channel which has acted to disrupt the natural river system processes. This includes impoundment disrupting the downstream transport of sediment, over widening which reduces channels velocity (increasing sedimentation), channel narrowing increasing velocities (decreasing sedimentation and increasing bank erosion) and poor placement of in channel features and structures.

In relation to potential flood management solutions, opportunities exist to improve floodplain connectivity in several areas upstream of urban locations. This could help reduce flow energy causing erosion in key areas such as adjacent to the shopping centre. However, the steepness of the banks adjacent to the shopping centre and the limited easement between the top of bank and buildings means careful consideration should be given to bank stability, as the current ad-hoc method of bank protection could lead to long term issues. On the tributaries culvert replacement works are planned, and sediment transport processes will be temporarily impacted. The mitigation measures detailed in IFI (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent of Waters will be required for culverts and for fish passage will be required to reduce the long term impact of these works. A review of the effectiveness of these measures should be undertaken towards the end of the construction programme and any adjustments made to manage any potential erosion activity adjacent to new culverts and bank works.

A Appendix 1: Geomorphology Addendum (August 2016)

A.1 C09_B01: Replace existing twin 0.9m dia. culverts with new 1.6m by 1.2m high rect. culvert

Bleach Hill Stream at this location is entrenched (overly deep). As a result there is little floodplain connectivity except when flood water backs up behind the structure. The stream is dominated by a gravel and cobble bed which appears partially mobile (i.e. limited evidence of armouring). During flood conditions it is likely that this sediment will be mobilised and transported downstream, whilst new sediment will be delivered from upstream reaches. Due to the existing small culverts some sediment has accumulated upstream of the bridge. Whilst the existing culverts appear to be capable of allowing sediment to move downstream, it is likely that the culverts frequently become blocked with trash and debris which will hinder sediment continuity to downstream reaches.

The proposed larger culvert will improve sediment continuity through the system. The existing bed material should be maintained and matched where possible, however, any disturbance to the bed will quickly be rectified during subsequent high flow events. High flows event will be capable of transporting sediment to the structure from upstream reaches and the bed will quickly re stabilise.

A.2 C01_L01: Concrete flood defence (Old weir at Petrol Stn North of Sallybrook)

There is an impounded reach upstream of an old weir adjacent to the petrol station. The weir is partially collapsed and appears unmaintained. The reach upstream of the weir exhibits low velocities due to the impoundment impacts. The weir has also, over time acted to trap sediment upstream which in turn has elevated the upstream channel bed level.

The main flow route over the weir is towards the left bank (outside bed) at the weir site. The steep gradient of the weir acts to elevate velocities and this has caused outer bank erosion problems.

Measures to protect the banks from erosion have been implemented using boulders and concrete which appear to be working in the short term.

In the long term there is a risk that the existing bank protection measures could fail due to their ad-hoc nature and the old weir structure could fail. If this occurs the existing river bed upstream of the weir will naturally lower as the trapped sediment is released. There may be a case for further investigation to determine the impact of the failure of this old weir structure on both the bed and bank upstream. Works are planned on the left hand bank, and this will stabilise this bank.

Any future failure would release trapped sediment downstream (which may impact structures) and cause upstream bank instability (which may impact the existing and future flood defences and erosion protection measures depending on foundation depth). This issue should be monitored and action taken if conditions deteriorate.

A.3 C08_700: Silted mill race


The redundant weir (noted above) feeds into the mill race shown in the photographs above. This is heavily silted due to the low velocities and limited variation in flow. Limited change is expected in this area following the construction of the new flood defences.

A.4 Cols na Gleann Stream: Replace existing culvert with a new 2m wide by 0.9m high rectangular culvert




The Cols na Gleann Stream is a small steep channel dominated by cobbles and gravels, which appear to readily transported downstream. The channel is very narrow and it is likely that it has been straightened historically. Such modifications act to elevate in channel velocities. Sediment has accumulated upstream of the culvert. Downstream of the culvert the channel gradient reduces and smaller gravels have been deposited (due to the reduced velocities associated with the reduced gradient). Within this area gravels dominate the channel bed and less cobbles are present. The existing culvert appears to disrupt the downstream continuity of sediment due to blockages at the small trash screen and the undersized nature of the bridge.

The proposals at this location should improve sediment continuity downstream. Care will be required to ensure large cobbles do not become trapped against the upstream trash screen (if one is to be constructed) as the high energy conditions will still be present.

A.5 C01_C01, B02, C02: Proposed flood relief channel and culvert

The existing channel at this location is dominated by cobbles and gravels. The bed is partially armoured (evidenced by the moss over some of the larger cobbles) which suggests limited large sediment delivery. However, site conditions suggest higher velocity flows frequently transport smaller gravels through this reach. The construction of a flood relief channel is unlikely to significantly alter existing morphological conditions. However, the invert of the flood relief channel should be set at a point as to not decrease velocity as this could lead to an increase in deposition if in channel velocities are reduced significantly.

The existing bed material should be maintained and matched where possible. High flows event will be capable of transporting sediment; however, several flood events may need to pass through the system before the bed re-stabilises.

A.6 C01_B03: Replace bridge

The channel at this location is currently over wide which acts to influence morphological processes. As a consequence, depositional zones are noted within this reach. (i.e. the over wide nature of the channel may lead to lower velocities which in turn may encourage deposition). The proposed new

bridge should not change the existing morphological regime, as the channel width is remaining the same.

Upstream and downstream of this bridge some channel erosion is evident. In particular, downstream of the bridge, existing gabion basket protection has begun to fail on the outside of the bend. An alternative solution to bank protection is recommended at this location.

The existing bed material should be maintained and matched where possible. High flow events will be capable of transporting sediment, however several flood events may need to pass through the system before the bed destabilises.

A.7 C06_B01: Replace existing twin 0.4m dia culverts with a new 1.8m wide by 0.9m high rect culvert

No safe access could be sought to see this culvert on the Springmount stream. However, extensive gravels and sands were present downstream. A wooden weir structure is also in place downstream which acts to impound water upstream for an unspecified distance. This appears to have collected a substantial amount of sediment. If this weir fails it could impact the stability of the channel upstream in the short term. Further investigation should be sought to see if this weir influences flow conditions at the upstream culvert.

A.8 C01_C03: Bridge arch to be cleared by removing vegetation




Sediment was in the process of being removed from the channel during the site visit on the 03/07/16. Sediment was being removed several hundred metres upstream and downstream of the bridge. Some banks remain steeply profiled and could be subject to erosion until vegetation re-establishes.

Nevertheless, it is expected that the channel will quickly recover and new gravel bars will reform and the river attempts to re-establish a sediment equilibrium.

A.9 C09_C01 (channel deepening), C05_B01 (replace culverts), C05_C02 (channel widening), C05_C03 (widening)


Deepening and increasing the culvert size will increase conveyance through the bridge. There will be limited impact on the channel morphology. The weir downstream of the bridge acts to trap some sediment.

The delivery of sediment within this reach appears to be lower than over reaches. This means that the channel may take longer to recover following any in channel works.

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Appendix 6.3

Otter Derogation Licence
and Artificial Holt Location

Appendix 6.3a

Otter Derogation Licence

An Roinn
Cultúir, Oidhreachta agus Gaeltachta

Department of
Culture, Heritage and the Gaeltacht

Licence No.: DER – OTTER – 2017 – 170

EUROPEAN COMMUNITIES (BIRDS AND NATURAL HABITATS) REGULATIONS 2011 (S.I. No 477 of 2011)

DEROGATION LICENCE

Granted under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011, hereinafter referred to as "the Habitats Regulations".

Introduction

The Minister for Culture, Heritage, and the Gaeltacht, (hereinafter referred to as "the Minister"), after obtaining professional advice, is satisfied that: -

(A) this licence should be granted for the purpose of protecting wild fauna and conserving natural habitats and for imperative reasons of overriding public interest, including those of a social or economic nature, and

(B) there is no satisfactory alternative, and the action authorised by this licence will not be detrimental to the maintenance of the population of **OTTERS** referred to below at a favourable conservation status in their natural range.

Licence

The Minister, in exercise of the powers conferred on her by Regulation 54 of the Habitats Regulations hereby grants to **Ross Macklin, Senior Ecologist, Triturus Environmental Services, 42 Norwood Court, Rochestown, Cork** on behalf of **Cork County Council**, ("the licensee") a licence in respect of **Otter Species**. This licence authorises the following:

(a) disturbance;
(b) damage or destruction of breeding sites or resting places;
("the authorised actions").

This licence is subject to the terms and conditions set out overleaf.

National Parks & Wildlife Services
LICENCE

Terms and Conditions

1. This licence is granted solely in respect of the activities specified in connection with **holt closure on Glenmore River, Co. Cork**.

2. The authorised actions shall be carried out on the licensee's behalf by, or under the authorisation of **Ross Macklin** ("the scientific agent").

3. All activities authorised by this licence, and all equipment used in connection herewith, shall be carried out, constructed and maintained (as the case may be) so as to avoid unnecessary injury or distress to any species of **OTTER**.

4. This licence may be modified or revoked, for stated reasons, at any time.

5. The actions to which this licence authorises shall be completed between **1st January** and **28th February 2018**.

6. The works are to comply with **TII's 'Guidelines for the treatment of Ottters prior to the construction of National Road Scheme.'**

7. No agent or servant of the licensee, nor any other person, shall carry out any of the activities to which this licence applies unless authorised in writing by the scientific agent. Any such agent, servant or other person shall make a copy of the written authorisation available for and shall produce it on demand to any member of An Garda Síochána or an authorised officer.

8. This licence is granted subject to the licensee, including his or her servants and the scientific agent, adhering to the recommendations as set out in the accompanying survey report, prepared by **Triturus Environmental Services**, for **Cork County Council**, dated **20th December 2017** and any additional mitigation measures requested by the National Parks and Wildlife Service.

9. The local NPWS official shall be contacted prior to the commencement of work under the terms of this licence. The local NPWS District Conservation Officer is **Declan O'Donnell** who can be contacted at **087-2646452**.

10. Within 5 working days of being requested to do so by an authorised officer, the licensee shall provide a report on the progress of the work covered by this licence and of the mitigation measures implemented.

11. The licensee shall, within 14 days of completion of the actions which this licence authorises, submit a written report to the address below, describing the activities carried out and the mitigation measures implemented in pursuance of this licence.

12. The licensee shall provide for and implement a scientific programme (hereinafter referred to as "the scientific programme") of monitoring of any translocated populations and of the operation of the mitigation measures, to investigate and provide data on the effectiveness of the mitigation measures. The scientific programme will provide for supplementary mitigation measures informed by data obtained from this monitoring programme.

13. The licensee shall, within **3 calendar months** of the submission of the report under 13 above, submit to the signatory at the address below an interim report on the continued monitoring under the scientific programme. The licensee shall submit a further report by the **13th (final report)** calendar month after the submission of the report under 10 above, setting out the results of the monitoring carried out over these periods and particulars of any supplementary mitigation measures taken.

14. The reporting requirements under this licence will continue in force after the completion of the actions which it authorises, until their completion and the licensee shall be responsible for ensuring that these requirements are met in full.

Gerry Leckey
(a person authorised by the Minister to sign on her behalf)

22nd December 2017

Wildlife Licensing Unit,
National Parks and Wildlife Service,
Department of Culture, Heritage, and the Gaeltacht.
7 Ely Place,
Dublin 2, D02 TW98.

wildlifelicence@chg.gov.ie

NOTES (1 to 2).

1. This licence is granted for the period specified and subject to compliance with the conditions specified. Anything done other than in accordance with the terms of this licence may constitute an offence.

2. This licence applies to **otters** and to no other species.

National Parks & Wildlife Service
LICENCE

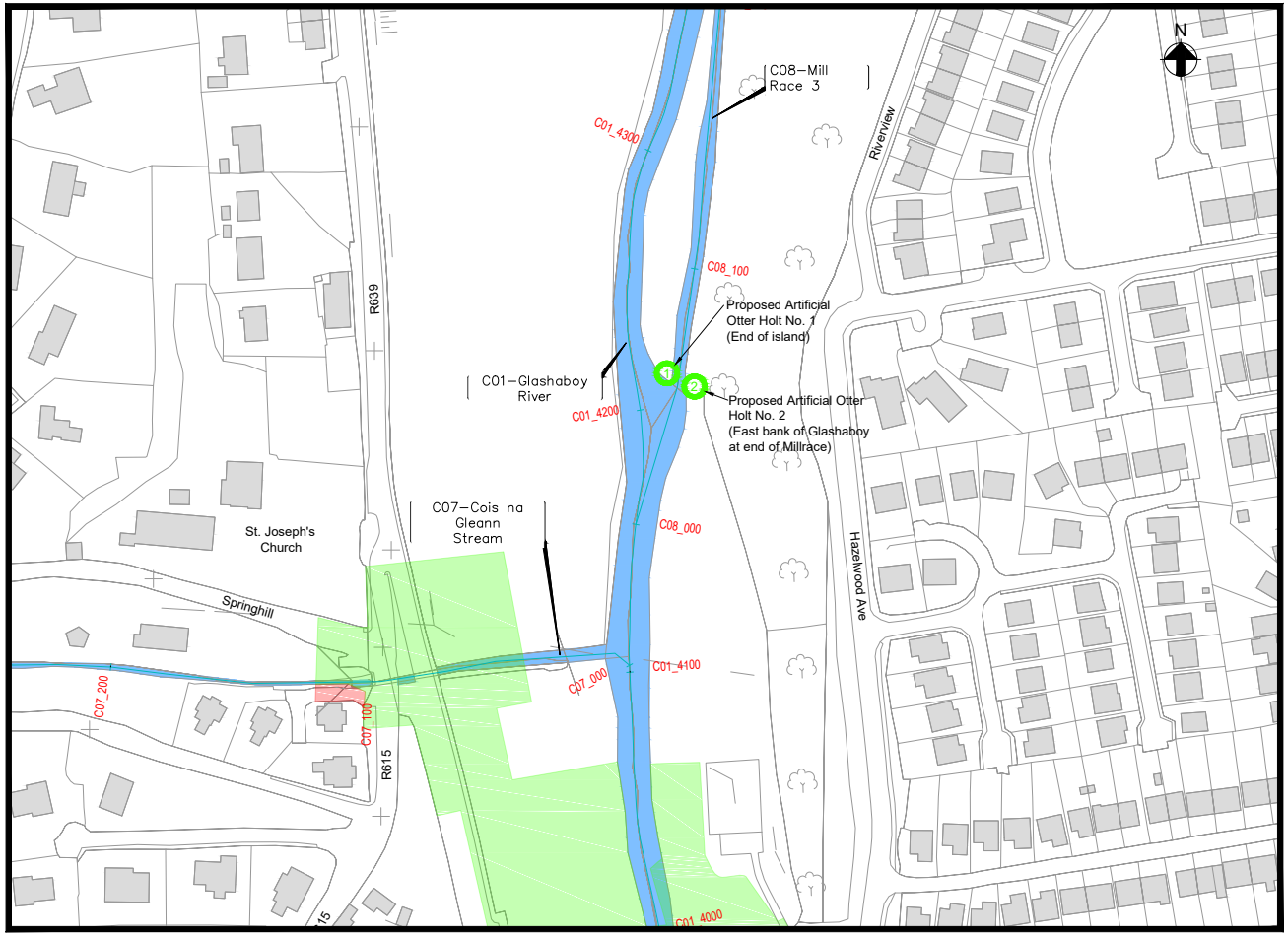
Appendix 6.3b

Artificial Holt Location

Glashaboy River (Glanmire/Sallybrook) Drainage Scheme

Appendix 6.3b

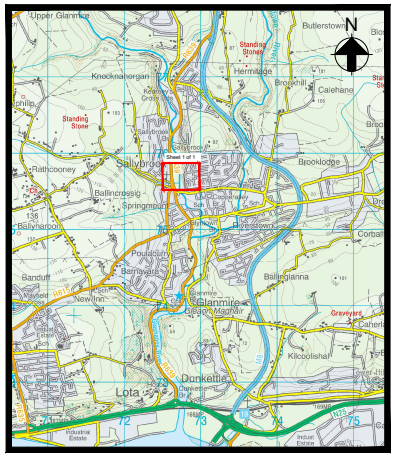
Figure 1. Proposed Artificial Otter Holt Locations



Location Plan

0 5 10 20 50 Metres

Scale 1:1,000 at A1
Scale 1:2,000 at A3



Key Plan

Key to Plan

- Watercourse
- C08_300 — Channel Centreline, Reference (C08) and Chainage (300m)
- 1 — Proposed Artificial Otter Holt
- Potential Access Routes
- Indicative Extent of Works (excluding channel cleaning and maintenance)

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Appendix 6.4

Bat Derogation Licence

An Roinn
Cultúir, Oidhreachta agus Gaeltachta

Department of
Culture, Heritage and the Gaeltacht

Licence No.: DER/BAT 2017 (amended) – 168

EUROPEAN COMMUNITIES (BIRDS AND NATURAL HABITATS) REGULATIONS, 2011 (S.I. No 477 of 2011)

DEROGATION LICENCE

Granted under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011, hereinafter referred to as "the Habitats Regulations".

Licence

The Minister for Culture, Heritage and the Gaeltacht, in exercise of the powers conferred on her by Regulation 54 of the Habitats Regulations hereby grants to the **Contractor for Flood Relief Scheme works appointed by Cork County Council** supervised by **Dr Tina Aughney, Ulex House, Drumheel, Virginia, Co. Cavan, Ecological Consultant ("the scientific agent")** a licence in respect of **Bat Species**. This licence authorises the following:

(a) roost disturbance

(b) damage or destruction of breeding sites or resting places;

("the authorised action(s)").

This licence is subject to the terms and conditions set out overleaf.

National Parks & Wildlife Services
LICENCE

Terms and Conditions

1. This licence is granted solely to allow the activities specified in connection with **Flood Relief Scheme** at **Riverstown Bridge, Co. Cork**.

2. All activities authorised by this licence, and all equipment used in connection herewith, shall be carried out, constructed and maintained (as the case may be) so as to avoid unnecessary injury or distress to any species of **BAT**.

3. This licence may be modified or revoked, for stated reasons, at any time.

4. The mitigation measures outlined in the report (**1. Bat Mitigation Measures, pp 5-11**), subject to any modification in conditions agreed upon between the agent and NPWS prior to issue of the licence.

5. No work can begin before **1st August 2018** and must be completed by **31st July 2019.**

6. The works will be supervised by a licensed bat specialist, **Dr Tina Aughney.**

7. This licence shall be produced for inspection on a request being made on that behalf by a member of An Garda Síochána or an authorised NPWS officer appointed under Regulation 4 of the Habitats Regulations.

8. The local NPWS District Conservation Ranger, **Danny O'Keeffe, (danny.okeefe@ahg.gov.ie, 026-41621**) should be contacted prior to the commencement of any activity, and if bats are detected on site during the course of the work, under the terms of this licence.

9. A report shall be submitted to Wildlife Licensing Unit, National Parks & Wildlife Service, 7 Ely Place, Dublin 2, D02 TW98 on completion of the actions which this licence authorises, describing the activities carried out in pursuance of this licence.

National Parks & Wildlife Services
LICENCE

Gerry Leckey
(a person authorised by the Minister to sign on her behalf)

9th January 2018

Wildlife Licensing Unit
National Parks and Wildlife Service,
7 Ely Place,
Dublin 2
D02 TW98

NOTES (1 to 2).

- This licence is granted for the period specified and subject to compliance with the conditions specified. Anything done other than in accordance with the terms of this licence may constitute an offence.

- This licence applies to **bats** and to no other species.

National Parks & Wildlife Service
LICENCE

Appendix 7.1
Photomontages

PHOTOMONTAGES

for
Project No. 6075
Glashaboy FRS

for
Client: Arup

Date: 07 March 2018
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:	6075	Document Number:	Appendix 7.1	Revision:	09
Project Name:	GLASHABOY FRS	Document Title:	PHOTOMONTAGES	Date:	07 March 2018

CONTENTS AMENDMENT RECORD

This report has been issued and amended as follows:

REVISION	DESCRIPTION	DATE	PREPARED BY	CHECKED BY
00	View Location and 6 no. of Photomontages	19 October 2016	BP	DBos
01	Revision to 1 Photomontage	19 October 2016	BP	DBos
02	Revision to 1 Photomontage	20 October 2016	BP	DBos
03	Revision to 2 Photomontages	20 October 2016	BP	DBos
04	Omission of one photomontage, revision to four photomontages	10 November 2016	BP	DBos
05	Revision to 2 Photomontages	11 November 2016	BP	DBos
06	Update of all photomontages to reflect current scheme.	14 December 2017	BP	DBos
07	Revision to all Photomontages based on 2017-12-18 comments and 2017-12-20 meeting	20 December 2017	BP	DBos
08	Ravision to 3 no of Photomontages based on 2018-02-28 comments	06 March 2018	BP	DBos
09	Revision to 1 photomontages	07 March 2018	BP	DBos

PHOTOMONTAGE TABLE OF CONTENT

Day:	19	19	20	20		10	11	14	20	06	07									
Month:	10	10	10	10		11	11	12	12	03	03									
Year:	16	16	16	16		16	16	17	17	18	18									
FIGURE NUMBER	**REVISION**																			
7.1.0	00	00	00	00		01	01	01	01	01	01									
7.1.1.1	00	00	00	00		00	00	00	00	00	00									
7.1.1.2	00	00	00	01		01	01	06	07	07	07									
7.1.2.1	00	00	00	00		00	00	00	00	00	00									
7.1.2.2	00	00	00	00		01	01	06	07	08	08									
7.1.3.1	00	00	00	00		00	00	00	00	00	00									
7.1.3.2	00	00	00	00		01	01	06	07	07	07									
7.1.4.1	00	00	00	00		00	00	06	06	06	06									
7.1.4.2	00	01	02	03		04	05	06	07	08	09									
7.1.5.1	00	00	00	00		00	00	00	00	00	00									
7.1.5.2	00	00	00	00		01	02	06	07	08	08									
7.1.6.1	00	00	00	00																
7.1.6.2	00	00	00	00																

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

Project Number:	6075	Document Number:	Appendix 7.1	Revision:	09
Project Name:	GLASHABOY FRS	Document Title:	PHOTOMONTAGES	Date:	07 March 2018

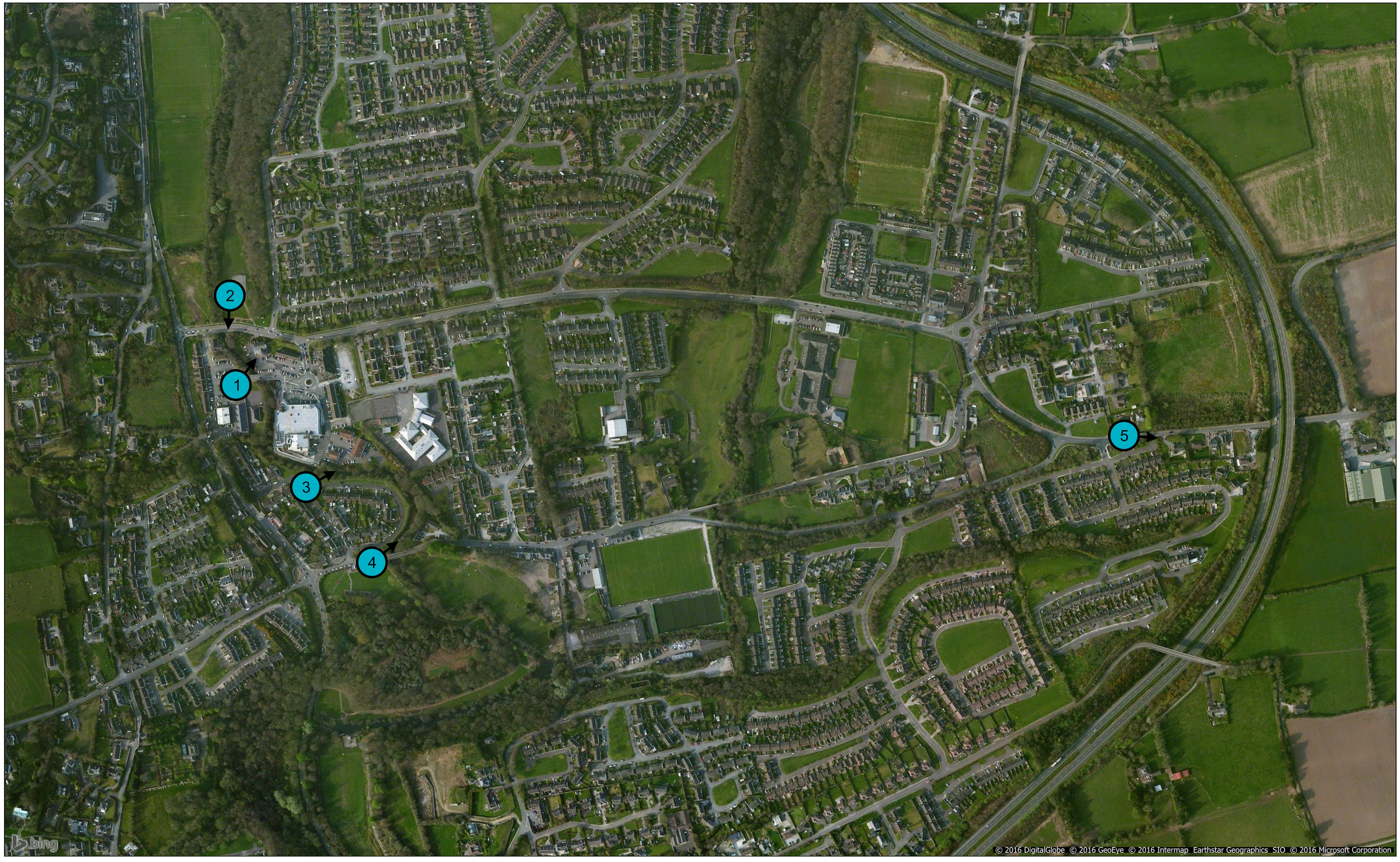

Figure: 7.1.0 **Rev: 01**
Photomontage View Location Map

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