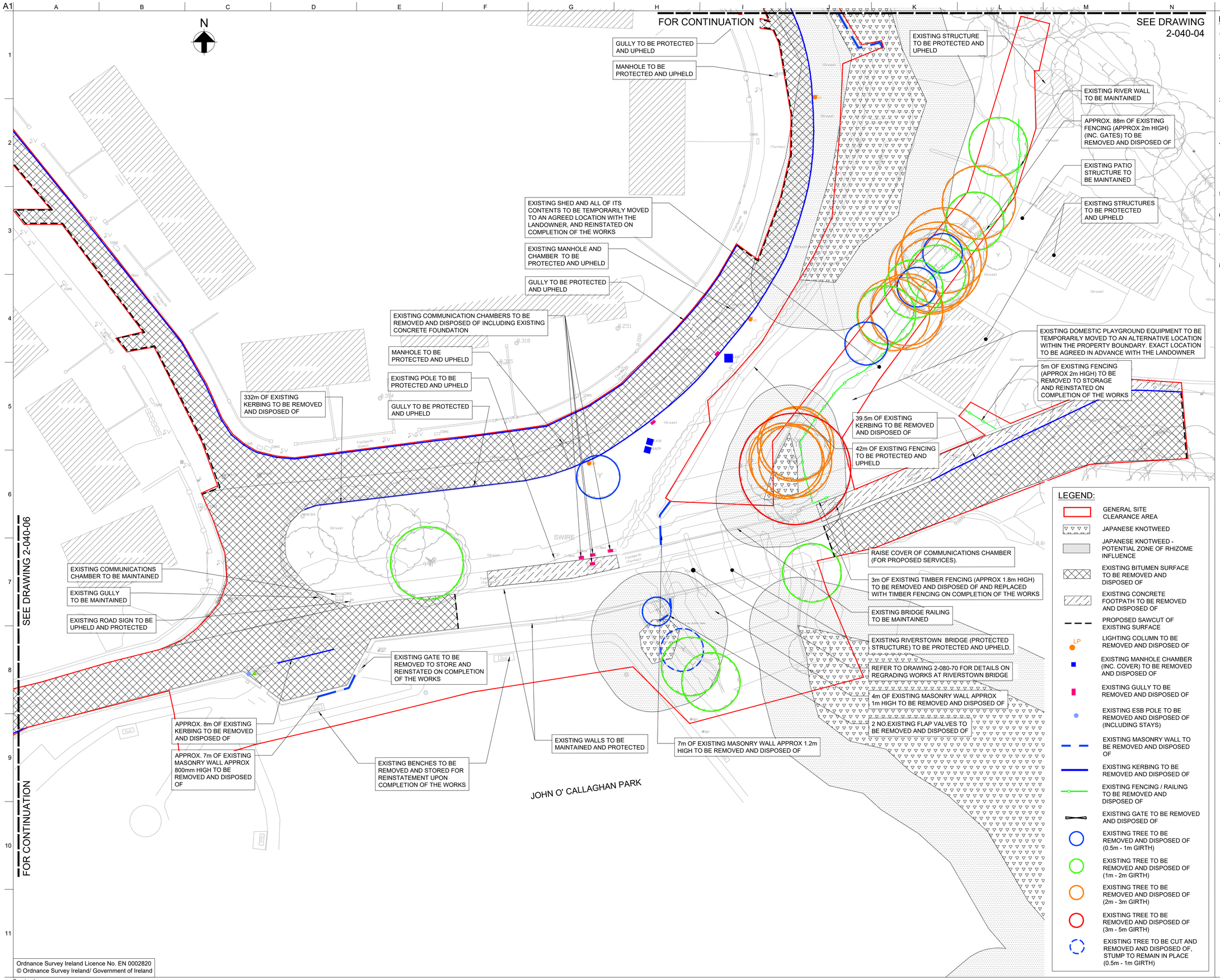

Do not scale

NOTES:

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5. REFER TO WORKS REQUIREMENTS FOR DETAILS OF EXISTING TREES.
6. UNLESS OTHERWISE NOTED, ALL ITEMS ARE TO BE PROTECTED AND UPHELD.
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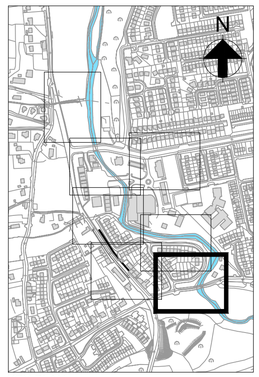
8. WHERE BUILDINGS/COMPONENTS ARE CALLED UP TO BE MOVED / REMOVED / REINSTATED DURING THE COURSE OF THE WORKS, THE CONTRACTOR IS TO INVENTORY THE CONTENTS IN THE PRESENCE OF THE ER AND OBTAIN THE OWNERS SIGNATURE ON THE INVENTORY. A PHOTOGRAPHIC SURVEY IS TO BE CARRIED OUT TO SUPPORT THE CONDITION OF THE BUILDING/SHED PRIOR TO MOVING/REMOVING/RELOCATING.



KEY PLAN

Rev	Date	By	Chkd	Appd
T2	16/12/22	AG	SW	KL
T1	19/07/21	CD	KOS	RK
P2	23/07/20	SB	DR	RK
P1	21/02/20	SB	DR	RK

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One Albert Quay
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www.arup.com

Client
OPW

Project Title
Glashaboy River (Glanmire/Sallybrook) Drainage Scheme

Drawing Title
Area 2
Site Clearance & Demolition
Sheet 5 of 7

Scale at A1: 1:250
Role: Civil Structures
Suitability: Tender
Arup Job No: 234334-10
Rev: T2
Name: 2-040-05

A1

FOR CONTINUATION SEE DRAWING 2-040-03

MANHOLE TO BE PROTECTED AND UPHELD

GULLY TO BE PROTECTED AND UPHELD

GULLY TO BE PROTECTED AND UPHELD

MEADOWBROOK ESTATE

R639

FOR CONTINUATION SEE DRAWING 2-040-05

LEGEND:

- GENERAL SITE CLEARANCE AREA
- EXISTING BITUMEN SURFACE TO BE REMOVED AND DISPOSED OF
- EXISTING CONCRETE FOOTPATH TO BE REMOVED AND DISPOSED OF
- EXISTING KERBING TO BE REMOVED AND DISPOSED OF

Do not scale

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KEY PLAN

Rev	Date	By	Chkd	Appd
T2	16/12/22	AG	SW	KL
T1	19/07/21	CD	KOS	RK
P2	23/07/20	SB	DR	RK
P1	21/02/20	SB	DR	RK

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OPW

Project Title

Glashaboy River (Glanmire/Sallybrook) Drainage Scheme

Drawing Title

Area 2
Site Clearance & Demolition
Sheet 6 of 7

Scale at A1: 1:250

Role: Civil Structures

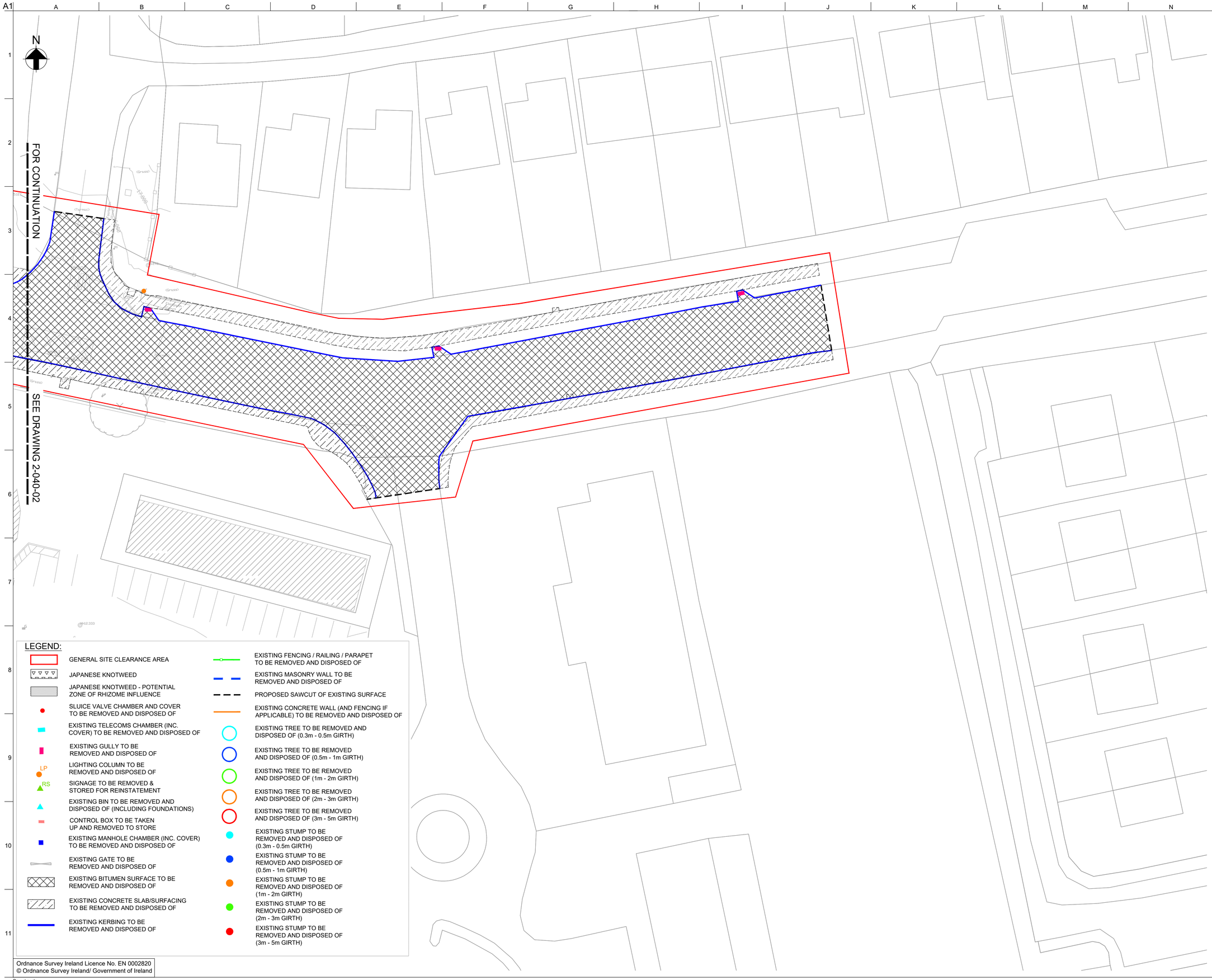
Suitability: Tender

Arup Job No: **234334-10**

Rev: **T2**

Name: **2-040-06**

A1



Do not scale

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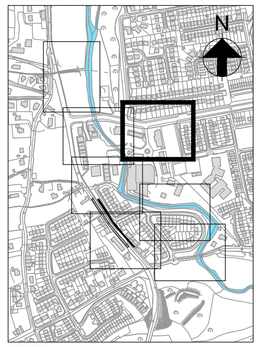
7. UNLESS OTHERWISE NOTED, ALL ITEMS TO BE REMOVED/DEMOLISHED ARE TO INCLUDE ASSOCIATED FOUNDATIONS.
8. FOR REUSE OF SPECIFIC LED LIGHTING FIXTURES, REFER TO DRAWING 2-040 SERIES.
9. WHERE BUILDINGS/COMPONENTS ARE CALLED UP TO BE MOVED / REMOVED / REINSTATED DURING THE COURSE OF THE WORKS, THE CONTRACTOR IS TO INVENTORY THE CONTENTS IN THE PRESENCE OF THE ER AND OBTAIN THE OWNERS SIGNATURE ON THE INVENTORY. A PHOTOGRAPHIC SURVEY IS TO BE CARRIED OUT TO SUPPORT THE CONDITION OF THE BUILDING/SHED PRIOR TO MOVING/REMOVING/RELOCATING.
10. FOR PROPOSED SIGNS AND ROAD MARKINGS PLEASE REFER TO DRAWING 2-120 SERIES



KEY PLAN

T1	16/12/22	AG	SW	KL
Rev	Date	By	Chkd	Appd

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Client

OPW

Project Title

Glashaboy River
(Glanmire/Sallybrook)
Drainage Scheme

Drawing Title

Area 2
Site Clearance & Demolition
Sheet 7 of 7

Scale at A1 1:250

Role Civil Structures

Suitability Tender

Arup Job No **234334-00**

Rev **T1**

Name **2-040-07**

A1

LEGEND:

- GENERAL SITE CLEARANCE AREA
- EXISTING BITUMEN SURFACE TO BE REMOVED AND DISPOSED OF
- EXISTING DECORATIVE GRAVEL SURFACE TO BE REMOVED AND DISPOSED OF
- EXISTING CONCRETE SLAB/SURFACING TO BE REMOVED AND DISPOSED OF
- LP — LIGHTING COLUMN TO BE REMOVED AND DISPOSED OF
- EXISTING GULLY TO BE REMOVED AND DISPOSED OF
- EXISTING MANHOLE CHAMBER (INC. COVER) TO BE REMOVED AND DISPOSED OF
- EXISTING TELECOMS CHAMBER (INC. COVER) TO BE REMOVED AND DISPOSED OF
- RS — SIGNAGE TO BE REMOVED & STORED FOR REINSTATEMENT
- EXISTING GATE TO BE REMOVED AND DISPOSED OF
- PROPOSED SAWCUT OF EXISTING SURFACE
- T3
- EXISTING KERBING TO BE REMOVED AND DISPOSED OF
- EXISTING MASONRY WALL TO BE REMOVED AND DISPOSED OF
- EXISTING ESB POLE TO BE REMOVED AND DISPOSED OF (INCLUDING STAYS)
- TELECOMMUNICATIONS POLE TO BE REMOVED AND DISPOSED OF
- SLUICE VALVE CHAMBER AND COVER TO BE REMOVED AND DISPOSED OF
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (0.5m - 1m GIRTH)
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (1m - 2m GIRTH)
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (2m - 3m GIRTH)
- EXISTING CULVERT AND ASSOCIATED FOUNDATIONS TO BE DEMOLISHED AND DISPOSED OF
- EXISTING FENCING TO BE REMOVED AND DISPOSED OF
- EXISTING STUMP TO BE REMOVED AND DISPOSED OF (0.5m - 1m GIRTH)
- EXISTING STUMP TO BE REMOVED AND DISPOSED OF (1m - 2m GIRTH)
- EXISTING STUMP TO BE REMOVED AND DISPOSED OF (2m - 3m GIRTH)

N

62m OF EXISTING KERBING TO BE REMOVED AND DISPOSED OF

27m OF MASONRY WALL TO BE REMOVED AND DISPOSED OF INCLUDING FOUNDATION

EXISTING CULVERT TO BE DEMOLISHED AND DISPOSED OF INCLUDING FOUNDATIONS. REFER TO 3-080-21 FOR DETAILS

SIGNAGE TO BE REMOVED AND STORED FOR REINSTATEMENT

TELECOM POLE TO BE REMOVED AND DISPOSED OF

REVISION T3. TREES AND VEGETATION REMOVAL WITHIN RED LINE EXTENT UPDATED TO REFLECT REDUCED SCOPE DUE TO TREE FELLING BEING UNDERTAKEN IN ADVANCE OF MAIN CONTRACT COMMENCEMENT.

SIGNAGE TO BE REMOVED AND STORED FOR REINSTATEMENT

EXISTING RIVER BANK TO BE PROTECTED AND UPHELD

53m OF MASONRY WALL ~1m HIGH ABOVE FOOTPATH TO BE REMOVED AND DISPOSED OF INCLUDING FOUNDATION

56m OF EXISTING KERBING TO BE REMOVED AND DISPOSED OF

57m OF EXISTING FENCE TO BE REMOVED AND DISPOSED OF

EXISTING SIGN AND LIGHTING TO BE REMOVED AND STORED FOR REINSTATEMENT. FOUNDATION/PLINTH TO BE REMOVED AND DISPOSED OF.

EXISTING FLAG POLES AND ORNAMENTAL PLANTING TO BE REMOVED AND STORED FOR REINSTATEMENT.

22m OF EXISTING MASONRY WALL TO BE REMOVED AND DISPOSED OF

22m OF EXISTING MASONRY WALL TO BE REMOVED AND DISPOSED OF

19m OF EXISTING KERBING TO BE REMOVED AND DISPOSED OF

60m OF EXISTING KERBING TO BE REMOVED AND DISPOSED OF

Do not scale

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KEY PLAN

Rev	Date	By	Chkd	Appd
T3	11/01/22	AG	SW	KL
T2	22/12/21	AG	SW	KL
T1	19/07/21	CD	KOS	RK
P4	01/06/21	SB	RK	RK
P3	07/08/20	SB	DR	RK
P2	03/04/20	SB	DR	RK
P1	21/02/20	SB	DR	RK

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Client

OPW

Project Title

Glashaboy River (Glanmire/Sallybrook) Drainage Scheme

Drawing Title

Area 3
Site Clearance and Demolition
(Sheet 1 of 6)

Scale at A1: 1:200

Role: Civil Structures

Suitability: Tender

Arup Job No: **234334-00**

Rev: **T3**

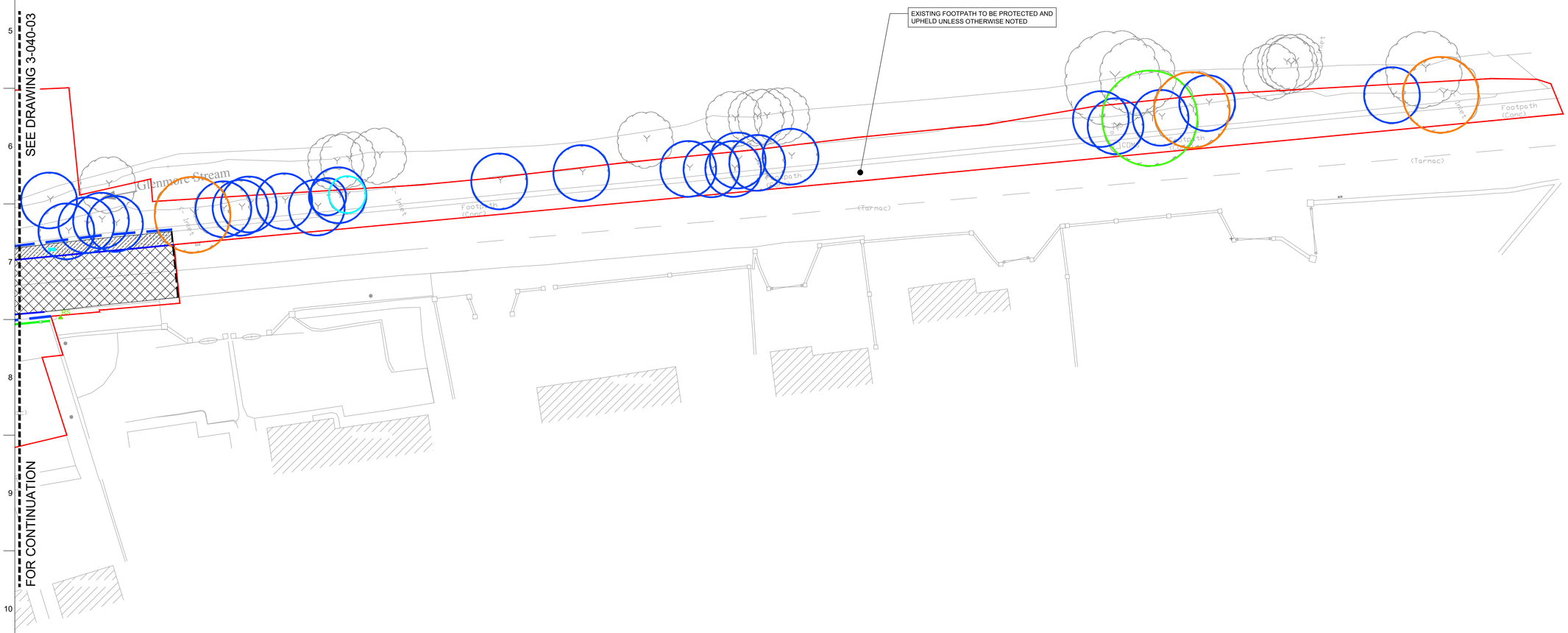
Name: **3-040-01**

A1

LEGEND:

- GENERAL SITE CLEARANCE AREA
- EXISTING BITUMEN SURFACE TO BE REMOVED AND DISPOSED OF
- EXISTING CONCRETE SLAB/SURFACING TO BE REMOVED AND DISPOSED OF
- EXISTING KERBING TO BE REMOVED AND DISPOSED OF
- EXISTING MASONRY WALL TO BE REMOVED AND DISPOSED OF
- TELECOMMUNICATIONS POLE TO BE REMOVED AND DISPOSED OF
- EXISTING GULLY TO BE REMOVED AND DISPOSED OF
- EXISTING MANHOLE CHAMBER (INC. COVER) TO BE REMOVED AND DISPOSED OF
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (0.3m - 0.5m GIRTH)
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (0.5m - 1m GIRTH)
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (1m - 2m GIRTH)
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (2m - 3m GIRTH)
- EXISTING TELECOMS CHAMBER (INC. COVER) TO BE REMOVED AND DISPOSED OF
- RS SIGNAGE TO BE REMOVED & STORED FOR REINSTATEMENT

N



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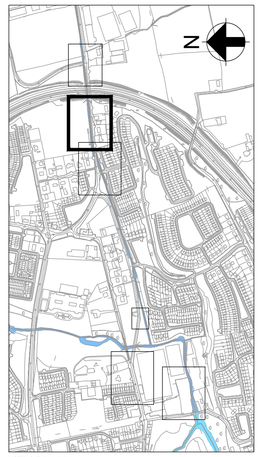

KEY PLAN

Rev	Date	By	Chkd	Appd
T1	19/07/21	CD	KOS	RK
P3	07/08/20	SB	DR	RK
P2	03/04/20	SB	DR	RK
P1	21/02/20	SB	DR	RK

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Client

OPW

Project Title

Glashaboy River
(Glanmire/Sallybrook)
Drainage Scheme

Drawing Title

Area 3
Site Clearance and Demolition
(Sheet 2 of 6)

Scale at A1: 1:250

Role: Civil Structures

Suitability: Tender

Arup Job No: **234334-00**

Rev: **T1**

Name: **3-040-02**

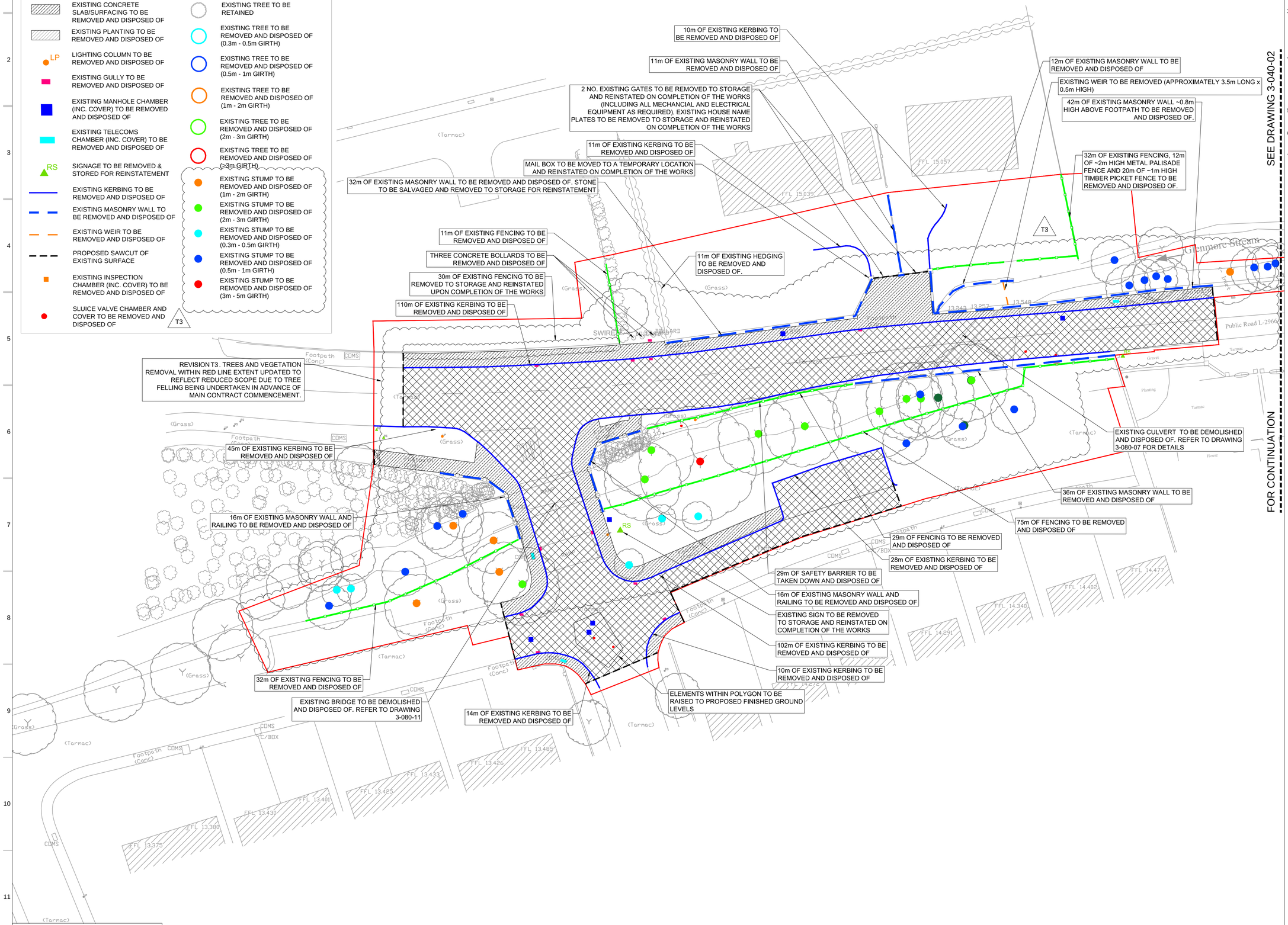
Do not scale

A1

LEGEND:

- GENERAL SITE CLEARANCE AREA
- EXISTING BITUMEN SURFACE TO BE REMOVED AND DISPOSED OF
- EXISTING CONCRETE SLAB/SURFACING TO BE REMOVED AND DISPOSED OF
- EXISTING PLANTING TO BE REMOVED AND DISPOSED OF
- LP — LIGHTING COLUMN TO BE REMOVED AND DISPOSED OF
- EXISTING GULLY TO BE REMOVED AND DISPOSED OF
- EXISTING MANHOLE CHAMBER (INC. COVER) TO BE REMOVED AND DISPOSED OF
- EXISTING TELECOMS CHAMBER (INC. COVER) TO BE REMOVED AND DISPOSED OF
- RS — SIGNAGE TO BE REMOVED & STORED FOR REINSTATEMENT
- EXISTING KERBING TO BE REMOVED AND DISPOSED OF
- EXISTING MASONRY WALL TO BE REMOVED AND DISPOSED OF
- EXISTING WEIR TO BE REMOVED AND DISPOSED OF
- PROPOSED SAWCUT OF EXISTING SURFACE
- EXISTING INSPECTION CHAMBER (INC. COVER) TO BE REMOVED AND DISPOSED OF
- SLUICE VALVE CHAMBER AND COVER TO BE REMOVED AND DISPOSED OF
- T3
- EXISTING GATE TO BE REMOVED AND DISPOSED OF
- EXISTING FENCING TO BE REMOVED AND DISPOSED OF
- EXISTING TREE TO BE RETAINED
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (0.3m - 0.5m GIRTH)
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (0.5m - 1m GIRTH)
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (1m - 2m GIRTH)
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (2m - 3m GIRTH)
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (>3m GIRTH)
- EXISTING STUMP TO BE REMOVED AND DISPOSED OF (1m - 2m GIRTH)
- EXISTING STUMP TO BE REMOVED AND DISPOSED OF (2m - 3m GIRTH)
- EXISTING STUMP TO BE REMOVED AND DISPOSED OF (0.3m - 0.5m GIRTH)
- EXISTING STUMP TO BE REMOVED AND DISPOSED OF (0.5m - 1m GIRTH)
- EXISTING STUMP TO BE REMOVED AND DISPOSED OF (3m - 5m GIRTH)

N



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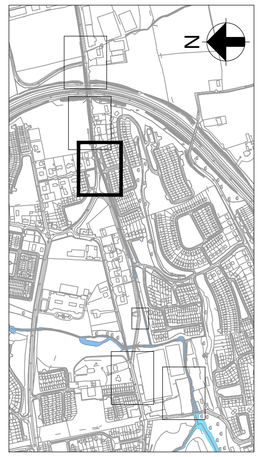

KEY PLAN

Rev	Date	By	Chkd	Appd
T3	11/01/22	AG	SW	KL
T2	22/12/21	AG	SW	KL
T1	19/07/21	CD	KOS	RK
P2	03/04/20	SB	DR	RK
P1	21/02/20	SB	DR	RK

Preliminary Issue

ARUP

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Client

OPW

Project Title

Glashaboy River (Glanmire/Sallybrook) Drainage Scheme

Drawing Title

Area 3
Site Clearance and Demolition
(Sheet 3 of 6)

Scale at A1: 1:250

Role: Civil Structures

Suitability: Tender

Arup Job No: **234334-00**

Rev: **T3**

Name: **3-040-03**

A1

N

EXISTING MANHOLE COVER LEVEL TO BE ADJUSTED TO SUIT PROPOSED LEVELS. REFER TO DRAWING 3-070-04 FOR DETAILS.

L3010

23m OF EXISTING KERBING TO BE REMOVED AND DISPOSED OF

EXISTING LIGHTING COLUMN TO BE PROTECTED AND UPHELD

10m OF EXISTING FENCING TO BE REMOVED AND DISPOSED OF

3m OF EXISTING FENCING TO BE REMOVED AND DISPOSED OF

LEGEND:

- GENERAL SITE CLEARANCE AREA
- EXISTING BITUMEN SURFACE TO BE REMOVED AND DISPOSED OF
- EXISTING KERBING TO BE REMOVED AND DISPOSED OF
- EXISTING FENCING / RAILING TO BE REMOVED AND DISPOSED OF
- JAPANESE KNOTWEED
- JAPANESE KNOTWEED - POTENTIAL ZONE OF RHIZOME INFLUENCE

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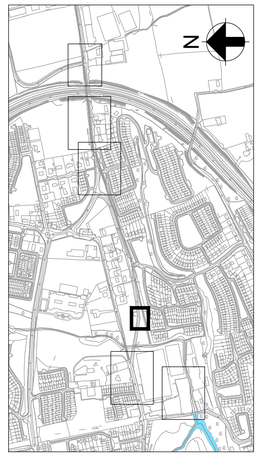

KEY PLAN

Rev	Date	By	Chkd	Appd
T1	19/07/21	CD	KOS	RK
P3	07/08/20	SB	DR	RK
P2	03/04/20	SB	DR	RK
P1	21/02/20	SB	DR	RK

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Client

OPW

Project Title

Glashaboy River (Glanmire/Sallybrook) Drainage Scheme

Drawing Title

Area 3
Site Clearance And Demolition
(Sheet 4 of 6)

Scale at A1: 1:100

Role: Civil Structures

Suitability: Tender

Arup Job No: **234334-00**

Rev: **T1**

Name: **3-040-04**

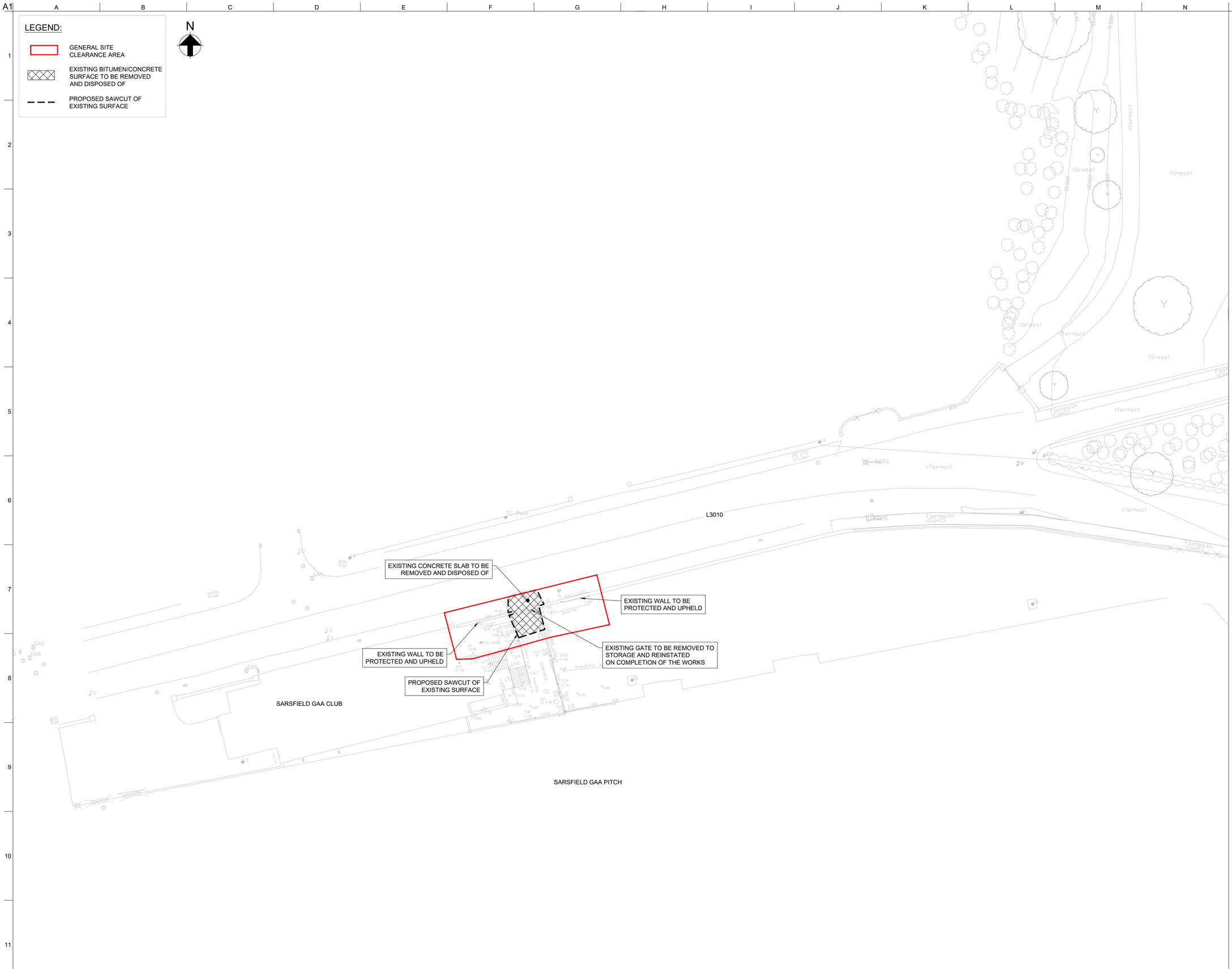
Do not scale

A1

LEGEND:

- GENERAL SITE CLEARANCE AREA
- EXISTING BITUMEN/CONCRETE SURFACE TO BE REMOVED AND DISPOSED OF
- PROPOSED SAWCUT OF EXISTING SURFACE

N



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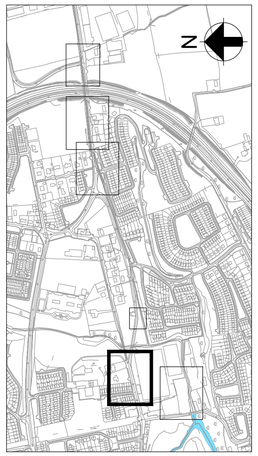

KEY PLAN

Rev	Date	By	Chkd	Appd
T1	19/07/21	CD	KOS	RK
P4	07/08/20	SB	DR	RK
P3	03/04/20	SB	DR	RK
P2	21/02/20	SB	DR	RK
P1	18/11/19	SB	DR	RK

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Tionscadal Éireann Project Ireland 2040

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Client

OPW

Project Title

Glashaboy River
(Glanmire/Sallybrook)
Drainage Scheme

Drawing Title

Area 3
Site Clearance and Demolition
(Sheet 5 of 6)

Scale at A1: 1:250

Role: Civil Structures

Suitability: Tender

Arup Job No: **234334-00**

Rev: **T1**

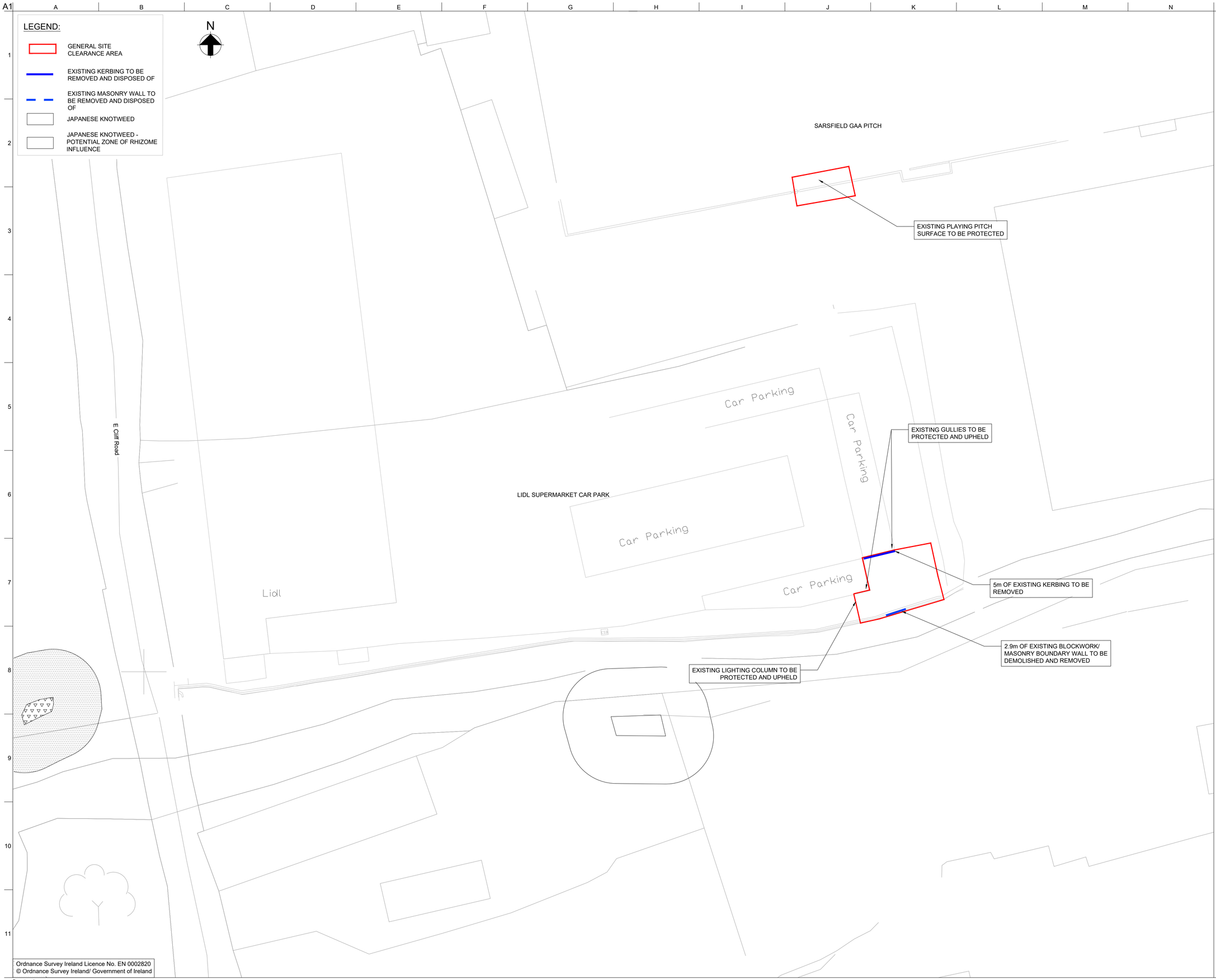
Name: **3-040-05**

Do not scale

A1

LEGEND:

- GENERAL SITE CLEARANCE AREA
- EXISTING KERBING TO BE REMOVED AND DISPOSED OF
- EXISTING MASONRY WALL TO BE REMOVED AND DISPOSED OF
- JAPANESE KNOTWEED
- JAPANESE KNOTWEED - POTENTIAL ZONE OF RHIZOME INFLUENCE



Do not scale

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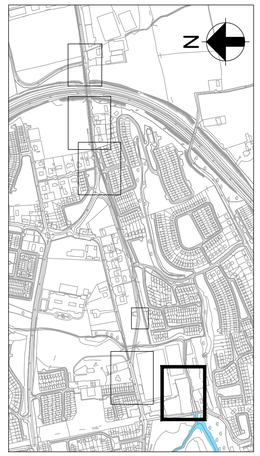

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Drawing Title

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(Sheet 6 of 6)

Scale at A1: 1:250

Role: Civil Structures

Suitability: Tender

Arup Job No: **234334-00**

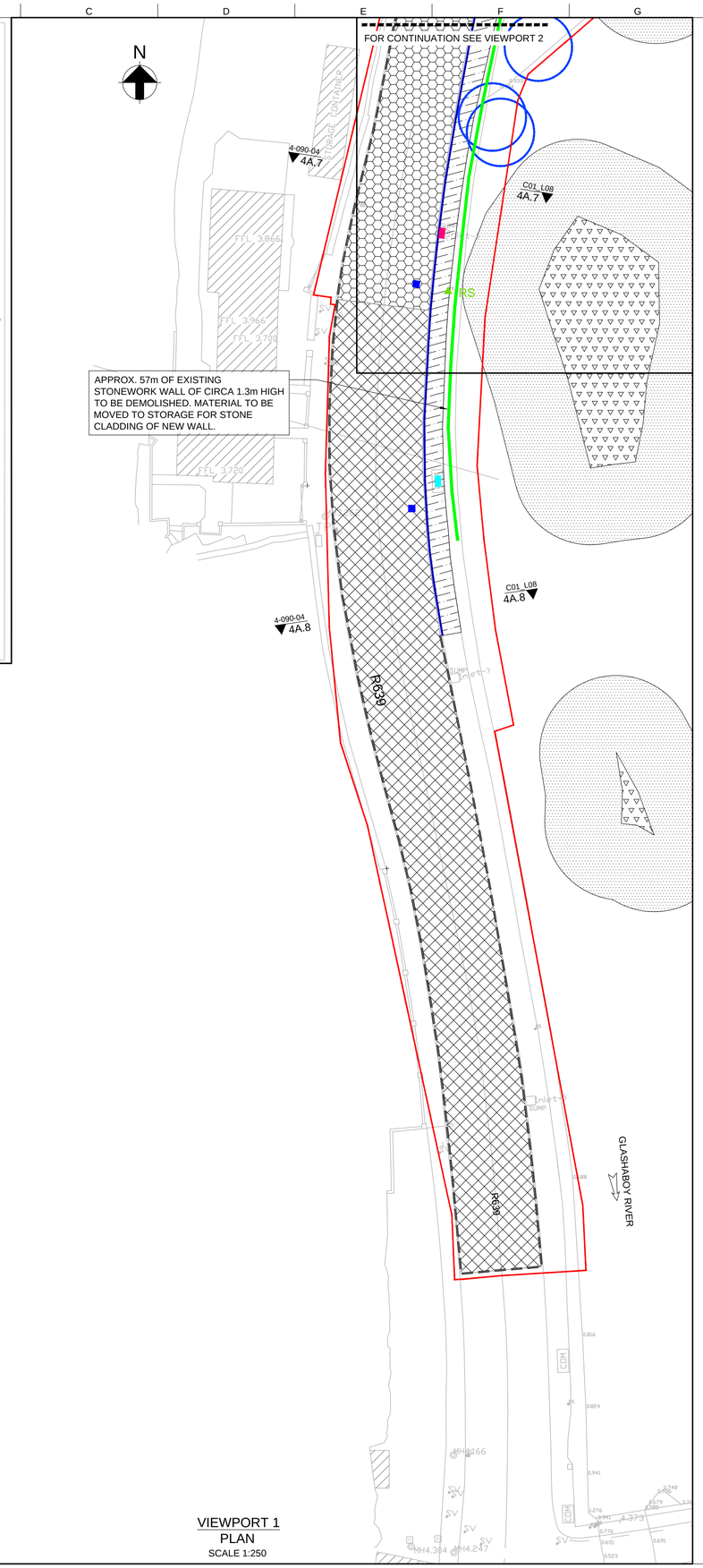
Rev: **T1**

Name: **3-040-06**

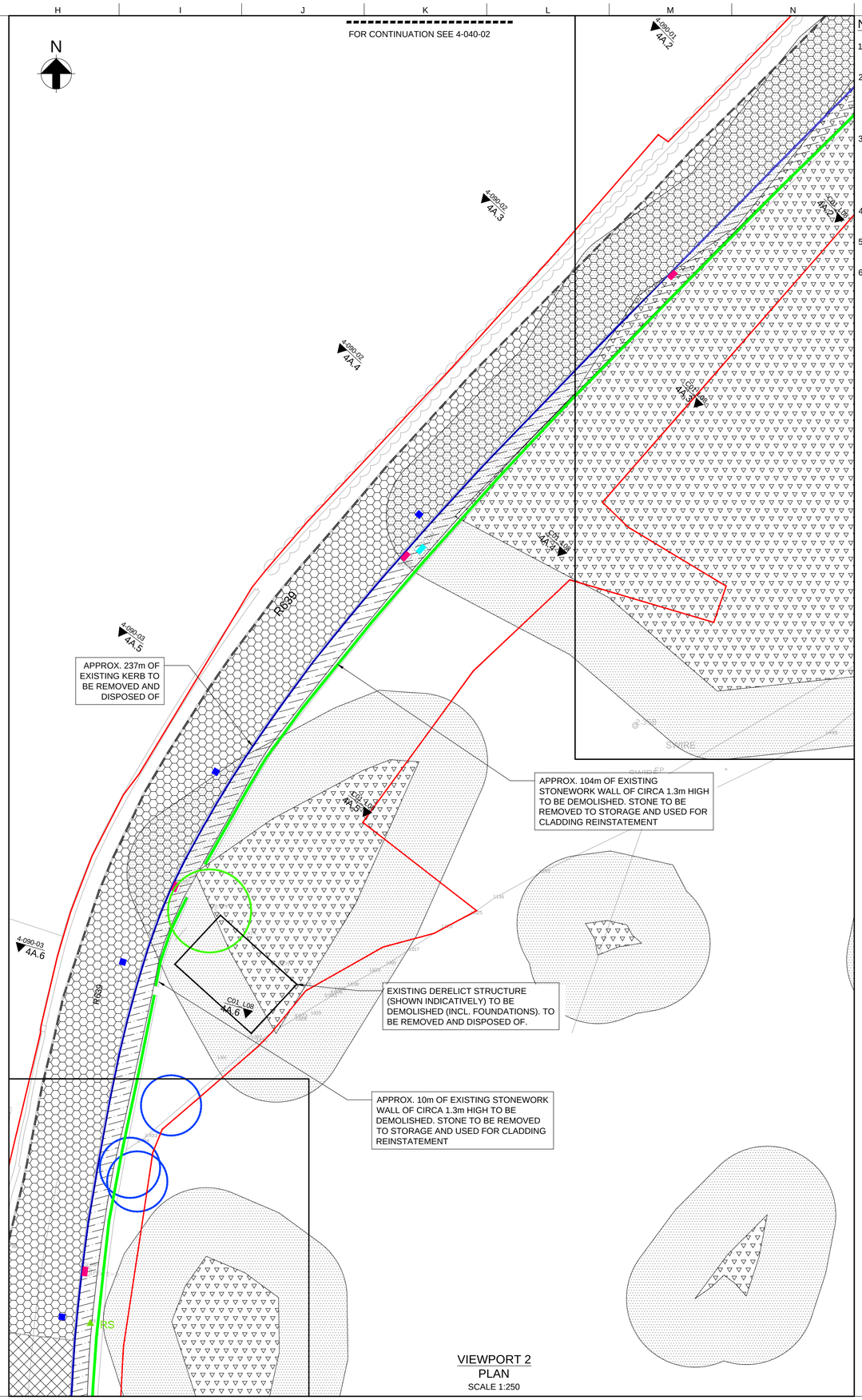
A1

LEGEND:

- GENERAL SITE CLEARANCE AREA
- JAPANESE KNOTWEED
- JAPANESE KNOTWEED - POTENTIAL ZONE OF RHIZOME INFLUENCE
- 40mm - 100mm DEPTH OF EXISTING BITUMEN SURFACE TO BE REMOVED AND DISPOSED OF
- 200mm DEPTH OF EXISTING BITUMEN SURFACE AND SUB-BASE TO BE REMOVED AND DISPOSED OF
- EXISTING CONCRETE SLAB / SURFACING TO BE REMOVED AND DISPOSED OF
- PROPOSED SAWCUT OF EXISTING SURFACE
- EXISTING STONEWORK WALL TO BE DEMOLISHED PLEASE REFER TO DRAWING SERIES 4-080 . STONE TO BE REMOVED TO STORAGE AND USED FOR CLADDING REINSTATEMENT
- EXISTING STONEWORK WALL TO BE REDUCED IN HEIGHT PLEASE REFER TO DRAWING SERIES 4-080 . STONE TO BE REMOVED TO STORAGE AND USED FOR CLADDING REINSTATEMENT
- EXISTING 254 x 127 HALF BATTER KERB TO BE REMOVED AND DISPOSED OF
- EXISTING MANHOLE CHAMBER (INC. COVER) TO BE REMOVED AND DISPOSED OF
- EXISTING GULLY TO BE REMOVED AND DISPOSED OF
- EXISTING TELECOMS CHAMBER (INC. COVER) TO BE REMOVED AND DISPOSED OF
- RS SIGNAGE TO BE REMOVED & STORED FOR REINSTATEMENT
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (0.5m - 1m GIRTH)
- EXISTING TREE TO BE REMOVED AND DISPOSED OF (1m - 2m GIRTH)



VIEWPORT 1
PLAN
SCALE 1:250



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SCALE 1:250

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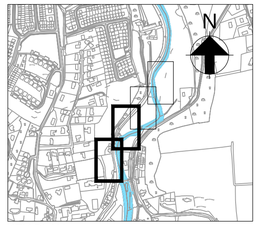

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Project Title

Glashaboy River (Glanmire/Sallybrook) Drainage Scheme

Drawing Title

Area 4
Site Clearance and Demolition
Shet 1 of 2

Scale at A1: 1:250

Role: Civil Structures

Suitability: Tender

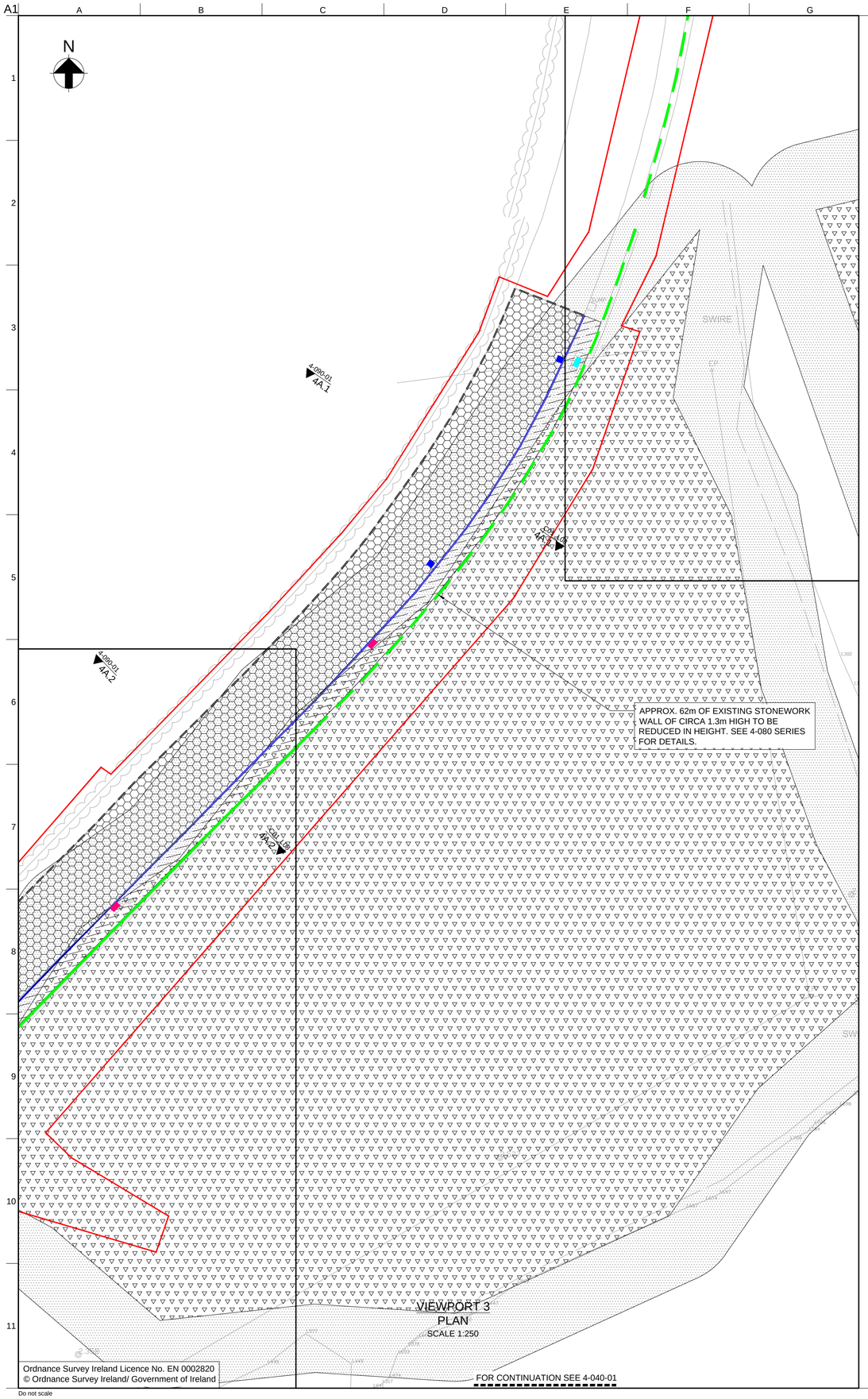
Arup Job No: **234334-00**

Rev: **T3**

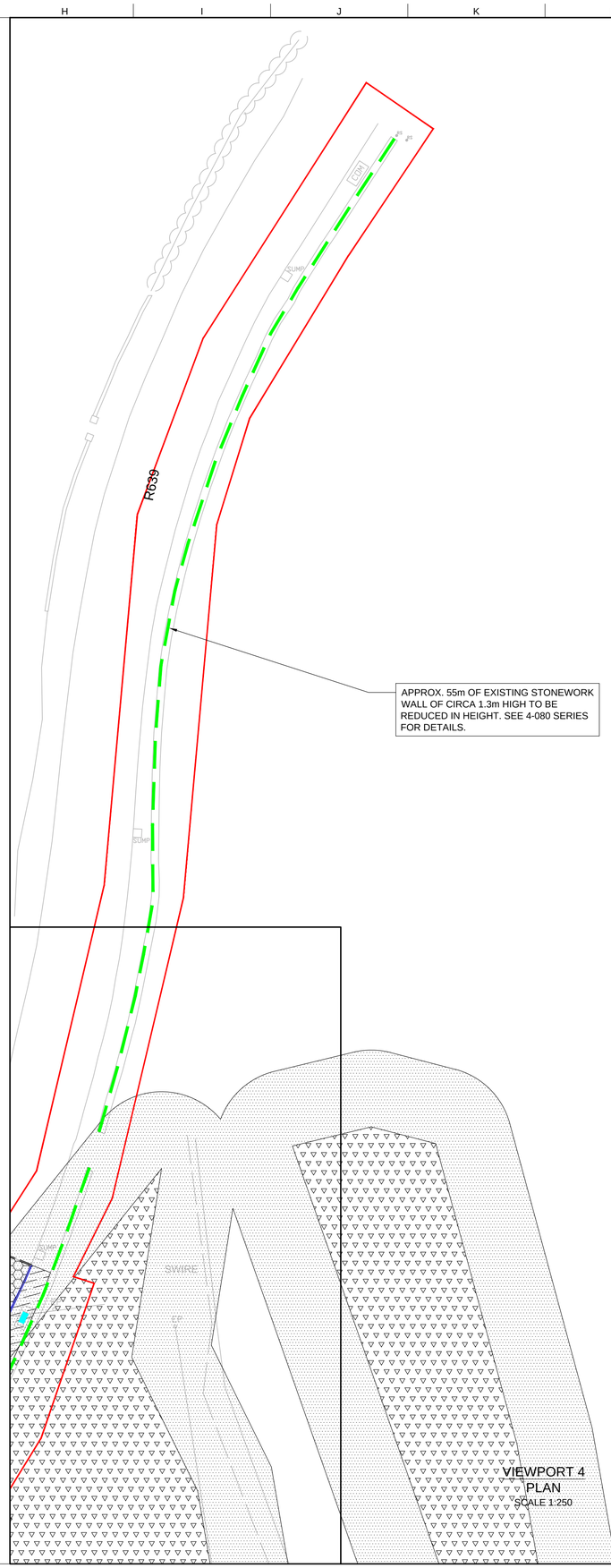
Name: **4-040-01**

Do not scale

A1



VIEWPORT 3
PLAN
SCALE 1:250



VIEWPORT 4
PLAN
SCALE 1:250

LEGEND:

- GENERAL SITE CLEARANCE AREA
- JAPANESE KNOTWEED
- JAPANESE KNOTWEED - POTENTIAL ZONE OF RHIZOME INFLUENCE
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Drainage Scheme

Drawing Title

Area 4
Site Clearance and Demolition
Sheet 2 of 2

Scale at A1 1:250

Role Civil Structures

Suitability Tender

Arup Job No **234334-00**

Rev **T1**

Name **4-040-02**

Do not scale

Appendix I

EMG Additional Mitigation Measures

ARUP

Cork City Council, Cork County Council and Office of Public Works

Glashaboy River (Glanmire/Sallybrook) Drainage Scheme

EMG Additional Mitigation Measures

Reference:

Issue | 25 April 2023

Job number 234334-00

Ove Arup & Partners Ireland Limited
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Cork
T12 X8N6
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Contents

Tables

Figures

Drawings

No table of figures entries found.

Pictures

No table of figures entries found.

Photographs

No table of figures entries found.

Attachments

No table of figures entries found.

Appendices

No table of contents entries found.

1. Introduction

This appendix sets out all additional environmental mitigation and monitoring measures for the scheme as approved by the Environmental Monitoring Group (EMG) for post-confirmation changes, in compliance with Condition 2 applied to the decision to confirm the scheme by the Minister for Public Expenditure and Reform.

For some environmental factors reviewed in the context of the post-confirmation changes, there has not been a need for additional mitigation or monitoring measures however all existing mitigation measures set out in the CEMP (Issue 2) remain valid and shall be implemented by the contractor.

Where relevant environmental 'features of note' are included to highlight any environmental sensitivities and any relevant applicable existing mitigation measures that should be considered in carrying out such works.

2. Tree Felling Works

The planned tree felling is shown on the following drawing No. 1-04-01 to 1-04-06; 2-04-01 to 2-04-06; 3-04-01 to 3-04-06; and 4-04-01 to 4-04-06.

Table 1 sets out the additional mitigation and monitoring measures agreed by the EMG for the post-confirmation changes made to the planned tree felling works on the scheme.

Table 1: Additional mitigation and monitoring measures for tree felling works

EIAR	Additional mitigation and monitoring measures and features of note
Population and Human Health	No additional mitigation or monitoring measures.
Landscape & Visual	No additional mitigation or monitoring measures.
Roads & Traffic	No additional mitigation or monitoring measures.
Noise & Vibration	No additional mitigation or monitoring measures.
Air Quality & Climate	No additional mitigation or monitoring measures.
Biodiversity	No additional mitigation or monitoring measures.
Soils, Geology and Hydrogeology	No additional mitigation or monitoring measures.
Archaeology, Architectural, and Cultural Heritage	No additional mitigation or monitoring measures. Note: Sallybrook House is listed in the National Inventory of Architectural Heritage (NIAH), Reg. No. 20906332.
Material Assets	No additional mitigation or monitoring measures.
Hydrology	No additional mitigation or monitoring measures.
Major Accidents and Disasters	No additional mitigation or monitoring measures.

3. Post-Confirmation Design Changes

Table 2 sets out the additional mitigation and monitoring measures agreed by the EMG for the post-confirmation design changes made to the scheme.

Where relevant environmental 'features of note' are included to highlight any environmental sensitivities and any relevant applicable existing mitigation measures that should be considered in carrying out such works.

Table 2: Additional mitigation and monitoring measures

Drawing No.	Post-confirmation change	Additional mitigation and monitoring measures and features of note
1-050-04	Pumping station relocation at Sallybrook industrial estate	No additional mitigation or monitoring measures. <u>Note for Biodiversity and NIS:</u> • Biodiversity: Section 7.4.11 of the EIAR Addendum (2020) sets out mitigation for such works, therefore the same mitigation measures in the EIAR will apply. <u>Note for Archaeology, Architectural, and Cultural Heritage:</u> • Sallybrook House is listed in the National Inventory of Architectural Heritage (NIAH), Reg. No. 20906332.
1-050-04	New domestic wastewater treatment system at Sallybrook house to replace existing historic septic tank.	No additional mitigation or monitoring measures. <u>Note for Biodiversity and NIS:</u> • Biodiversity: The existing outfall pipe to be removed from the river which can be done so by construction staff entering the river. It is not anticipated that plant or machinery will be required for this particular task. The main installation works will be set back from the river. • Mitigation measures to be implemented during instream works are described in Section 5.2.1 of the CEMP, Section 7.4 and 7.5.1 of the EIAR Addendum (2020) and Section 6.8 of the EIAR (2018). <u>Note for Hydrology:</u> • Mitigation measures to be implemented for water quality works are described in Section 5.8.1 of the CEMP, Section 12.7.1.1 of the EIAR (2018) and Section 6.3 and Section 6.4.1 of the EIAR Addendum (2020). <u>Note for Noise and Vibration:</u> • The contractor will be responsible for engaging with the landowner through the Community Liaison Officer. Section 9.6.1 of the EIAR (2018) states that "*works in proximity to sensitive receptors, such as the Eurofins facility will be carried out at an optimum time to minimise disturbance and potential impacts*."

Drawing No.	Post-confirmation change	Additional mitigation and monitoring measures and features of note
		Note for Archaeology, Architectural, and Cultural Heritage: • Sallybrook House is listed in the National Inventory of Architectural Heritage (NIAH), Reg. No. 20906332. The distance of the pumping station from the house will not change.
1-050-05	Increase in the height of flood defence wall around channel chainage 5075 by 120mm.	No additional mitigation or monitoring measures.
1-080-06	Flood defence wall construction changed from reinforced concrete to sheet pile wall (for a 44m length section).	No additional mitigation or monitoring measures. Note for Biodiversity and NIS: • Mitigation measures to be implemented during instream works are described in Section 5.2.1 of the CEMP, Section 7.4 and 7.5.1 of the EIAR Addendum (2020) and Section 6.8 of the EIAR (2018). Note for Hydrology: • Mitigation measures to be implemented for water quality works are described in Section 5.8.1 of the CEMP, Section 12.7.1.1 of the EIAR (2018) and Section 6.3 and Section 6.4.1 of the EIAR Addendum (2020). Note for Noise and Vibration: • The contractor will be responsible for engaging with the landowner through the Community Liaison Officer. Section 9.6.1 of the EIAR (2018) states that "*works in proximity to sensitive receptors, such as the Eurofins facility will be carried out at an optimum time to minimise disturbance and potential impacts*."
1-080-07	Increase in the height of the flood defence wall by 50mm around channel chainage 4875.	No additional mitigation or monitoring measures.
2-080-10	Realignment of wall to accommodate road widening (Hazelwood Avenue) and junction works and increase to the length of the flood relief culvert to accommodate Local Infrastructure Housing Activation Fund (LIHAF) works.	No additional mitigation or monitoring measures. Note for Biodiversity and NIS: • Mitigation measures to be implemented during instream works are described in Section 5.2.1 of the CEMP, Section 7.4 and 7.5.1 of the EIAR Addendum (2020) and Section 6.8 of the EIAR (2018). Note for Archaeology, Architectural, and Cultural Heritage: • The contractor will apply all mitigation measures including archaeological monitoring as described in Section 13.5.1 of the EIAR (2018). Note for Hydrology:

Drawing No.	Post-confirmation change	Additional mitigation and monitoring measures and features of note
		• Mitigation measures to be implemented for water quality works are described in Section 5.8.1 of the CEMP, Section 12.7.1.1 of the EIAR (2018) and Section 6.3 and Section 6.4.1 of the EIAR Addendum (2020).
2-080-40	Widening Hazelwood Avenue bridge at the by the addition of a new section to the upstream face to accommodate the LIHAF works.	No additional mitigation or monitoring measures. <u>Note for Biodiversity and NIS:</u> • Mitigation and monitoring measures to be implemented during instream works are described in Section 5.2.1 of the CEMP, Section 7.4 and 7.5.1 of the EIAR Addendum (2020) and Section 6.8 of the EIAR (2018). <u>Note for Archaeology, Architectural, and Cultural Heritage:</u> • The contractor will apply all mitigation measures including archaeological monitoring as described in Section 13.5.1 of the EIAR (2018). <u>Note for Hydrology:</u> • Mitigation and monitoring measures to be implemented for water quality works are described in Section 5.8.1 of the CEMP, Section 12.7.1.1 of the EIAR (2018) and Section 6.3 and Section 6.4.1 of the EIAR Addendum (2020). <u>Note for Noise and Vibration:</u> • The contractor will be responsible for engaging with the landowner through the Community Liaison Officer. Section 9.6.1 of the EIAR (2018) states that "*works in proximity to sensitive receptors, such as the Eurofins facility will be carried out at an optimum time to minimise disturbance and potential impacts*."
2-050-02	Pumping station relocated to channel chainage 3894 from 3805 to facilitate easier maintenance and less interference with property owner.	No additional mitigation or monitoring measures.
2-050-05	Removal of foul sewer pumping station from Meadowbrook Estate.	No additional mitigation or monitoring measures.
2-050-04 and **2-050-05**	Provision of new storm water sewer in Meadowbrook Estate.	No additional mitigation or monitoring measures.
3-070-02	Removal of surface water pumping station from Copper Valley Vue Estate	No additional mitigation or monitoring measures.

Drawing No.	Post-confirmation change	Additional mitigation and monitoring measures and features of note
3-070-02	Widening of property entrance (T45 HF53) to improve sight lines at Brooklodge Grove.	No additional mitigation or monitoring measures.
4-090-01 and 4-080-02	Increase in the height of the flood defence wall (by 100mm) over an 84m long section of wall.	No additional mitigation or monitoring measures.
4-080-02	Additional section of flood defence wall (12m) to be added to northern extent to cater for minor increase in defence level in this reach.	No additional mitigation or monitoring measures. <u>Note for Biodiversity and NIS:</u> • The contractor will be obliged to carry out vegetation removal works as described in Section 5.7 of EIAR Addendum (2020) Chapter 5.6.2.2 C*onstruction Activities and Implementation of Maintenance Activities*, whereby the timing of the vegetation clearing works is described: "*all vegetation clearance and site preparatory works will be conducted outside of the bird nesting season (1 March to 31 August inclusive) where possible. However, in the event that vegetation clearance works and/or site preparatory works are required during the bird nesting season, these will only be carried out once an advance survey has been carried out to establish whether there is any evidence of nests present, and the area proposed for clearance has been approved by a suitably qualified and experienced ecologist*." • Section 6 of the CEMP sets out the seasonal biodiversity constraints for the scheme.
3-070-01	Provision of a new section of vehicle restraint system (Armco barrier) to an overland flow path to direct water from the road into the Glenmore Stream.	No additional mitigation or monitoring measures. <u>Note for biodiversity:</u> • The contractor will be obliged to carry out vegetation removal works as described in Section 5.7 of EIAR Addendum (2020) Chapter 5.6.2.2 C*onstruction Activities and Implementation of Maintenance Activities*, whereby the timing of the vegetation clearing works is described: "*all vegetation clearance and site preparatory works will be conducted outside of the bird nesting season (1 March to 31 August inclusive) where possible. However, in the event that vegetation clearance works and/or site preparatory works are required during the bird nesting season, these will only be carried out once an advance survey has been carried out to establish whether there is any evidence of nests present, and the area proposed for clearance has been approved by a suitably qualified and experienced ecologist*." • Section 6 of the CEMP sets out the seasonal biodiversity constraints for the scheme.
3-080-20 and **3-070-07**	Addition of step pools upstream of the new planned bridge at the New Line junction.	No additional mitigation or monitoring measures. <u>Note for biodiversity:</u>

Drawing No.	Post-confirmation change	Additional mitigation and monitoring measures and features of note
		• Section 5.6.2.3 of EIAR Addendum Chapter 5 *Construction Activities and Implementation of Maintenance Activities*, includes specific mitigation measures regarding the in-stream works including the works window (July to September, inclusive) and the supervision by a suitably qualified and experienced ecologist. • Mitigation and monitoring measures to be implemented during instream works are described in Section 5.2.1 of the CEMP, Section 7.4 and 7.5.1 of the EIAR Addendum (2020) and Section 6.8 of the EIAR (2018). <u>Note for Hydrology:</u> • Mitigation and monitoring measures to be implemented for water quality works are described in Section 5.8.1 of the CEMP, Section 12.7.1.1 of the EIAR (2018) and Section 6.3 and Section 6.4.1 of the EIAR Addendum (2020).

4. Change to the Period for In-stream Works

The EMG agreed that the scope of the changes (changes to period for in-stream works) for the three tributaries (Cois na Gleann, Springmount Stream and Bleach Hill stream) fall within the residual effects described in the EIAR and NIS once the mitigation measures referenced to are implemented in full.

It was found that the suggested changes (changes to timing of in-stream works) for the main channel of the Glashaboy River at Sallybrook do not fall within the residual effects for fisheries as described in the EIAR and the timing of the in-stream works shall not change from that which was assessed in the EIAR.

The in-stream works window (EIAR and suggested change), and sensitive ecological periods are summarised below in Table 3. Mitigation measures for species is not limited to avoiding works at specific times of the year and Section 6.7 of the EIAR (2018) and Section 7.4 of the EIAR RFI Addendum (2020) set out all mitigation for biodiversity that the Contractor shall be obliged to adhere to.

Table 3: Summary of seasonal biodiversity constraints

Months:	J	F	M	A	M	J	J	A	S	O	N	D
In-stream works windows												
EIAR / IFI guidelines (2016)												
Post-confirmation change to in-stream works window for Cois na Gleann, Springmount Stream and Bleach Hill stream.												
Sensitive ecological periods for works to avoid:												
Lamprey – spawning												
Adult Sea Trout – migrating upstream												
Juvenile (glass) eel – ascending the river usually under the cover of darkness.												
Bats – transient roosting												
Bats – main maternity season												
Birds – nesting season (1st March – 31st August)												
Otters	Mitigation not seasonal.											
Badger	Mitigation not seasonal.											
Invasive species	Mitigation not seasonal.											

4.1 Cois na Gleann

The post-confirmation change, changes the timing of the in-stream works at Cois na Gleann from the current period of July to September to an extended period of May to September (inclusive). The construction methodology will not change from that which is described in Chapter 5 *Construction Activities and Implementation of Maintenance Activities* of the EIAR RFI Addendum (2020).

4.1.1 Biodiversity

Table 4 sets out the additional mitigation and monitoring measures for biodiversity to be applied for the post-confirmation design change to the period for in-stream works at Cois na Gleann.

Table 4: Additional mitigation and monitoring measures – biodiversity

EIAR	Additional Mitigation and Monitoring Measures
Biodiversity	• Fish rescue to be undertaken in advance of dry zone/ isolated area for culvert replacement work. • Pumping from the dry area will be with the use of filtration system attached to discharge end of the pipe (e.g., 'Silt buster' or similar). The precise arrangement via use of the Circus Field for filtration and clarification of pumped water to be agreed in advance of work on consultation with the project ECoW and Inland Fisheries Ireland. • Duration of the isolation works is to be kept as short as possible. • Screen the intake: Any pumps used for over-pumping must be 'fish-friendly' and fitted with appropriate screens to prevent fish being drawn into the pipe/pump. • Material that has accumulated upstream of the flow barrier should be carefully removed and properly disposed of e.g., by spreading over the adjacent field. The barrier should be removed as soon as possible after it is no longer needed.

Table 5 sets out biodiversity features that should be noted for the post-confirmation design change to the period for in-stream works at Cois na Gleann.

Table 5: Biodiversity features of note

Biodiversity	Features of note
Fisheries	The Cois na Gleann stream is not considered to be particularly good habitat for migratory fish species, due to low depths and head drops which impede passage upstream, (some measures are proposed within the project remit to improve longitudinal connectivity at this location). However, an increase in the period for in-stream works may increase the relative potential impact of silt mobilisation into the main channel during May-June period. Should a silt event arise from the works at Cois na Gleann occurs during the May-June period, the magnitude of potential impacts is higher downstream because the sensitive receptors are present during the May-June period. This area is close (<65m upstream) of the main channel at Hazelwood and Meadowbrook and some key areas for spawning lamprey and the upstream migrating adult sea trout in June, refer to below. Sea trout ascending the system at this time of year use the pools in the lower catchment – and particularly around John O'Callaghan Park to rest in before advancing upstream. While juvenile (glass) eel will ascend during the springtime window (March- May), it is usually under cover of darkness. If it is **a**ssumed that no night-time work is required at this location, then the migration period for glass eel is unlikely to coincide with ongoing works and associated runoff related risks from works areas. However, at this stage, the requirement for night-time works cannot be discounted given the traffic restrictions that may be required on the R615 and R639 and thus the migration period for glass eel may coincide with these works. Refer to mitigation below. Provided mitigation measures described in EIAR (2018) and EIAR RFI Addendum (2020) – over-pumping and filtration overland during works are correctly implemented, silt minimization should be effective and thus result in no measurable effects for the sensitive receptors described above. The key relevant elements of mitigation as described in the EIAR will be: • Daily presence of an ECoW, • Appropriate silt filtration and over-pumping techniques, and • Water quality monitoring as described in section 7.4.3.6 of EIAR RFI Addendum (2020), with triggered telemetry system.
Otter	The area around Meadowbrook is rich habitat for Otter. Surveys have shown several holts, slides and other otter signs in the area near to Cois na Gleann and downstream toward Meadowbrook. Since Otter are liable to change the location of their breeding holts year on year, it is possible that otter may be present within the footprint of proposed works for 2023. It is thus critical that pre-works surveys and checks will be carried out in advance of any planned works within the May-June window, and that adequate time is given for any potential derogation licences where needed. If these procedures are correctly followed, the potential impact for otter at this location should remain within the envelope of residual impacts predicted for otter in the EIAR.
Bats	None of the culverts surveyed during the baseline surveys for this project were found to have potential for bats. As such, the potential for risk at this location is limited to tree habitats and risk associated with vegetation clearance.

Biodiversity	Features of note
	Bat will be becoming active during the May-June seasonal window and may use trees as transient roosting sites. Bat checks prior to any necessary and agreed vegetation removal (within this breeding bird season) is required. No additional impacts for bats at this location are foreseen within the May -June window.
Birds	The area around Meadowbrook is key habitat for protected kingfisher and for dipper nesting in the area. Works within the key breeding bird season will need to consider the risk to birds and these two species in particular which nest directly within the river corridor. Dippers construct mossy nests within crevices in stonework and riverbanks, and kingfisher nest in holes within high bare banks, such as those at Meadowbrook. Pre-works checks by a suitably qualified Ecologist will be required to ensure no dipper, kingfisher, or any other breeding birds are present nesting in the vicinity. If all mitigation measures described in the EIAR for birds are correctly carried out, then no additional impacts during the extended May-June window is foreseen.
Invasive Species	Pre-works checks will need to show that the sites are clear in advance of the proposed works, and all biosecurity protocols are correctly followed during works. There is no additional risk associated with the extended works window in relation to invasive species.

4.1.2 Other Environmental Factors

Table 6 sets out the additional mitigation and monitoring measures has been prescribed for this post-confirmation change. Any features of note are also included where relevant.

Table 6: Additional mitigation and monitoring measures and features of note

EIAR	Additional mitigation measures and features of note
Population & Human Health	No additional mitigation or monitoring measures.
Landscape & Visual	No additional mitigation or monitoring measures.
Roads & Traffic	Careful consideration by the Contractor will need to be given to the timing of the works in May and June in the construction traffic management plan in order to minimise impacts on school traffic. Any temporary lane/road closure will be for a short duration only and would take place during the summer months or at other suitable times, i.e., long weekends or mid-term school holidays to minimise the impact on traffic in the area. <u>Note:</u> Section 14.6.2.1 of Chapter 14 of the 2018 EIAR set out a number of mitigation measures to minimise impacts which included temporary diversion routes, arranging the timing of road closures to coincide with off-peak times and to schedule the more disruptive elements during the summer months to coincide with the school holidays.
Noise & Vibration	No additional mitigation or monitoring measures.
Air Quality & Climate	No additional mitigation or monitoring measures.
Soils, Geology & Hydrogeology	No additional mitigation or monitoring measures.
Archaeology, Architectural, & Cultural Heritage	No additional mitigation or monitoring measures.
Material Assets	No additional mitigation or monitoring measures.
Hydrology	No additional mitigation or monitoring measures. <u>Note:</u> Mitigation measures to be implemented for water quality works are described in Section 5.8.1 of the CEMP, Section 12.7.1.1 of the EIAR (2018) and Section 6.3 and Section 6.4.1 of the EIAR Addendum (2020).

EIAR	Additional mitigation measures and features of note
Major Accidents & Disasters	No additional mitigation or monitoring measures.

4.1.3 NIS

No additional mitigation or monitoring is prescribed than what is proposed in the NIS for this post-confirmation design change. Section 5.2.1 of the CEMP sets out the mitigation and monitoring measures under the NIS.

4.2 Beach Hill

The post-confirmation change, changes the timing of the in-stream works at Bleach Hill from the current period of July to September to an extended period of May to September (inclusive). The construction methodology will not change from that which is described in Chapter 5 *Construction Activities and Implementation of Maintenance Activities* of the EIAR RFI Addendum (2020).

4.2.1 Biodiversity

Table 7 below sets out the additional mitigation and monitoring measures for biodiversity to be applied for the post-confirmation design change to the period for in-stream works at Bleach Hill.

Table 7: Additional mitigation and monitoring measures for biodiversity

EIAR	Additional Mitigation and Monitoring Measures
Biodiversity	• Fish rescue to be undertaken in advance of dry zone/ isolated area for culvert replacement work. • Pumping from the dry area will be with the use of filtration system attached to discharge end of the pipe (e.g., 'Silt buster' or similar). The precise arrangement via use of the Circus Field for filtration and clarification of pumped water to be agreed in advance of work on consultation with the project ECoW and Inland Fisheries Ireland. • Duration of the isolation works is to be kept as short as possible. • Screen the intake: Any pumps used for over-pumping must be 'fish-friendly' and fitted with appropriate screens to prevent fish being drawn into the pipe/pump. • Material that has accumulated upstream of the flow barrier should be carefully removed and properly disposed of e.g., by spreading over the adjacent field. The barrier should be removed as soon as possible after it is no longer needed.

Table 8 sets out biodiversity features that should be noted for the post-confirmation design change to the period for in-stream works at Bleach Hill.

Table 8: Biodiversity features of note

Biodiversity	Features of note
Fisheries	The Fisheries Habitat Value (FHV) was classed as 'Moderate' during the baseline surveys of the catchment, with the breakdown described as moderate for fish nursery and holding habitat, but of low value for spawning. The stream is located some 500m upstream of the Sallybrook fisheries sampling point (classed as 'Poor' FHV) and over 700m from the Mill Race sampling point (classed as 'Good'). The upstream Bleach Hill location and its relatively small stream size means that the risk of impact is lower than at other locations, and that control on sediment mobilization is simpler and more easily achieved. It is thus considered that no significant additional risk within the extended May-June works window is expected and provided all mitigation as escribed in the EIAR (2018) and EIAR RFI Addendum (2020) are correctly and effectively implemented the residual impacts remain as previously predicted.
Otter	If all pre-works surveys, checks and mitigation as described in EIAR are correctly followed, the potential impact for otter at this location should remain within the envelope of residual impacts predicted for otter in the EIAR.

Biodiversity	Features of note
Bats	None of the culverts surveyed during the baseline surveys for this project were found to have potential for bats. As such, the potential for risk at this location is limited to tree habitats and risk associated with vegetation clearance. Bats will be becoming active during the May-June seasonal window and may use trees as transient roosting sites. Bat checks prior to any necessary and agreed vegetation removal (within this breeding bird season) is required. No additional impacts for bats at this location are foreseen within the May -June window.
Birds	If all mitigation measures described in the EIAR for birds are correctly carried out, then no additional impacts during the extended May-June window is foreseen.
Invasive species	The area of Bleach Hill stream between chainages C09_000 and C09_200 was found to be infested with Japanese Knotweed during the baseline survey. In advance of the proposed works specialist checks will be needed to ensure that all stands of JK and other invasives species have successfully been eradicated from works areas in advance of commencement of works. Information on the locations of known invasive species is listed in the Invasive Species Management Plans (Appendices 4.1 of EIAR (2018) and 5.2 of EIAR RFI Addendum (2020)) and updated survey data (2021). Provided these checks show that the sites are clear in advance of the proposed works, and all biosecurity protocols are correctly followed during works, there is no additional risk associated with the extended works window in relation to invasive species.

4.2.2 Other Environmental Factors

Table 9: Additional mitigation and monitoring measures and features of note

EIAR	Additional mitigation measures and features of note
Population and Human Health	No additional mitigation or monitoring measures.
Landscape & Visual	No additional mitigation or monitoring measures.
Roads & Traffic	No additional mitigation or monitoring measures.
Noise & Vibration	No additional mitigation or monitoring measures.
Air Quality & Climate	No additional mitigation or monitoring measures.
Soils, Geology and Hydrogeology	No additional mitigation or monitoring measures.
Archaeology, Architectural, and Cultural Heritage	No additional mitigation or monitoring measures.
Material Assets	No additional mitigation or monitoring measures.
Hydrology	No additional mitigation or monitoring measures. <u>Note:</u> Mitigation measures to be implemented for water quality works are described in Section 5.8.1 of the CEMP, Section 12.7.1.1 of the EIAR (2018) and Section 6.3 and Section 6.4.1 of the EIAR Addendum (2020).
Major Accidents and Disasters	No additional mitigation or monitoring measures.

4.2.3 NIS

No additional mitigation is prescribed than what is proposed in the NIS for this post-confirmation design change. Section 5.2.1 of the CEMP sets out the mitigation and monitoring measures under the NIS.

4.3 Springmount Stream

The suggested change proposes to extend the period for in-stream works at Springmount Stream from the current July to September window to an extended period of May to September (inclusive). The construction

methodology will not change from that which is described in the Section 5.3.2 of Chapter 5 *Construction Activities and Implementation of Maintenance Activities* of the EIAR RFI Addendum (2020).

4.3.1 Biodiversity

Table 10 below sets out the additional mitigation and monitoring measures for biodiversity to be applied for the post-confirmation design change to the period for in-stream works at Springmount Stream.

Table 10: Additional mitigation and monitoring measures

EIAR	Additional Mitigation and Monitoring Measures
Biodiversity	• Fish rescue to be undertaken in advance of dry zone/ isolated area for culvert replacement work. • Pumping from the dry area will be with the use of filtration system attached to discharge end of the pipe (e.g., 'Silt buster' or similar). The precise arrangement via use of the Circus Field for filtration and clarification of pumped water to be agreed in advance of work on consultation with the project ECoW and Inland Fisheries Ireland. • Duration of the isolation works is to be kept as short as possible. • Screen the intake: Any pumps used for over-pumping must be 'fish-friendly' and fitted with appropriate screens to prevent fish being drawn into the pipe/pump. • Material that has accumulated upstream of the flow barrier should be carefully removed and properly disposed of e.g., by spreading over the adjacent field. The barrier should be removed as soon as possible after it is no longer needed.

Table 11 sets out biodiversity features that should be noted for the post-confirmation design change to the period for in-stream works at Bleach Hill.

Table 11: Biodiversity features of note

Biodiversity	Features of note
Fisheries	During the baseline survey site 7 at Springmount was classed as of poor habitat quality overall. However, the Springmount stream is just 60m upstream of quality habitat at Meadowbrook and as such there are specific sensitivities around lamprey spawning in early spring'/summer period at the Meadowbrook, which may be impacted by runoff from in-stream works at Springmount culvert. Additionally, elvers ascend the catchment during the March-May period. Lastly, adult sea trout tend to run on the Glashaboy catchment beginning in June and use the holding pools at Meadowbrook to rest during their migration. Thus, it is considered that there are additional sensitivities for in-stream receptors at this time of year (May-June), which may be negatively affected by works outside of the fisheries in-stream works period (July-Sept). Negative impacts on these species may interrupt an entire cohort and thus give rise to short term negative effects, significant at the catchment level. Due to the small capacity and minor nature of the Springmount stream it is possible that with extreme caution and adherence to silt mobilization prevention measures which would be effective in preventing any escapement of fine sediment downstream, that no additional impact may occur, even in the case of the heightened sensitivity of downstream receptors at this time of year.
Otter	The area just downstream of the culvert and around Meadowbrook is rich habitat for Otter. Surveys have shown several holts, slides and other otter signs in the area near to Springmount and downstream toward Meadowbrook. Since Otter are liable to change the location of their breeding holts year on year, it is possible that otter are present within the footprint of proposed works for 2023. It is thus critical that pre-works surveys and checks be carried out in advance of any planned works within the May-June Window, and that adequate time is given for any potential derogation licences where needed (typically 3-4 weeks).
Bats	None of the culverts surveyed during the baseline surveys for this project were found to have potential for bats. As such, the potential for risk at this location is limited to tree habitats and risk associated with vegetation clearance. Bats becoming active during the May-June seasonal window and may use trees as transient roosting sites. As such, bat checks prior to any necessary and agreed vegetation removal (within this breeding bird season) is required. No additional impacts for bats at this location are foreseen within the May -June window.
Birds	If all mitigation measures described in the EIAR for birds are correctly carried out, then no additional impacts during the extended May-June window is foreseen.

Biodiversity	Features of note
Invasive Species	Pre-works checks will need to show that the sites are clear in advance of the proposed works, and all biosecurity protocols are correctly followed during works. There is no additional risk associated with the extended works window in relation to invasive species.

4.3.2 Other environmental factors

Table 12: Additional mitigation and monitoring measures and features of note

EIAR	Additional mitigation measures and features of note
Population & Human Health	No additional mitigation or monitoring measures.
Landscape & Visual	No additional mitigation or monitoring measures.
Roads and Traffic	• Careful consideration by the Contractor will need to be given to the timing of the works in May and June in the construction traffic management plan in order to minimise impacts on school traffic. • Any temporary land/road closure will be for a short duration only and would take place during the summer months or at other suitable times, i.e., long weekends or mid-term school holidays to minimise the impact on traffic in the area. <u>Note:</u> • Section 14.6.2.1 of Chapter 14 of the 2018 EIAR set out a number of mitigation measures to minimise impacts which included temporary diversion routes, arranging the timing of road closures to coincide with off-peak times and to schedule the more disruptive elements during the summer months to coincide with the school holidays. With these mitigation measures in place, the conclusion was that the proposed scheme would have no significant residual impacts on traffic and the local road network. • The increase in the period for in-stream works to include the months of May and June will coincide with the school period. There are a number of schools in close proximity to the proposed works along the Springmount stream which would be accessed via the R639. • Should the culvert replacement works be carried out during the May-June period, the temporary lane/road closure would still take place during the summer months or at other suitable times, i.e., long weekends or mid-term school holidays to minimise the impact on traffic in the area as per the mitigation set out in the EIAR. Careful consideration by the Contractor will need to be given to the timing of the works in May and June in the construction traffic management plan in order to minimise impacts on school traffic and this will require approval with CCC and An Garda Síochána.
Noise & Vibration	No additional mitigation or monitoring measures.
Air Quality & Climate	No additional mitigation or monitoring measures.
Soils, Geology & Hydrogeology	No additional mitigation or monitoring measures.
Archaeology, Architectural, & Cultural Heritage	No additional mitigation or monitoring measures.
Material Assets	No additional mitigation or monitoring measures.
Hydrology	No additional mitigation or monitoring measures. <u>Note:</u> Mitigation measures to be implemented for water quality works are described in Section 5.8.1 of the CEMP, Section 12.7.1.1 of the EIAR (2018) and Section 6.3 and Section 6.4.1 of the EIAR Addendum (2020).
Major Accidents & Disasters	No additional mitigation or monitoring measures.

4.3.3 NIS

No additional mitigation is prescribed than what is proposed in the NIS for this post-confirmation design change. Section 5.2.1 of the CEMP sets out the mitigation and monitoring measures under the NIS.

5. Area 4 Additional Works

5.1 Summary of Post-confirmation change

The additional Area 4 works will consist of:

- New foul pipe construction and road reinstatement. See chainage c.77.98m to 112m in dwg. No. 4-080-02.
- New foul pipe construction and road reinstatement; Removal of 200mm of existing road build-up and road re-grading along the R639 at The Grove. See chainage c.112m to 329.33m in dwg. No. 4-080-02 and 4-080-03.
- Remove existing masonry wall, remove 200mm of existing road build-up, utility diversions and construction of a new flood defence embankment (c.112m long) with safety barrier, north of the confirmed pumping station lay-by. See chainage 217.8m to 329.33m in dwg. No. 4-080-01 and 4-080-02.
- Reduce existing masonry wall height to tie into the flood defence embankment and install a safety barrier (c.55m). See chainage 332.70m to 387.32m in dwg. No. 4-080-01.
- Wall repair works to the existing masonry wall (north of the new flood defence embankment) (c. 42m). See chainage 387.32m to 428.88m in dwg. No. 4-080-01.

To accommodate the additional flood protection works, minor changes to the confirmed works have been made to the design and these are:

- Reduce the length of the flood defence wall from 146m to 127.05m. See chainage 90.75m to 217.80m in dwg. No. 4-080-02.
- Reduce the length of wall repair works to the existing masonry wall, south of the pumping station layby, from 38m to 12.77m. See chainage 77.98m to 90.75m in dwg. No. 4-080-02.

5.2 Post-confirmation Surveys

Additional surveys were carried out for biodiversity and archaeology for parts of Area 4 that had not been surveyed for the EIAR (2018) and EIAR Addendum (2020) previously.

5.2.1 Ecology Survey

Table 13 summarises the ecological survey carried out at Area 4 on 7 December 2022 by Dr Niamh Burke.

Table 13: Summary of Ecological Survey (7 December 2022)

Biodiversity	Description of Effects
Habitats and Flora	The site for which additional road-raising and embankment works are proposed is a low-lying, D-shaped area of grassland, scrub and woodland, situated between the R639 road and the river. The area is flanked by the R639 from which it is currently separated by a footpath and a stone wall. The habitats found within this area are largely of low value ecologically, although the woodland and scrub represent good habitat for breeding birds. The area of mixed woodland to the north of the site and the woodland bordering the site to the east, represents medium-high potential for roosting bats within the mature specimen trees. Bats may also use the vegetated areas and the river corridor itself to commute and forage. Otter may commute along the river channel adjacent to the site. A mammal hole was identified in the central area of the site (see habitat map, Figure 1) and due to its size and shape, considered to be a potential fox den
Fisheries	As described in detail in section 7.3.1.7 of the EIAR (2018) and section 7.3.2.7 of the EIAR Addendum (2020), the Glashaboy catchment is an important river for fisheries. There are a number of protected species that occur in the catchment including Atlantic Eel, Atlantic Salmon, Lamprey and Brown Trout. There is the potential for pollution/sediment release locally to the river, and for disturbance to species at a local level. Additionally, vegetation maintenance or removal may also affect the in-river temperatures - especially during the summer months, so can affect salmonids (cold water fish) negatively.

Biodiversity	Description of Effects
	Depending on the extent of vegetation clearance and the degree of shading remaining, the impact due to riparian vegetation clearance may have a minor to medium impact on fisheries.
Otter	As described in detail in section 6.7 of the EIAR (2018) the Glashaboy catchment is an important river for otter. Several holting sites have been identified on the mainstem channel and on the Glenmore stream. Otter are considered to be of Regional Importance in the context of the Scheme. The rich fisheries habitat provides an abundant food source for the otter populations present on the catchment and within the scheme footprint. Predicted impacts include the potential for pollution and sediment release locally to the river creating deleterious effects on fisheries with knock-on effects for otter. Direct disturbance to otter during construction and / or maintenance activities is also possible. During the 2022 site survey, no otter holts in or near the river bankside were identified. Additionally, the additional Area 4 works proposed as part of this post-confirmation change is located some distance from the river channel (30 – 100m). Direct impacts and disturbance to otter are therefore unlikely at this location.
Bats	The EIAR (2018) identified 34 trees with bat roosting potential along the scheme. Some works to structures such as the sealing of crevices in bridges were also considered to have a negative impact on bats (Daubenton's and Natterer's bats in particular), and a derogation was applied for and obtained from National Parks and Wildlife Service (NPWS) with respect to bats for the Scheme, detailing mitigation measures and retention of crevices within structure to accommodate bats in the scope of the works. Where there was need to remove any trees with bat roosting potential, mitigation has also proposed to address this loss of habitat. Section 6.8.6 of the EIAR (2018) details this mitigation. Within the Area 4 suggested additional works footprint there are some areas of woodland (WN6 and WD1), but few of these trees are mature enough to represent bat roosting habitat. However, one mature oak specimen to the north of the site (at the trackway entrance) does represent medium to high potential bat roosting habitat and as such requires retention. There are also a number of semi-mature trees (Beech, Sycamore, Oak) along the right bank heading north past the trackway, and these may have some bat roosting potential (albeit low) due to ivy cover and other features such as tree limb splits and loose bark.
Birds	The Glashaboy FRS will require construction works to be undertaken north of Cork Harbour SPA. Therefore, no aspects of the works will encroach on the designations, and no part of the permanent flood structures will encroach within the boundaries of any designated sites. The Area 4 works are some 600m upstream of the Cork Harbour SPA and as such represent the closest works proposed along the scheme. As outlined within the EIAR (2018), the main potential impacts are disturbance during works and indirectly through contaminated water entering the tidal habitat and mudflats. The Glashaboy catchment, including the Area 4 proposed works footprint, provides good quality habitat for breeding birds during the March to September timeframe. The woodland and scrub habitat present on site is ideal for a variety of breeding and nesting passerine birds. Species observed during the 2022 site visit included bullfinch, chaffinch, wren, robin, sparrow, blackbird but this selection would not be representative of the much wider variety of birds that may be present in a breeding capacity during the spring and summer season.
Invasive Species	As outlined in the EIAR (2018) and the EIAR Addendum (2020), several non-native species are known to be present in the Glashaboy catchment and within the works footprint. In 2017, Japanese Knotweed Ireland carried out an invasive species survey in the study area and contributed to the Invasive Species Management Plan (Appendix 5.1, EIAR Addendum (2020)). The dominant invasives species found in the catchment was Japanese Knotweed, with some smaller stands of Himalayan Balsam and several areas infested with Winter Heliotrope. While certain species are controlled strictly under EU legislation - such as Japanese Knotweed, others are not legislated for in the European context although they are classed as 'invasive' and their relative risk or 'Impact Status' posed to biodiversity in Ireland scored as Low, Medium or High, as according to Biodiversity Ireland (Kelly et al., 2013). The following plant species considered non-native and invasive, were found on site within the proposed works Area 4. Complete eradication of all of these species is advisable in advance of works to reduce the risk of invasive species spread into the wider locality. Japanese Knotweed is controlled under European Legislation, and as such is part of the ongoing treatment programme carried out annually by contractor Japanese Knotweed Control ltd. One stand of Japanese knotweed was identified during the 2022 survey, within the understorey of WN6 woodland to the north of the site (see Habitat map for location in Figure 1 below).

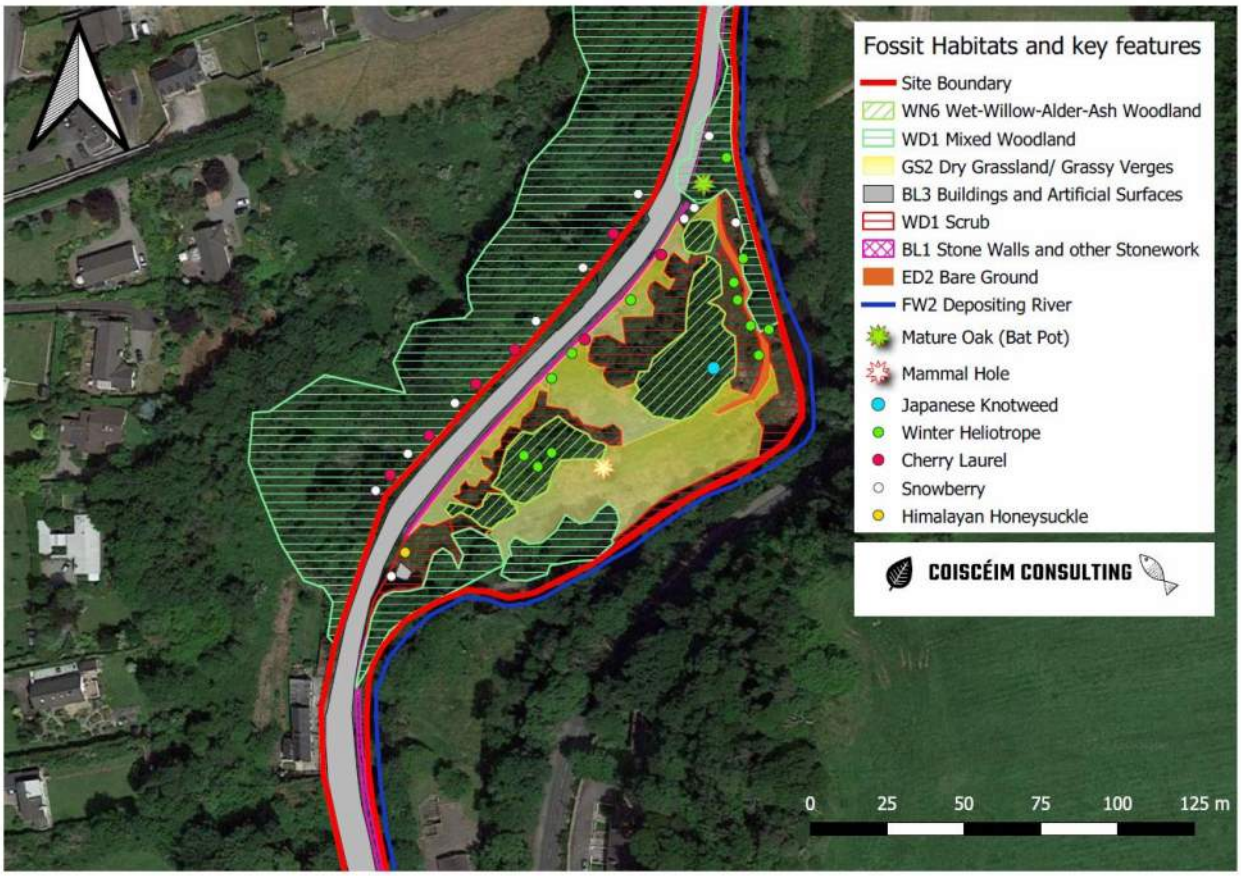

Figure 1: Fossitt (2000) Habitats within the additional site works area. Not to scale

5.2.2 Archaeological Survey

No potential archaeological finds or features were identified during a walkover survey of Area 4 undertaken on the 7th of February 2023 by Lane Purcell. However, the area where the embankment is proposed is greenfield and in the floodplain of the river which is considered to be an Area of Archaeological Potential (AAP) where previously unrecorded subsurface archaeological remains may be present.

Ground preparation works for the embankment will require excavation and ground reduction. This would have a direct effect on any potential subsurface archaeological sites which may be present in this AAP. Where extensive earthmoving is involved there is always the possibility that archaeological material will be uncovered.

The proposed construction of the embankment and safety barrier will require the removal of a section of existing random rubble wall (110m) which is part of the local built cultural heritage. The effect of this impact is assessed as direct slight negative.

The proposed repair works to a section of the same random rubble wall (55m) as part of additional Area 4 works will have a positive effect on the local built cultural heritage.

5.3 Biodiversity

Table 14 below sets out the additional mitigation and monitoring measures for biodiversity to be applied for the post-confirmation design change of additional flood protection works at Area 4.

Table 14: Additional mitigation and monitoring measures for biodiversity

EIAR	Additional Mitigation and Monitoring Measures
Biodiversity	**Bats** • One mature oak tree to the north of the site, at the site entrance adjacent to the R639 holds medium-high bat roosting potential and as such requires retention. The Mature woodland on the western side of the R639 also holds some mature specimen trees which have bat roosting

EIAR	Additional Mitigation and Monitoring Measures
	potential. It is assumed that the oak tree to the north of the site as well as all mature trees on the western site boundary will be retained. Any proposal for tree removal in these areas during works will require consultation with the on-site ECoW and an assessment of whether it meant the impact may fall outside the envelope of effects for the scheme. **Mammals** • The mammal hole identified to the south-centre of the site (see habitat map) will require pre-works checks to ascertain activity status and species, **Invasive Species** • Several stands of non-native invasive species occur within and at the site boundary to include a stand of Japanese knotweed, snowberry, Winter Heliotrope, Cherry Laurel, Himalayan Honeysuckle, Traveller's joy / Old Mans Beard and Buddleia. Full eradication of all Japanese knotweed is required prior to commencement of works. It is also recommended that all other above-mentioned species are safely removed in advance of works to ensure minimal risk of spreading to other areas. Likewise, strict biosecurity protocols are required at the location - to be implemented by the site manager in consultation with the project ecologist (ECoW). Those involved in the control of invasive species eradication shall obtain the advice of a Registered Pesticide Advisor on the register established by the Minister for Agriculture, Food and the Marine pursuant to Regulation 4 of the Sustainable Use of Pesticides Regulations. All pesticide users must be registered and have the appropriate training necessary to carry out the proposed method of control.

Table 15 sets out biodiversity features that should be noted for the additional Area 4 works.

Table 15: Biodiversity features of note

Biodiversity	Description of Effects
Protected Sites	The existing residual effects predicted in the EIAR will not change as a result of the additional Area 4 works. Imperceptible effect.
Habitats and Flora	The site for which additional road-raising and embankment works are proposed is a low-lying, D-shaped area of grassland, scrub and woodland, situated between the R639 road and the river. The area is flanked by the R639 from which it is currently separated by a footpath and a stone wall. The habitats found within this area are largely of low value ecologically, although the woodland and scrub represent good habitat for breeding birds. The area of mixed woodland to the north of the site and the woodland bordering the site to the east, represents medium-high potential for roosting bats within the mature specimen trees. Bats may also use the vegetated areas and the river corridor itself to commute and forage. Otter may commute along the river channel adjacent to the site. • A mammal hole was identified in the central area of the site (see habitat map, Figure 1 above) and due to its size and shape, considered to be a potential fox den. The habitats identified on site are described in ecological terms in the following sections.
Fisheries	The area 4 works involve bankside works only, and as such are not considered to pose any additional impact outside the envelope of existing impacts. The mitigation measures as described in the EIAR (2018) section 6.8.9 on Pollution Prevention Measures and in Table 17.1, and in the accompanying CEMP, - section 5.2.1.3 on Bankside works. The EIAR Addendum (2020) section 7.4.3.1 on Bankside Works further details measures to prevent silt and contaminant mobilisation and delivery to the watercourse, and in particular, the effective adoption of surface water controls during embankment construction, to include: *'Appropriate erosion and silt controls as described below, to prevent delivery of surface water from the work site into the adjacent watercourses, (these will include trenches, settling ponds, silt fences)'. (See also figure 7.5 in CEMP):* Use geotextile to cover any areas of bare soil. Disturb only the areas necessary for immediate construction to limit the amount of erosion and sediment control that is needed. Keep natural vegetation in place and leave topsoil undisturbed as much as possible. Use silt fencing coupled with a silt trap/ sump, to interrupt the pathway along the slope towards the river and intercept any fine sediment. Segment the site into manageable sediment storage areas for using multiple silt fence runs. Provided these mitigation procedures are correctly followed, the potential impact for fisheries at this location should remain within the envelope of residual impacts predicted in the EIAR.

Biodiversity	Description of Effects
Otter	The nature of the proposed works is some distance from the riverbank and thus poses minimal risk of impact to disturbance of otter along the watercourse. If all pre-works surveys/checks and mitigation procedures are correctly followed, the potential impact for otter at this location should remain within the envelope of residual impacts predicted for otter in the EIAR.
Bats	One mature oak tree to the north of the site, at the site entrance adjacent to the R639 holds medium-high bat roosting potential and as such requires retention. The mature woodland on the western side of the R639 also holds some mature specimen trees which have bat roosting potential. No vegetation removal of mature trees is required within the scope of these Area 4 works. The area is also prime commuting and foraging habitat for bats with its lush vegetation, linear hedgerows and treelines, and along the river channel. Provided due care is given to these sensitivities for bat roosting and foraging habitat, and per described in the EIAR, no additional impacts for bats at this location are foreseen.
Birds	If all mitigation measures described in the EIAR for birds are correctly carried out, then no additional impacts are foreseen. The retention of as much tree and scrub vegetation within this area as possible will benefit breeding birds. Enhancement of the site with further planting of native trees would also be advantageous for bird species and for biodiversity in general.
Invasive Species	The area within the Area 4 proposed works was found to be infested by Japanese Knotweed during the baseline surveys. Treatment to eradicate these stands is underway. Pre-works checks will need to show that the sites are clear of Japanese Knotweed in advance of the proposed works, and all biosecurity protocols as outlined in the Invasive Species Management Plan (ISMP) are correctly followed during works. Several other species which are considered invasive species but are not listed on the Third schedule of the Habitats Regulations (2011) but which are deemed to pose a risk to biodiversity were identified on site (table 3). Eradication by either hand, mechanical or chemical means (as appropriate) should be undertaken in advance of site works in area which are within the footprint of works. Table 4 below lists the appropriate methods for eradication of the various invasive plant species found on site during the 2022 site visit. Eradication should be caried out by competent and licenced contractors in advance of works. In addition, construction site biosecurity protocols as described in the ISMP (Appendix 5.1, EIAR Addendum (2020)) and in section 5.2.1.3 of the CEMP (Appendix 5.2 of the EIAR Addendum, 2020), should be strictly observed during works to further minimise the risk of invasive species spread, from the site to other areas, or from other areas on construction machinery into the Area 4 site. Provided these protocols are followed, there is no additional risk associated with the additional area 4 works in relation to invasive species, and so should remain within the envelope of residual impacts predicted in the EIAR.

5.4 Other Environmental Factors

All additional mitigation and monitoring measures for the other environmental factors addressed in the EIAR, apart from biodiversity (see above), are in Table 16 below.

Table 16: Additional mitigation and monitoring measures and features of note

EIAR	Additional mitigation measures and features of note
Population and Human Health	No additional mitigation or monitoring measures.
Landscape & Visual	No additional mitigation or monitoring measures.
Roads & Traffic	No additional mitigation or monitoring measures. <u>Note:</u> The proposed additional Area 4 works are likely to extend the duration of works beyond what was predicted in the EIAR (20 to 25 weeks). Therefore, the extent and duration of traffic management measures on the R639 may need to be extended for longer than was predicted under the confirmed scheme.
Noise & Vibration	No additional mitigation or monitoring measures.

EIAR	Additional mitigation measures and features of note
Air Quality & Climate	No additional mitigation or monitoring measures.
Soils, Geology and Hydrogeology	No additional mitigation or monitoring measures. <u>Note:</u> As noted in the EIAR and the biodiversity survey (December 2022), there are invasive plant species on site and the contractor will have to adhere to all invasive species mitigation measures described in the CEMP to ensure the appropriate bio-security and disposal (if necessary) measures are implemented.
Archaeology, Architectural, and Cultural Heritage	As per Construction Mitigation Measures outlined in Section 13.4.1 of the RFI (2020) the following mitigation is proposed for additional Area 4 works as follows: • Area Specific archaeological testing: Advanced licenced archaeological testing will be undertaken of the proposed embankment footprint in Area 4. • Archaeological Record (descriptive and photographic) of the impacted section of wall in advance of being removed. As per Remedial Actions outlined in Section 13.5 of the RFI (2020) any archaeological features identified during testing will be fully resolved to professional standards of archaeological practice. Such material will be preserved *in situ* or preserved by record, as appropriate, as outlined in Policy and Guidelines on Archaeological Excavation – Department of Arts, Heritage, Gaeltacht and the Islands.
Material Assets	No additional mitigation or monitoring measures.
Hydrology	No additional mitigation or monitoring measures. <u>Note:</u> The contractor shall implement all mitigation measures described in the EIAR and CEMP to minimise the risk of spills and contamination of the surface water i.e. Glashaboy River.
Major Accidents and Disasters	No additional mitigation or monitoring measures.

5.4.1 NIS

No additional mitigation is prescribed than what is proposed in the NIS for this post-confirmation design change. Section 5.2.1 of the CEMP sets out the mitigation and monitoring measures under the NIS.

Appendix J

Otter Derogation Licence - Tree felling works 2022

J.1 Licence No. DER-OTTER-2022-09 (Tree felling works 31 January 2022 - March 2022)

An Roinn Tithíochta,
Rialtas Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

Licence No.: DER – OTTER – 2022–09

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".

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

(A) this licence is to 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.

The Minister, in exercise of the powers conferred on him by Regulation 54 of the Habitats Regulations hereby grants to **Ross Macklin of Triturus Environmental Ltd** on behalf of **Cork County Council,** ("the licensee") a licence in respect of ***Lutra lutra***. 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.

Terms and Conditions

1. This licence is granted solely in respect of the activities specified in connection with **tree felling works in conjunction with the Glanmire/Sallybrook Drainage Scheme.**

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

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 **31st January 2022** and **31st March 2022.**

6. The works are to comply with **TII's 'Guidelines for the treatment of Otters 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 (**Glashaboy Otter Derogation)**, prepared by **Ross Macklin**, for **Cork County Council**, dated **22nd January 2022** and, if specified, 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 **Claire Deasy** who can be contacted at **Claire.Deasy@housing.gov.ie, 353 15393694.**

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 mentioned in point 10 above, submit to the signatory at the address below an interim report on the progress and impact of the works carried out under the terms of the licence. The licensee shall submit a further report by the **30th June 2022 (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.

Claire Crowley
(a person authorised by the Minister to sign on his behalf)

31/01/2022

Department of Housing, Local Government and Heritage
National Parks and Wildlife Service
Wildlife Licensing Unit
R. 2.03
90 North King Street, Smithfield
Dublin 7
D07 N7CV

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.

J.2 Glashaboy Flood Relief Scheme Otter Derogation Report, Triturus Environmental Ltd. for NPWS, April 2022

Glashaboy Flood Relief Scheme otter derogation report

Prepared by Triturus Environmental Ltd. for the NPWS

on behalf of ARUP consulting engineers

April 2022

Please cite as:

Triturus (2022). Glashaboy Flood Relief Scheme otter derogation survey report 2022. Report prepared by Triturus Environmental Ltd. for the NPWS on behalf of ARUP consulting engineers. April 2022.

Table of contents

1. Introduction

Arup consulting engineers commissioned Triturus Environmental Ltd. to attain a derogation licence for the temporary disturbance of otter during pre-works tree felling as part of the Glanmire-Sallybrook Drainage Scheme. The derogation was also required to facilitate the construction of artificial holts within 150m of known breeding and resting areas of otter as part of mitigation for disturbance to otter during the build of the scheme. The location of the identified holts was recorded as part of otter surveys carried out on the Glashaboy River during April 2021 (Triturus, 2021).

In light of the above and given the likely unavoidable disturbance to the breeding and or resting places of otter a derogation license under Regulation 54 of S.I. No. 477 of 2011 (Birds and Natural Habitats Regulations) was applied for. The derogation licence (number DER-OTTER-2022-09) was granted on the 30th of January 2023.

In addition to the derogation licence and as part of the monitoring requirements of the derogation a programme of scientific monitoring by trail camera under sections 9 and 23(b) of the Wildlife Acts 1976 to 2018 was also undertaken (licence number 3/22, granted on the 18th January 2022). The 'live' surveillance monitoring using cellular trail cameras helped elucidate patterns of activity by otter and establish the occupancy of the holts areas before, during and after tree felling.

1.1 Background on Advance Works Tree Felling

The advance tree felling was required to facilitate the Glashaboy River (Glanmire/Sallybrook) Drainage Scheme which includes the construction of direct flood defences and conveyance improvement measures along the Glashaboy River and its tributaries. The direct defences proposed include flood walls and embankments with the conveyance improvements consisting of localised channel widening and deepening and the introduction of, or replacement of, culverts. Due to existing residential and business property locations susceptible to flooding adjacent to the river there is a very limited scope to locate defences outside of the riparian corridor. Therefore, to construct these defences existing trees along the banks of the river were required. The advance tree felling works were being carried out due to the various time constraints relating to environmental factors (for example in-stream works period etc.) so as not to adversely delay the main project schedule.

1.2 Known breeding & resting areas of otter

Total channel walkover otter surveys were conducted in April 2021 by Triturus Environmental Ltd. to record otter signs throughout the Glashaboy River covering the Flood Relief Scheme extents. The surveys recorded both otter holts in the vicinity of the advance works tree felling areas and the proposed location for artificial holt construction (see Table 1 and Figures 1-3 below). Those holts situated on the scheme overlapping the proposed works areas (i.e. screened in if they were situated within 150m of the works areas) are presented on Table 1 below.

In total, 5 otter holts were recorded within the study area overlapping tree felling areas (**Table 1.1 & Figure 2.2**). The holt locations were situated on the Glashaboy River riparian areas at **1.** Sallybrook (single holt N2), **2.** East of Glanmire GAA pitch (holt cluster N3, N4 & N5) and **3.** in the Circus Field north of Meadowbrook Bridge. Given the scope and nature of the proposed tree felling works in relation to

the locations of the existing holts, disturbance was unavoidable. While there was a means for disturbance to otter at holt cluster N3-N5, albeit low, the location of the holt within 25m of the works area meant this holt area was also included in the derogation licence. However, it must be stated that no permanent loss of the holts identified overlapping the tree felling areas was required and disturbance was indirect and temporary only.

Table 1.1 – Summary of Otter Holts Screened in by virtue of distance from works (see also Figures 1, 2 & 3)

Holt Number	Holt Location (see also appended otter report Triturus 2021)	Distance from works (see Figures 1-3)	Rationale for monitoring	ITM (Coordinates)
1. Holt N2 (Sallybrook)	Adjoining proposed **tree felling** at Sallybrook	Adjacent to tree felling area	Indirect disturbance to holt (nearby tree felling)	572477, 576830
2. Holt N3, N4 & N5 (holt cluster)	Holts situated east of Glanmire GAA field on Millrace Channel Island. These are situated to the north of **proposed artificial holt area** at end of Millrace Channel Island.	25m to north of proposed artificial holt construction	Indirect disturbance to holt (construction of artificial holts – 2 number to south of holt cluster)	572676, 575837
3. Holt N6	Holt situated under root system of a large tree in the Circus Field north of Meadowbrook Bridge. Holt adjoining proposed **tree felling** area.	Adjacent to tree felling area	Indirect disturbance to holt (nearby tree felling)	572678, 575586

2. Methodology

2.1 Camera Surveys at Holts

Three Secacam Pro Plus mobile LTE trail cameras were positioned on riparian trees above normal flood levels in the vicinity of three holts overlapping the proposed tree felling areas. The cameras were positioned between 5m and 10m from the holts. The cameras recorded time, date, temperature and other attributes and are triggered by mammal movement using infra-red sensors. The cameras also recorded live imagery via mobile phone network with live images sent to a mobile phone. This minimised the requirement for regular movement of the cameras and thus reduced disturbance near holt areas during monitoring. In advance of commencement of the survey the local ranger of the NPWS (Claire Deasy) was be notified. A site visit was also undertaken with the NPWS during December 2021 to inform local staff of the proposals in advance of commencement of works. The trail camera monitoring was undertaken between the 14th of January 2021 and the 31st March 2022.

Table 2.1 Location of Otter Holt Monitoring areas by trail camera

Holt Number	Holt Location (see also appended otter report Triturus 2021)	Rationale for monitoring	ITM (Coordinates)
Holt N2	Adjoining proposed tree felling at Sallybrook	Indirect disturbance to holt (nearby tree felling)	572477 576830
Holt N3, N4 & N5 (holt cluster)	Holts to north of proposed artificial holt area at end of Millrace Channel Island	Indirect disturbance to holt (construction of artificial holts – 2 number to south of holt cluster)	572676 575837
Holt N6	Adjoining proposed tree felling upstream of Hazelwood Bridge (aka 'Circus Field')	Indirect disturbance to holt (nearby tree felling)	572678 575586

2.2 Supervision of Tree felling

Triturus Environmental Ltd. staff supervised tree felling works at Sallybrook and Hazelwood between the 3rd and 18th February 2023.

Tree cutting occurred on the same bank as holt N6 on the Glashaboy River (west bank) in the vicinity of Hazelwood Bridge in the Circus Field. A 10m buffer was marked around the holt entrance and all overhanging low lying tree limbs and scrub were maintained to preserve cover (seclusion) for otter. Felling in the vicinity of the holt was completed within two days to minimise the duration of works.

Tree cutting at holt N2 was on the east bank (opposite bank to holt) meaning no direct disturbance occurred. In advance of works the otter holt was marked with red hazard tape to ensure locations were visible to tree surgeons. This ensured that where cutting was undertaken no trees would fall in the direction of the holt. Felling in the vicinity of the holt was completed within two days to minimise the duration of works.

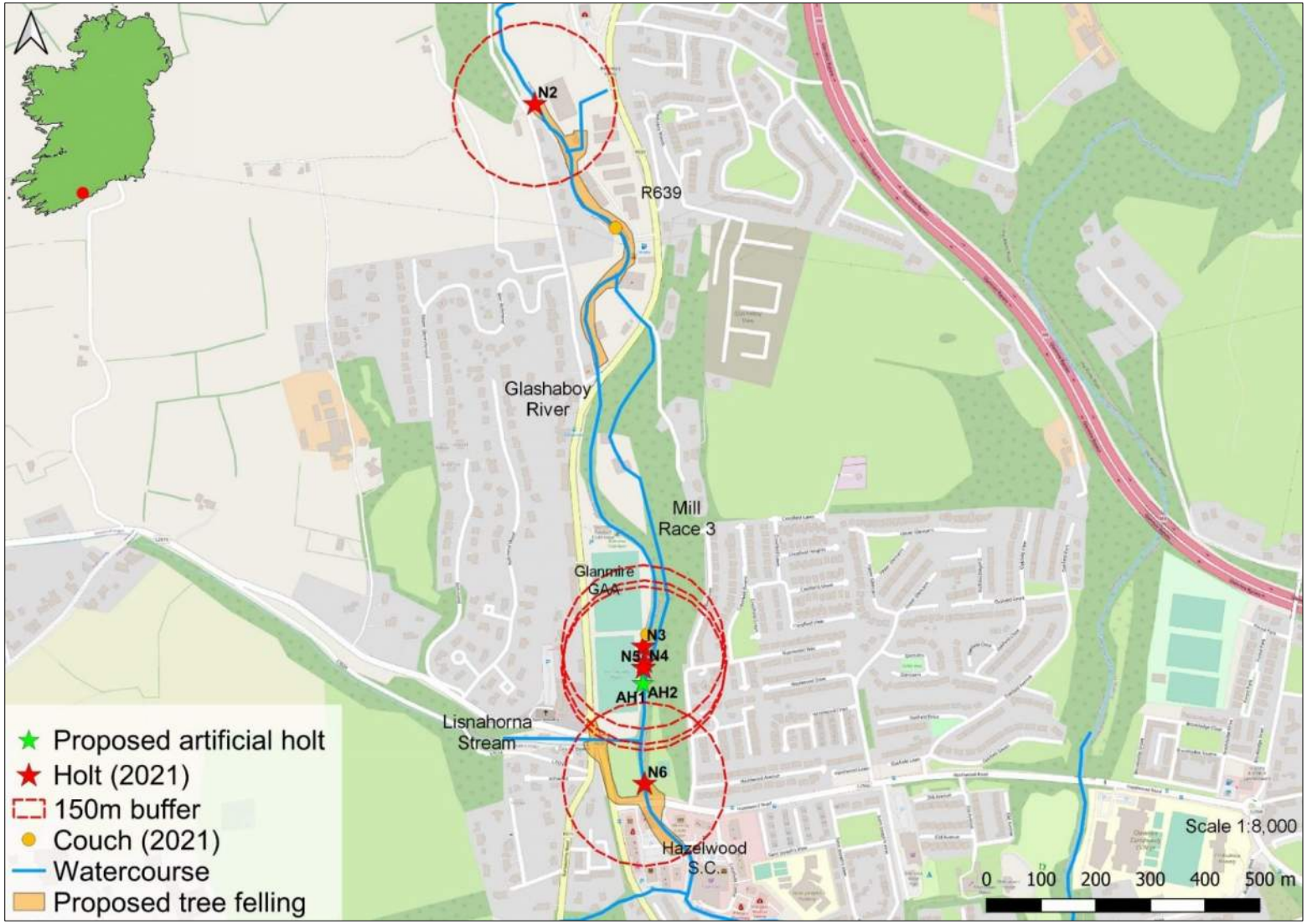

Figure 2.2 Overview of holt monitoring areas relative to tree felling and artificial holt construction

3. Results & Discussion

Otter breeding (holts) and resting areas (couches) are especially sensitive to direct human disturbance (Mason & Macdonald, 2009) and there is a known clear association between the location of holts and low disturbance areas of river channel on the Glashaboy River (pers. obs). This same local disturbance-related trend has been repeatedly observed in other urban and peri-urban watercourses across Ireland (e.g. Macklin et al., 2019; Brazier & Macklin, 2020; Triturus pers. obs.). Otter reproductive success is known to be higher in less disturbed habitats and demonstrates a preferential fidelity for low disturbance areas of channel (Loy et at., 2009; Ruiz-Olmo et al., 2011). Furthermore, well-developed and preserved riparian zones such as those found on the Glashaboy can buffer anthropogenic impacts, and healthy ecological corridors with good connectivity are likely to play an increasingly important role in otter dispersion and commuting considering climate change impacts (Cianfrani et al., 2018).

In light of the potential for disturbance during the pre-works felling tree felling supervision with site specific mitigation was undertaken in conjunction with the advice from local NPWS staff (Claire Deasy). The approach that was agreed between Triturus Environmental Ltd. and NPWS resulted in no observed significant impacts to the behaviour of otter with otter activity remaining consistent before and after the tree felling at two of the three active holts monitored (Table 3.1). This was achieved by minimising encroachment directly on the holt areas, minimizing the duration of works and by maintaining cover around the holt areas by selective tree felling with all works undertaken during daylight only. The holt areas were demarcated by hazard tape and the arborists were informed of where to avoid cutting and to minimise any encroachment on the holts (**Plates 3.1 & 3.2**). The works were monitored by trail camera monitoring before and after felling to monitor otter activity (**Plates 3.3-3.6**) confirming otter activity at holts before and after tree felling. This can be considered as evidence of no significant disturbance as otter continued to use the holt areas post felling (**Table 3.1**).

Table 3.1 Location of Otter Holt Monitoring areas by trail camera

Holt Number	Holt Location (see also appended otter report Triturus 2021)	Rationale for monitoring	Active before tree felling	Active after tree felling	Significant disturbance observed Y/N
Holt N2	Adjoining proposed tree felling at Sallybrook	Indirect disturbance to holt (nearby tree felling)	**Yes**	**Yes**	**No**
Holt N3, N4 & N5 (holt cluster)	Holts to north of proposed artificial holt area at end of Millrace Channel Island	Indirect disturbance to holt (construction of artificial holts – 2 number to south of holt cluster)	**No**	**No (no activity before or after works)**	**No**
Holt N6	Adjoining proposed tree felling upstream of Hazelwood Bridge (aka 'Circus Field')	Indirect disturbance to holt (nearby tree felling)	**Yes**	**Yes**	**No**

Plate 3.1 Tree felling in the 'Circus Field' at Meadowbrook showing the preservation of vegetation overhanging holt No. N6 on the Glashaboy River at Meadowbrook. Vegetation area that was preserved overhanding the holt was marked with yellow hazard tape from above to ensure drivers avoided inadvertent cutting

Plate 3.2 Tree felling did not occur on the west bank of the Glashaboy River at Sallybrook and the holt area was marked during cutting to ensure no inadvertent damage to vegetation

Plate 3.3 Otter activity before tree felling at Sallybrook holt No. N2

Plate 3.4 Otter activity after tree felling at Sallybrook holt No. N2

Plate 3.5 Otter activity before tree felling at Meadowbrook holt No. N6

Plate 3.6 Otter activity after tree felling at Meadowbrook holt No. N6, camera angle changed due to vegetation growth

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J.3 Letter from Triturus Environmental Ltd. to NPWS