

**SLOPE REMEDIATION PROJECT AT
COGHLANSTOWN, BALLYMORE EUSTACE**

ACCOMPANYING PLANNING STATEMENT

PROJECT NO. K401

JANUARY 2019



OCSC

O'CONNOR | SUTTON | CRONIN

Multidisciplinary
Consulting Engineers



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DOCUMENT CONTROL & HISTORY

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JANUARY 2019

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1 INTRODUCTION

1.1 Project Background

This report supports the Part 8 planning application for the Coghlanstown Slope Remediation project in Ballymore Eustace, Co.Kildare.

Significant slope failure occurred along the north bank of the River Liffey, west of Ballymore Eustace in August 2016. The slope failure occurred when the steep vegetated slope gave way, taking all vegetation in its' path with it. As a result the local road is closed to the public. Critical infrastructure is located within the road above the Liffey Valley Meander Belt pNHA (proposed National Heritage Area) and the proposed works are to stabilise the slope to prevent further slippage.

As part of the project, a multi-criteria analysis of 7 options was undertaken in accordance with the Department of Transport Tourism and Sport (DTTas) *Appraisal Guidelines for Regional and Local Roads Capital Projects*. The 7 options were agreed with Kildare County Council before the assessment. The extent of the analysis fell under section 4.5 of the DTTAS appraisal guidelines, Stage 1 – Preliminary Appraisal. The analysis for this stage of design includes:

- Completion of a Preliminary Appraisal Form
- Completion of the Preliminary Multi Criteria Analysis
- Total Project Budget Sheet

All documents listed above were included as part of the option assessment in an Options Selection Report.

1.2 Site Overview

The location of the site is shown in Figure 1 below.

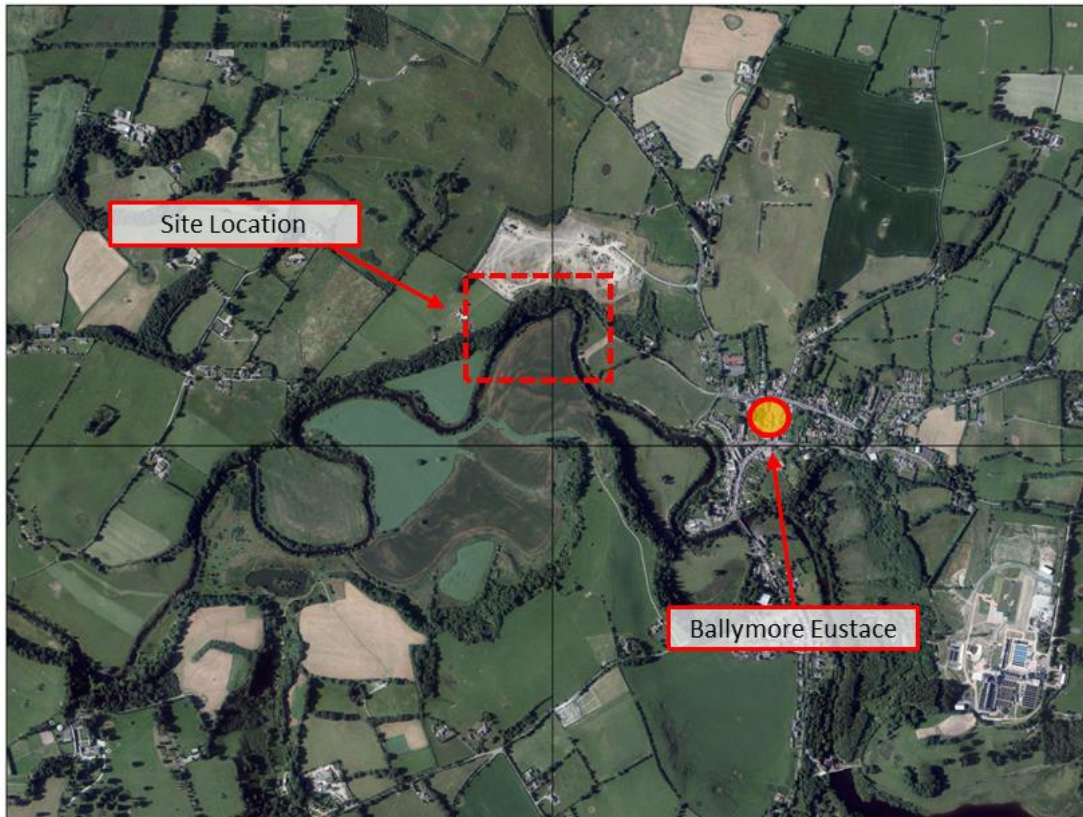


Figure 1 - Site Location

2 PLANNING AND DEVELOPMENT CONTEXT

From a review of the Kildare County Development Plan 2017-2023, the reinstatement of the L6047 is consistent with the planning and development objectives and policies of Kildare County Council.

In Chapter 2 Village Plans and Settlements, in relation to Ballymore Eustace there are a number of objectives related to L6047. These objectives assume that the road is open:

It is an objective of the Council to:

RD 1 Apply the following development requirements to lands identified

"C1" (New Residential) on Map V2-2.4A:

- To require the delivery of community facilities (e.g. health centre, nursing home, community centre, etc.) on 0.9 ha of the lands zoned C1. It is considered that this approach will allow for more flexibility in the delivery of community facilities within this area.***
- To require the improvement of the junction identified by objective T 4 on Map V2-2.4A.***

T 4 Improve the junction of the R411 (Naas Road) and the L6047.

Map V2-2.4A and Map V2-2.4B from the Kildare County Development Plans are included in Appendix A. One parcel of land along the L6047 is marked as C1 New Residential. This parcel of land begins at the junction of the L6047 with the R411 and runs adjacent to the L6047 for approximately 280m. The site

would require access from the L6047 if developed in future. The extent of the roadworks associated with this project begins further west along the L6047, a further 100m up the road.

In relation to the planning and development plans of Kildare County Council these works would be classified as emergency works.

3 ALTERNATIVES CONSIDERED

3.1 Alternative Options

As part of the scope, a total of seven options have been assessed; a “do-nothing” option, a “do-minimum” option and five potential “do-something” options (Options A-E).

- **“Do-nothing” option** – The do nothing option would permanently close the L6047 and no slope remediation works would be carried out. The existing utilities would remain in place. The responsibility of the road would transfer to the landowners in the area and the utility providers would be solely responsible for anything that would happen to their services.
- **“Do-minimum” option** – The do minimum option would permanently close the L6047 to vehicles and no slope remediation works would be carried out. An access route for pedestrians and cyclists would be created, with some of the route running in KTK land to avoid the line of the slip failure. Either end of the road would be gated off to prevent vehicle access. The responsibility of the road would transfer to the landowners in the area and the utility providers would be solely responsible for anything that would happen to their services.
- **Option A** – A plan and section view of this option is shown in Appendix I. This option requires the River Liffey to be moved away from the slope to allow the slope to be re-stabilised at a more natural angle. The realigned River Liffey would return back to the approximate alignment for the river as identified on the 6 inch

mapping from 1829-1841. The progression of the River Liffey can be seen from the images in Appendix F. Over years the course of the River Liffey has changed and cut progressively more into the embankment slope which runs up to the L6047. The realignment of the river would allow the embankment slope to be changed to a more natural angle, of 1vertical:2horizontal. Rock armour scour protection would also be provided at the base of the slope. The road would remain in its' existing location. There would be a very minor horizontal change to the alignment as a result of introduction of kerbing on the KTK landfill site side. 300m of the carriageway would be replaced i.e. new capping, sub-base, base, binder and surface layers. Any work in relation to the existing services in the L6047 would be carried out by the utility companies themselves.

- **Option B** – A plan and section view of this option is shown in Appendix I. This option would involve shifting the horizontal alignment of the road to the north by approximately 12-14m. The diverted L6047 would run for approximately 200m over the former KTK landfill site, and then tie in to the existing alignment. The ground conditions in the KTK site are unknown. The shift of the road alignment to the north, away from the River Liffey, enables the slope to be regraded to a more natural angle of 1vertical:2horizontal. The course of the River Liffey would remain on its' current alignment. A retaining wall would be required on the northern side of the road against the former landfill site because of the topography of the area. Any work in relation to the existing services in the L6047 would be carried out by the utility companies themselves.

- **Option C** – A plan and section view of this option is shown in Appendix I. This option would also involve shifting the horizontal alignment of the road to the north, by approximately 6m. The diverted L6047 would run for approximately 150m over former KTK landfill site, and then tie in to the existing alignment. The shift of the road away from the River Liffey helps to provide space for slope re-profiling. However, there is insufficient space to re-profile the slope to 1vertical:2horizontal from the southern side of the L6047 to the existing course of the River Liffey. Therefore, a retaining wall of approximately 4m in height would be required on the southern side of the L6047 to allow the embankment slope be re-profiled to 1vertical:2horizontal. The retaining wall would require significant foundations, likely piling. Any work in relation to the existing services in the L6047 would be carried out by the companies themselves.
- **Option D** – A plan and section view of this option is shown in Appendix I. This option keeps the road on its' existing alignment. The current course of the River Liffey is also maintained. A significant retaining would be structure is required in place of re-profiling the slope to 1vertical:2horizontal. The retaining wall would be approximately 7m in height with significant foundations, likely piling, underneath. An upgrade of the carriageway would also be part of this option. Any work in relation to the existing services in the L6047 would be carried out by the companies themselves.
- **Option E** – A plan of this option is shown in Appendix I. The L6047 is realigned through the KTK Landfill site, which sits north of the existing alignment. The new alignment of the L6047 would run from

the existing entrance to the landfill site and quarry, across the KTK landfill site for a distance of approximately 440m, before tie-ing-into the existing alignment. The new carriageway would be 6m wide with hard standing area of 0.5m on either side of the road. The current course of the River Liffey would be maintained with no slope stability work required. Any work in relation to the existing services in the L6047 would be carried out by the companies themselves.

3.2 Assessment of Options

There were six main criteria under which the options were assessed and given a scoring. The six main criteria had several sub criteria heading which were used to assess the impacts of each of the options. The main criteria and associated sub criteria are shown in Table 1 below.

Main Criteria:	Sub Criteria:
Economy	Transport Efficiency and Effectiveness
	Wider Economic Impact
	Transport Reliability and Quality
Safety	Collision Reduction (PIA/mvkm)
	Security
Environment	Air quality
	Noise and Vibration
	Landscape and Visual Qty
	Biodiversity
	Cultural, Archaeological , Architectural Heritage
	Land Use
	Water Resources
Landfill	
Accessibility and social inclusion	Vulnerable groups
	Deprived Geographical area
Integration	Transport Objectives
	Land Use Integration
	Geographic Integration
	Integration with other Government Policies
Physical Activity	Opportunities for pedestrians and cyclists

Table 1 – Main Criteria and Sub Criteria Table

A score value of between 1 and 7 was provided for each option against all of the sub criteria. The range of scoring was determined by the level of impact of the option under each sub criteria:

- Major negative impact – 1 point;
- Minor negative impact – 2 points;
- Neutral impact – 3 points;
- Minor positive impact – 4 points; and
- Major positive impact - 5 points.

3.3 Preferred Option

The Do-Nothing and Do-Minimum options compared unfavourably with the Do-Something Options. The Do-Something options scored significantly better than the Do Nothing and Do Minimum option. Doing nothing with respect to stabilising the slope, and closing the road, has a negative impact on the community from an integration, economic and accessibility perspective. This applies to both the Do Nothing and Do Minimum options.

Options A, B, C, D and E were broadly similar across 'Economy', 'Safety', 'Accessibility and Social Inclusion', 'Integration' and 'Physical Activity'. Compared to the Do-Nothing and Do-Minimum options, they are significantly better for 'Economy', 'Safety', 'Accessibility and Social Inclusion' and 'Integration'. The main differentiator between Options A-E was under the 'Environment' criteria, with Option A the least impactful.

Overall, Option A scored the most points as a result of the following:

- Option A overall has the lowest environmental impact, even though the option requires moving the River Liffey. Moving the river removes the need for diverting the road and thereby impacting on the landfill site. Options B and C require varying levels of interaction with the landfill site, shifting the L6047 horizontally into the former landfill site, which contains a number of major risks such as contaminated material and potential for leachate to impact on the water table and River Liffey. The ground conditions in the site are unknown. Option D does not require any interaction with the landfill site. Option E requires significant interaction with the landfill site as the L6047 is diverted across it. Moving the River Liffey is a significant undertaking. However, historic mapping shows that the proposed diversion of water course is back to where the River Liffey ran approximately 150 years ago. The diversion of the watercourse would be for a length of approximately 120-160m and tie into the existing course at either end.
- From a construction perspective, and in terms of interaction with the local site, Option A is thought to be the least impactful. Options B, C and D require a greater amount of material to be removed from the site than is required to be imported for Option A. Options C and D also require foundations to be built in the north bank of the River Liffey to support the respective retaining walls. Both of these options are considered to be significant from a construction impacts perspective as large amount of material will need to be removed to create a workable construction site. Options B and C would also require significant foundation works to support the road on the former landfill site, an area of significant risk because of potential contaminated material underneath. Disturbance of

the landfill site could increase the likeliness of groundwater infiltration of leachate. Similarly, Option E would require significant foundation works to support the road as more of the road would run across the site.

- From a risk perspective, Option A is thought to carry the least amount of unknown risk. Option A and D are the only Do-Something options that do not require any interaction with the KTK landfill site. This is mentioned within the environmental impact section but not truly borne out in the assessment. There is an element of risk with respect to the works i.e. permanent realignment of a section of the River Liffey. However this risk is known in relation to the construction methodology and can be managed out. With the other Do-Something options, B, C and E, there are varying levels of interaction with the landfill site. Ground conditions are completely unknown and therefore the risk is greater.

Therefore, the option that was progressed and is part of this accompanying planning statement is Option A.

4 CONSULTATION

4.1 Statutory Bodies

An initial meeting with the National Parks and Wildlife Service (NPWS) and Inland Fisheries Ireland (IFI) took place on site on the 29th of June 2018 to discuss the options for proposed remedial works for the slope stabilisation. Each of the options and the associated likely methods of construction were outlined.

Following the meeting and completion of the optioneering for the remedial work and for the preferred option, further work has gone into the construction methodology and the likely sequencing of works. Construction of the permanent diversion of the River Liffey which is required for the preferred option, Option A, will be required to be completed in dry conditions. Therefore a temporary channel will be required to allow for construction of the permanent channel to take place in dry conditions. This information and works proposals and methodology have been shared with the IFI and NPWS as part of the project development. All elements and stages of the proposed River Liffey diversion and slope stabilisation will be carried out in full consultation and in compliance with Inland Fisheries Ireland and NPWS.

4.2 ESB

A further meeting took place on site with the ESB to discuss the options around the remediation works and the likely methods of construction. Flow in the River Liffey is controlled by the ESB at Golden Falls Dam, which is located approximately 1.8km upstream from the site. Golden Falls Dam releases flow

from Poulaphouca Reservoir. Poulaphouca Dam controls flow into the reservoir. Following this meeting the ESB provided OCSC with daily flow data from Golden Falls Dam. This data was used in a follow up report to model the existing conditions of the River Liffey and simulate a flood event. This data was also used to compare the results of a flooding scenario in both the temporary alignment of the River Liffey so that works can take place in dry conditions, and also in the permanent re-alignment.

5 EXTENT OF PROPOSED WORKS

5.1 Existing Site Layout

The L6047 is 5m wide and runs for approximately 6.5km connecting the R411 and R412. Drawings showing the existing conditions at the site are included in Appendix B.

The River Liffey is approximately 18-20m wide at the site location. The flow in the River Liffey is controlled by the ESB at Golden Falls Dam, which is located approximately 1.8km upstream from the site. Poulaphouca Dam is located approximately 2.5km upstream from Golden Falls Dam which controls the flow from Poulaphouca Reservoir.

5.2 Proposed Works Extents

The proposal includes the permanent realignment of approximately 160m of the River Liffey, to a course the River Liffey ran approximately 150 years ago. It is evident from the review of the 1845 historical mapping that over time, the river has meandered. This movement over time created the steep embankment that is the subject of this report. The historical mapping for the river is shown in Appendix C.

Returning the River Liffey to a pre-existing course provides space to re-profile the embankment to a stable natural slope i.e. 1vertical: 2 horizontal. It is required that the diversionary works be completed in dry conditions and therefore a temporary river channel will need to be provided to facilitate work on the permanent realignment.

The re-profiled slope will be infilled using Class 1 material. Class 6C will be used for a drainage blanket. Geogrid reinforcement will be laid at 1m vertical centres and scour protection will be installed along the base of the slope to reduce the risk of further erosion from occurring. The L6047 will be re-constructed for a distance of 300m. The existing width of 5m will be maintained and a grass verge of 2m from the river edge of the L6047 will be put in place. Along this grass verge a wall will be built for 100m with a 50m safety barrier installed to the approach and departure of the wall.

A drawing showing the extents of the proposed works is included in Appendix D. This also includes temporary areas that could be used for construction sites during the works.

5.3 Construction Methodology

A work site will be required on both sides of the River Liffey during the proposed works. Potential sites have been identified and included within the proposed work extents drawing shown in Appendix D. The lands identified will be used to accommodate the site compounds and will include accommodation buildings, site offices and a storage area for all plant, equipment and materials.

The preliminary construction works would encompass the works related to site clearance for the compounds, clearing of some of the slope in preparation of slope re-stabilisation works and the excavation of the temporary diversion channel. The extent of the temporary diversion channel for the River Liffey is shown in Appendix E.

The main construction works would encompass the works related to the permanent realignment channel, the clearance of the remainder of the slope, the slope stabilisation works, the establishment of scour protection and the backfilling of the temporary channel. The reinstatement of lands made available for the temporary works and temporary accommodation will also be included as part of the stage prior to return to the third party land owners. The extent of the proposed permanent realignment of the River Liffey is shown in Appendix F.

5.4 Access to Site

Access to the site would be from two locations. Access to the southern end of the site would be from the R413. Access to the northern end of the site would be from the L6047. Temporary road widening works may be required on the road off the R413 to access the southern site. This is via a private road.



Figure 2 – Potential Site Access

6 IMPACT OF PROPOSED WORKS

6.1 Environmental Assessment

The location of the proposed works is within a proposed Natural Heritage Area (pNHA). This is not a site of European importance, but is a site of National importance. pNHA's were published on a non-statutory basis in 1995, they remain as sites that are not statutorily proposed or designated. Initial discussion with NPWS have indicated that works would require certain restrictions on the type of material that would be imported (i.e. gravels and sands to match the existing). The IFI has also outlined restrictions on the period of works in accordance with the "Guideline on Protection of Fisheries During Construction Works In and Adjacent to Waters".

An Appropriate Assessment Screening (AA) and Environmental Impact Assessment Report (EIAR) have been prepared. The AA Screening is included in Appendix G and the EIAR is included in Appendix H.

6.2 Flood Model

As part of the assessment of the preferred option, a HEC-RAS (Hydrologic Engineering Center) flood model assessment was completed to support this planning application. The HEC-RAS modelling software package (version 5.0.5) was used to create the model. HEC-RAS was developed by the US Army Corps of Engineers, and is used worldwide to provide an integrated hydraulic model of river channels, floodplains and hydraulic structures such as bridges, culverts, weirs and embankments.

The primary objective of the flood assessment was to ensure that the impact of the proposed project would not have any impact on flood levels and to ensure that sufficient land is made available for the Contractor to safely construct the proposed works.

River data was collected from the following publically available documents:

- Preliminary Flood Risk Assessment – ESB Dam and Embankments published in June 2011; and
- Eastern CFRAM Study HA09 Hydrology Report published in 2013.

The following flow rates were modelled based on the information taken from the documents above:

- Typical Daily Minimum – 1.5 m³/s;
- Typical Daily Maximum – 36 m³/s;
- Maximum Recorded – 52.8 m³/s;
- 10% AEP (1 in 10 year flood event) – 88 m³/s;
- 1% AEP (1 in 100 year flood event) – 121 m³/s; and
- 0.1% AEP (1 in 1000 year flood event) – 151 m³/s.

Three scenarios were modelled against the six flow rates; the existing condition, temporary condition and permanent condition.

6.3 Flood Model Results

The comparison of predicted water levels for the temporary scenario against the existing channel, for the six flow rates mentioned in Section 6.2, shows:

- 100-120mm decrease in water levels before the temporary channel; and
- No change in water levels downstream from the temporary channel.

The comparison of predicted water levels for the permanent scenario against the existing channel, for the six flow rates mentioned in Section 6.2 shows:

- 10-50mm increase in water levels before the permanent channel; and
- No change in water levels downstream from the permanent channel.

Overall the model showed that in the temporary and permanent scenario, there is no significant change in impact during a flood event, compared to the existing conditions.

7 CONCLUSION

From an integration, economics and local access perspective the L6047 is an important amenity for Ballymore Eustace, Coghlanstown and surrounding areas. It remains the most direct route from Ballymore Eustace to Kilcullen and Two Mile House and surrounding areas. The alternative to maintaining access to the road would be a detour of approximately 10-15 minutes for vehicles and the closure of a road used by locals for walking to and from Ballymore Eustace.

Following a review of the options for re-opening the road in conjunction with stabilising the existing embankment, planning permission is being sought to divert the River Liffey, re-profile the embankment to a more natural slope and re-surface the L6047 in its' existing location.



APPENDIX A. KILDARE COUNTY COUNCIL DEVELOPMENT PLAN MAPS



Kildare County Council
 Planning Department,
 Aras Chill Dara, Devoy Park,
 Naas, Co Kildare.

Ballymore Eustace Village
 County Development Plan
 2017 - 2023

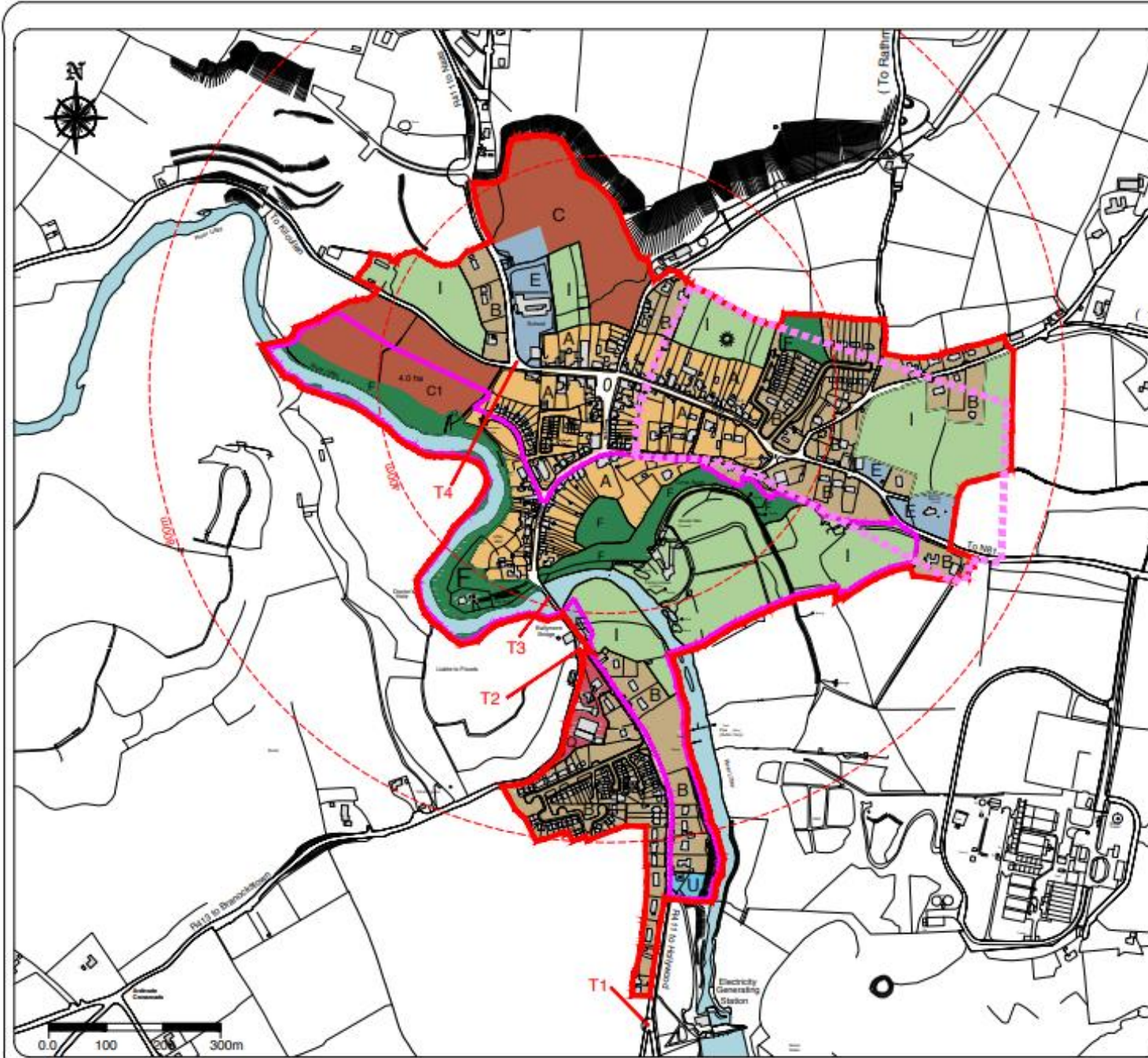
Legend :

- Village Plan Boundary
- A: Village Centre
- B: Existing Residential / Infill
- C: New Residential
- E: Community and Educational
- F: Open Space and Amenity
- I: Agriculture
- Q: Enterprise and Employment
- U: Utilities/Services
- Zone of Archaeological Potential
- Flood Risk Assessment
- River/Lakes/Ponds
- Distance from Village Centre
(at 400m intervals)
- Transportation Objective

This drawing is to be read in conjunction with
 the written statement.

Land Use Zoning Objectives

Date:	February 2017	Map Ref:	V2-2.4A
Scale:	N.T.S.	Dwg No:	200/15/749
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Kildare County Council
 Planning Department,
 Aras Chill Dara, Devoy Park,
 Naas, Co Kildare.

Ballymore Eustace Village
 County Development Plan
 2017 - 2023

Legend :

- Village Plan Boundary
- Zone of Archaeological Potential
- Flood Risk Assessment
- River/Lakes/Ponds
- Distance from Village Centre
(at 400m intervals)
- RMP Record of Monuments and Places
(KD029-039)
- RPS Record of Protected Structures
(B29-12)
- pNHA Proposed Natural Heritage Area
- Protected View / Objective
- Scenic Route (R9, R13.)
- TPO Tree Preservation Order 1991/OS sheet 29
- Walking Route (AR1)
- Tree and Woodland Preservation Objective

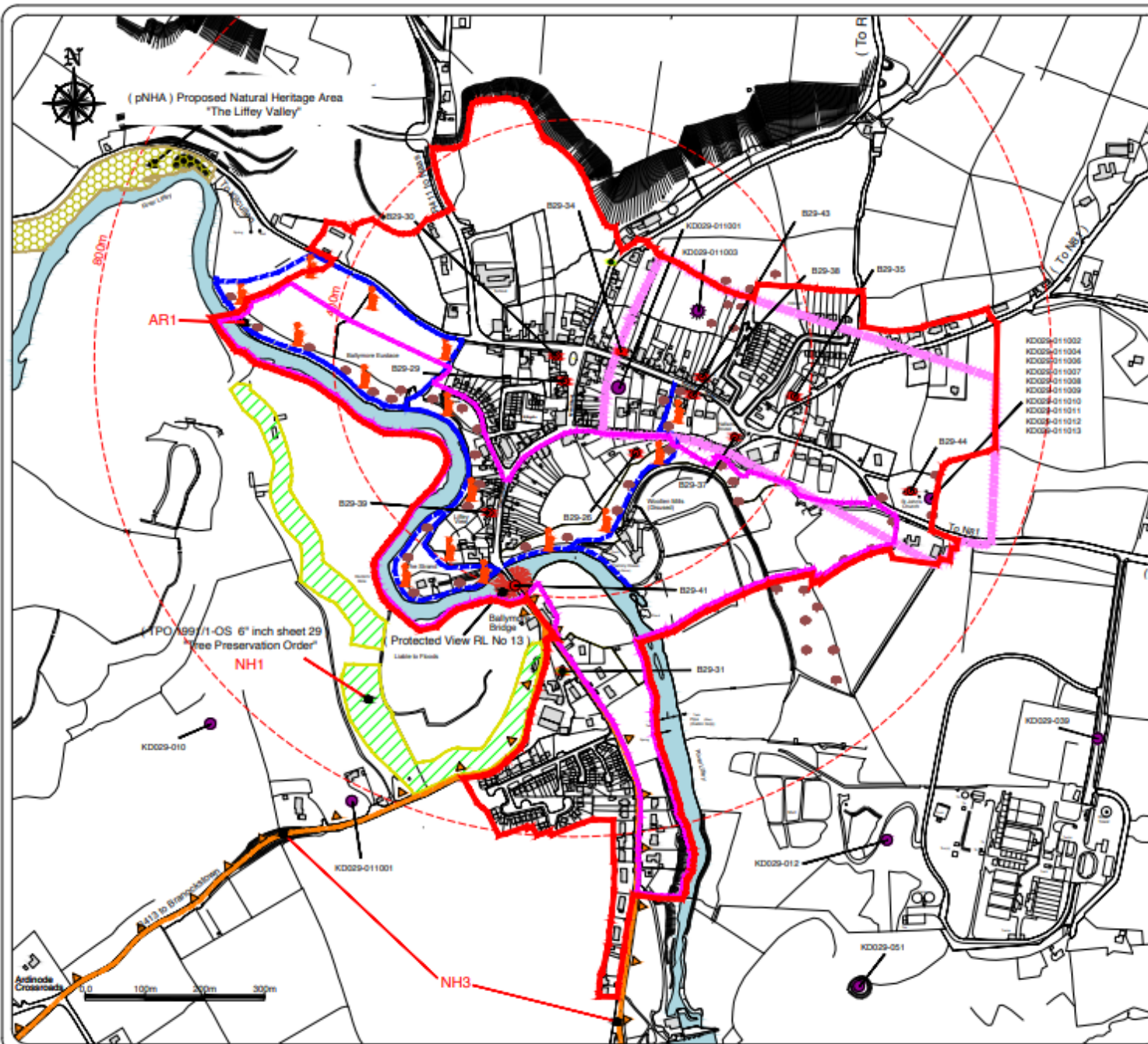
This drawing is to be read in conjunction with
 the written statement.

Objectives

Date:	February 2017	Map Ref:	V2-2.4B
Scale:	N.T.S.	Dwg No.:	200/15/757

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APPENDIX B. DRAWINGS SHOWING EXISTING CONDITIONS



LEGEND:

RIVER LIFFEY
EXISTING EXTENTS 
DIMENSION 

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P02	27.11.18	Text Updated	PON	BH
P03	30.01.19	Updated Text	PO	BH
P04	31.01.19	North Arrow	PO	BH

Rev No.	Date	Revision Note	Drn by	Chkd by



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Project: **Slope Remediation Project at Coghlanstown, Ballymore Eustace**

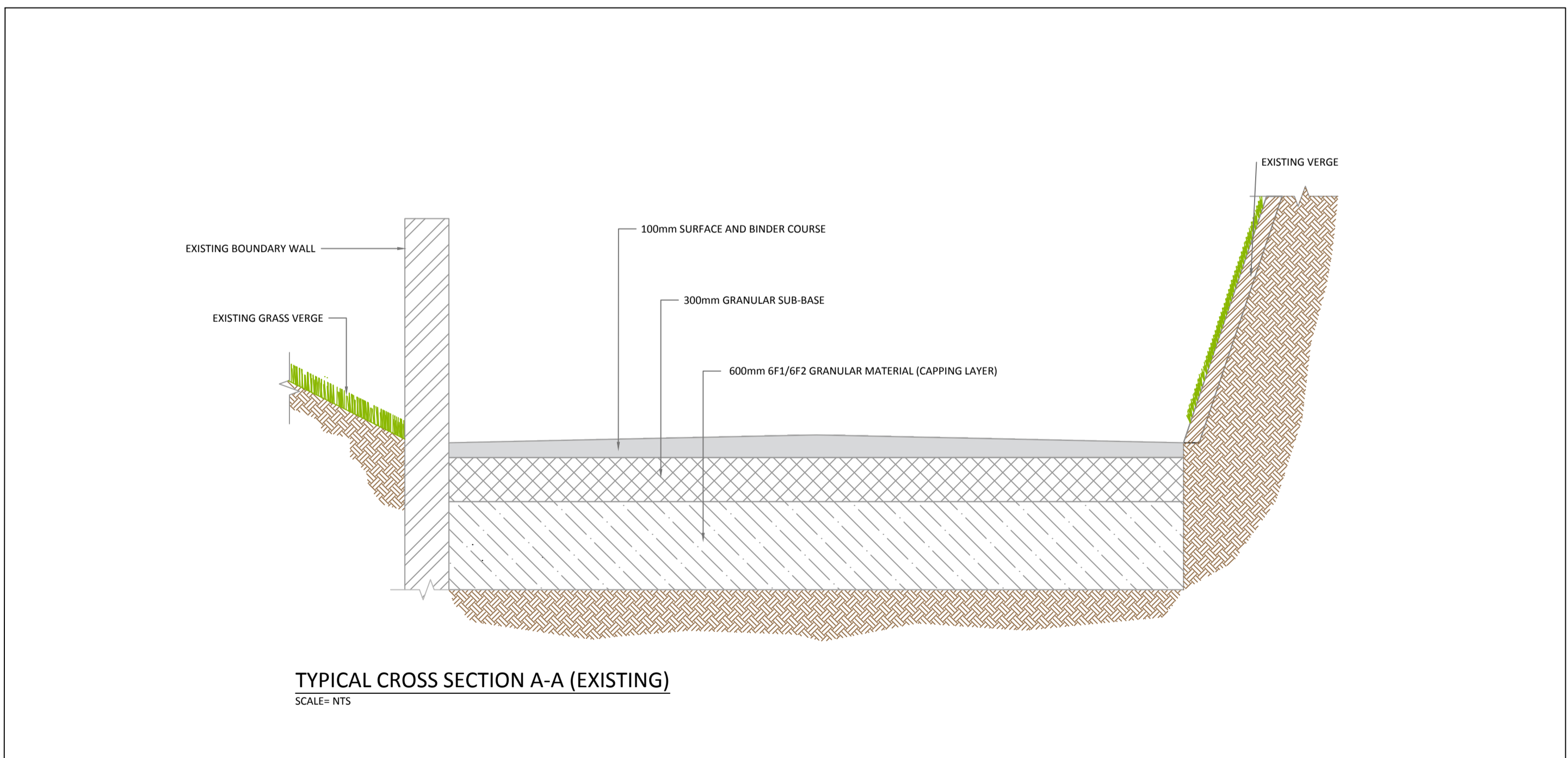
Title: **Existing Conditions Sheet 1 of 2**

Code [Originator] Zone | Level | Type | Role | Number | Status | Revision
K401 · OCSC · XX · XX · DR · C · 0146 · S2 · P04
 Date: 31.01.19 Scale: NTS @ A1 Drn by: PON Chkd by: BH Aprvd by: BOR

LEGEND:

RIVER LIFFEY
EXISTING EXTENTS

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Rev No.	Date	Revision Note	Drn by	Chkd by
P01	28.11.18	Existing Conditions showing L6047 cross section	PON	BH
P02	30.01.19	Title Updated	PO	BH
P03	31.01.19	North Point Added	PO	BH

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Client:	Kildare County Council											
Project:	Slope Remediation Project at Coghlanstown, Ballymore Eustace											
Title:	Existing Conditions Sheet 2 of 2											
Code	Originator	Zone	Level	Type	Role	Number	Status	Revision				
K401	OCSC	XX	XX	DR	C	0149	S2	P03				
Date:	31.01.19		Scale:	NTS		@ A1	Drn by:	PON	Chkd by:	BH	Aprvd by:	BOR



APPENDIX C. HISTORICAL MAPPING OF RIVER LIFFEY



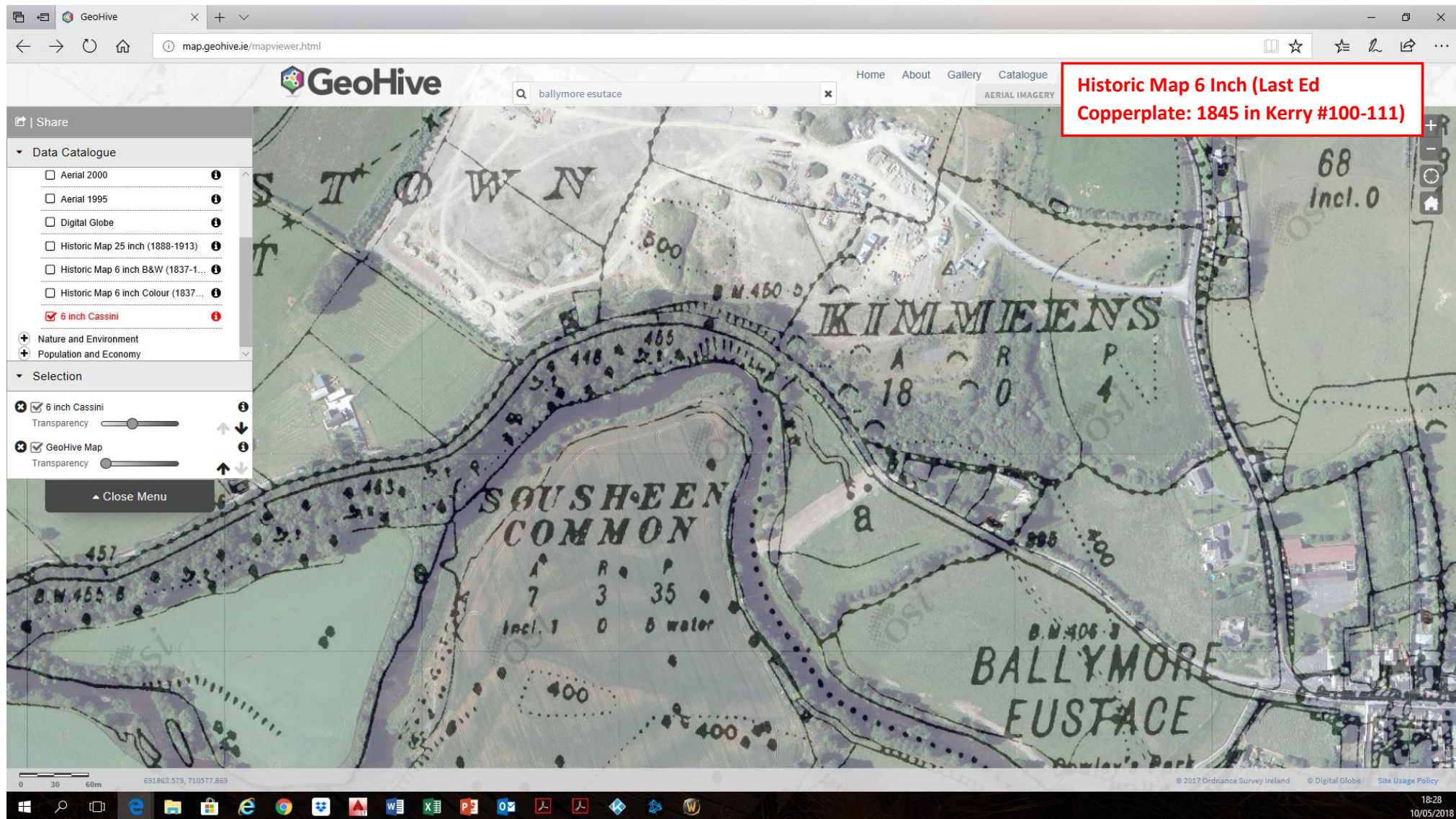
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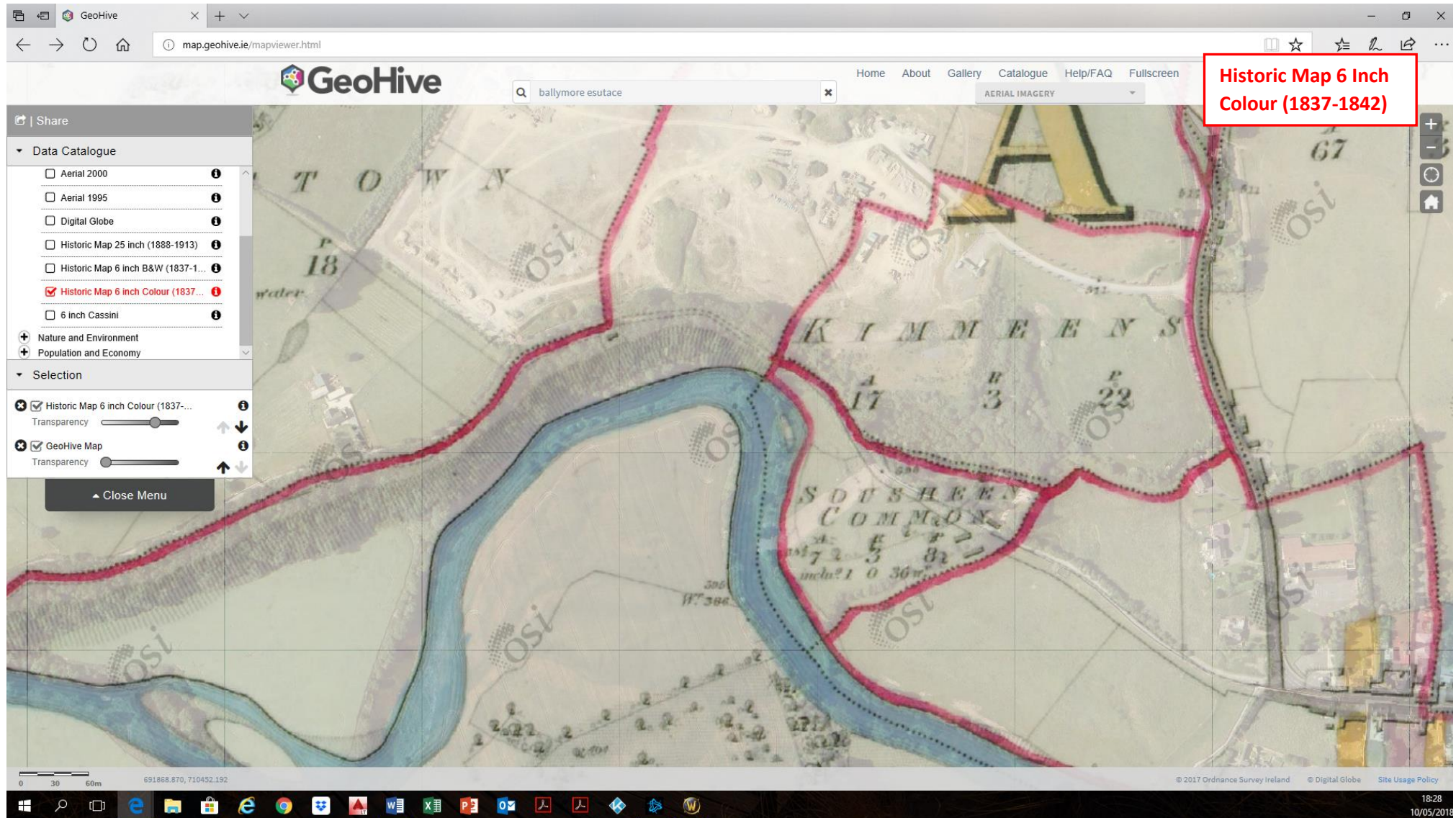
Mapping taken from GeoHive website <http://map.geohive.ie/>



Mapping taken from GeoHive website <http://map.geohive.ie/>



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Mapping taken from GeoHive website <http://map.geohive.ie/>

GeoHive

map.geohive.ie/mapviewer.html

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Historic 6 Inch Black & White (1837-1842)

Share

Data Catalogue

- Aerial 2000
- Aerial 1995
- Digital Globe
- Historic Map 25 inch (1888-1913)
- Historic Map 6 inch B&W (1837-1842)
- Historic Map 6 inch Colour (1837-1842)
- 6 inch Cassini

Nature and Environment

Population and Economy

Selection

- Historic Map 6 inch B&W (1837-1842)
Transparency
- GeoHive Map
Transparency

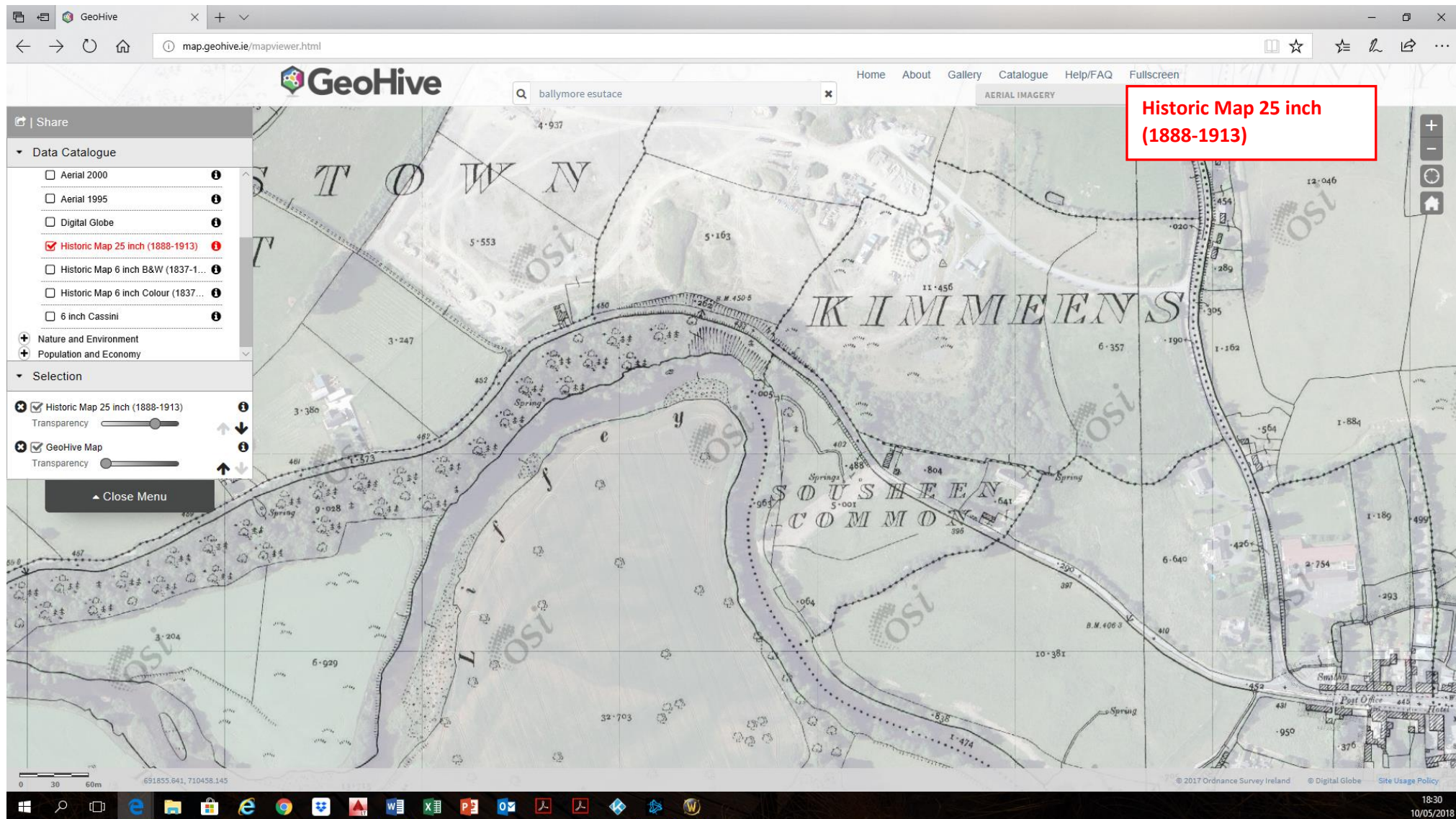
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18:29 10/05/2018

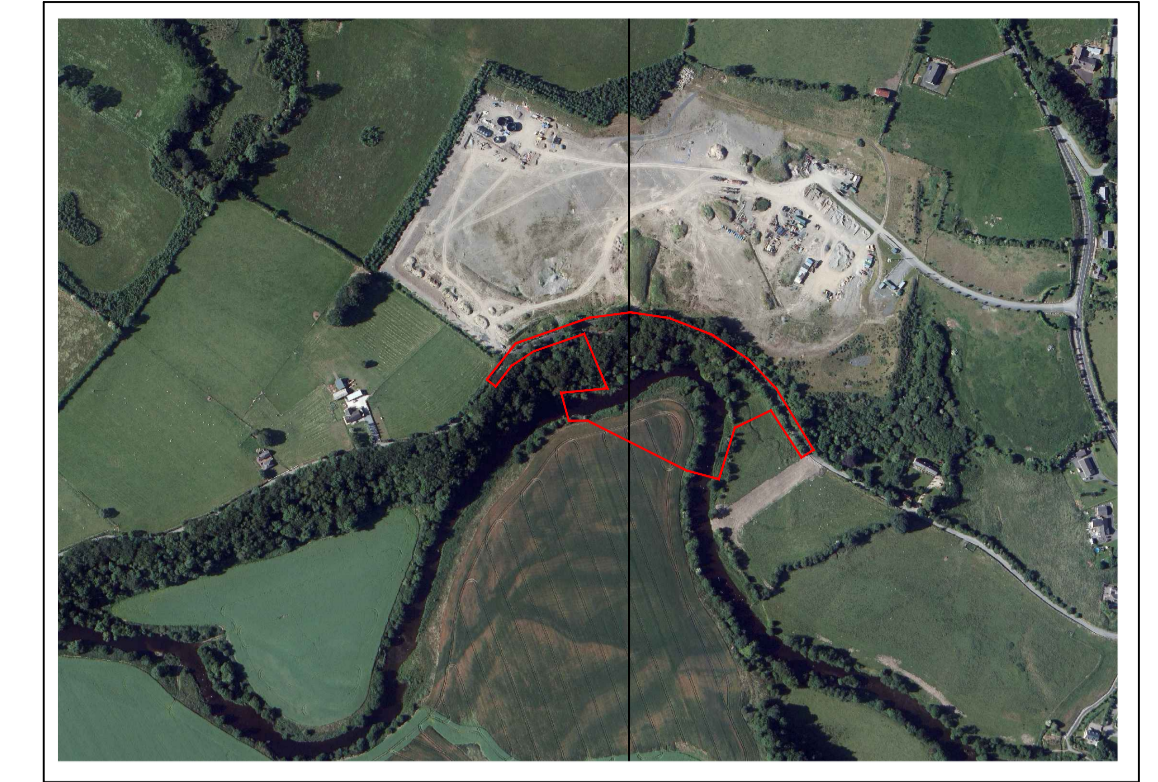
Mapping taken from GeoHive website <http://map.geohive.ie/>



Mapping taken from GeoHive website <http://map.geohive.ie/>



APPENDIX D. DRAWING SHOWING EXTENTS OF WORKS



LEGEND:

EXTENT OF PROPOSED WORKS 

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Rev No.	Date	Revision Note	Drn by	Chkd by
P01	28.11.18	Proposed work extents	PON	BH
P02	04.12.18	Updated Extents	PO	BH
P03	30.01.19	Updated Title	PO	BH

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Client: Kildare County Council
Project: Slope Remediation Project at Coghlanstown, Ballymore Eustace

Title: Proposed Work Extents

Code | Originator | Zone | Level | Type | Role | Number | Status | Revision
K401 · OCSC · XX · XX · DR · C · 0151 | S2 | P03
Date: 30.01.19 Scale: NTS @ A1 Drn by: PON Chkd by: BH Aprvd by: BOR



**APPENDIX E. DRAWING SHOWING TEMPORARY DIVERSION OF
RIVER LIFFEY**



LEGEND:

RIVER LIFFEY EXISTING EXTENTS 

RIVER LIFFEY TEMPORARY DIVERSION EXTENTS 

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Rev No.	Date	Revision Note	Drn by	Chkd by
P01	28.11.18	Temporary diversion of River Liffey	PON	BH
P02	30.01.19	Updated Title	PO	BH
P03	31.01.19	North point added	PO	BH

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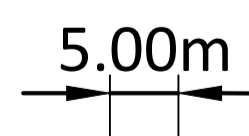
Client:	Kildare County Council											
Project:	Slope Remediation Project at Coghlanstown, Ballymore Eustace											
Title:	Temporary River Liffey Diversion											
Code	Originator	Zone	Level	Type	Role	Number	Status	Revision				
K401	OCSC	XX	XX	DR	C	0150	S2	P03				
Date:	31.01.19		Scale:	NTS		@ A1	Drn by:	PON	Chkd by:	BH	Aprvd by:	BOR



**APPENDIX F. DRAWING SHOWING EXENTS OF PERMANENT
REALIGNMENT OF RIVER LIFFEY, SLOPE RE-STABILISATION &
L6047 WORKS**



LEGEND:

- RIVER LIFFEY PERMANENT RE-ALIGNMENT EXTENTS 
- SLOPE RE-PROFILING EXTENTS 
- ROAD WORKS EXTENTS 
- STONEWALL 
- SAFETY BARRIER 
- RIVER LIFFEY EXISTING EXTENTS 
- DIMENSION 

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Rev No.	Date	Revision Note	Drn by	Chkd by
P01	14.11.18	SUITABLE FOR INFORMATION	PON	BH
P02	27.11.18	Text Updated	PON	BH
P03	30.01.19	Updated Title	PO	BH
P04	31.01.19	North Arrow	PO	BH

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Project:	Slope Remediation Project at Coghlanstown, Ballymore Eustace											
Title:	Proposed Works											
Code	Originator	Zone	Level	Type	Role	Number	Status	Revision				
K401	OCSC	XX	XX	DR	C	0147	S2	P04				
Date:	31.01.19		Scale:	NTS		@ A1	Drn by:	PON	Chkd by:	BH	Aprvd by:	BOR



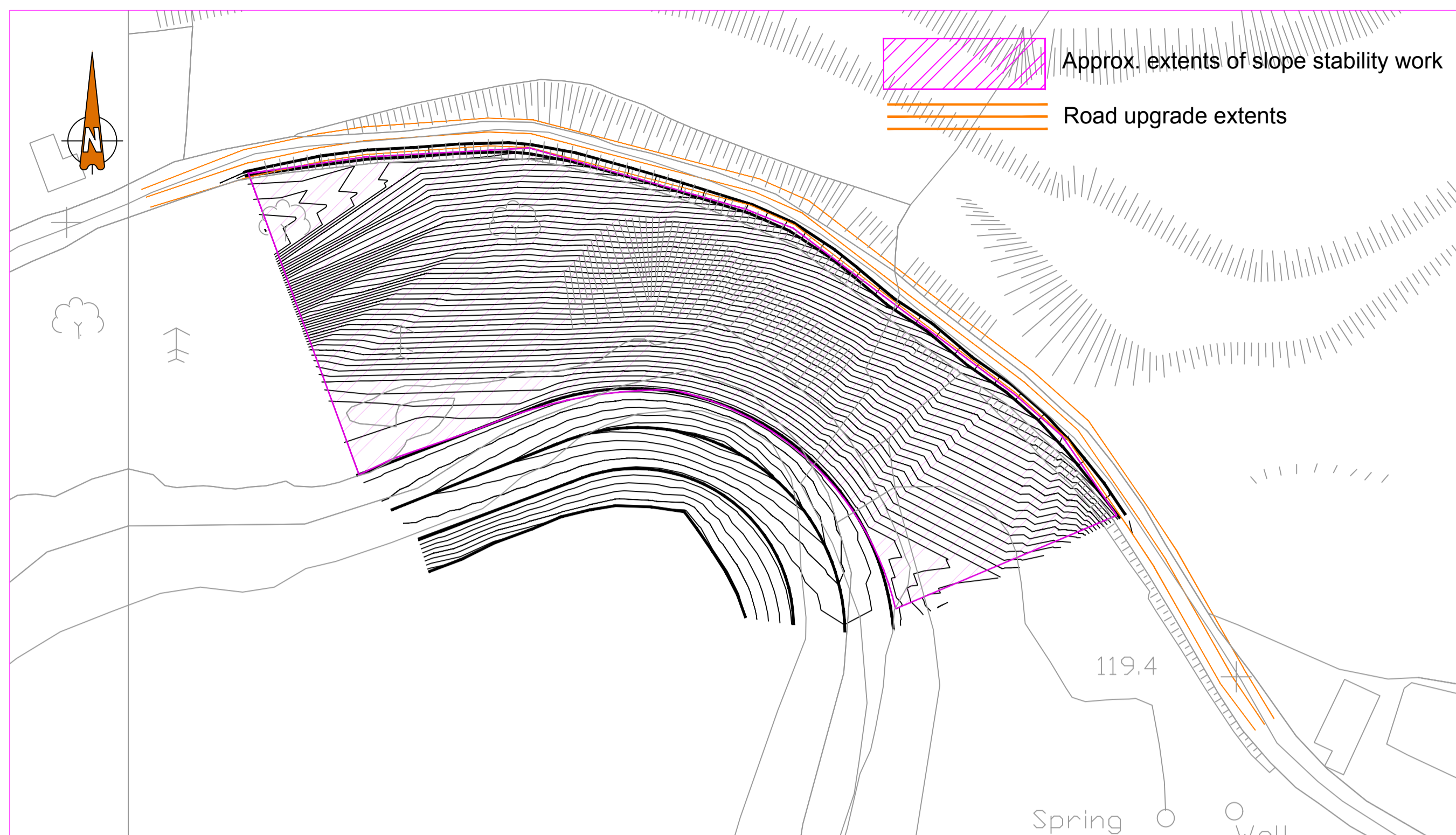
APPENDIX G. APPROPRIATE ASSESSMENT REPORT



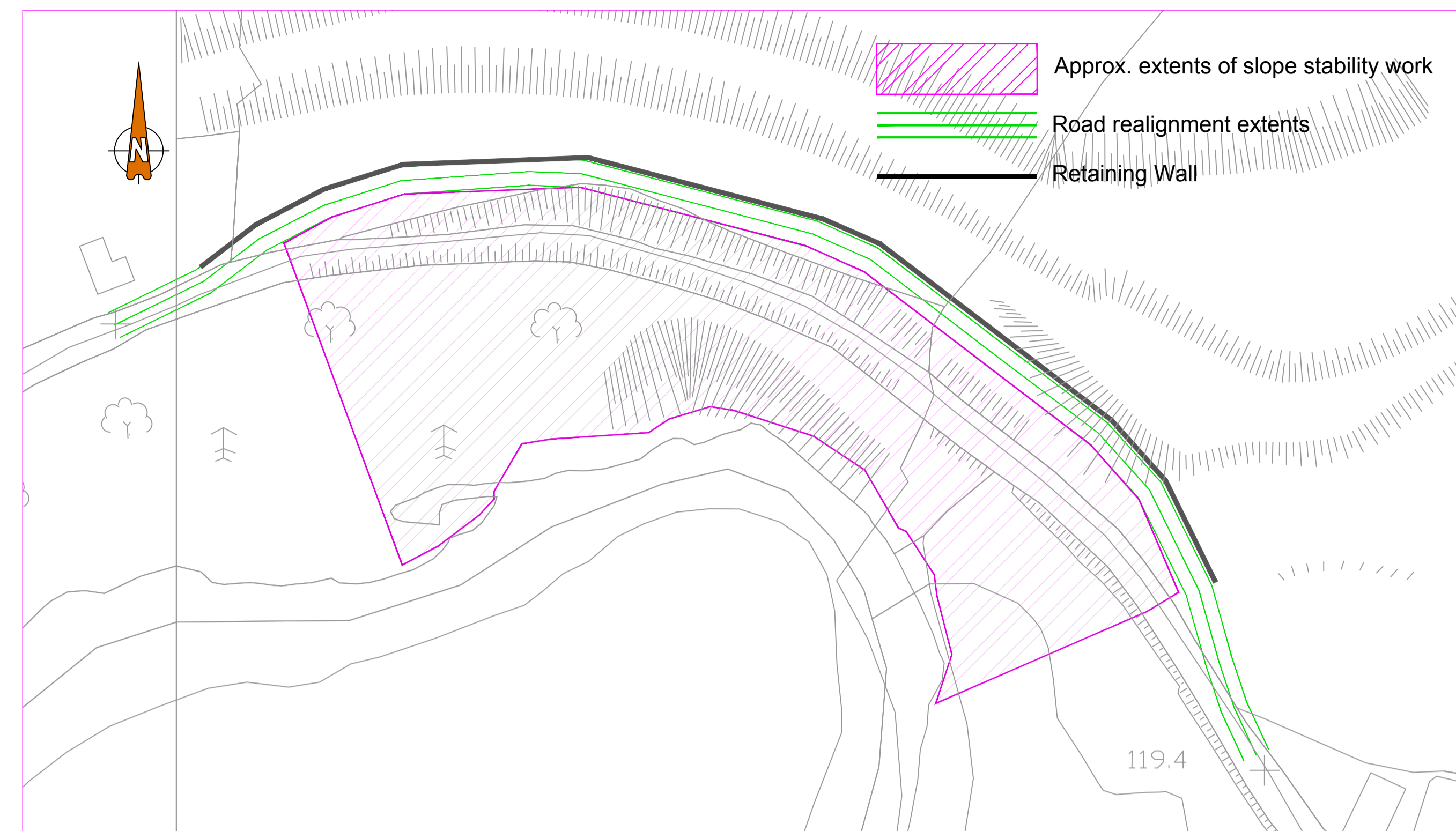
APPENDIX H. ENVIRONMENTAL IMPACT ASSESSMENT REPORT



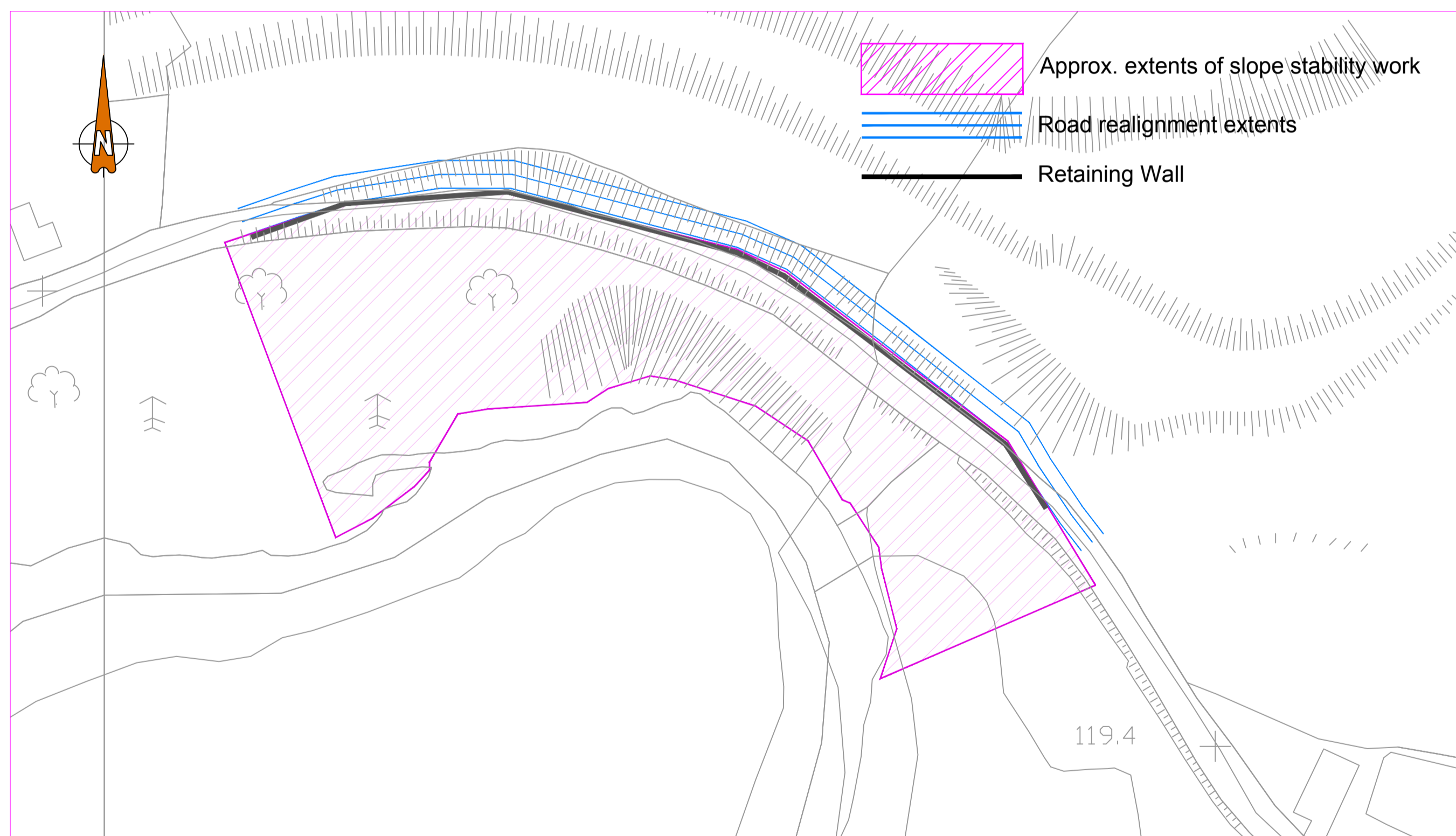
APPENDIX I. ALTERNATIVE OPTIONS A-E



Option A: Realign River Liffey and instatement of 1:2 slope. Existing road alignment maintained with 300m re-build of existing road build up.



Option B: Realign L6048 to the north by approximately 12-14m for an approximate distance of 200m. Retaining wall to be introduced on north side of the L6048 and slope stability works to take place with introduction of 1:2 slope.



Option C: Realign L6048 to the north by approximately 6-8m for an approximate distance of 150m. Piling and retaining wall required on southern side of L6048. Slope stability works to take place with introduction of 1:2 slope.



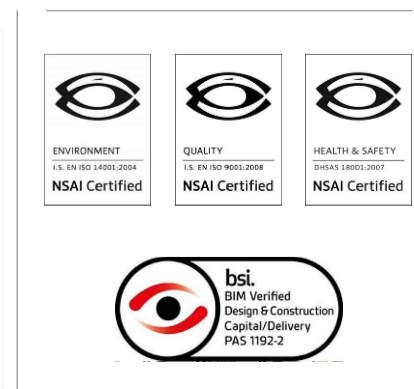
Option D: Existing alignment of L6048 maintained with introduction of piling and retaining wall on southern side of the road. Slope of 1:2 to be introduced to run towards the River Liffey. Existing road alignment maintained with 300m re-build of existing road build up.

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P01	18.09.18	Options A, B, C and D	PO	BH
P02	30.11.18		PO	BH
PO	30.01.19	Updated Title	PO	BH

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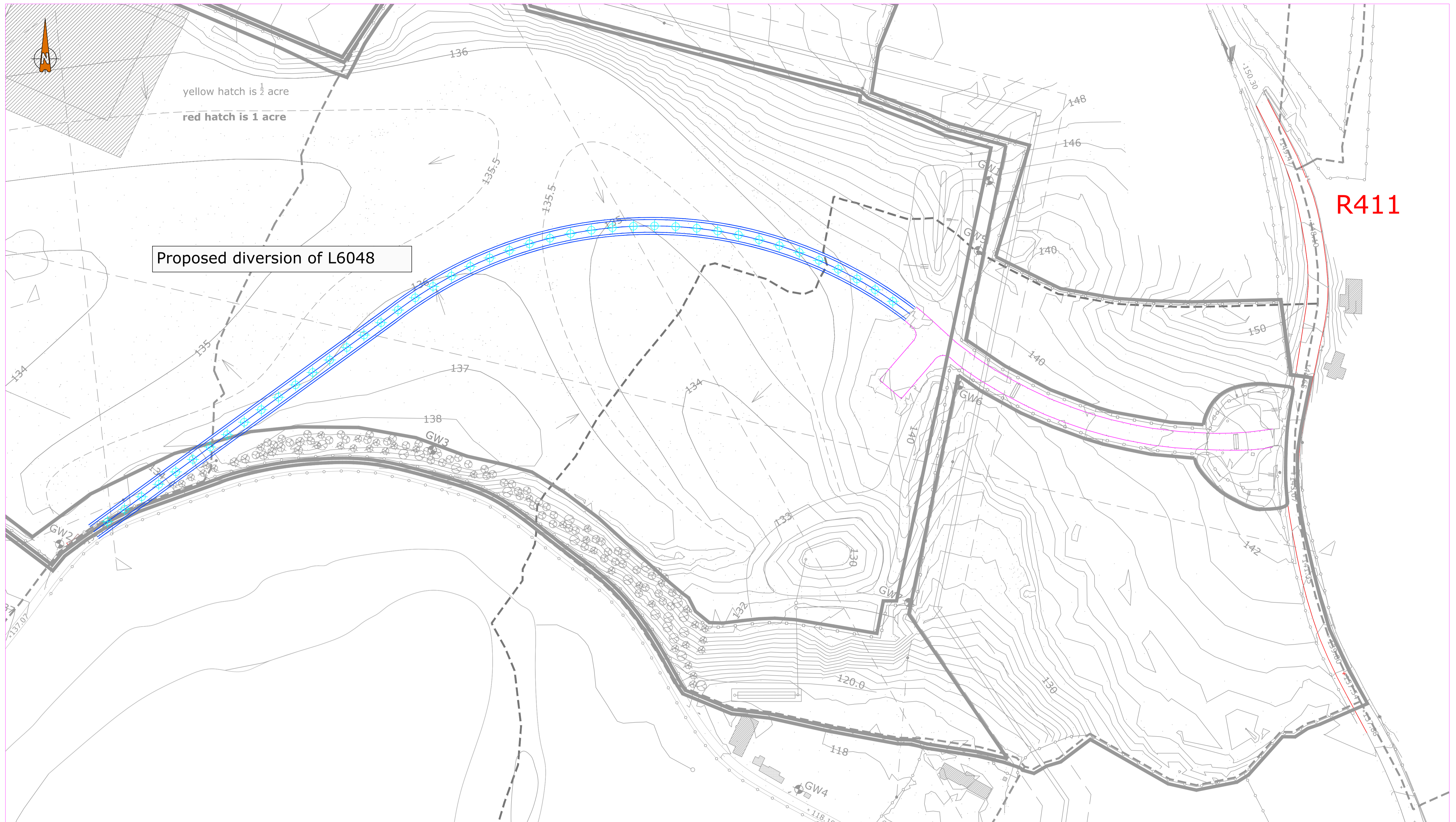
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Project: Slope Remediation Project at Coghlanstown, Ballymore Eustace
Title: Options A, B, C and D

Code | Originator | Zone | Level | Type | Role | Number | Status | Revision
K401 · OCSC · XX · XX · DR · C · 0203 · S2 · P03
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Option E: Diversion of L6048 across KTK Landfill site.

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P01	18.09.18	Option E	PO	BH
P02	22/11/18	Updated Information	PO	BH
P03	30.01.19	Updated Title	PO	BH

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Title: Option E

Code | Originator | Zone | Level | Type | Role | Number | Status | Revision
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